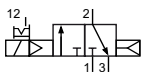


Technical details

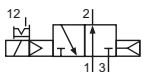
Connection	G1/8
Nominal Size	6 mm
Temperature range	-10°C ... +70°C
Medium	Filtered, oil-free and dried compressed air according to ISO 8573-1:2010, Class 7:2:4, instrument air, free of aggressive additives. Differing the pressure dew point must be at least 10°C below lowest occurring ambient temperature.
Materials	Body: Al (anodized), seals: NBR and POM, inner parts: Al, brass, stainless steel
Protection	IP 65 according to EN 60529
	Valves in accordance with 2014/34/EU (ATEX) available (page 13)



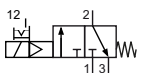
Electrically operated spool valve. The manual override is detent and is operated by screwdriver.

3/2-way-valves


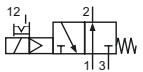
M-05-310-HN-xxx
3/2-way, single solenoid, air spring return, NC



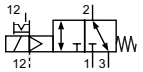
MO-05-310-HN-xxx
3/2-way, single solenoid, air spring return, NO



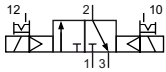
M-05-311-HN-xxx
3/2-way, single solenoid, mechanical spring return, NC



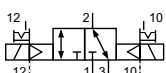
MO-05-311-HN-xxx
3/2-way, single solenoid, mechanical spring return, NO



ME-05-311-HN-xxx
3/2-way, single solenoid, external pilot pressure, mechanical spring return

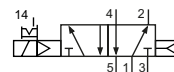


M-05-320-HN-xxx
3/2-way, double solenoid

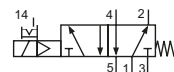


ME-05-320-HN-xxx
3/2-way, double solenoid, external pilot pressure

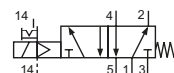
Please complete: xxx = electrical option

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


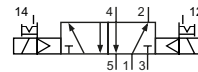
M-05-510-HN-xxx
5/2-way, single solenoid, air spring return



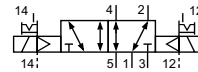
M-05-511-HN-xxx
5/2-way, single solenoid, mechanical spring return



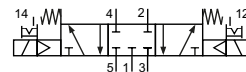
ME-05-511-HN-xxx
5/2-way, single solenoid, external pilot pressure, mechanical spring return



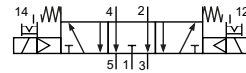
M-05-520-HN-xxx
5/2-way, double solenoid



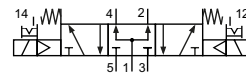
ME-05-520-HN-xxx
5/2-way, double solenoid, external pilot pressure



M-05-530-HN-xxx
5/3-way, center position closed



M-05-533-HN-xxx
5/3-way, center position exhausted



M-05-534-HN-xxx
5/3-way, center position pressurized

Electrical options

Nominal voltage	Power consumption	Specifics	Plug connection*1	-xxx Manual override on same side of ports	
				2 or 2 and 4	1. 3 or 1. 3 and 5
12 V DC	4.2 W		Form B industrial norm	-441	-411
12 V DC	2.2 W	max. 8 bar	Form B industrial norm	-461	-431
24 V DC	4.2 W		Form B industrial norm	-442	-412
24 V DC	4.8 W		M 12	-042	-012
24 V DC	2.2 W	max. 8 bar	Form B industrial norm	-462	-432
24 V DC	2.5 W	max. 8 bar	M 12	-062	-032
24 V AC	5 VA		Form B industrial norm	-452	-422
115 V AC	5 VA		Form B industrial norm	-456	-426
230 V AC	5 VA		Form B industrial norm	-457	-427

*1 Plug socket not included, suitable plug sockets page 06

Series M-05

Technical data

Model-no.:	M-05-310	MO-05-310	M-05-311	MO-05-311	ME-05-311	M-05-320	ME-05-320
Operating pressure* (bar)	2 ... 10	2 ... 10	3 ... 10	3 ... 10	0 ... 10	2 ... 10	0 ... 10
Pilot pressure* (bar)	2 ... 10	2 ... 10	3 ... 10	3 ... 10	3 ... 10	2 ... 10	2 ... 10
Flow rate (Nl/min)	750	750	750	750	750	750	750
Response time (ms) at 6 bar	on: 13 off: 16	on: 13 off: 16	on: 13 off: 16	on: 13 off: 16	on: 13 off: 18	on: 12 off: 12	on: 12 off: 12
Weight (kg)	0.255	0.255	0.260	0.260	0.308	0.400	0.426

Model-no.:	M-05-510	M-05-511	ME-05-511	M-05-520	ME-05-520	M-05-530	M-05-533	M-05-534
Operating pressure* (bar)	2 ... 10	3 ... 10	0 ... 10	2 ... 10	0 ... 10	3 ... 8	3 ... 8	3 ... 8
Pilot pressure* (bar)	2 ... 10	3 ... 10	3 ... 10	2 ... 10	2 ... 10	3 ... 8	3 ... 8	3 ... 8
Flow rate (Nl/min)	750	750	750	750	750	650	650	650
Response time (ms) at 6 bar	on: 13 off: 16	on: 13 off: 18	on: 15 off: 19	on: 12 off: 12	on: 12 off: 12	on: 13 off: 18	on: 13 off: 18	on: 13 off: 18
Weight (kg)	0.295	0.300	0.360	0.440	0.470	0.440	0.440	0.440

* max. 8 bar at 2.2 W and 2.5 W

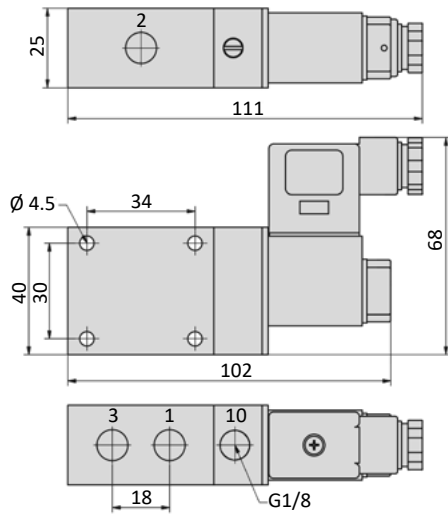
Accessories



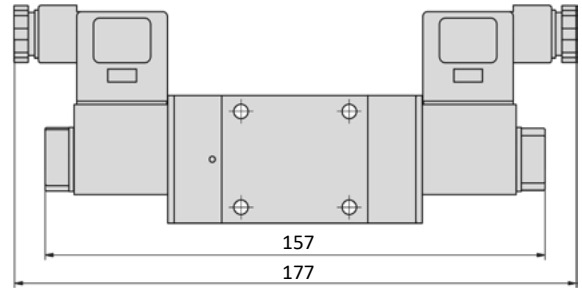
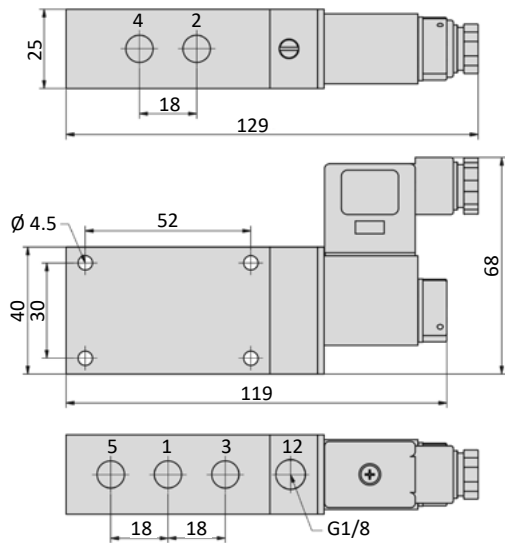
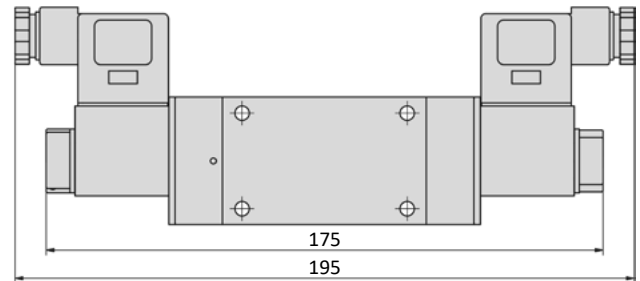
Plug sockets: page 06



Manifolds: page 04

Dimensions
M-05-31x-HN, MO-05-31x-HN*, ME-05-31x-HN


*For the NO version MO-05 the ports 1 and 3 are inverted.

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

M-05-51x-HN, ME-05-511-HN

M-05-520-HN, ME-05-520-HN, M-05-53x-HN


- 1 = pressure inlet
- 2,4 = outlets
- 3,5 = exhausts
- 10,12,14 = connection for external pilot pressure (only at ME-valves)

Plug socket (not included in scope of delivery) can be repositioned by 180°.
Solenoid coil can be repositioned by 4 x 90°.

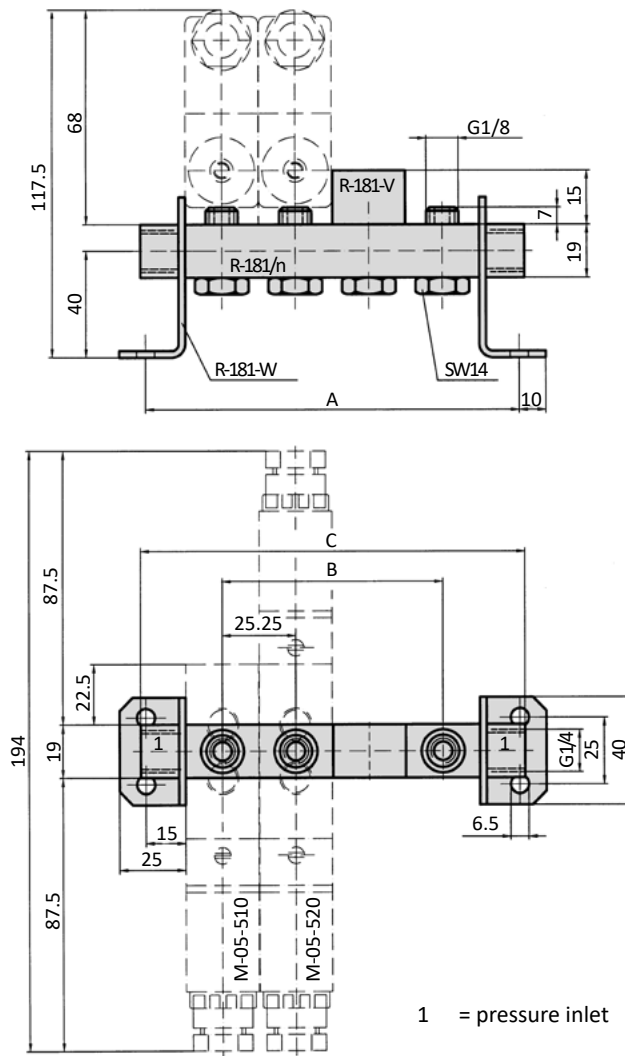
Series M-05

General information

The R-181/n manifold is suitable for the M-05 valve series. As well available are blind plates R-181-V for blank stations and mounting brackets R-181-W (pair). Hollow bolts and gaskets are included.
The manifold is as well suitable for the pneumatically operated valve series P-05.



Dimensions



Model-no.:	A	B	C	Weight (kg)
R-181/2	80.5	25.25	85	0.084
R-181/3	105.75	50.5	110	0.113
R-181/4	131	75.75	135	0.144
R-181/5	156.25	101	160	0.174
R-181/6	181.5	126.25	185	0.215
R-181/8	232	176.75	235	0.266
R-181/10	282.5	227.25	285	0.326
R-181/12	333	277.75	335	0.385

- HN * - * * *				
Manual override	Coil and plug options	Coil type	Voltage type Position of the manual override Position of the connector lugs	Voltage
- without	0 ATEX 2GD, encapsulated with casting compound width 30 mm	23-SP-037	0 without indication Manual override at 1/3/(5)	0 without
HN detent	1 with coil and plug	according to valve	DC	1 12 V
HNT non-detent	3 with coil, power consumption different from standard, without plug	shape according valve series	1 Manual override at 1/3/(5) Connector lugs at 2/(4)	2 24 V
	4 with coil, without plug	according to valve	AC	3 42 V
	5 without coil	no	2 Manual override at 1/3/(5) Connector lugs at 2/(4)	4 48 V
	7 with coil, with enhanced humidity resistance, without plug	according to valve	DC, low power	5 110 V
	8 with coil, with enhanced humidity resistance, with plug	according to valve	3 Manual override at 1/3/(5) Connector lugs at 2/(4)	6 115 V
	9 ATEX 2GD, intrinsically safe, with enclosed plug socket, width 30 mm	23-SP-038	DC	7 230 V
	A ATEX 3GD, coil with enclosed plug socket, width 30 mm	23-SP-043	3 Manual override at 1/3/(5) Connector lugs at 2/(4)	8 240 V
	B ATEX 3GD, valve with mounted coil and enclosed plug socket, width 30 mm	23-SP-043	DC	9 20 V
	C ATEX 3GD, without plug, width 22 mm	23-SP-041	4 Manual override at 2/(4) Connector lugs at 1/3/(5)	A 4 V
	H with coil shape B according to DIN EN 175301-803, with plug	23-SP-011-G	AC	B 6 V
	I with coil shape B according to DIN EN 175301-803, without plug	23-SP-011-G	5 Manual override at 2/(4) Connector lugs at 1/3/(5)	C 8 V
	J with coil shape A according to DIN EN 175301-803, without plug (if not standard)	23-SP-016	DC, low power	D 61 V
	K with coil shape A according to DIN EN 175301-803, with plug (if not standard)	23-SP-016	6 Manual override at 2/(4) Connector lugs at 1/3/(5)	E 36 V
	L with coil, with plug with LED and protective circuit	according to valve	7 without indication Manual override at 2/(4)	F 9 V
	M with coil, with plug with LED, without protective circuit	according to valve	DC	
	N with coil with M12 connection	according to valve	A Manual override at 1/3/(5) Connector lugs at 1/3/(5)	
	O with coil with M12 connection with LED and protective circuit	according to valve	AC	
	Q with coil with with cable	according to valve	B Manual override at 1/3/(5) Connector lugs at 1/3/(5)	
	R with cable up to 1 m length	according to valve	DC, low power	
	U ATEX 2GD, without coil (for coil 23-SP-036)	no	C Manual override at 1/3/(5) Connector lugs at 1/3/(5)	
	V ATEX 2GD, Flame proof enclosures and encapsulated with casting compound	23-SP-045	DC	
	W ATEX 2GD / 3GD, without coil (for coil 23-SP-041 and 23-SP-045)	no	D Manual override at 2/(4) Connector lugs at 2/(4)	
	X ATEX 3GD, without coil (for coil 23-SP-043 at 230V AC and 115V AC)	no	AC	
	Y ATEX 2GD, without coil (for coil 23-SP-038)	no	E Manual override at 2/(4) Connector lugs at 2/(4)	
	Z ATEX 2GD / 3GD, without coil (for coil 23-SP-043 at 24V DC and 23-SP-037)	no	DC, low power	
			F Manual override at 2/(4) Connector lugs at 2/(4)	

Not all options are suitable for all valve series

Plug sockets

Form A according to DIN EN 175301-803

Overall width	27 mm
Contact distance	18 mm
Contacts	2P + E
Protection	IP 65 according to EN 60529 requires a profile gasket
For use with series	no standard



Model-no.:	28-ST-03	28-ST-11-112
Voltage (AC/DC)	0 - 250 V	24 V
Status indicator	no	yes
Protective circuit	no	yes (varistor)
Connecting cable	without	without
Wire cross section	max. 1.5 mm ²	max. 1.5 mm ²
Ø Connecting cable	6 - 8 mm	6 - 8 mm

Form B according to DIN EN 175301-803

Overall width	22 mm
Contact distance	10 mm
Contacts	2P + E
Protection	IP 65 according to EN 60529 requires a flat gasket
For use with series	no standard



Model-no.:	28-ST-01-G
Voltage (AC/DC)	0 - 250 V
Status indicator	no
Protective circuit	no
Connecting cable	without
Wire cross section	max. 1.5 mm ²
Ø Connecting cable	6 - 8 mm

Form B industrial norm

Overall width	22 mm
Contact distance	11 mm
Contacts	2P + E
Protection	IP 65 according to EN 60529 requires a flat gasket
For use with series	M-04, M-05, M-07, M-22, KM-09, KM-10, MS-18, KN-05, MN-06, MI-01, MI-02, MI-03



Model-no.:	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*
Voltage (AC/DC)	0 - 250 V	10 - 50 V	70 - 250 V	24 V	230 V	24 V	230 V
Status indicator	no	yes	yes	yes	yes	yes	yes
Protective circuit	no	no	no	yes (varistor)	yes (varistor)	yes (varistor)	yes (varistor)
Connecting cable	without	without	without	without	without	3 m	3 m
Wire cross section	max. 1.5 mm ²	max. 1.5 mm ²	max. 1.5 mm ²	max. 1.5 mm ²	max. 1.5 mm ²	3 x 0.75 mm ²	3 x 0.75 mm ²
Ø Connecting cable	6 - 8 mm	6 - 8 mm	6 - 8 mm	6 - 8 mm	6 - 8 mm		

* These plug sockets are fitted with integrated flat gaskets.

Form B industrial norm with UL-approval

Overall width	22 mm
Contact distance	11 mm
Contacts	2P + E
Protection	IP 65 according to EN 60529 requires a flat gasket

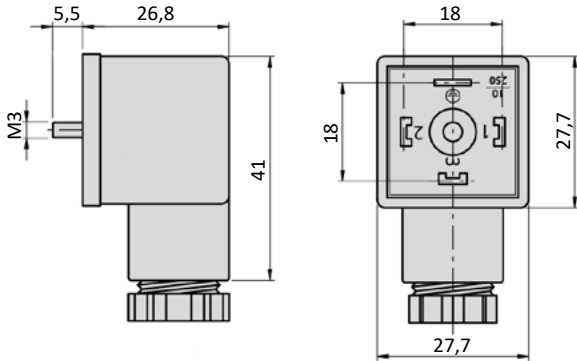


Model-no.:	28-ST-01-1
Voltage (AC/DC)	0 - 250 V
Status indicator	non
Protective circuit	non
Connecting cable	without
Wire cross section	max. 1,5 mm ²
Ø Connecting cable	6 - 8 mm

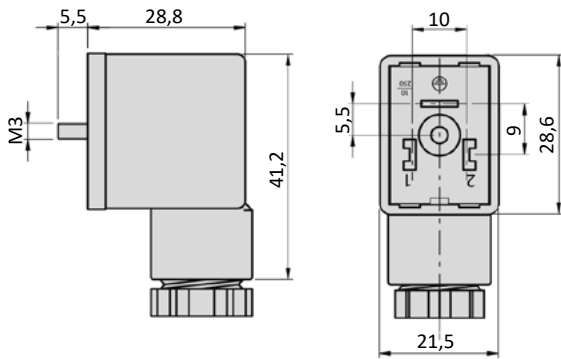
Plug sockets

Dimensions

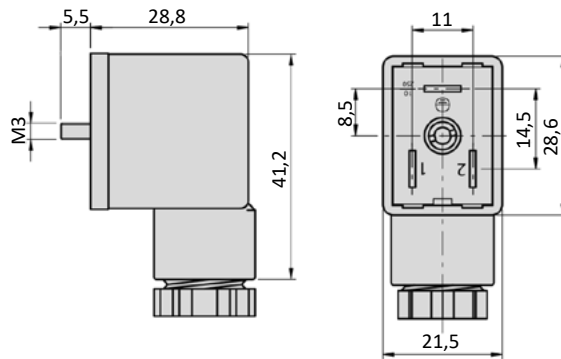
Form A according to DIN EN 175301-803



Form B according to DIN EN 175301-803

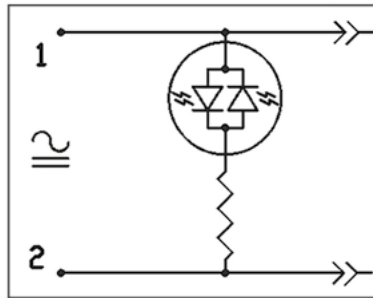


Form B industrial norm

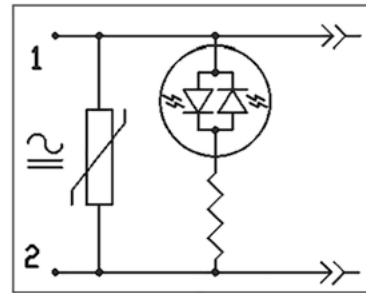


Electrically circuits

Status indicator (LED)



Status indicator (LED) and protective circuit (varistor)



Solenoid coils

Form A according to DIN EN 175301-803

Overall width	30 mm
Contact distance	18 mm
Contacts	2P + E
Protection	IP 65 according to EN 60529 with connected plug socket
Duty cycle	100 %
Temperature range*	-40°C ... +50°C
Voltage tolerance	± 10 %
For use with series	no standard



* The max. applicable operating temperature depends on the temperature specification of the used valve.

Model-no.:	23-SP-016-712	23-SP-016-722	23-SP-016-726	23-SP-016-727
Voltage	24 V DC	24 V AC	110/115 V AC	230 V AC/ 110 V DC
Power consumption DC	4.5 W	-	-	5.3 W
Power consumption AC	-	8.0 VA	7.6 VA/ 8.6 VA	7.9 VA
Specifics	enhanced humidity resistance			

Form B according to DIN EN 175301-803

Overall width	22 mm
Contact distance	10 mm
Contacts	2P + E
Protection	IP 65 according to EN 60529 with connected plug socket
Duty cycle	100 %
Temperature range*	-40°C ... +50°C
Voltage tolerance	± 10 %
For use with series	no standard



* The max. applicable operating temperature depends on the temperature specification of the used valve.

Model-no.:	23-SP-011-G-412	23-SP-011-G-427
Voltage	24 V DC	230 V AC
Power consumption DC	4.2 W	-
Power consumption AC	-	5 VA

Form B industrial norm

Overall width	22 mm
Contact distance	11 mm
Contacts	2P + E
Protection	IP 65 according to EN 60529 with connected plug socket
Duty cycle	100 %
Voltage tolerance	± 10 %
For use with series	M-04, M-05, M-07, M-22, KM-09, KM-10, MS-18, KN-05, MN-06, MI-01, MI-02, MI-03



Model-no.:	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
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 AC	-	-	5 VA	5 VA	5 VA	-	-
Temperature range*	-40°C...+50°C	-40°C...+50°C	-40°C...+50°C	-40°C...+50°C	-40°C...+50°C	-40°C...+50°C	-40°C...+50°C

Model-no.:	23-SP-011-1-711	23-SP-011-1-712	23-SP-011-1-725	23-SP-011-1-727	23-SP-012-1-732
Voltage	12 V DC	24 V DC	110/115 V AC	230 V AC	24 V DC
Power consumption DC	4.2 W	4.2 W	-	-	3 W
Power consumption AC	-	-	6.0 VA/ 7.6 VA	7.9 VA	-
Temperature range*	-40°C...+80°C	-40°C...+80°C	-20°C...+50°C	-20°C...+50°C	-40°C...+80°C
Specifics	enhanced humidity resistance				

* The max. applicable operating temperature depends on the temperature specification of the used valve.

Form B industrial norm with UL-approval

Overall width	22 mm
Contact distance	11 mm
Contacts	2P + E
Protection	IP 65 according to EN 60529 with connected plug socket
Duty cycle	100 %
Voltage tolerance	± 10 %
For use with series	M-04, M-05, M-07, M-22, KM-09, KM-10, MS-18, KN-05, MN-06, MI-01, MI-02, MI-03



Model-no.:	23-SP-027-412-02-UL	23-SP-027-427-02-UL
Voltage	24 V DC	230 V AC
Power consumption DC	6.5 W	-
Power consumption AC	-	8.5 VA

Solenoid coils



M12 connection

Overall width	22 mm
Contact distance	-
Contacts	2P
Protection	IP 65 according to EN 60529 with connected plug socket
Duty cycle	100 %
Temperature range*	-20°C ... +50°C
Voltage tolerance	± 10 %
For use with series	

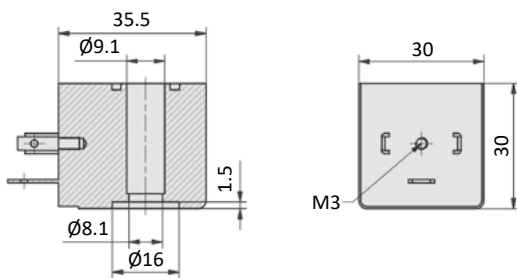


* The max. applicable operating temperature, depends on the temperature specification of the used valve.

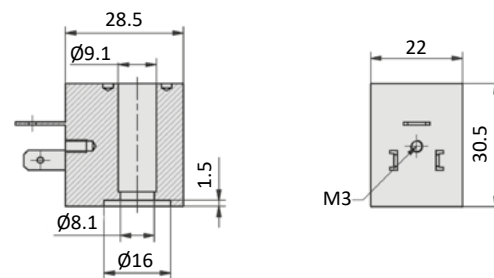
Model-no.:	23-SP-011-5-012	23-SP-012-5-032
Voltage	24 V DC	24 V DC
Power consumption DC	4.8 W	2.5 W
Power consumption AC	-	-
Specifics	Mounting on manifold not allowed. With integrated LED and protective circuit.	Min. mounting distance for manifold mounting is 20 mm. With integrated LED and protective circuit.
electrical connection		

Dimensions

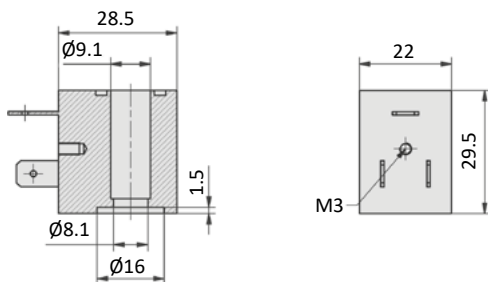
Form A according to DIN EN 175301-803



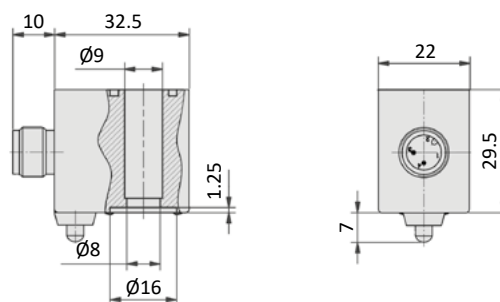
Form B according to DIN EN 175301-803



Form B industrial norm



M12 connection



Device marking

Electrically operated valves are marked as follows:

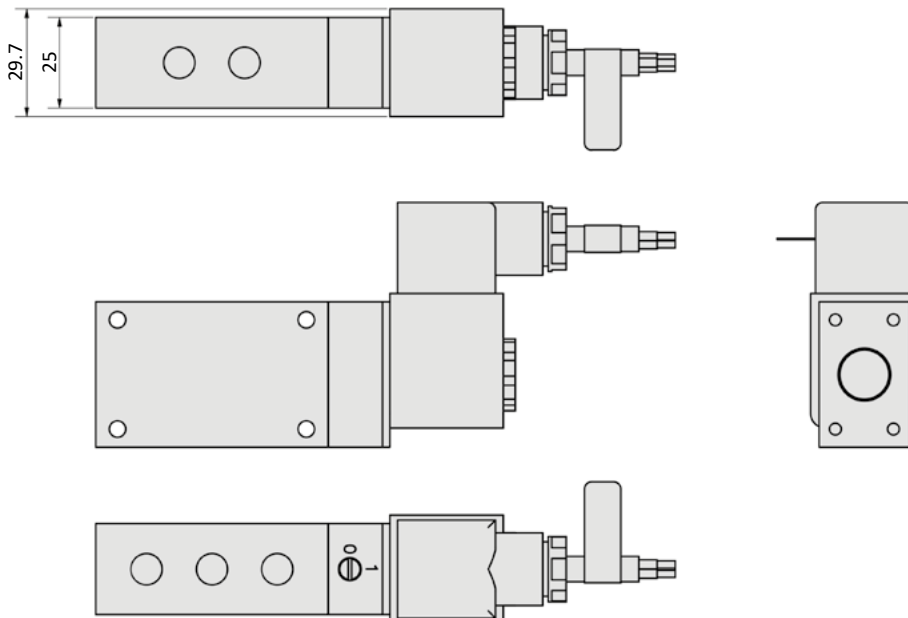
II 2G Ex h IIC T5 Gb
 II 2D Ex h IIIC T100°C Db
 -10°C T_{amb} +50°C

Marking according to DIN EN ISO 80079-36/ -37.



Electrically operated valves conform to equipment category 2 can be used in Zone 1 respectively in Zone 21. For the use in hazardous areas the category group of the used coil has to be taken into account. The specification of the whole equipment corresponds always to the lowest category of the single components.

Divergent dimensions



The valves are equipped with special electrical equipment. As a result, the dimensions of these components may change. In addition to the valve dimensions, please note the dimensions of the solenoid coils on the following pages.

Please observe the respective operating instructions and declarations of conformity. These are enclosed with the products and are available at www.airtec.de.



Electrical options

ATEX-category	Voltage	Power consumption	Ignition protection	Solenoid coil #	-xxx Manual override on same side of ports	
					2 or 2 and 4	1. 3 or 1. 3 and 5
3GD	24 V DC	2.7 W	Non-sparking device	23-SP-043-A12	-B42	-B12
3GD	230 V AC	4 VA	Non-sparking device	23-SP-043-A27	-B57	-B27
2GD	24 V DC	3 W	encapsulated with casting compound and flameproof enclosure	23-SP-045-V12	-V42	-V12
2GD	230 V AC	3.8 VA	encapsulated with casting compound and flameproof enclosure	23-SP-045-V27	-V57	-V27
2GD	12 V DC	3.3 W	Encapsulated with casting compound	23-SP-037-011-xx*	-041-xx*	-011-xx*
2GD	24 V DC	3.3 W	Encapsulated with casting compound	23-SP-037-012-xx*	-042-xx*	-012-xx*
2GD	110...120 V AC	3 VA	Encapsulated with casting compound	23-SP-037-025-xx*	-055-xx*	-025-xx*
2GD	230 V AC	3.1 VA	Encapsulated with casting compound	23-SP-037-027-xx*	-057-xx*	-027-xx*
2GD	U ≤ 28 V DC / U ≤ 32 V DC	I ≤ 115 mA / I ≤ 195 mA	Intrinsically safe	23-SP-038-01-912	-942	-912

For details on the ATEX solenoid coils, see chapter 12.

* xx = length of connecting cable: 03 = 3 m. 05 = 5 m. 10 = 10 m (available length see chapter 12)

Solenoid coils

23-SP-037

Ignition protection class	Encapsulated with casting compound mb (gases) mb tb (dust)
Classification	II 2G Ex mb IIC T5 II 2D Ex mb tb IIIC T95°C IP65
Overall width	30 mm
Temperature range*	-20°C...+50°C (battery fitted -20°C...+40°C)
Temperature range medium	-10°C...+50°C (battery fitted -10°C...+40°C)



* The max. applicable operating temperature depends on the temperature specification of the used valve.

Model-no.:	23-SP-037-012-xx	23-SP-037-025-xx	23-SP-037-027-xx
Voltage	24 V DC	110...120 V AC	230 V AC
Power consumption	3.3 W	3 VA	3.1 VA
Rated current	136 mA	27 mA	14 mA
Connecting cable (xx)	03 = 3 m, 05 = 5 m, 10 = 10 m	03 = 3 m	03 = 3 m, 05 = 5 m

Solenoid coils

23-SP-038

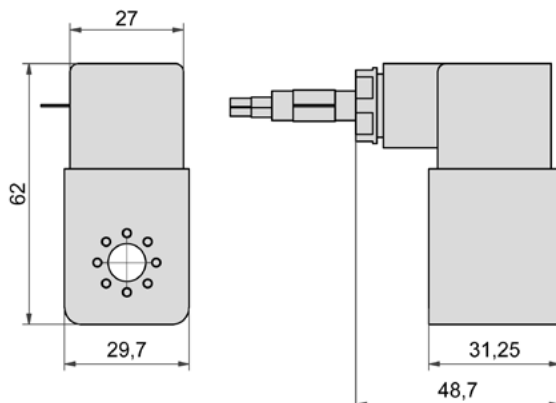
Ignition protection class	Intrinsically safe ia (gases) t (dust)
Classification	II 2G Ex ia IIC T6 Ga (≤ 28 V DC) II 2G Ex ia IIB T6 Ga (≤ 32 V DC) II 2D Ex t IIIC T80°C Db IP65
Overall width	30 mm
Temperature range*	-40°C...+50°C
Temperature range medium	-10°C...+50°C (battery fitted -10°C...+40°C)

* The max. applicable operating temperature depends on the temperature specification of the used valve.

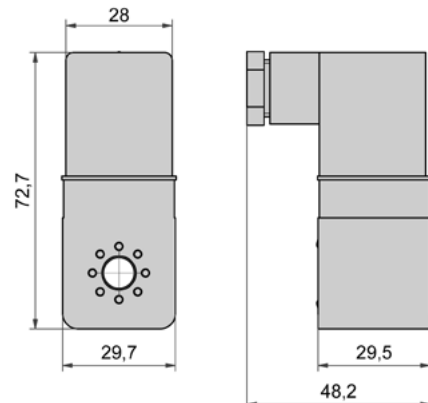
Model-no.:	23-SP-038-01-912
Voltage	$U \leq 28$ V DC / $U \leq 32$ V DC
Rated current	$I \leq 115$ mA / $I \leq 195$ mA
Connection	plug (part of delivery)

Dimensions

23-SP-037



23-SP-038





Valves
Electrically operated

Solenoid coils

23-SP-043

Ignition protection class	enhanced safety na (gases) tc (dust)
Classification	II 3 G Ex ec IIC T5 Gc II 3 D Ex tc IIIC T95°C Dc IP65
Overall width	30 mm
Temperature range*	-20°C...+50°C
Temperature range medium	-10°C...+50°C



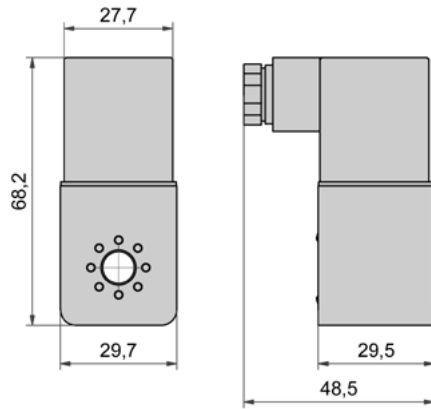
* The max. applicable operating temperature depends on the temperature specification of the used valve.

Model-no.:	23-SP-043-A12	23-SP-043-A27
Voltage	24 V DC	230 V AC
Power consumption	2.7 W	4 VA
Rated current	112 mA	17,5 mA
Connection	plug (part of delivery)*	plug (part of delivery)*

* The socket is supplied unassembled.

Dimensions

23-SP-043



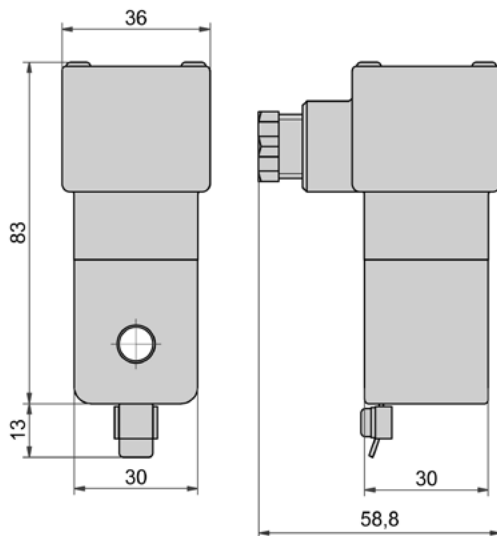
Solenoid coils
23-SP-045

Ignition protection class	encapsulated with casting compound and flameproof enclosure d mb (gases) tb (dust)
Classification	II 2G Ex d mb IIC T5 Gb II 2D tb IIIC T95°C Db IP66
Overall width	30 mm
Temperature range*	-20°C...+50°C
Temperature range medium	-10°C...+50°C



* The max. applicable operating temperature depends on the temperature specification of the used valve.

Model-no.:	23-SP-045-V12	23-SP-045-V27
Voltage	24 V DC	230 V AC
Power consumption	3 W	3,8 VA
Rated current	125 mA	14 mA
Connection	terminal box	terminal box

Dimensions
23-SP-045


Delivery is only made in a fully assembled state with valve, as the approval relates to both the electrical and mechanical components. The delivery of individual parts is only permitted for replacement purposes.



The operating instructions for the valve and the electrical equipment must be taken into account before putting into operation. These are included with each valve and are available at www.airtec.de.