

- > **Port size: 1/4" or 1/2" ISO G/NPT**
- > **Main application: single and double operated actuators**
- > **TÜV-approval based on type examination DIN EN 161, DIN 3394 and IEC 61 508**
- > **Valves for safety systems multi-channel up to SIL 3**
- > **Crossover-free switching**
- > **Add-on manual override**
- > **Suited for outdoor use under critical environment conditions (see solenoid list)**
- > **The solenoid valves are applicable in the protection classes Ex e mb, Ex d mb, Ex mb, Ex ia for zones 1 & 2 (gas), 21 & 22 (dust), ATEX cat. II 2GD**
- > **International approvals: IEC Ex, FM, CSA others on request**



Technical features

Medium:

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

Operation:

Indirect solenoid operated spool valves

Operating pressure:

2,5 ... 8 bar (36 ... 116 psi) with internal air supply
0 ... 8 bar (0 ... 116 psi) with external air supply (G1/2, 1/2 NPT or low power pilot system only)

Orifice:

DN 6 or DN 8

Port size::

G 1/4, 1/4 NPT, G 1/2, 1/2 NPT or NAMUR Interface with integrated exhaust air

Mounting position:

Optional, impuls valves preferably horizontally

Ambient/Media temperature:

Valve:

-40° ... +65°C (-40° ... +149°F) (special NBR)

-25° ... +80°C (-13° ... +176°F) (HNBR)

Depending on solenoid system

Air supply must be dry enough to avoid ice formation at temperatures below +2°C (+35°F).

For outdoor installations must be protected all connections against the penetration of moisture and a solenoid with IP66 protection must be used!

Materials:

Body: aluminium 3.0615 with surface treatment for critical environmental conditions (approved according to DIN 50018: Condensate test with alternating temperatures in sulphuric atmosphere, DIN 50021/ASTM B117-73: Salt spray test with different sodium chloride solutions, tested in ammonia atmosphere), brass 2.0401 (Ms 58) stainless steel 1.4404 (316 L)
Seals: special NBR or HNBR

3/2, 5/2 and 5/3 way valves with seals NBR -40 ... +65°C *3)

Housing: aluminium anodized

Symbol	Ports 1, 3, (5)	2, 4	Actuation	Operating pressure (bar)	Flow *6) (l/min)	Test certification IEC 61508 *2)	Weight (kg)	Dimension No.	Model *1)
	G 1/4	Flange	Solenoid/spring	2,5 ... 8	1300	x	0,45	1	9710505
	1/4 NPT	Flange	Solenoid/spring	2,5 ... 8	1300	x	0,45	1	9710515
	G 1/2	Flange	Solenoid/spring	2,5 ... 8	2600		0,80	7	9710595
	1/2 NPT	Flange	Solenoid/spring	2,5 ... 8	2600		0,80	7	9710596
	G 1/4	Flange	Solenoid/solenoid	2,5 ... 8	1300		0,65	2	9711505
	1/4 NPT	Flange	Solenoid/solenoid	2,5 ... 8	1300		0,65	2	9711515
	G 1/4	Flange	Solenoid/solenoid (APB)	2,5 ... 8	950		0,7	3	9712505
	1/4 NPT	Flange	Solenoid/solenoid (APB)	2,5 ... 8	950		0,7	3	9712515

Housing: brass

Symbol	Ports 1, 3, (5)	2, 4	Actuation	Operating pressure (bar)	Flow *6) (l/min)	Test certification IEC 61508 *2)	Weight (kg)	Dimension No.	Model *1)
	G 1/4	Flange	Solenoid/spring	2,5 ... 8	1300	x	1,00	1	9710605
	1/4 NPT	Flange	Solenoid/spring	2,5 ... 8	1300	x	1,00	1	9710615
	G 1/4	Flange	Solenoid/solenoid	2,5 ... 8	1300		1,40	2	9711605
	1/4 NPT	Flange	Solenoid/solenoid	2,5 ... 8	1300		1,40	2	9711615
	G 1/4	Flange	Solenoid/solenoid (APB)	2,5 ... 8	950		1,50	3	9712605
	1/4 NPT	Flange	Solenoid/solenoid (APB)	2,5 ... 8	950		1,50	3	9712615

Housing: stainless steel

Symbol	Ports 1, 3, (5)	2, 4	Actuation	Operating pressure (bar)	Flow *6) (l/min)	Test certification IEC 61508 *2)	Weight (kg)	Dimension No.	Model *1)
	G 1/4	Flange	Solenoid/spring	2,5 ... 8	1300	x	1,00	1	9710705
	1/4 NPT	Flange	Solenoid/spring	2,5 ... 8	1300	x	1,00	1	9710715
	G 1/4	Flange	Solenoid/solenoid	2,5 ... 8	1300		1,40	2	9711705
	1/4 NPT	Flange	Solenoid/solenoid	2,5 ... 8	1300		1,40	2	9711715
	G 1/4	Flange	Solenoid/solenoid (APB)	2,5 ... 8	950		1,50	3	9712705
	1/4 NPT	Flange	Solenoid/solenoid (APB)	2,5 ... 8	950		1,50	3	9712715

In order to ensure full flow and proper function make sure that sufficient pressure supply with feed pipe diameters according to the port size is available.

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

*2) Since May 2008, Date code A8192

*3) For operation in plants according to IEC 61511/61508 -40 ... +40°C see test certificate (on request)

*6) Flow characteristics conforms to ISO6358 [6 » 5 bar]

Note for *6): Connecting pipe/fitting: In order to ensure and a pressure collapse avoid the flow, the supply air cross section should with 1/4: ≥ 8 mm; with 1/2: ≥ 10 mm. With smaller cross section the inlet (A1) should more largely, however at least equally large line at the port (A2; A1).

Valve function: APB = All Ports Blocked

3/2 or 5/2 way function (Conversion instructions see page 14)

Option selector

971*****.*****.*****

Function	Substitute
5/2 way with spring return (3/2 way with adapter plate for NAMUR flange)	0
5/2 way impuls (3/2 way with adapter plate for NAMUR flange)	1
5/3 way with spring return (ABP)	2
Material: Housing/seals	Substitute
Aluminium/HNBR (-25 ... + 80°C)	2
Brass/HNBR (-25 ... + 80°C)	3
Stainless steel/HNBR (-25 ... + 80°C)	4
Aluminium/NBR (-40 ... + 65°C)	5
Brass/NBR (-40 ... + 65°C)	6
Stainless steel/NBR (-40 ... + 65°C)	7
Special version *1)	9
Ports size	Substitute
G 1/4	0
1/4 NPT	1
G 1/2	9
1/2 NPT (in connection with 'version code 6' below described)	9
Version	Substitute
Without manual override (retrofit)	5
Semi automatic (on request)	7
Low power pilot (see page 5)	9
For 1/2 NPT only + NAMUR (manual override retrofit)	6

Air supply	Substitute
Internal	0
Externa	Z
Voltage	Substitute
24 V d.c.	024.0
230 V a.c.	230.5
Solenoid	Substitute
see solenoid table	

Valve function:




APB = All Ports Blocked

*1) Norgren internal use.

Port size and other features shown under version are different.

E.g. 971x901: Valve with inlet filter and exhaust guards according to customer requirement.

Solenoids, standard voltages

Image	Power consumption		Rated current		Protection class IP/NEMA	Ex-Protection (ATEX-Category)	Temperature Ambient/ Media (°C)	Electrical connection	Drawing No.	Circuit diagram No.	Model
	24 V d.c. (W)	230 V a.c. (VA)	24 V d.c. (m A)	230 V a.c. (m A)							
	1,9	2,1 *2)	78	11	IP65 (with connector)	—	-25 ... +60	Connector DIN EN 175301-803, form A *1)	3	1/5	0763
	3,6	—	150	—	IP66	II 2G Ex mb IIC T4 Gb II 2D Ex mb IIIC T110°C Db	-20 ... +70	Cable length 3 m	5	4	0298
	—	4,6	—	18	IP66	II 2G Ex mb IIC T4 Gb II 2D Ex mb IIIC T110°C Db	-20 ... +70	Cable length 3 m	5	4	0299
	0,8	—	38	—	IP66 (with cable gland)	II 2G Ex eb mb IIC T5/T6 Gb II 2D Ex tb IIIC T130°C Db	T5: -40 ... +80 T6: -40 ... +70 -40 ... +80	M20 x 1,5 *1)	6	4	4200
	—	1,3	—	6	IP66 (with cable gland)	II 2G Ex eb mb IIC T5/T6 Gb II 2D Ex tb IIIC T130°C Db	T5: -40 ... +80 T6: -40 ... +70 -40 ... +80	M20 x 1,5 *1)	6	7	4201

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

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

*2) Required connector: type 0570275 for d.c.; type 0663303 for a.c., 200 V d.c. solenoid voltage must be ordered!


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

Approvals

Model	Approvals ATEX	IECEX	FM	Datasheet
029x	KEMA 02 ATEX 1347 X	—	—	N/en 7.1.505
42xx	KEMA 98 ATEX 4452 X	IECEX KEM 09.0068X	—	N/en 7.1.580

Solenoid actuators for intrinsically-safe circuits

	Nominal resistance RN coil (Ω)	Min. required switching current (mA)	Resistance Rw 60 coil (Ω)	Required voltage at terminal Rw 60 (V)	IP Protection class	Ex-Protection (ATEX-Category)	Temperature Ambient/Media (°C)	Drawing No.	Circuit diagram No.	Model
		200	33	240	8	IP66 (with cable gland)	II 2G Ex ia IIC T4/T6 Gb II 2D Ex ia IIIC T80°C Db II 2D Ex ia IIIC T100°C Db	T4: -40 ... +80 T6: -40 ... +60 -40 ... +60 -40 ... +80	17	10
391		24	460	11	IP66 (with cable gland)	II 2G Ex ia IIC T4/T6 Gb II 2D Ex ia IIIC T80°C Db II 2D Ex ia IIIC T100°C Db	T4: -40 ... +80 T6: -40 ... +60 -40 ... +60 -40 ... +80	17	10	2051
736		17	880	15	IP66 (with cable gland)	II 2G Ex ia IIC T4/T6 Gb II 2D Ex ia IIIC T80°C Db II 2D Ex ia IIIC T100°C Db	T4: -40 ... +80 T6: -40 ... +60 -40 ... +60 -40 ... +80	17	10	2052
1220		13	1460	19	IP66 (with cable gland)	II 2G Ex ia IIC T4/T6 Gb II 2D Ex ia IIIC T80°C Db II 2D Ex ia IIIC T100°C Db	T4: -40 ... +80 T6: -40 ... +60 -40 ... +60 -40 ... +80	17	10	2053

Cable gland (cable Ø 5 ... 10 mm) is in scope of delivery

When selecting an intrinsically safe power supply, the permissible maximum values according to the Certificate of Conformity should be taken into account.

Ui = 45 V, Ii = 500 mA according to Tab. A. 1, EN 60079-11

Pi = 2,0 W, Li and Ci can be ignored.

Approvals

Model	Approvals		Datasheet
	ATEX	IECEX	
205x	PTB 07 ATEX 2019	IECEX PTB 07.0017	N/en 7.1.535