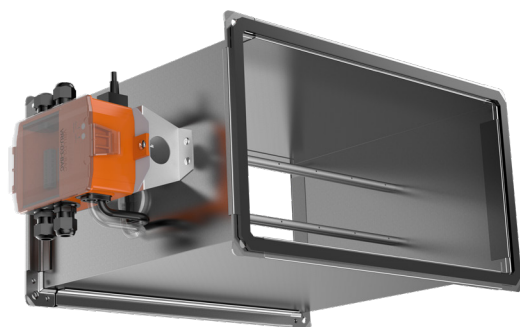# Lindab **FRA**

Flow measuring unit - rectangular

Flow measuring unit-rectangular   FRA

Description

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

FRA is equipped with a regulator, providing an output signal that is proportional to the volume air flow rate. FRA 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.

The FRA 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 VRU only in applications with clean air, meaning free of dust, particles and similar.

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

Order code

Product	FRA	aaa x bbb	ccc	dddd

Type
FRA

Dimension
Min. : a x b = 300 x 100 mm
Max. : a + b ≤ 2400 mm
        and a ≤ 1500 mm

Regulator
D   D3 dynamic flow sensor
M   M1 membrane sensor

Flange type
LS
RJFP 20   (Standard All sizes)
RJFP 30   When a or b > 800
RJFP 40   On request

Example: FRA-500x200-M-RJFP 20

Dimensions

Side view   Front view
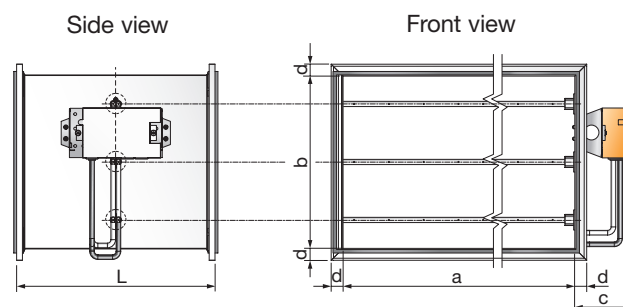
NB! Different flange types are available, see order code and dimension table below.
a and b dimensions, see order code.

Dimension table

Flange type	d mm	L mm	c mm
LS	20	341	
RJFP20	20	341	106
RJFP30	30	342	
RJFP40	40	343	

Installation

Using LS-profile. Installation instruction, please go to Asembly instruction, Rectangular air duct systems, LS-profile.

Using RJFP-profiles. Installation instruction, please go to to Lindab rectangular duct systems, RJFP.

You can find general information about air duct systems, theory calculations following this link.

Regulator type table

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

Belimo documentation

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

Type	Documentation
All	Belimo Universal

Flow measuring unit-rectangular FRA

Technical data

Volume flow measurement

The accuracy of volume 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 flow measurement and therefore higher inaccuracy in the regulation of the required air flow.
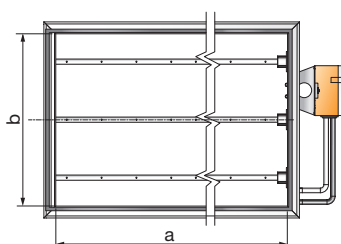
Components	Recommended straight duct before unit
Bend	$3 \times d_h$ *
Tee-piece	$4 \times d_h$ *
Damper	$6 \times d_h$ *

d_h* is the hydraulic diameter for a rectangular duct (and FRA), d_h can be calculated by using FRA dimension a and b:

$$d_h * = 2 \times a \times b / (a + b)$$
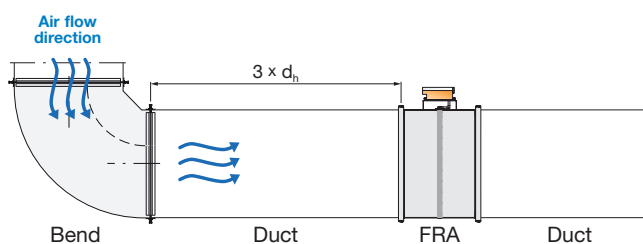
Example above showing top view of recommended straight duct distance between duct bend and a FRA.

Front view of FRA and dimension a and b.

Flow measuring unit-rectangular   FRA

Technical data

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

In special cases the FRA 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 1.0 m/s will result in a 2 V signal.

FRA$_{nom}$ and measuring limit.

Size mm			Measuring limit (1 m/s)		(Standard) V_{nom} (7 m/s)		V_{nom} (10 m/s)	
a	x	b	m³/h	l/s	m³/h	l/s	m³/h	l/s
300		200	216	60	1512	420	2160	600
400		200	288	80	2016	560	2880	800
		300	432	120	3024	840	4320	1200
500		200	360	100	2520	700	3600	1000
		300	540	150	3780	1050	5400	1500
		400	720	200	5040	1400	7200	2000
		500	900	250	6300	1750	9000	2500
600		200	432	120	3024	840	4320	1200
		300	648	180	4536	1260	6480	1800
		400	864	240	6048	1680	8640	2400
		500	1080	300	7560	2100	10800	3000
800		200	576	160	4032	1120	5760	1600
		300	864	240	6048	1680	8640	2400
		400	1152	320	8064	2240	11520	3200
		500	1440	400	10080	2800	14400	4000
1000		300	1080	300	7560	2100	10800	3000
		400	1440	400	10080	2800	14400	4000
		500	1800	500	12600	3500	18000	5000
		600	2160	600	15120	4200	21600	6000

Lindab

Flow measuring unit-rectangular   FRA

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 ofthe ZTH EU Service Tool on your local Belimo website or by scanning the QR code.

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 Google Play or Apple App store

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

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

Lindab®
For a better climate