CAMOZZI
Automation

SERIES AP
DIRECTLY OPERATED PROPORTIONAL VALVES

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.

2/2-way proportional valves, NC
Sizes: 16 - 22 mm
PWM or current operation
Open loop flow control
Suitable for use with oxygen

Several versions available:
With body in PVDF (size 16mm only)
With rear flanged bodies
With lower flanged bodies

Also suitable for use with vacuum
Seals in FKM and NBR

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 (for size 16mm only) seals = NBR and FKM

	GP7	GPH	U711	U712
Nominal resistance	193 ohm	48 ohm	85 ohm	22 ohm
Rated current	125 mA	250 mA	271 mA	542 mA

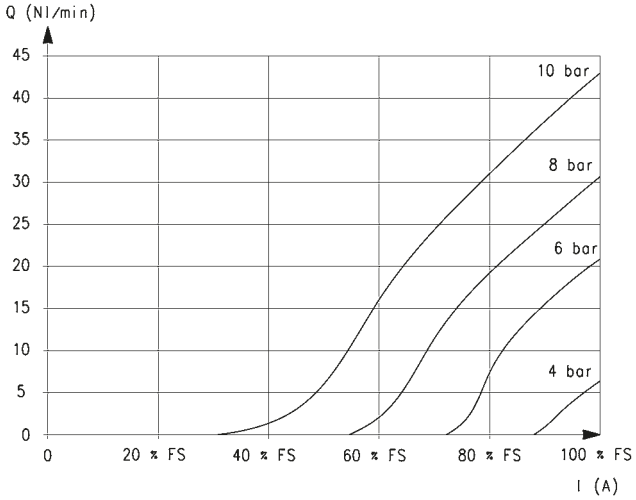
NOTE: Having a counterpressure on the outlet connection of at least 25% of the inlet pressure ensures the good functioning of the valve and improves its performance. Example: with inlet Pressure = 1 bar on the outlet connection, a min. counterpressure of 250 mbar is recommended.

Coding example

AP	-	7	2	1	1	-	L	R	2	-	U	7	11	OX2

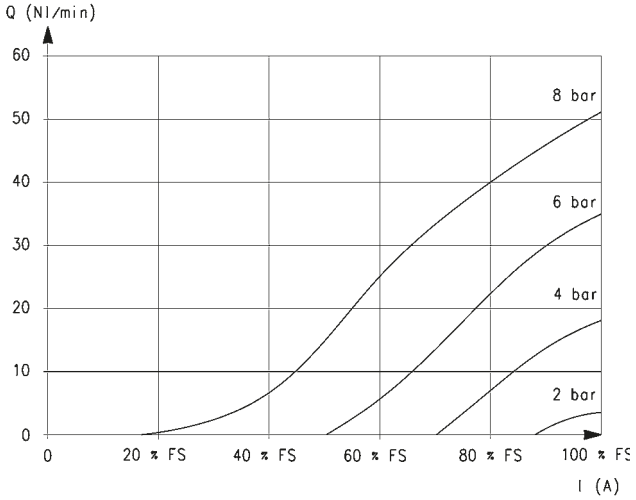
AP	SERIES
7	BODY: 6 = SIZE 16 MM 7 = Size 22 mm
2	NUMBER OF WAYS: 2 = 2-WAY
1	VALVE FUNCTION: 1 = NC
1	PORTS: 0 = M5 (for size 16 mm only) 1 = G1/8 (for size 22 mm only) L = male hose adaptor (for body in PVDF only, size 16 mm) 4 = with rear flanges 5 = with lower flanges
L	NOMINAL DIAMETER: D = ø 0.8 mm (for size 16 mm only) F = ø 1 mm H = ø 1.2 mm L = ø 1.6 mm N = ø 2 mm (for size 22 mm only) Q = ø 2.4 mm (for size 22 mm only)
R	SEAL MATERIAL: R = NBR W = FKM
2	BODY MATERIAL: 2 = brass 3 = PVDF (for size 16 mm only)
U	ENCAPSULATING MATERIAL: G = PA (for size 16 mm only) U = PET (for size 22 mm only)
7	SOLENOID DIMENSIONS: P = 16x26 DIN EN 175301-803-C (for size 16 mm only) 7 = 22x22 DIN 43650 B (for size 22 mm only)
11	SOLENOID VOLTAGE: H = 12 V DC 3 W (for size 16 mm only) 7 = 24 V DC 3 W (for size 16 mm only) 11 = 24 V DC 6.5 W (for size 22 mm only) 12 = 12 V DC 6.5 W (for size 22 mm only)
OX2	VERSION: OX2 = version with ASTM G93-03 Certification Level B (FKM seals only) = non-certified NBR version

FLOW DIAGRAMS - size 16mm



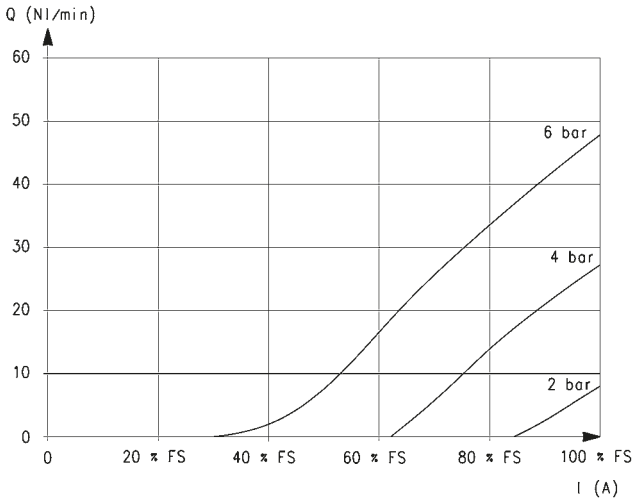
Nozzle 0.8mm

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



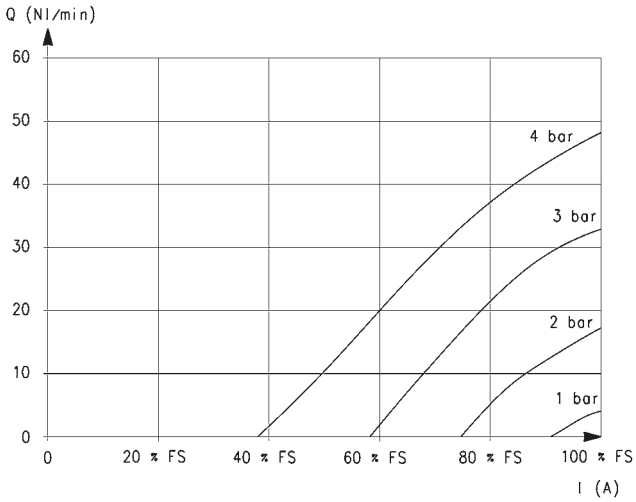
Nozzle 1mm

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



Nozzle 1.2mm

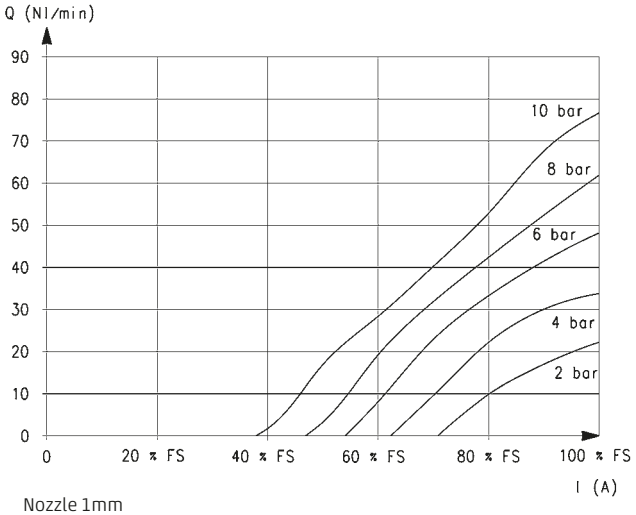
Q = Flow (Nl/min)
I = Current (A)
FS = Full scale



Nozzle 1.6mm

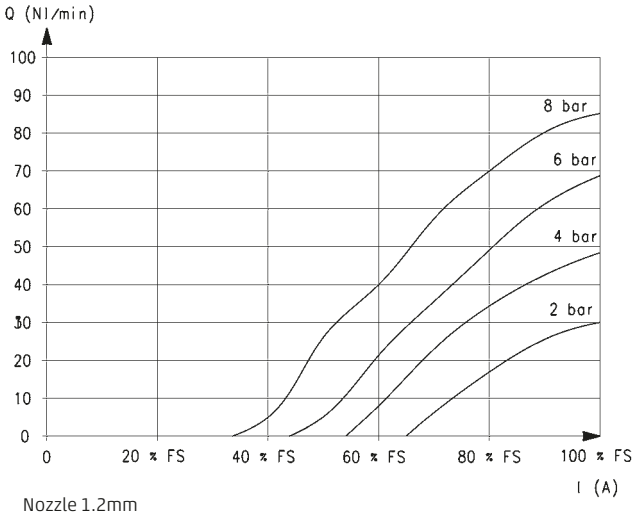
Q = Flow (Nl/min)
I = Current (A)
FS = Full scale

FLOW DIAGRAMS - size 22mm



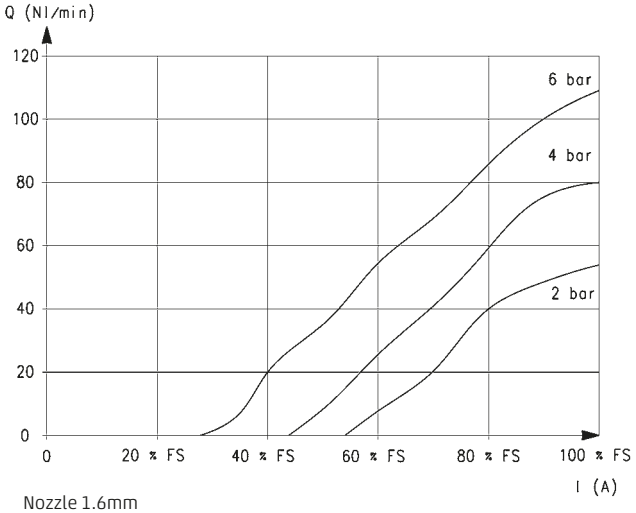
Nozzle 1mm

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



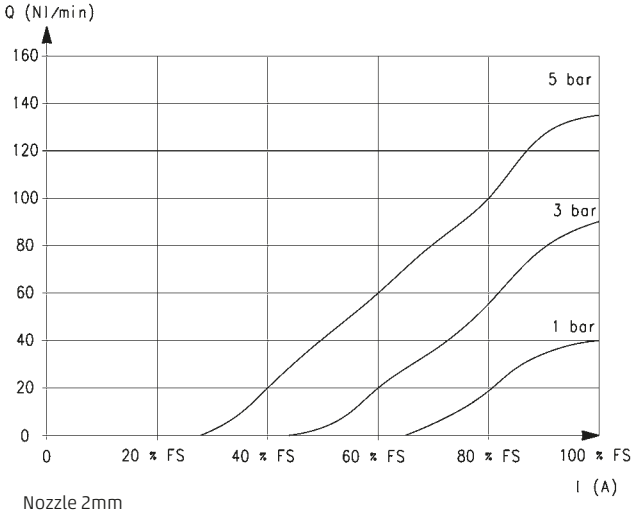
Nozzle 1.2mm

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



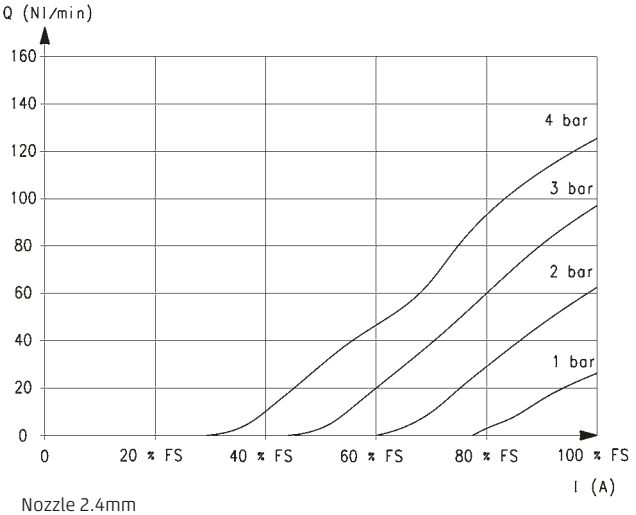
Nozzle 1.6mm

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



Nozzle 2mm

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



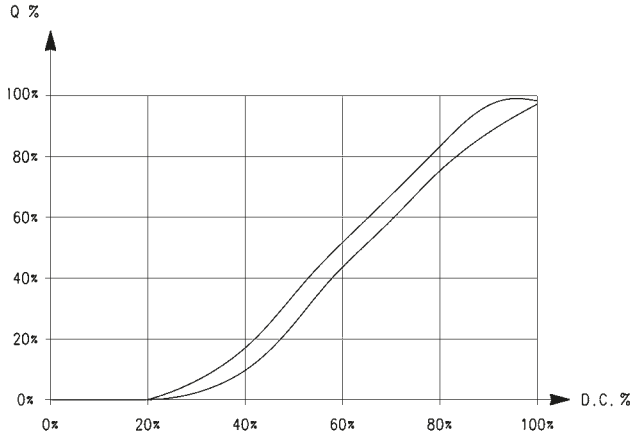
Nozzle 2.4mm

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

FLOW GRAPH

Flow characteristic curve
of a proportional valve

Q = flow
D.C. = duty cycle

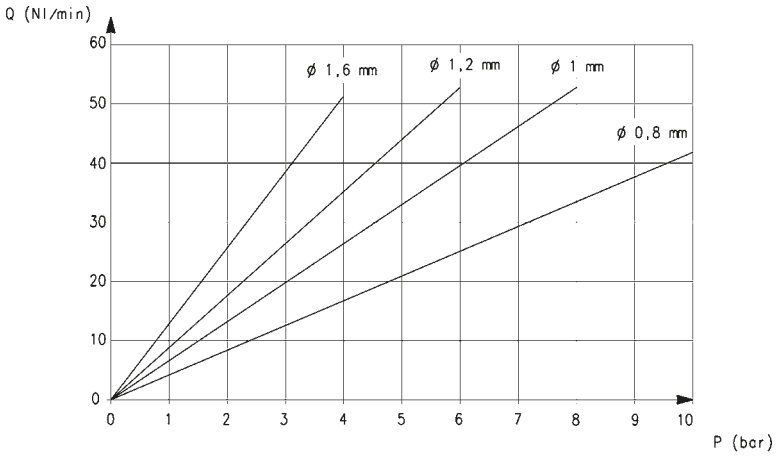


MAXIMUM FLOW AND RESPONSE TIMES - size 16mm

Maximum flow according to the inlet
pressure

DIAGRAM LEGEND:

Q = flow (Nl/min)
I = current (A)



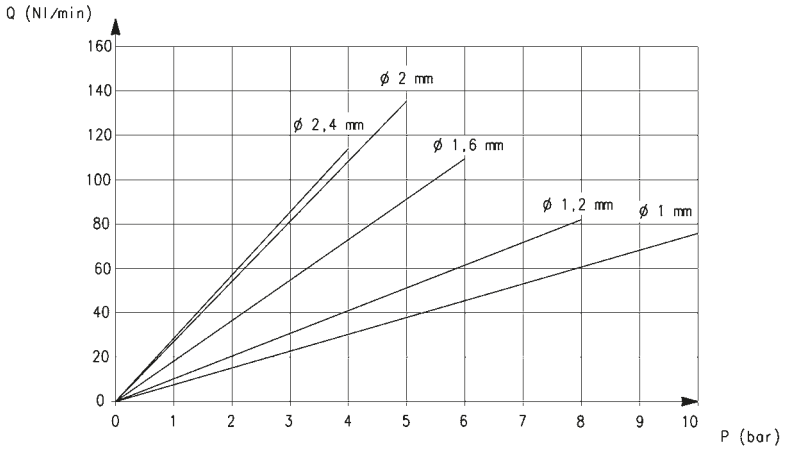
RESPONSE TIMES calculated according to the maximum flow at each operating pressure. [Electromechanical response time: 10 ms]							
ø	Pin [bar]	Load response time [ms]			Exhaust response time [ms]		
		0% - 10%	0% - 90%	10% - 90%	100% - 90%	100% - 10%	90% - 10%
0.8 mm	10	12	43	31	11	39	28
1 mm	8	12	42	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 inlet
pressure

DIAGRAM LEGEND:

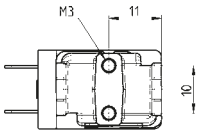
Q = flow (Nl/min)
I = current (A)

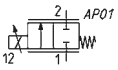


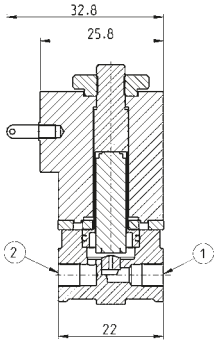
RESPONSE TIMES calculated according to the maximum flow at each operating pressure. [Electromechanical response time: 10 ms]							
ø	Pin [bar]	Load response time [ms]			Exhaust response time [ms]		
		0% - 10%	0% - 90%	10% - 90%	100% - 90%	100% - 10%	90% - 10%
1 mm	10	10	36	26	10	36	26
1.2 mm	8	10	45	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

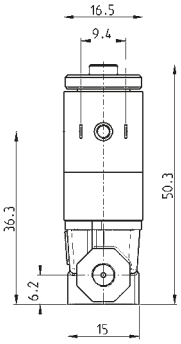
Series AP proportional valves - size 16mm

For the use with vacuum connect the line to connection 2







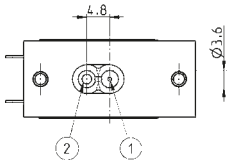


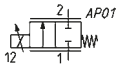
* choose the desired voltage

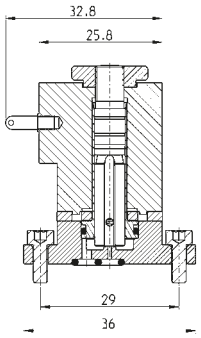
Mod.	Port 1	Port 2	Function	Orifice Ø (mm)	kv (l/min)	Max pressure (bar)	Max flow (Nl/min)
AP-6210-DR2-GP*	M5	M5	2/2 NC	0.8	0.3	10	43
AP-6210-FR2-GP*	M5	M5	2/2 NC	1	0.45	8	53
AP-6210-HR2-GP*	M5	M5	2/2 NC	1.2	0.57	6	53
AP-6210-LR2-GP*	M5	M5	2/2 NC	1.6	0.78	4	52
AP-6210-DW2-GP*OX2	M5	M5	2/2 NC	0.8	0.3	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

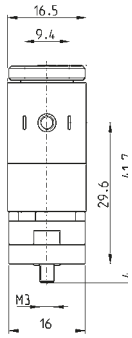
Series AP proportional valves - size 16mm, with lower flanges

For the use with vacuum connect the line to connection 2







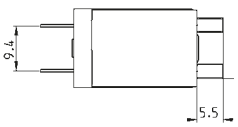


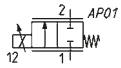
* choose the desired voltage

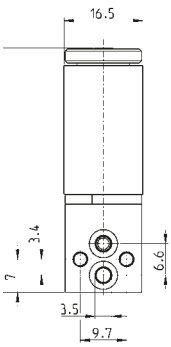
Mod.	Func.	Orifice Ø (mm)	kv (l/min)	Max pressure (bar)	Max flow (Nl/min)
AP-6215-DR2-GP*	2/2 NC	0.8	0.3	10	43
AP-6215-FR2-GP*	2/2 NC	1	0.45	8	53
AP-6215-HR2-GP*	2/2 NC	1.2	0.57	6	53
AP-6215-LR2-GP*	2/2 NC	1.6	0.78	4	52
AP-6215-DW2-GP*OX2	2/2 NC	0.8	0.3	10	43
AP-6215-FW2-GP*OX2	2/2 NC	1	0.45	8	53
AP-6215-HW2-GP*OX2	2/2 NC	1.2	0.57	6	53
AP-6215-LW2-GP*OX2	2/2 NC	1.6	0.78	4	52

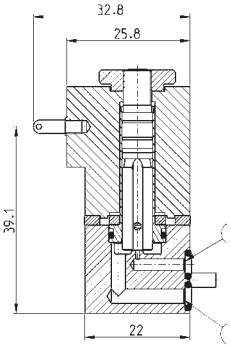
Series AP proportional valves - size 16mm, with rear flanges

For the use with vacuum connect the line to connection 2







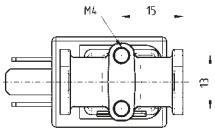


* choose the desired voltage

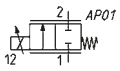
Mod.	Func.	Orifice Ø (mm)	kv (l/min)	Max pressure (bar)	Max flow (Nl/min)
AP-6214-DR2-GP*	2/2 NC	0.8	0.3	10	43
AP-6214-FR2-GP*	2/2 NC	1	0.45	8	53
AP-6214-HR2-GP*	2/2 NC	1.2	0.57	6	53
AP-6214-LR2-GP*	2/2 NC	1.6	0.78	4	52
AP-6214-DW2-GP*OX2	2/2 NC	0.8	0.3	10	43
AP-6214-FW2-GP*OX2	2/2 NC	1	0.45	8	53
AP-6214-HW2-GP*OX2	2/2 NC	1.2	0.57	6	53
AP-6214-LW2-GP*OX2	2/2 NC	1.6	0.78	4	52

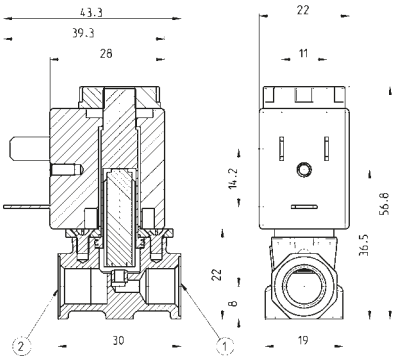
Series AP proportional valves - size 22mm

For the use with vacuum connect the line to connection 2



* choose the desired voltage

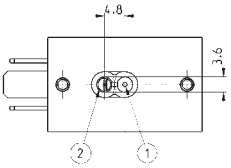




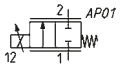
Mod.	Port 1	Port 2	Function	Orifice Ø (mm)	kv (l/min)	Max pressure (bar)	Max flow (Nl/min)
AP-7211-FR2-U7*	G1/8	G1/8	2/2 NC	1	0.5	10	75
AP-7211-HR2-U7*	G1/8	G1/8	2/2 NC	1.2	0.7	8	85
AP-7211-LR2-U7*	G1/8	G1/8	2/2 NC	1.6	1.2	6	110
AP-7211-NR2-U7*	G1/8	G1/8	2/2 NC	2	1.7	5	135
AP-7211-QR2-U7*	G1/8	G1/8	2/2 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

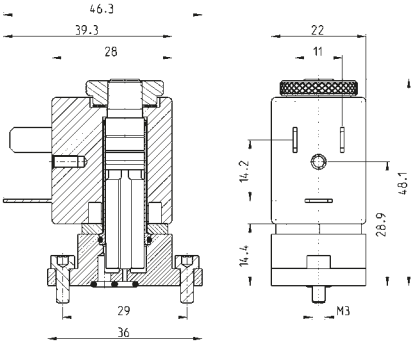
Series AP proportional valves - size 22mm, with lower flanges

For the use with vacuum connect the line to connection 2



* choose the desired voltage

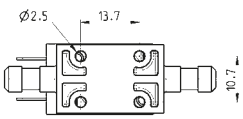




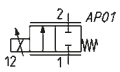
Mod.	Func.	Orifice Ø (mm)	kv (l/min)	Max pressure (bar)	Max flow (Nl/min)
AP-7215-FR2-U7*	2/2 NC	1	0.5	10	75
AP-7215-HR2-U7*	2/2 NC	1.2	0.7	8	85
AP-7215-LR2-U7*	2/2 NC	1.6	1.2	6	110
AP-7215-NR2-U7*	2/2 NC	2	1.7	5	135
AP-7215-QR2-U7*	2/2 NC	2.4	1.7	4	113
AP-7215-FW2-U7*OX2	2/2 NC	1	0.5	10	75
AP-7215-HW2-U7*OX2	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

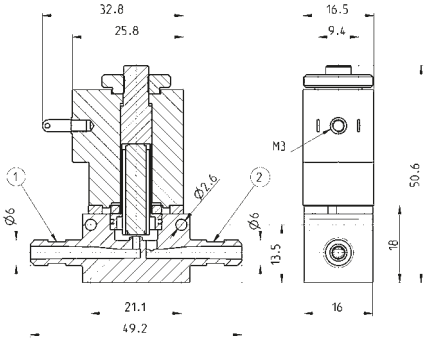
Series AP proportional valves, size 16mm - body in PVDF

For the use with vacuum connect the line to connection 2



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





Mod.	Port 1	Port 2	Function	Orifice Ø (mm)	kv (l/min)	Max pressure (bar)	Max flow (Nl/min)
AP-621L-DR3-GP*	Ø6 **	Ø6 **	2/2 NC	0.8	0.3	10	43
AP-621L-FR3-GP*	Ø6 **	Ø6 **	2/2 NC	1	0.45	8	53
AP-621L-HR3-GP*	Ø6 **	Ø6 **	2/2 NC	1.2	0.57	6	53
AP-621L-LR3-GP*	Ø6 **	Ø6 **	2/2 NC	1.6	0.78	4	52
AP-621L-DW3-U7*OX2	Ø6 **	Ø6 **	2/2 NC	0.8	0.3	10	43
AP-621L-FW3-U7*OX2	Ø6 **	Ø6 **	2/2 NC	1	0.45	8	53
AP-621L-HW3-U7*OX2	Ø6 **	Ø6 **	2/2 NC	1.2	0.57	6	53
AP-621L-LW3-U7*OX2	Ø6 **	Ø6 **	2/2 NC	1.6	0.78	4	52

MIX COMUNICAZIONE - MI

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