

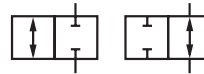
Working from 0 bar up

Short switching times

Suited for fine vacuum down to 1,33·10⁻³ mbar

For a.c. solenoid systems with integrated rectifier (40 ... 60 Hz)

These solenoid valves are applicable in Ex protection class ATEX (categories II 2 GD and II 3 GD) and other international approvals



Technical features

Medium:

For neutral gaseous and liquid fluids (with contaminated fluids, upstream installation of a dirt trap is recommended.)

Operation:

Direct solenoid operated poppet valves

Mounting position:

Optional, preferably with solenoid on top

Orifice:

1,5 ... 12 mm

Port size:

G 1/4, 1/4 NPT, G 1/2

Operating pressure:

0 ... 40 bar

Operating temperature:

NBR -25... +80°C

FKM -10...+120°C - Water +95°C

EPDM -40... +140°C

FFKM -10...+140°C

PTFE -50...+180°C

(depending on solenoid system)

Air supply must be dry enough to avoid ice formation at temperatures below +2°C.

Materials:

Housing: brass

Seals: NBR (Perbunan),

other see option selector

Inner parts: steel 1.4104/430F, brass

Further versions

Operating pressure to 50 bar;
Seat seals FKM, EPDM, FFKM, PTFE, Rubin;
Assembled oil and grease-free

Connectors – see data sheet N/en 7.7.002

Technical data

Switching function: Normally closed

Symbol	Port size	Orifice (mm)	Operating pressure (bar) min.	max.	Flow (l/min)	Weight without Solenoid (kg)	Dimension No.	Solenoid group *2)	Model *1)
	G1/4	1,5	0	40	70	0,21	1	13B	9500100
	G1/4	2	0	35	120	0,21	1	13B	9500200
	1/4 NPT	2	0	35	120	0,21	1	13B	9503200
	G1/4	3	0	10	200	0,21	1	13C	9500300
	1/4 NPT	3	0	10	200	0,21	1	13C	9503300
	G1/4	4	0	12	350	0,21	1	13D	9500400
	1/4 NPT	4	0	12	350	0,21	1	13D	9503400
	G1/4	6	0	5	550	0,25	2	16D	9501600
	G1/2	12	0	1	1700	0,8	4	16D	9501700
	1/4 NPT	6	0	5	550	0,25	2	16D	9504600

Switching function: Normally open

Symbol	Port size	Orifice (mm)	Operating pressure (bar) min.	max.	Flow (l/min)	Weight without Solenoid (kg)	Dimension No.	Solenoid group *2)	Model *1)
	G1/4	2	0	20	100	0,21	3	13B	9502210
	G1/4	3	0	10	160	0,21	3	13B	9502310

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

*2) Technical data and ordering information see following pages.

Option selector
950XX*.*****.*****.*****

Orifice	Substitute
1,5	1
2	2
3	3
4	4
6	6
12	7
Material seat seal	Substitute
NBR (Perbunan)	0
EPDM	1
FKM (Viton)	2
PTFE (Teflon) (DN1,5 - 4) NC	3
FFKM (Kalrez)	4
Rubin (DN2+3) NC	5

Frequency (Hz)	Substitute
At d.c.	00
At a.c. (40 ... 60 Hz)	50
Voltage	Substitute
24 V d.c.	024
230 V a.c.	230
Solenoid operators	Substitute
See table	

Solenoid operators

Solenoids group 13B

	Power consumption 24 V d.c. (W)	230 V a.c. (VA)	Current 24 V d.c. (mA)	230 V a.c. (mA)	Ex-Protection (ATEX- Category)	Protection class *7)	Temperature Ambient/ Fluid (°C)	Electrical connection	Weight (kg)	Dimen- sion No.	Circuit diagram No.	Model
	8,0	-	331	-	-	IP 65 mit Connector *5)	-25 ... +60 Fluid: max. 80	Connector DIN EN 175301-803 Form A *6)	0,15	1	1	0246
	-	9,2	-	40	-	IP 65 mit Connector *5)	-25 ... +60 Fluid: max. 80	Connector DIN EN 175301-803 Form A *6)	0,16	2	7	3206
	8,0	-	331	-	II3G II3D	Ex nA II T4 Ex tD A22 IP65 T 110°C	-20 ... +60	Connector DIN EN 175301-803 Form A indicated in delivery	0,16	1	1	3216
	-	9,2	-	40	II3G II3D	Ex nA II T4 Ex tD A22 IP65 T 110°C	-20 ... +60	Connector DIN EN 175301-803 Form A indicated in delivery	0,16	2	6	3218
	6,9	-	289	-	II2G, II2D	Ex mb II T4 Ex tD A21 IP66 T 110°C *1)	-20 ... +60	Cable 3 m long	0,4	5	4	0292 *8)
	-	8,7	-	34	II2G, II2D	Ex mb II T4 Ex tD A21 IP66 T 110°C *1)	-20 ... +60	Cable 3 m long	0,4	5	7	0293 *8)
	3,9	-	162	-	II2G, II2D	Ex emb II T4/T6 Ex tD A21 IP66 T130°C *2), *10)	-40 ...+80 T4 -40 ...+55 T6 -40 ...+80	M20 x 1,5 *6)	0,5	6	4	4210 *8)
	-	5,3	-	23	II2G, II2D	Ex emb II T4/T6 Ex tD A21 IP66 T130°C *2), *10)	-40 ...+80 T4 -40 ...+55 T6 -40 ...+80	M20 x 1,5 *6)	0,5	6	7	4211 *8)
	3,9	-	162	-	II2G II2D	Ex dmb IIC T4/T6 Ex emb II T4/T6 Ex tD A21 IP66 T130°C *3)	-40 ...+80 T4 -40 ...+55 T6 -40 ...+80	1/2-14 NPT *6)	0,8	7	4	4610 *8)
	-	5,3	-	23	II2G II2D	Ex dmb IIC T4/T6 Ex emb II T4/T6 Ex tD A21 IP66 T130°C *3)	-40 ...+80 T4 -40 ...+55 T6 -40 ...+80	1/2-14 NPT *6)	0,8	7	4	4611 *8)
	3,9	-	162	-	II2G II2D	Ex dmb IIC T4/T6 Ex emb II T4/T6 Ex tD A21 IP66 T130°C *3)	-40 ...+80 T4 -40 ...+55 T6 -40 ...+80	M20 x 1,5 *6)	0,8	7	7	4612 *8)
	-	5,3	-	23	II2G II2D	Ex dmb IIC T4/T6 Ex emb II T4/T6 Ex tD A21 IP66 T130°C *3)	-40 ...+80 T4 -40 ...+55 T6 -40 ...+80	M20 x 1,5 *6)	0,8	7	4	4613 *8)
	5,5	-	-	228	-	XP/DIP, Div. 1 & 2 Cl. I, Gr. A-D Cl. II/III, Gr. E-G T3 (160°C) *4) NEMA 4, 4X, 6, 6P, 7, 9	-20 ... +60	Flying leads 450 mm long	0,5	8	1	3722
	-	5,9	-	26	-	XP/DIP, Div. 1 & 2 Cl. I, Gr. A-D Cl. II/III, Gr. E-G T3 (160°C) *4) NEMA 4, 4X, 6, 6P, 7, 9	-20 ... +60	Flying leads 450 mm long	0,5	8	5	3723

Standard voltages 24 V d.c., 230 V a.c., other voltages on request.

Design according to VDE 0580, EN 50014/50028. 100% duty cycle.

*1) EG-Type-Examination-Certificate PTB 06 ATEX 2054 X

*2) EG-Type-Examination-Certificate KEMA 98 ATEX 4452 X

*3) EG-Type-Examination-Certificate PTB 02 ATEX 2085 X

*4) CSA-LR 57643-6, FM Approval

*5) Required connector: type 0570275

*6) Connector cable gland not supplied, see table »Accessories«

*7) IP-Protection class according to EN60529

*8) Suitable for outdoor installation

*10) IEC Ex Certificate of Conformity

Attention:

The protection class for coil series 46xx and 48xx is determined by the choice of cable gland.

Example: if an ATEX-certified cable gland is used that has Ex d type of protection, the solenoid will have the protection class Ex dmb; if a cable gland with Ex e type of protection is used, the solenoid will have protection class Ex emb.

Solenoid operators
Solenoids group 13C

	Power consumption 24 V d.c. (W)	230 V a.c. (VA)	Current 24 V d.c. (mA)	230 V a.c. (mA)	Ex-Protection (ATEX- Category)	Protection class *7)	Temperature Ambient/ Fluid (°C)	Electrical connection	Weight (kg)	Dimen- sion No.	Circuit diagram No.	Model
	12,1	-	504	-	-	IP 65 (with Connector) *5)	-25 ... +60 Fluid: max. 80	Connector DIN EN 175301-803 Form A *6)	0,117	1	1	0200
	-	11,3	-	49	-	IP 65 (with Connector) *5)	-25 ... +60 Fluid: max. 80	Connector DIN EN 175301-803 Form A *6)	0,160	2	6	3204
	12,1	-	504	-	I13G I13D	Ex nA II T4 Ex tD A22 IP65 T 130°C	-20 ... +60	Connector DIN EN 175301-803, Form A with special screw	0,127	1	1	3217
	-	11,3	-	49	I13G I13D	Ex nA II T4 Ex tD A22 IP65 T 120°C	-20 ... +50	Connector DIN EN 175301-803, Form A with special screw	0,17	2	6	3219
	10,7	-	446	-	I12G, I12D	Ex mb II T4 Ex tD A21 IP66 T 110°C *1)	-20 ... +40	3 m cable	0,4	5	4	0290
	-	12,4	-	54	I12G, I12D	Ex mb II T4 Ex tD A21 IP66 T 110°C *1)	-20 ... +40	3 m cable	0,4	5	7	0291
	8,9	-	369	-	I12G, I12D	Ex emb II T4/T5 Ex tD A21 IP66 T130°C *2), *10)	-40 ... +65 T4 -40 ... +55 T5 -40 ... +65	M20 x 1,5 *6)	0,5	6	4	4220 *8)
	-	10,0	-	43	I12G, I12D	Ex emb II T4/T5 Ex tD A21 IP66 T130°C *2), *10)	-40 ... +65 T4 -40 ... +55 T5 -40 ... +65	M20 x 1,5 *6)	0,5	6	7	4221 *8)
	8,9	-	369	-	I12G I12D	Ex dmb IIC T4/T6 Ex emb II T4/T6 Ex tD A21 IP66 T130°C *3)	-40 ... +70 T4 -40 ... +40 T6 -40 ... +70	1/2-14 NPT *6)	0,8	7	4	4620 *8)
	-	10,0	-	43	I12G I12D	Ex dmb IIC T4/T6 Ex emb II T4/T6 Ex tD A21 IP66 T130°C *3)	-40 ... +70 T4 -40 ... +40 T6 -40 ... +70	1/2-14 NPT *6)	0,8	7	7	4621 *8)
	8,9	-	369	-	I12G I12D	Ex dmb IIC T4/T6 Ex emb II T4/T6 Ex tD A21 IP66 T130°C *3))	-40 ... +70 T4 -40 ... +40 T6 -40 ... +70	M20 x 1,5 *6)	0,8	7	4	4622 *8)
	-	10,0	-	43	I12G I12D	Ex dmb IIC T4/T6 Ex emb II T4/T6 Ex tD A21 IP66 T130°C *3)	-40 ... +70 T4 -40 ... +40 T6 -40 ... +70	M20 x 1,5 *6)	0,8	7	7	4623 *8)
	8,9	-	369	-	-	XP/DIP, Div. 1 & 2 Cl. I, Gr. A-D Cl. II/III, Gr. E-G T3 (160°C) *4) NEMA 4, 4X, 6, 6P, 7, 9	-20 ... +60	Flying leads 450 mm long	0,5	8	1	3724
	-	9,5	-	41	-	XP/DIP, Div. 1 & 2 Cl. I, Gr. A-D Cl. II/III, Gr. E-G T3 (160°C) *4) NEMA 4, 4X, 6, 6P, 7, 9	-20 ... +60	Flying leads 450 mm long	0,5	8	5	3725

Standard voltages 24 V d.c., 230 V a.c., other voltages on request.

Design according to VDE 0580, EN 50014/50028. 100% duty cycle.

*1) EG-Type-Examination-Certificate PTB 06 ATEX 2054 X

*2) EG-Type-Examination-Certificate KEMA 98 ATEX 4452 X

*3) EG-Type-Examination-Certificate PTB 02 ATEX 2085 X

*4) CSA-LR 57643-6, FM Approval

*5) Required connector: type 0570275

*6) Connector cable gland not supplied, see table »Accessories«

*7) IP-Protection class according to EN60529

*8) Suitable for outdoor installation

*10) IEC Ex Certificate of Conformity





Attention:

The protection class for coil series 46xx and 48xx is determined by the choice of cable gland.

Example: if an ATEX-certified cable gland is used that has Ex d type of protection, the solenoid will have the protection class Ex dmb; if a cable gland with Ex e type of protection is used, the solenoid will have protection class Ex emb.

Solenoid operators

Solenoids group 13D

	Power consumption 24 V d.c. (W)	230V a.c. (VA)	Nominal current 24 V d.c. (mA)	230 V a.c. (mA)	Ex-Protection (ATEX- Category)	Protection class *7)	Temperature Ambient/ Fluid (°C)	Electrical connection	Weight (kg)	Dimen- sion No.	Circuit diagram No.	Model
	16,9	--	703	-	-	IP 65 (with Connector) *5)	-25 ... +60 Fluid: max. 80	Connector DIN EN 175301-803 Form A *6)	0,27	3	1	0700
	-	17,3	-	75	-	IP 65 (with Connector) *5)	-25 ... +60 Fluid: max. 80	Connector DIN EN 175301-803 Form A *6)	0,32	4	6	3703
	11,4	-	475	-	II2G, II2D	Ex emb II T4/T5 *2), *10) Ex tD A21 IP66 T130°C *2), *10)	-40 ... +50 T4 -40 ... +40 T5 -40 ... +50	M20 x 1,5 *6)	0,5	6	4	4230
	-	15,2	-	66	II2G, II2D	Ex emb II T4/T5 *2), *10) Ex tD A21 IP66 T130°C *2), *10)	-40 ... +50 T4 -40 ... +40 T5 -40 ... +50	M20 x 1,5 *6)	0,5	6	7	4231 *8)
	11,4	-	475	-	II2G II2D	Ex dmb IIC T4/T5 Ex emb II T4/T5 Ex tD A21 IP66 T130°C *3)	-40 ... +50 T4 -40 ... +40 T5 -40 ... +50	1/2 x 14 NPT *6)	0,8	7	4	4630 *8)
	-	15,2	-	66	II2G II2D	Ex dmb IIC T4/T5 Ex emb II T4/T5 Ex tD A21 IP66 T130°C *3)	-40 ... +50 T4 -40 ... +40 T5 -40 ... +50	1/2 x 14 NPT *6)	0,8	7	7	4631 *8)
	11,4	-	475	-	II2G II2D	Ex dmb IIC T4/T5 Ex emb II T4/T5 Ex tD A21 IP66 T130°C *3)	-40 ... +50 T4 -40 ... +40 T5 -40 ... +50	1/2 x 14 NPT *6)	0,8	7	4	4632 *8)
	-	15,2	-	66	II2G II2D	Ex dmb IIC T4/T5 Ex emb II T4/T5 Ex tD A21 IP66 T130°C *3)	-40 ... +50 T4 -40 ... +40 T5 -40 ... +50	M20 x 1,5 *6)	0,8	7	7	4633 *8)
	13,6	-	567	-	-	XP/DIP, Div. 1 & 2 Cl. I, Gr. A-D Cl. II/III, Gr. E-G T3 (160°C) *4) NEMA 4, 4X, 6, 6P, 7, 9	-20 ... +60	Flying leads 450 mm long	0,5	8	1	3726
	-	15,7	-	68	-	XP/DIP, Div. 1 & 2 Cl. I, Gr. A-D Cl. II/III, Gr. E-G T3 (160°C) *4) NEMA 4, 4X, 6, 6P, 7, 9	-20 ... +60	Flying leads 450 mm long	0,5	8	5	3727

Standard voltages 24 V d.c., 230 V a.c., other voltages on request.

Design according to VDE 0580, EN 50014/50028. 100% duty cycle.

*2) EG-Type-Examination-Certificate KEMA 98 ATEX 4452 X

*3) EG-Type-Examination-Certificate PTB 02 ATEX 2085 X

*4) CSA-LR 57643-6, FM Approval

*5) Required connector: type 0570275

*6) Connector cable gland not supplied, see table »Accessories«

*7) IP-Protection class according to EN60529

*8) Suitable for outdoor installation

*10) IEC Ex Certificate of Conformity

Attention:

The protection class for coil series 46xx and 48xx is determined by the choice of cable gland.

Example: if an ATEX-certified cable gland is used that has Ex d type of protection, the solenoid will have the protection class Ex dmb; if a cable gland with Ex e type of protection is used, the solenoid will have protection class Ex emb.

Solenoid operators
Solenoids group 16D

	Power consumption 24 V d.c. (W)	230V a.c. (VA)	Nominal current 24 V d.c. (mA)	230 V a.c. (mA)	Ex-Protection (ATEX- Category)	Protection class *7)	Temperature Ambient/ Fluid (°C)	Electrical connection	Weight (kg)	Dimen- sion No.	Circuit diagram No.	Model
	16,9	-	703	-	-	IP 65 (with Connector) *5)	-25 ... +60 Fluid: max. 80	Connector DIN EN 175301-803 Form A *6)	0,26	3	1	0800
	-	17,3	-	75	-	IP 65 (with Connector) *5)	-25 ... +60 Fluid: max. 80	Connector DIN EN 175301-803 Form A *6)	0,35	4	6	3803
	16,9	-	703	-	II3G II3D	Ex nA II T4 Ex tD A22 IP65 T 130°C	-20 ... +60	Connector DIN EN 175301-803 Form A indicated in delivery	0,27	3	1	3817
	-	17,3	-	75	II3G II3D	Ex nA II T4 Ex tD A22 IP65 T 120°C	-20 ... +50	Connector DIN EN 175301-803 Form A indicated in delivery	0,36	4	6	3819
	11,4	-	475	-	II2G, II2D	Ex emb II T4/T5 *2), *10) Ex tD A21 IP66 T130°C *2), *10)	-40 ... +50 T4 -40 ... +40 T5 -40 ... +50	M20 x 1,5 *6)	0,5	6	4	4280 *8)
	-	15,2	-	66	II2G II2D	Ex emb II T4/T5 *2), *10) Ex tD A21 IP66 T130°C *2), *10)	-40 ... +50 T4 -40 ... +40 T5 -40 ... +50	M20 x 1,5 *6)	0,5	6	7	4281 *8)
	11,4	-	475	-	II2G II2D	Ex dmb IIC T4/T5 Ex emb II T4/T5 Ex tD A21 IP66 T130°C *3)	-40 ... +50 T4 -40 ... +40 T5 -40 ... +50	1/2 x 14 NPT *6)	0,8	7	4	4680 *8)
	-	15,2	-	66	II2G II2D	Ex dmb IIC T4/T5 Ex emb II T4/T5 Ex tD A21 IP66 T130°C *3)	-40 ... +50 T4 -40 ... +40 T5 -40 ... +50	1/2 x 14 NPT *6)	0,8	7	7	4681 *8)
	11,4	-	475	-	II2G II2D	Ex dmb IIC T4/T5 Ex emb II T4/T5 Ex tD A21 IP66 T130°C *3)	-40 ... +50 T4 -40 ... +40 T5 -40 ... +50	M20 x 1,5 *6)	0,8	7	4	4682 *8)
	-	15,2	-	66	II2G II2D	Ex dmb IIC T4/T5 Ex emb II T4/T5 Ex tD A21 IP66 T130°C *3)	-40 ... +50 T4 -40 ... +40 T5 -40 ... +50	M20 x 1,5 *6)	0,8	7	7	4683 *8)
	13,6	-	567	-	-	XP/DIP, Div. 1 & 2 Cl. I, Gr. A-D Cl. II/III, Gr. E-G T3 (160°C) *4) NEMA 4, 4X, 6, 6P, 7, 9 *4)	-20 ... +60	Flying leads 450 mm long	0,5	8	1	3826
	-	15,7	-	68	-	XP/DIP, Div. 1 & 2 Cl. I, Gr. A-D Cl. II/III, Gr. E-G T3 (160°C) *4) NEMA 4, 4X, 6, 6P, 7, 9 *4)	-20 ... +60	Flying leads 450 mm long	0,5	8	5	3827

Standard voltages 24 V d.c., 230 V a.c., other voltages on request.

Design according to VDE 0580, EN 50014/50028. 100% duty cycle.

*2) EG-Type-Examination-Certificate KEMA 98 ATEX 4452 X

*3) EG-Type-Examination-Certificate PTB 02 ATEX 2085 X

*4) CSA-LR 57643-6, FM Approval

*5) Required connector: type 0570275

*6) Connector cable gland not supplied, see table »Accessories«

*7) IP-Protection class according to EN60529

*8) Suitable for outdoor installation

*10) IEC Ex Certificate of Conformity

Attention:

The protection class for coil series 46xx and 48xx is determined by the choice of cable gland.

Example: if an ATEX-certified cable gland is used that has Ex d type of protection, the solenoid will have the protection class

Ex dmb; if a cable gland with Ex e type of protection is used, the solenoid will have protection class Ex emb.

Accessories

Cable gland
Protection class
Ex e, Ex d (ATEX),
Nickel plated brass/
stainless steel



Connector

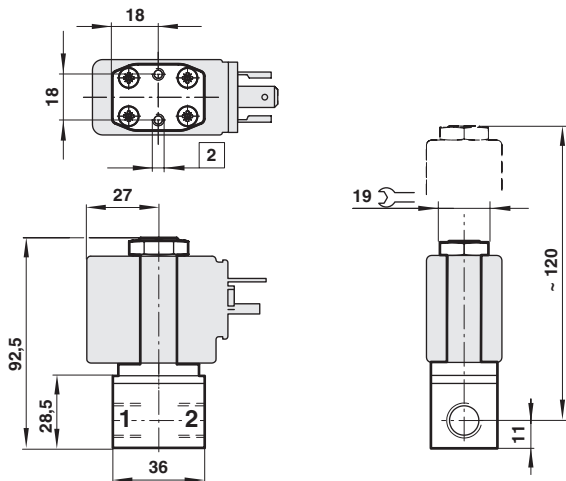


Page 9 Thread	Cable Ø	Material	Protection class (ATEX)	Model	Model
M 20x1,5	5,0...8,0 mm	Nickel plated brass	II2GD Ex e	0588819	0570275
M 20x1,5	10...14 mm	Nickel plated brass	II2GD Ex d	0588851	
1/2-14-NPT	7,5...11,9 mm	Nickel plated brass	II2GD Ex d, Ex e	0588925	
M 20x1,5	9,0...13 mm	Stainless steel 1.4571	II2GD Ex e	0589385	
M 20x1,5	7,0...12 mm	Stainless steel 1.4404	II2GD Ex d	0589395	
M 20x1,5	10...14 mm	Stainless steel 1.4404	II2GD Ex d	0589387	

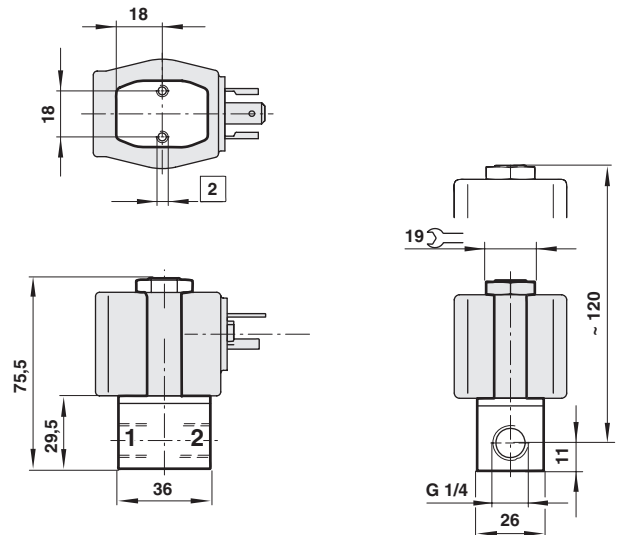
Dimensions

Valves

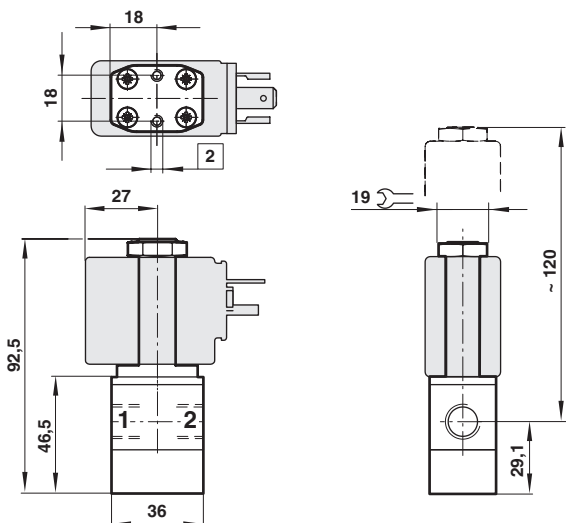
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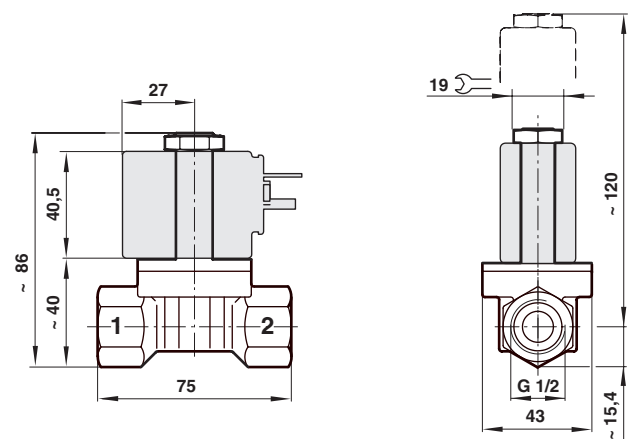
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③



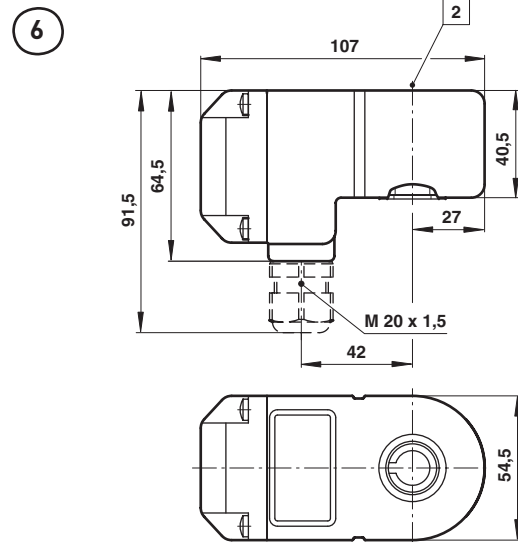
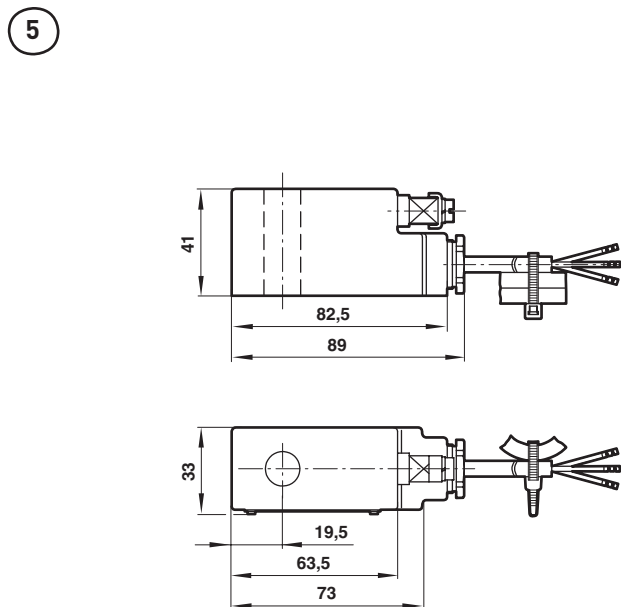
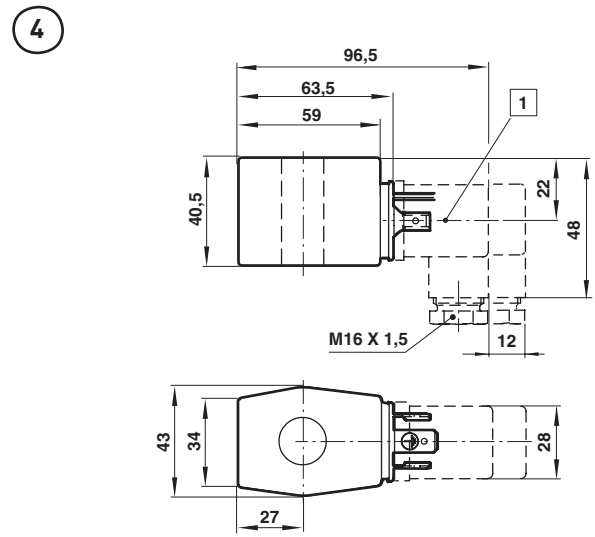
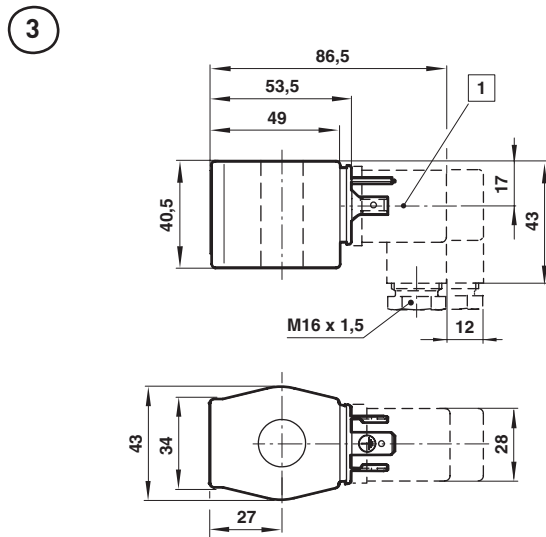
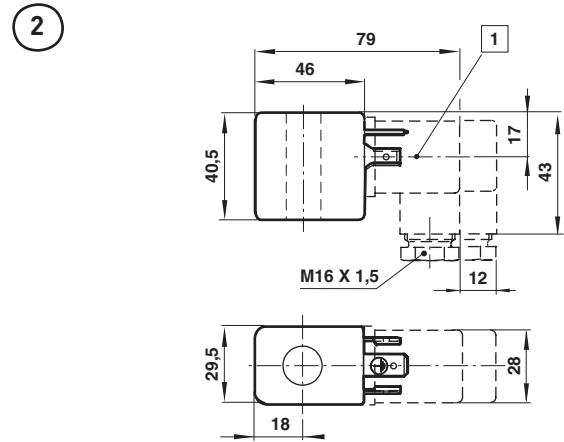
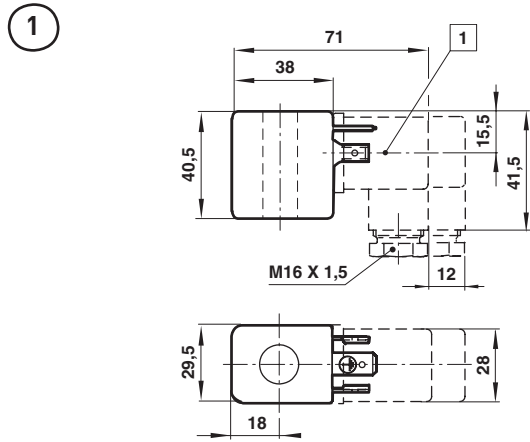
④



② M4 x 6 mm deep

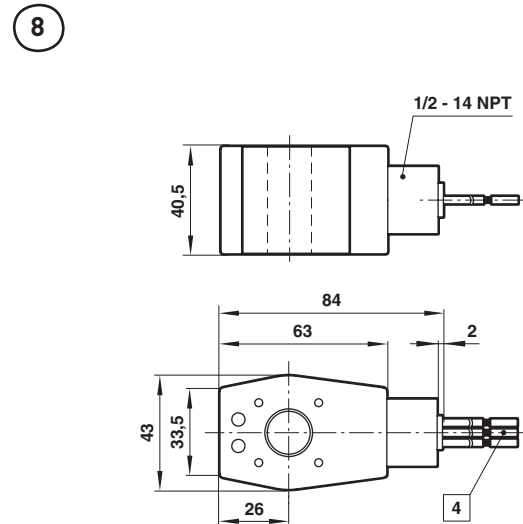
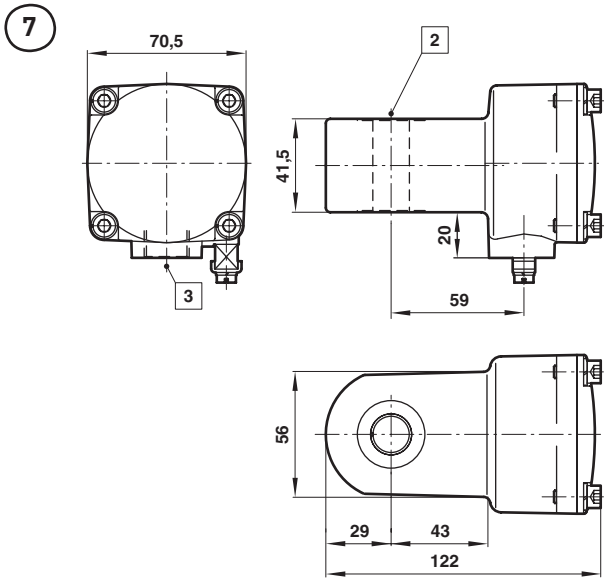
Dimensions

Solenoid operators



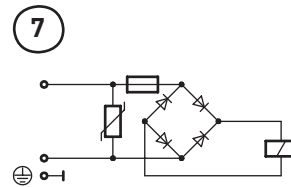
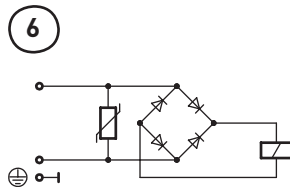
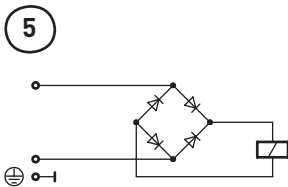
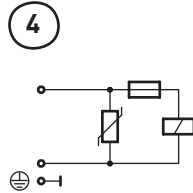
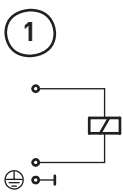
① Connector can be indexed by 4x90°

② Ø 16 or 13 (with spacer tube)

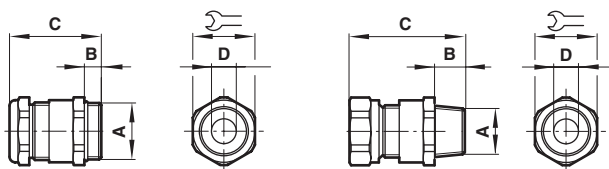


- 2 Ø 16 or 13 (with spacer tube)
- 3 M20 x 1,5 or 1/2 - 14 NPT
- 4 Flying leads AWG 18 (450 mm long)

Circuit diagrams



Cable gland



0588925 only

A	B	C	∅ D		Model
M20 x 1,5	9	36	5 ... 8	22	0588819
M20 x 1,5	6,5	27,5	9 ... 13	22	0589385
M20 x 1,5	14	39	10 ... 14	24	0588851
1/2-14 NPT	15	58	7,5 ... 11,9	24	0588925
M20 x 1,5	14	39	7 ... 12	24	0589395
M20 x 1,5	10	34	10 ... 14	24	0589387

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.