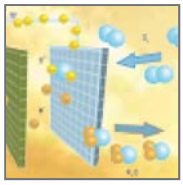
Buschjost



RENEWABLE ENERGIES

Ventiltechnik aus Leidenschaft

NORGREN FLUID CONTROLS

Comercial Andaluza de Técnicas y Suministros, S.L. (CATS, S.L.) Málaga (España). Telf: +(34) 952 24 61 37 www.cats.es comercial@cats.es

On off or control

The opening and closing of a valve is just one simple act. Yet so much depends on it. Valves must always operate reliably, without any “ifs” and “buts”.
Valve technology is essential to almost every walk of life. It maintains and enhances our high standard of living.

Good address

Buschjost, now a member of the British IMI Norgren Group, is a market leader in process and all-fluid valves. Short communication channels make the company flexible and responsive. All of its facilities are under one roof: product development with its modern laboratories, production, tooling and prototyping, fully automatic test equipment - in short everything we need for our trend-setting work. A 320-strong workforce ensures perfect integration of all processes.

Over 75 years experience, over 1 million valves per year

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Content

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Markets

Technical progress implies a rapidly changing world where the demand for valve technology is steadily growing. As an expanding company Buschjost is set on opening up new national and international markets.

Buschjost valves are already to be found in virtually every market sector. Well-known customers in mechanical engineering, energy and environmental technology, vehicle manufacturing, process plant engineering etc. place their trust in the high quality and functionality of Buschjost products.

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Individual Solutions

Competitiveness is increasingly important in today's markets. Buschjost helps ist customers be more competitive by providing them with innovative technologies for Fluid Control.

In partnership with its customers, Buschjost develops dedicated system solutions, perfectly adapted to optimise production processes and machine performance. This gives our customers a significant competitive advantage on the market.

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Valve components for hydrogen and fuel cell applications

The fuel cell is one of the most forward-looking technologies for the creation of energy. Developments in this field have reached the stage where all the fundamental questions of how the technology works have been clarified. The next step is to further develop the fuel cell technically into a product with a specific place on the market and start initial production. Already three main areas of application have been identified: moving fuel cells powering vehicles, stationary fuel cells providing energy to buildings and in emergencies or portable applications in laptops and cellphones, for example.

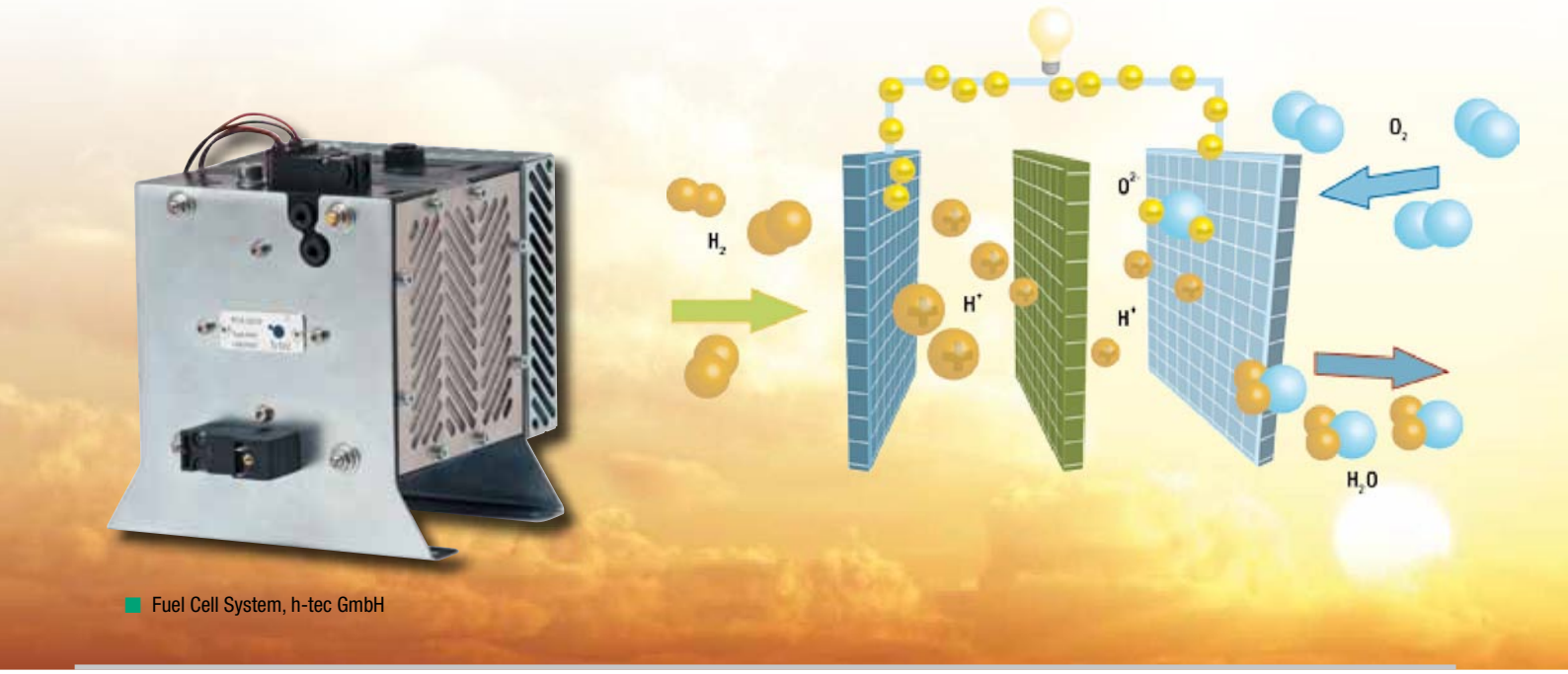
For safe operation, fuel cell systems require advanced valve technology: gas flows must be controlled, liquids must be metered and heat produced in the process must be dissipated. Buschjost offers a comprehensive range of customized and specially developed valve solutions for fuel cell applications. The Buschjost programme covers everything from solenoid stop valves to motor control valves and tailor-made system solutions.

Small portable units require of course extremely compact solutions. In this area, the miniature valves of Buschjost's sister company FAS based in Switzerland are the ideal solution.

For the serial production of stationary plants such as fuel cell heating units, manufacturers require specially adapted yet affordable valve technology. For this market, Buschjost provides viable solutions that are well established in this field.

Mobile applications depend on components that can handle pressures of up to 700 bar as well as low-pressure levels in front of the fuel cell stack. In addition, the valve manufacturer should be experienced in the field of automotive technology. Again, Buschjost, together with its sister companies of the Norgren Group, is your competent partner in this area. Reliable valve technology is also a must when it comes to the production of hydrogen.

This section of our catalogue provides you with an overview of the various system components for hydrogen applications. In addition, Buschjost offers you tailor-made solutions to meet your specific needs. Please contact us to discuss your requirements - and we will provide you with a technically optimised and cost-effective solution!



Fuel Cell System, h-tec GmbH

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Fuel Cell Heating Unit, BAXI INNOTECH

Fuel Cell Heating Unit, VIESSMANN

Fuel Cell Heating Unit, inhouse engineering

Reformer WS Reformer

NORGREN FLUID CONTROLS

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Overview

Picture	Series	Nominal Diameter	Medium	Application	Page
Solenoid valves					
	82510 / 82520	1.5 – 5 mm	Neutral gases and liquids e. g. natural gas, dry hydrogen	e. g. Process medium flow control, Purgefunction, NO-Function	**10**
	82610 / 82620	1.5 – 5 mm	Neutral and slightly aggressive gases and liquids, e. g. demineralized water, reformat, hydrogen	e. g. Process medium flow control, Purgefunction Purgefunction, NO-Function	**14**
	82530 / 82630	10 mm	Neutral gases and liquids, e. g. natural gas, dry hydrogen	e. g. Process medium flow control, Purgefunktion	**18**
	82560 / 82570	10 mm	Neutral and slightly aggressive gases and liquids, e. g. demineralized water, reformat, hydrogen	e. g. Process medium flow control, Purgefunktion	**22**
	Latching	10 mm	Neutral and slightly aggressive gases and liquids, e. g. reformat, hydrogen	e. g. Process medium flow control with power optimisation	**26**
	Bypass	15 mm	Neutral and slightly aggressive gases and liquids, e. g. reformat, hydrogen	e. g. 3-way Bypass circuits for process gas	**27**
	82540	8 – 50 mm	Neutral gases and liquids, e. g. natural gas	e. g. Process medium flow control, NO-Function	**28**
	82590	8 – 50 mm	Neutral and slightly aggressive gases and liquids, e. g. reformat, hydrogen	e. g. Process medium flow control, NO-Function	**34**
	8499881 8499882 8499883	2.5 mm	Neutral and slightly aggressive gases and liquids, e. g. demineralized water,	e. g Process water	**38**
Motorised valves					
	8497342	16 mm	Neutral gases and liquids, e. g. air, water	e. g. Cathode air, cooling circuit	**40**
	8497793	16 mm	Neutral gases and liquids, e. g. air, water	e. g. Cathode air, cooling circuit	**42**
	8497573	25 mm	Neutral gases and liquids, e. g. air, water	e. g. Cathode air, cooling circuit	**44**
	82880	15 – 20 mm	Neutral gases and liquids, e. g. air, water	e. g. Cathode air, cooling circuit	**46**

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Picture	Series	Nominal Diameter	Medium	Application	Page
Miniature valves					
	Chipsol 8 mm	0.5 – 1 mm	Neutral gases	Process gas flow control	**52**
	Picosol 10 mm	0.8 – 1.6 mm	Neutral gases, e. g. hydrogen	Process gas flow control	**55**
	Microsol 15 mm	0.5 – 3.6 mm	Neutral gases, e. g. hydrogen	Process gas flow control	**58**
	Microsol 15 mm media separated	0.5 – 3.6 mm	Neutral gases, e. g. hydrogen	Process gas flow control	**62**
High pressure valves					
	82510 70 bar	1.5 mm	Neutral gases and liquids, e. g. carbon dioxide	e. g. Process medium flow control	**10**
	82610 70 bar	1.5 mm	Neutral and slightly aggressive gases and liquids, e. g. hydrogen	e. g. Process medium flow control	**14**
	200 bar	15 mm	Neutral and slightly aggressive gases and liquids	Process medium flow control, e.g. water misting equipment, fire extinguishing systems, humidification plants	**64**
	320 / 350 bar	10 mm	Neutral and slightly aggressive gases and liquids	Process medium flow control,, e.g. CNG filling stations, H_2 applications	**65**
Pressure reducer					
	K 16	6.3 mm	Air, gases, liquids	Small dome pressure reducing valve for high pressure and low flows	**66**
	J 50	6.3 mm Pressure balanced	Air, gases, liquids	Pressure reducing valve for rapid regulation of outlet pressure, accurate and reliable, ideal for high pressures	**66**
	D 131	4 mm Pressure balanced	Air, gases, liquids	HP-pressure reducing valve for precise regulation of low outlet pressures	**67**
	J 20	1.6 mm	Gases, liquids	e.g. used in laboratories and gas chromatography machines	**67**

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2/2-way valves DN 1.5 to DN 5.0

For neutral gases and liquids
Directly solenoid actuated
Seat valves
Internal threads G 1/8 to G 3/8 or 1/8 NPT to 3/8 NPT
Operating pressure 0 to 40 bar (70 bar)

Click-on®

Description (standard valve)

Solenoid valve for neutral gases and liquids

Switching function:	normally closed
Flow direction:	determined
Fluid temperature:	–10 °C up to max. +90 °C
Ambient temperature:	–10 °C up to max. +50 °C
Mounting position:	optional, preferably solenoid vertical on top

Material

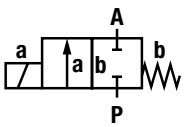
Body:	Brass (CW617N)
Seat seal:	NBR (70 bar version - polymer)
Internal parts:	Stainless steel, Brass

For contaminated fluids insertion of a strainer is recommended.

Features

- Suitable for vacuum
- High flow rate
- Functional compact design
- Body with M5 fastening thread as standard
- Solenoid interchangeable without tools (***Click-on***®)
- Valve operates without pressure differential

Symbol



Ordering information

To order, quote model number from table overleaf. e.g. 8251820.9101 for a DN 2.5 valve.

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Characteristic data

Valves normally closed

Part Number	Nominal Diameter (mm)	Connection Size	Operating Pressure* min. (bar)	max. (bar)	k_V-value ** (Base m^3/h)	Weight Total (kg)
8251800.9101 8252800.9101	1.5	G 1/8 1/8 NPT	0	25	0.07	0.33
8251000.9101 8252000.9101	1.5	G 1/4 1/4 NPT	0	25	0.07	0.33
8251100.9101 8252100.9101	1.5	G 3/8 3/8 NPT	0	25	0.07	0.33
8251807.9151 8252807.9151	1.5	G 1/8 1/8 NPT	0	70	0.07	0.57
8251007.9151 8252007.9151	1.5	G 1/4 1/4 NPT	0	70	0.07	0.57
8251107.9151 8252107.9151	1.5	G 3/8 3/8 NPT	0	70	0.07	0.57
8251820.9101 8252820.9101	2.5	G 1/8 1/8 NPT	0	10	0.15	0.33
8251020.9101 8252020.9101	2.5	G 1/4 1/4 NPT	0	10	0.15	0.33
8251120.9101 8252120.9101	2.5	G 3/8 3/8 NPT	0	10	0.15	0.33
8251820.9151 8252820.9151	2.5	G 1/8 1/8 NPT	0	40	0.15	0.57
8251020.9151 8252020.9151	2.5	G 1/4 1/4 NPT	0	40	0.15	0.57
8251120.9151 8252120.9151	2.5	G 3/8 3/8 NPT	0	40	0.15	0.57
8251840.9101 8252840.9101	3.0	G 1/8 1/8 NPT	0	4	0.21	0.33
8251040.9101 8252040.9101	3.0	G 1/4 1/4 NPT	0	4	0.21	0.33
8251140.9101 8252140.9101	3.0	G 3/8 3/8 NPT	0	4	0.21	0.33
8251840.9151 8252840.9151	3.0	G 1/8 1/8 NPT	0	20	0.21	0.57
8251040.9151 8252040.9151	3.0	G 1/4 1/4 NPT	0	20	0.21	0.57
8251140.9151 8252140.9151	3.0	G 3/8 3/8 NPT	0	20	0.21	0.57
8251860.9151 8252860.9151	4.0	G 1/8 1/8 NPT	0	12	0.35	0.57
8251060.9151 8252060.9151	4.0	G 1/4 1/4 NPT	0	12	0.35	0.57
8251160.9151 8252160.9151	4.0	G 3/8 3/8 NPT	0	12	0.35	0.57
8251880.9151 8252880.9151	5.0	G 1/8 1/8 NPT	0	6	0.50	0.57
8251080.9151 8252080.9151	5.0	G 1/4 1/4 NPT	0	6	0.50	0.57
8251180.9151 8252180.9151	5.0	G 3/8 3/8 NPT	0	6	0.50	0.57

Valves normally open

8251001.9101 8252001.9101	1.5	G 1/4 1/4 NPT	0	16	0.07	0.33
8251021.9101 8252021.9101	2.5	G 1/4 1/4 NPT	0	6	0.15	0.33
8251021.9151 8252021.9151	2.5	G 1/4 1/4 NPT	0	25	0.15	0.57
8251041.9151 8252041.9151	3.0	G 1/4 1/4 NPT	0	3	0.21	0.33
8251041.9151 8252041.9151	3.0	G 1/4 1/4 NPT	0	16	0.21	0.57
8251061.9151 8252061.9151	4.0	G 1/4 1/4 NPT	0	8	0.35	0.57

* for gases and liquid fluids up to 25 mm^2/s (cSt)

** C_V-value (US) ≈ k_V-value x 1.2

State voltage [V] and frequency [Hz]

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Solenoid 9101 / 9151

Standard voltage

DC ⎓	AC ∼ 50 Hz	AC ∼ 60 Hz
24 V	24 V	–
–	110 V	120 V
–	230 V	220 V

Design acc. to DIN VDE 0580
Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP65
Socket Form A acc. to DIN EN 175301-803 (included)

Power Consumption

According to DIN VDE 0580 at coil temperature of +20 °C. In operation the power consumption of the solenoid decreases by approx. 30 %.

Solenoid	DC ⎓	AC ∼ Inrush	AC ∼ Holding
9101 *	8 W	15 VA	12 VA / 7 W
9151 *	18 W	9 VA	9 VA / 7 W

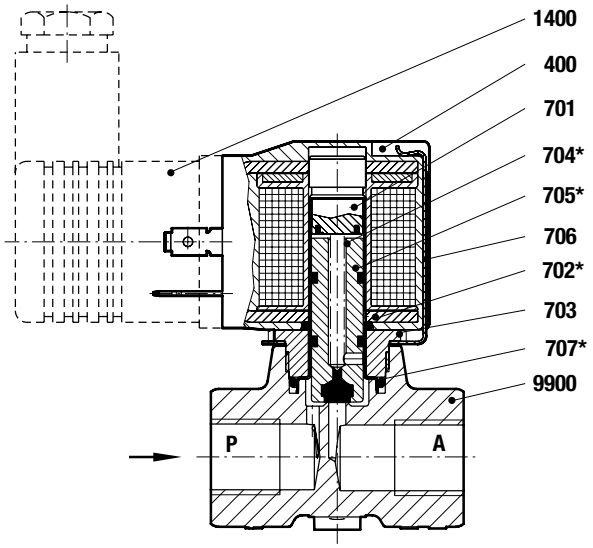
* c SP us coil only

Attention!
The conditions imposed on the Ex approvals lead to reduction of the permissible standard temperature ranges in the cases of explosion protected solenoids.

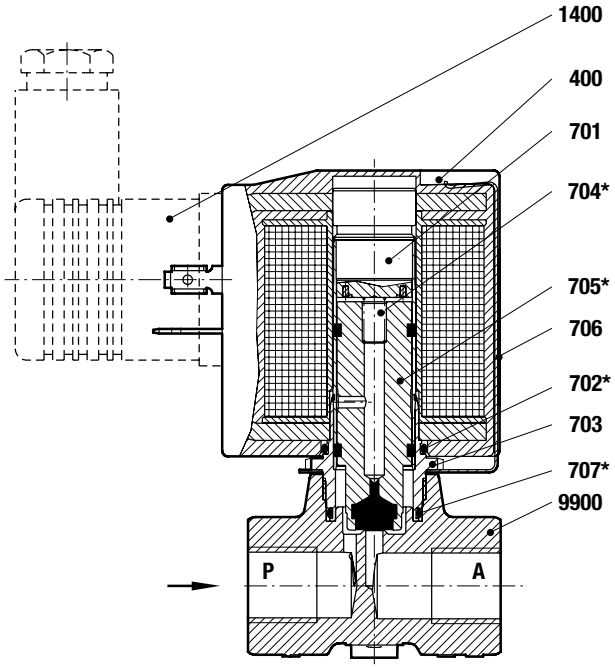
On request
deeper temperatures

Section View

with solenoid 9101



with solenoid 9151



400 Solenoid
701 Core tube
*702 O-ring
703 Screw piece
*704 Pressure spring
*705 Plunger
706 Spring clip
*707 O-ring
1400 Electrical connector (included)
9900 Valve body

* These individual parts form a complete wearing unit.
When ordering spare parts please state Cat. No. and Series No.

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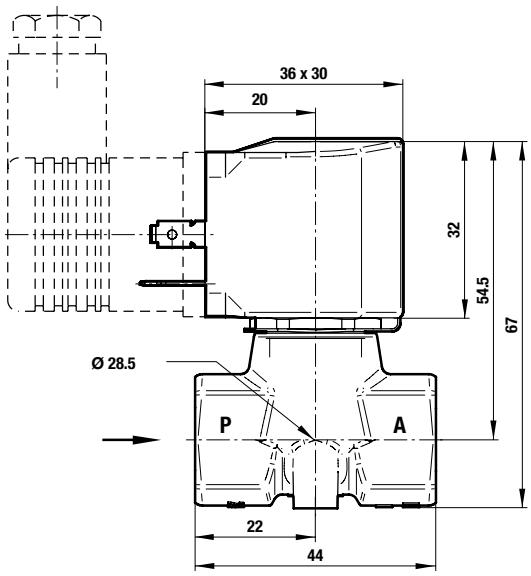
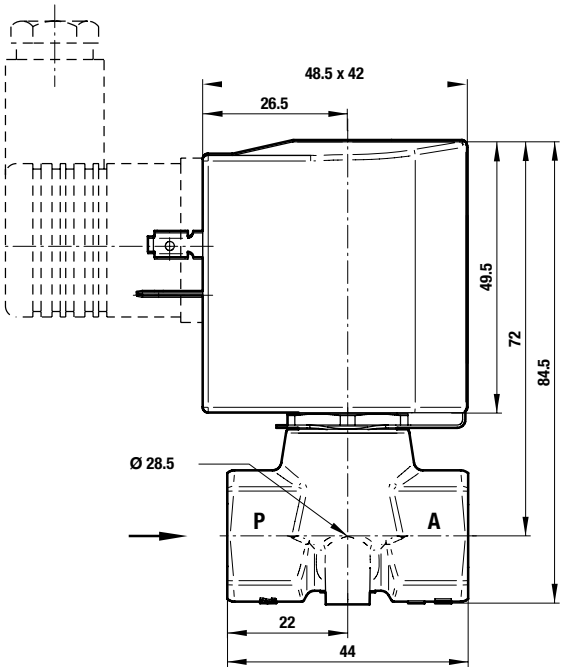
General Dimensions

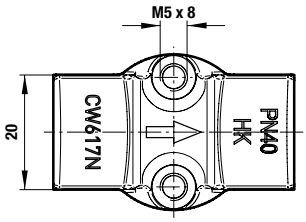
Solenoid rotatable 360°
Socket turnable 4 x 90°
(Socket included)

with solenoid 9101



with solenoid 9151





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2/2-way valves DN 1.5 to DN 5.0

For neutral and slightly aggressive gases and liquid fluids
Directly solenoid actuated
Seat valves
Internal threads G 1/8 to G 3/8 or 1/8 NPT to 3/8 NPT, special connections
Operating pressure 0 to 40 bar (70 bar)

Stainless Steel

Click-on®

Description (standard valve)

Solenoid valve for neutral gases and liquids

Switching function:	normally closed
Flow direction:	determined
Fluid temperature:	–10 °C up to max. +110 °C
Ambient temperature:	–10 °C up to max. +50 °C
Mounting position:	optional . preferably solenoid vertical on top

Material

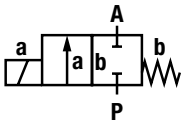
Body:	Stainless steel (1.4408)
Seat seal:	FPM (70 bar version - polymer)
Internal parts:	Stainless steel

For contaminated fluids insertion of a strainer is recommended.

Features

- Suitable for vacuum
- High flow rate
- Functional compact design
- Body with M5 fastening thread as standard
- Solenoid interchangeable without tools (***Click-on***®)
- Valve operates without pressure differential

Symbol



Ordering information

To order, quote model number from table overleaf, e.g. 8261823.9101 for a DN 2.5 valve.

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Characteristic data

Valves normally closed

Part Number	Nominal Diameter (mm)	Connection Size	Operating Pressure * min. (bar)	max. (bar)	k_V-value ** (Base m^3/h)	Weight Total (kg)
8261803.9101 8462803.9101	1.5	G 1/8 1/8 NPT	0	25	0.07	0.33
8261003.9101 8462003.9101	1.5	G 1/4 1/4 NPT	0	25	0.07	0.33
8261103.9101 8462103.9101	1.5	G 3/8 3/8 NPT	0	25	0.07	0.33
8261807.9151 8462807.9151	1.5	G 1/8 1/8 NPT	0	70	0.07	0.57
8261007.9151 8462007.9151	1.5	G 1/4 1/4 NPT	0	70	0.07	0.57
8261107.9151 8462107.9151	1.5	G 3/8 3/8 NPT	0	70	0.07	0.57
8261823.9101 8462823.9101	2.5	G 1/8 1/8 NPT	0	10	0.15	0.33
8261023.9101 8462023.9101	2.5	G 1/4 1/4 NPT	0	10	0.15	0.33
8261123.9101 8462123.9101	2.5	G 3/8 3/8 NPT	0	10	0.15	0.33
8261823.9151 8462823.9151	2.5	G 1/8 1/8 NPT	0	40	0.15	0.57
8261023.9151 8462023.9151	2.5	G 1/4 1/4 NPT	0	40	0.15	0.57
8261123.9151 8462123.9151	2.5	G 3/8 3/8 NPT	0	40	0.15	0.57
8261843.9101 8462843.9101	3.0	G 1/8 1/8 NPT	0	4	0.21	0.33
8261043.9101 8462043.9101	3.0	G 1/4 1/4 NPT	0	4	0.21	0.33
8261143.9101 8462143.9101	3.0	G 3/8 3/8 NPT	0	4	0.21	0.33
8261843.9151 8462843.9151	3.0	G 1/8 1/8 NPT	0	20	0.21	0.57
8261043.9151 8462043.9151	3.0	G 1/4 1/4 NPT	0	20	0.21	0.57
8261143.9151 8462143.9151	3.0	G 3/8 3/8 NPT	0	20	0.21	0.57
8261863.9151 8462863.9151	4.0	G 1/8 1/8 NPT	0	12	0.35	0.57
8261063.9151 8462063.9151	4.0	G 1/4 1/4 NPT	0	12	0.35	0.57
8261163.9151 8462163.9151	4.0	G 3/8 3/8 NPT	0	12	0.35	0.57
8261883.9151 8462883.9151	5.0	G 1/8 1/8 NPT	0	6	0.50	0.57
8261083.9151 8462083.9151	5.0	G 1/4 1/4 NPT	0	6	0.50	0.57
8261183.9151 8462183.9151	5.0	G 3/8 3/8 NPT	0	6	0.50	0.57

Valves normally open

8261001.9101 8462001.9101	1.5	G 1/4 1/4 NPT	0	16	0.07	0.33
8261021.9101 8462021.9101	2.5	G 1/4 1/4 NPT	0	6	0.15	0.33
8261021.9151 8462021.9151	2.5	G 1/4 1/4 NPT	0	25	0.15	0.57
8261041.9101 8462041.9101	3.0	G 1/4 1/4 NPT	0	3	0.21	0.33
8261041.9151 8462041.9151	3.0	G 1/4 1/4 NPT	0	16	0.21	0.57
8261061.9151 8462061.9151	4.0	G 1/4 1/4 NPT	0	8	0.35	0.57

* for gases and liquid fluids up to 25 mm^2/s (cSt)

** C_V-value (US) ≈ k_V-value x 1.2

State voltage [V] and frequency [Hz]

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Solenoid 9101 / 9104 and 9151 / 9154

Standard voltage

DC ⎓	AC ∼ 40 Hz – 60 Hz	
24 V	24 V	–
–	110 V	120 V
–	230 V	220 V

Design acc. to DIN VDE 0580
Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP65
Socket Form A acc. to DIN EN 175301-803 (included)
AC with rectifier plug

Power Consumption

According to DIN VDE 0580 at coil temperature of +20 °C. In operation the power consumption of the solenoid decreases by approx. 30 %.

Solenoid	DC ⎓	AC ∼ Inrush	Holding
9101 *	8 W	15 VA	12 VA / 7 W
9151 *	18 W	9 VA	9 VA / 7 W

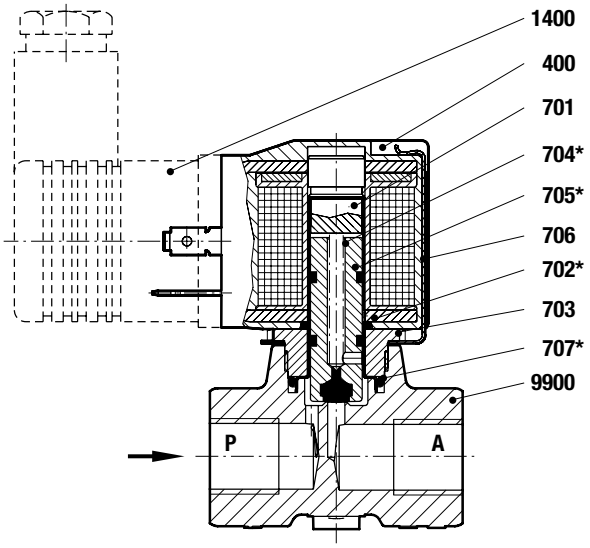
* c SP us coil only

Attention!
The conditions imposed on the Ex approvals lead to reduction of the permissible standard temperature ranges in the cases of explosion protected solenoids.

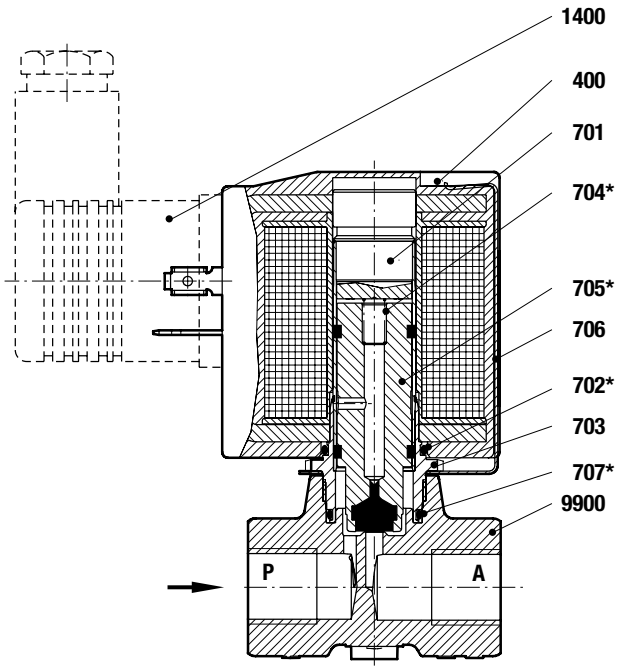
On request
Seat seal material EPDM
Seat seal material PTFE (leakage rate E acc. to EN 12266-1)
deeper temperatures

Section View

with solenoid 9101



with solenoid 9151



400 Solenoid
701 Core tube
*702 O-ring
703 Screw piece
*704 Pressure spring
*705 Core
706 Spring clip
*707 O-ring
1400 Socket (included)
9900 Valve body

* These individual parts form a complete wearing unit.
When ordering spare parts please state Cat. No. and Series No.

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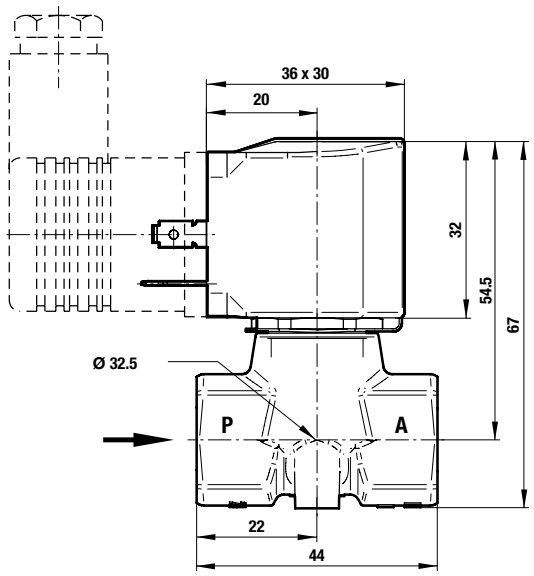
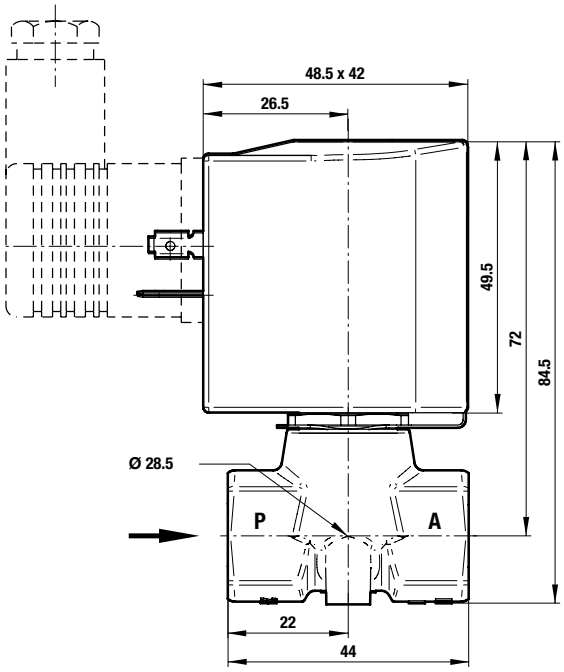
General Dimensions

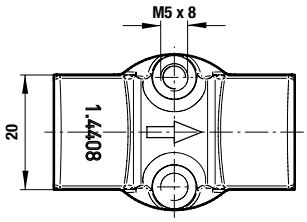
Solenoid rotatable 360°
Socket turnable 4 x 90°
(Socket included)

with solenoid 9101



with solenoid 9151





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2/2-way valves DN 10

For neutral gases and liquids
Solenoid actuated, with forced lifting
Diaphragm valves
Internal threads G 1/4 to G 1/2 or 1/4 NPT to 1/2 NPT, special connections
Operating pressure 0 to 10 bar

Description (standard valve)

Solenoid valve for e. g. air, water, oil and other neutral fluids

Switching function:	normally closed
Flow direction:	determined
Fluid temperature:	–10 °C up to max. +90 °C
Ambient temperature:	–10 °C up to max. +50 °C
Mounting position:	optional, preferably solenoid vertical on top

Material

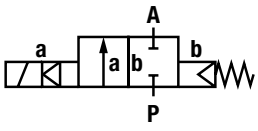
Body:	Brass (CW617N), PA 66
Seat seal:	NBR
Internal parts:	Stainless steel, PVDF

For contaminated fluids insertion of a strainer is recommended.

Features

- Suitable for vacuum
- Functional design
- Compact solenoid with integrated core tube
- Valve operates without differential pressure
- Operating pressure 0 – 20 bar with alternating current and NBR sealing

Symbol



Ordering information

To order, quote model number from table overleaf, e. g. 8253200.8001 for a DN 10 valve.

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Characteristic data

Valves

Part Number	Nominal Diameter (mm)	Connection Size	Valve Length (mm)	Operating Pressure * min. (bar)	max. (bar)	k_V-value ** (Base m^3/h)	Weight Total (kg)
8253000.8001 8263000.8001	10	G 1/4 1/4 NPT	44	0	10	1.5	0.5
8253100.8001 8263100.8001	10	G 3/8 3/8 NPT	44	0	10	1.7	0.5
8253200.8001 8263200.8001	10	G 1/2 1/2 NPT	60	0	10	1.7	0.6

* for gases and liquid fluids up to 25 mm^2/s (cSt)

** C_V-value (US) ≈ k_V-value x 1.2

State voltage [V] and frequency [Hz]

Solenoid 8001

Standard voltage

DC ⎓	AC ∼ 50 Hz	AC ∼ 60 Hz
24 V	24 V	–
–	110 V	120 V
–	230 V	220 V

Design acc. to DIN VDE 0580
Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP65
Socket Form A acc. to DIN EN 175301-803 (included)

Power Consumption

According to DIN VDE 0580 at coil temperature of +20 °C. In operation the power consumption of the solenoid decreases by approx. 30 %.

Solenoid	DC ⎓	AC ∼ Inrush	Holding
8001	18 W	–	–
8001	–	20 VA	20 VA

Attention!
The conditions imposed on the Ex approvals lead to reduction of the permissible standard temperature ranges in the cases of explosion protected solenoids.

Further options (valves)

XXXXX**03**.XXXX Seat seal FPM,
for fuel and oil,
max. fluid temperature +110 °C

XXXXX**14**.XXXX Seat seal EPDM,
for hot water,
max. fluid temperature +110 °C

XXXXX**18**.XXXX Degreased version, seat seal FPM

XXXXX**22**.XXXX Operating pressure 0 up to 20 bar,
only for NBR and AC solenoid

XXXXX**51**.XXXX Seat seal HNBR,
for hot water and steam,
operating pressure 0 – 6 bar
fluid temperature 0 °C up to max. +150 °C

On request Further versions

Accessoires: - body with fastening thread 2x M5

Further options (solenoids)

XXXXXX.**8004** DC solenoid with rectifier for AC only

XXXXXX.**8041** Protection class
Ⓔx II 2 GD EEx me II T3 T 140 °C

On request Further versions

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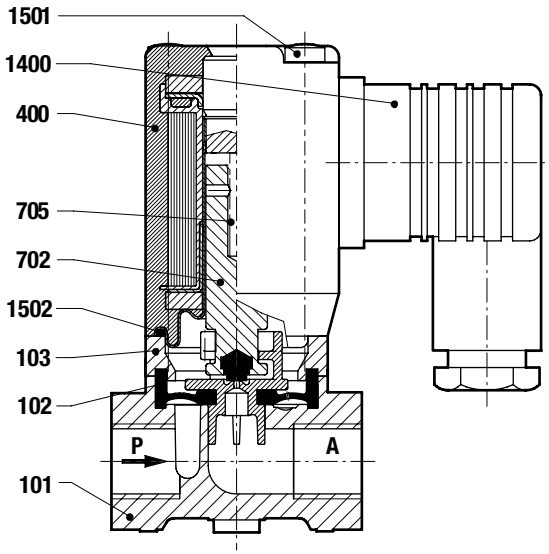
Section View



101	Valve body
*102	Diaphragm
103	Spacer
400	Solenoid
*702	Plunger
*705	Pressure spring
1400	Electrical connector (included)
1501	Oval head cap screw
*1502	O-ring

* These individual parts form a complete wearing unit.
When ordering spare parts please state Cat. No. and Series No.

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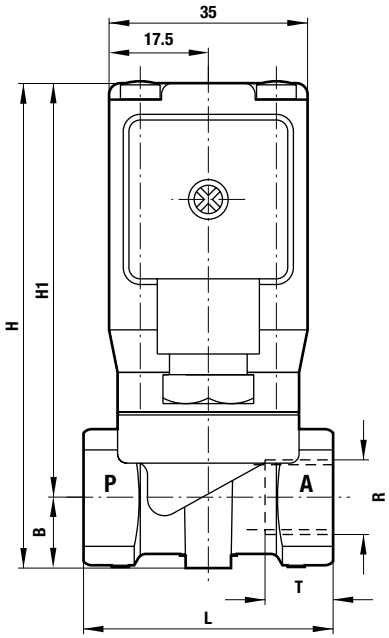
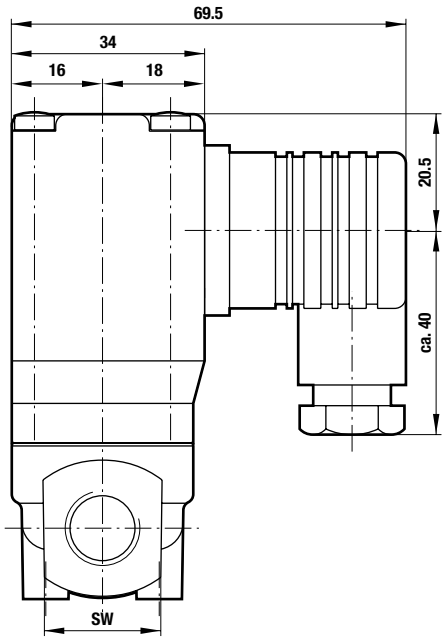
General Dimensions

Solenoid rotatable 360°
Socket turnable 4 x 90°
(Socket included)





Part Number	Nominal Diameter (mm)	Connection Size	B (mm)	H (mm)	H1 (mm)	L (mm)	SW	T (mm)
8253000.8001 8263000.8001	10	G 1/4 1/4 NPT	14	87	73	44	21	12 10
8253100.8001 8263100.8001	10	G 3/8 3/8 NPT	14	87	73	44	21	12 10
8253200.8001 8263200.8001	10	G 1/2 1/2 NPT	14	90	74,5	60	27	15 13

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2/2-way valves DN 10

For slightly aggressive gases and liquids
Solenoid actuated, with forced lifting
Diaphragm valves
Internal threads G 1/4 to G 1/2 or 1/4 NPT to 1/2 NPT, special connections
Operating pressure 0 to 10 bar

Description (standard valve)

Stainless Steel

Solenoid valve for slightly aggressive gases and liquids

Switching function:	normally closed
Flow direction:	determined
Fluid temperature:	–10 °C up to max. +90 °C
Ambient temperature:	–10 °C up to max. +50 °C
Mounting position:	optional, preferably solenoid vertical on top

Material

Body:	Stainless steel (1.4408), PA 66
Seat seal:	NBR
Internal parts:	Stainless steel, PVDF, Sandvik 1802

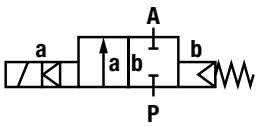
For contaminated fluids insertion of a strainer is recommended.

Special conection:
Flange clamp

Features

- Suitable for vacuum
- Clear design
- Compact solenoid with integrated core tube
- Valve operates without differential pressure

Symbol



Ordering information

To order, quote model number from table overleaf, e. g. 8256200.8001 for a DN 10 valve.

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Characteristic data

Valves

Part Number Solenoid with ⎓	Part Number Solenid with ∼	Nominal Diameter (mm)	Conneczion Size	Valve Length (mm)	Operating Pressure * min. (bar)	max. (bar)	k_V-value ** (Base m^3/h)	Weight Total (kg)
8256000.8001 8257000.8001	8256000.8004 8257000.8004	10	G 1/4 1/4 NPT	44	0	10	1.5	0.5
8256100.8001 8257100.8001	8256100.8004 8257100.8004	10	G 3/8 3/8 NPT	44	0	10	1.7	0.5
8256200.8001 8257200.8001	8256200.8004 8257200.8004	10	G 1/2 1/2 NPT	60	0	10	1.7	0.6

* for gases and liquid fluids up to 25 mm^2/s (cSt)

** C_V-value (US) ≈ k_V-value x 1.2

State voltage [V] and frequency [Hz]

Solenoid 8001 / 8004

Standard voltage

DC ⎓	AC ∼ 40 Hz – 60 Hz	
24 V	24 V	–
–	110 V	120 V
–	230 V	220 V

Design acc. to DIN VDE 0580
Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP65
Socket Form A acc. to DIN EN 175301-803 (included)
AC with rectifier plug

Power Consumption

According to DIN VDE 0580 at coil temperature of +20 °C. In operation the power consumption of the solenoid decreases by approx. 30 %.

Solenoid	DC ⎓	AC ∼ Inrush	Holding
8001	12 W		
8004		13 VA	13 VA

Attention!
The conditions imposed on the Ex approvals lead to reduction of the permissible standard temperature ranges in the cases of explosion protected solenoids.

Further options (Valves)

XXXXX**03**.XXXX Seat seal FPM,
for fuel ad oil,
max. fluid temperature +110 °C

XXXXX**14**.XXXX Seat seal EPDM,
for hot water,
max. fluid temperature +110 °C

XXXXX**51**.XXXX Seat seal HNBR,
for steam,
max. fluid temperature +150 °C,
max. operating pressure 6 bar

On request Further versions

Further options (Solenoids)

XXXXXXX.**8041** Solenoid in protection class
Ⓔx II 2 GD EEx me II T3 T 140 °C

On request Further versions

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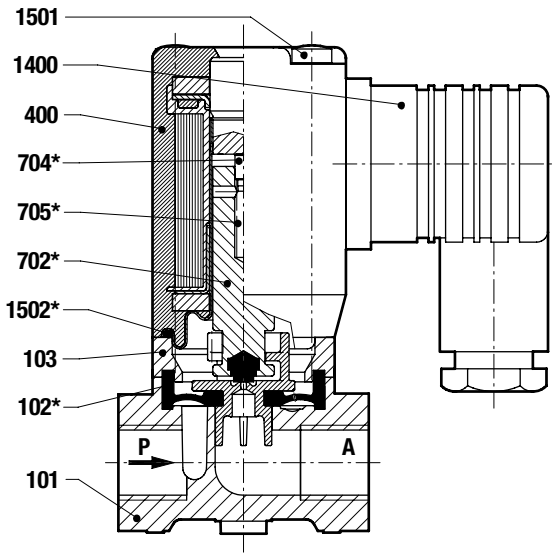
Section View



101	Valve body
*102	Diaphragm
103	Spacer
400	Solenoid
*702	Plunger
*704	Guiding pin
*705	Pressure spring
1400	Electrical connector (included)
1501	Oval head cap screw
*1502	O-ring

* These individual parts form a complete wearing unit.
When ordering spare parts please state Cat. No. and Series No.

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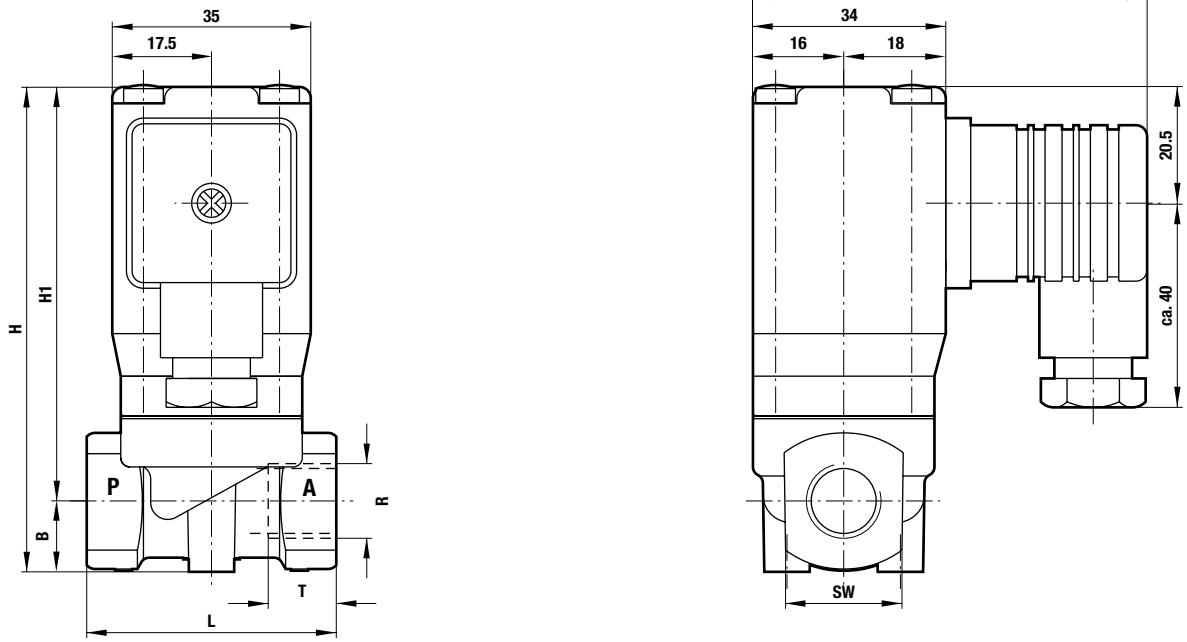
General Dimensions

Solenoid rotatable 360°
Socket turnable 4 x 90°
(Socket included)



Part Number	Nominal Diameter (mm)	Connection Size	B (mm)	H (mm)	H1 (mm)	L (mm)	SW (mm)	T (mm)
8256000.800x 8257000.800x	10	G 1/4 1/4 NPT	12.5	85.5	73.0	44	21	12 10
8256100.800x 8257100.800x	10	G 3/8 3/8 NPT	12.5	85.5	73.0	44	21	12 10
8256200.800x 8257200.800x	10	G 1/2 1/2 NPT	14.0	88.5	74.5	60	27	15 13

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2/2-way valves DN 10

For slightly aggressive gases and liquids
Latching valve, Directly solenoid actuated
Seat valves
Internal threads G 1/4 to G 1/2 or 1/4 NPT to 1/2 NPT, special connections
Operating pressure depending on application

Description (standard valve)

Solenoid valve for e.g. hydrogen / reformat

Switching function:	normally closed
Flow direction:	determined
Fluid temperature:	0°C up to max. +80 °C
Ambient temperature:	0°C up to max. +70 °C
Mounting position:	optional, preferably solenoid vertical on top

Material

Body:	Stainless steel (1.4408)
Seat seal:	FPM
Internal parts:	Stainless steel, PVDF, Sandvik 1802

For contaminated fluids insertion of a strainer is recommended.

Features

- High flow rate
- Clear design

Special connection:
Flange clamp

Solenoid 91xx

Standard voltage

DC ⎓	AC ∿ 40 Hz – 60 Hz	
24 V	–	–

Impulse input signal

Power Consumption

According to DIN VDE 0580 at coil temperature of +20 °C. In operation the power consumption of the solenoid decreases by approx. 30 %.

Solenoid	DC ⎓	AC ∿ Inrush	Holding
91xx	12 W	–	–

Attention!
The conditions imposed on the Ex approvals lead to reduction of the permissible standard temperature ranges in the cases of explosion protected solenoids.

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3/2-way valves DN 15

For slightly aggressive gases and liquids
Directly solenoid actuated
Seat valves
Internal threads M18 x 1.5, G 1/2, special connections
Operating pressure depending on application

Stainless Steel

Special conection:
Flange clamp

Beschreibung

Fluid temperature:	0°C up to max. +120 °C
Ambient temperature:	0°C up to max. +60 °C
Mounting position:	optional, preferably solenoid vertical on top

Material

Body:	Stainless steel (1.4408)
Seat seal:	FPM
Internal parts:	Stainless steel, PVDF, Sandvik 1802

For contaminated fluids insertion of a strainer is recommended.

Features

- High flow rate
- Clear design
- Wide voltage range

Solenoid 93xx

Standard voltage

DC ⎓	AC ∼ 40 Hz – 60 Hz	
24 V	24 V	–
–	110 V	120 V
–	230 V	220 V

Design acc. to DIN VDE 0580
Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP65

Power Consumption

According to DIN VDE 0580 at coil temperature of +20 °C. In operation the power consumption of the solenoid decreases by approx. 30 %.

Solenoid	DC ⎓	AC ∼ Inrush	Holding
93xx	18 W	–	–

Attention!
The conditions imposed on the Ex approvals lead to reduction of the permissible standard temperature ranges in the cases of explosion protected solenoids.

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2/2-way valves DN 8 to DN 50

For neutral gases and liquid fluids
Solenoid actuated, with forced lifting
Diaphragm valves
Internal threads G 1/4 to G 2 or 1/4 NPT to 2 NPT
Operating pressure 0 to 10 / 16 bar

Description (standard valve)

Solenoid valve for e. g. air, water, oil

Switching function:	normally closed
Flow direction:	determined
Fluid temperature:	–10 °C up to max. +90 °C
Ambient temperature:	–10 °C up to max. +50 °C
Mounting position:	optional, preferably solenoid vertical on top

Material

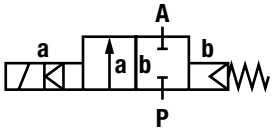
Body:	Brass (CW617N)
Seat seal:	NBR
Internal parts:	Stainless steel, PVDF, Brass

For contaminated fluids insertion of a strainer is recommended.

Features

- High flow rate
- For robust industry solutions
- Damped operation
- Suitable for vacuum
- For systems with low or fluctuating pressure
- Valve operates without differential pressure
- Solenoid interchangeable without tools (***Click-on***®)
  only solenoid 915x and 940x

Symbol



Ordering information

To order, quote model number from table overleaf, e. g. 8254400.9151 for a DN 25 valve.

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Characteristic data

Valves

Part Number Solenoid with ⎓	Part Number Solenoid with ∿	Nominal Diameter (mm)	Connection Size	Operating Pressure * min. (bar)	max. (bar)	kv-value ** (Base m³/h)	Weight Total (kg)
8254000.9151 8254000.9301 8264000.9151 8264000.9301	8254000.9154 8254000.9304 8264000.9154 8264000.9304	8	G 1/4 G 1/4 1/4 NPT 1/4 NPT	0	10 16 *** 10 16 ***	1.9	0.80
8254100.9151 8254100.9301 8264100.9151 8264100.9301	8254100.9154 8254100.9304 8264100.9154 8264100.9304	10	G 3/8 G 3/8 3/8 NPT 3/8 NPT	0	10 16 *** 10 16 ***	3.0	0.80
8254200.9151 8254200.9301 8264200.9151 8264200.9301	8254200.9154 8254200.9304 8264200.9154 8264200.9304	12	G 1/2 G 1/2 1/2 NPT 1/2 NPT	0	10 16 *** 10 16 ***	3.4	0.90
8254300.9151 8254300.9301 8264300.9151 8264300.9301	8254300.9154 8254300.9304 8264300.9154 8264300.9304	20	G 3/4 G 3/4 3/4 NPT 3/4 NPT	0	10 16 *** 10 16 ***	5.8	1.00
8254400.9151 8254400.9301 8264400.9151 8264400.9301	8254400.9154 8254400.9304 8264400.9154 8264400.9304	25	G 1 G 1 1 NPT 1 NPT	0	10 16 *** 10 16 ***	8.0	1.30
8254500.9401 8264500.9401	8254500.9404 8264500.9404	32	G 1 1/4 1 1/4 NPT	0	16 ***	23.0	4.30
8254600.9401 8264600.9401	8254600.9404 8264600.9404	40	G 1 1/2 1 1/2 NPT	0	16 ***	25.0	4.30
8254700.9401 8264700.9401	8254700.9404 8264700.9404	50	G 2 2 NPT	0	16 ***	41.0	5.40

* for gases and liquid fluids up to 25 mm²/s (cSt)
** C_V-value (US) ≈ k_V-value x 1.2
*** for liquid mediums and an operating pressure > 10 bar is the maximum allowed differential pressure limited to 2 bar.

State voltage [V] und frequency [Hz]

Solenoid 9151 / 9154; 9401 / 9404; 9301 / 9304

Standard voltages

DC ⎓	AC ∿ 40 Hz – 60 Hz	
24 V	24 V	–
–	110 V	120 V
–	230 V	220 V

Design acc. to DIN VDE 0580
Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP65
Socket Form A acc. to DIN EN 175301-803 (included)
AC with rectifier plug

Power Consumption

According to DIN VDE 0580 at coil temperature +20 °C.
In operation the power consumption of the solenoid decreases by approx. 30 %.

Solenoid	DC ⎓	AC ∿ Inrush	AC ∿ Holding
915X *	18 W	20 VA	20 VA
940X *	38 W	42 VA	42 VA
930X	18 W	20 VA	20 VA

* c SP us coil only
(with the expection of solenoid 94XX up to 41 V AC)

Attention!
The conditions imposed on the Ex approvals lead to reduction of the permissible standard temperature ranges in the cases of explosion protected solenoids.

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Options (Valves)

XXXXX**01**.XXXX	Normally open, up to G 1 (1 NPT) with solenoid 9150 max. 10 bar, with solenoid 8300 max. 16 bar, from G 1 1/4 (1 1/4 NPT) only with solenoid 8400 max. 16 bar
XXXXX**02**.XXXX	Manual override only from G 1 1/4 (1 1/4 NPT)
XXXXX**03**.XXXX	Seat seal FPM, fluid temperature –5 °C up to max. +110 °C
XXXXX**14**.XXXX	Seat seal EPDM, for hot water, fluid temperature –10 °C up to max. +110 °C
XXXXX**17**.XXXX	Normally open, seat seal FPM, fluid temperature –5 °C up to max. +110 °C, from G 1 1/4 (1 1/4 NPT) only with solenoid 8400
On request	Further versions

Accessoires:
- Manual override conversion kit
- Mounting bracket conversion kit

Options (Solenoids)

XXXXXX.**9356**	Protection class Ⓔx II 2 GD EEx me II T3 T 140 °C
XXXXXX.**8326** *	Protection class Ⓔx II 3 GD EEx nA II T4 T 135 °C
XXXXXX.**8426** *	Protection class Ⓔx II 3 GD EEx nA II T4 T 135 °C
XXXXXX.**8441** *	Protection class Ⓔx II 2 GD EEx me II T3 T 140 °C
XXXXXX.**9176** *	Protection class Ⓔx II 3 GD EEx nA II T4 T 135 °C
XXXXXX.**9191** *	Protection class Ⓔx II 2 GD EEx me II T3 T 140 °C
XXXXXX.**9426** *	Protection class Ⓔx II 3 GD EEx nA II T4 T 135 °C
On request	Further versions

* DC only, for AC solenoids with design inspection certificate according to category 2, e. g. XXXXXX.9191, XXXXXX.8341 or XXXXXX.8441

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Drawings

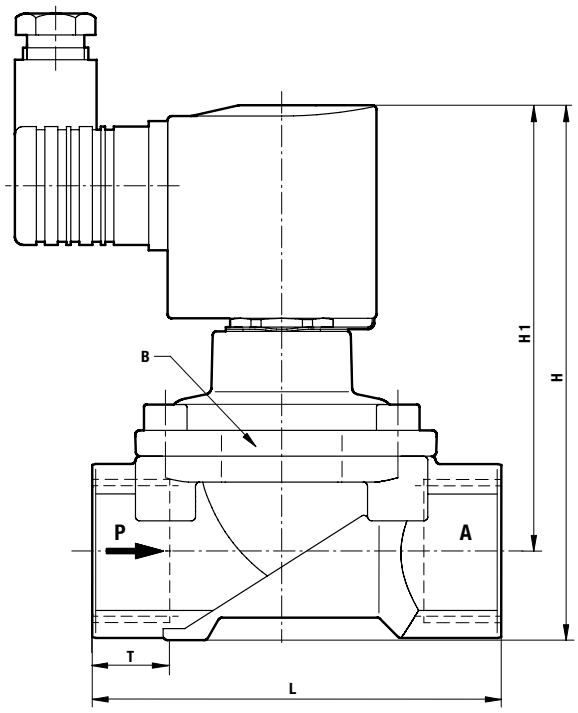
G 1/4 - G 1 with solenoid 915x (10 bar)
resp. 1/4 NPT - 1 NPT with solenoid 915x (10 bar)

General Dimensions

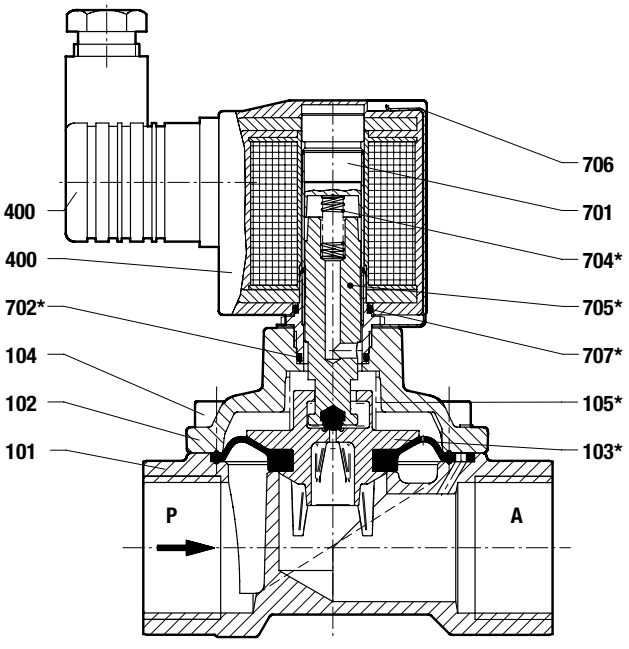
Solenoid rotable 360°
Socket turnable 4 x 90°
(socket included)

Part Number	Connection Size	L (mm)	H (mm)	H1 (mm)	B* (mm)	T (mm)
8254000.915x 8264000.915x	G 1/4 1/4 NPT	60	104	92.5	44	12.0 10.0
8254100.915x 8264100.915x	G 3/8 3/8 NPT	60	104	92.5	44	12.0 10.5
8254200.915x 8264200.915x	G 1/2 1/2 NPT	67	108	94.5	44	14.0 13.5
8254300.915x 8264300.915x	G 3/4 3/4 NPT	80	115	99.0	50	16.0 14.0
8254400.915x 8264400.915x	G 1 1 NPT	95	124	103.5	62	18.0 17.0

* B = max. depth



Section view



101 Valve body
102 Valve cover
*103 Diaphragm
104 Allen head screw
*105 Pressure spring
400 Solenoid
701 Core tube
*702 O-ring
703 Round plate
*704 Pressure spring
*705 Plunger
706 Spring clip
*707 O-ring
1400 Electrical connector (included)

*These individual parts form a complete wearing unit.
When ordering spare parts please state Cat. No. and Series No.

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Drawings

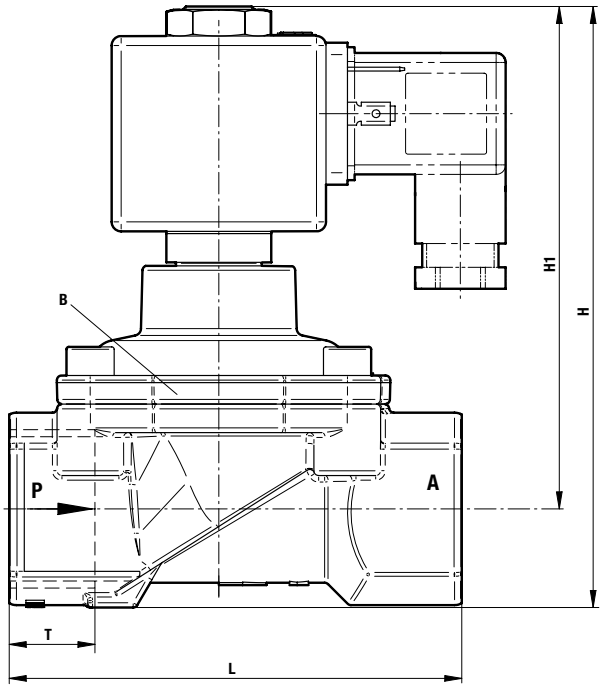
G 1/4 - G 1 with solenoid 930x (16 bar)
resp. 1/4 NPT - 1 NPT with solenoid 930x (16 bar)

General Dimensions

Solenoid rotable 360°
Socket turnable 4 x 90°
(socket included)

Part Number	Connection Size	L (mm)	H (mm)	H1 (mm)	B* (mm)	T (mm)
8254000.930x 8264000.930x	G 1/4 1/4 NPT	60	108	96	44	12.0 10.0
8254100.930x 8264000.930x	G 3/8 3/8 NPT	60	108	96	44	12.0 10.5
8254200.930x 8264200.930x	G 1/2 1/2 NPT	67	110	96	44	14.0 13.5
8254300.930x 8264300.930x	G 3/4 3/4 NPT	80	117	100	50	12.5 14.0
8254400.930x 8264400.930x	G 1 1 NPT	95	126	105	62	14.0 17.0

* B = max. depth



Section view

101 Valve body
102 Valve cover
*103 Diaphragm assembly
104 Allen head screw
*105 Pressure spring
400 Solenoid
701 Core tube
*702 O-ring
*704 Pressure spring
*705 Plunger
1400 Electrical connector (included)
1501 Hexagon screw
*1502 O-ring

*These individual parts form a complete wearing unit.
When ordering spare parts please state Cat. No. and Series No.

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Drawings

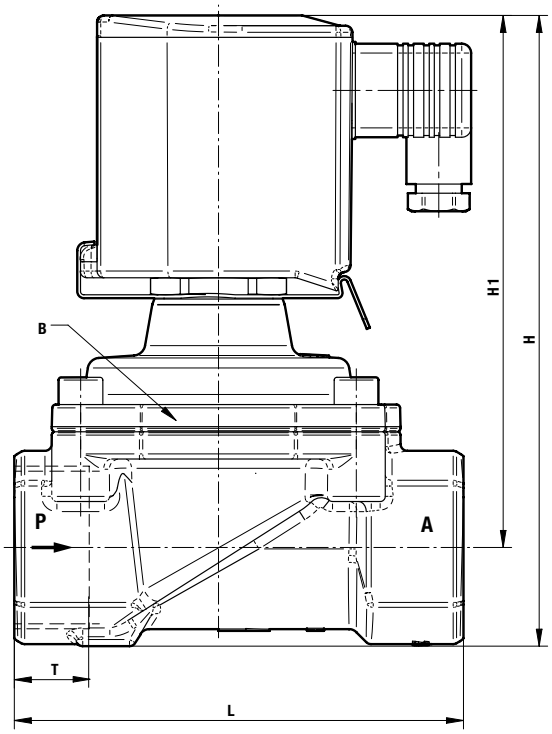
G 1 1/4 - G 2 with solenoid 940x (16 bar)
resp. 1 1/4 NPT - 2 NPT with solenoid 940x (16 bar)

General Dimensions

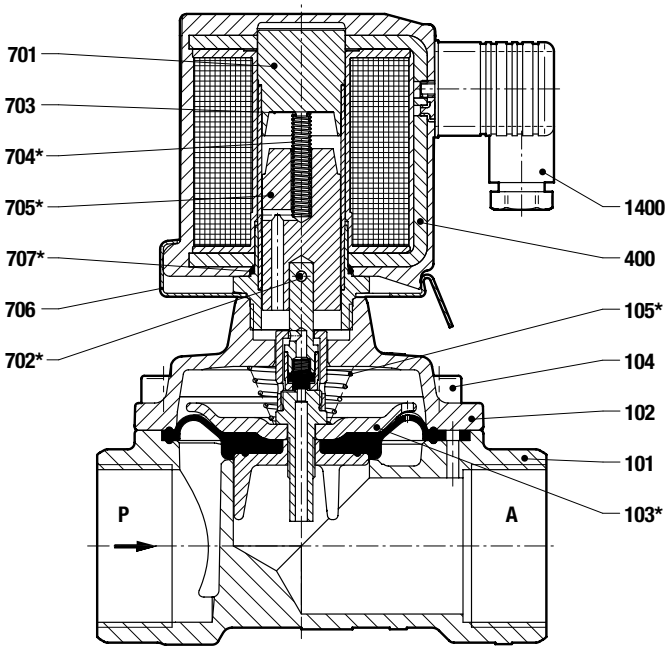
Solenoid rotable 360°
Socket turnable 4 x 90°
(socket included)

Part Number	Connection Size	L (mm)	H (mm)	H1 (mm)	B* (mm)	T (mm)
8254500.940x 8264500.940x	G 1 1/4 1 1/4 NPT	132	186	157	92	20.0 17.0
8254600.940x 8264600.940x	G 1 1/2 1 1/2 NPT	132	186	157	92	22.0 17.0
8254700.940x 8264700.940x	G 2 2 NPT	160	201	167	109	24.0 17.5

* B = max. depth



Section view



101 Valve body
102 Valve cover
*103 Diaphragm
104 Allen head screw
*105 Pressure spring
400 Solenoid
701 Core tube
*702 O-ring
703 Round plate
*704 Pressure spring
*705 Plunger
706 Spring clip
*707 O-ring
1400 Electrical connector (included)

*These individual parts form a complete wearing unit.
When ordering spare parts please state Cat. No. and Series No.

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2/2-way valves DN 8 to DN 50

For slightly aggressive gases and liquids
Solenoid actuated, with forced lifting
Diaphragm valves
Female threads G 1/4 to G 2 or 1/4 NPT to 2 NPT
Operating pressure 0 to 10 / 16 bar

Stainless Steel

Click-on®

Description (standard valve)

Solenoid valve for slightly aggressive gases and liquids

Switching function:	normally closed
Flow direction:	determined
Fluid temperature:	–10 °C up to max. +90 °C
Ambient temperature:	–10 °C up to max. +50 °C
Mounting position:	optional, preferably solenoid vertical on top

Material

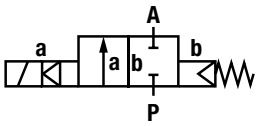
Body:	Stainless steel (1.4408)
Seat seal:	NBR-K
Internal parts:	Stainless steel, PVDF

For contaminated fluids insertion of a strainer is recommended.

Features

- High flow rate
- For robust industry applications
- Damped operation
- Suitable for vacuum
- For systems with low or fluctuating pressure
- Solenoid interchangeable without tools (***Click-on***®)
- Valve operates without differential pressure

Symbol



Ordering information

To order, quote model number from table overleaf, e. g. 8259400.9151 for a DN 25 valve.

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Characteristic data

Valves

Part Number Solenoid with ⎓	Part Number Solenoid with ∿	Nominal Diameter (mm)	Connection Size	Operating Pressure * min. (bar)	max. (bar)	kv-value ** (Base m³/h)	Weight Total (kg)
8259000.9151 8259000.9301 8449000.9151 8449000.9301	8259000.9154 8259000.9304 8449000.9154 8449000.9304	8	G 1/4 G 1/4 1/4 NPT 1/4 NPT	0	10 16 *** 10 16 ***	1.9	0.80
8259100.9151 8259100.9301 8449100.9151 8449100.9301	8259100.9154 8259100.9304 8449100.9154 8449100.9304	10	G 3/8 G 3/8 3/8 NPT 3/8 NPT	0	10 16 *** 10 16 ***	3.0	0.80
8259200.9151 8259200.9301 8449200.9151 8449200.9301	8259200.9154 8259200.9304 8449200.9154 8449200.9304	12	G 1/2 G 1/2 1/2 NPT 1/2 NPT	0	10 16 *** 10 16 ***	3.4	0.90
8259300.9151 8259300.9301 8449300.9151 8449300.9301	8259300.9154 8259300.9304 8449300.9154 8449300.9304	20	G 3/4 G 3/4 3/4 NPT 3/4 NPT	0	10 16 *** 10 16 ***	5.8	1.00
8259400.9151 8259400.9301 8449400.9151 8449400.9301	8259400.9154 8259400.9304 8449400.9154 8449400.9304	25	G 1 G 1 1 NPT 1 NPT	0	10 16 *** 10 16 ***	8.0	1.30
8259500.9401 8449500.9401	8259500.9404 8449500.9404	32	G 1 1/4 1 1/4 NPT	0	16	23.0	4.3
8259600.9401 8449600.9401	8259600.9404 8449600.9404	40	G 1 1/2 1 1/2 NPT	0	16	25.0	4.1
8259700.9401 8449700.9401	8259700.9404 8449700.9404	50	G 2 2 NPT	0	16	41.0	5.1

* for gases and liquid fluids up to 25 mm²/s (cSt)
** C_V-value (US) ≈ k_V-value x 1.2
*** for liquid mediums and an operating pressure > 10 bar is the maximum allowed differential pressure limited to 2 bar.

State voltage [V] und frequency [Hz]

Solenoid 9151 / 9154; 9401 / 9404; 9301 / 9304

Standard voltages

DC ⎓	AC ∿ 40 Hz – 60 Hz	
24 V	24 V	–
–	110 V	120 V
–	230 V	220 V

Design acc. to DIN VDE 0580
Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP65
Socket Form A acc. to DIN EN 175301-803 (included)
AC with rectifier plug

Power Consumption

According to DIN VDE 0580 at coil temperature +20 °C.
In operation the power consumption of the solenoid decreases by approx. 30 %.

Solenoid	DC ⎓	AC ∿ Inrush	AC ∿ Holding
915X *	18 W	20 VA	20 VA
940X *	38 W	42 VA	42 VA
930X	18 W	20 VA	20 VA

* c SP us coil only
(with the expection of solenoid 94XX up to 41 V AC)

Attention!
The conditions imposed on the Ex approvals lead to reduction of the permissible standard temperature ranges in the cases of explosion protected solenoids.

Further Options (Valves)

see Page 30

Further Options (Solenoids)

see Page 30

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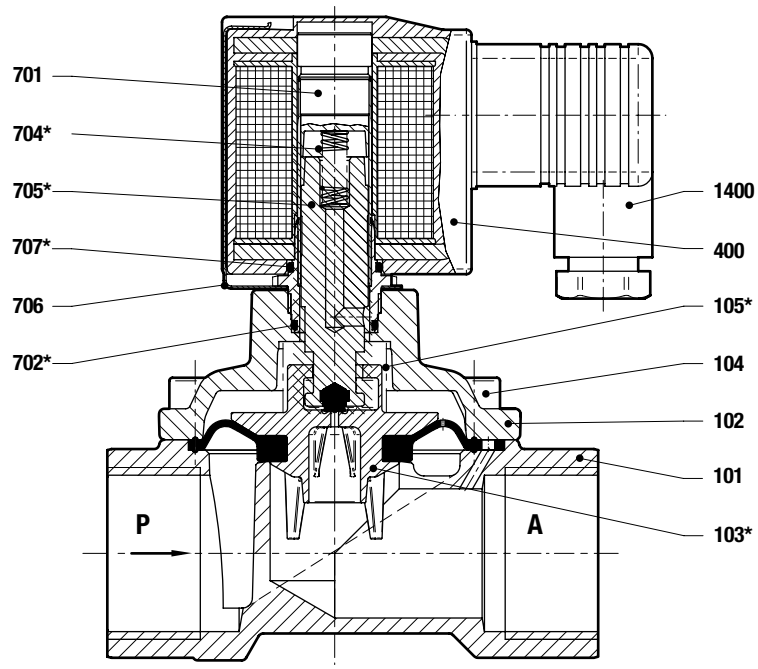
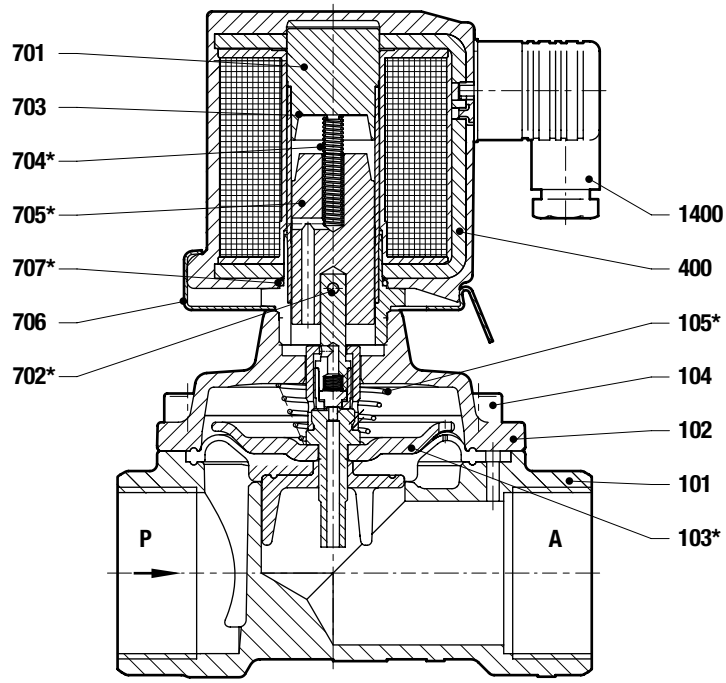
Section View

up to DN 25



101	Valve body
102	Valve cover
*103	Diaphragm
104	Allen head screw
*105	Pressure spring
400	Solenoid
701	Core tube
*702	O-ring
*704	Pressure spring
*705	Plunger
706	Spring clip
*707	O-ring
1400	Electrical connector (included)

from DN 32



101	Valve body
102	Valve cover
*103	Diaphragm
104	Allen head screw
*105	Pressure spring
400	Solenoid
701	Core tube
*702	O-ring
*704	Pressure spring
*705	Plunger
706	Spring clip
*707	O-ring
1400	Electrical connector (included)

* These individual parts form a complete wearing unit.
When ordering spare parts please state Cat. No. and Series No.

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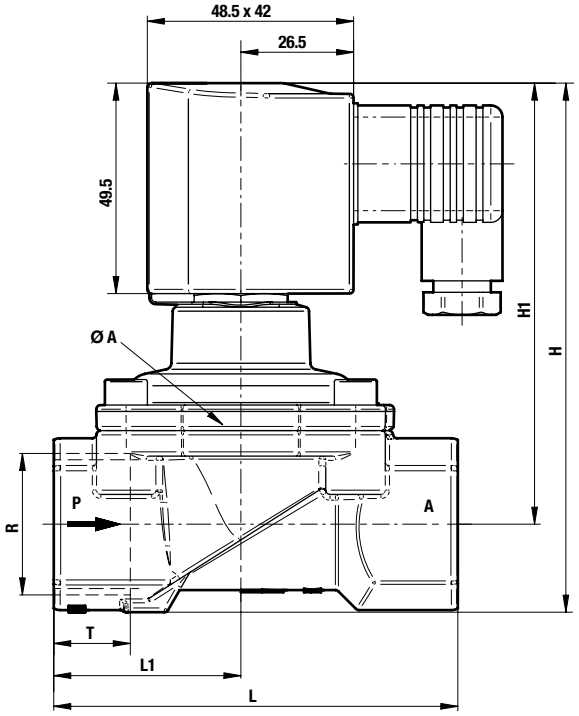
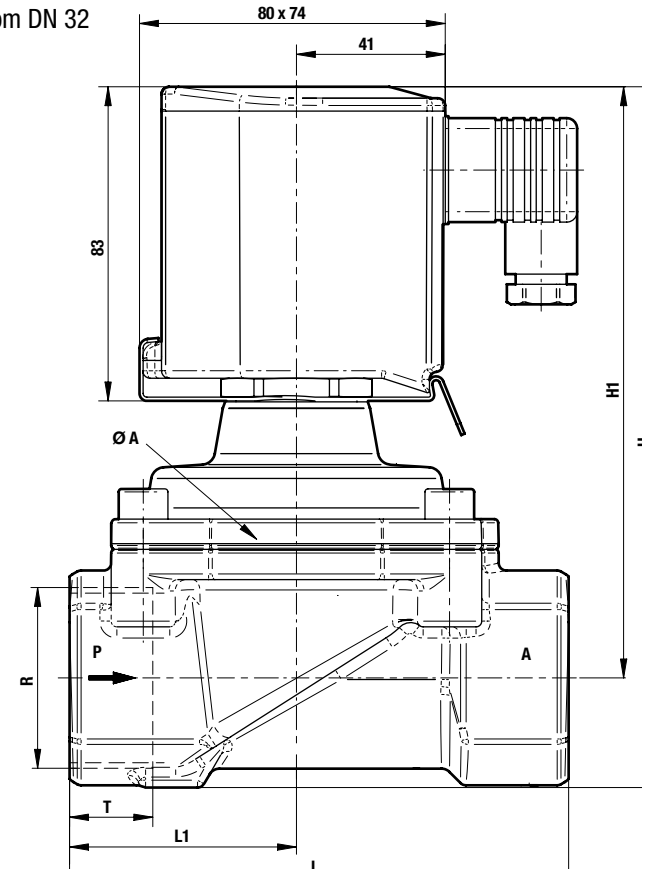
General Dimensions

Solenoid rotatable 360°
Socket turnable 4 x 90°
(Socket included)

up to DN 25



from DN 32



Part Number	Nominal Diameter (mm	Connection Size	ø A (mm)	H (mm)	H 1 (mm)	L (mm)	L 1 (mm)	T (mm)
8259000.915x 8259000.930x 8449000.915x 8449000.930x	8	G 1/4 G 1/4 1/4 NPT 1/4 NPT	44	104.0 108.0 104.0 108.0	92.5 96.0 92.5 96	60	27.5	12 12 10 10
8259100.915x 8259100.930x 8449100.915x 8449100.930x	10	G 3/8 G 3/8 3/8 NPT 3/8 NPT	44	104.0 108.0 104.0 108.0	92.5 96.0 92.5 96.0	60	27.5	12 12 13.5 13.5
8259200.915x 8259200.930x 8449200.915x 8449200.930x	12	G 1/2 G 1/2 1/2 NPT 1/2 NPT	44	108.0 110.0 108.0 110.0	94.5 96.0 94.5 96.0	67	31.0	14 14 13.5 13.5
8259300.915x 8259300.930x 8449300.915x 8449300.930x	20	G 3/4 G 3/4 3/4 NPT 3/4 NPT	50	115.0 117.0 115.0 110.0	99.0 100.0 99.0 100.0	80	36.5	16 16 14.0 14.0
8259400.915x 8259400.930x 8449400.915x 8449400.930x	25	G 1 G 1 1 NPT 1 NPT	62	124.0 126.0 124.0 126.0	103.5 105.0 103.5 105.0	95	44.0	18.0 18.0 17.0 17.0
8259500.940x 8449500.940x	32	G 1 1/4 1 1/4 NPT	92	186.0	157.0	132	60.0	20
8259600.940x 8449600.940x	40	G 1 1/2 1 1/2 NPT	92	186.0	157.0	132	60.0	22
8259700.940x 8449700.940x	50	G 2 2 NPT	109	201.5	167.0	160	74.0	24

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2/2-way valves DN 2.5 and DN 3.5

For slightly aggressive fluids
Directly solenoid actuated
Seat valves
Hose clip Ø 6 mm, special connections
Operating pressure 0 to 12 bar

Click-on®

Description (standard valve)

Solenoid valve for cold water, hot water, steam and descaler

Switching function:	normally closed
Flow direction:	determined, limited backpressure tight
Fluid temperature:	0 °C up to max. +125 °C
Ambient temperature:	0 °C up to max. +50 °C
Mounting position:	optional, preferably solenoid vertical on top

Material

Body:	PPSU (Polyphenylsulfon)
Seat seal:	EPDM
Internal parts:	Stainless steel

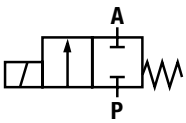
Features

- Back pressure tight
- High flow rate
- Functional compact design
- Solenoid interchangeable without tools (***Click-on***®)
- Valve operates without differential pressure
- Long life

Standard version

Alternative connection technology

Symbol



Ordering information

To order, quote model number from table overleaf, e. g. 8499881.9840 for a DN 2.5 valve.

Characteristic data

Valves

Part Number	Stroke (mm)	Nominal Diameter (mm)	Connection Size external / internal	Operating Pressure * min. (bar)	max. (bar)	k_V-value ** (Base m^3/h)	Weight Total (kg)
8499881.9840	0.75	2.5	tube 6/4	0	12	0.15	0.12
8499882.9840	1.2	2.5	tube 6/4	0	4	0.15	0.12
8499883.9840	1.0	3.5	tube 6/4	0	4	0.18	0.12

* for gases and liquid fluids up to 25 mm^2/s (cSt)
** C_V-value (US) ≈ k_V-value x 1.2

State voltage [V] and frequency [Hz]

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Solenoid 9840

Standard voltage

DC ⎓
24 V

Design acc. to DIN VDE 0580
Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP00
terminals 6.3 x 0.8, Faston

Power Consumption

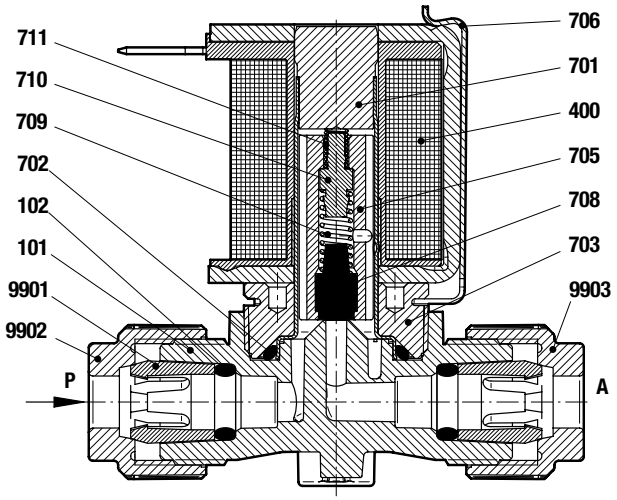
According to DIN VDE 0580 at coil temperature of +20 °C. In operation the power consumption of the solenoid decreases by approx. 30 %.

Solenoid	DC ⎓
9840	9.5 W

Further options

On request
- mounting screw
- solenoid version
- alternative connection technology

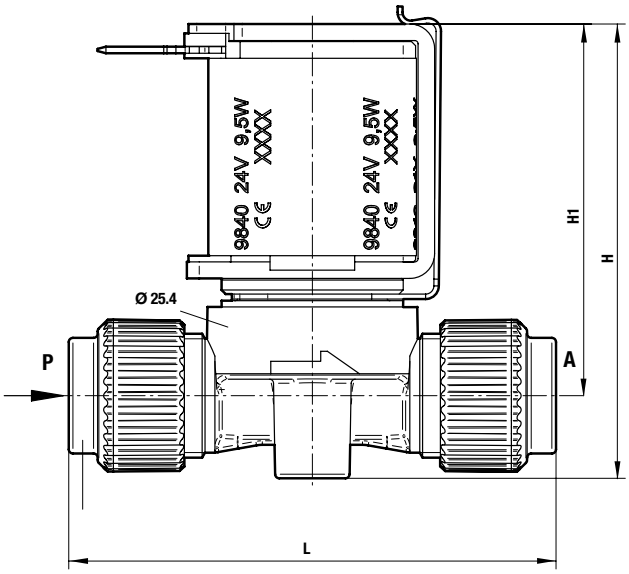
Section View



101 Valve body
102 O-Ring
400 Solenoid
701 Core tube
702 O-Ring
703 Screw piece
705 Plunger
706 Spring clip
708 Sealing plug
709 Pressure spring
710 Spring bolt
711 Pressure spring
9901 Clamping ring
9902 Nut
9903 Nut

* These individual parts form a complete wearing unit.
When ordering spare parts please state Cat. No. and Series No.

General Dimensions



Part Number	Nominal Diameter (mm)	Connection Size external / internal	L (mm)	H (mm)	H 1 (mm)
8499881.9840	2.5	tube 6/4	59	55	45
8499882.9840	2.5	tube 6/4	59	55	45
8499883.9840	3.5	tube 6/4	59	55	45

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2-way motorised valve DN 16

For water, glycol mixture and air
Electric motor drive
Rotary slide valves
Hose nozzle P=28 mm A=28 mm DIN 71550
Operating pressure up to 2 bar

Description

Switching function:	throttle setting with overlap
Flow direction:	determined
Fluid temperature:	-30 °C to +110 °C
Ambient temperature:	-30 °C to +80 °C
Mounting position:	optional

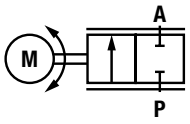
Material

Body:	PA 66
Seat seal:	HNBR
Control discs:	Al2 O3 Oxydceramic (option valve spindle stainless steel)
Internal parts:	2.0402, 1.4310

Features

- Low power consumption
- Remains in last position if power is lost
- Operating time through 90 °C angle appr. 1.7 to 3.7 seconds. (Depending on supply voltage)

Symbol



Characteristic data

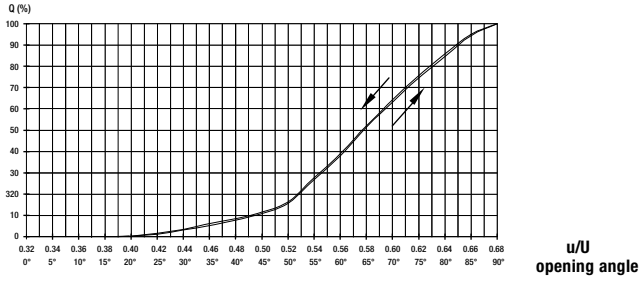
Part Number	Nominal Diameter (mm)	Connection Size (mm)	Operating Pressure * min. (bar)	max. (bar)	k_V-value ** (Base m^3/h)	Weight Total (kg)
8497342.9663	16	28	–0.98	2	4.2	0.25

* for fluids up to 80 mm^2/s (cSt)
** k_V-value (US) ≈ k_V-value x 1,2

Motor drive

Drive-Part Number:	9663.02400
Design:	Ge ared D.C. Motor
Supply Voltage:	024 V - 6 V + 8 V
Power Consumption:	Inrush: 2.4 W / Hold: 2.4 W
Duty Cycle:	100 %
Protection Class:	IP 00/54 (IP6K9K with special plug)
Terminal:	AMP-socket
Special design:	Feedback potentiometer 4.7 kOhm

Flow characteristic



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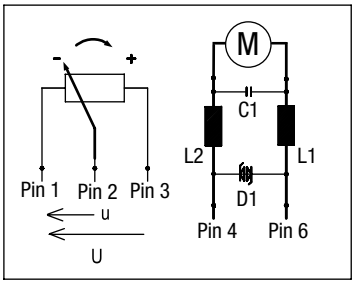
Wiring Diagram

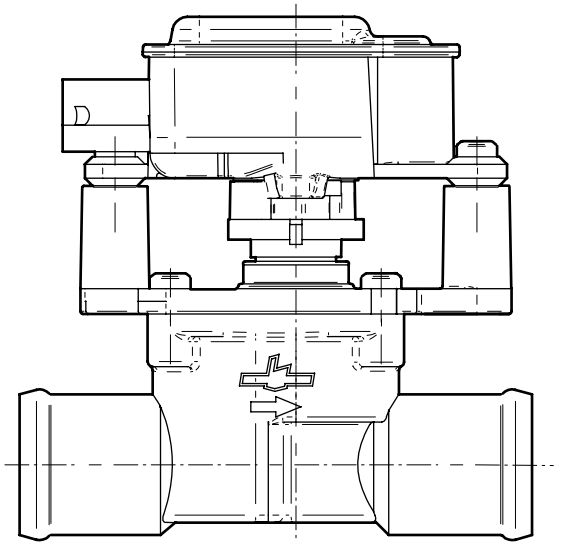
Potentiometer-nominal value at 90° mechanical travel

Valve closed: $\frac{u}{U}$ = 0.225... 0.389

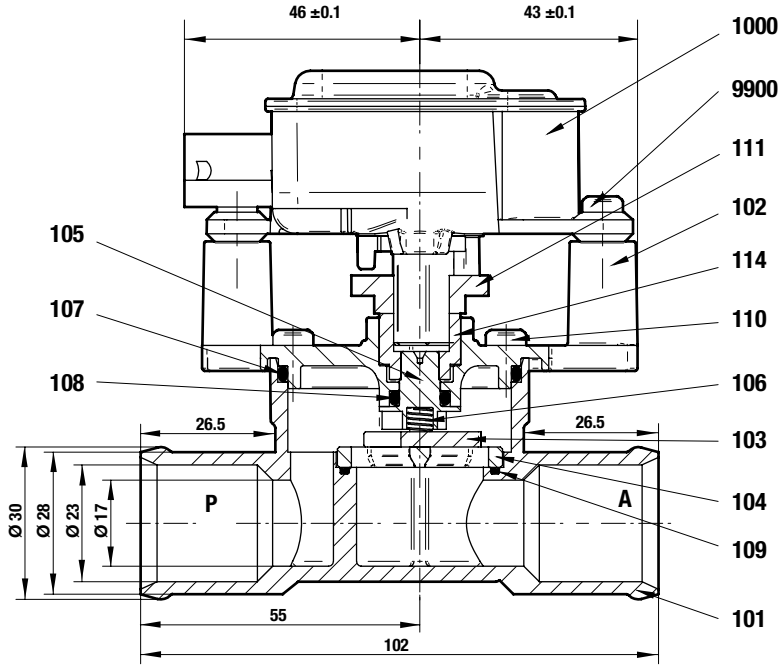
Valve open: $\frac{u}{U}$ = 0.584... 0.389



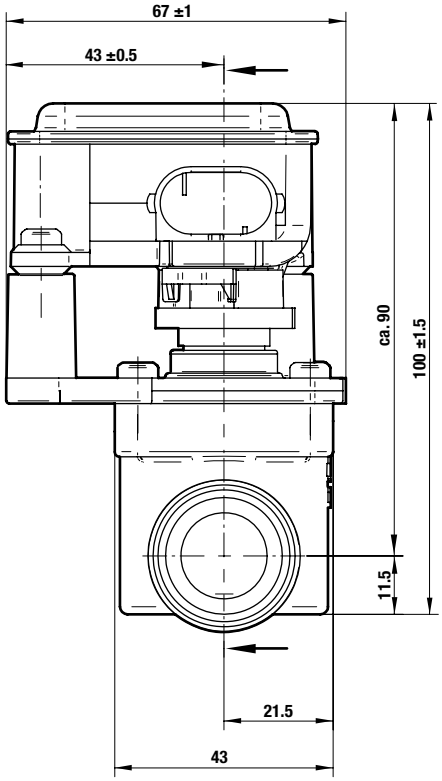
Direction of rotation open CW: + on 4, - on 6
Direction of rotation closed CCW: + on 6, - on 4



Section View



General Dimensions



101	Valve body	106	Pressure spring	111	Mechanical stop
*102	Body cover	*107	O-ring	114	Clutch part
103	Round plate	*108	O-ring	1000	Motor drive
104	Round plate	*109	O-ring	9900	Oval head screw
105	Valve spindle	110	Oval head screw		

* These individual parts form a complete wearing unit.
When ordering spare parts please state Cat. No. and Series No.

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3-way motorised valve DN 16

For water, glycol mixture and air
Electric motor drive
Rotary slide valves
Hose nozzle P = 22 mm, A = 22 mm, B = 22 mm, DIN 71 550
Operating pressure up to 2.5 bar

Description

Switching function:	throttle setting with bypass
Flow direction:	determined
Fluid temperature:	–30 °C to +110 °C
Ambient temperature:	–30 °C to +110 °C
Mounting position:	optional

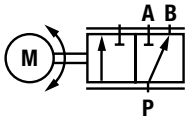
Material

Body:	PA 66
Seat seal:	HNBR
Control discs:	Al2O3 Oxydceramic
Internal Parts:	2.0402, 1.4310, PSU (option valve spindle stainless steel)

Features

- Low power consumption
- Remains in last position if power is lost
- Operating time through 90° angle appr. 1.7 to 3.7 seconds (Depending on supply voltage)
- Feedback potentiometer 4.7 kΩ
- Manual override

Symbol



Characteristic data

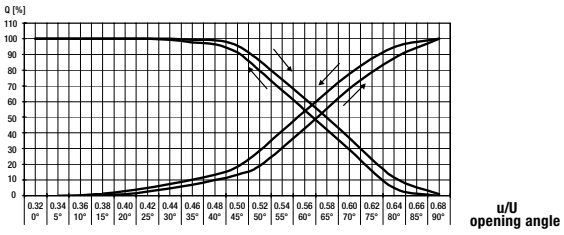
Part Number	Nominal Diameter (mm)	Connection Size (mm)	Operating Pressure * min. (bar)	max. (bar)	k_V-value ** (Base m^3/h)	Weight Total (kg)
8497793.9663	16	22	-0.5	2.5	4	0.3

* for fluids up to 80 mm^2/s (cSt)
** k_V-value (US) ≈ k_V-value x 1.2

Motor drive

Drive-Cat. No.:	9663.02400
Design:	Geared D.C. Motor
Supply Voltage:	24 V –6 V / +8 V
Power Consumption:	Inrush: 2.4 W / Hold: 2.4 W
Duty Cycle:	100 %
Protection Class:	IP 54 (IP6K9K with special plug)
Terminal:	AMP-socket
Special Design:	Feedback potentiometer 4.7 kΩ

Flow characteristic



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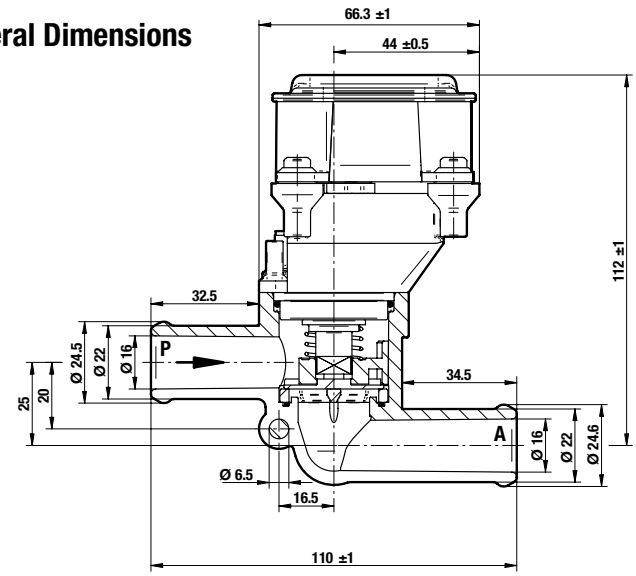
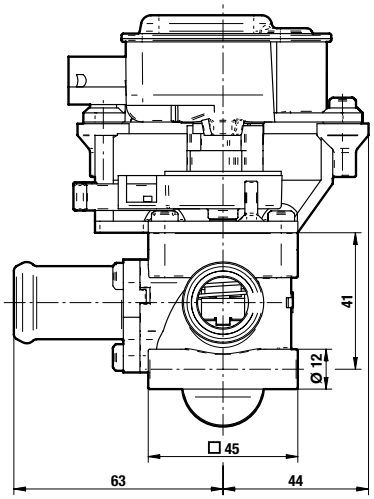
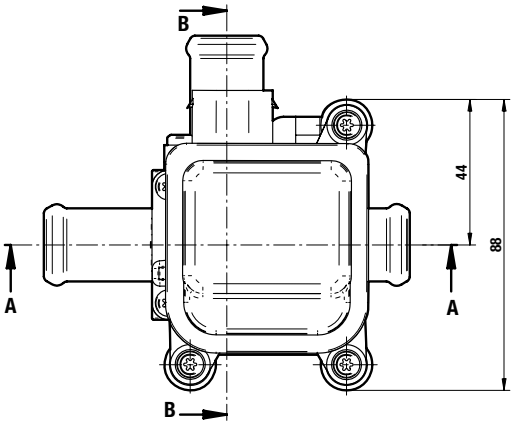
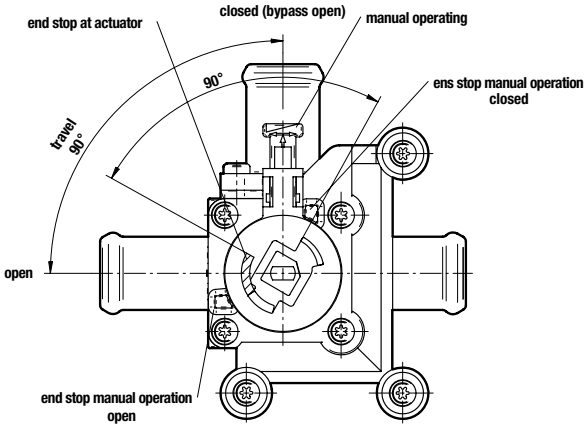
General Dimensions



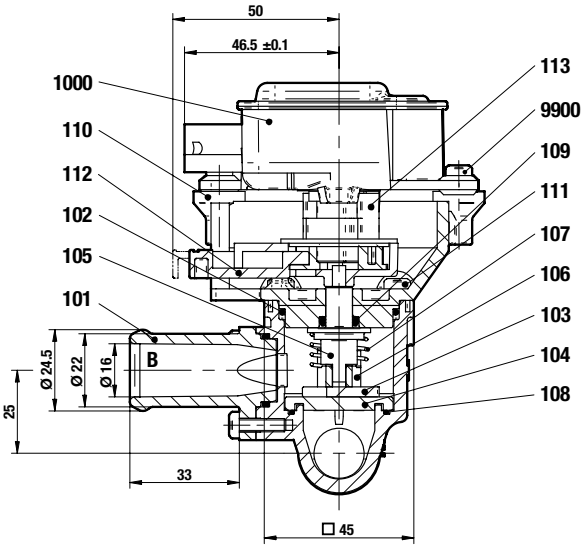


Valve without actuator





Section View

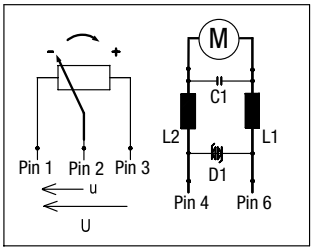


Wiring Diagram

Potentiometer-nominal value
at 90° mechanical travel

Valce closed: $\frac{u}{U}$ = 0.225... 0.389

Valve open: $\frac{u}{U}$ = 0.590... 0.754



Direction of rotation open CW: + on 4, - on 6
Direction of rotation closed CCW :+ on 6, - on 4

101	Valve body	106	Mechanical bracket	111	Oval head screw
*102	O-ring	*107	Pressure spring	112	Manual operation
103	Round plate	*108	O-ring	113	Cover
104	Round plate	*109	O-ring	1000	Motor drive
105	Valve spindle	110	Body cover	9900	Oval head screw

* These individual parts form a complete wearing unit. When ordering spare parts please state Cat. No. and Series No.

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3-way- (optional 2-way-) motorised valve DN 25

For water, glycol mixture and air
Electric motor drive
Ball Cock valves
Hose nozzle 28 + 38 mm, DIN 71 550
Operating pressure up to 2.5 bar

Description

Switching Function:	mixing and diverting function, 2-way flow control function
Flow Direction:	optional
Fluid Temperature:	–30 °C to +110 °C
Ambient Temperature:	–30 °C to +110 °C (optional for higher temperatures with longer distance to motor drive and metal body)
Mounting Position:	optional

3-way-motorised valve

Material

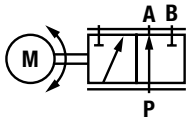
Body:	PA 66 (2-way option: additional brass or stainless steel)
Cover:	PA 66
Seat seal:	HNBR
Ball Seals:	PTFE
Ball:	Brass chromium plated (Option: stainless steel)
Internal Parts:	1.4310 (Option: valve spindle stainless steel)

2-way-motorised valve

Features

- Low power consumption
- Remains in last position if power is lost
- Operating angle 180°
- Optional 2-way in 28 + 38 mm available

Symbol



Characteristic data

Function	Part Number	Nominal Diameter (mm)	Connection Size (mm)	Operating Pressure * min. (bar)	max. (bar)	k_V-value ** (Base m^3/h)	Weight Total (kg)
3-way	8497573.9663	25	38	–0.5	2.5	16	0.46
3-way	8497572.9663	25	28	–0.5	2.5	14	0.44

* for fluids up to 40 mm^2/s (cSt)
** k_V-value (US) ≈ k_V-value x 1,2

Motor drive

Drive-Cat. No.:	9663.02400
Design:	Geared D.C. Motor
Supply Voltage:	24 V –6 V / +8 V
Power Consumption:	Inrush: 2.4 W / Hold: 2.4 W
Duty Cycle:	100 %
Protection Class:	IP 54 (IP6K9K with special plug)
Terminal:	AMP-socket
Special Design:	Feedback potentiometer 4.7 kΩ

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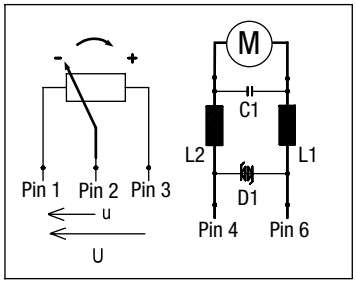
Wiring Diagram

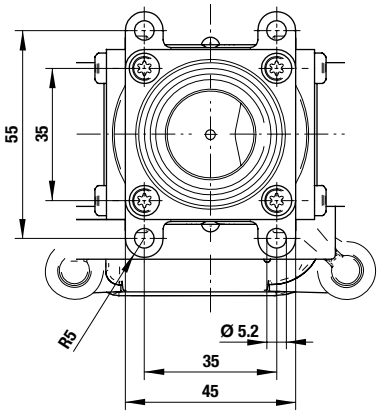
Potentiometer-nominal value at 90° mechanical travel

Valve closed: $\frac{u}{U}$ = 0.225... 0.389

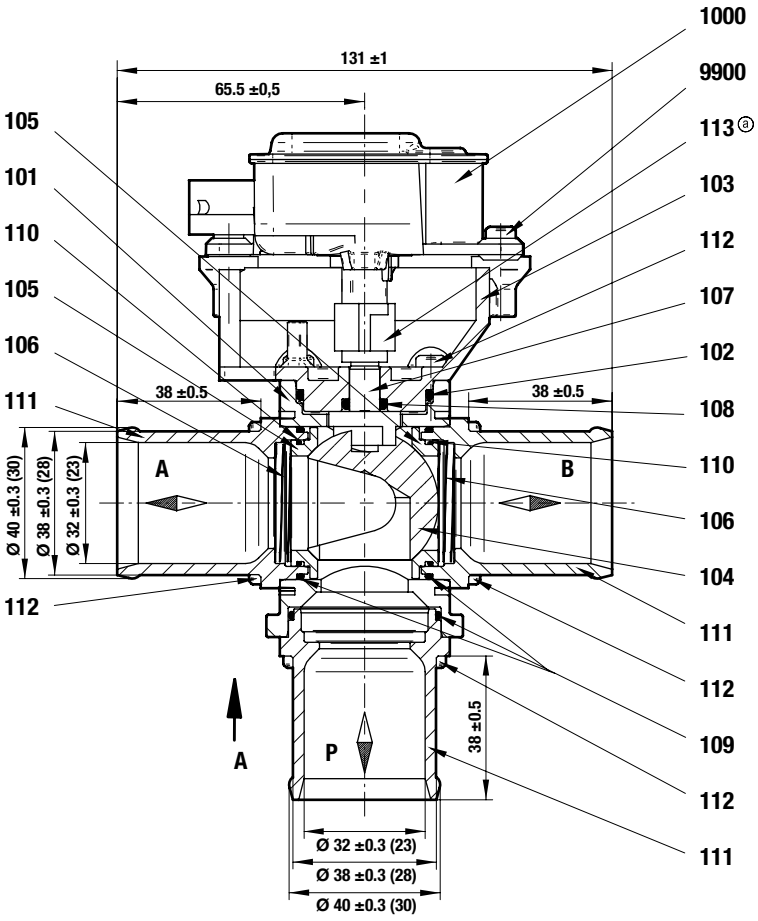
Valve open: $\frac{u}{U}$ = 0.584... 0.748



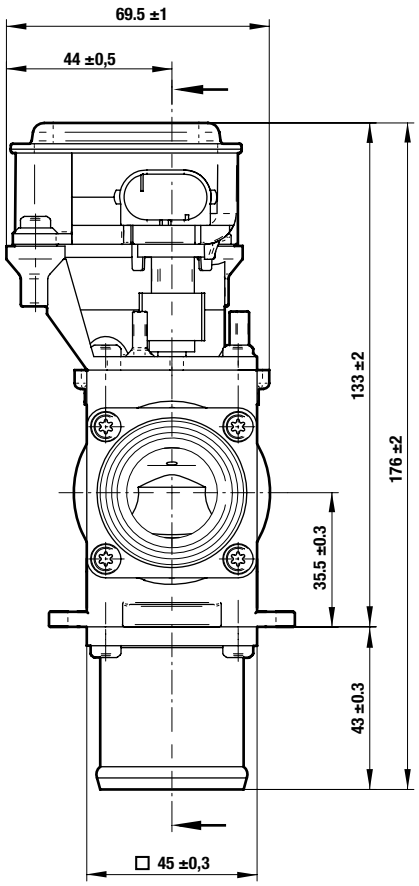
Direction of rotation open CW: + on 4, - on 6
Direction of rotation closed CCW: + on 6, - on 4



Section View



General Dimensions



101	Valve body	*106	Zigzag spring	111	Fitting
*102	O-ring	107	Valve spindle	112	Oval head screw
103	Body cover	*108	O-ring	113	Clutch part
104	Ball	*109	O-ring	1000	Motor drive
*105	Seal ring	*110	O-ring	9900	Oval head screw

* These individual parts form a complete wearing unit. When ordering spare parts please state Cat. No. and Series No.

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Motorised valves

For neutral gases and liquids
G 1/2 to G 1 female thread
Cartridge system
Operating pressure –0.9 to 10 bar (see table)

Description (standard valve)

Motorised valve for e. g. hot water, oil, air

Flow direction:	determined
Fluid temperature:	max. +90 °C
Ambient temperature:	max. +40 °C (higher temperatures on request)
Mounting position:	optional, preferably with drive upright

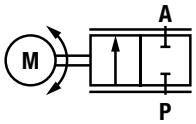
Material

Body:	Brass
Seat seal:	NBR
Control discs:	Oxydceramic

Merkmale

- Low power consumption
- Choice of compact drives
- Valve remains on last setting if power lost
- Will handle dirty fluids
- Throttle setting produced by wear-resistant control discs

Symbol

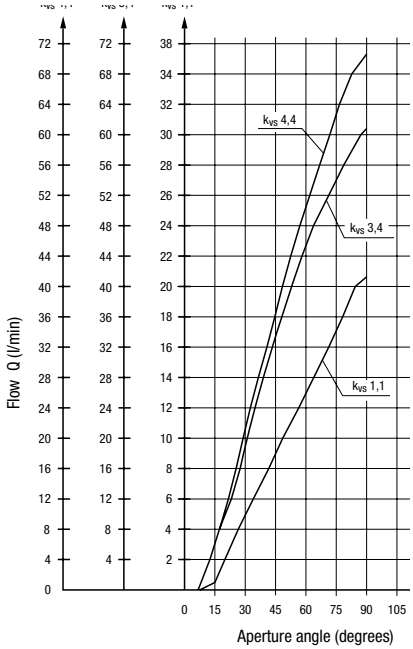


Throttle setting with overlap [1)]

Ordering information

To order, quote model number from table overleaf,
e. g 8288400.9615 for a DN 20 Valve.

[1)] Not gastight



Characteristics curve
Fluid: water
Δp: 1 bar

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Characteristic data

Valves

Part Number (motor [1])	Nominal Diameter (mm)	Connection Size	Operating Pressure min. (bar)	max. (bar)	k_{VS}-value (Base m^3/h)	Weight Total (kg)
8288200.96xx	15	G 1/2	–0.9	10	1.1	0.9
8288300.96xx	20	G 3/4	–0.9	6 [2]	4.4	1.6
8288400.96xx	20	G 1	–0.9	6 [2]	4.4	1.6

[1] See motor drives for motor Part Number and power supply

[2] Operating pressure increases to 10 bar for 9624 and 9651

Characteristic data

Motor drives

Motor type	Standard voltage Tolerance ± 10 % [V]	Frequency [Hz]	Power consumption [W]	Protection class	Torque [Ncm]	Operating time [1] through 90 ° ∢	Wiring diagram	Motor Part Number
DC motor	24	-	1.5	IP 54	120	10 - 14 s	01	9615.02400
DC motor	24	-	1.5	IP 54	120	10 - 16 s	02	9650.02400
DC motor	24	-	2.1	IP 54	120	10 - 16 s	03	9657.02400
Synchronous motor	24	50	3.0	IP 54	120	10 s	04	9636.02450
Stepping motor	24	[2]	5.0	IP 54	120	10 s	05	9638.02400
DC motor	24	-	2.0	IP 54	200	13 s	01	9624.02400 [3]
DC motor	24	-	2.5	IP 54	200	13 - 16 s	02	9651.02400 [3]

[1] Operating time depends on operating pressure

[2] Nominal stepping frequency 200 Hz

[3] Only in conjunction with G 3/4 and G 1

Note! All motor drives fulfil the requirements of the generic standards for electromagnetic compability (EN 50081-1 and EN 61000-6-2) to Directive 89/336/EEC.

Limit switch service life >100.000 cycles

Further technical data for DC motor Part Number 9615, 9624

Motor with feedback potentiometer for servo-amplifier

Feedback potentiometer
Resistor: 1 k Ω
Resistor tolerance: ± 20 %
Max wiper current: 1mA
Power rating: 0.1 W
Only part of the potentiometer's range is used.

Further technical data for DC motors Part Number 9650 and 9651

Drives with integrated position controller

The set point input can be set to the required signal range with the 2 jumpers.

Power supply residual ripple: max 1.2 V_{pp}

Set point input:
0 – 10 V J1, J2 not inserted
0 – 20 mA J1 inserted, J2 not inserted
4 – 20 mA J1, J2 inserted

Input signal ripple:
max 40 mV_{pp} with voltage signal
max 0.08 A_{pp} with current signal

Input resistance:
200 k Ω with voltage signal
500 k Ω with current signal

Auxiliary voltage for external potentiometer:
12 V ± 3 %
max 10 mA

IMPORTANT! Brief interruptions in the power supply e. g. caused, by it being switched by an electromechanical relay, can cause the electronics to malfunction.

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Further technical data for stepper motor Part Number 9638

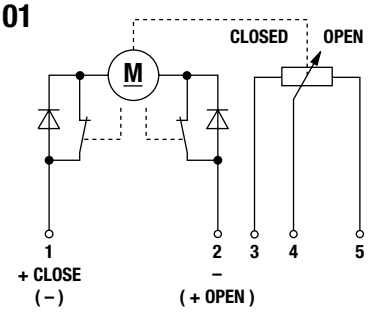
Control:
bipolar, by means of SAA 1042 A (Motorola)
stepper motor driver or equivalent with drop resistance of 44 Ω per phase at a driver (full-step) operating voltage of 24 V ± 5 %, or by means of a constant current driver set to 0.4A.

Resistance per phase:	9 Ω
Inductance per phase:	12 mH
Steps for opening angle of 90°:	2028

See publication D112901 for further technical data for the motor drive with CAN interface 9657.

Wiring diagrams

01



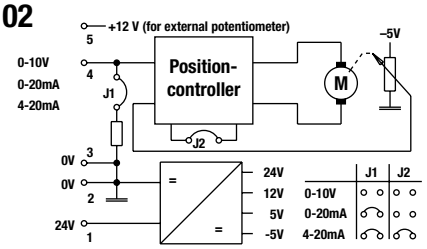
DC motor

Wiring:

+ to 1	Direction of operation: CLOSE
– to 2	
+ to 2	Direction of operation: OPEN
– to 1	

Cutoff at limits provided by microswitches
Resistance between 3 and 4:
minimum value – valve closed
maximum value – valve opened

02

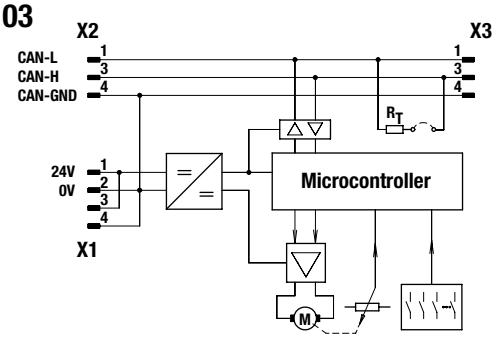


DC motor

Wiring :

1 and 2	Power supply
3 and 4	Input control voltage
5	Output/auxiliary

03



DC motor

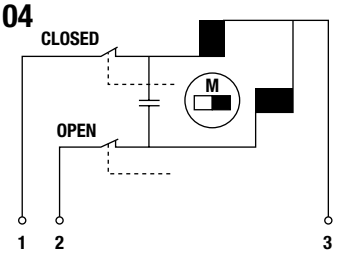
Wiring:
X1

1 und 2	Power supply

X2, X3

1	CAN bus signal
3	CAN bus signal
4	CAN earth

04



Synchronous motor

Wiring:

AC to 1 and 3	Direction of operation: CLOSE
2 unused	
AC to 2 and 3	Direction of operation: OPEN
1unused	

Cutoff at limits provided by microswitches

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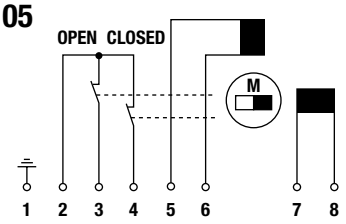
05



Stepper motor

Wiring:

1	Motor frame (possibly for screening)
2	Reference potential for contacts
3	Limit feedback signal (OPEN) contact opened at limit
4	Limit feedback signal (CLOSED) contact opened at limit
5 and 6	Connections for phase 1
7 and 8	Connections for phase 2

Notes on choice of motor

Buschjost offers various valve designs and a choice of DC, synchronous and stepper motors catering for the wide range of applications of the motorised valve and the customer‘s needs.

The mechanical contacts of DC motors make them unsuitable for control functions involving a large number of small adjustments. The AC synchronous motors last longer thanks to their absence of contacts. A stepper motor has to be used where frequent and/or fine adjustment is required.

The following table shows the characteristics of the components used.

Motor Type		Motor life (running time)	Recommended pulse duration	Recommended interval without current during reversal in direction of rotation
DC motor	9615	500 h	> 100 msec	600 msec
DC motor	9624	500 h	> 100 msec	250 msec
DC motor	9650, 9657, 9651	500 h	-	-
Synchronous motor	9636	1000 h	> 100 msec	40 msec
Stepping motor	9638	1000 h	Stepping frequency 200 Hz	-

- To provide a temperature regulation system, the motorised valve can be combined with the 9368 drive, the 82690 microprocessor-controlled PID three-point stepper regulator (Publication 7501533) and the 1244362 digital temperature sensor.
- Further drive models and electronic controllers available on request.
- Flow regulation kit available on request

Further Options

XXXXX**60**.96XX FPM seat seal, control discs for k_{VS} 1.1

XXXXX**61**.96XX EPDM seat seal, control discs for k_{VS} 1.1

XXXXX**62**.96XX Control discs for k_{VS} 3.4 pmax 6 bar, only for G 1/2 and cartridge models

XXXXX**64**.96XX EPDM seat seal, control discs for k_{VS} 3,4 pmax 6 bar, only for G 1/2 and cartridge models

XXXXX**75**.96XX Oxygen model, assembled without oil and grease, sealing material (FPM) [1)]

On request
- Stainless steel model
- Separate drive, max fluid temperature 130 °C
- Other models/combinations
- Control discs for k_{VS} values

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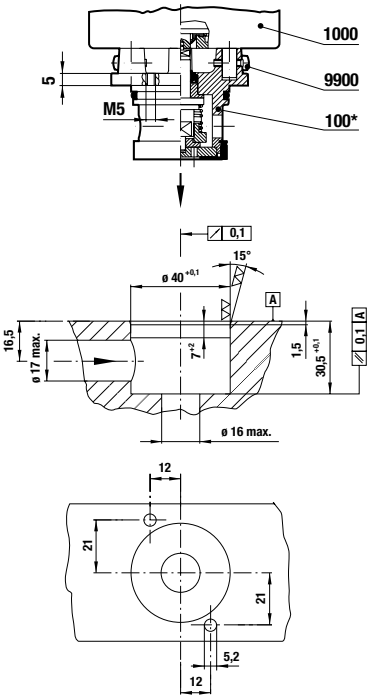
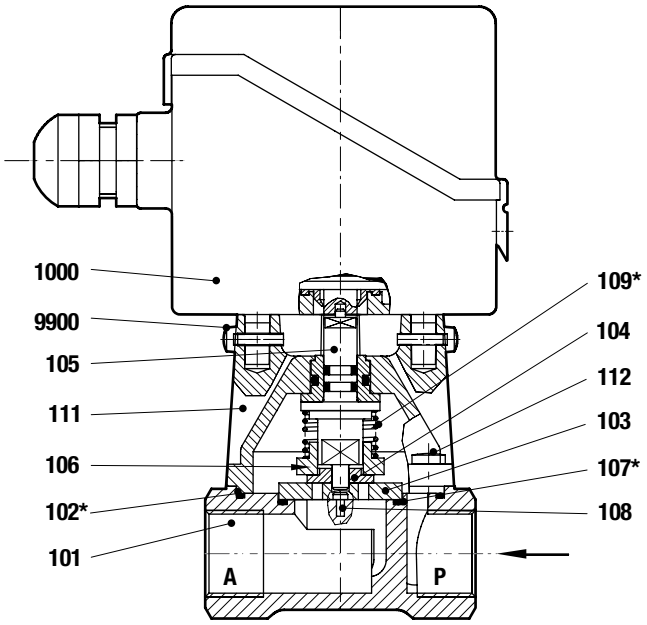
Section View / General Dimensions



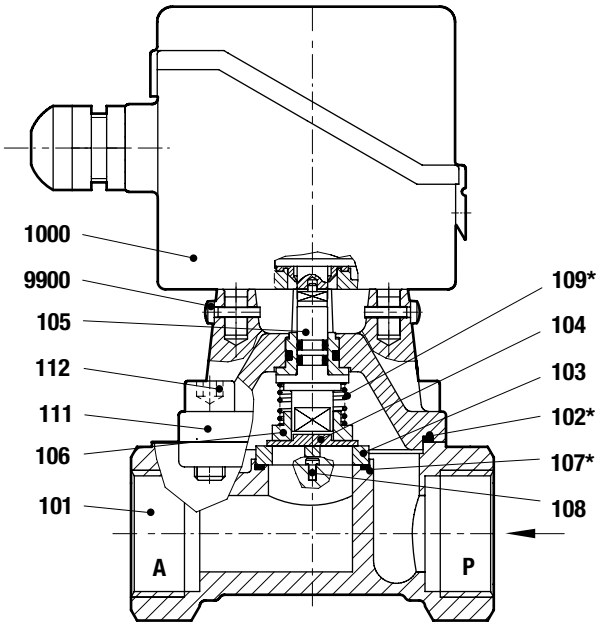
*100 Valve cartridge
1000 Motor drive
9900 Cheese-head screw

Section View

up to G 1/2



from G 3/4



101 Valve body
*102 O-ring
103 Ceramic disc
104 Round plate
*105 Valve spindle
106 Mechanical fixture
*107 O-ring
108 Pin
*109 Pressure spring
111 Valve cover
112 Mounting screws
1000 Motor drive
9900 Oval head screw

* These individual parts form a complete wearing unit.
When ordering spare parts please state Cat. No. and Series No.

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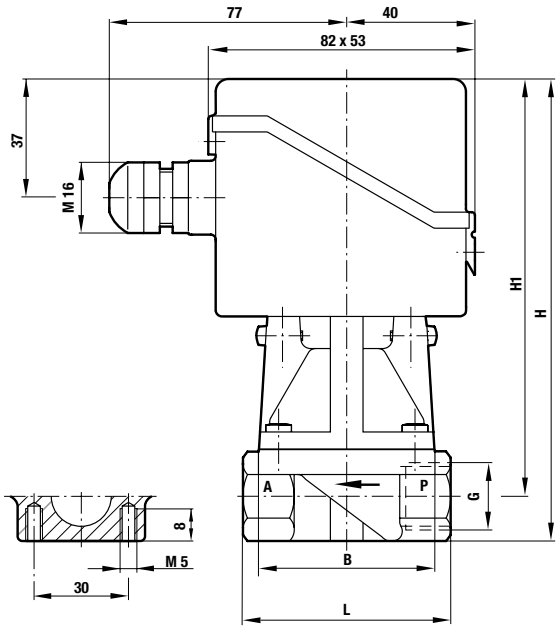
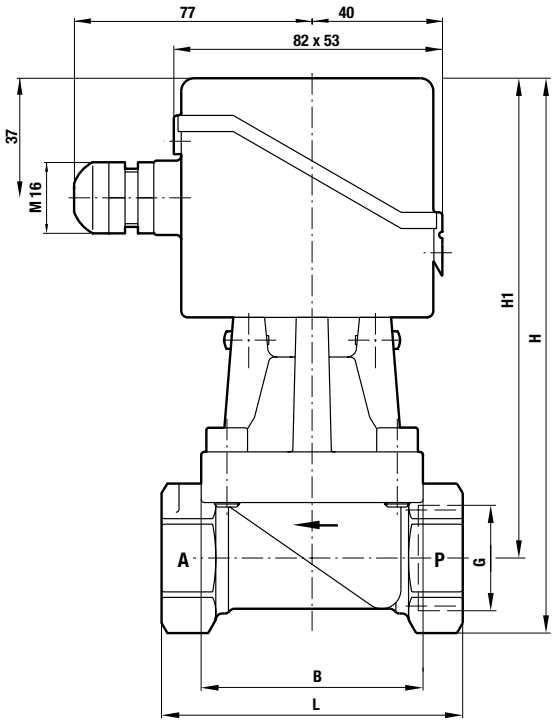
General Dimensions

up to DN 25



from DN 32



Part Number	Nominal Diameter (mm)	Connection Size	L (mm)	B (mm)	H (mm)	H1 (mm)
8288200.96xx	15	G 1/2	65	55	147	134
8288300.96xx	20	G 3/4	95	70	164	140
8288400.96xx	20	G 1	95	70	164	140

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Chipsol 8 mm 2/2 and 3/2-way valves

For lubricated and unlubricated compressed air and neutral gases
Cartridge valve, directly actuated with spring return
High cycle rate of up to 6000 cycles per minute
Long life - in excess of 100 million cycles
Cartridge: plug-in connection
Response time: 5-10 ms
Operating pressure: see characteristic data

Description

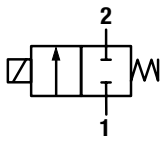
Solenoid valve for air and other neutral gases

Switching function:	normally closed, normally open
Flow direction:	determined
Fluid temperature:	-10 °C up to +50 °C
Ambient temperature:	-10 °C up to +50 °C
Mounting position:	as required

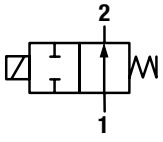
Material

Body:	Stainless steel
Seat seal:	HNBR
Valve seat:	PPS

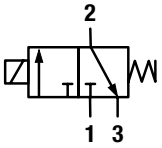
Symbols



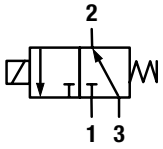
Symbol 1: 2/2 NC



Symbol 2: 2/2 NO



Symbol 3: 3/2 NC



Symbol 4: 3/2 NO

NC: Normally closed
NO: Normally open

Characteristic data

Connection	DN mm	kv-value l/min	kv-value m³/h	Part Number	Operating Pressure / bar	Function	Manual Override	Hit & Hold*	Voltage	Power Consumption	Symbol/ Drawing
2/2 Solenoid valve											
Cartridge	0.5	0.11	0.007	14-211CA00-HH++AYJ	0 – 8	NC	–	–	24 V DC	0.5 W	1 / 1
Cartridge	0.8	0.20	0.012	14-211CA01-HH++AYJ	0 – 5	NC	–	–	24 V DC	0.5 W	1 / 1
Cartridge	1.0	0.35	0.021	14-211CA010HH++AYJ	0 – 1.5	NC	–	–	24 V DC	0.5 W	1 / 1
Cartridge	0.6	0.11	0.007	14-221CA060HH++AYJ	0 – 8	NO	–	–	24 V DC	0.5 W	2 / 2
Cartridge	0.7	0.20	0.012	14-221CA070HH++AYJ	0 – 5	NO	–	–	24 V DC	0.5 W	2 / 2
3/2 Solenoid valve											
Cartridge	0.5	0.11	0.007	14-311CA00-HH++AYJ	0 – 8	NC	–	–	24 V DC	0.5 W	3 / 3
Cartridge	0.8	0.22	0.013	14-311CA01-HH++AYJ	0 – 3	NC	–	–	24 V DC	0.5 W	3 / 3
Cartridge	0.6	0.12	0.007	14-321CA060HH++AYJ	0 – 4	NO	–	–	24 V DC	0.5 W	4 / 3

* PWM energy saving option

Electrical characteristics

Voltage range ±10 %
Electrical insulation: 500 V AC
Insulation class F (155 °C)
Duty cycle: 100 %

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Drawing legend

Index	Description
1	Connection 1
2	Connection 2
3	Connection 3
4	Burr-free

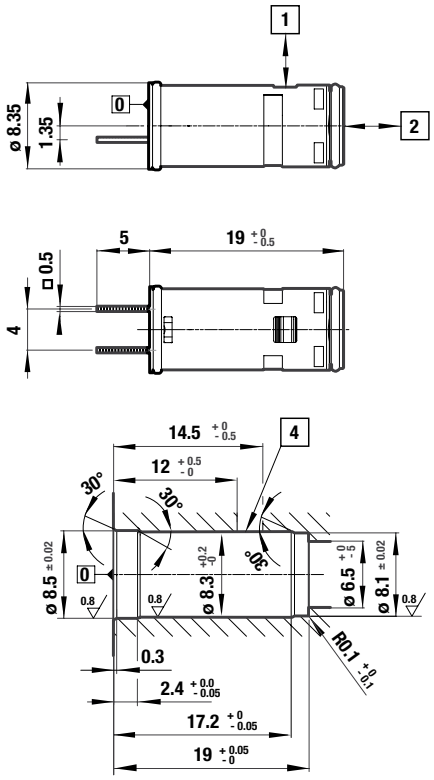
Functions

Function	2/2 NC	2/2 NO	3/2 NC	3/2 NO
Connection 1	P	P	P	R
Connection 2	A	A	A	A
Connection 3	–	–	R	P

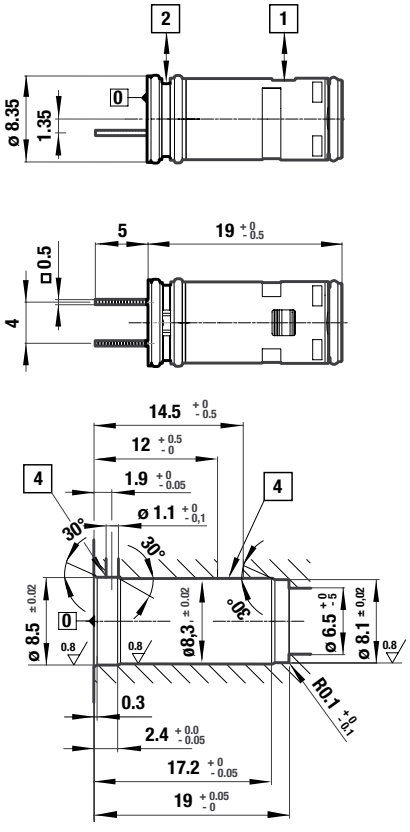
P = Inlet port, A = Outlet port, R = Exhaust port

Important:
Align surfaces of cartridge when mounting.
Use compatible grease when fitting O-ring.

Drawing 1*



Drawing 2*



* Dimensions in mm

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Drawing legend

Index	Description
1	Connection 1
2	Connection 2
3	Connection 3
4	Burr-free

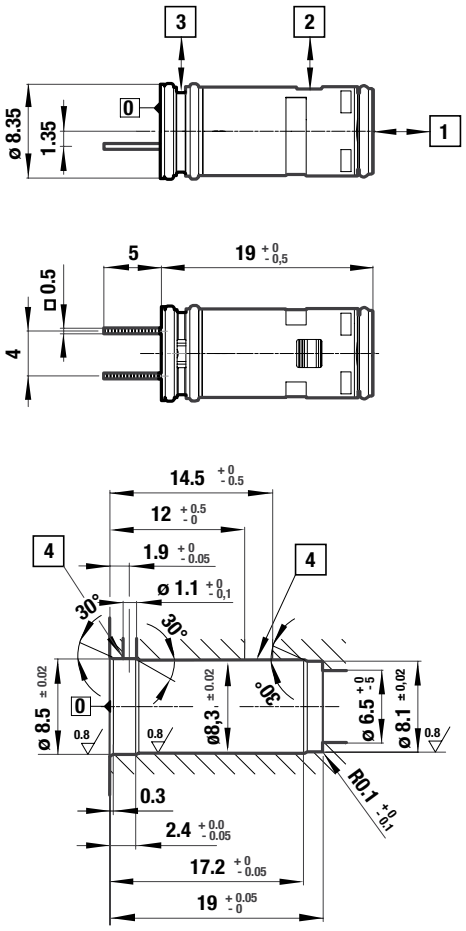
Functions

Fucktion	2/2 NC	2/2 NO	3/2 NC	3/2 NO
Connection 1	P	P	P	R
Connection 2	A	A	A	A
Connection 2	–	–	R	P

P = Inlet port, A = Outlet port, R = Exhaust port

Important:
Align surfaces of cartridge when mounting.
Use compatible grease when fitting O-ring.

Drawing 3*



* Dimensions in mm

fluid automation systems
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Picosol 10 mm 2/2 and 3/2-way valves

For lubricated and unlubricated compressed air, neutral liquids or gases
Poppet valve, directly actuated with spring return
High cycle rate of up to 1800 cycles per minute
Long life - in excess of 100 million cycles*
*** Hit & Hold valves:**
2/2 types with 1.6 mm orifice: 25 million cycles
3/2 types with 1.1 mm or 1.3 mm orifice: 50 million cycles
Sub-base mounted, Response time: 8 - 15 ms, Operating pressure: see technical data

Description

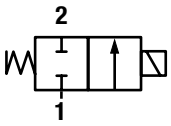
Solenoid valve for air, and neutral liquids or gases

Switching function:	normally closed
Flow direction:	determined
Fluid temperature:	–10 °C up to +30 °C
Ambient temperature:	–10 °C up to +50 °C
Mounting position:	as required

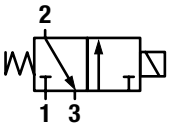
Material

Body:	PPS
Seat seal:	NBR
Internal parts:	Stainless steel, PA 6/6

Symbols



Symbol 1: 2/2 NC



Symbol 2: 3/2 NC

NC: Normally closed

Characteristic data

Connection	DN mm	kv-value l/min	kv-value m³/h	Part Number	Operating Pressure / bar	Function	Manual Override	Hit & Hold*	Voltage	Power Consumption	Symbol/ Drawing
2/2 Direct acting valves / standard models											
Flange	0.8	0.20	0.012	11-211P601-H0+1341+AYR**	0 – 8	NC	No	No	24 V DC	1.2 W	1 / 1
Flange	1.2	0.39	0.023	11-211P602-H0+1341+AYR**	0 – 4	NC	No	No	24 V DC	1.2 W	1 / 1
Flange	1.6	0.50	0.030	11-211P603-H0+6311+AZU	0 – 8	NC	No	Yes	24 V DC	4 W / 0.4 W	1 / 1
3/2 Direct acting valves / standard models											
Flange	0.8	0.19	0.011	11-311PI01-H0+1141+AYR**	2 – 8	NC	Push only	No	24 V DC	1.2 W	2 / 2
Flange	1.1	0.38	0.023	11-311PI011H0+6111+AZR	2 – 8	NC	Push only	Yes	24 V DC	3 W /0.3 W	2 / 2
Flange	1.3	0.50	0.030	11-311PI013H0+6111+AZR	2 – 6.5	NC	Push only	Yes	24 V DC	3 W /0.3 W	2 / 2

** PWM energy saving option
** Optional surge suppression diode

Electrical characteristics

Voltage range ±10 %, duty cycle 100 %
Protection class according to EN 60529: IP51 with connector
Electrical insulation: 1000 V AC
Insulation class F (155 °C)
Electrical connection: Molex®

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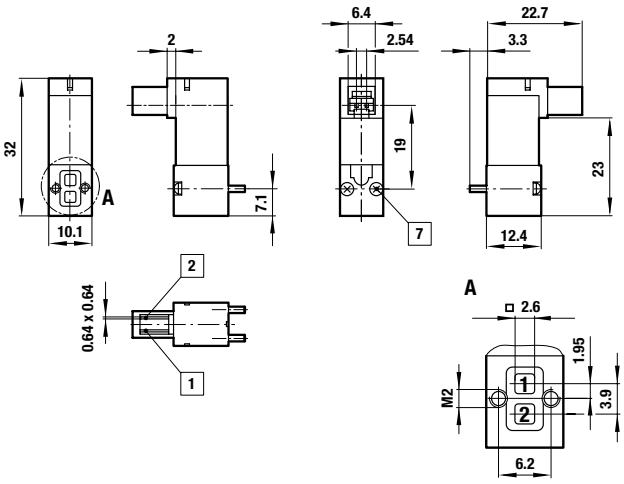
Drawing legend

Index	Description
1	Pin +
2	Pin –
3	Manual override
7	The recommended mounting screw tightening torque is 0.15 Nm.

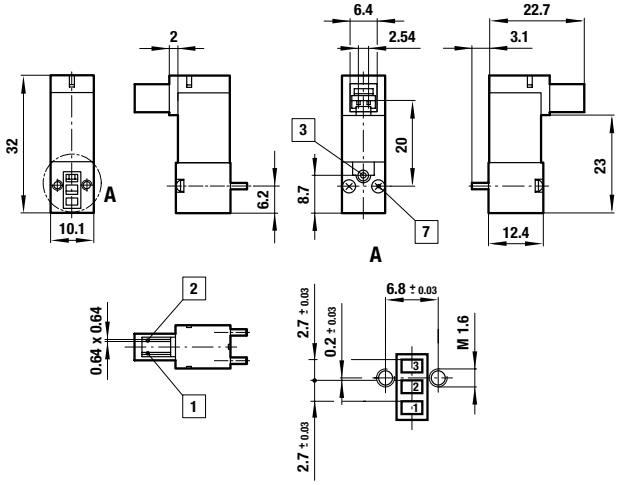
All solenoids are supplied with mounting screws and gasket.

Warning for Hit and Hold valves: damage could be caused to the valve if wired incorrectly.

Drawing 1*



Drawing 2*



* Dimensions in mm

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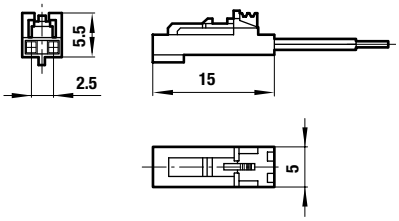
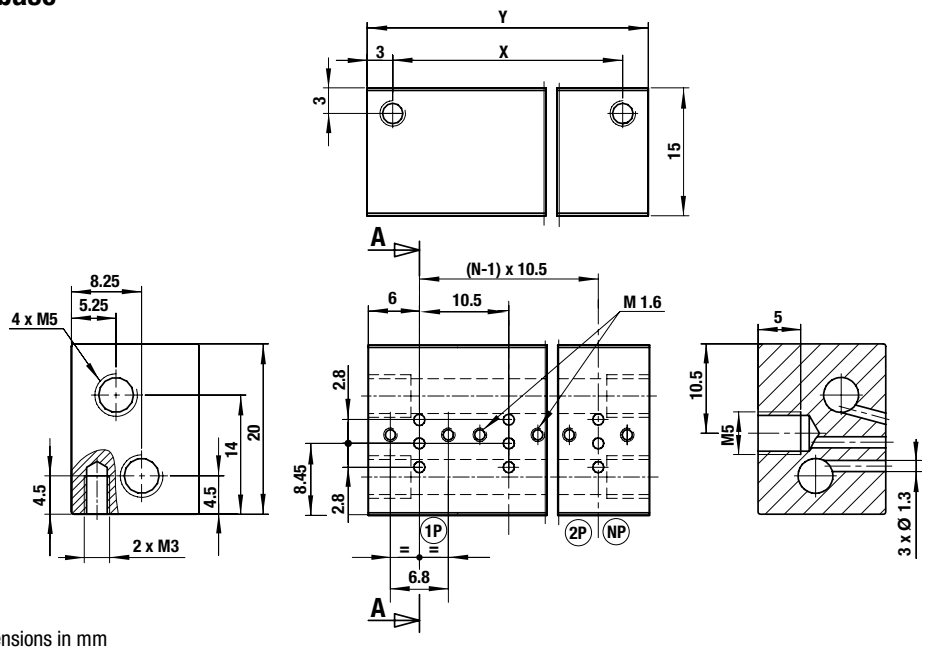
Accessories

Electrical connector		M5 ported sub-base	
			
N/C-11010	0.3 m	1 station:	N/B11001
N/C-11020	0.6 m	2 stations:	N/B11001
		3 stations:	N/B11003
		4 stations:	N/B11004
		5 stations:	N/B11005
		6 stations:	N/B11006

Electrical connector*



Subbase*



* Dimensions in mm

Further options on request

- Function (NO, Universal, Latching)
- Pressure range
- Vacuum
- Materials
- Manual override
- Voltage (DC only)
- Electrical connection
- Power consumption

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Microsol 15 mm 2/2 and 3/2-way valves

For lubricated and unlubricated compressed air, neutral liquids or gases
Poppet valve, directly actuated with spring return
Microsol interface: pilot operated poppet valve, servo assisted
High cycle rate of up to 2000 cycles per minute
Long life - in excess of 100 million cycles*, * Hit & Hold valves: 10 million cycles
Flange mounted, Response time: 8 - 10 ms, Operating pressure: see characteristic data

Description

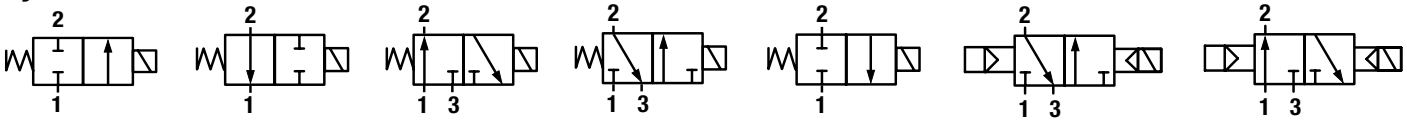
Solenoid valve for air, and neutral liquids or gases

Switching function:	normally closed and normally open
Flow direction:	determined
Fluid temperature:	–10 °C up to +30 °C
Ambient temperature:	–10 °C up to +50 °C
Mounting position:	as required

Material

Body:	for 2/2 valves PPS, for 3/2 valves PPS, PA, Stainless steel
Seat seal:	NBR
Internal parts:	Stainless steel, PA 6/6

Symbols



Symbol 1: 2/2 NC | Symbol 2: 2/2 NO | Symbol 3: 3/2 NO | Symbol 4: 3/2 NC | Symbol 5: 2/2 NC | Symbol 6: 3/2 NC | Symbol 7: 3/2 NO

NC: Normally closed, NO: Normally open

Characteristic data

Con-nection	DN mm	kv-value l/min	kv-value m³/h	Part Number	Operating Pressure / bar	Function	Manual Override	Hit & Hold *	Voltage	Power Consumption	Symbol/ Drawing
2/2 Direct acting valves / standard models											
Flange	1.2	0.75	0.045	01-211P202-H0+63111+AYZ	0 - 10	NC	No	No	24 V DC	2.0 W	1 / 1
Flange	1.2	0.75	0.045	01-221P202-H0+631A1+AYZ	0 - 10	NO	No	No	24 V DC	2.0 W	2 / 2
3/2 Direct acting valves											
Flange	1.1	0.42	0.025	01-311P-011H0+61111+AYZ	0 - 10	NC	Push only	No	24 V DC	2.0 W	4 / 4
Flange	1.1	0.42	0.025	01-321P-011H0+631A1+AYZ	0 - 6	NO	No	No	24 V DC	2.0 W	3 / 4
2/2 Direct acting valves / high flow models											
Flange	3.6	3.00	0.180	01-211P-036H0+63111+AZN	0 - 6	NC	No	Yes	24 V DC	12 / 0.5 W	5 / 3
3/2 Interface valves											
Flange	3.0	3.00	0.007	01-312E-06-HP+A1171+AYV	1.5 - 10	NC	Push only	No	24 V DC	1.0 W	6 / 6
Flange	3.0	3.00	0.012	01-322E-06-HP+C31G1+AYZ	1.5 - 10	NO	No	No	24 V DC	2.0 W	7 / 6
3/2 Direct acting valves / intrinsically safe (IS) models**. labeling: EEx ia IIC T6 IINERIS 00ATEX0031 X											
Flange	0.5	0.12	0.007	01-311P-00-H0+F01003+BBC	0 - 7	NC	Push only	No	12 V AC/DC	0.55 W	4 / 5
Flange	0.5	0.12	0.007	01-311P-00-H0+F01003+BDH	0 - 7	NC	Push only	No	24 V AC/DC	0.7 W	4 / 5
Flange	0.5	0.12	0.007	01-311P-00-H0+F01014+AWD	4 - 7	NC	Push only	No	12 V AC/DC	0.1 W	4 / 5
Flange	0.5	0.12	0.007	01-311P-00-H0+F01016+AYG	4 - 7	NC	Push only	No	24 V AC/DC	0.1 W	4 / 5
3/2 Direct acting valves / other options as used on M54 range**											
Flange	0.8	0.28	0.017	01-311P101-H0+61511I+AWM	0 - 10	NC	Push only	No	12 V DC	1.5 W	4 / 4
Flange	0.8	0.28	0.017	01-311P101-H0+61511I+AYS	0 - 10	NC	Push only	No	24 V DC	1.5 W	4 / 4
Flange	0.8	0.28	0.017	01-311P101-H0+11511I+AXX	0 - 10	NC	Push only	No	24 V AC	1 W	4 / 4
Flange	0.8	0.28	0.017	01-311P101-H0+11511I+BAU	0 - 10	NC	Push only	No	48 V AC	1 W	4 / 4
Flange	0.8	0.28	0.017	01-311P101-H0+11511I+BBJ	0 - 10	NC	Push only	No	110 V AC	1 W	4 / 4
Flange	0.8	0.28	0.017	01-311P101-H0+11511I+BCK	0 - 10	NC	Push only	No	220 V AC	1 W	4 / 4

* PWM energy saving option, ** IP65 with connector

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Electrical characteristics

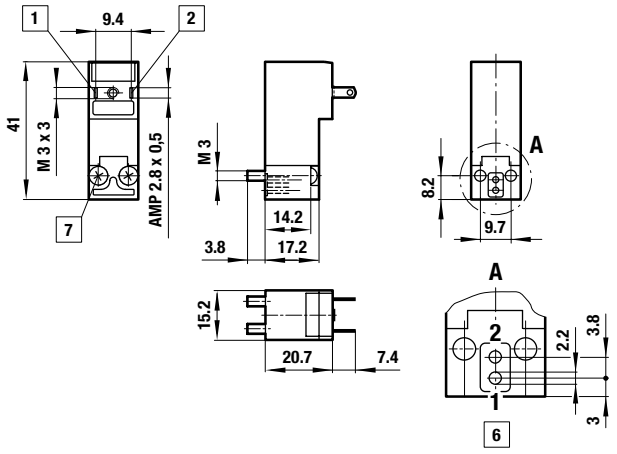
Voltage range –10 % / +15 %
Protection class according to EN 60529: IP51 with connector
Electrical insulation: 1500 V AC
Insulation class F (155 °C)
Electrical connection AMP +/-

Drawing legend

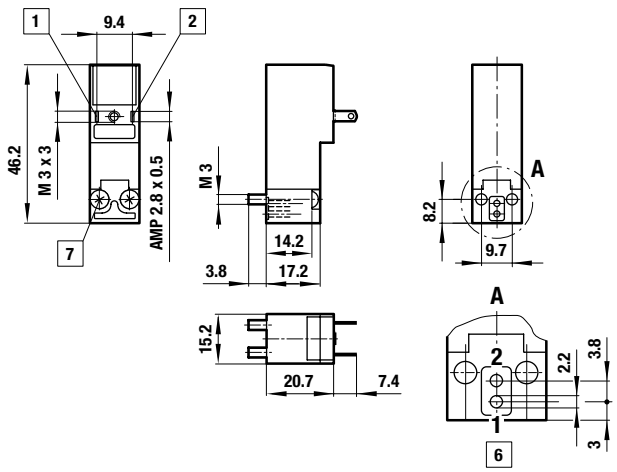
Index	Description
1	Wire (red) / pin +
2	Wire (black) / pin –
3	Manual override
4	For NC models
5	For NO models
6	Mounting pattern
7	The recommended mounting screw tightening torque is 0.6 Nm.

All solenoids are supplied with mounting screws and gasket.

Drawing 1*



Drawing 2*



* Dimensions in mm

Warning for Hit and Hold valves: damage could be caused to the valve if wired incorrectly.

Further options on request

- Switching function (NO, Universal, Latching)
- Operating pressure
- Vacuum
- Materials
- Manual override
- Voltage
- Electrical connection
- Power consumption

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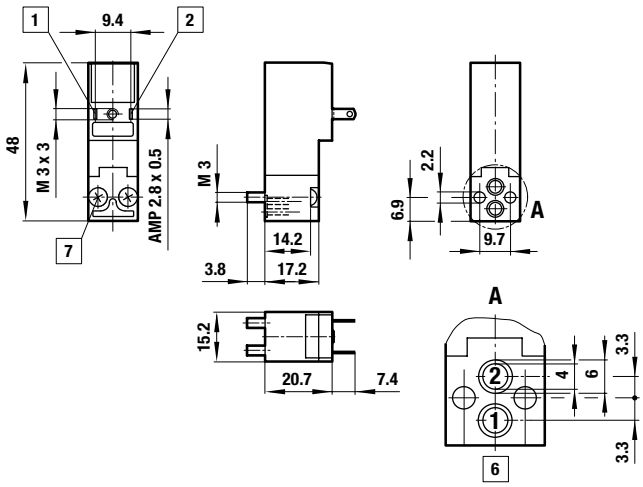
Drawing legend

Index	Description
1	Wire (red) / pin +
2	Wire (black) / pin –
3	Manual override
4	For NC models
5	Für NO-Ventile
6	For NO models
7	The recommended mounting screw tightening torque is 0.6 Nm.

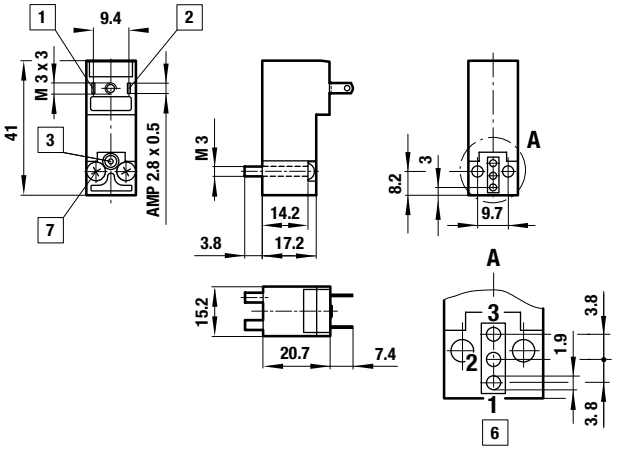
All solenoids are supplied with mounting screws and gasket.

Warning for Hit and Hold valves: damage could be caused to the valve if wired incorrectly.

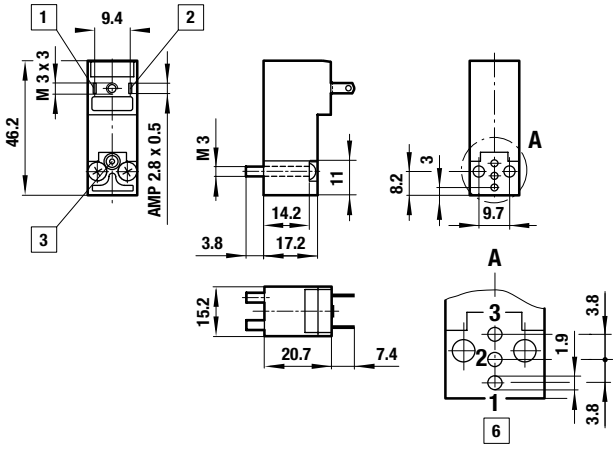
Drawing 3*



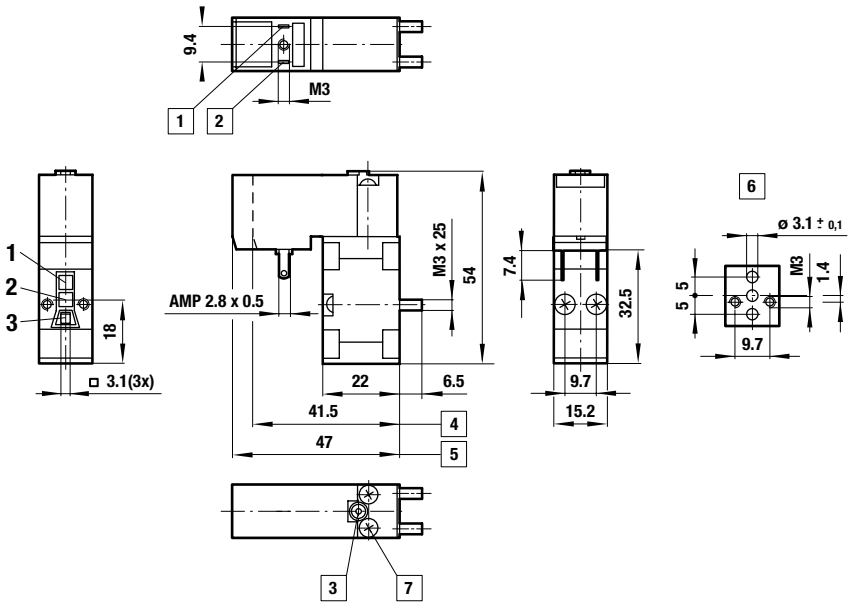
Drawing 4*



Drawing 5*



Drawing 6*



* Dimensions in mm

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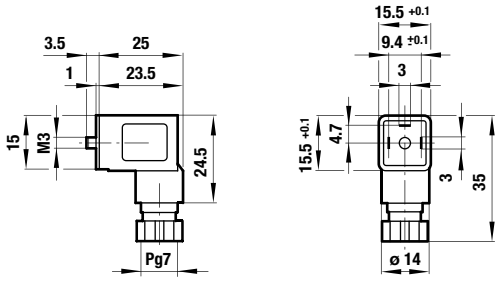
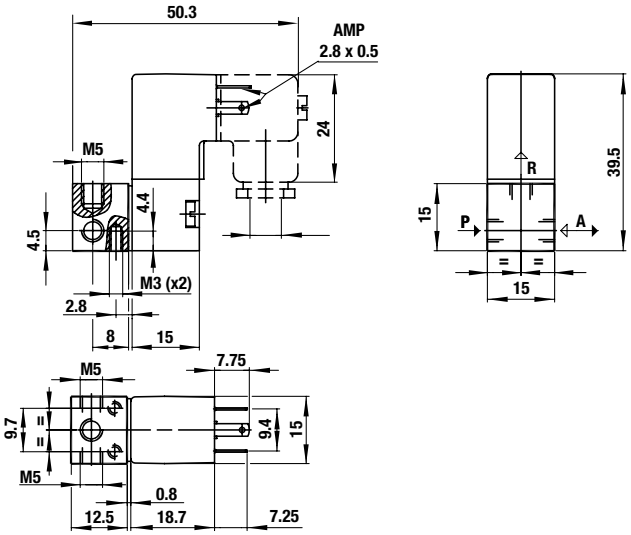
Accessories

Electrical connector		Subbase	
			
Single connector	M/P43082	1 station:	N/S5001
Single connector LED+VDR 24V	M/P43086	2 stations:	N/B5002
Single connector LED+VDR 110V	M/P43148	3 stations:	N/B5003
Single connector LED+VDR 220V	M/P43087	4 stations:	N/B5004
Single connector & 1 m flying lead	M/P43066	5 stations:	N/B5005
		6 stations:	N/B5006

Electrical connector*

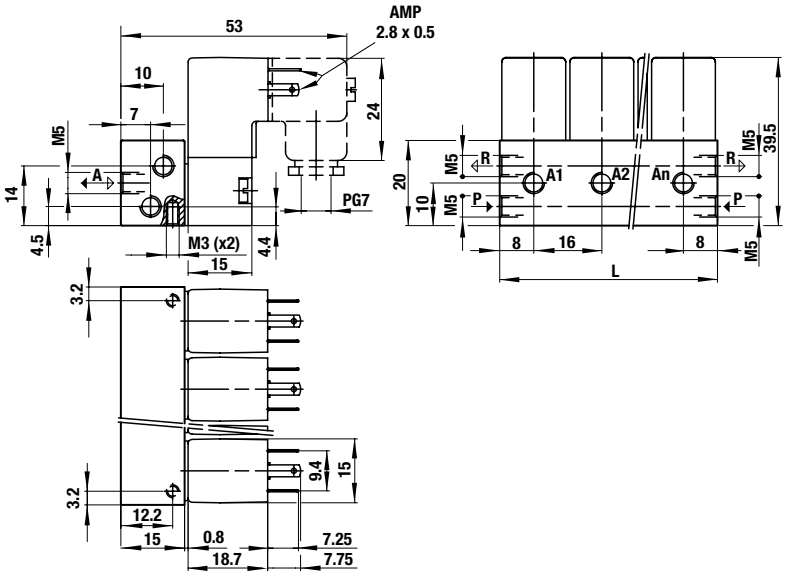


Subbase*



Number of stations	Length (L)
2	32
3	48
4	64
5	80
6	96

Subbase*



* Dimensions in mm

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Microsol 15 mm media separated valves

Low internal volume, virtually no unswept volume
Low power consumption 0.4W (4W for first 50 ms)
Long life - in excess of 10 million cycles depending on the application
Very compact design (27 x 15 x 50 mm)
100 % ED operation up to 50 °C fluid temperature

Description

Medium:	neutral or aggressive gases and liquids
Operation:	Media separated solenoid valve, direct acting
Mounting:	2 x M2.5
Operating pressure:	-0.95 to 2.2 bar relative pressure
Flow characteristics:	k_V: 0.8
	Orifice size 1.6 mm
Fluid temperature:	0 °C to 50 °C
Ambient temperature:	0 °C to 50 °C

Material

Body material in contact with media:	PEEK
Seal material in contact with media:	FFPM, FPM or EPDM

Symbols

Characteristic data

Connection	DN mm	k_V-value l/min	m^3/h	Part Number	Operating Pressure / bar	Function	Material Diaphragm	Seal	Hit & Hold	Voltage	Power Consumption	Drawing
Flange	1.6	0.8	0.048	01-333EB03-B5+23112+AXA	-0.95 – 2.2	3/2 UNI	EPDM	EPDM	Ja	12 V DC	4 / 0.4 W	1
Flange	1.6	0.8	0.048	01-333EB03-B5+23112+AZU	-0.95 – 2.2	3/2 UNI	EPDM	EPDM	Ja	24 V DC	4 / 0.4 W	1
Flange	1.6	0.8	0.048	01-333EB03-B1+23112+AXA	-0.95 – 2.2	3/2 UNI	FPM	FPM	Ja	12 V DC	4 / 0.4 W	1
Flange	1.6	0.8	0.048	01-333EB03-B1+23112+AZU	-0.95 – 2.2	3/2 UNI	FPM	FPM	Ja	24 V DC	4 / 0.4 W	1
Flange	1.6	0.8	0.048	01-333EB03-B6+23112V+AZU	-0.95 – 2.2	3/2 UNI	FFPM	FPM	Ja	12 V DC	4 / 0.4 W	1
Flange	1.6	0.8	0.048	01-333EB03-B6+23112V+AXA	-0.95 – 2.2	3/2 UNI	FFPM	FPM	Ja	24 V DC	4 / 0.4 W	1
Flange	1.6	0.8	0.048	01-333EB03-B6+23112+AXA	-0.95 – 2.2	3/2 UNI	FFPM	FFPM	Ja	12 V DC	4 / 0.4 W	1
Flange	1.6	0.8	0.048	01-333EB03-B6+23112+AZU	-0.95 – 2.2	3/2 UNI	FFPM	FFPM	Ja	24 V DC	4 / 0.4 W	1

Contact your local Norgren Fluid Controls specialist for information about our manifolding capabilities, which include laminated polymer manifolds.

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Electrical characteristics

Voltage tolerance: -/+ 5 %
Electrical response time: 10 – 15 ms (ON), 10 – 15 ms (OFF)
Protection class according to EN 60529: IP51 with connector
Electrical insulation: 1500V AC
Insulation class: F (155 °C)
Electrical connection: AMP 2P (caution, polarity + / -)
Coil Orientation: B01 / B03

Further options on request

Orifice size, operating pressure, materials, voltage, electrical connection, manual override, position indicator.

2/2 NC and NO configurations are available in the Microsol 15 mm media separated range.

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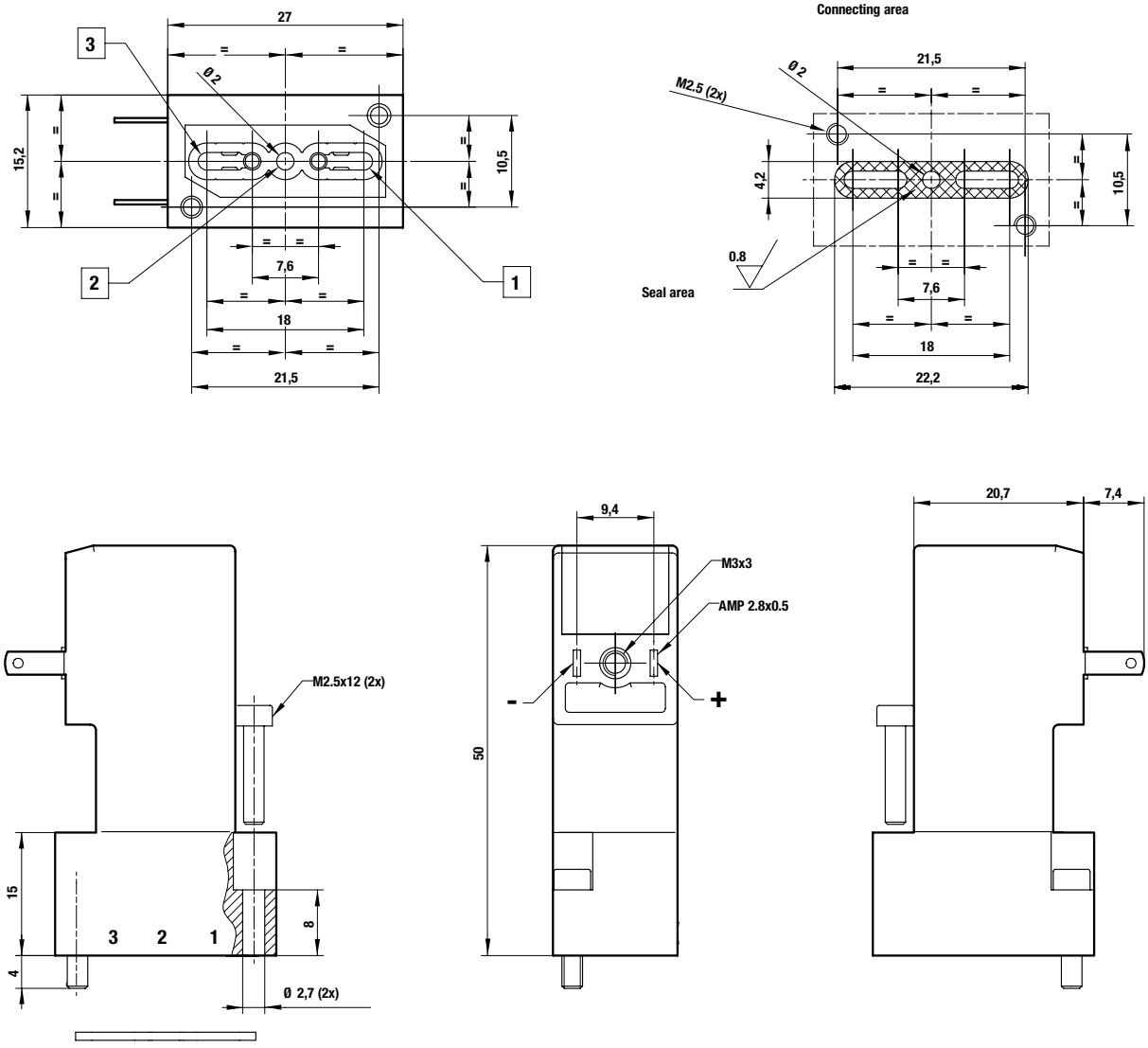
Drawing 1*



* Dimensions in mm

Drawing legend

Index	Description
1	Port 1
2	Port 2
3	Port 3

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High pressure valves DN 15 und DN 25

For neutral and slightly aggressive gases and liquids
Indirectly solenoid actuated
Piston valves
Internal threads G 1/4 to G1 or 1/4 NPT to 1 NPT
Operating pressure 1 up to 200 bar

Standard

Description

Solenoid valve for e. g. water

Switching function:	normally closed
Flow direction:	determined
Fluid temperature:	–20 °C up to max. +90 °C
Ambient temperature:	–20 °C up to max. +50 °C
Mounting position:	optional, preferably solenoid vertical on top

Material

Body:	Stainless steel (1.4305)
Seat seal:	PTFE, POM
Internal parts:	EPDM, 1.4104

For contaminated fluids insertion of a strainer is recommended.

With manual override

Features

- High flow rate
- Compact design
- Optional with manual override (picture, right)
- Optional 2-fold, 3-fold or 4-fold manifold available

Characteristic data

Nominal Diameter (mm)	Connection Size	Operating Pressure min. (bar)	max. (bar)	k_V-value (Base m^3/h)	Weight Total (kg)
15	G 1/4 – G 1/2	1	200	1.60 – 3.25	3.2
25	G 3/4 – G 1	1	200	5.20 – 7.00	7.1

* for gases and liquid fluids up to 25 mm^2/s (cSt)
** C_V-value (US) ≈ k_V-value x 1.2

State voltage [V] and frequency [Hz]

Solenoid 9301 / 9304

Standard voltage

DC ⎓	AC ∼ 40 Hz – 60 Hz	
24 V	24 V	–
–	230 V	220 V

Design acc. to DIN VDE 0580
Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP65
Socket Form A acc. to DIN EN 175301-803 (included)
AC with rectifier plug

Power Consumption

According to DIN VDE 0580 at coil temperature of +20 °C. In operation the power consumption of the solenoid decreases by approx. 30 %.

Solenoid	DC ⎓	AC ∼ Inrush	AC ∼ Holding
9301	18 W	20 VA	18 VA

* c SP us coil only (with the expection of solenoid 94xx up to 41 V AC)

Attention!
The conditions imposed on the Ex approvals lead to reduction of the permissible standard temperature ranges in the cases of explosion protected solenoids.

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High pressure valves DN 6 and DN 10

For neutral and slightly aggressive gases
Direct and Indirectly solenoid actuated
Piston valves
Internal threads G 3/8 oder G 1/2
Operating pressure 0 to 350 bar (10 mm)
Operating pressure 5 to 320 bar (6 mm)

Description

Solenoid valve for CNG, N_2, H_2 and air

Switching function:	normally closed
Flow direction:	determined
Fluid temperature:	0 °C up to +90 °C
Ambient temperature:	0 °C up to +90 °C
Mounting position:	optional , preferably solenoid vertical on top

Material

Body:	Stainless steel (1.4301)
Seat seal:	POM, NBR
Internal parts:	POM 1.4105

For contaminated fluids insertion of a strainer is recommended.

Features

- High flow rate
- Compact design
- Mounting threating M6 x 8
- With solenoid 8341 acc. to ATEX available

Characteristic data

Nominal Diameter (mm)	Connection Size	Operating Pressure min. (bar)	max. (bar)	k_V-value (Base m^3/h)	Weight Total (kg)
6	G 1/2	0	350	0.6	1.95
10	G 1/2	5	320	1.9	1.95

* for gases up t_0 25 mm^2/s (cSt)
** C_V-value (US) ≈ k_V-value x 1.2

State voltage [V] and frequency [Hz]

Solenoid 8301 / 8341

Standard voltage

DC ⎓	AC ∼ 40 Hz – 60 Hz	
24 V	24 V	–
–	110 V	120 V
–	230 V	220 V

Design acc. to DIN VDE 0580
Voltage range ±10 %
100 % duty cycle
Protection class according to - E Ex em II T3
- Ex II 2 GD T 140 °C

Power Consumption

According to DIN VDE 0580 at coil temperature of +20 °C. In operation the power consumption of the solenoid decreases by approx. 30 %.

Solenoid	DC ⎓	AC ∼ Inrush	AC ∼ Holding
8304	22 W	25 VA	25 VA
8341	22 W	25 VA	25 VA

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Dome pressure reducing valve K 16

For air, gases and liquids
Small dome pressure reducing valve for high pressures and low flows

Description

Diameter valve seat:	6.3 mm pressure balanced
Connections:	G 1/4
Pressure range:	max. inlet pressure 420 bar outlet pressure range 0.5 to 300 bar

Material

Body:	Stainless steel
Dome / spring body:	Stainless steel
Valve cone:	Stainless steel with PCTFE-pad
Valve seat:	Stainless steel
Seals:	Buna, FPM, EPDM

Dimensions

Overall length:	70 mm
Overall height:	71 mm

Options

- 1/4 NPT

Spring-loaded pressure reducing valve J 50 with DVGW approval

For air, gases and liquids
Pressure reducing valve for rapid regulation of outlet pressure, accurate and reliable, ideal for high pressures

Description

Diameter valve seat:	6.3 mm pressure balanced
Connections:	G 3/8
Pressure range:	max. inlet pressure 700 bar different outlet pressure ranges 0.5 to 550 bar

Material

Body:	a) Aluminium b) Stainless steel
Dome / spring body:	a) Aluminium b) Stainless steel
Valve cone:	Stainless steel with PCTFE-pad
Valve seat:	Stainless steel
Seals:	Buna, FPM, EPDM, FFPM

Dimensions

Overall length:	60 mm
Overall height:	188 mm

Options

- Valve seat 1.6 mm (1/16), not pressure-balanced
- Integral relief valve
- 3/8 NPT
- Integral fine filter 25 µm
- Panel mounting
- Differential pressure design
- Gauge connection

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Spring-loaded pressure reducing valve D 131

For air, gases and liquids
HP-pressure reducing valve for precise regulation of low outlet pressures

Description

Diameter valve seat:	4 mm pressure balanced
Connections:	G 3/8
Pressure range:	max. inlet pressure 250 bar different outlet pressure range 0.1 to 10 bar

Material

Body:	Brass
Dome / spring body:	Brass
Valve cone:	Stainless steel with PCTFE-pad
Valve seat:	Stainless steel
Seals:	NBR, FPM, EPDM

Dimensions

Overall length:	70 mm
Overall height:	220 mm

Options

- Connections G 1/2 or flange
- Integral relief valve
- Gauge connection for inlet and outlet pressure
- Option in brass chemical nickel plated or stainless steel (D118)

Very low flow and analytical pressure reducing valves J 20

For air, gases and liquids
Pressure reducing valve for low to medium flow rates
Suitable for all gases and liquids compatible with the valve materials

Description

Diameter valve seat:	1.6 mm
Connections:	G 1/4
Pressure range:	max. inlet pressure 420 bar different outlet pressure range 0.5 bis 11 bar

Material

Body:	Stainless steel (optional brass)
Dome / spring body:	Stainless steel (optional brass)
Valve cone:	Stainless steel (optional brass)
Valve seat:	Nylon
Seals:	NBR, FPM, EPDM

Dimensions

Overall length:	57 mm
Overall height:	121 mm

Options

- Side mounted overflow valve
- Integral filter cartridge
- Stainless steel diaphragm

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Hydrogen bottle unit

Valve manifold solution

Valve manifold solution

Valve manifold solution

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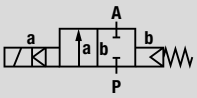
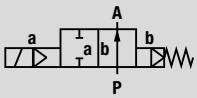
Reduce energy consumption

In fuel cell applications, it is important to achieve the highest possible efficiency; the operation of the fuel cell should not consume a large proportion of the energy generated. There are currently a number of options available to reduce the power consumption of electrically actuated solenoid valves. In many valves, the switching positions NC (normally closed) or NO (normally open) can be freely chosen, depending on the application and the safety requirements. This ensures that no energy is consumed when the valve is in its normal operating position.

NC



NO



With latching valves, the power consumption in switched status can be reduced to virtually zero, as the valve is only powered for a short period during switching and then held in the switched position by a permanent magnet. The second valve position is achieved by switching polarity (direct current) and by means of a spring mechanism that is stronger than the field force of the permanent magnet.

Valve control by means of PWM signal is another energy saving solution that can be easily implemented. The switching power is thereby provided by an electronic circuit. The subsequent holding power is reduced to a minimum (up to 30 % of the nominal power, depending on the application). This energy saving technology meets all relevant safety requirements as the valve is in its neutral position when not powered. The circuit can be integrated into the control system of the unit or into the adapter of a solenoid valve. The electronics must of course be adjusted to suit the actual application.

Media connections

Buschjost offers various media connections for its valve housings. These range from standard BST and NPT connections, metric options and hose adapters to flange clamp connections, which are considered the assembly technology of the future.

BSP, NPT

Flange clamp

Hose nozzle

Hose clip

Engineering Advantage

Through its close ties with other companies of the IMI Group, Buschjost Norgren GmbH can offer you a wide range of products designed for hydrogen applications and fuel cell technology covering every aspect from pressure reduction and control of flows from the hydrogen storage (up to 700 bar) to low-pressure control and purge functions. On request, we also provide hydrogen storage up to 700 bar as part of the package.
Thanks to its extensive know-how in the field of valve technology, Buschjost is the ideal partner when It comes to advanced solutions for specialised applications such as return flow control and condensate discharge developed in close cooperation with our customers.
Buschjost considers certification according to EN 50465 and other relevant standards as an important step towards the commercial exploitation of hydrogen applications.
Please contact us to discuss these issues in more detail.

With goverment support for standardised BoP components, Buschjost is developing a future-proof technology for process valves.

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Valve components for alternative fuel and energy systems

The movements in the crude oil market mean alternative fuels such as biodiesel, vegetable oil or bioethanol are becoming more and more attractive. In the automobile field as well, the use of natural gas is gaining in importance from the requirement to minimise CO_2 emissions. Energy, especially for decentralised use, is also being generated from waste materials and crops produced in the agricultural sector. The ever growing wind energy industry is today well established in the field of renewable energy. The conversion of geothermal energy into electricity will gain in importance, not least due to the nearly unlimited resources available in this field.

The energy sources of the future are varied and versatile. They all require however appropriate equipment for the control of medium and material flows - be it at the point of fuel consumption, for example when using pure vegetable oil in heavy goods vehicles, or at the point of fuel production, for example in bio ethanol production plants. Other valve applications include biogas sampling for quality analyses or the temperature control of transmission oils in wind turbines. Another application of valves is the regelation of CNG in filling stations.

For all these applications, Buschjost offers tailor-made valve solutions that will enable you to gain a competitive edge.

This section of the catalogue contains an overview of all currently available valve solutions. Please contact us to discuss your special requirements. Our experienced development and design engineers will be delighted to assist you in finding a suitable solution!

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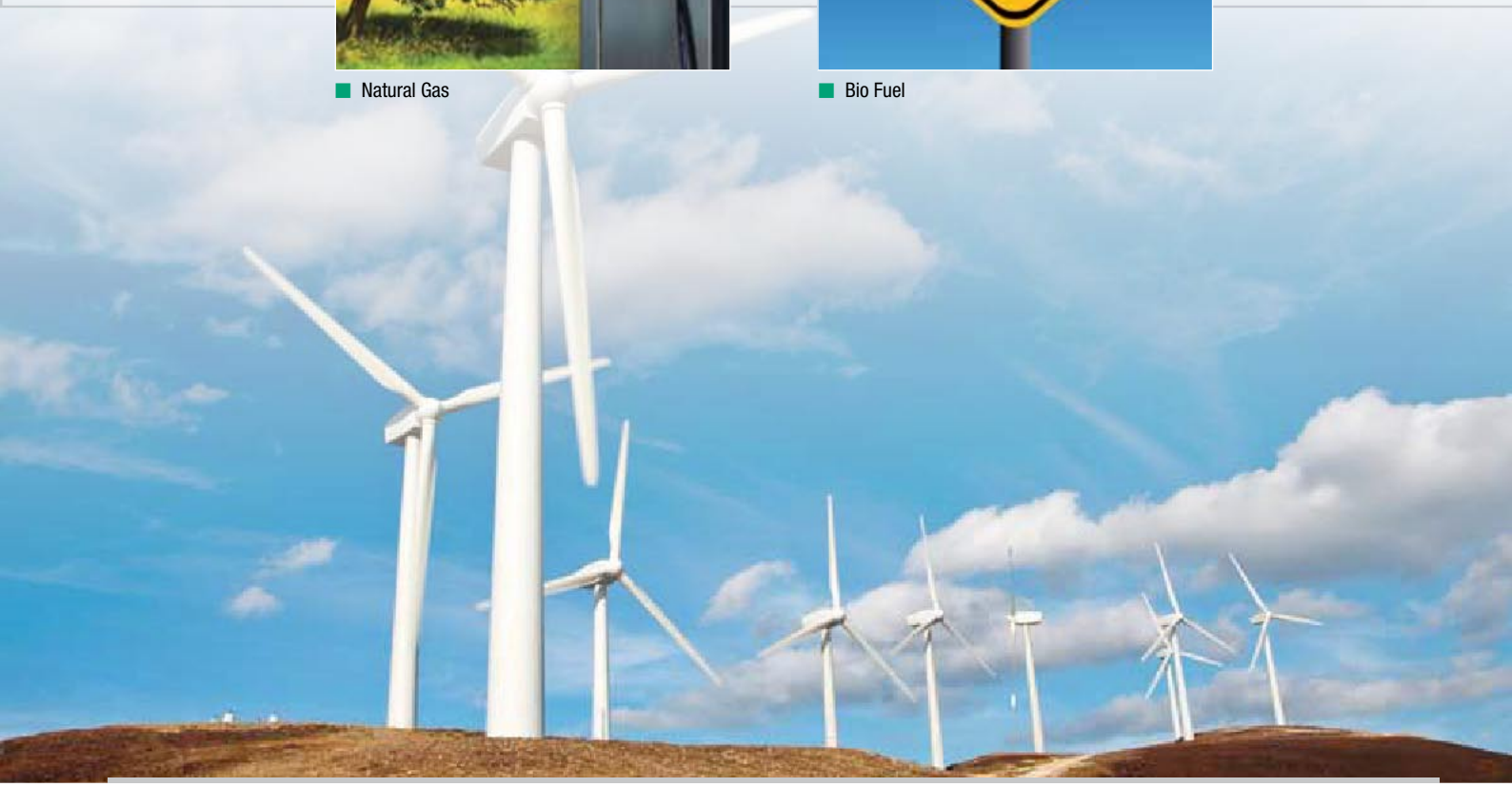
Geothermics

Biogas

Natural Gas

Bio Fuel



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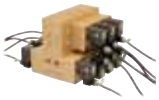
Overview

Picture	Series	Nominal Diameter	Medium	Application	Seite
Solenoid valves					
	82510	1.5 – 5 mm	Neutral gases and liquids e. g. Natural Gas	e. g. process medium flow control	**10**
	82560	10 mm	Slightly aggressive gases and liquids e. g. fuels, biodiesel	e. g. process medium flow control	**22**
	8498894	10 mm	Neutral liquids e. g. fuels, vegetable oil, biodiesel	e.g. for switching between diesel and vegetable oil as the fuel in motor vehicle engines	**73**
	8499523	15 mm	Neutral liquids e. g. fuels, vegetable oil, biodiesel	e.g. for switching between diesel and vegetable oil as the fuel in motor vehicle engines	**74**
	85740 / 85750	8 – 50 mm	Slightly aggressive gases and liquids e. g. natural gas, biogas	e. g. process medium flow control, NO-Function	**76**
	82370	8 – 12 mm	Neutral gases and liquid fuels e. g. natural gas	e. g. gas flow control, with with DVGW approval	**80**
CNG High pressure solenoid valves and manifolds					
	8590178/8590185 8590337/8590371	8 mm	CNG	e. g. natural gas filling stations for cars, to control the Priortity Panel and the Dispenser	**85**
	8590372 / 8590373	15 mm	CNG	e. g. natural gas filling stations for busses, to control the Priortity Panel and the Dispenser	**88**
	3-fold / 8590365	15 mm	CNG **Available soon!**	e. g. natural gas filling stations for busses, to control the Priortity Panel and the Dispenser	
	6-fold / 8499898	8 mm	CNG	e. g. natural gas filling stations for cars, to control the Priortity Panel and the Dispenser	**91**
	6-fold / 8590439	8 mm	CNG	e. g. natural gas filling stations for cars, to control the Priortity Panel and the Dispenser	**94**
	11-fold / 8590237	8 mm	CNG	e. g. natural gas filling stations for cars, to control the Priortity Panel and the Dispenser	**97**
	11-fold / 8590230	15 mm	CNG	e. g. natural gas filling stations for busses, to control the Priortity Panel and the Dispenser	**100**
Pressure reducer					
	K 51	12.7 mm Pressure balanced	Air, gases, liquids	High pressure reducing valve for precise regulation of downstream pressure with medium flows	**103**
	J 55	6.3 mm Pressure balanced	Air, gases, liquids	Pressure reducing valve for low to medium throughputs for all gases and liquids compatible with the valve materials	**103**

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3/2-way valves DN 11

For neutral liquids
Directly solenoid actuated
Seat valves
Internal thread G 3/8 (alternativ M16 x 1.5 and M18 x 1.5)
Operating pressure 0 up to 2 bar

Description

Fluid temperature:	0 °C up to max. +100 °C
Ambient temperature:	0 °C up to max. +60 °C
Mounting position:	optional, preferably solenoid vertical on top

Material

Body:	Aluminium anodised
Seat seal:	FPM
Internal parts:	Stainless steel (Sandvik 1802)

For contaminated fluids the use of a strainer upstream of the valve is recommended.

Features

- High flow rate
- Functional compact design
- Wide voltage range
- Flat mounting surface, body with fastening thread

Ordering information

The Part number with G 3/8 and 24 VDC is 8498894.8001
The Part number with M 18 x 1,5 and 12 VDC is 8498921.8001
The Part number with M 16 x 1,5 and 24 VDC is 8498956.8001

Characteristic data

Part Number	Nominal Diameter (mm)	Connection Size	Operating Pressure * min. (bar)	max. (bar)	k_V-value ** (Base m^3/h)	Weight Total (kg)
8498894.8001	11	G 3/8	0	2	1.5	0.33

* for gases and liquid fluids up to 40 mm^2/s (cSt)
** C_V-value (US) P k_V-value x 1.2

State voltage [V] and frequency [Hz]

Solenoid 8001

Standard voltage

DC ⎓	AC ∼ 40 Hz – 60 Hz	
24 V	24 V	–
–	110 V	120 V
–	230 V	220 V

Design acc. to DIN VDE 0580
Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP65

Power Consumption

According to DIN VDE 0580 at coil temperature of +20 °C. In operation the power consumption of the solenoid decreases by approx. 30 %

Solenoid	DC ⎓	AC ∼ Inrush	Holding
8001	12 W	–	–

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3/2-way valves DN 15

For slightly aggressive gases and liquids
Directly solenoid actuated
Seat valves
Internal thread M18 x 1.5, G 1/2
Operating pressure –0.,3 up tos 2 bar

Stainless Steel

Description

Fluid temperature:	0 °C up to max. +100 °C
Ambient temperature:	0 °C up to max. +60 °C
Mounting position:	optional, preferably solenoid vertical on top

Material

Body:	Stainless steel (1.4408)
Seat seal:	FPM
Internal parts:	Stainless steel (Sandvik 1802)

For contaminated fluids the use of a strainer upstream of the valve is recommended.

Features

- High flow rate
- Functional compact design
- Wide voltage range
- Double-sides body with fastening thread

Ordering information

The part number with G 1/2 24 V DC is 849977.9301

Characteristic data

Part Number	Nominal Diameter (mm)	Connection Size	Operating Pressure * min. (bar)	max. (bar)	k_V-value ** (Base m^3/h)	Weight Total (kg)
8499977.9301	15	G 1/2	–0.3	2.0	3.00	1.2

* for gases and liquid fluids up to 40 mm^2/s (cSt)
** C_V-value (US) P k_V-value x 1.2

State voltage [V] and frequency [Hz]

Solenoid 93xx

Standard voltage

DC ⎓	AC ∼ 40 Hz – 60 Hz	
24 V	–	–

Design acc. to DIN VDE 0580
Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP65

Power Consumption

According to DIN VDE 0580 at coil temperature of +20 °C. In operation the power consumption of the solenoid decreases by approx. 30 %

Solenoid	DC ⎓	AC ∼ Inrush	Holding
93xx	18 W	–	–

Attention! The conditions imposed on the Ex approvals lead to reduction of the permissible standard temperature ranges in thecases of explosion protected solenoids.

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Cartridge valve for vegetable oil

Unit for vegetable oil, 3E GmbH

Manifold solution or vegetable oil

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2/2-way valves DN 8 to DN 50

For slightly aggressive gases and liquids
Solenoid actuated, with forced lifting
Piston valves
Internal threads G 1/4 to G 2 or 1/4 NPT to 2 NPT, optional flange connection
Operating pressure 0 to 25 bar (40 bar)

Stainless Steel

Click-on®

Description (standard valve)

Solenoid valve for slightly aggressive gases and liquids

Switching function:	normally closed
Flow direction:	determined
Fluid temperature:	–20 °C up to max. +90 °C
Ambient temperature:	–20 °C up to max. +50 °C
Mounting position:	optional, preferably solenoid vertical on top

Material

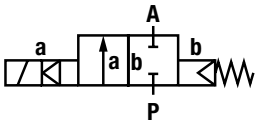
Body:	Stainless steel (1.4408)
Seat seal:	NBR-K
Internal parts:	Stainless steel, PTFE/Carbon

For contaminated fluids insertion of a strainer is recommended.

Features

- High flow rate
- For robust industry solutions
- Damped operation
- Suitable for vacuum
- For systems with low or fluctuating pressure
- Valve operates without differential pressure
- Solenoid interchangeable without tools (***Click-on***®) up to G 1 thread

Symbol



Ordering information

To order, quote model number from table overleaf, e. g. 8574400.9401 for a DN 25 valve.

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Characteristic data

Valves

Part Number Solenoid with ⎓	Part Number Solenoid with ∿	Nominal Diameter (mm)	Connection Size	Operating Pressure * min.	max. (bar)	k_V-value ** (Base m^3/h)	Weight Total (kg)
8574000.9401 8575000.9401	8574000.9404 8575000.9404	8	G 1/4 1/4 NPT	0	25	2.2	2.40
8574100.9401 8575100.9401	8574100.9404 8575100.9404	10	G 3/8 3/8 NPT	0	25	3.4	2.40
8574200.9401 8575200.9401	8574200.9404 8575200.9404	12	G 1/2 1/2 NPT	0	25	4.4	2.50
8574300.9401 8575300.9401	8574300.9404 8575300.9404	20	G 3/4 3/4 NPT	0	25	7.0	2.70
8574400.9401 8575400.9401	8574400.9404 8575400.9404	25	G 1 1 NPT	0	25	10.5	3.10
8574500.8401 8575500.8401	8574500.8404 8575500.8404	32	G 1 1/4 1 1/4 NPT	0	25	25.0	5.60
8574600.8401 8575600.8401	8574600.8404 8575600.8404	40	G 1 1/2 1 1/2 NPT	0	25	27.0	5.40
8574700.8401 8575700.8401	8574700.8404 8575700.8404	50	G 2 2 NPT	0	25	43.0	6.80

* for gases and liquid fluids up to 40 mm^2/s (cSt)
** C_V-value (US) P k_V-value x 1.2

State voltage [V] and frequency [Hz]

Solenoid 9401 / 9404 and 8401 / 8404

Standard voltage

DC ⎓	AC ∿ 40 Hz – 60 Hz	
24 V	24 V	–
–	110 V	120 V
–	230 V	220 V

Design acc. to DIN VDE 0580
Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP65
Socket Form A acc. to DIN EN 175301-803 (included)
AC with rectifier plug

Power Consumption

According to DIN VDE 0580 at coil temperature of +20 °C. In operation the power consumption of the solenoid decreases by approx. 30 %.

Solenoid	DC ⎓	AC ∿ Inrush	Holding
9401 *	38 W		
9404 *		42 VA	42 VA
8401	40 W		
8404		45 VA	45 VA

* cULus coil only
(with the expection of solenoid 94xx up to 41 V AC)

Attention!
The conditions imposed on the Ex approvals lead to reduction of the permissible standard temperature ranges in the cases of explosion protected solenoids.

Further Options (Valves)

XXXXX**01**.XXXX Normally open, vertical on top, only with solenoid 8400

XXXXX**02**.XXXX Manual override

XXXXX**03**.XXXX Seat seal FPM, Fluid temperature –10 °C up to max. +110 °C [1)]

XXXXX**06**.XXXX Seat seal PTFE, Fluid temperature max. + 110 °C [1)], operating pressure max. 16 bar

XXXXX**14**.XXXX Seat seal EPDM, max. Fluid temperature +110 °C

XXXXX**17**.XXXX Normally open, Seat seal FPM, Fluid temperature –10 °C up to max. +110 °C [1)], Mounting position: vertical on top, only with solenoid 8400

XXXXX**22**.XXXX max. operating pressure 40 bar

XXXXX**23**.XXXX Position indicator with two solenoid switches, only with solenoid 8400

XXXXX**25**.XXXX Seat seal FPM, with larger bleed orifices in the piston, for fluids such as fuel and oil , viscosity max. 80 mm^2/s (cSt), Fluid temperature –10 °C up to max. +110 °C [1)]

On request Further versions

Further Options (Solenoids)

XXXXXXX.**8441** Protection class Ⓔx II 2 GD EEx me II T3 T 140 °C

XXXXXXX.**9426*** Protection class Ⓔx II 3 GD EEx nA II T4 T 135 °C

XXXXXXX.**8426*** Protection class Ⓔx II 3 GD EEx nA II T4 T 135 °C

On request Further versions

* DC only, for AC solenoids with design inspection certificate acc. to category 2, e. g. XXXX.8441

[1)] Up to max. 200 °C fluid temperature with solenoid for higher temperature

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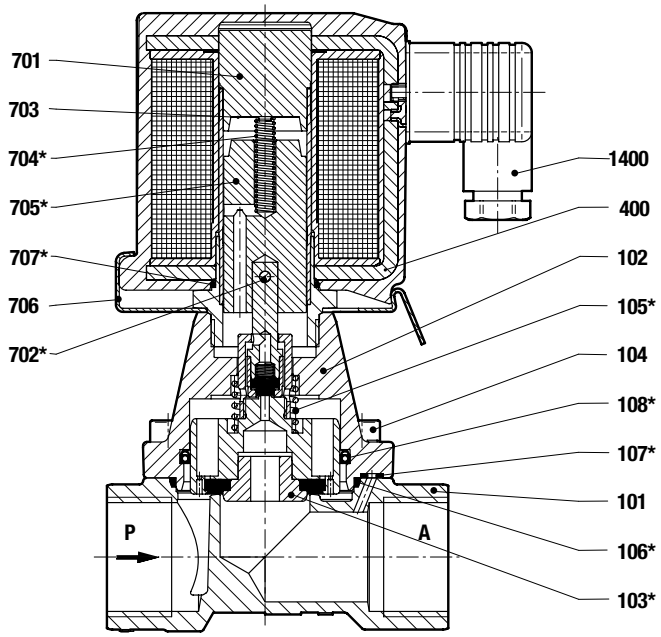
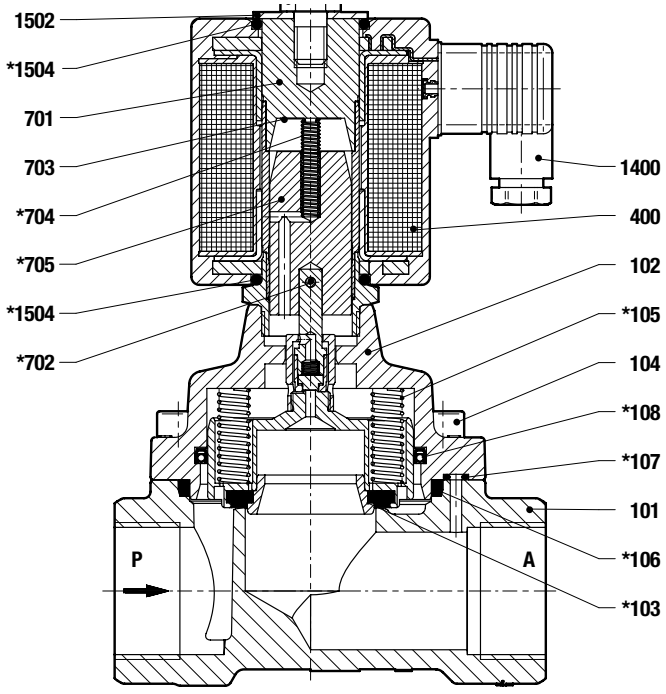
Section View

up to G 1 resp. 1 NPT



101	Valve body
102	Valve cover
*103	Valve piston
104	Socket head cap screw
*105	Pressure spring
*106	O-ring
*107	O-ring
*108	Grooved ring
400	Solenoid
701	Core tube
*702	Straight pin
703	Round plate
*704	Pressure spring
*705	Core
706	Spring clip
*707	O-ring
1400	Socket (included)

from G 1 1/4 resp. 1 1/4 NPT



101	Valve body
102	Valve cover
*103	Valve piston
104	Socket head cap screw
*105	Pressure spring (2x)
*106	O-ring
*107	O-ring
*108	Grooved ring
400	Solenoid
701	Core tube
*702	Straight pin
703	Round plate
*704	Pressure spring
*705	Core
1400	Socket (included)
1501	Hexagon screw
1502	Round plate
*1504	O-ring (2x)

* These individual parts form a complete wearing unit.
When ordering spare parts please state Cat. No. and Series No.

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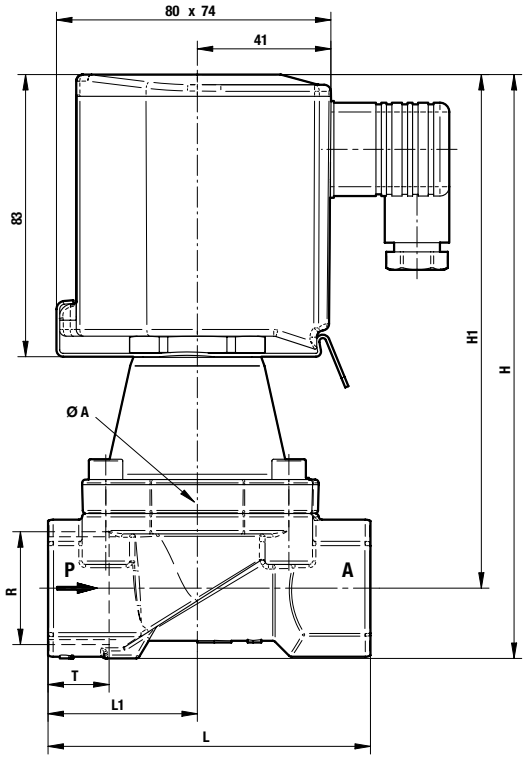
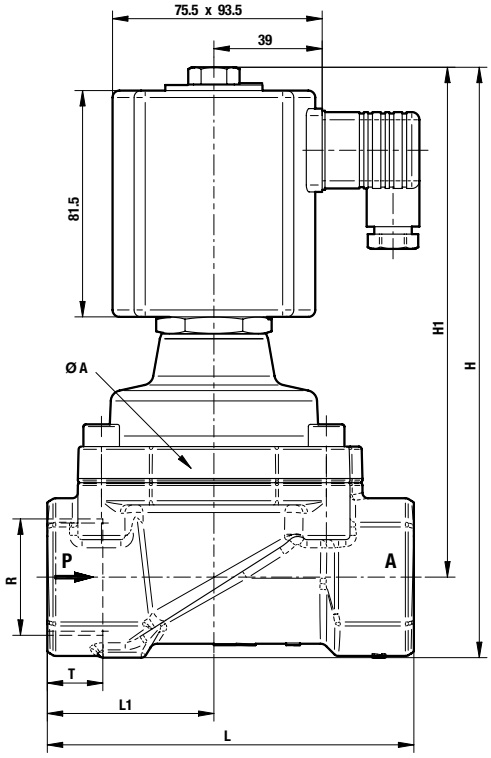
General Dimensions

Solenoid rotatable 360°
Socket turnable 4 x 90°
(Socket included)

up to G 1 resp. 1 NPT



from G 1 1/4 rep. 1 1/4 NPT



Part Number	Nominal Diameter (mm)	Connection Size	A (mm)	H (mm)	H 1 (mm)	L (mm)	L 1 (mm)	T (mm)
8574000.940x 8575000.940x	8	G 1/4 1/4 NPT	44	152.0	140.5	60	27.5	12.0 10.0
8574100.940x 8575100.940x	10	G 3/8 3/8 NPT	44	152.0	140.5	60	27.5	12.0 10.5
8574200.940x 8575200.940x	12	G 1/2 1/2 NPT	44	154.5	140.5	67	31.0	14.0 13.5
8574300.940x 8575300.940x	20	G 3/4 3/4 NPT	50	162.0	146.5	80	35.5	16.0 14.0
8574400.940x 8575400.940x	25	G 1 1 NPT	62	183.0	162.0	95	44.0	18.0 17.0
8574500.840x 8575500.840x	32	G 1 1/4 1 1/4 NPT	92	212.5	183.5	132	60.0	20.0 17.0
8574600.840x 8575600.840x	40	G 1 1/2 1 1/2 NPT	92	212.5	183.5	132	60.0	22.0 17.0
8574700.840x 8575700.840x	50	G 2 2 NPT	109	226.5	192.0	160	74.0	24.0 17.5

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2/2-way valves DN 8 to 25 with DVGW-approval

For neutral gases and liquid fuels
Solenoid actuated with forced lifting
Diaphragm valves
Internal threads G 1/4 to G 1
Operating pressure 0 to 4 / 8 bar

TÜV Rheinland

DVGW Zertifizierungsstelle

Description (standard valve)

Solenoid valve for neutral gases and liquid fuels

Switching function:	normally closed
Flow direction:	determined
Fluid temperature:	–10 °C up to max. +60 °C
Ambient temperature:	–10 °C up to max. +50 °C
Mounting position:	optional, preferably solenoid vertical on top

Material

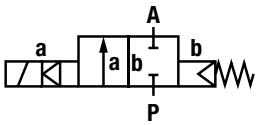
Body:	Brass (CW617N)
Seat seal:	FPM
Internal parts:	Stainless steel, Brass, PVDF

Strainer with maximum mesh size of 0.25 mm is necessary upstream of the valve.

Features

- EC-Type Examination Certificate
  product ID-No.: CE-0085AU0323
  valve class A G 1/4 - G 1/2; B G 3/4 and G 1; valve group 2
- Qualification approval EN 161/3394 part 1 and EN 264
- High functional reliability
- Short response time < 1 s

Symbol



Ordering information

To order, quote model number from table overleaf, e. g. 8237400.9381 for a DN 25 valve.

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Characteristic data

Valves

Part Number solenoid with ⎓	Part Number solenoid with ∼	Nominal Diameter (mm)	Connection Size	Operating Pressure * min. (bar)	max. (bar)	k_V-value ** (Base m^3/h)	Weight Total (kg)
8237000.9381 8237080.9381	8237000.9382 8237080.9382	8	G 1/4	0	4 8	1.6	1.00 1.20
8237100.9381 8237180.9381	8237100.9382 8237180.9382	10	G 3/8	0	4 8	2.0	0.90 1.10
8237200.9381 8237280.9381	8237200.9382 8237280.9382	12	G 1/2	0	4 8	2.3	0.90 1.10
8237300.9381 8237380.9381	8237300.9382 8237380.9382	20	G 3/4	0	4 8	5.8	1.55 1.85
8237400.9381 8237480.9381	8237400.9382 8237480.9382	25	G 1	0	4 8	6.1	1.45 1.75

* for gases and liquid fluids up to 25 mm^2/s (cSt)
State voltage [V] and frequency [Hz]

** C_V-value (US) ≈ k_V-value x 1.2

Note:

Operating pressure exceeding 4 bars female threaded sealing connections are not allowed.
Outer threaded version available on request (extra charge).

Solenoid 9381 / 9382

Standard voltage

DC ⎓	AC ∼ 40 Hz – 60 Hz	
24 V	24 V	–
–	110 V	120 V
–	120 V	220 V

Design acc. to DIN VDE 0580
Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP65
Socket Form A acc. to DIN EN 175301-803 (included)
AC with rectifier plug

Power Consumption

According to DIN VDE 0580 at coil temperature of +20 °C. In operation the power consumption of the solenoid decreases by approx. 30 %.

Solenoid	DC ⎓	AC ∼ Inrush	AC ∼ Holding
9381 *	18 W		
9382 *		20 VA	20 VA

* cULus coil only

Attention!
The conditions imposed on the Ex approvals lead to reduction of the permissible standard temperature ranges in the cases of explosion protected solenoids.

Further Options (Valves)

On request — Further versions

Further Options (Solenoids)

XXXXXX.**9356** — Protection class
Ex II 2 GD EEx me II T3 T 140 °C

On request — Further versions

Supplementary equipment

XXXXX**80**.XXXX — Valve with compression fitting

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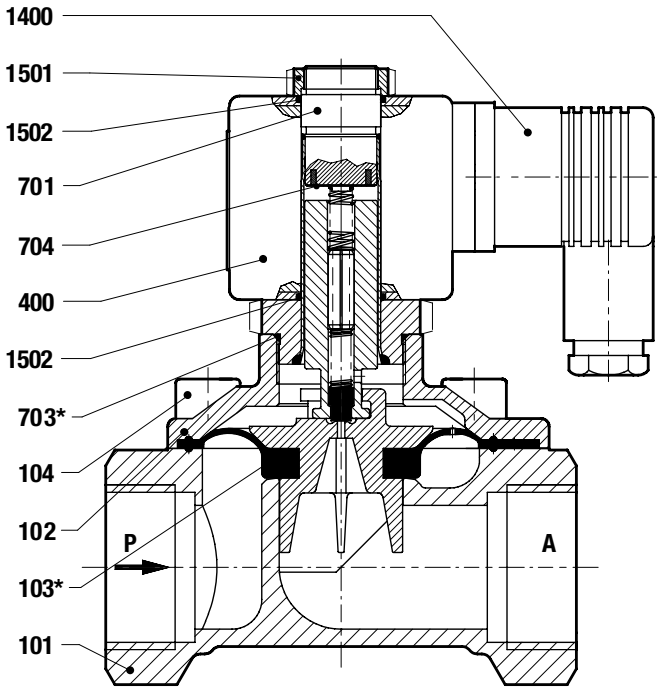
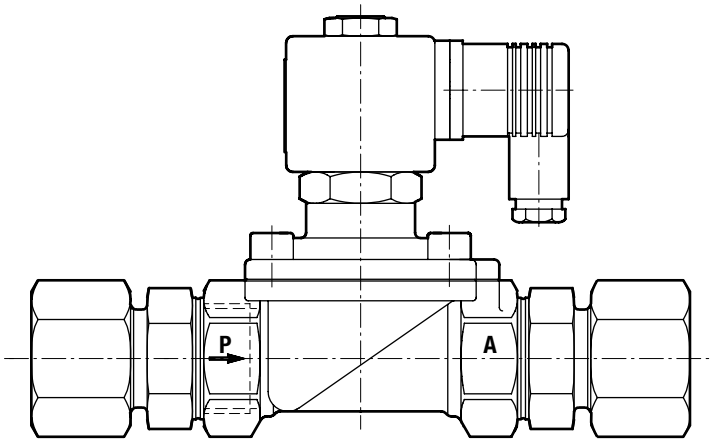
Section View

101	Valve body
102	Valve cover
*103	Diaphragm, complete
104	Oval head cap screw up to G 1/2 Socket head cap screw from G 3/4
400	Solenoid
701	Core tube
*703	O-ring
704	Round plate
1400	Socket (included)
1501	Hexagon nut
1502	O-ring



Valve with compression fitting



* These individual parts form a complete wearing unit.
When ordering spare parts please state Cat. No. and Series No.

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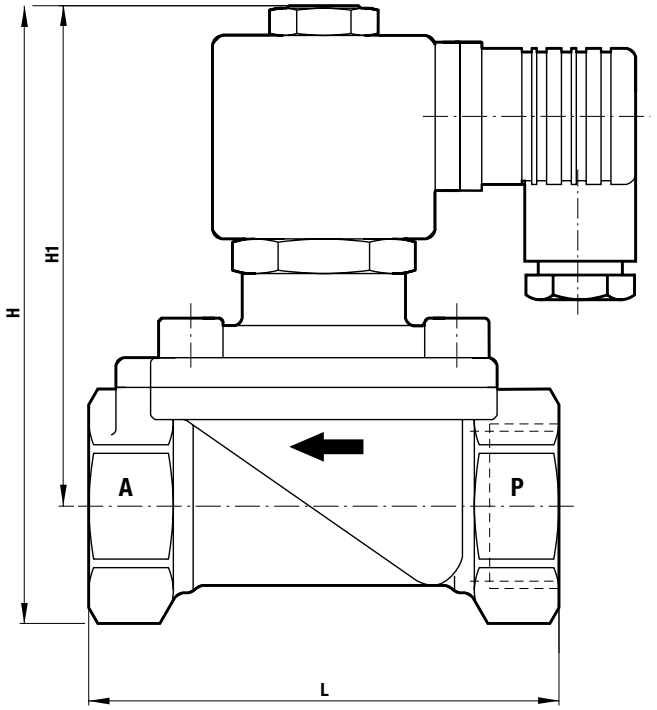
General Dimensions

Solenoid rotatable 360°
Socket turnable 4 x 90°
(Socket included)



Part Number	Nominal Diameter (mm)	Connection Size	L (mm)	B * (mm)	H (mm)	H1 (mm)
8237000.938x	8	G 1/4	67	54	105	90
8237100.938x	10	G 3/8	67	54	105	90
8237200.938x	12	G 1/2	67	54	105	90
8237300.938x	20	G 3/4	95	70	130	105
8237400.938x	25	G 1	95	70	130	105

* B = max. width

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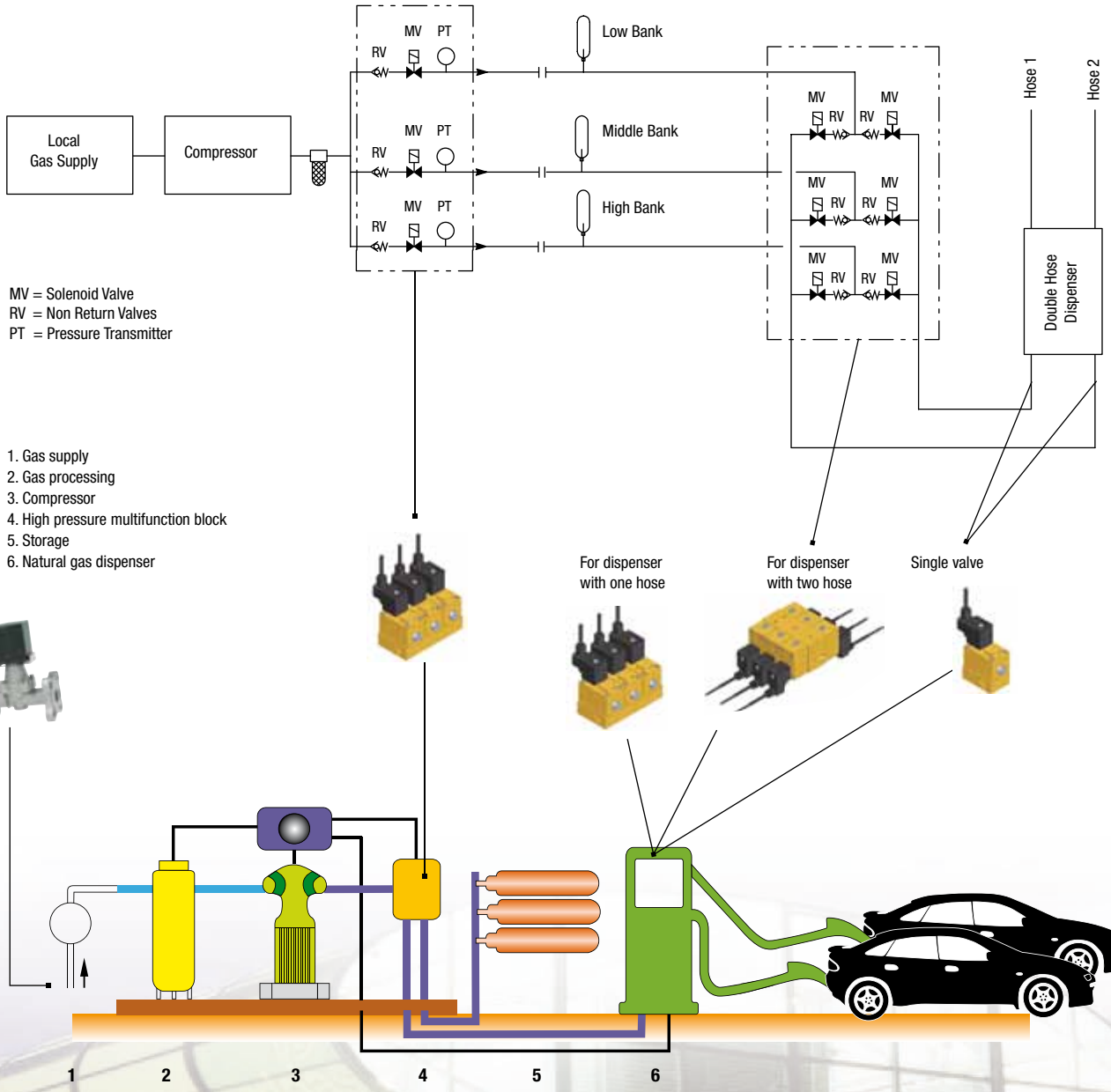
Schema Natural Gas Filling Station



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2/2-way high pressure solenoid valve DN 8

For compressed natural gas (CNG)
Indirectly solenoid actuated
Piston valves
Internal threads G 1/4 to G 1/2
Operating pressure 10 to 350 bar

Further customized solutions available upon request!

Type 8590185.**9841**.02400

Type 8590178.**9186**.23049

Description (standard valve)

Switching function:	normally closed
Flow direction:	determined
Fluid temperature:	
Solenoid **9841**	–20 °C up to max. +60 °C
Solenoid **9186**	–20 °C up to max. +60 °C
Ambient temperature:	
Solenoid **9841**	–20 °C up to max. +50 °C
Solenoid **9186**	–20 °C up to max. +40 °C
Mounting position:	optional, preferably solenoid vertical on top

Material

Valve body:	Brass
Seat seal:	Polymer
Internal parts:	Brass / Stainless steel / Polymer

Internal leakage acc. to DIN EN 12266-1 Leakage rate "E"
External leakage acc. to DIN EN 12266-1 Leakage rate "A"

Installation of a 40 µm filter in front of the valve is required.

Characteristic data

Valves

Part Number Solenoid with ⎓ or ∿	Nominal Diameter (mm)	Connection size	Operating pressure **(max. differential pressure)** min. (bar)	max. (bar)	kv-value * (Base m^3/h	Weight (kg)
8590371.9841	8	G 1/4	10	350 **(250)**	1	2.2
8590371.9186	8	G 1/4	10	350 **(250)**	1	2.2
8590185.9841	8	G 3/8	10	350 **(250)**	1	2.2
8590178.9186	8	G 3/8	10	350 **(250)**	1	2.2
8590337.9841	8	G 1/2	10	350 **(250)**	1	2.2
8590337.9186	8	G 1/2	10	350 **(250)**	1	2.2

* C_V-value (US) ≈ k_V-value x 1.2

Acc. to PED 97/23/EC and ATEX 94/9/EC!

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Solenoid 9841

Standard voltage

DC ⎓	AC ∿ 50 Hz – 60 Hz	
24 V	–	–
–	230 V	–

Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP65

XXXXXXX.**9841**
Solenoid with 3 m cable ends
Protection class according to
- II 2 G Ex mb II T4
- II 2 D Ex tD A21 IP 65 T 130 °C

Solenoid 9186

Standard voltage

DC ⎓	AC ∿ 40 Hz – 60 Hz	
24 V	–	–
–	230 V	–

Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP65

XXXXXXX.**9186**
Solenoid with terminal box
cable gland M16 x 1.5
cable gland diameter range Ø 5-10 mm
Protection class according to
- EEx me II T4
- Ex II 2 GD IP 65 T 140 °C

Power Consumption

According to DIN VDE 0580 at coil temperature of +20 °C. In operation the power consumption of the solenoid decreases by approx. 30 %.

Solenoid	DC ⎓	AC ∿ Inrush	AC ∿ Holding
9841	10.1 W	9.2 VA	9.2 VA
9186	14 W	16 VA	16 VA

Further Options (Solenoids)

XXXXXXX.**9845** Solenoid with 10 m cable ends
Protection class according to
- II 2 G Ex mb II T4
- II 2 D Ex tD A21 IP 65 T 130 °C

XXXXXXX.**3826 for DC** with 1/2 - 14 NPT female thread and 460 mm flying leads
Protection class according to ANSI/NEMA
USA: FM approved (File-No. 2Z2A6.AE)
Canada: CSA certified (File-No. LR 57643-6)
Solenoids in temperature class T3C (160° C) are usable in Ex-areas.

Class I, Division 1 and 2, Groups A-D (Gases and fumes)
Class II, Division 1 and 2, Groups E-G (dusts)
Class III, Division 1 and 2 (fibres and fluffs)
Ambient temperature: –20 °C up to +60° C

XXXXXXX.**3827 for AC with integrated rectifier** with 1/2 - 14 NPT female thread and 460 mm flying leads
Protection class according to ANSI/NEMA
USA: FM approved (File-No. 2Z2 A6.AE)
Canada: CSA certified (File-No. LR57643-6)
Solenoids in temperature class T3C (160° C) are usable in Ex-areas.

Class I, Division 1 and 2, Groups A-D (Gases and fumes)
Class II, Division 1 and 2, Groups E-G (dusts)
Class III, Division 1 and 2 (fibres and fluffs)
Ambient temperature: –20 °C up to +60° C

XXXXXXX.**428X** Solenoid with terminal box
cable gland M20 x 1.5
cable gland diameter range Ø 5-8 mm
Protection class according to
- II 2G Ex emb II T4/T5
- II 2D Ex tD A21 IP 66 T 130° C
Ambient temperature: T4 –40 °C up to +50° C
T5 –40 °C up to +40° C

XXXXXXX.**468X** Solenoid with terminal box

cable gland	cable gland diameter range
M20 x 1.5	Ø 10-14 mm
1/2 - 14 NPT	Ø 7.5-11.9 mm

Protection class according to
- II 2G Ex dmb II T4/T5
- II 2D Ex tD A21 IP 66 T 130° C
Ambient temperature: T4 –40 °C up to +50° C
T5 –40 °C up to +40° C

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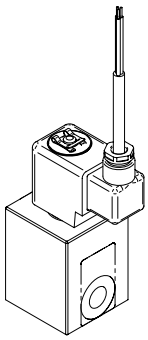
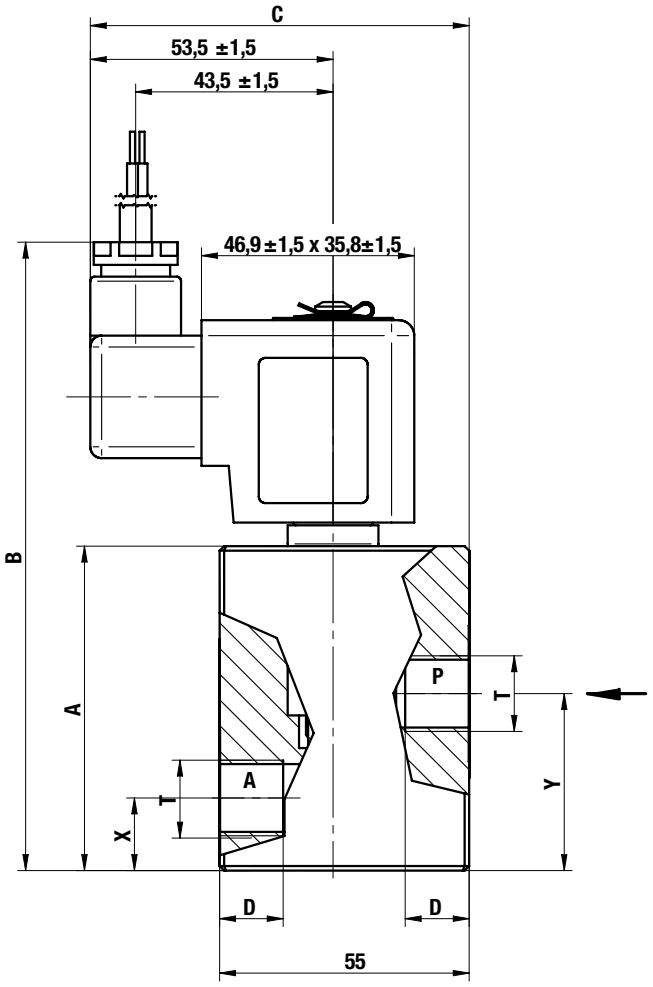
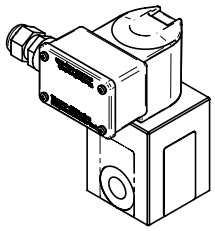
Drawing

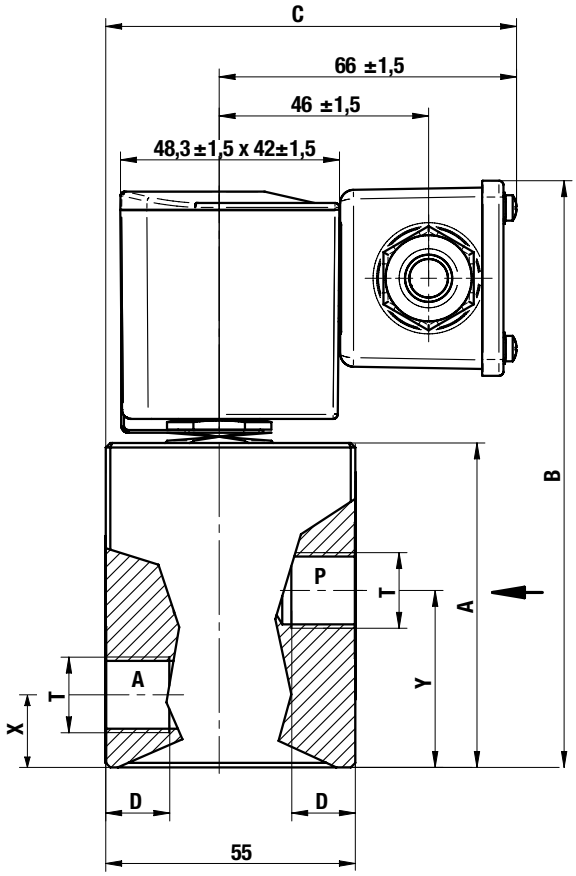
Type 8590185.**9841**





Type 8590178.**9186**





	8590371	8590178	8590185	8590337
T => companion dimensions	G 1/4	G 3/8	G 3/8	G 1/2
D => depth of thread (mm)	13	14	14	16
X => (mm)	16	16	16	16
Y => (mm)	39	39	39	42
A => block size (mm)	71.5	71.5	71.5	74.5
B => footage (mm) extent	130 ± 2.5	130 ± 2.5	139 ± 2.5	133 ± 2.5
C => footage (mm) breadth	96 ± 2	96 ± 2	83.5 ± 2	96 ± 2

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2/2-way high pressure solenoid valve DN 15

For compressed natural gas (CNG)
Indirectly solenoid actuated
Piston valves
Internal threads G 3/4
Operating pressure 10 to 250 bar

Further customized solutions available upon request!

Description (standard valve)

Switching function:	normally closed
Flow direction:	determined
Fluid temperature:	
Solenoid **9841**	–20 °C up to max. +60 °C
Solenoid **9186**	–20 °C up to max. +60 °C
Ambient temperature:	
Solenoid **9841**	–20 °C up to max. +50 °C
Solenoid **9186**	–20 °C up to max. +40 °C
Mounting position:	preferably, with filter on the bottom side

Material

Valve manifold:	Brass
Seat seal:	Polymer
Internal parts:	Brass / Stainless steel / Polymer

Internal leakage acc. to DIN EN 12266-1 Leakage rate "E"
External leakage acc. to DIN EN 12266-1 Leakage rate "A"

Characteristic data

Valves

40 µm filter included in the inlet port

Part Number Solenoid with ⎓ or ∿	Nominal Diameter (mm)	Connection size	Operating pressure = max. differential pressure min. (bar)	 max. (bar)	Weight (kg)
8590372.9841	15	G 3/4	10	250	4.5

without filter
Installation of a 40 µm filter in front of the valve is required!

Part Number Solenoid with ⎓ or ∿	Nominal Diameter (mm)	Connection size	Operating pressure = max. differential pressure min. (bar)	 max. (bar)	Weight (kg)
8590373.9841	15	G 3/4	10	250	4.5

Acc. to PED 97/23/EC and ATEX 94/9/EC!

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Solenoid 9841

Standard voltage

DC ⎓	AC ∼ 50 Hz – 60 Hz	
24 V	–	–
–	230 V	–

Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP65

XXXXXXX.**9841**
Solenoid with 3 m cable ends
Protection class according to
- II 2 G Ex mb II T4
- II 2 D Ex tD A21 IP 65 T 130 °C

Solenoid 9186

Standard voltage

DC ⎓	AC ∼ 40 Hz – 60 Hz	
24 V	–	–
–	230 V	–

Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP65

XXXXXXX.**9186**
Solenoid with terminal box
cable gland M16 x 1.5
cable gland diameter range Ø 5-10 mm
Protection class according to
- EEx me II T4
- Ex II 2 GD IP 65 T 140 °C

Power Consumption

According to DIN VDE 0580 at coil temperature of +20 °C. In operation the power consumption of the solenoid decreases by approx. 30 %.

Solenoid	DC ⎓	AC ∼ Inrush	AC ∼ Holding
9841	10.1 W	9.2 VA	9.2 VA
9186	14 W	16 VA	16 VA

Further Options (Solenoids)

XXXXXXX.**9845** Solenoid with 10 m cable ends
Protection class according to
- II 2 G Ex mb II T4
- II 2 D Ex tD A21 IP 65 T 130 °C

XXXXXXX.**3826 for DC** with 1/2 - 14 NPT female thread and 460 mm flying leads
Protection class according to ANSI/NEMA
USA: FM approved (File-No. 2Z2A6.AE)
Canada: CSA certified (File-No. LR 57643-6)
Solenoids in temperature class T3C (160° C) are usable in Ex-areas.

Class I, Division 1 and 2, Groups A-D (Gases and fumes)
Class II, Division 1 and 2, Groups E-G (dusts)
Class III, Division 1 and 2 (fibres and fluffs)
Ambient temperature: –20 °C up to +60° C

XXXXXXX.**3827 for AC with integrated rectifier** with 1/2 - 14 NPT female thread and 460 mm flying leads
Protection class according to ANSI/NEMA
USA: FM approved (File-No. 2Z2 A6.AE)
Canada: CSA certified (File-No. LR57643-6)
Solenoids in temperature class T3C (160° C) are usable in Ex-areas.

Class I, Division 1 and 2, Groups A-D (Gases and fumes)
Class II, Division 1 and 2, Groups E-G (dusts)
Class III, Division 1 and 2 (fibres and fluffs)
Ambient temperature: –20 °C up to +60° C

XXXXXXX.**428X** Solenoid with terminal box
cable gland M20 x 1.5
cable gland diameter range Ø 5-8 mm
Protection class according to
- II 2G Ex emb II T4/T5
- II 2D Ex tD A21 IP 66 T 130° C
Ambient temperature: T4 –40 °C up to +50° C
T5 –40 °C up to +40° C

XXXXXXX.**468X** Solenoid with terminal box

cable gland	cable gland diameter range
M20 x 1.5	Ø 10-14 mm
1/2 - 14 NPT	Ø 7.5-11.9 mm

Protection class according to
- II 2G Ex dmb II T4/T5
- II 2D Ex tD A21 IP 66 T 130° C
Ambient temperature: T4 –40 °C up to +50° C
T5 –40 °C up to +40° C

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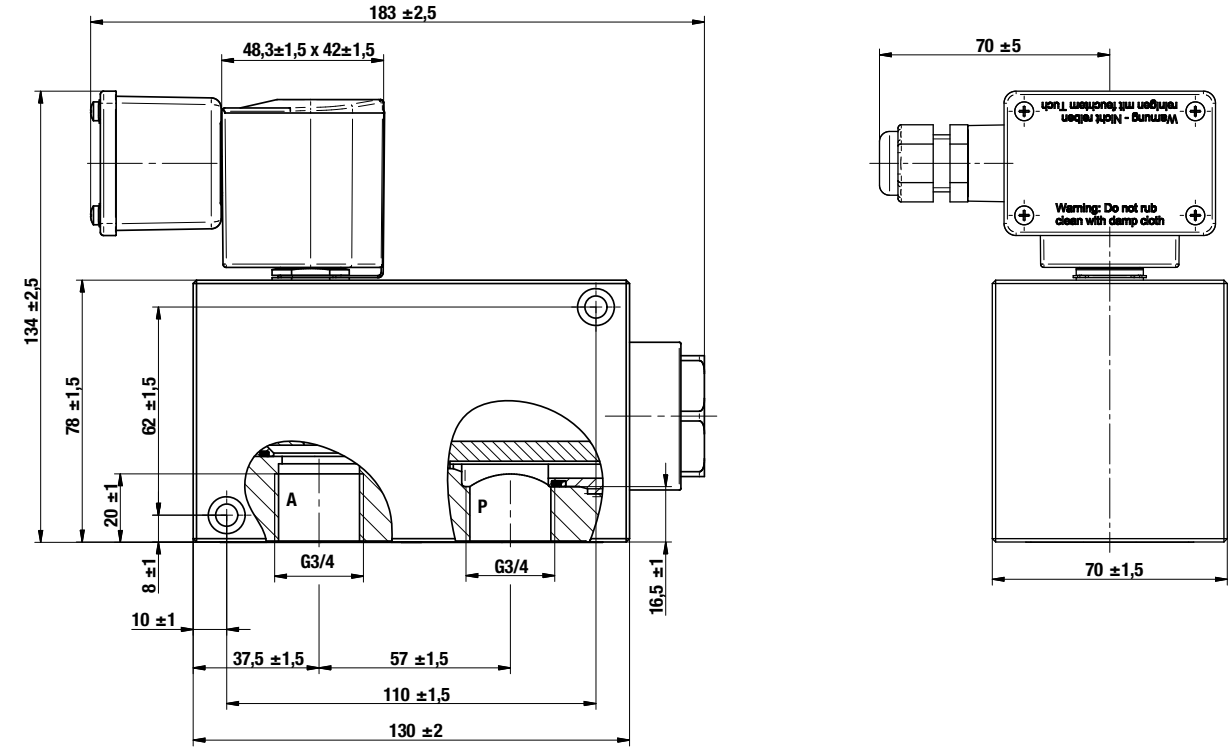
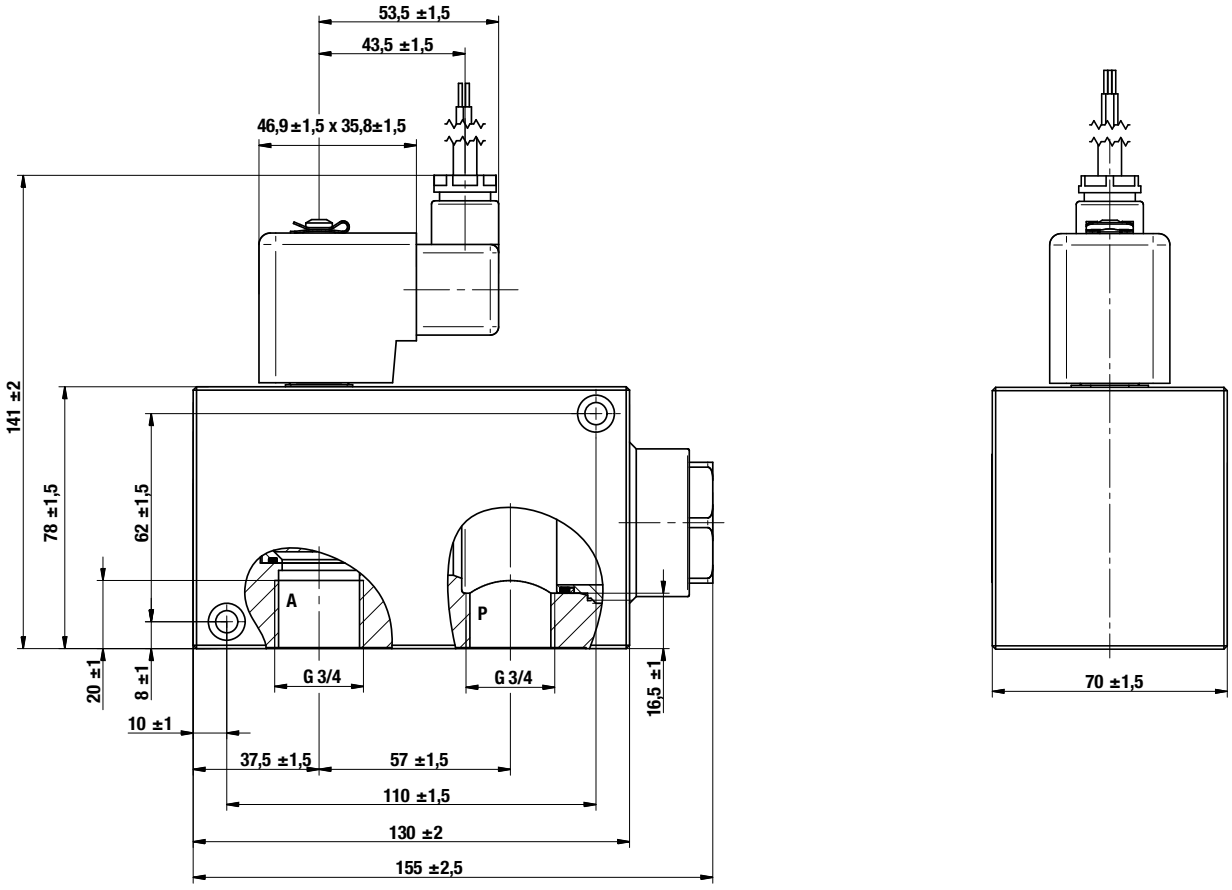
Drawings





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6-fold high pressure solenoid valve manifold DN 8

For compressed natural gas (CNG)
Indirectly solenoid actuated
Piston valves
Consisting of:

- **6 solenoid valves to control a dispenser with two lines (parallel filling of two cars)**
- **6 non return valves to avoid the inflow from higher pressure levels (e. g. High Bank) to lower pressure levels (e. g. Middle Bank)**

Further customized solutions available upon request!

Description (standard valve)

Switching function:	normally closed
Flow direction:	determined
Fluid temperature:	–20 °C up to max. +60 °C
Ambient temperature:	–20 °C up to max. +50 °C
Mounting position:	optional

Material

Valve manifold:	Brass
Seat seal:	Polymer
Internal parts:	Brass / Stainless steel / Polymer

Internal leakage acc. to DIN EN 12266-1 Leakage rate "E"
External leakage acc. to DIN EN 12266-1 Leakage rate "A"

Installation of a 40 µm filter in front of the valve is required!

Characteristic data

Valves

Part Number Solenoid with ⎓ or ∿	Nominal Diameter (mm)	Connection size	Operating pressure **(max. differential pressure)** min. (bar)	max. (bar)	kv-value * (Base m^3/h)	Weight (kg)
8499898.9841	8	G 3/8	10	350 **(250)**	1	17.5

* C_V-value (US) ≈ k_V-value x 1.2

Acc. to PED 97/23/EC and ATEX 94/9/EC!

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Solenoid 9841

Standard voltage

DC ⎓	AC ∿ 50 Hz – 60 Hz	
24 V	–	–
–	230 V	–

Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP65

XXXXXXX.**9841**
Solenoid with 3 m cable ends
Protection class according to
- II 2 G Ex mb II T4
- II 2 D Ex tD A21 IP 65 T 130 °C

Power Consumption

According to DIN VDE 0580 at coil temperature of +20 °C. In operation the power consumption of the solenoid decreases by approx. 30 %.

Solenoid	DC ⎓	AC ∿ Inrush	AC ∿ Holding
9841	10.1 W	9.2 VA	9.2 VA

Further Options (Solenoids)

XXXXXXX.**9845** Solenoid with 10 m cable ends
Protection class according to
- II 2 G Ex mb II T4
- II 2 D Ex tD A21 IP 65 T 130 °C

XXXXXXX.**3826 for DC** with 1/2 - 14 NPT female thread and 460 mm flying leads
Protection class according to ANSI/NEMA
USA: FM approved (File-No. 2Z2A6.AE)
Canada: CSA certified (File-No. LR 57643-6)
Solenoids in temperature class T3C (160° C) are usable in Ex-areas.

Class I, Division 1 and 2, Groups A-D (Gases and fumes)
Class II, Division 1 and 2, Groups E-G (dusts)
Class III, Division 1 and 2 (fibres and fluffs)
Ambient temperature: –20 °C up to +60° C

XXXXXXX.**3827 for AC with integrated rectifier** with 1/2 - 14 NPT female thread and 460 mm flying leads
Protection class according to ANSI/NEMA
USA: FM approved (File-No. 2Z2 A6.AE)
Canada: CSA certified (File-No. LR57643-6)
Solenoids in temperature class T3C (160° C) are usable in Ex-areas.

Class I, Division 1 and 2, Groups A-D (Gases and fumes)
Class II, Division 1 and 2, Groups E-G (dusts)
Class III, Division 1 and 2 (fibres and fluffs)
Ambient temperature: –20 °C up to +60° C

XXXXXXX.**428X** Solenoid with terminal box
cable gland M20 x 1.5
cable gland diameter range Ø 5-8 mm
Protection class according to
- II 2G Ex emb II T4/T5
- II 2D Ex tD A21 IP 66 T 130° C
Ambient temperature: T4 –40 °C up to +50° C
T5 –40 °C up to +40° C

XXXXXXX.**468X** Solenoid with terminal box

cable gland	cable gland diameter range
M20 x 1.5	Ø 10-14 mm
1/2 - 14 NPT	Ø 7.5-11.9 mm

Protection class according to
- II 2G Ex dmb II T4/T5
- II 2D Ex tD A21 IP 66 T 130° C
Ambient temperature: T4 –40 °C up to +50° C
T5 –40 °C up to +40° C

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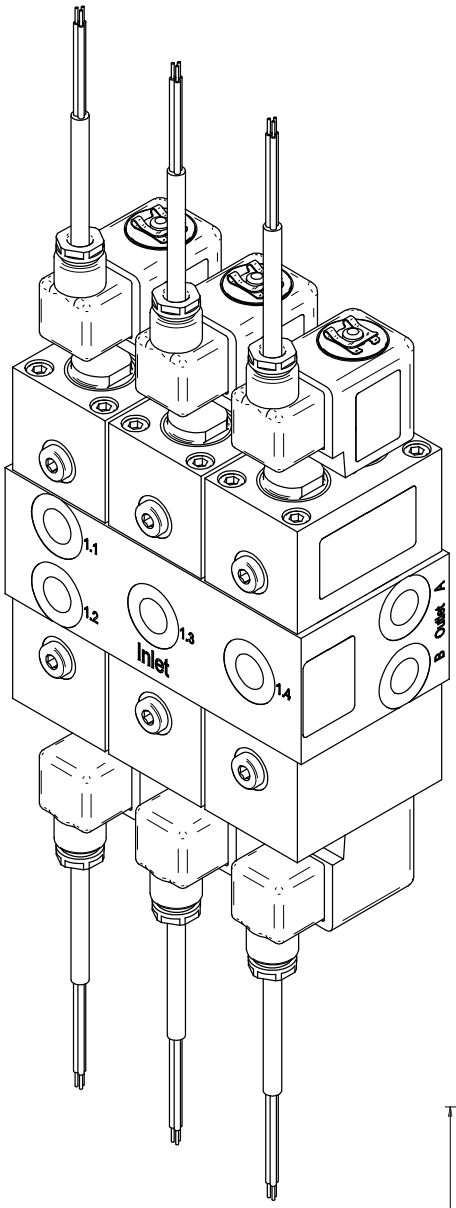
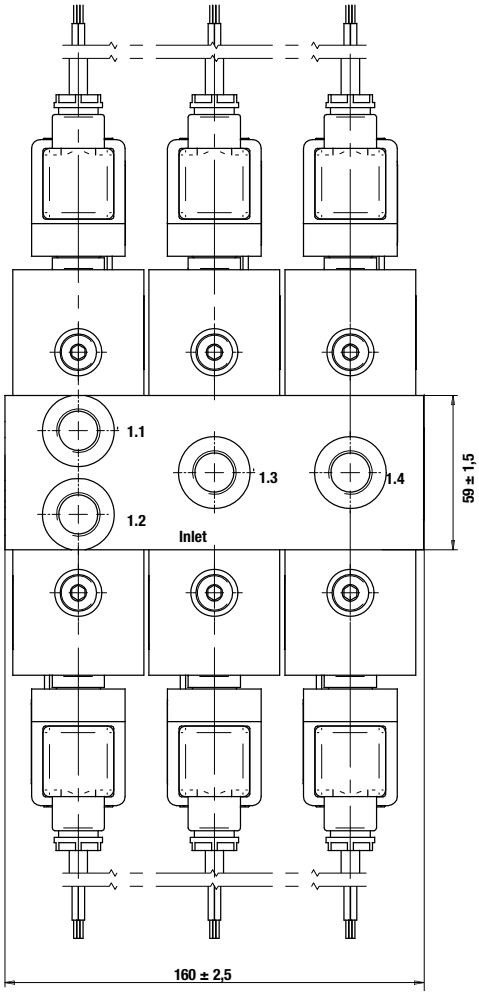
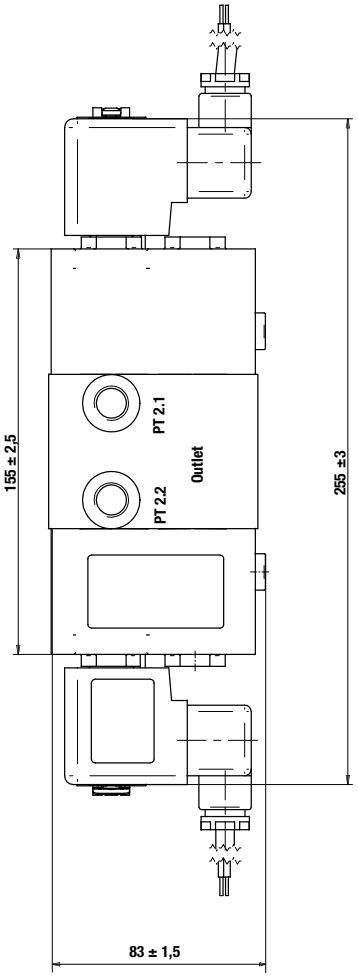
Drawings







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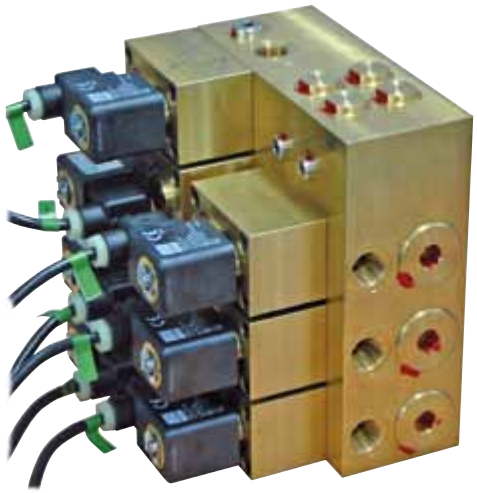
7-fold high pressure solenoid valve manifold DN 8

For compresses natural gas (CNG)
Indirectly solenoid actuated
Piston valves
Consisting of:

Further customized solutions available upon request!

- **3 solenoid valves to control the filling of the Low-, Middle- and High-Bank**
- **3 solenoid valves to control a dispenser with one line**
- **1 solenoid valve as security valve in front of the dispenser**
- **6 non return valves to avoid the inflow from higher pressure levels (e. g. High Bank) to lower pressure levels (e. g. Middle Bank)**
- **2 additional non return valves for filling a car directly from the compressor via the dispenser (without needing to pre-fil the banks), necessary at highly frequented stations**
- **3 filters 40 µm**



Description (standard valve)

Switching function:	normally closed
Flow direction:	determined
Fluid temperature:	–20 °C up to max. +60 °C
Ambient temperature:	–20 °C up to max. +50 °C
Mounting position:	preferably, with filter on the bottom side

Material

Valve manifold:	Brass
Seat seal:	Polymer
Internal parts:	Brass / Stainless steel / Polymer

Internal leakage acc. to DIN EN 12266-1 Leakage rate "E"
External leakage acc. to DIN EN 12266-1 Leakage rate "A"

Characteristic data

Valves

Part Number Solenoid with ⎓ or ∼	Nominal Diameter (mm)	Connection size	Operating pressure min. (bar)	**(max. differential pressure)** max. (bar)	Weight (kg)
8590439.9841	8	G 1/2	10	350 **(250)**	40.00

Acc. to PED 97/23/EC and ATEX 94/9/EC!

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Solenoid 9841

Standard voltage

DC ⎓	AC ∼ 50 Hz – 60 Hz	
24 V	–	–
–	230 V	–

Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP65

XXXXXXX.**9841**
Solenoid with 3 m cable ends
Protection class according to
- II 2 G Ex mb II T4
- II 2 D Ex tD A21 IP 65 T 130 °C

Power Consumption

According to DIN VDE 0580 at coil temperature of +20 °C. In operation the power consumption of the solenoid decreases by approx. 30 %.

Solenoid	DC ⎓	AC ∼ Inrush	AC ∼ Holding
9841	10.1 W	9.2 VA	9.2 VA

Further Options (Solenoids)

XXXXXXX.**9845** Solenoid with 10 m cable ends
Protection class according to
- II 2 G Ex mb II T4
- II 2 D Ex tD A21 IP 65 T 130 °C

XXXXXXX.**3826 for DC** with 1/2 - 14 NPT female thread and 460 mm flying leads
Protection class according to ANSI/NEMA
USA: FM approved (File-No. 2Z2A6.AE)
Canada: CSA certified (File-No. LR 57643-6)
Solenoids in temperature class T3C (160° C) are usable in Ex-areas.

Class I, Division 1 and 2, Groups A-D (Gases and fumes)
Class II, Division 1 and 2, Groups E-G (dusts)
Class III, Division 1 and 2 (fibres and fluffs)
Ambient temperature: –20 °C up to +60° C

XXXXXXX.**3827 for AC with integrated rectifier** with 1/2 - 14 NPT female thread and 460 mm flying leads
Protection class according to ANSI/NEMA
USA: FM approved (File-No. 2Z2 A6.AE)
Canada: CSA certified (File-No. LR57643-6)
Solenoids in temperature class T3C (160° C) are usable in Ex-areas.

Class I, Division 1 and 2, Groups A-D (Gases and fumes)
Class II, Division 1 and 2, Groups E-G (dusts)
Class III, Division 1 and 2 (fibres and fluffs)
Ambient temperature: –20 °C up to +60° C

XXXXXXX.**428X** Solenoid with terminal box
cable gland M20 x 1.5
cable gland diameter range Ø 5-8 mm
Protection class according to
- II 2G Ex emb II T4/T5
- II 2D Ex tD A21 IP 66 T 130° C

Ambient temperature: T4 –40 °C up to +50° C
T5 –40 °C up to +40° C

XXXXXXX.**468X** Solenoid with terminal box

cable gland	cable gland diameter range
M20 x 1.5	Ø 10-14 mm
1/2 - 14 NPT	Ø 7.5-11.9 mm

Protection class according to
- II 2G Ex dmb II T4/T5
- II 2D Ex tD A21 IP 66 T 130° C

Ambient temperature: T4 –40 °C up to +50° C
T5 –40 °C up to +40° C

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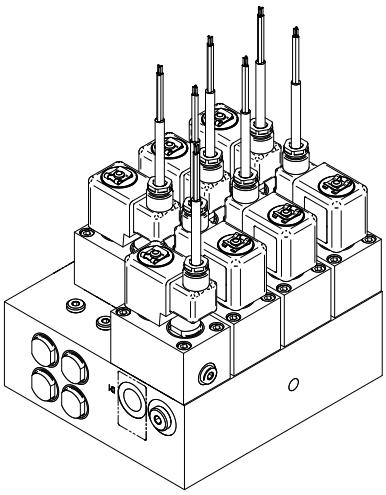
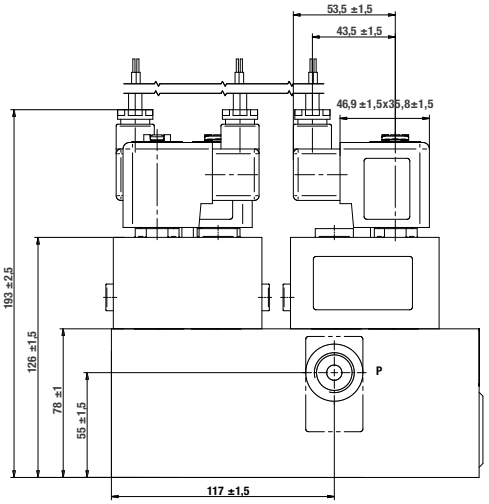
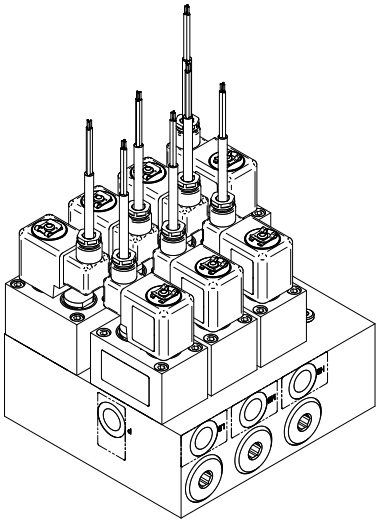
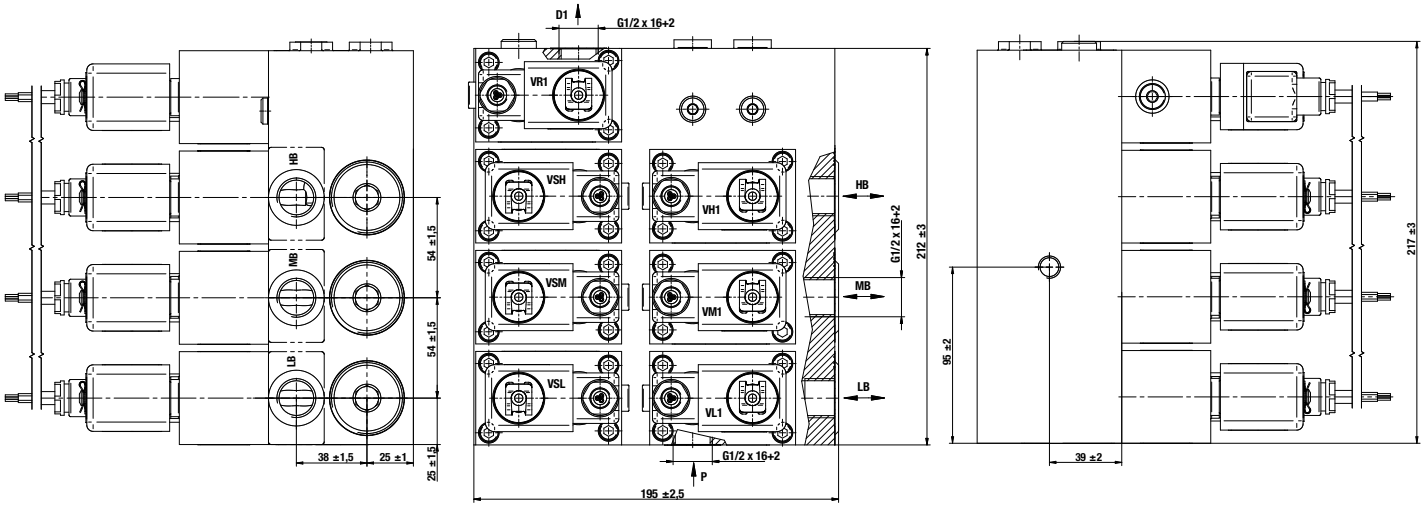
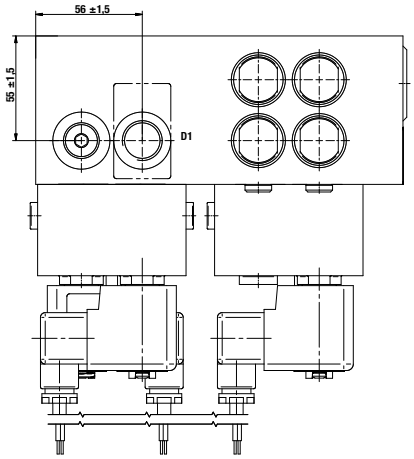
Drawings











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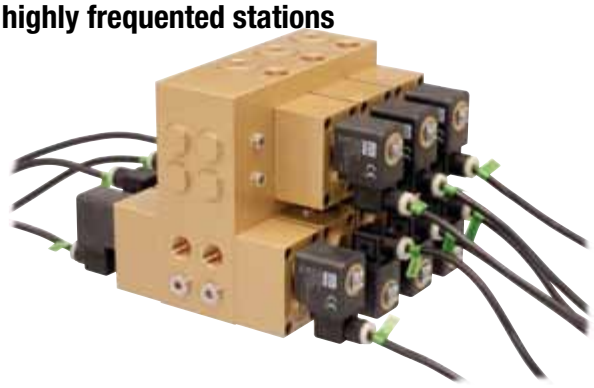
11-fold high pressure solenoid valve manifold DN 8

For compresses natural gas (CNG)
Indirectly solenoid actuated
Piston valves
Consisting of:

Further customized solutions available upon request!

- **3 solenoid valves to control the filling of the Low-, Middle- and High-Bank**
- **6 solenoid valves to control a dispenser with two lines (parallel filling of two cars)**
- **2 solenoid valves as security valves in front of the dispenser**
- **9 non return valves to avoid the inflow from higher pressure levels (e. g. High Bank) to lower pressure levels (e. g. Middle Bank)**
- **2 additional non return valves for filling a car directly from the compressor via the dispenser (without needing to pre-fil the banks), necessary at highly frequented stations**
- **3 filters 40 µm**



Description (standard valve)

Switching function:	normally closed
Flow direction:	determined
Fluid temperature:	–20 °C up to max. +60 °C
Ambient temperature:	–20 °C up to max. +50 °C
Mounting position:	preferably, with filter on the bottom side

Material

Valve manifold:	Brass
Seat seal:	Polymer
Internal parts:	Brass / Stainless steel / Polymer

Internal leakage acc. to DIN EN 12266-1 Leakage rate "E"
External leakage acc. to DIN EN 12266-1 Leakage rate "A"

Characteristic data

Valves

Part Number Solenoid with ⎓ or ∿	Nominal Diameter (mm)	Connection size	Operating pressure **(max. differential pressure)** min. (bar)	max. (bar)	Weight (kg)
8590237.9841	8	G 1/2	10	350 **(250)**	40.00

Acc. to PED 97/23/EC and ATEX 94/9/EC!

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Solenoid 9841

Standard voltage

DC ⎓	AC ∼ 50 Hz – 60 Hz	
24 V	–	–
–	230 V	–

Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP65

XXXXXXX.**9841**
Solenoid with 3 m cable ends
Protection class according to
- II 2 G Ex mb II T4
- II 2 D Ex tD A21 IP 65 T 130 °C

Power Consumption

According to DIN VDE 0580 at coil temperature of +20 °C. In operation the power consumption of the solenoid decreases by approx. 30 %.

Solenoid	DC ⎓	AC ∼	
		Inrush	Holding
9841	10.1 W	9.2 VA	9.2 VA

Further Options (Solenoids)

XXXXXXX.**9845** Solenoid with 10 m cable ends
Protection class according to
- II 2 G Ex mb II T4
- II 2 D Ex tD A21 IP 65 T 130 °C

XXXXXXX.**3826 for DC** with 1/2 - 14 NPT female thread and 460 mm flying leads
Protection class according to ANSI/NEMA
USA: FM approved (File-No. 2Z2A6.AE)
Canada: CSA certified (File-No. LR 57643-6)
Solenoids in temperature class T3C (160° C) are usable in Ex-areas.

Class I, Division 1 and 2, Groups A-D (Gases and fumes)
Class II, Division 1 and 2, Groups E-G (dusts)
Class III, Division 1 and 2 (fibres and fluffs)
Ambient temperature: –20 °C up to +60° C

XXXXXXX.**3827 for AC with integrated rectifier** with 1/2 - 14 NPT female thread and 460 mm flying leads
Protection class according to ANSI/NEMA
USA: FM approved (File-No. 2Z2 A6.AE)
Canada: CSA certified (File-No. LR57643-6)
Solenoids in temperature class T3C (160° C) are usable in Ex-areas.

Class I, Division 1 and 2, Groups A-D (Gases and fumes)
Class II, Division 1 and 2, Groups E-G (dusts)
Class III, Division 1 and 2 (fibres and fluffs)
Ambient temperature: –20 °C up to +60° C

XXXXXXX.**428X** Solenoid with terminal box
cable gland M20 x 1.5
cable gland diameter range Ø 5-8 mm
Protection class according to
- II 2G Ex emb II T4/T5
- II 2D Ex tD A21 IP 66 T 130° C
Ambient temperature: T4 –40 °C up to +50° C
T5 –40 °C up to +40° C

XXXXXXX.**468X** Solenoid with terminal box

cable gland	cable gland diameter range
M20 x 1.5	Ø 10-14 mm
1/2 - 14 NPT	Ø 7.5-11.9 mm

Protection class according to
- II 2G Ex dmb II T4/T5
- II 2D Ex tD A21 IP 66 T 130° C
Ambient temperature: T4 –40 °C up to +50° C
T5 –40 °C up to +40° C

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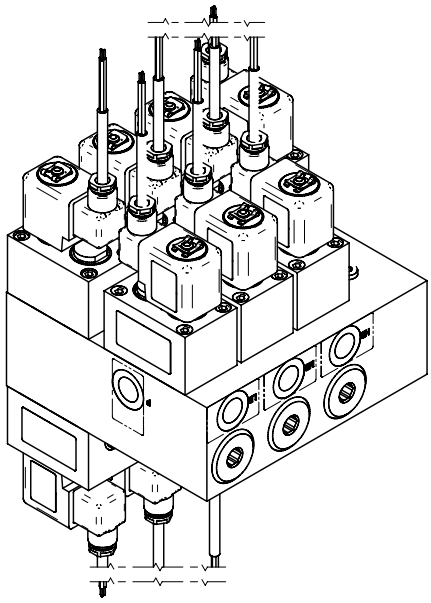
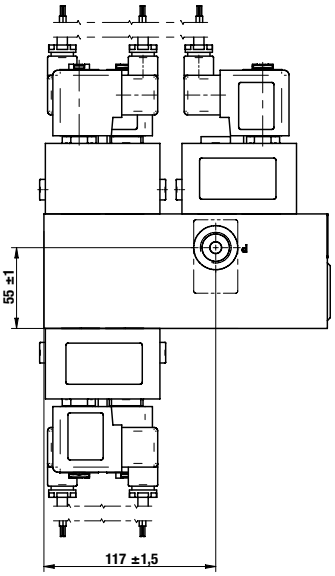
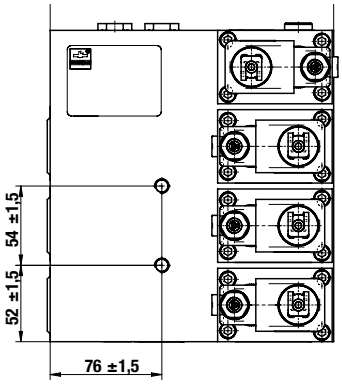
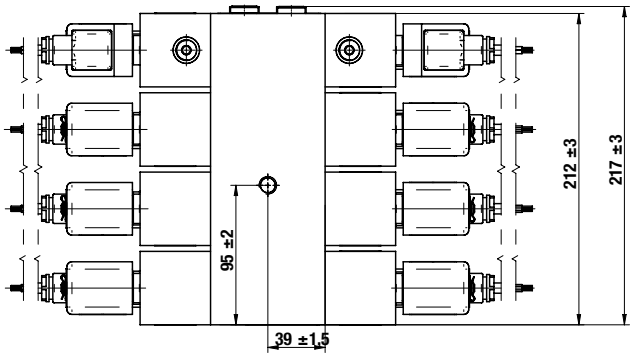
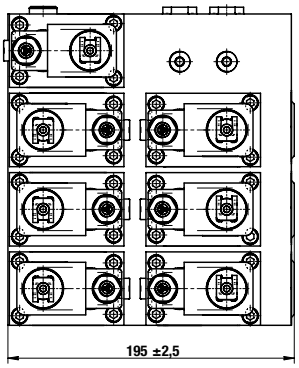
Drawings

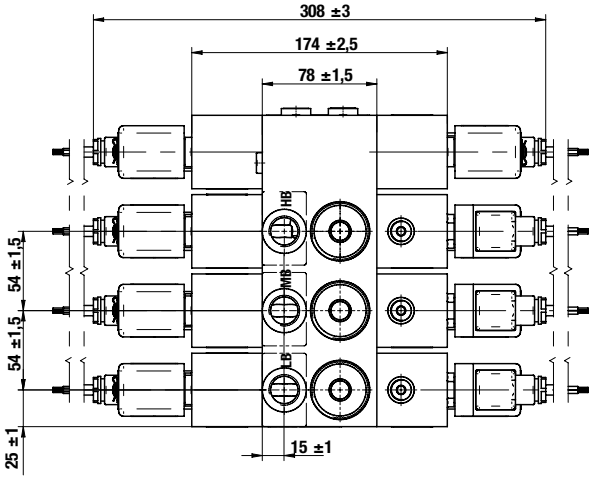


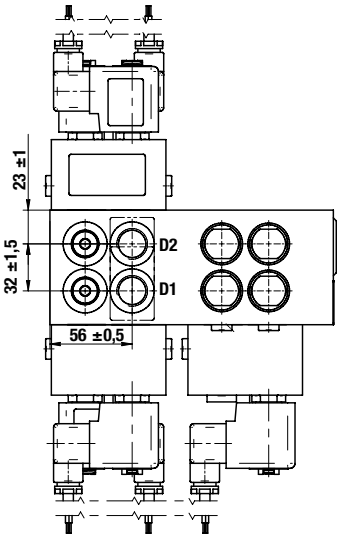












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11-fold high pressure solenoid valve manifold DN 15

For compressed natural gas (CNG)
Indirectly solenoid actuated
Piston valves
Consisting of:

Further customized solutions available upon request!

- **3 solenoid valves to control the filling of the Low-, Middle- and High Bank**
- **6 solenoid valves to control a dispenser with two lines (parallel filling of two cars)**
- **2 solenoid valves as security valves in front of the dispenser**
- **9 non return valves to avoid the inflow from higher pressure levels (e. g. High Bank) to lower pressure levels (e. g. Middle Bank)**
- **2 additional non return valves for filling a car directly from the compressor via the dispenser (without needing to pre-fill the banks), necessary at highly frequented stations**
- **3 filters 40 µm**

Description (standard valve)

Switching function:	normally closed
Flow direction:	determined
Fluid temperature:	–20 °C up to max. +60 °C
Ambient temperature:	–20 °C up to max. +50 °C
Mounting position:	preferably, with filter on the bottom side

Material

Valve manifold:	Brass
Seat seal:	Polymer
Internal parts:	Brass / Stainless steel / Polymer

Internal leakage acc. to DIN EN 12266-1 Leakage rate "E"
External leakage acc. to DIN EN 12266-1 Leakage rate "A"

Characteristic data

Valves

Part Number Solenoid with ⎓ or ∼	Nominal Diameter (mm)	Connection size	Operating pressure = max. differential pressure min. (bar)	max. (bar)	Weight (kg)
8590230.9845	15	G 3/4	10	250	50.00

Acc. to PED 97/23/EC and ATEX 94/9/EC!

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Solenoid 9841

Standard voltage

DC ⎓	AC ∼ 50 Hz – 60 Hz	
24 V	–	–
–	230 V	–

Voltage range ±10 %
100 % duty cycle
Protection class acc. to EN 60529 IP65

XXXXXXX.**9841**
Solenoid with 3 m cable ends
Protection class according to
- II 2 G Ex mb II T4
- II 2 D Ex tD A21 IP 65 T 130 °C

Power Consumption

According to DIN VDE 0580 at coil temperature of +20 °C. In operation the power consumption of the solenoid decreases by approx. 30 %.

Solenoid	DC ⎓	AC ∼ Inrush	AC ∼ Holding
9841	10.1 W	9.2 VA	9.2 VA

Further Options (Solenoids)

XXXXXXX.**9845** Solenoid with 10 m cable ends
Protection class according to
- II 2 G Ex mb II T4
- II 2 D Ex tD A21 IP 65 T 130 °C

XXXXXXX.**3826 for DC** with 1/2 - 14 NPT female thread and 460 mm flying leads
Protection class according to ANSI/NEMA
USA: FM approved (File-No. 2Z2A6.AE)
Canada: CSA certified (File-No. LR 57643-6)
Solenoids in temperature class T3C (160° C) are usable in Ex-areas.

Class I, Division 1 and 2, Groups A-D (Gases and fumes)
Class II, Division 1 and 2, Groups E-G (dusts)
Class III, Division 1 and 2 (fibres and fluffs)
Ambient temperature: –20 °C up to +60° C

XXXXXXX.**3827 for AC with integrated rectifier** with 1/2 - 14 NPT female thread and 460 mm flying leads
Protection class according to ANSI/NEMA
USA: FM approved (File-No. 2Z2 A6.AE)
Canada: CSA certified (File-No. LR57643-6)
Solenoids in temperature class T3C (160° C) are usable in Ex-areas.

Class I, Division 1 and 2, Groups A-D (Gases and fumes)
Class II, Division 1 and 2, Groups E-G (dusts)
Class III, Division 1 and 2 (fibres and fluffs)
Ambient temperature: –20 °C up to +60° C

XXXXXXX.**428X** Solenoid with terminal box
cable gland M20 x 1.5
cable gland diameter range Ø 5-8 mm
Protection class according to
- II 2G Ex emb II T4/T5
- II 2D Ex tD A21 IP 66 T 130° C
Ambient temperature: T4 –40 °C up to +50° C
T5 –40 °C up to +40° C

XXXXXXX.**468X** Solenoid with terminal box

cable gland	cable gland diameter range
M20 x 1.5	Ø 10-14 mm
1/2 - 14 NPT	Ø 7.5-11.9 mm

Protection class according to
- II 2G Ex dmb II T4/T5
- II 2D Ex tD A21 IP 66 T 130° C
Ambient temperature: T4 –40 °C up to +50° C
T5 –40 °C up to +40° C

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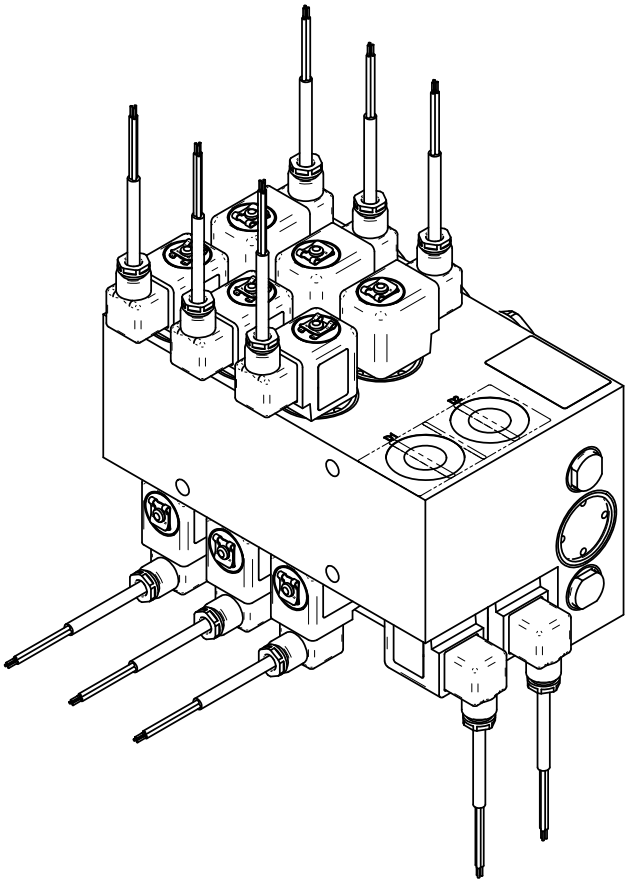
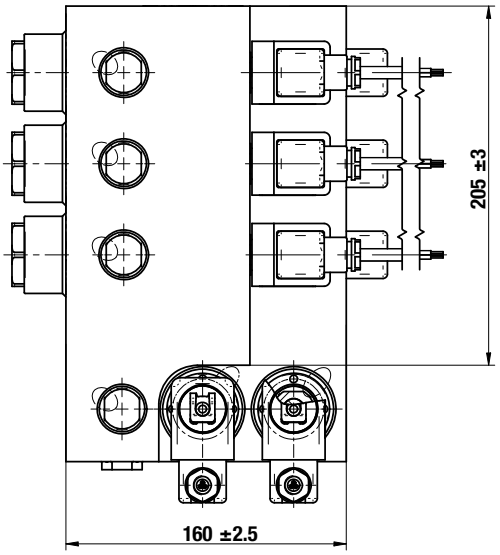
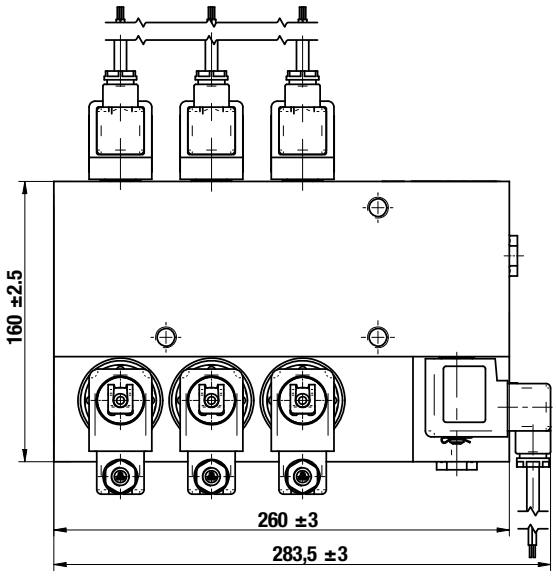
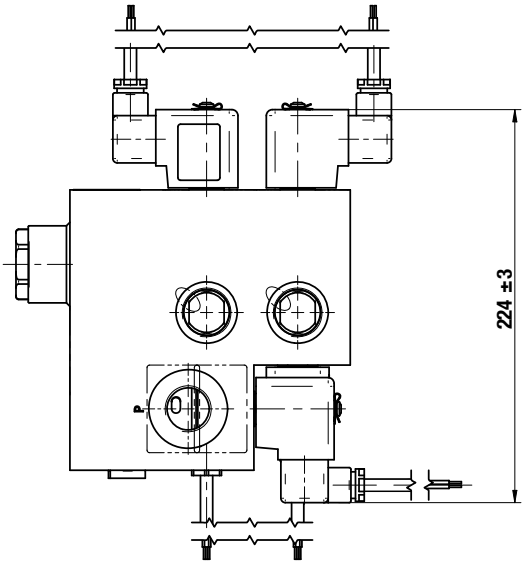
Drawings









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Dome pressure reducing valve K 51

For air, gases and liquids
High pressure reducing valve for precise regulation of downstream pressure with medium flows

Description

Diameter valve seat:	12.7 mm (1/2) pressure balanced
Connections:	G 1
Power range:	max. inlet pressure 420 bar outlet pressure range 0.5 bis 300 bar

Material

Body:	Stainless steel 100881.4401
Dome / sping body:	Stainless steel 100881.4401
Valve cone:	Stainless steel EN 100881.4401 with Nylon-cartridge
Valve seat:	Stainless steel EN 100881.4401
Seals:	Buna, FPM, EPDM

Dimensions

Overall length:	89 mm
Overall height:	150 mm

Options

- Valve seat 6,3 mm (1/4) not pressure balanced

(Alternative body- and dome material on request)

Spring-loaded pressure reducing valve J 55

For air, gases and liquids
Pressure reducing valve for low to medium flow rates for all gases and liquids compatible with the valve materials

Description

Diameter valve seat:	6.3 mm pressure balanced
Connections:	G 1/2
Power range:	max. inlet pressure 420 bar different outlet pressure ranges 0.5 bis 103 bar

Material

Body:	Stainless steel
Dome / sping body:	Stainless steel
Valve cone:	Stainless steel
Valve seat:	Nylon
Seals:	NBR, FPM, EPDM

Dimensions

Overall length:	60 mm
Overall height:	215 mm

Options

- Integral overflow valve
- Integral filter cartridge

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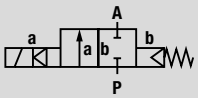
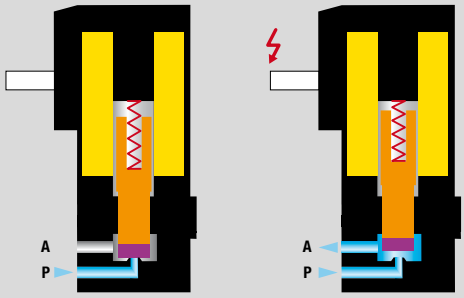
Switching functions and symbols

Most solenoid valves operate on a digital principle. They therefore possess two distinct states, which are (1) - when the coil is activated by an electrical current, and (2) - when the valve is resting (without electricity). Valve functions are defined from the resting position. The direct acting or pilot operated solenoid valves may have two functions:

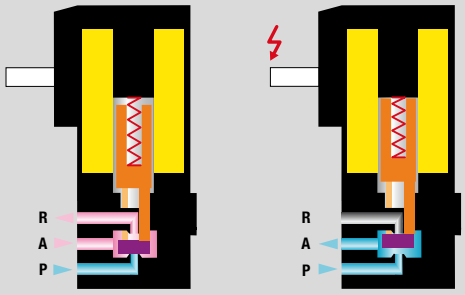
Normally closed (NC)
A solenoid valve is normally closed (abbreviated - NC) if there is no flow across the valve in its resting position (with no current on the solenoid contacts).

Symbol





Example of 2/2-way normally closed solenoid valve

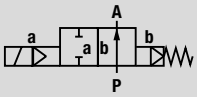


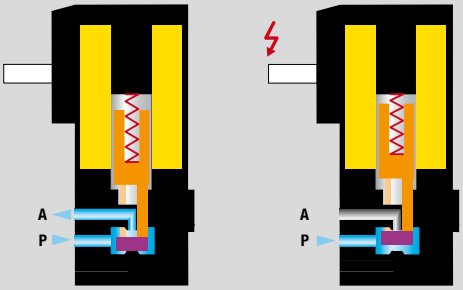
Example of 3/2-way normally closed solenoid valve

Please note that in the case of 3-way solenoid valves, port A is open to port R which, for example, enables the valve's single-action cylinder to be exhausted to atmosphere.

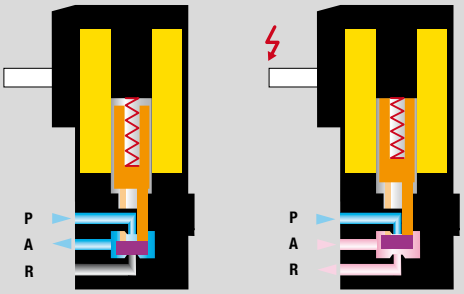
Normally open (NO)
A solenoid valve is said to be "normally open" (abbreviated NO) when it enables fluid to pass in its resting position with no current on the solenoid contacts).

Symbol





Example of 2/2-way normally open solenoid valve



Example of 3/2-way normally open solenoid valve

3

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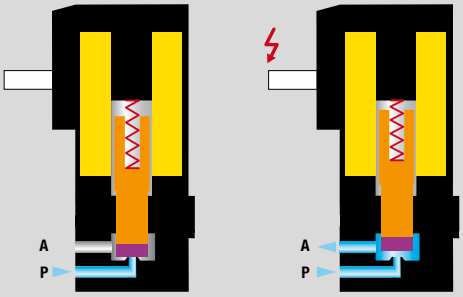
Number of ways

2 Ways (2/2-Valves)
The solenoid valves have two ports (one inlet, one outlet and only one orifice (seat) allowing fluid control.

a. **1 port inlet fluid P**
1 port outlet fluid A



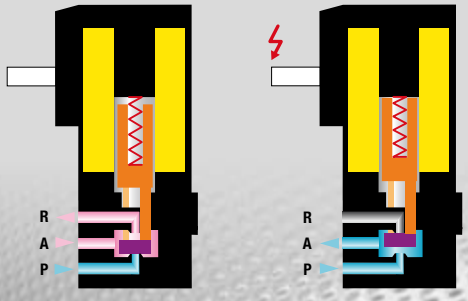
Example of solenoid valve de-energized to stop or energized to allow a flow of pressurized fluid

3 Ways
These solenoid valves have three ports (one inlet, one outlet and one exhaust) and two orifices (seats) allowing fluid control.

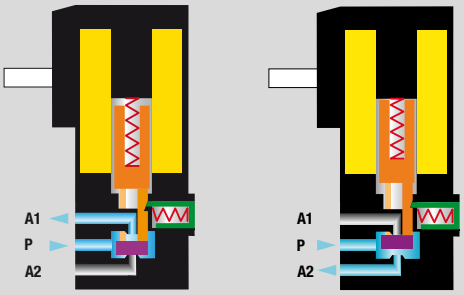
a. 1 port inlet fluid P
1 port outlet fluid A
1 port exhaust fluid R
Typical application: to operate a single acting cylinder

b. 1 port inlet fluid P
2 port outlet fluid A1, A2
Typical application: to select or divert flow

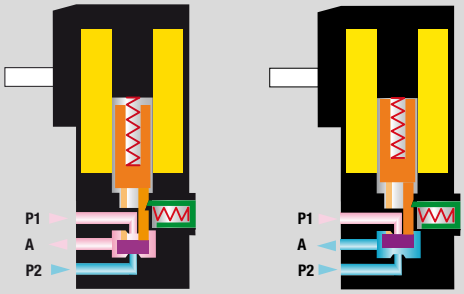
c. 2 port inlet fluid P1, P2
1 port outlet fluid A
Typical application: to mix two fluids



Example of solenoid valve operating a single acting cylinder



Example: “Selector” pneumatic connection where the pressure “P” is directed either to outlet “A1” or outlet “A2”



Example: “Mixer” pneumatic connection where either pressure “P1”or pressure “P2” are directed to outlet “A”

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Motorised proportional valves

Production and process automation with electronic regulation and control equipment requires interfaces between the electronic and fluidic control loops.

The valve described below for regulating the flow rate of liquids and gases represents such an interface. Motorised valves are used wherever exact adjustment to the actual requirements is needed. There is a choice of different designs to suit the application and requisite accuracy.

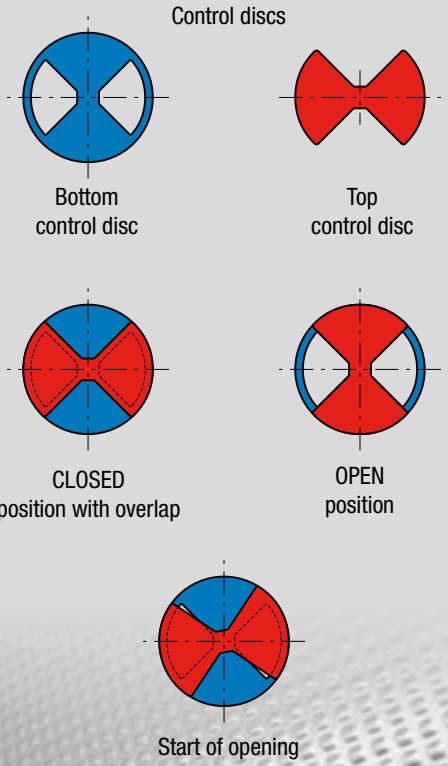
A motorised proportional valve is a rotary valve, with two oxide ceramic throttling disks that resist dirt and do not wear.
The maintenance-free electric actuator consists of a powerful, reversible motor; with a choice of DC, synchronous and stepper designs to suit different types of control systems.

The control disc is rotated by the output shaft of gearing that is free from backlash to guarantee a reproducible control characteristic. Two separate, floating microswitches detect the closed and fully open limits of the valve. The low power consumption of between 1.5 and 5W means the electronic regulator can drive certain types of motor directly.

Various motorised valve regulators and electronic components are offered to complement the valve in solving control problems of varying complexity, e. g. flow and temperature regulation kits, and electronic control cards such as a servo amplifier and stepper motor controller.

One of the two control discs opens two opposite triangular flow apertures in the other disc continuously, over an angle of rotation of 90°. The matching geometry of the pair of discs achieves a virtually linear flow characteristic. The particular throttling cross-section adopted is retained if the control voltage is switched off. The overlap in the closed position provides a sufficiently tight seal to prevent dripping.

Note: You will find a video showing how our valves operate on our website: www.buschjost.com



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Operating voltage

We differ basically between DC and AC solenoids. As alternating voltage is more frequently available, it would seem obvious to give preference to the AC solenoids.

However, from a certain size the latter have definite disadvantages in comparison to the DC solenoids in terms of lifetime and magnetic force, so that DC solenoids with intermediate rectifiers are preferred.

This voltage rectifier is integrated in the electrical connector or within the solenoid.

The main advantage of the DC solenoid is its constant current consumption, which leads to smooth switching and a coil that can cope with mechanical obstructions.

Voltage surges (inductive peaks) can be avoided by connecting a varistor, diode or RC-network in parallel.

The voltage tolerances permitted are ±10 %. If AC solenoids designed for 50 Hz have to be used with 60 Hz, this entails a reduction in performance. In such cases our technical services should be consulted beforehand.

DC coils supplied via rectifiers can be operated between 40 and 60 Hz.

Electrical connection

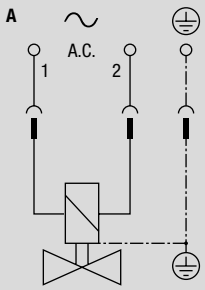
Connect solenoid in accordance with the electrical regulations. Then close the terminal compartment carefully to maintain protection. Make sure the cable entry is sealed properly. Tighten central screw of the power lead socket to a maximum of 60 N cm. The housing must not show signs of deformation. Ensure correct polarity of terminals marked + and -. If unmarked the live wires can be connected either way round. It is absolutely essential to connect the earth wire to the marked terminal provided.

DANGER: Earth connection essential

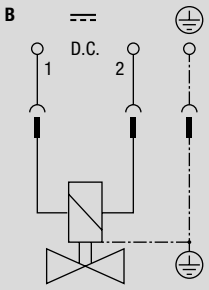
It is advisable to carry out an operating test before pressurising. The clicking of the plunger must be audible during switching. The power lead socket may only be connected with the power disconnected. Operation of AC solenoids without the plunger causes irreparable damage.

The surface of the solenoid will heat up to a maximum of +120 °C during continuous duty.

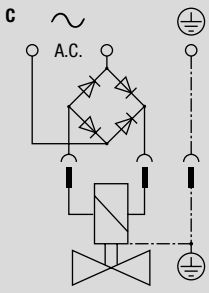
Wiring



AC voltage



DC voltage



AC voltage via rectifier

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Solenoids

General
Valve actuating solenoids are designed for the service conditions and conform to VDE 0580.

Power supply, voltage ranges
The preferred voltages are specified in the separate publications. Special voltages are possible on request.

The permissible voltage range is ±10 % of the nominal value.

Type of supply
Solenoids are available for connection to a DC or AC supply. Those designed for AC may only be used at the specified frequency. The more powerful solenoids are a DC design. They can be operated off an AC supply via a rectifier, which is connected in series as standard. The permissible frequency is then 40 to 60Hz.

Duty cycle
All standard solenoids are designed for continuous duty in order to rule out the possibility of the winding overheating during normal service conditions.

DC solenoids
The main advantage of this type is constant current consumption. This gives soft switching and makes the winding less sensitive to binding of the plunger. The maximum frequency of operation is only limited by the system's electrical and mechanical inertia.

AC solenoids
The current consumption of this system depends on the position of the plunger. The plunger must be able to reach its limit unhindered, otherwise the winding will overheat.
Special spark quenching is generally not necessary.

Ensure that the mains frequency agrees with the value specified on the name plate. If it is higher, the solenoid will develop less force and may burn out, since the plunger cannot reach its limit. At a lower frequency the smaller inductive reactance causes more heating, which can influence the lifetime of the coil.

Solenoids - Heating

The solenoids are normally designed for continuous duty, so under normal conditions there is no danger of the permanent operating temperature of the coil reaching an impermissible value.

The coil temperature that is reached during operation is influenced by 3 factors:

- the self-heating
- the temperature of the fluid flowing through
- the ambient temperature

The highest permissible solenoid temperature is generally determined by the thermal durability of the material used for insulation.

In order to ensure that there is no thermal damage, the specifications for the maximum permitted fluid and ambient temperatures should not be exceeded.

In this context, particular attention should be paid to the power consumption of the solenoids. Many valve manufacturers give their power consumption at operating temperature, which is lower than the specifications given in this catalogue, because of the high coil resistance.

Particular attention should be paid to the passage in the Buschjost data sheets:

The power consumption is measured according to VDE 0580 at a coil temperature of +20 °C. Physical factors reduce the value by up to about 30 % when the DC solenoid coil has reached normal operating temperature.

The actuating solenoids are offered with a range of different connections. The most common are the sockets to DIN EN175 301-803, terminals in the terminal compartment with cable passing through a gland or directly encapsulated in the coil area (moulded cable).

At continuous duty the surface temperature of the solenoid can reach up to 120 °C.

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Response time and cycling rate

The response time of a solenoid valve is the lapse of time between the electrical signal and the outlet of a fluid signal.
The C.E.T.O.P. defines the test conditions as follows:
Test pressure: air at 6 kg/cm^2
Ambient temperature: 20 °C

Response Time at Energising
Lapse of time between energizing of the solenoid until the outlet pressure reaches 90 % of the maximum test pressure (see chart for AC and DC).

Response Time at De-Energising
Lapse of time between de-energizing of the solenoid until the pressure outlet drops to 10 % of the test pressure (see chart for AC and DC).

Effect of Alternating Current on Response Time
The response time of a solenoid valve operating on alternating current depends on the phase of the current at the time of the electrical command. If the command is given at an unfavorable moment, the system will be delayed for a fraction period, which is generally unknown, until the available current is sufficient to re-activate the solenoid valve. This lapse of time should be added to the nominal response time of the solenoid valve.

Cycling Rate
The cycling rate of a solenoid valve depends directly on its response time. It is the number of cycles per minute calculated for continuous operations. The valve should not be reversed at less than 90 %, or above 10 % of reference pressure. The cycling rates shown in this catalogue are the maximum possible cycles per minute of the solenoid valve. It varies when the valve is mounted in a circuit which then depends on the installation pressure drop.

Latching valves

Operation
The force exerted by the permanent magnet is not sufficient to attract the plunger against the force of the spring. The valve is closed.
A short pulse of current assists the force of a permanent magnet to operate the solenoid valve.
After an interruption in the current, the permanent magnetic maintains the operating position reached without any power consumption. An approximately 30 millisecond pulse of current is sufficient to guarantee switching.
The valve is open. Another pulse of current of the same duration but reverse polarity forces the spring-assisted plunger back onto the seat of the valve. The valve is closed.
These solenoid valves are suitable for applications with a battery or solar power supply.

Features

- Single coil system with permanent magnet
- Bistable solenoid valves
- Switching to OPEN/CLOSED position by short pulses of current
- OPEN position maintained without power consumption
- Extremely low power consumption
- Low self-heating
- Supplied by battery or solar power
- Valve can be switched from OPEN to CLOSED position with a pulse of current of reverse polarity

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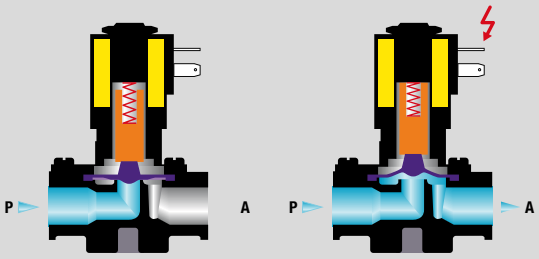
Media separated solenoid valves

Media separated (MS) solenoid valves are specially designed for transporting corrosive or ultra-pure fluids.

They are designed so that the valve's membrane (violet) enables the medium to be separated from the operating part of the valve (orange) while maintaining a minimum dead (unswept) volume. Both the membrane and the valve body are highly resistant to chemical corrosion and can be easily opened for cleaning.



An example of a separated membrane solenoid valve

The Norgren range of 2/2 and 3/2 media separated valves feature:

- Miniature valves with virtually no unswept volumes
- Compatibility with aggressive media
- Comprehensive range of wetted materials
- Low power consumption from 0.35W to 4W
- Installation versatility
- Footprints as small as 6 mm

Materials - Polymers

Material selection
The design of the valve is decided by the application, with the materials' ability to resist the operating fluid constituting an important factor.
Information about the concentration, temperature and the degree of contamination of the fluid is important in making the right choice of materials. Further criteria are the operating pressure and maximum flow rate.
All of the materials used for the bodies, seals, solenoids, etc. of Buschjost valves are carefully selected to suit various applications.

Plastics for valve bodies

PVC **Polyvinyl Chloride**
Resistant to most acids, alkalis, salt solutions and organic solutions; miscible with water. Not resistant to aromatic and chlorinated hydrocarbons.

PVDF **Polyvinylidene Fluoride**
Suitable for nearly all aggressive fluids in the temperature range from -20 to +100 °C.

PFA **Perfluoralkoxy**
As resistant as PVDF but in a higher temperature range from -20 to +150 °C.

PP **Polypropylene**
Resistant to aqueous solutions of acids, alkalis and salts, depending on concentration and temperature.

POM **Polyoxymethylene**
A material with a high degree of hardness and low water absorption. Not suitable for bases, acids or oxidising agents.

PA **Polyamid**
Suitable for all neutral fluids and gases

PPS **Polyphenylene Sulfide**
Suitable for all neutral fluids and gases.

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Materials - Metals

Material selection
Information about the concentration, temperature and the degree of contamination of the fluid is important in making the right choice of materials. Further criteria are the operating pressure and maximum flow rate.

Brass (Ms 58)
Has many applications, not suitable for aggressive and ammoniacal fluids.

Brass
(CuZn36Pb2As)
Suitable in agressive fluids and seawater.

Grey cast iron (G 1/4-25)
Mainly for flanged valve bodies up to PN 16, the temperature range is limited, suitable for neutral fluids.

Spheroidal cast iron (GGG-40.3)
Mainly for flanged valve bodies up to PN 16, suitable for neutral fluids.

Cast steel (GS-C 25)
Mainly for flanged valve bodies up to PN 40, high temperature range, suitable for neutral fluids.

Gun metal (Rg 5)
(CuSn 5 ZnPb)
Seawater,mildly aggressive water or steam.

Cast stainless steel
(G-X 7 CrNiMo 18 10)
Austenitic high-alloy steel for aggressive fluids.

Stainless steel - Ingot material
(X 10 CrNiMoTi 18 10)
Austenitic high-alloy steel for aggressive fluids.

Stainless steel
(X 5 CrNi 18 9)
Low-alloy austenitic stainless steel for valve's internal parts.

Stainless steel
(X 12 CrMo S 17)
- Corrosion-resistant magnetisable stainless steel, not suitable aggressive fluids or seawater.
- Sandvik Stainless steel 1802.
- Magnetic stainless steel, suitable for aggressive fluids.

Aluminium
(AlSi 8 Cu 3)
Aluminium die casting for bodies up to PN 16, suitable for neutral fluids.

Materials - Seals

Material selection
Information about the concentration, temperature and the degree of contamination of the fluid is important in making the right choice of materials. Further criteria are the operating pressure and maximum flow rate. Besides extreme temperatures, pressures and flow rates must be taken into consideration when choosing a material.

NBR **Nitrile Butadiene Rubber**
Standard flexible material for neutral fluids such as air, water, oil. Good resistance to mechanical loads. Temperature range depending on working conditions from -10 to +90 °C.

HNBR **Hydrogenated Nitrile Rubber**
Similar in many features to NBR. Particularly suitable for hot water and steam. Temperature range depending on working conditions from -20 to +150 °C.

EPDM **Ethylene Propylene Diene Monomer Rubber**
Resistant to alkalis and acids of mid-range concentration, water, hot water and steam. Not resistant to oils and greases. Temperature range depending on working conditions from -20 to +130 °C.

FPM **Fluorocarbon Rubber**
A highly temperature and weatherproof elastomer. Suitable for many acids, bases, fuels and oils (including synthetic). Not resistant to steam. Temperature range depending on working conditions from -10 to +180 °C.

CR **Polychloroprene Rubber**
Similar in many features to NBR. Particularly suitable for most refrigerants. Temperature range depending on working conditions from -20 to +90 °C.

PTFE **Polytetrafluoroethene**
A duroplastic, not a flexible material and therefore not suitable for the conventional diaphragms (separating membranes are possible). Resistance is almost universal in the temperature ranges from -20 to +200 °C. Valve bodies and internal parts are also made of this material.

FFPM **Perfluoride Elastomer**
A flexible material with the same resistance as PTFE and excellent sealing qualities. Temperature range depending on working conditions from -30 to +200 °C.

TPE **Thermoplastic elastomers**
Very durable yet flexible over a wide temperature range. Resist oils, grease, many solvents and weathering.

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Pressure equipment directive (PED)

The Pressure Equimpent Dierective (PED) is generally applicable to equipment with a working pressure greater than 0.5 bar. Valves as components of this equipment come under the scope of the directive. However, only valves above a certain nominal size are required to bear CE markings.

Valves suitable for different (e. g. neutral, toxic or flammable) fluids only require CED markings above a nominal size of DN 25. Smaller valves must not bear a CE mark in accordance with the Pressure Equipment Directive. This equipment must be designed in line with standard engineering practice so that it meets the requirements of the directive.

Almost all of the valves over DN 25 in size requiring marking should be assigned to Categories I and II. This means their design and testing is in the responsibility of the manufacturer, Buschjost Norgren in this case. Module A 1 has been chosen ass the related method of evaluating conformity and certified by the “nominated body” (TÜV Nord).

The products are also subject to other EU Directives such as EMC, Low Voltages, etc. The products bear a CE mark as a declaration of conformity with all of these. Where applicable (sizes > DN 25) this mark also serves as a declaration of conformity with the Pressure Equipment Directive. Category II valves are also marked with the identification number of the nominated body; CE 0045 for TÜV Nord.

3

DGRL1 **Applies to the following series:** 82510, 82610, 82530, 82560, 8499881/849882/849883, High pressure valves, High pressure valve manifold

Note to Pressure Equipment Directive (PED):
The valves of this series are according to Art. 3 § 3 of the Pressure Equipment Directive (PED) 97/23/EG.
This means interpretation and production are in accordance to engineers practice wellknown in the member countries.
The CE-sign at the valve does not refer to the PED. Thus the declaration of comformity is not longer applicable for this directive.

Note to Electromagnetic Compatibility Guideline (EEC):
The valves shall be provided with an electrical circuit which ensures the limits of the harmoniised standards EN 61000-6-3 and EN 61000-6-1 are observed, and hence the requirements of the Electromagnetic Guildeline (2004/108/EC) satisfield.

DGRL3 **Applies to the following series:** 82540, 82590, 85740, 82370

Note to Pressure Equipment Directive (PED):
The valves of this series, including the connection size DN 25 (G 1), are according to Art. 3 § 3 of the Pressure Equipment Directive (PED) 97/23/EG. This means interpretation and production are in accordance to engineers practice wellknown in the member countries.

The CE-sign at the valve refers not to the PED. Thus the declaration of conformity is not longer applicable for this directive.

For valves > DN 25 (G 1) Art. 3 § (1) No.1.4 applies.
The basic requirements of the Enclosure I of the PED must be fulfilled.
The CE-sign at the valve includes the PED. A certificate of conformity of this directive will be available on request.

Note to Electromagnetic Compatibility Guideline (EEC):
The valves shall be provided with an electrical circuit which ensures the limits of the harmonised standards EN 61000-6-3 and EN 61000-6-1 are observed, and hence the requirements of the Electromagnetic Compatibility Guideline (2004/108/EG) satisfield.

DGRL4 **Applies to the following series:** 82880

Note to Pressure Equipment Directive (PED):
The valves of this series are according to Art. 3 § 3 of the Pressure Equipment Directive (PED) 97/23/EG.
This means interpretation and production are in accordance to engineers practice wellknown in the member countries.
The CE-sign at the valve does not refer to the PED. Thus the declaration of conformity is not longer applicable for this directive.

Note to Electromagnetic Compatibility Guideline (EEC):
The valves shall be provided with an electrical circuit which ensures the limits of the harmonised standards EN 61000-6-3:2007 and EN 61000-6-1:2007 are observed, and hence the requirements of the Electromagnetic Compatibility Guideline (2004/108/EEC) satisfield.

Key to valve catalogue numbers

Standard valves 8296300.8171.XXXXX

- Series
- Thread size / Nominal diameter
- Additional equipment
- Solenoid
- Voltage
- Frequency
  - **00** for DC
  - **49** for 40-60 Hz
  - **50** for 50 Hz
  - **60** for 60 Hz

Comercial Andaluza de Técnicas y Suministros, S.L. (CATS, S.L.) Málaga (España). Telf: +(34) 952 24 61 37 www.cats.es comercial@cats.es

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- We received the ECOPROFIT award of the district of Minden-Lübbecke as an environmentally-friendly business
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- We optimise the energy used for producing compressed air by conducting regular leakage tests on our products throughout the whole factory
- Our consumption of water per employee has fallen by 26 % in the past three years.
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- We use the latest simulation software in the design of our products to ensure
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- We do not use any chlorinated hydrocarbons in our washing plants
- All processes with liquids hazardous to water are safeguarded by structural measures
- Wherever possible we recover and recycle our manufacturing waste
- Our Group IMI is listed in the Dow Jones Sustainability Index, to which companies meeting, among other things, sustainability criteria are admitted

DIN EN ISO 14001

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NORGREN COMPANIES AND SALES OFFICES

GERMANY
Buschjost GmbH
Tel: +49 (0) 57 31 / 7 91- 0
Fax: +49 (0) 57 31 / 79 11 79
mail@buschjost.com
www.buschjost.com

NORGREN SALES OFFICES

AUSTRALIA
Tel: +61 3 9213 0800
Fax: +61 3 9213 0890
enquiry@norgren.com.au

AUSTRIA
Tel: +43 2236 63520
Fax: +43 2236 6352020
enquiry@at.norgren.com

BELGIUM & LUXEMBURG
Tel: +32 2 333 44 11
Fax: +32 2 333 26 34
enquiry@be.norgren.com

BRAZIL
Tel: +55 11 5698 4000
Fax: +55 11 5698 4001
vendas@norgren.com.br

CHINA
Tel: +86 21 64 85 69 09
Fax: +86 21 64 95 60 42
info@norgren.com.cn
www.norgren.cn

CANADA
Tel: +1 303 794 2611
Fax: +1 303 798 4856
enquiry@usa.norgren.com

CROATIA
Tel: +386 4 531 75 50
Fax: +386 4 531 75 55
info@si.norgren.com

CZECH REPUBLIC & SLOVAKA
Tel: +420 465 612 879
Fax: +420 465 612 908
enquiry@cz.norgren.com

DENMARK
Tel: +45 44 91 41 66
Fax: +45 44 91 15 60
norgren@norgren.dk

FINLAND
Tel: +358 95 712 140
Fax: +358 95 712 1440
arki@norgren.fi

FRANCE
Tel: +33 1 60 04 95 95
Fax: +33 1 60 06 08 52
norgren@norgren.fr

GERMANY
Tel: +49 2802 49 0
Fax: +49 2802 49356
info@norgren.de

HONG KONG
Tel: +852 2492 7608
Fax: +852 2498 5878
enquiry@norgren.com.hk

HUNGARY
Tel: +36 1 284 9000
Fax: +36 1 284 8980
budapest@norgren.hu

INDIA
Tel: +91 (0120) 3089500
Fax: +91 (0120) 3089700
enquiry@norgren.co.in

IRELAND
Tel: +353 1 8300 288
Fax: +353 1 8300 082
norgren@indigo.ie

ITALY
Tel: +39 039 60 631
Fax: +39 039 60 63 301
d.aziendale@norgrenitalia.it

JAPAN
Tel: +81 66 876 8913
Fax: +81 66 876 8929
toiawase@norgren.co.jp

MALAYSIA
Tel: +60 3 5121 9255
Fax: +60 3 5121 2889
sales@norgren.com.my

MEXICO
Tel: +52 55 1500 6400
Fax: +52 55 1500 6430
neumatica@norgren.com.mx

NETHERLANDS
Tel: +31 36 548 6828
Fax: +31 36 548 6838
enquiry@nl.norgren.com

NEW ZEALAND
Tel: +64 9 579 0189
Fax: +64 9 526 3398
enquiry@norgren.co.nz

NORWAY
Tel: +47 67 90 82 01
Fax: +47 67 97 06 24
norgren@norgren.no

POLAND
Tel: +48 22 518 9530
Fax: +48 22 518 9531
biuro@norgren.pl

ROMANIA
Tel: +40 31 425 17 06
Fax: +40 31 425 17 08
office@norgren.ro

RUSSIA
Tel: +7 495 911-91-41
Fax: +7 495 710-86-62
sales@.norgren-imi.ru

SINGAPORE
Tel: +65 6862 1811
Fax: +65 6862 1916/7
sales@norgren.com.sg

SLOVENIA
Tel: +386 4 531 7550
Fax: +386 4 531 7555
info@si.norgren.com

SPAIN
Tel: +34 93 748 9800
Fax: +34 93 783 0838
norgren@norgren.es

SWEDEN
Tel: +46 40 59 51 00
Fax: +46 40 49 50 90
info@norgren.se

SWITZERLAND
Tel: +41 71 973 82 00
Fax: +41 71 973 82 01
norgren@norgren.ch

TAIWAN
Tel: +886 33162673
Fax: +886 33162910
info@norgren.com.tw

THAILAND
Tel: +66 2750 3598
Fax: +66 2750 3855
sales@norgren.co.th

UK
Tel: +44 1543 265 000
Fax: +44 1543 265 811
advantage@norgren.com

UKRAINE
Tel: +38 095 276 42 25
Fax: +38 044 574 60 36
yvladinets@norgren.com.ua

USA
Tel: +1 303 794 2611
Fax: +1 303 798 4856
enquiry@usa.norgren.com

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