24011
3/2 way direct solenoid operated valves
G 1/4, 1/4 NPT or flanged with NAMUR interface

TÜV-approval based on IEC 61 508

Valves for safety systems up to SIL 4

Standard NAMUR type
- **redundancy: 1 of 2, 2 of 3 for P in flange interface only**
- **add-on manual override or inductive limit switches**

Valve switches at power failure into starting position (mechanical spring return)

Suited for outdoor use under critical environment conditions (see solenoid list)

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





TÜV
DIN EN 61508
IEC 61508
bis SIL 4

Technical features

Medium:
Compressed air, filtered, non-lubricated and dry
Other gase and liquid fluids on request
Operation:
Direct solenoid operated poppet valves
Flow direction:
Optional
Mounting position:
Any, but preferably with solenoid vertical

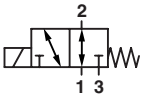
Flow:
Gaseous fluids: 340 l/min
Liquid fluids: Kv 0,34
Port size:
G 1/4, 1/4 NPT or flanged with NAMUR Interface
Orifice:
DN 5
Operating pressure:
0 ... 10 bar

Temperature valve:
Fluid: -25* ... +80°C (NBR)
-10* ... +120°C (FKM) –
Water ... +95°C
-40* ... +60°C (VMQ)
Air supply must be dry enough to avoid ice formation at temperatures below 2°C.
Temperature solenoid:
See table

Materials:
Housing: stainless steel 1.4404/316, brass, hard anodized aluminium
Seal: FKM, NBR (perbunan), VMQ (silicon)
Inner parts: stainless steel, brass

Technical data

With threaded connection, brass valves

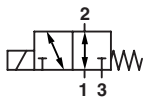
Symbol	Solenoid group	Port size	Operating pressure* (bar)	Material Seat seal	Manual override	Weight (kg)	Test certificate EC 61 508 *2)	Dimension No.	Model *1)
	A + B	G 1/4	0 ... 10	NBR		0,65	X	1	2401103
	A + B	G 1/4	0 ... 10	NBR	push only	0,70		1	2401107
	A + B	G 1/4	0 ... 10	NBR	turn and lock	0,70		1	2401119
	A + B	G 1/4	0 ... 10	NBR		0,65	X	1	2401149
	A + B	G 1/4	0 ... 10	FKM		0,65	X	1	2401126
	A + B	G 1/4	0 ... 10	Silicon *3)		0,65	X	1	2401153
	A + B	G 1/4	0 ... 10	Silicon *3)	semi-automatic	0,70		1	2401154
	A + B	1/4 NPT	0 ... 10	NBR		0,65	X	1	2401138
	A + B	1/4 NPT	0 ... 10	NBR	push only	0,70		1	2401148
	A + B	1/4 NPT	0 ... 10	NBR	turn and lock	0,70		1	2401136
	A + B	1/4 NPT	0 ... 10	NBR	semi-automatic	0,70		1	2401140
	A + B	1/4 NPT	0 ... 10	FKM		0,65	X	1	2401131
	A + B	1/4 NPT	0 ... 10	Silicon *3)		0,65	X	1	2401106
	A + B	1/4 NPT	0 ... 10	Silicon *3)	semi-automatic	0,70		1	1025226

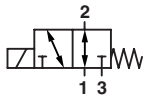
*1) When ordering please indicate solenoid, voltage and current type (frequency).
*2) Approval is not included in delivery, part No. 0695241
* Viscosity for gaseous or liquid fluids up to 40 mm2/s
- Particulary for valves with TÜV approval and attachment in plants based on safety standards DIN V 19250, IEC 61511, taking into account to the operating and maintance instructions document 7503444.
- The responsibility for the maintance and repair of the solenoid valves lies with the users or the supervisory authority for these process systems.

*3) For ambient temperature down to -40°C

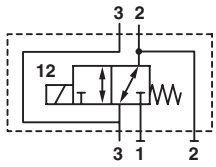
Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document.

Housing: stainless steel (1.4404) for aggressive environment

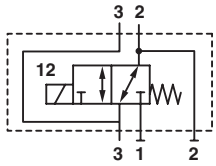
Symbol	Solenoid group	Port size	Operating pressure* (bar)	Material Seat seal	Manual override	Weight (kg)	Test certificate EC 61 508 *2)	Dimension No.	Model *1)
	A + B	G 1/4	0 ... 10	NBR	–	0,65	X	1	2401186
	A + B	1/4 NPT	0 ... 10	NBR	–	0,65	X	1	2401112

Symbol	Solenoid group	Port size	Operating pressure* (bar)	Material Seat seal	Manual override	Weight (kg)	Test certificate EC 61 508 *2)	Dimension No.	Model *1)
	A	G 1/4	0 ... 10	FKM		0,70		1	2401127
	A	G 1/4	0 ... 10	FKM	push only	0,70		1	2401170
	A	G 1/4	0 ... 10	FKM	turn and lock	0,70		1	2401139
	A	G 1/4	0 ... 10	Silikon *3)		0,65		1	2401155
	A	1/4 NPT	0 ... 10	FKM		0,65		1	2401147
	A	1/4 NPT	0 ... 10	FKM	semi-automatic	0,70		1	2401146
	A	1/4 NPT	0 ... 10	Silikon *3)		0,65		1	2401168

Housing: aluminium hard anodized, flanged with NAMUR Interface

Symbol	Solenoid group	Port size	Operating pressure* (bar)	Material Seat seal	Manual override	Variants	Weight (kg)	Test certificate EC 61 508 *2)	Dimension No.	Model *1)
	A + B	G 1/4	0 ... 10	NBR	add-on		0,55	X	2	2401191
	A + B	G 1/4	0 ... 10	NBR	add-on	with limit switch	0,70		2	1025333
	A + B	1/4 NPT	0 ... 10	NBR	add-on		0,55	X	2	1025254
	A + B	G 1/4	0 ... 10	Silicon *3)	add-on		0,55	X	2	2401133
	A + B	G 1/4	0 ... 10	NBR	add-on	P in flange interface *4)	0,55	X	3	2401109

Housing: stainless steel (1.4404) for aggressive environment, flanged with NAMUR Interface

Symbol	Solenoid group	Port size	Operating pressure* (bar)	Material Seat seal	Manual override	Variants	Weight (kg)	Test certificate EC 61 508 *2)	Dimension No.	Model *1)
	A + B	G 1/4	0 ... 10	NBR	Add-on		1,00	X	2	2401196
	A	G 1/4	0 ... 10	Silikon *3)	Add-on		1,00		2	2401142
	A + B	G 1/4	0 ... 10	NBR	Add-on	P in flange interface *4)	1,00	X	3	1025212
	A + B	1/4 NPT	0 ... 10	NBR	Add-on	P in flange interface *4)	1,00	X	3	1025328

* Viscosity for gaseous or liquid fluids up to 40 mm^2/s.
*1) When ordering please indicate solenoid, voltage and current type (frequency).
*2) Approval is not included in delivery, part No. 0695241
*3) For ambient temperature down to -40°C
*4) Acc. to VDI/VDE 3845 port P in flange for attachment of positioners
or to interlinking plate (see data sheet N/en 5.8.300)

- Approval S 137/01, SIL 4 for low demand mode, SIL 3 for high demand mode, Approval S 83/96, AK 7 (request from manufactor)
- Particulary for valves with TÜV approval and attachment in plants based on safety standards DIN V 19250, IEC 61511, taking into account to the operating and maintance instructions document 7503444.
- The responsibility for the maintance and repair of the solenoid valves lies with the users or the supervisory authority for these process systems.

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document.

Solenoid operators

Solenoids group A

	Power consumption 24 V d.c. (W)	230 V a.c. (VA)	Rated current 24 V d.c. (m A)	230 V a.c. (m A)	Ex-Protection (ATEX-Category)	Protection class *7)	Temperature Ambient/ Fluid (°C)	Electrical connection	Weight (kg)	Dimension 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
	8,9	-	369	-		IP65	-30...+90 Fluid: 110	Terminals, cable gland Pg 13,5	0,5	9	2	4120
	-	10,0	-	43		IP65	-30...+90 Fluid: 110	Terminals, cable gland Pg 13,5	0,5	9	6	4121
	8,9		369	-		IP67	-30...+90 Fluid: 110	3 m cable, encapsulated in EP resin	0,7	9	2	4122
	-	10,0	-	43		IP67	-30...+90 Fluid: 110	3 m cable, encapsulated in EP resin	0,7	9	6	4123
	8,9	-	369	-	II2G, II2D	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)	0,500	6	4	4270 *8)
	-	10,0	-	43	II2G, II2D	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)	0,500	6	7	4271 *8)
	8,9	-	369	-	II2G II2D	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)	0,800	7	4	4670 *8)
	-	10,0	-	43	II2G II2D	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)	0,800	7	7	4671 *8)
	8,9	-	369	-	II2G II2D	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)	0,800	7	4	4672 *8)
	-	10,0	-	43	II2G II2D	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)	0,800	7	7	4673 *8)
Stainless steel 	8,9	–	369	–	II2G II2D	Ex mb d IIC T4/T6 Ex mb e II T4/T6 Ex mbD 21 tD A21 IP66 T100°C Ex tD A21 IP66 T100°C *1) *10)	-40 ... +50 T4 -40 ... +40 T6 -40 ... +50	M20x1,5 *6)	1,2	10	4	4872 *8), *11)
	–	10	–	43	II2G II2D	Ex mb d IIC T4/T6 Ex mb e II T4/T6 Ex mbD 21 tD A21 IP66 T100°C Ex tD A21 IP66 T100°C *1) *10)	-40 ... +50 T4 -40 ... +40 T6 -40 ... +50	M20x1,5 *6)	1,2	10	7	4873 *8), *11)
	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	9	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	9	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.

*1) EG-Type-Examination-Certificate KEMA 02 ATEX 1347 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
*11) EG-Type-Examination-Certificate PTB 06 ATEX 2054 X

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 proteciton is used, the solenoid will have protection class Ex emb.

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document.

Solenoid operators

	Power consumption 24 V d.c. (W)	230 V a.c. (VA)	Rated current 24 V d.c. (m A)	230 V a.c. (m A)	Ex-Protection (ATEX-Category)	Protection class *7)	Temperature Ambient/ Fluid (°C)	Electrical connection	Weight (kg)	Dimension No.	Circuit diagram No.	Model
	6,8	-	284	-		IIP00 without, IP65 with connector *5)	-25...+60	DIN EN175301-803 Form A	0,33	3	1	0827
	-	10,6	-	46		IP00 without, IP65 with connector *5)	-25...+60	DIN EN175W301-803 Form A	0,34	4	6	3805
	3,9	-	162	-		IP65	-30...+90 Fluid: 110	Terminals, cable gland Pg 13,5	0,5	9	2	4140
	-	5,3	-	23		IP65	-30...+90 Fluid: 110	Terminals, cable gland Pg 13,5	0,5	9	6	4141
	3,9		162	-		IP67	-30...+90 Fluid: 110	3 m cable, encapsulated in EP resin	0,7	9	2	4142
	-	5,3	-	23		IP67	-30...+90 Fluid: 110	3 m cable, encapsulated in EP resin	0,7	9	6	4143
	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)	0,6	6	4	4260
	-	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	M20x1,5 *6)	0,6	6	7	4261
	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 NPT *6)	0,8	7	4	4660 *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 NPT *6)	0,8	7	7	4661 *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	M20x1,5 *6)	0,8	7	4	4662 *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	M20x1,5 *6)	0,8	7	7	4663 *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	9	1	3824
	-	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	9	5	3825

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 KEMA 02 ATEX 1347 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 proteciton is used, the solenoid will have protection class Ex emb.

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document.

Accessories

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



Page 10

Thread	Cable Ø	Material	Protection class (ATEX)	Model
M 20x1,5	5,0...8,0 mm	Nickel plated brass	II2GD Ex e	0588819
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

Connector	Silencer *1)	Exhaust guard *2)	Throttle control plate	Flange plate	Yoke
					
	Page 10	Page 10	Page 9	Page 9	Page 9
0570275	C/S2 1/4 NPT	0613422 (G1/4, 1/4 NPT)	4040239 (for G1/4 only)	0612790 (NAMUR single connection plate, for G1/4 only)	0540593
	M/S2 G 1/4			0612791 (NAMUR-rip use in combination with 0612790, Alu)	

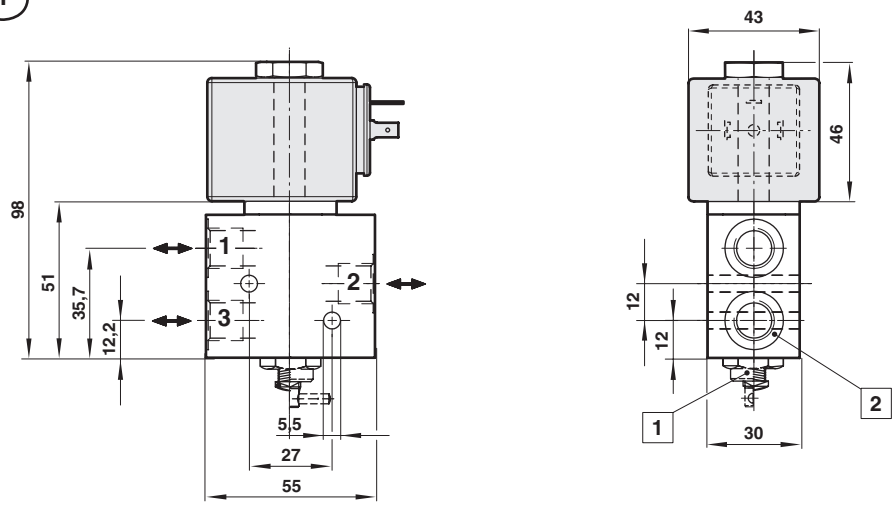
*1) For indoors use
*2) For outdoors use

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document.

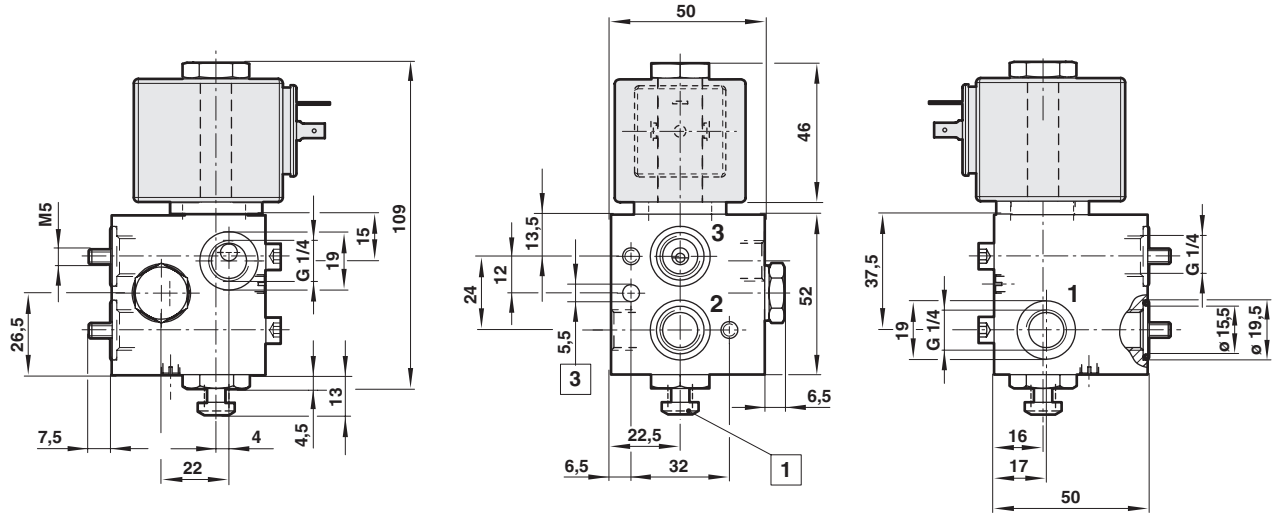
Dimensions

Valves

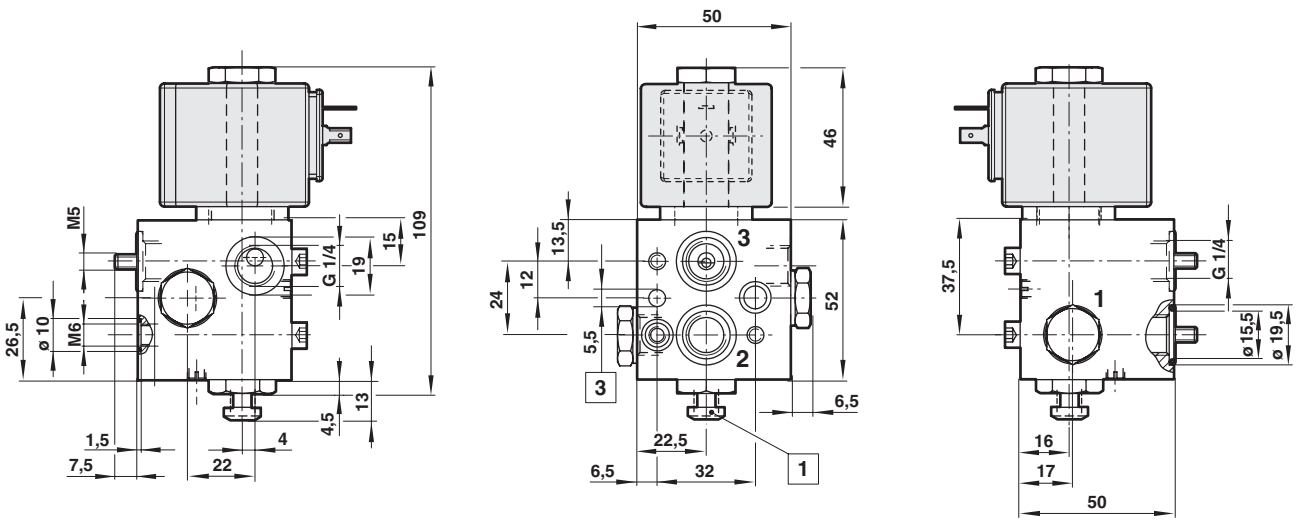
1



2



3



1 Add-on manual override see page

2 Port size G 1/4 or 1/4 NPT

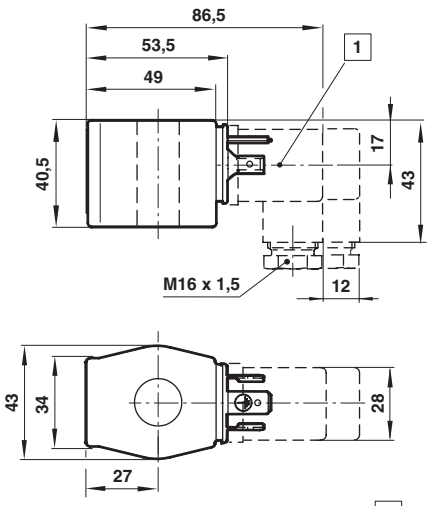
3 3 mm deep

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document.

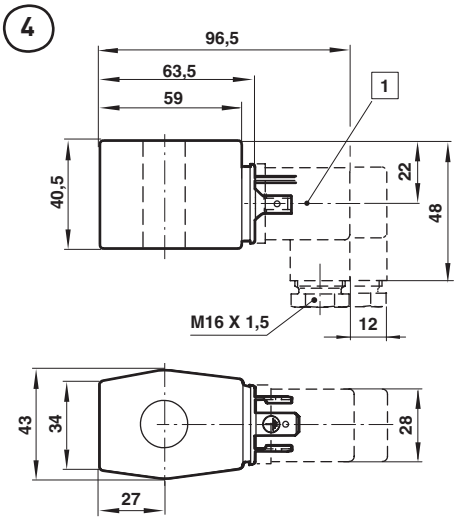
Dimensions

Solenoids

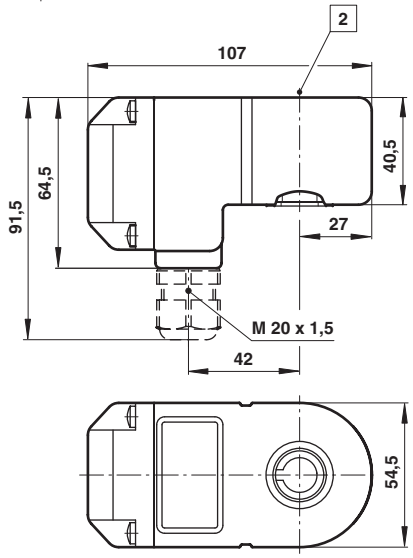
3



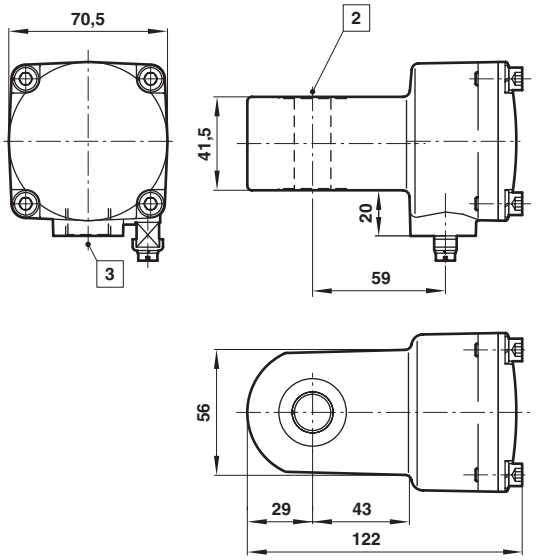
4



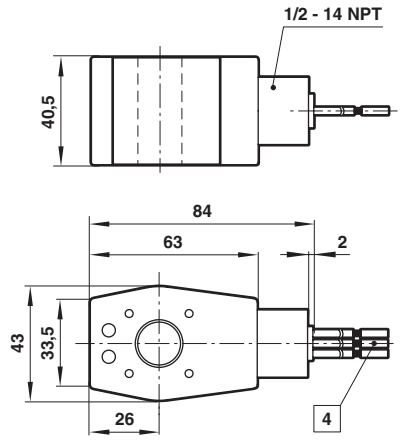
6



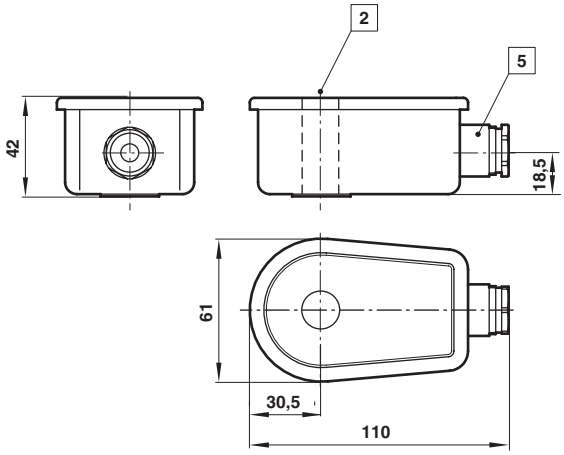
7



8



9



1 Connector can be indexed by 4x90°

2 Ø 16 or 13 (with spacer tube)

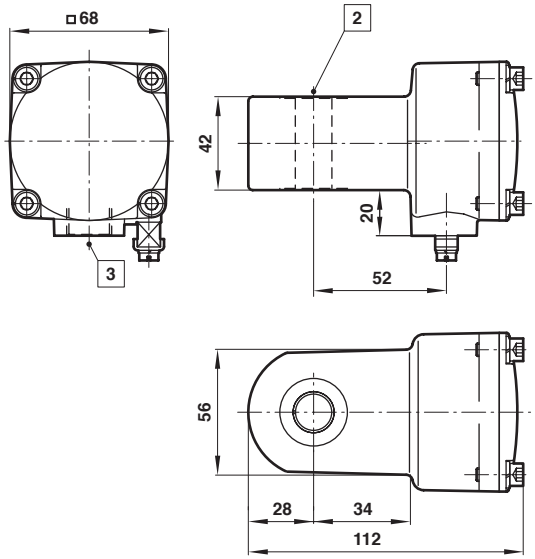
3 M20 x 1,5 or 1/2 - 14 NPT

4 Flying leads AWG 18 (450 mm long)

5 With cable gland, Pg 13,5

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document.

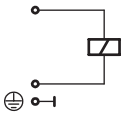
10



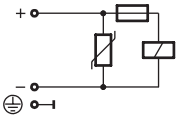
2 Ø 16 or 13 (with spacer tube)

Circuit diagrams

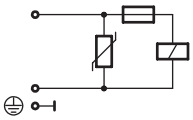
1



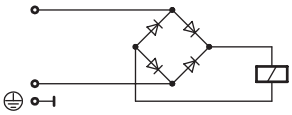
2



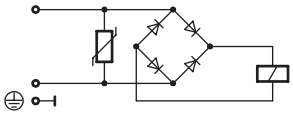
4



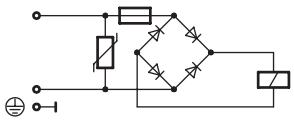
5



6

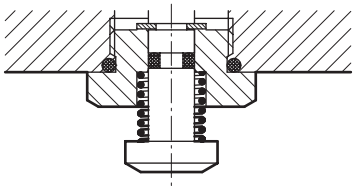


7

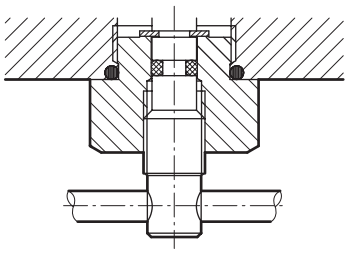


Add-on manual override

Without detent
Model: 0600205



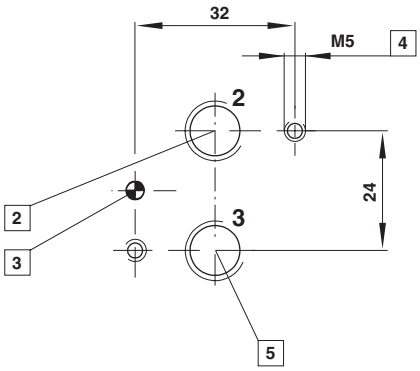
With detent
Model: 0601765



Please note: add-on manual override for NAMUR valves provided only for commissioning and tests

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document.

NAMUR hole pattern



2 Port 2 (A)

3 Coding stud threaded

4 M5 (10 deep)

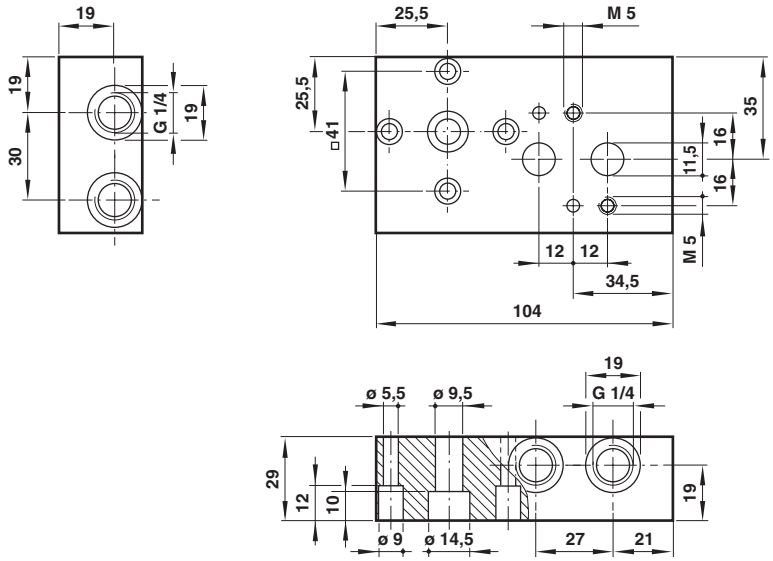
5 Port 3 (R)

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

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

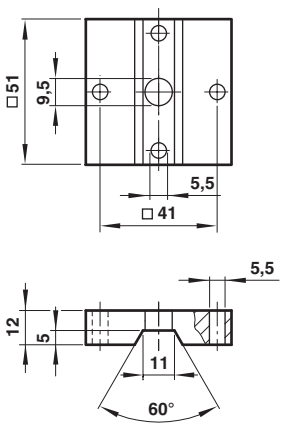
Single connection plate

Model: 0612790



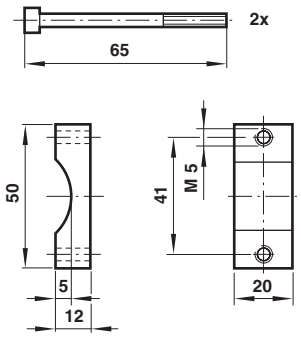
NAMUR slot

Model: 0612791



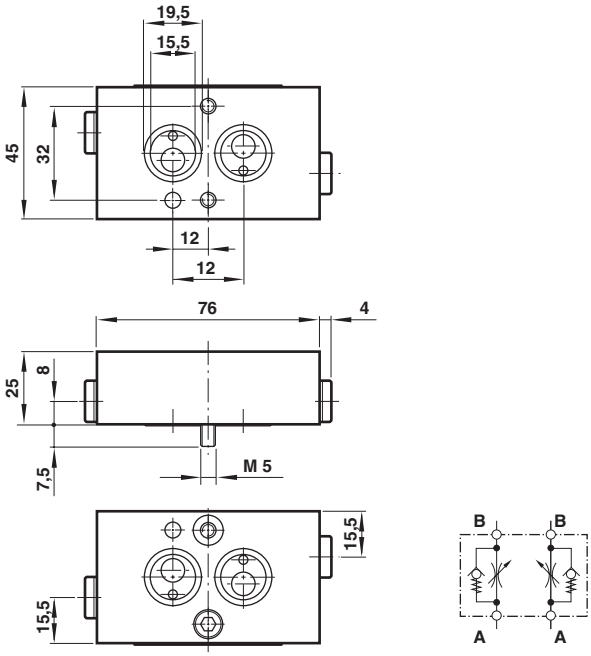
Yoke

Model: 0540593



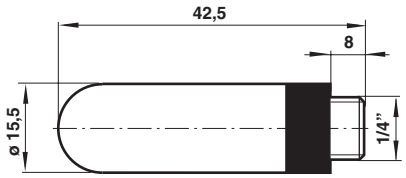
Throttle control plate

Model: 4040239

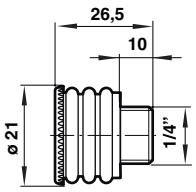


Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document.

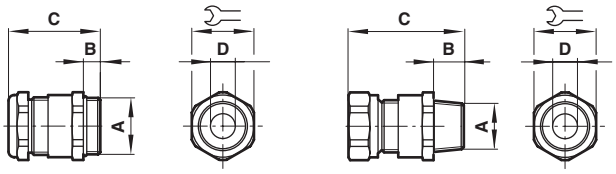
Silencer
Model: M/S2, C/S2



Exhaust guard
Model: 0613422



Cable gland



0588925 only

A	B	C	ø 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.

Our policy is one of continued research and development. We therefore reserve the right to amend, without notice, the specifications given in this document.