

# Lindab **FRU**

Flow measuring unit - circular



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# FRU



## 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.

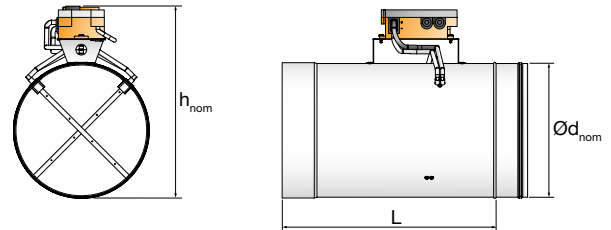
- Belimo MP, Modbus, BACnet & analogue 0(2)-10V.
- Integrated NFC interface, compliable with Belimo Assistant App.

## Order code

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

Example: FRU - 200 - M

## Dimension



## Dimension table

Ød <sub>nom</sub>	L	h <sub>nom</sub>	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	<a href="#">Belimo Universal</a>

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## 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.

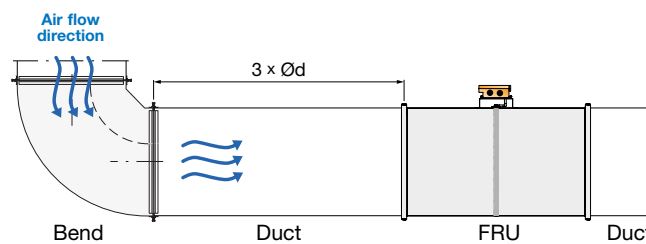
If these recommendations are not followed, it will cause an unstable air flow measurement and therefore higher inaccuracy in the regulation of the required air flow.

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

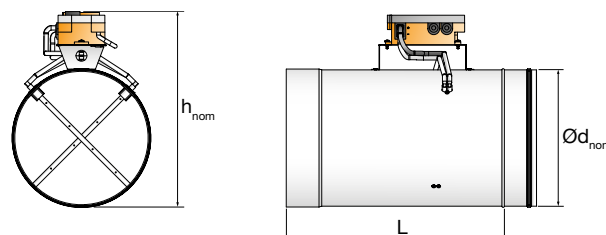
With recommended straight duct in front of the unit, the air flow accuracy will be according to the table below.

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.

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## 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 <sup>3</sup> /h	l/s	m <sup>3</sup> /h	l/s	m <sup>3</sup> /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

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## Belimo information

Find all information and download here: [Belimo](#)

### Key features:

- Check and modify device setting parameters
- Display identification data: Device type, position, designation, serial number, bus address
- Addressing (MP-Bus, BACnet, Modbus, TCP/IP)
- "Setup": Guided parameter setup for your device
- "Copy/Paste Configuration": Replicate settings for the same device types
- "Live trend": Perform local override and live trending with the easyshare function
- "Health": Monitor device operation KPIs. E.g. Power supply, Bus state, Sensor state, etc.
- "Reports": Retrieve digital reports of your device with the easy-share function. E.g. Calibration certificate, Commissioning report
- "Export Configuration": Create a logfile with the easy-share function -
- In-app language adjustment (EN/DE/FR/IT/ES/CN/RU)
- Platform-independent for Android, Apple iOS, and Windows



Smartphone/ Tablet



PC



- 1) LINK.10 is needed for Bluetooth and USB connection. It is recommended for more extended use and working with devices with a higher information density.
- 2) ZIP-BT-NFC is also possible.
- 3) ZTH EU/US/AP is also possible

Download and install


- [Link.10](#) - (Supports Bluetooth and USB to NFC and MP-Bus)
- [ZK1-GEN](#) (Connecting cable 5 m, A: RJ11 6/4 LINK.10, B: 6-pin for connection to service socket)
- [ZK2-GEN](#) (Connecting cable 5 m, A: RJ11 6/4 LINK.10, B: free wire end for connection to MP/PP terminal)



Most of us spend the majority of our time indoors. Indoor climate is crucial to how we feel, how productive we are and if we stay healthy.

We at Lindab have therefore made it our most important objective to contribute to an indoor climate that improves people's lives. We do this by developing energy-efficient ventilation solutions and durable building products. We also aim to contribute to a better climate for our planet by working in a way that is sustainable for both people and the environment.

[Lindab](#) | For a better climate