



Flygt MagFlux EMF 801

ELECTROMAGNETIC FLOW METER

General

MagFlux Electromagnetic Flow Meters deliver very stable and highly accurate flow measurements in conductive liquids.

MagFlux Flow Meters have no moving parts to foul, create no hydraulic influence on the flow, use a well-proven technology, and communicate using a standard protocol.

MagFlux Flow Sensors are available in sizes ranging from DN 15(½") to DN 1200(48"), with ISO standard construction lengths and connections.

MagFlux Flow Meters can be installed either with the electronics mounted on the flow sensor, on a wall, or mounted in a panel.

Application

MagFlux Flow Meters are used for measuring and totalizing flow of conductive liquids in pressurized closed pipe systems.

MagFlux Flow Meters measure flow in both directions of potable water, waste water and process fluids.



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Mob**

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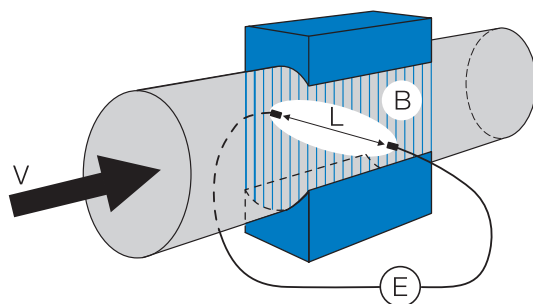
PAGINA WEB: www.electromecanicamm.com.ar

E-MAIL: electromecanicamm@hotmail.com

FLYGT
a xylem brand

MagFlux Electromagnetic Flow Meter

Function



The MagFlux operation is based on Faraday's law of induction. When a conductive fluid passes through a magnetic field in the sensor, an electromagnetic voltage is induced between the two electrodes in the flow sensor tube. This voltage (E) is directly proportional to the fluid velocity.

When the internal diameter of the Flow Sensor is known, the actual volume is calculated by the Converter.

The electromagnetic voltage induced between the electrodes equates to:

$$E = L \times B \times V \text{ where:}$$

E: Induced electromagnetic voltage

L: Flow sensor diameter

B: The strength of the magnetic field

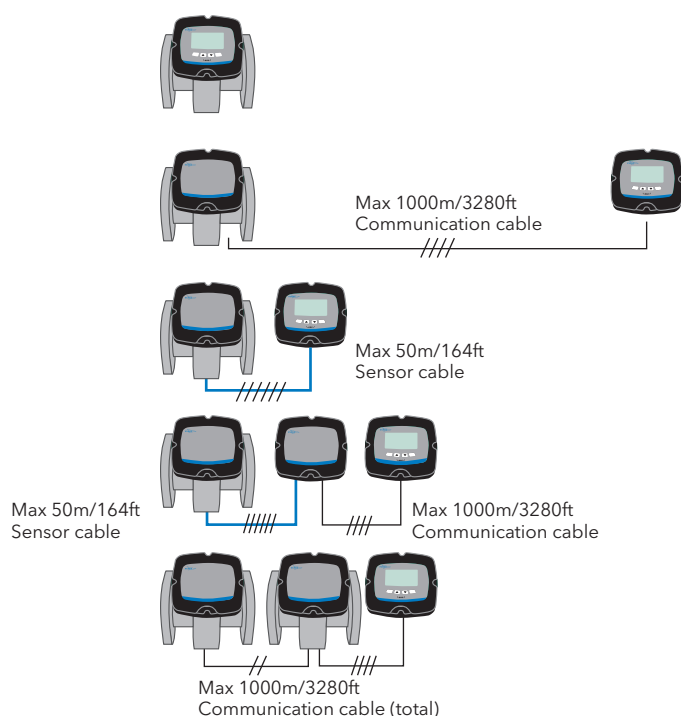
V: The velocity of the liquid

The voltage E is measured and consequently converted to a volumetric flow.

Flexible Installation

The modular design is versatile. The Display Unit can be mounted up to 1000 m (3000ft.) from the Flow Converter with ordinary twisted wires. It also provides options for mounting the Converter where it is most convenient to make the electrical connections.

One Display Unit can control up to 4 Converters and Flow Sensors for greater economy, space savings and an improved overview of the multiple measurement values



The MagFlux Converter and Display Unit mounted directly on the Flow Sensor.

The MagFlux Converter mounted directly on the flow sensor with a remote mounted Display Unit.

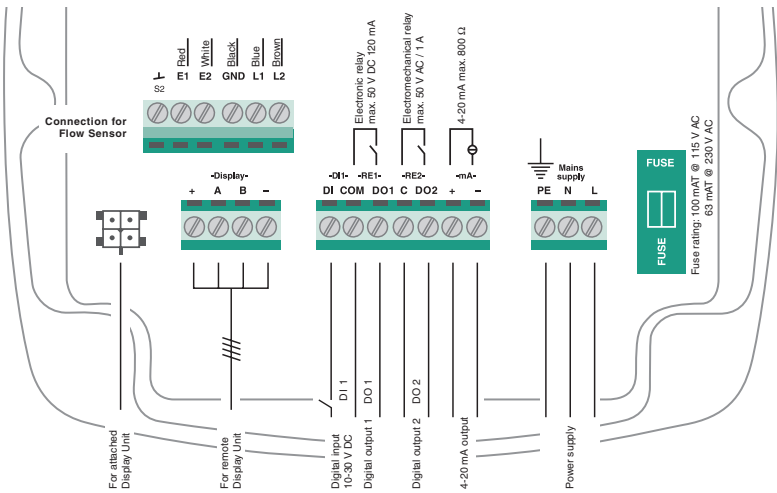
The MagFlux Converter and Display Unit remote mounted. For example when the sensor is being buried or submerged.

The MagFlux Converter is mounted remote from the Flow Sensor, and the Display Unit is mounted separately from the Converter. E.g when the Sensor is being buried

The MagFlux Converters are mounted directly on the Flow Sensors, while the remote mounted Display Unit communicates with two MagFlux Converters and Flow Sensors.

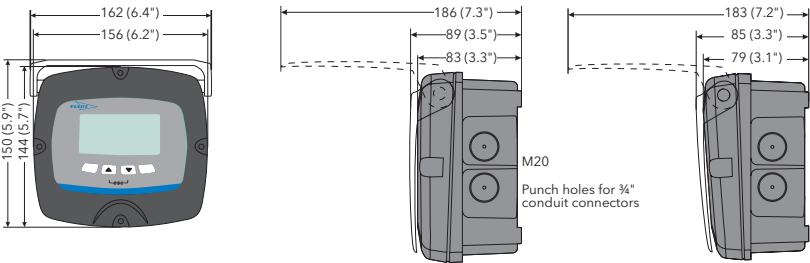
MagFlux Electromagnetic Flow Meter

Electrical Connection



Dimensions

mm (Inch)



MagFlux Electromagnetic Flow Meter

Specifications Converter and display unit

Display	
Display	White background-lit LCD-display (64 x 128 pixels) with soft keys
Display Indication	Indication of flow , flow direction, volume, totalizers, configuration and graph
Power Supply	From MagFlux Converter
Clock	Real-time clock with built-in lithium battery (lifetime 10 years@20°C)
Communication	MODBUS® RTU-mode, 9600 baud, 2-wire RS 485, master-mode
Interface	1 pcs. RS-485 Modbus® RTU-mode 1 pcs. USB 1,1 type mini B, female 1 pcs. for Communication module
Interface	1 pcs. USB 1,1 type mini B, female
Memory Storage	32 Mb Flash memory, 168.000 loggings incl. date, time and value (curve display)
Enclosure Rating	IP 67, NEMA 6 (when mounted on Converter)
Material	Housing: Glass-reinforced Polycarbonate Protection Lid: Transparent Polycarbonate
Temperature Range	- 20 ... 60 °C / -5 ... 150°F
Weight	0,5 kg / 1.1lb

Converter	
Accuracy	+/- 0,1% of reading
Measuring Input Resolution	16 bit
Min. Liquid Conductivity	≥ 5 µS
Power Supply	24 V AC, 50 / 60 Hz ± 10 % or 230 (115) V AC, 50 / 60 Hz ± 10 % or 10-30 VDC
Power Consumption	Max. 10 W
Internal Communication	MODBUS® RTU-mode
External Communication	MODBUS® RTU-mode, 9600 baud, 2-wire RS 485, slave-mode
Interface	1 pcs. RS 485 for connection to Display Unit or PLC
Analog Output	1 pcs. Active 4 - 20 mA, galvanically isolated, 12 bit resolution, (max. load 800 Ω) Min. range = 0 - 0,2 m/s (0-0.6ft/s), Max. range = 0 - 10 m/s (0-30ft/s)
Digital Outputs	1 pcs. Voltage-free electromechanical relay (max. 50 V DC / 1 A) 1 pcs. Optically isolated MOSFET relay (max. 50 VAC / V DC / 120 mA) Programmable for: Totalizer counter, batch counter, high/low flow , system error, empty pipe and flow direction.
Digital Inputs	One, max. 30 V DC, < 5 V DC = 0 (low) , > 10 V DC = 1 (high), pulse length > 100 ms
Enclosure Rating	IP 67, NEMA 6
Material	Glass-reinforced Polycarbonate
Temperature Range	- 20 ... 60 °C / -5 ... 150°F
Weight	1,0 kg / 2.2lb
Approvals	UL, cUL CE EN 61000-6-4 2007-02-19 • EN 61000-6-2 2005-09-08

Connection Box	
Enclosure Rating	IP 68, NEMA 6P (using gel potting kit part no. 838776). The flow meter can withstand unlimited immersion of up to 10 m (30ft) of water.
Material	Glass-reinforced Polycarbonate
Temperature Range	- 20 ... 60 °C / -5 ... 150°F

As our products are developed continuously, we reserve the right to make any changes without prior notice.

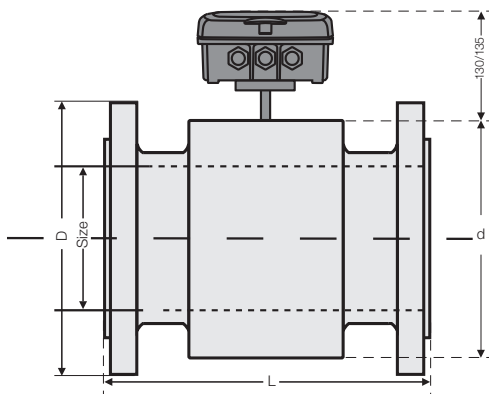
MagFlux Electromagnetic Flow Meter

Order numbers

Magflux® Converters and Accessories	
838766	MagFlux Converter (blind) for sensor mounting, 230/115VAC
838796	MagFlux Converter (blind) for sensor mounting, 115VAC
838767	MagFlux Converter (blind) for sensor mounting, 24VAC
838768	MagFlux Converter (blind) for sensor mounting, 10-30VDC
838763	MagFlux Converter w/display unit for sensor mounting 230/115VAC
838797	MagFlux Converter w/display unit for sensor mounting 115VAC
838764	MagFlux Converter w/display unit for sensor mounting 24VAC
838765	MagFlux Converter w/display unit for sensor mounting 10-30VDC
838769	MagFlux Converter w/display unit for wall mounting, 230/115VAC
838798	MagFlux Converter w/display unit for wall mounting, 115VAC
838770	MagFlux Converter w/display unit for wall mounting, 24VAC
838771	MagFlux Converter w/display unit for wall mounting, 10-30VDC
838839	MagFlux Converter w/o display unit for wall mounting, 230/115VAC
838799	MagFlux Converter w/o display unit for wall mounting, 115VAC
838807	Sensor cable 10m (30 ft) - for remote connection between the wall mounted converter w/display and the sensor mounted converter (blind)
838808	Sensor cable 25m (82 ft) - for remote connection between the wall mounted converter w/display and the sensor mounted converter (blind)
838809	Sensor cable 50m (164 ft)- for remote connection between the wall mounted converter w/display and the sensor mounted converter (blind)
838810	Communication cable 25m (82ft) -for remote display and multiple converters
838811	Communication cable 50m (164 ft) - for remote display and multiple converters
838812	Communication cable 200m (656 ft)- for remote display and multiple converters
838966	Modbus and RS 485 communications module
838967	Profibus DP communication module
838772	Wall mounting kit for converter
838935	Cabinet bottom part for wall mounting
838965	Mounting plate, Field Cabinet (small)
838773	Panel Mounting Bracket
838937	Field cabinet bottom part for sensor mounting
838973	Display Unit for MagFlux®
838968	Display Cover (Transparent)
838934	Converter Lid (Blind)
838936	Converter PCB
838932	Connection PCB
838970	Surge Arrester for MagFlux® for wall mounting
838971	Surge Arrester for MagFlux® for sensor mounting
838972	MagFlux® Verificator
838776	Gel potting kit
840559	Connection Cable USB
838931	USB Mini/USB mini, for panel mounting, 200mm (7.9") IP67/NEMA6
840560	MJK Field-Link
838939	Demo case including: Flow Sensor DN20 - EN, Converter w. display, Hydrostatic Level Transmitter LTU 601 0-3m & Level Indicator LI 531. 230VAC. 455 x 330mm (17.9 x 13in) W x H
838991	Demo case including: Flow Sensor 3/4" - ANSI, Converter w. display, Hydrostatic Level Transmitter LTU 601 0-3m & Level Indicator LI 531. 115VAC. 455 x 330mm (17.9 x 13in) W x H

MagFlux Electromagnetic Flow Meter

Dimensions
Magflux EMF 801
Sensor



Dimensions

Magflux EMF 801 EN-1092-1 Flanges
Sizes and dimensions information

Size	Pres- sure	D	L	Weight	P/N
DN	PN	[mm]	[mm]	[kg]	
15	40	95	200	3,5	838693
20	40	105	200	3,5	838694
25	40	115	200	3,5	838695
32	40	140	200	6	838696
40	40	150	200	7	838697
50	16	165	200	8	838698
65	16	185	200	10	838699
80	16	200	200	12	838700
100	16	220	250	16	838701
125	16	250	250	21	838702
150	16	285	300	28	838703
200	16	340	350	35	838704
250	10	395	450	43	838705
300	10	445	500	55	838706
350	10	505	550	66	838707
400	10	565	600	94	838708
450	10	615	600	105	838709
500	10	670	600	122	838710
600	10	780	600	158	838711
700	10	895	700	230	838712
800	6	1015	800	325	838713
900	6	1115	900	420	838714
1000	6	1230	1000	510	838715
1200	6	1450	1200	680	838716

Specifications

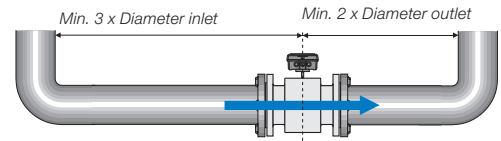
Mounting	Flange EN-1092-1
<i>Materials</i>	
Housing	Carbon steel
Flanges	Carbon steel
Lining	Hard rubber
Electrodes	1,4571 / AISI 316 Ti
Accuracy	Better than $\pm 0.25\%$
Media temp. range	10...80 °C / 15...175 °F
Ambient temp. range	
Compact converter	10...60 °C / 15...140 °F
Remote converter	10...80 °C / 15...175 °F
Enclosure	IP67, NEMA 6 / IP 68, NEMA 6P,

MagFlux Electromagnetic Flow Meter

Mounting Data

Accurate flow measurement requires a minimum of three (3) pipe diameters of straight pipe upstream and two (2) pipe diameters of straight pipe downstream from the center of the Flow Sensor.

Minimum pipe diameter distances for accurate MagFlux® flow measurements:



Flow Sensor Sizing

Min. / Max. Flow and Default mA Settings				
Size		Q min = 0,2 m/s	Q max = 10 m/s	20 mA
DN	[inch]	[l/h]		
15	½"	127	6362	5000
20	¾"	226	11304	10000
25	1"	353	17676	20000
32	1 ¼"	578	28944	30000
40	1 ½"	905	45360	50000
50	2"	1414	70560	75000
-	-	[m³/h]		
65	2 ½"	2,39	119	100
80	3"	3,62	181	200
100	4"	5,65	283	300
125	5"	8,84	442	400
150	6"	12,7	636	600
200	8"	22,6	1131	1000
250	10"	35,3	1767	2000
300	12"	50,9	2545	2500
350	14"	69,3	3464	3000
400	16"	90,5	4524	4500
450	18"	115	5726	6000
500	20"	141	7069	7000
600	24"	204	10179	10000
700	28"	277	13854	15000
800	32"	362	18095	20000
900	36"	458	22902	25000
1000	40"	565	28274	30000
1200	48"	814	40715	40000

Min and max flow Imperial		
Size	Qmin 0.6 ft./s	Qmax 30 ft./s
[inch]	[GPM]	
½"	0.559	28.0
¾"	0.995	49.76
1"	1.550	77.82
1¼"	2.549	127.4
1½"	3.984	199.7
2"	6.226	310.7
2½"	10.52	523.9
3"	15.93	796.9
4"	24.87	1246
5"	38.92	1946
6"	55.91	2800
8"	99.50	4,979
10"	155.4	7,780
12"	224.1	11,205
14"	305.1	15,258
16"	398.5	19,919
18"	506.3	25,210
20"	620.8	31,120
24"	999.1	44,910
28"	1220	74,920
32"	1594	79,620
36"	2017	100,800
40"	2497	124,500
48"	3584	179,300

20mA output is factory preset to Qmax

To calculate the correct size of the Flow Sensor the recommended flow velocity should be between 1 and 3 m/s (3 and 10 ft/s) to achieve high accuracy at low velocities (down to 0,2 m/s equal to 0.66 ft/s), to ensure safe operation of the tube system and to minimize pressure losses.

The flow curves and graphs on the following page illustrate how the size of the Flow Sensor is calculated to get the required measuring accuracy.

Example:

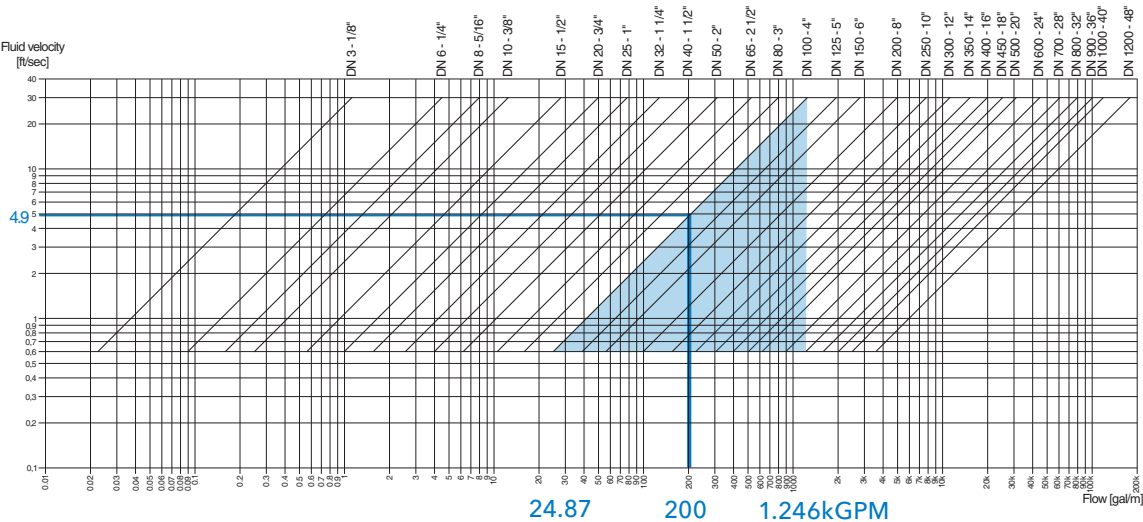
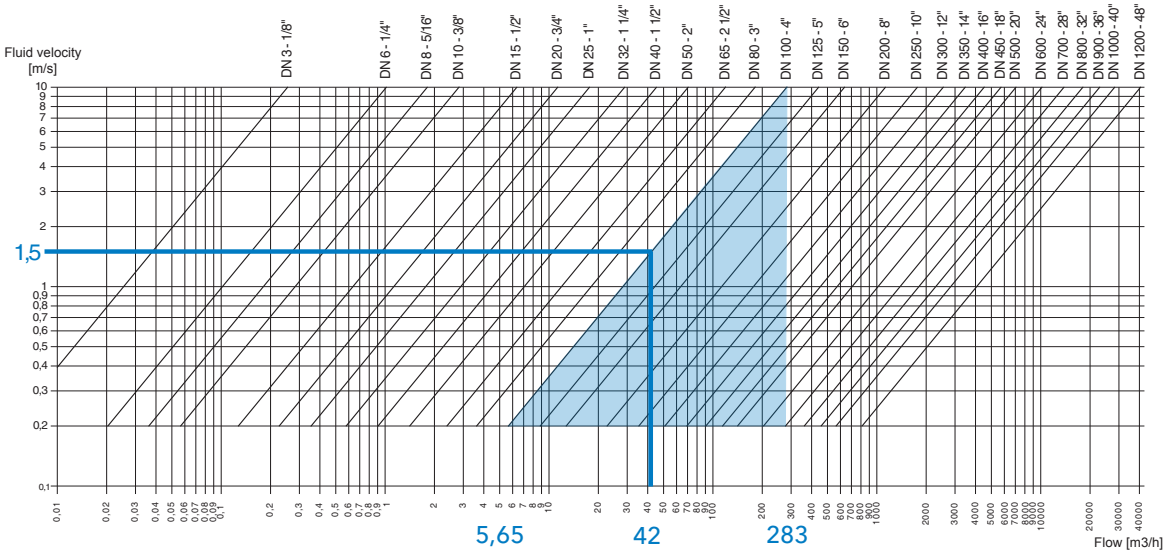
A volume of 50 m³/h (220 GPM) is running through a DN100 pipe that measures 4" in internal diameter. To select the correct MagFlux® Flow Sensor, the liquid velocity should be in the range 1 - 3 m/s for 50 m³/hr (3 ft/s - 10 ft/s for 220 GPM.)

If a MagFlux® Flow Sensor with the same inner diameter as the DN100 pipe is selected (4"), the flow velocity will be 1.5 m/s (4.9 ft/s) at a flow rate of 42 m³/h (200 GPM). The diagram and the table below also shows that a flow between 5.65 m³/h and 283 m³/h (24.87 and 1.246 kGPM) can be measured.

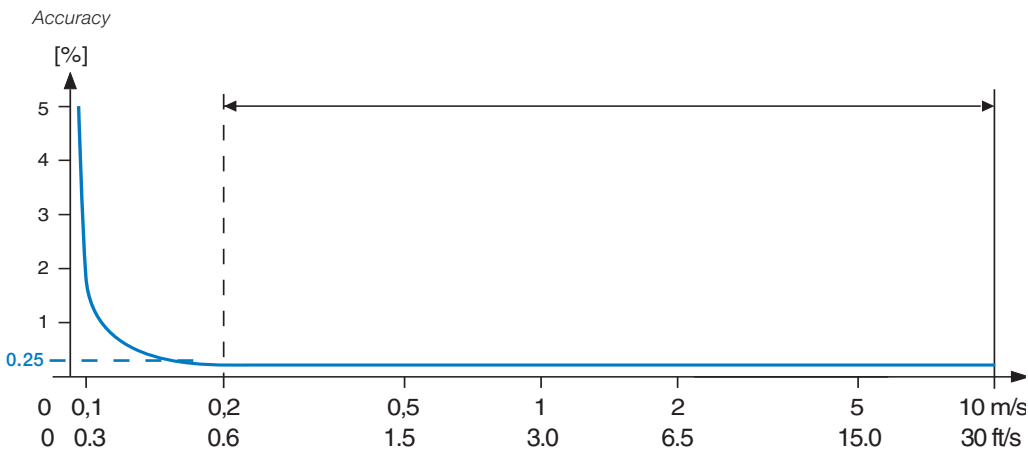
MagFlux Electromagnetic Flow Meter

Flow / Velocity Graph (metric)

Nominal diameter of MagFlux flow sensor



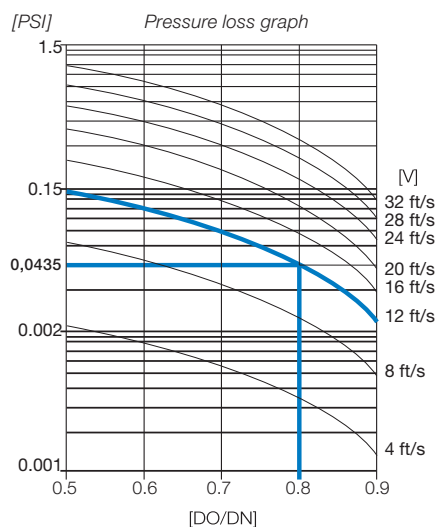
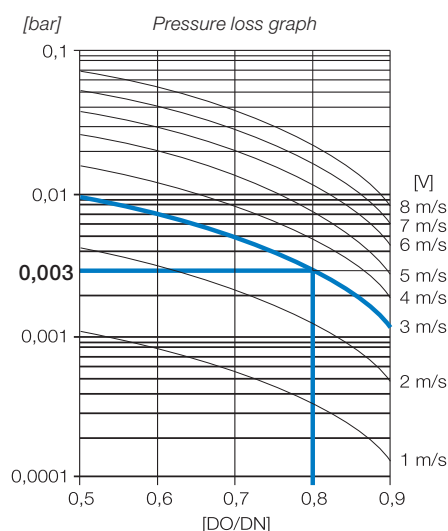
Measurement Accuracy



Example:
If a 100 mm MagFlux Flow Sensor is selected, the diagram shows the available measuring accuracy between 0.2 - 10 m/s or 0.6 - 30 ft/s (here: 0.25%).

MagFlux Electromagnetic Flow Meter

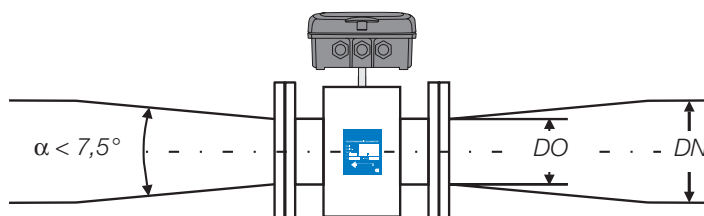
Reducing the Flow Meter Size



When the size of the Flow Meter is reduced to cause the flow to reach a sufficient velocity, the pipe size has to be reduced. This will cause a pressure loss which can be calculated using the pressure loss chart at the right.

When the MagFlux Sensor is smaller than nominal pipe diameter, the pressure loss can be checked, using the pressure loss chart.

Example



A MagFlux Flow Sensor with an internal diameter of 80 mm is selected and the pipe size is 100 mm. Consequently the fluid velocity for a flow of approximately 50 m³/h will increase to app 3 m/s.

Using a DN80 mm MagFlux flow sensor also leads to a smaller measurement range (3.62 m³/h - 181 m³/h).

The diagram shows that reducing the pipe size from 100 to 80 mm will cause a pressure loss of 3 mbar (0.003 bar).

A MagFlux Flow Sensor with an internal diameter of 3 in. is selected and the pipe size is 4 in., the fluid velocity for a flow of approximately 220 GPM will increase to about 10 ft/s.

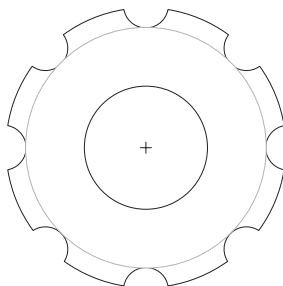
Using a 3 in. MagFlux flow sensor, a smaller measurement range (from 15.93 GPM to 796.9 GPM) will be available.

The diagram shows that reducing the pipe size 4 in. to 3 in. will cause a pressure loss of 0.0435 psi.

MagFlux Electromagnetic Flow Meter

Grounding rings

Grounding Ring Example



DN100 Grounding Ring

Sizes and Ordering Information

Grounding Rings Sizes and Ordering Information			
Size			Weight
DN	[inch]	Order no.	kg / lb
15	½"	83 89 74	0,08 / 0.18
20	¾"	83 89 75	0,10 / 0.22
25	1"	83 89 76	0,12 / 0.26
32	1¼"	83 89 77	0,16 / 0.35
40	1½"	83 89 78	0,22 / 0.49
50	2"	83 89 79	0,28 / 0.62
65	2½"	83 89 80	0,36 / 0.79
80	3"	83 89 81	0,44 / 0.97
100	4"	83 89 82	0,56 / 1.23
125	5"	83 89 83	0,66 / 1.46
150	6"	83 89 84	0,92 / 2.03
200	8"	83 89 85	0,98 / 2.16
250	10"	83 89 86	1,30 / 2.87
300	12"	83 87 17	2,04 / 4,50
350	14"	83 89 90	2,44 / 5.38
400	16"	83 89 69	3,50 / 7.72
450	18"	83 89 88	3,36 / 7.41
500	20"	83 89 89	3,64 / 8.02
600	24"	83 89 38	4,50 / 9.92

Specifications

Grounding Rings Specifications	
Material	AISI 316 SS
Wire	2,5 mm ² / AWG 13

Xylem |'zīləm|

- 1) The tissue in plants that brings water upward from the roots;
- 2) A leading global water technology company.

We're 12,700 people unified in a common purpose: creating innovative solutions to meet our world's water needs. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. We move, treat, analyze, and return water to the environment, and we help people use water efficiently, in their homes, buildings, factories and farms. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise, backed by a legacy of innovation.

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