

#### **Order code**

#### M-05-310-HN-442

|          |        | Coil options <sup>1) 2)</sup> |              |         |                              |                       |                      |  |  |
|----------|--------|-------------------------------|--------------|---------|------------------------------|-----------------------|----------------------|--|--|
| Series   | Standa | ard coil                      |              | Withou  | t coil and plug socket       |                       |                      |  |  |
| and      | HN at  | ports 2 + 4 HN at ports       | rts 1, 3 + 5 | HN at j | ports 2 + 4                  | HN at ports           | HN at ports 1, 3 + 5 |  |  |
| function | 441    | 12 V DC, 4,2 W                | 411          | 570     | Power consumpt. 4            | .2 W, 7/4 VA          | 500                  |  |  |
|          | 442    | 24 V DC, 4,2 W                | 412          | 560     | Power consumption            | n 2.2 W <sup>2)</sup> | 530                  |  |  |
|          | 452    | 24 V AC, 7/4 VA               | 422          |         |                              |                       |                      |  |  |
|          | 456    | 115 V AC, 7/4 VA              | 426          | Coil wi | ith M12 connector and        | LED                   |                      |  |  |
|          | 457    | 230 V AC, 7/4 VA              | 427          | HN at j | ports 2 + 4                  | HN at ports           | 1, 3 + 5             |  |  |
|          | 461    | 12 V DC, 2,2 W <sup>2)</sup>  | 431          | 042     | 24 V DC, 4.8 W               | -                     | 012                  |  |  |
|          | 462    | 24 V DC, 2,2 W <sup>2)</sup>  | 432          | 062     | 24 V DC, 2.5 W <sup>2)</sup> |                       | 032                  |  |  |

#### Design, function and technical data

Spool valve actuated by an electrical signal. Please specify required control voltage when ordering.

Valves of this series are available in explosion proof design in accordance with 2014/34/EU (ATEX). Due to the bigger dimensions of the ATEX coils, ATEX specified valves cannot be mounted on standard manifolds. More details see chapter 13.

#### 3/2-way valve

<sup>v</sup> Manual override (HN) is on the side of port 2 by default. It can be easily repositioned by 180° (side of ports 1 and 3). The valve M-05-311-HN is available for use with vacuum, order number ME-05-312-HN.



| Order number                                   | M-05-310-HN  | MO-05-310-HN   | M-05-311-HN          | MO-05-311-HN       | M-05-320-HN                            | ME-05-311-HN                           | ME-05-320-HN                           |  |  |
|--|--|--|----------------------|--------------------|--|--|--|--|--|
| Please complete<br>according to order<br>code. |  |  |                      |                    |  |  |  |  |  |
| Function                                       | normally closed  | normally open  | normally closed      | normally open      | double solenoid                        | ext. pilot supply                      | double solenoid                        |  |  |
|  | air spring return  | air spring return  | spring return        | spring return      |  | spring return                          | ext. pilot supply                      |  |  |
| Connection                                     | G1/8   |  |                      |                    |  |  |  |  |  |
| Nominal size                                   | 6 mm   |  |                      |                    |  |  |  |  |  |
| Flow rate                                      | 750 NI/min (0.7  | 750 NI/min (0.762 Cv)  |                      |                    |  |  |  |  |  |
| Pressure range                                 | 2 10 bar <sup>2</sup> 3 10 bar <sup>2</sup><br>(29 145 psi) (43 145 psi) |  |                      |                    | 2 10 bar <sup>2)</sup><br>(29 145 psi) | 0 10 bar <sup>2)</sup><br>(0 145 psi)  |  |  |  |
| Control pressure                               | Control pressur  | e is identical to r  | nain pressure ra     | nge                |  | 3 10 bar <sup>2)</sup><br>(43 145 psi) | 2 10 bar <sup>2)</sup><br>(29 145 psi) |  |  |
| Response<br>time at 6 bar                      | on 13 ms<br>off 16 ms  |  |                      |                    | 12 ms                                  | on 13 ms<br>off 18 ms                  | 12 ms                                  |  |  |
| Temperature range                              | - 10 ℃ + 70  | °C (+ 14 °F +  | 158 °F)              |                    | •                                      |  |  |  |  |
| Materials                                      | Body: AI (anodiz   | zed), Seals: NBR   | and POM, Inner       | parts: Al, stainle | ss steel and bra                       | SS                                     |  |  |  |
| Medium   | Compressed air   | Compressed air in accordance with ISO 8573-1:2010, Class 7:2:4 - and free of aggressive additives. |                      |                    |  |  |  |  |  |
| Degree of protection                           | IP 65 according  | to EN 60529  |                      |                    |  |  |  |  |  |
| Weight   | 0.255 kg (0.561 lb.)   |  | 0.260 kg (0.572 lb.) |                    | 0.400 kg (0.88 lb.)                    | 0.308 kg (0.678 lb.)                   | 0.426 kg (0.937 lb.)                   |  |  |

#### 5/2- and 5/3-way valves

 $^{\circ}$  HN = Manual override (HN) is on the side of ports 2 and 4 by default. It can be easily repositioned by 180° (side of ports 1, 3 and 5). Valves ME-05-511-HN and ME-05-520-HN are available for use with vacuum (- 0.95 ... 10 bar/-14 ... 175

psi). Order number changes to ME-05-511-HN-Q and ME-05-520-HN-Q.

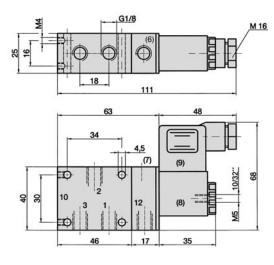
| Order number                        | M-05-510-HN                                     | M-05-511-HN                                 | M-05-520-HN                            | M-05-530-HN                            | M-05-533-HN                             | M-05-534-HN                               | ME-05-511-HN                         | ME-05-520-HN                                    |
|-------------------------------------|---|---|--|--|---|---|--------------------------------------|---|
| Please complete acc. to order code. |   |   |  |  |   |   |                                      |   |
| Function                            | 5/2-way<br>single solenoid<br>air spring return | 5/2-way<br>single solenoid<br>spring return | 5/2-way<br>double solenoid             | 5/3-way<br>center position<br>closed   | 5/3-way<br>center position<br>exhausted | 5/3-way<br>center position<br>pressurized | 5/2-way<br>single solenoid           | 5/2-way<br>double solenoid<br>ext. pilot supply |
| Connection                          | G1/8  |   |  |  |   |   |                                      |   |
| Nominal size                        | 6 mm  |   |  | 5 mm                                   |   |   | 6 mm                                 |   |
| Flow rate                           | 750 NI/min (0                                   | ).762 Cv)                                   |  | 650 NI/min (0                          | ).661 Cv)                               | 750 NI/min (0.762 Cv)                     |                                      |   |
| Pressure range                      | 210 bar <sup>2)</sup><br>(29145 psi)            | 310 bar <sup>2)</sup><br>(43145 psi)        | 2 10 bar <sup>2)</sup><br>(29 145 psi) | 3 10 bar <sup>2)</sup><br>(43 145 psi) |   | 0 10 bar <sup>2)</sup><br>(0 145 psi)     |                                      |   |
| Control pressure                    | Control press                                   | ure is identical                            | to main pressu                         | re range                               |   |   | 310 bar <sup>2)</sup><br>(43145 psi) | 210 bar <sup>2)</sup><br>(29 145 psi)           |
| Response<br>time at 6 bar           | on 13 ms<br>off 16 ms                           | on 13 ms<br>off 18 ms                       | 12 ms                                  | on 13 ms<br>off 18 ms                  |   |   | on 13 ms<br>off 16 ms                | 12 ms   |
| Temperature range                   | – 10 ℃ + 7                                      | 70 °C (+ 14 °F .                            | + 158 °F)                              |  |   |   |                                      |   |
| Materials                           | Body: AI (ano                                   | dized), Seals: I                            | NBR and POM,                           | Inner parts: Al                        | , stainless stee                        | el and brass                              |                                      |   |
| Medium                              | Compressed a                                    | air in accordan                             | ce with ISO 85                         | 573-1:2010, CI                         | ass 7:2:4 - an                          | d free of aggre                           | ssive additives                      | 6.  |
| Degree of protection                | IP 65 accordi                                   | ng to EN 60529                              | )                                      |  |   |   |                                      |   |
| Weight                              | 0,295 kg<br>(0.649 lb.)                         | 0,300 kg<br>(0.660 lb.)                     | 0,440 kg<br>(0.968 lb.)                |  |   |   | 0,360 kg<br>(0.792 lb.)              | 0,470 kg<br>(1.034 lbs.)                        |

<sup>2)</sup> max. 8 bar (max. 116 psi) at 2.2 W and 2.5 W.

G1/8 • 650 and 750 NI/min (0.661 and 0.762 Cv)

# airlec

#### M-05-310-HN, M-05-311-HN, MO-05-310-HN, MO-05-311-HN, ME-05-311-HN, ME-05-312-HN



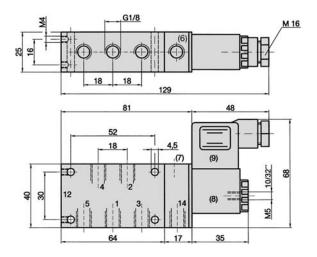
- 1 = pressure inlet
- 2 = outlets
- 3 = exhausts
- (6) = Only valve ME-05-311-HN includes G1/8 at port 12 for external pilot supply.
- (7) = manual override (detent) can be repositioned by  $180^{\circ}$
- (8) = solenoid coil can be repositioned by  $4 \times 90^{\circ}$
- (9) = plug socket can be repositioned by  $180^{\circ}$

Valves MO-05-310-HN and MO-05-311-HN carry the solenoid on the opposite side (at pilot 10).

#### Note:

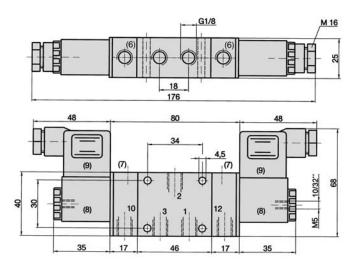
Plug socket(s) not included in scope of delivery.

# M-05-510-HN, M-05-511-HN, ME-05-511-HN, ME-05-511-HN-Q



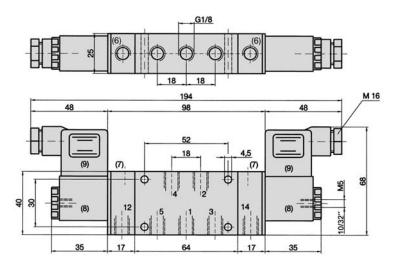
- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (6) = Only valve ME-05-511-HN includes G1/8 at port 14 for external pilot supply.
- (7) = manual override (detent) can be repositioned by  $180^{\circ}$
- (8) = solenoid coil can be repositioned by  $4 \times 90^{\circ}$
- (9) = plug socket can be repositioned by  $180^{\circ}$

#### M-05-320-HN, ME-05-320-HN



- 1 = pressure inlet
- 2 = outlets
- 3 = exhausts
- (7) = manual override (detent) can be repositioned by 4 x 90° (6) = Only valve ME-05-320-HN includes G1/8 at ports 10 and
- 12 for external pilot supply.
- (8) = solenoid coil can be repositioned by  $4 \times 90^{\circ}$
- (9) = plug socket can be repositioned by  $180^{\circ}$

#### M-05-520-HN, ME-05-520-HN, ME-05-520-HN-Q, M-05-530-HN, M-05-533-HN, M-05-534-HN



- 1 = pressure inlet
- 2, 4 = outlets
- 3, 5 = exhausts
- (6) = Only valve ME-05-520-HN includes G1/8 at ports 12 and 14 for external pilot supply.
- (7) = manual override (detent) can be repositioned by  $180^{\circ}$
- (8) = solenoid coil can be repositioned by  $4 \times 90^{\circ}$
- (9) = plug socket can be repositioned by  $180^{\circ}$

### Manifolds for valve

Series M-05 and P-05



| Solenoid coils | s, actuators  |   |  |
|----------------|---|---|--|
| Solenoid coils | 23-SP-011<br>23-SP-012<br>23-SP-011-5-012<br>23-SP-012-5-032<br>(2) explosion proof | Standard coil<br>Coil with 2,2 W power consumption<br>Coil with M12 plug connection, 4,8 W, LED and circuit protection<br>Coil with M12 plug connection, 2,5 W, LED and circuit protection<br>Valves with explosion proof actuator see chapter 13 | page 4.280<br>page 4.280<br>page 4.282<br>page 4.282 |
| Actuators      | 23-R-011<br>23-R-012  | Standard actuator<br>Low power actuator   |  |
| Plug sockets   | 28-ST-01<br>28-ST-04<br>28-ST-06<br>28-ST-06-K3                                     | Standard plug socket<br>Plug socket with LED<br>Plug socket with LED and circuit protection<br>Plug socket with LED, circuit protection and cable   | page 4.283<br>page 4.283<br>page 4.283<br>page 4.283 |

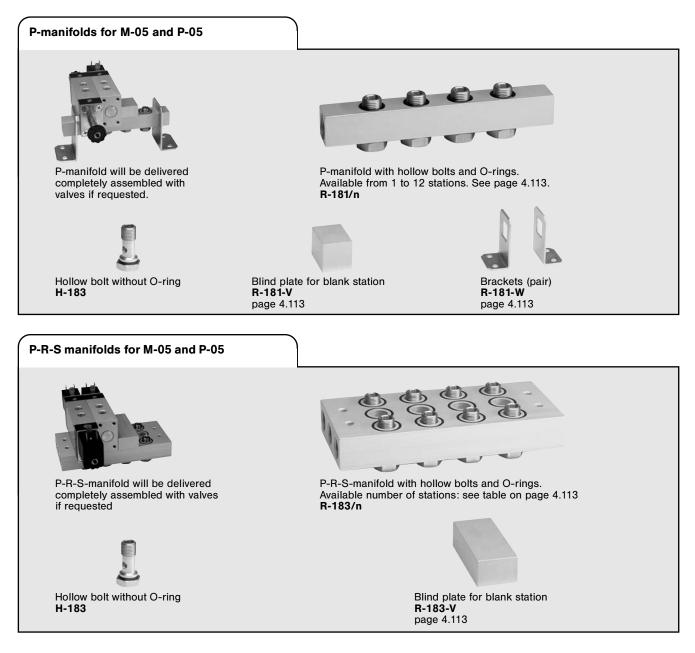
#### User information

Low power consumption coils (2.2 W or 2.5 W) are for pressures up to 8 bar (116 psi) only. Valve actuator 23-R-012 is required. The actuator 23-R-012 is nickel plated. Make sure that the coils with the right power consumption are used.

For outdoor applications or in areas with high humidity use coil 23-SP-011-1-... or 23-SP-012-1-... (see page 4.280).

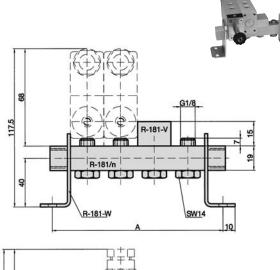
#### The following types are available on request

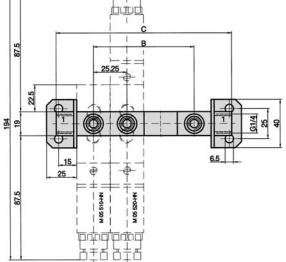
Coils and sockets with contacts according to DIN EN 175301-803 type B (U-form). Plug sockets with molded cable.



ane

#### **Dimensions for P-manifold R-181**





1 = pressure inlet

#### R-181-V

Blind plate for blank station. Material: Al (anodized).

#### R-181-W

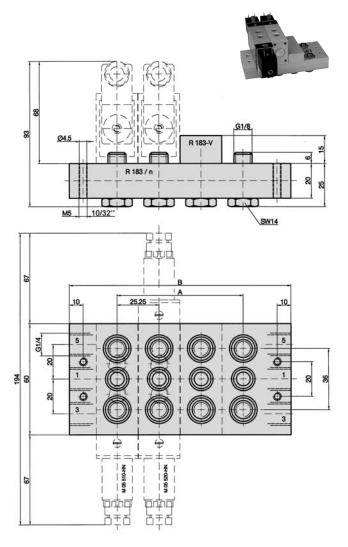
One pair of mounting brackets for P-manifold R-181. Material: steel zinc plated.

#### R-181/n

P-manifold with hollow bolts and O-rings. Within the brackets the manifold can be repositioned by 4 x 90°. Suitable for all valves of series M-05 and P-05.

Material: AI (anodized), O-rings: NBR, hollow bolts: brass

| Order number | Α      | В      | С   | Weight               |
|--------------|--------|--------|-----|----------------------|
| R-181/2      | 80.5   | 25.25  | 85  | 0.084 kg (0.185 lb.) |
| R-181/3      | 105.75 | 50.5   | 110 | 0.113 kg (0.249 lb.) |
| R-181/4      | 131    | 75.75  | 135 | 0.144 kg (0.317 lb.) |
| R-181/5      | 156.25 | 101    | 160 | 0.174 kg (0.383 lb.) |
| R-181/6      | 181.5  | 126.25 | 185 | 0.215 kg (0.473 lb.) |
| R-181/8      | 232    | 176.75 | 235 | 0.266 kg (0.585 lb.) |
| R-181/10     | 282.5  | 227.25 | 285 | 0.326 kg (0.717 lb.) |
| R-181/12     | 333    | 277.75 | 335 | 0.385 kg (0.788 lb.) |



**Dimensions for P-R-S-manifold R-183** 

1 = pressure inlet

3, 5 = exhausts

#### R-183-V

Blind plate for blank station. Material: AI (anodized).

#### R-183/n

P-R-S-manifold with hollow bolts and O-rings. Suitable for all 5/2- and 5/3-way valves of series M-05 and P-05. Material: Al (anodized), O-rings: NBR, hollow bolts: brass.

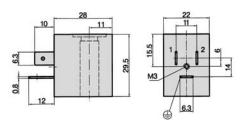
| Order number | Α      | В   | Weight                |
|--------------|--------|-----|-----------------------|
| R-183/2      | 25.25  | 85  | 0.246 kg (0.541 lb.)  |
| R-183/3      | 50.5   | 110 | 0.330 kg (0.726 lb.)  |
| R-183/4      | 75.75  | 135 | 0.415 kg (0.913 lb.)  |
| R-183/5      | 101    | 160 | 0.500 kg (1.100 lbs.) |
| R-183/6      | 126.25 | 185 | 0.580 kg (1.276 lbs.) |
| R-183/8      | 176.75 | 235 | 0.750 kg (1.650 lbs.) |
| R-183/10     | 227.25 | 285 | 0.910 kg (2.002 lbs.) |

## Accessories for electrically operated valves

Solenoid coils







#### Solenoid coils with connection pattern pursuant to DIN EN 175301-803 Shape B

| Order number            | 23-SP-011-411  | 23-SP-011-412 | 23-SP-011-422 | 23-SP-011-426 | 23-SP-011-427 | 23-SP-012-431 | 23-SP-012-432 |  |  |
|-------------------------|--|---------------|---------------|---------------|---------------|---------------|---------------|--|--|
| Standard voltage        | 12 V DC  | 24 V DC       | 24 V AC       | 115 V AC      | 230 V AC      | 12 V DC       | 24 V DC       |  |  |
| Power consumption DC    | 4.2 W  | 4.2 W         |               |               | •             | 2.2 W         | 2.2 W         |  |  |
| Power consumption 50 Hz |  |               | 4 VA          | 4 VA          | 4 VA          |               |               |  |  |
| Degree of protection    | IP 65 according to EN 60529 with connected plug socket                                       |               |               |               |               |               |               |  |  |
| Duty cycle              | 100 %  |               |               |               |               |               |               |  |  |
| Temperature range       | - 20 ℃ +   | 50 °C (−4 °F  | . + 122 °F)   |               |               |               |               |  |  |
| Voltage tolerance       | ± 10 %   | ± 10 %        |               |               |               |               |               |  |  |
| Standard for series     | MS-18, M-04, M-05, M-07, M-22, KM-09. KM-10, MF-05, MF-07, MN-06, KN-05, MI-01, MI-02, MI-03 |               |               |               |               |               |               |  |  |

Other voltages on request.

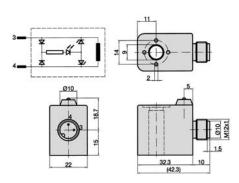
# Solenoid coils with connection pattern pursuant to DIN EN 175301-803 Shape B (with enhanced humidity resistance)

| Order number            | 23-SP-011-1-711  | 23-SP-011-1-712 | 23-SP-011-1-712 | 23-SP-011-1-722 | 23-SP-011-1-725 | 23-SP-011-1-727 | 23-SP-012-1-732 |  |
|-------------------------|--|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|--|
| Standard voltage        | 12 V DC/24 V AC  | 24 V DC         | 48 V AC         | 12 V DC/24 V AC | 110 V AC        | 230 V AC        | 24 V DC         |  |
| Power consumption DC    | 4.6 W  | 4.8 W           | -               | 5.5 W           | -               | -               | 2.5 W           |  |
| Power consumption 50 Hz | 7.1 VA   | -               | 7.7 VA          | 8.9 VA          | 8.5 VA          | 7.9 VA          |                 |  |
| Degree of protection    | IP 65 accordir   | ng to EN 60529  | with connected  | d plug socket * | 1               |                 |                 |  |
| Duty cycle              | 100 %  |                 |                 |                 |                 |                 |                 |  |
| Temperature range       | – 20 ℃ … + 5   | 50 °C (-4 °F    | . + 122 °F)     |                 |                 |                 |                 |  |
| Voltage tolerance       | ± 10 %   |                 |                 |                 |                 |                 |                 |  |
| Standard for series     | KMX-09, KMX-10, ICK-09, ICK-10, KN-55, KNX-55, ICKN-55 |                 |                 |                 |                 |                 |                 |  |

\*1: IP67 pursuant to EN 60529 with plug socket and sealing set 20-SP-011/012-02

## Solenoid coils with M12 connection, with LED and protective circuit.





| Order number         | 23-SP-011-5-O12                                  | 23-SP-012-5-O32 |
|----------------------|--|-----------------|
| Standard voltage     | 24 V DC  | 24 V DC         |
| Power consumption    | 4.8 W  | 2.5 W           |
| Degree of protection | IP 65 according to EN 60529 with connected cable |                 |
| Duty cycle           | 100 %  |                 |
| Temperature range    | – 20 °C + 50 °C                                  |                 |
| Voltage tolerance    | ± 10 %   |                 |



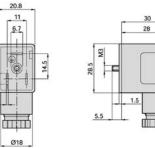
#### Plug sockets pursuant to DIN EN 175301-803 Shape B

(2pol. + PE, 21 x 28 mm, Contact distance 11 mm)









8.9

|            | 30<br>28 |   |
|------------|----------|---|
| 28.5<br>M3 |          | 4 |
| 5.5        | 1.5      |   |

| Order number            | 28-ST-01               | 28-ST-04-112     | 28-ST-04-127      | 28-ST-06-112 | 28-ST-06-127 | 28-ST-06-K3-112 | 28-ST-06-K3-127 |
|-------------------------|------------------------|------------------|-------------------|--------------|--------------|-----------------|-----------------|
| Standard voltage        | all                    | 24 V DC          | 230 V AC          | 24 V DC      | 230 V AC     | 24 V DC         | 230 V AC        |
| Protective circuit      | no                     | no               | no                | yes          | yes          | yes             | yes             |
| Status indicator        | without                | yes              | yes               | yes          | yes          | yes             | yes             |
| Degree of protection    | IP 65 pursuar          | nt to EN 60529 i | requires a flat g | asket        |              |                 |                 |
| Connecting cable        | without                |                  |                   |              |              | 3 m             | 3m              |
| Ø Connecting cable      | 6 – 8 mm               |                  |                   | -            | -            |                 |                 |
| Max. wire cross section | 1,5 mm <sup>2</sup>    |                  | -                 | -            |              |                 |                 |
| for coil                | 23-SP-011, 23-SP-011-1 |                  |                   |              |              |                 |                 |