

98015 series, 3/2 Direct solenoid actuated poppet valve

- 1/4" & 1/2" (ISO G or NPT) Inline & NAMUR
- Main application: Single acting actuators
- Approval based on type examination DGRL 97/23/EG and IEC 61508, multichannel up to SIL 3
- Optional add-on manual override or inductive limit switches on request
- Suited for outdoor use with critical environment conditions
- Variable valve solenoid combination



Technical features

Medium:

Neutral or aggressive, gaseous fluids which do not damage the product or affect the function (e.g. compressed air, nitrogen). Based on ISO 8573-1-2010 classification 1-2-3.

Operation:

Direct solenoid operated poppet valve

Operating pressure:

0 ... 10 bar (0 ... 145 psi)

Orifice: 8 mm

Port size:

G1/4, G1/4 NAMUR, 1/4 NPT, 1/4 NPT NAMUR, G1/2, G1/2 NAMUR, 1/2 NPT, 1/2 NPT NAMUR NAMUR Interface with integrated recirculation from the exhaust air to the acutator spring chamber

Flow direction:

Optional

Mounting position:

Any, but preferably with solenoid vertical

Ambient/Media temperature:

-40 ... +60°C (-40 ... +140°F)
-25 ... +60°C (-13 ... +140°F) (SIL version)
Depending on solenoid system. Air supply must be dry enough to avoid ice formation at temperatures below +2°C (35°F). For outdoor installations all connections must be protected against the penetration of moisture and a solenoid with IP66 protection must be used!

Materials:

Body: Aluminium anodized (suitable for high humidity, sulphuric, sodium chloride or ammonia environments), brass 2.0401 (Ms 58), stainless steel 1.4404 (316 L)
Seals: NBR

Flow conversion:

Cv US Gallon/min (water) = l/min (air) x 0,001
Kv m³/h (water) = l/min (air) x 0,000906

Technical data

Seals: NBR -40 ... +60°C (-40 ... +140°F) / IEC 61508: -25 ... +60°C (-13 ... +140°F). Housing: Aluminium anodized

Symbol	Port size		Flow (l/min) *1)		Flow (l/min) *2)		Operating pressure		Drawing No.	Model *3)
	1, 3	2 (3)	1 » 2	2 » 3	1 » 2	2 » 3	(bar)	(psi)		
	G1/4, G1/2	G1/4 NAMUR	1100	1300	2900	3400	0 ... 10	0 ... 145	1	9801505
	1/4 NPT, 1/2 NPT	1/4 NPT NAMUR	1100	1300	2900	3400	0 ... 10	0 ... 145	1	9801515

Housing: Stainless steel

Symbol	Port size	Flow (l/min) *1)		Flow (l/min) *2)		Operating pressure		Drawing No.	Model *3)
		1 » 2	2 » 3	1 » 2	2 » 3	(bar)	(psi)		
	G1/2	1200	1300	3100	3400	0 ... 10	0 ... 145	2	9801755
	1/2 NPT	1200	1300	3100	3400	0 ... 10	0 ... 145	2	9801765

Housing: Brass

Symbol	Port size	Flow (l/min) *1)		Flow (l/min) *2)		Operating pressure		Drawing No.	Model *3)
		1 » 2	2 » 3	1 » 2	2 » 3	(bar)	(psi)		
	G1/2	1200	1300	3100	3400	0 ... 10	0 ... 145	2	9801655
	1/2 NPT	1200	1300	3100	3400	0 ... 10	0 ... 145	2	9801665

*1) Inlet pressure 6 bar (87 psi), outlet pressure 5 bar (72 psi)

*2) Inlet pressure 10 bar (145 psi), outlet pressure 0 bar (0 psi)

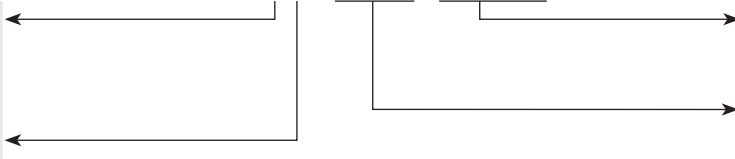
*3) When ordering please indicate solenoid, voltage and current Modele (frequency).

Option selector

9801**5*****

Materials	Substitute
Aluminium	5
Brass	6
Stainless steel	7
Port size	Substitute
G1/4 NAMUR	0
1/4 NPT NAMUR	1
G1/4	3
1/4 NPT	4
G1/2	5
1/2 NPT	6

Voltage	Substitute
24 V d.c.	02400
230 V a.c.	23050
Solenoid actuators	Substitute
See table	



Solenoids

	Power consumption		Rated current		Protection class IP/NEMA	Ex-Protection (ATEX-Category)	Temperature Ambient/Media (°C)	Electrical connection	Drawing	Circuit	Model
	24 V d.c. (W)	230 V a.c. (VA)	24 V d.c. (mA)	230 V a.c. (mA)					No.	diagram No.	
	16,9	—	703	—	IP65 (with connector)	—	-25 ... +60 Media: +80	Connector DIN EN 175301-803, Form A *4)	3	10	0800
	—	17,3	—	75	IP65 (with connector)	—	-25 ... +50 Media: +80	Connector DIN EN 175301-803, Form A *4)	4	13	3803
	8,9	—	369	—	IP65	—	-25...+90 Media: +110	Terminals, cable gland Pg 13,5	7	11	4120
	—	10,0	—	43	IP65	—	-25...+90 Media: +110	Terminals, cable gland Pg 13,5	7	14	4121
	8,9	—	369	—	IP67	—	-25...+90 Media: +110	3 m cable, encapsulated in EP resin	7	11	4122
	—	10,0	—	43	IP67	—	-25...+90 Media: +110	3 m cable, encapsulated in EP resin	7	14	4123
	8,9	—	369	—	IP66 (with cable gland)	II 2G Ex eb mb IIC T4/ T5 Gb	T4: -40 ... +65 T5: -40 ... +55 -40 ... +65	M20 x 1,5 *4)	5	12	4270
	—	10,0	—	43	IP66 (with cable gland)	II 2D Ex tb IIIC T130°C Db	T4: -40 ... +65 T5: -40 ... +55 -40 ... +65	M20 x 1,5 *4)	5	15	4271
	8,9	—	369	—	IP66 (with cable gland)	II 2G Ex db mb IIC T4/T6 Gb II 2G Ex eb mb IIC T4/T6 Gb II 2D Ex tb IIIC T130°C Db	T4: -40 ... +70 T6: -40 ... +40 -40 ... +70	1/2 NPT *4)	6	16	4670
	—	10,0	—	43	IP66 (with cable gland)	II 2G Ex db mb IIC T4/T6 Gb II 2G Ex eb mb IIC T4/T6 Gb II 2D Ex tb IIIC T130°C Db	T4: -40 ... +70 T6: -40 ... +40 -40 ... +70	1/2 NPT *4)	6	17	4671
	8,9	—	369	—	IP66 (with cable gland)	II 2G Ex db mb IIC T4/T6 Gb II 2G Ex eb mb IIC T4/T6 Gb II 2D Ex tb IIIC T130°C Db	T4: -40 ... +70 T6: -40 ... +40 -40 ... +70	M20 x 1,5 *4)	6	16	4672
	—	10,0	—	43	IP66 (with cable gland)	II 2G Ex db mb IIC T4/T6 Gb II 2G Ex eb mb IIC T4/T6 Gb II 2D Ex tb IIIC T130°C Db	T4: -40 ... +70 T6: -40 ... +40 -40 ... +70	M20 x 1,5 *4)	6	17	4673
	8,9	—	369	—	IP66 (with cable gland)	II 2G Ex db mb IIC T4 Gb II 2G Ex eb mb IIC T4 Gb II 2D Ex tb IIIC T110°C Db	T4: -40 ... +50 -40 ... +50	M20 x 1,5 *4)	8	12	4872
	—	10,0	—	43	IP66 (with cable gland)	II 2G Ex db mb IIC T4 Gb II 2G Ex eb mb IIC T4 Gb II 2D Ex tb IIIC T110°C Db	T4: -40 ... +50 -40 ... +50	M20 x 1,5 *4)	8	15	4873

Standard voltages ($\pm 10\%$) 24 V d.c., 230 V a.c., other voltages on request. Design according to VDE 0580, EN 50014/50028. 100% duty cycle.

*4) Connector/cable gland is not scope of delivery, see table »Accessories


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

Approvals

Model	Approvals		Datasheet
	ATEX	IECEX	
42xx	KEMA 98 ATEX 4452 X	IECEX KEM 09.0068X	7.1580
46xx	PTB 02 ATEX 2085 X	IECEX PTB 11.0094X	7.1585
48xx	EPS 18 ATEX 1 019	IECEX EPS 18.0013	7.1590

Solenoids

	Power consumption		Rated current		Protection class IP/NEMA	Ex-Protection (ATEX-Category)	Temperature Ambient/Media (°C)	Electrical connection	Drawing	Circuit diagram	Model
	24 V d.c. (W)	120 V a.c. (VA)	24 V d.c. (mA)	120 V a.c. (mA)					No.	No.	
	8,9	—	369	—	4x	Cl. I, Div. 1, Gr. A - D Cl. II/III, Div. 1, Gr. E - G T3C (160°C)	-20 ... +60	Flying leads length 460 mm	9	10	3824
	—	9,5	—	84	4x	Cl. I, Div. 1, Gr. A - D Cl. II/III, Div. 1, Gr. E - G T3C (160°C)	-20 ... +60	Flying leads length 460 mm	9	13	3825
	13,6	—	567	—	4x	Cl. I, Div. 1, Gr. A - D Cl. II/III, Div. 1, Gr. E - G T3C (160°C)	-20 ... +60	Flying leads length 460 mm	9	10	3826
	—	15,7	—	130	4x	Cl. I, Div. 1, Gr. A - D Cl. II/III, Div. 1, Gr. E - G T3C (160°C)	-20 ... +60	Flying leads length 460 mm	9	13	3827

Standard voltages ($\pm 10\%$) 24 V d.c., 120 V a.c., other voltages on request. Design according to VDE 0580, EN 50014/50028. 100% duty cycle.

Approvals

Model	Approvals FM	Datasheet
382x	CSA-LR 57643-6	7.1.575

Partnumbers for international approval

Land/Approval	Coil/Code	382x	42xx	46xx	48xx
Europa/ATEX	Standard	—	x	x	x
International/IECEX	Standard	—	x	x	x
China/NEPSI	-01	—	x	x	—
Brasilien/INMETRO	-02	—	x	x	—
Korea/KOSHA (only gas approval)	-03	—	x	x	x
Russland, Kasachstan & Weißrussland/TR-CU 012	-04	—	x	x	x
Indien/CCOE	Standard	—	x	x	—
Taiwan/ITRI	Standard	—	x	x	—
USA/FM	Standard	x	—	—	—
Kanada/CSA	Standard	x	—	—	—

Example: 000000427002400-04

(Coil: 4270; Voltage: 24V DC; Approval: TR-CU 012)

Accessories

Cable gland
Protection class Ex e, Ex d Plastic,
nickel plated brass/
stainless steel



Page 10

For solenoid	Thread	Cable Ø (mm)	Material	Protection class (ATEX)	Ambient temperature limitation *1)	Model
42xx	M20 x 1,5	7,0 ... 12,0	Plastic	II 2G Ex e / II 2D Ex t	See table	0589735
42xx	M20 x 1,5	10,0 ... 14,0	Plastic	II 2G Ex e / II 2D Ex t	See table	0589736
42xx	M20 x 1,5	6,0 ... 12,0	Plastic	II 2G Ex e / II 2D Ex t	See table	0589737
42xx	M20 x 1,5	5,0 ... 10,0	Plastic	II 2G Ex e / II 2D Ex t	See table	0589739
46xx	M20 x 1,5	5,0 ... 14,0	Nickel plated brass	II 2G Ex e / II 2D Ex t	-	0589654
46xx	M20 x 1,5	10,0 ... 14,0	Nickel plated brass	II 2G Ex d / II 2D Ex t	-	0588851
46xx	1/2 NPT	7,5 ... 11,9	Nickel plated brass	II 2G Ex d / II 2D Ex t	-	0588925
46xx, 48xx	M20 x 1,5	9,0 ... 13,0	Stainless steel 1.4571	II 2G Ex e / II 2D Ex t	-	0589385
46xx, 48xx	M20 x 1,5	7,0 ... 12,0	Stainless steel 1.4404	II 2G Ex d / II 2D Ex t	-	0589395
46xx, 48xx	M20 x 1,5	10,0 ... 14,0	Stainless steel 1.4404	II 2G Ex d / II 2D Ex t	-	0589387

*1) The limitation of the temperature range to the mentioned range is due to the self-heating of the

For solenoid	Ambient temperature limitation solenoid 42xx	0589735 & 0589736 *2)	0589737	0589739 *2)
422x/427x	T4 & Dust Ex: -35 ... +65°C	T4 & Dust Ex: -40 ... +62°C	T4 & Dust Ex: -40 ... +65°C	T4 & Dust Ex: -40 ... +65°C
	T5: -35 ... +55°C	T5: -40 ... +55°C	T5: -40 ... +55°C	T5: -40 ... +55°C

*2) Tested for the lower level of mechanical risk (4 joule), an additional protection against impacts might be needed.

Accessories

Connector
DIN EN 175301-803



0570275, form A

More connectors see datasheet 7.1.507

Accessories

Silencer *6)	Silencer (Stainless steel) *6)	Silencer (Brass) *6)	Exhaust guard *7)	Add-on manual override *8) without detent	with detent
Page 8	Page 9	Page 9	Page 8	Page 6	Page 6
M/S2 (G1/4)	0014613 (G1/4)	T40C2800 (G1/4)	0613422 (G1/4, 1/4 NPT)	0600205	0601765
C/S2 (1/4 NPT)	0613678 (1/4 NPT)	MS002A (1/4 NPT)	0613423 (G1/2, 1/2 NPT)		
M/S4 (G1/2)	0014813 (G 1/2)	T40C4800 (G 1/2)			
C/S4 (1/2 NPT)	0613679 (1/2 NPT)	MS004A (1/2 NPT)			

*6) For indoors use only

*7) For outdoors use, opening pressure ~ 0,2 bar

*8) Using the manual override with detent cancels the SIL-Approval!

Manual override

Using the manual override with detent cancels the SIL-approval! The manual override is meant to be used for system testing.

NAMUR accessories (G1/4 only)

Throttle control plate *9)	Flange plate	Yoke	Mounting plate	Quick exhaust module *10)
Page 10	Page 9 & 10	Page 10	Page 9	Page 10
4040239	0612790 (NAMUR single connection plate) 0612791 (NAMUR-rip use in combination with 0612790)	0540593 (Pipe mounting use in combination with 0612790)	0613453 (90°)	4050218

*9) The throttle control plate 4040239 has a minimum flow rate for safety reason.

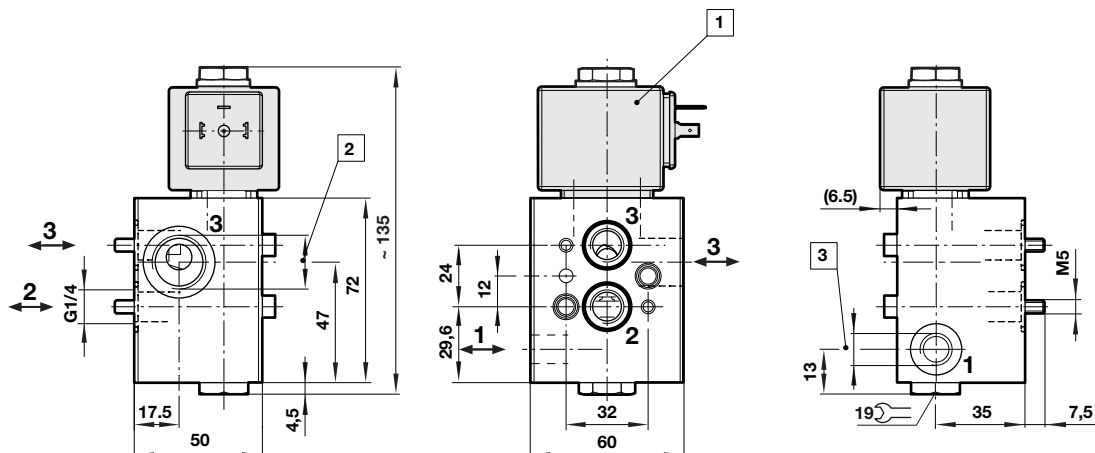
*10) Technical details see catalogue page en 5.4.820.

Drawings Valves

Dimensions in mm
Projection/First angle



① Weight: Aluminium eloxiert: 0,7 kg



① Solenoid optional turnable, for dimensions see page 6 & 7

② Port size G1/2 or 1/2 NPT

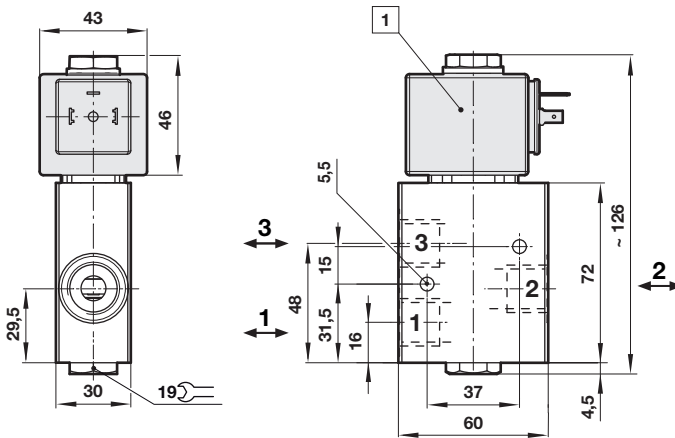
③ Port size G1/4 or 1/4 NPT

Drawings Valves

Dimensions in mm
Projection/First angle



2 Weight: Stainless steel: 0,9 kg, Brass: 0,9 kg

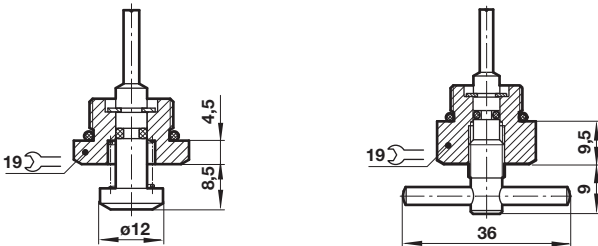


1 Solenoid optional turnable, for dimensions see page 6 & 7

Add-on manual override

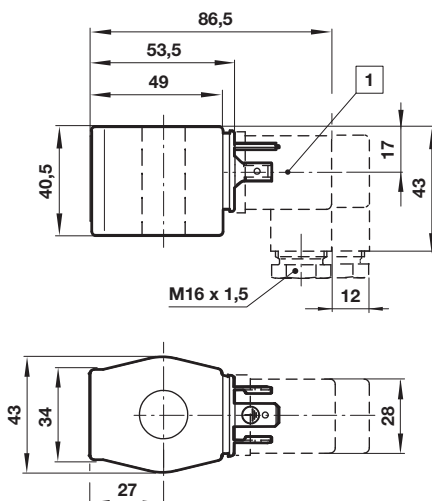
Without detent
Model: 0600205

With detent
Model: 0601765



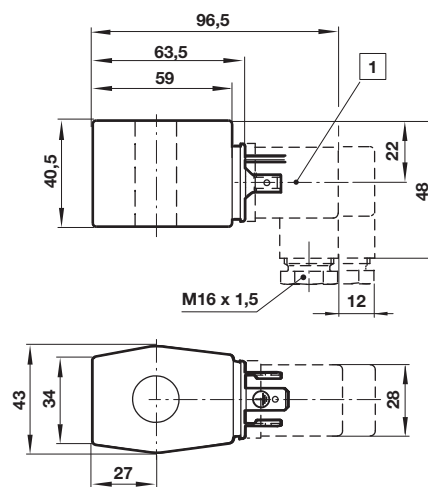
Solenoids

3 Weight: 0,27 kg

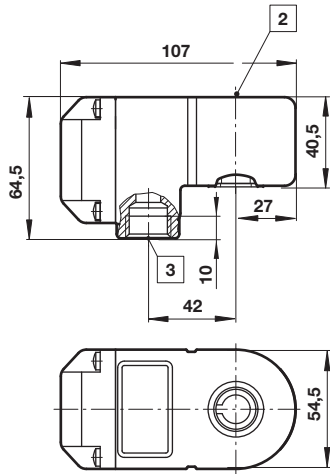


1 Connector can be indexed by 4x90°

4 Weight: 0,32 kg

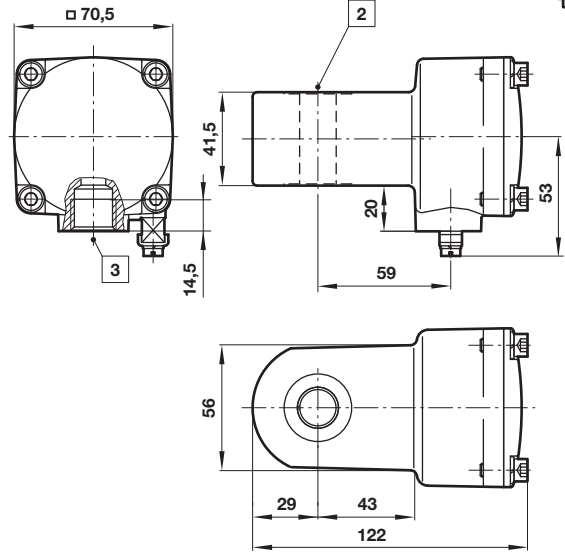


5 Weight: 0,4 kg

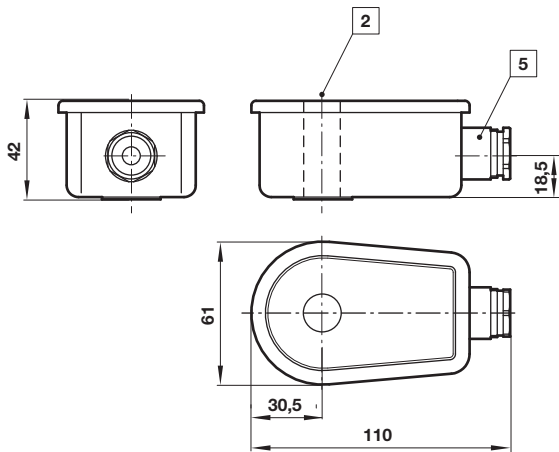


6 Weight: 0,8 kg

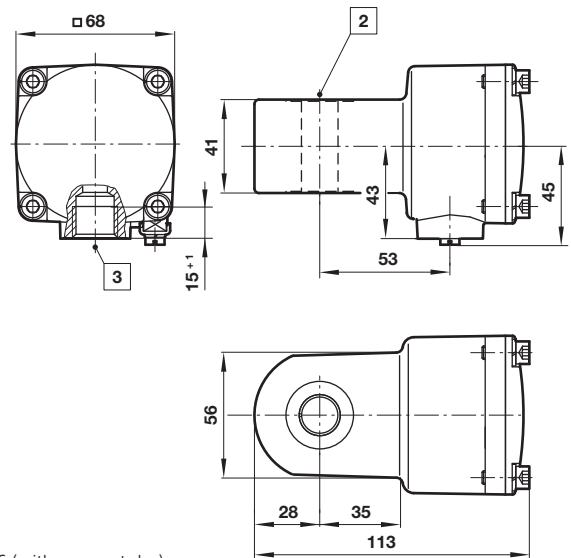
Dimensions in mm
Projection/First angle



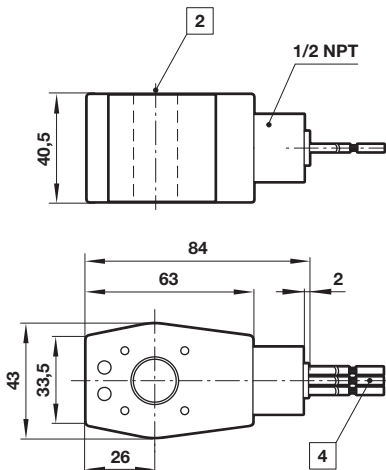
7 Weight: 0,5 kg / 0,7 kg



8 Weight: 1,2 kg

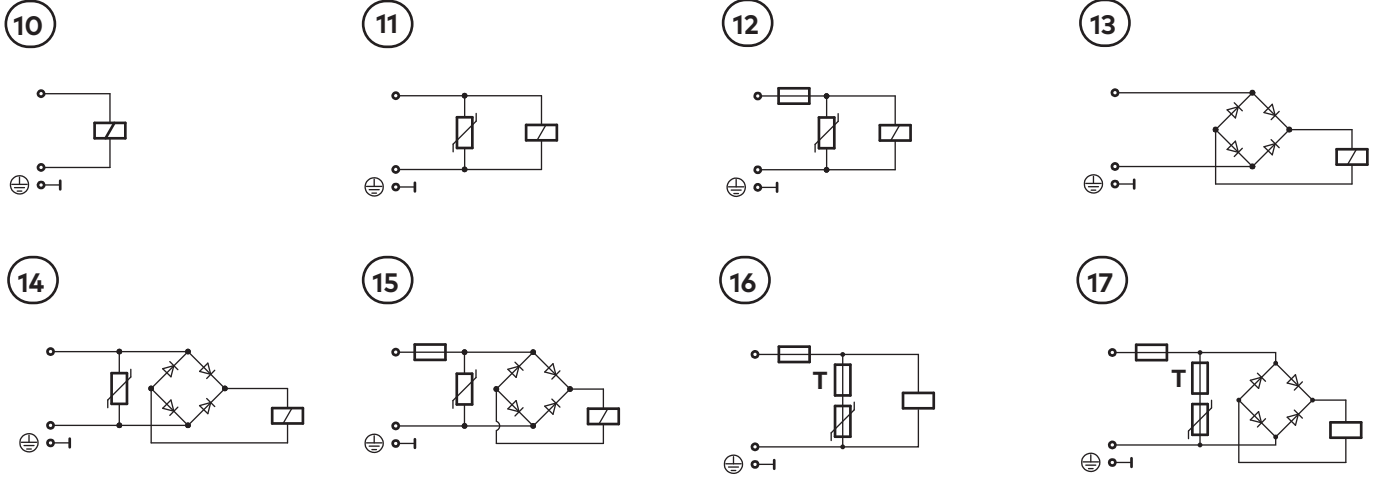


9 Weight: 0,5 kg

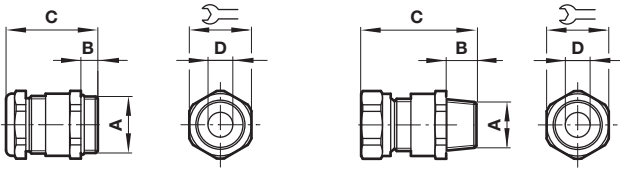


- 2 Ø 16 (with spacer tube)
- 3 M20 x 1,5 or 1/2 NPT
- 4 Flying leads AWG 18 (460 mm long)
- 5 With cable gland, Pg 13,5

Circuit diagrams



Cable gland



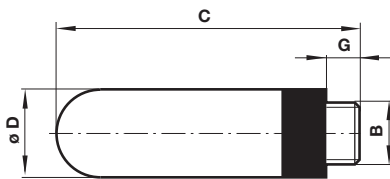
0588925 only

A	B	C	∅ D		Model
M20 x 1,5	10	40	7,0 ... 12,0	24	0589735
M20 x 1,5	10	43	10,0 ... 14,0	27	0589736
M20 x 1,5	10	40	6,0 ... 12,0	24	0589737
M20 x 1,5	10	39,5	5,0 ... 10,0	24	0589739
M20 x 1,5	6,5	35,5	5,0 ... 14,0	24	0589654
M20 x 1,5	12	37	9,0 ... 14,0	30	0588851
1/2 NPT	15	58	7,5 ... 11,9	24	0588925
M20 x 1,5	6,5	27,5	9,0 ... 13,0	22	0589385
M20 x 1,5	16	40	7,0 ... 12,0	24	0589395
M20 x 1,5	16	41	10,0 ... 14,0	24	0589387

Accessories

Silencer

Model: M/S2, M/S4, C/S2 & C/S4

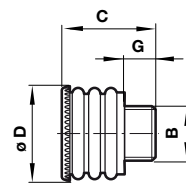


B	G	C	∅ D	Weight (g)	Model
G1/4	7	35,5	15,5	2,9	M/S2
1/4 NPT	7	35,5	15,5	2,9	C/S2
G1/2	12	67	23	11,5	M/S4
1/2 NPT	12	67	23	11,5	C/S4

Exhaust guard

Model: 0613422 & 0613423

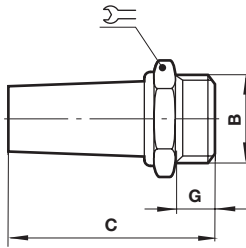
Dimensions in mm
Projection/First angle



B	Suitable for	G	C	∅ D	Weight (g)	Model
1/4"	G1/4, 1/4 NPT	10	26,5	21	5	0613422
1/2"	G1/2, 1/2 NPT	12	33,5	29	11	0613423

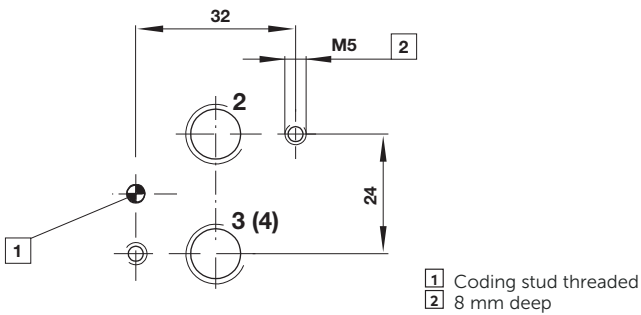
Silencer (Stainless steel and brass)

Dimensions in mm
Projection/First angle



B	C	G		Weight (g)	Model
G1/4	33	8	17	18	T40C2800
1/4 NPT	35	8	9/16	18	MS002A
G1/4	36	8	16	23	0014613
1/4 NPT	36	8	16	67	0613678
G1/2	56	12	27	63	T40C4800
1/2 NPT	48	12	7/8	63	MS004A
G1/2	49	12	24	81	0014813
1/2 NPT	49	12	24	235	0613679

NAMUR hole pattern (actuator side)

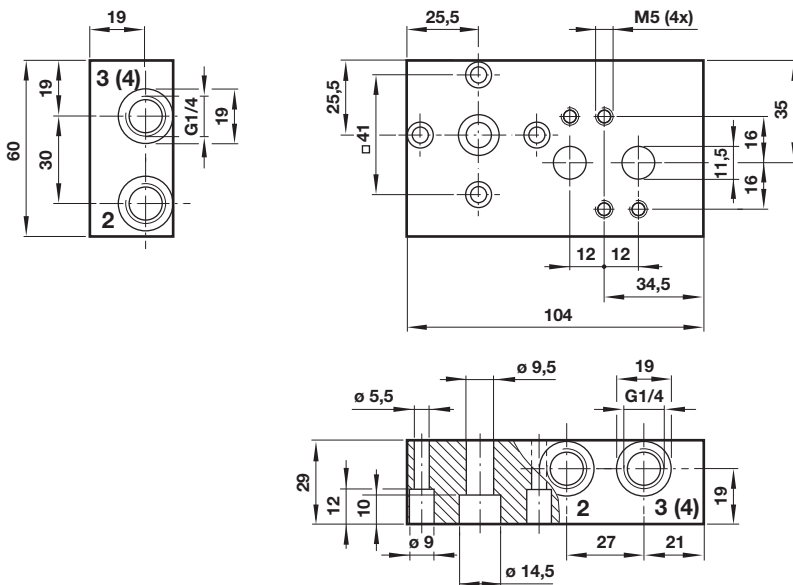


NAMUR quick exhaust module for a better kv-value by exhaust see data sheet 5.4.820

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

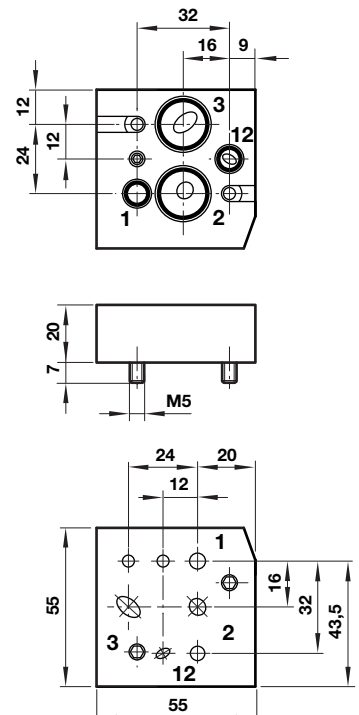
Single connection plate

Model: 0612790

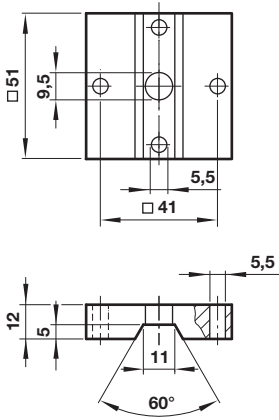


Mounting plate

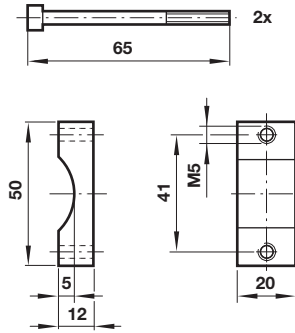
Model: 0613453 (90°)



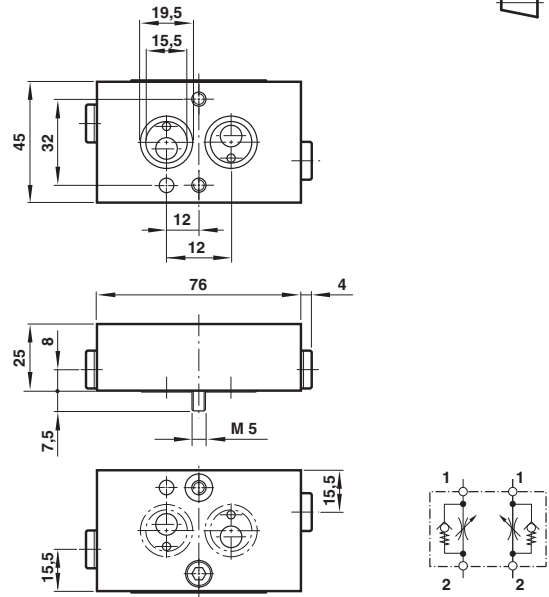
NAMUR slot
Model: 0612791



Yoke
Model: 0540593



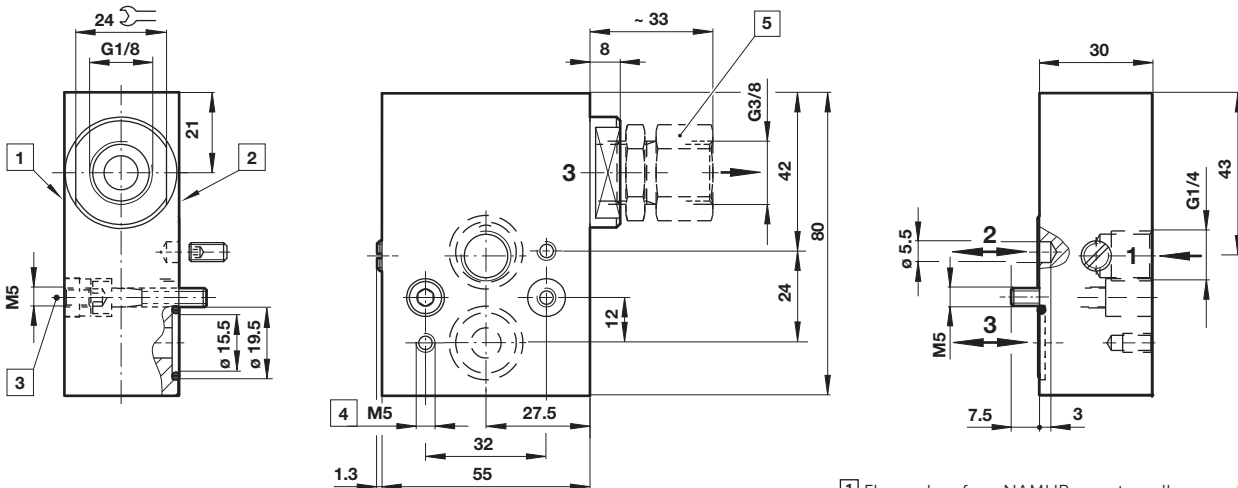
Throttle control plate
Model: 4040239



Dimensions in mm
Projection/First angle



Quick exhaust module
Model: 4050218



- 1 Flanged surface NAMUR or externally mounted valve
- 2 Flanged surface NAMUR actuator
- 3 Push-in threaded piece after plate mounting
(to secure correct position)
- 4 8 mm deep
- 5 Flow regulator assembly

Warning

These products are intended for use in industrial compressed air and fluid systems only. Do not use these products where pressures and temperatures can exceed those listed under »**Technical features/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 GmbH.

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.

Functional safety (SIL):

Suitable for certain applications can only be evaluated through examination of each safety-related overall system with regard to the requirements of IEC 61508/61511.