

DIASTAR Type 025



Product description

The DIASTAR 025 has the highest closing forces in the portfolio of pneumatically actuated diaphragm valves and is available with the functions FC (fail safe to close), FO (fail safe to open) and DA (double-acting).

The valve is thus used wherever high pipe pressures of up to 10 bar need to be controlled on on both sides.

Function

Pneumatic diaphragm valves from GF Piping Systems are used for regulating, as well as closing, controlling and monitoring volume flows. Especially when transporting contaminated, aggressive or abrasive media, this type of valve has decisive advantages thanks to its simple function and optimized construction. Only the valve body and diaphragm come into contact with the medium.

Applications

- Control applications
- Controlling pure and ultrapure media
- Water treatment
- Chemical dosing
- Applications with higher viscosity and solids content

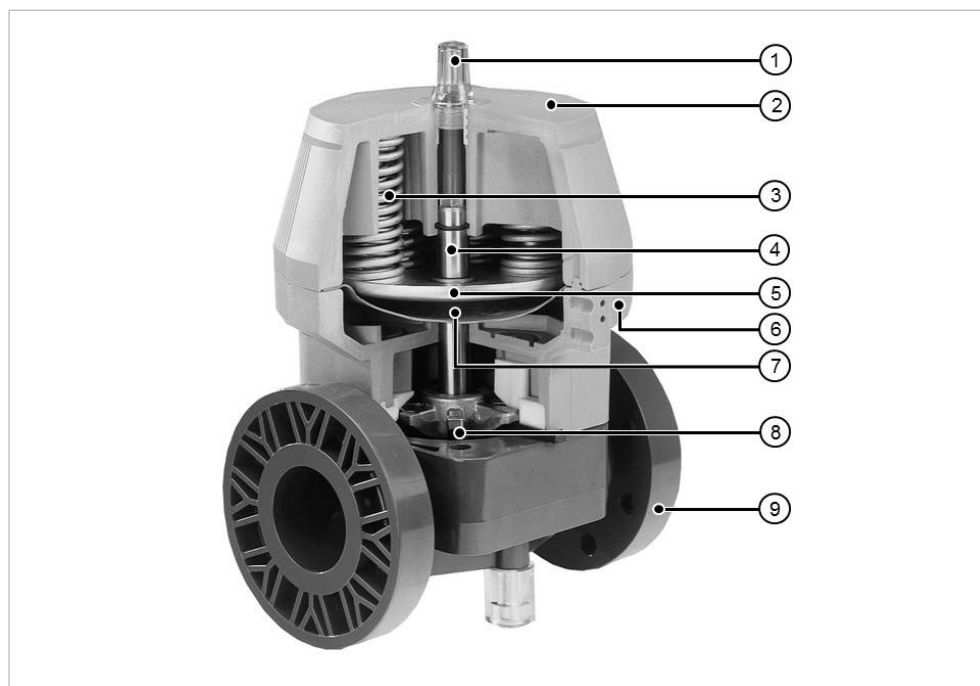
Benefits/features

- Safe transport of aggressive media
- Adapting closing forces to medium pressure through reduction of spring assemblies
- High corrosion resistance
- Maximum system safety
- Safe maintenance and minimal downtime
- Wide range of materials available
- Broad spectrum of applications
- Quick retrofitting through simple integration of accessories

Possible flow media

Contaminated, solid or ultrapure media.

Technical data



- 1 Optical position indicator
- 2 All-plastic housing, PP-GF
- 3 Pre-tensioned springs
- 4 Lifting spindle group, rust-free steel
- 5 Diaphragm plate
- 6 NAMUR interface for control air
- 7 Control diaphragms
- 8 Pressure piece
- 9 Valve body

Specification							
Dimensions	d75/DN65 – d160/DN150, 2 ½" – 6						
Pressure levels	PN10, from DN100: PN6						
Valve body materials	PVC-U, PVC-C, ABS, PP-H, PVDF, PVDF-HP						
Housing materials	PPGF-30 (polypropylene, 30 % fiberglass-reinforced)						
Piston	PPGF-30 white (polypropylene, 30 % fiberglass-reinforced)						
Pressure spindle	Stainless steel 1.4104						
Metal inserts	Stainless steel 1.4305						
Gaskets	NBR						
Springs	Galvanized steel						
Gasket/diaphragm materials	EPDM, PTFE/EPDM, FKM, FFKM, NBR						
Functions	FC, FO, DA						
Connecting thread control air	G ¼"						
Allowable control pressure	Max. 6 bar for FC mode Max. 5 bar for FO, DA mode						
Control volume for pneumatic actuator	FC		FO		DA		
	d75/DN65	d110/DN100	d110/DN100	d110/DN100, d160/DN150	d75/DN65	d110/DN100	
	d90/DN80	d160/DN150	d160/DN15	d160/DN150	d90/DN80	d160/DN150	
	2.2 dm ³	3.8 dm ³	4.4 dm ³	7.6 dm ³	4.4dm ³	2.2 dm ³	7.6 dm ³ 3.8 dm ³
Ambient temperature	-10 °C to 50 °C						
Product standard	EN ISO 16138						
Test standard	ISO 9393-2, EN 12266-1 (leakage rate A)						
Approvals	ACS, FDA, DIBt						

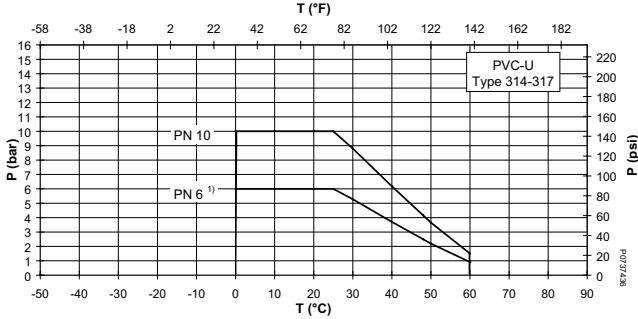
Pressure-temperature diagrams

The following pressure-temperature diagrams are based on a lifetime of 25 years and water or similar media.

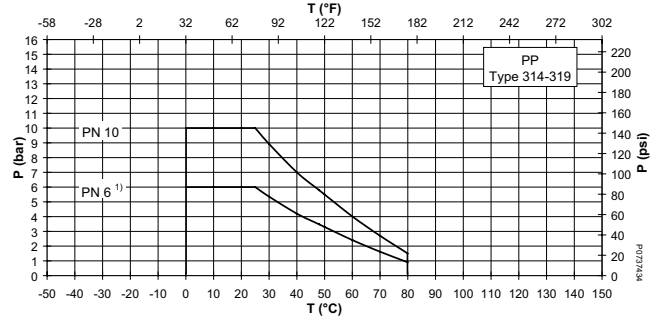
T Temperature (°C, °F)

P Permissible pressure (bar, psi)

PVC-U

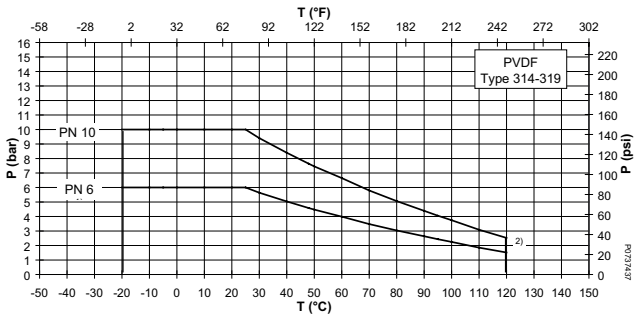


PP-H

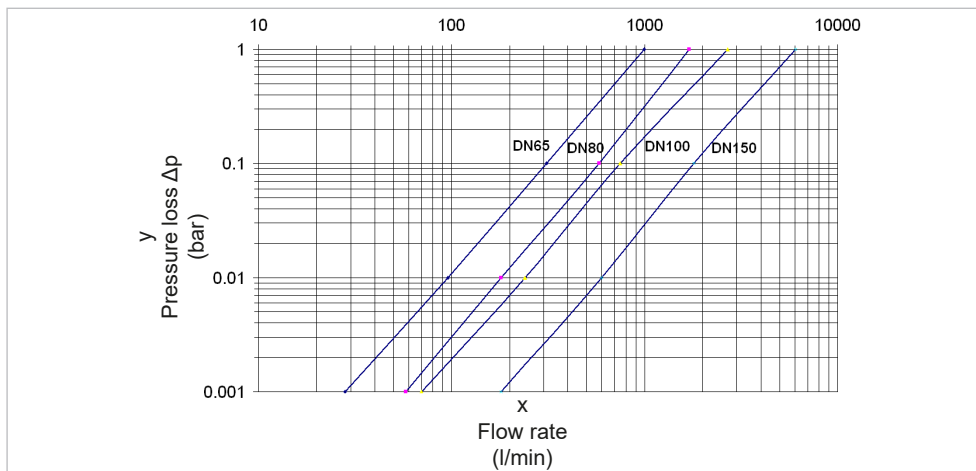


- 1) DIASTAR 025 DN100 and DN150
- 2) Depending on the connection type and actuator, the nominal pressure is reduced to PN10
- 3) Depending on the connection type and actuator, the nominal pressure is reduced to PN6

PVDF

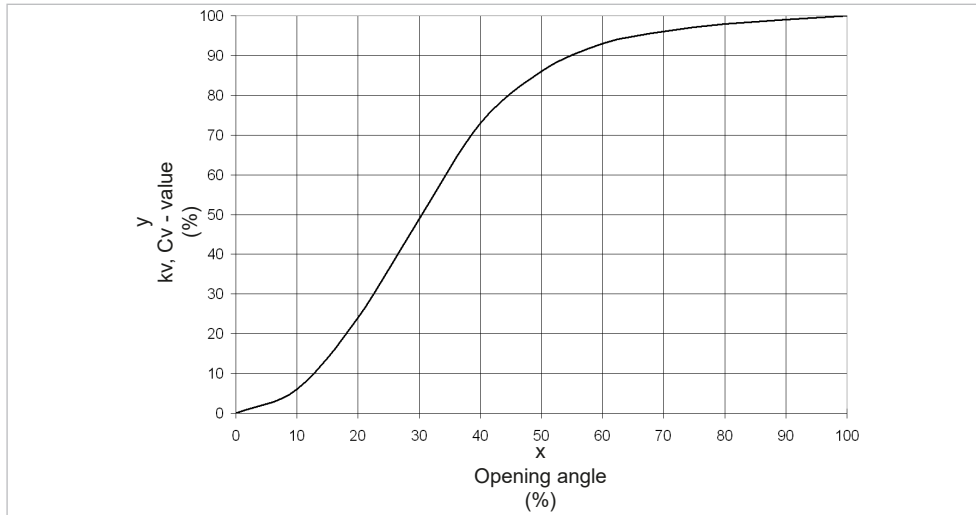


Pressure losses



- x Flow rate (l/min, US gal/min)
- y Pressure loss Δp (bar, psi)

Flow characteristics



x Open angle (%)
y Kv, Cv value (%)

Pressure ratings

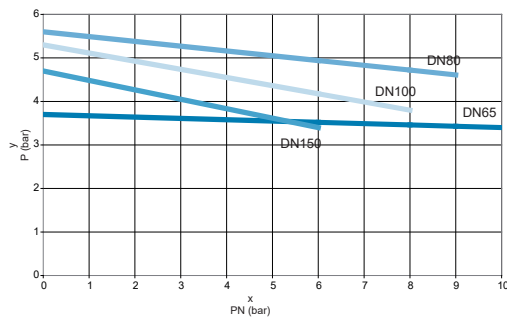
DN	Pressure rating [bar]	Max. control pressure [bar]		
		FC	FC	FO/DA
		EPDM ¹⁾	PTFE ¹⁾	EPDM
75DN65	10	3.8	5.8	3.0 ²⁾
90DN80	10	5.6	5.3	4.0 ²⁾
110DN100	6	5.3	5.3	4.0 ³⁾
160DN150	6	4.8	4.8	5.0 ³⁾

Medium pressure → One sided applied

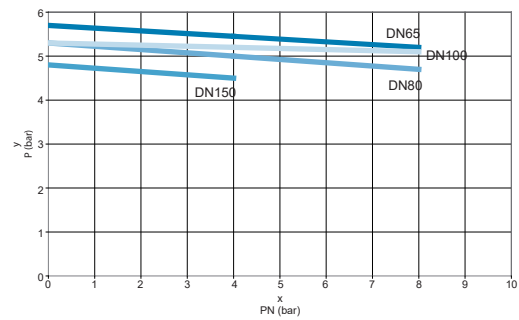
- ¹⁾ At 0 bar medium pressure
- ²⁾ At 10 bar medium pressure
- ³⁾ At 6 bar medium pressure

Control pressure diagrams for actuator

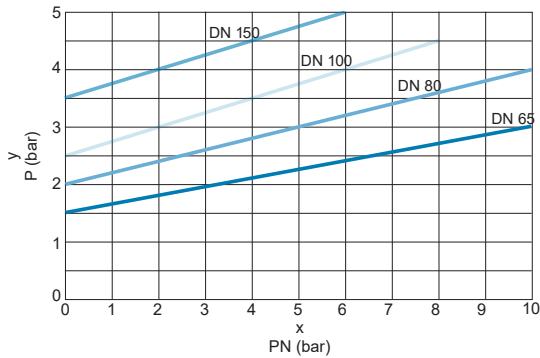
Fail safe to close (FC) with EPDM diaphragm



Fail safe to close (FC) with PTFE diaphragm



Fall safe to open (FO/DA)



Technical basics

The upper part of the housing is made of PPGF (fiberglass-reinforced polypropylene) and is screwed to the lower part of the housing using a central plastic nut, which avoids exposed metal screws. A position indicator integrated into the handle is required for determining the diaphragm position.

i All PVC-U diaphragm valves in metric sizes are flange variants DN65 – DN150. All diaphragm valves are manufactured in accordance with EN ISO 16138.

Differentiation in functionalities – FC, FO, DA

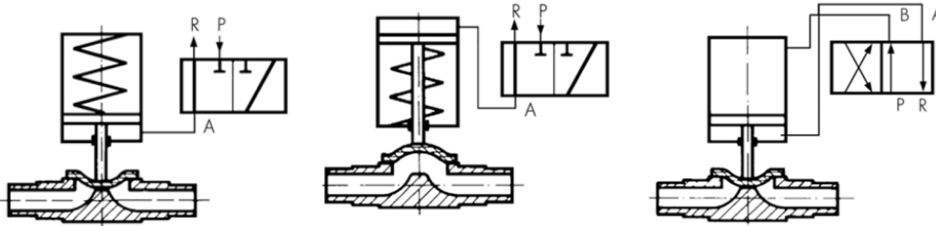
Function	Name
FC	Fail safe to close
FO	Fail safe to open
DA	Fail safe double-acting

FC mode	FO mode	DA mode
In the non-operative state, the valve is closed by means of spring resistance. 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 resistance.	In the non-operative state, the valve is opened by means of spring resistance. 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 resistance.	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).

Selection of the solenoid valve and associated connecting thread

3/2-way solenoid valves are used to control single acting actuators (FC). They are mounted either directly to the actuator using a hollow screw or via a multiple connection plate or valve clusters, as required.	3/2-way solenoid valves are used to control single acting actuators (FO). They are mounted either directly to the actuator using a hollow screw or via a multiple connection plate or valve clusters, as required.	4/2-way or 5/2-way solenoid valves are used to control double-acting actuators (DA). They can be mounted either directly to the actuator using a NAMUR connector plate or via valve clusters.
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Selection of the solenoid valve and associated connecting thread



FC mode of operation with a 3/2-way solenoid valve for bottom connection.

FO mode with a 3/2-way solenoid valve for top connection.

The DA mode with a 4/2- or 5/2-way solenoid valve. Both connections are used.

Relation between pipe pressure and spring assemblies

The closing force of the actuators were designed for the specified PN pressure level. Operation with very low pipe pressure can cause increased diaphragm wear. In order to extend the diaphragm life span with low pipe pressure, the number of spring assemblies can be reduced. For the specific dimensioning, please contact your representative at GF Piping Systems.

Control medium

FC mode	FO mode	DA mode
Compressed air classes (ISO 8573-1): 2 or 3 for $-10\text{ }^{\circ}\text{C}$ and 3 or 4 for $T > 0\text{ }^{\circ}\text{C}$	When the medium pressure exceeds 10 bar, the control pressure must be throttled by exhaust air (adjust actuating time to approx. 3 s)	When the medium pressure exceeds 10 bar, the control pressure must be throttled using exhaust air (adjust actuating time to approx. 3 s)
Temperature of control medium: max. $40\text{ }^{\circ}\text{C}$	Compressed air classes (ISO 8573-1): 2 or 3 for $-10\text{ }^{\circ}\text{C}$ and 3 or 4 for $T > 0\text{ }^{\circ}\text{C}$	Compressed air classes (ISO 8573-1): 2 or 3 for $-10\text{ }^{\circ}\text{C}$ and 3 or 4 for $T > 0\text{ }^{\circ}\text{C}$
When the medium pressure exceeds 10 bar, the control pressure must be throttled using exhaust air (adjust actuating time to approx. 3 s)	Temperature of control medium: max. $40\text{ }^{\circ}\text{C}$	Temperature of control medium: max. $40\text{ }^{\circ}\text{C}$
The corresponding control pressure diagrams can be found in the "Technical data" section	Depending on the working pressure PN, lower control pressures may be selected	Depending on the working pressure PN, lower control pressures may be selected

Tightening torques for valve housing

The valve body and pneumatic actuator are firmly connected by means of metal screws. Due to the different coefficients of thermal expansion of plastic and metal, it is essential – especially in the event of temperature changes within the pipe or if there are large temperature differences between the medium and the ambient temperature – to tighten the screws regularly to guarantee that the valve is continuously leak-tight. Tightening is recommended even after the first change in temperature.

The screws must be tightened crosswise to the stated tightening torques so that the housing is pressed together evenly. The valve is open. For valves with a stroke limiter installed, the valve must be reset following replacement.

Tightening torques

Dim. (mm)	DN (mm)	Inch (inch)	Tightening torque
75	65	2 ½	25
90	80	3	30

Dim. (mm)	DN (mm)	Inch (inch)	Tightening torque
110	100	4	30
160	150	6	40

Diaphragms

Diaphragms in this Valve Type are heavily stressed components. In addition to the mechanical stress caused by wear and tear over several actuating cycles, the diaphragms are also subject to wear and tear due to the flow medium. We strongly recommend that you inspect and, if necessary, replace the diaphragms after 50,000 cycles. In the case of abrasive media, the inspection of the diaphragms should take place regularly at short intervals. An inspection can be quickly performed at any time by opening the connection screws between the actuator and the lower part of the valve. The elastomer diaphragms with threaded bolts can be removed at any time by turning counterclockwise. PTFE diaphragms with bayonet joints can be turned 90° in any direction and then removed.

Changing the gaskets

The pistons and spindle seals can wear after a certain amount of time, depending on the area of use and control medium. This can be noticed through a loss of air or discharge sounds. GF Piping Systems provides replacement gasket sets.

Adapting spring assemblies to operating conditions

Valves with the FC (fail safe to close) control function are equipped with pre-tensioned spring assemblies. By loosening the screws connecting the actuator and flow body, the spring assemblies are relieved to such an extent that the actuator can be opened without additional equipment.

Valves with the control function FO (fail safe to open) have no pre-tensioned spring assemblies, which is why this actuator can only be opened at the factory.

Valve handling

Installation notes

Ensure that the diaphragm valve and spring assemblies are designed for the pipe pressure. Reducing the spring assemblies leads to a reduced closing force. When the pipe pressure rises, the valve cannot close or cannot close completely if spring assemblies are missing. This can have a negative impact on the process.

Maintenance notes

Maintenance interval	Maintenance activity
Regularly	Check the connection between the upper part and valve body for leak-tightness.
1 - 2 x per year	Actuate continuously opened or closed diaphragm valves to check their function.



Installation and maintenance must be performed in accordance with the corresponding installation manual. The installation manual is provided with the product, see also the online product catalog at www.gfps.com

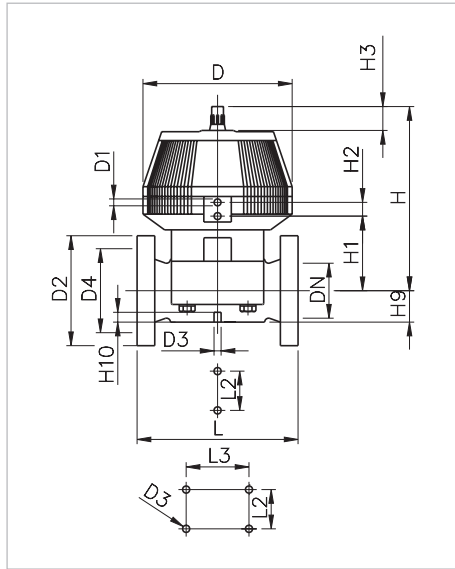
Tips for installation

- The direction of flow and mounting position may be chosen freely.
- The valve is attached via threaded sleeves that are injected into the flow body.
- The actuator can be optionally activated by the control media.
 - Compressed air (oil-free)
 - Neutral gases
 - Liquids upon request

Variable operating and control pressures are possible by adapting the number of spring assemblies to the operating conditions.

Dimensions

DIASTAR 025 DN65 - DN150



Dim. (mm)	DN (mm)	Inch (inch)	D (mm)	D1 (G) (mm)	D2 (mm)	D3 (mm)	D4 (mm)	L (mm)	L2 (mm)	L3 (mm)	H (mm)	H1 (mm)	H2 (mm)	H3 (mm)	H9 (mm)	H10 (inch)	Stroke
75	65	2 1/2	280	1/4	185	M8	145	290	70		298	148	24	46	46	15	30
90	80	3	280	1/4	200	M12	160	310	120		302	150	24	46	57	15	35
110	100	4	335	1/4"	225	M12	180	350	120		409	176	24	46	69	20	40
160	150	6	335	1/4	285	M12	240	480	100	200	201	237	24	46	108	20	40

Weight

DN (mm)	PVC-U (kg)	PP-H (kg)	PVDF (kg)
65	13.6	13.7	14.2
80	17.4	16.0	18.7
100	24.7	22.8	26.5
150	35.0	33.4	38.2

Accessories

- Stroke limiter / emergency manual override
- Solenoid pilot Valve Type PV94, PV95, MNL532, PV2000
- Feedback – ER55 ER52 and ER53
- Positioner – Type SPC
- Bus communication – AS interface

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

■ Mobile apps and online tools to support configuration and calculation at www.gfps.com/tools



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