DIRECTLY OPERATED AND PRESSURE COMPENSATED PROPORTIONAL SOLENOID VALVES

SERIES CP

Function: 2/2-way NC
Sizes: 16 and 20 mm

- High flow and great precision
- Low hysteresis
- Cartridge body
- Pressure compensated version available
- Suitable to work also with oxygen

Series CP directly operated proportional solenoid valves can be used where an open loop flow control is required, with gas mixtures or to control flows.
Their cartridge design makes them particularly compact, thus they can be mounted directly near the workstation.

Series CP valves have been designed to optimize dimensions and reduce friction and stick-slip effects.
The output flow is proportional to the control signal.
Apart from the pressure compensated version, these valves can work also in vacuum.
A minimum working pressure is thus not required.

GENERAL DATA

TECHNICAL FEATURES				
Size	Size 16mm, 2/2 NC	Size 16mm, 2/2 NC pressure compensated	Size 20mm, 2/2 NC	Size 20mm, 2/2 NC pressure compensated
Operation	proportional directly operated	proportional pressure compensated	proportional directly operated	proportional pressure compensated
Pneumatic connections	cartridge	cartridge	cartridge	cartridge
Nominal diameters	1 mm - 1.5 mm - 2 mm	4.4 mm	3 mm - 3.5 mm	4.4 mm
Free flow capacity	70 Nl/min - 80 Nl/min - 90 Nl/min	120 l/min	130 Nl/min - 150 Nl/min	200 l/min
Operating pressure	3 bar - 5 bar - 8 bar	2 bar (max pressure 7 bar)	2.8 bar - 2 bar	2.8 bar (max pressure 6 bar)
Max overpressure	16 bar	10 bar	16 bar	16 bar
Linearity (5-95%)	3% FS	<7% FS	5% FS	2% FS
Hysteresis	10% FS	<20% FS	15% FS	15% FS
Repeatibility	5% FS	<5% FS	5% FS	5% FS
Operating temperature	10°C ÷ 50°C	10°C ÷ 50°C	10°C ÷ 50°C	10°C ÷ 50°C
Fluid	filtered compressed air, unlubricated, according to ISO 8573-1 class 7.4.4, inert gas. and oxygen	filtered compressed air, unlubricated, according to ISO 8573-1 class 7.4.4, inert gas. and oxygen	filtered compressed air, unlubricated, according to ISO 8573-1 class 7.4.4, inert gas. and oxygen	filtered compressed air, unlubricated, according to ISO 8573-1 class 7.4.4, inert gas. and oxygen
Installation	in any position	in any position	in any position	in any position
MATERIALS IN CONTACT WITH THE MEDIUM				
Body	Stainless steel AISI 304/EN, PPS	Stainless steel AISI 304/EN, PPS FKM	Stainless steel AISI 304/EN, PPS	Stainless steel AISI 304/EN, PPS
Seals	FKM	(FDA, BAM)	FKM	FKM
ELECTRICAL FEATURES				
Operation	PWM > 1000 Hz or current control	PWM > 1000 Hz or current control	PWM > 500 Hz or current control	PWM > 1000 Hz or current control
Operation voltage	6 V DC, 12 V DC, 24 V DC	6 V DC, 12 V DC, 24 V DC	6 V DC, 12 V DC, 24 V DC	6 V DC, 12 V DC, 24 V DC
Max power consumption	3.1 W	3 W (Nominal power 2 W)	3.7 W	4.2 W
Nominal resistance	11.8 Ohm - 37.6 Ohm - 184.7 Ohm	11.8 Ohm - 47.7 Ohm - 184.7 Ohm	6.4 Ohm - 25.1 Ohm - 102.1 Ohm	6.4 Ohm - 25.1 Ohm - 102.1 Ohm
Rated current	410 mA, 238 mA, 103 mA	410 mA, 205 mA, 103 mA	615 mA - 313 mA - 154 mA	700 mA - 350 mA - 175 mA
Duty cycle	100% with air flow	100% with air flow	100% with air flow	100% with air flow
Electrical connection	cable 300mm AWG24	cable 300mm AWG24	cable 300mm AWG24	cable 300mm AWG24
Protection class	IP00 / IP40	IP00 / IP40	IP00 / IP40	IP00 / IP40
Average lifecycles	50000000	50000000	50000000	50000000
Command signal	recommended PWM: 1000 Hz	recommended PWM: 1000 Hz	recommended PWM: 500 Hz	recommended PWM: 1000 Hz

DIRECTLY OPERATED AND PRESSURE COMPENSATED PROPORTIONAL SOLENOID VALVES
SERIES CP - CODING EXAMPLE

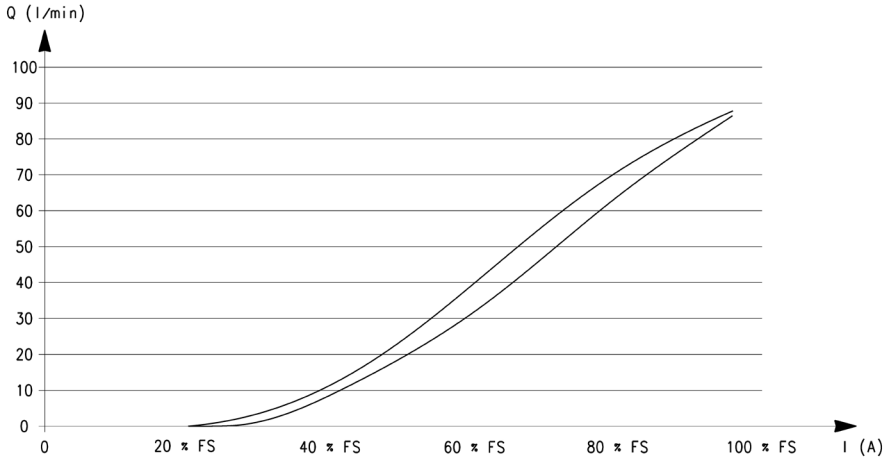
CODING EXAMPLE

CP	-	C	6	2	1	-	G	W	X	-	0	P	3

CP	SERIES		
C	PORTS C = cartridge S = subbase		
6	BODY SIZE 6 = size 16mm 7 = size 20 mm	8 = size 16 pressure compensated 9 = size 20 pressure compensated	
2	NUMBER OF PORTS 2 = 2-way		
1	FUNCTION 1 = NC		
G	ORIFICE DIAMETRES F = 1mm (size 16mm only) G = 1,5 mm (size 16 mm only)	N = 2mm (size 16mm only) M = ø 3 mm (solo taglia 20 mm)	P = ø 3.5 mm (solo taglia 20 mm) T = ø 4.4 mm (pressure compensated only)
W	SEAL MATERIAL W = FKM		
X	BODY MATERIAL X = stainless steel AISI 304		
0	OVERMOULDING MATERIAL OF COIL 0 = cartridge		
P	COIL DIMENSIONS P = ø 16 7 = ø 20		
3	VOLTAGE 1 = 6 V DC 3.1 W (size 16 mm only) 2 = 12 V DC 4.3 W (size 20 mm only) 3 = 24 V DC 3.1 W (size 16 mm only) 4 = 24 V DC 4.3 W (size 20 mm only)	5 = 12 V DC 3.1 W (size 16 mm only) 6 = 6 V DC 4.3 W (size 20 mm only) 10 = 6 V DC 4.2 W (size 20 mm only, pressure compensated) 11 = 24 V DC 4.2 W (size 20 mm only, pressure compensated)	12 = 12 V DC 4.2 W (size 20 mm only, pressure compensated) 13 = 6 V DC 3 W (size 16 mm only, pressure compensated) 14 = 12 V DC 3 W (size 16 mm only, pressure compensated) 15 = 24 V DC 3 W (size 16 mm only, pressure compensated)

HYSTERESIS AND RESPONSE TIMES

Q = flow (l/min)
I = current (A)
FS = full scale



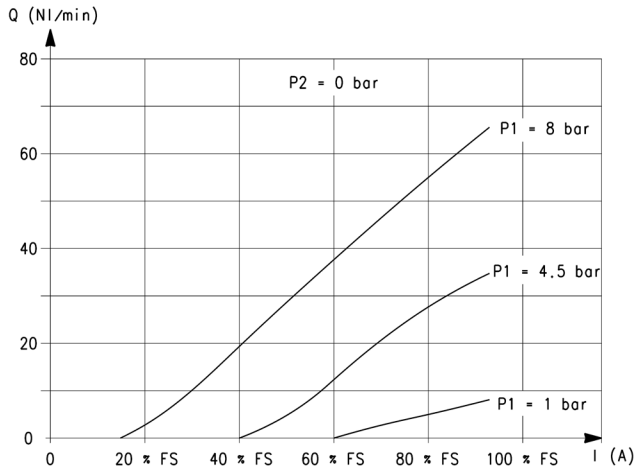
RESPONSE TIMES calculated according to the maximum flow at each operating pressure. [Electromechanical response time: 10 ms]

Ø	Inlet pressure (bar)	Load response time (ms)			Exhaust response time (ms)		
		0% - 10%	0% - 90%	10% - 90%	100% - 90%	100% - 10%	90% - 10%
1 mm	8	12	42	30	9	33	24
1,5 mm	5	12	39	27	9	33	24
2 mm	3	11	39	28	9	33	26
3 mm	2,8	13	29	16	14	28.5	14.5
3,5 mm	2	15	31	16	12.5	27.5	15
4,4 mm *	2,8	13	52	49	10	37	27

* in the pressure compensated version the counter pressure at the valve outlet must be always lower than 15-20% of the inlet pressure.

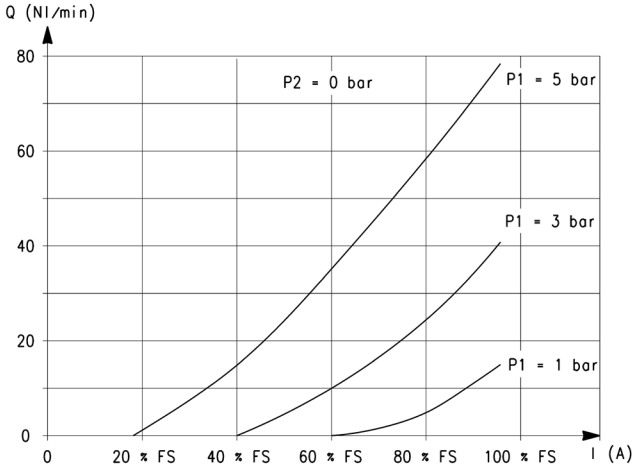
FLOW DIAGRAMS - Size 16mm

Nominal diameter 1 mm



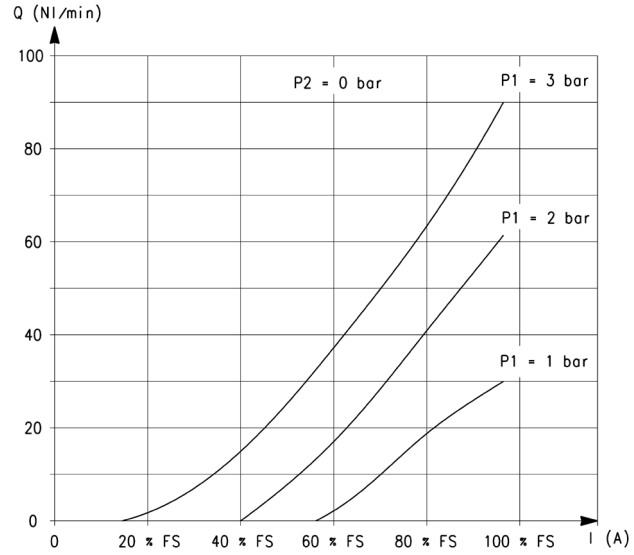
Q = flow (l/min)
I = current (A)
P1 = pressure in load (bar)
P2 = 0 [free flow pressure] (bar)
FS = full scale of the command signal

Nominal diameter 1,5 mm



Q = flow (l/min)
I = current (A)
P1 = pressure in load (bar)
P2 = 0 [free flow pressure] (bar)
FS = full scale of the command signal

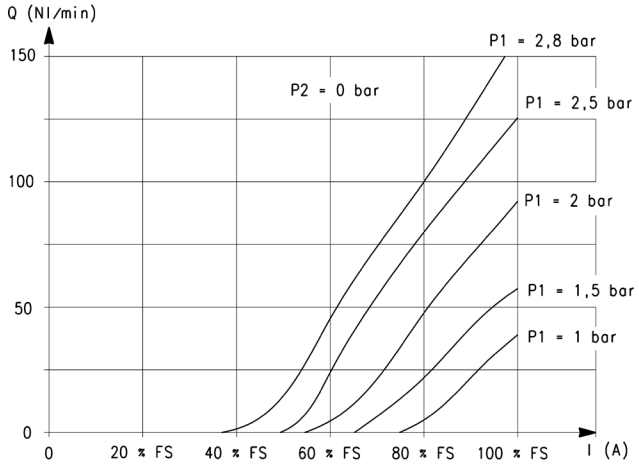
Nominal diameter 2 mm



Q = flow (l/min)
I = current (A)
P1 = pressure in load (bar)
P2 = 0 [free flow pressure] (bar)
FS = full scale of the command signal

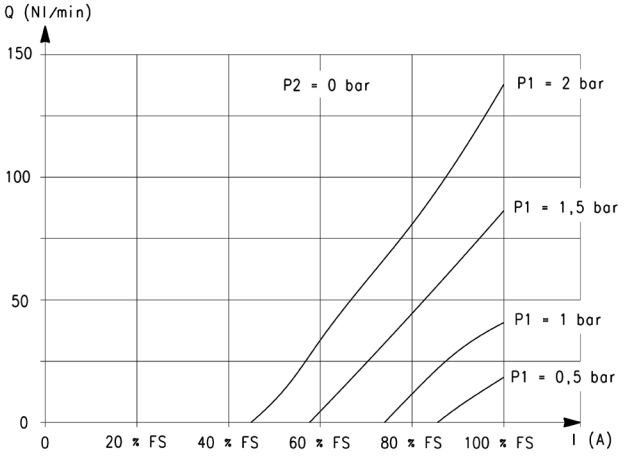
FLOW DIAGRAMS - Size 20 mm

Nominal diameter 3 mm



Q = flow (l/min)
I = current (A)
P1 = pressure in load (bar)
P2 = 0 [free flow pressure] (bar)
FS = full scale of the command signal

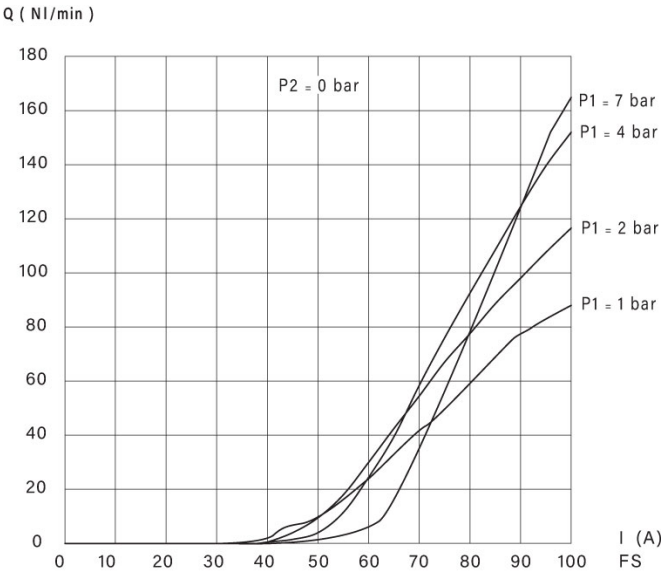
Nominal diameter 3,5 mm



Q = flow (l/min)
I = current (A)
P1 = pressure in load (bar)
P2 = 0 [free flow pressure] (bar)
FS = full scale of the command signal

FLOW DIAGRAMS - Size 16-20 mm pressure compensated

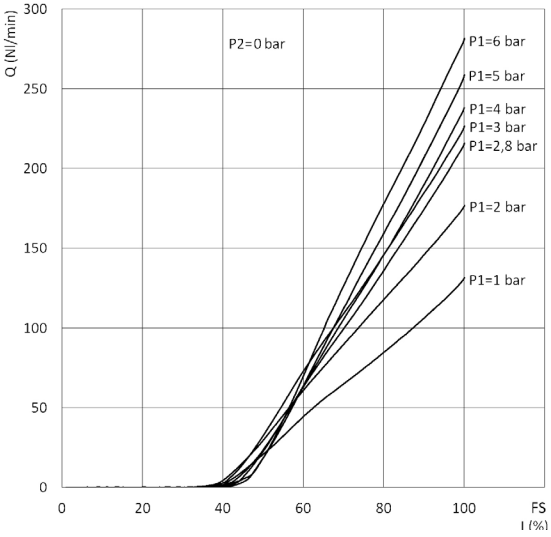
Nominal diameter 4,4 mm



Size 16 mm

Q = flow (l/min)
I = current (A)
P1 = pressure in load (bar)
P2 = 0 [free flow pressure] (bar)
FS = full scale of the command signal

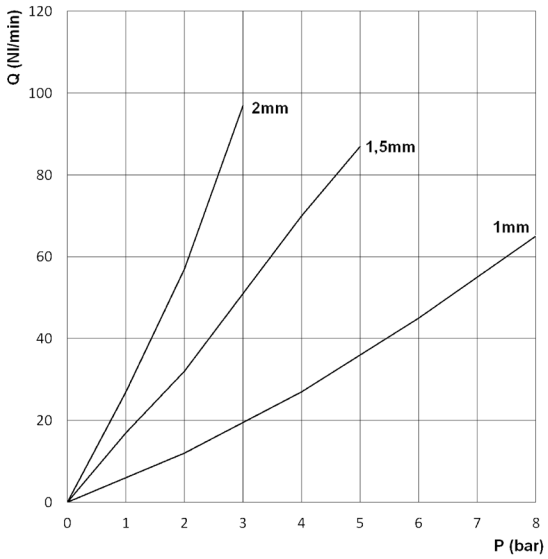
Nominal diameter 4,4 mm



Size 20 mm

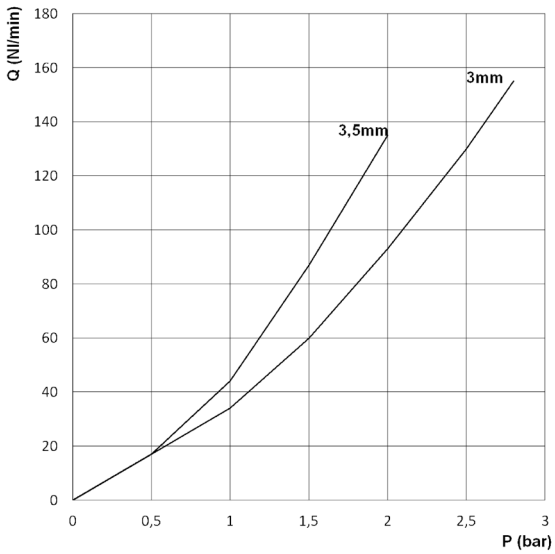
Q = flow (l/min)
I = current (A)
P1 = pressure in load (bar)
P2 = 0 [free flow pressure] (bar)
FS = full scale of the command signal

MAXIMUM FLOW ACCORDING TO THE INLET PRESSURE



Size 16 mm

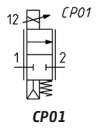
Q = Flow (Nl/min)
P = Inlet pressure (bar)

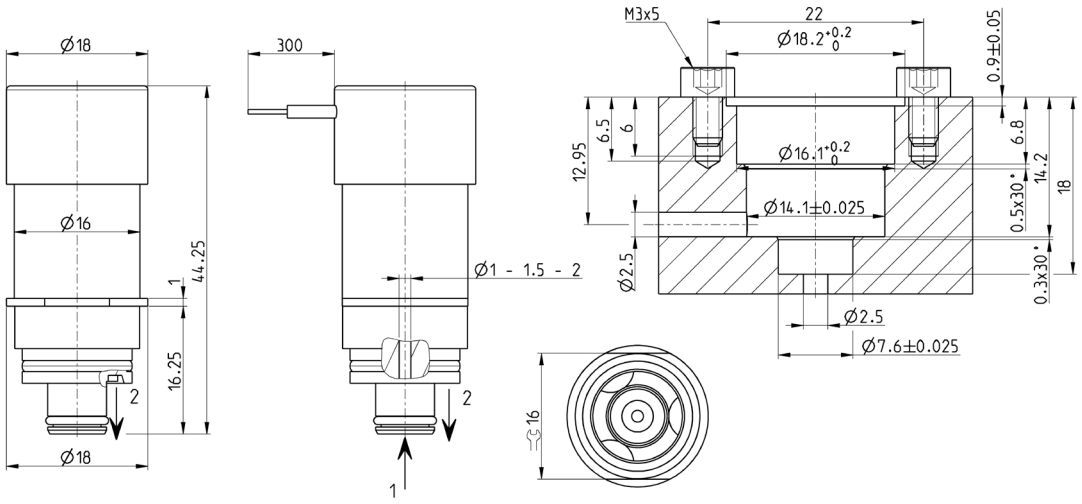


Size 20 mm

Q = Flow (Nl/min)
P = Inlet pressure (bar)

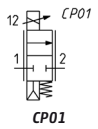
Solenoid valves, size 16m

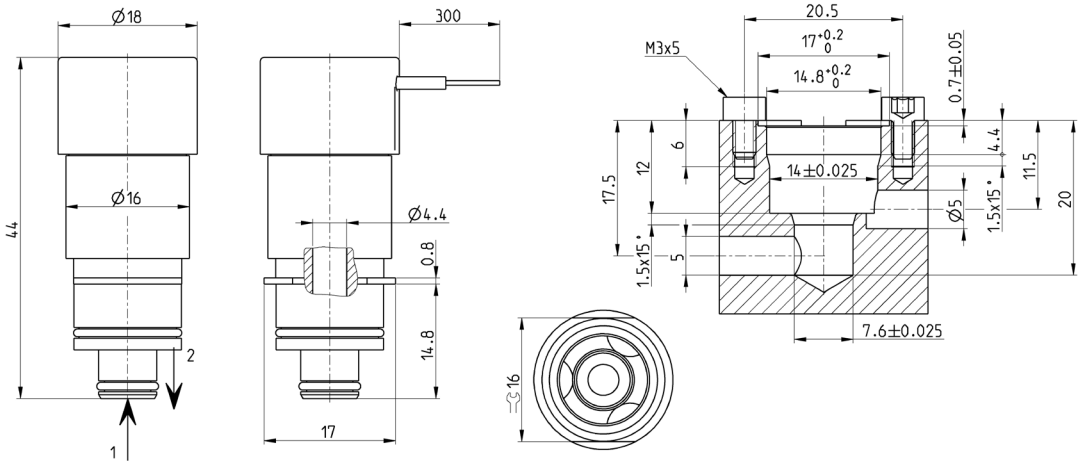




Mod.	Orifice Ø (mm)	Max operating pressure (bar)	Max flow (Nl/min)	Max flow kv (l/min)	Operation voltage (V DC)	Max current (mA)
CPN-C621-FWX-0P1	1	8	70	0.55	6	410
CPN-C621-GWX-0P1	1.5	5	80	0.88	6	410
CPN-C621-NWX-0P1	2	3	90	1.42	6	410
CPN-C621-FWX-0P3	1	8	70	0.55	24	103
CPN-C621-GWX-0P3	1.5	5	80	0.88	24	103
CPN-C621-NWX-0P3	2	3	90	1.42	24	103
CPN-C621-FWX-0P5	1	8	70	0.55	12	238
CPN-C621-GWX-0P5	1.5	5	80	0.88	12	238
CPN-C621-NWX-0P5	2	3	90	1.42	12	238

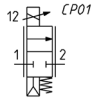
Solenoid valves, size 16m pressure compensated



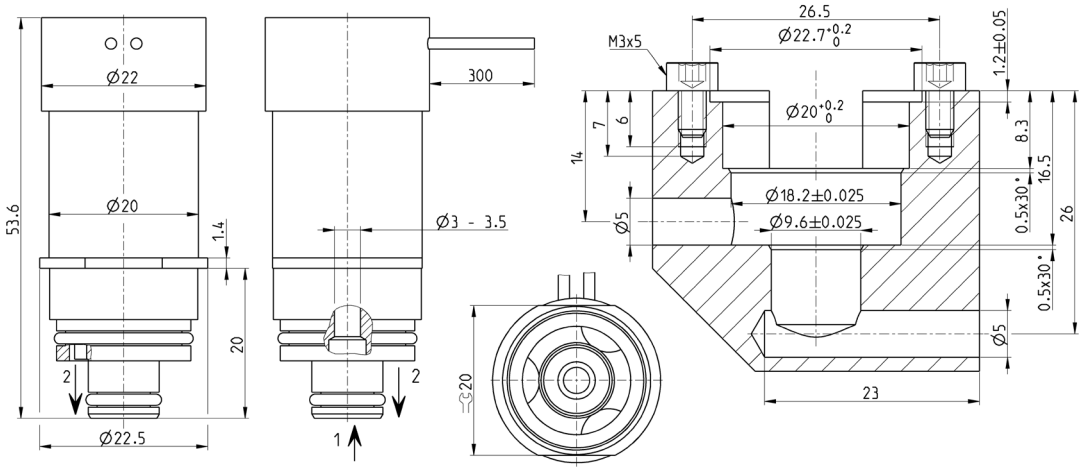


Mod.	Orifice Ø (mm)	Max operating pressure (bar)	Max flow (Nl/min)	Max flow kv (l/min)	Operation voltage (V DC)	Max current (mA)
CP-C821-TWX-0P13	4.4	7	160	-	6	410
CP-C821-TWX-0P14	4.4	7	160	-	12	205
CP-C821-TWX-0P15	4.4	7	160	-	24	103

Solenoid valves, size 20mm



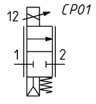
CP01



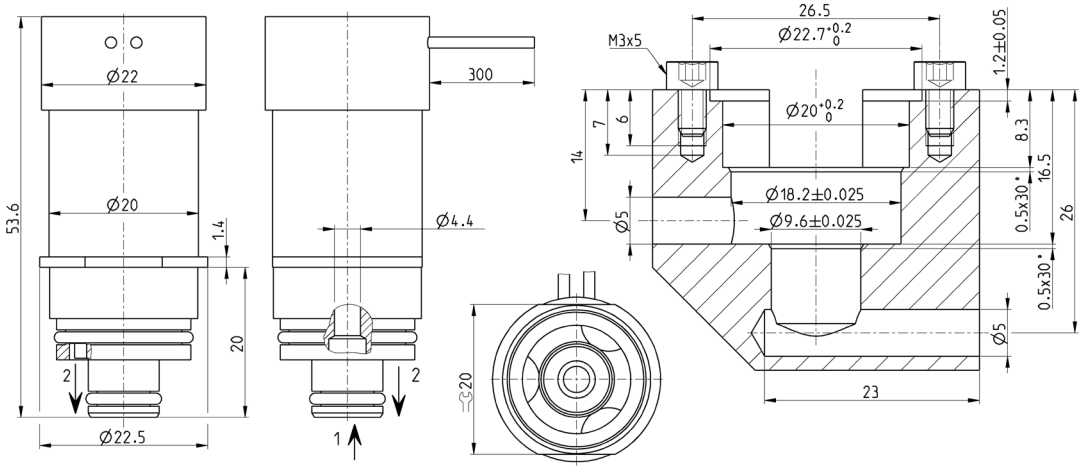
Mod.	Orifice Ø (mm)	Max operating pressure (bar)	Max flow (Nl/min)	Max flow kv (l/min)	Operation voltage (V DC)	Max current (mA)
CP-C721-MWX-072	3	2.8	150	2.8	12	313
CP-C721-MWX-074	3	2.8	150	2.8	24	154
CP-C721-MWX-076	3	2.8	150	2.8	6	615
CP-C721-PWX-072	3.5	2	130	3	12	313
CP-C721-PWX-074	3.5	2	130	3	24	154
CP-C721-PWX-076	3.5	2	130	3	6	615

Solenoid valves, size 20mm pressure compensated

Working nominal pressure: 2.8 bar



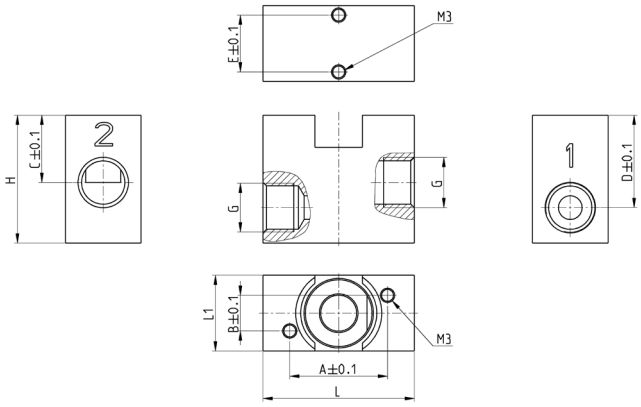
CP01



Mod.	Orifice Ø (mm)	Max operating pressure (bar)	Max flow (Nl/min)	Max flow kv (l/min)	Operation voltage (V DC)	Max current (mA)
CP-C921-TWX-0710	4.4	6	200	4	6	700
CP-C921-TWX-0711	4.4	6	200	4	24	175
CP-C921-TWX-0712	4.4	6	200	4	12	350

Sub-base Mod. CP-S

- CP-S6 = for 16 mm versions CP-C6... and CPN-C6...
- CP-S8 = only for 16 mm versions CP-C8...
- CP-S7 = for 20 mm versions CP-C7... and CPN-C9...



Mod.	Ø	A	B	C	D	E	G	H	L	L1
CP-S6	16	20,7	7,5	14,2	19,5	12	G1/8	27	32	16
CP-S7	20	25,2	8	14	22,5	15	G1/4	31,5	45	22
CP-S8	16	17,75	10,25	13,2	17,5	12	G1/8	27	32	16