Solenoid Valves

General Information

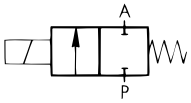
Solenoid valves from George Fischer play a major role in industrial systems engineering due to their outstanding quality. The comprehensive range with a large number of different versions fully satisfies international standards and customers' requirements. Their proven advantages and special features make them convincing in operation. Plastic solenoid valves from George Fischer are the ideal products, especially for demanding media.
Their good characteristics and short response times make the solenoid valves suitable as components of coordinated control circuits and filling stations.

Product Features

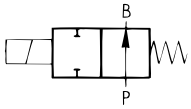
- Compact design
- In some cases with union ends
- Corrosion-resistant
- Various operating modes
- Wide range of sizes
- Various sealing materials
- Straight-through and angled versions
- Maintenance-friendly designs

PVC-U 2/2-Way Solenoid Valve, Type 157

Functions



Function A:
2/2-way straight passage valve de-energized closed



Function B:
2/2-way straight passage valve de-energized open

Model:

- Direct acting completely encapsulated 2/2-way solenoid valve with lever arm and lockable manual override. The valves control the flow in neutral and aggressive media in gaseous or liquid form. The valves are designed for a maximum operating pressure of 4 bar.
- Range of sizes: DN 4–8
  $G^3/_8$″
  d 16

Types available

	DN mm	Threaded sockets inches	d Solvent cement sockets mm	Nominal voltage U_N	Type of valve 2/2-way straight passage valve Function A Sealing material EPDM Code	FPM Code	Function B EPDM Code	FPM Code
with solvent cement sockets ISO/DIN	4		16	230 V/	199 157 017	199 157 012	199 157 037	199 157 032
	6		16	50 Hz	199 157 018	199 157 013	199 157 038	199 157 033
	8		16		199 157 019	199 157 014	199 157 039	199 157 034
					2/2-way right angle valve Function A		Function B	
	4		16	230 V/	199 157 087	199 157 082	199 157 107	199 157 102
	6		16	50 Hz	199 157 088	199 157 083	199 157 108	199 157 103
	8		16		199 157 089	199 157 084	199 157 109	199 157 104
					2/2-way straight passage valve Function A		Function B	
with threaded sockets parallel female thread ISO/DIN	4	$G^3/_8$		230 V/	199 157 007	199 157 002	199 157 027	199 157 022
	6	$G^3/_8$		50 Hz	199 157 008	199 157 003	199 157 028	199 157 023
	8	$G^3/_8$			199 157 009	199 157 004	199 157 029	199 157 024
					2/2-way right angle valve Function A		Function B	
	4	$G^3/_8$		230 V/	199 157 077	199 157 072	199 157 097	199 157 092
	6	$G^3/_8$		50 Hz	199 157 078	199 157 073	199 157 098	199 157 093
	8	$G^3/_8$			199 157 079	199 157 074	199 157 099	199 157 094

k_v values

DN mm	k_v value, l/min (Δp = 1 bar)
4	5.0
6	10.0
8	16.6

Special Models (on request)

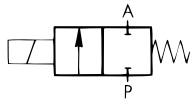
Nominal voltage	12–380 V/50 Hz or 60 Hz 24–220 V=
Electrical connection	– without cable plug – with position indicator (factory installed) – explosion-protected model
Valve body	PVDF

PTFE 2/2-Way Solenoid Valve, Type 157

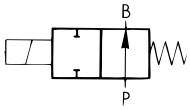
Model:

- Direct acting completely encapsulated 2/2-way solenoid valve with lever arm and lockable manual override. The valves control the flow of neutral and aggressive gases or liquids. The valves are designed for a maximum operating pressure of 4 bar.
- Range of sizes: DN 4–8
  $G^3/_8$"
  d 16

Functions



Function A:
2/2-way straight passage valve de-energized closed



Function B:
2/2-way straight passage valve de-energized open

Types available

with threaded sockets parallel female thread ISO/DIN

DN mm	Threaded sockets inches	Nominal voltage U_N	Type of valve 2/2-way straight passage valve Function A Sealing material EPDM Code	FPM Code	Kalrez Code	Function B EPDM Code	FPM Code	Kalrez Code
4	$G^3/_8$	230 V/ 50 Hz	199 157 047	199 157 042	199 157 052	199 157 062	199 157 057	199 157 067
6	$G^3/_8$		199 157 048	199 157 043	199 157 053	199 157 063	199 157 058	199 157 068
8	$G^3/_8$		199 157 049	199 157 044	–	199 157 064	199 157 059	–
			2/2-way right angle valve Function A			Function B		
4	$G^3/_8$	230 V/ 50 Hz	199 157 117	199 157 112	199 157 122	199 157 132	199 157 127	199 157 137
6	$G^3/_8$		199 157 118	199 157 113	199 157 123	199 157 133	199 157 128	199 157 138
8	$G^3/_8$		199 157 119	199 157 114	–	199 157 134	199 157 129	–

Special Models (on request)

Nominal voltage	12–380 V/50 Hz or 60 Hz 24–220 V=
Electrical connection	– without cable plug – with position indicator (factory installed) – explosion-protected model

k_v values

DN mm	k_v value, l/min (Δp = 1 bar) Sealing material EPDM/FPM	PTFE
4	5.0	4.1
6	10.0	8.3
8	16.6	–

Technical Data

DN mm	Valve body	Sealing material	Media temper-ature °C	Pressure range in bar AC ~	DC =	With heavy duty coil ~/=	Ambient temper-ature max.	Permis-sible viscosity max.
4 6 8	PVC-U	EPDM/ FPM	–10° to +50°C	0–4 0–2 0–1	0–2 0–1 –	0–4 0–2 0–1	+50°C	37 cSt (5°E)
4 6 8	PTFE	EPDM/ FPM	–10° to +90°C	0–4 0–2 0–1	0–2 0–1 –	0–4 0–2 0–1	+50°C	37cSt (5°E)
4 6	PTFE	Kalrez	–10° to +90°C	0–4 0–2	– –	0–4 0–2	+50°C	27 cSt (5°E)

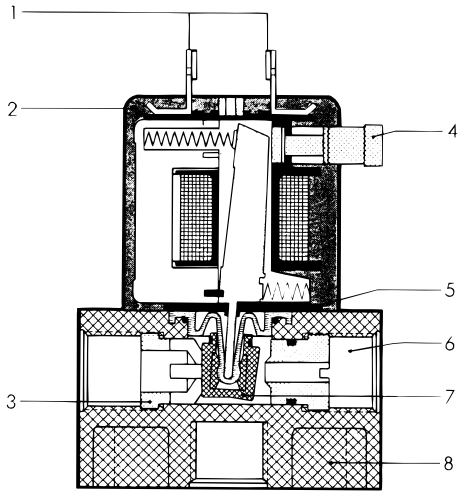
All pressure values are given at excess over atmospheric pressure.

Power consumption (at operating temperature)	AC	DC	With heavy duty coil
	Initial movement 40 VA hold 18 VA/7 W	8.5 W	Initial movement 40 W hold 2 W

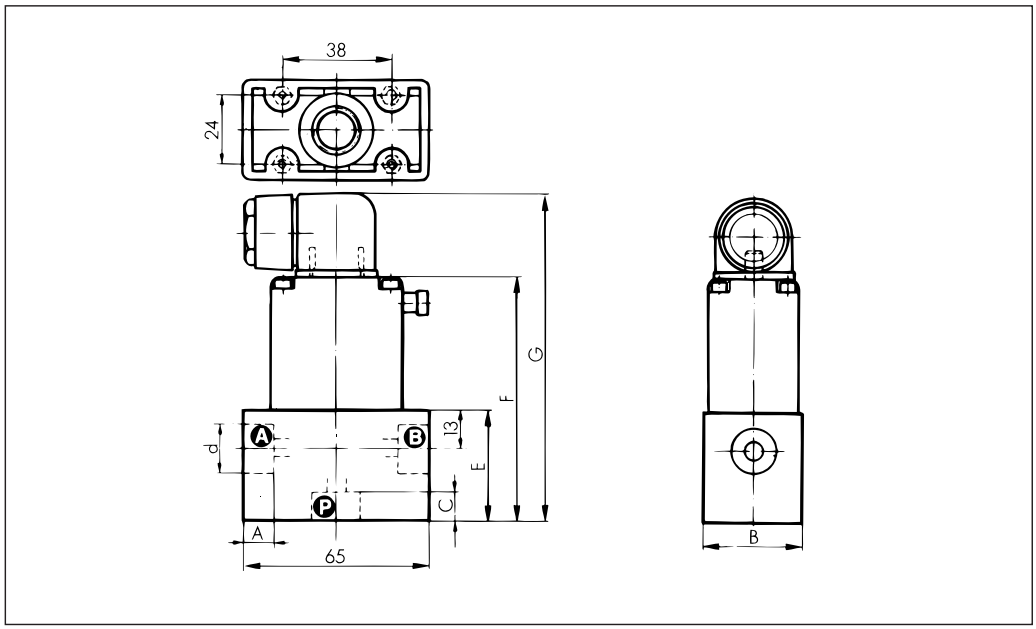
Duty rating	Normal coil (~ and =): – PVC-U body } intermittent operation 40%, 10 min – PTFE body } Heavy duty coil: 100% (PVC-U and PTFE)
Switching frequency	Normal coil approx. 600 switchings per min Heavy duty coil approx. 10 switchings per min
Opening rate	15–25 ms
Closing rate	15–25 ms
Electrical connection	with DIN 43650 cable plug, safety classification IP 65
Installation position	any (preferably vertical)

Technical Features

1) Electrical connection with cable plug, other connections on request
2) The resin coating provides moisture-proof electrical insulation to safety classification IP 65 as well as protection against corrosion and mechanical influences
3) The seats are adjusted and may not be switched
4) Lockable manual override
5) Double insulation and ventilated spacing ensures protection of the solenoid system from aggressive media
6) Port connections:
   – solvent cement socket
   – female thread BSP
7) Sealing materials for diaphragm, EPDM, FPM or Kalrez
8) Valve body, PVC-U or PTFE



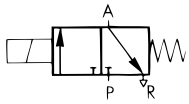
Dimensions



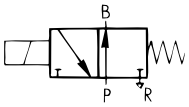
Type of connection	A mm	B mm	C mm	d	E mm	F mm	G mm	Weight kg
Solvent cement socket	10	35	13	16	38	84	115	0.32
Parallel female threaded socket	10	35	13	G 3/8"	38	84	115	0.32

PVC-U 3/2-Way Solenoid Valve, Type 158

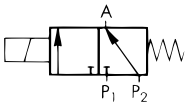
Functions



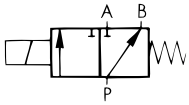
Function C:
3/2-way valve, when de-energized outlet port A exhausted



Function D:
3/2-way valve, when de-energized outlet port B pressurized



Function E:
3/2-way mixer valve, when de-energized inlet port P_2 open, P_1 closed



Function F:
3/2-way diverter valve, when de-energized inlet port P connected to outlet port B

Model:

- Direct acting completely encapsulated 3/2-way solenoid valve with lever arm and lockable manual override. The valves control flow in neutral and aggressive gases or liquids. They are designed for a maximum operating pressure of 4 bar.
- Range of sizes: DN 4–6
  $G^3/_8$″
  d 16

Types available

	DN mm	Threaded sockets inches	d Solvent cement socket mm	Nominal voltage U_N	Function C Sealing material EPDM Code	Function C Sealing material FPM Code	Function D EPDM Code	Function D FPM Code
with solvent cement sockets ISO/DIN	4		16	230 V/ 50 Hz	199 158 017	199 158 012	199 158 037	199 158 032
	6		16		199 158 018	199 158 013	199 158 038	199 158 033
					Function E		Function F	
	4		16	230 V/ 50 Hz	199 158 057	199 158 052	199 158 077	199 158 072
	6		16		199 158 058	199 158 053	199 158 078	199 158 073
with threaded sockets parallel female thread ISO/DIN					Function C		Function D	
	4	$G^3/_8$		230 V/ 50 Hz	199 158 007	199 158 002	199 158 027	199 158 022
	6	$G^3/_8$			199 158 008	199 158 003	199 158 028	199 158 023
					Function E		Function F	
	4	$G^3/_8$		230 V/ 50 Hz	199 158 047	199 158 042	199 158 067	199 158 062
	6	$G^3/_8$			199 158 048	199 158 043	199 158 068	199 158 063

Special Models (on request)

Nominal voltage	12–380 V/50 Hz or 60 Hz 24–220 V=
Electrical connection	– without cable plug – with position indicator (factory installed) – explosion-protected model
Valve body	PVDF

k_v values

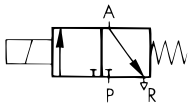
DN mm	k_v value, l/min (Δp = 1 bar)
4	5.0
6	10.0

PTFE 3/2-Way Solenoid Valve, Type 158

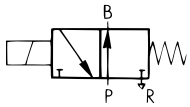
Model:

- Direct acting completely encapsulated 3/2-way solenoid valve with lever arm and lockable manual override. The valves control flow in neutral and aggressive gases or liquids. They are designed for a maximum operating pressure of 4 bar.
- Range of sizes: DN 4–6
  $G^3/_8$"
  d 16

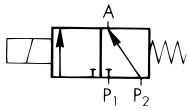
Functions



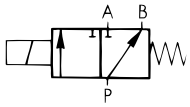
Function C:
3/2-way valve, when de-energized outlet port A exhausted



Function D:
3/2-way valve, when de-energized outlet port B pressurized



Function E:
3/2-way mixer valve, when de-energized inlet port P_2 open, P_1 closed



Function F:
3/2-way diverter valve, when de-energized inlet port P connected to outlet port B

Types available

with threaded sockets parallel female thread ISO/DIN

DN mm	inches	Nominal voltage U_N	Function C Sealing material EPDM Code	FPM Code	Kalrez Code
4	$G^3/_8$	230 V/	199 158 087	199 158 082	199 158 092
6	$G^3/_8$	50 Hz	199 158 088	199 158 083	199 158 093
			Function D		
4	$G^3/_8$	230 V/	199 158 102	199 158 097	199 158 107
6	$G^3/_8$	50 Hz	199 158 103	199 158 098	199 158 108
			Function E		
4	$G^3/_8$	230 V/	199 158 117	199 158 112	199 158 122
6	$G^3/_8$	50 Hz	199 158 118	199 158 113	199 158 123
			Function F		
4	$G^3/_8$	230 V/	199 158 132	199 158 127	199 158 137
6	$G^3/_8$	50 Hz	199 158 133	199 158 128	199 158 138

Special Models (on request)

Nominal voltage	12–380 V/50 Hz or 60 Hz 24–220 V=
Electrical connection	– without cable plug – with position indicator (factory installed) – explosion-protected model

k_v values

DN mm	k_v value, l/min (Δp = 1 bar)	
	Sealing material	
mm	EPDM/FPM	PTFE
4	5.0	4.2
6	10.0	8.3

Technical Data

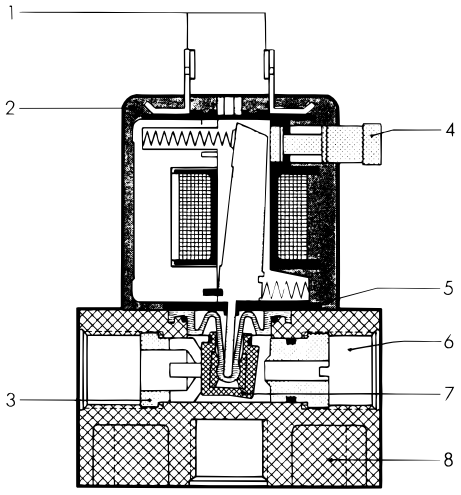
DN	Valve body	Sealing material	Media temperature	Pressure range in bar AC		DC		With heavy duty coil		Ambient temperature	Permissible viscosity
mm			°C	F	C, D, E	F	C, D, E	F	C, D, E	max.	max.
4 6	PVC-U	EPDM/ FPM	–10° to +50°C	0–4 0–2	0–2 0–1	0–2 0–1	0–1 0–0.5	0–4 0–2	0–2 0–1	+50°C	37 cSt (5°E)
4 6	PTFE	EPDM/ FPM	–10° to +90°C	0–4 0–2	0–2 0–1	0–2 0–1	0–1 0–0.5	0–4 0–2	0–2 0–1	+50°C	37 cSt (5°E)
4 6	PTFE	PTFE	–10° to +90°C	0–4 0–2	0–2 0–1	– –	– –	0–4 0–2	0–2 0–1	+50°C	37 cSt (5°E)

All pressure values are given at excess over atmospheric pressure.

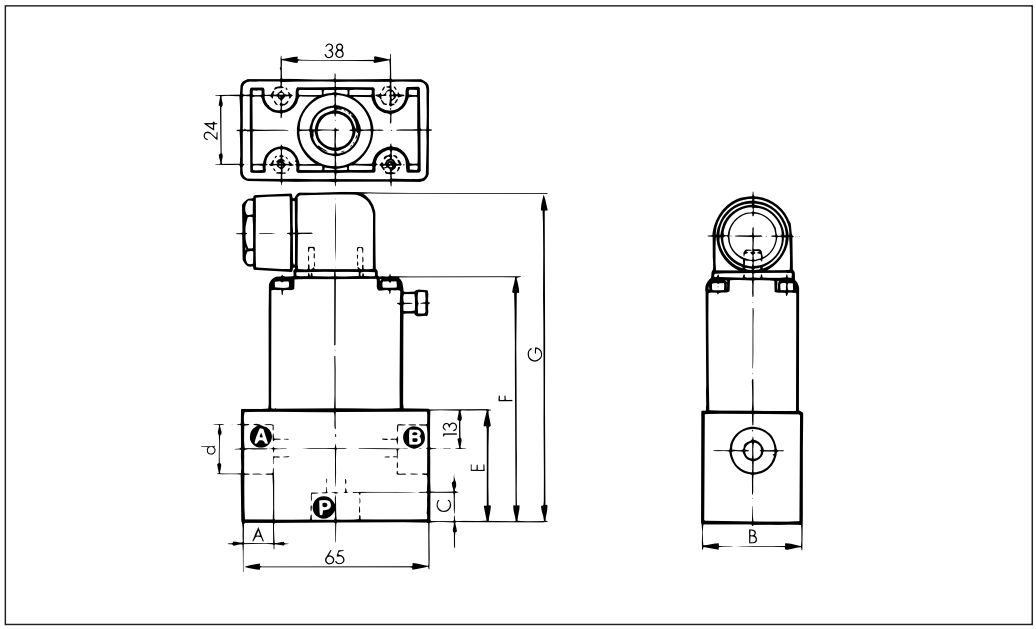
Power consumption (at operating temperature)	AC	DC	With heavy duty coil
	Initial movement 40 VA hold 18 VA/7 W	8.5 W	Initial movement 40 W hold 2 W
Duty rating	Normal coil (~ and =): – PVC-U body – PTFE body } intermittent operation 40%, 10 min Heavy duty coil: 100% (PVC-U and PTFE)		
Switching frequency	Normal coil approx. 600 switchings per min Heavy duty coil approx. 10 switchings per min		
Opening rate	15–25 ms		
Closing rate	15–25 ms		
Electrical connection	with DIN 43650 cable plug, safety classification IP 65		
Installation position	any (preferably vertical)		

Technical Features

1) Electrical connection with cable plug; other connections on request
2) The resin coating provides moisture-proof electrical insulation to safety class IP 65 as well as protection against corrosion and mechanical influences
3) The seats are adjusted and may not be switched
4) Lockable manual override
5) Double insulation and ventilated spacing ensures protection of the solenoid system from aggressive media
6) Port connections:
   – solvent cement socket
   – female thread, BSP
7) Diaphragm seals, EPDM, FPM or Kalrez
8) Valve body, PVC-U or PTFE



Dimensions



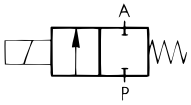
Type of connection	A mm	B mm	C mm	d	E mm	F mm	G mm	Weight kg
Solvent cement socket	10	35	13	16	38	84	115	0.32
Parallel female threaded socket	10	35	13	G 3/8"	38	84	115	0.32

PVC-U 2/2-Way Solenoid Valve, Type 159

Model:

- Direct acting completely encapsulated 2/2-way solenoid valve. This George Fischer solenoid valve regulates the flow of neutral and aggressive gases or liquids with low or medium viscosity. Low weight of moving parts contributes to rapid operation and long working life. The valve is closed by spring pressure when de-energized.
- Range of sizes: DN 2–6
  $G^1/_8''$
  d 10

Function A:
de-energized
closed



Types available

with solvent cement sockets ISO/DIN

with ISO/DIN parallel female threaded sockets

DN mm	Threaded sockets inches	d – Solvent cement socket mm	Nominal voltage U_N	Types of valves 2/2-way straight passage valve Sealing material EPDM Code	FPM Code	2/2-way right angle valve EPDM Code	FPM Code
2		10	AC	199 159 005	199 159 010	199 159 065	199 159 070
4		10	230 V/50 Hz	199 159 006	199 159 011	199 159 066	199 159 071
6		10		199 159 007	199 159 012	199 159 067	199 159 072
2		10	DC	199 159 020	199 159 025	199 159 080	199 159 085
4		10	24 V	199 159 021	199 159 026	199 159 081	199 159 086
6		10		199 159 022	199 159 027	199 159 082	199 159 087
2	$G^1/_8$		AC	199 159 035	199 159 040	199 159 095	199 159 100
4	$G^1/_8$		230 V/50 Hz	199 159 036	199 159 041	199 159 096	199 159 101
6	$G^1/_8$			199 159 037	199 159 042	199 159 097	199 159 102
2	$G^1/_8$		DC	199 159 050	199 159 055	199 159 110	199 159 115
4	$G^1/_8$		24 V	199 159 051	199 159 056	199 159 111	199 159 116
6	$G^1/_8$			199 159 052	199 159 057	199 159 112	199 159 117

Special Models (on request)

Nominal voltage	12–380 V~/6–220 V=
Electrical connection	– with cable moulded into valve body 3 x 0.75 mm^2 length 300 mm safety classification IP 65 – with cable moulded into valve body, length as requested safety classification IP 65 – without cable plug – cable plug for Ø 9 mm cable safety classification IP 65

k_v values

DN mm	k_v value, l/min (Δp = 1 bar)
2	2.2
4	6.7
6	10.0

Technical Information

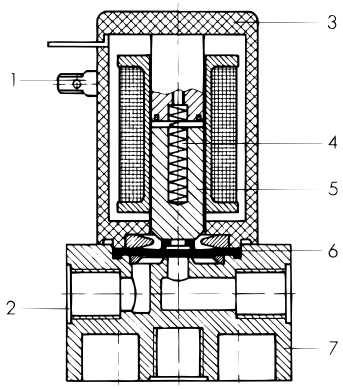
DN	Media temperature		Pressure range in bar		Ambient temperature	Permissible viscosity
	Sealing material		flow rate in direction	flow rate in direction		
mm	EPDM	FPM/NBR	of arrow	against arrow	max.	max.
2 4 6	–30 to +50°C	–10° to +50°C	0–4 0–1.5 0–0.6	0–0.6 0–0.5 0–0.4	+50°C	37 cSt (5° E)

All pressures are given at excess over atmospheric pressure.

Power consumption (at operating temperature)	AC	DC
	initial movement 21 VA hold 12 VA/8 W	8 W
Duration of operation	100% at max. media and ambient temperature 30°C	
Switching frequency	approx. 300 switchings per min	
Opening times	30–40 ms	
Closing times	40–50 ms	
Electrical connection	with cable plug of IP 65 safety classification	
Installation position	any (preferably vertical)	

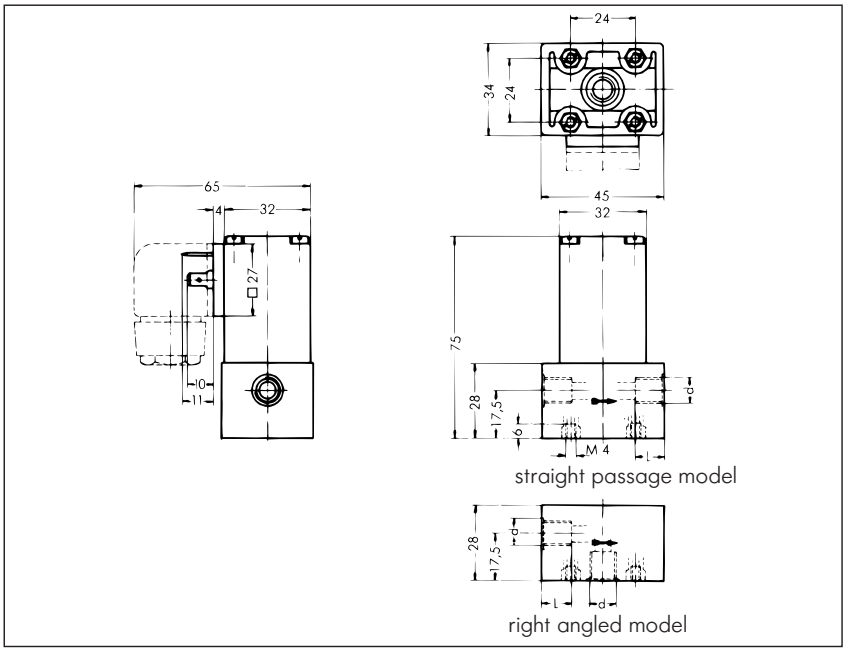
Technical Features

1) Cable plug electrical connection; other connections on request
2) Port connections:
   – solvent cement sockets
   – female threaded sockets
3) The epoxy resin casing of the solenoid system provides moisture-proof electrical insulation as well as protection against corrosion and mechanical influences
4) Stainless steel compressing spring for applying mechanical pressure on magnet core
5) A sturdy direct acting magnetic actuator assures safe operation throughout a wide range of voltages
6) Diaphragm and seals of EPDM, FPM
7) Valve body PVC-U



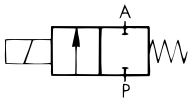
Dimensions

DN mm	D mm	L mm	Weight kg
2 4 6	10.2 mm 10.2 mm 10.2 mm	12 12 12	0.2 0.2 0.2
2 4 6	G 1/8″ G 1/8″ G 1/8″	11 11 11	0.2 0.2 0.2

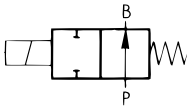


PVC-U 2/2-Way Solenoid Valve, Type 160

Functions



Function A:
2/2-way straight passage valve de-energized closed



Function B:
2/2-way straight passage valve de-energized open

Model:

- Encapsulated 2/2-way solenoid valve with lifting magnet and manual override for controlling the flow of neutral and aggressive gaseous and liquid media with low to medium viscosity. Available as straight passage or right angled valve, with a maximum operating pressure of 2 bar.
- Range of sizes: DN 10–20
  $G^3/_8$"–$^3/_4$"
  d 16–25

Types available

with solvent cement sockets ISO/DIN

DN	Rp Threaded sockets	d Solvent cement sockets	Nominal voltage	Valve type 2/2-way straight passage valve Function A			Function B	
				Sealing material Code				
mm	inches	mm	U_N	EPDM	FPM		EPDM	FPM
10		16	AC	199 160 010	199 160 005		199 160 025	199 160 020
10		20	voltage	199 160 011	199 160 006		199 160 026	199 160 021
15		20	230 V/50 Hz	199 160 012	199 160 007		199 160 027	199 160 022
15		25		199 160 013	199 160 008		199 160 028	199 160 023
20		25		199 160 014	199 160 009		199 160 029	199 160 024
				2/2-way right-angle valve Function A			Function B	
10		16	AC	199 160 070	199 160 065		199 160 085	199 160 080
10		20	voltage	199 160 071	199 160 066		199 160 086	199 160 081
15		20	230 V/50 Hz	199 160 072	199 160 067		199 160 087	199 160 082
15		25		199 160 073	199 160 068		199 160 088	199 160 083
20		25		199 160 074	199 160 069		199 160 089	199 160 084

with BSP parallel threaded sockets ISO/DIN

				2/2-way straight passage valve Function A			Function B	
10	G $^3/_8$		AC	199 160 040	199 160 035		199 160 055	199 160 050
10	G $^1/_2$		voltage	199 160 041	199 160 036		199 160 056	199 160 051
15	G $^1/_2$		230 V750 Hz	199 160 042	199 160 037		199 160 057	199 160 052
15	G $^3/_4$			199 160 043	199 160 038		199 160 058	199 160 053
20	G $^3/_4$			199 160 044	199 160 039		199 160 059	199 160 054
				2/2-way right-angled valve Function A			Function B	
10	G $^3/_8$		AC	199 160 100	199 160 095		199 160 115	199 160 110
10	G $^1/_2$		voltage	199 160 101	199 160 096		199 160 116	199 160 111
15	G $^1/_2$		230 V/50 Hz	199 160 102	199 160 097		199 160 117	199 160 112
15	G $^3/_4$			199 160 103	199 160 098		199 160 118	199 160 113
20	G $^3/_4$			199 160 104	199 160 099		199 160 119	199 160 114

k_v values

DN	Functions A, B
mm	k_v value in l/min for Δp = 1bar
10	33.3
15	75.0
20	100.0

Special Models (on request)

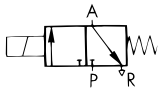
Nominal voltage	12–380 V~/=
Electrical connection	– with encapsulated cable length 300 mm IP 65 safety classification – with encapsulated cable length as specified IP 65 safety classification – without cable plug – with position indicator
Body	– PVDF

PVC-U 3/2-Way Solenoid Valve, Type 161

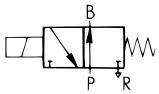
Model:

- Encapsulated 3/2-way solenoid valve with lifting magnet and manual override for controlling the flow of neutral and aggressive gaseous and liquid media with low to medium viscosity. Available with various functions, with a maximum operating pressure of 1 bar.
- Range of sizes: DN 10–20
  $G^{3}/_{8}$"–$^{3}/_{4}$"
  d 16–25

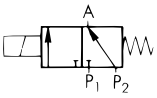
Functions



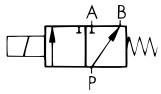
Function C:
3/2-way valve outlet port A to exhaust when de-energized



Function D:
3/2-way valve outlet port B pressurized when de-energized



Function E:
3/2-way mixer valve pressure ports P_1 closed and P_2 open when de-energized



Function F:
3/2-way diverter with pressure port P connected to outlet B when de-energized

Types available

with solvent cement sockets ISO/DIN

DN	Rp Threaded sockets	d Solvent cement sockets	Nominal voltage	Function C			Function D		
				Sealing material Code					
mm	inches	mm	U_N	EPDM	FPM		EPDM	FPM	
10		16	AC	199 161 010	199 161 005		199 161 025	199 161 020	
10		20	voltage	199 161 011	199 161 006		199 161 026	199 161 021	
15		20	230 V/50 Hz	199 161 012	199 161 007		199 161 027	199 161 022	
15		25		199 161 013	199 161 008		199 161 028	199 161 023	
20		25		199 161 014	199 161 009		199 161 029	199 161 024	
				Function E			Function F		
10		16	AC	199 161 040	199 161 035		199 161 055	199 161 050	
10		20	voltage	199 161 041	199 161 036		199 161 056	199 161 051	
15		20	230 V/50 Hz	199 161 042	199 161 037		199 161 057	199 161 052	
15		25		199 161 043	199 161 038		199 161 058	199 161 053	
20		25		199 161 044	199 161 039		199 161 059	199 161 054	

with BSP parallel threaded sockets ISO/DIN

DN	Rp Threaded sockets	d Solvent cement sockets	Nominal voltage	Function C			Function D		
				Sealing material Code					
mm	inches	mm	U_N	EPDM	FPM		EPDM	FPM	
10	G $^{3}/_{8}$		AC	199 161 070	199 161 065		199 161 085	199 161 080	
10	G $^{1}/_{2}$			199 161 071	199 161 066		199 161 086	199 161 081	
15	G $^{1}/_{2}$		230 V/50 Hz	199 161 072	199 161 067		199 161 087	199 161 082	
15	G $^{3}/_{4}$			199 161 073	199 161 068		199 161 088	199 161 083	
20	G $^{3}/_{4}$			199 161 074	199 161 069		199 161 089	199 161 084	
				Function E			Function F		
10	G $^{3}/_{8}$		AC	199 161 100	199 161 095		199 161 115	199 161 110	
10	G $^{1}/_{2}$		voltage	199 161 101	199 161 096		199 161 116	199 161 111	
15	G $^{1}/_{2}$		230 V/50 Hz	199 161 102	199 161 097		199 161 117	199 161 112	
15	G $^{3}/_{4}$			199 161 103	199 161 098		199 161 118	199 161 113	
20	G $^{3}/_{4}$			199 161 104	199 161 099		199 161 119	199 161 114	

Special Models (on request)

Nominal voltage	12–380 V~/=
Electrical connection	– with encapsulated cable length 300 mm IP 65 safety classification – with encapsulated cable length as specified IP 65 safety classification – without cable plug – with position indicator

k_v values

DN	Functions C, D, E, F
mm	k_v value in l/min for Δp = 1bar
10	33.3
15	66.6
20	83.3

Technical Information

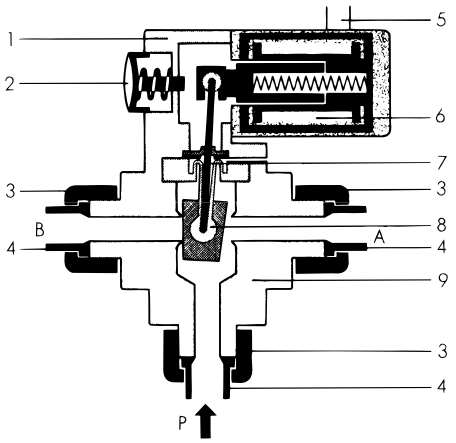
All pressures are given at excess over atmospheric pressure

DN	Media temperature		Pressure range in bar				Ambient temperature	Permissible viscosity
	Sealing material		Functions					
mm	EPDM	FPM/NBR	A	B	C, D, F	E	max.	max.
10 15 20	–30°C to +50°C	–10°C to +50°C	0–3 0–1 0–0.5	0–2 0–1 0–0.5	0–1 0–0.5 0–0.25	0–0.6 0–0.3 0–0.15	+50°C	37 cSt (5° E)

Power consumption	AC	
	Functions A, D, F,	B, C, E
*with heavy duty coil uniformly for 50–60 Hz and DC	Initial movement 100–120 VA Hold 32 VA/16 W	Initial movement 100 W* Hold 9 W
	DC	
	All functions Initial movement 100 W*/Hold 9 W	
Duty rating	100%	
Switching frequency	normal coil 100–150 per min / high tension coil 10–20 per min	
Opening times	10–20 ms	
Closing times	40–60 ms	
Electrical connection	with cable plug to IP 65 safety classification	
Installation position	any (preferably vertical)	

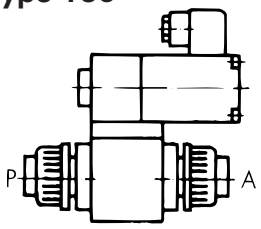
Technical Features

1) The epoxy resin of the solenoid system provides moisture-proof electrical insulation as well as protection against corrosion and mechanical influences
2) Lockable manual override
3) Valve nuts allow the valve to be easily installed and removed
4) Port connections:
   – solvent cement sockets
   – female threaded sockets
5) Cable plug electrical connection; other connections on request
6) A sturdy direct acting magnetic actuator assures safe operation throughout a wide range of voltages
7) Double sealing of the air cavity prevents line fluid from entering the solenoid system
8) Positive shut off by means of a PTFE pivoting closing seat
9) Valve body PVC-U

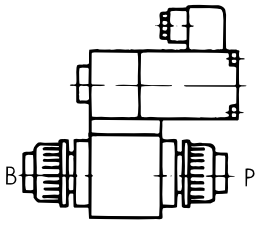


Connections

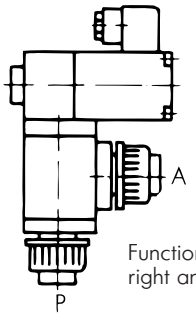
Type 160



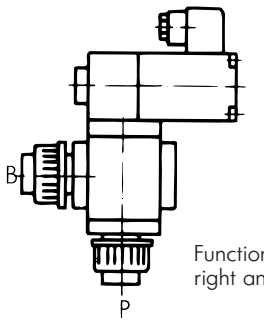
Function A, straight passage



Function B, straight passage

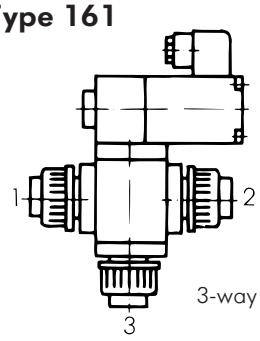


Function A,
right angle passage



Function B,
right angle passage

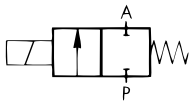
Type 161



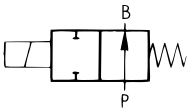
3-way model

Function	3-way valve connections 1	2	3
C	R	P	A
D	P	R	B
E	P_2	P_1	A
F	B	A	P

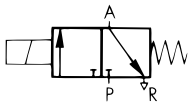
Functions



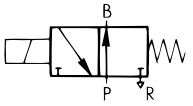
Function A:
2/2-way straight passage
valve closed at rest
de-energized closed



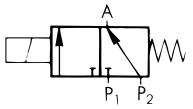
Function B:
2/2-way straight passage
valve open at rest
de-energized open



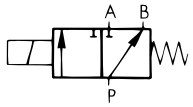
Function C:
3/2-way valve outlet port A
to exhaust when de-energized



Function D:
3/2-way valve outlet port B
pressurized when de-energized

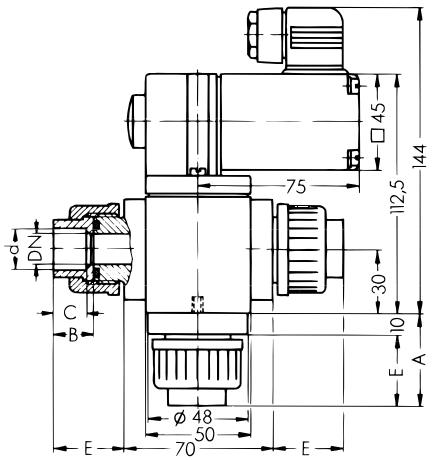


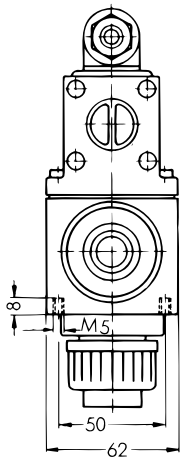
Function E:
3/2-way mixer valve pressure
port P_1 closed and P_2 open
when de-energized



Function F:
3/2-way diverter with pressure
port P connected to outlet B
when de-energized

Dimensions

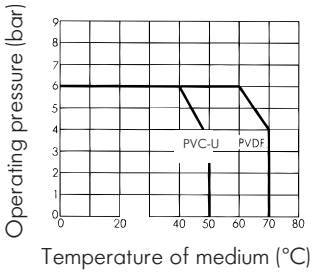




DN mm	A mm	B mm	C mm	d mm	E mm	Weight kg
10	40 (43)	17 (19)	14 (16)	16 (20.2)	30 (33)	1.2
15	43 (47)	19 (22)	16 (19)	20 (25.2)	33 (37)	1.2
20	47	22	19	25	37	1.2

PVC-U/PVDF 2/2-Way Solenoid Valve, Type 165

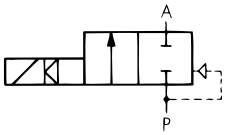
Pressure/temperature diagrams PVC-U/PVDF



Model:
The 165 series comprises 2/2-way solenoid valves with assisted operation for regulating the flow of neutral and aggressive media; the valves are designed so that virtually no closing impacts occur.

- With union ends
- Compact design
- All components in the flow area are made of plastic
- Lockable manual operation
- EPDM and FPM sealing materials
- Pressure range 0.5–6 bar
- Low power consumption
- Range of sizes: DN 15–50
  $^1/_2$″–2″
  d 20–63

Function A:
closed in the off position (auxiliary control)



Types available

PVC-U with solvent cement sockets ISO/DIN

DN		d	Nominal voltages, solenoid actuator 230 V/50 Hz		110 V/50 Hz		24 V DC	
			Sealing material					
mm	in.	mm	EPDM Code	FPM Code	EPDM Code	FPM Code	EPDM Code	FPM Code
15	$^1/_2$″	20	199 165 012	199 165 002	199 165 042	199 165 032	199 165 022	199 165 072
20	$^3/_4$″	25	199 165 013	199 165 003	199 165 043	199 165 033	199 165 023	199 165 073
25	1	32	199 165 014	199 165 004	199 165 044	199 165 034	199 165 024	199 165 074
32	1$^1/_4$″	40	199 165 015	199 165 005	199 165 045	199 165 035	199 165 025	199 165 075
40	1$^1/_2$″	50	199 165 016	199 165 006	199 165 046	199 165 036	199 165 026	199 165 076
50	2	63	199 165 017	199 165 007	199 165 047	199 165 037	199 165 027	199 165 077

PVDF with fusion sockets ISO/DIN

DN		d	Nominal voltages, solenoid actuator 230 V/50 Hz		110 V/50 Hz		24 V DC	
			Sealing material					
mm	in.	mm	EPDM Code	FPM Code	EPDM Code	FM Code	EPDM Code	FPM Code
15	$^1/_2$″	20	199 165 412	199 165 402	199 165 442	199 165 432	199 165 422	199 165 452
20	$^3/_4$″	25	199 165 413	199 165 403	199 165 443	199 165 433	199 165 423	199 165 453
25	1	32	199 165 414	199 165 404	199 165 444	199 165 434	199 165 424	199 165 454
32	1$^1/_4$″	40	199 165 415	199 165 405	199 165 445	199 165 435	199 165 425	199 165 455
40	1$^1/_2$″	50	199 165 416	199 165 406	199 165 446	199 165 436	199 165 426	199 165 456
50	2	63	199 165 417	199 165 407	199 165 447	199 165 437	199 165 427	199 165 457

k_v values

mm	k_v value in l/min for Δp = 1bar
15	88.3
20	100
25	233.3
32	266.7
40	500
50	600

Special Models (on request)

– other nominal voltages
– explosion-proof versions
– with electric position indicator (fitted by the manufacturer)

Technical Information

DN	Media temperature		Pressure range ≃	Ambient temperature	Permissible viscosity
	Sealing material				
mm	EPDM	FPM	bar	max.	max.
15			0.5–6		
20	0°C	0°C	0.5–6	0°C	21 cSt
25	to	to	0.5–6	to	(3°C)
32	+50°C	+50°C	0.5–6	+40°C	
40			0.5–6		
50			0.5–6		

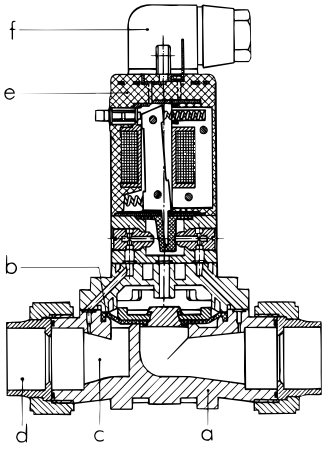
Power consumption AC and DC currents (at operating temperature)	AC initial movement 20 VA hold 11 VA/5 W	DC 5 W
Duty rating	100% (continuous operation) 25°C	
Switching frequency	10–15 switchings per min	
Switching times* (medium water at 6 bar)	opening time 100–800 ms	closing time 1000–4000 ms
Electrical connection	with cable plug for 7-mm connecting cable, insulation IP 65	
Installation position	any (preferably vertical)	
Materials	valve body PVC-U, PVDF	valve PVC-U (DN 40–50: PVDF)

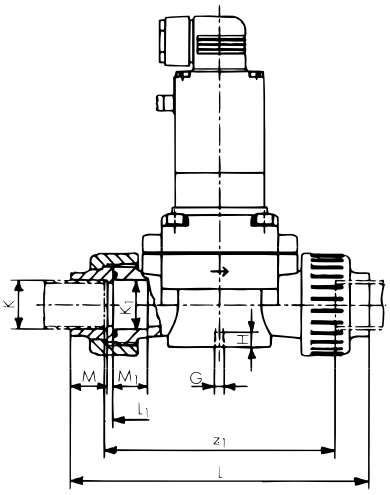
The valve is controlled exclusively via the pressure of the medium by means of the pilot valve. A minimum pressure differential of 0.5 bar is therefore necessary for satisfactory operation (P>A).

** The switching times are dependent on the nominal width and function of the valve, and on the pressure and viscosity of the medium being conveyed.*

Technical Features

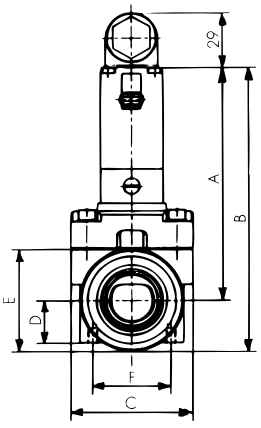
a) Valve body made from PVC-U or PVDF
b) Sealing diaphragm made from EPDM or FPM
c) Nominal widths DN 15–50
d) Pipeline connection: solvent cement socket/fusion socket ISO/DIN
e) Hinged-armature pilot valve
f) Plug connection conforming to DIN 43650





Dimensions

DN	A	B	C	D	E	F	G	H	L	L_1	K	K_1	M	M_1	z_1	Weight
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
15	122	148	62.5	22	53	40	M5	8	148	110	20.2	–	16	–	116	0.65
20	122	148	62.2	22	53	40	M5	8	154	110	25.2	25.2	19	18	116	0.65
25	136.5	174.5	85	31	76	44.5	M8	15	190	141	32.2	–	22	–	147	1.20
32	136.5	174.5	85	31	76	44.5	M8	15	198	141	40.2	40.2	26	22.5	147	1.20
40	160	212	115	42.2	104.5	44.5	M8	15	254	192	50.2	–	31	–	198	2.20
50	160	212	115	42.2	104.5	44.5	M8	15	268	192	63.2	63.2	38	33	198	2.20



GEORGE FISCHER +GF+

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