24010, 3/2
Direct solenoid actuated poppet valve

- 1/4" (G or NPT) Inline & NAMUR
- Main application: Single acting actuators in intrinsically safe circuits
- Approval according to IEC 61508, multichannel up to SIL 3
- Solenoid valve with low power consumption
- High operational reliability even after long periods of non-operation
- Suited for outdoor use under critical environment conditions
- Universal flow direction

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:
5 mm

Flow:
Gaseous fluids: 375 l/min
Liquid fluids: Kv 0,34

Port size:
G1/4, 1/4 NPT, G1/4 NAMUR or 1/4 NPT NAMUR
NAMUR Interface with integrated recirculation from the exhaust air to the acutator spring chamber

Flow direction:
Universal

Mounting position:
Any, but preferably with solenoid vertical

Ambient/Media temperature:
-25 ... +80°C (-13 ... +176°F)
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!

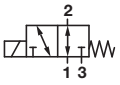
Flow conversion:
Cv US Gallon/min (water) = l/min (air) x 0,001
Kv m^3/h (water) = l/min (air) x 0,000906

Materials:
Body: Aluminium anodized (suitable for high humidity, sulphuric, sodium chloride or ammonia environments), brass 2.0401, stainless steel 1.4404 (316 L)
Inner parts: Stainless steel, brass
Solenoid housing: Aluminium anodized
Seals: NBR

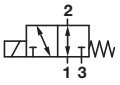
Further versions:
On request

Technical data

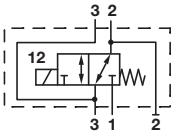
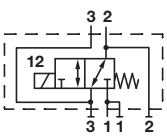
Housing: Brass, seals: NBR -25 ... +80°C (-13 ... +176°F)

Symbol	Port size	Operating pressure (bar)	Manual override	Test certificate IEC 61508	Weight (kg)	Drawing No.	Model
	1/4 NPT	0 ... 10	Not possible	X	0,65	1	2401087200400000
	G1/4	0 ... 10	Not possible	X	0,65	1	2401088200400000

Housing: Stainless steel, seals: NBR -25 ... +80°C (-13 ... +176°F)

Symbol	Port size	Operating pressure (bar)	Manual override	Test certificate IEC 61508	Weight (kg)	Drawing No.	Model
	1/4 NPT	0 ... 10	Not possible	X	0,65	2	2401012200400000
	G1/4	0 ... 10	Not possible	X	0,65	2	2401086200400000

Housing: Aluminium anodized, seals: NBR -25 ... +80°C (-13 ... +176°F)

Symbol	Port size	Operating pressure (bar)	Manual override	Test certificate IEC 61 508	Weight (kg)	Drawing No.	Model
	G1/4 NAMUR	0 ... 10	Retrofittable	X	0,55	3	2401091200400000
	1/4 NPT NAMUR	0 ... 10	Retrofittable	X	0,55	3	2401090200400000
	G1/4 NAMUR	0 ... 10	Retrofittable	X	0,55	4	2401009200400000 *1)

*1) Port 1 in flange according to VDI/VDE 3845 for attachment of positioners or to interlinking plate (see data sheet 5.4.830)

Solenoid parameters for use in non harardous locations

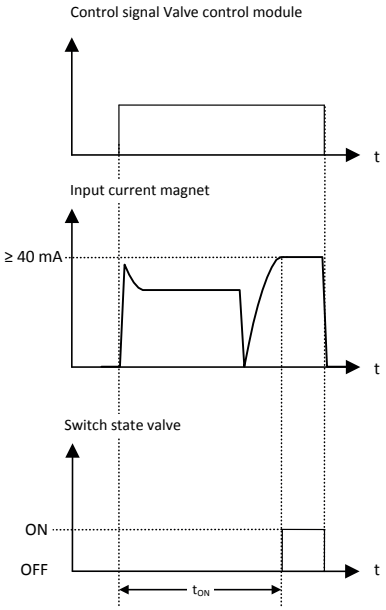
	Switch-on voltage	Current con-sumption	Holding current	Power consumption	Pick-up delay typical *2)	Protection class IP	Ex-Protection (ATEX-Category)	Temperature Ambient/Fluid	Weight	Model
	(V)	(mA)	(mA)	(W)	(s)			(°C)	(kg)	
	18 ... 28	62	> 40	1,5 at 24 V	3	IP66 with cable gland (cable Ø 5 ... 10 mm) is in scope of delivery	–	–40 ... +80	0,85	2004

Solenoid parameters for use in intrinsically safe circuits

	Switch-on voltage	Holding current	Holding voltage	Pick-up delay typical *2)	Protection class IP	Ex-Protection (ATEX-Category)	Temperature Ambient/Fluid	Weight	Model
	(V)	(mA)	(V)	(s)			(°C)	(kg)	
	17 ... 28	> 40	~ 5	2 ... 5	IP66 with cable gland (cable Ø 5 ... 10 mm) is in scope of delivery	II 2G Ex ia IIC T5/ T6 Gb II 2D Ex ia IIIC T95°C Db	T5: –40 ... +70 T6: –40 ... +55 –40 ... +70	0,85	2004

*2) Depending on intrinsically current supply

Operating sequence



Approvals

Model	Approvals ATEX	IECEx
2004	EPS 16 ATEX 1 001	IECEx EPS 16.0001

Function of solenoid drive

To switch the direct operated valve, a certain energy is required. This energy is stored in a capacitor. The charging voltage is 17 V. The higher the supply voltage, the shorter the charging time. As soon as the charging voltage has been reached, the valve switches. The small current now flowing through the coil is sufficient to hold the valve in the open position. At least 40 mA are required for this.

Current supply units:

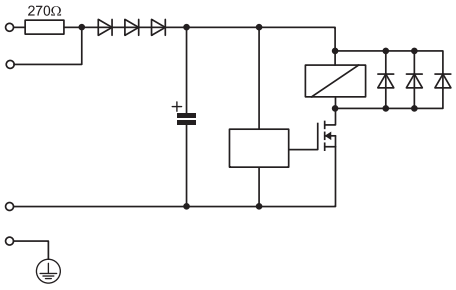
When selecting an intrinsically safe power supply, it is important to observe the maximum permissible values acc. to the EU-Type-Examination Certificate EPS 16 ATEX 1 001 respectively IECEx EPS 16.0001
Ui 28 V, Ii 110 mA, Pi 1,5 W. The effective internal capacities Ci; and inductivities Ii of the solenoid are negligible low.

Item numbers for international approvals

Country/Approvals	Solenoid series/Code	2004
Europe/ATEX	Standard	x
International/IECEx	Standard	x
China/NEPSI	-01	-
Brasil/INMETRO	-02	-
Korea/KOSHA	-03	-
Russia, Kazakhstan & Belarus/TR-CU 012	-04	x
India/CCOE	Standard	x
Taiwan/ITRI	Standard	-

Example: 0000000200400000-04
(Solenoid: 2004; Approval: TR-CU 012)

Circuit diagram



Accessories

Silencer (plastic) *3)	Silencer (stainless steel) *3)	Silencer (brass) *3)	Exhaust guard *4)	Add-on manual override (Without detent)	(with detent)
					
Page 6	Page 6	Page 6	Page 6	Page 5	Page 5
C/S2 (1/4 NPT)	0014613 (G1/4)	T40C2800 (G1/4)	0613422 (G1/4, 1/4 NPT)	0600205	0601765
M/S2 (G1/4)	0613678 (1/4 NPT)	MS002A (1/4 NPT)			

*3) For indoors use
*4) For outdoors use, opening pressure ~ 0,2 bar
Using the manual override with detent cancels the SIL-Approval!

Manual Override

The manual override is meant to be used for system testing.
The valve switches back into normal position when deenergized.

NAMUR accessories (only G1/4)

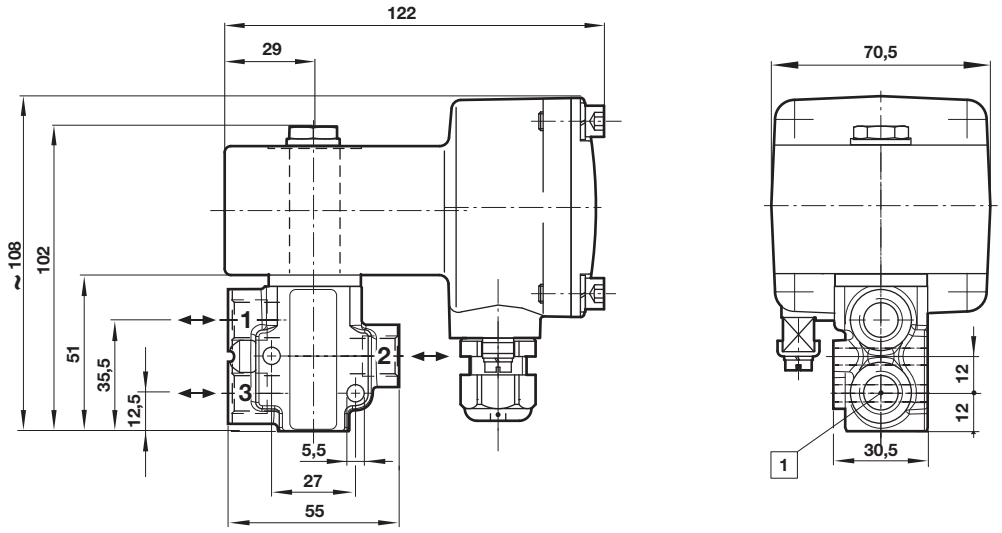
Throttle control plate *5)	Flange plate	Yoke	Mounting plate	Quick exhaust module *6)
				
Page 7	Page 7	Page 7	Page 7	Page 7
4040239	0612790 (NAMUR single connection plate)	0540593 (Pipe mounting use in combination with 0612790)	0613453 (90°)	4050218
	0612791 (NAMUR-rip use in combination with 0612790)			

*5) The throttle control plate 4040239 has a minimum flow rate for safety reason.
*6) Technical details see catalogue page 5.4.820

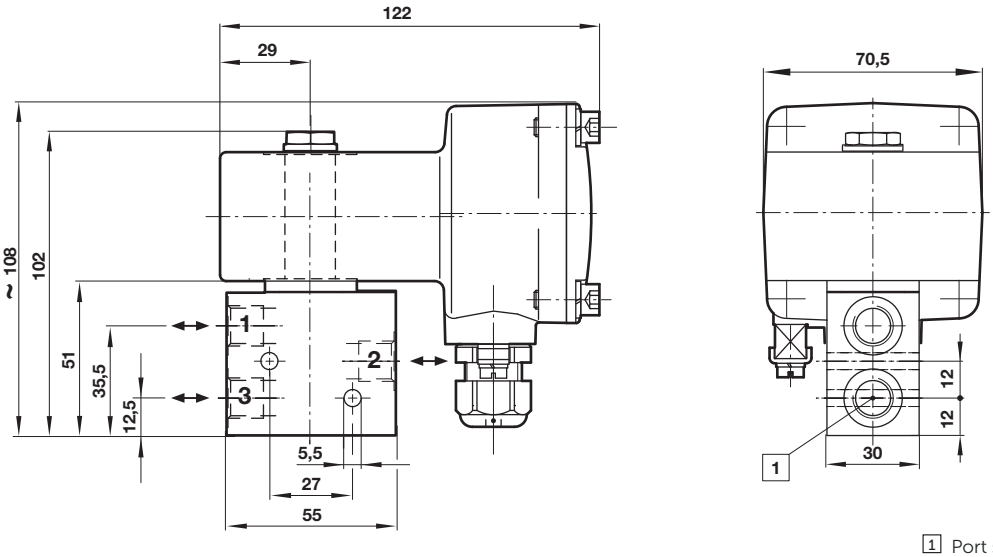
Dimensions
Valves

Dimensions in mm
Projection/First angle

1



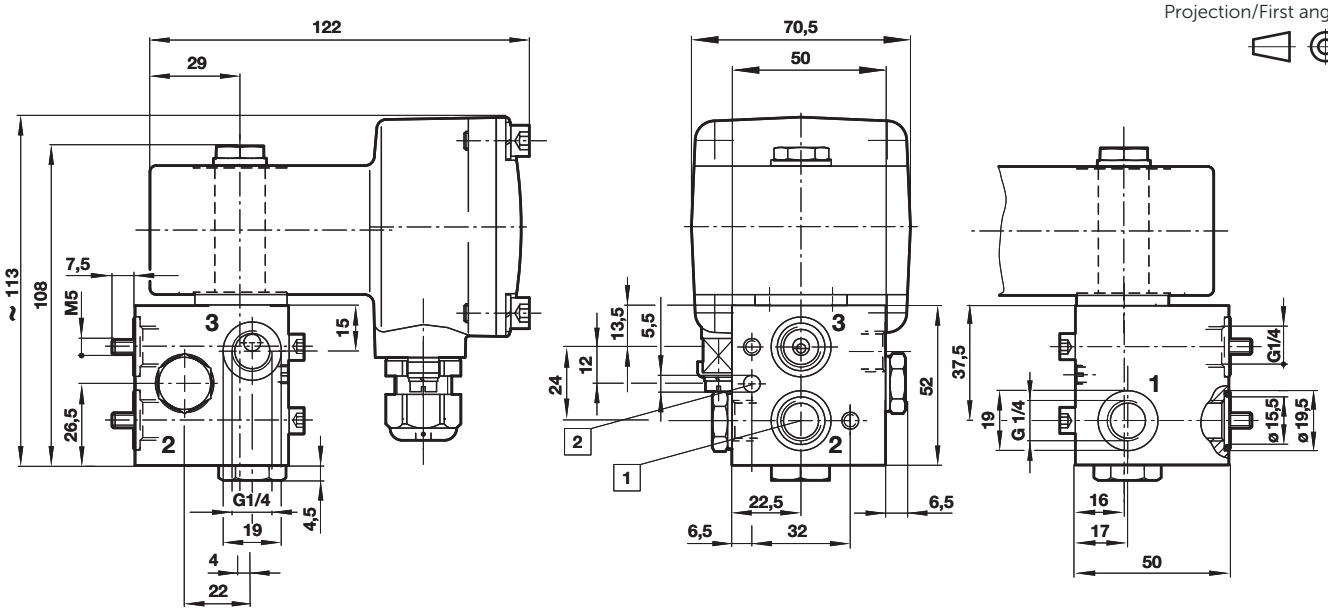
2



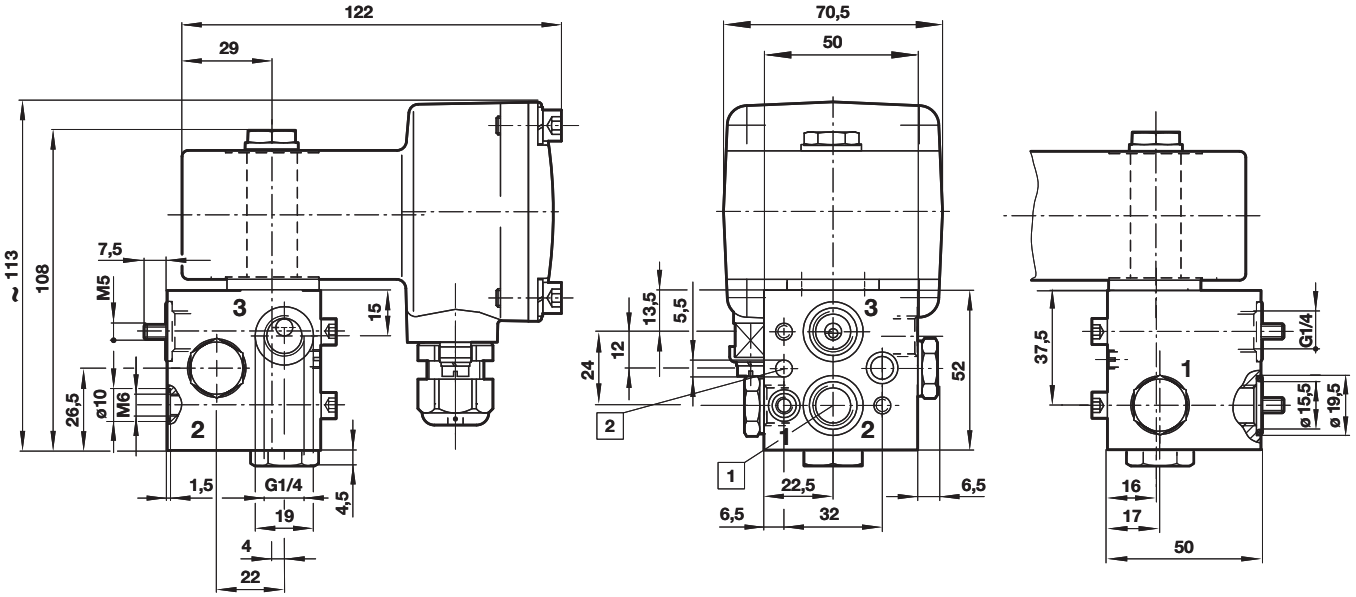
1 Port size G1/4 or 1/4 NPT

Dimensions in mm
Projection/First angle

3



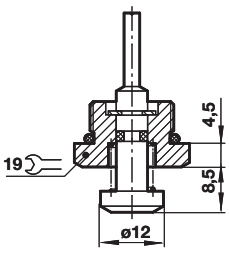
4



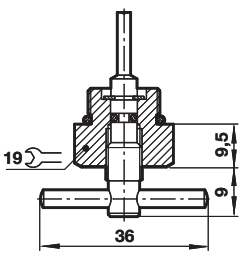
1 Port size G1/4 or 1/4 NPT
2 3 mm deep

Add-on manual override

Without detent
Model: 0600205



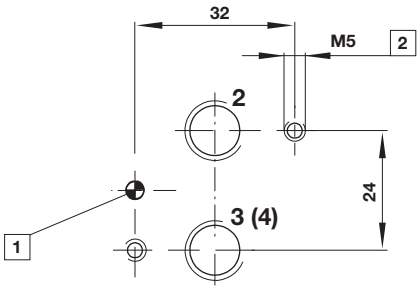
With detent
Model: 0601765



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

NAMUR hole pattern (actuator side)

Dimensions in mm
Projection/First angle



1 Coding stud threaded
2 8 mm deep

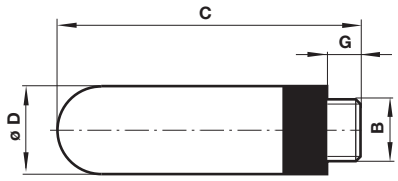
NAMUR quick exhaust module for a better kv-value by exhaust see data sheet 5.4.820

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

Accessories

Silencer

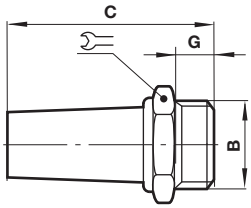
Model:
plastic: M/S2, C/S2



B	G	C	Ø 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

Silencer

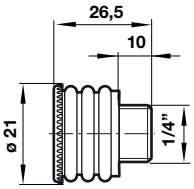
Model:
brass: T40C2800, MS002A
stainless steel: 0014613, 0613678



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	17	67	0613678

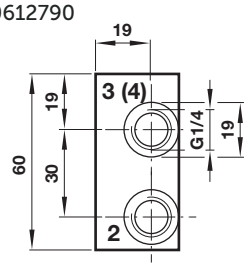
Exhaust guard

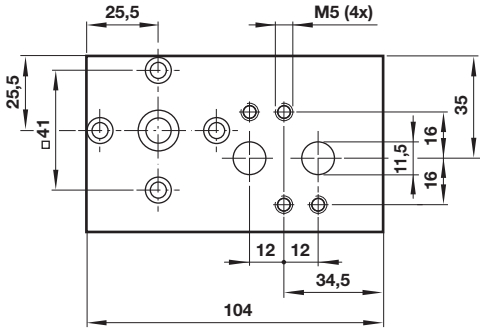
Model:
0613422

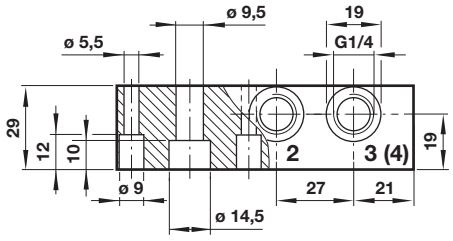


Single connection plate

Model:
0612790

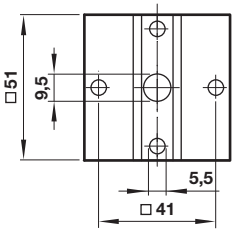


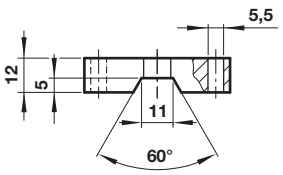




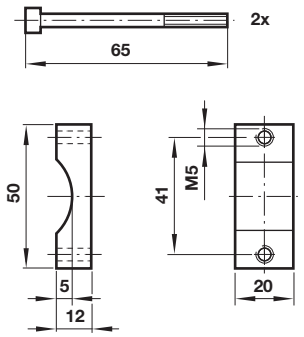
NAMUR rip

Model: 0612791

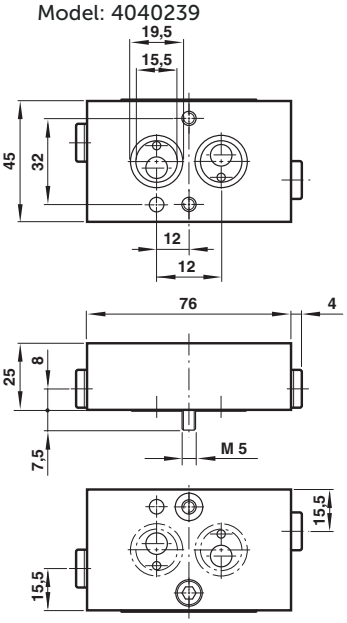


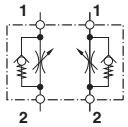


Yoke
Model: 0540593



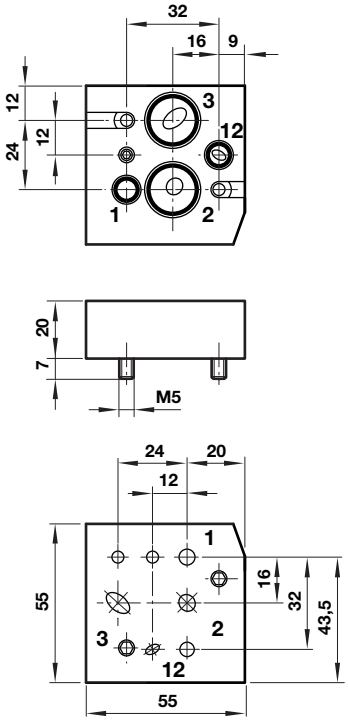
Throttle control plate
Model: 4040239



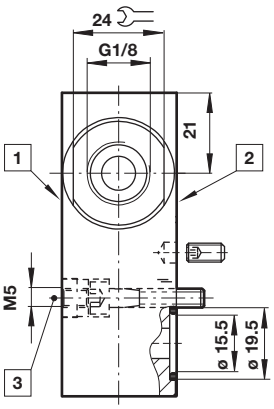


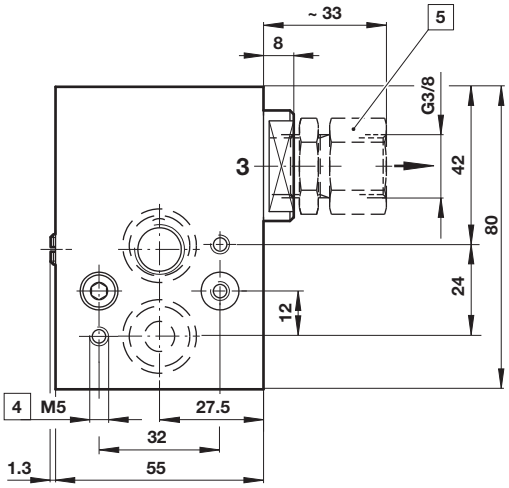
90° Mounting plate
Model: 0613453

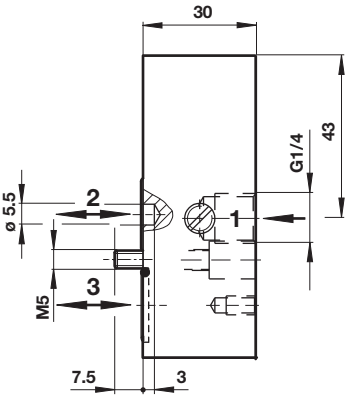
Dimensions in mm
Projection/First angle



Quick exhaust module
Typ: 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 retrofittable

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 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.
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.