PROPORTIONAL VALVES

Proportional control is essential when you need the flexibility to control the output pressure or flow in an application. This can be achieved with simple programming steps combining the proven technologies of Watson Smith and Herion. Norgren offers unrivalled expertise to find the right solution for you. Choose from our extensive range of Proportional Valves: Analogue and digital, open or closed loop, flow or pressure control.




Proportional pressure control valves

VP10
G1/4
550 N l/min

Page 4-002

VP12
G1/8
200 N l/min

Page 4-004

VP23
G1/4 to G3/4
0 ... 20.000 N l/min

Page 4-006

VP40
G1/8 to G3/8 and Flange
0 ... 2.000 N l/min

Page 4-013

VP50, VP50S
G1/4
1400 N l/min

Page 4-018, 4-021

VP51
G1/4
1400 N l/min

Page 4-024

140 failsafe series
1/4 NPT or G1/4
300 N l/min

Page 4-034

422 failfreeze series
1/4 NPT
300 N l/min

Page 4-036

Proportional flow control valve

VP60
G1/4
1200 N l/min

Page 4-027

Proportional solenoid valve (Flatprop)

Flatprop 16 mm series
0,2 to 4,5 mm orifice
195 N l/min

Page 4-038

Proportional pressure control valve

VP10

G 1/4

- **Reliable, rugged design**
- **Excellent accuracy**
- **Low power consumption**
- **Excellent performance characteristics**
- **IP 65 environmental protection in normal operation**
- **2 & 3 wire versions available**

TECHNICAL DATA

Medium:
Compressed air filtered to 5 µm, oil free and dry air

Operation:
Air piloted seat valve

Orifice (nominal):
2 mm

Output pressure (nominal):
0,2 to 1 bar, 0,2 to 2 bar, 0,2 to 4 bar, 0,2 to 6 bar and 0,2 to 8 bar (or PSI equivalent)

Operating pressure:
At least 1 bar above maximum required output pressure

Supply sensitivity:
Better than 0,075% span output change per % supply pressure change

Flow:
Up to 550 N l/min (see characteristic curves)

Air consumption:
< 4 bar: 0,85 N l/min typical
> 4 bar: 1,75 N l/min typical

Ambient temperature:
-40 to +85 °C
Contact our technical service for use below +2°C

Temperature effect:
Typically better than 0,1% of span/°C for span and zero over operating range

Response time:
< 2 bar: less than 0,5 s for 10 - 90% step change
> 2 bar: 2 s for 10 - 90% step change

Degree of protection:
IP65 in normal operation

Linearity:
< 0,5%

Hysteresis:
< 0,35%

Vibration immunity:
< 3% output shift for ± 3 g 10-150 Hz

Weight:
0,83 kg approx

Materials:
Body: zinc die-casting passivated and epoxy paint
Diaphragms: nitrile
Flapper nozzle: stainless steel/beryllium copper
Supply valve: brass

Actuation	Port size	Max. flow (N l/min)	Output pressure (bar)	Control signal	MODELS	ACCESSORIES Straight fitting (Tube diameter in bold)	Elbow fitting
							
	G1/4	550	0,2 ... 8	0 ... 10 V	**VP1008BJ101A00**	C022508**28**	C024708**28**
	G1/4	550	0,2 ... 8	4 ... 20 mA	**VP1008BJ401A00**	C022508**28**	C024708**28**
	G1/4	550	0,2 ... 6	0 ... 10 V	**VP1006BJ101A00**	C022508**28**	C024708**28**
	G1/4	550	0,2 ... 6	4 ... 20 mA	**VP1006BJ401A00**	C022508**28**	C024708**28**
	G1/4	550	0,2 ... 4	0 ... 10 V	**VP1004BJ100A00**	C022508**28**	C024708**28**
	G1/4	550	0,2 ... 4	4 ... 20 mA	**VP1004BJ400A00**	C022508**28**	C024708**28**
	G1/4	550	0,2 ... 2	0 ... 10 V	**VP1002BJ100A00**	C022508**28**	C024708**28**
	G1/4	550	0,2 ... 2	4 ... 20 mA	**VP1002BJ400A00**	C022508**28**	C024708**28**
	G1/4	550	0,2 ... 1	0 ... 10 V	**VP1001BJ100A00**	C022508**28**	C024708**28**
	G1/4	550	0,2 ... 1	4 ... 20 mA	**VP1001BJ400A00**	C022508**28**	C024708**28**

OPTIONS SELECTOR

VP10★★★★★0★A00

Output pressure	Substitute
0,2 ... 1 bar/15 psi	01
0,2 ... 2 bar/30 psi	02
0,2 ... 4 bar/60 psi	04
0,2 ... 6 bar/90 psi	06
0,2 ... 8 bar/120 psi	10

The models with 6 and 8 bar pressure only available as 3-pin

Unit for pressure	Substitute
Bar	B
PSI	P

Pin options	Substitute
2	0
3 (24 V d.c. supply)	1

Control signal	Substitute
0 ... 10 V	1
4 ... 20 mA	4

Port size	Substitute
G 1/4	J
NPT 1/4	K

For further information

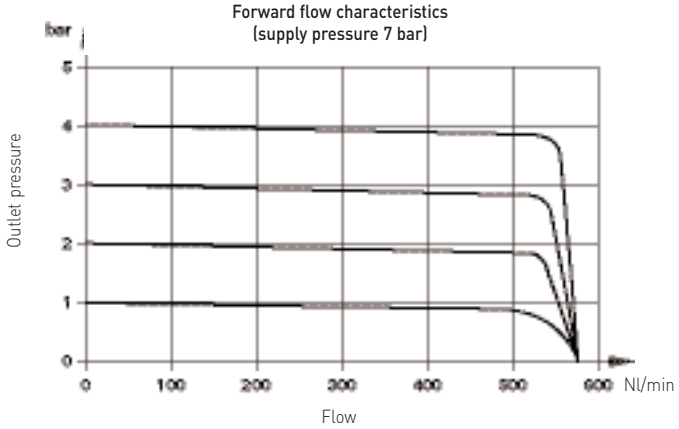
i PDF CAD

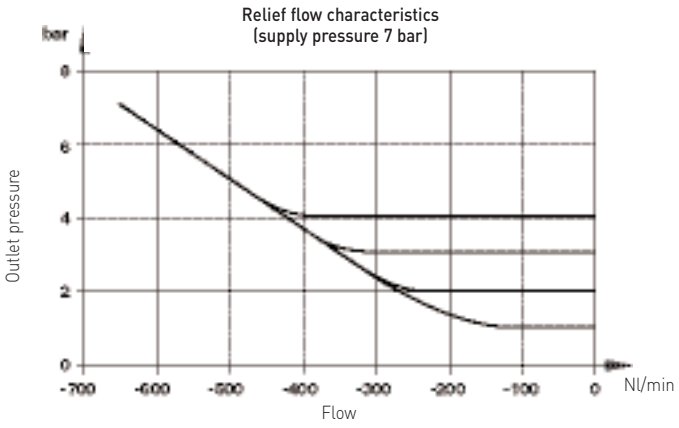
www.norgren.com/info/en4-002

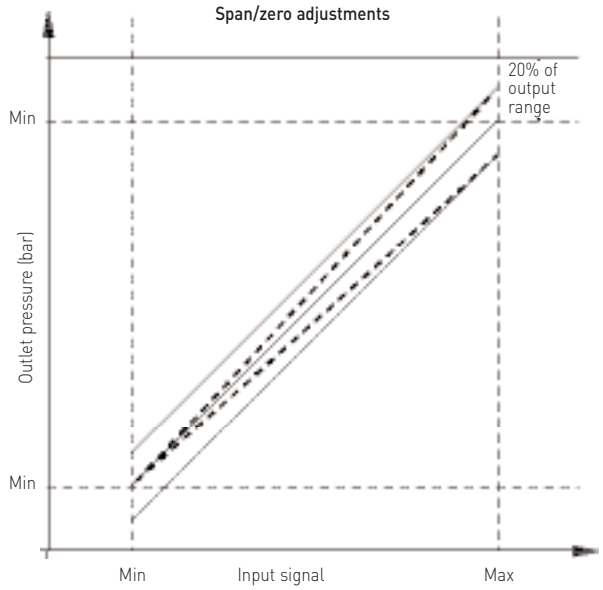
ELECTRICAL INFORMATION

Electromagnetic compatibility	CE marked: conforms to EC requirements EN 50081-2 (1994) and EN 50082-2 (1995)
Electrical input signal	2-pin versions 4 to 20 mA or 1 to 10 V 3-pin versions requires 12 to 24 V d.c. supply
Electrical power input	24 V d.c. ±25% (power consumption < 1 W)
Failure mode	Signal falls to bleed pressure when electrical supply fails
Connections	30 mm square connectors DIN EN 175 301-803 (DIN 43650) table A, mountable in four directions

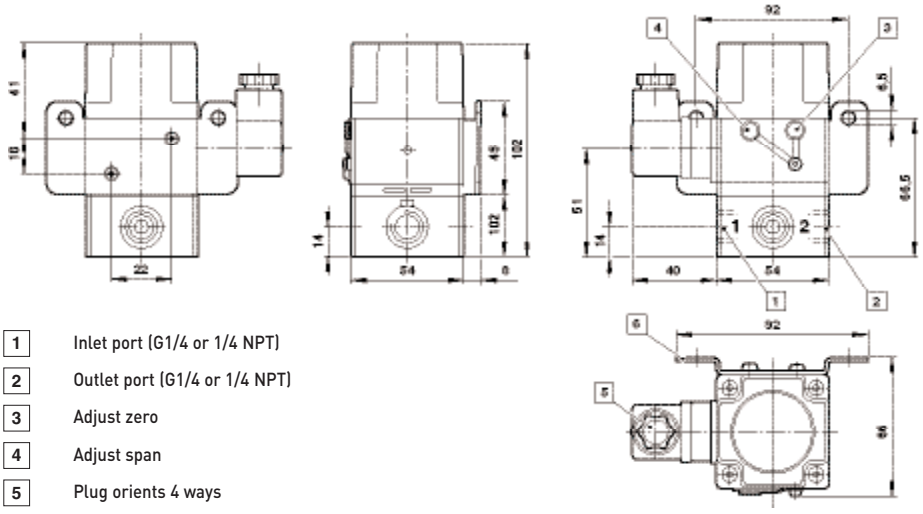
CHARACTERISTIC CURVES







BASIC DIMENSIONS



1. Inlet port (G1/4 or 1/4 NPT)
2. Outlet port (G1/4 or 1/4 NPT)
3. Adjust zero
4. Adjust span
5. Plug orients 4 ways
6. Bracket supplied as standard

Miniature proportional pressure control valve

VP12

G 1/8

- **Compact and flexible design**
- **Proven low power technology**
- **Reliable, rugged, open-loop device**
- **Excellent performance characteristics**
- **Low power consumption**
- **Manifold mountable**
- **Available in 2- and 3-pin version**

TECHNICAL DATA

Medium:
Compressed air filtered to 5 µm, oil free and dry air

Orifice (nominal):
0,5 mm

Output pressure (nominal):
0 to 1 bar, 0 to 2 bar, 0 to 4 bar, 0 to 6 bar and 0 to 8 bar (or PSI equivalent)

Operating pressure:
At least 1,5 bar above maximum required output pressure

Supply sensitivity:
Less than 0,2 bar/3 psi for 1 bar/15 psi supply pressure change

Flow:
Up to 200 N l/min (see characteristic curves)

Air consumption:
≤ 6 bar/90 psi = < 3 N l/min typical
8 bar/120 psi = < 10 N l/min typical

Ambient temperature:
0 to +60 °C
Contact our technical service for use below +2°C

Temperature effect:
Typically less than 7 mbar

Response time:
≤ 500 ms from 0 to 100% or
≤ 100 ms from 100 to 0% of output pressure into a 10cc load

Degree of protection:
IP20

Linearity:
< 1,5% of span

Hysteresis:
< 1% of span

Vibration immunity:
< 3% output shift for ± 2 g 15-150 Hz

Weight:
0,20 kg

Materials:
Body: zinc casting
Diaphragms: nitrile
Spacer: nylon

Actuation	Port size	Max. flow (N l/min)	Output pressure (bar)	Control signal	MODELS	ACCESSORIES Straight fitting (Tube diameter in bold)	ACCESSORIES Elbow fitting (Tube diameter in bold)
							
	G1/8	200	0 ... 8	0 ... 10 V	**VP1208BG101Q00**	C02250**6**18	C02470**6**18
	G1/8	200	0 ... 8	4 ... 20 mA	**VP1208BG401Q00**	C02250**6**18	C02470**6**18
	G1/8	200	0 ... 6	0 ... 10 V	**VP1206BG101Q00**	C02250**6**18	C02470**6**18
	G1/8	200	0 ... 6	4 ... 20 mA	**VP1206BG401Q00**	C02250**6**18	C02470**6**18
	G1/8	200	0 ... 4	0 ... 10 V	**VP1204BG101Q00**	C02250**6**18	C02470**6**18
	G1/8	200	0 ... 4	4 ... 20 mA	**VP1204BG401Q00**	C02250**6**18	C02470**6**18
	G1/8	200	0 ... 2	0 ... 10 V	**VP1202BG100A00**	C02250**6**18	C02470**6**18
	G1/8	200	0 ... 2	4 ... 20 mA	**VP1202BG400A00**	C02250**6**18	C02470**6**18
	G1/8	200	0 ... 1	0 ... 10 V	**VP1201BG100A00**	C02250**6**18	C02470**6**18
	G1/8	200	0 ... 1	4 ... 20 mA	**VP1201BG400A00**	C02250**6**18	C02470**6**18

For further information

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www.norgren.com/info/en4-004

OPTIONS SELECTOR

VP12★★★★★★0★Q00

Output pressure	Substitute
0 ... 1 bar/15 psi	01
0 ... 2 bar/30 psi	02
0 ... 4 bar/60 psi	04
0 ... 6 bar/90 psi	06
0 ... 8 bar/120 psi	10

The models above 2 bar pressure only available as 3-pin

Unit for pressure	Substitute
Bar	B
PSI	P

Pin options	Substitute
2	0
3 (24 V d.c. supply)	1

Control signal	Substitute
0 ... 10 V	1
4 ... 20 mA	4

Port size	Substitute
G1/8	G
1/8 NPT	H
Manifold optional	X

ELECTRICAL INFORMATION

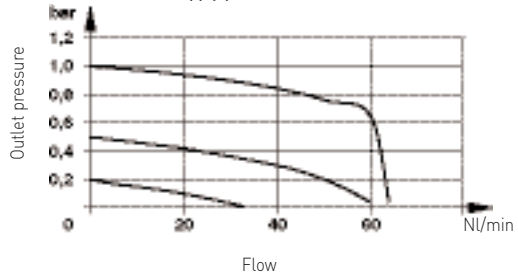
Electromagnetic compatibility	CE marked: conforms to EC requirements EN61000-6-4:2001(Emissions) and EN61000-6-2:1999(Immunity)
Electrical input signal	2-pin versions 4 to 20 mA or 1 to 10 V 3-pin versions requires 12 to 24 V d.c. supply
Electrical power input	24 V d.c. ±10%
Failure mode	Signal falls to bleed pressure when electrical supply fails
Loop resistance	mA = 220 Ω max., V = 16 kΩ min.

ACCESSORIES

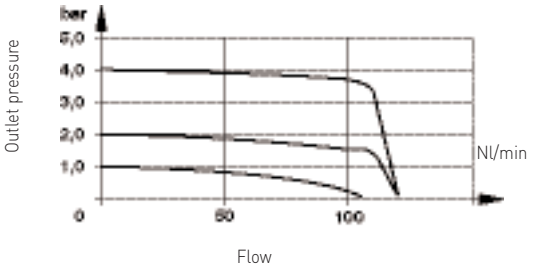
Description	MODELS
Blanking plate kit	ZZ12BP00
Manifold (metric)	ZZ12M01
Manifold (imperial)	ZZ12M02

CHARACTERISTIC CURVES

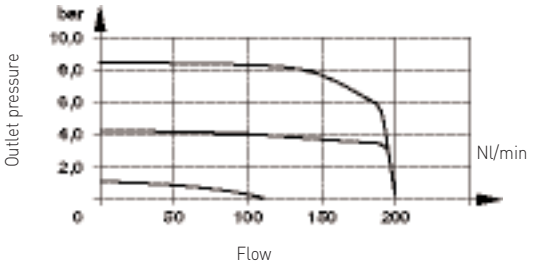
Supply pressure 2,5 bar



Supply pressure 5,5 bar

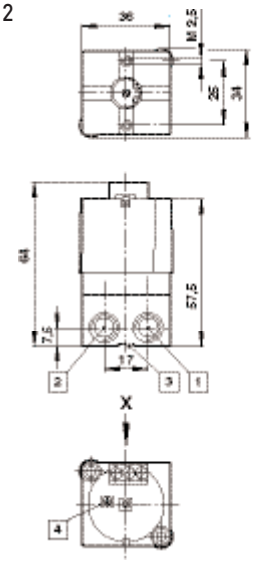


Supply pressure 9,5 bar



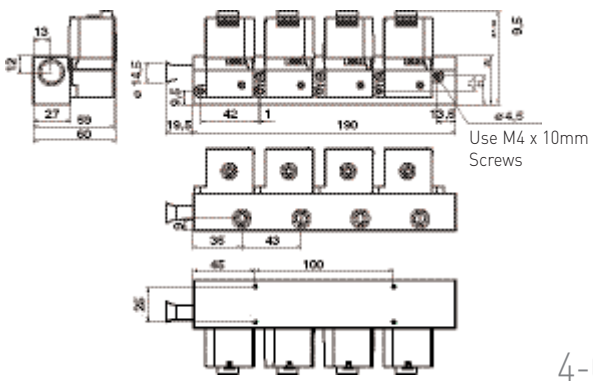
BASIC DIMENSIONS

VP12



1	Inlet port (G1/8 or 1/8 NPT)
2	Outlet port (G1/8 or 1/8 NPT)
3	Exhaust, do not obstruct
4	Adjust span
5	Power
6	Signal
7	Common
8	Adjust zero

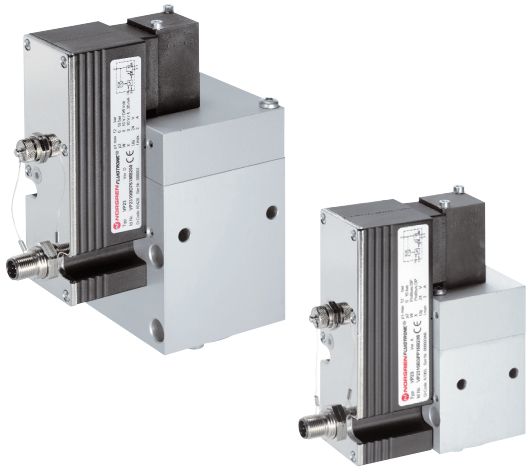
Manifold



Proportional pressure control valve

VP23

G 1/4 ... G 3/4



All-digital control electronics

Variable pressure control, external pressure control upon request

Optional: serial interfacing with VP-Tool program

Optional actuation via fieldbus

Valve conforms to CE

Free of lacquer affecting substances

TECHNICAL DATA

Medium:
Filtered 50 µm, unlubricated or lubricated condensate-free compressed air or neutral gases
Due to the lubricants and their additives, use of lubricated compressed air can affect the dynamics and service life

Operation:
Directly-controlled seat valve with µP-driven pressure control

Orifice (nominal):
8, 16 mm

Operating pressure p1 (nominal):
7 bar, 12 bar, 17 bar max

Pressure setting p2:
0 (0,02) to 2 bar/0 (0,1) to 10 bar/0 (0,16) to 16 bar

Flow:
See flow characteristics

Flow direction:
1 → 2, 2 → 3

Fluid temperature:
-5 to +50°C (no condensation permitted)

Ambient
Valve series is designed for indoor use at normal industrial ambient

Ambient temperature:
-5 to +60 °C
Contact our technical service for use below +2°C

Degree of protection:
IP65 (M12-variant with connected plug)

Service life:
> 10 Million operations, max. stroke

Tolerance:
Linearity < ± 1,0 (% p2 max.)

Control accuracy:
< ± 1,0 (% p2 max.)

Response accuracy:
< ± 0,2 (% p2 max.)

Hysteresis:
< ± 0,5 (% p2 max.)

Repeat accuracy:
< ± 0,5 (% p2 max.)
values related to 20°C and 24 V d.c. power supply

Materials:
Valve housing: aluminium
Electronic housing: PAA
Seals: NBR, HNBR on request
Internal parts: PBT
Springs : steel

Actuation	Orifice (mm)	Output pressure (bar)	Set point	Actual value	MODELS
					
	16	0 ... 16	4 ... 20 mA	0 ... 10 V/4 ... 20 mA	VP2316BE1461Mxxxx
	8	0 ... 16	4 ... 20 mA	0 ... 10 V/4 ... 20 mA	VP2316BD1461Mxxxx
	16	0 ... 16	0 ... 10 V	0 ... 10 V/4 ... 20 mA	VP2316BE1761Mxxxx
	8	0 ... 16	0 ... 10 V	0 ... 10 V/4 ... 20 mA	VP2316BD1761Mxxxx
	16	0 ... 10	4 ... 20 mA	0 ... 10 V/4 ... 20 mA	VP2310BE1461Mxxxx
	8	0 ... 10	4 ... 20 mA	0 ... 10 V/4 ... 20 mA	VP2310BD1461Mxxxx
	16	0 ... 10	0 ... 10 V	0 ... 10 V/4 ... 20 mA	VP2310BE1761Mxxxx
	8	0 ... 10	0 ... 10 V	0 ... 10 V/4 ... 20 mA	VP2310BD1761Mxxxx
	16	0 ... 2	4 ... 20 mA	0 ... 10 V/4 ... 20 mA	VP2302BE1461Mxxxx
	8	0 ... 2	4 ... 20 mA	0 ... 10 V/4 ... 20 mA	VP2302BD1461Mxxxx
	16	0 ... 2	0 ... 10 V	0 ... 10 V/4 ... 20 mA	VP2302BE1761Mxxxx
	8	0 ... 2	0 ... 10 V	0 ... 10 V/4 ... 20 mA	VP2302BD1761Mxxxx

For further information

www.norgren.com/info/en4-006

OPTIONS SELECTOR

VP23★★B★★★1★★★★★

Pressure range	Substitute
0 ... 2 bar	02
0 ... 10 bar	10
0 ... 16 bar	16

Orifice	Substitute
8 mm	D
16 mm	E

Set point	Substitute
4 to 20 mA	4
0 to 10 V/differential	7
Profibus DP (on request)	P

Option	Substitute
Serial interface	B200
Serial interface + LED-display*	B201

Connector	Substitute
M12x1, 8-pin	M
Fieldbus spec. (on request)	N

Actual value	Substitute
0 ... 10 V / 4 ... 20 mA	6
Profibus DP (on request)	P

* LED-display for bus version not available,
external pressure control upon request
(separate sensor input including software adjustment)

Electrical connections

Straight connector

Elbow connector

Description	Specification	MODELS
Connecting plug	M12 x 1; 8-pin; 5 m, 8 x 0,25 mm², straight	0250811
Connecting plug	M12 x 1; 8-pin; 5 m, 8 x 0,25 mm², 90°	0250813
Connecting plug	M12 x 1; 8-pin; screw terminals, 90°	0252383
Connector (Bus only)	M12 x 1; 5-pin; 5 m, 90°, A-coded, open (power)	0252086
Connector (Bus only)	M12 x 1; 5-pin; 5 m, straight, A-coded,open (power)	0252087
Connector (Bus only)	M12 x 1; 5-pin; 5 m, 90°, A-coded, open (power)	0252088
Connector (Bus only)	M12 x 1; 5-pin; 5 m, 90°, B-coded, open (Bus in)	0251310
Connector (Bus only)	M12 x 1; 5-pin; 5 m, 90°, B-coded, open (Bus out)	0251312
Connector (Bus only)	M12 x 1; 5-pin; convertible, 90°, B-coded (Bus in)	0252089
Connector (Bus only)	M12 x 1; 5-pin; convertible, 90°, B-coded (Bus out)	0252090
Connector with cable (Bus only)	Plug M12 x 1; 5-pin; 5 m, 90°, B-coded, (Bus in/out)	0250091

Note: Cable material PUR shielded

Connection plates

Description	Ports	MODELS
Connection plate NG 8	G1/4	0542636
Connection plate NG 8	G3/8	0543705
Connection plate NG16	G1/2	0542814
Connection plate NG16	G3/4	0542840

Serial interface

Description	Ports	MODELS
Adaptor complete	Cable + CD VP-Tool	5988299

ELECTRICAL INFORMATION

Electromagnetic compatibility	CE marked: conforms to EC requirements guideline 89/336/EWG
	Endurance limit in relation to oscillations to DIN EN 60068-2-6: 10g at 12-500Hz in switched-off-status
Durability under shock effect to DIN EN 68-2-67:	30 g/10 shocks
Valves should not be used in safety systems that require blocking or exhaust valves	
Without power the pneumatic connection 2 → 3 is open	

Supply

Supply voltage	Ub (V d.c.)	18 to 32
Residual ripple max.	[%]	10
Current consumption at 16 bar	NG 8,16 max. [A]	ca. 1,8 A at 24 V d.c.
Current consumption at 16 bar	NG 8,16 static at 25°C (corrected) [A]	ca. 1,4 A at 24 V d.c.
Current consumption at 10 bar	NG 8,16 max. [A]	ca. 1,8 A at 24 V d.c.
Current consumption at 10 bar	NG 8,16 static at 25°C (corrected) [A]	ca. 1,2 A at 24 V d.c.
Current consumption at 2 bar	NG 8,16 max. [A]	ca. 1,8 A at 24 V d.c.
Current consumption at 2 bar	NG 8,16 static at 25°C (corrected) [A]	ca. 1,2 A at 24 V d.c.

Proportional pressure control valve VP23

G 1/4 ... G 3/4

Inputs (signal)

Set point W (+/-U d) analogue differential

Voltage signal UE (V)	0 ... 10
Input resistance RI (kΩ)	170
Set point W(I) analogue: Current signal UE (mA)	4 ... 20
Burden (Ω)	500
Max. input voltage	-10 ... 40

Output pressure actual value

Current signal of pneumatic output pressure IA (mA)	0 (4) to 20 mA = 0 to max. p2
Load resistance RL (W)	500 recommended

Outputs (signal)

Output pressure actual value X(U)

Voltage signal of pneumatic output pressure UA (V)	0 ... 10 V = 0 to max. p2
Output current max. IA (mA)	1

Output »pressure reached« X (comp)

Switching range (% max. p2)	+/-2%
Digital output signal	SPS-Level
Control pressure outside of switching range (X≠W)	Low
Pressure reached (X = W) (V)	High
Outout current max. (mA)	10

Pneumatic parameters

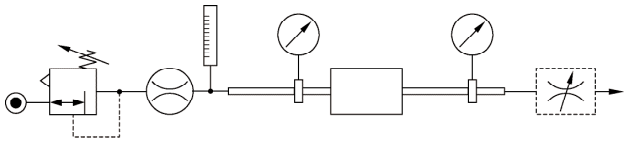
Recommended application area by nominal value:
NG8: Volume (closed) from 100 to 1500 cm³
NG16: Volume (closed) from 1000 to 8000 cm³

Residual ripple max.	[%]	10
Input pressure p1 max.	[bar]	17 / 12 / 7
Output pressure p2 max.	[bar]	0-16 / 0-10 / 0-2
Flow quantity NG 8	[l/min]	see diagram
Flow quantity NG16	[l/min]	see diagram
Switching times (10%-90%) nominal size 8 at volume 400 cm³		
Typical values for P1=12 bar		
Pressure build-up (tr) 1 bar _ 9 bar	100 [ms]	
Pressure build-up (tf) 4 bar _ 5 bar	50 [ms]	
Pressure drop (tr) 9 bar _ 1 bar	250 [ms]	
Pressure drop (tf) 5 bar _ 4 bar	50 [ms]	
Switching times (10%-90%), nominal size 16 at volume 1000 cm³		
Typical values for P1=12 bar		
Pressure build-up (tr) 1 bar _ 9 bar	100 [ms]	
Pressure build-up (tf) 4 bar _ 5 bar	50 [ms]	
Pressure drop (tr) 9 bar _ 1 bar	100 [ms]	
Pressure drop (tf) 5 bar _ 4 bar	50 [ms]	

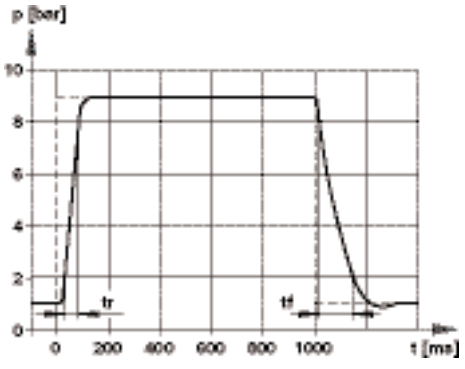
Dynamic value stated relates to 24 V d.c. power supply

Test assembly flow

CETOP RP 84 P.: flow characteristic of pneumatic devices



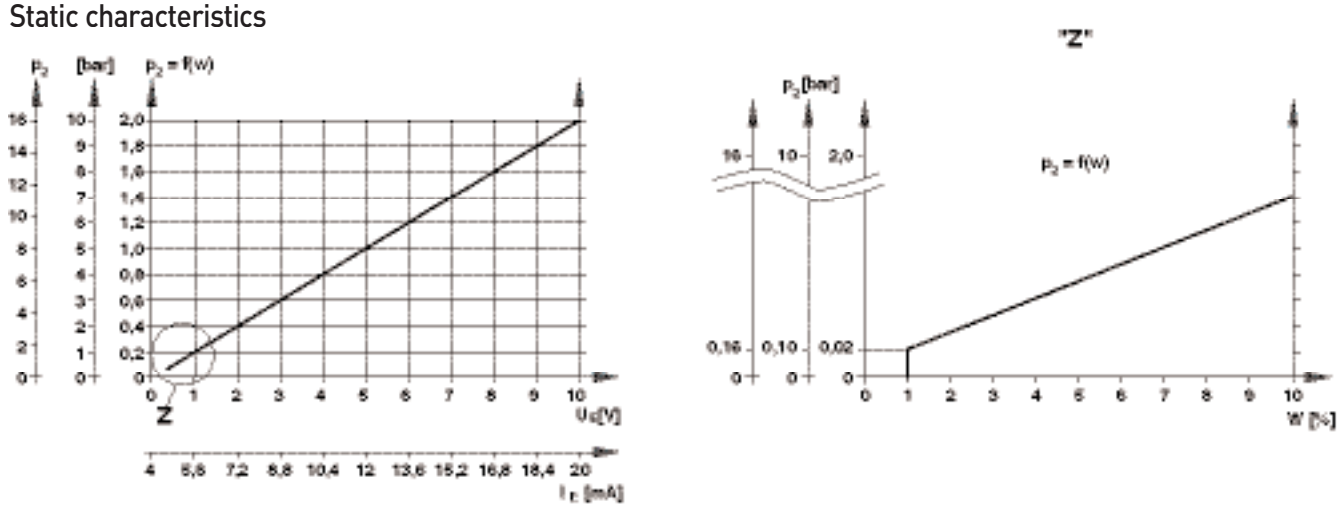
Step-response diagram



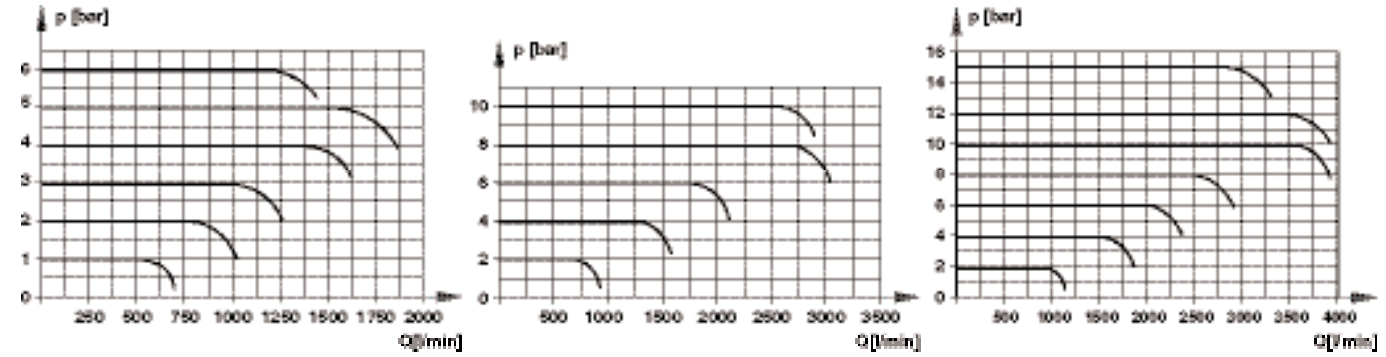
Pneumatic characteristic curves

Flow rate characteristic as a function of the set-point (voltage/current) and input pressure 7 bar, 12 bar, 17 bar
for nominal value 8 and 16

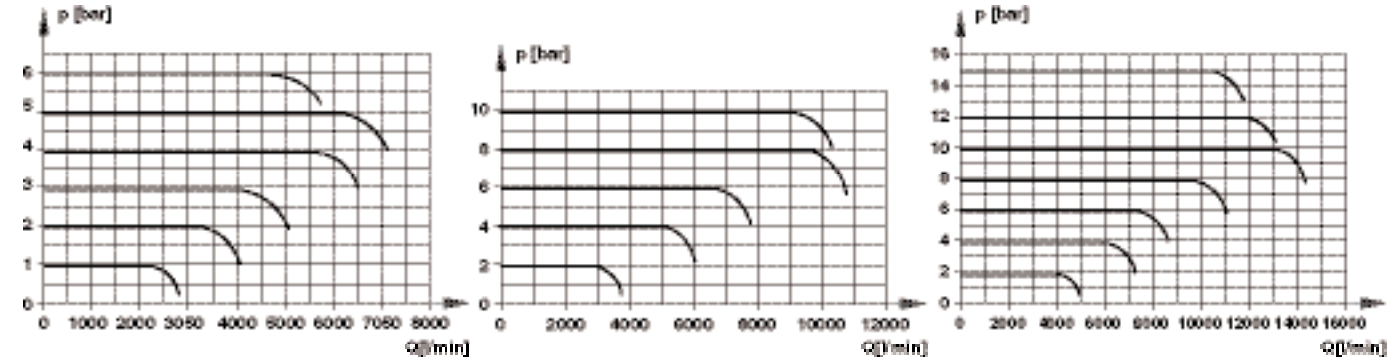
Static characteristics



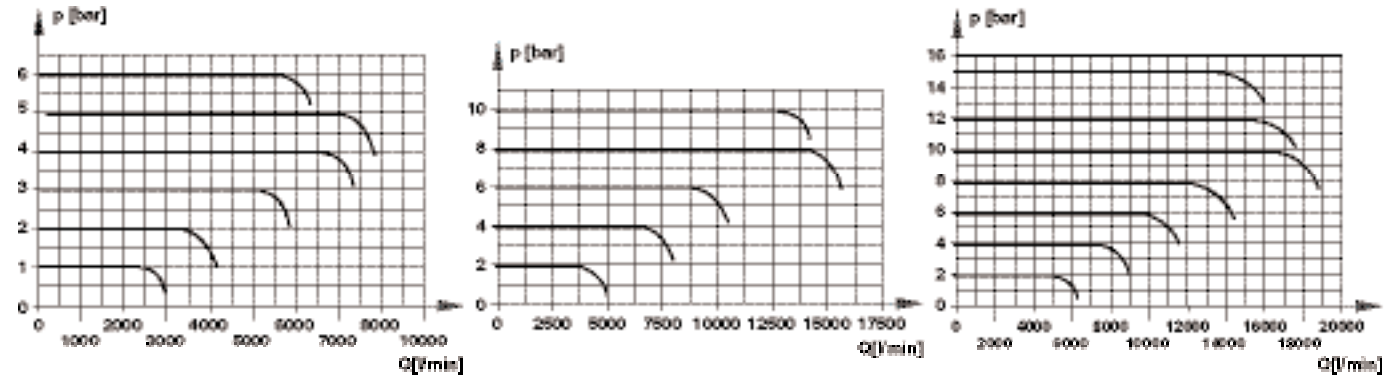
Flow rate characteristics for models with 8 mm orifice and P1 with 7 bar, 12 bar, 17 bar



Flow rate characteristics for models with 16 mm orifice, connection plate 1/2" (NG12) and P1 with 7 bar, 12 bar, 17 bar



Flow rate characteristics for models with 16 mm orifice, connection plate 3/4" (NG20) and P1 with 7 bar, 12 bar, 17 bar

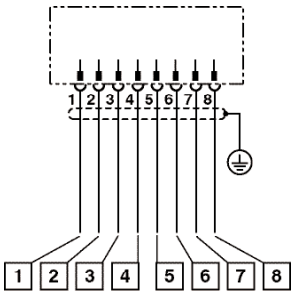


Proportional pressure control valve VP23

G 1/4 ... G 3/4

Connection diagrams

Standard connection (M12 x 1; 8-pin)



1	W (I), white
2	X (comp), brown
3	W (-Ud), green
4	W (+Ud), yellow
5	X (I), grey
6	Ub pink
7	GND blue
8	X (U), red

Assignment

Supply

Pin		Description	Colour of connection cable
6	Ub	power supply 18 to 32 V d.c.	pink
7	GND	power ground/PGND	blue

Inputs

Set point

Pin		Description	Colour of connection cable
3	-W	Analogue GND/set point, input voltage 0 to 10 V	green
4	+W	Signal/set point, input voltage 0 to 10 V	yellow
1	W(I)	Set point input current, 4 to 20 mA	white

Note: depending on the order number, both outputs (U/I) but only the ordered input will be active.

Voltage input 0 to 10 V between pins 4 and 3
Current input between pins 1 and 7

Outputs

Set point

Pin		Description	Colour of connection cable
5	X(I)	Actual value current 4 to 20 mA	grey
8	X(U)	Actual value voltage 0 to 10V	red

Voltage output refers to Gnd Pin 7

Due to the voltage drop on the ground wire you should consider an accuracy loss of the voltage output. Both outputs are active as standard.

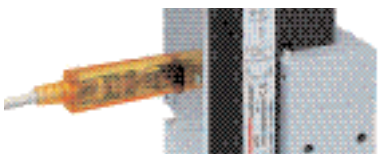
Comparator output/pressure switch*

Pressure reached

Pin		Description	Colour of connection cable
2	X (comp)	Digital output signal, PLC level (I max) =3,3 mA	brown
		High : pressure reached devation Iw-xI < ± 2%	
		Low: pressure not reached devation Iw-xI > ± 2%	

The output relates to Gnd Pin 7
* Selectable via VP-Tool

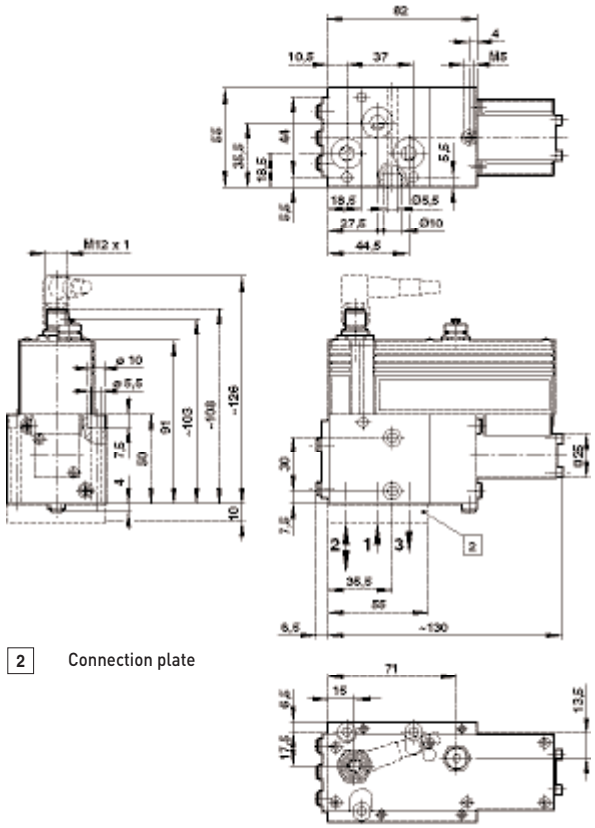
Serial interface connection



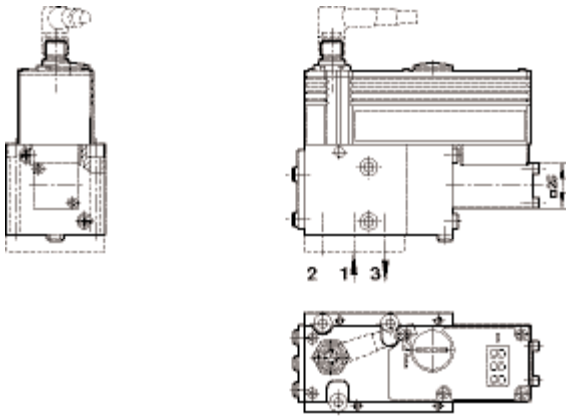
Remove fitting, plug in the interface cable, establish communication with VP-Tool.
Note: There is no IP-protection with remote fitting!

BASIC DIMENSIONS

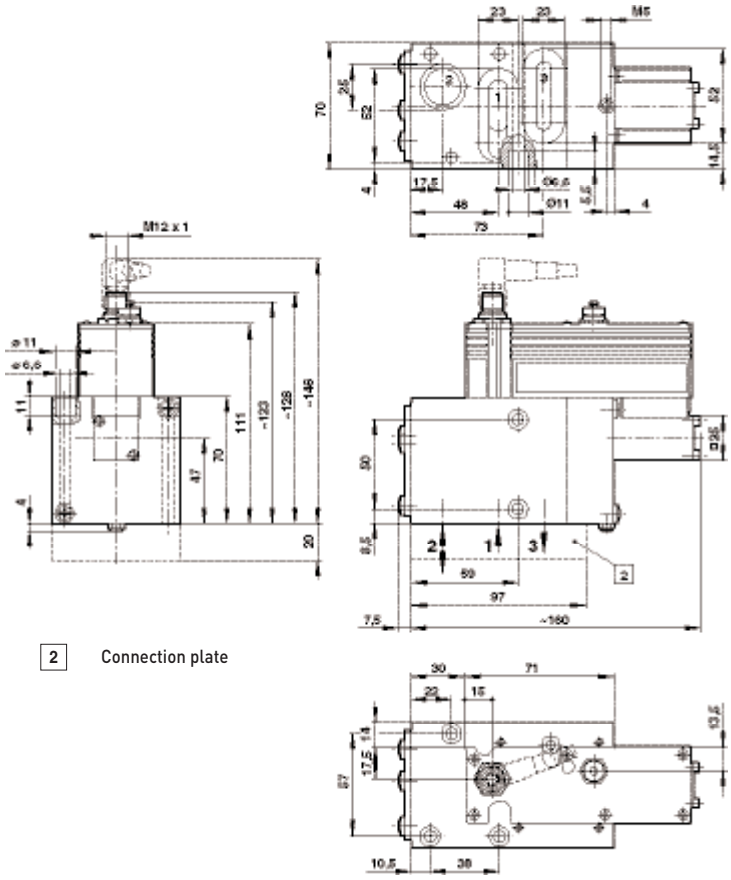
VP23 with 8 mm orifice



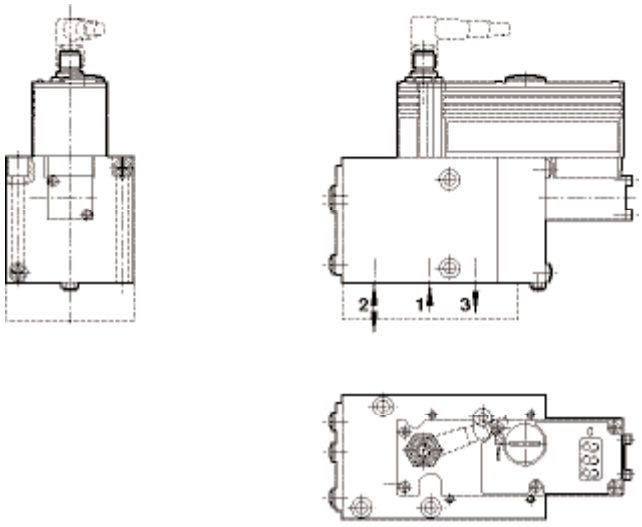
VP23 with 8 mm orifice (optional serial interface, LED indicator)



VP23 with 16 mm orifice



VP23 with 8 mm orifice (optional serial interface, LED indicator)

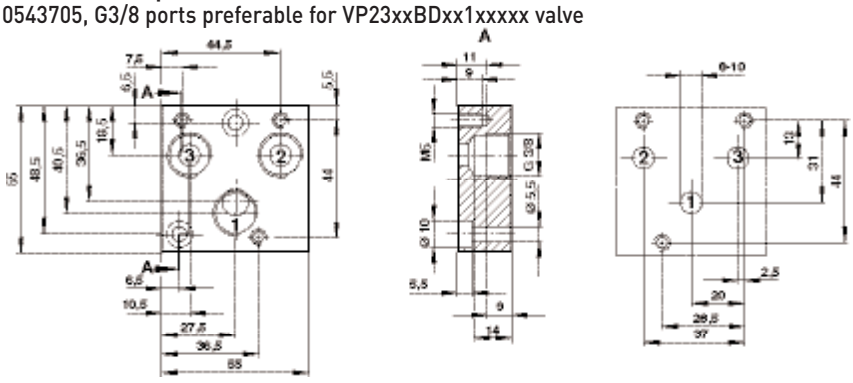


Proportional pressure control valve VP23

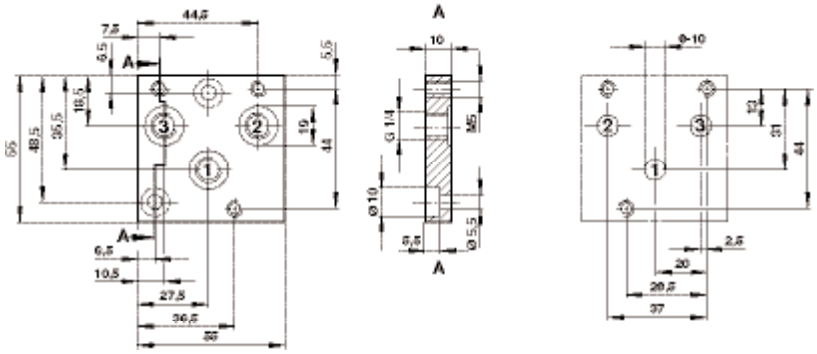
G 1/4 ... G 3/4

Connection plate

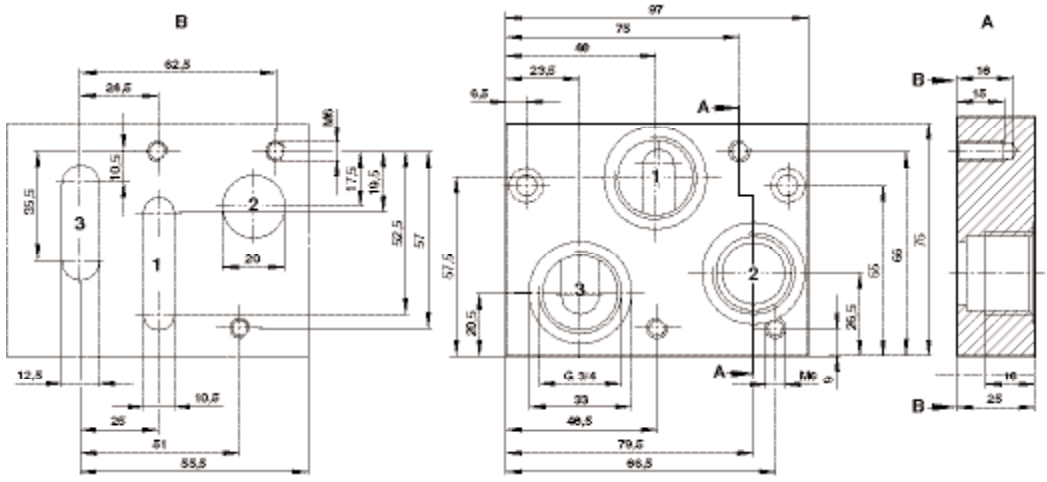
0543705, G3/8 ports preferable for VP23xxBDxx1xxxxx valve



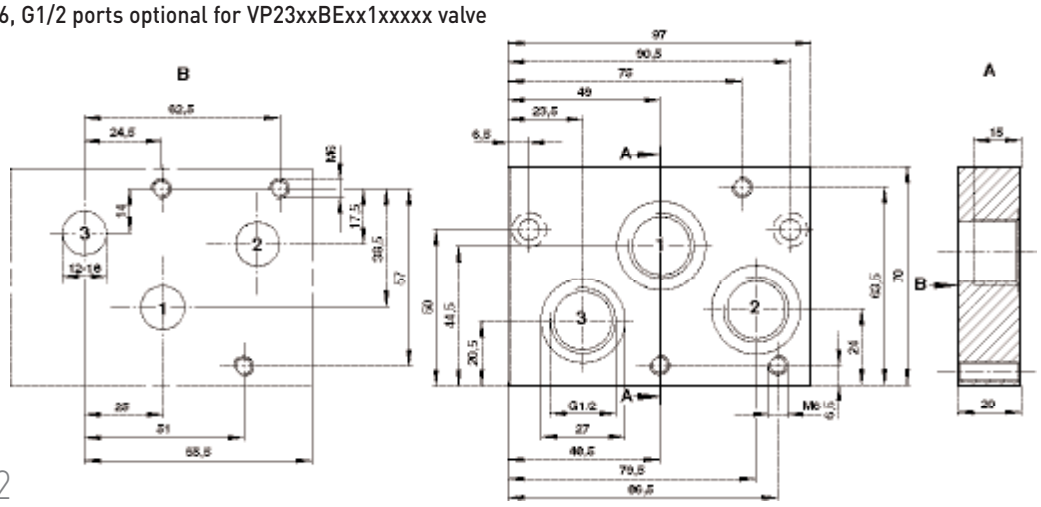
0542636, G1/4 ports optional for VP23xxBDxx1xxxxx valve



0542840, G3/4 ports preferable for VP23xxBExx1xxxxx valve



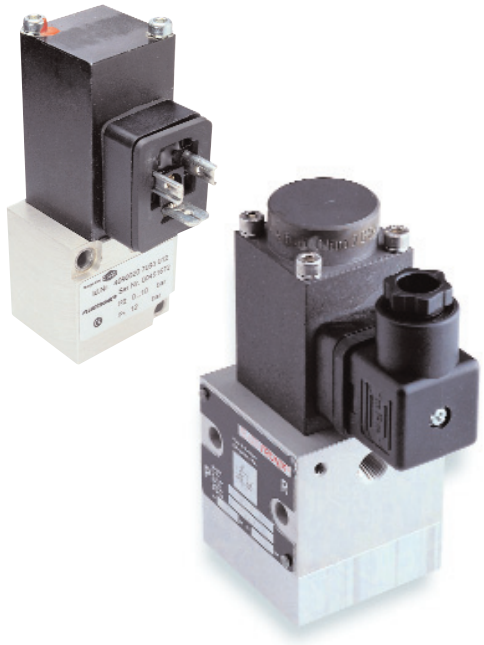
0542636, G1/2 ports optional for VP23xxBExx1xxxxx valve



Proportional pressure control valve

VP40

G 1/8 ... G 3/8 and Flange



Low hysteresis
Good repeatability
High flow capacity at exhaust port
High response sensitivity
Manifold mountable (2 mm versions)

TECHNICAL DATA

Medium:
Compressed air filtered to 40 µm, lubricated or non-lubricated

Operation:
Proportional solenoid

Orifice (nominal):
2, 4, 6 and 8 mm

Operating pressure p1 (nominal):
20 bar max.
0 to 16,5 bar max. for 2 mm versions

Pressure setting p2:
0 to 19 bar

Supply sensitivity*:
< 1 % (I max., p2 max.)

Flow*:
See characteristic curves

Air consumption:
< 4 bar: 0,85 N l/min typical
> 4 bar: 1,75 N l/min typical

Ambient temperature:
-10 to +40 °C
Contact our technical service for use below +2°C

Degree of protection:
IP65 with connector

Linearity*:
See characteristic curves

Hysteresis*:
< 0,3% (I max., p2 max.)

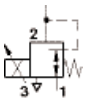
Repeatability*:
< 1 % (p2 max)

Mounting:
Any, preferably vertical

Materials:
Body: aluminium alloy
Seals: NBR (perbunan)

* Values referred to 20°C with dither 20% In, 50 Hz

Actuation	Port size	Orifice (mm)	Pressure setting p2 (bar)	Max. Op. pressure p1 (bar)	Rated current (m A)	Drive electronics	MODELS	ACCESSORIES Straight fitting (Tube diameter in bold)	Elbow fitting	Silencer
										
	G1/8	4	0 to 19	20	0 to 1600 (1800)	pQ11, pQ12, pQ05	**4088218 7071 012 00**	C0225**06**18	C0247**06**18	T40C1800
	Flange	2	0 to 16	16	1540	pQ11, pQ12, pQ05	**4090022 7093 012 00**	C0225**06**18	C0247**06**18	T40C1800
	Flange	2	0 to 10	12	950	pQ11, pQ12, pQ05	**4090020 7093 012 00**	C0225**06**18	C0247**06**18	T40C1800
	G1/8	4	0 to 10	10	0 to 1600 (1800)	pQ11, pQ12, pQ05	**4088110 7053 012 00**	C0225**06**18	C0247**06**18	T40C1800
	G1/4	6	0 to 10	12	0 to 1600 (1800)	pQ11, pQ12, pQ05	**4088210 7053 012 00**	C0225**08**28	C0247**08**28	T40C2800
	G3/8	8	0 to 7	10	0 to 1600 (1800)	pQ11, pQ12, pQ05	**4088310 7071 012 00**	C0225**10**38	C0247**10**38	T40C3800
	Flange	2	0 to 6	7	720	pQ11, pQ12, pQ05	**4090021 7093 012 00**	C0225**06**18	C0247**06**18	T40C1800
	G1/4	6	0 to 2	7	0 to 1600 (1800)	pQ11, pQ12, pQ05	**4088200 7053 012 00**	C0225**08**28	C0247**08**28	T40C2800



These are typical values depending on ambient temperature and valve tolerances.
For operation of the valve, the use of a plug in drive electronics module is neccessary, for further information please see data sheets.

ELECTRICAL INFORMATION

Limiting current (I)	1930 mA (models with 2 mm orifice) 1600 mA (models with 4, 6, 8 mm orifice)
Rated power (PN)	25 W (models with 2 mm orifice) 22 W (models with 4, 6, 8 mm orifice)
Resistance (R20)	6,3 Ω +3%
Duty cycle	100%
Connections	DIN EN 175 301-803 (DIN 43650) table B, for models with 2 mm orifice
	DIN EN 175 301-803 (DIN 43650) table A, for models with 4, 6, 8 mm orifice

For further information

www.norgren.com/info/nec/en4-013

Proportional pressure control valve VP40

G 1/8 ... G 3/8 and Flange

Drive electronics pQ11

Rated current mA	Type of connection	Remarks	MODELS
0 ... 2400	Connector conforming to DIN 43651	Suitable for 4088000 0000 valves	5980081
0 ... 2400	2 m cable		5980085
0 ... 1000	Connector conforming to DIN 43651	Suitable for 4090020 7093 and 4090021 7093	5980083
0 ... 1000	2 m cable		5980087
0 ... 2400	Connector conforming to DIN 43651	Suitable for 4090022 7093 valves	5980118
0 ... 2400	2 m cable		5980119

Drive electronics pQ12

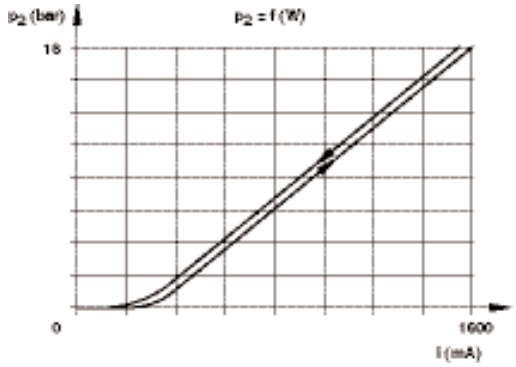
Rated current mA	Remarks	MODELS
0 ... 2400	Suitable for 4088000 0000, 4090020 7093 and 4090021 7093 valves	5980126
0 ... 1000	Suitable for 4090022 7093 valves	5980127

Drive electronics pQ05

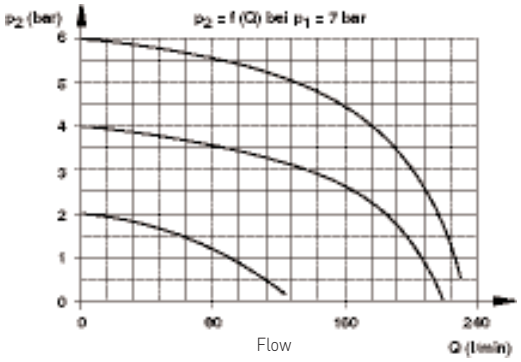
MODELS
5988197
5988198
5988199
5988200
5988201

CHARACTERISTIC CURVES

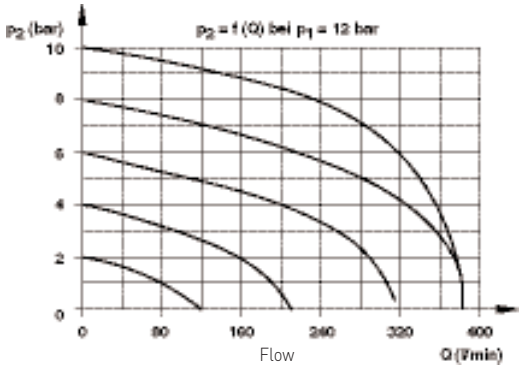
Principle for 16 bar



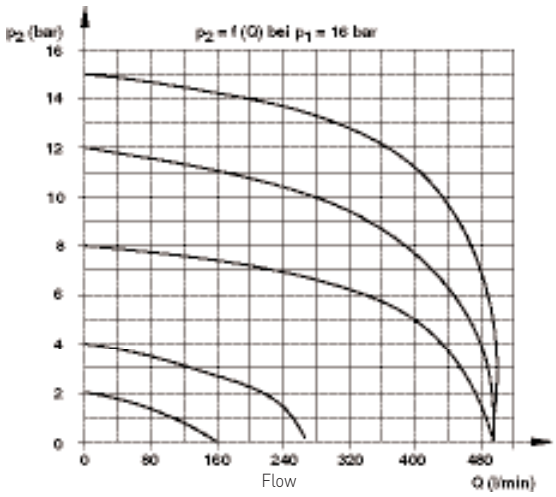
Operating pressure 7 bar



Operating pressure 12 bar

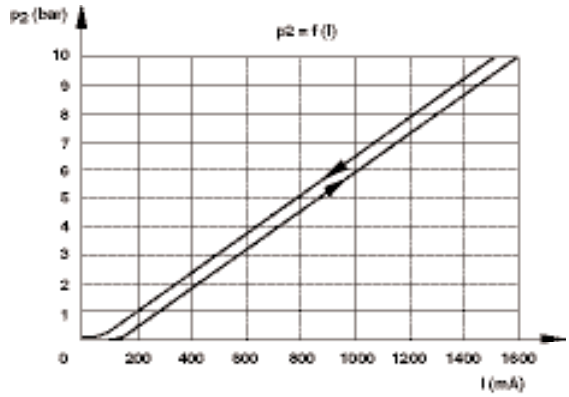


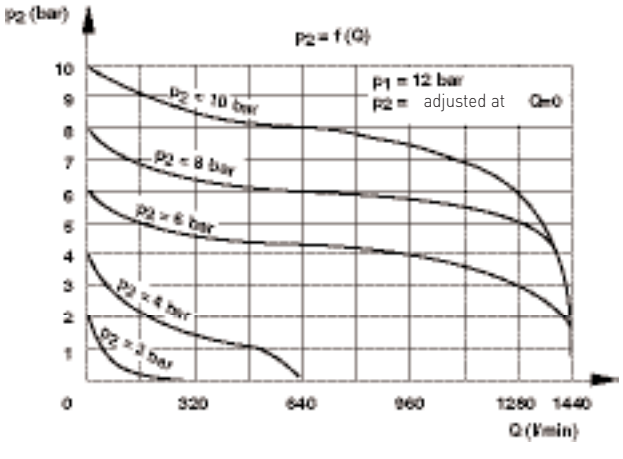
Operating pressure 16 bar



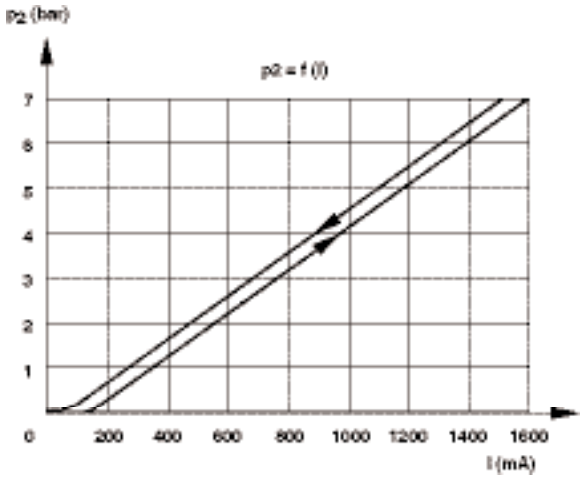
FLOW CHARACTERISTIC

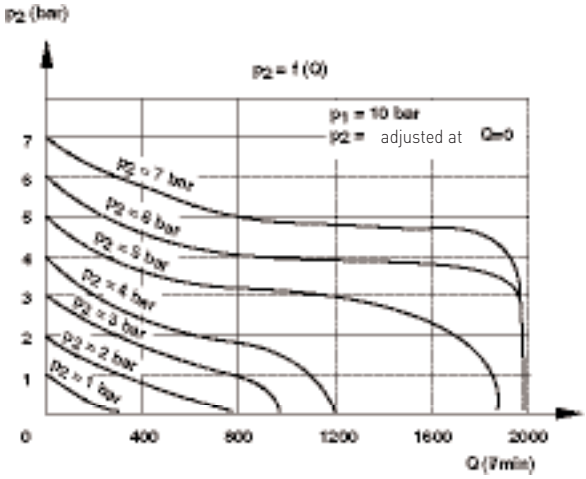
Model: 4088210 / 4088211



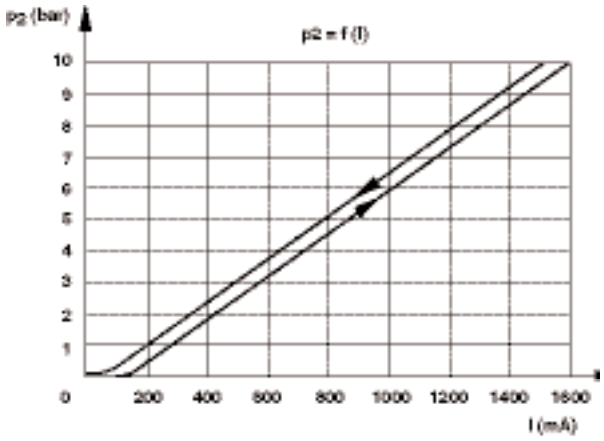


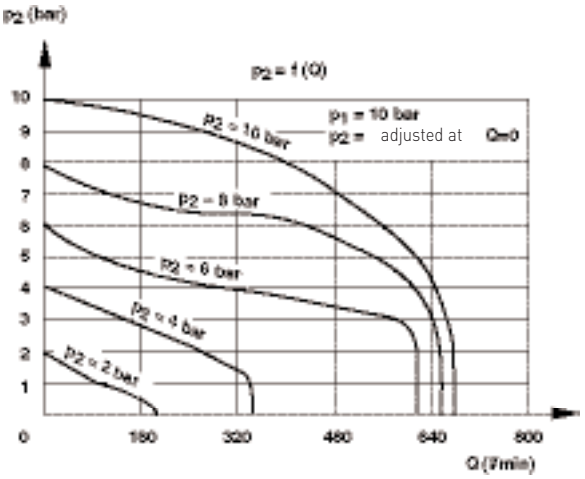
FLOW CHARACTERISTIC
Model: 4088310 / 4088311



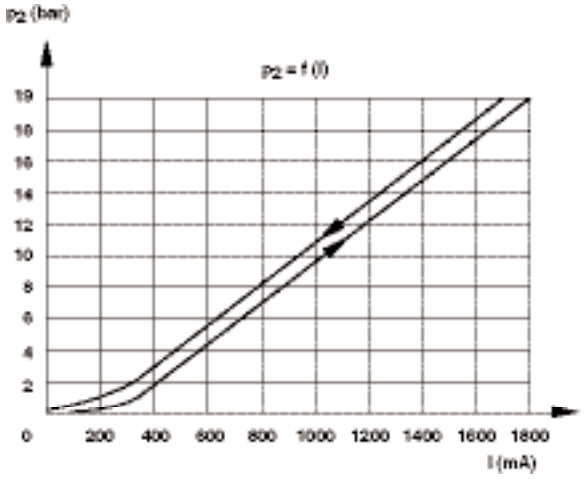


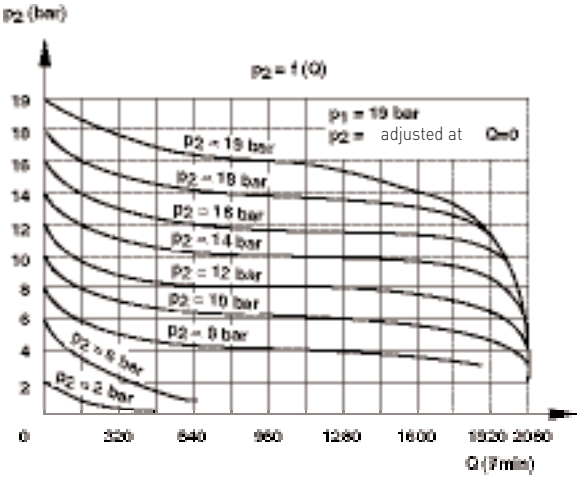
FLOW CHARACTERISTIC
Model: 4088110 / 4088119





FLOW CHARACTERISTIC
Model: 4088218



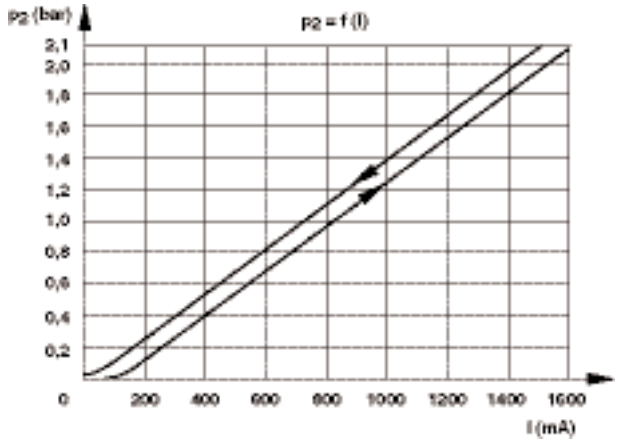


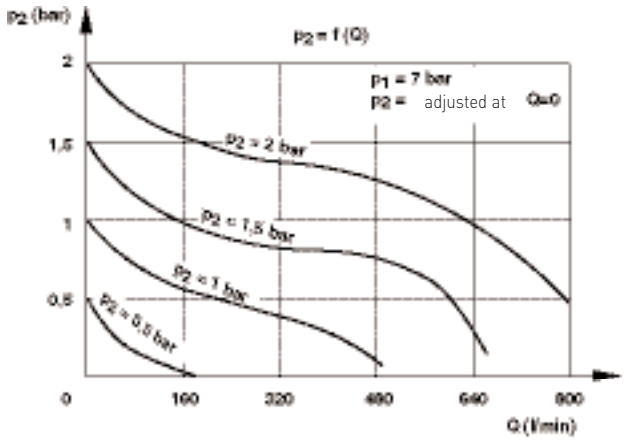
Proportional pressure control valve VP40

G 1/8 ... G 3/8 and Flange

FLOW CHARACTERISTIC

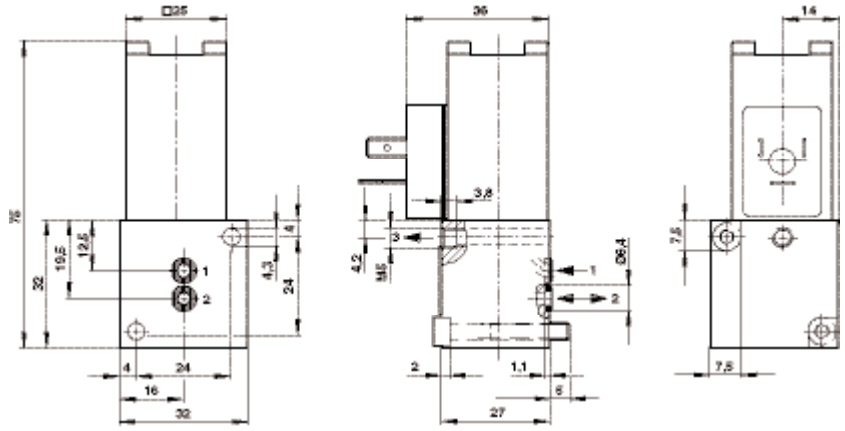
Model: 4088200 / 4088201



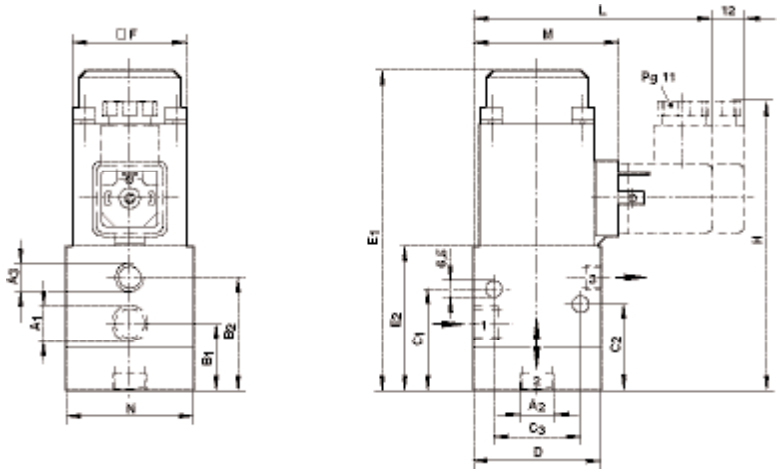


BASIC DIMENSIONS

VP40 with 2 mm orifice



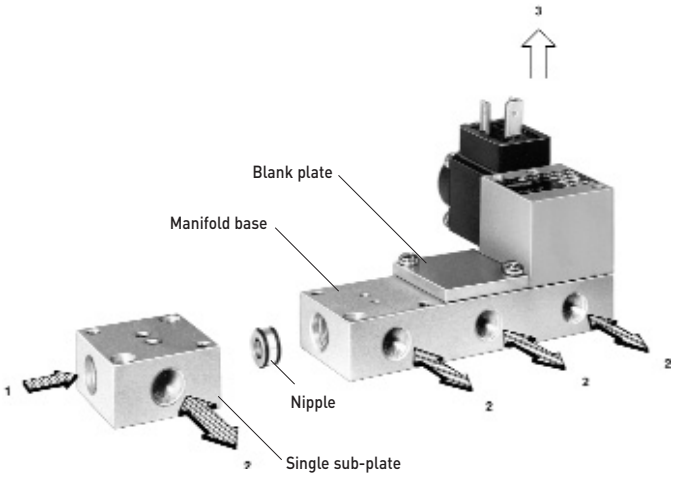
VP40 with 4, 6, 8 mm orifice



A1	A2	A3	B1	B2	C1	C2	C3	D	E1	E2	□F	H	L	M	N	MODELS
1/8	1/8	1/8	23	50,5	36	36	34	50	121	62,5	35	131	89	52,5	50	**4088110**
1/4	1/4	1/8	26,5	44,5	40	34	34	50	121	56,5	45	128	94	57	50	**4088218**
1/4	1/4	1/4	30	50	43	38	49	60	117	58,5	35	127	94	57,5	40	**4088200**
1/4	1/4	1/8	26,5	44,5	40	34	34	50	115	56,5	35	125	89	52,5	50	**4088210**
3/8	3/8	3/8	36,5	67	52	52	50	70	142	77,5	45	149,5	104	67	55	**4088310**

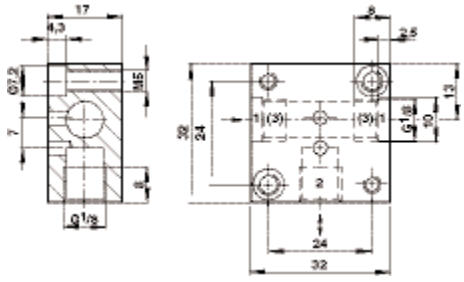
Manifold system
Components

Description	Weight	MODELS
Single sub-plate assembly	0,04	**0601740**
Manifold base – 2 valves	0,08	**0601741**
– 3 valves	0,13	**0601742**
– 4 valves	0,17	**0601743**
– 5 valves	0,21	**0601744**
– 6 valves	0,24	**0601745**
Nipple	–	**0559301**
Blank plate assembly	0,22	**0602005**
Screw plug G1/8	–	**0568384**



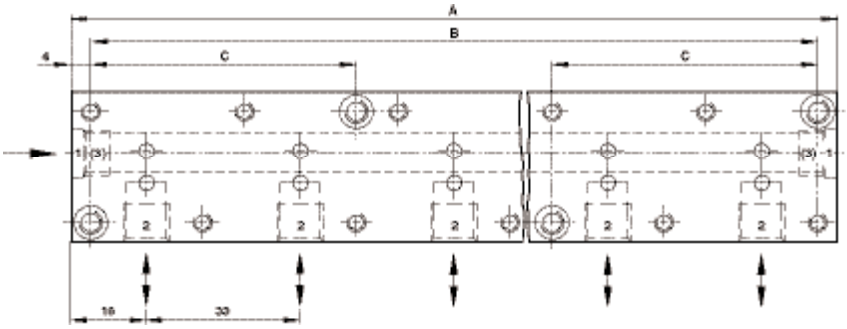
Sub-bases for valves with 2 mm orifice

G1/8 sub-plate
Model: 0601740



Screw plug for open port
Model: 0568384

Manifold dimensions



No. of valves	A	B	C	MODELS
2	65	57	–	**0601741**
3	98	90	–	**0601742**
4	131	123	–	**0601743**
5	164	156	57	**0601744**
6	197	189	57	**0601745**

Proportional pressure control valve

VP50

G 1/4

Closed loop air pilot operated proportional pressure control valve

High flow

Excellent performance characteristics

Fast response time

Adjustable gain

Adjustable pressure range

Low power consumption

Feedback signal

manifold mountable

TECHNICAL DATA

Medium:
Compressed air filtered to 5 µm, dry and non-lubricated

Operation:
Air piloted spool valve with integrated electronic pressure control

Orifice (nominal):
4 mm

Output pressure (nominal):
0 to 2 bar, 0 to 6 bar, 0 to 10 bar (or PSI equivalent)

Supply pressure:
Minimum 2 bar above maximum output required,14 bar max.

Supply sensitivity:
Better than 0,75% span output change per bar supply pressure change

Flow:
Up to 1400 N l/min (see characteristic curves)

Air consumption:
< 5 N l/min

Ambient temperature:
0°C to +50°C
Contact our technical service for use below +2°C

Temperature effect:
Typically better than 0,03% of span/°C for span and zero over operating range

Response time:
< 80 ms (from 10 to 90% of output pressure into a 0,1 litre load)

Degree of protection:
IP65 in normal operation

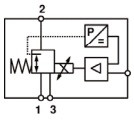
Linearity:
< 1%

Hysteresis:
< 1%

Vibration immunity:
< 3% output shift for ± 3 g 10-150 Hz

Weight:
0,63 kg

Materials:
Body: aluminium
Lid and end cover: zinc diecast, nylon

Actuation	Port size	Max. flow (N l/min)	Output pressure (bar)	Control signal	MODELS	ACCESSORIES Straight fitting Tube diameter in bold	Elbow fitting	Silencer
								
	G1/4	1400	0 ... 10	0 ... 10 V	**VP5002BJ111H00**	C022**5**0828	C024**7**0828	T40C2800
	G1/4	1400	0 ... 10	4 ... 20 mA	**VP5002BJ411H00**	C022**5**0828	C024**7**0828	T40C2800
	G1/4	1400	0 ... 6	0 ... 10 V	**VP5006BJ111H00**	C022**5**0828	C024**7**0828	T40C2800
	G1/4	1400	0 ... 6	4 ... 20 mA	**VP5006BJ411H00**	C022**5**0828	C024**7**0828	T40C2800
	G1/4	1400	0 ... 2	0 ... 10 V	**VP5010BJ111H00**	C022**5**0828	C024**7**0828	T40C2800
	G1/4	1400	0 ... 2	4 ... 20 mA	**VP5010BJ411H00**	C022**5**0828	C024**7**0828	T40C2800

For further information

www.norgren.com/info/en4-018

OPTIONS SELECTOR

VP50★★★★★11H00

Control signal	Substitute
0 ... 2 bar/30 psi	02
0 ... 6 bar/90 psi	06
0 ... 10 bar/150 psi	10

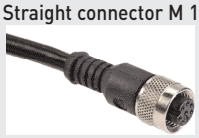
Unit for pressure	Substitute
Bar	B
PSI	P

Input signal	Substitute
0 ... 10 V	1
4 ... 20 mA	4

Port size	Substitute
G 1/4	J
NPT 1/4	K
Manifold	X

Other versions on request

Electrical connections

Straight connector M 12 x 1	Elbow connector M 12 x 1
	
0523822 (5-pin, 5 m cable, 5 x 0,34 mm²)	0250081 (5-pin, 5 m cable, 5 x 0,34 mm²)
–	0250472 (5-pin, 10 m cable, 5 x 0,34 mm²)
–	0252543 (5-pin, wireable)

Single manifold

Assembly to ISO-2 sub base

ZZ5M00

Electrical information

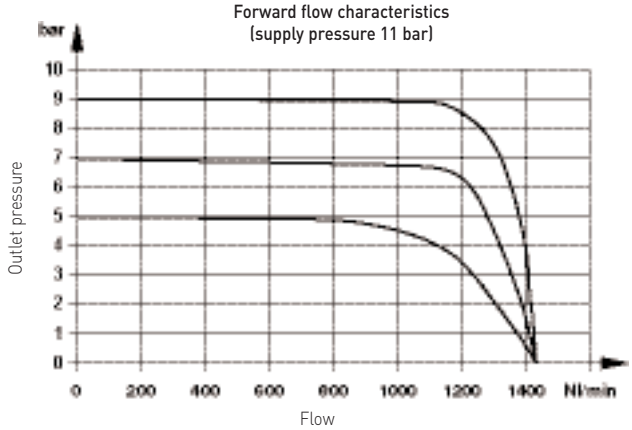
Electromagnetic compatibility	CE marked: conforms to EC requirements EN 50081-2 (1994) and EN 50082-2 (1995)
Electrical input signal	4 to 20 mA or 0 to 10 V factory set
Electrical power input	24 V d.c. ±25% (power consumption < 1 W)
Output pressure feedback signal	0 ... 10 V full range
Connections	M12x1, 5-pin

Instrument pin configuration

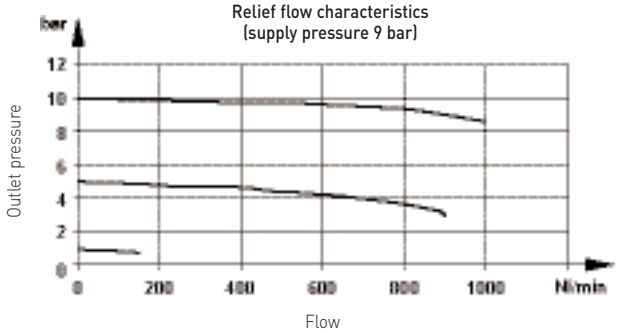
1	+24 V d.c. supply
2	0 ... 10 V feedback
3	Control signal (+ve)
4	Common (supply signal and feedback return)
5	Chassis (earth)

CHARACTERISTIC CURVES

Forward flow characteristics
(supply pressure 11 bar)



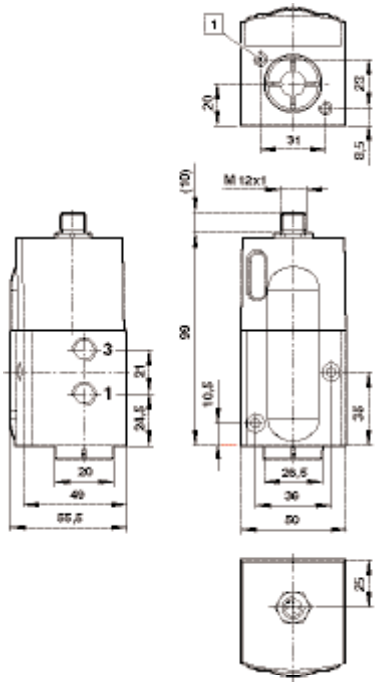
Relief flow characteristics
(supply pressure 9 bar)



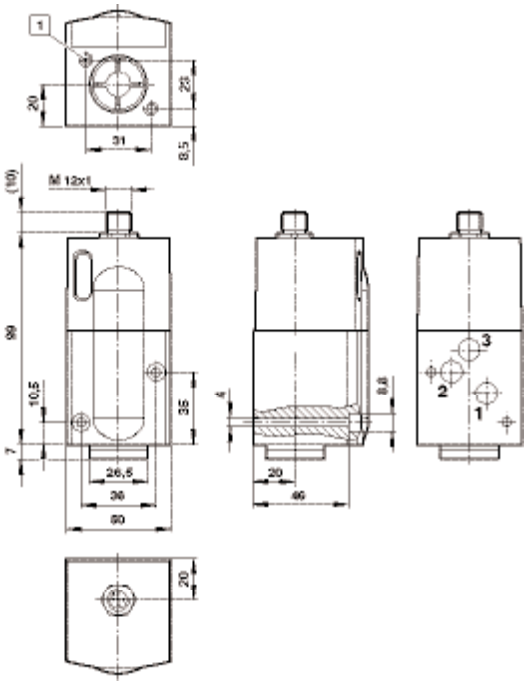
Proportional pressure control valve VP50

G 1/4

BASIC DIMENSIONS

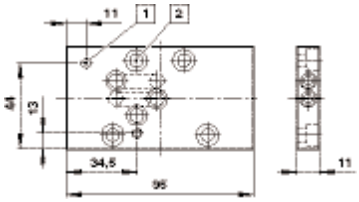


VP50 with manifold surface



1 M5 x 8 mm deep

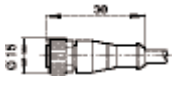
Manifold mount assembly to ISO 2 sub base
All seals and screws included



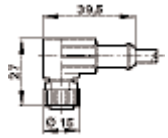
1 Four screws M6 x 16 mm deep to mount the manifold onto the ISO sub base

2 Two screws M4 x 50 mm deep to mount the VP50 onto the manifold

Electrical connections

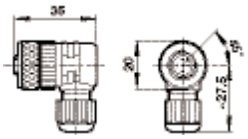


Straight connector
M12 x 1, 5-pin, female,
A coded and 5 m cable length
Model: 0523822



Elbow connector
M12 x 1, 5-pin, female,
A coded and 5 m cable length
Model: 0250081

M12 x 1, 5-pin, female,
A coded and 10 m cable length
Model: 0250472



Elbow connector
M12 x 1, 5-pin, female, A coded
Model: 0252543

Proportional pressure control valve

VP50S

G 1/4

Closed loop air pilot operated proportional pressure control valve with pressure output display

Fast response time

High flow

Excellent performance characteristics

Adjustable gain

Adjustable pressure range

Low power consumption

Feedback signal

Manifold mountable

TECHNICAL DATA

Medium:
Compressed air filtered to 5 µm, dry and non-lubricated

Operation:
Air piloted spool valve with integrated electronic pressure control

Orifice (nominal):
4 mm

Output pressure:
0 to 2 bar, 0 to 6 bar, 0 to 10 bar (or PSI equivalent)

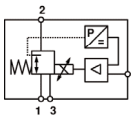
Supply pressure:
Minimum 2 bar above maximum output required,14 bar max.

Supply sensitivity:
Better than 0,75% span output change per bar supply pressure change

Flow:
Up to 1400 N l/min (see characteristic curves)

Air consumption:
< 5 N l/min

Ambient temperature:
0°C to +50°C
Contact our technical service for use below +2°C

					MODELS	ACCESSORIES		
Actuation	Port size	Max. flow (N l/min)	Output pressure (bar)	Control signal		Straight fitting Tube diameter in bold	Elbow fitting	Silencer
								
	G1/4	1400	0 ... 10	0 ... 10 V	**VP5002SBJ111H00**	C022**50**828	C024**70**828	T40C2800
	G1/4	1400	0 ... 10	4 ... 20 mA	**VP5002SBJ411H00**	C022**50**828	C024**70**828	T40C2800
	G1/4	1400	0 ... 6	0 ... 10 V	**VP5006SBJ111H00**	C022**50**828	C024**70**828	T40C2800
	G1/4	1400	0 ... 6	4 ... 20 mA	**VP5006SBJ411H00**	C022**50**828	C024**70**828	T40C2800
	G1/4	1400	0 ... 2	0 ... 10 V	**VP5010SBJ111H00**	C022**50**828	C024**70**828	T40C2800
	G1/4	1400	0 ... 2	4 ... 20 mA	**VP5010SBJ411H00**	C022**50**828	C024**70**828	T40C2800

For further information

i PDF CAD

www.norgren.com/info/en4-021

Proportional pressure control valve VP50S

G 1/4

OPTIONS SELECTOR

VP50★★S★★★11H00

Control signal	Substitute
0 ... 2 bar/30 psi	02
0 ... 6 bar/90 psi	06
0 ... 10 bar/150 psi	10

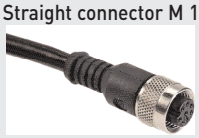
Unit for pressure	Substitute
Bar	B
PSI	P

Input signal	Substitute
0 ... 10 V	1
4 ... 20 mA	4

Port size	Substitute
G 1/4	J
NPT 1/4	K
Manifold	X

Other versions on request

Electrical connections

Straight connector M 12 x 1	Elbow connector M 12 x 1
	
0523822 (5-pin, 5 m cable, 5 x 0,34 mm²)	0250081 (5-pin, 5 m cable, 5 x 0,34 mm²)
–	0250472 (5-pin, 10 m cable, 5 x 0,34 mm²)
–	0252543 (5-pin, wireable)

Single manifold

Assembly to ISO-2 sub base	
	
ZZ5M00	

Electrical information

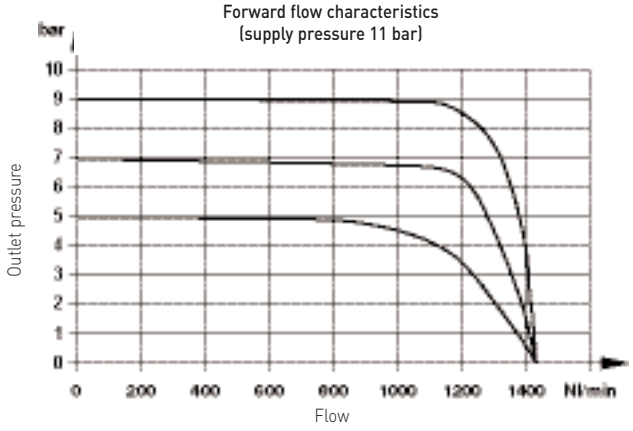
Electromagnetic compatibility	CE marked: conforms to EC requirements EN 50081-2 (1994) and EN 50082-2 (1995)
Electrical input signal	4 to 20 mA or 0 to 10 V factory set
Electrical power input	24 V d.c. ±25% (power consumption < 1 W)
Output pressure feedback signal	0 ... 10 V full range
Connections	M12x1, 5-pin

Instrument pin configuration

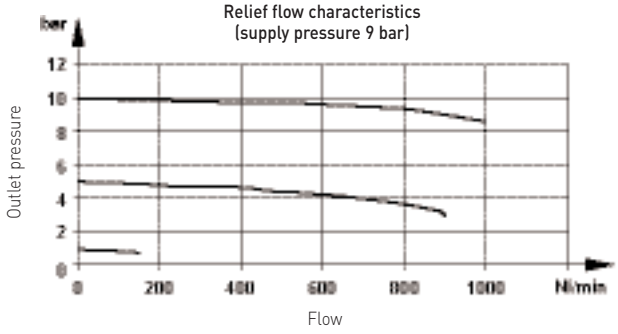
1	+24 V d.c. supply
2	0 ... 10 V feedback
3	Control signal (+ve)
4	Common (supply signal and feedback return)
5	Chassis (earth)

CHARACTERISTIC CURVES

Forward flow characteristics
(supply pressure 11 bar)

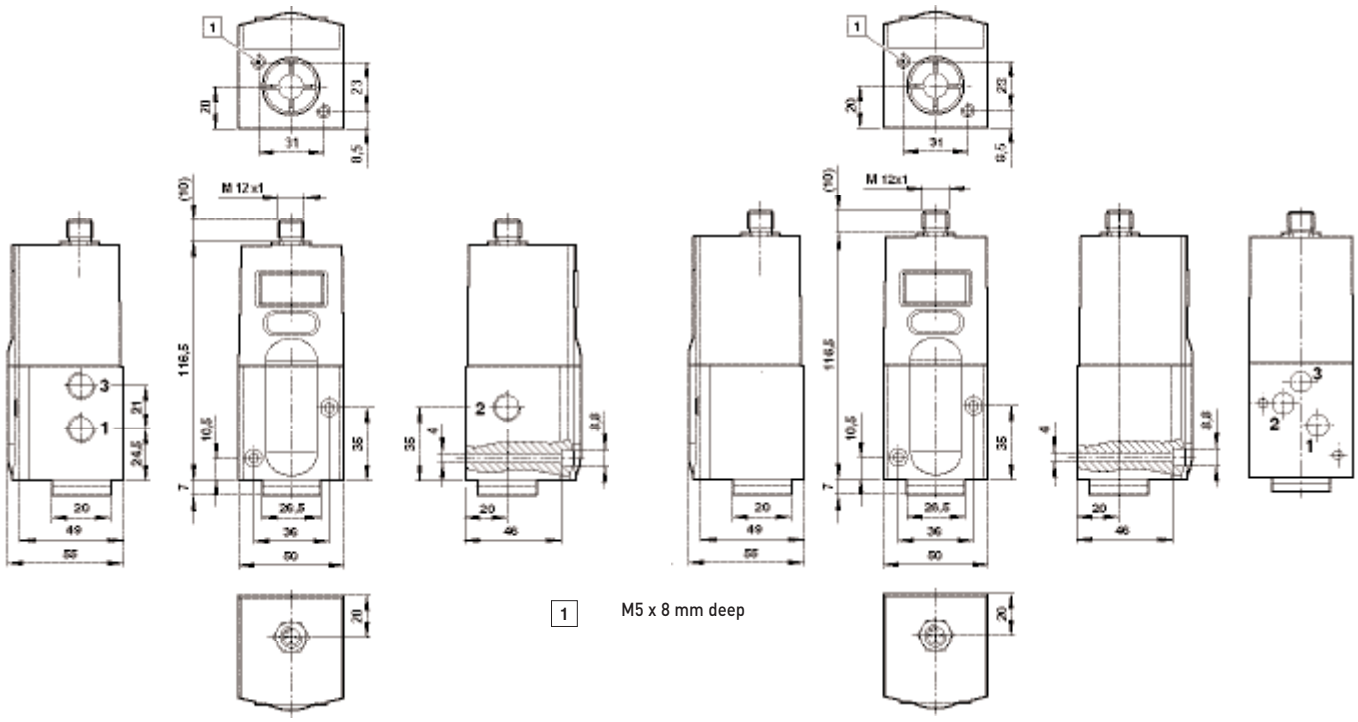


Relief flow characteristics
(supply pressure 9 bar)

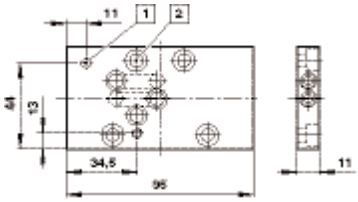


BASIC DIMENSIONS

VP50S with manifold surface



Manifold mount assembly to ISO 2 sub base
All seals and screws included

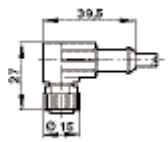


1 Four screws M6 x 16 mm deep to mount the manifold onto the ISO sub base

2 Two screws M4 x 50 mm deep to mount the VP50 onto the manifold

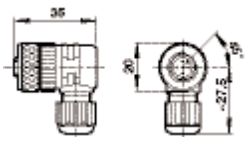
Electrical connections

Straight connector
M12 x 1, 5-pin, female,
A coded and 5 m cable length
Model: 0523822



Elbow connector
M12 x 1, 5-pin, female,
A coded and 5 m cable length
Model: 0250081

M12 x 1, 5-pin, female,
A coded and 10 m cable length
Model: 0250472



Elbow connector
M12 x 1, 5-pin, female, A coded
Model: 0252543

Programmable proportional pressure control valve

VP51

G 1/4

Closed-loop air piloted digital proportional pressure control valve

Ability to set up offline

Fully programmable with on-board diagnostics

Multi-language menu option

High flow

Excellent performance characteristics

Adjustable gain

Instant LED warning lights

Pressure output display

Fast response time

Low power consumption

Manifold mountable

TECHNICAL DATA

Medium:
Compressed air filtered to 5 µm, dry and non-lubricated

Operation:
Air piloted spool valve with integrated electronic pressure control

Orifice (nominal):
4 mm

Output pressure:
0 to 6 bar, 0 to 10 bar (or PSI equivalent)

Supply pressure:
Minimum 2 bar above maximum output required, 14 bar max.

Supply sensitivity:
Better than 0,75% span output change per bar supply pressure change

Flow:
Up to 1400 N l/min (see characteristic curves)

Air consumption:
< 5 N l/min

Ambient temperature:
0°C to +50°C
Contact our technical service for use below +2°C

Temperature effect:
Typically better than 0,03% of span/°C for span and zero over operating range

Response time:
< 100 ms (from 10 to 90% of output pressure into a 0,1 litre load)

Degree of protection:
IP65 in normal operation

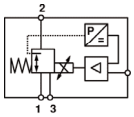
Linearity:
< 50 mbar

Hysteresis:
< ±50 mbar

Vibration immunity:
< 3% output shift for ± 3 g 10-150 Hz

Weight:
0,80 kg approx

Materials:
Body: aluminium
Lid and end cover: zinc diecast, nylon

Actuation	Port size	Max. flow (N l/min)	Output pressure (bar)	Control signal	MODELS	ACCESSORIES Straight fitting (Tube diameter in bold)	Elbow fitting	Silencer
								
	G1/4	1400	0 ... 10	0 ... 10 V	**VP5110BJ111H00**	C022**50**828	C024**70**828	T40C2800
	G1/4	1400	0 ... 10	4 ... 20 mA	**VP5110BJ411H00**	C022**50**828	C024**70**828	T40C2800
	G1/4	1400	0 ... 6	0 ... 10 V	**VP5106BJ111H00**	C022**50**828	C024**70**828	T40C2800
	G1/4	1400	0 ... 6	4 ... 20 mA	**VP5106BJ411H00**	C022**50**828	C024**70**828	T40C2800

For further information

www.norgren.com/info/en4-024

OPTIONS SELECTOR

VP51★★★★★11H00

Control signal	Substitute
0 ... 6 bar/90 psi	06
0 ... 10 bar/150 psi	10

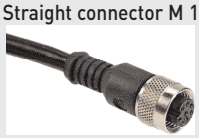
Unit for pressure	Substitute
Bar	B
PSI	P

Other versions on request

Input signal	Substitute
0 ... 10 V	1
4 ... 20 mA	4

Port size	Substitute
G 1/4	J
NPT 1/4	K
Manifold	X

Electrical connections

Straight connector M 12 x 1	Elbow connector M 12 x 1
	
0523822 (5-pin, 5 m cable, 5 x 0,34 mm²)	0250081 (5-pin, 5 m cable, 5 x 0,34 mm²)
–	0250472 (5-pin, 10 m cable, 5 x 0,34 mm²)
–	0252543 (5-pin, wireable)

Single manifold

Assembly to ISO-2 sub base	
	
ZZ5M00	

Electrical information

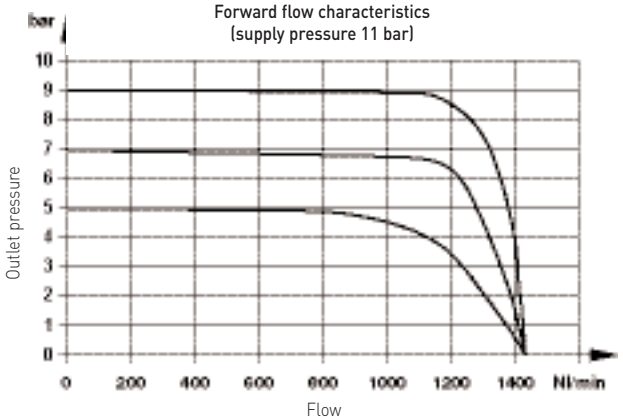
Electromagnetic compatibility	CE marked: conforms to EC requirements EN 50081-2 (1994) and EN 50082-2 (1995)
Electrical input signal	4 to 20 mA or 0 to 10 V factory set
Electrical power input	24 V d.c. ±25% (power consumption < 1 W)
Output pressure feedback signal	0 ... 10 V full range
Connections	M12x1, 5-pin

Instrument pin configuration

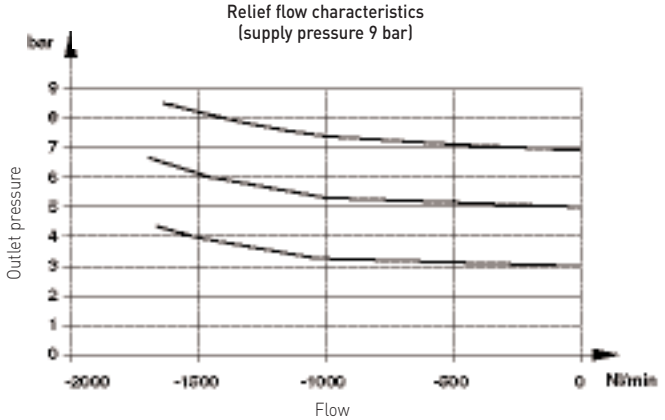
1	+24 V d.c. supply
2	0 ... 10 V feedback
3	Control signal (+ve)
4	Common (supply signal and feedback return)
5	Chassis (earth)

CHARACTERISTIC CURVES

Forward flow characteristics
(supply pressure 11 bar)



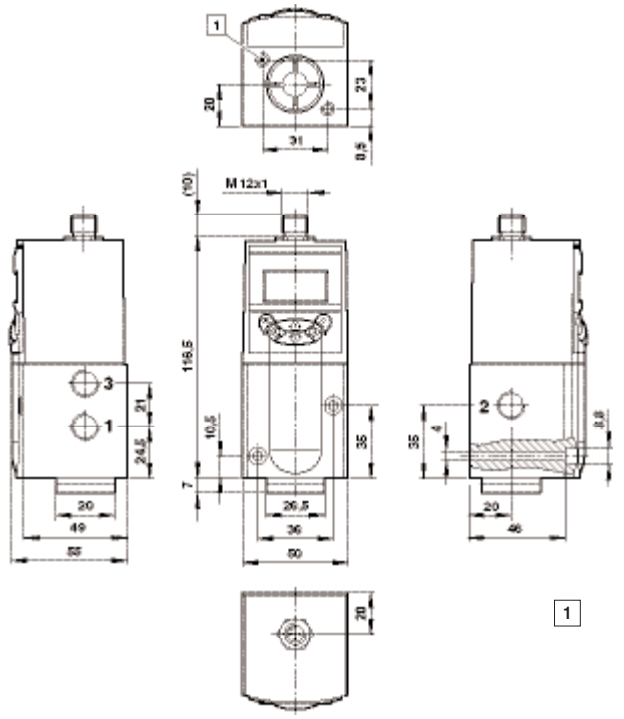
Relief flow characteristics
(supply pressure 9 bar)



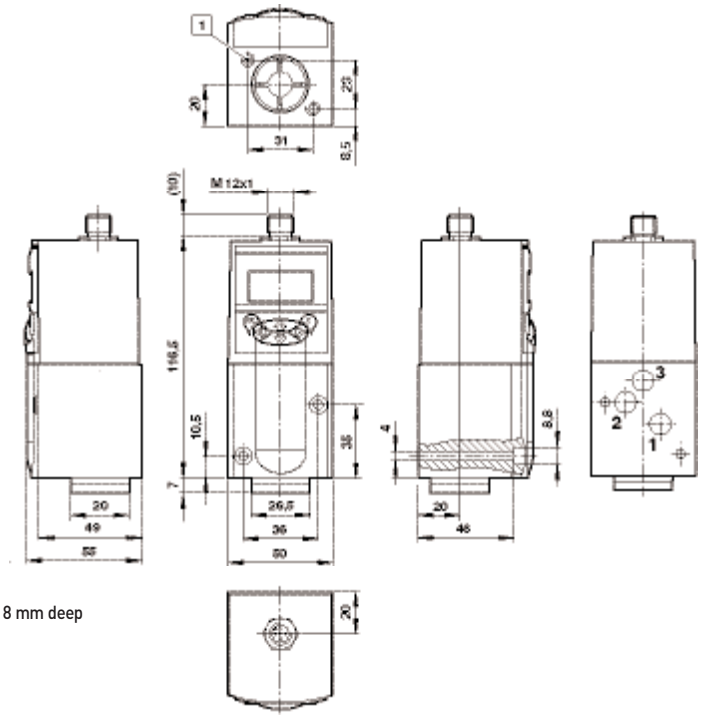
Programmable proportional pressure control valve VP51

G 1/4

BASIC DIMENSIONS

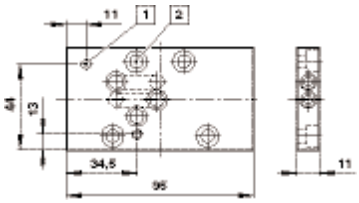


VP50 with manifold surface



1 M5 x 8 mm deep

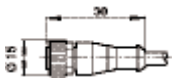
Manifold mount assembly to ISO 2 sub base
All seals and screws included



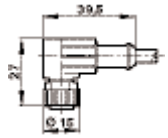
1 Four screws M6 x 16 mm deep to mount the manifold onto the ISO sub base

2 Two screws M4 x 50 mm deep to mount the VP51 onto the manifold

Electrical connections

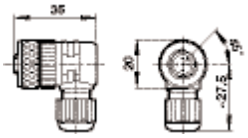


Straight connector
M12 x 1, 5-pin, female,
A coded and 5 m cable length
Model: 0523822



Elbow connector
M12 x 1, 5-pin, female,
A coded and 5 m cable length
Model: 0250081

M12 x 1, 5-pin, female,
A coded and 10 m cable length
Model: 0250472



Elbow connector
M12 x 1, 5 pin, female, A coded
Model: 0252543

Proportional flow control valve

VP60

G 1/4

High flow rate, low pressure loss

Calibrated, linear flow characteristic with zero crossover

Choice of setpoint input: 4 to 20 mA, ±5 V,

0 to 10 V, fixed value, function generator, optional Profibus DP

Silicon-free to test spec P-VW 3.10.7/01.92

Fast dynamic response

Diagnostic function

CE compliant 89/336/EEC

TECHNICAL DATA

Medium:
ISO8573-1 Class: 2-3-1, filtered, dried, oil-free
The dynamic performance and service life of the valve may be significantly reduced if using unfiltered air containing water and oil!

Operation:
Directly-controlled spool valve with fast dynamic response

Orifice (nominal):
8 mm

Operating pressure (nominal):
-1 to 16 bar
Vacuum up to 16 bar

Critical pressure ratio:
b = 0,1 to 0,4

Filter:
< 3 µm

Flow:
1200 N l/min at p1 = 6 bar, p2 = 5 bar

Pneumatical flow coeff.:
C = 290 N l/ (min • bar)

Flow direction:
1 → 4 + 2 → 3; 1 → 2 + 4 → 5

Temperature:
Ambient: 0 to +60 °C
Medium: 5 to +60 °C
Storage: -20 to 80 °C
Condensation not permitted!
Please contact our technical service for use below +5°C

Leakage:
Centre max. 16 N l/min
Typical value: 8 N l/min
(p1 = 10 bar and p2/4 = 0 bar)

Degree of protection:
IP65

Service life:
> 250 million full-travel operations with recommended air quality

Response sensitivity:
± 0,5 (% max. Q)*

Hysteresis:
± 0,5 (% max. Q)*

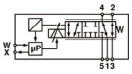
Repeat accuracy:
± 1,0 (% max. Q)*

Linearity:
± 3,0 (% max. Q)*

* Values related to 20°C
Dynamic values stated relate
24 V d.c. power supply

Weight:
1,25 kg

Materials:
Valve housing and internal parts: anodised aluminium
Electronic housing: PAA
Other static seals: NBR
Actuator magnet: Fe, surface refined

					MODELS	ACCESSORIES		
Actuation	Orifice (mm)	Output pressure (bar)	Set point	Actual value		Straight fitting Tube diameter in bold	Elbow fitting	Silencer
								
	8	-1 ... 16	4 ... 20 mA	0 ... 10 V/4 ... 20 mA	**VP6010LJ461MB200**	C022**50**828	C024**70**828	T40C2800
	8	-1 ... 16	-5 V ... +5 V	0 ... 10 V/4 ... 20 mA	**VP6010LJ661MB200**	C022**50**828	C024**70**828	T40C2800
	8	-1 ... 16	0 ... 10 V	0 ... 10 V/4 ... 20 mA	**VP6010LJ761MB200**	C022**50**828	C024**70**828	T40C2800

For further information

i PDF CAD

www.norgren.com/info/en4-027

Proportional flow control valve VP60

G 1/4

OPTIONS SELECTOR

VP6010L★★★1★B200

Pneumatic port	Substitute
G1/4	J
1/4 NPT	K
ISO1	T

Set point	Substitute
4 to 20 mA	4
-5 V to +5 V/differential	6
0 to 10 V/differential	7
Profibus DP (on request)	P

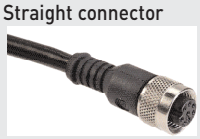
Connector	Substitute
M12x1, 8-pin	M
Fieldbus spec. (on request)	N

Actual value	Substitute
0 ... 10 V / 4 ... 20 mA	6
Profibus DP (on request)	P

Adjustable with VP tool
Preadjusted 0 to 10V

Electrical connections

Straight connector



Elbow connector

Description	Specification		MODELS
Connecting plug, shielded	M12 x 1; 8-pin; 5 m, 8 x 0,25 mm², straight	F	**0250811**
Connecting plug, shielded	M12 x 1; 8-pin; 5 m, 8 x 0,25 mm², 90°	F	**0250813**
Connector (Bus only)	M12 x 1; 5-pin; 5 m, 90°, A-coded, open (power)	F	**0252086**
Connector (Bus only), shielded	M12 x 1; 5-pin; 5 m, 90°, B-coded, open (Bus in)	F	**0251310**
Connector (Bus only), shielded	M12 x 1; 5-pin; 5 m, 90°, B-coded, open (Bus out)	M	**0251312**
Connector (Bus only)	M12 x 1; 5-pin; convertible, 90°, B-coded (Bus in)	F	**0252089**
Connector (Bus only)	M12 x 1; 5-pin; convertible, 90°, B-coded (Bus out)	M	**0252090**
Connector with cable (Bus only), shielded	Plug M12 x 1; 5-pin; 5 m, 90°, B-coded, (Bus in/out)	M&F	**0250091**
Profibus termination			FD6710K5SM5S00

F = female, M = male
Note: Cable material PUR shielded

Serial interface

Description	Ports	MODELS
Adaptor complete	Cable + CD VP-Tool	**5988319**

Electrical information

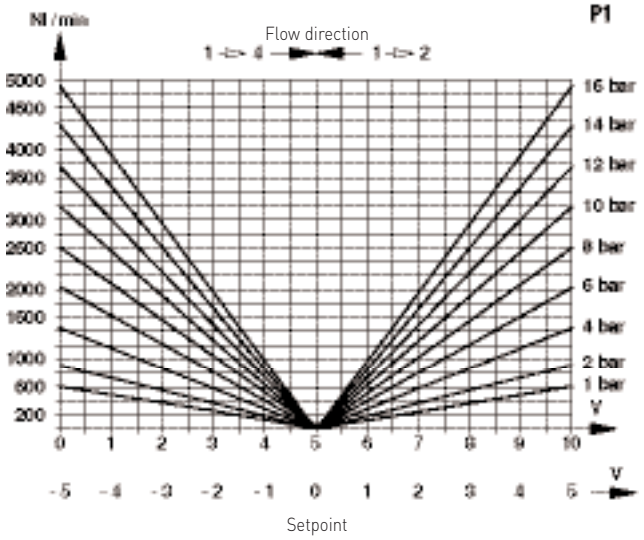
Electromagnetic compatibility	EMV compliant to 89/336/EWG: EN61000-4-4, EN61000-6- 2, 4, 5. Silicon-free to test spec P-VW 3.10.7/01.92
Vibration resistance	DIN EN 60068-2-6, 10 g at 12-500 Hz switched off. When working more than > 1 g function interference
Shock resistance	DIN EN68-2-67, 30 g/10 shocks

Supply

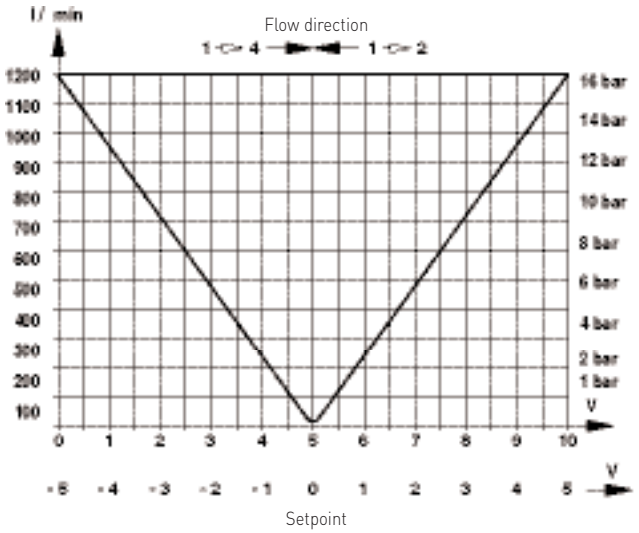
Supply voltage (Ub):	21 ... 32 V
Residual ripple:	10%
Switch-on point:	21 V
Switch-off point:	18 V
Voltage across diff. inputs:	-10 ... +40 V
Other voltages:	0 ... Ub V
Current input:	4 ... 20 mA
Working resistance:	500 W
Differential voltage input:	±5, 0 ... 10 V
Internal impedance:	117 kW
Current output:	4 ... 20 mA
Voltage output:	0 ... 10 V
Current consumption at 24 V	
setpoint, static:	0,1 A
setpoint ±100%, 50 Hz sine:	0,3 A
abs. max. for 10 s:	2,0 A

CHARACTERISTIC CURVES

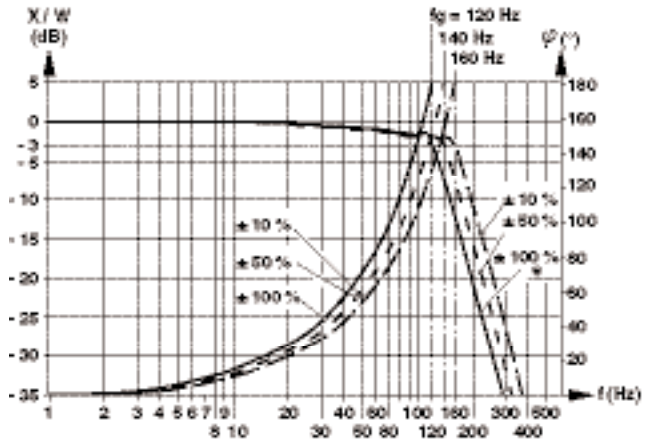
Flow rate characteristic as a function of the set-point value and P1, P2, P4 = 0 bar (free-flowing)



Flow rate characteristic as a function of the set-point value at constant pressure P1 = 6 bar, P2, P4 = 5 bar



Frequency response and phase of spool position-controller for 10, 50 and 100% setpoints

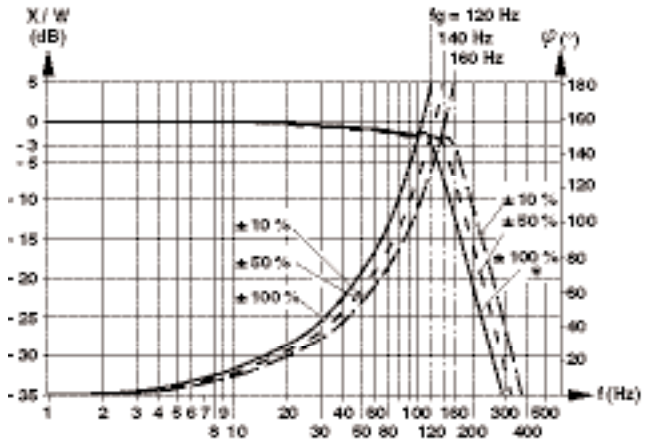


X = Actual value
W = Set point
f = frequency

*) ± 100% corresponds to 1150 Nl at ∂ p = 1 bar (6 ➔ 5 bar)
- 100% corresponds to 0 Nl

Valve in 5/3 operation. 0% corresponds to centre position

Flow rate as a function of the pressure ratio P2/P1 for setpoint values 10, 20, ...100%



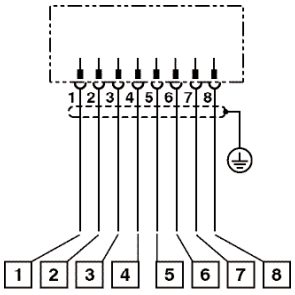
**) ± 100% corresponds to 1150 Nl at ∂ p = 1 bar (6 ➔ 5 bar)

Proportional flow control valve VP60

G 1/4

Electrical inputs and outputs

In addition to the power supply, the VP60 has two analogue inputs and two analogue outputs, plus one digital output. These are combined in one M12 x 1; 8-pin connector



1	W (U/I), white
2	X (comp), brown
3	W (-Ud), green
4	W (+Ud), yellow
5	X (I), grey
6	Ub pink
7	GND blue
8	X (U), red

Assignment

Supply

Pin		Description	Colour of connection cable
6	Ub	power supply 21 to 32 V d.c.	pink
7	GND	power ground GND	blue

Inputs

Set point

Pin		Description	Colour of connection cable
3	W(-Ud)*	Analogue GND/set point, input voltage 0 to 10 V or +/- 5 V	green
4	W(+Ud)*	Signal/set point, input voltage 0 to 10 V or +/- 5 V	yellow
1	W(I)	Set point input current, 4 to 20 mA	white

Note: depending on the order number, both outputs (U/I) but only the ordered input will be active.

Differential input between pins 4 and 3
Current input between pins 1 and 6

Outputs

Set point

Pin		Description	Colour of connection cable
5	X(I)	Actual value current 4 to 20 mA	grey
8	X(U)	Actual value voltage 0 to 10V	red

Voltage output refers to Gnd Pin 6

Due to the voltage drop on the ground wire you should consider an accuracy loss of the voltage output. Both outputs are active as standard.

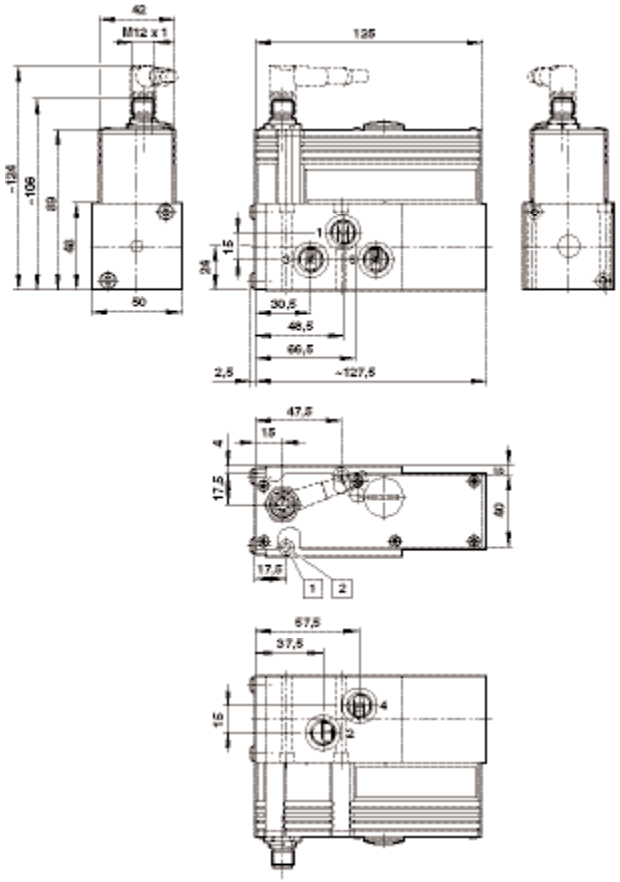
Fault output

Pin		Description	Colour of connection cable
2	X (comp)	Digital output signal PLC level (I (max) = 3,3 mA) High: Function ok Deviation: Iw-xI < ± 0.2% Low: Position not reached Deviation: Iw-xI > ± 0.2 %	brown

Voltage output refers to Gnd Pin 6

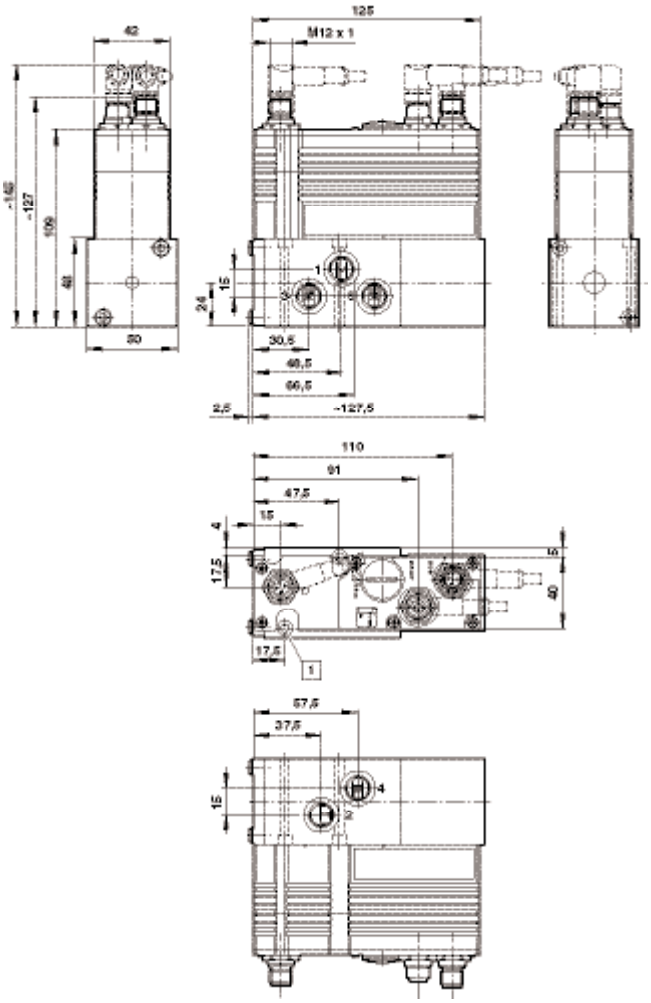
BASIC DIMENSIONS

Standard model G1/4 and 1/4 NPT



1 Valves are delivered with M4 x 50 mounting screws

Profibus DP (G1/4 and 1/4 NPT)



1 Valves are delivered with M4 x 50 mounting screws

Proportional pressure control valve

140 failsafe series

1/4 NPT or G1/4

ATEX certified

Explosion proof / Intrinsically safe / Type nL

Advanced electronic control

Fail-Safe (unit pressure falls to zero on signal failure)

Rugged proven technology

Field replaceable parts

High performance and accuracy

Fast response and large flow capacity

Minimal temperature effect

Tight shut off

TECHNICAL DATA

Medium:
Compressed air filtered to 50 µm, dry and non-lubricated

Orifice (nominal):
2 mm

Output pressure (nominal):
0,2 to 1 bar (or PSI equivalent)

Supply pressure:
1,2 to 10 bar (or PSI equivalent)

Supply sensitivity:
Less than 0,1% span over full supply pressure range

Flow:
Max. 300 N l/min (see characteristic curves)

Air consumption:
< 2,5 N l/min at 50% signal

Ambient temperature:
-40°C to +85°C

Contact our technical service for use below +2°C

Temperature sensitivity:
Typically less than 0,035% of span/°C between
-40°C to +85°C

Response time:
1 second (from 0 to 90% or
100 to 10% of output pressure
into a 0,5 litre load)

Degree of protection:
IP 66, NEMA 4X (when mounted upright)

Linearity:
< 0,1% of span

Hysteresis:
< 0,1% of span

Vibration immunity:
Output pressure changes less than 3% for vibration amplitude 4mm 5-15Hz, 2g 15-150Hz

Weight:
2,07 kg

Calibration:
Independent control of 0% and 100% set points. Adjustable by potentiometers up to 20% of output range. Unit is factory calibrated to within 1% of span

Materials:
Body: aluminium and zinc diecasting
Diaphragms: nitrile
Black epoxy powder coating standard

Actuation	Port size	Max. flow (N l/min)	Output pressure	Port	MODELS
					
	G1/4	300	0,2 ... 1 bar	BSP	EX14001BJ4LE2
	G1/4	300	0,2 ... 1 bar	NPT	EX14001BK4LE2
	G1/4	300	3 ... 15 psi	BSP	EX14001PJ4LE2
	G1/4	300	3 ... 15 psi	NPT	EX14001PK4LE2

Electrical information

Electromagnetic compatibility	CE marked: conforms to EC requirements EN 50081-2 (1994) and EN 50082-2 (1995)
Electrical input signal	4 to 20 mA (two wire) Terminal voltage < 6,5 V @ 20 mA
Failure mode	Signal falls to below 15 mbar (0,2 psi) in < 2 sec, when input signal fails
Overload protection	100 mA max overload current
Insulation resistance	> 100 mΩ at 850 V d.c., electrical terminals to case
Tight shut off	Adjustable up to 4,5 mA to achieve tight shut off
Input Impedance	The impedance changes with applied current, because it's terminal voltage remains fairly constant, therefore 4 mA = approx 1370 Ω 12 mA = approx 470 Ω 20 mA = approx 290 Ω
Connections:	1/2" NPT or M 20; internal terminal block with capacity up to 2,5 mm² cable

For further information

i PDF CAD

www.norgren.com/info/en4-032

Certification

Certification agency	Explosion proof/ flame proof	Intrinsically safe	Type N/ non-incendive	Others
SIRA (CENELEC ATEX approved)	EEx d IIC T4 Ta=-20°C to +40°C EExd IIB+H2 T5/T6 Ta=-20°C to +80°C (T5) Ta=-20°C to +65°C (T6) Umax=30V Sira 01ATEX1006 2G(T4/T5/T6)/2D(95°C)	EEx ia IIC T4 Ta=-40°C to +85°C Ui=30V, Ii=110mA Pi=0.84W Ci=6nF, Li=100µH Sira 01ATEX2007X 1G(T4)/1D(95°C)	EEx nL IIC T5 Ta=-40°C to +85°C Ii=24mA Ci=6nF, Li=100µH Sira 01ATEX4008X 3G(T5)/3D(95°C)	
Factory MUTUAL	Class I, Division 1, Group B, C, D; T6, Ta=75°C; T5, Ta=85°C	Class I, II, III, Division 1, Group A, B, C, D, E, F, G; T4, Ta=85°C	Class I, Division 2, Group A, B, C, D; T6, Ta=75°C; T5, Ta=85°C	**Dust Ingress Protection:** Class II, III, Division 1, Group E, F, G; T6, Ta = 75°C; T5, Ta = 85°C **Suitable for:** Class II, III, Division 2, Group F, G; T6, Ta=75°C; T5, Ta=85°C
CSA	Class I, Group B, C, D; Class II, Group E, F, G; Class III; Ex d IIC; T4 Ex d IIB+H2; T5/T6	Class I, Group A, B, C, D; Class II, Group E, F, G; Class III; Ex ia IIC; T4	Class I, Division 2, Group A, B, C, D; Ex nL IIC; T5; Class II, Division 2, Group E, F, G; Class III	

OPTIONS SELECTOR

EX14001★★4★★★

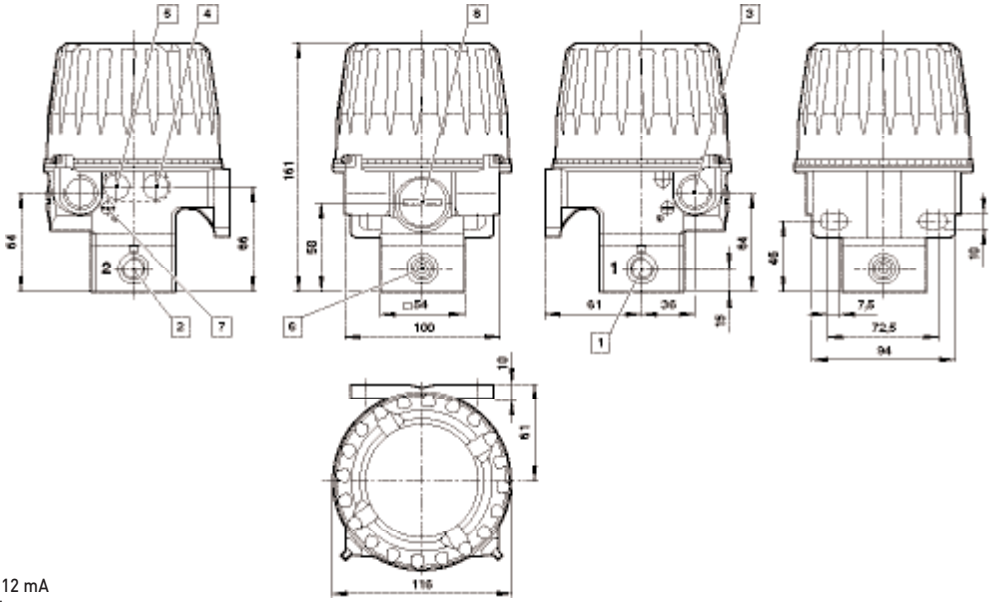
Output pressure	Substitute
0,2 ... 1 bar	B
3 ... 15 psi	P

Ports	Substitute
BSP	J
NPT	K

Certification	Substitute
Cenelec only (M 20 x 1,5)	LE2
Triple certification/ triple agency	EE1

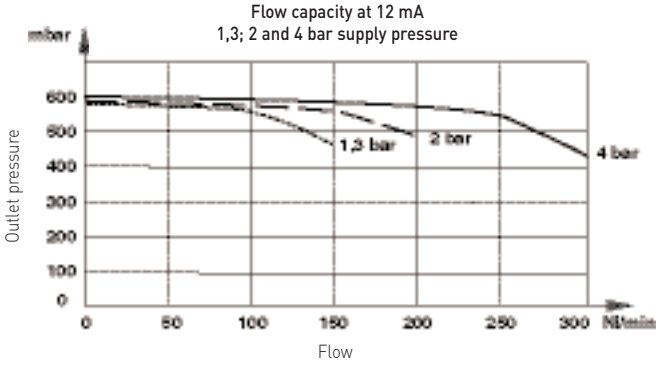
BASIC DIMENSIONS

1	Inlet port
2	Outlet port
3	Conduit entry (1/2 NPT standard)
4	Enclosed bleed port
5	Exhaust port
6	1/4" Gauge port
7	External earth
8	Air filter



CHARACTERISTIC CURVES

Flow capacity at 12 mA
1,3; 2 and 4 bar supply pressure



Proportional pressure control valve

422 failfreeze series

1/4 NPT

ATEX approved

Failfreeze operation (output pressure retained on power failure)

High performance & accuracy

Rugged proven technology

Advanced electronic control

Vibration immune

IP65 environment protection

TECHNICAL DATA

Medium:
Compressed air filtered to 5 µm, dry and non-lubricated

Orifice (nominal):
2 mm

Output pressure (nominal):
0,2 to 1 bar, standard low pressure unit
0,2 to 8 bar, standard high pressure unit
(or PSI equivalent)

Supply pressure:
At least 0,7 bar above maximum required output pressure (or PSI equivalent)

Supply sensitivity:
Negligible effect

Flow:
Max. 300 N l/min (see characteristic curves)

Air consumption:
0,2 l/min typical low pressure unit
0,4 l/min typical high pressure unit

Ambient temperature:
-20°C to +70°C
Contact our technical service for use below +2°C

Temperature sensitivity:
Typically less than 1% of span/°C between -10°C and +60°C

Response time:
6 seconds, low pressure unit
12 seconds, high pressure unit
(from 10 to 90% of output pressure into a 2 litre load)

Degree of protection:
IP 65

Linearity:
< 0,5% of span

Hysteresis:
< 0,1% of span

Vibration immunity:
Negligible effect for vibration level up to 3g, 5-500Hz

Weight:
0,80 kg

Materials:
Body: zinc diecasting passivated and epoxy painted
Cover: Verton glass/nylon
Diaphragms: nitrile

Actuation	Port size	Max. flow (N l/min)	Output pressure	MODELS
				
	1/4 NPT	300	0,2 ... 8 bar	**AC2100**
	1/4 NPT	300	0,2 ... 1 bar	**AC2400**
	1/4 NPT	300	3 ... 120 psi	**AC0400**
	1/4 NPT	300	3 ... 15 psi	**AC0100**

For further information

www.norgren.com/info/en4-034

Electrical information

Electromagnetic compatibility	Compliant and CE marked in accordance with the EC Directive 89/336/EEC Compatibility Tested to standards: BS EN50082-2: 1995, BS EN50081-2: 1994
Electrical input signal	4 to 20 mA (two wire) Load presents 6 volts (± 0,5 V) constant voltage drop to the current source at 20 mA
Failure mode	Output pressure held at previous value when input signal fails; drift rate 0,02% in 30 seconds
Span / Zero	Adjustable 20% output range
Connections:	30 mm square connector DIN EN 175 301-803, form A (DIN 43650) provided, mountable in four directions

Certification

Certification agency	Hazardous area approvals
ATEX approved	Intrinsically safe applications to EN50020:2002 with x II 1G EEx ia IIC T4 (Ta= -40°C to +80°C)
	Type nL applications to EN50021:1999 with x II 3G EEx nL IIC T6 (Ta = -40°C to +70°C)

OPTIONS SELECTOR

AC★★★★

Pressure unit	Substitute
Bar	2
Psi	0

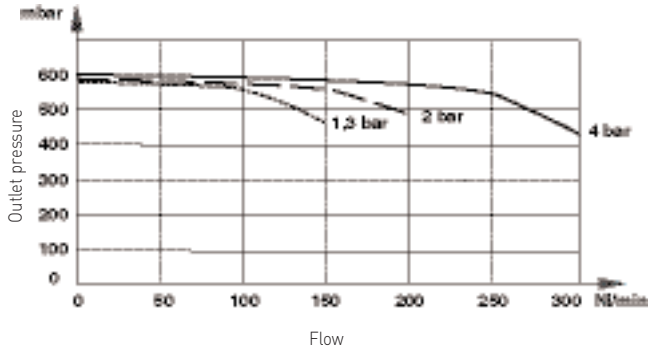
Output pressure	Substitute
0,2 ... 1 bar/ 3 ... 15 psi	1
0,2 ... 8 bar/ 3 ... 120 psi	4

Captured bleed	Substitute
Without	0
With	1

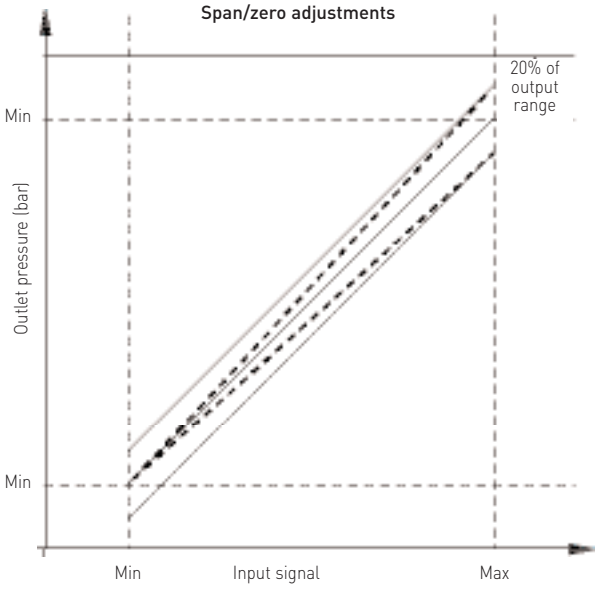
Intrinsically safe	Substitute
Without	0
With	1

CHARACTERISTIC CURVES

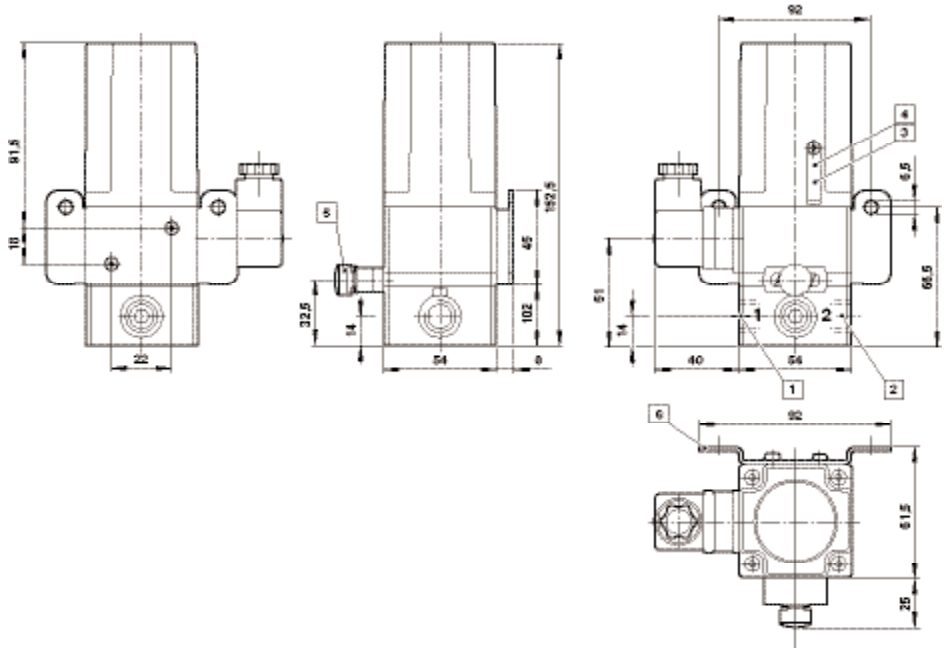
Flow capacity at 12 mA
1,3; 2 and 4 bar supply pressure



Span/zero adjustments



BASIC DIMENSIONS

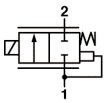


1	Inlet port
2	Outlet port
3	Adjust span
4	Adjust zero
5	Exhaust port
6	Bracket supplied as standard

Proportional solenoid valve

Flatprop 16 mm

0,2 to 4,5 mm orifice



2/2 NC
Pressure compensated

2/2 NC

Frictionless and compact design

High flow rate

Low power consumption

Long life – in excess of 100 million cycles (triangular signal, not on/off)

TECHNICAL DATA

Medium:
air and neutral gases

Operation:
Direct acting seat valve or pressure compensated with spring return

Orifice:
0,2; 0,8; 1,6; 4,5 mm

Operating pressure:
0 to 12 bar
Back pressure < 10% of the inlet pressure*

* For pressure compensated models. Allowed backpressure may be higher in direct acting models.

Flow:
Up to 195 N l/min (see characteristic curves)

Fluid temperature:
10°C to +50°C

Ambient temperature:
10°C to +50°C

Weight:
Cartridge: 50g
Sub-base mounted: 55g

Materials:
Body: brass, stainless steel PEEK (flange mounted models only)
Lid and end cover: zinc diecast, nylon
Seat seal: NBR
Actuator: stainless steel

Conection	Orifice (mm)	Flow (N l/min)	kv*	Operating pressure (bar)	Function	Current / resistance	Power consumption	MODELS
								
Cartridge	0,2	2	0,025	0 ... 12	NC	42 mA / 288 Ohm	0,5 W	**12-216C-00220+D3WFIL+BDO**
Cartridge	0,8	23	0,330	0 ... 10	NC	211 mA / 57 Ohm	2,5 W	**12-216C-01-20+D3WFIL+BED**
Cartridge	1,6	55	0,800	0 ... 5	NC	211 mA / 57 Ohm	2,5 W	**12-216C-03-20+D3WFIL+BED**
Cartridge	4,5	195	2,800	0 ... 7	NC	211 mA / 57 Ohm	2,5 W	**12-216C-04520+EQIFIL+BED**
Flange	0,2	2	0,025	0 ... 12	NC	42 mA / 288 Ohm	0,5W	**12-216P-00220+D3WFIL+BDO**
Flange	0,8	23	0,330	0 ... 10	NC	211 mA / 57 Ohm	2,5 W	**12-216P-01-20+D3WFIL+BED**
Flange	1,6	55	0,800	0 ... 5	NC	211 mA / 57 Ohm	2,5 W	**12-216P-03-20+D3WFIL+BED**
Flange	4,5	195	2,800	0 ... 7	NC	211 mA / 57 Ohm	2,5 W	**12-216P-04520+EQIFIL+BED**

* kv (l/min) is not constant over the entire pressure range. Please see diagrams for details

Electrical information

Rated voltage (U max.) *	12V (18V) - Other voltages available on request
Electrical insulation	1000 V a.c.
Insulation class	F (155 °C)
Electrical connection	300 mm long wire (other connections upon request)

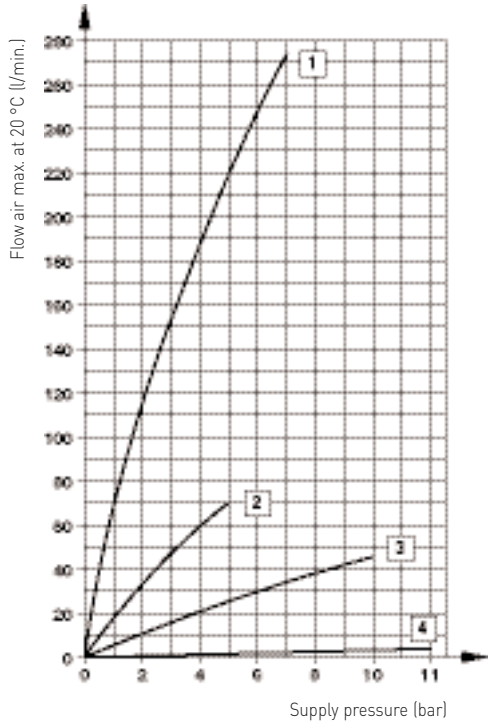
* Depending on the ambient temperature, the voltage can increase by up to 50%

For further information

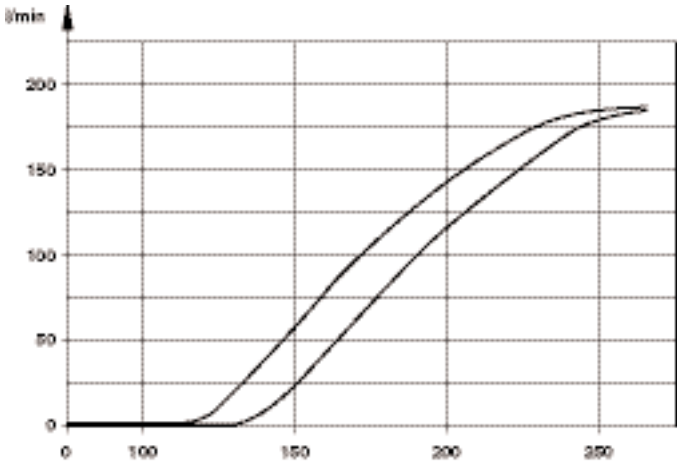
i PDF CAD

www.norgren.com/info/en4-036

FLOW CHARACTERISTIC



Hysteresis example

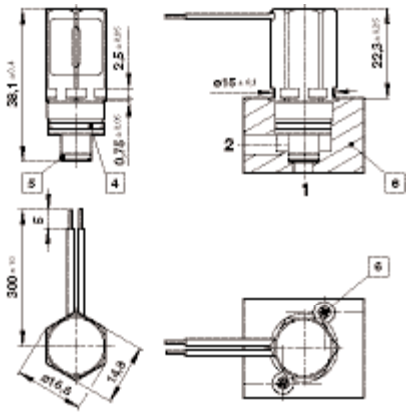


1	Orifice 4,5 mm, kv 2,8
2	Orifice 1,6 mm, kv 0,8
3	Orifice 0,8 mm, kv 0,33
4	Orifice 0,2 mm, kv 0,025

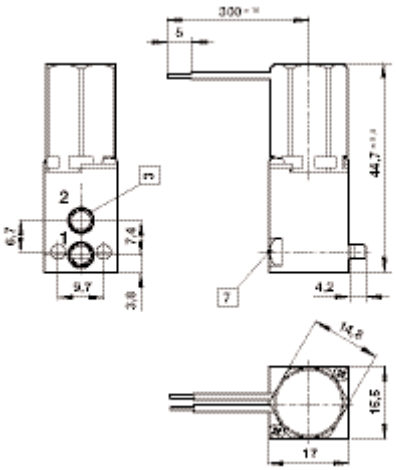
Further options on request
- Other orifice sizes
- Other voltages

BASIC DIMENSIONS

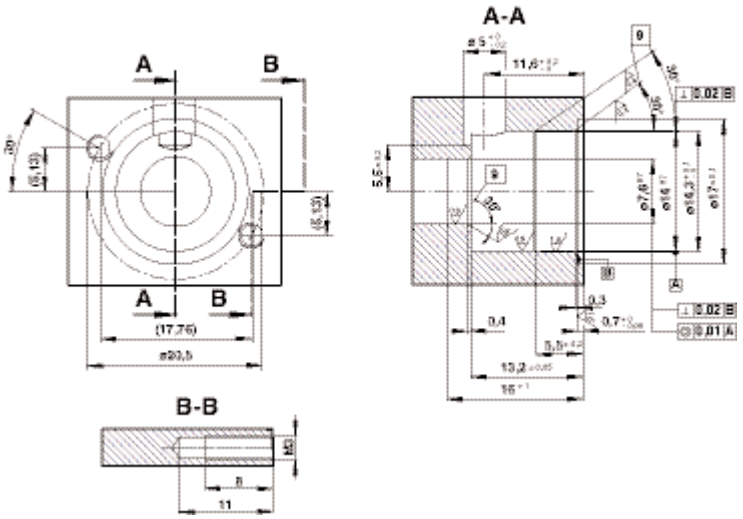
Cartridge valve



Sub-base valve



Cartridge fitting dimensions



3	O-ring 4 x 1 (2x)
4	O-ring 12 x 1 (1x)
5	O-ring 6 x 1 (1x)
6	Screw, M3 x 6 (2x)
7	Screw, M3 x 18 (2x)
8	Base plate, not included
9	Burr-free

Dimensions in mm