VP60, 5/3
Proportional flow and directional control spool valve

- Nominal size: 8 mm
- High flow rate - low pressure loss
- Calibrated, linear flow characteristic with zero crossover
- Variety of setpoint input: 4 to 20 mA, 0 to 10 V, ±5 V, IO-Link
- Instant dynamic response

Technical features

Medium:
Air acc. to ISO8573-1
Grouping: 2-3-1, filtered (recommended < 3 µm), dried, non lubricated.
The dynamic performance and service life of the valve may be significantly reduced if using unfiltered air containing water and oil!

Operating pressure on all ports:
-1 ... 16 bar (-14 ... 232 psi)

Pneumatical flow coeff.:
C = 290 Nl/(min bar)

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

Calibrated flow rate (Qmax.):
1200 Nl/min at P1 = 6 bar (87 psi), P2, P4 = 5 bar (72 psi)
Imperial vals. for 8 Nl/min -> 0.0081 Cv

Leakage:
Typical value: 8 Nl/min
at (P1 = 10 bar (145 psi), P2/P4 = 0 bar)

Port size:
G1/4, 1/4 NPT or flange mounted according ISO 1

Spool deadtime:
3 ms max

Risetime 10 ... 90%:
5 ms

Threshold frequency -3dB:
105 Hz

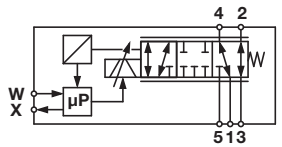
Service life:
> 250 million full stroke operations with recommended air quality

Ambient/Media temperature:
Ambient:
0 ... +60°C (+32 ... +140°F)
Media:
+5 ... +60°C (+41 ... +140°F)

Storage temperature:
-20 ... +80°C (-4 ... +176°F)
Condensation not permitted!
Air supply must be dry enough to avoid ice formation at temperatures below +5°C (+41°F).

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

Technical data, standard model

Symbol	Pneumatic Port	Flow (l/min)	Set point (input)	Actual value (output)	Weight (kg)	Model
	G1/4	1200	4 ... 20 mA	0 ... 10 V, 4 ... 20 mA	1,25	VP6010LJ461MB200
	G1/4	1200	-5 ... +5 V	0 ... 10 V, 4 ... 20 mA	1,25	VP6010LJ661MB200
	G1/4	1200	0 ... 10 V	0 ... 10 V, 4 ... 20 mA	1,25	VP6010LJ761MB200
	G1/4	1200	IO-Link	IO-Link	1,25	VP6010LJLL1MB200
	1/4 NPT	1200	IO-Link	IO-Link	1,25	VP6010LKLL1MB200

Option selector

VP6010L★★★1★B200

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

Set point	Substitute
4 ... 20 mA	4
-5 V ... +5 V differential	6
0 ... 10 V differential	7
IO-Link	L

Electrical connection	Substitute
M12 8 pin analogue Version 5 pin IO-Link Version	M

Output	Substitute
0 ... 10 V/4 ... 20 mA	6
IO-Link	L

Note: Analogue configurations not applicable to IO-Link variant.

Construction data:

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 EN 60068-2-67, 30g /18 schocks.

Weight:
1,25 kg

Electrical parameters

Supply voltage (Ub):
21 ... 32 V d.c.

Residual ripple:
10%

Switch-on point:
21 V

Switch-off point:
18 V

Voltage across diff. inputs:
-10 ... +32 V

Current input:
4 ... 20 mA

Working resistance:
500Ω

Differential voltage input:
± 5 V
0 ... 10 V

Internal impedance:
> 100 kΩ

Current output:
4 ... 20 mA

Voltage output:
0 ... 10 V

Current consumption at 24 V setpoint, static:
0,2 A

Setpoint ±100%, 50 Hz sinus:
0,4 A

abs. max. for 10s:
1,5 A

IO-Link Port class:
B

Accessories

Connection cables - Analogue versions

Description	Model
M12x1, 8 pin, 5 meter long, open end - straight	0250811
M12x1, 8 pin, 5 meter long, open end - 90°	0250813

Note: Cable material PUR shielded

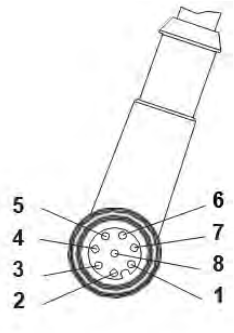
Analogue version
serial interface cable

Description	Model
USB-C Adaptor cable	0253875

Connection cables - IO-Link versions

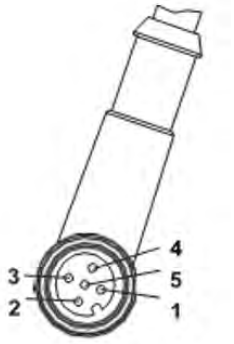
Description	Model
Cable 5 Pin A-coded M12 - M12 x 0.6 metre long	NC-125FS-125MS-A
Cable 5 Pin A-coded M12 - M12 x 1 metre long	NC-125FS-125MS-1
Cable 5 Pin A-coded M12 - M12 x 2 metre long	NC-125FS-125MS-2
Cable 5 Pin A-coded M12 - M12 x 5 metre long	NC-125FS-125MS-5
Cable 5 Pin A-coded M12 - Open End x 5 metre long	NC-125FS-00000-5

Pin assignment analogue version:



Pin	Colour	Name	Function
1	white	Iin	Setpoint input, current 4 ... 20 mA (500 Ω working resistor to GND)
2	brown	Fault	Fault output (current limited to 15 mA from Ub)
3	green	-Ud	Setpoint input, differential voltage, reference potential
4	yellow	+Ud	Setpoint input, differential voltage, 0 ... 10 V / ± 5 V signal
5	grey	Iout	Current output, actual value, 4 ... 20 mA from Ub
6	pink	Ub	Supply voltage +24 V d.c.
7	blue	GND	Supply ground GND
8	red	Uout	Voltage output, actual value 0 ... 10 V (referenced to GND)

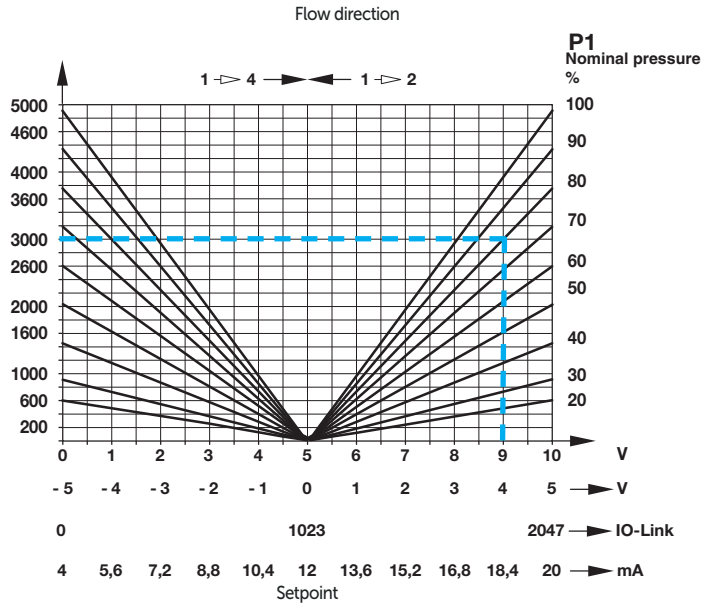
Pin assignment IO-Link version



Pin	Colour (typ.)	Function
1	brown	Supply voltage +24V (Vs)
2	white	Supply voltage 2L+ (VA)
3	blue	Supply ground (Vs GND)
4	black	Signal (C/Q)
5	gr/(gn/ge)	Supply ground 2M (VA GND)

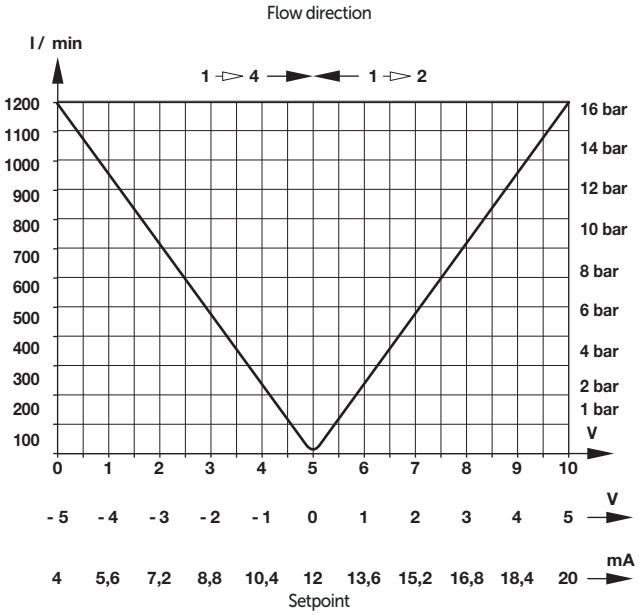
Curve
Maximum flow rates: p1 in % of Pmax → p2/p4 = 0 bar
(free flow to atmosphere)
- Horizontal axis: setpoint (V / mA / digit)
- Vertical right axis: pressure p1 in % of pmax in bar (16 bar = 100%)
- Vertical left axis: resulting flow rate in Nl/min depending on setpoint and p1

Example :
Setpoint 9 V / p1 = 80% = 12.8 bar / flow rate = 3000 Nl/min



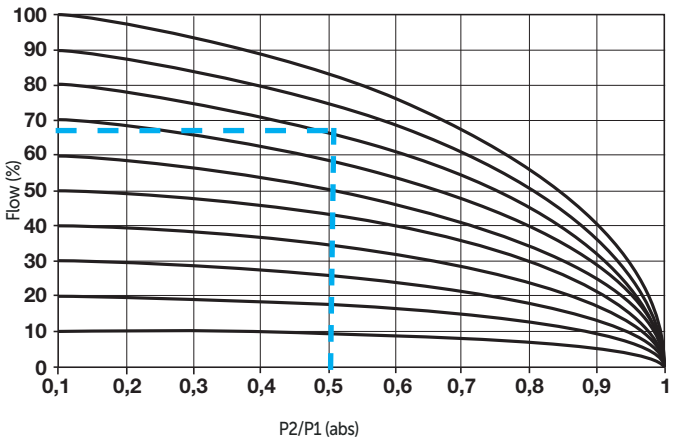
Curve
Calibrated flow: p1 = 6 bar → p2 / p4 = 5 bar
(flow with defined pressure drop)
- Horizontal axis: setpoint (V / mA / numbers)
- Vertical left axis: resulting flow rate in Nl/min depending on the setpoint at p1 = 6 bar

Example:
Setpoint 7.5 V / p1 = 6 bar / flow rate = 600 Nl/min



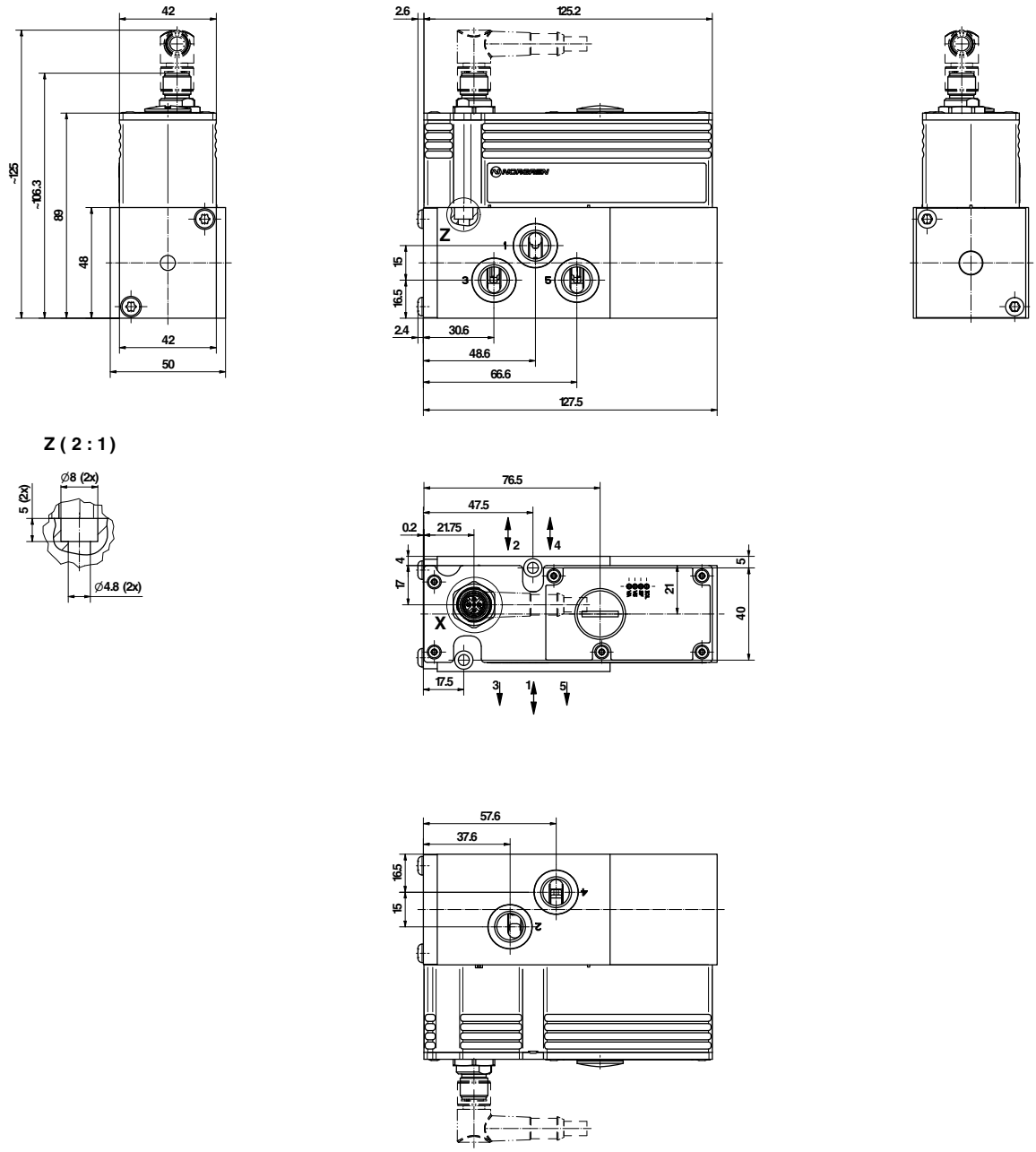
Flow-rate as a function of the pressure ratio P2/P1 for setpoint values 10, 20, ...100%

Curve
Flow depending on the pressure ratio P2/P1 at setpoints 10, 20, up to 100%
Example:
Input pressure 8 bar (P1);
Outlet pressure 4 bar (P2) = 4/8 = 0.5 (pressure ratio)



Basic dimensions
Standard model G1/4 and 1/4 NPT

Dimensions in mm
Projection/First angle



1 Valves are delivered with M4 x 50 mounting screws

Warning

These products are intended for use in industrial compressed air systems only. Do not use these products where pressures and temperatures can exceed those listed under »**Technical features/ data**«.
Before using these products with fluids other than those specified, for non-industrial applications, life-support systems or other applications not within published specifications, consult Norgren Ltd.

Through misuse, age, or malfunction, components used in fluid power systems can fail in various modes.

The system designer is warned to consider the failure modes of all component parts used in fluid power systems and to provide adequate safeguards to prevent personal injury or damage to equipment in the event of such failure.
System designers must provide a warning to end users in the system instructional manual if protection against a failure mode cannot be adequately provided.
System designers and end users are cautioned to review specific warnings found in instruction sheets packed and shipped with these products.