Flow meter

FMU

Description

Applications
The meter is suitable both for setting up and for continous flow measurement. It is intended for permanent installation and must therefore be specified at the design stage.

There is a separate assembly, measuring, balancing and maintenance instruction for this product.

Design
The meter consists of two reductions joined together, with measurement nozzles. Each nozzle has a removable plastic plug which prevents dirt from entering. It also eliminates air leakage when measurement is not done.

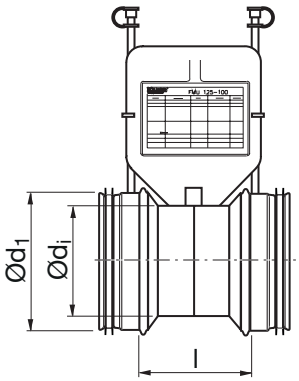
The unit permits insulation of up to 100 mm thickness to be installed without concealing the measurement nozzles or label plate. The plate can be rotated for best legibility, irrespective of the way the fitting is installed and can easily be removed, to be located away from the unit.

Flow meters with reductions of two dimension steps can be obtained, to give higher reading pressure in the measurement nozzles. This entails higher pressure drop and noise generation, however.

Ordering example

	FMU	160	125
Product			
Dimension $Ød_1$			
Dimension $Ød_i$			

Dimensions



$Ød_1$ nom	$Ød_i$ nom	l [mm]	m [kg]
80	63	110	0,33
100	80	120	0,42
125	100	111	0,48
160	125	123	0,62
200	160	129	0,83
250	200	131	1,15
315	250	195	1,81
400	315	206	2,60
500	400	275	3,92
630	500	355	6,38

Advantages
- Has low pressure drop due to good aerodynamic design.
- Has low noise generation due to good aerodynamic design.
- Does not obstruct duct cleaning.
- Suitable for use with insulation.

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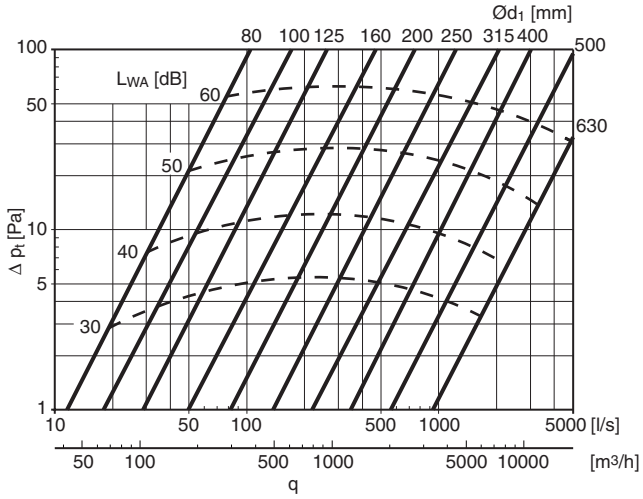
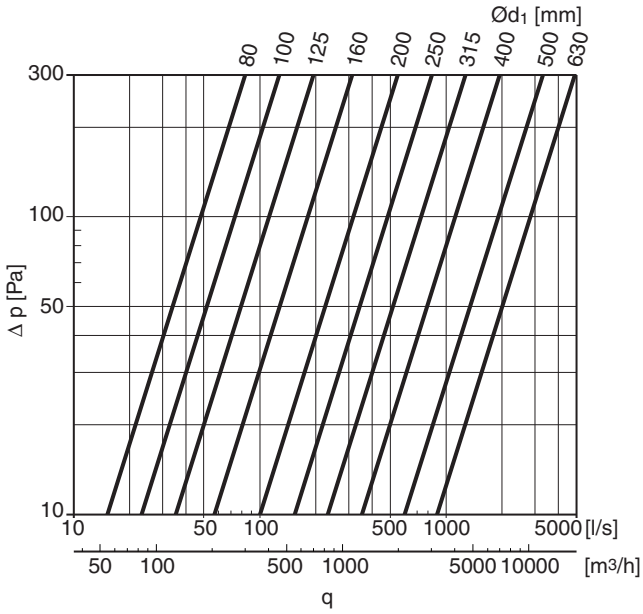
Technical data

Pressure drop graph with sound data for dimensioning
The solid lines give the pressure drop, Δp, as a function of flow, q. The dashed lines give the A-weighted sound power data, L_{WA}, in dB to the duct. Flow data for balancing differ from this graph.



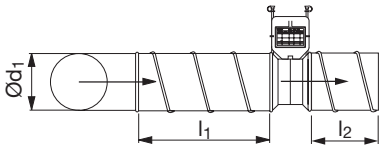
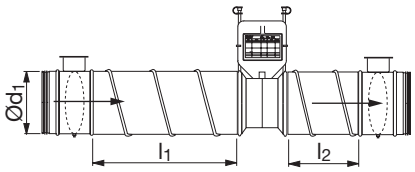
Sound
Sound generation has been measured at the Swedish National Testing and Research Institute in reverberation room, in accordance with ISO 5135 and ISO 3741.

Flow graph for balancing
The curves show the flow, q, as a function of the pressure difference in the measurement nozzles. Flow data for dimensioning differ from this graph.



Measurement function
By measuring the pressure difference, Δp, between the measurement nozzles, you can derive the flow in the duct by means of the equation on the units plate.

Measurement accuracy
If the velocity profile is asymmetric, the measurement values can differ from the ideal values. For this reason, the flow meter should never be located right up to any flow disturbance. The method error in the table below will differ, depending on the distance to the flow disturbance.

l_1 =straight distance before meter	Method error m_2	
Type of disturbance	5%	10%
A 90° bend 	$2 \cdot d_1$	$1 \cdot d_1$
A rotary damper (45°). Shaft in line with measurement nozzles 	$4 \cdot d_1$	$3 \cdot d_1$
l_2 = straight distance after meter	$1 \cdot d_1$	$1 \cdot d_1$

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Sound generation

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Sound generation

dim Ød$_1$	Velocity app. 5 [m/s]								Velocity app. 10 [m/s]								Velocity app. 15 [m/s]							
	Centre frequency [Hz]								Centre frequency [Hz]								Centre frequency [Hz]							
	63	125	250	500	1k	2k	4k	8k	63	125	250	500	1k	2k	4k	8k	63	125	250	500	1k	2k	4k	8k
80	Flow 25 [l/s]								Flow 50 [l/s]								Flow 75 [l/s]							
	49	45	42	33	22	14	11	11	54	56	56	51	42	34	29	21	68	62	61	59	54	44	41	34
100	Flow 40 [l/s]								Flow 80 [l/s]								Flow 120 [l/s]							
	50	45	39	30	18	6	2	7	51	59	54	48	38	30	22	16	60	64	62	59	50	43	38	34
125	Flow 60 [l/s]								Flow 120 [l/s]								Flow 180 [l/s]							
	45	40	33	24	11	1	1	8	53	55	50	42	34	26	21	16	61	62	61	53	45	38	35	33
160	Flow 100 [l/s]								Flow 200 [l/s]								Flow 300 [l/s]							
	41	39	31	24	13	0	0	3	58	54	50	42	34	27	19	15	66	64	61	52	46	41	35	31
200	Flow 150 [l/s]								Flow 300 [l/s]								Flow 450 [l/s]							
	41	36	32	23	7	0	0	4	55	52	47	39	30	27	20	17	64	62	58	48	42	38	34	31
250	Flow 250 [l/s]								Flow 500 [l/s]								Flow 750 [l/s]							
	44	37	31	22	17	15	17	17	64	53	48	39	28	27	26	22	72	64	58	49	44	40	39	29
315	Flow 400 [l/s]								Flow 800 [l/s]								Flow 1200 [l/s]							
	51	35	29	19	14	10	5	6	64	55	46	38	34	31	32	28	72	65	57	48	45	42	42	41
400	Flow 600 [l/s]								Flow 1200 [l/s]								Flow 1800 [l/s]							
	46	37	30	22	19	14	9	7	64	58	47	41	40	40	37	30	75	69	59	53	51	52	51	46
500	Flow 1000 [l/s]								Flow 2000 [l/s]								Flow 3000 [l/s]							
	54	40	29	24	22	15	8	5	64	58	47	41	40	40	37	30	75	69	59	53	51	52	51	46
630	Flow 1500 [l/s]								Flow 3000 [l/s]								Flow 4500 [l/s]							
	53	43	32	28	25	19	14	10	68	61	50	44	43	45	42	35	78	73	62	56	54	58	57	48