Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Ноябрьск (3496)41-32-12
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Саранск (8342)22-96-24
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70 Казахстан +7(7172)727-132 Киргизия +996(312)96-26-47

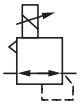
www.norgren.nt-rt.ru | | ner@nt-rt.ru

Технические характеристики на пропорциональные клапаны Watson Smith 100X, 140 Failsafe, VP10, VP12, VP23, VP50, VP51, VP60 компании IMI NORGREN

Виды товаров: трехходовые клапаны с замкнутым контуром, клапаны без уплотнений и пневматической пилотной технологии с цифровым дисплеем, клапаны с низкой потребляемой мощностью, 5/3 регулирующие расход клапаны с разомкнутым контуром, цифровые клапаны с замкнутым контуром, клапаны с микропроцессорным управлением, миниатюрные конверторы.

VP12
Miniature propotional pressure control valve

- **Port size: 1/8" (ISO G, NPT)**
- **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 wire**



Technical features

Medium:
Compressed air filtered to 5 µm, oil free and dry air
Output (nominal) pressure:
0 ... 1 bar (0 ... 14,5 psi),
0 ... 2 bar (0 ... 30 psi),
0 ... 4 bar (0 ... 58 psi),
0 ... 6 bar (0 ... 90 psi) and
0 ... 8 bar (0 ... 116 psi)
Supply pressure:
At least 1,5 bar (21 psi) above maximum required output pressure
Supply sensitivity:
Less than 0,2 bar/3 psi for 1 bar/15 psi supply pressure change
Flow capacity:
Up to 200 N l/min
(see characteristic curves)
Air consumption:
≤ 6 bar/90 psi ≤ 3 Nl/min (Typical)
8 bar/120 psi ≤ 10 Nl/min (Typical)
Response time:
< 500 ms (from 0 ... 100% or
< 150 ms (from 100 ... 0% of output pressure into a 10cc load)
Degree of protection:
IP20
Linearity:
< 1,5% of span
Hysteresis and deadband:
< 1% of span
Vibration & shock immunity:
< 3% output shift for ± 2 g
15-150 Hz
Ambient/Media temperature:
0 ... +60°C (+32 ... 140°F)
Air supply must be dry enough to avoid ice formation at temperatures below +2°C (+35°F)
Temperature effect:
14 mbar max/°C change in temperature
Weight:
0,20 kg
Materials:
Body: zinc casting & nylon
Diaphragms: NBR

Electrical details

Electrical input signal	2-pin versions 4 to 20 mA or 1 to 10 V 3-pin versions require 12 to 24 V d.c. supply
Electrical power input	24 V d.c. ±10%
Failure mode	Output pressure falls to bleed pressure when electrical supply fails
Loop resistance	2 wire version; 250 Ω max

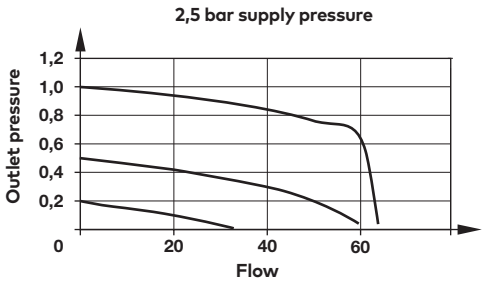
Option selector

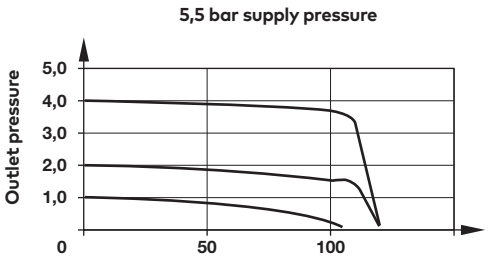
VP12★★★★★0★Q00

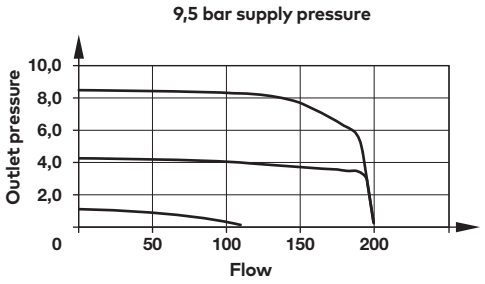
Output pressure	Substitute
0 ... 1 bar/15 psi	**01**
0 ... 2 bar/30 psi	**02**
0 ... 4 bar/60 psi*	**04**
0 ... 6 bar/90 psi*	**06**
0 ... 8 bar/120 psi*	**08**
Unit for pressure	**Substitute**
bar	**B**
psi	**P**

Wire options	Substitute
2	**0**
3 (24 V d.c. supply)	**1**
Input signal	**Substitute**
0 ... 10 V	**1**
4 ... 20 mA	**4**
Port size	**Substitute**
G 1/8	**G**
NPT 1/8	**H**
Manifold	**X**

Characteristic curves

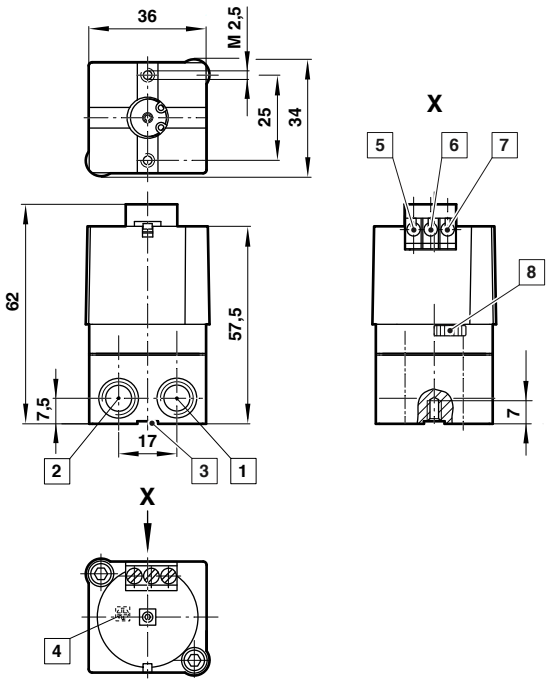




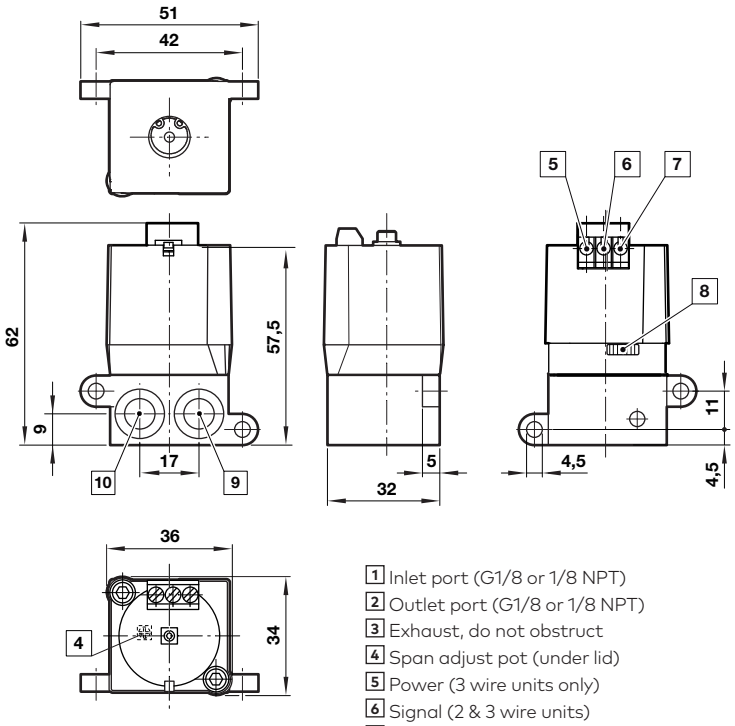


Dimensions in mm
Projection/First angle

Basic dimensions
Standard version



Manifold version



1 Inlet port (G1/8 or 1/8 NPT)
2 Outlet port (G1/8 or 1/8 NPT)
3 Exhaust, do not obstruct
4 Span adjust pot (under lid)
5 Power (3 wire units only)
6 Signal (2 & 3 wire units)
7 Common (2 & 3 wire units)
8 Adjust zero
9 Inlet port (11,1 ID x 1,6 CS O-ring supplied)
10 Outlet port (11,1 ID x 1,6 CS O-ring supplied)

Warning

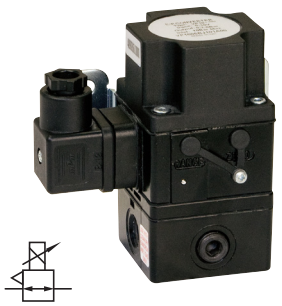
These products are intended for use in industrial compressed air systems only. Do not use these products where pressures and temperatures can exceed those listed under »**Technical features/ data**«.
Before using these products with fluids other than those specified, for non-industrial applications,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

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.

VP10
Proportional pressure control valves

- **Port size: 1/4" (ISO G or NPT)**
- **Reliable, rugged, open loop control**
- **Proportional I/P and E/P converters**
- **Minimum vibration effects**
- **IP65 environmental protection**
- **Mounting bracket and connector included**



Technical features

Medium:
Oil free, dry air, filtered to 5 µm
Output Pressure:
0,2 ... 1 bar (2,9 ... 14 psi)
0,2 ... 2 bar (2,9 ... 29 psi)
0,2 ... 4 bar (2,9 ... 58 psi)
0,2 ... 8 bar (2,9 ... 116 psi)
See ordering options
Supply pressure:
At least 0,7 bar (10 psi) above max. required output pressure.
up to 2 bar (29 psi) instruments: max 5 bar (72 psi)
up to 8 bar (116 psi) instruments: max 10 bar (145 psi)
Flow capacity:
> 300Nl/min forward & relief flow
Air consumption:
up to 1 bar (1 psi): 2,8 Nl/min
up to 2 bar (29 psi): 4,0 Nl/min
up to 4 bar (58 psi): 7,5 Nl/min
up to 8 bar (116 psi): 9,0 Nl/min
Linearity:
≤ 0,5% of span
Hysteresis:
≤ 0,5% of span
Response Time:
<0,35 seconds for 10 .... 90% or 90 ...10% of output pressure into a 10cc load (1 bar range instruments)
Temperature Sensitivity:
< 0,1% of span/°C between -40 ... +85°C (-40 ... 185°F)
Supply sensitivity:
<0,075% span output change per % supply pressure change
Port sizes:
Main ports:
G 1/4 or 1/4 NPT
Integral gauge ports:
G 1/4 or 1/4 NPT
Ambient/Media temperatur:
-40 ... +85°C (-40 ... 185°F)
Air supply must be dry enough to avoid ice formation at temperatures below +2°C (+35°F)
I.P. Rating:
IP65 in normal operation
Weight:
1,0 kg
Mounting Position:
Surface mounting bracket provided.
Alternative mounting options available.
Vibration Effect:
5% of span: 4mmp-p 5 ... 15Hz and 2g sine 15 ... 150Hz.
Materials:
Body: Passivated zinc die-casting, epoxy painted
Cover: Glass reinforced PA
Diaphragms: NBR

Electrical parameters

Input Signal	mA versions 1 ... 4 bar: 2 wire 4 ... 20 mA; 3 wire 4 ... 20 mA +12 ... 24 V mA versions 6 ... 8 bar: 3 wire 4 ... 20 mA +12 ... 24 V voltage versions 1 ... 4 bar: 2 wire 0 ... 10 V; 3 wire 0 ... 10 V +12 ... 24 V voltage versions 6 ... 8 bar: 3 wire 0 ... 10 V +12 ... 24 V
Failure Mode	Output pressure falls to zero signal state when electrical supply fails
Connections	30 mm square connector provided (DIN 43650, form A) mountable in four orientations
Span/Zero	Adjustable up to 20 % output range - further information available

Option selector

VP10★★★★★0★A00

Pressure range	Substitute
0,2 ... 1 bar / 3 ... 15 psi	**01**
0,2 ... 2 bar / 3 ... 30 psi	**02**
0,2 ... 4 bar / 3 ... 60 psi	**04**
0,2 ... 6 bar / 3 ... 90 psi	**06**
0,2 ... 8 bar / 3 ... 120 psi	**08**

Unit of Measure	Substitute
bar	**B**
psi	**P**

Power supply	Substitute
None requied	**0**
12 / 24 V (Required for 6 & 8 bar units)	**1**

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

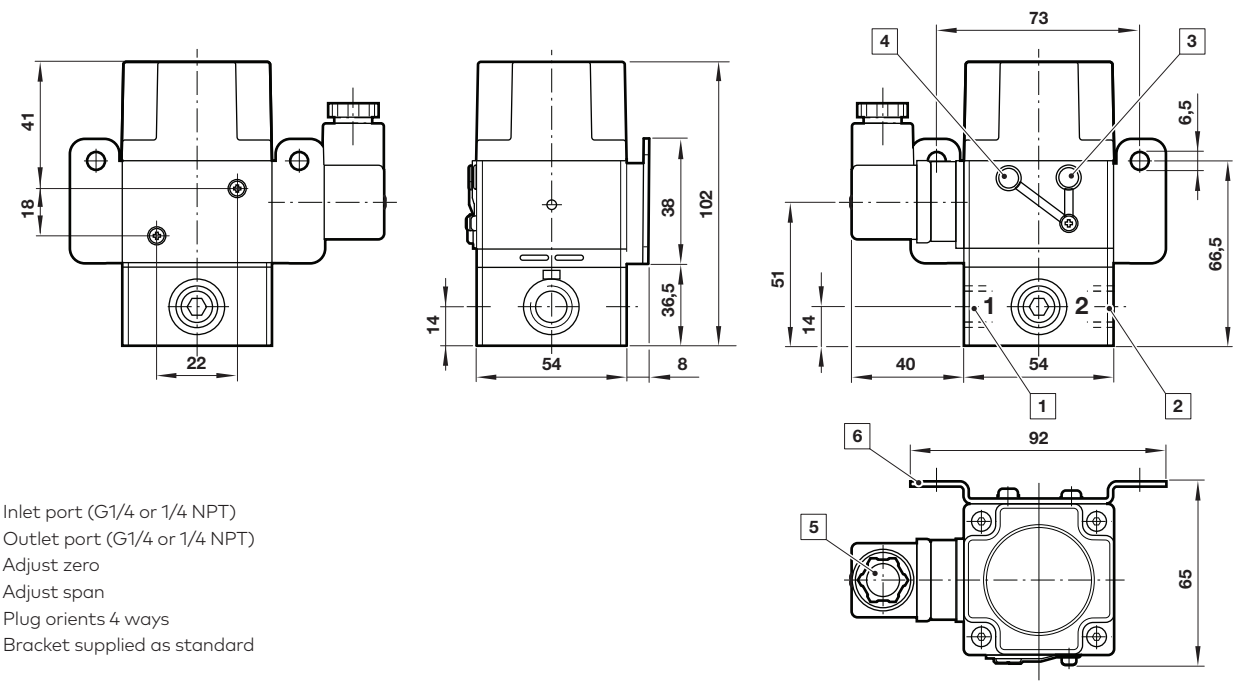
Port size	Substitute
1/4 NPT	**K**
1/4 BSP	**J**

Other options available:

- Alternative input signal ranges
- Alternative pressure ranges
- Flying Leads
- Conduit entry with flying leads
- Junction box (M20 / ½" NPT)
- Intrinsically safe certification
- 50 mm pipe mounting bracket
- Captured exhaust
- Reverse acting
- Split range

Dimensions

Dimensions in mm
Projection/First angle



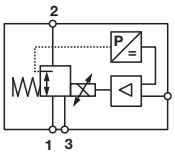
1 Inlet port (G1/4 or 1/4 NPT)
2 Outlet port (G1/4 or 1/4 NPT)
3 Adjust zero
4 Adjust span
5 Plug orients 4 ways
6 Bracket supplied as standard

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.
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.

- **Port size: 1/4” (ISO G or NPT) or manifold**
- **Closed-loop air piloted proportional pressure control valve**
- **High flow**
- **Excellent performance characteristics**
- **Fast response time**
- **Adjustable gain and pressure range**
- **Low power consumption**
- **Feedback signal**
- **Manifold mountable**



Technical features

Medium:
Compressed dry air,
oil free filtered to 5 µm.
Operation:
Air piloted spool valve with integrated electronic pressure control
Output (nominal) pressure:
Standard units:
0 ... 2 bar, (0 … 30 psi);
0 ... 4 bar, (0 … 60 psi);
0 ... 6 bar, (0 … 90 psi);
0 ... 8 bar, (0 … 120 psi);
0 ... 10 bar, (0 … 150 psi)
Vacuum units:
-1 ... 1 bar (-15 ... 15 psi)
Supply pressure:
Minimum 2 bar (29 psi) above maximum output required.
Standard units: 12 bar max. (174 psi)
Vacuum units: 6 bar max. (90 psi)

Air Supply sensitivity:
Better than 0,75% span output change per bar supply pressure change
Flow:
Standard units up to 1400 N l/min (see characteristic curves)
Vacuum units up to 300 N l/min
Air consumption:
< 5 N l/min
Ambient/Media temperature:
0 ... +50°C (+32 ... 122°F)
Air supply must be dry enough to avoid ice formation at temperatures below +2°C (+35°F)
Temperature Sensitivity:
Typically better than
0,03% span/°C

Degree of protection:
IP65 in normal operation [exhaust and baffle protected from water ingress at temperatures <+5°C (+41°F)]
Linearity:
< 1%
Hysteresis and deadband:
< 1%
Response Time:
< 80 ms (from 10 ... 90% of output pressure into a 0,1 litre load).
Vibration & shock immunity:
< 3% span
0,75 m/s^2, 5 ... 150Hz,
1 m/s^2, 5 ... 150Hz
Weight:
0,55 kg

Materials:
Body: Aluminium
Lid: Zinc die cast,
Front cover: Grivory
End cap: PA

Maintenance:
No maintenace required
Calibration:
Gain, Span, Zero

Electrical details

Electromagnetic compatibility	Conforms to EC requirements EN 50081-2 (1994) and EN 50082-2 (1995)
Electrical input signal	4 ... 20 mA or 0 ... 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, <±1% Accuracy
Connections	M12x1, 5-pin

Standard proportional valves
Option selector

VP50★★★★★11H00

Output pressure	Substitute
0 ... 2 bar/30 psi	02
0 ... 4 bar/60 psi	04
0 ... 6 bar/90 psi	06
0 ... 8 bar/120 psi	08
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

Vacuum proportional valves
- 1 ... 1 bar (-15 ... 15 psi)

Option selector

VP50★★★★★11HV1

Absolute pressure range	Substitute
0 ... 2 bar/30 psi	02
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

Connecting plugs

Elbow connector M12 x 1

Page 4

0250081

Manifold mount assembly to ISO 2 sub base

Single manifold

Page 4

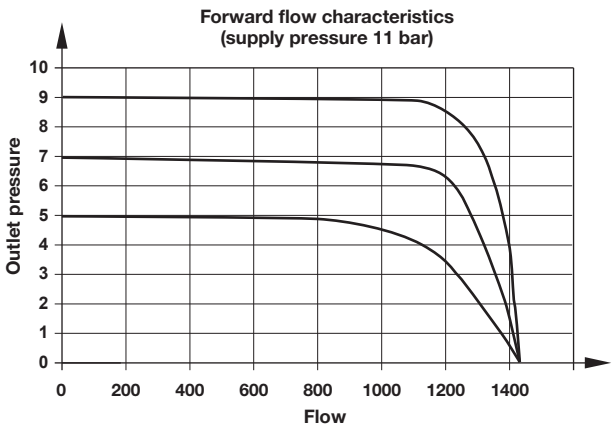
ZZ5M00

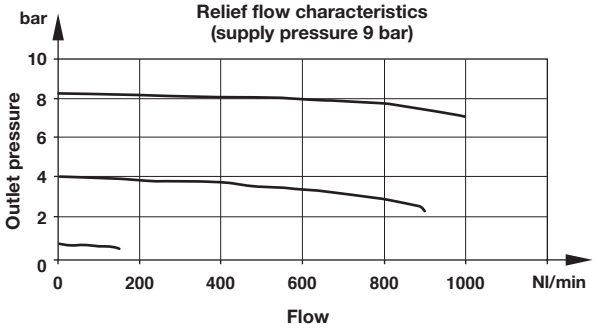
O-rings, flat seal and screws are included

Electrical connector pin looking into the end of the instrument

Pin-No.	Function
1	+24 V d.c. supply
2	0 ... 10 V feedback
3	Control signal (+VE)
4	Common (supply signal and feedback return)
5	Chassis

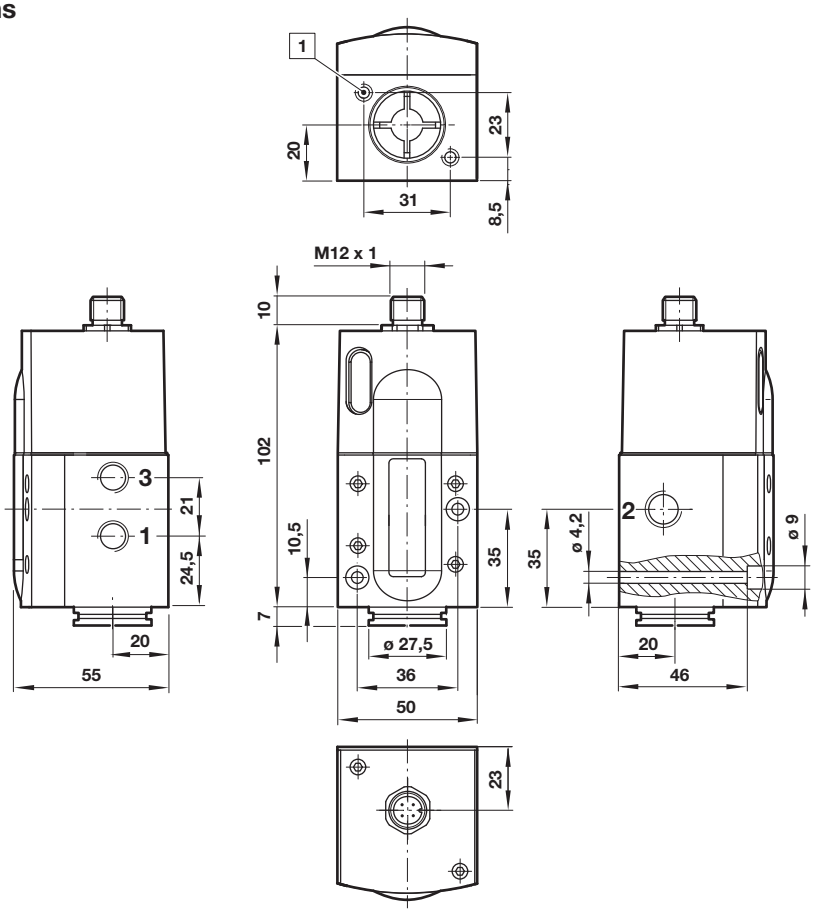
Characteristic curves (standard units)





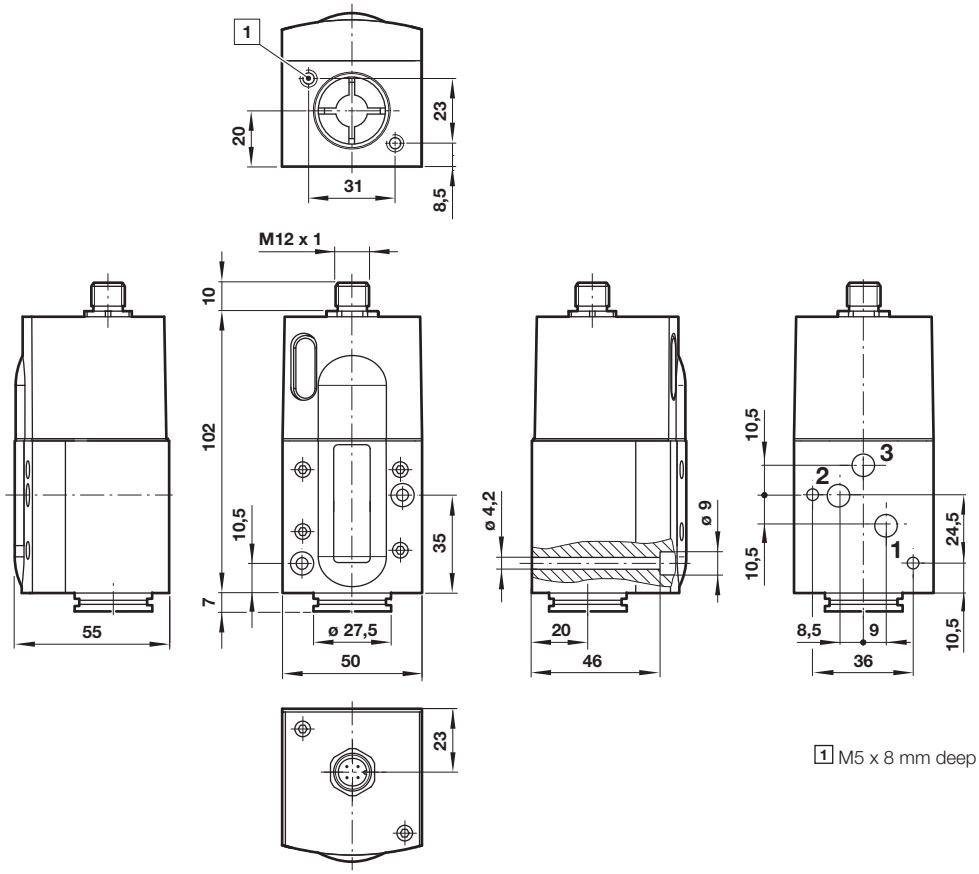
Basic dimensions

Dimensions in mm
Projection/First angle



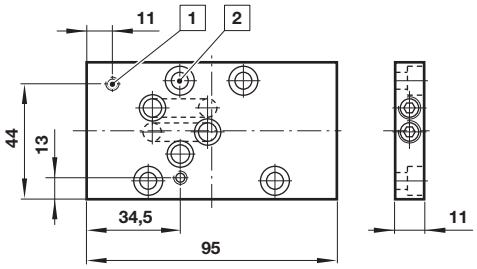
1 M5 x 8 mm deep

VP50 with manifold surface



1 M5 x 8 mm deep

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

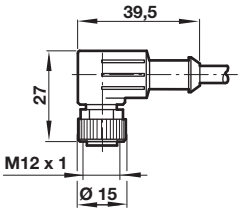


1 Two screws M4 x 50 mm deep to mount the VP50 onto the manifold
2 Four screws M6x16 mm deep to mount the manifold onto the iso subbase

Connector

Model: 0250081

Dimensions in mm
Projection/First angle



Connector, 90°
M12 x 1, 5 pin, female,
5 m cable length, A coded

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 IMI NORGREN.

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.

- **Port size: 1/4” (ISO G/NPT)**
- **Reliable, rugged, open loop control**
- **Proportional I/P and E/P converters**
- **ATEX certified units are available as intrinsically safe**
- **Minimum vibration effects**
- **IP65 environmental protection**
- **Mounting bracket and connector included**

Technical features

Medium:
Oil free, dry air, filtered to 5 µm
Output Pressure:
100X: 0,2 ... 1 bar (2,9 ... 14 psi),
3 ... 15 (0,2 ... 1 bar)
3 ... 27 psi (0,2 ... 1,8 psi)
101X: 0,14 ... 8 bar (2 ... 116 psi)
2 ... 120 (0,1 ... 8 bar)
Supply pressure:
At least 0,7 bar (10 psi) above maximum required output pressure.
max. 5 bar(72 psi)
Flow capacity:
> 300Nl/min forward & relief flow
Air consumption:
up to 1 bar (15 psi): 2,8 Nl/min
up to 2 bar (27 psi): 4,0 Nl/min
Linearity:
< 0,5% of span

Hysteresis:
< 0,5% of span
Response Time:
<0,35 seconds for 10 .... 90% or 90 ...10% of output pressure into a 10cc load (1 bar range instruments)
Temperature Sensitivity:
< 0,1% of span/°C between -40 ... +85°C
Supply sensitivity:
<0,075% span output change per % supply pressure change
Port sizes:
Main ports: G 1/4 or 1/4 NPT
Integral gauge ports: G 1/4 or 1/4 NPT

Ambient/Media Temperature:
-40 ... +85°C (-40 ... +185°F)
Air supply must be dry enough to avoid ice formation at temperatures below +2°C (+35°F).
I.P. Rating:
IP65 in normal operation
Weight:
1,0 kg
Mounting Position:
Surface mounting bracket provided.
Alternative mounting options available
Vibration Effect:
5% of span: 4mmp-p 5 ... 15Hz and 2g sine 15 ... 150Hz.

Materials:
Body: Passivated zinc die-casting, epoxy painted
Cover: Glass reinforced nylon
Diaphragms: NBR

Electrical parameters

Input Signal	mA versions 1 ... 4 bar: 2 wire 4 ... 20 mA; 3 wire 4 ... 20 mA +12 ... 24 V mA versions 6 ... 8 bar: 3 wire 4 ... 20 mA +12 ... 24 V voltage versions 1 ... 4 bar: 2 wire 0 ... 10 V; 3 wire 0 ... 10 V +12 ... 24 V voltage versions 6 ... 8 bar: 3 wire 0 ... 10 V +12 ... 24 V
Failure Mode	Output pressure falls to zero signal state when electrical supply fails
Connections	30 mm square connector provided (DIN 43650, form A) mountable in four orientations
Span/Zero	Adjustable up to 20 % output range - further information available

Technical data - standard models

Symbol	Output pressure	Input Signal	ATEX intrinsically safe	Weight (kg)	Model
	3 ... 15 psi	4 ... 20 mA		1,0	400100R
	0,2 ... 1 bar	4 ... 20 mA		1,0	402100R
	3 ... 15 psi	4 ... 20 mA	x	1,0	490100R
	0,2 ... 1 bar	4 ... 20 mA	x	1,0	492100R
	2 ... 120 psi	4 ... 20 mA			570400R
	0,14 ... 8 bar	4 ... 20 mA			572400R

Certification

Certification agency	Type 100X Intrinsically Safe
SIRA (CENELEC ATEX approved) to EN60079	Sira 02ATEX2002X Ex ia IIC T4 Ga (Ta = -40° to +80 °C) Ui = 28 V, Ii = 59 mA, Pi = 0.633 W Ci = 0 Li = 10 mH CE Ex II 1G

Option selector - 100X

4★★★★★R

Input signal	Substitute
4 ... 20 mA	**0**
0 ... 20 mA	**2**
1 ... 5 V	**3**
0 ... 10 V/ 1 ... 10 V	**4**
Intrinsically safe	**9**

Version	Substitute
Standard	**00**
Weatherbox	**10**
Output pressure	**Substitute**
3 ... 15 psi	**01**
3 ... 27 psi	**07**
0,2 ...1 bar	**21**

Option selector - 101X

5★★★00R

Input signal	Substitute
0 ... 60 mA (basic 2 wire)	**0**
1 ... 10 V (basic 2 wire)	**4**
1 ... 5 V (analogue 3 wire)	**5**
1 ... 10 V (analogue 3 wire)	**6**
4 ... 20 mA (analogue 3 wire)	**7**

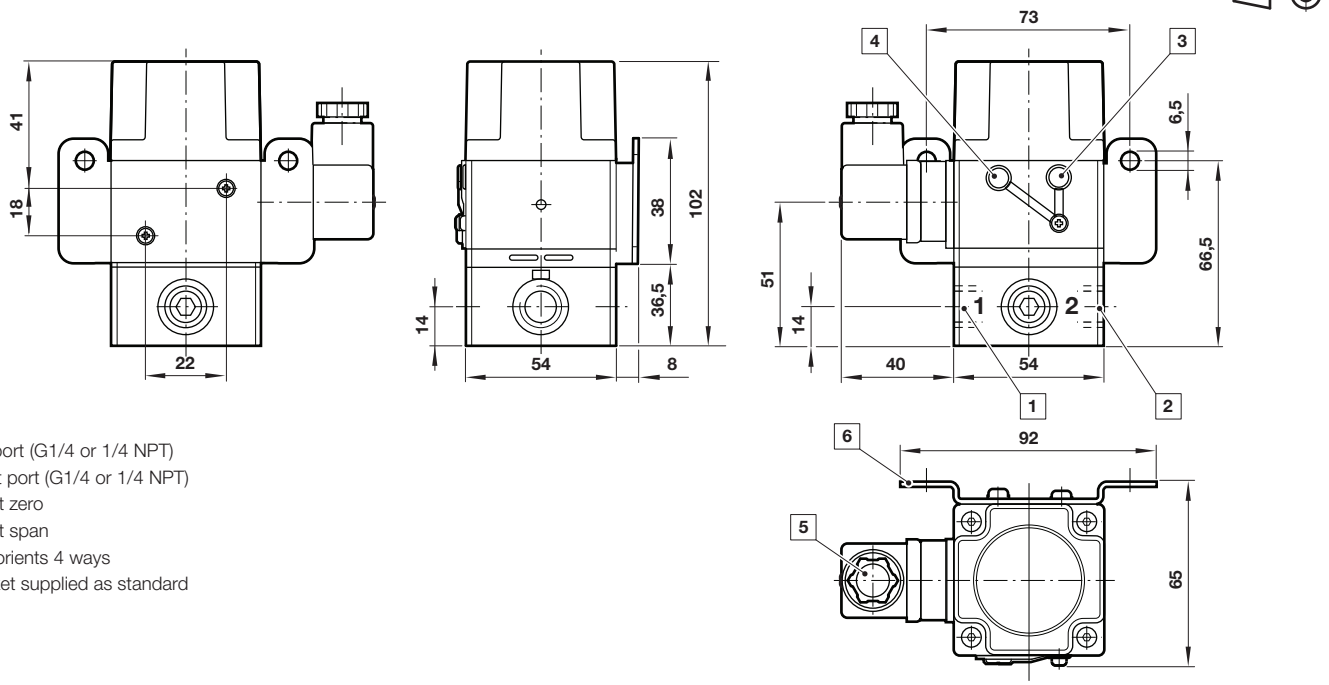
Output pressure	Substitute
2 ... 120 psi	**04**
0,14 ...8 bar	**24**

Other options available:

- Alternative input signal ranges
- Alternative pressure ranges
- Flying Leads
- Conduit entry with flying leads
- Junction box (M20 / ½" NPT)
- Intrinsically safe certification
- 50mm pipe mounting bracket
- Captured exhaust
- Reverse acting
- Split range
- For G 1/4 ports, contact your representative

Dimensions

Dimensions in mm
Projection/First angle



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

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 IMI NORGREN.

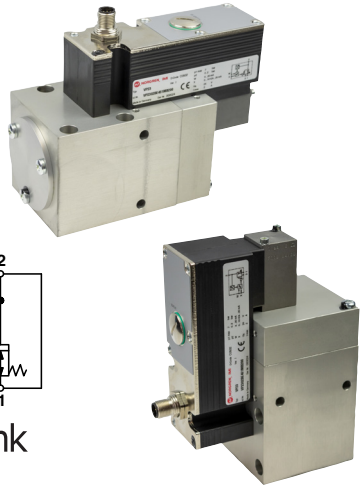
Through misuse, age, or malfunction, components used in fluid power systems can fail in various modes.

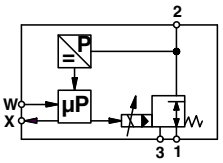
The system designer is warned to consider the failure modes of all component parts used in fluid power systems and to provide adequate safeguards to prevent personal injury or damage to equipment in the event of such failure.
System designers must provide a warning to end users in the system instructional 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.

NORGREN

VP23, 3-way Proportional pressure control valves seat valve with µP-driven pressure control

- **Port size: G1/4 ... G3/4**
- **Pressure ranges 0...2, 0...10 and 0...16 bar**
- **Microprocessor-controlled closed-loop controller**
- **Setpoint: 4 to 20 mA, 0 to 10 V, IO-Link**





IO-Link

Technical features

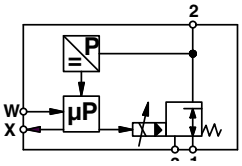
Medium:
Filtered (50 µm), unlubricated or lubricated condensate-free compressed air or neutral gases Due to the lubricants and their additives, use of lubricated compressed air can affect the dynamics and service life
Operation:
Proportional solenoid
Pressure range:
Operating pressure P1 max:
7 bar (101 psi), 12 bar (174 psi), 17 bar (246 psi)
Operating pressure P2:
0 (0,02) ... 2 bar (0 ... 29 psi)
0 (0,1) ...10 bar (0 ... 145 psi)
0 (0,16) ... 16 bar(0 ... 232 psi)

Flowrate:
See flow characteristics
Flow direction:
1 –> 2, 2 –> 3
Service life:
> 10 Million operations, max. stroke
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
Ambient:
Valve series is designed for indoor use at normal industrial ambient
Ambient/Media temperature:
Media
-5 ... +50°C (+23 ... +122°F)
(no condensation permitted)
Ambient
-5 ... +60°C (+23 ... +140°F)
Air supply must be dry enough to avoid ice formation at temperatures below +2°C (+35°F).

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

Technical data, standard model

Symbol	Pressure Range	Nominal size (mm)	Max. Flow (l/min)	Set point (input)	Actual value (output)	Weight (kg)	Model
	0 ... 2 bar	8	850	0...10 V	0...10 V, 4...20 mA	1,1	VP2302BD761MB200
	0 ... 2 bar	8	850	4...20 mA	0...10 V, 4...20 mA	1,1	VP2302BD461MB200
	0 ... 2 bar	8	850	IO-Link	IO-Link	1,1	VP2302BDLL1MB200
	0 ... 2 bar	16	3.500	0...10 V	0...10 V, 4...20 mA	1,7	VP2302BE761MB200
	0 ... 2 bar	16	3.500	4...20 mA	0...10 V, 4...20 mA	1,7	VP2302BE461MB200
	0 ... 2 bar	16	3.500	IO-Link	IO-Link	1,7	VP2302BELL1MB200
	0 ... 10 bar	8	2.500	0...10 V	0...10 V, 4...20 mA	1,1	VP2310BD761MB200
	0 ... 10 bar	8	2.500	4...20 mA	0...10 V, 4...20 mA	1,1	VP2310BD461MB200
	0 ... 10 bar	8	2.500	IO-Link	IO-Link	1,1	VP2310BDLL1MB200
	0 ... 10 bar	16	12.500	0...10 V	0...10 V, 4...20 mA	1,7	VP2310BE761MB200
	0 ... 10 bar	16	12.500	4...20 mA	0...10 V, 4...20 mA	1,7	VP2310BE461MB200
	0 ... 10 bar	16	12.500	IO-Link	IO-Link	1,7	VP2310BELL1MB200
	0 ... 16 bar	8	3.000	0...10 V	0...10 V, 4...20 mA	1,1	VP2316BD761MB200
	0 ... 16 bar	8	3.000	4...20 mA	0...10 V, 4...20 mA	1,1	VP2316BD461MB200
	0 ... 16 bar	8	3.000	IO-Link	IO-Link	1,1	VP2316BDLL1MB200
	0 ... 16 bar	16	14.000	0...10 V	0...10 V, 4...20 mA	1,7	VP2316BE761MB200
	0 ... 16 bar	16	14.000	4...20 mA	0...10 V, 4...20 mA	1,7	VP2316BE461MB200
	0 ... 16 bar	16	14.000	IO-Link	IO-Link	1,7	VP2316BELL1MB200

03/21
en 6.6.050.001

Option selector

VP23★★B★★★1★★★★★

Pressure range	Substitute
0 ... 2 bar	**02**
0 ... 10 bar	**10**
0 ... 16 bar	**16**
Nominal size	**Substitute**
8 mm	**D**
16 mm	**E**
Set point	**Substitute**
4 ... 20 mA	**4**
0...10 V	**7**
IO-Link	**L**

Option	Substitute
Serial interface	**B200**
Connector	**Substitute**
M12 8 pin analogue Version 5 pin IO-Link Version	**M**
Actual value	**Substitute**
0 ... 10 V/4 ... 20 mA	**6**
IO-Link	**L**

Note: IO-Link cannot be combined with an analogue version

Function

The electronic pressure regulator is used for quickly and precisely set an output pressure on port 2 according to a specified setpoint (control signal) . Even with consumption of the medium (compressed air or neutral gases) the output pressure is retained constantly.

Proportional valves are used in many different applications across all sectors of industry. They are used anywhere where precise and fast, direct or indirect controll of pressure, force, rotational speed etc. is required.

Design

The electronic pressure regulator consists of:
- Proportional solenoid
- pneumatic spool
- integrated pressure sensor
- Microprocessor driven controller
- USB-Interface

Configuration Software VP-Tool available on our Website.

Operating principle

The valve operates with a closed loop, thus the output pressure is constantly measured by the internal pressure sensor and compared with the specified setpoint

If the output presssure is lower than the specified output pressure or if a higher output pressure is specified, the pneumatic controlled plunger is actuated by the proportional solenoid. A connection between port 1 (inlet pressure) and port 2 (output pressure) is established until the output pressure corresponds to the specified setpoint.

If the output pressure is higher than the specified pressure set via setpoint, or if a lower pressure is required, the force on the control plunger is reduced by the proportional solenoid.

A connection between port 2 (outlet pressure) and port 3 (venting) is established, until the output pressure corresponds to the specified setpoint.

After switching off the supply voltage the last specified outlet pressure is vented down to 0 bar.

Fatigue strength against sinusoidal oscillations according to

DIN EN 60068-2-6: 10g at 10-500Hz in the switched-off state.

Durability under shock conditions according to DIN EN 60068-2-27:

30 g/10 shocks

Valves cannot be used in safety systems that require shut-off or venting valves.
Without power supply, pneumatic port 2 -> 3 is open

Electrical Parameters

Supply

Supply Voltage	UB resp.. VA and VS	18 ... 32 V DC
Residual ripple	[%]	10
Current consumption at 24V	Maximum, dynamic. [A]	< approx. 2,0 A
	static (balanced) at 25°C [A]	< approx. 0,7 A

Inputs (Signal)

Setpoint W (U/I switchable)

Setpoint W (U) analogue differential (V)	0 ... 10
Inputresistance RI (kΩ)	> 100
Setpoint W(I) analogue: **Current signal (mA) Burde (Ω)**	0 ... 20 / 4 ... 20 (default) 500
Max. Voltage Input (V)	-10 ... 40

Outputs (Signal)

Pressure Feedback Signal X(U)

Voltage signal of the pneumatic Output pressure (V)	0 ... 10 V = 0 ... max. p2

Pressure Feedback Signal X(I)

Current signal of the pneumatic Output pressure (mA)	0 (4) ... 20 mA = 0 ... max. p2
Load resistance RL (Ω)	500 recommended

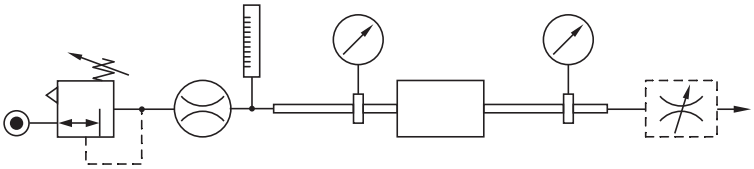
Output "Pressure reached" X (comparator)

Switching range (% max. p2)	+/-2% (default)
Digital output signal	SPS- Pegel (PLC- Level)
Outlet pressure out of the Switching range (X≠W)	Low (0V)
Pressure reached (X = W) (V)	High (+24V nom.)
Output current max. (mA)	10

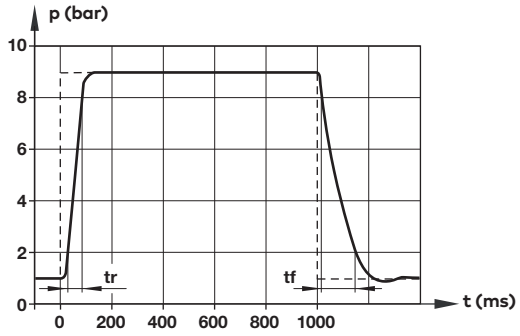
Pneumatic parameters
Recommended application area by nominal value:
NG8: Volume (closed) from 100 ... 1500 cm³
NG16: Volume (closed) from 1000 ... 8000 cm³

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]	

Test assembly flow
CETOP RP 84 P.: flow characteristic of pneumatic devices

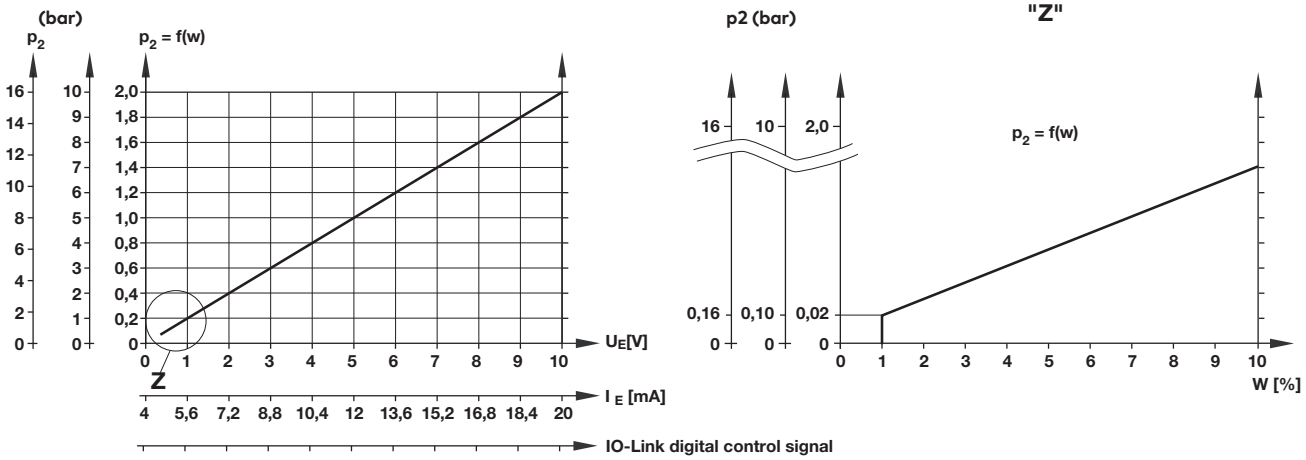


Step-response diagram



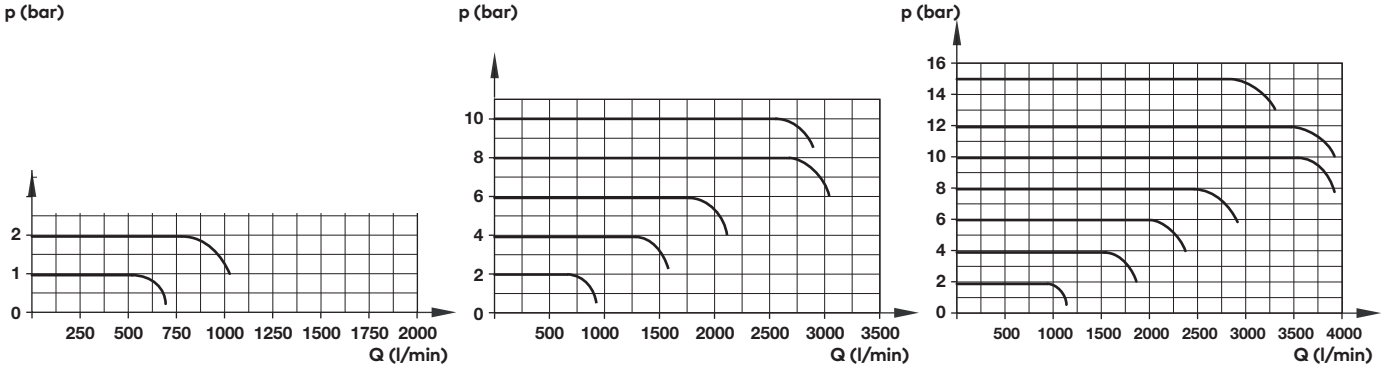
Pneumatic characteristics curves

Static characteristics

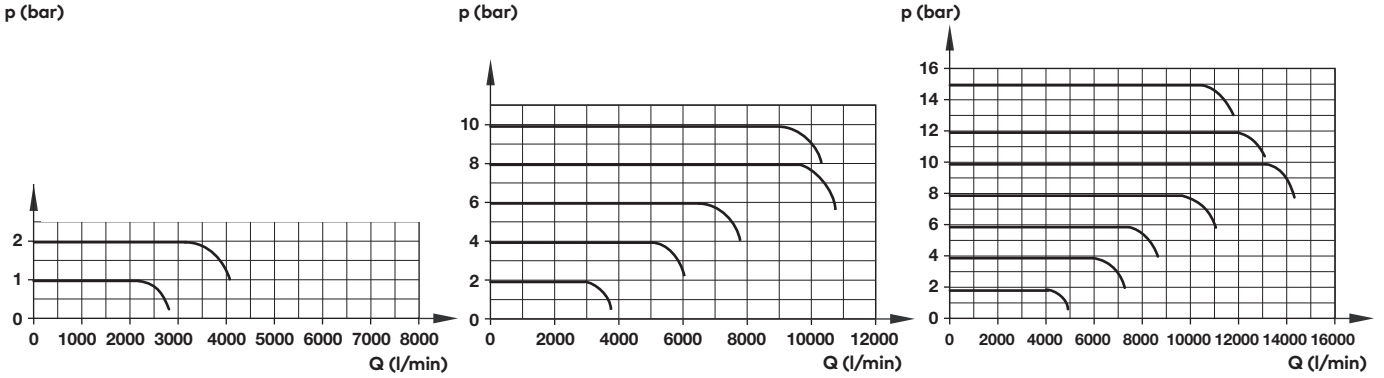


Flow rate characteristic as a function of the set-point (voltage/current/digital IO-Link) and input pressure 7 bar, 12 bar, 17 bar for nominal value 8 and 16

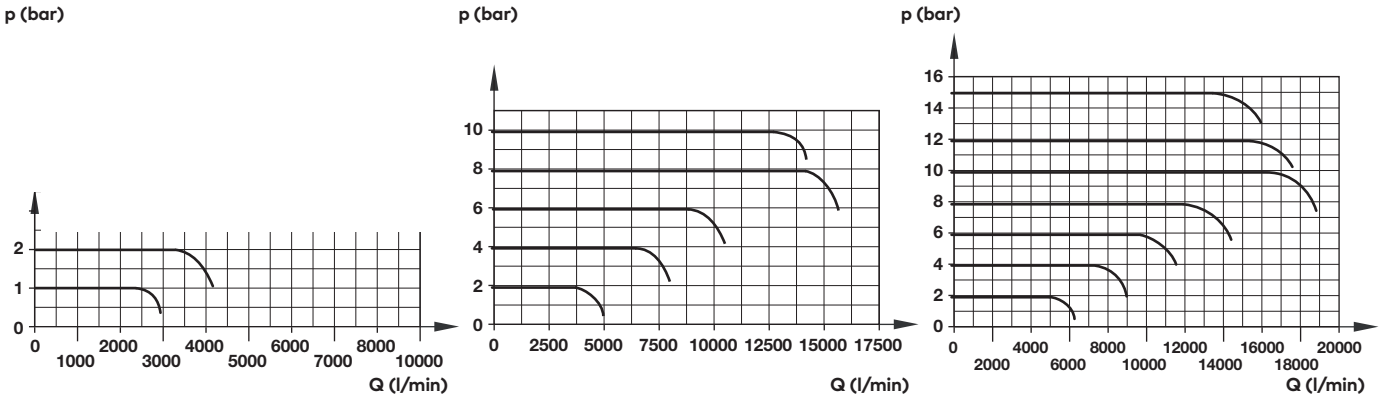
Flow rate characteristics NG 8/P1=7 bar, 12 bar, 17 bar



Flow rate characteristics NG 16/connection plate 1/2" (NG12); P1=7 bar, 12 bar, 17 bar



Flow rate characteristics NG 16/connection plate 3/4" (NG20); P1=7 bar, 12 bar, 17 bar



Functional descriptions Status LED and Controller gain

General display Status LED

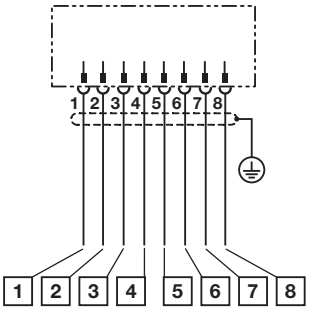
Status	Status-LED
Device off	off
Device running	solid green
Valve malfunction*	red*
Output current max	red*

*Potential error sources of error:
-Power supply or internal references out of range.
- Valve not controllable (X≠W time out)
- Program sequence interrupted

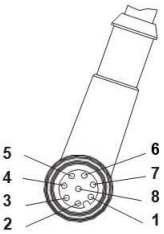
Setting controller gain via PC with VP-Tool
The gain of the integrated controller is factory preset to a default value. This allows an universal use of the valve.
If necessary, the controller gain can be varied to allow a specific compressed air application.
If the plug at the connector is opened, the USB interface can be used to adjust certain controller parameters using VP-Tool.

Connection Diagrams

1. Analogue Version (M12x1, 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 bleu
8 X (U), red



Assignment Supply:

Pin		Description	Color connection cable
6	Ub	Power supply 18 ... 32 V DC	pink
7	GND	Power ground/PGND	blue

Input Setpoint:

Pin		Description	Color connection cable
3	-W	Analogue GND /Setpoint Voltage 0 ... 10 V	green
4	+W	Signal/Setpoint Voltage 0 ... 10V	yellow
1	W(I)	Setpoint current 4 ... 20 mA	white

Depending on the order number, only the ordered input is active, but both outputs (U/I) are active. Voltage input 0 to 10V between pins 4(+) and 3(-); Current input between pins 1(+) and 7(-).

Output Actual value:

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

The voltage output refers to GNDS pin 3. (This means that due to the voltage drop on the GND pin 7, no loss of accuracy of the of the voltage output has to be considered). Both outputs are activated per default.

Comparator output/pressure switch*: Pressure reached:

Pin		Description	Color connection cable
2	X (comp)	Digital output signal PLC level (I max) =3.3 mA	brown
		High: Pressure reached, deviation Iw-xI < ± 2%.	
		Low: pressure not reached, deviation Iw-xI > ± 2%	

Output refers to Gnd pin 7
*Selectable via VP-Tool

2. USB interface connection (analogue Version)

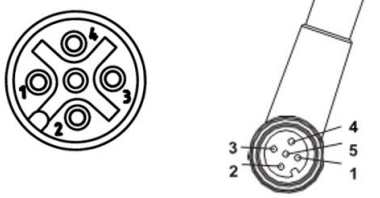
Interface connection
Plug in USB cable, configuration via VP-Tool.

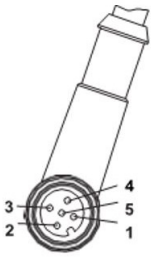
IO-Link Version:
LEDs and Controller parameters

LEDs	Description
1. IO-Link	Flashes green when IO-Link connection exists
2. SF (Valve status)	green: Status ok (status byte = 0); red: error status (status byte > 0: various causes)
3. VS	green: voltage ok; red: voltage missing or too low
4. VA	green: voltage ok; red: voltage missing or too low

Adjustment controller gain via IO-Link
The gain of the integrated controller is factory preset to a default value. This allows an universal use of the valve.
If necessary, the controller gain can be varied to allow a specific compressed air application.
Specific parameters can be configured via IO-Link (during operation) or via USB interface by VP-Tool (default setting).

Connection Diagrams
3. IO-Link connection (M12x1, 5-pin) - Port Class B





1 +VS, brown
2 2L+ (VA), white
3 VS GND, blue
4 C/Q, black
5 2M (VA GND), grey

Assignment

Pin		Description	Color connection cable
1	VS	Power supply +18 ... 32 V DC	brown
2	2L+ (VA)	Power supply +18 ... 32 V DC	white
3	VS GND	Power ground VS / GND	blue
4	C/Q	IO-Link signal cable	black
5	2M (VA GND)	Power ground/GND	grey

Connecting plugs analogue version

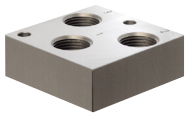
Description	Model
Cable 8 Pin M12 - Open End x 5 metre long, straight	0250811
Cable 8 Pin M12 - Open End x 5 metre long, 90°	0250813
Adaptor 8 Pin M12 - convertible, 90°	0252383

Note: Cable material PUR shielded

Connector IO-Link version

Description	Model
Cable 5 Pin A-coded M1 - 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

Connection plates



Description	Ports	Model
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

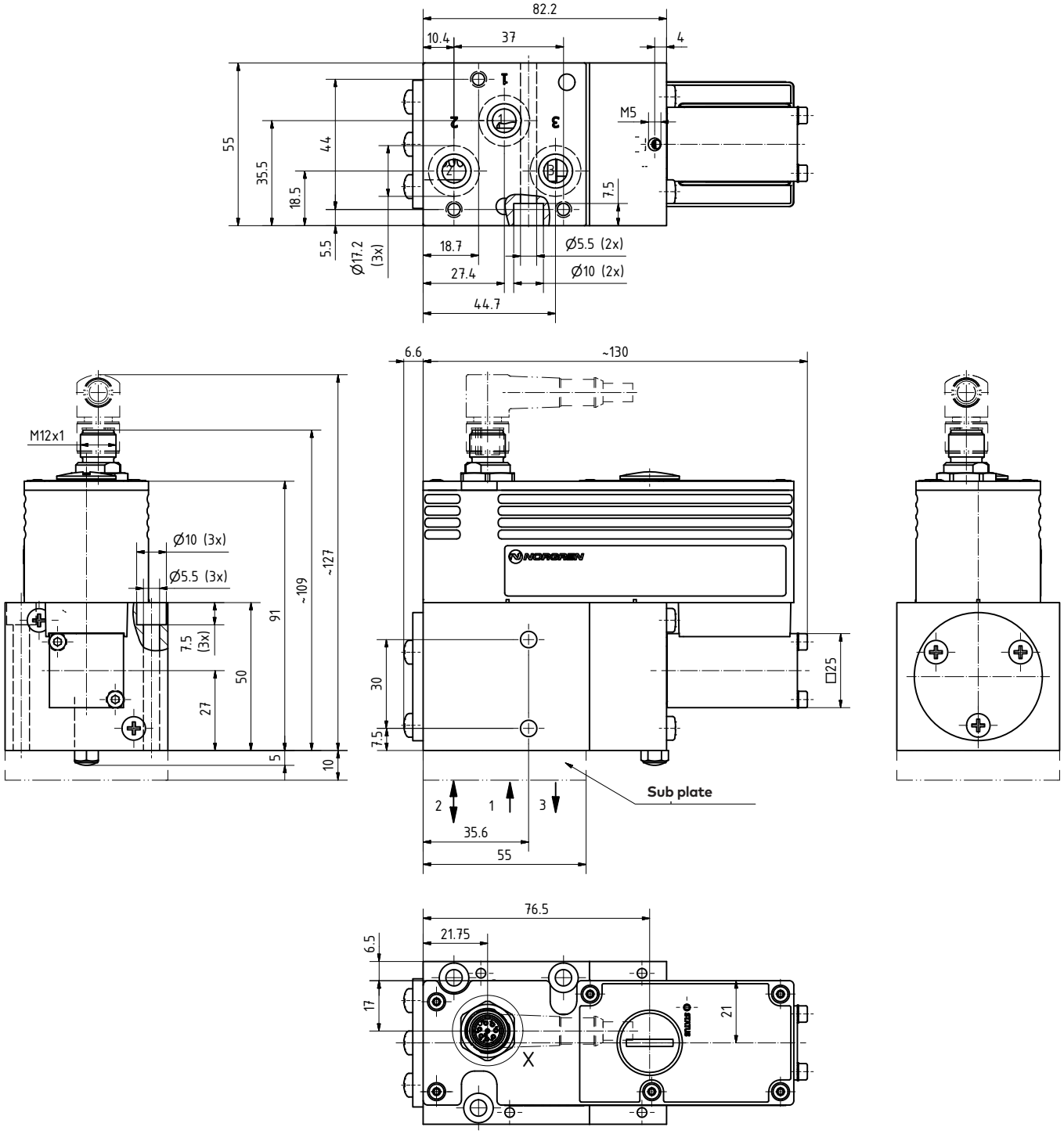
Serial interface accessories

Description	Model
USB-C interface cable	0253875

Dimensions

Analogue ND8

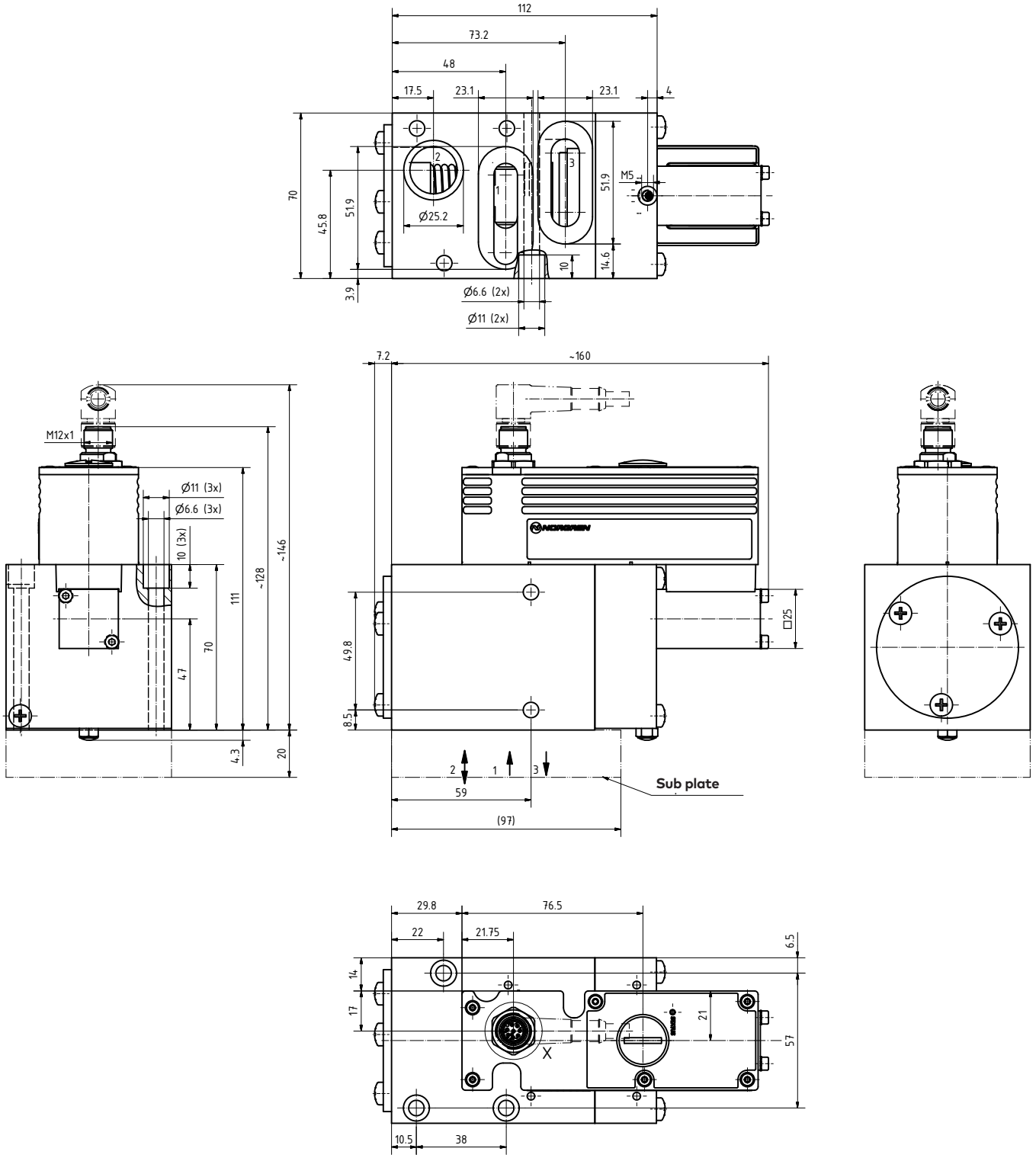
Dimensions in mm
Projection/First angle



Dimensions

Analogue ND16

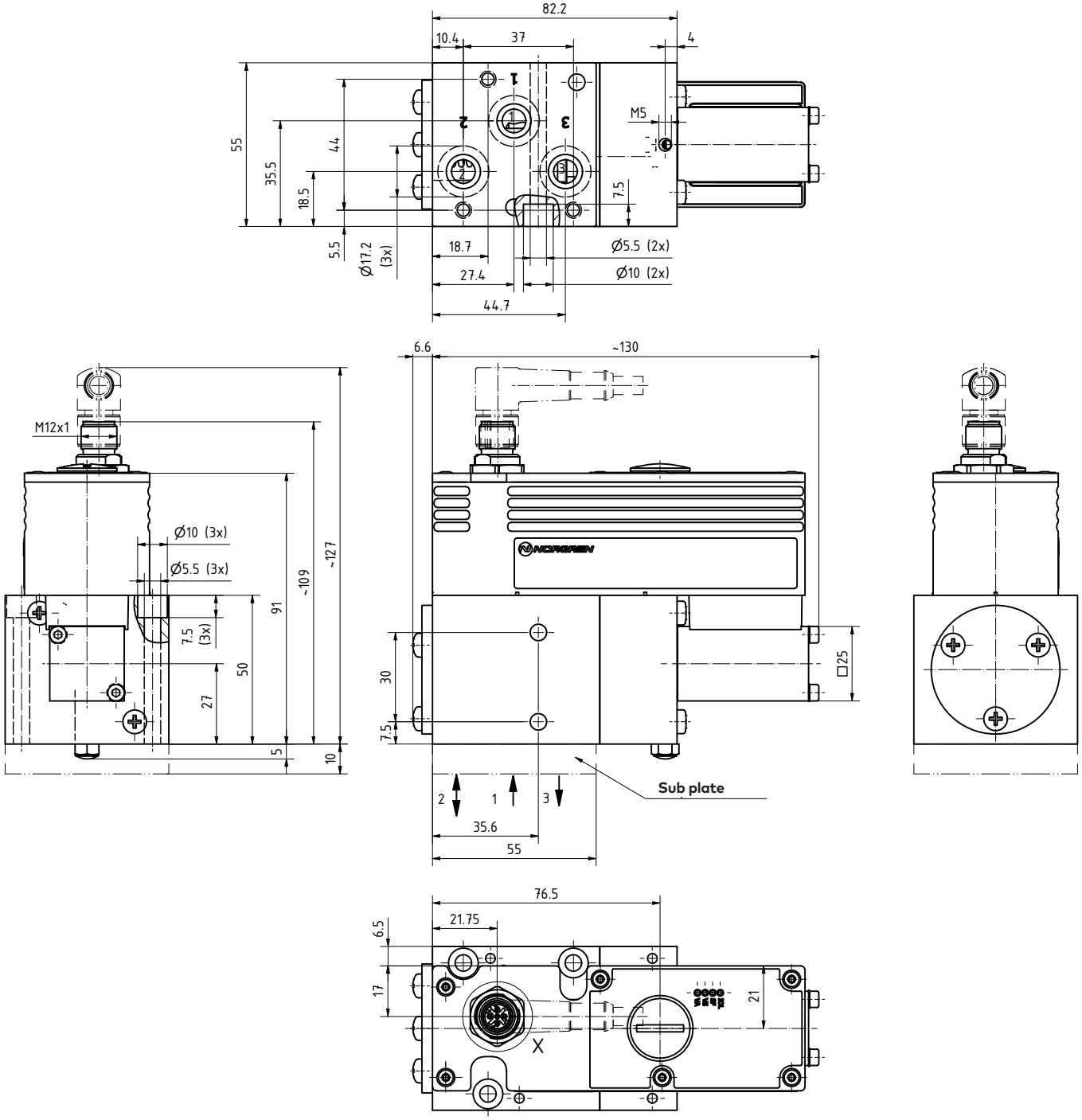
Dimensions in mm
Projection/First angle



Dimensions

IO-Link NG 8

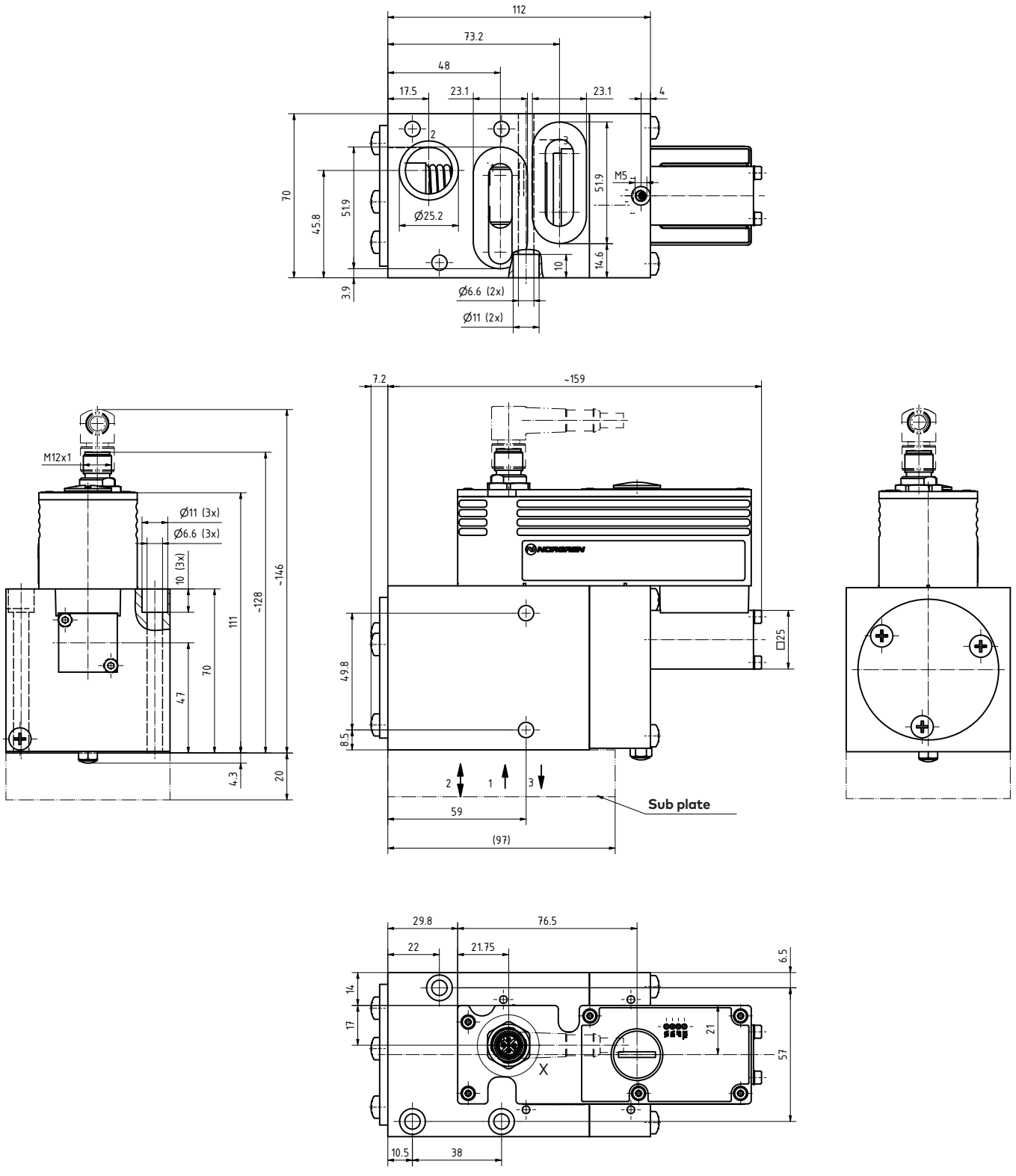
Dimensions in mm
Projection/First angle



Dimensions

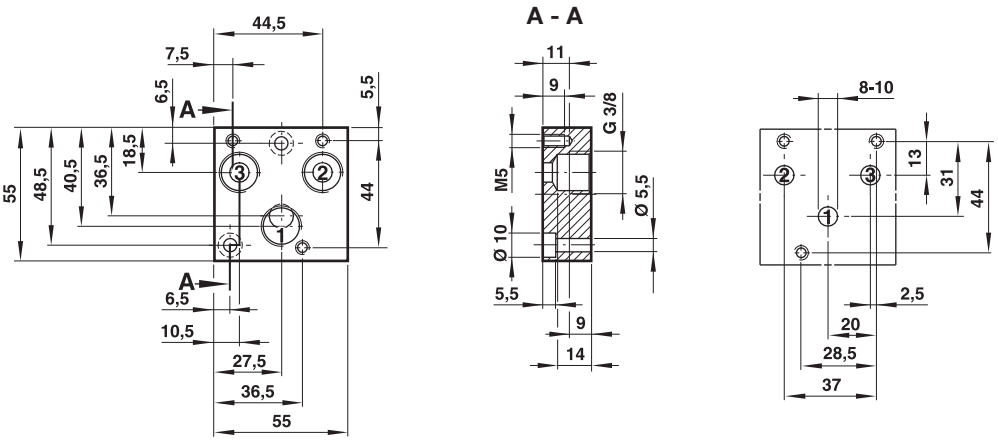
IO-Link NG 16

Dimensions in mm
Projection/First angle

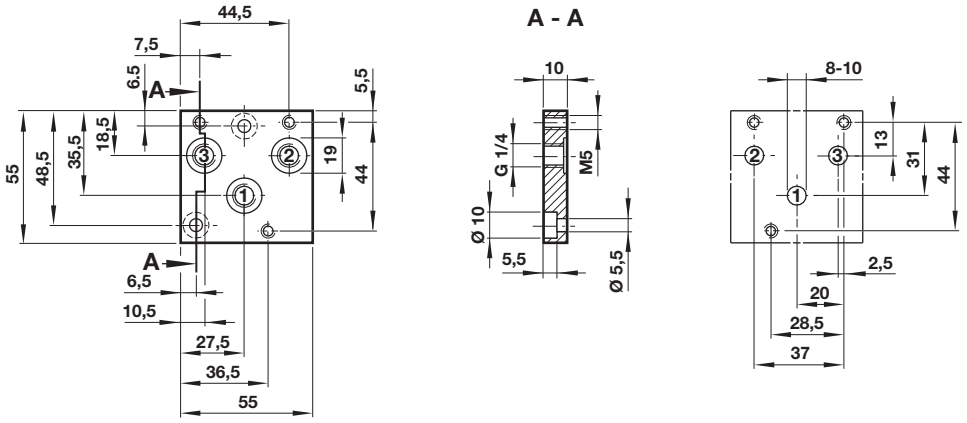


Connection plate
0543705, G3/8 ports preferable for VP23xxBDxx1xxxxx valve

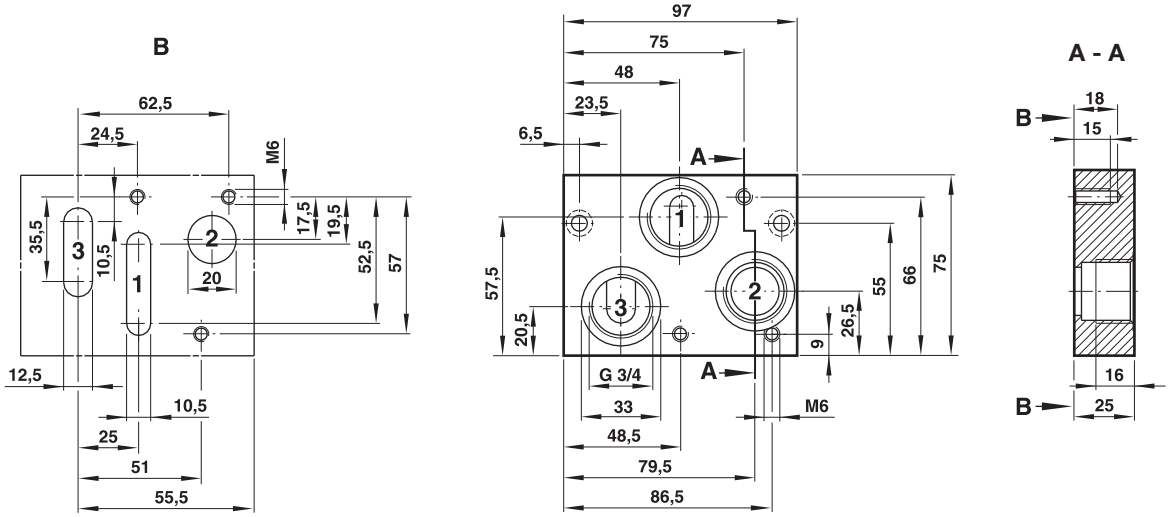
Dimensions in mm
Projection/First angle



0542636, G1/4 ports optional for VP23xxBDxx1xxxxx valve

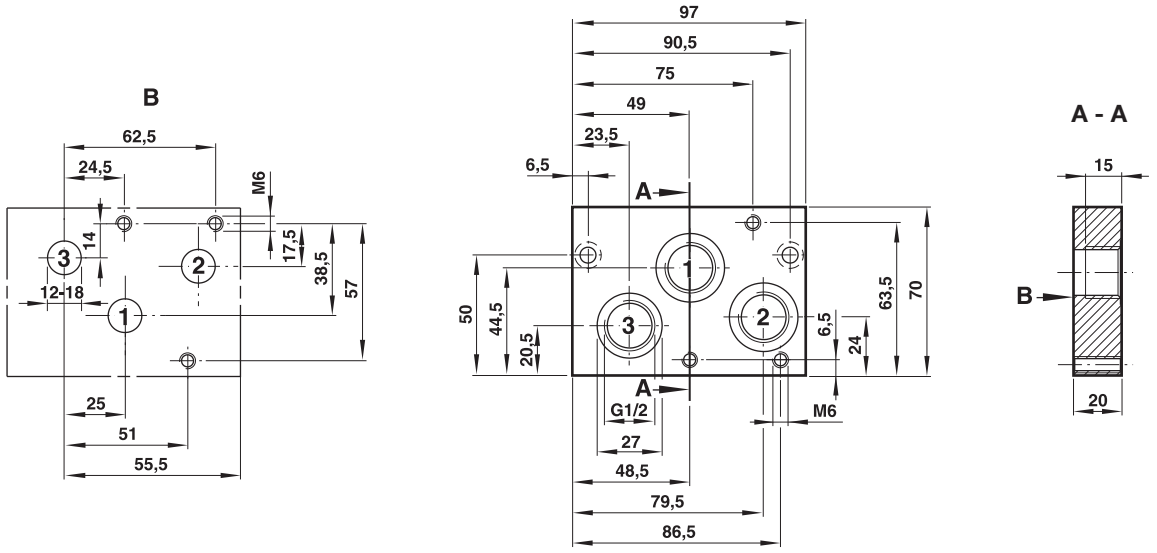


0542840, G3/4 ports preferable for VP23xxBExx1xxxxx valve



Connection plate
0542814, G1/2 ports optional for VP23xxBExx1xxxxx valve

Dimensions in mm
Projection/First angle



Warning

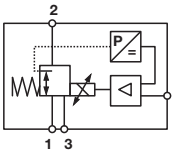
These products are intended for use in industrial compressed air systems only. Do not use these products where pressures and temperatures can exceed those listed under »**Technical features/ data**«.
Before using these products with fluids other than those specified, for non-industrial applications,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

VP51
3 way proportional pressure control valve

- **Port size: 1/4" (ISO G or NPT) or manifold**
- **Closed-loop air piloted digital proportional pressure control valve**
- **Fully programmable with on-board diagnostics**
- **Multi option language display, with offline setup**
- **Instant LED warning lights and pressure output display**
- **Excellent performance characteristics**
- **Fast response time and high flow**
- **Adjustable gain**
- **Low power consumption**
- **Feedback signal**
- **Manifold mountable**



Technical features

Medium:
Compressed dry air, oil free filtered to 5 µm.
Operation:
Air piloted spool valve with integrated electronic pressure control
Output (nominal) pressure:
0 ... 6 bar, (0 ... 90 psi);
0 ... 10 bar, (0 ... 150 psi)
Supply pressure:
Minimum 2 bar (29 psi) above maximum output required, 12 bar max. (174 psi)
Air 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/Media temperature:
0 ... +50°C (+32 ... 122°F)
Air supply must be dry enough to avoid ice formation at temperatures below +2°C (+35°F)
Temperature Sensitivity:
Typically better than 0,03% span/°C
Degree of protection:
IP65 in normal operation (exhaust and baffle protected from water ingress at temperatures <+5°C (+41°F))

Linearity:
< 1%
Hysteresis and deadband:
< 1%
Response Time:
< 80 ms (from 10 ... 90% of output pressure into a 0,1 litre load)
Vibration & shock immunity:
< 3% span
0,75 m/s², 5 ... 150Hz,
1 m/s², 5 ... 150Hz
Weight:
0.60 kg

Materials:
Body: Aluminium
Lid: Zinc die cast
Front cover: Nylon

Maintenance:
No maintenace required
Calibration:
Gain, Span, Zero

Electrical details

Electromagnetic compatibility	Conforms to EC requirements EN 50081-2 (1994) and EN 50082-2 (1995)
Electrical input signal	4 ... 20 mA or 0 ... 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, <±1%
Connections	M12x1, 5-pin

Option selector

VP51★★★★★11H00

Output pressure	Substitute
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**

Connecting plugs

Elbow connector M12 x 1

Page 4

0250081

Manifold mount assembly to ISO 2 sub base

Single manifold

Page 4

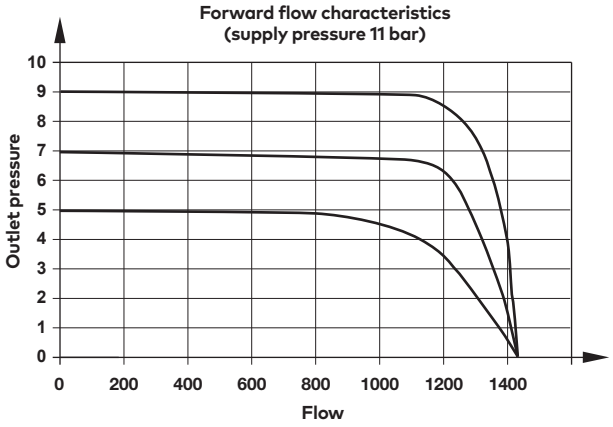
ZZ5M00

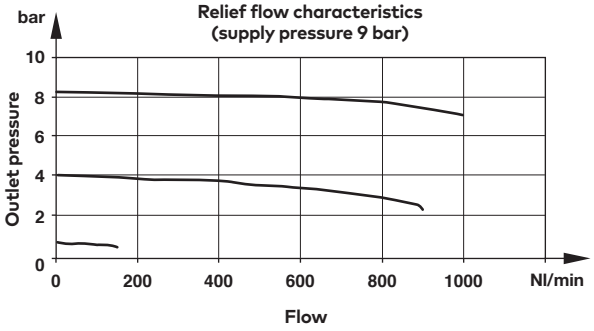
O-rings, flat seal and screws are included

Electrical connector pin looking into the end of the instrument

Pin-No.	Function
1	+24 V d.c. supply
2	0 ... 10 V feedback
3	Control signal (+VE)
4	Common (supply signal and feedback return)
5	Chassis

Characteristic curves (standard units)



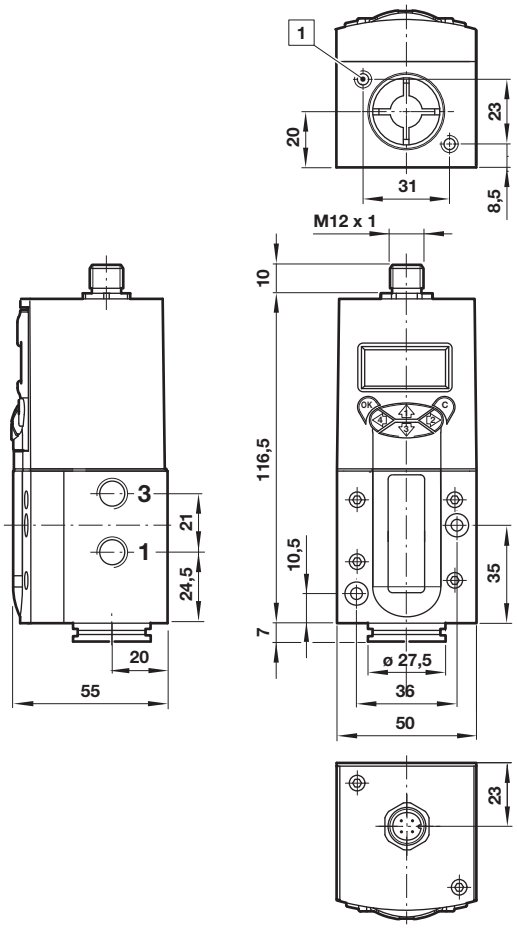


Valve built in user adjustable settings

Setting		Options
Language		English, Español, Français, Italiano, German
Pressure units		Bar, atm, kg/cm², kPa, psi
Password Protection		Protect against unauthorised adjustment of the valve
Off-line Set up	Min Set up	Set pressure between 0...10 Bar and Min – Max Signal
	Max Set up	Set pressure between 10...0 Bar and Min – Max Signal
	Speed Setting	Change the time taken to ramp between two pressures. (Volume dependent)
	Dynamic Response	Allows the Integrator settle time to be set
	Dither Amp	Amplitude of the dither on the spool
On-line Set up	Min Set up	Can be used for fine adjustment of output pressure at a given signal
	Max Set up	Can be used for fine adjustment of output pressure at a given signal
Monitor Set up	Monitor Output	Display feedback for user information.
	Green Indicator	Shows power is present and can be set to flash when the output pressure is outside specified limits
	Red Indicator	Normally off. Can be set to flash if the output pressure does not reach the required value within a specific time limit. Will also flash when the unit is set to local control.
Local Control	Manual Control	Valve output can be set using the arrow keys
Factory Defaults		Option to resets the valve to the Factory default settings.

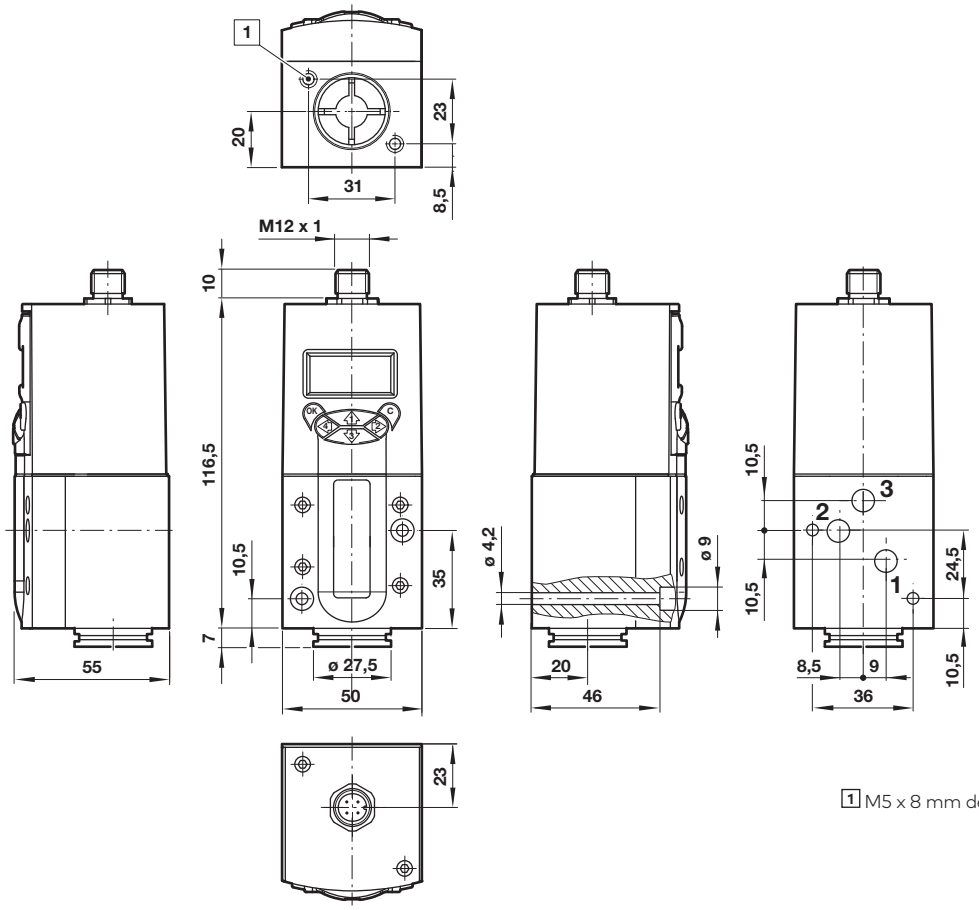
Basic dimensions

Dimensions in mm
Projection/First angle



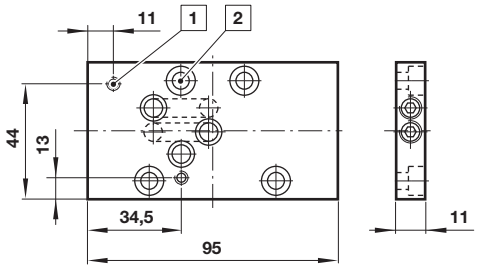
1 M5 x 8 mm deep

VP51 with manifold surface



1 M5 x 8 mm deep

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

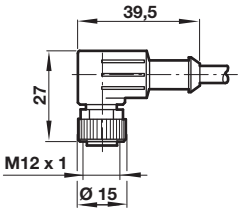


1 Two screws M4 x 50 mm deep to mount the VP50 onto the manifold
2 Four screws M6x16 mm deep to mount the manifold onto the iso subbase

Connector

Model: 0250081

Dimensions in mm
Projection/First angle



Connector, 90°
M12 x 1, 5 pin, female,
5 m cable length, A coded

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.

140 failsafe series
Current to pressure, (I/P) electronic converter

- **Port size: 1/4" (ISO G/NPT)**
- **Advanced electronic control**
- **Explosion proof/ Intrinsically Safe**
- **Complete electronics modularity for ease of maintenance**
- **Jack Socket for on-site monitoring**
- **Fail-Safe (unit pressure falls to zero on signal failure)**
- **Field replaceable filter**
- **Weatherproof (IP 66 or Type 4X)**
- **High performance and accuracy**
- **Fast response and minimal temperature effect**
- **Large flow capacity**

Technical features

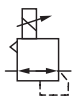
Medium:
Oil free, dry media, min filtered to 50 µm; internal in-built filter
Output pressure:
0,2 ... 1 bar (3 ... 15 psi)
0,2 ... 2 bar (3 ... 30 psi)
Supply pressure:
1,2 ... 10,3 bar (18 ... 150 psi)
Flow capacity:
up to 300 NL/min
Air Consumption:
< 2,5 NL/min at 50% signal
Linearity independent:
Typically <0.1%, guaranteed <0.2%
Hysteresis & deadband:
Typically <0.1%, guaranteed <0.2%

Response time:
<1 second (from 0 ... 90% or 90 ... 10% of output pressure into a 0,5 litre load)
Temperature sensitivity:
Typically <0,06% span/°C between -40 ... +85°C (-40 ... +185°F)
Supply sensitivity:
<0,1% of span for full supply pressure range
Port sizes:
Main ports: G1/4 or 1/4 NPT
Integral gauges: G1/4 or 1/4 NPT
Exhaust port: 1/8 NPT

Calibration:
Independent user adjustment of 0% and 100% calibration points. Independent adjustment of tight shut off point. Adjustable by potentiometers up to 20% of output range. Unit is factory calibrated to within 1% of span.
Ambient/Media Temperature:
-40 ... +85 °C (-40 ... +185 °F)
Air supply must be dry enough to avoid ice formation at temperatures below +2°C (+35°F).**I.P. Rating:**
IP 66, NEMA Type 4X
Maintenance:
Modular Electronics and in-built filter offered as field replaceable parts

Mounting position:
Integral bracket allows for flat surface or 2" (50 mm) pipe mounting in any orientation. Designed for mounting with 57 ... 73 mm pitch U bolts.
Vibration effect:
Output pressure changes less than 3% for vibration amplitude
4 mm 5 ... 15 Hz,
2g15 ... 150 Hz,
1g150 ... 1000 Hz
Leak sensitivity:
<0,875% of span for up to 3,0 scfm downstream leakage
Materials:
Body: aluminium and zinc diecasting
Diaphragms: NBR
Black epoxy powder coating standard

Technical data - standard models

Symbol	Certification	Port size	Output pressure	Conduit Entry	Weight (kg)	Model Multi certified units only – IS/Exd
	Cenelec only	G1/4	0,2 ... 1 bar	M20 x 1,5	2,07	EX14001BJ4LE2
		G1/4	3 ... 15 psi	M20 x 1,5	2,07	EX14001PJ4LE2
	Triple certification / Triple agency	1/4 NPT	0,2 ... 1 bar	1/2 NPT	2,07	EX14001BK4EE1
		1/4 NPT	3 ... 15 psi	1/2 NPT	2,07	EX14001PK4EE1

Standard models: conduit entry 1/2 NPT
Options available: conduit entry M20, output pressure monitoring gauge

Electrical parameters

Input Signal	4 ... 20 mA (two wire) Terminal voltage < 6,5 V at 20 mA
Failure Mode	Pressure 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 chassis
Connections	1/2 NPT or M20; internal terminal block with capacity up to 2,5 mm² conductor
Span/Zero	Independently adjustable tight shut off point adjustable up to 4,5 mA .
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

Option selector

EX140★★★★4★★★

Output pressure bar (psi)	Substitute
0,2 ... 1 (3 ... 15)	**01**
0,4 ... 2 (6 ... 30)	**02**
Unit of Pressure	**Substitute**
Bar	**B**
Psi	**P**
KPa	**K**
Kg/cm²	**G**

Certification	Substitute
Triple certification/ triple agency	**E1**
Cenelec only (M20x1,5)	**E2**
Conduit Entry	**Substitute**
1/2 NPT	**E**
M 20 Cenelec Only	**L**
Ports	**Substitute**
G1/4	**J**
1/4 NPT	**K**

Accessories

Pipe mounting kit

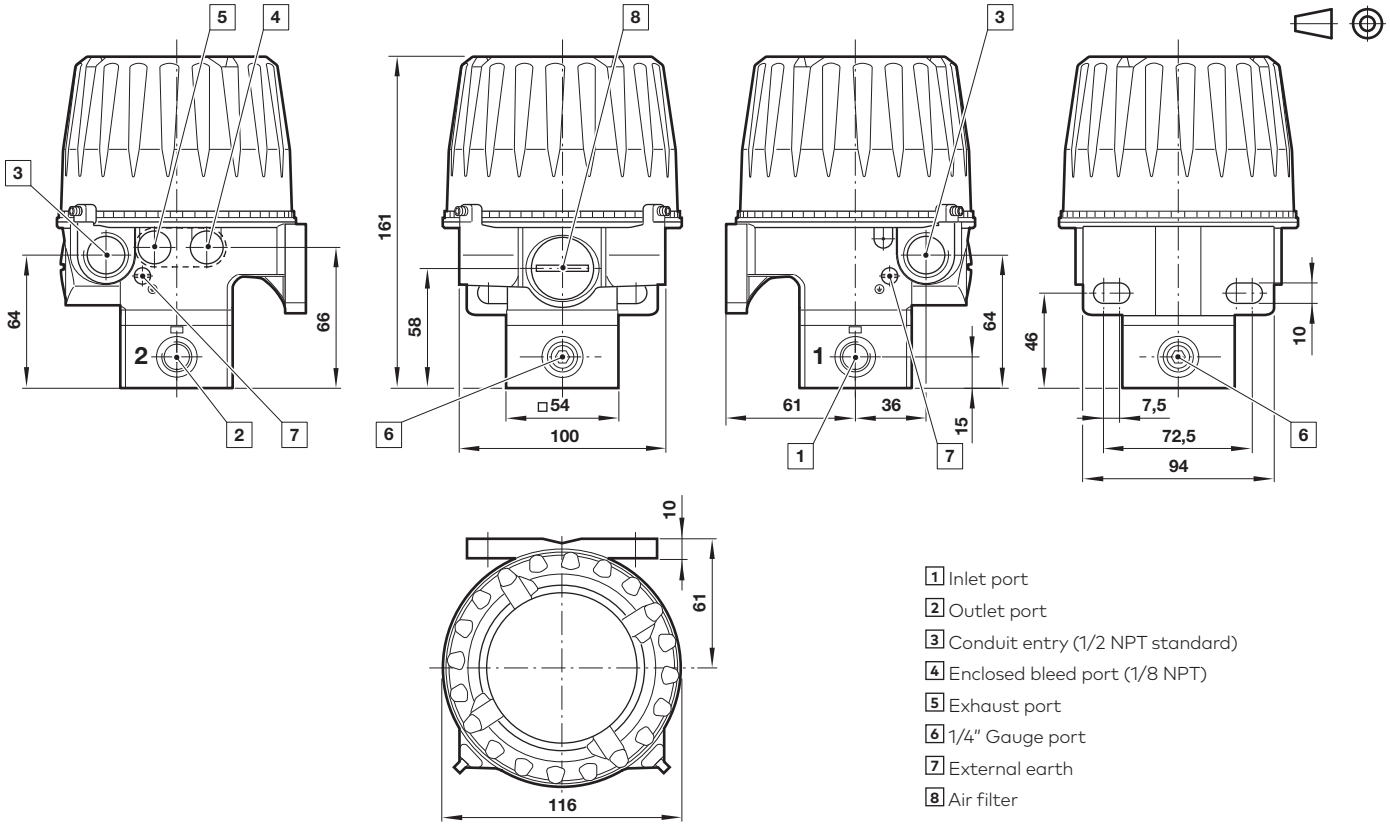
ZZ0150 (2")

Certification

Certification agency	Flame Proof / Explosion Proof	Intrinsically Safe	Non-Incendive	others
SIRA (CENELEC ATEX approved)	Sira 01ATEX1006 Ex d IIC T4 Gb (Ta = -20 ... +40°C) Ex d IIB+H2 T5 Gb (Ta = -20 ... +80°C) Ex d IIB+H2 T6 Gb (Ta = -20 ... +65°C) Ex t IIIC T95 °C Db (Ta = -20 ... +85°C) Umax = 30 V d.c. 2GD	Sira 01ATEX2007X Ex ia IIC T4 Ga Ex ia IIIC Da T95°C (Ta = -40 ... +85°C) Ui = 30 V d.c. Ii = 110 mA Pi = 0.84 W Ci = 6 nF Li = 100 µH 1GD		
FACTORY MUTUAL	Class I, Division 1, Group BCD. T6 Ta = 75°C, T5 Ta = 85°C.	Class I, II & III, Division 1, Group ABCDEFG. T4 Ta = 85°C. Vmax = 30 V d.c. Imax = 110 mA Ci = 0,006 µF Li = 100 µH	Class I, Division 2, Group ABCD. T6 Ta = 75°C, T5 Ta = 85°C.	Dust Ingress Protection: Class II & III, Division 1, Group EFG. T6 Ta = 75°C, T5 Ta = 85°C. Suitable for: Class II, III Division 2, Group FG, T6 Ta = 75°C, T5 Ta = 85°C;
CSA	Class I, Division 1, Group BCD. Class II, Groups EFG Class III Ta = -40 ... +85°C; T5 Ta = -40 ... +65°C; T6	Ex ia, Class I, Division 1, Group ABCD. Class II, Groups EFG, CL III Ta = -40 ... +85°C; T4 Vmax = 30 V d.c. Imax = 100 mA Pmax = 0.75 W Ci = 10,5 nF Li = 100 µH (30 V d.c. max, 300 Ohms).	Class I, Division 2, Group ABCD. Class II, Division 2, Group EFG, Class III Ta = -40 ... +85°C; T5 Ta = -40 ... +75°C; T6 Ii = 24 mA Ci = 6 nF Li = 100 µH	

Dimensions

Dimensions in mm
Projection/First angle



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

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.

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

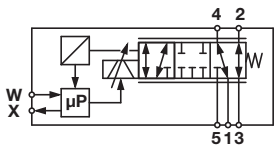
Medium:
Air acc. to ISO8573-1
Grouping: 2-3-1, filtered (recommended < 3 µm), dried, non lubricated.
The dynamic performance and service life of the valve may be significantly reduced if using unfiltered air containing water and oil!
Operating pressure on all ports:
-1 ... 16 bar (-14 ... 232 psi)
Pneumatical 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:
500 Ω

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

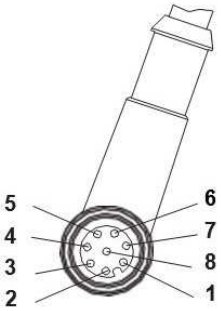
Analogue version
serial interface cable

Description	Model
USB-C Adaptor cable	0253875

Connection cables - IO-Link versions

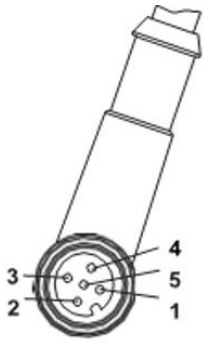
Description	Model
Cable 5 Pin A-coded M12 - M12 x 0.6 metre long	NC-125FS-125MS-A
Cable 5 Pin A-coded M12 - M12 x 1 metre long	NC-125FS-125MS-1
Cable 5 Pin A-coded M12 - M12 x 2 metre long	NC-125FS-125MS-2
Cable 5 Pin A-coded M12 - M12 x 5 metre long	NC-125FS-125MS-5
Cable 5 Pin A-coded M12 - Open End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

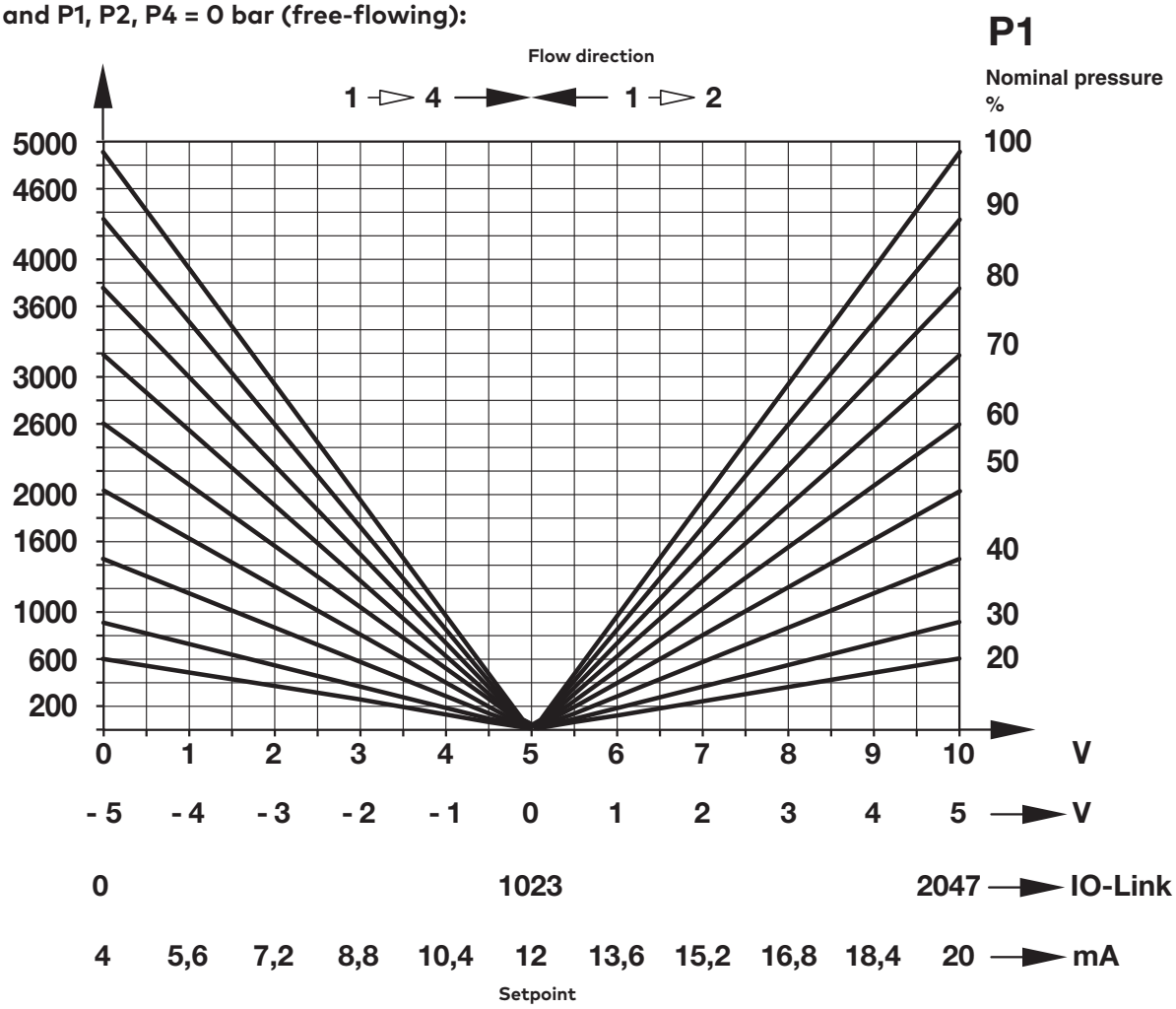
Pin assignment IO-Link version



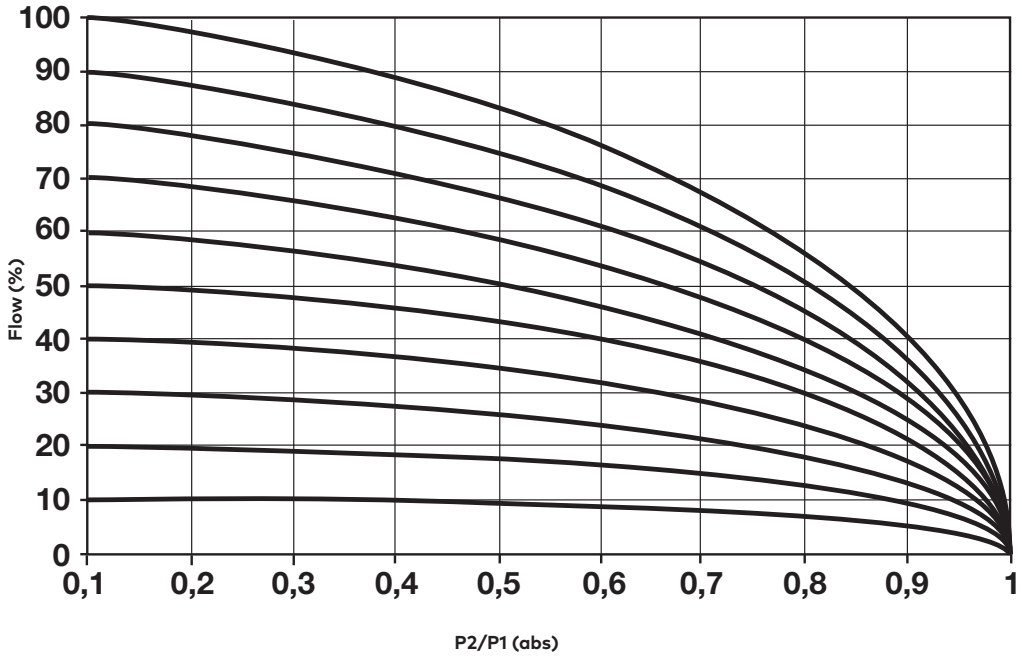
Pin	Colour (typ.)	Function
1	brown	Supply voltage +24V (Vs)
2	white	Supply voltage 2L+ (VA)
3	blue	Supply ground (Vs GND)
4	black	Signal (C/Q)
5	gr/(gn/ge)	Supply ground 2M (VA GND)

Curves

Flow-rate as a function of setpoint value and P1, P2, P4 = 0 bar (free-flowing):

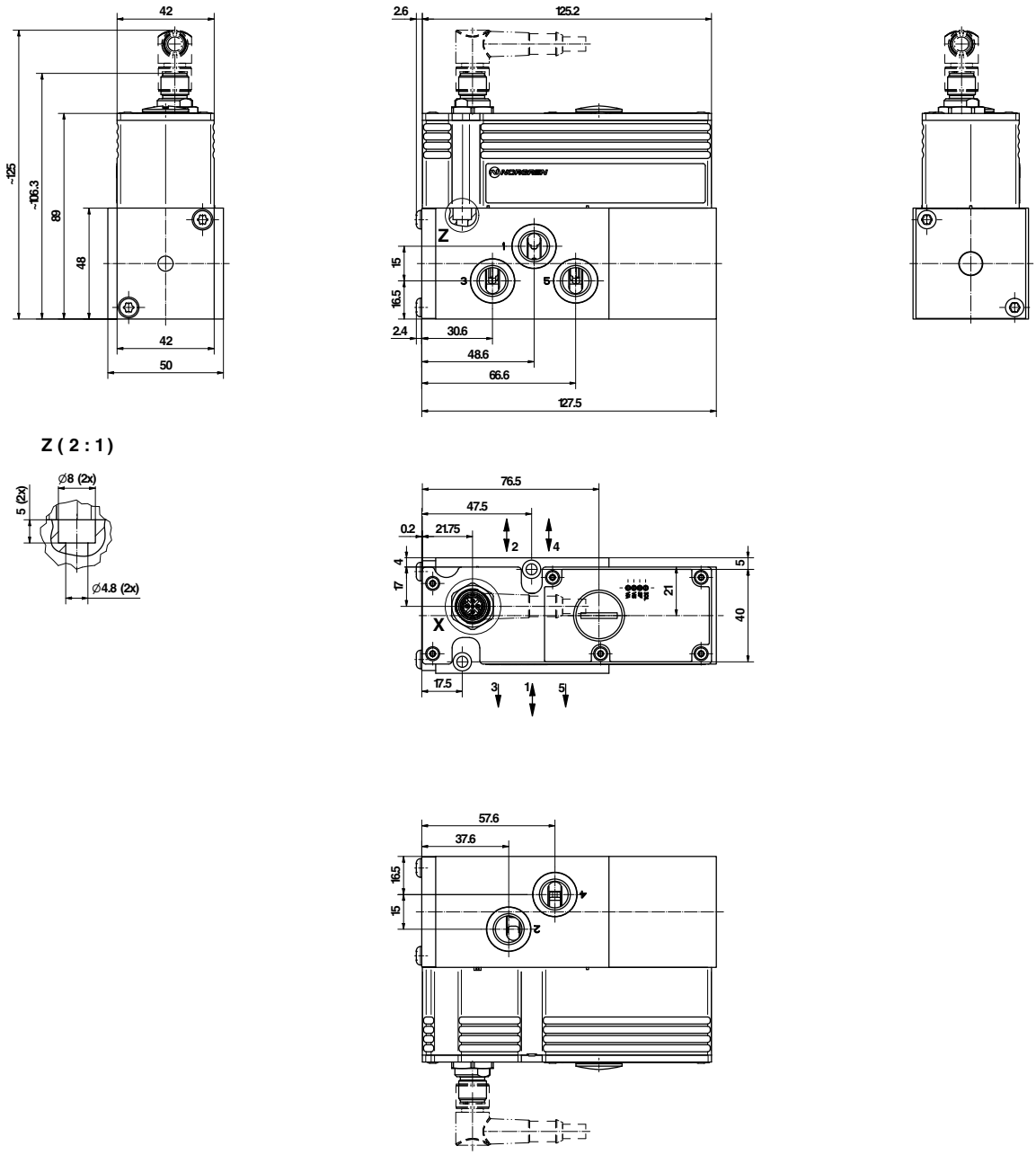


Flow-rate as a function of the pressure ratio P2/P1 for setpoint values 10, 20, ...100%



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.

Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Ноябрьск (3496)41-32-12
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Саранск (8342)22-96-24
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70 **Казахстан** +7(7172)727-132 **Киргизия** +996(312)96-26-47

www.norgren.nt-rt.ru | | ner@nt-rt.ru