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Technical Documentation

DIASTAR Pneumatic Diaphragm Valves

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Our Product Family

The DIASTAR family from GF Piping Systems consists of three type series. All three versions are compact and designed for the respective line pressure.
You can choose from a complete range of pneumatically actuated diaphragm valves:

- for applications with high working pressures and closing forces
- for compact installations in the low pressure range

State-of-the-art materials technology and innovative manufacturing methods are the platform on which all three DIASTAR type series are based. Georg Fischer's expertise in developing diaphragm valves ensures that you get:

- best performance
- top quality
- long service life

Our wide range of valve bodies means there are no limits as far as applications are concerned. You are free to choose among PVC-U, PVC-C, ABS, PP-H, PP-n and PVDF. In conjunction with our large selection of diaphragm materials, you can use our valves with almost any chemical in your application. The benefit for you:

- safer conveyance of aggressive media
- an optimal solution for controlling aggressive media

Valve bodies are available with threaded connections, spigots, sockets, flanges or branches, depending on the installation. International standards, such as ISO, BS, ASTM, ANSI and JIS, have of course also been taken into consideration.

DIASTAR Eco

This actuator has been optimized especially for elastomer diaphragms and 6 bar working pressure. The perfect solution if you are looking for an economical valve with compact dimensions and a long life cycle.

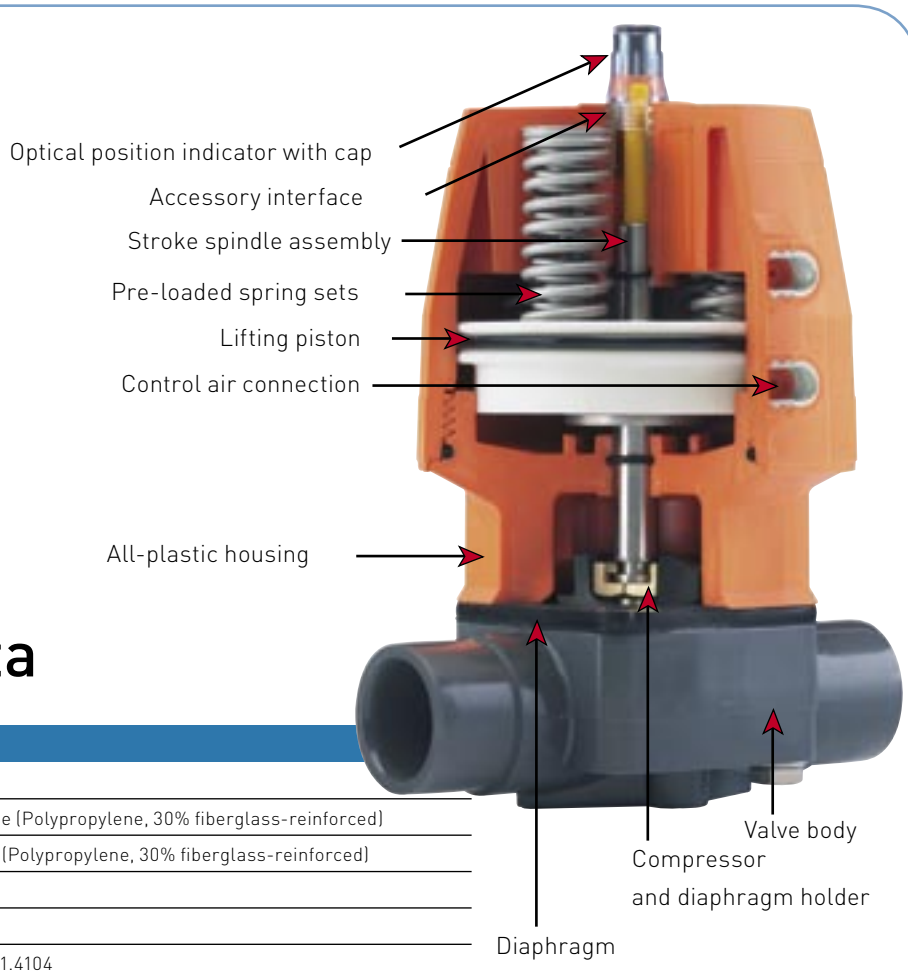
DIASTAR 028

The DIASTAR 028 is ideal for all standard applications up to 10 bar that require integrating accessories. This version has an interface for accessories that allows you to link the actuator effortlessly to your system control. It also features an outstanding price-performance ratio and compact dimensions.

DIASTAR 025

Our strongest one. Because this type series has the highest closing forces, it is implemented wherever high line pressure, up to 10 bar on both sides, needs to be controlled. The DIASTAR 025 with the integrated accessory interface is also your valve of choice if you place a great deal of importance on easy system integration. Available in the modes of operation: FC, FO and DA.

Valve design



Technical data

Technical data for all type series	
Materials	
Housing	PP-GF30 orange (Polypropylene, 30% fiberglass-reinforced)
Pistons	PP-GF30 white (Polypropylene, 30% fiberglass-reinforced)
Position indicator	PP
Indicator cap	SAN
Spindle	Stainless steel 1.4104
Metal inserts	Stainless steel 1.4305
Seals	NBR
Spring sets	Galvanized steel
Control medium	Compressed air (oil-free) / Inert, non-aggressive gases, max. 40°C
Ambient temperature	-10°C to 50°C

Specific technical data according to type series								
	DIASTAR Eco		DIASTAR 028		DIASTAR 025 FO/DA		DIASTAR 025 FC	
Valve body materials	PVC-U, PVC-C, ABS, PP-H		PVC-U, PVC-C, ABS, PP-H, PP-n, PVDF, PVDF-HP		PVC-U, PVC-C, ABS, PP-H, PP-n, PVDF, PVDF-HP		PVC-U, PVC-C, ABS, PP-H, PP-n, PVDF, PVDF-HP	
Diaphragm materials	EPDM		EPDM, FPM, CSM, NBR, PTFE/EPDM, PTFE/FPM		EPDM, FPM, CSM, NBR, PTFE/EPDM, PTFE/FPM		EPDM, FPM, CSM, NBR, PTFE/EPDM, PTFE/FPM	
Mode of operation	FC		FC		FO / DA		FC	
Nominal diameter	DN15...DN50		DN15...DN50		DN15...DN150		DN15...DN150	
Pressure rating *	EPDM:	PTFE	EPDM:	PTFE	EPDM:	PTFE	EPDM:	PTFE
20DN15	6 bar	-	10 bar	6 bar	10 bar	10 bar	10 bar	10 bar
25DN20	6 bar	-	10 bar	6 bar	10 bar	10 bar	10 bar	10 bar
32DN25	6 bar	-	10 bar	6 bar	10 bar	10 bar	10 bar	10 bar
40DN32	6 bar	-	10 bar	6 bar	10 bar	10 bar	10 bar	10 bar
50DN40	6 bar	-	10 bar	6 bar	10 bar	10 bar	10 bar	10 bar
63DN50	6 bar	-	10 bar	6 bar	10 bar	10 bar	10 bar	10 bar
75DN65	-	-	-	-	10 bar	10 bar	10 bar	10 bar
90DN80	-	-	-	-	10 bar	10 bar	10 bar	10 bar
110DN100	-	-	-	-	6 bar	6 bar	6 bar	6 bar
160DN150	-	-	-	-	6 bar	6 bar	6 bar	-
Medium temperature	-30°C to 80°C *		-30°C to 120° *		-30°C to 120° *		-30°C to 120° *	
Max. control pressure	6 bar		6 bar		5 bar		6 bar	

* depending on the material of the valve body - see the pressure-temperature-diagrams on the next page

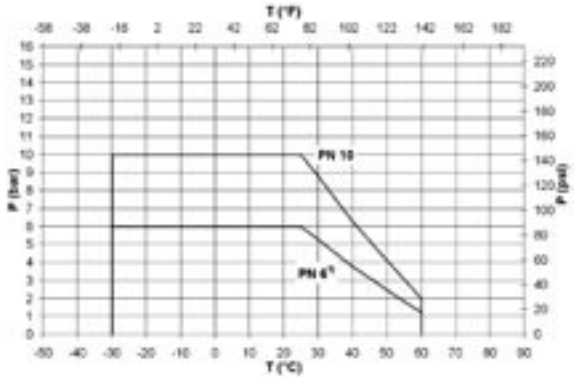
Diagrams

1) DN 100 and DN 150 / Diastar Eco / Diastar 028 with PTFE membrane

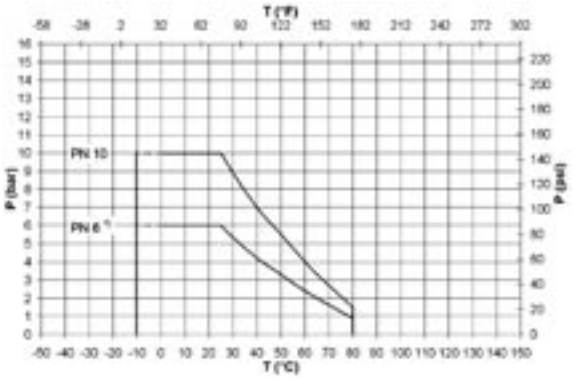
p permissible pressure in bar / psi
T Temperature in °C / °F

In case of applications with temperatures in the range of the dotted lines please contact your GF company.

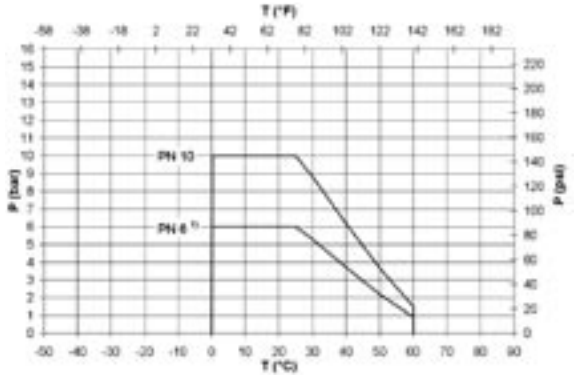
Pressure-temperature diagram
for all diaphragm valves types ABS



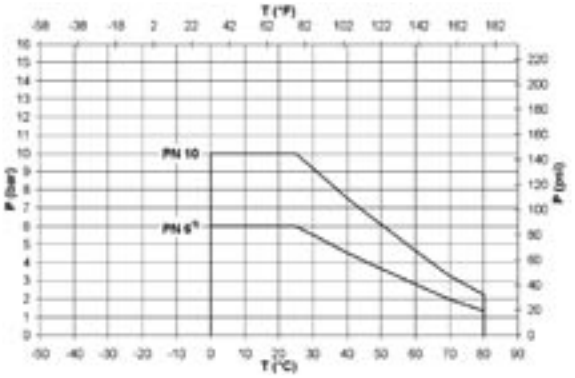
Pressure-temperature diagram
for all diaphragm valves types PP-H



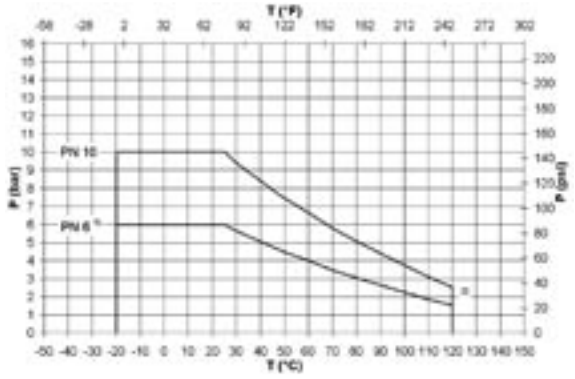
Pressure-temperature diagram
for all diaphragm valves types PVC-U



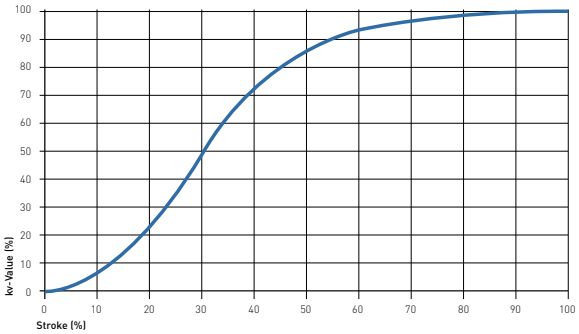
Pressure-temperature diagram
for all diaphragm valves types PVC-C



Pressure-temperature diagram
for all diaphragm valves types PVDF



Flow charakteristics

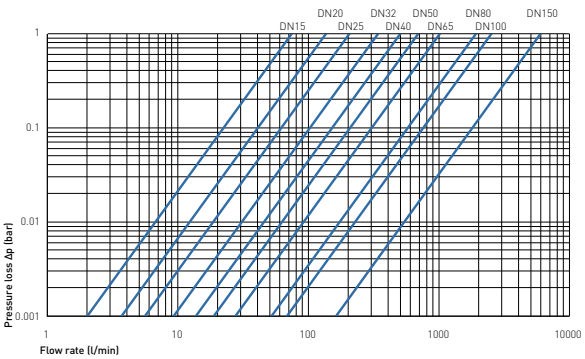


kv 100 values

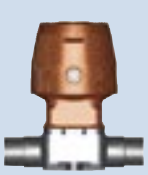
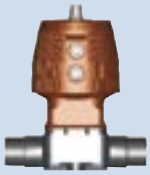
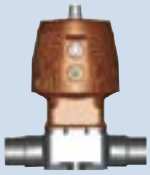
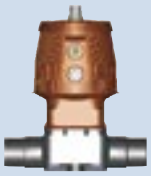
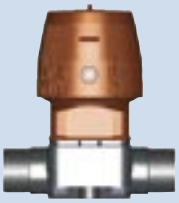
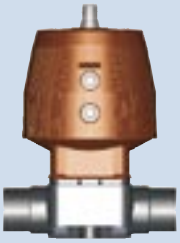
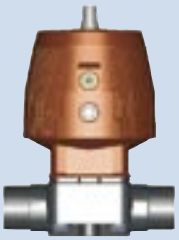
d	DN (mm)	DN (inch)	kv 100 l/min (Δp = 1 bar)	kv 100 m³/h (Δp = 1 bar)
20	15	1/2	72	4.3
25	20	3/4	137	8.2
32	25	1	207	12.4
40	32	1 1/4	354	21.2
50	40	1 1/2	517	31.0
63	50	2	713	42.8
75	65	2 1/2	992	59.5
90	80	3	1700	102.0
110	100	4	2700	162.0
160	150	6	6033	362.0

The kv 100 values combined with the flow characteristics allow determining the kv values for every intermediate position of the valve.

Pressure loss
(Media Water, 20°C)



Size comparison

DN	Eco	025 DA	025 FO	028 FC	025 FC
15	 1	 1	 1	 1	 2
20	 2	 2	 2	 2	 2
25	 2	 2	 2	 2	 3
32	 3	 3	 3	 3	 4
40	 3	 4	 4	 4	 5
50	 3	 4	 4	 4	 5

Modes of operation

FC mode:

Fail-safe-to-close

In the non-operative state, the valve is closed with spring force. When the actuator is pressurized with the control medium (bottom connection), the valve opens. When the control medium escapes, the valve is closed via spring force.

FO mode:

Fail-safe-to-open

In the non-operative state, the valve is open with spring force. When the actuator is pressurized with the control medium (top connection), the valve closes. When the control medium escapes, the valve is opened via spring force.

DA mode:

Double acting

The valve has no defined basic position. The valve is opened and closed by applying control pressure to the corresponding connection. (top connection for closing, bottom connection for opening)

Control medium

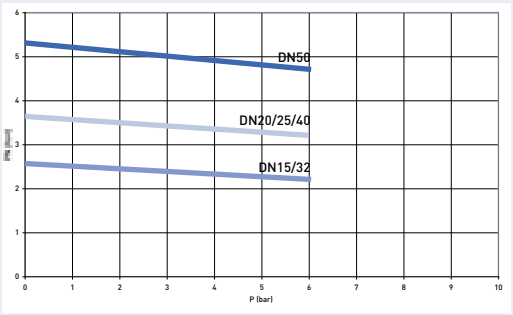
- 6 bar max. for the FC mode; lower control pressures possible by reducing the spring force
- 5 bar max. for the FO and DA operating modes
- depending on the working pressure PN, lower control pressures may be selected. See the next page for the corresponding control pressure diagrams.
- control medium:
  - compressed air (oil-free)
  - inert, non-aggressive gases
- temperature of control medium max. 40°C

Control volume

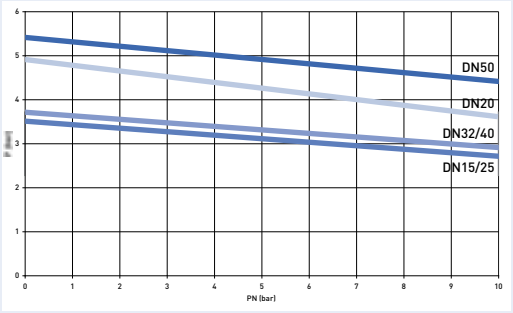
Nominal diameter	DIASTAR Eco (dm3)	DIASTAR 028 FC (dm3)	DIASTAR 025 DA (dm3)		DIASTAR 025 FO	DIASTAR 025 FC
			Close	Open		
20DN15	0.07	0.07	0.07	0.07	0.07	0.20
25DN20	0.20	0.20	0.20	0.20	0.20	0.20
32DN25	0.22	0.22	0.23	0.22	0.23	0.40
40DN32	0.40	0.40	0.44	0.40	0.44	0.78
50DN40	0.44	0.77	0.86	0.77	0.86	0.85
63DN50	0.44	1.20	1.52	1.20	1.52	1.33
75DN65	-	-	4.40	2.20	4.40	2.20
90DN80	-	-	4.40	2.20	4.40	2.20
110DN100	-	-	7.60	3.80	7.60	3.80
160DN150	-	-	7.60	3.80	7.60	3.80

Control pressure diagrams

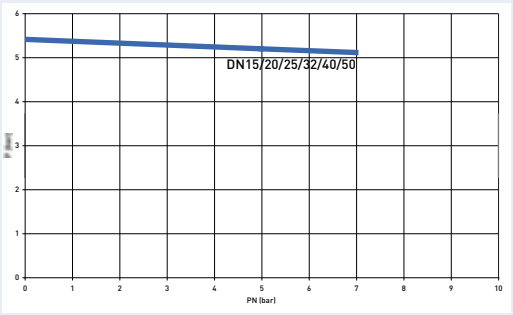
1. Control pressure diagram type Eco FC with EPDM-diaphragm



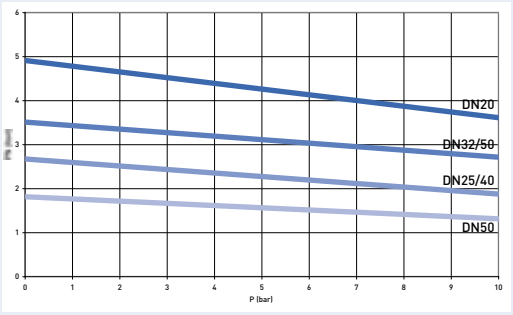
2. Control pressure diagram type 028 FC with EPDM-diaphragm



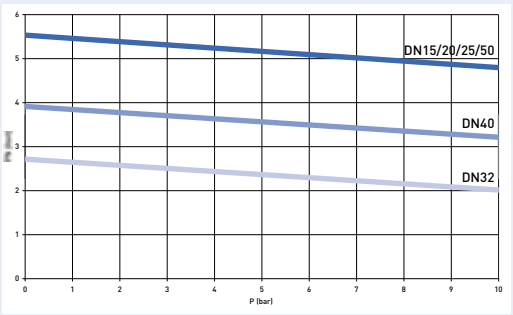
3. Control pressure diagram type 028 FC with PTFE-diaphragm



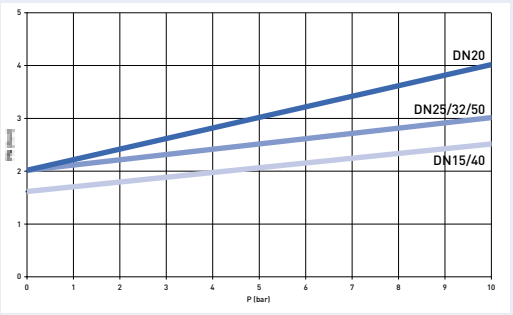
4. Control pressure diagram type 025 FC with EPDM-diaphragm



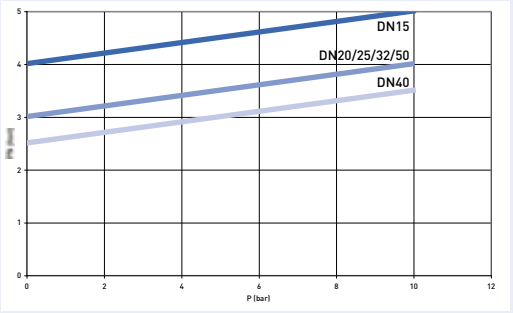
5. Control pressure diagram type 025 FC with PTFE-diaphragm



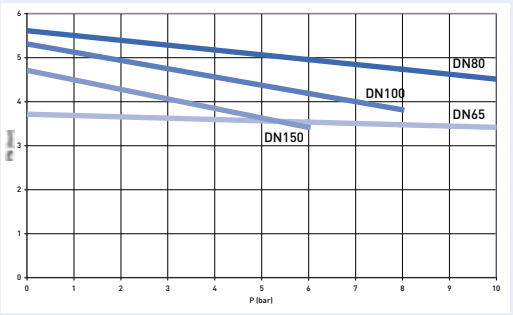
6. Control pressure diagram type 025 FO / DA with EPDM-diaphragm



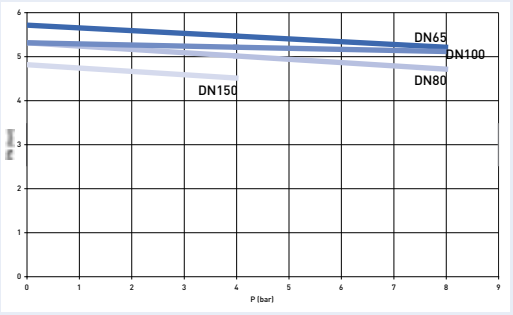
7. Control pressure diagram type 025 FO / DA with PTFE-diaphragm



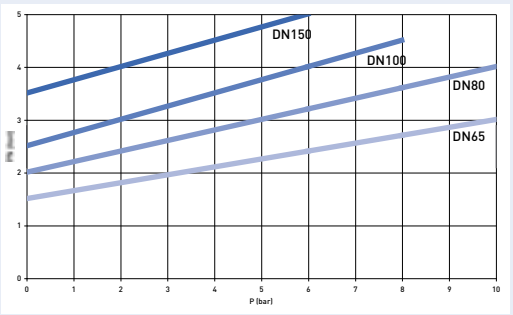
8. Control pressure diagram type 025 FC with EPDM-diaphragm



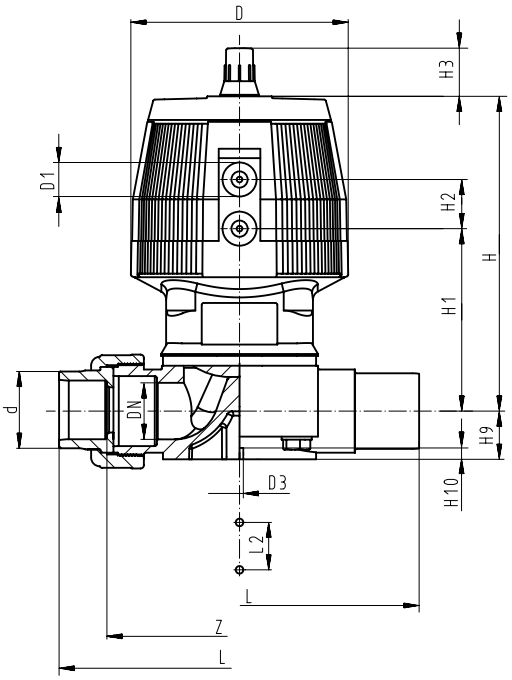
9. Control pressure diagram type 025 FC with PTFE-diaphragm

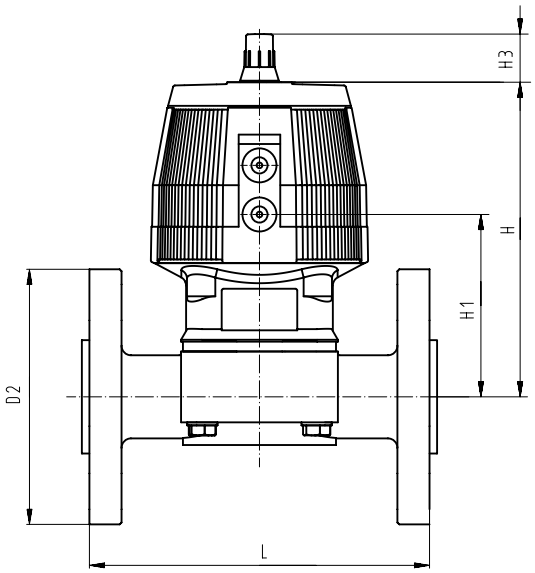


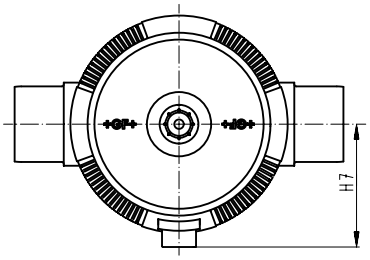
10. Control pressure diagram type 025 FO / DA with EPDM/PTFE-diaphragm



DIASTAR dimensions







Indices

(1) Cemented spigot / socket fusion spigot / butt fusion spigot
(2) BCF fusion spigot
(3) Union with cemented socket ISO/DIN
(4) Union with fusion socket ISO/DIN
(5) Union with butt fusion spigot ISO/DIN (PP)
(6) Union with butt fusion spigot ISO/DIN (PVDF)
(7) Union with BCF fusion spigot
(8) Backing flange ISO/DIN
(9) Union with threaded socket

DIASTAR Eco series

d [mm]	DN [mm]	D [mm]	D1 [G]	D2 [mm]	D3 [mm]	L (1) [mm]	L (2) [mm]	L (3) [mm]	L (4) [mm]	L (5) [mm]	L (6) [mm]	L (7) [mm]	L (8) [mm]	L (9) [mm]	L 2 [mm]	H [mm]	H1 [mm]	H2 [mm]	H3 [mm]	H7 [mm]	H9 [mm]	H10 [mm]	Z (3) [mm]	Z (4) [mm]	Z (9) [mm]	Stroke [mm]
20	15	68	1/8	95	M6	124	-	128	128	196	-	-	130	128	25	99	59	-	-	44	14	12	96	100	102	8
25	20	96	1/8	105	M6	144	-	152	150	221	-	-	150	152	25	130	71	-	-	56	18	12	114	118	122	10
32	25	96	1/8	115	M6	154	-	166	162	234	-	-	160	166	25	143	85	-	-	56	21	12	122	126	132	12
40	30	120	1/8	140	M8	174	-	192	184	260	-	-	180	192	45	170	97	-	-	68	26	15	140	144	154	14
50	40	120	1/8	150	M8	194	-	222	210	284	-	-	200	222	45	182	109	-	-	68	33	15	160	164	184	16
63	50	120	1/8	165	M8	224	-	266	248	321	-	-	230	266	45	199	126	-	-	68	39	15	190	194	220	16

DIASTAR 028 FC series

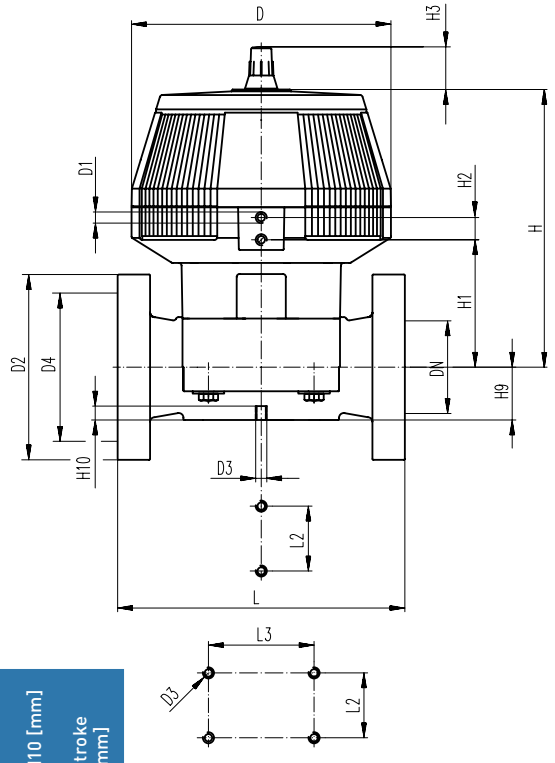
d [mm]	DN [mm]	D [mm]	D1 [G]	D2 [mm]	D3 [mm]	L (1) [mm]	L (2) [mm]	L (3) [mm]	L (4) [mm]	L (5) [mm]	L (6) [mm]	L (7) [mm]	L (8) [mm]	L (9) [mm]	L 2 [mm]	H [mm]	H1 [mm]	H2 [mm]	H3 [mm]	H7 [mm]	H9 [mm]	H10 [mm]	Z (3) [mm]	Z (4) [mm]	Z (9) [mm]	Stroke [mm]
20	15	68	1/8	95	M6	124	133	128	128	196	196	225	130	128	25	99	59	24	23	44	14	12	96	100	102	8
25	20	96	1/8	105	M6	144	144	152	150	221	220	242	150	152	25	130	71	25	23	56	18	12	114	118	122	10
32	25	96	1/8	115	M6	154	154	166	162	234	234	254	160	166	25	143	85	25	23	56	21	12	122	126	132	12
40	30	120	1/8	140	M8	174	199	192	184	260	258	308	180	192	45	170	97	26	36	68	26	15	140	144	154	14
50	40	150	1/4	150	M8	194	205	222	210	284	284	330	200	222	45	203	108	36	36	85	33	15	160	164	184	18
63	50	150	1/4	165	M8	224	224	266	248	321	320	373	230	266	45	220	126	36	36	85	39	15	190	194	220	22

DIASTAR 025FO/DA series

d [mm]	DN [mm]	D [mm]	D1 [G]	D2 [mm]	D3 [mm]	L (1) [mm]	L (2) [mm]	L (3) [mm]	L (4) [mm]	L (5) [mm]	L (6) [mm]	L (7) [mm]	L (8) [mm]	L (9) [mm]	L 2 [mm]	H [mm]	H1 [mm]	H2 [mm]	H3 [mm]	H7 [mm]	H9 [mm]	H10 [mm]	Z (3) [mm]	Z (4) [mm]	Z (9) [mm]	Stroke [mm]
20	15	68	1/8	95	M6	124	133	128	128	196	196	225	130	128	25	99	59	24	23	44	14	12	96	100	102	8
25	20	96	1/8	105	M6	144	144	152	150	221	220	242	150	152	25	130	71	25	23	56	18	12	114	118	122	10
32	25	96	1/8	115	M6	154	154	166	162	234	234	254	160	166	25	143	85	25	23	56	21	12	122	126	132	12
40	30	120	1/8	140	M8	174	199	192	184	260	258	308	180	192	45	170	97	26	36	68	26	15	140	144	154	14
50	40	150	1/4	150	M8	194	205	222	210	284	284	330	200	222	45	203	108	36	36	85	33	15	160	164	184	18
63	50	150	1/4	165	M8	224	224	266	248	321	320	373	230	266	45	220	126	36	36	85	39	15	190	194	220	22

DIASTAR 025 FC series

d [mm]	DN [mm]	D [mm]	D1 [G]	D2 [mm]	D3 [mm]	L (1) [mm]	L (2) [mm]	L (3) [mm]	L (4) [mm]	L (5) [mm]	L (6) [mm]	L (7) [mm]	L (8) [mm]	L (9) [mm]	L 2 [mm]	H [mm]	H1 [mm]	H2 [mm]	H3 [mm]	H7 [mm]	H9 [mm]	H10 [mm]	Z (3) [mm]	Z (4) [mm]	Z (9) [mm]	Stroke [mm]
20	15	96	1/8	95	M6	124	133	128	128	196	196	225	130	128	25	128	69	25	23	56	14	12	96	100	102	8
25	20	96	1/8	105	M6	144	144	152	150	221	220	242	150	152	25	130	71	25	23	56	18	12	114	118	122	10
32	25	120	1/8	115	M6	154	154	166	162	234	234	254	160	166	25	166	93	26	23	68	21	12	122	126	132	12
40	30	150	1/4	140	M8	174	199	192	184	260	258	308	180	192	45	201	106	36	36	85	26	15	140	144	154	14
50	40	180	1/4	150	M8	194	205	222	210	284	284	330	200	222	45	233	119	37	36	101	33	15	160	164	184	18
63	50	180	1/4	165	M8	224	224	266	248	321	320	373	230	266	45	247	133	37	36	101	39	15	190	194	220	22



DIASTAR 025 FC/FO/DA DN65...DN150

d [mm]	DN [mm]	D [mm]	D1 [G]	D2 [mm]	D3 [mm]	D4 [mm]	L [mm]	L2 [mm]	L3 [mm]	H [mm]	H1 [mm]	H2 [mm]	H3 [mm]	H9 [mm]	H10 [mm]	Stroke [mm]
75	65	280	1/4	185	M8	145	290	70	-	298	148	24	46	46	15	30
90	80	280	1/4	200	M12	160	310	120	-	302	150	24	46	57	15	35
110	100	335	1/4	225	M12	180	350	120	-	409	176	24	46	69	20	40
160	150	335	1/4	285	M12	240	480	100	200	201	237	24	46	108	20	40

Accessories

Solenoid pilot valve

Description
Type PV94 3/2-way solenoid valve for controlling single acting pneumatic actuators in the dimensions DN15-DN50. Mounted with a banjo bolt directly on the actuator. For the control air connection, a G 1/8, G 1/4 and 6 mm hose coupling is available. The following voltages are available for the PV94: • 230V, 50-60Hz • 115V, 50-60Hz • 24V, 50-60Hz • 24VDC
Type PV95 3/2-way solenoid valve for controlling single acting pneumatic actuators in the dimensions DN65-DN150. Mounted with a banjo bolt directly on the actuator. For the control air connection, a G 1/8 and G 1/4 is available. The solenoid valve is available in the dimensions DN1.5 and DN2 as well as in the following voltages: • 230V, 50-60Hz • 115V, 50-60Hz • 24V, 50-60Hz • 24VDC
MNL532 3/2 and 5/2-way solenoid valve for controlling double acting actuators. Mounted via a Namur connection. For the dimension range DIASTAR DN15-DN50 a Namur mounting plate needs to be installed between the actuator and the pilot valve. • 230V, 50-60Hz • 115V, 50-60Hz • 48V, 50-60Hz • 24V, 50-60Hz • 24VDC
PV2000 For simultaneous controlling of several actuators, we offer the PV2000 valve cluster. The cluster consists of a connecting module, several pilot valves and an end module. Depending on the application, a connecting module for the D-Sub plug, AS Interface or Profibus can be selected. The modular system allows combining 3/2 and 5/2-way valves as required by the application.

Stroke limiter / Emergency manual override

Description
Stroke limiter / Emergency manual override Used to limit the minimum and maximum stroke and for emergency manual override. With the help of adapters, the stroke limiter can also be used together with our electrical position indicator ER52/53.

Accessories

Feedback

Description
ER55 The ER55 has a Reed contact which is activated via a magnet in the position indicator. The Reed contact can be set so that either the open or closed position is indicated. To show both positions, the ER55 can be retrofitted with a second Reed contact.
ER52 & ER53 The ER52/53 is an electrical position indicator device with two limit switches and can therefore indicate both the open and the closed positions. The limit switches are activated with cams which are self-adjusting. The ER52/53 is available with the following limit switches. • ER52 & ER53 silver-nickel (AG-Ni) • ER52 & ER53 gold contacts (AU) • ER52 & ER53 inductive switch NPN • ER52 & ER53 inductive switch PNP • ER52 & ER53 inductive switch NAMUR

Positioner

Description
DSR The digital positioner type DSR100 and 101 is the ideal product for control applications using our pneumatic valves.The micropro-cessor-controlled positioner features a compact and uncompli-cated design that simplifies installation. The positioner is supplied with or without optical indicator.

Bus communication

Description
AS-Interface Modern plants with conventional valve control require more and more installation and maintenance efforts. The GF AS-i controller enables state-of-the-art bus communication at very little expense. The controller contains all the necessary electric and pneumatic components; installing a serial cable and the air connections is all that is required to be able to independently control up to 62 valves.