

## 97100 NAMUR, 3/2 & 5/2 Indirect solenoid actuated spool valves

- Port size:  
1/4" (ISO G or NPT),  
NAMUR Interface
- Main application:  
Single and double  
acting actuators
- 5/2 way valve usable as  
3/2 way valve
- Crossover-free  
switching
- Manual override with  
detent
- Variable valve solenoid  
combination
- The solenoid valves  
are applicable in the  
protection class Ex m  
for zones 1, 2, 21, 22  
(gases and dusts) ATEX  
cat.II 2GD, Ex ia for  
zones 1, 2 (gases) ATEX  
cat.II 2G, Ex ec, tc for  
zones 2, 22 (gases and  
dusts) ATEX cat.II 3 GD



### Technical features

**Medium:**  
Filtered, lubricated or non-  
lubricated and dry compressed air

**Operation:**  
Indirect solenoid operated  
spool valve

**Operating pressure:**  
2 ... 8 bar (29 ... 116 psi)

**Orifice:**  
6 mm

**Port size:**  
G1/4, 1/4 NPT  
3 and 5: G1/8, 1/8 NPT  
NAMUR Interface with integrated  
recirculation from the exhaust air  
to the acuator sping chamber

**Flow direction:**  
Fixed

**Mounting position:**  
Optional

**Ambient/Media temperature:**  
-15 ... +50°C (5 ... +122°F)  
Air supply must be dry enough  
to avoid ice formation at  
temperatures below +2°C (35°F).

**Materials:**  
Housing: Aluminium anodized  
Pilot flange: Plastic (PBT)  
Flange plate: Aluminium  
Seals: NBR

**Flow conversion:**  
Cv US Gallon/min (water) =  
l/min (air) x 0,001  
Kv m³/h (water) =  
l/min (air) x 0,000906

### Option selector

| Function                                                              | Substitute |
|-----------------------------------------------------------------------|------------|
| 5/2 way, spring return<br>(3/2 way spare adaptor plate<br>supplied)   | 0          |
| 5/2 way, solenoid return<br>(3/2 way spare adaptor plate<br>supplied) | 1          |
| 5/3 way valve, APB<br>(all ports blocked)                             | 2          |
| Ports size                                                            | Substitute |
| G1/4                                                                  | 0          |
| 1/4 NPT                                                               | 1          |

971★ 0 ★ 0 ★★★★★ ★★★★★

| Voltage                 | Substitute |
|-------------------------|------------|
| 24 V d.c.               | 02400      |
| 230 V a.c.              | 23050      |
| Solenoid actuators      | Substitute |
| See table on page 2 & 3 |            |

Technical data
Housing: Aluminium anodized, Seals: NBR -15 ... +50°C (+5 ... +122°F)

Table with 9 columns: Symbol, Port size, Actuation/Return, Flow, Operating pressure, Weight, Drawing, Model. It lists various solenoid models (9710000, 9710010, 9711000, 9711010, 9712000, 9712010) with their respective specifications.

Suitable solenoids, see below only
\*1) When ordering please indicate solenoid, voltage and current type (frequency).

Solenoids for 971xxx0 only, standard voltages

Table with 12 columns: Power consumption, Rated current, Protection class, Ex-Protection, Temperature, Electrical connection, Weight, Drawing, Circuit diagram, Model. It lists various solenoid models (3050, 3036, 3046, 3047, 3062, 3063, 3071) with their respective specifications.

Standard voltages (±10%) 24 V d.c., 230 V a.c., other voltages on request. Design according to VDE 0580, EN 50014/50028. 100% duty cycle.
\*1) Connector is not scope of delivery, see table »Accessories«

Approvals

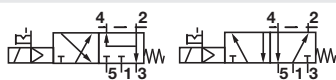
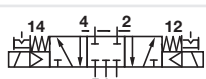
Table with 2 columns: Model, Approvals. It lists models 304x and 306x with their respective approvals (self assessment, PTB 03 ATEX 2015).

Electrical connection M12 x 1

Table with 3 columns: Model, Pin, Cable. It shows the pin configuration for the M12 x 1 connector, with pins 1 (brown), 2 (white), 3 (blue), and 4 (black).

## Valves for minimal electrical power, included Ex ia

### Housing: Aluminium anodized, Seals: NBR -15 ... +50°C (+5 ... +122°F)

| Symbol                                                                            | Port size |         |        | Actuation/Return  | Flow    | Operating pressure |            | Weight | Drawing | Model   |
|-----------------------------------------------------------------------------------|-----------|---------|--------|-------------------|---------|--------------------|------------|--------|---------|---------|
|                                                                                   | 1         | 3 & 5   | 2 & 4  |                   | (l/min) | (bar)              | (psi)      | (kg)   | No.     | *1)     |
|  | G1/4      | G1/8    | Flange | Solenoid/spring   | 750     | 2 ... 8            | 29 ... 116 | 0,25   | 1       | 9710002 |
|                                                                                   | 1/4 NPT   | 1/8 NPT | Flange | Solenoid/spring   | 750     | 2 ... 8            | 29 ... 116 | 0,25   | 1       | 9710012 |
|  | G1/4      | G1/8    | Flange | Solenoid/solenoid | 750     | 2 ... 8            | 29 ... 116 | 0,35   | 2       | 9711002 |
|                                                                                   | 1/4 NPT   | 1/8 NPT | Flange | Solenoid/solenoid | 750     | 2 ... 8            | 29 ... 116 | 0,35   | 2       | 9711012 |
|  | G1/4      | G1/8    | Flange | Solenoid/solenoid | 500     | 2 ... 8            | 29 ... 116 | 0,40   | 3       | 9712002 |
|                                                                                   | 1/4 NPT   | 1/8 NPT | Flange | Solenoid/solenoid | 500     | 2 ... 8            | 29 ... 116 | 0,40   | 3       | 9712012 |

Suitable solenoids, see below only

\*1) When ordering please indicate solenoid, voltage and current type (frequency).

## Solenoids for 971xxx2 only, standard voltages

|                                                                                     | Power consumption<br>24 V d.c. 230 V a.c.<br>(W) (VA) |         | Rated current<br>24 V d.c. 230 V a.c.<br>(mA) (mA) |   | Protection class<br>IP/NEMA | Ex-Protection<br>(ATEX-Category)                       | Temperature<br>Ambient/Media<br>(°C) | Electrical connection                                                            | Weight | Drawing | Circuit diagram | Model |
|-------------------------------------------------------------------------------------|-------------------------------------------------------|---------|----------------------------------------------------|---|-----------------------------|--------------------------------------------------------|--------------------------------------|----------------------------------------------------------------------------------|--------|---------|-----------------|-------|
|                                                                                     |                                                       |         |                                                    |   |                             |                                                        |                                      |                                                                                  | (kg)   | No.     | No.             |       |
|    | 1,8                                                   | —       | 70                                                 | — | IP65 (with connector)       | —                                                      | -15 ... +50                          | Connector<br>DIN EN 175301-803,<br>form B *1)                                    | 0,1    | 11      | 1               | 3050  |
|   | 0,7                                                   | 2,0 *3) | 29                                                 | 4 | IP65 (with connector)       | —                                                      | -15 ... +50                          | Connector<br>DIN EN 175301-803,<br>form A *1)                                    | 0,1    | 12      | 1               | 3034  |
|  | 2                                                     | —       | 85                                                 | — | IP65 (with connector)       | II 3 G Ex ec IIC T5 Gc<br>II 3 D Ex tc IIIC T95°<br>Dc | -20 ... +50                          | Special connector<br>supplied with<br>solenoid                                   | 0,3    | 12      | 1               | 3046  |
|  | 2,7                                                   | —       | 115                                                | — | IP65 (with connector)       | II 2 G Ex mb IIC T5 Gb<br>II 2 D Ex mb tb T95°C<br>Db  | -20 ... +50                          | Cable length<br>3 m                                                              | 0,3    | 13      | 14              | 3062  |
|                                                                                     | —                                                     | 2,1     | —                                                  | 9 | IP65 (with connector)       | II 2 G Ex mb IIC T5 Gb<br>II 2 D Ex mb tb T95°C<br>Db  | -20 ... +50                          | Cable length<br>3 m                                                              | 0,3    | 13      | 15              | 3063  |
|  | 2,7                                                   | —       | 115                                                | — | IP66 (with connector)       | —                                                      | -10 ... +50                          | Connector *1)<br>M12x1,<br>DIN IEC<br>61076-2-101<br>Solenoid with<br>yellow LED | 0,1    | 14      | 17              | 3071  |

Standard voltages (±10%) 24 V d.c., 230 V a.c., other voltages on request. Design according to VDE 0580, EN 50014/50028. 100% duty cycle.

\*1) Connector is not scope of delivery, see table »Accessories«

\*3) Valves can be operated with DC only. For 230 V AC application please use 206 V DC coil together with rectifier plug 0663303

## Solenoid actuators for intrinsically-safe circuits

|                                                                                     | Nominal resistance | Min. required switching current | Resistance     | Required voltage at terminal | IP                    | Ex-Protection              | Temperature                        | Weight | Drawing | Circuit diagram | Model |
|-------------------------------------------------------------------------------------|--------------------|---------------------------------|----------------|------------------------------|-----------------------|----------------------------|------------------------------------|--------|---------|-----------------|-------|
|                                                                                     | RN coil (Ω)        | (mA)                            | Rw 60 coil (Ω) | (V)                          | Protection class      | (ATEX-Category)            | Ambient/Media (°C)                 | (kg)   | No.     | No.             |       |
|  | 275                | 37                              | 345            | 13,8                         | IP65 (with connector) | II 2 G Ex ia IIC T6/ T4 Gb | T6: -40 ... +50<br>T4: -40 ... +85 | 0,2    | 15      | 13              | 3039  |

When selecting an intrinsically safe power supply, the permissible maximum values according to the Certificate of Conformity should be taken in account.

On the other hand, the low effective inductivity and capacity can be ignored.

Connector DIN EN 175301-803 form A is not scope of delivery, see table »Accessories«

## Approvals

| Model | Approvals ATEX   | FM |
|-------|------------------|----|
| 3039  | PTB 03 ATEX 2134 | —  |
| 304x  | self assessment  | —  |
| 306x  | PTB 03 ATEX 2015 | —  |

## Electrical connection M12 x 1

| Model                                                                                 | Pin | Cable |
|---------------------------------------------------------------------------------------|-----|-------|
|  | 1   | brown |
|                                                                                       | 2   | white |
|                                                                                       | 3   | blue  |
|                                                                                       | 4   | black |

Accessories

|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| Connector<br>DIN EN 175301-803                                                    | 4-pin, 90°                                                                        | 4-pin, 90°                                                                        | 4-pin, straight                                                                   | 4-pin, straight                                                                   |
|  |  |  |  |  |
|                                                                                   | Page 8                                                                            | Page 8                                                                            | Page 8                                                                            | Page 8                                                                            |
| 0570275, form A                                                                   | 0523058<br>(2 m cable,4-core)                                                     | 0523056<br>(without cable)                                                        | 0523057<br>(2 m cable, 4-core)                                                    | 0523055 (without cable)                                                           |
| 0663303 Form A<br>(with rectifier)                                                | 0523053<br>(5 m cable,4-core)                                                     |                                                                                   | 0523052<br>(5 m cable, 4-core)                                                    |                                                                                   |
| 0680003, form B                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |

|                                                                                     |
|-------------------------------------------------------------------------------------|
| Silencer                                                                            |
|  |
| Page 6                                                                              |
| C/S1 (1/8 NPT)                                                                      |
| M/S1 (G1/8)                                                                         |

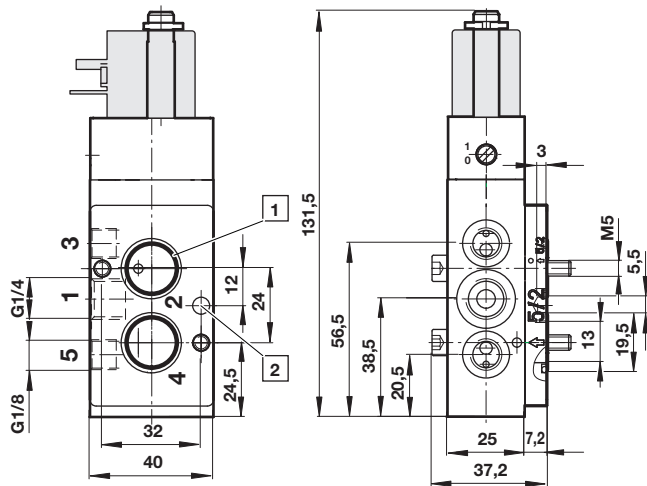
NAMUR accessories

|                                                                                    |                                                                                   |                                                                                    |                                                                                    |                                                                                     |                                                                                      |                                                                                      |
|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Throttle control<br>plate *1)                                                      | Flange plate                                                                      |                                                                                    | Yoke                                                                               | Distance plate for<br>pressure switches                                             | Mounting plate                                                                       | Quick exhaust module *2)                                                             |
|  |  |  |  |  |  |  |
| Page 7                                                                             | Page 6 & 7                                                                        |                                                                                    | Page 7                                                                             | Page 7                                                                              | Page 7                                                                               |                                                                                      |
| 4040239                                                                            | 0612790 (NAMUR single connection plate)                                           |                                                                                    | 0540593                                                                            | 0540109                                                                             | 0613453 (90°)                                                                        | 4050218                                                                              |
|                                                                                    | 0612791 (NAMUR-rip use in combination with 0612790)                               |                                                                                    |                                                                                    |                                                                                     | 0612631 (180°)                                                                       |                                                                                      |
|                                                                                    |                                                                                   |                                                                                    |                                                                                    |                                                                                     | 0613556 (270°)                                                                       |                                                                                      |

\*1) The throttle control plate 4040239 has a minimum flow rate for safety reason.  
\*2) Technical details see datasheet en 5.4.820

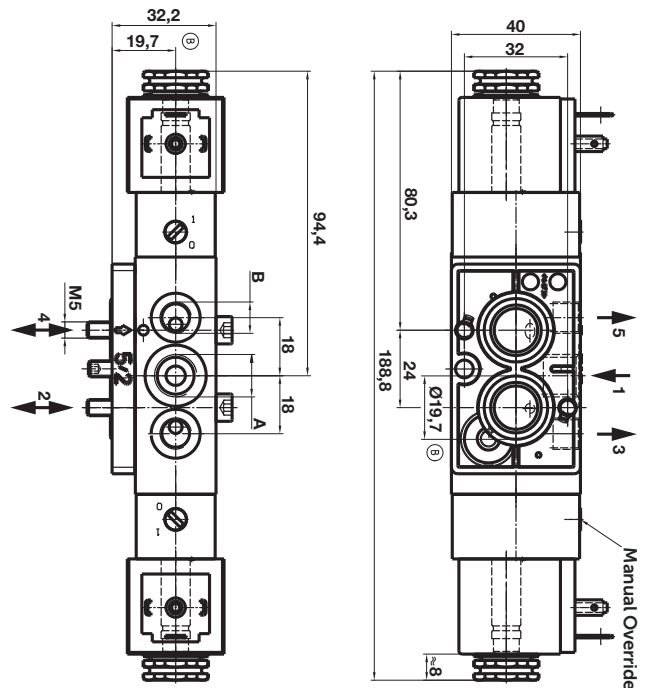


1

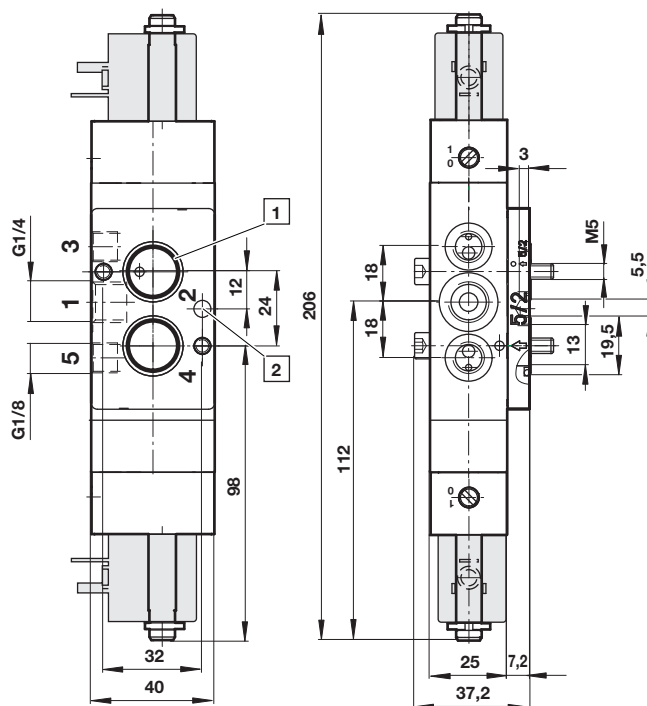


- 1 O ring  $\varnothing$  6 x 2 mm in scope with delivery
- 2 Hole (3 mm deep) coding stud

(2)

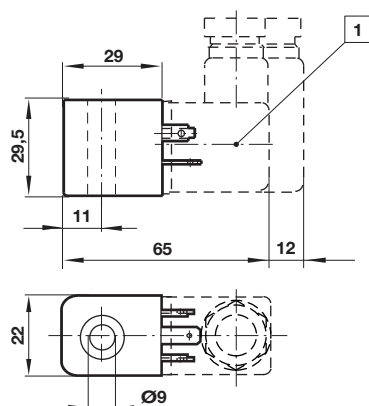


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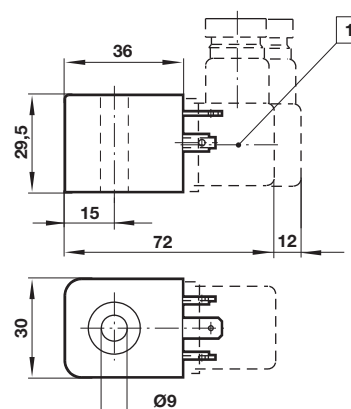


## Solenoids

11



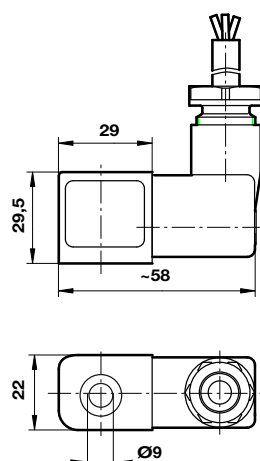
12



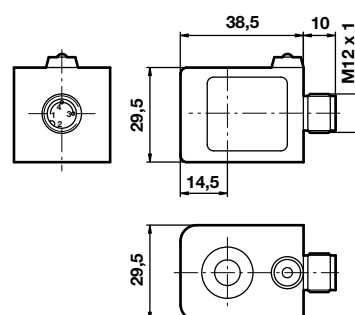
Dimensions in mm  
Projection/First angle



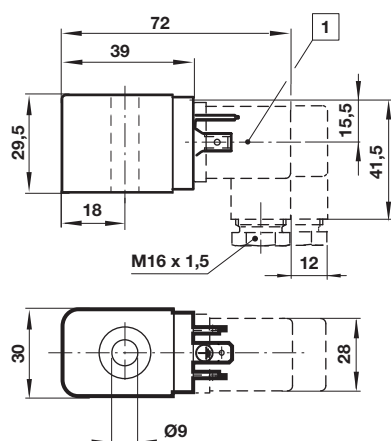
13



14



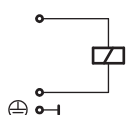
15



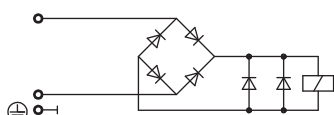
1 Connector 4 x 90° turnable

## Circuit diagrams

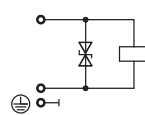
1



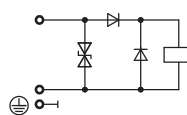
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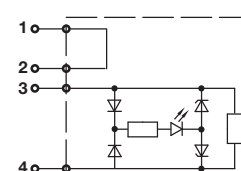
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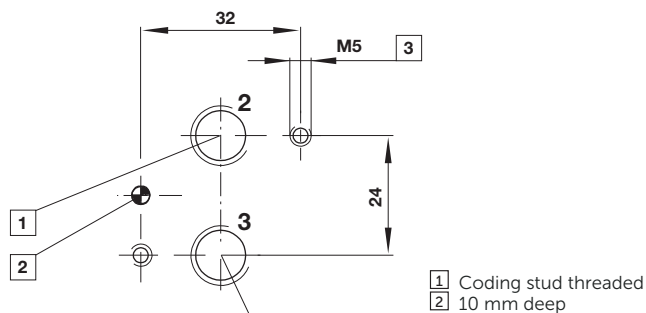
15



17



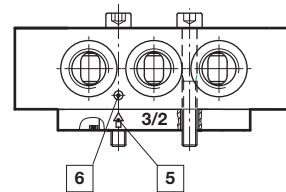
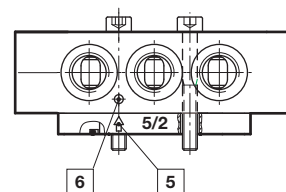
## NAMUR hole pattern (actuator side)



NAMUR quick exhaust module for a better kv-value by exhaust see data sheet 5.4.820

NAMUR interlinking plates in redundancy design for »safety exhausting« and »safety ventilating« see data sheet 5.4.830

## Conversion instructions of 5/2 into 3/2 way function



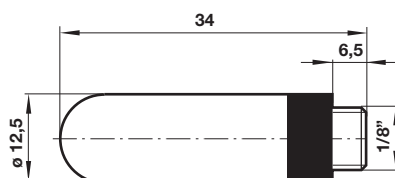
3/2 resp. 5/2 way function can be achieved just by swapping enclosed adaptor plates. Make sure marker and arrow do match as shown on above drawing. Original mode of supply: 5/2 function.

5 Arrow  
6 Marker

## Accessories

### Silencer

Model: M/S1, C/S1

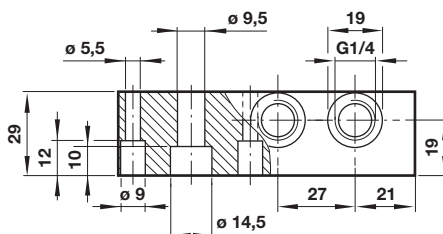
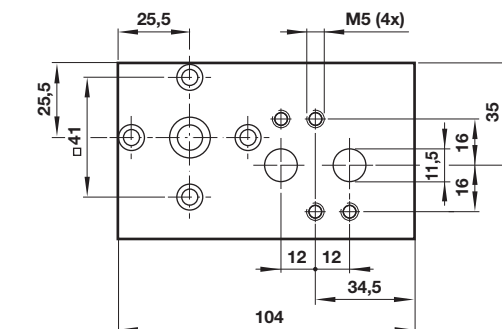
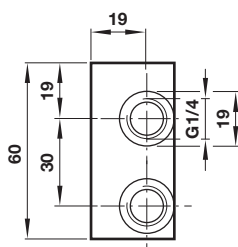


Dimensions in mm  
Projection/First angle



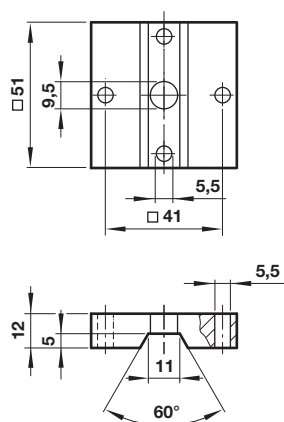
## Single connection plate

Model:  
0612790



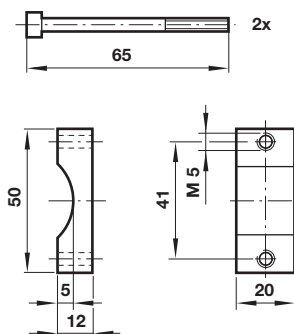
### NAMUR slot

Model: 0612791



### Yoke

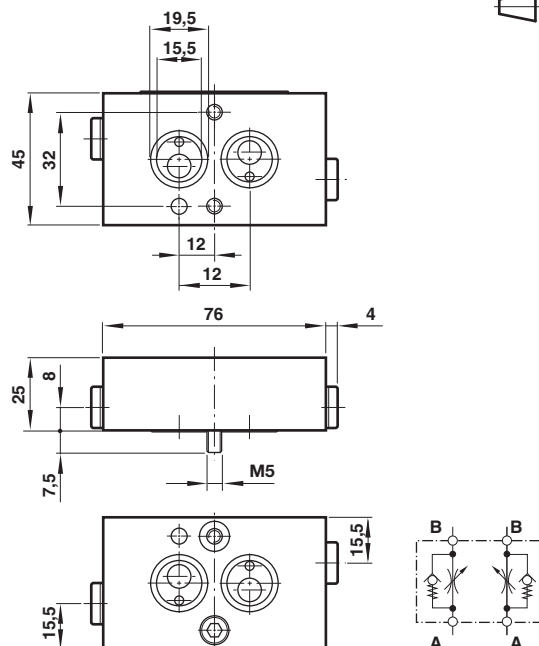
Model: 0540593



### Throttle control plate

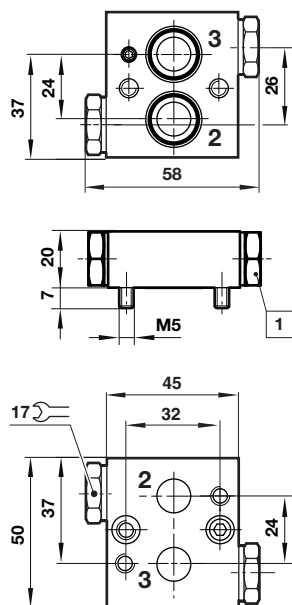
Model: 4040239

Dimensions in mm  
Projection/First angle



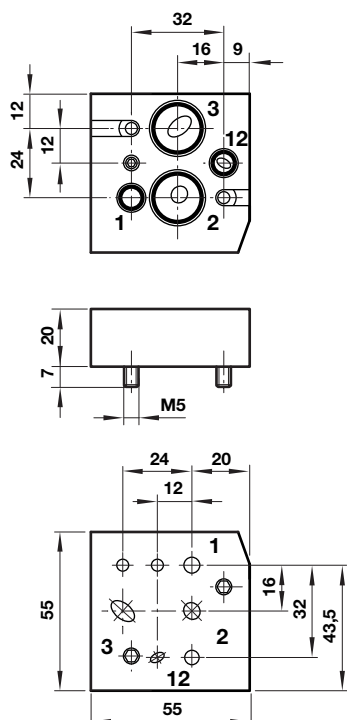
### Distance plate for pressure switches

Model: 0540109

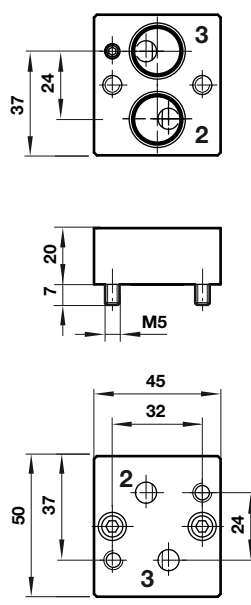


### Mounting plate

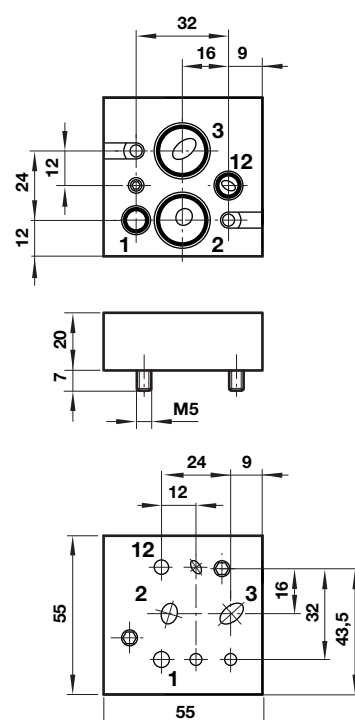
Model: 0613453 (90°)



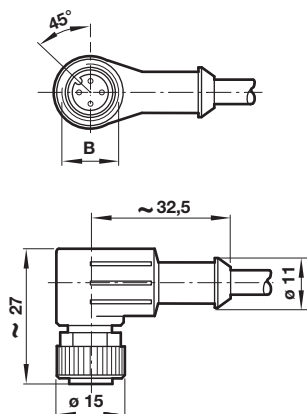
### Model: 0612631 (180°)



### Model: 0613556 (270°)

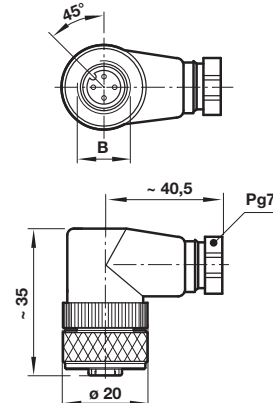


## Connector 90°, 4 pin, with PUR cable



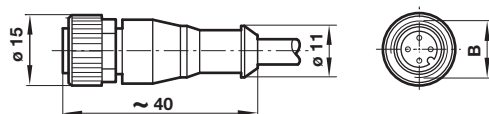
| B         | C    | øD | øD1 | F  | Wire x dim.  | Cable length (m) | Weight (g) | Model   |
|-----------|------|----|-----|----|--------------|------------------|------------|---------|
| M12 x 1,5 | 32,5 | 15 | 11  | 27 | 4 x 0,34 mm2 | 2                | 90         | 0523058 |
| M12 x 1,5 | 32,5 | 15 | 11  | 27 | 4 x 0,34 mm2 | 5                | 180        | 0523053 |

## 4 pin, without cable



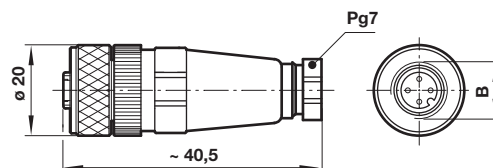
| B         | C    | øD | E    | F  | Weight (g) | Model   |
|-----------|------|----|------|----|------------|---------|
| M12 x 1,5 | 40,5 | 20 | Pg 7 | 35 | 30         | 0523056 |

## Straight, 4 pin, with PUR cable



| B         | C  | øD | øD1 | Wire x dim.  | Cable length (m) | Weight (g) | Model   |
|-----------|----|----|-----|--------------|------------------|------------|---------|
| M12 x 1,5 | 40 | 15 | 11  | 4 x 0,34 mm2 | 2                | 80         | 0523057 |
| M12 x 1,5 | 40 | 15 | 11  | 4 x 0,34 mm2 | 5                | 200        | 0523052 |

## Straight, 4 pin, without cable



| B         | C    | øD | E    | Weight (g) | Model   |
|-----------|------|----|------|------------|---------|
| M12 x 1,5 | 40,5 | 20 | Pg 7 | 26         | 0523055 |

## 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.