STOPPER CYLINDERS
SERIES ST

Single and double-acting, magnetic, non-rotating
Sizes 20, 32, 40, 50 mm

- In compliance with UNITOP and ISO 21287 standards
- Compact design
- Can be used with magnetic sensors
- Reliable and silent
- Non-rotating rod version
- Roller rod version
- Female threaded rod version
- High capacity to absorb kinetic energy of workpiece-holder pallets
- Mechanical end-stroke shock absorbers
- Sizing guide in catalog appendix

The Series ST Stopper cylinders are pneumatic actuators with rod, complying with UNITOP and ISO 21287 standards, where rod and bushing have been specifically enlarged to ensure high resistance to radial loads and shocks. These cylinders are available in two versions, double-acting and single-acting, and with rear spring. The non-rotating rod version is also available.

The detection of the piston position is enabled by means of proximity switches (Mod. CST or CSH) which are mounted in slots along three sides of the cylinder profile. It is possible to cover the slots with a proper profile (Mod. S-CST-500). The high resistance to shocks and radial loads and the easy mounting makes Series ST particularly suitable for use in transport/conveyor lines where it is required to stop the transit of workpieces and workpiece-holder pallets.

GENERAL DATA

Construction	profile with self-tapping screws
Cylinder design	compact based on UNITOP and ISO 21287 standards
Operation	double-acting, single-acting rear spring, double-acting rear spring
Sizes	20, 32, 40 (Mod. ST32 only), 50 mm
Strokes min. max	5 ÷ 30 mm (see the table of standard strokes)
Rod versions	without thread, with female thread, non-rotating, non-rotating with feemale thread, non-rotating with roller
Non-rotating function	with technopolymer anti-friction ring
Fixing and mounting	direct with holes on the end-caps, in any position
Type of cushioning	mechanical end-stroke shock absorbers in rubber
Max frequency	5 Hz (Ø 20, 32, 40 mm) - 3 Hz (Ø 50 mm)
Working temperature	0°C ÷ 80°C (with dry air -20°C)
Storage temperature	-20°C ÷ 100°C
Working pressure	1 ÷ 10 bar (double-acting) - 2 ÷ 10 bar (single-acting)
Max rotation play	± 4° (Ø 20, 32 e 40 mm) - ± 3° (Ø50 mm)
Max torque (for non-rotating version)	1,5 Nm (Ø20 mm) - 2,5 Nm (Ø 32 e 40 mm) - 3,5 Nm (Ø50 mm)
Medium	filtered air in class 7.8.4 according to ISO 8573-1 standard
Lubrification	Not required. The cylinder is pre-lubricated. If lubricated air is used, it is recommended to use oil ISOVG32. Once applied the lubrication should never be interrupted.
Use with external sensors	slots on the three sides for proximity switches Mod. CST and CSH

STOPPER CYLINDERS
SERIES ST - STANDARD STROKES

STANDARD STROKES

✖ = Single-acting and double-acting

Mod.	Ø	10	15	20	25	30
ST31	20		✖			
ST31	32			✖		
ST31	50					✖
ST32	20	✖	✖			
ST32	32		✖	✖	✖	
ST32	40			✖	✖	✖
ST32	50			✖	✖	✖

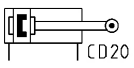
CODING EXAMPLE

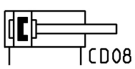
ST	31	2	A	050	A	030

ST	SERIES	
31	CONSTRUCTION STANDARD 31 = UNITOP 32 = ISO 21287	
2	OPERATION 2 = double-acting 4 = single-acting, rear spring 9 = double-acting, rear spring	**PNEUMATIC SYMBOLS** CD20 / CD08 CS15 / CS08 CS16 / CS17
A	DESIGN A = standard R = non-rotating (for Mod. ST32 only)	
050	BORE 020 = 20 mm 032 = 32 mm 040 = 40 mm (for Mod. ST32 only) 050 = 50 mm	
A	CONSTRUCTION A = standard R = with roller (for non-rotating version only) F = with female thread (for Mod. ST32 only)	
030	STROKE (see the table)	
	VERSION = standard (_ _ _) = extended piston rod _ _ _ mm	

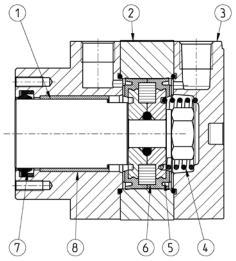
PNEUMATIC SYMBOLS

The pneumatic symbols which have been indicated in the CODING EXAMPLE are shown below.

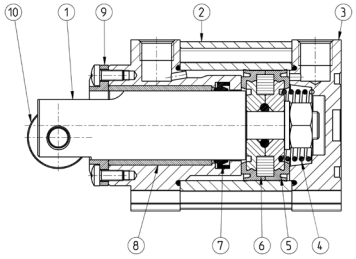




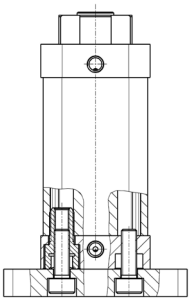
SERIES ST MATERIALS



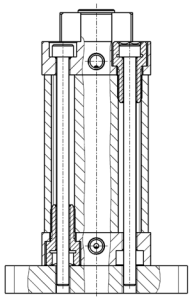
PARTS	Materials
1 - Rod	Stainless steel
2 - Profile	Anodized aluminium
3 - Head	Anodized aluminium
4 - Spring	Steel
5 - Piston seal	PU
6 - Magnet	Plastoferrite
7 - Rod seal	PU
8 - Rod guide bushing	Technopolymer
9 - Non-rotating ring	Technopolymer
10 - Roller	Stainless steel



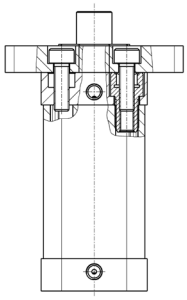
EXAMPLES OF FIXING



Fixing from below



Fixing from above

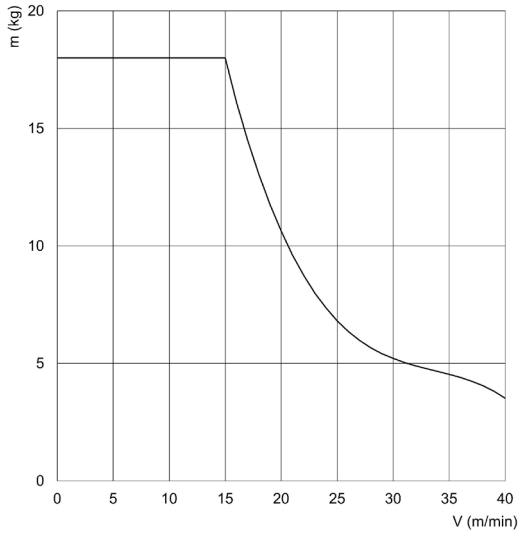


IMPACT FORCE

Between the mass to stop and the stopper rod, an elastic bumper is assumed to be inserted, which is capable of absorbing the impact by deforming at least 1mm.

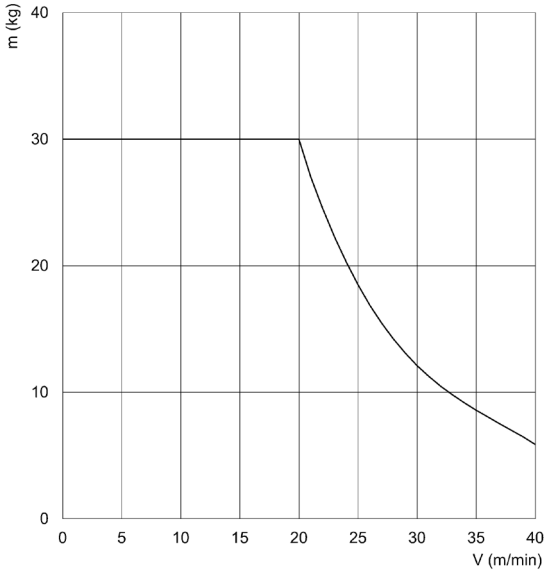
	20	32	40	50
ST	1320 (N)	3200 (N)	5500 (N)	6200 (N)
ST...R	820 (N)	2600 (N)	4450 (N)	5900 (N)

DIAGRAMS OF MASS / IMPACT SPEED



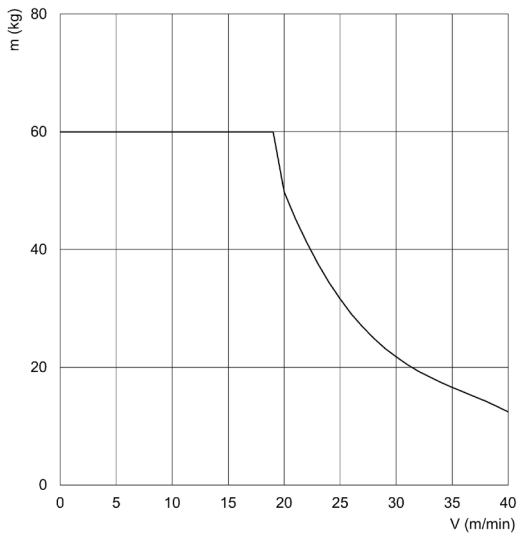
Cylinders Ø20 mm

m = mass (kg)
V = impact speed (m/min)



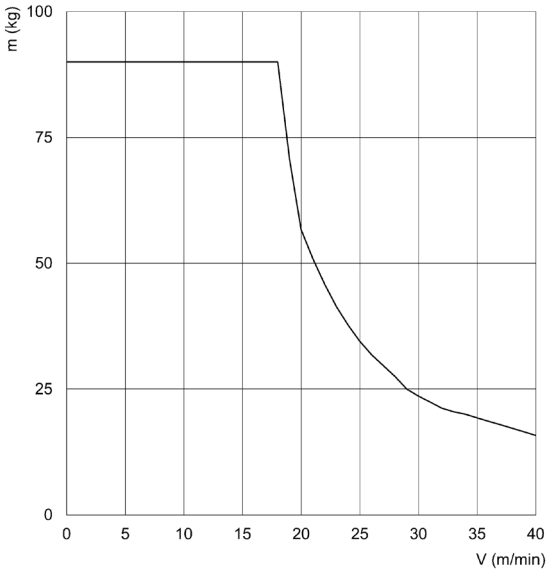
Cylinders Ø32 mm

m = mass (kg)
V = impact speed (m/min)



Cylinders Ø40 mm

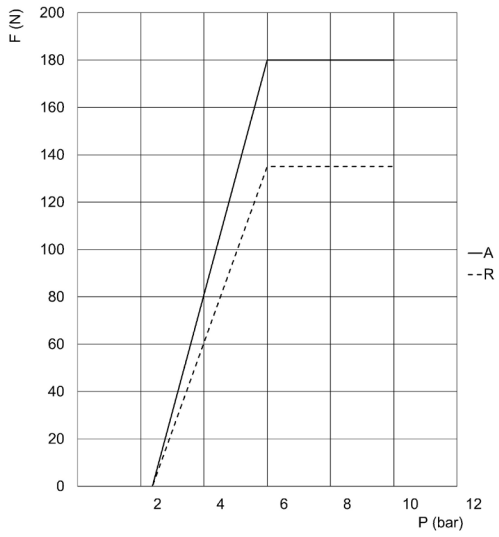
m = mass (kg)
V = impact speed (m/min)



Cylinders Ø50 mm

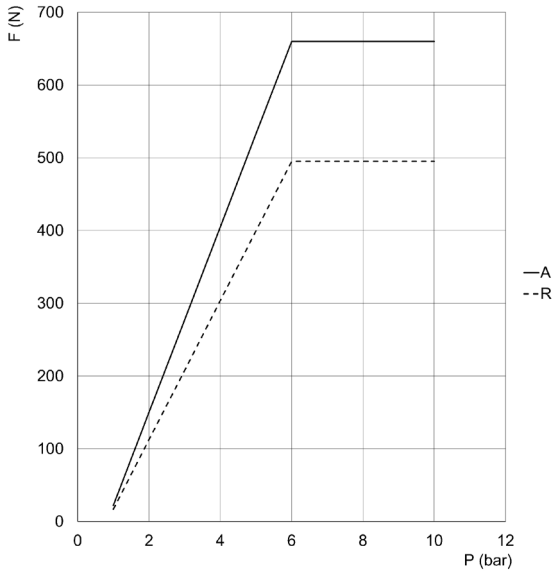
m = mass (kg)
V = impact speed (m/min)

DIAGRAMS OF APPLICABLE LATERAL FORCES DURING OPERATION



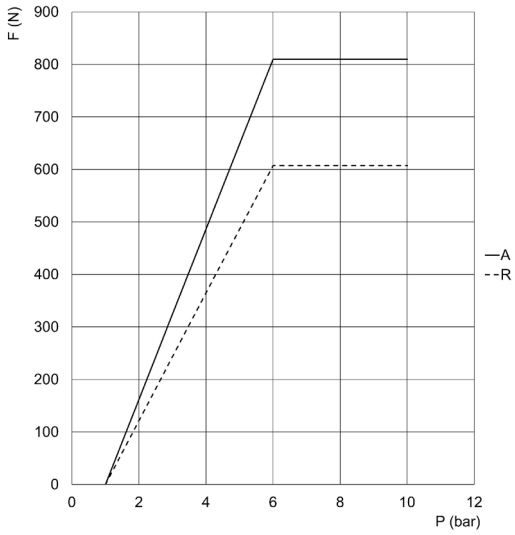
Cylinders Ø20 mm, standard (A) and non-rotating (R) version

P = Pressure (bar)
F = applicable lateral Force (N)



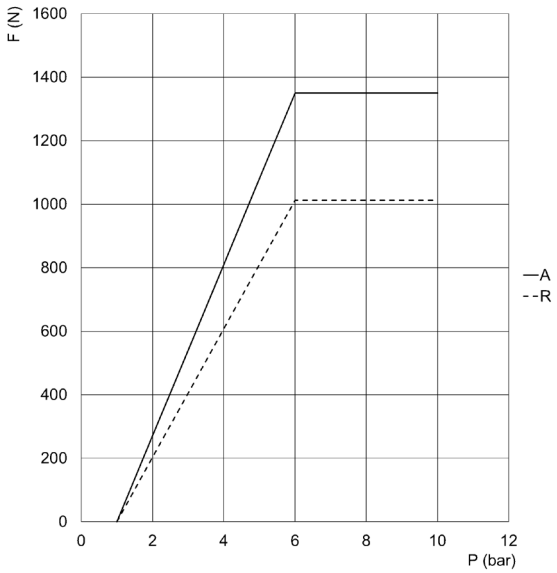
Cylinders Ø32 mm, standard (A) and non-rotating (R) version

P = Pressure (bar)
F = applicable lateral Force (N)



Cylinders Ø40 mm, standard (A) and non-rotating (R) version

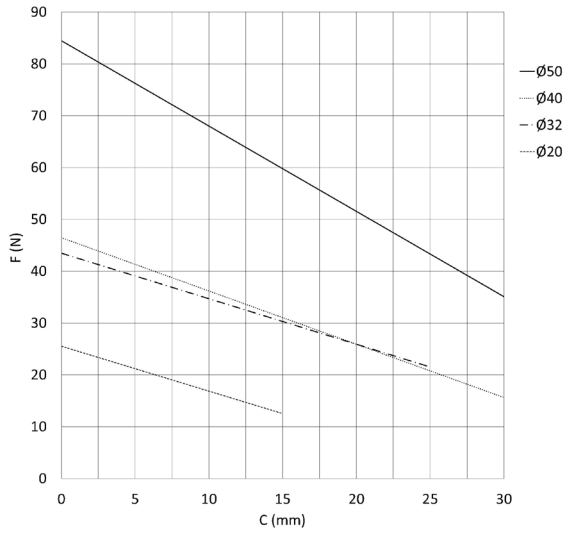
P = Pressure (bar)
F = applicable lateral Force (N)



Cylinders Ø50 mm, standard (A) and non-rotating (R) version

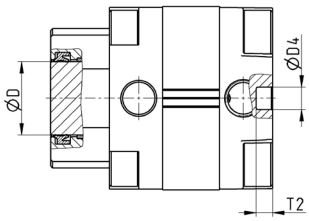
P = Pressure (bar)
F = applicable lateral Force (N)

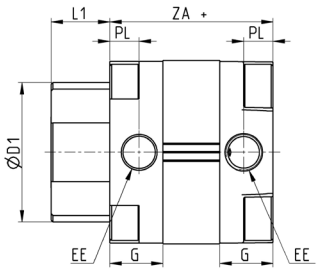
DIAGRAM OF THE SPRING FORCES ACCORDING TO THE CYLINDER STROKE

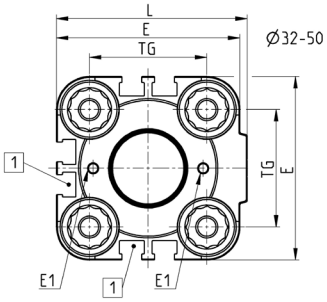


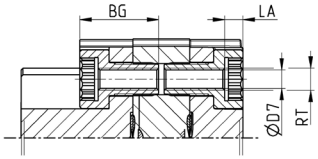
F = Force
C = Stroke

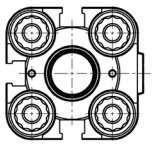
Stopper cylinders Mod. ST31 (UNITOP)





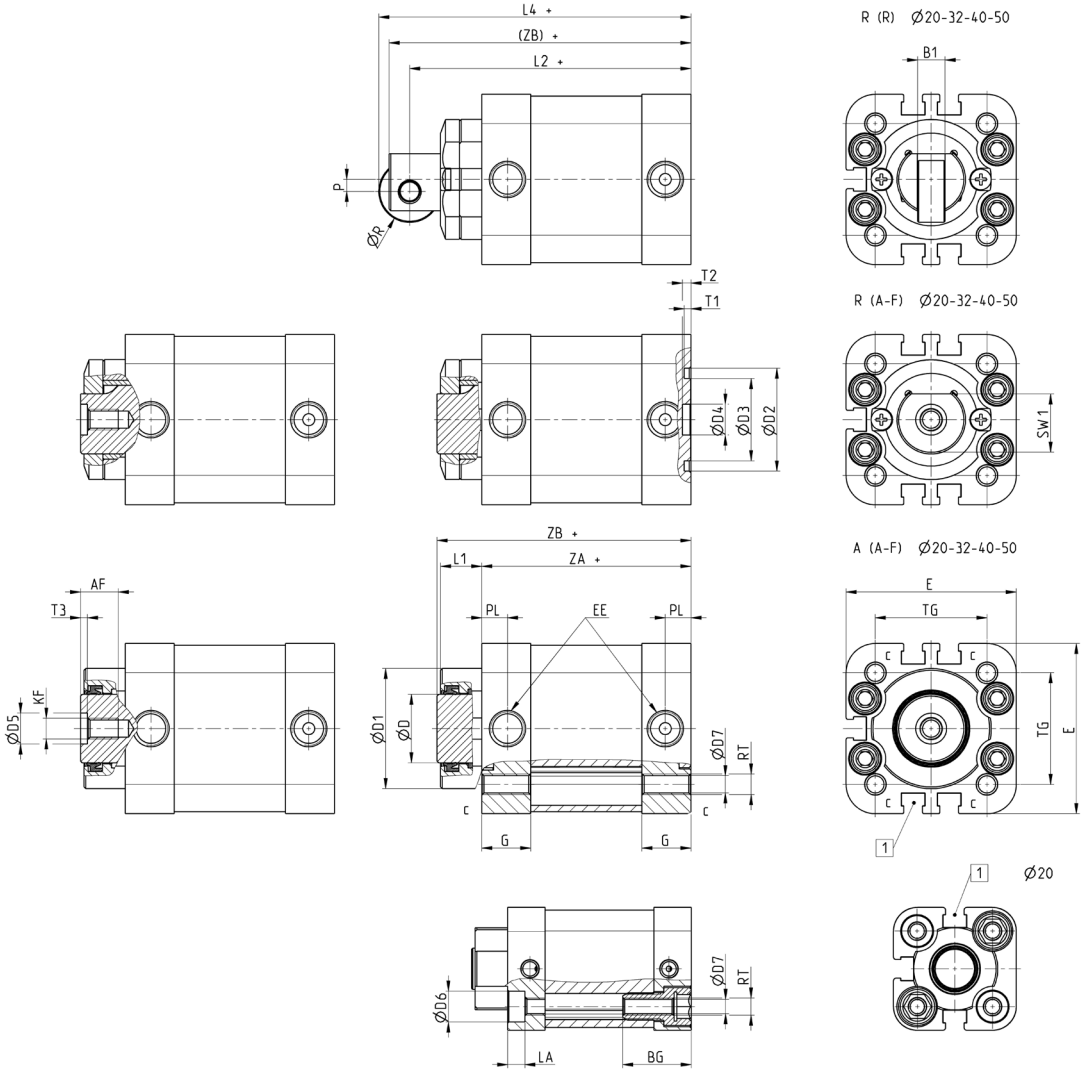






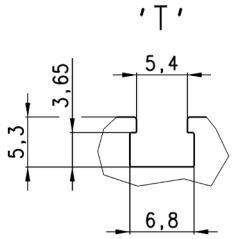
Ø	BG	G	øD	øD1	øD4	øD7	E	EE	E1	L	LA	L1	PL	RT	T2	TG	ZA	ZB
20	18,5	12	12	26	6	4	35,5	G1/8	M2	38	5	11,5	8	M5	4,5	22	38	49,5
32	21,5	14,5	20	38	6	5	50	G1/8	M3	52	5	16	8	M6	4,5	32	45	60,5
50	20	14,5	32	53	6	6	68	G1/8	M3	71	6	24	8	M8	4,5	50	46	69,5

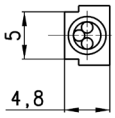
Stopper cylinders Mod. ST32 (ISO 21287)

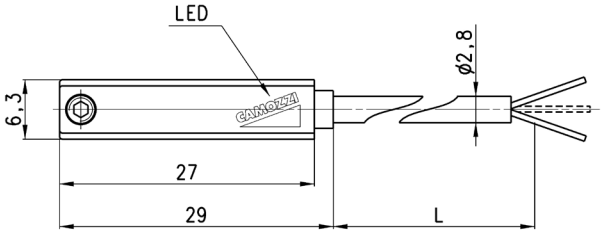


Ø	AF	BG	B1	G	øD	øD1	øD2	øD3	øD4	øD5	øD6	øD7	E	EE	KF	LA	L1	L2	L4	P	PL	øR	RT	SW1	T1	T2	T3	TG	ZA	ZB	ZB
20	6	20	4	10,9	12	25	-	-	9	5	9	4	35,8	M5	M3	5	9,5	68	73	2	6,5	10	M5	10	-	2,5	1,2	22	53,5	71	71
32	11	-	8	14,3	20	35	30	24	9	9	-	5	49,6	G1/8	M6	-	12	82	91	3,5	7,6	18	M6	17,5	2	2,5	2	32,5	61	88	88
40	14,5	-	8	14,3	25	43	35	29	12	12	-	5	57	G1/8	M8	-	12,5	90	101	5	7,6	22	M6	22	2	2,5	2,5	38	66,5	97	97
50	14,5	-	10	14,3	32	51	40	34	12	12	-	6	69,6	G1/8	M8	-	14,5	92,5	105	7	7,6	25	M8	28	2	3	2,5	46,5	65,5	81	81

Magnetic proximity switches with 2 or 3 wire cable for T-slotMagnetic proximity switches with 2 or 3 wire cable for T-slot



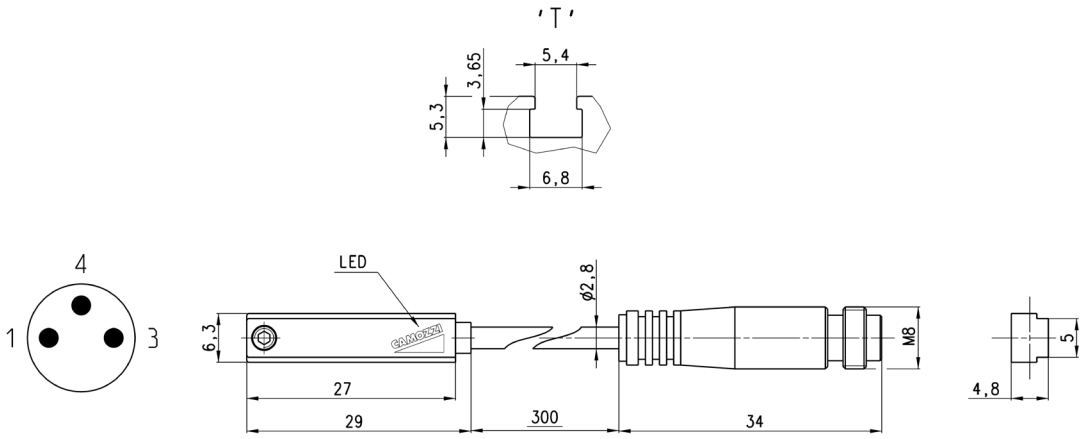




Mod.	Operation	Connections	Voltage	Output	Max. current	Max Load	Protection	L = length cable
CST-220	Reed	2 wires	10 ÷ 110 V AC/DC-230 V AC	-	250 mA	10 VA / 8W	None	2 m
CST-220-5	Reed	2 wires	10 ÷ 110 V AC/DC-230 V AC	-	250 mA	10 VA / 8 W	None	5 m
CST-220-12	Reed	2 wires	10 ÷ 110 V AC/DC-230 V AC	-	250 mA	10 VA / 8W	None	12 m
CST-220EX	Reed	2 wires	10 ÷ 110 V AC/DC-230 V AC	-	250 mA	10 VA / 8W	None	2 m
CST-220-5EX	Reed	2 wires	10 ÷ 110 V AC/DC-230 V AC	-	250 mA	10 VA / 8W	None	5 m
CST-220-12EX	Reed	2 wires	10 ÷ 110 V AC/DC-230 V AC	-	250 mA	10 VA / 8W	None	12 m
CST-232	Reed	3 wires	5 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing	2 m
CST-232-5	Reed	3 wires	5 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing	5 m
CST-232EX	Reed	3 wires	5 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8W	Against polarity reversing	2 m
CST-232-5EX	Reed	3 wires	5 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8W	Against polarity reversing and overvoltage	5 m
CST-332	Magnetoresistive	3 wires	10 ÷ 27 V DC	PNP	100 mA	6 W	Against polarity reversing and overvoltage	2 m
CST-332-5	Magnetoresistive	3 wires	10 ÷ 27 V DC	PNP	100 mA	6 W	Against polarity reversing and overvoltage	5 m
CST-332EX	Magnetoresistive	3 wires	10 ÷ 27 V DC	PNP	100 mA	6 W	Against polarity reversing and overvoltage	2 m
CST-332-5EX	Magnetoresistive	3 wires	10 ÷ 27 V DC	PNP	100 mA	6 W	Against polarity reversing and overvoltage	5 m
CST-432	Reed	3 wires	5 ÷ 30 V AC/DC	PNP-NC	250 mA	10 VA / 8 W	Against polarity reversing	2 m
CST-432-5	Reed	3 wires	5 ÷ 30 V AC/DC	PNP-NC	250 mA	10 VA / 8 W	Against polarity reversing	5 m
CST-432EX	Reed	3 wires	5 ÷ 30 V AC/DC	PNP-NC	250 mA	10 VA / 8 W	Against polarity reversing	2 m
CST-432-5EX	Reed	3 wires	5 ÷ 30 V AC/DC	PNP-NC	250 mA	10 VA / 8 W	Against polarity reversing	5 m
CST-532	Hall effect	3 wires	10 ÷ 27 V DC	PNP	100 mA	6 W	Against polarity reversing and overvoltage	2 m
CST-532-5	Hall effect	3 wires	10 ÷ 27 V DC	PNP	100 mA	6 W	Against polarity reversing and overvoltage	5 m
CST-532EX	Hall effect	3 wires	10 ÷ 27 V DC	PNP	100 mA	6 W	Against polarity reversing and overvoltage	2 m
CST-532-5EX	Hall effect	3 wires	10 ÷ 27 V DC	PNP	100 mA	6 W	Against polarity reversing and overvoltage	5 m

Note for 2-wire switches Mod. CST-220, CST-220-5:
in case of polarity reversing the sensor will still be operating, but the LED diode won't turn on.

Magnetic proximity switches with M8 3-pin connector for T-slot

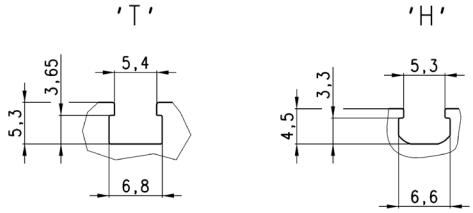


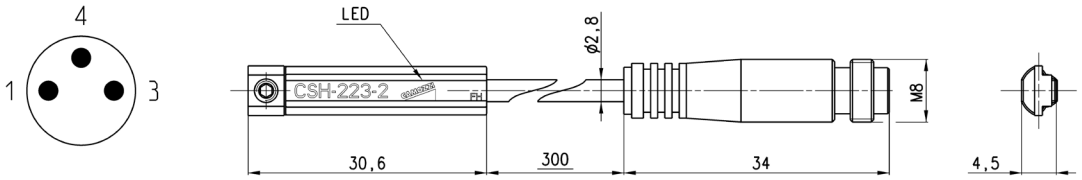
Cable length: 0,3 m

Mod.	Operation	Connection	Voltage	Output	Max. current	Max Load	Protection
CST-250N	Reed	2 wires M8 male 3 pin	10 ÷ 110 V AC/DC	-	250 mA	10 VA / 8 W	None
CST-250NEX	Reed	2 wires M8 male 3 pin	10 ÷ 110 V AC/DC	-	250 mA	10 VA / 8 W	None
CST-262	Reed	3 wires M8 male 3 pin	5 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing
CST-262EX	Reed	3 wires M8 male 3 pin	5 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing
CST-362	Magnetoresistive	3 wires M8 male 3 pin	10 ÷ 27 V DC	PNP	100 mA	6 W	Against polarity reversing and overvoltage
CST-362EX	Magnetoresistive	3 wires M8 male 3 pin	10 ÷ 27 V DC	PNP	100 mA	6 W	Against polarity reversing and overvoltage
CST-562	Hall effect	3 wires M8 male 3 pin	10 ÷ 27 V DC	PNP	100 mA	6 W	Against polarity reversing and overvoltage
CST-562EX	Hall effect	3 wiresM8 male 3 pin	10 ÷ 27 V DC	PNP	100 mA	6 W	Against polarity reversing and overvoltage

Note for 2-wire switch Mod. CST-250N:
in case of polarity reversing the sensor will still be operating, but the LED diode won't turn on

Magnetic proximity switches wtih M8 3-pin connector for H-slot



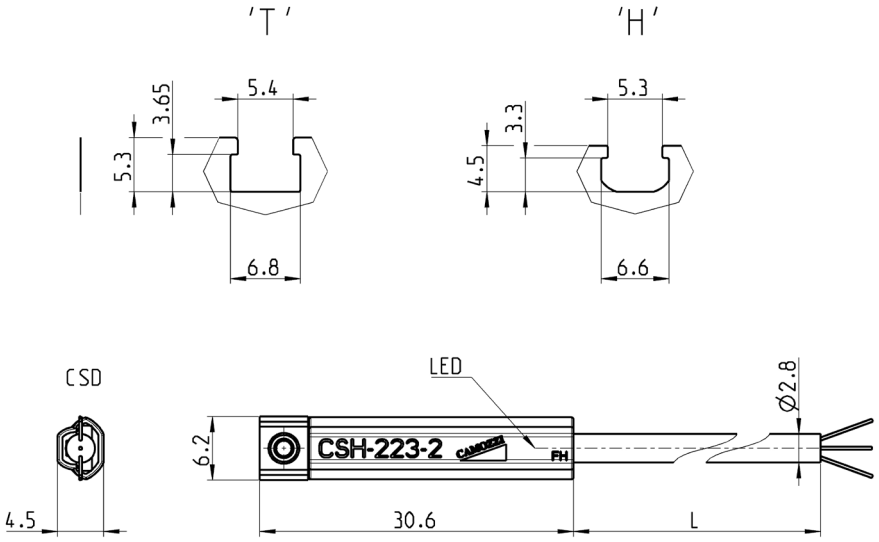


Cable length: 0,3 m

Mod.	Operation	Connection	Voltage	Output	Max. current	Max Load	Protection
CSH-253	Reed NO	2 wires M8 male 3 pin	10 ÷ 30 V AC/DC	-	250 mA	10 VA / 8 W	Against polarity reversing
CSH-253EX	Reed NO	2 wires M8 male 3 pin	10 ÷ 30 V AC/DC	-	250 mA	10 VA / 8 W	Against polarity reversing
CSH-263	Reed NO	3 wires M8 male 3 pin	10 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing
CSH-263EX	Reed NO	3 wires M8 male 3 pin	10 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing
CSH-364	Magnetoresistive	3 wires M8 male 3 pin	10 ÷ 27 V DC	PNP	250 mA	6 W	Against polarity reversing and overvoltage
CSH-364EX	Magnetoresistive	3 wires M8 male 3 pin	10 ÷ 27 V DC	PNP	250 mA	6 W	Against polarity reversing and overvoltage
CSH-463	Reed NC	3 wires M8 male 3 pin	10 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing
CSH-463EX	Reed NC	3 wires M8 male 3 pin	10 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing

Note for 2-wire switch Mod. CSH-253:
in case of polarity reversing the sensor will still be operating, but LED diode won't turn on.

Magnetic proximity switches with 2 or 3 wire cable for H-slot



Mod.	Operation	Connection	Voltage	Output	Max. current	Max Load	Protection	L = cable legth
CSH-223-2	Reed	2 wires	10 ÷ 30 V AC/DC	-	250 mA	10 VA / 8 W	Against polarity reversing	2 m
CSH-223-5	Reed	2 wires	10 ÷ 30 V AC/DC	-	250 mA	10 VA / 8 W	Against polarity reversing	5 m
CSH-223-10	Reed	2 wires	10 ÷ 30 V AC/DC	-	250 mA	10 VA / 8 W	Against polarity reversing and overvoltage	10 m
CSH-223-2EX	Reed	2 wires	10 ÷ 30 V AC/DC	-	250 mA	10 VA / 8 W	Against polarity reversing and overvoltage	2 m
CSH-223-5EX	Reed	2 wires	10 ÷ 30 V AC/DC	-	250 mA	10 VA / 8 W	Against polarity reversing	5 m
CSH-223-10EX	Reed	2 wires	10 ÷ 30 V AC/DC	-	250 mA	10 VA / 8 W	Against polarity reversing	10 m
CSH-221-2	Reed	2 wires	30 ÷ 230 V AC - 30 ÷ 110 V DC	-	250 mA	10 VA / 8 W	Against polarity reversing	2 m
CSH-221-5	Reed	2 wires	30 ÷ 230 V AC - 30 ÷ 110 V DC	-	250 mA	10 VA / 8 W	Against polarity reversing	5 m
CSH-221-2EX	Reed	2 wires	30 ÷ 230 V AC - 30 ÷ 110 V DC	-	250 mA	10 VA / 8 W	Against polarity reversing	2 m
CSH-221-5EX	Reed	2 wires	30 ÷ 230 V AC - 30 ÷ 110 V DC	-	250 mA	10 VA / 8 W	Against polarity reversing	5 m
CSH-233-2	Reed	3 wires	10 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing	2 m
CSH-233-5	Reed	3 wires	10 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing	5 m
CSH-233-2EX	Reed	3 wires	10 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing	2 m
CSH-233-5EX	Reed	3 wires	10 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing	5 m
CSH-334-2	Magnetoresistive	3 wires	10 ÷ 27 V DC	PNP	250 mA	6 W	Against polarity reversing and overvoltage	2 m
CSH-334-5	Magnetoresistive	3 wires	10 ÷ 27 V DC	PNP	250 mA	6 W	Against polarity reversing and overvoltage	5 m
CSH-334-2EX	Magnetoresistive	3 wires	10 ÷ 27 V DC	PNP	250 mA	6 W	Against polarity reversing and overvoltage	2 m
CSH-334-5EX	Magnetoresistive	3 wires	10 ÷ 27 V DC	PNP	250 mA	6 W	Against polarity reversing and overvoltage	5 m
CSH-433-2	Reed NC	3 wires	10 ÷ 30 V AC/DC	PNP	250 mA	10 VA / 8 W	Against polarity reversing and overvoltage	2 m
CSH-433-5	Reed	3 wires	10 ÷ 30 V AC/DC	PNP-NC	250 mA	10 VA / 8 W	Against polarity reversing	5 m
CSH-433-2EX	Reed	3 wires	10 ÷ 30 V AC/DC	PNP-NC	250 mA	10 VA / 8 W	Against polarity reversing	2 m
CSH-433-5EX	Reed	3 wires	10 ÷ 30 V AC/DC-	PNP-NC	250 mA	10 VA / 8 W	Against polarity reversing	5 m

Note for 2-wire switches Mod. CSH-223-2, CSH-223-5, CSH-221-2, CSH-221-5:
in case of polarity reversing the sensor will still be operating, but the LED diode won't turn on.