

3/2-, 5/2- and 5/3 directional valves
Actuation: electromagnetic
Indirectly controlled soft seal spool valves
G 1/4, 1/4 NPT, G 1/2, 1/2 NPT

For single and double operated actuators

Crossover-free switching, switch-over function guaranteed even with small cross section

Rest position in the event of power failure provided by mechanical return spring (monostable) design

Add-on manual override

Suitable for outdoor installation if equipped with corresponding solenoid

Minimal electrical power consumption – therefore many protection classes possible, e.g. EEx i

The solenoid valves are applicable in the protection class EEx me, EEx md, EEx m, EEx ia for zones 1, 2 (gases), 21, 22 (dusts), ATEX cat. II 2GD

Additional protection class (FM, CSA): XP, NI, AEx ia



Technical data

Medium:

Filtered, non-lubricate and dried compressed air, instrument air, nitrogen and or other non-flammable neutral, dry fluids

Operation:

Solenoid, indirectly controlled

Mounting position:

Optional; Impulse valves preferably horizontally

Nominal diameter:

ND 6 mm

Port size:

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

Operating pressure:

2,5 to 8 bar with internal air supply

0 to 8 bar with external air supply

Temperature:

Valve: -40 to +65°C

Solenoid: see solenoid table

(please consult our technical service for use below +2°C, if installed in the open protect all connections against the penetration of moisture!)

Materials:

Body: aluminium 3.0615 with surface treatment for rough environmental conditions condensate test with alternating temperatures in sulphuric environment, salt spray test with different sodium chloride solutions, tested in ammonia environment
 Seals: NBR (special perbunan)

Ordering information

5/2 directional control valve with spring return, Port size G 1/4, solenoid in protection class EEx me, 24 V DC

Type: **9710535.4200.024.00** internal air supply

Type: **9710535.4200.024.0Z** external air supply

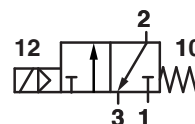
EEx e cable gland M 20x1,5

Type: **0588819**

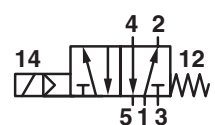
Accessories

See page 5

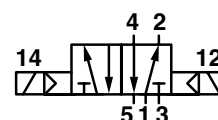
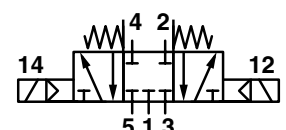
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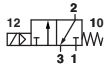
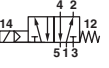
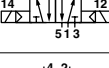
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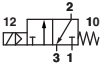
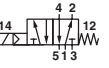
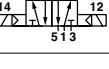
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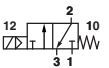
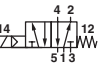
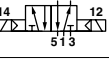
3/2-, 5/2- and 5/3 directional valves Aluminium anodized body

Symbol	Type	Port size	Function	Actuation	Operating pressure (bar)	Flow (l/min)	Weight (kg)	Dimensions No.
	9713535 *	G 1/4	3/2	Solenoid/Spring	2,5 ... 8 bar	1300	0,5	1
	9713545 *	1/4 NPT	3/2	Solenoid/Spring	2,5 ... 8 bar	1300	0,5	1
	9713555 *	G 1/2	3/2	Solenoid/Spring	2,5 ... 8 bar	2600	0,5	2
	9713565 *	1/2 NPT	3/2	Solenoid/Spring	2,5 ... 8 bar	2600	0,5	2
	9710535 *	G 1/4	5/2	Solenoid/Spring	2,5 ... 8 bar	1300	0,7	3
	9710545 *	1/4 NPT	5/2	Solenoid/Spring	2,5 ... 8 bar	1300	0,7	3
	9710555 *	G 1/2	5/2	Solenoid/Spring	2,5 ... 8 bar	2600	0,7	4
	9710565 *	1/2 NPT	5/2	Solenoid/Spring	2,5 ... 8 bar	2600	0,7	4
	9711535 *	G 1/4	5/2	Solenoid/Solenoid	2,5 ... 8 bar	1300	0,7	5
	9711545 *	1/4 NPT	5/2	Solenoid/Solenoid	2,5 ... 8 bar	1300	0,7	5
	9712535 *	G 1/4	5/3	Solenoid/Solenoid mid position APB	2,5 ... 8 bar	950	0,7	6
	9712545 *	1/4 NPT	5/3	Solenoid/Solenoid mid position APB	2,5 ... 8 bar	950	0,7	6

Brass body

Symbol	Type	Port size	Function	Actuation	Operating pressure (bar)	Flow (l/min)	Weight (kg)	Dimensions No.
	9713635 *	G 1/4	3/2	Solenoid/Spring	2,5 ... 8 bar	1300	1,0	1
	9713645 *	1/4 NPT	3/2	Solenoid/Spring	2,5 ... 8 bar	1300	1,0	1
	9713655 *	G 1/2	3/2	Solenoid/Spring	2,5 ... 8 bar	2600	1,0	2
	9713665 *	1/2 NPT	3/2	Solenoid/Spring	2,5 ... 8 bar	2600	1,0	2
	9710635 *	G 1/4	5/2	Solenoid/Spring	2,5 ... 8 bar	1300	1,7	3
	9710645 *	1/4 NPT	5/2	Solenoid/Spring	2,5 ... 8 bar	1300	1,7	3
	9710655 *	G 1/2	5/2	Solenoid/Spring	2,5 ... 8 bar	2600	1,7	4
	9710665 *	1/2 NPT	5/2	Solenoid/Spring	2,5 ... 8 bar	2600	1,7	4
	9711635 *	G 1/4	5/2	Solenoid/Solenoid	2,5 ... 8 bar	1300	1,7	5
	9711645 *	1/4 NPT	5/2	Solenoid/Solenoid	2,5 ... 8 bar	1300	1,7	5

Stainless steel body







Symbol	Type	Port size	Function	Actuation	Operating pressure (bar)	Flow (l/min)	Weight (kg)	Dimensions No.
	9713735 *	G 1/4	3/2	Solenoid/Spring	2,5 ... 8 bar	1300	1,1	1
	9713745 *	1/4 NPT	3/2	Solenoid/Spring	2,5 ... 8 bar	1300	1,1	1
	9713755 *	G 1/2	3/2	Solenoid/Spring	2,5 ... 8 bar	2600	1,1	2
	9713765 *	1/2 NPT	3/2	Solenoid/Spring	2,5 ... 8 bar	2600	1,1	2
	9710735 *	G 1/4	5/2	Solenoid/Spring	2,5 ... 8 bar	1300	1,8	3
	9710745 *	1/4 NPT	5/2	Solenoid/Spring	2,5 ... 8 bar	1300	1,8	3
	9710755 *	G 1/2	5/2	Solenoid/Spring	2,5 ... 8 bar	2600	1,8	4
	9710765 *	1/2 NPT	5/2	Solenoid/Spring	2,5 ... 8 bar	2600	1,8	4
	9711735 *	G 1/4	5/2	Solenoid/Solenoid	2,5 ... 8 bar	1300	1,8	5
	9711745 *	1/4 NPT	5/2	Solenoid/Solenoid	2,5 ... 8 bar	1300	1,8	5

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

Valve function: APB = All Ports Blocked

Accessories on page 5

Actuation solenoids

	Type	Power consumption		Rated current at		Protection class	Temp. range Ambient/Fluid °C	Electroport size	Weight (kg)	Dimensions No.	Circuit diagram No.
		24V DC (W)	230V AC (VA) *5)	24V DC (mA)	230V AC (mA)						
	0763 *7)	1,9	2,1	78	-	IP00 w/o connector *5) IP65 with connector *5)	-25 ... +60	DIN EN 175 301-803 Form A	0,3	14	1
	0298	3,2	-	135	-	EEx m II T4 *1) IP66 T110°C	-20 ... +70	3 m cable *5)	0,4	15	4
	0299	-	3,5	-	15	EEx m II T4 *1) IP66 T110°C	-20 ... +70	3 m cable	0,4	15	7
	4200 *8)	0,7	-	33	-	EEx me II T5/T6 *2) IP66 T130°C	-40 ... +80 (T5) -40 ... +70 (T6)	M20 X 1,5 *6)	0,85	16	4
	4201 *8)	-	1,3	-	26	EEx me II T4/T6 *2) IP66 T130°C	-40 ... +80 (T4) -40 ... +55 (T6)	M20 X 1,5 *6)	0,85	16	7
	4600 *8)	0,7	-	33	-	EEx me II T5/T6 *3) IP66 T130°C	-40 ... +80 (T5) -40 ... +70 (T6)	1/2 NPT *6) M20 X 1,5 *6)	0,85	17	4
	4602 *8)	0,7	-	33	-	EEx me II T5/T6 *3) IP66 T130°C	-40 ... +80 (T5) -40 ... +70 (T6)	1/2 NPT *6) M20 X 1,5 *6)	0,85	17	7
	4601 *8)	-	1,3	-	26	EEx md II T5/T6 *3) IP66 T130°C	-40 ... +80 (T5) -40 ... +70 (T6)	1/2 NPT *6) M20 X 1,5 *6)	0,85	17	7
	4603 *8)	-	1,3	-	26	IP66 T130°C	-40 ... +80 (T5) -40 ... +70 (T6)	M20 X 1,5 *6)	0,85	17	7
Stainless steel	4802	0,8	-	33	-	Ex mb d IIC T4/T6 or Ex mb e II T5/T6 Ex mbD 21 tDA21 IP66 T100°C	Cat. II 2G (gas) -40 ... +80 (T4) -40 ... +70 (T6)		1,2	19	12
	4803	-	1,3	-	6		Cat. II 2D (dust)		1,2	19	7
	3720	1,4	-	59	-	XP (NEMA) *4) 4, 4X, 6, 6P, 7, 9 3	-20 ... +60	Flying leads 450 mm long	0,4	18	1

Standard voltages 24V DC, 230V AC. other voltages on request

Design acc. to VDE 0580, EN 50014/50028.100% duty cycle.

*1) Categorie II 2 GD, EC-Type-Examination-Certificate KEMA 02 ATEX 1347X

*2) Categorie II 2 GD, EC-Type-Examination-Certificate KEMA 98 ATEX 4452 X

*3) Categorie II 2 GD, EC-Type-Examination-Certificate PTB 02 ATEX 2085 X

*4) CSA-LR 57643-6, FM approved, for hazardous locations: Div. 1 and 2, Class I, II, III


*5) Required connector for DC: type 0570275. Valves can be operated with DC only for 230V AC application please use 200V DC coil together with rectifier plug 0663305

*6) Cable gland is not indicated in delivery

*7) IP65 according to DIN 40050/IEC 529 and DIN EN 600068-2-38

*8) This solenoid has a fuse with an appropriate rating.

Solenoid actuators for intrinsically-safe circuits, protection class EEx ia IIC T5/T6, cat.II G, II 2 D, IP66, T90°C, EC type examin. certificate KEMA 03 ATEX 1051X

	Type	Nominal resist. RN coil (Ω)	Min. required switching current (mA)	Resistance R _{w 60} coil * (Ω)	Required voltage at terminal (R _{w 60})	Temperature range Ambient/fluid		Weight (kg)	Dimensions No.	Circuit diagram No.
						T5	T6			
	2050	200	33	240	8	-40...+80°C	-40...+70°C	0,85	16	10
	2051	391	24	470	11	-40...+80°C	-40...+70°C	0,85	16	10
	2052	736	17	880	15	-40...+80°C	-40...+70°C	0,85	16	10
	2053	1220	13	1460	19	-40...+80°C	-40...+70°C	0,85	16	10


Cable gland is included in delivery

When selecting an intrinsically safe power supply, the permissible maximum values according to the certificate should be taken in account. On the other hand, the low effective inductivity and capacity can be ignored.

Solenoid actuators with FM-approval

Intrinsically safe: IS/I, II, III/1/ABCDEF/G/ T6 Ta = 65 °C; I/O AEx ia IIC/ T6 Ta = 65 °C - 0588672/B; Entity

Nonincendive: NI/I/2/ABCD/ T6 Ta = 65 °C; S/II,III/2/FG/T6 Ta = 65 °C; NEMA Type 4

	Type	Nominal resist. RN coil (Ω)	Min. required switching current (mA)	Resistance R _{w 60} coil * (Ω)	Required voltage at terminal (R _{w 60})	Temperature range Ambient/fluid		Weight (kg)	Dimensions No.	Circuit diagram No.
						T5	T6			
	2040	124	43	150	6,4	-40 ... +65°C		0,83	19	10
	2041	159	38	193	7,3	-40 ... +65°C		0,83	19	10
	2042	198	34	240	8,2	-40 ... +65°C		0,83	19	10
	2043	248	30	301	9,0	-40 ... +65°C		0,83	19	10
	2044	306	27	371	10,0	-40 ... +65°C		0,83	19	10
	2045	378	25	458	11,5	-40 ... +65°C		0,83	19	10
	2046	467	23	566	13,0	-40 ... +65°C		0,83	19	10
	2047	566	21	686	14,4	-40 ... +65°C		0,83	19	10
	2048	692	19	839	15,9	-40 ... +65°C		0,83	19	10

3/2-, 5/2- and 5/3-directional control valves 50 mW/5 mW in protection class EEx ia IIC T4/6 Aluminium anodized body

Symbol	Type	Power	Port size	Function	Actuation	Operating pressure (bar)	Flow (l/min)	Weight (kg)	Dimensions No.
	9713539 2086 005 00	23,2 mW	G 1/4	3/2	Solenoid/Spring	2,5 ... 8 bar	1300	0,5	7
	9713549 2086 005 00	23,2 mW	1/4 NPT	3/2	Solenoid/Spring	2,5 ... 8 bar	1300	0,5	7
	9713559 2086 005 00	23,2 mW	G 1/2	3/2	Solenoid/Spring	2,5 ... 8 bar	2600	0,5	8
	9713569 2086 005 00	23,2 mW	1/2 NPT	3/2	Solenoid/Spring	2,5 ... 8 bar	2600	0,5	8
	9710539 2086 005 00	23,2 mW	G 1/4	5/2	Solenoid/Spring	2,5 ... 8 bar	1300	0,7	9
	9710549 2086 005 00	23,2 mW	1/4 NPT	5/2	Solenoid/Spring	2,5 ... 8 bar	1300	0,7	9
	9710559 2086 005 00	23,2 mW	G 1/2	5/2	Solenoid/Spring	2,5 ... 8 bar	2600	0,7	10
	9710569 2086 005 00	23,2 mW	1/2 NPT	5/2	Solenoid/Spring	2,5 ... 8 bar	2600	0,7	10
	9711539 2086 005 00	23,2 mW	G 1/4	5/2	Solenoid/Solenoid	2,5 ... 8 bar	1300	0,7	11
	9711549 2086 005 00	23,2 mW	1/4 NPT	5/2	Solenoid/Solenoid	2,5 ... 8 bar	1300	0,7	11
	9712539 2086 005 00	23,2 mW	G 1/4	5/3	Solenoid/Solenoid mid position APB	2,5 ... 8 bar	950	0,7	12
	9712549 2086 005 00	23,2 mW	1/4 NPT	5/3	Solenoid/Solenoid mid position APB	2,5 ... 8 bar	950	0,7	12

Brass body

Symbol	Type	Power	Port size	Function	Actuation	Operating pressure (bar)	Flow (l/min)	Weight (kg)	Dimensions No.
	9713639 2086 005 00	23,2 mW	G 1/4	3/2	Solenoid/Spring	2,5 ... 8 bar	1300	1,0	7
	9713649 2086 005 00	23,2 mW	1/4 NPT	3/2	Solenoid/Spring	2,5 ... 8 bar	1300	1,0	7
	9713659 2086 005 00	23,2 mW	G 1/2	3/2	Solenoid/Spring	2,5 ... 8 bar	2600	1,0	8
	9713669 2086 005 00	23,2 mW	1/2 NPT	3/2	Solenoid/Spring	2,5 ... 8 bar	2600	1,0	8
	9710639 2086 005 00	23,2 mW	G 1/4	5/2	Solenoid/Spring	2,5 ... 8 bar	1300	1,7	9
	9710649 2086 005 00	23,2 mW	1/4 NPT	5/2	Solenoid/Spring	2,5 ... 8 bar	1300	1,7	9
	9710659 2086 005 00	23,2 mW	G 1/2	5/2	Solenoid/Spring	2,5 ... 8 bar	2600	1,7	10
	9710669 2086 005 00	23,2 mW	1/2 NPT	5/2	Solenoid/Spring	2,5 ... 8 bar	2600	1,7	10
	9711639 2086 005 00	23,2 mW	G 1/4	5/2	Solenoid/Solenoid	2,5 ... 8 bar	1300	1,7	11
	9711649 2086 005 00	23,2 mW	1/4 NPT	5/2	Solenoid/Solenoid	2,5 ... 8 bar	1300	1,7	11

Stainless steel body

Symbol	Type	Power	Port size	Function	Actuation	Operating pressure (bar)	Flow (l/min)	Weight (kg)	Dimensions No.
	9713739 2086 005 00	23,2 mW	G 1/4	3/2	Solenoid/Spring	2,5 ... 8 bar	1300	1,1	7
	9713749 2086 005 00	23,2 mW	1/4 NPT	3/2	Solenoid/Spring	2,5 ... 8 bar	1300	1,1	7
	9713759 2086 005 00	23,2 mW	G 1/2	3/2	Solenoid/Spring	2,5 ... 8 bar	2600	1,1	8
	9713769 2086 005 00	23,2 mW	1/2 NPT	3/2	Solenoid/Spring	2,5 ... 8 bar	2600	1,1	8
	9710739 2086 005 00	23,2 mW	G 1/4	5/2	Solenoid/Spring	2,5 ... 8 bar	1300	1,8	9
	9710749 2086 005 00	23,2 mW	1/4 NPT	5/2	Solenoid/Spring	2,5 ... 8 bar	1300	1,8	9
	9710759 2086 005 00	23,2 mW	G 1/2	5/2	Solenoid/Spring	2,5 ... 8 bar	2600	1,8	10
	9710769 2086 005 00	23,2 mW	1/2 NPT	5/2	Solenoid/Spring	2,5 ... 8 bar	2600	1,8	10
	9711739 2086 005 00	23,2 mW	G 1/4	5/2	Solenoid/Solenoid	2,5 ... 8 bar	1300	1,8	11
	9711749 2086 005 00	23,2 mW	1/4 NPT	5/2	Solenoid/Solenoid	2,5 ... 8 bar	1300	1,8	11

code for electrical connection: standard: 005 = M 16 x 1,5

Ordering examples






9710539.	2085.	005.	00
valve	pilot 6,3 mW	electr. connection	internal air supply
		005 M16 x 1,5 cable gland	OZ external air supply

Solenoid operators protection class EEx ia II C T4/T6

	Type	Power P (+20°C)	Switch-on voltage U _{on} (+20°C)	Switch-on voltage U _{on} (+80°C)	Switch-off voltage U _{off} (+20°C)	Switch-off voltage U _{off} (-25°C)	Rated current I _{ein}	Resistance coil R (+20°C)	max. values EEx i			Type of protection *4)	Ambient temperature	Circuit diagram No.			
									U _i	I _i	P _i						
	2085	6,3 mW	≥ 4,3 V	≥ 5,2 V	≤ 1,44 V	≤ 1,2 V	≥ 1,45 mA	2800 Ω	25 V	150 mA	250 mW	EEx ia IIC T4	-40 bis +80°C	11			
									27 V	125 mA	250 mW						
									28 V	115 mA	250 mW				EEx ia IIC T6	-40 bis +60°C	11
									30 V	100 mA	250 mW						
32 V	85 mA	250 mW															

*4) Categorie II2G, EC-Examination certificate no. PTB 06 ATEX 2001U
Air consumption: home position ≤ 60 l/h, operating position ≤ 15 l/h

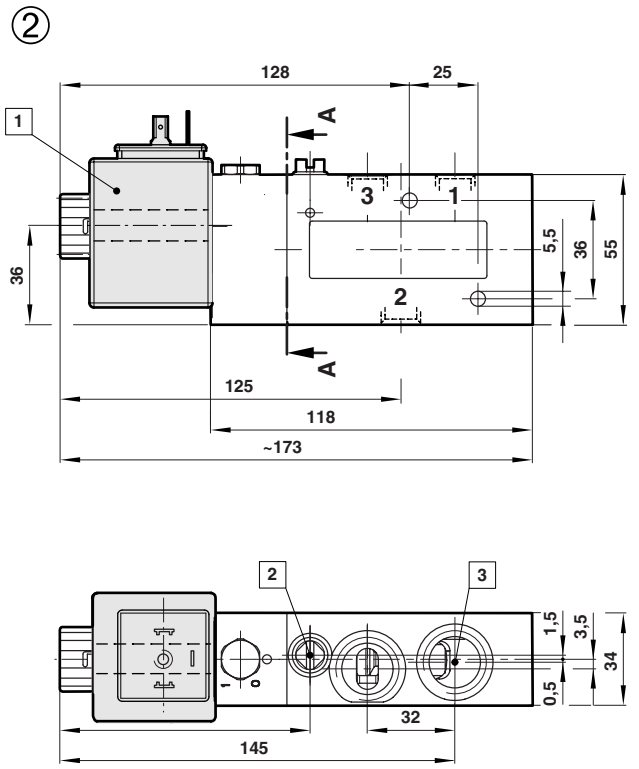
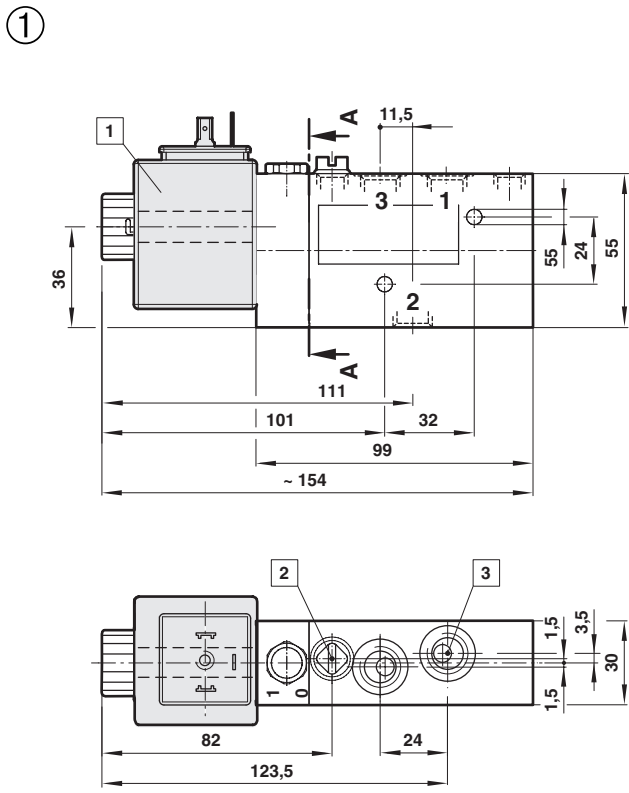
Accessories

Manual override	Silencer	Flow regulator for outdoor use with non-return diaphragm	Cable gland Protection class EEx e, EEx d (ATEX), Ms nickel plated brass	Connectors
				
0553886 (without detent) *2)	0014600 (G1/4) *1)	0611746 (G1/4) *3)	EEx e 0588819 (for solenoid 42xx / 46xx M20 x 1,5)	0570275
0553887 (with detent) *2)	0014800 (G1/2) *1)		EEx d 0588851 (for solenoid 46xx M20 x 1,5)	0663303 (with rectifier)
			EEx e, EEx d (ATEX) 0588925 (for solenoid 46xx 1/2-14 NPT)	
			EEx e, EEx d (ATEX) 0588925 (für Magnet 46xx 1/2-14 NPT)	
			II 2 G/D EEx d IIC 0589387 (für Magnet 48xx M20x1,5; Ø 10...14 mm)	
			II 2 G/D EEx e II 0589385 (für Magnet 48xx M20x1,5; Ø 9...13 mm)	

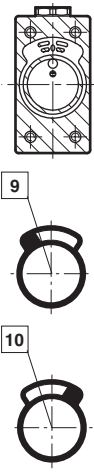
For detailed information about connectors see page : N/UK 7.7.002
 *1) For indoors use

*2) Useable only with the valves on page 2
 *3) Throttle exhaust port can be protected from penetration of liquids, dirt etc.

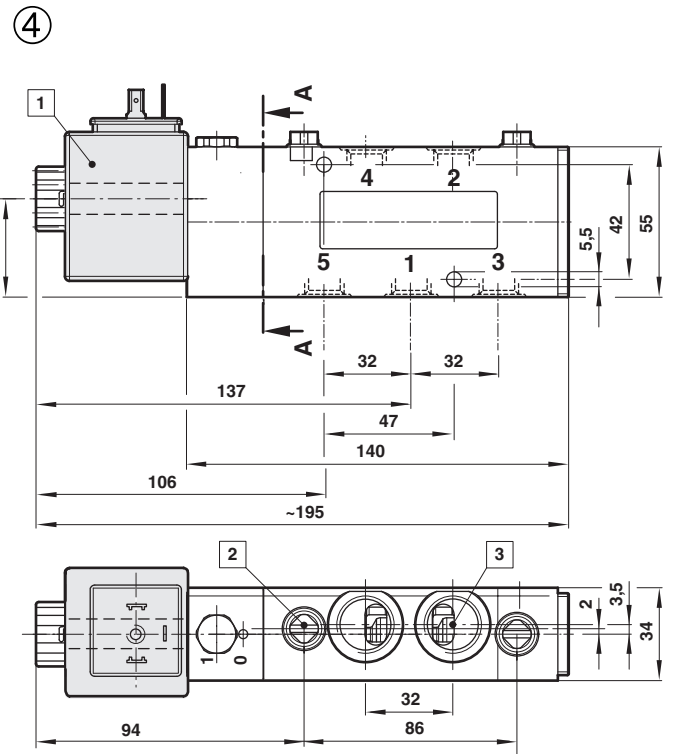
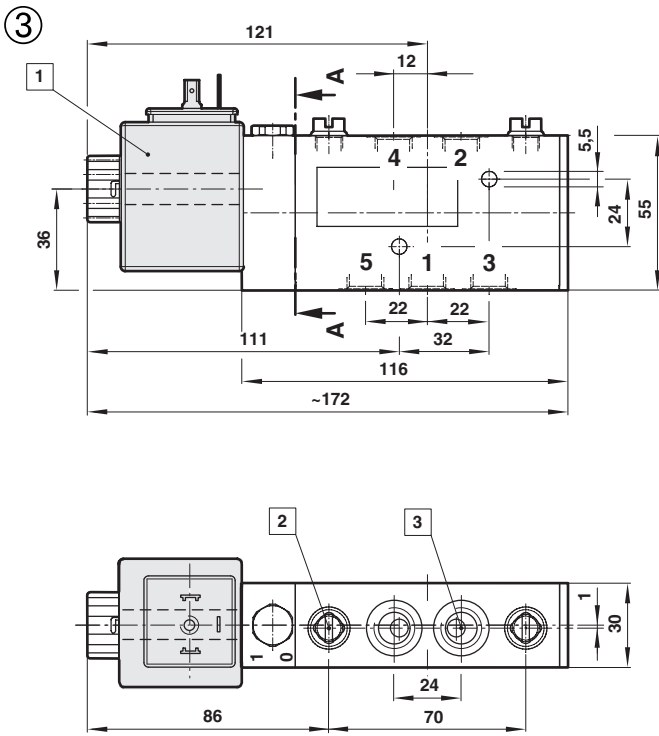
Basic dimensions valves



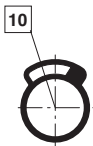
A - A



- 1** Solenoid dimensions see page 10
- 2** External control pressure connection G1/8
- 3** Working port G1/4, G1/2 or 1/4 NPT, 1/2 NPT
- 9** Position of gasket internal pilot air
- 10** Position of gasket external pilot air

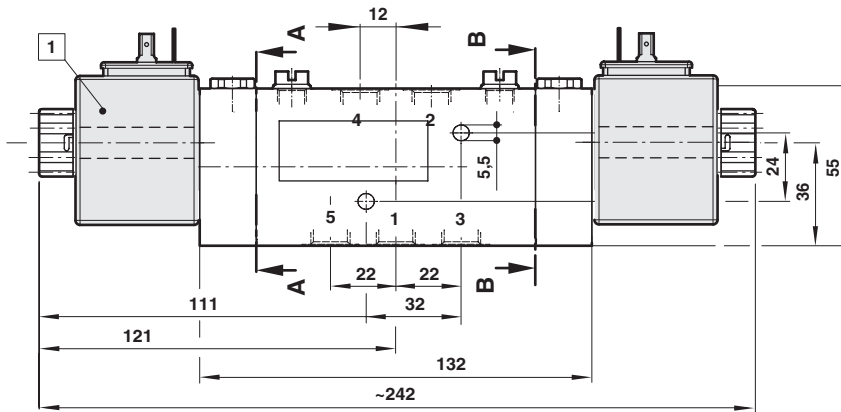


A - A

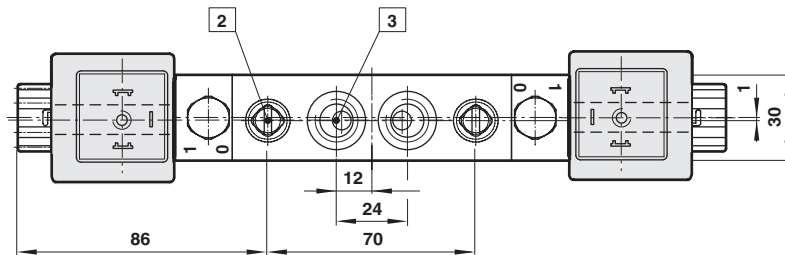
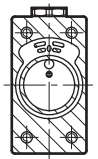


1	Solenoid dimensions see page 10
2	External control pressure connection G1/8
3	Working port G1/4, G1/2 or 1/4 NPT, 1/2 NPT
9	Position of gasket internal pilot air
10	Position of gasket external pilot air

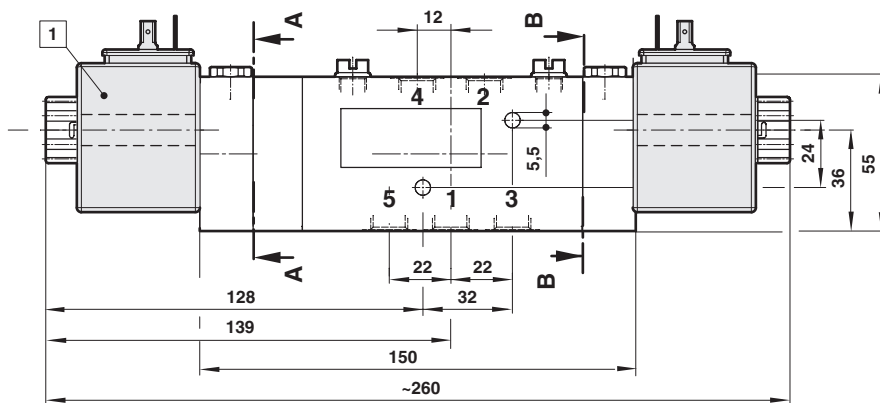
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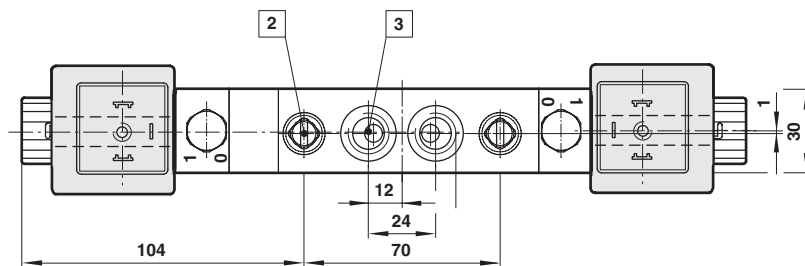
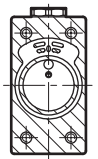
A - A



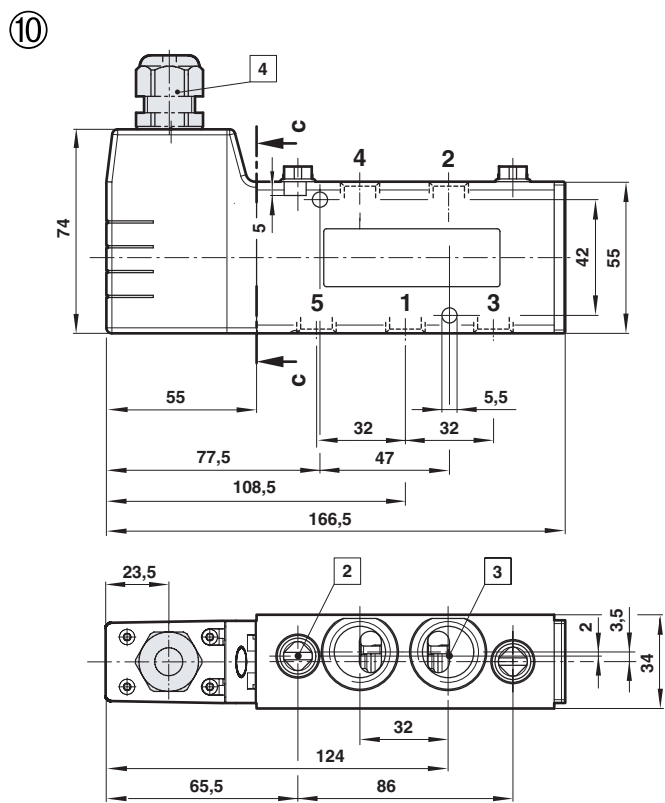
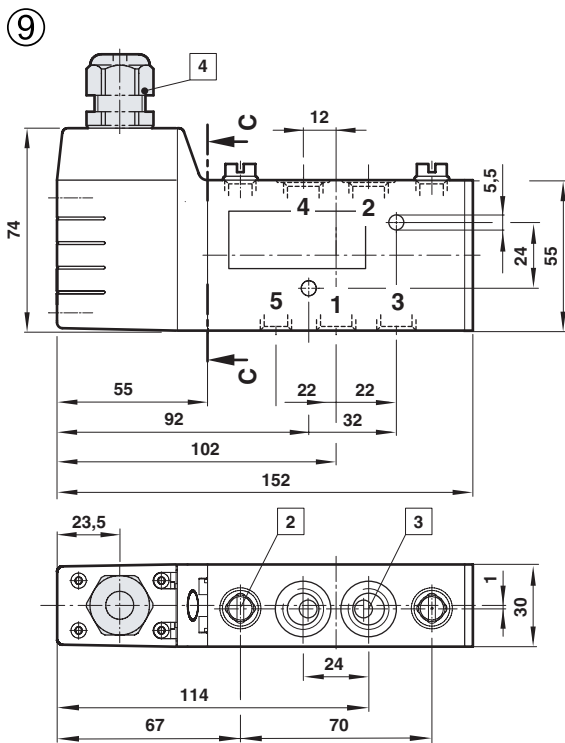
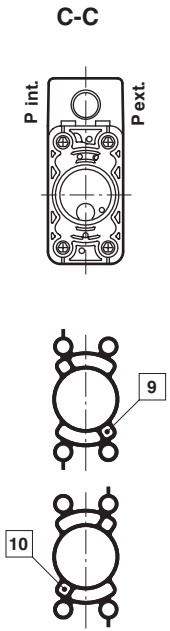
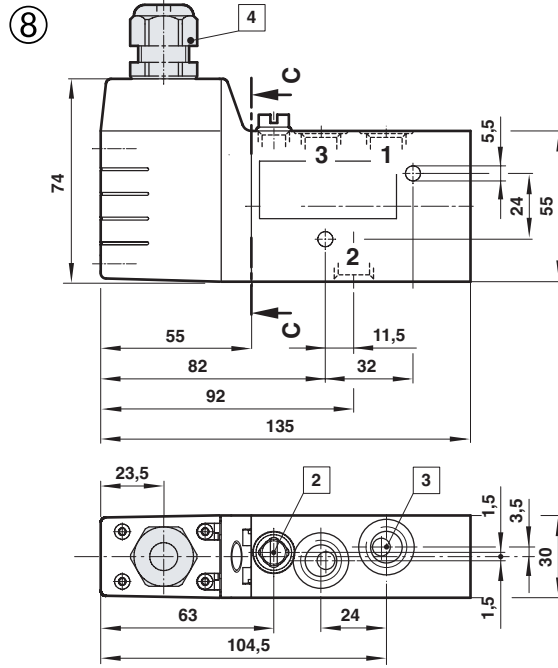
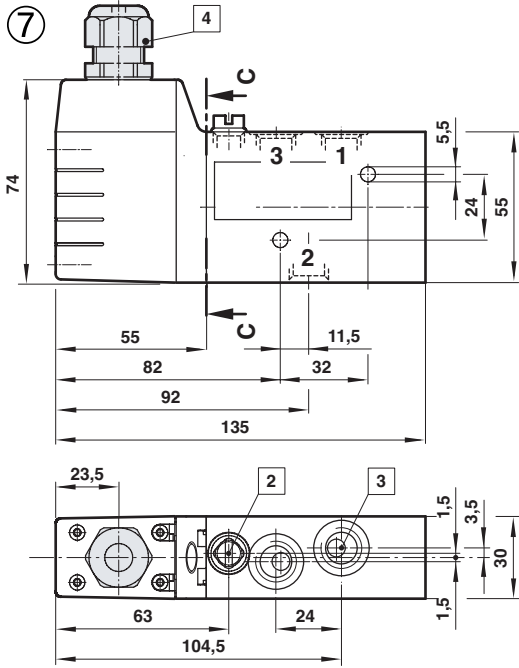
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B - B

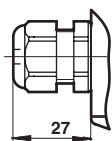


1	Solenoid dimensions see page 10
2	External control pressure connection G1/8
3	Working port G1/4, G1/2 or 1/4 NPT, 1/2 NPT
9	Position of gasket internal pilot air
10	Position of gasket external pilot air



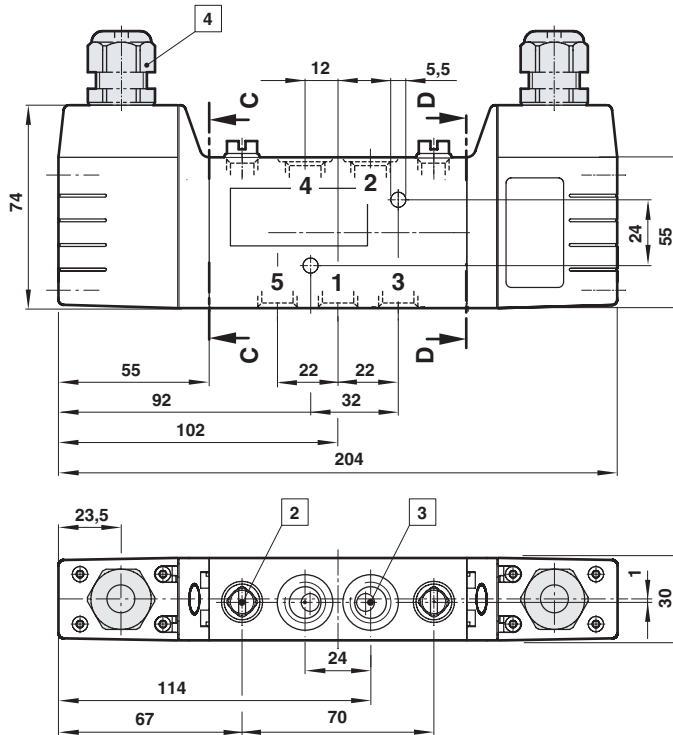
Electrical connection

005

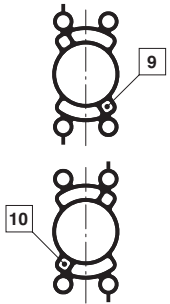
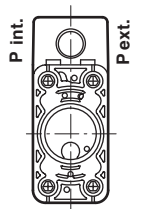


2	External control pressure connection G1/8
3	Working port G1/4, G1/2 or 1/4 NPT, 1/2 NPT
4	Electrical connection, M16x1,5
9	Position of gasket internal pilot air
10	Position of gasket external pilot air

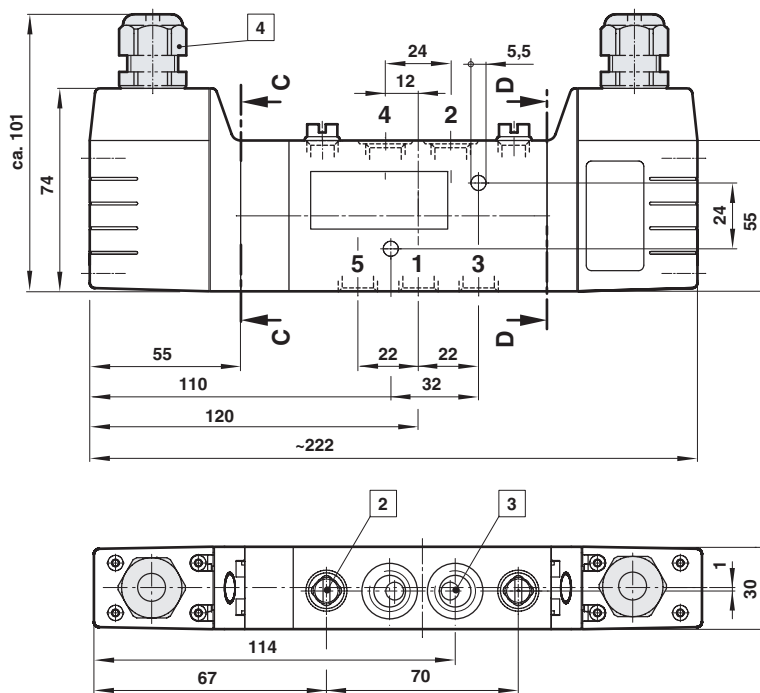
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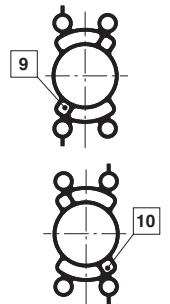
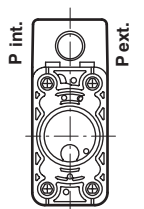
C-C



12

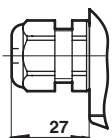


D-D

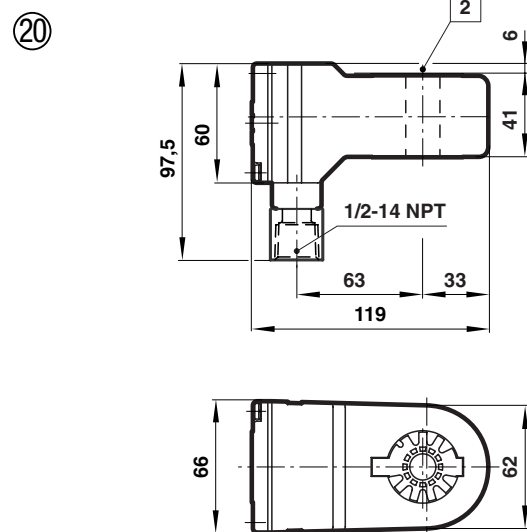
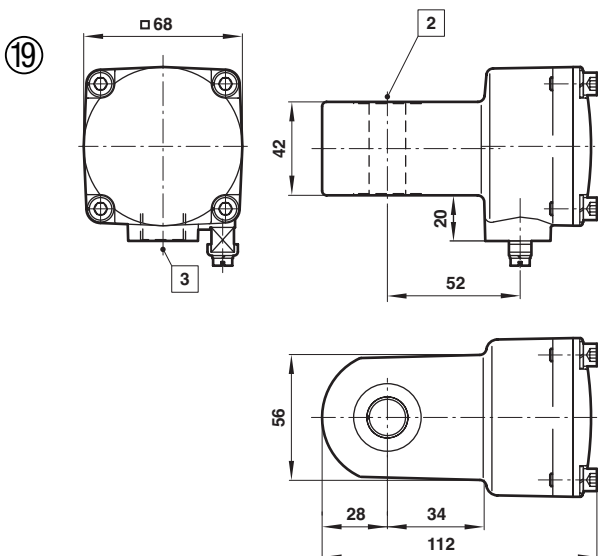
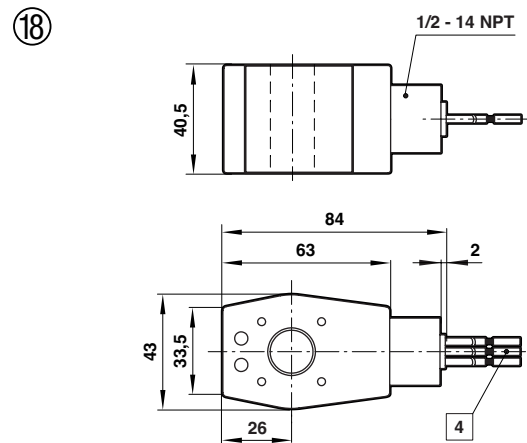
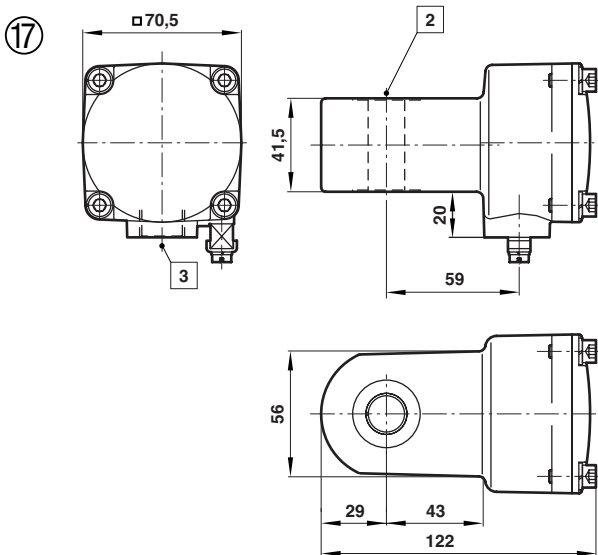
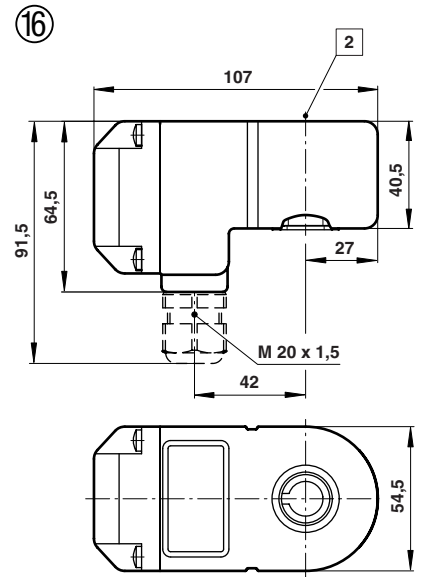
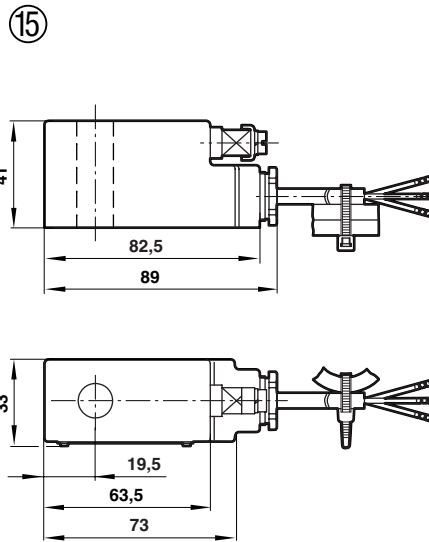
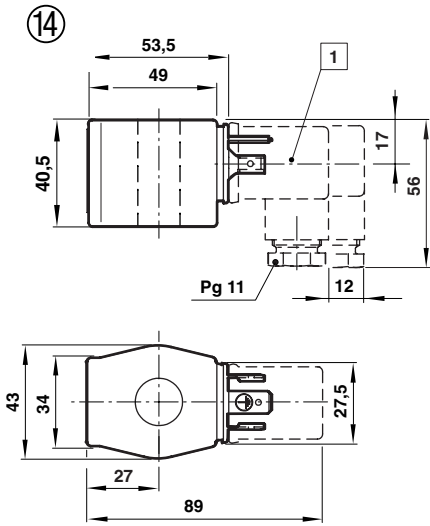


Electrical connection

005



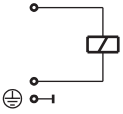
2	External control pressure connection G1/8
3	Working port G1/4, G1/2 or 1/4 NPT, 1/2 NPT
4	Electrical connection, M16x1,5
9	Position of gasket internal pilot air
10	Position of gasket external pilot air



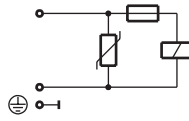
- 1 Connector can be indexed by 4 x 90°
- 2 Ø 16 or 13 (with spacer tube)
- 3 M20 x 1,5 or 1/2 - 14 NPT
- 4 Flying leads AWG 18 (450 mm long)

Circuit diagrams

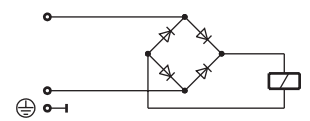
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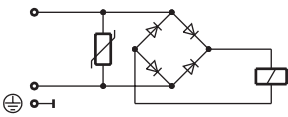
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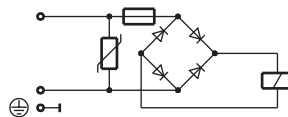
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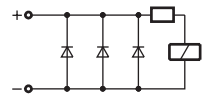
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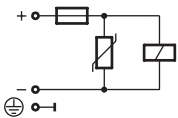
⑦



⑪



⑫



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.