NORGREN HERION

# VP21

**3 Way Proportional Pressure Control Valve with integrated electronic pressure control**
**Poppet valve**
**Nominal diameter (ND) 2, 4, 8, 12, 20**

- **Free of lacquer affecting substances**
- **Combines valve and electronic control unit**
- **Good linearity**
- **Good response sensitivity**
- **Fast response time**
- **Adjustable amplification control**
- **Adjustable pressure range**
- **Threshold switch (comperator)**
- **Valve conforms to CE**

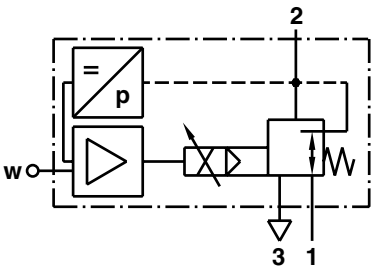


## Technical Data

Medium:
Filtered compressed air, lubricated or unlubricated
Filter 50 µm
Fluid temperature:
-5 to +50°C
Operation:
Proportional solenoid
Connection:
Flange type with subplate
G 1/8, G 1/4, G 3/8, G 1/2, G 3/4
Mounting position:
Any, preferable vertical (solenoid above)
Flow direction:
Defined (see scheme)
Operating temperature:
0 to +60°C
Material:
Valve housing: Aluminium alloy
Electronic housing: ABS
Seals: NBR (Perbunan)
Degree of protection: IP 65 (M12-variant)
Operating pressure $p_{1\ max}$:
7 bar, 12 bar, 16,5 bar
Setting pressure $p_2$:
0 (0,03) – 2 bar, 0 (0,15) – 10 bar, 0 (0,24) – 16 bar
Hysteresis:
< 0.5 [% $p_2$ max]
Repeatability:
< 0.5 [% $p_2$ max]
Linearity:
< 1 [% $p_2$ max]
Response sensitivity:
< 0.2 [% $p_2$ max]

## Ordering Information

3 way proportional pressure control valve, Nominal diameter 2, operating pressure 0,15 to 10 bar, set point 0 to 10 V, connector 1 x M12
**Type: 4095010.9000.024.00**




**Versions with integrated electronic pressure control**
For different set point inputs:
0 - 10 V, 0 - 20 mA, 4 - 20 mA, digital 8 bit with memory function
Actual value output:
0 - 10 V, 0 - 20 mA, 4 - 20 mA
Threshold switch (comperator):
Adjustment of tolerance and response time
Adjustable pressure range
Internal set point: Adjustable potentiometer

**Electromagnetic Compatibility**
The valves conform to the EC requirements EN50081-2 (emission) und EN50082-2 (disturbance noise). For this specification shielded cables have to be used.


Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document.

## General Information

2 x Connector (2 x M12 or 1 x M12 + 14 pole)

| Type | Pressure setting $p_2$ (bar) | Operating pressure max. $p_1$ (bar) | Set point input w | Actual value output x | Pressure range adjustment | Comperator fixed | Comperator variable | Connection diagram No. | Connector Variant |
|---|---|---|---|---|---|---|---|---|---|
| **4094x00.9000.024.00** | 0 ... 2 | 7 | 0 ... 10 V | 0 ... 10 V | x | x | | 1 | A + B |
| **4094x01.9000.024.00** | | | 0 ... 20 mA | 0 ... 10 V | x | x | | 1 | A + B |
| **4094x02.9000.024.00** | | | 4 ... 20 mA | 0 ... 10 V | x | x | | 1 | A + B |
| **4094x03.9000.024.00** | | | 8 bit parallel | 0 ... 10 V | x | x | | 3 | A + D |
| **4094x04.9000.024.00** | | | 0 ... 10 V | 0 ... 10 V | x | | x | 1 | A + B |
| **4094x05.9000.024.00** | | | 0 ... 20 mA | 0 ... 10 V | x | | x | 1 | A + B |
| **4094x06.9000.024.00** | | | 4 ... 20 mA | 0 ... 10 V | x | | x | 1 | A + B |
| **4094x07.9000.024.00** | | | 0 ... 10 V | 4 ... 20 mA | x | | x | 1 | A + B |
| **4094x09.9000.024.00** | | | 4 ... 20 mA | 4 ... 20 mA | x | | x | 1 | A + B |
| | | | | | | | | | |
| **4094x10.9000.024.00** | 0 ... 10 | 12 | 0 ... 10 V | 0 ... 10 V | x | x | | 1 | A + B |
| **4094x11.9000.024.00** | | | 0 ... 20 mA | 0 ... 10 V | x | x | | 1 | A + B |
| **4094x12.9000.024.00** | | | 4 ... 20 mA | 0 ... 10 V | x | x | | 1 | A + B |
| **4094x13.9000.024.00** | | | 8 bit parallel | 0 ... 10 V | x | x | | 3 | A + D |
| **4094x14.9000.024.00** | | | 0 ... 10 V | 0 ... 10 V | x | | x | 1 | A + B |
| **4094x15.9000.024.00** | | | 0 ... 20 mA | 0 ... 10 V | x | | x | 1 | A + B |
| **4094x16.9000.024.00** | | | 4 ... 20 mA | 0 ... 10 V | x | | x | 1 | A + B |
| **4094x17.9000.024.00** | | | 0 ... 10 V | 4 ... 20 mA | x | | x | 1 | A + B |
| **4094x19.9000.024.00** | | | 4 ... 20 mA | 4 ... 20 mA | x | | x | 1 | A + B |
| | | | | | | | | | |
| **4094x26.9000.024.00** | 0 ... 16 | 16,5 | 0 ... 10 V | 0 ... 10 V | x | x | | 1 | A + B |
| **4094x27.9000.024.00** | | | 0 ... 20 mA | 0 ... 10 V | x | x | | 1 | A + B |
| **4094x28.9000.024.00** | | | 4 ... 20 mA | 0 ... 10 V | x | x | | 1 | A + B |
| **4094x29.9000.024.00** | | | 8 bit parallel | 0 ... 10 V | x | x | | 3 | A + D |
| **4094x30.9000.024.00** | | | 0 ... 10 V | 0 ... 10 V | x | | x | 1 | A + B |
| **4094x31.9000.024.00** | | | 0 ... 20 mA | 0 ... 10 V | x | | x | 1 | A + B |
| **4094x32.9000.024.00** | | | 4 ... 20 mA | 0 ... 10 V | x | | x | 1 | A + B |
| **4094x33.9000.024.00** | | | 0 ... 10 V | 4 ... 20 mA | x | | x | 1 | A + B |
| **4094x35.9000.024.00** | | | 4 ... 20 mA | 4 ... 20 mA | x | | x | 1 | A + B |

1 x Connector (1 x M12)

| Type | Pressure setting $p_2$ (bar) | Operating pressure max. $p_1$ (bar) | Set point input w | Actual value output x | Pressure range adjustment | Comperator fixed | Comperator variable | Connection diagram No. | Connector Variant |
|---|---|---|---|---|---|---|---|---|---|
| **4095x00.9000.024.00** | 0 ... 2 | 7 | 0 ... 10 V | 0 ... 10 V | x | | | 2 | C |
| **4095x01.9000.024.00** | | | 0 ... 20 mA | 0 ... 10 V | x | | | 2 | C |
| **4095x02.9000.024.00** | | | 4 ... 20 mA | 0 ... 10 V | x | | | 2 | C |
| **4095x07.9000.024.00** | | | 0 ... 10 V | 4 ... 20 mA | x | | | 2 | C |
| **4095x09.9000.024.00** | | | 4 ... 20 mA | 4 ... 20 mA | x | | | 2 | C |
| | | | | | | | | | |
| **4095x10.9000.024.00** | 0 ... 10 | 12 | 0 ... 10 V | 0 ... 10 V | x | | | 2 | C |
| **4095x11.9000.024.00** | | | 0 ... 20 mA | 0 ... 10 V | x | | | 2 | C |
| **4095x12.9000.024.00** | | | 4 ... 20 mA | 0 ... 10 V | x | | | 2 | C |
| **4095x17.9000.024.00** | | | 0 ... 10 V | 4 ... 20 mA | x | | | 2 | C |
| **4095x19.9000.024.00** | | | 4 ... 20 mA | 4 ... 20 mA | x | | | 2 | C |
| | | | | | | | | | |
| **4095x26.9000.024.00** | 0 ... 16 | 16,5 | 0 ... 10 V | 0 ... 10 V | x | | | 2 | C |
| **4095x27.9000.024.00** | | | 0 ... 20 mA | 0 ... 10 V | x | | | 2 | C |
| **4095x28.9000.024.00** | | | 4 ... 20 mA | 0 ... 10 V | x | | | 2 | C |
| **4095x33.9000.024.00** | | | 0 ... 10 V | 4 ... 20 mA | x | | | 2 | C |
| **4095x35.9000.024.00** | | | 4 ... 20 mA | 4 ... 20 mA | x | | | 2 | C |

The „x“ should be replaced by:
**0** for ND 2
**1** for ND 4
**3** for ND 8
**4** for ND 12/20

Subplates and plug connectors should be ordered separately (see accessories)



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## General Information

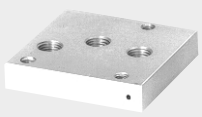
6 pole + PE Connector

| Type | Pressure setting $p_2$ (bar) | Operating pressure max. $p_1$ (bar) | Set point input w | Actual value output x | Pressure range adjustment *) | Comperator fixed | Comperator variable | Connection diagram No. | Connector Variant |
|---|---|---|---|---|---|---|---|---|---|
| **4091x00.9000.024.00** | 0 ... 2 | 7 | 0 ... 10 V | 0 ... 10 V | x | | | 4 | E |
| **4091x01.9000.024.00** | | | 0 ... 20 mA | 0 ... 10 V | x | | | 4 | E |
| **4091x02.9000.024.00** | | | 4 ... 20 mA | 0 ... 10 V | x | | | 4 | E |
| **4091x03.9000.024.00** | | | 8 bit parallel | 0 ... 10 V | x | | | 6 | F |
| | | | | | | | | | |
| **4091x10.9000.024.00** | 0 ... 10 | 12 | 0 ... 10 V | 0 ... 10 V | x | | | 4 | E |
| **4091x11.9000.024.00** | | | 0 ... 20 mA | 0 ... 10 V | x | | | 4 | E |
| **4091x12.9000.024.00** | | | 4 ... 20 mA | 0 ... 10 V | x | | | 4 | E |
| **4091x13.9000.024.00** | | | 8 bit parallel | 0 ... 10 V | x | | | 6 | F |
| **4091x16.9000.024.00** | | | 0 ... 10 V | 0 ... 10 V | x | | x | 5 | E |
| | | | | | | | | | |
| **4091x26.9000.024.00** | 0 ... 16 | 16,5 | 0 ... 10 V | 0 ... 10 V | x | | | 4 | E |
| **4091x27.9000.024.00** | | | 0 ... 20 mA | 0 ... 10 V | x | | | 4 | E |
| **4091x28.9000.024.00** | | | 4 ... 20 mA | 0 ... 10 V | x | | | 4 | E |
| **4091x29.9000.024.00** | | | 8 bit parallel | 0 ... 10 V | x | | | 6 | F |

The „x“ should be replaced by:
**0** for ND 2
**1** for ND 4
**3** for ND 8
**4** for ND 12/20

*) Please, clarify the availability of the pressure range adjustment with the manufacturing site.
Subplates and plug connectors should be ordered separately (see accessories)

## Accessories



Subplate

| Specification | Type |
|---|---|
| ND 2 G 1/8 | **0542845** |
| ND 4 G 1/8 | **0542848** |
| ND 8 G 1/4 | **0542636** |
| ND 8 G 3/8 | **0543705** |
| ND 12 G 1/2 | **0542814** |
| ND 20 G 3/4 | **0542840** |



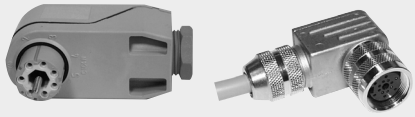
Silencer for venting port at subplate

| Specification | Type |
|---|---|
| ND 2 G 1/8 | **0014510** |
| ND 4 G 1/4 | **0014610** |
| ND 8 G 3/8 | **0014710** |
| ND 12 G 1/2 | **0014810** |
| ND 20 G 3/4 | **0014910** |



Plug connector M12

| Specification | Variant | Type |
|---|---|---|
| M 12 x 1; 3 pole; 2 m 3 x 0,34 mm² | A | **0799843** |
| M 12 x 1; 4 pole; 2 m 4 x 0,34 mm² | B | **0799844** |
| M 12 x 1; 5 pole; 2 m 5 x 0,34 mm² | C | **0799845** |
| M 12 x 1; 3 pole; 5 m 3 x 0,34 mm² | A | **0250079** |
| M 12 x 1; 4 pole; 5 m 4 x 0,34 mm² | B | **0250080** |
| M 12 x 1; 5 pole; 5 m 5 x 0,34 mm² | C | **0250081** |
| M 12 x 1; 3 pole; 10 m 3 x 0,34 mm² | A | **0250470** |
| M 12 x 1; 4 pole; 10 m 4 x 0,34 mm² | B | **0250471** |
| M 12 x 1; 5 pole; 10 m 5 x 0,34 mm² | C | **0250472** |



Plug connector 6-/14-/15 pole

| Specification | Variant | Type |
|---|---|---|
| 14 pole; Pg 9 | D | **0799847** |
| 14 pole; 2 m 14 x 0,25 mm² | D | **0799857** |
| 14 pole; 5 m 14 x 0,25 mm² | D | **0250082** |
| 6 pole + PE 90° plastic | E | **0660689** |
| 6 pole + PE metal, Pg 13,5 | E | **0799695** |
| 6 pole + PE metal 3 m 7 x 0,5 mm² | E | **0799853** |
| 15 pole MIL-C-26482 | F | **0680683** |



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## Electrical information

### Supply

| | | |
|---|---|---|
| Supply voltage | $U_B$ (VDC) | 18 to 32 |
| Residual ripple max | (%) | 10 |
| Power consumption at 24 V DC | | |
| 16 bar Valve size 2 | $I_B$ (A) | 1,8 |
| 16 bar Valve size 4, 8, 12 | $I_B$ (A) | 1,5 |
| 10 bar Valve size 2 | $I_B$ (A) | 1,2 |
| 10 bar Valve size 4, 8, 12 | $I_B$ (A) | 1,0 |
| 2 bar Valve size 2, 4, 8, 12 | $I_B$ (A) | 0,8 |
| Stand-by-operation | $I_B$ (A) | < 0,05 |

**16 bar model ND 2 and ND 4**
Should these valves be run at 100 % ED on a high pressure level / in a high pressure range for a longer time, the solenoid current will be reduced. Thereby the pressure setting $p_2$ will be decreased. This ensures the operational safety of the valves. This reaction of the system depends directly on the surrounding temperature. At an ED ≤ 50 %, the maximum pressure can be maintained over the whole range of temperature.
This safety function does not work for the valves ND 4 until from +45 °C surrounding temperature.

### Inputs (signal)
#### Analogue setpoints[1] (w)

| | | |
|---|---|---|
| Voltage signal | $U_E$ (V) | 0 to 10 |
| Input resistance | $R_E$ (kΩ) | < 500 |
| Current signal | $I_E$ (mA) | 0 to 20 / 4 to 20 |
| Load resistance | (Ω) | ≤ 135 |

#### Digital setpoints[1] (w)

| | | |
|---|---|---|
| Data inputs (parallel) | (bit) | 8 bit + enable |
| Level for logic „L“ [2] | (V) | 0 to 2 |
| Level for logic „H“ | (V) | 12 to 32 |
| Enable * | | Low active |
| Input current | (mA) | 1 |

* see General information

#### Set point (W) intern (optional)[1]

| | | |
|---|---|---|
| Setting range | (V) | 0 to 10 |
| Pneumatic output pressure | (%) | 0 to 100 |
| Factory setting | (%) | 0 |
| Adjusting facility | | Internal potentiometer |

### Outputs (signal)
#### Actual value (X)

| | | |
|---|---|---|
| Voltage signal for Pneumatic Output pressure | $U_A$ (V) | 0 ... 2 bar 1 V = 0,2 bar<br>0 ... 10 bar 1 V = 1,0 bar<br>0 ... 16 bar 1 V = 1,6 bar |
| Output current | $I_A$ (mA) | 1 |
| Current signal for Pneumatic Output pressure | $I_A$ (0-20 mA) | 0 ... 2 bar 1 mA = 0,1 bar<br>0 ... 10 bar 1 mA = 0,5 bar<br>0 ... 16 bar 1 mA = 0,8 bar |
| Current signal for Pneumatic Output pressure | $I_A$ (4-20 mA) | 0 ... 2 bar 1,6 mA = 0,2 bar<br>0 ... 10 bar 1,6 mA = 1,0 bar<br>0 ... 16 bar 1,6 mA = 1,6 bar |

#### Comperator (fixed)
#### Signal output „pressure reached“ (x = w)

| | | |
|---|---|---|
| Switching range | (%$p_2$ max) | ± 2 |
| Voltage signal for Pressure outside Switching range x ≠ w | (V) | 0 |
| Pressure reached (x = w) | (V) | $U_B$ - 1,5 |
| Output current max. | (mA) | 10 |

#### Comperator (variable)
#### Signal output „pressure reached“ (x = w)

| | | |
|---|---|---|
| Switching range | (%$p_2$ max) | 0 to ± 20 |
| Adjusting facility | | Internal potentiometer |
| Factory setting | (%$p_2$ max) | Middle position |
| Delay time (during pressure build-up) | (ms) | 100 to 1200 |
| Factory setting | (ms) | 1200 |
| Voltage signal for Pressure outside Switching range x ≠ w | (V) | 0 |
| Pressure reached (x = w) | (V) | $U_B$ - 1,5 |
| Output current max. | (mA) | 10 |

## Electromagnetic compatibility

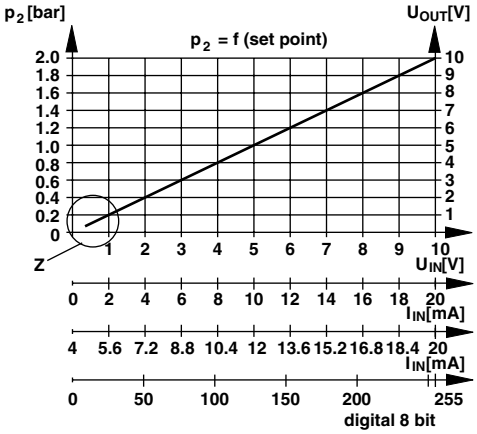
| | |
|---|---|
| Noise immunity | To DIN EN 50082, Part 2 |
| Noise transmission | To DIN EN 50081, Part 1 |

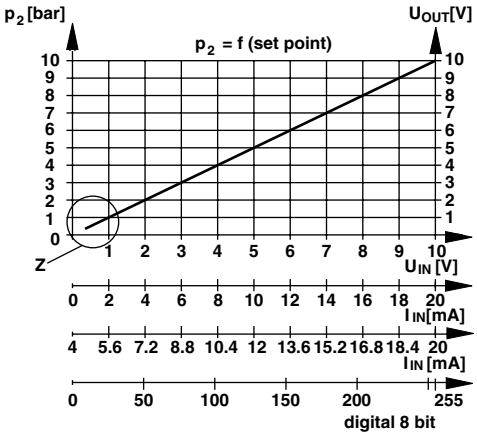
[1] Valve function is activated as soon as the set point is ≥ 1.5%. If the set point is < 1.5% the set pressure = 0 and the valve is in stand-by-mode.
[2] Input open = Logic L

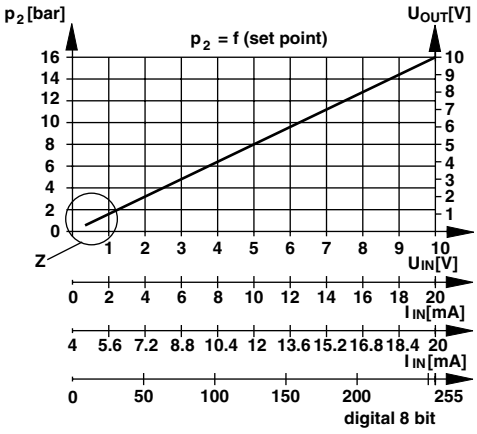

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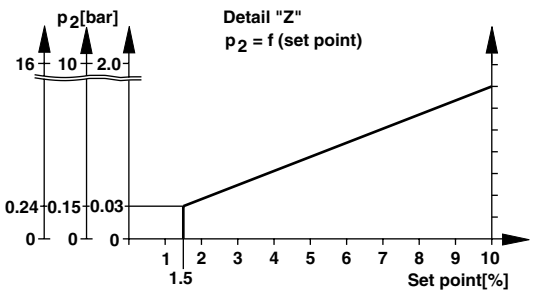
## Characteristic Curves

Static Characteristic curves ND 2 to ND 20

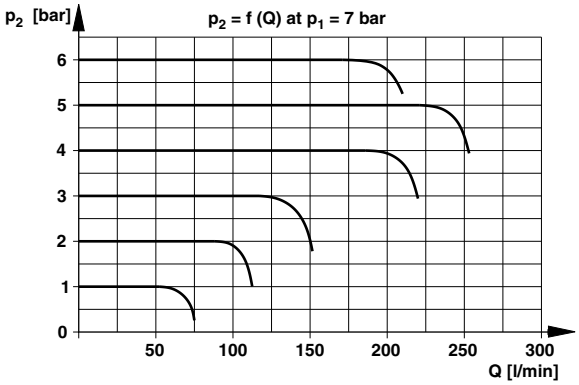


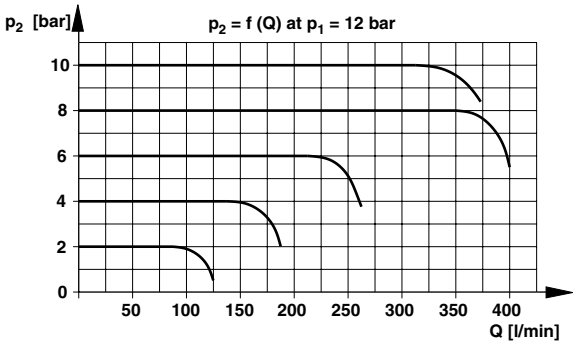



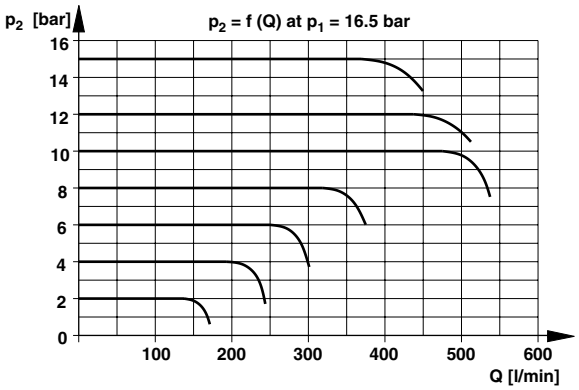




Flow characteristic curves ND 2



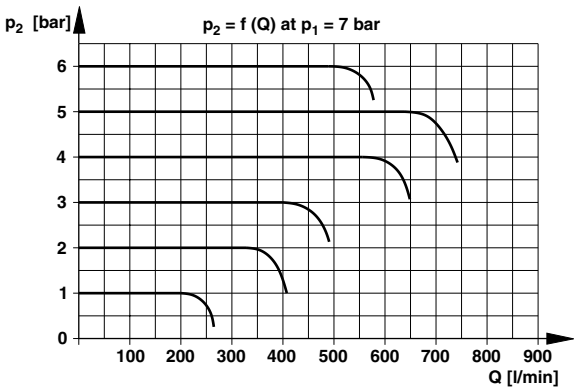

The valve function is activated as soon as the setpoint is ≥1,5%

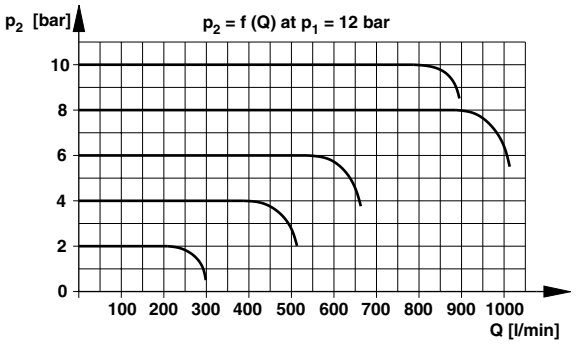


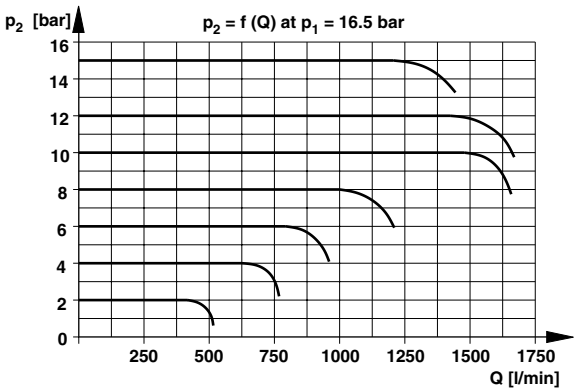
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## Characteristic Curves

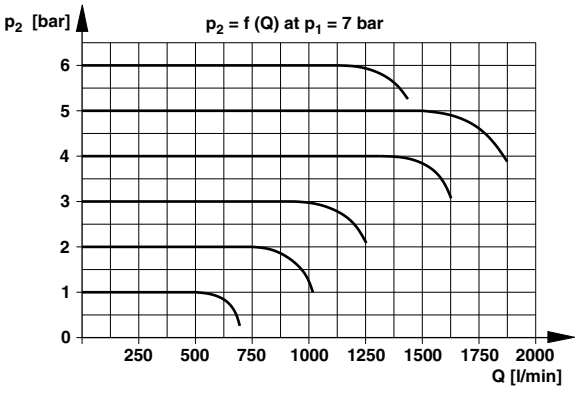
Flow characteristic curves ND 4

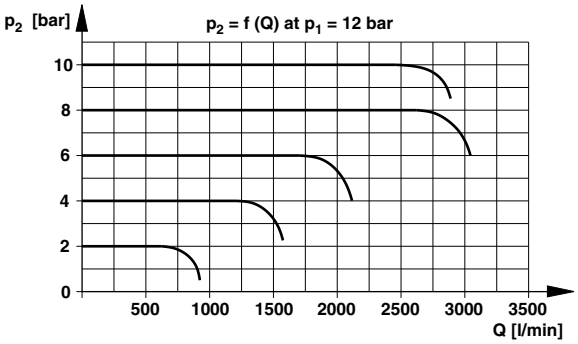


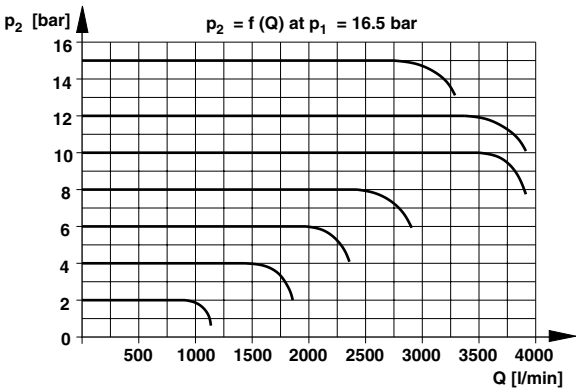




Flow characteristic curves ND 8



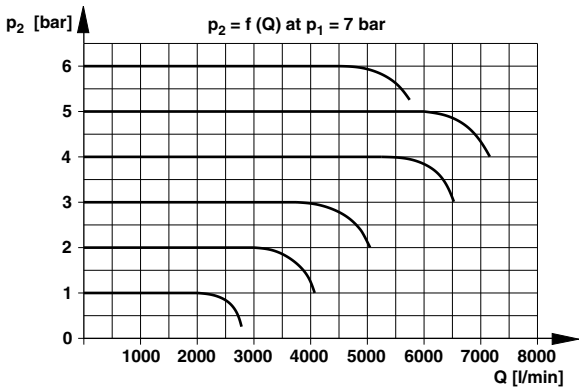



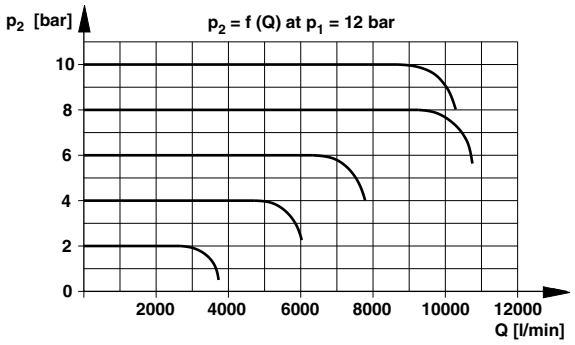


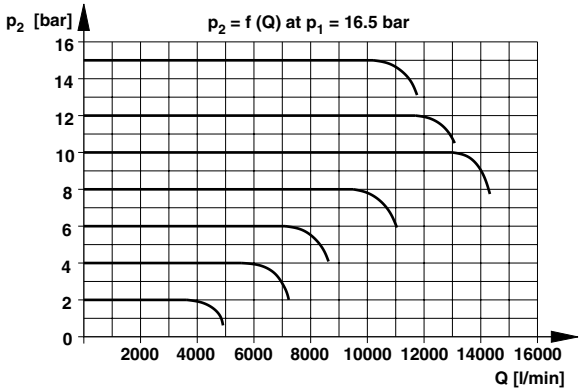

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## Characteristic Curves

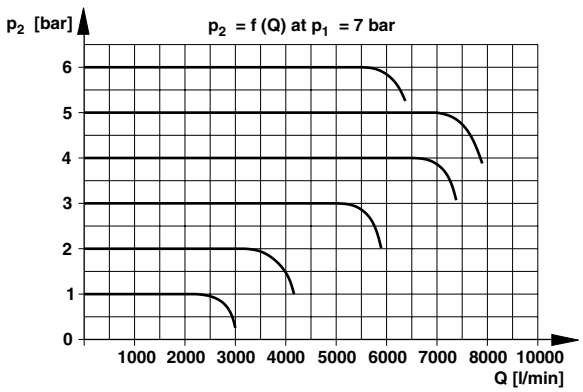
Flow characteristic curves ND 12

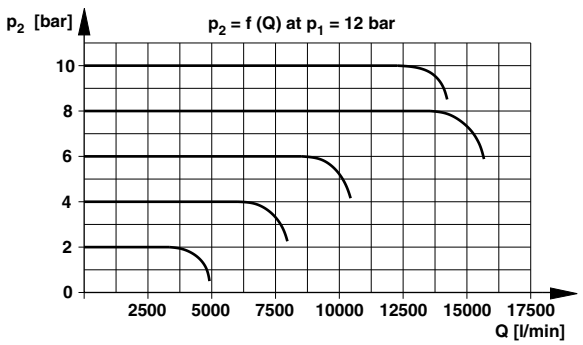


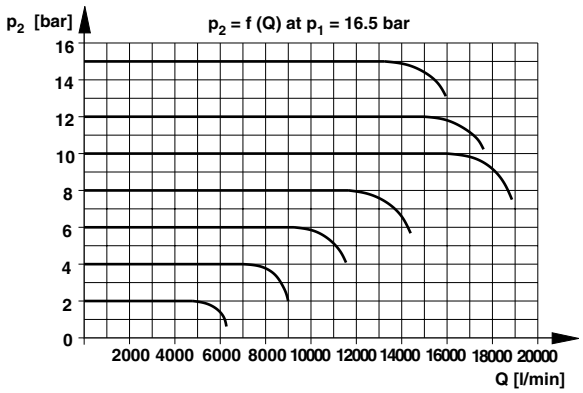




Flow characteristic curves ND 20



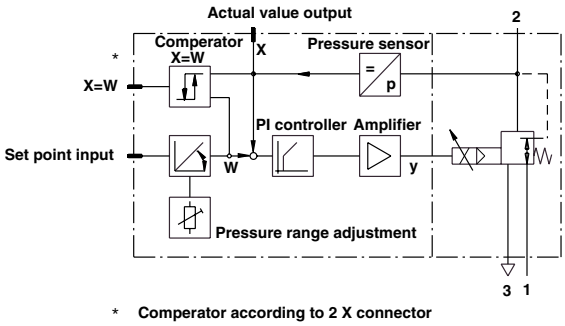





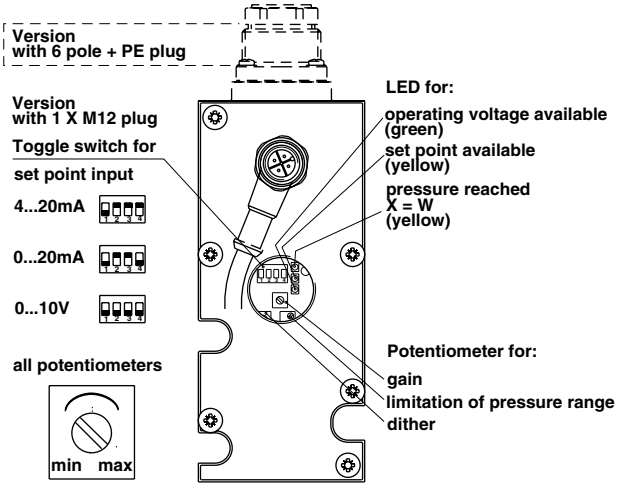

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## Functions/adjustment facilities (basic)

**Block diagram (Basic)**




* Comperator according to 2 X connector



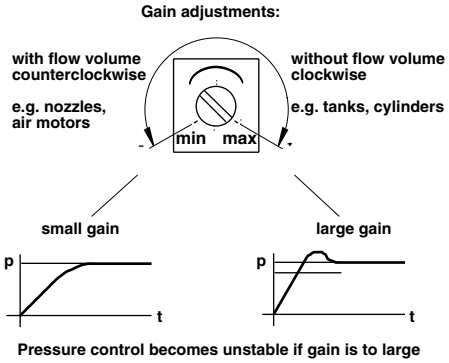

### Switch over set point input

The set point input is factory pre-adjusted according to type no. In case of later change-over the accuracy will be reduced to ± 1.5%.

### Setting the controller gain

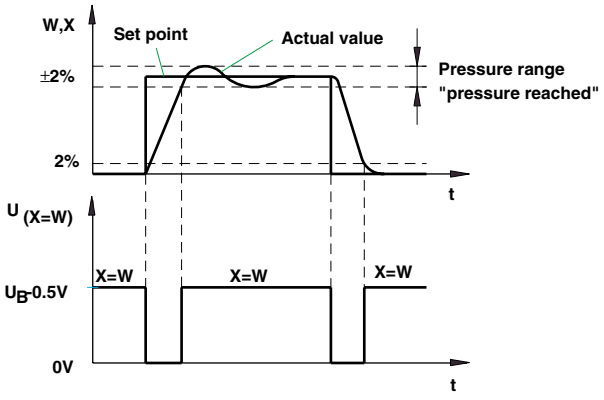
The gain of the integrated controller is set in the factory to a value which allows universal use of the valve. If necessary, the controller gain can be varied to suit a specific pneumatic application of the valve. The controller gain can be changed by turning the potentiometer (under the screw plug in the electronics cover).
Factory setting in an application which requires permanent flow of air at the valve output 2 resp. for volume according to the table below:

| ND | For volume approx. ($cm^3$) |
|---|---|
| 2 | 0 ... 100 |
| 4 | 50 ... 500 |
| 8 | 100 ... 1500 |
| 12/20 | 1000 ... 8000 |




### Comperator/Signal output (fixed) „pressure reached“ (x = w)

Description:
The function „Pressure reached“ enables the monitoring of the pressure control function.
The actual value is compared with the desired value (x = w).
Identical values (selected pressure lying within the switching range) will cause a status signal at the output (x = w).
Switching range ± 2 % of $p_2$ max.

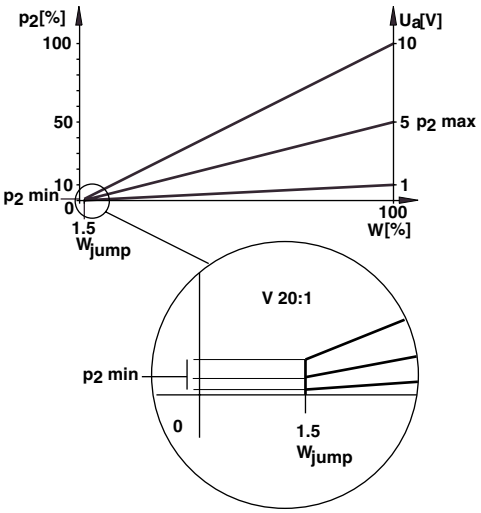





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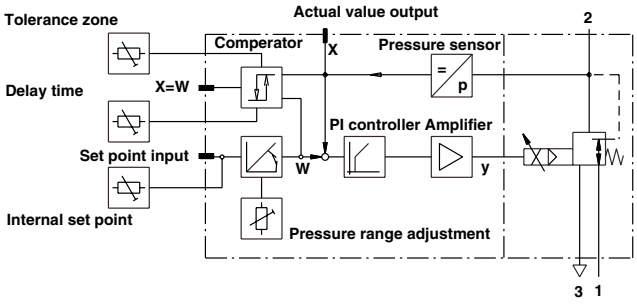
**Pressure range adjustment**

Description:
When delivered the relation between the set point pressure and the output pressure is adjusted to the prevailing pressure range (2 bar, 10 bar, 16 bar):
Set point 100%
corresponding to output pressure 100%
The potentiometer „pressure range adjustment“ offers the possibility to change the presssure range. Meanwhile it is possible to decrease the set point pressure down to 10 % (see characteristic curve 10 %).
The valve always starts to respond at $p_2$ min.
This means at a pressure range up to 2 bar = 0,03 bar
10 bar = 0,15 bar
16 bar = 0,24 bar.

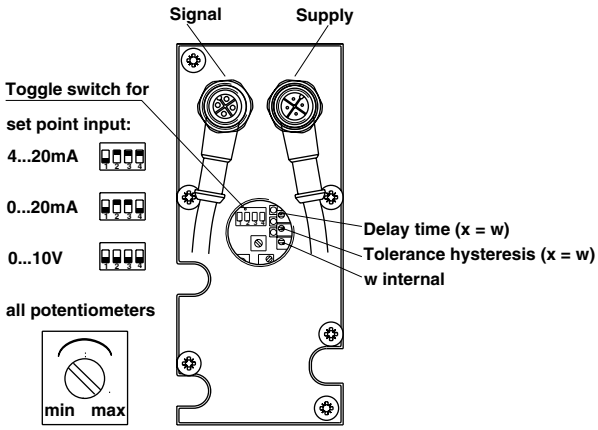



## Functions/adjustment facilities (enlarged)

Block diagram (enlarged)




Version with 2 X M12 plug

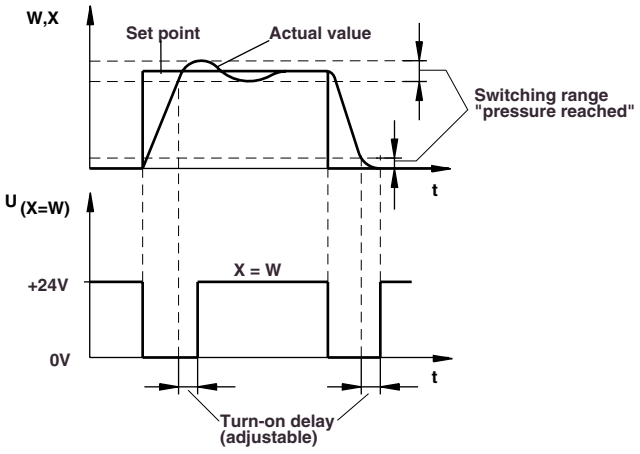



**Internal set point**

Should there be no set point, it is possible to adjust an internal set point via potentiometer (this must be activated by the factory). Then, however, an external adjustment of a set point is impossible.

**Comperator/Signal output (variable adjustable)**
**„pressure reached“ (x = w)**

Description:
The function „pressure reached“ enables the monitoring of the pressure control function.
The actual value is compared with the desired value (x = w). Identical values (selected pressure lying within the switching range) will cause a status signal at the output (x = w). Switching range ± 2 % of $p_2$ max (adjustable with potentiometer).
It is also possible to adjust the turn-on delay from 100 ms up to 1200 ms (adjustable with the potentiometer).



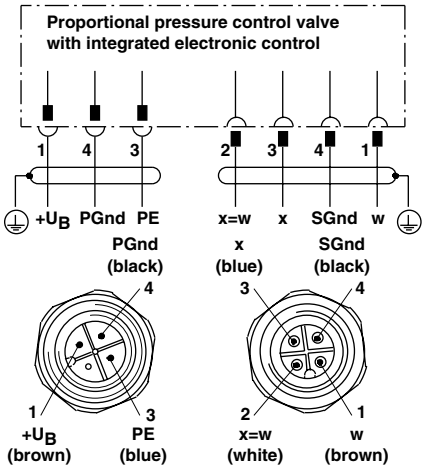


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## Electrical Connection Diagrams

### Connection diagram 1

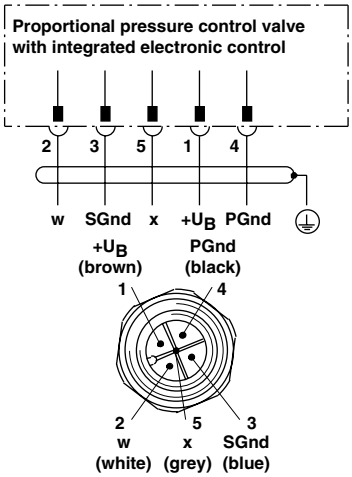
Valves with analogue set point input
2 connectors




| PIN | Supply | Signal |
|---|---|---|
| 1 | +UB | w |
| 2 | – | x=w |
| 3 | PE | x |
| 4 | PGnd | SGnd |
| Screen | ⏚ | ⏚ |

### Connection diagram 2

Valves with analogue set point input
1 connector



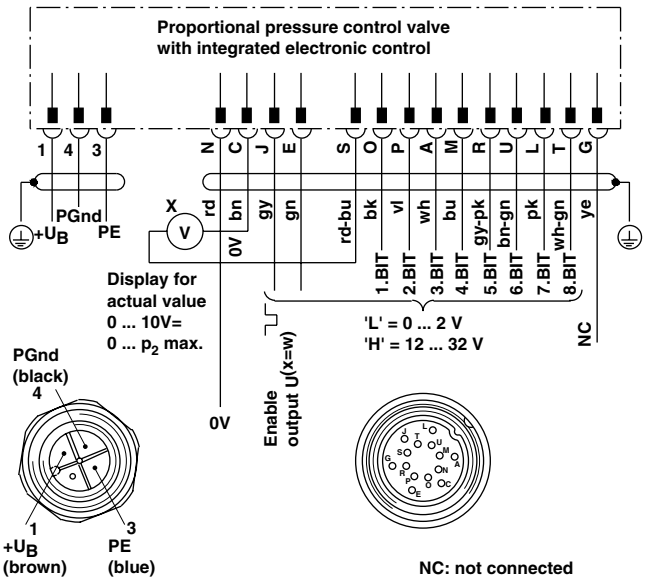

| PIN | |
|---|---|
| 1 | +UB |
| 2 | w |
| 3 | SGnd |
| 4 | PGnd |
| 5 | x |
| Screen | ⏚ |

### Explanation of the connections

| | | | |
|---|---|---|---|
| $+U_B$ | Supply voltage | w | Set point input |
| PGnd | Zero potential supply | x | Actual value output |
| SGnd | Zero potential signal | x = w | Comperator output |
| | | PE | Protective ground |

### Connection diagram 3

Valves with digital set point input
2 connectors




Notes on memory [1]
Logic table

| T | L | U | R | M | A | P | O | J | Output signal |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | L | As triggered at pins O to T |
| X | X | X | X | X | X | X | X | H | The previously-set value is stored; the triggered signals at pins O to T are ignored |

[1] If the memory function is not required, pin J can be ignored. In case of an interrupt of the valve function $U_B$ the memory information is lost.

Conversion table for digital input signal

| Signal at pin | | | | | | | | Value z (decimal) | Valve version for pressure range $p_2$ (bar) | |
|---|---|---|---|---|---|---|---|---|---|---|
| T | L | U | R | M | A | P | O | | 0 ... 2 | 0 ... 10 |
| L | L | L | L | L | L | L | L | 0 | 0,000 | 0,000 |
| L | L | L | L | L | L | L | H | 1 | 0,008 | 0,039 |
| L | L | L | L | L | L | H | L | 2 | 0,016 | 0,078 |
| L | L | L | L | L | H | L | L | 4 | 0,031 | 0,156 |
| L | L | L | L | H | L | L | L | 8 | 0,063 | 0,314 |
| L | L | L | H | L | L | L | L | 16 | 0,126 | 0,627 |
| L | L | H | L | L | L | L | L | 32 | 0,251 | 1,255 |
| L | H | L | L | L | L | L | L | 64 | 0,502 | 2,510 |
| H | L | L | L | L | L | L | L | 128 | 1,004 | 5,020 |
| H | H | H | H | H | H | H | H | 255 | 2,000 | 10,00 |

$p_2$ (bar) = $\frac{2}{255} \times z$ $\frac{10}{255} \times z$

z = Sum of values triggered by „H“

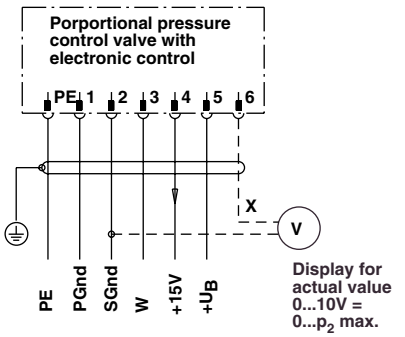


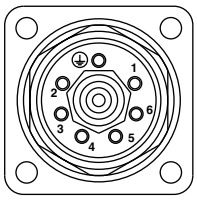
Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document.

# Electrical Connection Diagrams

## Connection diagram 4

Valves with analogue set point input

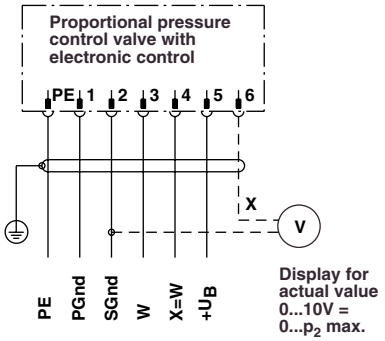


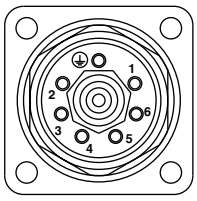




| PIN | |
|---|---|
| 1 | PGnd |
| 2 | SGnd |
| 3 | W |
| 4 | +15V |
| 5 | +$U_B$ |
| 6 | X |
| PE | PE |
| Screen | ⏚ |

## Connection diagram 5

Valves with analogue set point input



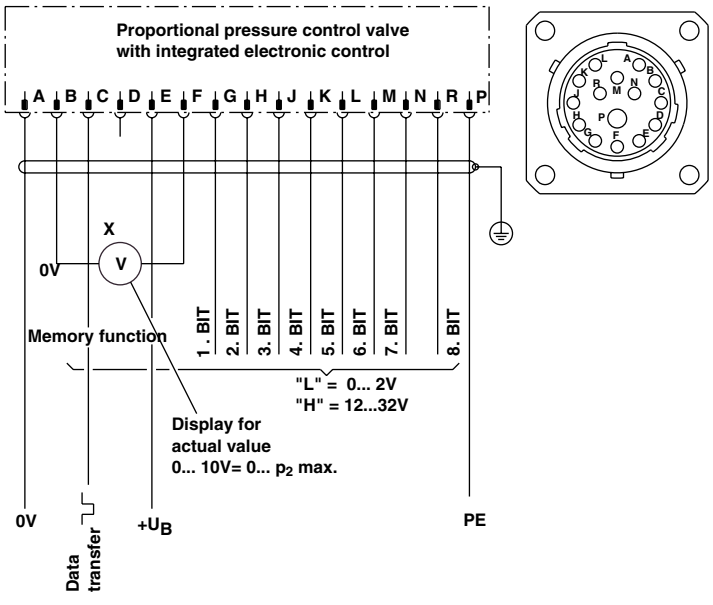

| PIN | |
|---|---|
| 1 | PGnd |
| 2 | SGnd |
| 3 | W |
| 4 | X=W |
| 5 | +$U_B$ |
| 6 | X |
| PE | PE |
| Screen | ⏚ |

## Explanation of the connections

| | | | |
|---|---|---|---|
| +$U_B$ | Supply voltage | w | Set point input |
| PGnd | Zero potential supply | x | Actual value output |
| SGnd | Zero potential signal | x = w | Comperatur output |
| | | PE | Protective earth |

## Connection diagram 6

Valves with digital set point input







Notes on memory [1)]

Logic table

| R | N | M | L | K | J | H | G | C | Output signal |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | L | As triggered at pins G to R |
| X | X | X | X | X | X | X | X | H | The previously-set value is stored; the triggered signals at pins G to R are ignored |

[1)] If the memory function is not required, pin C can be ignored. In case of an interrupt of the valve function $U_B$ the memory information is lost.

Conversion table for digital input signal

| Signal at pin | | | | | | | | Value z (decimal) | Valve version for pressure range $p_2$ (bar) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R | N | M | L | K | J | H | G | | 0 ... 2 | 0 ... 10 | 0 ... 16 |
| L | L | L | L | L | L | L | L | 0 | 0,000 | 0,000 | 0,000 |
| L | L | L | L | L | L | L | H | 1 | 0,008 | 0,039 | 0,063 |
| L | L | L | L | L | L | H | L | 2 | 0,016 | 0,078 | 0,125 |
| L | L | L | L | L | H | L | L | 4 | 0,031 | 0,156 | 0,251 |
| L | L | L | L | H | L | L | L | 8 | 0,063 | 0,314 | 0,502 |
| L | L | L | H | L | L | L | L | 16 | 0,126 | 0,627 | 1,004 |
| L | L | H | L | L | L | L | L | 32 | 0,251 | 1,255 | 2,008 |
| L | H | L | L | L | L | L | L | 64 | 0,502 | 2,510 | 4,016 |
| H | L | L | L | L | L | L | L | 128 | 1,004 | 5,020 | 8,031 |
| H | H | H | H | H | H | H | H | 255 | 2,000 | 10,00 | 16,000 |

$p_2$ (bar) = $\frac{2}{255} \times z$ $\frac{10}{255} \times z$ $\frac{16}{255} \times z$

z = Sum of values triggered by „H“



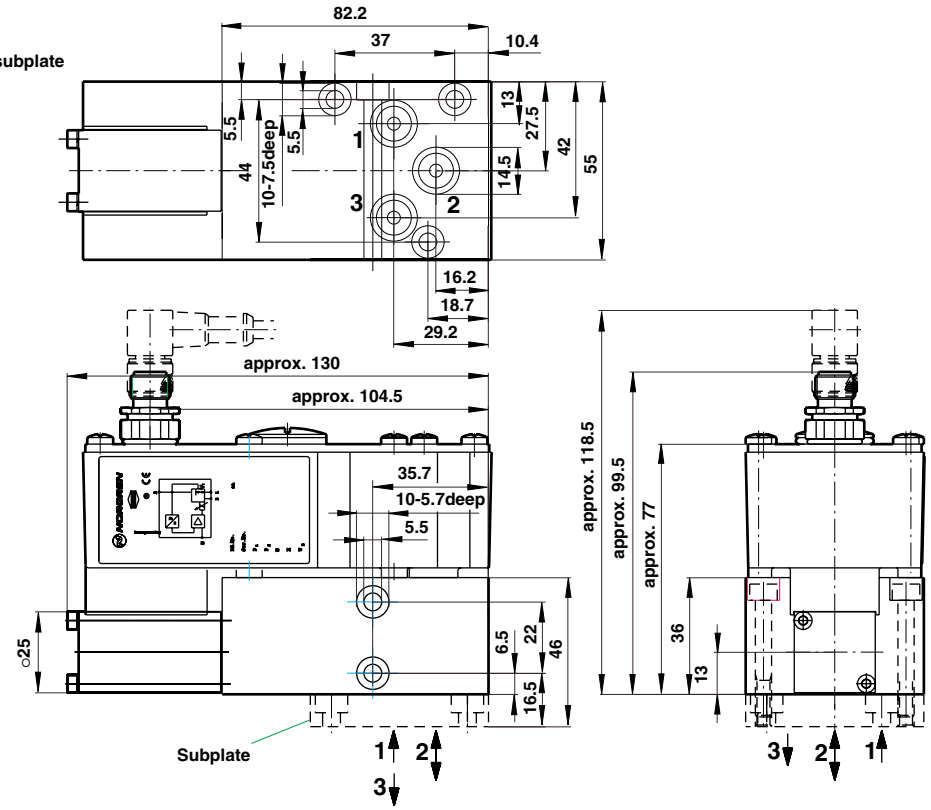
Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document.

## Basic dimensions Valves

Version with M12 plug

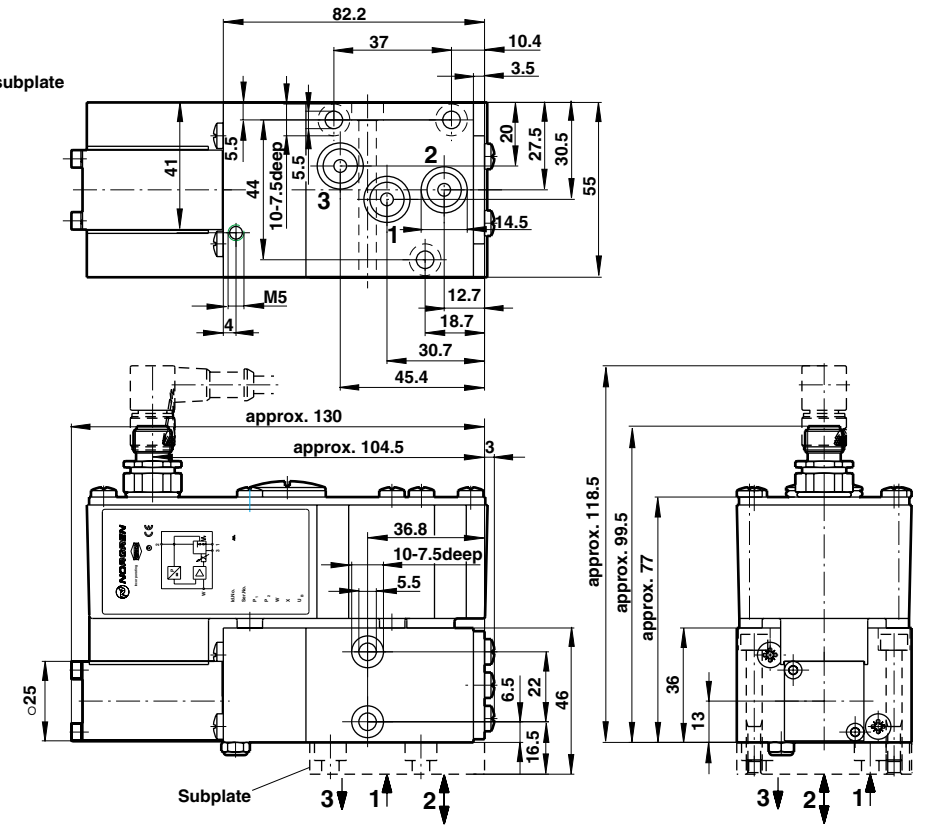
ND 2

**Option without subplate**




ND 4

**Option without subplate**





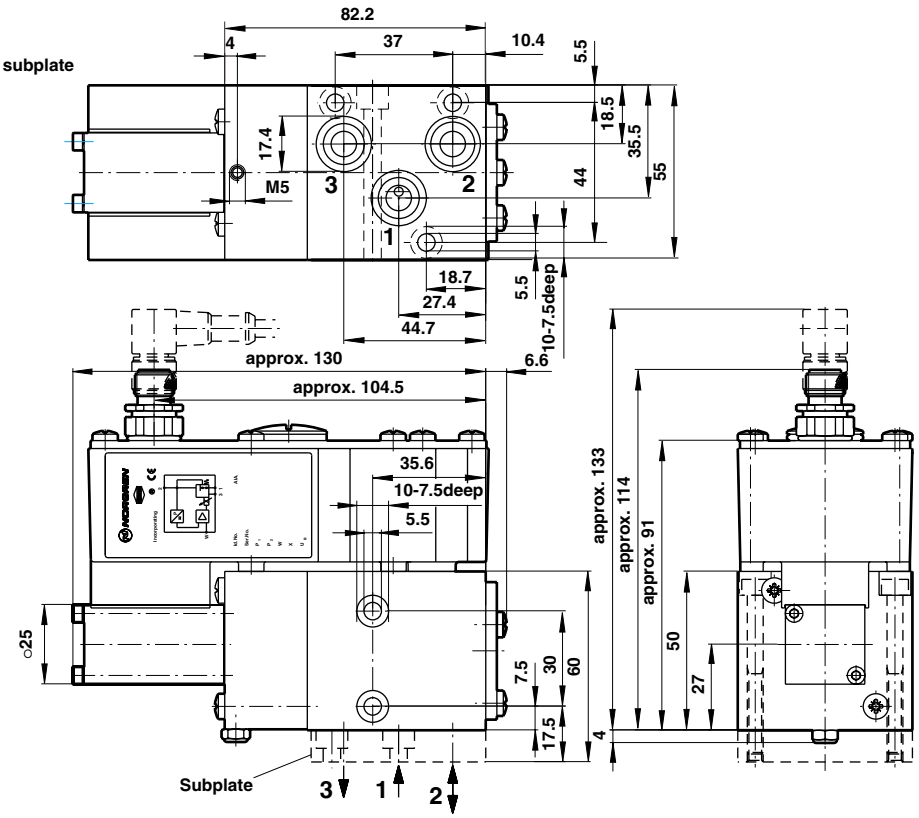

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## Basic dimensions Valves

Version with M12 plug

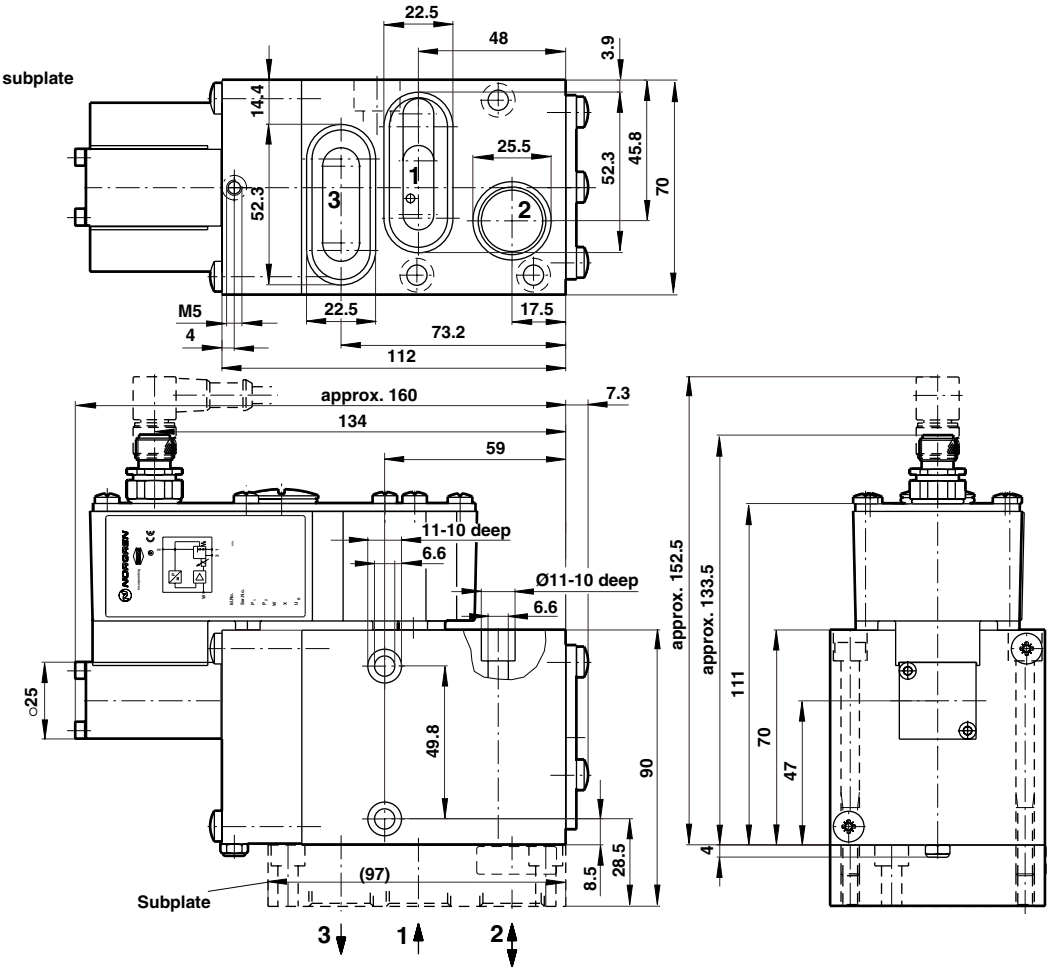
ND 8

**Option without subplate**




ND 12 / 20

**Option without subplate**



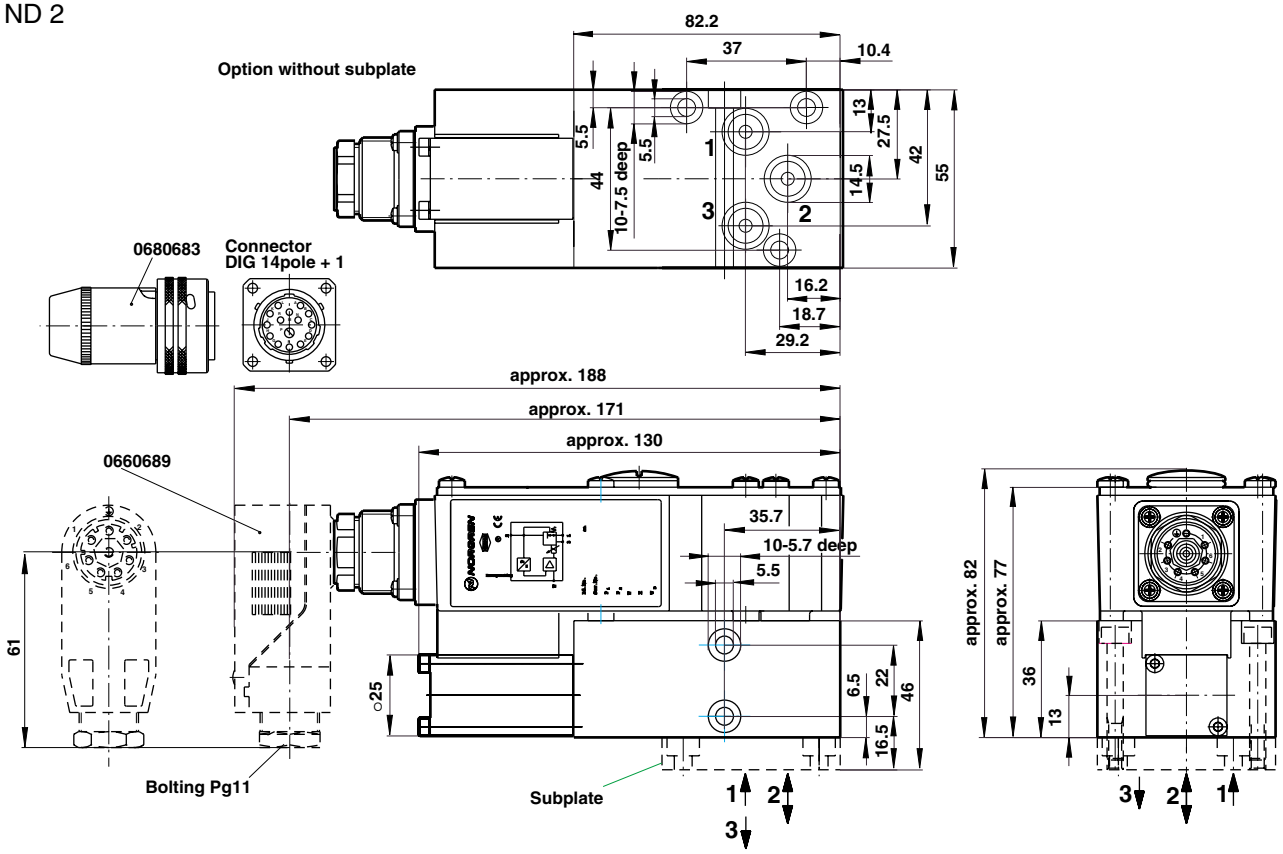



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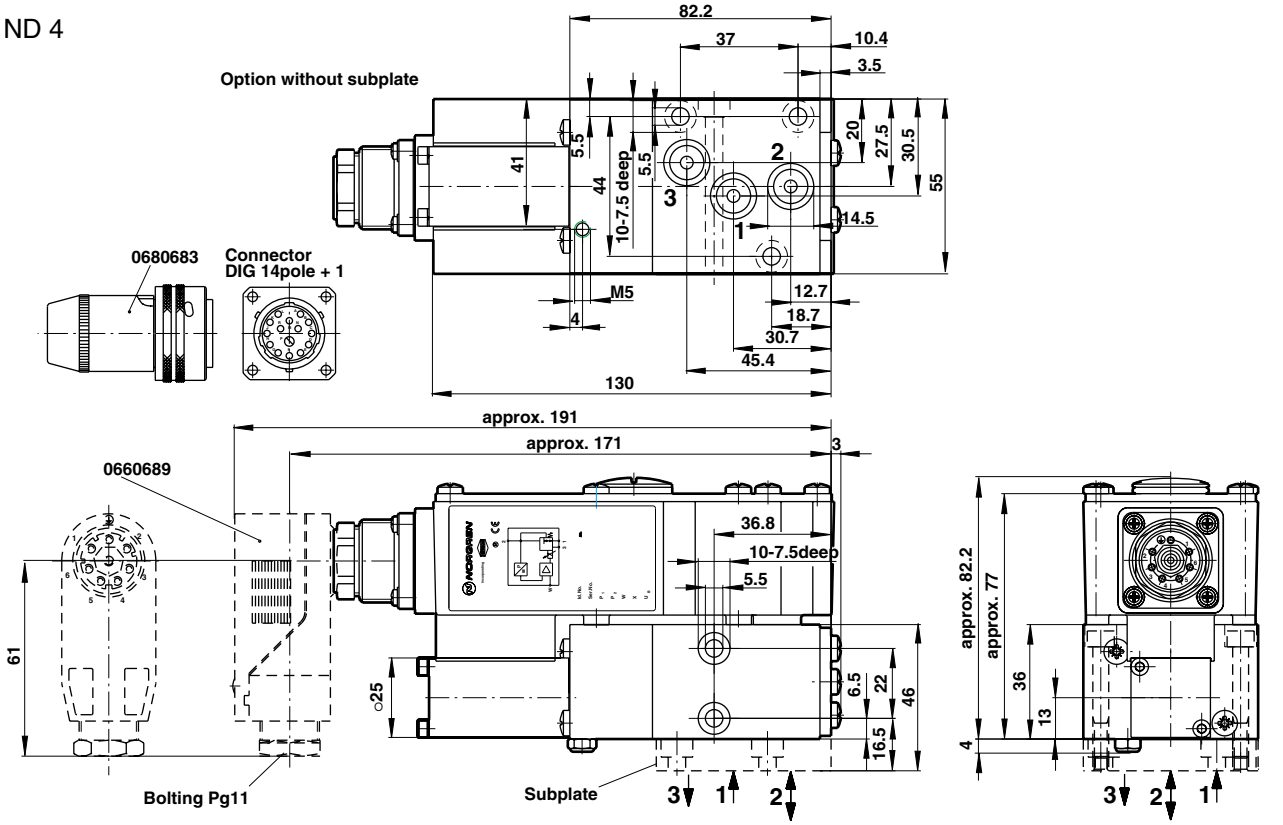
## Basic dimensions Valves

Version with 6 pole + PE plug

ND 2




ND 4



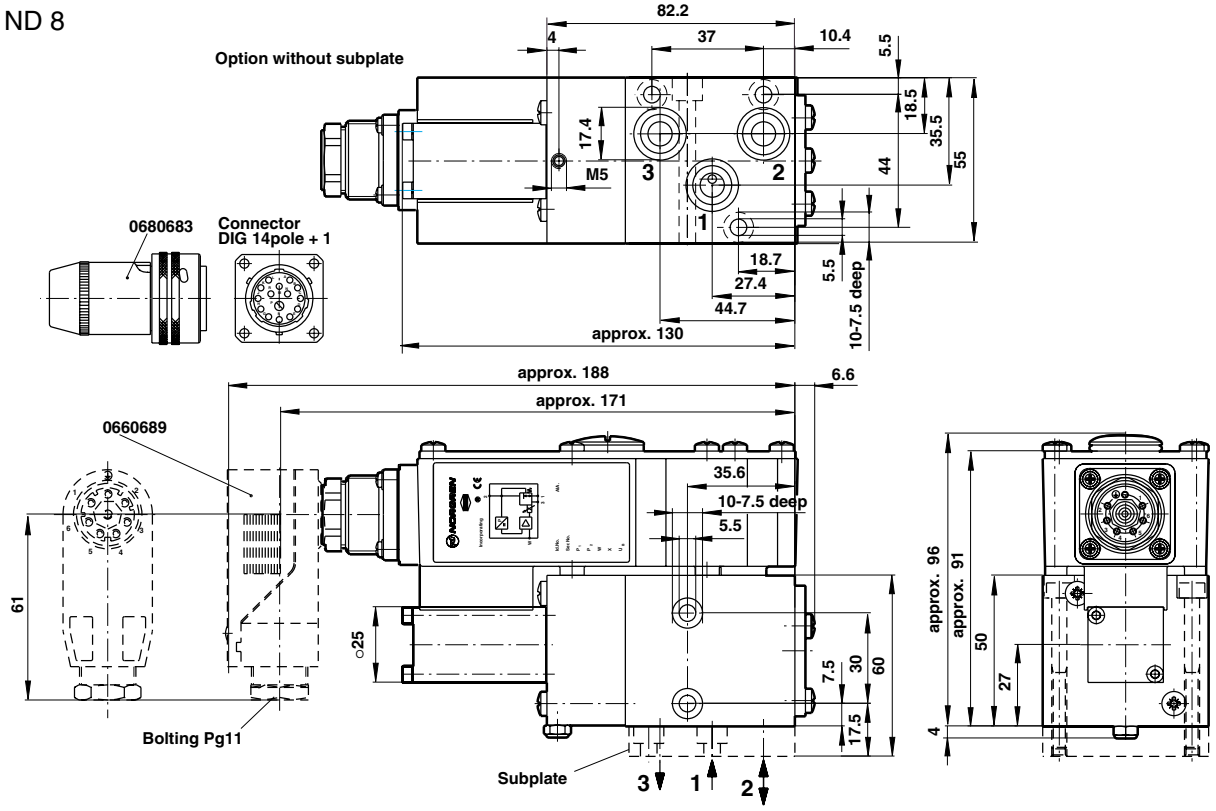



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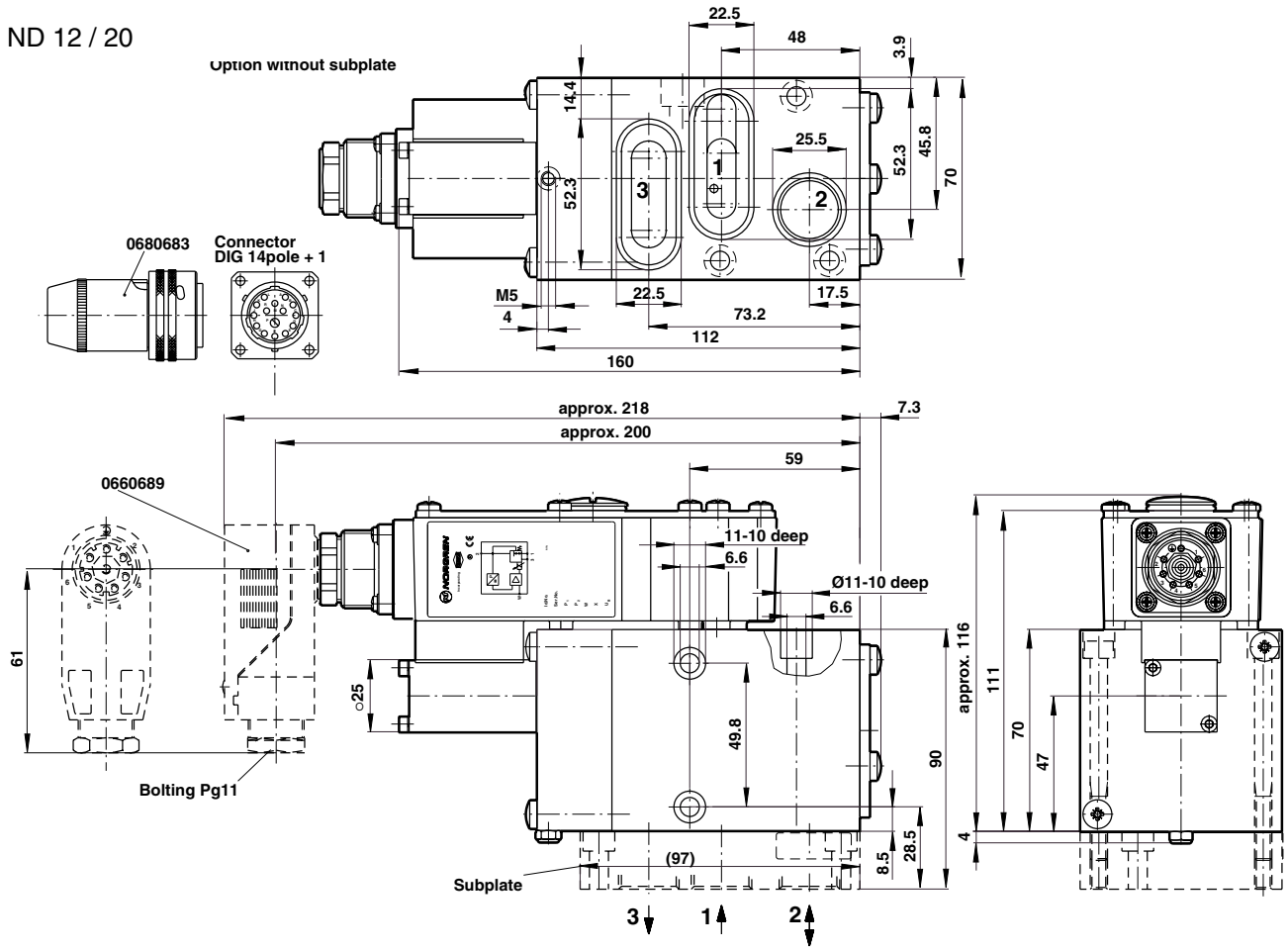
## Basic dimensions Valves

Version with 6 pole + PE plug

ND 8




ND 12 / 20

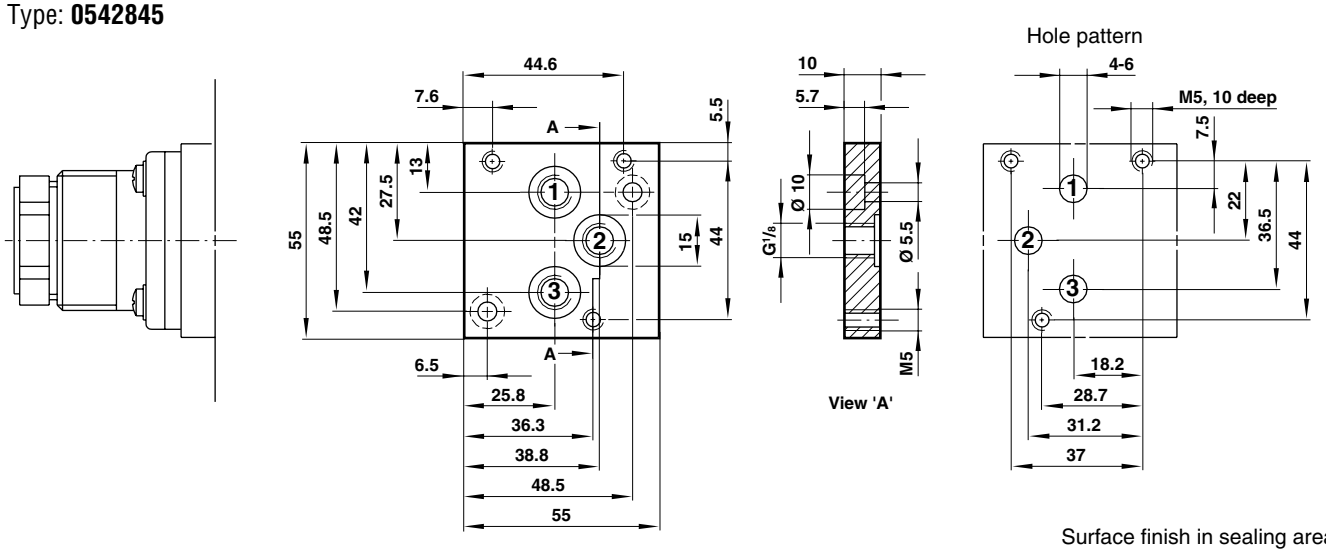





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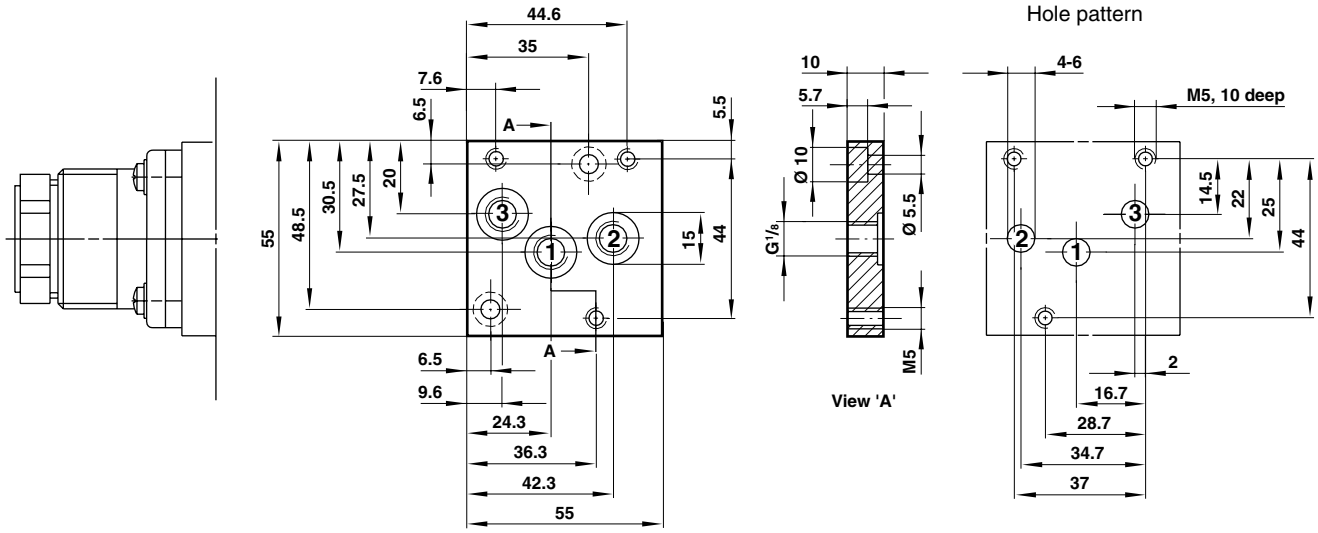
## **Basic dimensions Subplates** (to be ordered separately)

Subplate G 1/8 for ND 2
Type: **0542845**




Surface finish in sealing area: $R_Z$ 16

Subplate G 1/8 for ND 4
Type: **0542848**



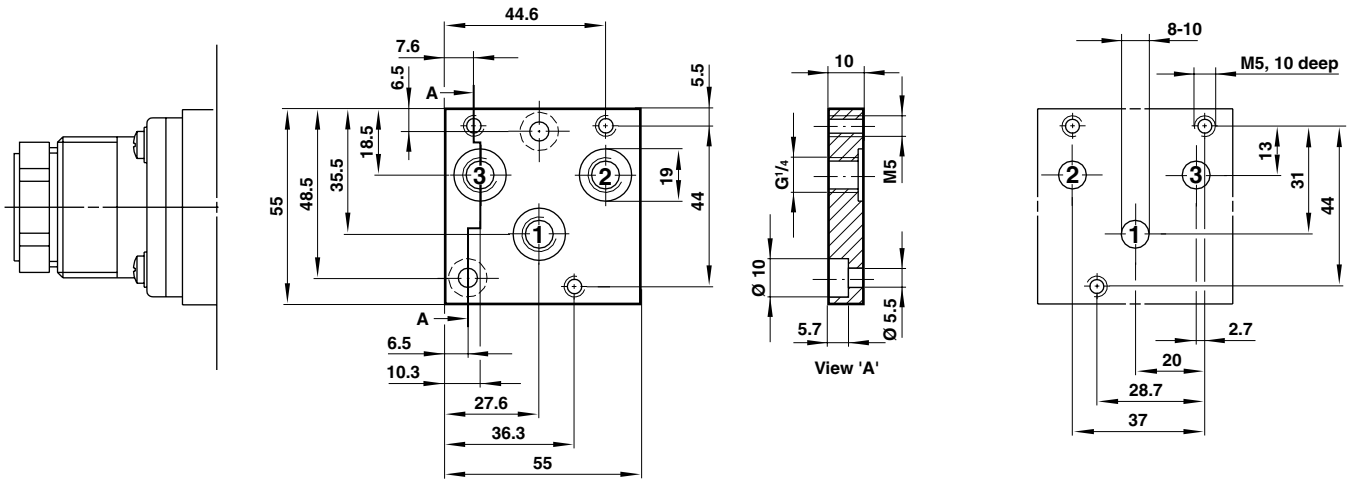

Surface finish in sealing area: $R_Z$ 16



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## **Basic dimensions Subplates** (to be ordered separately)

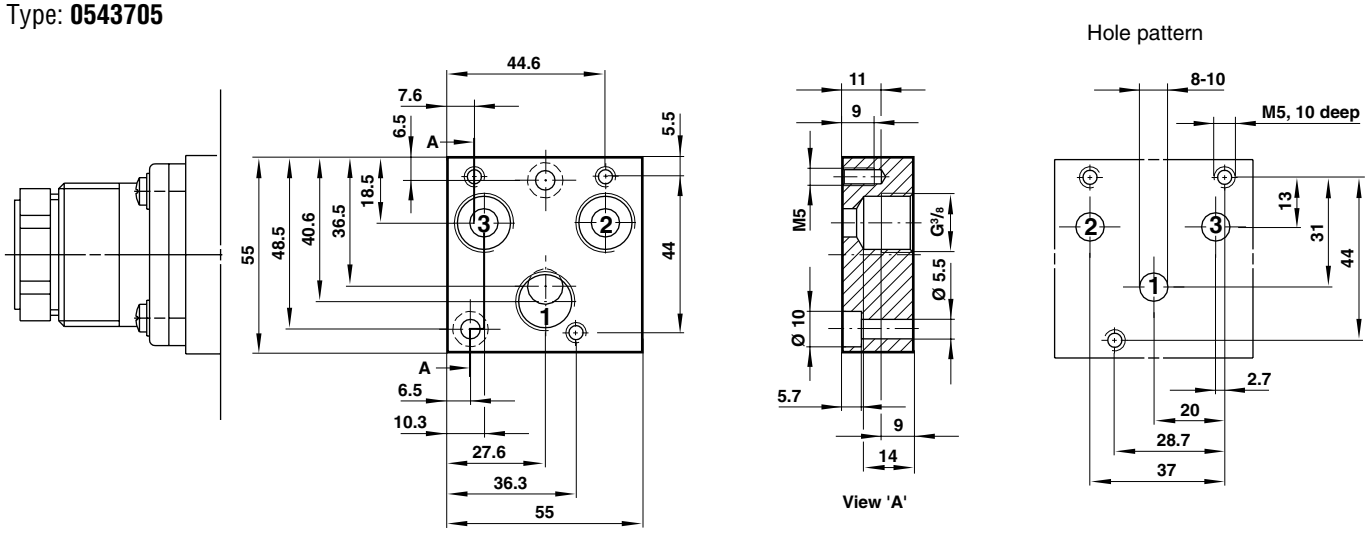
Subplate G 1/4 for ND 8
Type: **0542636**




Surface finish in sealing area: $R_Z$ 16

---

Subplate G 3/8 for ND 8
Type: **0543705**



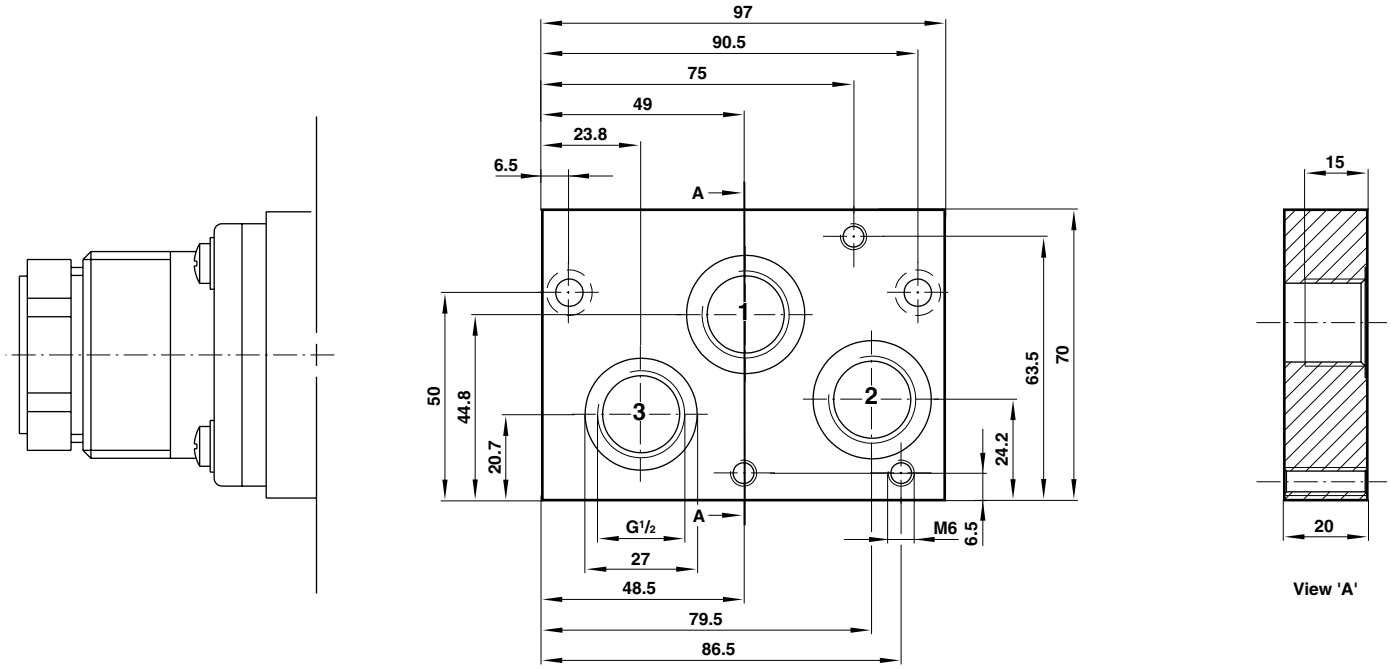

Surface finish in sealing area: $R_Z$ 16



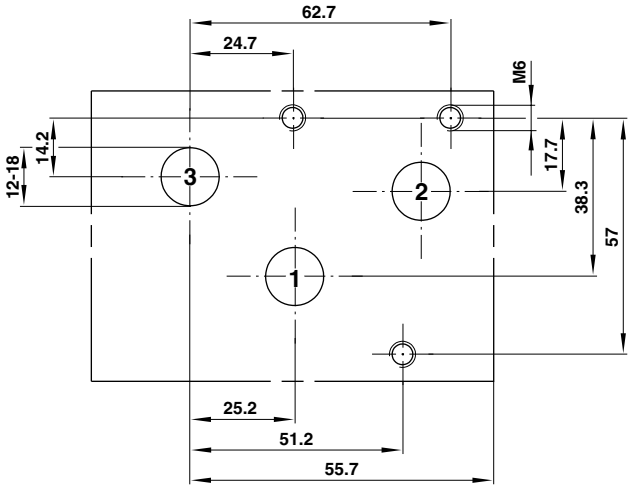
Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document.

## **Basic dimensions Subplates** (to be ordered separately)

G 1/2 Subplate for ND 12
Type: **0542814**




Hole pattern



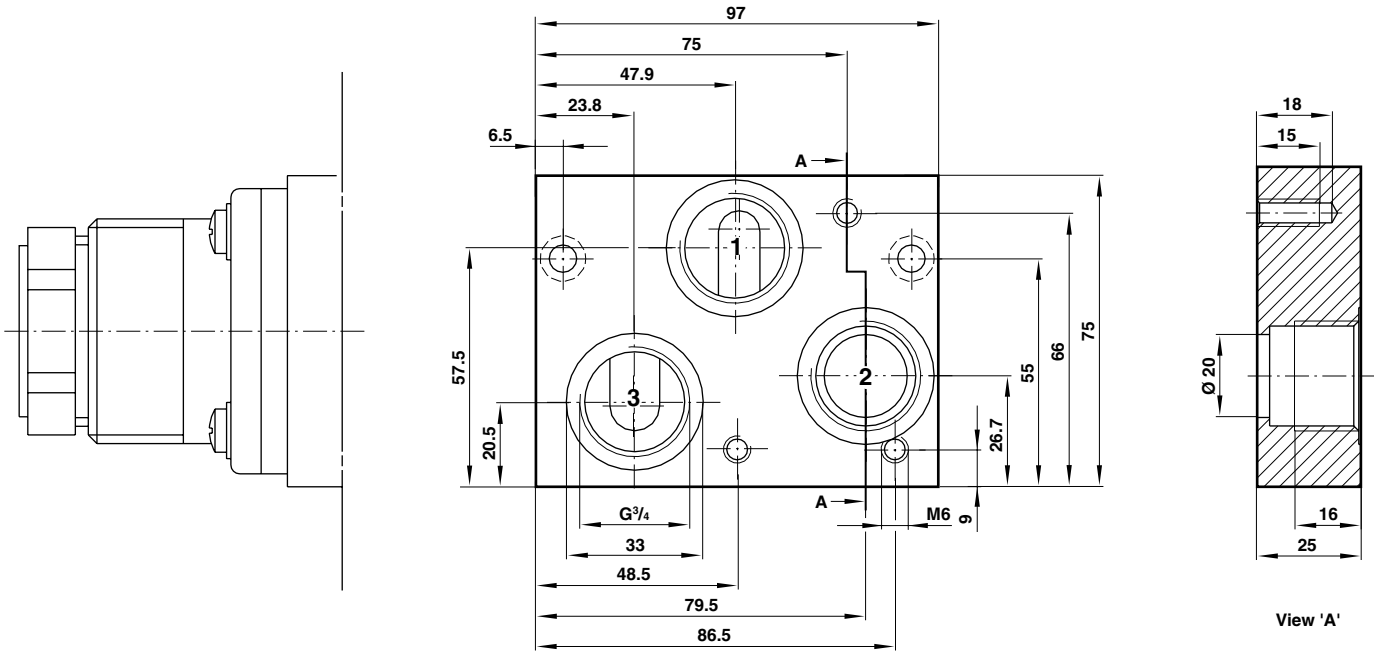

Surface finish in sealing area: $R_Z$ 16



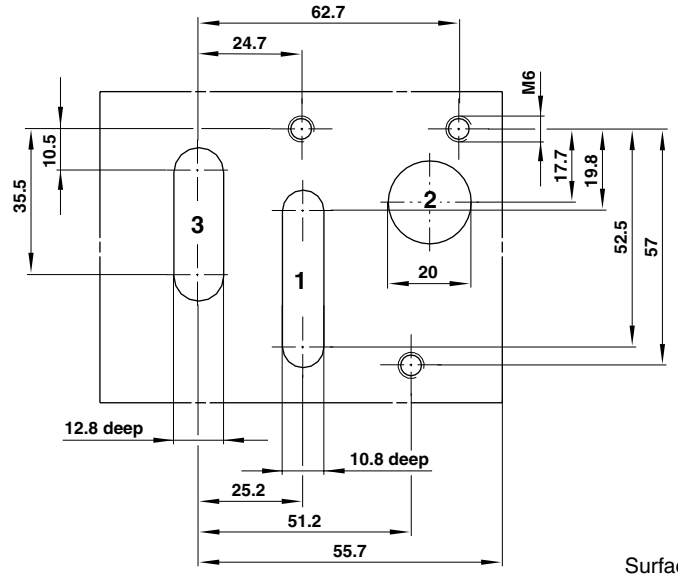
Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document.

## **Basic dimensions Subplates** (to be ordered separately)

G 3/4 Subplate for ND 20
Type: **0542840**




Hole pattern




Surface finish in sealing area: $R_Z$ 16



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## Instructions for pneumatic installation and commissioning

**1. Operating pressure $p_1$**
The operating pressure must be higher than the max. required set pressure at the valve outlet.
Recommended: ≥1 bar.
When switching off the operating pressure, the operating voltage should be disconnected as well.

**2. Line cross section**
Cross section of supply line to 1 (P) should be larger than the nominal width of the valve.
Cross section of the working line to 2 (A) should be of the same size but at all events larger than the nominal width of the valve.
Air at the exhaust port 3 (R) must be discharged without pressure.

**3. Combination with other units**

**3.1 Units connected upstream**
(e.g. pressure sensors) Flow rate must be larger than that of the proportional valve.

**3.2 Units connected downstream**
(e.g. pilot valves) Same flow rate, but at any rate larger than that of the proportional valve.

**4. Mounting place**
As close as possible to the consuming device.

**5. VERY IMPORTANT !**
Before mounting the valve on the connection plate, the pneumatic lines must be blown out and freed from mounting residues.

## Instructions for electrical installation

**1. Voltage supply**
Voltage supply 18 ... 32 V (incl. residual ripple) excess voltage may destroy the electronic system!

**2. Avoidance of interferences**

**2.1 Screening**
In order to prevent interferences by electric fields,screened lines must be used. The screen must beconnected to PE (see circuit diagram)

**2.2 Laying of cables**
Supply and signalling lines shall not be laid in parallel to power mains or high-voltage lines.

**3. Line cross section**
According to VDE 01134.

**Zero potentials**
For zero potentials (0 V), the supply voltage and the set point signal, two separate wires must be used in order to prevent distortion of the set points.

## General

**Repairs and servicing**

Do not attempt to repair the product by yourself.
After repair tasks, certain adjustments and test procedures have to be performed, which can only be done by qualified and authourised personnel. Products in need of repair may be sent to the following address:

IMI Norgren Herion Fluidtronic GmbH & Co. KG
Föhrenbachstraße1, D-73630 Remshalden

Tel.: +49 (0) 71 51 / 70 88 -0
Fax: +49 (0) 71 51 / 70 88 -55

Abroad:

Your local representative dealer or agent will forward the product to the manufacturer for repair.

Please indicate a description of the error, malfunction or failure with the product you send in for repair. You should always state the serial number and the purchase date.
For servicing and repairing the products, we can offer experienced and qualified personnel. In case you need our assistance, please contact the following address:

IMI Norgren Herion Fluidtronic GmbH & Co. KG
Föhrenbachstraße1, D-73630 Remshalden

Tel.: +49 (0) 71 51 / 70 88 -0
Fax: +49 (0) 71 51 / 70 88 -55

Abroad:

Your local representative dealer or agent.

**Transport, storage, default setting, cleaning**

The product can only be transported and stored in the original Norgren Herion packaging which ensures suitable protection against mechanical damage.
The product is shipped in a ready-to-operate-state (default settings). After correct installation, it is ready for use.
In case it is necessary to clean product, we recommend sending it back to the manufacturer. The correct address can by found under repairs and servicing.

### 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 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 where applicable.


Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document.