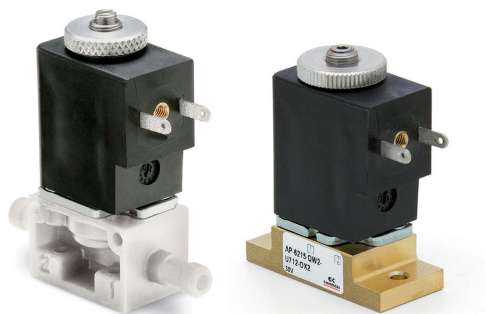


DIRECTLY OPERATED PROPORTIONAL VALVES

SERIES AP

2/2-way proportional valves, NC
Sizes: 16 - 22 mm



- PWM or current operation
- Open loop flow control
- Also suitable for use with vacuum
- Several versions available:
 - with body in PVDF (size 16mm only)
 - with rear flanged bodies
 - with lower flanged bodies
 - suitable for use with oxygen
 - seals in FKM, NBR and EPDM

Series AP directly operated 2/2-way proportional solenoid valves, NC, with nominal diameters range from 0,8 to 2,4 mm, can be used where an open loop flow control is required, with gas mixtures, to control free flows or blows, or emptying chambers using vacuum.

Series AP proportional valves have been manufactured to optimize and reduce friction and stick-slip effects. The output flow is proportional to the control signal. As they can work also in vacuum, a minimum working pressure is not required.

GENERAL DATA

Function	2/2 NC
Operation	proportional directly operated
Ports	M5 - G1/8 - with rear flanges - with lower flanges
Hysteresis	Size 16mm: 12% FS - Size 22mm: 10% FS
Repeatability	Size 16mm: 7% FS - Size 22mm: 7% FS
Operating temperature	0 ÷ 60°C
Medium	filtered compressed air, unlubricated, according to ISO 8573-1 class 3.4.3, inert gas. All the valves are suitable for use with oxygen.
Installation	any position
Materials	body = brass / PVDF (size 16mm only) seals = NBR, FKM, EPDM
Nominal resistance	GP7 = 193 ohm - GPH = 48 ohm - U711 = 85 ohm - U712 = 22 ohm
Rated current	GP7 = 125 mA - GPH = 250 mA - U711 = 271 mA - U712 = 542 mA

NOTE: Having a counterpressure on the outlet connection of at least 25% of the inlet pressure ensures the good functioning of the valve and improves its performance.
Example: with inlet Pressure = 1 bar on the outlet connection, a min. counterpressure of 250 mbar is recommended.

DIRECTLY OPERATED PROPORTIONAL VALVES
SERIES AP - CODING EXAMPLE

CODING EXAMPLE

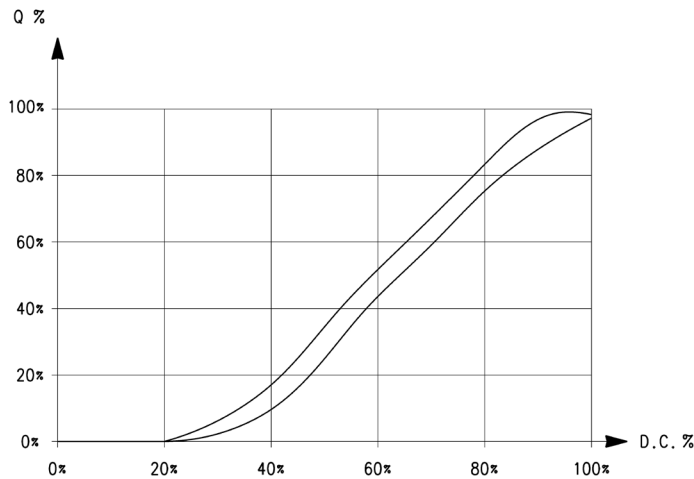
AP	-	7	2	1	1	-	L	R	2	-	U	7	11	OX2
AP	SERIES													
7	BODY 6 = size 16mm 7 = size 22mm													
2	NUMBER OF WAYS 2 = 2-way													
1	VALVE FUNCTION 1 = NC													
1	PORTS 0 = M5 (size 16mm only) 1 = G1/8 (size 22mm only) 4 = with rear flanges (size 16mm only) 5 = with lower flanges L = male hose adaptor (for body in PVDF only, size 16mm)													
L	ORIFICE D = Ø0,8 mm (size 16mm only) F = Ø1 mm H = Ø1,2 mm L = Ø1,6 mm N = Ø2 mm (size 22mm only) Q = Ø2,4 mm (size 22mm only)													
R	SEAL MATERIAL R = NBR W = FKM E = EPDM													
2	BODY MATERIAL 2 = brass 3 = PVDF (size 16mm only)													
U	ENCAPSULATING MATERIAL G = PA (size 16mm only) U = PET (size 22mm only)													
7	SOLENOID DIMENSIONS P = 16x26 DIN EN 175301-803-C (size 16mm only) 7 = 22x22 DIN 43650 B (size 22mm only)													
11	SOLENOID VOLTAGE H = 12 V DC 3 W (size 16mm only) 7 = 24 V DC 3 W (size 16mm only) 11 = 24 V DC 6,5 W (size 22mm only) 12 = 12 V DC 6,5 W (size 22mm only)													
	COIL ORIENTATION = fastons opposite to pneumatic ports/same side of the outlet 5 = fastons towards pneumatic ports/same side of the inlet													
OX2	VERSION OX2 = version with ASTM G93-03 Certification Level B (FKM seals only) = non-certified version													

TECNOLOGIA PROPORZIONALE

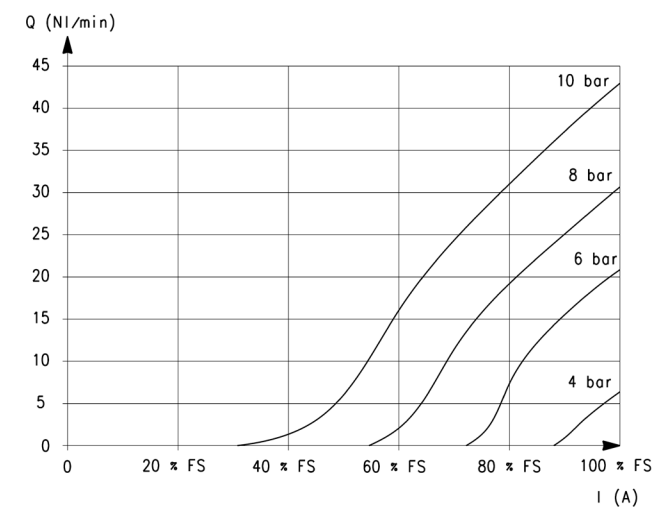
8

FLOW GRAPH

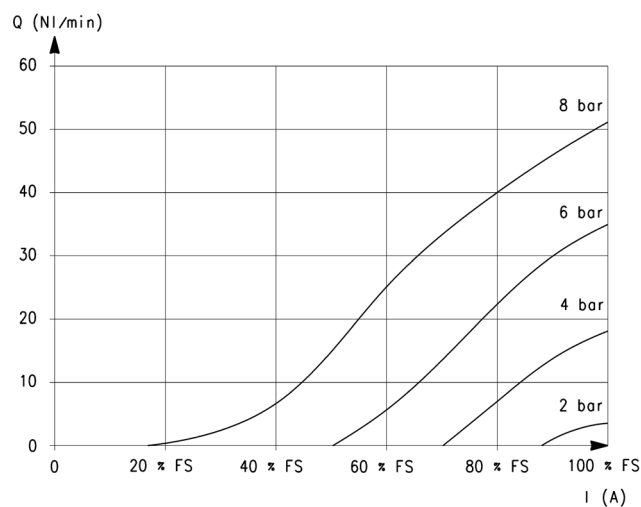
Flow characteristic curve of a proportional valve.



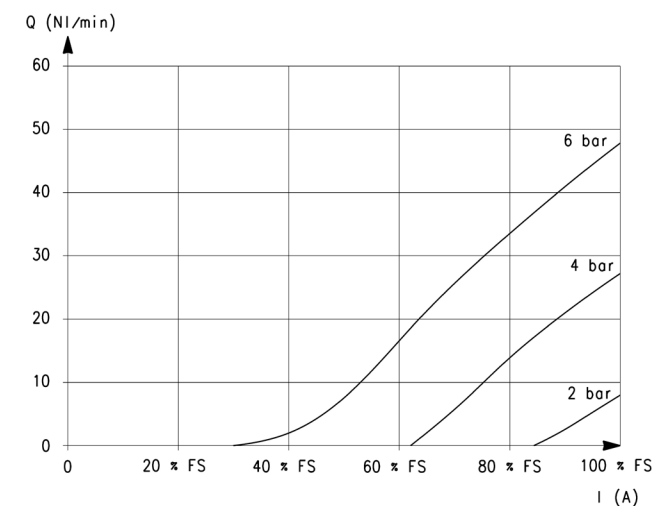
Q = flow
D.C. = duty cycle

FLOW DIAGRAMS - size 16mm
Nozzle 0,8 mm


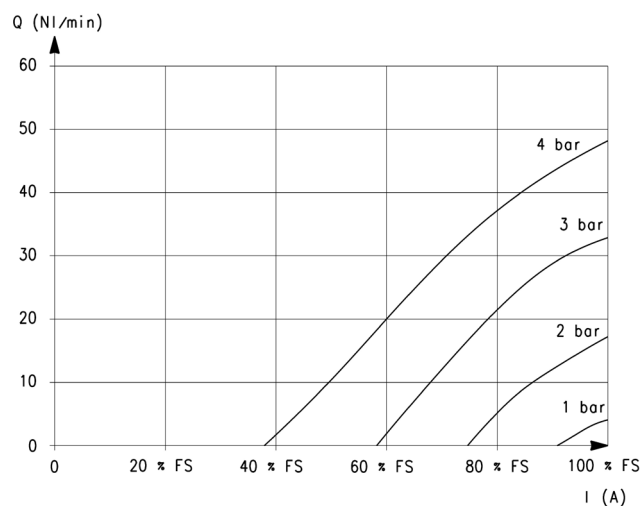
Q = Flow (NL/min)
 I = Current (A)
 FS = Full scale

Nozzle 1 mm


Q = Flow (NL/min)
 I = Current (A)
 FS = Full scale

Nozzle 1,2 mm


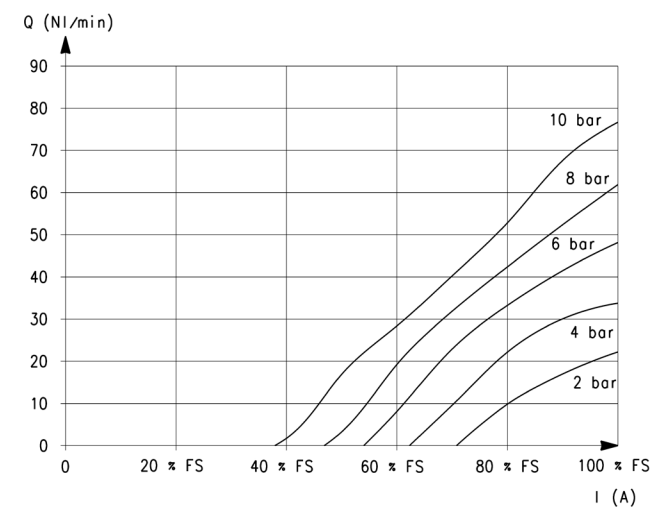
Q = Flow (NL/min)
 I = Current (A)
 FS = Full scale

Nozzle 1,6 mm


Q = Flow (NL/min)
 I = Current (A)
 FS = Full scale

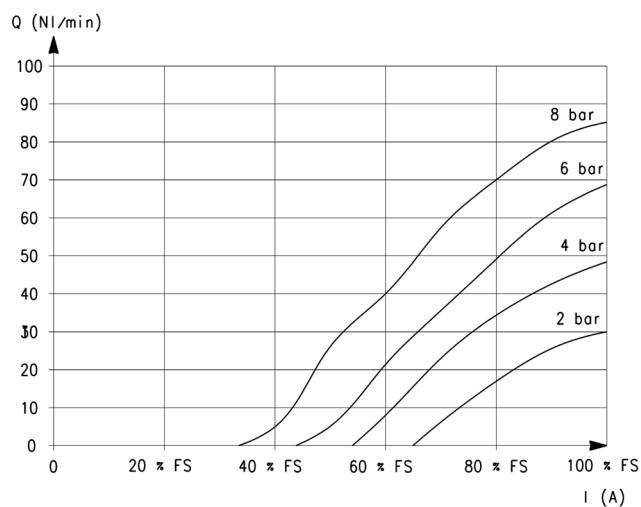
FLOW DIAGRAMS - size 22mm

Nozzle 1 mm



Q = Flow (NI/min)
I = Current (A)
FS = Full scale

Nozzle 1,2 mm

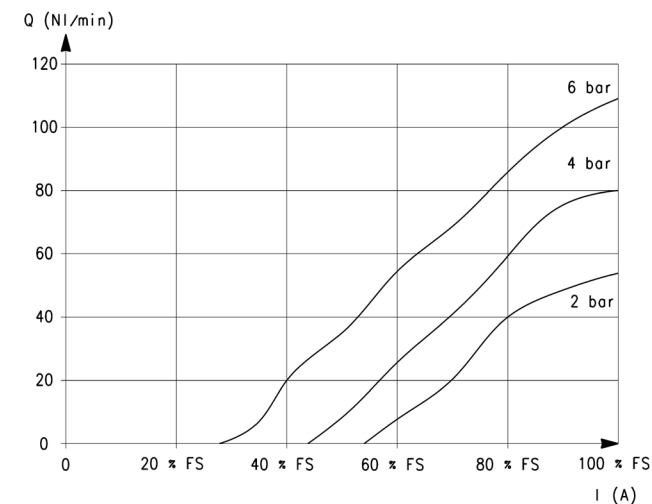


Q = Flow (NI/min)
I = Current (A)
FS = Full scale

TECNOLOGIA PROPORZIONALE

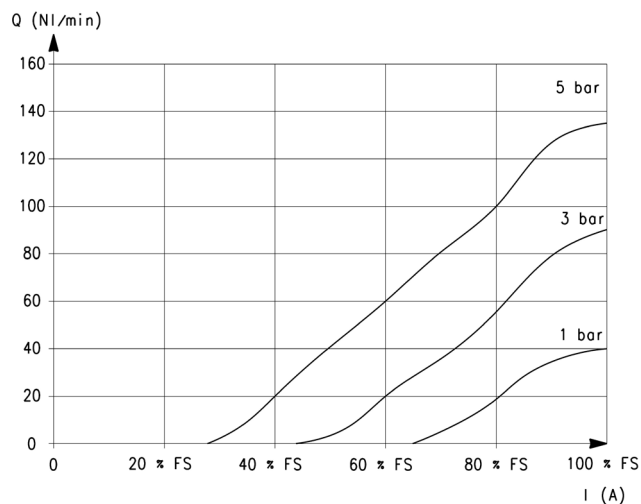
8

Nozzle 1,6 mm

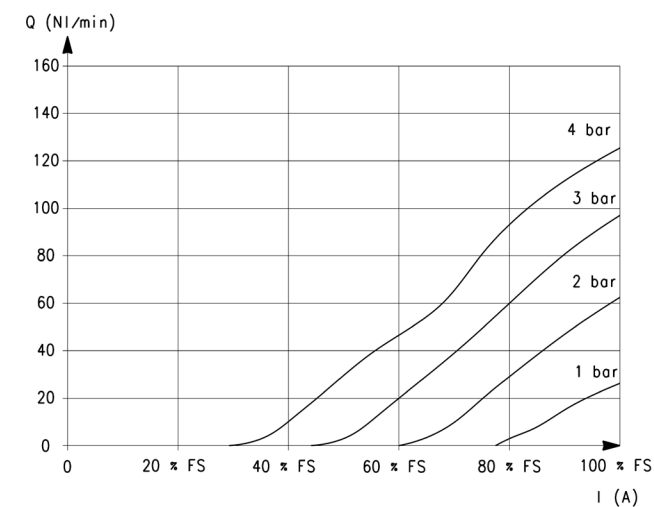


Q = Flow (NI/min)
I = Current (A)
FS = Full scale

Nozzle 2 mm



Q = Flow (NI/min)
I = Current (A)
FS = Full scale

FLOW DIAGRAM - size 22mm
Nozzle 2,4 mm


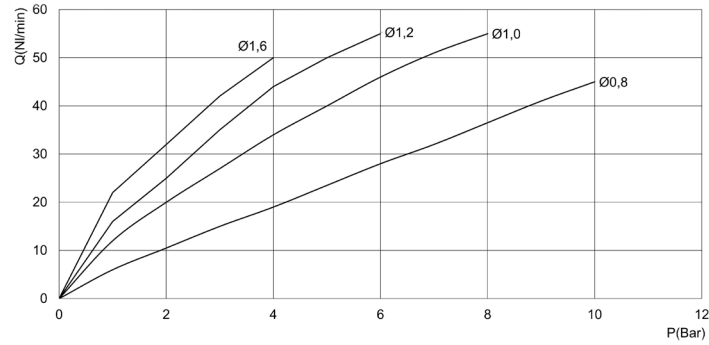
Q = Flow (NI/min)
 I = Current (A)
 FS = Full scale

DIRECTLY OPERATED PROPORTIONAL VALVES
SERIES AP - TECHNICAL CHARACTERISTICS

MAXIMUM FLOW AND RESPONSE TIMES - size 16mm

Maximum flow according to the set pressure, for each orifice.

RESPONSE TIMES calculated according to the maximum flow at each operating pressure.
[Electromechanical response time: 10 ms]

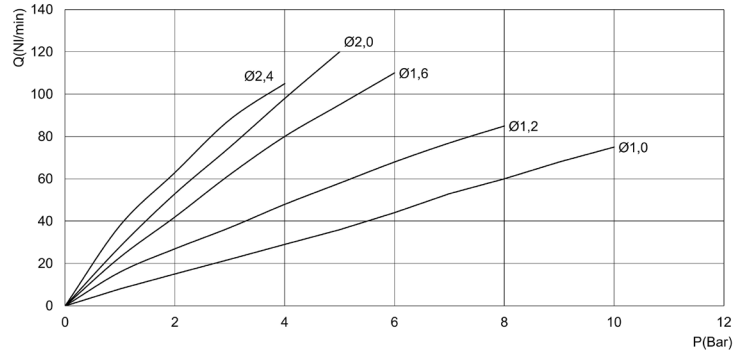


Q = flow (NI/min)
P = set pressure (bar)

Ø	Pin [bar]	Opening response time [ms]			Closing response time [ms]		
		0% - 10%	0% - 90%	10% - 90%	100% - 90%	100% - 10%	90% - 10%
0,8 mm	10	12	43	31	11	39	28
1 mm	8	12	42	30	11	38	27
1,2 mm	6	10	41	31	11	41	30
1,6 mm	4	10	40	30	11	40	29

MAXIMUM FLOW AND RESPONSE TIMES - size 22mm

Maximum flow according to the set pressure, for each orifice.



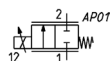
Q = flow (NI/min)
P = set pressure (bar)

Ø	Pin [bar]	Load response time (ms)			Exhaust response time [ms]		
		0% - 10%	0% - 90%	10% - 90%	100% - 90%	100% - 10%	90% - 10%
1 mm	10	10	36	26	10	36	26
1,2 mm	8	10	45	35	12	38	26
1,6 mm	6	12	45	33	12	40	28
2 mm	5	12	42	30	11	34	26
2,4 mm	4	11	45	34	12	44	32

DIRECTLY OPERATED PROPORTIONAL VALVES

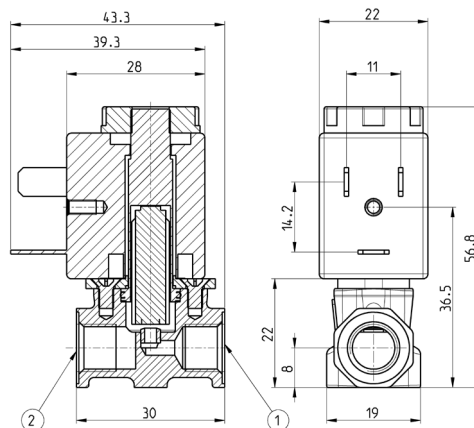
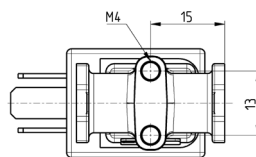
SERIES AP - DIMENSIONAL CHARACTERISTICS

Series AP proportional valves - 22mm, body with threaded ports



AP01

For the use with vacuum connect the line to port 2.



Mod.	Port 1	Port 2	Function	Orifice Ø (mm)	kv (l/min)	Max pressure (bar)	Max flow (Nl/min)
AP-7211-FR2-U7*	G1/8	G1/8	2/2 NC	1	0,5	10	75
AP-7211-HR2-U7*	G1/8	G1/8	2/2 NC	1,2	0,7	8	85
AP-7211-LR2-U7*	G1/8	G1/8	2/2 NC	1,6	1,2	6	110
AP-7211-NR2-U7*	G1/8	G1/8	2/2 NC	2	1,7	5	135
AP-7211-QR2-U7*	G1/8	G1/8	2/2 NC	2,4	1,7	4	113
AP-7211-FW2-U7*OX2	G1/8	G1/8	2/2 NC	1	0,5	10	75
AP-7211-HW2-U7*OX2	G1/8	G1/8	2/2 NC	1,2	0,7	8	85
AP-7211-LW2-U7*OX2	G1/8	G1/8	2/2 NC	1,6	1,2	6	110
AP-7211-NW2-U7*OX2	G1/8	G1/8	2/2 NC	2	1,7	5	135
AP-7211-QW2-U7*OX2	G1/8	G1/8	2/2 NC	2,4	1,7	4	113

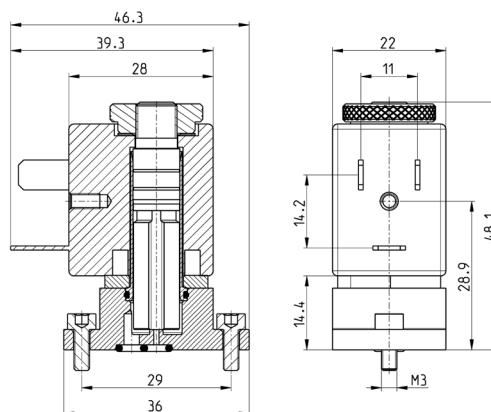
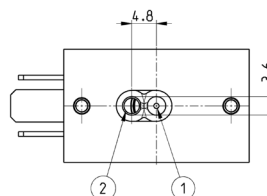
*choose the desired voltage

Series AP proportional valves - size 22mm, low flanged body



AP01

For the use with vacuum connect the line to port 2.



Mod.	Function	Orifice Ø (mm)	kv (l/min)	Max pressure (bar)	Max flow (Nl/min)
AP-7215-FR2-U7*	2/2 NC	1	0,5	10	75
AP-7215-HR2-U7*	2/2 NC	1,2	0,7	8	85
AP-7215-LR2-U7*	2/2 NC	1,6	1,2	6	110
AP-7215-NR2-U7*	2/2 NC	2	1,7	5	135
AP-7215-QR2-U7*	2/2 NC	2,4	1,7	4	113
AP-7215-FW2-U7*OX2	2/2 NC	1	0,5	10	75
AP-7215-HW2-U7*OX2	2/2 NC	1,2	0,7	8	85
AP-7215-LW2-U7*OX2	2/2 NC	1,6	1,2	6	110
AP-7215-NW2-U7*OX2	2/2 NC	2	1,7	5	135
AP-7215-QW2-U7*OX2	2/2 NC	2,4	1,7	4	113

* choose the desired voltage

DIRECTLY OPERATED PROPORTIONAL VALVES
SERIES AP - DIMENSIONAL CHARACTERISTICS

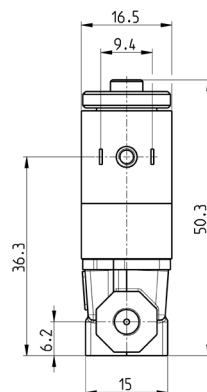
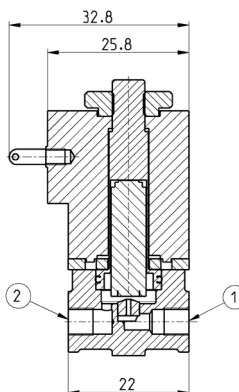
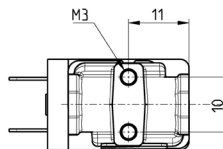
Series AP proportional valves - 16mm, body with threaded ports



For the use with vacuum connect the line to port 2.



AP01



Mod.	Port 1	Port 2	Function	Orifice Ø (mm)	kv (l/min)	Max pressure (bar)	Max flow (Nl/min)
AP-6210-DR2-GP*	M5	M5	2/2 NC	0,8	0,3	10	43
AP-6210-FR2-GP*	M5	M5	2/2 NC	1	0,45	8	53
AP-6210-HR2-GP*	M5	M5	2/2 NC	1,2	0,57	6	53
AP-6210-LR2-GP*	M5	M5	2/2 NC	1,6	0,78	4	52
AP-6210-DW2-GP*OX2	M5	M5	2/2 NC	0,8	0,3	10	43
AP-6210-FW2-GP*OX2	M5	M5	2/2 NC	1	0,45	8	53
AP-6210-HW2-GP*OX2	M5	M5	2/2 NC	1,2	0,57	6	53
AP-6210-LW2-GP*OX2	M5	M5	2/2 NC	1,6	0,78	4	52

* choose the desired voltage

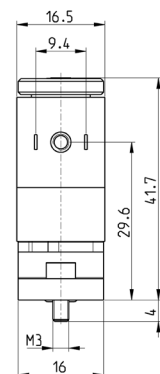
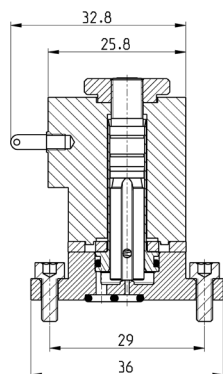
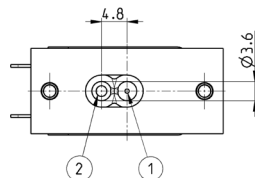
Series AP proportional valves - 16mm, low flanged body



For the use with vacuum connect the line to port 2.



AP01



Mod.	Function	Orifice Ø (mm)	kv (l/min)	Max pressure (bar)	Max flow (Nl/min)
AP-6215-DR2-GP*	2/2 NC	0,8	0,3	10	43
AP-6215-FR2-GP*	2/2 NC	1	0,45	8	53
AP-6215-HR2-GP*	2/2 NC	1,2	0,57	6	53
AP-6215-LR2-GP*	2/2 NC	1,6	0,78	4	52
AP-6215-DW2-GP*OX2	2/2 NC	0,8	0,3	10	43
AP-6215-FW2-GP*OX2	2/2 NC	1	0,45	8	53
AP-6215-HW2-GP*OX2	2/2 NC	1,2	0,57	6	53
AP-6215-LW2-GP*OX2	2/2 NC	1,6	0,78	4	52

* choose the desired voltage

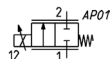
DIRECTLY OPERATED PROPORTIONAL VALVES

SERIES AP - DIMENSIONAL CHARACTERISTICS

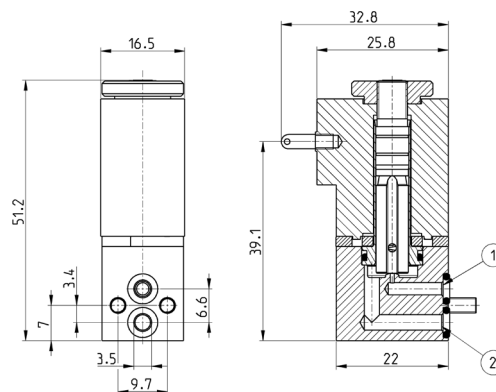
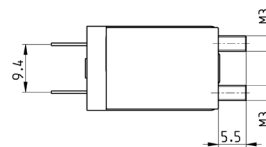
Series AP proportional valves - 16mm, rear flanged body



For the use with vacuum connect the line to port 2.



AP01



Mod.	Function	Orifice Ø (mm)	kv (l/min)	Max pressure (bar)	Max flow (NL/min)
AP-6214-DR2-GP*	2/2 NC	0,8	0,3	10	43
AP-6214-FR2-GP*	2/2 NC	1	0,45	8	53
AP-6214-HR2-GP*	2/2 NC	1,2	0,57	6	53
AP-6214-LR2-GP*	2/2 NC	1,6	0,78	4	52
AP-6214-DW2-GP*OX2	2/2 NC	0,8	0,3	10	43
AP-6214-FW2-GP*OX2	2/2 NC	1	0,45	8	53
AP-6214-HW2-GP*OX2	2/2 NC	1,2	0,57	6	53
AP-6214-LW2-GP*OX2	2/2 NC	1,6	0,78	4	52

* choose the desired voltage

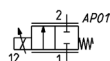
TECNOLOGIA PROPORZIONALE

8

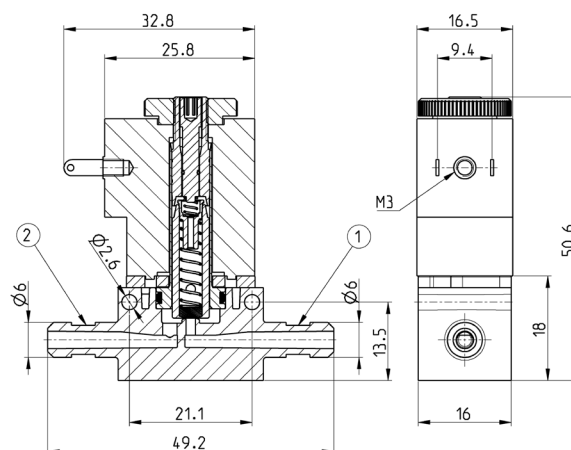
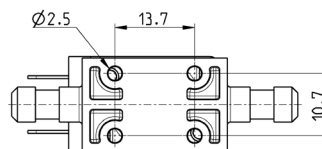
Series AP proportional valves, size 16mm - body in PVDF



For the use with vacuum connect the line to port 2.



AP01



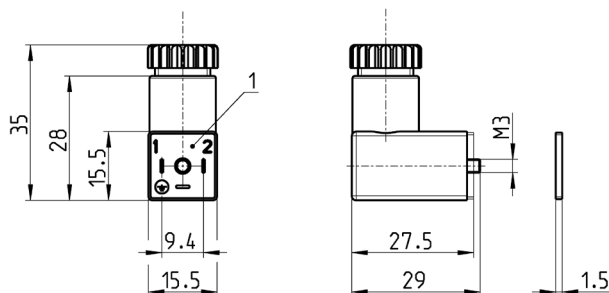
Mod.	Port 1	Port 2	Function	Orifice Ø (mm)	kv (l/min)	Max pressure (bar)	Max flow (NL/min)
AP-6211-DR3-GP*	Ø6 **	Ø6 **	2/2 NC	0,8	0,3	10	43
AP-6211-FR3-GP*	Ø6 **	Ø6 **	2/2 NC	1	0,45	8	53
AP-6211-HR3-GP*	Ø6 **	Ø6 **	2/2 NC	1,2	0,57	6	53
AP-6211-LR3-GP*	Ø6 **	Ø6 **	2/2 NC	1,6	0,78	4	52
AP-6211-DW3-GP*OX2	Ø6 **	Ø6 **	2/2 NC	0,8	0,3	10	43
AP-6211-FW3-GP*OX2	Ø6 **	Ø6 **	2/2 NC	1	0,45	8	53
AP-6211-HW3-GP*OX2	Ø6 **	Ø6 **	2/2 NC	1,2	0,57	6	53
AP-6211-LW3-GP*OX2	Ø6 **	Ø6 **	2/2 NC	1,6	0,78	4	52

* choose the desired voltage

** pneumatic connection with tube and clamps

Connector Mod. 125-800 DIN 43650 pitch 9,4 mm

For size 16 mm only

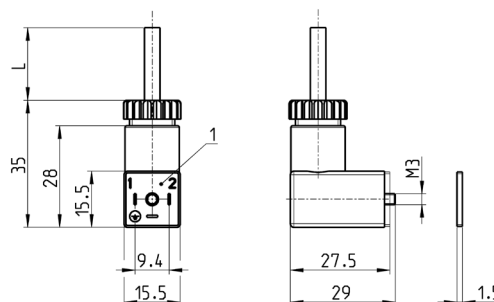


1 = 90° adjustable connector

Mod.	Description	Colour	Working voltage	Cable gland	Tightening torque
125-800	connector, without electronics	black	-	PG7	0,3 Nm

Connector Mod. 125-550- DIN 43650 pitch 9,4 mm with cable

For size 16 mm only

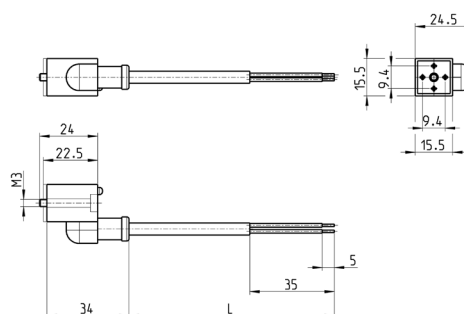


1 = 90° adjustable connector

Mod.	Description	Colour	Working voltage	Cable length (L)	Cable gland	Tightening torque
125-550-1	moulded cable, without electronics	black	-	1000 mm	-	0,3 Nm

In-line connectors with cable Mod. 125-553

For size 16 mm only



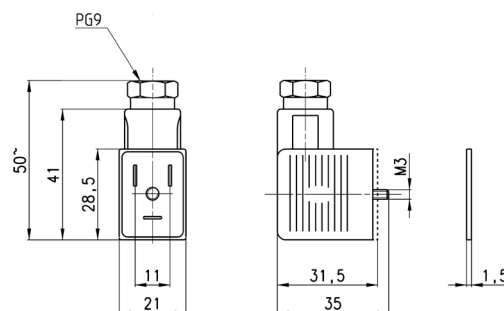
Mod.	Description	Colour	Working voltage	Cable length (L)	Cable gland	Tightening torque
125-553-2	in-line moulded cable, without electronics	black	-	2000 mm	-	0,3 Nm
125-553-5	in-line moulded cable, without electronics	black	-	5000 mm	-	0,3 Nm

Connectors Mod. 122-800 DIN 43650



For size 22 mm only

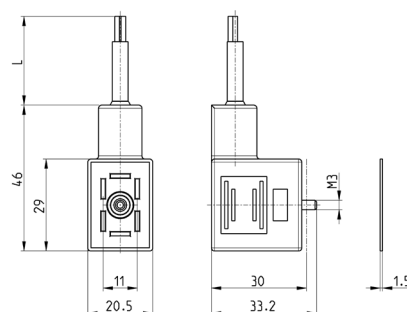
Mod. 122-800EX: for ATEX certified solenoids
Mod. U7*EX, with anti-screwing off screw Mod. TORX.



Mod.	Description	Colour	Working voltage	Cable gland	Tightening torque
122-800	connector, without electronics	black	-	PG9	0,5 Nm
122-800EX	connector, without electronics	black	-	PG9	0,5 Nm

Connectors Mod. 122-550 DIN 43650 with cable

For size 22 mm only



Mod.	Description	Colour	Working voltage	Cable length (L)	Cable gland	Tightening torque
122-550-1	moulded cable, without electronics	black	-	1000 mm	-	0,5 Nm
122-550-5	moulded cable, without electronics	black	-	5000 mm	-	0,5 Nm