

Butterfly valve with actuator, Flange, PN 16

- Torque motor 160 Nm
- Nominal voltage AC 24...240 V / DC 24...125 V
- Control Open-close, modulating, communicative
- for mixing and diverting applications
- For water-side changeover and control applications
- Communication via BACnet MS/TP, Belimo MP-Bus or conventional control


**Type overview**

Type	DN [ ]	kvmax [ m <sup>3</sup> /h]	kvs [ m <sup>3</sup> /h]	PN [ ]
<b>D7150NL/BAC</b>	150	1100	400	16
<b>D7200WL/BAC</b>	200	1800	800	16
<b>D7250WL/BAC</b>	250	3000	1200	16
<b>D7300WL/BAC</b>	300	4700	1700	16

General technical data can be found on the data sheets for the products D6..NL, D6..WL and PRCA-BAC-S2-T.

kvmax: for change-over applications. The maximum flow speed of 4 m/s may not be exceeded in the butterfly valve.

kvs: for control applications with opening angle 60% (parameterisable with Belimo Assistant App). The maximum flow speed of 2.7 m/s may not be exceeded in the butterfly valve.

**Technical data**

<b>Electrical data</b>	Nominal voltage	AC 24...240 V / DC 24...125 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...264 V / DC 19.2...137.5 V
	Power consumption in operation	20 W
	Power consumption at rest	6W
	Power consumption for wire sizing	with 24 V 20 VA / with 230 V 52 VA
<b>Functional data</b>	Torque motor	160 Nm
	Operating range Y	DC 2...10 V
	Operating range Y variable	DC 0.5...10 V 4...20 mA
	Running time motor	35 s / 90°
	Running time motor variable	30...120 s
	Sound power level motor	68 dB(A)
	Media	Cold and warm water, water with glycol up to max. 50% vol.
	Medium temperature	-20...120°C
	Permissible pressure ps	1600 kPa
	Differential pressure Δpmax	300 kPa
	Flow	100% opening angle: Bypass B – AB: 70% of kvmax value; 60% opening angle: Bypass B – AB: 100% of kvs value
	Flow characteristic	0...100% opening angle: control path A–AB: S-form; Bypass B – AB: S-form inverted; 0...60% opening angle: control path A–AB: equal percentage; Bypass B–AB: equal percentage inverted
	Leakage rate	Leakage rate A, tight (EN 12266-1)
Pipe connector	Flange PN 16 according to ISO 7005-2	
Installation position	Upright to horizontal (in relation to the stem)	
Maintenance	Maintenance-free	
Manual override	with hand crank, can be fixed in any position	
<b>Safety</b>	Degree of protection IEC/EN	IP66/67
	Degree of protection NEMA/UL	NEMA 4X, UL Enclosure Type 4X
	Control pollution degree	3

## Technical data

<b>Safety</b>	Ambient temperature	-30...50 °C
	Non-operating temperature	-40...80 °C
	Ambient humidity	95% r.h., non-condensing

## Safety notes



- The valve has been designed for use in stationary heating, ventilation and air-conditioning systems and must not be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The valve may not be disposed of as household refuse. All locally valid regulations and requirements must be observed.

## Product features

<b>Mode of operation</b>	The 3-way butterfly valve is operated by two multifunctional actuators (for shut-off and control applications). Both actuators can be controlled with the same control signal, however, one of the actuators needs to be set up for the use of an inverted control signal. This settings can be made using the Belimo Assistant App. It is recommended to monitor the feedback signal U5 of the actuators to ensure that the 3-way function in the control and bypass path is guaranteed.
<b>Parameterisable actuators</b>	For change-over applications, both actuators are parameterized with either On-Off or communicative control. In addition, the control signal of one of the two actuators is set to "inverted". This allows both actuators to be controlled with the same control signal. For control functions, the control can be selected between 2..10 V, 0.5..10 V, 4..20 mA or communicative. The control signal of one of the two actuators is parameterised to be "inverted" and additionally a kv setting is made via the limitation of the opening angle.
<b>Manual override</b>	The valve can be manually operated using a hand crank. Unlocking is carried out manually by removing the hand crank.
<b>Combination valve/actuator</b>	Two butterfly valves and two actuators are supplied separately, so that any installation on one T-piece is possible. The T-piece must be ordered separately.

## Accessories

	Description	Type
<b>Mechanical accessories</b>	T-piece 3-way butterfly valve DN 150	ZD7150
	T-piece 3-way butterfly valve DN 200	ZD7200
	T-piece 3-way butterfly valve DN 250	ZD7250
	T-piece 3-way butterfly valve DN 300	ZD7300
<b>Service Tools</b>	<b>Description</b>	<b>Type</b>
	Smartphone app for easy commissioning, parameterising and maintenance	Belimo Assistant App
	Bluetooth / NFC converter	ZIP-BT-NFC

## Electrical installation

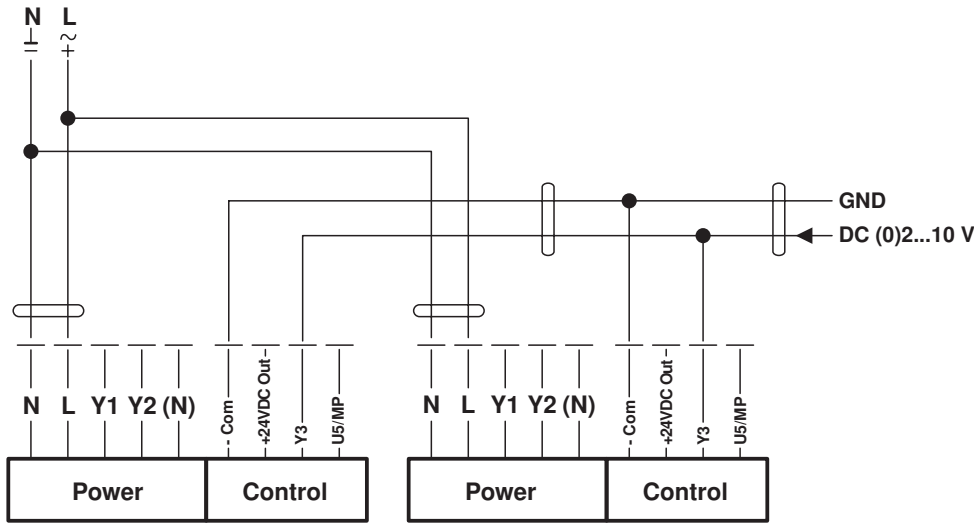


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|--------------|--|
| <b>Notes</b> | <ul style="list-style-type: none"> <li>• Caution: Power supply voltage!</li> <li>• The wiring of the line for BACnet (MS/TP) has to be carried out in accordance with applicable RS485 regulations.</li> </ul> |
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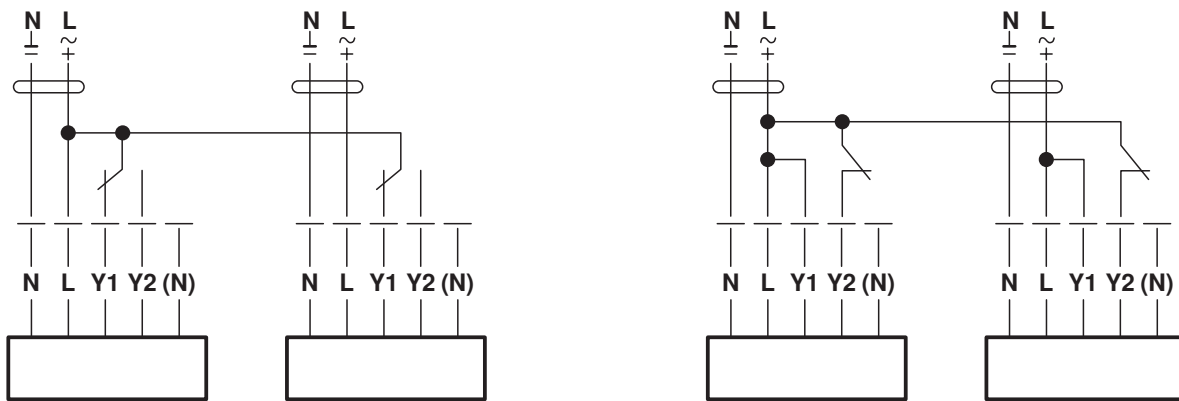
Electrical installation

Wiring diagrams

Modulating control



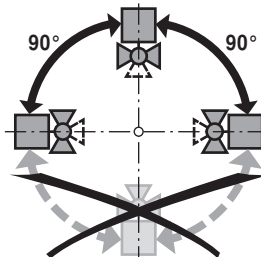
Control open-close



Installation notes

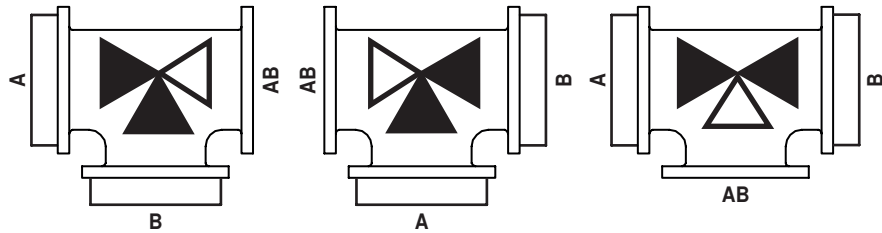
Recommended installation positions

The butterfly valves may be mounted upright to horizontal. The butterfly valves may not be installed in a hanging position i.e. with the spindle pointing downwards.



Installation notes

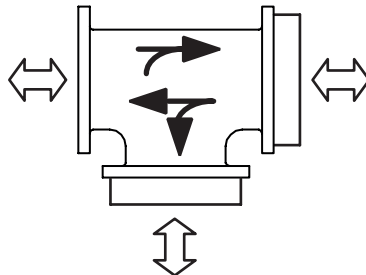
**Installation situation** The two butterfly valves can be mounted in any combination on one T-piece.



**Water quality requirements** The water quality requirements specified in VDI 2035 must be adhered to. Belimo valves are regulating devices. For the valves to function correctly in the long term, they must be kept free from particle debris (e.g. welding beads during installation work). The installation of suitable strainer is recommended.

**Maintenance** Butterfly valves and rotary actuators are maintenance-free. Before any service work on the final controlling device is carried out, it is essential to isolate the rotary actuator from the power supply (by unplugging the electrical cable if necessary). Any pumps in the part of the piping system concerned must also be switched off and the appropriate slide valves closed (allow all components to cool down first if necessary and always reduce the system pressure to ambient pressure level). The system must not be returned to service until the butterfly valve and the rotary actuator have been reassembled correctly in accordance with the instructions and the pipeline has been refilled by professionally trained personnel. To avoid a torque increase during off season shut down, exercise the butterfly valve (full open and close) at least once a month.

**Flow direction** Direction of flow in both directions possible.



**Flow setting** The Belimo butterfly valves have an approximate equal percentage characteristic curve between 0 and 60 percent opening angle. Depending on the desired kv value, the opening angle can be set with the Belimo Assistant App with a smartphone via Near Field Communication (NFC). Belimo butterfly valves can be ideally used as a control armature.

		10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
DN 150	kv (m3/h)	1	30	70	140	240	400	580	800	1010	1100
DN 200	kv (m3/h)	10	60	170	330	530	800	1120	1450	1690	1800
DN 250	kv (m3/h)	10	100	280	520	830	1200	1760	2340	2800	3000
DN 300	kv (m3/h)	30	150	400	700	1100	1700	2400	3300	4200	4700



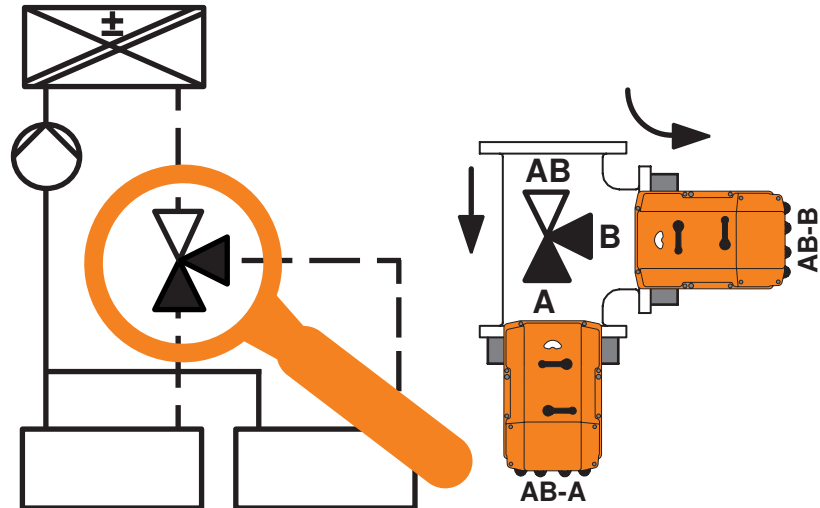
Table: Valve opening / flow  
The 3-way kv-values are calculated values based on 2-way kv-values considering the pipe friction losses caused by a T-piece.

**Parameterization for various applications**

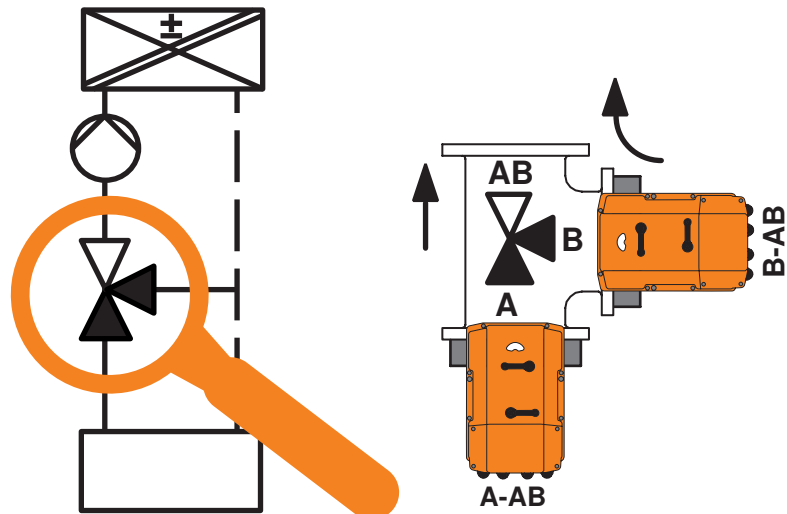
The Belimo 3-way butterfly valve can flexibly be used for change-over and control applications. A specific parameterisation is necessary for each application.

### Installation notes

- Change-over application**
1. Parameterisation PR actuator in the control path AB-A:  
> Change "Control" to: O-C/3-point
  2. Parameterisation PR actuator in the Bypass AB-B:  
> Change "Control" to: O-C/3-point  
> Change "Control Signal" to: Inverted



- Control application**
1. Parameterisation PR actuator in the control path A-AB:  
> Set "Max. Position" to: 60%
  2. Parameterisation PR actuator in the Bypass B-AB:  
> Set "Max. Position" to: 75%  
> Change "Control Signal" to: Inverted



## Service

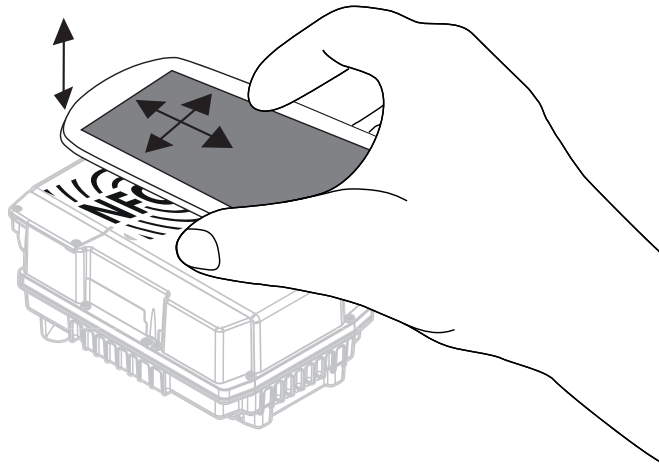
**NFC connection** Belimo equipment marked with the NFC logo can be operated with the “Belimo Assistant App”.

Requirement:

- NFC- or Bluetooth-capable smartphone
- Belimo Assistant App (Google Play & App Store)

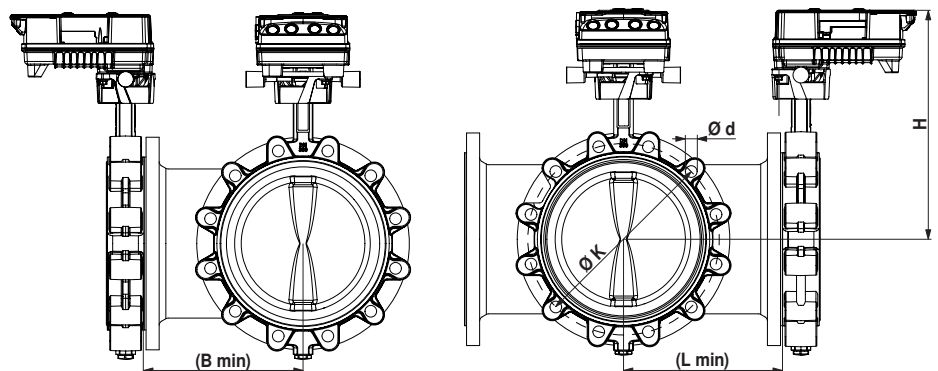
Align NFC-capable smartphone on the actuator so that both NFC antennas are superposed.

Connect Bluetooth-enabled smartphone via the Bluetooth-to-NFC Converter ZIP-BT-NFC to the actuator. Technical data and operation instructions are shown in the ZIP-BT-NFC data sheet.



## Dimensions / Weight

Dimensional drawings



Type	DN [ ]	L [ mm]	B [ mm]	H [ mm]	d (PN16) [ mm]	K (PN16) [ mm]	Weight [ kg]
D7150NL/BAC	150	220	220	350	8 x M20	240	33
D7200WL/BAC	200	260	260	400	12 x M20	295	47
D7250WL/BAC	250	300	300	450	12 x M24	355	69
D7300WL/BAC	300	340	340	500	12 x M24	410	100

## Further documentation

- Data sheets for butterfly valves
- Data sheets for actuators
- Installation instructions for actuators and/or butterfly valves
- Notes for project planning for butterfly valves
- General notes for project planning
- Data sheet for T-piece