

SITRANS F M MAGFLO®

Electromagnetic flowmeters

Transmitter type MAG 6000 19" &

safety barrier [EEx ia/ib] IIB


sensor type MAG 1100 Ex & MAG 3100 Ex




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1. Introduction

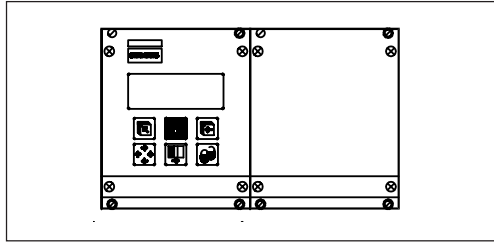
 For safety reasons it is important that the following points, especially the points marked with a warning sign, are read and understood before the system is being installed:

- Installation, connection, commissioning and service must be carried out by personnel who are qualified and authorized to do so.
- It is very important that the same people have read and understand the instructions and directions provided in this manual and that they follow the instructions and directions before taking the equipment into use!
- People who are authorized and trained by the owner of the equipment may operate the equipment.
- The installation must ensure that the measuring system is correctly connected and is in accordance with the connection diagram. The transmitter has to be earthed unless the power supply is galvanically isolated.
- In applications with working pressures/media that can be dangerous to people, surroundings, equipment or others in case of pipe fracture, we recommend that special precautions such as special placement, shielding or installation of a security guard or a security valve should be made when the sensor is being installed.
- Siemens Flow Instruments want to assist by estimating the chemical resistance of the sensor parts that are in connection with the media, but it is at any time the customer's responsibility, which materials are chosen and Siemens Flow Instruments takes no responsibility if the sensor corrodes!
- Equipment used in hazardous areas must be Ex-approved and marked  for Europe and UL for USA.
It is required that the special directions provided in the manual and in the Ex certificate must be followed!
- Installation of the equipment must comply with national regulations.
Example EN 60079-14 for Denmark.
- Repair and service can be done by approved Siemens Flow Instruments personnel only.

2. Installation

2.1 Installation of transmitter MAG 6000

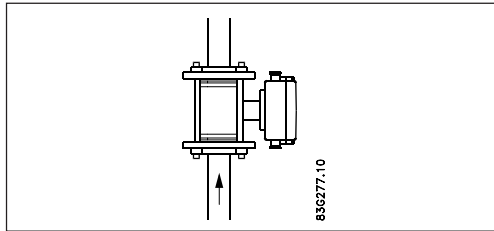
 **Safe area only!**



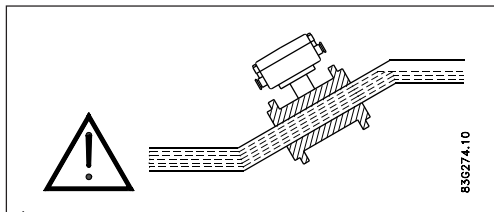
Transmitter MAG 6000 can be installed in the **safe area only!**

2.2 Installation of sensor

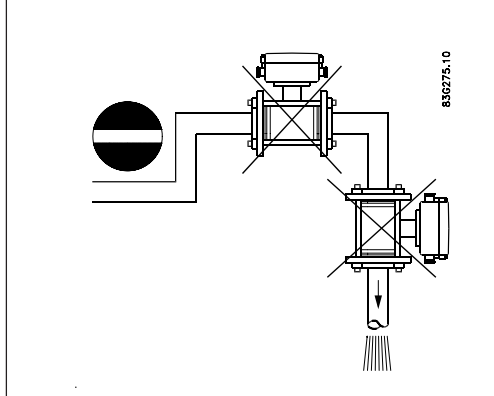
 **Hazardous area**

**Category 2 equipment**

Sensors may be installed in zone 1 and zone 2.

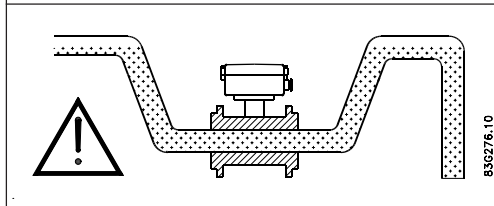


The sensor must always be completely full with liquid.

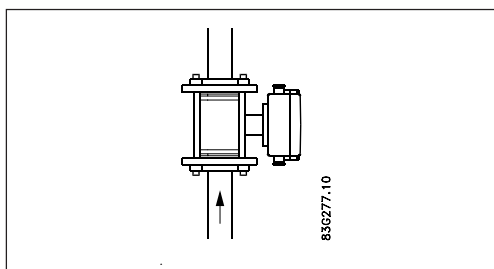


Therefore avoid:

- Installation at the highest point in the pipe system
- Installation in vertical pipes with free outlet

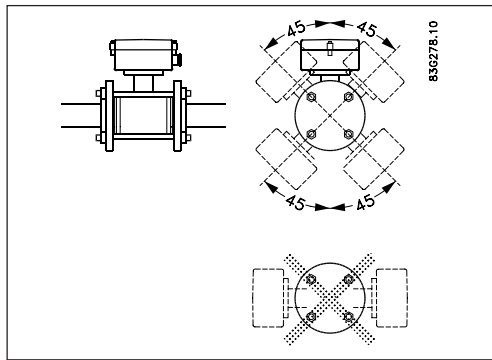


For partially filled pipes or pipes with downward flow and free outlet the flowmeter should be located in a U-tube.

**Installation in vertical pipes**

Recommended flow direction: upwards. This minimizes the effect on the measurement of any gas/air bubbles in the liquid.

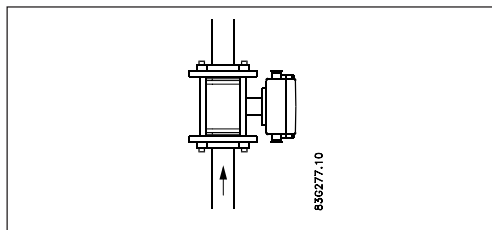
2.2 Installation of sensor
(continued)



Installation in horizontal pipes

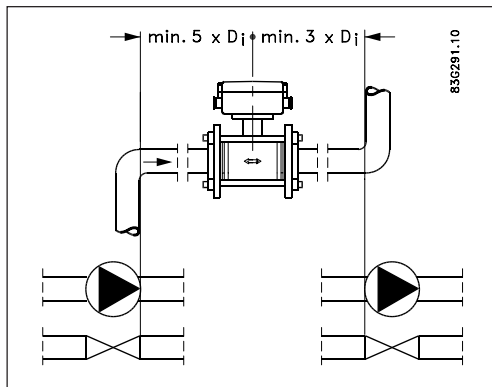
The sensor must be mounted as shown in the upper figure. Do not mount the sensor as shown in the lower figure. This will position the electrodes at the top where there is possibility for air bubbles and at the bottom where there is possibility for mud, sludge, sand etc.

If using empty pipe detection the sensor can be tilted 45°, as shown in the upper figure.



Measuring abrasive liquids and liquids containing particles

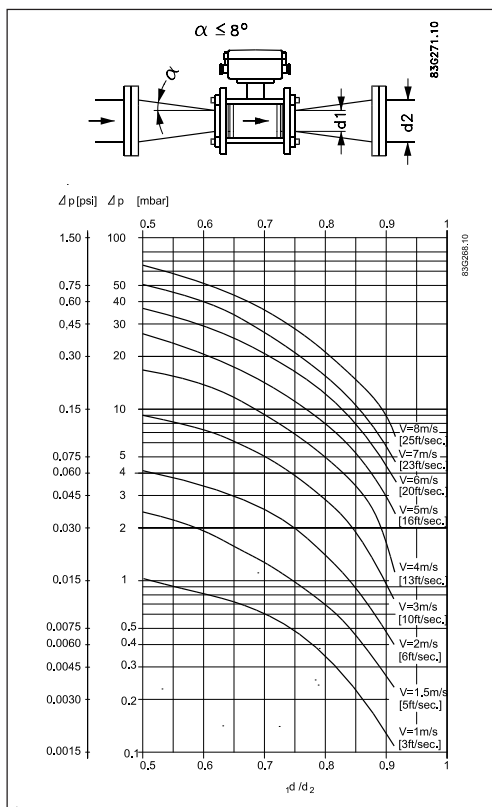
Recommended installation is in a vertical/inclined pipe to minimize the wear and deposits in the sensor.



Inlet and outlet conditions

To achieve accurate flow measurement it is essential to have straight lengths of inlet and outlet pipes and a certain distance between pumps and valves.

It is also important to centre the flowmeter in relation to pipe flanges and gaskets.



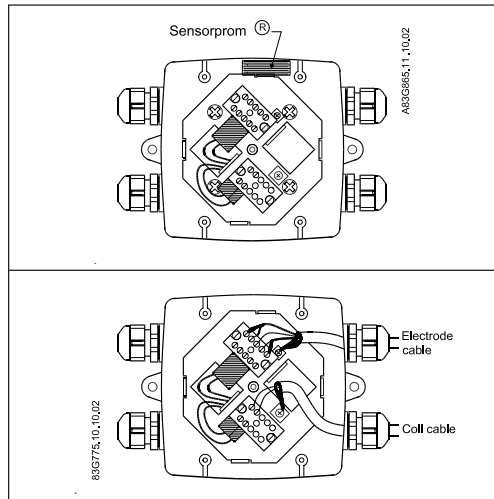
Installation in large pipes

The flowmeter can be installed between two reducers (e.g. DIN 28545). Assuming that at 8° the following pressure drop curve applies. The curves are applicable to water.

Example:

A flow velocity of 3 m/s (V) in a sensor with a diameter reduction from DN 100 to DN 80 ($d_1/d_2 = 0.8$) gives a pressure drop of 2.9 mbar.

2.3.1 Remote installation - At the sensor



Remove the SENSORPROM® unit from the sensor and mount it on the connection plate in the transmitter.

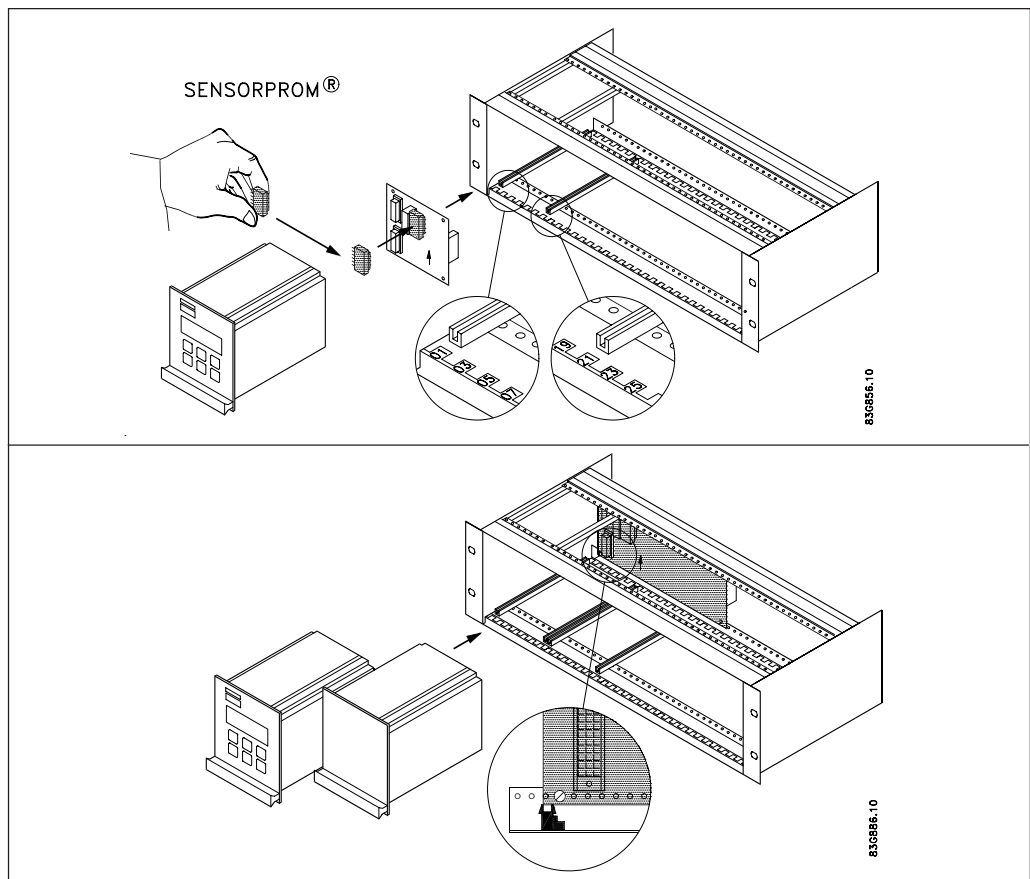
Fit and connect the electrode and coil cables as shown in chapter 7 "Electrical connections" in the handbook.

The unscreened cable ends must be kept as short as possible.

The electrode cable and the coil cable must be kept separate to prevent interference.

Tighten the cable glands well to obtain optimum sealing.

2.3.2 Remote installation - Transmitter in 19" insert



1. Fit the SENSORPROM® memory unit on the connection board supplied with the transmitter. The SENSORPROM® unit is supplied with the sensor in the terminal box.
2. Mount the guide rails into the rack system as shown. Distance between guide rails is 20 TE. Guide rails are supplied with the rack system and not with the transmitter.
3. Mount the connection board as shown.
4. Connect the cables as shown under "Electrical connection", chapter 7 in the handbook.
5. Insert the transmitter into the rack system.

2.4 Ex survey according to Directive 94/9/EC (ATEX)

as an example:

II 2G E Ex ia IIB T3-T6

Directive 94/9/EC (ATEX)

Instrument groups _____

I	Applies to instruments used in underground mining operations, as well as their above ground operations, which can be endangered by mine gas and/or flammable dusts.
II	Applies to instruments used in the remaining areas which can be endangered by a potentially explosive atmosphere.

Instrument category _____

Labelling with gases	Labelling with dusts	Definition
1G (0)	1D (20)	Instruments of this category are for use in areas where ignitable atmospheres, caused by a mixture of air and gasses, vapours or mists or by dust/air mixtures, can exist all of the time or for long periods of time or else frequently.
2G (1)	2D (21)	Instruments of this category are for use in areas where ignitable atmospheres caused, by a mixture of air and gasses, vapours or mists or by dust/air mixtures, can exist some of the time.
3G (2)	3D (22)	Instruments of this category are for use in areas where ignitable atmospheres, caused by a mixture of air and gasses, vapours or mists or by dust/air mixtures, are not likely to exist. However, if they do occur then in all probability, only seldom or for short periods of time.

(The figures in brackets refer to IEC)

Built according to European norm = E _____

Explosion protected electrical equipment = Ex _____

Ex protection labelling in square brackets refers to "Associated electrical equipment"

Type of protection _____

o Oil encapsulated	i Intrinsic safety (ia, ib)
p Pressurized apparatus	n Non-incentive equipment
q Powder filling	m Encapsulation
d Flameproof enclosure	s Special protection
e Increased safety	

Explosion groups _____

Gases and vapours (examples)	Minimum ignition energy [mJ]	EN/IEC
• Ammonia	-	IIA
• Acetone, aircraft fuel, benzine, crude oil, diesel oil, ethane, ethanoic acid, ether, gasolines, heating oil, hexane, methane, propane	0.18	IIA
• Ethylene, isoprene, town gas	0.06	IIB
• Acetylene, carbon disulphide, hydrogen	0.02	IIC

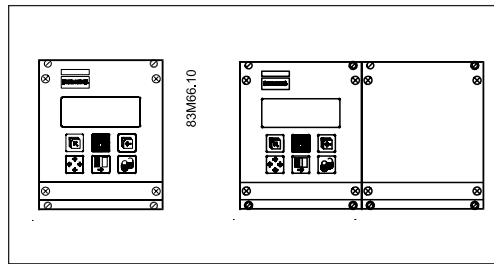
Ignition temperature _____

Maximum surface temperature	EN / IEC
450°C 842°F	T1
300°C 572°F	T2
200°C 392°F	T3
135°C 275°F	T4
100°C 212°F	T5
85°C 185°F	T6

EN 50014

2.5 Overview and intrinsically safe data

MAG 6000 19" IP 20 & IP 65 [EEx ia] IIB



Can **only** be installed in **safe area!**

All MAG 1100 Ex and MAG 3100 Ex sensors have the following ratings and input parameters:

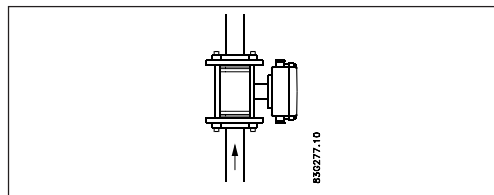
Specifications:

Supply: 115-230 V or 24 V
Ambient temperature: -20 to 50°C
Enclosure: IP 20 or IP 65

IS data transmitter

Terminals MAG barriers	85-86 ib coil	82-83 ia electrode
U _o	28 V	9.3 V
I _o	138 mA	40 mA
P _o		0.4 W
L _o	4 mH	23 mH
C _o	100 nF	500 nF

**MAG 1100 & MAG 3100
EEx ia IIB T3...T6**

**Category 2 equipment**

Sensors may be installed in zone 1 and zone 2.

Sensors intrinsically safe data

See table below.

IS data sensor

MAG 1100 DN 6 - 100
MAG 3100 DN 15 - 300 Ex ib

Terminals MAG sensor	85-86 coil	82-83 electrode
U _i	28 V	10 V
I _i	140 mA	50 mA
P _i	2 W	0.5 W
L _i	2 mH	20 mH
C _i	50 nF	50 nF

MAG 3100 DN 350 - 2000 Ex e ia

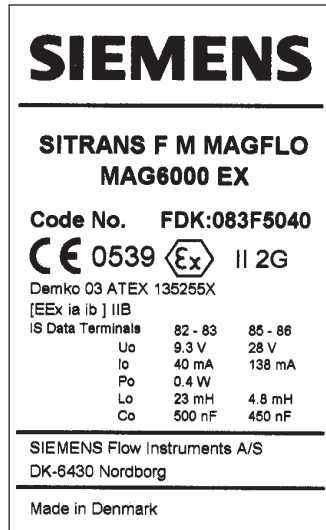
Terminals MAG sensor	85-86 coil	82-83 electrode
U _i	-	10 V
I _i	-	50 mA
P _i	-	0.5 W
L _i	-	20 mH
C _i	-	50 nF

2.6 Device identification

**Sensor MAG 1100 Ex or
MAG 3100 Ex label**

SIEMENS		SITRANS F M MAGFLO MAG3100Ex	
SIRA No.03ATEX1442X		Ex II 2 (1) (2) G	
EEx d [ia] [ib] IIB T4-T6		CE 0518	
Ex ia TERMINALS: U _i =10V , I _i =50mA , P _i =0.5W, C _i =50nF, L _i =20mH.			
Ex ib TERMINALS: U _i =28V , I _i =140mA , P _i =2W, C _i =50nF, L _i =2mH.			
SITRANS F M MAGFLO MAG3100 Ex			
Nom. Size	DN100	Type No.	3100-121C214100
Nom. Press.	16 Bars	Code No.	083Z3264
Lining	NEOPRENE	Serial No.	000135T093
Electrode	STAINLESS STEEL	Cal Factor.	20.6892
Flange	PN16	Enclosure	IP68 Year 03
Fluid Temp. °C	70°C	User Tag No.	
SIEMENS Flow Instruments Ltd. Magflo House, GL10 2LU. ENGLAND.			

Transmitter
MAG 6000 19" IP 20 and
IP 65 label



2.7 Approvals

SITRANS F M MAGFLO® sensors carry the following approvals

MAG 1100 Ex for mounting in Ex areas DN 6 - DN 100

EEx [ia] [ib] IIB T4...T6, Ex II 2 (1)(2)
SIRA 03 ATEX 1423X CE 0518

Temperature ratings are as follows:

T4 (max. surface < 135°C) for liquid temperatures lower than 100°C
T5 (max. surface < 100°C) for liquid temperatures lower than 82°C
T6 (max. surface < 85°C) for liquid temperatures lower than 67°C
For an ambient temperature of -20°C to + 50°C

MAG 3100 Ex for mounting in Ex areas DN 15 - DN 300

EEx-d [ia] [ib] IIB T4...T6, Ex II 2 (1)(2)
SIRA 03 ATEX 1442X CE 0518

Temperature ratings are as follows*):

T4 (max. surface < 135°C) for liquid temperatures lower than 100°C
T5 (max. surface < 100°C) for liquid temperatures lower than 87°C
T6 (max. surface < 85°C) for liquid temperatures lower than 72°C
For an ambient temperature of -20°C to +50°C

DN 350 - DN 2000

EEx e ia IIC T3...T6, Ex II 2 GD IP 65 T(**)°C
SIRA 03 ATEX 3339X CE 0518

where (**) represents the pipeline temperature + 5K for the purposes of the dust approval

Temperature ratings are as follows*):

T3 (max. surface < 200°C) for liquid temperatures lower than 190°C
T4 (max. surface < 135°C) for liquid temperatures lower than 125°C
T5 (max. surface < 100°C) for liquid temperatures lower than 90°C
T6 (max. surface < 85°C) for liquid temperatures lower than 75°C
For an ambient temperature of -20°C to +40°C

MAG 6000 & safety barriers carry the following approvals

For use with **MAG 1100 Ex (all sizes) and MAG 3100 Ex sizes DN 15 - DN 300** for mounting in the safe area

[EEx ia ib] IIB, Ex II 2 G
DEMKO 03 ATEX 135255X CE539

For use with **MAG 3100 Ex sizes DN 350 - DN 2000**, for mounting in the safe area

[EEx ia] IIC, Ex II 2 G
DEMKO 03 ATEX 135254X CE539

*) Note

Temperature ratings may be limited by the lining selected, see section 4.2.2.

2.8 Special conditions for safe use

MAG 3100 Ex DN 40 - DN 300

The relation between assigned temperature ambient temperature and media temperature:

Temperature class	Ambient temperature range	Media temperature range
T6	-20 °C to +50 °C	-20 °C to +60 °C
T5	-20 °C to +50 °C	-20 °C to +75 °C
T4	-20 °C to +50 °C	-20 °C to +100 °C

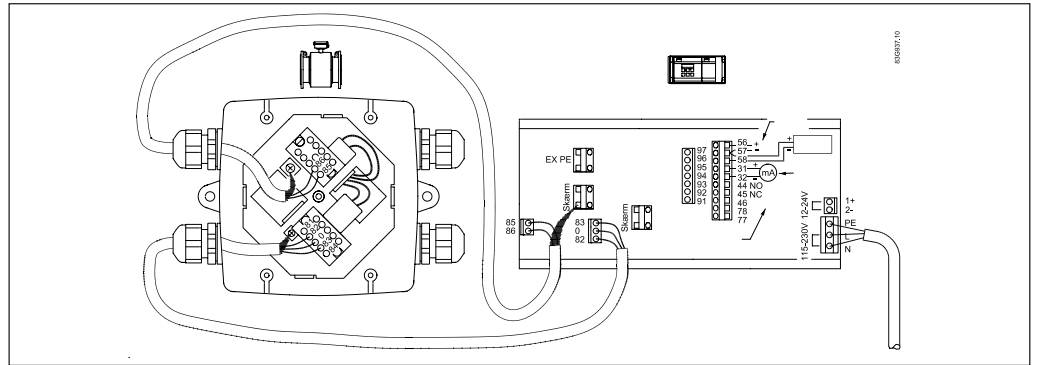
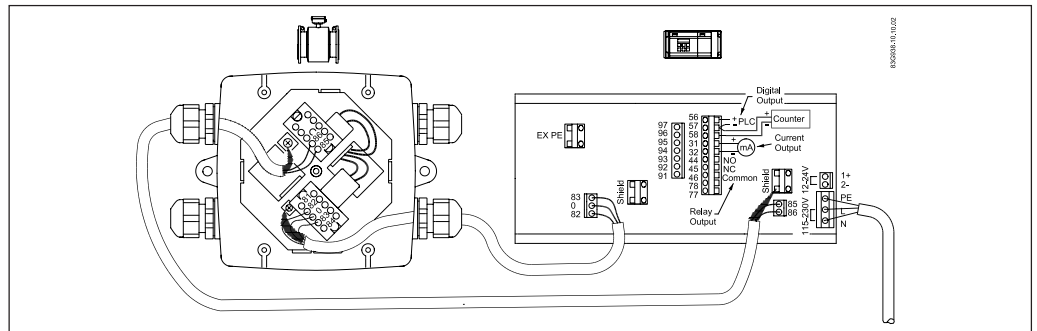
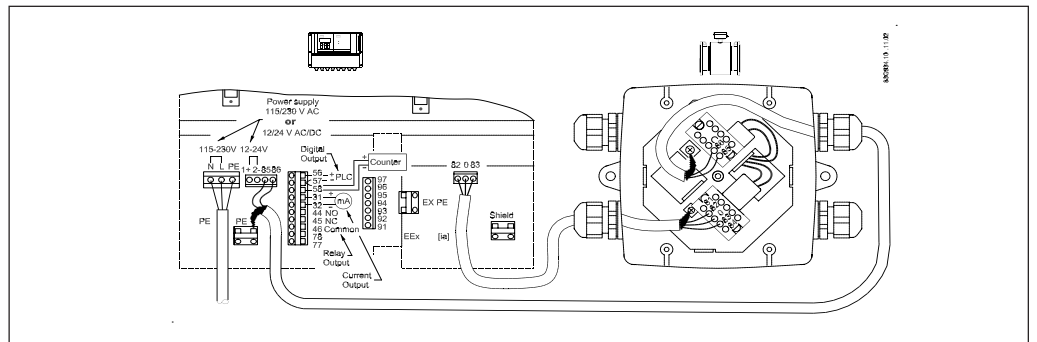
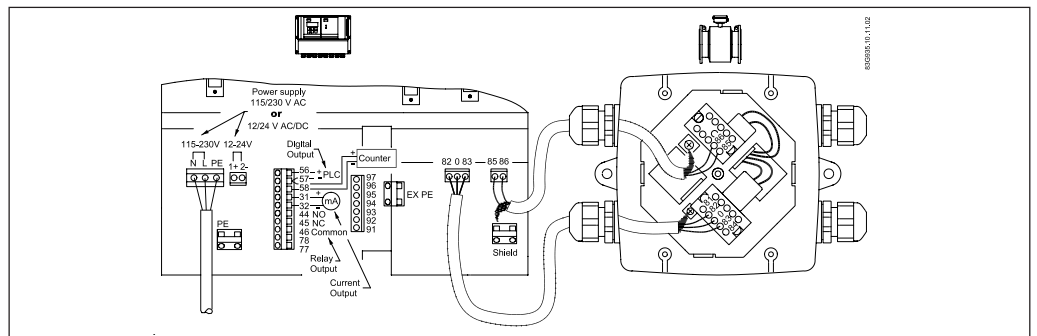
This electrode circuit "ia" is **connected** to the media inside the sensor. The screen for the "ib" circuit is **connected** to chassis and the installations shall therefore take that into account.

Safety Barrier type FDK:083F50_ _ for MAG sensors

Special conditions for safe use:

- The ambient temperature range is -20 °C to +50 °C.
- The safety barrier shall be connected to the PE earth (light blue) according to local installation equipments. IEC 60079-14 can be used as guideline.
- The PE earth shall be connected to the PE at the sensor according to local installation equipments. IEC 60079-14 can be used as guideline.
- The intrinsic safety wiring shall be separated from non intrinsic safety wiring according to local installation equipments.
- The apparatus must be installed in plastic enclosure code FDK:083F5038 with an **Ingress Protection** suitable for the environment. The plastic box FDK:083F5038 has been evaluated for IP 65 according to EN 60529: 1989.

3. Electrical connection

3.1.1 19" IP 20 version
EEx (ia/ib) DN ≤ 3003.1.2 19" IP 20 version
EEx e (ib) DN ≥ 3503.1.3 19" IP 66 version
EEx (ia/ib) DN ≤ 3003.1.4 19" IP 66 version
EEx e (ib) DN ≥ 350

1. Connection terminals to:

- Power supply
- In- and output

2. Connection terminals to:

Sensors

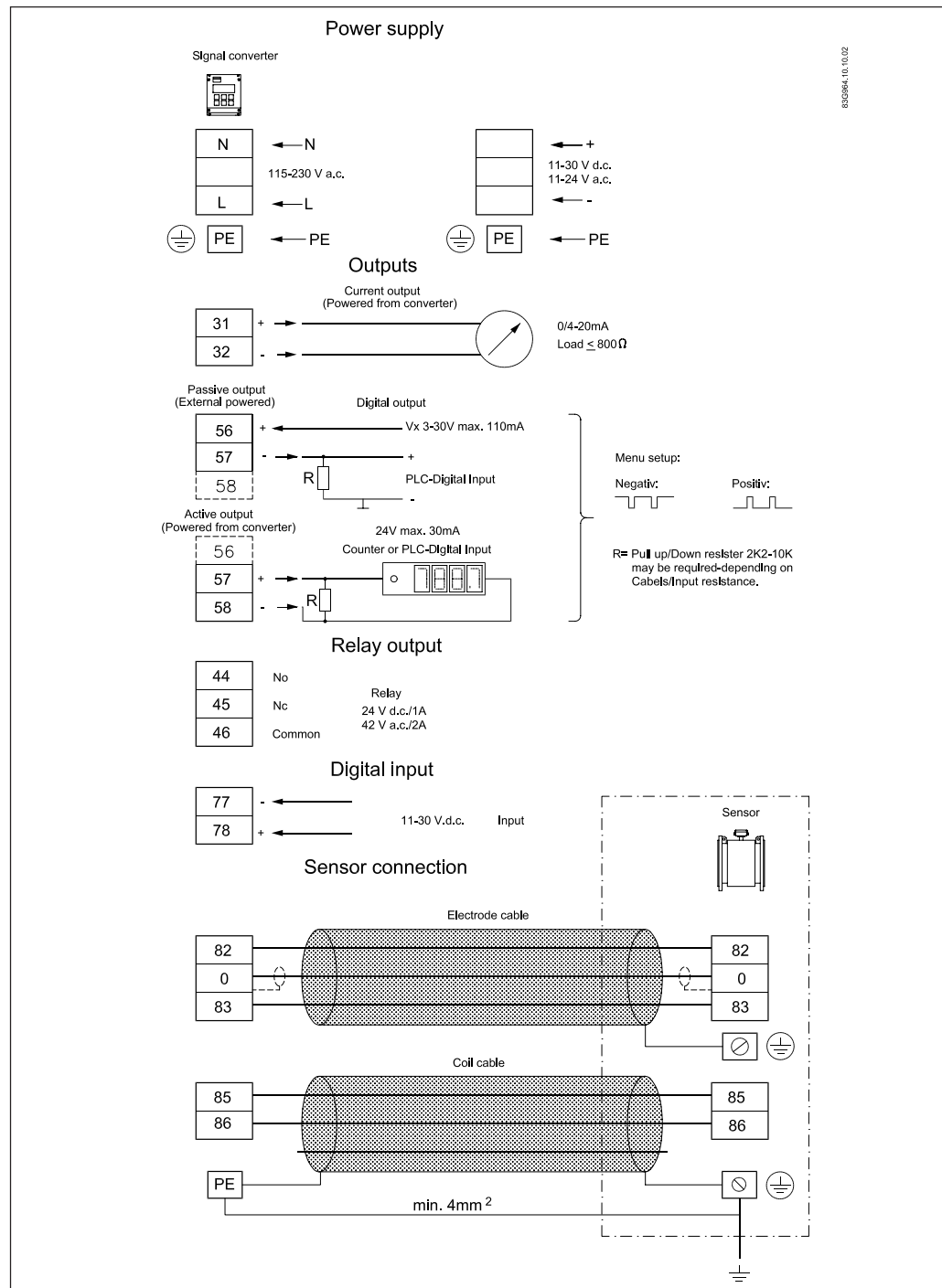
⚠ Intrinsically safe terminals!

It is an absolute requirement that the wires/terminals of the intrinsically safe circuits **cannot** get into contact with the wires of the other cables. The distance between cables/wires therefore must be at least 50 mm.

It is recommended to fasten the cables/wires in a way that they, even in case of an error, **cannot** get into contact with each other. Make the wire ends as short as possible.

3.2 Transmitter
MAG 6000

ENGLISH

**Installation**

- ⚠** 1) Mains supply 115 to 230 V AC from building installation Class II. A switch or circuit-breaker (max. 15 A) shall be included in the building installation. It must be in close proximity to the equipment and within easy reach of the OPERATOR, and it shall be marked as the disconnecting device for the equipment.
- ⊕** 2) Protective conductor terminal. Required cable min. AGW16 or 1.5 □ Cu. The insulation between the connected mains supply and 24 V AC/DC supply for the flowmeters, models 24 V AC/DC shall at least be rated with double or reinforced insulation at mains voltage.

For field wiring installation **National Installation Code** shall be met of the country, where the flowmeters are installed.

Digital output

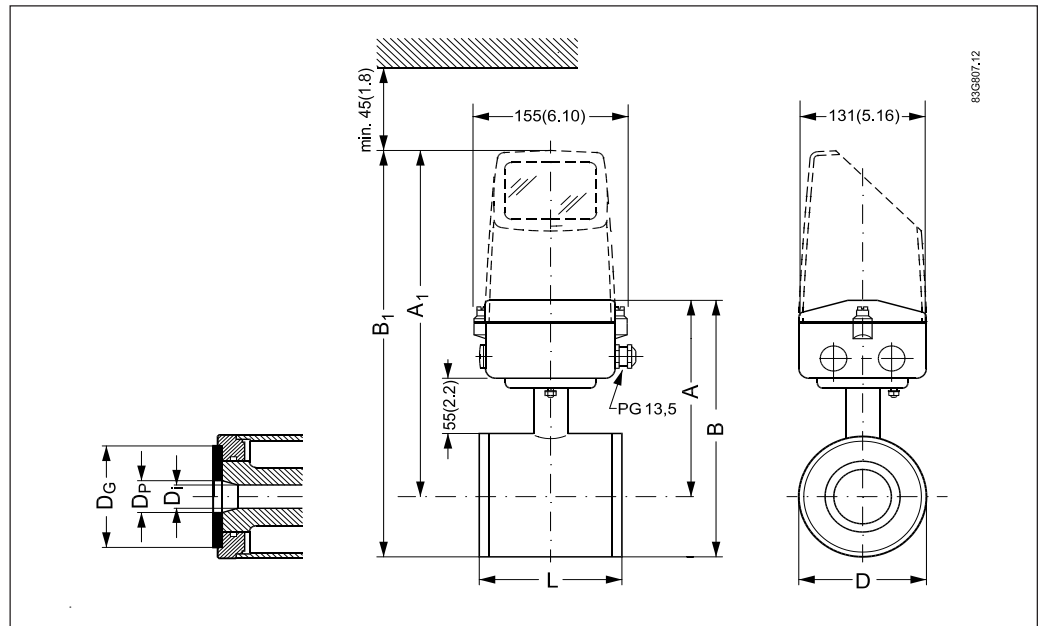
If the internal resistance of the loads exceeds 10KΩ, it is recommended to connect an external 10KΩ load resistor in parallel to the load.

4. Technical data

4.1.1 Dimensions and weight MAG 1100 Ex



MAG 1100/6000 and MAG 1100/5000, compact/separate



DN	A ¹⁾ [mm]	B ¹⁾ [mm]	A ₁ [mm]	B ₁ [mm]	D [mm]	D _i Ceramic [mm]	D _i (PFA) [mm]	D _p [mm]	D _G [mm]	Weight ²⁾ [kg]
6	161	186	314	339	48.3	6		17.3	34	2.2
10	161	186	314	339	48.3	10	10	17.3	34	2.2
15	161	186	314	339	48.3	15	16	17.3	40	2.2
25	169	201	322	354	63.4	25	26	28.5	56	2.7
40	181	223	334	376	84.0	40	38	43.4	75	3.4
50	189	240	342	393	101.6	50	50	54.5	90	4.2
65	199	259	352	412	120.0	65	66	62.5	112	5.5
80	205	271	358	424	133.0	80	81	82.5	124	7.0
100	218	297	371	450	159.0	100	100	107.1	150	10.0

¹⁾ 13 mm shorter when the AISI terminal box is used (high temperature 200 °C).

²⁾ With transmitter MAG 5000 or MAG 6000 installed, weight is increased by approx. 0.8 kg.

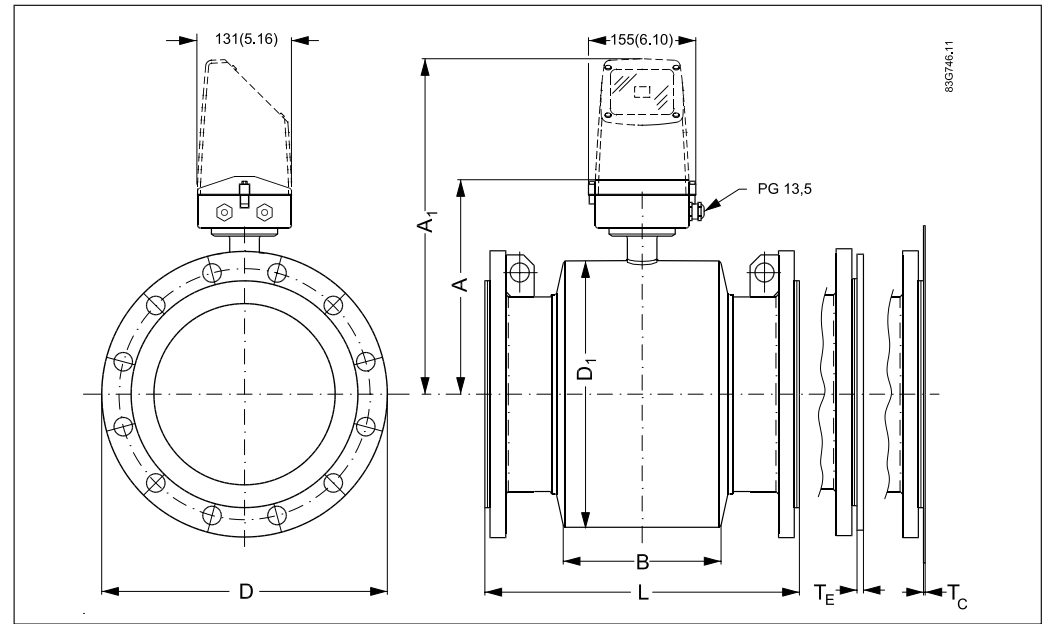
4.1.2 Sensor MAG 1100 Ex

Type		Flangeless sensor (Sandwich design)
Nominal size	<i>mm</i>	DN 6, 10, 15, 25, 40, 50, 65, 80, 100
Operating pressure		DN 6 - DN 65: 40 bar, DN 80: 37.5 bar, DN 100: 30 bar Vacuum: 1×10^{-6} bar
Temperature of medium		-20°C to +120°C
Temperature shock		(Duration > 1 min.):
<i>(Ceramic liner)</i>		DN 6, 10, 15, 25: Max. $\Delta T \leq 15^\circ\text{C}/\text{min.}$
		DN 40, 50, 65: Max. $\Delta T \leq 10^\circ\text{C}/\text{min.}$
		DN 80, 100: Max. $\Delta T \leq 5^\circ\text{C}/\text{min.}$
		(Duration ≤ 1 min., followed by 10 min. rest):
		DN 6, 10, 15, 25: Max. $\Delta T \leq 80^\circ\text{C}$
		DN 40, 50, 65: Max. $\Delta T \leq 70^\circ\text{C}$
		DN 80, 100: Max. $\Delta T \leq 60^\circ\text{C}$
Ambient temperature		Remote transmitter: -40°C to +100°C
Liner		Aluminium oxide Al_2O_3 (ceramics)
Electrodes		Platinum with gold/titanium brazing alloy
Enclosure		Stainless steel AISI 316 L (1.4404)
Terminal box		Stainless steel AISI 316 (1.4436)
Fixing studs		Stainless steel AISI 304 (1.4301) Number and size to EN 1092-1:2001
Mating flanges		EN 1092-1:2001, ANSI B16.5 class 150 and 300 or equivalent
Gaskets	<i>Standard</i>	EPDM (max. 150°C, PN 40)
	<i>Option</i>	Graphite (max. 200°C, PN 40)
	<i>Option</i>	PTFE (max. 130°C, PN 25)
Cable entries		4 Pg 13.5
Enclosure rating	<i>Standard</i>	IP 67 to EN 60529 (NEMA 4x) (1 m w.g for 30 min.)
	<i>Option</i>	IP 68 to EN 60529 (NEMA 6) (10 m w.g. cont.)
Mechanical load		18-1000 Hz random in all directions to EN 60068-2-36
<i>(vibration)</i>		Sensor: 3.17 G/Compact Ex-d: 1.14 G
Test pressure		80 bar ($2 \times \text{PN}$)
Approvals		See section 2.7
Excitation frequency		DN 6 - 65: 6.25 Hz DN 80 - 100: 3.125 Hz
Conforms to PED, LVT, EMC		PED - 97/23EC, LVD - 73/23 EEC + amendment 93/68/EEC, EMC - 89/336 EEX

4.2.1 Dimensions and weight MAG 3100 Ex



MAG 3100 Ex



DN	A ¹⁾	A ₁	B	D ₁	L ²⁾								AS 2129 E, AS 4087 Class 14-21- 35	AWWA C-207 Class D	T _C ³⁾	T _E ³⁾	Weight ⁴⁾
					EN 1092-1-2001						BS 1560/ ANSI 16.5						
					PN 6, 10	PN 16	PN 25	PN 40	PN 64	PN 100	Class 150	Class 300					
15	199	338	59	104	200	200	200	200	-	-	200	200	200		-	6	4
25	199	338	59	104	200	200	200	200	-	260	200	200	200		1.2	6	5
40	209	348	82	124	200	200	200	200	-	280	270	270	200		1.2	6	8
50	217	356	72	139	200	200	200	200	276	300	270	270	200		1.2	6	9
65	224	363	72	154	200	200	200	200	320	350	280	280	200		1.2	6	11
80	234	373	72	174	200	200	272	272	323	340	290	290	200		1.2	6	12
100	254	393	85	214	250	250	250	250	380	400	250	310	250		1.2	6	16
125	267	406	85	239	250	250	250	250	420	450	250	335	250		1.2	6	19
150	288	427	85	282	300	300	300	300	415	450	300	300	300		1.2	6	27
200	316	455	137	338	350	350	350	350	480	530	350	350	350		1.2	8	40
250	344	483	137	393	450	450	450	450	550	620	450	450	450		1.2	8	60
300	369	508	137	444	500	500	500	500	600	680	500	500	500		1.6	8	80
350	362	513	270	462	550	550	550	550	700	800	550	550	550	-	1.6	8	110
400	387	538	270	512	600	600	600	600	750	-	600	600	600	-	1.6	10	125
450	418	569	310	563	600	600	600	600	-	-	600	640	600	-	1.6	10	175
500	443	594	350	614	625	625	625	680	-	-	680	730	625	-	1.6	10	200
600	494	645	430	715	750	750	750	750	-	-	820	860	750	-	1.6	10	300
700	544	695	500	816	875	875	-	-	-	-	-	-	875	875	2.0	-	350
750	571	722	556	869	-	-	-	-	-	-	-	-	937	937	2.0	-	380
800	606	757	560	939	1000	1000	-	-	-	-	-	-	1000	1000	2.0	-	475
900	653	804	630	1042	1125	1125	-	-	-	-	-	-	1125	1125	2.0	-	560
1000	704	906	670	1146	1250	1250	-	-	-	-	-	-	1250	1250	2.0	-	700
1100	755	906	770	1248	1375	1375	-	-	-	-	-	-	-	-	2.0	-	1200
1200	810	961	792	1348	1500	1500	-	-	-	-	-	-	1500	1500	2.0	-	1250
1400	925	1076	1000	1675	1750	1750	-	-	-	-	-	-	-	-	3.0	-	1753
1500	972	1123	1020	1672	-	-	-	-	-	-	-	-	1875	1875	3.0	-	2600
1600	1025	1176	1130	1915	2000	2000	-	-	-	-	-	-	-	-	3.0	-	2341
1800	1123	1274	1250	1974	2250	2250	-	-	-	-	-	-	-	-	3.0	-	3253
2000	1223	1374	1375	2174	2500	2500	-	-	-	-	-	-	-	-	3.0	-	4060

1) 13 mm shorter with AISI terminal box (Ex and high temperature)

2) When earthing flanges are used, the thickness of the earthing flange must be added to the built-in length

3) T_C = Type C grounding ring, T_E = Type E grounding ring

4) Weights are approx. and for PN 16 without transmitter

D = Outside diameter of flange, see flange tables

4.2.2 Sensor MAG 3100 Ex



Type	Sensor with flanges		
Nominal size <i>mm</i>	DN 15 - DN 2000		
Temperature of medium¹⁾	Temperature classification		
Liner:	T3 + T4	T5	T6
Neoprene (standard)	0 to 70°C	0 to 70°C	0 to 70°C
EPDM ²⁾	-10 to 95°C	-10 to 90°C	-10 to 75°C
Linatex® rubber	-20 to 70°C	-20 to 70°C	-20 to 70°C
Ebonite ²⁾	0 to 95°C	0 to 90°C	0 to 75°C
PTFE	-20 to 100°C	-20 to 90°C	-20 to 75°C
Ambient temperature	Remote transmitter: -20°C to 50°C		
Operating pressure³⁾ [abs.bar]			
Liner:			
Neoprene	0.01 to 100 bar		
EPDM	0.01 to 40 bar		
Linatex®	0.01 to 40 bar		
Ebonite	0.01 to 100 bar		
PTFE teflon:			
DN 15 to 600:	0.3 to 40 bar		
Excitation frequency	DN 15 - 65: 6.25 Hz		
	DN 80/100: 3.125 Hz		
	DN 125 - 300: 1.5625 Hz		
	DN 350 - 1200: 3.125 Hz		
Enclosure rating <i>Standard</i>	IP 67 to EN 60529 (NEMA 4x) (1 m w.g for 30 min.)		
<i>Option</i>	IP 68 to EN 60529 (NEMA 6) (10 m w.g. cont.)		
Cable entries	4 Pg 13.5		
Mechanical load	18-1000 Hz random, 3.17 G rms in all directions to EN 60068-2-36		
Test pressure	1.5 × PN		
Flanges <i>Standard</i>	DN 15-50:	PN 40	
EN 1092-1:2001 ⁴⁾	DN 65-150:	PN 16	
Raised face	DN 200-1000:	PN 10	
	DN 1100 -2000:	PN 6	
<i>Option</i>	DN 65-1000:	PN 6	
	DN 1200-2000:	PN 10	
	DN 200-2000:	PN 16	
	DN 200-600:	PN 25	
	DN 65-600:	PN 40	
	DN 50-400:	PN 63	
	DN 25-350:	PN 100	
ANSI B 16.5 (-BS 1560)	3/4"-24":	Class 150 (20 bar)	
	3/4"-24":	Class 300 (50 bar)	
AS 2129	3/4"-48":	Table D/E	
AS 4087	Class 14	(DN 50 - 1200, 14 bar)	
	Class 21	(DN 50 - 600, 21 bar)	
	Class 35	(DN 50 - 600, 35 bar)	
AWWA C-207	28"-78":	Class D (10 bar)	
Electrodes <i>Standard</i>	AISI 316 Ti (1.4571)		
<i>Option</i>	Hastelloy C-276, Platinum / Iridium, Titanium, AISI 316 Ti Ceramic Coated, Tantalum		
PE - electrodes <i>Standard</i>	As measuring electrodes (except PTFE)		
Measuring pipe <i>Standard</i>	AISI 304 (1.4301)		
<i>Option</i>	AISI 316 L (1.4404)		
Flange and housing material <i>Standard</i>	Carbon steel		
	Corrosion-resistant two-component coating (min. 150 µm)		
<i>Option</i>	AISI 304 (1.4301) flanges and carbon steel housing.		
	Coating as above		
<i>Option</i>	AISI 316 L (1.4404) flanges and housing		
Ex-approval	See section 2.7		
Conforms to PED, LVT, EMC	PED - 97/23EC, LVD - 73/23 EEC + amendment 93/68/EEC, EMC - 89/336 EEX		

¹⁾ The maximum fluid temperature may be further limited by the approval temperature ratings, see section 2.7

²⁾ With WRC (Water Research Council, UK) approval

³⁾ Maximum operating pressure decreases with increasing operating temperature and with stainless steel flanges

⁴⁾ EN 1092-1, DIN 2501 & BS 4504 have the same mating dimensions

4.3 Transmitter MAG 6000 Accuracy 0.25%



Current output			
Current	0-20 mA, 4-20 mA or 4-20 mA + alarm		
Load	< 800 ohm		
Time constant	0.1-30 s adjustable		
Digital output			
Frequency	0-10 kHz, 50% duty cycle		
Time constant	0.1-30 s adjustable		
Active	24 V DC, 30 mA, $1\text{ K}\Omega \leq R_{\text{load}} \leq 10\text{ K}\Omega$, short-circuit-protected		
Passive	3-30 V DC, max. 110 mA, $200\ \Omega \leq R_{\text{load}} \leq 10\text{ K}\Omega$		
Relay			
Time constant	Changeover relay, time constant same as current time constant		
Load	42 V AC/2 A, 24 V DC/1A		
Digital input	11-30 V DC, $R_i = 4.4\text{ K}\Omega$		
Activation time	50 ms		
Current	$I_{11\text{ V DC}} = 2.5\text{ mA}$, $I_{30\text{ V DC}} = 7\text{ mA}$		
Functions	Flow rate, 2 totalizers, low flow cut-off, empty pipe cut-off, flow direction, error system, operating time, uni/bidirectional flow, limit switches, pulse output, control for cleaning unit and batch		
Galvanic isolation	All inputs and outputs are galvanically isolated		
Cut-off			
Low flow	0-9.9% of maximum flow		
Empty pipe	Detection of empty pipe ¹⁾		
Totalizer	Two eight-digit counters for forward, net or reverse flow		
Display	Background illumination with alphanumeric text, 3 x 20 characters to indicate flow rate, totalized values, settings and faults		
	Reverse flow indicated by negative sign		
Time constant	Time constant as current output time constant		
Zero point adjustment	Automatic		
Electrode input impedance	$> 1 \times 10^{14}\ \Omega$		
Excitation frequency	Sensor size depending pulsating DC current (125 mA)		
Ambient temperature	Display version during operation: -20 to +50°C		
	Blind version during operation: -20 to +60°C		
	During storage: -40 to +70°C (RH max. 95%)		
Custody transfer approval <i>MAG 6000 CT</i>	PTB (cold water) 6.221 99.19	DANAK OIML R75 (hot water)	DANAK OIML R117 (cold water/milk, beer etc.)
Communication			
Standard	Prepared for client mounted add-on modules		
Optional	HART, Profibus PA as add-on module		
19" insert			
Enclosure material	Standard 19" insert of aluminium/steel (DIN 41494)		
	Width: 21 TE		
	Height: 3 HE		
Enclosure rating	IP 20 to EN 60529 and DIN 40050		
Mechanical load	Version: 1 G, 1-800 Hz sinusoidal in all directions to EN 60068-2-36		
EMC performance	Emission: EN 50081-1 (Light industry)		
	Immunity: EN 50082-2 (Industry)		
Supply voltage	115-230 V AC +10% to -15%, 50-60 Hz		
	11-30 V DC or 11-24 V AC		
Power consumption	230 V AC: 17 VA		
	24 V DC: 9 W, $I_N = 380\text{ mA}$, $I_{ST} = 8\text{ A}$ (30 ms)		
	12 V DC: 11 W, $I_N = 920\text{ mA}$, $I_{ST} = 4\text{ A}$ (250 ms)		

¹⁾ Special cable required in separate mounted installation

4.4.1 Safety barrier (ia/ib) DN ≤ 300



Application	As combined unit with MAG 6000 only and MAG 1100 Ex/3100 Ex in the size range DN 6-300
Ex approval	See section 2.7
Ambient temperature	During operation: -20 to +50°C During storage: -20 to +70°C
19" insert	
Enclosure material	Standard 19" insert in aluminium/steel (DIN 41494) Width: 21 TE Height: 3 HE
Enclosure rating	IP 20 to EN 60529 and DIN 40050
Mechanical load	1 G, 1-800 Hz sinusoidal in all directions to EN 60068-2-36
EMC performance	
Emission	EN 50081-1 (Light industry)
Immunity	EN 50082-2 (Industry)

IS data transmitter

Terminals MAG barriers	85-86 ib coil	82-83 ia electrode
U _o	28 V	9.3 V
I _o	138 mA	40 mA
P _o		0.4 W
L _o	4 mH	23 mH
C _o	100 nF	500 nF

4.4.2 Safety barrier (ia) DN ≥ 350



Application	For use with MAG 5000/6000 19 insert and MAG 3100 Ex in the size range DN 350-2000
Ex approval	See section 2.7
Ambient temperature	During operation: -20 to +50°C During storage: -20 to +70°C
19" insert	
Enclosure material	Standard 19" insert in aluminium/steel (DIN 41494) Width: 21 TE Height: 3 HE
Enclosure rating	IP 20 to EN 60529 and DIN 40050
Mechanical load	1 G, 1-800 Hz sinusoidal in all directions to EN 60068-2-36
EMC performance	
Emission	EN 50081-1 (Light industry)
Immunity	EN 50082-2 (Industry)

IS data transmitter

Terminals MAG barriers	82-83 ia electrode
U _o	9.3 V
I _o	40 mA
P _o	0.4 W
L _o	23 mH
C _o	500 nF

4.4.3 IS data sensor

MAG 1100 DN 6 - 100 MAG 3100 DN 15 - 300 Ex ib

Terminals MAG sensor	85-86 coil	82-83 electrode
U _i	28 V	10 V
I _i	140 mA	50 mA
P _i	2 W	0.5 W
L _i	2 mH	20 mH
C _i	50 nF	50 nF

MAG 3100 DN 350 - 2000 Ex e ia

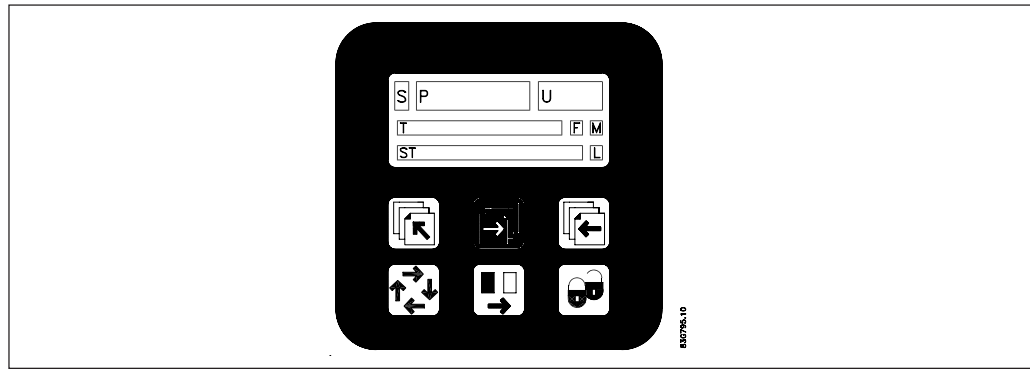
Terminals MAG sensor	85-86 coil	82-83 electrode
U _i	-	10 V
I _i	-	50 mA
P _i	-	0.5 W
L _i	-	20 mH
C _i	-	50 nF

4.5 Output characteristics
MAG 6000

Output characteristics 0-20 mA	Bidirectional mode		Unidirectional mode	
4-20 mA				
Frequency				
Pulse output				
Relay	Power down		Active	
Error relay	No error		Error	
Limit switch or direction switch	1 set point		2 set points	
	Low flow (Reverse flow)		Intermediate flow	
	High flow (Forward flow)		High flow/ Low flow	
Batch on digital output (MAG 6000 only)				
Batch on relay (MAG 6000 only)	Hold		Batch	

5. Commissioning

5.1 Keypad and display layout



Keypad

The keypad is used to set the flowmeter. The function of the keys is as follows:

TOP UP KEY		This key (hold 2 sec.) is used to switch between operator menu and setup menu. In the transmitter setup menu, a short press will cause a return to the previous menu.
FORWARD KEY		This key is used to step forward through the menus. It is the only key normally used by the operator.
BACKWARD KEY		This key is used to step backward through the menus.
CHANGE KEY		This key changes the settings or numerical values.
SELECT KEY		This key selects the figures to be changed.
LOCK/UNLOCK KEY		This key allows the operator to change settings and gives access to submenus.

Display

The display is alphanumerical and indicates flow values, flowmeter settings and error messages.

The upper line is for primary flow readings and will always show either flow rate, totalizer 1 or totalizer 2. The line is divided into 3 fields.

S: Sign field
P: Primary field for numerical value
U: Unit field

The centre line is the title line (T) with individual information according to the selected operator or setup menu.

The lowest line is the subtitle line (ST) which either will add information to the title line or keep individual information independent of the title line.

F: The alarm field. Two flashing triangles will appear by a fault condition.

M: The mode field. The symbols indicate the following.

Communication mode	Basic settings	Operator active
Service mode	Output	Operator inactive
Operator menu	External input	
Product identity	Sensor characteristics	
Language mode	Reset mode	

L: The lock field. Indicates the function of the lock key.

Ready for change	Access to submenu
Value locked	RESET MODE: Zero setting of totalizers and initialization of setting

5.2.1 Basic settings

Main frequency
To select the main power supply frequency corresponding to the country in which the flowmeter is installed.
(US = 60 Hz)

Flow direction
Select the correct flow direction in the pipe.

Q_{max}
Sets the measuring range, the analog outputs and the frequency output. Value, decimal point, unit and time can be set individually (setting is dimension dependent).

$Q_{max.2}$
Sets the measuring range, the analog outputs and the frequency output. Value, decimal point, unit and time can be set individually (setting is dimension dependent). Only visible when it has been chosen as external digital input.

Totalizers
To set unit and decimal point.



Low flow cut off
To set a % of selected Q_{max} . To filter noise in the installation. Influences display and all outputs.



Error level
To select which error level, the flowmeter will detect an error.

(Only when selected as external input)

430796.1.14.10.02

Comma for flow rate, totalizer 1 and totalizer 2 can be individually positioned.

- open the respective window.
- ensure that the cursor is positioned below the comma. Use the SELECT KEY .
- move the comma to the requested position. Use the CHANGE KEY .

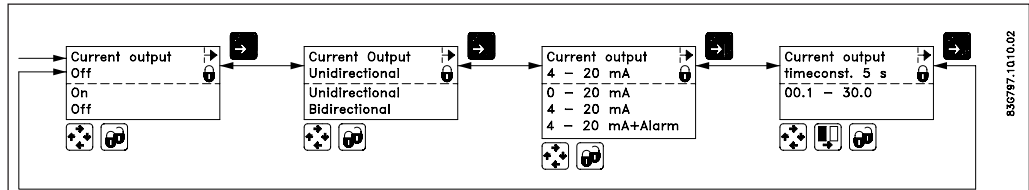
Units are changed by means of the CHANGE KEY  with the cursor placed below the unit selected. Select units (cursor moved) by means of the SELECT KEY .

Totalizer 2 is not visible when batch is selected as digital output.

$Q_{max.2}$ - is only visible when it has been chosen as external input.

5.2.2 Outputs

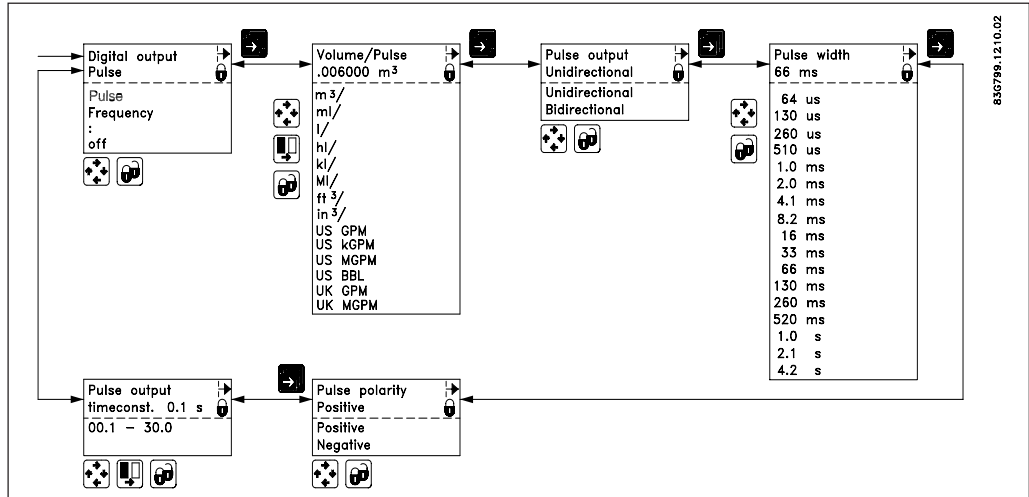
Current output
Proportional to flowrate
(Terminal 31 and 32)



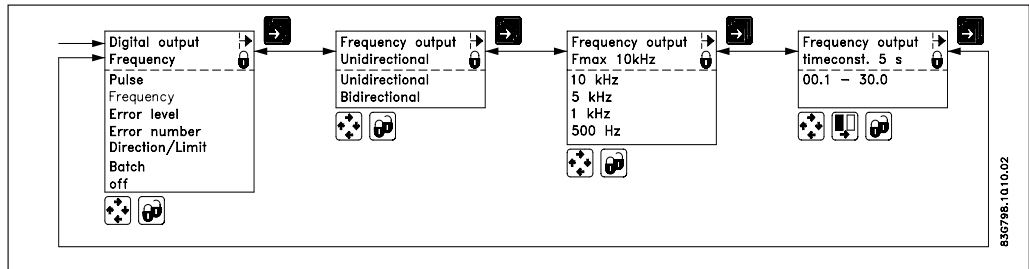
4 - 20 mA + alarm:
Current output gives the following mA, depending on what is selected as error level in basic settings.
Fatal: 1 mA, permanent: 2 mA, warning: 3 mA

The current output must be set off when not used.

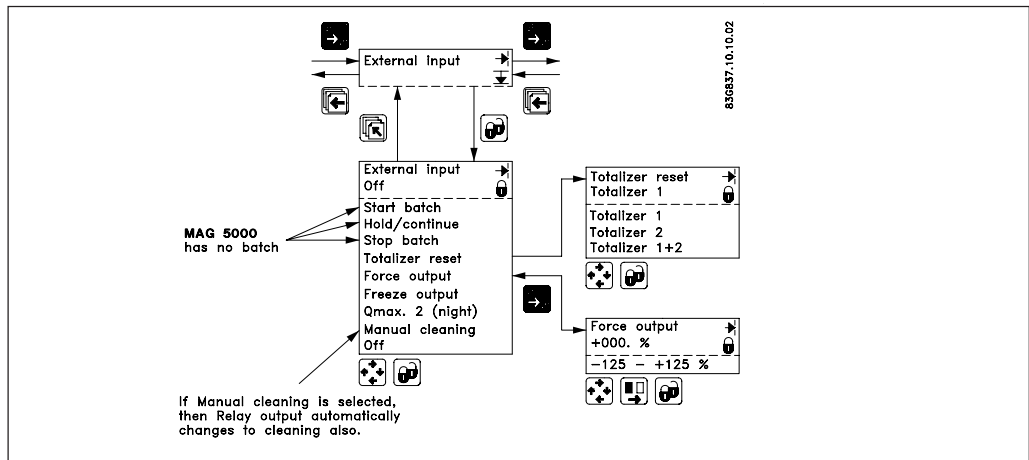
Digital output
Pulse/volume
(Terminal 56, 57, 58)



Digital output
Frequency
Proportional to flowrate
(Terminal 56, 57, 58)



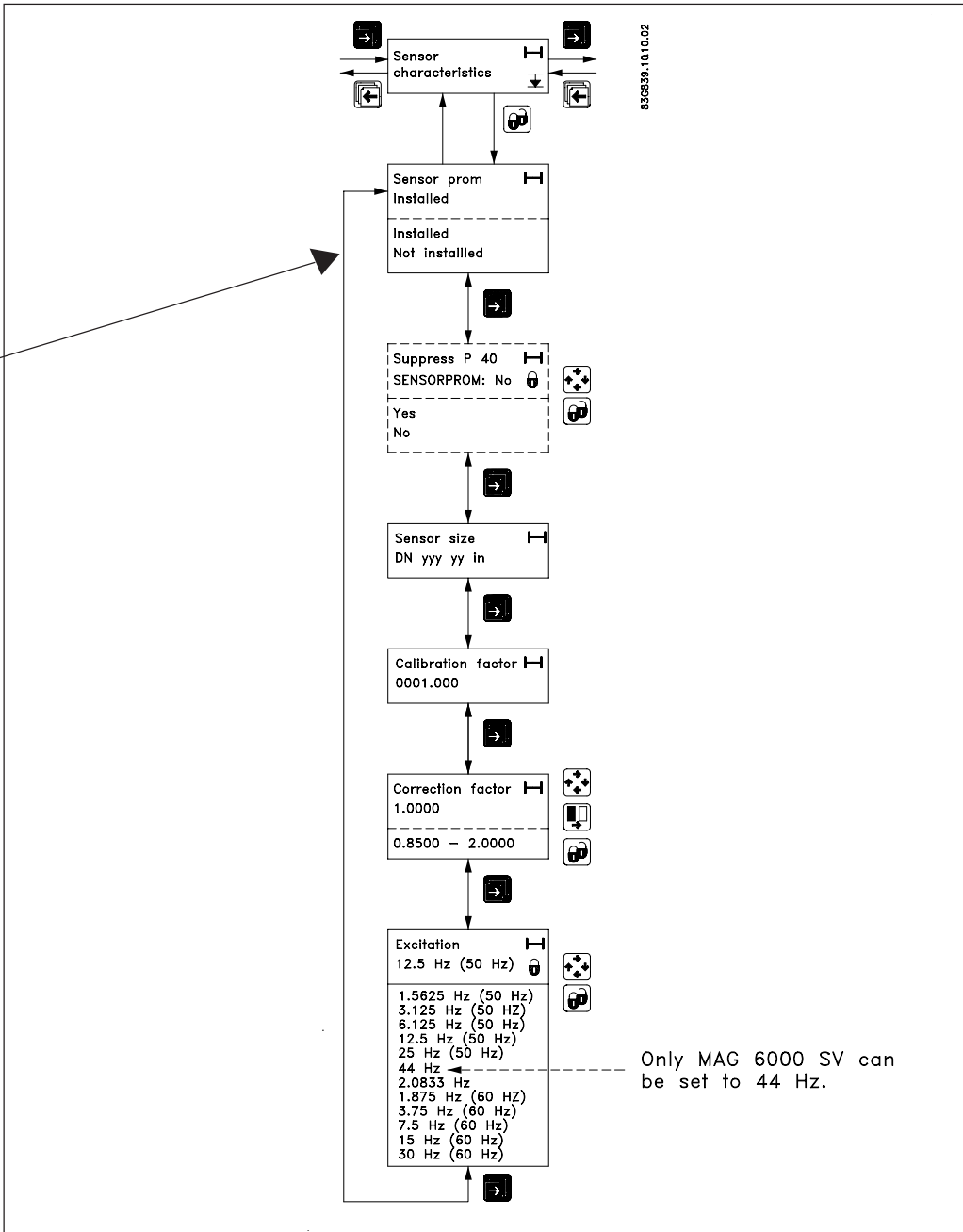
5.2.3 External input



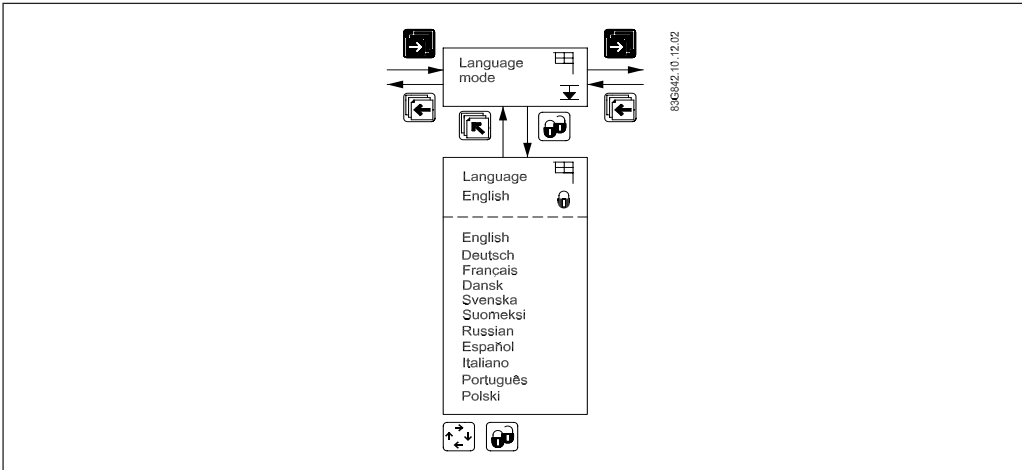
Batch control is available on MAG 6000 only.

5.2.4 Sensor characteristics

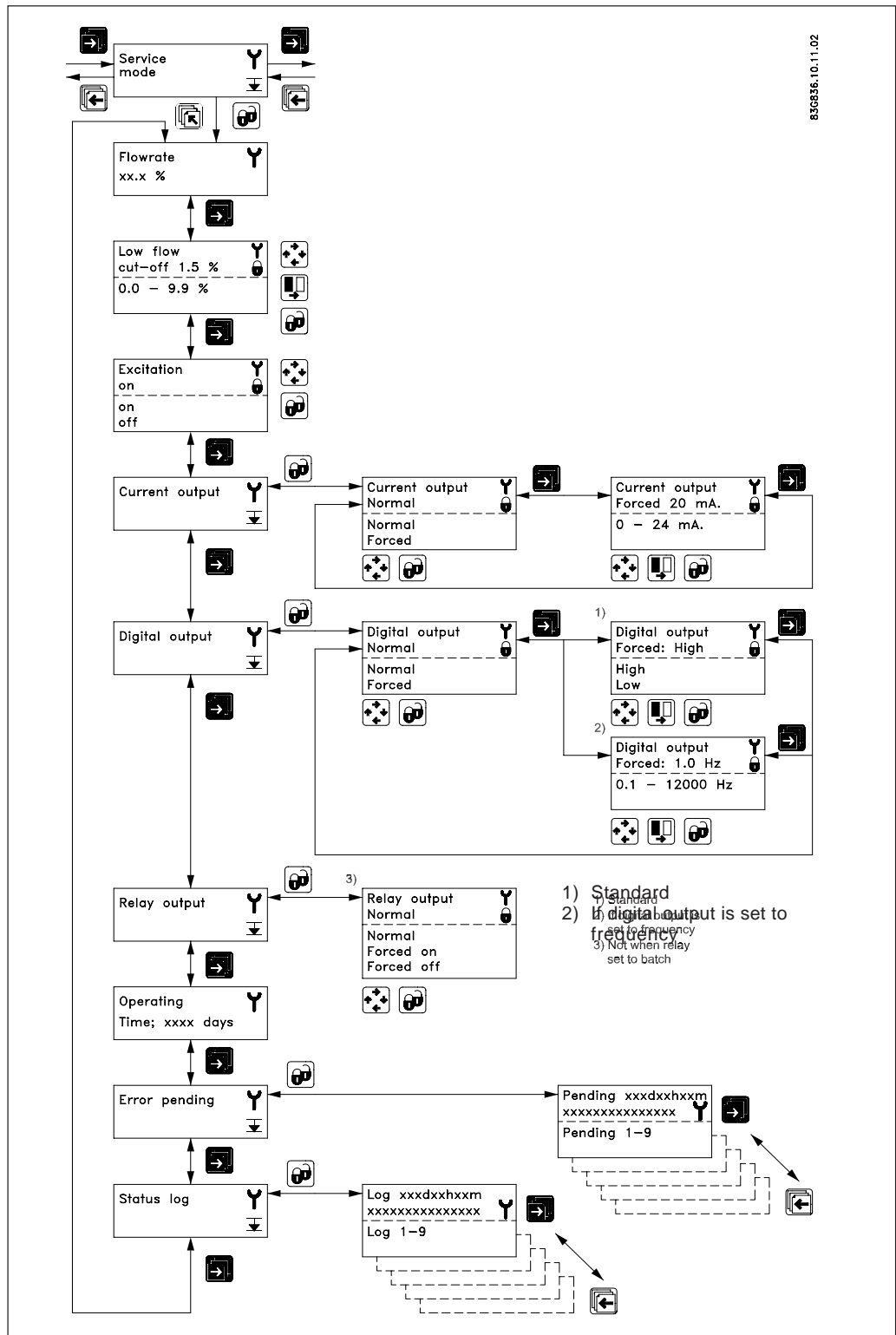
If "SENSORPROM not installed" is shown, refer to chapter 6 in the handbook (depending on type of mounting configuration).



5.2.5 Language mode



5.2.6 Service mode



All previous settings are reinitialised when service mode is exited using the top up key.

The error system

The error system is divided into an error pending list and a status log list. Time is gained as days, minutes and hours since the error has occurred.

The first 9 standing errors are stored in error pending. When an error is removed it is removed from error pending.

The latest 9 errors are stored in the status log. When an error is removed it is still kept in status log. Errors in status log is stored for 180 days.

Error pending and status log are accessible when enabled in the operator menu.

6. Service

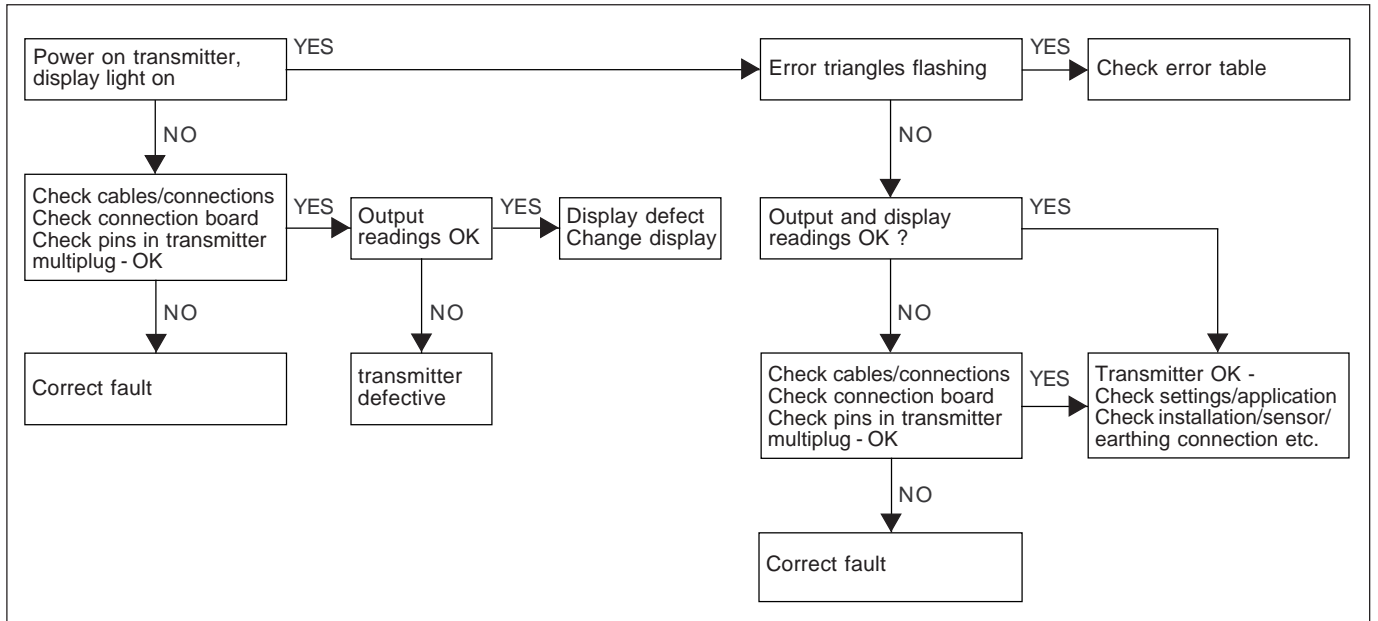
Often problems with unstable/wrong measurements occur due to insufficient/wrong earthing or potential equalization. Please check this connection. If OK, the SITRANS F M MAGFLO® transmitter can be checked as described under 9.1 and sensor under 9.3 in the handbook.

6.1 Transmitter check list

When checking SITRANS F M MAGFLO® installations for malfunction the easiest method to check the transmitter is to replace it with another MAG 5000/6000 transmitter with a similar power supply.

A replacement can easily be done as all settings are stored in and downloaded from the SENSORPROM® unit - no extra settings need to be made.

If no spare transmitter is available - then check transmitter according to check table.



6.2 Trouble shooting MAG transmitter

Symptom	Output signals	Error code	Cause	Remedy	
Empty display	Minimum		1. No power supply	Power supply Check MAG 5000/6000 for bended pins on the connector	
			2. MAG 5000/6000 defective	Replace MAG 5000/6000	
No flow signal	Minimum		1. Current output disabled	Turn on current output	
			2. Digital output disabled	Turn on digital output	
			3. Reverse flow direction	Change direction	
	Undefined	F70	Incorrect or no coil current	Check cables/connections	
		W31	Measuring pipe empty	Ensure that the measuring pipe is full	
		F60	Internal error	Replace MAG 5000/6000	
Indicates flow with no flow in pipe	Undefined		Measuring pipe empty	Select empty pipe cut-off	
			Empty pipe cut-off is OFF	Ensure that the measuring pipe is full	
Unstable flow signal	Unstable		Electrode connection missing/ electrode cable is insufficiently screened	Ensure that electrode cable is connected and sufficiently screened	
			1. Pulsating flow	Increase time constant	
			2. Conductivity of medium too low	Use special electrode cable	
			3. Electrical noise potential between medium and sensor	Ensure sufficient potential equalization	
			4. Air bubbles in medium	Ensure medium does not contain air bubbles	
Measuring error	Undefined		5. High concentration of particles or fibres	Increase time constant	
			Incorrect installation	Check installation	
			P40	No SENSORPROM® unit	Install SENSORPROM® unit
			P44	CT SENSORPROM® unit	Replace SENSORPROM® unit or reset SENSORPROM® unit with MAG CT transmitter
			F61	Deficient SENSORPROM® unit	Replace SENSORPROM® unit
			F62	Wrong type of SENSORPROM® unit	Replace SENSORPROM® unit
	Maximum	W30	F63	Deficient SENSORPROM® unit	Replace SENSORPROM® unit
			F71	Loss of internal data	Replace MAG 5000/6000
Measuring approx. 50%			Flow exceeds 100% of Q_{max} .	Check Q_{max} . (Basic Settings)	
			W21	Pulse overflow <ul style="list-style-type: none"> • Volume/pulse too small • Pulse width too large 	Change volume/pulse Change pulse width
Loss of totalizer data	OK	W20	Missing one electrode connection	Check cables	
##### Signs in display	OK		Initializing error	Reset totalizer manually	
	OK		Totalizer roll over	Reset totalizer or increase totalizer unit	

7. Ordering

Please look on our homepage <http://www.siemens.com/flow> under "Product Selector".

8.1 EC-declaration of conformity

Please note the following certificates are incomplete for the full version please refer to <http://siemens.com/flow>

SIEMENS

Flow Instruments A/S

DK-6430 Nordborg
Danmark

Telefon: +45 7488 5252
Fax: +45 7449 52 50

EC-DECLARATION OF CONFORMITY

SIEMENS Flow Instruments A/S
DK-6430 Nordborg, Denmark

declare under our sole responsibility that the products

SITRANS F M MAGFLO
MAG5000, MAG6000, MAG6000CT with option modules,
Used with the sensors
SITRANS F M MAGFLO
MAG1100, MAG3100 and MAG5100

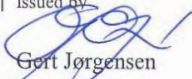
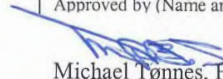
to which this declaration relates is in conformity with the following directives, standards, provided that it is used according to our instructions:

ATEX directive 94/9/EC (EXplosive ATmospheres) MAG6000/MAG3100/MAG1100
EN50014-1997 E + A1+A2 General Part
EN50020-2002 E Intrinsic Safety "i"
EN50019-2000 E Increased Safety "e"

EMC directive 89/336EEC
EN50081-1:1992 Electromagnetic compatibility - Generic emission standard
EN50082-1:1992 Electromagnetic compatibility - Generic immunity standard
EN50081-2:1995 Electromagnetic compatibility - Generic emission standard
EN50082-2:1995 Electromagnetic compatibility - Generic immunity standard

Low voltage directive 73/23 EEC + amendment 93/68/EEC
EN60730 Automatic electrical controls for household and similar use.
EMC test report 083R3047, 083R3048
LVD test report

UL Certification **CUL Mark**
UL 3101-1 Standard for Safety
Report reference E194495, 99ME60313 CC/213A

Date	Issued by	Date	Approved by (Name and title)
2003-09-01	 Gert Jørgensen	2003-09-01	 Michael Tønnes, Head of department

KM I0073.004.147 083R3044

8.2 EC type examination certificate

Please note the following certificates are incomplete for the full version please refer to <http://siemens.com/flow>



sira
Certification Service

1 **EC TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

3 Certificate Number: Sira 03ATEX1442X

4 Equipment: SITRANS F M MAGFLO MAG3100Ex DN15 and DN25 Flowmeters

5 Applicant: Siemens Flow Instruments Limited

6 Address: Magflo House
Ebley Road
Stonehouse
Gloucester
GL10 2LU
UK

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number R53M10688A.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 50014:1997 (A1 and A2)
EN 50018:2000

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:

II 2(1)(2)G
EEx d [ia][ib] IIB T4-T6Project Number 53M10688
Date 27 August 2003
C. Index 13

M D Shearman
Certification Manager

This certificate and its schedules may only be reproduced in its entirety and without change

Sira Certification ServiceRake Lane, Eccleston, Chester, CH4 9JN, England
Tel: +44 (0) 1244 670900 Fax: +44 (0) 1244 681330Email: exhazard@siratc.co.uk

Sira Certification Service is a service of Sira Test & Certification Ltd

Appendix to certificate Number: Sira 03ATEX1442X.



sira
Certification Service

EC TYPE-EXAMINATION CERTIFICATE VARIATION

CERTIFICATE NUMBER	Sira 03ATEX1442X	Dated	27 August 2003
VARIATION NUMBER	1 (ONE)	Dated	21 October 2003

VARIATION TO EQUIPMENT

To permit:

- 1 Additional sizes of flowmeter in the range, sizes DN40 to DN300.
- 2 A modification to the cable entry device to include a circlip.
- 3 The removal an additional external earth stud.

DESCRIPTIVE DOCUMENTS

Number	Sheet	Rev	Date	Description
083A0275	1 of 1	3	20 Aug 03	Data label
083A0281	1 of 1	2	15 Oct 03	Certification label
083R1538	1 of 1	1	17 Oct 03	Certification drawing – snubber circuit installation
083Z9583	1 of 1	3	14 Oct 03	Certification drawing DN15 to DN25 flowsensor
083Z9585	1 of 1	2	14 Oct 03	Certification drawing DN40 to DN300 flowsensor

CONDITIONS OF CERTIFICATION

The Condition of Certification 17.3 in the original certificate is modified as follows:

- 17.3 Each enclosure shall be subjected to a routine pressure test of 9.2 bar for at least 10 s as required by clause 16.1 of EN 50018:2000. There shall be no permanent deformation as a result of the tests.

File No 53A10792

Report No. R53A10792A

M D Shearman
Certification Manager

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Sira Certification Service

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Email: exhazard@siratc.co.uk
Sira Certification Service is a service of Sira Test & Certification Ltd

Please note the following certificates are incomplete for the full version please refer to <http://siemens.com/flow>



sira
Certification Service

1 **EC TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

3 Certificate Number: Sira 03ATEX1423X

4 Equipment: SITRANS F M MAGFLO MAG1100Ex DN6 to DN100 Range of Flowmeters

5 Applicant: Siemens Flow Instruments Limited

6 Address: Magflo House
Ebley Road
Stonehouse
Gloucester
GL10 2LU
UK

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number R53M10551A.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 1127-1:1998

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:



II 2(1)(2)G
EEx [ia][ib] IIB T4-T6

Project Number 53M10551
Date 27 August 2003
C. Index 13

M D Shearman
Certification Manager

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ST&C(Chester) Form 9176 Issue 7

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sira
Certification Service

1 **EC TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

3 Certificate Number: Sira 03ATEX3339X

4 Equipment: SITRANS F M MAGFLO MAG3100 Ex

5 Applicant: Siemens Flow Instruments

6 Address: Magflo house
Ebley Road
Stonehouse
Gloucestershire
GL10 2LU

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number 52V10518.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 50014:1997 (A1 and A2)
EN 50019:2000
EN 50020:2002
EN 50281-1-1:1998

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.


11 This EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:



II 2 G D
EEx e ia IIC T3 to T6

Project Number 52V10518
Date 29 August 2003
C. Index 13


M D Shearman
Certification Manager


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Sira Certification Service

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Please note the following certificates are incomplete for the full version please refer to <http://siemens.com/flow>

[1] **EC-TYPE EXAMINATION CERTIFICATE** 

[2] **Equipment or Protective System intended for use
in Potentially Explosive Atmospheres
Directive 94/9/EC**

[3] EC-Type Examination Certificate Number: DEMKO 03 ATEX 135255X

[4] Equipment or Protective System: SITRANS F M MAGFLO Safety Barrier Type FDK:083F50__

[5] Manufacturer: Siemens Flow Instruments A/S

[6] Address: Nordborgvej 81, DK-6430 Nordborg, Denmark.

[7] This equipment or protective system and any acceptable variation there to is specified in the schedule to this certificate and the documents therein referred to.

[8] UL International Demko A/S, notified body number 0539 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report no. 135255.

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
EN 50014: 1997 E Amds. A1+A2 EN 50020: 2002 E


[10] If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

[11] This EC-Type examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by the certificate.

[12] The marking of the equipment or protective system shall include the following:

Ex II (2)G [EEx ia ib] IIB

On behalf of UL International Demko A/S Herlev, 2003-09-01




Karina Christiansen
Certification Manager

Certificate: 03 ATEX 135255X

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P1

We have checked the contents of this manual for agreement with the hardware and software described. Since deviations cannot be precluded entirely, we cannot guarantee full agreement. However, the data in this manual are reviewed regularly and any necessary corrections included in subsequent editions. Suggestions for improvement are always welcomed.

Technical data subject to change without prior notice.

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