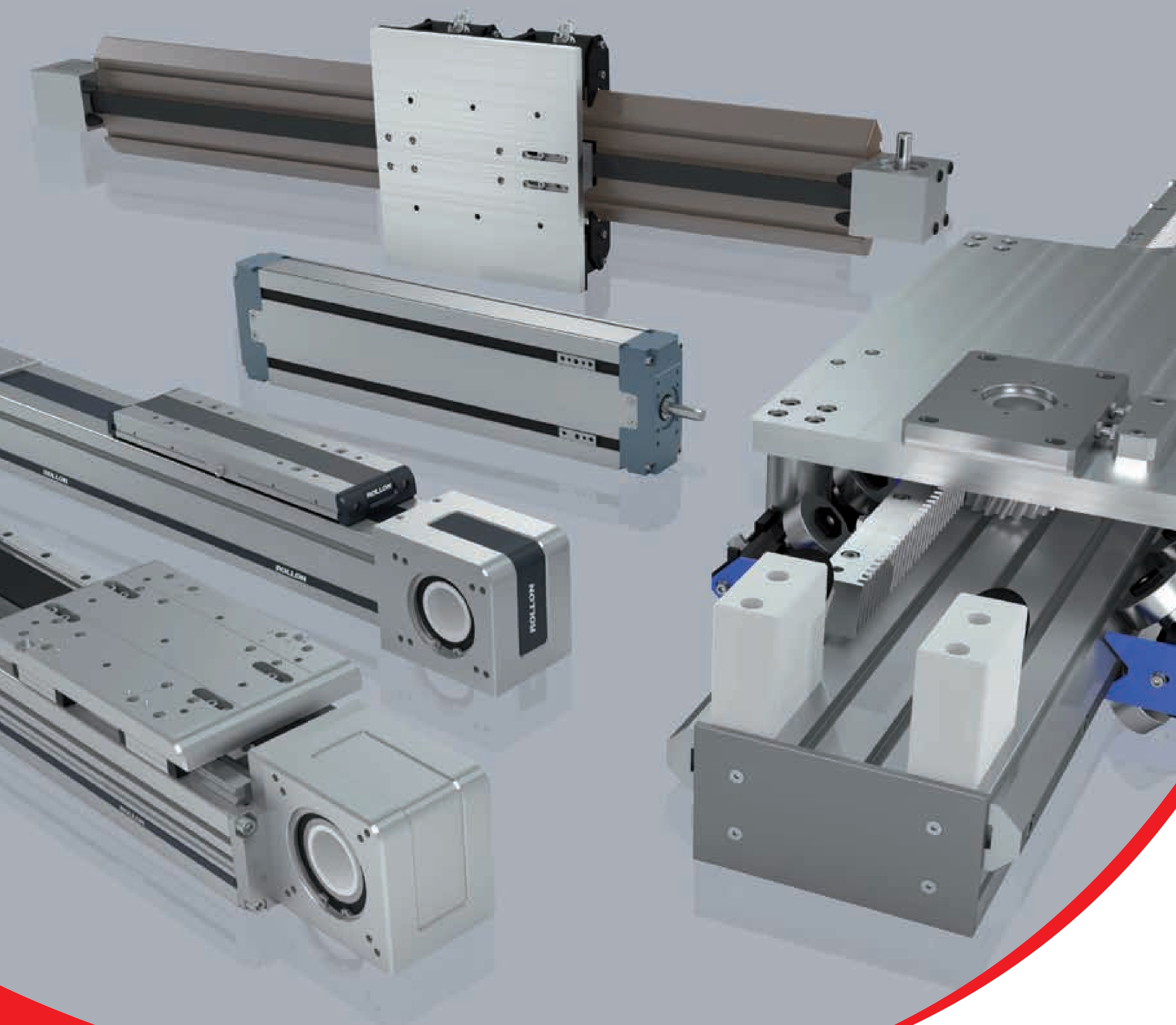
ROLLON
BY TIMKEN

Actuator Line



General catalogue

English

Interactive catalogs on: www.rollon.com

TO SUPPORT YOU, WE DESIGN AND PRODUCE

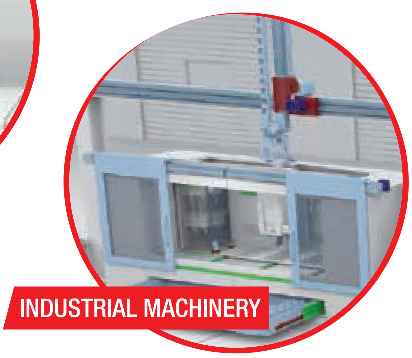
An industrialized process with various levels of customization

VALUES

For over 40 years, Rollon has adopted an approach entailing responsibility and ethics in the design and production of our linear motion solutions for different industrial sectors. The reliability of an international technology group has now been combined with the availability of a local support and service network

PERFORMANCE

Rollon's goal is to help our clients become more competitive in their markets through technological solutions, design simplification, productivity, reliability, duration, and low maintenance.



COLLABORATION

High-level technical consulting and cross-competence allow us to identify the needs of our clients and transform them into guidelines for continuous exchange, while**our strong specialization in the different industrial sectors becomes an factor in developing projects and innovative applications.**

Rollon takes on the task of design and development of linear motion solutions, taking care of everything for our customers, so that they can concentrate on their core business. **We offer everything from individual components to specifically designed, mechanically integrated systems: the quality of our applications is an expression of our technology and competence.**

SOLUTIONS APPLICATIONS

DIVERSIFIED LINEAR SOLUTIONS FOR EVERY APPLICATION REQUIREMENT

Linear and telescopic rails

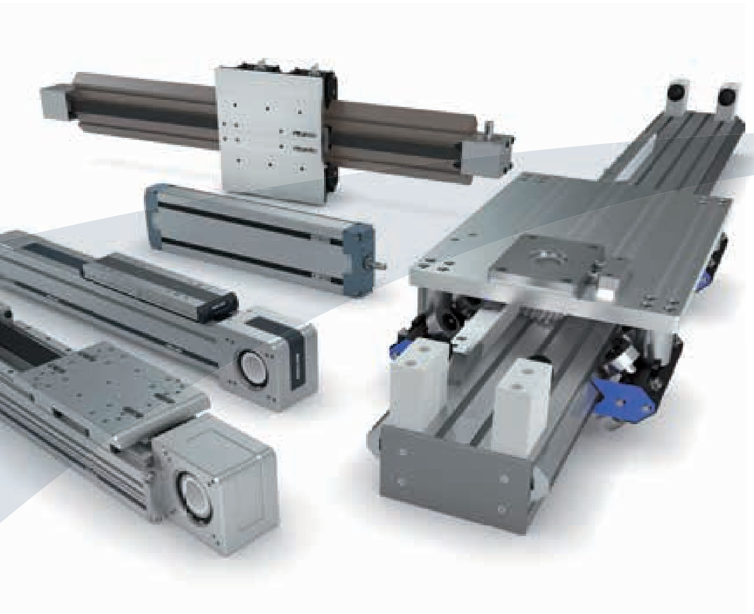
Linear Line

Linear and curved rails with ball and roller bearings, with hardened raceways, high load capacity, self-alignment, and capable of working in dirty environments.

Telescopic Line

Telescopic rails with ball and roller bearings, with hardened raceways, high load capacities, low bending, resistant to shocks and vibrations. For partial, total or extended extraction up to 200% of the length of the guide.

Linear actuators and automation systems



Actuator Line

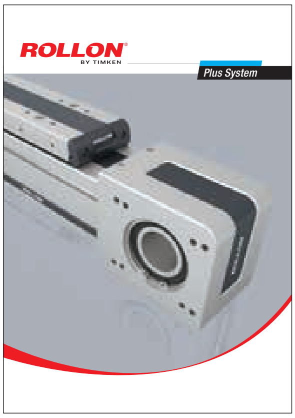
Linear actuators with different rail configurations and transmissions, available with belt, screw, or rack and pinion drives for different needs in terms of precision and speed. Rails with bearings or ball recycle systems for different load capacities and critical environments.

Actuator System Line

Integrated actuators for industrial automation, used in applications in several industrial sectors: automated industrial machinery, precision assembly lines, packaging lines and high speed production lines. The Actuator Line evolves to satisfy the requests of our most discerning clients.

Content

Plus System



Technical features overview

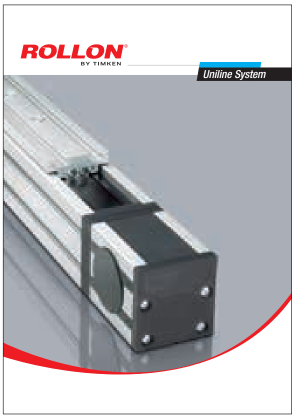
Clean Room System

Smart System

Eco System

1 ECO series

Uniline System



1 Uniline A series

2 Uniline C series

3 Uniline E series

4 Uniline ED series

5 Uniline H series

Modline

4 ZMCH series

Precision System

Tecline

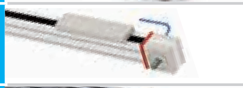
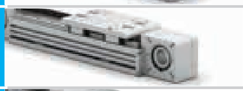
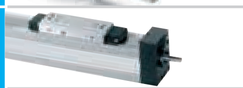
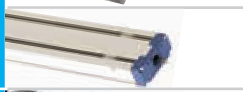
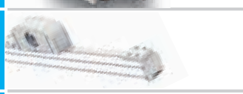
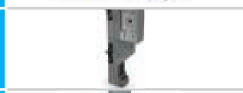
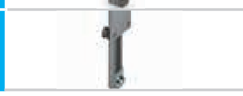
1 PAR/PAS series

Speedy Rail A

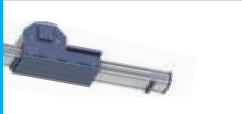
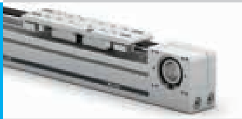
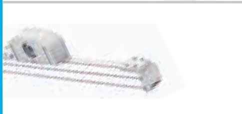
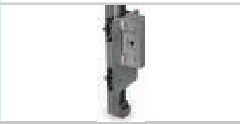
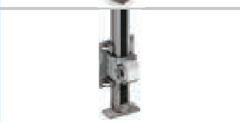
Pre-selection overview

Application Priority	Driving system	Section
Max. speed from 4 to 15 [m/s] Max. acceleration from 10 to 50 [m/s²] Stroke up to 10 m	Belt	Square
		Rectangular
		Other section
High precision up to ± 0,005 [mm] Stroke up to 3.5 m	Ball screw	Square
		Rectangular
Heavy loads up to 4.000 Kg Infinite stroke Multiple independent carriages	Rack and pinion	Rectangular
		Other section
Vertical mounting Profile moving	Ω Belt	Square
		Rectangular
		Rectangular
		Other section

* Optimal reliability in dirty environments thanks to plastic compound coated rollers

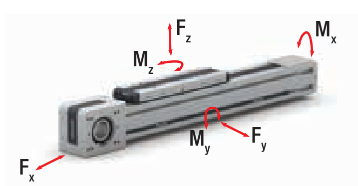
Protection	Rollon solution		
	Product Family		Product
Protected	Plus System		ELM
	Modline		MCR/MCH with protection
Semi-protected	Eco System		ECO
	Modline		MCR/MCH
	Uniline System		UNILINE
Open	Smart System		E-SMART
Protected with suction	Clean Room System		ONE
Protected	Plus System		ROBOT
Open	Smart System		R-SMART
	Modline		TCR/TCS
Open*	Speedy Rail A		SAB
Semi-protected	Precision System		TV
			TVS
			TT
			TH
Open	Tecline		PAS
			PAR
Open*	Speedy Rail A		SAR
Semi-protected	Smart System		S-SMART
Semi-protected	Plus System		SC
Open	Modline		ZCR/ZCH
Open*	Speedy Rail A		ZSY

Technical features overview

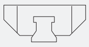
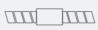
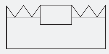
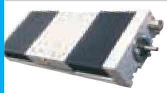
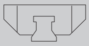
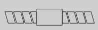
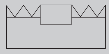
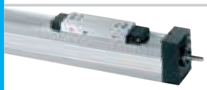
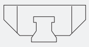
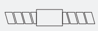
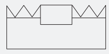
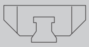
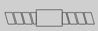
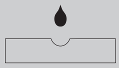
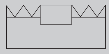
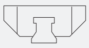
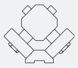
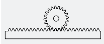
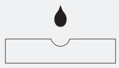
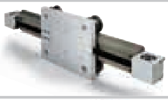
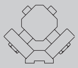
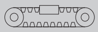
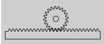
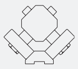
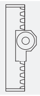
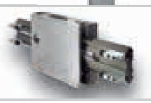
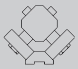
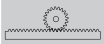
Reference			Linear motion system		Driving			Anticorrosion	Protection
Product Family		Product	Balls	Rollers	Toothed belt	Ball screw	Rack and pinion		
Plus System		ELM							Protected
		ROBOT							Protected
		SC							Semi-protected
Clean Room System		ONE							Protected with suction
Smart System		E-SMART							
		R-SMART							
		S-SMART							Semi-protected
Eco System		ECO							Semi-protected
Uniline System		A/C/E/ED/H							Semi-protected
Modline		MCR MCH							Semi-protected
		TCR TCS							
		ZCR ZCH							
		ZMCH							

Reported data must be verified according to the application.
* Longer stroke is available for jointed version

Size	Max. load capacity per carriage [N]			Max. static moment per carriage [Nm]			Max. speed [m/s]	Max. acceleration [m/s²]	Repeatability accuracy [mm]	Max stroke (per system) [mm]
	F_x	F_y	F_z	M_x	M_y	M_z				
50-65-80-110	4980	129400	129400	1392	11646	11646	5	50	± 0,05	6130*
100-130-160-220	9545	258800	258800	22257	28986	28986	5	50	± 0,05	6100*
65-130-160	6682	153600	153600	13555	31104	31104	5	50	± 0,05	2500
50-65-80-110	4980	104800	104800	1126	10532	10532	5	50	± 0,05	6000*
30-50-80-100	4980	130860	130860	1500	12039	12039	4	50	± 0,05	6145*
120-160-220	9960	258800	258800	21998	28468	28468	4	50	± 0,05	6050*
50-65-80	2523	51260	51260	520	3742	3742	4	50	± 0,05	2000
60-80-100	4565	76800	76800	722	7603	7603	5	50	± 0,05	6000*
40-55-75	19360	11000	17400	800,4	24917	18788	7	15	± 0,05	5700*
65-80-105	3984	51260	51260	520	5536	5536	5	50	± 0,1	10100*
140-170 200-220-230 280- 360	9960	266400	266400	42624	61272	61272	5	50	± 0,1	11480
60-90-100 170-220	7470	174480	174480	12388	35681	35681	4	25	± 0,1	2500
105	4980	61120	61120	3591	10390	10390	3	25	± 0,1	2100



Technical features overview

Reference			Linear motion system		Driving			Anticorrosion	Protection
Product Family		Product	Balls	Rollers	Toothed belt	Ball screw	Rack and pinion		
Precision System		TH							 Semi-protected
		TT							 Semi-protected
		TV							 Semi-protected
		TVS							 Semi-protected
Tecline		PAR PAS							
Speedy Rail A		SAB							
		ZSY							
		SAR							

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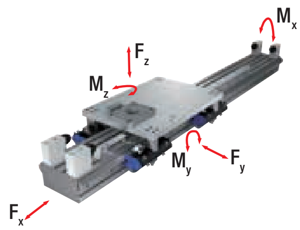
Size	Max. load capacity per carriage [N]			Max. static moment per carriage [Nm]			Max. speed [m/s]	Max. acceleration [m/s²]	Repeatability accuracy [mm]	Max stroke (per system) [mm]
	F_x	F_y	F_z	M_x	M_y	M_z				
70-90-110-145	32600	153600	153600	6682	5053	5053	2		± 0,005	1500
100-155-225-310	30500	230500	274500	30195	26625	22365	2,5		± 0,005	3000
60-80-110	11538	85000	85000	1080	2316	2316	2,5		± 0,01	3000
170-220	66300	258800	258800	19410	47360	47360	1	5	± 0,02	3500
118-140-170-200-220-230-280-360	10989	386400	386400	65688	150310	150310	4	10	± 0,05	10800*
60-120-180-250	4980	5431	5431	558	597	644	15	10	± 0,2	7150
180	4980	2300	2600	188	806	713	8	8	± 0,2	6640
120-180-250	1905	7240	7240	744	1521	1521	3	10	± 0,15	7150*



ROLLON
BY TIMKEN

Plus System

NEW

ELM series

ELM series description

Fig. 1

ELM

This is Rollon's highly versatile, premier line of completely enclosed belt driven linear actuators.

The ELM series linear units are available in four sizes: 50 - 65 - 80-110 mm. They have a self-supporting structure with a robust profile of extruded and anodized aluminum. The thrust force is transmitted by a steel reinforced, polyurethane belt. The moving carriage is guided and supported by a linear guide system.

A polyurethane sealing strip ensures complete protection of the belt drive and linear guide system against dust, dirt and other contaminants. It avoids the fragility of other sealing systems such as stainless steel strips.

The components used for linear motion and accessories promote a "maintenance-free" system. The pulleys, bearings and drive shafts are among the most robust in the industry. The ELM is the best product for applications in very aggressive working environments that also require high speed duty cycles and position repeatability.

Corrosion resistant version

ELM linear actuators are available with stainless steel elements, for applications in harsh environments and/or subject to frequent washes.
They are constructed using extruded anodized 6060 and 6082 Anti-Corrosive Aluminum, which houses bearings, linear rails, nuts and bolts and components made of stainless steel preventing or delaying corrosion caused by humidity experienced in the environments where the linear units are used.

Special no-deposit surface treatments are combined with a food grade lubrication system to allow use in highly sensitive applications, such as the food and pharmaceutical industries where product contamination is prohibited.

- Internal stainless steel elements
- Anodized 6060 and 6082 Anti-Corrosive Aluminum Profile
- AISI 440 stainless steel linear rails
- Lubricated with organic food grade vegetable oils

The components

Extruded profile

The anodized 6060 aluminum alloy extrusion used for the profile of ELM series linear units are designed and manufactured by industry experts to optimize weight while maintaining mechanical strength. (see physical-chemical characteristics below).The dimensional tolerances comply with EN 755-9 standard.

Driving belt

ELM series linear units use steel reinforced polyurethane drive belts with AT pitch. This belt is ideal due to its high load transmission characteristics, compact size and low noise. Used in conjunction with a backlash-free pulley, smooth alternating motion can be achieved. Optimization of the maximum belt width/body dimension ratio enables the following performance characteristics to be achieved:

- **High speed**
- **Low noise**
- **Low wear**

Carriage

The carriage of the ELM series linear units are made of anodized aluminum. Each carriage has mounting holes fitted with stainless steel thread inserts. Rollon offers multiple carriages to accommodate a vast array of applications. The unique design of the carriage allows for the sealing strip to pass through it, as well as house brush seals to remove contaminates from the sealing strip.

Sealing strip

ELM series linear units are equipped with a polyurethane sealing strip to protect all of the internal components from dust, contaminates, and other foreign objects. The sealing strip runs the length of the body and is kept in position by micro-bearings located inside the carriage. This minimizes resistance as the strip passes through the carriage while providing maximum protection.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 1

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.7	69	23	200	880-900	33	600-655

Tab. 2

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
205	165	10	60-80

Tab. 3

The linear motion system

The linear motion system has been designed to meet the load capacity, speed, and maximum acceleration conditions of a wide variety of applications.

ELM with ball bearing guides

- A ball bearing guide with high load capacity is mounted in a dedicated seat inside the body.
- The carriage is assembled on two pre-loaded ball bearing blocks.
- The two ball bearing blocks enable the carriage to withstand loading in the four main directions.
- The two blocks have seals on both sides and, if necessary, an additional scraper can be fitted for very dusty conditions.
- The ball bearing carriages are also fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment.
- Lubrication reservoirs (pockets) installed on the front of the ball bearing blocks supply the right amount of grease, thus promoting long maintenance interval.

The linear motion system described above offers:

- High speed and acceleration
- High load capacity
- High permissible bending moments
- Low friction
- Long life
- Maintenance free (depending on applications)
- Low noise

ELM section

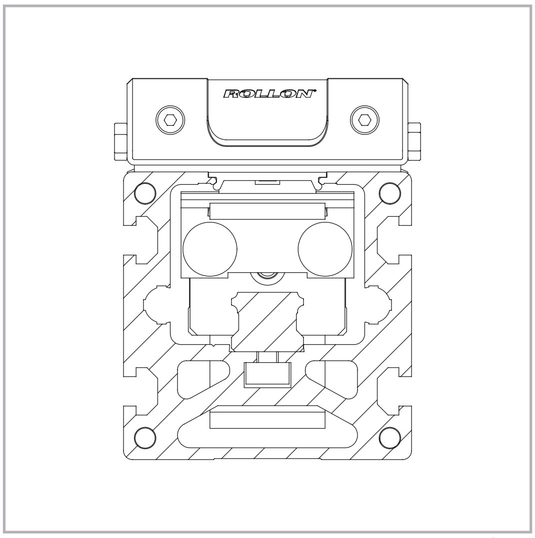


Fig. 2

The new driving head

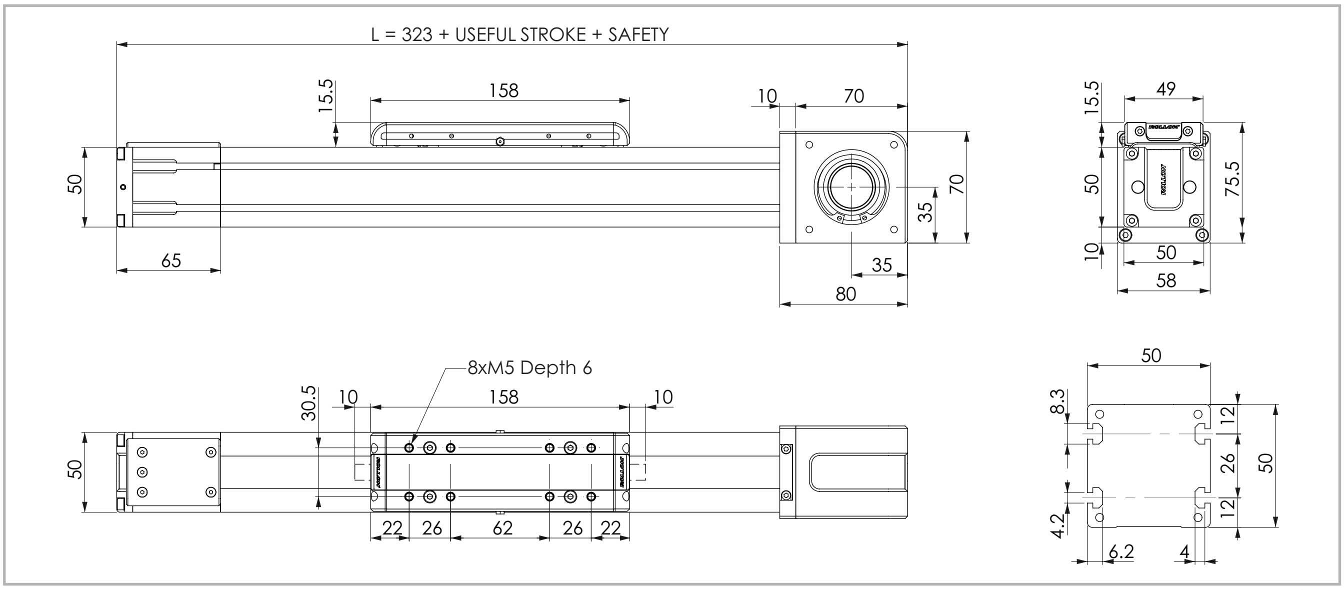
The new driving head is designed to allow high freedom while sizing the application and mounting the gearbox on the ELM series linear actuators. With the new head, it is possible to assembly the gearbox on either the right or the left side of the actuator by means of a standard assembly kit.

The assembly kit includes: shrink disk; adapter plate and fixing hardware; and can be ordered with the actuator. Different kits are available to accomodate gearboxes from the major brands on the market. For more information see pag. PLS-14.

The same logic is valid when mounting the shaft to connect two units in parallel.

ELM 50

ELM 50 Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 3

Technical data

	Type
	ELM 50
Max. useful stroke length [mm]*1	6130
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	4.0
Max. acceleration [m/s²]	50
Type of belt	22 AT 5
Type of pulley	Z 23
Pulley pitch diameter [mm]	36.61
Carriage displacement per pulley turn [mm]	115
Carriage weight [kg]	0.4
Zero travel weight [kg]	1.8
Weight for 100 mm useful stroke [kg]	0.4
Starting torque [Nm]	0.4
Moment of inertia of pulleys [g·mm²]	30228
Rail size [mm]	12 mini

*1) It is possible to obtain strokes up to 9000 mm by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 4

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ELM 50	0.025	0.031	0.056

Tab. 5

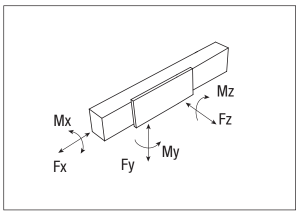
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ELM 50	22 AT 5	22	0.072

Tab. 6

Belt length (mm) = 2 x L - 130



Load capacity

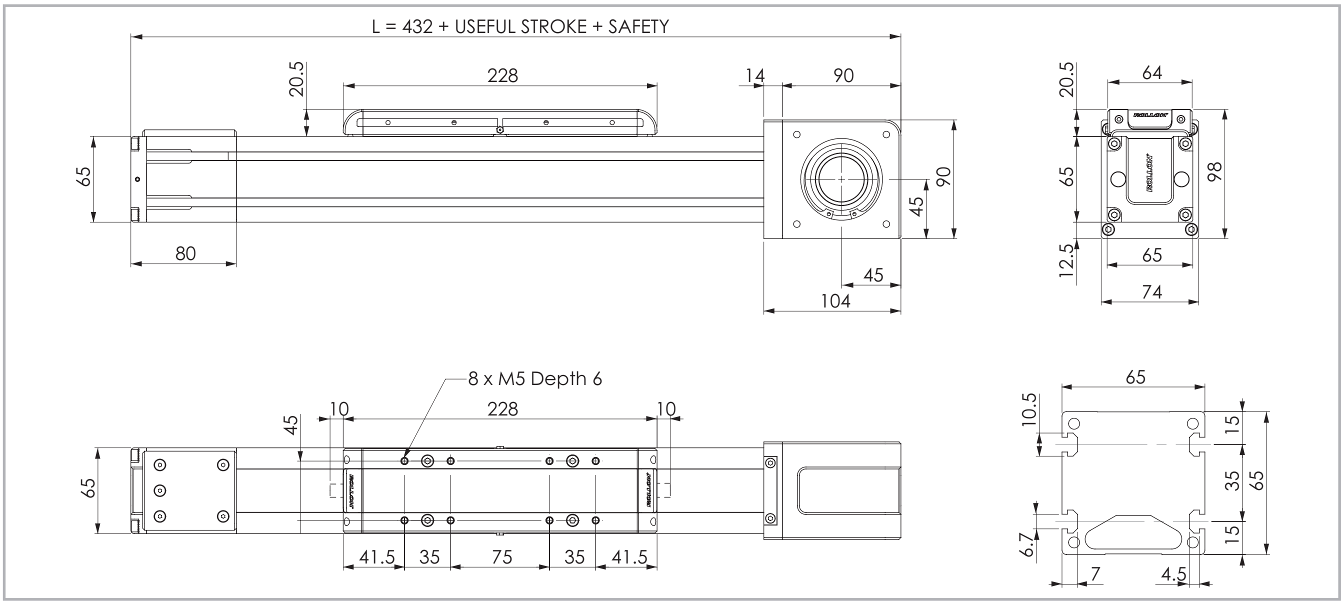
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ELM 50	809	508	7060	6350	7060	46.2	233	233

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 7

ELM 65

ELM 65 Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 4

Technical data

	Type
	ELM 65
Max. useful stroke length [mm]*1	6060
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	5.0
Max. acceleration [m/s²]	50
Type of belt	32 AT 5
Type of pulley	Z 32
Pulley pitch diameter [mm]	50.93
Carriage displacement per pulley turn [mm]	160
Carriage weight [kg]	1.1
Zero travel weight [kg]	3.5
Weight for 100 mm useful stroke [kg]	0.6
Starting torque [Nm]	1.5
Moment of inertia of pulleys [g·mm²]	185496
Rail size [mm]	15

*1) It is possible to obtain strokes up to 11000 mm by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 8

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ELM 65	0.060	0.086	0.146

Tab. 9

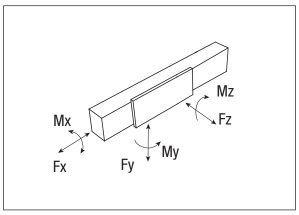
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ELM 65	32 AT 5	32	0.105

Tab. 10

Belt length (mm) = 2 x L - 167



Load capacity

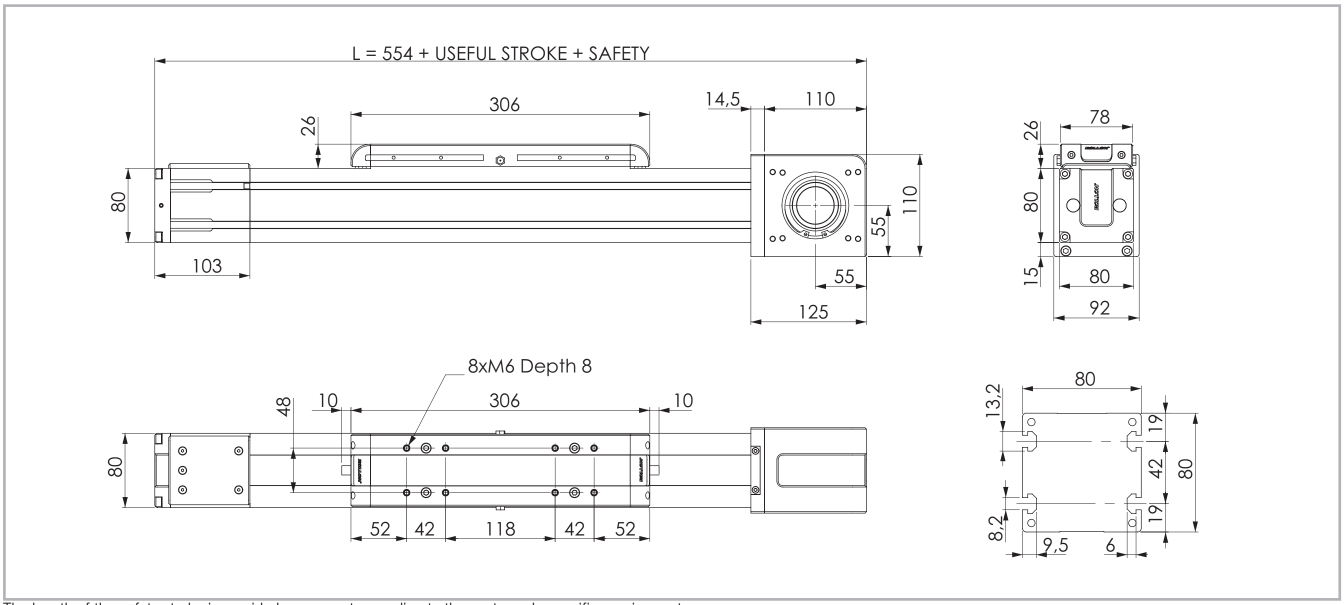
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ELM 65	1344	883	48400	22541	48400	320	1376	1376

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 11

ELM 80

ELM 80 Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.
** For ELM80 with AC19 see PLS-11 for head length. Constant for total length calculation 554mm.

Fig. 5

Technical data

	Type
	ELM 80
Max. useful stroke length [mm]*1	5980
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	5.0
Max. acceleration [m/s²]	50
Type of belt	32 AT 10
Type of pulley	Z 19
Pulley pitch diameter [mm]	60.48
Carriage displacement per pulley turn [mm]	190
Carriage weight [kg]	2.7
Zero travel weight [kg]	10.5
Weight for 100 mm useful stroke [kg]	1.0
Starting torque [Nm]	2.2
Moment of inertia of pulleys [g·mm²]	400064
Rail size [mm]	20

*1) It is possible to obtain strokes up to 11000 mm by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 12

Moments of inertia of the aluminum body

Type	I_x [10^7 mm⁴]	I_y [10^7 mm⁴]	I_p [10^7 mm⁴]
ELM 80	0.136	0.195	0.331

Tab. 13

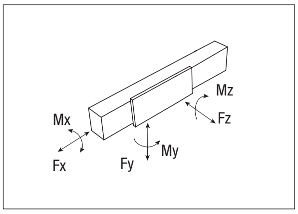
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ELM 80	32 AT 10	32	0.185

Tab. 14

Belt length (mm) = 2 x L - 225



Load capacity

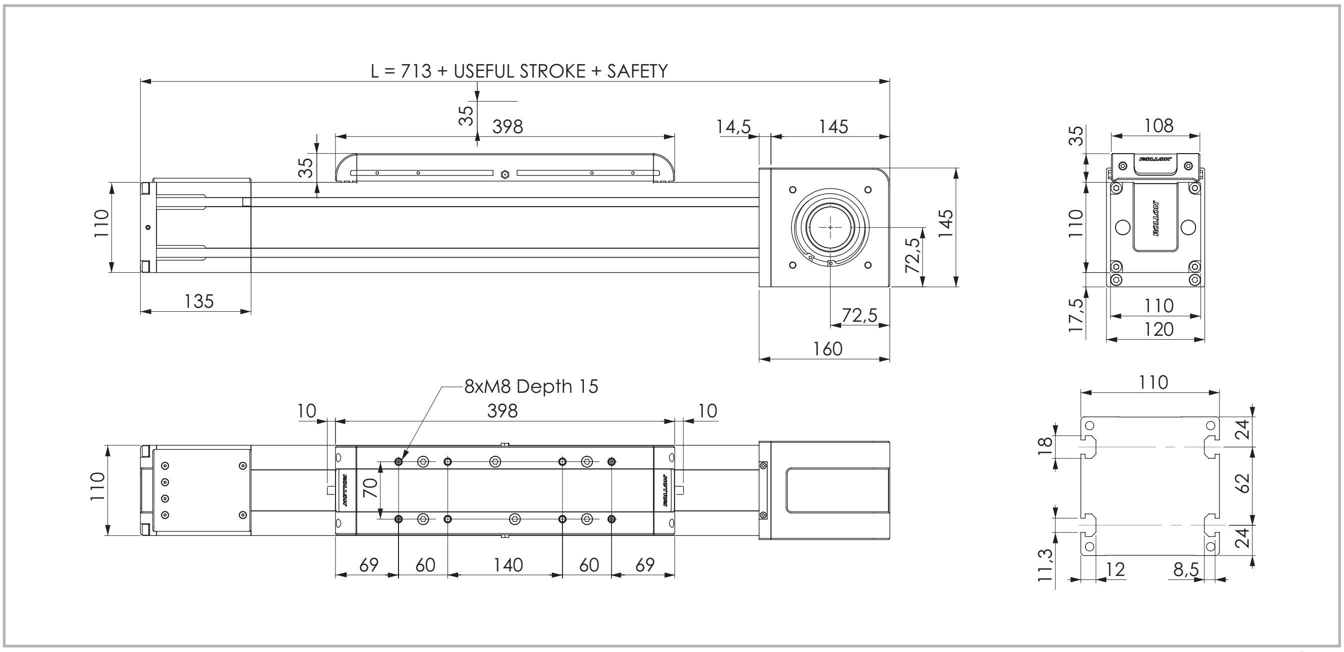
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ELM 80	2258	1306	76800	35399	76800	722	5606	5606

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 15

ELM 110

ELM 110 Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 6

Technical data

	Type
	ELM 110
Max. useful stroke length [mm]*1	5900
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	5.0
Max. acceleration [m/s²]	50
Type of belt	50 AT 10
Type of pulley	Z 27
Pulley pitch diameter [mm]	85.94
Carriage displacement per pulley turn [mm]	270
Carriage weight [kg]	5.6
Zero travel weight [kg]	22.5
Weight for 100 mm useful stroke [kg]	1.4
Starting torque [Nm]	3.5
Moment of inertia of pulleys [g·mm²]	$2.286 \cdot 10^6$
Rail size [mm]	25

*1) It is possible to obtain strokes up to 11000 mm by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 16

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ELM 110	0.446	0.609	1.054

Tab. 17

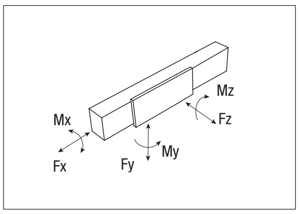
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ELM 110	50 AT 10	50	0.290

Tab. 18

Belt length (mm) = 2 x L - 290



Load capacity

Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ELM 110	4980	3300	129400	58416	129400	1392	11646	11646

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 19

Lubrication

ELM Linear units are equipped with self lubricating linear ball guides. The ball bearing carriages are also fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment of these in the circuits.

Special lubrication reservoirs are mounted on the front plates of the linear blocks which continuously provide the necessary amount of grease to the ball raceways under load. These lubrication reservoirs also considerably reduce the frequency of lubrication of the module. This system guarantees a long interval between maintenances: every 5000 km or 1 year of use, based on the value reached first. If a longer service life is required or in case of high dynamic or high loaded applications please contact our offices for further verification.

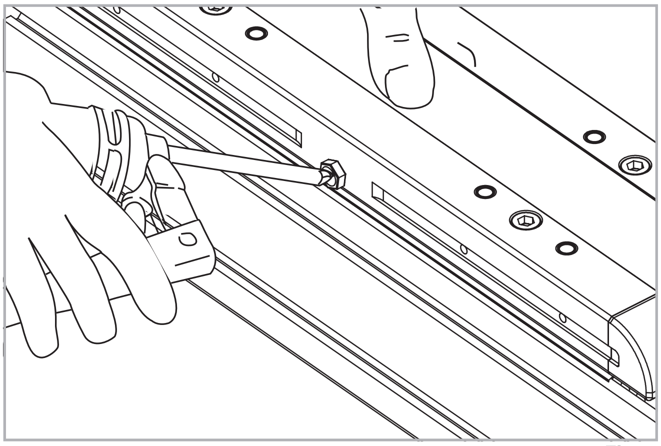


Fig. 7

Quantity of lubricant necessary for re-lubrication:

Type	Unit: [cm^3]
ELM 50	1
ELM 65	1.4
ELM 80	2.8
ELM 110	4.8

Tab. 20

- Insert the tip of the grease gun in the specific grease blocks.
- For lubrication of linear units use lithium soap grease NLGI 2.
- For specially stressed applications or difficult enviromental conditions, lubrication should be carried out more frequently. Refer to Rollon for further advice.

Simple shaft version

Simple shaft type AS

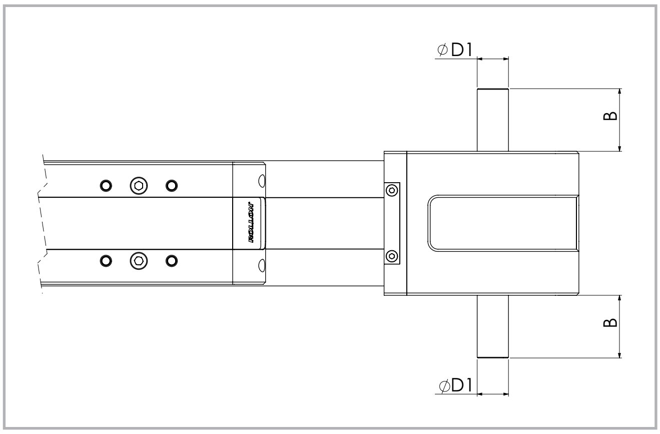


Fig. 8

Unit	Shaft type	B	D1
ELM 50	**AS 12**	25	12h7
ELM 65	**AS 15**	35	15h7
ELM 80	**AS 20**	40	20h7
ELM 110	**AS 25**	50	25h7

Tab. 21

Position of the simple shaft can be to the right, left, or both sides of the drive head.

Unit	Shaft type	B	D1	AS assembly kit code
ELM 50	**AS 12**	25	12h7	G002697
ELM 65	**AS 15**	35	15h7	G000851
ELM 80	**AS 20**	40	20h7	G002696
ELM 110	**AS 25**	50	25h7	G000649

Tab. 22

Simple shaft type AE 10 for encoder assembly + AS

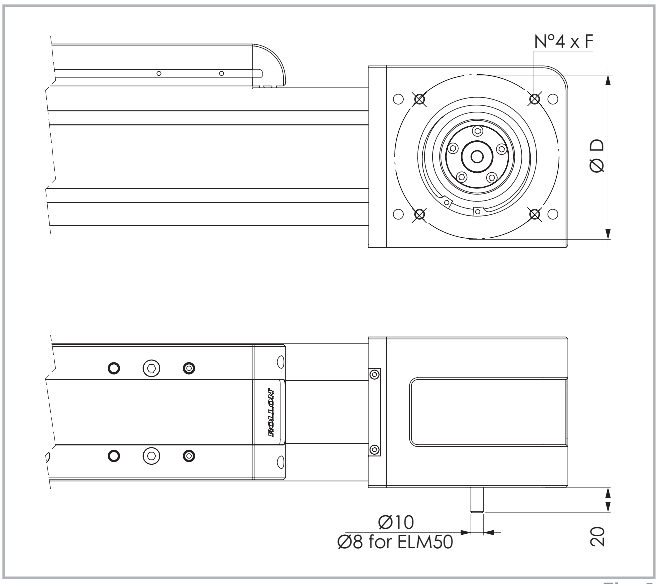


Fig. 9

Unit	Code kit AE	ØD	F
ELM 50	G002744	75	M5
ELM 65	G002592	96	M6
ELM 80	G002745	100	M6
ELM 110	G002370	130	M8

Tab. 23

Position of the simple shafts for encoder assembly to the right or to the left on the drive head.

Air Hole

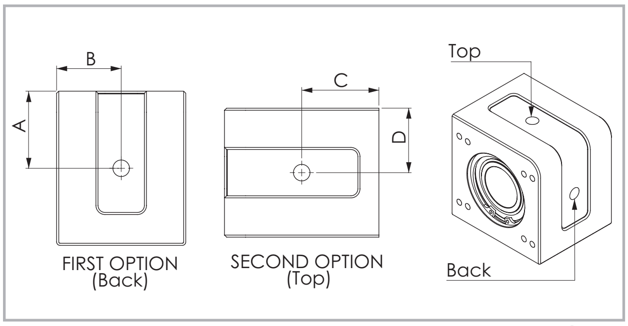


Fig. 10

Unit	First		Second	
	A	B	C	D
ELM 50	35	29	35	29
ELM 65	45	37	45	37
ELM 80	55	46	55	46
ELM 110	72.5	60	72.5	60

Tab. 24

Hollow shafts

Hollow shaft

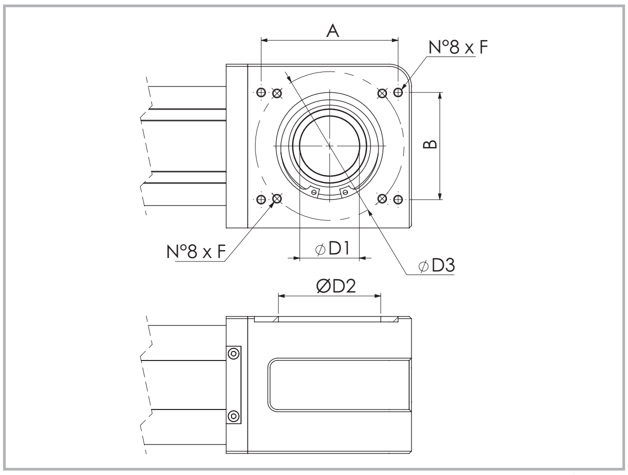


Fig. 11

Appliable to unit	Shaft type	Head code
ELM 50	AC 26	1R
ELM 65	AC 34	1R
ELM 80	AC 41	1R
ELM 110	AC 50	1R

Tab. 25

An (optional) connection flange is required to fit the standard reduction units selected by Rollon. For further information contact our offices

Dimensions (mm)

Appliable to unit	Shaft type	D1	D2	D3	F
ELM 50	FP 26	26 H7	47	75	M5
ELM 65	FP 34	34 H7	62	96	M6
ELM 80	FP 41	41 H7	72	100	M6
ELM 110	FP 50	50 H7	95	130	M8

Tab. 26

Linear units in parallel

Synchronization kit for use of ELM linear units in parallel

When movement consisting of two linear units in parallel is essential, a synchronization kit must be used. This consists of original Rollon lamina type precision joints complete with tapered splines and hollow aluminum drive shafts.

Moment of inertia [g·mm^2] C1 + C2 · (X-Y)

	C1	C2	Y	Weight [Kg] D1+D2 · (X-Y)	
	[g·mm^2]	[g·mm^2]	[mm]	D1 [Kg]	D2 [Kg mm]
GK12P	61.456	69	166	0.308	0.00056
GK15P	906.928	464	210	2.28	0.00148
GK20P	1.014.968	464	250	2.48	0.00148
GK25P	5.525.250	4.708	356	6.24	0.0051

Tab. 27

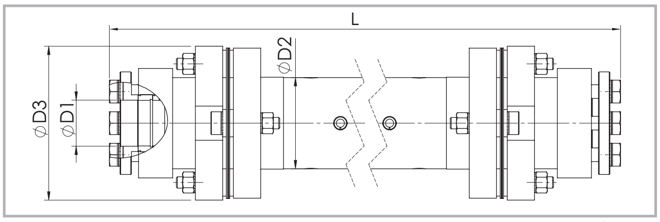


Fig. 12

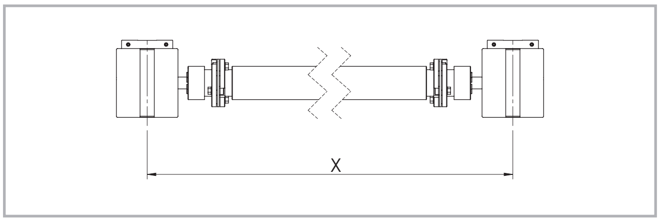


Fig. 13

Dimensions (mm)

Appliable to unit	Shaft type	D1	D2	D3	Code	Formula for length calculation
ELM 50	**AP 12**	12	25	45	GK12P...1A	L= X-66 mm
ELM 65	**AP 15**	15	40	69.5	GK15P...1A	L= X-83 mm
ELM 80	**AP 20**	20	40	69.5	GK20P...1A	L= X-109 mm
ELM 110	**AP 25**	25	70	99	GK25P...1A	L= X-155 mm

Tab. 28

Accessories

Fixing by brackets

The linear motion system used for the ELM series linear units enables them to support loads in any direction. They can therefore be installed in any position.

To install the units, we recommend the use of the dedicated T-slots in the extruded bodies as shown below.

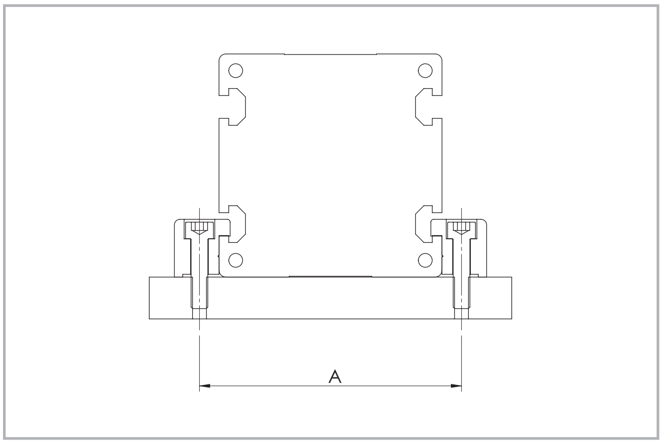


Fig. 14

Unit	A (mm)
ELM 50	62
ELM 65	77
ELM 80	94
ELM 110	130

Tab. 29

Warning:
Do not fix the linear units through the drive ends.

Fixing brackets

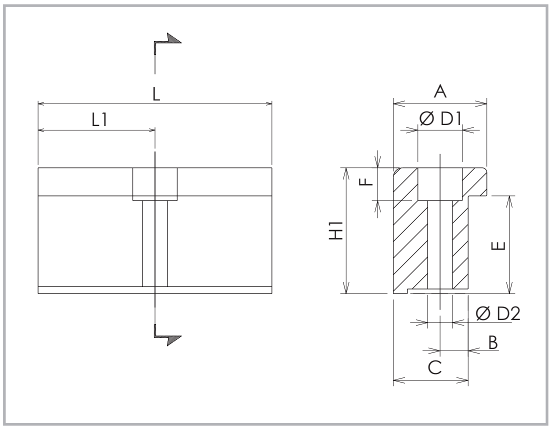


Fig. 15

Dimensions (mm)

Unit	A	H1	B	C	E	F	D1	D2	L	L1	Code
ELM 50	20	14	6	16	10	6	10	5.5	35	17.5	1000958
ELM 65	20	17.5	6	16	11.5	6	9.4	5.3	50	25	1001490
ELM 80	20	20.7	7	16	14.7	7	11	6.4	50	25	1001491
ELM 110	36.5	28.5	10	31	18.5	11.5	16.5	10.5	100	50	1001233

Tab. 30

Fixing bracket

Anodized aluminum block for fixing the linear units through the side T-slots of the body.

T-Nuts

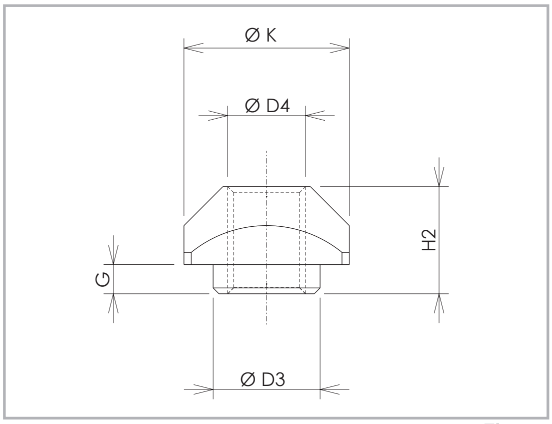


Fig. 16

Dimensions (mm)

Unit	D3	D4	G	H2	K	Code
ELM 50	-	M4	-	3.4	8	1001046
ELM 65	6.7	M5	2.3	6.5	10	1000627
ELM 80	8	M6	3.3	8.3	13	1000043
ELM 110	11	M8	2.8	10.8	17	1000932

Tab. 31

T-nuts

Steel nuts to be used in the T-slots of the body.

Proximity ELM

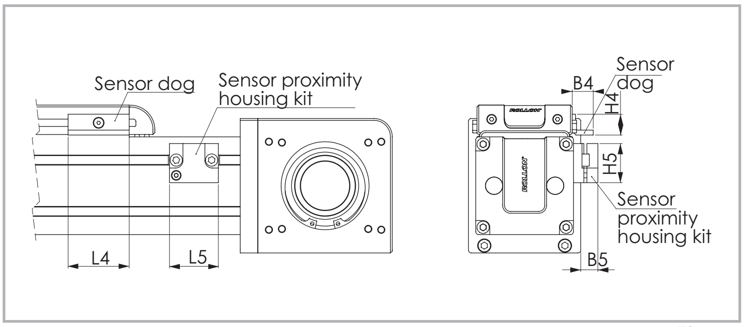


Fig. 17

Sensor proximity housing kit

Red anodized aluminum sensor holder, equipped with T-nuts for fixing onto the profile.

Sensor dog

L-shaped bracket in zinc-plated iron, mounted on the carriage and used for proximity switch operations.

Dimensions (mm)

Unit	B4	B5	L4	L5	H4	H5	For proximity	Sensor dog code	Sensor proximity housing kit code
ELM 50	9.5	14	25	29	11.9	22.5	Ø 8	G000268	G000211
ELM 65	17.2	20	50	40	17	32	Ø 12	G000267	G000212
ELM 80	17.2	20	50	40	17	32	Ø 12	G000267	G000209
ELM 110	17.2	20	50	40	17	32	Ø 12	G000267	G000210

Tab. 32

Adapter flange for gearbox assembly

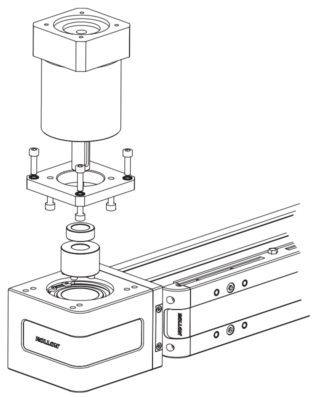


Fig. 18

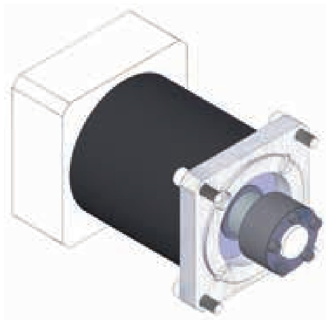


Fig. 19

Assembly kit includes: shrink disk; adapter plate; fixing hardware

Unit type	Gearbox type (not included)	Kit Code
ELM 50	MP060	G000566
	LC050; PE2; NP005S	G001444
ELM 65	MP080	G000529
	MP060; PLE060	G000531
	SW030	G000748
	PE3; NP015S; LC070	G000530
	P3	G001162
ELM 80	P3	G000824
	MP080	G000826
	LC090; MPV01; NP025S; PE4	G000827
	MP105	G000830
	PE3; NP015S; LC070	G001078
	SP075; PLN090	G000859
	SP060; PLN070	G000829
	SW040	G000866
ELM 110	MP130	G000482
	LC120; MPV02; NP035S; PE5; AE120	G000483
	LC090; NP025S; PE4; NP025S	G000525
	MP105	G000527
	SW050	G000717
	SP075; PLN090; P4; VRS075; AF075A	G000526

Tab. 33

For other gearbox type ask Rollon

Ordering key

Identification codes for the ELM linear unit

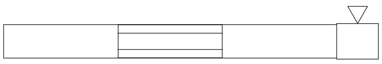
E	06	1R	2000	1R	D
	05=50				
	06=65				
	08=80				
	11=110				

- D: Multiple carriage
- 1R: Linear motion system *see pg. PLS-4*
- 2000: L = total length of the unit
- 1R: Driving head code *see pg. PLS-10 - PLS-11*
- 06: Linear unit size *see from pg. PLS-5 to pg. PLS-8*
- E: ELM Series *see pg. PLS-2*

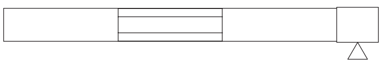
In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Configure Actuator

Left / right orientation



Right



Left

ROBOT series

ROBOT series description

ROBOT

Fig. 20

ROBOT 2C - Double indepedent carriage

Fig. 21

ROBOT

The ROBOT series is particularly well-suited for heavy load applications where significant carriage pitch, yaw or roll moments are applied; or for the linear conveyance of SCARA-type and 6 axis articulated arm robots on a transfer or factory automation line. As a robust, high load choice, the ROBOT Series is the linear actuator for the most demanding applications.

Available in four sizes from 100 mm to 220 mm, the ROBOT series linear units have a rigid structure made by a heavy rectangular cross-section of extruded and anodized aluminum. The thrust force is transmitted by a steel reinforced polyurethane. The carriage is running on two parallel linear guides with four self-lubricated "maintenance-free" caged ball bearing blocks, positioned to support the carriage and all incident loads and moments. A polyurethane sealing strip ensures complete protection of the driving belt against dirt, chips, liquids and other contaminants.

The ROBOT series is the clear choice for heavy, high-speed, fluctuating load and moment applications in aggressive environments where repeatable, maintenance-free industrial automation is required.

ROBOT 2C

For all sizes of the ROBOT series a 2C version with 2 independent carriages is also available. Each carriage is driven by its own belt. The driving head can accomodate two gearboxes, one on each side. This solution is ideal for pick & place application or loading and unloading machine.

Corrosion resistant version

ROBOT linear actuators are available with stainless steel elements, for applications in harsh environments and/or subject to frequent washes. They are constructed using extruded anodized 6060 and 6082 Anti-Corrosive Aluminum, which houses bearings, linear rails, nuts and bolts and components made of stainless steel, preventing or delaying corrosion caused by humidity experienced in the environments where the linear units are used.

Special no-deposit surface treatments are combined with a food grade lubrication system to allow use in highly sensitive applications, such as the food and pharmaceutical industries where product contamination is prohibited.

- Internal stainless steel elements
- Anodized 6060 and 6082 Anti-Corrosive Aluminum Profile
- AISI 440 stainless steel linear rails
- Lubricated with organic food grade vegetable oils

The components

Extruded profile
The anodized 6060 aluminum alloy extrusion used for the profile of ROBOT series linear units are designed and manufactured by industry experts to optimize weight while maintaining mechanical strength. The dimensional tolerances comply with EN 755-9 standards. T-slots are provided in the side and bottom faces to facilitate mounting.

Driving belt
ROBOT series linear units use steel reinforced polyurethane drive belts with AT pitch. This belt is ideal due to its high load transmission characteristics, compact size and low noise. Used in conjunction with backlash-free pulleys, smooth alternating motion can be achieved. Optimization of the maximum belt width/body dimension ratio enables the following performance characteristics to be achieved:

- **High speed**
- **Low noise**
- **Low wear**

The provision of guidance for the belt within the body causes it to run central on the pulley, there by ensuring long service life.

Carriage
The carriage of the ROBOT series linear units are made of anodized aluminum. Each carriage has mounting holes fitted with stainless steel thread inserts. Rollon offers multiple carriages to accommodate a vast array of applications. The unique design of the carriage allows for the sealing strip to pass through it, as well as house brush seals to remove contaminates from the sealing strip.

Sealing strip
ROBOT series linear units are equipped with a polyurethane sealing strip to protect all of the internal components from dust, contaminants, and other foreign objects. The sealing strip runs the length of the body and is kept in position by micro-bearings located with in the carriage. This minimizes frictional resistance as the strip passes through the carriage while providing maximum protection.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remainder	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 34

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.7	69	23	200	880-900	33	600-655

Tab. 35

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
205	165	10	60-80

Tab. 36

The linear motion system

The linear motion system has been designed to meet the load capacity, speed, and maximum acceleration conditions of a wide variety of applications.

ROBOT with ball bearing guides

- Two ball bearing guides with high load capacity are mounted in two dedicated seats on the outer sides of the body.
- The carriage is assembled on four pre-loaded ball bearing blocks.
- The four ball row configuration enable the carriage to withstand loading in the four main directions.
- The four blocks have seals on both sides and, if necessary, an additional scraper can be fitted for very dusty conditions.
- The ball bearing carriages are also fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment.
- The lubrication reservoirs (pockets) fitted on the cages considerably decreases re-lubrication frequency. Lubrication reservoirs (pockets) installed on the front of the ball bearing blocks supply the right amount of grease, thus promoting long maintenance interval.

The linear motion system described above offers:

- High speed and acceleration
- High load capacity
- High bending permissible moments
- Low friction
- Long duration
- Maintenance free (dependent on application)
- Low noise

ROBOT section

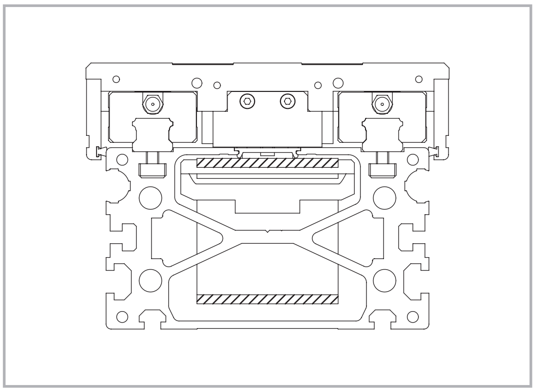


Fig. 22

The new driving head

The new driving head is designed to allow high freedom while sizing the application and mounting the gearbox on ROBOT series linear actuators. With the new head, it is possible to assembly the gearbox on either the right or the left side of the actuator by means of a standard assembly kit.

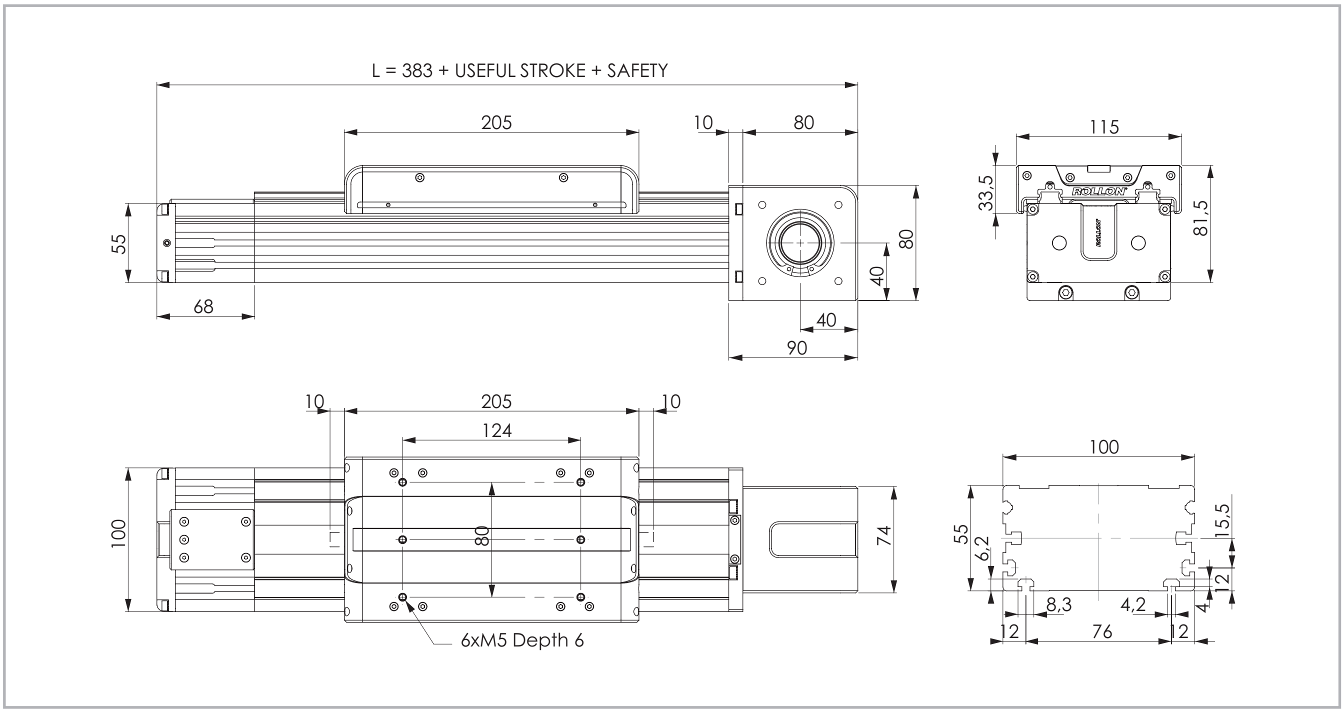
The assembly kit includes: shrink disk; adapter plate and fixing hardware; and can be ordered with the actuator. Different kits are available to accomodate gearboxes from the major brands on the market. For more information see pag. PLS-33.

The same logic is valid when mounting the shaft to connect two units in parallel.

The ROBOT-2C driving head can accomodate two gearboxes, one on each side, to control the two independent carriage. This distinctive feature requires that Rollon assembles the gearbox in-house prior the axis shipment. Please contact our Technical Department.

ROBOT 100

ROBOT 100 Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 23

Technical data

	Type ROBOT 100
Max. useful stroke length [mm]	6100
Max. positioning repeatability [mm]*1	± 0.05
Max. speed [m/s]	4.0
Max. acceleration [m/s²]	50
Type of belt	32 AT 5
Type of pulley	Z 23
Pulley pitch diameter [mm]	36.61
Carriage displacement per pulley turn [mm]	115
Carriage weight [kg]	2.4
Zero travel weight [kg]	4.5
Weight for 100 mm useful stroke [kg]	0.8
Starting torque [Nm]	1.3
Moment of inertia of pulleys [g·mm²]	40004
Rail size [mm]	15 mini

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 37

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ROBOT 100	0.05	0.23	0.28

Tab. 38

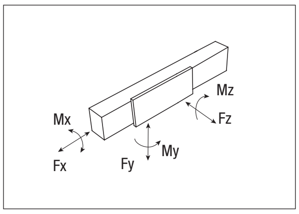
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ROBOT 100	32 AT 5	32	0.105

Tab. 39

Belt length (mm) = 2 x L - 125



Load capacity

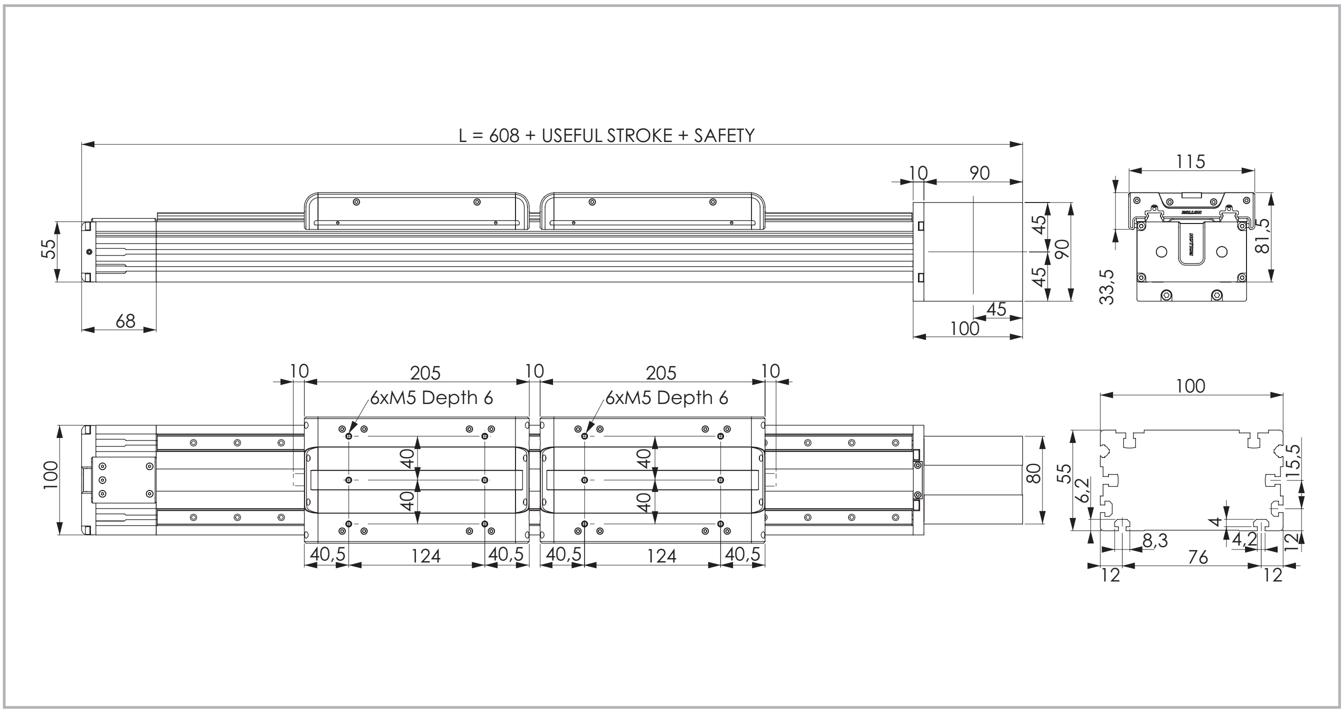
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ROBOT 100	1176	739	22800	21144	22800	775	1322	1322

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 40

ROBOT 100 2C (Double independent carriage)

ROBOT 100 2C Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 24

Technical data

	Type
	ROBOT 100 2C
Max. useful stroke length [mm]	5885
Max. positioning repeatability [mm]*1	± 0.05
Max. speed [m/s]	4.0
Max. acceleration [m/s²]	50
Type of belt	16 AT 5
Type of pulley	Z 23
Pulley pitch diameter [mm]	36.61
Carriage displacement per pulley turn [mm]	115
Carriage weight [kg]	2.4
Zero travel weight [kg]	8.0
Weight for 100 mm useful stroke [kg]	0.8
Starting torque [Nm]	1.3
Moment of inertia of pulleys [g·mm²]	16220
Rail size [mm]	15 mini

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 41

Moments of inertia of the aluminum body

Type	I_x [10^7 mm⁴]	I_y [10^7 mm⁴]	I_p [10^7 mm⁴]
ROBOT 100 2C	0.05	0.23	0.28

Tab. 42

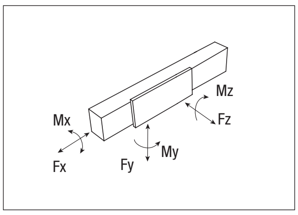
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ROBOT 100 2C	16 AT 5	16	0.05

Tab. 43

Belt length (mm) = 2 x L - 115
Two belts for each actuator.



Load capacity

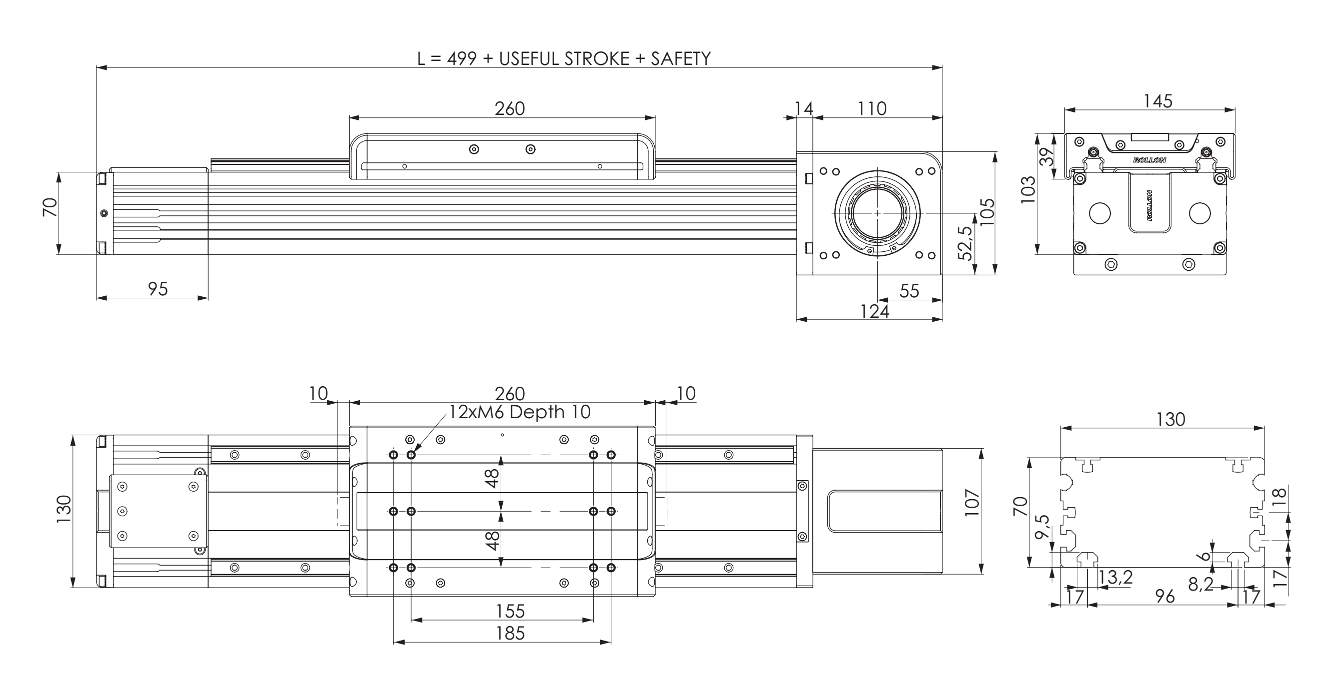
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ROBOT 100 2C	588	370	22800	21144	22800	775	1322	1322

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 44

ROBOT 130

ROBOT 130 Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 25

Technical data

	Type
	ROBOT 130
Max. useful stroke length [mm]*1	6050
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	5.0
Max. acceleration [m/s²]	50
Type of belt	50 AT 10
Type of pulley	Z 17
Pulley pitch diameter [mm]	54.11
Carriage displacement per pulley turn [mm]	170
Carriage weight [kg]	2.8
Zero travel weight [kg]	9.1
Weight for 100 mm useful stroke [kg]	1.2
Starting torque [Nm]	2.7
Moment of inertia of pulleys [g·mm²]	360659
Rail size [mm]	15

*1) It is possible to obtain strokes up to 11000 mm by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 45

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ROBOT 130	0.15	0.65	0.79

Tab. 46

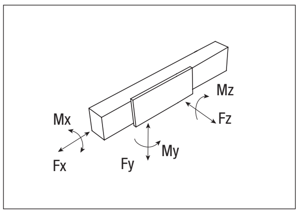
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ROBOT 130	50 AT 10	50	0.29

Tab. 47

Belt length (mm) = 2 x L - 93



Load capacity

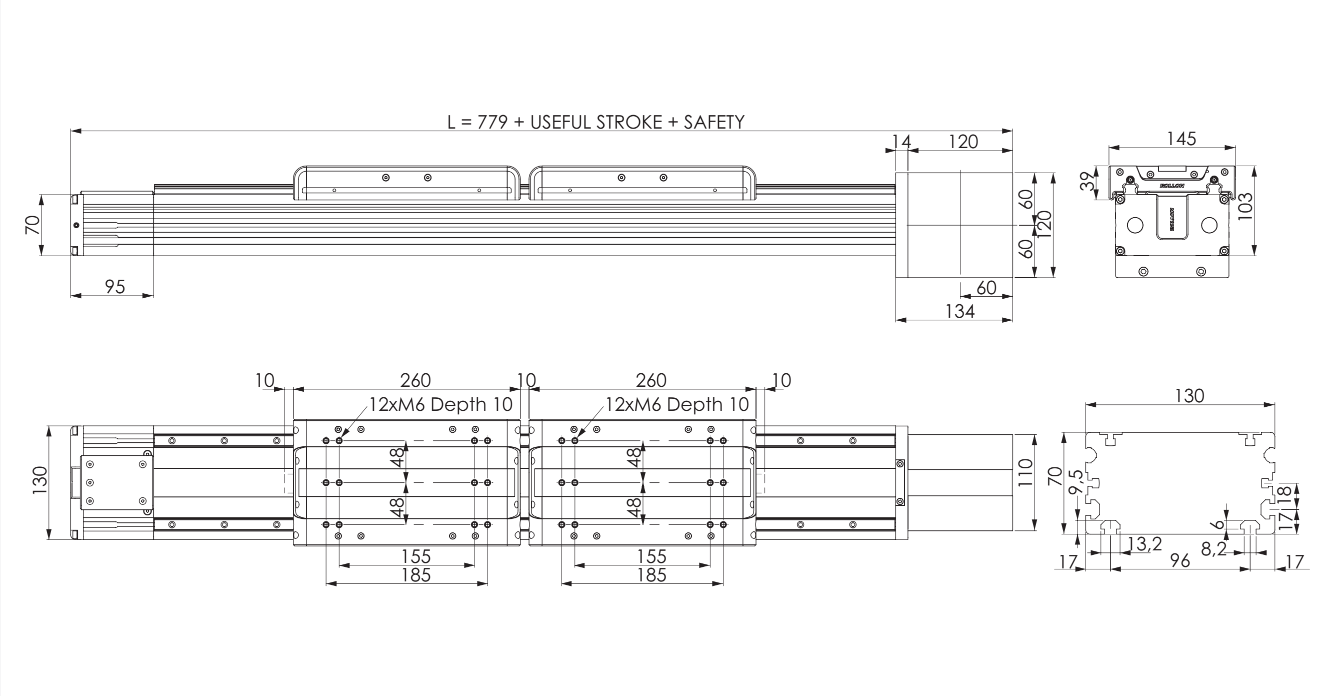
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ROBOT 130	3112	1725	96800	45082	96800	4646	6340	6340

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 48

ROBOT 130 2C (Double independent carriage)

ROBOT 130 2C Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 26

Technical data

	Type
	ROBOT 130 2C
Max. useful stroke length [mm]*1	5780
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	5.0
Max. acceleration [m/s²]	50
Type of belt	25 AT 10
Type of pulley	Z 17
Pulley pitch diameter [mm]	54.11
Carriage displacement per pulley turn [mm]	170
Carriage weight [kg]	2.8
Zero travel weight [kg]	14.9
Weight for 100 mm useful stroke [kg]	1.2
Starting torque [Nm]	2.7
Moment of inertia of pulleys [g·mm²]	196200
Rail size [mm]	15

*1) It is possible to obtain strokes up to 11000 mm by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 49

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ROBOT 130 2C	0.15	0.65	0.79

Tab. 50

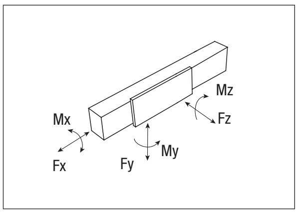
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ROBOT 130 2C	25 AT 10	25	0.16

Tab. 51

Belt length (mm) = 2 x L - 103
Two belts for each actuator.



Load capacity

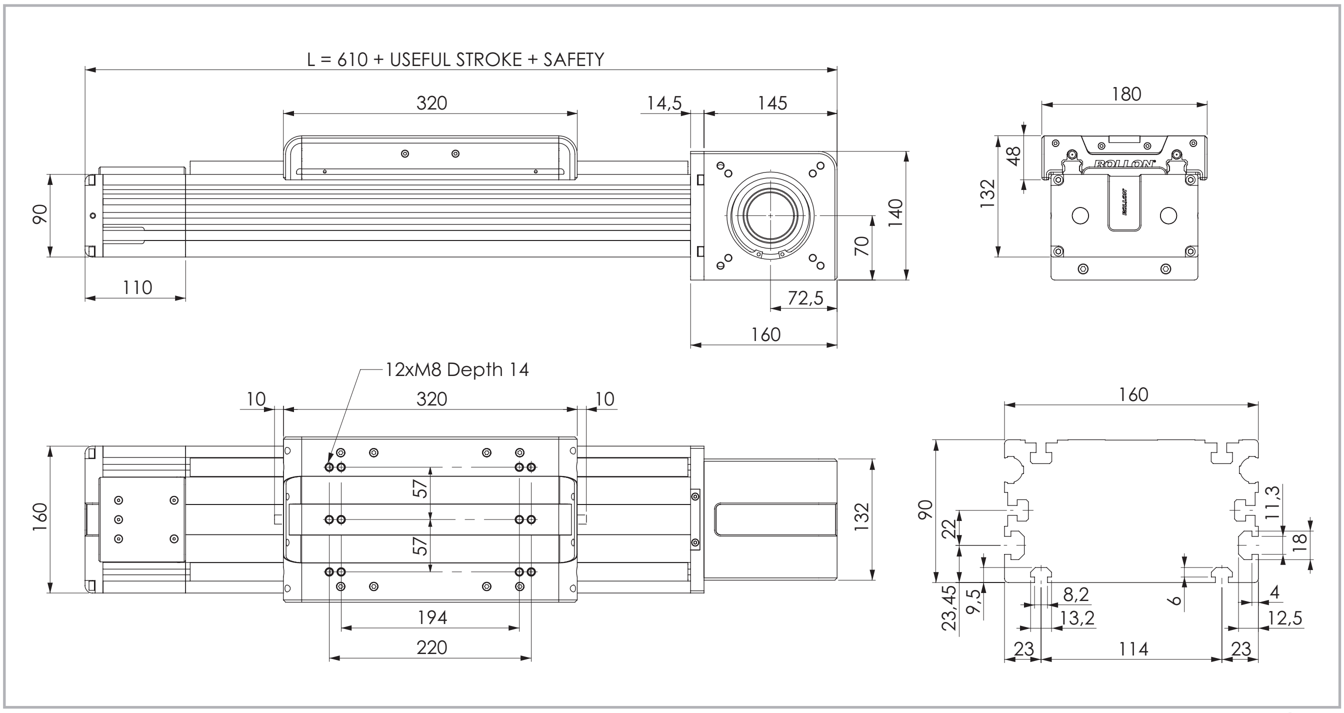
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ROBOT 130 2C	1556	862	96800	45082	96800	4646	6340	6340

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 52

ROBOT 160

ROBOT 160 Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 27

Technical data

	Type
	ROBOT 160
Max. useful stroke length [mm]*1	6000
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	5.0
Max. acceleration [m/s²]	50
Type of belt	70 AT 10
Type of pulley	Z 22
Pulley pitch diameter [mm]	70.03
Carriage displacement per pulley turn [mm]	220
Carriage weight [kg]	5.3
Zero travel weight [kg]	21
Weight for 100 mm useful stroke [kg]	1.9
Starting torque [Nm]	4.5
Moment of inertia of pulleys [g·mm²]	$1.303 \cdot 10^6$
Rail size [mm]	20

*1) It is possible to obtain strokes up to 11000 mm by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 53

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ROBOT 160	0.37	1.51	1.88

Tab. 54

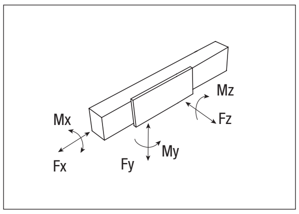
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ROBOT 160	70 AT 10	70	0.41

Tab. 55

Belt length (mm) = 2 x L - 130



Load capacity

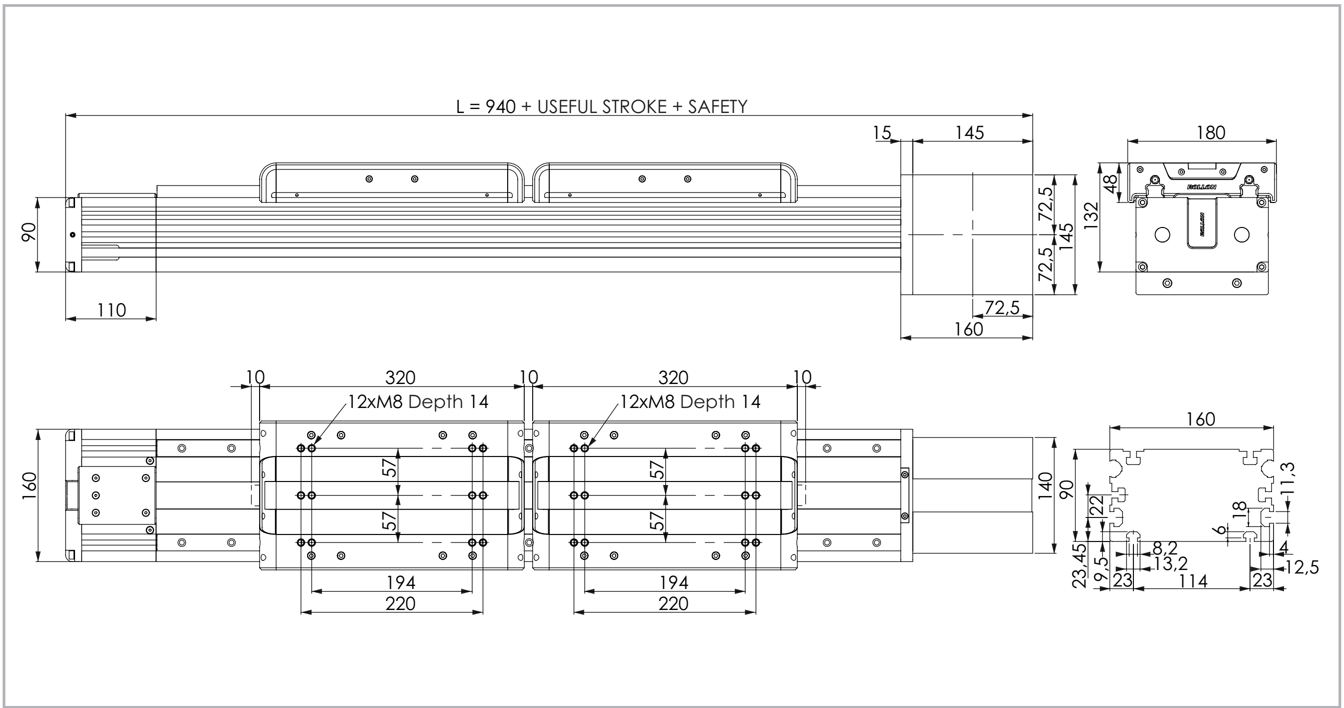
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ROBOT 160	5229	3024	153600	70798	153600	8755	12211	12211

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 56

ROBOT 160 2C (Double independent carriage)

ROBOT 160 2C Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 28

Technical data

	Type
	ROBOT 160 2C
Max. useful stroke length [mm]*1	5670
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	5.0
Max. acceleration [m/s²]	50
Type of belt	32 AT 10
Type of pulley	Z 19
Pulley pitch diameter [mm]	60.48
Carriage displacement per pulley turn [mm]	190
Carriage weight [kg]	5.3
Zero travel weight [kg]	30
Weight for 100 mm useful stroke [kg]	1.9
Starting torque [Nm]	4.5
Moment of inertia of pulleys [g·mm²]	210300
Rail size [mm]	20

*1) It is possible to obtain strokes up to 11000 mm by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 57

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ROBOT 160 2C	0.37	1.51	1.88

Tab. 58

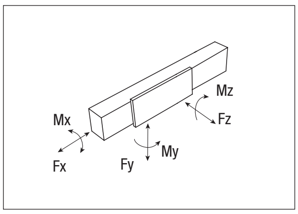
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ROBOT 160 2C	32 AT 10	32	0.185

Tab. 59

Belt length (mm) = 2 x L - 130
Two belts for each actuator.



Load capacity

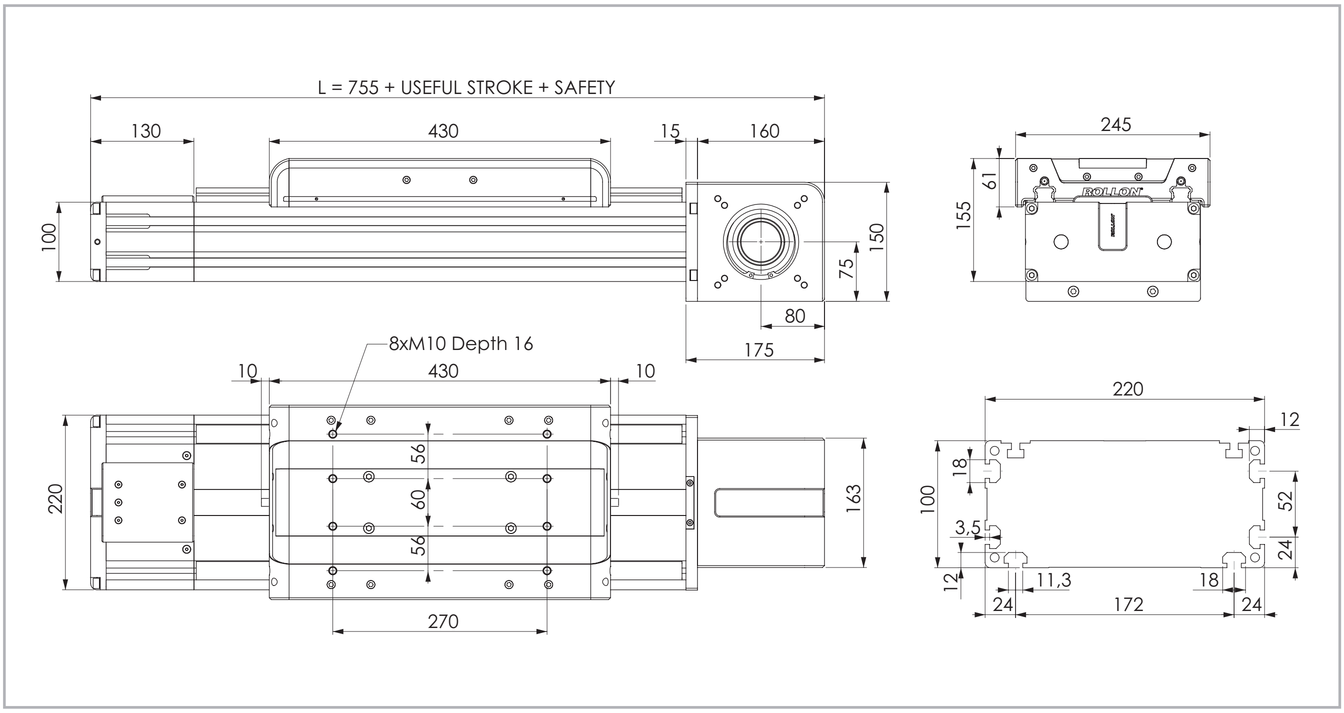
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ROBOT 160 2C	2258	1306	153600	70798	153600	8755	12211	12211

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 60

ROBOT 220

ROBOT 220 Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 29

Technical data

	Type ROBOT 220
Max. useful stroke length [mm]*1	5900
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	5.0
Max. acceleration [m/s²]	50
Type of belt	100 AT 10
Type of pulley	Z 25
Pulley pitch diameter [mm]	79.58
Carriage displacement per pulley turn [mm]	250
Carriage weight [kg]	14.4
Zero travel weight [kg]	41
Weight for 100 mm useful stroke [kg]	2.5
Starting torque [Nm]	6.4
Moment of inertia of each pulley [g·mm²]	$3.687 \cdot 10^6$
Rail size [mm]	25

*1) It is possible to obtain strokes up to 11000 mm by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 61

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ROBOT 220	0.65	3.26	3.92

Tab. 62

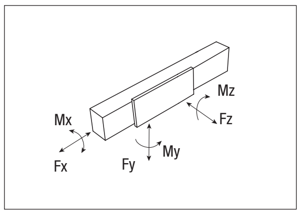
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ROBOT 220	100 AT 10	100	0.58

Tab. 63

Belt length (mm) = 2 x L - 105



Load capacity

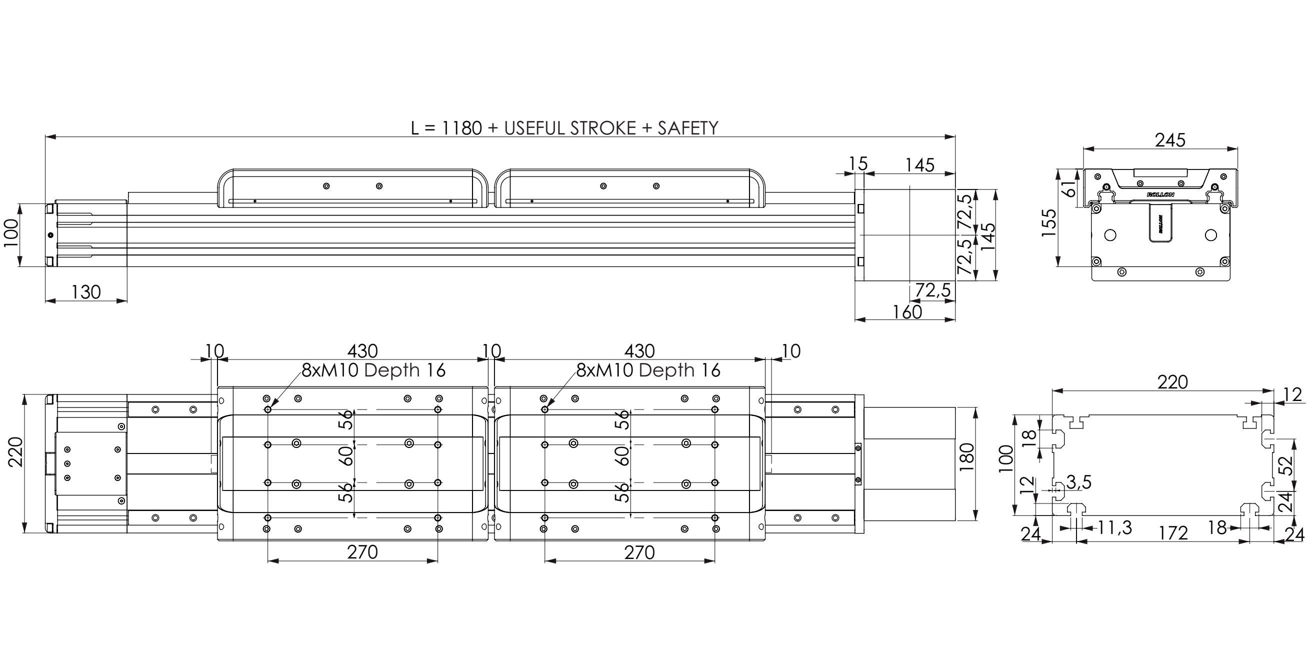
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ROBOT 220	9545	6325	258800	116833	258800	22257	28986	28986

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 64

ROBOT 220 2C (Double independent carriage)

ROBOT 220 2C dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 30

Technical data

	Type
	ROBOT 220 2C
Max. useful stroke length [mm]*1	5460
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	5.0
Max. acceleration [m/s²]	50
Type of belt	40 AT 10
Type of pulley	Z 25
Pulley pitch diameter [mm]	79.58
Carriage displacement per pulley turn [mm]	250
Carriage weight [kg]	13.3
Zero travel weight [kg]	46
Weight for 100 mm useful stroke [kg]	2.5
Starting torque [Nm]	6.4
Moment of inertia of each pulley [g·mm²]	$2.026 \cdot 10^6$
Rail size [mm]	25

*1) It is possible to obtain strokes up to 11000 mm by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 65

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ROBOT 220 2C	0.65	3.26	3.92

Tab. 66

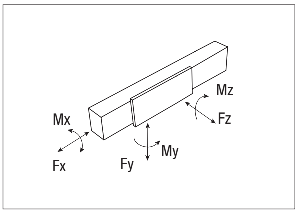
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ROBOT 220 2C	40 AT 10	40	0.23

Tab. 67

Belt length (mm) = 2 x L - 120
Two belts for each actuator.



Load capacity

Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ROBOT 220 2C	3818	2530	258800	116833	258800	22257	28986	28986

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 68

Lubrication

ROBOT Linear units are equipped with self lubricating linear ball guides. The ball bearing carriages are also fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment of these in the circuits.

Special lubrication reservoirs are mounted on the front plates of the linear blocks which continuously provide the necessary amount of grease to the ball raceways under load. These lubrication reservoirs also considerably reduce the frequency of lubrication of the module. This system guarantees a long interval between maintenances: every 5000 km or 1 year of use, based on the value reached first. If a longer service life is required or in case of high dynamic or high loaded applications please contact our offices for further verification.

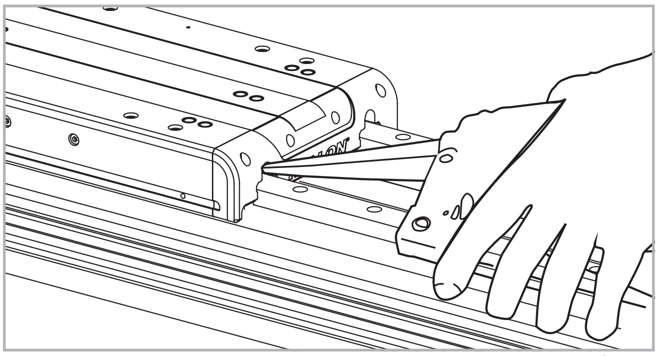


Fig. 31

Quantity of lubricant necessary for re-lubrication of each block:

Type	Unit: [cm^3]
ROBOT 100	0.7
ROBOT 130	0.7
ROBOT 160	1.4
ROBOT 220	2.4

Tab. 69

- Insert grease gun in the specific grease nipples.
- Type of lubricant: Lithium soap grease of class NLGI 2.
- For specially stressed applications or difficult environemental conditions, lubrication should be carried out more frequently. Apply to Rollon for further advice.

Simple shaft version

Simple shaft type AS

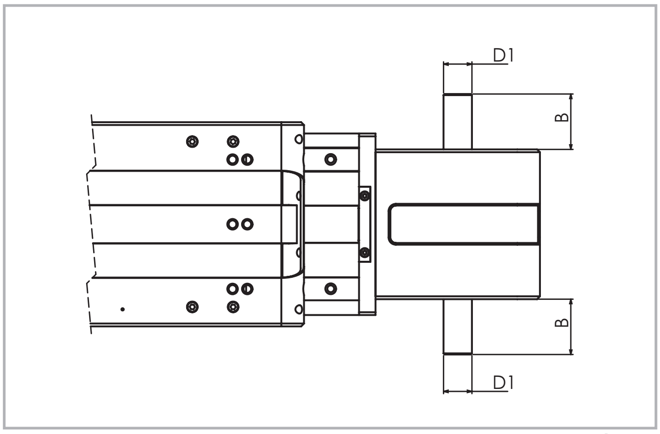


Fig. 32

Unit	Shaft type	B	D1
ROBOT 100	AS 15	35	15h7
ROBOT 130	AS 20	40	20h7
ROBOT 160	AS 25	50	25h7
ROBOT 220	AS 25	50	25h7

Tab. 70

Position of the simple shaft can be to the right, left, or both sides of the drive head.

Unit	Shaft type	B	D1	AS assembly kit code
ROBOT 100	AS 15	35	15H7	G002695
ROBOT 130	AS 20	40	20H7	G002696
ROBOT 160	AS 25	50	25H7	G000649
ROBOT 220	AS 25	50	25H7	G000649

Tab. 71

Simple shaft type AE 10 for encoder assembly + AS

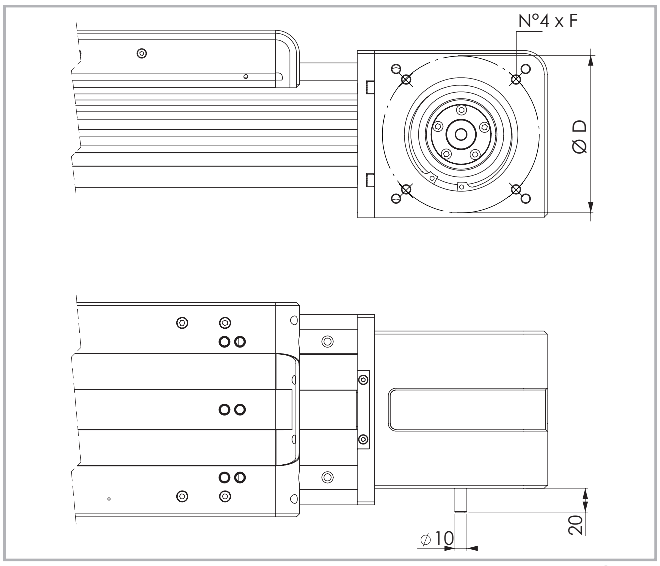


Fig. 33

Unit	Code kit AE	ØD	F
ROBOT 100	G002746	75	M6
ROBOT 130	G002745	100	M6
ROBOT 160	G002370	130	M8
ROBOT 220	G002370	130	M8

Tab. 72

Position of the simple shafts for encoder assembly to the right or to the left on the driving head.

Hollow shafts

AC hollow shaft type

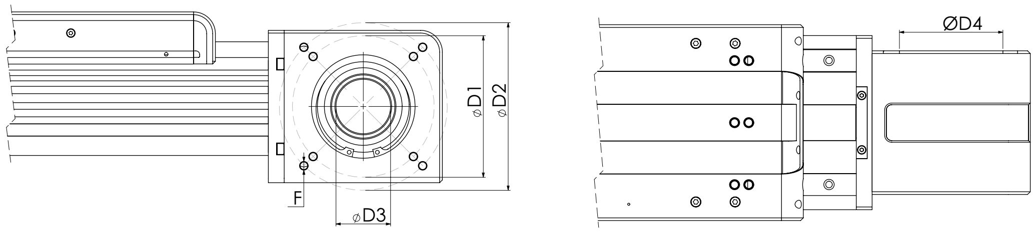


Fig. 34

Unit mm

Appliable to unit	Shaft type	D1	D2	D3	D4	F
ROBOT 100	AC26	75	-	26H7	47	M5
ROBOT 130	AC41	100	72x92	41H7	72	M6
ROBOT 160	AC50	130	154	50H7	95	M8
ROBOT 220	AC50	130	154	50H7	95	M8

Tab. 73

An (optional) connection flange is required to fit the standard reduction units selected by Rollon.
For further informations contact our offices

Accessories

Fixing by brackets

The linear motion systems used for the Rollon series ROBOT linear units enable support of loads in any direction. They can therefore be installed in any position.
To install the units, we recommend the use of the dedicated T-slots in the extruded bodies as shown below.

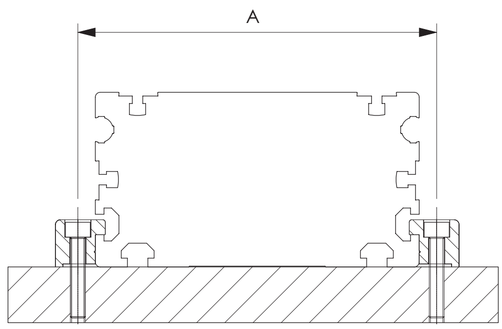


Fig. 35

Unit	A (mm)
ROBOT 100	112
ROBOT 130	144
ROBOT 160	180
ROBOT 220	240

Tab. 74

Fixing brackets

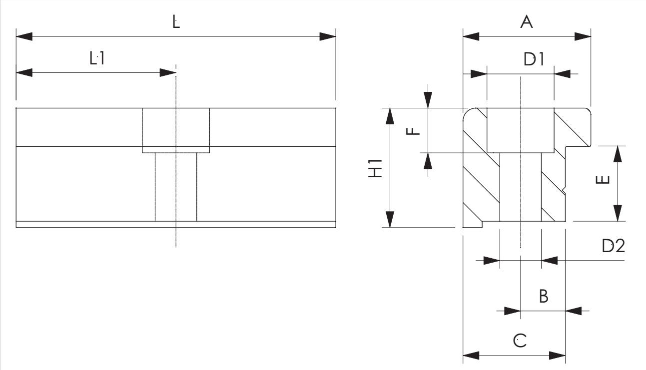


Fig. 36

Anodised aluminum block for fixing the linear units through the side T-slots of the body.

Fixing by T-nuts

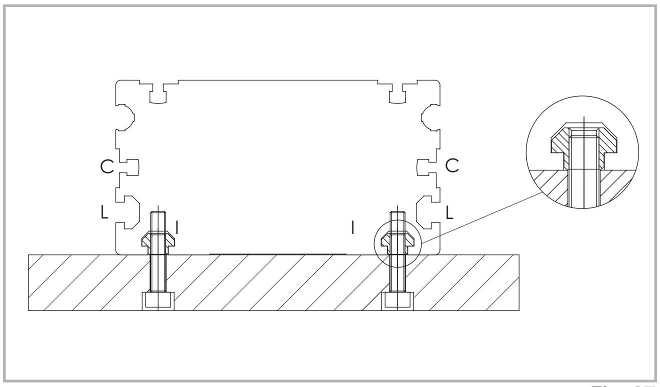


Fig. 37

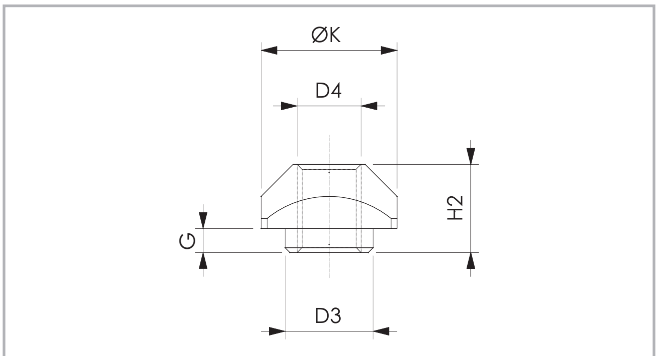
Warning:
Do not fix the linear units through the drive ends.

Dimensions (mm)

Unit	A	B	C	E	F	D1	D2	H1	L	L1	Code
ROBOT 100	20	6	16	10	5.5	9.5	5.3	14	35	17.5	1000958
ROBOT 130	20	7	16	12.7	7	10.5	6.5	18.7	50	25	1001061
ROBOT 160	36.5	10	31	18.5	10.5	16.5	10.5	28.5	100	50	1001233
ROBOT 220	36.5	10	31	18.5	10.5	16.5	10.5	28.5	100	50	1001233

Tab. 75

T-nuts



L=Side / **C**=Central / **I**=Lower - see fig. 31

Fig. 38

Steel nuts to be used in the slots of the body.

Dimensions (mm)

Unit		D3	D4	G	H2	K	Code
ROBOT 100	**L-I**	-	M4	-	3.4	8	1001046
ROBOT 130	**C**	-	M3	-	4	6	1001097
ROBOT 130	**L-I**	8	M6	3.3	8.3	13	1000043
ROBOT 160	**C**	-	M6	-	5.8	13	1000910
ROBOT 160	**I**	8	M6	3.3	8.3	13	1000043
ROBOT 160	**L**	11	M8	2.8	10.8	17	1000932
ROBOT 220	**L-I**	11	M8	2.8	10.8	17	1000932

Tab. 76

Proximity ROBOT

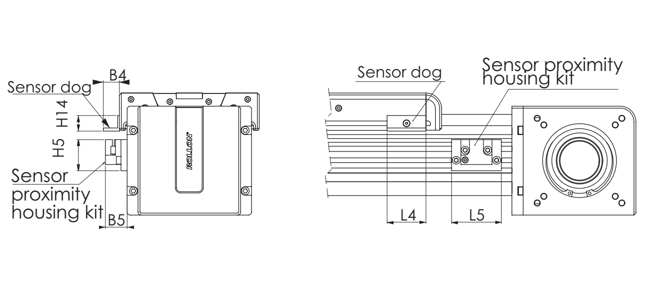


Fig. 39

Sensor proximity housing kit

Red anodized aluminum sensor holder, equipped with T-nuts for fixing into the body slots.

Sensor dog

L-shaped bracket in zinc-plated iron, mounted on the carriage and used for proximity switch operations.

PLS

Dimensions (mm)

Unit	B4	B5	L4	L5	H4	H5	For proximity	Sensor dog code	Sensor proximity housing kit code
ROBOT 100	9.5	20	25	45	12	25	Ø 8	G000268	G000092
ROBOT 130	21	28	50	60	20	40	Ø 12	G000269	G000126
ROBOT 160	21	28	50	64	20	40	Ø 12	G000269	G000123
ROBOT 220	21	28	50	70	20	40	Ø 12	G000269	G000207

Tab. 77

Warning:

If a bellow is used, it is not possible to assemble the proximity switch holders to the aluminum body.

Protections

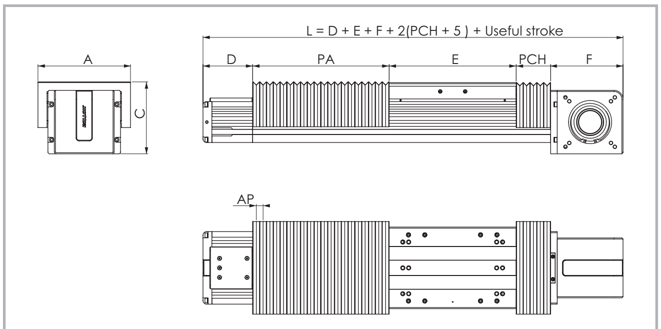


Fig. 40

Protection of ball bearing guides

The four ball bearing blocks have seals on both sides and, where necessary, an additional scraper can be fitted for very dusty conditions.

Special protection

To use these linear units in very critical environments, they can be fitted with a bellows system in addition to the standard protection. The bellows is fixed to the carriage and the ends of the body with Velcro tape for easy assembly and disassembly.

The total length (L) of the linear unit will vary:

See Fig. 40.

Standard protections

The Rollon series ROBOT linear units are equipped with a polyurethane sealing strip to protect all parts inside the body against dust and foreign matter. The sealing strip runs the length of the body and is kept in position by micro-bearings located within the carriage. This ensures very low frictional resistance as it passes through the carriage.

Dimensions (mm)

Unit	A	C	D	E	F
ROBOT 130	174	103	95	230	135
ROBOT 160	204	131.5	110	280	160
ROBOT 220	275	149.5	130	380	160

Tab. 78

Standard material: Thermally welded nylon coated with polyurethane

Materials on demand: Nylon coated with PVC, fiberglass, stainless steel

Warning: The use of bellows does not allow the assembly of the proximity switch holders to the aluminum body.

Assembly kits

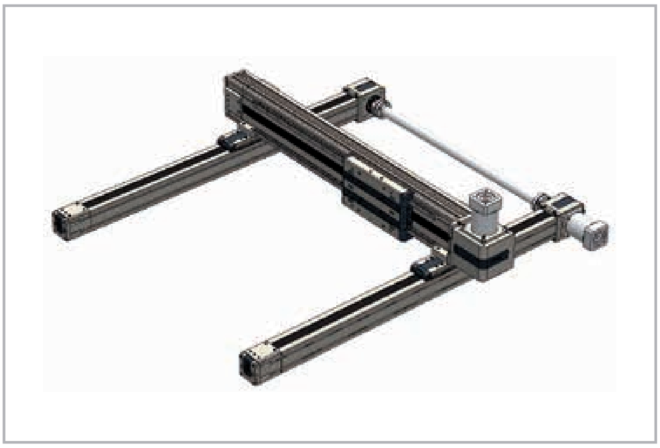


Fig. 41

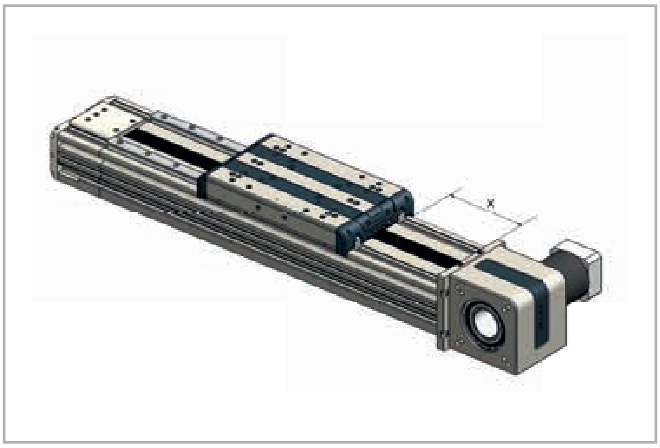
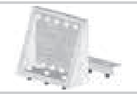


Fig. 42

For the direct assembly of Robot linear units on other types of actuators Rollon offers dedicated assembly kits (brackets) in order to fix those brackets the ends of the actuator must be free of rails. The table below gives the codes of the assembly kit. The allowed combination of assembly as well as the length without rails at each end.

Kit		Code	X No rail at each end (mm)
	ROBOT 100 - ELM 65	G000205	75
	ROBOT 100 - ROBOT 130	G000201*	155
	ROBOT 100 - ECO 80	G000203	90
	ROBOT 100 - E-SMART 50	G000642	60
	ROBOT 130 - ELM 65	G000196	75
	ROBOT 130 - ELM 80	G000195	90
	ROBOT 130 - ROBOT 130	G000197*	155
	ROBOT 130 - ROBOT 160	G000197*	190
	ROBOT 160 - ELM 80	G000204	90
	ROBOT 160 - ELM 110	G000452	120
	ROBOT 160 - ROBOT 160	G000202*	190
	ROBOT 160 - ROBOT 220	G000202*	255
	ROBOT 220 - ELM 110	G000199	120

* Additional fixing holes are requested on the robot plate

Tab. 79

Adapter flange for gearbox assembly

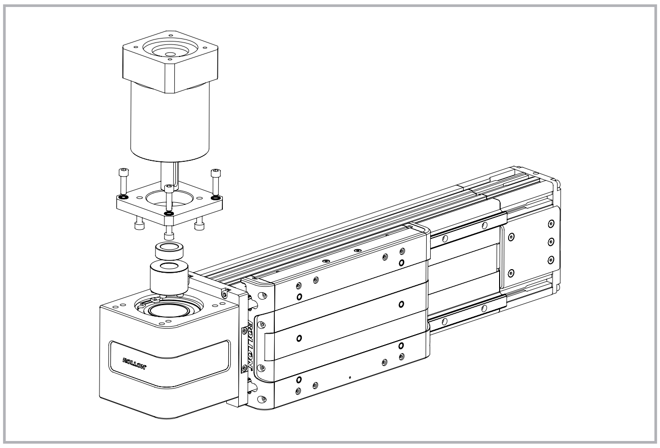


Fig. 43

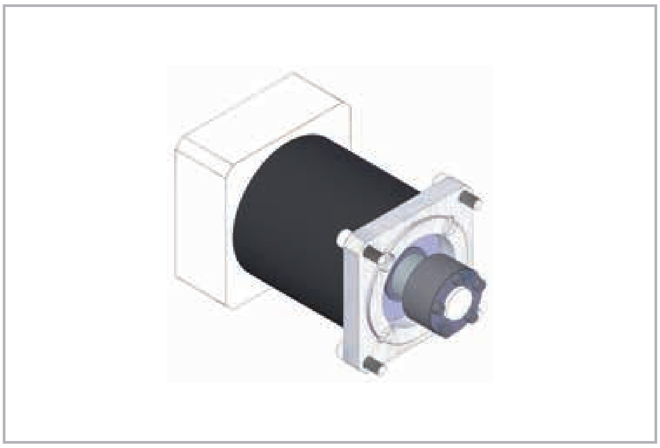


Fig. 44

Assembly kit includes: shrink disk; adapter plate; fixing hardware

Unit type	Gearbox type (not included)	Kit Code
ROBOT 100	MP060	G000566
	LC050; PE2; NP005S	G001444
ROBOT 130	P3	G000824
	MP080	G000826
	LC090; MPV01; NP025S; PE4	G000827
	MP105	G000830
	PE3; NP015S; LC070	G001078
	SP075; PLN090	G000859
	SP060; PLN070	G000829
	SW040	G000866
ROBOT 160	AB115	G000481
	MP130	G000482
	LC120; MPV02; NP035S; PE5; AE120	G000483
	LC090, NP025S, PE, NP025S	G000525
	SP+075, PLN090, P4, VRS075, AF075A	G000526
	PSF5; NPS35; SP+100	G000657
	MP105	G000527
ROBOT 220	AB115	G000481
	MP130	G000482
	LC120; MPV02; NP035S; PE5; AE120	G000483
	LC090, NP025S, PE4, NP025S	G000525
	SP+075, PLN090, P4, VRS075, AF075A	G000526
	PSF5; NPS35; SP+100	G000657
	MP105	G000527

Tab. 80

For other gearbox type ask Rollon

Ordering key

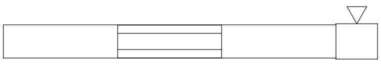
Identification codes for the ROBOT linear unit

R	13	1R	2000	1R	-075	D
	10=100 13=130 16=160 22=220					

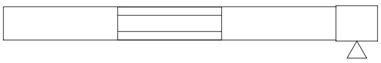
Code	Description
D	Multiple carriage
-075	ROBOT on ELM: 075 ROBOT 130 - ELM 65; 075 ROBOT 100 - ELM 65; 120 ROBOT 130 - ELM 110; 090 ROBOT 130 - ELM 80; 120 ROBOT 130 - ELM 110 *see pg. PLS-32*
1R	Linear motion system *see pg. PLS-18*
2000	L = total length of the unit
1R	Driving head code *see pg. PLS-28 - PLS-29*
13	Linear unit size *see from pg. PLS-19 to pg. PLS-26*
R	Linear unit serie ROBOT *see pg. PLS-16*

In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Left / right orientation



Right



Left

SC series

SC series description

Fig. 45

SC

The SC series linear units are specifically designed for vertical motion in gantry applications, or in applications where the aluminum profile must move while the carriage remains fixed.

Available in three sizes: 65 mm, 130 mm and 160 mm, the SC linear actuator has a self-supporting structure made by a profile (square profile for SC 65) of extruded and anodized aluminum.

The SC is a stiff vertical system, guaranteed by the use of two parallel linear guides, four "maintenance-free" caged ball bearing blocks and a wide belt drive.

The SC Series has been designed for heavy loads and high cycle applications. It is specifically designed and configured to be compatible and assembled with the ROBOT Series actuators without the need for adaptor plates.

Corrosion resistant version

All Plus System series of linear actuators are available with stainless steel elements, for applications in harsh environments and/or subject to frequent washes.

The Plus System linear units are constructed using extruded anodized 6060 and 6082 Anti-Corrosive Aluminum, which houses bearings, linear rails, nuts and bolts and components, all of which are made of low carbon SS AISI 303 and 404C steel, to prevent or delay corrosion caused by humidity experienced in the environments where the linear units are used.

Special no-deposit surface treatments are combined with a food grade lubrication system to allow use in highly sensitive applications, such as the food and pharmaceutical industries where product contamination is prohibited.

- Internal stainless steel elements
- Anodized 6060 and 6082 Anti-Corrosive Aluminum Profile
- Very low carbon SS AISI 303 and 404C steel linear rails, nuts and bolts and components
- Lubricated with organic food grade vegetable oils

The components

Extruded profile

The anodized aluminum extrusions used for the profile of the Rollon SC series linear units were designed and manufactured by industry experts to optimize weight while maintaining mechanical strength. The anodized aluminum alloy 6060 used (see physical-chemical characteristics below) was extruded with dimensional tolerances complying with EN 755-9 standards.
Side slots are provided for fast, trouble-free mounting of accessories (proximity switch runner, etc.). Power cables and/or air hoses (gripper, etc.) can be passed inside the body.

Driving belt

The Rollon SC series linear units use steel reinforced polyurethane drive belt with AT pitch. This belt is ideal due to its high load transmission characteristics, compact size and low noise. Used in conjunction with a backlash-free pulley, smooth alternating motion can be achieved. Optimization of the maximum belt width/body dimension ratio enables the following performance characteristics to be achieved:

- **High speed**
- **Low noise**
- **Low wear**

Carriage

The carriage is an enveloping structure that houses the entire linear motion system consisting of a drive pulley and two driven pulleys.The external parts are made of anodized aluminum. Dimensions vary according to type. One of the two configurations shown on page PLS-48 can be used for fast, simple assembly of the SC series. The carriage also houses brush seals to remove contaminants from the system.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 81

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.7	69	23	200	880-900	33	600-655

Tab. 82

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
205	165	10	60-80

Tab. 83

The linear motion system

The linear motion system has been designed to meet the load capacity, speed, and maximum acceleration conditions of a wide variety of applications.

SC series with ball bearing guides

- Two ball bearing guides with high load capacity are mounted in two dedicated seats on the outer sides of the aluminum body.
- The carriage of the linear unit is assembled on four pre-loaded ball bearing blocks with plastic retention cages.
- The four ball row configuration enables the carriage to withstand loading in the four main directions.
- The four blocks have seals on both sides and, where necessary, an additional scraper can be fitted for very dusty conditions.
- Lubrication reservoirs (pockets) installed on the front of the ball bearing blocks supply the right amount of grease, thus promoting long maintenance intervals.

SC section

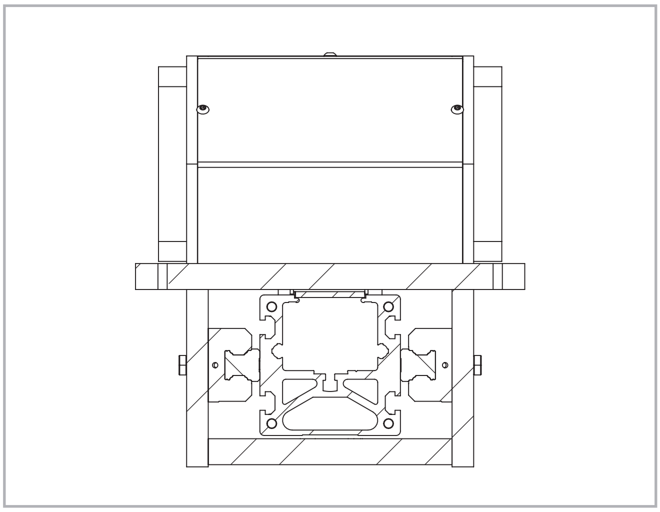


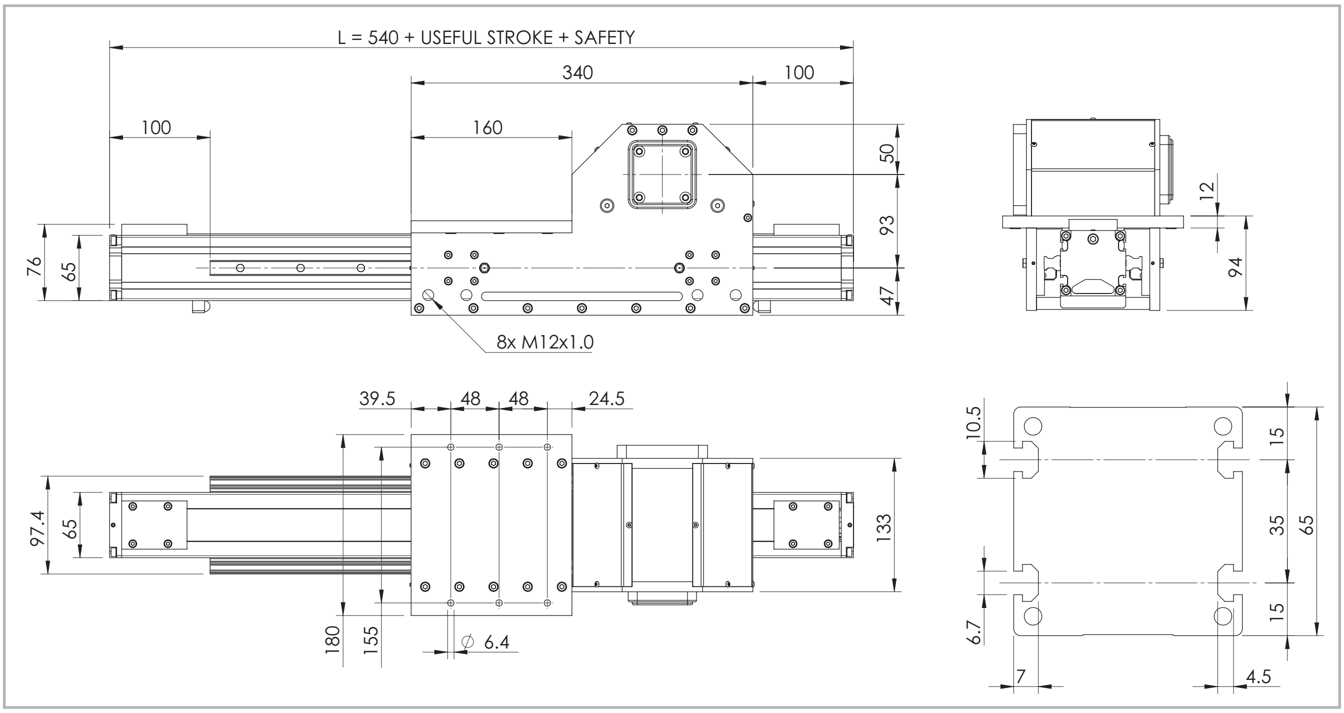
Fig. 46

The linear motion system described above offers:

- High speed and acceleration
- High load capacity
- High permissible bending moments
- Low friction
- Long life
- Low noise
- Free maintenance (dependent on application)

SC 65 SP

SC 65 SP Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 47

Technical data

	Type
	SC 65 SP
Max. useful stroke length [mm]	1500
Max. positioning repeatability [mm]*1	± 0.05
Max. speed [m/s]	5.0
Max. acceleration [m/s²]	50
Type of belt	32 AT 5
Type of pulley	Z 32
Pulley pitch diameter [mm]	50.93
Carriage displacement per pulley turn [mm]	160
Carriage weight [kg]	7.8
Zero travel weight [kg]	11.6
Weight for 100 mm useful stroke [kg]	0.7
Starting torque [Nm]	1.3
Rail size [mm]	15

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 84

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
SC 65	0.06	0.09	0.15

Tab. 85

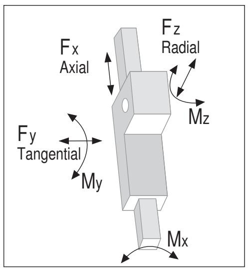
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
SC 65	32 AT 5	32	0.105

Tab. 86

Belt length (mm) = L + 85



Load capacity

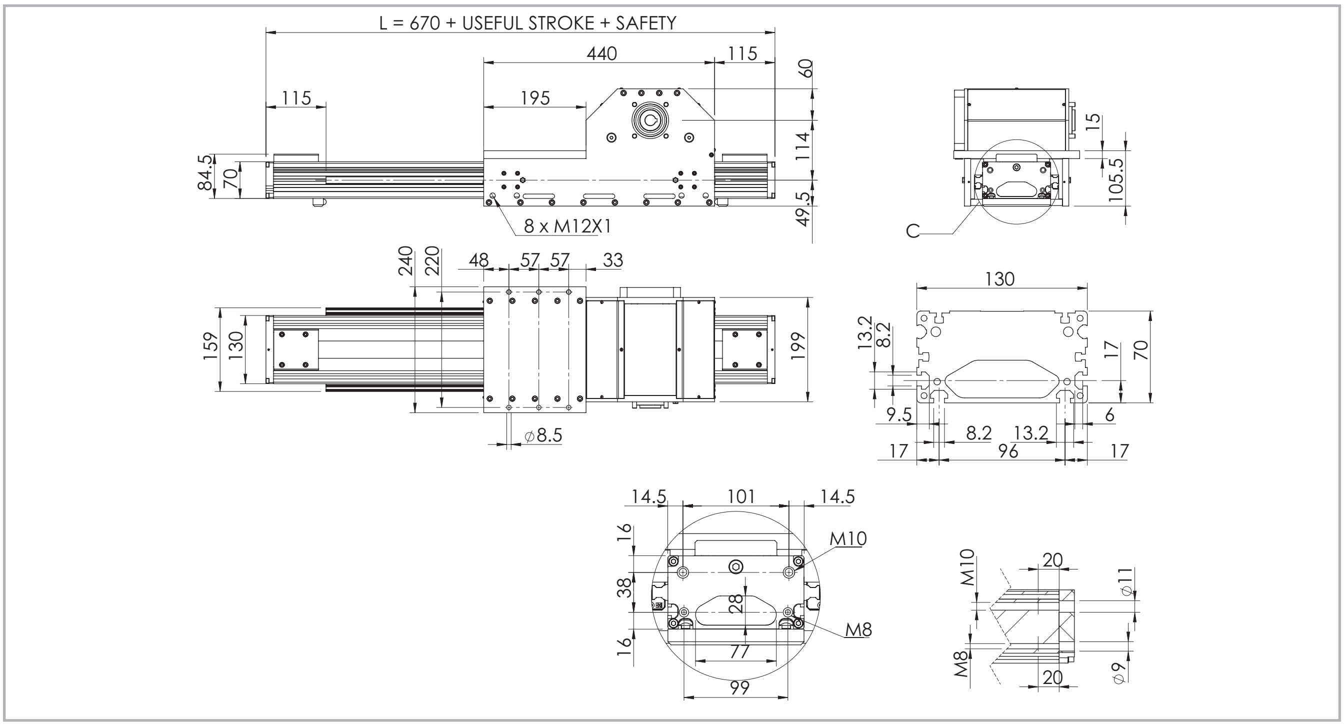
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
SC 65 SP	1344	883	96800	45082	96800	3775	11616	11616

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 87

SC 130 SP

SC 130 SP Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 48

Technical data

	Type
	SC 130 SP
Max. useful stroke length [mm]	2000
Max. positioning repeatability [mm]*1	± 0.05
Max. speed [m/s]	5.0
Max. acceleration [m/s²]	50
Type of belt	50 AT 10
Type of pulley	Z 20
Pulley pitch diameter [mm]	63.66
Carriage displacement per pulley turn [mm]	200
Carriage weight [kg]	13.5
Zero travel weight [kg]	23
Weight for 100 mm useful stroke [kg]	1.4
Starting torque [Nm]	3
Rail size [mm]	15

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 88

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
SC 130	0.15	0.65	0.79

Tab. 89

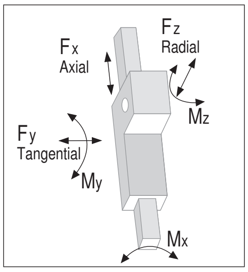
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
SC 130	50 AT 10	50	0.209

Tab. 90

Belt length (mm) = L + 101



Load capacity

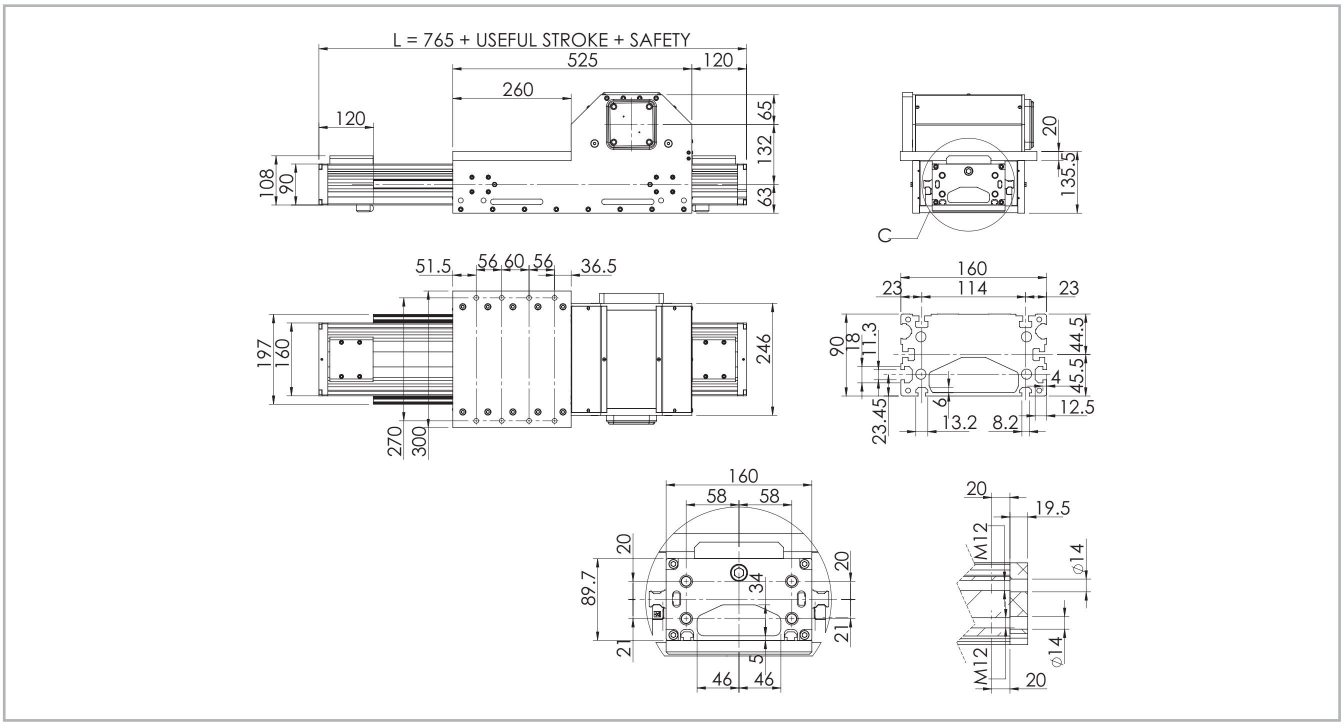
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
SC 130 SP	3735	2160	96800	45082	96800	6921	16311	16311

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 91

SC 160 SP

SC 160 SP Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 49

Technical data

	Type
	SC 160 SP
Max. useful stroke length [mm]	2500
Max. positioning repeatability [mm]*1	± 0.05
Max. speed [m/s]	5.0
Max. acceleration [m/s²]	50
Type of belt	70 AT 10
Type of pulley	Z 25
Pulley pitch diameter [mm]	79.58
Carriage displacement per pulley turn [mm]	250
Carriage weight [kg]	32
Zero travel weight [kg]	48
Weight for 100 mm useful stroke [kg]	1.9
Starting torque [Nm]	6.1
Rail size [mm]	20

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 92

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
SC 160	0.37	1.50	1.88

Tab. 93

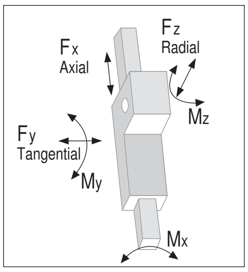
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
SC 160	70 AT 10	70	0.407

Tab. 94

Belt length (mm) = L + 121



Load capacity

Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
SC 160 SP	6682	4428	153600	70798	153600	13555	31104	31104

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 95

Lubrication

SP linear units with ball bearing guides

SP Linear units are equipped with self lubricating linear ball guides. The ball bearing carriages of the SP versions are also fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment of these in the circuits.
Special lubrication reservoirs are mounted on the front plates of the linear blocks which continuously provide the necessary amount of grease to the ball raceways under load. These lubrication reservoirs also considerably reduce the frequency of lubrication of the module. This system guarantees a long interval between maintenances: SP version: every 5000 km or 1 year of use, based on the value reached first. If a longer service life is required or in case of high dynamic or high loaded applications please contact our offices for further verification.

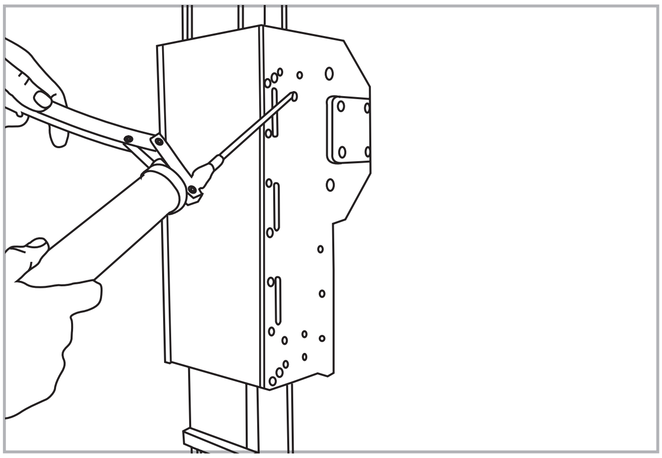


Fig. 50

Quantity of lubricant necessary for re-lubrication of each block:

Type	Unit: [cm^3]
SC 65	0.7
SC 130	0.7
SC 160	1.4

Tab. 96

- Insert the tip of the grease gun in the specific grease blocks.
- For lubrication of linear units use lithium soap grease NLGI 2.
- For specially stressed applications or difficult enviromental conditions, lubrication should be carried out more frequently. Refer to Rollon for further advice.

Planetary gears

Assembly to the right or to the left of the driving head

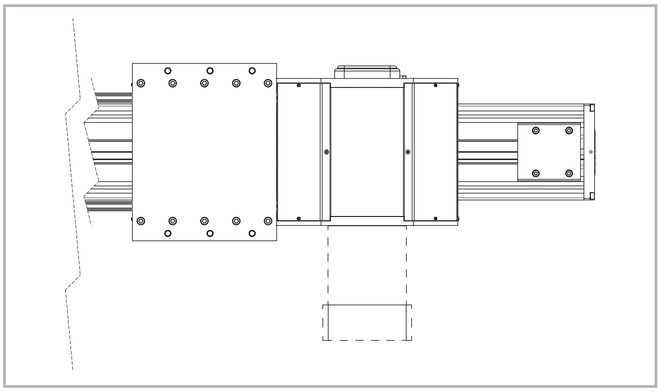


Fig. 51

Motion can be achieved with standard transmission types as follows:

- Planetary gears
- Worm gears
- Versions with simple shaft
- Versions with hollow shaft

Versions with planetary gears

Planetary gears are used for highly dynamic robot, automation and handling applications involving stressing cycles and with high level precision requirements. Standard models are available with a clearance ranging from 3' to 15' and with a reduction ratio from 1:3 to 1:1000. For assembly of non-standard planetary gear, contact our offices.

Type	Left	Right	Gear type
SC 65	4EA	4CA	MP 080
SC 130	4EA	4CA	MP 105
SC 160	4EA	4CA	MP 130

Tab. 97

Simple shaft version

Simple shaft type AS

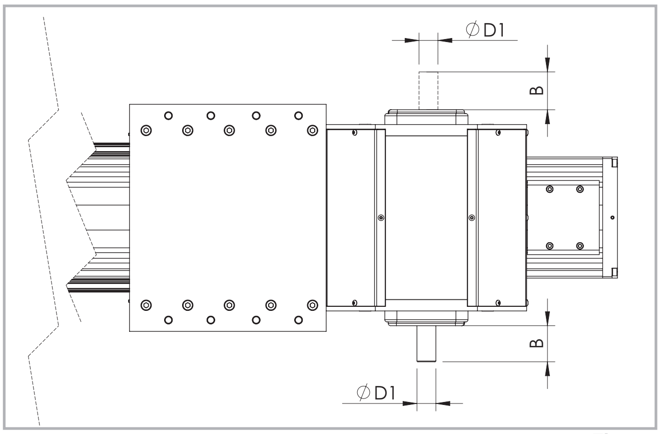


Fig. 52

Unit	Shaft type	B	D1
SC 65	AS 20	40	20h7
SC 130	AS 25	50	25h7
SC 160	AS 25	50	25h7

Tab. 98

Position of the simple shaft can be to the left or right of the drive head.

Unit	Shaft type	Head code AS left	Head code AS right	Head code double AS
SC 65	AS 20	1EA	1CA	1AA
SC 130	AS 25	1EA	1CA	1AA
SC 160	AS 25	1EA	1CA	1AA

Tab. 99

Hollow shafts

AC hollow shaft type

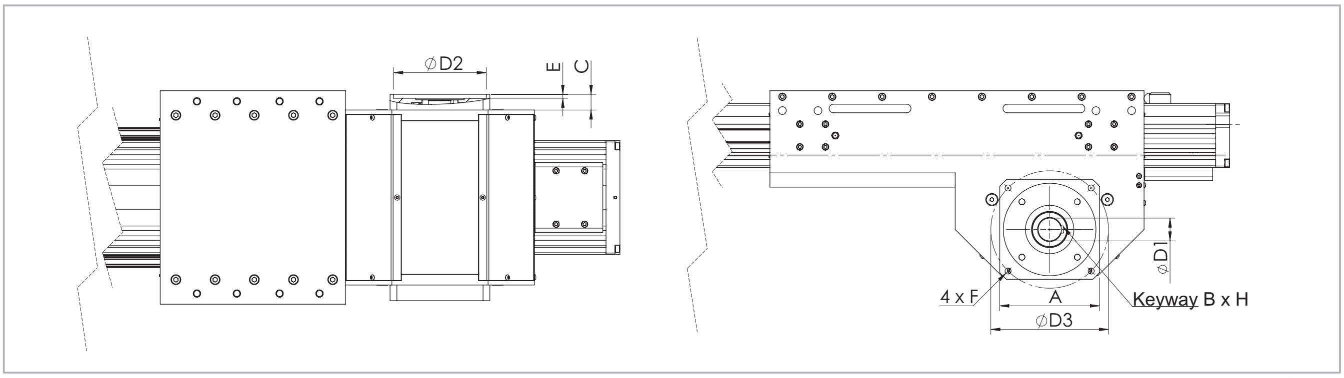


Fig. 53

Unit mm

Appliable to unit	Shaft type	D1	D2	D3	A	C	E	F	Keyway B x H	Head code
SC 65 SP	AC 19	19H7	80	100	90	13	3	M6	6 x 6	2AA
SC 65 SP	AC 20	20H7	80	100	90	13	3	M6	6 x 6	2BA
SC 130 SP	AC 20	20H7	80	100	115	19	4.5	M6	6 x 6	2AA
SC 130 SP	AC 25	25H7	110	130	115	19	4.5	M8	8 x 7	2BA
SC 160 SP	AC 32	32H7	130	165	140	22	5.5	M10	10 x 8	2AA

Tab. 100

An (optional) connection flange is required to fit the standard reduction units selected by Rollon. For further information contact our offices

Accessories

Fixing by brackets

The ball bearing guide linear drive systems of Rollon SC series linear units enable support of loads in any direction. They can therefore be installed in any position. To install the SC series units, we recommend use of one of the two systems indicated below:

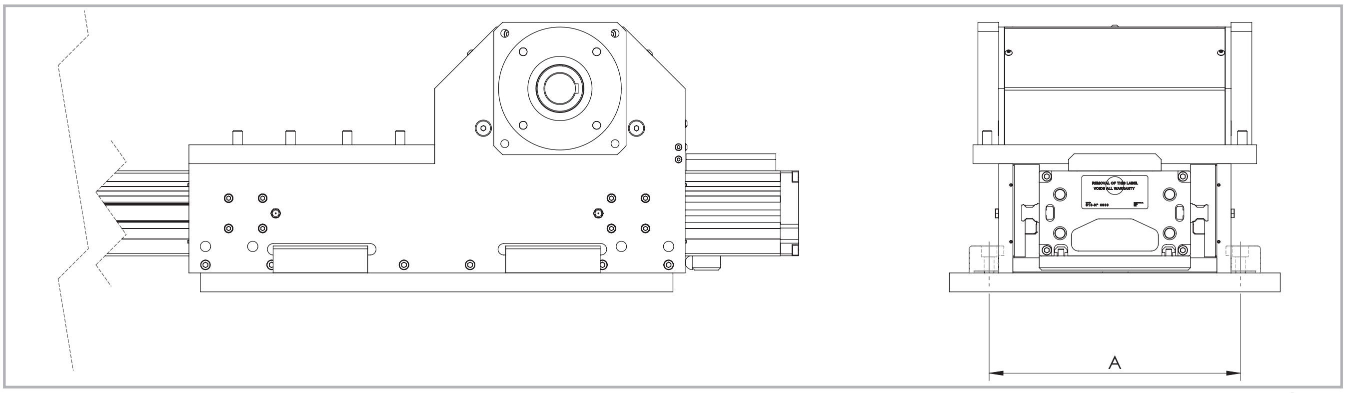


Fig. 54

Fixing brackets

Material: Anodized aluminum

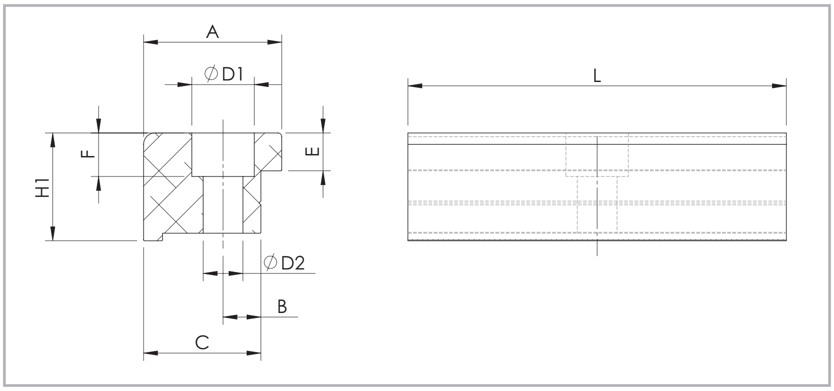


Fig. 55

Unit	A (mm)
SC 65 SP	147
SC 130 SP	213
SC 160 SP	266

Tab. 101

Unit	A	B	C	E	F	D1	D2	H1	L	Code
SC 65 SP	20	6	16	10	5.5	9.5	5.3	14	35	1001491
SC 130 SP	20	7	16	12.7	7	10.5	6.5	18.7	50	1001491
SC 160 SP	36.5	10	31	18.5	10.5	16.5	10.5	28.5	100	1001233

Tab. 102

Direct fixing

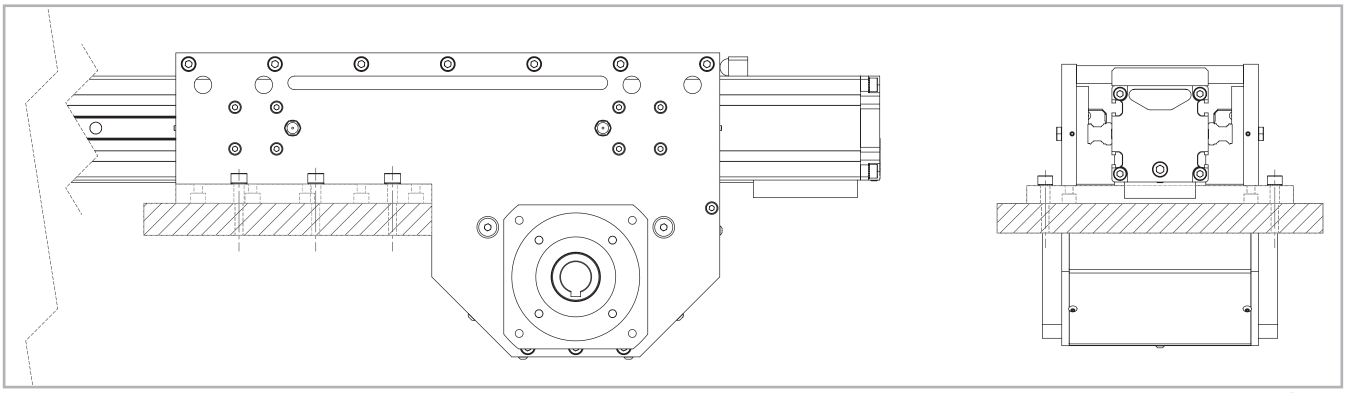


Fig. 56

T-nuts

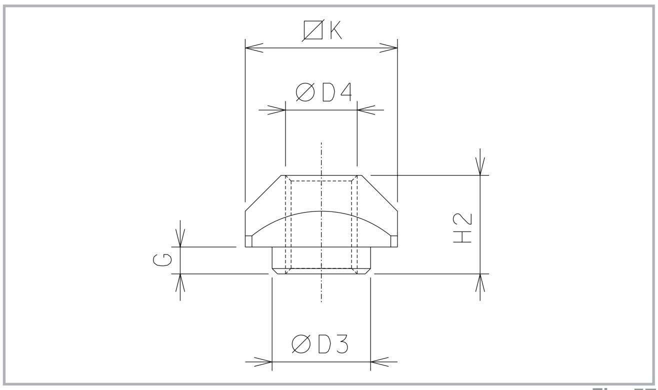


Fig. 57

Steel nuts to be used in the slots of the body

Fixing by T-nuts

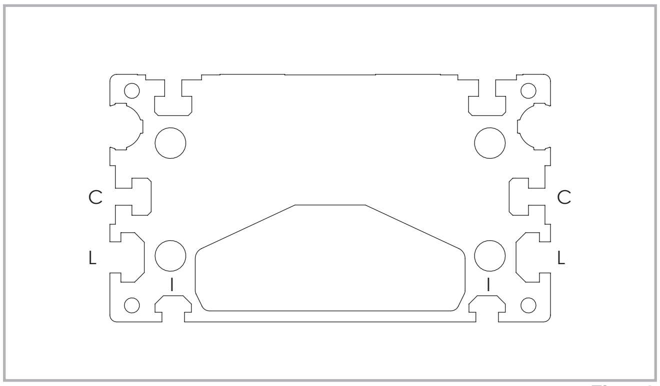


Fig. 58

Warning:
Do not fix the linear units through the drive ends.

Unit	Slot	D3	D4	G	H2	K	Code
SC 65	L	6.7	M5	2.3	6.5	10	1000627
SC 130	L-I	8	M6	3.3	8.3	13	1000043
SC 130	C	-	M3	-	4	6	1001097
SC 160	I	8	M6	3.3	8.3	13	1000043
SC 160	L	11	M8	2.8	10.8	17	1000932
SC 160	C	-	M6	-	5.8	13	1000910

L = Side - **I** = Lower - **C**=Central

Tab. 103

Proximity

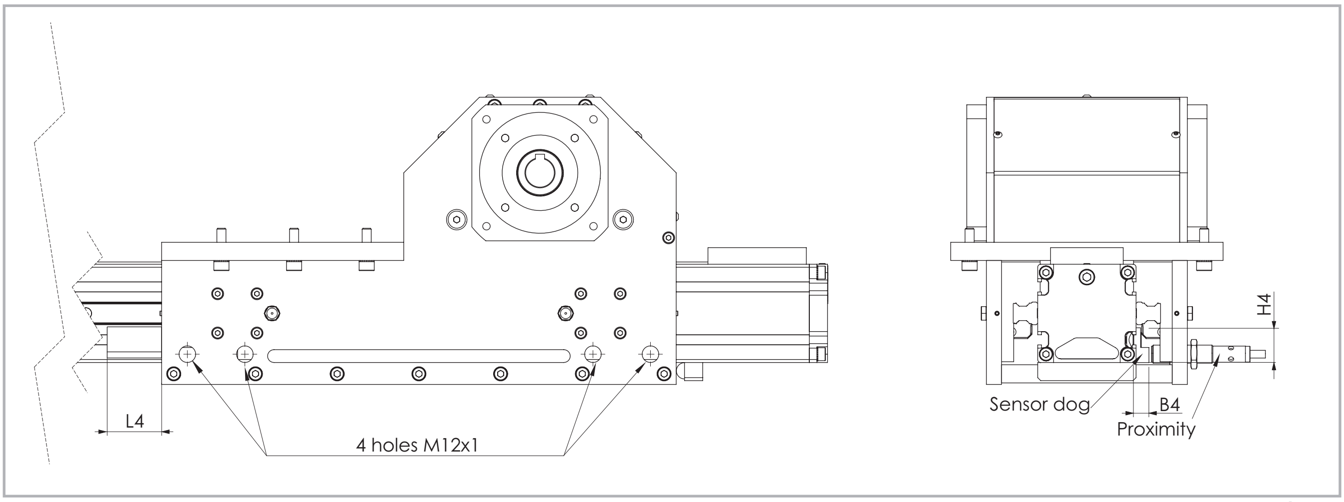


Fig. 59

Fitting of the proximity switch

Proximity switches can be mounted on four threaded mounting holes that are positioned on the sides of the carriage. Do not over-torque the switches during installation as this can cause interference with the proximity switch runner and damage the sensor.

Sensor dog

L-shaped bracket in zinc-plated iron, mounted on the carriage and used for proximity switch operations.

Unit	B4	H4	L4	Sensor dog Code
SC 65	8.5	23	50	G001997
SC 130	8.4	25	50	G001862
SC 160	10	27	50	G000272

Tab. 104

Protections

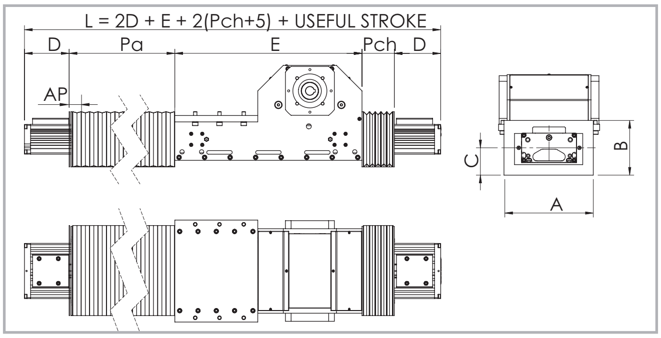


Fig. 60

Protection of ball bearing guides

The four ball bearing blocks have seals on both sides and an additional scraper can be fitted for very dusty conditions.

Special protection

For use in hostile conditions, the SC can be fitted with a bellows system in addition to the standard protection. The bellows is fixed to the carriage and drive ends with hook and loop fasteners for ease of assembly and disassembly.

The total length (L) of the linear unit will vary:

See Fig. 60.

Dimensions (mm)

Unit	A	B	C	D	E
SC 65	135	109	54,5	100	340
SC 130	212	130	64	115	440
SC 160	248	150	73	120	525

Tab. 105

Standard material: Thermally welded nylon coated with polyurethane

Materials on demand: Nylon coated with PVC, fiberglass, stainless steel

Warning: The use of bellows does not allow the assembly of the proximity switch holders to the aluminum body.

Ordering key

Identification codes for the SC linear unit

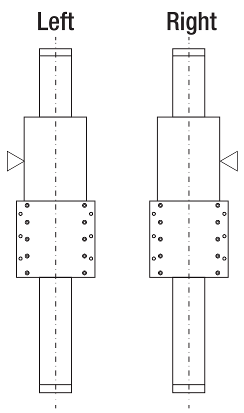
S	13	1 CA	2000	1A
	06=65 13=130 16=160			1A=SP

- 1A: Linear motion system *see pg. PLS-37*
- 2000: L = total length of the unit
- 1 CA: Driving head code *see pg. PLS-42*
- 13: Linear unit size *see from pg. PLS-38 to pg. PLS-40*
- S: Linear unit series SC *see pg. PLS-35*

In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Configure Actuator

Left / right orientation



Multiaxis systems

Previously, customers wishing to build multiaxis units have had to design, draw and manufacture all the elements necessary to assemble two or more axis. Rollon now offers a set of fittings including brackets and cross plates, to enable multiaxis units to be built. The SC series is also pre-engineered to facilitate direct connection with the units of the ROBOT series. In addition to standard elements, Rollon also provides plates for special applications.

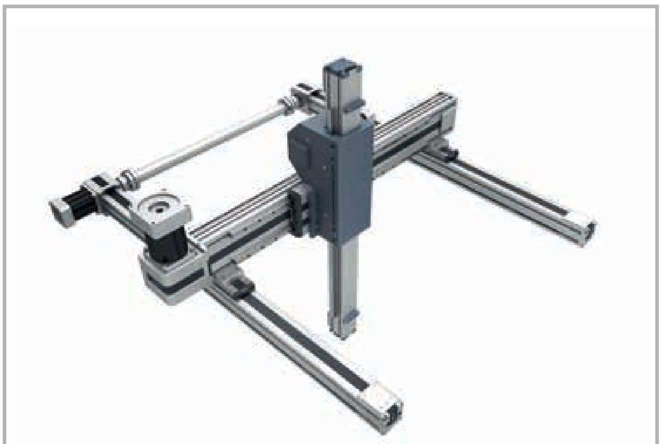
Application examples:

Two axis - X-Y system

A

A - Linear units: X axis: 2 ELM 80 SP... Y axis: 1 ROBOT 160 SP...
Connection part: 2 kits of fixing brackets for ROBOT 160 SP... on to the carrieages of ELM 80 SP...

Three axis - X-Y-Z system



C

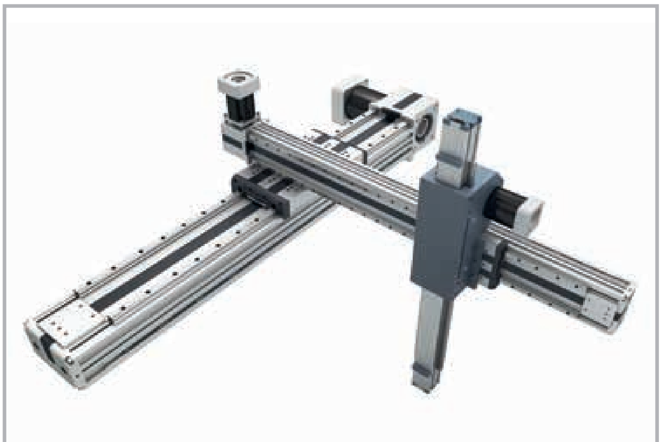
C - Linear units: X axis: 2 ELM 65 SP... Y axis: 1 ROBOT 130 SP... Z axis: 1 SC 65
Connection part: 2 kits of fixing brackets for ROBOT 130 SP... on to the carrieages of ELM 65 SP... The SC 65 unit is directly assembled on to the ROBOT 130 SP... unit without further elements.

Two axis - Y-Z system

B

B - Linear units: X axis: 1 ROBOT 220 SP... Z axis: 1 SC 160
Connection part: None
The SC 160 unit is directly assembled on to the ROBOT 220 SP... unit without further elements

Three axis - X-Y-Z system



D

D - Linear units: X axis: 1 ROBOT 220 SP... Y axis: 1 ROBOT 130 SP... Z axis: SC 65
Connection part: 1 kit of fixing brackets for ROBOT 130 SP... unit to the carriage of the ROBOT 220 SP... unit. The SC 65 unit is directly assembled on to the ROBOT 130 SP... unit without further elements.

Notes

ROLLON®

BY TIMKEN

Clean Room System

ONE series

ONE series description

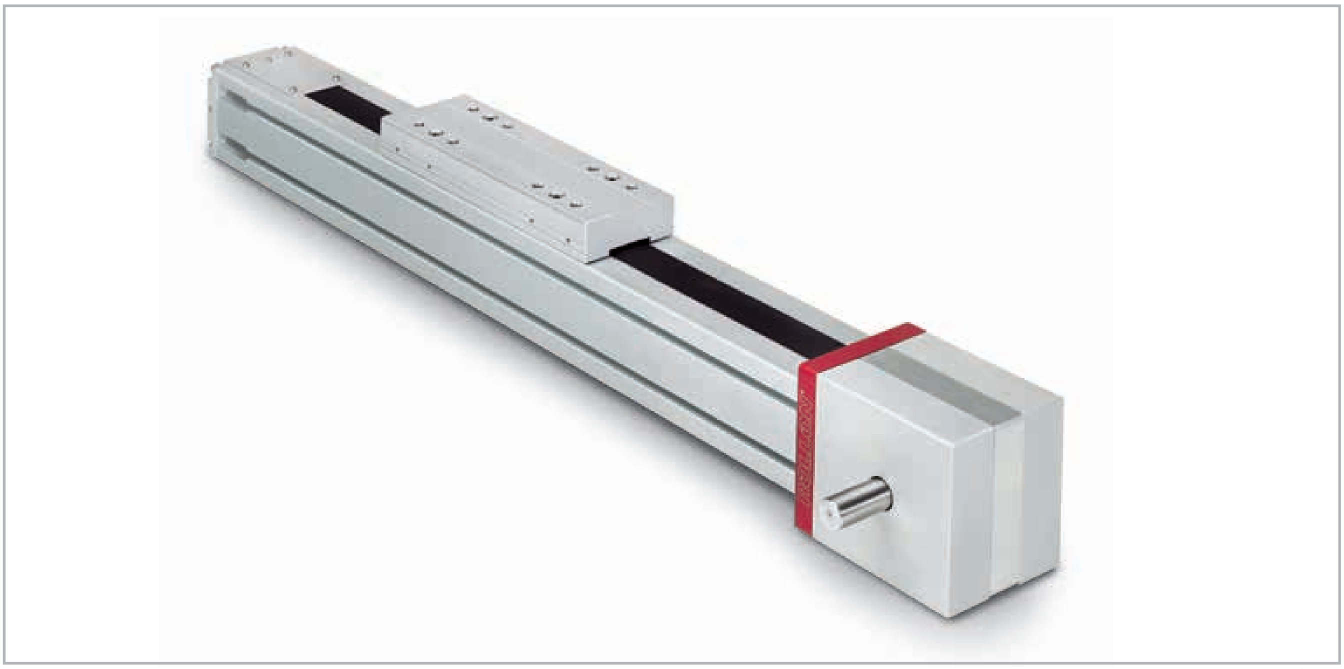


Fig. 1

The ONE series actuators are belt driven linear actuators specifically designed for Clean Room applications.

The ONE series reduces particle contamination using a specially designed straight seal that isolates the internals of the actuator from the environment. In addition to particle containment, the ONE series can support a vacuum pump (up to 0,8 bar) to remove and transport contaminates from the interior of the actuator to filtration sites. The 2 vacuum ports are located on the drive and idle head.

All internal components of the ONE series actuators are designed to minimize particle release. Component materials are limited to stainless steel. Where stainless steel is not an option, special treatments are used to ensure low particle release.

Special lubrications designed for use in cleanroom environments are used for all bearings and linear rails.

The components

Extruded bodies

The anodized aluminum extrusions used for the bodies of the Rollon ONE series linear units were designed and manufactured in cooperation with a leading company in this field to obtain the right combination of high mechanical strength and reduced weight. Aluminum alloy 6060 is used (see physical-chemical characteristics below).The dimensional tolerances comply with EN 755-9 standard.

Driving belt

We are using selected higth quality polyurethane timing belts, AT profile, manufactured by leading companies in this field.

Carriage

The carriage of the Rollon ONE series linear units are made entirely of anodized aluminum. Each carriage has mounting holes fitted with stainless steel thread inserts. Rollon offers multiple carriages to accommodate a vast array of applications. The unique design of the carriage allows for the sealing strip to pass through the carriage.

Sealing strip

Rollon ONE series linear units are equipped with a polyurethane sealing strip to prevent particles generated inside the unit to go outside. The sealing strip runs the length of the body and is kept in position by micro-bearings located with in the carriage. This minimizes frictional resistance as the strip passes through the carriage while providing maximum protection.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 1

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.7	69	23	200	880-900	33	600-655

Tab. 2

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
205	165	10	60-80

Tab. 3

The linear motion system

Vacuum system

The ONE series actuator has specific connection ports on the drive and the idle end of the unit to connect a vacuum system. The vacuum quality must be evaluated case by case, but Rollon has had success with 0,8 bar on a ONE 80 with a stroke of 1.000 mm up to 4.000 mm.

Selected mechanical components

ONE Series is assembled with select high-quality components.
Only Stainless Steel (AISI 303, AISI 440C) is used for bearings, linear guides, shafts, pulleys, and other metallic components. Where it is impossible to use Stainless Steel, Rollon provides a special treatment tested under severe conditions and under particle generation.

Lubrication

ONE Series is equiped with "innovate and hi-tech linear guides" that feature special ball cages to maintain spacing. This feature supports a long-term maintenance and a low particle generation if combined with special lubricant, specifically developed and adopted for Clean Room applications.

Range

ONE Series is now available in 3 different sizes, for multi axes combinations:

- **ONE 50**
- **ONE 65**
- **ONE 80**
- **ONE 110**

Maximum stroke is 6.000 mm, except ONE 50 where the maximum stroke is 3.700 mm.
For technical details and load capacities, please refer to next pages.

ONE SP section

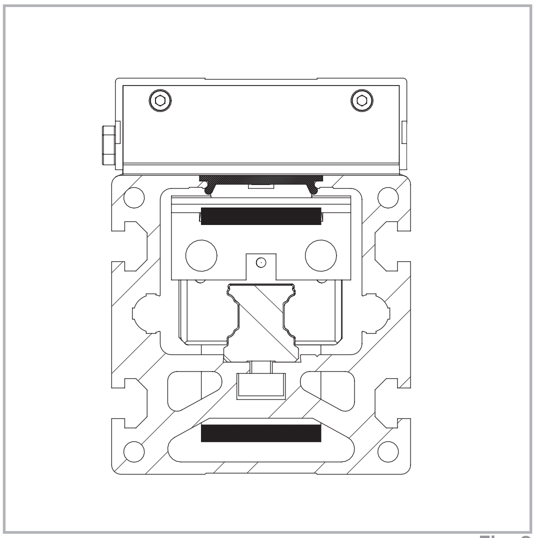
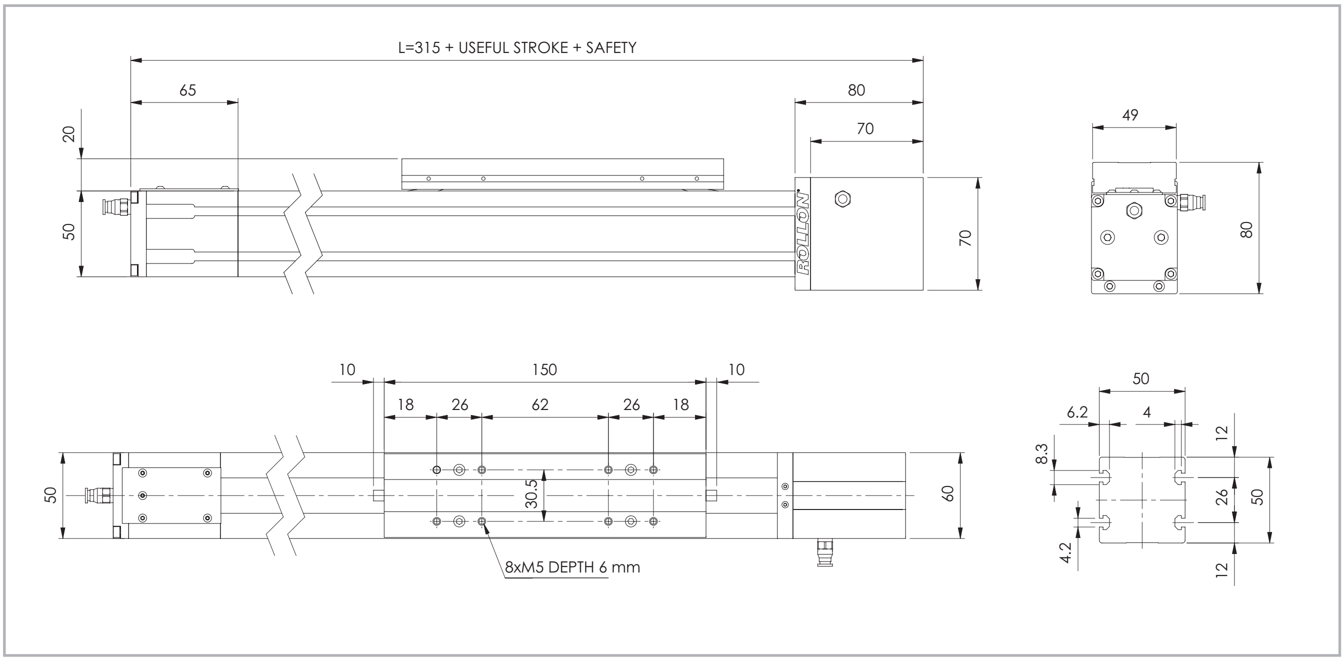


Fig. 2

ONE 50

ONE 50 Dimension



For further details please visit our website www.rollon.com and download the related DXF files.

Fig. 3

Technical data

	Type
	ONE 50
Max. useful stroke length [mm]	3700
Max. positioning repeatability [mm]*1	± 0.05
Max. speed [m/s]	4
Max. acceleration [m/s²]	50
Type of belt	22 AT 5
Type of pulley	Z 23
Pulley pitch diameter [mm]	36,61
Carriage displacement per pulley turn [mm]	115
Carriage weight [kg]	0.4
Zero travel weight [kg]	1.8
Weight for 100 mm useful stroke [kg]	0.4
Starting torque [Nm]	0.4
Moment of inertia of pulleys [g mm²]	19810
Rail size [mm]	12 mini

*1) Positioning repeatability is dependant on the type of transmission used

Tab. 4

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ONE 50	0.025	0.031	0.056

Tab. 5

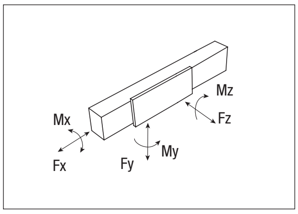
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ONE 50	22 AT 5	22	0.072

Tab. 6

Belt length (mm) = 2 x L - 130



Load capacity

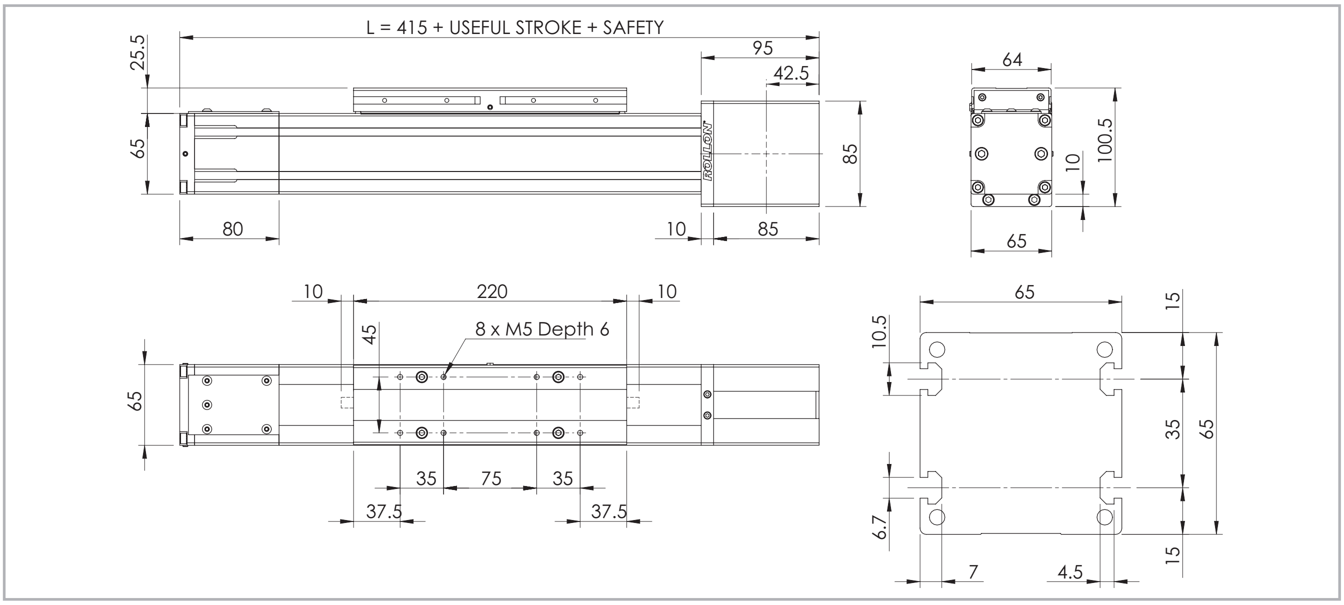
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ONE 50	809	508	7060	6350	7060	46.2	233	233

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 7

ONE 65

ONE 65 Dimension



For further details please visit our website www.rollon.com and download the related DXF files.

Fig. 4

Technical data

	Type
	ONE 65
Max. useful stroke length [mm]	6000
Max. positioning repeatability [mm]*1	± 0.05
Max. speed [m/s]	5.0
Max. acceleration [m/s²]	50
Type of belt	32 AT 5
Type of pulley	Z 32
Pulley pitch diameter [mm]	50.93
Carriage displacement per pulley turn [mm]	160
Carriage weight [kg]	1.1
Zero travel weight [kg]	3.5
Weight for 100 mm useful stroke [kg]	0.6
Starting torque [Nm]	1.5
Moment of inertia of pulleys [g mm²]	117200
Rail size [mm]	15

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 8

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ONE 65	0.060	0.086	0.146

Tab. 9

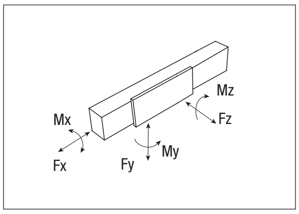
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ONE 65	32 AT 5	32	0.105

Tab. 10

Belt length (mm) = 2 x L - 180



Load capacity

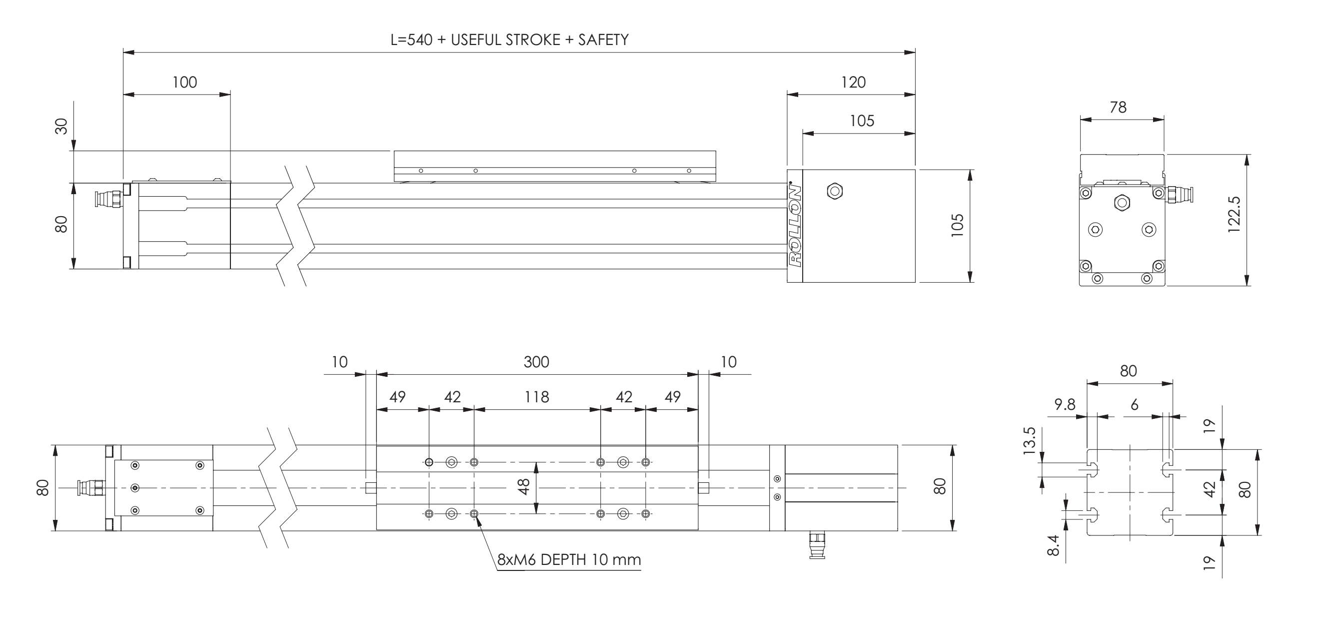
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ONE 65	1344	883	48400	22541	48400	320	1376	1376

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 11

ONE 80

ONE 80 Dimension



For further details please visit our website www.rollon.com and download the related DXF files.

Fig. 5

Technical data

	Type
	ONE 80
Max. useful stroke length [mm]	6000
Max. positioning repeatability [mm]*1	± 0.05
Max. speed [m/s]	5
Max. acceleration [m/s²]	50
Type of belt	32 AT 10
Type of pulley	Z 19
Pulley pitch diameter [mm]	60.48
Carriage displacement per pulley turn [mm]	190
Carriage weight [kg]	2.7
Zero travel weight [kg]	10.5
Weight for 100 mm useful stroke [kg]	1
Starting torque [Nm]	2.2
Moment of inertia of pulleys [g mm²]	388075
Rail size [mm]	20

*1) Positioning repeatability is dependant on the type of transmission used

Tab. 12

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ONE 80	0.136	0.195	0.331

Tab. 13

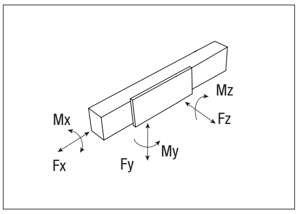
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ONE 80	32 AT 10	32	0.185

Tab. 14

Belt length (mm) = 2 x L - 230



Load capacity

Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ONE 80	2258	1306	76800	35399	76800	722	5606	5606

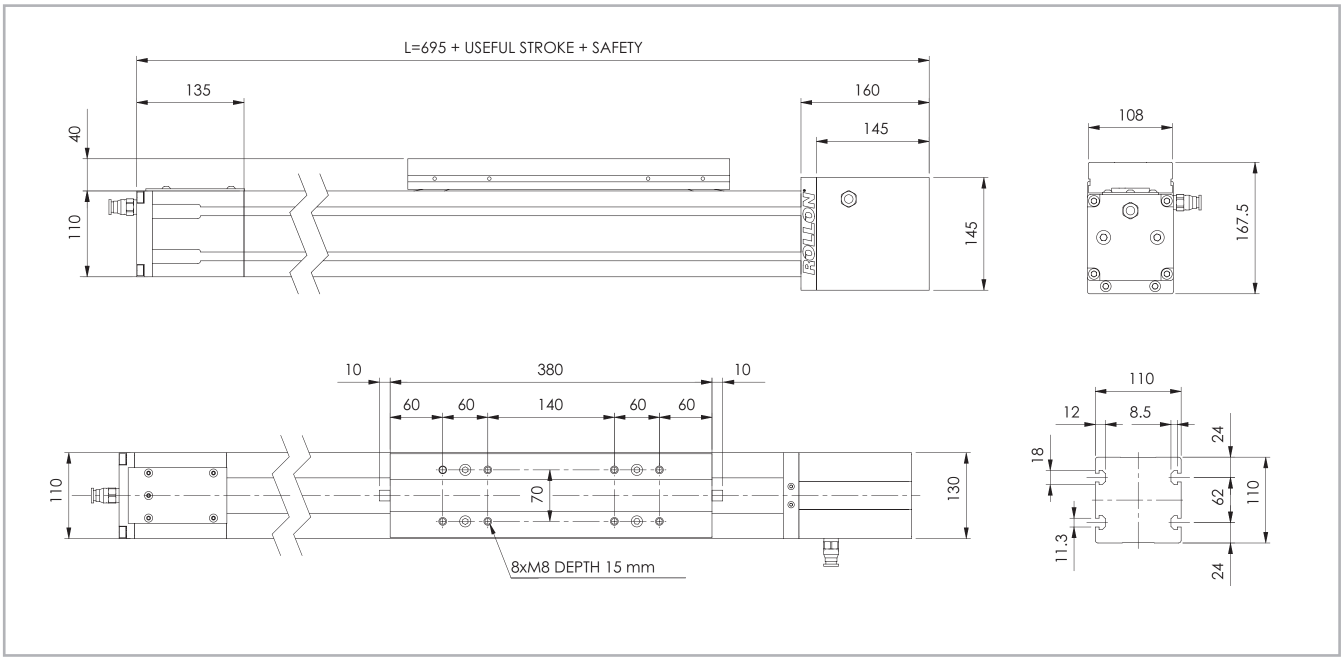
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 15

C
R
S

ONE 110

ONE 110 Dimension



For further details please visit our website www.rollon.com and download the related DXF files.

Fig. 6

Technical data

	Type
	ONE 110
Max. useful stroke length [mm]	6000
Max. positioning repeatability [mm]*1	± 0.05
Max. speed [m/s]	5
Max. acceleration [m/s²]	50
Type of belt	50 AT 10
Type of pulley	Z 27
Pulley pitch diameter [mm]	85.94
Carriage displacement per pulley turn [mm]	270
Carriage weight [kg]	5.6
Zero travel weight [kg]	22.5
Weight for 100 mm useful stroke [kg]	1.4
Starting torque [Nm]	3.5
Moment of inertia of pulleys [g mm²]	$2.193 \cdot 10^6$
Rail size [mm]	25

*1) Positioning repeatability is dependant on the type of transmission used

Tab. 16

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ONE 110	0.446	0.609	1.054

Tab. 17

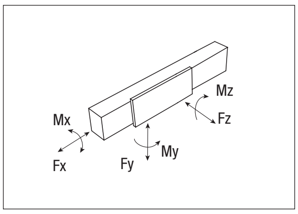
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ONE 110	50 AT 10	50	0.290

Tab. 18

Belt length (mm) = 2 x L - 290



Load capacity

Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ONE 110	4980	3300	104800	50321	104800	1126	10532	10532

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 19

Planetary gears

Assembly to the right or to the left of the driving head

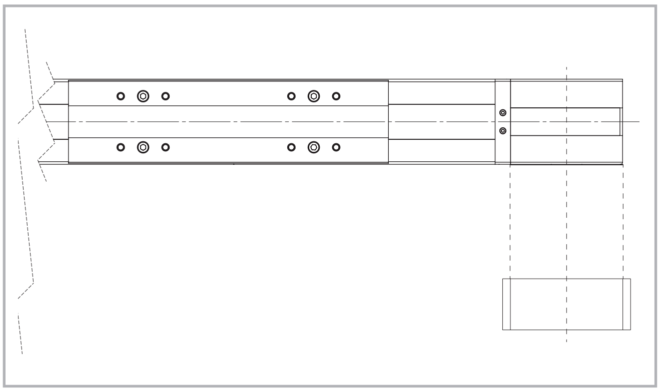
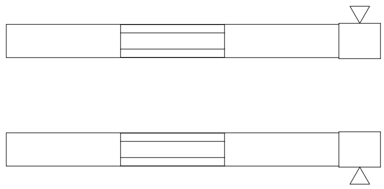


Fig. 7

Versions with planetary gears

Planetary gears are used for highly dynamic robot, automation and handling applications involving stressing cycles and with high level precision requirements. Standard models are available with clearance from 3' to 15' and with a reduction ratio from 1:3 to 1:1000. For assembly of non-standard planetary gear, contact our offices.

The series ONE linear units can be fitted with several different drive systems. In each case, the driving pulley is attached to the reduction gearshaft by means of a tapered coupling to ensure high accuracy over a long period of time.



Shaft with centering

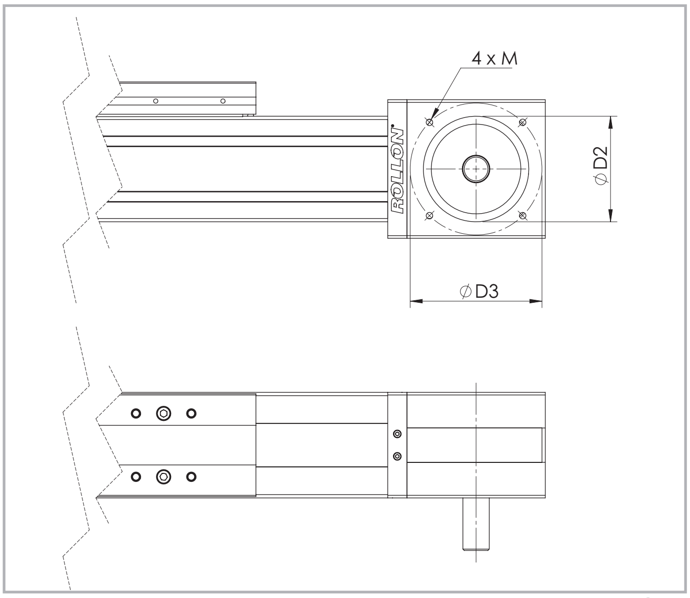


Fig. 8

Unit	Shaft type	D2	D3	M	Head code AS left	Head code AS right
ONE 50	AS 12	55	70	M5	VB	VA
ONE 65	AS 15	60	85	M6	VB	VA
ONE 80	AS 20	80	100	M6	VB	VA
ONE 110	AS 25	110	130/160	M8	VB	VA

Tab. 20

Accessories

Fixing by brackets

The linear motion systems used for the Rollon series ONE linear units enables them to support loads in any direction. They can therefore be installed in any position.
To install the units, we recommend the use of the dedicated T-Slots in the extruded bodies as shown below.

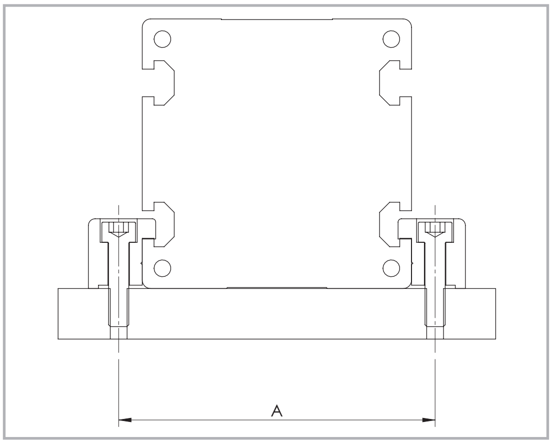


Fig. 9

Unit	A (mm)
ONE 50	62
ONE 65	77
ONE 80	94
ONE 110	130

Tab. 21

Warning:
Do not fix the linear units through the drive ends.

Fixing brackets

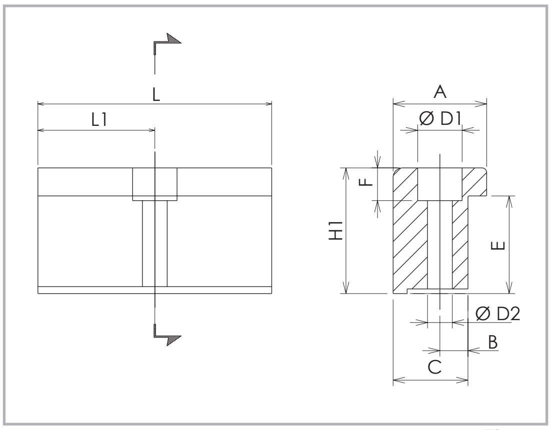


Fig. 10

Dimensions (mm)

Unit	A	H1	B	C	E	F	D1	D2	L	L1	Code
ONE 50	20	14	6	16	10	6	10	5.5	35	17.5	1000958
ONE 65	20	17.5	6	16	11.5	6	9.4	5.3	50	25	1001490
ONE 80	20	20.7	7	16	14.7	7	11	6.4	50	25	1001491
ONE 110	36.5	28.5	10	31	18.5	11.5	16.5	10.5	100	50	1001233

Tab. 22

Fixing bracket
Anodized aluminum block for fixing the linear units through the side T-Slots of the body.

T-Nuts

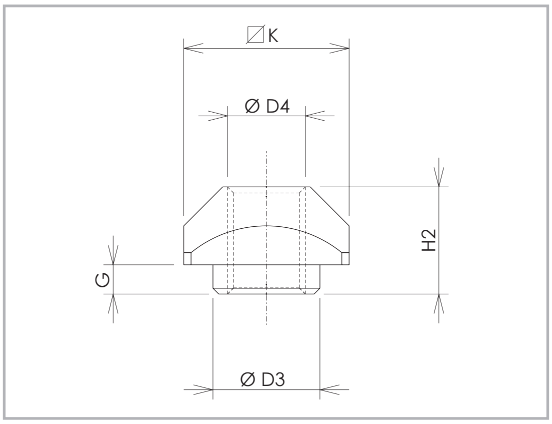


Fig. 11

Dimensions (mm)

Unit	D3	D4	G	H2	K	Code
ONE 50	-	M4	-	3.4	8	1001046
ONE 65	6.7	M5	2.3	6.5	10	1000627
ONE 80	8	M6	3.3	8.3	13	1000043
ONE 110	11	M8	2.8	10.8	17	1000932

Tab. 23

T-nuts
Steel nuts to be used in the slots of the body.

Proximity

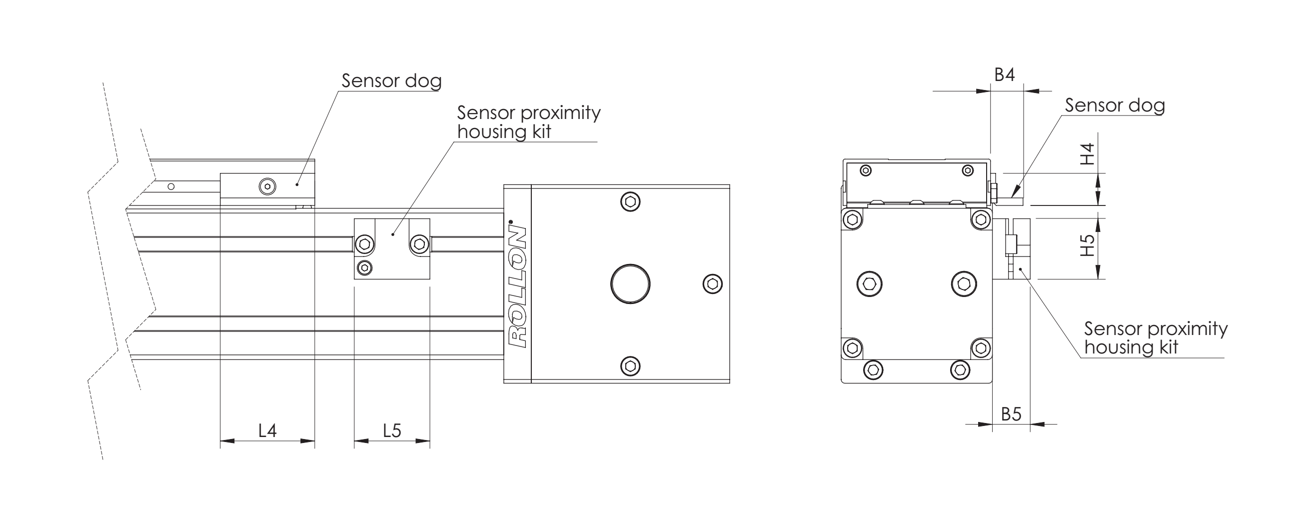


Fig. 12

Sensor proximity housing kit

Red anodized aluminum sensor holder, equipped with T-nuts for fixing onto the profile.

Sensor dog

L-shaped bracket in zinc-plated iron, mounted on the carriage and used for proximity switch operations.

Dimensions (mm)

Unit	B4	B5	L4	L5	H4	H5	For proximity	Sensor dog code	Sensor proximity housing kit code
ONE 50	9.5	14	25	29	11.9	22.5	Ø 8	G000268	G000211
ONE 65	17.2	20	50	40	17	32	Ø 12	G000267	G000212
ONE 80	17.2	20	50	40	17	32	Ø 12	G000267	G000209
ONE 110	17.2	20	50	40	17	32	Ø 12	G000267	G000210

Tab. 24

Ordering key

Identification codes for the ONE linear unit

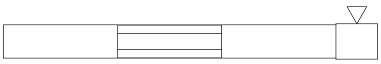
N	08	VA	02000	3B
	05=50 06=65 08=80 10=100			

3B	SP stainless steel	*see pg. CRS-3*
02000	L= total length of the unit	
VA	Driving head code	*see pg. CRS-9*
08	Linear unit size	*see from pg. CRS-5 to pg. CRS-8*
N	ONE Series	*see pg. CRS-2*

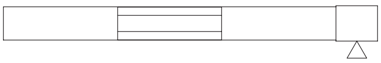
In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Configure Actuator

Left / right orientation



Right



Left

Notes

BY TIMKEN

Smart System

NEW

E-SMART series

E-SMART series description

Fig. 1

E-SMART

The E-SMART series linear units are available in four sizes: 30 - 50 - 80 - 100 mm. They have a self-supporting structure with a robust profile of extruded and anodized aluminum. The thrust force is transmitted by a steel reinforced, polyurethane belt. The moving carriage is guided and supported by a recirculating ball guide system featuring one or more blocks.

The components

Extruded bodies

The anodized aluminum extrusions used for the bodies of the E-SMART series linear units are designed and manufactured by industry experts to optimize weight while maintaining mechanical strength. (see physical-chemical characteristics below).The dimensional tolerances comply with EN 755-9 standard.

Optimization of the maximum belt width/body dimension ratio enables the following performance characteristics to be achieved:

- **High speed**
- **Low noise**
- **Low wear**

Driving belt

The Rollon SMART series linear units use steel reinforced polyurethane drive belts with AT pitch. This type of belt is ideal due to its high load transmission characteristics, compact size, and low noise. Used in conjunction with a backlash-free pulley, smooth alternating motion can be achieved.

Carriage

The carriage of the E-SMART series linear units is made of machined anodized aluminum. The dimensions vary depending on the type. Rollon offers multiple carriages to accomodate a vast array of applications.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 1

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.7	70	23.8	200	880-900	33	600-655

Tab. 2

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
250	200	10	75

Tab. 3

SS

The linear motion system

The linear motion system has been designed to meet the load capacity, speed, and maximum acceleration conditions of a wide variety of applications.

Performance characteristics:

- The ball bearing guides with high load capacity are mounted in a dedicated seat on the aluminum body.
- The carriage of the linear unit is assembled on preloaded ball bearing blocks that enables the carriage to withstand loading in the four main directions.
- The ball bearing carriages of the SP versions are also fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment.
- The blocks have seals on both sides and, when necessary, an additional scraper can be fitted for very dusty conditions.

The linear motion system described above offers:

- High speed and acceleration
- High load capacity
- High permissible bending moments
- Low friction
- Long life
- Low noise

The driving heads

The couple of symmetrical heads is designed to allow the highest freedom while sizing the application and mounting the gearbox on the E-SMART series linear actuators. Therefore, it is possible to assembly the gearbox on both the heads, either on the right or the left side, by means of a standard assembly kit. This feature is also useful when the unit is assembled to be part of a multiaxis system.

The assembly kit includes: shrink disk; adapter plate and fixing hardware; and can be ordered with the actuator. Different kits are available to accomodate gearboxes from the major brands on the market. For more information see pag. SS-15.

The same logic is valid when mounting the shaft to connect two units in parallel.

E-SMART section

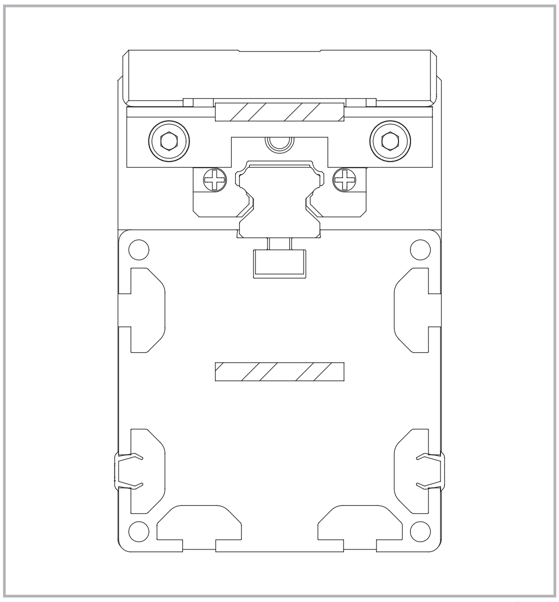
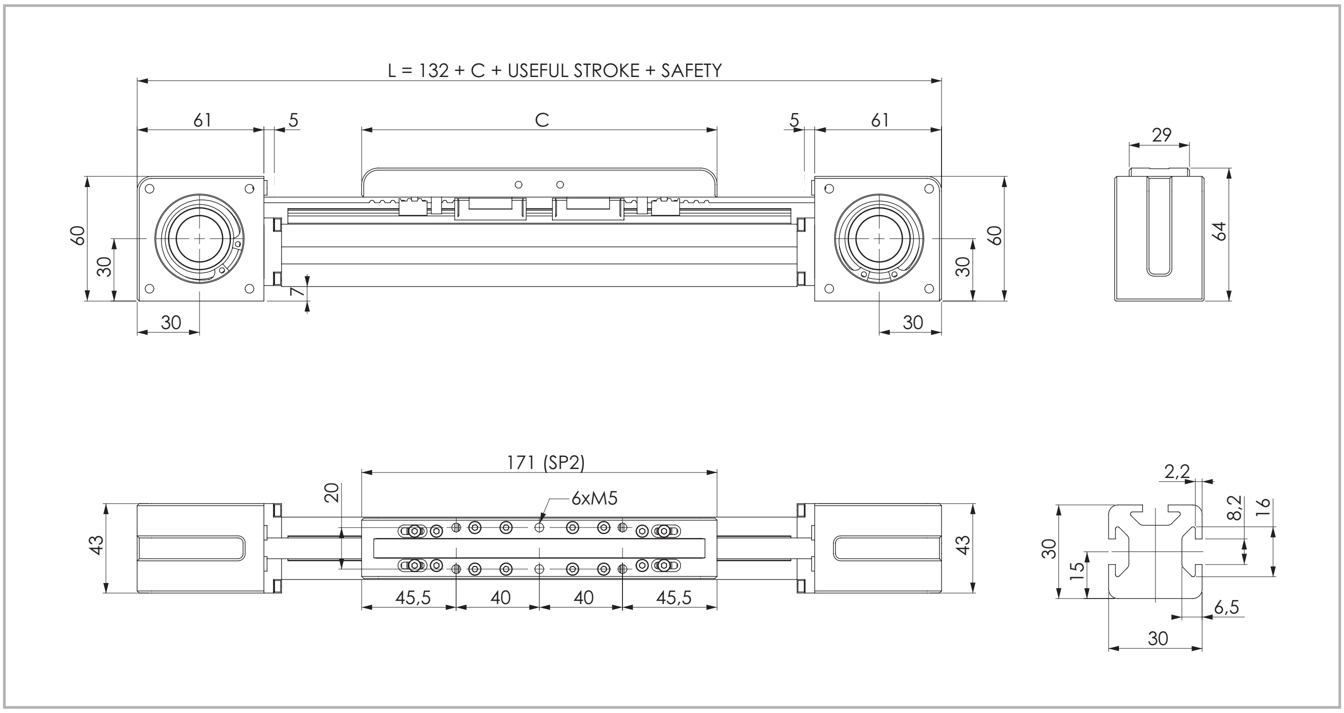


Fig. 2

E-SMART 30 SP2

E-SMART 30 Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 3

Technical data

	Type E-SMART 30 SP2
Max. useful stroke length [mm]	3700
Max. positioning repeatability [mm]*1	± 0.05
Max. speed [m/s]	4.0
Max. acceleration [m/s²]	50
Type of belt	10 AT 5
Type of pulley	Z 24
Pulley pitch diameter [mm]	38.2
Carriage displacement per pulley turn [mm]	120
Carriage weight [kg]	0.28
Zero travel weight [kg]	1.83
Weight for 100 mm useful stroke [kg]	0.16
Starting torque [Nm]	0.15
Moment of inertia of pulleys [g · mm²]	57.630
Rail size [mm]	12 mini

*1) Positioning repeatability is dependent on the type of transmission used.

Tab. 4

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
E-SMART 30 SP2	0.003	0.003	0.007

Tab. 5

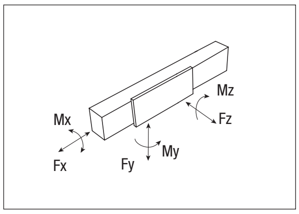
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
E-SMART 30 SP2	10 AT 5	10	0.033

Tab. 6

Belt length (mm) = 2 x L - 100 (SP2)



Load capacity

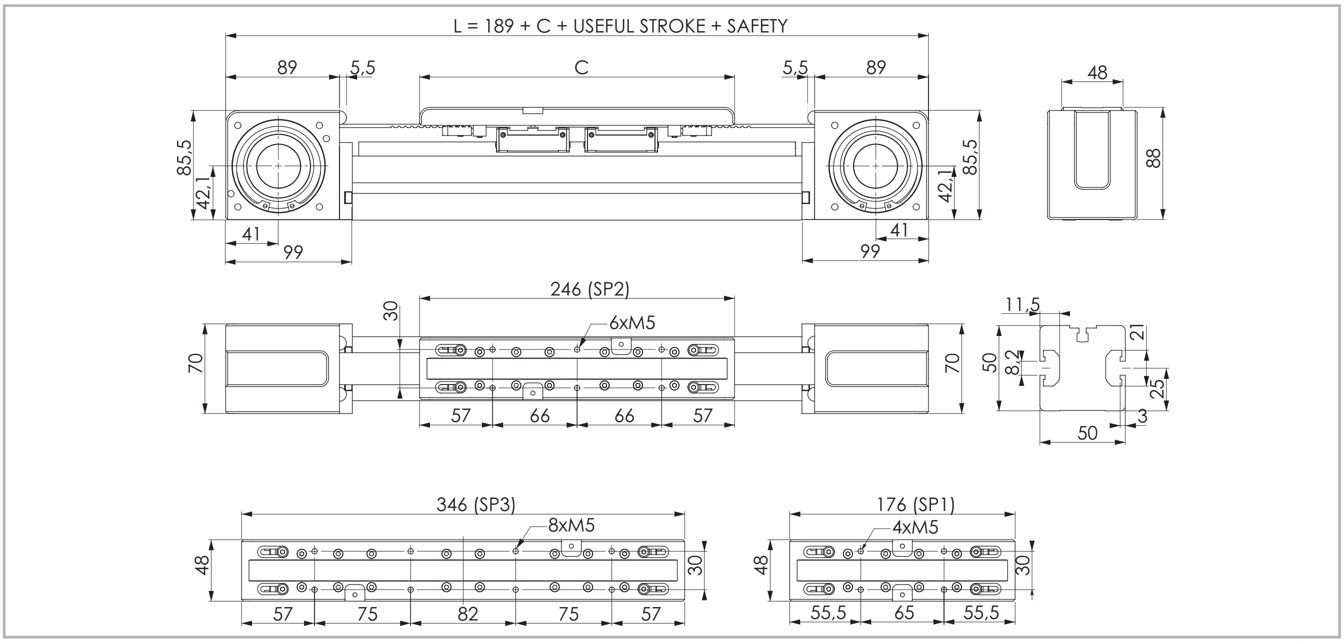
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
E-SMART 30 SP2	385	242	7060	6350	7060	46.2	166	166

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 7

E-SMART 50 SP1 - SP2 - SP3

E-SMART 50 Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 4

Technical data

	Type		
	E-SMART 50 SP1	E-SMART 50 SP2	E-SMART 50 SP3
Max. useful stroke length [mm]*1	6145	6075	5975
Max. positioning repeatability [mm]*2	± 0.05	± 0.05	± 0.05
Max. speed [m/s]	4.0	4.0	4.0
Max. acceleration [m/s²]	50	50	50
Type of belt	25 AT 5	25 AT 5	25 AT 5
Type of pulley	Z 40	Z 40	Z 40
Pulley pitch diameter [mm]	63.66	63.66	63.66
Carriage displacement per pulley turn [mm]	200	200	200
Carriage weight [kg]	0.54	0.85	1.21
Zero travel weight [kg]	4.89	5.4	6.16
Weight for 100 mm useful stroke [kg]	0.34	0.34	0.34
Starting torque [Nm]	0.35	0.35	0.55
Moment of inertia of pulleys [g · mm²]	891.270	891.270	891.270
Rail size [mm]	15	15	15

*1) It is possible to obtain stroke up to 11.270 (SP1), 11.200 (SP2), 11.100 (SP3) by means of special Rollon joints.
*2) Positioning repeatability is dependent on the type of transmission used.

Tab. 8

Moments of inertia of the aluminum body

Type	I_x [10^7 mm⁴]	I_y [10^7 mm⁴]	I_p [10^7 mm⁴]
E-SMART 50 SP	0.021	0.020	0.041

Tab. 9

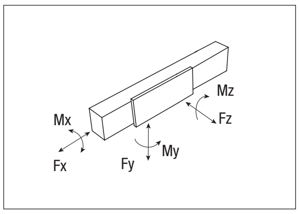
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
E-SMART 50 SP	25 AT 5	25	0.080

Tab. 10

Belt length (mm) = 2 x L - 60 (SP1)
2 x L - 125 (SP2)
2 x L - 225 (SP3)



Load capacity

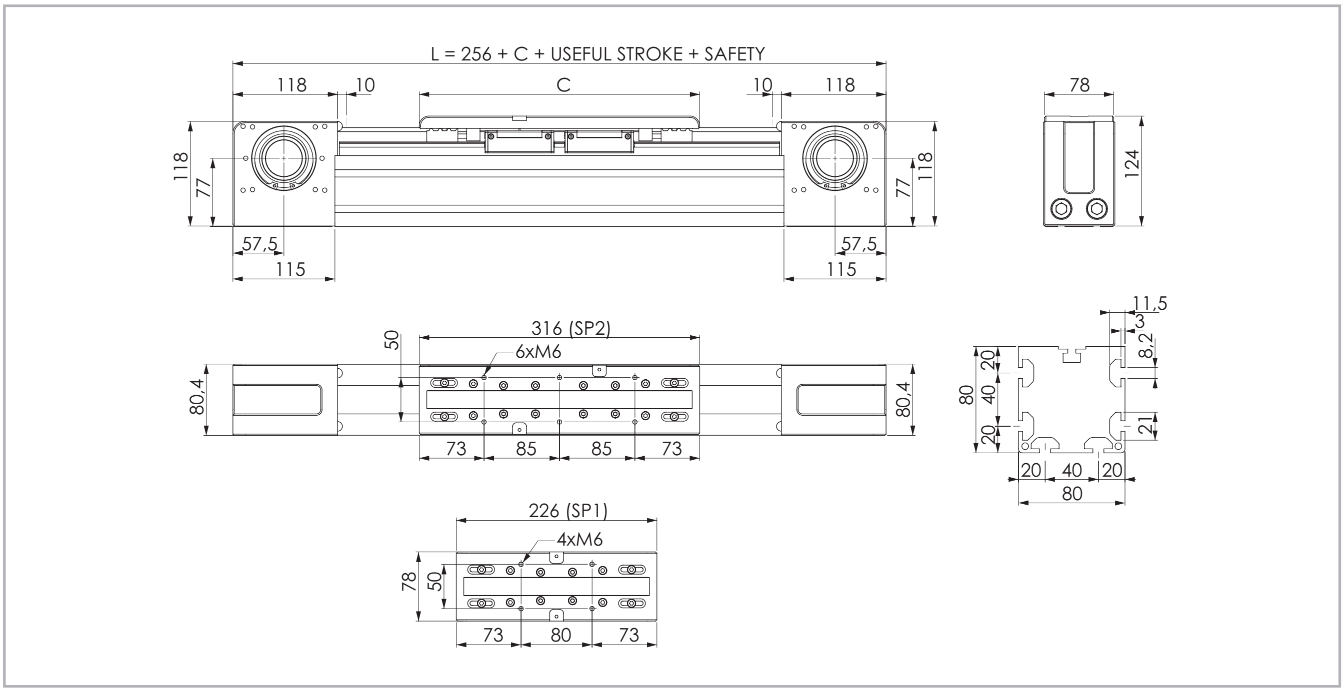
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
E-SMART 50 SP1	1050	750	15280	9945	15280	120	90	90
E-SMART 50 SP2	1050	750	30560	19890	30560	240	1054	1054
E-SMART 50 SP3	1050	750	45840	29835	45840	360	2582	2582

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 11

E-SMART 80 SP1 - SP2

E-SMART 80 Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 5

Technical data

	Type	
	E-SMART 80 SP1	E-SMART 80 SP2
Max. useful stroke length [mm]*1	6060	5970
Max. positioning repeatability [mm]*2	± 0.05	± 0.05
Max. speed [m/s]	4.0	4.0
Max. acceleration [m/s²]	50	50
Type of belt	32 AT 10	32 AT 10
Type of pulley	Z 21	Z 21
Pulley pitch diameter [mm]	66,84	66,84
Carriage displacement per pulley turn [mm]	210	210
Carriage weight [kg]	1.34	1.97
Zero travel weight [kg]	9.94	11.31
Weight for 100 mm useful stroke [kg]	0.76	0.76
Starting torque [Nm]	0.95	1.3
Moment of inertia of pulleys [g · mm²]	938.860	938.860
Rail size [mm]	20	20

*1) It is possible to obtain stroke up to 11.190 (SP1), 11.100 (SP2) by means of special Rollon joints.
*2) Positioning repeatability is dependent on the type of transmission used.

Tab. 12

Moments of inertia of the aluminum body

Type	I_x [10^7 mm⁴]	I_y [10^7 mm⁴]	I_p [10^7 mm⁴]
E-SMART 80 SP	0.143	0.137	0.280

Tab. 13

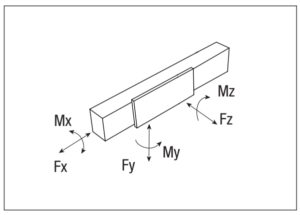
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
E-SMART 80 SP	32 AT 10	32	0.186

Tab. 14

Belt length (mm) = 2 x L - 135 (SP1)
2 x L - 225 (SP2)



Load capacity

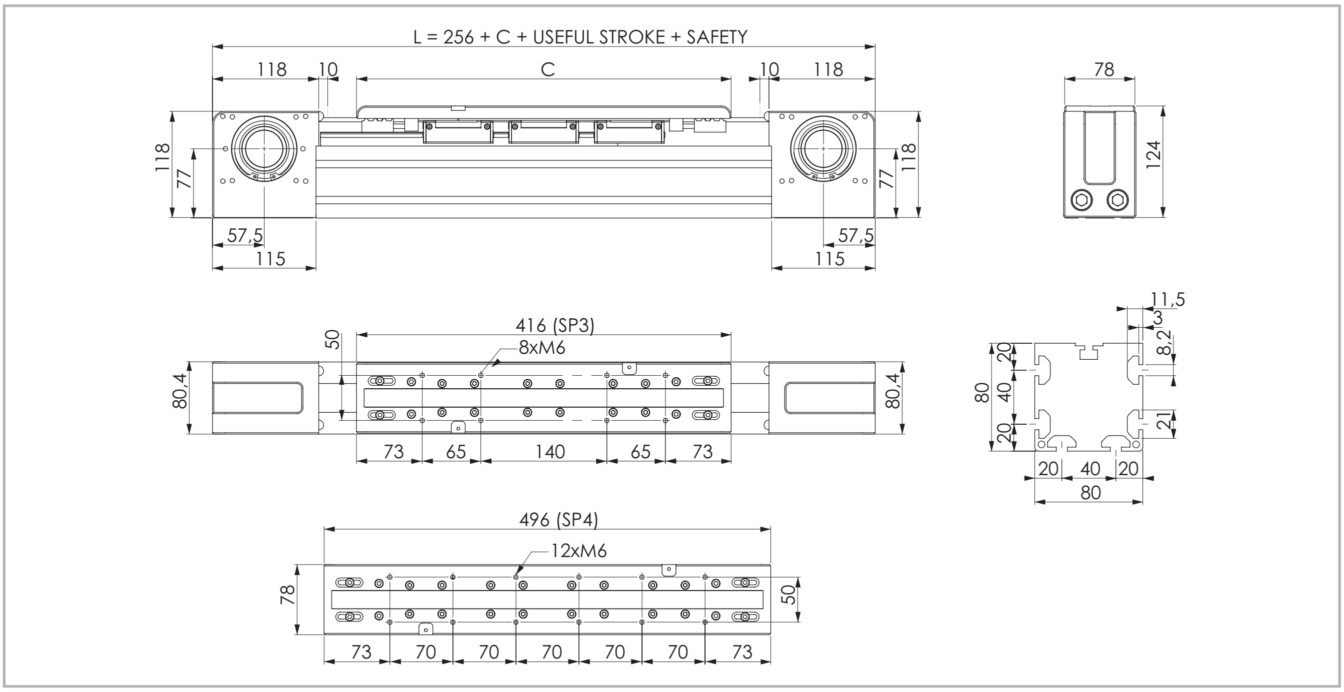
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
E-SMART 80 SP1	2523	1672	25630	18318	25630	260	190	190
E-SMART 80 SP2	2523	1672	51260	36637	51260	520	1874	1874

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 15

E-SMART 80 SP3 - SP4

E-SMART 80 Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 6

Technical data

	Type	
	E-SMART 80 SP3	E-SMART 80 SP4
Max. useful stroke length [mm]*1	5870	5790
Max. positioning repeatability [mm]*2	± 0.05	± 0.05
Max. speed [m/s]	4.0	4.0
Max. acceleration [m/s²]	50	50
Type of belt	32 AT 10	32 AT 10
Type of pulley	Z 21	Z 21
Pulley pitch diameter [mm]	66,84	66,84
Carriage displacement per pulley turn [mm]	210	210
Carriage weight [kg]	2.63	3.23
Zero travel weight [kg]	12.83	14.06
Weight for 100 mm useful stroke [kg]	0.76	0.76
Starting torque [Nm]	1.4	1.52
Moment of inertia of pulleys [g · mm²]	938.860	938.860
Rail size [mm]	20	20

*1) It is possible to obtain stroke up to 11.000 (SP3), 10.920 (SP4) by means of special Rollon joints.
*2) Positioning repeatability is dependent on the type of transmission used.

Tab. 16

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
E-SMART 80 SP	0.143	0.137	0.280

Tab. 17

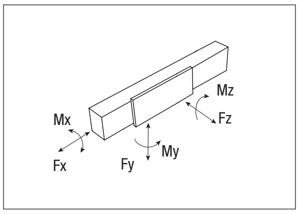
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
E-SMART 80 SP	32 AT 10	32	0.186

Tab. 18

Belt length (mm) = 2 x L - 325 (SP3)
2 x L - 405 (SP4)



Load capacity

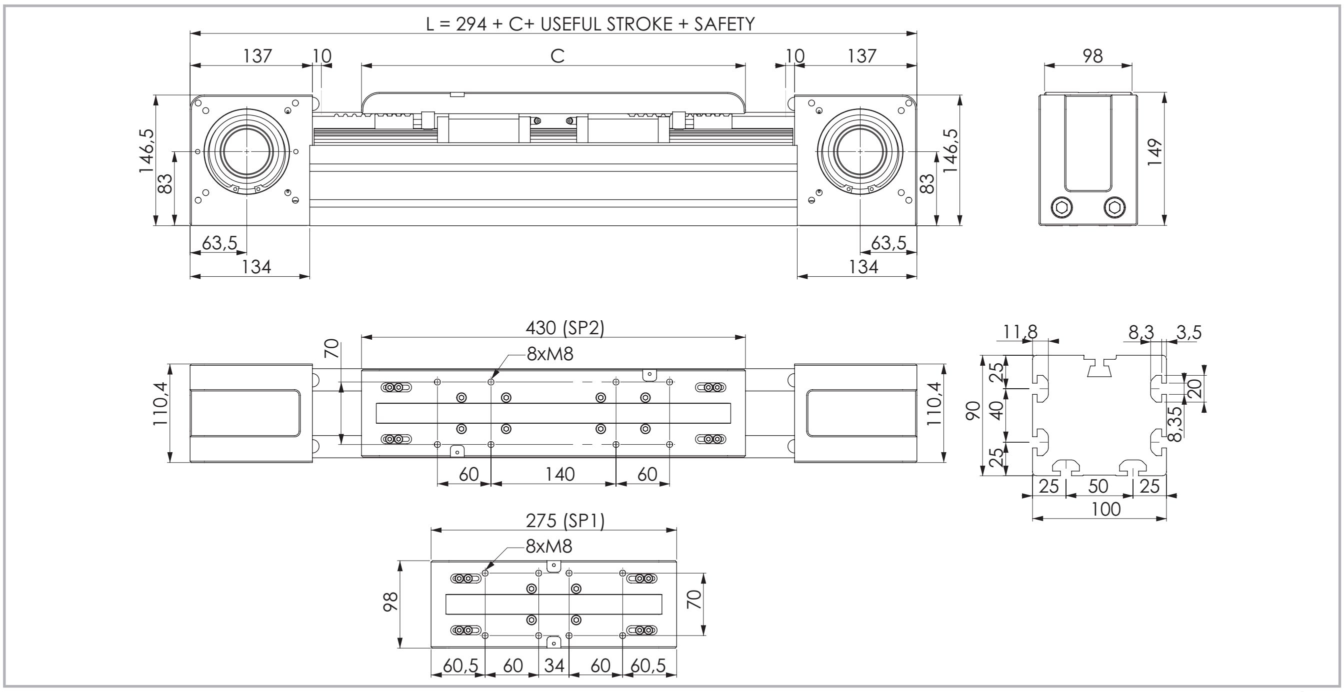
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
E-SMART 80 SP3	2523	1672	76890	54956	76890	780	4870	4870
E-SMART 80 SP4	2523	1672	102520	73274	102520	1040	6920	6920

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 19

E-SMART 100 SP1 - SP2

E-SMART 100 Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 7

Technical data

	Type	
	E-SMART 100 SP1	E-SMART 100 SP2
Max. useful stroke length [mm]*1	6025	5870
Max. positioning repeatability [mm]*2	± 0.05	± 0.05
Max. speed [m/s]	4.0	4.0
Max. acceleration [m/s²]	50	50
Type of belt	50 AT 10	50 AT 10
Type of pulley	Z 27	Z 27
Pulley pitch diameter [mm]	85.94	85.94
Carriage displacement per pulley turn [mm]	270	270
Carriage weight [kg]	2.72	4.42
Zero travel weight [kg]	18.86	22.38
Weight for 100 mm useful stroke [kg]	1.3	1.3
Starting torque [Nm]	2.1	2.4
Moment of inertia of pulleys [g · mm²]	4.035.390	4.035.390
Rail size [mm]	25	25

*1) It is possible to obtain stroke up to 11.155 (SP1), 11.000 (SP2) by means of special Rollon joints.
*2) Positioning repeatability is dependent on the type of transmission used.

Tab. 20

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
E-SMART 100 SP	0.247	0.316	0.536

Tab. 21

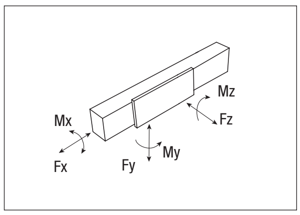
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
E-SMART 100 SP	50 AT 10	50	0.290

Tab. 22

Belt length (mm) = 2 x L - 120 (SP1)
2 x L - 275 (SP2)



Load capacity

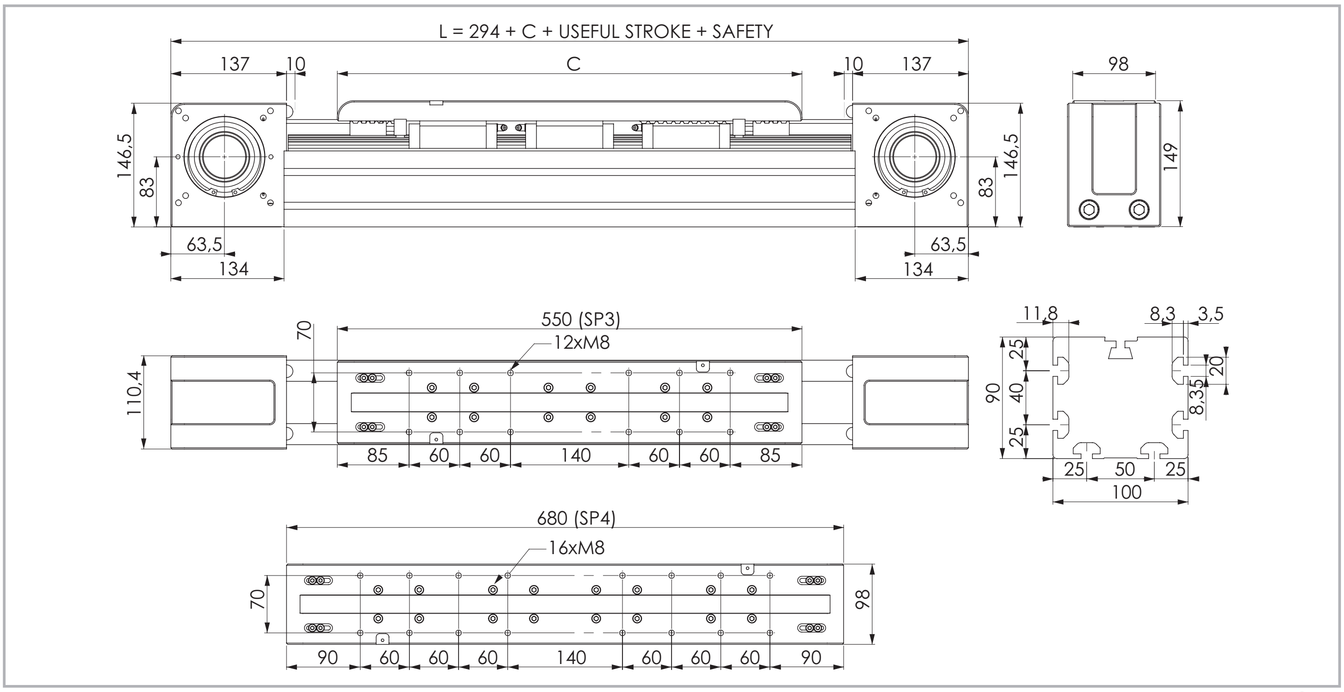
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
E-SMART 100 SP1	4980	3390	43620	31192	43620	500	450	450
E-SMART 100 SP2	4980	3390	87240	62385	87240	1000	6805	6805

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 23

E-SMART 100 SP3 - SP4

E-SMART 100 Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 8

Technical data

	Type	
	E-SMART 100 SP3	E-SMART 100 SP4
Max. useful stroke length [mm]*1	5750	5620
Max. positioning repeatability [mm]*2	± 0.05	± 0.05
Max. speed [m/s]	4.0	4.0
Max. acceleration [m/s²]	50	50
Type of belt	50 AT 10	50 AT 10
Type of pulley	Z 27	Z 27
Pulley pitch diameter [mm]	85.94	85.94
Carriage displacement per pulley turn [mm]	270	270
Carriage weight [kg]	5.85	7.34
Zero travel weight [kg]	25.22	28.25
Weight for 100 mm useful stroke [kg]	1.3	1.3
Starting torque [Nm]	2.6	2.8
Moment of inertia of pulleys [g · mm²]	4.035.390	4.035.390
Rail size [mm]	25	25

*1) It is possible to obtain stroke up to 10.880 (SP3), 10.750 (SP4) by means of special Rollon joints.
*2) Positioning repeatability is dependent on the type of transmission used.

Tab. 24

Moments of inertia of the aluminum body

Type	I_x [10^7 mm⁴]	I_y [10^7 mm⁴]	I_p [10^7 mm⁴]
E-SMART 100 SP	0.247	0.316	0.536

Tab. 25

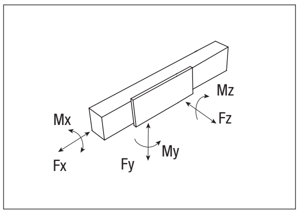
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
E-SMART 100 SP	50 AT 10	50	0.290

Tab. 26

Belt length (mm) = 2 x L - 395 (SP3)
2 x L - 252 (SP4)



Load capacity

Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
E-SMART 100 SP3	4980	3390	130860	93577	130860	1500	12039	12039
E-SMART 100 SP4	4980	3390	174480	124770	174480	2000	17710	17710

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 27

Lubrication

SP linear units with ball bearing guides

The ball bearing carriages of the SP versions are fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment of these in the circuits.
This system guarantees a long interval between maintenances: SP version: every 2000 km or 1 year of use, based on the value reached first. If a longer service life is required or in case of high dynamic or high loaded applications please contact our offices for further verification.

E-SMART

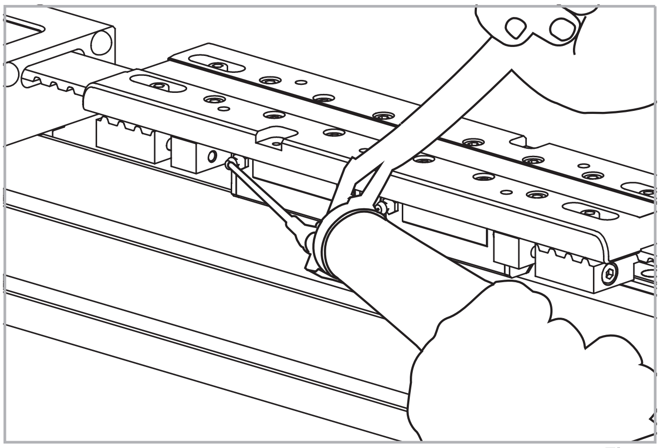


Fig. 9

Quantity of lubricant necessary for re-lubrication of each block:

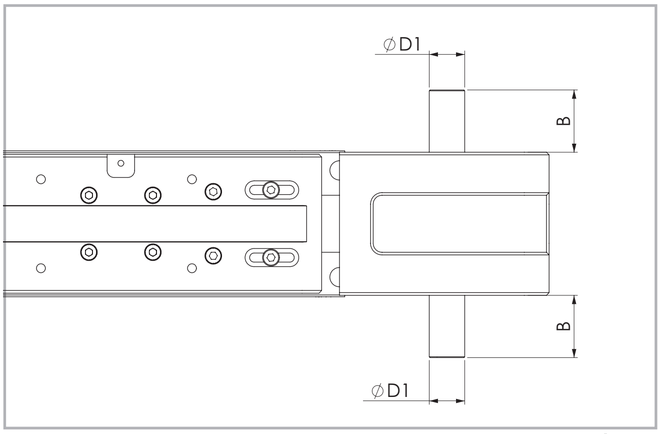
Type	Unit [cm^3]
E-SMART 30	0.5
E-SMART 50	0.2
E-SMART 80	0.5
E-SMART 100	0.6

Tab. 28

- Insert the tip of the grease gun into the specific grease blocks.
- Type of lubricant: Lithium soap grease of class NLGI 2.
- For specially stressed applications or hostile environmental conditions, lubrication should be applied out more frequently.
  Contact Rollon for further advice

Simple shafts

AS type simple shafts



Position of the simple shaft can be to the right or to the left of the drive head.

Fig. 10

This head configuration is obtained by utilizing an assembly kit delivered as a separate accessory item.

Shaft can be installed on the left or right side of the drive head as decided by the customer.

Units (mm)

Applicable to unit	Shaft type	B	D1	AS assembly kit code
E-SMART 30	AS 12	25	12h7	G000348
E-SMART 50	AS 15	35	15h7	G000851
E-SMART 80	AS 20	36.5	20h7	G000828
E-SMART 100	AS 25	50	25h7	G000649

Tab. 29

Hollow shaft

Hollow shaft type FP - Standard supply

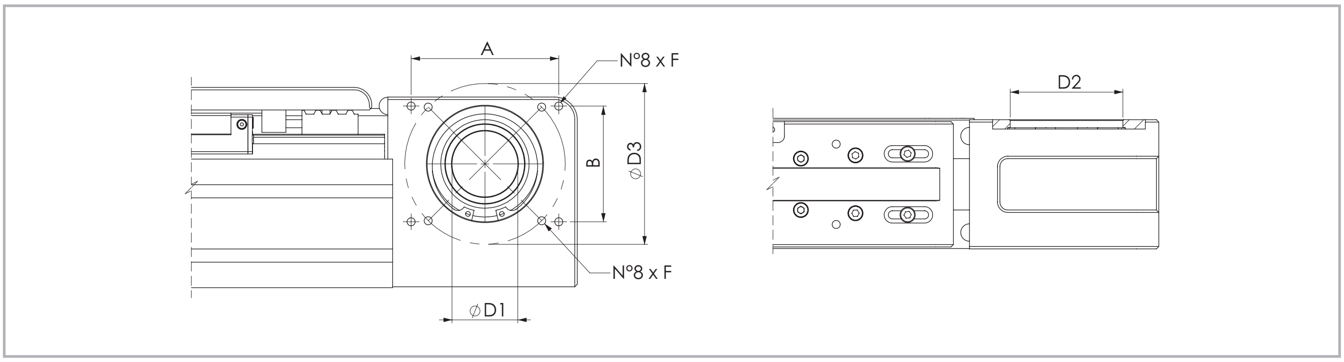


Fig. 11

Units (mm)

Applicable to unit	Shaft type	D1	D2	D3	F	A x B	Drive head code
E-SMART 30	FP 22	22H7	42	68	M5	-	2R
E-SMART 50	FP 34	34H7	72	90	M6	-	2R
E-SMART 80	FP 41	41H7	72	100	M6	92x72	2R
E-SMART 100	FP 50	50H7	95	130	M8	109x109	2R

Tab. 30

An (optional) connection flange is required to fit the standard reduction units selected by Rollon.

For further information contact our offices.

Linear units in parallel

Synchronization kit for use of SMART linear units in parallel

When movement consisting of two linear units in parallel is essential, a synchronization kit must be used. This consists of original Rollon lamina type precision joints complete with tapered splines and hollow aluminum drive shafts.

Moment of inertia [g·mm²] C1 + C2 · (X-Y)

	C1	C2	Weight [Kg] D1+D2 · (X-Y)	
	[g·mm²]	[g·mm²]	D1 [Kg]	D2 [Kg mm]
GK12P	61.456	69	0.308	0.00056
GK15P	906.928	464	2.28	0.00148
GK20P	1.014.968	464	2.48	0.00148
GK25P	5.525.250	4.708	6.24	0.0051

Tab. 31

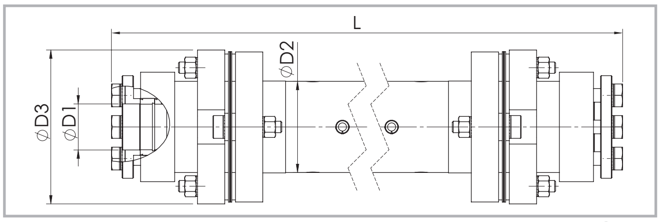


Fig. 12

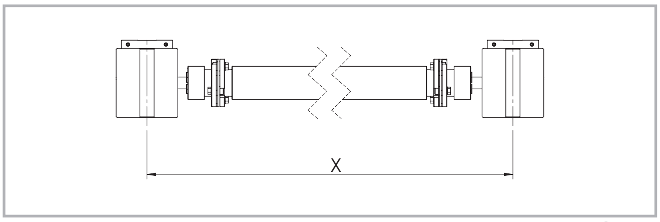


Fig. 13

Dimensions (mm)

Applicable to unit	Shaft type	D1	D2	D3	Y [mm]	Code	Formula for length calculation
E-SMART 30	**AP 12**	12	25	45	166	GK12P...1A	L= X-51 [mm]
E-SMART 50	**AP 15**	15	40	69.5	210	GK15P...1A	L= X-79 [mm]
E-SMART 80	**AP 20**	20	40	69.5	250	GK20P...1A	L= X-97 [mm]
E-SMART 100	**AP 25**	25	70	99	356	GK25P...1A	L= X-145 [mm]

Tab. 32

Accessories

Fixing by brackets

The ball bearing guide linear drive system of Rollon SMART System series linear units enables them to support loads in any direction.

They can therefore be installed in any position.

To install the SMART System series units, we recommend use of one of the systems indicated below:

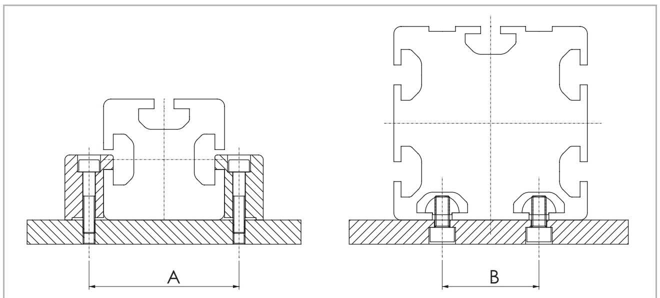


Fig. 14

Dimensions (mm)

	A	B
E-SMART 30	42	-
E-SMART 50	62	-
E-SMART 80	92	40
E-SMART 100	120	50

Tab. 33

SS

Fixing brackets

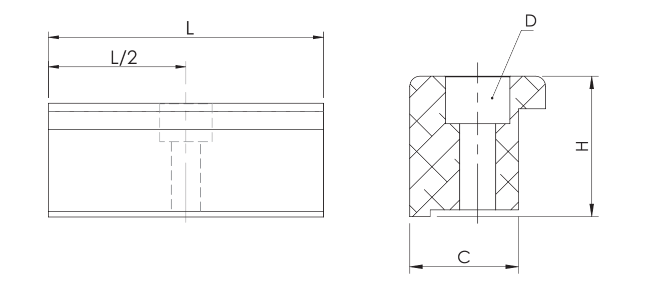
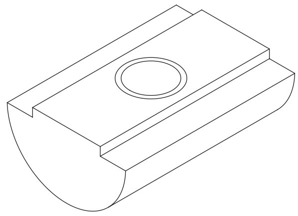


Fig. 15

T-nuts



Steel nuts to be used in the slots of the body.

Fig. 16

Dimensions (mm)

	C	H	L	D	Cod. Rollon
E-SMART 30	16	17.5	50	M5	1001490
E-SMART 50	16	26.9	50	M5	1000097
E-SMART 80	16	20.7	50	M5	1000111
E-SMART 100	31	28.5	100	M10	1002377

Tab. 34

Units (mm)

	Hole	Length	Cod. Rollon
E-SMART 30	M5	20	6000436
E-SMART 50	M6	20	6000437
E-SMART 80	M6	20	6000437
E-SMART 100	M6	20	6000437

Tab. 35

Proximity

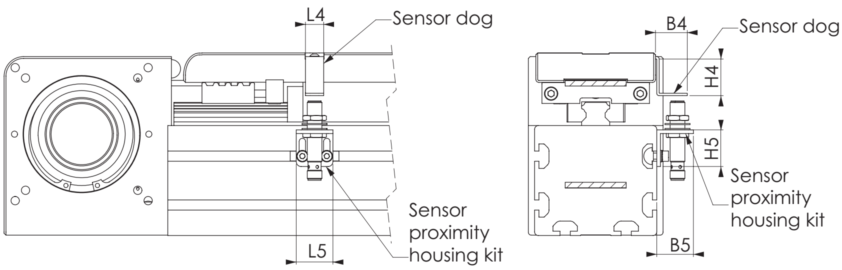


Fig. 17

Sensor proximity housing kit

Aluminum block equipped with T-nuts for fixing

Sensor dog

Iron plate mounted on the carriage used for the proximity operation

Units (mm)

	B4	B5	L4	L5	H4	H5	For proximity	Sensor dog code	Sensor proximity kit code
E-SMART 30	30	30	30	30	15	30	Ø 8	G000847	G000901
E-SMART 50	26	30	15	30	32	30	Ø 8	G000833	G000838
E-SMART 80	26	30	15	30	32	30	Ø 8	G000833	G000838
E-SMART 100	26	30	15	30	32	30	Ø 8	G000833	G000838

Tab. 36

Adapter flange for gearbox assembly

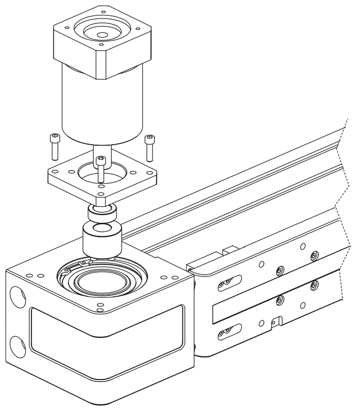


Fig. 18

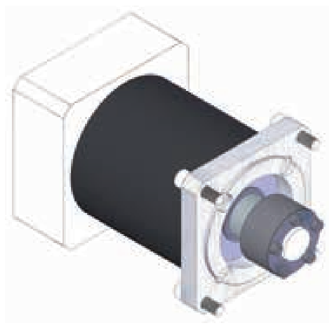


Fig. 19

Assembly kit includes: shrink disk; adapter plate; fixing hardware

Unit type	Gearbox type (not included)	Kit Code
E-SMART 30	MP053	G000356
	LC050; NP005S; PE2	G000357
	SW030	G000383
E-SMART 50	MP060; PLE60	G000852
	LC070; MPV00; NP015S; PE3	G000853
	SW040	G000854
E-SMART 80	P3	G000824
	MP080	G000826
	LC090; MPV01; NP025S; PE4	G000827
	MP105	G000830
	PE3; NP015S; LC070	G001078
	SP075; PLN090	G000859
	SP060; PLN070	G000829
	SW040	G000866
	SW050	G000895
E-SMART 100	MP130	G000482
	LC120; MPV02; NP035S; PE5	G000483
	LC090; PE4; NP025S	G000525
	MP105	G000527
	SW050	G000717

Tab. 37

For other gearbox type ask Rollon

SS

Ordering key

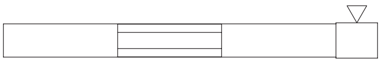
Identification codes for the E-SMART linear unit

L	10	2R	02000	2R
	03 = 30 05 = 50 08 = 80 10 = 100			Type (30) 2R=SP2 Type (50-80) 1R=SP1 - 2R=SP2 - 3R=SP3 - 4R=SP4 Type (100) 1R=SP1 - 2R=SP2 - 3R=SP3 - 4R=SP4
			L=total length of the unit	
		Drive head code *see pg. SS-12*		
	Linear unit type *see from pg. SS-5 to pg. SS-10*			
Linear unit series E-SMART *see pg. SS-2*				

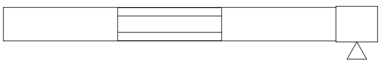
In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Configure Actuator

Left / right orientation



Right



Left

R-SMART series

R-SMART series description

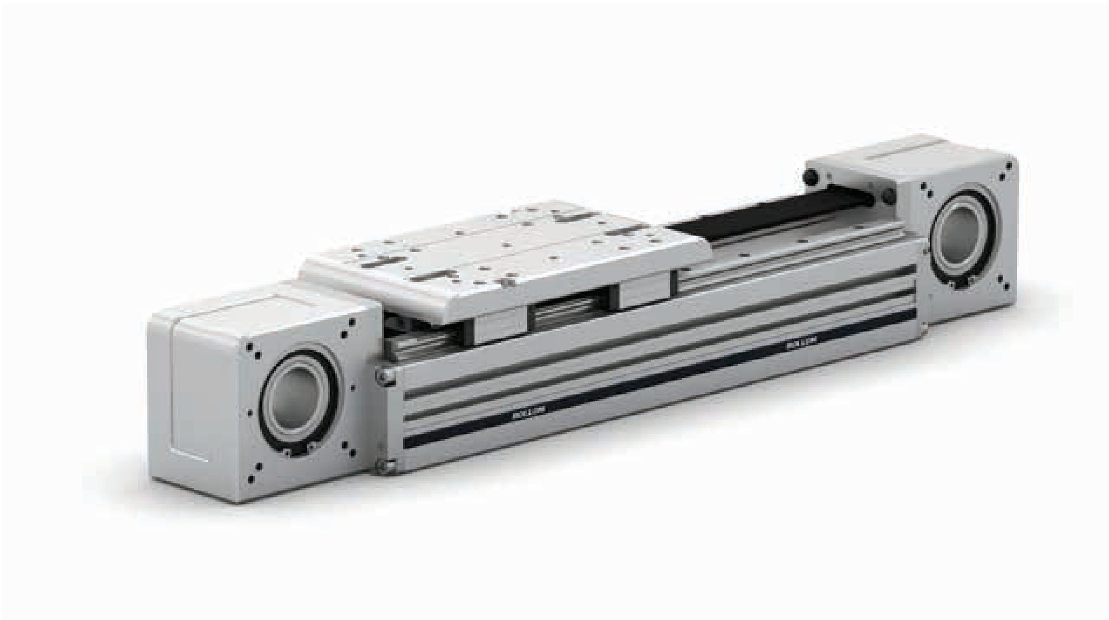


Fig. 20

R-SMART

The R-SMART series linear units are particularly suitable for: heavy loads, pulling and pushing very heavy weights, demanding work cycles, possible cantilever or gantry mounting, and operation in industrial automated lines.

The extruded and anodized aluminum self-supporting structure with a rectangular section is available in three sizes ranging from 120 to 220 mm. Transmission is achieved with a polyurethane steel reinforced driving belt. Also featured is a dual rail system with four or more recirculating ball bearing runner blocks. Multiple sliders are available to further improve load capacity.

These units are best used in applications requiring very heavy loads in extremely confined spaces, and where machines cannot be stopped to carry out ordinary system maintenance.

The components

Extruded bodies

The anodized aluminum extrusions used for the bodies of the R-SMART series linear units are designed and manufactured by industry experts to optimize weight while maintaining mechanical strength. (see physical-chemical characteristics below).The dimensional tolerances comply with EN 755-9 standard.

Optimization of the maximum belt width/body dimension ratio enables the following performance characteristics to be achieved:

- **High speed**
- **Low noise**
- **Low wear**

Driving belt

The Rollon SMART series linear units use steel reinforced polyurethane drive belts with AT pitch. This belt is ideal due to its high load transmission characteristics, compact size, and low noise. Used in conjunction with a backlash-free pulley, smooth alternating motion can be achieved.

Carriage

The carriage of the Rollon SMART series linear units is made entirely of machined anodized aluminum. The dimensions vary depending on the type. Rollon offers multiple carriages to accomodate a vast array of applications.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 38

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m . K}$	$\frac{J}{kg . K}$	$\Omega . m . 10^{-9}$	°C
2.7	70	23.8	200	880-900	33	600-655

Tab. 39

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
250	200	10	75

Tab. 40

The linear motion system

The linear motion system has been designed to meet the load capacity, speed, and maximum acceleration conditions of a wide variety of applications. Rollon SMART series systems feature a linear motion system with ball bearing guides:

Performance characteristics:

- The ball bearing guides with high load capacity are mounted in a dedicated seat on the aluminum body.
- The carriage of the linear unit is assembled on preloaded ball bearing blocks that enables the carriage to withstand loading in the four main directions.
- The ball bearing carriages of the SP versions are also fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment.
- The blocks have seals on both sides and, when necessary, an additional scraper can be fitted for very dusty conditions.

The linear motion system described above offers:

- High speed and acceleration
- High load capacity
- High permissible bending moments
- Low friction
- Long life
- Low noise

R-SMART section

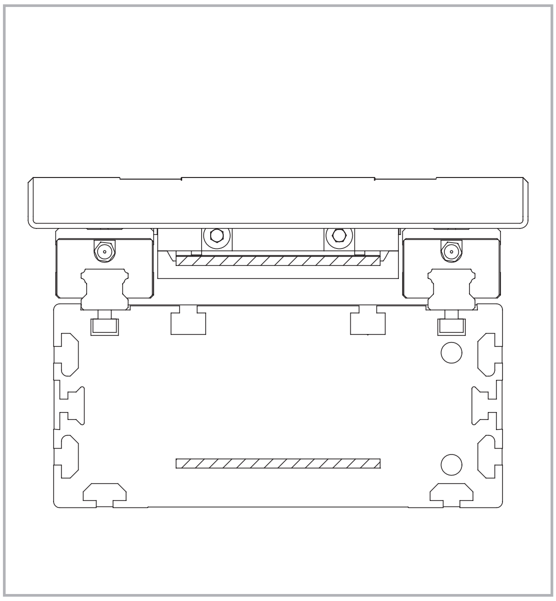


Fig. 21

The driving heads

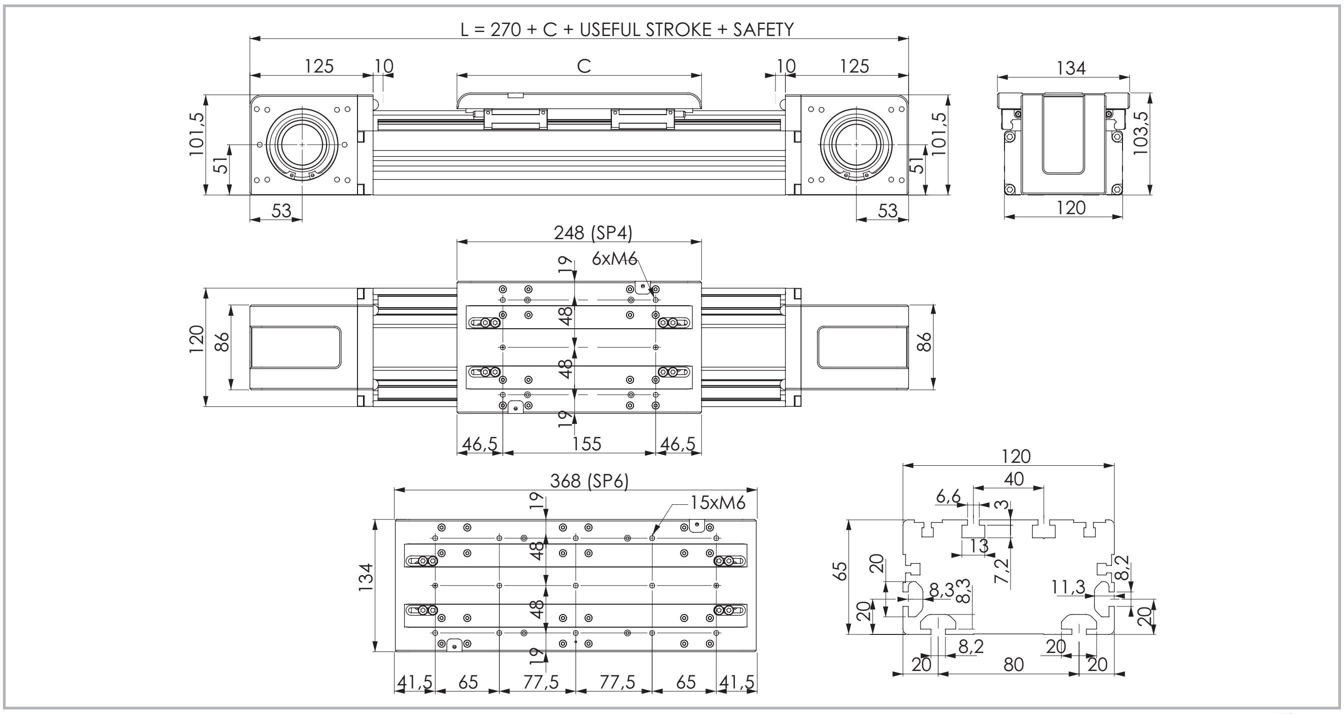
The couple of symmetrical heads is designed to allow the highest freedom while sizing the application and mounting the gearbox on the R-SMART series linear actuators. Therefore, it is possible to assembly the gearbox on both the heads, either on the right or the left side, by means of a standard assembly kit. This feature is also useful when the unit is assembled to be part of a multiaxis system.

The assembly kit includes: shrink disk; adapter plate and fixing hardware; and can be ordered with the actuator. Different kits are available to accomodate gearboxes from the major brands on the market. For more information see pag. SS-28.

The same logic is valid when mounting the shaft to connect two units in parallel.

R-SMART 120 SP4 - SP6

R-SMART 120 Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 22

Technical data

	Type	
	R-SMART 120 SP4	R-SMART 120 SP6
Max. useful stroke length [mm]*1	6050	5930
Max. positioning repeatability [mm]*2	± 0.05	± 0.05
Max. speed [m/s]	4.0	4.0
Max. acceleration [m/s²]	50	50
Type of belt	40 AT 10	40 AT 10
Type of pulley	Z 21	Z 21
Pulley pitch diameter [mm]	66.84	66.84
Carriage displacement per pulley turn [mm]	210	210
Carriage weight [kg]	3	4
Zero travel weight [kg]	12.9	15
Weight for 100 mm useful stroke [kg]	0.9	0.9
Starting torque [Nm]	1.95	2.3
Moment of inertia of pulleys [g · mm²]	1.054.300	1.054.300
Rail size [mm]	15	15

*1) It is possible to obtain stroke up to 11.200 (SP4), 11.080 (SP6) by means of special Rollon joints.
*2) Positioning repeatability is dependent on the type of transmission used.

Tab. 41

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
R-SMART 120 SP	0.108	0.367	0.475

Tab. 42

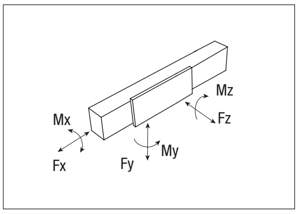
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
R-SMART 120 SP	40 AT 10	40	0.23

Tab. 43

Belt length (mm) = 2 x L - 115 (SP4)
2 x L - 235 (SP6)



Load capacity

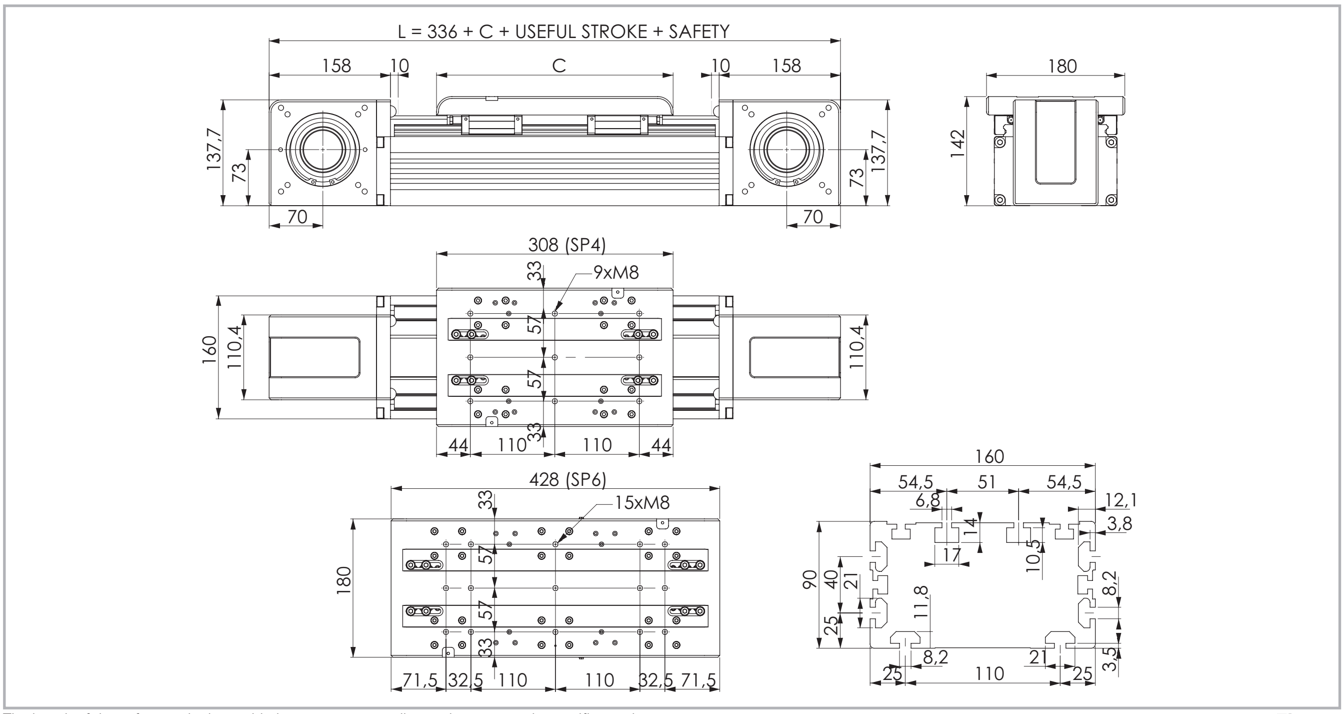
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
R-SMART 120 SP4	3154	2090	96800	45082	96800	4453	6244	6244
R-SMART 120 SP6	3154	2090	145200	67623	145200	6679	11906	11906

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 44

R-SMART 160 SP4 - SP6

R-SMART 160 Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 23

Technical data

	Type R-SMART 160 SP4	Type R-SMART 160 SP6
Max. useful stroke length [mm]*1	6000	5880
Max. positioning repeatability [mm]*2	± 0.05	± 0.05
Max. speed [m/s]	4.0	4.0
Max. acceleration [m/s²]	50	50
Type of belt	50 AT 10	50 AT 10
Type of pulley	Z 27	Z 27
Pulley pitch diameter [mm]	85.94	85.94
Carriage displacement per pulley turn [mm]	270	270
Carriage weight [kg]	5.4	7.5
Zero travel weight [kg]	24.4	27.9
Weight for 100 mm useful stroke [kg]	1.75	1.75
Starting torque [Nm]	3.4	3.95
Moment of inertia of pulleys [g · mm²]	4.035.390	4.035.390
Rail size [mm]	20	20

*1) It is possible to obtain stroke up to 11.200 (SP4), 11.080 (SP6) by means of special Rollon joints
*2) The positioning repeatability depends upon the type of transmission used

Tab. 45

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
R-SMART 160 SP	0.383	1.313	1.696

Tab. 46

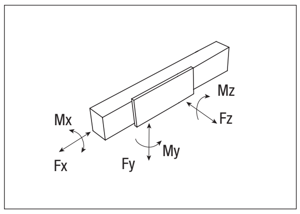
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
R-SMART 160 SP	50 AT 10	50	0.29

Tab. 47

Belt length (mm) = 2 x L - 150 (SP4)
2 x L - 270 (SP6)



Load capacity

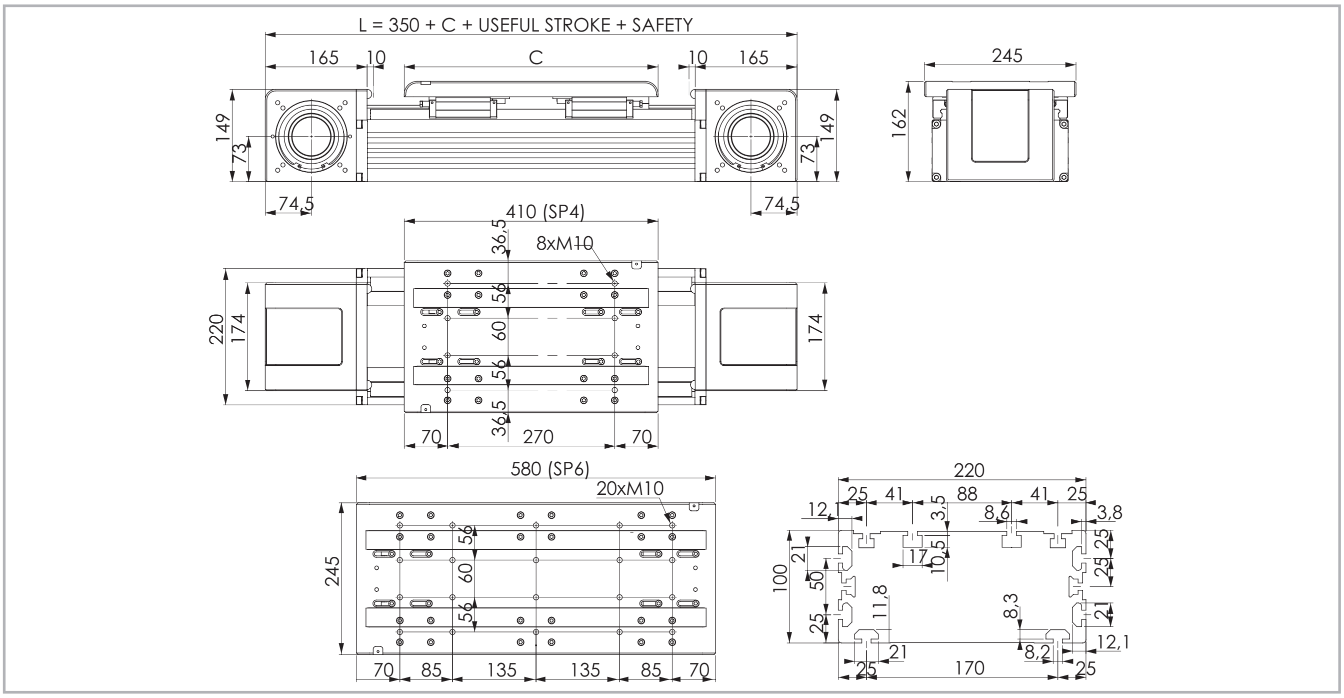
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
R-SMART 160 SP4	4980	3390	153600	70798	153600	8909	12595	12595
R-SMART 160 SP6	4980	3390	230400	106197	230400	13363	21427	21427

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 48

R-SMART 220 SP4- SP6

R-SMART 220 Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 24

Technical data

	Type	
	R-SMART 220 SP4	R-SMART 220 SP6
Max. useful stroke length [mm]*1	5900	5730
Max. positioning repeatability [mm]*2	± 0.05	± 0.05
Max. speed [m/s]	4.0	4.0
Max. acceleration [m/s²]	50	50
Type of belt	100 AT 10	100 AT 10
Type of pulley	Z 32	Z 32
Pulley pitch diameter [mm]	101.86	101.86
Carriage displacement per pulley turn [mm]	320	320
Carriage weight [kg]	12.1	16.95
Zero travel weight [kg]	41.13	49.93
Weight for 100 mm useful stroke [kg]	2.45	2.45
Starting torque [Nm]	4.3	7
Moment of inertia of pulleys [g · mm²]	12.529.220	12.529.220
Rail size [mm]	25	25

*1) It is possible to obtain stroke up to 11.100 (SP4), 10.930 (SP6) by means of special Rollon joints.
*2) Positioning repeatability is dependent on the type of transmission used.

Tab. 49

Moments of inertia of the aluminum body

Type	I_x [10^7 mm⁴]	I_y [10^7 mm⁴]	I_p [10^7 mm⁴]
R-SMART 220 SP	0.663	3.658	4.321

Tab. 50

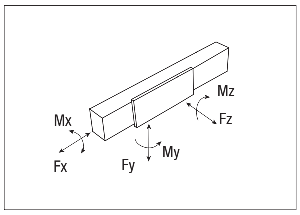
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
R-SMART 220 SP	100 AT 10	100	0.58

Tab. 51

Belt length (mm) = 2 x L - 130 (SP4)
2 x L - 300 (SP6)



R-SMART 220 SP4 - R-SMART 220 SP6 - Load capacity

Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
R-SMART 220 SP4	9960	7380	258800	116833	258800	21998	28468	28468
R-SMART 220 SP6	9960	7380	388200	175249	388200	32997	50466	50466

See verification under static load and lifetime on page SS-30 and SS-31

Tab. 52

Lubrication

SP linear units with ball bearing guides

SP Linear units are equipped with self lubricating linear ball guides. The ball bearing carriages of the SP versions are also fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment.
This system guarantees a long interval between maintenances: SP version: every 2000 Km or 1 year of use, based on the value reached first. If a longer service life is required or in case of high dynamic or high loaded applications please contact our offices for further verification.

R-SMART

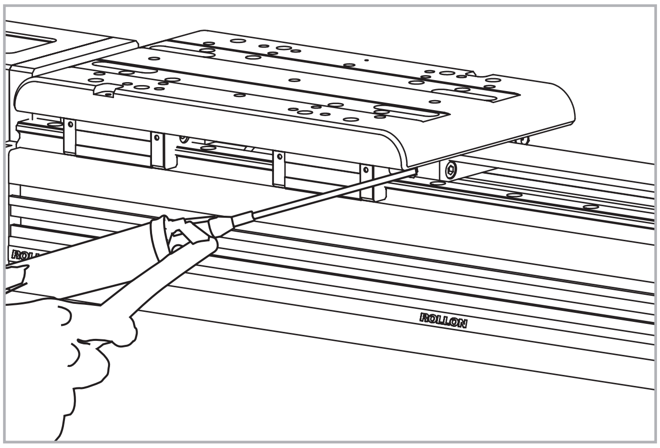


Fig. 25

- Insert the tip of the grease gun into the specific grease blocks.
- Type of lubricant: Lithium soap grease of class NLGI 2.
- For specially stressed applications or hostile environmental conditions, lubrication should be applied out more frequently.
  Contact Rollon for further advice

Quantity of lubricant necessary for re-lubrication of each block:

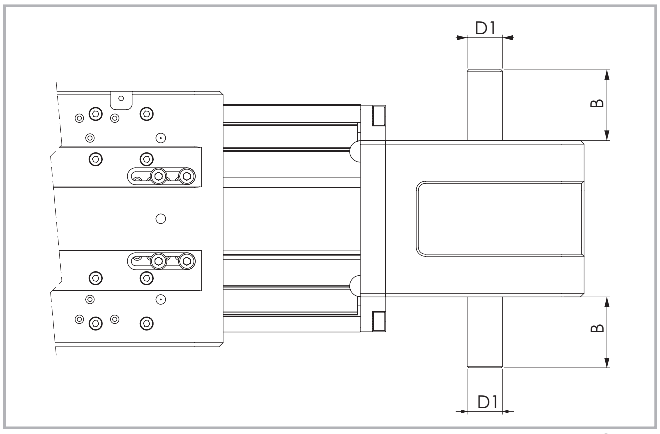
Type	Quantity of Grease [cm^3]
R-SMART 120	0.7
R-SMART 160	1.4
R-SMART 220	2.4

Tab. 53

SS

Simple shafts

AS type simple shafts



Position of the simple shaft can be to the right or to the left of the drive head.

Fig. 26

This head configuration is obtained by utilizing an assembly kit delivered as a separate accessory item.

Shaft can be installed on the left or right side of the drive head as decided by the customer.

Units (mm)

Applicable to unit	Shaft type	B	D1	AS assembly kit code
R-SMART 120	**AS 20**	36	20h7	G000828
R-SMART 160	**AS 25**	50	25h7	G000649
R-SMART 220	**AS 25**	50	25h7	G000649

Tab. 54

Hollow shaft

Hollow shaft type FP - Standard supply

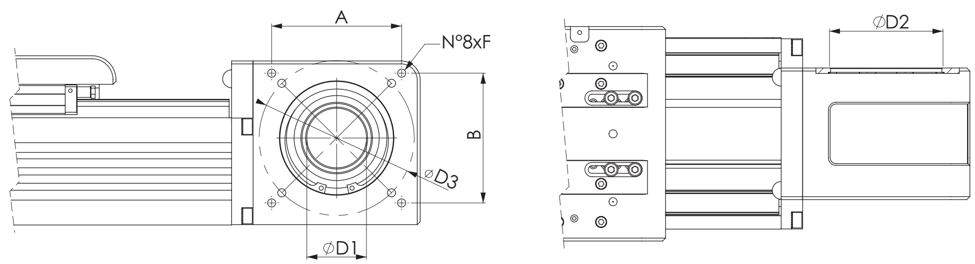


Fig. 27

Units (mm)

Applicable to unit	Shaft type	D1	D2	D3	F	A x B	Drive head code
R-SMART 120	**FP 41**	41H7	72	100	M6	92x72	2R
R-SMART 160	**FP 50**	50H7	95	130	M8	109x109	2R
R-SMART 220	**FP 60**	60H7	115	130	M8	109x109	2R

Tab. 55

An (optional) connection flange is required to fit the standard reduction units selected by Rollon.

For further information contact our offices.

Accessories

Fixing by brackets

The ball bearing guide linear drive system of Rollon SMART System series linear units enables them to support loads in any direction. They can therefore be installed in any position.
To install the SMART System series units, we recommend use of one of the systems indicated below:

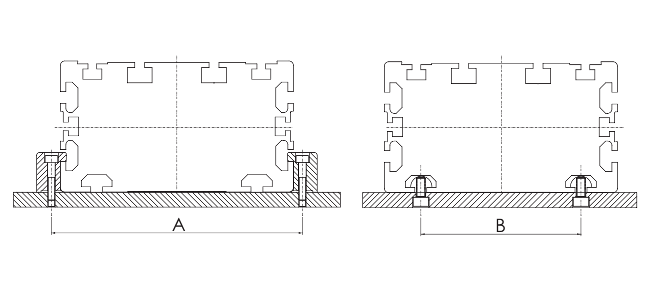


Fig. 28

Units (mm)

	A	B
R-SMART 120	132	80
R-SMART 160	180	110
R-SMART 220	240	170

Tab. 56

Fixing brackets

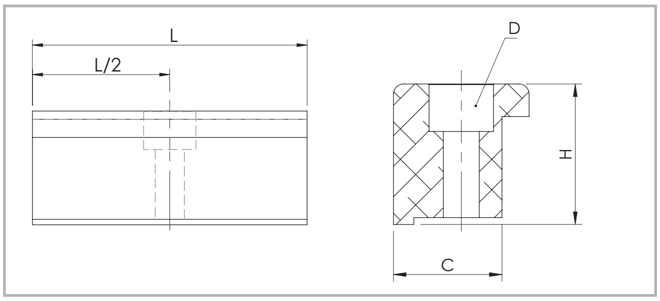


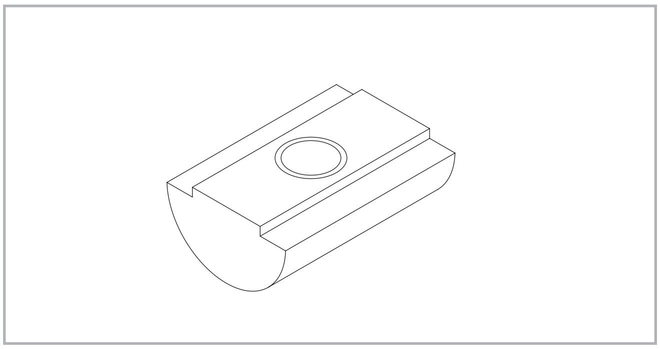
Fig. 29

Dimensions (mm)

	C	H	L	D	Code Rollon
R-SMART 120	16	20.7	50	M5	1000111
R-SMART 160	31	28.5	100	M10	1002377
R-SMART 220	31	28.5	100	M10	1002377

Tab. 57

T-nuts



Steel nuts to be used in the slots of the body. Fig. 30

Units (mm)

	Hole	Length	Code Rollon
R-SMART 120	M6	20	6000437
R-SMART 160	M6	20	6000437
R-SMART 160	M8	20	6001544
R-SMART 220	M6	20	6000437
R-SMART 220	M8	20	6001544

Tab. 58

SS

Proximity

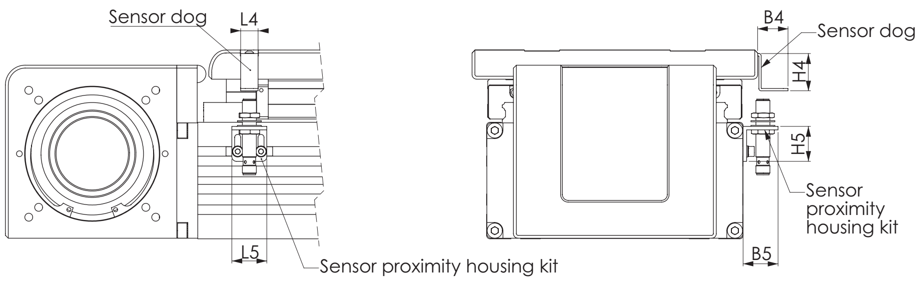


Fig. 31

Sensor proximity housing kit

Aluminum block equipped with T-nuts for fixing

Sensor dog

Iron plate mounted on the carriage used for the proximity operation

Units (mm)

	B4	B5	L4	L5	H4	H5	For proximity	Sensor dog	Sensor proximity housing kit
R-SMART 120	26	30	15	30	32	30	Ø 8	G000833	G000844
R-SMART 160	26	30	15	30	32	30	Ø 8	G000833	G000838
R-SMART 220	26	30	15	30	32	30	Ø 8	G000833	G000838

Tab. 59

Assembly kits

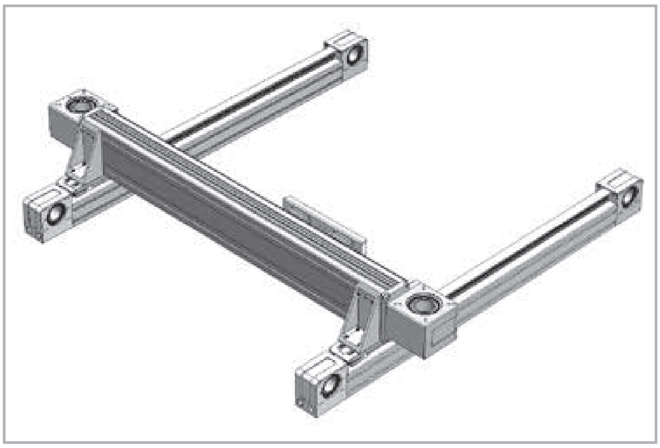


Fig. 32

Fig. 33

For the direct assembly of R-SMART linear units on other types of actuators Rollon offers dedicated assembly kits. The table below shows the allowed combinations as well as the assembly kit codes.

Kit	Code	X No rail at each end (mm)
R-SMART 120 on E-SMART 50	G000899*	60
R-SMART 120 on E-SMART 80	G000863*	90
R-SMART 160 on E-SMART 80	G000902*	90
R-SMART 160 on E-SMART 100	G000903*	110
R-SMART 220 on E-SMART 100	G001207	110

* Additional fixing holes are requested on the E-SMART plate.

Tab. 60

Adapter flange for gearbox assembly

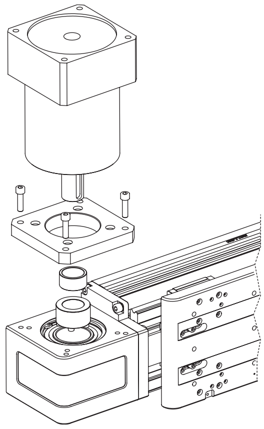


Fig. 34

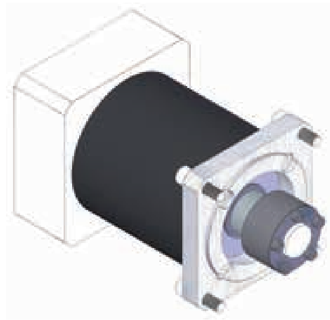


Fig. 35

Assembly kit includes: shrink disk; adapter plate; fixing hardware

Unit type	Gearbox type (not included)	Kit Code
R-SMART 120	P3	G000824
	MP080	G000826
	LC90; MPV01; NP025S; PE4	G000827
	MP105	G000830
	PE3; NP015S; LC070	G001078
	SP060; PLN070	G000829
	SP070; PLN090	G000859
	SW040	G000866
R-SMART 160	MP130	G000482
	LC120; MPV02; NP035S; PE5	G000483
	LC090; NP025S; PE4	G000525
	MP105	G000527
	SP075; PLN090	G000526
	SW050	G000717
R-SMART 220	MP130	G002785
	MP105	G002786
	LP120; LC120; PE5	G002787
	SP100	G002788

Tab. 61

For other gearbox type ask Rollon

Ordering key

Identification codes for the R-SMART linear unit

D	12	2R	02000	4R
	12=120 16=160 22=220			

Type (120-160-220) 4R=SP4 6R=SP6

L=total length of the unit

Drive head code *see pg. SS-24*

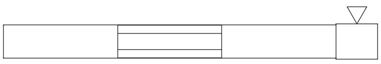
Linear unit type *see from pg. SS-20 to pg. SS-22*

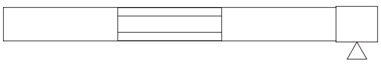
Linear unit series R-SMART *see pg. SS-17*

In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Configure Actuator

Left / right orientation


Right


Left

S-SMART series

S-SMART series description

Fig. 36

S-SMART

The S-SMART series linear units were designed to meet the vertical motion requirements in gantry applications or for applications where the aluminum profile must be moving and the carriage must be fixed.

The self-supporting extruded and anodized aluminum structure is available in three sizes. Since it is a rigid system, it is ideal for a "Z" axis in a 3-axis system by using a linear guide rail.

In addition, the S-SMART series has been specifically designed and configured to be easily assembled with the R-SMART series by using a simple bracket.

The components

Extruded profile

The anodized aluminum extrusions used for the bodies of the Rollon SMART series linear units were designed and manufactured in cooperation with a leading company in this field to obtain the right combination of high mechanical strength and reduced weight. The anodized aluminum alloy 6060 used (see physical chemical characteristics below for further information) was extruded with dimensional tolerances complying with EN 755-9 standards.

Driving belt

The Rollon SMART series linear units use steel reinforced polyurethane drive belts with AT pitch. This belt is ideal due to its high load transmission characteristics, compact size and low noise. Used in conjunction with a backlash-free pulley, smooth alternating motion can be achieved. Optimization of the maximum belt width/body dimension ratio enables the following performance characteristics to be achieved:

- **High speed**
- **Low noise**
- **Low wear**

Carriage

The carriage of the Rollon SMART series linear units is made entirely of anodized aluminum. The dimensions vary depending on the type.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 62

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.7	70	23.8	200	880-900	33	600-655

Tab. 63

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
250	200	10	75

Tab. 64

The linear motion system

The linear motion system has been designed to meet the load capacity, speed, and maximum acceleration conditions of a wide variety of applications. Rollon SMART System series systems feature a linear motion system with ball bearing guides:

Performance characteristics:

- The ball bearing guides with high load capacity are mounted in a dedicated seat on the aluminum body.
- The carriage of the linear unit is assembled on pre-loaded ball bearing blocks that enables the carriage to withstand loading in the four main directions.
- The ball bearing carriages of the SP versions are also fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment.
- The blocks have seals on both sides and, when necessary, an additional scraper can be fitted for very dusty conditions.

The linear motion system described above offers:

- High speed and acceleration
- High load capacity
- High permissible bending moments
- Low friction
- Long life
- Low noise

S-SMART section

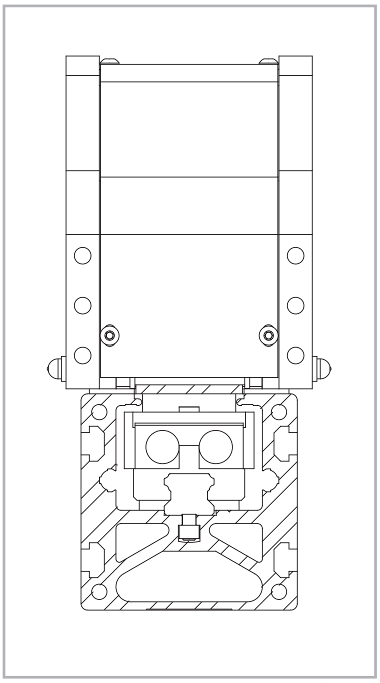
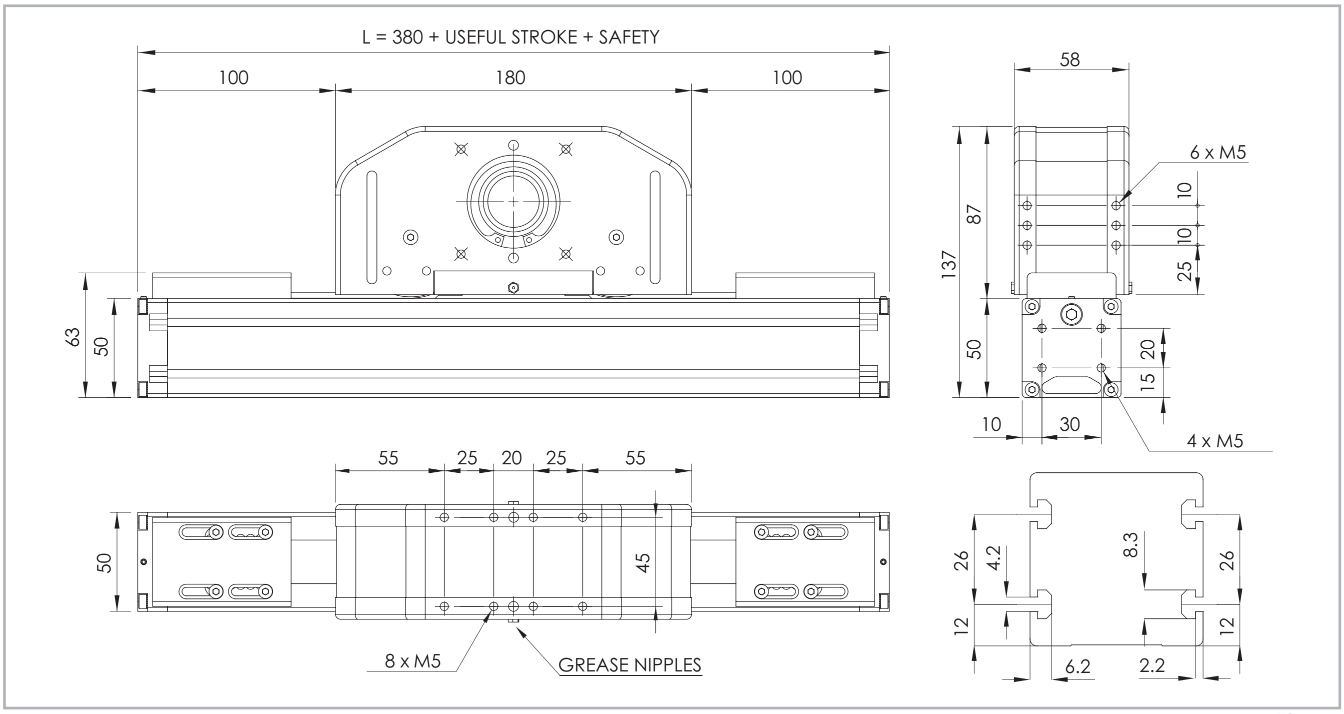


Fig. 37

S-SMART 50 SP

S-SMART 50 SP Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 38

Technical data

	Type
	S-SMART 50 SP
Max. useful stroke length [mm]	1000
Max. positioning repeatability [mm]*1	± 0.05
Max. speed [m/s]	4.0
Max. acceleration [m/s²]	50
Type of belt	22 AT 5
Type of pulley	Z 23
Pulley pitch diameter [mm]	36.61
Carriage displacement per pulley turn [mm]	115
Carriage weight [kg]	2
Zero travel weight [kg]	5.7
Weight for 100 mm useful stroke [kg]	0.4
Starting torque [Nm]	0.25
Rail size [mm]	12 mini

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 65

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
S-SMART 50 SP	0.025	0.031	0.056

Tab. 66

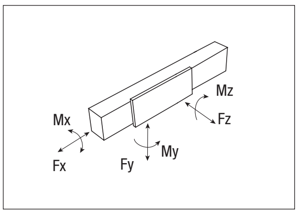
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
S-SMART 50 SP	22 AT 5	22	0.072

Tab. 67

Belt length (mm) = L + 30



Load capacity

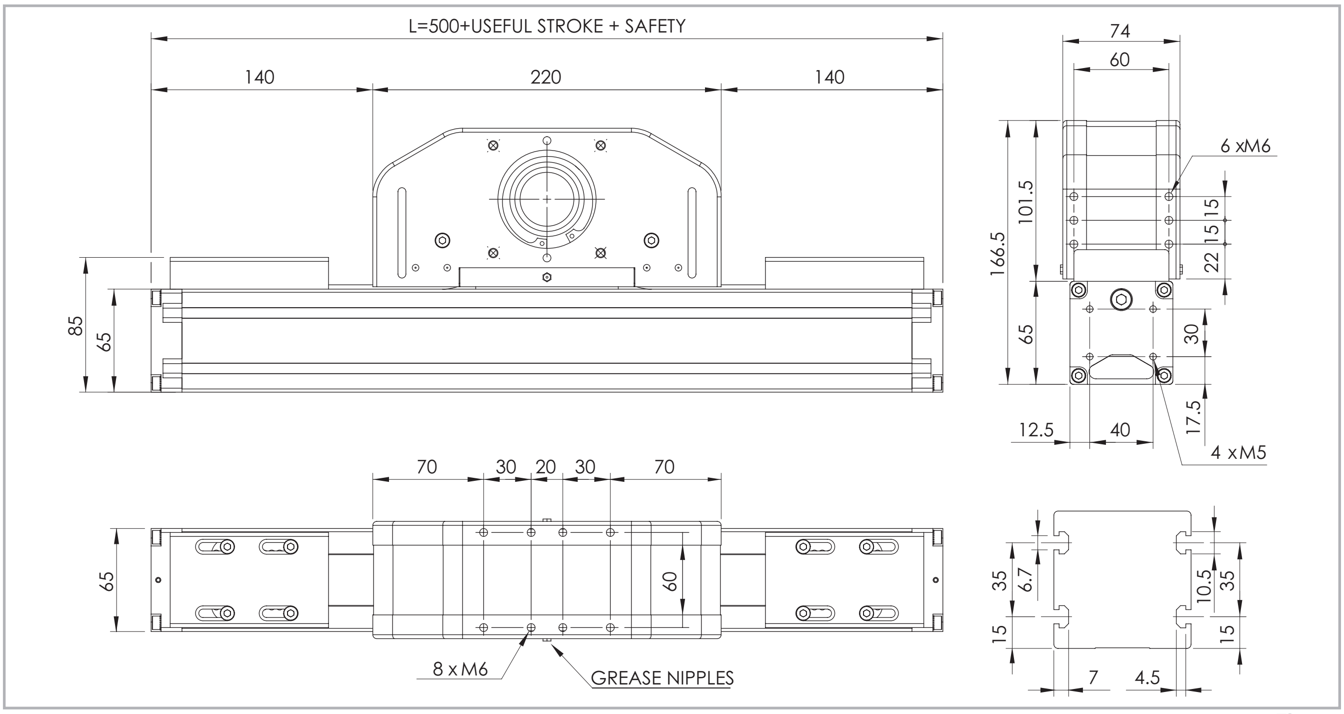
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
S-SMART 50 SP	809	508	7060	6350	7060	46.2	233	233

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 68

S-SMART 65 SP

S-SMART 65 SP Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 39

Technical data

	Type S-SMART 65 SP
Max. useful stroke length [mm]	1500
Max. positioning repeatability [mm]*1	± 0.05
Max. speed [m/s]	4.0
Max. acceleration [m/s²]	50
Type of belt	32 AT 5
Type of pulley	Z 32
Pulley pitch diameter [mm]	50.93
Carriage displacement per pulley turn [mm]	160
Carriage weight [kg]	3.6
Zero travel weight [kg]	7.3
Weight for 100 mm useful stroke [kg]	0.6
Starting torque [Nm]	0.60
Rail size [mm]	15

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 69

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
S-SMART 65 SP	0.060	0.086	0.146

Tab. 70

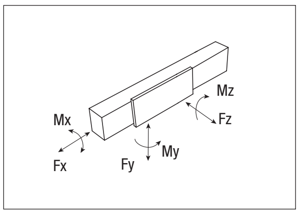
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
S-SMART 65 SP	32 AT 5	32	0.105

Tab. 71

Belt length (mm) = L + 35



Load capacity

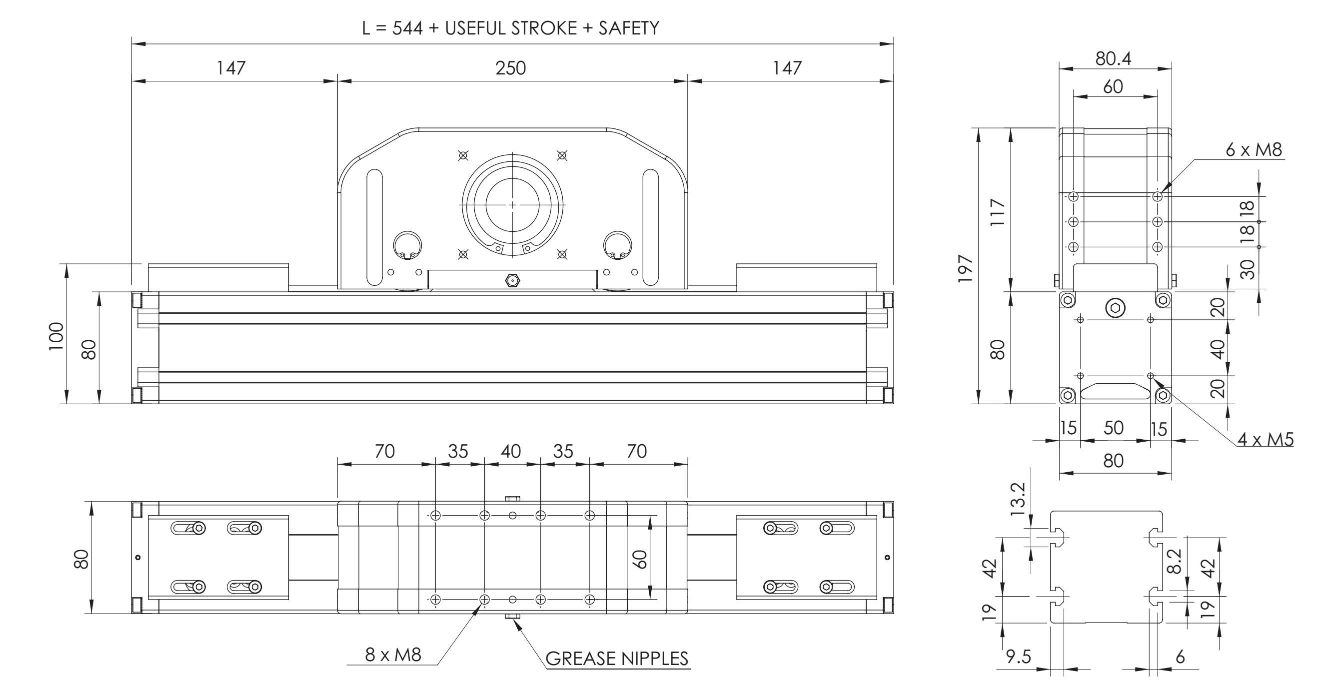
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
S-SMART 65 SP	1344	960	30560	19890	30560	240	1213	1213

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 72

S-SMART 80 SP

S-SMART 80 SP Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 40

Technical data

	Type
	S-SMART 80 SP
Max. useful stroke length [mm]	2000
Max. positioning repeatability [mm]*1	± 0.05
Max. speed [m/s]	4.0
Max. acceleration [m/s²]	50
Type of belt	32 AT 10
Type of pulley	Z 21
Pulley pitch diameter [mm]	66.85
Carriage displacement per pulley turn [mm]	210
Carriage weight [kg]	6.3
Zero travel weight [kg]	12.6
Weight for 100 mm useful stroke [kg]	1
Starting torque [Nm]	1.65
Rail size [mm]	20

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 73

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
S-SMART 80 SP	0.136	0.195	0.331

Tab. 74

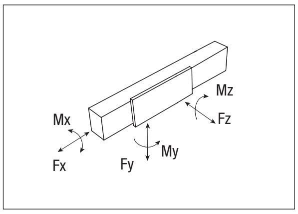
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
S-SMART 80 SP	32 AT 10	32	0.186

Tab. 75

Belt length (mm) = L + 50



Load capacity

Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
S-SMART 80 SP	2523	1672	51260	36637	51260	520	3742	3742

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 76

Lubrication

SP linear units with ball bearing guides

The ball bearing carriages of the SP versions are fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment of these in the circuits.

This system guarantees a long interval between maintenances: SP version: every 2000 Km or 1 year of use, based on the value reached first. If a longer service life is required or in case of high dynamic or high loaded applications please contact our offices for further verification.

S-SMART

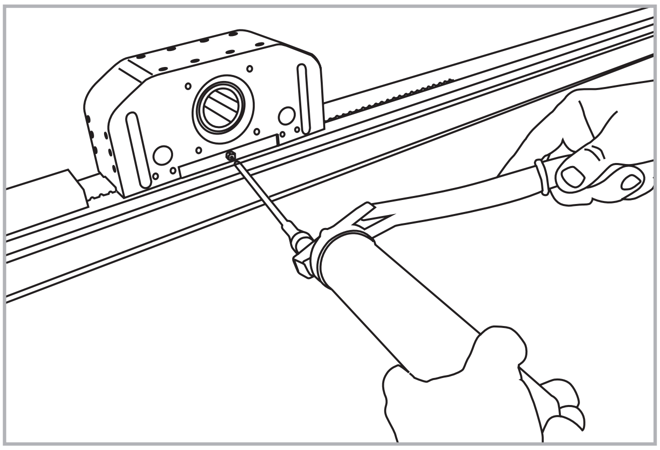


Fig. 41

Quantity of lubricant necessary for re-lubrication of each block:

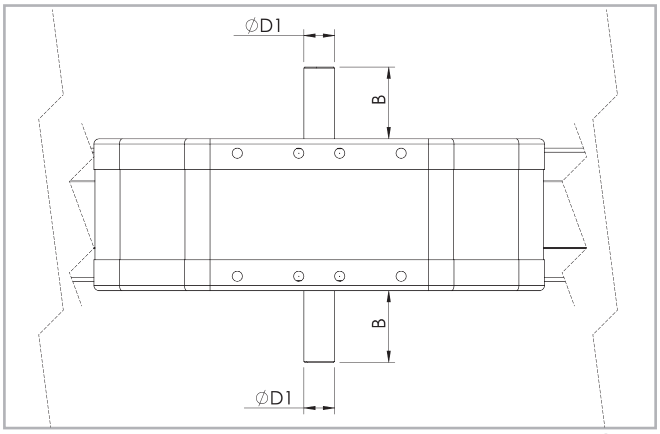
Type	Quantity of Grease (cm³)
S-SMART 50	0.5
S-SMART 65	0.2
S-SMART 80	0.5

Tab. 77

- Insert the tip of the grease gun into the specific grease blocks.
- Type of lubricant: Lithium soap grease of class NLGI 2.
- For specially stressed applications or hostile environmental conditions, lubrication should be applied out more frequently.
  Contact Rollon for further advice

Simple shafts

AS type simple shafts



Position of the simple shaft can be to the right or to the left of the drive head.

Fig. 42

This head configuration is obtained by utilizing an assembly kit delivered as a separate accessory item.
Shaft can be installed on the left or right side of the drive head as decided by the customer.

Units (mm)

Applicable to unit	Shaft type	B	D1	AS Assembly kit code
S-SMART 50	AS 12	26	12h7	G000652
S-SMART 65	AS 15	35	15h7	G000851
S-SMART 80	AS 20	40	20h7	G000828

Tab. 78

Hollow shaft

Hollow shaft type FP - Standard supply

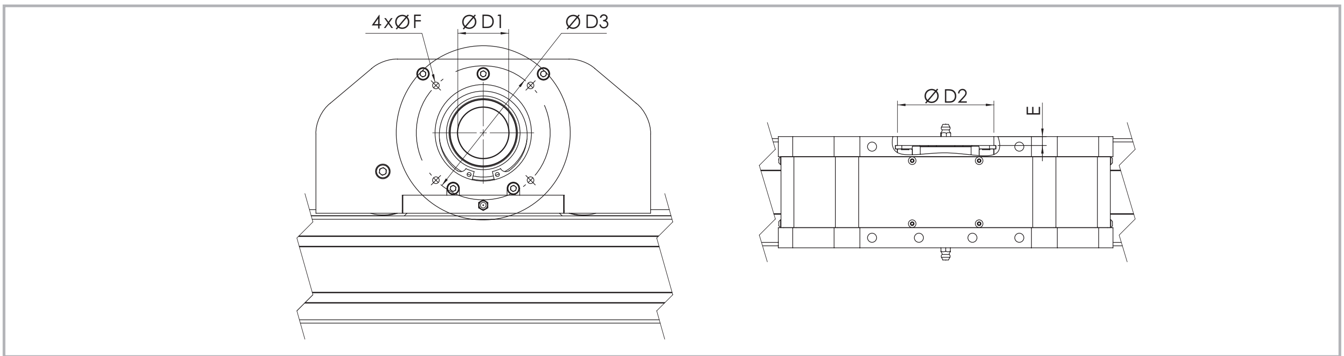


Fig. 43

Units (mm)

Applicable to unit	Shaft type	D1	D2	D3	E	F	Drive head code
S-SMART 50	FP 26	26H7	47	75	2.5	M5	2YA
S-SMART 65	FP 34	34H7	62	96	2.5	M6	2YA
S-SMART 80	FP 41	41H7	72	100	5	M6	2ZA

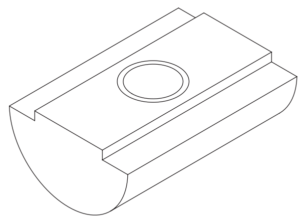
Tab. 79

An (optional) connection flange is required to fit the standard reduction units selected by Rollon.
For further information contact our offices.

Accessories

The ball bearing guide linear drive system of Rollon SMART System series linear units enables them to support loads in any direction. They can therefore be installed in any position.
To install the SMART System series units, we recommend use of one of the systems indicated below:

T-nuts



Steel nuts to be used in the slots of the body.

Fig. 44

Units (mm)

	Hole	Length	Code Rollon
S-SMART 50	M4	8	1001046
S-SMART 65	M5	10	1000627
S-SMART 80	M6	13	1000043

Tab. 80

Proximity

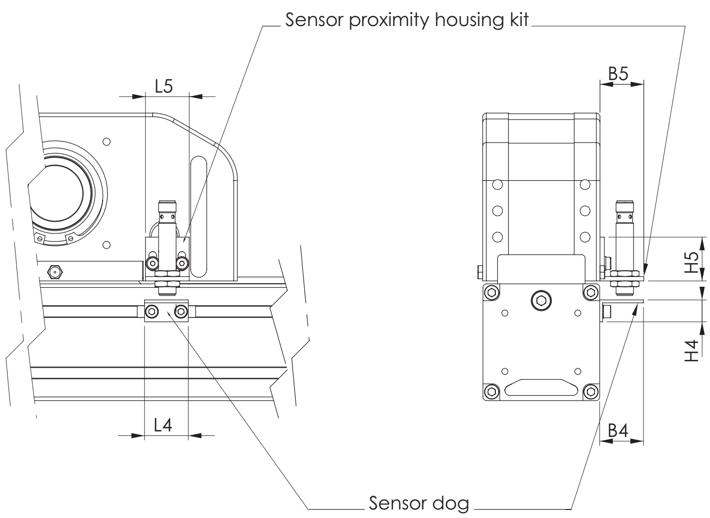


Fig. 45

Proximity switch holder

Aluminum block equipped with T-nuts for fixing

Proximity switch runner

Iron plate mounted on the carriage used for the proximity operation

Units (mm)

	B4	B5	L4	L5	H4	H5	For proximity	Sensor dog code	Sensor proximity housing code
S-SMART 50	30	30	30	30	15	30	Ø8 / Ø12	G000835	G000834 / G001408
S-SMART 65	30	30	30	30	15	30	Ø8 / Ø12	G000836	G000834 / G001408
S-SMART 80	30	30	30	30	15	30	Ø8 / Ø12	G000837	G000834 / G001408

Tab. 81

Assembly kits

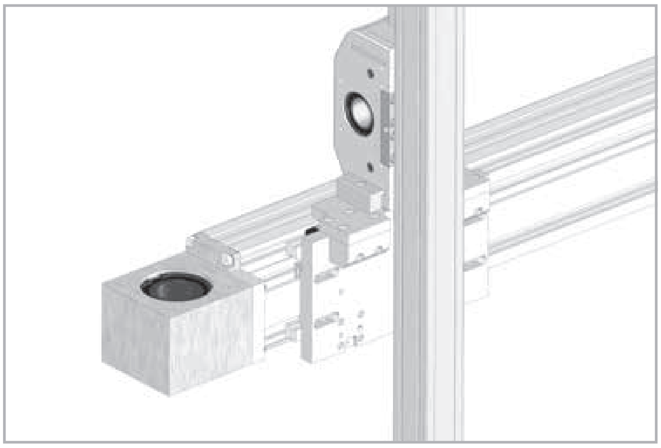


Fig. 46

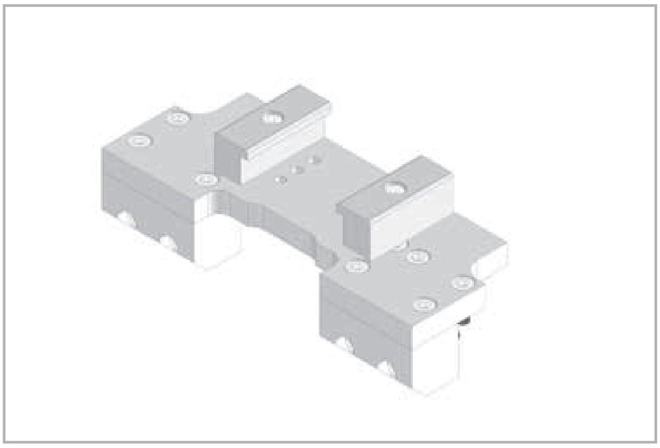
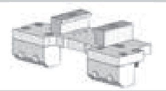
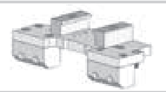
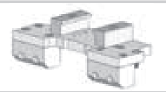
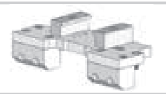
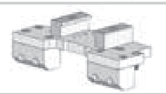


Fig. 47

While ordering two units for Y-Z assembly key has to be specified that they work together in order to drill the trolleys for the assembly of the kit.

Actuator combination Y-Z		Kit Code
	S-SMART 50 on E-SMART 50	G000647
	S-SMART 50 on R-SMART 120	G000910
	S-SMART 65 on E-SMART 50	G000654
	S-SMART 65 on E-SMART 80	G000677
	S-SMART 65 on R-SMART 120	G000911
	S-SMART 65 on R-SMART 160	G000912
	S-SMART 80 on E-SMART 80	G000653
	S-SMART 80 on E-SMART 100	G000688
	S-SMART 80 on R-SMART 120	G000990
	S-SMART 80 on R-SMART 160	G000913

Tab. 82

For examples of S-Smart on E-Smart see page SS-42

Adapter flange for gearbox assembly

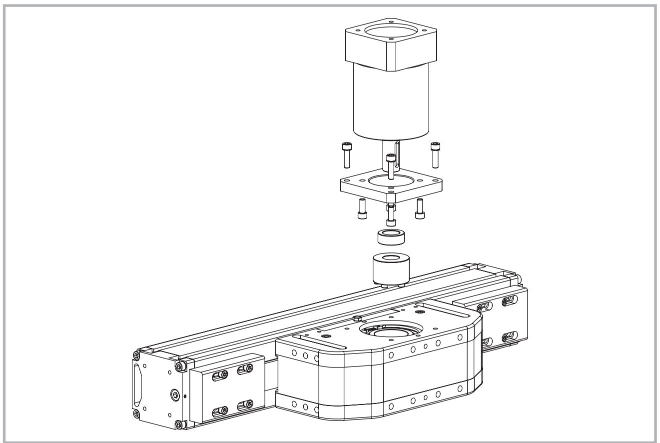


Fig. 48

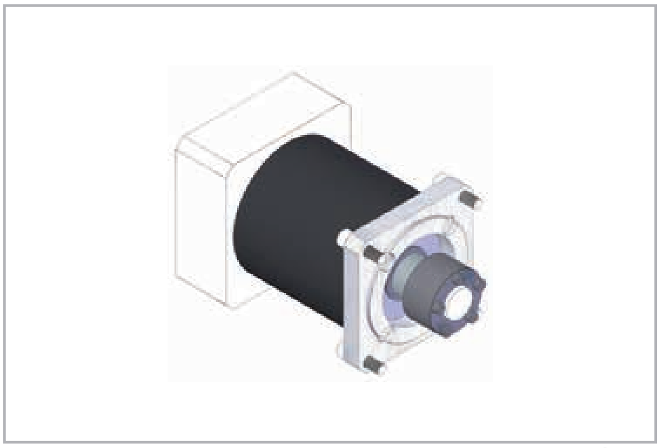


Fig. 49

Assembly kit includes: shrink disk; adapter plate; fixing hardware

Unit	Gearbox type (not included)	Kit Code
S-SMART 50	MP060	G000566
	LC050; PE2; LP050	G001444
S-SMART 65	MP080	G000529
	MP060; PLE060	G000531
	SW030	G000748
	PE3; LP070; LC070	G000530
S-SMART 80	P3	G000824
	MP080	G000826
	LC090; MPV01; LP090; PE4	G000827
	PLE080	G000884
	SP060; PLN070	G000829
	SW040	G000866
	SW050	G000895

Tab. 83

For other gearbox type ask Rollon

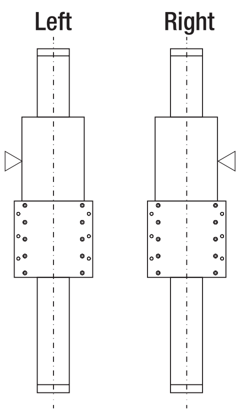
Ordering key

Identification codes for the S-SMART linear unit

F	08	2ZA	1300	1A
	05 = 50 06 = 65 08 = 80			1A=SP
				Linear motion system *see pg. SS-32*
			L=total length of the unit	
		Drive head code *see pg. SS-37*		
	Linear unit type *see from pg. SS-33 to pg. SS-35*			
Linear unit series S-SMART *see pg. SS-30*				

In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Left / right orientation



SS

Multiaxis systems

Previously, customers wishing to build multiaxis units have had to design, draw and manufacture all the elements necessary to assemble two or more axes. Rollon now offers a set of components, including brackets and plates, to enable multiaxis units to be built.

In addition to the standard elements, Rollon can supply plates for special applications.

Application examples:

One axis system

A

A - X Axis: E-SMART

Two parallel axis system

B

B - Linear units: 2 E-SMART

Connection kit: Parallel Kit

Two axis Y-Z system

E

E - Linear units: Y Axis 1 R-SMART - Z Axis 1 S-SMART

Connection kit: Connection plate Kit for S-SMART (Z axis) on R-SMART (Y axis).

Three axis X-Y-Z system

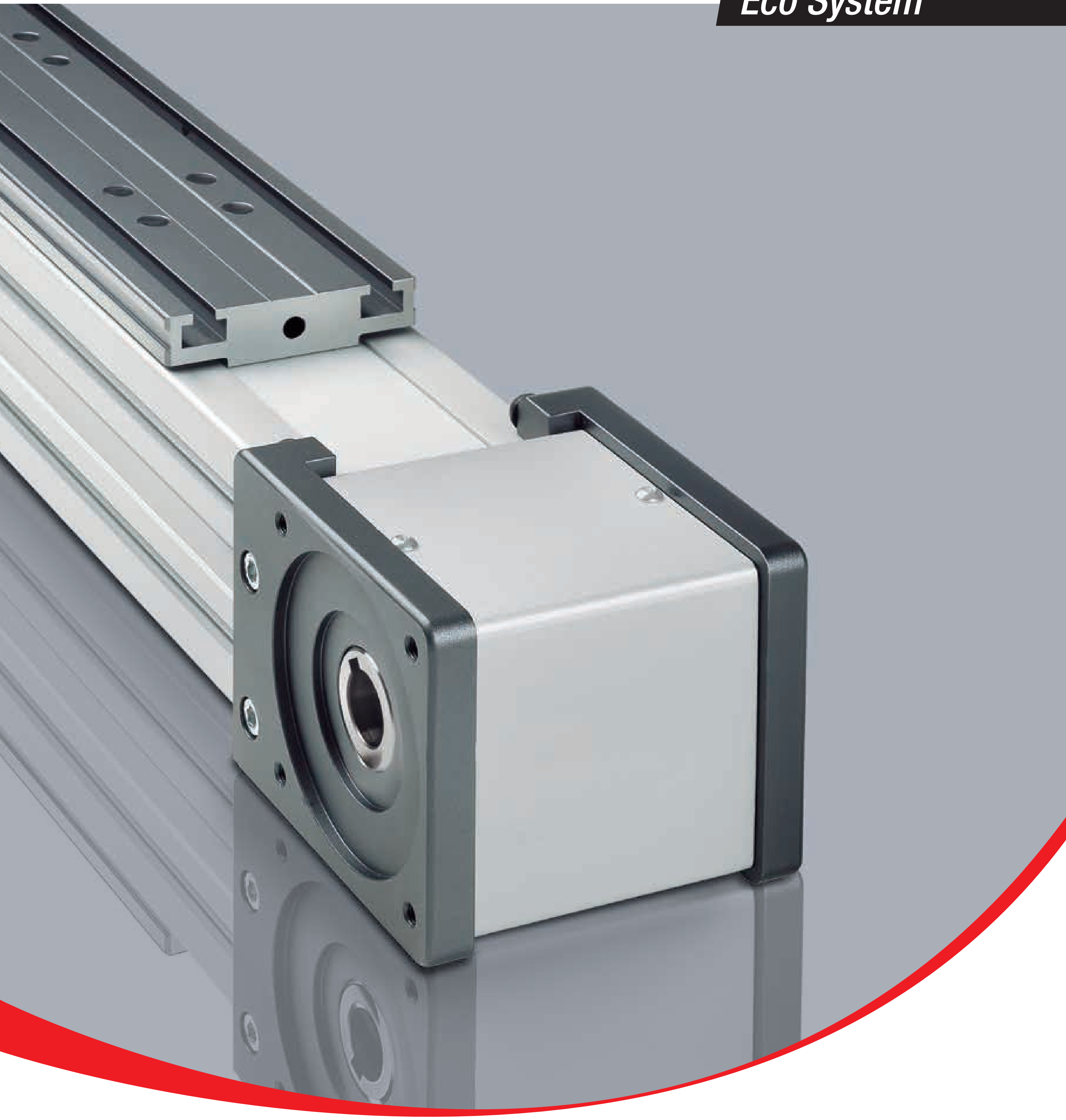
F

F - Linear units: X Axis 2 E-SMART - Y Axis 1 R-SMART - Z Axis 1 S-SMART

Connection kit: 2 fixing brackets Kit for 2 R-SMART (Y axis) on 2 E-SMART (X axis). Connection plate Kit for S-SMART (Z axis) on 2 R-SMART (Y axis). Parallel Kit

Notes

Eco System



ECO series

ECO series description

Fig. 1

The ECO SYSTEM units are linear actuators made of a self-supporting extruded aluminum frame and are driven by a polyurethane belt with AT metric profile steel inserts.

- Three different sizes available: 60mm, 80mm, 100mm
- Version available with recirculating ball bearing or roller rails
- Reduced weight ensured by the light frame and the aluminum sliders
- High sliding speed

The ECO SYSTEM series actuators are offered with two motion systems:

ECO SYSTEM – SP
Featuring a maintenance free recirculating linear guide rail fitted inside the profile.

ECO SYSTEM – CI
Featuring four rollers with a Gothic arch outer profile sliding on hardened steel bars placed inside the profile.

The components

Extruded bodies

The anodized aluminum extrusion used for the profile of the Rollon ECO series linear units was designed and manufactured by industry experts to optimise weight while maintaining mechanical strength. The anodized aluminum alloy 6060 used (see physical-chemical characteristics below) was extruded with dimensional tolerances complant with EN 755-9 standards.

Driving belt

The Rollon ECO series linear units use steel reinforced polyurethane drive belts with AT pitch. This belt is ideal due to its high load transmission characteristics, compact size and low noise. Used in conjunction with a backlash-free pulley, smooth alternating motion can be achieved.

Optimisation of the maximum belt width/body dimension ratio enables the following performance characteristics to be achieved:

- **High speed**
- **Low noise**
- **Low wear**

The driving belt is guided by specific slots in the aluminum extruded body thus covering the inside components.

Carriage

The carriage of the Rollon ECO series linear units is made of anodized aluminum. Two different length carriages are available for each type of linear unit.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 1

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.70	69	23	200	880-900	33	600-655

Tab. 2

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
205	165	10	60-80

Tab. 3

ES

The linear motion system

The linear motion system has been designed to meet the load capacity, speed, and maximum acceleration conditions of a wide variety of applications. Two linear motion systems are offered:

ECO...SP with ball bearing guides

- A ball bearing guide with high load capacity is mounted in a dedicated seat on the inside of the aluminum body.
- The carriage is assembled on two pre-loaded ball bearing blocks.
- The two ball bearing blocks enable the carriage to withstand loading in the four main directions.
- The two blocks have seals on both sides and, if necessary, an additional scraper can be fitted for very dusty conditions.
- The ball bearing carriages of the SP versions are also fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment.
- Lubrication reservoirs (pockets) installed on the front of the ball bearing blocks supply the appropriate amount of grease, thus promoting a long maintenance interval.

The linear motion system described above offers:

- High speed and acceleration
- High load capacity
- High permissible bending moments
- Low friction
- Long life
- Maintenance Free (dependent on application)
- Low noise
- Suitable for long stroke

ECO...CI with gothic arch bearing guides inside the body

- Two hardened steel rods (58/60 HRC tolerance h6) are securely inserted inside the aluminum body.
- The carriage is fitted with six bearing assemblies each having a gothic arch groove machined into its outer race to run on the steel rods.
- The six bearings are mounted on steel pins, two of which are eccentric, to allow setting of running clearance and pre-load.
- To keep the running tracks clean and lubricated, four grease impregnated felt seals, complete with grease reservoirs, are fitted on the ends of the carriage.
- The driving belt is supported by the entire length of the profile in order to avoid deflection as well as to protect the linear guide.

The linear motion system described above offers:

- Good positioning accuracy
- Low noise
- Maintenance Free (dependent on application)

ECO SP

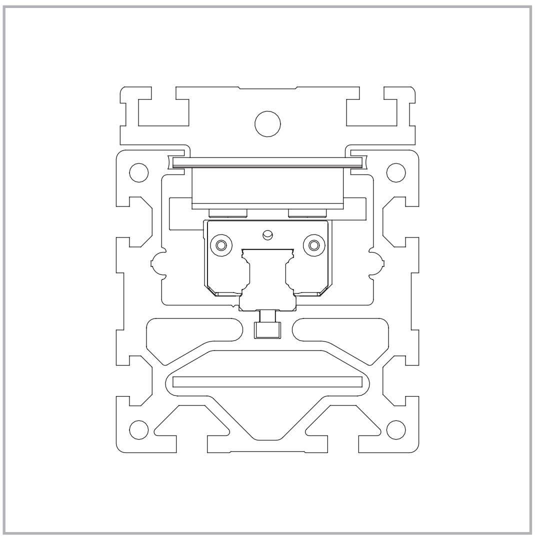


Fig. 2

ECO CI

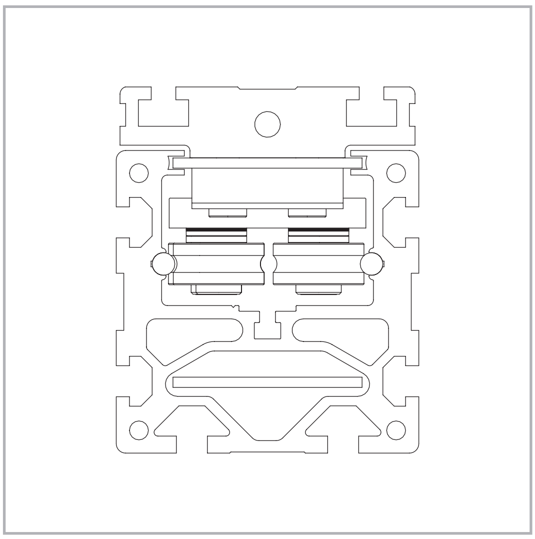
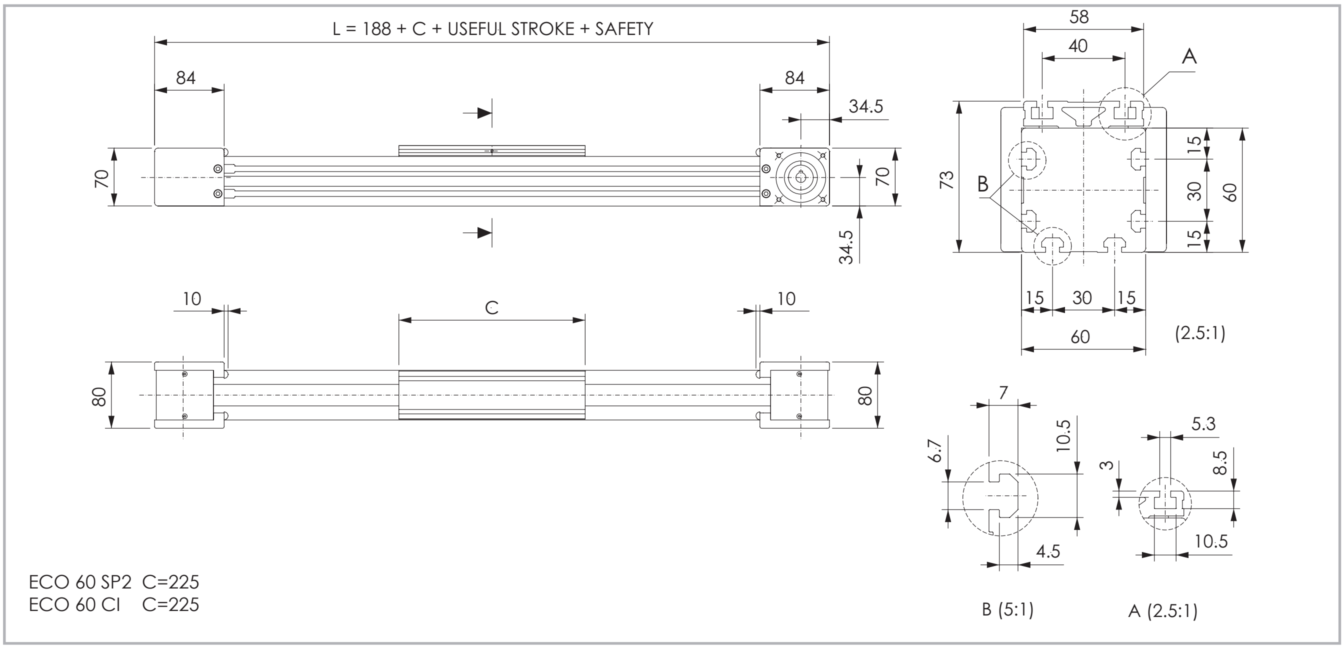


Fig. 3

ECO 60 SP2 - ECO 60 CI

ECO 60 SP2 - ECO 60 CI Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 4

Technical data

	Type	
	ECO 60 SP2	ECO 60 CI
Max. useful stroke length [mm]	6025	5725
Max. positioning repeatability [mm]*1	± 0.05	± 0.05
Max. speed [m/s]	4.0	1.5
Max. acceleration [m/s²]	50	1.5
Type of belt	32 AT 5	32 AT 5
Type of pulley	Z 28	Z 28
Pulley pitch diameter [mm]	44.56	44.56
Carriage displacement per pulley turn [mm]	140	140
Carriage weight [kg]	0.51	0.80
Zero travel weight [kg]	3.5	3.2
Weight for 100 mm useful stroke [kg]	0.45	0.68
Starting torque [Nm]	0.24	0.32
Moment of inertia of pulleys [g mm²]	163000	163000
Rail size [mm]	12 mini	Ø6

*1) Positioning repeatability is dependant on the type of transmission used

Tab. 4

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ECO 60	0.037	0.054	0.093

Tab. 5

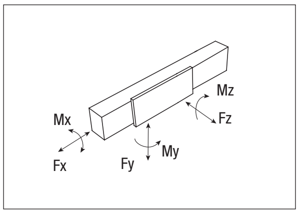
Driving belt

The driving belt is manufactured with friction resistant polyurethane, with steel cord reinforcement for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ECO 60	32 AT 5	32	0.105

Tab. 6

Belt length (mm) SP2/CI = 2 x L - 166



Load capacity

Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ECO 60 SP2	1344	922	7060	6350	7060	46.2	325	325
ECO 60 CI	1344	922	1648	3072	1110	24.4	33	76.2

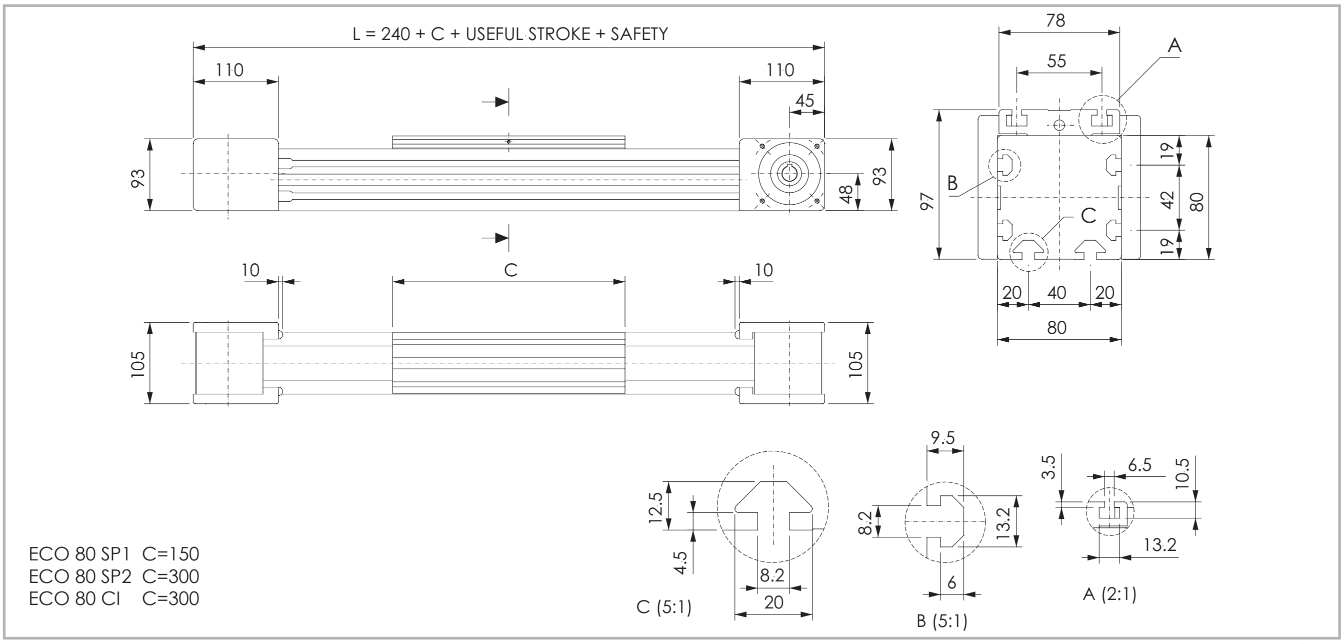
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 7

E S

ECO 80 SP2 - ECO 80 SP1 - ECO 80 CI

ECO 80 SP2 - ECO 80 SP1 - ECO 80 CI Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 5

Technical data

	Type		
	ECO 80 SP2	ECO 80 SP1	ECO 80 CI
Max. useful stroke length [mm]	5940	6090	5640
Max. positioning repeatability [mm]*1	± 0.05	± 0.05	± 0.05
Max. speed [m/s]	5.0	5.0	1.5
Max. acceleration [m/s²]	50	50	1.5
Type of belt	50 AT 5	50 AT 5	50 AT 5
Type of pulley	Z 37	Z 37	Z 37
Pulley pitch diameter [mm]	58.89	58.89	58.89
Carriage displacement per pulley turn [mm]	185	185	185
Carriage weight [kg]	1.6	0.9	2.1
Zero travel weight [kg]	7.7	5.9	8.2
Weight for 100 mm useful stroke [kg]	0.8	0.8	0.65
Starting torque [Nm]	0.75	0.75	0.75
Moment of inertia of pulleys [g mm²]	706000	706000	706000
Rail size [mm]	15	15	Ø6

*1) Positioning repeatability is dependant on the type of transmission used

Tab. 8

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ECO 80	0.117	0.173	0.280

Tab. 9

Driving belt

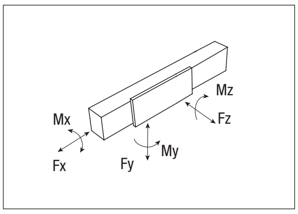
The driving belt is manufactured with friction resistant polyurethane, with steel cord reinforcement for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ECO 80	50 AT 5	50	0.164

Tab. 10

Belt length (mm) SP2/CI = 2 x L - 240

SP1= 2 x L - 90



Load capacity

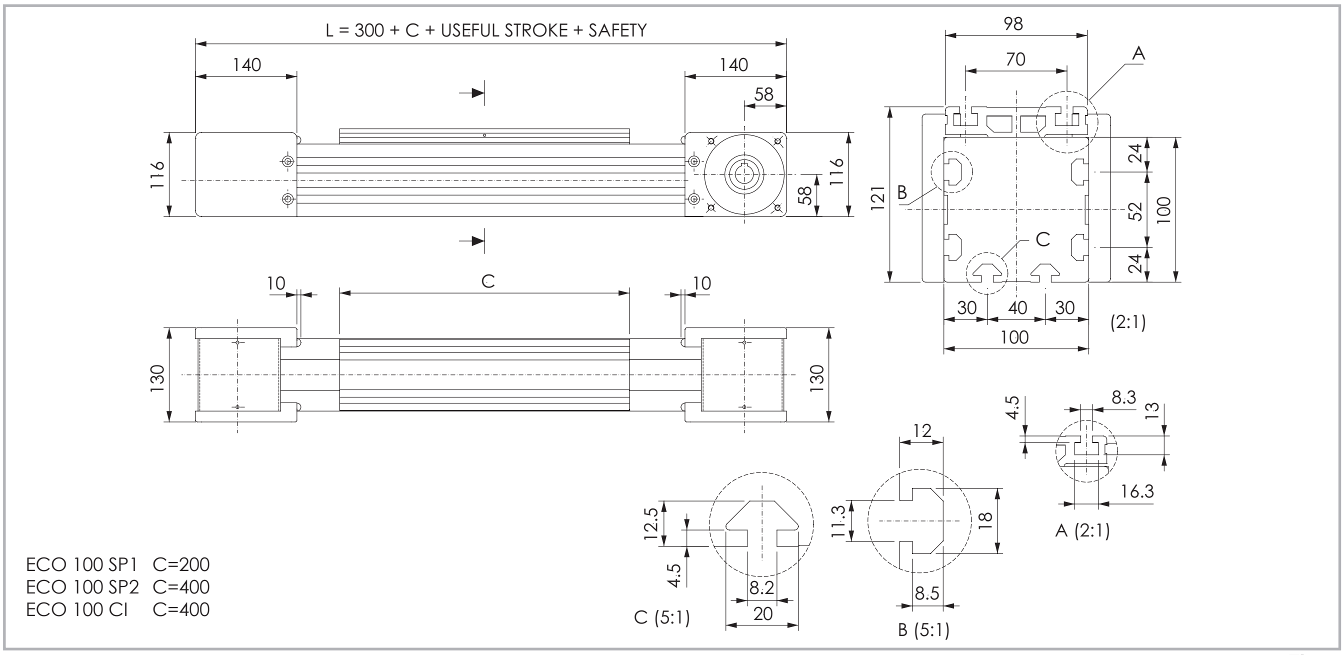
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ECO 80 SP2	2100	1440	48400	22541	48400	320	3412	3412
ECO 80 SP1	2100	1440	24200	11271	24200	160	175	175
ECO 80 CI	2100	1770	4229	8731	2849	83	129	297

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 11

ECO 100 SP2 - ECO 100 SP1 - ECO 100 CI

ECO 100 SP2 - ECO 100 SP1 - ECO 100 CI Dimensions



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 6

Technical data

	Type		
	ECO 100 SP2	ECO 100 SP1	ECO100 CI
Max. useful stroke length [mm]	6630	6830	5530
Max. positioning repeatability [mm]*1	± 0.05	± 0.05	± 0.05
Max. speed [m/s]	5.0	5.0	1.5
Max. acceleration [m/s²]	50	50	1.5
Type of belt	50 AT 10	50 AT 10	50 AT 10
Type of pulley	Z 24	Z 24	Z 24
Pulley pitch diameter [mm]	76.39	76.39	76.39
Carriage displacement per pulley turn [mm]	240	240	240
Carriage weight [kg]	2.9	1.5	3.3
Zero travel weight [kg]	16.7	12.5	17.1
Weight for 100 mm useful stroke [kg]	1.3	1.3	1.1
Starting torque [Nm]	1.90	1.35	1.35
Moment of inertia of pulleys [g mm²]	2070000	2070000	2070000
Rail size [mm]	20	20	Ø10

*1) Positioning repeatability is dependant on the type of transmission used

Tab. 12

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ECO 100	0.342	0.439	0.781

Tab. 13

Driving belt

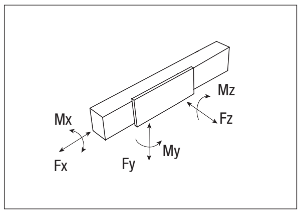
The driving belt is manufactured with friction resistant polyurethane, with steel cord reinforcement for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ECO 100	50 AT 10	50	0.290

Tab. 14

Belt length (mm) SP1 = 2 x L - 112

SP2/CI = 2 x L - 312



Load capacity

Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ECO 100 SP2	4565	2832	76800	35399	76800	722	7603	7603
ECO 100 SP1	4565	2832	38400	17700	38400	361	334	334
ECO 100 CI	4565	3740	9154	20079	6167	214	310	962

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 15

ES

Lubrication

ECO linear units with ball bearing guides

ECO linear are equipped with self lubricating linear ball guides.

The ball bearing carriages of the ECO series are also fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment of these in the circuits.

Special lubrication reservoirs are mounted on the front plates of the linear blocks which continuously provide the necessary amount of grease to the ball raceways under load. These lubrication reservoirs also considerably reduce the frequency of lubrication of the module. This system guarantees a long interval between maintenances: every 5000 km or 1 year of use, based on the value reached first. If a longer service life is required or in case of high dynamic or high loaded applications please contact our offices for further verification.

ECO

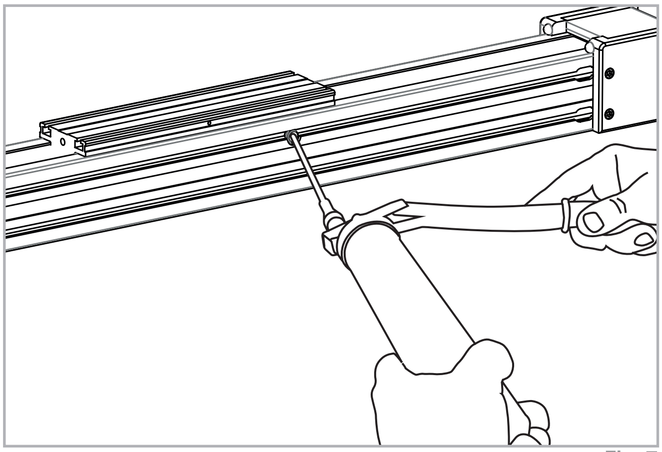


Fig. 7

- Insert the tip of the grease gun in the specific grease blocks.
- For lubrication of linear units use lithium soap grease NLGI 2.
- For specially stressed applications or difficult enviromental conditions, lubrication should be carried out more frequently. Refer to Rollon for further advice.

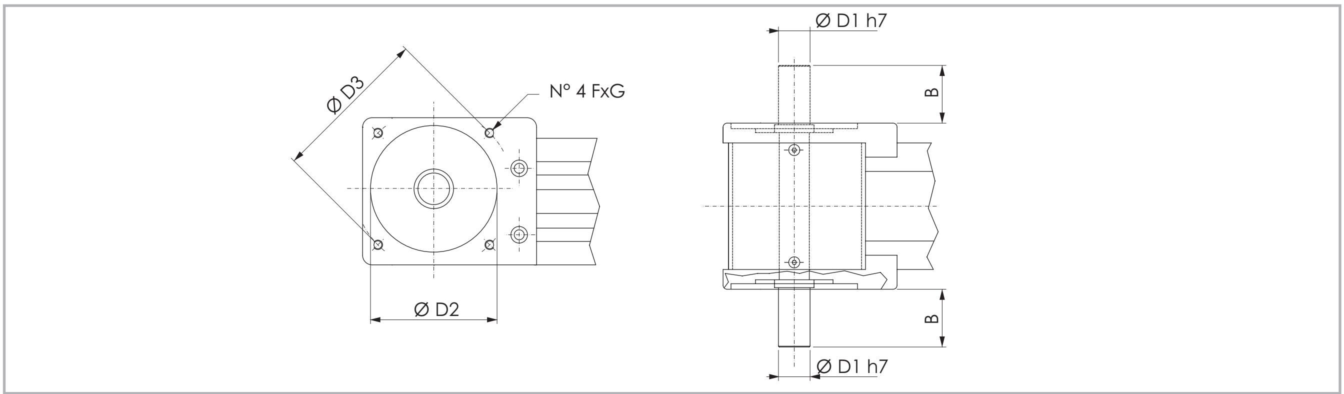
Quantity of lubricant necessary for re-lubrication of each block:

Type	Unit: [cm^3]
ECO 60	0.5
ECO 80	0.7
ECO 100	1.4

Tab. 16

Simple shafts

AS type simple shafts



Position of the simple shaft can be to the left or right of the drive head.

Fig. 8

Dimensions (mm)

Applicable to unit	Shaft type	D1	D2	D3	B	F	G	Head code AS left	Head code AS right
ECO 60	**AS 12**	12	60	75	25	M5	12	2G	2I
ECO 80	**AS 20**	20	80	100	36.5	M6	16	2G	2I
ECO 100	**AS 25**	25	110	130	50	M8	20	2G	2I

Tab. 17

Hollow shafts

Transmission of torque to the drive pulley

Torque is transmitted to the drive pulley from a hollow shaft and keyway. This system may create backlash in the case of alternating loads and high level acceleration. For further information, contact our offices.

Hollow shaft

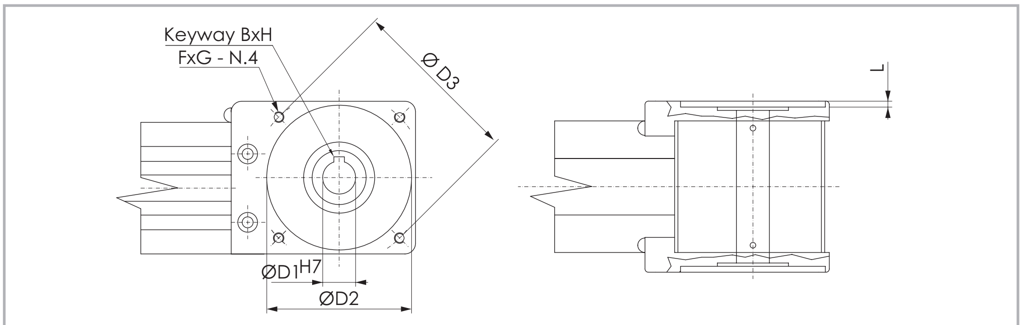


Fig. 9

An (optional) connection flange is required to fit the standard reduction units selected by Rollon.
For further information, contact our offices

Unit	Shaft type	D1	D2	D3	L	Key way BxH	F	G	Drive head code
ECO 60	**AC 12**	12H7	60	75	3.5	4 x 4	M5	12	2A
ECO 80	**AC 19**	19H7	80	100	3.5	6 x 6	M6	16	2A
ECO 100	**AC 25**	25H7	110	130	4.5	8 x 7	M8	20	2A

Tab. 18

ES

Linear units in parallel

Synchronisation kit for use of ECO linear units in parallel

When movement consisting of two linear units in parallel is essential, a synchronisation kit must be used. The kit contains original Rollon blade type precision joints complete with tapered splines and hollow aluminum drive shafts.

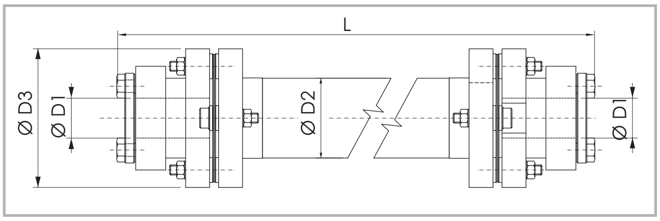


Fig. 10

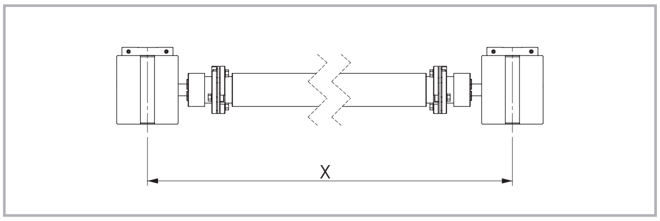


Fig. 11

Unit	Shaft type	D1	D2	D3	Code	Formula for length calculation
ECO 60	**AP 12**	12	25	45	GK12P...1A	L= X-88 [mm]
ECO 80	**AP 20**	20	40	69.5	GK20P...1A	L= X-116 [mm]
ECO 100	**AP 25**	25	70	99	GK25P...1A	L= X-165 [mm]

Tab. 19

Accessories

Fixing by brackets

The linear motion systems used for the Rollon ECO series linear units enables them to support loads in any direction. They can therefore be installed in any position.

To install the units, we recommend use of the dedicated T-slots in the aluminum extruded bodies as shown below.

Moment of inertia [g mm^2] C1 + C2 · (X-Y)

	C1	C2	Y	Weight [Kg] C1+C2 · (X-Y)	
	[g mm^2]	[g mm^2]	[mm]	C1 [Kg]	C2 [Kg mm]
GK12P	61.456	69	166	0.308	0.00056
GK20P	1.014.968	464	250	2.48	0.00148
GK25P	5.525.250	4.708	356	6.24	0.0051

Tab. 20

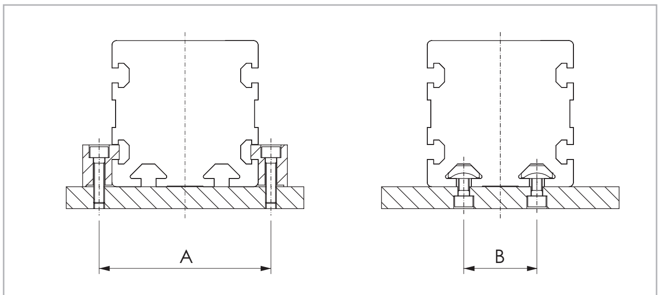
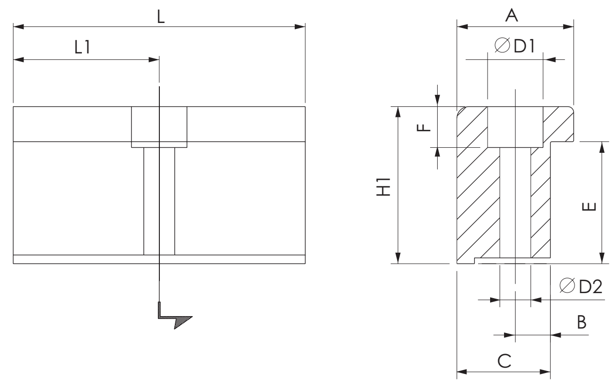


Fig. 12

Unit	A (mm)	B (mm)
ECO 60	72	30
ECO 80	94	40
ECO 100	120	40

Tab. 21

Fixing brackets



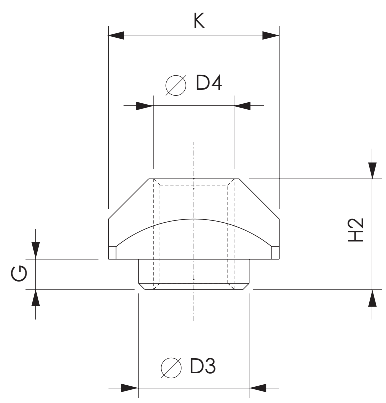
Anodized aluminum block for fixing the linear units through the side slots of the body

Fig. 13

Unit	A	H1	B	C	E	F	D1	D2	L	L1	Code
ECO 60	20	17.5	6	16	11.5	6	9.4	5.3	50	25	1001490
ECO 80	20	20.7	7	16	14.7	7	11	6.4	50	25	1001491
ECO 100	36.5	28.5	10	31	18.5	11.5	16.5	10.5	100	50	1001233

Tab. 22

T-nuts



Steel nuts to be used in the slots of the body.

Fig. 14

Dimensions (mm)

Unit		D3	D4	G	H2	K	Code
ECO 60	S	6.7	M5	2.3	6.5	10	1000627
ECO 60	C	-	M5	-	5	10	1000620
ECO 80	S	8	M6	3.3	8.3	13	1000043
ECO 80	C	-	M6	-	5.8	13	1000910
ECO 80	L	-	M6	-	6.5	17	1000911
ECO 100	S	11	M8	3	11	17	1000932
ECO 100	C	-	M8	-	8	16	1000942
ECO 100	L	-	M8	-	6.5	17	1000943

S = Side - **C** = Carriage - **L** = Lower

Tab. 23

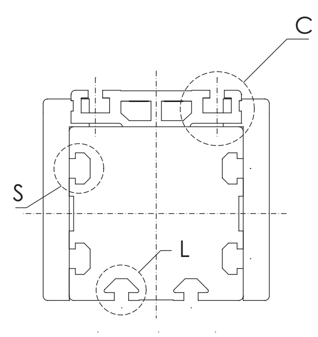


Fig. 15

E S

Proximity

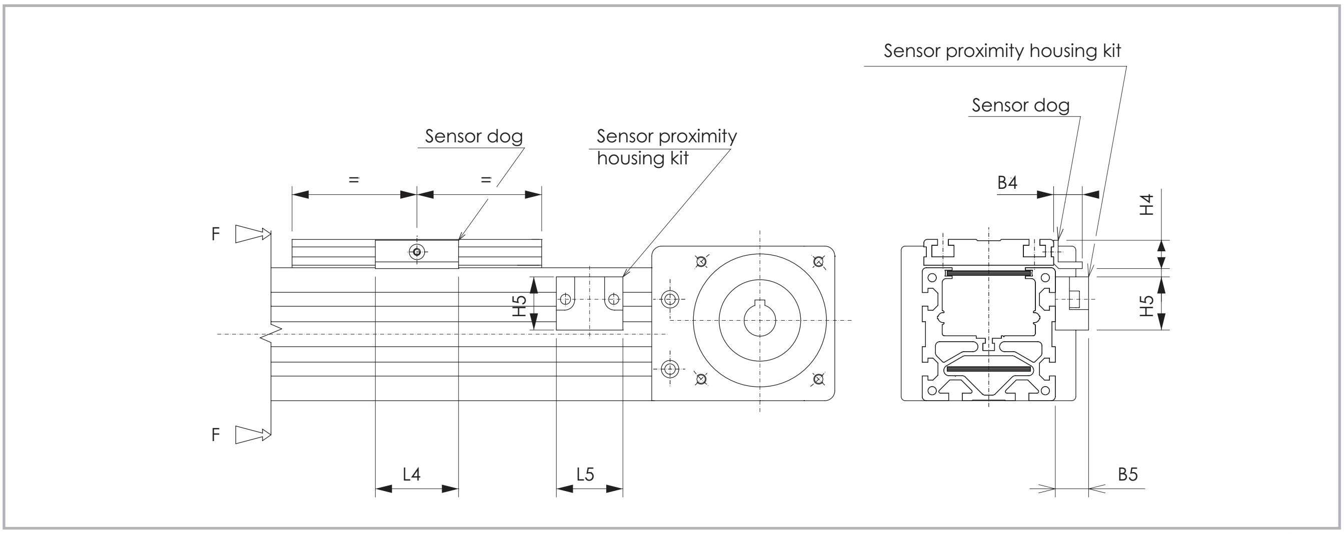


Fig. 16

Sensor proximity housing kit

Anodized aluminum block, red colour, equipped with T-nuts for fixing into the body slots.

Sensor dog

L-shaped bracket in zinc-plated iron, mounted on the carriage and used for the proximity switch operation.

Unit	B4	B5	L4	L5	H4	H5	For proximity	Sensor dog Code	Sensor proximity housing kit code
ECO 60	9.5	14	25	29	12	22.5	Ø 8	G000268	G000213
ECO 80	17.2	20	50	40	17	32	Ø 12	G000267	G000209
ECO 100	17.2	20	50	40	17	32	Ø 12	G000267	G000210

Tab. 24

Ordering key

Identification codes for the ECO linear unit

C	06	2A	0 2000	1A
	06=60			1A=SP1
	08=80			2A=SP2
	10=100			1C=CI

Linear motion system *see pg. ES-4*

L=total length of the unit

Driving head code *see pg. ES-8*

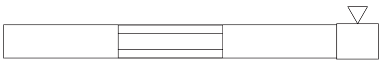
Linear unit size *see from pg. ES-5 to pg. ES-7*

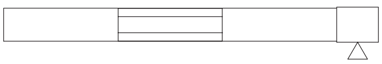
ECO series *see pg. ES-2*

In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Configure Actuator

Left / right orientation


Right


Left

Multiaxis systems

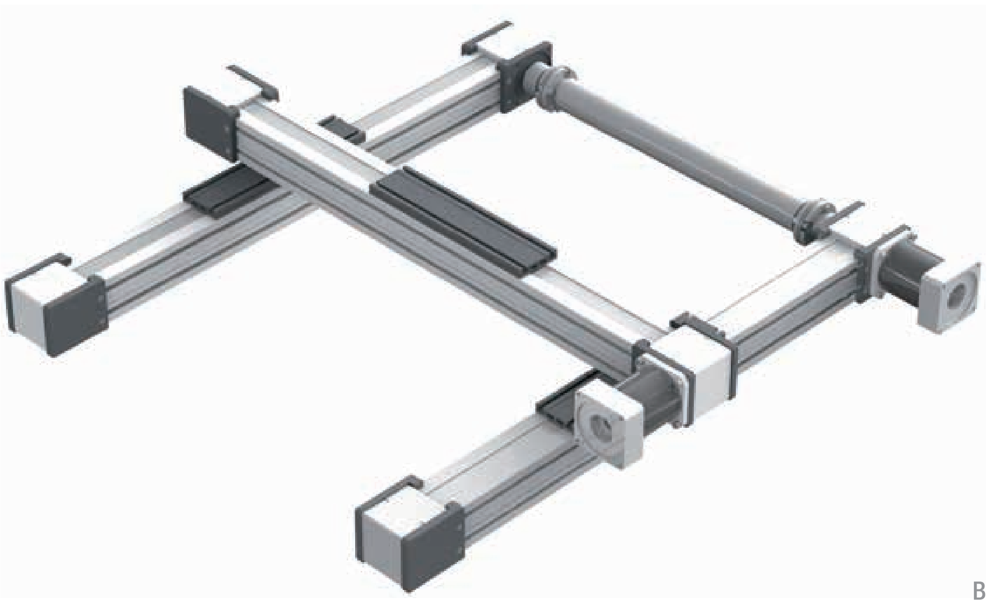
Previously, customers wishing to build multiaxis units have had to design, draw and manufacture all the elements necessary to assemble two or more axis. Rollon now offers a set of fittings including brackets and cross plates to enable multiaxis units to be built. In addition to standard elements, Rollon also provides plates for special applications.

ECO axis system


A

A - Linear units: X axis 1 ECO 80

Two axis X-Y system


B

B - Linear units: X axis: 2 ECO 80 - Y axis 1 ECO 80
Connection kit: 2 Kits of fixing brackets for the ECO 80 unit (Y axis) on the carriages of the ECO 80 units (X axis).

ROLLON®
BY TIMKEN

Uniline System

Uniline A series

Uniline A series description

Fig. 1

Uniline is a family of ready-to-install linear actuators. They consist of internal Compact Rail roller sliders and steel-reinforced polyurethane belts in a rigid aluminum profile. Longitudinal seals enclose the system. This arrangement provides the best protection for the actuator from soiling and damage. In the A series, the fixed bearing rail (T-rail) is mounted horizontally in the aluminum profile. Versions with long (L) or double (D) sliders in one axis are possible.

The most important characteristics:

- Compact design
- Protected internal linear guides
- High traversing speeds
- Grease-free operation possible (depending on the application. For further information, please contact our Application Engineering department)
- High versatility
- Long strokes
- Versions with long or multiple sliders available in one linear axis

Preferred areas of application:

- Handling and automation
- Multi-axis gantries
- Packaging machines
- Cutting machines
- Displaceable panels
- Painting installations
- Welding robots
- Special machines

Technical data:

- Available sizes [mm]:
  Type A: 40, 55, 75
- Length and stroke tolerances:
  For strokes <1 m: +0 mm to +10 mm (+0 in to 0.4 in)
  For strokes >1 m: +0 mm to +15 mm (+0 in to 0.59 in)

The components

Extruded profile

The anodized 6060 aluminum alloy extrusion used for the profile of the Rollon Uniline A series linear units were designed and manufactured by industry experts to optimize weight while maintaining mechanical strength. (see physical-chemical characteristics below). The dimensional tolerances comply with EN 755-9 standard.

Driving belt

The Rollon Uniline A series linear units use steel reinforced polyurethane drive belts with RPP pitch and parabolic profiles. This belt is ideal due to its high load transmission characteristics, compact size and low noise. Used in conjunction with a backlash-free pulley, smooth alternating motion can be achieved. Optimization of the maximum belt width/body dimension ratio enables the following performance characteristics to be achieved:

- **High speed**
- **Low noise**
- **Low wear**

Carriage

The carriage of the Rollon Uniline A series linear units are made entirely of anodized aluminum. Each carriage has mounting T-slots for the connection to the moving element (size 40 has threded holes). Rollon offers multiple carriages to accommodate a vast array of applications.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 1

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.7	69	23	200	880-900	33	600-655

Tab. 2

Mechanical characteristics

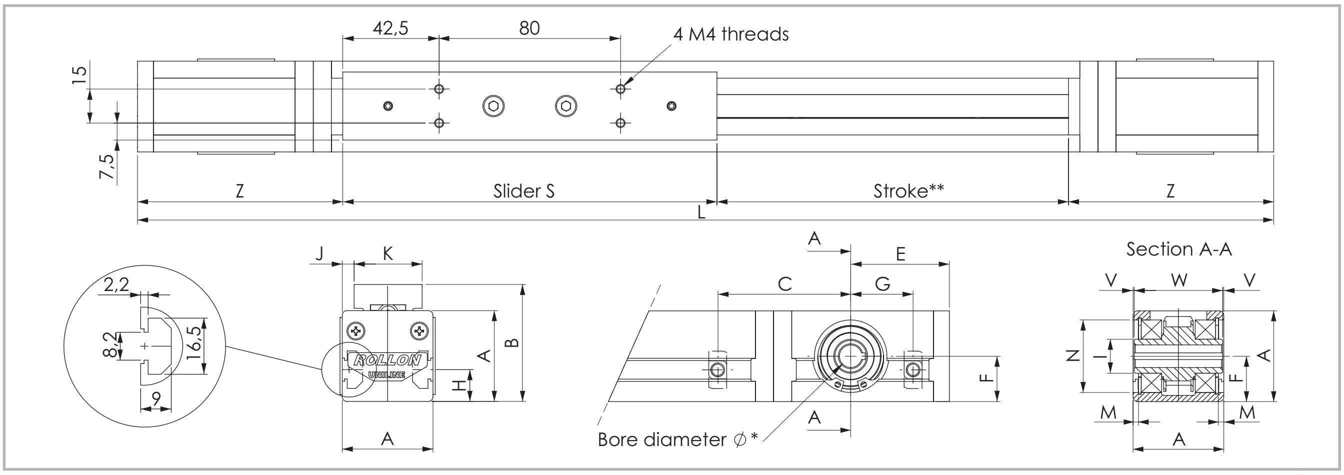
Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
205	165	10	60-80

Tab. 3

US

A40

A40 system



* For information on the motor connection bores, see ordering key. ** The length of the safety stroke is provided on request according to the customer's specific requirements.

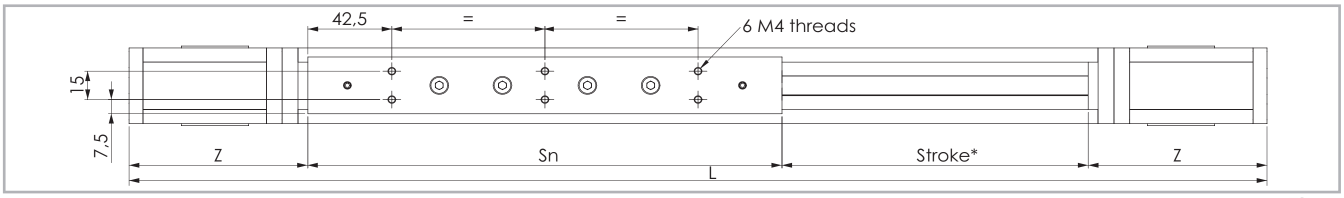
Fig. 2

Type	A [mm]	B [mm]	C* [mm]	E [mm]	F [mm]	G* [mm]	H [mm]	I [mm]	J [mm]	K [mm]	M [mm]	N [mm]	S [mm]	V [mm]	W [mm]	Z [mm]	Stroke** [mm]
A40	40	51.5	57	43.5	20	26	14	Ø 14,9	5	30	2.3	Ø 32	165	0.5	39	91.5	1900

* For the position of the T-nuts when using our motor adapter plates, see pg. US-11ff
** Maximum stroke for a single-piece guiding rail. For longer strokes, see tab. 9

Tab. 4

A40L with long slider



* The length of the safety stroke is provided on request according to the customer's specific requirements.

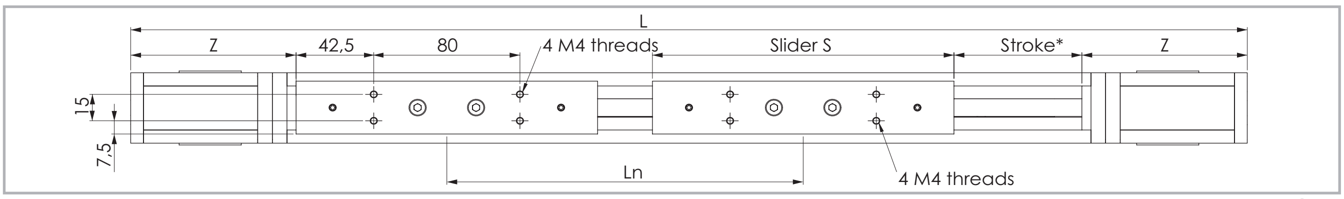
Fig. 3

Type	S_{min} [mm]	S_{max} [mm]	Sn [mm]	Z [mm]	Stroke* [mm]
A40L	240	400	$Sn = S_{min} + n \cdot 10$	91.5	1660

* Maximum stroke for a single-piece guiding rail and a maximum slider plate length S_{max}
For longer strokes, see tab. 9

Tab. 5

A40D with double slider



* The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 4

Type	S [mm]	L_{min} [mm]	L_{max}** [mm]	Ln [mm]	Z [mm]	Stroke* [mm]
A40D	165	235	1900	$Ln = L_{min} + n \cdot 5$	91.5	1660

* Maximum stroke for a single-piece guiding rail and a minimum slider plate distance L_{min}
** Maximum distance L_{max} between the centres of slider plates at a stroke of 0 mm
For longer strokes, see tab. 9

Tab. 6

Load ratings, moments and characteristic data

A40

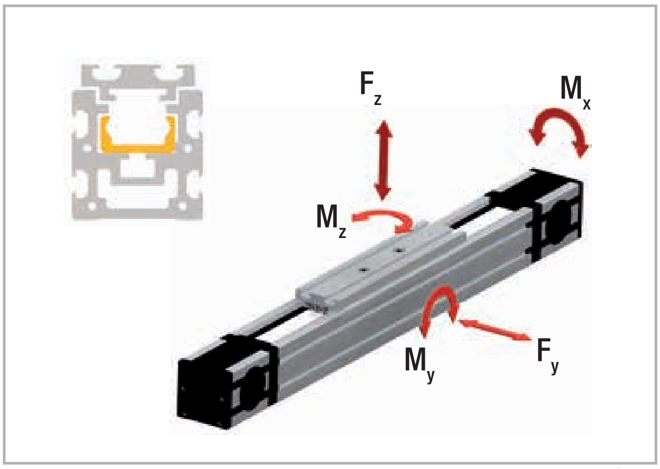


Fig. 5

Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
A40	10RPP5	10	0.041

Tab. 7

Belt length (mm) = 2 x L - 168 Standard slider

Belt length (mm) = 2 x L - S_n-3 Long slider

Belt length (mm) = 2 x L - L_n - 168 Double slider

Type	C [N]	F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
A40	1530	820	300	2.8	5.6	13.1
A40-L	3060	1640	600	5.6	22 to 70	61 to 192
A40-D	3060	1640	600	5.6	70 to 570	193 to 1558

For the calculation of the allowed moments, please observe pages SL-5ff

Tab. 8

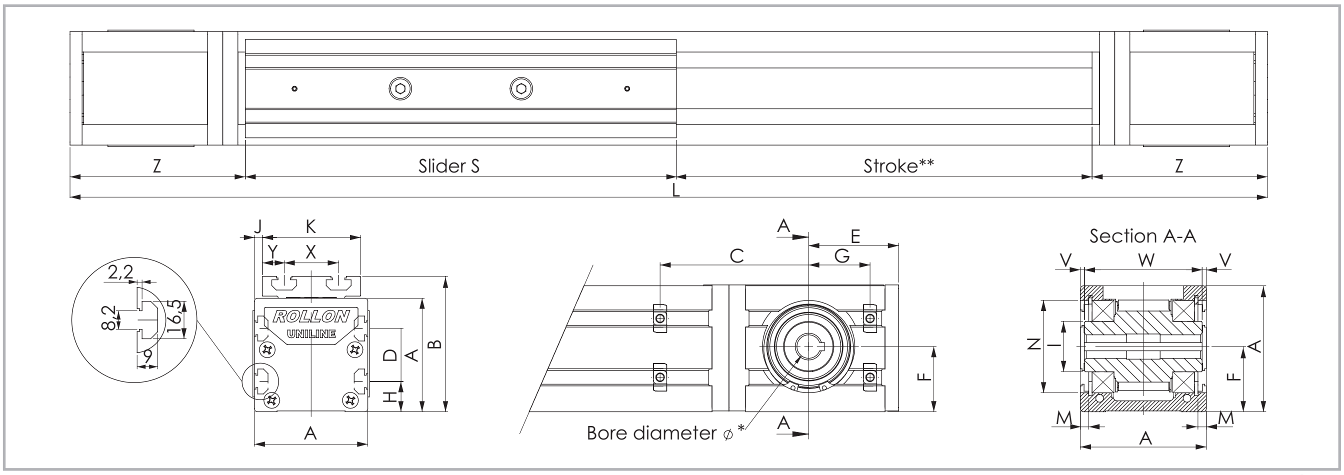
Technical data	Type
	A40
Standard belt tension [N]	160
Moment at no load [Nm]	0.14
Max. traversing speed [m/s]	3
Max. acceleration [m/s²]	10
Repeat accuracy [mm]	0.1
Compact Rail guiding rail	TLV18
Slider type	CS18 spec.
Moment of inertia Iy [cm⁴]	12
Moment of inertia Iz [cm⁴]	13.6
Pitch diameter of pulley [m]	0.02706
Moment of inertia of each pulley [gmm²]	5055
Stroke per shaft revolution [mm]	85
Mass of slider [g]	220
Weight with zero stroke [g]	1459
Weight with 1 m stroke [g]	3465
Max. stroke [mm]	3500
Working temperature	from -20 °C to + 80 °C

Tab. 9

US

A55

A55 system



* For information on the motor connection bores, see ordering key. ** The length of the safety stroke is provided on request according to the customer's specific requirements.

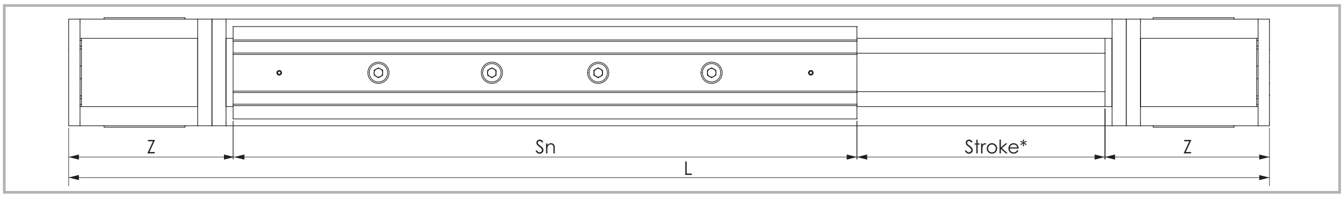
Fig. 6

Type	A [mm]	B [mm]	C* [mm]	D [mm]	E [mm]	F [mm]	G* [mm]	H [mm]	I [mm]	J [mm]	K [mm]	M [mm]	N [mm]	S [mm]	X [mm]	Y [mm]	V [mm]	W [mm]	Z [mm]	Stroke** [mm]
A55	55	71	67.5	25	50.5	27.5	32.5	15	Ø 24.9	1.5	52	2.35	Ø 47	200	28	12	0.5	54	108	3070

* For the position of the T-nuts when using our motor adapter plates, see pg. US-11ff
** Maximum stroke for a single-piece guiding rail. For longer strokes, see tab. 15

Tab. 10

A55L with long slider



* The length of the safety stroke is provided on request according to the customer's specific requirements.

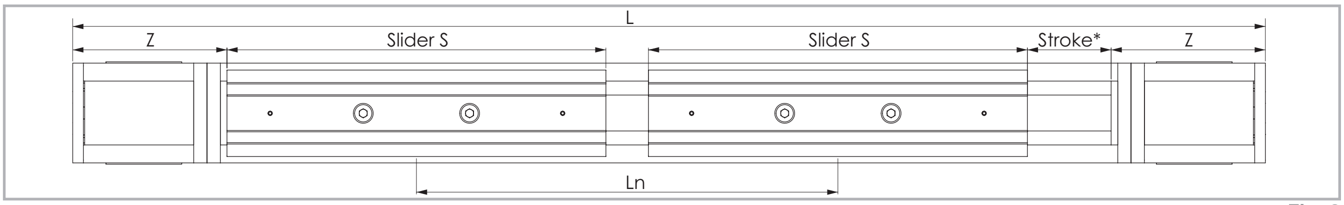
Fig. 7

Type	S_{min} [mm]	S_{max} [mm]	Sn [mm]	Z [mm]	Stroke* [mm]
A055-L	310	500	$Sn = S_{min} + n \cdot 10$	108	2770

* Maximum stroke for a single-piece guiding rail and a maximum slider plate length S_{max}
For longer strokes, see tab. 15

Tab. 11

A55D with double slider



* The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 8

Type	S [mm]	L_{min} [mm]	L_{max} ** [mm]	Ln [mm]	Z [mm]	Stroke* [mm]
A55D	200	300	3070	$Ln = L_{min} + n \cdot 5$	108	2770

* Maximum stroke for a single-piece guiding rail and a minimum slider plate distance L_{min}
** Maximum distance L_{max} between the centres of slider plates at a stroke of 0 mm
For longer strokes, see tab. 15

Tab. 12

Load ratings, moments and characteristic data

A55

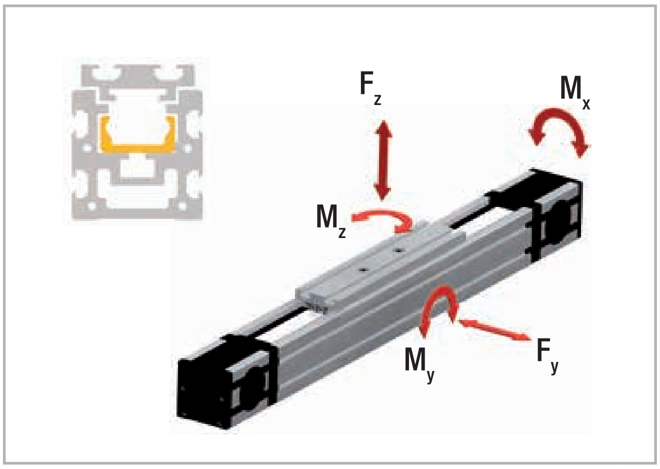


Fig. 9

Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
A55	18RPP5	18	0.074

Tab. 13

Belt length (mm) = 2 x L - 182 Standard slider

Belt length (mm) = 2 x L - S_n+18 Long slider

Belt length (mm) = 2 x L - L_n - 182 Double slider

Type	C [N]	F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
A55	4260	2175	750	11.5	21.7	54.4
A55-L	8520	4350	1500	23	82 to 225	239 to 652
A55-D	8520	4350	1500	23	225 to 2302	652 to 6677

For the calculation of the allowed moments, please observe pages SL-5ff

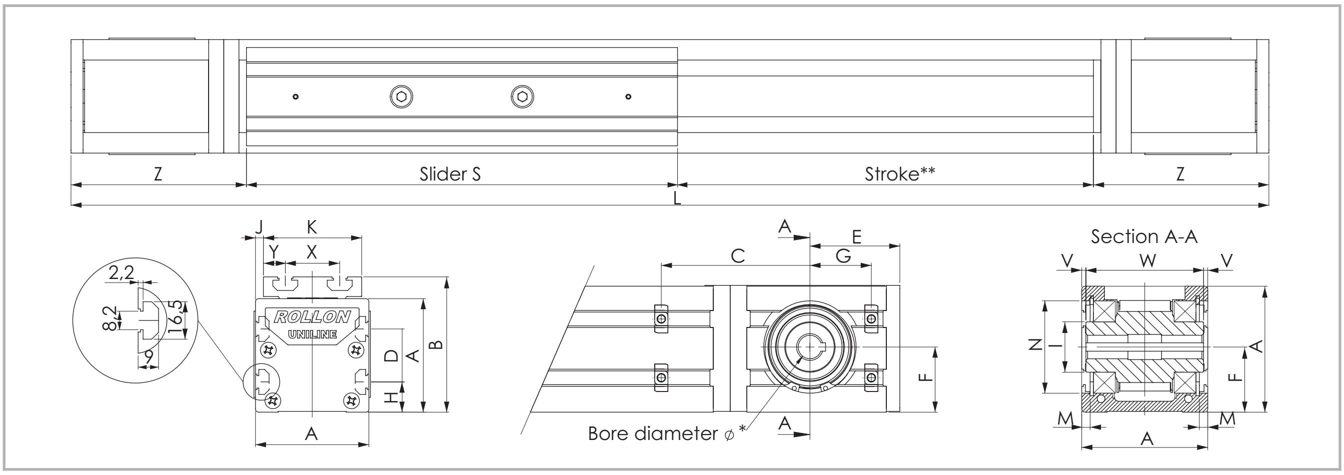
Tab. 14

Technical data	Type
	A55
Standard belt tension [N]	220
Moment at no load [Nm]	0.22
Max. traversing speed [m/s]	5
Max. acceleration [m/s²]	15
Repeat accuracy [mm]	0.1
Compact Rail guiding rail	TLV28
Slider type	CS28 spec.
Moment of inertia Iy [cm⁴]	34.6
Moment of inertia Iz [cm⁴]	41.7
Pitch diameter of pulley [m]	0.04138
Moment of inertia of each pulley [gmm²]	45633
Stroke per shaft revolution [mm]	130
Mass of slider [g]	475
Weight with zero stroke [g]	2897
Weight with 1 m stroke [g]	4505
Max. stroke [mm]	5500
Working temperature	from -20 °C to + 80 °C

Tab. 15

A75

A75 system



* For information on the motor connection bores, see ordering key. ** The length of the safety stroke is provided on request according to the customer's specific requirements.

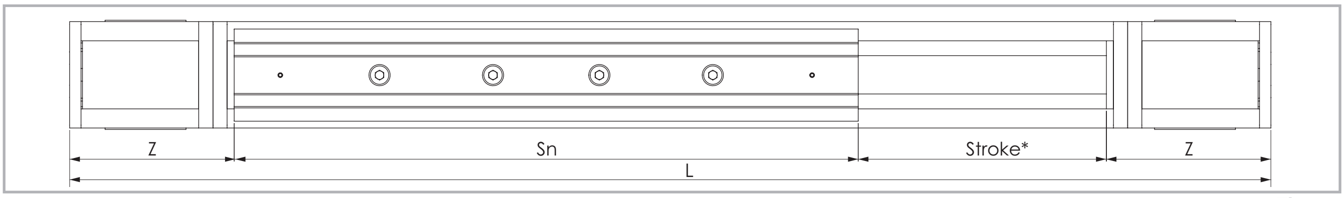
Fig. 10

Type	A [mm]	B [mm]	C* [mm]	D [mm]	E [mm]	F [mm]	G* [mm]	H [mm]	I [mm]	J [mm]	K [mm]	M [mm]	N [mm]	S [mm]	X [mm]	Y [mm]	V [mm]	W [mm]	Z [mm]	Stroke** [mm]
A75	75	90	71.5	35	53.5	38.8	34.5	20	Ø 29.5	5	65	4.85	Ø 55	285	36	14.5	2.3	70.4	116	3420

* For the position of the T-nuts when using our motor adapter plates, see pg. US-11ff
** Maximum stroke for a single-piece guiding rail. For longer strokes, see tab. 21

Tab. 16

A75L with long slider



* The length of the safety stroke is provided on request according to the customer's specific requirements.

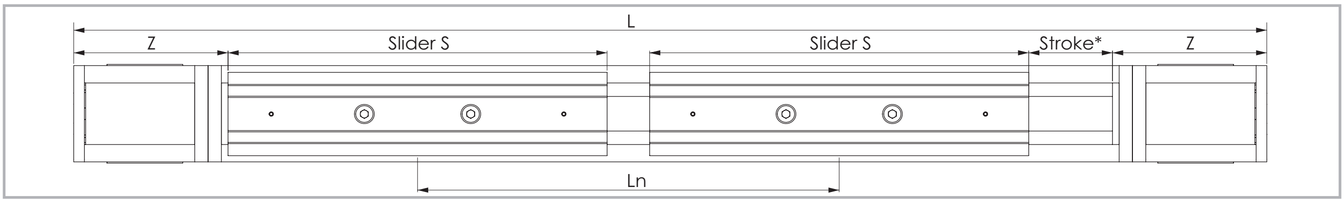
Fig. 11

Type	S_{min} [mm]	S_{max} [mm]	Sn [mm]	Z [mm]	Stroke* [mm]
A75-L	440	700	$Sn = S_{min} + n \cdot 10$	116	3000

* Maximum stroke for a single-piece guiding rail and a maximum slider plate length S_{max}
For longer strokes, see tab. 21

Tab. 17

A75D with double slider



* The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 12

Type	S [mm]	L_{min} [mm]	L_{max}** [mm]	Ln [mm]	Z [mm]	Stroke* [mm]
A75D	285	416	3416	$Ln = L_{min} + n \cdot 8$	116	3000

* Maximum stroke for a single-piece guiding rail and a minimum slider plate distance L_{min}
** Maximum distance L_{max} between the centres of slider plates at a stroke of 0 mm
For longer strokes, see tab. 21

Tab. 18

Load ratings, moments and characteristic data

A75

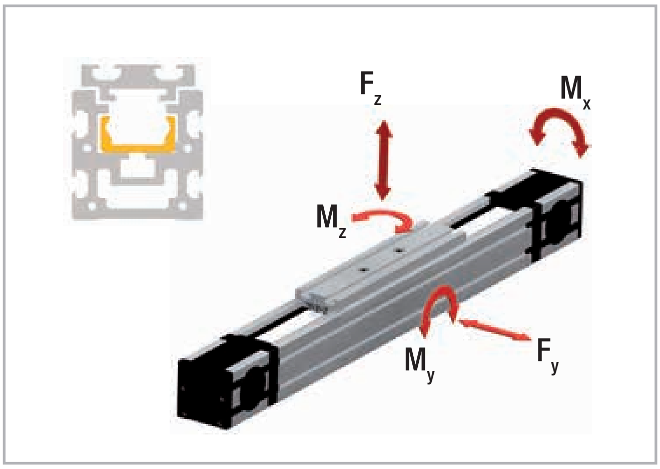


Fig. 13

Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
A75	30RPP8	30	0.185

Tab. 19

Belt length (mm) = 2 x L - 213 Standard slider

Belt length (mm) = 2 x L - S_n+72 Long slider

Belt length (mm) = 2 x L - L_n - 213 Double slider

Type	C [N]	F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
A75	12280	5500	1855	43.6	81.5	209
A75-L	24560	11000	3710	87.2	287 to 770	852 to 2282
A75-D	24560	11000	3710	87.2	771 to 6336	2288 to 18788

For the calculation of the allowed moments, please observe pages SL-5ff

Tab. 20

Technical data	Type
	A75
Standard belt tension [N]	800
Moment at no load [Nm]	1.15
Max. traversing speed [m/s]	7
Max. acceleration [m/s²]	15
Repeat accuracy [mm]	0.1
Compact Rail guiding rail	TLV43
Slider type	CS43 spec.
Moment of inertia Iy [cm⁴]	127
Moment of inertia Iz [cm⁴]	172
Pitch diameter of pulley [m]	0.05093
Moment of inertia of each pulley [gmm²]	139969
Stroke per shaft revolution [mm]	160
Mass of slider [g]	1242
Weight with zero stroke [g]	6729
Weight with 1 m stroke [g]	9751
Max. stroke [mm]	7500
Working temperature	from -20 °C to + 80 °C

Tab. 21

US

Lubrication

The raceways of the guide rails in the Uniline linear axes are prelubricated. To achieve the calculated service life, a lubrication film must always be present between the raceway and the roller. The lubrication film also provides anticorrosion protection to the ground raceways. An approximate value for the lubrication period is every 100 km or every six months. The recommended lubricant is a lithium-based roller bearing grease of medium consistency.

Lubrication of the raceways

Proper lubrication under normal conditions:

- reduces friction
- reduces wear
- reduces stress on the contact faces
- reduces running noise

Lubricants	Thickeners	Temperature range [°C]	Dynamic viscosity [mPas]
Roller bearing grease	Lithium soap	-30 to +170	<4500

Tab. 22

Relubrication of the guide rails

These types of rails have a lubricating conduit on the side of the slider plate through which the lubricant can be applied directly to the raceways. Lubrication can be done in one of two ways:

1. Relubrication using a grease gun:

This is done by inserting the tip of the grease gun into the conduit at the slider plate and injecting the grease inside (see fig. 14). Please note that the grease has to fill the whole conduit in order to lubricate the rail properly; for this reason sufficient grease must be used.

2. Automatic lubrication system:

To connect the unit to an automatic greasing system, use a proper adapter/connector* that attaches to the threaded hole on the side of the trolley. The advantage of this solution is the possibility of rail re-lubrication without machine downtime.

*(Any adapter that may be necessary must be manufactured on site)

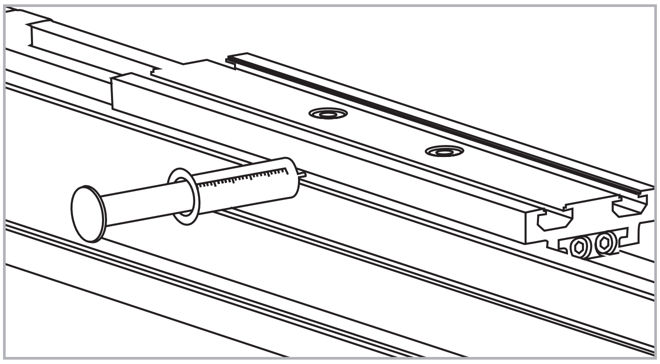


Fig. 14

Cleaning the guide rails

It is always recommended to clean the slider rail prior to any relubrication, in order to remove grease residues. This can be done while performing maintenance work or during a scheduled machine stop.

1. Unscrew the safety screws C (on top of the slider plate) from the belt tensioning device A (see fig. 15).
2. Also completely unscrew the belt tensioning screws B and remove the belt tensioning devices A from their housings.
3. Lift the toothed belt until the guide rails can be seen.
   Important: Ensure that the side seal is not damaged.
4. Clean the rail raceways with a clean and dry cloth. Ensure that all grease and dirt residues from previous work processes are removed. To ensure that the rails are cleaned over their entire length, the slider plate should be moved once over its entire length.
5. Apply a sufficient amount of grease to the raceways.
6. Re-insert the belt tensioning devices A into their housings and mount the belt tensioning screws B. Re-adjust the belt tension (see pg. US-59).
7. Fasten the safety screws C.

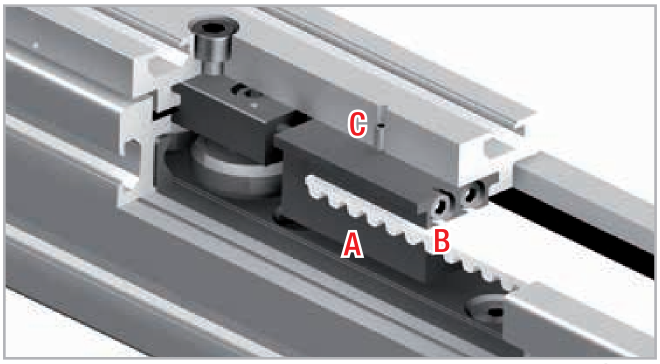


Fig. 15

Accessories

Adapter plates

Standard motor adapter plates AC2

Mounting plates for the most common motors or gearboxes. The connection bores for the motors or gearboxes must be made on site. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

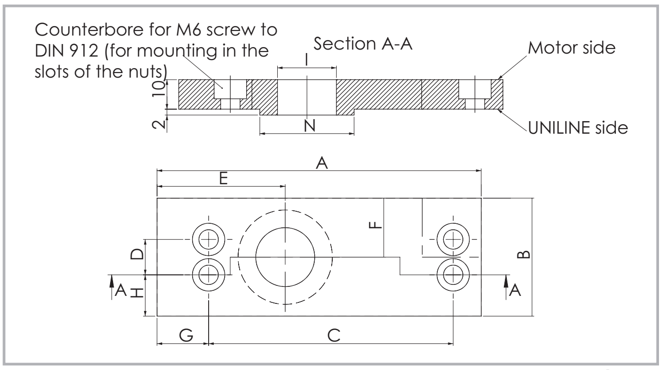


Fig. 16

Size	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	N [mm]
40	110	40	83	12	43.5	20	17.5	14	Ø 20	Ø 32
55	126	55	100	25	50.5	27.5	18	15	Ø 30	Ø 47
75	135	70	106	35	53.5	35	19	17.5	Ø 35	Ø 55

Tab. 23

NEMA plates AC1-P

Mounting plates for NEMA motors or gearboxes. These plates are delivered ready-to-mount on the linear axes. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

Size	NEMA Motors / Gearboxes
40	NEMA 23
55	NEMA 34
75	NEMA 42

Tab. 24

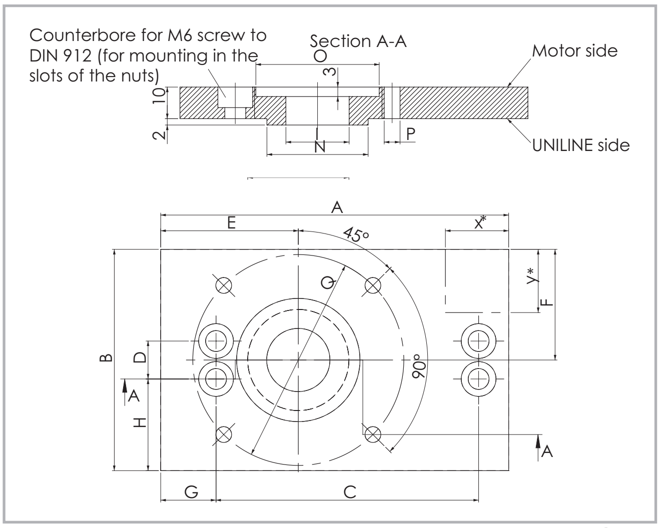


Fig. 17

Size	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	N [mm]	O [mm]	P [mm]	Q [mm]
40	110	70	83	12	43.5	35	17.5	29	20	Ø 32	Ø 39	Ø 5	Ø 66.7
55	126	100	100	25	50.5	50	18	37.5	30	Ø 47	Ø 74	Ø 5.5	Ø 98.4
75	135	120	106	35	53.5	60	19	42.5	35	Ø 55	Ø 57	Ø 7.1	Ø 125.7

Tab. 25

Synchronous use of linear axes in pairs

If two axes are to be used in parallel using a connecting shaft, please specify when ordering, to ensure that the key slots of the pulleys are synchronized.

Fixing brackets APF-2

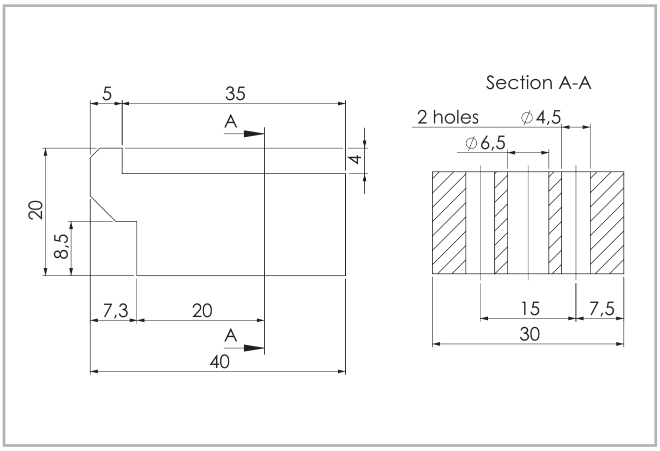


Fig. 18

Fixing clamp for simple mounting of a linear axis on a mounting surface or for connecting two units with or without a connection plate (see pg. US-63).

A spacer* may be necessary.

*(Any spacer that may be necessary must be manufactured on site)

T-nut

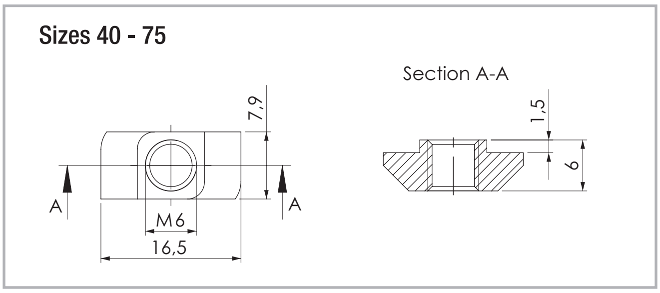


Fig. 19

The maximum tightening torque is 10 Nm.

Assembly kits

T-connection plate APC-1

T-connection plate allows two units to be mounted perpendicular to each other (see pg. US-60). The plate will not interfere with the strokes of either unit. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

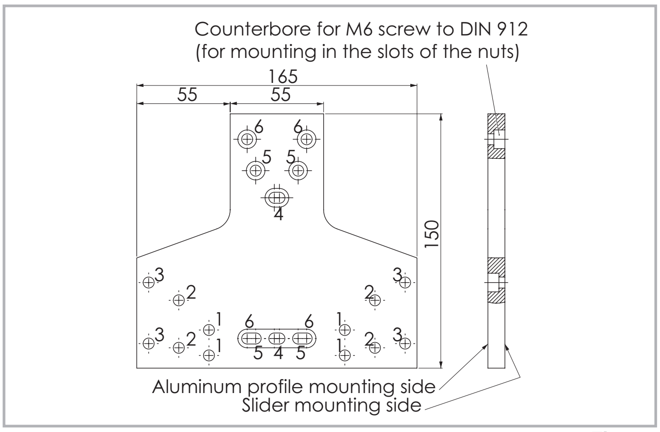


Fig. 20

Note

In case of use of APC-1 plates with E and ED series, please consult Rollon Technical Dpt. In standard there is an interference between U-rail and APC-1 plate. A special version with shorter U-rail at both extremities will be offered.

Size	Fixing holes for the slider	Fixing holes for the profile
40	Holes 1	Holes 4
55	Holes 2	Holes 5
75	Holes 3	Holes 6

Tab. 26

Angle connection plate APC-2

allows the right angle mounting of two units. The trolley of one unit can be mounted to the side of the other (see pg. US-61). The plate will not interfere with the strokes of either unit. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting to the linear units.

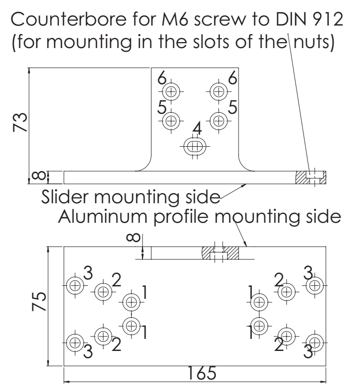


Fig. 21

Size	Fixing holes for the slider	Fixing holes for the profile
40	Holes 1	Holes 4
55	Holes 2	Holes 5
75	Holes 3	Holes 6

Tab. 27

X connection plate APC-3

X connection plate for mounting two sliders perpendicular to each other (see pg. US-62). The plate will not interfere with the strokes of either unit. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

Size	Fixing holes for slider 1	Fixing holes for slider 2
40	Holes 1	Holes 4
55	Holes 2	Holes 5
75	Holes 3	Holes 6

Tab. 28

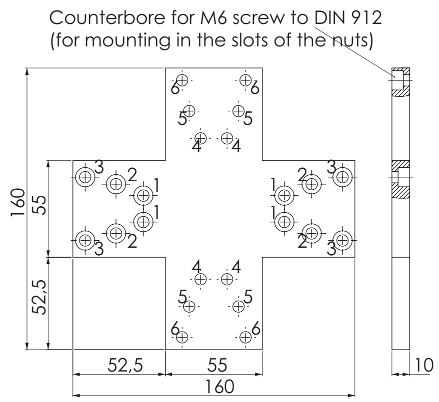


Fig. 22

US

Ordering key

Identification code for Uniline linear unit

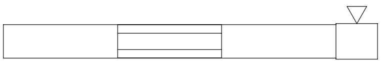
U	A	07	1A	1190	1A	D 500	L 350
		04=40 05=55 07=75					
							Indices of long slider plate *see pg. US-4 - US-6 - US-8*
						Indices of double slider plate, *distance of the centers of slider plates see pg. US-4 - US-6 - US-8*	
					Profile/Rail code		
				L= Total length of the unit			
			Driving head code				
		Size *see pg. US-4 - US-6 - US-8*					
	Type						
Uniline prefix							

Ordering example: UA 07 1A 1190 1A D 500 L 350

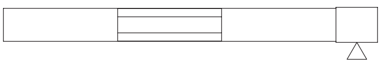
In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Configure Actuator

Left / right orientation



Right



Left

Accessories

Standard motor adapter plate

A	07	AC2	
	04=40 05=55 07=75	Standard motor adapter plates	*see pg. US-11*
	Size	*see pg. US-11*	
Type			

Ordering example: A07-AC2

NEMA motor adapter plates

A	07	AC1	
	04=40 05=55 07=75	NEMA motor adapter plates	*see pg. US-11*
	Size	*see pg. US-11*	
Type			

Ordering example: A07-AC1

T-connection plate Order code: APC-,1 s. pg. US-12
Angle connection plate Order code: APC-2, s. pg. US-13
X connection plate Order code: APC-3, s. pg. US-13
Fixing clamp Order code: APF-2, s. pg. US-12

Motor connection bores

Hole [Ø]	Size 40	Size 55	Size 75	Head code
Metric [mm] with slot for key	**10G8 / 3js9**	**12G8 / 4js9**	**14G8 / 5js9**	1A
		10G8 / 3js9	16G8 / 5js9	2A
		14G8 / 5js9	19G8 / 6js9	3A
		16G8 / 5js9		4A
Metric [mm] for compression coupling			18	1B
			24	2B
Inch [in] with slot for key	3/8 / 1/8	**1/2 / 1/8**	**5/8 / 3/16**	1P
		3/8 / 1/8		2P
		5/8 / 3/16		3P

Tab. 29

The highlighted connection bores are standard connections

Metric: key seat for keys to DIN 6885 form A

Inch: key seat for keys to BS 46 Part 1: 1958

Uniline C series

Uniline C series description

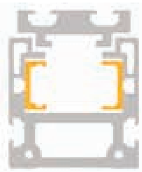


Fig. 23

Uniline is a family of ready-to-install linear actuators. They consist of internal Compact Rail roller sliders and steel-reinforced polyurethane belts in a rigid aluminum profile. Longitudinal seals enclose the system. This arrangement provides the best protection for the actuator from soiling and damage. In the C series, the fixed bearing rail (T-rail) and the compensating bearing rail (U-rail) are mounted in the aluminum profile vertically. Versions with long (L) or double (D) sliders in one axis are possible.

The most important characteristics:

- Compact design
- Protected internal linear guides
- High traversing speeds
- Grease-free operation possible (depending on the application. For further information, please contact our Application Engineering department)
- High versatility
- Long strokes
- Versions with long or multiple sliders available in one linear axis

Preferred areas of application:

- Handling and automation
- Multi-axis gantries
- Packaging machines
- Cutting machines
- Displaceable panels
- Painting installations
- Welding robots
- Special machines

Technical data:

- Available sizes [mm]:
  Type C: 55, 75
- Length and stroke tolerances:
  For strokes <1 m: +0 mm to +10 mm (+0 in to 0.4 in)
  For strokes >1 m: +0 mm to +15 mm (+0 in to 0.59 in)

The components

Extruded profile

The anodized 6060 aluminum alloy extrusion used for the profile of the Rollon Uniline C series linear units were designed and manufactured by industry experts to optimize weight while maintaining mechanical strength. (see physical-chemical characteristics below).The dimensional tolerances comply with EN 755-9 standard.

Driving belt

The Rollon Uniline C series linear units use steel reinforced polyurethane drive belts with RPP pitch and parabolic profiles. This belt is ideal due to its high load transmission characteristics, compact size and low noise. Used in conjunction with a backlash-free pulley, smooth alternating motion can be achieved. Optimization of the maximum belt width/body dimension ratio enables the following performance characteristics to be achieved:

- **High speed**
- **Low noise**
- **Low wear**

Carriage

The carriage of the Rollon Uniline C series linear units are made entirely of anodized aluminum. Each carriage has mounting T-slots for the connection to the moving element. Rollon offers multiple carriages to accommodate a vast array of applications.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 30

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m . K}$	$\frac{J}{kg . K}$	$\Omega . m . 10^{-9}$	°C
2.7	69	23	200	880-900	33	600-655

Tab. 31

Mechanical characteristics

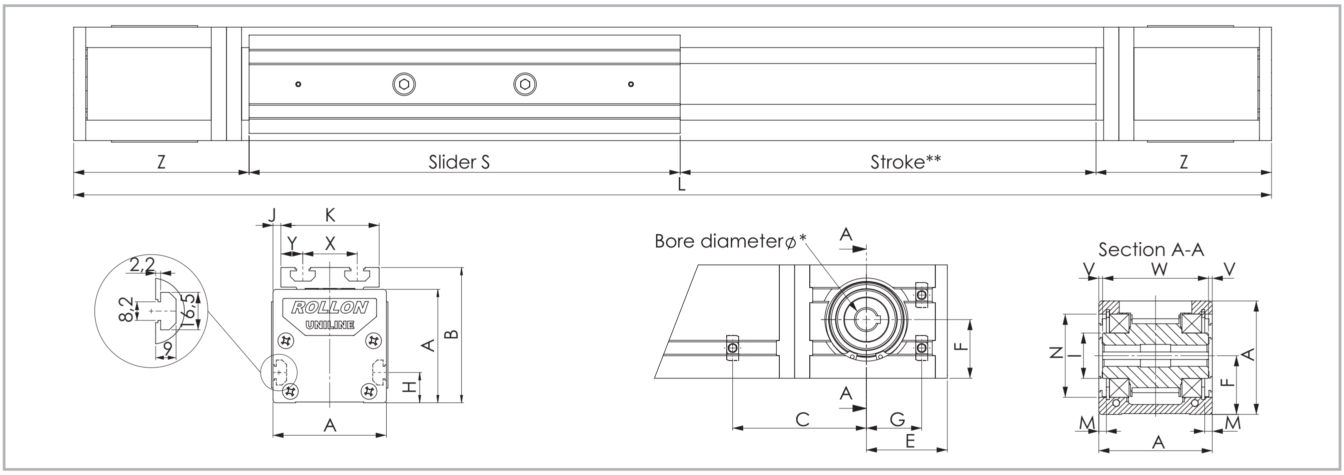
Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
205	165	10	60-80

Tab. 32

U
S

C55

C55 system



* For information on the motor connection bores, see ordering key. ** The length of the safety stroke is provided on request according to the customer's specific requirements.

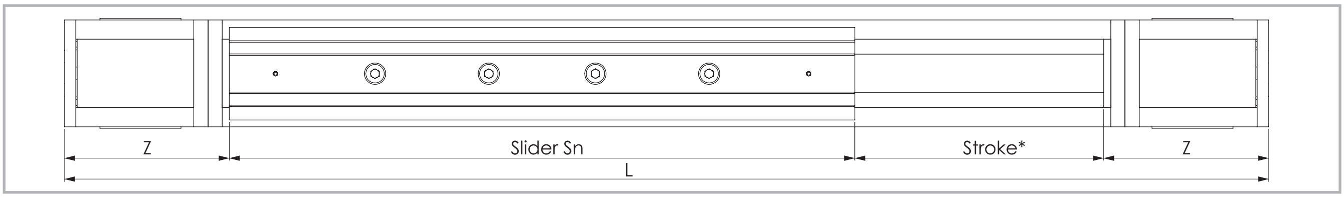
Fig. 24

Type	A [mm]	B [mm]	C* [mm]	E [mm]	F [mm]	G* [mm]	H [mm]	I [mm]	J [mm]	K [mm]	M [mm]	N [mm]	S [mm]	X [mm]	Y [mm]	V [mm]	W [mm]	Z [mm]	Stroke** [mm]
C55	55	71	67.5	50.5	27.5	32.5	15	Ø 24.9	1.5	52	2.35	Ø 47	200	28	12	0.5	54	108	1850

* For the position of the T-nuts when using our motor adapter plates, see pg. US-23ff
** Maximum stroke for a single-piece guiding rail. For longer strokes, see tab. 38

Tab. 33

C55L with long slider



* The length of the safety stroke is provided on request according to the customer's specific requirements.

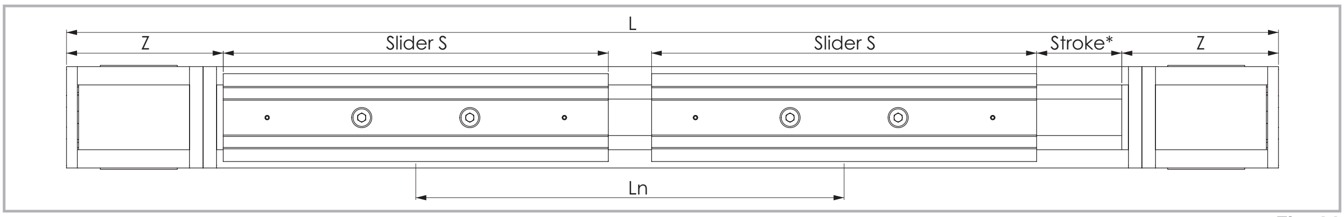
Fig. 25

Type	S_{min} [mm]	S_{max} [mm]	Sn [mm]	Z [mm]	Stroke* [mm]
C55L	310	500	$Sn = S_{min} + n \cdot 10$	108	1550

* Maximum stroke for a single-piece guiding rail and a maximum slider plate length S_{max}
For longer strokes, see tab. 38

Tab. 34

C55D with double slider



* The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 26

Type	S [mm]	L_{min} [mm]	L_{max}** [mm]	Ln [mm]	Z [mm]	Stroke* [mm]
C55D	200	300	1850	$Ln = L_{min} + n \cdot 5$	108	1570

* Maximum stroke for a single-piece guiding rail and a minimum slider plate distance L_{min}
** Maximum distance L_{max} between the centres of slider plates at a stroke of 0 mm
For longer strokes, see tab. 38

Tab. 35

Load ratings, moments and characteristic data

C55

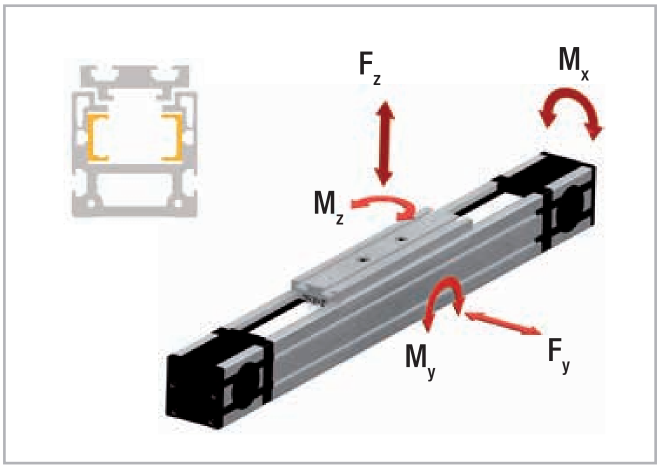


Fig. 27

Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
C55	18RPP5	18	0.074

Tab. 36

Belt length (mm) = 2 x L - 182 Standard slider

Belt length (mm) = 2 x L - S_n+18 Long slider

Belt length (mm) = 2 x L - L_n - 182 Double slider

Type	C [N]	F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
C55	560	300	1640	18.5	65.6	11.7
C55-L	1120	600	3280	37	213 to 525	39 to 96
C55-D	1120	600	3280	37	492 to 3034	90 to 555

For the calculation of the allowed moments, please observe pages SL-5ff

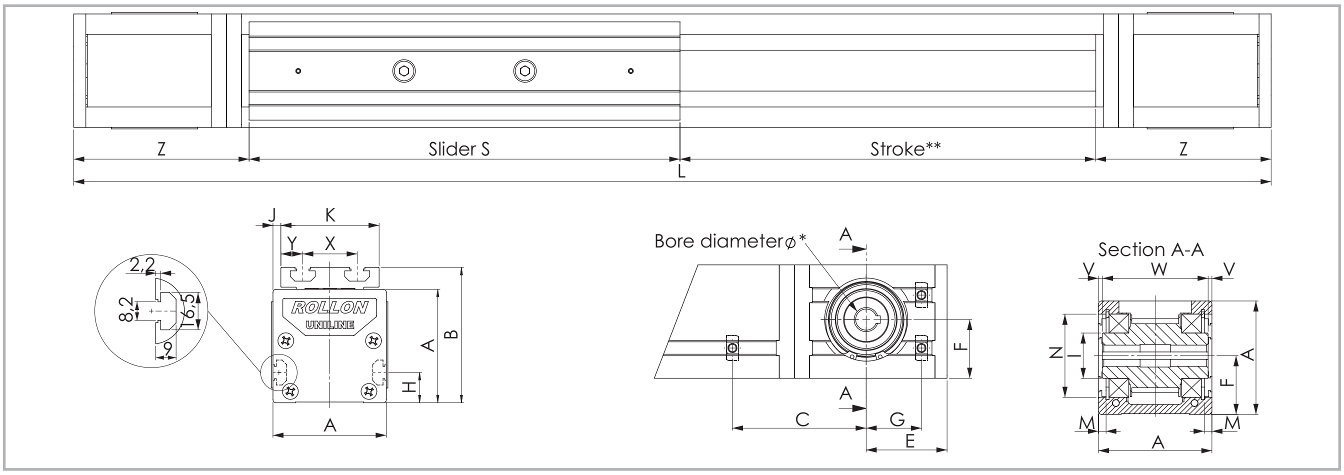
Tab. 37

Technical data	Type
	C55
Standard belt tension [N]	220
Moment at no load [Nm]	0.3
Max. traversing speed [m/s]	3
Max. acceleration [m/s²]	10
Repeat accuracy [mm]	0.1
Compact Rail guiding rail	TLV18 / ULV18
Slider type	2 CS18 spec.
Moment of inertia Iy [cm⁴]	34.4
Moment of inertia Iz [cm⁴]	45.5
Pitch diameter of pulley [m]	0.04138
Moment of inertia of each pulley [gmm²]	45633
Stroke per shaft revolution [mm]	130
Mass of slider [g]	549
Weight with zero stroke [g]	2971
Weight with 1 m stroke [g]	4605
Max. stroke [mm]	5500
Working temperature	from -20 °C to + 80 °C

Tab. 38

C75

C75 system



* For information on the motor connection bores, see ordering key. ** The length of the safety stroke is provided on request according to the customer's specific requirements.

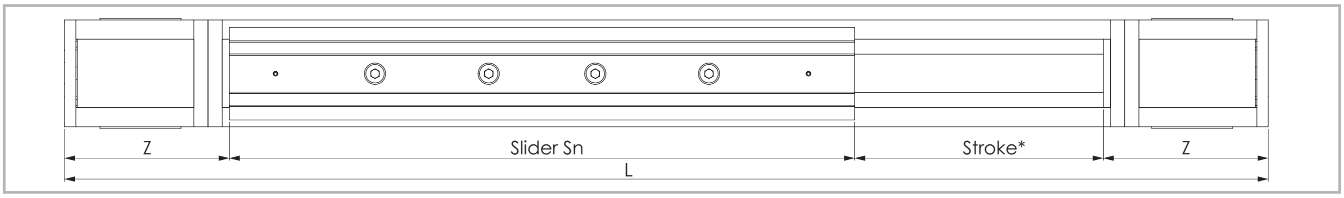
Fig. 28

Type	A [mm]	B [mm]	C* [mm]	E [mm]	F [mm]	G* [mm]	H [mm]	I [mm]	J [mm]	K [mm]	M [mm]	N [mm]	S [mm]	X [mm]	Y [mm]	V [mm]	W [mm]	Z [mm]	Stroke** [mm]
C75	75	90	71.5	53.5	38.8	34.5	20	Ø 29.5	5	65	4.85	Ø 55	285	36	14.5	2.3	70.4	116	3000

* For the position of the T-nuts when using our motor adapter plates, see pg. US-23ff
** Maximum stroke for a single-piece guiding rail. For longer strokes, see tab. 44

Tab. 39

C75L with long slider



* The length of the safety stroke is provided on request according to the customer's specific requirements.

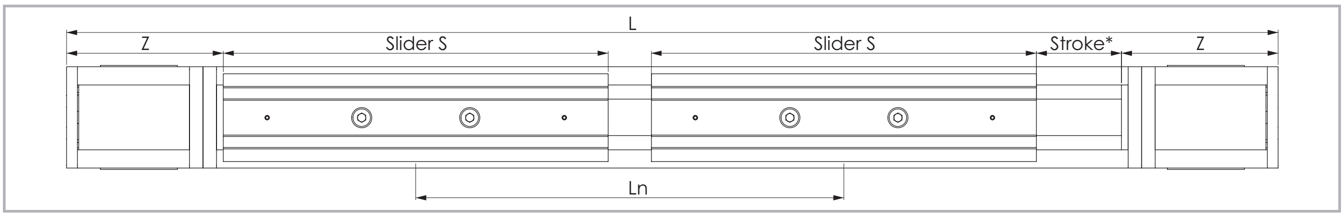
Fig. 29

Type	S_{min} [mm]	S_{max} [mm]	Sn [mm]	Z [mm]	Stroke* [mm]
C75L	440	700	$Sn = S_{min} + n \cdot 10$	116	2610

* Maximum stroke for a single-piece guiding rail and a maximum slider plate length S_{max}
For longer strokes, see tab. 44

Tab. 40

C75D with double slider



* The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 30

Type	S [mm]	L_{min} [mm]	L_{max}** [mm]	Ln [mm]	Z [mm]	Stroke* [mm]
C75D	285	416	3024	$Ln = L_{min} + n \cdot 8$	116	2610

* Maximum stroke for a single-piece guiding rail and a minimum slider plate distance L_{min}
** Maximum distance L_{max} between the centres of slider plates at a stroke of 0 mm
For longer strokes, see tab. 44

Tab. 41

Load ratings, moments and characteristic data

C75

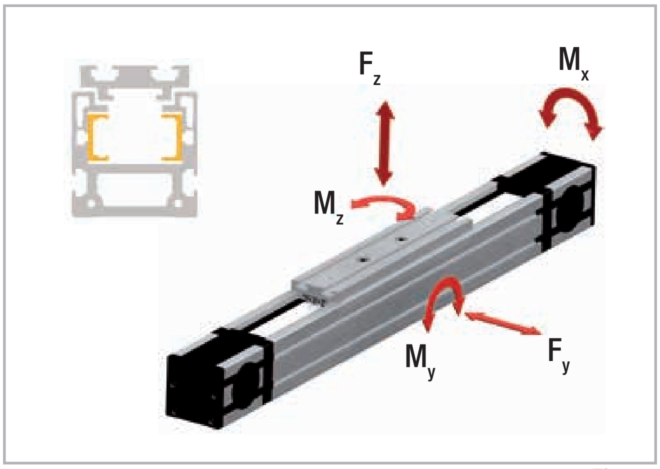


Fig. 31

Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
C75	30RPP8	30	0.185

Tab. 42

Belt length (mm) = 2 x L - 213 Standard slider

Belt length (mm) = 2 x L - S_n+72 Long slider

Belt length (mm) = 2 x L - L_n - 213 Double slider

Type	C [N]	F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
C75	1470	750	4350	85.2	217	36.1
C75-L	2940	1500	8700	170.4	674 to 1805	116 to 311
C75-D	2940	1500	8700	170.4	1809 to 13154	312 to 2268

For the calculation of the allowed moments, please observe pages SL-5ff

Tab. 43

Technical data	Type C75
Standard belt tension [N]	800
Moment at no load [Nm]	1.3
Max. traversing speed [m/s]	5
Max. acceleration [m/s²]	15
Repeat accuracy [mm]	0.1
Compact Rail guiding rail	TLV28 / ULV28
Slider type	2 CS28 spec.
Moment of inertia Iy [cm⁴]	108
Moment of inertia Iz [cm⁴]	155
Pitch diameter of pulley [m]	0.05093
Moment of inertia of each pulley [gmm²]	139969
Stroke per shaft revolution [mm]	160
Mass of slider [g]	1666
Weight with zero stroke [g]	6853
Weight with 1 m stroke [g]	9151
Max. stroke [mm]	7500
Working temperature	from -20 °C to + 80 °C

Tab. 44

US

Lubrication

The raceways of the guide rails in the Uniline linear axes are prelubricated. To achieve the calculated service life, a lubrication film must always be present between the raceway and the roller. The lubrication film also provides anticorrosion protection to the ground raceways. An approximate value for the lubrication period is every 100 km or every six months. The recommended lubricant is a lithium-based roller bearing grease of medium consistency.

Lubrication of the raceways

Proper lubrication under normal conditions:

- reduces friction
- reduces wear
- reduces stress on the contact faces
- reduces running noise

Lubricants	Thickeners	Temperature range [°C]	Dynamic viscosity [mPas]
Roller bearing grease	Lithium soap	-30 to +170	<4500

Tab. 45

Relubrication of the guide rails

1. Slide the slider plate to one end of the unit.
2. At about half the stroke press and manually move the belt in order to see one of the two rails inside the unit (see Fig. 32).
   It may be necessary to release or loosen the belt tension. See chapter Belt tension (pg. US-59).
3. By using a grease syringe (not supplied by ROLLON) or an alternative tool (i.e. brush), apply a sufficient quantity of grease on the raceways.
4. If required, re-establish the recommended belt tension (see pg. US-59).
5. Finally slide the slider plate back and forth over the entire stroke, in order to distribute the grease over the entire length of the rail.

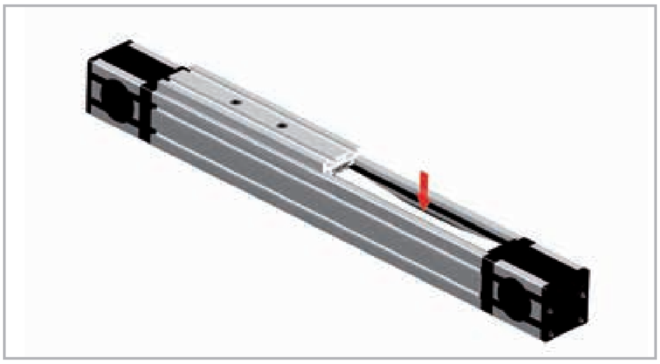


Fig. 32

Cleaning the guide rails

It is always recommended to clean the slider rail prior to any relubrication, in order to remove grease residues. This can be done while performing maintenance work or during a scheduled machine stop.

1. Unscrew the safety screws C (on top of the slider plate) from the belt tensioning device A (see fig. 33).
2. Also completely unscrew the belt tensioning screws B and remove the belt tensioning devices A from their housings.
3. Lift the toothed belt until the guide rails can be seen.
   Important: Ensure that the side seal is not damaged.
4. Clean the rail raceways with a clean and dry cloth. Ensure that all grease and dirt residues from previous work processes are removed. To ensure that the rails are cleaned over their entire length, the slider plate should be moved once over its entire length.
5. Apply a sufficient amount of grease to the raceways.
6. Re-insert the belt tensioning devices A into their housings and mount the belt tensioning screws B. Re-adjust the belt tension (see pg. US-59).
7. Fasten the safety screws C.

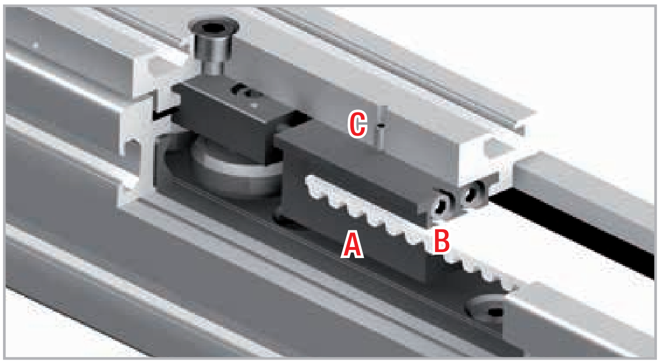


Fig. 33

Accessories

Adapter plates

Standard motor adapter plates AC2

Mounting plates for the most common motors or gearboxes. The connection bores for the motors or gearboxes must be made on site. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

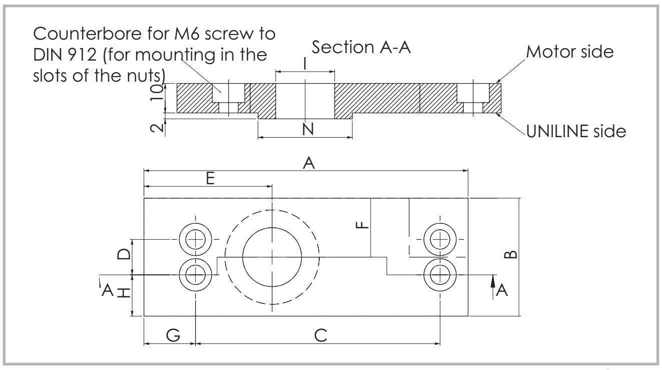


Fig. 34

Size	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	N [mm]
55	126	55	100	25	50.5	27.5	18	15	Ø 30	Ø 47
75	135	70	106	35	53.5	35	19	17.5	Ø 35	Ø 55

Tab. 46

NEMA plates AC1-P

Mounting plates for NEMA motors or gearboxes. These plates are delivered ready-to-mount on the linear axes. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

Size	NEMA Motors / Gearboxes
55	NEMA 34
75	NEMA 42

Tab. 47

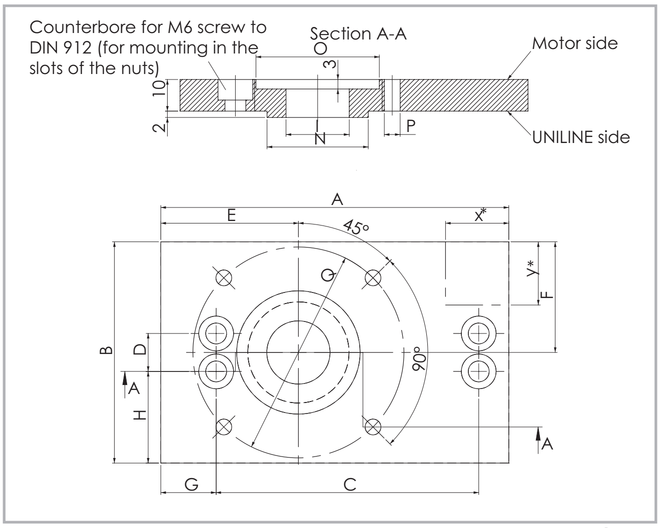


Fig. 35

Size	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	N [mm]	O [mm]	P [mm]	Q [mm]
55	126	100	100	25	50.5	50	18	37.5	30	Ø 47	Ø 74	Ø 5.5	Ø 98.4
75	135	120	106	35	53.5	60	19	42.5	35	Ø 55	Ø 57	Ø 7.1	Ø 125.7

Tab. 48

Synchronous use of linear axes in pairs

If two axes are to be used in parallel using a connecting shaft, please specify when ordering, to ensure that the key slots of the pulleys are synchronized.

US

Fixing brackets APF-2

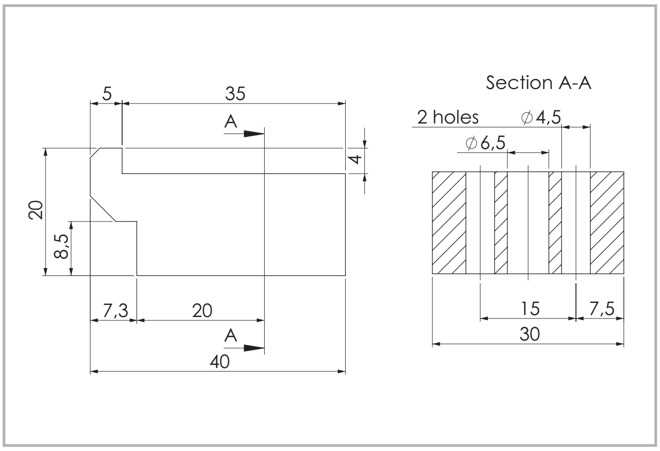


Fig. 36

Fixing clamp for simple mounting of a linear axis on a mounting surface or for connecting two units with or without a connection plate (see pg. US-63).

A spacer* may be necessary.

*(Any spacer that may be necessary must be manufactured on site)

T-nut

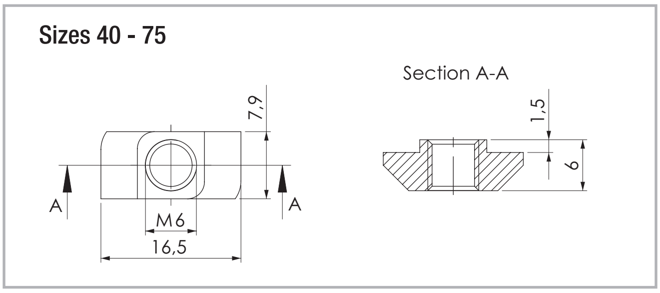


Fig. 37

The maximum tightening torque is 10 Nm.

Assembly kits

T-connection plate APC-1

T-connection plate allows two units to be mounted perpendicular to each other (see pg. US-60). The plate will not interfere with the strokes of either unit. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

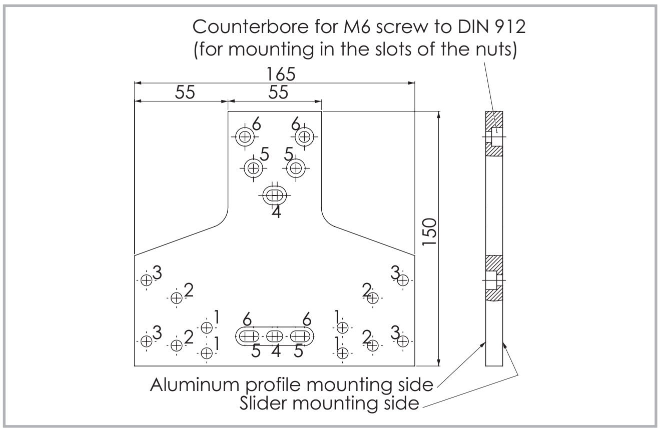


Fig. 38

Note

In case of use of APC-1 plates with E and ED series, please consult Rollon Technical Dpt. In standard there is an interference between U-rail and APC-1 plate. A special version with shorter U-rail at both extremities will be offered.

Size	Fixing holes for the slider	Fixing holes for the profile
55	Holes 2	Holes 5
75	Holes 3	Holes 6

Tab. 49

Angle connection plate APC-2

allows the right angle mounting of two units. The trolley of one unit can be mounted to the side of the other (see pg. US-61). The plate will not interfere with the strokes of either unit. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting to the linear units.

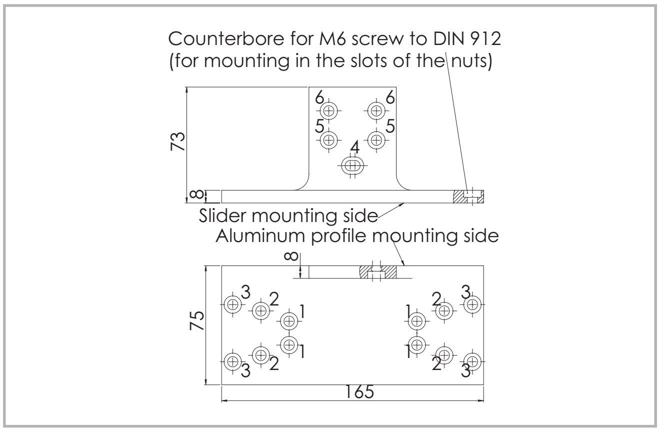


Fig. 39

Size	Fixing holes for the slider	Fixing holes for the profile
55	Holes 2	Holes 5
75	Holes 3	Holes 6

Tab. 50

X connection plate APC-3

X connection plate for mounting two sliders perpendicular to each other (see pg. US-62). The plate will not interfere with the strokes of either unit. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

Size	Fixing holes for slider 1	Fixing holes for slider 2
55	Holes 2	Holes 5
75	Holes 3	Holes 6

Tab. 51

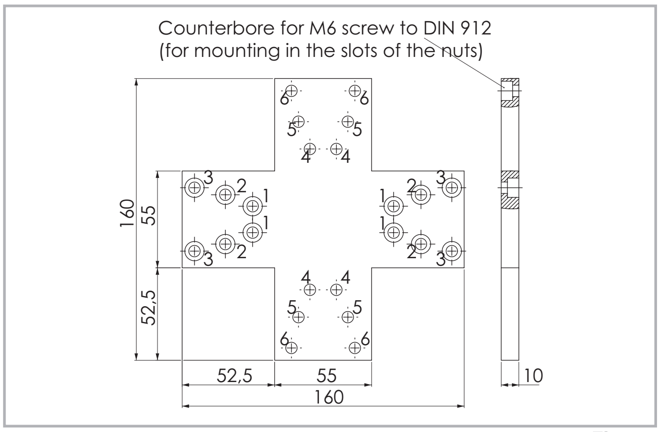


Fig. 40

US

Ordering key

Identification code for Uniline linear unit

U	C	07	1A	1190	1A	D 500	L 350
		05=55 07=75					

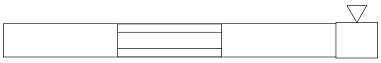
- L 350: Indices of long slider plate *see from pg. US-18 to pg. US-20*
- D 500: Indices of double slider plate, *distance of the centers of slider plates see from pg. US-18 to pg. US-20*
- 1A: Profile/Rail code
- 1190: L= Total length of the unit
- 1A: Driving head code
- 07: Size *see from pg. US-18 to pg. US-20*
- C: Type
- U: Uniline prefix

Ordering example: UC 07 1A 1190 1A D 500 L 350

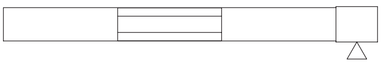
In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Configure Actuator

Left / right orientation



Right



Left

Accessories

Standard motor adapter plate

C	07	AC2	
	05=55 07=75	Standard motor adapter plates	*see pg. US-23*
	Size	*see pg. US-23*	
Type			

Ordering example: C07-AC2

NEMA motor adapter plates

C	07	AC1	
	05=55 07=75	NEMA motor adapter plates	*see pg. US-23*
	Size	*see pg. US-23*	
Type			

Ordering example: C07-AC1

T-connection plate Order code: APC-1, s. pg. US-24
Angle connection plate Order code: APC-2, s. pg. US-25
X connection plate Order code: APC-3, s. pg. US-26
Fixing clamp Order code: APF-2, s. pg. US-24

Motor connection bores

	Size		
Hole [Ø]	55	75	Head code
Metric [mm] with slot for key	**12G8 / 4js9**	**14G8 / 5js9**	1A
	10G8 / 3js9	16G8 / 5js9	2A
	14G8 / 5js9	19G8 / 6js9	3A
	16G8 / 5js9		4A
Metric [mm] for compression coupling		18	1B
		24	2B
Inch [in] with slot for key	**½ / ⅛**	**⅝ / 3⁄16**	1P
	⅜ / ⅛		2P
	⅝ / 3⁄16		3P

Tab. 52

The highlighted connection bores are standard connections

Metric: key seat for keys to DIN 6885 form A

Inch: key seat for keys to BS 46 Part 1: 1958

Uniline E series

Uniline E series description

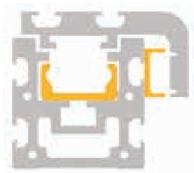


Fig. 41

Uniline is a family of ready-to-install linear actuators. They consist of internal Compact Rail roller sliders and steel-reinforced polyurethane belts in a rigid aluminum profile. Longitudinal seals enclose the system. This arrangement provides the best protection for the actuator from soiling and damage. In the E series, the fixed bearing rail (T-rail) is mounted horizontally in the aluminum profile, and the compensating bearing rail (U-rail) is flanged to the outside of the profile as moment support. Versions with long (L) or double (D) sliders in one axis are possible.

The most important characteristics:

- Compact design
- Protected internal linear guides
- High traversing speeds
- Grease-free operation possible (depending on the application. For further information, please contact our Application Engineering department)
- High versatility
- Long strokes
- Versions with long or multiple sliders available in one linear axis

Preferred areas of application:

- Handling and automation
- Multi-axis gantries
- Packaging machines
- Cutting machines
- Displaceable panels
- Painting installations
- Welding robots
- Special machines

Technical data:

- Available sizes [mm]:
  Type E: 55, 75
- Length and stroke tolerances:
  For strokes <1 m: +0 mm to +10 mm (+0 in to 0.4 in)
  For strokes >1 m: +0 mm to +15 mm (+0 in to 0.59 in)

The components

Extruded profile

The anodized 6060 aluminum alloy extrusion used for the profile of the Rollon Uniline E series linear units were designed and manufactured by industry experts to optimize weight while maintaining mechanical strength. (see physical-chemical characteristics below).The dimensional tolerances comply with EN 755-9 standard.

Driving belt

The Rollon Uniline E series linear units use steel reinforced polyurethane drive belts with RPP pitch and parabolic profiles. This belt is ideal due to its high load transmission characteristics, compact size and low noise. Used in conjunction with a backlash-free pulley, smooth alternating motion can be achieved. Optimization of the maximum belt width/body dimension ratio enables the following performance characteristics to be achieved:

- **High speed**
- **Low noise**
- **Low wear**

Carriage

The carriage of the Rollon Uniline E series linear units are made entirely of anodized aluminum. Each carriage has mounting T-slots for the connection to the moving element. Rollon offers multiple carriages to accommodate a vast array of applications.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 53

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.7	69	23	200	880-900	33	600-655

Tab. 54

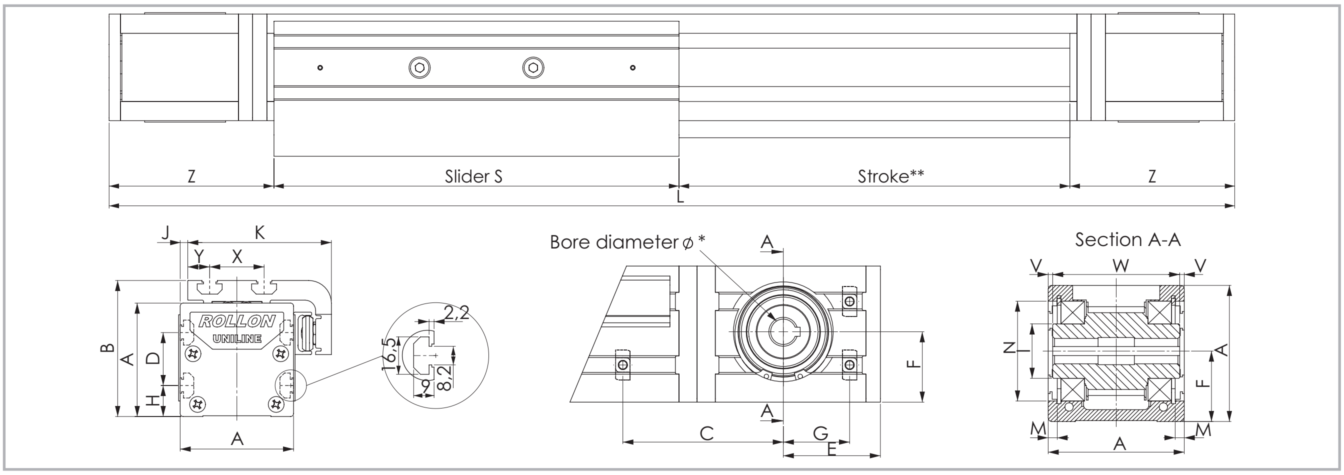
Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
205	165	10	60-80

Tab. 55

E55

E55 system



* For information on the motor connection bores, see ordering key. ** The length of the safety stroke is provided on request according to the customer's specific requirements.

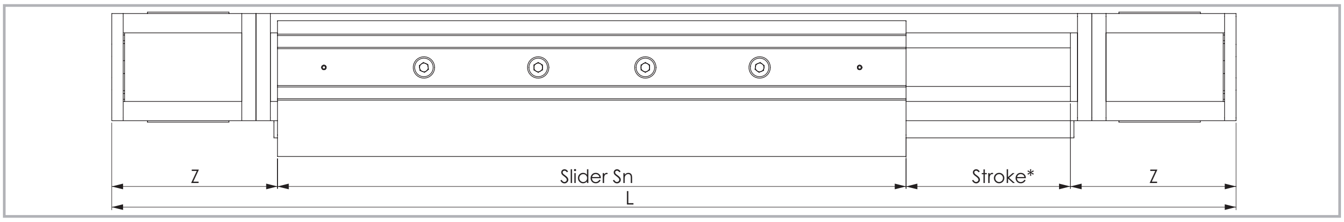
Fig. 42

Type	A [mm]	B [mm]	C* [mm]	D [mm]	E [mm]	F [mm]	G* [mm]	H [mm]	I [mm]	J [mm]	K [mm]	M [mm]	N [mm]	S [mm]	X [mm]	Y [mm]	V [mm]	W [mm]	Z [mm]	Stroke** [mm]
E55	55	71	67.5	25	50.5	27.5	32.5	15	Ø 24.9	1.5	71	2.35	Ø 47	200	28	12	0.5	54	108	3070

* For the position of the T-nuts when using our motor adapter plates, see pg. US-35ff
** Maximum stroke for a single-piece guiding rail. For longer strokes, see tab. 61

Tab. 56

E55L with long slider



* The length of the safety stroke is provided on request according to the customer's specific requirements.

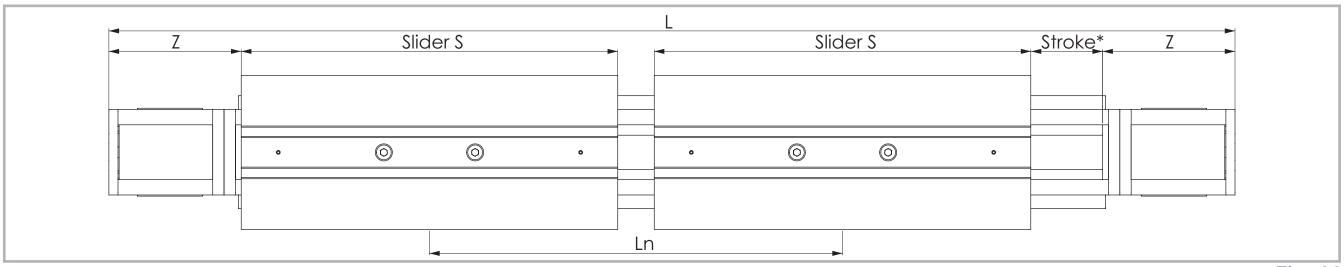
Fig. 43

Type	S_{min} [mm]	S_{max} [mm]	Sn [mm]	Z [mm]	Stroke* [mm]
E55L	310	500	$Sn = S_{min} + n \cdot 10$	108	2770

* Maximum stroke for a single-piece guiding rail and a maximum slider plate length S_{max}
For longer strokes, see tab. 61

Tab. 57

E55D with double slider



* The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 44

Type	S [mm]	L_{min} [mm]	L_{max}** [mm]	Ln [mm]	Z [mm]	Stroke* [mm]
E55D	200	300	3070	$Ln = L_{min} + n \cdot 5$	108	2770

* Maximum stroke for a single-piece guiding rail and a minimum slider plate distance L_{min}
** Maximum distance L_{max} between the centres of slider plates at a stroke of 0 mm
For longer strokes, see tab. 61

Tab. 58

Load ratings, moments and characteristic data

E55

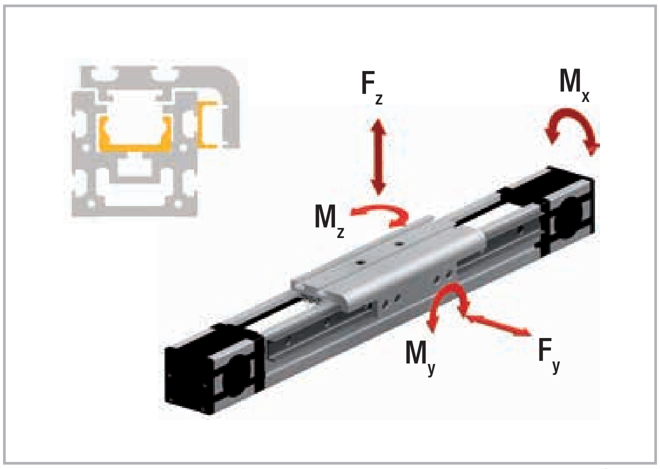


Fig. 45

Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
E55	18RPP5	18	0.074

Tab. 59

Belt length (mm) = 2 x L - 182 Standard slider
Belt length (mm) = 2 x L - S_n+18 Long slider
Belt length (mm) = 2 x L - L_n - 182 Double slider

Type	C [N]	F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
E55	4260	2175	1500	25.5	43.4	54.4
E55-L	8520	4350	3000	51	165 to 450	239 to 652
E55-D	8520	4350	3000	51	450 to 4605	652 to 6677

For the calculation of the allowed moments, please observe pages SL-5ff

Tab. 60

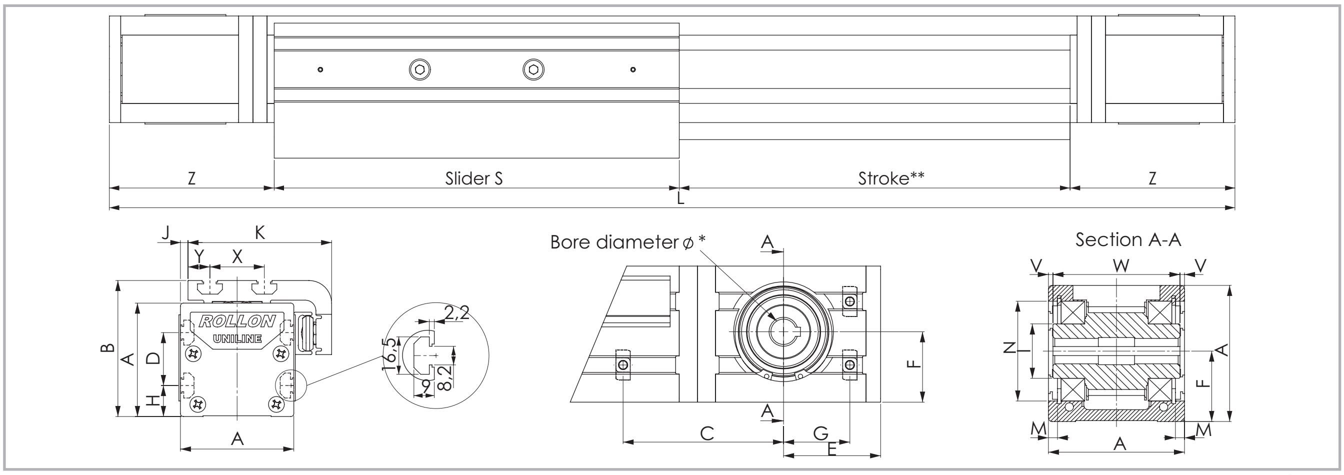
Technical data	Type
	E55
Standard belt tension [N]	220
Moment at no load [Nm]	0.3
Max. traversing speed [m/s]	3
Max. acceleration [m/s²]	10
Repeat accuracy [mm]	0.1
Compact Rail guiding rail	TLV28 / ULV18
Slider type	CS28 spec. / CPA 18
Moment of inertia Iy [cm⁴]	34.6
Moment of inertia Iz [cm⁴]	41.7
Pitch diameter of pulley [m]	0.04138
Moment of inertia of each pulley [gmm²]	45633
Stroke per shaft revolution [mm]	130
Mass of slider [g]	635
Weight with zero stroke [g]	3167
Weight with 1 m stroke [g]	5055
Max. stroke [mm]	5500
Working temperature	from -20 °C to + 80 °C

Tab. 61

US

E75

E75 system



* For information on the motor connection bores, see ordering key. ** The length of the safety stroke is provided on request according to the customer's specific requirements.

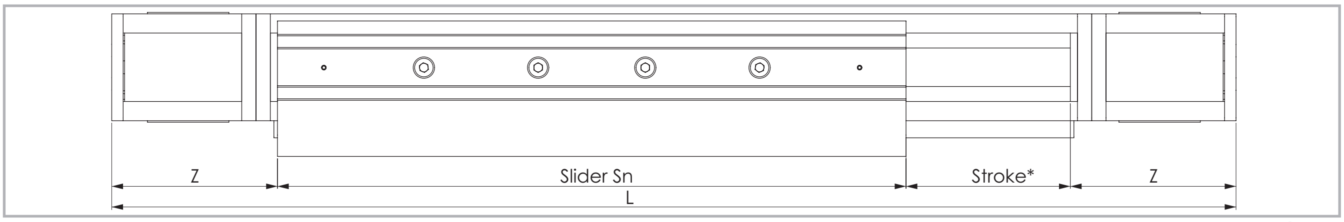
Fig. 46

Type	A [mm]	B [mm]	C* [mm]	D [mm]	E [mm]	F [mm]	G* [mm]	H [mm]	I [mm]	J [mm]	K [mm]	M [mm]	N [mm]	S [mm]	X [mm]	Y [mm]	V [mm]	W [mm]	Z [mm]	Stroke** [mm]
E75	75	90	71.5	35	53.5	38.8	34.5	20	Ø 29.5	5	95	4.85	Ø 55	285	36	14.5	2.3	70.4	116	3420

* For the position of the T-nuts when using our motor adapter plates, see pg. US-35ff
** Maximum stroke for a single-piece guiding rail. For longer strokes, see tab. 67

Tab. 62

E75L with long slider



* The length of the safety stroke is provided on request according to the customer's specific requirements.

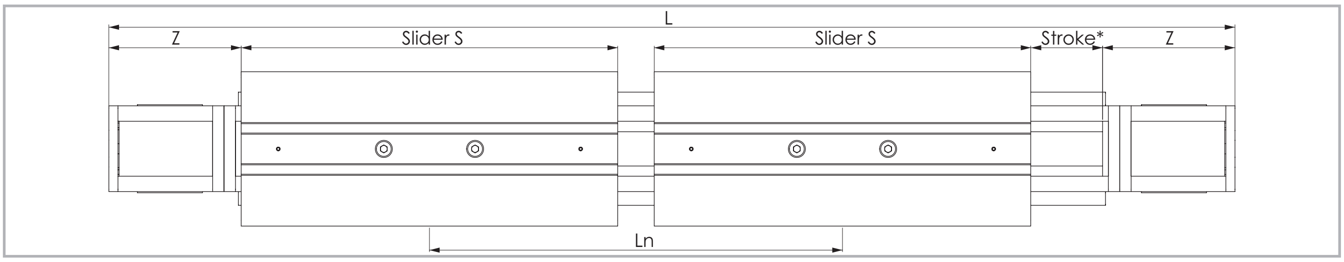
Fig. 47

Type	S_{min} [mm]	S_{max} [mm]	Sn [mm]	Z [mm]	Stroke* [mm]
E75L	440	700	$Sn = S_{min} + n \cdot 10$	116	3000

* Maximum stroke for a single-piece guiding rail and a maximum slider plate length S_{max}
For longer strokes, see tab. 67

Tab. 63

E75D with double slider



* The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 48

Type	S [mm]	L_{min} [mm]	L_{max} ** [mm]	Ln [mm]	Z [mm]	Stroke* [mm]
E75D	285	416	3416	$Ln = L_{min} + n \cdot 8$	116	3000

* Maximum stroke for a single-piece guiding rail and a minimum slider plate distance L_{min}
** Maximum distance L_{max} between the centres of slider plates at a stroke of 0 mm
For longer strokes, see tab. 67

Tab. 64

Load ratings, moments and characteristic data

E75

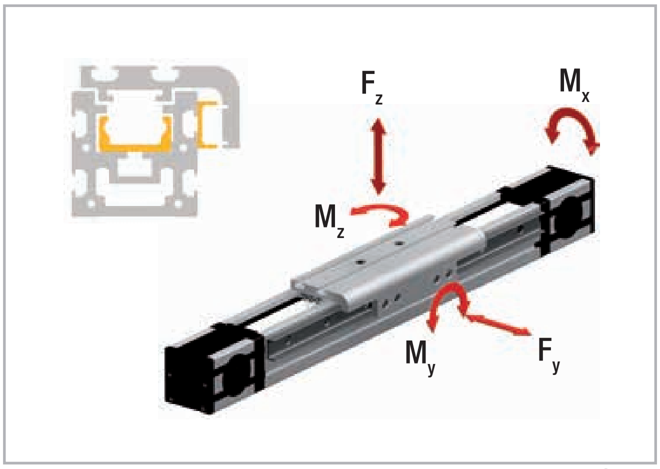


Fig. 49

Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
E75	30RPP8	30	0.185

Tab. 65

Belt length (mm) = 2 x L - 213 Standard slider
Belt length (mm) = 2 x L - S_n+72 Long slider
Belt length (mm) = 2 x L - L_n - 213 Double slider

Type	C [N]	F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
E75	12280	5500	3710	85.5	163	209
E75-L	24560	11000	7420	171	575 to 1540	852 to 2282
E75-D	24560	11000	7420	171	1543 to 12673	2288 to 18788

For the calculation of the allowed moments, please see pages SL-5ff

Tab. 66

Technical data	Type
	E75
Standard belt tension [N]	800
Moment at no load [Nm]	1.3
Max. traversing speed [m/s]	5
Max. acceleration [m/s²]	15
Repeat accuracy [mm]	0.1
Compact Rail guiding rail	TLV43 / ULV28
Slider type	CS43 spec. / CPA 28
Moment of inertia Iy [cm⁴]	127
Moment of inertia Iz [cm⁴]	172
Pitch diameter of pulley [m]	0.05093
Moment of inertia of each pulley [gmm²]	139969
Stroke per shaft revolution [mm]	160
Mass of slider [g]	1772
Weight with zero stroke [g]	7544
Weight with 1 m stroke [g]	10751
Max. stroke [mm]	7500
Working temperature	from -20 °C to + 80 °C

Tab. 67

US

Lubrication

The raceways of the guide rails in the Uniline linear axes are prelubricated. To achieve the calculated service life, a lubrication film must always be present between the raceway and the roller. The lubrication film also provides anticorrosion protection to the ground raceways. An approximate value for the lubrication period is every 100 km or every six months. The recommended lubricant is a lithium-based roller bearing grease of medium consistency.

Lubrication of the raceways

Proper lubrication under normal conditions:

- reduces friction
- reduces wear
- reduces stress on the contact faces
- reduces running noise

Lubricants	Thickeners	Temperature range [°C]	Dynamic viscosity [mPas]
Roller bearing grease	Lithium soap	-30 to +170	<4500

Tab. 68

Relubrication of the guide rails

These types of rails have a lubricating conduit on the side of the slider plate through which the lubricant can be applied directly to the raceways. Lubrication can be done in one of two ways:

1. Relubrication using a grease gun:
This is done by inserting the tip of the grease gun into the conduit at the slider plate and injecting the grease inside (see fig. 50). Please note that the grease has to fill the whole conduit in order to lubricate the rail properly; for this reason sufficient grease must be used.

2. Automatic lubrication system:
To connect the unit to an automatic greasing system, use a proper adapter/connector* that attaches to the threaded hole on the side of the trolley.

The advantage of this solution is the possibility of rail re-lubrication without machine downtime.

*(Any adapter that may be necessary must be manufactured on site)

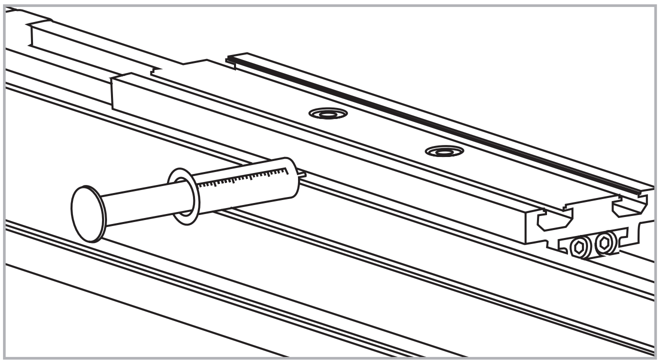


Fig. 50

Cleaning the guide rails

It is always recommended to clean the slider rail prior to any relubrication, in order to remove grease residues. This can be done while performing maintenance work or during a scheduled machine stop.

1. Unscrew the safety screws C (on top of the slider plate) from the belt tensioning device A (see fig. 51).
2. Also completely unscrew the belt tensioning screws B and remove the belt tensioning devices A from their housings.
3. Lift the toothed belt until the guide rails can be seen. Important: Ensure that the side seal is not damaged.
4. Clean the rail raceways with a clean and dry cloth. Ensure that all grease and dirt residues from previous work processes are removed. To ensure that the rails are cleaned over their entire length, the slider plate should be moved once over its entire length.
5. Apply a sufficient amount of grease to the raceways.
6. Re-insert the belt tensioning devices A into their housings and mount the belt tensioning screws B. Re-adjust the belt tension (see pg. US-59).
7. Fasten the safety screws C.

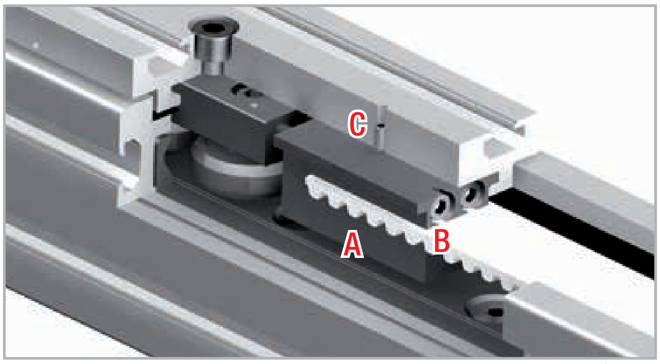


Fig. 51

Accessories

Adapter plates

Standard motor adapter plates AC2

Mounting plates for the most common motors or gearboxes. The connection bores for the motors or gearboxes must be made on site. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

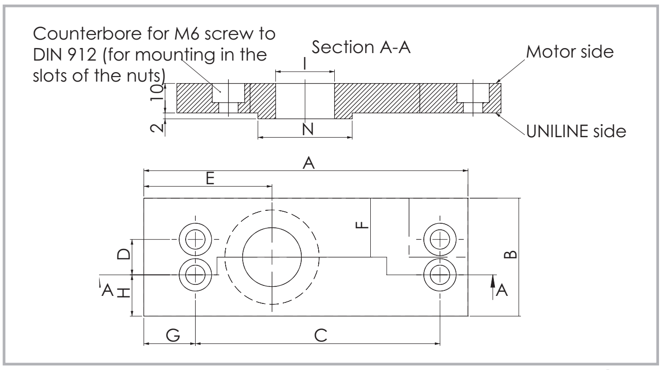


Fig. 52

Size	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	N [mm]
55	126	55	100	25	50.5	27.5	18	15	Ø 30	Ø 47
75	135	70	106	35	53.5	35	19	17.5	Ø 35	Ø 55

Tab. 69

NEMA plates AC1-P

Mounting plates for NEMA motors or gearboxes. These plates are delivered ready-to-mount on the linear axes. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

Size	NEMA Motors / Gearboxes
55	NEMA 34
75	NEMA 42

Tab. 70

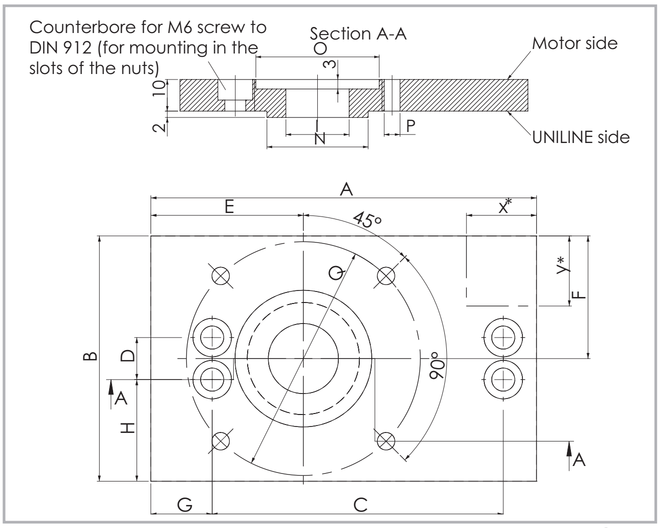


Fig. 53

Size	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	N [mm]	O [mm]	P [mm]	Q [mm]
55	126	100	100	25	50.5	50	18	37.5	30	Ø 47	Ø 74	Ø 5.5	Ø 98.4
75	135	120	106	35	53.5	60	19	42.5	35	Ø 55	Ø 57	Ø 7.1	Ø 125.7

Tab. 71

Synchronous use of linear axes in pairs

If two axes are to be used in parallel using a connecting shaft, please specify when ordering, to ensure that the key slots of the pulleys are synchronized.

Fixing brackets APF-2

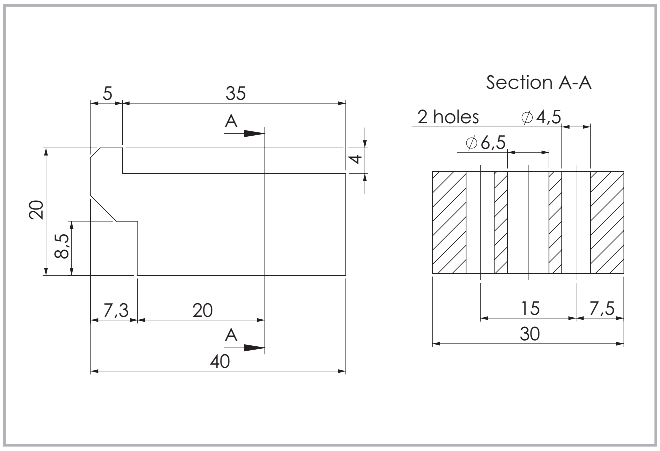


Fig. 54

Fixing clamp for simple mounting of a linear axis on a mounting surface or for connecting two units with or without a connection plate (see pg. US-63).

A spacer* may be necessary.

*(Any spacer that may be necessary must be manufactured on site)

T-nut

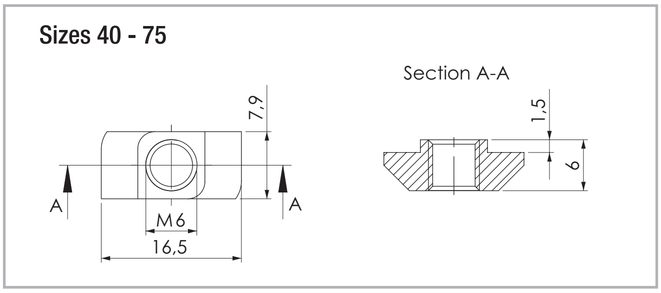


Fig. 55

The maximum tightening torque is 10 Nm.

Assembly kits

T-connection plate APC-1

T-connection plate allows two units to be mounted perpendicular to each other (see pg. US-60). The plate will not interfere with the strokes of either unit. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

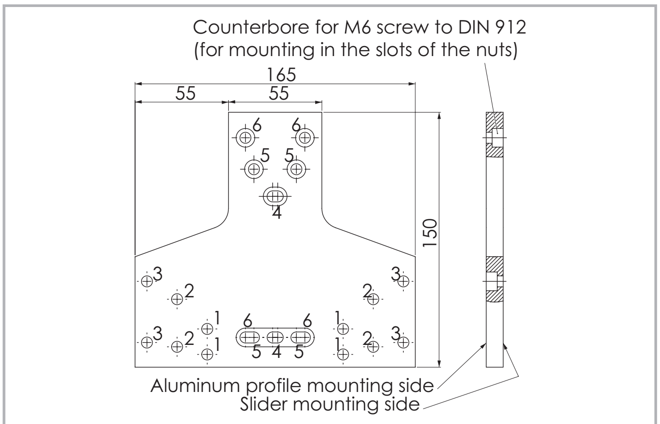


Fig. 56

Note

In case of use of APC-1 plates with E and ED series, please consult Rollon Technical Dpt. In standard there is an interference between U-rail and APC-1 plate. A special version with shorter U-rail at both extremities will be offered.

Size	Fixing holes for the slider	Fixing holes for the profile
55	Holes 2	Holes 5
75	Holes 3	Holes 6

Tab. 72

Angle connection plate APC-2

allows the right angle mounting of two units. The trolley of one unit can be mounted to the side of the other (see pg. US-61). The plate will not interfere with the strokes of either unit. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting to the linear units.

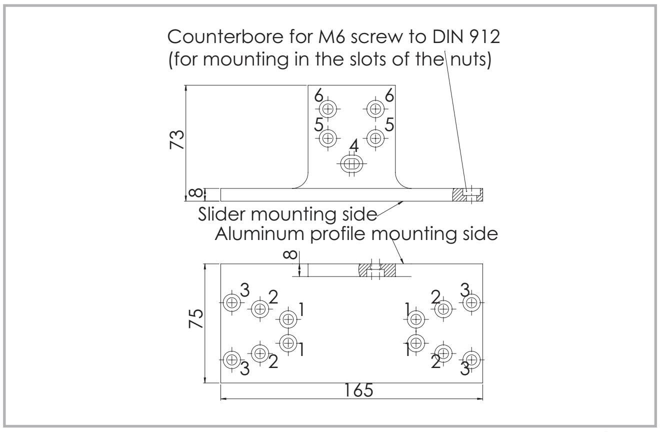


Fig. 57

Note

This adapter plate can be used with types E and ED only to a limited extent. For further information, please contact our Application Engineering Department.

Size	Fixing holes for the slider	Fixing holes for the profile
55	Holes 2	Holes 5
75	Holes 3	Holes 6

Tab. 73

X connection plate APC-3

X connection plate for mounting two sliders perpendicular to each other (see pg. US-62). The plate will not interfere with the strokes of either unit. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

Size	Fixing holes for slider 1	Fixing holes for slider 2
55	Holes 2	Holes 5
75	Holes 3	Holes 6

Tab. 74

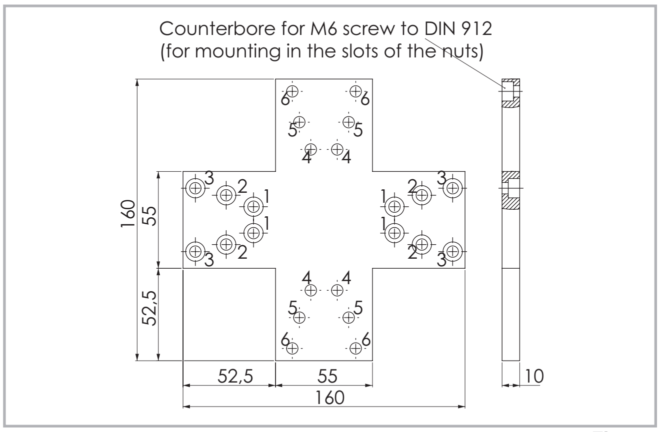


Fig. 58

Ordering key

Identification code for Uniline linear unit

U	E	07	1A	1190	1A	D 500	L 350
		05=55					
		07=75					

Indices of long slider plate *see from pg. US-30 to pg. US-32*

Indices of double slider plate, *distance of the centers of slider plates see from pg. US-30to pg. US-32*

Profile/Rail code

L= Total length of the unit

Driving head code

Size *see from pg. US-30 to pg. US-32*

Type

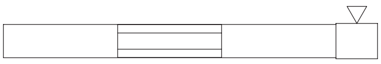
Uniline prefix

Ordering example: UE 07 1A 1190 1A D 500 L 350

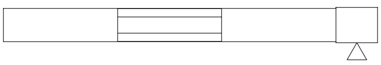
In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Configure Actuator

Left / right orientation



Right



Left

Accessories

Standard motor adapter plate

E	07	AC2	
	05=55 07=75	Standard motor adapter plates	*see pg. US-35*
	Size	*see pg. US-35*	
Type			

Ordering example: E07-AC2

NEMA motor adapter plates

E	07	AC1	
	05=55 07=75	NEMA motor adapter plates	*see pg. US-35*
	Size	*see pg. US-35*	
Type			

Ordering example: E07-AC1

T-connection plate	Order code: APC-1, s. pg. US-36
Angle connection plate	Order code: APC-2, s. pg. US-37
X connection plate	Order code: APC-3, s. pg. US-37
Fixing clamp	Order code: APF-2, s. pg. US-36

Motor connection bores

Hole [Ø]	Size 55	Size 75	Head code
Metric [mm] with slot for key	**12G8 / 4js9**	**14G8 / 5js9**	1A
	10G8 / 3js9	16G8 / 5js9	2A
	14G8 / 5js9	19G8 / 6js9	3A
	16G8 / 5js9		4A
Metric [mm] for compression coupling		18	1B
		24	2B
Inch [in] with slot for key	**½ / ⅛**	**⅝ / 3⁄16**	1P
	3⁄8 / ⅛		2P
	⅝ / 3⁄16		3P

Tab. 75

The highlighted connection bores are standard connections

Metric: key seat for keys to DIN 6885 form A

Inch: key seat for keys to BS 46 Part 1: 1958

US

Uniline ED series

Uniline ED series description

Fig. 59

Uniline is a family of ready-to-install linear actuators. They consist of internal Compact Rail roller sliders and steel-reinforced polyurethane belts in a rigid aluminum profile. Longitudinal seals enclose the system. This arrangement provides the best protection for the actuator from soiling and damage. In the ED series, a compensating bearing rail (U-rail) is mounted horizontally in the aluminum profile, and for increased moment support, two more compensating bearing rails (U-rail) are flanged to the profile externally. Versions with long (L) or double (D) sliders in one axis are possible.

Preferred areas of application:

- Handling and automation
- Multi-axis gantries
- Packaging machines
- Cutting machines
- Displaceable panels
- Painting installations
- Welding robots
- Special machines

The most important characteristics:

- Compact design
- Protected internal linear guides
- High traversing speeds
- Grease-free operation possible (depending on the application. For further information, please contact our Application Engineering department)
- High versatility
- Long strokes
- Versions with long or multiple sliders available in one linear axis

Technical data:

- Available sizes [mm]:
  Type ED: 75
- Length and stroke tolerances:
  For strokes <1 m: +0 mm to +10 mm (+0 in to 0.4 in)
  For strokes >1 m: +0 mm to +15 mm (+0 in to 0.59 in)

The components

Extruded profile

The anodized 6060 aluminum alloy extrusion used for the profile of the Rollon Uniline ED series linear units were designed and manufactured by industry experts to optimize weight while maintaining mechanical strength. (see physical-chemical characteristics below).The dimensional tolerances comply with EN 755-9 standard.

Driving belt

The Rollon Uniline ED series linear units use steel reinforced polyurethane drive belts with RPP pitch and parabolic profiles. This belt is ideal due to its high load transmission characteristics, compact size and low noise. Used in conjunction with a backlash-free pulley, smooth alternating motion can be achieved. Optimization of the maximum belt width/body dimension ratio enables the following performance characteristics to be achieved:

- **High speed**
- **Low noise**
- **Low wear**

Carriage

The carriage of the Rollon Uniline ED series linear units are made entirely of anodized aluminum. Each carriage has mounting T-slots for the connection to the moving element. Rollon offers multiple carriages to accommodate a vast array of applications.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 76

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m\,.\,K}$	$\frac{J}{kg\,.\,K}$	$\Omega\,.\,m\,.\,10^{-9}$	°C
2.7	69	23	200	880-900	33	600-655

Tab. 77

Mechanical characteristics

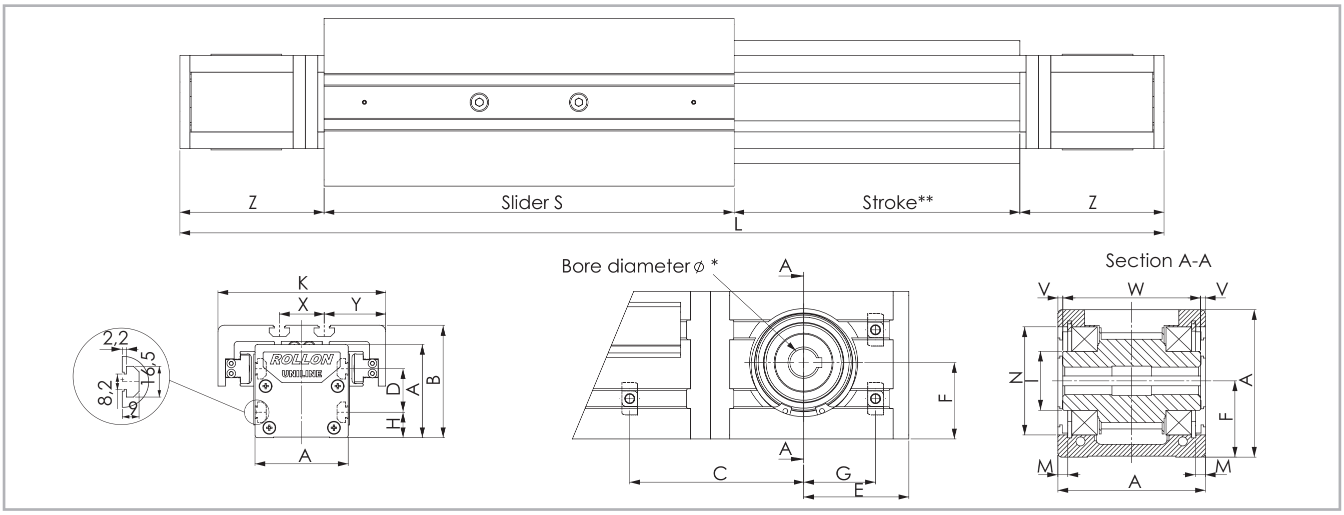
Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
205	165	10	60-80

Tab. 78

U S

ED75

ED75 system



* For information on the motor connection bores, see ordering key. ** The length of the safety stroke is provided on request according to the customer's specific requirements.

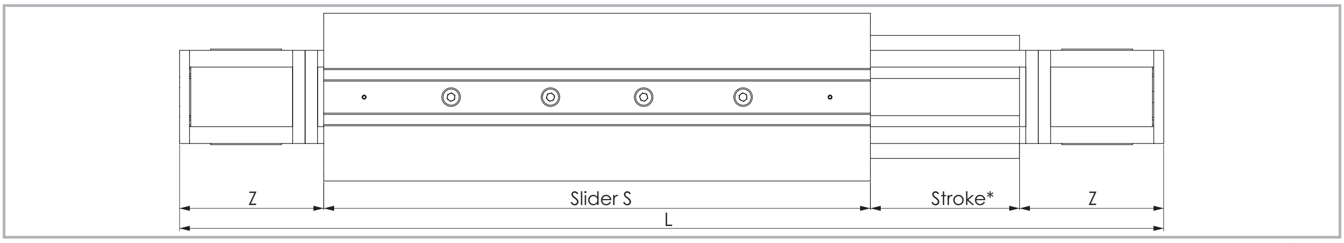
Fig. 60

Type	A [mm]	B [mm]	C* [mm]	D [mm]	E [mm]	F [mm]	G* [mm]	H [mm]	I [mm]	K [mm]	M [mm]	N [mm]	S [mm]	X [mm]	Y [mm]	V [mm]	W [mm]	Z [mm]	Stroke** [mm]
ED75	75	90	71.5	35	53.5	38.8	34.5	20	Ø 29.5	135	4.85	Ø 55	330	36	49.5	2.3	70.4	116	2900

* For the position of the T-nuts when using our motor adapter plates, see pg. US-45ff
** Maximum stroke for a single-piece guiding rail. For longer strokes, see tab. 84

Tab. 79

ED75L with long slider



* The length of the safety stroke is provided on request according to the customer's specific requirements.

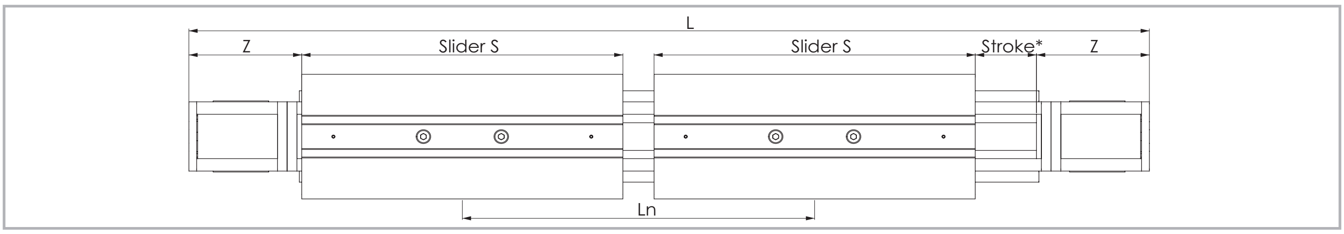
Fig. 61

Type	S_{min} * [mm]	S_{max} [mm]	Sn [mm]	Z [mm]	Stroke** [mm]
ED75L	440	700	$Sn = S_{min} + n \cdot 10$	116	2500

* The length of 440 mm is considered standard, all other lengths are considered special dimensions
** Maximum stroke for a single-piece guiding rail and a maximum slider plate length S_{max}
For longer strokes, see tab. 84

Tab. 80

ED75D with double slider



* The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 62

Type	S [mm]	L_{min} [mm]	L_{max} ** [mm]	Ln [mm]	Z [mm]	Stroke* [mm]
ED75D	330	416	2864	$Ln = L_{min} + n \cdot 8$	116	2450

* Maximum stroke for a single-piece guiding rail and a minimum slider plate distance L_{min}
** Maximum distance L_{max} between the centres of slider plates at a stroke of 0 mm
For longer strokes, see tab. 84

Tab. 81

Type ED

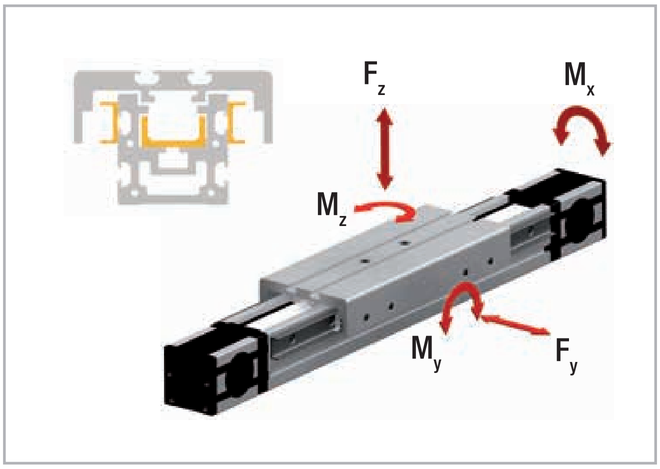


Fig. 63

Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ED75	30RPP8	30	0.185

Tab. 82

Belt length (mm) = 2 x L - 258 Standard slider

Belt length (mm) = 2 x L - S_n+72 Long slider

Belt length (mm) = 2 x L - L_n - 258 Double slider

Type	C [N]	F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
ED75	9815	5500	8700	400.2	868	209
ED75-L	19630	11000	8700	400.2	1174 to 2305	852 to 2282
ED75-D	19630	11000	17400	800.4	3619 to 24917	2288 to 15752

For the calculation of the allowed moments, please see pages SL-5ff

Tab. 83

Technical data	Type
	ED75
Standard belt tension [N]	1000
Moment at no load [Nm]	1.5
Max. traversing speed [m/s]	5
Max. acceleration [m/s²]	15
Repeat accuracy [mm]	0.1
Compact Rail guiding rail	ULV43 / ULV28
Slider type	CS43 spec. / CS28 spec.
Moment of inertia Iy [cm⁴]	127
Moment of inertia Iz [cm⁴]	172
Pitch diameter of pulley [m]	0.05093
Moment of inertia of each pulley [gmm²]	139969
Stroke per shaft revolution [mm]	160
Mass of slider [g]	3770
Weight with zero stroke [g]	9850
Weight with 1 m stroke [g]	14400
Max. stroke [mm]	7500
Working temperature	from -20 °C to + 80 °C

Tab. 84

Lubrication

The raceways of the guide rails in the Uniline linear axes are prelubricated. To achieve the calculated service life, a lubrication film must always be present between the raceway and the roller. The lubrication film also provides anticorrosion protection to the ground raceways. An approximate value for the lubrication period is every 100 km or every six months. The recommended lubricant is a lithium-based roller bearing grease of medium consistency.

Lubrication of the raceways

Proper lubrication under normal conditions:

- reduces friction
- reduces wear
- reduces stress on the contact faces
- reduces running noise

Lubricants	Thickeners	Temperature range [°C]	Dynamic viscosity [mPas]
Roller bearing grease	Lithium soap	-30 to +170	<4500

Tab. 85

Relubrication of the guide rails

1. Slide the slider plate to one end of the unit.
2. At about half the stroke press and manually move the belt in order to see one of the two rails inside the unit (see Fig. 64).
   It may be necessary to release or loosen the belt tension. See chapter Belt tension (pg. US-59).
3. By using a grease syringe (not supplied by ROLLON) or an alternative tool (i.e. brush), apply a sufficient quantity of grease on the raceways.
4. If required, re-establish the recommended belt tension (see pg. US-59).
5. Finally slide the slider plate back and forth over the entire stroke, in order to distribute the grease over the entire length of the rail.

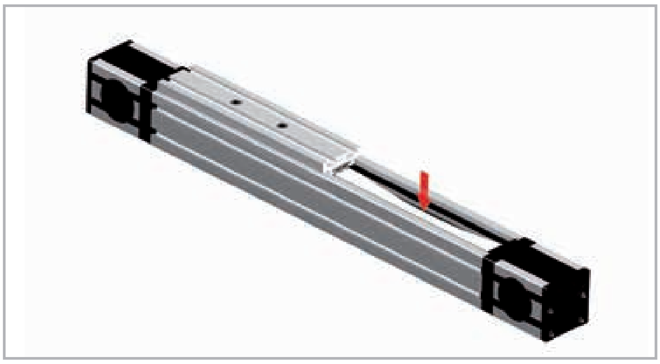


Fig. 64

Cleaning the guide rails

It is always recommended to clean the slider rail prior to any relubrication, in order to remove grease residues. This can be done while performing maintenance work or during a scheduled machine stop.

1. Unscrew the safety screws C (on top of the slider plate) from the belt tensioning device A (see fig. 65).
2. Also completely unscrew the belt tensioning screws B and remove the belt tensioning devices A from their housings.
3. Lift the toothed belt until the guide rails can be seen.
   Important: Ensure that the side seal is not damaged.
4. Clean the rail raceways with a clean and dry cloth. Ensure that all grease and dirt residues from previous work processes are removed. To ensure that the rails are cleaned over their entire length, the slider plate should be moved once over its entire length.
5. Apply a sufficient amount of grease to the raceways.
6. Re-insert the belt tensioning devices A into their housings and mount the belt tensioning screws B. Re-adjust the belt tension (see pg. US-59).
7. Fasten the safety screws C.

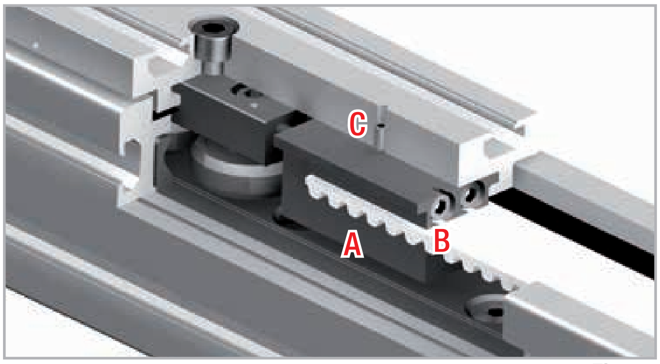


Fig. 65

Accessories

Adapter plates

Standard motor adapter plates AC2

Mounting plates for the most common motors or gearboxes. The connection bores for the motors or gearboxes must be made on site. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

* Area of plate needs to be cut if used for ED75 linear unit. (Adding 20 mm to total length of unit will render this modification unnecessary). Othewise it gets in contact with the outer rail.
X = 20 mm; Y = 35 mm

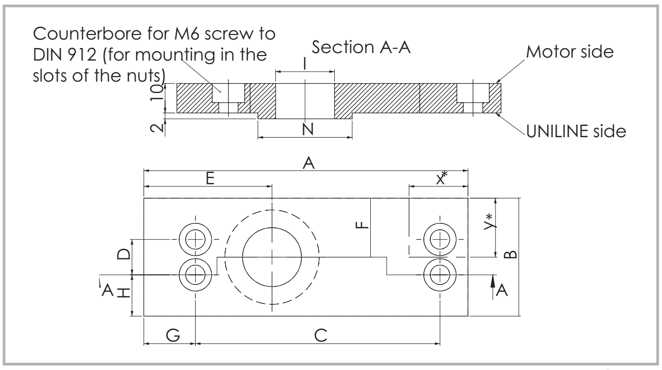


Fig. 66

Size	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	N [mm]
75	135	70	106	35	53.5	35	19	17.5	Ø 35	Ø 55

Tab. 86

NEMA plates AC1-P

Mounting plates for NEMA motors or gearboxes. These plates are delivered ready-to-mount on the linear axes. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

Size	NEMA Motors / Gearboxes
75	NEMA 42

Tab. 87

* Area of plate needs to be cut if used for ED75 linear unit. (Adding 20 mm to total length of unit will render this modification unnecessary). Othewise it gets in contact with the outer rail.
X = 20 mm; Y = 60 mm

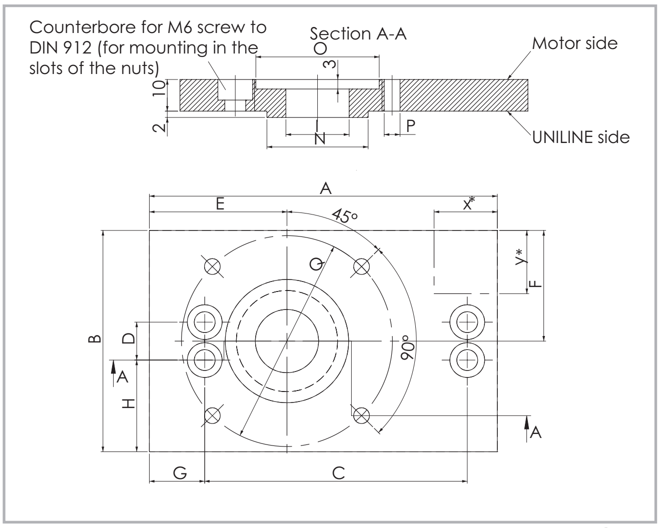


Fig. 67

Size	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]	H [mm]	I [mm]	N [mm]	O [mm]	P [mm]	Q [mm]
75	135	120	106	35	53.5	60	19	42.5	35	Ø 55	Ø 57	Ø 7.1	Ø 125.7

Tab. 88

Synchronous use of linear axes in pairs

If two axes are to be used in parallel using a connecting shaft, please specify when ordering, to ensure that the key slots of the pulleys are synchronized.

US

Fixing brackets APF-2

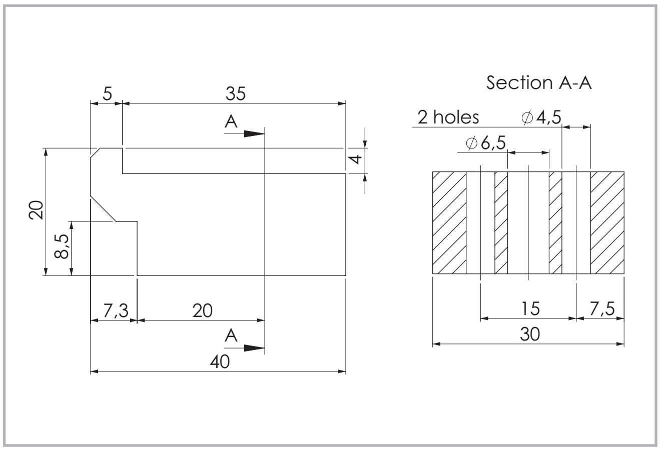


Fig. 68

Fixing clamp for simple mounting of a linear axis on a mounting surface or for connecting two units with or without a connection plate (see pg. US-63).

A spacer* may be necessary.

*(Any spacer that may be necessary must be manufactured on site)

T-nut

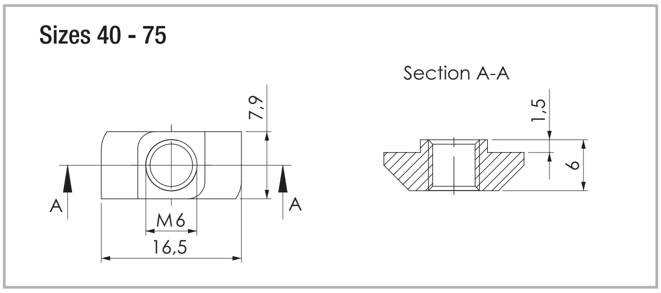


Fig. 69

The maximum tightening torque is 10 Nm.

Assembly kits

T-connection plate APC-1

T-connection plate allows two units to be mounted perpendicular to each other (see pg. US-60). The plate will not interfere with the strokes of either unit. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

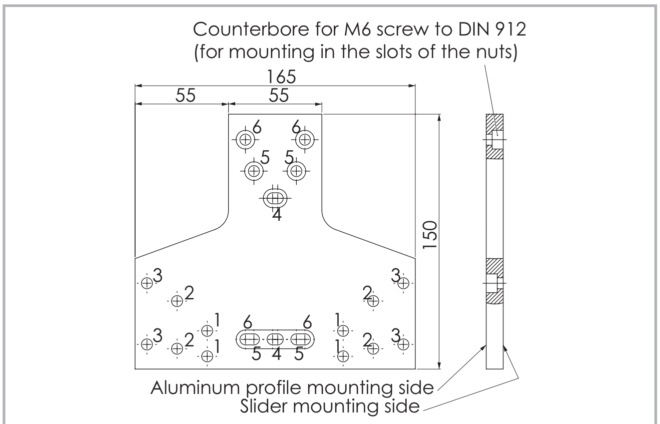


Fig. 70

Note

In case of use of APC-1 plates with E and ED series, please consult Rollon Technical Dpt. In standard there is an interference between U-rail and APC-1 plate. A special version with shorter U-rail at both extremities will be offered.

Size	Fixing holes for the slider	Fixing holes for the profile
75	Holes 3	Holes 6

Tab. 89

Angle connection plate APC-2

allows the right angle mounting of two units. The trolley of one unit can be mounted to the side of the other (see pg. US-61). The plate will not interfere with the strokes of either unit. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting to the linear units.

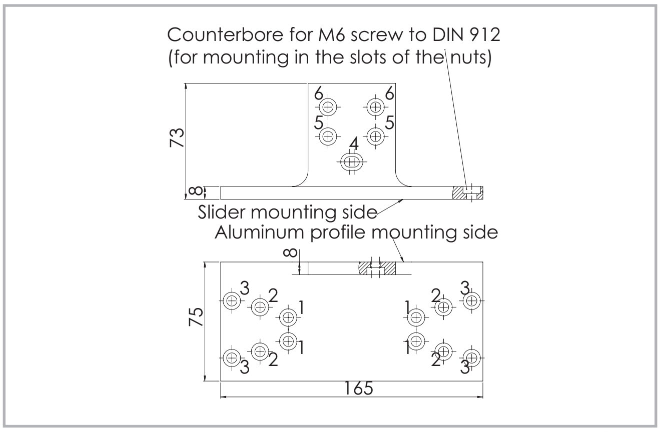


Fig. 71

Note

This adapter plate can be used with types E and ED only to a limited extent. For further information, please contact our Application Engineering Department.

Size	Fixing holes for the slider	Fixing holes for the profile
75	Holes 3	Holes 6

Tab. 90

X connection plate APC-3

X connection plate for mounting two sliders perpendicular to each other (see pg. US-62). The plate will not interfere with the strokes of either unit. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

Size	Fixing holes for slider 1	Fixing holes for slider 2
75	Holes 3	Holes 6

Tab. 91

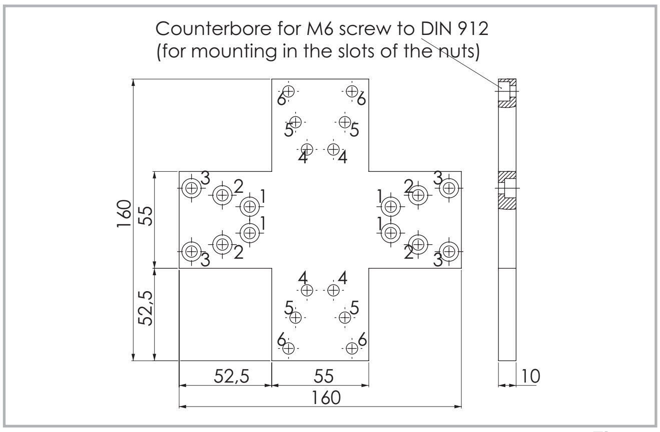


Fig. 72

U S

Ordering key

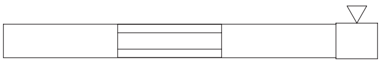
Identification code for Uniline linear unit

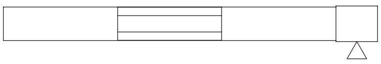
U	Uniline prefix
D	Type
07 07=75	Size *see pg. US-42*
1A	Driving head code
1190	L= Total length of the unit
1A	Profile/Rail code
D 500	Indices of double slider plate, *distance of the centers of slider plates see pg. US-42*
L 350	Indices of long slider plate *see pg. US-42*

Ordering example: UD 07 1A 1190 1A D 500 L 350

In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Left / right orientation





Accessories

Standard motor adapter plate

D	**07**	**AC2**	
	07=75	Standard motor adapter plates	*see pg. US-45*
	Size	*see pg. US-45*	
Type			

Ordering example: D07-AC2

NEMA motor adapter plates

D	**07**	**AC1**	
	07=75	NEMA motor adapter plates	*see pg. US-45*
	Size	*see pg. US-45*	
Type			

Ordering example: D07-AC1

T-connection plate Order code: APC-1, s. pg. US-46
Angle connection plate Order code: APC-2, s. pg. US-47
X connection plate Order code: APC-3, s. pg. US-47
Fixing clamp Order code: APF-2, s. pg. US-46

Motor connection bores

Hole [Ø]	Size 75	Head code
Metric [mm] with slot for key	**14G8 / 5js9**	1A
	16G8 / 5js9	2A
	19G8 / 6js9	3A
		4A
Metric [mm] for compression coupling	18	1B
	24	2B
Inch [in] with slot for key	$\frac{5}{8}$ / $\frac{3}{16}$	1P
		2P
		3P

Tab. 92

The highlighted connection bores are standard connections

Metric: key seat for keys to DIN 6885 form A

Inch: key seat for keys to BS 46 Part 1: 1958

Uniline H series

Uniline H series description

Fig. 73

Uniline is a family of ready-to-install linear actuators. They consist of internal Compact Rail roller sliders in a rigid aluminum profile. Longitudinal seals enclose the system. This arrangement provides the best protection for the actuator from soiling and damage. In the H series, the compensating bearing rail (U-rail) is mounted horizontally in the aluminum profile. The H series is used as a compensating bearing axis for load absorption of radial forces, and in combination with the other series, as support bearing for the resulting moments. Versions with long (L) or double (D) sliders in one axis are possible. H series is a slave actuator, it has not the driving belt.

The most important characteristics:

- Compact design
- Protected internal linear guides
- High traversing speeds
- Grease-free operation possible (depending on the application. For further information, please contact our Application Engineering department)
- High versatility
- Long strokes
- Versions with long or multiple sliders available in one linear axis

Preferred areas of application:

- Handling and automation
- Multi-axis gantries
- Packaging machines
- Cutting machines
- Displaceable panels
- Painting installations
- Welding robots
- Special machines

Technical data:

- Available sizes [mm]:
  Type H: 40, 55, 75
- Length and stroke tolerances:
  For strokes <1 m: +0 mm to +10 mm (+0 in to 0.4 in)
  For strokes >1 m: +0 mm to +15 mm (+0 in to 0.59 in)

The components

Extruded profile

The anodized 6060 aluminum alloy extrusion used for the profile of the Rollon Uniline series linear units were designed and manufactured by industry experts to optimize weight while maintaining mechanical strength. (see physical-chemical characteristics below).The dimensional tolerances comply with EN 755-9 standard.

Carriage

The carriage of the Rollon Uniline H series linear units are made entirely of anodized aluminum. Each carriage has mounting T-slots for the connection to the moving element. Rollon offers multiple carriages to accommodate a vast array of applications.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 93

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.7	69	23	200	880-900	33	600-655

Tab. 94

Mechanical characteristics

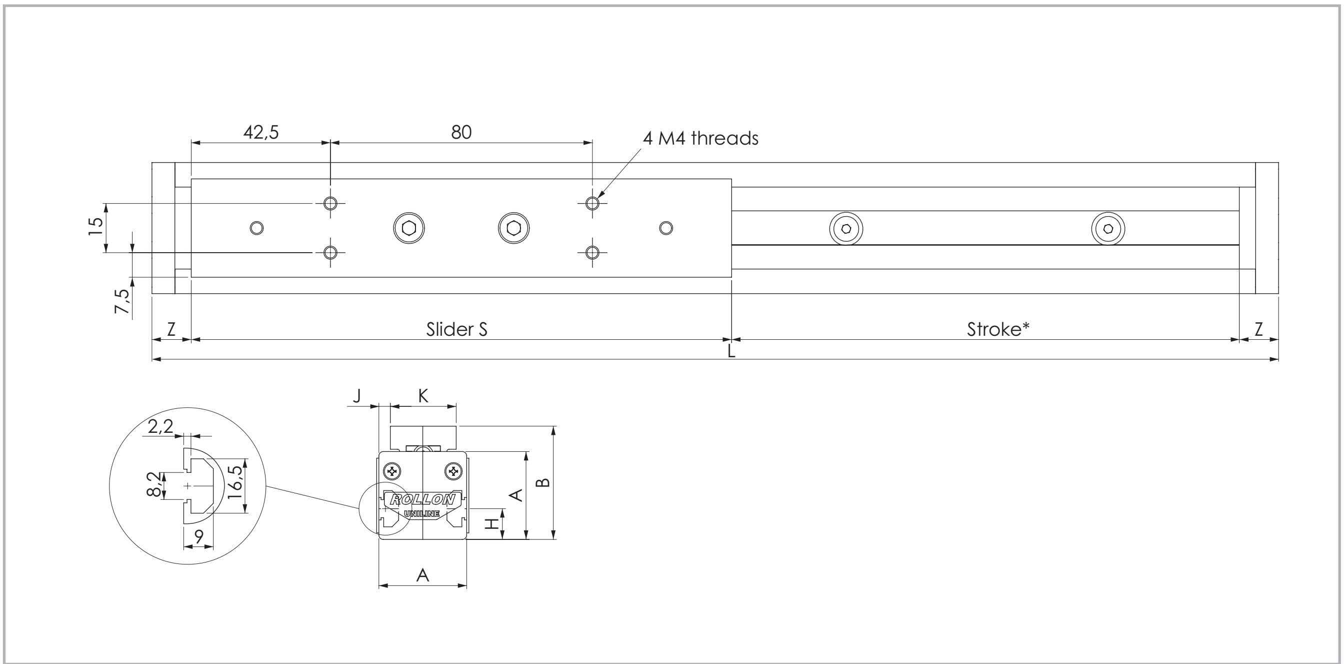
Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
205	165	10	60-80

Tab. 95

US

H40

H40 system



* The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 74

Type*	A [mm]	B_{nom} [mm]	B_{min} [mm]	B_{max} [mm]	D [mm]	H [mm]	J [mm]	K [mm]	S [mm]	X [mm]	Y [mm]	Z [mm]	Stroke** [mm]
H40	40	51.5	51.2	52.6	-	14	5	30	165	-	-	12	1900

* Including long or double slider. See chapter 3 Product dimensions Types A...L and A...D
** Maximum stroke for a single-piece guiding rail. For longer strokes, see tab. 98

Tab. 96

H40

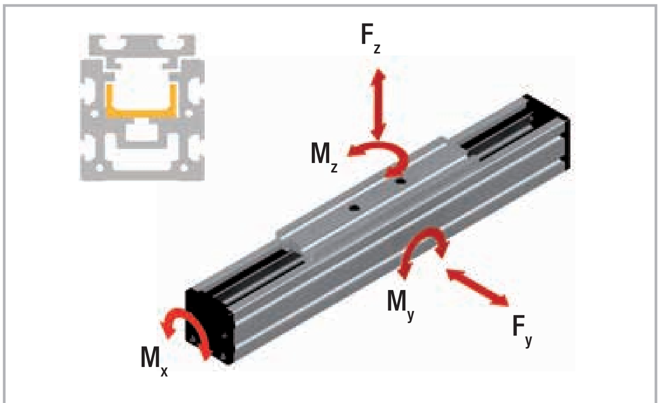


Fig. 75

Type	C [N]	F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
H40	1530	820				13.1
H40-L	3060	1640	0	0	0	61 to 192
H40-D	3060	1640				192 to 1558

For the calculation of the allowed moments, please see pages SL-5ff

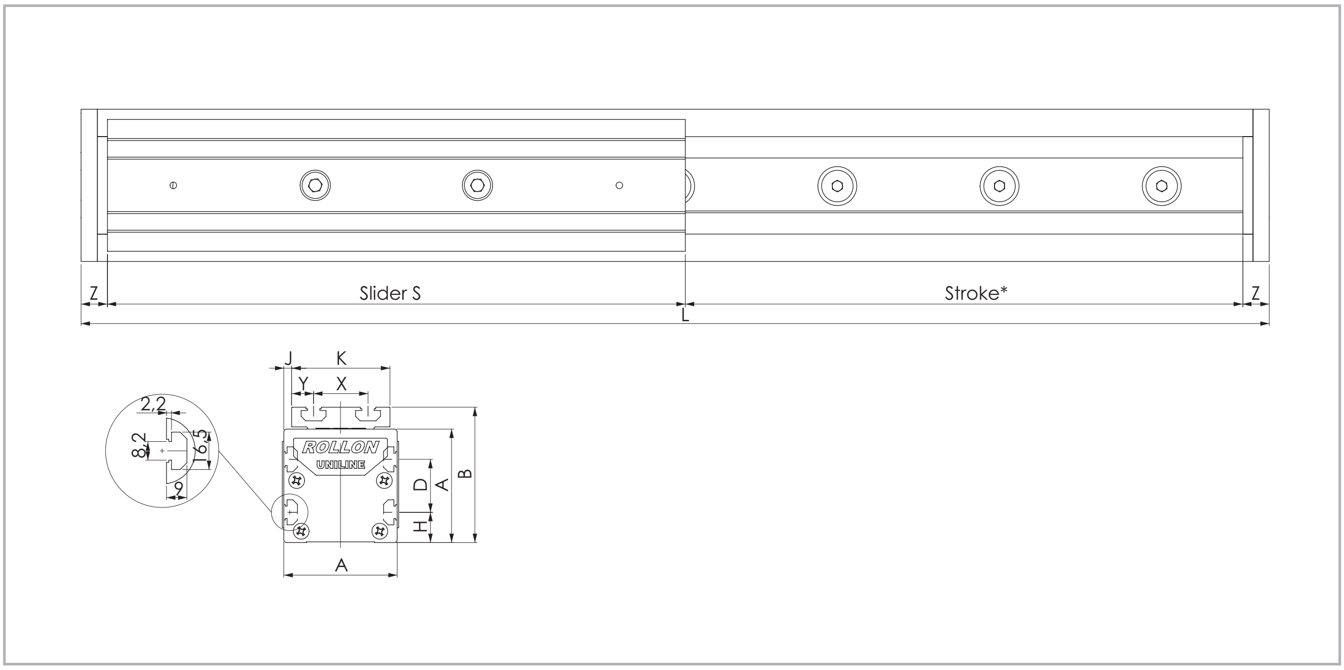
Tab. 97

Technical data	Type
	H40
Max. traversing speed [m/s]	3
Max. acceleration [m/s²]	10
Repeat accuracy [mm]	0.1
Compact Rail guiding rail	ULV18
Slider type	CS18 spec.
Moment of inertia Iy [cm⁴]	12
Moment of inertia Iz [cm⁴]	13.6
Mass of slider [g]	220
Weight with zero stroke [g]	860
Weight with 1 m stroke [g]	3383
Max. stroke [mm]	3500
Working temperature	from -20 °C to + 80 °C

Tab. 98

H55

H55 system



* The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 76

Type*	A [mm]	B_{nom} [mm]	B_{min} [mm]	B_{max} [mm]	D [mm]	H [mm]	J [mm]	K [mm]	S [mm]	X [mm]	Y [mm]	Z [mm]	Stroke** [mm]
H55	55	71	70.4	72.3	25	15	1.5	52	200	28	12	13	3070

* Including long or double slider. See chapter 3 Product dimensions Types A...L and A...D
** Maximum stroke for a single-piece guiding rail. For longer strokes, see tab. 101

Tab. 99

H55

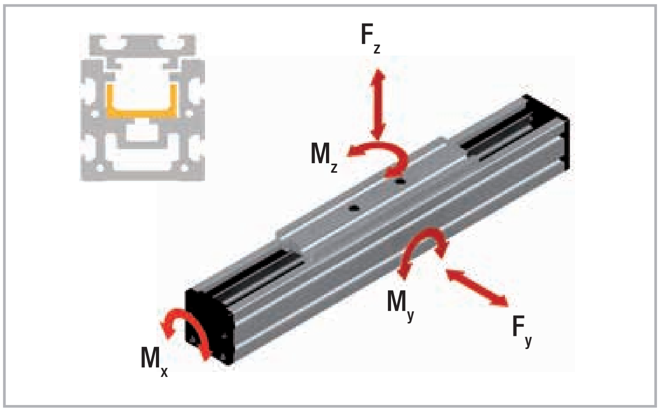


Fig. 77

Type	C [N]	F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
H55	4260	2175				54.5
H55-L	8520	4350	0	0	0	239 to 652
H55-D	8520	4350				652 to 6677

For the calculation of the allowed moments, please see pages SL-5ff

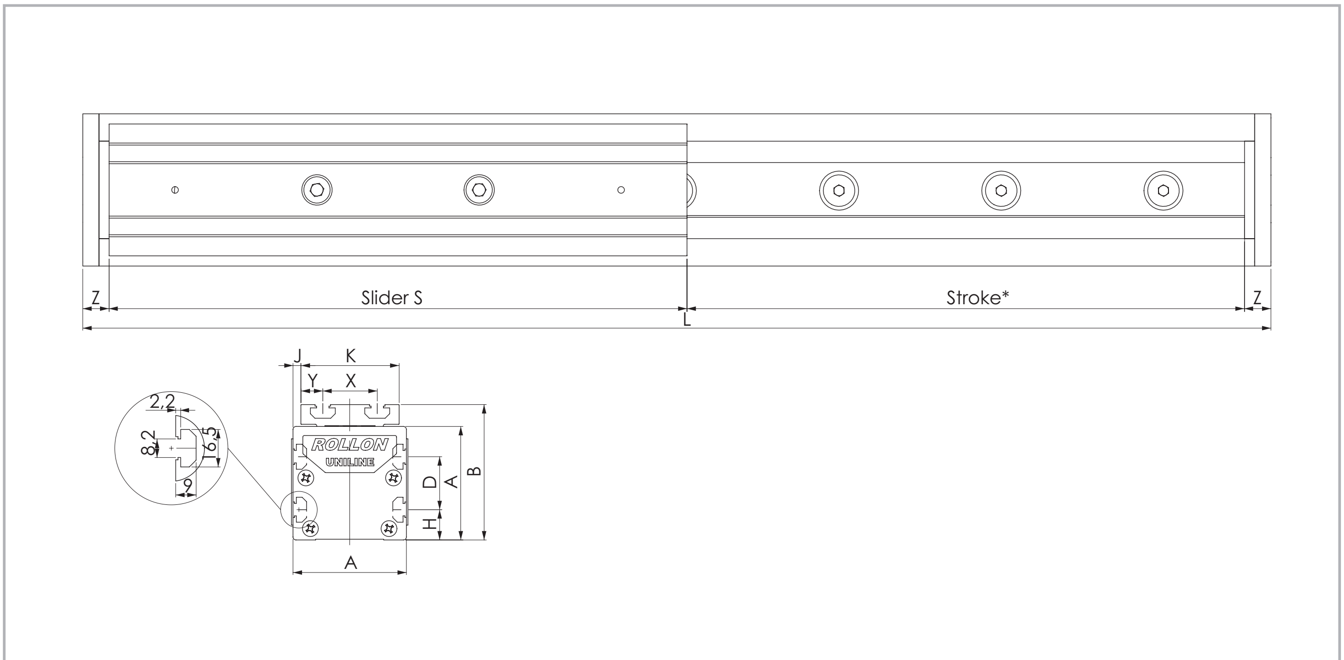
Tab. 100

Technical data	Type H55
Max. traversing speed [m/s]	5
Max. acceleration [m/s²]	15
Repeat accuracy [mm]	0.1
Compact Rail guiding rail	ULV28
Slider type	CS28 spec.
Moment of inertia Iy [cm⁴]	34.6
Moment of inertia Iz [cm⁴]	41.7
Mass of slider [g]	475
Weight with zero stroke [g]	1460
Weight with 1 m stroke [g]	4357
Max. stroke [mm]	5500
Working temperature	from -20 °C to + 80 °C

Tab. 101

H75

H75 system



* The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 78

Type*	A [mm]	B_{nom} [mm]	B_{min} [mm]	B_{max} [mm]	D [mm]	H [mm]	J [mm]	K [mm]	S [mm]	X [mm]	Y [mm]	Z [mm]	Stroke** [mm]
H75	75	90	88.6	92.5	35	20	5	65	285	36	14.5	13	3420

* Including long or double slider. See chapter 3 Product dimensions Types A...L and A...D

** Maximum stroke for a single-piece guiding rail. For longer strokes, see tab. 104

Tab. 102

H75

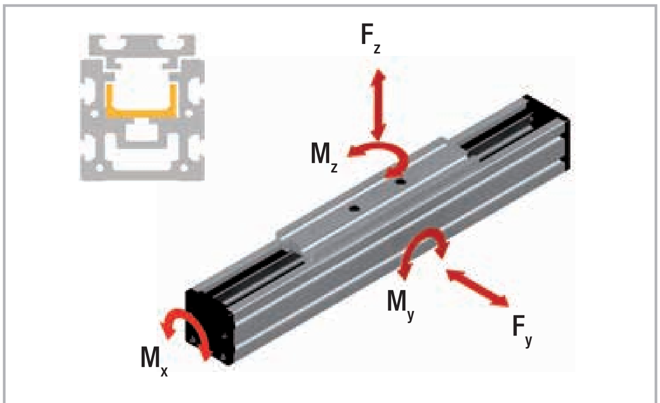


Fig. 79

Type	C [N]	F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
H75	12280	5500				209
H75-L	24560	11000	0	0	0	852 to 2282
H75-D	24560	11000				2288 to 18788

For the calculation of the allowed moments, please see pages SL-5ff

Tab. 103

Technical data	Type H75
Max. traversing speed [m/s]	7
Max. acceleration [m/s²]	15
Repeat accuracy [mm]	0.1
Compact Rail guiding rail	ULV43
Slider type	CS43 spec.
Moment of inertia Iy [cm⁴]	127
Moment of inertia Iz [cm⁴]	172
Mass of slider [g]	1242
Weight with zero stroke [g]	4160
Weight with 1 m stroke [g]	9381
Max. stroke [mm]	7500
Working temperature	from -20 °C to + 80 °C

Tab. 104

Lubrication

The raceways of the guide rails in the Uniline linear axes are prelubricated. To achieve the calculated service life, a lubrication film must always be present between the raceway and the roller. The lubrication film also provides anticorrosion protection to the ground raceways. An approximate value for the lubrication period is every 100 km or every six months. The recommended lubricant is a lithium-based roller bearing grease of medium consistency.

Lubrication of the raceways

Proper lubrication under normal conditions:

- reduces friction
- reduces wear
- reduces stress on the contact faces
- reduces running noise

Lubricants	Thickeners	Temperature range [°C]	Dynamic viscosity [mPas]
Roller bearing grease	Lithium soap	-30 to +170	<4500

Tab. 105

Relubrication of the guide rails

These types of rails have a lubricating conduit on the side of the slider plate through which the lubricant can be applied directly to the raceways. Lubrication can be done in one of two ways:

1. Relubrication using a grease gun:
This is done by inserting the tip of the grease gun into the conduit at the slider plate and injecting the grease inside (see fig. 80). Please note that the grease has to fill the whole conduit in order to lubricate the rail properly; for this reason sufficient grease must be used.
2. Automatic lubrication system:
To connect the unit to an automatic greasing system, use a proper adapter/connector* that attaches to the threaded hole on the side of the trolley.

The advantage of this solution is the possibility of rail re-lubrication without machine downtime.
*(Any adapter that may be necessary must be manufactured on site)

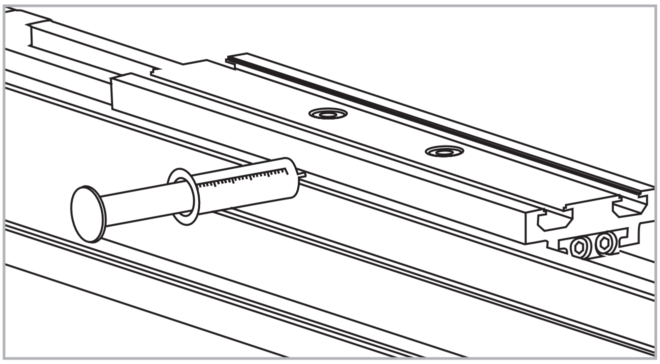


Fig. 80

Cleaning the guide rails

It is always recommended to clean the slider rail prior to any relubrication, in order to remove grease residues. This can be done while performing maintenance work or during a scheduled machine stop.

1. Clean the rail raceways with a clean and dry cloth. Ensure that all grease and dirt residues from previous work processes are removed. To ensure that the rails are cleaned over their entire length, the slider plate should be moved once over its entire length.
2. Apply a sufficient amount of grease to the raceways.

US

Accessories

Fixing brackets APF-2

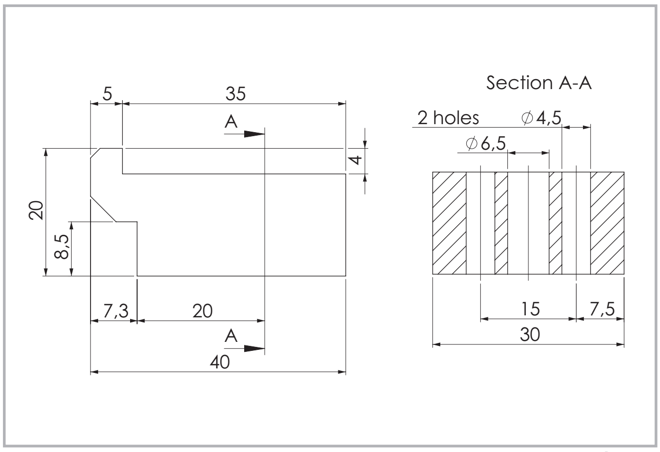


Fig. 81

Fixing clamp for simple mounting of a linear axis on a mounting surface or for connecting two units with or without a connection plate (see pg. US-63).

A spacer* may be necessary.

*(Any spacer that may be necessary must be manufactured on site)

T-nut

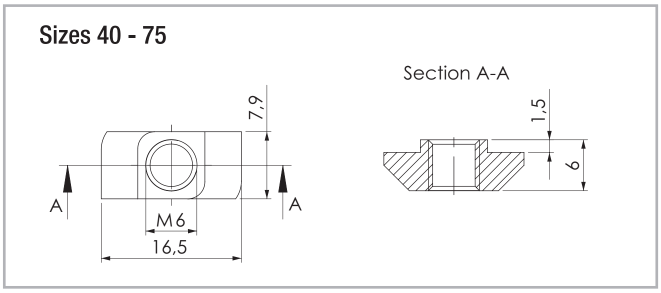


Fig. 82

The maximum tightening torque is 10 Nm.

Assembly kits

T-connection plate APC-1

T-connection plate allows two units to be mounted perpendicular to each other (see pg. US-60). The plate will not interfere with the strokes of either unit. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

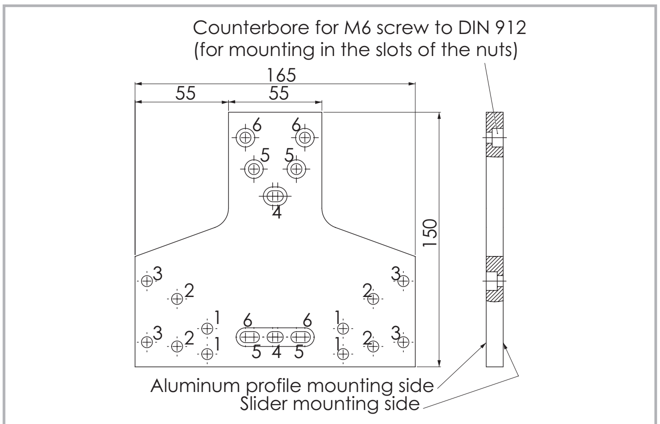


Fig. 83

Note

In case of use of APC-1 plates with E and ED series, please consult Rollon Technical Dpt. In standard there is an interference between U-rail and APC-1 plate. A special version with shorter U-rail at both extremities will be offered.

Size	Fixing holes for the slider	Fixing holes for the profile
40	Holes 1	Holes 4
55	Holes 2	Holes 5
75	Holes 3	Holes 6

Tab. 106

Angle connection plate APC-2

allows the right angle mounting of two units. The trolley of one unit can be mounted to the side of the other (see pg. US-61). The plate will not interfere with the strokes of either unit. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting to the linear units.

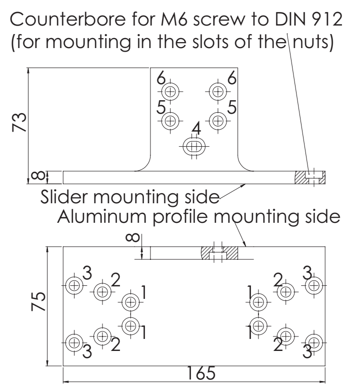


Fig. 84

Size	Fixing holes for the slider	Fixing holes for the profile
40	Holes 1	Holes 4
55	Holes 2	Holes 5
75	Holes 3	Holes 6

Tab. 107

X connection plate APC-3

X connection plate for mounting two sliders perpendicular to each other (see pg. US-62). The plate will not interfere with the strokes of either unit. All plates are delivered with M6 x 10 screws to DIN 912 and T-nuts for mounting on the linear units.

Size	Fixing holes for slider 1	Fixing holes for slider 2
40	Holes 1	Holes 4
55	Holes 2	Holes 5
75	Holes 3	Holes 6

Tab. 108

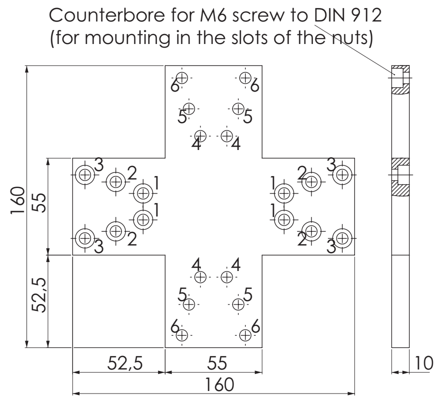


Fig. 85

US

Ordering key

Identification code for Uniline linear unit

U	H	07	1190	1A	D 500	L 350
		04=40 05=55 07=75				

Indices of long slider plate *see pg. US-52 - US-53 - US-54*

Indices of double slider plate, *distance of the centers of slider plates see pg. US-52 - US-53 - US-54*

Profile/Rail code

L= Total length of the unit

Size *see pg. US-52 - US-53 - US-54*

Type

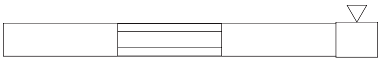
Uniline prefix

Ordering example: UH 07 1H 1190 1A D 500 L 350

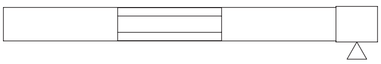
In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Configure Actuator

Left / right orientation



Right



Left

Belt tension

All Uniline linear axes are all supplied with a standard belt tension suitable for most applications (see tab. 109).

Size	40	55	75	ED75
Belt tension [N]	160	220	800	1000

Tab. 109

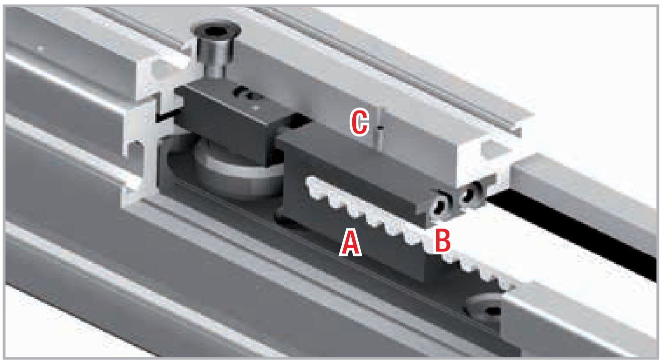


Fig. 86

The belt tensioning system (located at the ends of the slider plates for sizes 45 to 75) allows the toothed belt tension to be set in accordance with requirements.

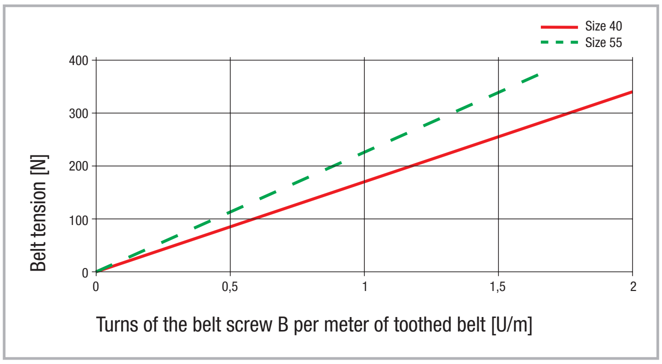


Fig. 87

To set the belt tension for sizes 40 to 75, the following steps must be followed (the reference values are standard values):

1. Determine the deviation of the belt tension from the standard value.
2. Figures 87 and 88 show how many turns the belt tensioning screws B must be for the required belt tension deviation.
3. Calcualte the length of the belt (m), with the formula:
   L = 2 x stroke (m) + 0.515 m (size 40);
   L = 2 x stroke (m) + 0.630 m (size 55);
   L = 2 x stroke (m) + 0.792 m (size 75).
4. Multiply the number of turns (see step 2) by the toothed belt length m (see step 3) to calculate the required number of turns to achieve the new desired belt tension..
5. Unscrew the safety screw C.
6. Turn the belt tensioning screws B in accordance with the above explanation. Re-tighten the safety screw C.

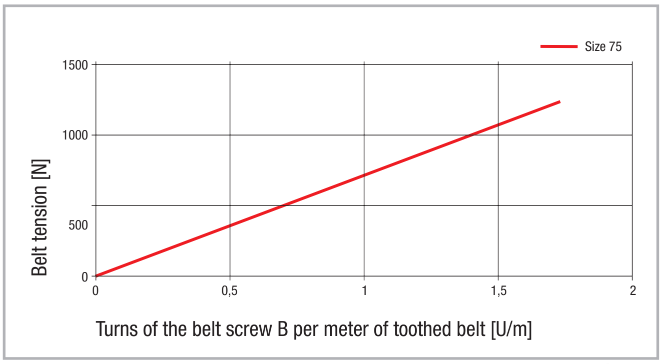


Fig. 88

Example:

Increasing the belt tension from 220 N to 330 N for an A55 - 1070:

1. deviation = 330 N - 220 N = 110 N.
2. Figures 87 and 88 show that the value by which the belt tensioning screws B must be turned to increase the belt tension by 110 N is 0.5 turns.
3. Formula for calculating the toothed belt length:
   L = 2 x stroke (m) + 0.630 m = 2 x 1.070 + 0.630 = 2.77 m.
4. This means that the required number of turns is:
   0.5 rpm x 2.77 m = 1.4 turns.
5. Unscrew the safety screw C.
6. Turn the belt tensioning screws B by 1.4 turns with the aid of an external reference.
7. Re-tighten the safety screw C.

Note:

If the linear unit is used such that the load acts directly on the toothed belt, it is important not to exceed the specified values for the belt tension. Otherwise, the positional accuracy and stability of the toothed belt cannot be guaranteed. If higher values are required for the belt tension, please contact our Application Engineering Department.

Installation instructions

Motor adapter plates AC2 and AC1-P, sizes 40 - 75

To connect the linear units to the motor and gearbox, suitable adapter plates must be used. Rollon offers these plates in two different designs (see chapter Accessories). The standard plates are already provided with the holes required for mounting to the linear unit. The fixing holes must be made on site. Ensure that the mounted plate will not interfere with the stroke of the traversing slider plate.

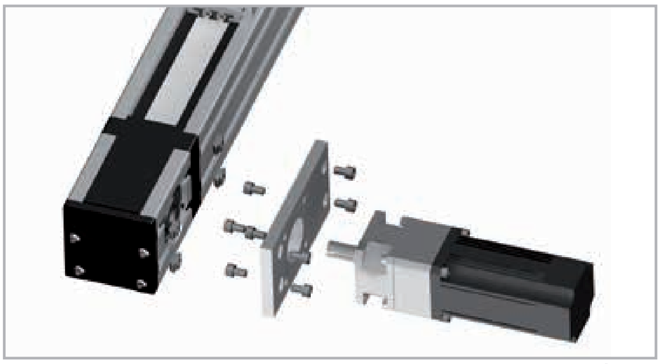


Fig. 89

Connection to motor and gearbox

1. Attach the motor adapter plate to the motor or gearbox.
2. Connect the T-nuts by inserting the screws without tightening them and align the nuts in parallel to the slots of the unit.
3. Insert the connecting shaft into the drive head by aligning the key in the key slot.
4. Attach the motor adapter plate to the drive head of the linear axis by means of nuts and make sure that the nuts in the slots were rotated by 90° (see Accessories). Ensure correct fit of the adapter plate.

Note:

- The connecting plates for the Uniline A40 are delivered with four fixing holes, even though only two holes are required for the connection. The presence of four holes give the plate a symmetric design which allows it to be used on any side of the unit.
- Due to the constructive design of the aluminum profile, only three fixing holes can be used the for the Uniline C series. (see pg. US-18, fig. 24).

T-connection plate APC-1, sizes 40 - 75

Connection of two linear axes is achieved by means of the T-connection plate APC-1 (see chapter Accessories). To mount the above-mentioned configuration, the following steps should be carried out:

1. Prepare the connection plate by inserting the screws into the existing holes on the APC-1 (see fig. 90).
2. Connect the T-nuts by introducing the screws without tightening them and align the nuts in parallel to the slots of the unit.
3. Place the plate against the long side of unit 1 and tighten the screws. Ensure that the nuts in the slots were rotated by 90°.
4. To fasten the plate to unit 2, insert the screws from the the long side of unit 1 (see fig. 91).
5. Connect the T-nuts by introducing the screws without tightening them and align the nuts in parallel to the slots of the slider plate of unit 2.
6. Place the plate against the slider plate and tighten the screws. Important: Please make sure that the nuts in the slots were rotated by 90°.

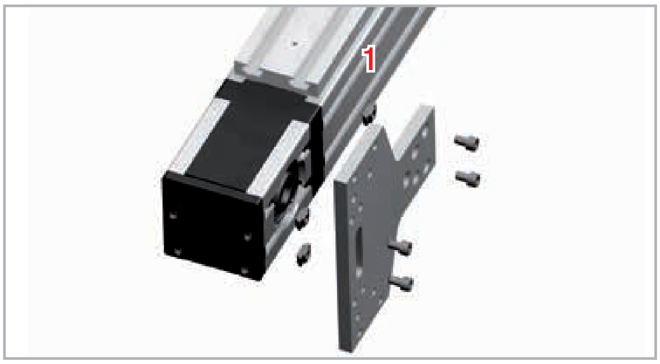


Fig. 90

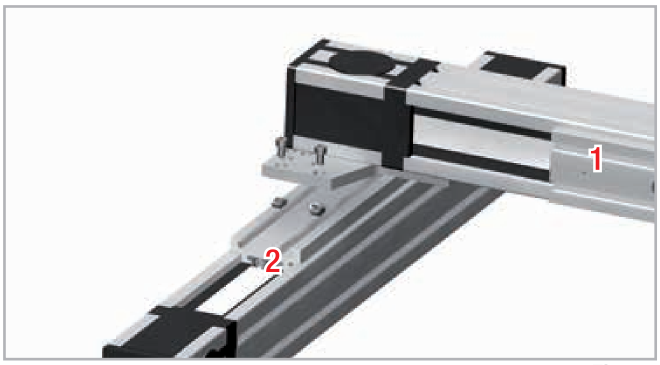


Fig. 91

Example 1: System consisting of 2 X-axes and 1 Y-axis

The connection of the two units is attained by means of the parallel slider plates and the drive heads. For this configuration, we recommend using our connection plate APC-1.

Fig. 92

Angle connection plate APC-2, sizes 40 - 75

Connection of two linear axes is achieved by means of the angle connection plate APC-2. To mount the above-mentioned configuration, the following steps should be carried out:

1. Insert the screws to be used for the connection to unit 1 into the prepared holes (see fig. 93).
2. Connect the T-nuts by inserting the screws without tightening them and align the nuts in parallel to the slots of the slider plates.
3. Place the connection plate against the slider plate and tighten the screws. Ensure that the nuts in the slots were rotated by 90°.
4. To fix the connection plate to unit 2, insert the screws into the prepared holes on the short plate side (see fig. 94).
5. Connect the T-nuts by inserting the screws without tightening them and align the nuts in parallel to the slots of the aluminum profile of unit 2.
6. Place the connection plate against the slider plate and tighten the screws. Ensure that the nuts in the slots were rotated by 90°.

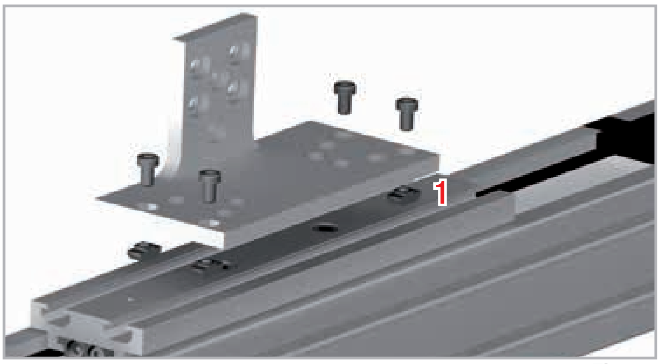


Fig. 93

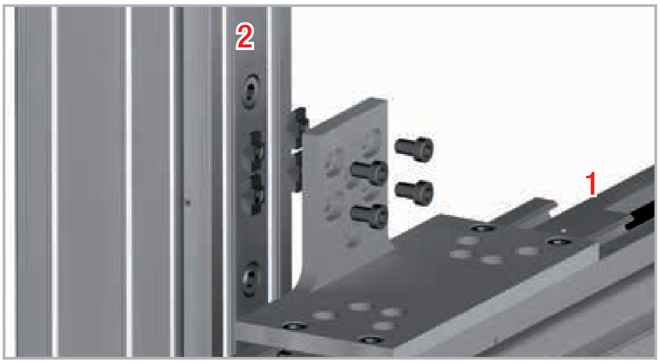


Fig. 94

Example 2 – System consisting of 1 X-axis and 1 Z-axis

With this configuration, the Z-axis is connected to the slider plate of the X-axis by means of the angle connection plate APC-2.

Fig. 95

X connection plate APC-3, sizes 40 - 75

Connection of the two linear axes is achieved by means of the X connection plate APC-3 (see chapter Accessories). To mount the above-mentioned configuration, the following steps should be carried out:

1. Insert the screws from one side of the connection plate into the prepared holes (see fig. 96).
2. Connect the T-nuts by inserting the screws without tightening them and align the nuts in parallel to the slots of the slider plate of unit 1.
3. Place the connection plate against the slider plate and tighten the screws. Ensure that the nuts in the slots were rotated by 90°.
4. Insert the screws from the other side of the connection plate (see fig. 97).
5. Connect the T-nuts by inserting the screws without tightening them and align the nuts in parallel to the slots of the slider plate of unit 2.
6. Place the connection plate against the slider plate and tighten the screws. Ensure that the nuts in the slots were rotated by 90°.

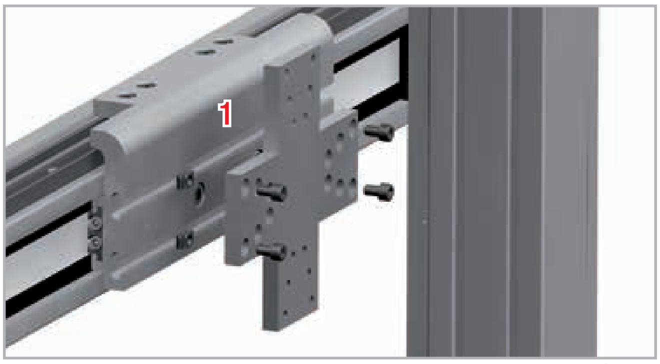


Fig. 96

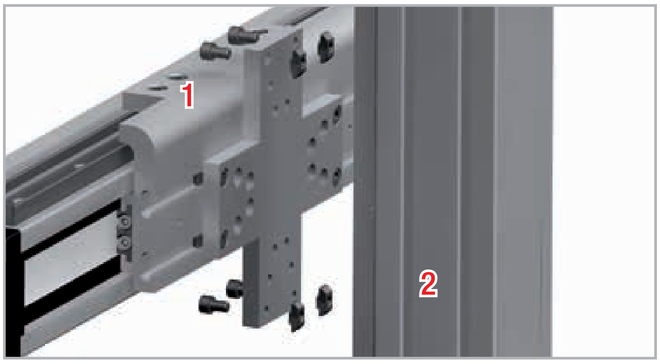


Fig. 97

Example 3 – System consisting of 2 X-axes, 1 Y-axis and 1 Z-axis

Connect four linear units to create a 3-axis gantry. The vertical axis is arranged to be self-supporting on the central unit. To do so, connect the two slider plates to each other, using the X connection plate APC-3.

The connection of the two parallel axes to the central unit is attained by means of the T-connection plate APC-1.

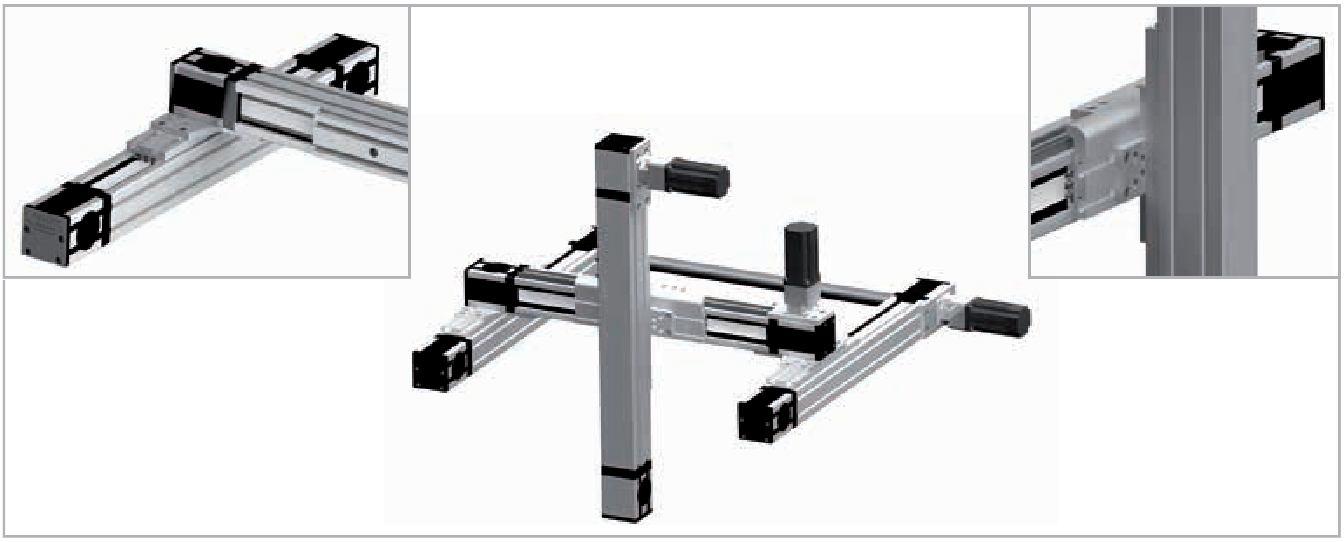


Fig. 98

Fixing clamp APF-2, sizes 40 - 75

Connection of two linear axes is achieved by means of the fixing clamps APF-2 (see chapter Accessories). To mount the above-mentioned configuration, the following steps should be carried out:

1. Insert the fastening screws into the clamp and, if necessary, place a spacer* between the clamp and the slider plate.
   *(Any spacer that is to be used must be manufactured on site)
2. Connect the T-nuts by inserting the screws without tightening them and align the nuts in parallel to the slots of the slider plates.
3. Insert the projecting part of the clamp into the lower slot of the aluminum profile of unit 1.
4. Position the clamp lengthwise according to the desired position of the slider plate of unit 2.
5. Tighten the fastening screws. Ensure that the nuts in the slots were rotated by 90°.
6. Repeat this operation for the required number of fixing clamps.

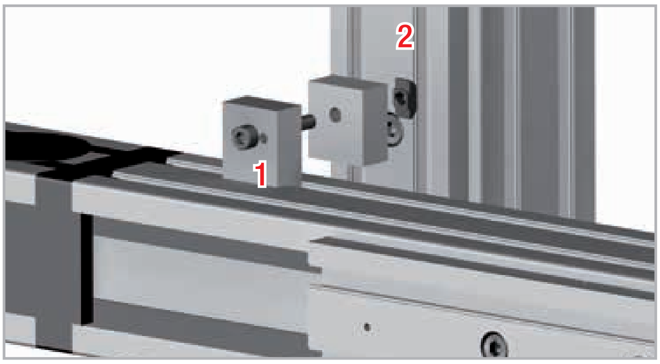


Fig. 99

Example 4 – System consisting of 1 Y-axis and 2 Z-axes

The connection of the Y-axis to the parallel slider plates is attained via the fixing clamps APF-2.

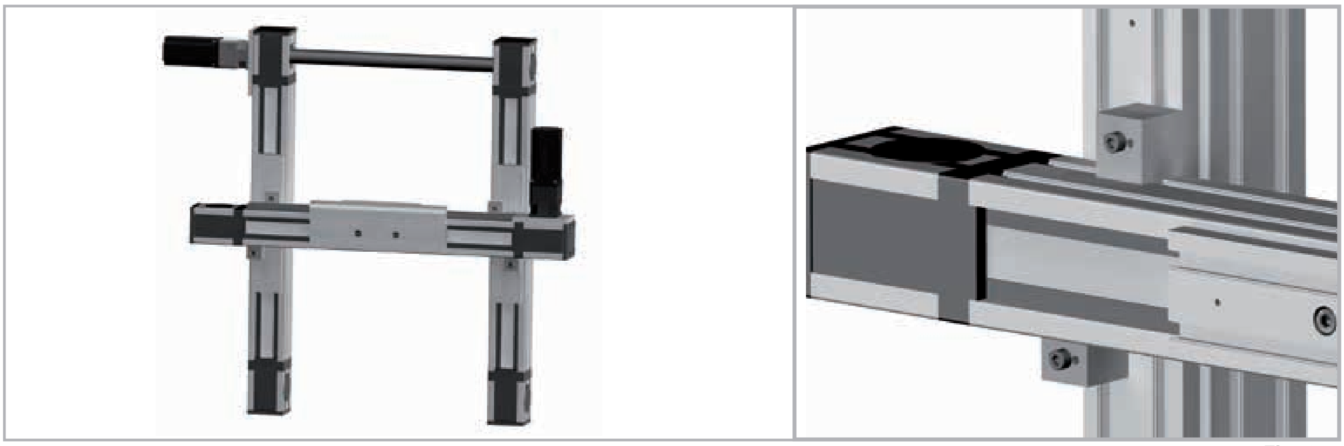
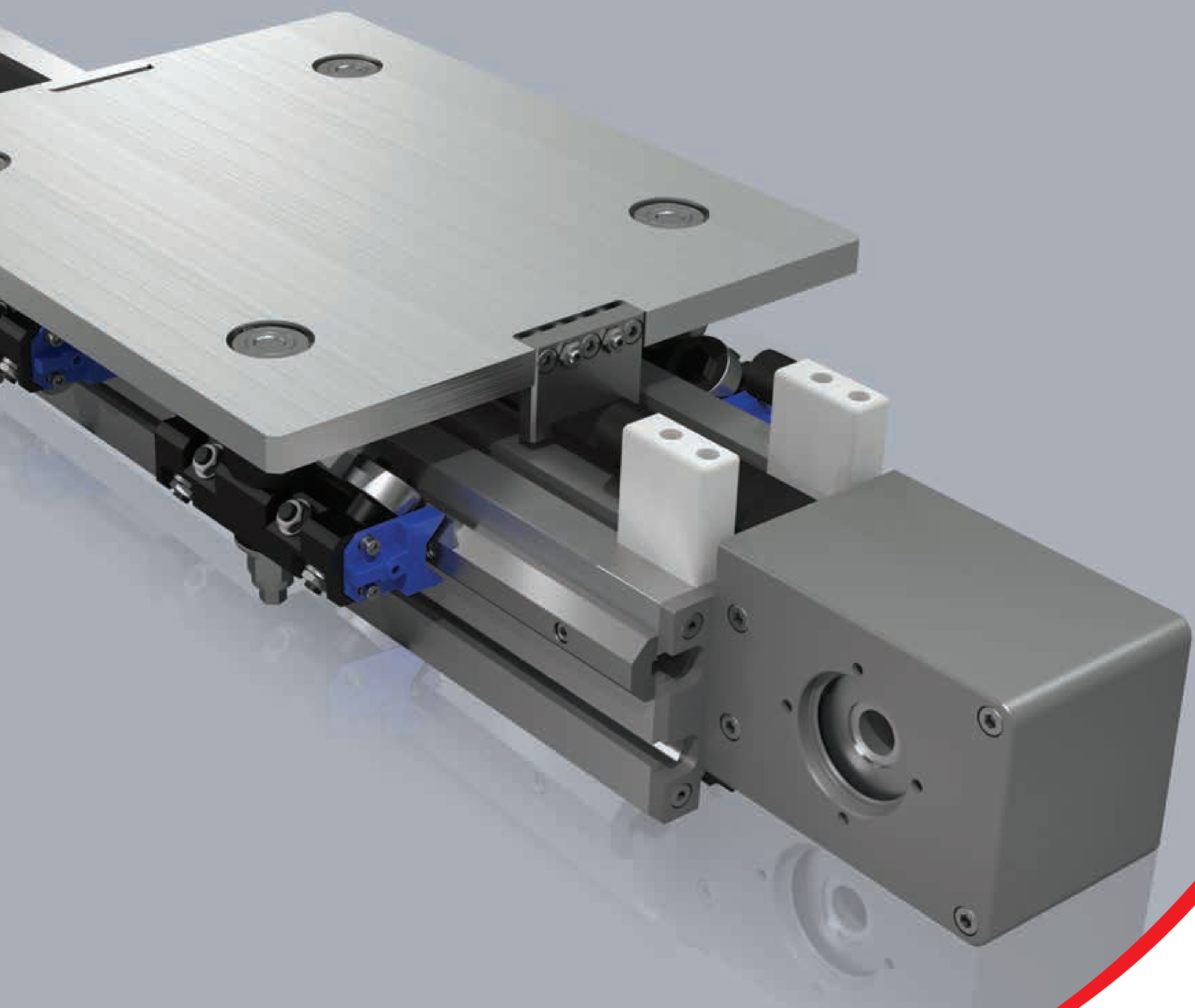


Fig. 100

US

BY TIMKEN

Modline



MCR/MCH series

MCR/MCH series description

Fig. 1

The MCR/MCH units are linear actuators made of a self-supporting extruded aluminum frame and are driven by a polyurethane belt with AT metric profile steel inserts.

- Reduced weight ensured by the light frame and the aluminum sliders
- Three different sizes available: 65mm, 80mm, 105mm
- High sliding speed

MCR

Featuring four + four rollers with a Gothic arch outer profile and flat outer profile, sliding on hardened steel bars placed inside the profile.

MCH

Featuring a recirculating ball linear guide rail placed inside the profile.

The components

Extruded bodies

The anodized aluminum extrusion used for the profile of the Rollon MCR/MCH series linear units was designed and manufactured by industry experts to optimise weight while maintaining mechanical strength. The anodized aluminum alloy 6060 used (see physical-chemical characteristics below) was extruded with dimensional tolerances complaint with EN 755-9 standards.

Driving belt

The Rollon MCR/MCH series linear units use steel reinforced polyurethane drive belts with AT pitch. This belt is ideal due to its high load transmission characteristics, compact size and low noise. Used in conjunction with a backlash-free pulley, smooth alternating motion can be achieved. Optimisation of the maximum belt width/body dimension ratio enables the following performance characteristics to be achieved:

- **High speed**
- **Low noise**
- **Low wear**

The driving belt is guided by specific slots in the aluminum extruded body thus covering the inside components.

Carriage

The carriage of the Rollon MCR/MCH series linear units is made of anodized aluminum. Two different length carriages are available for size 80 and 105.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 1

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.70	69	23	200	880-900	33	600-655

Tab. 2

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
205	165	10	60-80

Tab. 3

The linear motion system

The linear motion system has been designed to meet the load capacity, speed, and maximum acceleration conditions of a wide variety of applications.

MCR with gothic arch bearing guides

- Hardened steel rods (58/60 HRC tolerance h6) are securely inserted inside the aluminum body.
- The carriage is fitted with four + four bearing assemblies, four having a gothic arch groove machined into its outer race, to run on the steel rods, and four having flat outer ring.
- The bearings are mounted on steel pins, two of which are eccentric, to allow setting of running clearance and pre-load.
- The driving belt is supported by the entire length of the profile to avoid deflection as well as to protect the linear guide.

The linear motion system described above offers:

- Good positioning accuracy
- Low noise
- Maintenance Free (dependent on application)

MCH with ball bearing guides

- A recirculating ball guide with high load capacity is mounted in a dedicated seat inside the aluminum body.
- The carriage is assembled on two pre-loaded ball bearing blocks.
- The two ball bearing blocks enable the carriage to withstand loading in the four main directions.
- The two blocks have seals on both sides and, if necessary, an additional scraper can be fitted for very dusty conditions.
- The ball bearing carriages are also fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment.
- Lubrication reservoirs (pockets) installed on the front of the ball bearing blocks supply the appropriate amount of grease, thus promoting a long maintenance interval.

The linear motion system described above offers:

- High permissible bending moments
- High speed and acceleration
- High load capacity
- Low friction
- Long life
- Low noise

MCR

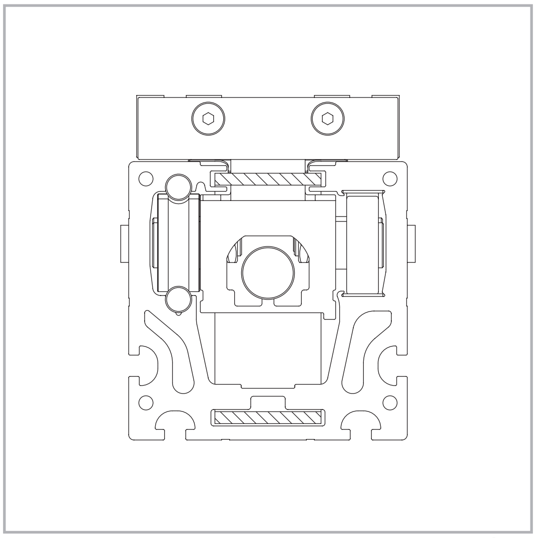


Fig. 2

MCH

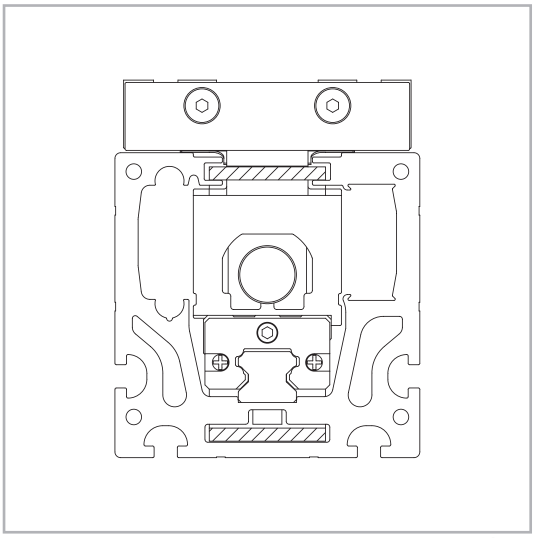
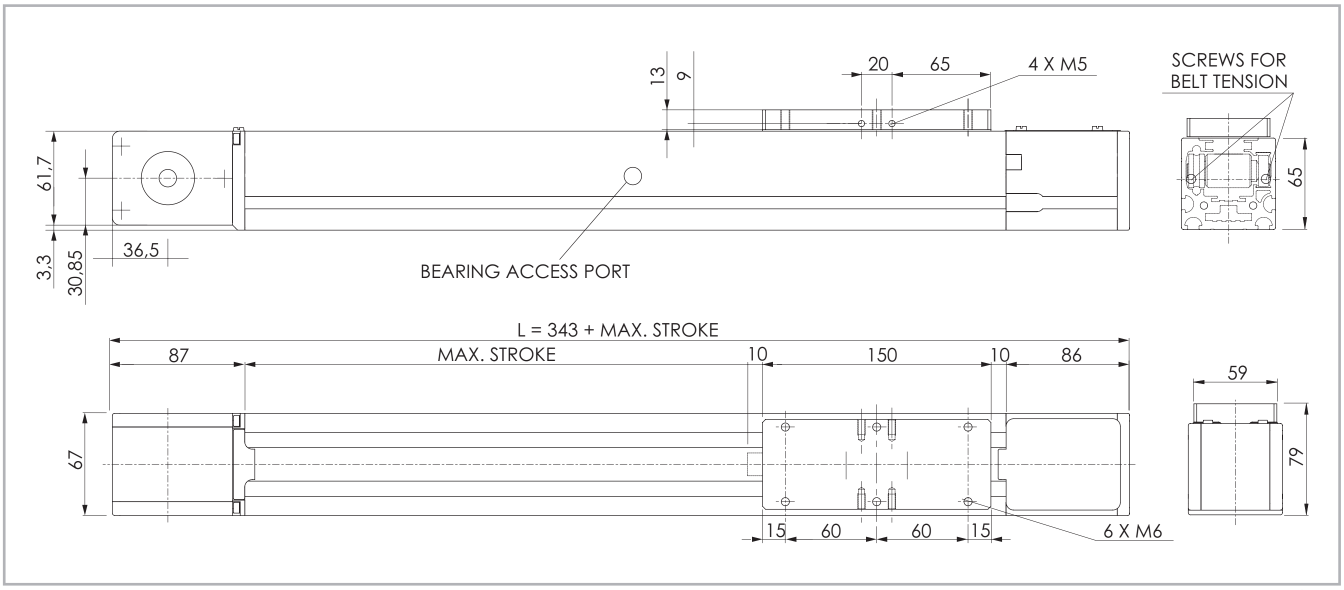


Fig. 3

MCR 65

MCR 65 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 4

Technical data

	Type MCR 65
Max. useful stroke length [mm]	5800
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	4
Max. acceleration [m/s²]	20
Type of belt	32 AT 05
Type of pulley	Z 32
Pulley pitch diameter [mm]	50.93
Carriage displacement per pulley turn [mm]	160
Carriage weight [kg]	0.87
Zero travel weight [kg]	3.7
Weight for 100 mm useful stroke [kg]	0.475
Starting torque [Nm]	0.4
Moment of inertia of pulleys [g mm²]	267443
Rail size [mm]	Ø8

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 4

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
MCR 65	0.080	0.068	0.148

Tab. 5

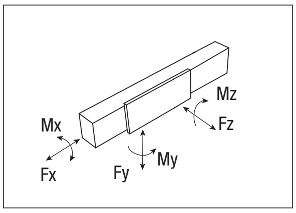
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
MCR 65	32 AT 05	32	0.105

Tab. 6

Belt length (mm) = 2 x L - 69



Load capacity

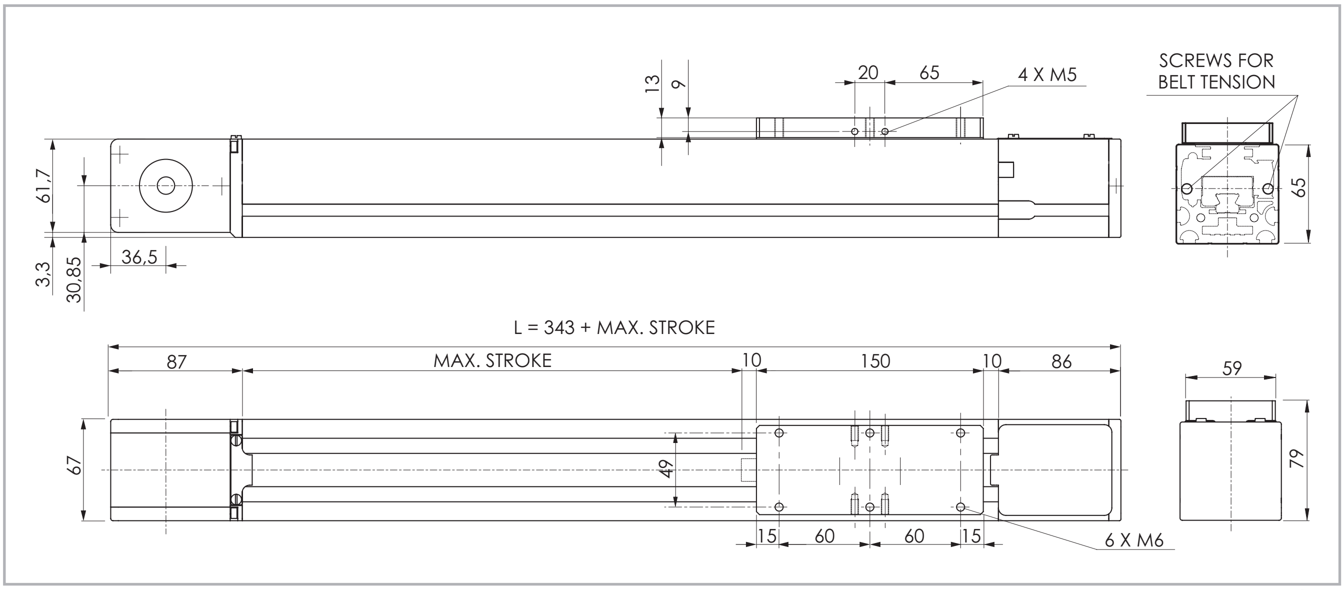
Type	F_x [N]		F_y [N]	F_z [N]		M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.
MCR 65	1344	960	1964	2192	9195	65.1	132	93.9

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 7

MCH 65

MCH 65 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 5

Technical data

	Type
	MCH 65
Max. useful stroke length [mm]	8750
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	4
Max. acceleration [m/s²]	30
Type of belt	32 AT 05
Type of pulley	Z 32
Pulley pitch diameter [mm]	50.93
Carriage displacement per pulley turn [mm]	160
Carriage weight [kg]	0.9
Zero travel weight [kg]	3.85
Weight for 100 mm useful stroke [kg]	0.58
Starting torque [Nm]	0.3
Moment of inertia of pulleys [g mm²]	267443
Rail size [mm]	15

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 8

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
MCH 65	0.080	0.068	0.148

Tab. 9

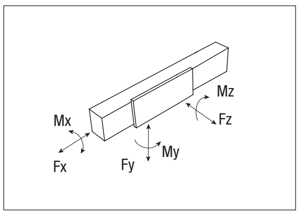
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
MCH 65	32 AT 05	32	0.105

Tab. 10

Belt length (mm) = 2 x L - 69



Load capacity

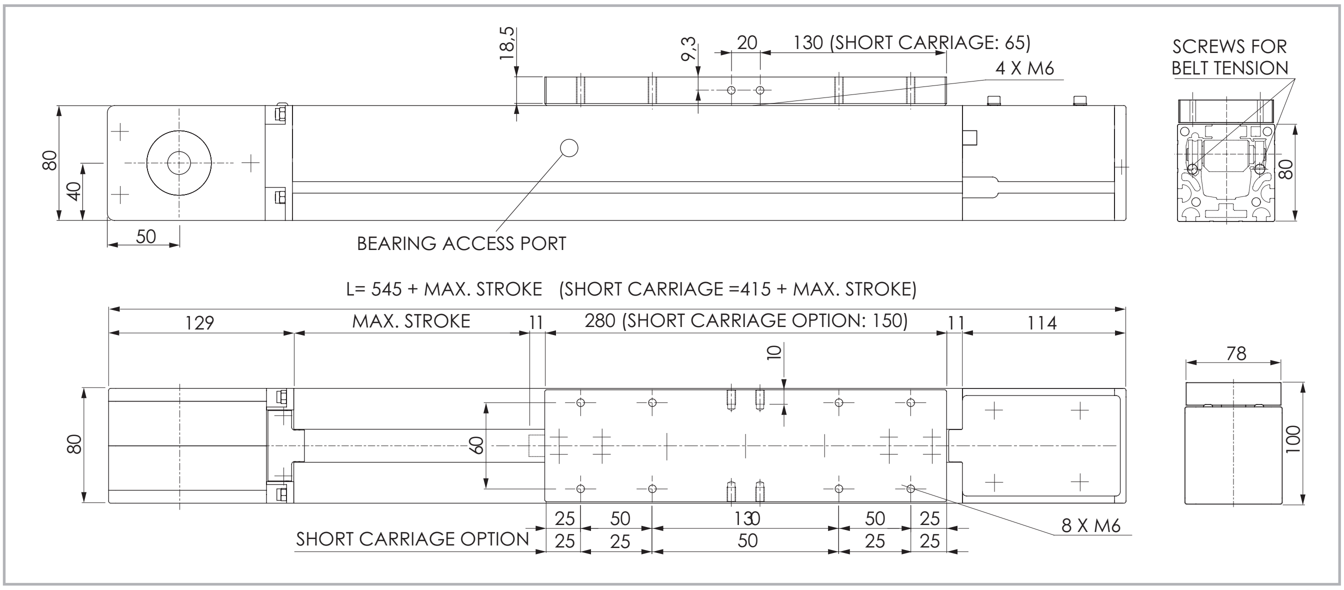
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
MCH 65	1344	960	30560	19890	30560	240	1406	1406

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 11

MCR 80

MCR 80 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig.6

Technical data

	Type	
	MCR 80	MCR 80 C
Max. useful stroke length [mm]	5650	5780
Max. positioning repeatability [mm] *1	± 0.1	± 0.1
Max. speed [m/s]	5	5
Max. acceleration [m/s²]	20	20
Type of belt	32 AT 10	32 AT 10
Type of pulley	Z 22	Z 22
Pulley pitch diameter [mm]	70.03	70.03
Carriage displacement per pulley turn [mm]	220	220
Carriage weight [kg]	2.2	1.25
Zero travel weight [kg]	8.8	6.95
Weight for 100 mm useful stroke [kg]	0.7	0.7
Starting torque [Nm]	0.7	0.7
Moment of inertia of pulleys [g mm²]	1174346	1174346
Rail size [mm]	Ø8	Ø8

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 12

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
MCR 80	0.179	0.147	0.326

Tab. 13

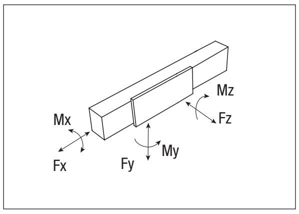
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
MCR 80	32 AT 10	32	0.185

Tab. 14

Belt length (mm) = 2 x L - 182
Short carriage (mm) = 2 x L - 52



Load capacity

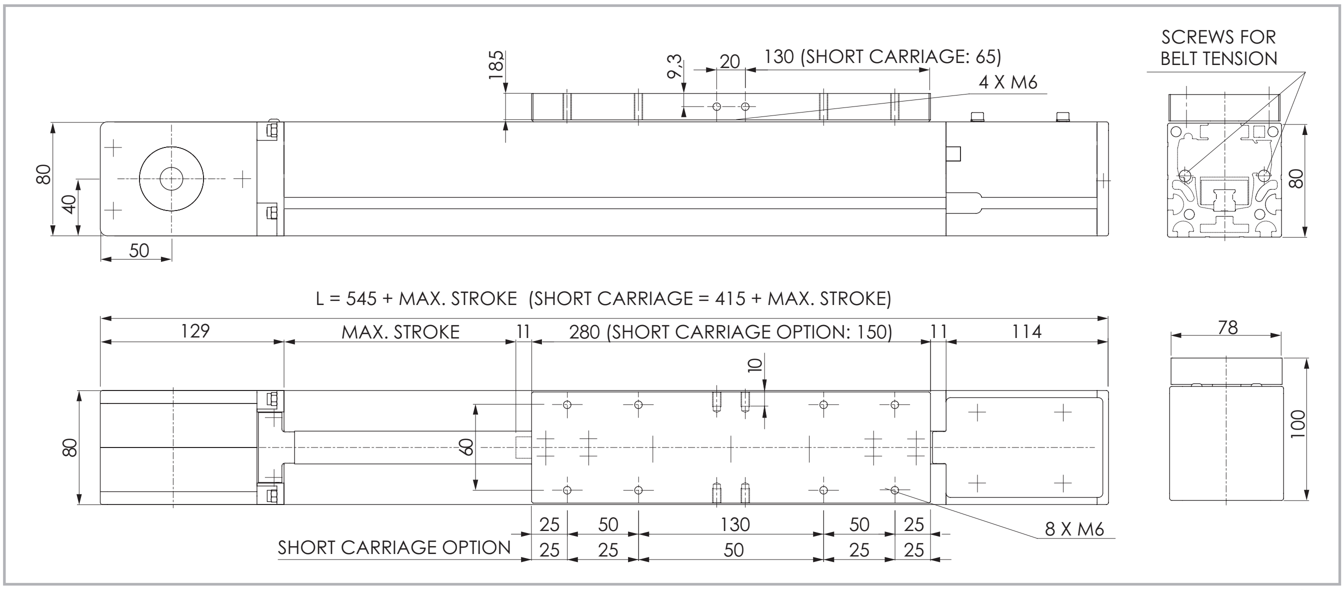
Type	F_x [N]		F_y [N]	F_z [N]		M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.
MCR 80	2656	1760	1964	2579	9195	85.4	361	193
MCR 80 C	2656	1760	1964	2579	9195	85.4	156	93.9

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 15

MCH 80

MCH 80 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 7

Technical data

	Type	
	MCH 80	MCH 80 C
Max. useful stroke length [mm] *1	7650	7780
Max. positioning repeatability [mm]*2	± 0.1	± 0.1
Max. speed [m/s]	5	5
Max. acceleration [m/s²]	40	40
Type of belt	32 AT 10	32 AT 10
Type of pulley	Z 22	Z 22
Pulley pitch diameter [mm]	70.03	70.03
Carriage displacement per pulley turn [mm]	220	220
Carriage weight [kg]	2.45	1.3
Zero travel weight [kg]	9.4	7.1
Weight for 100 mm useful stroke [kg]	0.79	0.79
Starting torque [Nm]	0.9	0.9
Moment of inertia of pulleys [g mm²]	1174346	1174346
Rail size [mm]	15	15

*1) It is possible to obtain strokes up to 9000 mm by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 16

Moments of inertia of the aluminum body

Type	I_x [10^7 mm⁴]	I_y [10^7 mm⁴]	I_p [10^7 mm⁴]
MCH 80	0.179	0.147	0.326

Tab. 17

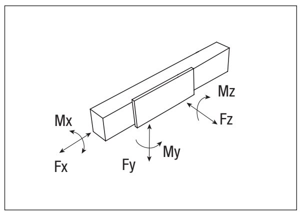
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
MCH 80	32 AT 10	32	0.185

Tab. 18

Belt length (mm) = 2 x L - 182
Short carriage (mm) = 2 x L - 52



Load capacity

Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
MCH 80	2656	1760	30560	19890	30560	240	3285	3285
MCH 80 C	2656	1760	15280	9945	15280	120	90	90

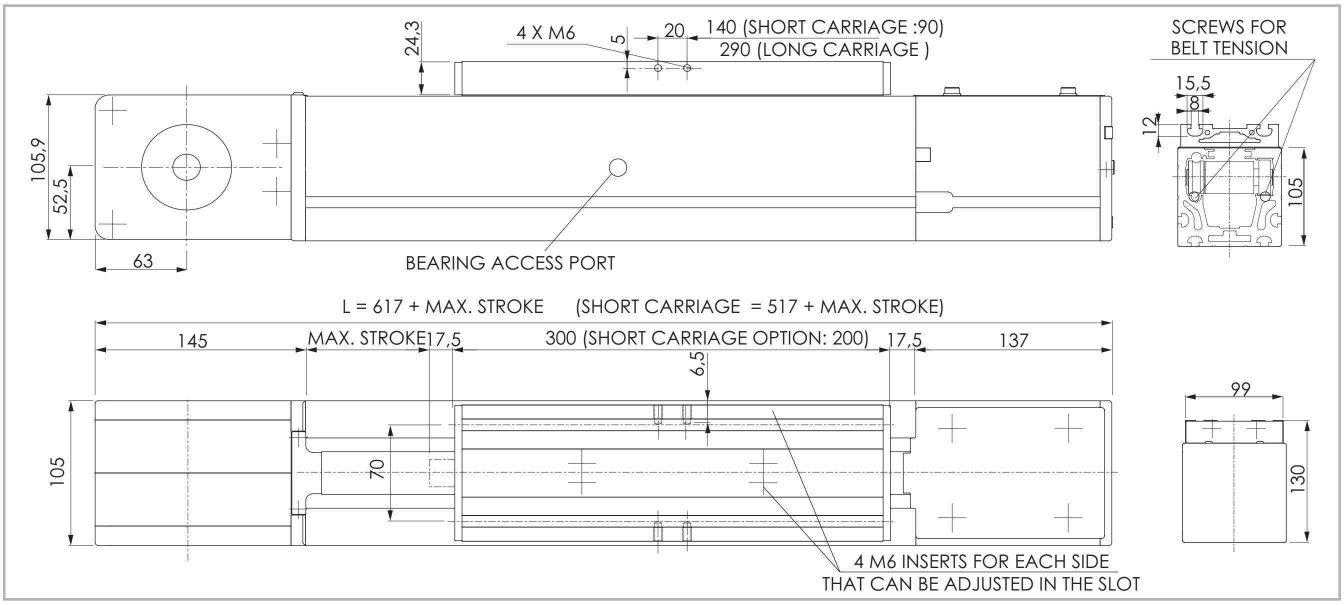
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 19

ML

MCR 105

MCR 105 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 8

Technical data

	Type	
	MCR 105	MCR 105 C
Max. useful stroke length [mm]	7100	7200
Max. positioning repeatability [mm]*1	± 0.1	± 0.1
Max. speed [m/s]	5	5
Max. acceleration [m/s²]	20	20
Type of belt	40 AT 10	40 AT 10
Type of pulley	Z 29	Z 29
Pulley pitch diameter [mm]	92.31	92.31
Carriage displacement per pulley turn [mm]	290	290
Carriage weight [kg]	3.51	2.56
Zero travel weight [kg]	17.15	14.9
Weight for 100 mm useful stroke [kg]	1.2	1.2
Starting torque [Nm]	1.2	1.2
Moment of inertia of pulleys [g mm²]	4482922	4482922
Rail size [mm]	Ø10	Ø10

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 20

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
MCR 105	0.448	0.576	1.015

Tab. 21

Driving belt

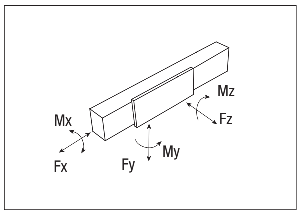
The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
MCR 105	40 AT 10	40	0.231

Tab. 22

Belt length (mm) = 2 x L - 165

Short carriage (mm) = 2 x L - 65



Load capacity

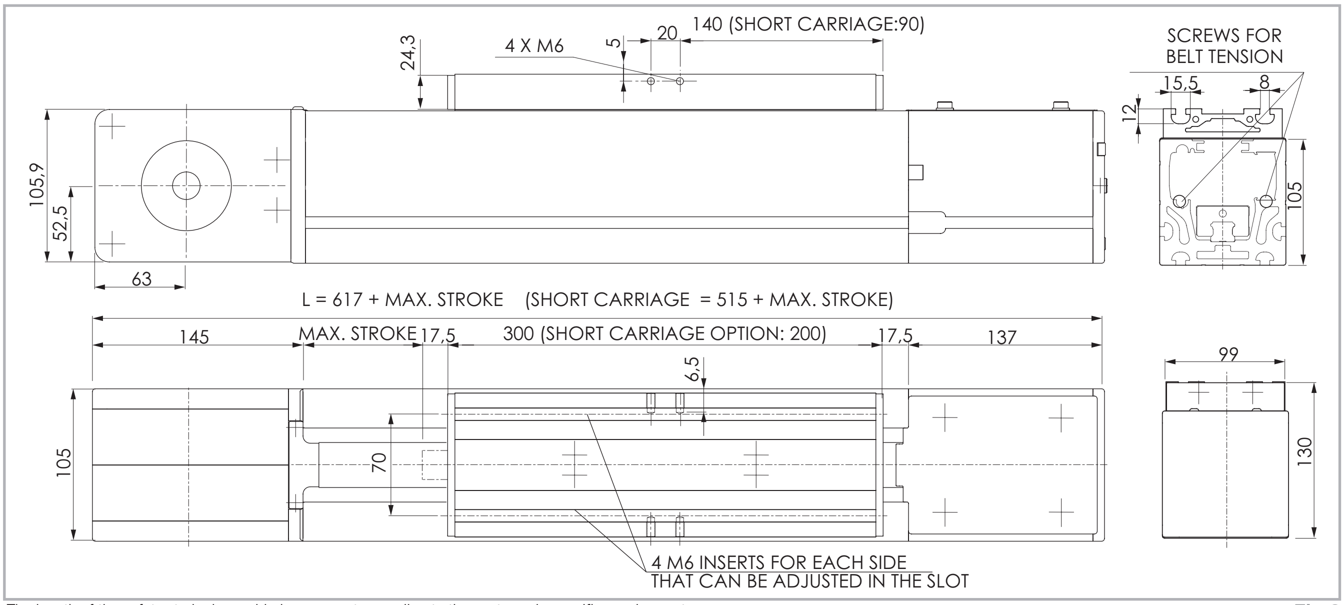
Type	F_x [N]		F_y [N]	F_z [N]		M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.
MCR 105	3984	2640	4250	7812	26997	340	1033	417
MCR 105 C	3984	2640	4250	7812	26997	340	544	250

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 23

MCH 105

MCH 105 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig.9

Technical data

	Type	
	MCH 105	MCH 105 C
Max. useful stroke length [mm]	7100	7200
Max. positioning repeatability [mm]*2	± 0.1	± 0.1
Max. speed [m/s]	5	5
Max. acceleration [m/s²]	50	50
Type of belt	40 AT 10	40 AT 10
Type of pulley	Z 32	Z 32
Pulley pitch diameter [mm]	92.31	92.31
Carriage displacement per pulley turn [mm]	290	290
Carriage weight [kg]	3.5	2.3
Zero travel weight [kg]	17.5	14.4
Weight for 100 mm useful stroke [kg]	1.36	1.36
Starting torque [Nm]	1.5	1.5
Moment of inertia of pulleys [g mm²]	4482922	4482922
Rail size [mm]	20	20

*1) It is possible to obtain strokes up to 10000mm by means of special rollon joint
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 24

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
MCH 105	0.448	0.576	1.015

Tab. 25

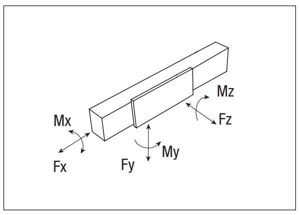
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
MCH 105	40 AT 10	40	0.231

Tab. 26

Belt length (mm) = 2 x L - 165
Short carriage (mm) = 2 x L - 65



Load capacity

Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
MCH 105	3984	2640	51260	36637	51260	520	5536	5536
MCH 105 C	3984	2640	25630	18319	25630	260	190	190

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 27

Linear units in parallel

Synchronisation kit for use of MCR/MCH linear units in parallel

When movement consisting of two linear units in parallel is essential, a synchronisation kit must be used. The kit contains original Rollon blade type precision joints complete with tapered splines and hollow aluminum drive shafts.

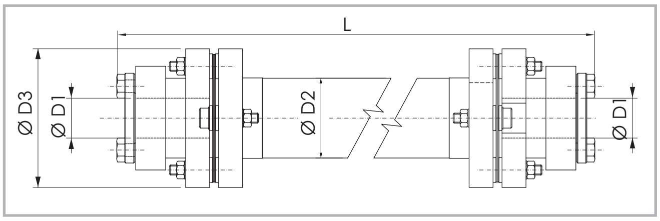


Fig. 10

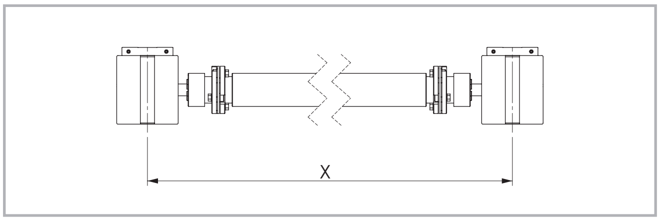
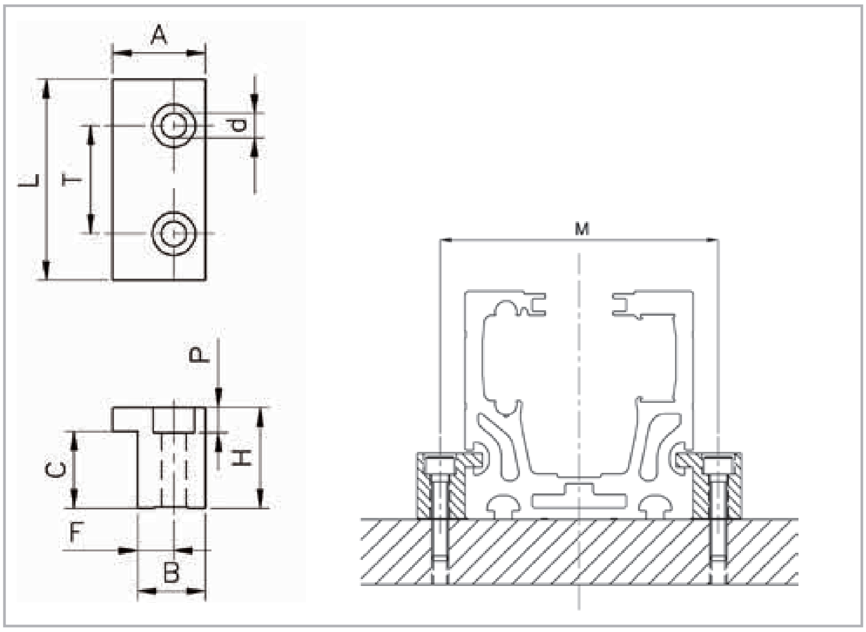


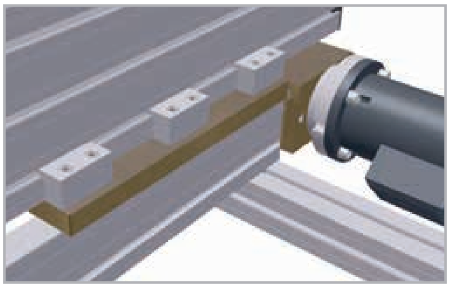
Fig. 11

Unit	Shaft type	D1	D2	D3	Code	Formula for length calculation
MCR/MCH 65	**AP 12**	12	25	45	GK12P...1A	L= X-80 [mm]
MCR/MCH 80	**AP 20**	20	40	69.5	GK20P...1A	L= X-97 [mm]
MCR/MCH 105	**AP 25**	25	70	99	GK25P...1A	L= X-130 [mm]

Tab. 28

Accessories





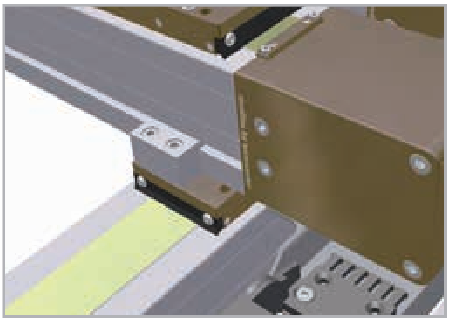


Fig. 12

Material: aluminum alloy 6082

Unit	A	L	T	d	H	P	C	F	B	M	Code
MCR/MCH 65	25	50	25	6.7	20	6.8	13.5	10	18	87	415.0380
MCR/MCH 80	25	50	25	6.7	25	6.8	18.6	10	18	100	415.0760
MCR/MCH 105	30	50	25	9	30	9.5	23.6	12	22	129	415.0761

Tab. 29

Insertable nuts and plates

Spring nut

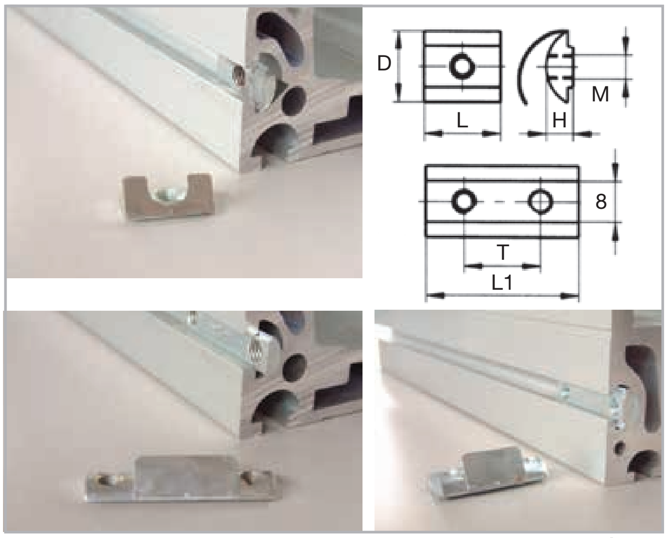


Fig. 13

Plate suitable for every kind of module (8 mm slot).

Material: nut in galvanised steel welded to the harmonic steel spring.

Single plate	MC 80-105	MC 65
M5	A32-55	B32-55
M6	A32-65	B32-65
M8	A32-85	B32-85

Tab. 30

Double plate	MC 80-105	MC 65
M6	A32-67	B32-67

Tab. 31

Size					
Base module	D	H	L	L1	T
MC 80-105	14	7.8	20	40	30
MC 65	11	4.1	20	40	30

Tab. 32

Simple nut

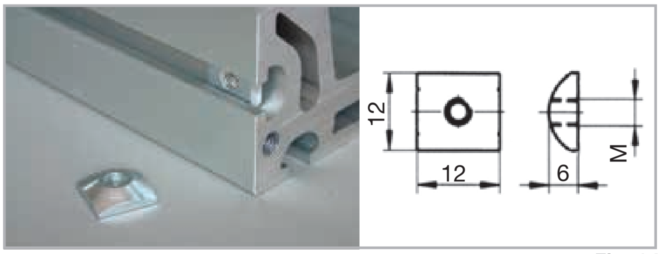


Fig. 14

Material: galvanised steel.

Insert through the end of the profile.

Suitable for series: MC 80-105

Thread	Code
M5	209.2431
M6	209.2432
M8	209.2433

Tab. 33

Front insertable spring nut

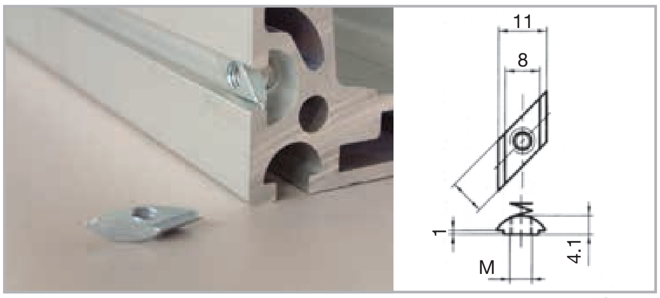


Fig. 15

Material: galvanised steel, harmonic steel spring.

To be inserted through the slot.

Suitable for series: MC 65

Thread	Code
M3	BD31-30
M4	BD31-40
M5	BD31-50
M6	BD31-60

Tab. 34

Simple nut

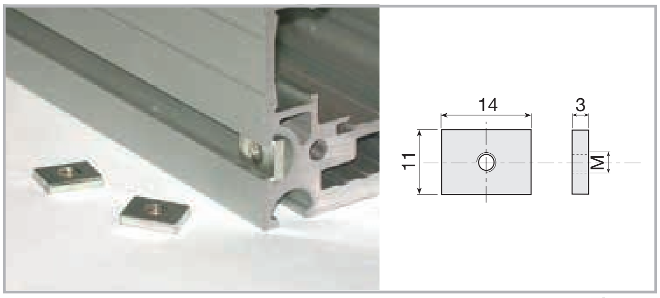


Fig. 16

Material: galvanised steel.

To be inserted through the slot.

Suitable for series: MC 65

Thread	Code
M4	D32.40
M5	D32.50
M6	D32.60

Tab. 35

Sensor brackets

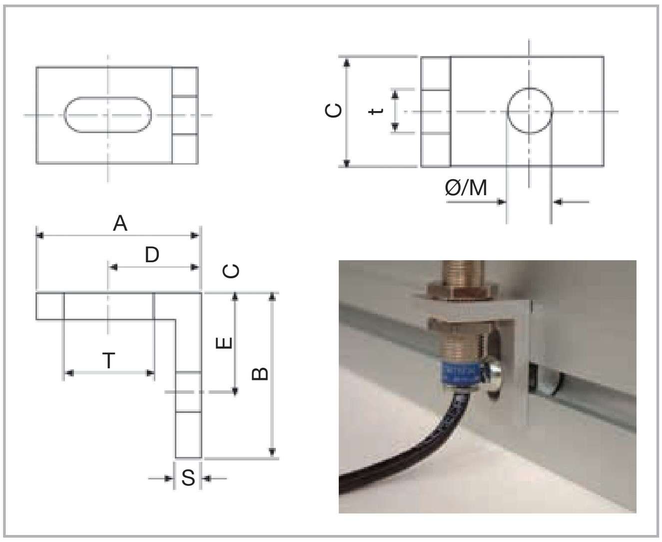


Fig. 17

Material: natural, anodized anticorodal alloy.

Thread								Code	
A	B	C	D	E	S	Txt	Ø/M	Ø	M
45	45	20	25	25	5	20X6.5	6	A30-76	A 30-86
35	25	20	19	15	5	20X6.5	4	A30-54	A30-64
35	25	20	19	15	5	20X6.5	5	A30-55	A30-65
35	25	20	19	15	5	20X6.5	6	A30-56	A30-66
25	25	15	14	15	4	13.5X5.5	3	B30-53	B30-63
25	25	14	14	15	4	13.5X5.5	4	B30-54	B30-64
25	25	15	14	15	4	13.5X5.5	5	B30-55	B30-65
25	25	15	14	15	4	13.5X5.5	6	B30-56	B30-66

Suitable for all the modules

Tab. 36

M = Threaded version

Ø = Passing through hole version

Steel strip protection for series MCR/MCH 80-105

Material: Stainless steel foil.

Optional: For additional protection from dust and debris, a magnetic seal strip can be added to the profile to cover the belt way.

Due to the magnetic strip, it is best to avoid use in the presence of ferrous debris.

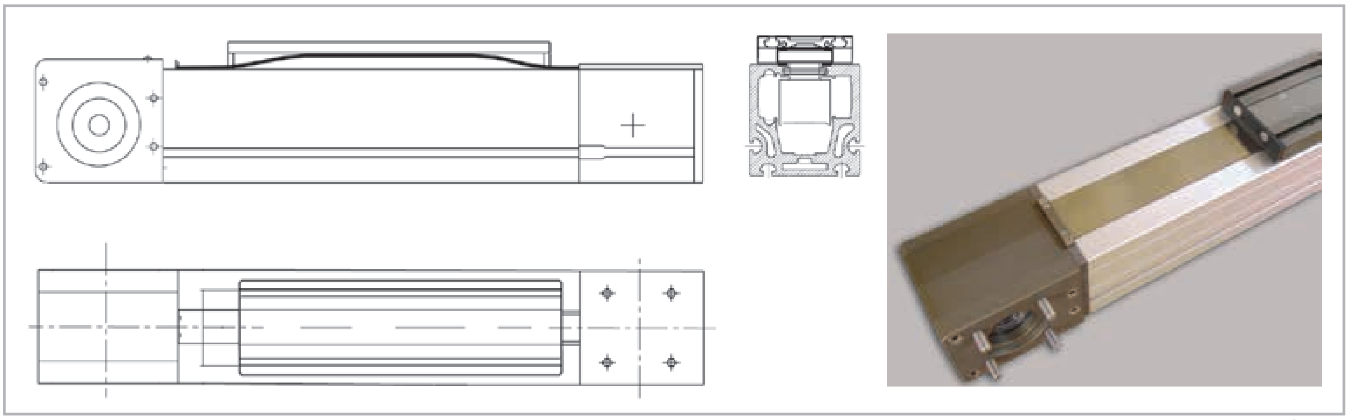


Fig. 18

Ordering key

Identification codes for the MCR/MCH series

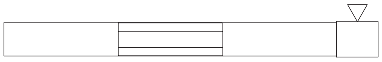
MCR	10	1A	02000	1A	D
MCH	06=65				
	08=80				
	10=105				

- D: Multiple carriages
- 1A: Carriage option
- 02000: L=Total length of the unit
- 1A: Driving head code
- 10: Linear unit size *see from pg. ML-6 to pg. ML-11*
- MCR/MCH: MCR/MCH Series *see pg. ML-3*

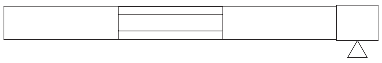
In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Configure Actuator

Left / right orientation



Right



Left

TCR/TCS series

TCR/TCS series description

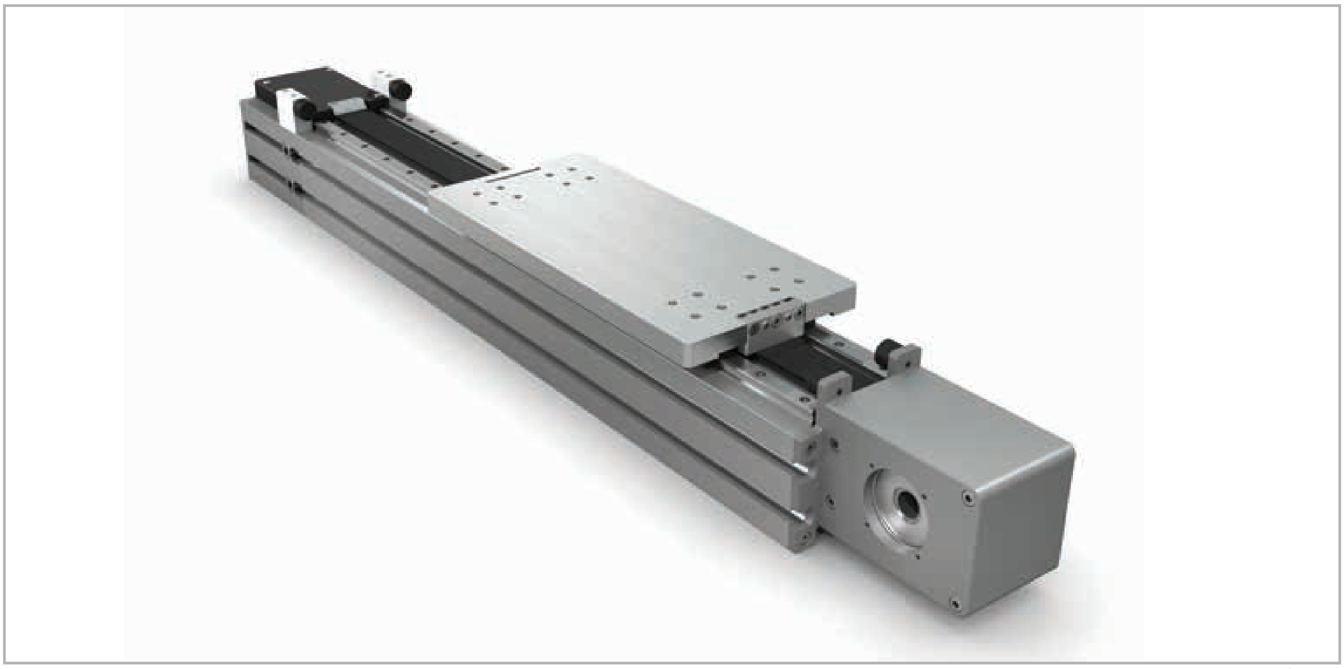


Fig. 19

The TCR/TCS series linear units are particularly suitable for: heavy loads, pulling and pushing very heavy weights, demanding work cycles, possible cantilever or gantry mounting and operations in industrial automated lines.

The extruded and anodized aluminum self-supporting structure with a rectangular section is available in different sizes ranging from 140 to 360 mm. Transmission is achieved with a polyurethane steel reinforced driving belt. Multiple sliders are available to further improve load capacity.

These units are best used in applications requiring very heavy loads in extremely confined spaces, and where machines cannot be stopped to carry out ordinary maintenance.

TCR

Features a dual Prismatic Rail system.

TCS

Features a dual rail system with four recirculating ball bearing runner blocks.

The components

Extruded bodies

The anodized aluminum extrusions used for the bodies of the Rollon TCR/TCS series linear units were designed and manufactured in cooperation with a leading company in this field, to obtain the right combination of high mechanical strength and reduced weight. The anodized aluminum alloy 6060 used (see physical chemical characteristics below) was extruded with dimensional tolerances complying with EN 755-9 standards.

Driving belt

The Rollon TCR/TCS series linear units use steel reinforced polyurethane drive belts with AT pitch. This belt is ideal due to its high load transmission characteristics, compact size, and low noise. Used in conjunction with a backlash-free pulley, smooth alternating motion can be achieved. Optimization of the maximum belt width/body dimension ratio enables the following performance characteristics to be achieved:

- **High speed**
- **Low noise**
- **Low wear**

Carriage

The carriage of the Rollon TCR/TCS series linear units is made entirely of machined anodized aluminum. The dimensions vary depending on the type. Rollon offers multiple carriages to accommodate a vast array of applications.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 37

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.7	70	23.8	200	880-900	33	600-655

Tab. 38

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
250	200	10	75

Tab. 39

The linear motion system

The linear motion system has been designed to meet the load capacity, speed, and maximum acceleration conditions of a wide variety of applications.

TCR with Prismatic Rail:

Prismatic Rails are made of specially treated high-carbon steel and provided with a permanent lubrication system. Thanks to this kind of solution TCR is specifically dedicated for dirty environments and high dynamics in automation.

- The Prismatic Rails with high load capacity are mounted in a dedicated seat on the aluminum body.
- The carriage is assembled with preload, that enables to withstand loading in the four main directions.
- Hardened and ground steel guide rails.
- Sliders have felts for self-lubrication.

The linear motion system described above offers:

- Suitable for dirty environments
- High speed and acceleration
- Maintenance free
- High load capacity
- Low friction
- Long life
- Low noise

TCS with recirculating ball guides:

- The ball bearing guides with high load capacity are mounted in a dedicated seat on the aluminum body.
- The carriage is assembled on preloaded ball bearing blocks that allow to withstand loading in the four main directions.
- The ball bearing carriages are also fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment.
- The blocks have seals on both sides.

The linear motion system described above offers:

- High permissible bending moments
- High accuracy of the movement
- High speed and acceleration
- High load capacity
- High rigidity
- Low friction
- Long life
- Low noise

TCR section

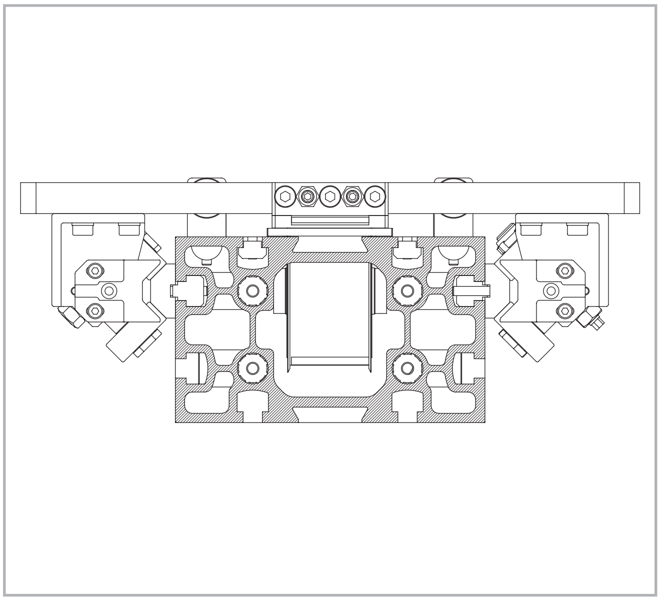


Fig. 20

TCS section

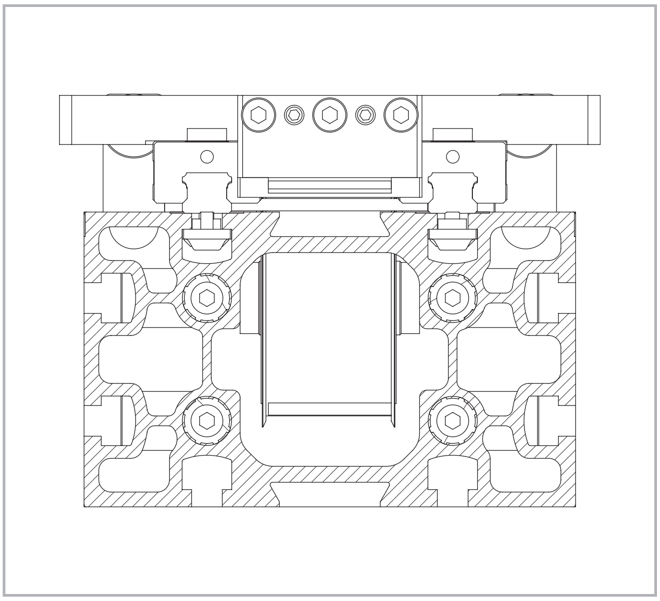
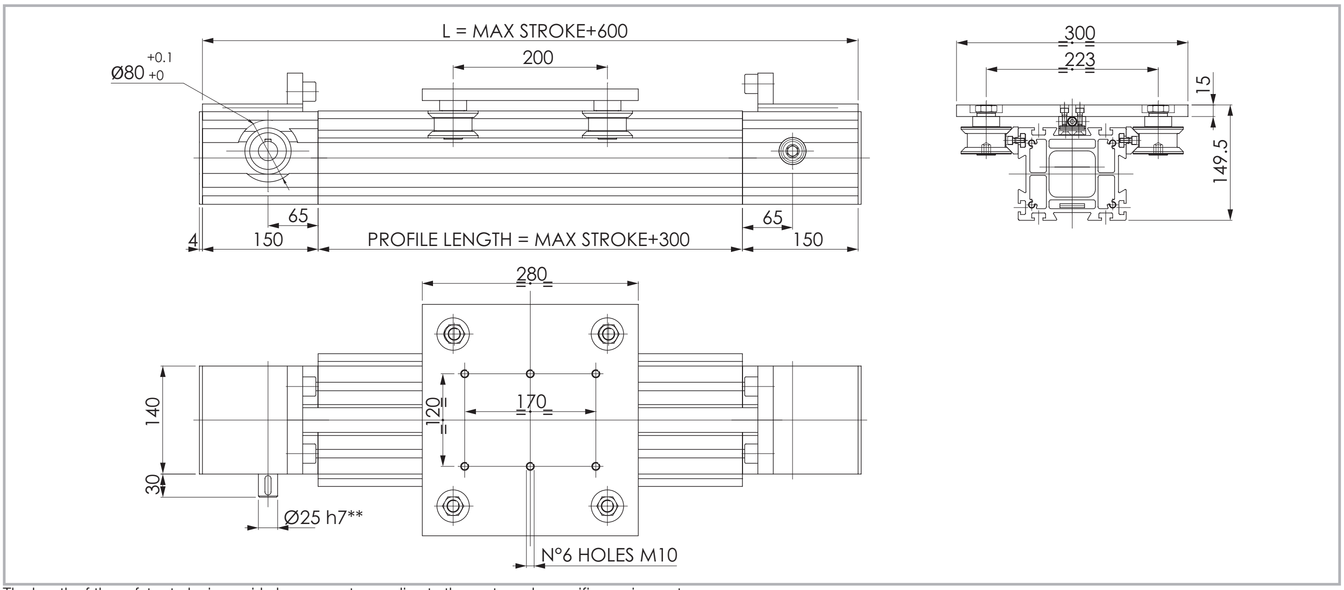


Fig. 21

TCR 140

TCR 140 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.
** Output shaft is the only option available

Fig.22

Technical data

	Type
	TCR 140
Max. useful stroke length [mm]	9700
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	5
Max. acceleration [m/s²]	20
Type of belt	32 AT 10
Type of pulley	Z 32
Pulley pitch diameter [mm]	101.86
Carriage displacement per pulley turn [mm]	320
Carriage weight [kg]	6.0
Zero travel weight [kg]	21.2
Weight for 100 mm useful stroke [kg]	2.2
Starting torque [Nm]	3
Moment of inertia of pulleys [g mm²]	978467
Rail size [mm]	35x16

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 40

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TCR 140	1.148	0.892	2.040

Tab. 41

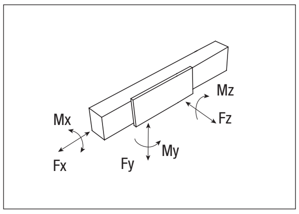
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
TCR 140	32 AT 10	32	0.185

Tab. 42

Belt length (mm) = 2 x L - 160



Load capacity

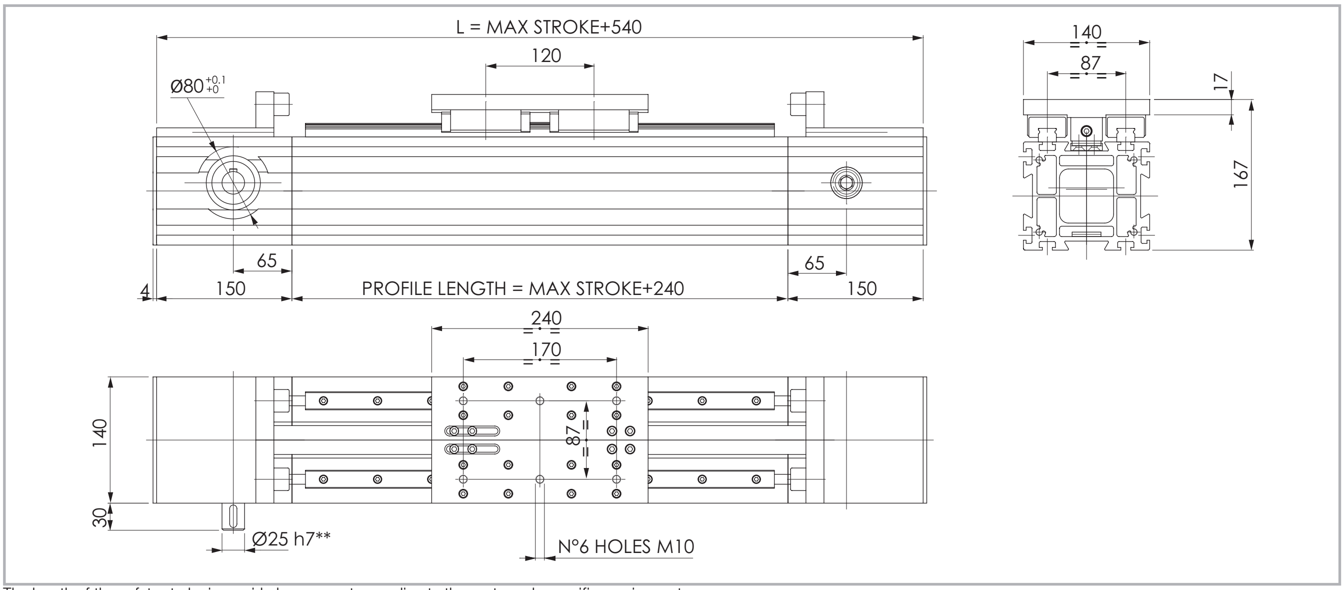
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
TCR 140	3187	2170	6000	23405	4000	280	400	600

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 43

TCS 140

TCS 140 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.
** Output shaft is the only option available

Fig. 23

Technical data

	Type
	TCS 140
Max. useful stroke length [mm]	9760
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	5
Max. acceleration [m/s²]	50
Type of belt	32 AT 10
Type of pulley	Z 32
Pulley pitch diameter [mm]	101.86
Carriage displacement per pulley turn [mm]	320
Carriage weight [kg]	4.2
Zero travel weight [kg]	18
Weight for 100 mm useful stroke [kg]	1.9
Starting torque [Nm]	3.5
Moment of inertia of pulleys [g mm²]	978467
Rail size [mm]	20

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 44

Moments of inertia of the aluminum body

Type	I_x [10^7 mm⁴]	I_y [10^7 mm⁴]	I_p [10^7 mm⁴]
TCS 140	1.148	0.892	2.040

Tab. 45

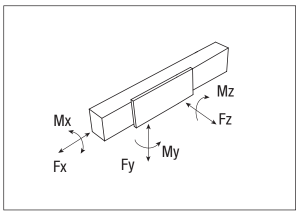
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
TCS 140	32 AT 10	32	0.185

Tab. 46

Belt length (mm) = 2 x L - 100



Load capacity

Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
TCS 140	3187	2170	153600	70798	153600	6682	9216	9216

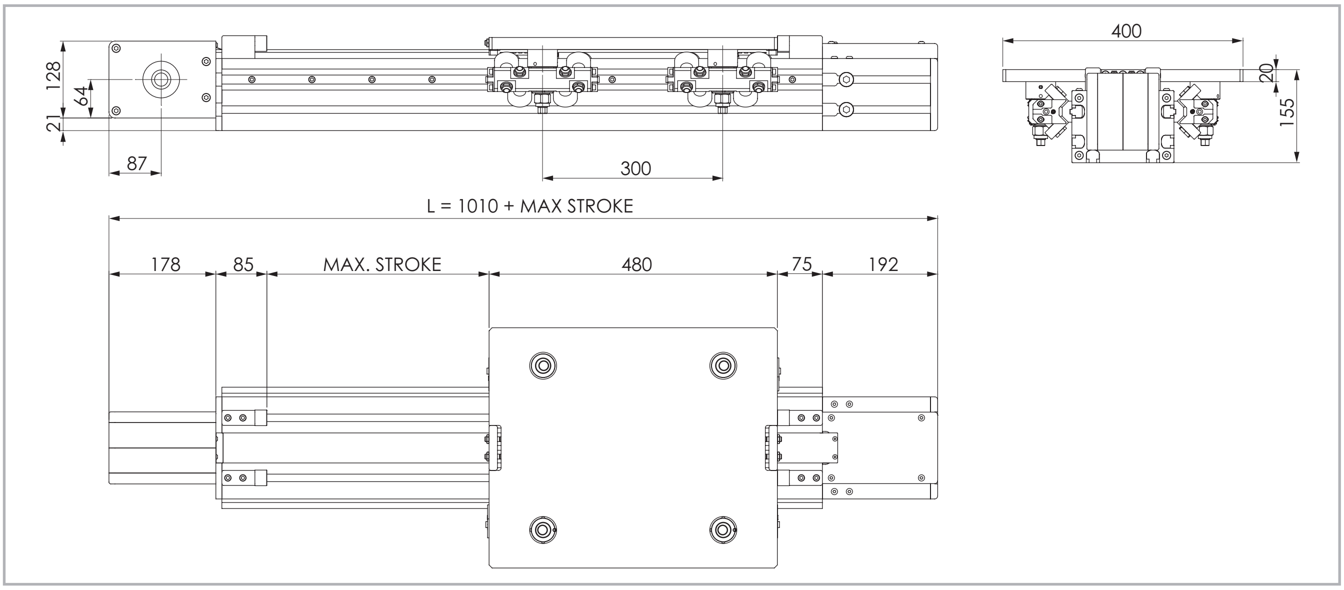
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 47

ML

TCR 170

TCR 170 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 24

Technical data

	Type
	TCR 170
Max. useful stroke length [mm]	11360
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	5
Max. acceleration [m/s²]	20
Type of belt	50 AT 10 HP
Type of pulley	Z 30
Pulley pitch diameter [mm]	95.49
Carriage displacement per pulley turn [mm]	300
Carriage weight [kg]	17.2
Zero travel weight [kg]	51.1
Weight for 100 mm useful stroke [kg]	2.4
Starting torque [Nm]	4.2
Moment of inertia of pulleys [g mm²]	7574717
Rail size [mm]	35x16

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 48

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TCR 170	1.973	0.984	2.957

Tab. 49

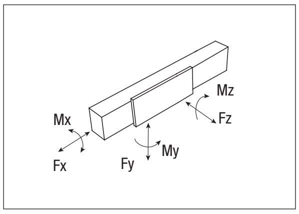
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
TCR 170	50 AT 10 HP	50	0.290

Tab. 50

Belt length (mm) = 2 x L - 250



Load capacity

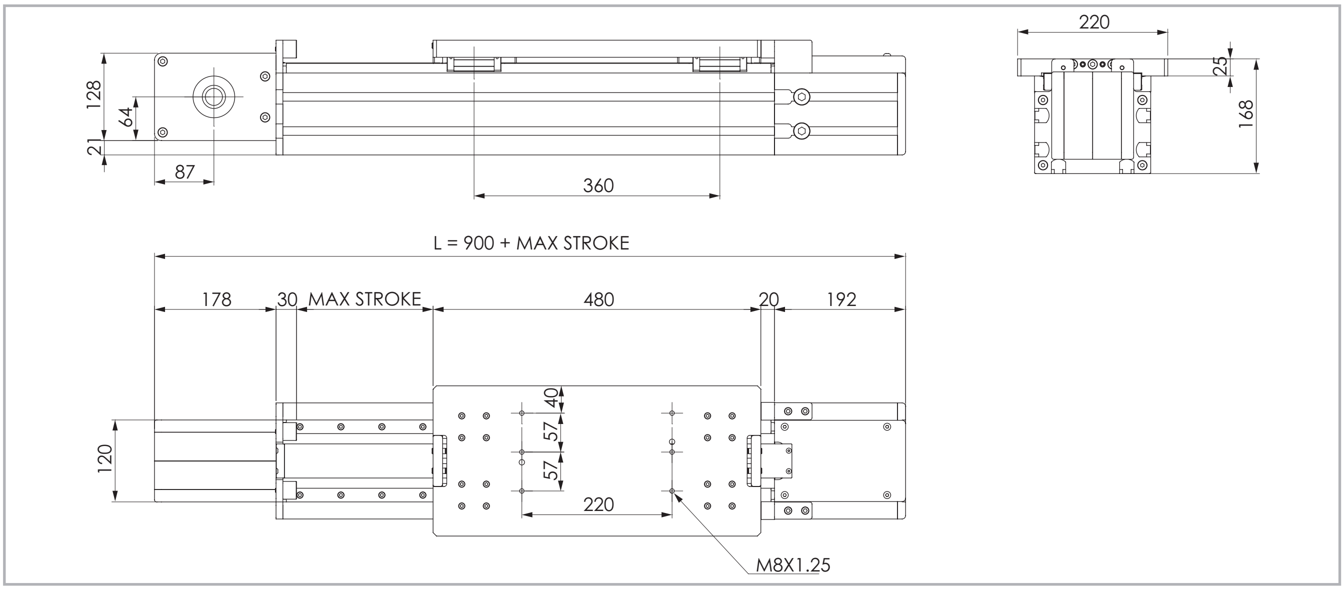
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
TCR 170	4980	3300	14142	65928	14142	1202	2121	2121

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 51

TCS 170

TCS 170 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 25

Technical data

	Type
	TCS 170
Max. useful stroke length [mm]	11470
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	5
Max. acceleration [m/s²]	50
Type of belt	50 AT 10 HP
Type of pulley	Z 30
Pulley pitch diameter [mm]	95.49
Carriage displacement per pulley turn [mm]	300
Carriage weight [kg]	8.6
Zero travel weight [kg]	34.2
Weight for 100 mm useful stroke [kg]	2,2
Starting torque [Nm]	4.8
Moment of inertia of pulleys [g mm²]	7574717
Rail size [mm]	20

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 52

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TCS 170	1.973	0.984	2.957

Tab. 53

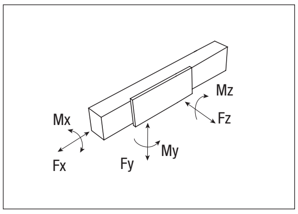
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
TCS 170	50 AT 10 HP	50	0.290

Tab. 54

Belt length (mm) = 2 x L - 250



Load capacity

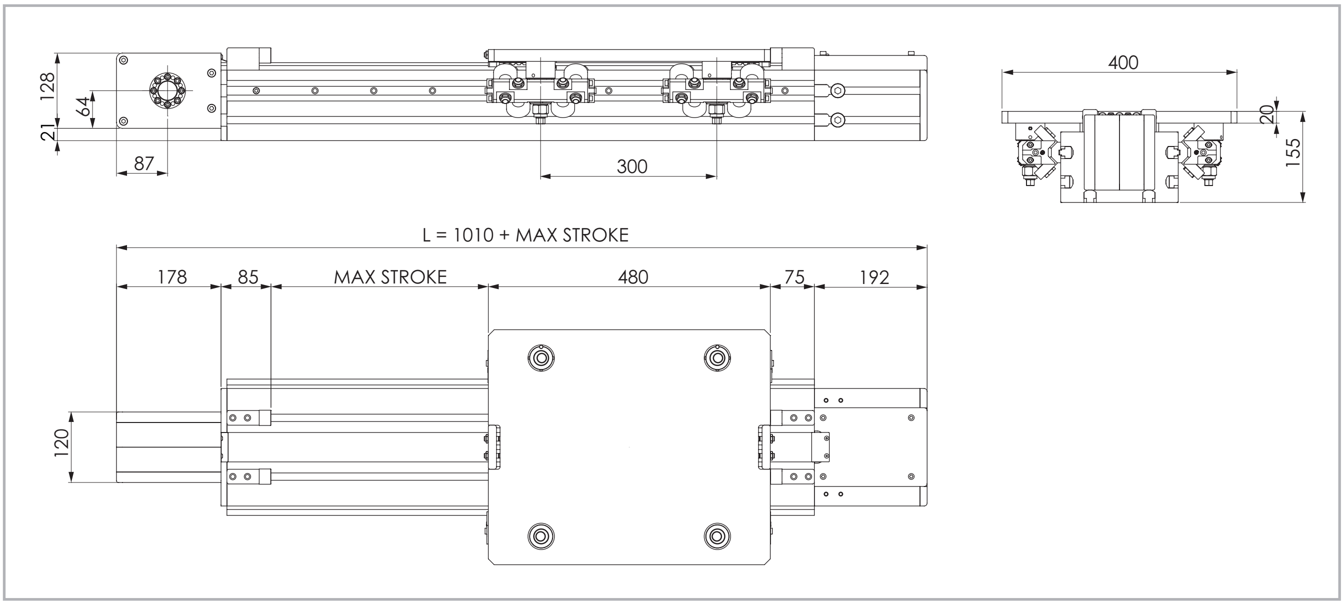
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
TCS 170	4980	3300	153600	70798	153600	7680	27648	27648

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 55

TCR 200

TCR 200 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig.26

Technical data

	Type
	TCR 200
Max. useful stroke length [mm]	11360
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	5
Max. acceleration [m/s²]	20
Type of belt	50 AT 10 HP
Type of pulley	Z 30
Pulley pitch diameter [mm]	95.49
Carriage displacement per pulley turn [mm]	300
Carriage weight [kg]	17.3
Zero travel weight [kg]	54.5
Weight for 100 mm useful stroke [kg]	2.7
Starting torque [Nm]	4.2
Moment of inertia of pulleys [g mm²]	7574717
Rail size [mm]	35x16

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 56

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TCR 200	3.270	1.298	4.586

Tab. 57

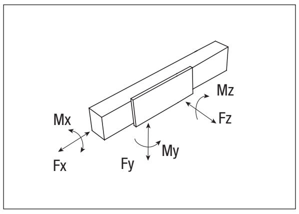
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
TCR 200	50 AT 10 HP	50	0.290

Tab. 58

Belt length (mm) = 2 x L - 250



Load capacity

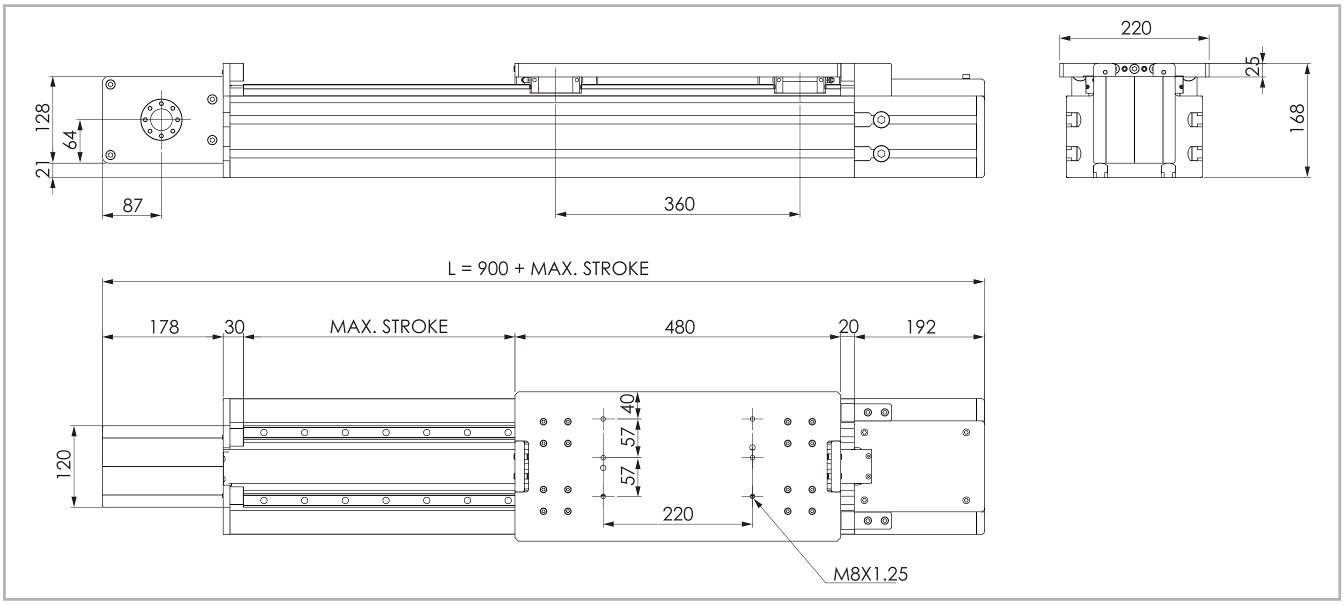
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
TCR 200	4980	3300	14142	65928	14142	1414	2121	2121

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 59

TCS 200

TCS 200 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 27

Technical data

	Type
	TCS 200
Max. useful stroke length [mm]	11470
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	5
Max. acceleration [m/s²]	50
Type of belt	50 AT 10 HP
Type of pulley	Z 30
Pulley pitch diameter [mm]	95.49
Carriage displacement per pulley turn [mm]	300
Carriage weight [kg]	8.6
Zero travel weight [kg]	39.7
Weight for 100 mm useful stroke [kg]	2.6
Starting torque [Nm]	4.8
Moment of inertia of pulleys [g mm²]	7574717
Rail size [mm]	20

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 60

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TCS 200	3.270	1.298	4.586

Tab. 61

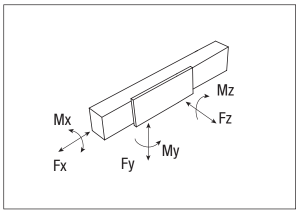
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
TCS 200	50 AT 10 HP	50	0.290

Tab. 62

Belt length (mm) = 2 x L - 250



Load capacity

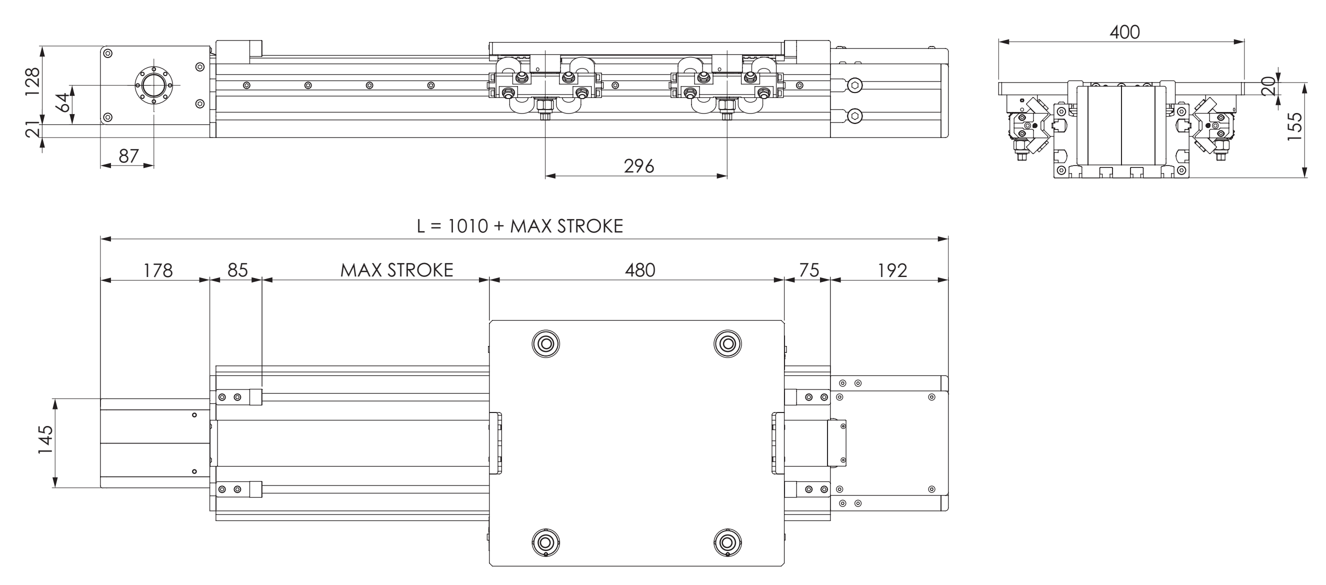
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
TCS 200	4980	3300	153600	70798	153600	7680	27648	27648

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 63

TCR 220

TCR 220 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 28

Technical data

	Type
	TCR 220
Max. useful stroke length [mm]	11360
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	5
Max. acceleration [m/s²]	20
Type of belt	75 AT 10 HP
Type of pulley	Z 30
Pulley pitch diameter [mm]	95.49
Carriage displacement per pulley turn [mm]	300
Carriage weight [kg]	17.3
Zero travel weight [kg]	60.1
Weight for 100 mm useful stroke [kg]	3.7
Starting torque [Nm]	5.8
Moment of inertia of pulleys [g mm²]	9829829
Rail size [mm]	35x16

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 64

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TCR 220	4.625	1.559	6.184

Tab. 65

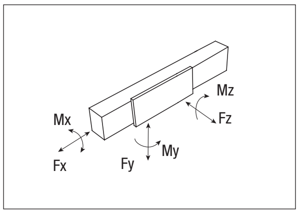
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
TCR 220	75 AT 10 HP	75	0.435

Tab. 66

Belt length (mm) = 2 x L - 250



Load capacity

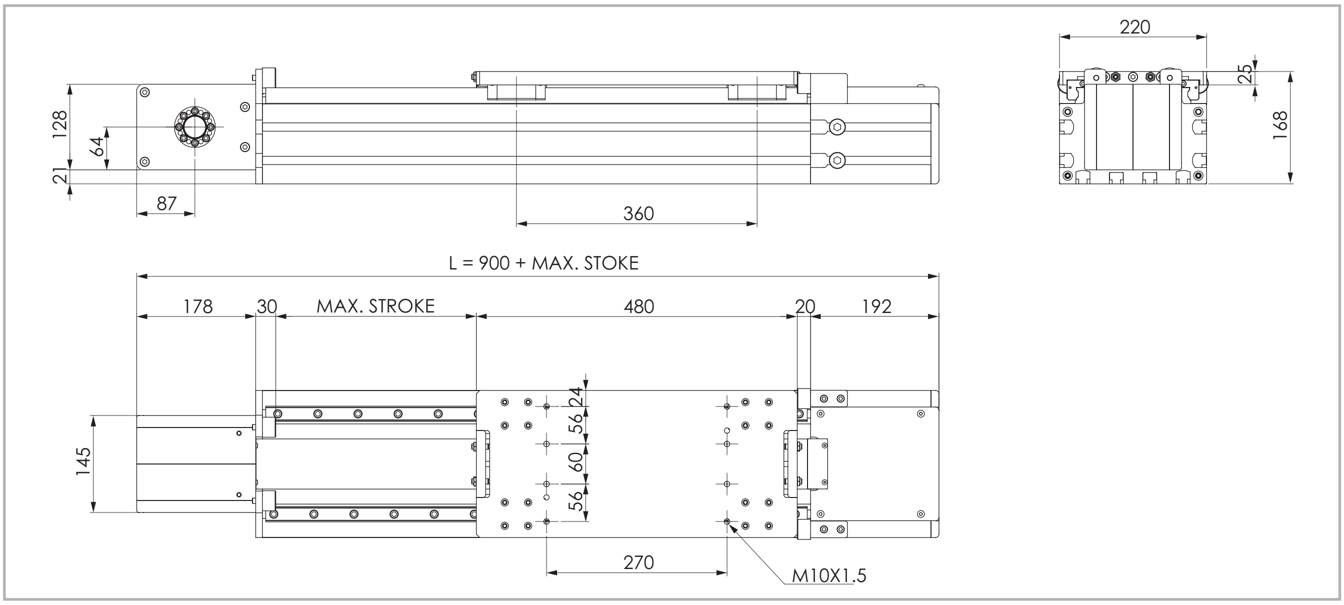
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
TCR 220	7470	4950	14.142	65928	14142	1556	2093	2093

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 67

TCS 220

TCS 220 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 29

Technical data

	Type
	TCS 220
Max. useful stroke length [mm]	11470
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	5
Max. acceleration [m/s²]	50
Type of belt	75 AT 10 HP
Type of pulley	Z 30
Pulley pitch diameter [mm]	95.49
Carriage displacement per pulley turn [mm]	300
Carriage weight [kg]	9.5
Zero travel weight [kg]	49.3
Weight for 100 mm useful stroke [kg]	3.2
Starting torque [Nm]	6.9
Moment of inertia of pulleys [g mm²]	9829829
Rail size [mm]	25

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 68

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TCS 220	4.625	1.559	6.184

Tab. 69

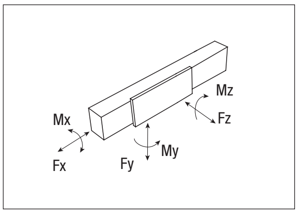
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
TCS 220	75 AT 10 HP	75	0.435

Tab. 70

Belt length (mm) = 2 x L - 250



Load capacity

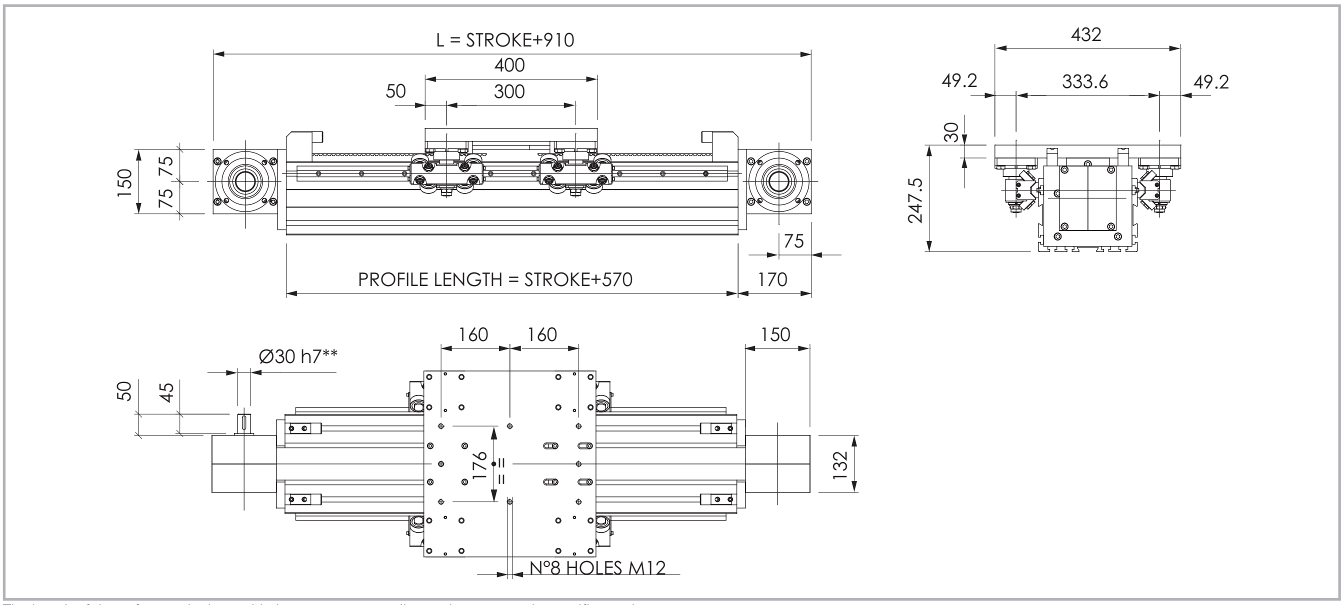
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
TCS 220	7470	4950	258800	116833	258800	19410	46584	46584

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 71

TCR 230

TCR 230 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.
** Output shaft is the only option available

Fig. 30

Technical data

	Type
	TCR 230
Max. useful stroke length [mm]	11430
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	5
Max. acceleration [m/s²]	20
Type of belt	75 AT 10
Type of pulley	Z 40
Pulley pitch diameter [mm]	127.32
Carriage displacement per pulley turn [mm]	400
Carriage weight [kg]	23.0
Zero travel weight [kg]	60
Weight for 100 mm useful stroke [kg]	3.3
Starting torque [Nm]	10.5
Moment of inertia of pulleys [g mm²]	12020635
Rail size [mm]	35x16

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 72

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TCR 230	6.501	3.778	1.028

Tab. 73

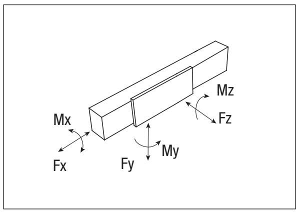
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
TCR 230	75 AT 10	75	0.435

Tab. 74

Belt length (mm) = 2 x L - 100



Load capacity

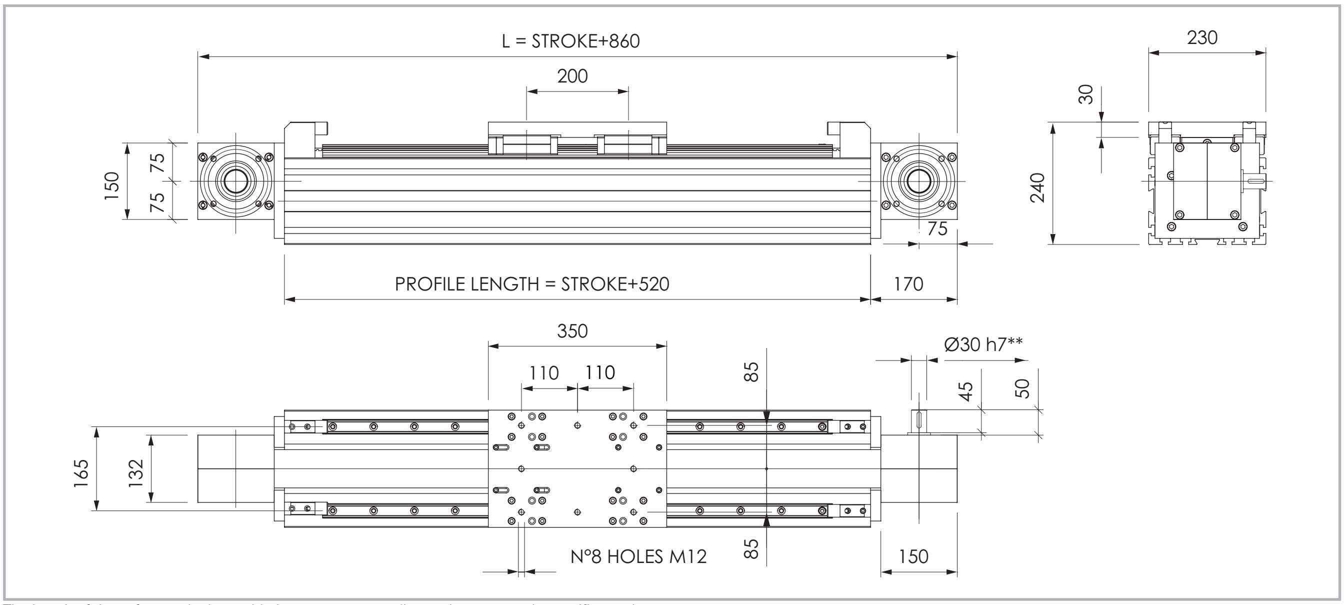
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
TCR 230	7470	5220	14142	65928	14142	1626	2121	2121

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 75

TCS 230

TCS 230 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.
** Output shaft is the only option available

Fig.31

Technical data

	Type
	TCS 230
Max. useful stroke length [mm]	11480
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	5
Max. acceleration [m/s²]	50
Type of belt	75 AT 10
Type of pulley	Z 40
Pulley pitch diameter [mm]	127.32
Carriage displacement per pulley turn [mm]	400
Carriage weight [kg]	10.5
Zero travel weight [kg]	43.5
Weight for 100 mm useful stroke [kg]	3.7
Starting torque [Nm]	11.5
Moment of inertia of pulleys [g mm²]	12020635
Rail size [mm]	30

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 76

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TCS 230	6.501	3.778	1.028

Tab. 77

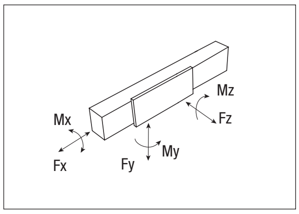
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
TCS 230	75 AT 10	75	0.435

Tab. 48

Belt length (mm) = 2 x L - 50



Load capacity

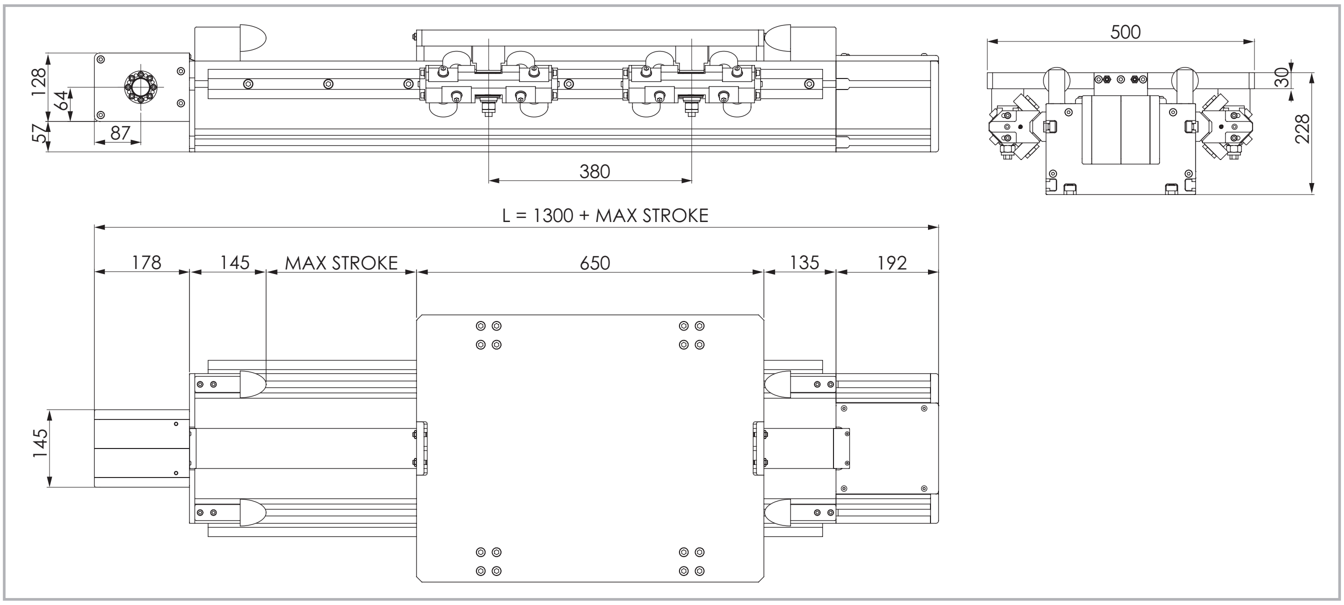
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
TCS 230	7470	5220	355200	172074	355200	29304	35520	35520

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 79

TCR 280

TCR 280 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 32

Technical data

	Type
	TCR 280
Max. useful stroke length [mm]	11070
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	5
Max. acceleration [m/s²]	20
Type of belt	75 AT 10 HP
Type of pulley	Z 30
Pulley pitch diameter [mm]	95.49
Carriage displacement per pulley turn [mm]	300
Carriage weight [kg]	47.3
Zero travel weight [kg]	126.1
Weight for 100 mm useful stroke [kg]	4.8
Starting torque [Nm]	8.5
Moment of inertia of pulleys [g mm²]	9829829
Rail size [mm]	55x25

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 80

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TCR 280	12.646	4.829	17.475

Tab. 81

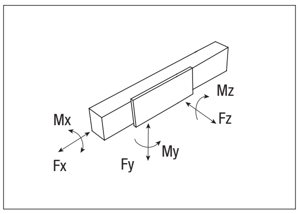
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
TCR 280	75 AT 10 HP	75	0.435

Tab. 82

Belt length (mm) = 2 x L - 420



Load capacity

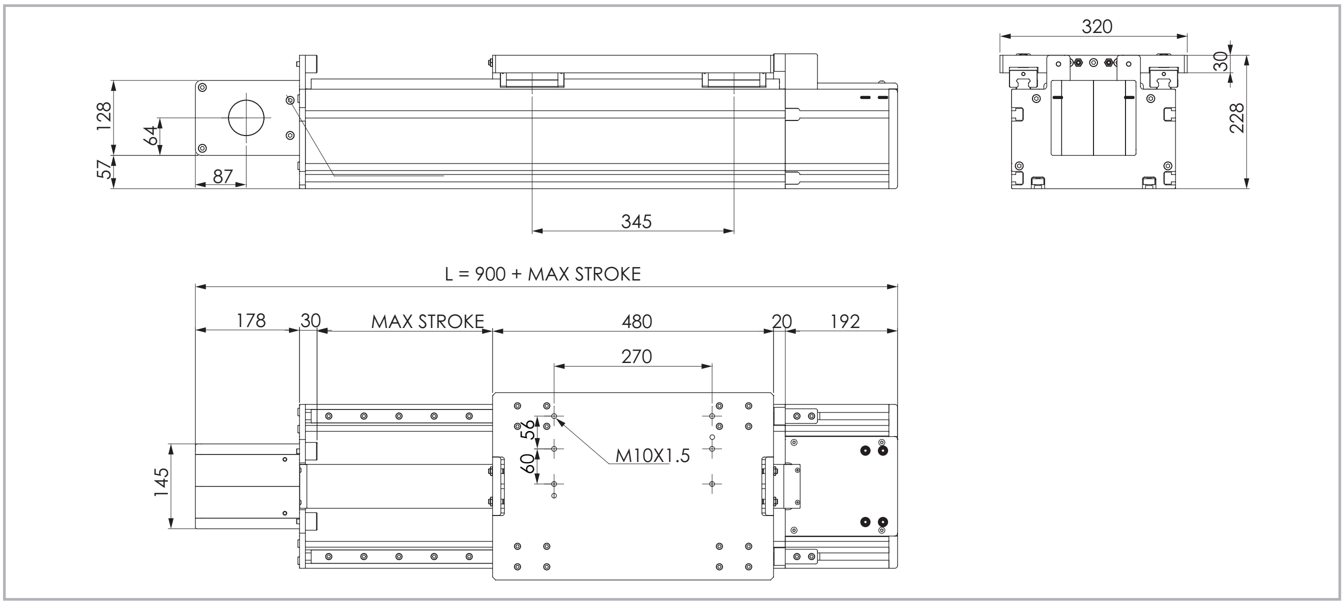
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
TCR 280	7470	4950	24042	112593	24042	3366	4568	4568

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 83

TCS 280

TCS 280 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 33

Technical data

	Type
	TCS 280
Max. useful stroke length [mm]	11470
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	5
Max. acceleration [m/s²]	50
Type of belt	75 AT 10 HP
Type of pulley	Z 30
Pulley pitch diameter [mm]	95.49
Carriage displacement per pulley turn [mm]	300
Carriage weight [kg]	18
Zero travel weight [kg]	65.1
Weight for 100 mm useful stroke [kg]	4.6
Starting torque [Nm]	8.3
Moment of inertia of pulleys [g mm²]	9829829
Rail size [mm]	25

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 84

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TCS 280	12.646	4.829	17.475

Tab. 85

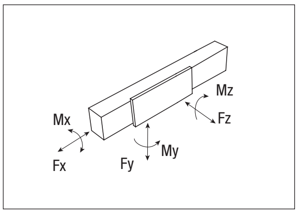
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
TCS 280	75 AT 10 HP	75	0.435

Tab. 86

Belt length (mm) = 2 x L - 250



Load capacity

Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
TCS 280	7470	4950	258800	116833	258800	31056	46584	46584

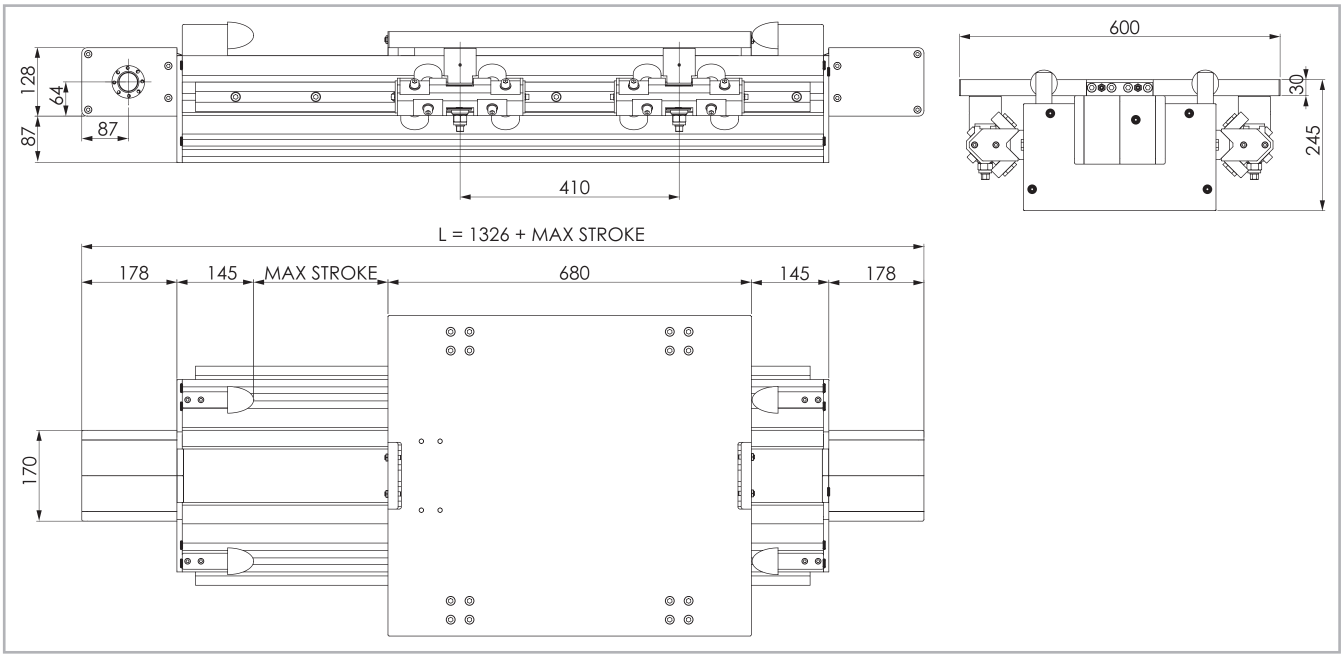
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 87

ML

TCR 360

TCR 360 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 34

Technical data

	Type
	TCR 360
Max. useful stroke length [mm]	11030
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	5
Max. acceleration [m/s²]	10
Type of belt	100 AT 10 HP
Type of pulley	Z 30
Pulley pitch diameter [mm]	95.49
Carriage displacement per pulley turn [mm]	300
Carriage weight [kg]	56.3
Zero travel weight [kg]	163
Weight for 100 mm useful stroke [kg]	6.8
Starting torque [Nm]	8.5
Moment of inertia of pulleys [g mm²]	14085272
Rail size [mm]	55x25

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 88

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TCR 360	31.721	10.329	42.05

Tab. 89

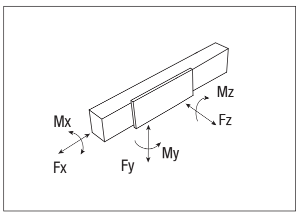
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
TCR 360	100 AT 10 HP	100	0.58

Tab. 90

Belt length (mm) = 2 x L - 460



Load capacity

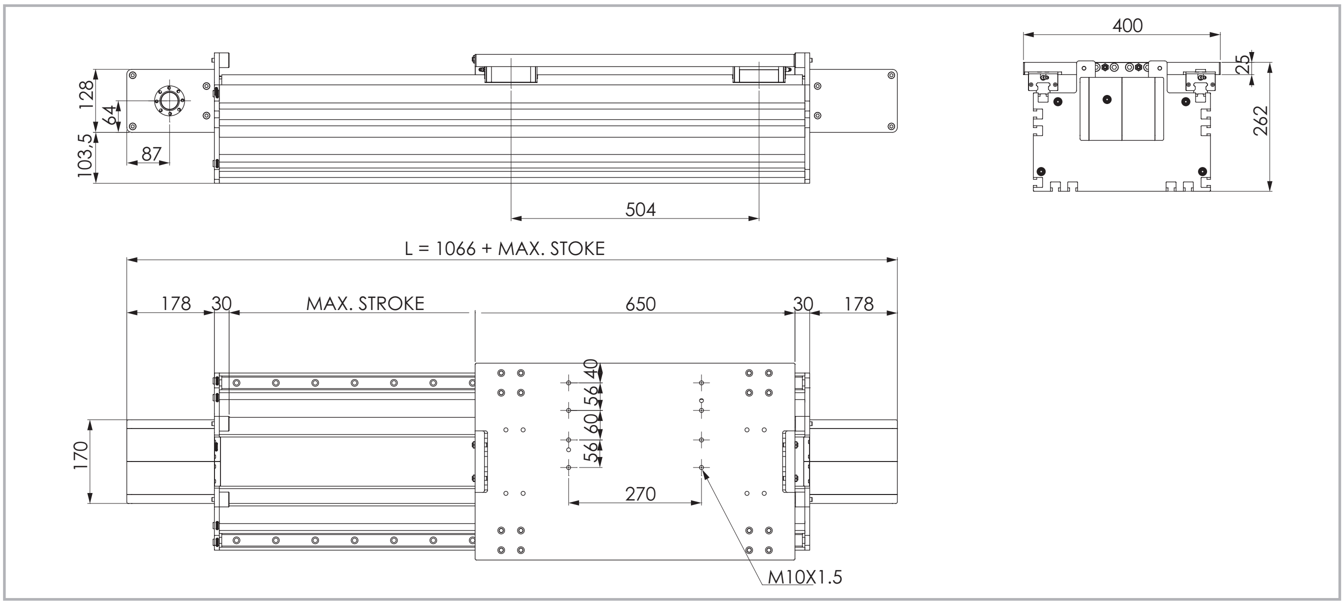
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
TCR 360	9960	6600	24042	112593	24042	4327	4929	4929

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 91

TCS 360

TCS 360 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 35

Technical data

	Type
	TCS 360
Max. useful stroke length [mm]	11290
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	5
Max. acceleration [m/s²]	50
Type of belt	100 AT 10 HP
Type of pulley	Z 30
Pulley pitch diameter [mm]	95.49
Carriage displacement per pulley turn [mm]	300
Carriage weight [kg]	25.2
Zero travel weight [kg]	104.6
Weight for 100 mm useful stroke [kg]	6.9
Starting torque [Nm]	8.3
Moment of inertia of pulleys [g mm²]	14085272
Rail size [mm]	30

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 92

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TCS 360	31.721	10.329	42.05

Tab. 93

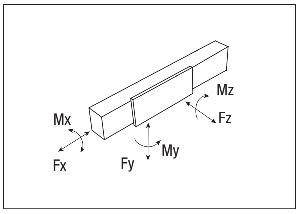
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
TCS 360	100 AT 10 HP	100	0.580

Tab. 94

Belt length (mm) = 2 x L - 430



Load capacity

Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
TCS 360	9960	6600	266400	142231	266400	42624	61272	61272

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 95

Lubrication

TCS linear units with ball bearing guides

TCS Linear units are equipped with ball bearing carriage fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment. Lubrication interval between maintenance every 2000 Km or 1 year of use, based on the value reached first.

If a long service life is required or in case of high dynamic or high loaded applications please contact our offices for further verification.

TCS

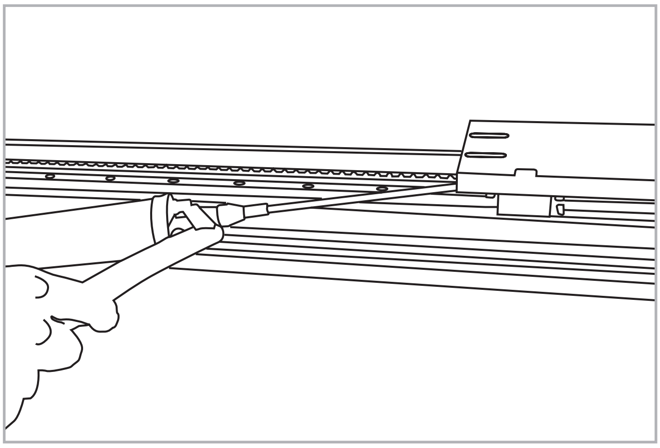


Fig. 36

Quantity of lubricant necessary for re-lubrication of each block:

Type	Quantity of Grease [cm^3]
TCS 140	1.4
TCS 170	1.4
TCS 200	1.4
TCS 220	2.4
TCS 230	4.2
TCS 280	2.4
TCS 360	3.2

Tab. 96

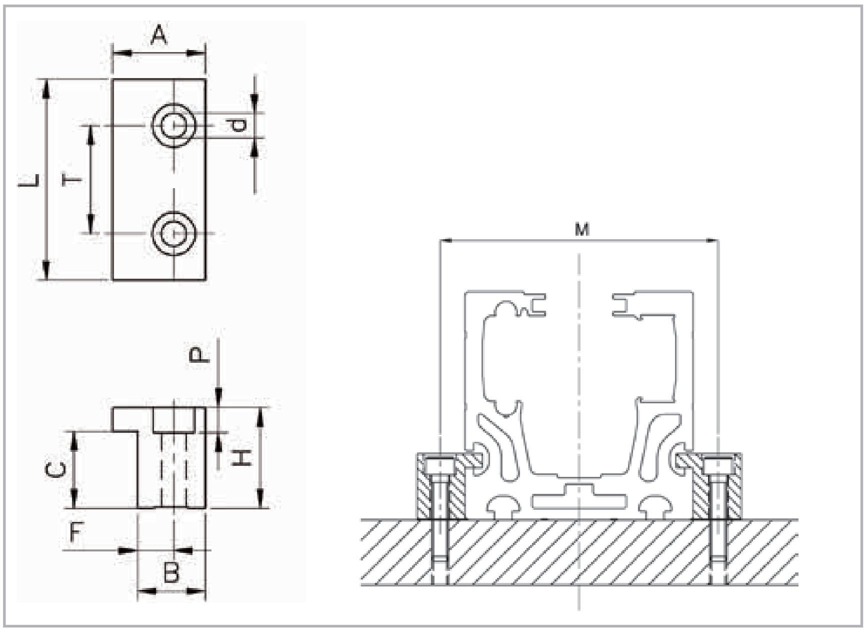
- Insert the tip of the grease gun into the specific grease blocks.
- Type of lubricant: Lithium soap grease of class NLGI 2.
- For specially stressed applications or hostile environmental conditions, lubrication should be applied out more frequently.
  Contact Rollon for further advice

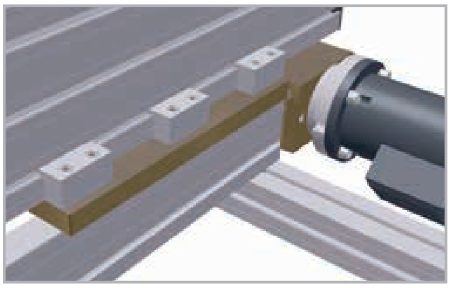
TCR linear units with roller guides

Roller slides are provided with a self- lubrication system for a long lubrication interval. For applications on plants with a high number of daily cycles, or with a significant build-up of impurities, please check the need for lubrication, seals and additional tanks with our technical dept. Do not use solvents to clean rollers or roller slides, as you could unintentionally remove the grease lubricating coat applied to the rolling elements during assembly. Use lithium soap based mineral grease according to DIN 51825 - K3N.

Guide rails do not require excessive lubrication, which would attract impurities and have negative consequences. Should there be any surface defects on the guide rails and/or on the rolling parts, such as pitting or erosion, this might be indicative of an excessive loading. In this case, all worn parts must be replaced and the load geometry and alignment checked.

Accessories





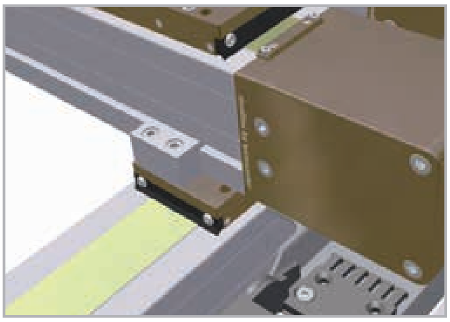


Fig.37

Material: aluminum alloy 6082

Unit	bxh	A	L	T	d	H	P	C	F	B	M	Code
TCR/TCS 170	120x170										198	
TCR/TCS 200	120x200	30	90	50	11	40	11	28.3	14	25	228	415.0762
TCR/TCS 220	120x220										248	
TCR/TCS 280	170x280	30	90	50	11	20	11	11.3	14	25	308	415.0763
TCR/TCS 280 Vert.	280x170	30	90	50	11	20	11	13.5	14	25	198	915.1174

Tab. 97

Semi-rounded threaded inserts with spring

Threaded plate for base profile 45, 50 and 60. Material: galvanised steel.

Important: to be inserted through the longitudinal slots before assembling.

Suitable for series:

TC 170-180-200-220-360

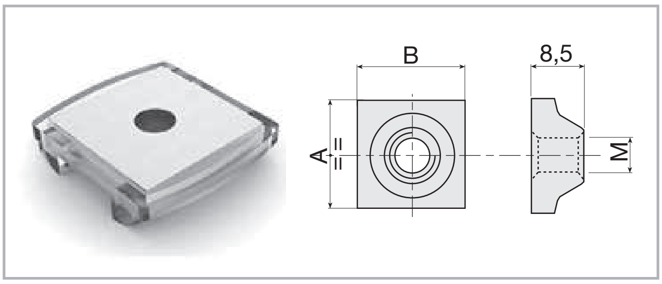


Fig. 38

Thread	AxB	
	18x18	20x20
M4	209.0031	209.0023
M5	209.0032	209.0019
M6	209.033	209.1202
M8	209.0034	209.0467

Tab. 98

Plastic compound spring for vertical positioning of insert.

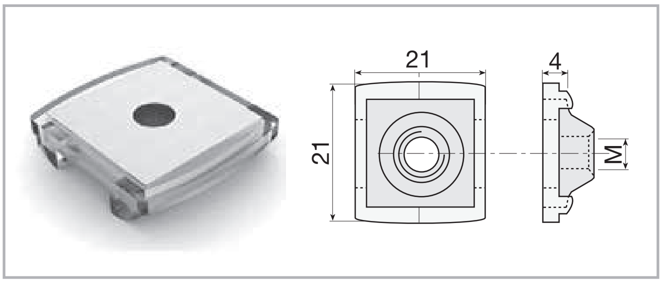


Fig. 39

Spring	Code
Suitable for all inserts 18x18	101.0732

Tab. 99

Assembly brackets

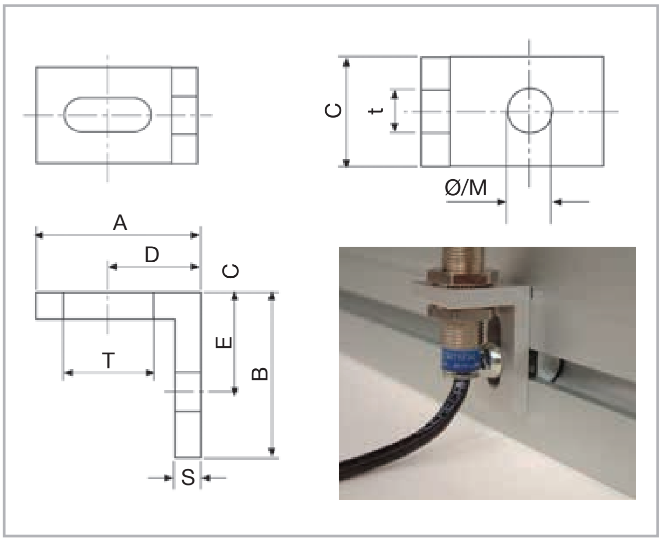


Fig. 40

Material: natural, anodized anticorodal alloy.

Thread								Code	
A	B	C	D	E	S	Txt	Ø/M	Ø	M
45	45	20	25	25	5	20X6.5	6	A30-76	A 30-86
35	25	20	19	15	5	20X6.5	4	A30-54	A30-64
35	25	20	19	15	5	20X6.5	5	A30-55	A30-65
35	25	20	19	15	5	20X6.5	6	A30-56	A30-66
25	25	15	14	15	4	13.5X5.5	3	B30-53	B30-63
25	25	14	14	15	4	13.5X5.5	4	B30-54	B30-64
25	25	15	14	15	4	13.5X5.5	5	B30-55	B30-65
25	25	15	14	15	4	13.5X5.5	6	B30-56	B30-66

Suitable for all the modules

Tab. 100

M = Threaded version

Ø = Passing trough hole version

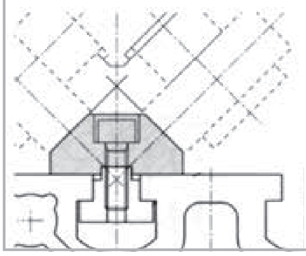
Alignment nuts

Nuts for steel guide rails

Material: galvanised steel.

Code 209.1855

Alignment nuts.
V-shaped guide rail: 35x16
Profile with slot. 12.5 mm.
Series: **TC 170-200-220-280-360**



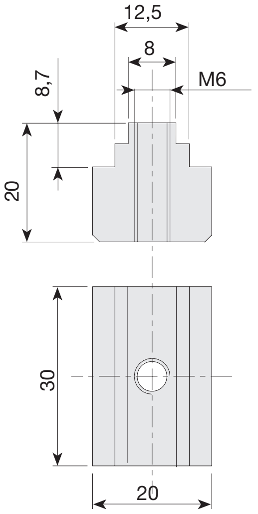


Fig. 41

Alignment nut for slot 12.5 mm

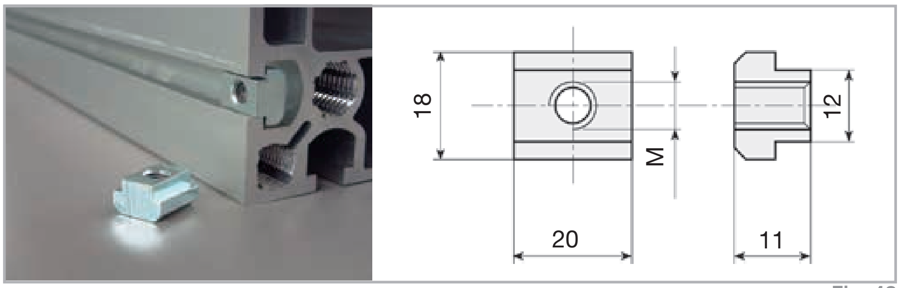


Fig. 42

Material: galvanised steel. Suitable for series:
TC 170-200-280-360

Thread	Code
M5	215.1768
M6	215.1769
M8	215.1770
M10	215.2124

Tab. 101

Alignment nut for slot 12.5 mm front insertable

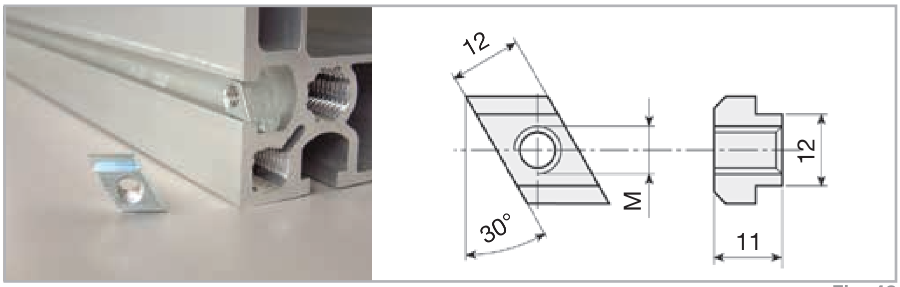


Fig. 43

Material: galvanised steel. Suitable for series:
TC 170-200-280-360

Thread	Code
M5	215.1771
M6	215.1772
M8	215.1773
M10	215.2125

Tab. 102

Threaded nuts and plates

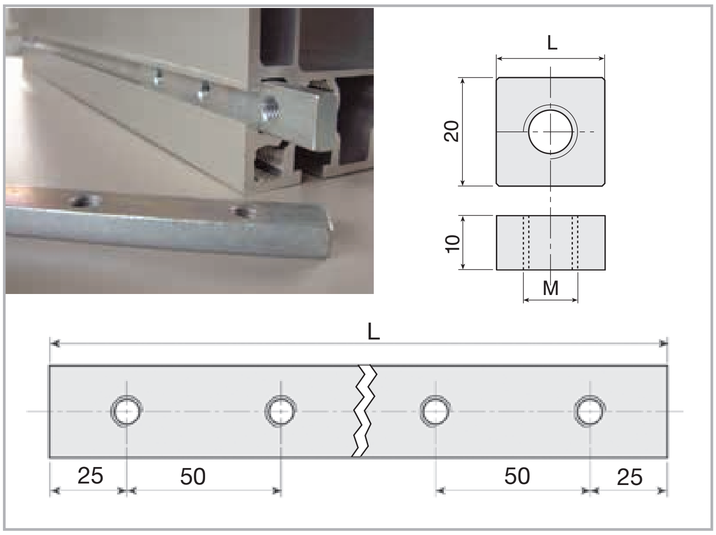


Fig. 44

M12 (CH19) hexagonal-head screws can be used as stud bolts in profiles with 12.5 mm slots.

Material: galvanised steel. Suitable for series:
TC 170-200-220-280-360

Thread	Threaded holes	L	Code
M10	1	40	215.0477
M12	1	40	209.1281
M10	1	20	209.1277
M10	2*	80	209.1776
M10	3*	150	209.1777
M10	4*	200	209.1778
M10	5*	250	209.1779
M10	6*	300	209.1780
M10	7*	350	209.1781

* Hole centre-distance: 50 mm.

Tab. 103

Ordering key

Identification codes for the TCR/TCS series

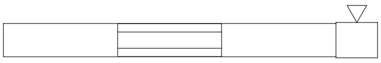
TCR	14	1A	02000	1A	D	1000
TCS	14=140					
	17=170					
	20=200					
	22=220					
	23=230					
	28=280					
	36=360					

- 1000 – Center distance
- D – Multiple carriages
- 1A – Carriage option
- 02000 – L=Total length of the unit
- 1A – Driving head code
- 14 – Linear unit size *see from pg. ML-20 to pg. ML-33*
- TCR/TCS – TCR/TCS Series *see pg. ML-17*

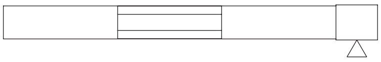
In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Configure Actuator

Left / right orientation



Right



Left

ZCR/ZCH series

ZCR/ZCH series description

Fig. 45

The ZCR/ZCH series linear units are designed to meet the vertical motion requirements in gantry applications or where the aluminum profile must be moving and the carriage must be fixed. The self-supporting extruded and anodized aluminum structure is available in different sizes from 60 to 220 mm. Being a rigid system, it is ideal for a "Z" axis in a 3-axis system. In addition, the ZCR/ZCH series has been specifically designed and configured to be easily assembled with the R-SMART, TCR/TCS series and ROBOT series.

ZCR
Features a dual Prismatic Rail system.

ZCH
Features a dual recirculating ball guide system.

The components

Extruded profile

The anodized aluminum extrusions used for the bodies of the Rollon ZCR/ZCH series linear units were designed and manufactured in cooperation with a leading company in this field, to obtain the right combination of high mechanical strength and reduced weight. The anodized aluminum alloy 6060 used (see physical chemical characteristics below) was extruded with dimensional tolerances complying with EN 755-9 standards.

Driving belt

The Rollon ZCR/ZCH series linear units use steel reinforced polyurethane drive belts with AT pitch. This belt is ideal due to its high load transmission characteristics, compact size and low noise. Used in conjunction with a backlash-free pulley, smooth alternating motion can be achieved. Optimization of the maximum belt width/body dimension ratio enables the following performance characteristics to be achieved:

- **High speed**
- **Low noise**
- **Low wear**

Carriage

The carriage of the Rollon ZCR/ZCH series linear units is made entirely of anodized aluminum. The dimensions vary depending on the type.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 104

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.7	70	23.8	200	880-900	33	600-655

Tab. 105

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
250	200	10	75

Tab. 106

The linear motion system

The linear motion system has been designed to meet the load capacity, speed, and maximum acceleration conditions of a wide variety of applications.

ZCR with Prismatic Rail:

Prismatic Rails are made of specially treated high-carbon steel and provided with a permanent lubrication system. Thanks to this kind of solution ZCR is specifically dedicated for dirty environments and high dynamics in automation.

- The Prismatic Rails with high load capacity are mounted in a dedicated seat on the aluminum body.
- The carriage is assembled with preload, that enables to withstand loading in the four main directions.
- Hardened and ground steel guide rails.
- Sliders have felts for self-lubrication.

The linear motion system described above offers:

- Suitable for dirty environments
- High speed and acceleration
- Maintenance free
- High load capacity
- Low friction
- Long life
- Low noise

ZCH with recirculating ball guides:

- The ball bearing guides with high load capacity are mounted in a dedicated seat on the aluminum body.
- The carriage is assembled on preloaded ball bearing blocks that allow to withstand loading in the four main directions.
- The ball bearing carriages are also fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment.
- The blocks have seals on both sides.

The linear motion system described above offers:

- High permissible bending moments
- High accuracy of the movement
- High speed and acceleration
- High load capacity
- High rigidity
- Low friction
- Long life
- Low noise

ZCR section

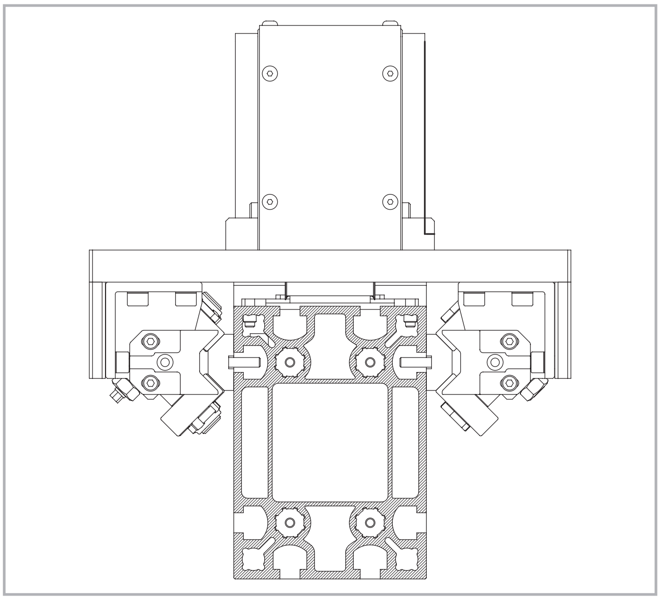


Fig. 46

ZCH section

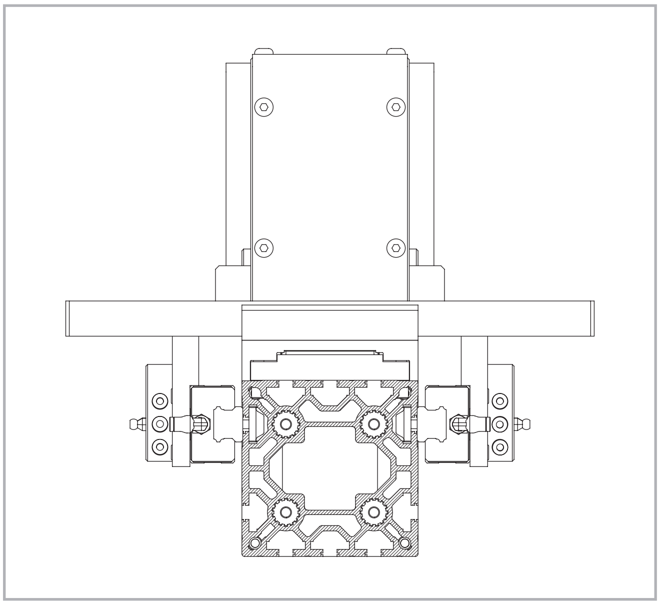
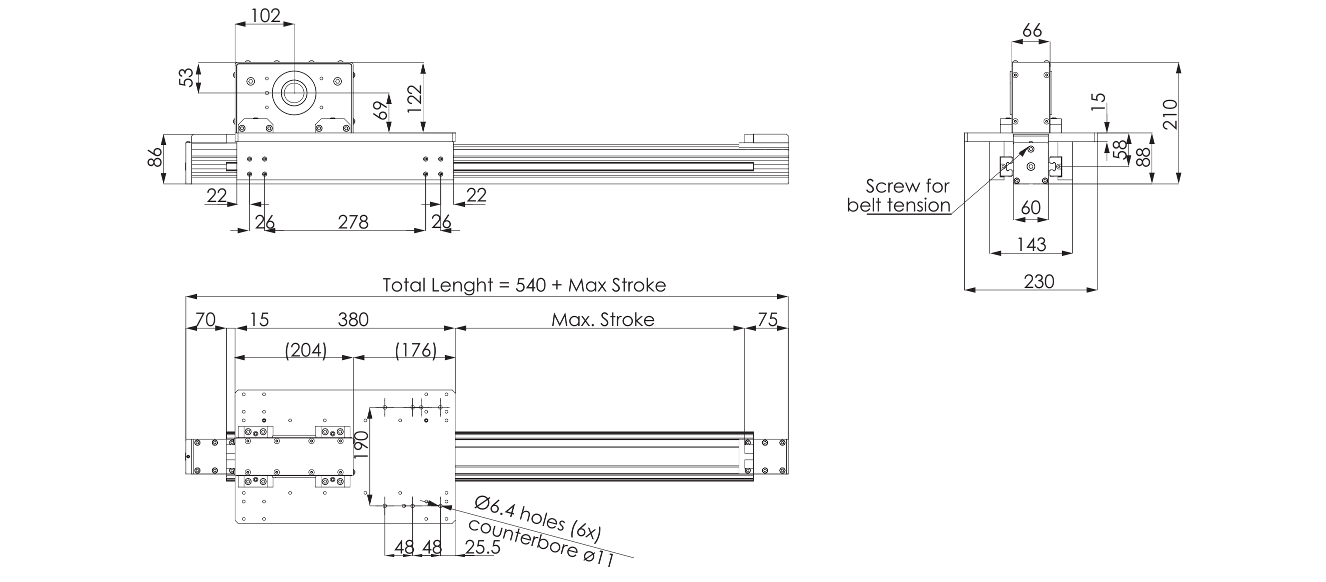


Fig. 47

ZCH 60

ZCH 60 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig.48

Technical data

	Type
	ZCH 60
Max. useful stroke length [mm]	1500
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	4
Max. acceleration [m/s²]	40
Type of belt	32 AT 10 HF
Type of pulley	Z 22
Pulley pitch diameter [mm]	70.03
Carriage displacement per pulley turn [mm]	220
Carriage weight [kg]	11.1
Zero travel weight [kg]	15.8
Weight for 100 mm useful stroke [kg]	0.8
Starting torque [Nm]	1.8
Rail size [mm]	15

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 107

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ZCH 60	0.043	0.043	0.086

Tab. 108

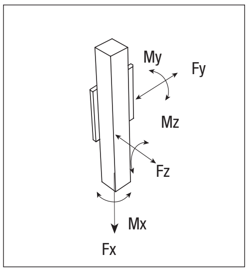
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
ZCH 60	32 AT 10 HF	32	0.185

Tab. 109

Belt length (mm) = L + 190



Load capacity

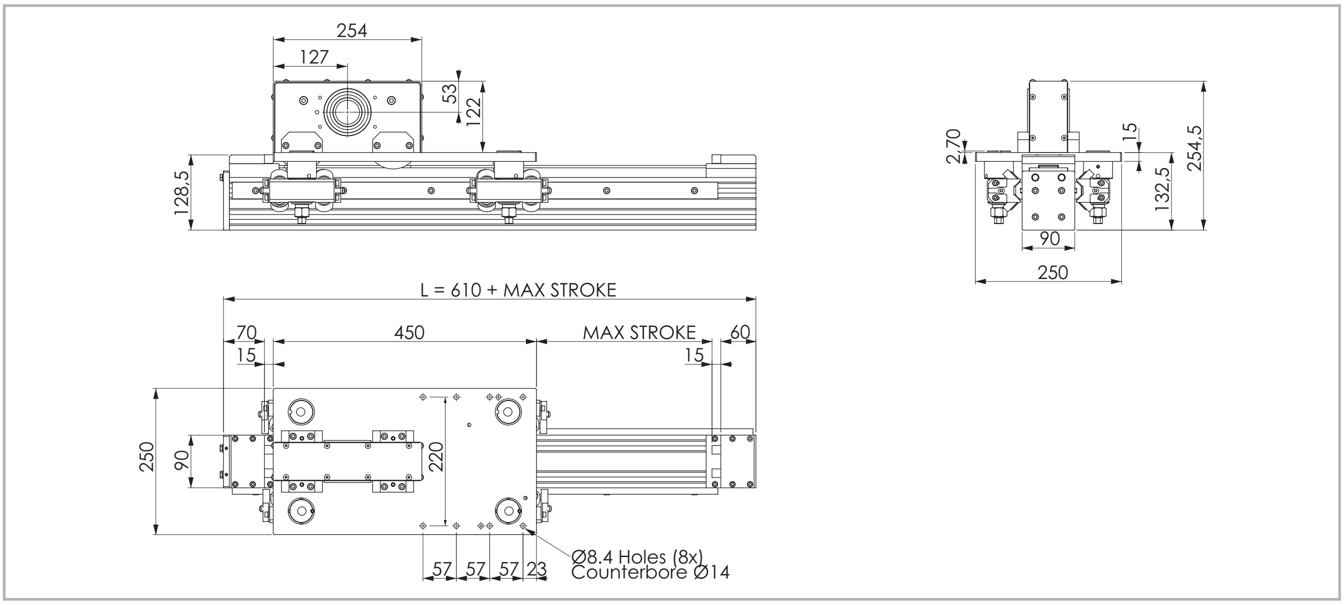
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ZCH 60	2656	1760	61120	39780	61120	2216	7946	7946

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 110

ZCR 90

ZCR 90 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 49

Technical data

	Type
	ZCR 90
Max. useful stroke length [mm]	2000
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	4
Max. acceleration [m/s²]	25
Type of belt	32 AT 10 HF
Type of pulley	Z 22
Pulley pitch diameter [mm]	70.03
Carriage displacement per pulley turn [mm]	220
Carriage weight [kg]	11.6
Zero travel weight [kg]	19.4
Weight for 100 mm useful stroke [kg]	1
Starting torque [Nm]	1.8
Rail size [mm]	28.6x11

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 111

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ZCR 90	0.197	0.195	0.392

Tab. 112

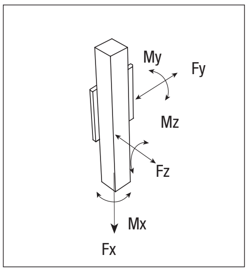
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
ZCR 90	32 AT 10 HF	32	0.185

Tab. 113

Belt length (mm) = L + 190



Load capacity

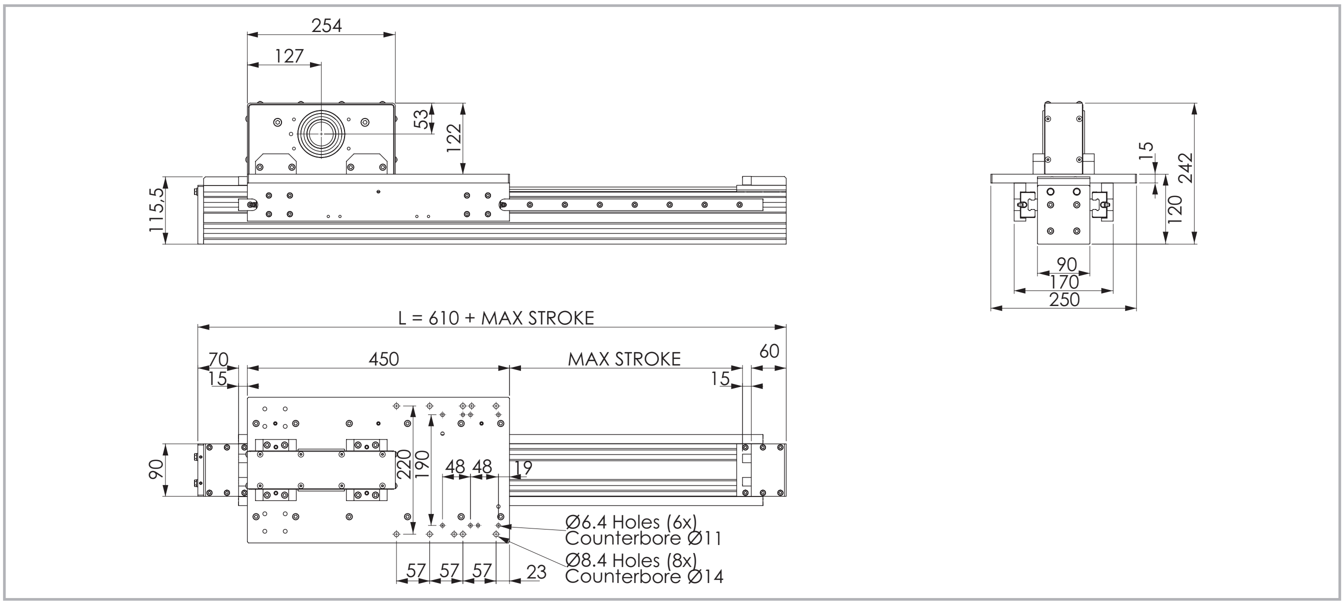
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
ZCR 90	2656	1760	7637	28286	7637	344	1298	1298

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 114

ZCH 90

ZCH 90 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 50

Technical data

	Type
	ZCH 90
Max. useful stroke length [mm]	2000
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	4
Max. acceleration [m/s²]	20
Type of belt	32 AT 10 HF
Type of pulley	Z 22
Pulley pitch diameter [mm]	70.03
Carriage displacement per pulley turn [mm]	220
Carriage weight [kg]	12.8
Zero travel weight [kg]	20.6
Weight for 100 mm useful stroke [kg]	1.3
Starting torque [Nm]	1.8
Rail size [mm]	20

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 115

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ZCH 90	0.197	0.195	0.392

Tab. 116

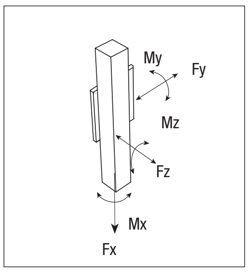
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
ZCH 90	32 AT 10 HF	32	0.185

Tab. 117

Belt length (mm) = L + 190



Load capacity

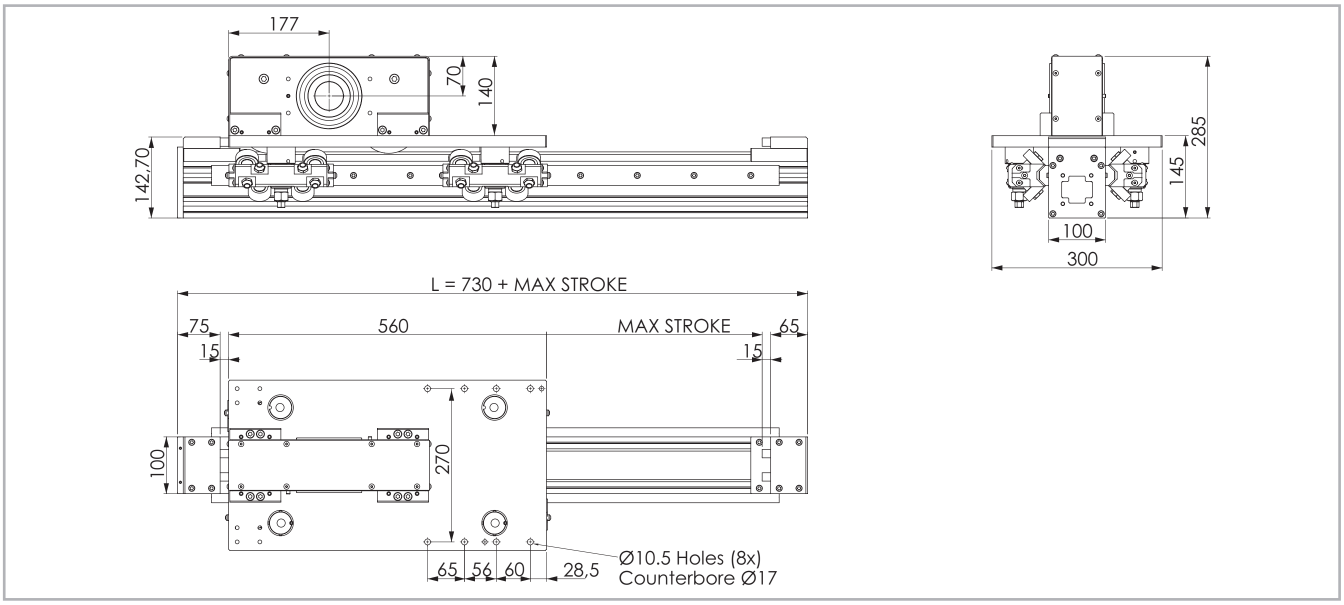
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ZCH 90	2656	1760	102520	73274	102520	5510	14865	14865

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 118

ZCR 100

ZCR 100 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 51

Technical data

	Type
	ZCR 100
Max. useful stroke length [mm]	2100
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	4
Max. acceleration [m/s²]	25
Type of belt	50 AT 10 HPF
Type of pulley	Z 30
Pulley pitch diameter [mm]	95.49
Carriage displacement per pulley turn [mm]	300
Carriage weight [kg]	27.6
Zero travel weight [kg]	41
Weight for 100 mm useful stroke [kg]	1.3
Starting torque [Nm]	4.5
Rail size [mm]	35x16

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 119

Moments of inertia of the aluminum body

Type	I_x [10^7 mm⁴]	I_y [10^7 mm⁴]	I_p [10^7 mm⁴]
ZCR 100	0.364	0.346	0.709

Tab. 120

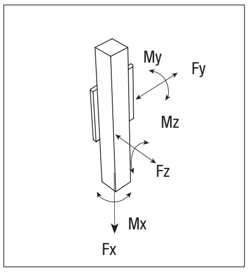
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
ZCR 100	50 AT 10 HPF	50	0.290

Tab. 121

Belt length (mm) = L + 250



Load capacity

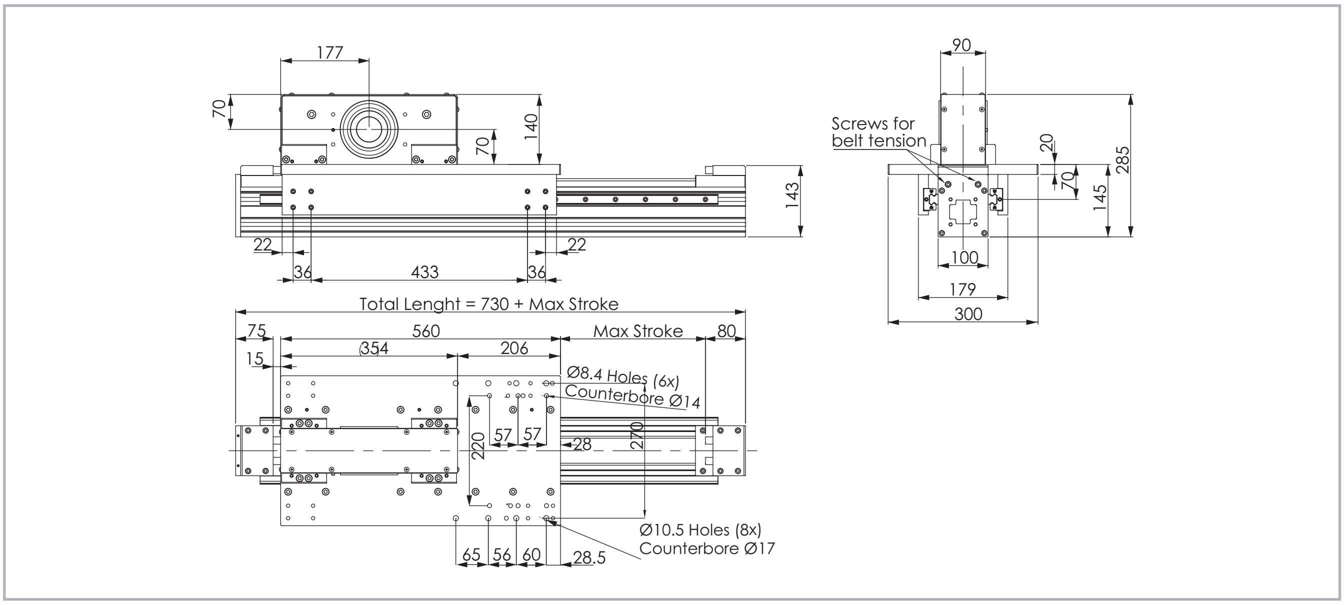
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ZCR 100	4980	3480	14142	65298	14142	707	2666	2666

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 122

ZCH 100

ZCH 100 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 52

Technical data

	Type
	ZCH 100
Max. useful stroke length [mm]	2100
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	4
Max. acceleration [m/s²]	25
Type of belt	50 AT 10 HPF
Type of pulley	Z 30
Pulley pitch diameter [mm]	95.49
Carriage displacement per pulley turn [mm]	300
Carriage weight [kg]	25.1
Zero travel weight [kg]	37.4
Weight for 100 mm useful stroke [kg]	1.5
Starting torque [Nm]	4.5
Rail size [mm]	20

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 123

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ZCH 100	0.364	0.346	0.709

Tab. 124

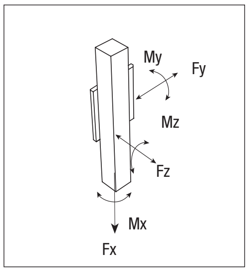
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
ZCH 100	50 AT 10 HPF	50	0.290

Tab. 125

Belt length (mm) = L + 250



Load capacity

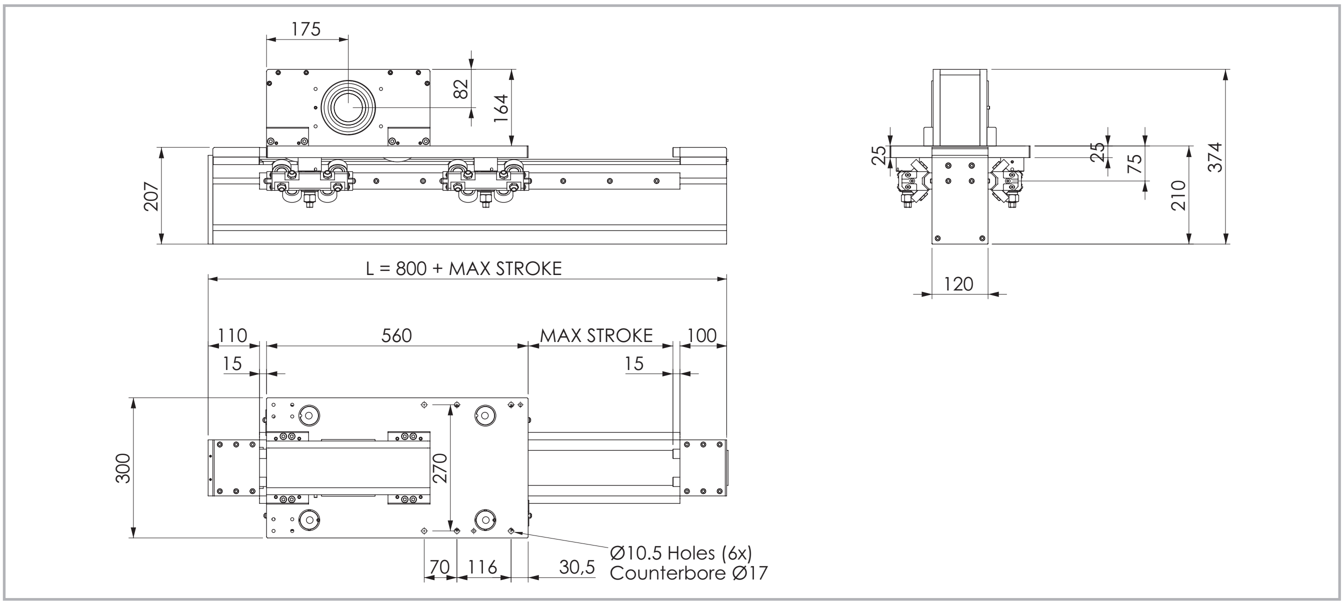
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ZCH 100	4980	3480	102520	73274	102520	6023	22503	22503

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 126

ZCR 170

ZCR 170 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 53

Technical data

	Type
	ZCR 170
Max. useful stroke length [mm]	2500
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	4
Max. acceleration [m/s²]	25
Type of belt	75 AT 10 HPF
Type of pulley	Z 30
Pulley pitch diameter [mm]	95.49
Carriage displacement per pulley turn [mm]	300
Carriage weight [kg]	32.5
Zero travel weight [kg]	55.4
Weight for 100 mm useful stroke [kg]	2.6
Starting torque [Nm]	7.8
Rail size [mm]	35x16

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 127

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ZCR 170	1.973	0.984	2.957

Tab. 128

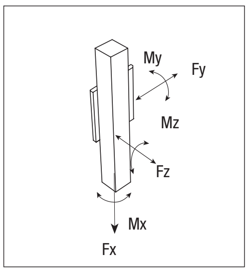
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
ZCR 170	75 AT 10 HPF	75	0.435

Tab. 129

Belt length (mm) = L + 280



Load capacity

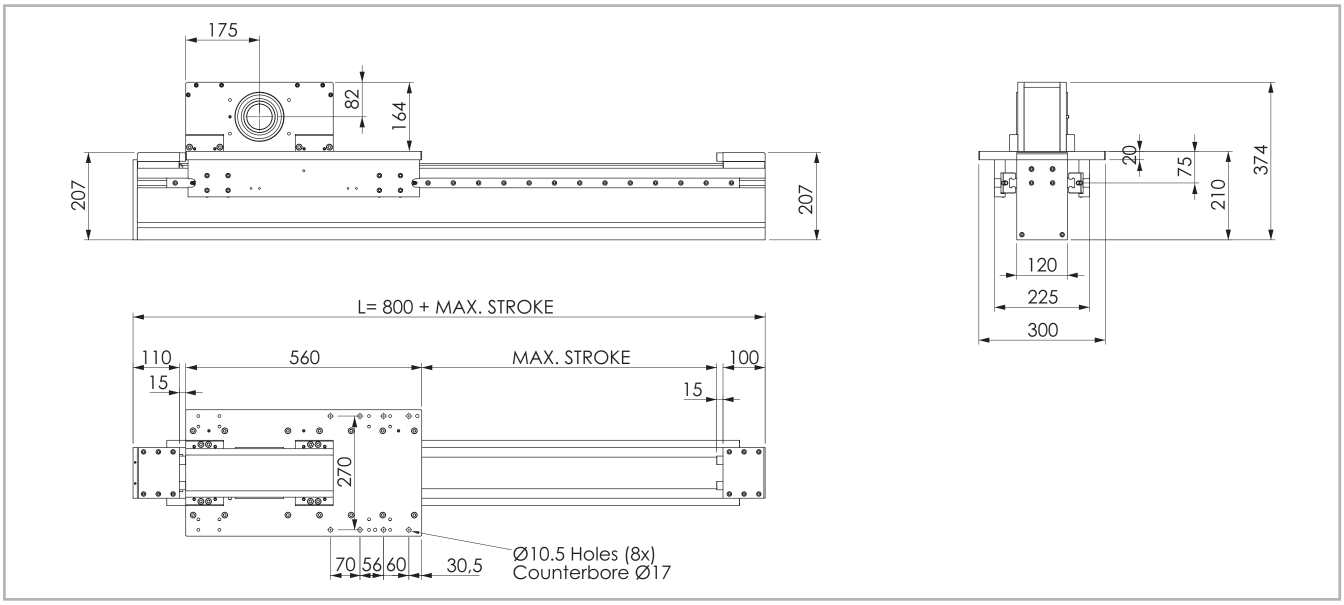
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ZCR 170	7470	5220	14142	65298	14142	849	2666	2666

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 136

ZCH 170

ZCH 170 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig.54

Technical data

	Type
	ZCH 170
Max. useful stroke length [mm]	2500
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	4
Max. acceleration [m/s²]	25
Type of belt	75 AT 10 HPF
Type of pulley	Z 30
Pulley pitch diameter [mm]	95.49
Carriage displacement per pulley turn [mm]	300
Carriage weight [kg]	34.4
Zero travel weight [kg]	53.7
Weight for 100 mm useful stroke [kg]	2.5
Starting torque [Nm]	7.8
Rail size [mm]	25

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 130

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ZCH 170	1.973	0.984	2.957

Tab. 131

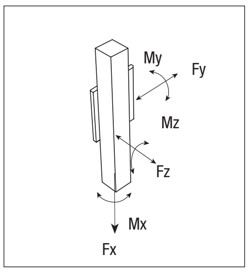
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
ZCH 170	75 AT 10 HPF	75	0.435

Tab. 132

Belt length (mm) = L + 280



Load capacity

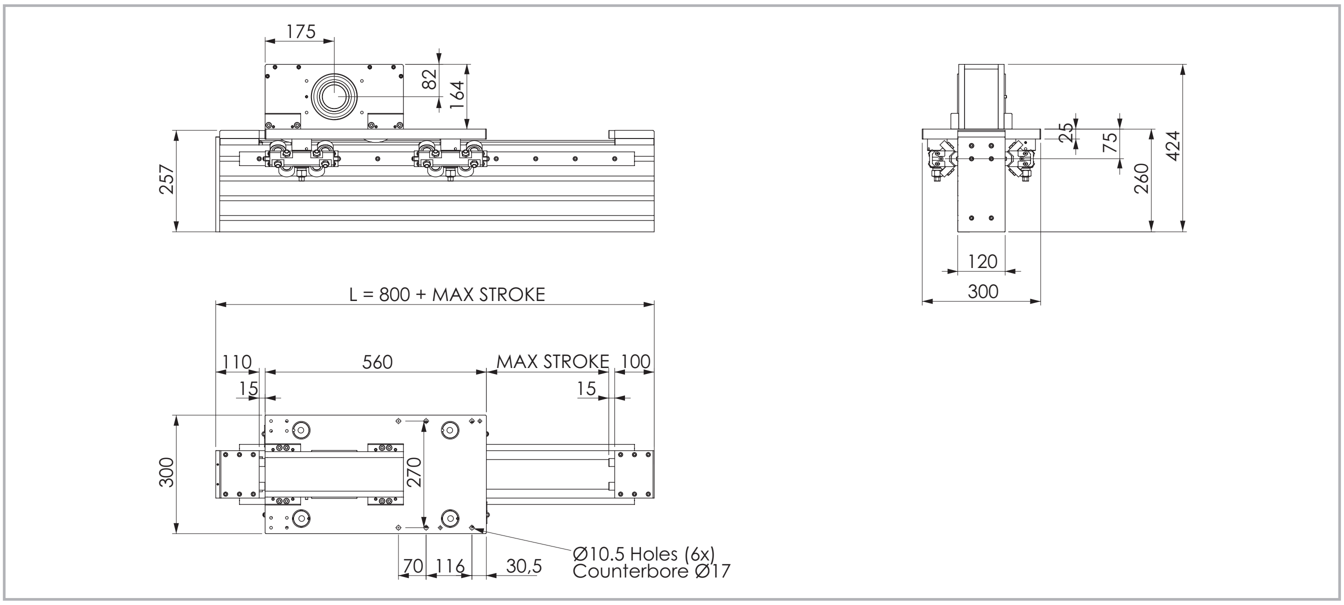
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ZCH 170	7470	5220	174480	124770	174480	12388	35681	35681

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 133

ZCR 220

ZCR 220 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 55

Technical data

	Type
	ZCR 220
Max. useful stroke length [mm]	2500
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	4
Max. acceleration [m/s²]	25
Type of belt	75 AT 10 HPF
Type of pulley	Z 30
Pulley pitch diameter [mm]	95.49
Carriage displacement per pulley turn [mm]	300
Carriage weight [kg]	32.5
Zero travel weight [kg]	61
Weight for 100 mm useful stroke [kg]	3.2
Starting torque [Nm]	7.8
Rail size [mm]	35x16

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 134

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ZCR 220	4.625	1.559	6.184

Tab. 135

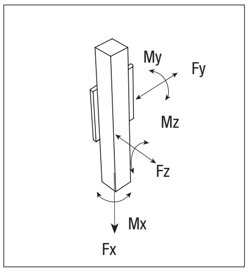
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
ZCR 220	75 AT 10 HPF	75	0.435

Tab. 136

Belt length (mm) = L + 280



Load capacity

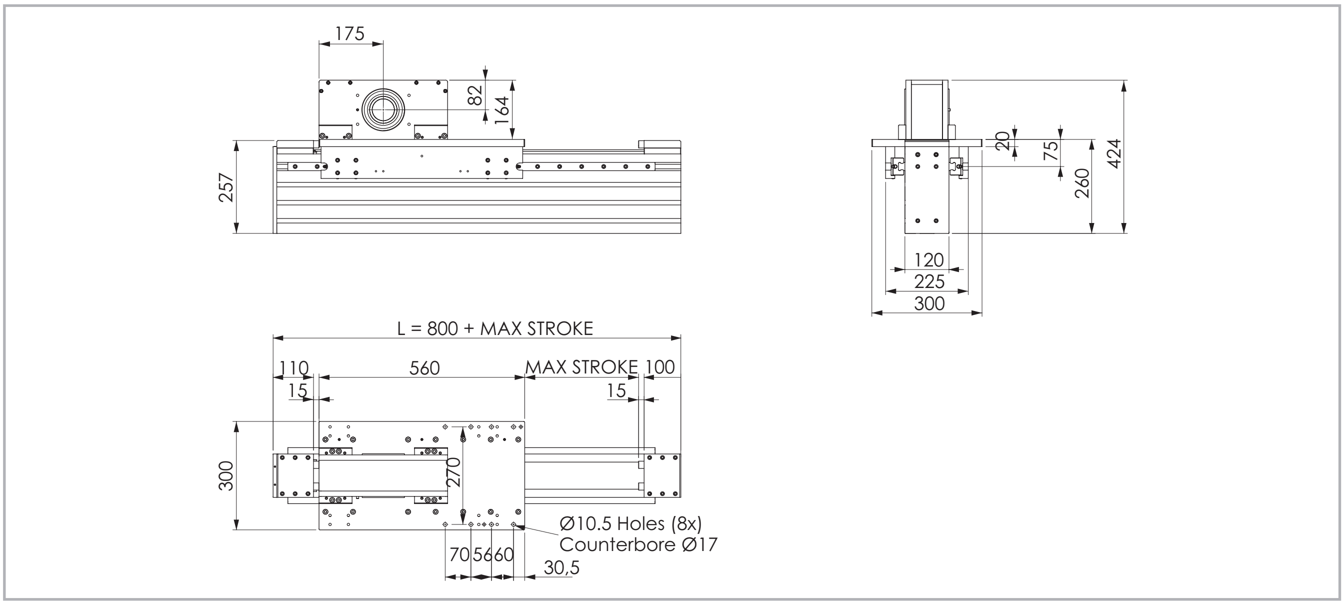
Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ZCR 220	7470	5220	14142	65298	14142	849	2666	2666

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 137

ZCH 220

ZCH 220 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig.56

Technical data

	Type
	ZCH 220
Max. useful stroke length [mm]	2500
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	4
Max. acceleration [m/s²]	25
Type of belt	75 AT 10 HPF
Type of pulley	Z 30
Pulley pitch diameter [mm]	95.49
Carriage displacement per pulley turn [mm]	300
Carriage weight [kg]	34.4
Zero travel weight [kg]	60.7
Weight for 100 mm useful stroke [kg]	3.5
Starting torque [Nm]	7.8
Rail size [mm]	25

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 138

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ZCH 220	4.625	1.559	6.184

Tab. 139

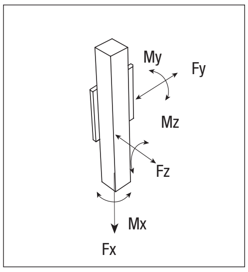
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
ZCH 220	75 AT 10 HPF	75	0.435

Tab. 140

Belt length (mm) = L + 280



Load capacity

Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
ZCH 220	7470	5220	174480	124770	174480	12388	35681	35681

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 141

ML

Lubrication

ZCH linear units with ball bearing guides

The ball bearing carriages of the ZCH versions are fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment of these in the circuits.
This system guarantees a long interval between maintenances: every 2000 Km or 1 year of use, based on the value reached first. If a longer service life is required or in case of high dynamic or high loaded applications please contact our offices for further verification.

ZCH

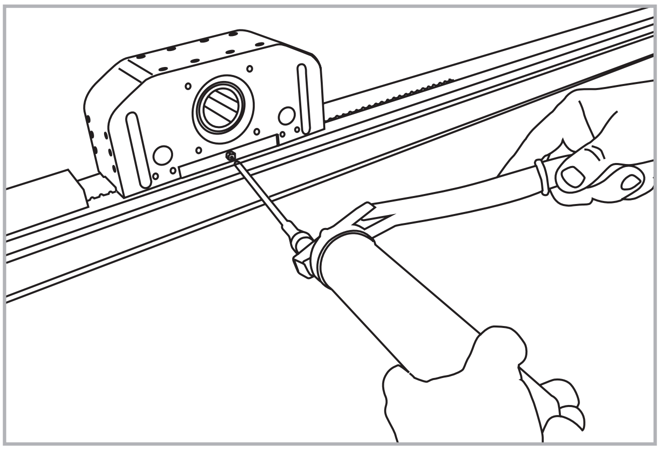


Fig.57

Quantity of lubricant necessary for re-lubrication of each block:

Type	Quantity of Grease [cm³]
ZCH 60	0.2
ZCH 90	0.5
ZCH 100	0.5
ZCH 170	0.6
ZCH 220	0.6

Tab. 142

- Insert the tip of the grease gun into the specific grease blocks.
- Type of lubricant: Lithium soap grease of class NLGI 2.
- For specially stressed applications or hostile environmental conditions, lubrication should be applied out more frequently.
  Contact Rollon for further advice

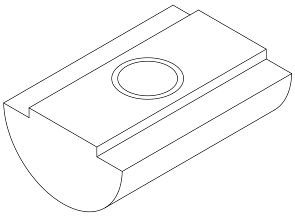
ZCR linear units with roller guides

Roller slides are provided with a self- lubrication system for a long lubrication interval. For applications on plants with a high number of daily cycles, or with a significant build-up of impurities, please check the need for lubrication, seals and additional tanks with our technical dept. Do not use solvents to clean rollers or roller slides, as you could unintentionally remove the grease lubricating coat applied to the rolling elements during assembly. Use lithium soap based mineral grease according to DIN 51825 - K3N.
Guide rails do not require excessive lubrication, which would attract impurities and have negative consequences. Should there be any surface defects on the guide rails and/or on the rolling parts, such as pitting or erosion, this might be indicative of an excessive loading. In this case, all worn parts must be replaced and the load geometry and alignment checked.

Accessories

To install accessories on ZCH series aluminum profile we recommend to use the T-nuts shown below

T-nuts



Steel nuts to be used in the slots of the body. Fig.58

Units (mm)

	Hole	Length	Code Rollon
ZCH 60	M4	8	1001046
ZCH 90	M5	10	1000627
ZCH 100	M6	13	1000043
ZCR 90	M4	8	1000627
ZCR 100	M5	10	1000043

Tab. 143

Bushings for ZCR/ZCH series

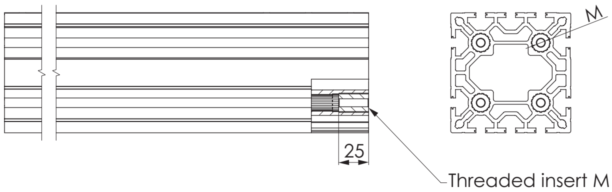


Fig. 59

	Threaded insert Nb. x M			
ZCH 60	1 x M6	**1 x M8**	1 x M10	
ZCH 90	**4 x M6**	4 x M8	4 x M10	
ZCH 100	4 x M6	**4 x M8**	4 x M10	
ZCH 170		4 x M8	**4 x M10**	4 x M12
ZCH 220		4 x M8	**4 x M10**	4 x M12

The highlighted threaded inserts are standard.
In case of need, the others have to be ordered separately.

Tab. 144

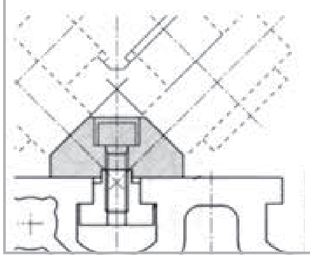
Alignment nuts

Nuts for steel guide rails

Material: galvanised steel.

Code 209.1855

Alignment nuts.
V-shaped guide rail: 35x16
Profile with slot. 12.5 mm.
Series: **ZC 170-220**



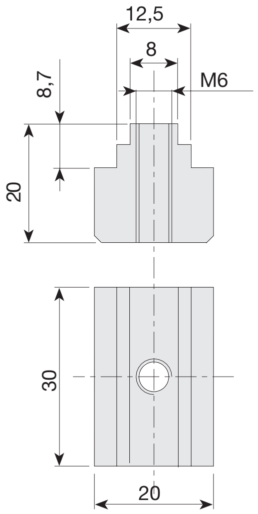
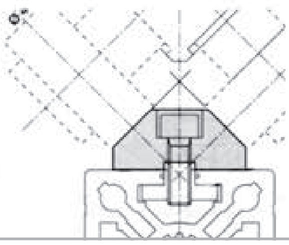


Fig. 60

Code 209.0298

Alignment nuts.
V-shaped guide rail: 35x16
Profile with slot 8 mm.
Series: **ZC 100**



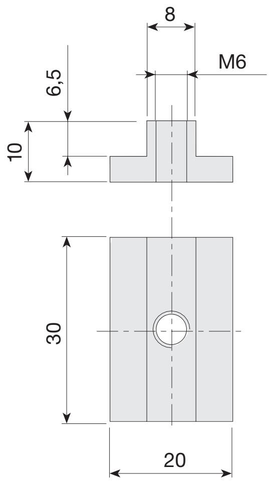


Fig.61

Alignment nut for slot 12.5 mm

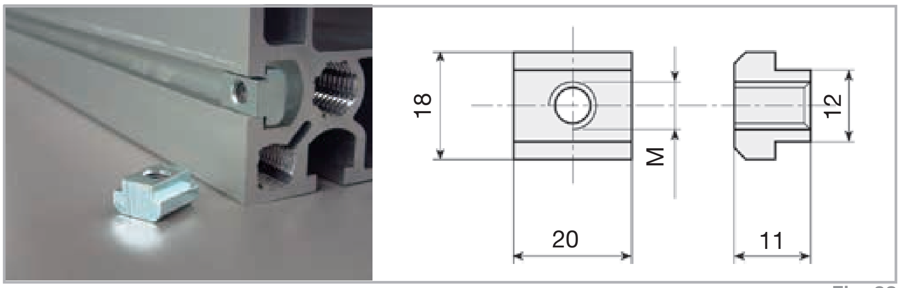


Fig. 62

Material: galvanised steel. Suitable for series:
ZC 170-220

Thread	Code
M5	215.1768
M6	215.1769
M8	215.1770
M10	215.2124

Tab. 145

Alignment nut for slot 12.5 mm front insertable

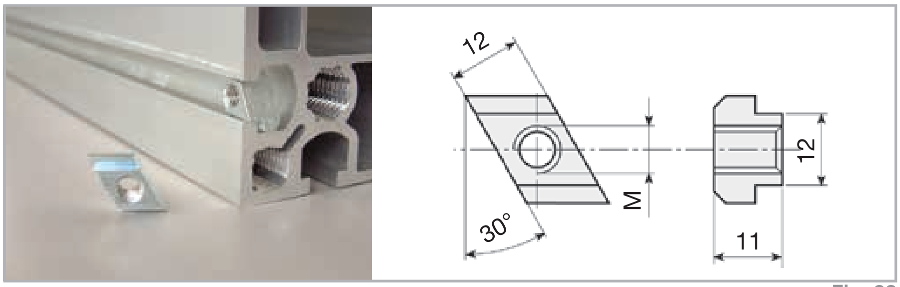


Fig. 63

Material: galvanised steel. Suitable for series:
ZC 170-220

Thread	Code
M5	215.1771
M6	215.1772
M8	215.1773
M10	215.2125

Tab. 146

Threaded nuts and plates

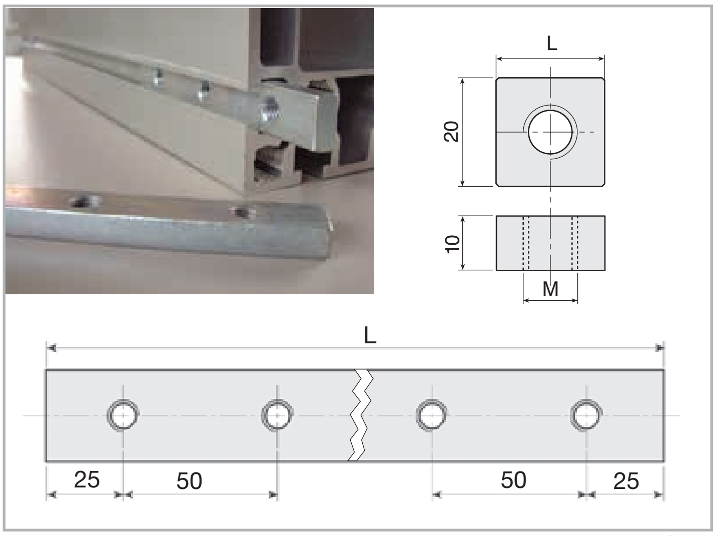


Fig.64

M12 (CH19) hexagonal-head screws can be used as stud bolts in profiles with 12.5 mm slots.

Material: galvanised steel. Suitable for series:
ZC 170-220

Thread	Threaded holes	L	Code
M10	1	40	215.0477
M12	1	40	209.1281
M10	1	20	209.1277
M10	2*	80	209.1776
M10	3*	150	209.1777
M10	4*	200	209.1778
M10	5*	250	209.1779
M10	6*	300	209.1780
M10	7*	350	209.1781

* Hole centre-distance: 50 mm.

Tab. 147

Adapter flange for gearbox assembly

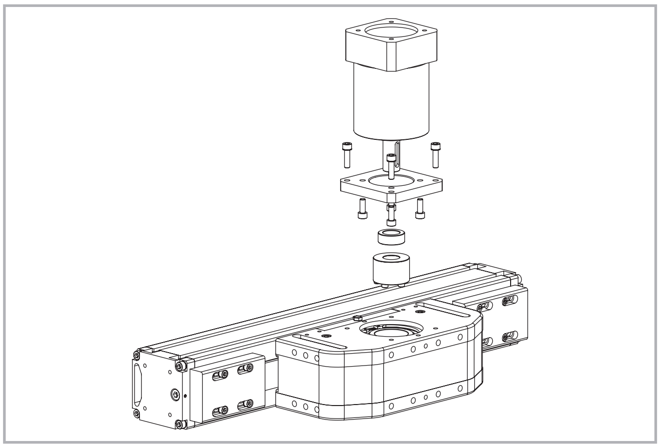


Fig. 65

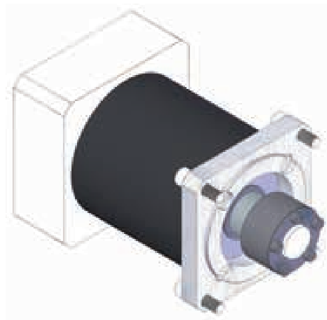


Fig. 66

Assembly kit includes: shrink disk; adapter plate; fixing hardware

Unit	Gearbox type (not included)	Kit Code
ZCH 60	SP 100	G002255
	LP 090	G001920
	LP 070	G002264
	MP080	G001915
	CP080	G001970
	PSF221	G001917
ZCR/ZCH 90	RF 27	G002335
	LP 090	G002254
	SP 100	G002316
	MP 080	G002328
	PSF 321	G002345
	PSF 221	G002348
ZCR/ZCH 100	LP120; PE5; LC120	G001856
	SP100; P5	G001857
	PSF321	G001858
	PSF521	G001859
	EP120TT	G001860
	MP105	G001861
	MP080	G001951

Tab. 148

For other gearbox type ask Rollon

Ordering key

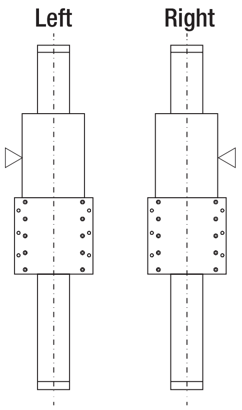
Identification codes for the ZCR/ZCH linear unit

ZCR ZCH	10 06 = 60 09 = 90 10 = 100 17 = 170 22 = 220	1A	02000	1A
				Linear motion system *see pg. ML-42*
			L=total length of the unit	
		Drive head code		
	Linear unit size *see from pg. ML-43 to pg. ML-51*			
ZCR/ZCH series *see pg. ML-40*				

In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Configure Actuator

Left / right orientation



ZMCH series

ZMCH series description

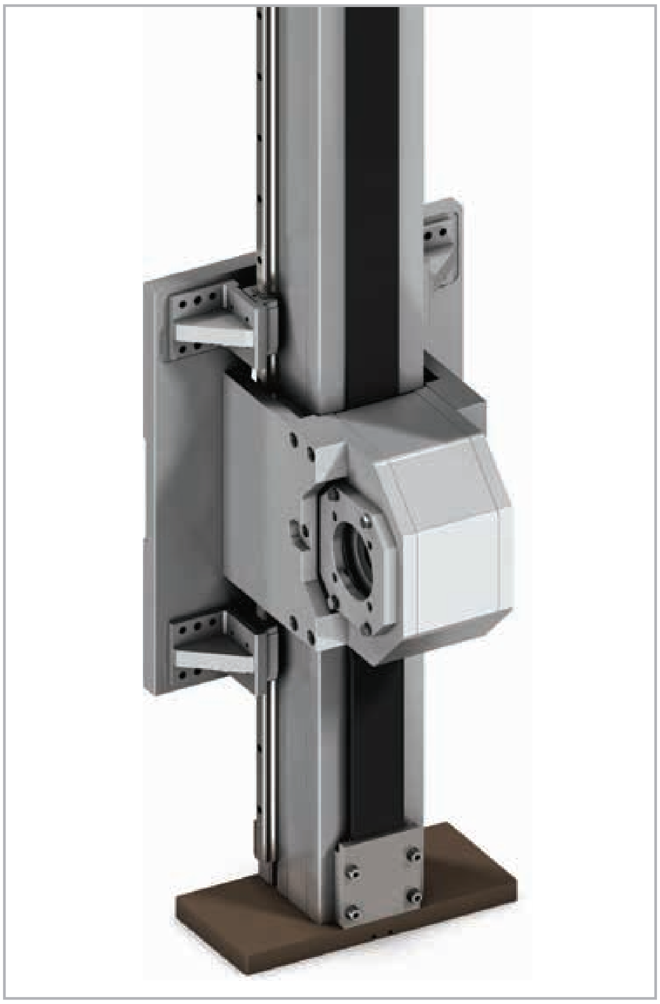


Fig. 67

ZMCH

The ZMCH series linear units were designed to meet the vertical motion requirements in gantry applications or for applications where the aluminum profile must be moving and the carriage must be fixed.

The self-supporting extruded and anodized aluminum structure is available in three sizes. Since it is a rigid system, it is ideal for a "Z" axis in a 3-axis system by using a linear guide rail.

In addition, the ZMCH series has been specifically designed and configured to be easily assembled with the R-SMART, TCS/TCR series and ROBOT series.

The components

Extruded profile

The anodized aluminum extrusions used for the bodies of the Rollon ZMCH series linear units were designed and manufactured in cooperation with a leading company in this field to obtain the right combination of high mechanical strength and reduced weight. The anodized aluminum alloy 6060 used (see physical chemical characteristics below for further information) was extruded with dimensional tolerances complying with EN 755-9 standards.

Driving belt

The Rollon ZMCH series linear units use steel reinforced polyurethane drive belts with AT pitch. This belt is ideal due to its high load transmission characteristics, compact size and low noise. Used in conjunction with a backlash-free pulley, smooth alternating motion can be achieved. Optimization of the maximum belt width/body dimension ratio enables the following performance characteristics to be achieved:

- **High speed**
- **Low noise**
- **Low wear**

Carriage

The carriage of the Rollon ZMCH series linear units is made entirely of anodized aluminum. The dimensions vary depending on the type.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 149

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m\,.\,K}$	$\frac{J}{kg\,.\,K}$	$\Omega\,.\,m\,.\,10^{-9}$	°C
2.7	70	23.8	200	880-900	33	600-655

Tab. 150

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
250	200	10	75

Tab. 151

The linear motion system

The linear motion system has been designed to meet the load capacity, speed, and maximum acceleration conditions of a wide variety of applications. Rollon ZMCH System series systems feature a linear motion system with ball bearing guides:

ZMCH with recirculating ball guides:

- The ball bearing guides with high load capacity are mounted in a dedicated seat on the aluminum body.
- The carriage of the linear unit is assembled on pre-loaded ball bearing blocks that enables the carriage to withstand loading in the four main directions.
- The ball bearing carriages are also fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment.
- The blocks have seals on both sides and, when necessary, an additional scraper can be fitted for very dusty conditions.

The linear motion system described above offers:

- High speed and acceleration
- High load capacity
- High permissible bending moments
- Low friction
- Long life
- Low noise

ZMCH section

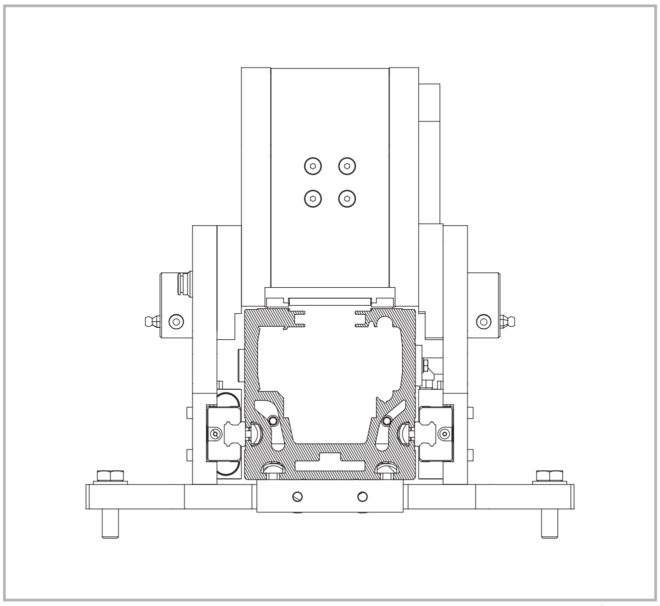
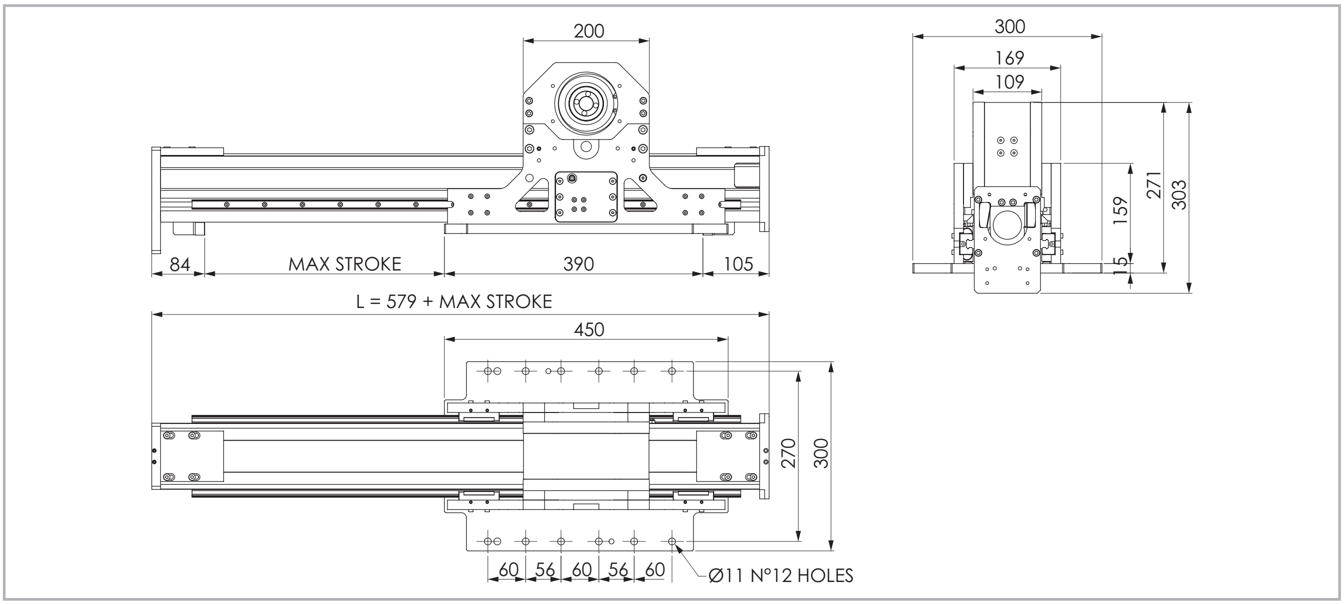


Fig. 68

ZMCH 105

ZMCH 105 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 69

Technical data

	Type ZMCH 105
Max. useful stroke length [mm]	2100
Max. positioning repeatability [mm]*1	± 0.1
Max. speed [m/s]	3
Max. acceleration [m/s²]	25
Type of belt	50 AT 10 HPF
Type of pulley	Z 29
Pulley pitch diameter [mm]	92.31
Carriage displacement per pulley turn [mm]	290
Carriage weight [kg]	16.5
Zero travel weight [kg]	28
Weight for 100 mm useful stroke [kg]	1.5
Starting torque [Nm]	4.4
Rail size [mm]	15

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 152

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ZMCH 105	0.568	0.448	1.015

Tab. 153

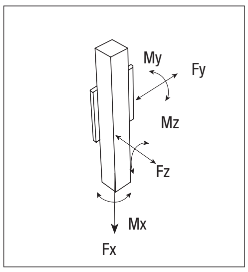
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight per meter [kg/m]
ZMCH 105	50 AT 10 HPF	50	0.290

Tab. 154

Belt length (mm) = L + 260



Load capacity

Type	F_x [N]		F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
ZMCH 105	4980	5850	61120	39780	61120	3591	10390	10390

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 155

Lubrication

ZMCH linear units with ball bearing guides

The ball bearing carriages are fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment of these in the circuits.
This system guarantees a long interval between maintenances: every 2000 km or 1 year of use, based on the value reached first. If a longer service life is required or in case of high dynamic or high loaded applications please contact our offices for further verification.

ZMCH

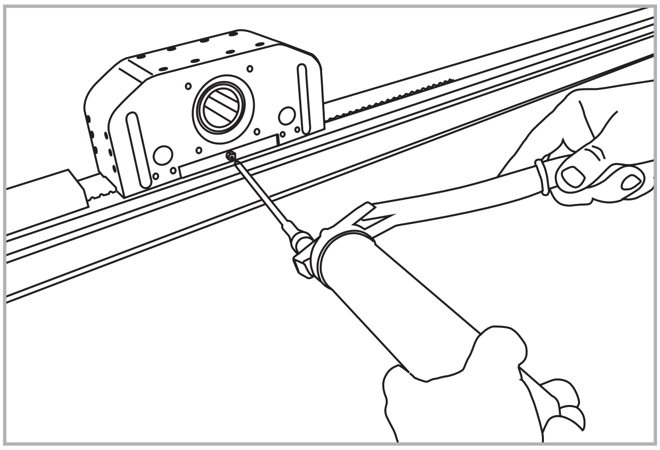


Fig. 70

Quantity of lubricant necessary for re-lubrication of each block:

Type	Quantity of Grease [cm^3]
ZMCH 105	0.2

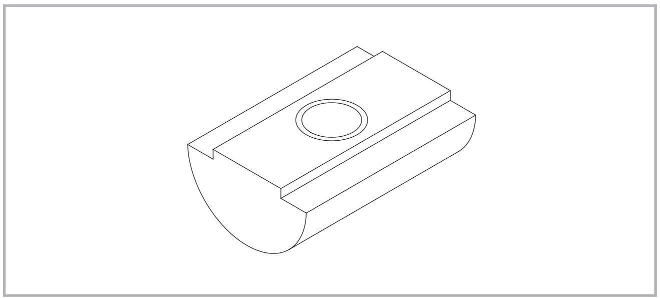
Tab. 156

- Insert the tip of the grease gun into the specific grease blocks.
- Type of lubricant: Lithium soap grease of class NLGI 2.
- For specially stressed applications or hostile environmental conditions, lubrication should be applied out more frequently.
  Contact Rollon for further advice

Accessories

To install accessories on ZMCH series aluminum profile we recommend to use the T-nuts shown below

T-nuts



Steel nuts to be used in the slots of the body. Fig. 71

Units (mm)

	Hole	Length	Code Rollon
ZMCH 105	M4	8	1001046

Tab. 157

Spring nut

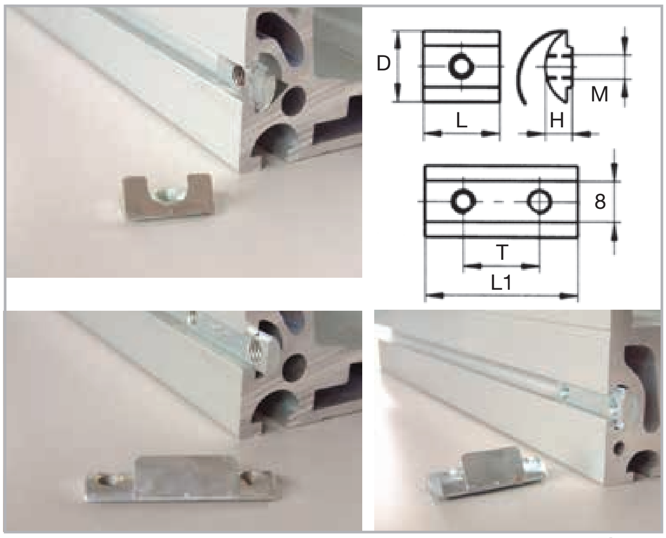


Fig. 72

Plate suitable for every kind of module (8 mm slot).

Material: nut in galvanised steel welded to the harmonic steel spring.

Single plate	MC 80-105	MC 65
M5	A32-55	B32-55
M6	A32-65	B32-65
M8	A32-85	B32-85

Tab. 158

Double plate	MC 80-105	MC 65
M6	A32-67	B32-67

Tab. 159

Size					
Base module	D	H	L	L1	T
MC 80-105	14	7.8	20	40	30
MC 65	11	4.1	20	40	30

Tab. 160

Ordering key

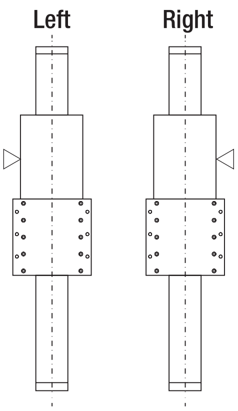
Identification codes for the ZMCH series

ZMCH	10	1A	01200	1A
ZMCH series *see pg. ML-57*	10 = 105 Linear unit size *see pg. ML-60*	Drive head code	L=total length of the unit	Linear motion system *ML-59*

In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Configure Actuator

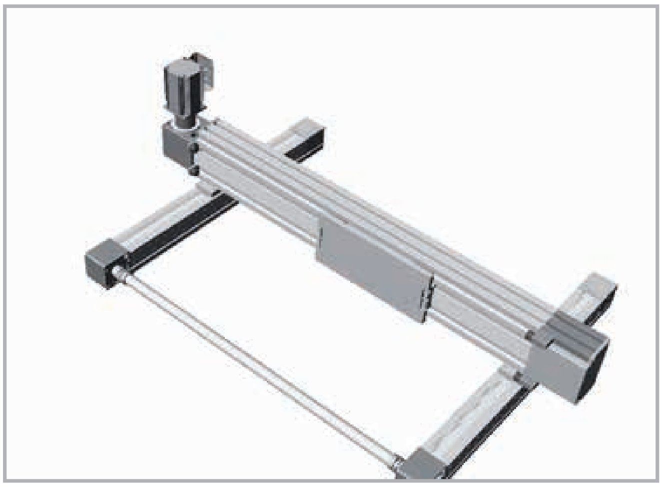
Left / right orientation



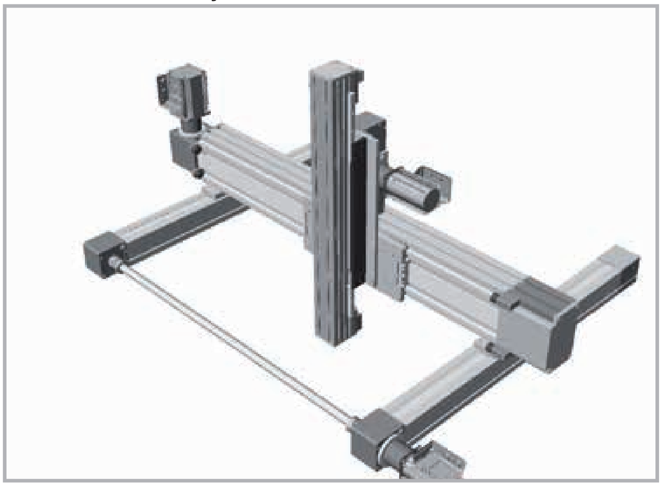
Multiaxis systems

1 - Two axis Y-Z system

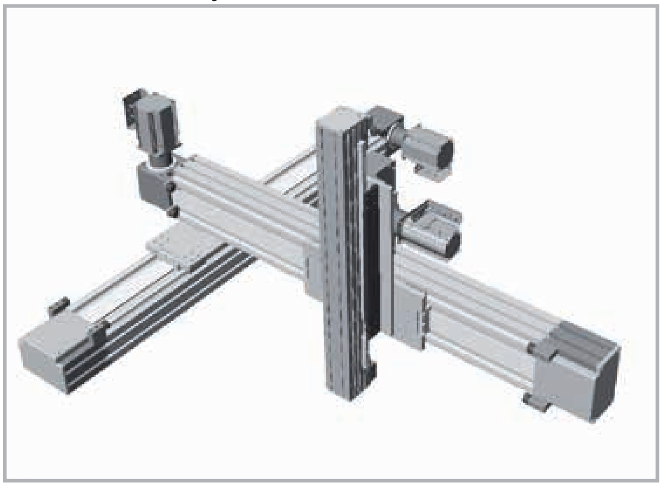
2 - Two axis X-Y system



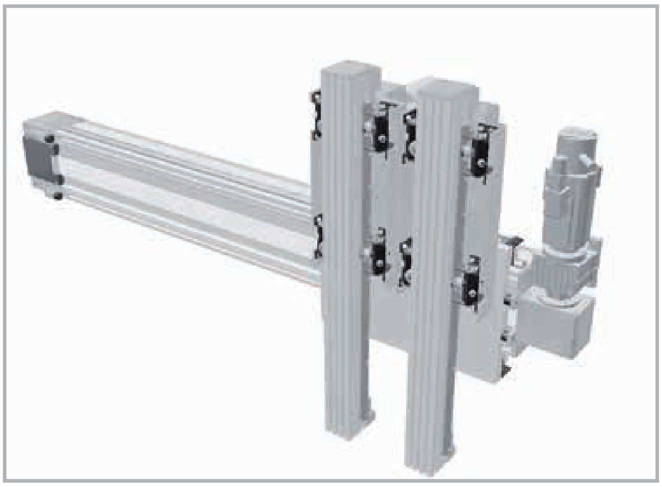
3 - Three axis X-Y-Z system



4 - Three Axis X-Y-Z system



5 - Two axis Y-Z system



6 - Two axis Y-Z system

BY TIMKEN

Precision System

TH series

TH series description

Fig. 1

TH linear actuators are rigid and compact, ball screw driven linear units, that enable high positioning accuracy and repeatability in all process phases. With optimal performance assured, TH actuators have a repeatability within 5 μm.

Thrust force transmission is achieved by means of super high efficient ball screws, which are available in several precision classes and a variety of leads. Linear motion is based on two or four preloaded re-circulating ball bearing blocks, with ball retainer technology, mounted on two precision aligned parallel rails. The TH series is available in single carriage or double carriage versions to meet different load requirements.

The TH linear units also feature safe rail and screw lubrication through a dedicated channel for each component. The incredibly compact structure of the TH actuator makes it the ideal solution for applications where space is limited.

- Extremely compact dimensions
- High positioning accuracy
- High load capacity and stiffness
- Preloaded ball screw
- Block with ball retainer
- Internal protected rails and ball screw
- Safe lubrication through dedicated channels for each component (block and ball screw)

The components

Aluminum base unit and carriage

The anodized extrusions used for the profile and carriages of the Rollon TH-series linear units were designed and manufactured in cooperation with industry experts to achieve high-level accuracy and to maximize mechanical properties. The anodized aluminum alloy 6060 used and was extruded with dimensional tolerances complying with UNI 3879 standards.

Linear motion system

Precision ball bearing guides with ground rails and preloaded blocks are used on Rollon TH series linear units. Use of this technology makes it possible to obtain the following features:

- **High accuracy running parallelism**
- **High positioning accuracy**
- **High level of rigidity**
- **Reduced wear**
- **Low resistance to movement**

Drive system

Rollon TH-series linear units use precision ball screws with either preloaded or non-preloaded ball screw nuts. The standard precision class of the ball screws used is ISO 7, however ISO 5 precision class is also available upon request. The ballscrew on the TH unit is available in different diameters and leads (see specifications tables). Use of this type of technology makes it possible to obtain the following features:

- **High speed (for long pitch screws)**
- **High load capacity and accurate thrust forces**
- **Superior mechanical performance**
- **Reduced wear**
- **Low resistance to movement**

Protection

Rollon TH series linear units are equipped with sealing strips in order to protect the mechanical components inside the linear unit against contaminants. In addition, the ball bearing guides and ball screws have their own protection system, including scrapers and lip seals to remove contaminates from the raceways of the ball bearings.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 1

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.7	69	23	200	880-900	33	600-655

Tab. 2

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
205	165	10	60-80

Tab. 3

TH 70 SP2

TH 70 SP2 Dimensions (single carriage)

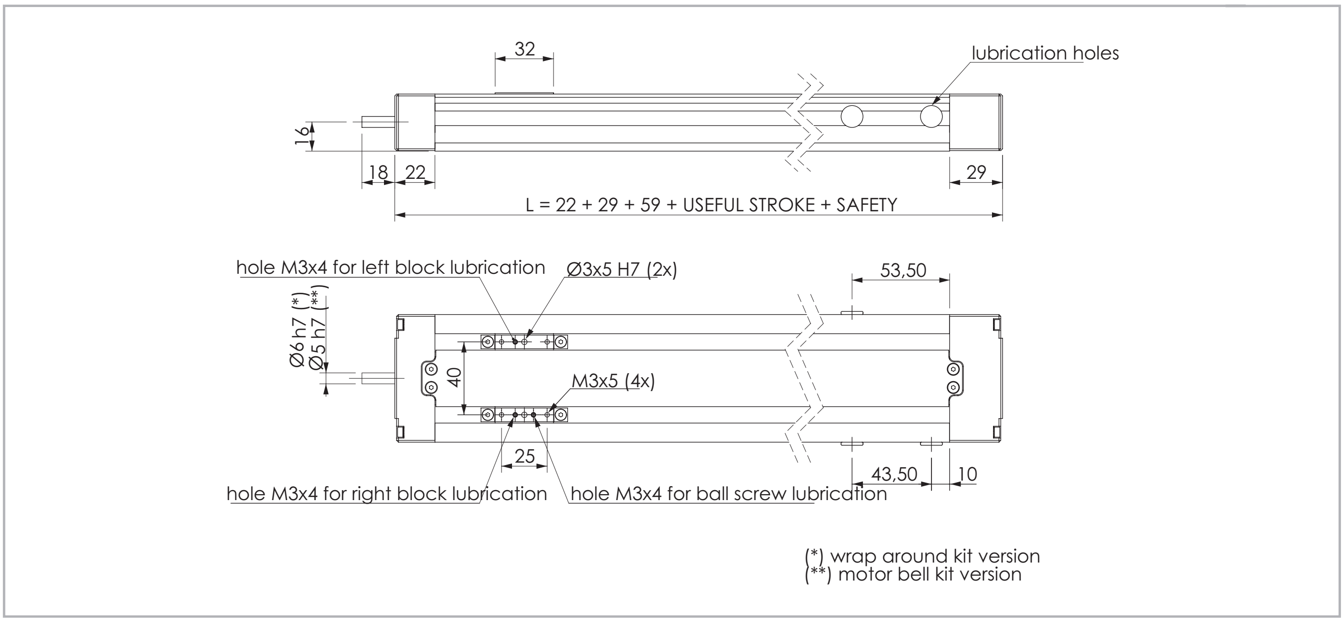


Fig. 2

Technical data

	Type
	TH 70 SP2
Useful stroke length [mm]	290 *1
Max. speed [m/s]	See page PS-14
Carriage weight [kg]	0.152
Zero travel weight [kg]	0.58
Weight for 100 mm useful stroke [kg]	0.26
Rail size [mm]	9 mini

*1 Max stroke 591mm. For more information please contact Rollon.

Tab. 4

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TH 70 SP2	0.0054	0.0367	0.042

Tab. 6

Ball screw precision

Type	Max. positioning precision [mm/300mm]		Max. repeatability precision [mm]	
	ISO 5*	ISO 7	ISO 5*	ISO 7
TH 70 / 8-2.5	0.023	0.05	0.01	0.02

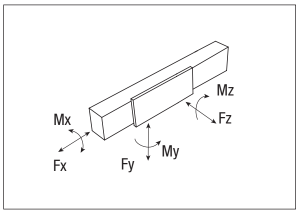
* ISO5 available only for max stroke 370mm. For more information please contact Rollon.

Tab. 5

Load capacity F_X

Type	F_x [N]		
	Screw	Stat.	Dyn.
TH 70 SP2	8-2.5	2220	1470

Tab. 7



Load capacity

Type	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
TH 70 SP2	4990	3140	4990	99.8	12.8	12.8

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 8

TH 70 SP4

TH 70 SP4 Dimensions (dual carriage)

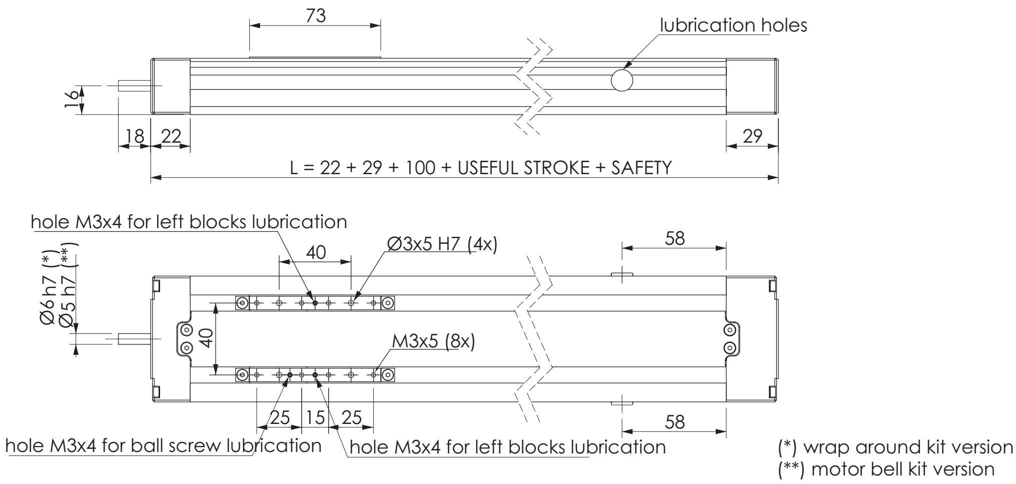


Fig. 3

Technical data

	Type
	TH 70 SP4
Useful stroke length [mm]	249 *1
Max. speed [m/s]	See page PS-14
Carriage weight [kg]	0.268
Zero travel weight [kg]	0.8
Weight for 100 mm useful stroke [kg]	0.26
Rail size [mm]	9 mini

*1 Max stroke 550mm. For more information please contact Rollon.

Tab. 9

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TH 70 SP4	0.0054	0.0367	0.042

Tab. 11

Ball screw precision

Type	Max. positioning precision [mm/300mm]		Max. repeatability precision [mm]	
	ISO 5*	ISO 7	ISO 5*	ISO 7
TH 70 / 8-2.5	0.023	0.05	0.01	0.02

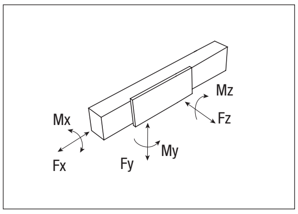
* ISO5 available only for max stroke 330mm. For more information please contact Rollon.

Tab. 10

Load capacity F_x

Type	F_x [N]		
	Screw	Stat.	Dyn
TH 70 SP4	8-2.5	2220	1470

Tab. 12



Load capacity

Type	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
TH 70 SP4	9980	6280	9980	200	319	319

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 13

Note: for SP4 model the load capacities are valid only when the sliders are fixed together

TH 90 SP2

TH 90 SP2 Dimensions (single carriage)

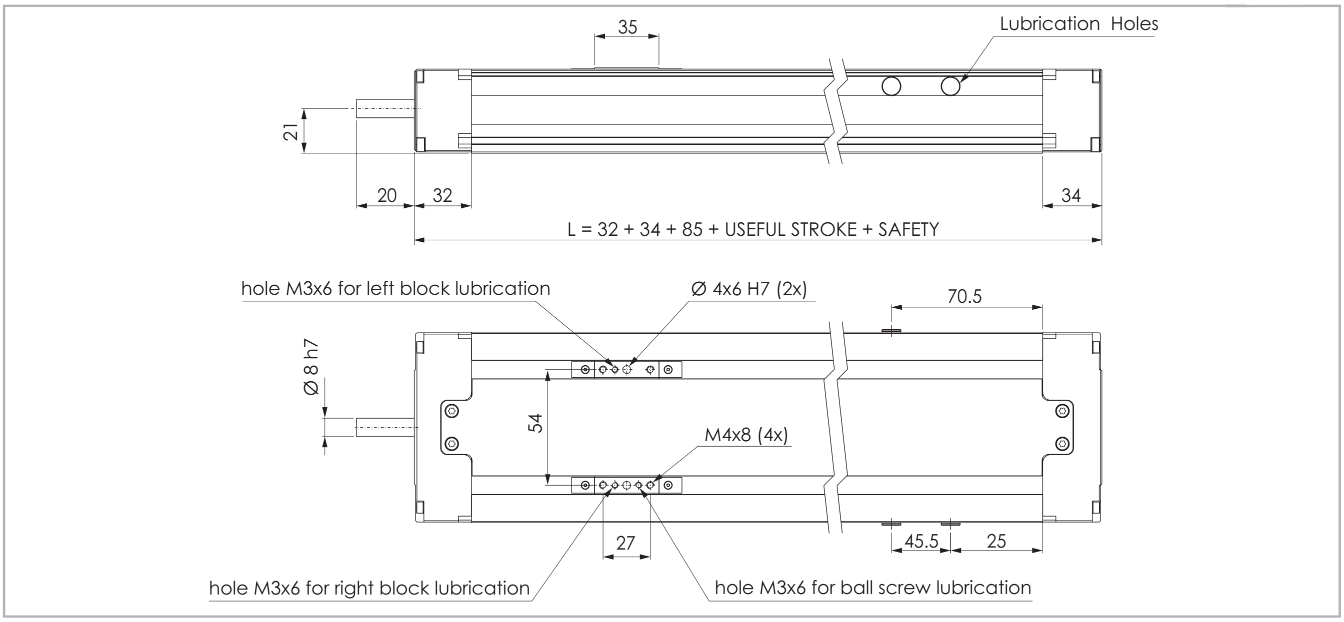


Fig. 4

Technical data

	Type
	TH 90 SP2
Max. useful stroke length [mm]	665
Max. speed [m/s]	See page PS-14
Carriage weight [kg]	0.65
Zero travel weight [kg]	1.41
Weight for 100 mm useful stroke [kg]	0.6
Rail size [mm]	12 mini

Tab. 14

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TH 90 SP2	0.0130	0.0968	0.1098

Tab. 16

Starting torque

Type	Ball Screw	[Nm]
TH 90 SP2	12-05	0.07
	12-10	0.08

Tab. 17

Ball screw precision

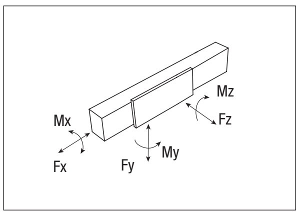
Type	Max. positioning precision [mm/300mm]		Max. repeatability precision [mm]	
	ISO 5	ISO 7	ISO 5	ISO 7
TH 90 / 12-05	0.023	0.05	0.01	0.02
TH 90 / 12-10	0.023	0.05	0.01	0.02

Tab. 15

Load capacity F_x

Type	F_x [N]		
	Screw	Stat.	Dyn.
TH 90 SP2	12-05	9000	4300
	12-10	6600	3600

Tab. 18



Load capacity

Type	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
TH 90 SP2	7060	6350	7060	192	24	24

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 19

PS

TH 90 SP4

TH 90 SP4 Dimensions (dual carriage)

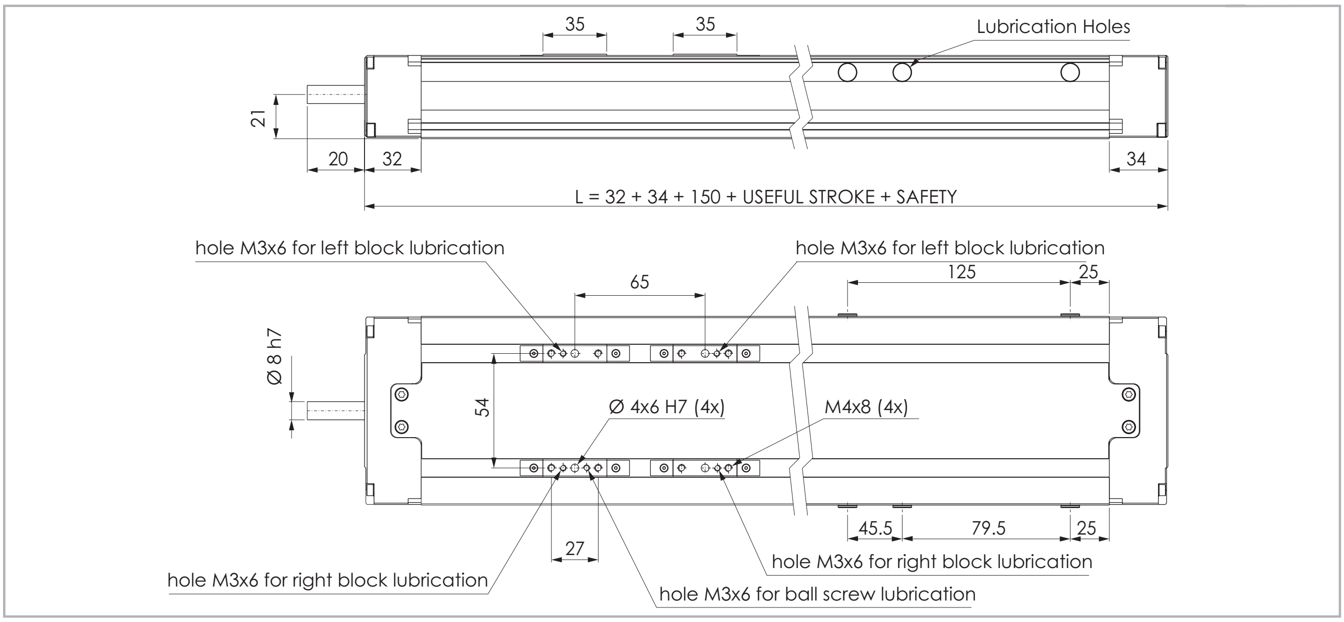


Fig. 5

Technical data

	Type
	TH 90 SP4
Max. useful stroke length [mm]	600
Max. speed [m/s]	See page PS-14
Carriage weight [kg]	0.90
Zero travel weight [kg]	2.04
Weight for 100 mm useful stroke [kg]	0.6
Rail size [mm]	12 mini

Tab. 20

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TH 90 SP4	0.0130	0.0968	0.1098

Tab. 22

Starting torque

Type	Ball Screw	[Nm]
TH 90 SP4	12-05	0.07
	12-10	0.08

Tab. 23

Ball screw precision

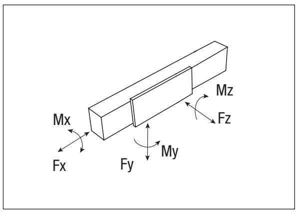
Type	Max. positioning precision [mm/300mm]		Max. repeatability precision [mm]	
	ISO 5	ISO 7	ISO 5	ISO 7
TH 90 / 12-05	0.023	0.05	0.01	0.02
TH 90 / 12-10	0.023	0.05	0.01	0.02

Tab. 21

Load capacity F_x

Type	F_x [N]		
	Screw	Stat.	Dyn
TH 90 SP4	12-05	9000	4300
	12-10	6600	3600

Tab. 24



Load capacity

Type	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
TH 90 SP4	14120	12699	14120	384	459	459

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 25

Note: for SP4 model the load capacities are valid only when the sliders are fixed together

TH 110 SP2

TH 110 SP2 Dimensions (single carriage)

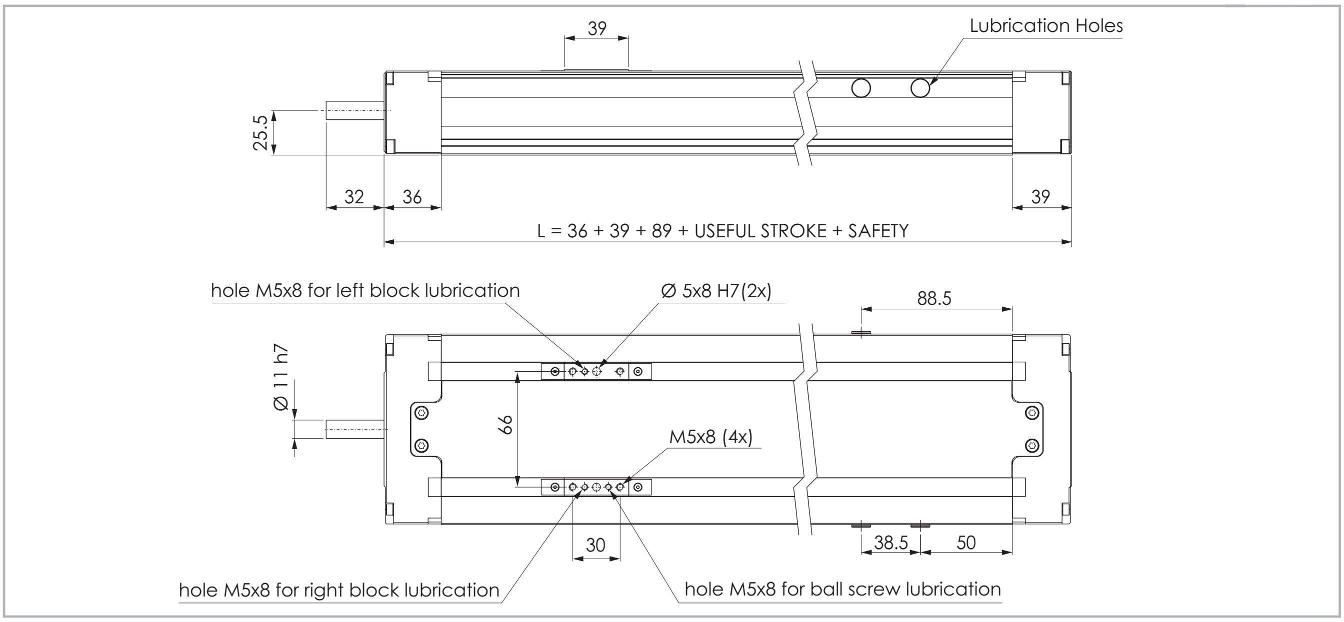


Fig. 6

Technical data

	Type
	TH 110 SP2
Max. useful stroke length [mm]	1411
Max. speed [m/s]	See page PS-14
Carriage weight [kg]	0.76
Zero travel weight [kg]	2.65
Weight for 100 mm useful stroke [kg]	0.83
Rail size [mm]	15

Tab. 26

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TH 110 SP2	0.0287	0.2040	0.2327

Tab. 28

Starting torque

Type	Ball Screw	[Nm]
TH 110 SP2	16-05	0.16
	16-10	0.23
	16-16	0.27

Tab. 29

Ball screw precision

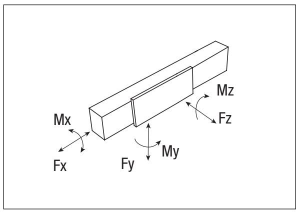
Type	Max. positioning precision [mm/300mm]		Max. repeatability precision [mm]	
	ISO 5	ISO 7	ISO 5	ISO 7
TH 110 / 16-05	0.023	0.05	0.005	0.045
TH 110 / 16-10	0.023	0.05	0.005	0.045
TH 110 / 16-16	0.023	0.05	0.005	0.045

Tab. 27

Load capacity F_x

Type	F_x [N]		
	Screw	Stat.	Dyn.
TH 110 SP2	16-05	17400	11800
	16-10	18300	10500
	16-16	18800	10300

Tab. 30



Load capacity

Type	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
TH 110 SP2	48400	22541	48400	1549	350	350

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 31

TH 110 SP4

TH 110 SP4 Dimensions (Dual carriage)

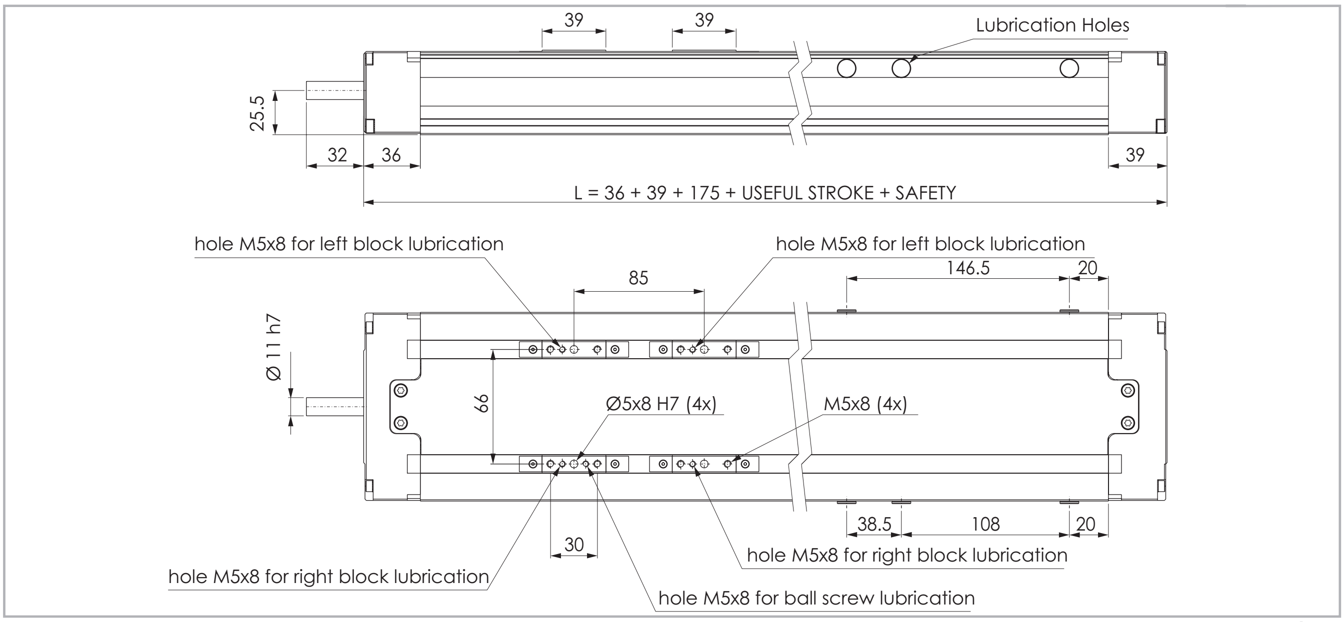


Fig. 7

Technical data

	Type
	TH 110 SP4
Max. useful stroke length [mm]	1325
Max. speed [m/s]	See page PS-14
Carriage weight [kg]	1.26
Zero travel weight [kg]	4.00
Weight for 100 mm useful stroke [kg]	0.83
Rail size [mm]	15

Tab. 32

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TH 110 SP4	0.0287	0.2040	0.2327

Tab. 34

Starting torque

Type	Ball Screw	[Nm]
TH 110 SP4	16-05	0.16
	16-10	0.23
	16-16	0.27

Tab. 35

Ball screw precision

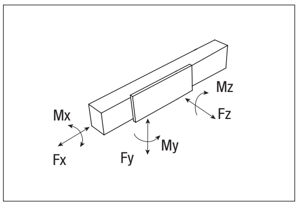
Type	Max. positioning precision [mm/300mm]		Max. repeatability precision [mm]	
	ISO 5	ISO 7	ISO 5	ISO 7
TH 110 / 16-05	0.023	0.05	0.005	0.045
TH 110 / 16-10	0.023	0.05	0.005	0.045
TH 110 / 16-16	0.023	0.05	0.005	0.045

Tab. 33

Load capacity F_x

Type	F_x [N]		
	Screw	Stat.	Dyn
TH 110 SP4	16-05	17400	11800
	16-10	18300	10500
	16-16	18800	10300

Tab. 36



Load capacity

Type	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
TH 110 SP4	96800	45082	96800	3098	2606	2606

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 37

Note: for SP4 model the load capacities are valid only when the sliders are fixed together

TH 145 SP2

TH 145 SP2 Dimensions (single carriage)

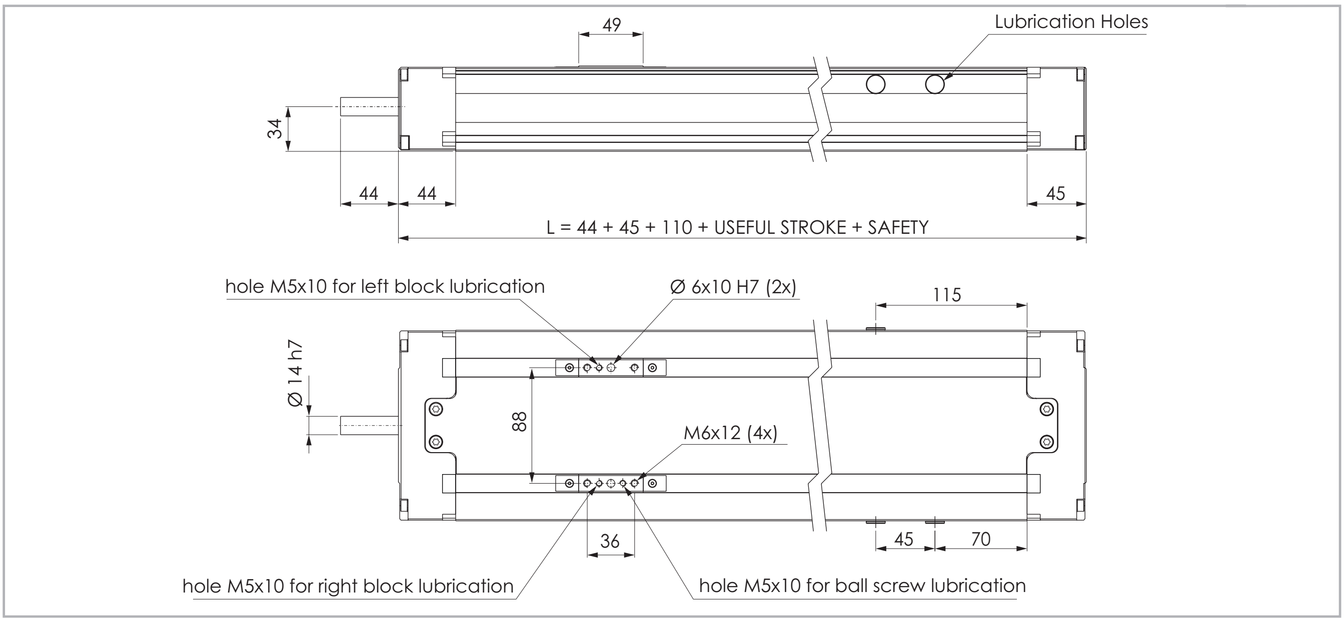


Fig. 8

Technical data

	Type
	TH 145 SP2
Max. useful stroke length [mm]	1690
Max. speed [m/s]	See page PS-14
Carriage weight [kg]	1.45
Zero travel weight [kg]	5.9
Weight for 100 mm useful stroke [kg]	1.6
Rail size [mm]	20

Tab. 38

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TH 145 SP2	0.090	0.659	0.749

Tab. 40

Starting torque

Type	Ball Screw	[Nm]
TH 145 SP2	20-05	0.22
	20-20	0.35
	25-10	0.29

Tab. 41

Ball screw precision

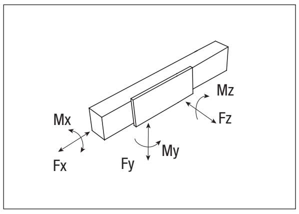
Type	Max. positioning precision [mm/300mm]		Max. repeatability precision [mm]	
	ISO 5	ISO 7	ISO 5	ISO 7
TH 145 / 20-05	0.023	0.05	0.005	0.045
TH 145 / 20-20	0.023	0.05	0.005	0.045
TH 145 / 25-10	0.023	0.05	0.005	0.045

Tab. 39

Load capacity F_x

Type	F_x [N]		
	Screw	Stat.	Dyn.
TH 145 SP2	20-05	25900	14600
	20-20	23900	13400
	25-10	32600	16000

Tab. 42



Load capacity

Type	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
TH 145 SP2	76800	35399	76800	3341	668	668

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 43

TH 145 SP4

TH 145 SP4 Dimensions (dual carriage)

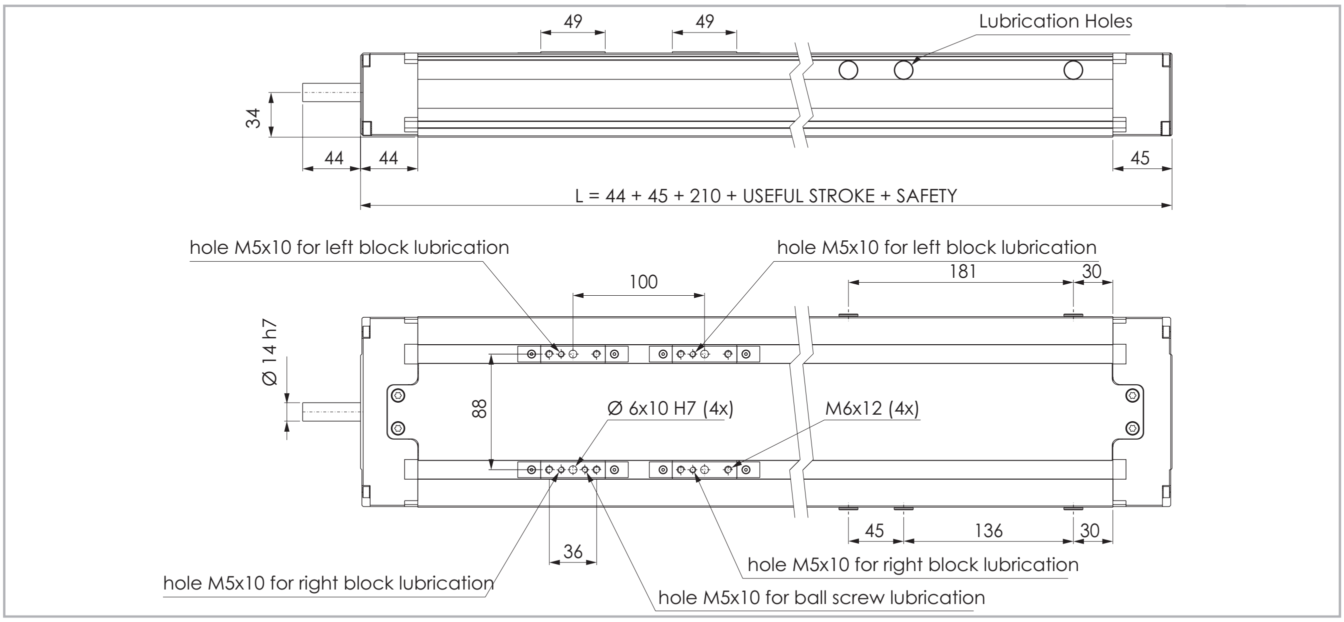


Fig. 9

Technical data

	Type
	TH 145 SP4
Max. useful stroke length [mm]	1590
Max. speed [m/s]	See page PS-14
Carriage weight [kg]	2.42
Zero travel weight [kg]	8.3
Weight for 100 mm useful stroke [kg]	1.6
Rail size [mm]	20

Tab. 44

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TH 145 SP4	0.090	0.659	0.749

Tab. 46

Starting torque

Type	Ball Screw	[Nm]
TH 145 SP4	20-05	0.22
	20-20	0.35
	25-10	0.29

Tab. 47

Ball screw precision

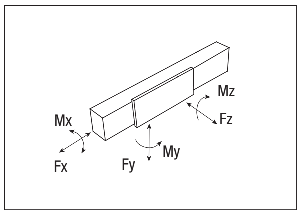
Type	Max. positioning precision [mm/300mm]		Max. repeatability precision [mm]	
	ISO 5	ISO 7	ISO 5	ISO 7
TH 145 / 20-05	0.023	0.05	0.005	0.045
TH 145 / 20-20	0.023	0.05	0.005	0.045
TH 145 / 25-10	0.023	0.05	0.005	0.045

Tab. 45

Load capacity F_x

Type	F_x [N]		
	Screw	Stat.	Dyn.
TH 145 SP4	20-05	25900	14600
	20-20	23900	13400
	25-10	32600	16000

Tab. 48



Load capacity

Type	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
TH 145 SP4	153600	70798	153600	6682	5053	5053

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 49

Note: for SP4 model the load capacities are valid only when the sliders are fixed together

Motor connections

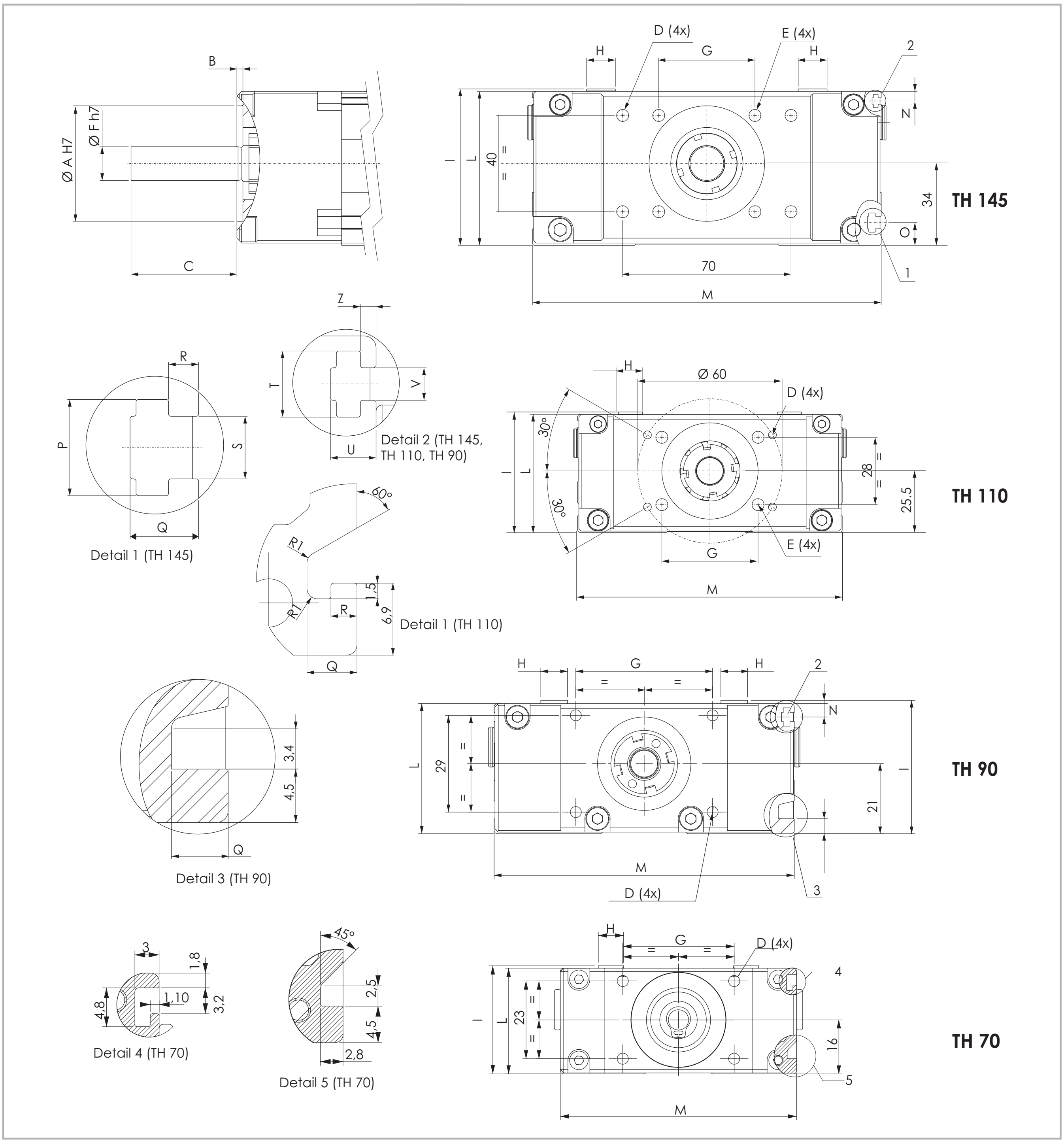


Fig. 10

Units [mm]

Type	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q	R	S	T	U	V	Z
TH 70	28	2.5	18	M4x8	-	5 or 6	33	7.5	32	31.3	70	-	-	-	-	-	-	-	-	-	-
TH 90	28	2.5	20	M4x8	-	8	41	8	40	39	90	4	4.5	-	4.8	-	-	5.5	3.8	2.7	1.3
TH 110	40	2.5	32	M4x8	M6x10	11	40	10	50	49	110	4	-	-	4.8	2.5	-	5.5	3.8	2.7	1.3
TH 145	48	2.5	44	M6x10	M6x12	14	40	12	65	64	145	4	9.5	8	5.7	2.5	5.2	5.5	3.8	2.7	1.3

Tab. 50

Lubrication

TH linear units with ball bearing guides

TH Linear units are equipped with self lubricating linear ball guides. The ball bearing carriages are also fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents mis-alignment of these in the circuits.

This system guarantees a long interval between maintenances: every 2000 Km or 1 year of use, based on the value reached first. If a longer service life is required or in case of high dynamic or high loaded applications please contact our offices for further verification.

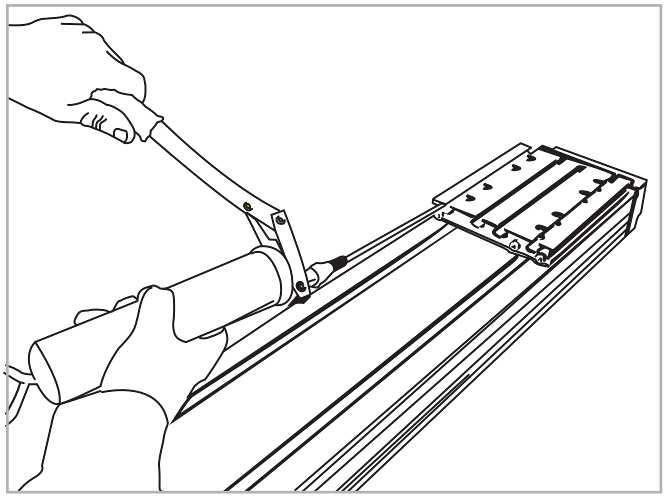


Fig. 11

Amount of lubricant needed to lubricate carriages:

Type	Quantity [cm^3]
TH 70	0.23
TH 90	0.5
TH 110	0.7
TH 145	1.4

Tab. 52

- Insert grease gun into the specific grease nipples.
- Type of lubrificant: Lithium soap grease of class NLGI 2.
- For specially stressed applications or difficult enviromental conditions, lubrication should be carried out more frequently. Refer to Rollon for further advice.

Ball screws

The ball screw nuts for the Rollon TH series linear slides should be re-lubricated every 100 km.

Type	Quantity [cm^3] for grease nipple
08-2.5	0.1
12-05	0.2
12-10	0.2
16-05	0.41
16-10	0.78
16-16	0.6
20-05	0.79
20-20	1.0
25-10	1.2

Tab. 51

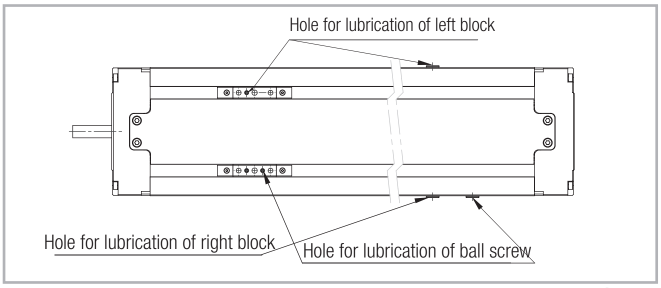
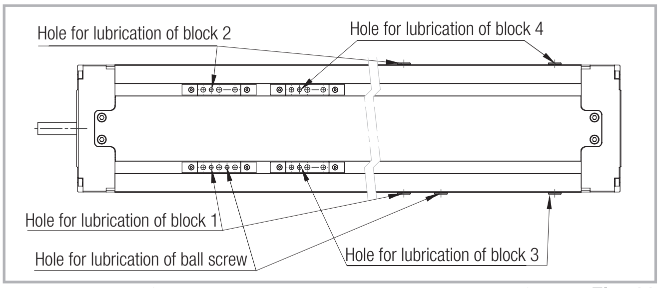


Fig. 12



Please refer to page PS-5 for the position of the holes for lubrication for TH 90 SP 4.

Fig. 13

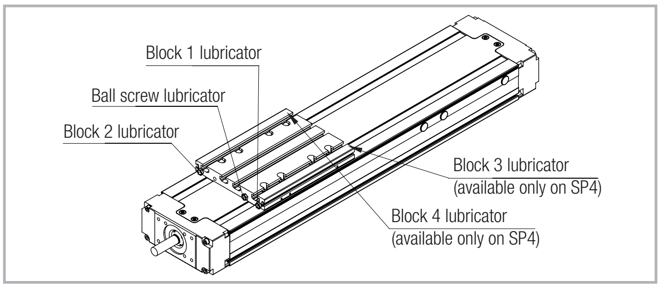


Fig. 14

Critical speed

The maximum linear speed of Rollon TH series linear units depends on the critical speed of the screw (based on its diameter and length) and on the max. permissible speed of the ball screw nut used.

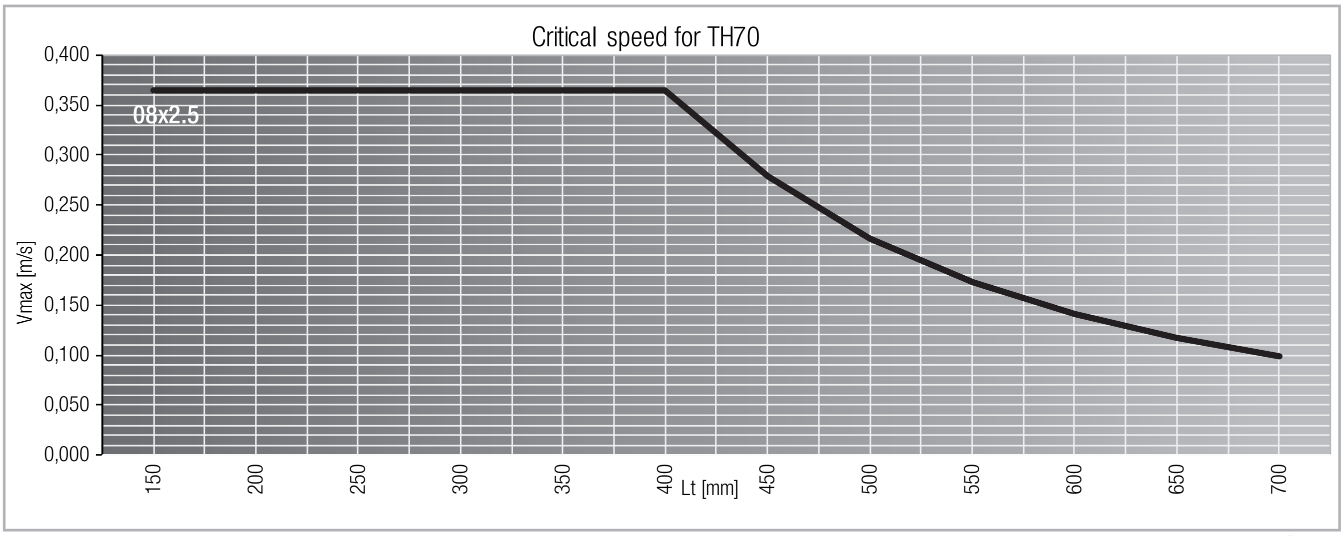


Fig. 15

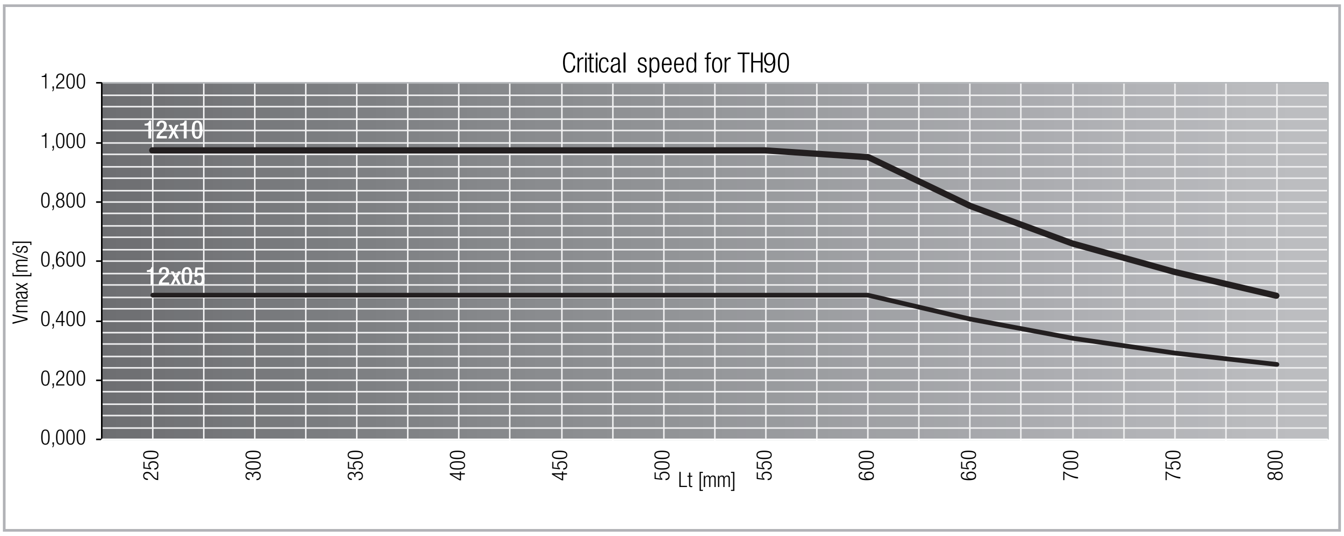


Fig. 16

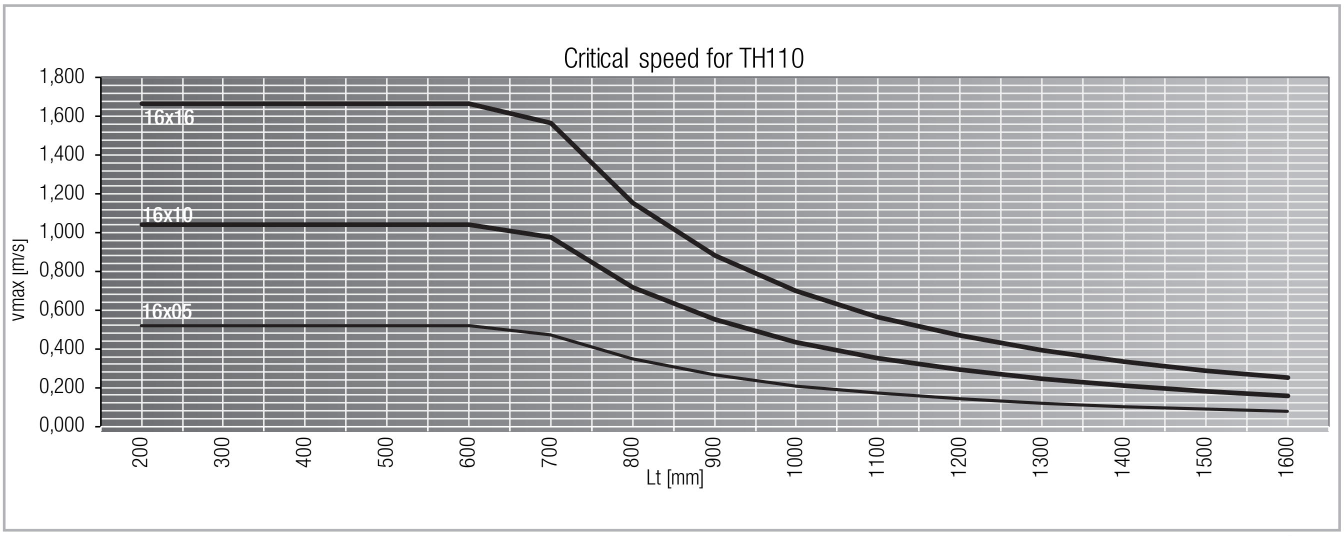


Fig. 17

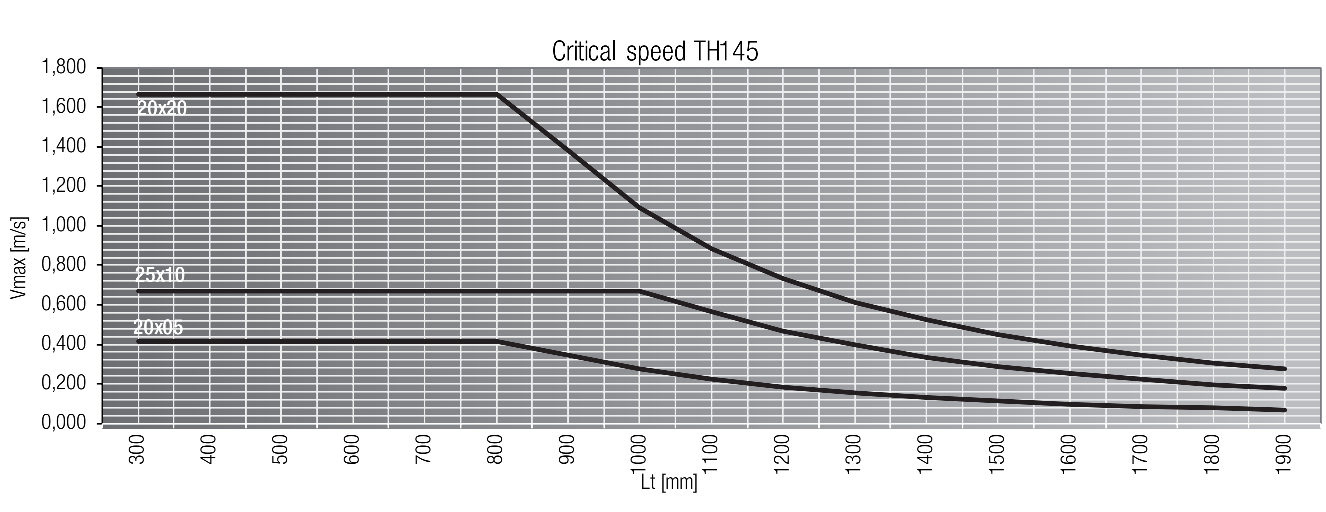


Fig. 18

Accessories

Fixing by brackets

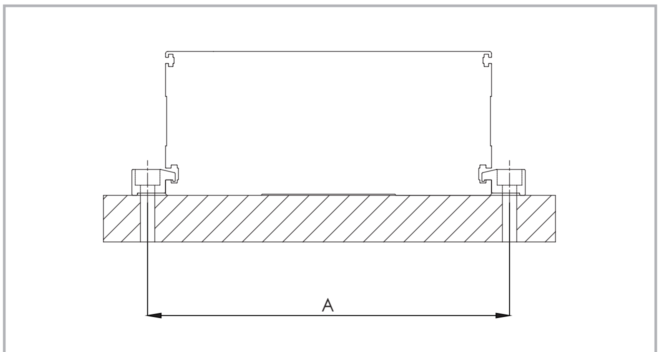


Fig. 19

Units (mm)

Type	A Unit mm
TH 70	82
TH 90	102
TH 110	126
TH 145	161

Tab. 53

Fixing brackets

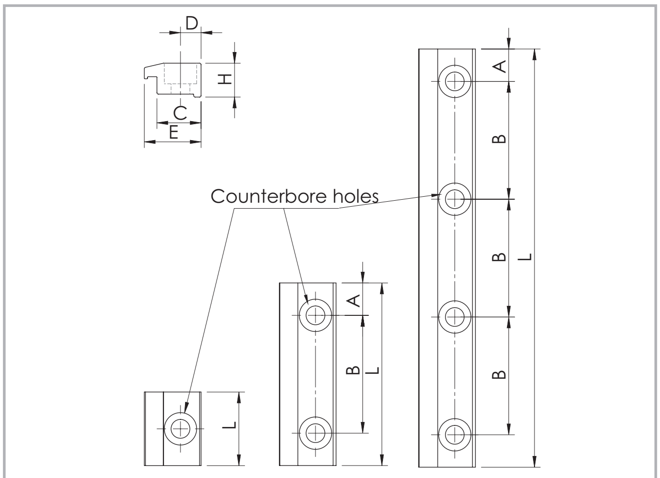


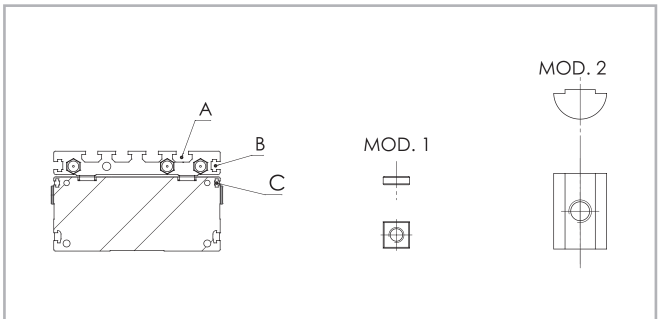
Fig. 20

Dimensions (mm)

Type	N° holes	Counterbore for screw	A	B	C	D	E	H	L	Code Rollon
TH 70	1	M4	-	-	12.5	6.5	15	9	22	1005198
TH 90	2	M4	11	40	10.5	4.5	14.5	9.1	62	1003385
	4	M4	8.5	30	10.5	4.5	14.5	9.1	107	1003509
	4	M4	8.5	20	10.5	4.5	14.5	9.1	77	1003510
	1	M4	-	-	10.5	4.5	14.5	9.1	25	1003612
TH 110 TH 145	4	M5	8.5	30	15	7	19.3	11.5	107	1002805
	4	M6	11	40	15	7	19.3	11.5	142	1002864
	1	M6	-	-	15	7	19	11.5	25	1002970
	2	M6	11	40	15	7	19	11.5	62	1002971
	4	M5	20	20	15	7	19	11.5	100	1003311

Tab. 54

T nuts



21

Units (mm)

Type	A	B	C
TH 70	Mod. 1 M4 - 963.0407.81	Mod. 1 M4 - 963.0407.81	-
TH 90	Mod. 2 M5 - 6000436	-	Mod. 1 M2.5 - 6001361
TH 110	Mod. 2 M5 - 6000436	Mod. 1 M4 - 963.0407.81	Mod. 1 M2.5 - 6001361
TH 145	Mod. 2 M6 - 6000437	Mod. 1 M4 - 963.0407.81	Mod. 1 M2.5 - 6001361

Tab. 55

Proximity

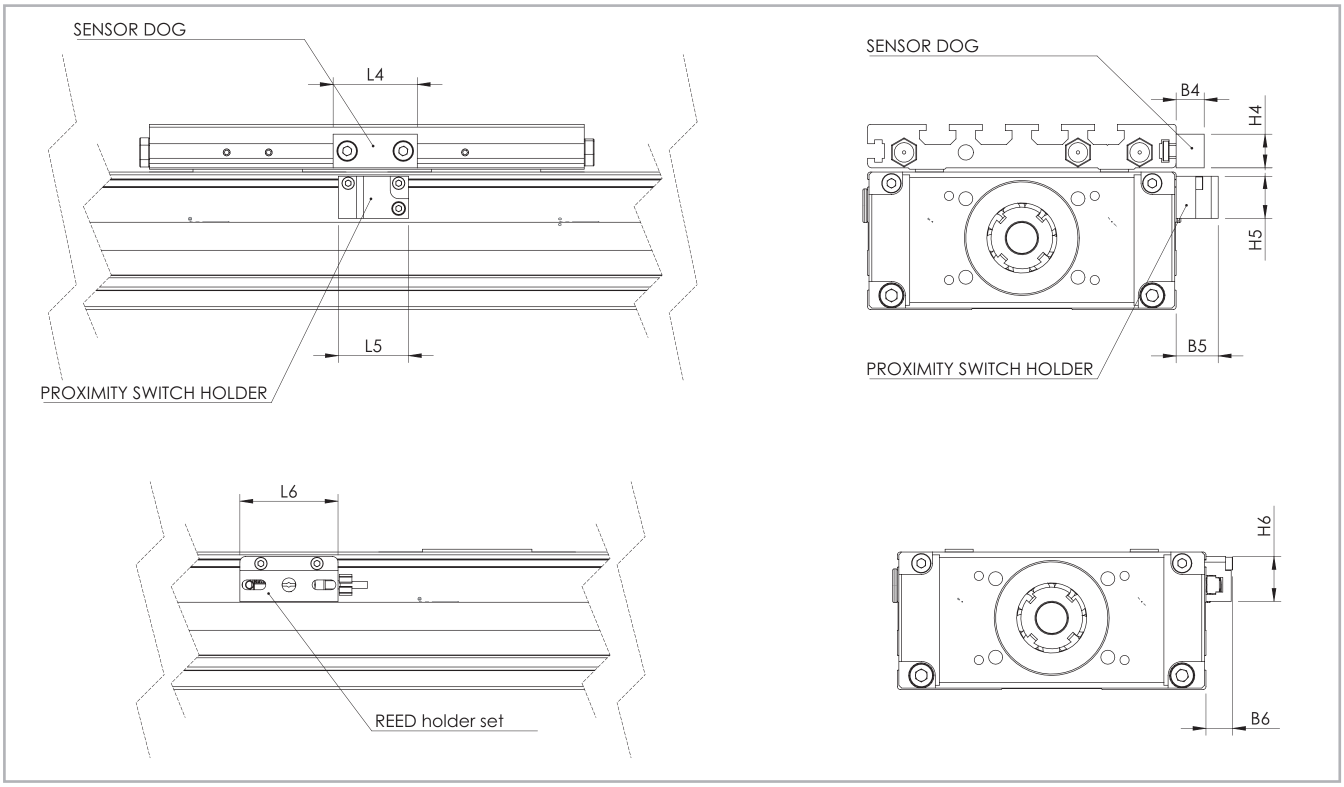


Fig. 22

Units (mm)

	B4	B5	B6	L4	L5	L6	H4	H5	H6	Sensor	Proximity holder set	Sensor dog	REED holder set
TH 70	8	10	8	30	25	35	10	18	18	Ø 6.5	G001975	G001976	G001974
TH 90	10	15	9.5	12	25	35	6	15	16	Ø 8	G001193	G001203	G001204
TH 110	10	15	9.5	30	25	35	12	15	16	Ø 8	G001193	G001198	G001204
TH 145	10	15	9.5	30	25	35	12	15	16	Ø 8	G001193	G001198	G001204

Tab. 56

External carriage

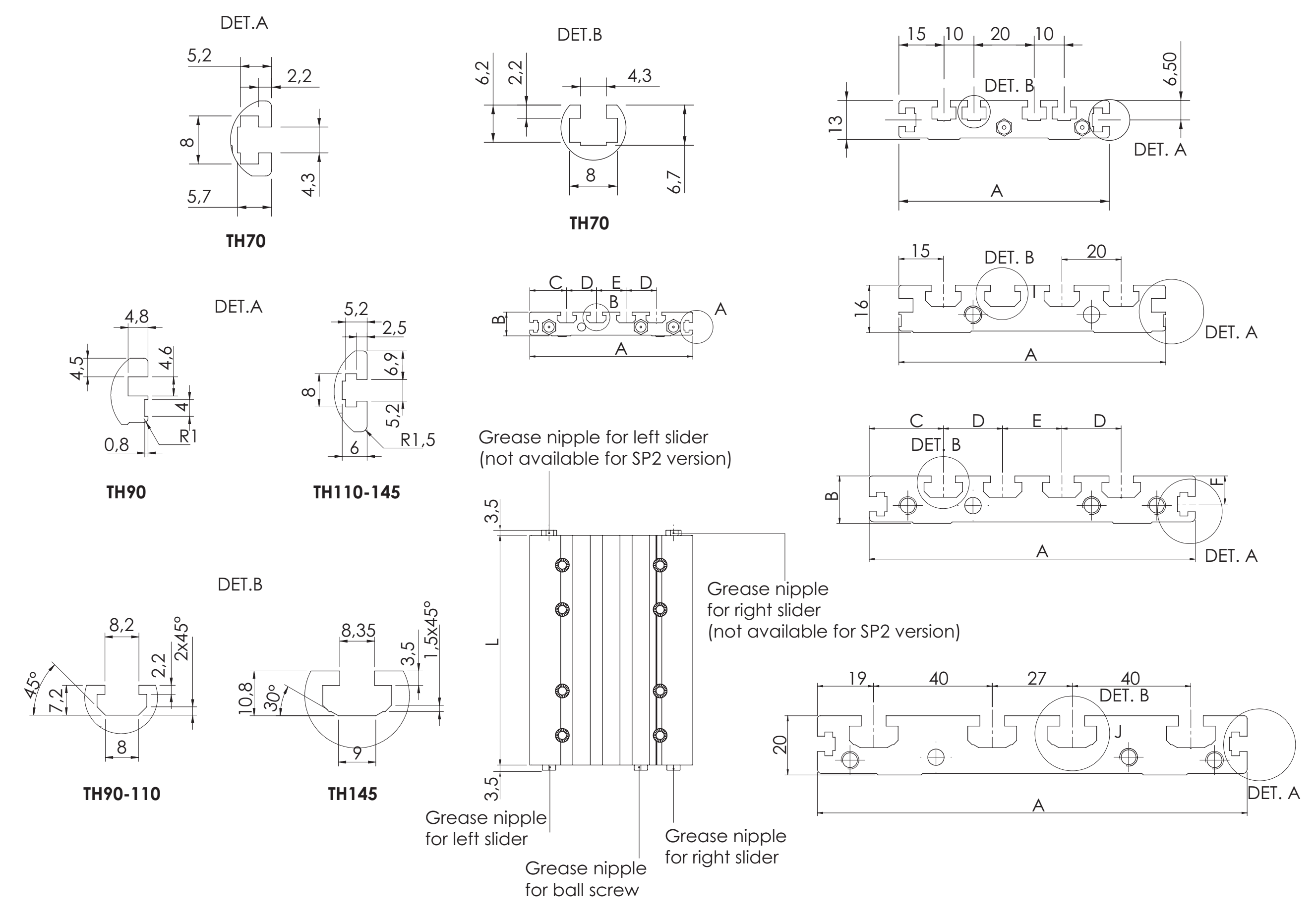


Fig. 23

External carriage for SP2	Type	A	B	C	D	E	F	L	Code
	TH 70	70	13	15	10	20	6,5	60	G001957
	TH 90	90	16	15	20	20	6.8	60	G001195
	TH 110	110	16	25	20	20	9.5	60	G001059
	TH 145	145	20	19	40	27	9.5	80	G001062

Tab. 57

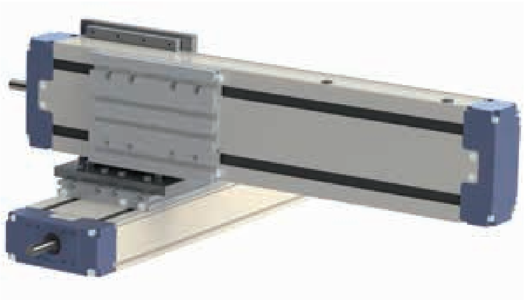
External carriage for SP4	Type	A	B	C	D	E	F	L	Code
	TH 70	70	13	15	10	20	6,5	95	G001958
	TH 90	90	16	15	20	20	6.8	125	G001194
	TH 110	110	16	25	20	20	9.5	155	G001060
	TH 145	145	20	19	40	27	9.5	190	G001061

Tab. 58

Coupling	Motor bell Kit
	

Tab. 59

Assembly kits



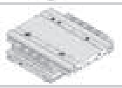
X-Y$_2$

Fig. 24

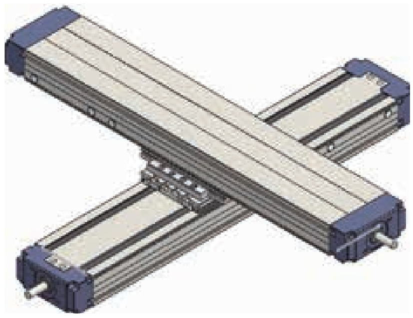
X-Z

Fig. 25

For the direct assembly of TH linear units on multiple axis system Rollon offers dedicated assembly kits. The table below shows the allowed combinations as well as the assembly kit codes.

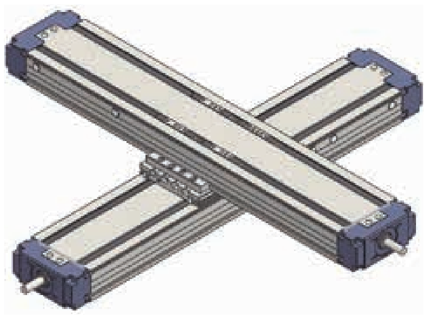
Kit		Code
	TH 90 - TH 90 XY$_2$	G001199
	TH 90 - TH 110 XY$_2$	G001199
	TH 90 - TH 110 XZ	G001205
	TH 110 - TH 110 XY$_2$	G001080
	TH 110 - TH 110 XZ	G001083
	TH 110 - TH 145 XY$_2$	G001079
	TH 110 - TH 145 XZ	G001084
	TH 145 - TH 145 XY$_2$	G001081
	TH 145 - TH 145 XZ	G001085
	TH 90 - TH 90 XY$_1$	G001483
	TH 90 - TH 90 XY$_3$	G001483 + G001194
	TH 110 - TH 110 XY$_1$	G001173
	TH 110 - TH 110 XY$_2$	G001173 + G001060
	TH 145 - TH 145 XY$_1$	G001362
	TH 145 - TH 145 XY$_2$	G001362 + G001061

Tab. 60



X-Y$_1$

Fig. 26



X-Y$_1$

Fig. 27

Wrap around kit

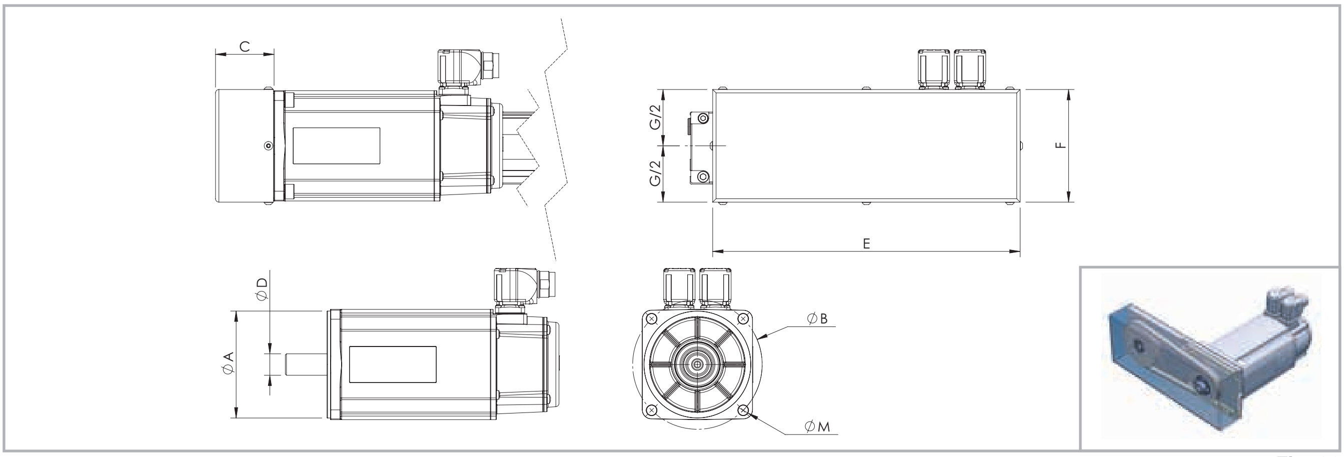


Fig. 28

Unit	Ratio	A	B	C	D	E	F	M	Code
TH 90	1 : 1	Ø 40	Ø 63	30	Ø 9	168	63	M4	G001592
TH 110	1 : 1	Ø 40	Ø 63	40.5	Ø 9	233	88	M4	G001011
TH 110	1 : 1	Ø 50	Ø 70	40.5	Ø 14	233	88	M4	G001055
TH 110	1 : 1	Ø 60	Ø 75	40.5	Ø 14	233	88	M6	G001013
TH 145	1 : 1	Ø 80	Ø 100	52	Ø 14	273	100	M6	G000984
TH 145	1 : 1	Ø 95	Ø 115	52	Ø 19	273	100	M8	G000988

Tab. 61

For further information please contact Rollon Technical Dept.

Mounting of the motor

Rollon TH Series linear units can be supplied with different types of motor mounts, adapter flanges, and with torsionally stiff couplings for screw and motor connections that enable fast, hassle-free assembly of the motors.

The types of bells available for the related units are shown in the table motor mounts:

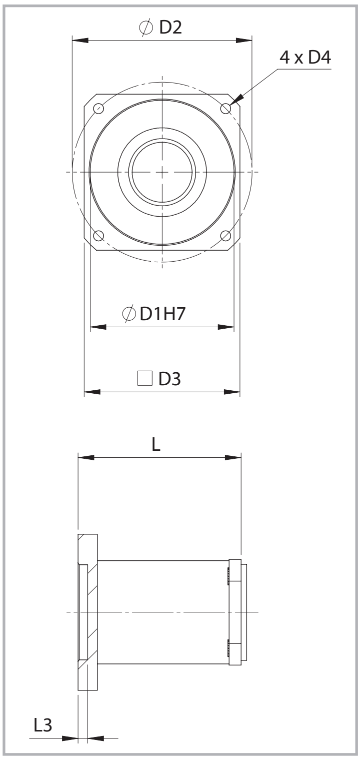


Fig. 29

Unit	D1	D2	D3	D4	L	L3	Code
TH70	Ø 30	Ø 45	38	M3	52	4	G002000
TH70	Ø 40	Ø 63	54	M4	49	3.5	G002001
TH70	Ø 50	Ø 70	60	M4	59	4	G002002
TH90	Ø 40	Ø 63	56	M5	50	3	G001192
TH110	Ø 60	Ø 75	65	M6	68	4	G001051
TH110	Ø 73,1	Ø 98,4	86	M5	76.7	2	G001074
TH110	Ø 60	Ø 75	65	M5	68	4	G001119
TH110	Ø 50	Ø 70	65	Ø 5.4	75	11	G001200
TH145	Ø 50	Ø 70	80x60	M4	92	21	G000979
TH145	Ø 70	Ø 85	80x85	M6	92	4	G001066
TH145	Ø 70	Ø 90	80x85	M5	92	5	G001067
TH145	Ø 80	Ø 100	90	M6	92	4	G001068
TH145	Ø 50	Ø 65	80x85	M5	92	21	G001069
TH145	Ø 60	Ø 75	80x85	M6	92	4	G001070
TH145	Ø 50	Ø 70	80x85	M5	92	21	G001071
TH145	Ø 73	Ø 98,4	85	M5	92	4	G001072
TH145	Ø 55	68X40	85x60	Ø6,4	82	11	G001073

Tab. 62

Ordering key

Identification code for the TH linear units

H	09	1205	5P	0800	1A
	07=70	08-2.5	5P=ISO 5		1A=SP2 set for motor bell kit
	09=90	12-05	7N=ISO 7		2A=SP4 set for motor bell kit
	11=110	12-10			3A=SP2 set for wrap around kit
	14=145	16-05			4A=SP4 set for wrap around kit
		16-10			
		16-16			
		20-05			
		20-20			
		25-10			

Head configuration code

L=total length of th unit

Type *see from pg. PS-4 to pg. PS-11, tab. 5, 10, 15, 21, 27, 33*

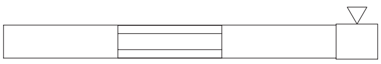
B/S diameter and lead

Size *see from pg. PS-4 to pg. PS-11*

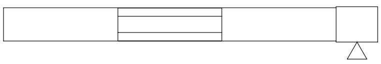
Linear unit serie TH *see pg. PS-2*

In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Left / right orientation



Right



Left

TT series

TT series description

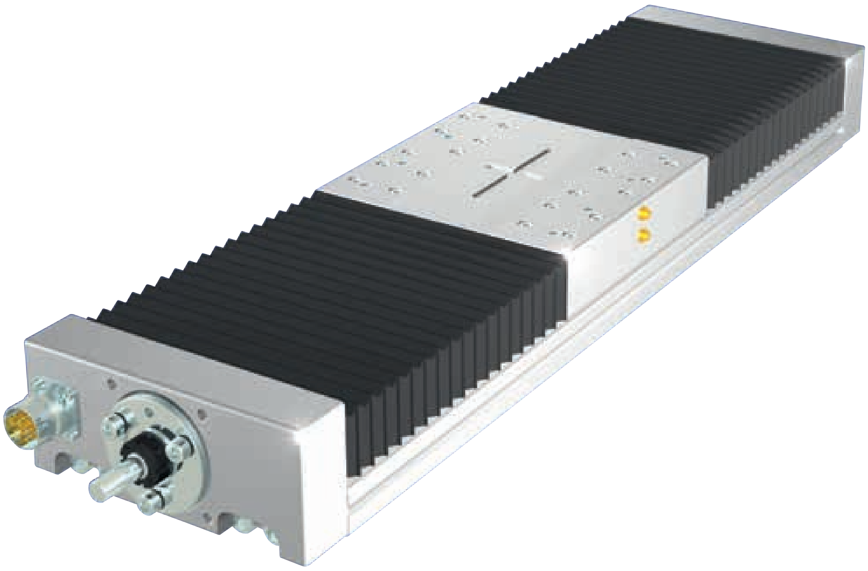


Fig. 30

TT

The TT is a linear actuator series mainly used for high accuracy positioning within a 10 µm range and precision repeatability within 5 µm. Manufactured using a very rigid extruded anodized aluminum base structure, this actuator series is designed for high loads and precise movements that are typically required in machine tools and other exacting machine design applications.

All mounting surfaces and reference datums have been produced to significantly reduce the deviations of pitch, yaw and roll along the entire stroke. The heavy duty carriage is driven by a C5 or C7 preloaded ball screw drive and the payload is supported by a system of four runner blocks mounted on two parallel linear guides. High speeds can be accomplished by specifying available super lead ball screw drivers.

The TT series contains all the necessary features and hardware to make multi-axis configurations and assembly easy. All TT units are 100% inspected and supplied with certificates of accuracy.

The components

Aluminum base unit and carriage

The base and carriages of the Rollon TT series linear units were designed and manufactured in co-operation with industry experts to obtain the high-level of accuracy and maximize mechanical properties. Anodized aluminum alloy 6060 was used with dimensional tolerances complying with UNI 3879 standards. To guarantee highly precise movement, the bodies are precision machined on all outer surfaces and in the areas where the mechanical components are fitted, such as ball bearing guides and ball screw supports.

Linear motion system

Precision ball bearing guides with ground rails and preloaded blocks are used on Rollon TT series linear units. Use of this technology makes it possible to obtain the following features:

- **High accuracy running parallelism**
- **High positioning accuracy**
- **High level of rigidity**
- **Reduced wear**
- **Low resistance to movement**

Drive system

Rollon TT-series linear units use precision ball screws with either preloaded or non-preloaded ball screw nuts. The standard precision class of the ball screws used is ISO 5, however ISO 7 precision class is also available upon request. The ballscrew on the TH unit is available in different diameters and leads (see specifications tables). Use of this type of technology makes it possible to obtain the following features:

- **High speed (for long pitch screws)**
- **High load capacity and accurate thrust forces**
- **Superior mechanical performance**
- **Reduced wear**
- **Low resistance to movement**

Protection

Rollon TT-series linear units are equipped with bellows in order to protect the mechanical and electrical components inside the linear unit against contaminants. In addition to the bellows system, the ball bearing guides and ball screws have their own protection including scrapers and lip seals to remove contaminates from the raceways of the ball bearings.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 63

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.7	69	23	200	880-900	33	600-655

Tab. 64

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
205	165	10	60-80

Tab. 65

TT 100

TT 100 Dimensions

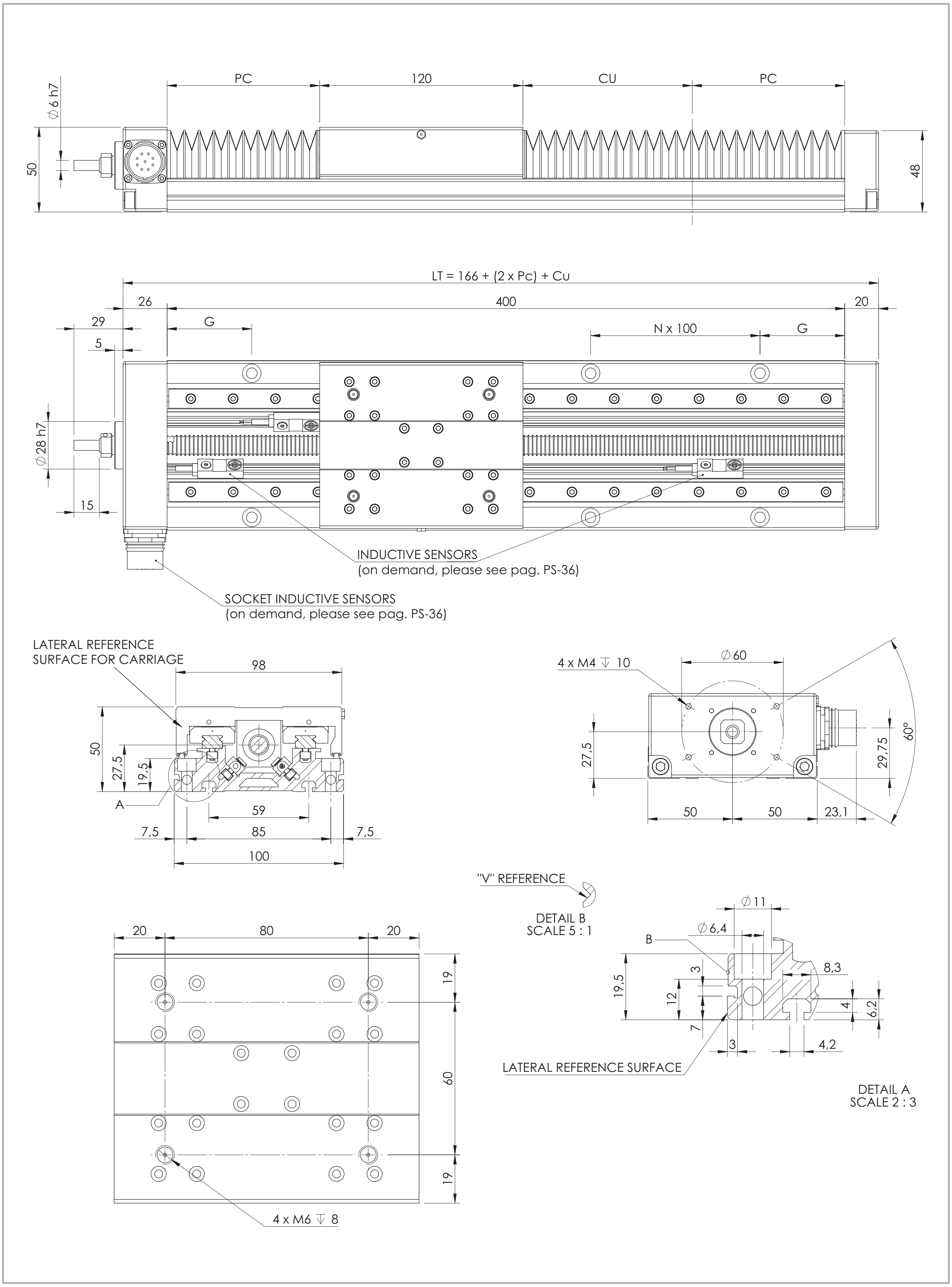


Fig. 31

Technical data

Useful stroke CU [mm]	Total length LT [mm]	G Dimension [mm]	Weight [Kg]
46	246	50	2.5
114	346	50	3
182	446	50	4
252	546	50	5
320	646	50	6
390	746	50	7
458	846	50	7
526	946	50	8
596	1046	50	9
664	1146	50	10
734	1246	50	11
802	1346	50	11
940	1546	50	13

Note: for the ballscrew 12/10 the max. useful stroke is 664 mm.

Tab. 66

Technical data

	Type
	TT 100
Max. speed [m/s]	See page PS-35
Carriage weight [kg]	0.93
Rail size [mm]	12 mini

Tab. 68

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TT 100	0.006	0.144	0.150

Tab. 69

Ball screw precision

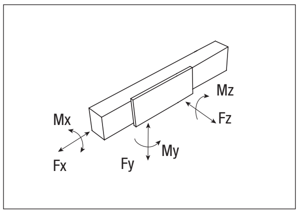
Type	Max. positioning precision [mm/300mm]		Max. repeatability precision [mm]	
	ISO 5	ISO 7	ISO 5	ISO 7
TT 100 / 12-05	0.023	0.05	0.01	0.02
TT 100 / 12-10	0.023	0.05	0.01	0.02

Tab. 67

Load capacity F_x

Type	F_x [N]		
	Screw	Stat.	Dyn.
TT 100	12-05	9000	4300

Tab. 70



Load capacity

Type	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
TT 100	9980	6280	9980	274	349	349

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 71

TT 155

TT 155 Dimensions

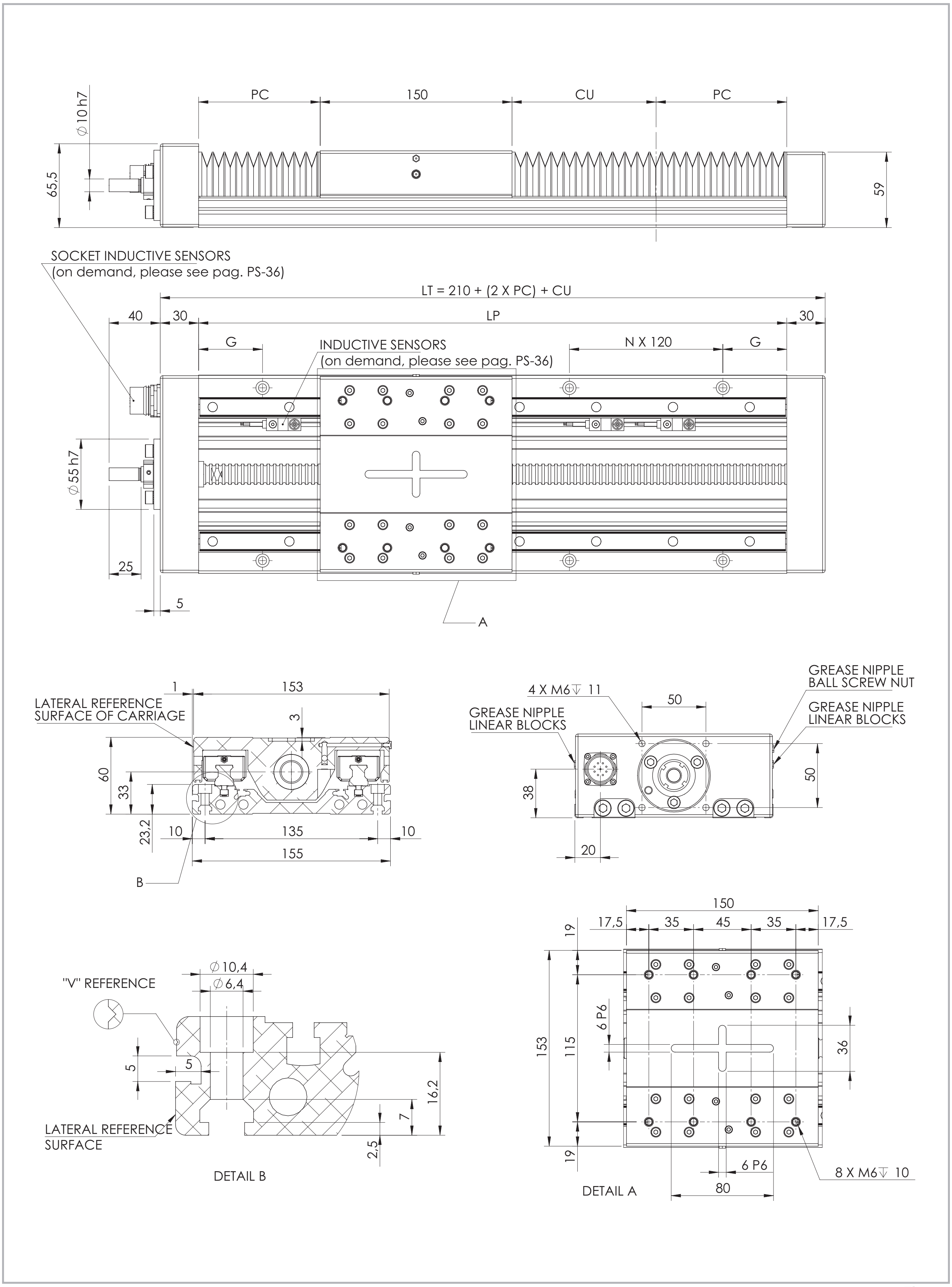


Fig. 32

Technical data

Useful stroke CU [mm]	Total length LT [mm]	G Dimension [mm]	Weight [Kg]
92	340	20	7.5
140	400	50	8.5
188	460	20	9
236	520	50	10
282	580	20	11
330	640	50	12
378	700	20	13
424	760	50	13
520	880	50	15
614	1000	50	17
710	1120	50	18
806	1240	50	20
900	1360	50	21
994	1480	50	23
1090	1600	50	25
1184	1720	50	26
1280	1840	50	28
1376	1960	50	30
1470	2080	50	31

Note: for the ballscrew Ø16 the max. useful stroke is 994 mm.

Tab. 72

Technical data

	Type
	TT 155
Max. speed [m/s]	See page PS-35
Carriage weight [kg]	2.93
Rail size [mm]	15

Tab. 74

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TT 155	0.009	0.531	0.54

Tab. 75

Ball screw precision

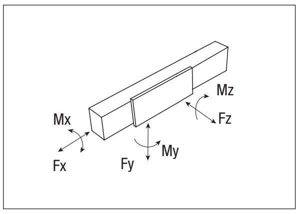
Type	Max. positioning precision [mm/300mm]		Max. repeatability precision [mm]	
	ISO 5	ISO 7	ISO 5	ISO 7
TT 155 / 16-05	0.023	0.05	0.005	0.045
TT 155 / 16-10	0.023	0.05	0.005	0.045
TT 155 / 20-05	0.023	0.05	0.005	0.045
TT 155 / 20-20	0.023	0.05	0.005	0.045

Tab. 73

Load capacity F_x

Type	F_x [N]		
	Screw	Stat.	Dyn.
TT 155	16-05	17400	11800
	16-10	18300	10500
	20-05	25900	14600
	20-20	23900	13400

Tab. 76



Load capacity

Type	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
TT 155	96800	45082	96800	5082	2972	2972

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 77

P S

TT 225

TT 225 Dimensions

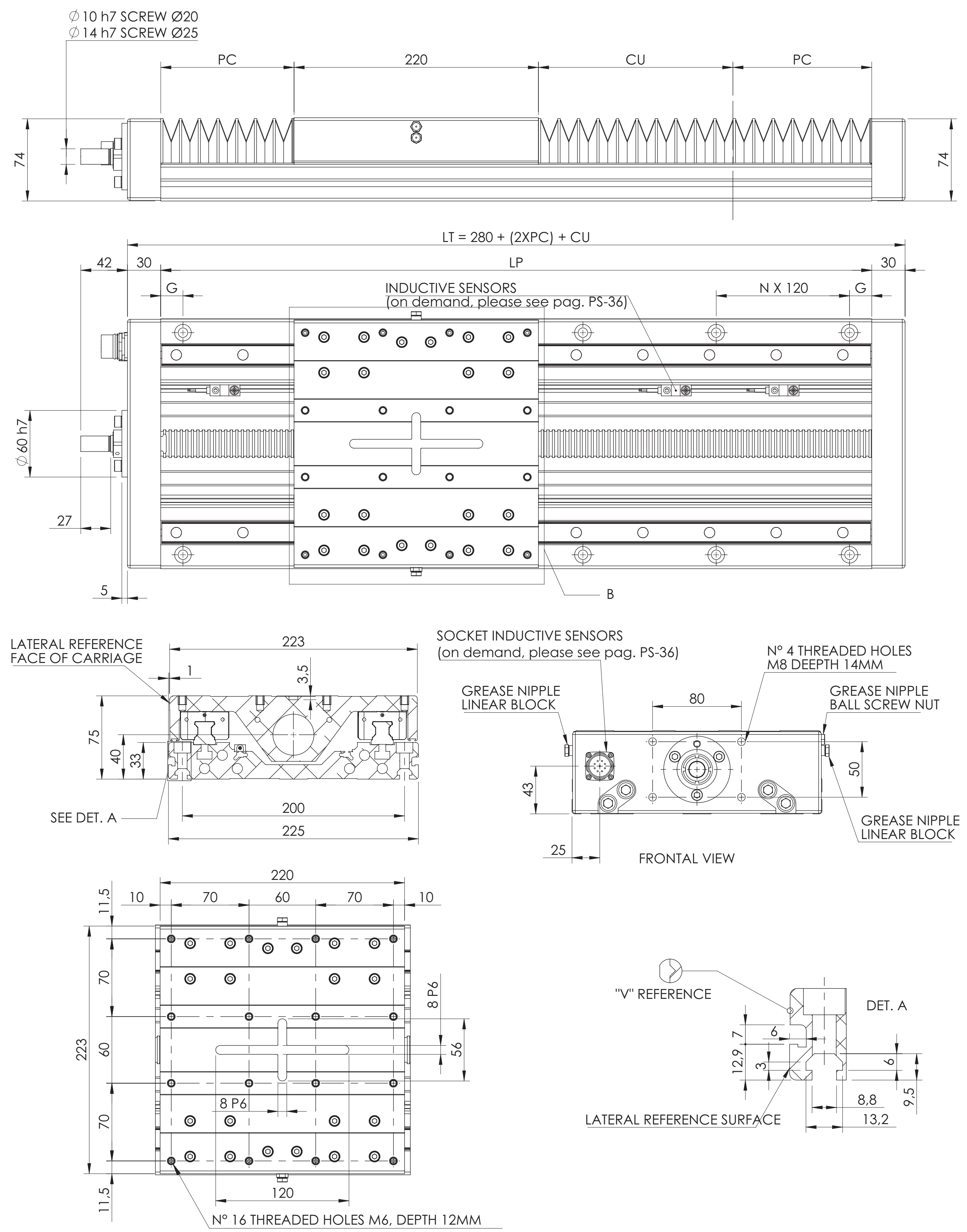


Fig. 33

Technical data

Useful stroke CU [mm]	Total length LT [mm]	G Dimension [mm]	Weight [Kg]
92	400	50	15
144	460	20	16
196	520	50	17
248	580	20	19
300	640	50	20
352	700	20	21
404	760	50	23
508	880	50	25
612	1000	50	28
714	1120	50	31
818	1240	50	33
922	1360	50	36
1026	1480	50	39
1234	1720	50	44
1440	1960	50	49
1648*	2200	50	54
1856*	2440	50	60
2062*	2680	50	65
2270*	2920	50	70

Note: for the ballscrew Ø20 the max. useful stroke is 1440 mm.
* For the indicated lengths Rollon does not guarantee the tolerance values shown on pag. PS-33

Tab. 78

Technical data

	Type
	TT 225
Max. speed [m/s]	See page PS-35
Carriage weight [kg]	5.4
Rail size [mm]	20

Tab. 80

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TT 225	0.038	2.289	2.327

Tab. 81

Ball screw precision

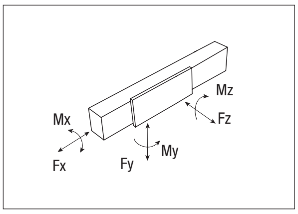
Type	Max. positioning precision [mm/300mm]		Max. repeatability precision [mm]	
	ISO 5	ISO 7	ISO 5	ISO 7
TT 225 / 20-05	0.023	0.05	0.005	0.045
TT 225 / 20-20	0.023	0.05	0.005	0.045
TT 225 / 25-05	0.023	0.05	0.005	0.045
TT 225 / 25-10	0.023	0.05	0.005	0.045
TT 225 / 25-25	0.023	0.05	0.005	0.045

Tab. 79

Load capacity F_x

Type	F_x [N]		
	Screw	Stat.	Dyn.
TT 225	20-05	25900	14600
	20-20	23900	13400
	25-05	41200	19800
	25-10	32600	16000
	25-25	30500	15100

Tab. 82



Load capacity

Type	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
TT 225	153600	70798	153600	12288	9984	9984

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 83

TT 310

TT 310 Dimensions

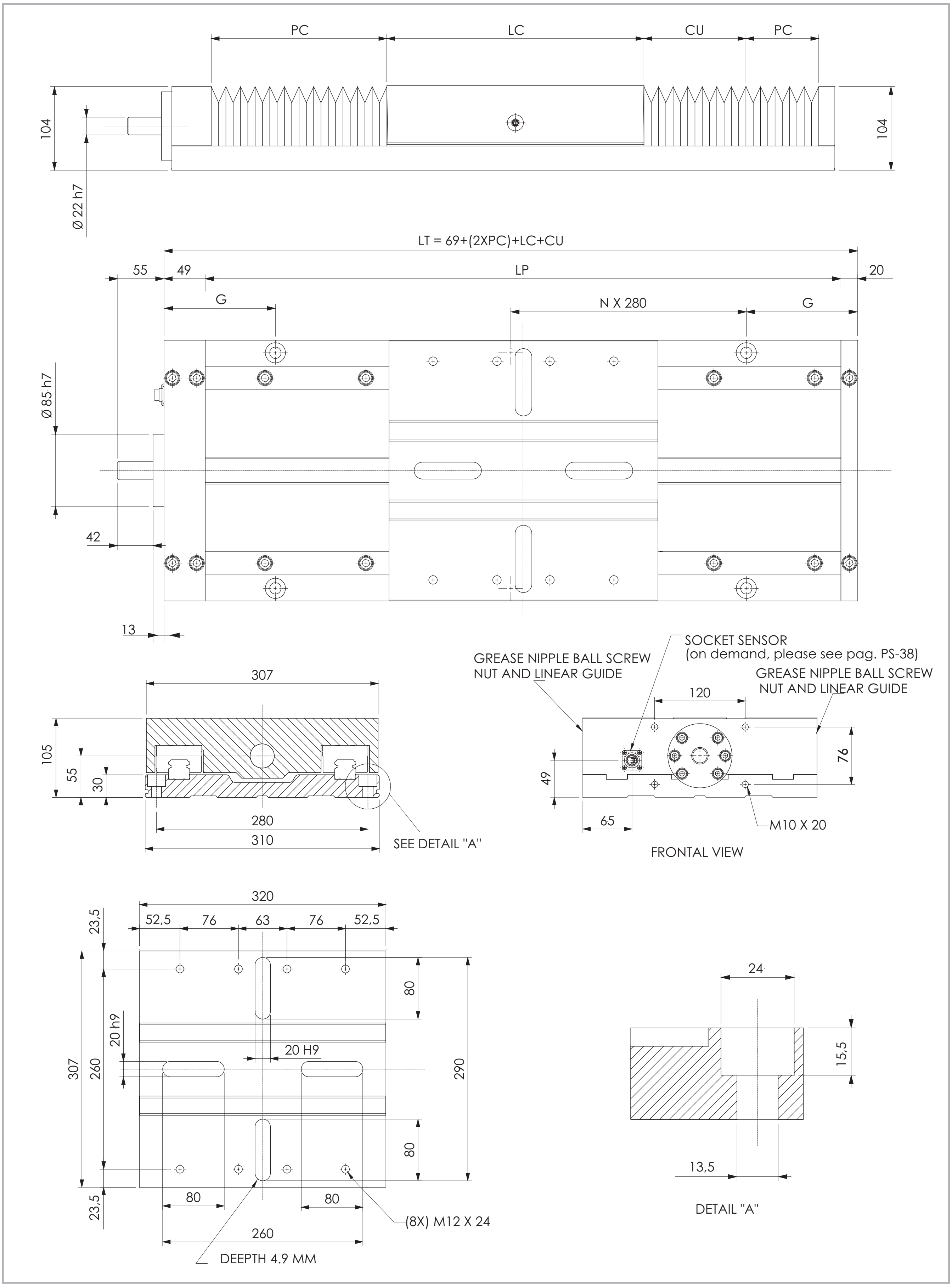


Fig. 34

Technical data

Useful stroke CU [mm]	Total length LT [mm]	G Dimension [mm]	Weight [Kg]
100	560	140	47
150	625	172.5	50
200	690	65	53
250	760	100	56
300	825	132.5	59
350	895	167.5	62
400	965	62.5	65
450	1030	95	68
500	1100	130	71
600*	1235	197.5	77
800*	1505	192.5	89
1000*	1750	175	100
1200*	2000	160	111
1600*	2495	127.5	133
2000*	2990	235	156
2400*	3485	202.5	178
3000*	4225	292.5	211

* For the indicated lengths Rollon does not guarantee the tolerance values shown on pag. PS-33

Tab. 84

Technical data

	Type
	TT 310
Max. speed [m/s]	See page PS-36
Carriage weight [kg]	16.6
Rail size [mm]	30

Tab. 86

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TT 310	0.1251	8.56	8.008

Tab. 87

Ball screw precision

Type	Max. positioning precision [mm/300mm]		Max. repeatability precision [mm]	
	ISO 5	ISO 7	ISO 5	ISO 7
TT 310 / 32-05	0.023	0.05	0.008	0.045
TT 310 / 32-10	0.023	0.05	0.008	0.045
TT 310 / 32-32	0.023	0.05	0.008	0.045

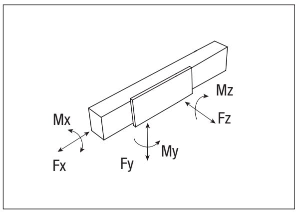
Tab. 85

Load capacity F_x

Type	F_x *1 [N]		
	Screw	Stat.	Dyn.
TT 310	32-05	11538	8947
	32-10	11538	8947
	32-32	11538	8947

*1 Referred to the Max axial load on the bearings not the Ball Screw

Tab. 88



Load capacity

Type	F_y [N]		F_z [N]		M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn.	Stat.	Stat.	Stat.
TT 310	230500	128492	274500	146031	30195	26625	22365

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 89

Lubrication

TT linear units with ball bearing guides

TT Linear units are equipped with self lubricating linear ball guides. The ball bearing carriages are also fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment of these in the circuits.

This system guarantees a long interval between maintenances: every 2000 Km or 1 year of use, based on the value reached first. If a longer service life is required or in case of high dynamic or high loaded applications please contact our offices for further verification.

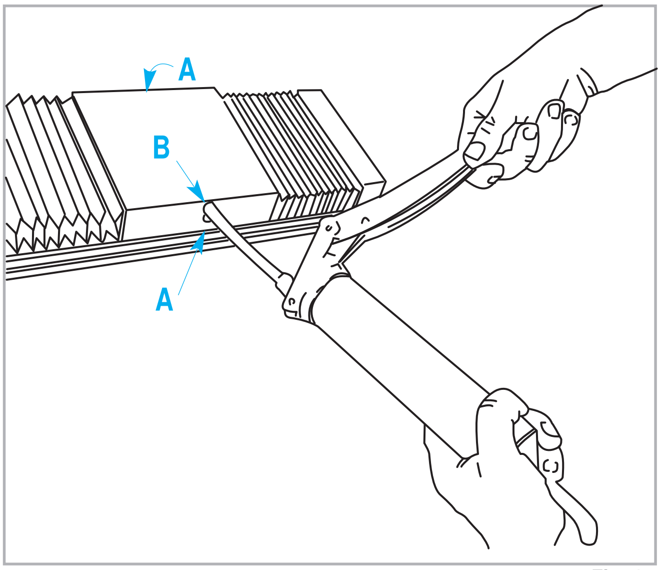


Fig. 35

- Insert the tip in the specific grease nipples:
  A - Linear block - B - Ball screw nut
- Type of lubricant: Lithium soap grease of class NLGI 2.
- For specially stressed applications or difficult enviromental conditions, lubrication should be carried out more frequently. Refer to Rollon for further advice.

Quantity of lubricant necessary for block re-lubrication at each point:

Type	Quantity [cm³] for grease nipple
TT 100	1.4
TT 155	1.4
TT 225	2.8
TT 310	5.6

Tab. 90

Ball screws

The ball screw nuts of Rollon TT series linear units must be relubricated every 100 km.

Standard lubrication

Lubrication of the ball bearing blocks and the ball screw nut is facilitated by grease nipples located on the sides of the carriage of the Rollon TT series actuators. The linear units are lubricated with class NLGI2 lithium soap grease.

Amount of lubricant recommended for ball screw nut re-lubrication

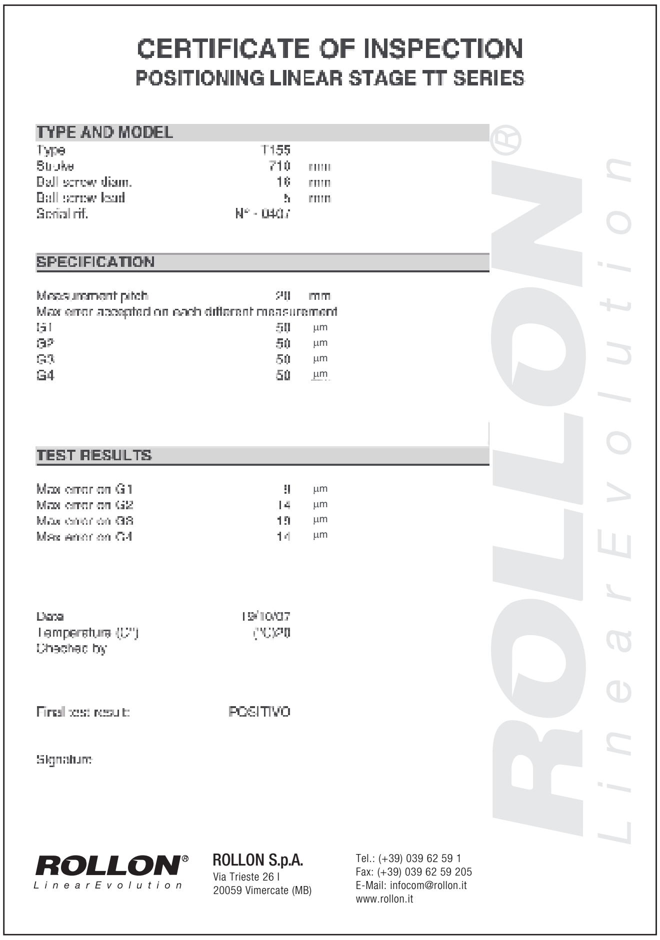
Type	Quantity [cm³] for grease nipple
12-05	0.3
12-10	0.3
16-05	0.41
16-10	0.78
20-05	0.79
20-20	1
25-05	1.2
25-10	1.2
25-25	1.58
32-05	1.8
32-10	2.0
32-32	3.0

Tab. 91

Accuracy certificate

The Rollon TT series linear units are high accurate products. The base and the carriages are made of aluminum extrusions that are manufactured by means of high precision machining of all external faces and all mounting surfaces of mechanical components (linear guides, ball screw supports, etc.). This results in excellent repeatability, positioning accuracy and running parallelism. Rollon TT series linear units are 100% tested and will be delivered with a certificate of accuracy.

The certificate shows all parallel tolerances during the movement of the carriage on the base unit. The figures can be used for eventual electronic compensations during the movement of the linear units.
The maximum deviations are shown as follows:
G1 - rolling 50 µm
G2 - pitching 50 µm
G3 - yawing 50 µm
G4 - parallelism carriage/base unit 50µm



CERTIFICATE OF INSPECTION
POSITIONING LINEAR STAGE TT SERIES

TYPE AND MODEL

Type	T155	
Stroke	710	mm
Ball screw diam.	16	mm
Ball screw lead	5	mm
Serial rif.	N° - 0407	

SPECIFICATION

Measurement pitch	20	mm
Max error accepted on each different measurement		
G1	50	µm
G2	50	µm
G3	50	µm
G4	50	µm

TEST RESULTS

Max error on G1	9	µm
Max error on G2	14	µm
Max error on G3	19	µm
Max error on G4	14	µm

Date	19/10/07
Temperatura (C°)	(°C)20
Checked by	

Final test result: POSITIVO

Signature:

ROLLON® LinearEvolution

ROLLON S.p.A.
Via Trieste 26 I
20059 Vimercate (MB)

Tel.: (+39) 039 62 59 1
Fax: (+39) 039 62 59 205
E-Mail: infocom@rollon.it
www.rollon.it

Type	Screw	Fixing torques screws 12.9	
		On aluminum	On steel
TT 100	M6	10 Nm	14 Nm
TT 155	M6	10 Nm	14 Nm
TT 225	M8	15 Nm	30 Nm
TT 310	M12	60 Nm	120 Nm

Tab. 92

Note :Values for base unit length (Lt) <_ 2000 mm
These values are measured while linear unit is fixed with brackets on a reference table with parallelism error < 2 µm.
The fixing torques of the bolt must follow the indicated values in the table.

ATTENTION: The mentioned accuracy grades are valid only if the linear unit is fixed on a continuous mounting surface with the same length. The errors of the mounting surface may negatively influence the accuracy of the Rollon linear unit. Rollon does not guarantee the above mentioned parallelism tolerances for applications when the linear unit is mounted without support or as a cantilever.

The graphs below show an example of measurement of accuracy along the stroke the deviation is given.

Each actuator delivered is provided with the graphs.

Precision G1

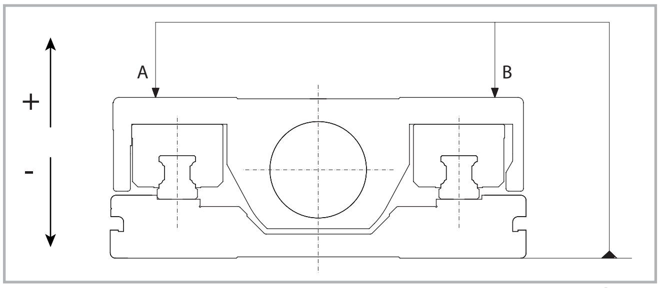
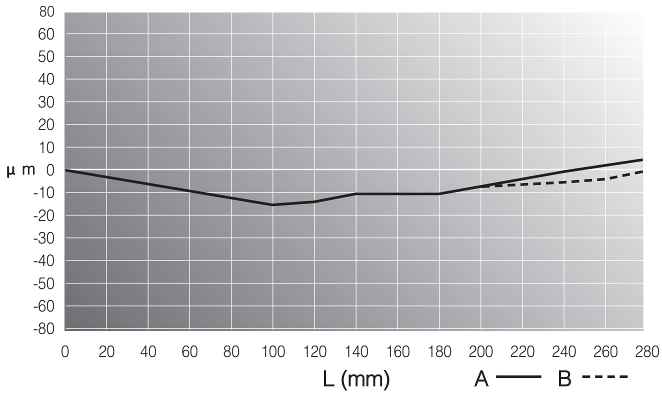


Fig. 36



Precision G2

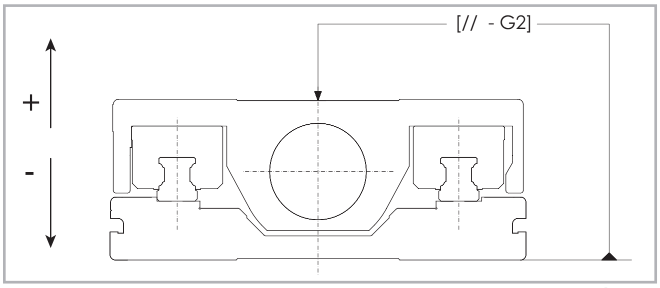
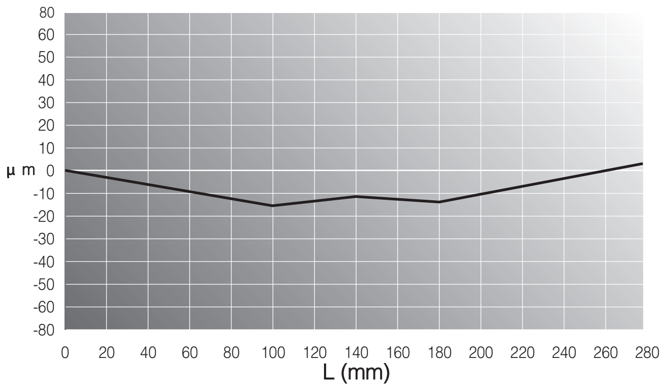


Fig. 37



Precision G3

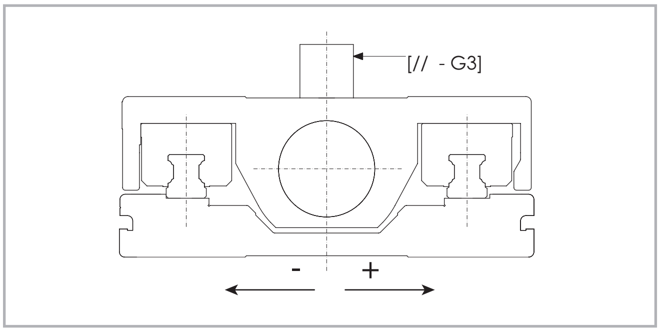
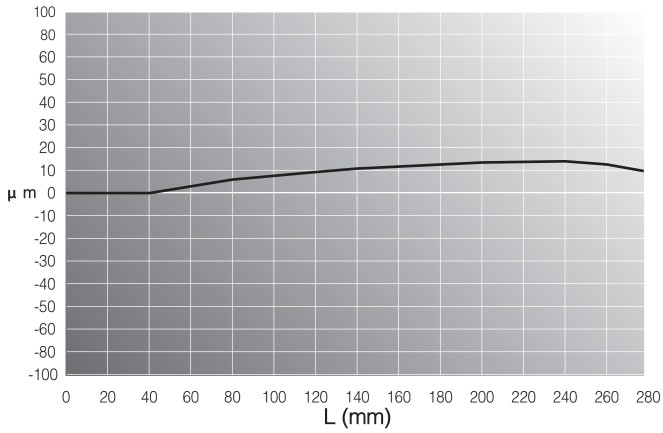


Fig. 38



Precision G4

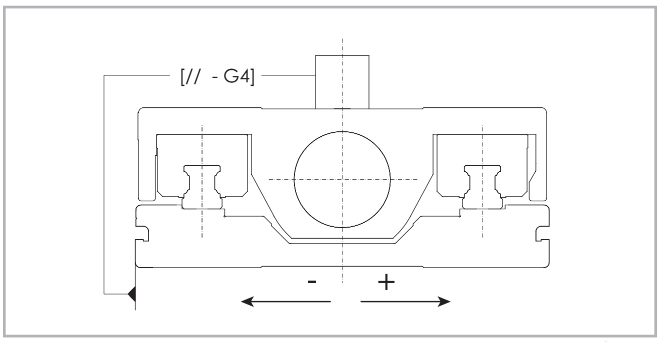
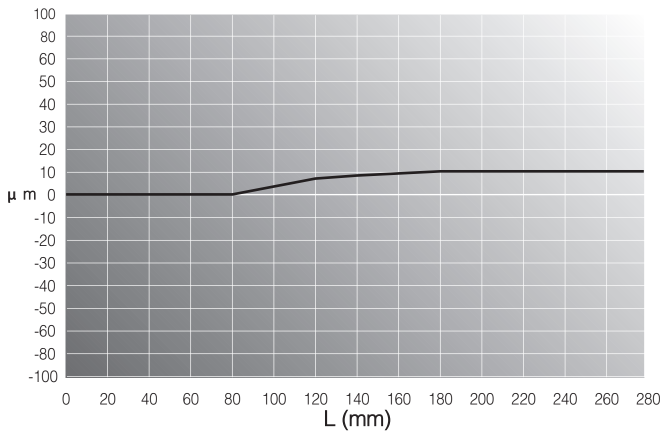


Fig. 39



Critical speed

The maximum linear speed of Rollon TT series linear units depends on the critical speed of the screw (based on its diameter and length) and on the max. permissible speed of the ball screw nut used.

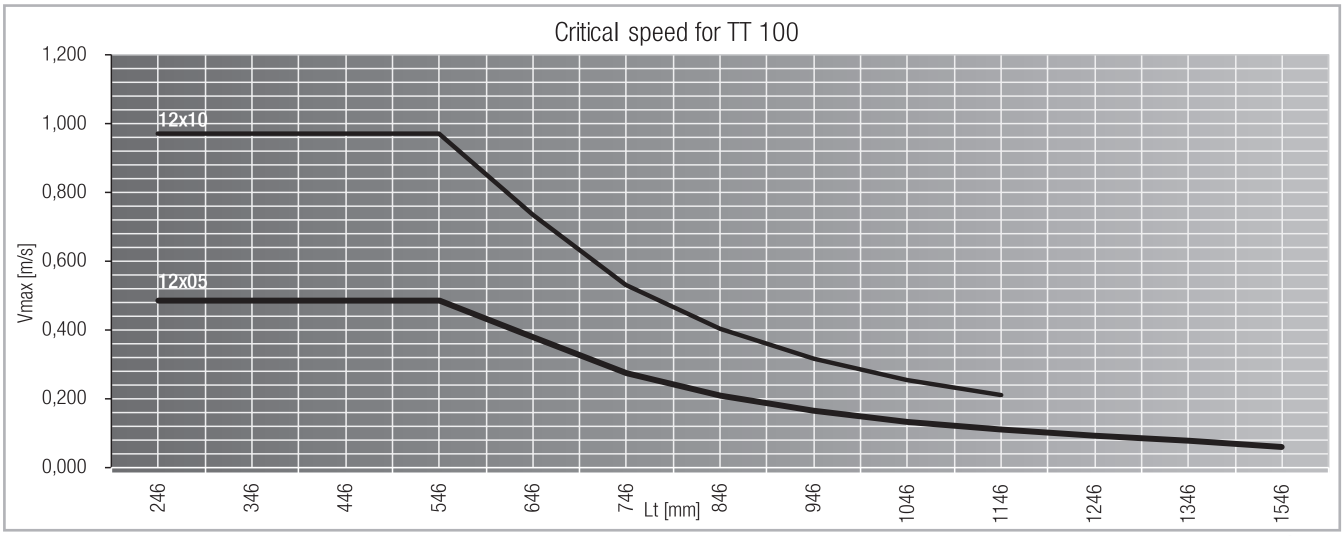


Fig. 40

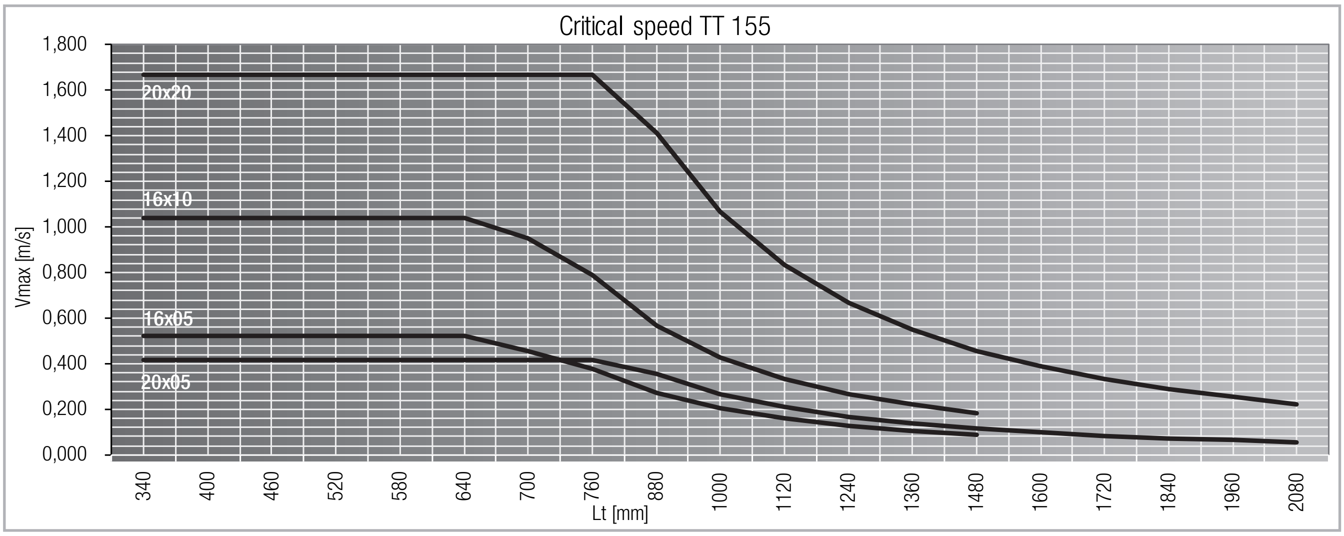


Fig. 41

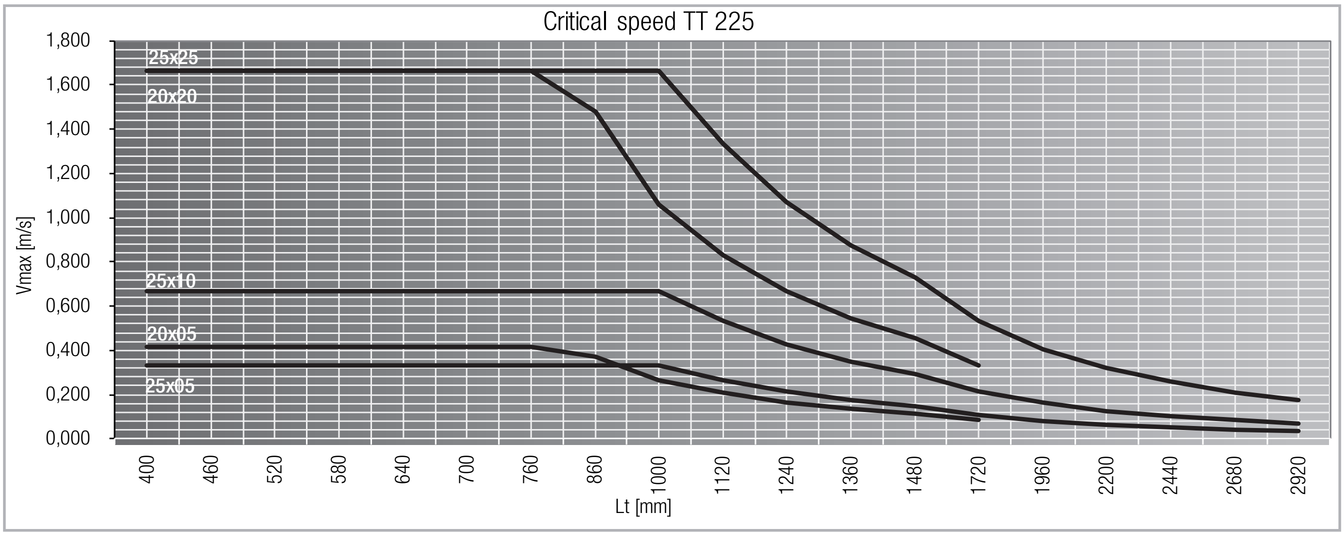


Fig. 42

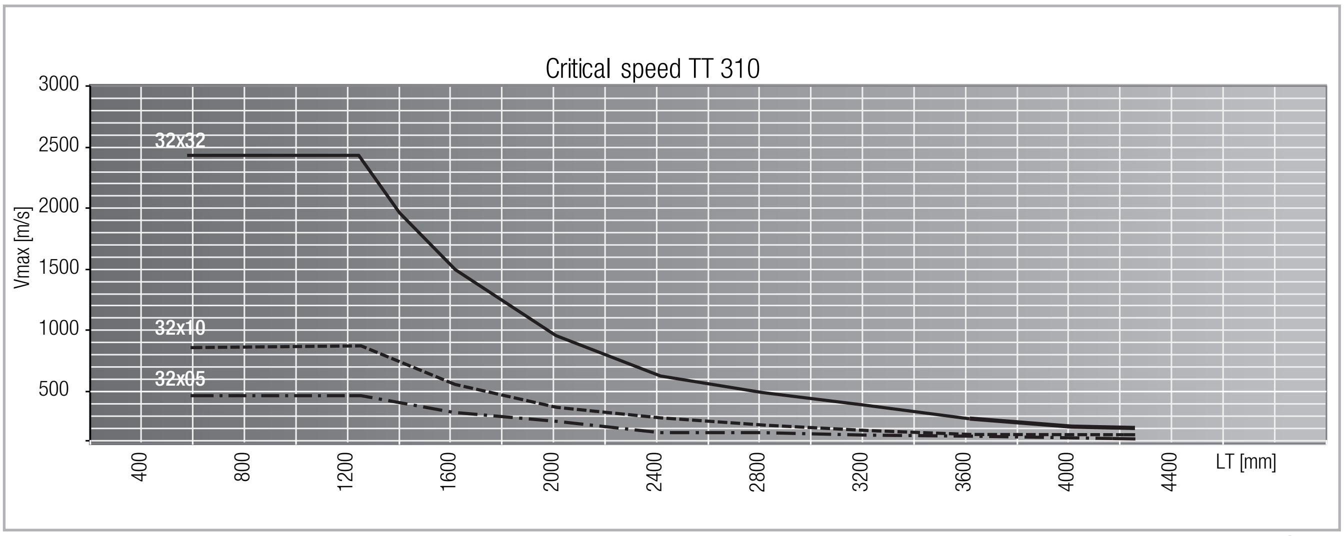


Fig. 43

Accessories

Mounting of the motor

Rollon TT Series linear units can be supplied with different types of motor mounts, adapter flanges, and with torsionally stiff couplings for screw and motor connections that enable fast, hassle-free assembly of the motors.

The types of bells available for the related units are shown in the table motor mounts:

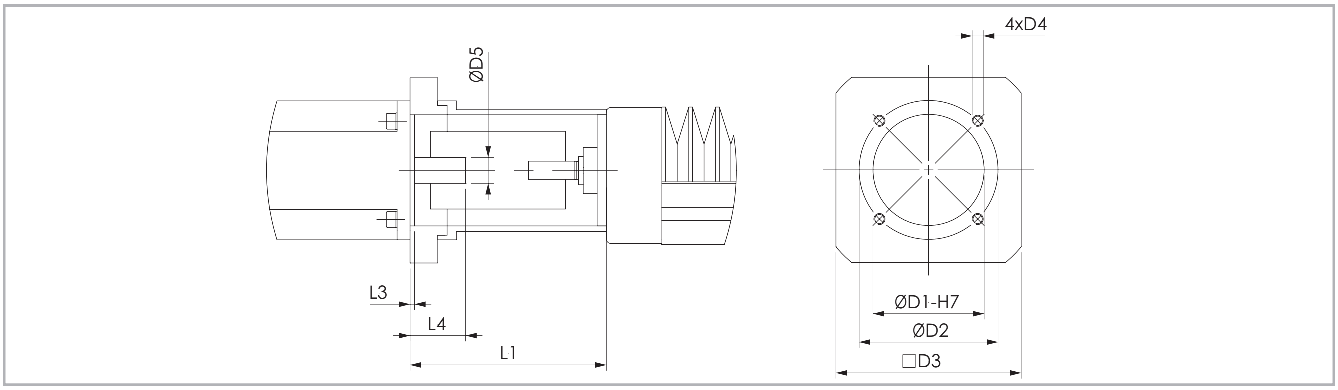


Fig. 44

Units [mm]

Type of unit	Ø D1	Ø D2	Ø D3	D4	Ø D5		L1	L3	L4		Kit code
					min.	max.			min.	max.	
TT 100	60	75	65	M6	5	16	68	4	25	27	G000321
	73.1	98.4	86	M5	5	16	76.7	2	33.7	35.7	G000322
	40	64.5	65	M5	5	16	68	4	25	27	G000336
	50	70	65	M5	5	16	77.5	3.5	34.5	36.5	G000433
TT 155	70	85	80	M6	10	20	90	4	20	34	G000311
	70	90	80	M5	10	20	90	5	20	34	G000312
	80	100	90	M6	10	20	90	4	20	34	G000313
	50	65	80	M5	10	20	90	5	20	34	G000314
	60	75	80	M6	10	20	90	4	20	34	G000315
	50	70	80	M5	10	20	90	5	20	34	G000316
	73	98.4	85	M5	10	20	90	4	20	34	G000317
	55.5	125.7	105	M6	10	20	100	5	30	44	G000318
	60	99	85	M6	10	20	98	4	28	42	G000319
TT 225	80	100	100	M6	10	28	106	5	30	48	G000302
	95	115	100	M8	10	28	106	5	30	48	G000303
	110	130	115	M8	10	28	106	5	30	48	G000304
	60	75	100	M6	10	28	106	5	30	48	G000305
	70	85	100	M6	10	28	106	5	30	48	G000306
	70	90	100	M5	10	28	106	5	30	48	G000307
	50	70	96x75	M4	10	28	101	4	30	48	G000308
	55.5	125.7	105	M6	10	28	106	5	30	48	G000309
	73.1	98.4	96	M5	10	28	101	3	30	48	G000310
	130	165	150	M10	10	28	106	5	30	48	G000363
TT 310	Option										

Tab. 93

Fixing by brackets

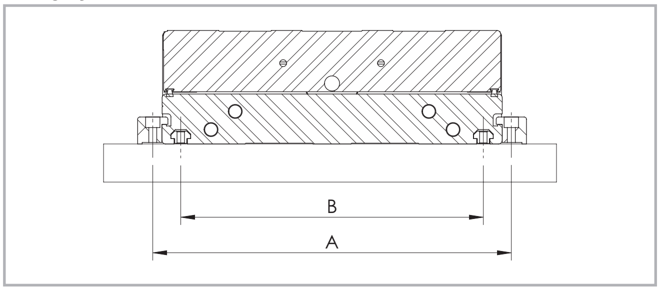


Fig. 45

Type	A Unit mm	B Unit mm
TT 100	112	59
TT 155	167	135
TT 225	237	200

Tab. 94

Fixing brackets

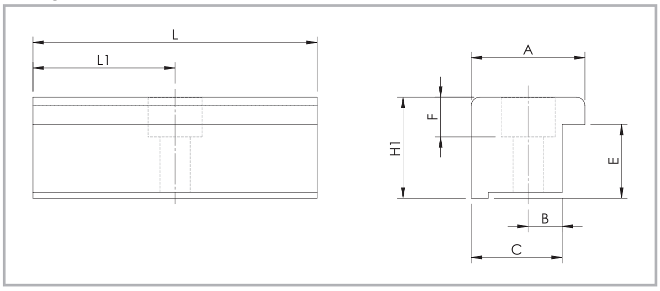


Fig. 46

Type	A	B	C	E	F	D1	D2	H1	L	L1	Code Rollon
TT 100	18.5	6	16	7	4.5	9.5	5.3	9.8	50	25	1002353
TT 155	20	6	16	11	7	9.5	5.3	15.8	50	25	1002167
TT 225	20	6	16	13	7	9.5	5.3	17.8	50	25	1002354

Tab. 98

T nuts

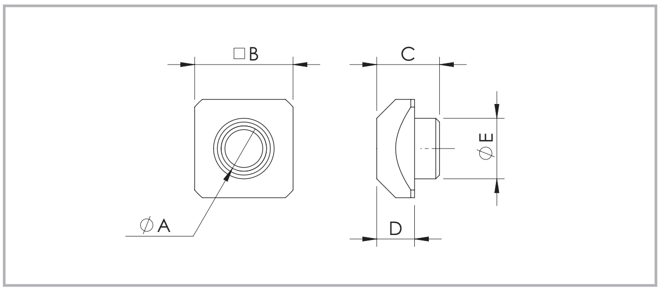


Fig. 47

Type	∅ A	□B	C	D	∅ E	Code Rollon
TT 100	M4	8	-	3.4	-	1001046
TT 155	M5	10	6.5	4.2	6.7	1000627
TT 225	M6	13	8.3	5	8	1000043

Tab. 99

Proximity	Type	PNP-NO	PNP-NC
	TT 100	G001981	G001980
	TT 155	G001981	G001980
	TT 225	G001981	G001980
	TT 310	/	/

Tab. 95

End cap	Type	Code
	TT 100	G000245
	TT 155	G000244
	TT 225	G000244
	TT 310	/

Tab. 100

Cable Strain Relief	Type	Code
	TT 100	G000249
	TT 155	G000248
	TT 225	G000248
	TT 310	/

Tab. 96

9 Pin Fixed Connector	Type	Code
	TT 100	G000191
	TT 155	G000191
	TT 225	G000191
	TT 310	/

Tab. 101

9 Pin Back-Shell Connector	Type	To crimp	To solder
	TT 100	6000516	6000589
	TT 155	6000516	6000589
	TT 225	6000516	6000589
	TT 310	/	/

Tab. 97

Assembly kits

The Rollon TT series linear units must be mounted to the application's surface in an appropriate way in order to achieve maximum accuracy of the system. The evenness of the mounting surface determines the final result of the movement of the system.The aluminum base and the carriage of the Rollon TT linear units have a lateral reference surface, indicated by a groove (except on the TT 310). On the carriage's surface are two reference slots at 90° angles, useful for accurate mounting of X-Y-systems. The Rollon TT series linear units can be fixed to the mounting surface from above the base unit by screws (fig. 48), through T-slots (fig. 49), or through appropriate mounting brackets (fig. 50), depending on the application. For high accuracy applications, Rollon recommends bolting the unit down from above. For mounting dimensions please refer to the dimensional drawings of the units.

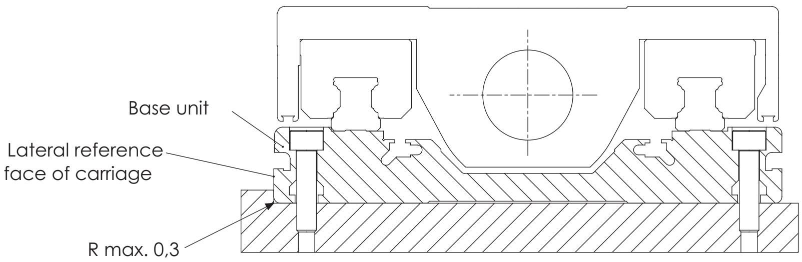


Fig. 48

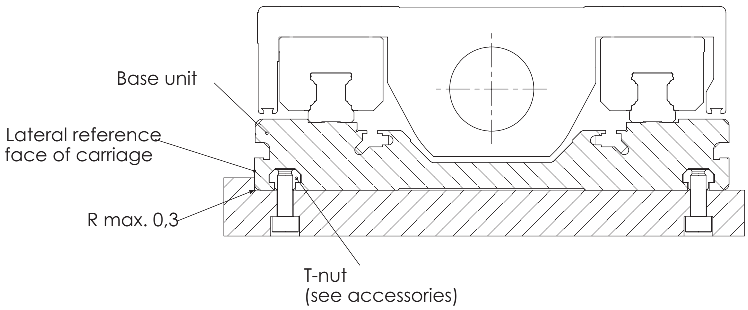


Fig. 49

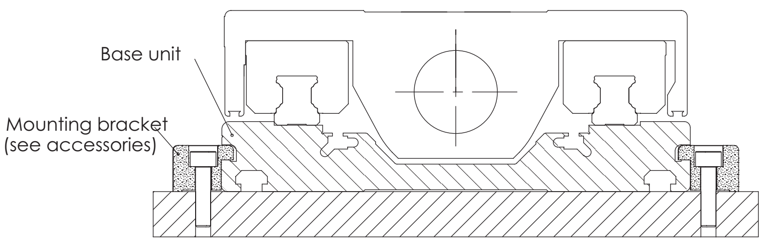


Fig. 50

Ordering key

Identification code for the TT linear units

T	10	1205	5P	0880	1A
	10=100	12-05	5P=ISO 5		
	15=155	12-10	7N=ISO 7		
	22=225	16-05			
	31=310	16-10			
		20-05			
		20-20			
		25-05			
		25-10			
		25-25			
		32-05			
		32-10			
		32-32			

Head configuration code

L=total length of th unit

Type *see from pg. PS-24 to pg. PS-30*

B/S diameter and lead *see from pg. PS-24 to pg. PS-30*

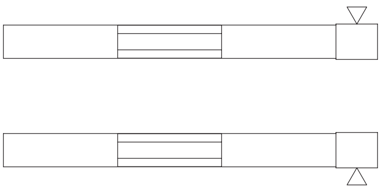
Size *see from pg. PS-24 to pg. PS-30*

Linear unit series TT *see pg. PS-22*

In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Configure Actuator

Left / right orientation



Right

Left

TV series

TV series description

Fig. 51

TV

TV series linear units have a rigid anodized aluminum extrusion with a square cross-section. Transmission of motion is achieved by means of a precision C5 or C7 rolled ball screw drive.

The payload is supported by a dual block, single linear guide system which ensures high precision and high rigidity.

The components

Extruded bodies

The anodized aluminum extrusions used for the bodies of the Rollon TV series linear units were designed and manufactured in cooperation with a leading company in this field to obtain the accuracy and high mechanical properties necessary to accommodate the bending and torsional stresses. Aluminum alloy 6060 was used and was extruded with dimensional tolerances complying with EN 755-9 standards. T-slots are provided in the side and bottom faces to facilitate mounting.

Carriage

The carriage of the Rollon TV series linear units is made entirely of anodized aluminum. The dimensions vary depending on the size of the actuator. The carriage is installed on 2 linear runner blocks on a single linear guide rail.

Drive system

Rollon TV series linear units use a precision rolled ball screw. The standard precision class of the ball screw used is ISO 7 without a preloaded nut. ISO 5 precision class with preloaded nut is available upon request. The ball screws of linear units can be supplied with different diameter and leads. Use of this type of technology makes it possible to obtain the following features:

- **High speed (for long pitch screws)**
- **Highly accurate thrust**
- **Superior mechanical performance**
- **Reduced wear**
- **Low resistance to movement**

Protection

Rollon TV series linear units are equipped with an external steel protective strip in order to protect mechanical components inside the linear units against contaminants. A resin deflector compresses the steel strip on its own magnetic base with very low friction.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 102

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.7	69	23	200	880-900	33	600-655

Tab. 103

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
205	165	10	60-80

Tab. 104

TV 60

TV 60 Dimensions

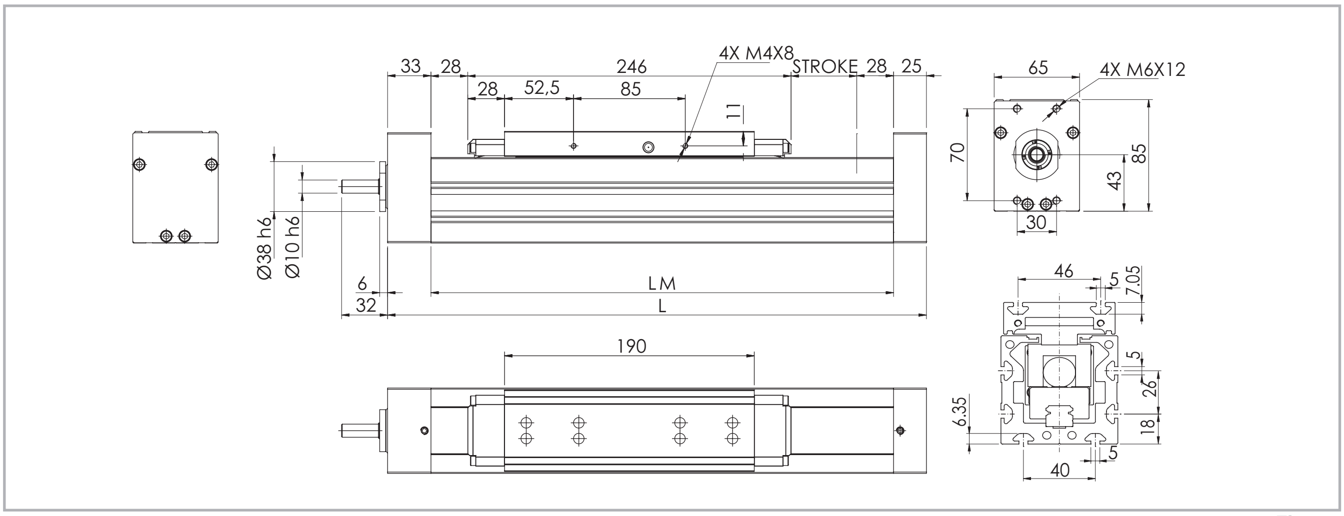


Fig. 52

Technical data

	Type
	TV 60
Max. useful stroke length [mm]	2000
Max. speed [m/s]	See page PS-47
Basement length LM [mm]	LT - 58
Total length LT [mm]	Stroke + 360
Carriage weight [kg]	1.41
Zero travel weight [kg]	4.6
Weight for 100 mm useful stroke [kg]	0.65
Rail size [mm]	15

Tab. 105

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TV 60	0.064	0.081	0.145

Tab. 107

Ball screw precision

Type	Max. positioning precision [mm/300mm]		Max. repeatability precision [mm]	
	ISO 5	ISO 7	ISO 5	ISO 7
TV 60 / 16-05	0.023	0.05	0.01	0.05
TV 60 / 16-10	0.023	0.05	0.01	0.05
TV 60 / 16-16	0.023	0.05	0.01	0.05

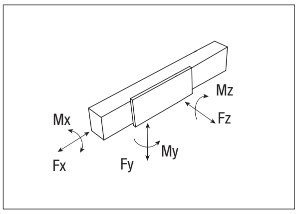
Tab. 106

Load capacity F_x

Type	F_x *1 [N]		
	Screw	Stat.	Dyn.
TV 60	16-05	4551	4327
	16-10	4551	4327
	16-16	4551	4327

*1 Referred to the Max axial load on the bearings not the Ball Screw

Tab. 108



Load capacity

Type	F_y [N]		F_z [N]		M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn.	Stat.	Stat.	Stat.
TV 60	35000	18000	35000	18000	286	1353	1353

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 109

TV 80

TV 80 Dimensions

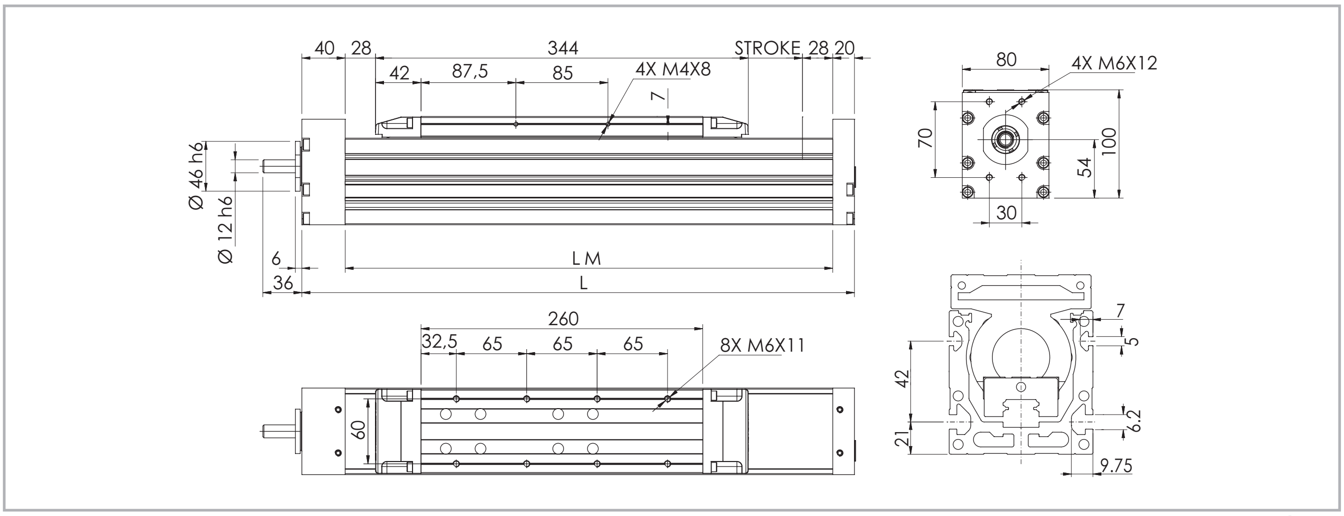


Fig. 53

Technical data

	Type
	TV 80
Max. useful stroke length [mm]	3000
Max. speed [m/s]	See page PS-47
Basement length LM [mm]	LT - 60
Total length LT [mm]	Stroke + 460
Carriage weight [kg]	2.5
Zero travel weight [kg]	7.8
Weight for 100 mm useful stroke [kg]	0.95
Rail size [mm]	20

Tab. 110

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TV 80	0.106	0.152	0.258

Tab. 112

Ball screw precision

Type	Max. positioning precision [mm/300mm]		Max. repeatability precision [mm]	
	ISO 5	ISO 7	ISO 5	ISO 7
TV 80 / 20-05	0.023	0.05	0.01	0.05
TV 80 / 20-20	0.023	0.05	0.01	0.05

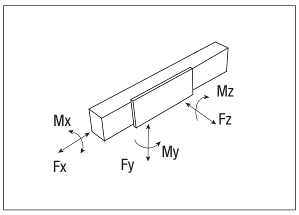
Tab. 111

Load capacity F_x

Type	F_x *1 [N]		
	Screw	Stat.	Dyn.
TV 80	20-05	5705	4912
	20-20	5705	4912

*1 Referred to the Max axial load on the bearings not the Ball Screw

Tab. 113



Load capacity

Type	F_y [N]		F_z [N]		M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn.	Stat.	Stat.	Stat.
TV 80	59900	34200	59900	34200	646	1573	1573

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 114

TV 110

TV 110 Dimensions

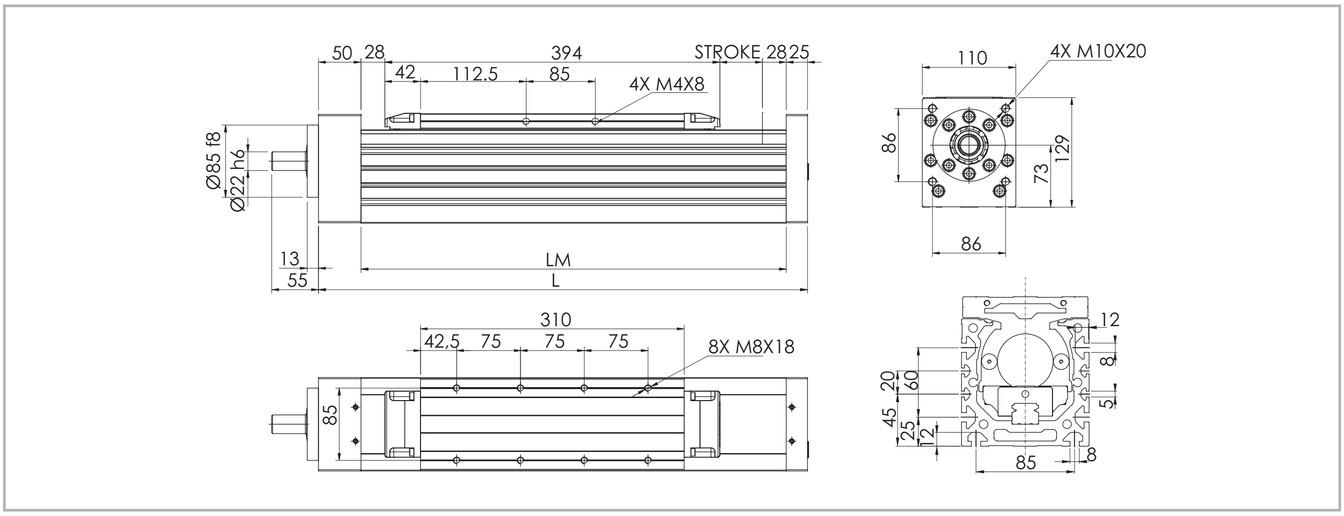


Fig. 54

Technical data

	Type
	TV 110
Max. useful stroke length [mm]	3000
Max. speed [m/s]	See page PS-47
Basement length LM [mm]	LT - 75
Total length LT [mm]	Stroke + 525
Carriage weight [kg]	5.33
Zero travel weight [kg]	16.8
Weight for 100 mm useful stroke [kg]	1.9
Rail size [mm]	25

Tab. 115

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TV 110	0.432	0.594	1.026

Tab. 117

Ball screw precision

Type	Max. positioning precision [mm/300mm]		Max. repeatability precision [mm]	
	ISO 5	ISO 7	ISO 5	ISO 7
TV 110 / 32-05	0.023	0.05	0.01	0.05
TV 110 / 32-10	0.023	0.05	0.01	0.05
TV 110 / 32-32	0.023	0.05	0.01	0.05

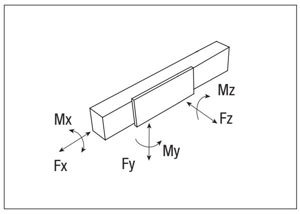
Tab. 116

Load capacity F_x

Type	F_x *1 [N]		
	Screw	Stat.	Dyn.
TV 110	32-05	11538	8947
	32-10	11538	8947
	32-32	11538	8947

*1 Referred to the Max axial load on the bearings not the Ball Screw

Tab. 118



Load capacity

Type	F_y [N]		F_z [N]		M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.	Stat.	Dyn.	Stat.	Stat.	Stat.
TV 110	85000	49600	85000	49600	1080	2316	2316

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 119

Lubrication

TV 60, TV 80, TV 110 linear units

Rollon TV series linear units are equipped with ball bearing guides lubricated with grease lithium soap based grade 2. Re-lubrication is required every 3-6 months or approximately 2000 Km of linear travel. The application environment and applied loads may infl uence the re-lubrication periods.

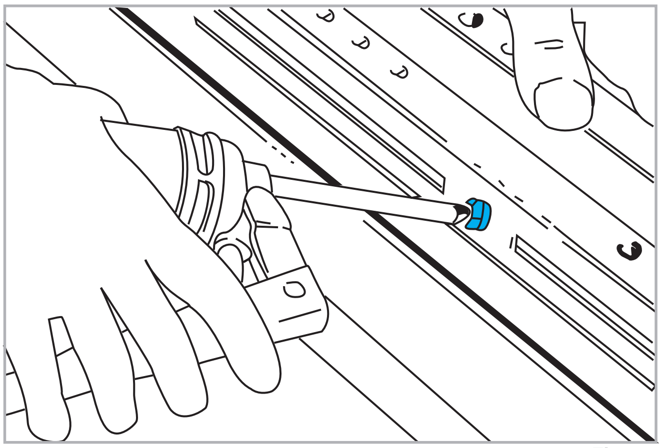


Fig. 55

- Type of lubricant: Lithium soap grease of class NLGI 2.
- For specially stressed applications or difficult enviromental conditions, lubrication should be carried out more frequently.
  Refer to Rollon for further advice.

Quantity of lubricant necessary for block re-lubrication at each point:

Type	Quantity [g] of grease for each nipple
TV 60	1.4
TV 80	2.6
TV 110	5.0

Tab. 120

Ball screws

The ball screw nuts of Rollon TV series linear units must be re-lubricated every 100 km.

Grease Nipples position

The position of grease nipples for the linear blocks and for the ball screw nuts are indicated in the specific drawings of each product.

Amount of lubricant recommended for ball screw nut re-lubrication

Type	Quantity [g] for grease nipple
16-05	0.6
16-10	0.8
16-16	1.0
20-05	0.9
20-20	1.7
32-05	2.3
32-10	2.8
32-32	3.7

Tab. 121

Critical speed

The maximum linear speed of Rollon TV series linear units depends on the critical speed of the screw (based on its diameter and length) and on the max. permissible speed of the ball screw nut used.

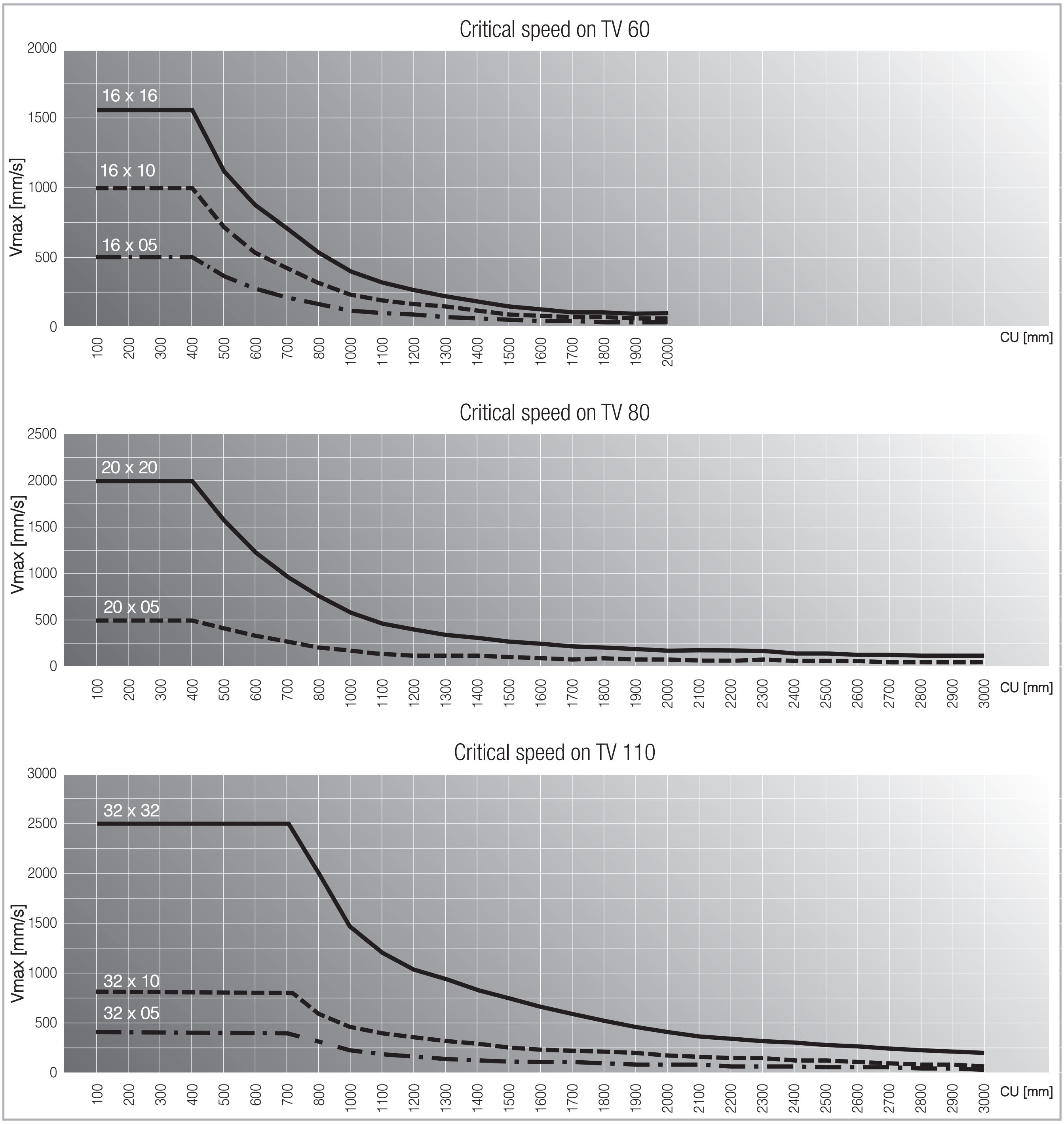


Fig. 56

Accessories

Fixing by brackets

The linear motion systems used for the Rollon TV series linear units enables them to support loads in any direction. They can therefore be installed in any position. To install the units, we recommend the use of the dedicated slots in the extruded bodies as shown below.

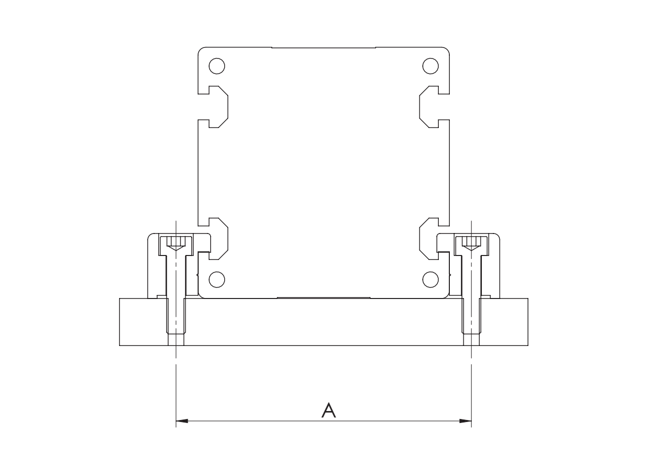


Fig. 57

Type	A [mm]
TV 60	77
TV 80	94
TV 110	130

Tab. 122

Warning: Do not secure the linear units by means of the T-slots in the Drive head or Idle head at either end of the actuator.

Fixing bracket

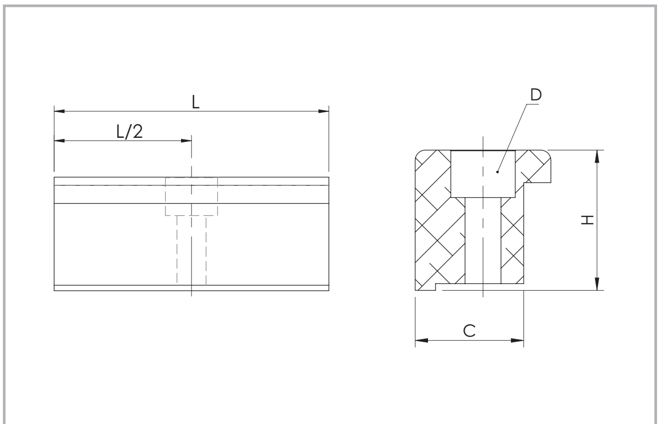


Fig. 58

Dimensions / Unit [mm]

Type	C	H	L	D	Code Rollon
TV 60	16	19.5	35	M5	1002358
TV 80	16	22.5	50	M6	1004552
TV 110	31	27	100	M10	1002360

Tab. 123

Anodized aluminum block for fixing the linear units through the side slots of the body.

T-nuts

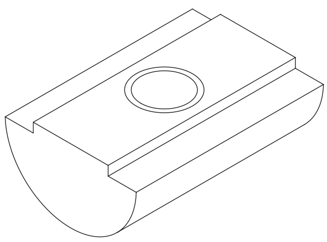


Fig. 59

Code Rollon

Slot dimension [mm]	M5	M6	M8
5	6001038	-	-
6	-	6001863	-
8	-	6001044	6001045

Tab. 124

Steel nuts to be used in the slots of the body.

Proximity

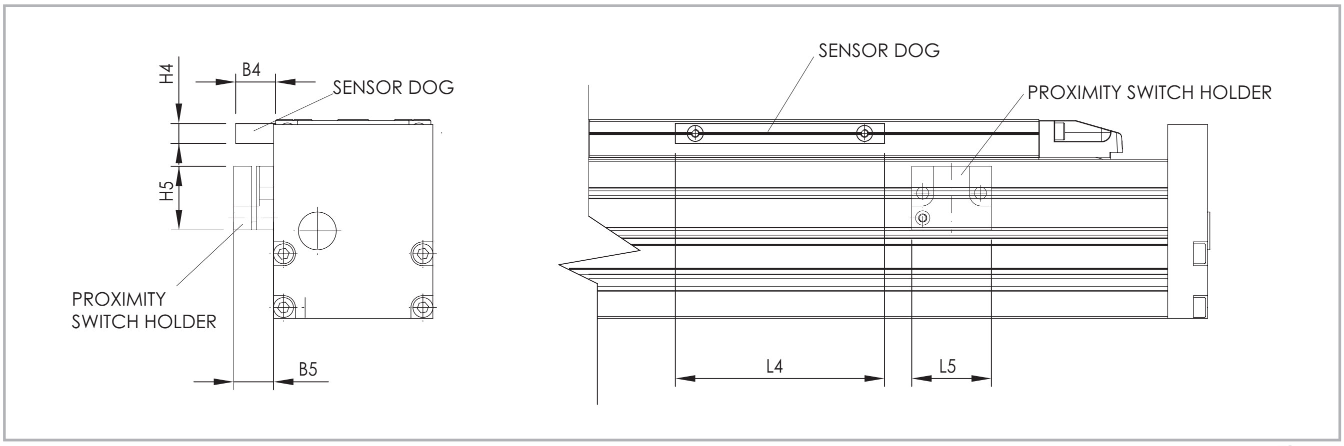


Fig. 60

Proximity switch holder

Red anodized aluminum block, equipped with T-nuts for fixing into the body slots.

Sensor dog

Zinc-plated steel plate, mounted on the carriage and used for the proximity switch operation.

Unit [mm]

Type	B4	B5	L4	L5	H4	H5	Sensor	Proximity holder set	Sensor dog
TV 60	20	20	105	40	10	32	Ø12	G000849	G000581
TV 80	20	20	105	40	10	32	Ø12	G000849	G000581
TV 110	20	20	105	40	10	32	Ø12	G000850	G000581

Tab. 125

Ordering key

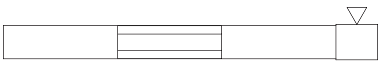
Identification code for the TV linear units

V	06	1605	5P	0800	1A
	06=60	16-05	5P=ISO 5		
	08=80	16-10	7N=ISO 7		
	11=110	16-16			
		20-05			
		20-20			
		32-05			
		32-10			
		32-32			
				L=total length of th unit	
			Type *see from pg. PS-43 to pg. PS-45, tab. 106, 111, 116*		
		B/S diameter and lead			
	Size *see from pg. PS-43 to pg. PS-45*				
Linear unit series TV *see pg. PS-41*					

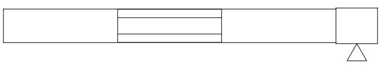
In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Configure Actuator

Left / right orientation



Right



Left

TVS series

TVS series description

Fig. 61

TVS

TVS series linear actuators have a rigid anodized and extruded aluminum alloy profile and transmission of motion is achieved by means of a precision rolled ball screw drive. Recirculating ball guides with cage as linear motion components ensure high precision and high rigidity. TVS linear actuators are available with profiles of different sizes: 170 - 220.

The components

Extruded bodies

The anodized 6060 aluminum alloy extrusion used for the profile of the Rollon TVS series linear units were designed and manufactured by industry experts to optimize weight while maintaining mechanical strength. (see physical-chemical characteristics below). The dimensional tolerances comply with EN 755-9 standard.

Drive system

Rollon TVS series linear units use a precision rolled ball screw. The standard precision class of the ball screw used is ISO 7 without a preloaded nut. ISO 5 precision class with preloaded nut is available upon request. The ball screws of linear units can be supplied with different diameter and leads. This type of technology makes it possible to obtain the following features:

- **Highly accurate thrust**
- **Superior mechanical performance**
- **Reduced wear**
- **Low resistance to movement**

Carriage

The carriage of the Rollon TVS series linear units is made entirely of anodized aluminum. The dimensions vary depending on the size of the actuator.

Protection

Rollon TVS series linear units can be equipped with an external steel protective strip in order to protect mechanical components inside the linear units against contaminants. A resin deflector compresses the steel strip on its own magnetic base with very low friction.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 126

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.7	69	23	200	880-900	33	600-655

Tab. 127

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
205	165	10	60-80

Tab. 128

The linear motion system

The linear motion system has been designed to meet load capacity and precision conditions of a wide variety of applications.

TVS with recirculating ball guides

The recirculating ball guides used for TVS have the cage system. The cage included has two purposes: it reduces the friction between the guide and the slider, increasing their service life, and allows lubrication refills to be performed more rarely. The assembly of recirculating ball guides normally also involves the machining of the related seat in the profile. Due to the cage keeping the ball bearings apart, these units are regarded as permanently lubricated; considering the average life of handling devices, no maintenance is needed before 5000km.

Main advantages of this configuration:

- High load capacity
- Long lasting
- High precision
- High rigidity

TVS section

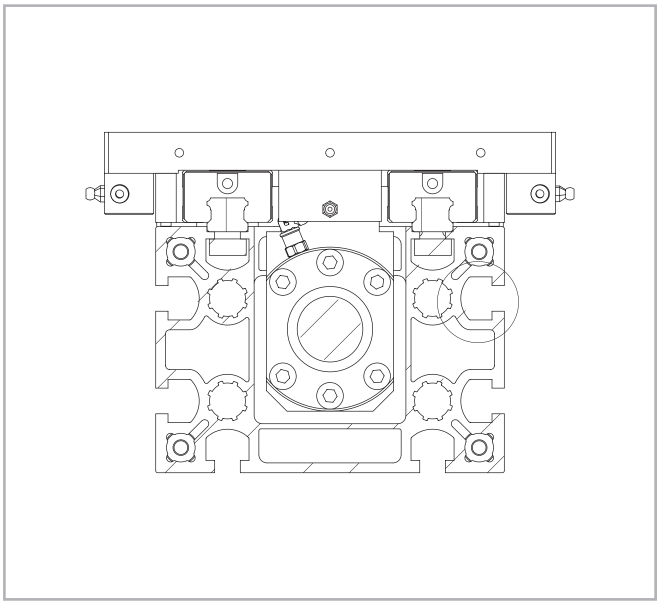
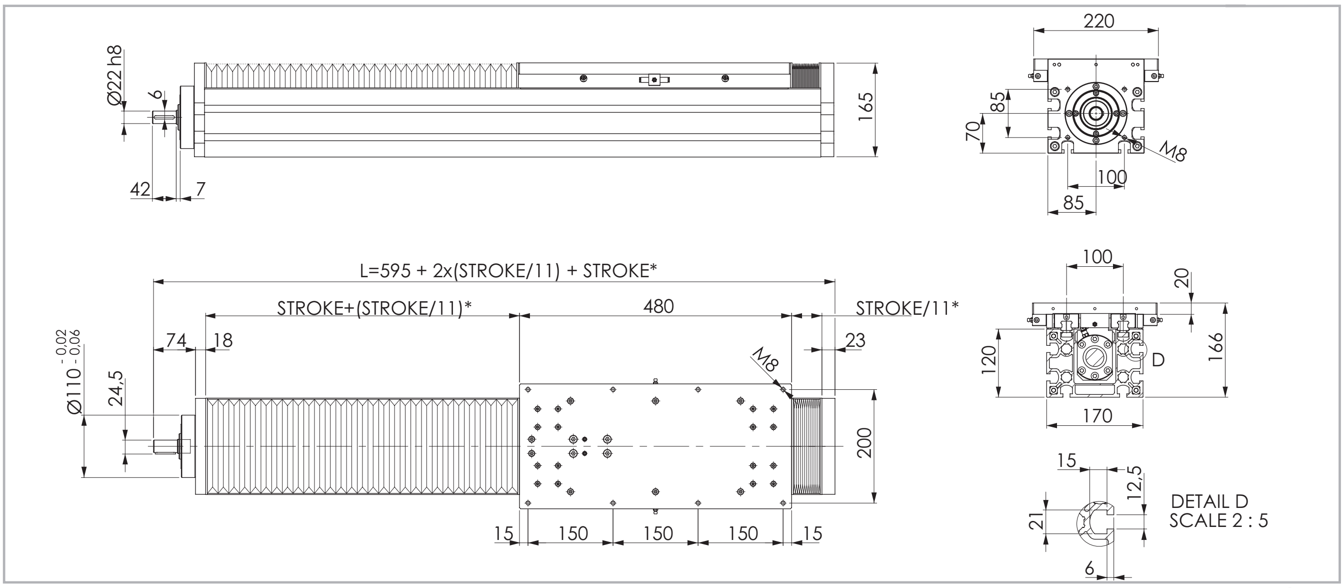


Fig. 62

TVS 170

TVS 170 Dimensions



*To be calculated by Rollon technical department based on the stroke of the actuator.

Fig. 63

Technical data

	Type
	TVS 170
Max. useful stroke length [mm]	3000
Max. speed [m/s]	See page PS-57
Carriage weight [kg]	9.9
Zero travel weight [kg]	28.9
Weight for 100 mm useful stroke [kg]	2.7
Rail size [mm]	20

Tab. 129

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TVS 170	1.944	0.799	2.742

Tab. 131

Ball screw precision

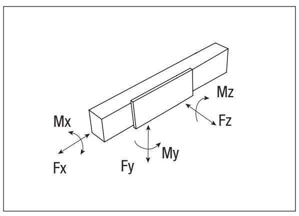
Type	Max. positioning precision [mm/300mm]		Max. repeatability precision [mm]	
	ISO 5	ISO 7	ISO 5	ISO 7
TVS 170	0.023	0.05	0.02	0.02

Tab. 130

Load capacity F_x

Type	F_x [N]		
	Screw	Stat.	Dyn
TVS 170	32-05	64200	25900
	32-10	66300	29800
	32-20	49700	24100
	32-32	48600	22700

Tab. 132



Load capacity

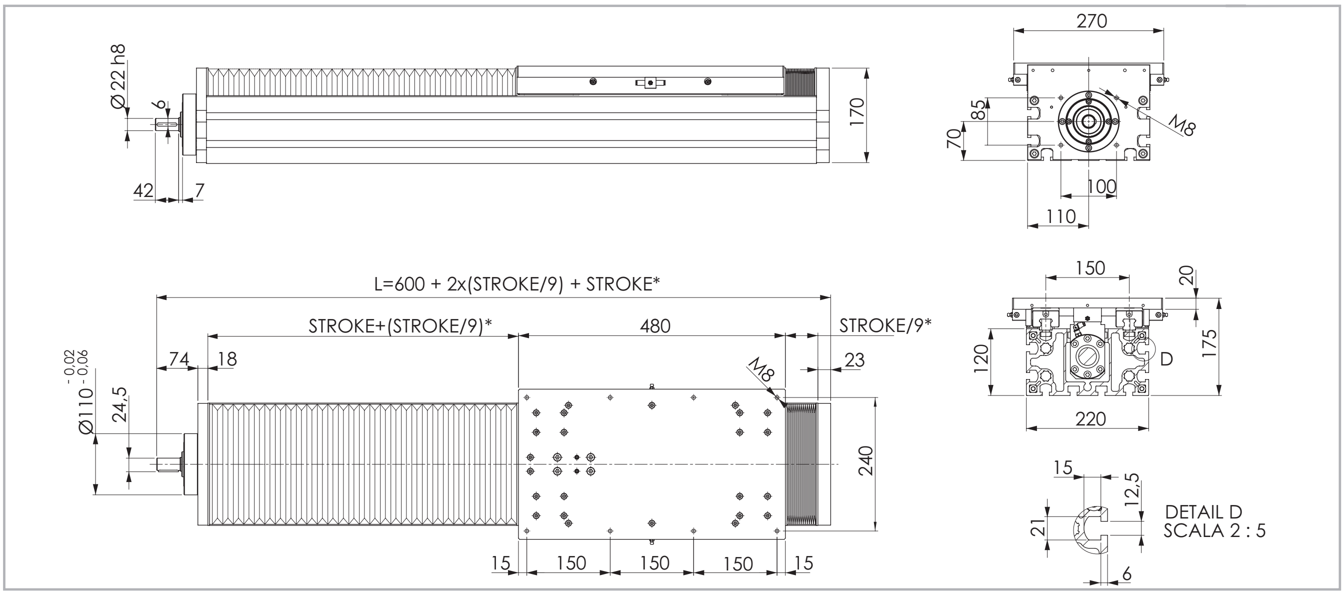
Type	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
TVS 170	153600	70798	153600	7680	29184	29184

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 133

TVS 220

TVS 220 Dimensions



*To be calculated by Rollon technical department based on the stroke of the actuator.

Fig. 64

Technical data

	Type
	TVS 220
Max. useful stroke length [mm]	3500
Max. speed [m/s]	See page PS-57
Carriage weight [kg]	13.3
Zero travel weight [kg]	37.4
Weight for 100 mm useful stroke [kg]	3.6
Rail size [mm]	25

Tab. 134

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
TVS 220	4.394	1.247	5.641

Tab. 136

Ball screw precision

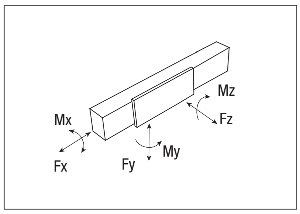
Type	Max. positioning precision [mm/300mm]		Max. repeatability precision [mm]	
	ISO 5	ISO 7	ISO 5	ISO 7
TVS 220	0.023	0.05	0.02	0.02

Tab. 135

Load capacity F_x

Type	F_x [N]		
	Screw	Stat.	Dyn
TVS 220	32-05	64200	25900
	32-10	66300	29800
	32-20	49700	24100
	32-32	48600	22700

Tab. 137



Load capacity

Type	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
TVS 220	258800	116833	258800	19410	47360	47360

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 138

Lubrication

TVS linear units with ball bearing guides

TVS Linear units are equipped with self lubricating linear ball guides. The ball bearing carriages are also fitted with a retention cage that eliminates "steel-steel" contact between adjacent revolving parts and prevents misalignment of these in the circuits.

This system guarantees a long interval between maintenances: every 5000 km or 1 year of use, based on the value reached first. If a longer service life is required or in case of high dynamic or high loaded applications please contact our offices for further verification.

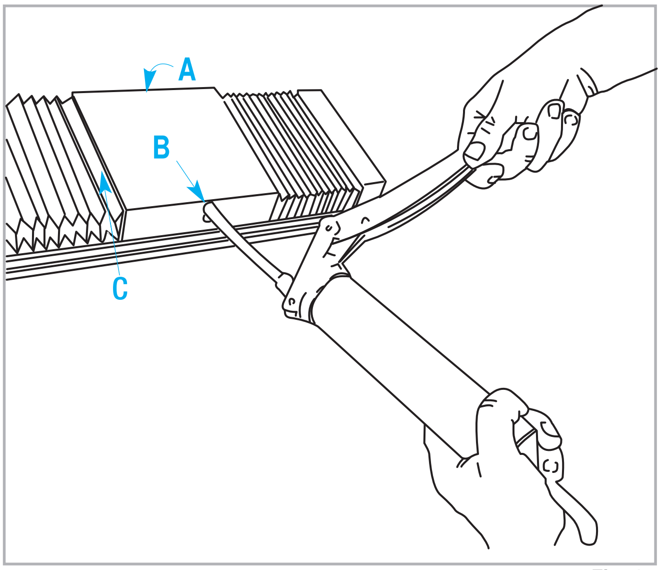


Fig. 65

- Insert the tip in the specific grease nipples:
  A and **B** - Linear block - **C** - Ball screw nut
- Type of lubricant: Lithium soap grease of class NLGI 2.
- For specially stressed applications or difficult enviromental conditions, lubrication should be carried out more frequently. Refer to Rollon for further advice.

Quantity of lubricant necessary for block re-lubrication at each point:

Type	Quantity [cm^3] for grease nipple
TVS 170	1.4
TVS 220	2.8

Tab. 139

Ball screws

The ball screw nuts of Rollon TVS-series linear units must be relubricated every 100 km.

Standard lubrication

Lubrication of the ball bearing blocks and the ball screw nut is facilitated by grease nipples located on the sides of the carriage of the Rollon TVS series actuators. The linear units are lubricated with class NLGI2 lithium soap grease.

Amount of lubricant recommended for ball screw nut re-lubrication

Type	Quantity [cm^3] for grease nipple
32-05	1.8
32-10	2.0
32-20	2.0
32-32	3.0

Tab. 140

Critical speed

The maximum linear speed of Rollon TVS series linear units depends on the critical speed of the screw (based on its diameter and length) and on the max. permissible speed of the ball screw nut used.

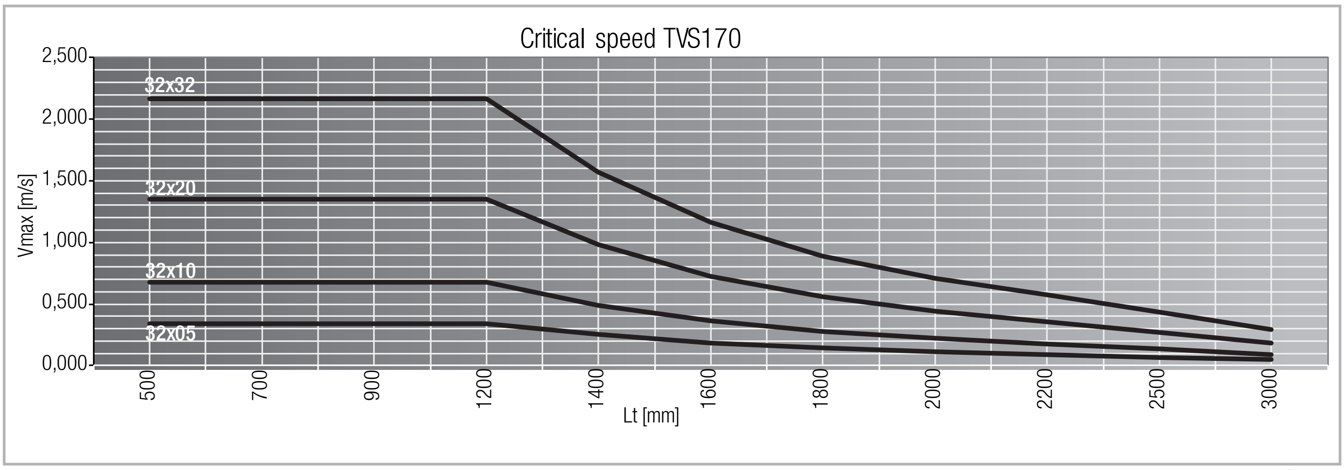


Fig. 66

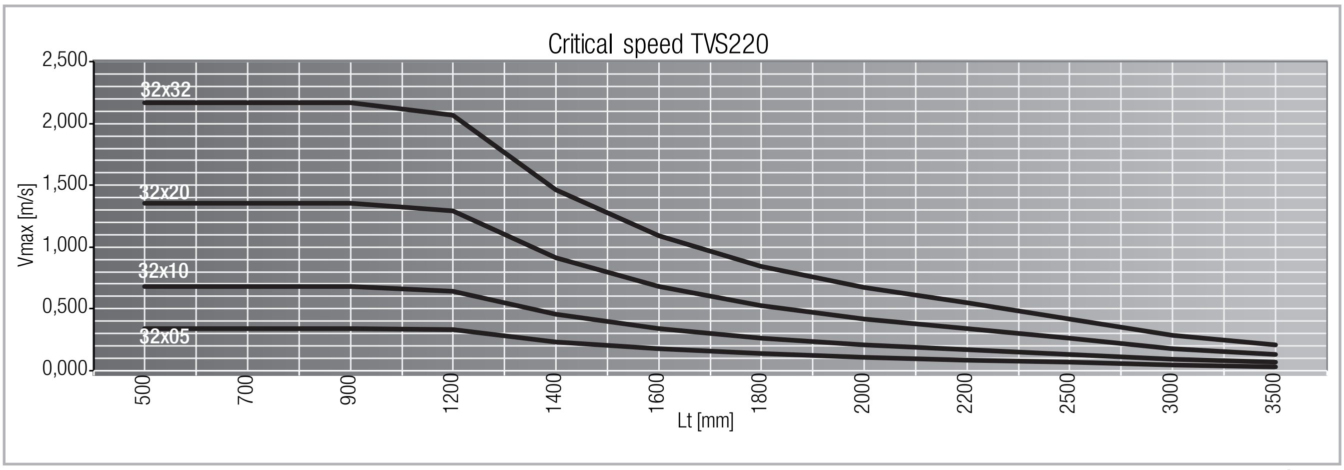


Fig. 67

Accessory

Semi-rounded threaded inserts with spring

Material: galvanised steel.
Important: to be inserted through the longitudinal slots before assembling.

Suitable for series:
TVS 170 - TVS 220

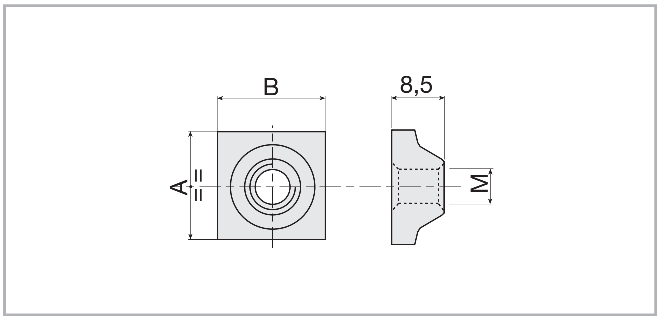


Fig. 68

Plastic compound spring for vertical positioning of insert.

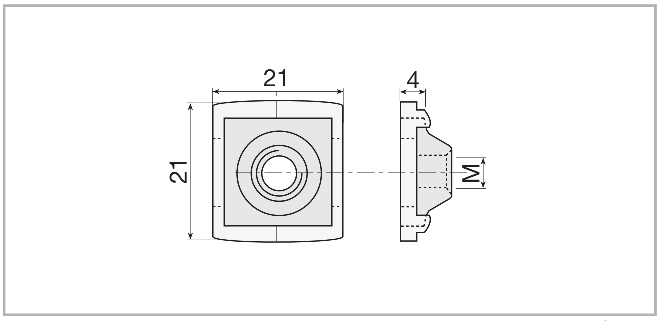


Fig. 69

Thread	AxB	
	18x18	20x20
M4	209.0031	209.0023
M5	209.0032	209.0019
M6	209.0033	209.1202
M8	209.0034	209.0467

Tab. 141

Spring	Code
Suitable for all insert 18x18	101.0732

Tab. 142

Alignment nuts

Alignment nut for slot 12.5 mm

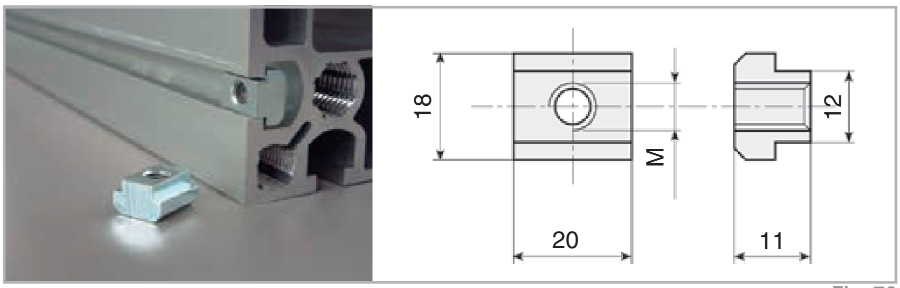


Fig. 70

Material: galvanised steel. Suitable for series:
TVS 170 - TVS 220

Thread	Code
M5	215.1768
M6	215.1769
M8	215.1770
M10	215.2124

Tab. 143

Alignment nut for slot 12.5 mm front insertable

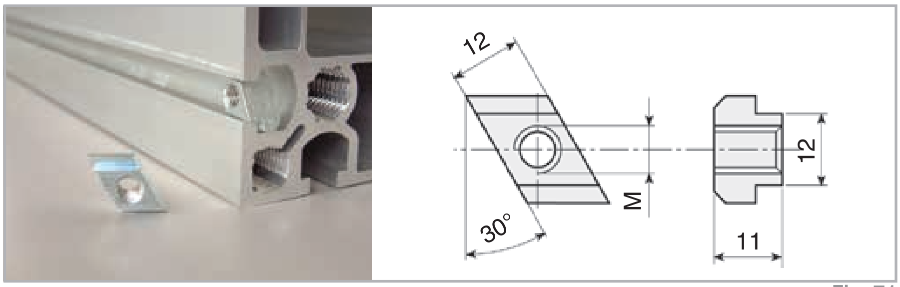


Fig. 71

Material: galvanised steel. Suitable for series:
TVS 170 - TVS 220

Thread	Code
M5	215.1771
M6	215.1772
M8	215.1773
M10	215.2125

Tab. 144

Threaded nuts and plates

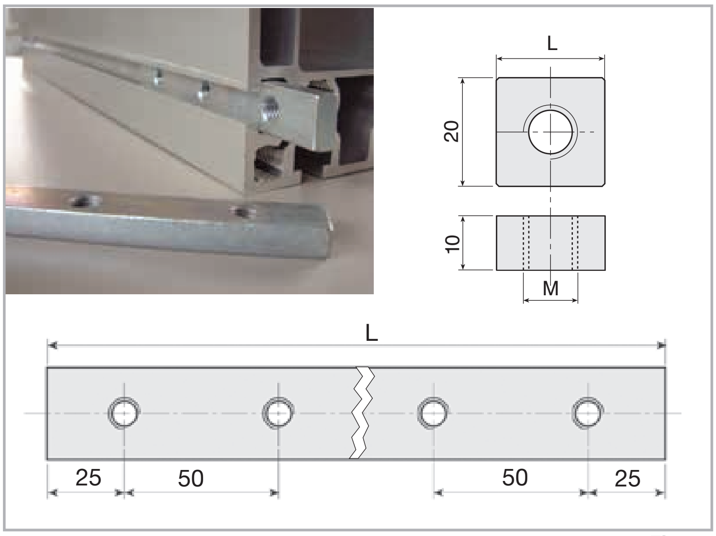


Fig. 72

M12 (CH19) hexagonal-head screws can be used as stud bolts in profiles with 12.5 mm slots.

Material: galvanised steel. Suitable for series:
TVS 170 - TVS 220

Thread	Threaded holes	L	Code
M10	1	40	215.0477
M12	1	40	209.1281
M10	1	20	209.1277
M10	2*	80	209.1776
M10	3*	150	209.1777
M10	4*	200	209.1778
M10	5*	250	209.1779
M10	6*	300	209.1780
M10	7*	350	209.1781

* Hole centre-distance: 50 mm.

Tab. 145

Profile anchor brackets

Material: alluminum alloy (Rs=310 N/mm²).

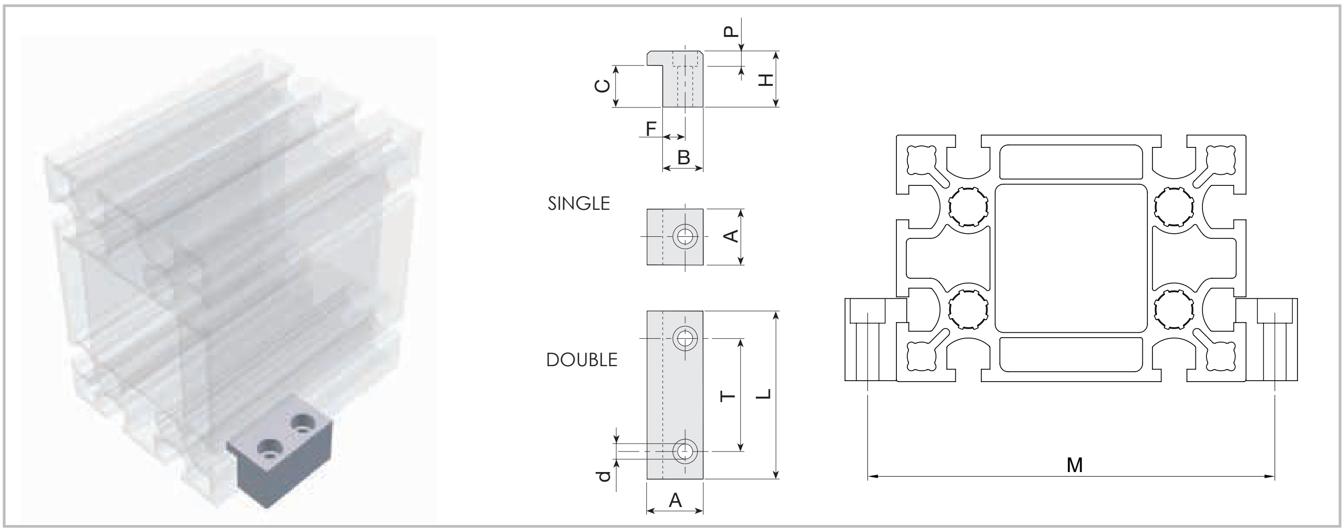


Fig. 73

Profile	A	L	T	d	H	P	C	F	B	M	Single code	Double code
TVS 170	30	90	50	11	40	11	28.3	14	25	198	415.0767	415.0762
TVS 220	30	90	50	11	40	11	28.3	14	25	248	415.0767	415.0762

Tab. 146

Ordering key

Identification code for the TVS linear units

TVS	17	3205	5P	02000	1A
	17=170	32-05	5P=ISO 5		
	22=220	32-10	7N=ISO 7		
		32-20			
		32-32			

Carriage option

L=total length of the unit

Type *see from pg. PS-54 to pg. PS-55, tab. 130, 135*

B/S diameter and lead

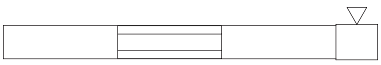
Size *see from pg. PS-54 to pg. PS-55*

Linear unit series TVS *see pg. PS-51*

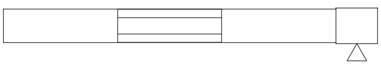
In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Configure Actuator

Left / right orientation



Right

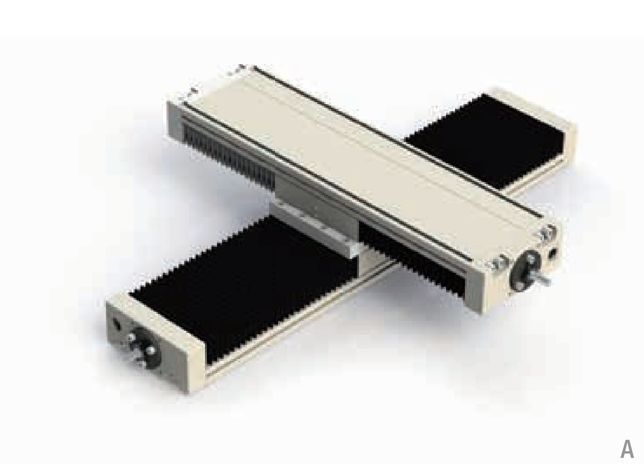


Left

Multiaxis systems

Rollon Precision System series linear units have been specifically designed to be modular and therefore to permit fast, trouble-free setup of multi-axis systems. Rollon can provide all the connection elements necessary for combining the various sizes and lengths of Precision System series linear units.

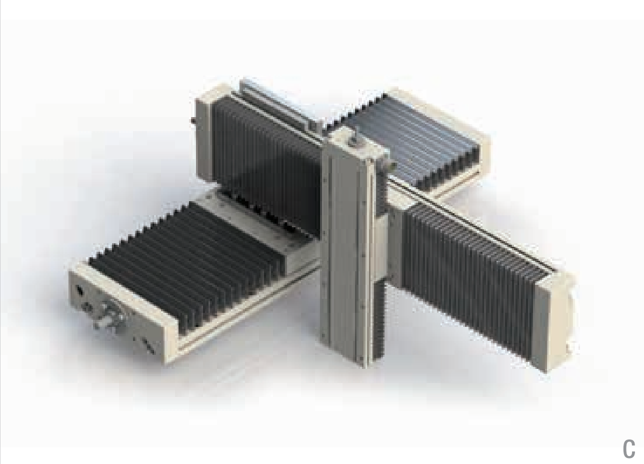
System with 2 horizontal axes



A

A - Direct fastening of the Y-axis on the X-axis ("base unit on carriage" assembly) using screws without intermediate brackets.

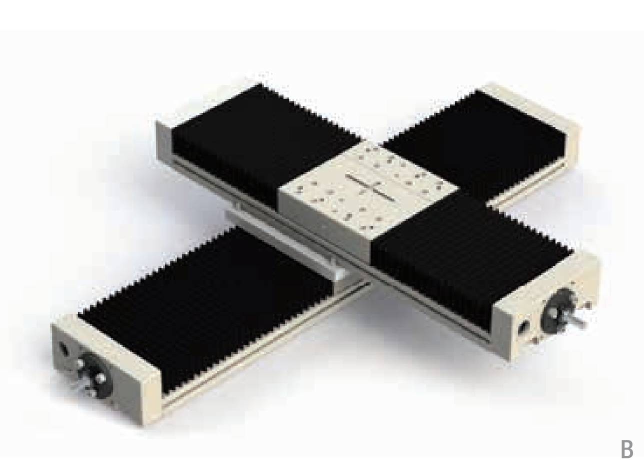
Three-axes system



C

C - Fastening of the Y-axis on the X-axis (“base unit on carriage“ assembly) using 90° brackets.
Fastening of the Z-axis on the Y-axis (“carriage on carriage" assembly) using a “cross“ plate.

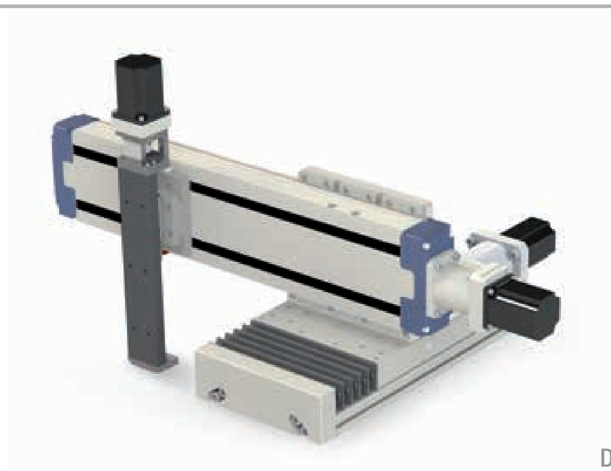
System with 2 horizontal axes



B

B - Fastening of the Y-axis on the X-axis ("carriage on carriage" assembly) using a "cross" plate.

Three-axes system

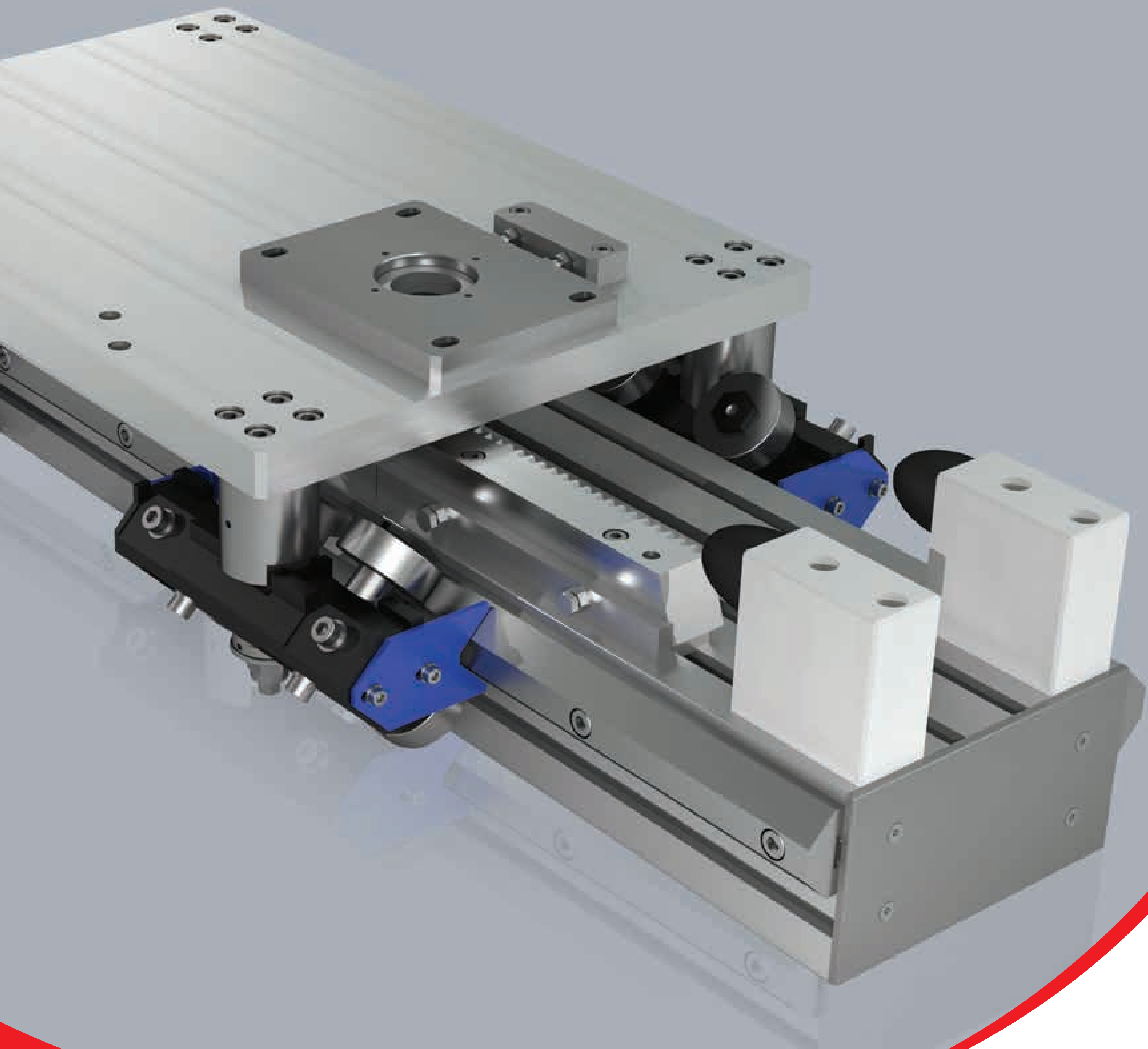


D

D - Fastening of the Y-axis on the X-axis (“base unit on carriage assembly) using 90° brackets.

Connection plates are available only upon request

Tecline



PAR/PAS series

PAR/PAS series description

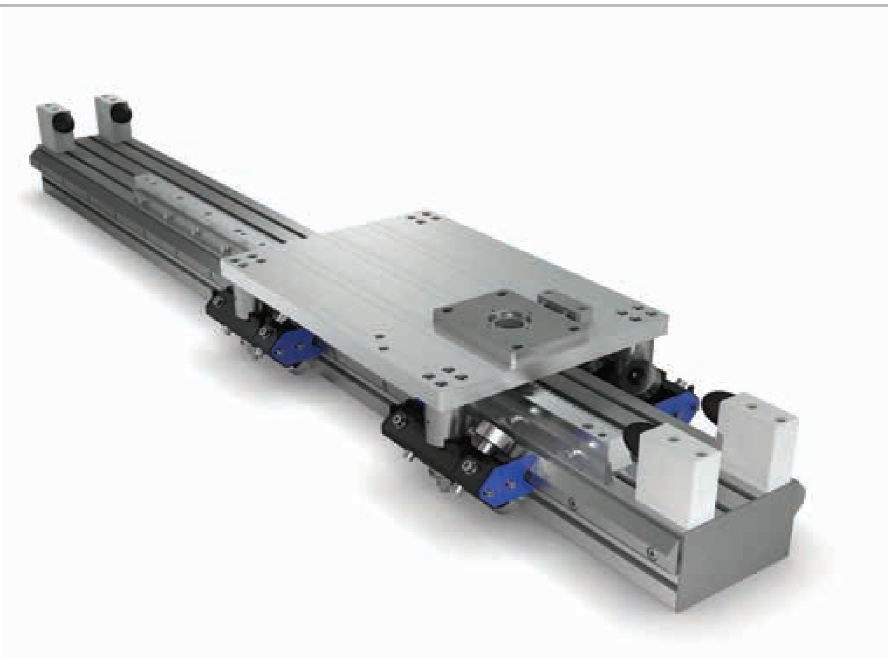


Fig. 1

Tecline products are linear actuators made of a self-supporting extruded aluminum with rack and pinion transmission designed for multi-axes solutions for several applications like pick and place, industrial machines feeding and logistics with loads up to 2.000 Kg.
PAR/PAS linear actuators are available with profiles of different sizes: 118 - 140 - 170 - 200 - 220 - 230 - 280 - 360 mm.

Some of the main advantages of PAR/PAS solutions are:
- Easy and quick assembly.
- High quality and competitive performances.
- Reduced and simplified maintenance.
- Wide range of integrated solutions.
- Possibility of customized solutions.
- Up to 10,8 m beams, high level torsional rigidity, precise shape. Longer lengths can be obtained with jointed versions.
- Precise machining of all profiles.

PAR
PAR series is defined by Prismatic Rails as linear motion components.

PAS
PAS series is defined by recirculating ball guides with cage as linear motion components.

The components

Extruded bodies

The PAR/PAS series is created using extruded and anodized Rollon profiles, made of hardened and tempered aluminum alloy tolerance according to UNI EN 755-9. Profiles are specifically designed by Rollon to create rigid and light structures, suitable for manufacturing linear transfer machines.

Rack and pinion drive

The PAR/PAS series is driven by a rack and pinion system, with hardened teeth, that allows long stroke up to 10,8 m. Longer lengths can be obtained with jointed versions. Racks with helical teeth, made of induction-hardened steel, are available with three different modules: M2, M3 and M4. PAR/PAS series axes are assembled with ground, KSD induction-hardened racks with pinions in high-performance tempered and surface-hardened steel (RD). High-performance KRD racks are available upon request (Rs>900 MPa). These are hardened and tempered, induction-hardened, and fully ground. With RD pinions and KRD racks, and with the help of continuous lubrication, speeds up to 5 m/s can be reached.

Carriage

The carriage of the PAR/PAS series linear units is made of anodized aluminum. Different lengths of the carriages are available according to the different sizes.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 1

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.70	69	23	200	880-900	33	600-655

Tab. 2

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
205	165	10	60-80

Tab. 3

The linear motion system

The linear motion system has been designed to meet the load capacity, speed, and maximum acceleration conditions of a wide variety of applications.

PAR with Prismatic Rails

Prismatic Rails are made of specially treated high-carbon steel and provided with a permanent lubrication system. Thanks to this kind of solution PAR is specifically dedicated for dirty environments and high dynamics in automation.

- The Prismatic Rails with high load capacity are mounted in a dedicated seat on the aluminum body.
- The carriage is assembled with preload, that enables to withstand loading in the four main directions.
- Hardened and ground steel guide rails.
- Sliders have felts for self-lubrication.

The linear motion system described above offers:

- Suitable for dirty environments
- High speed and acceleration
- Maintenance free
- High load capacity
- Low friction
- Long life
- Low noise

PAS with recirculating ball guides with cage

The recirculating ball guides used for PAS have the cage system. The cage included has two purposes: it reduces the friction between the guide and the slider, increasing their service life, and allows lubrication refills to be performed more rarely. Due to the cage keeping the ball bearings apart, these units are regarded as permanently lubricated; considering the average life of handling devices, no maintenance is needed before 2000 Km.

The linear motion system described above offers:

- High permissible bending moments
- High accuracy of the movement
- High speed and acceleration
- High load capacity
- High rigidity
- Low friction
- Long life
- Low noise

PAR

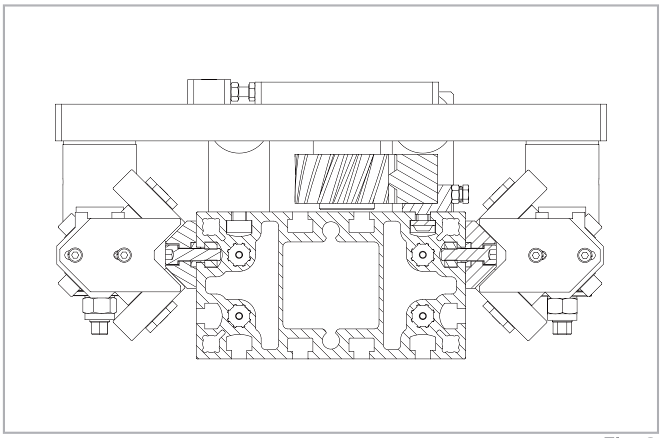


Fig. 2

PAS

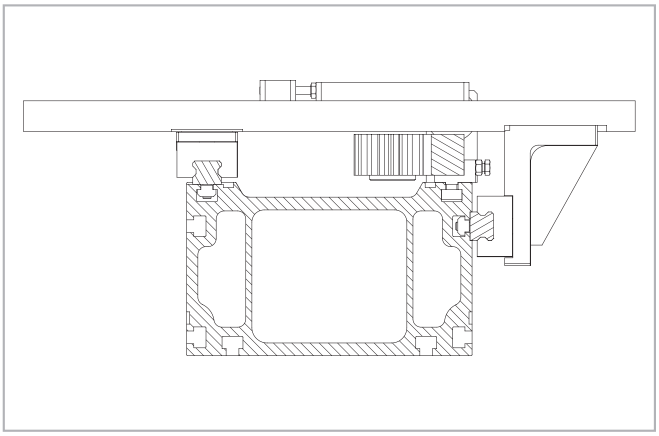


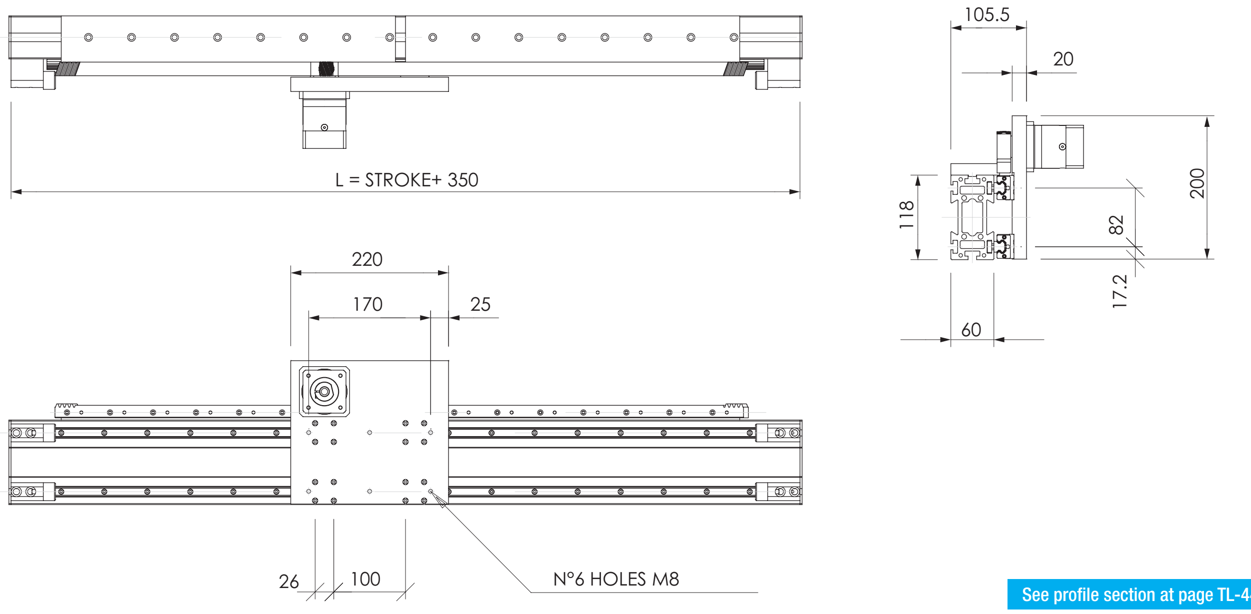
Fig. 3

PAS 118

PC

30 Kg High Cycle Rate Low Cycle Rate 80 Kg

PAS 118 Dimension



See profile section at page TL-44

The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 4

Technical data

	Type
	PAS 118
Max. useful stroke length [mm]*1	9550
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	4
Max. acceleration [m/s²]	5
Rack module	m 2
Pinion pitch diameter [mm]	38.2
Carriage displacement per pinion turn [mm]	120
Carriage weight [kg]	3.5
Zero travel weight [kg]	11
Weight for 100 mm useful stroke [kg]	1.9
Rail size [mm]	15

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 4

Moments of inertia of the aluminum body

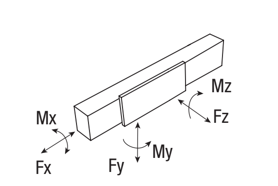
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
PAS 118	0.432	0.101	0.533

Tab. 5

Rack specifications

Type	Type of rack	Rack module	Quality
PAS 118	Helical teeth hardened ground	m 2	Q6

Tab. 6



Load capacity

Type	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
PAS 118	1814	96800	45082	96800	3969	6098	6098

See verification under static load and lifetime on page SL-2 and SL-3

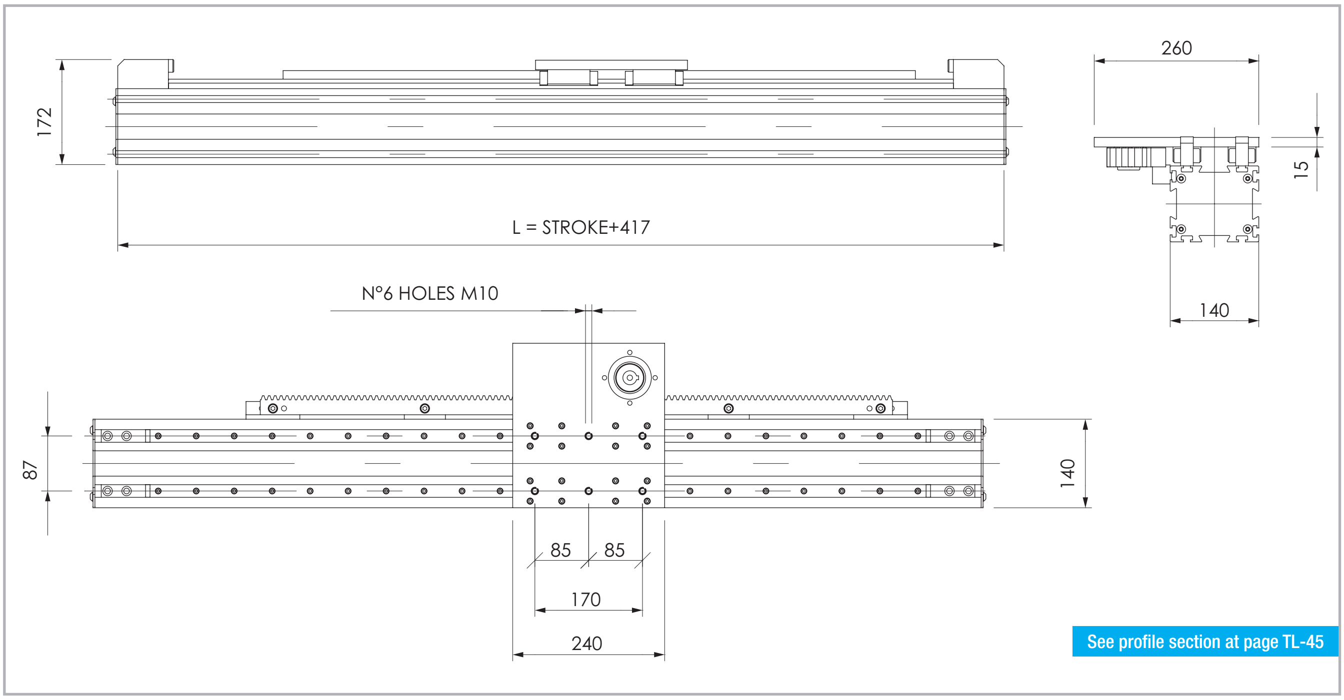
Tab. 7

PAS 140

PC

80 Kg | High Cycle Rate — Low Cycle Rate | 160 Kg

PAS 140 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 5

Technical data

	Type
	PAS 140
Max. useful stroke length [mm]*1	7100
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	4
Max. acceleration [m/s²]	5
Rack module	m 3
Pinion pitch diameter [mm]	63.66
Carriage displacement per pinion turn [mm]	200
Carriage weight [kg]	5
Zero travel weight [kg]	15
Weight for 100 mm useful stroke [kg]	2.6
Rail size [mm]	20

*1) It is possible to obtain longer stroke by means of special Rollon joints

*2) Positioning repeatability is dependent on the type of transmission used

Tab. 8

Moments of inertia of the aluminum body

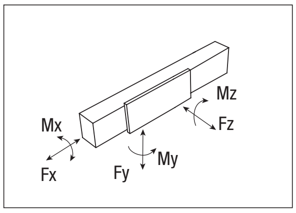
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
PAS 140	1.148	0.892	2.040

Tab. 9

Rack specifications

Type	Type of rack	Rack module	Quality
PAS 140	Helical teeth hardened ground	m 3	Q6

Tab. 10



Load capacity

Type	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
PAS 140	5714	201200	89212	201200	8752	13581	13581

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 11

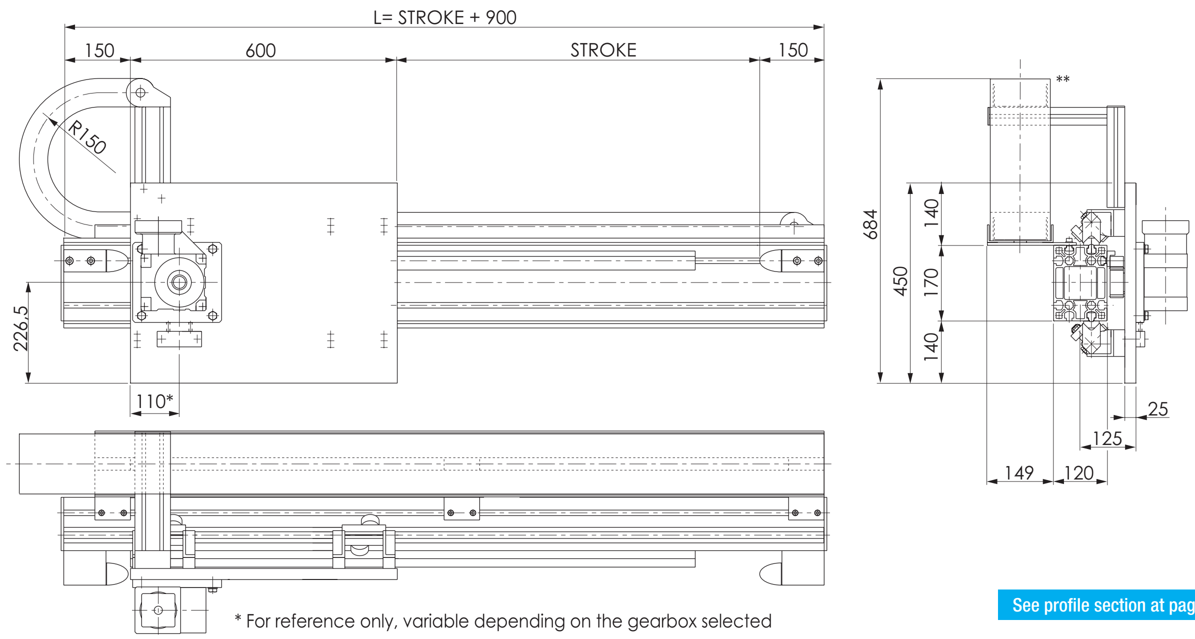
PAR 170

PC

80 Kg — 250 Kg

High Cycle Rate — Low Cycle Rate

PAR 170 Dimension



* For reference only, variable depending on the gearbox selected

See profile section at page TL-45

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 6

Technical data

	Type
	PAR 170
Max. useful stroke length [mm]*1	11100
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	3.5
Max. acceleration [m/s²]	10
Rack module	m 3
Pinion pitch diameter [mm]	63.66 (89.13)
Carriage displacement per pinion turn [mm]	200 (280)
Carriage weight [kg]	29
Zero travel weight [kg]	59
Weight for 100 mm useful stroke [kg]	3.1
Rail size [mm]	35x16

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 12

Moments of inertia of the aluminum body

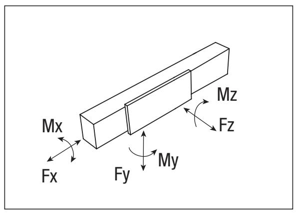
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
PAR 170	1.973	0.984	2.957

Tab. 13

Rack specifications

Type	Type of rack	Rack module	Quality
PAR 170	Helical teeth hardened ground	m 3	Q6

Tab. 14



Load capacity

Type	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
PAR 170	5714	14142	65928	14142	1202	3076	3076

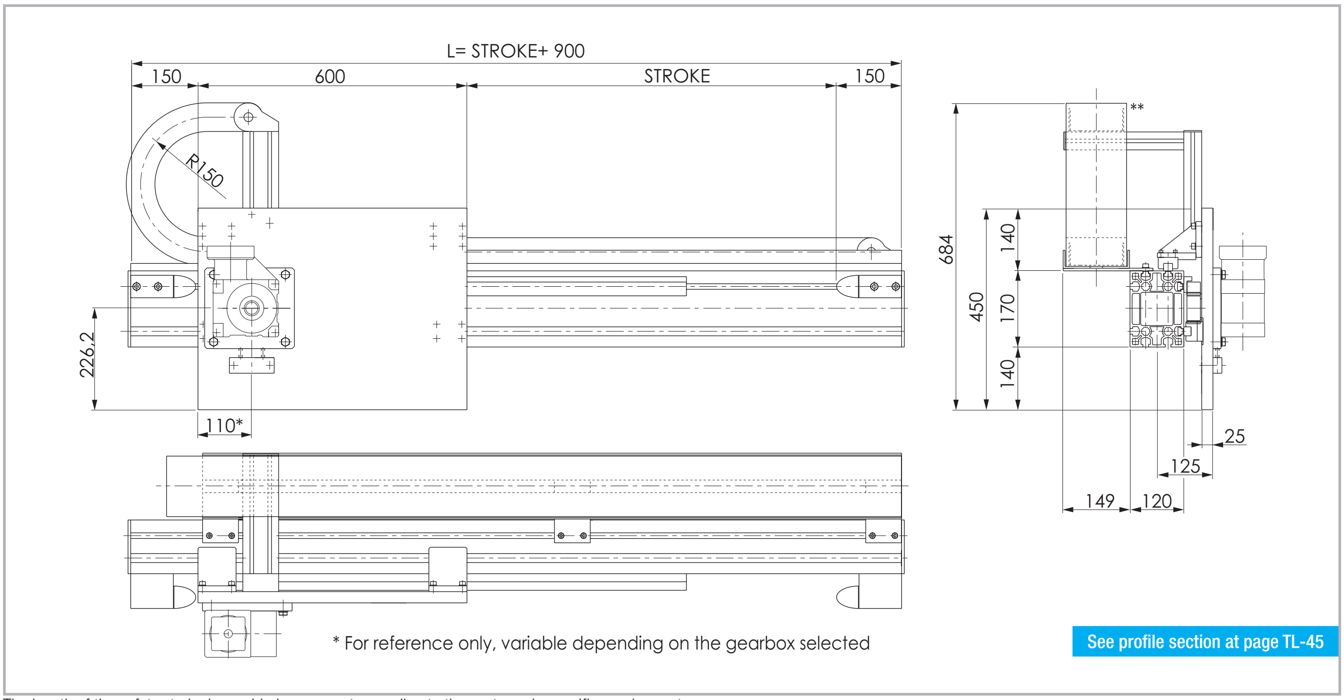
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 15

PAS 170

PC
80 Kg High Cycle Rate Low Cycle Rate 250 Kg

PAS 170 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 7

Technical data

	Type
	PAS 170
Max. useful stroke length [mm]*1	11100
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	3.5
Max. acceleration [m/s²]	10
Rack module	m 3
Pinion pitch diameter [mm]	63.66 (89.13)
Carriage displacement per pinion turn [mm]	200 (280)
Carriage weight [kg]	29
Zero travel weight [kg]	57
Weight for 100 mm useful stroke [kg]	2.9
Rail size [mm]	20

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 16

Moments of inertia of the aluminum body

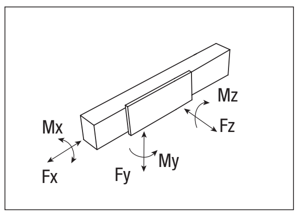
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
PAS 170	1.973	0.984	2.957

Tab. 17

Rack specifications

Type	Type of rack	Rack module	Quality
PAS 170	Helical teeth hardened ground	m 3	Q6

Tab. 18



Load capacity

Type	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	DYN.	Stat.	Stat.	Stat.	Stat.
PAS 170	5714	153600	70798	153600	10368	39552	39552

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 19

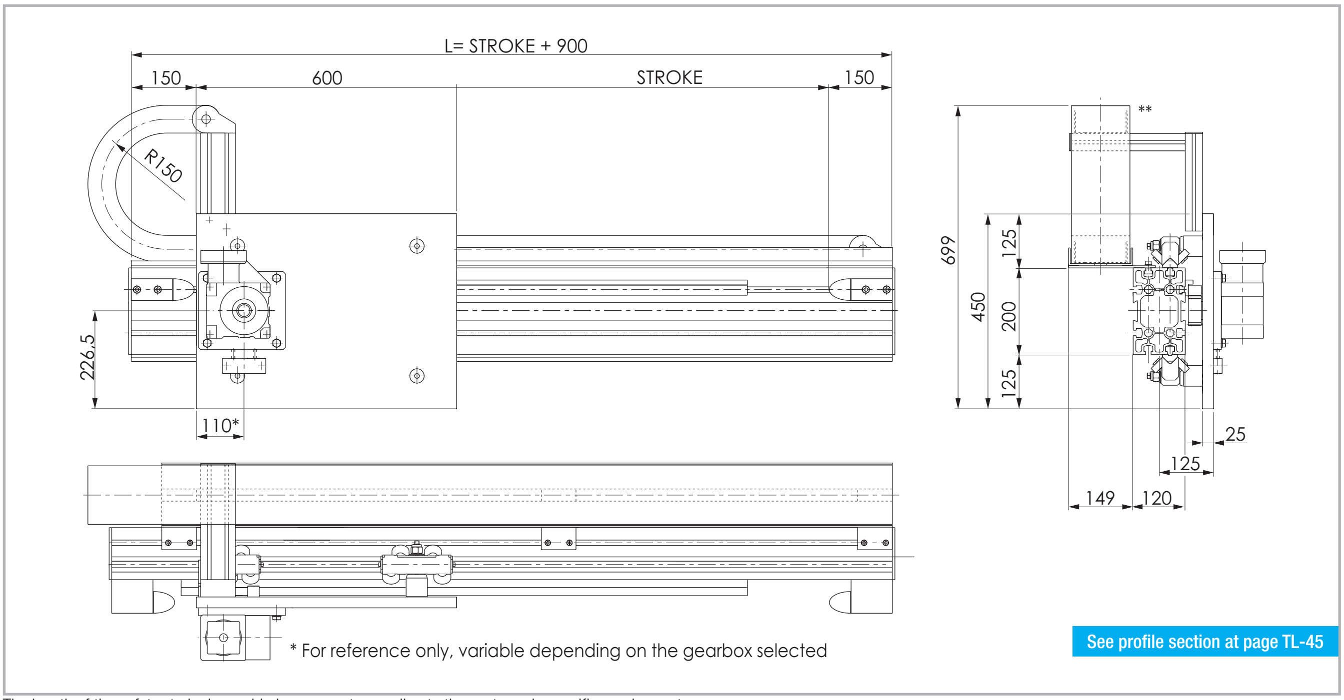
PAR 200

PC

100 Kg — 300 Kg

High Cycle Rate — Low Cycle Rate

PAR 200 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 8

Technical data

	Type
	PAR 200
Max. useful stroke length [mm]*1	11100
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	3
Max. acceleration [m/s²]	7
Rack module	m 3
Pulley pitch diameter [mm]	63.66 (89,13)
Carriage displacement per pulley turn [mm]	200 (280)
Carriage weight [kg]	36
Zero travel weight [kg]	70
Weight for 100 mm useful stroke [kg]	3.5
Rail size [mm]	35x16

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 20

Moments of inertia of the aluminum body

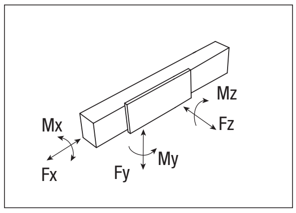
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
PAR 200	3.270	1.289	4.586

Tab. 21

Rack specifications

Type	Type of rack	Rack module	Quality
PAR 200	Helical teeth hardened ground	m 3	Q6

Tab. 22



Load capacity

Type	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
PAR 200	5714	14142	65928	14142	1414	3536	3536

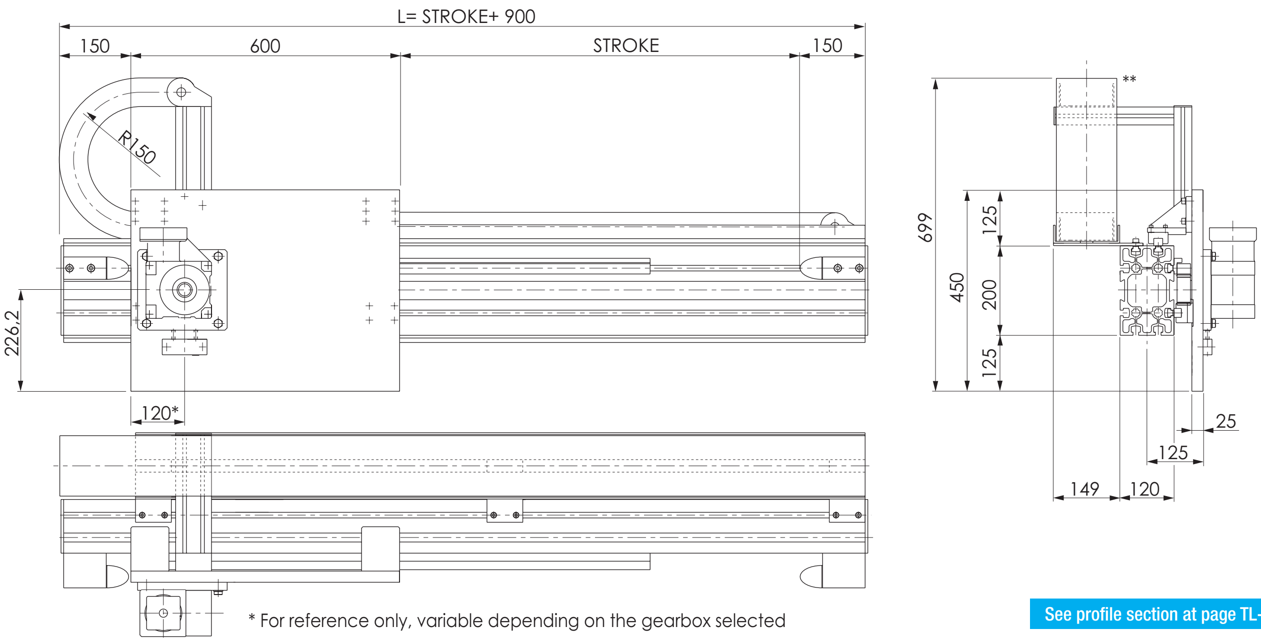
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 23

PAS 200

PC
100 Kg — 300 Kg
High Cycle Rate — Low Cycle Rate

PAS 200 Dimension



* For reference only, variable depending on the gearbox selected

See profile section at page TL-45

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 9

Technical data

	Type
	PAS 200
Max. useful stroke length [mm]*1	11100
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	3
Max. acceleration [m/s²]	7
Rack module	m 3
Pinion pitch diameter [mm]	63.66 (89,13)
Carriage displacement per pinion turn [mm]	200 (280)
Carriage weight [kg]	36
Zero travel weight [kg]	68
Weight for 100 mm useful stroke [kg]	3.3
Rail size [mm]	20

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 24

Moments of inertia of the aluminum body

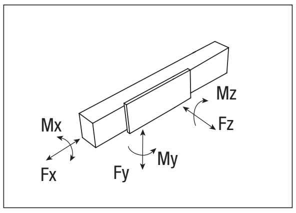
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
PAS 200	3.270	1.289	4.586

Tab. 25

Rack specifications

Type	Type of rack	Rack module	Quality
PAS200	Helical teeth hardened ground	m 3	Q6

Tab. 26



Load capacity

Type	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
PAS 200	5714	153600	70798	153600	11520	39552	39552

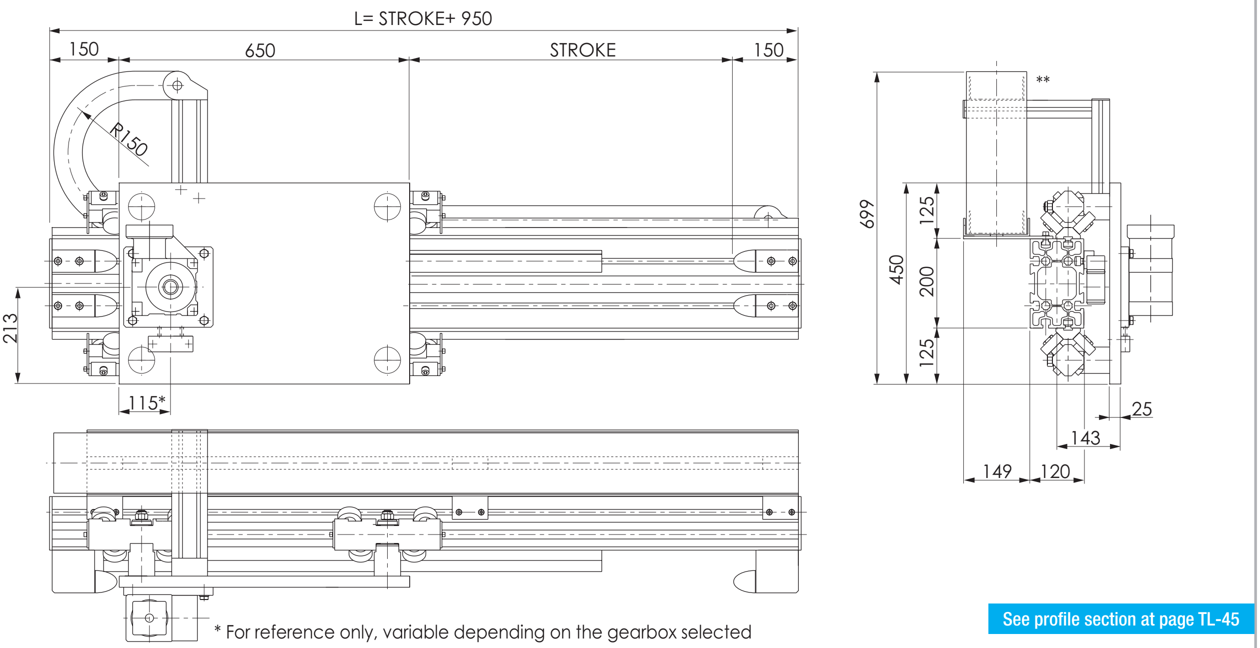
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 27

PAR 200P

100 Kg — PC — 400 Kg
High Cycle Rate — Low Cycle Rate

PAR 200P Dimension



See profile section at page TL-45

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 10

Technical data

	Type PAR 200P
Max. useful stroke length [mm]*1	11050
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	3
Max. acceleration [m/s²]	7
Rack module	m 4
Pinion pitch diameter [mm]	76.39 (106.1)
Carriage displacement per pinion turn [mm]	240 (333.33)
Carriage weight [kg]	48
Zero travel weight [kg]	96
Weight for 100 mm useful stroke [kg]	4.8
Rail size [mm]	55x25

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 28

Moments of inertia of the aluminum body

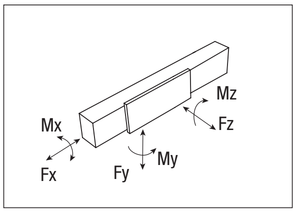
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
PAR 200P	3.270	1.289	4.586

Tab. 29

Rack specifications

Type	Type of rack	Rack module	Quality
PAR 200P	Helical teeth hardened ground	m 4	Q6

Tab. 30



Load capacity

Type	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
PAR 200P	10989	24042	112593	24042	2404	6611	6611

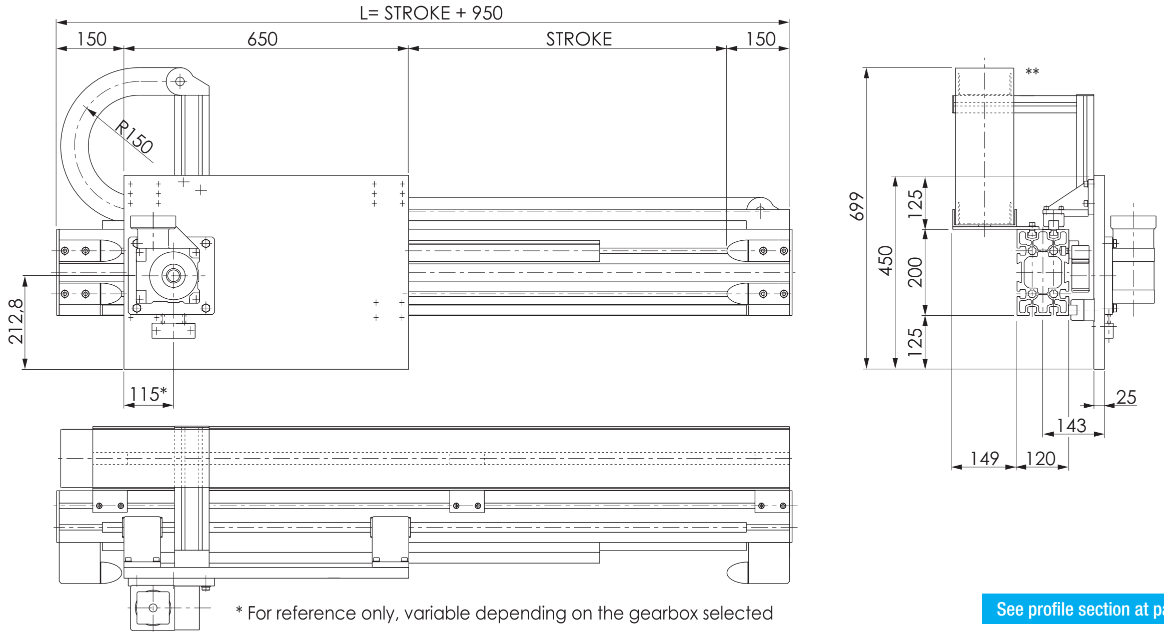
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 31

PAS 200P

PC
100 Kg High Cycle Rate Low Cycle Rate 400 Kg

PAS 200P Dimension



* For reference only, variable depending on the gearbox selected

See profile section at page TL-45

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 11

Technical data

	Type
	PAS 200P
Max. useful stroke length [mm]*1	11050
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	3
Max. acceleration [m/s²]	7
Rack module	m 4
Pinion pitch diameter [mm]	76.39 (106.1)
Carriage displacement per pinion turn [mm]	240 (333.33)
Carriage weight [kg]	38
Zero travel weight [kg]	80
Weight for 100 mm useful stroke [kg]	4.0
Rail size [mm]	25

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 32

Moments of inertia of the aluminum body

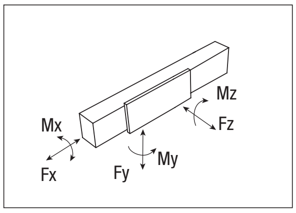
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
PAS 200P	3.270	1.289	4.586

Tab. 33

Rack specifications

Type	Type of rack	Rack module	Quality
PAS 200P	Helical teeth hardened ground	m 4	Q6

Tab. 34



Load capacity

Type	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
PAS 200P	10989	258800	116833	258800	19410	73111	73111

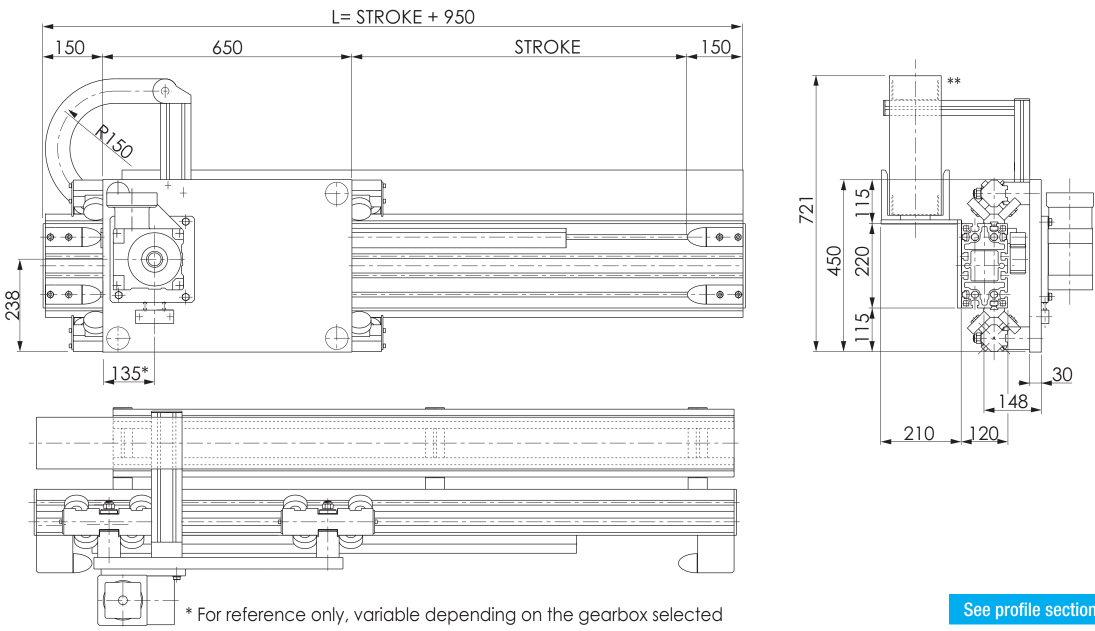
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 35

PAR 220

PC
250 Kg High Cycle Rate Low Cycle Rate 500 Kg

PAR 220 Dimension



See profile section at page TL-46

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 12

Technical data

	Type
	PAR 220
Max. useful stroke length [mm]*1	11050
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	3
Max. acceleration [m/s²]	6
Rack module	m 4
Pinion pitch diameter [mm]	76.39 (106.1)
Carriage displacement per pinion turn [mm]	240 (333.33)
Carriage weight [kg]	54
Zero travel weight [kg]	106
Weight for 100 mm useful stroke [kg]	5.2
Rail size [mm]	55x25

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 36

Moments of inertia of the aluminum body

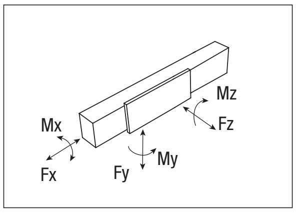
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
PAR 220	4.625	1.559	6.184

Tab. 37

Rack specifications

Type	Type of rack	Rack module	Quality
PAR 220	Helical teeth hardened ground	m 4	Q6

Tab. 38



Load capacity

Type	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
PAR 220	10989	29981	149063	29981	3298	8425	8425

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 39

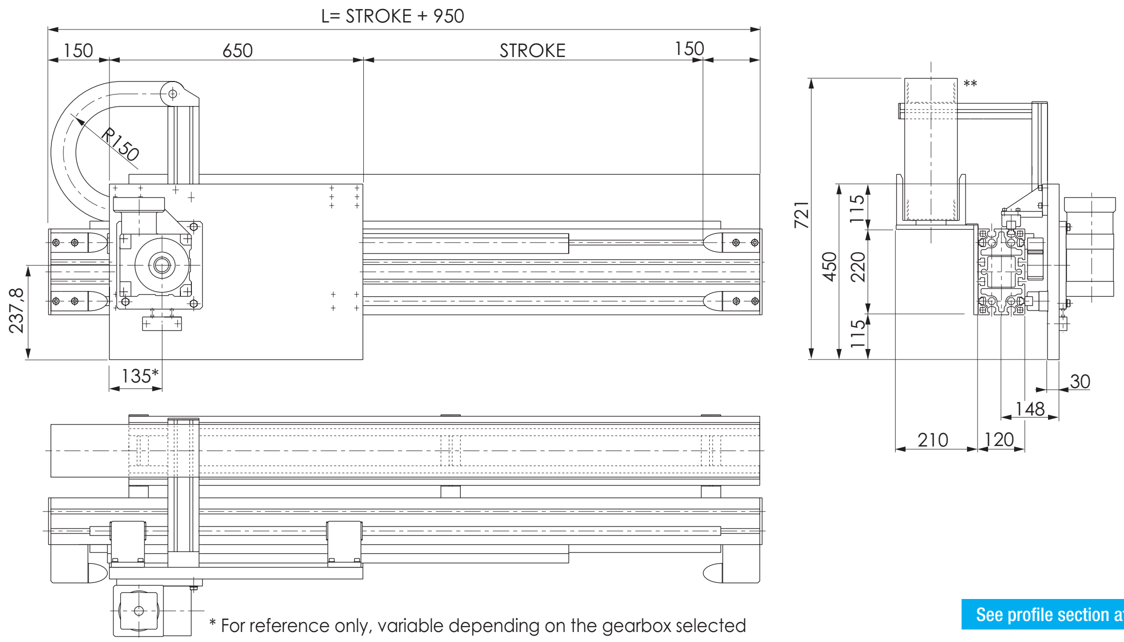
PAS 220

PC

250 Kg — 500 Kg

High Cycle Rate — Low Cycle Rate

PAS 220 Dimension



See profile section at page TL-46

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 13

Technical data

	Type
	PAS 220
Max. useful stroke length [mm]*1	11050
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	3
Max. acceleration [m/s²]	6
Rack module	m 4
Pinion pitch diameter [mm]	76.39 (106.1)
Carriage displacement per pinion turn [mm]	240 (333.33)
Carriage weight [kg]	44
Zero travel weight [kg]	99
Weight for 100 mm useful stroke [kg]	4.4
Rail size [mm]	25

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 40

Moments of inertia of the aluminum body

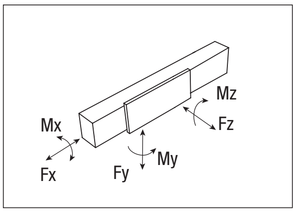
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
PAS 220	4.625	1.559	6.184

Tab. 41

Rack specifications

Type	Type of rack	Rack module	Quality
PAS 220	Helical teeth hardened ground	m 4	Q6

Tab. 42



Load capacity

Type	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
PAS 220	10989	258800	116833	258800	23939	73111	73111

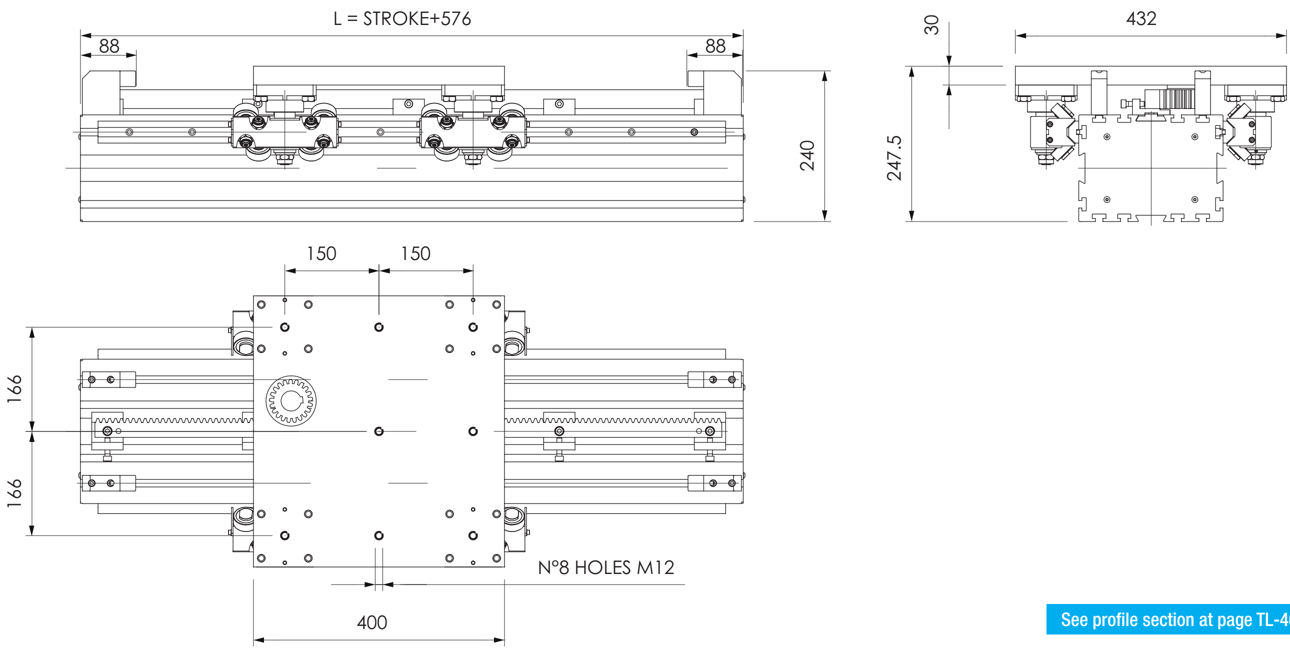
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 43

PAR 230

PC
150 Kg High Cycle Rate Low Cycle Rate 270 Kg

PAR 230 Dimension



See profile section at page TL-46

The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 14

Technical data

	Type
	PAR 230
Max. useful stroke length [mm]*1	11400
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	3
Max. acceleration [m/s²]	6
Rack module	m 3
Pinion pitch diameter [mm]	(89.13) 63.66
Carriage displacement per pinion turn [mm]	(280) 200
Carriage weight [kg]	25
Zero travel weight [kg]	50
Weight for 100 mm useful stroke [kg]	4
Rail size [mm]	35x16

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 44

Moments of inertia of the aluminum body

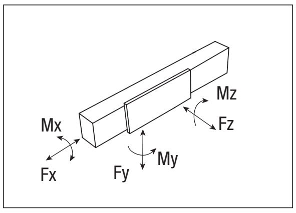
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
PAR 230	6.501	3.778	10.279

Tab. 45

Rack specifications

Type	Type of rack	Rack module	Quality
PAR 230	Helical teeth hardened ground	m 3	Q6

Tab. 46



Load capacity

Type	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
PAR 230	5714	14142	65928	14142	1626	2121	2121

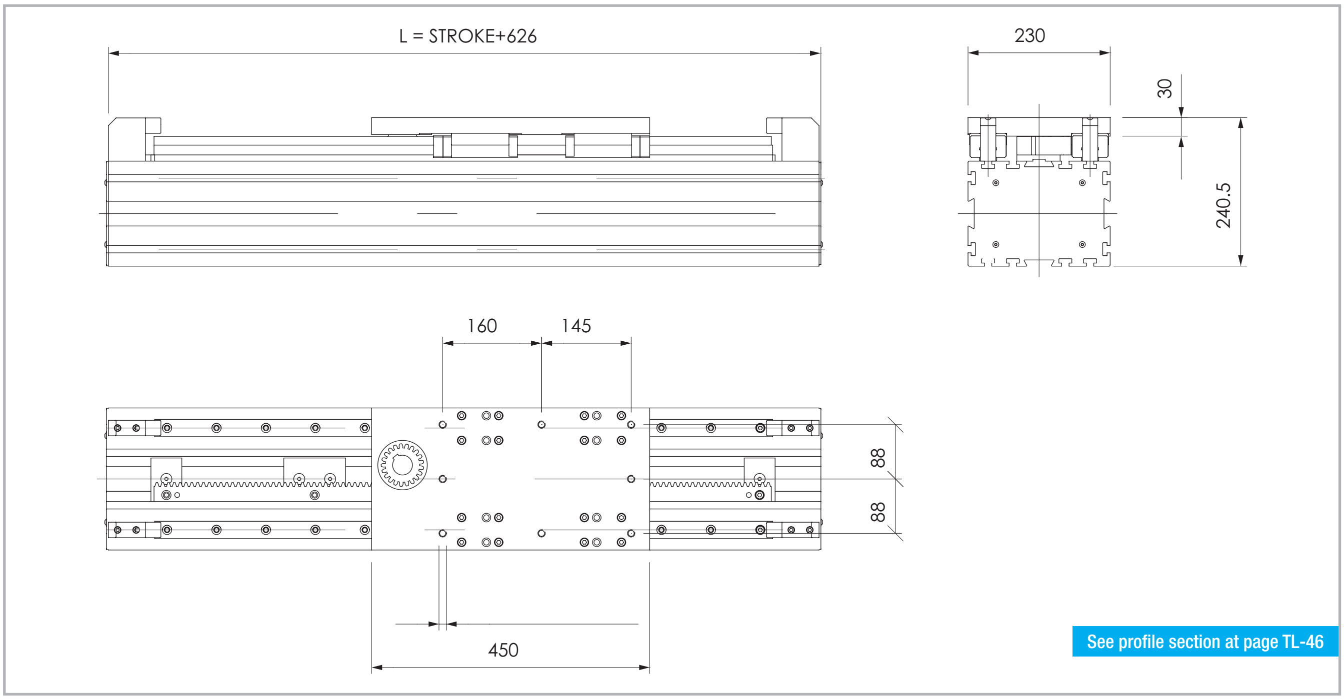
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 47

PAS 230

PC
280 Kg — 580 Kg
High Cycle Rate — Low Cycle Rate

PAS 230 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 15

Technical data

	Type PAS 230
Max. useful stroke length [mm]*1	11350
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	3
Max. acceleration [m/s²]	5
Rack module	m 3
Pinion pitch diameter [mm]	63.66
Carriage displacement per pinion turn [mm]	200
Carriage weight [kg]	12.5
Zero travel weight [kg]	41
Weight for 100 mm useful stroke [kg]	4.35
Rail size [mm]	30

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 48

Moments of inertia of the aluminum body

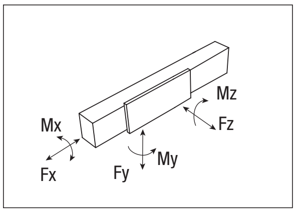
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
PAS 230	6.501	3.778	10.279

Tab. 49

Rack specifications

Type	Type of rack	Rack module	Quality
PAS 230	Helical teeth hardened ground	m 3	Q6

Tab. 50



Load capacity

Type	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
PAS 230	5714	355200	172074	355200	29304	35520	35520

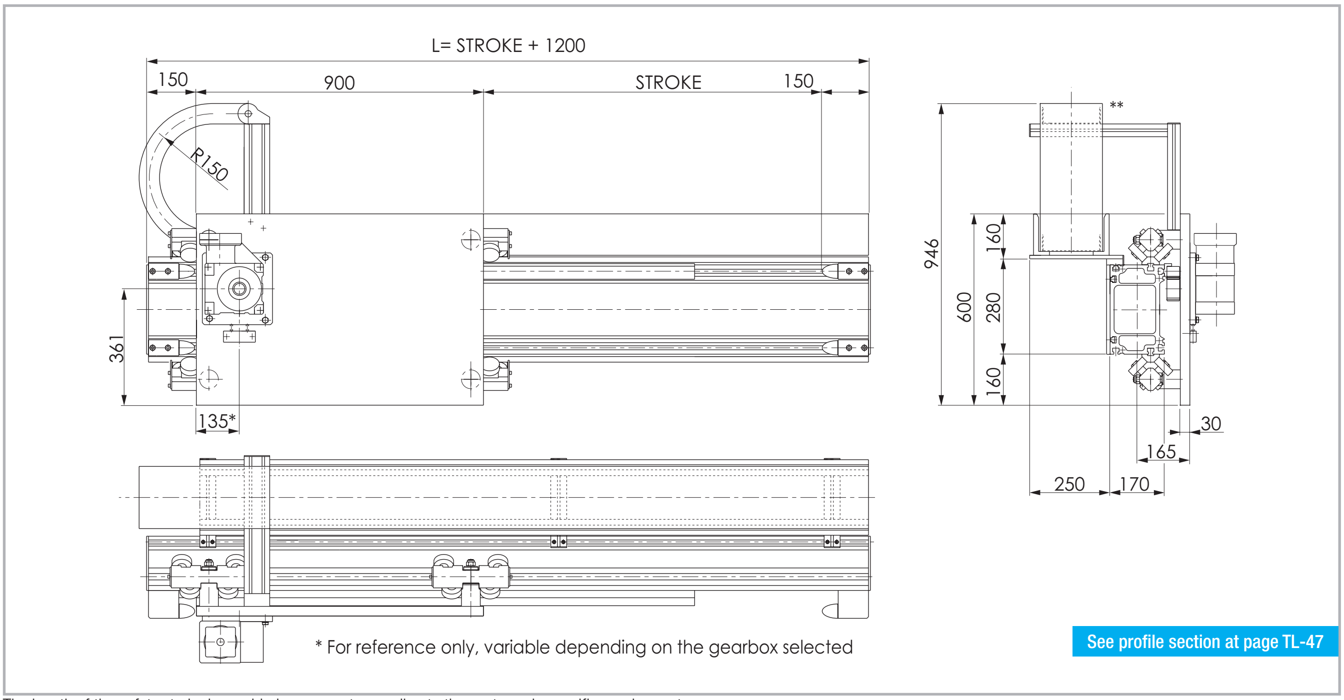
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 51

PAR 280

PC
300 Kg — High Cycle Rate — Low Cycle Rate — 600 Kg

PAR 280 Dimension



See profile section at page TL-47

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 16

Technical data

	Type
	PAR 280
Max. useful stroke length [mm]*1	10800
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	3
Max. acceleration [m/s²]	4
Rack module	m 4
Pinion pitch diameter [mm]	76.39 (106.1)
Carriage displacement per pinion turn [mm]	240 (333.33)
Carriage weight [kg]	79
Zero travel weight [kg]	164
Weight for 100 mm useful stroke [kg]	6.6
Rail size [mm]	55x25

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 52

Moments of inertia of the aluminum body

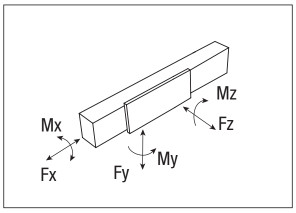
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
PAR 280	12.646	4.829	17.475

Tab. 53

Rack specifications

Type	Type of rack	Rack module	Quality
PAR 280	Helical teeth hardened ground	m 4	Q6

Tab. 54



Load capacity

Type	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
PAR 280	10989	29981	149063	29981	4197	12307	12307

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 55

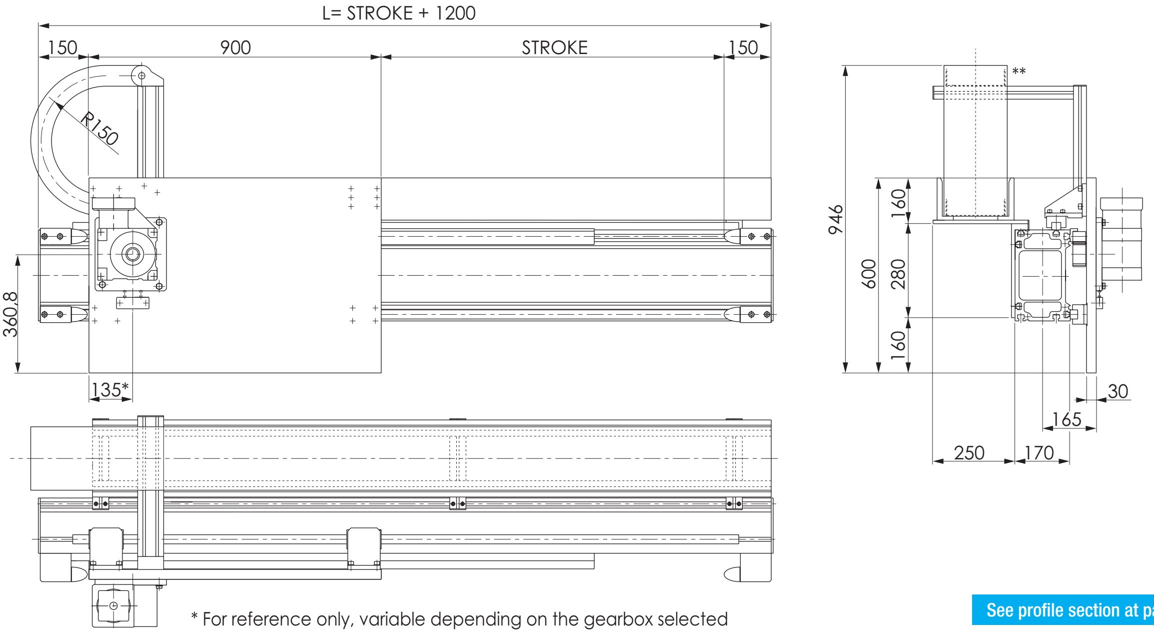
PAS 280

PC

300 Kg — 600 Kg

High Cycle Rate — Low Cycle Rate

PAS 280 Dimension



* For reference only, variable depending on the gearbox selected

See profile section at page TL-47

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 17

Technical data

	Type
	PAS 280
Max. useful stroke length [mm]*1	10800
Max. positioning repeatability [mm]*2	± 0.05
Max. speed [m/s]	3
Max. acceleration [m/s²]	5
Rack module	m 4
Pinion pitch diameter [mm]	76.39 (106.1)
Carriage displacement per pinion turn [mm]	240 (333.33)
Carriage weight [kg]	69
Zero travel weight [kg]	149
Weight for 100 mm useful stroke [kg]	6.0
Rail size [mm]	30

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 56

Moments of inertia of the aluminum body

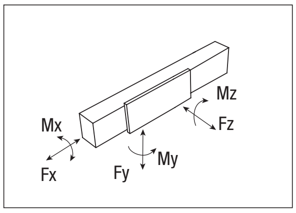
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
PAS 280	12.646	4.829	17.475

Tab. 57

Rack specifications

Type	Type of rack	Rack module	Quality
PAS 280	Helical teeth hardened ground	m 4	Q6

Tab. 58



Load capacity

Type	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
PAS 280	10989	266400	142231	266400	34632	106560	106560

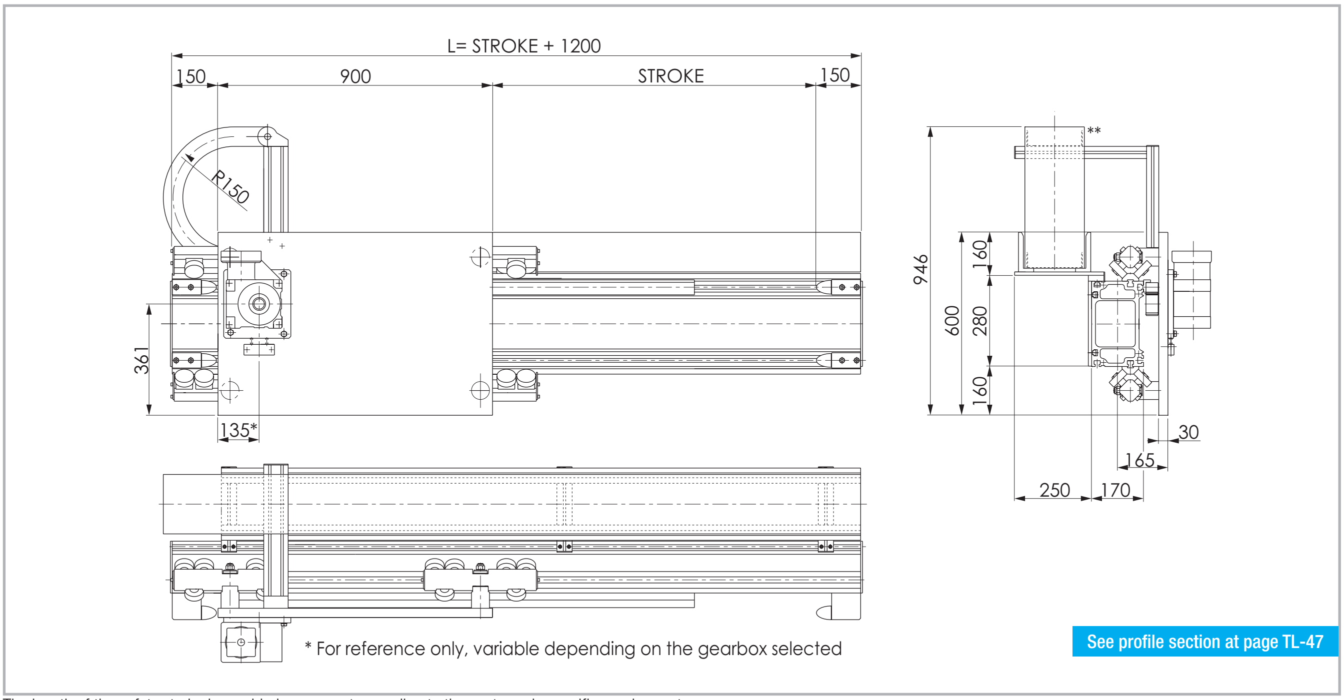
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 59

PAR 280P

PC
300 Kg — 800 Kg
High Cycle Rate — Low Cycle Rate

PAR 280P Dimension



See profile section at page TL-47

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 18

Technical data

	Type
	PAR 280P
Max. useful stroke length [mm]*1	10800
Max. positioning repeatability [mm]*2	± 0.1
Max. speed [m/s]	2.5
Max. acceleration [m/s²]	2
Rack module	m 4
Pinion pitch diameter [mm]	76.39 (106.1)
Carriage displacement per pinion turn [mm]	240 (333.33)
Carriage weight [kg]	88
Zero travel weight [kg]	173
Weight for 100 mm useful stroke [kg]	6.6
Rail size [mm]	55x25

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 60

Moments of inertia of the aluminum body

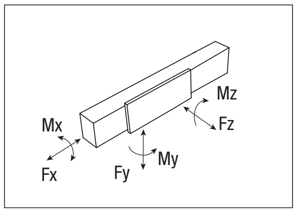
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
PAR 280P	12.646	4.829	17.475

Tab. 61

Rack specifications

Type	Type of rack	Rack module	Quality
PAR 280P	Helical teeth hardened ground	m 4	Q6

Tab. 62



Load capacity

Type	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
PAR 280P	10989	29981	149063	29981	8395	11108	11108

See verification under static load and lifetime on page SL-2 and SL-3

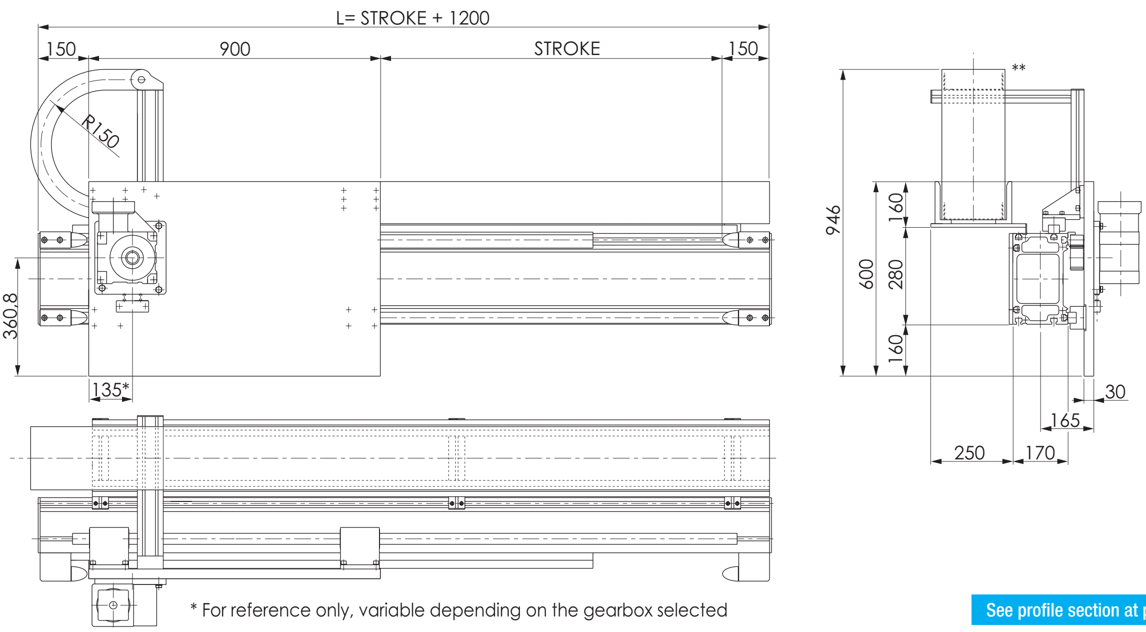
Tab. 63

PAS 280P

PC

300 Kg — High Cycle Rate — Low Cycle Rate — 800 Kg

PAS 280P Dimension



* For reference only, variable depending on the gearbox selected

See profile section at page TL-47

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 19

Technical data

	Type
	PAS 280P
Max. useful stroke length [mm]*1	10800
Max. positioning repeatability [mm]*2	± 0.1
Max. speed [m/s]	2.5
Max. acceleration [m/s²]	2
Rack module	m 4
Pinion pitch diameter [mm]	76.39 (106.1)
Carriage displacement per pinion turn [mm]	240 (333.33)
Carriage weight [kg]	76
Zero travel weight [kg]	159
Weight for 100 mm useful stroke [kg]	6.4
Rail size [mm]	35

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 64

Moments of inertia of the aluminum body

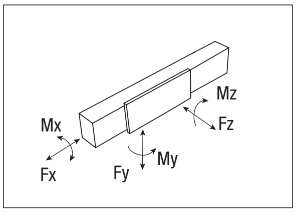
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
PAS 280P	12.646	4.829	17.475

Tab. 65

Rack specifications

Type	Type of rack	Rack module	Quality
PAS 280P	Helical teeth hardened ground	m 4	Q6

Tab. 66



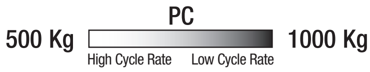
Load capacity

Type	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
PAS 280P	10989	386400	197790	386400	50232	150310	150310

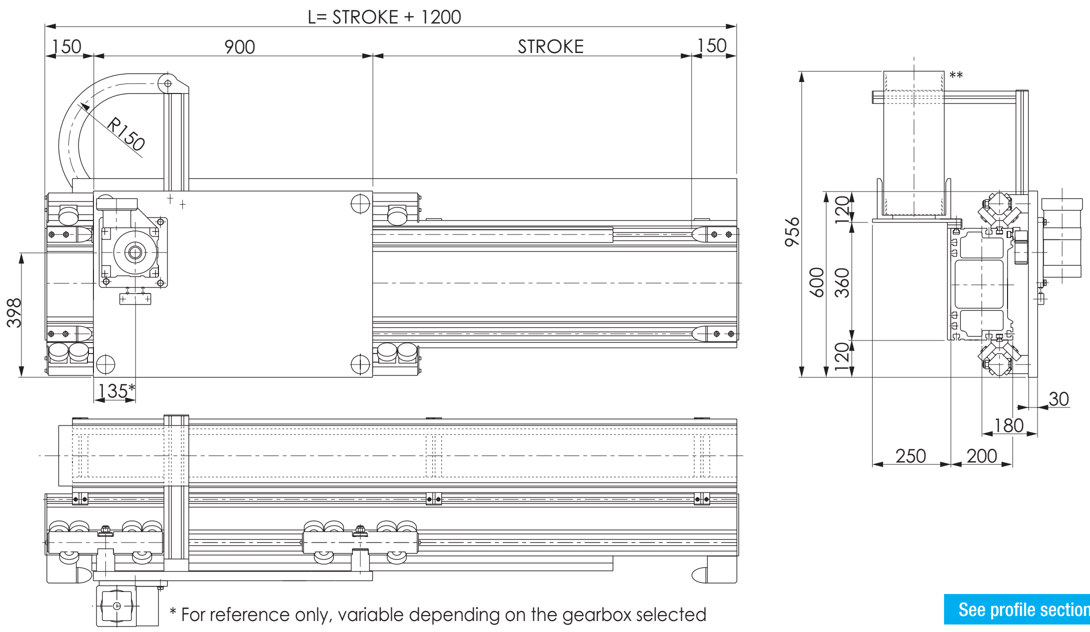
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 67

PAR 360



PAR 360 Dimension



See profile section at page TL-47

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 20

Technical data

	Type
	PAR 360
Max. useful stroke length [mm]*1	10800
Max. positioning repeatability [mm]*2	± 0.1
Max. speed [m/s]	2.5
Max. acceleration [m/s²]	2
Rack module	m 4
Pinion pitch diameter [mm]	76.39 (106.1)
Carriage displacement per pinion turn [mm]	240 (333.33)
Carriage weight [kg]	88
Zero travel weight [kg]	196
Weight for 100 mm useful stroke [kg]	8.5
Rail size [mm]	55x25

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 68

Moments of inertia of the aluminum body

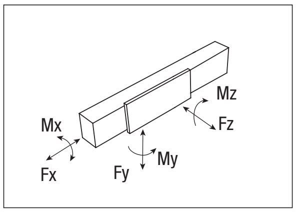
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
PAR 360	31.721	10.329	42.050

Tab. 69

Rack specifications

Type	Type of rack	Rack module	Quality
PAR 360	Helical teeth hardened ground	m 4	Q6

Tab. 70



Load capacity

Type	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
PAR 360	10989	29981	149063	29981	10793	11108	11108

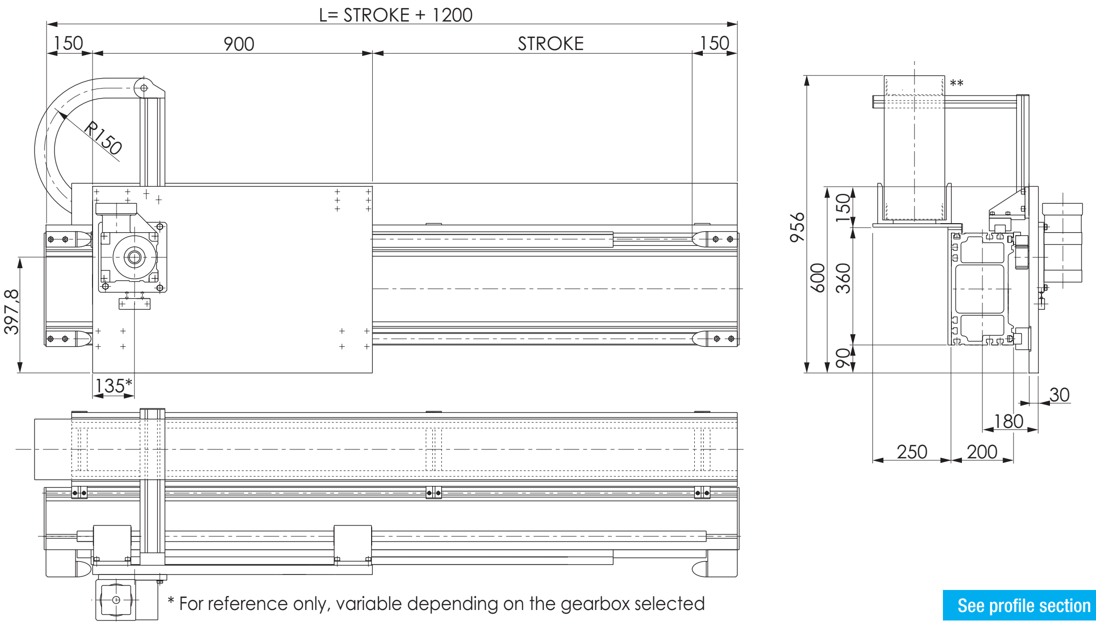
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 71

PAS 360

PC
500 Kg — 1000 Kg
High Cycle Rate — Low Cycle Rate

PAS 360 Dimension



* For reference only, variable depending on the gearbox selected

See profile section at page TL-47

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 21

Technical data

	Type
	PAS 360
Max. useful stroke length [mm]*1	10800
Max. positioning repeatability [mm]*2	± 0.1
Max. speed [m/s]	2.5
Max. acceleration [m/s²]	3
Rack module	m 4
Pinion pitch diameter [mm]	76.39 (106.1)
Carriage displacement per pinion turn [mm]	240 (333.33)
Carriage weight [kg]	76
Zero travel weight [kg]	182
Weight for 100 mm useful stroke [kg]	8.3
Rail size [mm]	35

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 72

Moments of inertia of the aluminum body

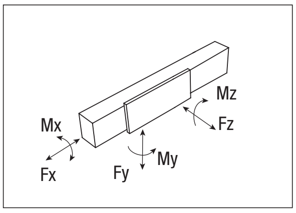
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
PAS 360	31.721	10.329	42.050

Tab. 73

Rack specifications

Type	Type of rack	Rack module	Quality
PAS 360	Helical teeth hardened ground	m 4	Q6

Tab. 74



Load capacity

Type	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
PAS 360	10989	386400	197790	386400	65688	150310	150310

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 75

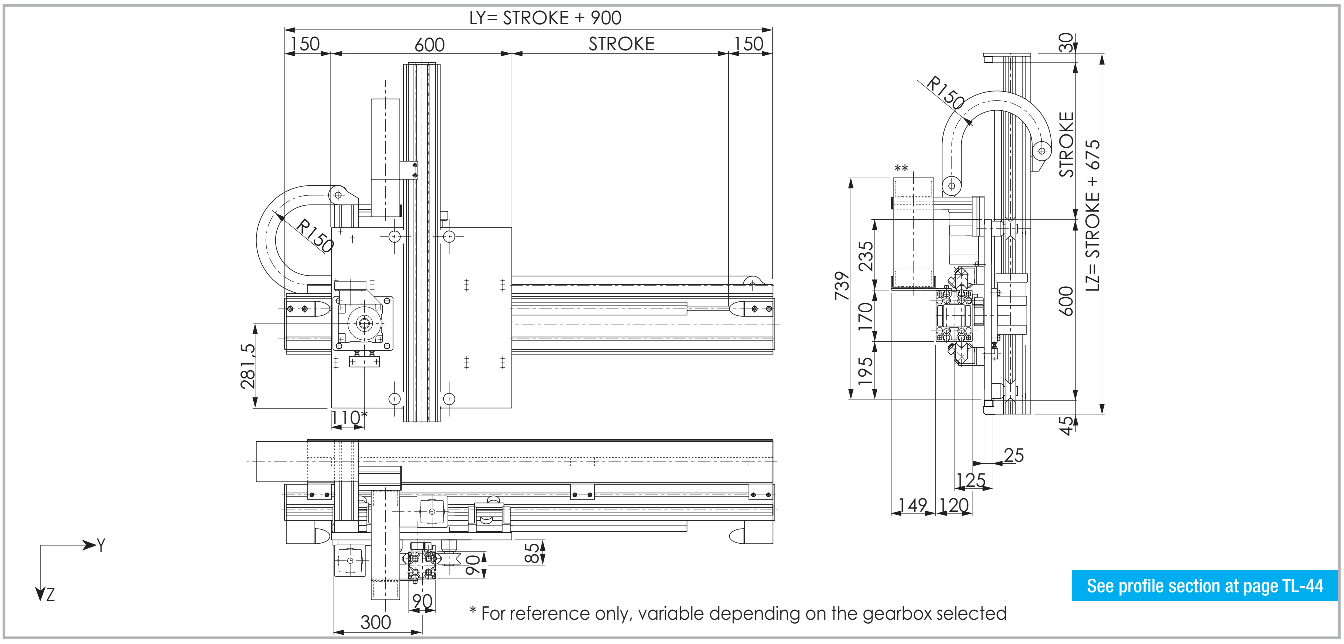
PAR 170/90

PC

25 Kg — 80 Kg

High Cycle Rate — Low Cycle Rate

PAR 170/90 Dimension



See profile section at page TL-44

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 22

Technical data

	Axis	
	Y-axis	Z-axis
Max. useful stroke length [mm]	11100*1	2000
Max. positioning repeatability [mm]	± 0.05	± 0.20*2
Max. speed [m/s]	3.5	3.5
Max. acceleration [m/s²]	10	7
Rack module	m 3	m 2
Pinion pitch diameter [mm]	63.66 (89.13)	44.56 (63.66)
Carriage displacement per pinion turn [mm]	200 (280)	140 (200)
Carriage weight [kg]	44	
Zero travel weight [kg]	88	
Weight for 100 mm useful stroke [kg]	3.1	1.5
Rail size [mm]	35x16	28x11

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Reference value considering a stroke of 1000 mm on Z-axis.

Tab. 76

Moments of inertia of the aluminum body

Axis	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
Y-axis	1.973	0.984	2.957
Z-axis	0.197	0.195	0.392

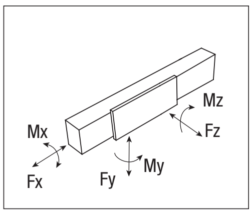
Tab. 77

Rack specifications

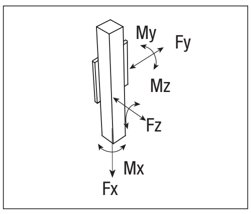
Axis	Type of rack	Rack module	Quality
Y-axis	Helical teeth hardened ground	m 3	Q6
Z-axis		m 2	

Tab. 78

PAR 170/90 - Y-axis



PAR 170/90 - Z-axis



Load capacity

Axis	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
Y-axis	5714	14142	65928	14142	1202	3076	3076
Z-axis	2902	2800	24216	2400	108	624	728

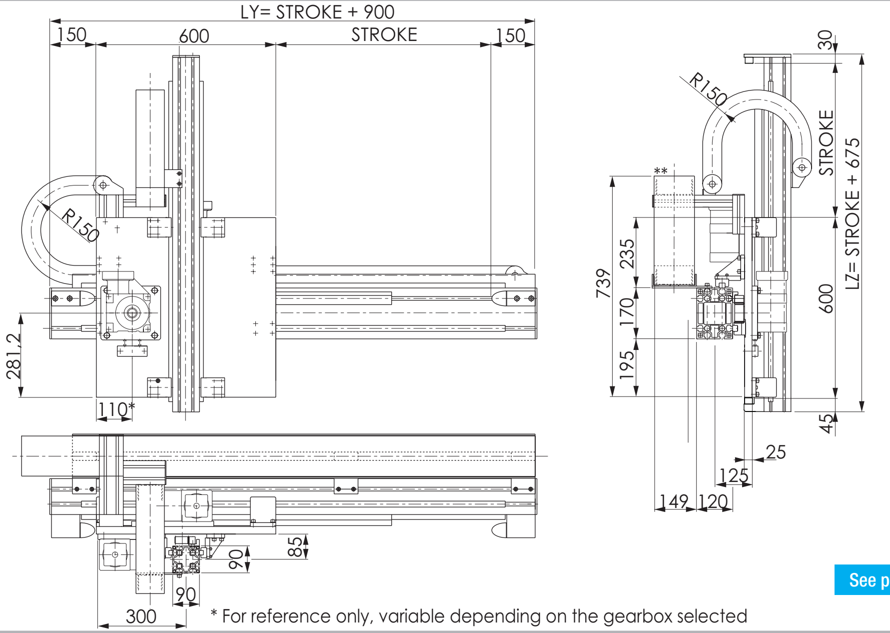
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 79

PAS 170/90

PC
25 Kg High Cycle Rate Low Cycle Rate 80 Kg

PAS 170/90 Dimension



See profile section at page TL-44

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 23

Technical data

	Axis	
	Y-axis	Z-axis
Max. useful stroke length [mm]	11100*1	2000
Max. positioning repeatability [mm]	± 0.05	± 0.1*2
Max. speed [m/s]	3.5	3.5
Max. acceleration [m/s²]	10	7
Rack module	m 3	m 2
Pinion pitch diameter [mm]	63.66 (89.13)	44.56 (63.66)
Carriage displacement per pinion turn [mm]	200 (280)	140 (200)
Carriage weight [kg]	43	
Zero travel weight [kg]	89	
Weight for 100 mm useful stroke [kg]	2.9	1.4
Rail size [mm]	20	15

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Reference value considering a stroke of 1000 mm on Z-axis.

Tab. 80

Moments of inertia of the aluminum body

Axis	I_x [10^7 mm⁴]	I_y [10^7 mm⁴]	I_p [10^7 mm⁴]
Y-axis	1.973	0.984	2.957
Z-axis	0.197	0.195	0.392

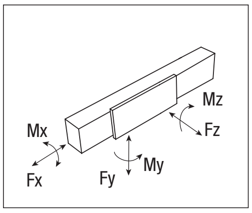
Tab. 81

Rack specifications

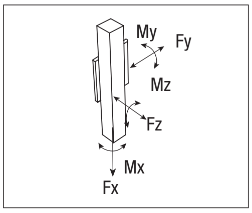
Axis	Type of rack	Rack module	Quality
Y-axis	Helical teeth hardened ground	m 3	Q6
Z-axis		m 2	

Tab. 82

PAS 170/90 - Y-axis



PAS 170/90 - Z-axis



Load capacity

Axis	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
Y-axis	5714	153600	70798	153600	10368	39552	39552
Z-axis	2902	96800	45082	96800	4356	25652	25652

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 83

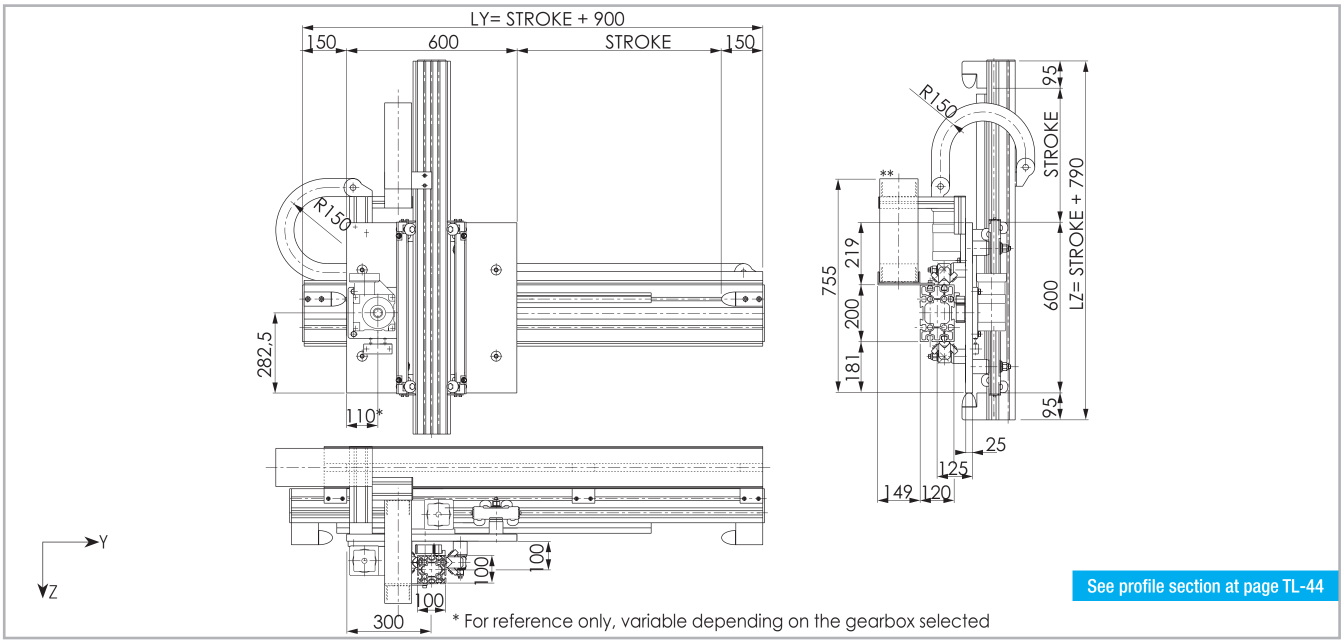
PAR 200/100

PC

25 Kg — 100 Kg

High Cycle Rate — Low Cycle Rate

PAR 200/100 Dimension



See profile section at page TL-44

The length of the safety stroke is provided on request according to the customer's specific requirements.

**Cable carrier offered as option

Fig. 24

Technical data

	Axis	
	Y-axis	Z-axis
Max. useful stroke length [mm]	11100*1	2200
Max. positioning repeatability [mm]	± 0.05	± 0.25*2
Max. speed [m/s]	3	3
Max. acceleration [m/s²]	7	7
Rack module	m 3	m 3
Pinion pitch diameter [mm]	63.66 (89.13)	63.66 (89.13)
Carriage displacement per pinion turn [mm]	200 (280)	200 (280)
Carriage weight [kg]	54	
Zero travel weight [kg]	111	
Weight for 100 mm useful stroke [kg]	3.5	2.4
Rail size [mm]	35x16	35x16

*1) It is possible to obtain longer stroke by means of special Rollon joints

*2) Reference value considering a stroke of 1000 mm on Z-axis.

Tab. 84

Moments of inertia of the aluminum body

Axis	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
Y-axis	3.270	1.289	4.586
Z-axis	0.364	0.346	0.709

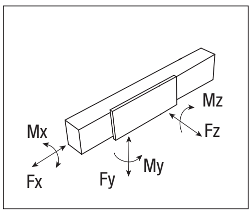
Tab. 85

Rack specifications

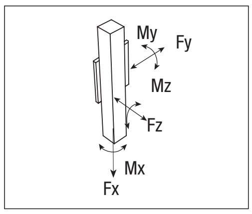
Axis	Type of rack	Rack module	Quality
Y-axis	Helical teeth hardened ground	m 3	Q6
Z-axis		m 3	

Tab. 86

PAR 200/100 - Y-axis



PAR 200/100 - Z-axis



Load capacity

Axis	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
Y-axis	5714	14142	65298	14142	1414	3536	3536
Z-axis	5714	7071	32964	7071	354	1867	1867

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 87

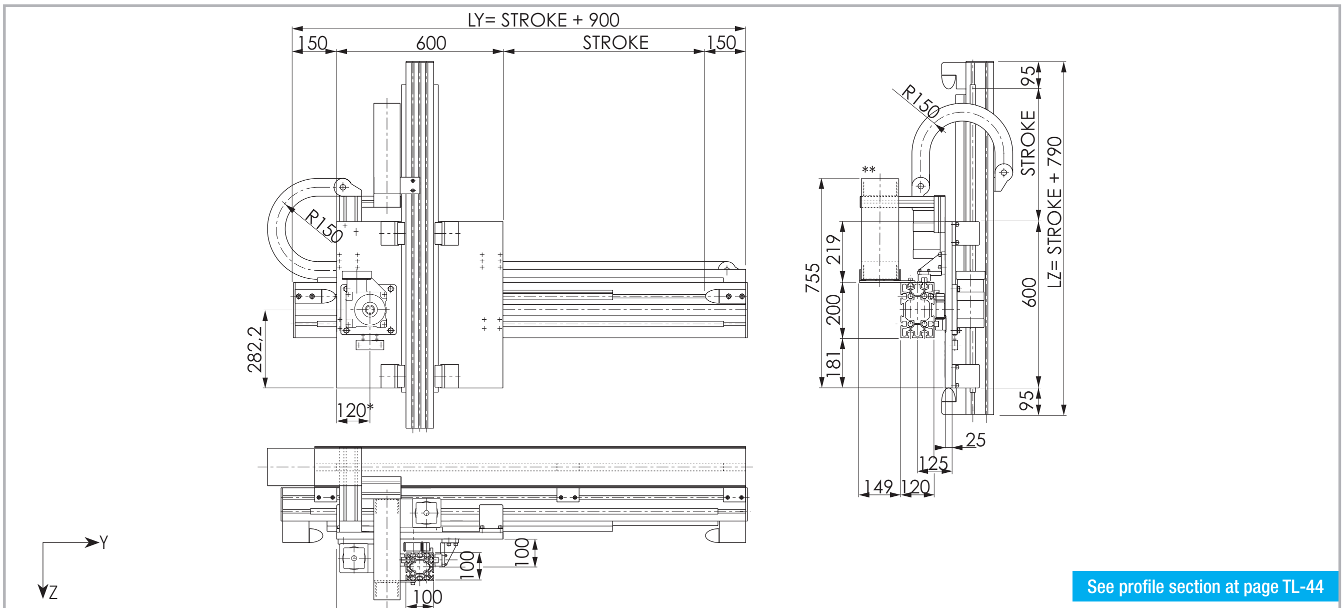
PAS 200/100

PC

25 Kg — 100 Kg

High Cycle Rate — Low Cycle Rate

PAS 200/100 Dimension



* For reference only, variable depending on the gearbox selected

See profile section at page TL-44

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 25

Technical data

	Axis	
	Y-axis	Z-axis
Max. useful stroke length [mm]	11100*1	2200
Max. positioning repeatability [mm]	± 0.05	± 0.1*2
Max. speed [m/s]	3	3
Max. acceleration [m/s²]	7	7
Rack module	m 3	m 3
Pinion pitch diameter [mm]	63.66 (89.13)	63.66 (89.13)
Carriage displacement per pinion turn [mm]	200 (280)	200 (280)
Carriage weight [kg]	45	
Zero travel weight [kg]	100	
Weight for 100 mm useful stroke [kg]	3.3	2.1
Rail size [mm]	20	20

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Reference value considering a stroke of 1000 mm on Z-axis.

Tab. 88

Moments of inertia of the aluminum body

Axis	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
Y-axis	3.270	1.289	4.586
Z-axis	0.364	0.346	0.709

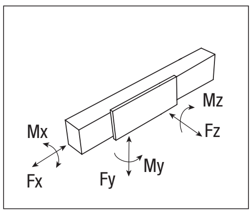
Tab. 89

Rack specifications

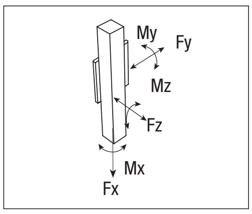
Axis	Type of rack	Rack module	Quality
Y-axis	Helical teeth hardened ground	m 3	Q6
Z-axis		m 3	

Tab. 90

PAS 200/100 - Y-axis



PAS 200/100 - Z-axis



Load capacity

Axis	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
Y-axis	5714	153600	70798	153600	11520	39552	39552
Z-axis	5714	153600	70798	153600	7680	40704	40704

See verification under static load and lifetime on page SL-2 and SL-3

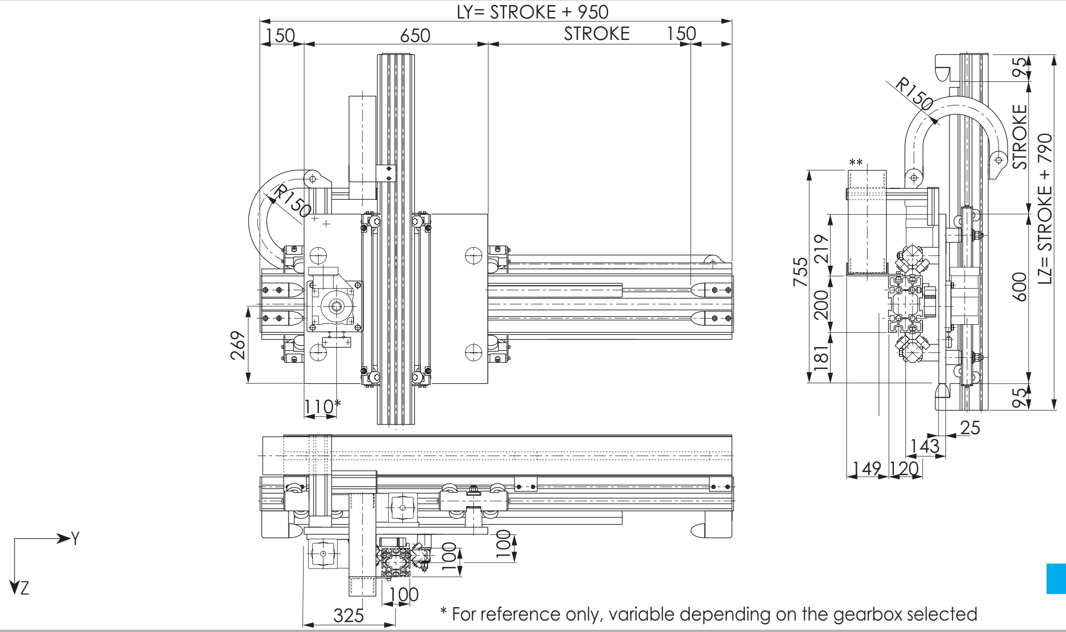
Tab. 91

PAR 200/100P

PC

25 Kg High Cycle Rate Low Cycle Rate 100 Kg

PAR 200/100 P Dimension



See profile section at page TL-44

* For reference only, variable depending on the gearbox selected

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 26

Technical data

	Axis	
	Y-axis	Z-axis
Max. useful stroke length [mm]	11050*1	2200
Max. positioning repeatability [mm]	± 0.05	± 0.25*2
Max. speed [m/s]	3	3
Max. acceleration [m/s²]	7	7
Rack module	m 4	m 3
Pinion pitch diameter [mm]	76.39 (106.1)	63.66 (89.13)
Carriage displacement per pinion turn [mm]	240 (333.33)	200 (280)
Carriage weight [kg]	69	
Zero travel weight [kg]	140	
Weight for 100 mm useful stroke [kg]	4.8	2.4
Rail size [mm]	55x25	35x16

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Reference value considering a stroke of 1000 mm on Z-axis.

Tab. 92

Moments of inertia of the aluminum body

Axis	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
Y-axis	3.270	1.289	4.586
Z-axis	0.364	0.346	0.709

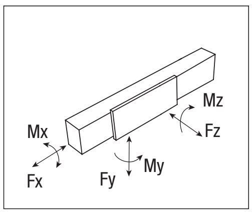
Tab. 93

Rack specifications

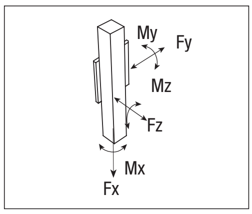
Axis	Type of rack	Rack module	Quality
Y-axis	Helical teeth hardened ground	m 4	Q6
Z-axis		m 3	

Tab. 94

PAR 200/100P - Y-axis



PAR 200/100P - Z-axis



Load capacity

Axis	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
Y-axis	10989	24042	112593	24042	2404	6611	6611
Z-axis	5714	7071	32964	7071	354	1867	1867

See verification under static load and lifetime on page SL-2 and SL-3

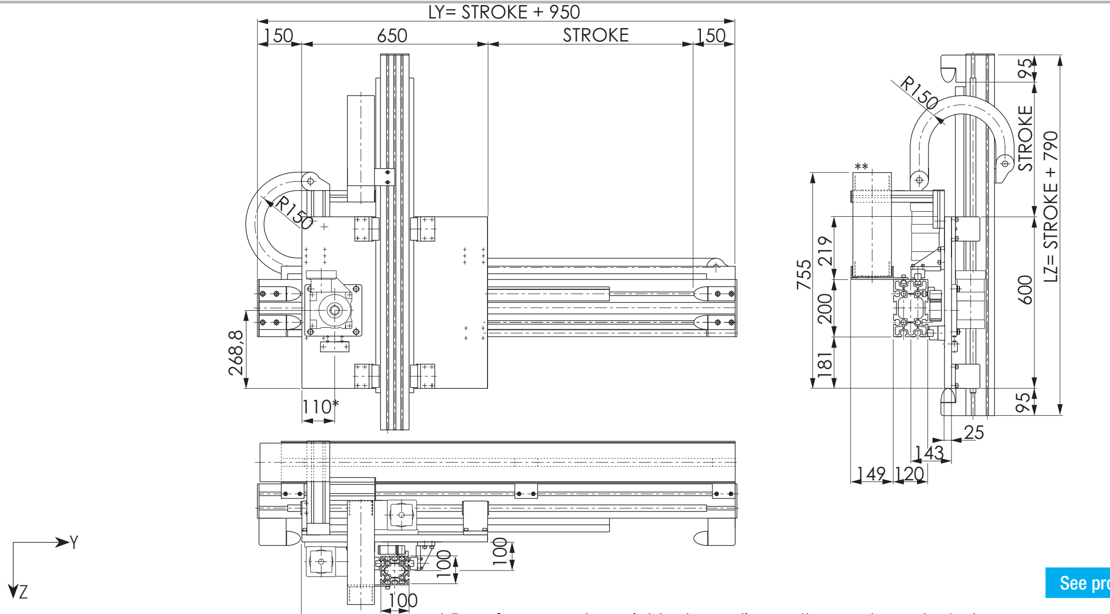
Tab. 95

PAS 200/100P

PC

25 Kg High Cycle Rate Low Cycle Rate 100 Kg

PAS 200/100P Dimension



* For reference only, variable depending on the gearbox selected

See profile section at page TL-44

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 27

Technical data

	Axis	
	Y-axis	Z-axis
Max. useful stroke length [mm]	11050*1	2200
Max. positioning repeatability [mm]	± 0.05	± 0.1*2
Max. speed [m/s]	3	3
Max. acceleration [m/s²]	7	7
Rack module	m 4	m 3
Pinion pitch diameter [mm]	76.39 (106.1)	63.66 (89.13
Carriage displacement per pinion turn [mm]	240 (333.33)	200 (280)
Carriage weight [kg]	59	
Zero travel weight [kg]	121	
Weight for 100 mm useful stroke [kg]	4.0	2.1
Rail size [mm]	25	20

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Reference value considering a stroke of 1000 mm on Z-axis.

Tab. 96

Moments of inertia of the aluminum body

Axis	I_x [10^7 mm⁴]	I_y [10^7 mm⁴]	I_p [10^7 mm⁴]
Y-axis	3.270	1.289	4.586
Z-axis	0.364	0.346	0.709

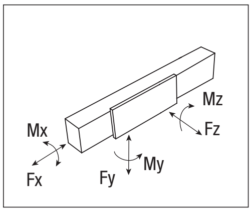
Tab. 97

Rack specifications

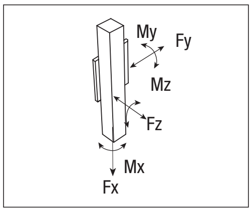
Axis	Type of rack	Rack module	Quality
Y-axis	Helical teeth hardened ground	m 4	Q6
Z-axis		m 3	

Tab. 98

PAS 200/100P - Y-axis



PAS 200/100P - Z-axis



Load capacity

Axis	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
Y-axis	10989	258800	116833	258800	19410	73111	73111
Z-axis	5714	153600	70798	153600	7680	40474	40474

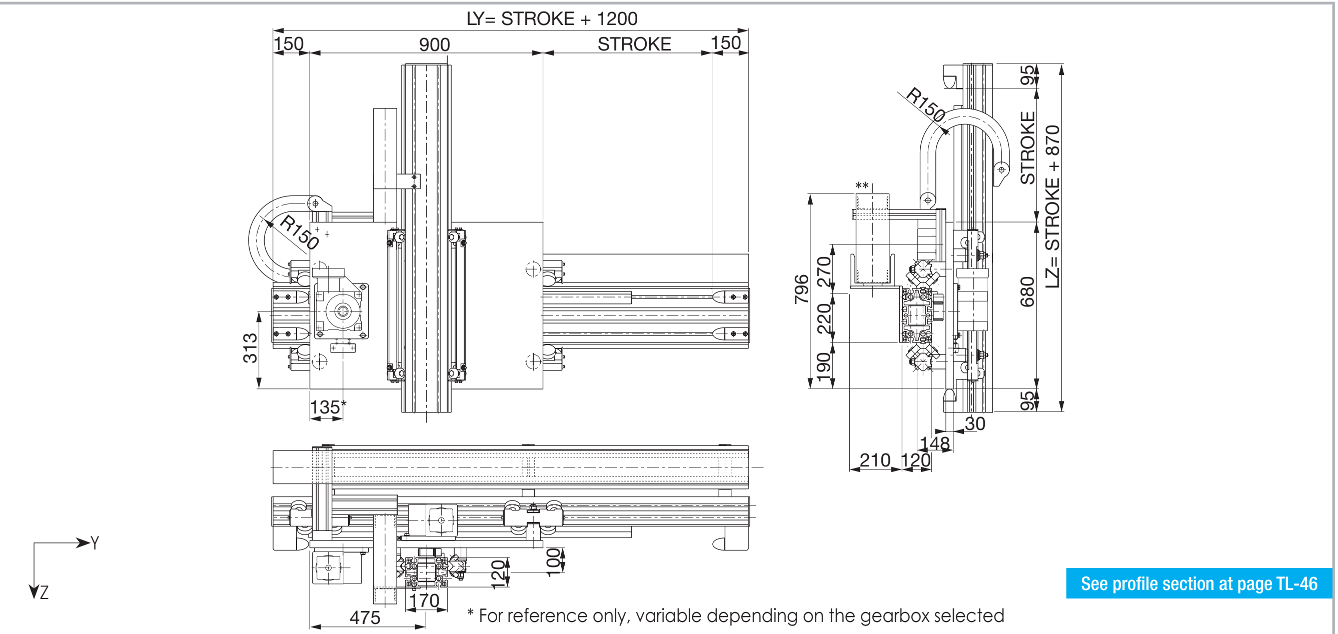
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 99

PAR 220/170

PC
60 Kg High Cycle Rate Low Cycle Rate 200 Kg

PAR 220/170 Dimension



See profile section at page TL-46

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 28

Technical data

	Axis	
	Y-axis	Z-axis
Max. useful stroke length [mm]	10800*1	2400
Max. positioning repeatability [mm]	± 0.05	± 0.25*2
Max. speed [m/s]	3	3
Max. acceleration [m/s²]	6	4
Rack module	m 4	m 3
Pinion pitch diameter [mm]	76.39 (106.1)	63.66 (89.13)
Carriage displacement per pinion turn [mm]	240 (333.33)	200 (280)
Carriage weight [kg]	98	
Zero travel weight [kg]	195	
Weight for 100 mm useful stroke [kg]	5.2	3.1
Rail size [mm]	55x25	35x16

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Reference value considering a stroke of 1000 mm on Z-axis.

Tab. 100

Moments of inertia of the aluminum body

Axis	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
Y-axis	4.625	1.559	6.184
Z-axis	1.973	0.984	2.957

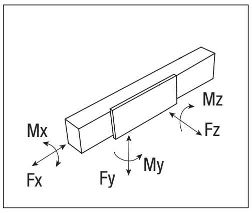
Tab. 101

Rack specifications

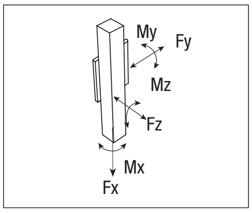
Axis	Type of rack	Rack module	Quality
Y-axis	Helical teeth hardened ground	m 4	Q6
Z-axis		m 3	

Tab. 102

PAR 220/170 - Y-axis



PAR 220/170 - Z-axis



Load capacity

Axis	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
Y-axis	10989	29981	149063	29981	3298	12307	12307
Z-axis	5714	7071	32964	7071	601	1867	1867

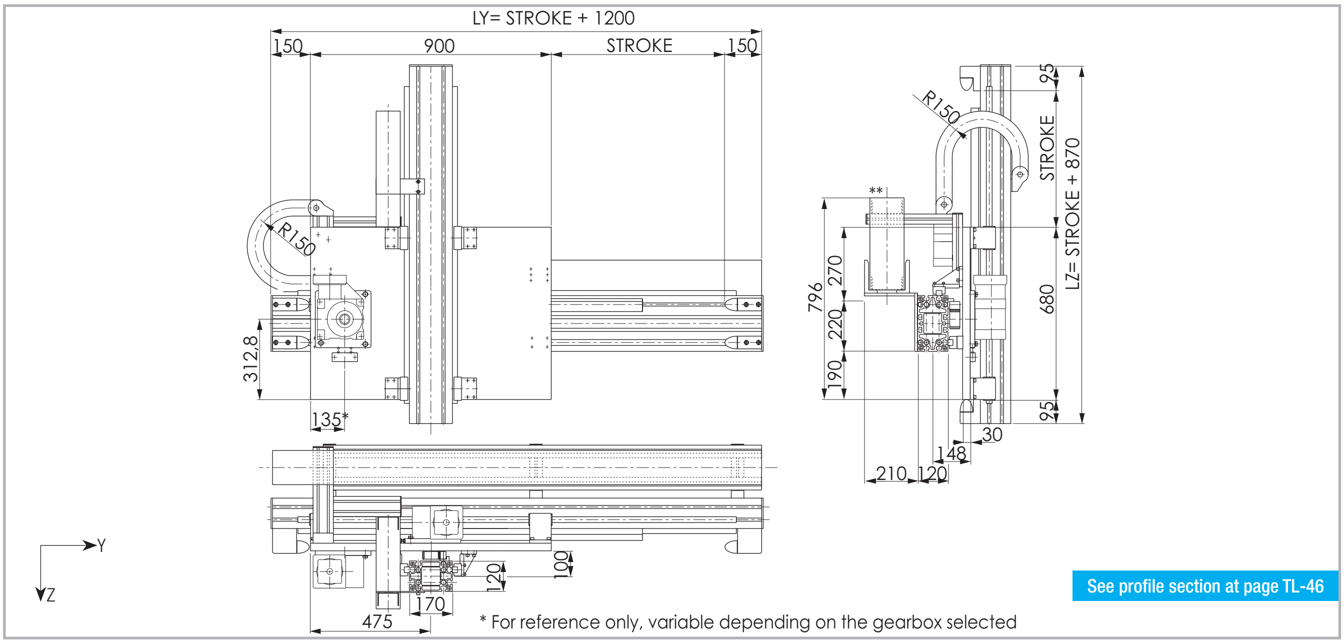
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 103

PAS 220/170

PC
60 Kg — 200 Kg
High Cycle Rate — Low Cycle Rate

PAS 220/170 Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 29

Technical data

	Axis	
	Y-axis	Z-axis
Max. useful stroke length [mm]	10800*1	2400
Max. positioning repeatability [mm]	± 0.05	± 0.1*2
Max. speed [m/s]	3	3
Max. acceleration [m/s²]	6	4
Rack module	m 4	m 3
Pinion pitch diameter [mm]	76.39 (106.1)	63.66 (89.13)
Carriage displacement per pinion turn [mm]	240 (333.33)	200 (280)
Carriage weight [kg]	95	
Zero travel weight [kg]	176	
Weight for 100 mm useful stroke [kg]	4.4	2.9
Rail size [mm]	25	25

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Reference value considering a stroke of 1000 mm on Z-axis.

Tab. 104

Moments of inertia of the aluminum body

Axis	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
Y-axis	4.625	1.559	6.184
Z-axis	1.973	0.984	2.957

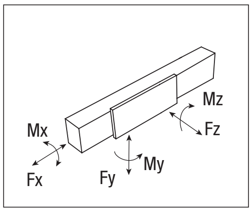
Tab. 105

Rack specifications

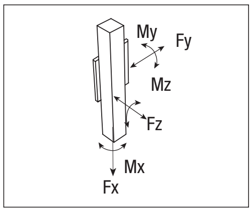
Axis	Type of rack	Rack module	Quality
Y-axis	Helical teeth hardened ground	m 4	Q6
Z-axis		m 3	

Tab. 106

PAS 220/170 - Y-axis



PAS 220/170 - Z-axis



Load capacity

Axis	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
Y-axis	10989	258800	116833	258800	23939	105461	105461
Z-axis	5714	258800	116833	258800	21998	76993	76993

See verification under static load and lifetime on page SL-2 and SL-3

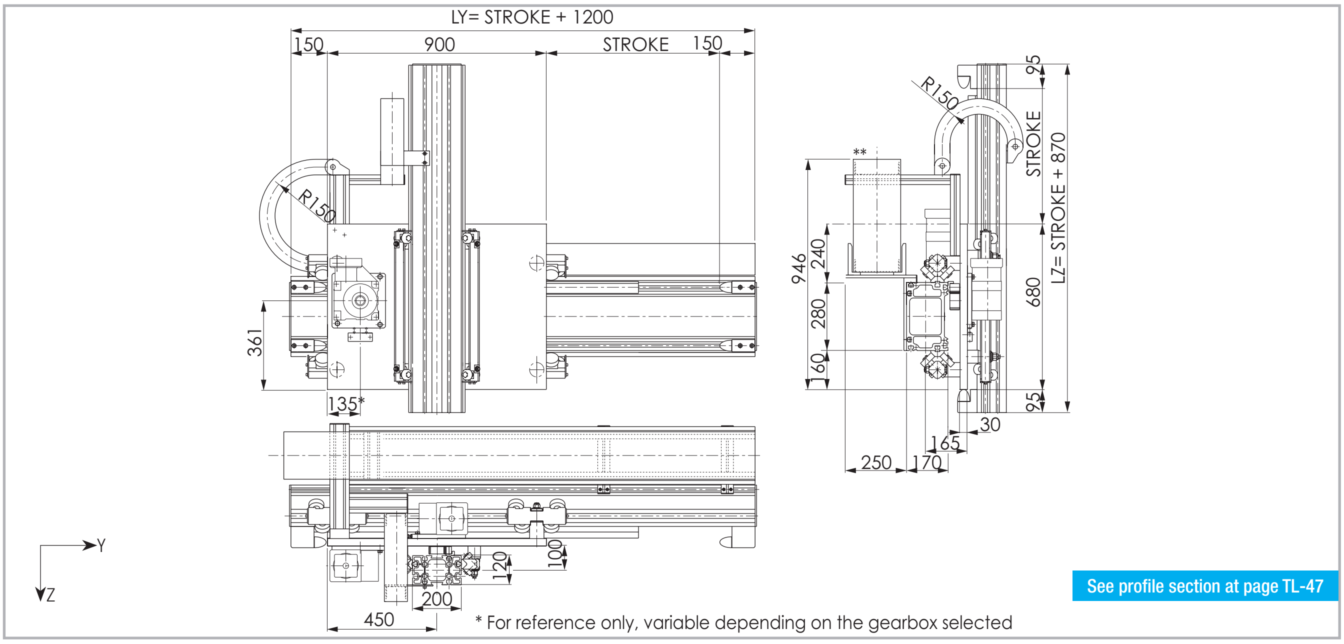
Tab. 107

PAR 280/200

PC

100 Kg — High Cycle Rate — Low Cycle Rate — 200 Kg

PAR 280/200 Dimension



See profile section at page TL-47

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 30

Technical data

	Axis	
	Y-axis	Z-axis
Max. useful stroke length [mm]	10800*1	2600
Max. positioning repeatability [mm]	± 0.05	± 0.25*2
Max. speed [m/s]	3	3
Max. acceleration [m/s²]	4	4
Rack module	m 4	m 3
Pinion pitch diameter [mm]	76.39 (106.1)	63.66 (89.13)
Carriage displacement per pinion turn [mm]	240 (333.33)	200 (280)
Carriage weight [kg]	99	
Zero travel weight [kg]	220	
Weight for 100 mm useful stroke [kg]	6.6	3.5
Rail size [mm]	55x25	35x16

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Reference value considering a stroke of 1000 mm on Z-axis.

Tab. 108

Moments of inertia of the aluminum body

Axis	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
Y-axis	12.646	4.829	17.475
Z-axis	3.270	1.289	4.586

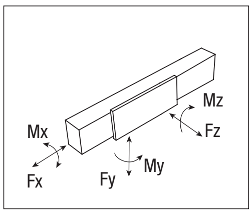
Tab. 109

Rack specifications

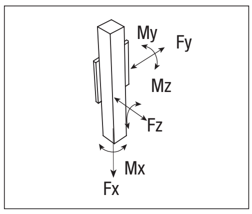
Axis	Type of rack	Rack module	Quality
Y-axis	Helical teeth hardened ground	m 4	Q6
Z-axis		m 3	

Tab. 110

PAR 280/200 - Y-axis



PAR 280/200 - Z-axis



Load capacity

Axis	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
Y-axis	10989	29981	149063	29981	4197	12307	12307
Z-axis	5714	7071	32964	7071	707	1867	1867

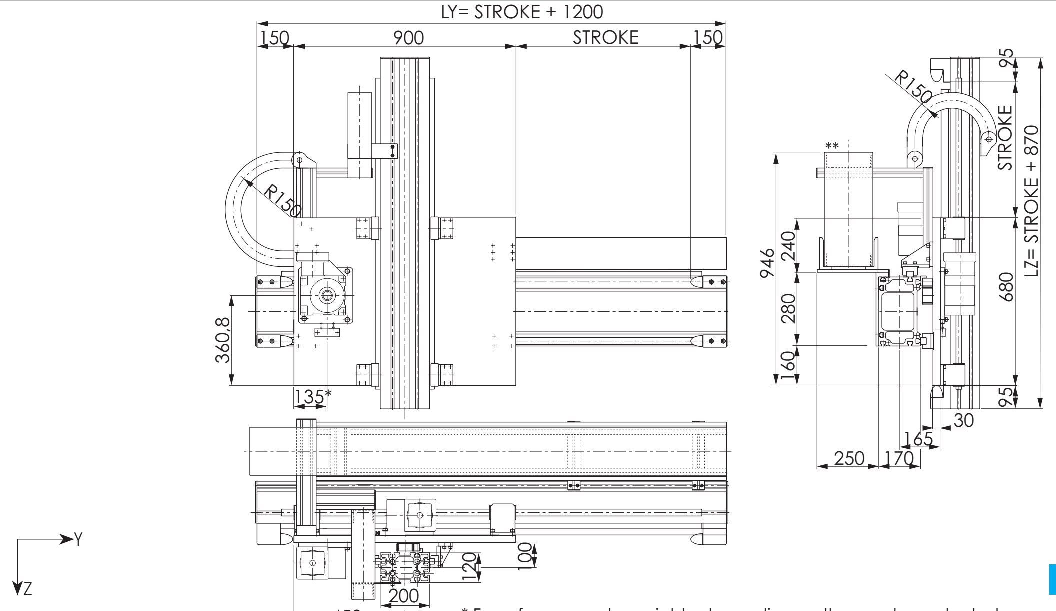
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 111

PAS 280/200

PC
100 Kg — 200 Kg
High Cycle Rate — Low Cycle Rate

PAS 280/200 Dimension



* For reference only, variable depending on the gearbox selected

See profile section at page TL-47

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 31

Technical data

	Axis	
	Y-axis	Z-axis
Max. useful stroke length [mm]	10800*1	2600
Max. positioning repeatability [mm]	± 0.05	± 0.1*2
Max. speed [m/s]	3	3
Max. acceleration [m/s²]	4	4
Rack module	m 4	m 3
Pinion pitch diameter [mm]	76.39 (106.1)	63.66 (89.13)
Carriage displacement per pinion turn [mm]	240 (333.33)	200 (280)
Carriage weight [kg]	86	
Zero travel weight [kg]	202	
Weight for 100 mm useful stroke [kg]	6.0	3.4
Rail size [mm]	30	25

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Reference value considering a stroke of 1000 mm on Z-axis.

Tab. 112

Moments of inertia of the aluminum body

Axis	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
Y-axis	12.646	4.829	17.475
Z-axis	3.270	1.289	4.586

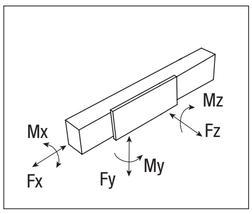
Tab. 113

Rack specifications

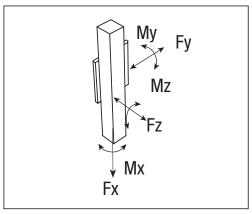
Axis	Type of rack	Rack module	Quality
Y-axis	Helical teeth hardened ground	m 4	Q6
Z-axis		m 3	

Tab. 114

PAS 280/200 - Y-axis



PAS 280/200 - Z-axis



Load capacity

Axis	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
Y-axis	10989	266400	142231	266400	34632	105228	105228
Z-axis	5714	258800	116833	258800	25880	76993	76993

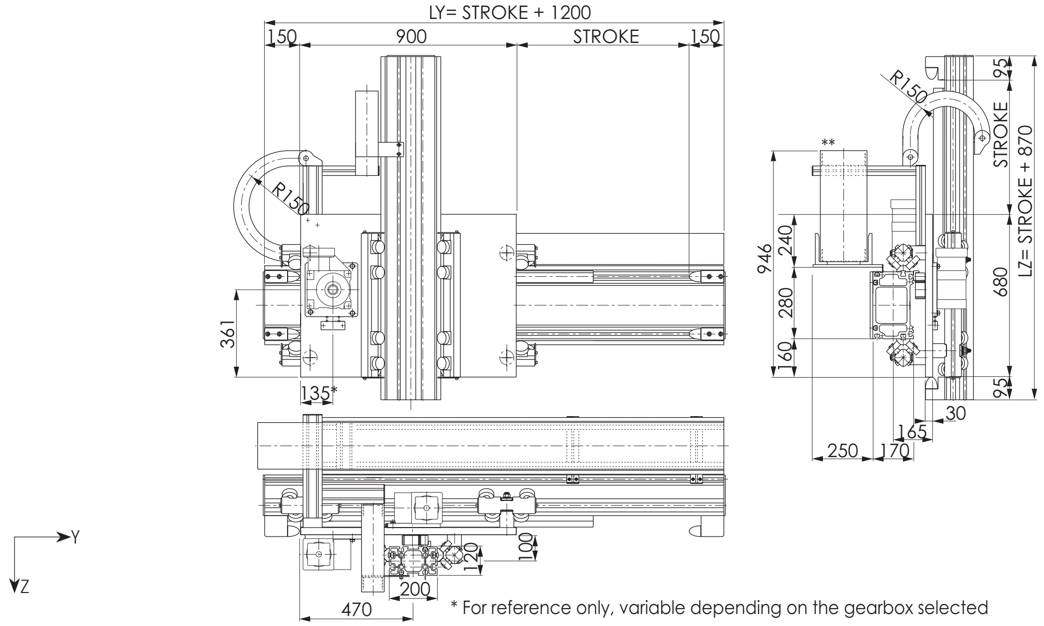
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 115

PAR 280/200P

PC
100 Kg High Cycle Rate Low Cycle Rate 400 Kg

PAR 280/200P Dimension



* For reference only, variable depending on the gearbox selected

See profile section at page TL-47

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 32

Technical data

	Axis	
	Y-axis	Z-axis
Max. useful stroke length [mm]	10800*1	2600
Max. positioning repeatability [mm]	± 0.05	± 0.25*2
Max. speed [m/s]	3	2
Max. acceleration [m/s²]	4	3
Rack module	m 4	m 4
Pinion pitch diameter [mm]	76.39 (106.1)	76.39 (106.1)
Carriage displacement per pinion turn [mm]	240 (333.33)	240 (333.33)
Carriage weight [kg]	112	
Zero travel weight [kg]	244	
Weight for 100 mm useful stroke [kg]	6.6	4.8
Rail size [mm]	55x25	55x25

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Reference value considering a stroke of 1000 mm on Z-axis.

Tab. 116

Moments of inertia of the aluminum body

Axis	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
Y-axis	12.646	4.829	17.475
Z-axis	3.270	1.289	4.586

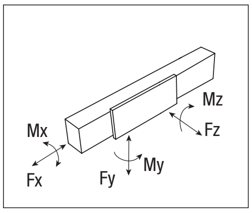
Tab. 117

Rack specifications

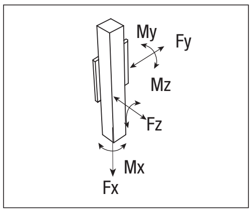
Axis	Type of rack	Rack module	Quality
Y-axis	Helical teeth hardened ground	m 4	Q6
Z-axis		m 4	

Tab. 118

PAR 280/200P - Y-axis



PAR 280/200P - Z-axis



Load capacity

Axis	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
Y-axis	10989	29981	149063	29981	4197	12307	12307
Z-axis	10989	24042	112593	24042	2404	4568	4568

See verification under static load and lifetime on page SL-2 and SL-3

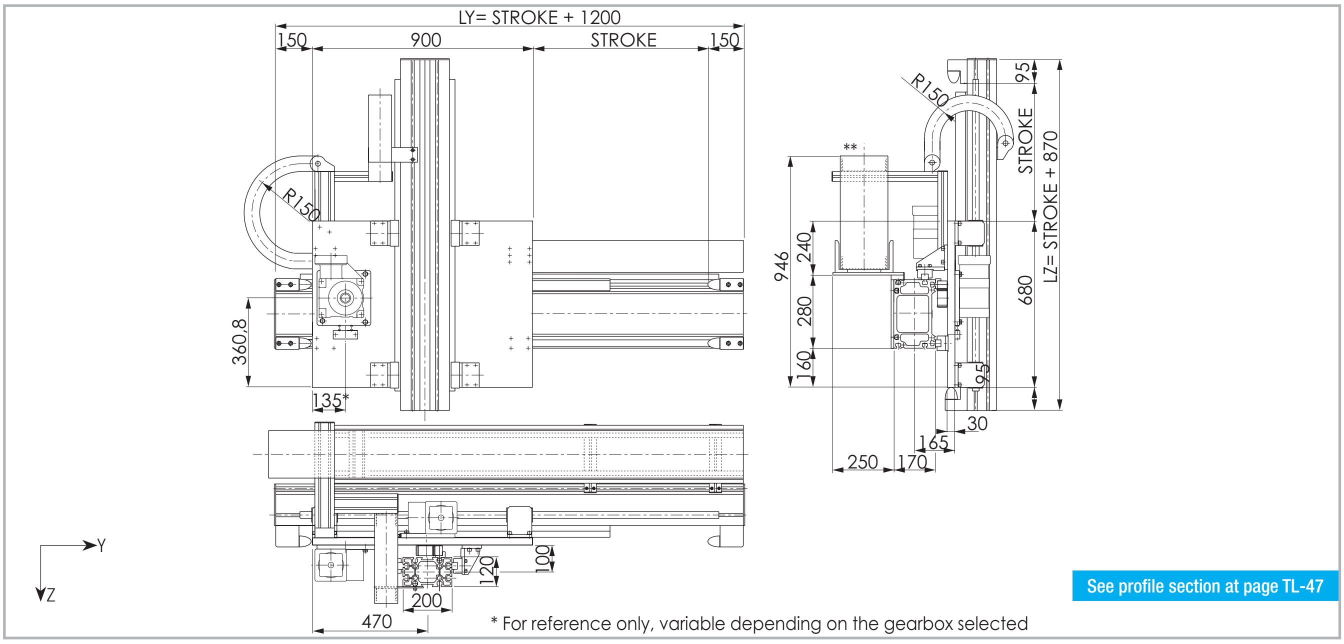
Tab. 119

PAS 280/200P

PC

100 Kg — High Cycle Rate — Low Cycle Rate — 400 Kg

PAS 280/200P Dimension



See profile section at page TL-47

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 33

Technical data

	Axis	
	Y-axis	Z-axis
Max. useful stroke length [mm]	10800*1	2600
Max. positioning repeatability [mm]	± 0.05	± 0.1*2
Max. speed [m/s]	3	2
Max. acceleration [m/s²]	4	3
Rack module	m 4	m 4
Pinion pitch diameter [mm]	76.39 (106.1)	76.39 (106.1)
Carriage displacement per pinion turn [mm]	240 (333.33)	240 (333.33)
Carriage weight [kg]	105	
Zero travel weight [kg]	217	
Weight for 100 mm useful stroke [kg]	6.0	3.9
Rail size [mm]	30	25

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Reference value considering a stroke of 1000 mm on Z-axis.

Tab. 120

Moments of inertia of the aluminum body

Axis	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
Y-axis	12.646	4.829	17.475
Z-axis	3.270	1.289	4.586

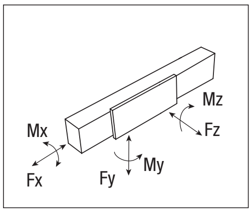
Tab. 121

Rack specifications

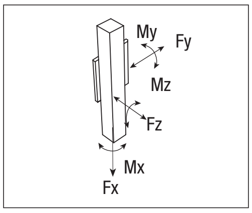
Axis	Type of rack	Rack module	Quality
Y-axis	Helical teeth hardened ground	m 4	Q6
Z-axis		m 4	

Tab. 122

PAS 280/200P - Y-axis



PAS 280/200P - Z-axis



Load capacity

Axis	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
Y-axis	10989	266400	142231	266400	34632	105228	105228
Z-axis	10989	258800	116833	258800	25880	76993	76993

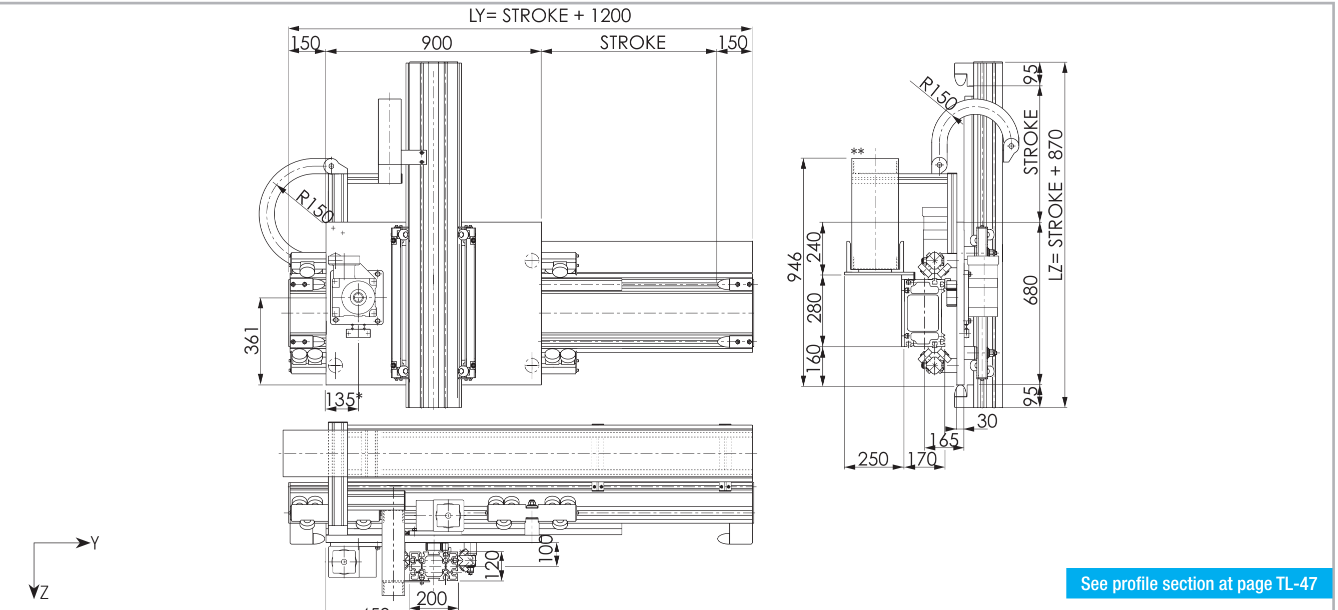
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 123

PAR 280/200E

100 Kg — PC — 300 Kg
High Cycle Rate — Low Cycle Rate

PAR 280/200E Dimension



* For reference only, variable depending on the gearbox selected

See profile section at page TL-47

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 34

Technical data

	Axis	
	Y-axis	Z-axis
Max. useful stroke length [mm]	10800*1	2600
Max. positioning repeatability [mm]	± 0.1	± 0.25*2
Max. speed [m/s]	2.5	2
Max. acceleration [m/s²]	2.5	3
Rack module	m 4	m 3
Pinion pitch diameter [mm]	76.39 (106.1)	63.66 (89.13)
Carriage displacement per pinion turn [mm]	240 (333.33)	200 (280)
Carriage weight [kg]	111	
Zero travel weight [kg]	232	
Weight for 100 mm useful stroke [kg]	6.6	3.5
Rail size [mm]	55x25	35x16

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Reference value considering a stroke of 1000 mm on Z-axis.

Tab. 124

Moments of inertia of the aluminum body

Axis	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
Y-axis	12.646	4.829	17.475
Z-axis	3.270	1.289	4.586

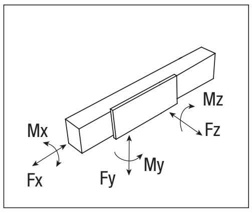
Tab. 125

Rack specifications

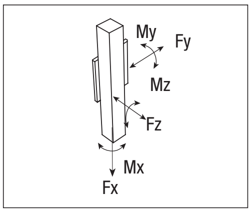
Axis	Type of rack	Rack module	Quality
Y-axis	Helical teeth hardened ground	m 4	Q6
Z-axis		m 3	

Tab. 126

PAR 280/200E - Y-axis



PAR 280/200E - Z-axis



Load capacity

Axis	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
Y-axis	10989	29981	149063	29981	8395	11108	11108
Z-axis	5714	7071	32964	7071	707	1867	1867

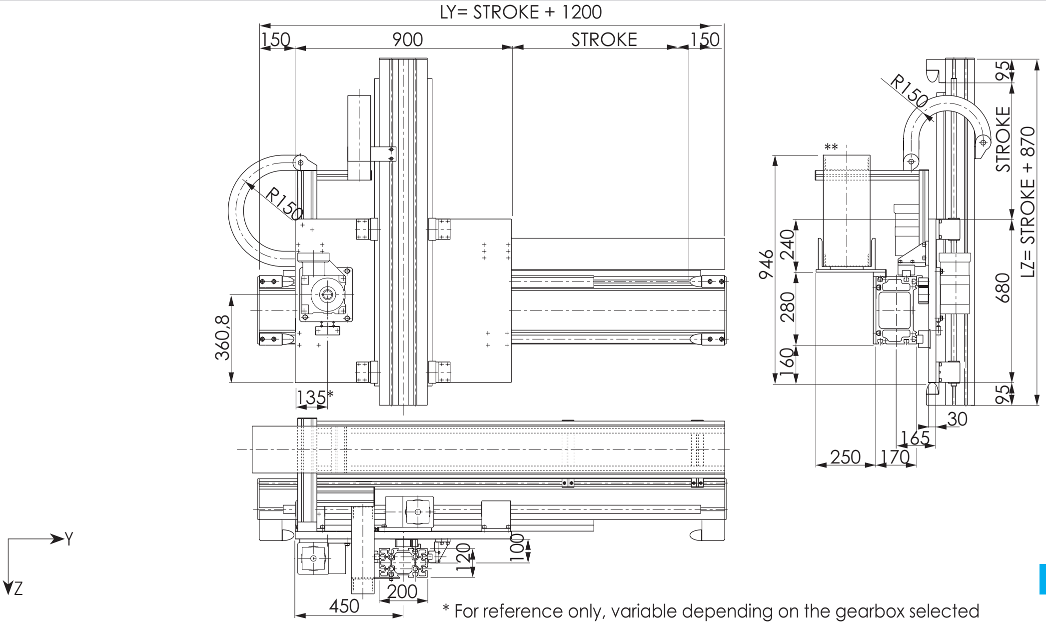
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 127

PAS 280/200E

PC
100 Kg High Cycle Rate Low Cycle Rate 300 Kg

PAS 280/200E Dimension



* For reference only, variable depending on the gearbox selected

See profile section at page TL-47

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 35

Technical data

	Axis	
	Y-axis	Z-axis
Max. useful stroke length [mm]	10800*1	2600
Max. positioning repeatability [mm]	± 0.1	± 0.1*2
Max. speed [m/s]	2.5	2
Max. acceleration [m/s²]	2.5	3
Rack module	m 4	m 3
Pinion pitch diameter [mm]	76.39 (106.1)	63.66 (89.13)
Carriage displacement per pinion turn [mm]	240 (333.33)	200 (280)
Carriage weight [kg]	102	
Zero travel weight [kg]	220	
Weight for 100 mm useful stroke [kg]	6.4	3.4
Rail size [mm]	35	25

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Reference value considering a stroke of 1000 mm on Z-axis.

Tab. 128

Moments of inertia of the aluminum body

Axis	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
Y-axis	12.646	4.829	17.475
Z-axis	3.270	1.289	4.586

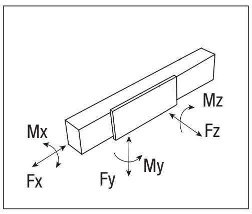
Tab. 129

Rack specifications

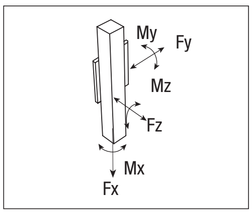
Axis	Type of rack	Rack module	Quality
Y-axis	Helical teeth hardened ground	m 4	Q6
Z-axis		m 3	

Tab. 130

PAS 280/200E - Y-axis



PAS 280/200E - Z-axis



Load capacity

Axis	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
Y-axis	10989	386400	197790	386400	50232	150310	150310
Z-axis	5714	258800	116833	258800	25880	76993	76993

See verification under static load and lifetime on page SL-2 and SL-3

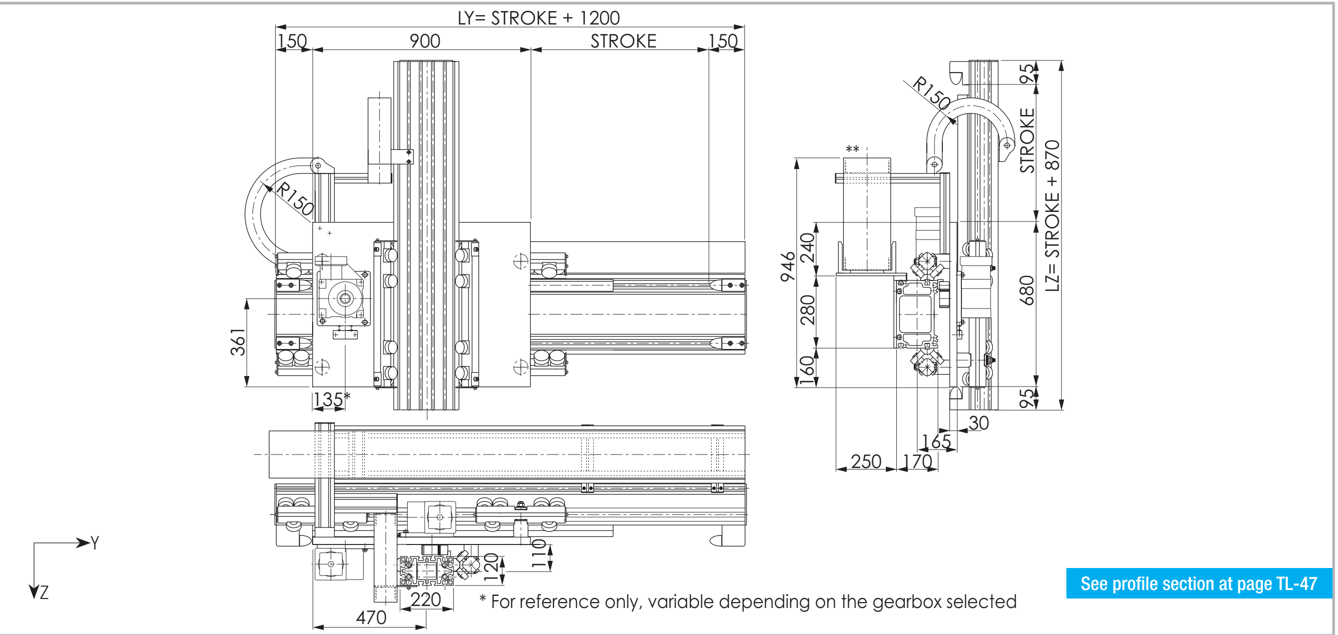
Tab. 131

PAR 280/220

PC

250 Kg High Cycle Rate Low Cycle Rate 600 Kg

PAR 280/220 Dimension



See profile section at page TL-47

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 36

Technical data

	Axis	
	Y-axis	Z-axis
Max. useful stroke length [mm]	10800*1	2800
Max. positioning repeatability [mm]	± 0.1	± 0.25*2
Max. speed [m/s]	2	2
Max. acceleration [m/s²]	2	2
Rack module	m 4	m 4
Pinion pitch diameter [mm]	76.39 (106.1)	76.39 (106.1)
Carriage displacement per pinion turn [mm]	240 (333.33)	240 (333.33)
Carriage weight [kg]	122	
Zero travel weight [kg]	260	
Weight for 100 mm useful stroke [kg]	6.6	5.2
Rail size [mm]	55x25	55x25

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Reference value considering a stroke of 1000 mm on Z-axis.

Tab. 132

Moments of inertia of the aluminum body

Axis	I_x [10^7 mm⁴]	I_y [10^7 mm⁴]	I_p [10^7 mm⁴]
Y-axis	12.646	4.829	17.475
Z-axis	4.625	1.559	6.184

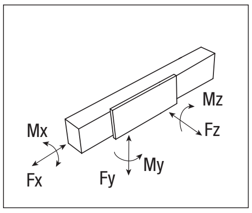
Tab. 133

Rack specifications

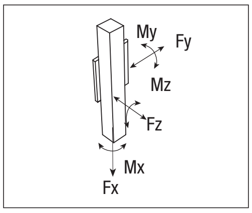
Axis	Type of rack	Rack module	Quality
Y-axis	Helical teeth hardened ground	m 4	Q6
Z-axis		m 4	

Tab. 134

PAR 280/220 - Y-axis



PAR 280/220 - Z-axis



Load capacity

Axis	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
Y-axis	10989	29981	149063	29981	8395	12307	12307
Z-axis	10989	24042	112593	24042	3298	4568	4568

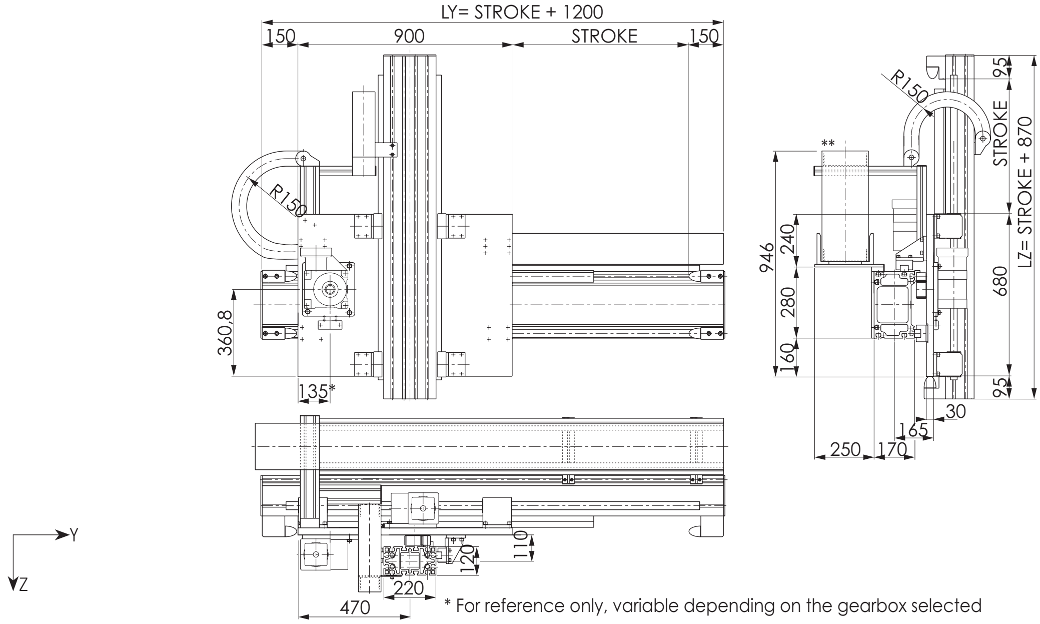
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 135

PAS 280/220

PC
250 Kg — 600 Kg
High Cycle Rate — Low Cycle Rate

PAS 280/220 Dimension



* For reference only, variable depending on the gearbox selected

See profile section at page TL-47

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 37

Technical data

	Axis	
	Y-axis	Z-axis
Max. useful stroke length [mm]	10800*1	2800
Max. positioning repeatability [mm]	± 0.1	± 0.15*2
Max. speed [m/s]	2	2
Max. acceleration [m/s²]	2	2
Rack module	m 4	m 4
Pinion pitch diameter [mm]	76.39 (106.1)	76.39 (106.1)
Carriage displacement per pinion turn [mm]	240 (333.33)	240 (333.33)
Carriage weight [kg]	102	
Zero travel weight [kg]	234	
Weight for 100 mm useful stroke [kg]	6.4	4.6
Rail size [mm]	35	30

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Reference value considering a stroke of 1000 mm on Z-axis.

Tab. 136

Moments of inertia of the aluminum body

Axis	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
Y-axis	12.646	4.829	17.475
Z-axis	4.625	1.559	6.184

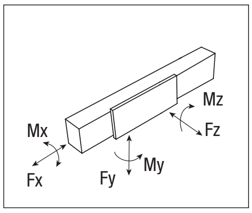
Tab. 137

Rack specifications

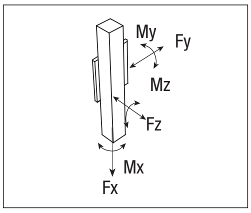
Axis	Type of rack	Rack module	Quality
Y-axis	Helical teeth hardened ground	m 4	Q6
Z-axis		m 4	

Tab. 138

PAS 280/220 - Y-axis



PAS 280/220 - Z-axis



Load capacity

Axis	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn	Stat.	Stat.	Stat.	Stat.
Y-axis	10989	386400	197790	386400	50232	150310	150310
Z-axis	10989	266400	142231	266400	29304	77256	77256

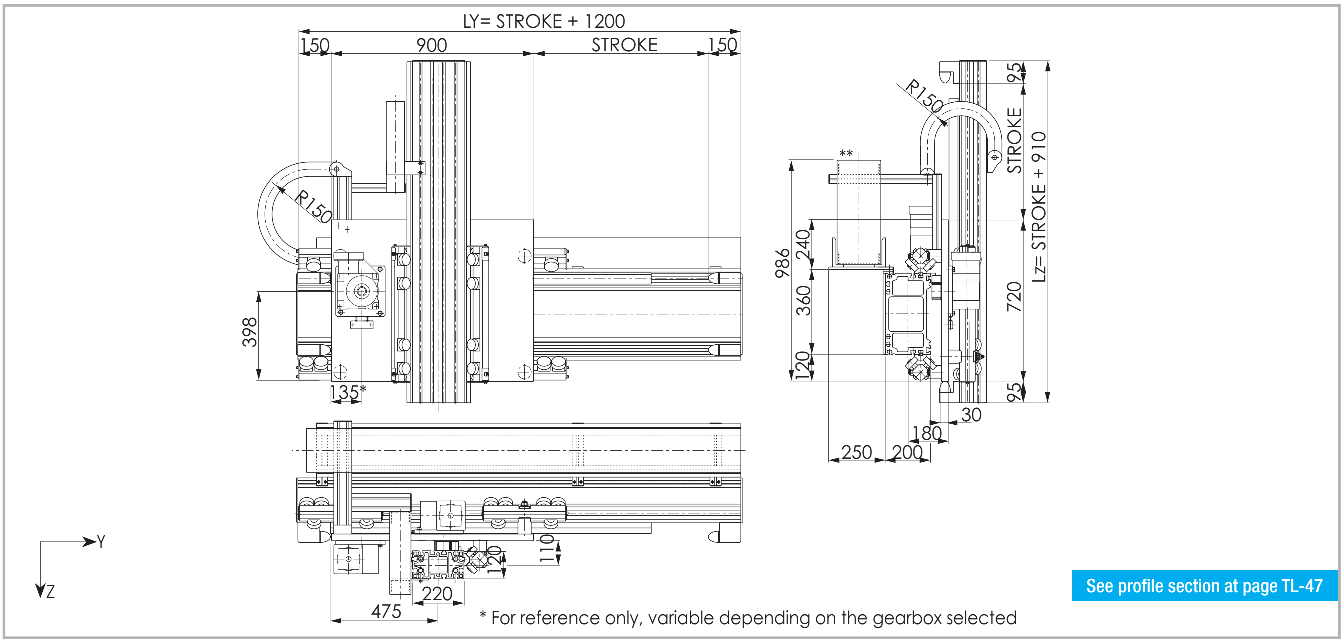
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 139

PAR 360/220

300 Kg — PC — 600 Kg
High Cycle Rate — Low Cycle Rate

PAR 360/220 Dimension



See profile section at page TL-47

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 38

Technical data

	Axis	
	Y-axis	Z-axis
Max. useful stroke length [mm]	10800*[1]	2800
Max. positioning repeatability [mm]	± 0.1	± 0.25*[2]
Max. speed [m/s]	2.5	2
Max. acceleration [m/s²]	2	2
Rack module	m 4	m 4
Pinion pitch diameter [mm]	76.39 (106.1)	76.39 (106.1)
Carriage displacement per pinion turn [mm]	240 (333.33)	240 (333.33)
Carriage weight [kg]	122	
Zero travel weight [kg]	283	
Weight for 100 mm useful stroke [kg]	8.5	5.2
Rail size [mm]	55x25	55x25

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Reference value considering a stroke of 1000 mm on Z-axis.

Tab. 140

Moments of inertia of the aluminum body

Axis	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
Y-axis	31.721	10.329	42.050
Z-axis	4.625	1.559	6.184

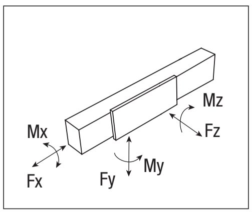
Tab. 141

Rack specifications

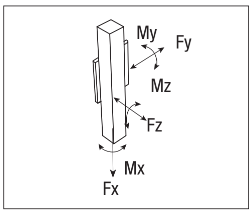
Axis	Type of rack	Rack module	Quality
Y-axis	Helical teeth hardened ground	m 4	Q6
Z-axis		m 4	

Tab. 142

PAR 360/220 - Y-axis



PAR 360/220 - Z-axis



Load capacity

Axis	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
Y-axis	10989	29981	149063	29981	10793	11108	11108
Z-axis	10989	24042	112593	24042	3298	4568	4568

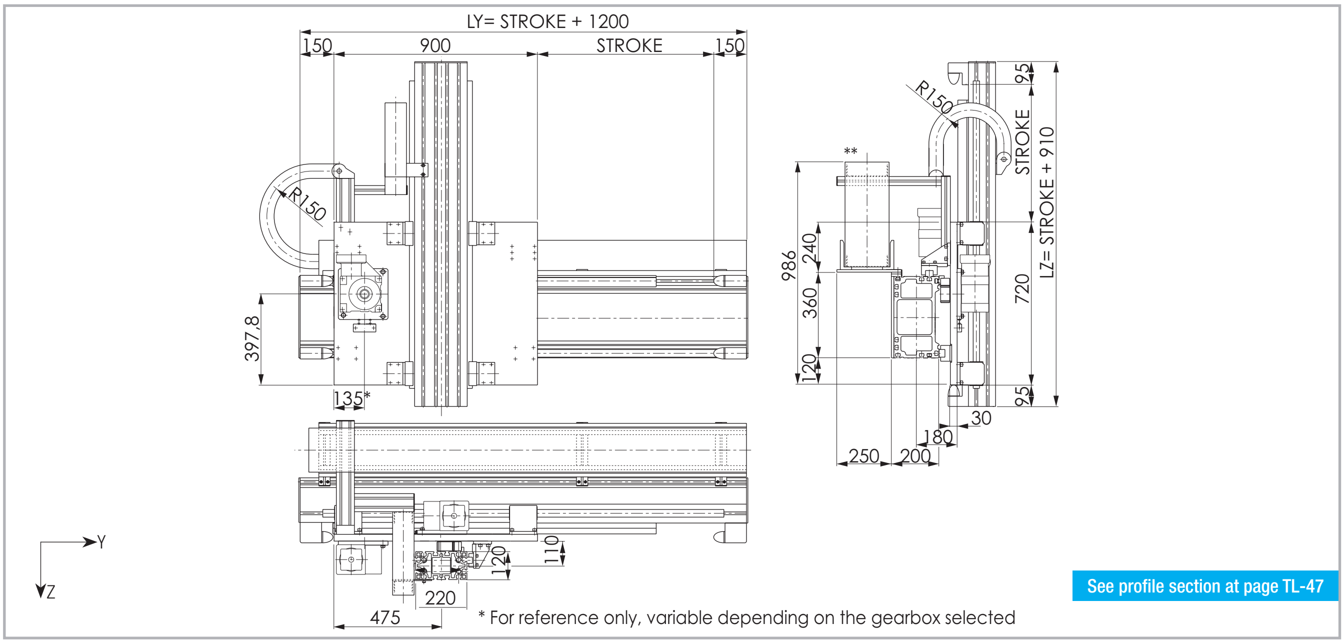
See verification under static load and lifetime on page SL-2 and SL-3

Tab. 143

PAS 360/220

PC
300 Kg High Cycle Rate Low Cycle Rate 600 Kg

PAS 360/220 Dimension



See profile section at page TL-47

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 39

Technical data

	Axis	
	Y-axis	Z-axis
Max. useful stroke length [mm]	10800*1	2800
Max. positioning repeatability [mm]	± 0.1	± 0.15*2
Max. speed [m/s]	2.5	2
Max. acceleration [m/s²]	2	2
Rack module	m 4	m 4
Pinion pitch diameter [mm]	76.39 (106.1)	76.39 (106.1)
Carriage displacement per pinion turn [mm]	240 (333.33)	240 (333.33)
Carriage weight [kg]	102	
Zero travel weight [kg]	260	
Weight for 100 mm useful stroke [kg]	8.3	4.6
Rail size [mm]	35	30

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Reference value considering a stroke of 1000 mm on Z-axis.

Tab. 144

Moments of inertia of the aluminum body

Axis	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
Y-axis	31.721	10.329	42.050
Z-axis	4.625	1.559	6.184

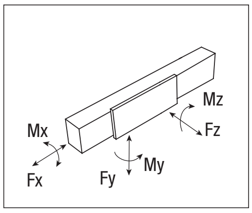
Tab. 145

Rack specifications

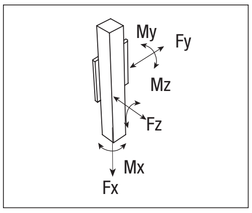
Axis	Type of rack	Rack module	Quality
Y-axis	Helical teeth hardened ground	m 4	Q6
Z-axis		m 4	

Tab. 146

PAS 360/220 - Y-axis



PAS 360/220 - Z-axis



Load capacity

Axis	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
Y-axis	10989	386400	197790	386400	65688	150310	150310
Z-axis	10989	266400	142231	266400	29304	82584	82584

See verification under static load and lifetime on page SL-2 and SL-3

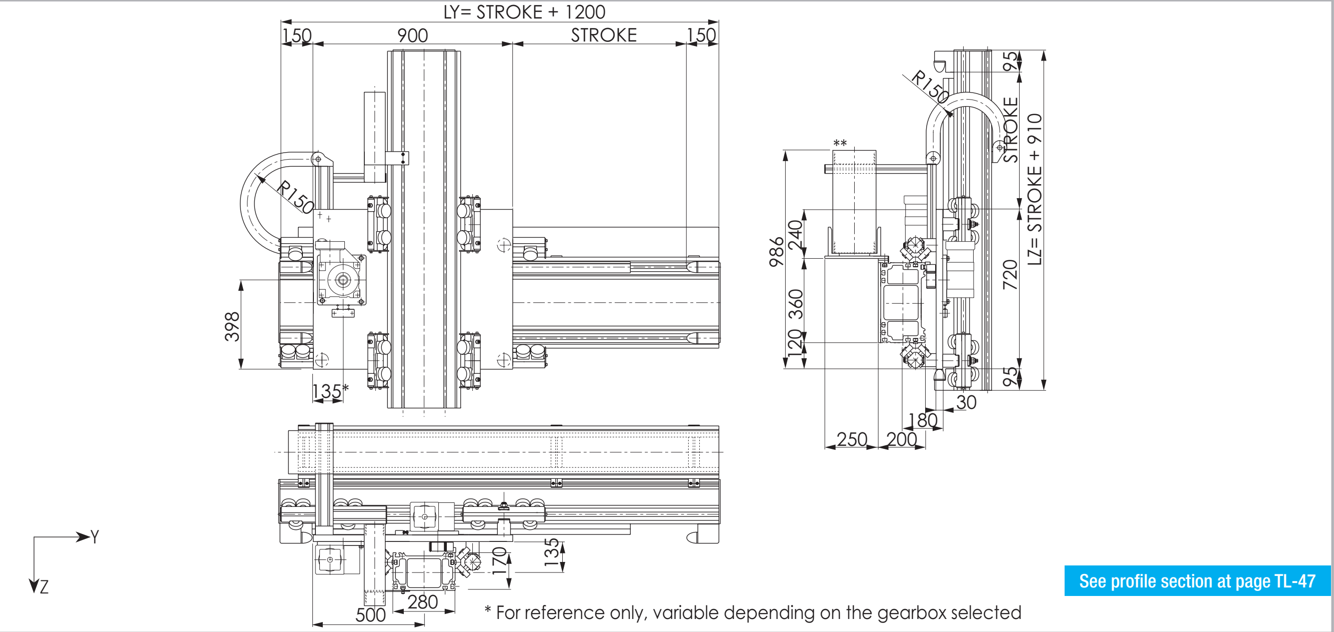
Tab. 147

PAR 360/280

PC

400 Kg | High Cycle Rate | Low Cycle Rate | 800 Kg

PAR 360/280 Dimension



See profile section at page TL-47

* For reference only, variable depending on the gearbox selected

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 40

Technical data

	Axis	
	Y-axis	Z-axis
Max. useful stroke length [mm]	10800*1	3000
Max. positioning repeatability [mm]	± 0.1	± 0.25*2
Max. speed [m/s]	2	2
Max. acceleration [m/s²]	2	2
Rack module	m 4	m 4
Pinion pitch diameter [mm]	76.39 (106.1)	76.39 (106.1)
Carriage displacement per pinion turn [mm]	240 (333.33)	240 (333.33)
Carriage weight [kg]	122	
Zero travel weight [kg]	300	
Weight for 100 mm useful stroke [kg]	8.5	6.6
Rail size [mm]	55x25	55x25

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Reference value considering a stroke of 1000 mm on Z-axis.

Tab. 148

Moments of inertia of the aluminum body

Axis	I_x [10^7 mm⁴]	I_y [10^7 mm⁴]	I_p [10^7 mm⁴]
Y-axis	31.721	10.329	42.050
Z-axis	12.646	4.829	17.475

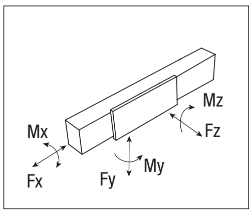
Tab. 149

Rack specifications

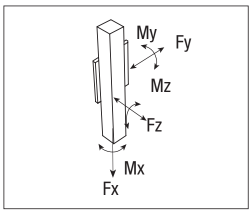
Axis	Type of rack	Rack module	Quality
Y-axis	Helical teeth hardened ground	m 4	Q6
Z-axis		m 4	

Tab. 150

PAR 360/280 - Y-axis



PAR 360/280 - Z-axis



Load capacity

Axis	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
Y-axis	10989	29981	149063	29981	10793	11108	11108
Z-axis	10989	29981	149063	29981	4197	9189	9189

See verification under static load and lifetime on page SL-2 and SL-3

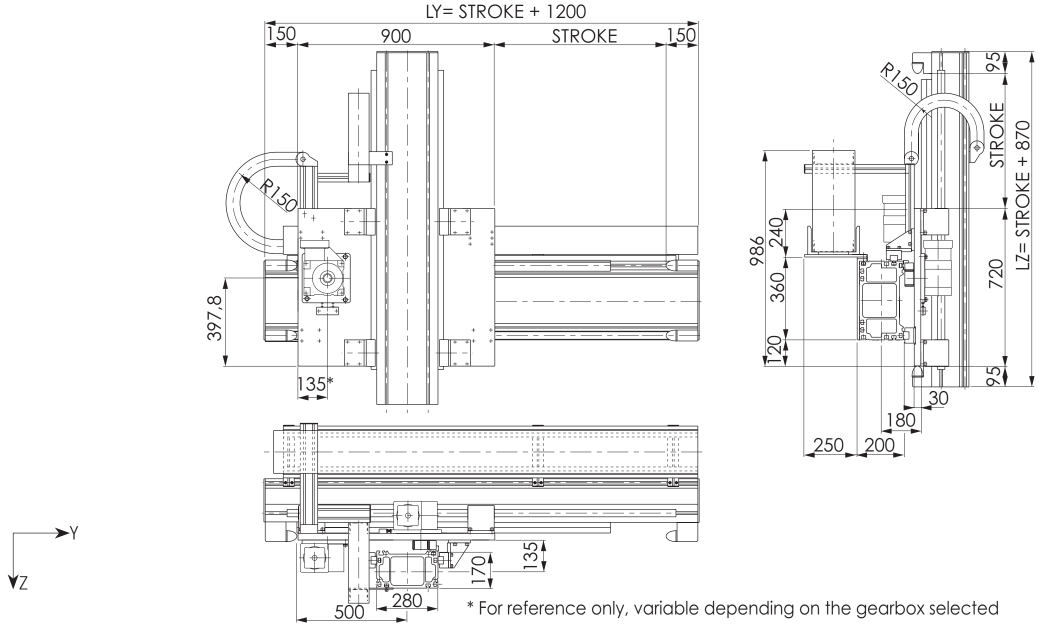
Tab. 151

PAS 360/280

PC

400 Kg — High Cycle Rate — Low Cycle Rate — 800 Kg

PAS 360/280 Dimension



* For reference only, variable depending on the gearbox selected

See profile section at page TL-47

The length of the safety stroke is provided on request according to the customer's specific requirements.
**Cable carrier offered as option

Fig. 41

Technical data

	Axis	
	Y-axis	Z-axis
Max. useful stroke length [mm]	10800*1	3000
Max. positioning repeatability [mm]	± 0.1	± 0.15*2
Max. speed [m/s]	2	2
Max. acceleration [m/s²]	2	2
Rack module	m 4	m 4
Pinion pitch diameter [mm]	76.39 (106.1)	76.39 (106.1)
Carriage displacement per pinion turn [mm]	240 (333.33)	240 (333.33)
Carriage weight [kg]	102	
Zero travel weight [kg]	275	
Weight for 100 mm useful stroke [kg]	8.3	6.4
Rail size [mm]	35	35

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Reference value considering a stroke of 1000 mm on Z-axis.

Tab. 152

Moments of inertia of the aluminum body

Axis	I_x [10^7 mm⁴]	I_y [10^7 mm⁴]	I_p [10^7 mm⁴]
Y-axis	31.721	10.329	42.050
Z-axis	12.646	4.829	17.475

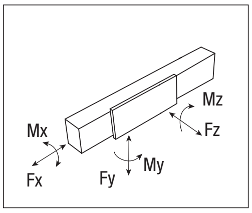
Tab. 153

Rack specifications

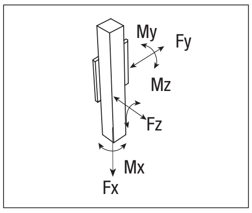
Axis	Type of rack	Rack module	Quality
Y-axis	Helical teeth hardened ground	m 4	Q6
Z-axis		m 4	

Tab. 154

PAS 360/280 - Y-axis



PAS 360/280 - Z-axis



Load capacity

Axis	F_x [N]	F_y [N]		F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Stat.	Dyn.	Stat.	Stat.	Stat.	Stat.
Y-axis	10989	386400	197790	386400	65688	150310	150310
Z-axis	10989	386400	197790	386400	54096	115534	115534

See verification under static load and lifetime on page SL-2 and SL-3

Tab. 155

Profile specifications

Medium profiles

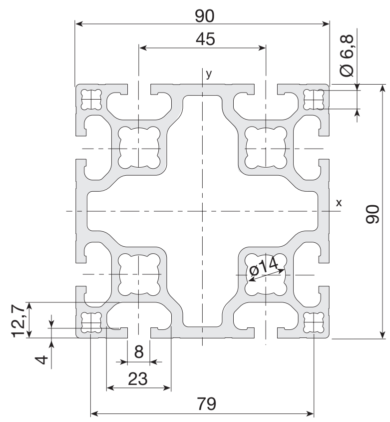
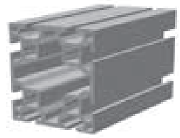


Fig. 42



Profile 90X90	
Weight [Kg/m]	6
Max. length [mm]	6000
Moment of inertia Ix [10^7 mm^4]	0.197
Moment of inertia Iy [10^7 mm^4]	0.195
Polar moment of inertia Ip [10^7 mm^4]	0.392
Bending section modulus Wx [mm^3]	45040
Bending section modulus Wy [mm^3]	45040

Tab. 156

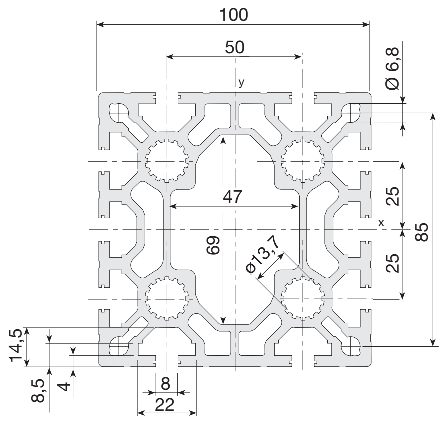
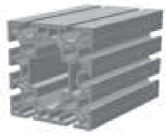


Fig. 43



Profile 100x100	
Weight [Kg/m]	9.5
Max. length [mm]	6000
Moment of inertia Ix [10^7 mm^4]	0.364
Moment of inertia Iy [10^7 mm^4]	0.346
Polar moment of inertia Ip [10^7 mm^4]	0.709
Bending section modulus Wx [mm^3]	76000
Bending section modulus Wy [mm^3]	73000

Tab. 157

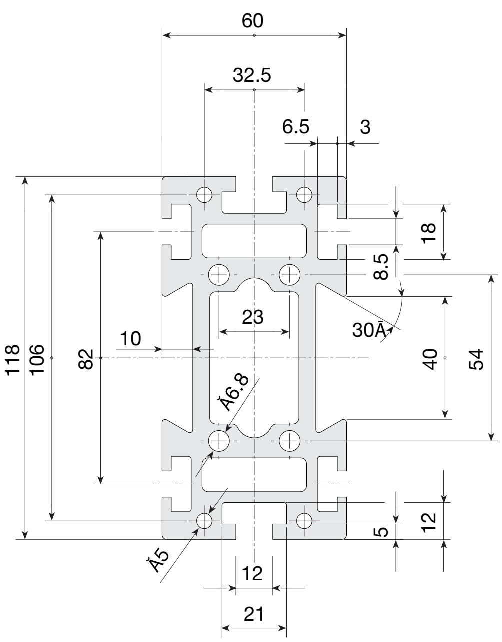


Fig. 44

Profile 118x60	
Weight [Kg/m]	7.89
Max. length [mm]	10000
Moment of inertia Ix [10^7 mm^4]	0.432
Moment of inertia Iy [10^7 mm^4]	0.101
Polar moment of inertia Ip [10^7 mm^4]	0.533
Bending section modulus Wx [mm^3]	73263
Bending section modulus Wy [mm^3]	33714

Tab. 158

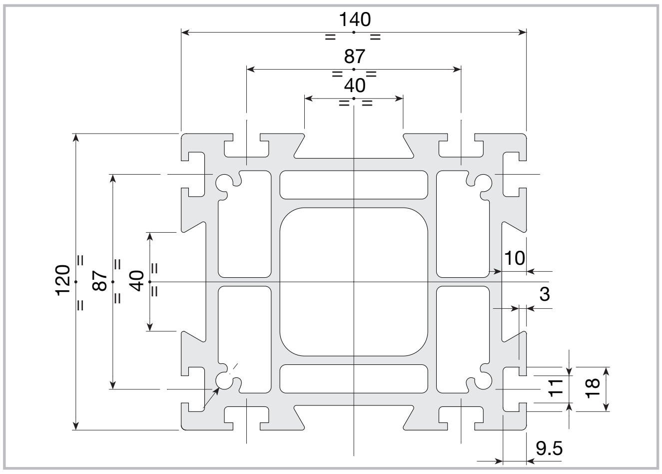


Fig. 45

Profile 140x120	
Weight [Kg/m]	14.6
Max. length [mm]	10000
Moment of inertia Ix [10^7 mm^4]	1.148
Moment of inertia Iy [10^7 mm^4]	0.892
Polar moment of inertia Ip [10^7 mm^4]	2.040
Bending section modulus Wx [mm^3]	191372
Bending section modulus Wy [mm^3]	127421

Tab. 159

Load bearing profiles

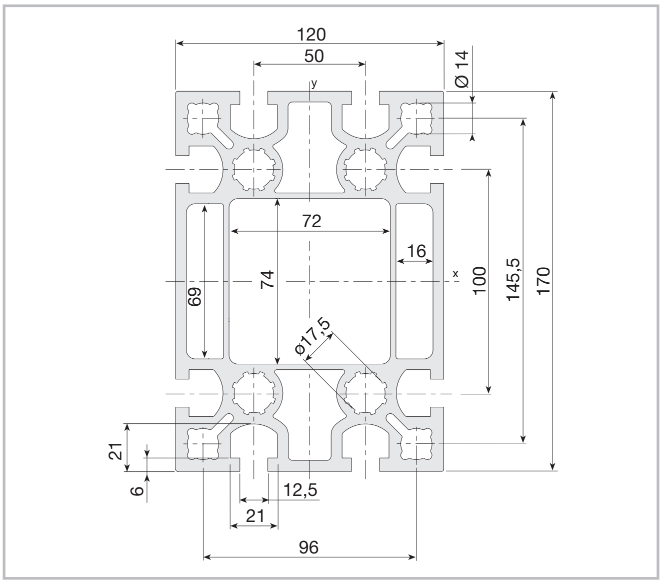
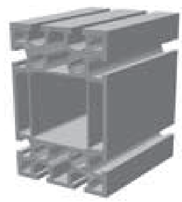


Fig. 46



STATYCA (120x170)	
Weight [Kg/m]	17
Max. length [mm]	10000
Moment of inertia Ix [10^7 mm^4]	1.973
Moment of inertia Iy [10^7 mm^4]	0.984
Polar moment of inertia Ip [10^7 mm^4]	0.846
Bending section modulus Wx [mm^3]	232168
Bending section modulus Wy [mm^3]	163929

Tab. 160

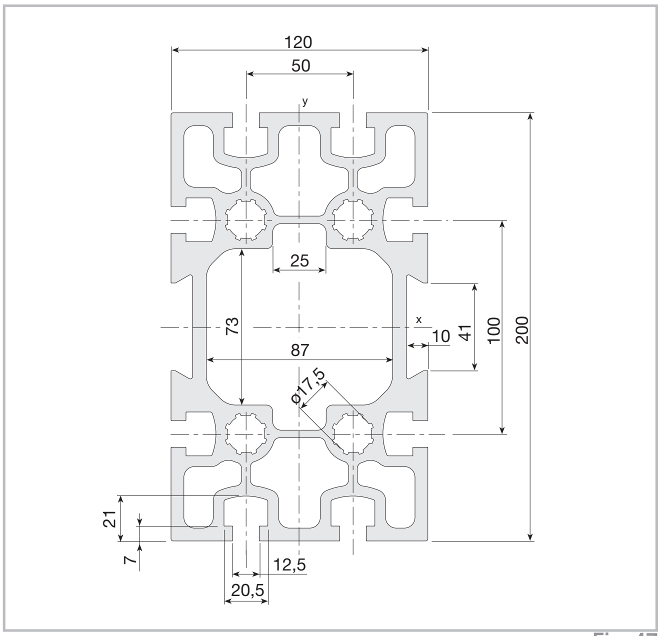
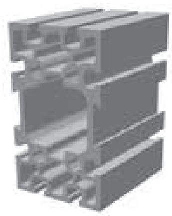


Fig. 47



VALYDA (120x200)	
Weight [Kg/m]	21
Max. length [mm]	12000
Moment of inertia Ix [10^7 mm^4]	3.270
Moment of inertia Iy [10^7 mm^4]	1.289
Polar moment of inertia Ip [10^7 mm^4]	1.050
Bending section modulus Wx [mm^3]	326979
Bending section modulus Wy [mm^3]	214883

Tab. 161

Load bearing profiles

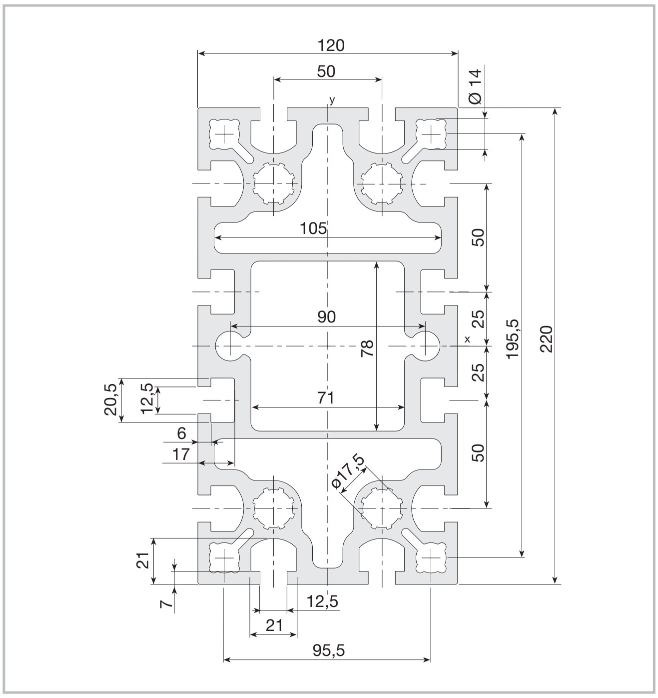
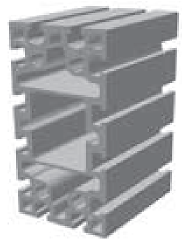


Fig. 48



LOGYCA (120x220)	
Weight [Kg/m]	25
Max. length [mm]	12000
Moment of inertia Ix [10^7 mm^4]	4.625
Moment of inertia Iy [10^7 mm^4]	1.559
Polar moment of inertia Ip [10^7 mm^4]	6.184
Bending section modulus Wx [mm^3]	423182
Bending section modulus Wy [mm^3]	260833

Tab. 162

Load bearing profiles

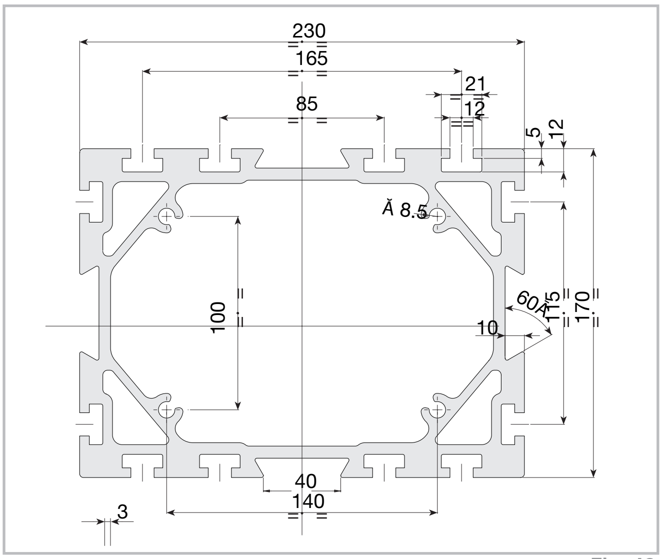


Fig. 49

Profile 230x170	
Weight [Kg/m]	25.5
Max. length [mm]	12000
Moment of inertia Ix [10^7 mm^4]	4.625
Moment of inertia Iy [10^7 mm^4]	1.559
Polar moment of inertia Ip [10^7 mm^4]	6.184
Bending section modulus Wx [mm^3]	564284
Bending section modulus Wy [mm^3]	444500

* Not anodized

Tab. 163

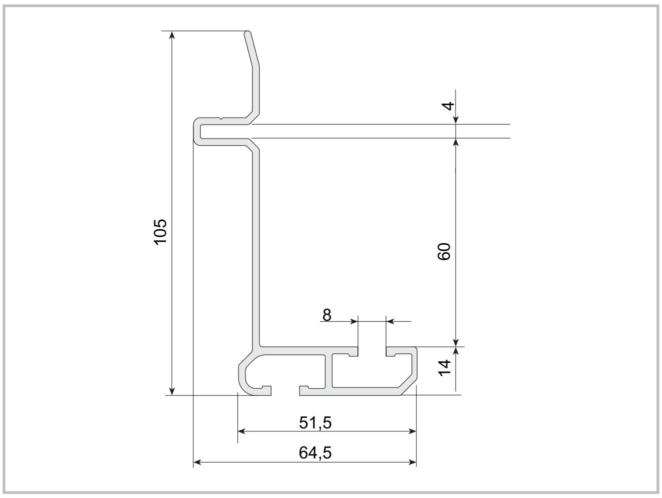
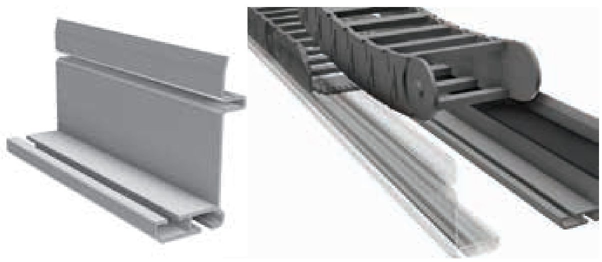


Fig. 50



7400568 energy chain support profile	
Weight [kg/m]	1.3
Available length [Mm]	6

Tab. 164

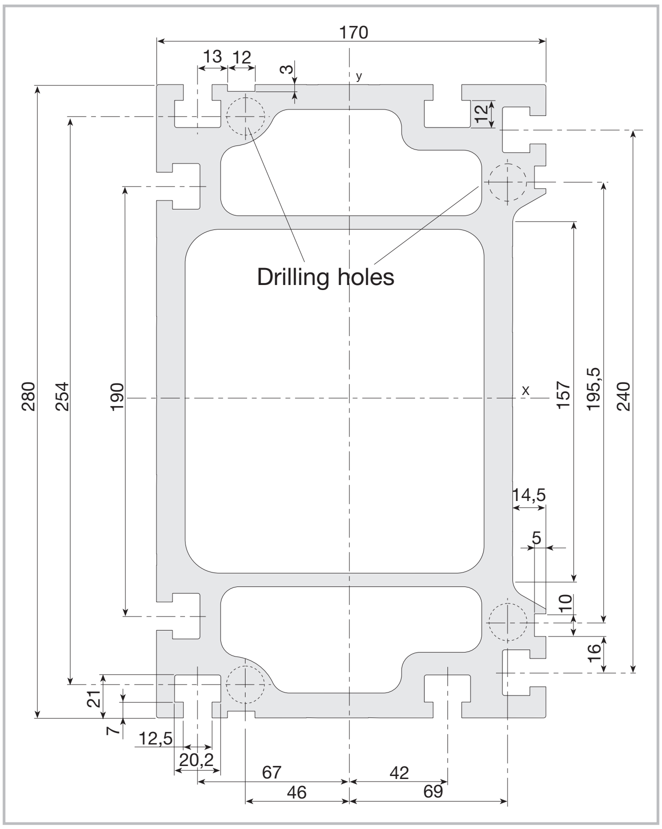


Fig. 51

PRATYCA (170x280)	
Weight [Kg/m]	40
Max. length [mm]	12000
Moment of inertia Ix [10^7 mm^4]	12.646
Moment of inertia Iy [10^7 mm^4]	4.829
Polar moment of inertia Ip [10^7 mm^4]	17.475
Bending section modulus Wx [mm^3]	957790
Bending section modulus Wy [mm^3]	591620

* Not anodized

Tab. 165

Load bearing profiles

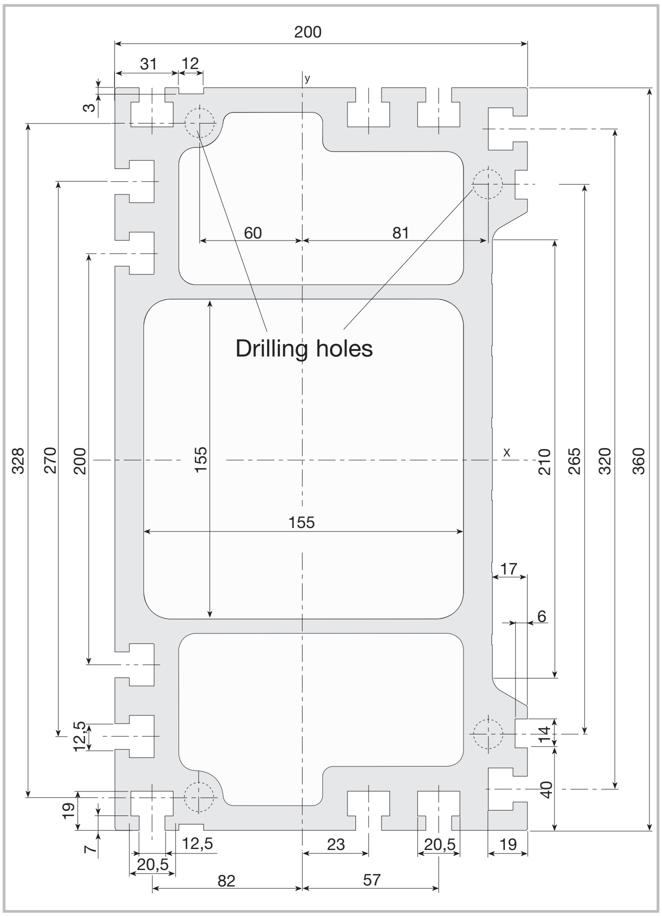
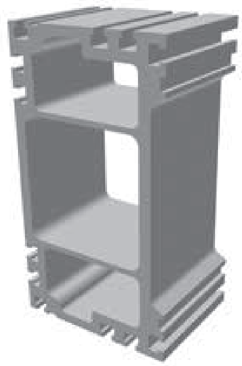


Fig. 52



SOLYDA (200X360)	
Weight [Kg/m]	60
Max. length [mm]	12000
Moment of inertia Ix [10^7 mm^4]	31.721
Moment of inertia Iy [10^7 mm^4]	10.329
Polar moment of inertia Ip [10^7 mm^4]	42.050
Bending section modulus Wx [mm^3]	1770500
Bending section modulus Wy [mm^3]	1035300

* Not anodized

Tab. 166

TL

Accessory

Programmable automatic rack lubrication

Grease is delivered by means of a programmable cartridge (average life: ca. 1 year) (a). The grease is spread evenly on the racks through a felt pinion (1). You will need one kit per driven carriage.

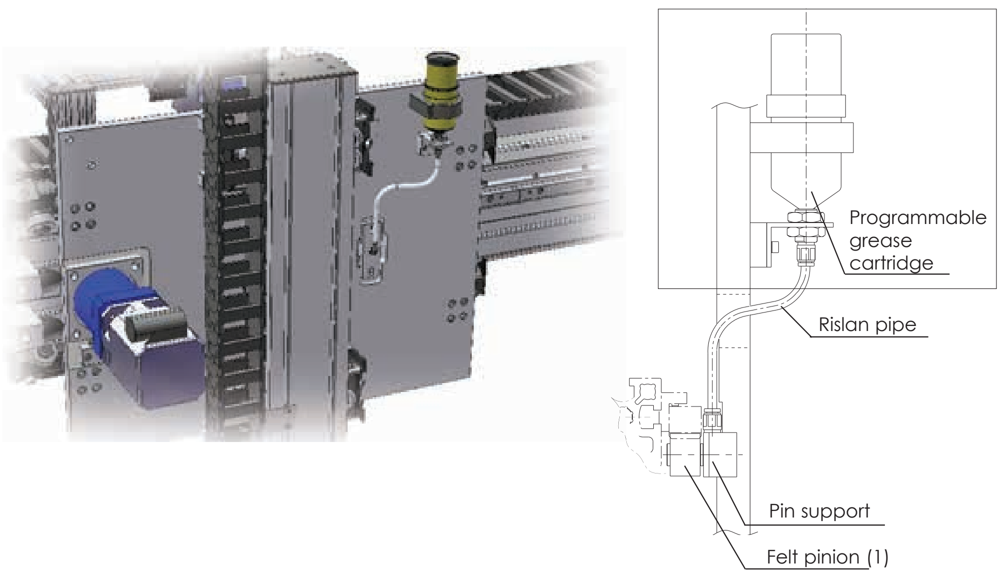


Fig. 53

1 - Spares

Specification	Code
Programmable grease cartridge (125 ml) [b]	101.0744
m2 - helical toolth felt pinion [1]	101.1079
m3 - helical toolth felt pinion [1]	701.0059
m4 - helical toolth felt pinion [1]	116.0051

Tab. 167

2 - Lubrication assembly kit

Specification (see figure C)	Code
Lubrication assembly kit (no felt pinion, nonriscan pipe)	736.0332

Tab. 168

Table for selecting maximum operating torque

Pinion / Racks - Helical tooth

Module	Z [n°]	Øp [mm]	KSD [Nm]	KRD [Nm]
2	21	44.56	150	200
	30	63.66	205	265
3	20	63.66	400	500
	28	89.13	500	650
4	18	76.39	880	1000
	25	106.1	1150	1500

Tab. 169

With lubrication guaranteed under ideal load conditions, dynamics, (1 m/s) with rigid pinion support [Nm].

Example of simplified calculation

To obtain the working torque value, divide the maximum operating torque (Tab. 1) by the safety factor (Tab. 2). Intermediate values can be adjusted according to the application.
Motion (A) = High shock 1.75
Speed (B) = Low 1
Lubrication (C) = Constant 0.9
Rack = module 3 KSD

Pinion = Øp 63.66 (400 Nm)
Safety factor = A x B x C = 1.575

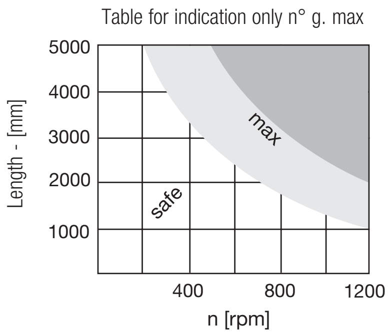
Maximum transmissible torque = Maximum torque 400 / Safety factor 1,575 ≤ 254 N
For heavy-duty applications, please ask our technical dept. to carry out the appropriate checks.

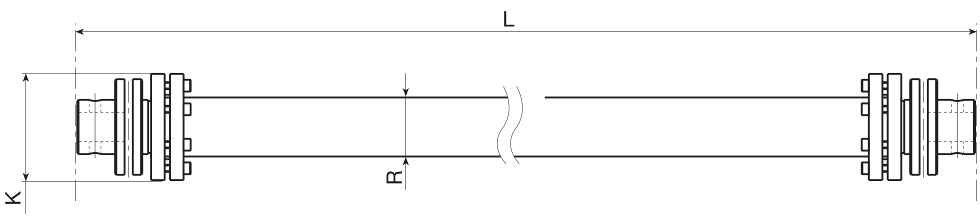
Motion (A)	Speed (B)	Lubrication (C)	Safety fac. (AxBxC)
Low shock 1.25	Low 1	Constant 0.9	1.13
Medium shock 1.5	Medium 1.25	Daily 1.2	2.25
High shock 1.75	High 1.5	Monthly 2.5	6.56

Tab. 170

Connections shafts

The Tecline range includes a series of hollow shafts for connecting the pinions on the systems. We can supply standard connections, according to your application requirements. The complete kit includes all the components needed to make the connection, with shrink-discs and crop down sizes of pins for insertion into the pinions.





Stainless steel blade joint connecting shafts, for backlash-free transmissions

Fig. 54

R(*)	K	L_{max}	MTwork [Nm]	Mom. of inertia [kgm²]	Code L
50	81	6.300	35	$0.0092 + 0.66 \times L. \times 10^{-6}$	436.0291
50	93	6.300	70	$0.0161 + 1.34 \times L. \times 10^{-6}$	436.0245
70	104	6.400	100	$0.0293 + 2.93 \times L. \times 10^{-6}$	436.0282
80	126	6.400	190	$0.0793 + 4.5 \times L. \times 10^{-6}$	436.0292
90	143	6.500	300	$0.1456 + 6.53 \times L. \times 10^{-6}$	436.0986

(*) R: Shaft material and diameter are selected in accordance with required speed, centre-distance L, torque and accuracy.

Tab. 171

Anti-drop safety device with pneumatic brake system

Anti-drop safety devices, available in a range of sizes, are supplied according to the type of application. For instance, they can act as a mechanical stop to block the free-falling load at any stroke point, or as a lock in static conditions at any position.
Two-way blocking occurs following an unexpected pressure drop.
A mechanical safety release system is available on request (patented).

The kit includes: braking device and rod with relative supports, microswitch. Solenoid valve available upon request.
Operating pressure 3-6 Bar.
With no pressure = locked.

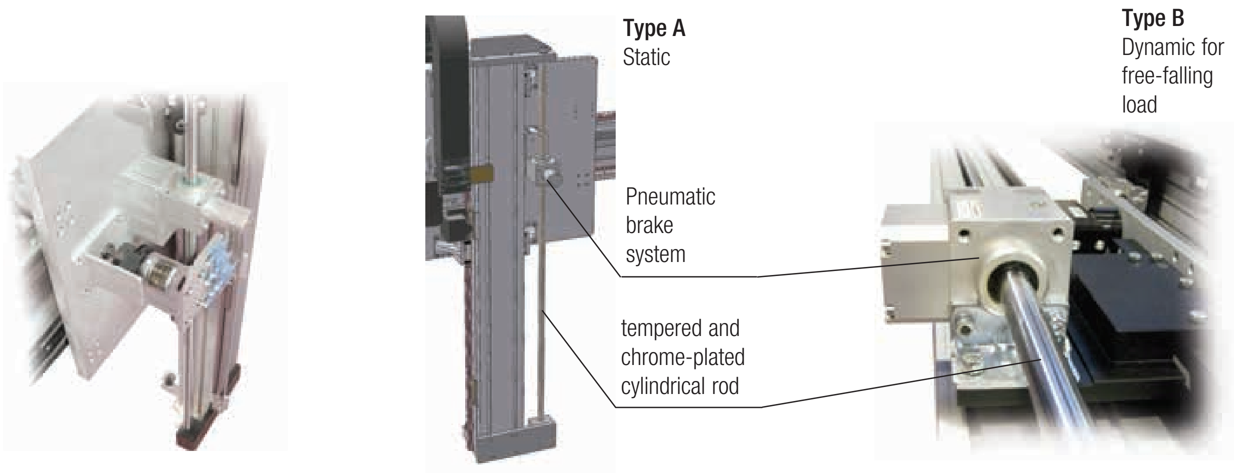


Fig. 55

1- Static rod blocking device

Type	Code	Rod blocking force [N]	Stroke [mm]
A	236.0018	/ 1.200	/ ...
A	236.0018	/ 1.900	/ ...
A	236.0018	/ 3.000	/ ...
A	236.0018	/ 5.400	/ ...
A	236.0018	/ 7.500	/ ...
A	236.0018	/ 12.000	/ ...

Tab. 172

1- Dynamic rod blocking device

Type	Code	Rod blocking force [N]	Stroke [mm]
B	236.0019	/ 3.200	/ ...
B	236.0019	/ 5.400	/ ...
B	236.0019	/ 7.500	/ ...
B	236.0019	/ 12.000	/ ...

Tab. 173

Emergency brake for free-falling load

Safety lock-pin (stopper cylinder)

Lock-pins are available in two sizes to block the vertical axes in the safety position to allow horizontal movements during maintenance. The safety lock-pins comprise the use of the through rod. Select the size according to the load. The kit includes: drilled plate for rod, stopper cylinder, micro-switch and 2 magnetic gearboxes. Max. operating pressure: 10 bar.

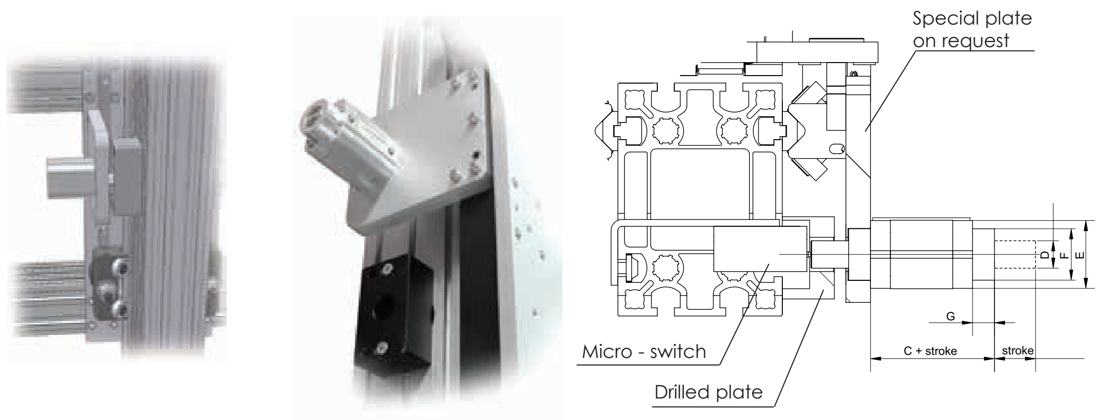


Fig. 56

1- Safety lock-pin

ØD Rod	Stroke	C	E	F	G	Kit Code
20	20	60.5	50	38	16	236.0021
32	30	-	-	-	-	236.0022

Tab. 174

2- Accessory: drilled plate for rod

ØD Rod	Base	Width	Thickness
20	60	100	39
32	60	100	39

Tab. 175

Profile anchor brackets

Material: alluminum alloy (Rs=310 N/mm²).

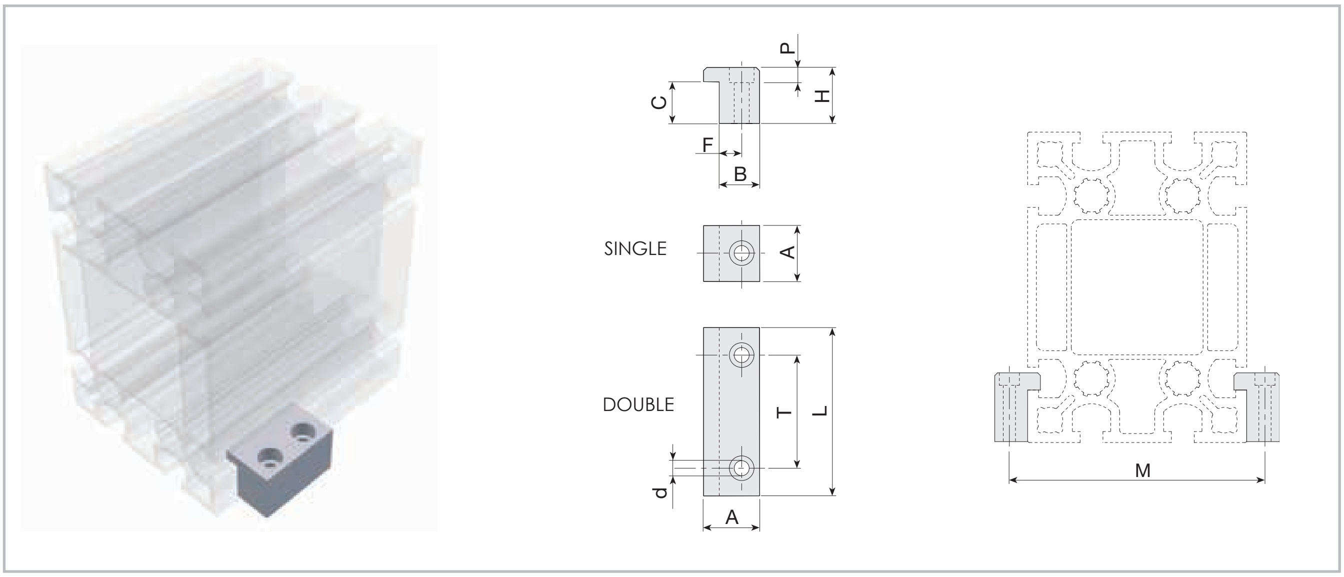


Fig. 57

Profile	A	L	T	d	H	P	C	F	B	M	Single code	Double code
Profile 90x90	30	50	25	9	25	9.5	18	12	22	69/114	415.0772	415.0773
Profile 100x100	25	50	25	6.7	27	6.8	20.6	10	18	120	415.0769	415.0764
STATYCA	30	90	50	11	40	11	28.3	14	25	198	415.0767	415.0762
VALYDA horizontal	30	90	50	11	40	11	28.3	14	25	228	415.0767	415.0762
VALYDA vertical	30	90	50	11	50	11	43.1	14	25	148	215.0042	215.0041
LOGYCA	30	90	50	11	40	11	28.3	14	25	248	415.0767	415.0762
PRATYCA horizontal	30	90	50	11	20	11	11.3	14	25	308	415.0768	416.0763
PRATYCA vertical*	30	90	50	11	25	11	13.5	14	25	198	-	-
SOLYDA horizontal	30	90	50	11	20	11	11.3	14	25	388	415.0768	415.0763
SOLYDA vertical*	30	90	50	11	25	11	13.5	14	25	228	-	-

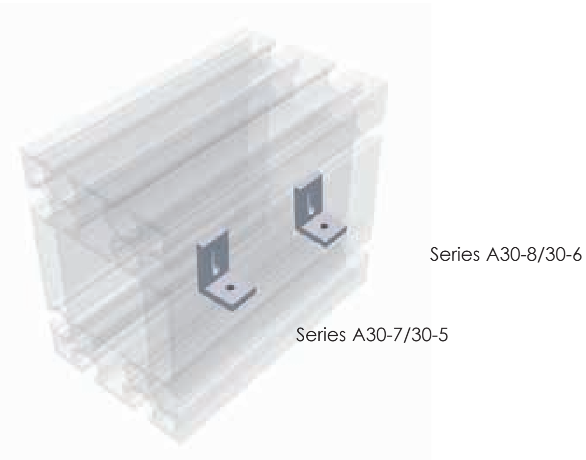
* For vertical orientation of cross section this profile has asymmetric position of the T-Slots. Contact Rollon Technical department

Tab. 176

L-shaped brackets

Threaded hole bracket

Threaded hole bracket for mounting additional equipment.
Material: 6060 natural anodized aluminum alloy.



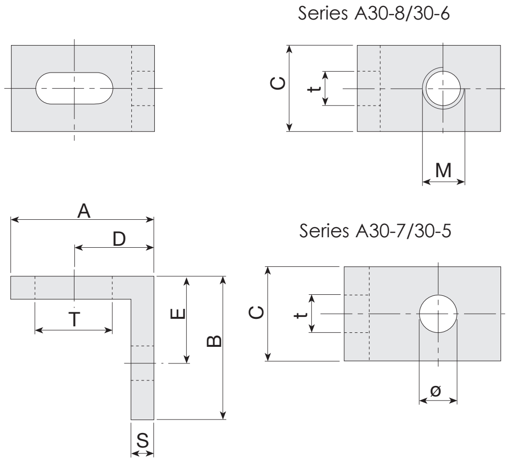
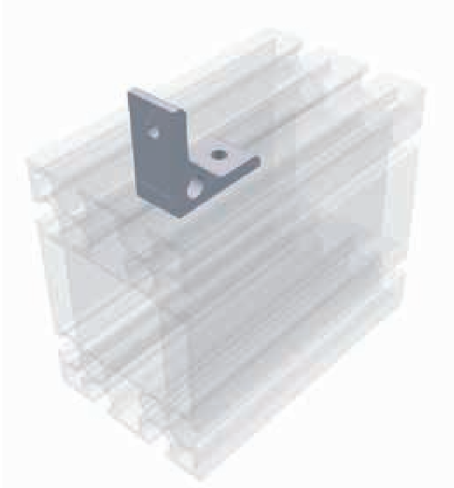


Fig. 58

A	B	C	D	E	S	Txt	M	Code	Ø	Code
45	45	20	25	25	5	16 x 6.5	M6	A30-86	6	A30-76
35	25	20	19	15	5	20 x 6.5	M4	A30-64	4	A30-54
35	25	20	19	15	5	20 x 6.5	M5	A30-65	5	A30-55
35	25	20	19	15	5	20 x 6.5	M6	A30-66	6	A30-56
25	25	15	14	15	4	13.5 x 5.5	M3	B30-63	3	B30-53
25	25	15	14	15	4	13.5 x 5.5	M4	B30-64	4	B30-54
25	25	15	14	15	4	13.5 x 5.5	M5	B30-65	5	B30-55
25	25	15	14	15	4	13.5 x 5.5	M6	B30-66	6	B30-56

Tab. 177

Bracket for mounting additional equipment



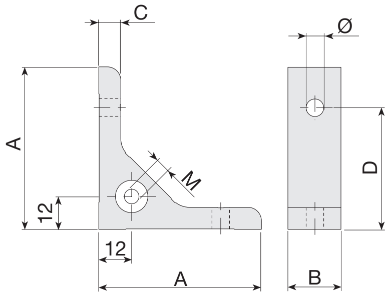


Fig. 59

L-shaped bracket for mounting additional equipment and improving the rigidity of frames made with profiles.
Material: 6060 natural anodized aluminum alloy.

A	B	C	D	E	Ø	M	Code
60	20	8	45	-	6.5	-	B30-10
60	20	8	45	-	6.5	M6	B30-20
60	30	8	45	-	9	-	A30-10
60	30	8	45	-	9	M6	A30-20
38	30	8	25	-	9	-	A30-00
31	20	6	20	-	6.5	-	C30-00

Tab. 178

Bracket for mounting additional profiles

Material: 6060 natural anodized aluminum alloy.

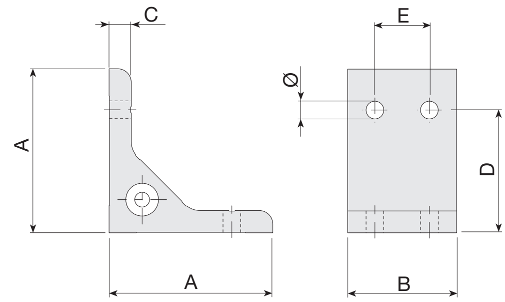


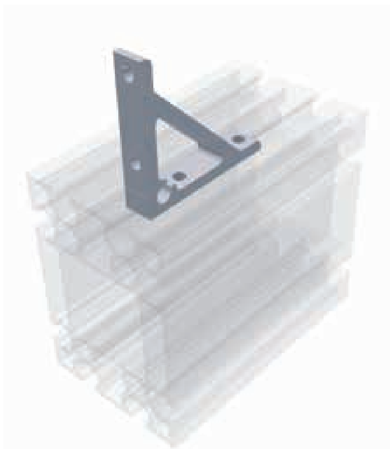
Fig. 60

A	B	C	D	E	Ø	M	Code
38	80	8	25	50	9	-	A30-02
31	60	6	20	40	6.5	-	C30-02

Tab. 179

Bracket for mounting additional profiles

Material: 6060 natural anodized aluminum alloy.



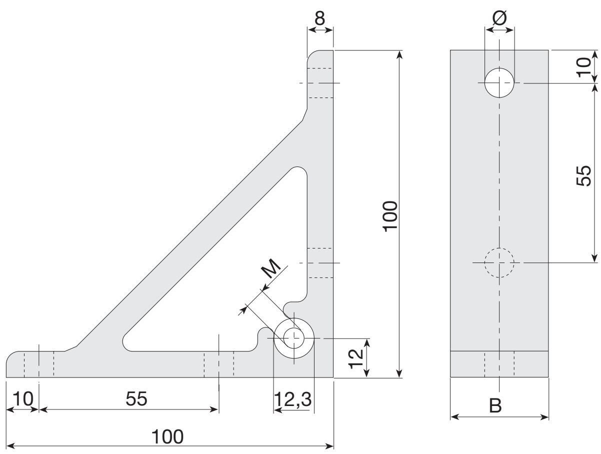
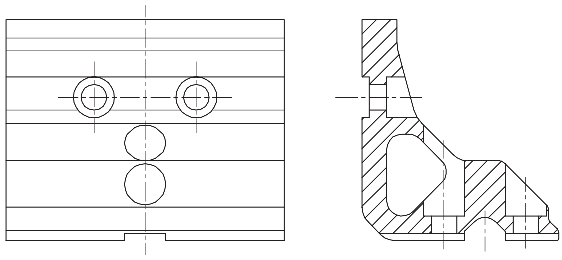


Fig. 61

	B	Ø	M	Code
Without bushing	30	9	-	A30-30
Without bushing	20	6.5	-	B30-30
With bushing	30	9	M6	A30-40
With bushing	20	6.5	M6	B30-40

Tab. 180

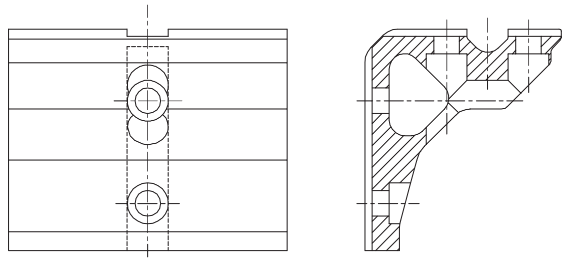
Bracket for assembly - Large side (Ø12.5 - Ø20) Aluminum



411.0498

Fig. 62

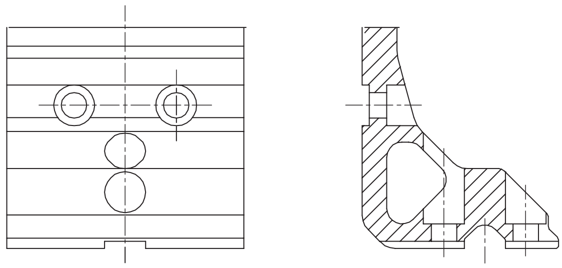
Bracket for assembly - Large side (Ø12.5 - Ø20) Aluminum



411.0499

Fig. 63

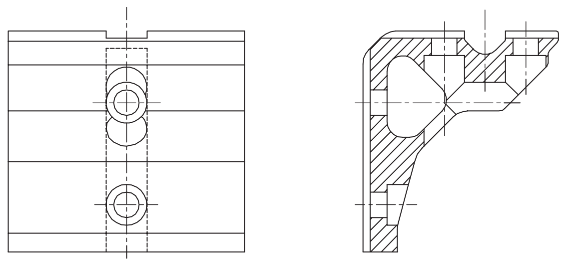
Bracket for assembly - Short side (Ø12.5 - Ø20) Aluminum



411.0502

Fig. 64

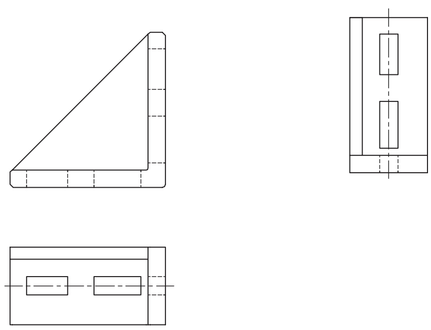
Bracket for assembly - Short side (Ø12.5 - Ø20) Aluminum



411.0501

Fig. 65

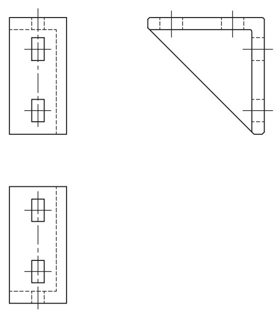
Joining bracket - Bracket 75x75x38 - Aluminum



411.1188

Fig. 66

Joining bracket - Bracket 75x75x38 - Aluminum



411.1187

Fig. 67

End caps for profile

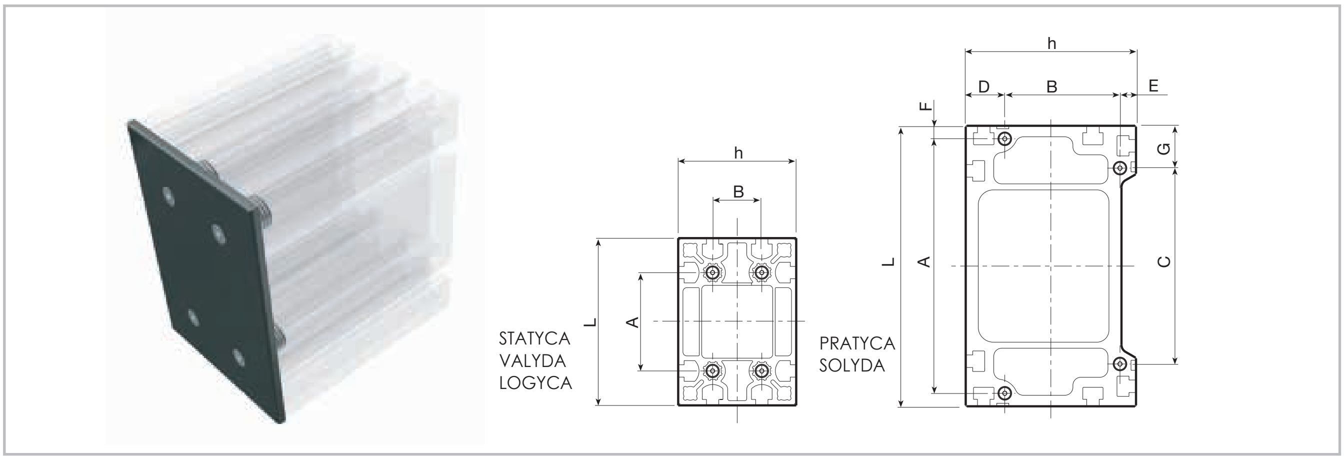


Fig. 68

The end caps for STATYCA, VALYDA, and LOGYCA (supplied with 4 bushings 207.1892 thr. M20/6) are fixed to the profiles using the 4 holes provided in the centre that must be M20 threaded. PRATYCA and SOLYDA profiles must instead be M6 drilled and threaded as in the areas indicted in the drawing (in this case the end caps are supplied without any bushings). Please specify whether profiles will require end caps.
Material: black polyethylene, 6 mm thick. End caps in 6 mm-thick aluminum alloy are available upon request.

Bearing profile	L	h	A	B	C	D	Code
202.1753 -STATYCA	170	120	100	50	-	-	212.1774
202.1146 - VALYDA	200	120	100	50	-	-	212.1704
202.2184 - LOGYCA	220	120	150	50	-	-	212.2279
202.1147 - PRATYCA	280	170	254	115	195.5	39	212.1705
202.0342 - SOLYDA	360	200	328	141	265	40	212.1706

Tab. 181

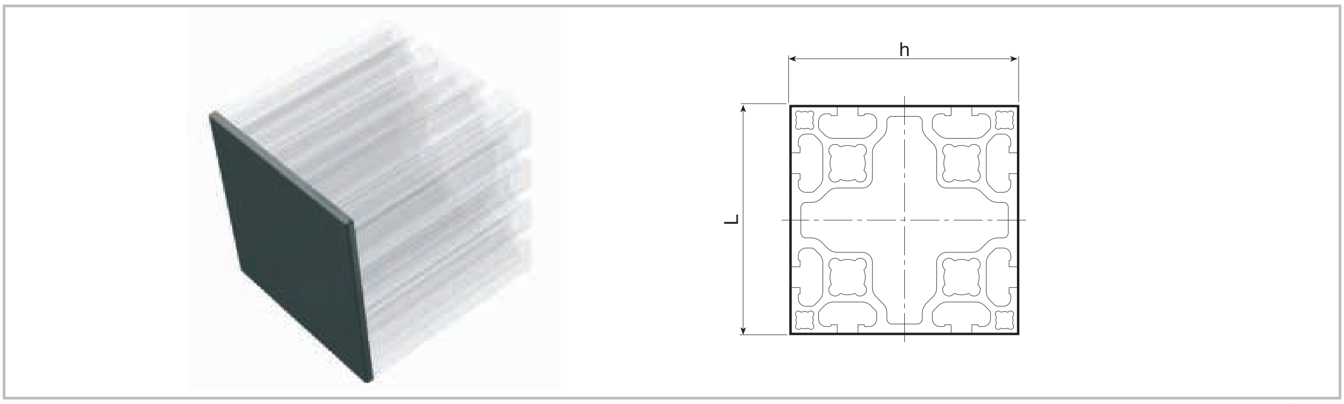


Fig. 69

The end caps for small and medium profiles have no screws or bushes and are fitted simply by exerting moderate pressure on the end of the profile.
Material: black polyethylene, approx. 5 mm thick.

Profile	L	h	Code
Profile 90x90	90	90	E40-40
Profile 100x100	100	100	A40-50

Tab. 182

Threaded inserts for small and medium profiles

Inserts for base profiles 30/45/50/60/90

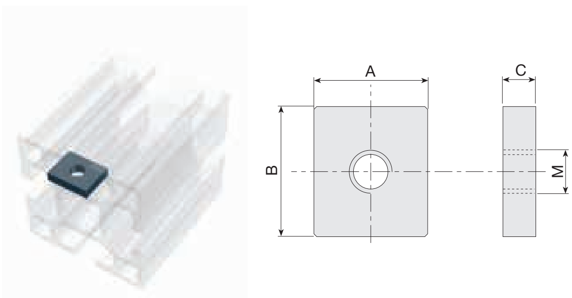


Fig. 70

Material: galvanised steel.
Important: inserts must be inserted into the longitudinal slots before assembling.

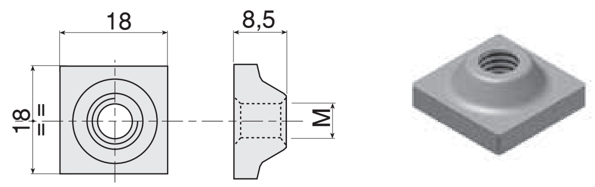
Thread	A-B-C Code	Thread	A-B-C Code
M3	B32-30	M4	A32-40
M4	B32-40	M5	A32-50
M5	B32-50	M6	A32-60
M6	B32-60	M8	A32-80
Spring	211.1077	Spring	211.1061

Tab. 183

Also suitable for profiles **100x100, STATYCA, VALYDA, LOGYCA, PRATYCA and SOLYDA**.
Material: galvanised steel.
Important: inserts must be inserted into the longitudinal slots before assembling.

Fig. 72

Square nuts



Plastic compound spring for vertical positioning of insert.

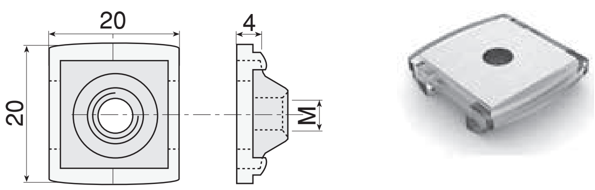


Fig. 71

Thread	Code 18x18	Code 20x20
M4	209.0031	209.0023
M5	209.0032	209.0019
M6	209.0033	209.1202
M8	209.0034	209.0467

Tab. 184

Spring	Code
Suitable for all inserts 18x18	101.0732

Tab. 185

Threaded inserts for LOGYCA-PRATYCA-SOLYDA profiles

Frontally insertable alignment plates

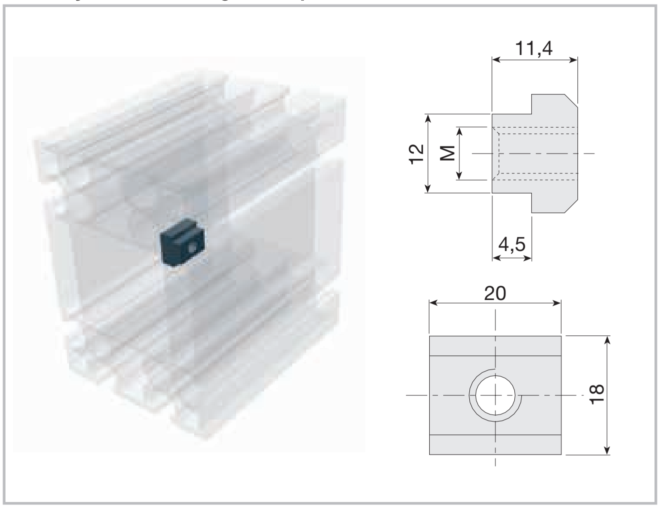


Fig. 73

Material: galvanised steel.
Important: inserts must be inserted into the longitudinal slots before assembling.

Thread	Code
M5	215.1768
M6	215.1769
M8	215.1770
M10	215.2124

Tab. 186

Frontally insertable alignment plates

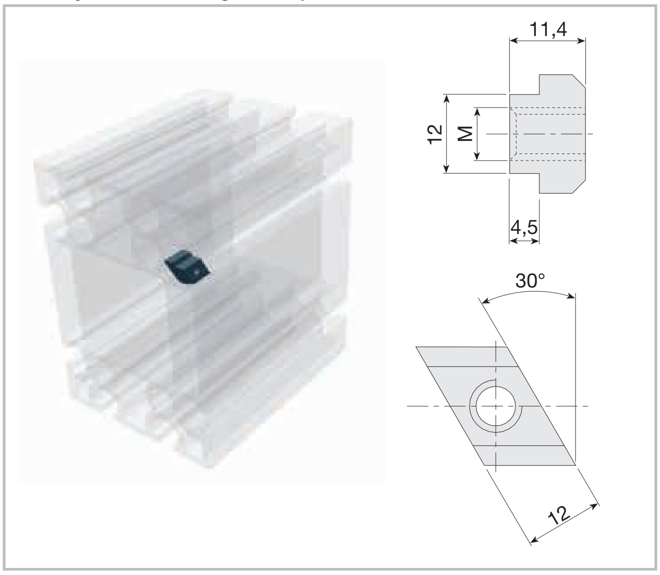


Fig. 74

Material: galvanised steel.

Thread	Code
M5	215.1771
M6	215.1772
M8	215.1773
M10	215.2125

Tab. 187

Threaded inserts

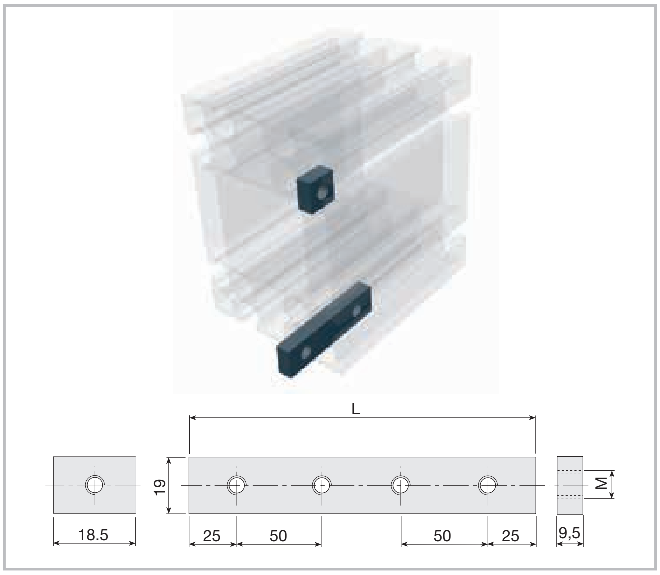


Fig. 75

Also suitable for base-50 profiles, except A32-91 insert.
Material: galvanised steel.

Thread	N. holes	L	Code
M10	1	40	215.0477
M12	1	40	209.1281
M10	1	20	209.1277
M10	2	80	209.1776
M10	3	150	209.1777
M10	4	200	209.1778
M10	5	250	209.1779
M10	6	300	209.1780
M10	7	350	209.1781

Tab. 188

Threaded inserts for 118x60, 140x20, 230x170 profiles

Quick front insert nuts for 118x60 profile (long side)

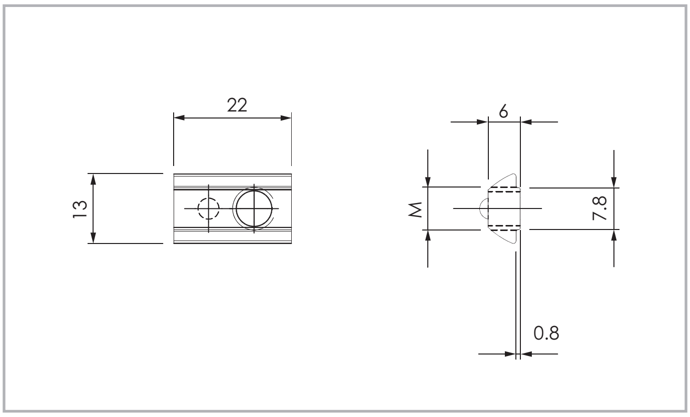


Fig. 76

Material: zinc-plated steel

Thread	Code
M5	4111355
M6	4111356

Tab. 189

Quick front insert nuts for 118x60 profile (long side)

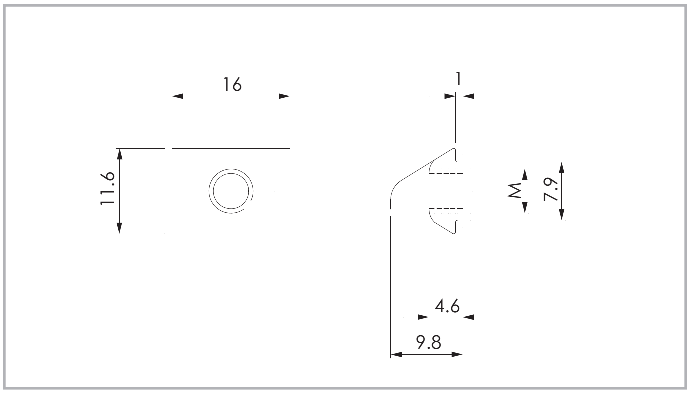


Fig. 77

Material: zinc-plated steel

Thread	Code
M4	4111357
M5	4111358
M6	4111359

Tab. 190

Threaded inserts for 118x60 profile (long side)

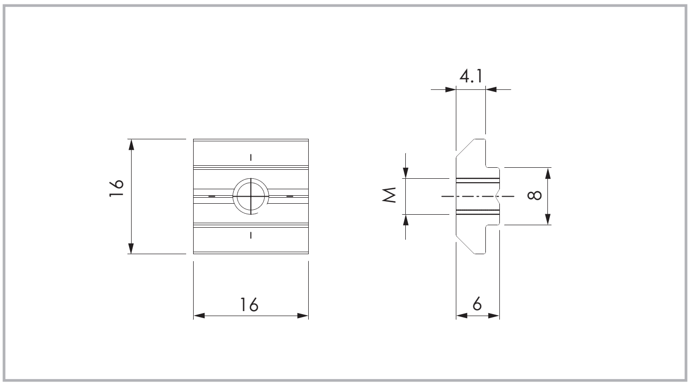


Fig. 78

Material: zinc-plated steel

Thread	Code
M5	4111361
M6	4111362
M8	4111363

Tab. 194

Inserts for 140x120 profile

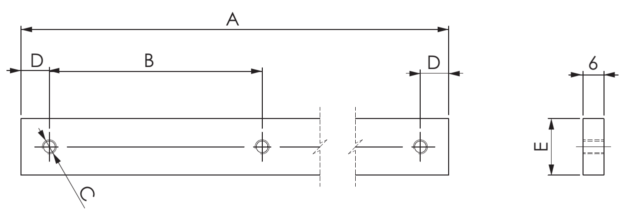


Fig. 79

Material: zinc-plated steel

A	B	C	D	E	Holes	Code
496	60	M4	8	16	9	4112534
496	60	M5	8	16	9	4112533
496	60	M6	8	16	9	4113633

Tab. 192

Inserts for profiles 118x60 (short side only) - 140x120 - 230x170

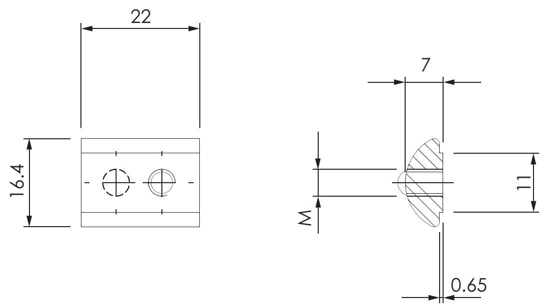


Fig. 80

Material: burnished steel

Thread	Holes	Code
M4*	1	4111360
M5*	1	4111351
M6*	1	4111352
M8*	1	4111353

* Quick front insert on PAS118 (short side) and PAS 230 only

Tab. 193

Inserts for profiles 118x60 (short side only) - 230x170

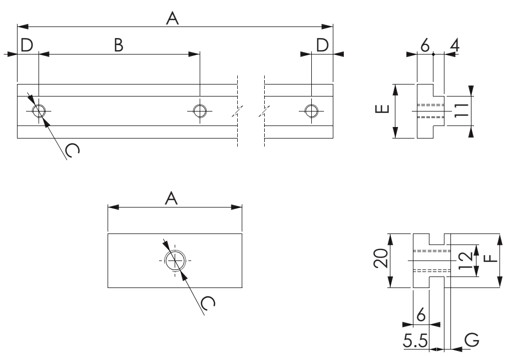


Fig. 81

Material: burnished steel

A	B	C	D	E	Holes	Code
20	-	M5	10	20	1	4112540
20	-	M6	10	20	1	4112541
20	-	M8	10	20	1	4112542
20	-	M10	10	20	1	4112543
496	60	M5	8	20	9	4112544
496	60	M6	8	20	9	4112545
496	60	M8	8	20	7	4112546

Tab. 194

A	B	C	F	G	Holes	Code
20	-	M6	8	2	1	4112547
20	-	M8	20	2.5	1	4112548
20	-	M10	20	3	1	4112549

Tab. 195

Dovetail inserts for VALYDA profiles

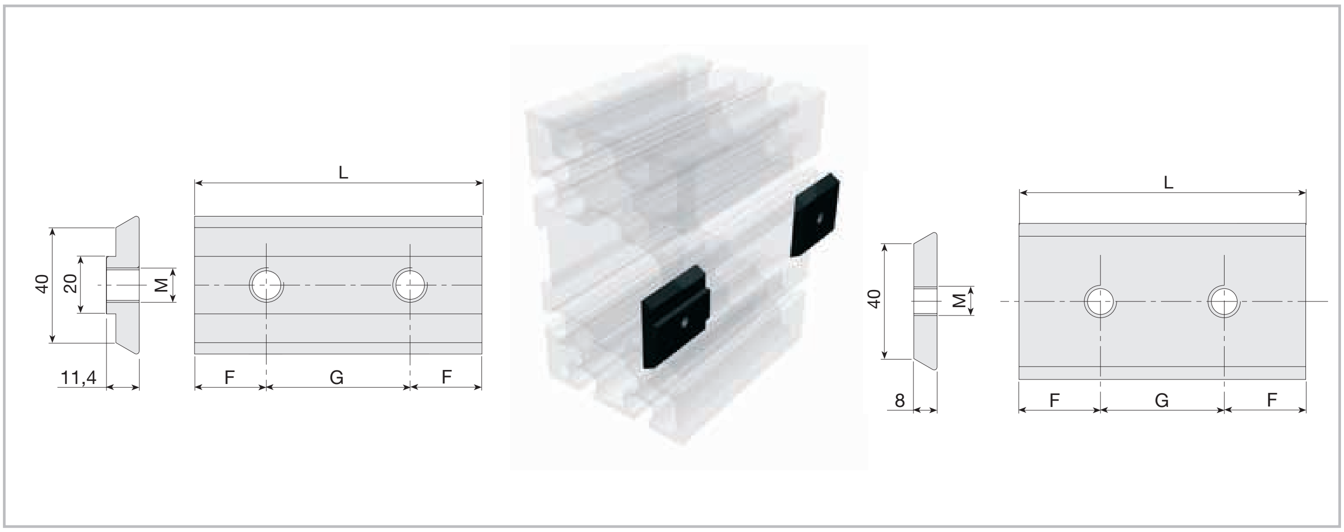


Fig. 82

Material: burnished C40.
Important: inserts must be inserted into the longitudinal slots before assembling.
Special sizes are available upon request.

F	G	L	Holes	M8	M10
25	-	50	1	214.0388	214.0394
25	50	100	2	214.0389	214.0395
25	50	200	4	214.0391	214.0398
25	50	300	6	214.0393	214.0400

Tab. 196

F	G	L	Holes	M10
25	-	50	1	214.0430
25	50	100	2	214.0431
25	50	200	4	214.0433
25	50	300	6	214.0435

Tab. 197

Reader system with magnetic scale and sensor

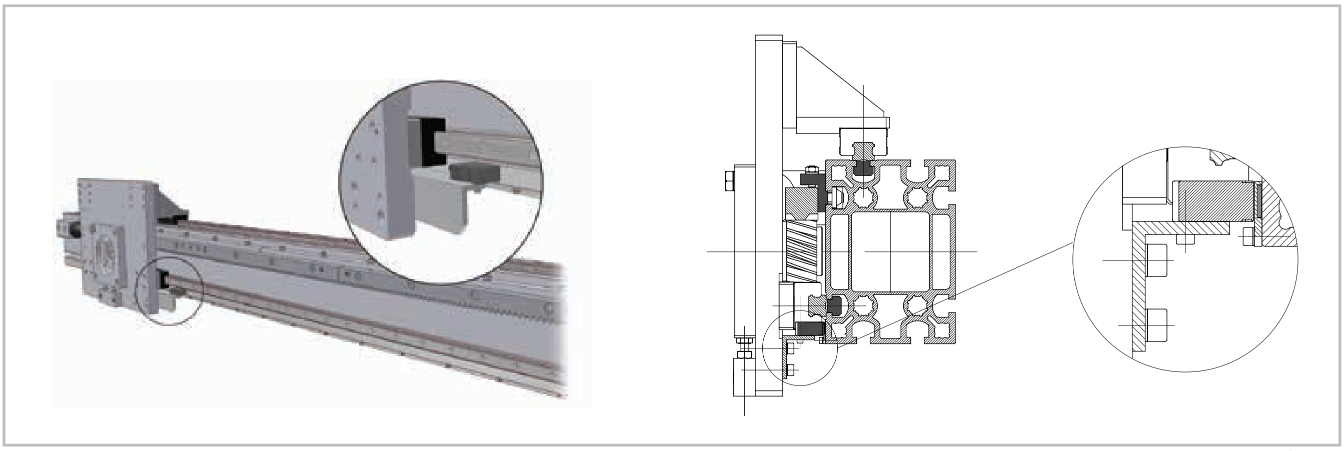


Fig. 83

The magnetic scale is applied to the body of the module using a supporting and protective profile.
Precision from ± 0.015 to ± 0.05 mm
Max. speed = 4 ÷ 10 m/s (according to type)

Dovetail inserts for profiles 118x60 (long side only) - 140x120 - 230x170

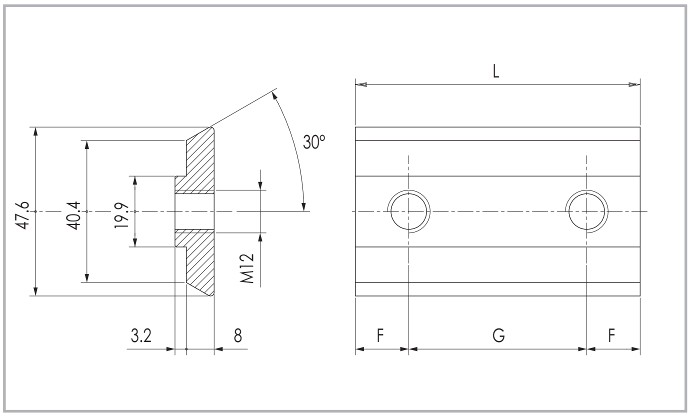


Fig. 84

Material: burnished steel.

Holes	F	G	L	Code N.
1	25	/	50	411.0745
2	15	40	70	411.0503
2	25	50	100	411.0469
3	25	50	150	411.0588
2	25	150	200	411.0472
6	25	50	300	411.0470

Tab. 198

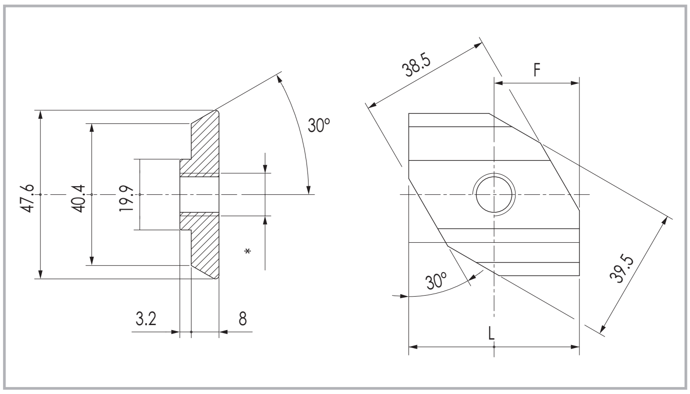


Fig. 85

411.1178
* M10 dovetail-quick front-insertion version

411.0845
* M12 dovetail-quick front-insertion version

Dovetail clamps with M8 threaded holes

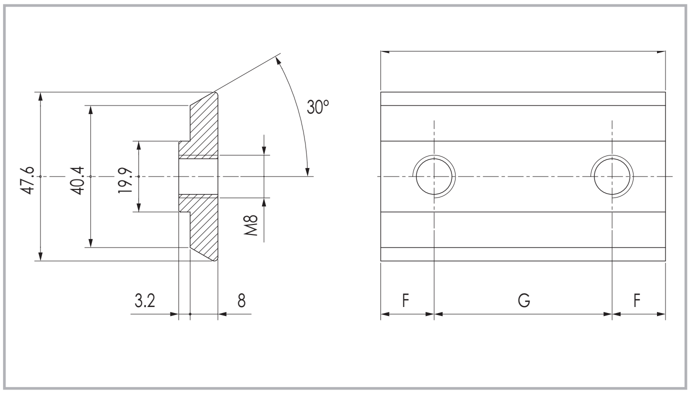


Fig. 86

Material: burnished steel.

Holes	F	G	L	Code N.
2	15	20	50	411.0675
1	25	/	50	411.1111
2	25	50	100	411.1112
3	25	50	150	411.1113
6	25	50	300	411.0970

Tab. 199

Dovetail clamps with M10 threaded holes

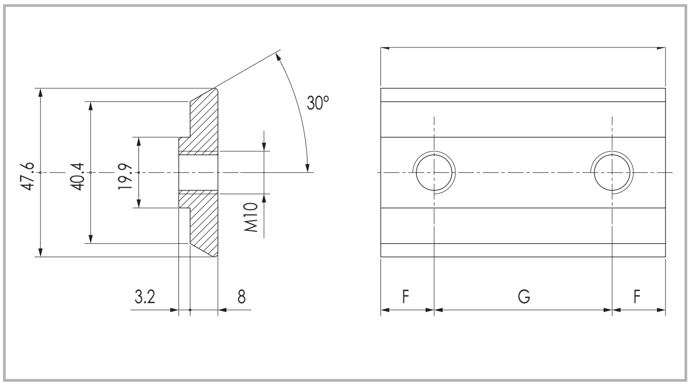


Fig. 87

Material: burnished steel.

Holes	F	G	L	Code N.
1	25	/	50	411.1117
2	25	50	100	411.1119
3	25	50	150	411.1120

Tab. 200

TL

Steel dovetail without step

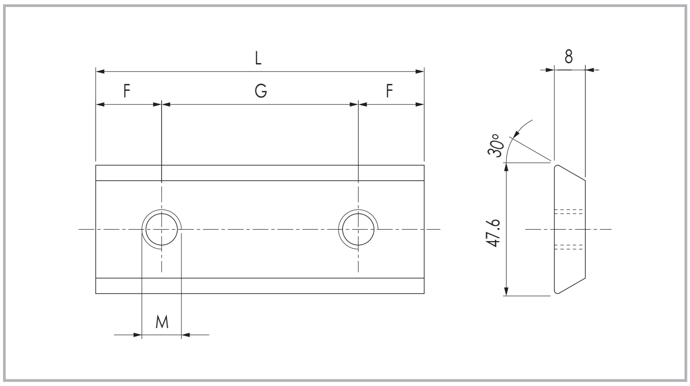


Fig. 88

Holes	F	G	L	M	Code N.
2	15	20	50	M8	411.1675
1	25	/	50	M10	411.1186
1	25	/	50	M12	411.1185
3	25	50	150	M12	411.0888

Tab. 201

Steel dovetail quick front insertion without step

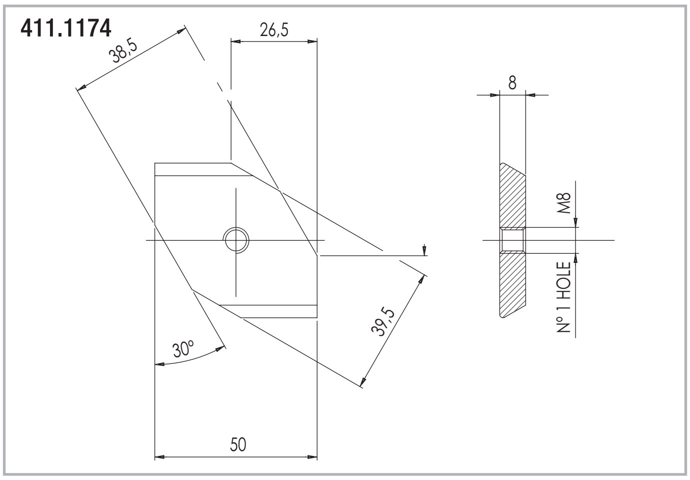


Fig. 89

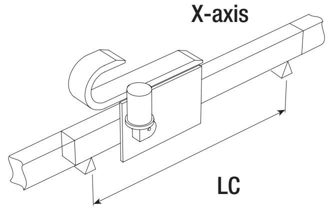
Preliminary selection table (1-2-3 axes)

These tables are useful for making a preliminary selection with load applied in a central position with respect to the plate or profile axis.
Z-axis length is < 1600 mm.
Deflection is computed assuming continuous beams having the same span and concentrated static loads.

In the following table, select the appropriate X axes according to the load.

Max load capacity [kg.] / Deflection

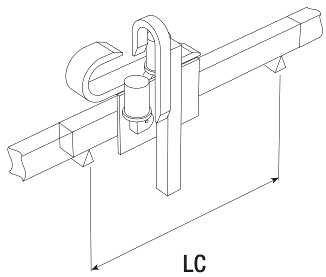
PA	170	200	200P	220	280	280P	360	LC
50	1.4							5000
100	1.8							5000
200	2.7	1.8						5000
300		2.3	2.7					5000
400			3.3	2.8				5000
500				2.8	1.8			5000
600					$\boxed{2}$	2		6000
800						2.5	1.8	6000
1000							2.1	7000



In the following table, select the appropriate Y-Z axes according to the load.

Max load capacity [kg.] / Deflection

PA	170/90	200/100	200/100P	220/170	280/200	280/200E	280/200P	280/220	360/220	360/280	LC
50	1.9										5000
100	2.4	1.7	2	1.6							5000
200				2.2	0.8	0.8					5000
300					1.6	$\boxed{1.6}$	$\boxed{1.6}$				5000
400							1.9	2	0.9		5000
500								2.2	1		5000
600								2.5	1.2	1.2	6000
800										2.2	6000



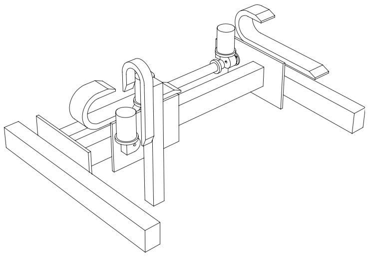
T L

In the following table, select the appropriate X and Y-Z axes according to the load.

			Y-Z-axes									
X-axis		PA	170/90	200/100	200/100P	220/170	280/200	280/200E	280/200P	280/220	360/220	360/280
	PA	load [kg]	100	100	100	200	200	300	400	600	600	700
	2X	(200)										
	3X	(300)										
	4X	(400)										
	5X	(500)										
										6X	(600)	
	8X	(800)										
	10X	(1000)										

NB: The choice of X axis is based upon the actual load, the supporting points, max. deflection and the total weight of the Y-Z axes.

X-Y-Z-axes



Example: Selection of a 3 axis gantry with roller guides

DATA: Total working load 300 kg, X axis stroke: 5,000 mm, Y-axis stroke: 4,000 mm, Z-axis stroke: 2,000 mm, support points: 2

By analysing the table of Y-Z axes based on the working load (Pc), profile length (Ly) and deflection, the selection falls on one PA 280/200E (load 300 kg.) system.

Check: $P_{eff} = P_{max}$- (Lz - 1600)/1000•q_z = 300-(2870-1600)/1000•35 = 255,55 kg. < di 300 kg (not sufficient).

Therefore select the larger size PA 280/200P (max. load capacity 400 kg.)

M_{toty+z} PA 280/200P = M_{base}+(q_y• strokeQ_y+q_z• strokeQ_z)/1000+Pc = 244+(66•4,000+48•2,000)/ 1,000+300 = 904 kg.

$P_{totx} = M_{tot}$ PA 280/200P (Y+Z)•0.66 = 596.6 kg.

Lx = strokex + 1,200 = 5,000+1,200 = 6,200 mm

By analyzing the table of X axes based on the load (P_{totx}) profile length (Lx) and deflection, it is possible to select 2 linear axes PA 280

Chosen composition: n°1 PA 280/200P + n° 2 PA 280

Perform a final analysis by computing the deflection based on the actual size of the spans.
Our technical dept. is at your complete disposal to help you examine the most suitable applications for your requirements and help you with motor and drive sizing for the whole project.

Ordering key

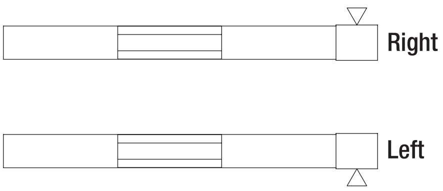
Identification codes for the PAR/PAS linear unit

PAR / PAS	220	170	5000	700
PAR/PAS Series *see pg. TL-3*	Y-axis profile	Z-axis profile	Y-axis stroke	Z-axis stroke

In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

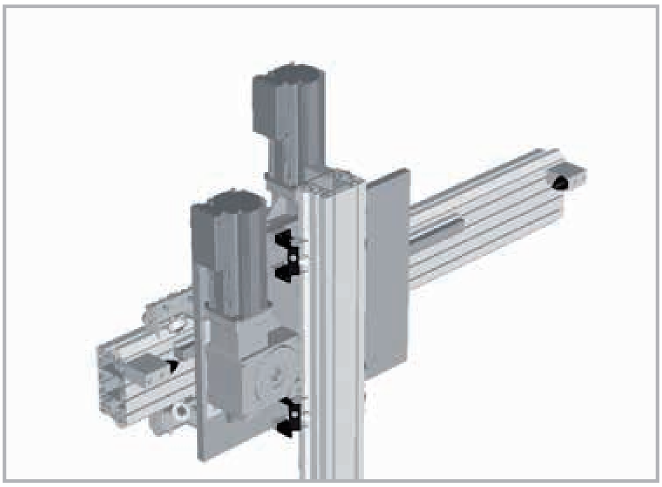
Configure Actuator

Left / right orientation

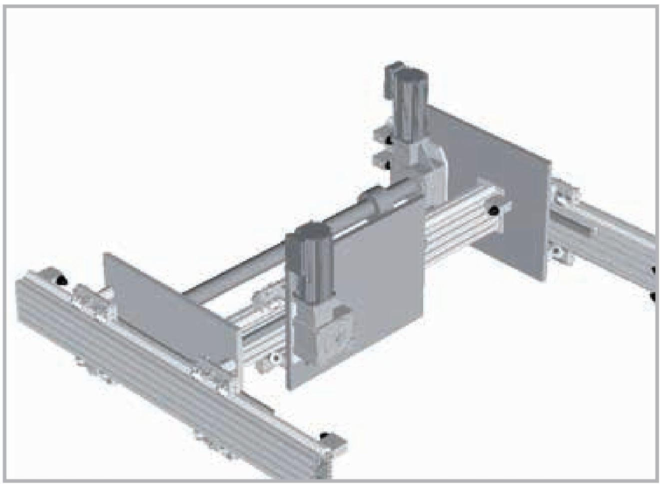


Multiaxis systems

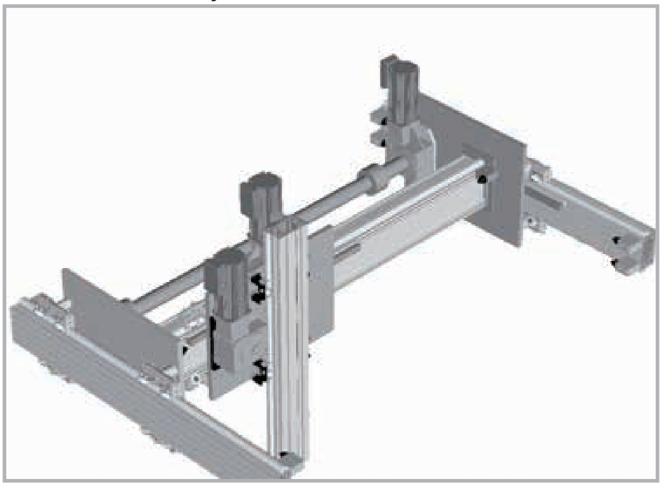
1 - Two axis Y-Z system



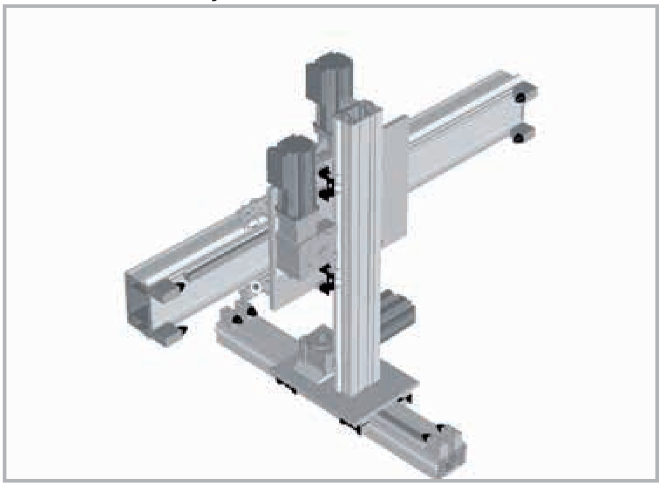
2 - Two axis Y-X system



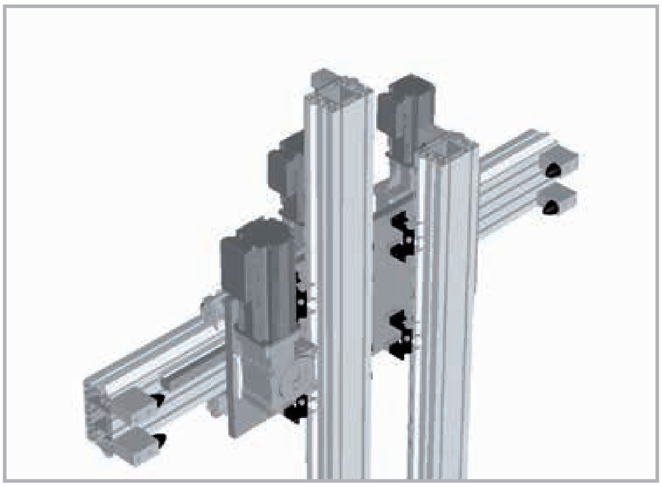
3 - Three axis X-Y-Z system



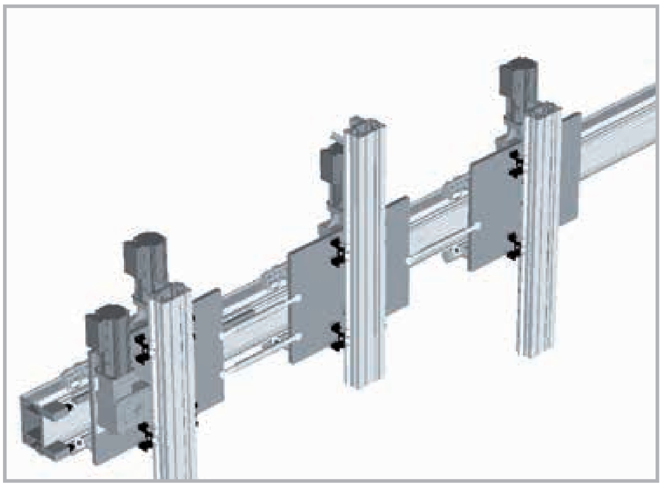
4 - Three Axis X-Y-Z system



5 - Two axis Y-Z system



6 - Two axis Y-Z system



Speedy Rail A

SAB series

SAB series description

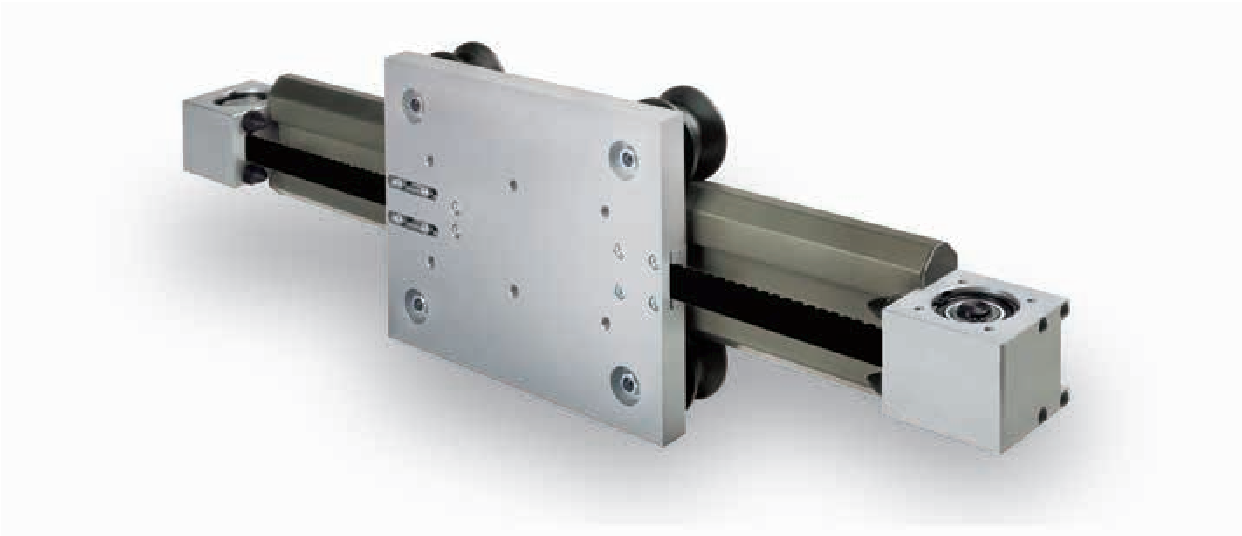


Fig. 1

SAB products are self-supporting extruded aluminum actuators driven by a polyurethane belt system. Due to their deep hard anodized surface treatment and their plastic compound coated rollers, SAB series can achieve exceptionally high performances and load capacity with no maintenance or lubrication required. They also provide total reliability even in dirty environments, with uniquely quiet operation.

SAB series is defined by the use of **guides with cylindrical and V-shaped rollers** as linear motion components. These linear motion systems are lightweight, self-supporting, easy to assemble, cost effective, modular, clean and quiet. Thanks to this kind of solution they are specifically dedicated for dirty environments and high dynamics in automation. SAB series is available with profiles of different sizes: 60 - 120 -180 - 250 mm.

Some of the main **advantages** of SAB series are:

- High reliability
- Self-supporting for greatest design freedom
- High technical performance
- High load
- Optimal reliability in dirty environments
- Absence of lubrication
- Uniquely quiet
- Self-aligning system

The components

Extruded bodies

SAB beam is a heat-treated Aluminum alloy profile with hollow cross-sections which makes it very strong under torsion and deflection stresses. Beams are then subject to a special patented treatment which provides a smooth, hard surface, comparable to tempered steel, and an optimal resistance to wear, even in dirty environments.

Driving belt

The SAB series driving system consists in a polyurethane toothed belt, reinforced with high resistance steel cords. For some applications, the belt driven solution is ideal due to its high load transmission characteristics, compact size and low noise. Some of the advantages of using a belt driven system are: high speed, high acceleration, low noise and no need for lubrication.

Carriage

The carriage of the SAB series linear units is made of anodised aluminum. Different lengths of the carriages are available according to the different sizes.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 1

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.7	69	23	200	880-900	33	600-655

Tab. 2

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
205	165	10	60-80

Tab. 3

The linear motion system

The linear motion system has been designed to meet the load capacity, speed, and maximum acceleration conditions of a wide variety of applications.

SAB with cylindrical and V-shaped rollers:

The SAB range includes a large selection of rollers both cylindrical and V-shaped, and sliders assembled with two or more rollers. SAB rollers are covered by a sintered plastic compound, resistant to pollutants and virtually maintenance-free. Ball and/or needle bearings with high performance are mounted into the rollers and can be maintained either with standard greasing procedure or lifetime lubricated. All roller boxes are equipped with concentric and eccentric pins for a quick adjustment of the contact between rollers and rail.
Supports are mounted on the frame when the rail is movable and on the trolleys when it is fixed.

SAB section

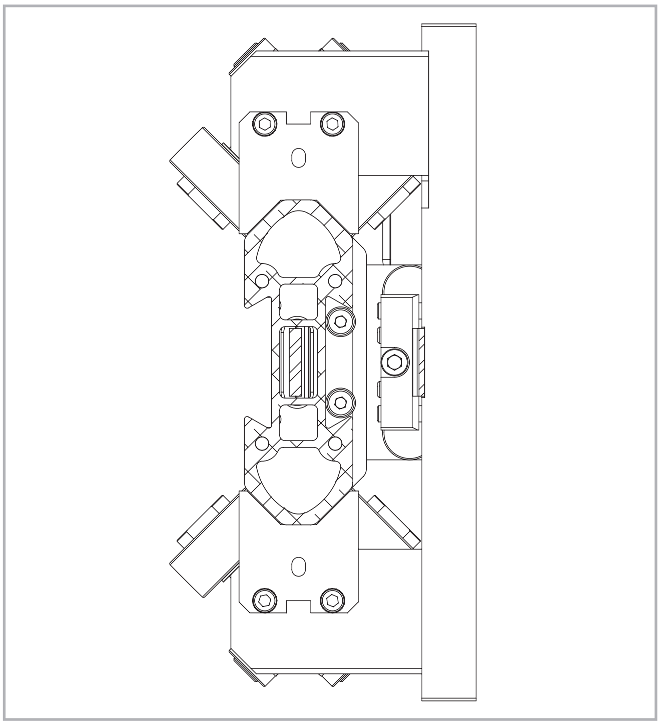
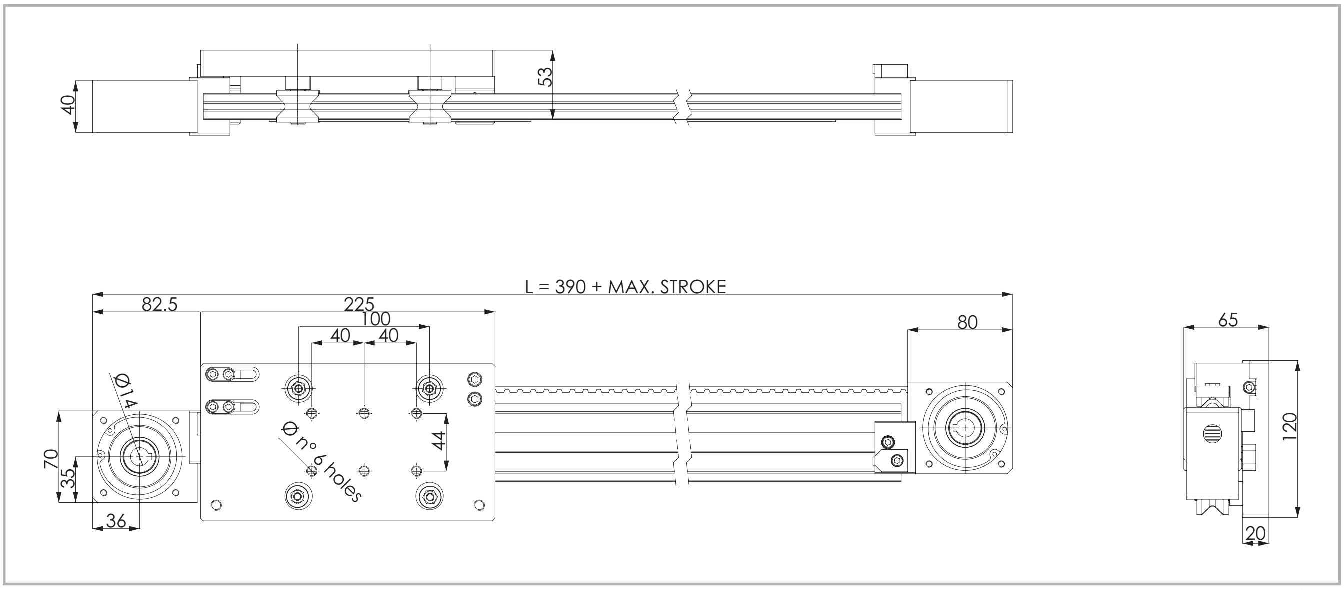


Fig. 2

SAB 60V

SAB 60V Dimension

Anticorrosion version available



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 3

Technical data

	Type
	SAB 60V
Max. useful stroke length [mm]	7250
Max. positioning repeatability [mm]*1	± 0.2
Max. speed [m/s]	7
Max. acceleration [m/s²]	8
Type of belt	10 AT 10
Type of pulley	Z 19
Pulley pitch diameter [mm]	60.479
Carriage displacement per pulley turn [mm]	190
Carriage weight [kg]	1.7
Zero travel weight [kg]	3.8
Weight for 100 mm useful stroke [kg]	0.13
Rail size [mm]	60x20

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 4

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
SAB 60V	0.014	0.002	0.003

Tab. 5

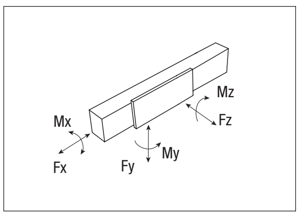
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
SAB 60V	10 AT 10	10	0.064

Tab. 6

Belt length (mm) = 2 x L - 80



Load capacity

Type	F_x [N]		F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.					
SAB 60V	706	374	540	400	9	20	27

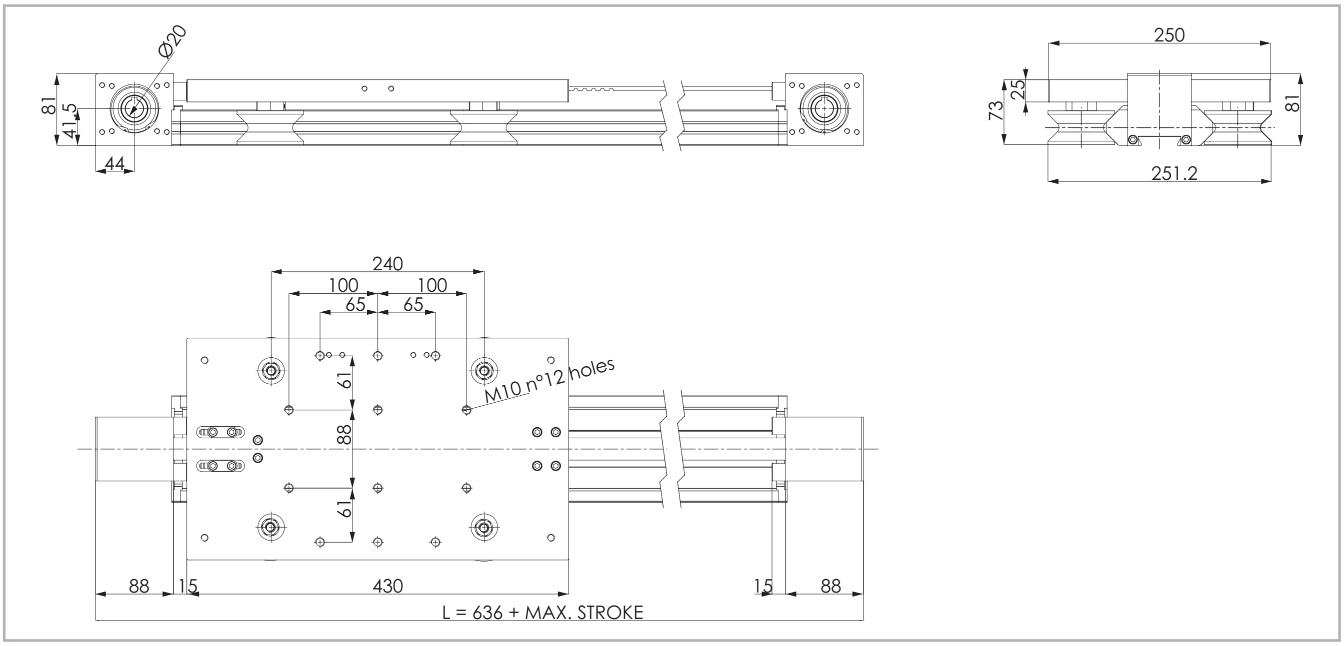
Non-cumulative moments referred to the median trolley axis and to a theoretical lifetime of the Speedy Rail guide and of the rollers of up to 80.000 km.

Tab. 7

SAB 120VX

Anticorrosion version available

SAB 120VX Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 4

Technical data

	Type
	SAB 120VX
Max. useful stroke length [mm]	7056
Max. positioning repeatability [mm]*1	± 0.2
Max. speed [m/s]	6
Max. acceleration [m/s²]	8
Type of belt	25 AT 10HPF
Type of pulley	Z 15
Pulley pitch diameter [mm]	47.746
Carriage weight [kg]	8.22
Zero travel weight [kg]	17.0
Weight for 100 mm useful stroke [kg]	0.472
Rail size [mm]	120x40

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 8

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
SAB 120VX	0.214	0.026	0.043

Tab. 9

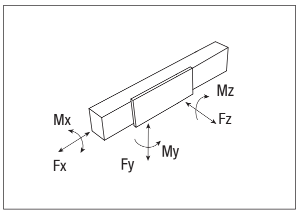
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
SAB 120VX	25 AT 10HPF	25	0.16

Tab. 10

Belt length (mm) = 2 x L - 300



Load capacity

Type	F_x [N]		F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.					
SAB 120VX	1349	715	1400	800	39.3	96	168

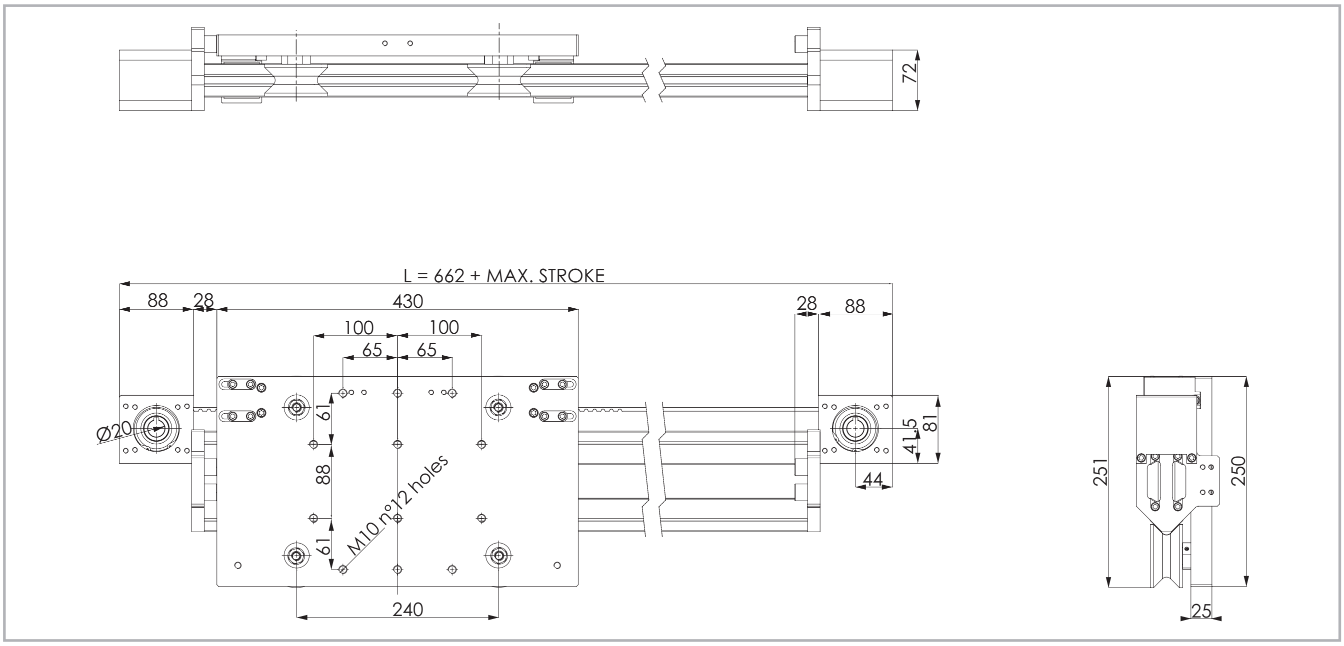
Non-cumulative moments referred to the median trolley axis and to a theoretical lifetime of the Speedy Rail guide and of the rollers of up to 80.000 km.

Tab. 11

SAB 120VZ

SAB 120VZ Dimension

Anticorrosion version available



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 5

Technical data

	Type
	SAB 120VZ
Max. useful stroke length [mm]*1	7040
Max. positioning repeatability [mm]*2	± 0.2
Max. speed [m/s]	6
Max. acceleration [m/s^2]	8
Type of belt	25 AT 10HPF
Type of pulley	Z 15
Pulley pitch diameter [mm]	47.746
Carriage displacement per pulley turn [mm]	150
Carriage weight [kg]	9.1
Zero travel weight [kg]	17.9
Weight for 100 mm useful stroke [kg]	0.472
Rail size [mm]	120x40

*1) It is possible to obtain longer strokes by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 12

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
SAB 120VZ	0.214	0.026	0.043

Tab. 13

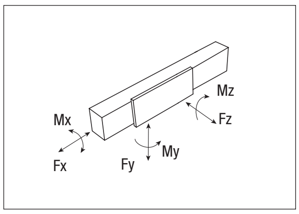
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
SAB 120VZ	25 AT 10HPF	25	0.16

Tab. 14

Belt length (mm) = 2 x L - 310



Load capacity

Type	F_x [N]		F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.					
SAB 120VZ	1349	715	1400	800	39.3	96	168

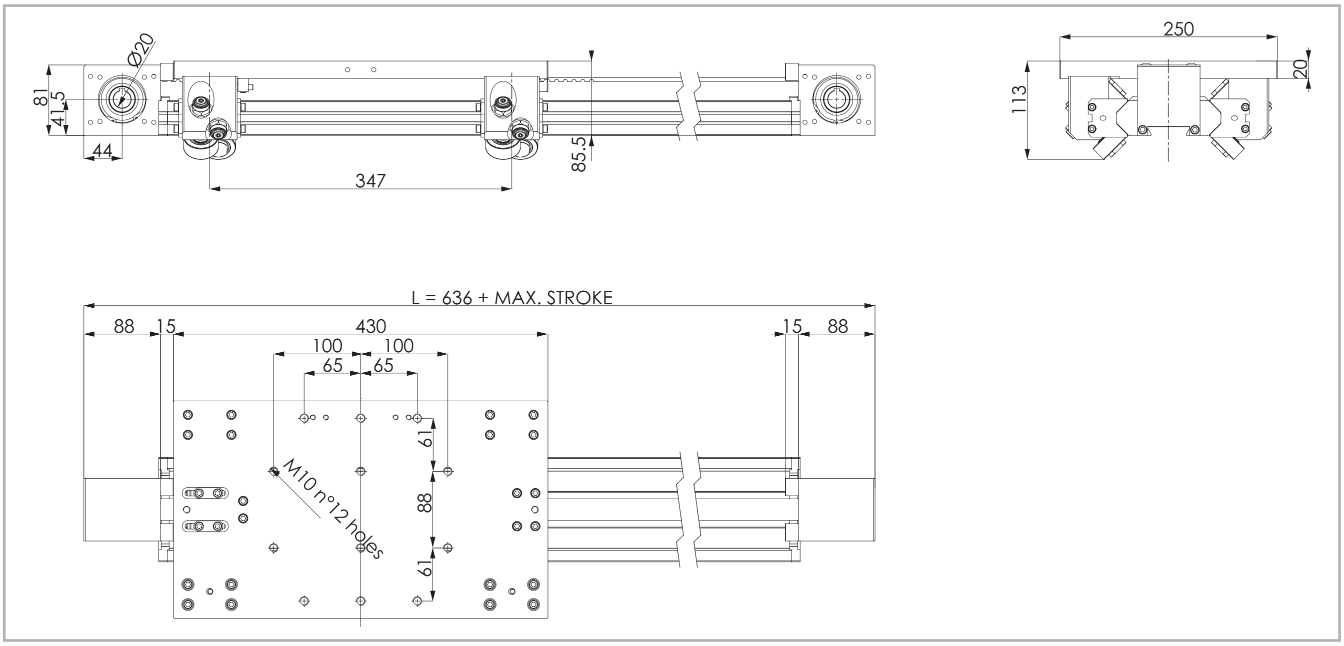
Non-cumulative moments referred to the median trolley axis and to a theoretical lifetime of the Speedy Rail guide and of the rollers of up to 80.000 km.

Tab. 15

SAB 120CX

Anticorrosion version available

SAB 120CX Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 6

Technical data

	Type
	SAB 120CX
Max. useful stroke length [mm]	7056
Max. positioning repeatability [mm]*1	± 0.2
Max. speed [m/s]	6
Max. acceleration [m/s²]	10
Type of belt	25 AT 10HPF
Type of pulley	Z 15
Pulley pitch diameter [mm]	47.746
Carriage displacement per pulley turn [mm]	150
Carriage weight [kg]	8.5
Zero travel weight [kg]	17.3
Weight for 100 mm useful stroke [kg]	0.472
Rail size [mm]	120x40

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 16

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
SAB 120CX	0.214	0.026	0.043

Tab. 17

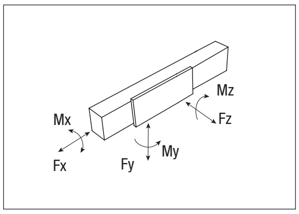
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
SAB 120CX	25 AT 10HPF	25	0.16

Tab. 18

Belt length (mm) = 2 x L - 300



Load capacity

Type	F_x [N]		F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.					
SAB 120CX	1349	715	2489	2489	98	432	432

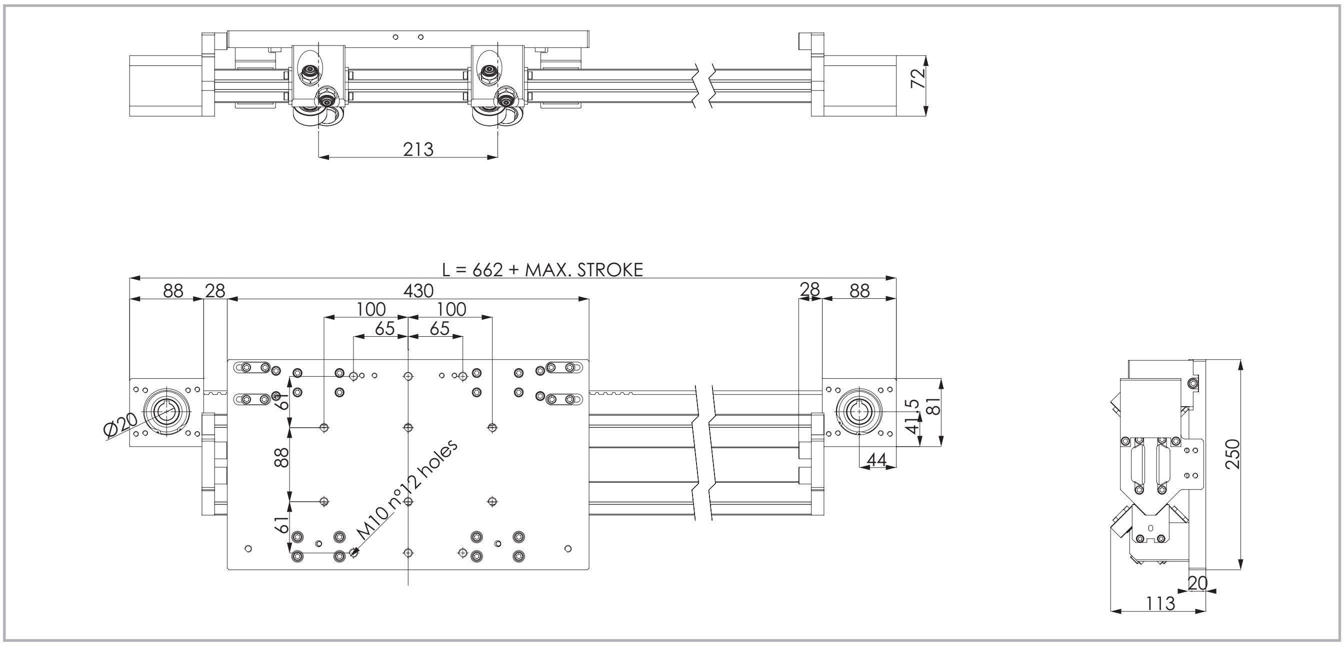
Non-cumulative moments referred to the median trolley axis and to a theoretical lifetime of the Speedy Rail guide and of the rollers of up to 80.000 km.

Tab. 19

SAB 120CZ

Anticorrosion version available

SAB 120CZ Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 7

Technical data

	Type
	SAB 120CZ
Max. useful stroke length [mm]*1	7040
Max. positioning repeatability [mm]*2	± 0.2
Max. speed [m/s]	6
Max. acceleration [m/s²]	10
Type of belt	25 AT 10HPF
Type of pulley	Z 15
Pulley pitch diameter [mm]	47.746
Carriage displacement per pulley turn [mm]	150
Carriage weight [kg]	9.4
Zero travel weight [kg]	18.2
Weight for 100 mm useful stroke [kg]	0.472
Rail size [mm]	120x40

*1) It is possible to obtain longer strokes by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 20

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
SAB 120CZ	0.214	0.026	0.043

Tab. 21

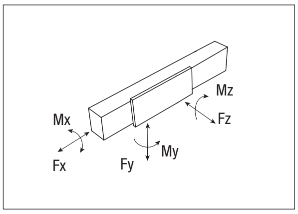
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
SAB 120CZ	25 AT 10HPF	25	0.16

Tab. 22

Belt length (mm) = 2 x L - 300



Load capacity

Type	F_x [N]		F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.					
SAB 120CZ	1349	715	2489	2489	98	265	265

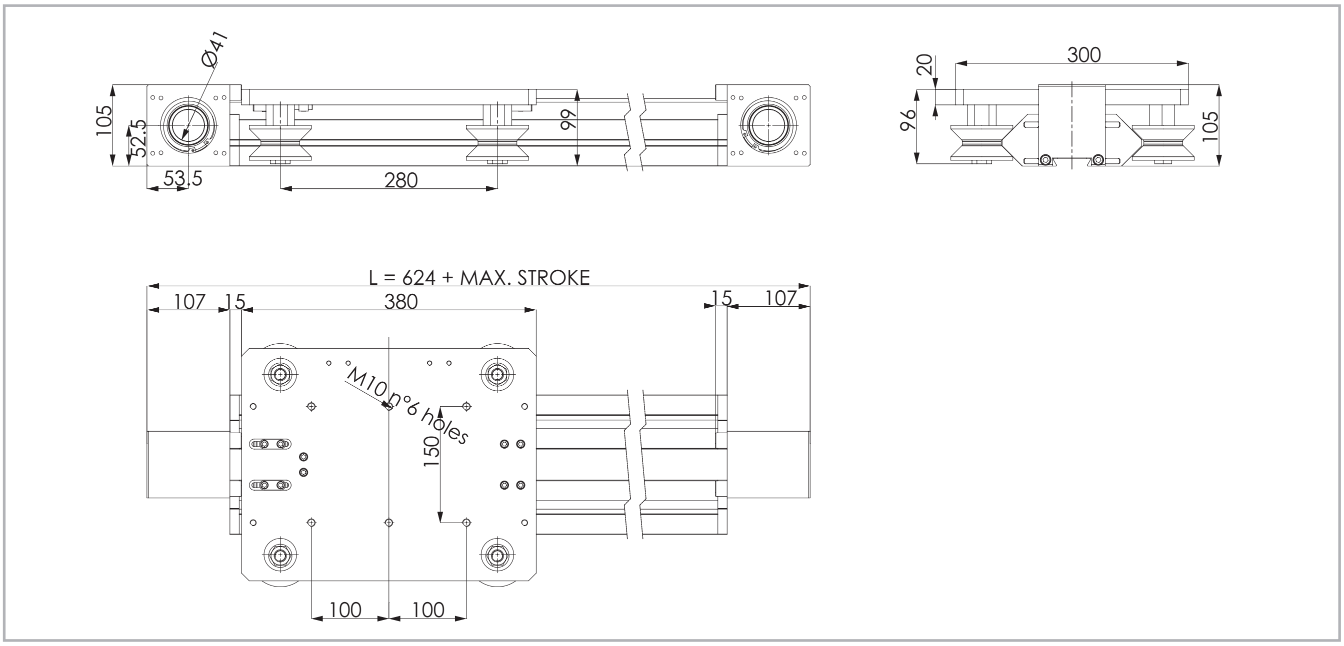
Non-cumulative moments referred to the median trolley axis and to a theoretical lifetime of the Speedy Rail guide and of the rollers of up to 80.000 km.

Tab. 23

SAB 180V

Anticorrosion version available

SAB 180V Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 8

Technical data

	Type
	SAB 180V
Max. useful stroke length [mm]	7114
Max. positioning repeatability [mm]*1	± 0.2
Max. speed [m/s]	8
Max. acceleration [m/s²]	8
Type of belt	40 AT10
Type of pulley	Z 21
Pulley pitch diameter [mm]	66.84
Carriage displacement per pulley turn [mm]	210
Carriage weight [kg]	8.3
Zero travel weight [kg]	27.6
Weight for 100 mm useful stroke [kg]	1.06
Rail size [mm]	180x60

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 24

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
SAB 180V	1.029	0.128	0.260

Tab. 25

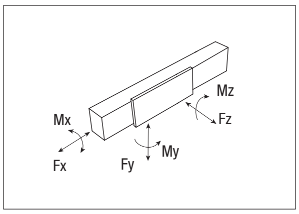
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
SAB 180V	40 AT10	40	0.23

Tab. 26

Belt length (mm) = 2 x L - 220



Load capacity

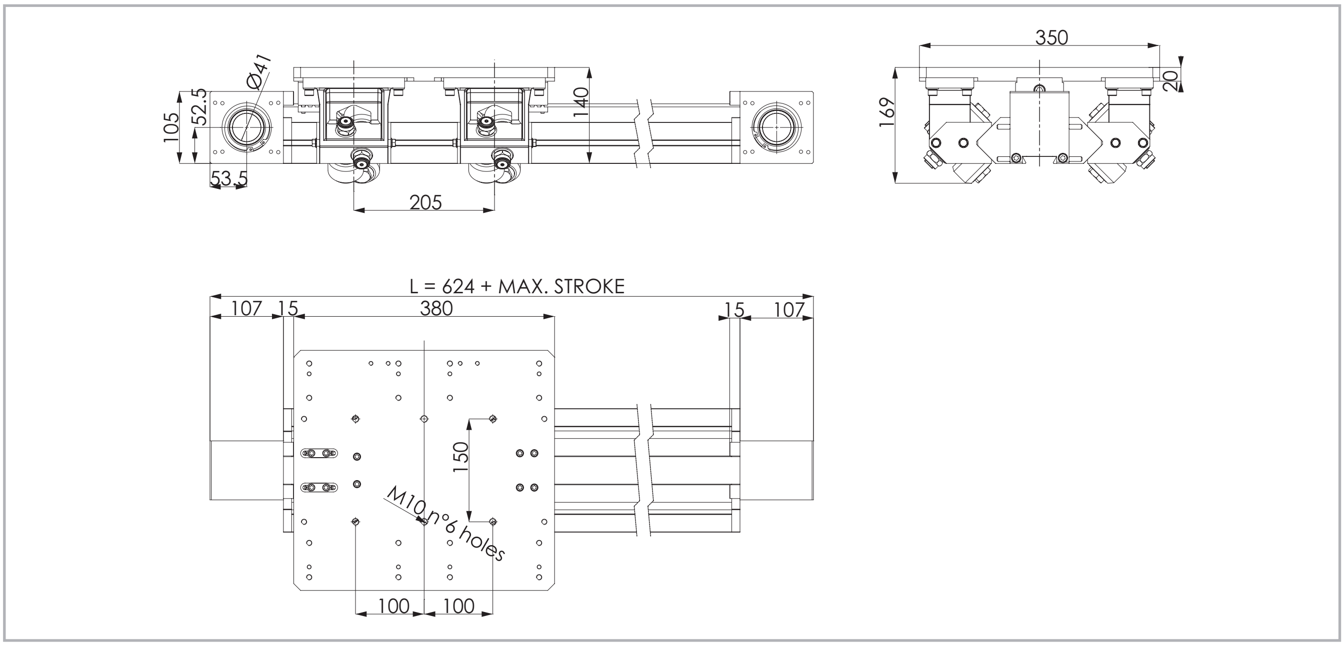
Type	F_x [N]		F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.					
SAB 180V	3154	1671	1400	800	58	112	196

Non-cumulative moments referred to the median trolley axis and to a theoretical lifetime of the Speedy Rail guide and of the rollers of up to 80.000 km.

Tab. 27

SAB 180C

SAB 180C Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 9

Technical data

	Type
	SAB 180C
Max. useful stroke length [mm]	7114
Max. positioning repeatability [mm]*1	± 0.2
Max. speed [m/s]	8
Max. acceleration [m/s^2]	10
Type of belt	40 AT10
Type of pulley	Z 21
Pulley pitch diameter [mm]	66.84
Carriage displacement per pulley turn [mm]	210
Carriage weight [kg]	16.0
Zero travel weight [kg]	30.8
Weight for 100 mm useful stroke [kg]	1.06
Rail size [mm]	180x60

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 28

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
SAB 180C	1.029	0.128	0.260

Tab. 29

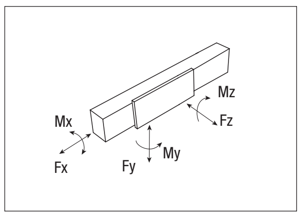
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
SAB 180C	40 AT 10	40	0.23

Tab. 30

Belt length (mm) = 2 x L - 210



Load capacity

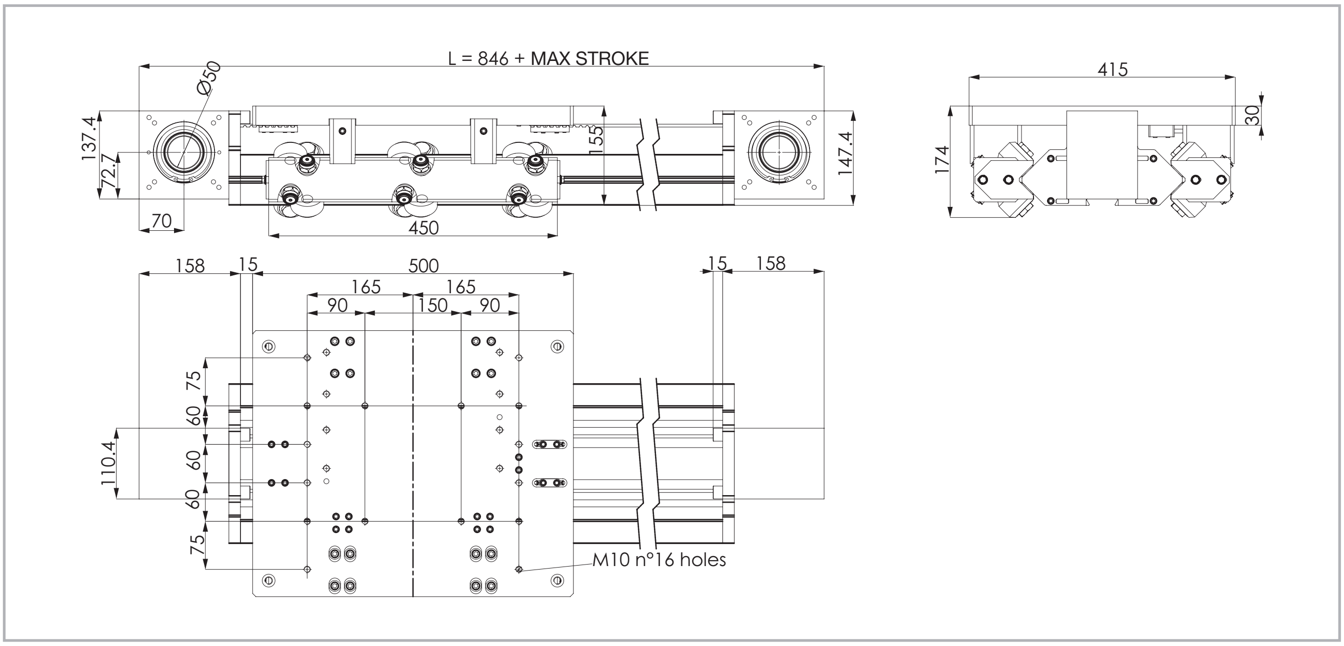
Type	F_x [N]		F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.					
SAB 180C	3154	1671	3620	3620	246	371	371

Non-cumulative moments referred to the median trolley axis and to a theoretical lifetime of the Speedy Rail guide and of the rollers of up to 80.000 km.

Tab. 31

SAB 250C

SAB 250C Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 10

Technical data

	Type
	SAB 250C
Max. useful stroke length [mm]	6970
Max. positioning repeatability [mm]*1	± 0.2
Max. speed [m/s]	10
Max. acceleration [m/s²]	10
Type of belt	50 AT 10
Type of pulley	Z 27
Pulley pitch diameter [mm]	85.94
Carriage displacement per pulley turn [mm]	270
Carriage weight [kg]	32.3
Zero travel weight [kg]	57.7
Weight for 100 mm useful stroke [kg]	1.55
Rail size [mm]	250x180

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 32

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
SAB 250C	2.735	0.412	0,840

Tab. 33

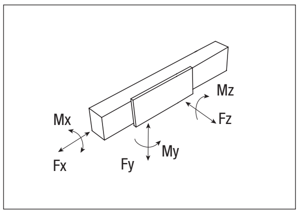
Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
SAB 250C	50 AT 10	50	0.34

Tab. 34

Belt length (mm) = 2 x L - 330



Load capacity

Type	F_x [N]		F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.					
SAB 250C	4980	2640	5431	5431	558	597	644

Non-cumulative moments referred to the median trolley axis and to a theoretical lifetime of the Speedy Rail guide and of the rollers of up to 80.000 km.

Tab. 35

Simple shaft version

Simple shaft type AS

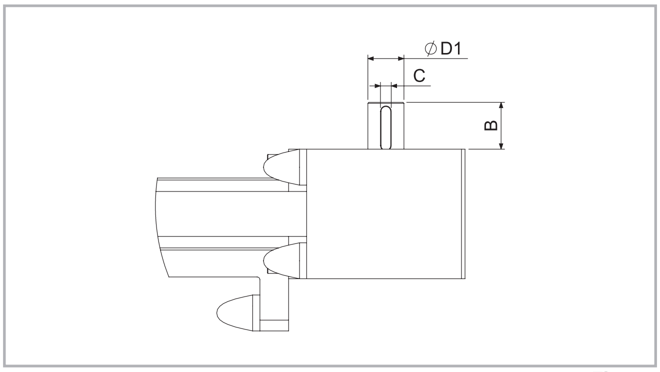


Fig. 11

Unit	Shaft type	Keyway C	B	D1	Kit Code
SAB 60	AS 14	5x5	32	14h7	G002486
SAB 120	AS 20	6x6	26	20h7	G002488

Tab. 36

Position of the simple shaft can be to the right, left, or both sides of the drive head.

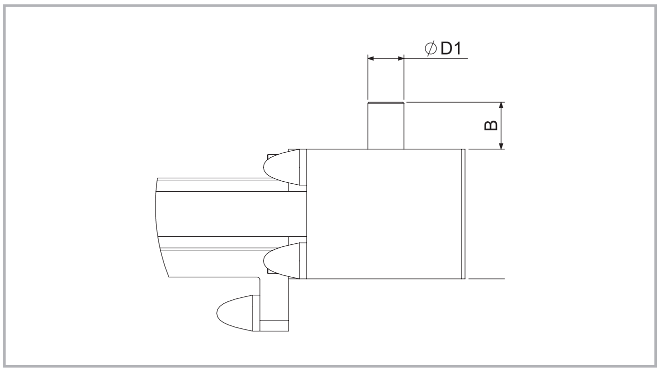


Fig. 12

Unit	Shaft type		B	D1	Kit Code
SAB 180	AS 20	Straight	36	20h7	G000828
SAB 250	AS 25	Straight	50	25h7	G000649

Tab. 37

Double shaft version

Double shaft type AS

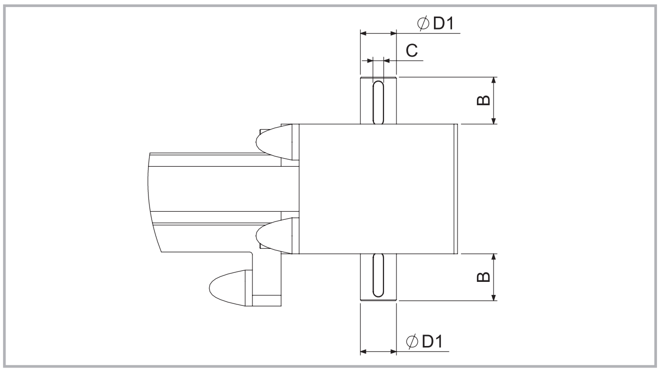


Fig. 13

Unit	Shaft type	Keyway C	B	D1	Kit Code
SAB 60	AS 14	5x5	32	14h7	G002487
SAB 120	AS 20	6x6	26	20h7	G002489

Tab. 38

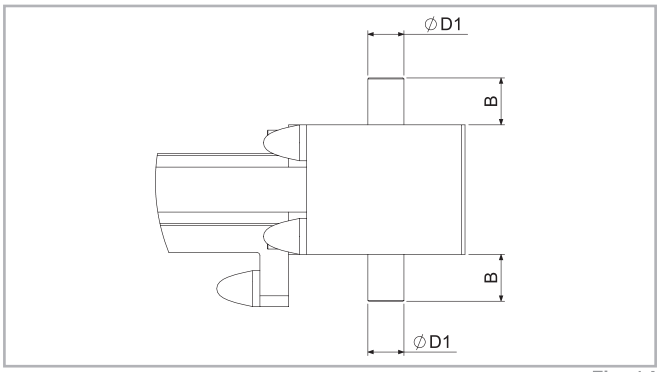


Fig. 14

Unit	Shaft type		B	D1	Kit Code
SAB 180	AS 20	Straight	36	20h7	2 x G000828
SAB 250	AS 25	Straight	50	25h7	2 x G000649

Tab. 39

Position of the simple shafts for encoder assembly to the right or to the left on the drive head.

Hollow shafts

Hollow shaft type AC

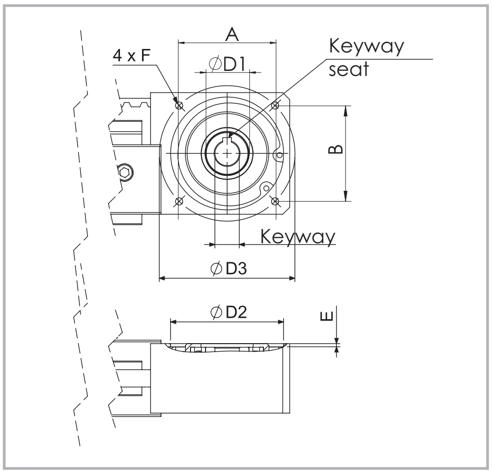


Fig. 15

Unit	Shaft type	Key-way	D1	D2	D3	E	F	A X B
SAB 60	AC 14	5 X 5	14H7	65	78	1.5	M5	-
SAB 120	AC 20	6 X 6	20H7	55	72	3.5	M6	72,8 x 59,2

Tab. 40

An (optional) connection flange is required to fit the standard reduction units selected by Rollon. For further information contact our offices

Hollow shaft type FP - Standard supply

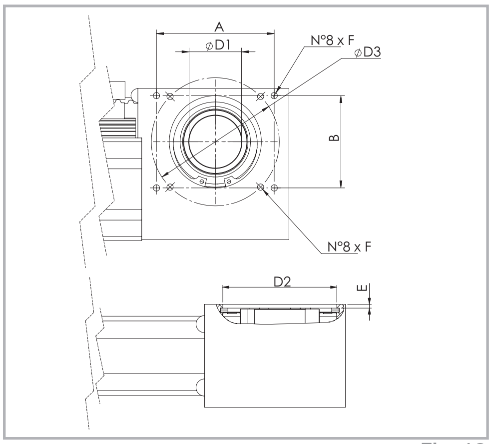


Fig. 16

Unit	Shaft type		D1	D2	D3	E	F	A X B
SAB 180	FP 41	Straight	41H7	72	100	3.5	M6	92 x 72
SAB 250	FP 50	Straight	25H7	95	130	3.5	M8	109 x 109

Tab. 41

Linear units in parallel

Synchronization kit for use of SAB linear units in parallel

When movement consisting of two linear units in parallel is essential, a synchronization kit must be used. This consists of original Rollon lamina type precision joints complete with tapered splines and hollow aluminum drive shafts.

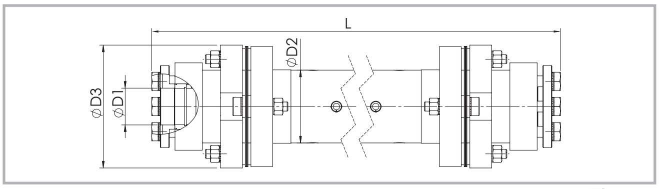


Fig. 17

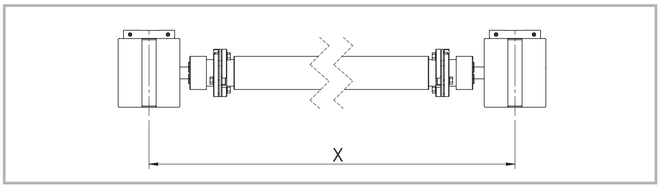


Fig. 18

Dimensions (mm)

Unit	Shaft type	D1	D2	D3	Kit Code
SAB 60	AP 15	15	40	69.5	GK15P...1A
SAB 120	AP 20	20	40	69.5	GK20P...1A
SAB 180	AP 20	20	40	69.5	GK20P...1A
SAB 250	AP 25	25	70	99	GK25P...1A

Tab. 42

Accessories

Adapter flange for gearbox assembly

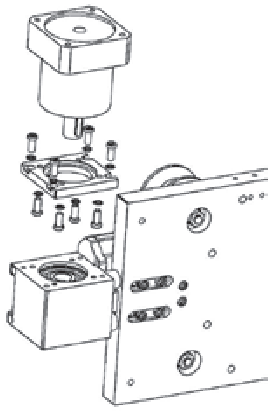


Fig. 19

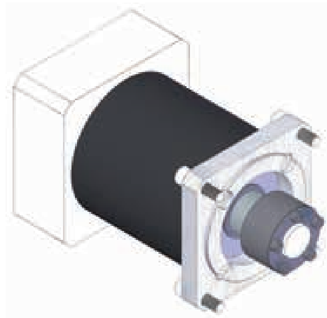


Fig. 20

Assembly kit includes: shrink disk; adapter plate; fixing hardware

Unit	Gearbox type	Kit Code
SAB60	MP060; PLE060; CP060	G002375
SAB120	PLE080	G002411
	PGII080	G002422
	MP080	G002426
	PLE060; CP060; PGII060	G002427
	MP060	G002432
SAB180	P3	G000824
	MP080	G000826
	LC90; MPV01; LP090; PE4	G000827
	MP105	G000830
	PE3; LP070; LC070	G001078
	SP060; PLN070	G000829
	SP070; PLN090	G000859
	SW040	G000866
SAB 250	MP130	G000482
	LC120; MPV02; LP120; PE5	G000483
	LC090; LP090; PE4	G000525
	MP105	G000527
	SP075; PLN090	G000526
	SW050	G000717

Tab. 43

Assembly kits

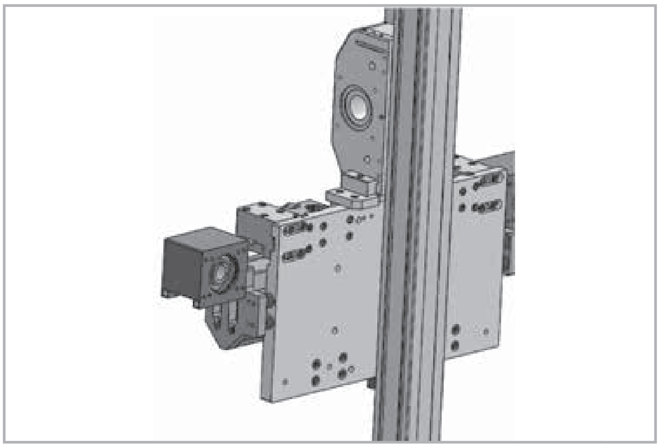


Fig. 21

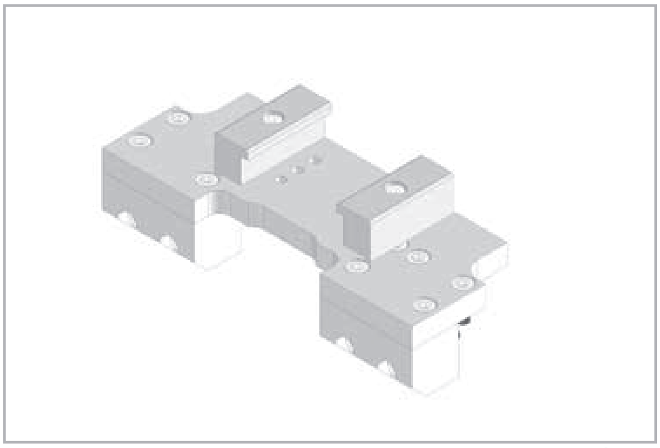


Fig. 22

While ordering two units for Y-Z assembly key has to be specified that they work together in order to drill the trolleys for the assembly of the kit.

Actuator combination Y-Z		Kit Code
	S-SMART 65 on SAB 120	G002440
	S-SMART 80 on SAB 180	G000990

Tab. 44

Connection rods

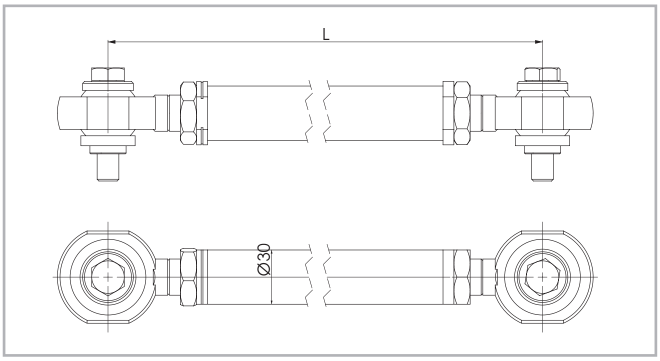


Fig. 23

Unit	Kit Code
SAB 60	GT125xxxxx1A
SAB 120	
SAB 180	
SAB 250	GT205xxxxx1A

Tab. 45

Kit spacer

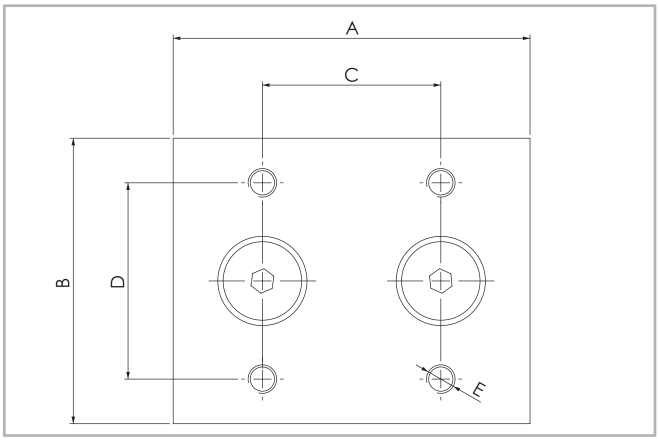
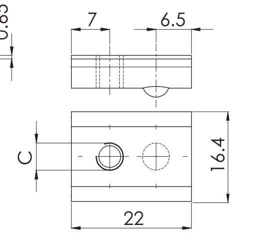


Fig. 24

Unit	A	B	C	D	E	Kit Code
SAB 60	50	40	30	25	M6	G002343
SAB 120	100	80	50	55	M8	G002362
SAB 180	100	125	50	70	M10	G002466
SAB 250	100	145	50	80	M12	G002523

Tab. 46

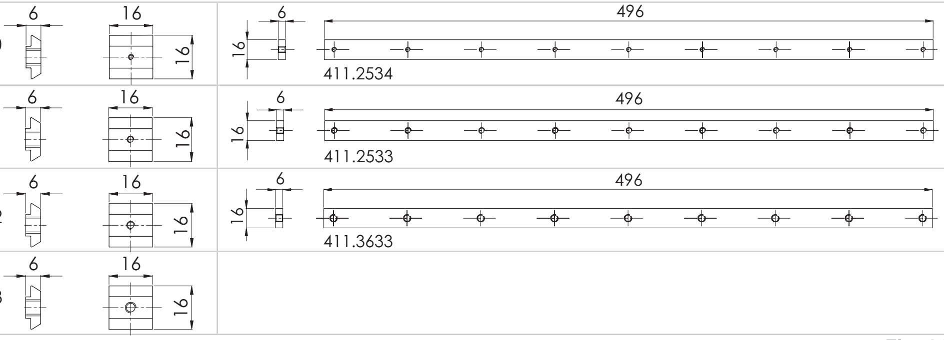
Insert for SAB 180V - SAB 180C - SAB250C



M5	Steel Std.	411.1351
M6	Steel Std.	411.1352
M8	Steel Std.	411.1353

Fig. 25

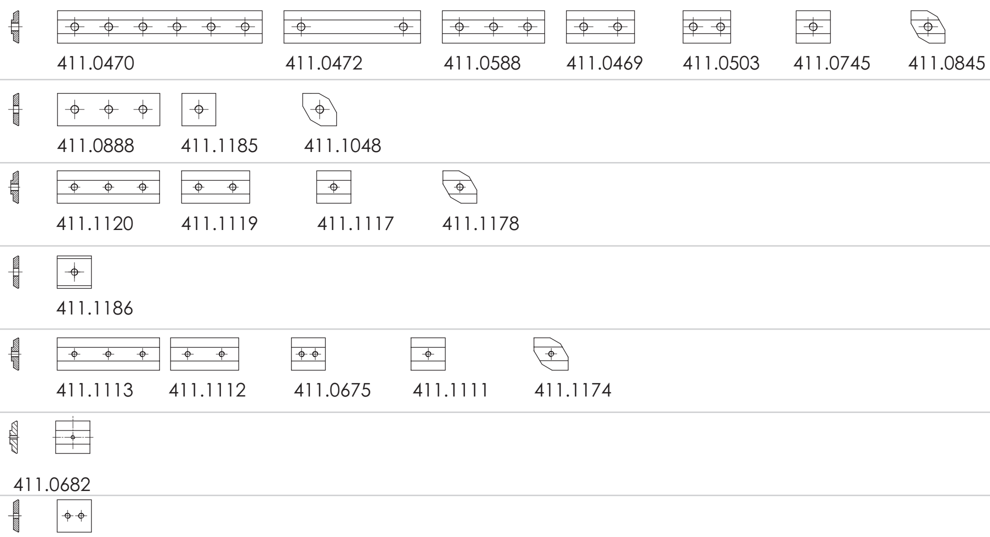
Quick insert for: SAB 180V - SAB 180C - SAB 250C



M4	Steel Std.	411.1360	411.2534
M5	Steel Std.	411.1361	411.2533
M6	Steel Std.	411.1362	411.3633
M8	Steel Std.	411.1363	

Fig. 26

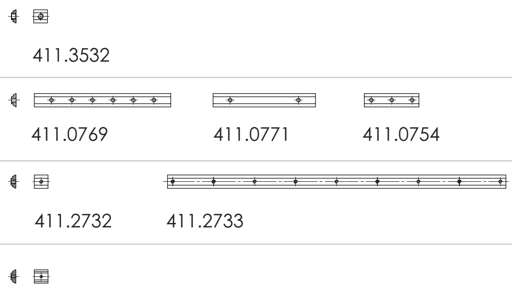
Dovetails for: SAB 120C - SAB 120V - SAB 180V - SAB 180C - SAB 250C



M12	Steel Std.	411.0470, 411.0472, 411.0588, 411.0469, 411.0503, 411.0745, 411.0845
M12	Steel Std.	411.0888, 411.1185, 411.1048
M10	Steel Std.	411.1120, 411.1119, 411.1117, 411.1178
M10	Steel Std.	411.1186
M8	Steel Std.	411.1113, 411.1112, 411.0675, 411.1111, 411.1174
M6	Steel Std.	411.0682
M8	Steel Std.	411.1675

Fig. 27

Dovetails for: SAB 60V



M8	Steel Std.	411.3532
M6	Steel Std.	411.0769, 411.0771, 411.0754, 411.0768, 411.0732
M5	Steel Std.	411.2732, 411.2733
M4	Steel Std.	411.1732

Fig. 28

S R A

Ordering key

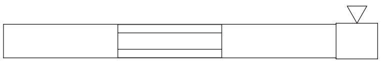
Identification codes for the SAB linear unit

SB	C	06=60	2D	XXXXX	1X	DXX
	V	12=120			1Z	
		18=180				
		25=250				

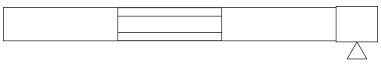
- DXX: Multiple carriages: D01, D02, D03, etc...
- 1X / 1Z: Belt orientation: 1X horizontal, 1Z vertical
- XXXXX: L = total length of the unit
- 2D: Hollow shaft head
- 06=60 … 25=250: Linear unit size
- C / V: Roller type C=cylindrical, V=V-shaped
- SB: SAB Series

In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Left/right orientation



Right



Left

ZSY series

ZSY series description

Fig. 29

ZSY products are self-supporting extruded aluminum actuators driven by a polyurethane belt system. Due to their deep hard anodized surface treatment and their plastic compound coated rollers, ZSY series can achieve exceptionally high performances and load capacity with no maintenance or lubrication required. They also provide total reliability even in dirty environments, with uniquely quiet operation.

The ZSY series linear units were designed to meet the vertical motion requirements in gantry applications or for applications where the Aluminum profile must be moving and the carriage must be fixed. It is ideal for a "Z" axis in a 3-axis system. Available in the 180mm size.

Some of the main advantages of ZSY series are:

- High reliability
- Self-supporting for greatest design freedom
- High technical performance
- High load
- Optimal reliability in dirty environments
- Absence of lubrication
- Uniquely quiet
- Self-aligning system

The components

Extruded bodies

ZSY beam is a heat-treated Aluminum alloy profile with hollow cross-sections which makes it very strong under torsion and deflection stresses. Beams are then subject to a special patented treatment which provides a smooth, hard surface, comparable to tempered steel, and an optimal resistance to wear, even in dirty environments.

Driving belt

The ZSY series driving system consists in a polyurethane toothed belt with AT pitch, reinforced with high resistance steel cords. For some applications, the belt driven solution is ideal due to its high load transmission characteristics, compact size and low noise. Some of the advantages of using a belt driven system are: high speed, high acceleration, low noise and no need for lubrication.

Carriage

The carriage of the ZSY series linear units is made of anodised aluminum.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 47

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.7	69	23	200	880-900	33	600-655

Tab. 48

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
205	165	10	60-80

Tab. 49

The linear motion system

The linear motion system has been designed to meet the load capacity, speed, and maximum acceleration conditions of a wide variety of applications.

ZSY with V-shaped rollers:

These rollers are V-shaped and covered by a sintered plastic compound, resistant to pollutants and virtually maintenance-free. Ball and/or needle bearings with high performance are mounted into the rollers and can be maintained either with standard greasing procedure or lifetime lubricated. All roller boxes are equipped with concentric and eccentric pins for a quick adjustment of the contact between rollers and rail. Supports are mounted on the frame when the rail is movable and on the trolleys when it is fixed.

ZSY 180 section

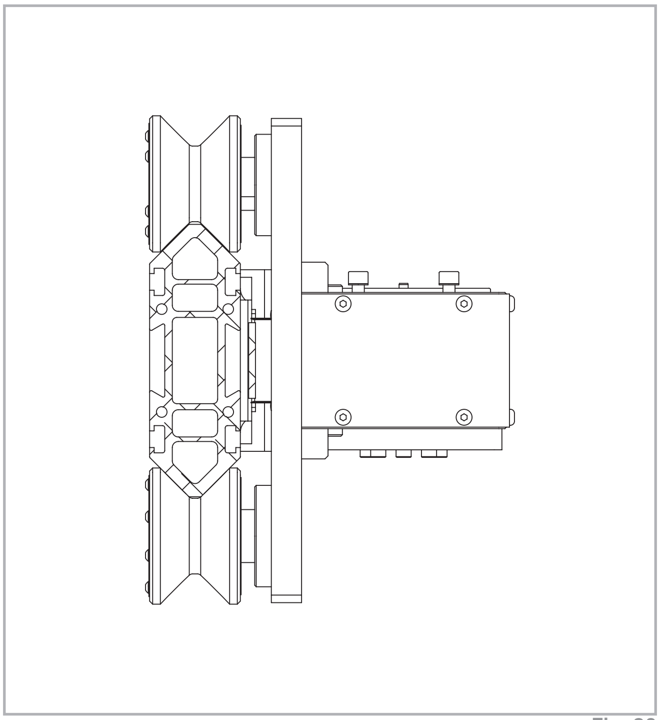
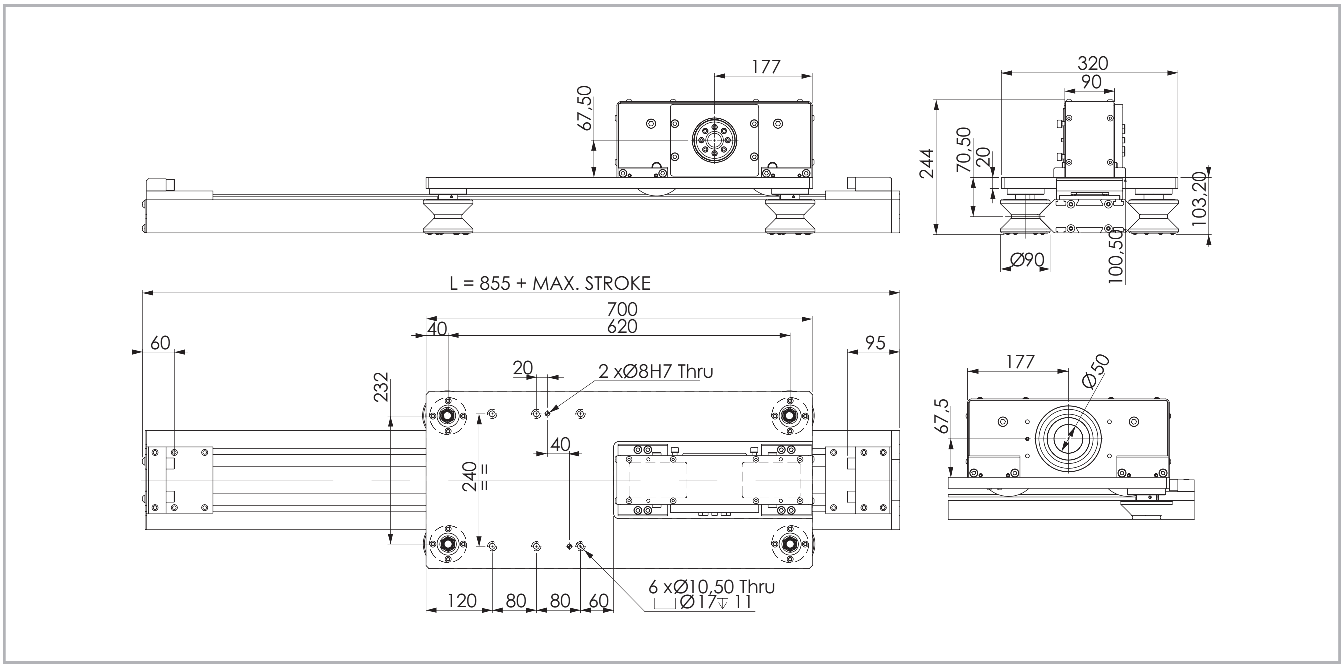


Fig. 30

ZSY 180V

ZSY 180V Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 31

Technical data

	Type
	ZSY 180V
Max. useful stroke length [mm]	2500
Max. positioning repeatability [mm]*1	± 0.2
Max. speed [m/s]	8
Max. acceleration [m/s²]	8
Type of belt	50 AT 10HPF
Type of pulley	Z 30
Pulley pitch diameter [mm]	95.49
Carriage displacement per pulley turn [mm]	300
Carriage weight [kg]	25.7
Zero travel weight [kg]	36
Weight for 100 mm useful stroke [kg]	1.06
Rail size [mm]	180x60

*1) Positioning repeatability is dependent on the type of transmission used

Tab. 50

Moments of inertia of the aluminum body

Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
ZSY 180V	1.029	0.128	0.260

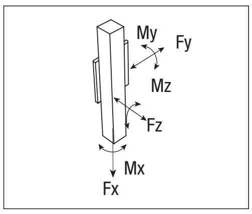
Tab. 51

Driving belt

The driving belt is manufactured from a friction resistant polyurethane and with steel cords for high tensile stress resistance.

Type	Type of belt	Belt width [mm]	Weight [kg/m]
ZSY 180V	50 AT 10HPF	50	0.34

Tab. 52



Load capacity

Type	F_x [N]		F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
	Stat.	Dyn.					
ZSY 180V	4980	2880	2300	2600	188	806	713

Non-cumulative moments referred to the median trolley axis and to a theoretical lifetime of the Speedy Rail guide and of the rollers of up to 80.000 km.

Tab. 53

Accessories

Adapter flange for gearbox assembly

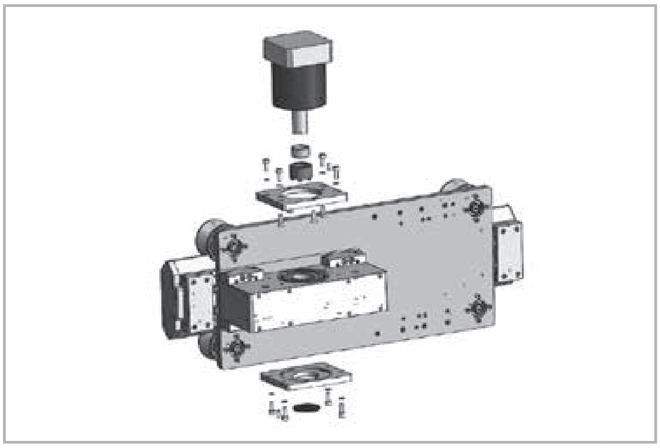


Fig. 32

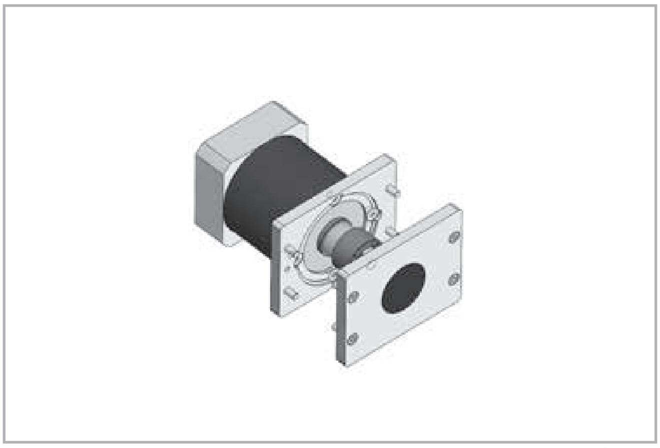


Fig. 33

Assembly kit includes: shrink disk; adapter plate; fixing hardware

Unit	Gearbox type (not included)	Kit Code
ZSY 180V	LP120; PE5; LC120	G001856
	SP100; P5	G001857
	PSF321	G001858
	PSF521	G001859
	EP120TT	G001860
	MP105	G001861
	MP080	G001951

Tab. 54

For other gearbox type ask Rollon

Kit spacer

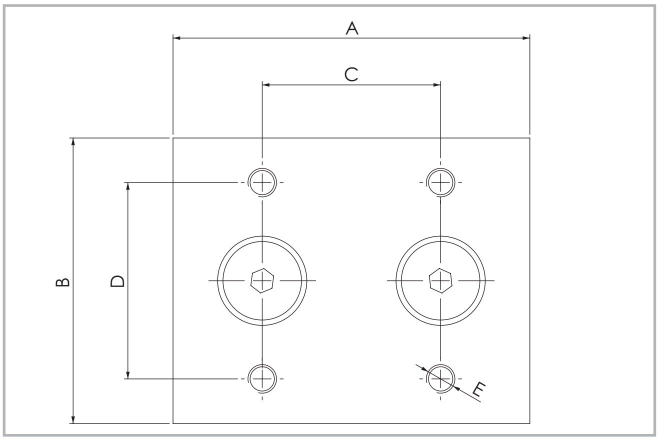


Fig. 34

Unit	A	B	C	D	E	Kit Code
ZSY 180V	100	125	50	70	M10	G002466

Tab. 55

S
R
A

Bracket for assembly - Large side (Ø12.5 - Ø20) Aluminum

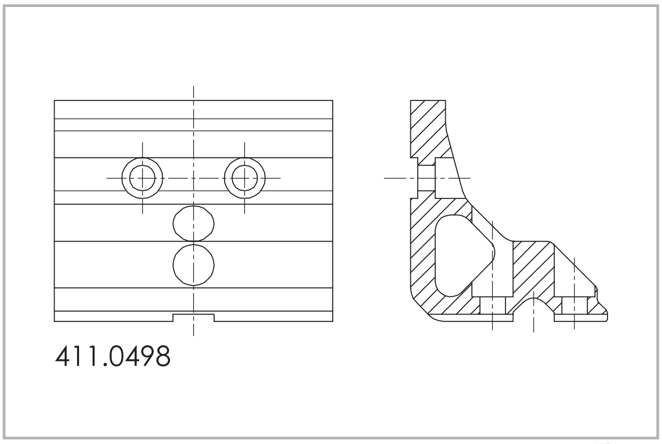


Fig. 35

Bracket for assembly - Large side (Ø12.5 - Ø20) Aluminum

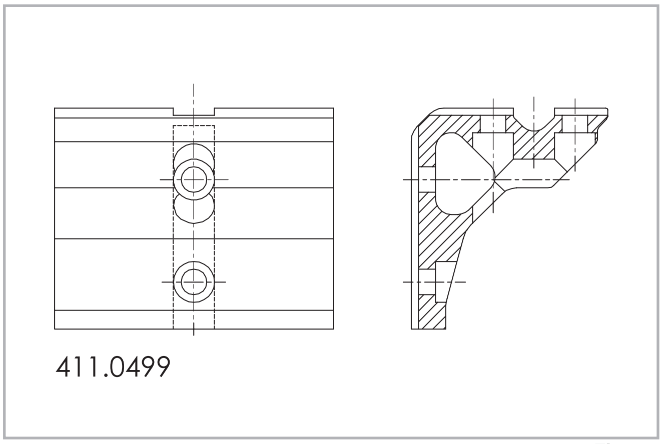


Fig. 36

Bracket for assembly - Short side (Ø12.5 - Ø20) Aluminum

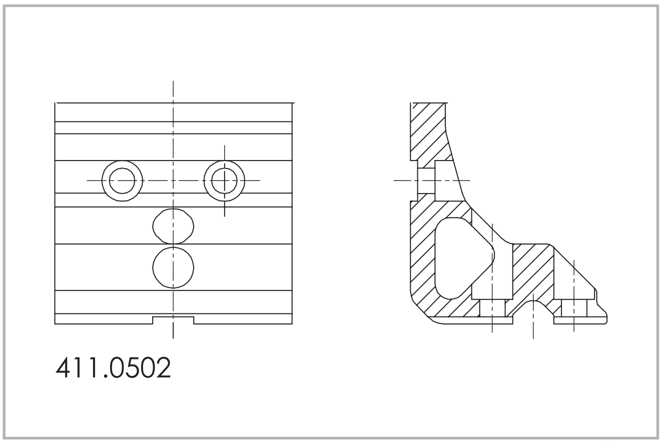


Fig. 37

Bracket for assembly - Short side (Ø12.5 - Ø20) Aluminum

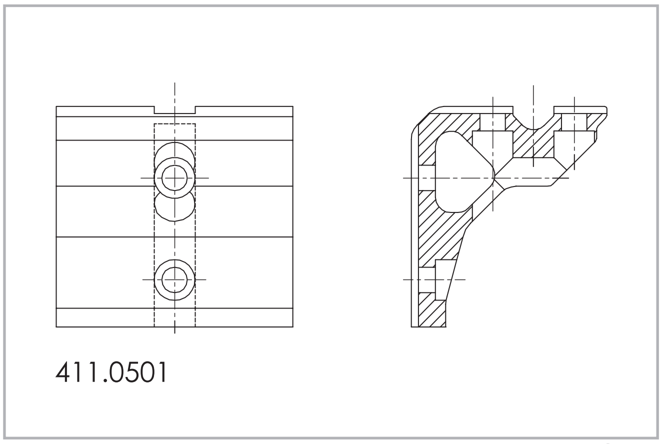
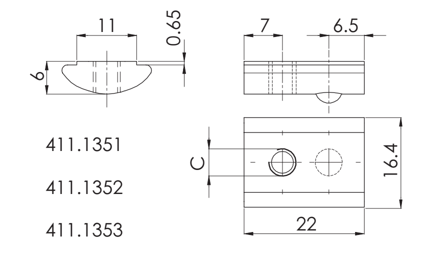


Fig. 38

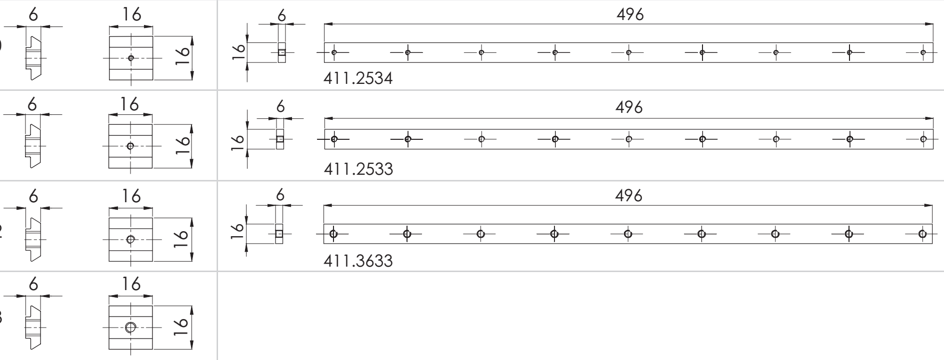
Insert for: ZSY 180V



M5	Steel Std.	411.1351
M6	Steel Std.	411.1352
M8	Steel Std.	411.1353

Fig. 39

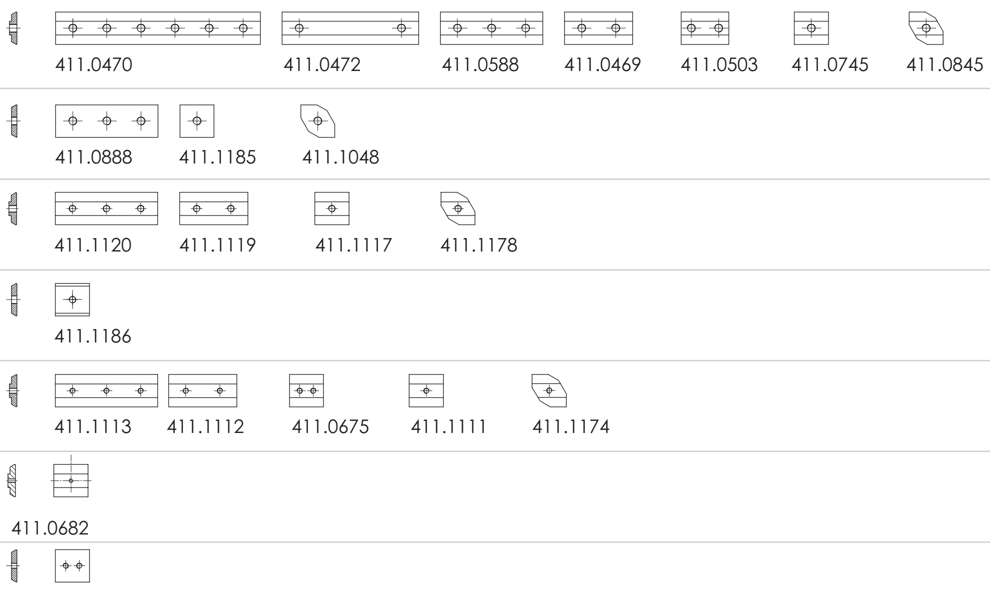
Quick front insert for: ZSY 180V



M4	Steel Std.	411.1360	411.2534
M5	Steel Std.	411.1361	411.2533
M6	Steel Std.	411.1362	411.3633
M8	Steel Std.	411.1363	

Fig. 40

Dovetails for: ZSY 180V



M12	Steel Std.	411.0470, 411.0472, 411.0588, 411.0469, 411.0503, 411.0745, 411.0845
M12	Steel Std.	411.0888, 411.1185, 411.1048
M10	Steel Std.	411.1120, 411.1119, 411.1117, 411.1178
M10	Steel Std.	411.1186
M8	Steel Std.	411.1113, 411.1112, 411.0675, 411.1111, 411.1174
M6	Steel Std.	411.0682
M8	Steel Std.	411.1675

Fig. 41

S R A

Ordering key

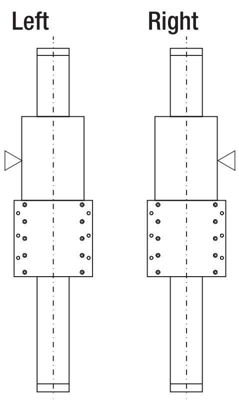
Identification codes for the ZSY linear unit

ZSY	V	18=180	2YA	XXXXX	1A
					Solution standard
				L = total length of the unit	
			Hollow shaft head d. 50		
		Linear unit size			
	Roller type: V=V-shaped				
ZSY Series					

In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Configure Actuator

Left/right orientation



SAR series

SAR series description

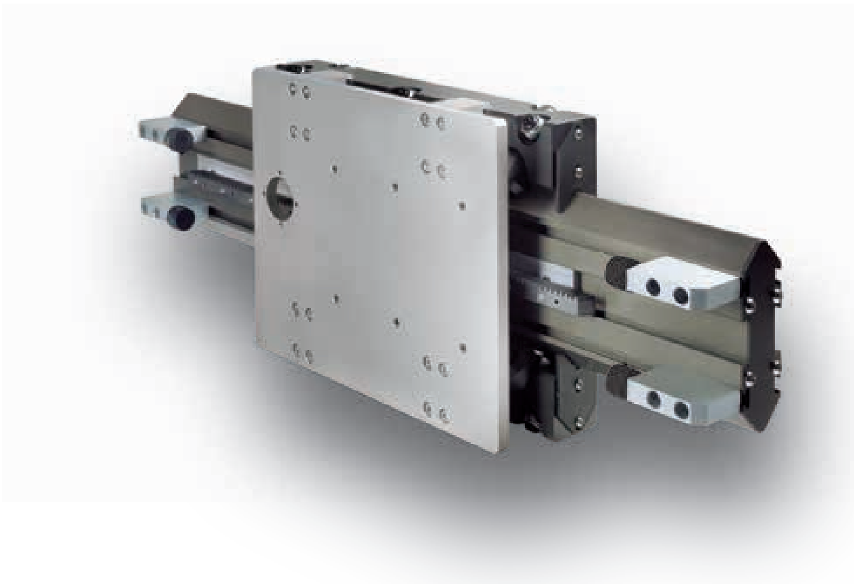


Fig. 42

SAR products are self-supporting extruded aluminum actuators driven by a rack and pinion system. Due to their deep hard anodized surface treatment and their plastic compound coated rollers, SAR series can achieve exceptionally high performances and load capacity with no maintenance or lubrication required. They also provide total reliability even in dirty environments, with uniquely quiet operation.

SAR series is defined by the use of **guides with cylindrical and V-shaped rollers** as linear motion components. These linear motion systems are lightweight, self-supporting, easy to assemble, cost effective, modular, clean and quiet. Thanks to this kind of solution they are specifically dedicated for dirty environments and high dynamics in automation. SAR series is available with profiles of different sizes: 120 -180 - 250 mm.

Some of the main **advantages** of SAR series are:

- High reliability
- Self-supporting for greatest design freedom
- High technical performance
- High load
- Optimal reliability in dirty environments
- Absence of lubrication
- Uniquely quiet
- Self-aligning system
- Potentially infinite strokes

The components

Extruded bodies

SAR beam is a heat-treated Aluminum alloy profile with hollow cross-sections which makes it very strong under torsion and deflection stresses. Beams are then subject to a special patented treatment which provides a smooth, hard surface, comparable to tempered steel, and an optimal resistance to wear, even in dirty environments.

Rack and pinion drive

The SAR series is driven by a rack and pinion system. This option is suitable to achieve long strokes and enables the possibility to mount and to manage multiple carriages. Hardened racks and pinions allow the system to work better in dirty environments, while straight teeth permit high load capacity, low noise and a smooth linear movement. SAR products can be provided with a lubrication kit, to eliminate periodic greasing operations.

Carriage

The carriage of the SAR series linear units is made of anodised aluminum. Different lengths of the carriages are available according to the different sizes.

General data about aluminum used: AL 6060

Chemical composition [%]

Al	Mg	Si	Fe	Mn	Zn	Cu	Impurites
Remaining	0.35-0.60	0.30-0.60	0.30	0.10	0.10	0.10	0.05-0.15

Tab. 56

Physical characteristics

Density	Coeff. of elasticity	Coeff. of thermal expansion (20°-100°C)	Thermal conductivity (20°C)	Specific heat (0°-100°C)	Resistivity	Melting point
$\frac{kg}{dm^3}$	$\frac{kN}{mm^2}$	$\frac{10^{-6}}{K}$	$\frac{W}{m \cdot K}$	$\frac{J}{kg \cdot K}$	$\Omega \cdot m \cdot 10^{-9}$	°C
2.7	69	23	200	880-900	33	600-655

Tab. 57

Mechanical characteristics

Rm	Rp (02)	A	HB
$\frac{N}{mm^2}$	$\frac{N}{mm^2}$	%	—
205	165	10	60-80

Tab. 58

The linear motion system

The linear motion system has been designed to meet the load capacity, speed, and maximum acceleration conditions of a wide variety of applications.

SAR with cylindrical and V-shaped rollers:

The SAR range includes a large selection of rollers both cylindrical and V-shaped, and sliders assembled with two or more rollers. SAR rollers are covered by a sintered plastic compound, resistant to pollutants and virtually maintenance-free. Ball and/or needle bearings with high performance are mounted into the rollers and can be maintained either with standard greasing procedure or lifetime lubricated. All roller boxes are equipped with concentric and eccentric pins for a quick adjustment of the contact between rollers and rail.
Supports are mounted on the frame when the rail is movable and on the trolleys when it is fixed.

SAR section

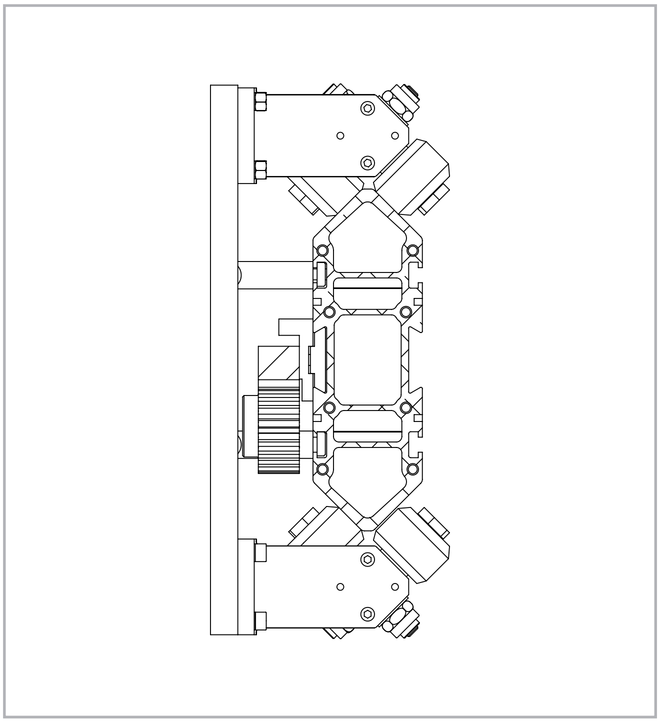
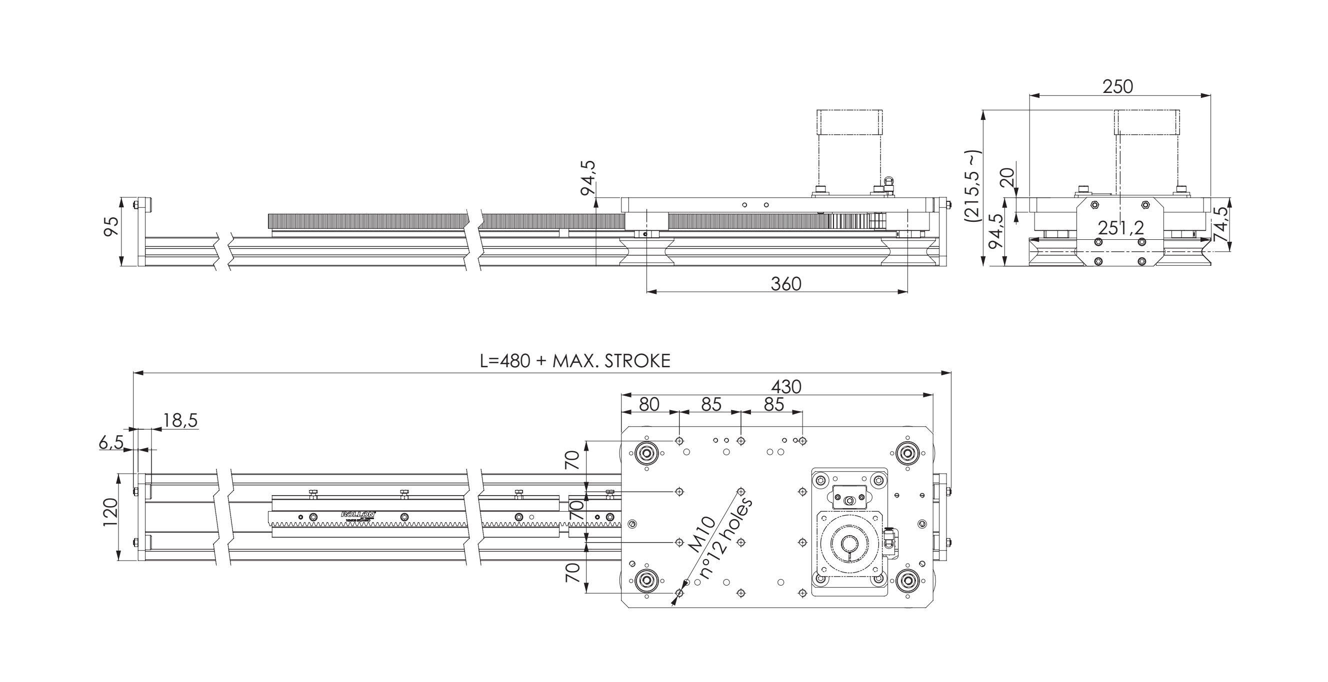


Fig. 43

SAR 120V

SAR 120V Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 44

Technical data

	Type
	SAR 120V
Max. useful stroke length [mm]*1	NO LIMITS
Max. positioning repeatability [mm]*2	± 0.15
Max. speed [m/s]	3
Max. acceleration [m/s²]	8
Rack module	m 2
Pinion pitch diameter [mm]	54
Carriage displacement per pinion turn [mm]	169.65
Carriage weight [kg]	7
Zero travel weight [kg]	12
Weight for 100 mm useful stroke [kg]	1.1
Rail size [mm]	120x40

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 59

Moments of inertia of the aluminum body

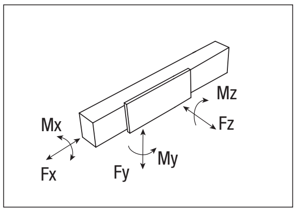
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
SAR 120V	0.214	0.026	0.043

Tab. 60

Rack specifications

Type	Type of rack	Rack module	Quality
SAR 120V	Straight teeth Hardened	m 2	Q10

Tab. 61



Load capacity

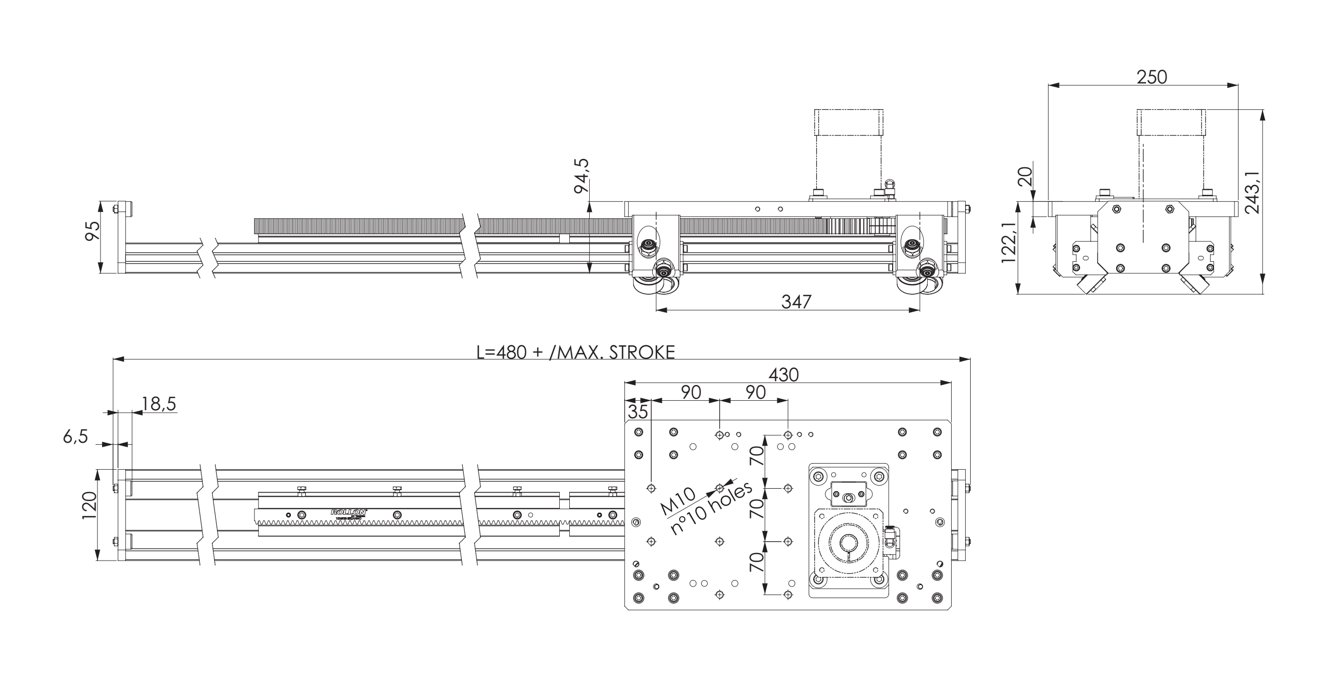
Type	F_x [N]	F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
SAR 120V	1633	1400	800	39.3	144	252

Non-cumulative moments referred to the median trolley axis and to a theoretical lifetime of the Speedy Rail guide and of the rollers of up to 80.000 km.

Tab. 62

SAR 120C

SAR 120C Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 45

Technical data

	Type
	SAR 120C
Max. useful stroke length [mm]*1	NO LIMITS
Max. positioning repeatability [mm]*2	± 0.15
Max. speed [m/s]	3
Max. acceleration [m/s²]	10
Rack module	m 2
Pinion pitch diameter [mm]	54
Carriage displacement per pinion turn [mm]	169.65
Carriage weight [kg]	8.4
Zero travel weight [kg]	13.5
Weight for 100 mm useful stroke [kg]	1.1
Rail size [mm]	120x40

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 63

Moments of inertia of the aluminum body

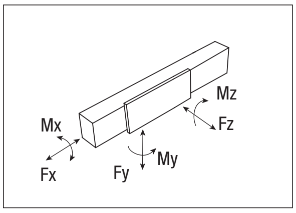
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
SAR 120C	0.214	0.026	0.043

Tab. 64

Rack specifications

Type	Type of rack	Rack module	Quality
SAR 120C	Straight teeth Hardened	m 2	Q10

Tab. 65



Load capacity

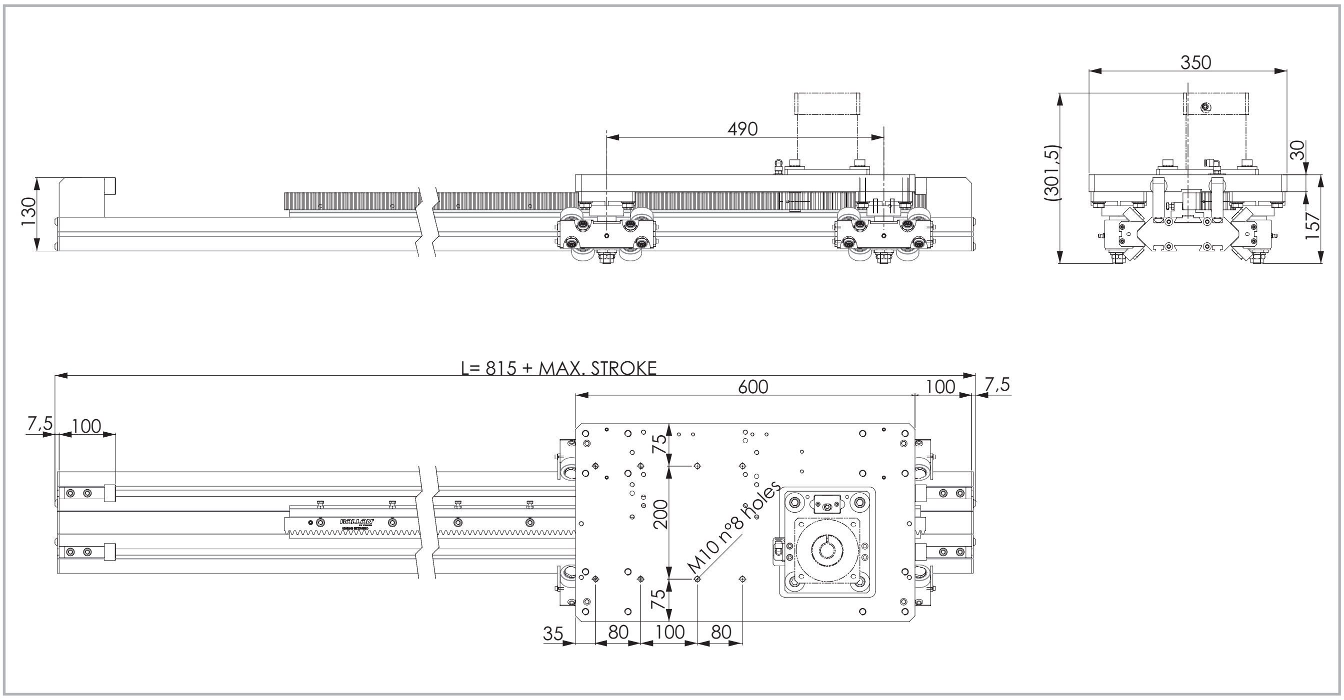
Type	F_x [N]	F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
SAR 120C	1633	2489	2489	98	432	432

Non-cumulative moments referred to the median trolley axis and to a theoretical lifetime of the Speedy Rail guide and of the rollers of up to 80.000 km.

Tab. 66

SAR 180C

SAR 180C Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 46

Technical data

	Type
	SAR 180C
Max. useful stroke length [mm]*1	NO LIMITS
Max. positioning repeatability [mm]*2	± 0.15
Max. speed [m/s]	3
Max. acceleration [m/s²]	10
Rack module	m3
Pinion pitch diameter [mm]	63
Carriage displacement per pinion turn [mm]	197.92
Carriage weight [kg]	31.3
Zero travel weight [kg]	47
Weight for 100 mm useful stroke [kg]	2
Rail size [mm]	180x40

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 67

Moments of inertia of the aluminum body

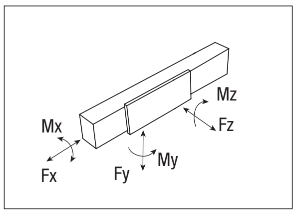
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
SAR 180C	1.029	0.128	0.260

Tab. 68

Rack specifications

Type	Type of rack	Rack module	Quality
SAR 180C	Straight teeth Hardened	m3	Q10

Tab. 69



Load capacity

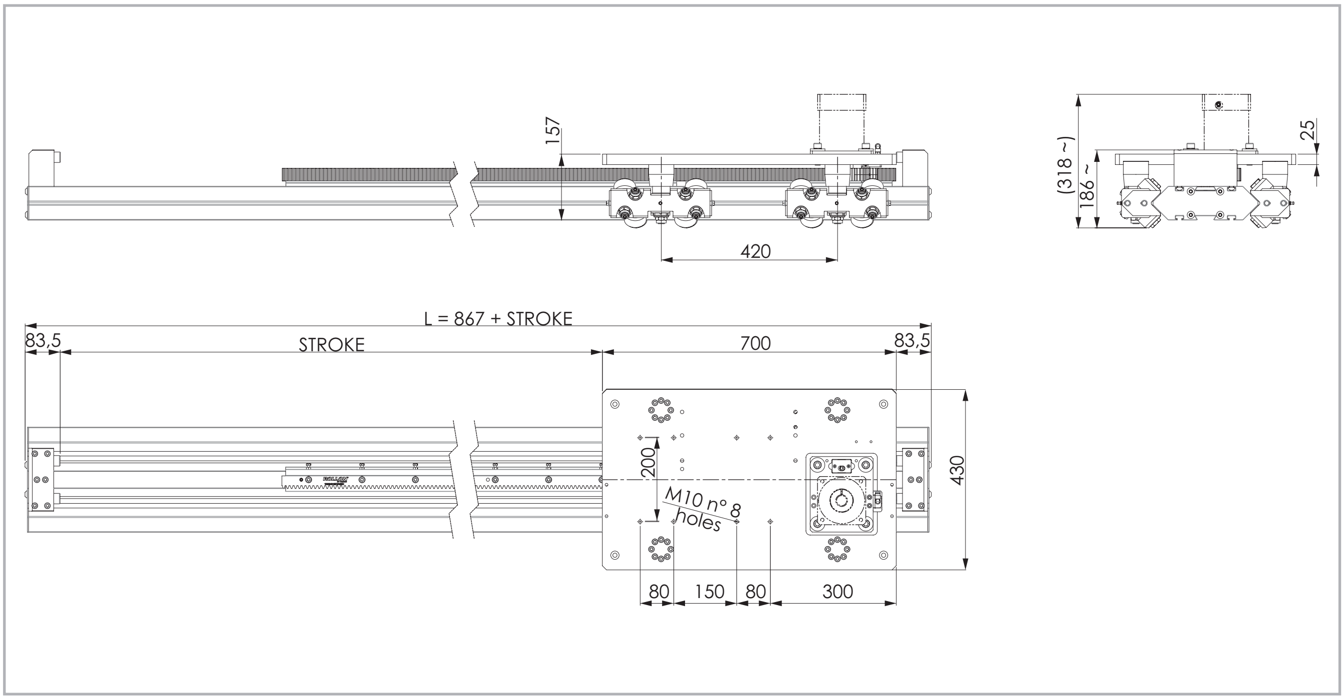
Type	F_x [N]	F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
SAR 180C	1905	4978	4978	246	1220	1220

Non-cumulative moments referred to the median trolley axis and to a theoretical lifetime of the Speedy Rail guide and of the rollers of up to 80.000 km.

Tab. 70

SAR 250C

SAR 250C Dimension



The length of the safety stroke is provided on request according to the customer's specific requirements.

Fig. 47

Technical data

	Type
	SAR 250C
Max. useful stroke length [mm]*1	NO LIMITS
Max. positioning repeatability [mm]*2	± 0.15
Max. speed [m/s]	3
Max. acceleration [m/s²]	10
Rack module	m3
Pinion pitch diameter [mm]	63
Carriage displacement per pinion turn [mm]	197.92
Carriage weight [kg]	40
Zero travel weight [kg]	64
Weight for 100 mm useful stroke [kg]	2.5
Rail size [mm]	250x80

*1) It is possible to obtain longer stroke by means of special Rollon joints
*2) Positioning repeatability is dependent on the type of transmission used

Tab. 71

Moments of inertia of the aluminum body

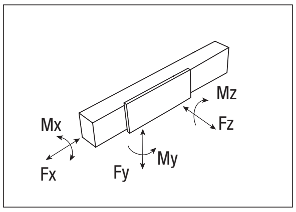
Type	I_x [10^7 mm^4]	I_y [10^7 mm^4]	I_p [10^7 mm^4]
SAR 250C	2.735	0.412	0,840

Tab. 72

Rack specifications

Type	Type of rack	Rack module	Quality
SAR 250C	Straight teeth Hardened	m3	Q10

Tab. 73



Load capacity

Type	F_x [N]	F_y [N]	F_z [N]	M_x [Nm]	M_y [Nm]	M_z [Nm]
SAR 250C	1905	7240	7240	744	1521	1521

Non-cumulative moments referred to the median trolley axis and to a theoretical lifetime of the Speedy Rail guide and of the rollers of up to 80.000 km.

Tab. 74

Rack specifications

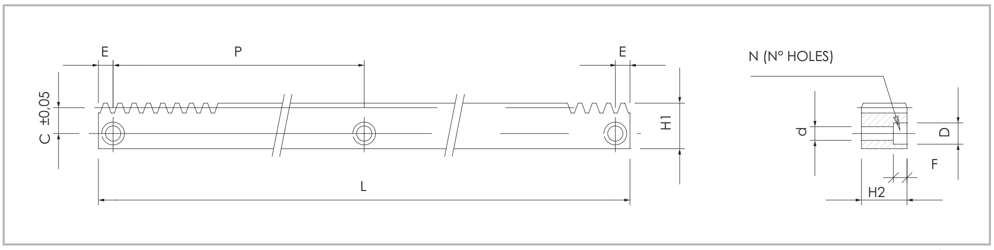


Fig. 48

Code	C	D	d	E	F	H1	H2	L	N	P	Mod.	Surface treatment / Material
1006919	10	11	7	62.8	7	20	20	1005.31	8	125.7	2	Black manganese phosphating/SAE1141
1006920	10	11	7	62.8	7	20	20	2010.6	16	125.7	2	Black manganese phosphating/SAE1141
1006430	10	11	7	19.41	7	20	20	998.82	9	120	2	Stainless steel AISI 304
1006242	18	15	10	63.6	9	30	30	1017.6	8	127.2	3	Black manganese phosphating/SAE1141
1006243	18	15	10	63.6	9	30	30	2035.2	16	127.2	3	Black manganese phosphating/SAE1141

Tab. 75

Lubrication

Programmable automatic rack lubrication

Grease is delivered by means of a programmable cartridge (average life: ca. 1 year) (a). The grease is spread evenly on the racks through a felt pinion (1). You will need one kit per rack.

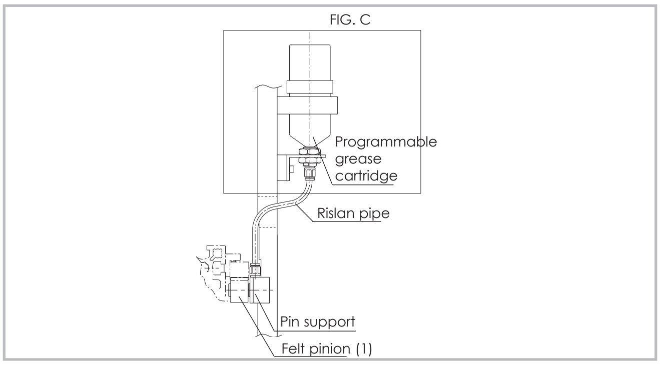


Fig. 49

Accessories

Kit spacer

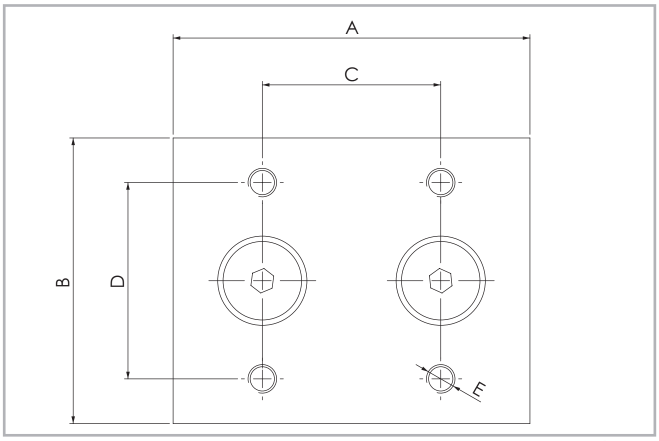


Fig. 50

Unit	A	B	C	D	E	Kit Code
SAR 120	100	80	50	55	M8	G002362
SAR 180	100	125	50	70	M10	G002466
SAR 250	100	145	50	80	M12	G002523

Tab. 76

Adapter flange for gearbox assembly

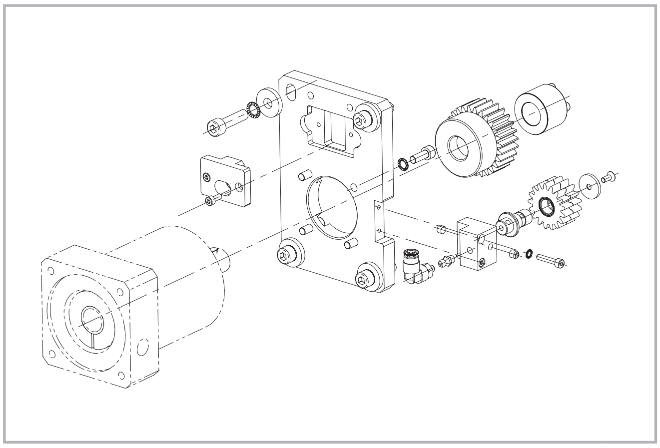


Fig. 51

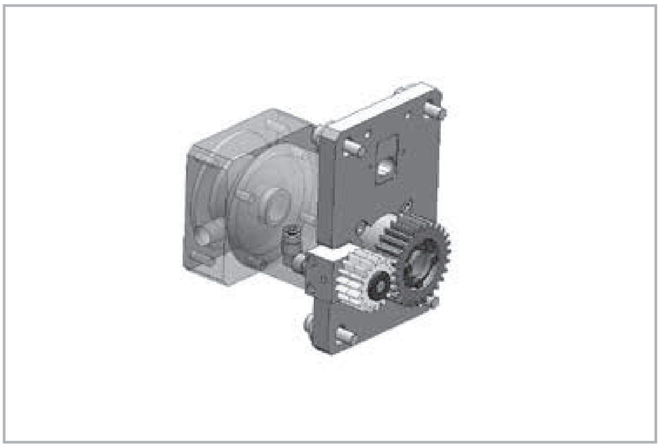


Fig. 52

Assembly kit includes: shrink disk; adapter plate; fixing hardware

Unit	Gearbox type (not included)	Kit Code
SAR 120	MP080	G002853
SAR 180 **SAR 250**	MP080 MP105	G003120 G002854

Tab. 77

For other gearbox type ask Rollon

Insert for: SAR 180C - SAR 180V - SAR 250C

M5	Steel Std.	411.1351
M6	Steel Std.	411.1352
M8	Steel Std.	411.1353

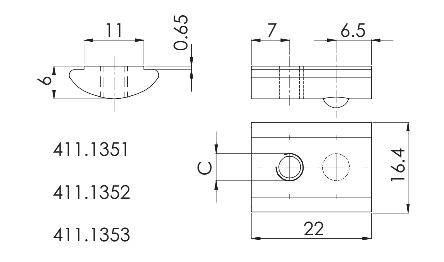


Fig. 53

Quick front insert for: SAR 180C - SAR 180V - SAR 250C

M4	Steel Std.	411.1360	411.2534
M5	Steel Std.	411.1361	411.2533
M6	Steel Std.	411.1362	411.3633
M8	Steel Std.	411.1363	

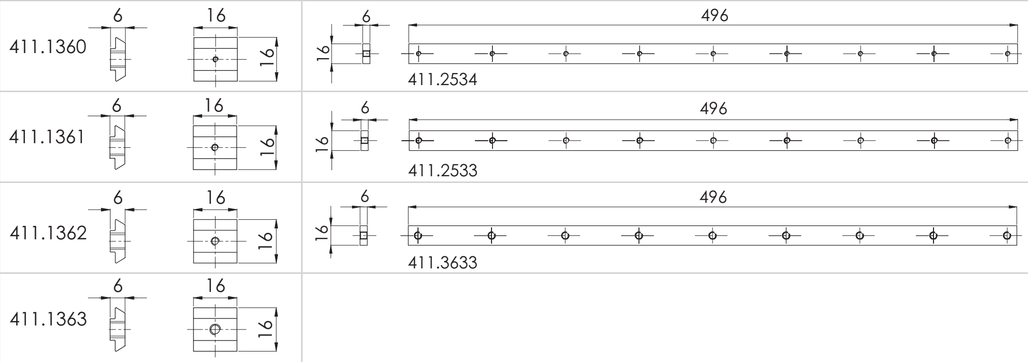


Fig. 54

Dovetails for: SAR 120C - SAR 120V - SAR 180C - SAR 180V - SAR 250C

M12	Steel Std.	411.0470, 411.0472, 411.0588, 411.0469, 411.0503, 411.0745, 411.0845
M12	Steel Std.	411.0888, 411.1185, 411.1048
M10	Steel Std.	411.1120, 411.1119, 411.1117, 411.1178
M10	Steel Std.	411.1186
M8	Steel Std.	411.1113, 411.1112, 411.0675, 411.1111, 411.1174
M6	Steel Std.	411.0682
M8	Steel Std.	411.1675

Fig. 55

Ordering key

Identification codes for the SAR linear unit

SR	C V	12=120 18=180 25=250	1A	02000	1A=standard 1B=inox

L = total length of the unit

Multiple carriages: 1A=1 carriage, 2A=2 carriages, ... , 9A=9 carriages

Linear unit size see from pg. SRA-30 to pg. SRA-33

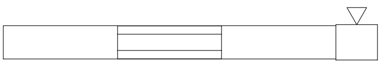
Roller type C=cylindrical, V=V-shaped

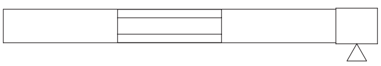
SAR Series *see pg. SRA-27*

In order to create identification codes for Actuator Line, you can visit: **http://configureactuator.rollon.com**

Configure Actuator

Left/right orientation


Right


Left

S R A

Static load and service life

Static load

In the static load test, the radial load rating F_y, the axial load rating F_z, and the moments M_x, M_y und M_z indicate the maximum allowed load values. Higher loads will impair the running characteristics. To check the static load, a safety factor S_0 is used, which accounts for the special conditions of the application defined in more detail in the table below:

All load capacity values refer to the actuator well fixed to a rigid structure. For cantilever applications the deflection of the actuator profile must be taken in account.

Safety factor S_0

No shocks or vibrations, smooth and low-frequency change in direction High mounting accuracy, no elastic deformations, clean environment	2 - 3
Normal assembly conditions	3 - 5
Shocks and vibrations, high-frequency changes in direction, substantial elastic deformations	5 - 7

Fig. 1

The ratio of the actual to the maximum allowed load must not be higher than the reciprocal value of the assumed safety factor S_0.

$$\frac{P_{fy}}{F_y} \leq \frac{1}{S_0} \qquad \frac{P_{fz}}{F_z} \leq \frac{1}{S_0} \qquad \frac{M_1}{M_x} \leq \frac{1}{S_0} \qquad \frac{M_2}{M_y} \leq \frac{1}{S_0} \qquad \frac{M_3}{M_z} \leq \frac{1}{S_0}$$

Fig. 2

The above formulae only apply to a one load case. If one or more of the forces described are acting simultaneously, the following calculation must be carried out:

$$\frac{P_{fy}}{F_y} + \frac{P_{fz}}{F_z} + \frac{M_1}{M_x} + \frac{M_2}{M_y} + \frac{M_3}{M_z} \leq \frac{1}{S_0}$$

P_{fy} = acting load (y direction) (N)
F_y = static load rating (y direction) (N)
P_{fz} = acting load (z direction) (N)
F_z = static load rating (z direction) (N)
M_1, M_2, M_3 = external moments (Nm)
M_x, M_y, M_z = maximum allowed moments in the different load directions (Nm)

Fig. 3

The safety factor S_0 can be at the lower limit given if the acting forces can be determined with sufficient accuracy. If shocks and vibrations act on the system, the higher value should be selected. In dynamic applications, higher safeties are required. For further information, please contact our Application Engineering Department.

Belt safety factor referred to the dynamic F_x

Impact and vibrations	Speed / acceleration	Orietation	Safety Factor
No impacts and/or vibrations	Low	horizontal	1.4
		vertical	1.8
Light impacts and/or vibrations	Medium	horizontal	1.7
		vertical	2.2
Strong impacts and/or vibrations	High	horizontal	2.2
		vertical	3

Tab. 1

Service life

Calculation of the service life

The dynamic load rating C is a conventional quantity used for calculating the service life. This load corresponds to a nominal service life of 100 km. The calculated service life, dynamic load rating and equivalent load are linked by the following formula:

$$L_{km} = 100\ \text{km} \cdot \left(\frac{\text{Fz-dyn}}{P_{eq}} \cdot \frac{1}{f_i}\right)^3$$

L_{km} = theoretical service life (km)
Fz-dyn = dynamic load rating (N)
P_{eq} = acting equivalent load (N)
f_i = service factor (see tab. 2)

Fig. 4

The effective equivalent load P_{eq} is the sum of the forces and moments acting simultaneously on a slider. If these different load components are known, P is obtained from the following equation:

For SP types

$$P_{eq} = P_{fy} + P_{fz} + \left(\frac{M_1}{M_x} + \frac{M_2}{M_y} + \frac{M_3}{M_z}\right) \cdot F_y$$

Fig. 5

For CI and CE types

$$P_{eq} = P_{fy} + \left(\frac{P_{fz}}{F_z} + \frac{M_1}{M_x} + \frac{M_2}{M_y} + \frac{M_3}{M_z}\right) \cdot F_y$$

Fig. 6

The external constants are assumed to be constant over time. Short-term loads that do not exceed the maximum load ratings have no relevant effect on the service life and can therefore be neglected in the calculation.

Service factor f_i

	f_i
no shocks or vibrations, smooth and low-frequency changes in direction; ($\alpha < 5m/s^2$) clean operating conditions; low speeds (<1 m/s)	1.5 - 2
Slight vibrations; medium speeds; (1-2 m/s) and medium-high frequency of the changes in direction ($5m/s^2 < \alpha < 10\ m/s^2$)	2 - 3
Shocks and vibrations; high speeds (>2 m/s) and high-frequency changes in direction; ($\alpha > 10m/s^2$) high contamination, very short stroke	> 3

Tab. 2

Speedy Rail A Lifetime

The rated lifetime for SRA actuators is 80,000 Km.

Static load and service life Uniline

Static load

In the static load test, the radial load rating F_y, the axial load rating F_z, and the moments M_x, M_y und M_z indicate the maximum allowed load values. Higher loads will impair the running characteristics. To check the static load, a safety factor S_0 is used, which accounts for the special conditions of the application defined in more detail in the table below:

Safety factor S_0

No shocks or vibrations, smooth and low-frequency change in direction High mounting accuracy, no elastic deformations, clean environment	1 - 1.5
Normal assembly conditions	1.5 - 2
Shocks and vibrations, high-frequency changes in direction, substantial elastic deformations	2 - 3.5

Fig. 7

The ratio of the actual to the maximum allowed load must not be higher than the reciprocal value of the assumed safety factor S_0.

$$\frac{P_{fy}}{F_y} \leq \frac{1}{S_0} \qquad \frac{P_{fz}}{F_z} \leq \frac{1}{S_0} \qquad \frac{M_1}{M_x} \leq \frac{1}{S_0} \qquad \frac{M_2}{M_y} \leq \frac{1}{S_0} \qquad \frac{M_3}{M_z} \leq \frac{1}{S_0}$$

Fig. 8

The above formulae apply to a one load case. If one or more of the forces described are acting simultaneously, the following test must be carried out:

$$\frac{P_{fy}}{F_y} + \frac{P_{fz}}{F_z} + \frac{M_1}{M_x} + \frac{M_2}{M_y} + \frac{M_3}{M_z} \leq \frac{1}{S_0}$$

P_{fy} = acting load (y direction) (N)
F_y = static load rating (y direction) (N)
P_{fz} = acting load (z direction) (N)
F_z = static load rating (z direction) (N)
M_1, M_2, M_3 = external moments (Nm)
M_x, M_y, M_z = maximum allowed moments in the different load directions (Nm)

Fig. 9

The safety factor S_0 can be at the lower limit given if the acting forces can be determined with sufficient accuracy. If shocks and vibrations act on the system, the higher value should be selected. In dynamic applications, higher safeties are required. For further information, please contact our Application Engineering Department.

Calculation formulae

Moments M_y and M_z for linear units with long slider plate

The allowed loads for the moments M_y and M_z depend on the length of the slider plate. The allowed moments M_{zn} and M_{yn} for each slider plate length are calculated by the following formulae:

$$S_n = S_{min} + n \cdot \Delta S$$

$$M_{zn} = \left(1 + \frac{S_n - S_{min}}{K}\right) \cdot M_{z\,min}$$

$$M_{yn} = \left(1 + \frac{S_n - S_{min}}{K}\right) \cdot M_{y\,min}$$

M_{zn} = allowed moment (Nm)
$M_{z\,min}$ = minimum values (Nm)
M_{yn} = allowed moment (Nm)
$M_{y\,min}$ = minimum values (Nm)
S_n = length of the slider plate (mm)
S_{min} = minimum length of the slider plate (mm)
ΔS = factor of the change in slider length
K = constant

Fig. 10

Type	$M_{y\,min}$ [Nm]	$M_{z\,min}$ [Nm]	S_{min} [mm]	ΔS	K
A40L	22	61	240	10	74
A55L	82	239	310		110
A75L	287	852	440		155
C55L	213	39	310		130
C75L	674	116	440		155
E55L	165	239	310		110
E75L	575	852	440		155
ED75L (M_z)	1174	852	440		155
ED75L (M_y)	1174	852	440		270

Tab. 3

Moments M_y and M_z for linear units with two slider plates

The allowed loads for the moments M_y and M_z are related to the value of the distance between the centers of the sliders. The allowed moments M_{yn} and M_{zn} for each distance between the centers of the sliders are calculated by the following formulae:

$$L_n = L_{min} + n \cdot \Delta L$$

$$M_y = \left(\frac{L_n}{L_{min}}\right) \cdot M_{y\,min}$$

$$M_z = \left(\frac{L_n}{L_{min}}\right) \cdot M_{z\,min}$$

M_y = allowed moment (Nm)
M_z = allowed moment (Nm)
$M_{y\,min}$ = minimum values (Nm)
$M_{z\,min}$ = minimum values (Nm)
L_n = distance between the centers of the sliders (mm)
L_{min} = minimum value for the distance between the centers of the sliders (mm)
ΔL = factor of the change in slider length

Fig. 11

Type	$M_{y\,min}$ [Nm]	$M_{z\,min}$ [Nm]	L_{min} [mm]	ΔL
A40D	70	193	235	5
A55D	225	652	300	5
A75D	771	2288	416	8
C55D	492	90	300	5
C75D	1809	312	416	8
E55D	450	652	300	5
E75D	1543	2288	416	8
ED75D	3619	2288	416	8

Tab. 4

Service life

Calculation of the service life

The dynamic load rating C is a conventional quantity used for calculating the service life. This load corresponds to a nominal service life of 100 km. The corresponding values for each liner unit are listed in Table 45 shown below. The calculated service life, dynamic load rating and equivalent load are linked by the following formula:

$$L_{km} = 100\text{ km} \cdot \left(\frac{C}{P} \cdot \frac{f_c}{f_i} \cdot f_h\right)^3$$

L_{km} = theoretical service life (km)
C = dynamic load rating (N)
P = acting equivalent load (N)
f_i = service factor (see tab. 5)
f_C = contact factor (see tab. 6)
f_h = stroke factor (see fig. 13)

Fig. 12

The effective equivalent load P is the sum of the forces and moments acting simultaneously on a slider. If these different load components are known, P is obtained from the following equation:

$$P = P_{fy} + \left(\frac{P_{fz}}{F_Z} + \frac{M_1}{M_x} + \frac{M_2}{M_y} + \frac{M_3}{M_z} \right) \cdot F_y$$

Fig. 13

The external constants are assumed to be constant over time. Short-term loads that do not exceed the maximum load ratings have no relevant effect on the service life and can therefore be neglected in the calculation.

Service factor f_i

f_i	
No shocks or vibrations, smooth and low-frequency changes in direction; clean operating conditions; low speeds (<1 m/s)	1 - 1.5
Slight vibrations; medium speeds; (1-2,5 m/s) and medium-high frequency of the changes in direction	1.5 - 2
Shocks and vibrations; high speeds (>2.5 m/s) and high-frequency changes in direction; high contamination	2 - 3.5

Tab. 5

Contact factor f_c

f_c	
Standard slider	1
Long slider	0.8
Double slider	0.8

Tab. 6

Stroke factor f_h

The stroke factor f_h accounts for the higher stress on the raceways and rollers when short strokes are carried out at the same total run distance. The following diagram shows the corresponding values (for strokes above 1 m, f_h remains 1):

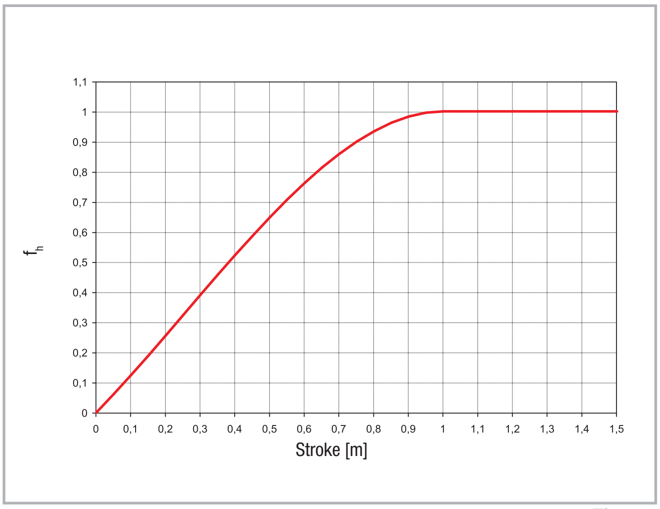


Fig. 14

Determination of the motor torque

The torque C_m required at the drive head of the linear axis is calculated by the following formula:

$$C_m = C_v + \left(F \cdot \frac{D_p}{2} \right)$$

C_m = torque of the motor (Nm)
C_v = starting torque (Nm)
F = force acting on the toothed belt (N)
D_p = pitch diameter of pulley (m)

Fig. 15

Warnings and legal notes

Before incorporating the partly completed machinery, we recommend consulting this chapter carefully, in addition to the assembly manual supplied with the individual modules. The information contained in this chapter and in the manuals for the individual modules, is provided by highly qualified and certified personnel, possessing adequate competence in incorporating the partly completed machinery.

Precaution in installation and handling operations. Significantly heavy equipment.

When handling the axis or system of axes, always make sure that the support or anchoring surfaces do not leave room for bending.

In order to stabilize the axis or system of axes, before handling it is mandatory to securely block the mobile parts. When moving axes with vertical translation (Z AXES) or combination systems (horizontal X and/or more than one vertical Z), it is mandatory to use the vertical movement to put all of the axes at the corresponding lower limit switch.

Do not overload. Do not subject to torsion stress.

Do not leave exposed to atmospheric agents.

Before mounting the motor on the gearbox, it is advisable to perform a pre-test of the motor itself, without connection to the gear unit. The testing of this component was not carried out by the manufacturer of the machine. It will therefore be the responsibility of the customer of Rollon to perform the testing of the same, in order to verify its correct operation.

The manufacturer cannot be considered responsible for any consequences derived from improper use or any use other than the purpose the axis or system of axes was designed for, or derived from failure to comply, during incorporation phases, with the rules of Good Technique and with what is indicated in this manual.

Avoid damage. Do not operate with inadequate tools

Warning: moving parts. Do not leave objectson the axis

Special installations: check the depth of the threads on moving elements

Make sure that the system has been installed on a level floor surface.

In use, accurately comply with the specific performance values declared in the catalog or, in particular cases, the load and dynamic performance characteristics requested in the phase prior to design.

For modules or parts of modular systems with vertical movement (Z axis), it is mandatory to mount self-braking motors to neutralize the risk of the axis dropping.

The images in this manual are to be considered merely an indication and not binding; therefore, the supply received could be different from the images contained in this manual, and Rollon S.p.A has deemed it useful to insert only one example.

Systems supplied by Rollon S.p.A. were not designed/envisaged to operate in ATEX environments.

Residual risks

- Mechanical risks due to the presence of moving elements (X, Y axes).
- Risk of fire resulting from the flammability of the belts used on the axes, for temperatures in excess of 250 °C in contact with the flame.
- The risk of the Z axis dropping during handling and installation operations on the partly completed machinery, before commissioning.
- Risk of the Z axis dropping during maintenance operations in the case of a drop in the electrical power supply voltage.
- Crushing hazard near moving parts with divergent and convergent motion.
- Shearing hazard near moving parts with divergent and convergent motion.
- Cutting and abrasion hazards.

Basic components

The Partly Completed Machinery shown in this catalog is to be considered a mere supply of simple Cartesian axes and their accessories agreed when the contract is stipulated with the client. The following are therefore to be considered excluded from the contract:

1. Assembly on the client's premises (direct or final)
2. Commissioning on the client's premises (direct or final)
3. Testing on the client's premises (direct or final)

It is therefore understood that the aforementioned operations in points 1.,2., and 3. are not chargeable to Rollon. Rollon is the supplier of Partly Completed Machinery, the (direct or final) client is responsible for testing and safely checking all equipment which, by definition, cannot be theoretically tested or checked at our facilities where the only movement possible is manual movement (for example: motors or reduction gears, cartesian axes movements that are not manually operated, safety brakes, stopper cylinders, mechanical or induction sensors, decelerators, mechanical limit switches, pneumatic cylinders, etc.). The partly completed machine must not be commissioned until the final machine, in which it is to be incorporated, has been declared compliant, if necessary, with the instructions in Machinery Directive 2006/42/CE.

Instructions of an environmental nature

Rollon operates with respect for the envirorment, in order to limit environmental impact. The following is a list of some instructions of an environmental nature for correct management of our supplies. Our products are mainly composed of:

Material	Details of the supply
Alluminum alloys	Profiles, pleates, various details
Steel with various composition	Screws, racks and pinions, and rails
Plastic	PA6 – Chains PVC – Covers and sliding block scrapers
Rubber of various types	Plugs, seals
Lubrification of various types	Used for the lubrication of sliding rails and bearings
Rust proof protectione	Rust proof protection oil
Wood, polyethylene, cardboard	Transport packaging

At the end of the product's life cycle, it is therfore possible to recover the various elements, in compliance with current regulations on waste issues.

Safety warnings for handling and transport

- The manufacturer has paid the utmost attention to packaging to minimize risks related to shipping, handling and transport.
- Transport can be facilitated by shipping certain components dismantled and appropriately protected and packaged.
- Handling (loading and unloading) must be carried out in compliance with information directly provided on the machine, on the packing and in the user manuals.
- Personnel authorized to lift and handle the machine and its components shall possess acquired and acknowledged skills and experience in the specific sector, besides having full control of the lifting devices used.
- During transport and/or storage, temperature shall remain within the allowed limits to avoid irreversible damage to electric and electronic components.
- Handling and transport must be carried out with vehicles presenting adequate loading capacity, and the machines shall be anchored to the established points indicated on the axes.
- DO NOT attempt to bypass handling methods and the established lifting points in any way.
- During handling and if required by the conditions, make use of one or more assistants to receive adequate warnings.
- If the machine has to be moved with vehicles, ensure that they are adequate for the purpose, and perform loading and unloading without risks for the operator and for people directly involved in the process.
- Before transferring the device onto the vehicle, ensure that both the machine and its components are adequately secured, and that their profile does not exceed the maximum bulk allowed. Place the necessary warning signs, if necessary.
- DO NOT perform handling with an inadequate visual field and when there are obstacles along the route to the final location.
- DO NOT allow people to either transit or linger within the range of action when lifting and handling loads.
- Download the axes just near the established location and store them in an environment protected against atmospheric agents.
- Failure to comply with the information provided might entail risks for the safety and health of people, and can cause economic loss.
- The Installation Manager must have the project to organize and monitor all operative phases.
- The Installation Manager shall ensure that the lifting devices and equipment defined during the contract phase are available.
- The Manager of the established location and the Installation Manager shall implement a “safety plan” in compliance with the legislation in force for the workplace.
- The “safety plan” shall take into account all surrounding work-related activities and the perimeter spaces indicated in the project for the es tablished location.
- Mark and delimit the established location to prevent unauthorized personnel from accessing the installation area.
- The installation site must have adequate environmental conditions (lighting, ventilation, etc.).
- Installation site temperature must be within the maximum and minimum range allowed.
- Ensure that the installation site is protected against atmospheric agents, does not contain corrosive substances and is free of the risk of explosion and/or fire.
- Installation in environments presenting a risk of explosion and/or of fire must ONLY be carried out if the machine has been DECLARED COMPLIANT for such use.
- Check that the established location has been correctly fitted out, as defined during the contract phase and based on indications in the relative project.
- The established location must be fitted out in advance to carry out complete installation in compliance with the defined methods and schedule.

Note

- Evaluate in advance whether the machine must interact with other production units, and that integration can be implemented correctly, in compliance with standards and without risks.
- The manager shall assign installation and assembly interventions ONLY to authorized technicians with acknowledged know-how.
- State of the art connections to power sources (electric, pneumatic, etc.) must be ensured, in compliance with relevant regulatory and legislative requirements.
- “State of the art” connection, alignment and leveling are essential to avoid additional interventions and to ensure correct machine function.
- Upon completion of the connections, run a general check to ascertain that all interventions have been correctly carried out and compliance with requirements.
- Failure to comply with the information provided might entail risks for the safety and health of people, and can cause economic loss.

Transport

- Transport, also based on the final destination, can be done with different vehicles.
- Perform transport with suitable devices that have adequate loading capacity.
- Ensure that the machine and its components are adequately anchored to the vehicle.

Handling and lifting

- Correctly connect the lifting devices to the established points on the packages and/or on the dismantled parts.
- Before handling, read the instructions, especially safety instructions, provided in the installation manual, on the packages and/or on the dismantled parts.
- DO NOT attempt, in any way, to bypass handling methods and the established lifting, moving and handling points of each package and/or dismantled part.
- Slowly lift the package to the minimum necessary height and move it with the utmost caution to avoid dangerous oscillations.
- DO NOT perform handling with an inadequate visual field and when there are obstacles along the route to reach the final location.
- DO NOT allow people to either transit or linger within the range of action when lifting and handling loads.
- Do not stack packages to avoid damaging them, and reduce the risk of sudden and dangerous movements.
- In case of prolonged storage, regularly ensure that there are no variations in the storage conditions of the packages.

Check axis integrity after shipment

Every shipment is accompanied by a document (“Packing list”) with the list and description of the axes.

- Upon receipt check that the material received corresponds to specifications in the delivery note.
- Check that packaging is perfectly intact and, for shipments without packaging, check that each axis is intact.
- In case of damages or missing parts, contact the manufacturer to define the relevant procedures.

Data sheet

General data:

Date: .... Inquiry N°: ....

Address: ....

Contact: ....

Company: ....

Zip Code: ....

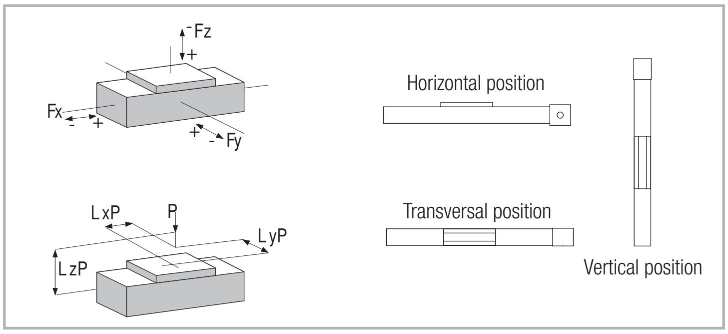
Phone: ....

Fax: ....

E-Mail: ....

Technical data:

				X axis	Y axis	Z axis
Useful stroke (Including safety overtravel)		S	[mm]			
Load to be translated		P	[kg]			
Location of Load in the	X-Direction	LxP	[mm]			
	Y-Direction	LyP	[mm]			
	Z-Direction	LzP	[mm]			
Additional force	Direction (+/-)	Fx (Fy, Fz)	[N]			
Position of force	X-Direction	Lx Fx (Fy, Fz)	[mm]			
	Y-Direction	Ly Fx (Fy, Fz)	[mm]			
	Z-Direction	Lz Fx (Fy, Fz)	[mm]			
Assembly position (Horizontal/Vertical/Transversal						
Max. speed		V	[m/s]			
Max. acceleration		a	[m/s^2]			
Positioning repeatability		Δs	[mm]			
Required life		L	yrs			



Attention: Please enclose drawing, sketches and sheet of the duty cycle

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BY TIMKEN

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