

Solenoid Valve Type 166



Product description

Type 166 is a direct-acting 2/2 or 3/2-way pivoted armature solenoid valve. Available with various mechanisms for opening, closing, dosing, mixing and distributing. The solenoid system and medium chamber are separated from one another by means of an isolating diaphragm system. The valve thus has a long service life, even with dry runs. Due to the use of PP and PVDF as housing materials, Type 166 is especially suitable for aggressive media. The valve is mounted via a G 1/4" union. The valve is available in the nominal diameters DN3, DN4 and DN5. All valves are available as 24 V=, 24 V 50 Hz, 110 V 60 Hz and 230 V 50 Hz versions.

Function

A solenoid valve is a valve which is actuated by an electromagnet. Their tasks are to shut off, release, dose, distribute or mix gases and fluids. The solenoid valves can switch very fast, and guarantee high reliability and a long lifetime at a low actuator power. Solenoid valves with position measuring can be operated as servo valves.

Applications

- Water treatment
- Process/chemical engineering
- Plant/mechanical engineering
- Semiconductor industry
- Environmental engineering
- Medical engineering
- Apparatus engineering
- Analytical technology

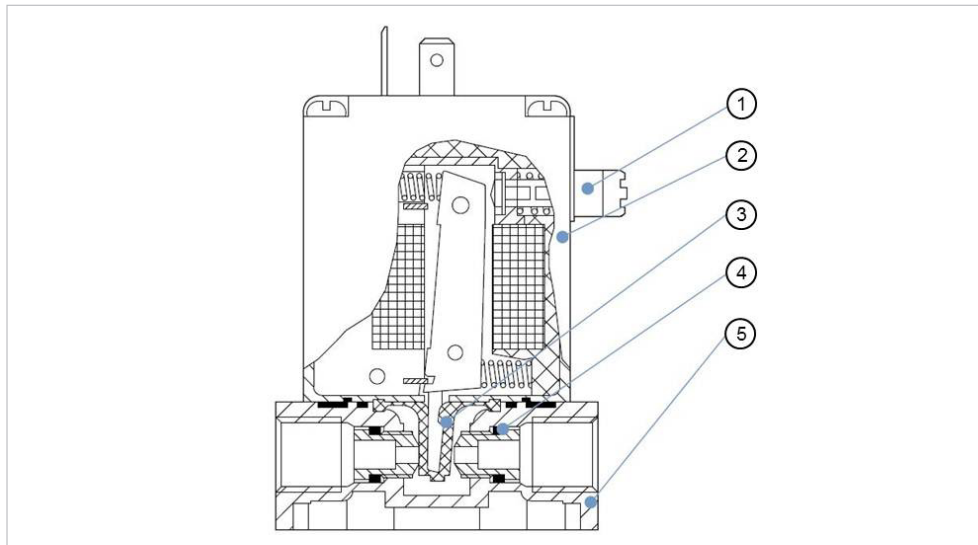
Benefits/features

- Mechanisms: A, E and F
- PN0 – PN 10 bar
- Handle with ratchet setting
- Electrical connection with cable plug
- Protection rating IP65
- Pivoted armature valve with emergency manual override
- Direct-acting with isolating membrane

Flow media

Suited for aggressive media

Technical data



- ① Manual override
- ② Reel housing
- ③ Isolating membrane
- ④ O-ring
- ⑤ Valve housing

Specification	
Nominal diameter	DN3 - DN5
Housing and seat materials	PP, PVDF
Coil material	Epoxy
Thermal insulation class coil	H
Sealing material	EPDM, FKM
Media	EPDM Alkalines, acids up to medium concentration, detergent and bleach solutions
	FKM Oxidizing acids and substances, oils and saline solutions, exhaust gases
Medium temperature	EPDM -30 to +80 °C
	FKM 0 to +80 °C
Ambient temperature	Max. +55 °C
Voltage tolerance	±10%
Rated duty	Intermittent operation 40 % ED (30 min) in 8 W designs
	Continuous duty 100 % ED in 5 W design (upon request)
Electrical connection	Plug connectors according to DIN EN 175301-803 form A (DIN 43650 up until now) for appliance socket
Protection rating	IP65 with appliance socket
Mounting position	As desired, preferably with actuator on top

Electrical power consumption

Nominal diameter (mm)	Mechanism	Kv value ¹⁾ water (l/min)	Pressure range ²⁾		Power consumption Inrush (electrical)		Power consumption Operation(electrical)		Weight (kg)
			AC (bar)	DC (bar)	AC (VA)	DC (W)	AC (VA/W)	DC (W)	
3	A	4.20	0-10	0-8	30	8	15/8	8	0.4
	F		0-10	0-8					
	E		0-6	0-4					
4	A	5.00	0-5	0-4					
	F		0-5	0-4					
	E		0-3	0-2					
5	A	6.70	0-4.5	-					

¹⁾ Kv value (l/min) at +20 °C, 1 bar pressure at valve inlet and free outlet

²⁾ Pressure data (bar) gauge pressure

Switching time

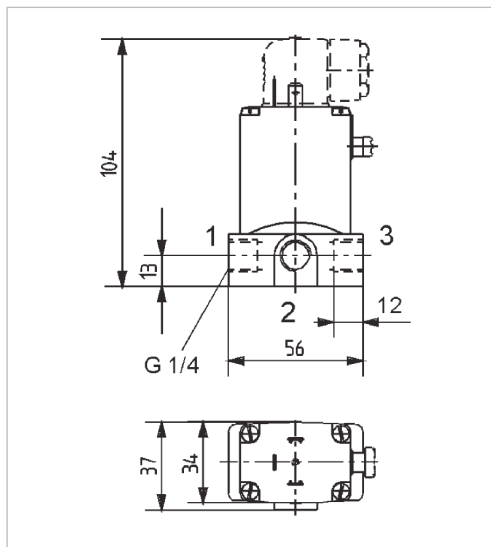
Switching time ¹⁾	Open		Close	
	AC (ms)	DC (ms)	AC (ms)	DC (ms)
A, E, F	Approx. 8	10 - 17	Approx. 15	15 - 20

¹⁾ Switching time (ms) measurement at valve outlet 6 bar and +20 °C

Open Pressure buildup 0 % to 90 %

Close Pressure buildup 100 % to 10 %

Dimensions



The ports are marked with 1, 2 and 3 as indicated in the configuration table, depending on the circuit function.

Possible connections

Mode of operation	Port 1	Port 2	Port 3
A ¹⁾	A	-	P
E	P1	A	P2
F	A	P	B

¹⁾ Type 166 has no middle connection in A operating mode

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Solenoid Valve Type 165



Product description

The pilot-controlled gate Valve Type 165 with servo diaphragm is closed when there is no current. A minimum differential pressure of 0.5 bar is required to fully open and close the valve. Actuator and media chamber are separated by a diaphragm.

Function

A solenoid valve is a valve which is actuated by an electromagnet. Their tasks are to shut off, release, dose, distribute or mix gases and fluids. The solenoid valves can switch very fast, and guarantee high reliability and a long lifetime at a low actuator power. Solenoid valves with position measuring can be operated as servo valves.

Applications

- Water treatment
- Process/chemical engineering
- Plant/mechanical engineering
- Semiconductor industry
- Environmental engineering
- Medical engineering
- Apparatus engineering
- Analytical technology

Benefits/features

- Function: A
- PN 0.5 – 6 bar
- Pilot-controlled valve with servo diaphragm
- Separate from media
- No metal internal parts
- Pivoted armature pilot control with lockable emergency manual override
- Simple installation and removal

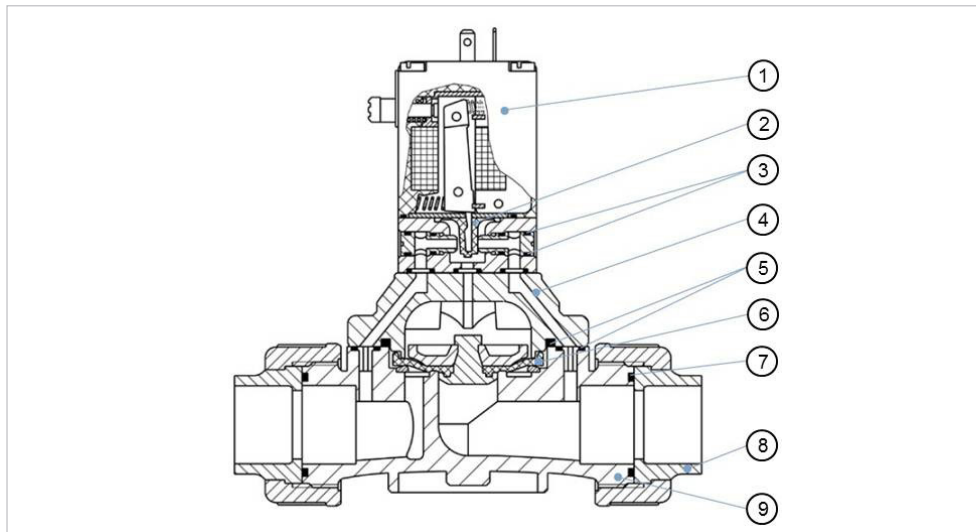
Limitations

- Sensitive to solids
- Δp of 0.5 bar absolutely necessary

Flow media

Clean liquids without solid particles (neutral or aggressive)

Technical data



- ① Reel housing
- ② Diaphragms
- ③ O-ring
- ④ Cover
- ⑤ O-ring
- ⑥ Diaphragms
- ⑦ O-ring
- ⑧ Insert (sleeve)
- ⑨ Housing

Specification		
Nominal diameter	DN15 – DN50	
Housing material	PVC, PVDF (upon request)	
Valve internal parts	PVDF	
Gasket material	EPDM, FKM	
Media	EPDM	Alkalines, detergent and bleach solutions
	FKM	Oxidizing acids and substances
Media temperature	PVC housing	0 to +40 °C
	PVDF housing	0 to +55 °C
Voltage tolerance	±10%	
Nominal mode of operation	Continuous operation 100 % ED	
Electrical connection	Appliance socket for ø 7 mm cable in accordance with DIN EN 175301-803 form A (included in scope of delivery)	
Protection rating	IP65 with appliance plug	
Insulation class coil	Class H	
Air connection	With threaded socket	
Air connection	Sleeve	
Mounting position	As desired, preferably with actuator on top	
Switching times	100 – 800	
	Open (ms), close (ms)	1000 - 4000

Kv 100 values

Nominal diameter (mm)	Mode of operation	Kv value ¹⁾ water (l/min)	Pressure range ²⁾ (bar)	Power consumption Inrush (electrical)		Power consumption Operation (electrical)	
				AC (VA)	DC (W)	AC (VA/W)	DC (W)
15	A	83	0.5 - 6	20	5	11/5	5
20	A	100					
25	A	233					
32	A	267					
40	A	500					
50	A	600					

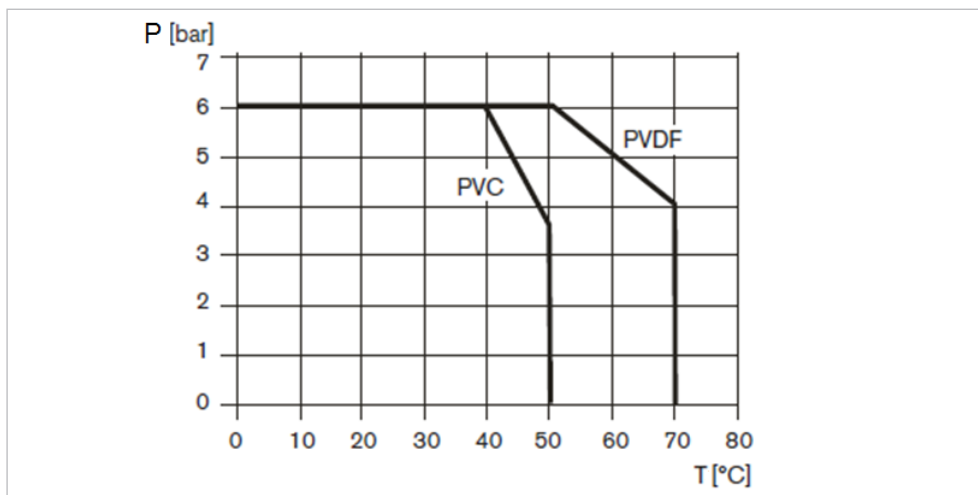
- ¹⁾ Kv value (l/min) at +20 °C, 1 bar pressure at valve inlet and free outlet
- ²⁾ Pressure data (bar) gauge pressure

Temperature diagrams

Switching time ¹⁾	Open	Close
Mode of operation	(ms)	(ms)
A	100 - 800	1000 - 4000

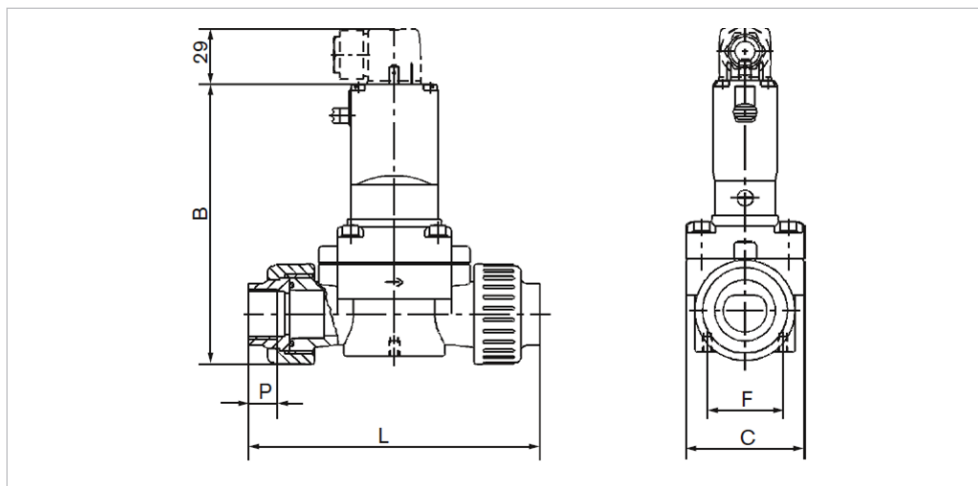
- ¹⁾ Switching time (ms) measured at valve outlet at 6 bar and +20 °C
- Open Pressure buildup 0 % to 90 %
- Close Pressure buildup 100 % to 10 %

Pressure-temperature diagrams



- T Temperature (°C, °F)
- P Permissible pressure (bar, psi)

Dimensions

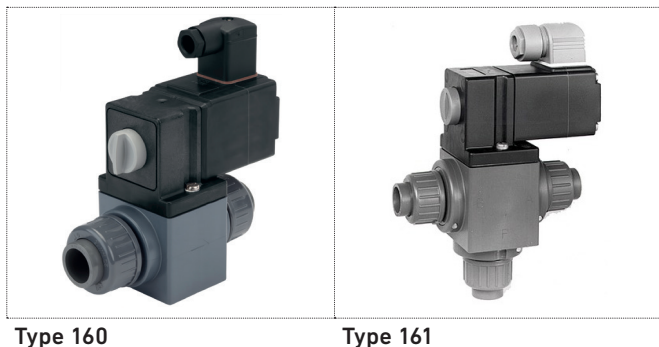


All versions			PVC housing		PVDF housing			
DN (mm)	Pipe Ø (mm)	B (mm)	C (mm)	F (mm)	L (mm)	P (mm)	L (mm)	P (mm)
15	20	148	62.5	40	148	16	147	16
20	25	148	62.5	40	154	19	151	18
25	32	174.5	85	44.5	190	22	185	20
32	40	174.5	85	44.5	198	26	189	22
40	50	212	115	44.5	254	31	245	25
50	63	212	115	44.5	268	38	253	29

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Solenoid Valve Type 160/161



Type 160

Type 161

Product description

Type 160/161 works according to the leverage principle and can therefore switch large nominal diameters directly. It is available in both the 2/2-way and the 3/2-way valve designs. It can be used for a wide range of functions, such as opening, locking, dosing, mixing and dispensing. The anchor operates horizontally on a permanently coupled rocker. The sealing cylinder on the lower lever is pressed to the valves seats through the horizontal movement. The plastic-coated metal lever forms one unit with the gas-tight diaphragm bushing. Through this construction, the actuator media is kept separate from the fluid housing.

Function

A solenoid valve is a valve which is actuated by an electromagnet. Their tasks are to shut off, release, dose, distribute or mix gases and fluids. The solenoid valves can switch very fast, they guarantee high reliability and a long lifetime at a low actuator power. Solenoid valves with position measuring can be operated as a servo valve.

Applications

- Water treatment
- Process/chemical engineering
- Plant/mechanical engineering
- Semiconductor industry
- Environmental engineering
- Medical engineering
- Apparatus engineering
- Analytical technology

Benefits/features

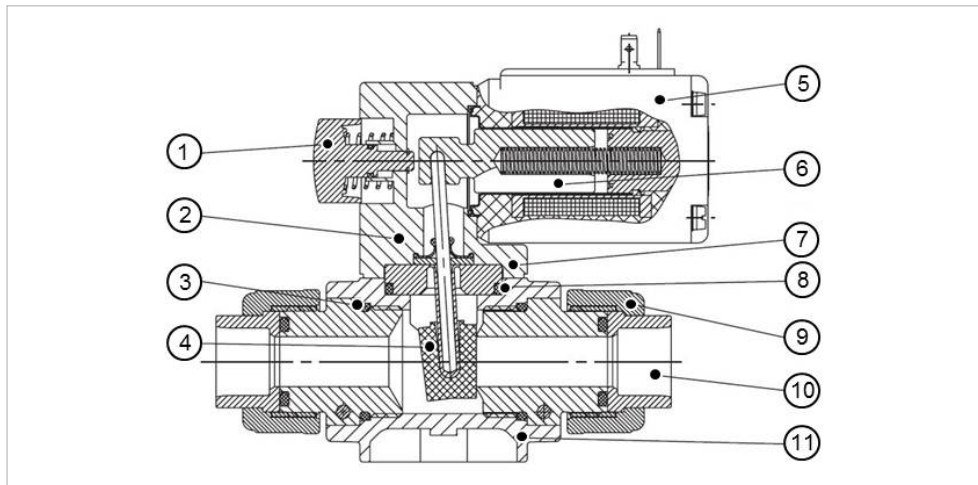
- With solvent cement socket, metric
- Modes of operation: A and B (Type 160), E and F (Type 161)
- PN 0 – 3bar
- Handle with ratchet setting
- Electrical connection with cable plug
- Protection rating IP65
- Directly-acting valve up to nominal diameter DN20, separated from media
- Vibration-resistant, block-connected coil system
- Energy-efficient decrease in power in all DC models
- Increased safety through electrical position feedback
- Robust, service-friendly manual override

Flow media

Suited for aggressive, abrasive and slightly contaminated media.

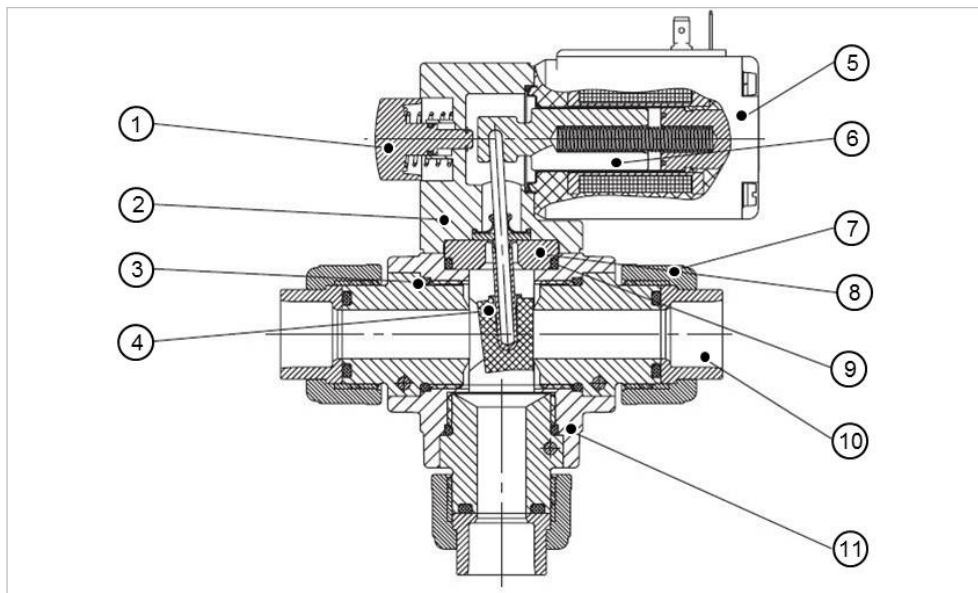
Technical data

2/2-way with coupling nut and branch fitting



- ① With manual override with locking function
- ② Angle flange (PC)
- ③ O-ring (FKM, EPDM)
- ④ Valve cone (FKM, EPDM)
- ⑤ Coil (epoxy)
- ⑥ Core (stainless steel 1.4105)
- ⑦ Rotating stem (PTFE)
- ⑧ O-ring (FKM, EPDM)
- ⑨ Coupling nut (PVC)
- ⑩ Branch fitting (solvent cement socket)
- ⑪ Housing (PVC)

3/2-way with coupling nut and branch fitting



- ① With manual override with locking function
- ② Angle flange (PC)
- ③ O-ring (FKM, EPDM)
- ④ Valve cone (FKM, EPDM)
- ⑤ Coil (epoxy)
- ⑥ Core (stainless steel 1.4105)
- ⑦ Coupling nut (PVC)
- ⑧ Rotating stem (PTFE)
- ⑨ O-ring (FKM, EPDM)
- ⑩ Branch fitting (solvent cement socket)
- ⑪ Housing (PVC)

Specification		
Housing material	PVC	
Sealing material	EPDM, FKM	
Media	Aggressive and non-aggressive liquids, neutral gases, aggressive gases according to their diffusion characteristics	
Media temperature (Housing and gasket)	PVC / EPDM	-10 to +50 °C
	PVC / FKM	-10 to +50 °C
Ambient temperature	Max. +50 °C	
Viscosity	37mm ² /s	
Supply voltage	24 V / UC, 230 V / UC, 24 V / 50 Hz, 230 V / 50 Hz	
Voltage tolerance	±10 %	
Switching frequency	AC	60/min
	UC	Max. 6/min
Rated duty	ED 100 %	
Electrical connection	Appliance socket (included in scope of delivery)	
Protection rating	IP 65 with appliance socket	
Mounting position	As desired, preferably with actuator on top	

Electrical power consumption

Nominal diameter (mm)	Kv value water ¹⁾ (l/min)	Pressure range ²⁾				Power consumption Inrush (electrical)		Power consumption Operation (electrical)		Weight (kg)
		A (bar)	B (bar)	E (bar)	F (bar)	AC (VA)	DC (W)	AC (VA/W)	DC (W)	
10	33	0-3	0-2	0-0.6	0-1	100	100	32/16	9	1.2
15	75	0-1	0-1	0-0.3	0-0.5	to				1.2
20	100	0-0.5	0-0.5	0-0.15	0-0.25	120				1.2

1) Kv value (l/min) at +20 °C, 1 bar pressure at valve inlet and free outlet

2) Pressure data (bar) gauge pressure

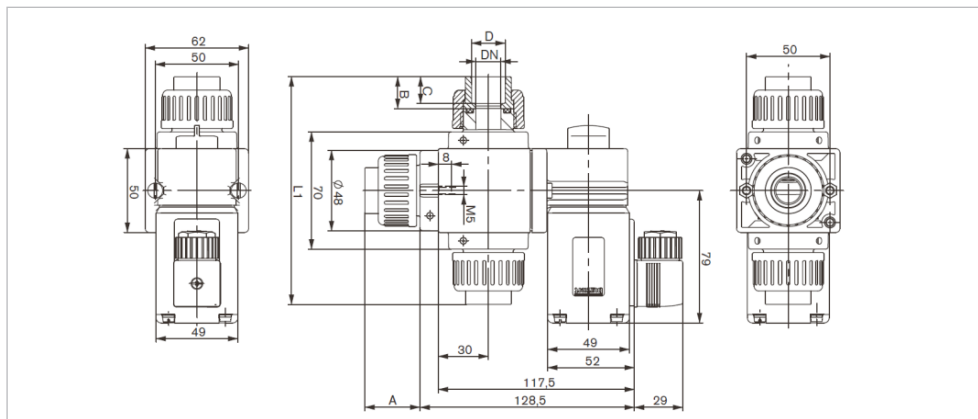
Switching time

Switching time ¹⁾	Open	Close
Mode of operation	(ms)	(ms)
A, B, E, F	10 - 20	40 - 60

¹⁾ Switching time (ms) measured at valve outlet 6 bar and +20°
 Open Pressure buildup 0 % to 90 %
 Close Pressure buildup 100 % to 10 %

Dimensions

3/2-way with coupling nut and branch fitting



Material	DN (mm)	Process connection	A (mm)	B (mm)	C (mm)	D (mm)	L1 (mm)
PVC	10	Solvent cement socket	30	17	14	Ø 16,2	130
	10 (with connection for DN15)	Solvent cement socket	32	19	16	Ø 20.2	134
	15	Solvent cement socket	33	19	16	Ø 20.2	136
	15 (with connection for DN20)	Solvent cement socket	36	22	19	Ø 25.2	142
	20	Solvent cement socket	37	22	19	Ø 25.2	144

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Solenoid Valve Type 157



Product description

Type 157 is a high-quality, direct-acting 2/2-way pivoted armature solenoid valve that can be used for opening or closing. The magnetic system and the media chamber are separated from one another by a separating diaphragm system. The valve is especially suitable for aggressive media.

Function

A solenoid valve is a valve which is actuated by an electromagnet. Their tasks are to release, shut off, dose, distribute or mix gases and liquids. The solenoid valves can switch very fast, and guarantee high reliability and a long lifetime at a low actuator power. Solenoid valves with position measuring can be operated as servo valves.

Applications

- Water treatment
- Process/chemical engineering
- Plant/mechanical engineering
- Semiconductor industry
- Environmental engineering
- Medical engineering
- Apparatus engineering
- Analytical technology

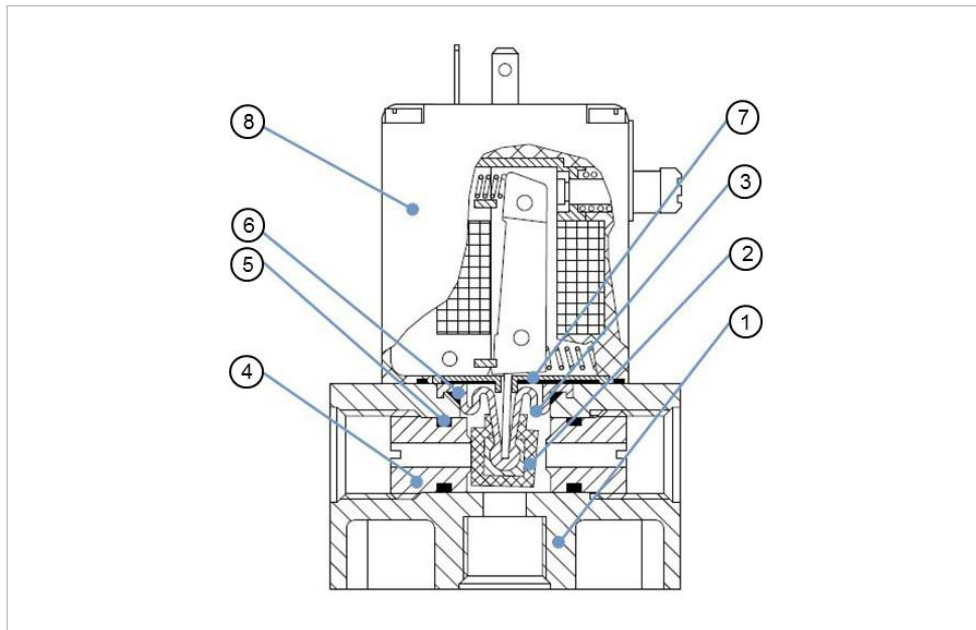
Benefits/features

- PVC-U material: threaded socket with cylindrical female pipe thread Rp
- Modes of operation: A, B
- Handle with ratchet setting
- Electrical connection with cable plug
- Protection rating IP65
- Pivoted armature valve with emergency manual override
- Direct-acting with isolating diaphragm
- Gasket materials are highly media-resistant

Flow media

Suited for aggressive media

Technical data



- ① Valve housing
- ② Gasket
- ③ Rotating stem
- ④ Seat
- ⑤ O-ring
- ⑥ PTFE
- ⑦ Isolating membrane
- ⑧ Epoxy

Specification		
Nominal diameter	DN2 – DN8	
Valve housing	PVC (resistant according to DIN 8062, 8061)	
Seal material media	FKM/EPDM	Oxidizing acids and substances, oils and saline solutions, exhaust gases, technical vacuum
Media temperatures	PVC + FKM	-10 to +50 °C
Housing + gasket (combination of materials)		
Ambient temperature	Max. +50 °C	
Viscosity	Max. 37 mm ² /s	
Voltage tolerance	±10%	
Switching frequency	Max. 100/min with AC Max. 10/min with UC	
Rated duty	Continuous duty	VA housing 100 % ED and with universal current (UC)
	Intermittent operation	With PVC 10 % ED (10 min)
Electrical connection with AC and DC	Appliance plug for cable Ø 6 – 7 mm (in scope of delivery) or cable connection	
Protection rating	IP65 with appliance socket	
Mounting position	As desired, preferably with actuator on top	

Electrical power consumption

Nominal diameter (mm)	Mechanism	Kv value ¹⁾ water (l/min)	Pressure range ²⁾		Power consumption Inrush (electrical)		Power consumption Operation(electrical)		Weight (kg)
			A (bar)	DC (bar)	AC (VA)	DC (W)	AC (VA/W)	DC (W)	
4	A	5	0-2	0-4	30	40	15/8	8-12	0.5
6	A	10	0-1	0-2	30	40	15/8	8-12	0.5
8	A	16.7	0-1	0-1	30	40	15/8	8-12	0.5

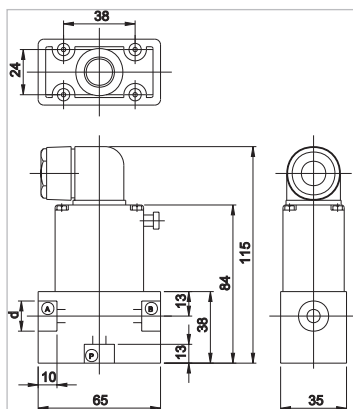
- 1) Kv value (l/min) at +20 °C, 1 bar pressure at valve inlet and free outlet
- 2) Pressure data (bar) excess pressure to atmospheric pressure

Switching time

Switching time ¹⁾	Open	Close
Mode of operation	(ms)	(ms)
A, B	15 - 20	15 - 20

- 1) Switching time (ms) measured at valve outlet at 6 bar and +20 °C
- Open Pressure buildup 0 % to 90 %
- Close Pressure buildup 100 % to 10 %

Dimensions



Housing material	Inch (inch)	B (mm)	E (mm)	F (mm)
PVC	G 3/8	91	35	65

Possible connections			
Mode of operation	Port 1	Port 2	Port 3
A	P	A	-
B	P	B	-

i For further information on accessories, refer to the online product catalog at www.gfps.com.

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3/2 – 5/2-way solenoid pilot valve MNL532



General

3/2 and 5/2-way solenoid valve for activating a double-acting pneumatic actuator. The mounting takes place via a NAMUR connection. For the dimensions of the DIASTAR series DN15 – DN50 and our pneumatic actuators PA11/21 a NAMUR connection plate must be used between the actuator and the solenoid pilot valve.

Technical data	
Air connection	G $\frac{1}{4}$ "
Dimension	5.5 mm
Air pressure	2 – 10 bar
Temperature	-10 °C – +50 °C
Protection rating	IP65 per DIN40050
Voltage (V AC) / Power consumption	230 V / 5 VA, 115 V / 5 VA, 48 V / 5 VA, 24 V / 5 VA
Voltage (V DC) / Power consumption	24 V / 3 W
Air flow	950 l/min

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