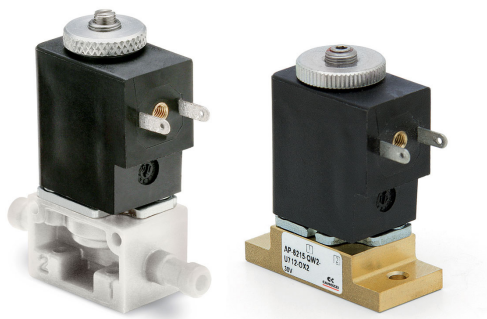
DIRECTLY OPERATED PROPORTIONAL VALVES
SERIES AP

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 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
Repeatibility	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 = FKM, EPDM
Nominal resistance	GP7 = 193 ohm GPH = 48 ohm U711 = 85 ohm U712 = 22 ohm
Rated current [mA]	GP7 = 125 mA GPH = 250 mA U711 = 271 mA U712 = 542 mA

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DIRECTLY OPERATED PROPORTIONAL VALVES
SERIES AP - CODING EXAMPLES

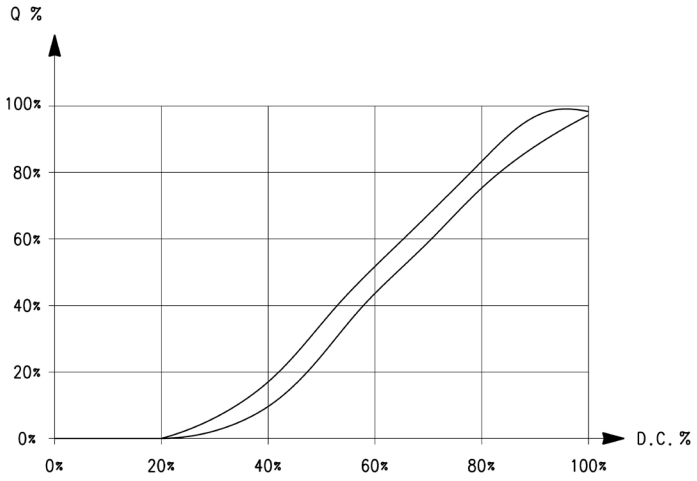
Coding example

AP	-	7	2	1	1	-	L	W	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 = Ø 0,8 mm (size 16mm only) F = Ø 1 mm	H = Ø 1,2 mm L = Ø 1,6 mm	N = Ø 2 mm (size 22mm only) Q = Ø 2,4 mm (size 22mm only)
W	SEAL MATERIAL 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)	
OX2	USE WITH OXYGEN: = Not suitable for use with oxygen OX2 = for use with oxygen – cleanliness level according to ASTM G93-03 Standard Level B		

FLOW GRAPH

Flow characteristic curve of a proportional valve.

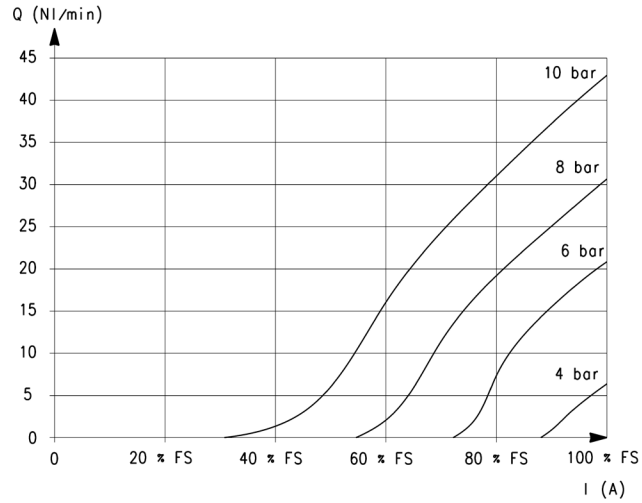


Q = flow
D.C. = duty cycle

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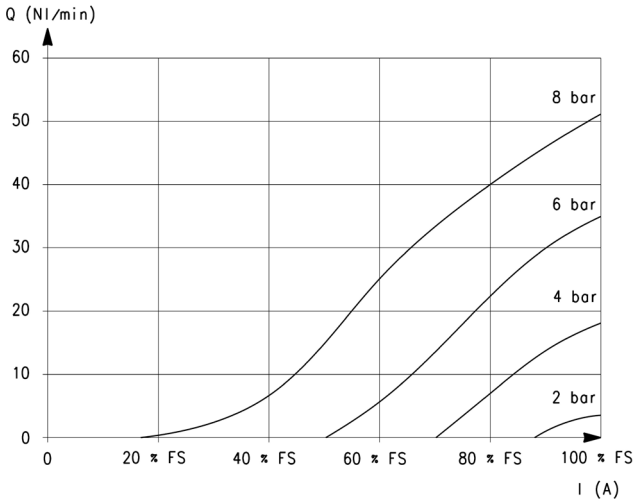
FLOW DIAGRAMS - size 16mm

Nozzle 0,8 mm



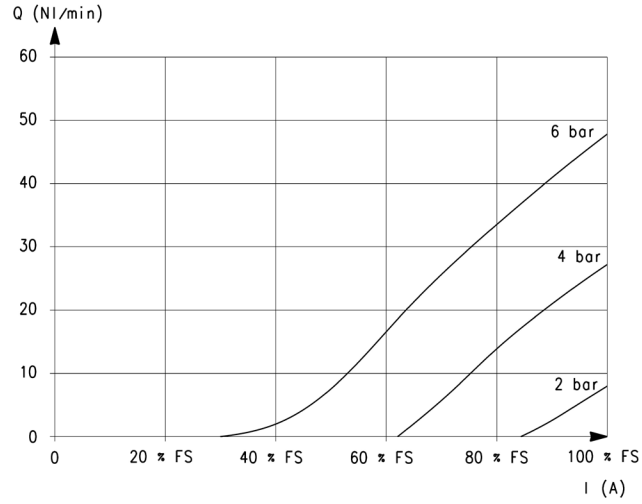
Q = Flow (Nl/min)
I = Current (A)
FS = Full scale

Nozzle 1 mm



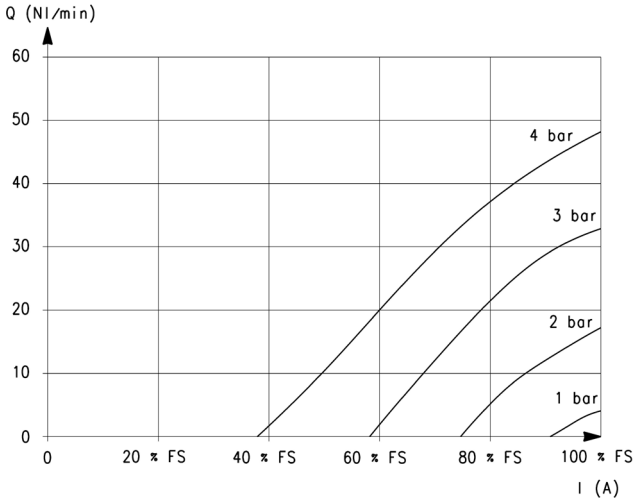
Q = Flow (Nl/min)
I = Current (A)
FS = Full scale

Nozzle 1,2 mm



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

Nozzle 1,6 mm

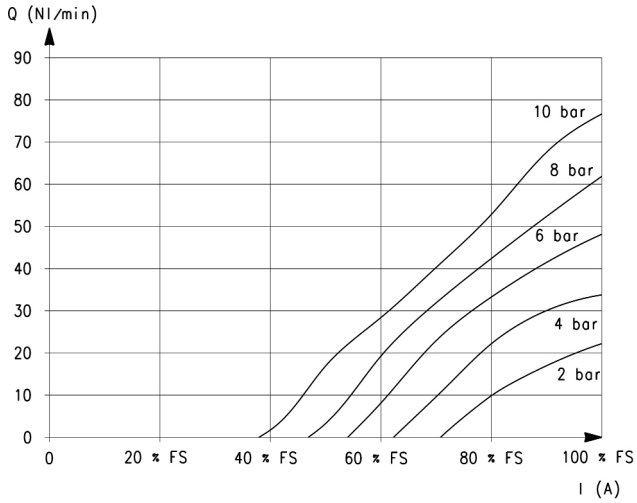


Q = Flow (Nl/min)
I = Current (A)
FS = Full scale

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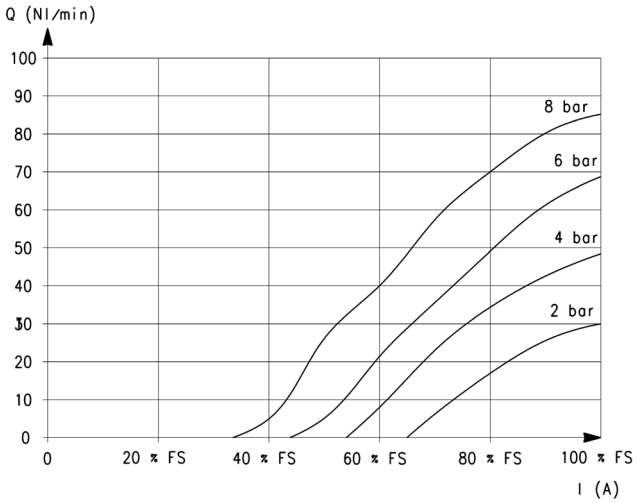
FLOW DIAGRAMS - size 22mm

Nozzle 1 mm



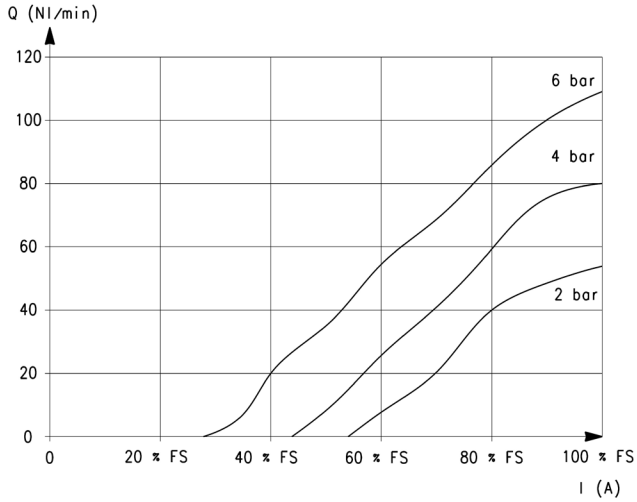
Q = Flow (Nl/min)
I = Current (A)
FS = Full scale

Nozzle 1,2 mm



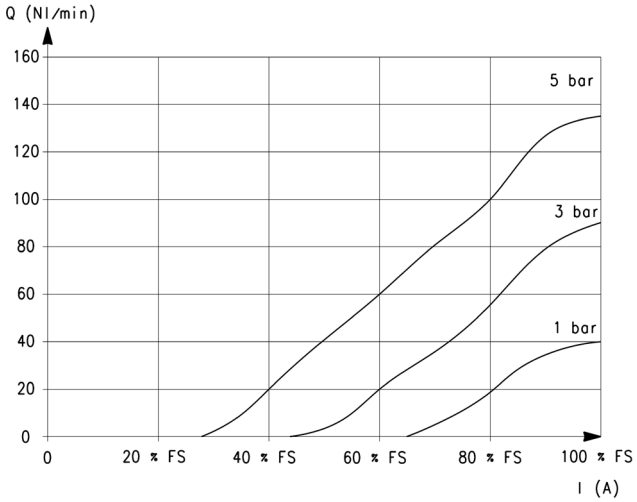
Q = Flow (Nl/min)
I = Current (A)
FS = Full scale

Nozzle 1,6 mm



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

Nozzle 2 mm

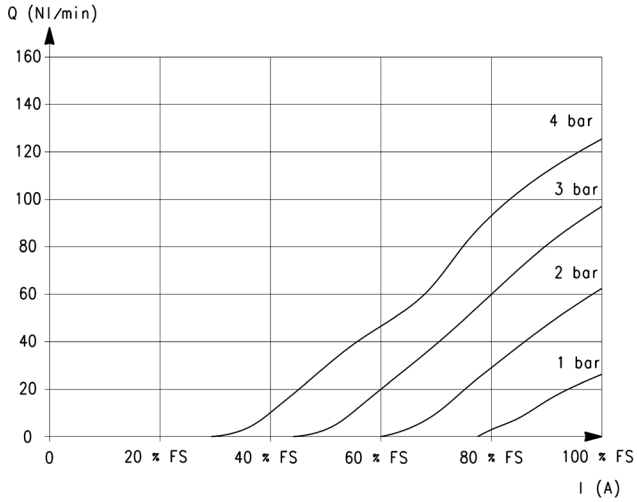


Q = Flow (Nl/min)
I = Current (A)
FS = Full scale

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FLOW DIAGRAM - size 22mm

Nozzle 2,4 mm



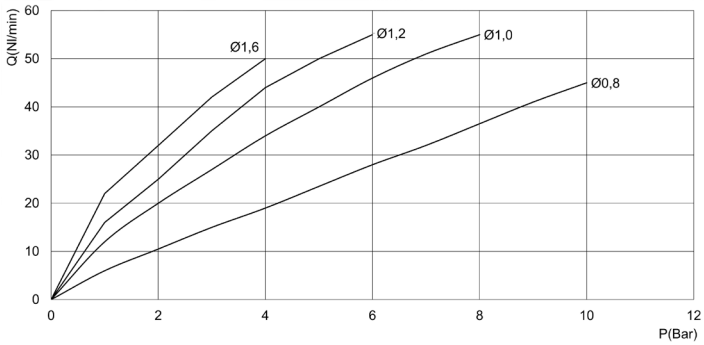
Q = Flow (Nl/min)
I = Current (A)
FS = Full scale

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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]

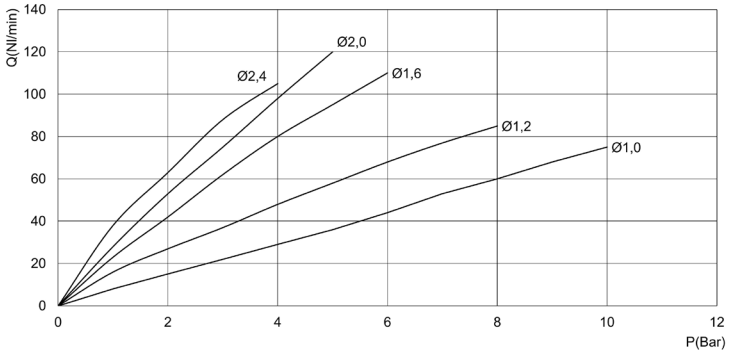


Q = flow (Nl/min)
P = set pressure (bar)

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.



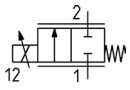
Q = flow (Nl/min)
P = set pressure (bar)

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

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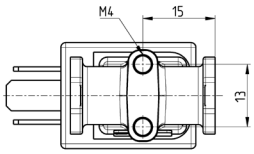
Series AP proportional valves - 22mm, body with threaded ports

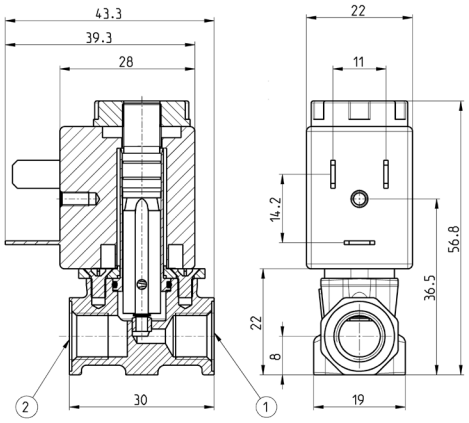




PV01

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



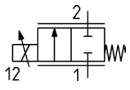


Mod.	Port 1	Port 2	Function	Orifice Ø (mm)	Kv (l/min)	Max. pressure (bar)	Max. flow (Nl/min)
AP-7211-FW2-U7*OX2	G1/8	G1/8	2/2 NC	1	0,5	10	75
AP-7211-HW2-U7*OX2	G1/8	G1/8	2/2 NC	1,2	0,7	8	85
AP-7211-LW2-U7*OX2	G1/8	G1/8	2/2 NC	1,6	1,2	6	110
AP-7211-NW2-U7*OX2	G1/8	G1/8	2/2 NC	2	1,7	5	135
AP-7211-QW2-U7*OX2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

*choose the desired voltage

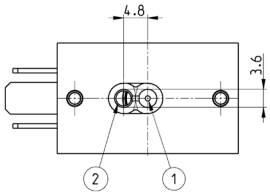
Series AP proportional valves - size 22mm, low flanged body

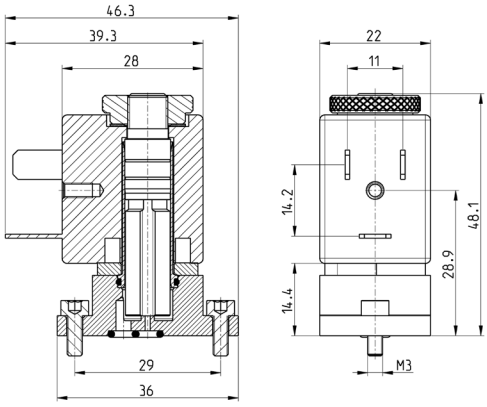




PV01

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





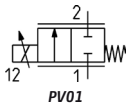
Mod.	Function	Orifice Ø (mm)	Kv (l/min)	Max. pressure (bar)	Max. flow (Nl/min)
AP-7215-FW2-U7*OX2	2/2 NC	1	0,5	10	75
AP-7215-HW2-U7*OX2	2/2 NC	1,2	0,7	8	85
AP-7215-LW2-U7*OX2	2/2 NC	1,6	1,2	6	110
AP-7215-NW2-U7*OX2	2/2 NC	2	1,7	5	135
AP-7215-QW2-U7*OX2	2/2 NC	2,4	1,7	4	113

* choose the desired voltage

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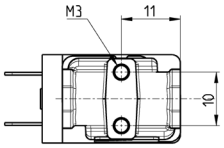
Series AP proportional valves - 16mm, body with threaded ports

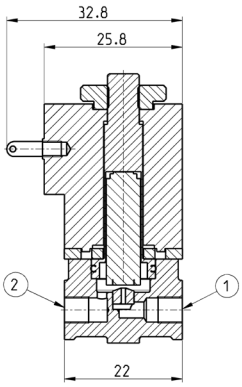


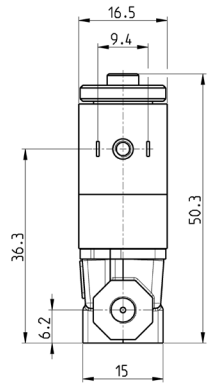


PV01

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





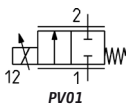


Mod.	Port 1	Port 2	Function	Orifice Ø (mm)	Kv (l/min)	Max. pressure (bar)	Max. flow (Nl/min)
AP-6210-DW2-GP*OX2	M5	M5	2/2 NC	0,8	0,3	10	43
AP-6210-FW2-GP*OX2	M5	M5	2/2 NC	1	0,45	8	53
AP-6210-HW2-GP*OX2	M5	M5	2/2 NC	1,2	0,57	6	53
AP-6210-LW2-GP*OX2	M5	M5	2/2 NC	1,6	0,78	4	52

* choose the desired voltage

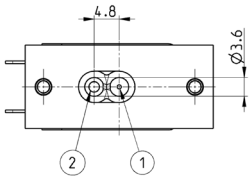
Series AP proportional valves - 16mm, low flanged body

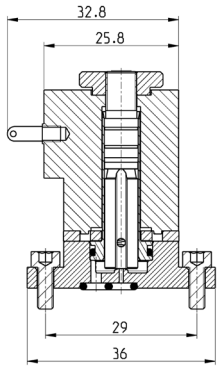


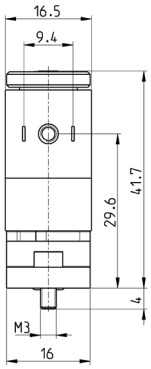


PV01

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-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

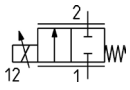
* choose the desired voltage

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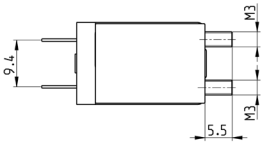
Series AP proportional valves - 16mm, rear flanged body

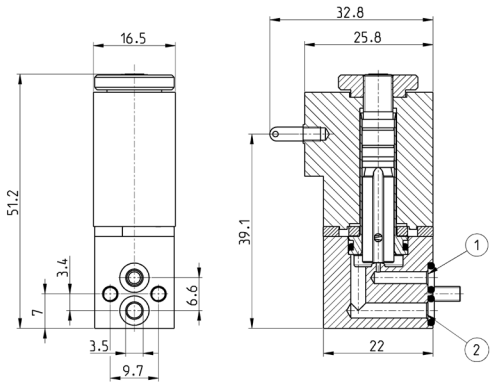


For the use with vacuum connect the line to port 2.



PV01





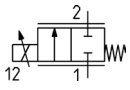
Mod.	Function	Orifice Ø (mm)	Kv (l/min)	Max. pressure (bar)	Max. flow (Nl/min)
AP-6214-DW2-GP*OX2	2/2 NC	0,8	0,3	10	43
AP-6214-FW2-GP*OX2	2/2 NC	1	0,45	8	53
AP-6214-HW2-GP*OX2	2/2 NC	1,2	0,57	6	53
AP-6214-LW2-GP*OX2	2/2 NC	1,6	0,78	4	52

* choose the desired voltage

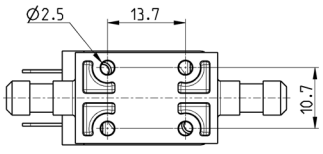
Series AP proportional valves, size 16mm - body in PVDF

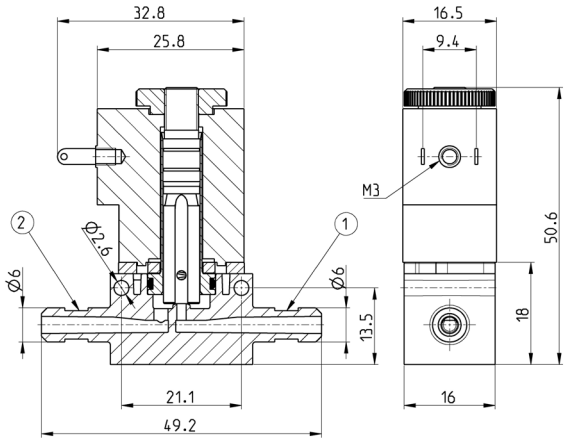


For the use with vacuum connect the line to port 2.



PV01





Mod.	Port 1	Port 2	Function	Orifice Ø (mm)	Kv (l/min)	Max. pressure (bar)	Max. flow (Nl/min)
AP-621L-DW3-GP*OX2	Ø6 **	Ø6 **	2/2 NC	0,8	0,3	10	43
AP-621L-FW3-GP*OX2	Ø6 **	Ø6 **	2/2 NC	1	0,45	8	53
AP-621L-HW3-GP*OX2	Ø6 **	Ø6 **	2/2 NC	1,2	0,57	6	53
AP-621L-LW3-GP*OX2	Ø6 **	Ø6 **	2/2 NC	1,6	0,78	4	52

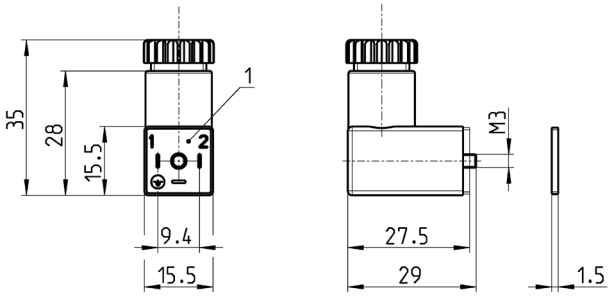
* choose the desired voltage
** pneumatic connection with tube and clamps

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

For size 16 mm only





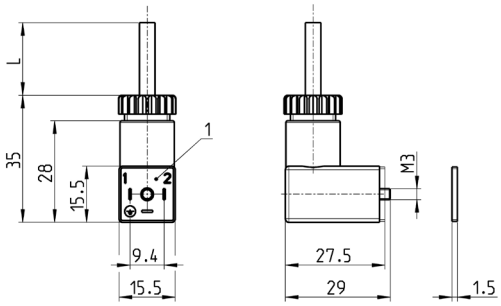
1 = 90° adjustable connector

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





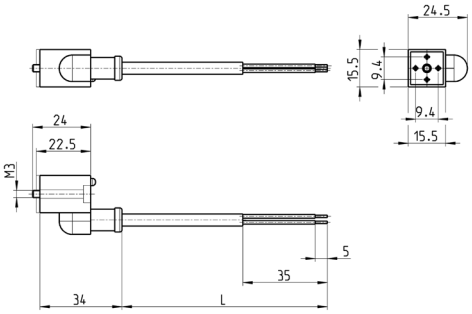
1 = 90° adjustable connector

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

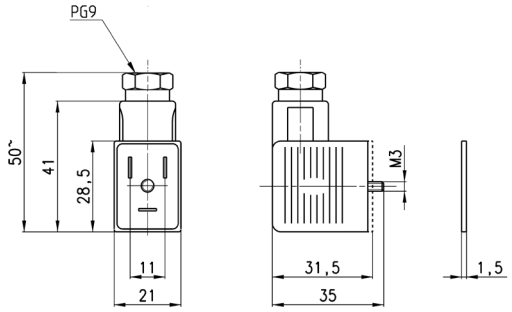
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Connectors Mod. 122-800 DIN 43650



For size 22 mm only

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

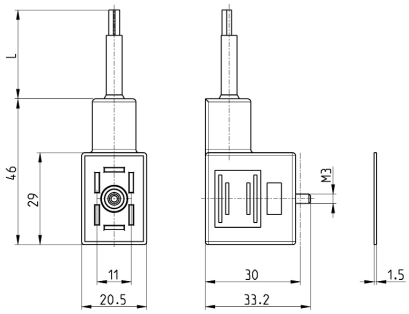


Mod.	Description	Colour	Working voltage	Cable gland	Tightening torque
122-800	Connector, without electronics	Black	-	PG9	0,5 Nm
122-800EX	Connector, without electronics	Black	-	PG9	0,5 Nm

Connectors Mod. 122-550 DIN 43650 with cable

For size 22 mm only



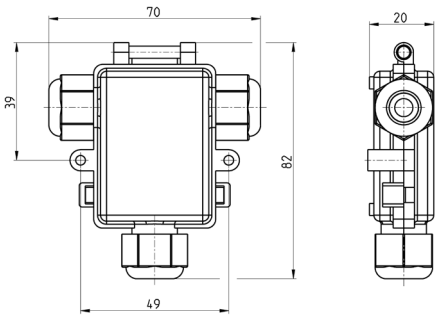


Mod.	Description	Colour	Working voltage	Cable length [L]	Cable gland	Tightening torque
122-550-1	Moulded cable, without electronics	Black	-	1000 mm	-	0,5 Nm
122-550-5	Moulded cable, without electronics	Black	-	5000 mm	-	0,5 Nm

Electrical connections and settings



NOTE: it is possible to realize configurations with voltage, power and PWM frequency values that are not shown in the table below.



Mod.	Size	Valve voltage (Output)	Adjusted power	Adjusted frequency
130-222	22 mm	24 V DC	6,5 W	500 Hz
130-322	22 mm	12 V DC	6,5 W	500 Hz
130-252	22 mm	24 V DC	10 W	500 Hz
130-352	22 mm	12 V DC	10 W	500 Hz
130-213	16 mm	24 V DC	3 W	1000 Hz
130-313	16 mm	12 V DC	3 W	1000 Hz

For further information we suggest you to contact our technical department.

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