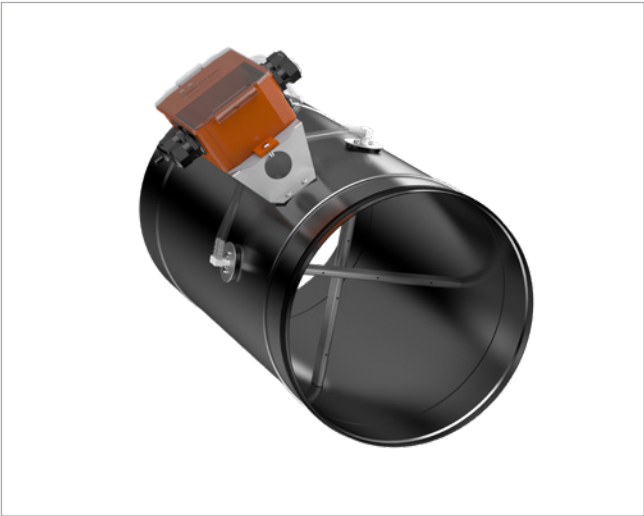




FRU

Flow measuring unit - circular

Flow measuring unit - circular



Description

FRU is a measuring unit with a measuring cross used for measuring volume air flow rate in circular duct systems.

FRU is equipped with a regulator, providing an output signal that is proportional to the volume air flowrate. FRU can be used to monitor the actual airflow or can be used to control a volume flow regulator.

Regulators comes with either flow sensor (D3) for clean air or membrane sensor (M1) for contaminated air.

FRU is equipped with Lindab Safe in the front for connection to the duct and a female coupling in the back, and is ready for insulation up to 50 mm.

FRU can be installed in any position without requiring adjustment.

The FRU needs a certain distance of straight duct before the unit and this has to be observed to obtain a stable and accurate air flow regulation.

To avoid clogging of the measuring cross, it is recommended to use FRU only in applications with clean air, meaning free of dust, particles and similar.

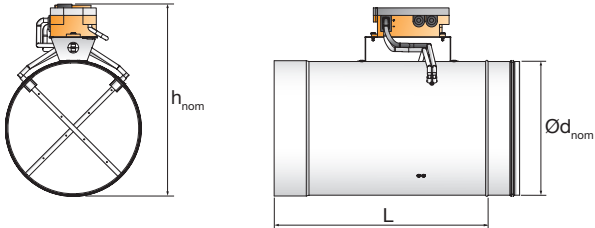
- Belimo MP, Modbus, BACnet & analogue 0(2)-10V.
- Integrated NFC interface, compliant with Belimo Assistant App.

Order code

Product	FRU	200	M
Type			
FRU			
Dimension			
Ød 100 - 630			
Regulator			
D D3 dynamic flow sensor			
M M1 membrane sensor			

Example: FRU - 200 - M

Dimension



Dimension table

Ød _{nom}	L	h _{nom}	Weight
100	300	205	1.6
125	300	230	1.8
160	300	265	2.1
200	300	305	2.4
250	400	355	3.7
315	400	420	4.5
400	400	507	6.6
500	510	607	9.3
630	560	737	12.4

Regulator type table

Type	Regulator
FRU-D	VRU-D3-BAC
FRU-M	VRU-M1-BAC

Belimo documentation

For Belimo motor documentation, visit and read more on Belimo's homepage:

Type	Documentation
All	Belimo Universal

Technical data

Air flow measurement

The accuracy of air flow measurement depends on the flow conditions in front of the measuring cross. It is preferable to have a long straight duct section in front of the measuring point, according to the table below.

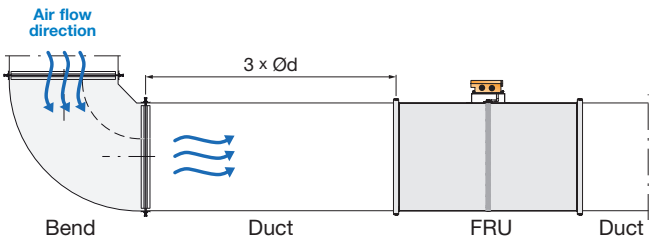
If these recommendations are not followed, it will cause an unstable air flow measurement and therefore higher inaccuracy in the regulation of the required air flow.

Components	Recommended straight duct before unit
Bend	3 x Ød
Tee-piece	4 x Ød
Damper	6 x Ød

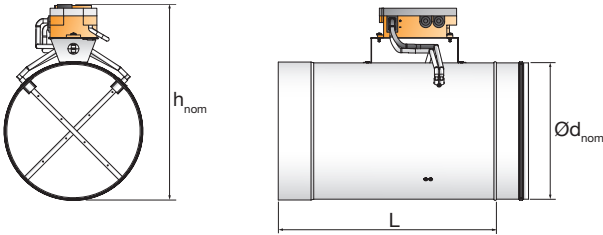
With recommended straight duct in front of the unit, the air flow accuracy will be according to the table below.

Duct velocity	Air flow accuracy
> 3 m/s	+/- 5%
1.2 - 3 m/s	+/- 10%
0.7 - 1.2 m/s	+/- 25%

Example:



Example above showing top view of recommended straight duct distance between duct bend and a FRU.



Front and side view of FRU and dimension Ød.

Flow measuring unit - circular

FRU

Technical data

Settings

V_{nom} indicates the measuring range for the actuator. A standard FRU is calibrated to V_{nom} of 7 m/s according to the table below.

In special cases the FRU can be set to a higher V_{nom} , e.g. 10 m/s.

The output signal from Belimo VAV universal is linear between 2-10 V which corresponds to a flow between 0 and V_{nom} .

Air flows corresponding to air velocities below 0.7 m/s will result in a 2 V signal. (Zero flow).

FRU nominal air flow (V_{nom}) and measuring limit.

Size Ød mm	Measuring limit (0.7m/s)		(Standard) V_{nom} (7m/s)		V_{nom} (10m/s)	
	m ³ /h	l/s	m ³ /h	l/s	m ³ /h	l/s
100	20	6	198	55	283	79
125	31	9	309	86	442	123
160	51	14	506	141	723	201
200	79	22	791	220	1130	314
250	124	34	1236	343	1766	491
315	196	54	1963	545	2804	779
400	317	88	3165	879	4522	1256
500	495	138	4946	1374	7065	1963
630	785	218	7851	2181	11216	3116

Technical data

Adjustment and simulation tool

- Graphical display of setpoint and actual values
- Create and print trend evaluations
- Useful tool for troubleshooting on the MP-Bus®
- Access levels can be defined and managed via release code
- Specialised software for OEMs to make efficient use of the tool in the production process



ZTH EU Service Tool

- The handy ZTH EU Service Tool is connected directly to the actuator for parameterisation
- Reliable and proven connection via the tool socket
- Supply via actuator – always ready
- MP-Bus® tester integrated (packet counter, signal level)
- ZIP level converter to USB for connecting the actuator with the PC Tool

You can find further information about the possible connections of the ZTH EU Service Tool at Belimo.com.



Belimo Assistant App

- Belimo devices marked with the NFC logo can be parameterised

using the Assistant App

- Can be installed on all Android mobile phones and iPhones
- Can be operated with ease using the smartphone's touch display
- The actuator can be parameterised while de-energised
- Updates are undertaken automatically via the



ZIP-BT-NFC Bluetooth to NFC converter

- Allows for simple use of the Belimo Assistant App via Bluetooth with Android mobile phones and iPhones in order to parameterise NFC enabled devices.
- Safe to attach to the actuator thanks to countless micro suction cups attached to the bottom.

