

# Flowmeters

## MAG 5100 W

### Overview



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The MAG 5100 W is an electromagnetic flow sensor designed to meet ground water, drinking water, waste water, sewage or sludge applications.

### Benefits

- DN 25 to DN 1200 (1" to 48")
- Connection flanges EN 1092-1 (DIN 2501), ANSI, AWWA and AS.
- NBR Hard Rubber liner for all water applications
- Drinking water EPDM liner with approvals
- Hastelloy integrated grounding and measuring electrodes
- Increased low flow accuracy for water leak detection, due to coned liner design.
- Drinking water approvals
- Suitable for direct burial and constant flooding
- Build-in length according to ISO 13359
- Easy commissioning, SENSORPROM unit automatically uploads calibration values and settings.
- Designed that patented in-situ verification can be conducted. Using SENSORPROM fingerprint.

### Application

The main applications of the flow sensors can be found in the following fields:

- Water abstraction
- Water treatment
- Water distribution network (leak detection management)
- Custody transfer water meters
- Irrigation
- Waste water treatment
- Filtration plant (e.g. reverse osmosis and ultra filtration)
- Industrial water applications

### Mode of operation

The flow measuring principle is based on Faradays law of electromagnetic induction where the sensor converts the flow into an electrical voltage proportional to the velocity of the flow.

### Function

- Highly resistant to a wide range of chemicals
  - Pattern approval OIML R49 (Denmark, Germany)
  - conforms to ISO 4064 and EN 14154
  - MI-001 Custody Transfer approval for billing (EU)
- Meets EEC directives: PED, 97/23/EC pressure directive for EN1092-1 flanges
- Simple onsite or factory upgrade to IP68/NEMA 6P of a standard sensor.

### Integration

The complete flowmeter consists of a flow sensor and an associated transmitter F M MAG 5000, MAG 6000 or MAG 6000 I.

The flexible communication concept USM II simplifies integration and update to a variety of fieldbus systems, e.g. HART, FOUNDATION Fieldbus H1, DeviceNet, PROFIBUS DP and PA, MODBUS RTU/RS485.

## Technical specifications

Design	Full bore sensor	Coned bore sensor	Full bore sensor
Nominal size	DN 25 ... 40 (1" ... 1½")	DN 50 ... 300 (2" ... 12")	DN 350 ... 1200 (14" ... 48")
<b>Measuring principle</b>	Electromagnetic induction		
Excitation frequency	12.5 Hz	<ul style="list-style-type: none"> <li>• DN 50 ... 65 (2" ... 2½"): 12.5 Hz</li> <li>• DN 80 ... 150 (3" ... 6"): 6.25 Hz</li> <li>• DN 200 ... 300 (8" ... 12"): 3.125 Hz</li> </ul>	1.56 Hz
<b>Process connection</b>			
Flanges		Flat face flanges	
<ul style="list-style-type: none"> <li>• EN 1092-1</li> </ul>	PN 40 (580 psi)	<ul style="list-style-type: none"> <li>• DN 50 ... 300: PN 16 (2" ... 12": 230 psi)</li> <li>• DN 200 ... 300: PN 10 (8" ... 12": 145 psi)</li> </ul>	<ul style="list-style-type: none"> <li>• PN 10 (145 psi)</li> <li>• PN 16 (230 psi)</li> </ul>
<ul style="list-style-type: none"> <li>• ANSI B16.5</li> </ul>	Class 150 lb	Class 150 lb -20 bar (290 psi)	--
<ul style="list-style-type: none"> <li>• AWWA C-207</li> </ul>	--	--	28" ... 48": Class D
<ul style="list-style-type: none"> <li>• AS4087</li> </ul>	PN 16 (230 psi) DN 50 ... 1200 (2" ... 48"), 14 bar (232 psi)		
<b>Rated Operation conditions</b>			
Ambient temperature			
<ul style="list-style-type: none"> <li>• Sensor</li> </ul>	-40 ... +70 °C (-40 ... +158 °F)		
<ul style="list-style-type: none"> <li>• With compact transmitter MAG 5000/6000</li> </ul>	-20 ... +50 °C (-4 ... +122 °F)		
<ul style="list-style-type: none"> <li>• With compact transmitter MAG 6000 I</li> </ul>	-20 ... +60 °C (-4 ... +140 °F)		
Operating pressure (Abs)	0.01 ... 40 bar (0.15 ... 580 psi)	0.03 ... 20 bar (0.44 ... 290 psi)	0.01 ... 16 bar (0.15 ... 232 psi)
Enclosure rating			
<ul style="list-style-type: none"> <li>• Standard</li> </ul>	IP67 to EN 60529 / NEMA 4X/6 (1 mH <sub>2</sub> O for 30 minutes)		
<ul style="list-style-type: none"> <li>• Option</li> </ul>	IP68 to EN 60529 / NEMA 6P (10 mH <sub>2</sub> O continuously)		
Pressure drop at 3 m/s (10 ft/s)	As straight pipe	Max. 25 mbar (0.36 psi)	As straight pipe
<b>Medium conditions</b>			
Temperature of medium			
<ul style="list-style-type: none"> <li>• NBR</li> </ul>	-10 ... +70 °C (14 ... +158 °F)		
<ul style="list-style-type: none"> <li>• EPDM</li> </ul>	-10 ... +70 °C (14 ... +158 °F)		
EMC	89/336 EEC		
<b>Design</b>			
Weight	See dimensional drawings		
Material			
<ul style="list-style-type: none"> <li>• Housing and flanges</li> </ul>	Carbon steel, St 37.2		
<ul style="list-style-type: none"> <li>• Terminal box</li> </ul>	Standard Fibre glass reinforced polyamide		
<ul style="list-style-type: none"> <li>• Measuring pipe</li> </ul>	AISI 304 (1.4301)		
<ul style="list-style-type: none"> <li>• Liner</li> </ul>	NBR Hard Rubber (hydro carbon resistant) EPDM		
<ul style="list-style-type: none"> <li>• Electrodes</li> </ul>	Hastelloy C276		
<ul style="list-style-type: none"> <li>• Grounding electrodes standard</li> </ul>	Hastelloy C276		
<b>Certificates and approvals</b>			
Custody Transfer (only together with MAG 5000/6000 CT), order as special	OIML R 49 pattern approval cold water (Denmark and Germany): DN 50 ... 300 (2" ... 12") MI 001 cold water (EU): DN 50 ... 300 (2" ... 12")		
Approvals	CSA/FM Class 1, Div 2		
Drinking water approvals			
<ul style="list-style-type: none"> <li>• EPDM</li> </ul>	NSF61 (Cold water, US) WRAS (WRc, BS6920 cold water, GB) ACS listed (F), DVGW W270 (D) Belaqua (B)		
<ul style="list-style-type: none"> <li>• NBR</li> </ul>	NSF61 (Cold water, US)		
Approvals	PED – 97/23 EC <sup>1)</sup> , CRN		

<sup>1)</sup> For sizes larger than 600 mm (24") in PN 16 PED conformity is available as a cost added option. The basic unit will carry the LVD (Low Voltage Directive) and EMC approval.

# Flowmeters

## MAG 5100 W

Selection and Ordering data	Order No.
<b>Flowsensor MAG 5100 W</b>	7ME 6 5 2 0 -
Hastelloy electrodes, carbon steel flanges	777 17 - 2777
<b>Diameter</b>	
DN 25 (1")	} 2 D
DN 40 (1½")	} 2 R
DN 50 (2")	} 2 Y
DN 65 (2½")	} 3 F
DN 80 (3")	} 3 M
DN 100 (4")	} 3 T
DN 125 (5")	} 4 B
DN 150 (6")	} 4 H
DN 200 (8")	} 4 P
DN 250 (10")	} 4 V
DN 300 (12")	} 5 D
DN 350 (14")	} 5 K
DN 400 (16")	} 5 R
DN 450 (18")	} 5 Y
DN 500 (20")	} 6 F
DN 600 (24")	} 6 P
DN 700 (28")	} 6 Y
DN 750 (30")	} 7 D
DN 800 (32")	} 7 H
DN 900 (36")	} 7 M
DN 1000 (40")	} 7 R
42"	} 7 U
44"	} 7 V
DN 1200 (48")	} 8 B
<b>Flange norm and pressure rating</b>	
<u>to EN 1092-1</u>	
PN 10 (DN 200 ... 1200/8" ... 48")	} B
PN 16 (DN 50 ... 1200/2" ... 48")	} C
PN 16, non PED (DN 700 ... 1200/28" ... 48")	} D
PN 40 (DN 25 ... 40/1" ... 1½")	} F
<u>to ANSI B16.5</u>	
class 150 (1" ... 24")	} J
<u>to AWWA C-207</u>	
Class D (28" ... 48")	} L
<u>to AS 4087</u>	
PN 16	} N
<b>Liner material</b>	
EPDM	2
NBR Hard Rubber	3
<b>Transmitter</b>	
Sensor for remote transmitter (Order transmitter separately)	A
MAG 6000 I, Aluminum, 18 ... 90 V DC, 115 ... 230 V AC	C
MAG 6000, Polyamid, 11 ... 30 V DC/11 ... 24V AC	H
MAG 6000, Polyamid, 115/230 V AC	J
MAG 5000, Polyamid, 11 ... 30 V DC/11 ... 24V AC	K
MAG 5000, Polyamid, 115/230 V AC	L

Selection and Ordering data	Order No.
<b>Flowsensor MAG 5100 W</b>	7ME 6 5 2 0 -
Hastelloy electrodes, carbon steel flanges	777 17 - 2777
<b>Communication</b>	
None	} A
HART	} B
PROFIBUS PA Profile 3 (only MAG 6000/MAG 6000 I)	} F
PROFIBUS DP Profile 3 (only MAG 6000/MAG 6000 I)	} G
MODBUS RTU/RS 485 (only MAG 6000/MAG 6000 I)	} E
FOUNDATION Fieldbus H1 (only MAG 6000/MAG 6000 I)	} J
<b>Cable glands/terminal box</b>	
Metric	1
½" NPT	2
} Available ex stock	

Selection and Ordering data	Order code
<b>Additional information</b>	
Please add "-Z" to Order No. and specify Order code(s) and plain text.	
Customer specific converter setup	Y20
Tag name plate, stainless steel fixed with SS wire (add plain text)	Y17
Tag name plate, plastic (self adhesive)	Y18
Factory certificate according to EN 10204-2.1	C15
Factory certificate according to EN 10204-2.2	C14
Sensor cables wired (specify cable order no.)	Y40
Sensor for remote transmitter's junction box potted to IP68 with wired cable (specify cable order no.)	Y41
Other postproduction requirements (add desired text)	Y99

Description	Order No.
Potting kit for terminal box of sensors for IP68/NEMA 6P (Not ATEX)	FDK-085U0220



MAG 5000/6000 transmitters and sensors are packed in separate boxes, the final assembly takes place during installation at the customer's place. MAG 6000 I transmitters and sensors are delivered compact mounted from factory. Communication module will be pre-mounted in the transmitter.

Please use online Product selector to get latest updates.

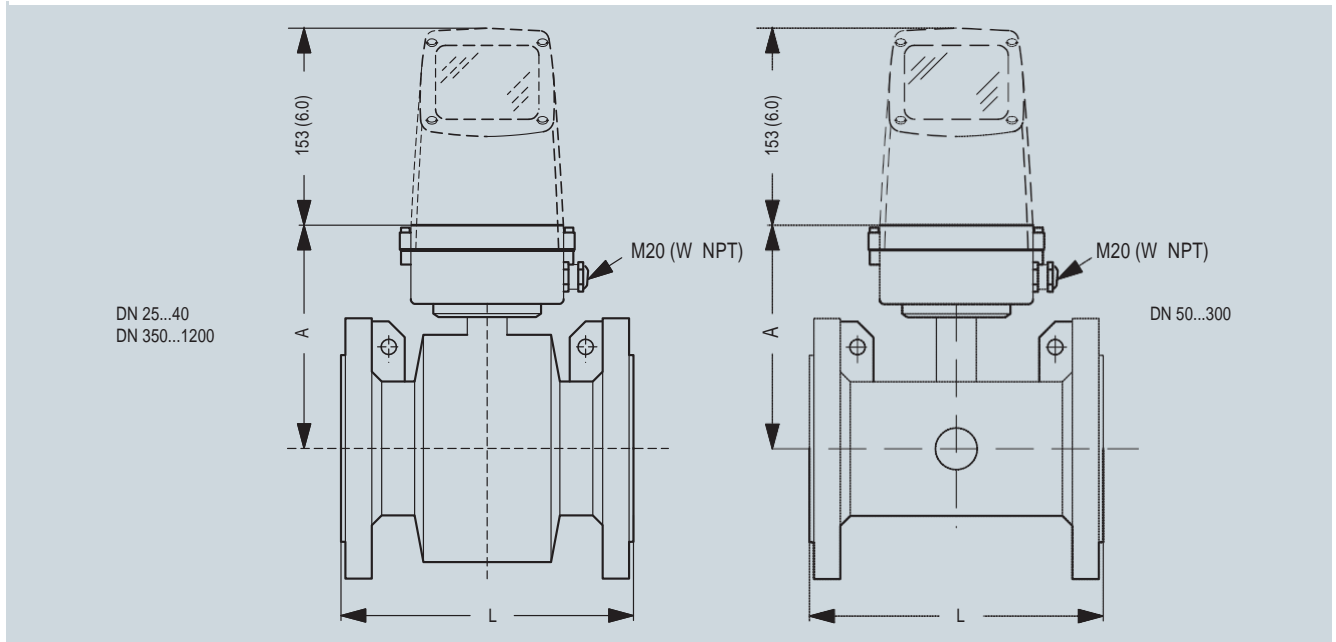
Product selector link:

[www.pia-selector.automation.siemens.com](http://www.pia-selector.automation.siemens.com)

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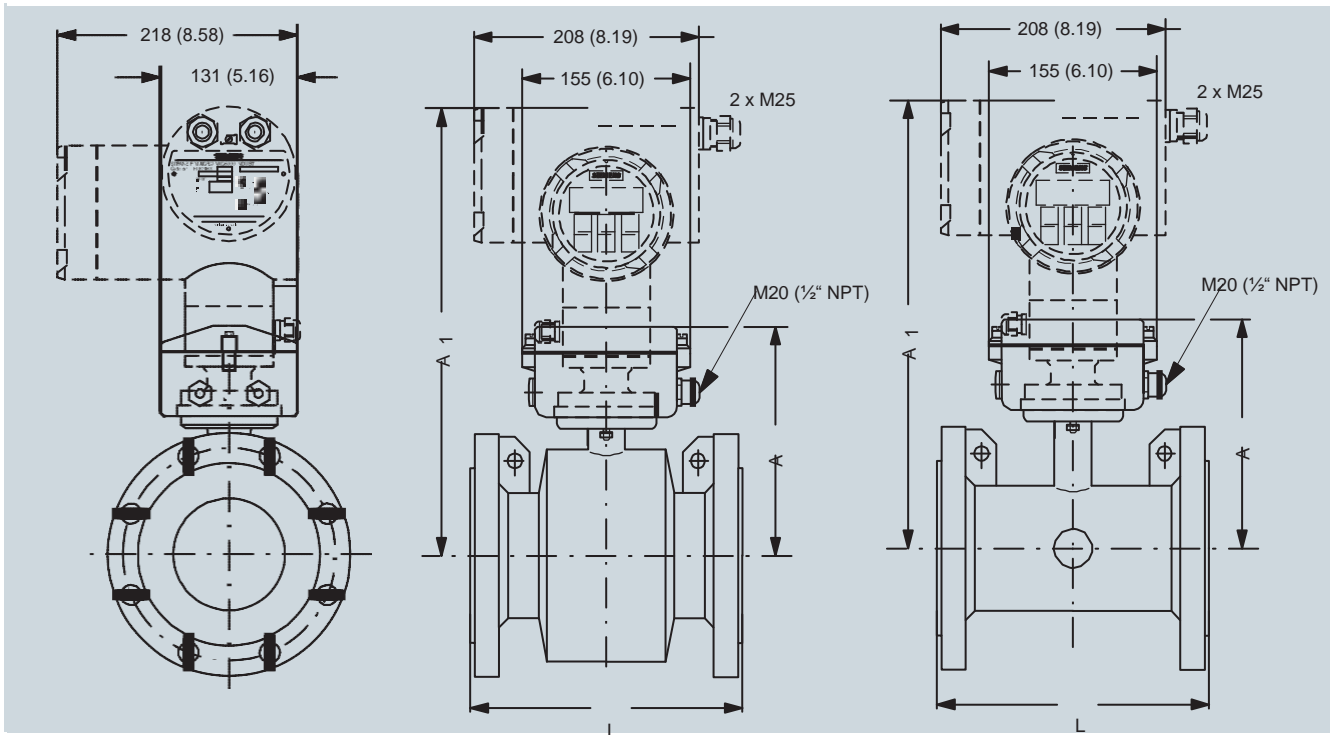
## Dimensional drawings



Nominal size		A		L									
				PN 10		PN 16		PN 40		Class 150 / AWWA		AS	
[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
25	1	187	7.4	-	-	-	-	200	7.9	200	7.9	200	7.87
40	1½	197	7.8	-	-	-	-	200	7.9	200	7.9	200	7.87
50	2	188	7.4	-	-	200	7.9	-	-	200	7.9	200	7.87
65	2½	194	7.6	-	-	200	7.9	-	-	200	7.9	200	7.87
80	3	200	7.9	-	-	200	7.9	-	-	200	7.9	200	7.87
100	4	207	8.1	-	-	250	9.8	-	-	250	9.8	250	9.84
125	5	217	8.5	-	-	250	9.8	-	-	250	9.8	250	9.84
150	6	232	9.1	-	-	300	11.8	-	-	300	11.8	300	11.81
200	8	257	10.1	350	13.8	350	13.8	-	-	350	13.8	350	13.78
250	10	284	11.2	450	17.7	450	17.7	-	-	450	17.7	450	17.72
300	12	310	12.2	500	19.7	500	19.7	-	-	500	19.7	500	19.69
350	14	382	15.0	550	21.7	550	21.7	-	-	550	21.7	550	21.65
400	16	407	16.0	600	23.6	600	23.6	-	-	600	23.6	600	23.62
450	18	438	17.2	600	23.6	600	23.6	-	-	600	23.6	600	23.62
500	20	463	18.2	600	23.6	600	23.6	-	-	600	23.6	600	23.6
600	24	514	20.2	600	23.6	600	23.6	-	-	600	23.6	600	23.6
700	28	564	22.2	700	27.6	700	27.6	-	-	700	27.6	700	27.6
750	30	591	23.3	-	-	-	-	-	-	750	29.5	750	-
800	32	616	24.3	800	31.5	800	31.5	-	-	800	31.5	800	31.5
900	36	663	26.1	900	35.4	900	35.4	-	-	900	35.4	900	35.4
1000	40	714	28.1	1000	39.4	1000	39.4	-	-	1000	39.4	1000	39.4
	42	714	28.1	-	-	-	-	-	-	1000	39.4	-	-
	44	765	30.1	-	-	-	-	-	-	1100	43.3	-	-
1200	48	820	32.3	1200	47.2	1200	47.2	-	-	1200	47.2	1200	47.2

- not available

## MAG 5100 W / 6000 I Compact



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Nominal size		A		A <sub>1</sub>		L									
						PN 10		PN 16		PN 40		Class 150/AWWA		AS	
[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
25	1	187	7.4	340	13.4	-	-	-	-	200	7.9	200	7.9	200	7.87
40	1½	197	7.8	350	13.8	-	-	-	-	200	7.9	200	7.9	200	7.87
50	2	188	7.4	341	13.4	-	-	200	7.9	-	-	200	7.9	200	7.87
65	2½	194	7.6	347	13.7	-	-	200	7.9	-	-	200	7.9	200	7.87
80	3	200	7.9	353	13.9	-	-	200	7.9	-	-	200	7.9	200	7.87
100	4	207	8.1	360	14.2	-	-	250	9.8	-	-	250	9.8	250	9.84
125	5	217	8.5	370	14.6	-	-	250	9.8	-	-	250	9.8	250	9.84
150	6	232	9.1	385	15.2	-	-	300	11.8	-	-	300	11.8	300	11.81
200	8	257	10.1	410	16.1	350	13.8	350	13.8	-	-	350	13.8	350	13.78
250	10	284	11.2	437	17.2	450	17.7	450	17.7	-	-	450	17.7	450	17.72
300	12	310	12.2	463	18.2	500	19.7	500	19.7	-	-	500	19.7	500	19.69
350	14	382	15.0	535	21.1	550	21.7	550	21.7	-	-	550	21.7	550	21.65
400	16	407	16.0	560	22.1	600	23.6	600	23.6	-	-	600	23.6	600	23.62
450	18	438	17.2	591	23.3	600	23.6	600	23.6	-	-	600	23.6	600	23.62
500	20	463	18.2	616	24.3	600	23.6	600	23.6	-	-	600	23.6	600	23.6
600	24	514	20.2	667	26.3	600	23.6	600	23.6	-	-	600	23.6	600	23.6
700	28	564	22.2	717	28.2	700	27.6	700	27.6	-	-	700	27.6	700	27.6
750	30	591	23.3	744	29.3	-	-	-	-	-	-	750	29.5	750	-
800	32	616	24.3	779	30.7	800	31.5	800	31.5	-	-	800	31.5	800	31.5
900	36	663	26.1	826	32.5	900	35.4	900	35.4	-	-	900	35.4	900	35.4
1000	40	714	28.1	877	34.5	1000	39.4	1000	39.4	-	-	1000	39.4	1000	39.4
	42	714	28.1	877	34.5	-	-	-	-	-	-	1000	39.4	-	-
	44	765	30.1	928	36.5	-	-	-	-	-	-	1100	43.3	-	-
1200	48	820	32.3	983	38.7	1200	47.2	1200	47.2	-	-	1200	47.2	1200	47.2

- not available

# Flowmeters

## MAG 5100 W

### Weight

Nominal size		PN 10		PN 16		PN 40		Class 150/AWWA		AS	
[mm]	[inch]	[kg]	[lbs]	[kg]	[lbs]	[kg]	[lbs]	[kg]	[lbs]	[kg]	[lbs]
25	1	-	-	-	-	4	9	4	9	4	9
40	1½	-	-	-	-	7	15	6	13	7	15
50	2	-	-	9	20	-	-	8	20	9	20
65	2½	-	-	10.7	24	-	-	11	24	10.7	24
80	3	-	-	11.6	26	-	-	13	28	11.6	26
100	4	-	-	15.2	33	-	-	19	41	15.2	33
125	5	-	-	20.4	45	-	-	24	52	20.4	45
150	6	-	-	26	57	-	-	29	64	26	57
200	8	48	106	48	106	-	-	56	124	48	106
250	10	64	141	69	152	-	-	79	174	69	152
300	12	76	167	86	189	-	-	110	243	86	189
350	14	104	229	125	274	-	-	139	307	115	254
400	16	119	263	143	314	-	-	159	351	125	277
450	18	136	299	173	381	-	-	182	400	141	311
500	20	163	359	223	491	-	-	225	495	189	418
600	24	236	519	338	744	-	-	320	704	301	664
700	28	270	595	314	692	-	-	273	602	320	704
750	30	-	-	-	-	-	-	329	725	-	-
800	32	346	763	396	873	-	-	365	804	428	944
900	36	432	951	474	1043	-	-	495	1089	619	1362
1000	40	513	1130	600	1321	-	-	583	1282	636	1399
	42	-	-	-	-	-	-	687	1512	-	-
	44	-	-	-	-	-	-	763	1680	-	-
1200	48	643	1415	885	1948	-	-	861	1896	813	1789

- not available

With transmitter MAG 5000 and MAG 6000 compact, weight is increased by approximately 0.8 kg (1.8 lbs), with MAG 6000 I, weight is increased by 5.5 kg (12.1 lb).

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