

Assunto: Re: Fwd: DOCUMENTAÇÃO AUTCOMPANY
De: José Antônio <jteixeira@cesama.com.br>
Data: 12/09/2025 14:46
Para: DELC - Alexandre <anogueira@cesama.com.br>
CC: "jhenrique@cesama.com.br" <jhenrique@cesama.com.br>

Alexandre boa tarde!

A proposta da empresa Autcompany **não atende** ao nosso edital, pois, não apresentou comprovação técnica para os seguintes itens:

"4.12. O equipamento deverá ser fornecido com dispositivo de proteção contra surto (DPS), para a entrada de alimentação, bobina, eletrodos, saída analógica e para porta de comunicação RS485;

4.12.1. Estes DPS devem ser especificados segundo as normas técnicas do próprio fabricante do equipamento ofertado.

(a proposta não inclui o fornecimento de DPS)

4.13. Sistema de auto limpeza dos eletrodos através de pulso de tensão reversa nos eletrodos;

4.14. Todas as entradas e saídas deverão ser isoladas galvanicamente da alimentação;"

att

Em 12/09/2025 13:23, DELC - Alexandre escreveu:

Você é quem manda, meu amigo!

Att

alexandre

Em 12/09/2025 13:21, José Antônio escreveu:

Caro, alex!

Qual o prazo que tenho?

att

Em 12/09/2025 11:45, DELC - Alexandre escreveu:

Caro zé, segue para sua avaliação.

Att

Alexandre

----- Mensagem encaminhada -----

Assunto:DOCUMENTAÇÃO AUTCOMPANY

Data:Fri, 12 Sep 2025 13:17:14 +0000

De:Contato@autcompany.com.br <Contato@autcompany.com.br>

Para:anogueira@cesama.com.br <anogueira@cesama.com.br>, AUTCOMPANY ELETRICA E AUTOMAÇÃO INDUSTRIAL LTDA <contato@autcompany.com.br>

Prezados,

Segue em anexo documentação AUTCOMPANY.

Conforme solicitado, declaração anexo IV, proposta reajustada e catalogo técnico do conversor.

Favor confirmar recebimento.

Att,



--
Alexandre Tedesco Nogueira
Pregoeiro
Departamento de Licitações e
Assessoria de Contratos (DELC)
(32) 3692-9200 / 3692-9201



PREGÃO ELETRÔNICO PARA REGISTRO DE PREÇOS Nº 0046/25

ANEXO II – MODELO DE PROPOSTA COMERCIAL

OBJETO: Aquisição de Conversor Universal para Medidores de vazão Eletromagnéticos para a CESAMA.

Razão Social do Licitante: AUTCOMPANY ELETRICA E AUTOMAÇÃO INDUSTRIAL LTDA

CNPJ: 58527518000168

Endereço: RUA MARTINICO PRADO, 555, SALA 04, VILA TIBÉRIO, 14050-050, RIBEIRÃO PRETO - SP

E-mail: contato@autcompany.com.br

Telefone / Fax: 16 99168-9539

Representante Legal:

Nome: ALAN MONTEIRO DE LIMA

Identificação (RG e CPF): 49568026 / 46126020804

Qualificação: SÓCIO ADMINISTRADOR

E-mail do representante: alamonteiro@gmail.com

Declaramos estar ciente e de acordo com as condições do Edital, cujos termos são de nossa perfeita compreensão e que nossa empresa contém as condições gerais relativas ao fornecimento, independente de qualquer instrumento ou termo especial.

Segue documentação técnica que comprove as características do item proposto que atende as características do item licitado constantes no capítulo 04 – Descrição do Material do termo de referência.

Item	Quant	Unid	Descrição	Fabricante / Marca	Preço Unitário	Preço Total
1	40	UN	Conversor Universal para Medidores de vazão Eletromagnéticos conforme Termo de referência 123108	AUTCOMP ANY / AUTMAG Converter	R\$ 5.400,00	R\$ 216.000,00
TOTAL:						R\$ 216.000,00

Ribeirão Preto, 12 de setembro de 2025.

ALAN MONTEIRO DE LIMA:46126020804
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Dados: 2025.09.12 10:06:57 -03'00'

ALAN MONTEIRO DE LIMA
46126020804
AUTCOMPANY

PREGÃO ELETRÔNICO Nº 0046/25

ANEXO IV

Declaração do artigo 38 da Lei 13.303/2016

Autcompany Elétrica e Automação Industrial, inscrito no CNPJ nº 58.527.518/0001-68, por intermédio de seu representante legal o (a) Sr(a) ALAN MONTEIRO DE LIMA, portador (a) da Carteira de Identidade nº 495680266 e do CPF nº 46126020804, **declara sob as penas da lei**, para fins do disposto no art. 10 do Regulamento Interno de Licitações, Contratos e Convênios da Cesama (RILC), em observância ao art. 38 da Lei Federal nº 13.303, de 30 de junho de 2.016, que não está impedida de licitar e contratar com a Cesama, comprometendo-se a informar a ocorrência de fato superveniente impeditivo.

Ribeirão Preto, 12 de setembro de 2025.

ALAN
MONTEIRO DE
LIMA:4612602
0804

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digital por ALAN
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LIMA:46126020804
Dados: 2025.09.12
10:09:55 -03'00'

Autcompany Elétrica e Automação Industrial
58.527.518/0001-68



AUTCOMPANY

AUTMPE

CONVERSOR/TRANSMISSOR



COMUNICAÇÃO
RS232/RS485
MODBUS RTU



VAZÃO
TOTALIZADA
POS/NEG/NET

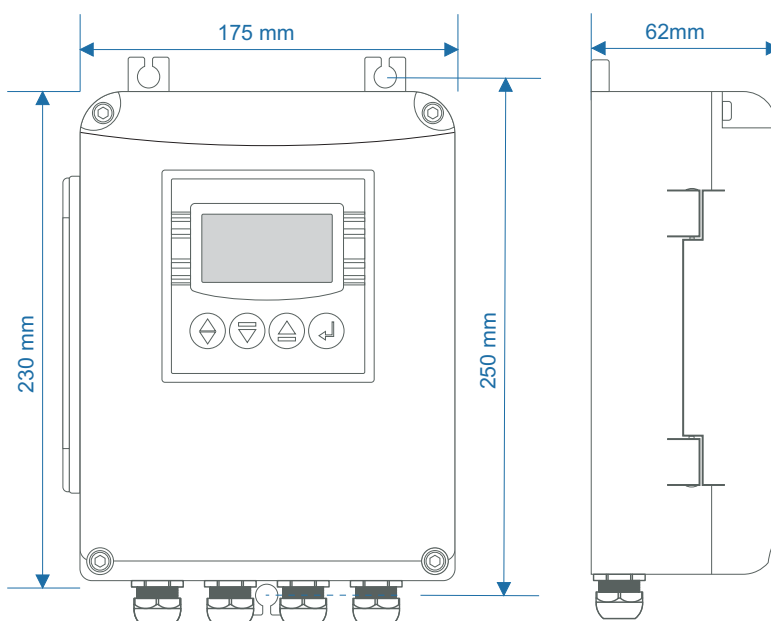


GRAU DE
PROTEÇÃO
IP 67

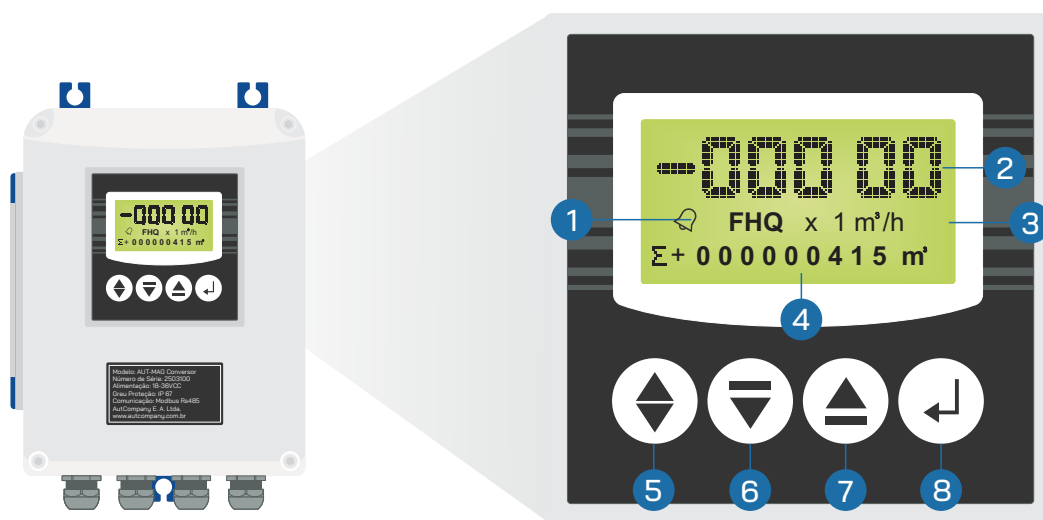
Especificações Técnicas

Alimentação Elétrica	VCC	18 ~ 36 VCC
	AC	85 ~ 265 V, 45 ~ 63 Hz
Consumo	8W (com o sensor)	
Calculadora Interna	Taxa de vazão totalizada positiva (POS), taxa de vazão totalizada negativa (NEG) e taxa de vazão da diferença (NET)	
Sinal de Saída (programável)	Saída de corrente	Sinal de saída: Dupla direção com duas opções, isolamento completo 0 a 10 mA e 4 a 20 mA. Impedância de saída: com 0 a 10 mA (0 a 1,5 Kohms); com 4 a 20 mA (0 a 750 Ohm) Erro básico: com base na medição acima o erro básico é de ± 10 mA
	Saída de Frequência	Saída de taxa de vazão de curso positivo e curso negativo; limite superior da frequência de saída pode ser definido entre 1 a 5000 Hz. Com saída transistor de coletor aberto e dupla direção de circuito eletrodo. Alimentação externa máximo de 35 V, quando maior a corrente do eletrodo atinge 250 mA.
	Saída de Pulso	Saída de taxa de fluxo de curso positivo e curso negativo; limite superior do pulso da saída pode amplificar até 5000 cp/s. Peso equivalente de pulso é 0,0001 a 1,0 m ³ /cp. Largura do pulso é definido automaticamente para 20 ms. ou onda quadrada. Com saída transistor de coletor aberto e dupla direção de circuito eletrodo. Alimentação externa máximo de 35 V, quando maior a corrente do eletrodo atinge 250 mA.
	Saída Indicativa da Direção da Vazão	Pode medir a taxa de fluxo de fluidos de curso positivo e negativos, e pode julgar a direção da vazão do fluido. Ao exibir taxa de fluxo de curso positivo, saída de nível alto de +10 V. Ao exibir a taxa de fluxo de curso negativo, saída de nível baixo de 0 V.
	Saída de alarme	2 saídas de transistor de coletor aberto de alarme do circuito eletrodo. Alimentação externa máximo de 35 V, quando maior a corrente do eletrodo atinge 250 mA. Condições de alarme: tubo sem fluido, desconexão de excitação, taxa de fluxo acima do limite.
	Interface de Comunicação	RS232 ou RS485, tipo MODBUS RTU ou Serial.
Taxa de Amortecimento	Selecionável entre 0 a 100 s (90%).	
Isolação Elétrica	Entrada analógica, saída analógica, alarme e pulso de saída, CA, tensão de isolação do GND máximo de 500 V.	
Condições Normais de Trabalho	Temperatura ambiente: -10 a +60°C. Umidade Relativa: 5% a 90%.	
Condições de Referência do Teste	Temperatura ambiente: 20 $\pm$ 2°C. Umidade relativa: 45% a 85% . Tensão AC: 220 V $\pm$ 2% . Frequência da alimentação: 50 Hz $\pm$ 5% (Conteúdo da onda harmônica inferior a 5%).	
Unidades de Exibição	L/s, L/m, L/h, m ³ /s, m ³ /m, m ³ /h, UKG, USG, gal/s, gal/m, gal/h, kg/s, kg/m, kg/h, t/s, t/m, t/h.	
Grau de Proteção	IP 67	
Material	Alumínio.	
Instalação	Modelo Remoto (instalação de sobrepor).	

Dimensões do Transmissor

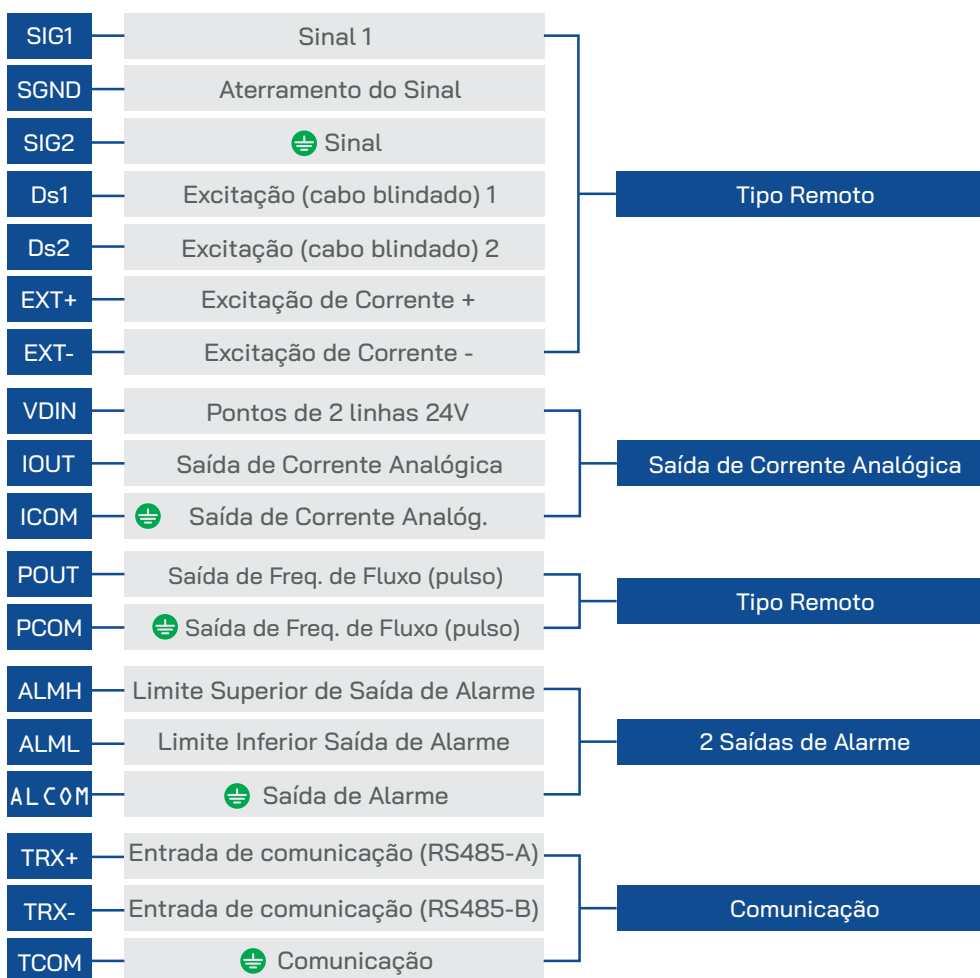
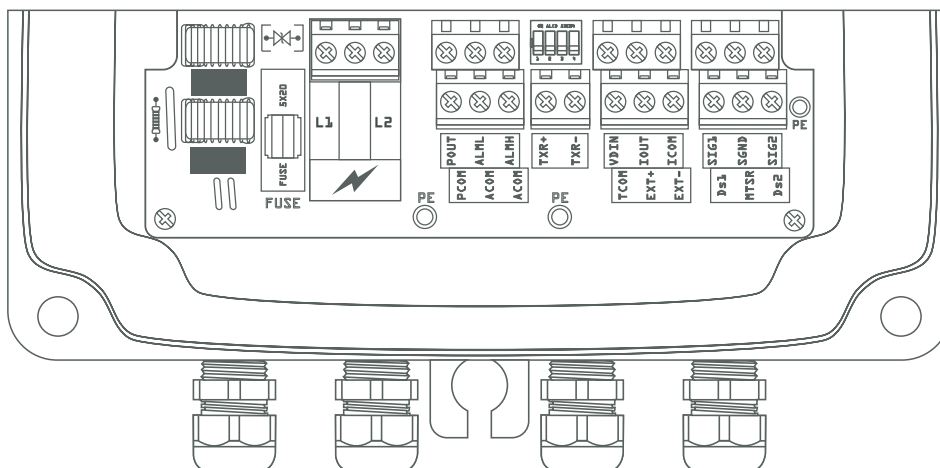


Exibição - Display LCD



1. Indicação de alarme;
2. Valor da vazão;
3. Unidade;
4. Velocidade de vazão (FLS), Porcentagem (FQP), Porcentagem de Vazio (MTP), Valor da vazão totalizada direta e reversa, Diferença da Totalizada direta e reversa;
5. Tecla composta;
6. Para baixo: Tecla desloca 1 página para baixo e para esquerda;
7. Para Cima: Tecla desloca 1 página para cima e para direita;
8. Enter: Tecla para entrar e confirmar (OK).

Diagrama Elétrico - Transmissor



Lista de Parâmetros do Transmissor

Código	Descrição do parâmetro	Modo de configuração	Classe da senha	Faixa de parâmetro
1	Idioma	Seleção	2	Português / Inglês
2	Endereço Comm	Definição do valor	2	00 até 99
3	Taxa de Transmissão	Seleção	2	300 até 38400
4	Tamanho Sensor	Seleção	2	3 até 3000mm
5	Unidade Vazão	Seleção	2	L/s, L/m, L/h, m³/s, m³/m, m³/h, T/s, T/m, T/h.
6	Faixa Vazão	Definição do valor	2	000.00 até 99999x1
7	Resposta Vazão	Seleção	2	01 até 50 SEC
8	Direção Vazão	Seleção	2	Direta / Reversa
9	Zero Vazão	Definição do valor	2	±0000 até ±9999
10	Corte Vazão	Definição do valor	2	000.00 até 999.99%
11	Habilita Corte	Seleção	2	Habilitado / Desabilitado
12	Unidade Volume	Seleção	2	0,001 até 1_Ltr, m³ ou T
13	Habilita Saídas	Seleção	2	Habilitado / Desabilitado
14	Tipo Analógica	Fixa (ou Seleção)	2	4-20mA (0 a 10mA sob consulta)
15	Tipo Pulsos	Seleção	2	Pulso / Frequência
16	Valor Pulso	Seleção	2	0,001 a 1_Ltr, m³ ou T.
17	Max Frequência	Definição do valor	2	1 a 5999Hz
18	Alrm Tubo Vazio	Seleção	2	Habilitado / Desabilitado
19	Valor Tubo Vazio	Definição do valor	2	00000 até 59999
20	Alrm Vazão Alta	Seleção	2	Habilitado / Desabilitado
21	Alrm Alta Valor	Definição do valor	2	000.00 até 599.99%
22	Alrm Vazão Baixa	Seleção	2	Habilitado / Desabilitado
23	Alrm Baixa Valor	Definição do valor	2	000.00 até 599.99%
24	Hab Alrm Vazão	Seleção	2	Habilitado / Desabilitado
25	Zerar Senha	Definição do valor	3	00000 até 99999
26	Código Sensor 1	Definição do fabricante	4	00000 até 99999
27	Código Sensor 2	Definição do fabricante	4	00000 até 99999
28	Tipo de Campo Mag.	Seleção	4	Tipo 1, 2 ou 3
29	Fator do Sensor	Definição do valor	4	0.0000 até 5.9999
0	Hab CRC Linear	Seleção	2	Habilitado / Desabilitado
31	CRC Linear 1	Definição do valor	4	Velocidade definida
32	Fator Linear 1	Definição do valor	4	0.0000 até 1.9999
33	CRC Linear 2	Definição do valor	4	Velocidade definida
34	Fator Linear 2	Definição do valor	4	0.0000 até 1.9999
35	CRC Linear 3	Definição do valor	4	Velocidade definida
36	Fator Linear 3	Definição do valor	4	0.0000 até 1.9999
37	CRC Linear 4	Definição do valor	4	Velocidade definida
38	Fator Linear 4	Definição do valor	4	0.0000 até 1.9999
39	Totalizador Baixa +	Corrigível	5	00000 até 99999
40	Totalizador Alta +	Corrigível	5	0000 até 9999
41	Totalizador Baixa -	Corrigível	5	00000 até 99999
42	Totalizador Alta -	Corrigível	5	0000 até 9999
43	Hab Filtro Lodo	Seleção	3	Habilitado / Desabilitado
44	Fat Filtro Lodo	Seleção	3	0.010 até 0.800m/s
45	Tmp Filtro Lodo	Seleção	3	400 até 2500mS
46	Senha 1	Definição pelo usuário	5	00000 até 99999
47	Senha 2	Definição pelo usuário	5	00000 até 99999
48	Senha 3	Definição pelo usuário	5	00000 até 99999
49	Senha 4	Definição pelo usuário	5	00000 até 99999
50	Analógico de Zero	Definição do valor	5	0.0000 até 1.9999
51	Faixa Analógica	Definição do valor	5	0.0000 até 3.9999
52	Fator do Medidor	Definição do valor	5	0.0000 até 5.9999
53	Cód Medidor 1	Definição do fabricante	6	00000 até 99999
54	Cód Medidor 2	Definição do fabricante	6	00000 até 99999
55	Modo de verificação	Definição do fabricante	2	Paridade ímpar/Paridade Par/Sem Paridade

NOTA: Os parâmetros dos conversores podem decidir o status de execução, o processo e a saída, bem como o estado da saída. A opção correta e a configuração dos parâmetros podem manter os conversores em execução de maneira ideal e obter maiores precisões de saída em exibição e medição.

PREGÃO ELETRÔNICO PARA REGISTRO DE PREÇOS Nº 0046/25

ANEXO II – PROPOSTA COMERCIAL

OBJETO: Aquisição de Conversor Universal para Medidores de vazão Eletromagnéticos para a CESAMA.

Razão Social do Licitante: Er Flow Manutencao e Calibracao Ltda

CNPJ: 40.959.911/0001-65

Endereço: Rua Argentina 54 , Centro, Diadema/SP, CEP 09921-050

E-mail: rogerio.correa57@uol.com.br ou flisboa.tec@gmail.com

Telefone / Fax: (11) 973558485 ou (11) 918624736

Representante Legal:

Nome: Eber Tales de Souza

Identificação (RG e CPF): 40.795.694 e 370.250.268-83

Qualificação: Sócio-administrador

Declaramos estar ciente e de acordo com as condições do Edital, cujos termos são de nossa perfeita compreensão e que nossa empresa contém as condições gerais relativas ao fornecimento, independente de qualquer instrumento ou termo especial.

Segue documentação técnica que comprove as características do item proposto que atende as características do item licitado constantes no capítulo 04 – Descrição do Material do termo de referência.

Item	Quant	Unid	Descrição	Fabricante / Marca	Preço Unitário	Preço Total
1	40	Und	Conversor para medidor eletromagnético com DPS (características técnicas detalhadas conforme catálogos anexos a esta proposta)	QT Instrument	R\$ 5.480,00	R\$ 219.200,00
TOTAL:						R\$ 219.200,00

Duzentos e dezenove mil e duzentos reais

Diadema-SP, 15 de setembro de 2025.

EBER TALES DE
SOUZA:37025026
883

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EBER TALES DE
SOUZA:37025026883
Dados: 2025.09.15 17:02:36
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MEDIDOR DE VAZÃO ELETROMAGNÉTICO





Descrição

O medidor de vazão magnético QTLD/S, também conhecido como medidor de vazão eletromagnético ou medidor mag, é amplamente utilizado por sua medição precisa, custo-benefício e baixa obstrução ao fluxo.

Ele se destaca por não possuir partes móveis, o que elimina o desgaste e reduz drasticamente a necessidade de manutenção ou substituição. Oferecemos medidores com uma variedade de revestimentos, eletrodos e tamanhos, atendendo a diversos tipos de líquidos condutivos. O display OLED está disponível nas cores amarela ou verde e o grau de proteção da versão compacta é IP67 e a versão IP 68 está disponível para o sensor remoto.

Opcionais

O medidor de vazão QTLD/S pode ser equipado com funções de cartão SD e Bluetooth (Opcional)

Medição de BTU (Opcional)

É possível conectar um sensor de temperatura PT1000 para que o dispositivo atue como um medidor de BTU Unidade Térmica (Opcional)



Compacto



Remoto



Indústrias

- Estação de Tratamento de Água ou Efluentes
- Redes de distribuição e abastecimento
- Indústrias Siderúrgicas e de Alumínio
- Indústria alimentícia e farmacêutica
- Indústrias Químicas e de Fertilizantes
- Indústrias de Laticínios
- Indústrias de Açúcar
- Indústrias de Processamento Têxtil



Aplicações



Características

- Ampla Faixa de Diâmetros Nominais: DN3 a DN3000.
- Desempenho do medidor não é afetado por pressão, temperatura, densidade e viscosidade do líquido.
- Design sem partes móveis, livre de manutenção.
- Função opcional de gravação automática de falhas de energia, garantindo a segurança dos dados.
- Eletrodos de aterramento embutidos
- Grau de proteção IP67 (compacto) e IP 68 (remoto)
- Display OLED nas cores amarela ou verde.
- Pode atuar como um medidor de BTU com a adição de um sensor de temperatura Pt1000
- Medição Bidirecional de Fluxo
- Modelo com Precisão de 0,2% disponível (opcional).
- Funções de autodiagnóstico, alarme de tubo vazio e alarme de excitação
- Suporta registro de dados, Bluetooth e comunicação sem fio (opcional)



Especificações Técnicas

Faixa DN	DN3-DN3000mm (1/8"-120")
Precisão	±0,5% da leitura em velocidade $\geq 0,5$ m/s, ±0,2% (opcional) em velocidade $\geq 0,5$ m/s
Faixa Velocidade	0.1~15 m/s
Método Instalação	$\leq 0.17\%$
Método Instalação	Compacto / remoto, 10 metros de cabo (padrão), máximo 100 metros
Condutividade mín.	$> 5 \mu\text{S/cm}$
Grau de proteção	Compacto: IP67 Remoto: IP68
Material eletrodo	SS316L, Hastelloy C, Hastelloy B, Titânio, Tântalo, Platina-irídio
Alimentação	85 ~ 250 VCA (50/60 Hz), 20 ~ 36 VCC
Consumo	$< 20\text{W}$
Sinais de Saída	Analógica 4~20mA (resistência de carga 0~750 Ω)
	Frequência
	Alarmes
Comunicação	RS485 MODBUS RTU (padrão). Opcional: HART, GPRS, PROFIBUS e Bluetooth
Tela	Display LCD ,128X128mm, três linhas, 4 botões
Temperatura (ambiente)	-20°C~60°C
Temperatura (fluido)	Compacto: -20°C~80°C, Remoto: -20°C~120°C
Revestimento	PTFE (-20°C~150°C, DN15-DN1600)
	FEP (-20°C~120°C, DN3-DN1800)
	PFA (-20°C~160°C, DN3-DN800)
	Poliuretano (-10°C~60°C, DN40-DN1600)
	Neoprene (-10°C~80°C, DN40-DN3000)
	Borracha Dura (-10°C~80°C, DN 40-DN3000)
	Cerâmica (-20°C~180°C, DN15-DN200)
Conexão processo	flange, tri-clamp, rosca, wafer, inserção
Material do Sensor	Tubo de medição: Aço Inox 304
	Flange e carcaça: Aço carbono (padrão), Aço Inox 304/316 (opcional)
Material do Conversor	Liga de alumínio com pintura epóxi
Data Logger	Cartão SD (opcional)
Exibição	Vazão instantânea, vazão total, velocidade do fluxo.
Funcionalidades	Alarme alto e baixo, alarme de excitação, alarme de tubo vazio, autodiagnóstico
Totalizadores	Três totalizadores integrados: fluxo direto, fluxo reverso e fluxo acumulado
Unidades de medida	L/s, L/m, L/h, m³/s, m³/m, m³/h, UKG, USG, gal/s, gal/m, gal/h, kg/s, kg/m, kg/h, t/s, t/m, t/h
Idioma	Inglês, Chinês, Italiano, Português, Francês, Espanhol, Coreano
Visor	Tela de LCD, OLED verde ou amarelo

Medidor de Vazão Eletromagnético Multifuncional QTLD/S



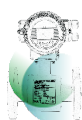
Versões

 A flow meter with a white body and a blue-rimmed circular display head. The display shows '+000.00' and technical specifications. It has two large horizontal flanges for pipe connection.	 A flow meter with a white body and a blue-rimmed circular display head. The display shows '+000.00' and technical specifications. It has two small ports on the top for wiring and a wafer-style body for flange connection.	 A flow meter with a stainless steel body and a blue-rimmed circular display head. The display shows '+000.00' and technical specifications. It has two tri-clamp connections for pipe connection.	 A flow meter with a blue-rimmed circular display head mounted on a long, thin stainless steel probe. The display shows '+000.00' and technical specifications. It is designed for insertion into a pipe.
Flange	Wafer	Tri-clamp	Inserção

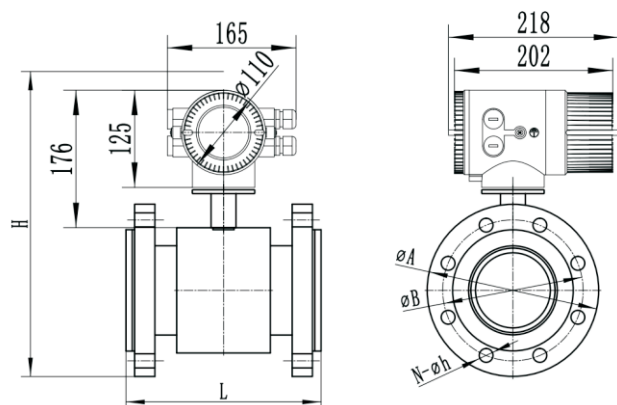
 A flow meter with a white body and a blue-rimmed circular display head. The display shows '+000.00' and technical specifications. It has two large horizontal flanges for pipe connection. A separate external display unit is shown to the left.	 A flow meter with a white body and a blue-rimmed circular display head. The display shows '+000.00' and technical specifications. It has two small ports on the top for wiring and a wafer-style body for flange connection. A separate external display unit is shown to the right.
Flangeado	Wafer

 A flow meter with a stainless steel body and a blue-rimmed circular display head. The display shows '+000.00' and technical specifications. It has two tri-clamp connections for pipe connection. A separate external display unit is shown to the right.
Tri-clamp

Medidor de Vazão Eletromagnético Multifuncional QTLD/S

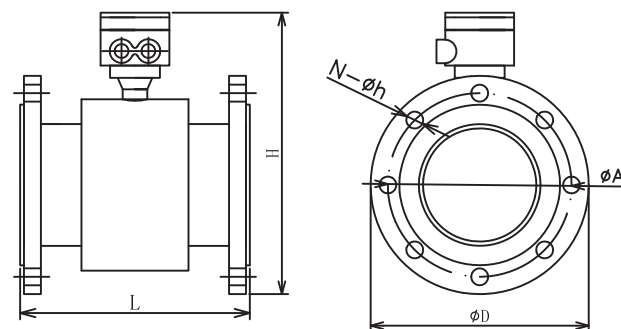


Dimensões



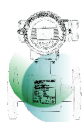
DN15-DN600 Medidor de Vazão Eletromagnético Multifuncional com Desenho DIN.

Tamanho do medidor de vazão magnético compacto						
Size	Nominal Pressure	H (mm)	L (mm)	φ A (mm)	φ B (mm)	N-φ h (mm)
15	PN16	273	200	95	65	4-φ 14
20		278	200	105	75	4-φ 14
25		283	200	115	85	4-φ 14
32		295	200	140	100	4-φ 18
40		305	200	150	110	4-φ 18
50		321	200	165	125	4-φ 18
65		338	200	185	145	4-φ 18
80		354	200	200	160	8-φ 18
100		373	250	220	180	8-φ 18
125		398	250	250	210	8-φ 18
150	PN10	431	300	285	240	8-φ 22
200		488	350	340	295	12-φ 22
250		564	450	405	355	12-φ 26
300		617	500	460	410	12-φ 26
350		674	550	520	470	16-φ 26
400		728	600	580	525	16-φ 30
450		784	600	640	585	20-φ 30
500		848	600	715	650	20-φ 33
600		965	600	840	770	20-φ 36



DN15-DN600 Medidor de Vazão Eletromagnético Remoto com Desenho DIN.

Tamanho do medidor de vazão magnético remoto						
Size	Nominal Pressure	L (mm)	φ D (mm)	φ A (mm)	H (mm)	N-φ h (mm)
15	PN16	200	95	65	220	4-φ 14
20		200	105	75	220	4-φ 14
25		200	115	85	223	4-φ 14
32		200	140	100	240	4-φ 18
40		200	150	110	250	4-φ 18
50		200	165	125	263	4-φ 18
65		200	185	145	283	4-φ 18
80		200	200	160	290	8-φ 18
100		250	220	180	310	8-φ 18
125		250	250	210	340	8-φ 18
150	PN10	300	285	240	373	8-φ 22
200		350	340	295	430	12-φ 22
250		450	405	355	495	12-φ 26
300		500	445	400	540	12-φ 22
350		550	505	460	595	16-φ 22
400		600	565	515	658	16-φ 26
450		600	615	565	708	20-φ 26
500		600	670	620	760	20-φ 26
600		600	780	725	882	20-φ 30



Material dos Eletrodos

Electrode Material	
SS316L	Aplicável a água industrial e municipal, efluentes e fluidos de baixa corrosividade. Amplamente utilizado nas indústrias petroquímica e química.
Hastelloy B	Forte resistência a ácidos clorídricos abaixo do ponto de ebulição. Resistente a ácidos oxidáveis, álcalis e sais não oxidáveis, como vitríolo, fosfato, ácidos fluorídricos e ácidos orgânicos.
Hastelloy C	Excepcional resistência a soluções fortes de sais e ácidos oxidantes, como Fe^{+++} , Cu^{+} , ácidos nítricos, ácidos mistos.
Titânio	O Titânio pode suportar fluidos corrosivos como água do mar, soluções salinas de cloreto, sais de hipoclorito, ácidos oxidáveis (incluindo ácidos nítricos fumegantes), ácidos orgânicos e álcalis. Não é resistente a ácidos redutores de alta pureza, como ácidos sulfúricos e clorídricos.
Tântalo	Altamente resistente a fluidos corrosivos. Aplicável a todos os fluidos químicos, exceto Ácidos Fluorídricos, Óleo e Álcalis.
Platino-irídio	Aplicável a todos os fluidos químicos, exceto sais de Amônio e Ácidos Fortes.



Material do Revestimento

PTFE	Melhor resistência química: Suporta ácido clorídrico, ácido sulfúrico, ácido nítrico, álcalis e uma variedade de solventes orgânicos em ebulição. Baixa resistência ao desgaste e baixa adesão.
PFA	Altamente resistente a produtos químicos. Bom desempenho sob condição de pressão de vácuo.
Neoprene	Excelente elasticidade, boa resistência à abrasão. Resiste à corrosão de ácidos, álcalis, sais e outros fluidos de baixa concentração. Não é resistente à corrosão por fluidos oxidantes.
Poliuretano	Forte resistência à abrasão, aplicável a líquidos com sólidos e lamas. Baixa resistência à corrosão, não pode ser usado para fluidos corrosivos.
Borracha Dura	Resiste à corrosão de ácido clorídrico, ácido acético, ácido oxálico, água amoníaco, ácido fosfórico e 50% de ácido sulfúrico, hidróxido de sódio, hidróxido de potássio. Uso para soluções de ácidos, álcalis e sais em geral, não resistente à corrosão de oxidantes fortes
Cerâmica	Suporta altas temperaturas, corrosão e desgaste. Interior liso. Totalmente resistente ao vácuo.

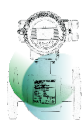


Tabela de Seleção QTLD

QTLD		x	x	x	x	x	x	x	x	x	x	x	x
Faixa de Diâmetro	DN3-DN3000 (1/8"-120")												
Instalação	Compacto	1											
	Remoto	2											
	Compacto à prova de explosão	3											
	Remote à prova de explosão	4											
Precisão	±0.5%	1											
	±0.2%	2											
	Outros	3											
Revestimento	PTFE	1											
	FEP	2											
	PFA	3											
	Neoprene	4											
	Poliuretano	5											
	Borracha Dura	6											
	Cerâmica	7											
Eletrodo	SS316L	1											
	Hastelloy B	2											
	Hastelloy C	3											
	Titânio	4											
	Tântalo	5											
	Platino-irídio	6											
	Aço inoxidável revestido com carboneto de tungstênio	7											
Material sensor	Aço Carbono	1											
	SS304	2											
	SS316	3											
Alimentação	20~36 VDC	G											
	85~265 VAC	E											
	9~36 VDC energia solar	SD											
Sinal de saída / Comunicação	4~20 mA + Pulso + RS485 MODBUS	A											
	4~20 mA + HART	B											
	4~20 mA + Profibus PA/DP	C											
Conexão ao processo	Flangeado	DIN D10: DIN PN10, D16: DIN PN16, D25: DIN PN25, D40: DIN PN40	D**										
		ANSI A15: ANSI 150#, A30: ANSI 300#, A60: ANSI 600#	A**										
		JIS J10: JIS 10K, J20: JIS 20K, J30: JIS 30K	J**										
		Others	O										
	Inserção	G2" válvula de esfera de rosca	IT										
		válvula de esfera de flange	IF										
	Tri-clamp	TC											
	Wafer	W											
	Roscada	T											
Grau de proteção	Conversor IP65 + Sensor IP 65										1		
	Conversor IP65 + Sensor IP 68										2		
Cartão SD	Não											N	
	Sim												
Display	LCD												1
	Oled Amarelo												2
	Oled Verde												3



Tabela de vazão

Tamanho		Faixa de Vazão e Tabela de Velocidade							
mm	Inch	0.1 m/s	0.2 m/s	0.5 m/s	1 m/s	4 m/s	10 m/s	12 m/s	15 m/s
DN3	1/8"	0.003	0.005	0.013	0.025	0.102	0.254	0.305	0.382
DN6	1/4"	0.01	0.02	0.051	0.102	0.407	1.017	1.221	1.526
DN10	3/8"	0.028	0.057	0.141	0.283	1.13	2.826	3.391	4.239
DN15	1/2"	0.064	0.127	0.318	0.636	2.543	6.359	7.63	9.538
DN20	3/4"	0.113	0.226	0.565	1.13	4.522	11.304	13.56	16.956
DN25	1"	0.177	0.353	0.883	1.766	7.065	17.663	21.2	26.494
DN32	1¼"	0.289	0.579	1.447	2.894	11.575	28.938	34.73	43.407
DN40	1½"	0.452	0.904	2.261	4.522	18.086	45.216	54.26	67.824
DN50	2"	0.707	1.413	3.533	7.065	28.26	70.65	84.78	10.598
DN65	2½"	1.19	2.39	5.97	11.94	47.76	119.4	143.3	179.1
DN80	3"	1.81	3.62	9.04	18.09	72.35	180.86	217	271.3
DN100	4"	2.83	5.65	14.13	28.26	113.04	282.6	339.1	423.9
DN125	5"	4.42	8.83	22.08	44.16	176.63	441.56	529.9	662.34
DN150	6"	6.36	12.72	31.79	63.59	254.34	635.85	763	953.78
DN200	8"	11.3	22.61	56.52	113.04	452.16	1130.4	1356	1696
DN250	10"	17.66	35.33	88.31	176.53	706.5	1766.25	2120	2649
DN300	12"	25.43	50.87	127.2	254.34	1017	2543.4	3052	3815
DN350	14"	34.62	69.24	1731	3461.9	1385	3461.85	4154	5193
DN400	16"	45	90	2261	452	1809	4522	5426	6782
DN450	18"	57	114	2861	572	2289	5723	6867	8584
DN500	20"	71	141	3533	707	2826	7065	8478	10598
DN600	24"	102	203	5087	1017	4069	10174	12208	15260
DN700	28"	138	277	6924	1385	5539	13847	16617	20771
DN800	32"	181	362	9043	1809	7235	18086	21704	27130
DN900	36"	229	458	1145	2289	9156	22891	27469	34336
DN1000	40"	283	565	1413	2826	11304	28260	33912	42390
DN1200	48"	407	814	2035	4069	16278	40694	48833	61042
DN1400	56"	554	1108	2769	5539	22156	55390	66468	83084
DN1600	64"	723	1447	3617	7235	28938	72346	86815	108518
DN1800	72"	916	1831	4578	9156	36625	91562	109875	137344
DN2000	80"	1130	2261	5652	11304	45216	113040	135648	169560
DN2200	88"	1368	2736	6839	13678	54711	136778	164134	205168
DN2400	96"	1628	3256	8139	16278	65111	162778	195333	244166
DN2600	104"	1910	3821	9552	19104	76415	191038	229245	286556
DN2800	112"	2216	4431	11078	22156	88623	221558	265870	332338
DN3000	120"	2543	5087	12717	25434	101736	254340	305208	381510

Remark: Recommend flow velocity range 0.5 ~ 15 m/s

Especialista na proteção contra raios e surtos elétricos



OCP	Norma	Nº Certificado
UL	IEC 61643-11	UL-BR 19.1325

Descrição

Dispositivo de Proteção contra Surtos (DPS), monopolar, Classe II (IEC 61643-11), do tipo limitador de tensão, composto por Varistor de Óxido Metálico (MOV) associado a um dispositivo de desconexão térmica (sobretensão).

Características

- Permite a substituição do plugue com o sistema energizado;
- Sinalização local do status de operação;
- Sinalização remota (opcional);
- Possui desligador interno que desconecta o DPS ao final da vida útil;
- Fixação em trilho DIN 35.

Aplicação

Quadros de distribuição abrigados, para proteção de instalações elétricas de baixa tensão contra surtos de tensão provenientes de descargas atmosféricas, manobras de carga e outros.

Características técnicas (Gerais)	Unid.	CLAMPER Front	CLAMPER Front/SR
Normas aplicáveis	-	IEC 61643-11 / UL 1449 / ABNT NBR 5410	
Modos de proteção	-	L/PE - N/PE (modo comum) ou L/N (modo diferencial)	
Tecnologia de proteção	-	Varistor de Óxido Metálico (MOV)	
Tempo de resposta típico	ns	< 25	
Proteção térmica	-	Sim	
Máxima corrente de curto-circuito sem fusível backup	kA	5	
Fusível backup	A	100 gL/gG	
Sinalização do status de operação	-	Verde - SERVIÇO; Vermelho - DEFEITO	
Temperatura de operação	°C	-40 ... +70	
Seção dos condutores de conexão elétrica	mm²	4 a 25	
Fixação	-	Trilho padrão DIN 35	
Torque máximo dos bornes de conexão elétrica	Nm	3,0	
Acondicionamento	-	Material com características de não propagação e auto-extinção do fogo	
Grau de proteção	-	IP20	
Dimensões máximas	mm	94,6 x 74 x 17,5 (C x A x L)	99 x 74 x 17,5 (C x A x L)
Parâmetros elétricos dos contatos de sinalização remota	-	-	120V _{AC} /1A 24V _{DC} /1A
Seção dos condutores de sinalização remota	mm²	-	1,5

Especialista na proteção contra raios e surtos elétricos

Características técnicas (Específicas)

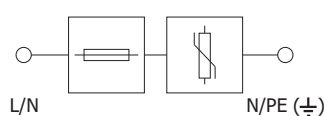
Código CLAMPER		Modelo	Tensão máxima de operação contínua	Corrente de descarga nominal @ 8/20µs	Corrente de descarga máxima @ 8/20µs	Tensão de referência @ 1mA	Nível de proteção	Peso aproximado
CDI		-	U _c	I _n	I _{máx}	U _{ref}	U _p	-
Standard	SR							
014291	014303	CLAMPER Front 75V 20kA	75 Vac	10 kA	20 kA	120 V	0,4 kV	85 g
014605	014618	CLAMPER Front 75V 30kA	75 Vac	10 kA	30 kA	120 V	0,5 kV	95 g
014292	014304	CLAMPER Front 75V 45kA	75 Vac	20 kA	45 kA	120 V	0,6 kV	100 g
014606	014619	CLAMPER Front 175V 15kA	175 Vac	5 kA	15 kA	270 V	0,7 kV	95 g
014293	014305	CLAMPER Front 175V 20kA	175 Vac	10 kA	20 kA	270 V	0,8 kV	100 g
014607*	014620*	CLAMPER Front 175V 30kA	175 Vac	10 kA	30 kA	270 V	0,8 kV	100 g
014649*	014650*	CLAMPER Front 175V 40kA	175 Vac	20 kA	40 kA	270 V	1,2 kV	105 g
014294	014306	CLAMPER Front 175V 45kA	175 Vac	20 kA	45 kA	270 V	1,2 kV	105 g
014608	014621	CLAMPER Front 275V 15kA	275 Vac	5 kA	15 kA	430 V	1,2 kV	95 g
014295	014307	CLAMPER Front 275V 20kA	275 Vac	10 kA	20 kA	430 V	1,2 kV	105 g
014696*	014697*	CLAMPER Front 275V 20kA	275 Vac	10 kA	20 kA	430 V	1,2 kV	105 g
014610	014622	CLAMPER Front 275V 30kA	275 Vac	10 kA	30 kA	430 V	1,2 kV	110 g
014651*	014652*	CLAMPER Front 275V 40kA	275 Vac	20 kA	40 kA	430 V	1,5 kV	115 g
014296	014308	CLAMPER Front 275V 45kA	275 Vac	20 kA	45 kA	430 V	1,5 kV	115 g
014698*	014699*	CLAMPER Front 275V 45kA	275 Vac	20 kA	45 kA	430 V	1,5 kV	115 g
014611*	014623*	CLAMPER Front 320V 15kA	320 Vac	5 kA	15 kA	510 V	1,2 kV	95 g
014297	014309	CLAMPER Front 320V 20kA	320 Vac	10 kA	20 kA	510 V	1,5 kV	105 g
014612*	014624*	CLAMPER Front 320V 30kA	320 Vac	10 kA	30 kA	510 V	1,5 kV	110 g
014298	014310	CLAMPER Front 320V 45kA	320 Vac	20 kA	45 kA	510 V	1,8 kV	115 g
014613	014625	CLAMPER Front 385V 15kA	385 Vac	5 kA	15 kA	620 V	1,4 kV	105 g
014299	014312	CLAMPER Front 385V 20kA	385 Vac	10 kA	20 kA	620 V	1,8 kV	105 g
014614*	014626*	CLAMPER Front 385V 30kA	385 Vac	10 kA	30 kA	620 V	1,8 kV	105 g
014653*	014654*	CLAMPER Front 385V 40kA	385 Vac	20 kA	40 kA	620 V	2,0 kV	115 g
014300	014313	CLAMPER Front 385V 45kA	385 Vac	20 kA	45 kA	620 V	2,0 kV	115 g
014615	014628	CLAMPER Front 460V 15kA	460 Vac	5kA	15 kA	750 V	1,8 kV	105 g
014301	014314	CLAMPER Front 460V 20kA	460 Vac	10 kA	20 kA	750 V	2,5 kV	105 g
014616*	014629*	CLAMPER Front 460V 30kA	460 Vac	10 kA	30 kA	750 V	2,5 kV	105 g
014655*	014656*	CLAMPER Front 460V 40kA	460 Vac	20 kA	40 kA	750 V	2,5 kV	125 g
014302	014315	CLAMPER Front 460V 45kA	460 Vac	20 kA	45 kA	750 V	2,5 kV	125 g

NOTA 1: Para especificação dos dispositivos com SINALIZAÇÃO REMOTA agregar /SR ao nome do produto. Ex.: CLAMPER Front xxxV xxkA/SR.

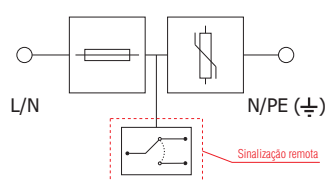
NOTA 2: Os modelos com SINALIZAÇÃO REMOTA apresentam uma variação no peso de aproximadamente 5g em relação aos respectivos modelos Standard.

NOTA 3: *Produtos sob consulta.

Diagrama elétrico:

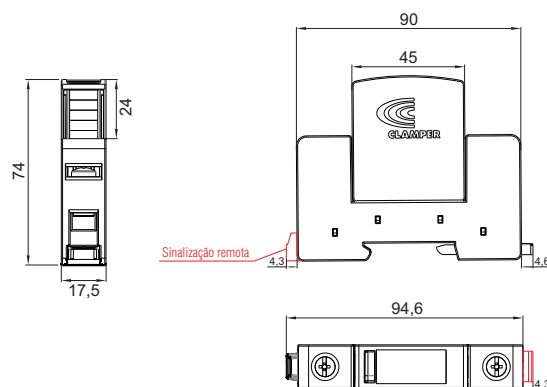


DPS Standard



DPS com sinalização remota "/>

Desenho mecânico:



Assunto: Re: Fwd: PROPOSTA COMERCIAL - PG 90046/2025 - 40X CONVERSORES - ERFLOW

De: José Antônio <jteixeira@cesama.com.br>

Data: 16/09/2025 15:30

Para: DELC - Alexandre <anogueira@cesama.com.br>

Alexandre boa tarde!

A proposta da empresa ER FLOW.**não atende** ao edital, pois, o produto apresentado no catalogo e ofertado na proposta, não condiz com o objeto do edital. Ele oferece um Medidor de vazão Eletromagnético, enquanto no edital é solicitado Conversor Universal Para Medidores de vazão, conforme o item 1 do edital.

"1. OBJETO - Aquisição de Conversor Universal para Medidores de vazão Eletromagnéticos para a CESAMA."

Att.

Em 16/09/2025 10:44, DELC - Alexandre escreveu:

Caro Zé, segue para sua avaliação proposta do fornecedor ER FLOW.

Att

Alexandre

----- Mensagem encaminhada -----

Assunto:PROPOSTA COMERCIAL - PG 90046/2025 - 40X CONVERSORES - ERFLOW

Data:Mon, 15 Sep 2025 17:04:23 -0300

De:Felipe Lisboa <felisboa.tec@gmail.com>

Para:anogueira@cesama.com.br

Prezados, boa tarde.

Segue nossa proposta comercial e técnica para o referido pregão, conforme solicitado.

Anexo PDF com valores e características técnicas

Obrigado

Felipe Lisboa

Analista de Licitações e Contratos

ER Flow Manutencao e Calibracao Ltda

(11) 918624736 - Vivo / WhatsApp



PREGÃO ELETRÔNICO PARA REGISTRO DE PREÇOS Nº 0046/25

PROPOSTA COMERCIAL

OBJETO: Aquisição de Conversor Universal para Medidores de vazão Eletromagnéticos para a CESAMA.

Razão Social do Licitante: Instrumentation Soluções Tecnológicas LTDA.

CNPJ: 20.348.506/0001-01

Endereço: Rua Salvador do Vale, 199 – Vila Formosa – São Paulo – SP CEP 03362-015

E-mail: licitacao@instrumentation.com.br

Telefone / Fax: (11) 3459-3481

Representante Legal:

Nome: Ragner Lemos de Arruda

Identificação (RG e CPF): CPF: 35284748824 - RG: 45.041.044-4

Qualificação: Socio Administrador

E-mail do representante: licitacao@instrumentation.com.br

Declaramos estar ciente e de acordo com as condições do Edital, cujos termos são de nossa perfeita compreensão e que nossa empresa contém as condições gerais relativas ao fornecimento, independente de qualquer instrumento ou termo especial.

Segue documentação técnica que comprove as características do item proposto que atende as características do item licitado constantes no capítulo 04 – Descrição do Material do termo de referência.

Item	Quant	Unid	Descrição	Fabricante / Marca	Preço Unitário	Preço Total
1	40	unidade	Conversor Sinal	Instrumentation	R\$ 5.300,0000	R\$ 212.000,0000
TOTAL:						R\$ 212.000,0000

São Paulo, 15 de Setembro de 2025

Ragner Lemos de Arruda



PREGÃO ELETRÔNICO Nº 0046/25

ANEXO IV

Declaração do artigo 38 da Lei 13.303/2016

Ivan Ludewig, inscrito no CNPJ nº 61.315.407/0001-00, por intermédio de seu representante legal o (a) Sr(a) Ivan Ludewig, portador (a) da Carteira de Identidade nº 38.860.188-7 e do CPF nº 552.830.518-70, declara sob as penas da lei, para fins do disposto no art. 10 do Regulamento Interno de Licitações, Contratos e Convênios da Cesama (RILC), em observância ao art. 38 da Lei Federal nº 13.303, de 30 de junho de 2.016, que não está impedida de licitar e contratar com a Cesama, comprometendo-se a informar a ocorrência de fato superveniente impeditivo.

Ribeirão Preto, 15 de Setembro de 2025

61 315 407 IVAN
LUDEWIG:61315
407000100

Assinado de forma digital
por 61 315 407 IVAN
LUDEWIG:61315407000100
Dados: 2025.09.15 15:14:32
-03'00'

Ivan Ludewig
Diretor

AXION Automação Industrial Ltda. CNPJ: 61.315.407/0001-00

Av. Maurílio Biagi, 800 – Sala 812 – Bairro Santa Cruz do José Jacques – Ribeirão Preto/SP

Tel.: (16) 9 9414-0500 axion.automacao@gmail.com



**PREGÃO ELETRÔNICO PARA REGISTRO DE PREÇOS Nº 0046/25
PROPOSTA COMERCIAL**

OBJETO: Aquisição de Conversor Universal para Medidores de vazão Eletromagnéticos para a CESAMA.

Razão Social do Licitante: IVAN LUDEWIG

CNPJ: 61.315.407/0001-00

Endereço: Av. Maurílio Biagi, 800 – Sala 812 – Bairro Santa Cruz do José Jacques – Ribeirão Preto/SP – CEP 14020-750

E-mail: axion.automacao@gmail.com

Telefone / Fax: (16) 9414-0500

Representante Legal:

Nome: Ivan Ludewig

Identificação (RG e CPF): 38.860.188-7

Qualificação: Diretor

E-mail do representante: axion.automacao@gmail.com

Declaramos estar ciente e de acordo com as condições do Edital, cujos termos são de nossa perfeita compreensão e que nossa empresa contém as condições gerais relativas ao fornecimento, independente de qualquer instrumento ou termo especial.

Segue documentação técnica que comprove as características do item proposto que atende as características do item licitado constantes no capítulo 04 – Descrição do Material do termo de referência.

Item	Quant	Unid	Descrição	Fabricante / Marca	Preço Unitário	Preço Final
01	40	Unid	7ME6920- 1AA30-1AA0 + FDK:085U0234 Modelo: MAG 6000	SIEMENS	R\$ 8.600,00	R\$ 344.000,00
Total:						R\$ 344.000,00

Observação: Modelo MAG 5000 não contém saída Modbus, portanto estamos cotando modelo **MAG6000 com Modbus RTU RS485**

Ribeirão Preto, 15 de Setembro de 2025

61 315 407 IVAN LUDEWIG:61315
407000100

Assinado de forma digital
por 61 315 407 IVAN
LUDEWIG:61315407000100
Dados: 2025.09.15 15:54:52
-03'00'

Ivan Ludewig
Diretor

AXION Automação Industrial Ltda. CNPJ: 61.315.407/0001-00

Av. Maurílio Biagi, 800 – Sala 812 - CEP 14020-750 - Ribeirão Preto / SP

Tel.: (16) 9 9414-0500 axion.automacao@gmail.com



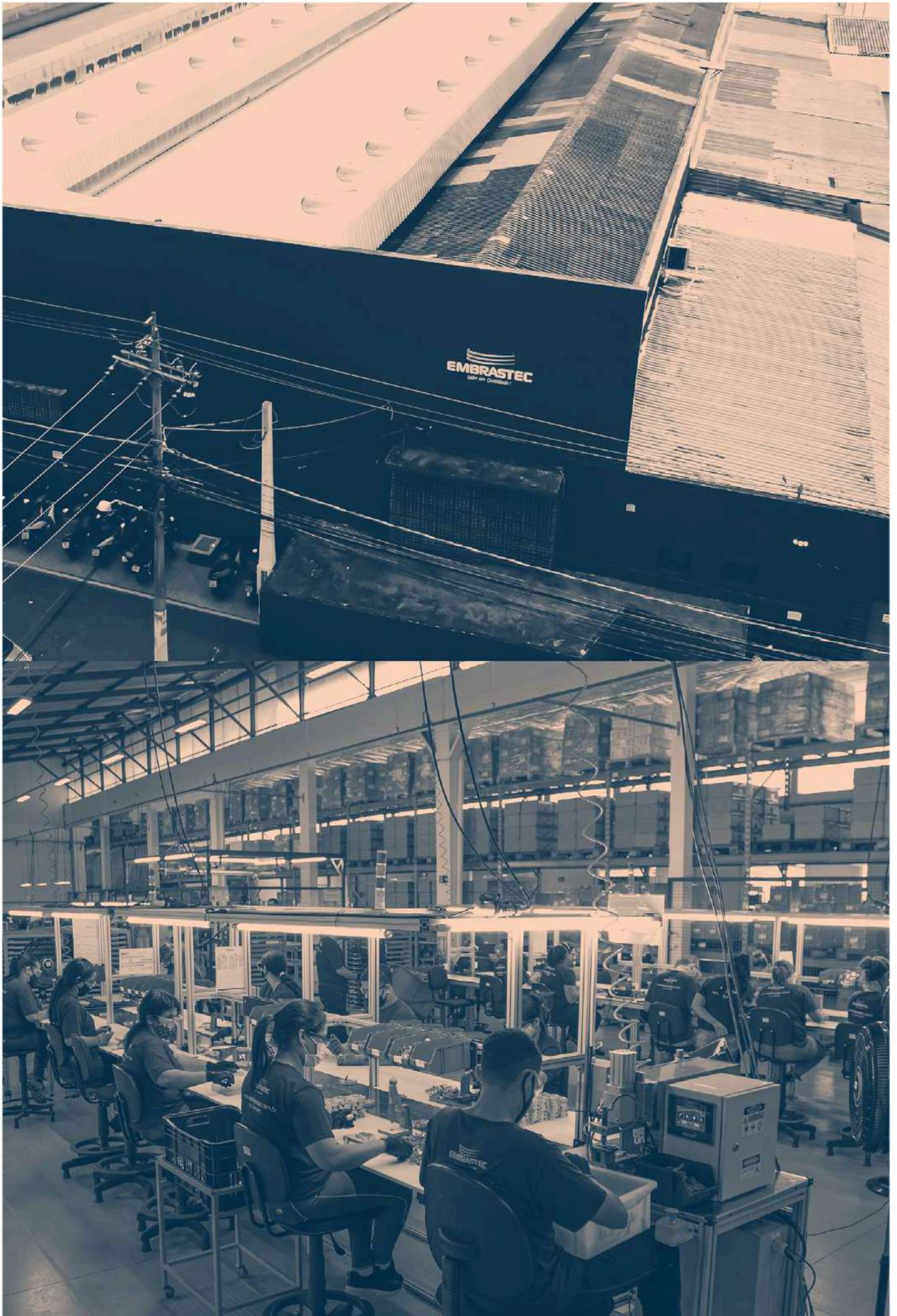
#embrastecprotege



Catálogo de produtos

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Nossa história

A Proteção que sua energia precisa

DESDE 1991

A Embrastec, uma empresa de capital nacional fundada em 1991, está localizada em Ribeirão Preto, interior do estado de São Paulo.

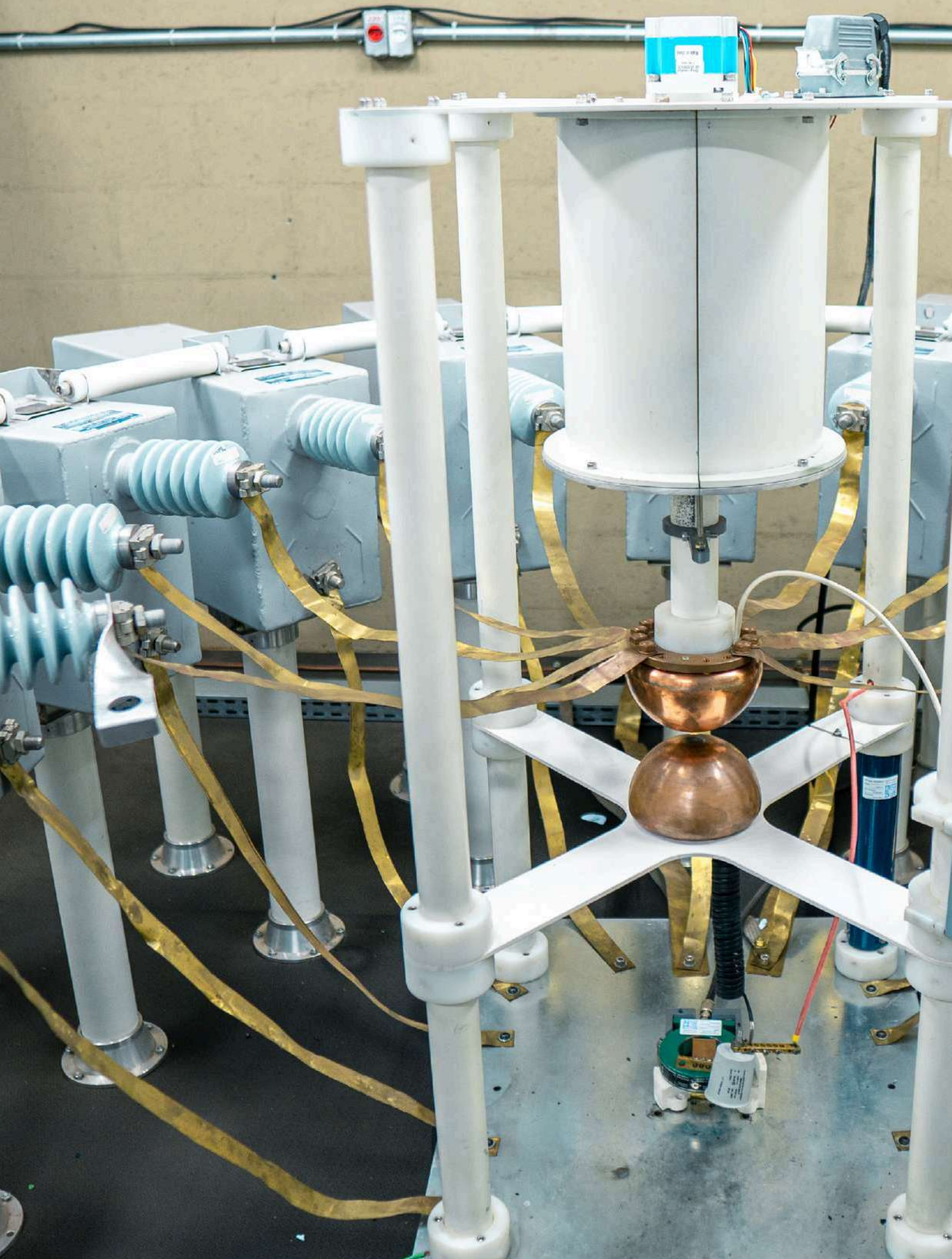
Ela dedicou-se primeiramente ao desenvolvimento de Dispositivos de Proteção Contra Surtos (DPS), para somente dois anos depois, em 1993, após vários testes, iniciar a sua fabricação e comercialização. Esse tema foi abordado com maior profundidade com a recente publicação da nova versão da norma ABNT NBR 5419 em 2015, onde as Medidas de Proteção contra Surtos (MPS) ganharam um capítulo inteiro. Sempre investindo em pesquisas, contamos com a linha mais completa de DPS, proporcionando proteção para redes elétricas de energia e sinal, composta por uma grade de produtos com mais de 1500 modelos.

Ao longo desses anos participamos do desenvolvimento e divulgação desses equipamentos, até que no ano 2004, finalmente

o DPS passou a ser um item obrigatório nas instalações elétricas de acordo com a norma ABNT NBR 5410. Buscando sempre a máxima qualidade, submetemos nossos equipamentos a ensaios em vários laboratórios renomados, como o Laboratório de Integração e Testes - LIT do Instituto Nacional de Pesquisas Espaciais - INPE em São José dos Campos (SP), o laboratório de alta tensão da UNICAMP em Campinas (SP) e o Laboratório de Compatibilidade Eletromagnética do Instituto de Tecnologia para o Desenvolvimento - LACTEC em Curitiba (PR). Nossa equipe técnica está sempre à disposição de nossos clientes para buscar soluções, seja com o desenvolvimento de projetos ou de novos produtos. Já desenvolvemos DPS para atender às necessidades de vários clientes, como Siemens, Autoban, Trixtec, TSE, Telefônica, Infraero, METRO-SP, entre outros. A satisfação de nossos clientes é a nossa maior vocação!



Norival Rosa e Márcio Rosa (da esquerda para direita)





Laboratório de Alta Tensão no Brasil.

Em 2019, sempre pensando em melhoria contínua, instalamos no Brasil um dos mais completos e modernos laboratórios de alta tensão.

TENSÃO DE ATÉ 50kV

CORRENTE DE ATÉ 100kA na onda 8/20 μ s

Sendo possível outras formas de onda.

Ensaio de tipo para:

DPS CLASSE I, II e III

Entenda o fenômeno

An aerial photograph of a city at night, with numerous lights from buildings and streets. A bright lightning bolt strikes down from a dark, stormy sky. The image is overlaid with several graphic elements: a horizontal yellow line in the top left, a vertical yellow line in the center, and a vertical blue line to the right of the yellow one.

O que são raios? —

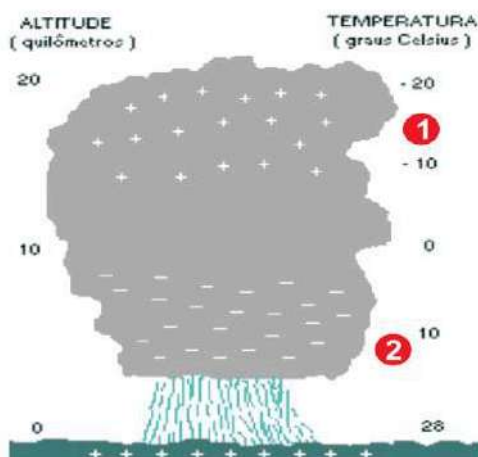
Raios são **descargas atmosféricas** que ocorrem entre nuvens ou entre nuvens e a terra. Essas descargas atmosféricas correspondem a correntes e tensões, possuindo uma grande capacidade destrutiva, podendo atingir edificações e instalações elétricas, sendo essas últimas o objeto de nosso estudo.

E como ocorrem?

O deslocamento de ar que forma as nuvens as tornam eletricamente carregadas, tanto com cargas negativas quanto positivas, criando em seu interior um campo elétrico. Este processo desloca gradativamente as cargas negativas para a parte inferior da nuvem (2) e as positivas (1) consequentemente para a parte superior. Ao mesmo tempo as cargas positivas no solo se deslocam em direção à nuvem, sendo atraídas pelas cargas negativas que lá se acumulam. As cargas negativas da nuvem geram um líder descendente (5) e as cargas positivas (6) da terra geram um líder ascendente, quando eles se encontram rompe-se totalmente a isolamento do ar, sendo completado então o processo de formação do RAIÃO (7).

E como se proteger?

A norma ABNT NBR5419:2015, trata especificamente da Proteção contra Descargas Atmosféricas (PDA). Segundo a Norma não há métodos capazes de impedir a ocorrência de descargas atmosféricas, as quais são perigosas às pessoas, estruturas e instalações elétricas. No entanto, há medidas de proteção que devem ser aplicadas. Vejamos:



Uma PDA é composta do SPDA (Sistema de Proteção contra Descargas Atmosféricas) e das MPS (Medidas de Proteção contra Surtos). Ao se especificar uma MPS, deve-se analisar a equipotencialização, o roteamento dos cabos e a aplicação dos DPS, os quais são responsáveis pela proteção da instalação elétrica e seus equipamentos eletroeletrônicos. Desta forma SPDA e MPS se complementam e juntos proporcionam proteção aos usuários.

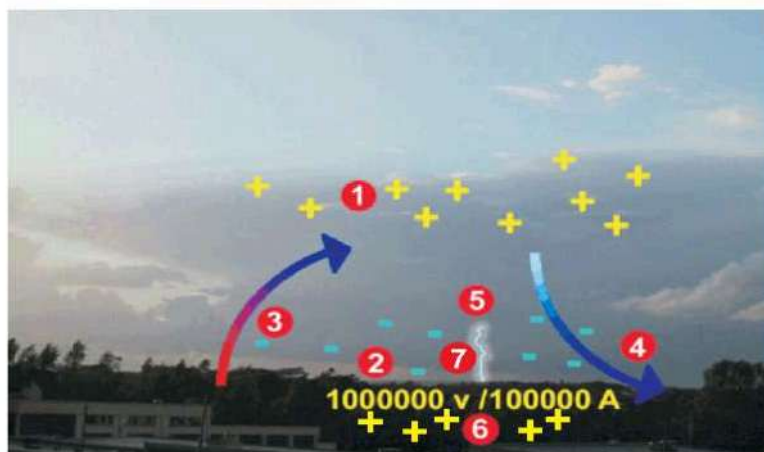
O que são transientes, surtos ou sobretensões transitórias? —

Transientes, surtos ou sobretensões transitórias são variações bruscas de energia que podem danificar tanto as instalações elétricas, como os equipamentos elétricos ou eletrônicos. Sua origem pode ser tanto pela ocorrência de descargas atmosféricas (RAIOS), como por manobras das concessionárias. Eles podem atingir tanto as redes elétricas como as redes telefônicas, de dados ou de sinais.

Como surgem os transientes em uma instalação?

As causas do surgimento de transientes nas instalações, são divididas de acordo com o ponto de impacto das descargas atmosféricas:

- Diretas em uma estrutura;
- Diretas nas linhas elétricas ou tubulações metálicas;
- Nas proximidades de uma estrutura;
- Nas proximidades das linhas elétricas ou tubulações metálicas.



1. Energia

DPS ECOBOX

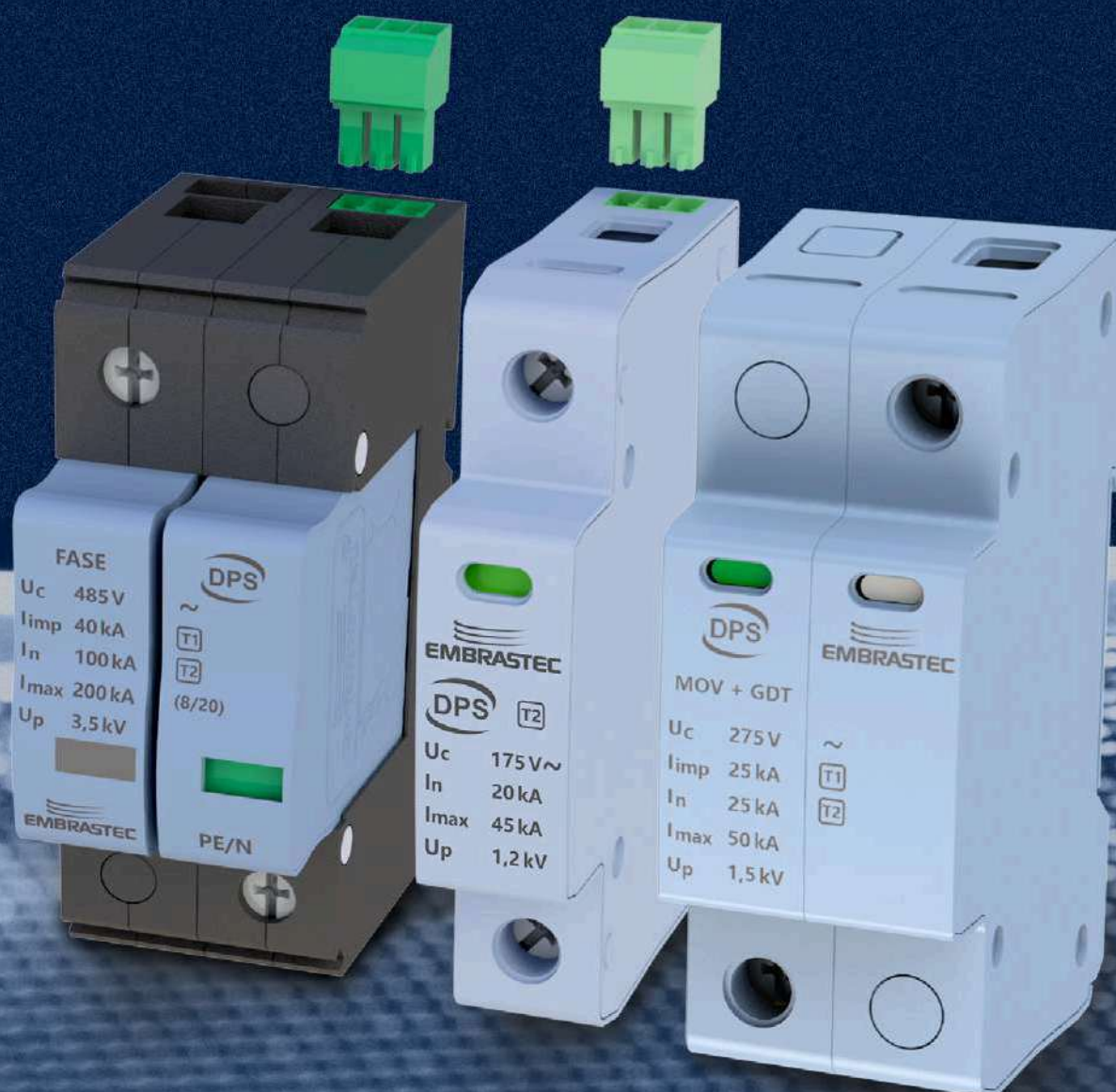
DPS PLUG-IN

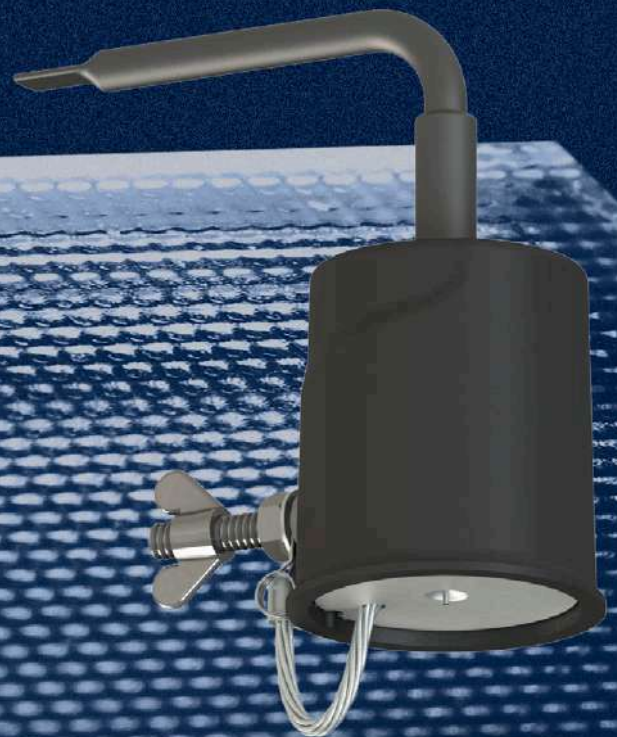
DPS SPARK GAP

DPS SAD

DPS VDC

DPS PRBT





DPS Ecobox Monofásico

CLASSE II e CLASSE I + II



CARACTERÍSTICAS GERAIS

Modelo	Linha	Classe de de ensaio conforme IEC	Nº de posições	Tensão nominal (Un)	Máx. tensão de operação (Uc)	Corrente de Impulso de descarga (Iimp)	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imáx)	Nível de tensão de proteção (Up)	Fusível de pré-proteção mínimo recomendado
E810.0150.015.0	Ecobox Neutro	II	1 DIN	Neutro/127V CA; 127/220V CA	150 V CA	-	5kA	15 kA	0,7 kV	-
E810.0150.020.0							10 kA	20 kA	0,8 kV	
E810.0150.030.0							15 kA	30 kA	0,9 kV	
E810.0150.045.0							20 kA	45 kA	1,2 kV	
E810.0150.050.0							25 kA	50 kA	1,3 kV	
E810.0150.060.0		I+II	2 DIN			12,5 kA	30 kA	60 kA	1,4 kV	
E810.0150.075.0						15 kA	35 kA	75 kA	1,5 kV	
E810.0150.090.0						20 kA	50 kA	90 kA	1,6 kV	
E810.0150.120.0						25 kA	60 kA	120 kA	1,8 kV	
E810.0150.200.0						40 kA	100 kA	200 kA	2,2 kV	
E810.0175.015.0	Ecobox 175 VCA	II	1 DIN	127/220V CA	175V CA	-	5kA	15 kA	0,7 kV	32 A
E810.0175.020.0							10 kA	20 kA	0,8 kV	
E810.0175.030.0							15 kA	30 kA	0,9 kV	
E810.0175.045.0							20 kA	45 kA	1,2 kV	
E810.0175.050.0							25 kA	50 kA	1,3 kV	
E810.0175.060.0		I+II	2 DIN			12,5 kA	30 kA	60 kA	1,4 kV	63 A
E810.0175.075.0						15 kA	35 kA	75 kA	1,5 kV	
E810.0175.090.0						20 kA	50 kA	90 kA	1,6 kV	
E810.0175.120.0						25 kA	60 kA	120 kA	1,8 kV	
E810.0175.200.0						40 kA	100 kA	200 kA	2,2 kV	
E810.0275.015.0	Ecobox 275 VCA	II	1 DIN	220/380V CA	275V CA	-	5kA	15 kA	1,3 kV	32 A
E810.0275.020.0							10 kA	20 kA	1,3 kV	
E810.0275.030.0							15 kA	30 kA	1,4 kV	
E810.0275.045.0							20 kA	45 kA	1,4 kV	
E810.0275.050.0							25 kA	50 kA	1,5 kV	
E810.0275.060.0		I+II	2 DIN			12,5 kA	30 kA	60 kA	1,5 kV	63 A
E810.0275.075.0						15 kA	35 kA	75 kA	1,7 kV	
E810.0275.090.0						20 kA	50 kA	90 kA	1,9 kV	
E810.0275.120.0						25 kA	60 kA	120 kA	2,1 kV	
E810.0275.200.0						40 kA	100 kA	200 kA	2,5 kV	

OBS: Para DPS com sinalização remota, substituir o último dígito do código de "0" para "I". Ex: E810.0275.015.0 para E810.0275.015.I

DPS Ecobox Monofásico

CLASSE II e CLASSE I + II



CARACTERÍSTICAS GERAIS

Modelo	Linha	Classe de de ensaio conforme IEC	Nº de posições	Tensão nominal (Un)	Máx. tensão de operação (Uc)	Corrente de Impulso de descarga (Iimp)	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imáx)	Nível de tensão de proteção (Up)	Fusível de pré-proteção mínimo recomendado
E810.0385.015.0	Ecobox 385 VCA	II	1 DIN	254/440V CA ou 277/480V CA	385 V CA	-	5kA	15 kA	1,7 kV	32 A
E810.0385.020.0							10 kA	20 kA	1,8 kV	
E810.0385.030.0							15 kA	30 kA	1,9 kV	
E810.0385.045.0							20 kA	45 kA	2,0 kV	
E810.0385.050.0							25 kA	50 kA	2,0 kV	
E810.0385.060.0		I+II	2 DIN			12,5 kA	30 kA	60 kA	2,2 kV	63 A
E810.0385.075.0						15 kA	35 kA	75 kA	2,4 kV	
E810.0385.090.0						20 kA	50 kA	90 kA	2,5 kV	
E810.0385.120.0						25 kA	60 kA	120 kA	2,8 kV	
E810.0385.200.0						40 kA	100 kA	200 kA	3,2 kV	
E810.0485.015.0	Ecobox 485 VCA	II	1 DIN	400/690V CA	485V CA	-	5kA	15 kA	2,2 kV	32 A
E810.0485.020.0							10 kA	20 kA	2,4 kV	
E810.0485.030.0							15 kA	30 kA	2,5 kV	
E810.0485.045.0							20 kA	45 kA	2,6 kV	
E810.0485.050.0							25 kA	50 kA	2,6 kV	
E810.0485.060.0		I+II	2 DIN			12,5 kA	30 kA	60 kA	2,7 kV	63 A
E810.0485.075.0						15 kA	35 kA	75 kA	2,9 kV	
E810.0485.090.0						20 kA	50 kA	90 kA	3,1 kV	
E810.0485.120.0						25 kA	60 kA	120 kA	3,3 kV	
E810.0485.200.0						40 kA	100 kA	200 kA	3,5 kV	
E810.0690.015.0	Ecobox 690 VCA	II	1 DIN	460/800V CA	690V CA	-	5kA	15 kA	2,8 kV	32 A
E810.0690.020.0							10 kA	20 kA	2,9 kV	
E810.0690.030.0							15 kA	30 kA	3,0 kV	
E810.0690.045.0							20 kA	45 kA	3,3 kV	
E810.0690.050.0							25 kA	50 kA	3,3 kV	
E810.0690.060.0		I+II	2 DIN			12,5 kA	30 kA	60 kA	3,4 kV	63 A
E810.0690.075.0						15 kA	35 kA	75 kA	3,7 kV	
E810.0690.090.0						20 kA	50 kA	90 kA	4,0 kV	
E810.0690.120.0						25 kA	60 kA	120 kA	4,2 kV	
E810.0690.200.0						40 kA	100 kA	200 kA	4,4 kV	
E810.0850.045.0	Ecobox 850 VCA	II	1 DIN	460/800V CA	850V CA	-	20 kA	45 kA	4,5 kV	32 A
E810.0850.060.0		I+II	2 DIN			12,5 kA	30 kA	60 kA	4,5 kV	63 A
E810.1000.045.0	Ecobox 1000 VCA	II	1 DIN	577/1000V CA	1000V CA	-	20 kA	45 kA	4,5 kV	32 A
E810.1000.060.0		I+II	2 DIN			12,5 kA	30 kA	60 kA	4,8 kV	63 A

OBS: Para DPS com sinalização remota, substituir o último dígito do código de "0" para "I". Ex: E810.0275.015.0 para E810.0275.015.I

DPS Ecobox

Bifásico

CLASSE II e CLASSE I + II



CARACTERÍSTICAS GERAIS

Modelo	Linha	Classe de de ensaio conforme IEC	Nº de posições	Tensão nominal (Un)	Máx. tensão de operação (Uc)	Corrente de Impulso de descarga (Iimp)	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imáx)	Nível de tensão de proteção (Up)	Fusível de pré-proteção mínimo recomendado		
E820.0175.015.0	Ecobox Bifásica 175V CA	II	2 DIN	127/220V CA	175 V CA	-	5kA	15 kA	0,7 kV	32 A		
E820.0175.020.0							10 kA	20 kA	0,8 kV			
E820.0175.030.0							15 kA	30 kA	0,9 kV			
E820.0175.045.0							20 kA	45 kA	1,2 kV			
E820.0175.050.0							25 kA	50 kA	1,3 kV			
E820.0175.060.0		I+II				12,5 kA	30 kA	60 kA	1,4 kV	63 A		
E820.0175.075.0						15 kA	35 kA	75 kA	1,5 kV			
E820.0175.090.0						20 kA	50 kA	90 kA	1,6 kV			
E821.0175.015.0	Ecobox Bifásica+N 175V CA	II	3 DIN			127/220V CA	175 V CA	-	5kA	15 kA	0,7 kV	32 A
E821.0175.020.0									10 kA	20 kA	0,8 kV	
E821.0175.030.0									15 kA	30 kA	0,9 kV	
E821.0175.045.0									20 kA	45 kA	1,2 kV	
E821.0175.050.0									25 kA	50 kA	1,3 kV	
E821.0175.060.0		I+II						12,5 kA	30 kA	60 kA	1,4 kV	63 A
E821.0175.075.0								15 kA	35 kA	75 kA	1,5 kV	
E821.0175.090.0								20 kA	50 kA	90 kA	1,6 kV	
E820.0275.015.0	Ecobox Bifásica 275V CA	II	2 DIN	220/380V CA	275V CA			-	5kA	15 kA	1,3 kV	32 A
E820.0275.020.0									10 kA	20 kA	1,3 kV	
E820.0275.030.0									15 kA	30 kA	1,4 kV	
E820.0275.045.0									20 kA	45 kA	1,4 kV	
E820.0275.050.0									25 kA	50 kA	1,5 kV	
E820.0275.060.0		I+II						12,5 kA	30 kA	60 kA	1,5 kV	63 A
E820.0275.075.0								15 kA	35 kA	75 kA	1,7 kV	
E820.0275.090.0								20 kA	50 kA	90 kA	1,9 kV	
E821.0275.015.0	Ecobox Bifásica+N 275V CA	II	3 DIN			220/380V CA	275V CA	-	5kA	15 kA	1,3 kV	32 A
E821.0275.020.0									10 kA	20 kA	1,3 kV	
E821.0275.030.0									15 kA	30 kA	1,4 kV	
E821.0275.045.0									20 kA	45 kA	1,4 kV	
E821.0275.050.0									25 kA	50 kA	1,5 kV	
E821.0275.060.0		I+II						12,5 kA	30 kA	60 kA	1,5 kV	63 A
E821.0275.075.0								15 kA	35 kA	75 kA	1,7 kV	
E821.0275.090.0								20 kA	50 kA	90 kA	1,9 kV	

DPS Ecobox

Trifásico

CLASSE II e CLASSE I + II



CARACTERÍSTICAS GERAIS

Modelo	Linha	Classe de de ensaio conforme IEC	Nº de posições	Tensão nominal (Un)	Máx. tensão de operação (Uc)	Corrente de Impulso de descarga (Iimp)	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imáx)	Nível de tensão de proteção (Up)	Fusível de pré-proteção mínimo recomendado		
E830.0175.015.0	Ecobox Trifásica 175V CA	II	3 DIN	127/220V CA	175 V CA	-	5kA	15 kA	0,7 kV	32 A		
E830.0175.020.0							10 kA	20 kA	0,8 kV			
E830.0175.030.0							15 kA	30 kA	0,9 kV			
E830.0175.045.0							20 kA	45 kA	1,2 kV			
E830.0175.050.0							25 kA	50 kA	1,3 kV			
E830.0175.060.0		I+II				12,5 kA	30 kA	60 kA	1,4 kV	63 A		
E830.0175.075.0						15 kA	35 kA	75 kA	1,5 kV			
E830.0175.090.0						20 kA	50 kA	90 kA	1,6 kV			
E831.0175.015.0	Ecobox Trifásica+N 175V CA	II	4 DIN			127/220V CA	175 V CA	-	5kA	15 kA	0,7 kV	32 A
E831.0175.020.0									10 kA	20 kA	0,8 kV	
E831.0175.030.0									15 kA	30 kA	0,9 kV	
E831.0175.045.0									20 kA	45 kA	1,2 kV	
E831.0175.050.0									25 kA	50 kA	1,3 kV	
E831.0175.060.0		I+II						12,5 kA	30 kA	60 kA	1,4 kV	63 A
E831.0175.075.0								15 kA	35 kA	75 kA	1,5 kV	
E831.0175.090.0								20 kA	50 kA	90 kA	1,6 kV	
E830.0275.015.0	Ecobox Trifásica 275V CA	II	3 DIN	220/380V CA	275V CA			-	5kA	15 kA	1,3 kV	32 A
E830.0275.020.0									10 kA	20 kA	1,3 kV	
E830.0275.030.0									15 kA	30 kA	1,4 kV	
E830.0275.045.0									20 kA	45 kA	1,4 kV	
E830.0275.050.0									25 kA	50 kA	1,5 kV	
E830.0275.060.0		I+II						12,5 kA	30 kA	60 kA	1,5 kV	63 A
E830.0275.075.0								15 kA	35 kA	75 kA	1,7 kV	
E830.0275.090.0								20 kA	50 kA	90 kA	1,9 kV	
E831.0275.015.0	Ecobox Trifásica+N 275V CA	II	4 DIN			220/380V CA	275V CA	-	5kA	15 kA	1,3 kV	32 A
E831.0275.020.0									10 kA	20 kA	1,3 kV	
E831.0275.030.0									15 kA	30 kA	1,4 kV	
E831.0275.045.0									20 kA	45 kA	1,4 kV	
E831.0275.050.0									25 kA	50 kA	1,5 kV	
E831.0275.060.0		I+II						12,5 kA	30 kA	60 kA	1,5 kV	63 A
E831.0275.075.0								15 kA	35 kA	75 kA	1,7 kV	
E831.0275.090.0								20 kA	50 kA	90 kA	1,9 kV	

DPS Ecobox

Trifásico

CLASSE II e CLASSE I + II



CARACTERÍSTICAS GERAIS

Modelo	Linha	Classe de de ensaio conforme IEC	Nº de posições	Tensão nominal (Un)	Máx. tensão de operação (Uc)	Corrente de Impulso de descarga (Iimp)	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imáx)	Nível de tensão de proteção (Up)	Fusível de pré-proteção mínimo recomendado		
E830.0385.015.0	Ecobox Trifásica 385V CA	II	3 DIN	254/440V CA ou 277/480V CA	385V CA	-	5kA	15 kA	1,7 kV	32 A		
E830.0385.020.0							10 kA	20 kA	1,8 kV			
E830.0385.030.0							15 kA	30 kA	1,9 kV			
E830.0385.045.0							20 kA	45 kA	2,0 kV			
E830.0385.050.0							25 kA	50 kA	2,0 kV			
E830.0385.060.0		I+II				12,5 kA	30 kA	60 kA	2,2 kV	63 A		
E830.0385.075.0						15 kA	35 kA	75 kA	2,4 kV			
E830.0385.090.0						20 kA	50 kA	90 kA	2,5 kV			
E831.0385.015.0	Ecobox Trifásica+N 385V CA	II	4 DIN			-	5kA	15 kA	1,7 kV	32 A		
E831.0385.020.0							10 kA	20 kA	1,8 kV			
E831.0385.030.0							15 kA	30 kA	1,9 kV			
E831.0385.045.0							20 kA	45 kA	2,0 kV			
E831.0385.050.0							25 kA	50 kA	2,0 kV			
E831.0385.060.0		I+II				12,5 kA	30 kA	60 kA	2,2 kV	63 A		
E831.0385.075.0						15 kA	35 kA	75 kA	2,4 kV			
E831.0385.090.0						20 kA	50 kA	90 kA	2,5 kV			
E830.0485.015.0	Ecobox Trifásica 485V CA	II	3 DIN	400/690V CA	485V CA	-	5kA	15 kA	2,2 kV	32 A		
E830.0485.020.0							10 kA	20 kA	2,4 kV			
E830.0485.030.0							15 kA	30 kA	2,5 kV			
E830.0485.045.0							20 kA	45 kA	2,6 kV			
E830.0485.050.0							25 kA	50 kA	2,6 kV			
E831.0485.015.0	Trifásica+N 485V CA		4 DIN					-	5kA	15 kA	2,2 kV	32 A
E831.0485.020.0									10 kA	20 kA	2,4 kV	
E831.0485.030.0									15 kA	30 kA	2,5 kV	
E831.0485.045.0									20 kA	45 kA	2,6 kV	
E831.0485.050.0									25 kA	50 kA	2,6 kV	

DPS Plug-in

CLASSE II e CLASSE I + II



CARACTERÍSTICAS GERAIS

Modelo	Base	Linha	Classe de de ensaio conforme IEC	Nº de posições	Tensão nominal (Un)	Máx. tensão de operação (Uc)	Corrente de Impulso de descarga (Iimp)	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imáx)	Nível de tensão de proteção (Up)	Fusível de pré-proteção mínimo recomendado
310015	310001	Plug-in Neutro	II	1 DIN	Neutro/127V CA; 127/220V CA	150V CA	-	5 kA	15 kA	0,7 kV	-
310020	310001							10 kA	20 kA	0,8 kV	
310030	310001							15 kA	30 kA	0,9 kV	
310045	310001							20 kA	45 kA	1,2 kV	
310050	310001							25 kA	50 kA	1,3 kV	
310060	310001		I+II	2 DIN		12,5 kA	30 kA	60 kA	1,4 kV	63 A	
310090	310001					15 kA	50 kA	90 kA	1,6 kV		
310099	310005					20 kA	60 kA	120 kA	1,8 kV		
310115	310001	Plug-in 175V CA	II	1 DIN	127/220V CA	175V CA	-	5 kA	15 kA	0,7 kV	32 A
310120	310001							10 kA	20 kA	0,8 kV	
310130	310001							15 kA	30 kA	0,9 kV	
310145	310001							20 kA	45 kA	1,2 kV	
310150	310001							25 kA	50 kA	1,3 kV	
310160	310001		I+II	2 DIN		12,5 kA	30 kA	60 kA	1,4 kV	63 A	
310190	310001					15 kA	50 kA	90 kA	1,6 kV		
310199	310005					20 kA	60 kA	120 kA	1,8 kV		
310215	310001	Plug-in 275V CA	II	1 DIN	220/380V CA	275V CA	-	5 kA	15 kA	1,3 kV	32 A
310220	310001							10 kA	20 kA	1,3 kV	
310230	310001							15 kA	30 kA	1,4 kV	
310245	310001							20 kA	45 kA	1,4 kV	
310250	310001							25 kA	50 kA	1,5 kV	
310260	310001		I+II	2 DIN		12,5 kA	30 kA	60 kA	1,5 kV	63 A	
310290	310001					15 kA	50 kA	90 kA	1,9 kV		
310299	310005					20 kA	60 kA	120 kA	2,1 kV		
310315	310001	Plug-in 385V CA	II	1 DIN	254/440V CA ou 277/480V CA	385V CA	-	5 kA	15 kA	1,7 kV	32 A
310320	310001							10 kA	20 kA	1,8 kV	
310330	310001							15 kA	30 kA	1,9 kV	
310345	310001							20 kA	45 kA	2,0 kV	
310350	310001							25 kA	50 kA	2,0 kV	
310360	310001		I+II	2 DIN		12,5 kA	30 kA	60 kA	2,2 kV	63 A	
310390	310001					15 kA	50 kA	90 kA	2,5 kV		
310399	310005					20 kA	60 kA	120 kA	2,8 kV		
310415	310001	Plug-in 485V CA	II	1 DIN	400/690V CA	485V CA	-	5 kA	15 kA	2,2 kV	32 A
310420	310001							10 kA	20 kA	2,4 kV	
310430	310001							15 kA	30 kA	2,5 kV	
310445	310001							20 kA	45 kA	2,6 kV	
310450	310001							25 kA	50 kA	2,6 kV	
310460	310005		I+II	2 DIN		12,5 kA	30 kA	60 kA	2,7 kV	63 A	
310490	310005					15 kA	50 kA	90 kA	3,1 kV		
310499	310005					20 kA	60 kA	120 kA	3,3 kV		

OBS: Para DPS com sinalização remota, incluir sufixo SR no código da base. Ex: 310001 para 310001SR

DPS SAD

CLASSE II



CARACTERÍSTICAS GERAIS

Modelo	Linha	Classe de de ensaio conforme IEC	Nº de posições	Tensão nominal (Un)	Máx. tensão de operação (Uc)	Corrente de Impulso de descarga (Iimp)	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imax)	Nível de tensão de proteção (Up)	Fusível de pré-proteção mínimo recomendado	
E810.0175.010.S	SAD	II	1 DIN	127/220V CA	127V CA	-	10 kA	10 kA	10 kA	32 A	
E810.0175.020.S							20 kA	20 kA	20 kA		
E810.0275.010.S				220/380V CA	275V CA		10 kA	10 kA	10 kA		
E810.0275.020.S							20 kA	20 kA	20 kA		

DPS PRBT

CLASSE II



CARACTERÍSTICAS GERAIS

Modelo	Linha	Tipo de Rede	Classe de de ensaio conforme IEC	Máx. tensão de operação (Uc)	Corrente de Impulso de descarga (Iimp)	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imax)	Nível de tensão de proteção (Up)		
E800.0280.020.2	PRBT	CONVENCIONAL	II	280V CA	-	10 kA	20 kA	1,3 kV		
E800.0280.040.2						20 kA	40 kA	1,3 kV		
E800.0440.020.2				440V CA		10 kA	20 kA	1,8 kV		
E800.0440.040.2						20 kA	40 kA	1,8 kV		
E800.0280.020.3		ISOLADA		280V CA		10 kA	20 kA	1,3 kV		
E800.0280.040.3						20 kA	40 kA	1,3 kV		
E800.0440.020.3				440V CA		10 kA	20 kA	1,8 kV		
E800.0440.040.3						20 kA	40 kA	1,8 kV		

DPS Spark Gap Ecobox

CLASSE I + II



CARACTERÍSTICAS GERAIS

Modelo	Linha	Classe de de ensaio conforme IEC	Nº de posições	Tensão nominal (Un)	Máx. tensão de operação (Uc)	Corrente de Impulso de descarga (Iimp)	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imax)	Nível de tensão de proteção (Up)	Fusível de pré-proteção mínimo recomendado
E810.0150.050.2	MOV+GDT	I+II	2 DIN	Neutro/127V CA; 127/220V CA	150V CA	25 kA	25 kA	50 kA	1,3 kV	63 A
E810.0150.120.2						50 kA	60 kA	120 kA	1,8 kV	
E810.0175.050.2				127/220V CA	175V CA	25 kA	25 kA	50 kA	1,3 kV	
E810.0175.120.2						60 kA	60 kA	120 kA	1,8 kV	
E810.0275.050.2				127/220V CA	275V CA	25 kA	25 kA	50 kA	1,5 kV	
E810.0275.120.2						60 kA	60 kA	120 kA	2,1 kV	
E810.0385.050.2				254/440V CA ou 277/480V CA	385V CA	25 kA	25 kA	50 kA	2,0 kV	
E810.0385.120.2						60 kA	60 kA	120 kA	2,8 kV	
E810.0485.050.2				400/690V CA	485V CA	25 kA	25 kA	50 kA	2,6 kV	
E810.0485.120.2						60 kA	60 kA	120 kA	3,3 kV	

OBS.: Para DPS com sinalização remota, substituir o último dígito do código de "2" para "3". Ex: E810.0275.050.2 para E810.0275.050.3

DPS Spark Gap Plug-in

CLASSE I + II



CARACTERÍSTICAS GERAIS

Modelo	Base	Linha	Classe de de ensaio conforme IEC	Nº de posições	Tensão nominal (Un)	Máx. tensão de operação (Uc)	Corrente de Impulso de descarga (Iimp)	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imax)	Nível de tensão de proteção (Up)	Fusível de pré-proteção mínimo recomendado
310050CT	310005	MOV+GDT	I+II	2 DIN	Neutro/127V CA; 127/220V CA	150V CA	25 kA	25 kA	50 kA	1,3 kV	63 A
310099CT	310005						50 kA	60 kA	120 kA	1,8 kV	
310150SG	310005				127/220V CA	175V CA	25 kA	25 kA	50 kA	1,3 kV	
310199SG	310005						60 kA	60 kA	120 kA	1,8 kV	
310250SG	310005				127/220V CA	275V CA	25 kA	25 kA	50 kA	1,5 kV	
310299SG	310005						60 kA	60 kA	120 kA	2,1 kV	
310350SG	310005				254/440V CA ou 277/480V CA	385V CA	25 kA	25 kA	50 kA	2,0 kV	
310399SG	310005						60 kA	60 kA	120 kA	2,8 kV	
310450SG	310005				400/690V CA	485V CA	25 kA	25 kA	50 kA	2,6 kV	
310499SG	310005						60 kA	60 kA	120 kA	3,3 kV	

OBS.: Para DPS com sinalização remota, incluir sufixo SR no código. Ex: 310001SG para 310001SGSR

DPS Ecobox VDC

CLASSE II



CARACTERÍSTICAS GERAIS

Modelo	Linha	Classe de de ensaio conforme IEC	Nº de posições	Tensão nominal (Un)	Máx. tensão de operação (Uc)	Corrente de Impulso de descarga (Iimp)	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imax)	Nível de tensão de proteção (Up)	Fusível de pré-proteção mínimo recomendado
E110.0024.020.0	Ecobox VDC	II	1 DIN	24V CC	31V CC	-	10 kA	20 kA	0,3 kV	32 A
E110.0048.020.0				48V CC	65V CC				0,4 kV	
E110.0060.020.0				60V CC	100V CC				0,4 kV	
E110.0075.020.0				75V CC	125V CC				0,4 kV	
E110.0125.020.0				125V CC	200 VCC				0,6 kV	
E110.0225.020.0				225V CC	300V CC				1,0 kV	
E110.0024.045.0				24V CC	31V CC		20 kA	45 kA	0,4 kV	
E110.0048.045.0				48V CC	65V CC				0,5 kV	
E110.0060.045.0				60V CC	100V CC				0,5 kV	
E110.0075.045.0				75V CC	125V CC				0,5 kV	
E110.0125.045.0				125V CC	200V CC				0,7 kV	
E110.0225.045.0				225V CC	300V CC				1,1 kV	

OBS: Para DPS com sinalização remota, substituir o último dígito do código de "0" para "I". Ex: E110.0025.020.0 para E110.0024.020.I

DPS Compact

CLASSE II



CARACTERÍSTICAS GERAIS

Modelo	Linha	Classe de de ensaio conforme IEC	Nº de posições	Tensão nominal (Un)	Máx. tensão de operação (Uc)	Corrente de Impulso de descarga (Iimp)	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imax)	Nível de tensão de proteção (Up)	Fusível de pré-proteção mínimo recomendado
E801.0175.015.0	Compact	II	1 DIN	127/220V CA	175V CA	-	5 kA	15 kA	0,7 kV	32 A
E801.0175.020.0				10 kA	20 kA		0,8 kV			
E801.0275.015.0				220/380V CA	275V CA		5 kA	15 kA	1,3 kV	
E801.0275.020.0							10 kA	20 kA	1,3 kV	



2. Linha Solar e Proteção para Estação de Carregamento Veicular (ECV)

DPS SOLAR

STRING BOX CC

STRING BOX CA

ECOMOBI



Proteção para
seus equipamentos



EcoMobi
Mobilidade Elétrica



DPS Solar

CLASSE II e CLASSE I+II



CARACTERÍSTICAS GERAIS

Modelo	Linha	Classe de de ensaio conforme IEC	Nº de posições	Máx tensão de operação (Uc)	Corrente de impulso de descarga (Iimp)	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imax)	Número de MPPTs	Nível de tensão de proteção (Up)	Fusível de pré-proteção mínimo recomendado
E130.0300.045.0	Solar	II	3 DIN	300 V	-	20 kA	45 kA	1 MPPT	1,8 kV	30 A gPV
E130.0500.045.0				500 V					2,2 kV	
E130.0600.045.0				600 V					2,2 kV	
E130.0750.045.0				750 V					2,8 kV	
E130.1040.045.0				1040 V					3,5 kV	
E130.1200.045.0				1200 V					4,6 kV	
E130.1500.045.0				1500 V					5,3 kV	
E140.0300.045.0		II	4 DIN	300 V				2 MPPT	1,8 kV	
E140.0500.045.0				500 V					2,2 kV	
E140.0600.045.0				600 V					2,2 kV	
E140.0750.045.0				750 V					2,8 kV	
E140.1040.045.0				1040 V					3,5 kV	
E130.0300.060.0		I+II	3 DIN	300 V	12,5 kA	30 kA	60 kA	1 MPPT	2,4 kV	
E130.0500.060.0				500 V					2,8 kV	
E130.0600.060.0				600 V					3,0 kV	
E130.0750.060.0				750 V					3,6 kV	
E130.1040.060.0				1040 V					4,5 kV	
E130.1200.060.0				1200 V					5,3 kV	
E130.1200.060.0				1500 V					6,0 kV	

OBS.: Para DPS com sinalização remota, substituir o último dígito do código de ".0" para ".1". Ex: E130.0300.045.0 para E130.0300.045.1

String Box CA

Monofásica



CARACTERÍSTICAS GERAIS

Modelo	Linha	Tipo de montagem	Grau de proteção	Tensão nominal (Un)	Máx. tensão de operação (Uc)	Proteção de sobrecorrente	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imáx)	Nível de proteção (Up)
SBA11.175.45.20.4	Monofásica 127V CA	Sobrepor	IP 40	127V CA	175V CA	20A CA	20 kA	45 kA	1,2 kV
SBA11.175.45.25.4						25A CA			
SBA11.175.45.32.4						32A CA			
SBA11.175.45.40.4						40A CA			
SBA11.175.45.50.4						50A CA			
SBA11.175.45.63.4						63A CA			
SBA11.275.45.20.4	Monofásica 220V CA			220V CA	275V CA	20A CA	20 kA	45 kA	1,4 kV
SBA11.275.45.25.4						25A CA			
SBA11.275.45.32.4						32A CA			
SBA11.275.45.40.4						40A CA			
SBA11.275.45.50.4						50A CA			
SBA11.275.45.63.4						63A CA			

String Box CA Bifásica



CARACTERÍSTICAS GERAIS

Modelo	Linha	Tipo de montagem	Grau de proteção	Tensão nominal (Un)	Máx. tensão de operação (Uc)	Proteção de sobrecorrente	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imáx)	Nível de proteção (Up)
SBA20.175.45.20.4	Bifásica 127V CA	Sobrepor	IP 40	127V CA	175V CA	20A CA	20 kA	45 kA	1,2 kV
SBA20.175.45.25.4						25A CA			
SBA20.175.45.32.4						32A CA			
SBA20.175.45.40.4						40A CA			
SBA20.175.45.50.4						50A CA			
SBA20.175.45.63.4						63A CA			
SBA20.275.45.20.4	Bifásica 220V CA			220V CA	275V CA	20A CA			1,4 kV
SBA20.275.45.25.4						25A CA			
SBA20.275.45.32.4						32A CA			
SBA20.275.45.40.4						40A CA			
SBA20.275.45.50.4						50A CA			
SBA20.275.45.63.4						63A CA			
SBA21.175.45.20.4	Bifásica + Neutro 127V CA	Sobrepor	IP 40	127V CA	175V CA	20A CA	20 kA	45 kA	1,2 kV
SBA21.175.45.25.4						25A CA			
SBA21.175.45.32.4						32A CA			
SBA21.175.45.40.4						40A CA			
SBA21.175.45.50.4						50A CA			
SBA21.175.45.63.4						63A CA			
SBA21.275.45.20.4	Bifásica + Neutro 220V CA			220V CA	275V CA	20A CA			1,4 kV
SBA21.275.45.25.4						25A CA			
SBA21.275.45.32.4						32A CA			
SBA21.275.45.40.4						40A CA			
SBA21.275.45.50.4						50A CA			
SBA21.275.45.63.4						63A CA			

String Box CA

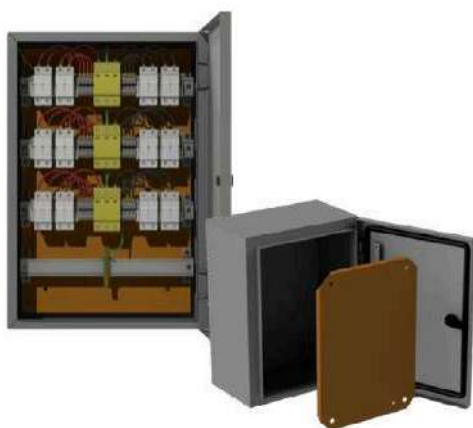
Trifásica



CARACTERÍSTICAS GERAIS

Modelo	Linha	Tipo de montagem	Grau de proteção	Tensão nominal (Un)	Máx. tensão de operação (Uc)	Proteção de sobrecorrente	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imáx)	Nível de proteção (Up)
SBA30.175.45.20.4	Trifásica 127V CA	Sobrepor	IP 40	127V CA	175V CA	20A CA	20 kA	45 kA	1,2 kV
SBA30.175.45.25.4						25A CA			
SBA30.175.45.32.4						32A CA			
SBA30.175.45.40.4						40A CA			
SBA30.175.45.50.4						50A CA			
SBA30.175.45.63.4						63A CA			
SBA30.275.45.20.4	Trifásica 220V CA			220/380V CA	275V CA	20A CA			1,4 kV
SBA30.275.45.25.4						25A CA			
SBA30.275.45.32.4						32A CA			
SBA30.275.45.40.4						40A CA			
SBA30.275.45.50.4						50A CA			
SBA30.275.45.63.4						63A CA			
SBA31.175.45.20.4	Trifásica + Neutro 127V CA	Sobrepor	IP 40	127V CA	175V CA	20A CA	20 kA	45 kA	1,2 kV
SBA31.175.45.25.4						25A CA			
SBA31.175.45.32.4						32A CA			
SBA31.175.45.40.4						40A CA			
SBA31.175.45.50.4						50A CA			
SBA31.175.45.63.4						63A CA			
SBA31.275.45.20.4	Trifásica + Neutro 220V CA			220/380V CA	275V CA	20A CA			1,4 kV
SBA31.275.45.25.4						25A CA			
SBA31.275.45.32.4						32A CA			
SBA31.275.45.40.4						40A CA			
SBA31.275.45.50.4						50A CA			
SBA31.275.45.63.4						63A CA			

String Box CC



CARACTERÍSTICAS GERAIS

Modelo	Código	Corrente nominal por entrada	Quantidade de Entradas/Saídas	Paralelismo na String Box	Tipo de montagem	Grau de proteção	Máx. tensão de operação (Uc)	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imáx)	Nível de proteção (Up)
S1.06.4.01.01-01.01	1584	35 A	01/01	Não	Quadro Sobrepor ABS	IP 65	600V CC	20 kA	45 kA	2,2 kV
S1.06.4.02.01-01.01	1743	20 A	02/01	Sim						
S1.06.4.02.02-01.02	4161	40 A	02/02	Não						
S1.06.4.03.03-02.03	1593	35 A	03/03	Não						
S1.06.4.04.02-02.02	1953	20 A	04/02	Sim						
S1.06.4.04.04-02.04	3639	40 A	04/04	Não						
S1.06.4.05.05-03.05	3163	35 A	05/05	Não						
S1.06.4.06.06-03.03	2758	40 A	06/06	Sim						
S1.06.4.06.06-03.06	2799	40 A	06/06	Não	Quadro Sobrepor ABS	IP 65	1040V CC	20 kA	45 kA	3,5 kV
S1.10.4.01.01-01.01	1531	32 A	01/01	Não						
S1.10.4.02.01-01.01	1463	20 A	02/01	Sim						
S1.10.4.02.02-01.02	3864	40 A	02/02	Não						
S1.10.4.03.03-02.03	1539	32 A	03/03	Não						
S1.10.4.04.02-02.02	1465	20 A	04/02	Sim						
S1.10.4.04.04-02.04	1544	40 A	04/04	Não						
S1.10.4.05.05-03.05	1546	32 A	05/05	Não						
S1.10.4.06.06-03.03	2759	40 A	06/06	Sim						
S1.10.4.06.06-03.06	1541	40 A	06/06	Não	Painel Metálico	IP 65	1040V CC	20 kA	45 kA	3,5 kV
PS1.10.4.07.07-04.07	2916	32 A	07/07	Não						
S1.10.4.08.08-04.04	3000	40 A	08/08	Sim						
PS1.10.4.08.08-04.04	2502	40 A	08/08	Sim						
PS1.10.4.08.08-04.08	2915	40 A	08/08	Não						
PS1.10.4.09.09-05.09	3628	32 A	09/09	Não						
PS1.10.4.10.10-05.05	1674	40 A	10/10	Sim						
PS1.10.4.10.10-05.10	2531	40 A	10/10	Não						
PS1.10.4.12.12-06.06	2526	40 A	12/12	Sim						
PS1.10.4.12.12-06.12	3162	40 A	12/12	Não						

EcoMobi Proteção para Estação de Carregamento Veicular (ECV)



CARACTERÍSTICAS GERAIS

Modelo	Linha	Medidor	Tipo de montagem	Grau de proteção	Tensão nominal (Un)	Máxima tensão de operação (Uc)	Proteção de sobrecorrente	Classe do IDR	Potência máxima de operação	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imáx)	Nível de proteção (Up)
MOB20.275.20.45-2	EcoMobi Bifásica	Não	Sobrepor	IP 65	127/220V CA	275V CA	20A	Tipo A	3,6 kW	20 kA	45 kA	1,4 kV
MOB20.275.32.45-3		Sim					40A		7 kW			
MOB20.275.40.45-0		Não					40A					
MOB20.275.40.45-1		Não					40A					
MOB31.275.32.45-0	EcoMobi Trifásica	Não			220/380V CA		40A		22 kW			
MOB31.275.32.45-1		Não					40A					





3. Telecom

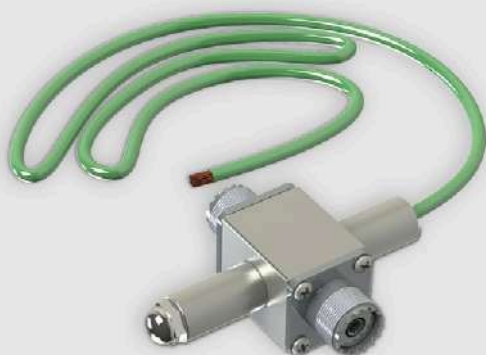
DPS LINHA FLEX

NEW RACK

DPS CNRF

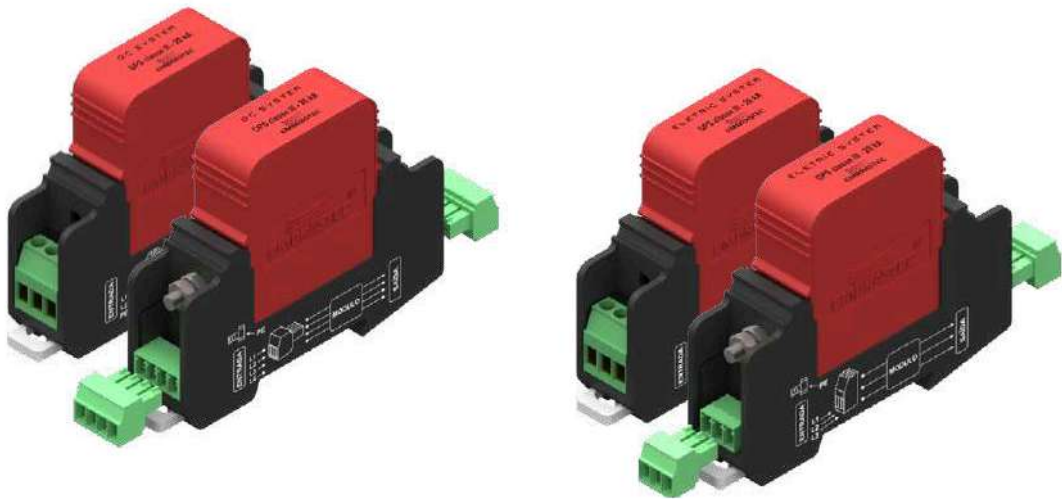
LINHA INOX





EletricSystem e DCSystem

CLASSE II+III



CARACTERÍSTICAS GERAIS

Modelo	Base	Linha	Classe de de ensaio conforme IEC	Nº de condutores protegidos	Tipo de conexão	Tensão nominal (Un)	Máxima tensão de operação (Uc)	Corrente nominal de carga (IL)	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imáx)	Nível de tensão de proteção de (Up)
F507121	F500003	DCSYSTEM	II+III	2	Borne	12 V	14V CA / 18V CC	10A	10 kA	20 kA	≤ 0,4 kV
F507181		DCSYSTEM				18 V	20V CA / 26V CC				≤ 0,4 kV
F507241		DCSYSTEM				24 V	25V CA / 31V CC				≤ 0,4 kV
F507381		DCSYSTEM				38 V	40V CA / 56V CC				≤ 0,4 kV
F507481		DCSYSTEM				48 V	50V CA / 65V CC				≤ 0,5 kV
F507601		DCSYSTEM				60 V	60V CA / 85V CC				≤ 0,5 kV
F507125		DCSYSTEM				125 V	95V CA / 125V CC				≤ 0,6 kV
F507122	F500007	DCSYSTEM	II+III	4	Borne	12 V	14V CA / 18V CC	10A	10 kA	20 kA	≤ 0,4 kV
F507182		DCSYSTEM				18 V	20V CA / 26V CC				≤ 0,4 kV
F507242		DCSYSTEM				24 V	25V CA / 31V CC				≤ 0,4 kV
F507382		DCSYSTEM				38 V	40V CA / 56V CC				≤ 0,4 kV
F507482		DCSYSTEM				48 V	50V CA / 65V CC				≤ 0,5 kV
F507602		DCSYSTEM				60 V	60V CA / 85V CC				≤ 0,5 kV
F501002	F500003	ELETRICSYSTEM	II+III	2	Borne	127 / 220V CA	275V CA	10A	10 kA	20 kA	≤ 1,3 kV
F501003	F500004	ELETRICSYSTEM		3		127 / 220V CA	275V CA				≤ 1,3 kV
F501303		ELETRICSYSTEM				220 / 380V CA	385V CA				≤ 1,6 kV

RS System e LinkSystem

CLASSE II+III

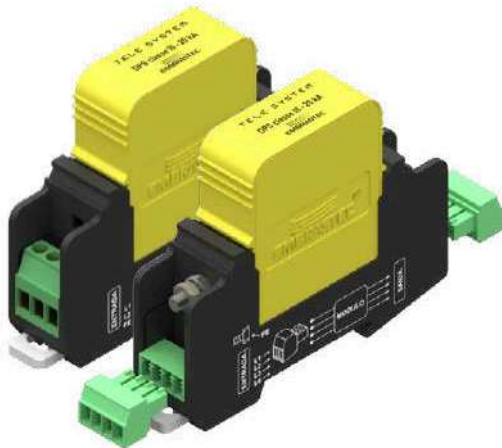


CARACTERÍSTICAS GERAIS

Modelo	Base	Linha	Classe de de ensaio conforme IEC	Nº de condutores protegidos	Tensão nominal (Un)	Máxima tensão de operação (Uc)	Corrente nominal de carga (IL)	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imáx)	Velocidade de Transmissão
F506052	F500003	RS SYSTEM	II+III	2	5 V	6 V	1A	10 kA	20 kA	10 Mbps
F506002		RS SYSTEM		2	12 V	15 V				
F506302		RS SYSTEM		2	30 V	31 V				
F506003	F500004	RS SYSTEM		3	12 V	15 V				
F506303		RS SYSTEM		3	30 V	31 V				
F506004	F500007	RS SYSTEM		4	12 V	15 V				
F506304		RS SYSTEM		4	30 V	31 V				
F505002	F500045	LINKSYSTEM	II+III	4	3,3 V	90 V	1A	2,5 kA	20 kA	100 Mbps
F505008	F500046	LINKSYSTEM		8	3,3 V					1000 Mbps
F505248	F500046	LINKSYSTEM		8	24 V (PoE/PoE+)					
F505308		LINKSYSTEM			30 V (PoE/PoE+)					
F505488		LINKSYSTEM			48 V (PoE/PoE+)					
F505608		LINKSYSTEM			60 V (PoE/PoE+)					

TeleSystem e Câmera System

CLASSE II+III



CARACTERÍSTICAS GERAIS

Modelo	Base	Linha	Classe de de ensaio conforme IEC	Nº de condutores protegidos	Tipo de conexão	Tensão nominal (Un)	Máxima tensão de operação (Uc)	Corrente nominal de carga (Ii)	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imáx)
F502002	F500003	TELESYSTEM	II+III	2	Borne	48 V	150 V	10A	10 kA	20 kA
F502004	F500007	TELESYSTEM		4						
F512001	F500003	CÂMERA SYSTEM		2	Borne	12 V	90 V	< 1A		
	F500012				BNC					

DPS Inox Sinais Digitais e Analógicos

CLASSE III



CARACTERÍSTICAS GERAIS

Modelo	Linha	Tipo de Rosca	Instalação	Classe de de ensaio conforme IEC	Nº de condutores protegidos	Tensão nominal (Un)	Máxima tensão de operação (Uc)	Corrente nominal de carga (I _L)	Corrente Nominal de descarga (I _n)	Corrente máxima de descarga (I _{máx})
E506.B012.020.1	DPS Inox Sinais Digitais	BSP	Paralelo	III	2	12 V	15V	1A	10 kA	20 kA
E506.B012.020.2			Série							
E506.N012.020.1		NPT	Paralelo							
E506.N012.020.2			Série							
E506.B024.020.1		BSP	Paralelo			24 V	31V			
E506.B024.020.2			Série							
E506.N024.020.1		NPT	Paralelo							
E506.N024.020.2			Série							
E507.B012.020.1	DPS Inox Sinais Analógicos	BSP	Paralelo	III	2	12 V	14V	1A	10 kA	20 kA
E507.B012.020.2			Série							
E507.N012.020.1		NPT	Paralelo							
E507.N012.020.2			Série							
E507.B024.020.1		BSP	Paralelo			24 V	31V			
E507.B024.020.2			Série							
E507.N024.020.1		NPT	Paralelo							
E507.N024.020.2			Série							

DPS CNRF Antenas

CLASSE II+III



CARACTERÍSTICAS GERAIS

Modelo	Linha	Tipo de Conector	Frequência de Trabalho	Classe de de ensaio conforme IEC	Nº de condutores protegidos	Máxima tensão de operação (Uc)	Capacitância	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imax)	Tensão residual
N503002	CNRF Antenas	"F"	< 1 GHz	II+III	2	90 V	< 2 pF	10 kA	20 kA	0,6 kV
515001		"N"	< 2,4 GHz			300 V				
515581			< 5,8 GHz							
516001		"UHF"	< 2,4 GHz							
516581			< 5,8 GHz							
516001M		"Mini-UHF"	< 2,4 GHz							
516581M			< 5,8 GHz							
517001		"BNC"	< 2,4 GHz							
517581G			< 5,8 GHz							
518001		"TNC"	< 2,4 GHz							
518581G			< 5,8 GHz							
519001		"SMA"	< 2,4 GHz							
519581			< 5,8 GHz							

DPS New Rack

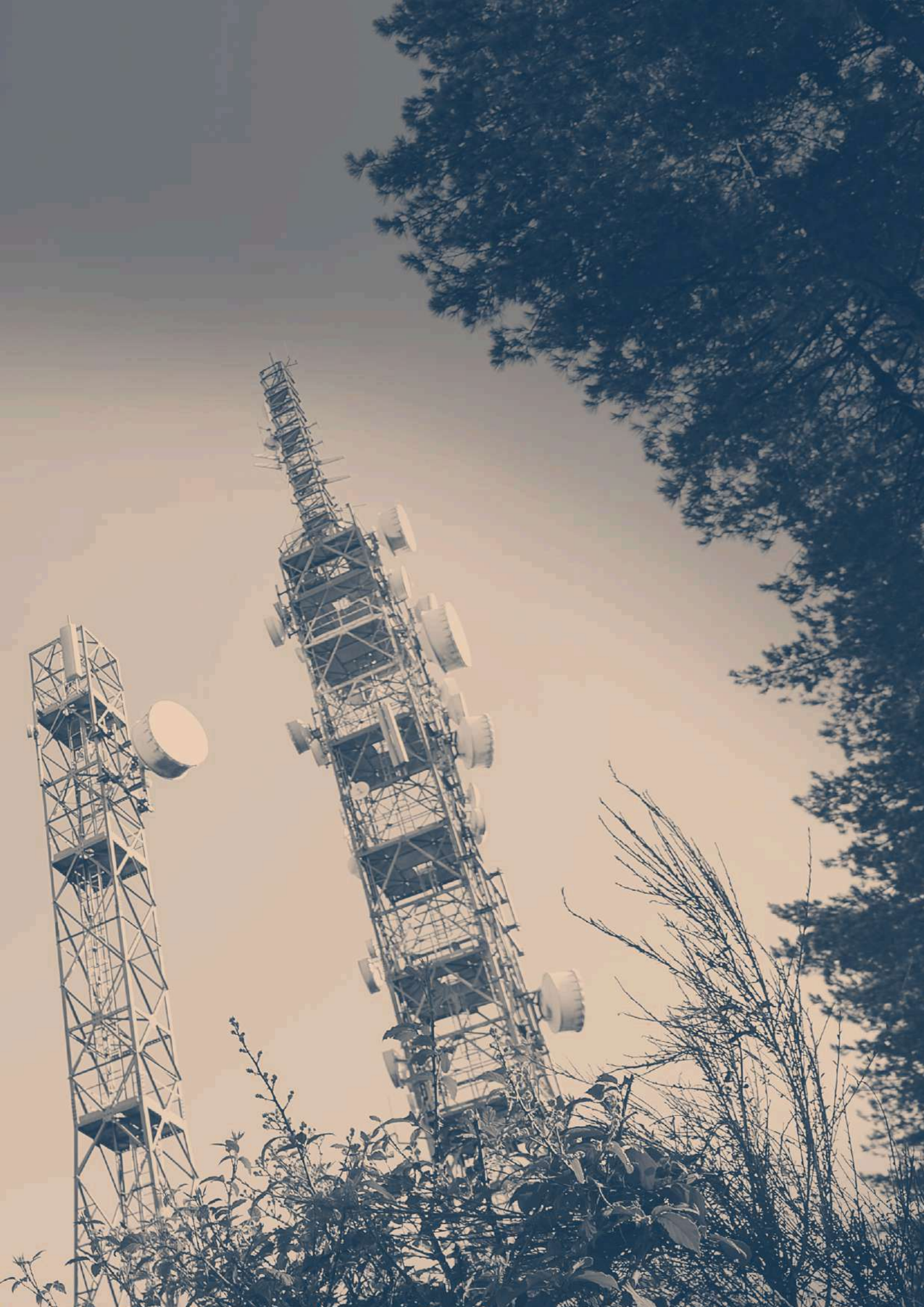
CLASSE III



CARACTERÍSTICAS GERAIS

Modelo	Linha	Conexão de entrada/saída	Classe de de ensaio conforme IEC	Nº de entradas/saídas	Tensão nominal (Un)	Máxima tensão de operação (Uc)	Corrente nominal de carga (IL)	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imáx.)	Velocidade de Transmissão	Tensão de impulso suportável @1,2/50µs
E505.4008.020.0	Fast Ethernet	RJ 45 Fêmea	II+III	08/08	3,3 V	75 V	1,0 A	2,5 kA	10 kA	100 Mbps	5 kV
E505.4016.020.0				16/16							
E505.4024.020.0				24/24							
E505.8008.020.0	Gigabit Ethernet			08/08	3,3 V	75 V	1,0 A	2,5 kA	20 kA	1 Gbps	
E505.8016.020.0				16/16							
E505.8024.020.0				24/24							
E505.8008.020.1	Gigabit PoE+ / PoE++	08/08	3,3 V	90 V PoE+	1,5 A	2,5 kA	20 kA	1 Gbps			
E505.8016.020.1		16/16									
E505.8024.020.1		24/24									
E512.2008.020.0	Câmeras	BNC	II+III	08/08	12 V	90 V	< 1A	10 kA	20 kA	-	5 kV
E512.2016.020.0				16/16							
E521.0275.020.0	Rack de Tomadas	Plugue e tomadas (2P + T 10A)	II+III	01/08	127 / 220V CA	275V CA	10 A	10 kA	20 kA	-	6 kV





4. Iluminação e Eletrônicos

DPS E-LED

ANTI RÁIO

FILTRO DE LINHA



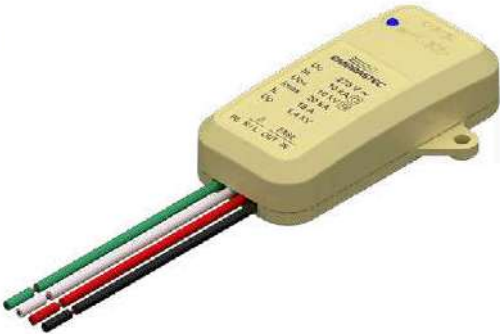
Proteção para
seus equipamentos





Linha E-LED

CLASSE II



CARACTERÍSTICAS GERAIS

Modelo	Linha	Classe de de ensaio conforme IEC	Grau de Proteção	Tensão nominal (Un)	Máx. tensão de operação (Uc)	Tensão de impulso (Uoc)	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imáx)	Nível de tensão de proteção (Up)	Tecnologia de proteção	Fusível de pré-proteção máximo	
E960.0275.015.0	E-Led	II+III	IP 66	100 @ 240 VCA	275V CA	10 kV	5 kA	15 kA	1,3 kV	MOV	16A	
E960.0275.020.0							10 kA	20 kA	1,4 kV			
E961.0275.020.0							10 kA	20 kA	1,4 kV			
E960.0275.015.1							5 kA	15 kA	1,3 kV			
E970.0275.010.0	New E-led		IP 20				5 kA	10 kA	1,3 kV	MOV+GDT		16A
E970.0275.012.0								12 kA				
E970.0275.015.0								15 kA				
E970.0275.012.1								12 kA				
E970.0275.015.1								15 kA				

ANTI ⚡ RAIO®

CLASSE III



CARACTERÍSTICAS GERAIS

Modelo	Gabinete	Linha	Classe de de ensaio conforme IEC	Tensão nominal (Un)	Máx. tensão de operação (Uc)	Corrente nominal de carga (Il)	Potência de carga máxima	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imáx)	Nível de tensão de proteção (Up)
920702	Preto fumê	Anti Raio	III	100 @ 250V CA	275V CA	10 A	1270 W (127V) / 2200 W (220V)	2,5 kA	7,5 kA	< 0,7 kV
920713	Azul cristal									

Filtro de Linha

CLASSE III



CARACTERÍSTICAS GERAIS

Modelo	Cor do gabinete	Linha	Quantidade de tomadas	Plugue	Tensão nominal (Un)	Potência de carga máxima	Corrente Nominal de descarga (In)	Corrente máxima de descarga (Imáx.)	Corrente nominal de carga (IL)	Comprimento do cabo
905000	Branco	Filtro de Linha 100@250V	6 tomadas (2P + T)	1 plugue 90º (2P + T)	100 @ 250V CA	1270W @ 127V CA 2200 W @ 220V CA	-	-	10 A	1,50m
906000										1,20m
907000										1,80m
915000	Preto									1,50m
916000										1,20m
917000										1,80m
905207	Branco	Filtro DPS 7,5kA 100@250V	6 tomadas (2P + T)	1 plugue 90º (2P + T)	100 @ 250V CA	1270W @ 127V CA	2,5 kA	7,5 kA	10 A	1,50m
906207										1,20m
907207										1,80m
915207	Preto									1,50m
916207										1,20m
917207										1,80m
905220	Branco	Filtro DPS 20kA 100@250V	6 tomadas (2P + T)	1 plugue 90º (2P + T)	100 @ 250V CA	1270W @ 127V CA 2200 W @ 220V CA	10 kA	20 kA	10 A	1,50m
906220										1,20m
907220										1,80m
915220	Preto									1,50m
916220										1,20m
917220										1,80m
936207	Azul Cristal	Filtro DPS 7,5 kA 100@250V	6 tomadas (2P + T)	1 plugue 90º (2P + T)	100 @ 250V CA	1270W @ 127V CA 2200 W @ 220V CA	2,5 kA	7,5 kA	10 A	1,20m
937207										1,80m
936220	Azul Cristal	Filtro DPS 20 kA 100@250V	6 tomadas (2P + T)	1 plugue 90º (2P + T)	100 @ 250V CA	1270W @ 127V CA 2200 W @ 220V CA	10 kA	20 kA	10 A	1,20m
937220										1,80m
926207	Preto fumê	Filtro DPS 7,5 kA 100@250V	6 tomadas (2P + T)	1 plugue 90º (2P + T)	100 @ 250V CA	1270W @ 127V CA 2200 W @ 220V CA	2,5 kA	7,5 kA	10 A	1,20m
927207										1,80m
926220	Preto fumê	Filtro DPS 20 kA 100@250V	6 tomadas (2P + T)	1 plugue 90º (2P + T)	100 @ 250V CA	1270W @ 127V CA 2200 W @ 220V CA	10 kA	20 kA	10 A	1,20m
927220										1,80m



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FIQUE POR
DENTRO



Flow Measurement

SITRANS F M

Transmitter MAG 5000/6000

Overview



Transmitter MAG 5000/6000 compact version (left) and 19" insert version (right)

The MAG 5000 and 6000 are transmitters engineered for high performance, easy installation, commissioning and maintenance. The transmitters evaluate the signals from the SITRANS F M sensors type MAG 1100, MAG 1100 F, MAG 3100, MAG 3100 P and MAG 5100 W.

Transmitter types:

- MAG 5000: Max. measuring error $\pm 0.4 \% \pm 1 \text{ mm/s}$ (incl. sensor)
- MAG 6000: Max. measuring error $\pm 0.2 \% \pm 1 \text{ mm/s}$ (incl. sensor, see also sensor specifications) and with additional features such as: "plug & play" add-on bus modules; integrated batch functions.

Benefits

- Superior signal resolution for optimum turn down ratio
- Digital signal processing with many possibilities
- Automatic reading of SENSORPROM data for easy commissioning
- User configurable operation menu with password protection.
- 3 lines, 20 characters display in 11 languages.
- Flow rate in various units
- Totalizer for forward, reverse and net flow as well as additional information available
- Multiple functional outputs for process control, minimum configuration with analogue, pulse/frequency and relay output (status, flow direction, limits)
- Comprehensive self-diagnostic for error indication and error logging (see under SITRANS F M diagnostics)
- Batch control (MAG 6000 only)
- Custody transfer approval: PTB, OIML R 75, OIML R 117, OIML R 49, MI-001 and PTB K 7.2 for chilled water
- MAG 6000 with add-on bus modules for HART, FOUNDATION Fieldbus H1, DeviceNet, Modbus RTU/RS 485, PROFIBUS PA and DP

Application

The SITRANS F M flowmeters are suitable for measuring the flow of almost all electrically conductive liquids, pastes and slurries. The main applications can be found in:

- Water and waste water
- Chemical and pharmaceutical industries
- Food and beverage industries
- Power generation and utility

Design

The transmitter is designed as either IP67 NEMA 4X/6 enclosure for compact or wall mounting or 19" version as a 19" insert as a base to be used in:

- 19" rack systems
- Panel mounting IP20/NEMA 1 (prepared for IP65/NEMA 2 display side)
- Back of panel mounting IP20/NEMA 1
- Wall mounting IP66/NEMA 4X

Several options on 19" versions are available such as:

- Transmitters mounted in safe area for Ex ATEX approved flow sensors (incl. barriers)
- Transmitters with electrode cleaning unit on request

Function

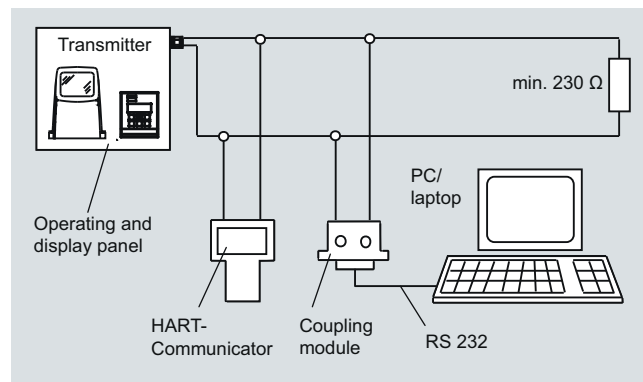
The MAG 5000/6000 are transmitters with a build-in alphanumeric display in several languages. The transmitters evaluate the signals from the associated electromagnetic sensors and also fulfil the task of a power supply unit which provides the magnet coils with a constant current.

Further information on connection, mode of operation and installation can be found in the data sheets for the sensors.

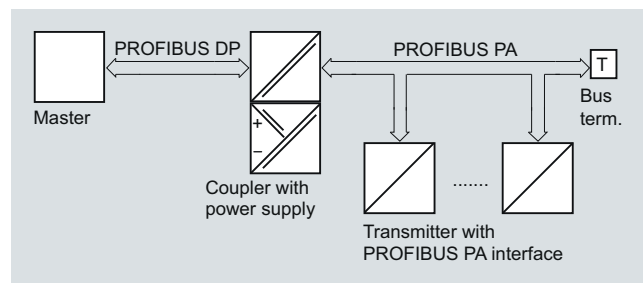
Displays and controls

Operation of the transmitter can be carried out using:

- Control and display unit
- HART communicator
- PC/laptop and SIMATIC PDM software via HART communication
- PC/laptop and SIMATIC PDM software using PROFIBUS or Modbus communication



HART communication



PROFIBUS PA communication

Technical specifications

Mode of operation and design

Measuring principle	Electromagnetic with pulsed constant field
Empty pipe	Detection of empty pipe (special cable required in remote mounted installation)
Excitation frequency	Depend on sensor size
Electrode input impedance	$> 1 \times 10^{14} \Omega$

Input

Digital input

• Activation time	50 ms
• Current	$I_{11 \text{ V DC}} = 2.5 \text{ mA}$, $I_{30 \text{ V DC}} = 7 \text{ mA}$

Output

Current output

• Signal range	0 ... 20 mA or 4 ... 20 mA
• Load	$< 800 \Omega$
• Time constant	0.1 ... 30 s, adjustable

Digital output

• Frequency	0 ... 10 kHz, 50 % duty cycle (uni/bidirectional)
• Pulse (active)	24 V DC, 30 mA, $1 \text{ K}\Omega \leq R_i \leq 10 \text{ K}\Omega$, short-circuit-protected (power supplied from flowmeter)
• Pulse (passive)	3 ... 30 V DC, max. 110 mA, $200 \Omega \leq R_i \leq 10 \text{ K}\Omega$ (powered from connected equipment)
• Time constant	0.1 ... 30 s, adjustable

Relay output

• Time constant	Changeover relay, same as current output
• Load	42 V AC/2 A, 24 V DC/1 A

Low flow cut off	0 ... 9.9 % of maximum flow
-------------------------	-----------------------------

Galvanic isolation	All inputs and outputs are galvanically isolated.
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Max. measuring error (incl. sensor and zero point)

• MAG 5000	0.4 % ± 1 mm/s
• MAG 6000	0.2 % ± 1 mm/s

Rated operation conditions

Ambient temperature	
• Operation	- Display version: -20 ... +60 °C (-4 ... +140 °F) - Blind version: -20 ... +60 °C (-4 ... +140 °F) - MI-001 version -25 ... +55 °C (-13 ... +131 °F) - Custody Transfer (CT) version -20 ... +50 °C (-4 ... +122 °F) - Storage -40 ... +70 °C (-40 ... +158 °F)

Mechanical load (vibration)

Compact version	18 ... 1000 Hz, 3.17 g rms, sinusoidal in all directions to IEC 68-2-36
19" insert	1 ... 800 Hz, 1 g, sinusoidal in all directions to IEC 68-2-36

Degree of protection

Compact version	IP67/NEMA 4X/6 to IEC 529 and DIN 40050 (1 mH ₂ O 30 min.)
19" insert	IP20/NEMA 1 to IEC 529 and DIN 40050

EMC performance	IEC/EN 61326-1 (all environments) IEC/EN 61326-2-5
------------------------	---

Display and keypad

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

Design

Enclosure material	Fiber glass reinforced polyamide; stainless steel AISI 316/1.4436 (IP65)
• Compact version	
• 19" insert	Standard 19" insert of aluminum/steel (DIN 41494), width: 21 TE, height: 3 HE
• Back of panel	IP20/NEMA 1; Aluminum
• Panel mounting	IP20/NEMA 1 (prepared for IP65/NEMA 2 display side); ABS plastic
• Wall mounting	IP66/NEMA 4X; ABS plastic

Dimensions

Compact version	See dimensional drawings
19" insert	See dimensional drawings

Weight

Compact version	0.75 kg (2 lb)
19" insert	See dimensional drawings

Power supply	115 ... 230 V AC +10 % -15 %, 50 ... 60 Hz 11 ... 30 V DC or 11 ... 24 V AC
---------------------	--

Power consumption	230 V AC: 17 VA 24 V AC: 9 VA, $I_N = 380 \text{ mA}$, $I_{ST} = 8 \text{ A}$ (30 ms) 12 V DC: 11 W, $I_N = 920 \text{ mA}$, $I_{ST} = 4 \text{ A}$ (250 ms) $I_{ST} = 4 \text{ A}$ (250 ms): For solar panel please secure stable current supply
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Certificates and approvals

Custody transfer approval (MAG 5000/6000 CT)	CE, C-UL general purpose, C-tick; FM Class I, Div 2, CSA Class I, Div 2 - Cold water: MI-001, PTB/OIML R 49 (pattern approval DE/DK) - Hot water: PTB and DANAK OIML R 75 (pattern approval DE/DK) (MAG 6000 CT) - Chilled water: PTB K 7.2 - Other media than water (milk, beer etc.): PTB and DANAK OIML R 117 (pattern approval DE/DK) (MAG 6000 CT)
--	---

Communication

Standard	Without serial communication or HART as option
• MAG 5000	
• MAG 6000	Prepared for client-mounted add-on modules
Optional (MAG 6000 only)	HART, Modbus RTU/RS 485, FOUNDATION Fieldbus H1, DeviceNet, PROFIBUS PA, PROFIBUS DP as add-on modules
• MAG 5000/6000 CT	No communication modules approved

Flow Measurement

SITRANS F M

Transmitter MAG 5000/6000

Safety barrier (e/ia)



Application	For use with MAG 5000/6000 19" and MAG 1100 Ex ATEX/MAG 3100 Ex ATEX		
Ex approval	MAG 1100 Ex [EEx e ia] IIB ATEX MAG 3100 Ex [EEx e ia] IIC ATEX		
Cable parameter	Group	Capacity in μF	Inductance in mH
Electrode	IIC	≤ 4.1	≤ 80
	IIB	≤ 45	≤ 87
	IIA	≤ 45	≤ 87
Ambient temperature			
• During operation	-20 ... +50 °C (-4 ... +122 °F)		
• During storage	-20 ... +70 °C (-4 ... +158 °F)		
Enclosure			
• Material	Standard 19" insert in aluminum/steel (DIN 41494)		
• Width	21 TE (4.75")		
• Height	3 HE (5.25")		
• Rating	IP20 / NEMA 1 to EN 60529		
• Mechanical load	1 g, 1 ... 800 Hz sinusoidal in all directions to EN 60068-2-36		

Electrode cleaning unit for MAG 5000 or 6000 in 19" insert version



The purpose of electrode cleaning is to remove unwanted deposits on the electrodes in water applications by applying either a DC or AC voltage to the electrodes. AC cleaning is used in waste water applications to remove fatty deposits on the electrodes by warming up the electrode. DC cleaning is used in district heating applications to eliminate electrically conductive deposits.

Application for use with transmitters MAG 5000 and 6000 19" to clean the electrodes on sensors MAG 1100 or MAG 3100

- Not to be used with intrinsically safe Ex sensors
 - Not to be used with sensors with Hastelloy and Tantalum electrodes
- Available on request

Selection and Ordering data

Transmitter MAG 5000

Description	Order No.	
Transmitter MAG 5000 Blind for compact and wall mounting; IP67/NEMA 4X/6, fibre glass reinforced polyamide		
• 11 ... 30 V DC/ 11 ... 24 V AC	◆ 7ME6910-1AA30-0AA0	
• 115 ... 230 V AC, 50/60 Hz	◆ 7ME6910-1AA10-0AA0	
Transmitter MAG 5000 Display for compact and wall mounting; IP67/NEMA 4X/6, fibre glass reinforced polyamide		
• 11 ... 30 V DC/ 11 ... 24 V AC	◆ 7ME6910-1AA30-1AA0	
• 115 ... 230 V AC, 50/60 Hz	◆ 7ME6910-1AA10-1AA0	
• 115 ... 230 V AC, 50/60 Hz, with HART	7ME6910-1AA10-1BA0	
Transmitter MAG 5000 CT for compact and wall mounting, approved for custody transfer (only with approval marks, no verification – only a complete flowmeter can be verified, i.e. sensor together with the transmitter); IP67/NEMA 4X/6, fibre glass reinforced polyamide		
• 11 ... 30 V DC/ 11 ... 24 V AC	◆ 7ME6910-1AA30-1AB0	
• 115 ... 230 V AC, 50/60 Hz	◆ 7ME6910-1AA10-1AB0	
Transmitter MAG 5000 for 19" rack and wall mounting		
• 11 ... 30 V DC/ 11 ... 24 V AC	7ME6910-2CA30-1AA0	
• 115 ... 230 V AC, 50/60 Hz	7ME6910-2CA10-1AA0	

◆ Short lead time (details in PMD)

Transmitter MAG 6000

Description	Order No.	
Transmitter MAG 6000 Blind for compact and wall mounting; IP67/NEMA 4X/6, fibre glass reinforced polyamide		
• 11 ... 30 V DC/ 11 ... 24 V AC	◆ 7ME6920-1AA30-0AA0	
• 115 ... 230 V AC, 50/60 Hz	◆ 7ME6920-1AA10-0AA0	
Transmitter MAG 6000 for compact and wall mounting; IP67/NEMA 4X/6, fibre glass reinforced polyamide		
• 11 ... 30 V DC/ 11 ... 24 V AC	◆ 7ME6920-1AA30-1AA0	
• 115 ... 230 V AC, 50/60 Hz	◆ 7ME6920-1AA10-1AA0	
Transmitter MAG 6000 for compact and wall mounting; IP65/NEMA 4, stainless steel AISI 316/1.4436 (only for sensor with SS terminal box) (for remote installation order SS terminal box separately)		
• 11 ... 30 V DC/ 11 ... 24 V AC	7ME6920-1QA30-1AA0	
• 115 ... 230 V AC, 50/60 Hz	7ME6920-1QA10-1AA0	
Transmitter MAG 6000 CT for compact and wall mounting, approved for custody transfer (no communication modules possible; only with approval marks, no verification – only a complete flowmeter can be verified, i.e. sensor together with the transmitter); IP67/NEMA 4X/6, fibre glass reinforced polyamide		
• 11 ... 30 V DC/ 11 ... 24 V AC	◆ 7ME6920-1AA30-1AB0	
• 115 ... 230 V AC, 50/60 Hz	◆ 7ME6920-1AA10-1AB0	
Transmitter MAG 6000 SV for compact and wall mounting; special excitation 44 Hz settings for Batch application DN ≤ 25/1" IP67/NEMA 4X/6, fibre glass reinforced polyamide		
11 ... 30 V DC/ 11 ... 24 V AC	7ME6920-1AB30-1AA0	
115 ... 230 V AC, 50/60 Hz	7ME6920-1AB10-1AA0	
Transmitter MAG 6000 for 19" rack and wall mounting		
• 11 ... 30 V DC/ 11 ... 24 V AC	◆ 7ME6920-2CA30-1AA0	
• 115 ... 230 V AC, 50/60 Hz	◆ 7ME6920-2CA10-1AA0	

Flow Measurement

SITRANS F M

Transmitter MAG 5000/6000

Description	Order No.	
Transmitter MAG 6000 SV for 19" rack and wall mounting; special excitation 44 Hz settings for Batch application DN ≤ 25/1"		
11 ... 30 V DC/ 11 ... 24 V AC 115 ... 230 V AC, 50/60 Hz	7ME6920-2CB30-1AA0 7ME6920-2CB10-1AA0	
MAG 6000 with IP66/NEMA 4X enclosure; 115 ... 230 V AC, 50/60 Hz; cable gland PG13.5	7ME6920-2EA10-1AA0	
MAG 6000 with safety barrier for Ex-approved sensors, complete mounted with IP66/NEMA 4X wall mounting enclosure, ATEX, 115 ... 230 V AC, 50/60 Hz; cable gland PG13.5		
For ATEX 2G D sensors	7ME6920-2MA11-1AA0	
MAG 6000 SV, 19" insert, in IP66/NEMA 4X, ABS plastic enclosure, excitation frequency 44 Hz for Batch application DN ≤ 25/1"; cable gland PG13.5		
11 ... 30 V DC, 11 ... 24 V AC, 50/60 Hz 115 ... 230 V AC, 50/60 Hz	7ME6920-2EB30-1AA0 7ME6920-2EB10-1AA0	

◆ Short lead time (details in PMD)

Operating instructions for SITRANS F M MAG 5000/6000

Description	Order No.	
For SITRANS F M MAG 5000/6000 IP67		
- English - German - Spanish - French	A5E02338368 A5E02944982 A5E02944995 A5E02944990	
For SITRANS F M MAG 5000/6000 19"		
English	A5E02082880	

This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

All literature is also available for free at:
<http://www.siemens.com/flowdocumentation>

Communication modules for MAG 6000

Description	Order No.	
HART (not for MAG 6000 I)	◆ FDK:085U0226	
Modbus RTU/RS 485	◆ FDK:085U0234	
PROFIBUS PA Profile 3	◆ FDK:085U0236	
PROFIBUS DP Profile 3	◆ FDK:085U0237	
DeviceNet	◆ FDK:085U0229	
FOUNDATION Fieldbus H1	◆ A5E02054250	

Operating instructions for SITRANS F add-on modules

Description	Order No.	
HART		
English	A5E03089708	
PROFIBUS PA/DP		
- English - German	A5E00726137 A5E01026429	
MODBUS		
- English - German - Spanish - French	A5E00753974 A5E03089262 A5E03089278 A5E03089265	
FOUNDATION Fieldbus		
- English - German - Spanish - French	A5E02318728 A5E02488856 A5E02512177 A5E02512169	
DeviceNet		
English	A5E03089720	

This device is shipped with a Quick Start guide and a CD containing further SITRANS F literature.

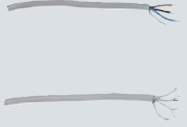
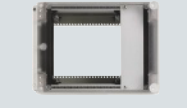
Accessories for MAG 5000 and MAG 6000

Description	Order No.	
Wall mounting unit for IP67/NEMA 4X/6 version, wall bracket, terminal box in polyamide		
4 x M20 cable glands 4 x 1/2" NPT cable glands	◆ FDK:085U1018 ◆ FDK:085U1053	
Sun lid for MAG 5000/6000 transmitter (Frame and lid)	A5E02328485	
Cable for standard electrode or coil, 3 x 1.5 mm ² / 18 gage with shield PVC; Temperature range: -30 ... +70 °C (-22 ... +158 °F)		
10 m (33 ft) 20 m (65 ft) 40 m (130 ft) 60 m (200 ft) 100 m (330 ft) 150 m (500 ft) 200 m (650 ft) 500 m (1650 ft)	◆ FDK:083F0121 ◆ FDK:083F0210 ◆ FDK:083F0211 ◆ FDK:083F0212 ◆ FDK:083F0213 FDK:083F3052 FDK:083F3053 FDK:083F3054	

Flow Measurement

SITRANS F M

Transmitter MAG 5000/6000

Description	Order No.	
Electrode cable for empty pipe or low conductivity ¹⁾ , double shielded, 3 x 0.25 mm ² . Temperature range : -30 ... +70 °C (-22 ... +158 °F)		
• 10 m (33 ft)	◆ FDK:083F3020	
• 20 m (65 ft)	◆ FDK:083F3095	
• 40 m (130 ft)	FDK:083F3094	
• 60 m (200 ft)	FDK:083F3093	
• 100 m (330 ft)	FDK:083F3092	
• 150 m (500 ft)	FDK:083F3056	
• 200 m (650 ft)	FDK:083F3057	
• 500 m (1650 ft)	FDK:083F3058	
Low-noise electrode coax cable for low conductivity and high vibration levels of cables, 3 x 0.13 mm ²		
• 2 m (6.6 ft)	A5E02272692	
• 5 m (16.5 ft)	A5E02272723	
• 10 m (33 ft)	A5E02272730	
Cable kit with standard coil cable ¹⁾ , 3 x 1.5 mm ² /18 gage with shield PVC and electrode cable double shielded, 3 x 0.25 mm ² . Temperature range: -30 ... +70 °C (-22 ... +158 °F)		
• 5 m (16.5 ft)	◆ A5E02296329	
• 10 m (33 ft)	◆ A5E01181647	
• 15 m (49 ft)	◆ A5E02296464	
• 20 m (65 ft)	◆ A5E01181656	
• 25 m (82 ft)	◆ A5E02296490	
• 30 m (98 ft)	◆ A5E02296494	
• 40 m (130 ft)	◆ A5E01181686	
• 50 m (164 ft)	◆ A5E02296498	
• 60 m (200 ft)	A5E01181689	
• 100 m (330 ft)	A5E01181691	
• 150 m (500 ft)	A5E01181699	
• 200 m (650 ft)	A5E01181703	
• 500 m (1650 ft)	A5E01181705	
Potting kit for terminal box of flow sensors for IP68/NEMA 6P (not for Ex sensors)	◆ FDK:085U0220	
19" safety barrier (21 TE) [EEx e ia] IIC for MAG 1100 Ex sensors and MAG 3100 Ex sensors, incl. back plate	FDK:083F5034	
Panel mounting enclosure for 19" insert (21 TE); IP65/NEMA 2 enclosure in ABS plastic for front panel mounting	FDK:083F5030	
Panel mounting enclosure for 19" insert (42 TE); IP65/NEMA 2 enclosure in ABS plastic for front panel mounting	FDK:083F5031	

Description	Order No.	
Back of panel mounting enclosure for 19" insert (21 TE); IP20/NEMA 1 enclosure in aluminum	FDK:083F5032	
Back of panel mounting enclosure for 19" insert (42 TE); IP20/NEMA 1 enclosure in aluminum	FDK:083F5033	
IP66/NEMA 4X, wall mounting enclosure for 19" inserts (without back plates). Use with PCB A5E02559813 or A5E02559814		
• 21 TE	FDK:083F5037	
• 42 TE	FDK:083F5038	
Front cover (7TE) for panel mounting enclosure	FDK:083F4525	
Sun shield for remote MAG 5000/6000 transmitters	A5E01209496	
Sun Shield for compact MAG 5000/6000 transmitters on MAG 3100 (DN 15 ... 2000 (1/2" ... 78") or MAG 5100 W (DN 150 ... 1200 (6" ... 48"))	A5E01209500	

◆ Short lead time (details in PMD)

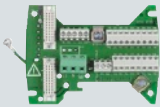
¹⁾ Not for MAG 6000 with safety barrier

Flow Measurement

SITRANS F M

Transmitter MAG 5000/6000

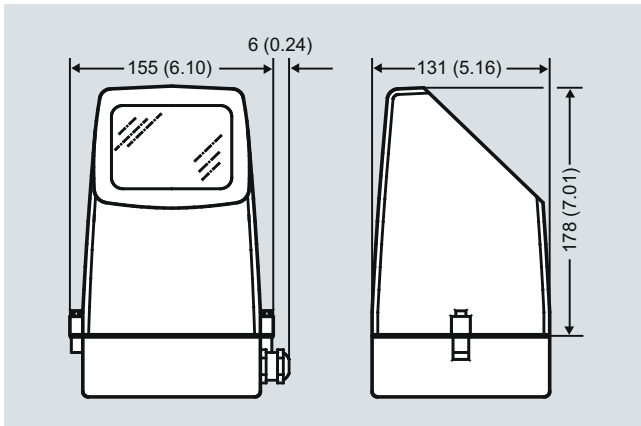
Spare parts

Description	Order No.	
Connection board (for polyamide terminalbox) • 12 ... 24 V • 115 ... 230 V	A5E02559817 A5E02559816	
Connection board (for stainless steel terminalbox) • 12 ... 24 V • 115 ... 230 V	A5E02604280 A5E02604272	
19" enclosure, 12 ... 24 V, 115 ... 230 V • Connection board for standard 19" transmitter	A5E02559809	
• Connection board for transmitter ia and safety barrier	A5E02559810	
• Connection board for transmitter ia/ib and safety barrier (only for sensors produced before October 2007)	A5E02559811	
• Connection board for transmitter and cleaning unit	FDK:083F4123	
SENSORPROM memory unit (Sensor code and serial numbers must be specified on order) • 2 kB (for MAG 5000/6000/ MAG 6000 I) • 250 B (for MAG 2500/3000)	FDK:085U1005 FDK:085U1008	
Display unit for MAG 5000/6000 • Black neutral front	FDK:085U1038	
• Siemens front	FDK:085U1039	
Display unit for 19" versions	FDK:085U3349	

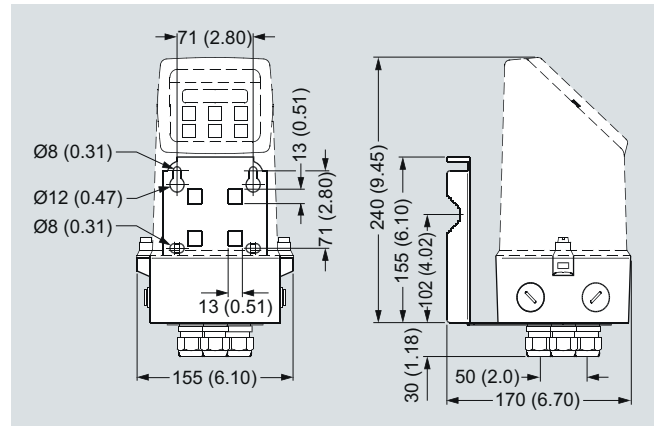
Description	Order No.	
Cable glands, for above cable, 4 pcs. • M20 • ½" NPT	A5E00822490 A5E00822501	
Sealing screws for sensor/transmitter, 2 pcs	FDK:085U0221	
Terminal box, in polyamide, inclusive lid • M20 • ½" NPT	FDK:085U1050 FDK:085U1052	
Terminal box lid, in polyamide	FDK:085U1003	
Terminal box, in stainless steel, inclusive lid for MAG 6000 in stainless steel and for all Ex sensors • M20 • ½" NPT	A5E00836867 A5E00836868	
Terminal box (3A) for MAG 1100 F in polyamide, inclusive lid • M20 • ½" NPT	A5E00822478 A5E00822479	
Wall unit enclosure IP66, 12 ... 24 V, 115 ... 230 V • PCB for standard transmitter	A5E02559813	
• PCB for transmitter ia/e and safety barrier	A5E02559814	
• PCB for transmitter ia/ib and safety barrier (7ME6130, 7ME6150 and 7ME6330)	A5E02559812	
• PCB for transmitter and cleaning unit	A5E02559815	

Dimensional drawings

Transmitter IP67/NEMA 4X/6 compact polyamide

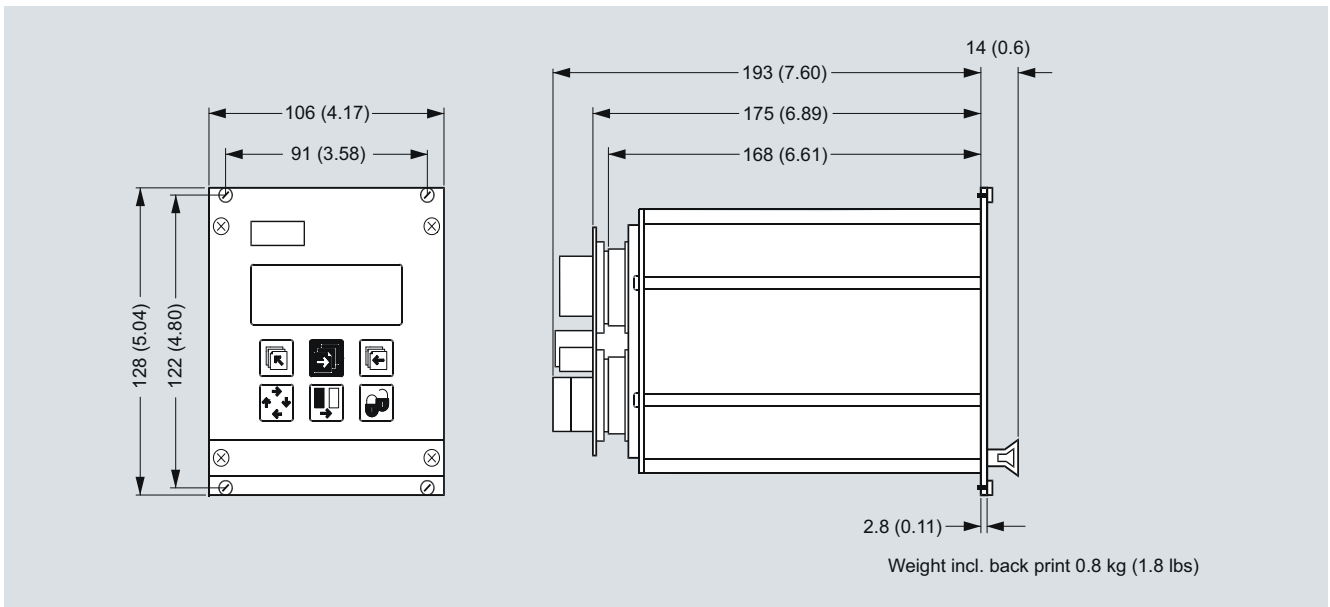


Transmitter compact mounted, dimensions in mm (inch)



Transmitter wall mounted, dimensions in mm (inch)

Transmitter, 19" IP20/NEMA 1 standard unit



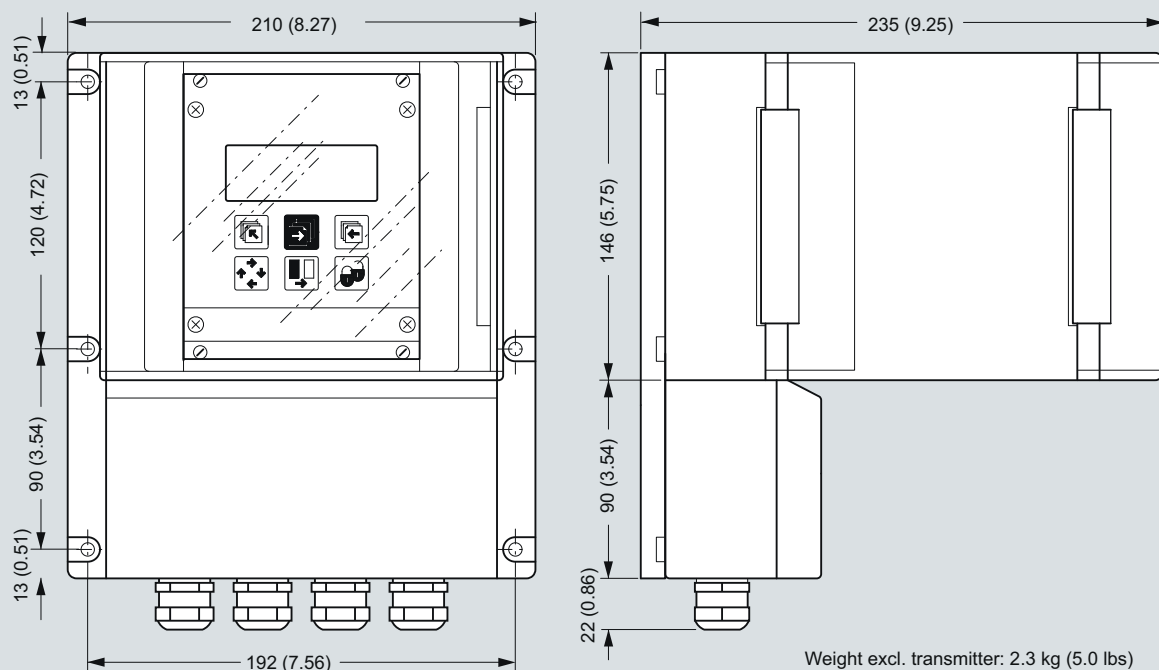
Dimensions in mm (inch)

Flow Measurement

SITRANS F M

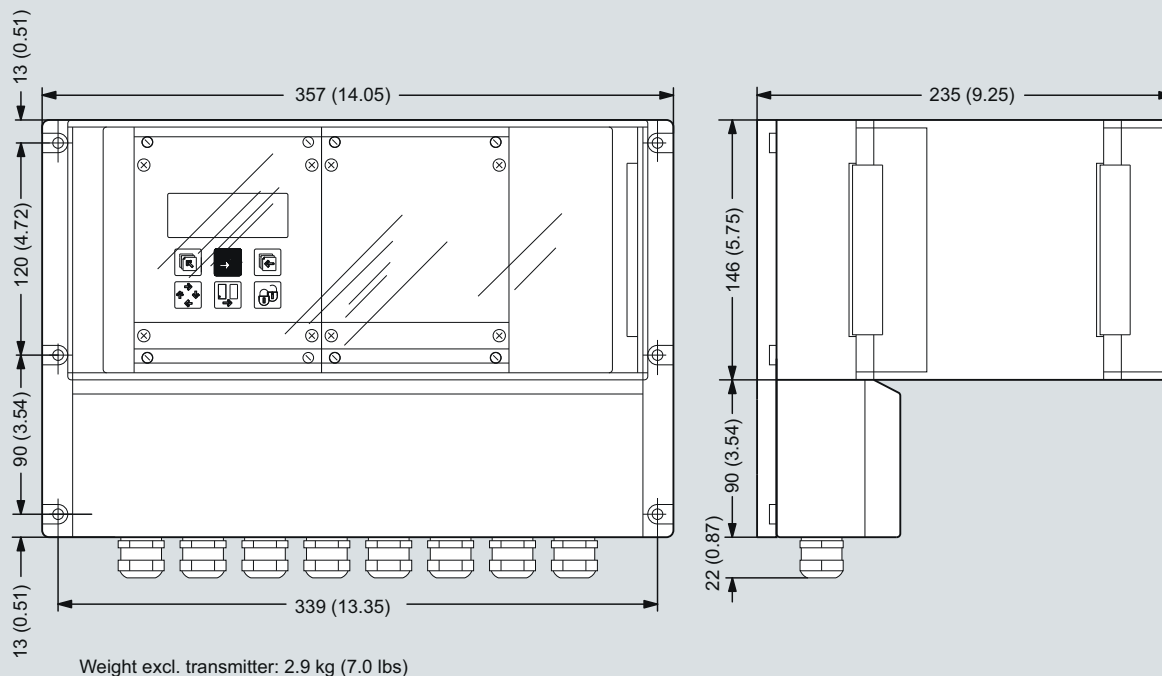
Transmitter MAG 5000/6000

Transmitter, wall mounting IP66/NEMA 4X, 21 TE



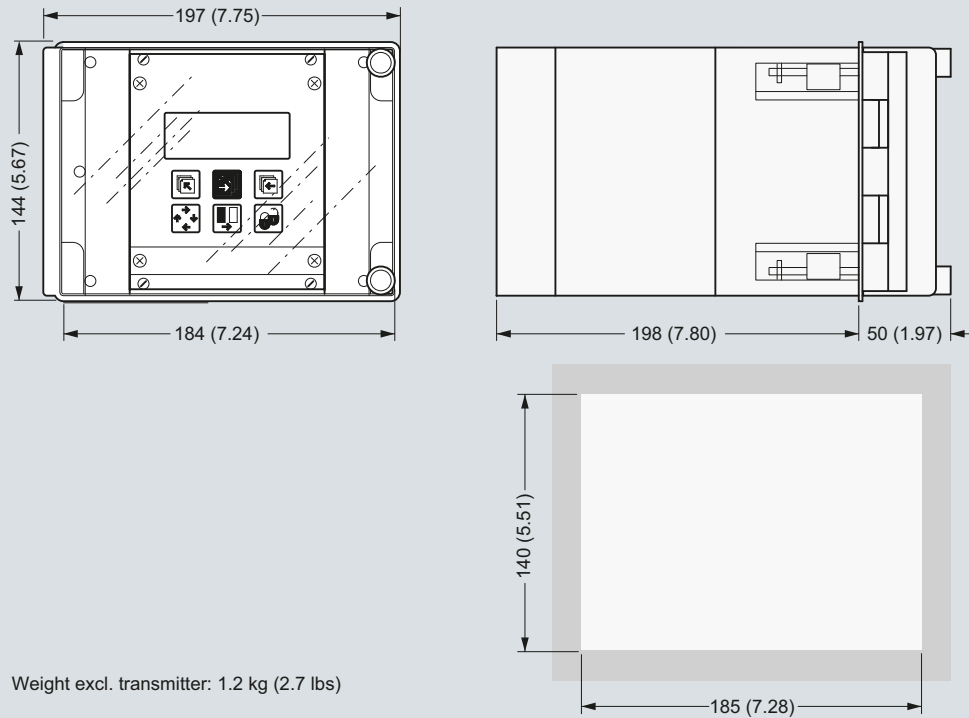
Dimensions in mm (inch)

Transmitter, wall mounting IP66/NEMA 4X, 42 TE



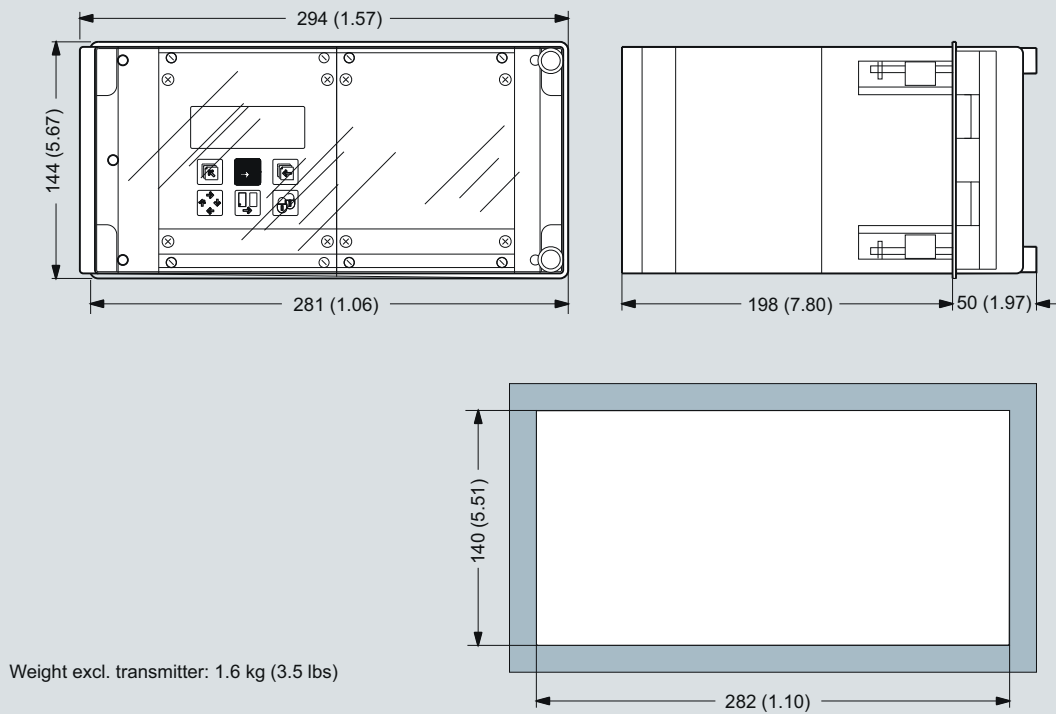
Dimensions in mm (inch)

Transmitter, panel front IP20/NEMA 1, 21 TE



Dimensions in mm (inch)

Transmitter, panel front IP20/NEMA 1, 42 TE



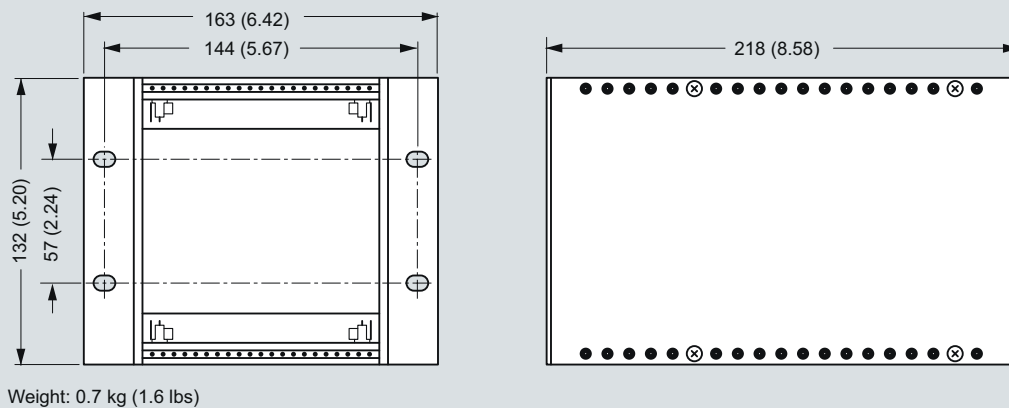
Dimensions in mm (inch)

Flow Measurement

SITRANS F M

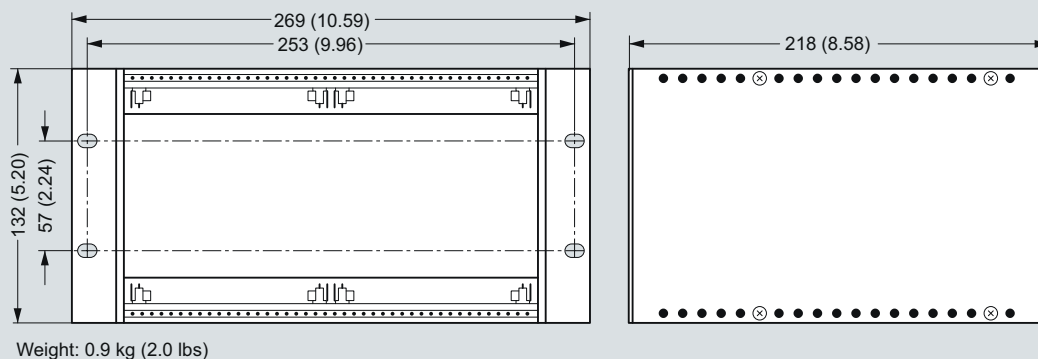
Transmitter MAG 5000/6000

Transmitter, back of panel IP20/NEMA 1, 21 TE



Dimensions in mm (inch)

Transmitter, back of panel IP20/NEMA 1, 42 TE



Dimensions in mm (inch)

Schematics

Electrical connection

Grounding

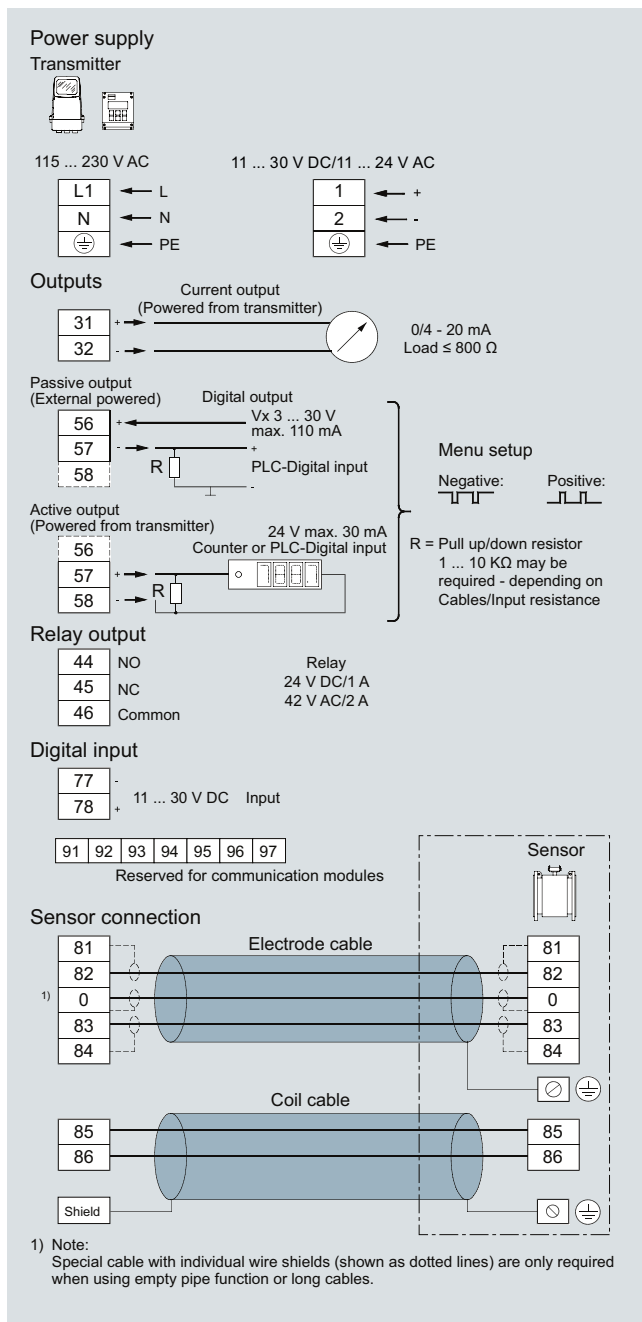
PE must be connected due to safety class 1 power supply.

Mechanical counters

When mounting a mechanical counter to terminals 57 and 58 (active output), a 1000 μ F capacitor must be connected to the terminals 56 and 58. Capacitor + is connected to terminal 56 and capacitor - to terminal 58.

Output cables

If the output cable length is long in noisy environment, we recommend to use shielded cable.



SITRANS F

Electromagnetic flowmeters SITRANS FM MAG 5000/6000 IP67

Operating Instructions

7ME6910 (SITRANS MAG 5000)
7ME6920 (SITRANS MAG 6000)

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D

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Introduction

1.1 Purpose of this documentation

These instructions contain all information required to commission and use the device. Read the instructions carefully prior to installation and commissioning. In order to use the device correctly, first review its principle of operation.

The instructions are aimed at persons mechanically installing the device, connecting it electronically, configuring the parameters and commissioning it, as well as service and maintenance engineers.

1.2 Document history

This document describes:

- SITRANS F MAG 5000 and MAG 6000 transmitters (standard version).
- Optional versions:
 - MAG 5000 Blind and MAG 6000 Blind
 - MAG 5000 CT and MAG 6000 CT
 - MAG 6000 SV

Documentation history

The following table shows major changes in the documentation compared to the previous edition.

Edition	Remarks	FW version
04/2022	• Torque value and electrical connection correction	4.09
12/2019	• BBL42 as default unit • Improved operation without SENSORPROM • Responsibility transfer to Siemens AG	4.09
12/2013	• Customer defined unit • Velocity value with unit • Operational without SENSORPROM • Signal suitability	4.07
01/2012		4.04
01/2010	First edition	

1.3 Checking the consignment

1. Check the packaging and the delivered items for visible damages.
2. Report any claims for damages immediately to the shipping company.
3. Retain damaged parts for clarification.
4. Check the scope of delivery by comparing your order to the shipping documents for correctness and completeness.

WARNING

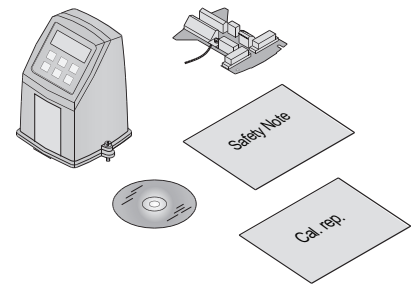
Using a damaged or incomplete device

Risk of explosion in hazardous areas.

- Do not use damaged or incomplete devices.

1.4 Items supplied

- SITRANS F M MAG 5000/6000 transmitter
- Siemens Process Instrumentation documentation disk containing certificates, and manuals
- Safety note
- Calibration report



1.5 Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial security measures that may be implemented, please visit

<https://www.siemens.com/industrialsecurity>.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer

supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under

<https://www.siemens.com/cert>.

1.6 Transportation and storage

To guarantee sufficient protection during transport and storage, observe the following:

- Keep the original packaging for subsequent transportation.
- Devices/replacement parts should be returned in their original packaging.
- If the original packaging is no longer available, ensure that all shipments are properly packaged to provide sufficient protection during transport. Siemens cannot assume liability for any costs associated with transportation damages.

NOTICE
Insufficient protection during storage
The packaging only provides limited protection against moisture and infiltration.
• Provide additional packaging as necessary.

Special conditions for storage and transportation of the device are listed in Technical specifications (Page 67).

1.7 Notes on warranty

The contents of this manual shall not become part of or modify any prior or existing agreement, commitment or legal relationship. The sales contract contains all obligations on the part of Siemens as well as the complete and solely applicable warranty conditions. Any statements regarding device versions described in the manual do not create new warranties or modify the existing warranty.

The content reflects the technical status at the time of publishing. Siemens reserves the right to make technical changes in the course of further development.

Safety notes



CAUTION

Correct, reliable operation of the product requires proper transport, storage, positioning and assembly as well as careful operation and maintenance.

Only qualified personnel should install or operate this instrument.

Note

Alterations to the product, including opening or improper modifications of the product are not permitted.

If this requirement is not observed, the CE mark and the manufacturer's warranty will expire.

2.1 Laws and directives

General requirements

Installation of the equipment must comply with national regulations. For example EN 60079-14 for the European Community.

Instrument safety standards

The device has been tested at the factory, based on the safety requirements. In order to maintain this condition over the expected life of the device the requirements described in these Operating Instructions must be observed.

Environmental conditions according to IEC 61010-1 (2010)

- Indoor use
- Altitude up to 2000m
- Maximum relative humidity 80% for temperatures up to 31°C (88°F) decreasing linearly up to 50% relative humidity from 40°C (104°F)
- Main supply voltage fluctuations up to $\pm 10\%$ of the nominal voltage (see Technical specifications (Page 67))
- Overvoltage category II
- Pollution degree 2

Environmental conditions according MID (Directive 2014/32/EU)

- Environment class: E2 (electromagnetic), M1 (mechanical)
- Climatic class: -25°C - +55°C, condensing, closed

2.2 Conformity with European directives

The CE marking on the device symbolizes the conformity with the following European directives:

Electromagnetic compatibility EMC 2014/30/EU	Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to electromagnetic compatibility
Low voltage directive LVD 2014/35/EU	Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits
Atmosphère explosible ATEX 2014/34/EU	Directive of the European Parliament and the Council on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres
CT: Measuring instruments directive MID 2014/32/EU	Directive of the European Parliament and the Council on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments

The applicable directives can be found in the EU declaration of conformity of the specific device.

2.3 Installation in hazardous location

WARNING

Conditions for safe use

Equipment used in hazardous areas must be Ex-approved and marked accordingly. It is required that the special conditions for safe use provided in the manual and in the Ex certificate are followed!

Ex approvals

CSA Class I, Division 2, Groups A, B, C and D. Code T5 for an ambient temperature of +60 °C.

FM Class I, Division 2, Groups A, B, C and D and Class I, Zone 2, Group IIC indoor/outdoor Type IP67 hazardous (classified) locations.

Process temperature specifications for Ex use

Temperature class	Ambient temperature [°C]		
	-40 to +40	-40 to +50	-40 to +60
T2	180	-	-
T3	165	140	-
T4	100	100	80
T5	65	65	65
T6	50	50	50

EX requirements

It is required that:

- Electrical connections are in accordance with Elex V (VO in explosion hazardous areas) and EN60079-14 (Installing Electrical Systems in Explosion Hazardous Areas).
- The protective cover over the power supply is properly installed. For intrinsically safe circuits the connection area can be opened.
- Appropriate cable connectors are used for the output circuits: intrinsically safe: blue, non-intrinsically safe: black.
- Sensor and transmitter are connected to the potential equalization. For intrinsically safe output circuits potential equalization must be maintained along the entire connection path.
- Sensor insulation thickness is max. 100mm (only insulated sensors).
- EN60079-31 is considered for installation in areas with combustible dust.
- When protective earth (PE) is connected, no potential difference between the protective earth (PE) and the potential equalization (PA) can exist, even during a fault condition.

Description

3.1 System components

A SITRANS F M MAG 5000/6000 flowmeter system includes:

- Transmitter (type SITRANS F M MAG 5000/6000)
- Sensor (types: SITRANS F MAG 1100/1100F/3100/3100 P/5100 W)
- Communication module (optional) (types: HART, PROFIBUS PA/DP, MODBUS RTU RS 485, Foundation Fieldbus H1, Devicenet)
- SENSORPROM memory unit

Communication solutions

The SITRANS F USM II range of add on modules, presently including HART, Foundation Fieldbus, MODBUS RTU RS 485, PROFIBUS PA / DP and Devicenet, are all applicable with the SITRANS F M MAG 6000 transmitter.

3.2 Operating principle

The transmitters are microprocessor-based with a built-in alphanumeric display in several languages. The flow measuring principle is based on Faraday's law of electromagnetic induction. Magnet coils mounted diametrically on the measuring pipe generate a pulsed electromagnetic field. The liquid flowing through this electromagnetic field induces a voltage.

The transmitters evaluate the signals from the associated electromagnetic sensors, convert the signals into appropriate standard signals such as 4 to 20 mA, and also fulfil the task of a power supply unit providing the magnet coils with a constant current.

The transmitter consists of a number of function blocks which convert the sensor voltage into flow readings.

3.3 Applications

The pulsed DC-powered magnetic flowmeters are suitable for measuring the flow of almost all electrically conductive liquids, pastes, and slurries with max. 40% solids.

The main applications can be found in the following sectors:

- Water and waste water
- Chemical and pharmaceutical industries
- Food & beverage industry
- Mining and cements industries
- Pulp and paper industry

- Steel industry
- Power generation; utility and chilled water industry



WARNING

This is a Class A product

In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

3.4 Features

Power supply

2 different types of power supply are available. A 12 to 24 V AC/DC and a 115 to 230 V AC switch mode type.

Coil current module generates a pulsating magnetizing current that drives the coils in the sensor. The current is permanently monitored and corrected. Errors or cable faults are registered by the self-monitoring circuit.

Input circuit amplifies the flow-proportional signal from the electrodes. The input impedance is extremely high: $>10^{14} \Omega$ which allows flow measurements on fluids with conductivities as low as $5 \mu\text{S/cm}$. Measuring errors due to cable capacitance are eliminated due to active cable screening.

Digital signal processor converts the analog flow signal to a digital signal and suppresses electrode noise through a digital filter. Inaccuracies in the transmitter as a result of long-term drift and temperature drift are monitored and continuously compensated for via the self-monitoring circuit. The analog to digital conversion takes place in an ultra low noise ASIC with 23 bit signal resolution. This has eliminated the need for range switching. The dynamic range of the transmitter is therefore unsurpassed with a turn down ratio of minimum 3000:1.

Dialog module

The display unit consists of a 3-line display and a 6-key keypad. The display shows a flow rate or a totalizer value as a primary reading.

Output module

The output module converts flow data to analog, digital and relay outputs. The outputs are galvanically isolated and can be individually set to suit a particular application.

3.5 MAG 5000/MAG 6000 versions

The transmitters are designed in various versions and offer high performance and easy installation, commissioning and maintenance.

Standard version



The standard version is an IP67 version for compact or remote installation. Its robust design ensures a long lifetime if installed outdoors.

Blind version



This version carries all the normal MAG 5000/6000 features, except those associated with the display and keypad.

Both current and digital outputs are available.

Factory setting of current output in unit is switched off when delivered.

CT version



The MAG 5000/6000 CT version is a custody transfer approved transmitter.

It is approved according to:

- Cold water approval:
 - MI-001 (Tested according to OIML R 49)
- Other media than water:
 - PTB K7.2

The above approval specifications apply at the time of publication. For the latest approval updates, see: <http://support.automation.siemens.com/WW/view/en/10806951/134200>

SV version (MAG 6000 only)



This version is identical to the standard MAG 6000 transmitters except for the following additional functions:

- Zero point adjustment
- Adjustable excitation frequency up to 44 Hz

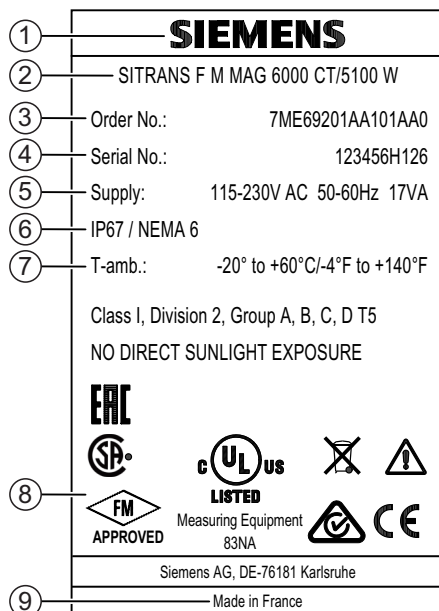
3.6 Nameplate layout

Inspection

1. Check for mechanical damage due to possible improper handling during shipment. All claims for damage are to be made promptly to the shipper.
2. Make sure the scope of delivery, and the information on the type plate corresponds to the ordering information.

3.6 Nameplate layout

Identification



- ① Manufacturer
- ② Product name
- ③ Order number
- ④ Serial number
- ⑤ Power supply
- ⑥ Degree of protection
- ⑦ Ambient temperature
- ⑧ Conformity with country-specific directives
- ⑨ Place of manufacture

Figure 3-1 MAG 6000 transmitter nameplate example

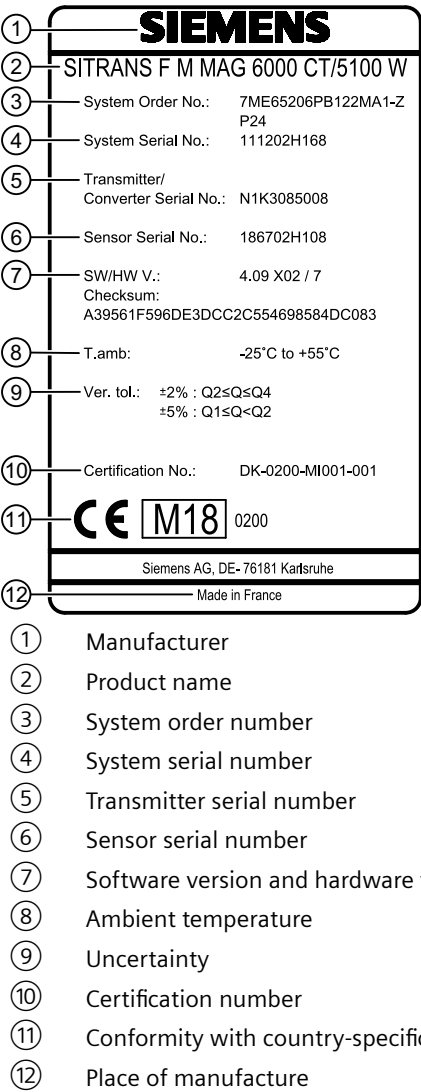


Figure 3-2 MAG 6000 CT system nameplate example

3.6 Nameplate layout

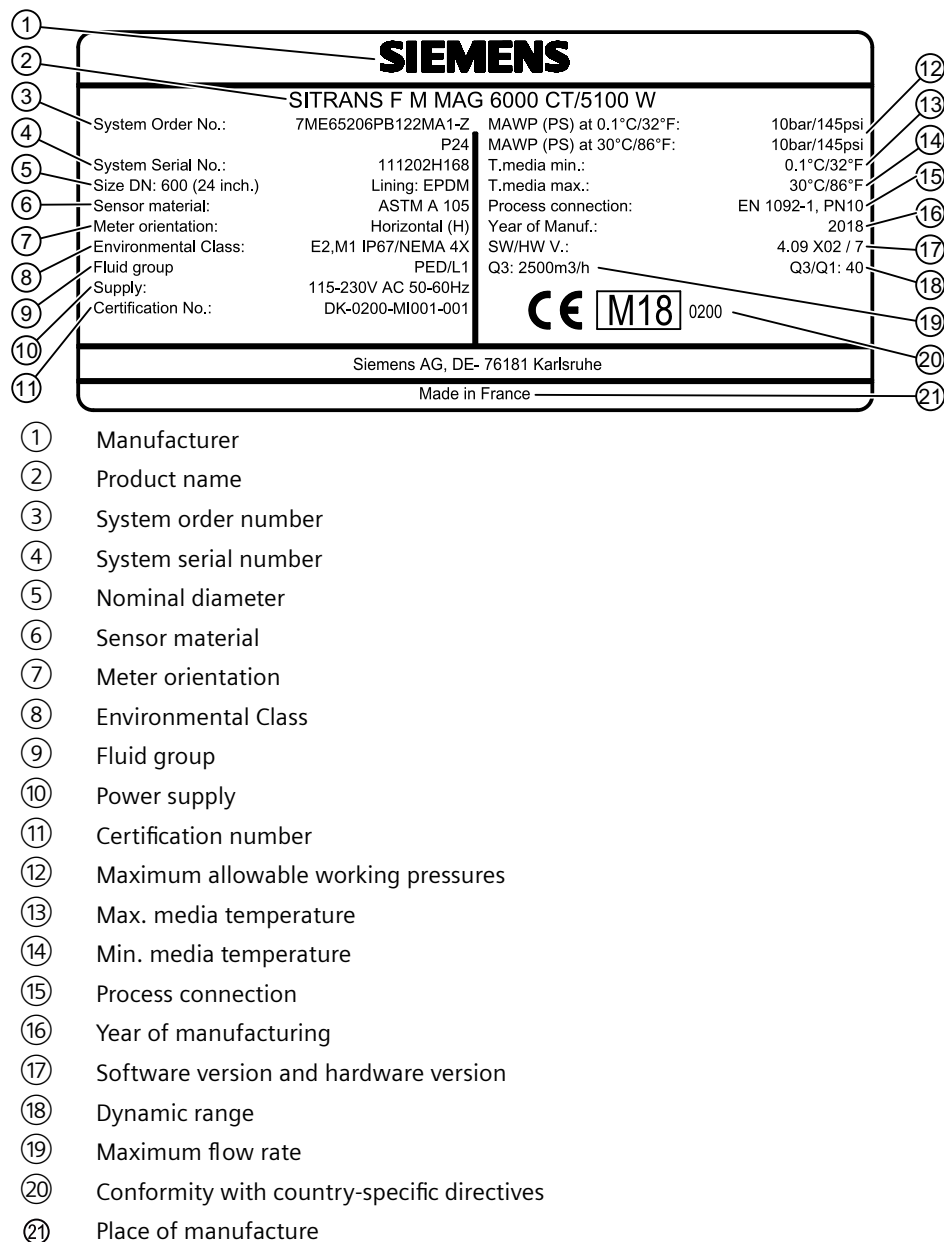


Figure 3-3 MAG 5000/6000 CT system sensor nameplate example

Note

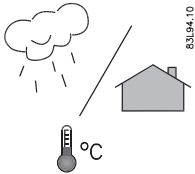
The matched paired transmitter and sensor shall be mounted together

At installation, please check that the system nameplates of transmitter and sensor have the same system serial number.

Installing/Mounting

4.1

Introduction



SITRANS F flowmeters are suitable for indoor and outdoor installations.

- Make sure that pressure and temperature specifications indicated on the device nameplate / label will not be exceeded.

! WARNING

Installation in hazardous location

Special requirements apply to the location and interconnection of sensor and transmitter. See Installation in hazardous location (Page 12)

This chapter describes how to install the flowmeter in the compact version as well as in the remote version.

The transmitter is delivered ready for mounting on the sensor. The transmitter is delivered with a compression plate ready for mounting on the sensor. No further assembling is necessary.

The transmitter can be installed either compact on the sensor or remote.

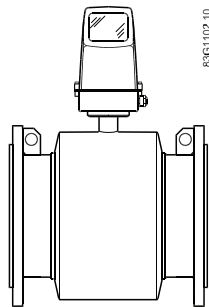


Figure 4-1 Compact installation

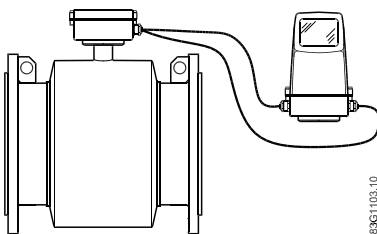


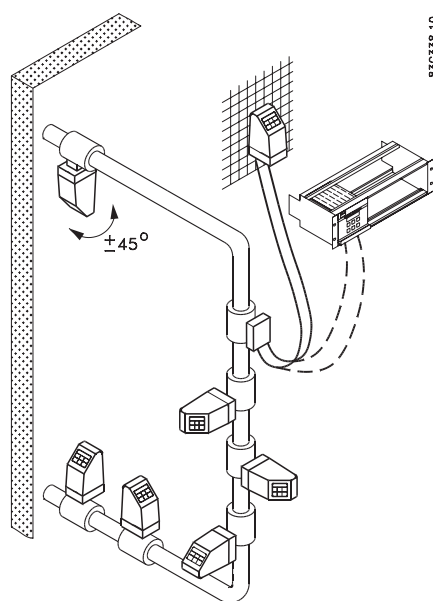
Figure 4-2 Remote installation

**CAUTION**

See Cable requirements (Page 76) before installing transmitter

4.2 Installation conditions

Reading and operating the flowmeter is possible under almost any installation conditions because the display can be oriented in relation to the sensor. To ensure optimum flow measurement, attention should be paid to the following:



Vibrations

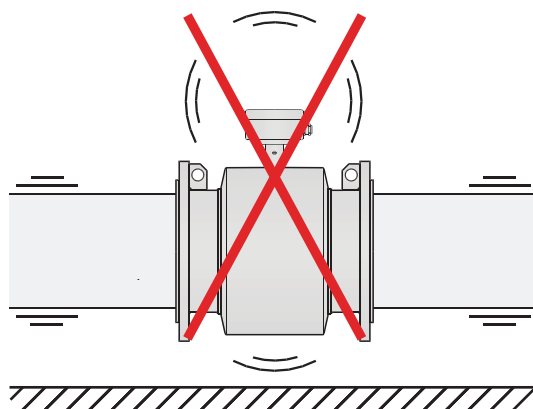
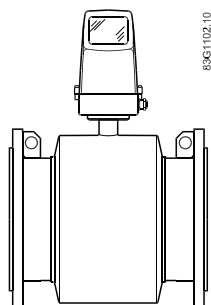


Figure 4-3 Avoid strong vibrations

Compact installation



Medium temperature must be in accordance with the graphs showing max. ambient temperature as a function of medium temperature.

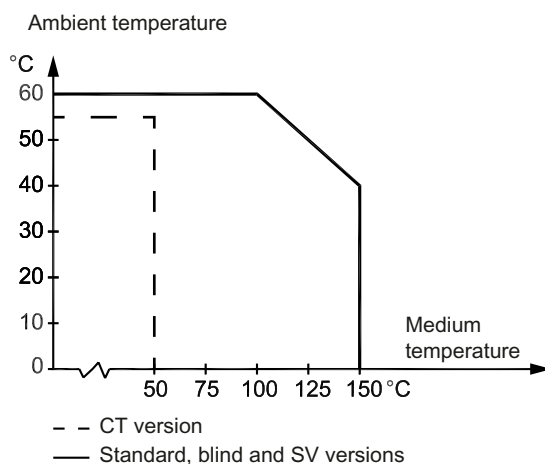
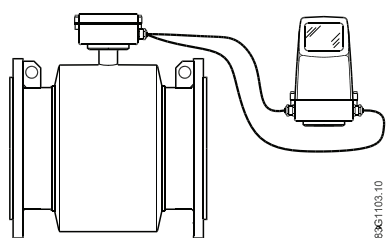


Figure 4-4 Medium and ambient temperatures

Remote installation

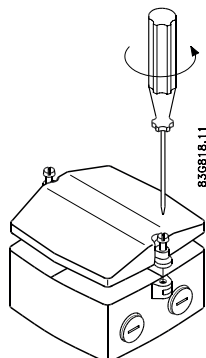


Cable length and type (as described in Cable requirements (Page 76)) must be used.
For installation conditions for sensors, see relevant sensor Operating Instructions.

4.3 MAG 5000/6000 compact

Install MAG 5000 / MAG 6000 compact version

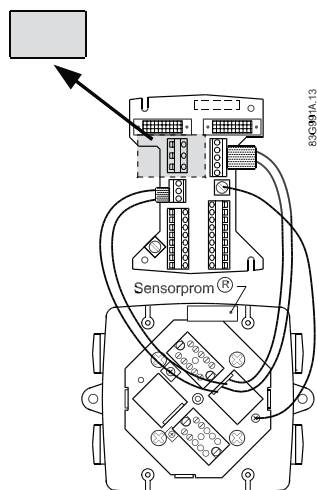
1. Remove and discard terminal box lid of sensor.



2. Ensure SENSORPROM® memory unit is installed.
3. Fit M20 or ½" NPT cable glands for supply and output cables.
4. Unplug the two black plug assemblies for coil and electrode cables in terminal box.
5. Connect earth wire from connection board to bottom of terminal box.
6. Connect 2-pin connector and 3-pin connector as shown to their corresponding terminal numbers on connection board as shown in Electrical connection (Page 38).

Note

System will not register flow if black plugs are not connected to connection board.



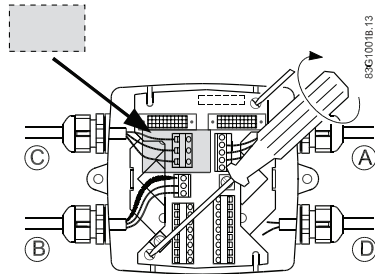
7. Fit supply and output cables through cable glands and connect to connection plate as shown in Electrical connection (Page 38).

8. Mount connection plate in terminal box.

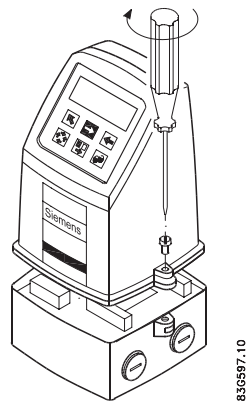
Note

Check that your connection board lines up with SENSORPROM® unit, if not, move SENSORPROM® unit to the other side of terminal box.

SENSORPROM® memory unit connections will be established automatically when connection plate is mounted in terminal box.



9. Tighten cable glands to obtain optimum sealing.
10. Mount transmitter on terminal box. Recommended torque value: 0.5 Nm.



11. Transmitter is ready to be powered up.

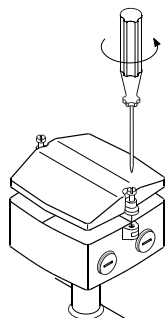
NOTICE

Exposing transmitter to direct sunlight may increase operating temperature above its specified limit, and decrease display visibility.

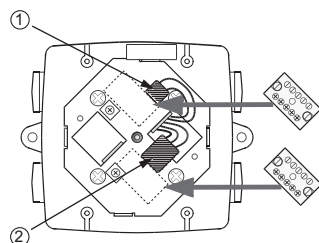
A sunshield is available as accessory.

4.4 Remote installation

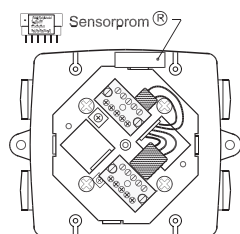
1. Remove terminal box lid.



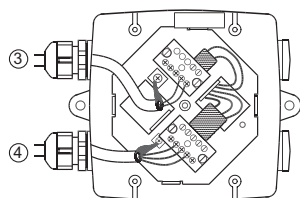
2. Mount the two terminal blocks as shown and insert coil cable plug ① (terminals 85 and 86) and electrode cable plug ② (terminals 82, 0 and 83).



3. Remove SENSORPROM (to be mounted in transmitter terminal box). Ensure that the serial no. on the SENSORPROM label is identical to the sensor serial no.



4. Connect coil cable ③ and electrode cable ④ in the corresponding terminals on the terminal blocks.

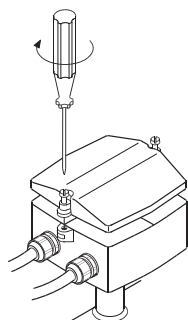


5. Remount terminal box lid.

Note

Tightening torque

Tighten the bolts with 0.5 Nm.



Wall mounting

1. Mount bracket on a wall or on a horizontal or a vertical pipe using ordinary hose clips or duct straps.

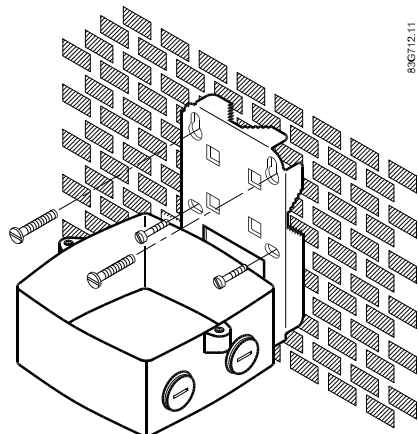


Figure 4-5 Wall mounting

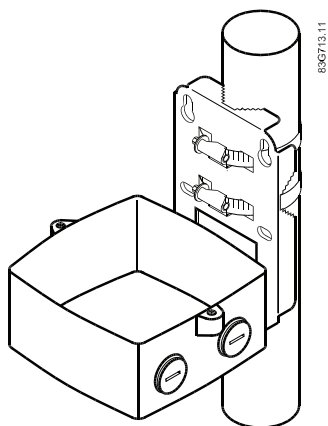


Figure 4-6 Pipe mounting - vertical

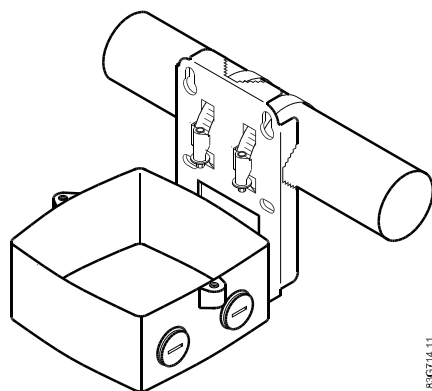
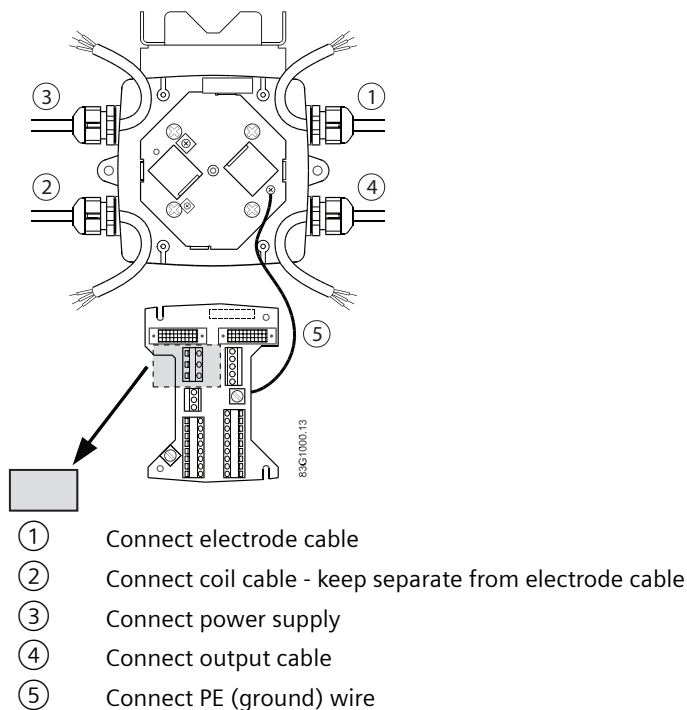


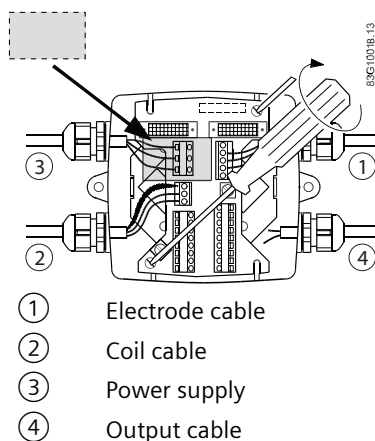
Figure 4-7 Pipe mounting - horizontal

2. Ensure that correct SENSORPROM® memory unit is mounted in wall/pipe mounting unit.
3. Fit M20 or 1/2" NPT cable glands for cables from bottom or sides of terminal box.

4. Mount earth wire in bottom of terminal box.



5. Mount connection plate in terminal box.



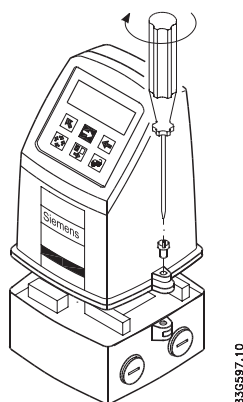
6. Fit coil, electrode, supply and output cables through cable glands and connect to connection plate as shown in Electrical connection (Page 38).
7. Fix connection plate with the two diagonally opposite screws.
8. Tighten cable glands to obtain optimum sealing.

! CAUTION

Coil cable shield

When remote mounted, power supply PE wire must be connected to PE terminal (⊕).
Coil cable shield must be connected to SHIELD terminal.

9. Mount transmitter on terminal box. Recommended torque value: 0.5 Nm.



10. Transmitter is ready to be powered up.

NOTICE

Direct sunlight

Exposing the transmitter to direct sunlight may increase the operating temperature above its specified limit, and decrease display visibility.

A sun shield is available as accessory.

4.5 MAG 5000/6000 CT

Calibration sealing has been carried out at calibration.

MAG 6000 CT is installed like a Standard MAG 6000 except for the final sealing.

4.5.1 Installing hardware key

Use hardware key on non-verified transmitter

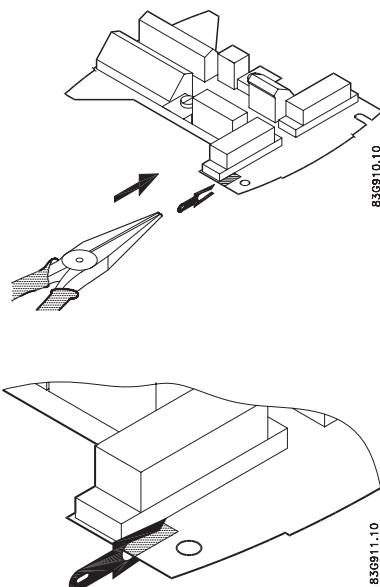
Note

Hardware key function

Setting of primary operating parameters is blocked during normal operation.

When key is mounted, access to all menu items is gained. When key is removed, primary settings are blocked in accordance with requirements in authorisation.

1. Mount hardware key on transmitter connection plate during setting of primary operating parameters such as Q_{max} , low-flow cut-off, units, approvals, etc. in connection with commissioning or calibration. See setup menus in appendix Transmitter menu overview (Page 81).



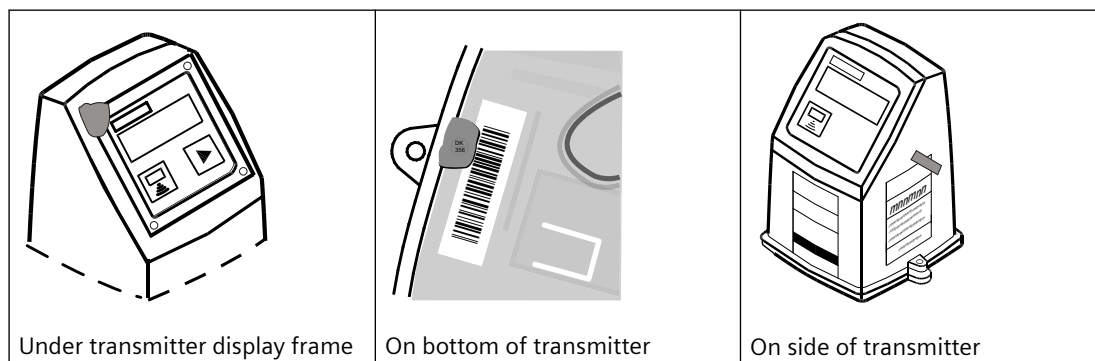
2. Remove hardware key after setting up and calibrating unit. This locks the menu structure and the selected settings.

4.5.2 Sealing of MAG 5000/6000 CT

4.5.2.1 Verification sealing

Note

The verification sealing is done at factory after initial verification.



Note

For type-approved and verified MID MAG 5000/6000 CT products

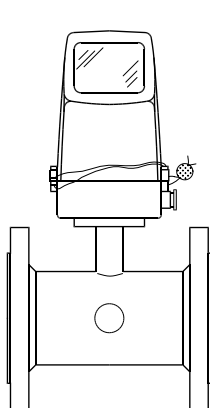
The verification sealing may only be broken by an authorized person, with the acceptance and under direction of the local authorities.

4.5.2.2 User sealing

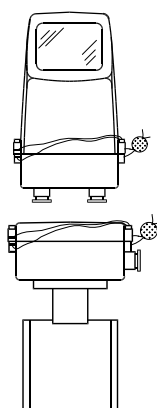
Note

User sealing has to be done after commissioning by an authorized person.

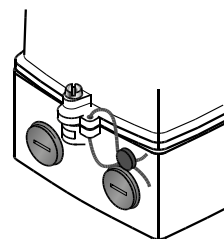
1. Drill through marked drilling holes in terminal box and transmitter/lid.
2. Seal the transmitter on both sides with either one or two wires, as shown below.



Compact version sealed with one wire



Remote version sealed with one wire



Compact version sealed with two wires

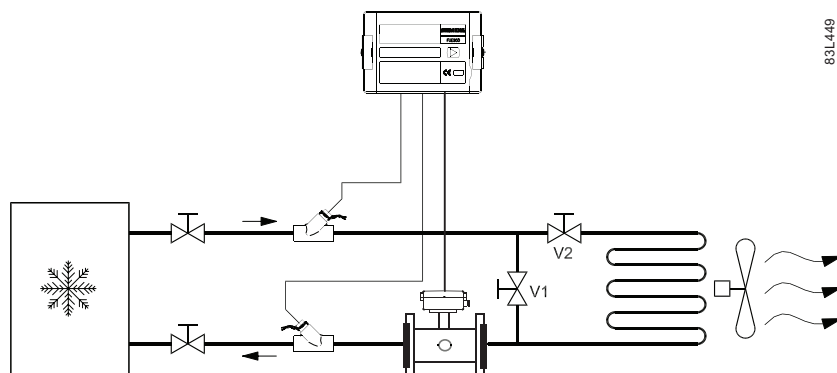
4.5.3 Installation conditions

4.5.3.1 MI-001

MAG 5000/6000 CT together with MAG 5100 W (7ME652) are approved for MI-001 under the following installation conditions.

- DN 50 to 300 (2" to 12") in any orientation
- DN 350 to 1200 (14" to 48") only in horizontal installation
- Compact or remote with max. 500 m (1640 ft.) cable
- Power supply 115 to 230 V AC and 12 to 24 V DC

Other restrictions may apply (see certificate).



4.5.3.2 PTB K7.2

MAG 5000/6000 CT together with MAG 5100 W (7ME652) are approved for PTB K7.2 under the following installation conditions.

SITRANS F M MAG 5100 W with MAG 5000/6000CT

- DN 15 to DN 300 (1/2" to 12") in any orientation
- DN 350 to DN 1200 (14" to 48") only in horizontal installation
- Compact or remote with max. 500 m (1640 ft.) cable

Other restrictions may apply (see certificate)

4.6 Turning transmitter/keypad

Note

Not allowed for MAG 5000/6000 CT

Altering the orientation of the transmitter or keypad is prohibited for non-CT versions.

Transmitter

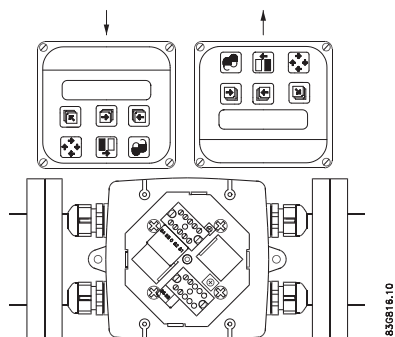


Figure 4-8 Transmitter can be mounted with its front in either direction indicated by the arrows without turning terminal box

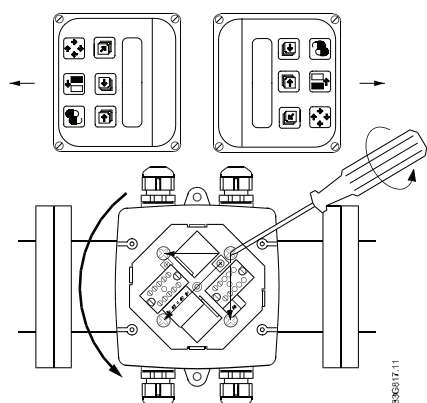
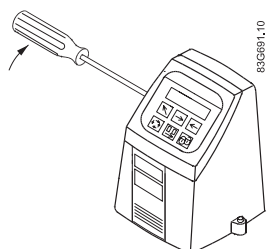


Figure 4-9 Terminal box can be rotated $\pm 90^\circ$ in order to optimize viewing angle of transmitter display/keypad

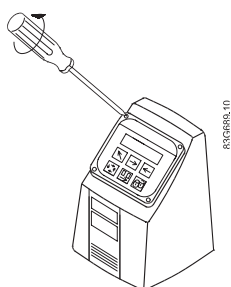
1. Unscrew the four screws in bottom of terminal box.
2. Turn terminal box to required position.
3. Retighten screws firmly.

Keypad

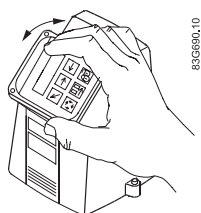
1. Remove outer frame using a screwdriver.



2. Loosen the four screws retaining keypad.

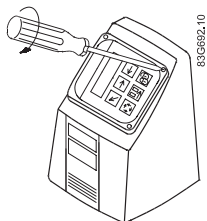


3. Withdraw keypad and turn it to required orientation.

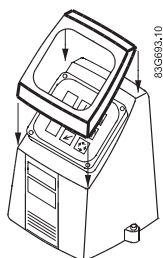


4.6 Turning transmitter/keypad

4. Tighten the four screws until a mechanical stop is felt in order to obtain IP67 enclosure.



5. Snaplock outer frame onto keypad (click).



Connecting



WARNING

The pertinent regulations must be observed for electrical installation.

- Never install the device with the mains voltage switched on!
- Danger of electric shock!
- The electrodes and magnetic current line may only be connected when the device is not connected to the power supply.
- If the housing is under voltage (power supply), the cover may be unscrewed by qualified personnel only.



WARNING

Mains supply from building installation Class II

A switch or circuit breaker (max. 15 A) must be installed in close proximity to the equipment and within easy reach of the operator. It must be marked as the disconnecting device for the equipment.

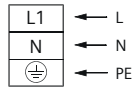
5.1 Electrical connection

Power supply

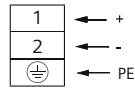
Transmitter



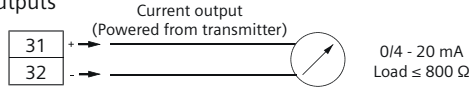
115 to 230 V AC



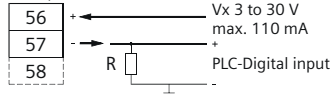
11 to 30 V DC/11 to 24 V AC



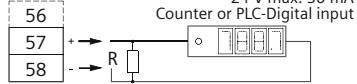
Outputs



Passive output (External powered)



Active output (Powered from transmitter)



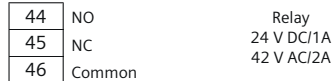
Menu setup

Negative: Positive:



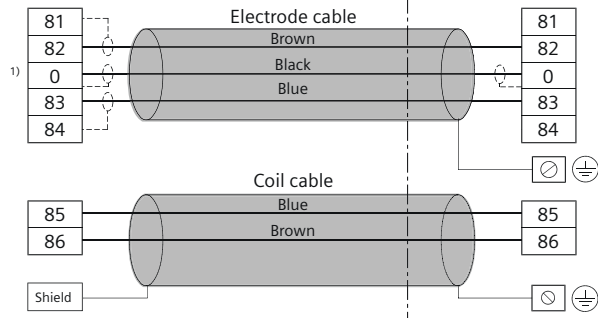
R = Pull up/down resistor
1!to 10 KΩ may be required
- depending on
Cables/Input resistance

Relay output



91 92 93 94 95 96 97
Reserved for communication modules

Sensor connection



1) Note:
Special cable with individual wire shields (shown as dotted lines) are only required
when using empty pipe function or long cables.

Note

Terminals 81 and 84 are only to be connected if special electrode cable with double screening is used, e.g. when empty pipe function or long cables are used.

Mains supply

Mains supply 115 to 230 V AC from building installation Class II.

Note

For DC installations it is recommended to install an under voltage relay or protection circuit in the application where there is a risk of low power supply below the specifications for more than 10 minutes.

WARNING

Grounding

Connect mains protective earth wire to PE terminal in accordance with diagram (due to class 1 power supply).

Mechanical counter

Connect a 1000 μ F capacitor (capacitor+ to terminal 56 and capacitor- to terminal 58) if a mechanical counter is connected to terminals 57 and 58 (active output).

Output cables

Use screened cables if long cables are used in noisy environments.

Digital output

If internal resistance of a load exceeds 10 k Ω , connect an external 10 k Ω load resistor in parallel to this load.

WARNING

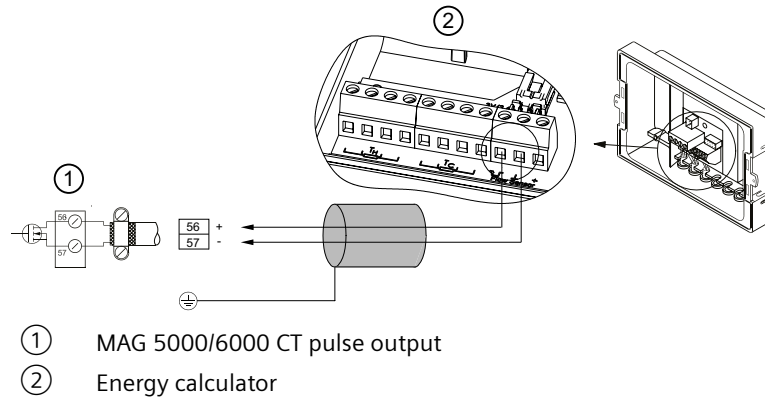
Intrinsically safe terminals

Always ensure that distance between cables/wires is **minimum 50 mm** in order to avoid that wires/terminals of intrinsically safe circuits get into contact with wires of other cables.

Fasten cables/wires in a way that they **cannot** get into contact with each other, not even in case of an error. Keep wire ends as short as possible.

5.2 Electrical connection PTB K7.2

Additional Electrical connection for PTB K7.2 approved MAG 5000/6000 CT with MAG 5100 W (7ME652)



5.3 Connection of add-on modules

When the add-on module has been installed, the electrical connections are available on terminal rows 91-97.

For more information

Refer to the relevant BUS communication Quick Start or Operating Instructions available on an included DVD or on the internet, at: www.siemens.com/flowdocumentation (www.siemens.com/flowdocumentation).

Commissioning

In this chapter it is described how to commission the device via the local user interface (LUI). The display is described in details in section Local user interface (Page 42).

Furthermore, the following functions are described in details:

- Changing password (Page 44)
- Changing basic settings (Page 44)
- Changing operator menu setup (Page 47)
- Changing language (Page 48)

Detailed diagrams concerning the specific menu are shown in appendix menu diagrams.

For factory settings, see Factory settings (Page 97).

6.1 MAG 5000/6000 Blind

Note

Does not have a display. All factory settings will be uploaded from the SENSORPROM® unit after power-up.

For sensor dependent factory settings, see Transmitter factory settings (Page 97).

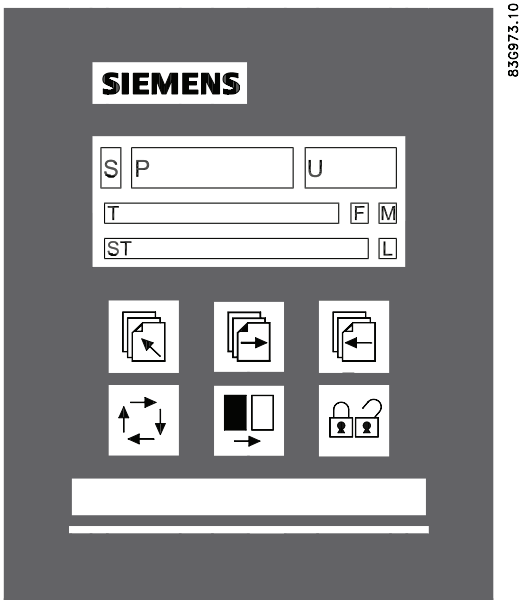
Changing settings

If other settings are required, a standard transmitter with display and similar power supply can be used.

1. Unscrew and remove MAG 5000/6000 Blind.
2. Mount standard MAG 5000/6000 transmitter.
3. Change required settings via display and keypad.
All changed data will be stored in SENSORPROM® memory unit.
4. Remove standard transmitter and remount Blind transmitter.
5. Fasten screws holding transmitter.

New settings stored in SENSORPROM® memory unit will be uploaded in blind transmitter.

6.2 Local user interface



- S Sign field
- P Primary field for numeric value flow rate, Totalizer 1 or Totalizer 2)
- U Unit field
- T Title line with individual information according to operator or setup menu selected.
- ST Subtitle line which will either add information to the title line or keep individual information independent of the title line.
- F Alarm field. Two flashing triangles will appear in case of a fault condition.
- M Mode field
- L Lock field

Figure 6-1 Local User Interface

Mode field symbols

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

Lock field symbols

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

Keypad

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

TOP UP KEY		This key (when held for 2 sec.) is used to switch between operator menu and setup menu. In transmitter setup menu, a short press will cause a return to previous level.
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 backwards through the menus.
CHANGE KEY		With this key settings or numerical values are changed.
SELECT KEY		With this key figures to be changed are selected.
LOCK/UNLOCK KEY		This key enables the operator to change settings and it gives access to submenus.

6.3 Menu structure

Note

Menus disabled on MAG 5000/6000 CT

Due to legal requirements, some parameters are disabled on MAG 5000/6000 CT.

The menu is built up of two parts. An **operator menu** and a **setup menu**, see Transmitter menu overview (Page 81).

Operator menu

The operator menu is for daily operation. It is customized in the operator menu setup. The transmitter always starts up in operator menu No. 1. The forward  and the backward keys  are used to step through the operator menus.

Setup menu

The setup menu is for commissioning and service only. Access to the setup menu is gained by pressing the top up key  for 2 seconds. The setup menu operates in two modes:

- View mode
- Setup mode

View mode is a read-only mode. The pre-selected settings can only be scanned.

Setup mode is a read and write mode. The pre-selected settings can be scanned and changed. Access to the setup mode is password-protected. The factory set password is 1000.

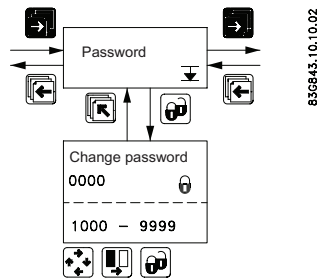
Access to a submenu in the setup menu is gained by pressing the lock key . Press the top up key  briefly to return to the previous menu. Press longer (2 sec.) to exit the setup menu and return to operator menu No. 1.

6.4 Changing password

The setup menu is password-protected in order to ensure that only authorized personnel can make any changes in transmitter settings.

Change password as follows:

1. Press top up key  for 2 sec.
2. Enter password.
3. Use forward key  or backward key  to reach password menu.
4. Press lock/unlock key  to unlock password.
5. Use select key  and change key  to change password.
6. Press lock/unlock key  to confirm new password.
7. Press top up key  two times to exit setup mode.



The factory-set password is 1000, but it can be changed to any value between 1000 and 9999.

Factory setting of password can be re-established as follows:

1. Switch off power supply.
2. While pressing top up key  - switch on power supply.
3. Release top up key  after 10 sec.

6.5 Changing basic settings

In the basic settings menu it is possible to set the following parameters:

Parameter	Description
Main frequency	Selection of main power supply frequency corresponding to the country in which the flowmeter is installed (e.g. 60 Hz in America).
Flow direction	Selection of correct flow direction in pipe.
Customer units	Setting of user defined volume and time units.
$Q_{\max}$	Setting of measuring range, analog outputs and frequency output. Also individual dimension-dependent setting of value, decimal point, unit and time.
$Q_{\max 2}$	Setting of measuring range, analog outputs and frequency output. Also individual dimension-dependent setting of value, decimal point, unit and time. This menu is only visible if chosen as external digital input.
Totalizer	Setting of unit and decimal point.

Parameter	Description
Low flow cut-off	Setting of a percentage of selected $Q_{\max}$. This filters noise in installation reducing fluctuations in display and all outputs.
Empty pipe cut-off	When set to "On" the alarm will indicate when sensor is running empty. All readings, display and outputs, will indicate zero.
Velocity unit	Setting of velocity unit per time unit
Error level	Selecting error level at which flowmeter will detect an error.

Note

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

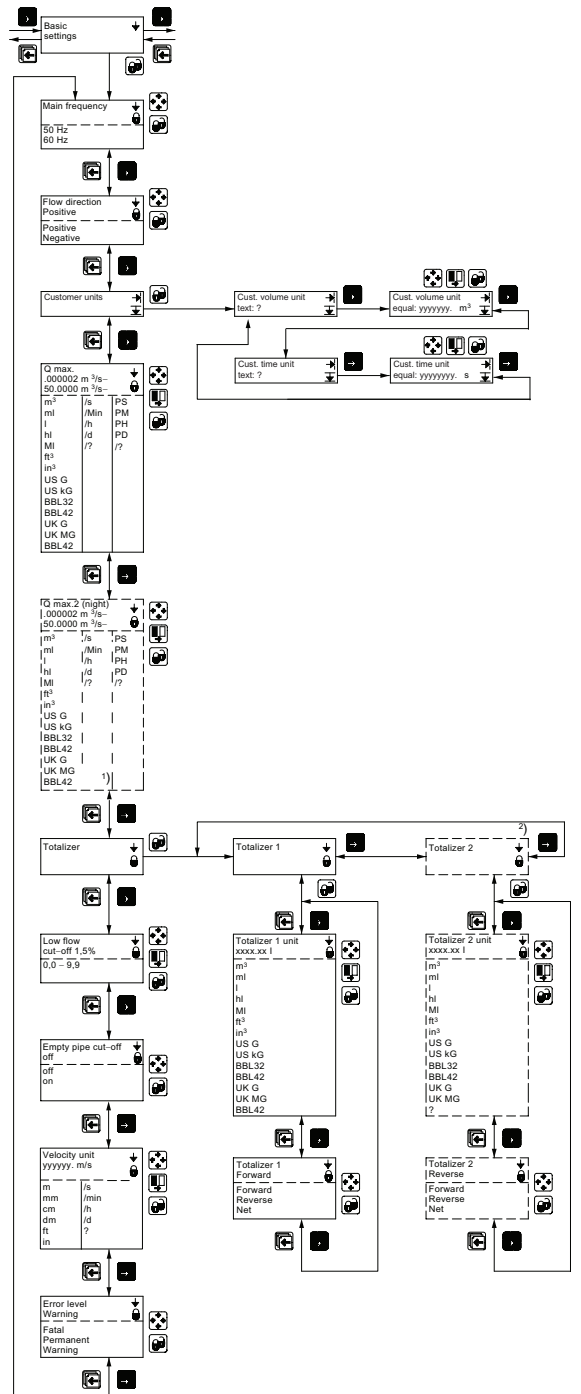
Note

$Q_{\max}$ 2 is visible only when chosen as digital input.

Change basic settings as follows:

1. Press top up key  for 2 sec.
2. Enter password.
3. Use forward key  to reach basic settings menu.
4. Press lock/unlock key  to unlock settings.
5. Use forward key  or backward key  to reach relevant menu.
6. Press lock/unlock key  to unlock settings.
7. Use select key  and change key  to change settings.
8. Press lock/unlock key  to confirm new settings.

9. Repeat steps 5-8 to change other settings.
10. Press top up key  two times to exit setup mode.



Decimal point can be positioned and units set individually for flow rate in totalizer 1 and totalizer 2.

Changing decimal point position

1. Enter the respective totalizer menu.
2. Use select key  to position cursor below decimal point.
3. Use change key  to move decimal point to requested position.

Changing units

Note**Menus disabled on MAG 5000/6000 CT**

Due to legal requirements, some parameters are disabled on MAG 5000/6000 CT. Only available units are m³/h and m³.

1. Use select key  to position cursor below unit.
2. Press change key  until requested unit is displayed.

6.6 Changing operator menu setup

In the operator menu the menus required for daily operation of the flowmeter are shown. It is possible to hide and change some of the menus in the operator menu. This is done in the operator menu setup menu, see diagram Operator menu setup (Page 94).

Customizing menus in operator menu

To customize the menus in the operator menu perform the following steps:

1. Press top up key  for 2 sec.
2. Enter password.
3. Use forward key  or backward key  to reach operator menu.

Changing text in line 1

1. Press lock/unlock key  to unlock setting.
2. Use change key  to select desired text.
3. Press lock/unlock key  to confirm selected text.

Note

If "Text" is selected in line 2, this line functions as a heading for the value shown in line 3. Otherwise it shows the actual value of the reading selected.

Enabling two readings

1. Use forward key  to reach requested menu.
2. Press lock/unlock key  to unlock setting.
3. Use select key  to move cursor to upper line.
4. Use change key  to select requested reading.
5. Press lock/unlock key  to confirm selection.
6. Use select key  to move cursor to line 3.
7. Use change key  to select desired setting.
8. Press lock/unlock key  to confirm new setting.
9. Repeat steps 1-8 for each requested menu.

Showing/hiding menus in operator menu

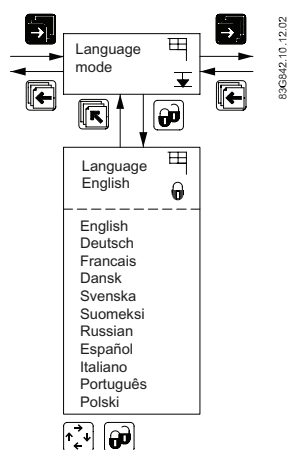
1. Use forward key  to reach requested menu.
2. Press lock/unlock key  to unlock setting.
3. Use select key  to move cursor to $\sqrt{I \div}$ symbol.
4. Press change key  to select visible ($\sqrt{}$) or hidden ($\div$).
5. Press lock/unlock key  to confirm new setting.

6.7 Changing language

It is possible to change language in transmitter. Default language is English, but it can be changed to various other languages.

Change language as follows:

1. Press top up key  for 2 sec.
2. Enter password.
3. Use forward key  or backward key  to reach language menu.
4. Press lock/unlock key  to unlock language.
5. Use change key  to select desired language.
6. Press lock/unlock key  to confirm new language.
7. Press top up key  two times to exit setup mode.



Operating

This chapter describes the various menus of the transmitter in details. The menu diagrams are shown in appendix Menu diagrams.

7.1 Output settings

Three outputs are available:

- Current output (range and time constant); terminals 31 and 32.
- Digital output (pulse, frequency, error, limit, or batch settings); terminals 56, 57, and 58.
- Relay output (error, limit, and batch settings); terminals 44, 45, and 46.

Current output

In the current output menu it is possible to select current output direction, range and time constant, see also Current output (Page 85).

If current output "4-20 mA + Alarm" is selected, then alarm level and alarm differentiation may also be defined.

"Alarm level" defines if an alarm should be above 21 mA "High" or below 3.6 mA "Low".

"Alarm diff." defines whether or not the alarm should vary according to selected error level. Error level "Fatal". "Permanent" or "Warning" is selected in "Basic settings".

If Alarm differentiation is set to "Yes", depending on the Alarm level setting, the current output will show:

Alarm level	Output / Error level		
	Fatal	Permanent	Warning
Low	1.3 mA	2 mA	3 mA
High	23 mA	22 mA	21.5 mA

If Alarm differentiation is set to "No", depending on the Alarm level setting, the current output will show:

Alarm level	Output
Low	3.5 mA
High	22.6 mA

For setting of error level, see Digital output / Relay output - Error level (Page 86).

If current output is not used, it must be set to "Off".

Digital output

Digital output can be used to configure various settings:

- Pulse (volume/pulse, pulse output, pulse width, pulse polarity, and time constant), see Digital output - pulse (Page 85).
- Frequency (frequency output, max frequency, and time constant), see Digital output - frequency (Page 86).
- Error settings (level and number), see Digital output / Relay output - Error level (Page 86) and Digital output / Relay output - Error number (Page 86).
- Limit settings (number of setpoints, setpoint settings, and hysteresis), see Digital output / Relay output - Direction/limit (Page 87).
- Batch settings (quantity, time and counter settings, and time constant), see Digital output / Relay output - Batch (Page 87).

Note

Batch settings

Only MAG 6000.

Not available in MAG 5000, MAG 5000 CT and MAG 6000 CT.

Note

When relay is set to batch function, pulse/frequency is not available on digital output.

Relay outputs

Relay output can be used to configure various settings:

- Error settings (level and number), see Digital output / Relay output - Error level (Page 86) and Digital output / Relay output - Error number (Page 86).
- Limit settings (number of setpoints, setpoint settings, and hysteresis), see Digital output / Relay output - Direction/limit (Page 87).
- Batch settings (quantity, time and counter settings, and time constant), see Digital output / Relay output - Batch (Page 87).
- Cleaning (cycle time), see Relay output - Cleaning (Page 87).

Note

Batch settings

Only MAG 6000.

Not available in MAG 5000, MAG 5000 CT and MAG 6000 CT.

Note

Cleaning

If a cleaning unit is installed together with transmitter, relay output must **always** be used to operate this unit. It cannot be used for other purposes.

7.2 External input

By applying 11 to 30 V DC to terminals 77 and 78, it is possible to perform:

- Batch control (start, stop, hold/continue)
- Reset totalizer
- Force/freeze output
- $Q_{\max}$ 2 (night)

See External input (Page 89).

Note

Batch settings

Only MAG 6000.

Not available in MAG 5000, MAG 5000 CT and MAG 6000 CT.

Note

Manual cleaning

If the digital input is used for manual cleaning, the relay output also automatically changes to "cleaning".

7.3 Sensor characteristics

The sensor characteristics menu shows:

- If a SENSORPROM® is installed or not
- Suppress error P 40 (SENSORPROM® not installed)
- Sensor size
- Calibration factor
- Correction factor
- Excitation

See Sensor characteristics (Page 90).

Note

If a SENSORPROM is not installed, check the sensor characteristics to see if they match the product label and the previous customer settings.

7.4 Reset mode

The reset mode is used for resetting/presetting totalizers or for restoring the factory settings.

Resetting

1. Press top up key  for 2 sec.
2. Enter password.
3. Use forward key  or backward key  to reach reset mode menu.
4. Press lock/unlock key  to enter reset menu.
5. Press forward key  to reach totalizer to be reset or default setting menu.
6. Press lock/unlock key  to start resetting.

If restoring of factory settings is required:

1. Press lock/unlock key  again to confirm destruction of customized settings.
See Reset mode (Page 91)

Zero point adjustment (MAG 6000 SV only)

Auto adjustment

Before auto zero point adjustment is carried out ensure that valves to and from flowmeter are completely closed and that flow velocity in sensor is zero.

1. Press top up key  for 2 sec.
2. Enter password.
3. Use forward key  or backward key  to reach reset mode menu.
4. Press lock/unlock key  to enter reset menu.
5. Press forward key  to reach zero adjust menu.
6. Press lock/unlock key  to enter the menu.
7. Use change key  to select "auto".
8. Press forward key  to view actual offset (lower line in display). Value will be zero after adjustment has been performed.
9. Press lock/unlock key  to start adjustment.

Manual adjustment.

1. Press top up key  for 2 sec.
2. Enter password.
3. Use forward key  or backward key  to reach reset mode menu.
4. Press lock/unlock key  to enter reset menu.
5. Press forward key  to reach zero adjust menu.
6. Press lock/unlock key  to enter the menu.
7. Use change key  to select "manual".
8. Press forward key  and then select key  and change key  to key in offset value.
9. Press lock/unlock key  to start adjustment.

Zero point can be adjusted manually in range -1.000 to +1.000 m³/s. If value outside this range is keyed in, zero point adjustment will not be implemented.

See Reset mode - MAG 6000 SV (Page 92).

7.5 Service mode

All outputs of the transmitter can be forced-controlled in the service mode menu, see Service mode (Page 93).

It is possible to check whether the outputs are functioning.

Error pending and status log lists are also accessible from this menu and the operating time (in days) can be read.

The forced control is stopped and all previous settings are reinitialized the moment the service mode is left by pressing top up key .

7.6 MAG 5000 CT and MAG 6000 CT settings

Internal totalizers

Depending on the type of approval it is possible to reset the internal totalizers. The type of approval is selected in the reset menu with the hardware key mounted. It is possible to choose between:

- Hot/cold water
- Other liquids

Resetting of totalizers by electrical input is not possible.

Hot/cold water

- Totalizer 1 is allocated to forward flow (cannot be reset)
- Totalizer 2 is allocated to reverse flow (cannot be reset)

Other liquids

Both totalizer 1 and totalizer 2 are allocated to measure the net flow, i.e. any reverse flow will make the totalizers count backwards.

- Totalizer 1 cannot be reset.
- Totalizer 2 can be reset if the flow velocity in the meter pipe is <0.25 m/s. When the totalizer is reset, the pulse output register will also be reset.

Output

- When choosing hot water, changing the output settings is not allowed and the output setting menus are not shown in display.
- When choosing cold water or other liquids, all output settings can be changed.

7.7 MAG 6000 SV

Excitation frequency

The MAG 6000 SV excitation frequency can be changed in Sensor characteristics (Page 90) to one of the following frequencies:

- $1 \frac{9}{16}$ Hz
- $3 \frac{1}{8}$ Hz
- $6 \frac{1}{4}$ Hz
- $12 \frac{1}{2}$ Hz
- 25 Hz
- 44 Hz

Note

Calibration has been made with the frequency stored in SENSORPROM® memory unit. A change in excitation frequency is not recommended and will always mean decreased measuring accuracy. In some instances, however, it may be necessary to change frequency due to pulsating flow from piston pumps or other resonance frequencies from surroundings.

It is highly recommended to carry out a External input (Page 53) after changing the excitation frequency as the offset is affected by the frequency selected. When this is done, the decrease in measuring accuracy can be kept below 1% o.r.

A too high frequency for the sensor used will cause a coil current alarm indication.

Service and maintenance

The device is maintenance-free. However, a periodic inspection according to pertinent directives and regulations must be carried out.

An inspection can include check of:

- Ambient conditions
- Seal integrity of the process connections, cable entries, and cover screws
- Reliability of power supply, lightning protection, and grounds

NOTICE
Repair and service must be carried out by Siemens authorized personnel only.

Note

Siemens defines flow sensors as non-repairable products.

Under ideal conditions the flowmeter will operate continuously with no manual adjustment or intervention required.

The SITRANS F M Vericator is an external tool developed for verifying the SITRANS F M system, installation, and application. It is a highly advanced instrument, which carries out the complex verification of the entire flowmeter system according to unique SIEMENS patented principles. The verification test is automated and the instrument easy to use, so no human error or influence will affect the verification.

8.1 Transmitter check list

If unstable/wrong measurements occur, it is often due to insufficient/wrong earthing or potential equalization. If earthing connection is OK, check transmitter as described below, and sensor as described in sensor check lists (see relevant sensor Operating Instructions).

The easiest way to check the transmitter in a SITRANS F M installation is to replace the transmitter with another transmitter with a similar power supply.

As all settings are stored in and downloaded from the SENSORPROM®, replacement is easily done and no extra settings need to be made.

Check transmitter

If no replacement transmitter is available, check transmitter according to the following check table.

Power on transmitter		
0	Display light on?	Yes ⇒ 1
		No ⇒ 2

Power on transmitter		
1	Flashing error triangles?	Yes ⇒ Check error table
		No ⇒ 1.2
1.2	Output and display readings OK?	Yes ⇒ 1.2.1
		No ⇒ 1.2.2
1.2.1	Transmitter OK	Check application Check installation/sensor/earthing connection etc.
1.2.2	Check cables/connections Check connection board Check pins in transmitter multiplug	OK ⇒ 1.2.1
		Not OK ⇒ correct fault
2	Check cables/connections Check connection board Check pins in transmitter multiplug	OK ⇒ 2.1
		Not OK ⇒ Correct fault
2.1	Output readings OK?	Yes ⇒ 2.1.1
		No ⇒ 2.1.2.
2.1.1	Display defective	Replace display
2.1.2	Transmitter defective	Replace transmitter

Note**Sensor check list**

Check list for sensors are included in the relevant sensor Operating Instructions.

8.2 Technical support

If you have any technical questions about the device described in these Operating Instructions and do not find the right answers, you can contact Customer Support:

- Via the Internet using the **Support Request:**
Support request (<http://www.siemens.com/automation/support-request>)
- Via Phone:
 - Europe: +49 (0)911 895 7222
 - America: +1 423 262 5710
 - Asia-Pacific: +86 10 6475 7575

Further information about our technical support is available on the Internet at
Technical support (<http://support.automation.siemens.com/WW/view/en/16604318>)

Service & Support on the Internet

In addition to our documentation, we offer a comprehensive knowledge base online on the Internet at:

Service and support (<http://www.siemens.com/automation/service&support>)

There you will find:

- The latest product information, FAQs, downloads, tips and tricks.
- Our newsletter, providing you with the latest information about your products.
- Our bulletin board, where users and specialists share their knowledge worldwide.
- You can find your local contact partner for Industry Automation and Drives Technologies in our partner database.
- Information about field service, repairs, spare parts and lots more under **Services**.

Additional Support

If you have additional questions about the device, please contact your local Siemens representative and offices at:

Local contact person (<http://www.automation.siemens.com/partner>)

8.3 Return procedure

To return a product to Siemens, see Returns to Siemens (www.siemens.com/returns-to-siemens).

Contact your Siemens representative to clarify if a product is repairable, and how to return it. They can also help with quick repair processing, a repair cost estimate, or a repair report/cause of failure report.

NOTICE
Decontamination
The product may have to be decontaminated before it is returned. Your Siemens contact person will let you know for which products this is required.

See also

Return goods delivery note (<http://www.siemens.com/processinstrumentation/returngoodsnote>)

Decontamination declaration (<http://www.siemens.com/sc/declarationofdecontamination>)

8.4 Recalibration

Siemens AG offers to recalibrate the sensor. Please use the recalibration MLFB 9LA110-8Qxxx-xxxx, where xxx-xxxx indicate customer-specific configuration.

Note

For recalibration the SENSORPROM® memory unit must always be returned with the sensor.

Diagnostics and Troubleshooting

9.1 Diagnostics

Error system

Transmitter system is equipped with an error and status log system with 4 groups of information.

(I) Information - system will continue to measure as normal, relay and current outputs will not be affected.

(W) Warning - system will continue to measure, but an event that may cause a system malfunction and require operator attention has occurred. The cause of the error may disappear on its own.

(P) Permanent error - may cause malfunction in the application and operator attention is required.

(F) Fatal error - is essential for the operation of the flowmeter. Immediate operator attention is required.

Two menus are available in service and operator menus for registration of information and errors.

- Error pending
- Status log

Note

Registration of errors in different modes

- In setup mode (local dialog) errors are entered only to Error pending list and not to Error log list, and not registered on physical outputs (current or relay).
- In service mode errors are entered to both Error pending and Error log lists, but not registered on physical outputs (current or relay).

Note

Power-off

Both error pending and status logs are reset at power-off.

Error pending

The first 9 pending errors are stored in the error pending list. When the error is corrected, it is removed from the error pending list.

The acceptance level for "error pending" can be individually configured to a particular application.

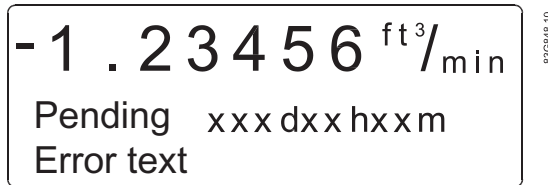
The acceptance level is set in the basic settings menu (Page 44).

Acceptance levels

The following three acceptance levels are selectable.

- Fatal error: Only fatal errors are registered as errors
- Permanent error: Permanent and fatal errors are registered as errors
- Warning (Default value): Warnings, permanent and fatal errors are registered as errors

Error information is displayed in title and subtitle lines, see display layout (Page 42). Title line will show time in days, hours and minutes since occurrence of error. Subtitle line will flash between an error text and a remedy text. Error text will indicate type of error (I, W, P or F), error number, and error text. Remedy text will inform operator of action to take to remove error.



Status log

The latest 9 errors are stored in the status log. Errors are stored in the status log for 180 days, even if they are corrected.

Alarm field

The alarm field on the display will always flash when an error is pending.

Error output

The digital and relay output can be activated individually error by error (error level). The relay output is default selected to error level. An output can also be selected to activate on a single error number.

The alarm field, error output and error pending always operate together.

Operator menu

Error pending and status log are as default enabled (✓) in the operator menu.

9.2 List of error numbers

Error No.	Error text Remedy text	Comment	Output status	Input status
1	I1 - Power on OK	Device powered on	Active	Active
2	I2 - Add-on module Applied	A new module has been applied to the system	Active	Active
3	I3 - Add-on module Install	An add-on module is defect or has been removed. This can be an internal add-on module	Active	Active
4	I4 - Param. corrected OK	A less vital parameter in the transmitter has been re- placed by its default value	Active	Active
20	W20 - Totalizer 1 Reset manually	During initialisation the check of the saved totalizer value has failed. It is not possible to rely on the saved totalizer value anymore. The totalizer value must be reset manually in order to rely on future readings	Active	Active
20	W20 - Totalizer 2 Reset manually	During initialisation the check of the saved totalizer value has failed. It is not possible to rely on the saved totalizer value anymore. The totalizer value must be reset manually in order to rely on future readings	Active	Active
21	W21 - Pulse overflow Adj. pulse settings	Actual flow is too big compared with pulse width and volume/pulse	Reduced pulse width	Active
22	W22 - Batch timeout Check installation	Duration of batching has exceeded a predefined max- imum time	Batch output on zero	Active
23	W23 - Batch overrun Check installation	Batch volume has exceeded a predefined maximum overrun volume	Batch output on zero	Active
24	W24 - Batch neg. flow Check flow direction	Negative flow direction during batch	Active	Active
30	W30 - Overflow Adj. $Q_{\max}$	Flow is above $Q_{\max}$ settings	Max. 120 %	Active
31	W31 - Empty pipe	Pipe is empty	Zero	Active
40	P40 - SENSORPROM® Insert/change	SENSORPROM® unit not installed	Active	Active
41	P41 - Parameter range Switch off and on	A parameter is out of range. The parameter could not be replaced by its default value. The error will disap- pear at the next power-on	Active	Active

9.2 List of error numbers

Error No.	Error text Remedy text	Comment	Output status	Input status
42	P42 - Current output Check cables	Current loop is disconnected or the loop resistance is too big	Active	Active
43	P43 - Internal error Switch off and on	Too many errors occurred at the same time. Some errors are not detected correctly	Active	Active
44	P44 - CT SENSORPROM® Replace	SENSORPROM® unit has been used as CT version	Active	Active
49	P49 - Protection violation Switch off and on	Internal protection of the device has been violated.	Active	
60	F60 - CAN comm. error Transmitter/AOM	CAN bus communication error. An add-on module, the display module or the transmitter is defective	Zero	Inactive
61	F61 - SENSORPROM® error Replace	It is not possible to rely on the data in SENSORPROM® unit anymore	Active	Active
62	F62 - SENSORPROM® ID Replace	The SENSORPROM® unit ID does not comply with the product ID. The SENSORPROM® unit is from another type of product SITRANS F C, SITRANS F US etc.	Zero	Inactive
63	F63 - SENSORPROM® Replace	It is not possible to read from the SENSORPROM® unit anymore	Active	Active
70	F70 - Coil current Check cables	Coil excitation has failed	Active	Active
71	F71 - Internal error Replace transmitter	Internal conversion error in ASIC	Active	Active

Symptom	Output signals	Error code	Cause	Remedy
Empty display	Minimum		1. No power supply	Power supply Check MAG 5000/6000/6000 I for bent pins on the connector
			2. MAG 5000/6000/6000 I defective	Replace MAG 5000/6000/6000 I

Symptom	Output signals	Error code	Cause	Remedy
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
		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 5000/6000/6000 I
	Undefined	P42	1. No load on current output	Check cables/connections
			2. MAG 5000/6000/6000 I defective	Replace MAG 5000/6000/6000 I
		P41	Initializing error	Switch off MAG 5000/6000/6000 I, wait 5 sec. and switch on again
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
			Electrode connection missing/ electrode cable is insufficiently screened	Ensure that electrode cable is connected and sufficiently screened
Unstable flow signal	Unstable		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
			5. High concentration of particles or fibres	Increase time constant
Measuring error	Undefined		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
		P49	Protection violation	Switch off MAG 5000/6000/6000I, wait 5 sec. and switch on again.
		F61	Defective SENSORPROM® unit	Replace SENSORPROM® unit
		F62	Wrong type of SENSORPROM® unit	Replace SENSORPROM® unit
		F63	Defective SENSORPROM® unit	Replace SENSORPROM® unit
		F71	Loss of internal data	Replace MAG 5000/6000/6000 I
	Maximum	W30	Flow exceeds 100% of $Q_{\max}$	Check $Q_{\max}$ (Basic Settings)
		W21	Pulse overflow	
			Volume/pulse too small	Change volume/pulse
			Pulse width too large	Change pulse width
Measuring approx. 50%			Missing one electrode connection	Check cables
Loss of totalizer data	OK	W20	Initializing error	Reset totalizer manually

9.2 List of error numbers

Symptom	Output signals	Error code	Cause	Remedy
##### Signs in display	OK		Totalizer roll over	Reset totalizer or increase totalizer unit
Empty pipe error message when Empty pipe set to off	OK	W31	Empty pipe error	Switch off MAG 5000/6000/6000I, wait 5 sec. and switch on again

Technical specifications

10.1 Technical specifications

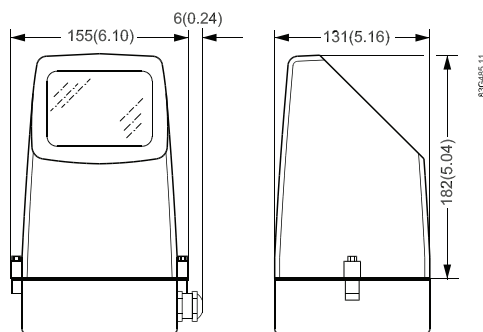


Technical specifications for MAG 5000/6000		
Mode of operation and design	Measuring principle	Electromagnetic with pulsed constant field
	Empty pipe	Detection of empty pipe (special cable required in remote mounted installation)
	Excitation frequency	Depends on sensor size
	Electrode input impedance	$> 1 \times 10^{14} \Omega$
Input	Digital input	11 to 30 V DC, $R_i = 4.4 \text{ K}\Omega$
	Activation time	50 ms
	Current	$I_{DC 11 \text{ V}} = 2.5 \text{ mA}$, $I_{DC 30 \text{ V}} = 7 \text{ mA}$
Output	Current output	
	Signal range	0 to 20 mA or 4 to 20 mA, Alarm
	Load	$< 800 \Omega$
	Time constant	0.1 to 30 s, adjustable (for batch: fixed at 0.1 s)
	Digital output	
	Frequency	0 to 10 kHz, 50% duty cycle (uni/bidirectional)
	Pulse (active)	DC 24 V, 30 mA, $1 \text{ k}\Omega \leq R_i \leq 10 \text{ k}\Omega$, short-circuit protected (power supplied from flowmeter)
	Pulse (passive)	DC 3 to 30 V, max. 110 mA, $200 \Omega \leq R_i \leq 10 \text{ k}\Omega$ (powered from connected equipment)
	Time constant	0.1 to 30 s, adjustable (for batch: fixed at 0.1 s)
	Relay output	
	Time constant	Changeover relay, same as current output
	Load	42 V AC/2 A, 24 V DC/1 A
Low flow cut off	0 to 9.9% of maximum flow	
Galvanic isolation	All inputs and outputs are galvanically isolated	
Max. measuring error (incl. sensor and zero point)	MAG 5000	$0.4\% \pm 1 \text{ mm/s}$ (for $v > 0.1 \text{ m/s}$)
	MAG 6000	$0.2\% \pm 1 \text{ mm/s}$ (for $v > 0.1 \text{ m/s}$)
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 and batch	

10.1 Technical specifications

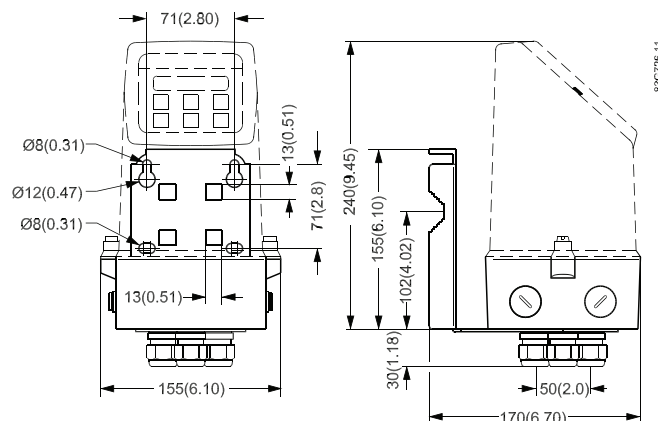
Technical specifications for MAG 5000/6000		
Rated operation conditions	Ambient temperature	
	Operation	Standard IP67, 19", blind and SV versions: -20 to +60 °C (-4 to +140 °F) CT version: -25 to +55 °C (-13 to +131 °F)
	Storage	-40 to +70 °C (-40 to +158 °F)
Mechanical load	18 to 1000 Hz, 3.17 G rms, sinusoidal in all directions to IEC 68-2-36	
Degree of protection	IP67/NEMA 4X/6 to IEC 529 and DIN 40050 (1 mH ₂ O 30 min.)	
EMC performance	EN 61326-1 (industrial environments)	
	EN 61326-2-5	
Display and keypad	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
Design	Enclosure material	Fiber glass reinforced polyamide; optional (IP67 only): AISI 316 stainless steel
	Dimensions	See dimensional drawings
	Weight	0.75 kg (2 lb)
Power supply	115 to 230 V AC +10% -15%, 50 to 60 Hz, Fuse: 500 mA T 11 to 30 V DC or 11 to 24 V AC; Fuse 2 A T	
Power consumption	115 to 230 V AC: 17 VA 24 V AC: 9 VA, I _N = 380 mA, I _{ST} = 8 A (30 ms) 12 V DC: 11 W, I _N = 920 mA, I _{ST} = 4 A (250 ms)	
Certificates and approvals	CE, C-UL US general purpose, C-tick, CSA/FM Class 1, div 2	
	Custody transfer approval (MAG 5000/6000 CT)	Cold water approval: PTB K7.2, MI-001
Communication	MAG 5000	Without communication or HART as option
	MAG 6000 / MAG 6000 CT	Prepared for client mounted add-on modules: HART, MODBUS RTU/RS485, FOUNDATION Fieldbus H1, DeviceNet, PROFIBUS PA, PROFIBUS DP as add-on modules

Transmitter IP67/NEMA 4X/6 compact polyamide



Weight: MAG 5000/6000: 0.75 kg (1.65 lbs)

Transmitter IP67/NEMA 4X/6 wall-mounted polyamide



Weight (transmitter and wall mounting bracket): 1.65 kg (3.64 lbs)

10.2 Accuracy

For accuracy reference conditions, see table Reference conditions for sensor calibration.

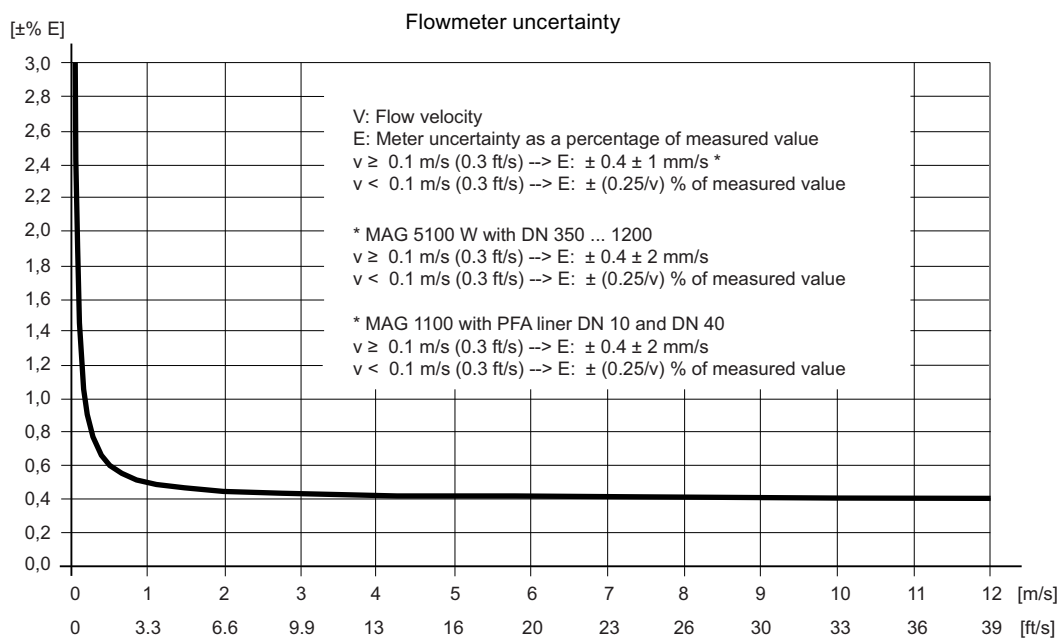


Figure 10-1 MAG 5000 with MAG 1100, MAG 1100 F, MAG 5100 W, MAG 3100 and MAG 3100 P and MAG 6000 with MAG 1100 (PFA), MAG 1100 F (PFA)

10.2 Accuracy

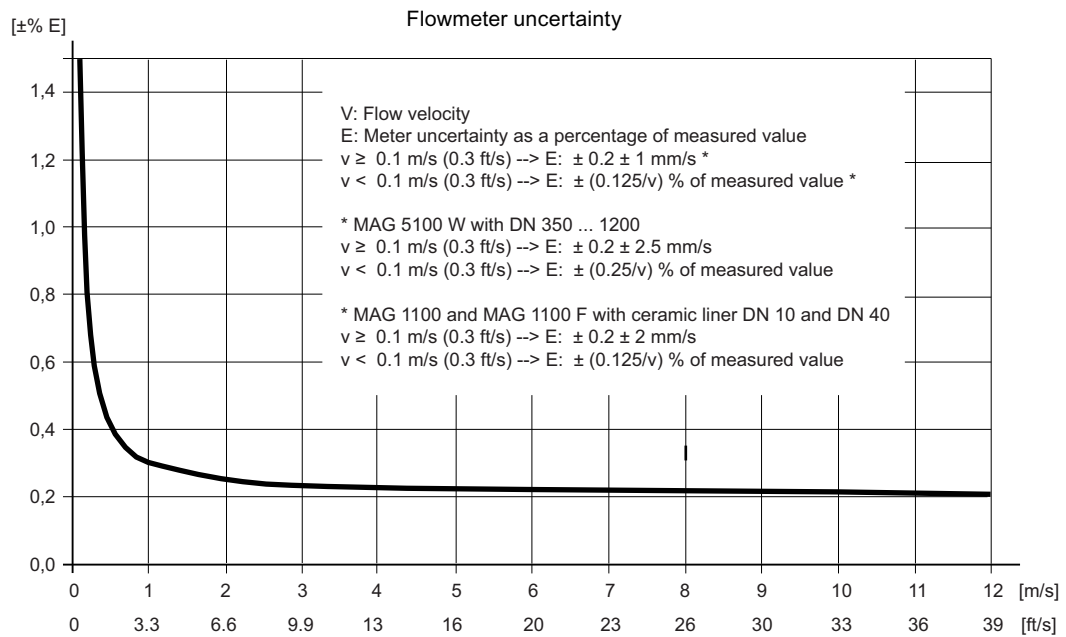


Figure 10-2 MAG 6000 with MAG 1100 (not PFA), MAG 1100 F (not PFA), MAG 5100 W, MAG 3100 and MAG 3100 P

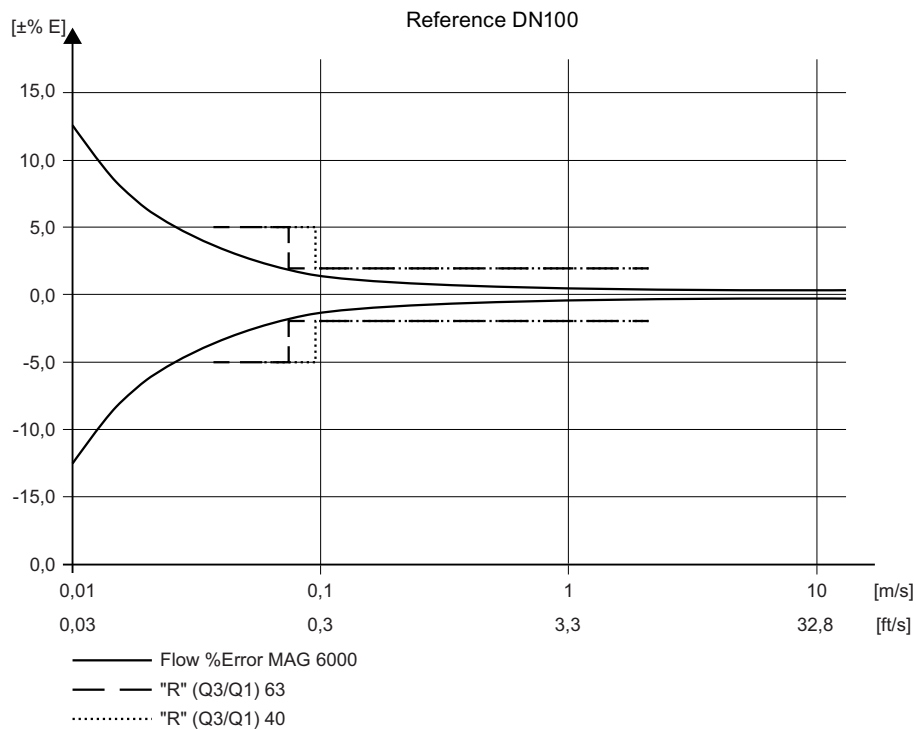


Figure 10-3 MID limits

Note**Uncertainties for MAG 5000/6000 CT systems under MID requirements**

$\pm 5\%$ for flowrate between Q1 and Q2

$\pm 2\%$ for flowrate between Q2 and Q4 if media temperature $\leq 30^{\circ}\text{C}$

More detailed installation conditions can be found in the certificate.

Reference conditions

(ISO 9104 and DIN/EN 29104)

A calibration certificate is shipped with every sensor and calibration data is stored in SENSORPROM memory unit.

Table 10-1 Reference conditions for sensor calibration

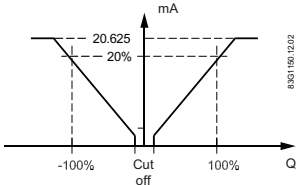
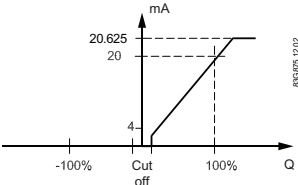
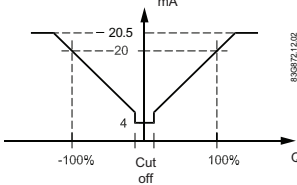
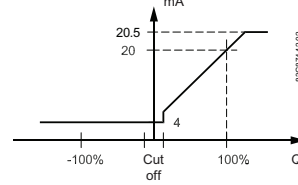
Medium temperature	$20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ($68^{\circ}\text{F} \pm 9^{\circ}\text{C}$)
Ambient temperature	$20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ($68^{\circ}\text{F} \pm 9^{\circ}\text{C}$)
Supply voltage	$U_n \pm 1\%$
Warming-up time	30 minutes
Incorporation in conductive pipe section	
Inlet section	10 x DN (DN $\leq$ 1200/48") 5 x DN (DN $>$ 1200/48")
Outlet section	5 x DN (DN $\leq$ 1200/48") 3 x DN (DN $>$ 1200/48")
Flow conditions	Developed flow profile

Table 10-2 Additions in the event of deviations from reference conditions

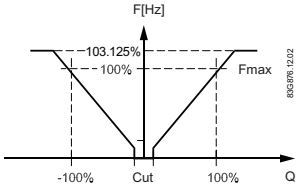
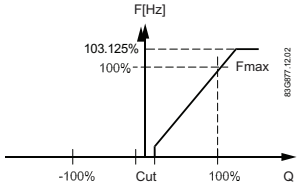
Current output	As pulse output $\pm$ (0.1% of actual flow + 0.05% FSO)
Effect of ambient temperature	
Display/frequency/pulse output	$< \pm 0.003\% / ^{\circ}\text{C act.}$
Current output	$< \pm 0.005\% / ^{\circ}\text{C act.}$
Effect of supply voltage	$< 0.005\%$ of measuring value on 1% change
Repeatability	$\pm 0.1\%$ of actual flow for $V \geq 0.5 \text{ m/s}$ (1.5 ft/s) and conductivity $\geq 10 \mu\text{S/cm}$

10.3 Output characteristics

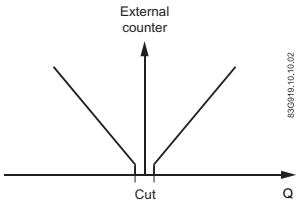
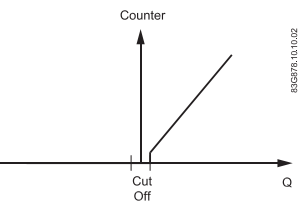
Current output

Output characteristics	Bidirectional mode	Unidirectional mode
0 to 20 mA		
4 to 20 mA		

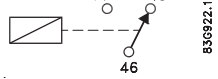
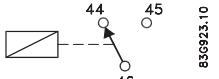
Frequency output

Bidirectional mode	Unidirectional mode
	

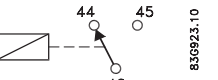
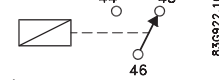
Pulse output

Bidirectional mode	Unidirectional mode
	

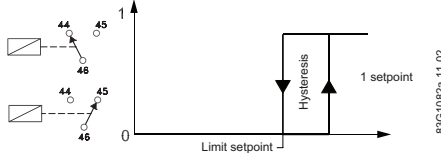
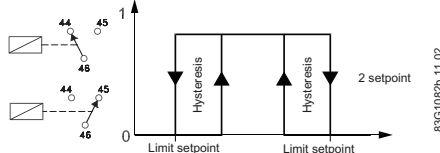
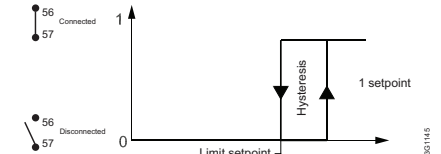
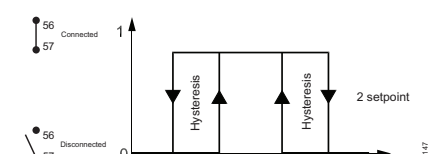
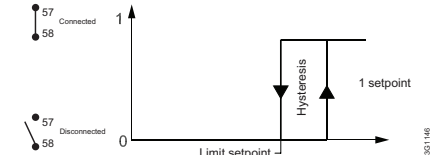
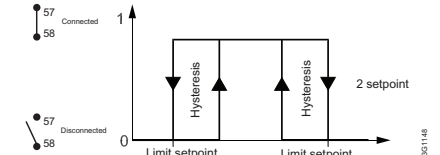
Relay output

Bidirectional mode		Unidirectional mode	
Power down		Active	

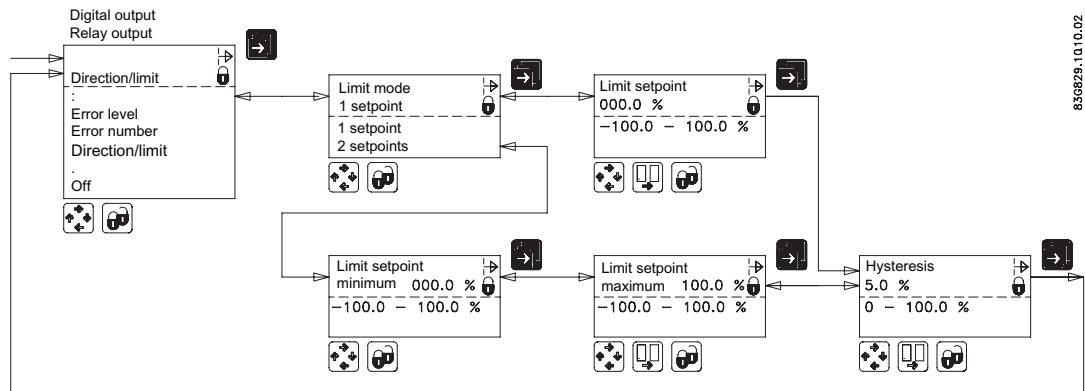
Error relay output

Bidirectional mode		Unidirectional mode	
No error		Error	

Limit switch (can be used as direction switch)

1 set point		2 set points	
			
Passive Digital output		Passive Digital output	
			
			

Limit/direction



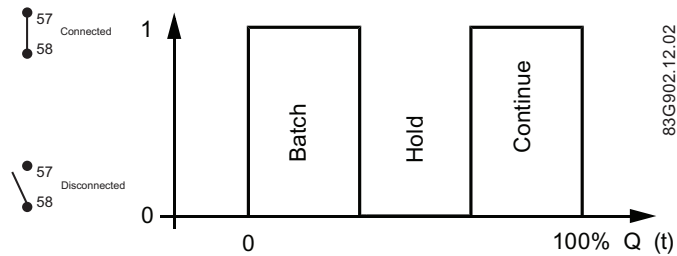
Limit switches are available for both digital and relay outputs.

Direction mode: 1 set point at 0% flow; hysteresis 5%.

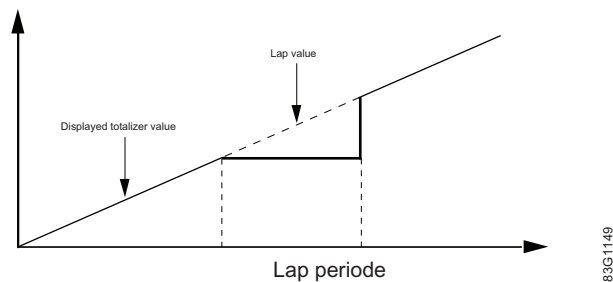
If 2 set points must activate 2 separate outputs, a single set point has to be selected individually for digital as well as relay outputs.

Batch on digital output

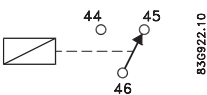
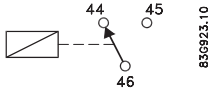
Unidirectional mode (forward flow only)



Totalizer lap



Batch on relay output

Unidirectional mode (forward flow only)			
Hold		Batch	

10.4 Cable data

Description

Electrode or coil cable (standard)	
Electrode cable, double shielded (for empty pipe detection or low conductivity fluids)	
Cable kit with standard coil cable and electrode cable double shielded (also available as low noise cable for MAG 1100 sensor)	

Technical data

		Standard cable (electrode/coil)	Double-shielded cable (electrode)
Basic data	No. of conductors	3	3
	Sqr. area	1.5 mm ²	0.25 mm ²
	Screen	Yes	Double
	Color code	Brown, blue, black	Brown, blue, black
	Outside color	Grey	Grey
	Ext. diameter	7.8 mm	8.1 mm
	Conductor	Flexible CU	Flexible CU
	Isolation material	PVC	PVC
Ambient temperature	Flexible installation	-5 to +70°C (23 to 158°F)	-5 to +70°C (23 to 158°F)
	Non-flexible installation	-30 to +70°C (-22 to 158°F)	-30 to +70°C (-22 to 158°F)
Cable parameter	Capacity	161.50 pF/m	-
	Inductance	0.583 μH/m	-
	L/R	43.83 μH/Ω	-

For more information on cable lengths, empty pipe detection, and conductivity, see Operating Instructions for relevant sensor.

10.5 Cable requirements

		Coil cable	Electrode cable
Basic data	No. of conductors	2	3
	Min. sqr. area	0.5 mm ²	0.2 mm ²
	Screen	Yes	Yes
	Max. capacitance	N/A	350 pF/m
Max. cable loop resistance	Media temperature:		
	< 100 °C	40 Ω	N/A
	> 200 °C	6 Ω	N/A
Cable glands on sensor	M20x1.5 gland - Cable ø 5 to 13 mm (0.20 to 0.51 inches)		
	½ NPT gland - cable ø 5 to 9 mm (0.20 to 0.35 inches)		



WARNING

Cable glands

For Ex zone 1 installations only certified cable glands with protection type "e" can be used for the power supply and the coil cable. The cable glands must be approved for the actual temperature and cable dimension.

Spare parts/Accessories

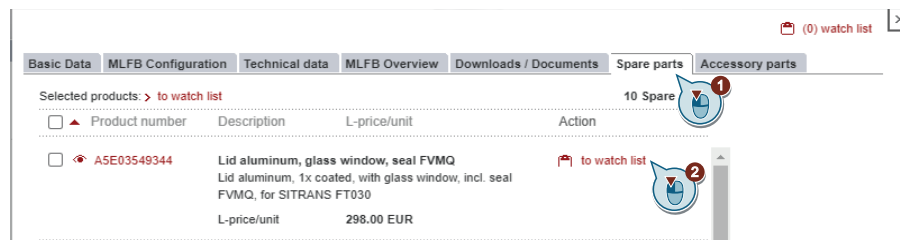
A.1 Ordering of spare parts

Condition

- You have a Siemens Industry Mall account.

Procedure

- Open the PIA Life Cycle Portal (<https://www.pia-portal.automation.siemens.com>).
- Select the desired language.
- To find spare parts for your device, do one of the following:
 - Enter the complete order number of your device (e.g. 7ME4633-4KA51-8DC3-Z A05+B11+E06+F11) into the "Product number" field and click "Go".
 - Enter the serial number of your device (e.g. N1KXXXXXXX) in the "Serial number" field and click "Go".
 - If you do not know the product or serial number, search for your device under "Product family".
- Navigate to the "Spare parts" tab.
You see the list of spare parts available for your device.



- Select a spare part and add it to your watch list.
The watch list opens.
- Click "Add to cart of Industry Mall".

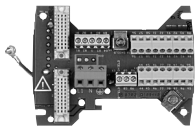


The Siemens Industry Mall opens and you can order your spare part.

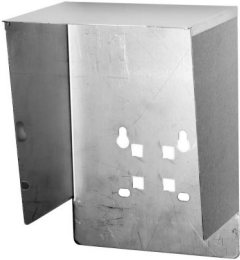
See also

SIOS catalog (<https://support.industry.siemens.com/cs/products?dtp=Catalog&mfn=ps&pnid=17318&lc=en-US>)

A.2 Spare parts

Description	
Connection plate	
SENSORPROM® memory unit	
Display unit	
Communication modules for MAG 6000	

A.3 Sun shield

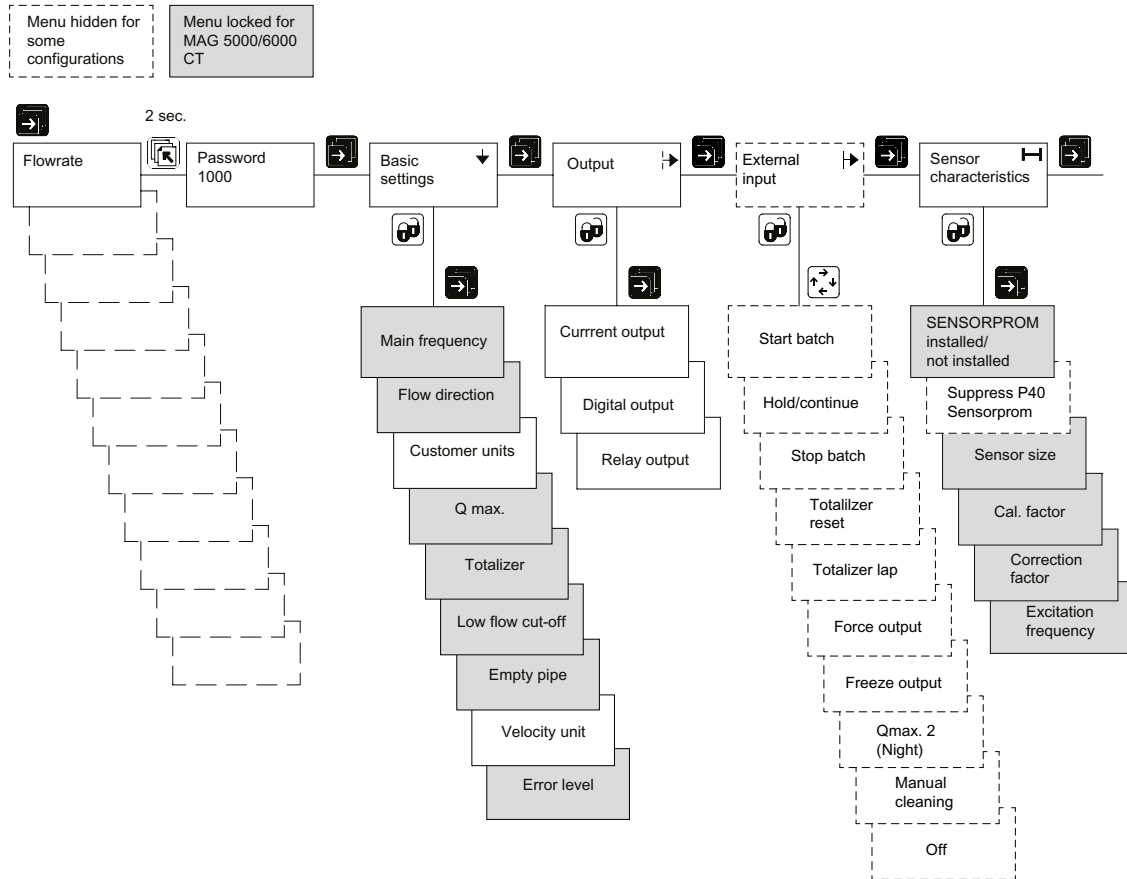
Description	
Sun shield	

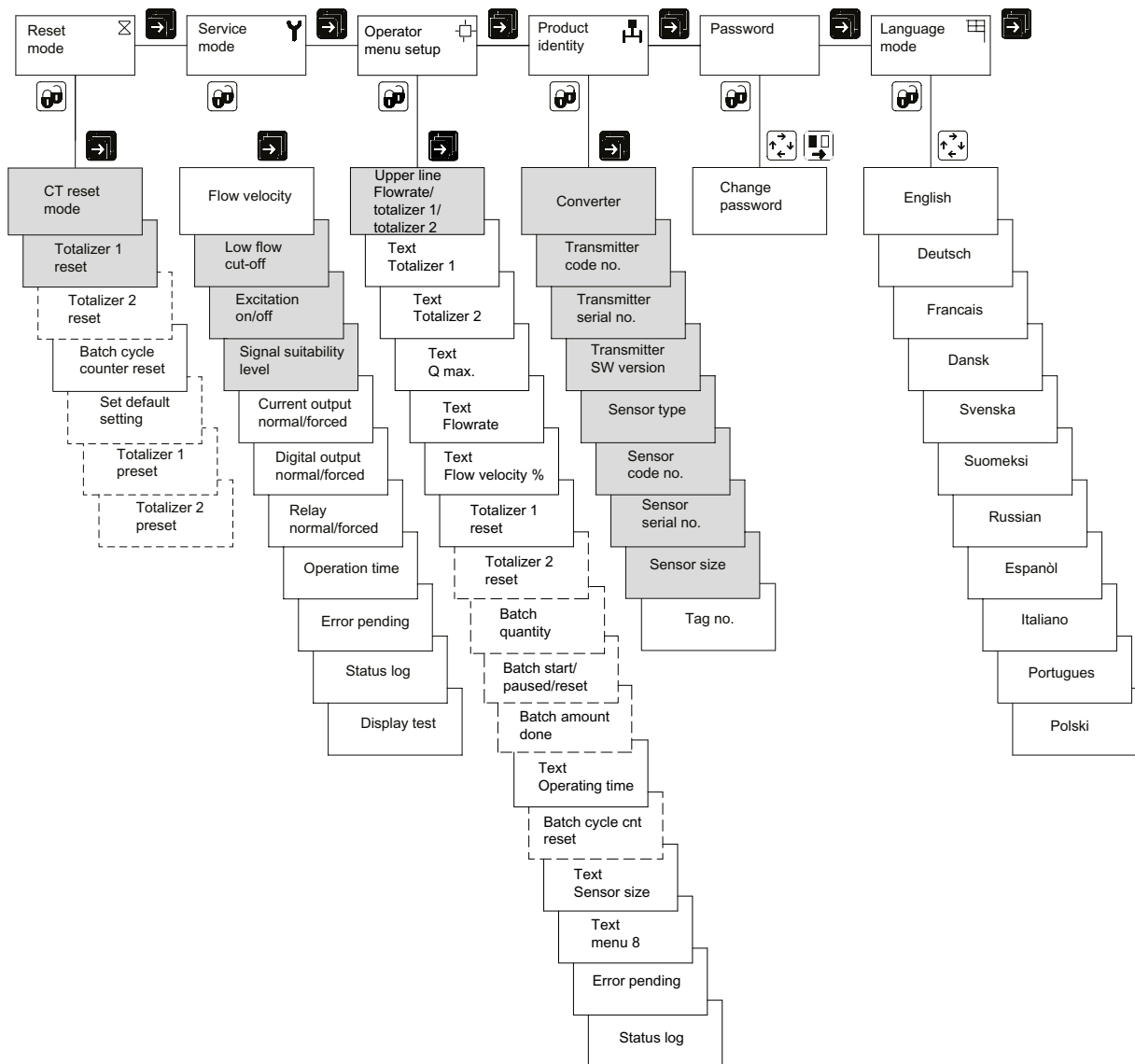
A.3 Sun shield

Menu diagrams

B.1 Transmitter menu overview

The menu diagrams shown on the following pages apply to MAG 5000/6000 as well as MAG 6000 I.



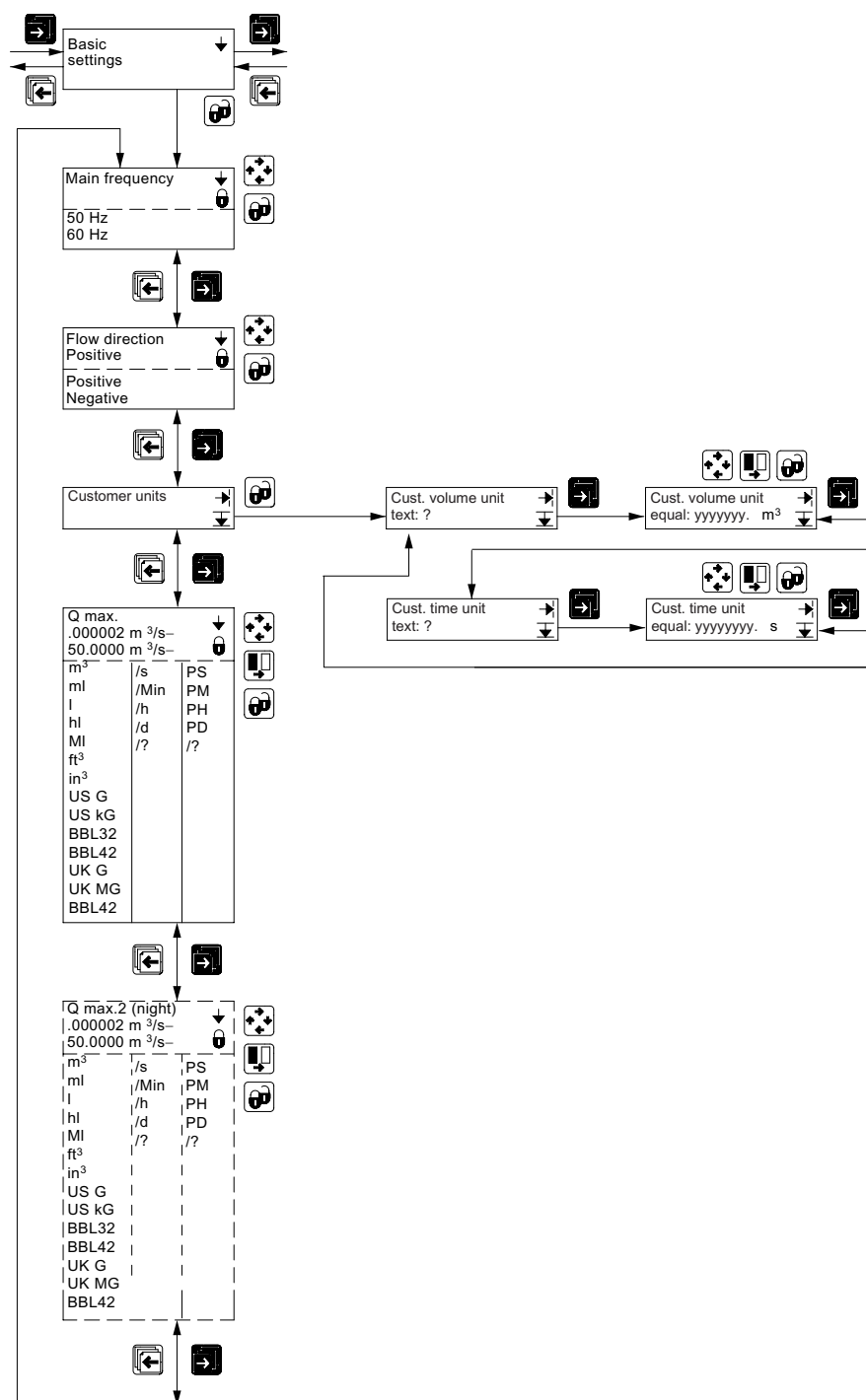


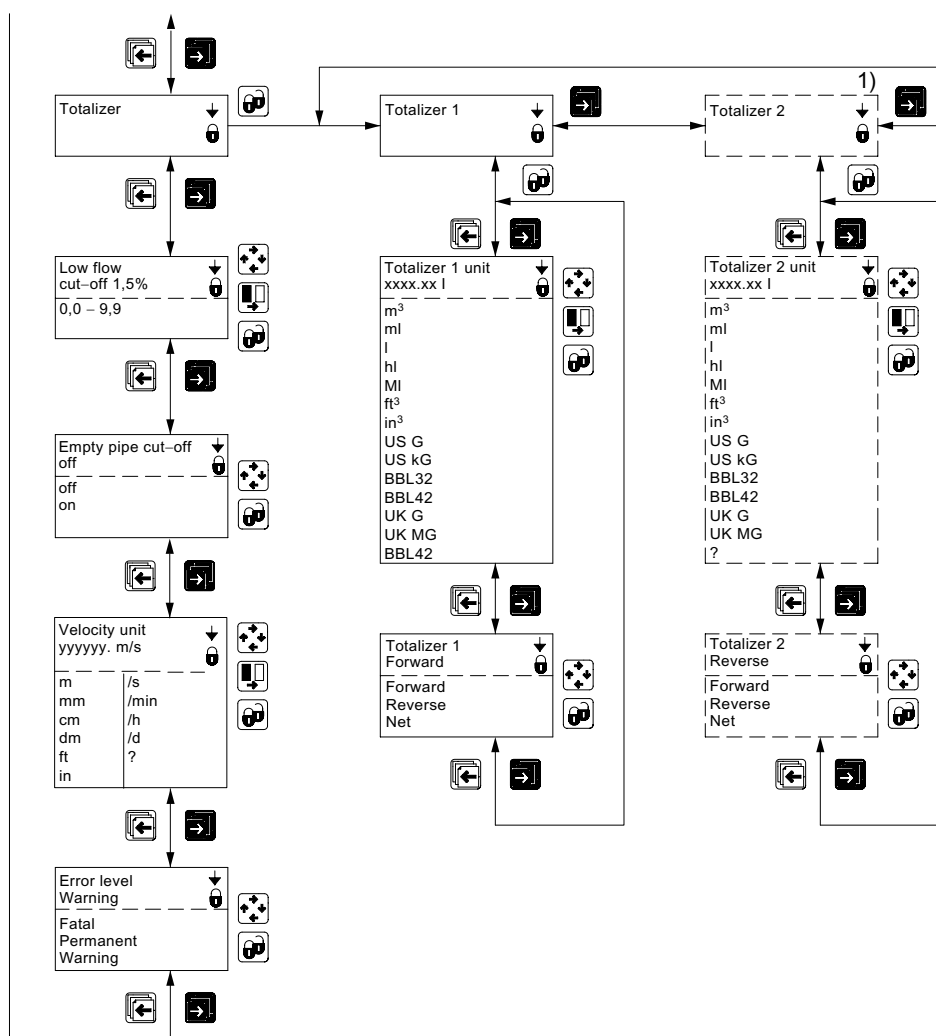
B.2 Basic settings

Note

Locked or hidden menus

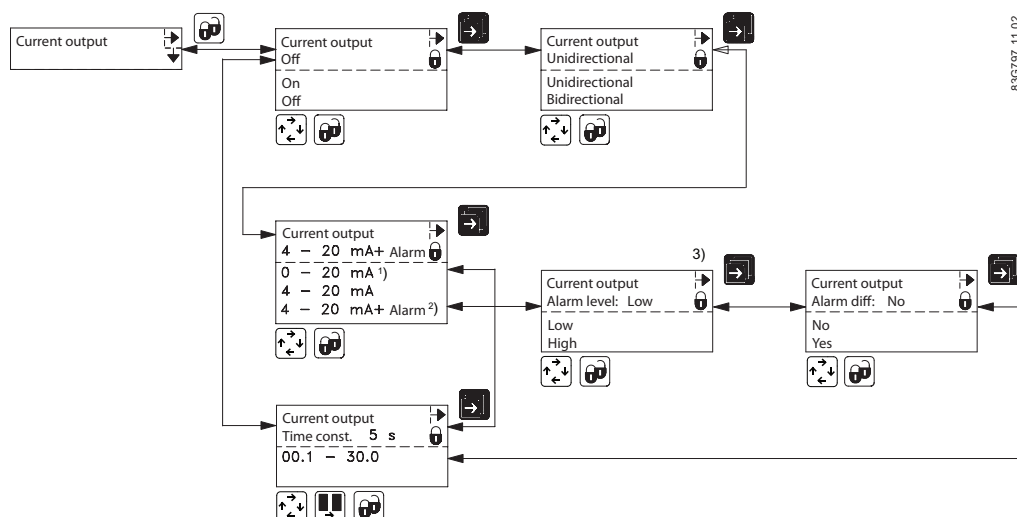
Depending on your configuration some menus might be locked or hidden.





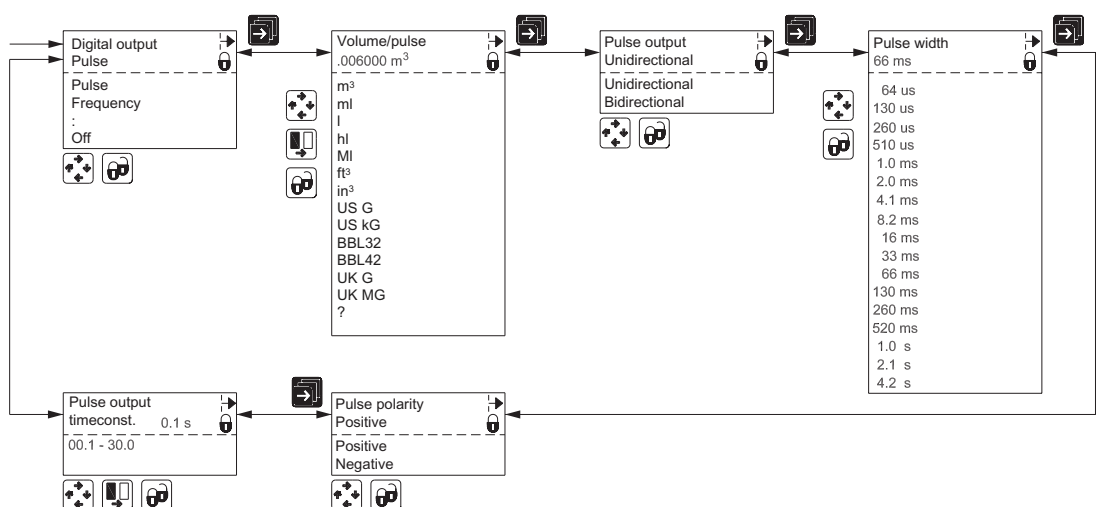
¹⁾ When batch is selected on digital output or relay, Totalizer 2 is not shown because it is controlled by the batch function.

B.3 Current output

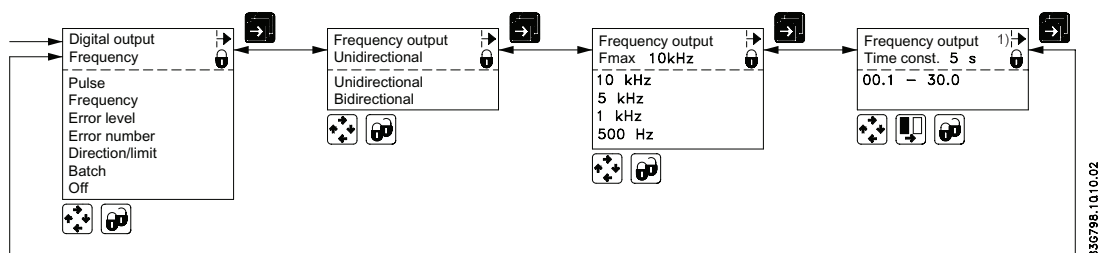


- 1) If HART communication is installed, it is not possible to set the output for 0-20 mA (even though the option is visible in the display). This is due to the fact that HART does not work if the output falls below 2-3 mA.
- 2) 4-20 mA + Alarm is the default setting for MAG 6000 I. For all other variants, the default setting is 4-20 mA.
- 3) For MAG 6000 I only: The controlling of alarm levels does not recognize if the jumper is mounted for passive output. Do not combine differentiation and low alarm level together with passive output. The output will try to pull down the level to 1.3 mA at fatal errors which is not possible for passive output.

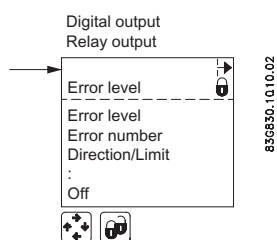
B.4 Digital output - pulse



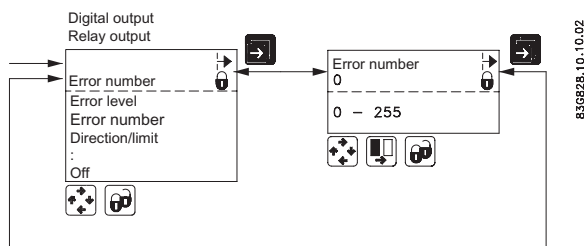
B.5 Digital output - frequency



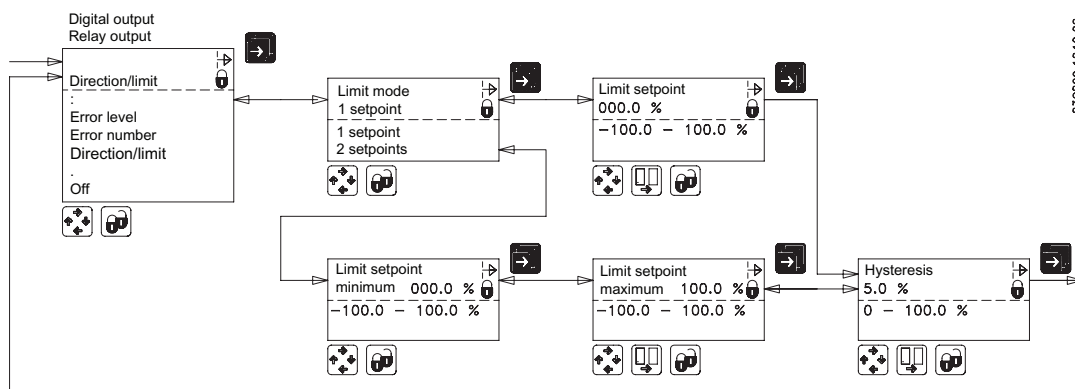
B.6 Digital output / Relay output - Error level



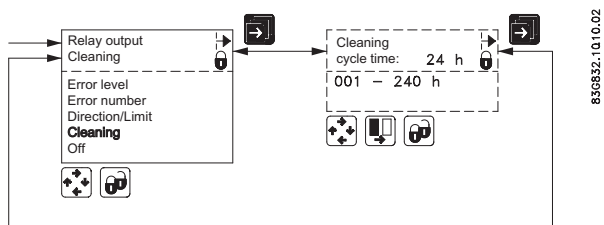
B.7 Digital output / Relay output - Error number



B.8 Digital output / Relay output - Direction/limit



B.9 Relay output - Cleaning



Note

Relay outputs

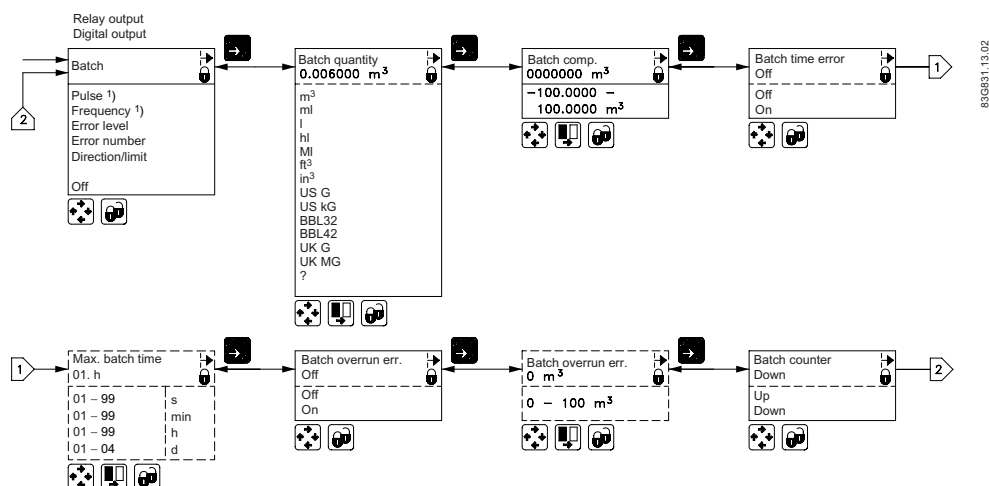
If cleaning unit is installed, relay outputs must always be used to operate cleaning.

Relay outputs cannot be used for other purposes

B.10 Digital output / Relay output - Batch

Note

This menu does not exist on MAG 5000/6000 CT



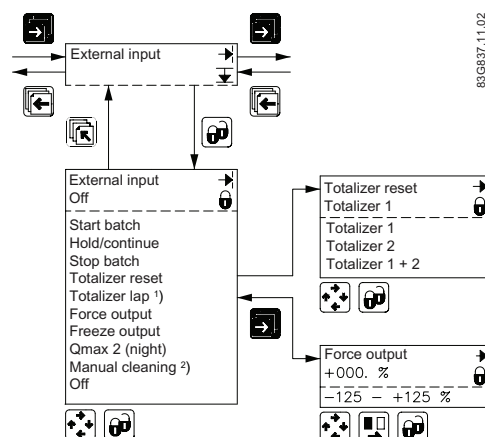
1) Visible only on Digital output.

Note

If batch function is chosen on the relay output, the digital output will be turned off if it has been set up for pulse, frequency or batch.

If digital output is set up for pulse, frequency or batch, then the relay output will be turned off if it has been set up for batch.

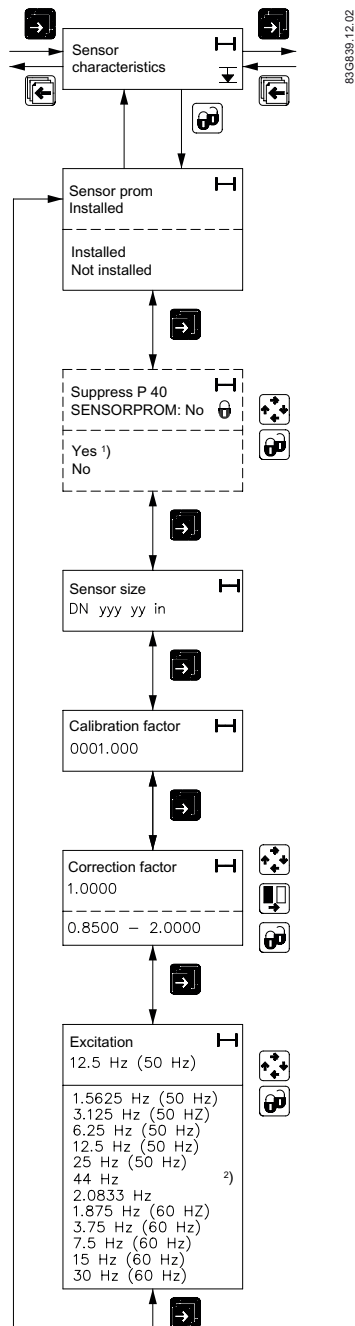
B.11 External input



- 1) The value showing totalizer 1 on the display is frozen for as long as the digital output is activated. However, totalizer 1 continues counting, and when the digital input is released, the value on the display again follows totalizer 1.
- 2) MAG 6000 I cannot be equipped with cleaning unit. The cleaning option for relay output is however possible. When selecting function for MAG 6000 I relay output, the relay output has the same behavior as if cleaning unit was installed.

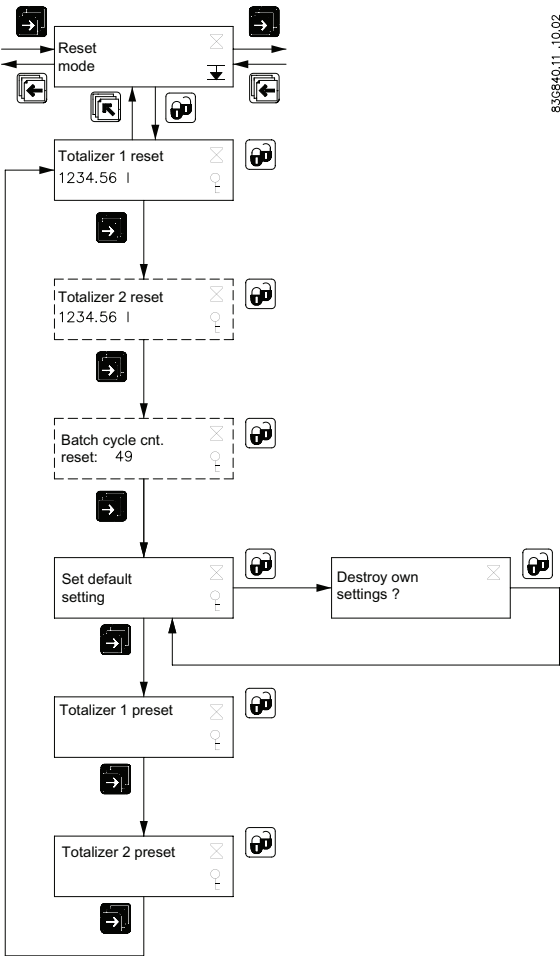
The relay output of the transmitter determines when the relay is on by applying voltage for approximately 60 seconds. The metering is resumed after another 60 seconds when the cycle is complete. (The display is locked during this time). The time cycle can be set at 1 to 240 hours. If the cycle is set at for example three hours, the transmitter will be active every three hours.

B.12 Sensor characteristics

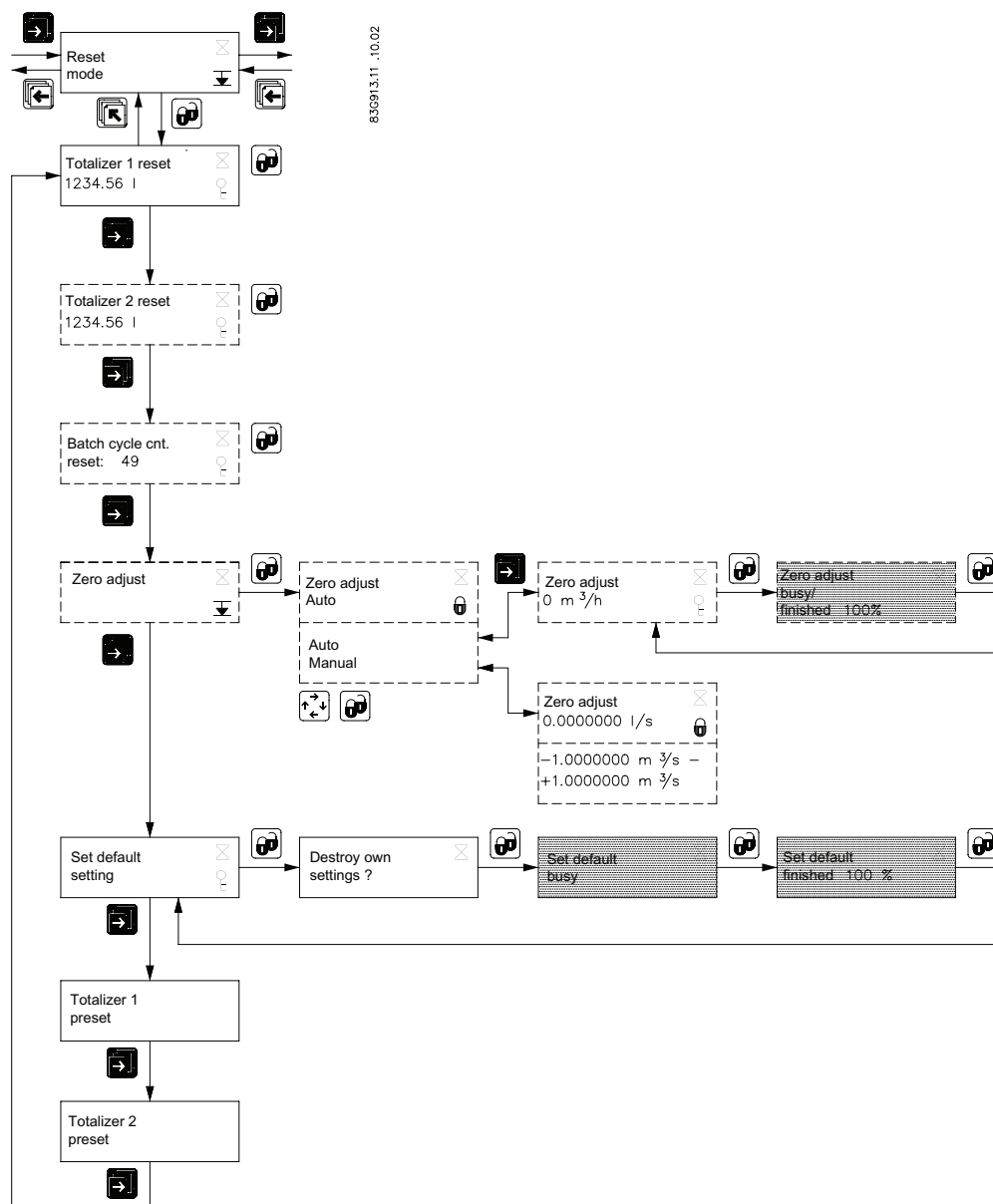


- 1) Error status (level or number) on an output is updated only at the time the error status changes (occurs or disappears). If P40 is suppressed after it has been detected (at power up), the output does not change state. In this case the power must be switched off/on to suppress the P40 error on the output.
- 2) The frequency can be set to 44 Hz in the MAG 6000 SV transmitter only.

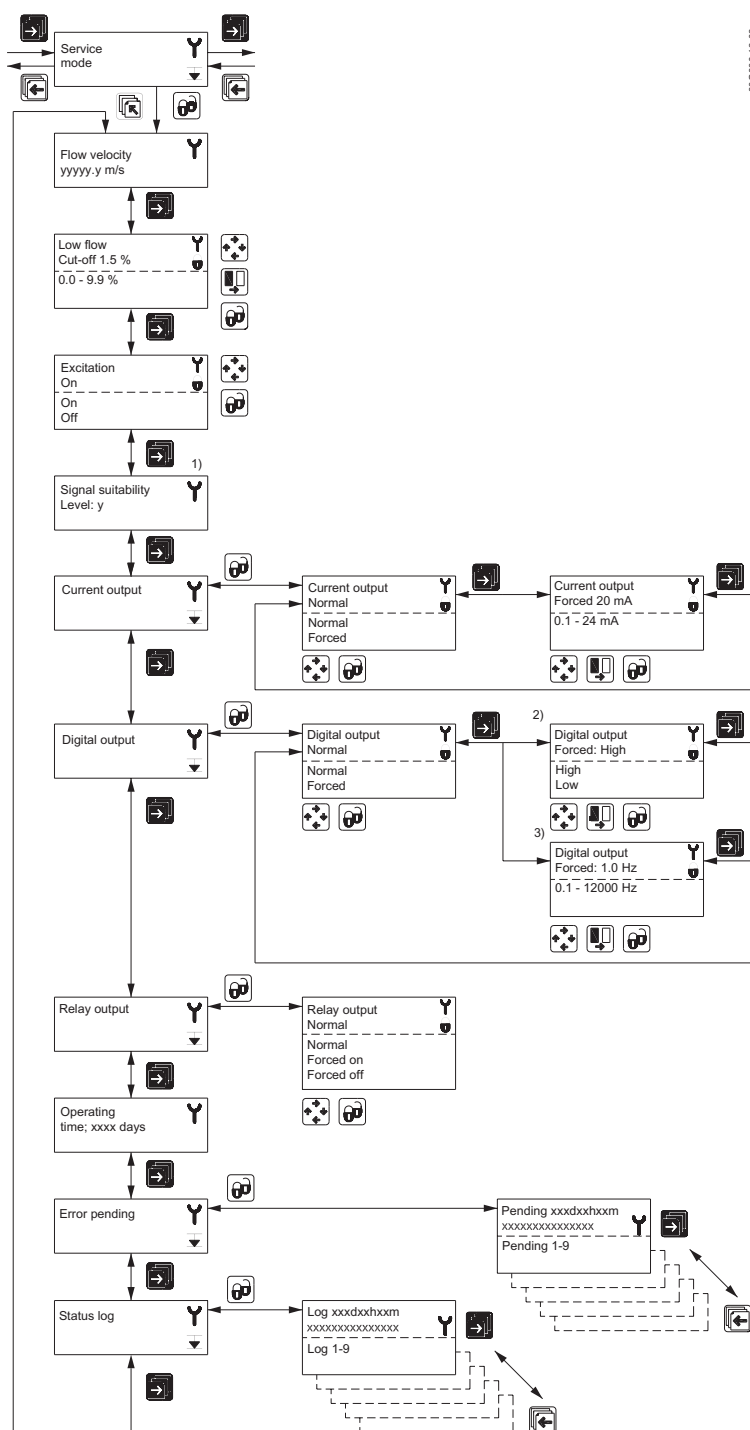
B.13 Reset mode



B.14 Reset mode - MAG 6000 SV

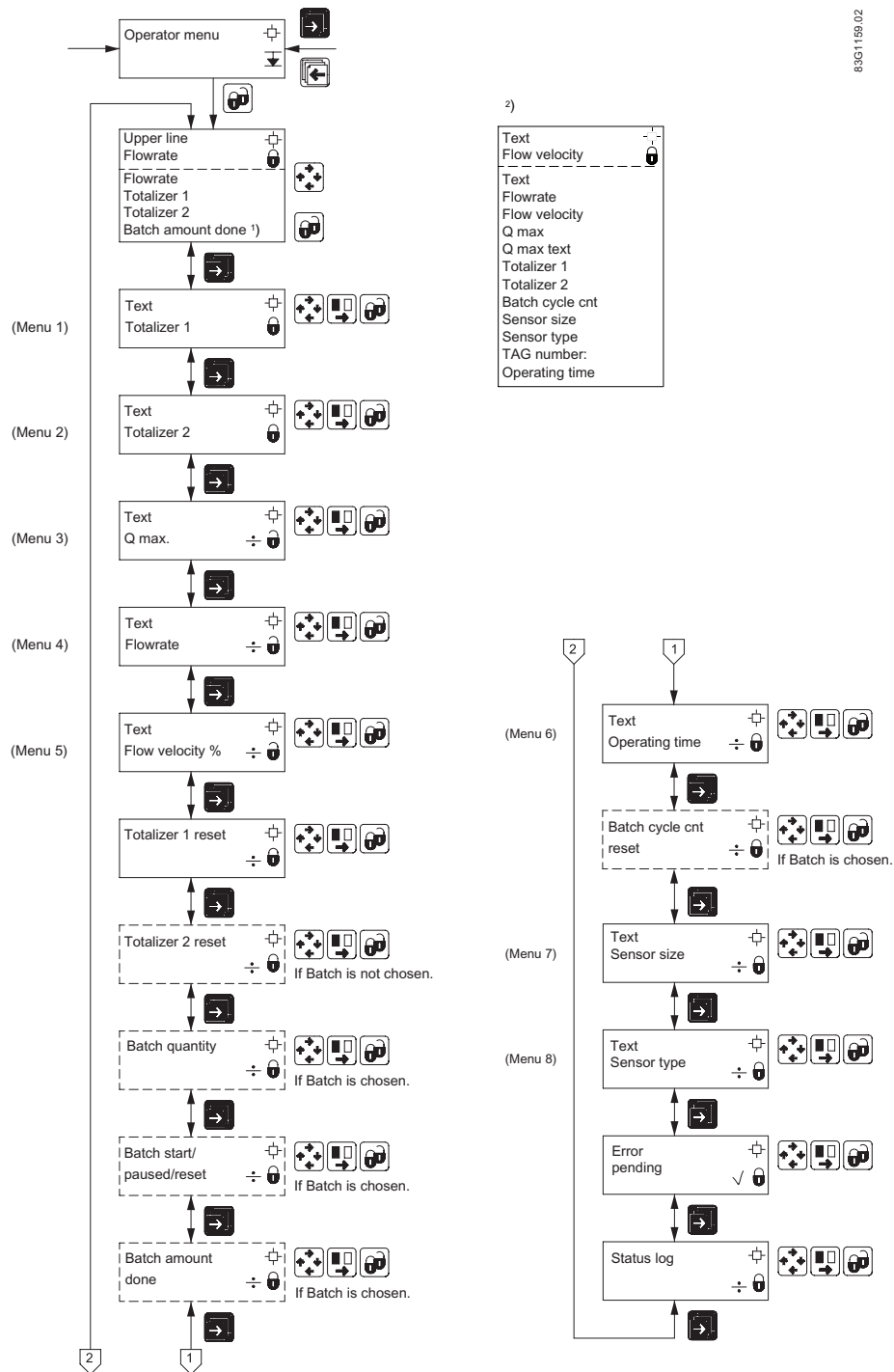


B.15 Service mode



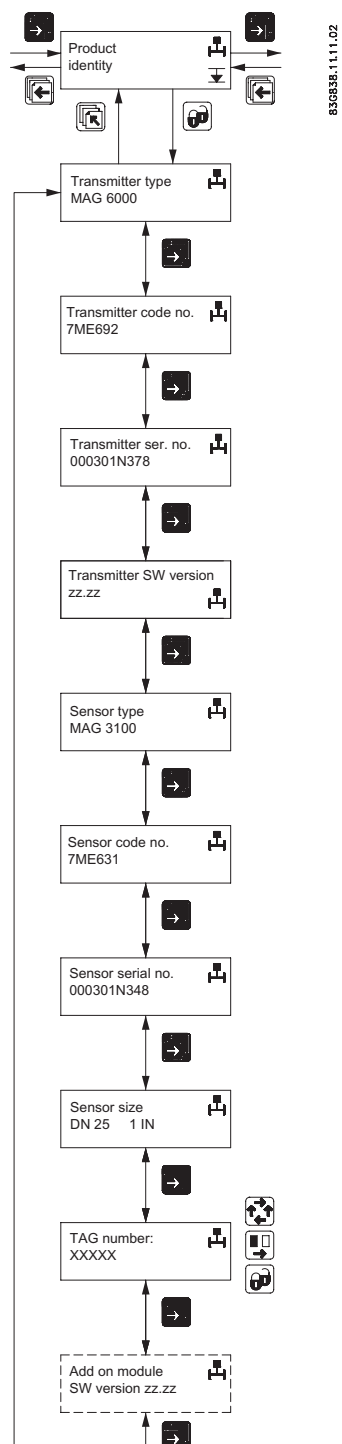
- 1) Signal suitability is a level from 0 to 9 of the electrode measured voltage. Level 0 is equal to the limit value that is set for empty pipe error detection, and level 9 is the best signal measured.
- 2) If digital output is set to pulse (standard).
- 3) If digital output is set to frequency.

B.16 Operator menu setup



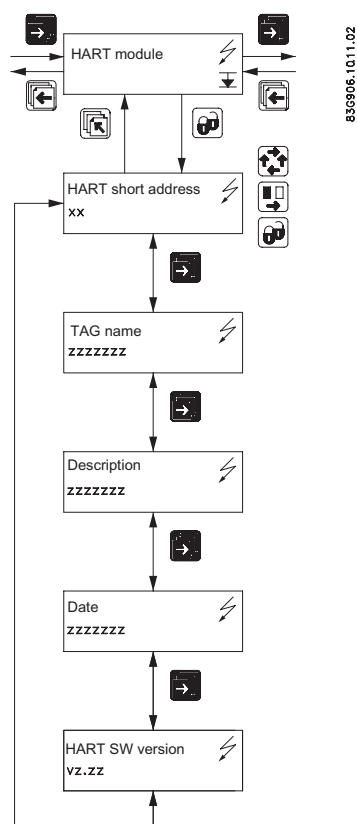
- 1) When selecting Batch amount for upper line, the upper line is initially blank. The amount done may not appear until the batch is started.
- 2) 'Text' means that the text for the chosen measured value is shown. For example, if text is chosen in line 2 and flow velocity is chosen in line 3, the text "Flow velocity" is shown in line 2 and the measured flow velocity is shown in line 3.

B.17 Product identity



B.18 Add-on communication module

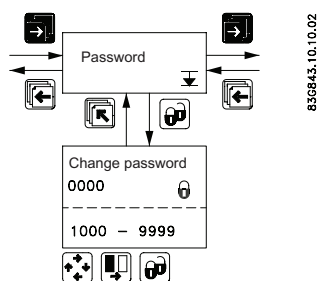
Example: HART



Note

Burst mode is not available with HART communication

B.19 Change password



Factory settings

C.1 Transmitter factory settings

The factory settings shown on the following pages apply to MAG 5000/6000 as well as MAG 6000 I.

Note

¹⁾ Due to legal requirements the only units available for MAG 5000/6000 CT are m³ and m³/h.

Menu item	Parameter	Factory settings	Options	More info
Password	Password	1000	1000 to 9999	Changing password (Page 44)
Basic settings	Flow direction	Positive	Positive, negative	Changing basic settings (Page 44)
	Q _{max}	Sensor size dependent	Sensor size dependent	
	• volume unit ¹⁾	Sensor size dependent	m ³ , ml, l, hl, Ml, ft ³ , in ³ , US G, US kG, BBL32, BBL42, UK G, UK MG, ? (customer unit)	
	• time unit	Sensor size dependent	Sec., min., hour, day, ? (customer unit)	
	Totalizer 1	Forward	Forward, reverse, net	
	• Totalizer 1 unit ¹⁾	Sensor size dependent	m ³ , ml, l, hl, Ml, ft ³ , in ³ , US G, US kG, BBL32, BBL42, UK G, UK MG, ? (customer unit)	
	Totalizer 2	Reverse	Forward, reverse, net	
	• Totalizer 2 unit ¹⁾	Sensor size dependent	m ³ , ml, l, hl, Ml, ft ³ , in ³ , US G, US kG, BBL32, BBL42, UK G, UK MG, ? (customer unit)	
	Low flow cut-off	1.5%	0 to 9.9%	
	Empty pipe	Off	On, Off	
	Velocity unit	m/s	m, mm, cm, dm, ft, in per s, min, h, d, ? (customer unit)	
	Error level	Warning	Fatal, permanent, warning	

C.1 Transmitter factory settings

Menu item	Parameter	Factory settings	Options	More info
Output	Current output	Off for MAG5000/6000	On/off, Unidirectional/bidirectional, 0 to 20 mA/4 to 20 mA/4 to 20 mA + Alarm	Output settings (Page 51)
	• Alarm level	Low	High/Low	
	• Alarm diff.	No	Yes/No	
	• Time constant	5 s	0.1 to 30 s	
	Digital output	Pulse	Error, direction/limit, batch, frequency, pulse, error number, off	Digital output - pulse (Page 85)
	Relay output	Error level	Error, direction/limit, cleaning, error number, off	Digital output / Relay output - Error level (Page 86)
	Direction/limit switch	Off	1 setpoint, 2 setpoints	Digital output / Relay output - Direction/limit (Page 87)
	• Setpoints	0%	-100 to +100%	
	• Hysteresis	5%	0.0 to 100%	
	Batch	Off		Digital output / Relay output - Batch (Page 87)
	• Batch quantity	0	Sensor size dependent	
	• Batch compensation	0	-100 to +100 m ³	
	• Batch counter	Down	Up, down	
	Frequency	Off	500 Hz, 1 kHz, 5 kHz, 10 kHz	Digital output - frequency (Page 86)
	• Time constant	5 s	0.1 to 30 s	
	Pulse	On		Digital output - pulse (Page 85)
	• Pulse polarity	Positive	Positive, negative	
	• Pulse width	66 ms	64 μs, 130 μs, 260 μs, 510 μs, 1.0 ms, 2.0 ms, 4.1 ms, 8.2 ms, 16 ms, 33 ms, 66 ms, 130 ms, 260 ms, 520 ms, 1.0 s, 2.1 s, 4.2 s	
	• Volume/pulse	Sensor size dependent	Dimension-dependent	
	• Time constant	0.1 s	0.1 to 30 s	
External input	External input	Off	Batch, reset totalizer, freeze output, forced output, off	External input (Page 89)
	• Batch	Start	Start, hold/continue, stop, Qmax 2	
Sensor characteristics	Correction factor	1	0.85 to 2.00	Sensor characteristics (Page 90)
Language	Language	English	English, German, French, Danish, Swedish, Finnish, Spanish, Russian, Italian, Portuguese, Polish	Changing language (Page 48)

Menu item	Parameter	Factory settings	Options	More info
Operator menu	Primary field	Flow rate	Flow rate, Totalizer 1, Totalizer 2	Changing operator menu setup (Page 47)
	Title/subtitle lines	Flow rate	Flow rate, Flow velocity, Q _{max} , Totalizer 1, Totalizer 2, Totalizer 1 reset, Totalizer 2 reset, Batch start/paused/stop, Batch cycle counter, Batch cycle counter reset, Sensor size, Sensor type, Error pending, Status log, Tag No.	

See also

Change password (Page 96)

C.2 50 Hz Dimension dependent Q_{max}

Table C-1 MAG 1100, MAG 1100 F, MAG 3100, MAG 3100 P and MAG 5100 W with M20 cable glands

DN	Q _{max} *					unit
	Factory sett- ing	MAG 5100 W (Order no. 7ME6520)		MAG 1100, MAG 1100 F, 5100 W (Order no. 7ME6580), MAG 3100, 3100 P		
mm (inch)			min.	max.	min.	max.
2 (1/12)	30	-	-	3.903623	156.1448	l/h
3 (1/8)	70	-	-	6.361726	254.469	l/h
6 (1/4)	300	-	-	25.44691	1017.876	l/h
10 (3/8)	900	-	-	70.68584	2827.433	l/h
15 (1/2)	2000	-	-	159.0432	6361.725	l/h
25 (1)	5000	441.7865	17671.45	441.7865	17671.45	l/h
40 (1½)	12	1.130974	45.23893	1.130974	45.23893	m³/h
50 (2)	20	1.574527	62.98107	1.767146	70.68583	m³/h
65 (2½)	30	2.499681	99.98723	2.986477	119.459	m³/h
80 (3)	50	4.003646	160.1458	4.523894	180.9557	m³/h
100(4)	120	6.252163	250.0864	7.068584	282.7433	m³/h
125 (5)	180	10.00647	400.2585	11.04467	441.7864	m³/h
150 (6)	250	15.74527	629.8107	15.90432	636.1725	m³/h
200(8)	400	24.93797	997.5184	28.27434	1130.973	m³/h
250(10)	700	40.00377	1600.15	44.17865	1767.145	m³/h
300 (12)	1000	62.50395	2500.157	63.61726	254469	m³/h
350 (14)	1200	86.59015	3463.605	86.59015	3463.605	m³/h
400 (16)	1800	113.0974	4523.893	113.0974	4523.893	m³/h
450 (18)	2000	143.1389	5725.552	143.1389	5725.552	m³/h
500 (20)	3000	176.7146	7068.583	176.7146	7068.583	m³/h
600 (24)	4000	254.4691	10178.76	254.4691	10178.76	m³/h
700 (28)	4500	346.3606	13854,42	346.3606	13854.42	m³/h
750 (30)	5000	397.6079	15904.31	397.6079	15904.31	m³/h

DN	Q _{max} *					
	Factory setting	MAG 5100 W (Order no. 7ME6520)		MAG 1100, MAG 1100 F, 5100 W (Order no. 7ME6580), MAG 3100, 3100 P		unit
mm (inch)		min.	max.	min.	max.	
800 (32)	7000	452.3894	18095.57	452.3894	18095.57	m ³ /h
900 (36)	9000	572.5553	22902.21	572.5553	22902.21	m ³ /h
1000 (40)	12000	706.8584	28274.33	706.8584	28274.33	m ³ /h
1050 (42)	12000	706.8584	28274.33	706.8584	28274.33	m ³ /h
1100 (44)	14000	855.986	34211.94	855.2986	34211.94	m ³ /h
1200 (48)	15000	1017.877	40715.04	1017.877	40715.04	m ³ /h
1400 (54)	25000	-	-	1385.443	55417.69	m ³ /h
1500 (60)	30000	-	-	1590.432	63617.25	m ³ /h
1600 (66)	35000	-	-	1809.558	72382.29	m ³ /h
1800 (72)	40000	-	-	2290.222	91608.84	m ³ /h
2000 (78)	45000	-	-	2827.434	113097.3	m ³ /h
2200 (90)	50000	-	-	3421.195	136847.7	m ³ /h
2400 (96)	55000	-	-	4071.505	162860.1	m ³ /h
2600 (102)	60000	-	-	4778.363	191134.4	m ³ /h
280 (114)	65000	-	-	5541.77	221670.7	m ³ /h
3000 (120)	70000	-	-	6361.726	254469	m ³ /h

* The min. and max. amount values show mathematical values and do not indicate measurement accuracy

C.3 60 Hz Dimension dependent Q_{max}

Table C-2 MAG 1100, MAG 1100 F, MAG 3100, MAG 3100 P and MAG 5100 W with ½" NPT cable glands

DN	Q _{max} *					
	Factory setting*	MAG 5100 W (Order no. 7ME6520)		MAG 1100, MAG 1100 F, 5100 W (Order no. 7ME6580), MAG 3100, 3100 P		unit
mm (inch)		min.	max.	min.	max.	
2 (1/16)	0.14	-	-	0.01718714	0.6874852	US GPM
3 (1/8)	0.31	-	-	0.02800984	1.120393	US GPM
6 (1/4)	1.4	-	-	0.1120394	4.481573	US GPM
10 (3/8)	4	-	-	0.3112204	12.44881	US GPM
15 (1/2)	9	-	-	0.7002459	28.0	US GPM
25 (1)	23	1.945128	77.80509	1.945128	77.80509	US GPM
40 (1 1/2)	53	4.979526	199.181	4.979526	199.181	US GPM
50 (2)	89	6.932434	277.2973	7.78051	311.2203	US GPM
65 (2 1/2)	133	11.00577	440.2305	13.14907	525.9624	US GPM
80 (3)	221	17.62753	705.1008	19.91811	796.7241	US GPM

DN	Q _{max} *					
	Factory setting*	MAG 5100 W (Order no. 7ME6520)		MAG 1100, MAG 1100 F, 5100 W (Order no. 7ME6580), MAG 3100, 3100 P		unit
mm (inch)		min.	max.	min.	max.	
100(4)	529	27.52745	1101.097	31.12204	1244.881	US GPM
125 (5)	793	44.05714	1762.285	48.62819	1945.127	US GPM
150 (6)	1101	69.32434	2772.973	70.02459	2800.984	US GPM
200 (8)	1762	109.7986	4391.941	124.48819	4979.525	US GPM
250 (10)	3083	176.1313	7045.251	194.5128	7780.507	US GPM
300 (12)	4403	275.1967	11007.86	280.0984	11203.93	US GPM
350 (14)	5284	381.245	15249.79	381.245	15249.79	US GPM
400 (16)	7926	497.9526	19918.1	497.9526	19918.1	US GPM
450 (18)	8806	630.2213	25208.84	630.2213	25208.84	US GPM
500 (20)	13209	778.051	31122.03	778.051	31122.03	US GPM
600 (24)	17612	1120.394	44815.73	1120.394	44815.73	US GPM
700 (28)	19813	1524.98	60999.19	1524.98	60999.19	US GPM
750 (30)	22015	1750.615	70024.58	1750.615	70024.58	US GPM
800 (32)	3082	1991.811	79672.4	1991.811	79672.41	US GPM
900 (36)	39626	2520.885	100835.3	2520.885	100835.3	US GPM
1000 (40)	52835	3112.204	124488.1	3112.204	124488.1	US GPM
1050 (42)	52835	3112.204	137248.1	3112.204	124488.1	US GPM
1100 (44)	61641	3765.767	150630.6	3765.767	150630.6	US GPM
1200 (48)	66044	4481.574	179262.9	4481.574	179262.9	US GPM
1400 (54)	110072	-	-	6099.92	243996.7	US GPM
1500 (60)	1320867	-	-	7002.459	280098.3	US GPM
1600 (66)	154101	-	-	7967.242	318689.6	US GPM
1800 (72)	176115	-	-	10083.54	403341.5	US GPM
2000 (78)	198130	-	-	12448.82	497952.5	US GPM
2200 (90)	220144	-	-	15063.07	602522.6	US GPM
2400 (96)	242158	-	-	17926.3	717051.7	US GPM
2600 (102)	264173	-	-	21038.5	841539.8	US GPM
2800 (114)	286187	-	-	24399.68	975987	US GPM
3000 (120)	308201	-	-	28009.84	1120393	US GPM

* Factory setting sets Q_{max} to a metric unit (see previous table). The values here are converted to rounded off US GPM.

C.4 50 Hz Dimension dependent volume/pulse and batch

Table C-3 MAG 1100, MAG 1100 F, MAG 3100, MAG 3100 P and MAG 5100 W with M20 cable glands

DN	Volume/pulse or batch quantity*				Factory setting		
	MAG 5100 W (Order no. 7ME6520)		MAG 1100, MAG 1100 F, 5100 W (Order no. 7ME6580), MAG 3100, 3100 P		Volume/ pulse & batch amount	Pulse & batch unit	Totaliz- er unit
mm (inch)	min.	max.	min.	max.			
2 ($1/12$)	-	-	3.61466 µl	94.75103 l	0.1	ml	ml
3 ($1/8$)	-	-	5.890487 µl	154.4155 l	0.1	ml	ml
6 ($1/4$)	-	-	23.56195 µl	617.6622 l	1	l	l
10 ($3/8$)	-	-	65.44985 µl	1.715728 m ³	1	l	l
15 ($1/2$)	-	-	147.2622 µl	3.860389 m ³	1	l	l
25 (1)	409.0616 µl	10.7233 m ³	409.0616 µl	10.7233 m ³	10	l	l**
40 (1½)	1.047198 ml	27.45165 m ³	1.047198 ml	27.45165 m ³	10	l	l**
50 (2)	1.457896 ml	38.21785 m ³	1.636247 ml	42.89321 m ³	10	l	l**
65 (2½)	2.31452 ml	60.67373 m ³	2.765257 ml	72.48952 m ³	100	l	l**
80 (3)	3.70708 ml	97.17886 m ³	4.188791 ml	109.8066 m ³	100	l	l**
100(4)	5.789039 ml	151.7561 m ³	6.544985 ml	171.5728 m ³	100	l	l**
125 (5)	9.265244 ml	242.8828 m ³	10.22654 ml	268.0825 m ³	100	l	m ³
150 (6)	14.57896 ml	382.1785 m ³	14.72622 ml	386.0389 m ³	100	l	m ³
200 (8)	23.09071 ml	605.309 m ³	26.17994 ml	686.2913 m ³	1	m ³	m ³
250 (10)	37.04053 ml	970.995 m ³	40.90616 ml	1072.33 m ³	1	m ³	m ³
300 (12)	57.87403 ml	1517.132 m ³	58.90487 ml	1544.155 m ³	1	m ³	m ³
350 (14)	80.17607 ml	2101.767 m ³	80.17607 ml	210.7671 m ³	1	m ³	m ³
400 (16)	104.7198 ml	2745.165 m ³	104.7198 ml	2745.165 m ³	1	m ³	m ³
450 (18)	132.536 ml	3474.35 m ³	132.536 ml	3474.35 m ³	1	m ³	m ³
500 (20)	163.6247 ml	4289.321 m ³	163.6247 ml	4289.321 m ³	10	m ³	m ³
600 (24)	235.6195 ml	6176.622 m ³	235.6195 ml	6176.622 m ³	10	m ³	m ³
700 (28)	320.7043 ml	8407.069 m ³	320.7143 ml	8407.069 m ³	10	m ³	m ³
750 (30)	368.1554 ml	9650.972 m ³	368.1554 ml	9650.972 m ³	10	m ³	m ³
800 (32)	418.8791 ml	10980.66 m ³	418.8791 ml	10980.66 m ³	10	m ³	m ³
900 (36)	530.1438 ml	13897.4 m ³	530.1438 ml	13897.4 m ³	10	m ³	m ³
1000 (40)	654.4985 ml	17157.28 m ³	654.4985 ml	17157.28 m ³	10	m ³	m ³
1050 (42)	654.4985 ml	17157.28 m ³	654.4985 ml	17157.28 m ³	10	m ³	m ³
1100 (44)	79.94321 ml	20760.31 m ³	791.9432 ml	20760.31 m ³	10	m ³	m ³
1200 (48)	942.4778 ml	24706.48 m ³	942.4778 ml	24706.48 m ³	10	m ³	m ³
1400 (54)	-	-	1.282817 l	33628.27 m ³	10	m ³	m ³
1500 (60)	-	-	1.472622 l	38603.89 m ³	10	m ³	m ³
1600 (66)	-	-	1.675517 l	43922.64 m ³	10	m ³	m ³
1800 (72)	-	-	2.120576 l	55589.6 m ³	10	m ³	m ³
2000 (78)	-	-	2.617994 l	68629.13 m ³	10	m ³	m ³
2200 (90)	-	-	3.167773 l	83041.25 m ³	10	m ³	m ³

C.5 60 Hz Dimension dependent volume/pulse and batch

DN	Volume/pulse or batch quantity*				Factory setting		
	MAG 5100 W (Order no. 7ME6520)		MAG 1100, MAG 1100 F, 5100 W (Order no. 7ME6580), MAG 3100, 3100 P		Volume/pulse & batch amount	Pulse & batch unit	Totalizer unit
mm (inch)	min.	max.	min.	max.			
2400 (96)	-	-	3.769912 l	98825.9 m ³	10	m ³	m ³
2600 (102)	-	-	4.4241 l	115983. m ³	10	m ³	m ³
2800 (114)	-	-	5.131268 l	134513.1 m ³	10	m ³	m ³
3000 (120)	-	-	5.890487 l	154415.5 m ³	10	m ³	m ³

* The min. and max. amount values show mathematical values and do not indicate measurement accuracy.

** For CT devices the totalizer 1 unit is in m³

C.5 60 Hz Dimension dependent volume/pulse and batch

Table C-4 MAG 1100, MAG 1100 F, MAG 3100, MAG 3100 P and MAG 5100 W with ½" NPT cable glands

DN	Volume/pulse or batch quantity			
	MAG 5100 W (Order no. 7ME6520)		MAG 1100, MAG 1100 F, 5100 W (Order no. 7ME6580), MAG 3100, 3100 P	
mm (inch)	US G min.	US G max.	US G min.	US G max.
2 (1/12)	-	-	0.00000095484069	25.03057
3 (1/8)	-	-	0.000001556102	40.79227
6 (1/4)	-	-	0.000006224408	163.1691
10 (3/8)	-	-	0.00001729003	453.2475
15 (1/2)	-	-	0.00003890255	1019.806
25 (1)	0.0001080627	2832.796	0.0001080627	2832.796
40 (1 1/2)	0.0002766404	7251.96	0.0002766404	7251.96
50 (2)	0.0003851353	10096.08	0.0004322506	11331.18
65 (2 1/2)	0.0006114314	16028.3	0.0007305034	19149.7
80 (3)	0.0009793068	25671.93	0.001106562	29007.84
100(4)	0.001529303	40089.74	0.001729003	45324.75
125 (5)	0.002447619	64162.85	0.002701566	70819.92
150 (6)	0.003851353	100960.8	0.003890255	101980.6
200 (8)	0.00609992	159905.7	0.006916009	181299
250 (10)	0.009785071	256509.7	0.01080627	283279.6
300 (12)	0.01528871	400784.1	0.01556102	407922.7
350 (14)	0.02118028	555228.2	0.02118028	555228.2
400 (16)	0.02766404	725196	0.02766404	725196
450 (18)	0.0350123	917826.2	0.0350123	917826.2
500 (20)	0.04322506	1133118	0.04322506	1133118
600 (24)	0.06224408	1631691	0.06224408	1631691
700 (28)	0.0847211	2220912	0.0847211	2220912

DN	Volume/pulse or batch quantity			
	MAG 5100 W (Order no. 7ME6520)		MAG 1100, MAG 1100 F, 5100 W (Order no. 7ME6580), MAG 3100, 3100 P	
mm (inch)	US G min.	US G max.	US G min.	US G max.
750 (30)	0.09725637	2549517	0.09725637	2549517
800 (32)	0.1106562	2900784	0.1106562	2900784
900 (36)	0.1400492	3671304	0.1400492	3671304
1000 (40)	0.1729003	4532475	0.1729003	4532475
1050 (42)	0.1729003	4532475	0.1729003	4532475
1100 (44)	0.2092093	5484294	0.2092093	5484294
1200 (48)	0.2489763	6526764	0.2489763	6526764
1400 (54)	-	-	0.3388844	8883651
1500 (60)	-	-	0.3890255	10198060
1600 (66)	-	-	0.4426246	11603130
1800 (72)	-	-	0.5601967	14685210
2000 (78)	-	-	0.6916009	18129900
2200 (90)			0.836837	21937170
2400 (96)			0.995906	26107050
2600 (102)			1.168806	30639530
2800 (114)			1.355538	35534600
3000 (120)			1.556102	40792270

Product documentation and support

D.1 Product documentation

Process instrumentation product documentation is available in the following formats:

- Certificates (<http://www.siemens.com/processinstrumentation/certificates>)
- Downloads (firmware, EDDs, software) (<http://www.siemens.com/processinstrumentation/downloads>)
- Catalog and catalog sheets (<http://www.siemens.com/processinstrumentation/catalogs>)
- Manuals (<http://www.siemens.com/processinstrumentation/documentation>)
You have the option to show, open, save, or configure the manual.
 - "Display": Open the manual in HTML5 format
 - "Configure": Register and configure the documentation specific to your plant
 - "Download": Open or save the manual in PDF format
 - "Download as html5, only PC": Open or save the manual in the HTML5 view on your PC

You can also find manuals with the Mobile app at Industry Online Support (<https://support.industry.siemens.com/cs/ww/en/sc/2067>). Download the app to your mobile device and scan the device QR code.

Product documentation by serial number

Using the PIA Life Cycle Portal, you can access the serial number-specific product information including technical specifications, spare parts, calibration data, or factory certificates.

Entering a serial number

1. Open the PIA Life Cycle Portal (<https://www.pia-portal.automation.siemens.com>).
2. Select the desired language.
3. Enter the serial number of your device. The product documentation relevant for your device is displayed and can be downloaded.

To display factory certificates, if available, log in to the PIA Life Cycle Portal using your login or register.

Scanning a QR code

1. Scan the QR code on your device with a mobile device.
2. Click "PIA Portal".

To display factory certificates, if available, log in to the PIA Life Cycle Portal using your login or register.

D.2 Technical support

Technical support

If this documentation does not completely answer your technical questions, you can enter a Support Request (<http://www.siemens.com/automation/support-request>).

For help creating a support request, view this video here.

Additional information on our technical support can be found at Technical Support (<http://www.siemens.com/automation/csi/service>).

Service & support on the Internet

In addition to our technical support, Siemens offers comprehensive online services at Service & Support (<http://www.siemens.com/automation/service&support>).

Contact

If you have further questions about the device, contact your local Siemens representative at Personal Contact (<http://www.automation.siemens.com/partner>).

To find the contact for your product, go to "all products and branches" and select "Products & Services > Industrial automation > Process instrumentation".

Contact address for business unit:

Siemens AG

Digital Industries

Process Automation

Östliche Rheinbrückenstr. 50

76187 Karlsruhe, Germany

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Assunto: Re: Fwd: Documentos de Habilitação P.E 0046/25

De: José Antônio <jteixeira@cesama.com.br>

Data: 22/09/2025, 10:35

Para: DELC - Alexandre <anogueira@cesama.com.br>

CC: "jhenrique@cesama.com.br" <jhenrique@cesama.com.br>

Alexandre, bom dia!

a proponente não apresentou catalogo e manual do produto ofertado em português conforme solicitado no item 4.16 do TR do nosso edital!

"4.16. Manual em português."

Por favor solicite para fazermos uma melhor avaliação.

att

Em 19/09/2025 14:13, DELC - Alexandre escreveu:

Caro Zé. segue a sua avaliação nova proposta.

Att

Alexandre

----- Mensagem encaminhada -----

Assunto: Documentos de Habilitação P.E 0046/25

Data: Mon, 15 Sep 2025 15:56:40 -0300

De: IVAN LUDEWIG <axion.automacao@gmail.com>

Para: anogueira@cesama.com.br

Prezado(a) Pregoeiro(a),

Boa tarde!

Segue em anexo a documentação de habilitação referente ao Pregão Eletrônico nº 0046/25, conforme solicitado.

Permanecemos à disposição para quaisquer dúvidas ou envio de documentação complementar que se faça necessário.

Atenciosamente,

Ivan Ludewig

Gerente Comercial

AXION Automação Industrial Ltda.

Assunto: Re: Fwd: Questionamento sobre a Convocação Ampla para Envio de Proposta por E-mail - Pregão Eletrônico 46/2025

De: José Antônio <jteixeira@cesama.com.br>

Data: 23/09/2025, 15:19

Para: DELC - Alexandre <anogueira@cesama.com.br>

CC: "jhenrique@cesama.com.br" <jhenrique@cesama.com.br>

Alexandre, boa tarde!

A proposta da empresa Isoil-Lamon **atende** o nosso edital!

att

Em 23/09/2025 14:03, DELC - Alexandre escreveu:

Caro Zé, segue proposta da Isoil para sua avaliação.

Att

Alexandre

----- Mensagem encaminhada -----

Assunto: RE: Questionamento sobre a Convocação Ampla para Envio de Proposta por E-mail - Pregão Eletrônico 46/2025

Data: Tue, 16 Sep 2025 13:39:11 +0000

De: Isoil Lamon - Comercial <comercial.isoil.lamon@gmail.com>

Para: DELC - Alexandre <anogueira@cesama.com.br>, licita@cesama.com.br
<licita@cesama.com.br>

CC: Rodrigo Lamon <rodrigo@lamon.com.br>, Gustavo Lamon <gustavo@lamon.com.br>

Prezados,

Bom dia,

Agradecemos pelo esclarecimento.

Segue anexo a proposta.

Permanecemos à disposição e aguardamos retorno quanto ao enredo. Agradecemos antecipadamente pela atenção.

Com distinta consideração,

Atenciosamente | Best Regards | Cordiali
Saluti

Wellington Ranniery



**Isoil-Lamon Indústria / Lamon Produtos
– Brasil**

R. Crepúsculo, 110 – Belo Horizonte – MG

Phone: +55 31 2552-0160 | + 55 31 9
9200-0155

E-mail: comercial@lamon.com.br

Website: www.isoil-lamon.com.br |
www.lamon.com.br



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LAMON](#)

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É de extrema importância que todos os e-mails trocados sobre este Atendimento, sejam respondidos através desta mensagem e os participantes mantidos, para não perdermos a rastreabilidade da comunicação.

Gentileza confirmar o recebimento .Texto confidencial para uso exclusivo do destinatário. Não o divulgue e apague-o imediatamente se o recebeu por engano.

De: DELC - Alexandre [<anogueira@cesama.com.br>](mailto:anogueira@cesama.com.br)

Enviado: terça-feira, 16 de setembro de 2025 09:44

Para: Isoil Lamon - Comercial [<comercial.isoil.lamon@gmail.com>](mailto:comercial.isoil.lamon@gmail.com)

Assunto: Re: Questionamento sobre a Convocação Ampla para Envio de Proposta por E-mail -

Pregão Eletrônico 46/2025

Senhor fornecedor, pedimos a gentileza de atentar as formas de convocação previstas em Edital, a saber:

9.13.3 A proposta comercial ajustada de acordo com o previsto no Capítulo 5 deverá ser recebida no prazo de 2 (duas) horas após a solicitação do(a) Pregoeiro(a).

a) Os documentos deverão ser encaminhados por uma das formas disponíveis (e-mail licita@cesama.com.br, ou outro informado pelo(a) Pregoeiro(a) no chat da sessão, ou como anexo no sistema), de acordo com o solicitado pelo(a) Pregoeiro(a) no chat do sistema eletrônico;

a) Os documentos deverão ser encaminhados por uma das formas disponíveis (e-mail licita@cesama.com.br, ou outro informado pelo(a) Pregoeiro(a) no chat da sessão, ou como anexo no sistema), de acordo com o solicitado pelo(a) Pregoeiro(a) no chat do sistema eletrônico;

No presente caso o pregoeiro determinou o envio por email, em completa aderência ao Instrumento; ademais, permanecem todas as propostas disponíveis pra vistas e devidamente publicadas na aba Licitações em www.cesama.com.br.

Quanto à convocação ampla, a mesma gera celeridade, indo ao encontro de um dos princípios da Administração, sem trazer qualquer prejuízo ao certame, uma vez que de acordo também com o instrumento, os fornecedores assumem o compromisso de estarem conectados a cada retorno agendado pelo Pregoeiro, como abaixo

9.19 Caberá ao licitante acompanhar as operações no sistema eletrônico, ficando responsável pelo ônus decorrente da perda de negócios diante da não observância de quaisquer mensagens emitidas pelo sistema ou pelo(a) Pregoeiro(a) ou de sua desconexão.

Foi ainda informado no chat que, além da concessão do mesmo prazo de duas horas para recebimento que disciplina o Edital, as propostas serão avaliadas dentro de mais um dos princípios basilares da Administração, o da Isonomia, de maneira que sua análise se dará de forma idêntica a aquela de uma convocação sequencial.

Como houve interessados e propostas recebidas neste contexto, há que se dizer que o intuito foi perfeitamente compreendido pelos fornecedores conectados.

Pedimos ao senhor que permaneça conectado a cada retorno e também que, caso haja interesse, nos encaminhe sua proposta para avaliação técnica.

Att

Alexandre

Em 16/09/2025 09:25, Isoil Lamon - Comercial escreveu:

Prezada equipe de licitação.

Bom dia.

A empresa ISOIL LAMON INDUSTRIA DE EQUIPAMENTOS E SERVICOS DE INSTRUMENTACAO LTDA, inscrita sob o CNPJ 14.502.966/0001-31, vem, respeitosamente, manifestar seu estranhamento e discordância em relação à convocação ampla realizada via e-mail para que todos os licitantes encaminhem suas propostas sob pena de desclassificação.

Entendemos que essa prática não está em conformidade com as normas que regem o rito do Pregão Eletrônico, em particular a **Lei nº 14.133/2021** e o **Decreto nº 10.024/2019**. O procedimento legal e transparente determina que a fase de negociação e a solicitação da proposta final devem seguir a **ordem de classificação**, sendo o pregoeiro obrigado a convocar os licitantes de forma sequencial, um a um.

Ao realizar uma convocação por e-mail, fora da plataforma oficial do Comprasnet, a Administração:

1. **Viola o Princípio da Transparência e da Impessoalidade:** A convocação deve ser pública e registrada no sistema oficial, garantindo que o processo seja auditável e acessível a todos os participantes.
2. **Gera Insegurança Jurídica:** O envio de propostas por e-mail está sujeito a falhas técnicas (e-mail não recebido, spam, etc.) e retira o rito da sua formalidade, o que pode prejudicar indevidamente os licitantes.

Dessa forma, solicitamos formalmente a **anulação da convocação ampla por e-mail** e a retomada do procedimento legal, ou seja, a convocação sequencial dos licitantes, respeitando-se a ordem de classificação, para a apresentação da proposta adequada e dos documentos de habilitação, conforme previsto em lei.

Agradecemos a atenção e aguardamos o ajuste do rito processual para que possamos continuar participando do certame de forma regular.

Atenciosamente | Best Regards | Cordiali
Saluti



Wellington Ranniery

Isoil-Lamon Indústria / Lamon Produtos
– Brasil



R. Crepúsculo, 110 – Belo Horizonte –
MG

Phone: +55 31 2552-0160 | + 55 31 9
9200-0155



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E-mail: comercial@lamon.com.br

Website: www.isoil-lamon.com.br |
www.lamon.com.br

[PT]

É de extrema importância que todos os e-mails trocados sobre este Atendimento, sejam respondidos através desta mensagem e os participantes mantidos, para não perdermos a rastreabilidade da comunicação.

Gentileza confirmar o recebimento .Texto confidencial para uso exclusivo do destinatário. Não o divulgue e apague-o imediatamente se o recebeu por engano.

--

Alexandre Tedesco Nogueira
Pregoeiro
Departamento de Licitações e
Assessoria de Contratos (DELC)
(32) 3692-9200 / 3692-9201



Belo Horizonte, 16 de Setembro de 2025

Proposta Número: **IL0041/25**comercial@lamon.com.br

Empresa: Cesama

Att.:

Tel. / Fax:

email:

Ref.: Pregão Eletrônico N° 046/2025



Item	Qtde	Descrição	Valor Unitário	Valor Final R\$	Prazo de Entrega
01	40	CONVERSOR MV110 Material do Corpo: Nylon; Grau de Proteção: IP-67; Versão da montagem: Separado; Temperatura de operação: -10 a 50°C; Indicação: Display gráfico de 128x64 pixels com iluminação de fundo e possibilidade de visualização da vazão e volume simultaneamente – possui dois totalizadores independentes – possui prompt claro de texto para operação com todas as funções e dados ajustáveis. Totalizador com 9 dígitos salvo em memória não volátil; Programação: através de 03 teclas localizadas no frontal do conversor – possibilidade de programação do modelo do sensor, fator de calibração, chave de habilitação – Opcionalmente via cabo USB 2.0 padrão Mini-B e software configurador gratuito; Senha de Proteção: senha de proteção de 7 dígitos programável pelo usuário com 6 níveis de acesso; Consumo máximo: 5VA; Alimentação: 12-48vdc Saída Analógica: 01 saída analógica4...20mA, com impedância de carga máxima de 800 Ohms; Saída Digital: 02 saídas digitais com frequência de 1250Hz – saídas de pulso podem ser	R\$ 10.950,00	R\$ 438.000,00	Conforme edital

	Saída Digital: 02 saídas digitais com frequência de 1250Hz - saídas de pulso podem ser programadas para funcionar como totalização ou saída para alarme; Comunicação Digital: nenhuma; Medição de fluxo bidirecional: sim; Correção do perfil do fluxo: sim; Menor velocidade detectável: 0,01m/s; Faixa de velocidade máxima de medição: 10m/s; Ajustes da faixa de velocidade: 0 a 0,4m/s à 0 a 10m/s; Faixa de Velocidade ajustada: 0,1 a 8m/s; Frequência de excitação do sensor: ajustável a até 50 Hz; Funções de diagnósticos: sim; Deteção de falha das bobinas: sim; Deteção de tubo vazio: sim; Auto Zero: automático; Senha de proteção: sim; Ajuste de Zero e Span não interativos: sim; Indicação sentido do fluxo: sim; Corte de vazão baixa: sim – programável; Estabilidade de zero: 0,005%; Totalização: Sentido direto e reverso, sendo vazão bidirecional, volume positivo/negativo; Damping: programável entre 0,1 a 1000s ou ainda, possui a opção de damping automático, que se ajusta em função do comportamento e estabilidade da vazão indicada; Unidade de indicação: unidade métrica (SI) para indicação vazão ou volume, por exemplo, l/s, m³/h, l, m³ etc. Campo para inserção da constante de linearização do sensor: sim; Sistema de autolimpeza dos eletrodos: sim, por pulso de tensão alternada permitindo assim a despolarização e limpeza dos eletrodos – recurso default (habilitável pelo usuário); Isolação galvânica: todas as entradas e saídas são isoladas galvanicamente da alimentação; Compatibilidade Eletromagnética: EN-61326-1 (2007) e EN-61010-1 (2001); Manual de Instrução: fornecido manual de instrução em português contendo todas as informações necessárias para operação e instalação do medidor; Assistência Técnica: toda a assistência técnica dos equipamentos fornecidos será realizada no Brasil. Acessórios: - Protetor de surto categoria III		
VALOR TOTAL		R\$ 438.000,00	

Condições de Fornecimento:

VALIDADE DA PROPOSTA:

CONFORME EDITAL

Isoil Lamon Indústria de Equipamentos e Serviços de Instrumentação Ltda
R.CHRISTINA MARIA DE ASSIS - 185 - CALIFORNIA - Belo Horizonte - MG - 30.855-440 - Brasil - Tel / Fax: +55-31-2552-0160
webpage: www.lamon.com.br email: produtos@lamon.com.br

BASE DE PREÇO: set/25
CONDIÇÃO DE PAGAMENTO: CONFORME EDITAL
PRAZO DE ENTREGA: O(s) prazo(s) de entrega mencionado(s) nesta proposta será(ão) contado(s) a partir da data do recebimento da aprovação formal para fabricação, informando os dados cadastrais para emissão Nota Fiscal.
EMBALAGEM: Incluso
LOCAL DE ENTREGA: CONFORME EDITAL
FABRICANTE: ISOIL
PROCEDÊNCIA: Itália
GARANTIA: CONFORME EDITAL
OBSERVAÇÕES:
ESTAMOS DE ACORDO COM EDITAL E TODAS SUAS EXIGÊNCIAS.

Isoil Lamon Ind. de Equip. e Serviços de Instrumentação Ltda - Banco Itau (341) Agência (3053) Gutierrez - BH - MG **C/C N° 08192-7**

RODRIGO DE ARAUJO
LAMON:03411505680

Assinado de forma digital por RODRIGO DE ARAUJO
LAMON:03411505680
Dados: 2025.09.16 10:32:55 -03'00'

Rodrigo de Araujo Lamon
ISOIL LAMON
CNPJ: 14.502.966/0001-31



Sistema de Cadastramento Unificado de Fornecedores - SICAF

Declaração

Declaramos para os fins exigidos na legislação, conforme documentação registrada no SICAF, que a situação do fornecedor no momento é a seguinte:

Dados do Fornecedor

CNPJ: 14.502.966/0001-31 DUNS®: 901082125
Razão Social: ISOIL LAMON INDUSTRIA DE EQUIPAMENTOS E SERVICOS DE INSTRUMENTACAO LTDA.
Nome Fantasia:
Situação do Fornecedor: **Credenciado** Data de Vencimento do Cadastro: 02/06/2026
Natureza Jurídica: **SOCIEDADE EMPRESÁRIA LIMITADA**
MEI: **Não**
Porte da Empresa: **Demais**

Ocorrências e Impedimentos

Ocorrência: **Nada Consta**
Impedimento de Licitar: **Nada Consta**
Ocorrências Impeditivas indiretas: **Nada Consta**
Vínculo com "Serviço Público": **Nada Consta**

Níveis cadastrados:

Documento(s) assinalado(s) com "*" está(ão) com prazo(s) vencido(s).

Fornecedor possui pendências em um ou mais níveis de cadastramento. Para mais informações, utilize as funcionalidades de consulta disponíveis.

Automática: a certidão foi obtida através de integração direta com o sistema emissor. Manual: a certidão foi inserida manualmente pelo fornecedor.

I - Credenciamento

II - Habilitação Jurídica (Possui Pendência)

III - Regularidade Fiscal e Trabalhista Federal

Receita Federal e PGFN	Validade:	25/01/2026	Automática
FGTS	Validade:	11/10/2025	Automática
Trabalhista (http://www.tst.jus.br/certidao)	Validade:	01/11/2025	Automática

IV - Regularidade Fiscal Estadual/Distrital e Municipal (Possui Pendência)

Receita Estadual/Distrital	Validade:	11/10/2017 (*)
Receita Municipal	Validade:	05/10/2017 (*)

VI - Qualificação Econômico-Financeira (Possui Pendência)

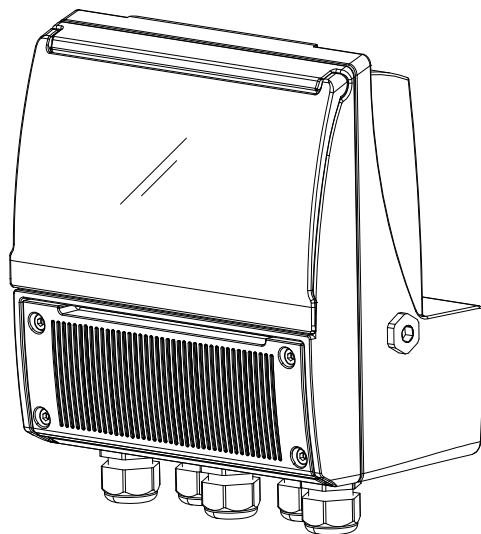
Sem Informação



ISOMAG[®]

The friendly magmeter

MANUL DE OPERAÇÃO



MV110



CARACTERÍSTICAS TÉCNICAS



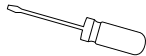
Classificação do conversor: classe I, IP67/68 para invólucro em alumínio/PA6, categoria de instalação (overvoltage) II, grau de poluição 2.

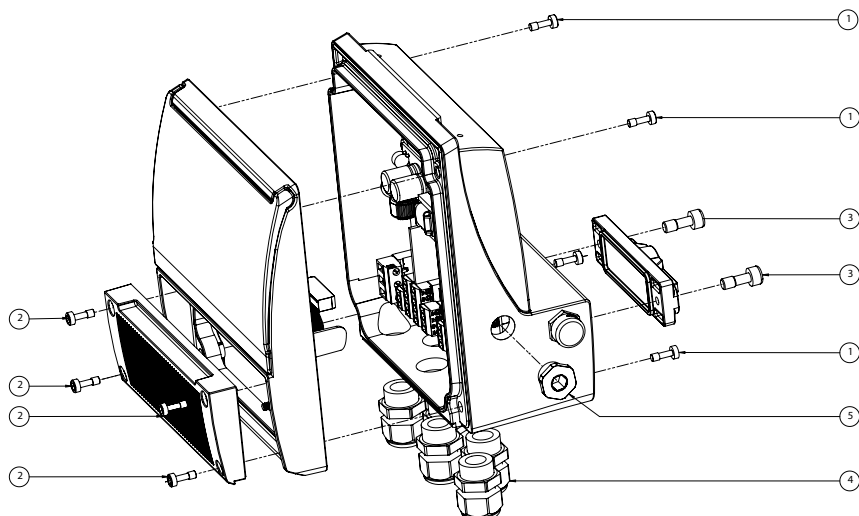
Versões de Alimentação	Tensão de Alimentação	Frequência de Alimentação	Min Power	Max power
HV	100-240V~	45-66HZ	1,5 W (Sensor apenas)	5 W (todas as cargas)
LV	24-36V---	45-66HZ		
	24-36V~	45-66HZ		
LLV	12-48---	//		

- ☐ Variação de tensão não deve exceder $\pm 10\%$ da nominal.
- ☐ Entradas/saídas isoladas a até 500V.
- ☐ A saída de 4-20mA (opcional) é conectada eletricamente a saídas ON/OFF e a tensão de saída é (24V ---).

TORQUES

Para garantir o grau IP do invólucro, são necessários aplicar os torques abaixo:

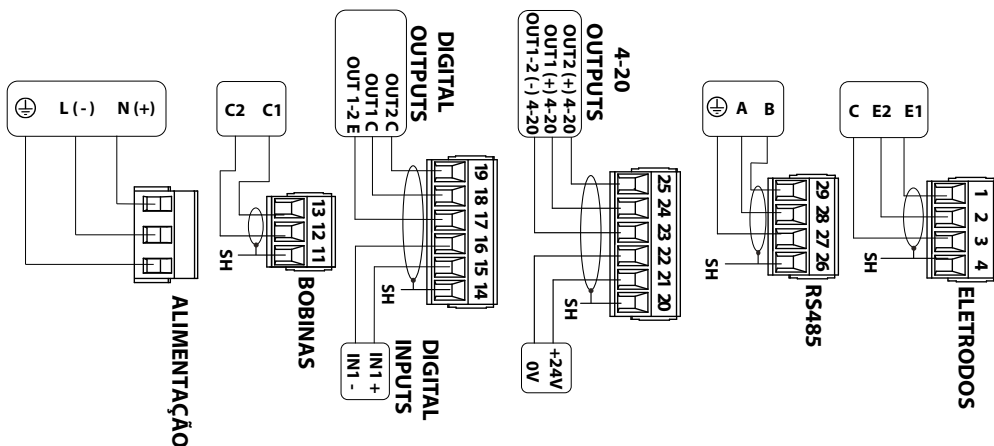
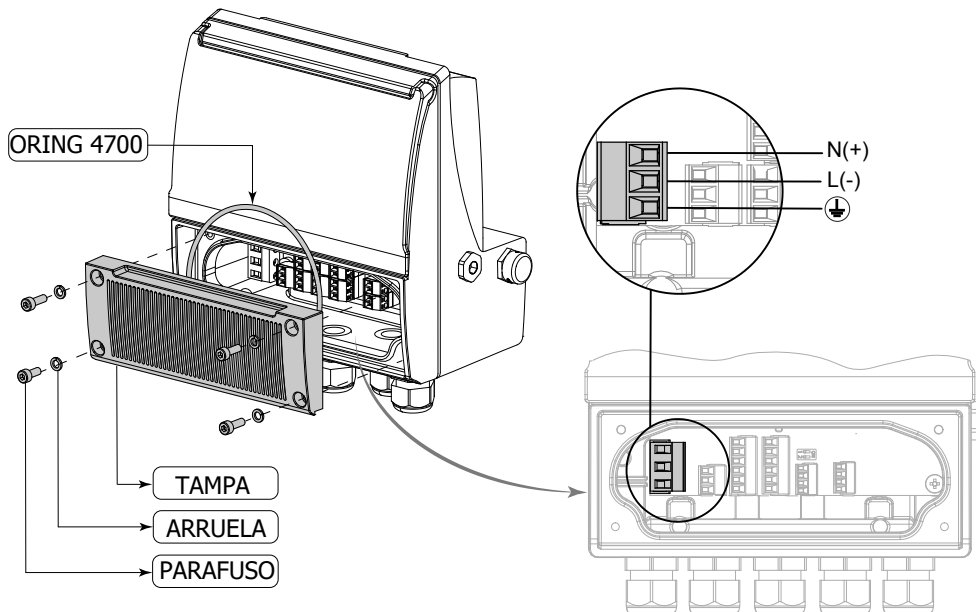
	Parafuso Invol. (1)	Parafuso tampa bloco de terminais (2)	Versão CUP (3)	Prensa Cabo (4)	Cup USB-B (5)
INVÓLUCRO ALUMÍNIO	6 Nm	5.5 Nm	8 Nm	4 Nm	4 Nm
INVÓLUCRO PA6	2 Nm	2 Nm	7 Nm	4 Nm	4 Nm



INSTRUÇÃO PARA CONEXÃO ELÉTRICA E ATERRAMENTO

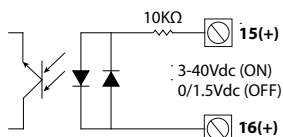


Assegure sempre que o conversor e o sensor estejam aterrados corretamente. O aterramento do sensor e conversor deve assegurar que o instrumento e o líquido estejam no mesmo potencial elétrico.

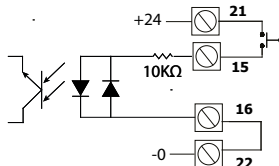


ENTRADA DIGITAL

ALIMENTAÇÃO EXTERNA

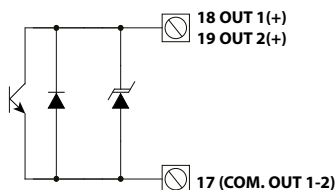


ALIMENTAÇÃO INTERNA



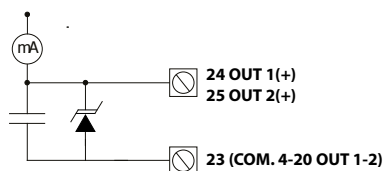
SAÍDAS

SAÍDA DIGITAL



- ☐ Saída com isolamento ótica com coletor e emissor flutuante.
- ☐ Máxima tensão de comutação: 40V
- ☐ Máxima corrente de comutação: 150mA
- ☐ Máxima tensão de saturação entre coletor e emissor @150mA: 1.2V
- ☐ Máxima frequência de comutação (carga no coletor ou emissor, $R_L=470$, $V_{OUT}=24V$): 1250Hz
- ☐ Máxima corrente reversa aceitável na entrada durante uma polarização reversa (VEC): 100mA
- ☐ Isolamento de outros circuitos secundários: 500V

SAÍDA ANALÓGICA



- ☐ Saída com isolamento ótica
- ☐ Carga Máxima: 1000Ω
- ☐ Tensão Máxima sem carga: 27V
- ☐ Frequência de atualização é a mesma da frequência do sensor conectado
- ☐ Proteção contra sobre tensão de no máximo 30V

CÓDIGO DE ACESSO DO CONVERSOR

O acesso a programação do instrumento é regulada por seis níveis de acesso agrupados logicamente. Cada nível é protegido por um código de acesso.

Código de acesso 1-2-3-4-5-6 são livremente programáveis pelo usuário.

Ajuste do código de acesso: MENU 13 - SYSTEM (Sistema)

```
SYSTEM
Data saving= ON
Time zone=h+01.00
2016/04/04-16:07
L1 code=*****
L2 code=*****
L3 code=*****
L4 code=*****
L5 code=*****
L6 code=*****
Restr.access= ON
010.011.012.013
010.011.012.014
255.255.255.000
KT= 0.96469
```

```
SYSTEM
L1 code=*****
L2 code=*****
L3 code=*****
L4 code=*****
L5 code=*****
L6 code=*****
0.99999999
```

O Código é inserido pelo teclado ou pela interface MCP. Dependendo do nível de acesso a ser visualizado nas funções do display. Estes acessos interagem com "Acesso Restrito"

RESTRICTED ACCESS SET MENU SYSTEM 13

```
SYSTEM
L1 code=*****
L2 code=*****
L3 code=*****
L4 code=*****
L5 code=*****
L6 code=*****
Restr.access=OFF
```

Valores de Ajuste

ON

OFF

Restrict = ON: Acesso permitido apenas as funções disponibilizadas ao nível específico;
Exemplo: Se o operador possui código de acesso nível 3, após inserir o código, ele poderá alterar parâmetros até o nível 3.

Restrict = OFF: Habilita as mudanças de função do nível selecionado e TODAS as funções com acesso inferior.

Exemplo: Se o operador possui o código nível 3, após inserir o código, ele poderá alterar todas as funções do nível 3 assim como as funções dos níveis inferiores.

ATENÇÃO: Tome nota do código inserido visto que não há como o usuário restaurar ou reiniciar se perdido. Abaixo seguem os códigos gerados em fábrica para cada nível:

☐ L1: 10000000
☐ L2: 20000000
☐ L3: 30000000

☐ L4: 40000000
☐ L5: 57291624
☐ L6: 65940123

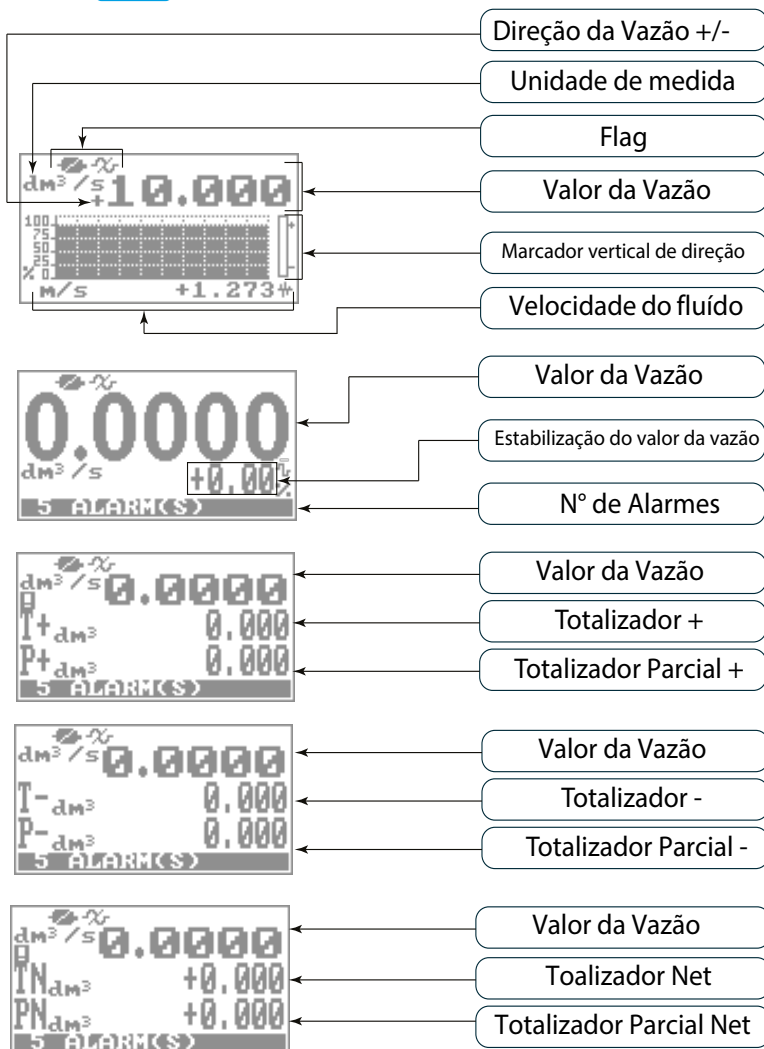
PÁGINA DE VISUALIZAÇÃO



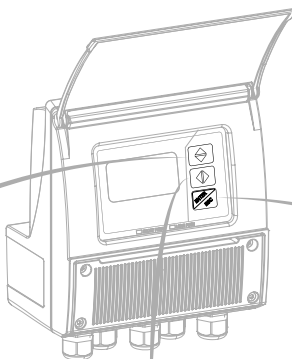
A exposição direta do conversor aos raios solares, pode danificar o cristal liquido do display. As páginas de visualização podem ser alteradas de acordo com o setup do instrumento.



Pressione para mudar a visualização



OPERAÇÃO DAS TECLAS



PRESSIONANDO RÁPIDO (< 1 SEGUNDO):

Aumenta o número do parâmetro selecionado pelo cursor e navega pelo menu.

PRESSIONANDO LONGAMENTE (> 1 SEGUNDO):

Diminui o número do parâmetro selecionado pelo cursor e navega pelo menu.



PRESSIONANDO RÁPIDO (< 1 SEGUNDO):

Move/posiciona o cursor para a direita. Navega pelo menu. Alterna o display da tela inicial.

PRESSIONANDO LONGAMENTE (> 1 SEGUNDO):

Move/posiciona o cursor para a esquerda. Navega pelo menu



PRESSIONANDO RÁPIDO (< 1 SEGUNDO):

Enter / permanece a função selecionada. Habilita o menu principal de configuração do instrumento. Cancela a função de seleção em progresso.

PRESSIONANDO LONGAMENTE (> 1 SEGUNDO):

Sai do menu. Habilita o reset do totalizador. Confirma a função selecionada.

ISOIL INDUSTRIA S.p.A.

HEAD OFFICE	JOINT VENTURE
Via Fratelli Gracchi, 27 20092 Cinisello Balsamo (MI) Tel +39 02 66027.1 Fax +39 02 6123202 vendite@isoil.it	Joint Venture Brasil ISOIL LAMON Rua Christina Maria Assis, 185 - Belo Horizonte - MG Phone: +5531-3373-1552 Email: vendas@isoil-lamon.com.br Web: www.isoil-lamon.com.br



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AZIENDA CON SISTEMA
DI GESTIONE QUALITÀ
CERTIFICATO DA DNV GL
= ISO 9001 =



NÃO DESCARTE O EQUIPAMENTO USADO
JUNTO AO LIXO COMUM. DESCARTE-O A
UM SEGREGADOR DE LIXO PARA
RECICLAGEM.

ISOIL 
L  M O N

CONVERSOR (MV110)

Material do Corpo: Nylon;

Grau de Proteção: IP-67;

Versão da montagem: Separado;

Temperatura de operação: -10 a 50°C;

Indicação: Display gráfico de 128x64 pixels com iluminação de fundo e possibilidade de visualização da vazão e volume simultaneamente – possui dois totalizadores independentes – possui *prompt* claro de texto para operação com todas as funções e dados ajustáveis. Totalizador com 9 dígitos salvo em memória não volátil;

Programação: através de 03 teclas localizadas no frontal do conversor – possibilidade de programação do modelo do sensor, fator de calibração, chave de habilitação – Opcionalmente via cabo USB 2.0 padrão Mini-B e software configurador gratuito;

Senha de Proteção: senha de proteção de 7 dígitos programável pelo usuário com 6 níveis de acesso;

Consumo máximo: 5VA;

Alimentação: 12-48vdc

Saída Analógica: 01 saída analógica 4...20mA, com impedância de carga máxima de 800 Ohms;

Saída Digital: 02 saídas digitais com frequência de 1250Hz - saídas de pulso podem ser programadas para funcionar como totalização ou saída para alarme;

Comunicação Digital: nenhuma;

Medição de fluxo bidirecional: sim;

Correção do perfil do fluxo: sim;

Menor velocidade detectável: 0,01m/s;

Faixa de velocidade máxima de medição: 10m/s;

Ajustes da faixa de velocidade: 0 a 0,4m/s à 0 a 10m/s;

Faixa de Velocidade ajustada: 0,1 a 8m/s;

Frequência de excitação do sensor: ajustável a até 50 Hz;

Funções de diagnósticos: sim;

Deteção de falha das bobinas: sim;

Deteção de tubo vazio: sim;

Auto Zero: automático;

Senha de proteção: sim;

Ajuste de Zero e Span não interativos: sim;

Indicação sentido do fluxo: sim;

Corte de vazão baixa: sim – programável;

Estabilidade de zero: 0,005%;

Totalização: Sentido direto e reverso, sendo vazão bidirecional, volume positivo/negativo;

Damping: programável entre 0,1 a 1000s ou ainda, possui a opção de damping automático, que se ajusta em função do comportamento e estabilidade da vazão indicada;



Unidade de indicação: unidade métrica (SI) para indicação vazão ou volume, por exemplo, l/s, m³/h, l, m³ etc.

Campo para inserção da constante de linearização do sensor: sim;

Sistema de autolimpeza dos eletrodos: sim, por pulso de tensão alternada permitindo assim a despolarização e limpeza dos eletrodos – recurso default (habilitável pelo usuário);

Isolação galvânica: todas as entradas e saídas são isoladas galvanicamente da alimentação;

Compatibilidade Eletromagnética: EN-61326-1 (2007) e EN-61010-1 (2001);

Manual de Instrução: fornecido manual de instrução em português contendo todas as informações necessárias para operação e instalação do medidor;

Assistência Técnica: toda a assistência técnica dos equipamentos fornecidos será realizada no Brasil.

Acessórios:

- Protetor de surto categoria III



Sistema de Cadastramento Unificado de Fornecedores - SICAF

Relatório de Credenciamento

Dados do Fornecedor

CNPJ: 14.502.966/0001-31 DUNS®: 901082125
Razão Social: ISOIL LAMON INDUSTRIA DE EQUIPAMENTOS E SERVICOS DE INSTRUMENTACAO LTDA.
Nome Fantasia:
Situação do Fornecedor: **Credenciado** Data de Vencimento do Cadastro: **02/06/2026**

Dados do Nível

Situação do Nível: **Cadastrado**

Dados do Fornecedor

Porte da Empresa: **Demais**
Natureza Jurídica: **SOCIEDADE EMPRESÁRIA LIMITADA** MEI: **Não**
Capital Social: **R\$ 750.000,00** Data de Abertura da Empresa: **20/10/2011**
CNAE Primário: **2651-5/00 - FABRICAÇÃO DE APARELHOS E EQUIPAMENTOS DE MEDIDA, TESTE E CONTROLE**

CNAE Secundário 1: **3312-1/02 - MANUTENÇÃO E REPARAÇÃO DE APARELHOS E**
CNAE Secundário 2: **4614-1/00 - REPRESENTANTES COMERCIAIS E AGENTES DO COMÉRCIO**
CNAE Secundário 3: **4669-9/99 - COMÉRCIO ATACADISTA DE OUTRAS MÁQUINAS E**
CNAE Secundário 4: **7112-0/00 - SERVIÇOS DE ENGENHARIA**
CNAE Secundário 5: **7120-1/00 - TESTES E ANÁLISES TÉCNICAS**
CNAE Secundário 6: **7739-0/99 - ALUGUEL DE OUTRAS MÁQUINAS E EQUIPAMENTOS**

Dados para Contato

CEP: **30.855-440**
Endereço: **RUA CHRISTINA MARIA DE ASSIS, 185 - CALIFORNIA**
Município / UF: **Belo Horizonte / Minas Gerais**
Telefone: **(31) 33978590** Telefone: **(31) 33978633**
E-mail: **NALDECI@TERRA.COM.BR**

Dados do Responsável Legal

CPF: **227.525.446-34**
Nome: **VERA LUCIA PEREIRA ARAUJO LAMON**

Relatório de Credenciamento

Dados do Responsável pelo Cadastro

CPF: 227.525.446-34
Nome: VERA LUCIA PEREIRA ARAUJO LAMON
E-mail: lamon@lamon.com.br

Relatório de Credenciamento

Sócios / Administradores

Dados do Sócio/Administrador 1

CPF: 227.525.446-34 Participação Societária: 3,34%
Nome: VERA LUCIA PEREIRA ARAUJO LAMON
Número do Documento: M984371 Órgão Expedidor: SSPMG
Data de Expedição: 19/07/1978 Data de Nascimento: 04/03/1958
Filiação Materna: ABIGAIL PEREIRA ARAUJO
Estado Civil: Casado(a)

Dados do Cônjuge/Companheiro(a)

Estrangeiro: Não CPF: 008.471.516-20
Nome: GERALDO PEDRO DA SILVA LAMON
Carteira de Identidade: Órgão Expedidor:
Data de Expedição:

CEP: 30.441-008
Endereço: OUTROS BERNARDINO DE LIMA, 230 - APT 703 - GUTIERREZ
Município / UF: Belo Horizonte / Minas Gerais
Telefone:
E-mail: lamon@lamon.com.br

Dados do Sócio/Administrador 2

CPF: 008.471.516-20 Participação Societária: 10,00%
Nome: GERALDO PEDRO DA SILVA LAMON
Número do Documento: 140728862-8 Órgão Expedidor: CREAMG
Data de Expedição: 14/07/2009 Data de Nascimento: 19/08/1943
Filiação Materna: MARIA JOSE SILVA LAMON
Estado Civil: Casado(a)

Dados do Cônjuge/Companheiro(a)

Estrangeiro: Não CPF: 227.525.446-34
Nome: VERA LUCIA PEREIRA ARAUJO LAMON
Carteira de Identidade: Órgão Expedidor:
Data de Expedição:

CEP: 30.441-008
Endereço: RUA BERNARDINO DE LIMA, 230 - APT 703 - GUTIERREZ
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Telefone: (31) 33731552
E-mail: lamon@lamon.com.br

Relatório de Credenciamento

Dados do Sócio/Administrador 3

CPF: 034.115.056-80 Participação Societária: 10,00%
Nome: RODRIGO DE ARAUJO LAMON
Número do Documento: M7154841 Órgão Expedidor: SSPMG
Data de Expedição: 21/07/1994 Data de Nascimento: 30/09/1978
Filiação Materna: VERA LUCIA PEREIRA ARAUJO LAMON
Estado Civil: Casado(a)

Dados do Cônjuge/Companheiro(a)

Estrangeiro: Não CPF: 039.957.276-70
Nome: CINTIA BORGES RIBEIRO LAMON
Carteira de Identidade: Órgão Expedidor:
Data de Expedição:

CEP: 30.441-023
Endereço: RUA HERCULANO DE FREITAS, 1409 - AP 702 - GUTIERREZ
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Telefone: (31) 00000000
E-mail: lamon@lamon.com.br

Dados do Sócio/Administrador 4

CPF: 037.699.476-22 Participação Societária: 10,00%
Nome: GUSTAVO DE ARAUJO LAMON
Número do Documento: M9139028 Órgão Expedidor: SSPMG
Data de Expedição: 21/07/1994 Data de Nascimento: 08/01/1980
Filiação Materna: VERA LUCIA PEREIRA ARAUJO LAMON
Estado Civil: Solteiro(a)
CEP: 30.441-042
Endereço: RUA ESTACIO DE SA, 921 - APTO 202 - GUTIERREZ
Município / UF: Belo Horizonte / Minas Gerais
Telefone: (31) 92097582
E-mail: lamon@lamon.com.br

Dados do Sócio/Administrador 5

CNPJ: 14.170.927/0001-84 Participação Societária: 33,33%
Nome: ISOIL INDUSTRIA SPA
Data Abertura Empresa: 23/08/2011
CEP:
Endereço: VIALLE VITTORIO VENETO, 24
Município / UF:
Telefone:
E-mail:

Relatório de Credenciamento

Dados do Sócio/Administrador 6

CNPJ: 14.170.926/0001-30 Participação Societária: 33,33%
Nome: HEMINA S.P.A.
Data Abertura Empresa: 23/08/2011
CEP:
Endereço: VIA DELLE MOLLE, 9
Município / UF:
Telefone:
E-mail:

Linhas Fornecimento

Serviços

19763 - Fabricação / Manutenção - Processo Industrial

20265 - Instalação / Manutenção - Equipamentos Industriais



ISOMAG 

The friendly magmeter

DATA SHEET

MV110



CE

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I N D U S T R I A

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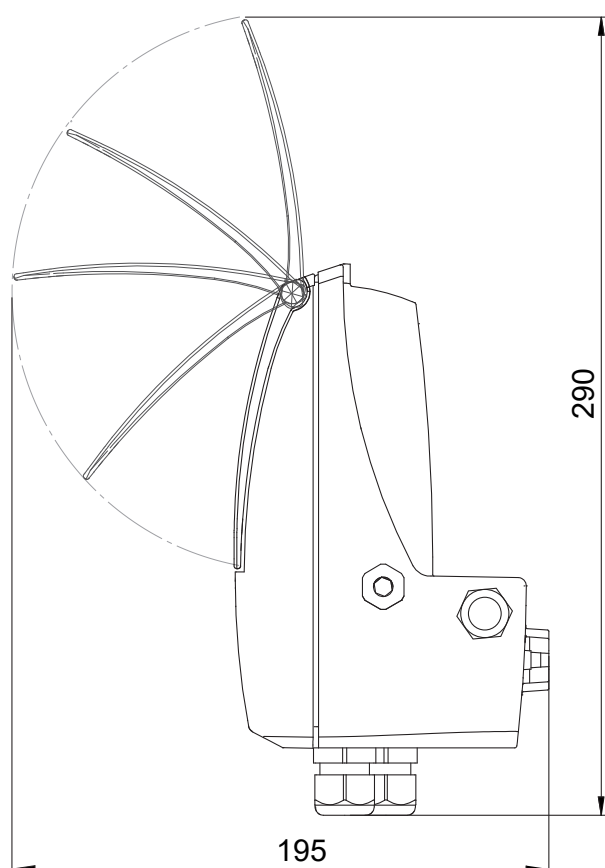
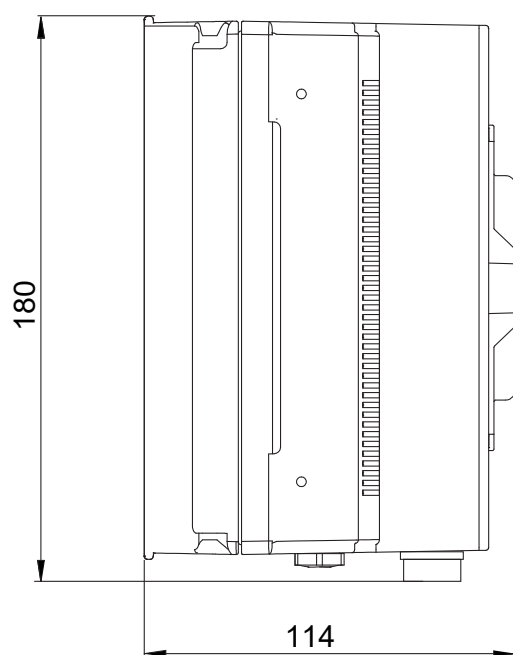
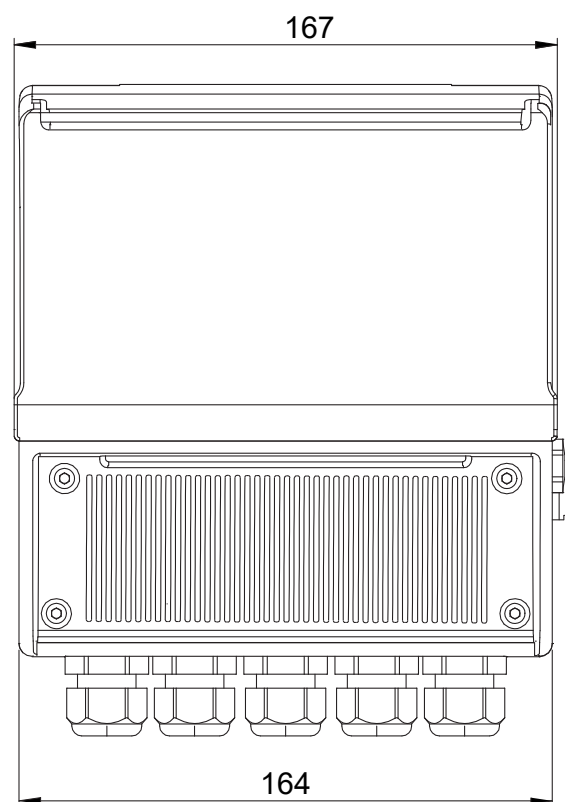
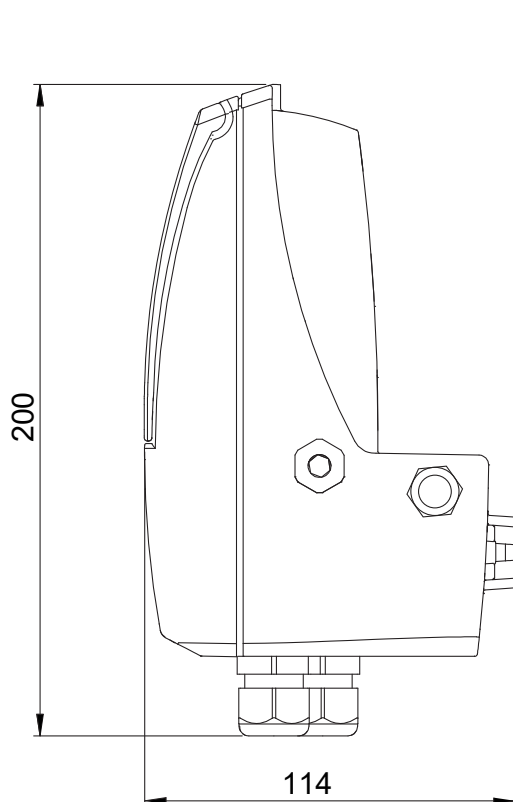
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OVERALL FEATURES	
Suitable For	☐ All the ISOMAG® sensors up to the DN 1000
Minimum conductivity	☐ 5 µS/cm
Altitude	☐ -200 m up to 4000 m
Ambient Temperature	☐ -20... +60°C / -4... +140 °F - Aluminium housing ☐ -10... +50°C / +14...+122 °F - Reinforced Nylon
Humidity Range	☐ 0÷100%
STANDARD FEATURES	
Version	☐ Compact ☐ Separate
Housing materials	☐ Painted Aluminium die casting ☐ Nylon reinforced with 15% of fiber glass ☐ AISI304 Stainless Steel
Protection Rate	☐ IP 67
Power Supply/Consumption	☐ 5W – 44-66 Hz
Cable Gland	☐ N° 5 cable gland PG 11
Full scale value	☐ 0,4...10m/s
Dig. Input	☐ N°1 , programmable function (i.e. Totalizer reset)
Data Storage	☐ Values storing system in case of power failure
Galvanic Isolation	☐ All the inputs/outputs are galvanically isolated from power supply up to 250 V
Programming Plug In	☐ USB port for the connection to PC (USB cable type A/USB MINI B is required for the programming)
Bi-Directional	☐ Yes
Diagnostic Funct.	☐ Yes
Empty Pipe Detect.	☐ Yes
CE Certification	☐ Yes
OPTIONAL FEATURES (CHECK HOW TO ORDER, AT LAST PAGE, FOR MORE DETAILS)	
Protection Rate	☐ IP 68
Conn. Sensor Cable	☐ CABLE C014 for separate version
LCD Display	☐ Graphic display 128x64 pixels back light, 3 programming keys
Power Supply/Consumption	☐ Power supply : 24 ... 36 VAC/VDC 0...45/66 Hz ☐ Power supply : 12...48 VDC ☐ Power supply : 100 ... 240 VAC 44/66 Hz + 1 Rechargeable Battery ☐ Power supply : 24 ... 36 VAC/VDC 0...44/66 Hz + 1 Rechargeable Battery ☐ Power supply : 12...48 VDC + 1 Rechargeable Battery
Outputs: Pulses/Frequence/Alarms	☐ N°1 digital Output , 1250 Hz, 100mA, 30 Vdc ☐ N°2 digital Outputs , 1250 Hz, 100mA, 30 Vdc
Analog Output	☐ n° 1 Analogue output 0/4...20/22 mA (Hart optional) ☐ n° 2 Analogue outputs 0/4...20/22 mA (Hart optional over Out.1)
Communication Gateway	☐ RS 485 ☐ Wi-Fi (for programming)
Data Logger	☐ MicroSD Memory Card 4...32 GBytes
Protocols	☐ Modbus over RS 485 ☐ HART (Available on analog output n° 1) ☐ MeterBus
MID Certifications	☐ MI-001  ☐ MI-004
ACCURACY	
Measurements tolerance	☐ Flow rate (volume) = ±0,05% c.r ☐ Out 4/20 mA = ± 0,08 % c.r ☐ Frequency Out = ± 0,08% c.r
Accuracy (Whole System Converter+Sensor)	☐ See table below

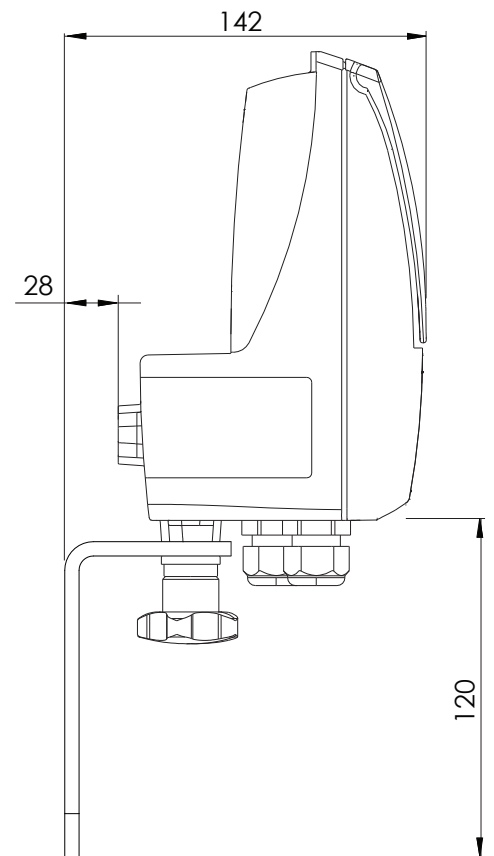
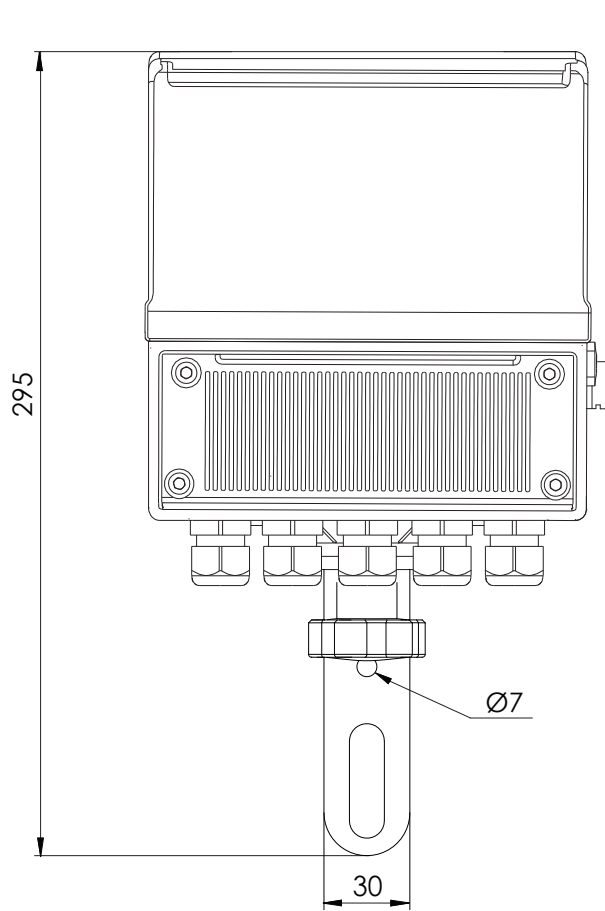


OVERALL DIMENSIONS

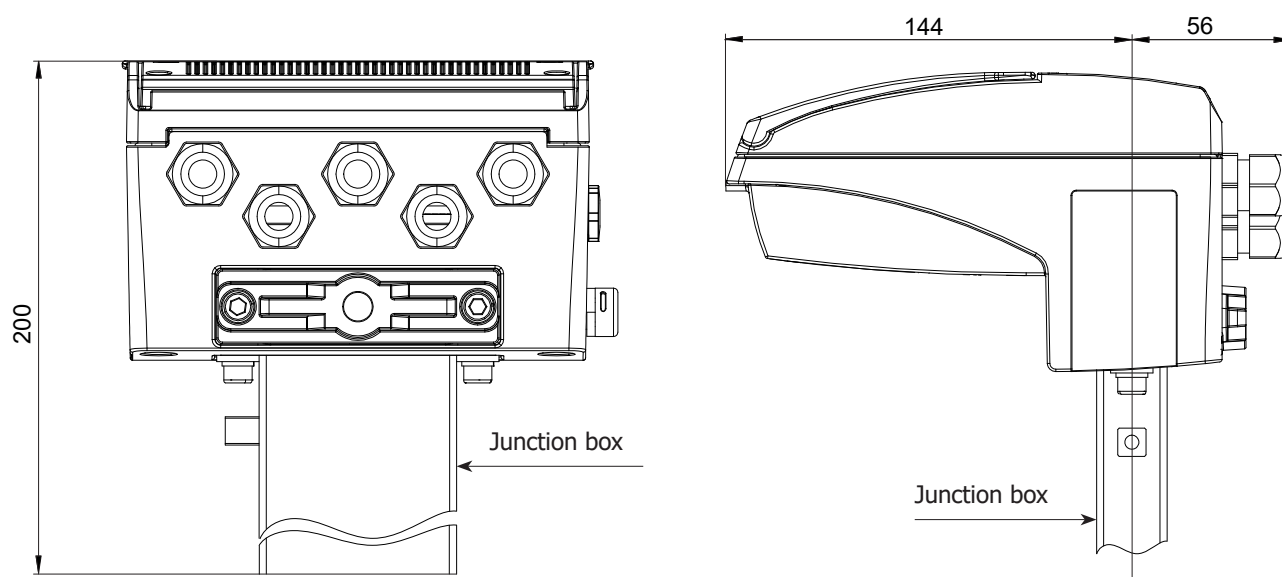
Compact version



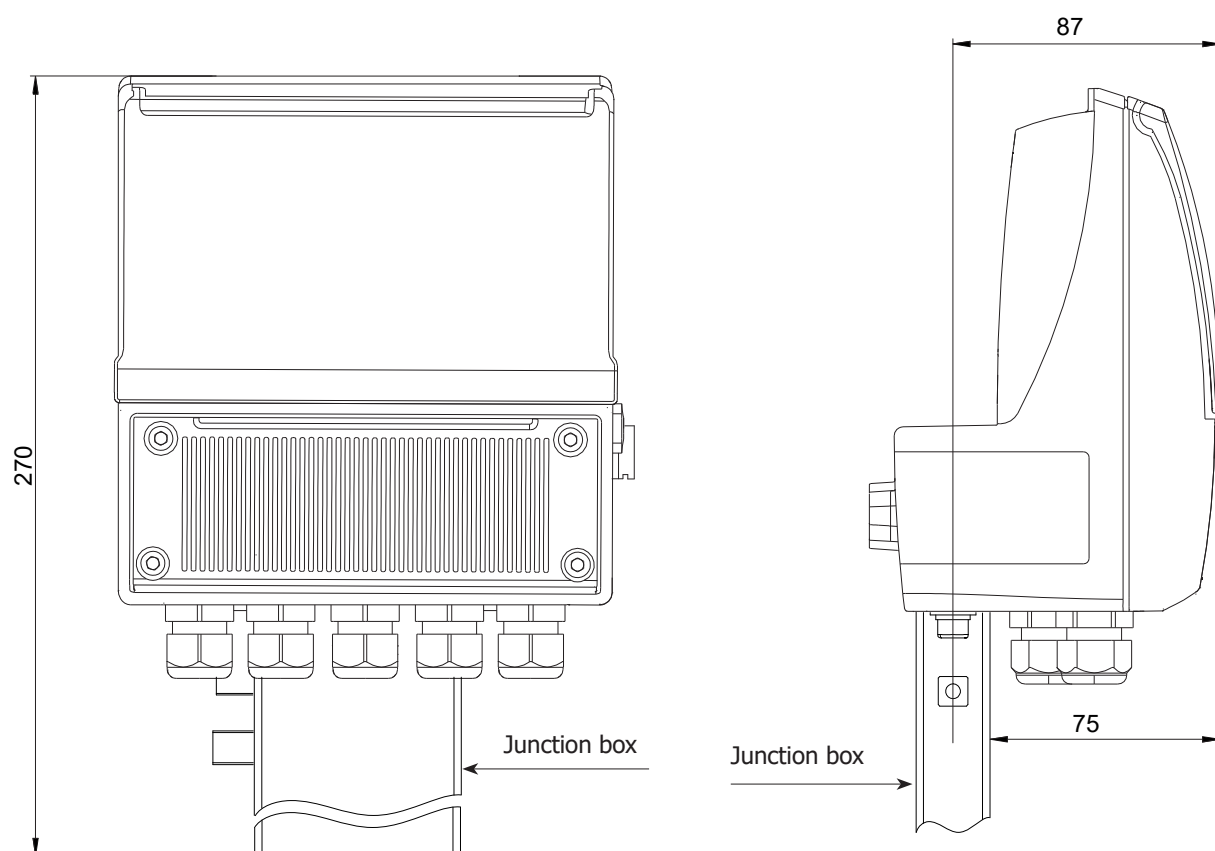
Separate (wall) version



Horizontal version

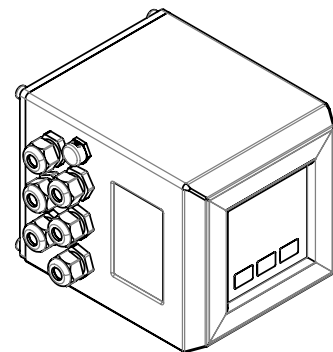
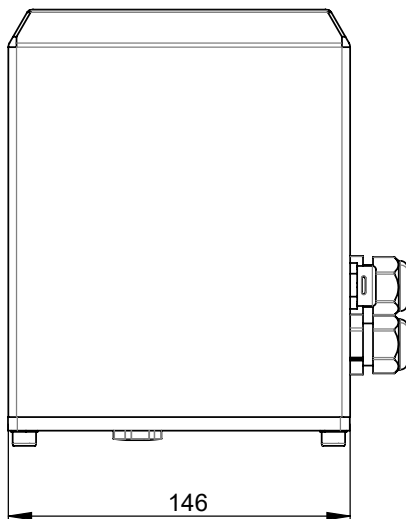
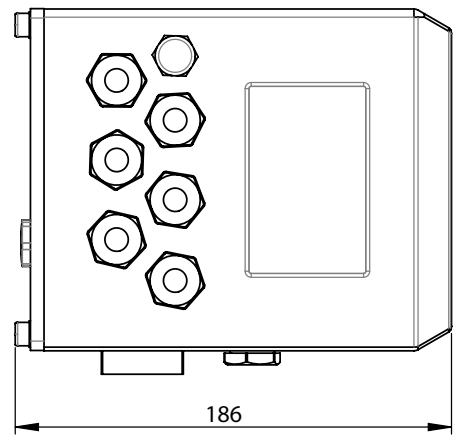
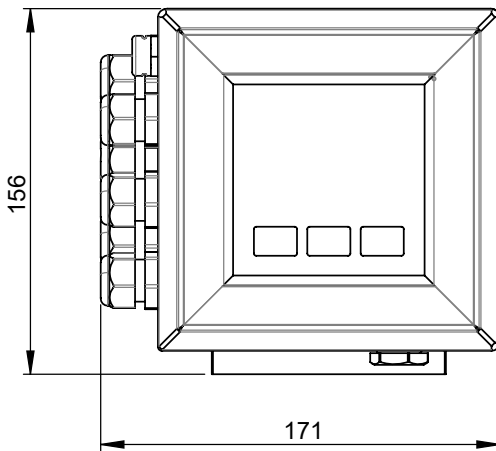


Vertical version

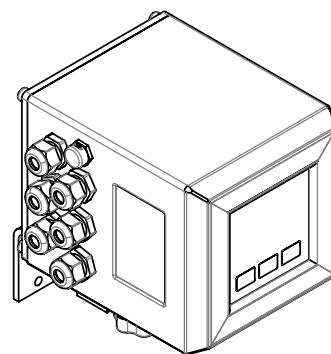
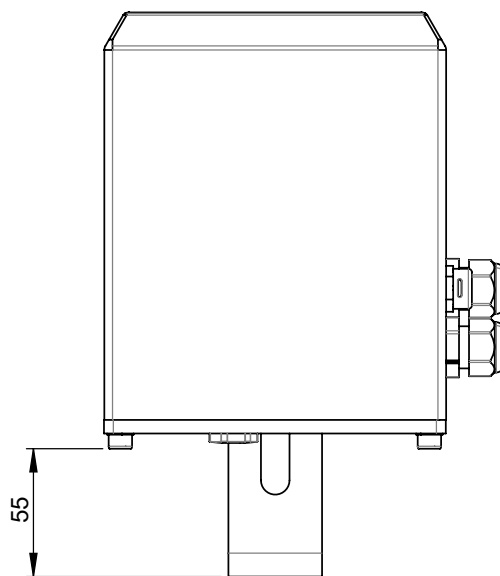
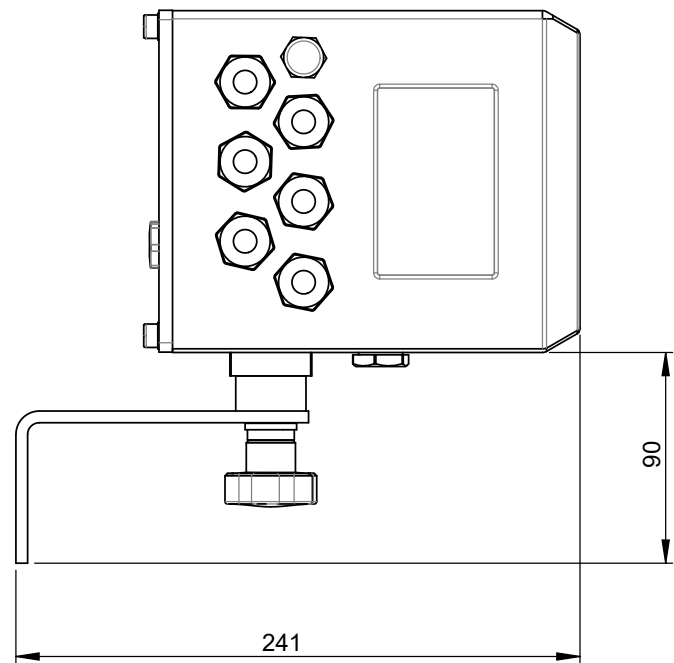
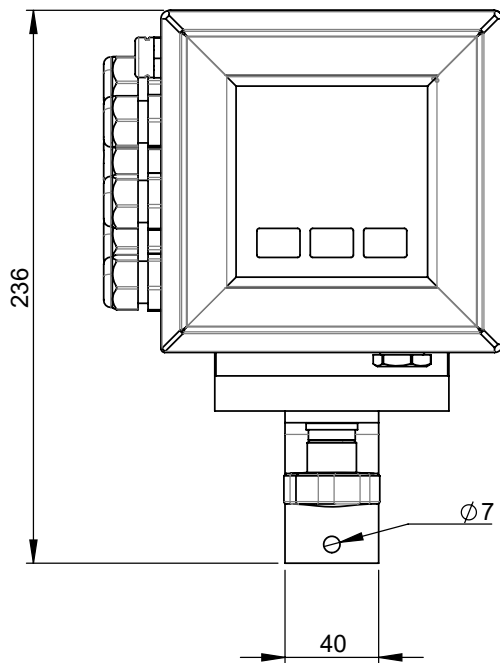


OVERALL DIMENSIONS (STAINLESS STEEL VERSION)

Compact Version

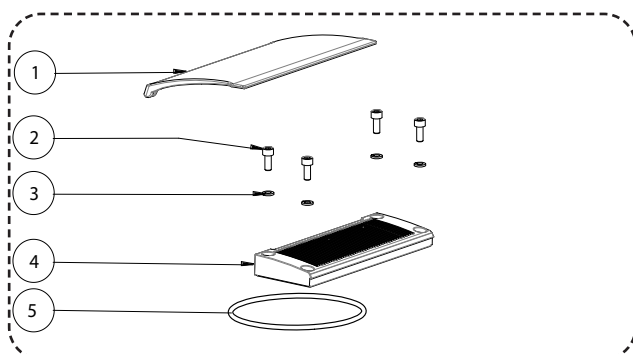


Separate Version

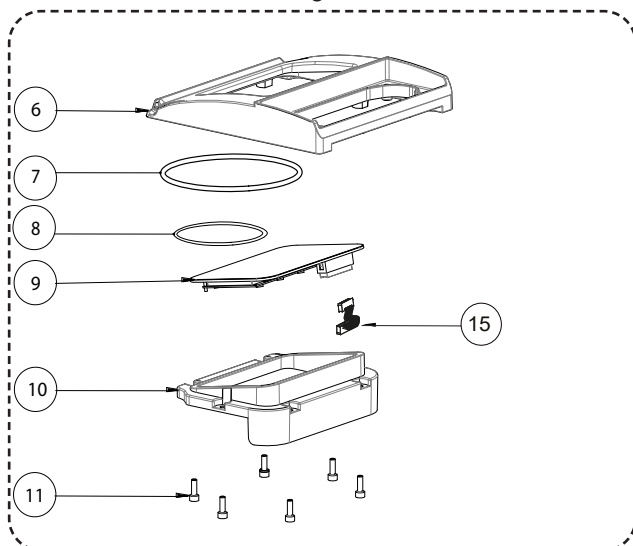


MV110 EXPLODED LAYOUT

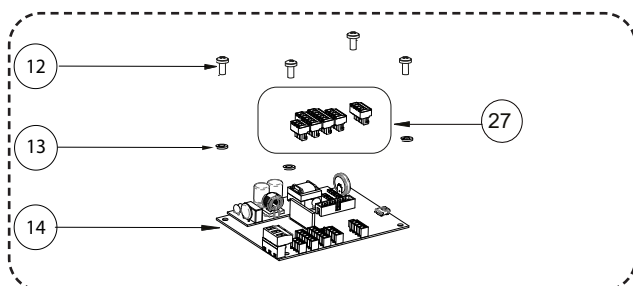
Terminal block cover



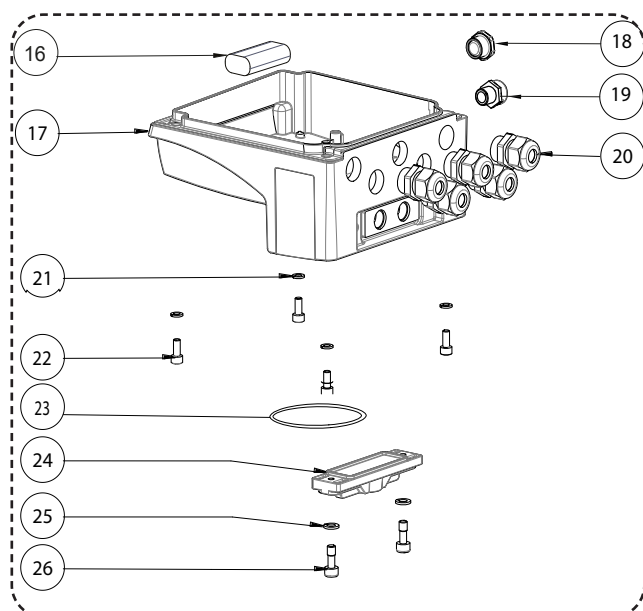
Main housing cover



PCB MV210

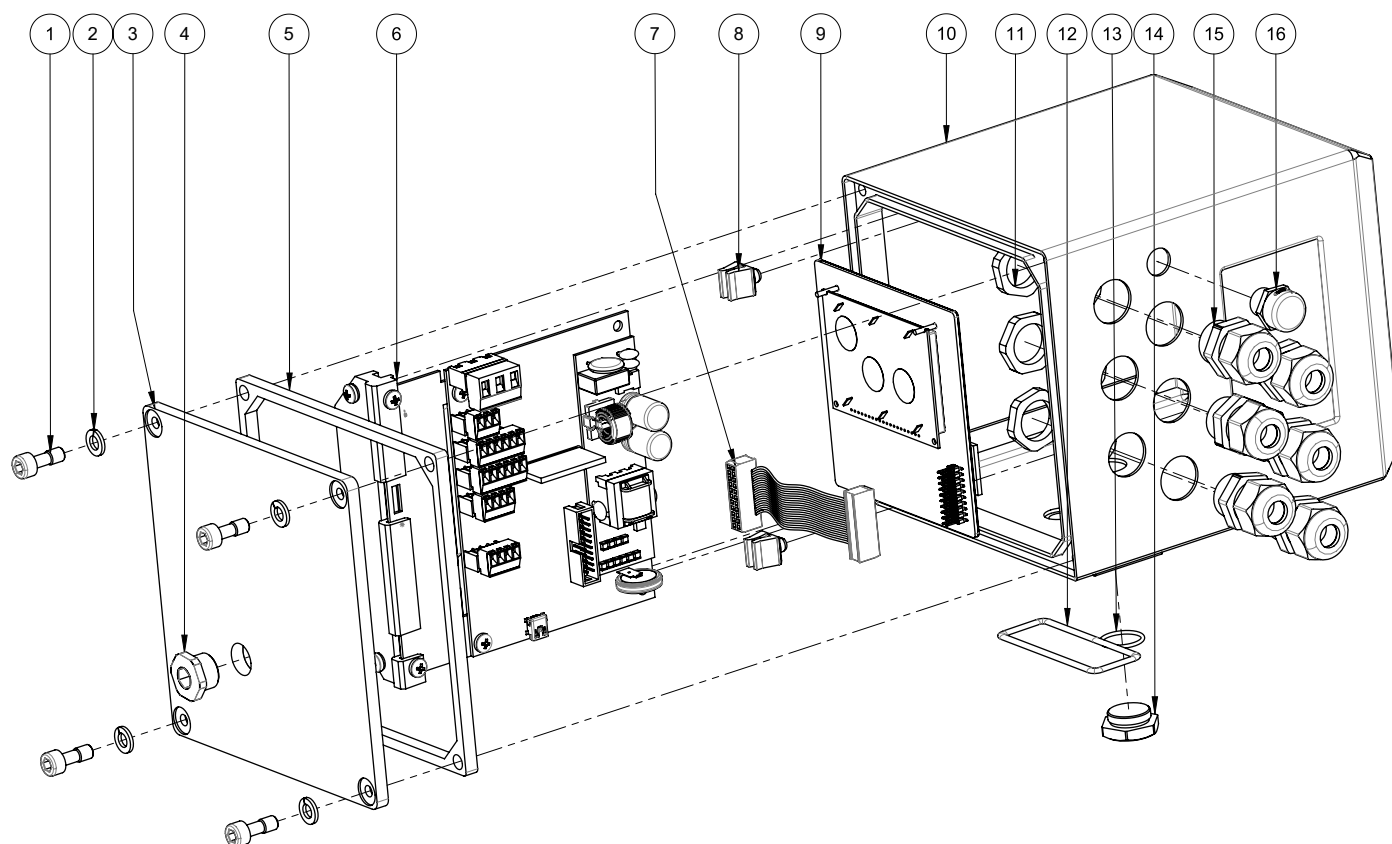


Main housing



POS.	DESCRIPTION	
	PA6 VERSION	ALLUMINIUM VERSION
1	PROTECTION COVER	
2	VITE M4x12	VITE M5x12
3	GROWER Ø4	GROWER Ø5
4	TERMINAL COVER	TERMINAL COVER
5	O-RING-4400	
6	HOUSING COVER	HOUSING COVER
7	O-RING-4700 (HOUSING COVER)	
8	O-RING-117x3 (DISPLAY)	
9	DISPLAY	
10	FIXING DISPLAY FRAME (MATERIAL PA06)	
11	SELF-TAPPING SCREW 4x10	TRILOBO SCREW 4x10
12	SELF-TAPPING SCREW 4x10	TRILOBO SCREW 4x10
13	GROWER Ø4	SPRING WASHER Ø4
14	PCB MV210	
15	FLAT CABLE	
16	LITHIUM BATTERY	
17	PA6 MAIN HOUSING	ALUMINIUM MAIN HOUSING
18	PG9 CAP	
19	ANTICONDENSE CAP	
20	PG11 CABLE GLAND CABLE DIAMETER: Ø5-Ø10mm	
21	GROWER Ø4	SPRING WASHER Ø5
22	SCREW M4x12	SCREW M5x12
23	O-RING-155	
24	VERSION CAP (MATERIAL PA06)	
25	GROWER Ø6	
26	SCREW M6x16	
27	TERMINAL BLOCK SOLID WIRE: 26-16 AWG / 0.129-1.31 mm² STRANDED WIRE: 26-16 AWG / 0.129-1.31 mm² TORQUE: 3.0 Lb.In / 0.34 Nm	

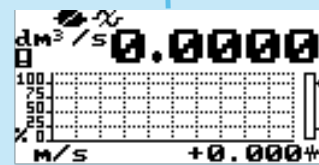
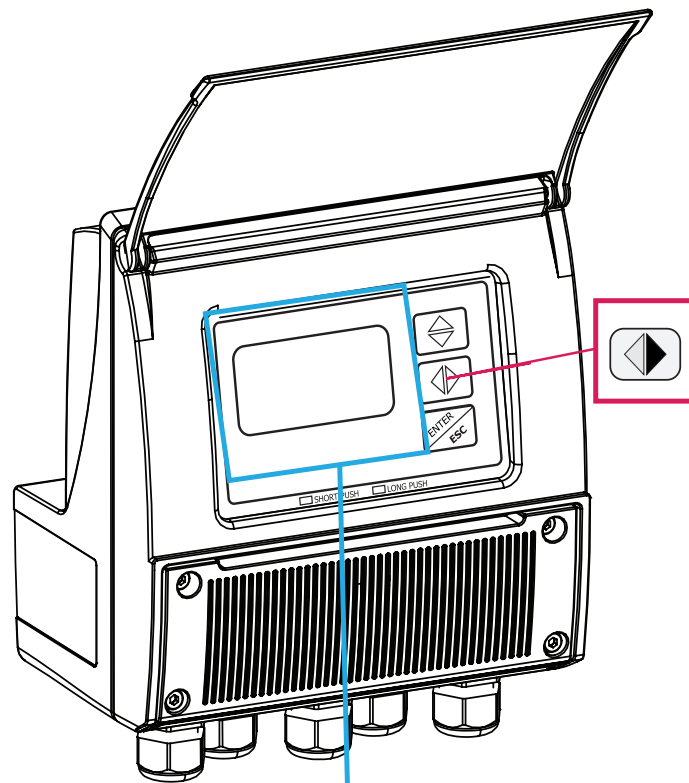
MV110 CONSTRUCTION (STAINLESS STEEL VERSION)



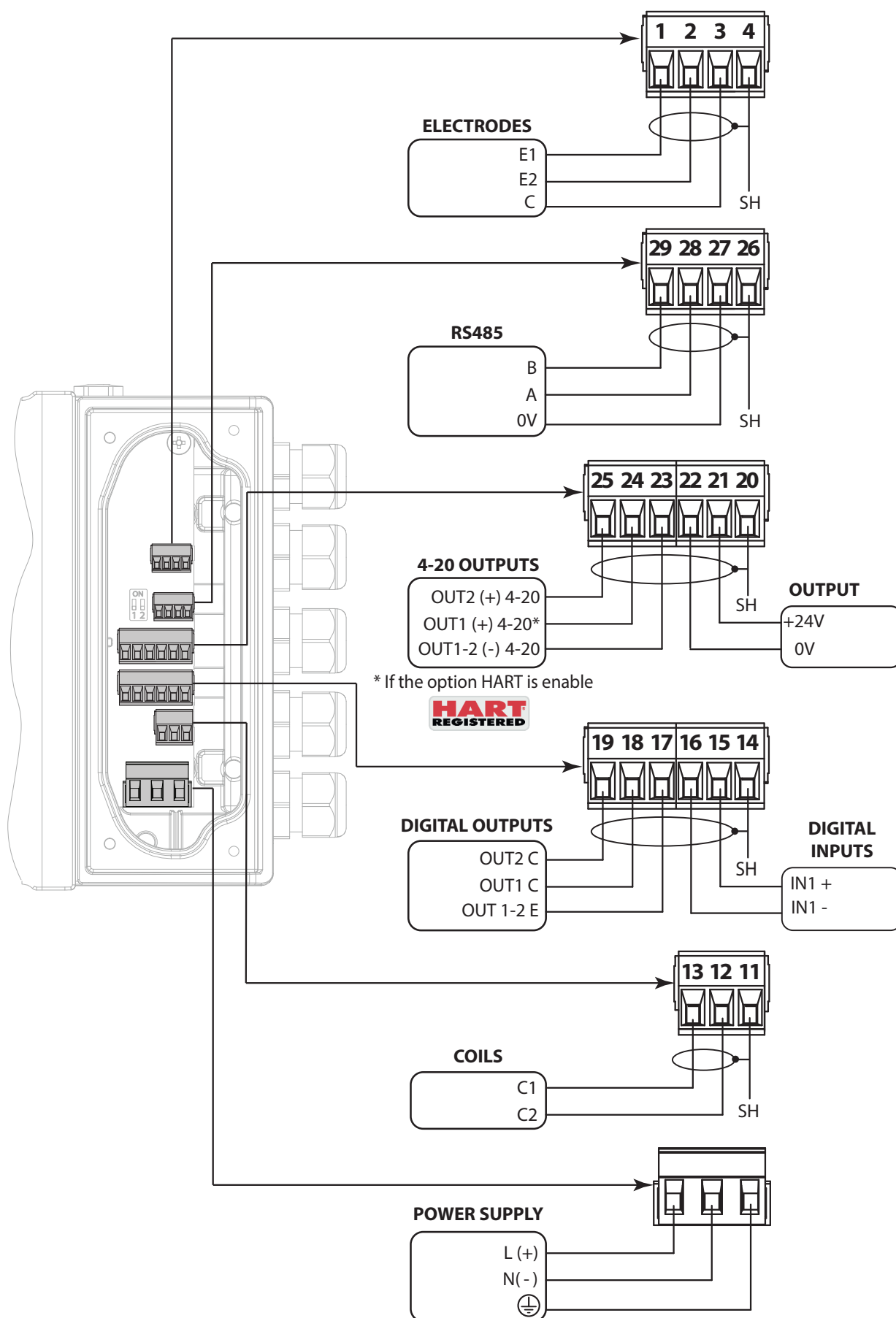
POS.	DESCRIPTION
1	SCREW M6X16
2	GROWER Ø 6
3	POLISHED COVER
4	PG9 CAP IP68
5	GASKET FOR Stainless steel HOUSING
6	BOARD FRAME M3C
7	FLAT CABLE
8	BOARD FIXING CLIPS
9	DISPLAY/BLIND
10	POLISHED Stainless steel HOUSING
11	PG11 NUT
12	FLAT GASKET O-RING 155
13	O-RING ORM 0160-15 Ø16X1.5
14	Stainless steel CAP M18X0.75
15	PG11 CABLE GLANDS
16	ANTICONDENSATION CAP

MAIN PAGES VISUALISATION

Different visualization possibilities by simply pressing of a key.

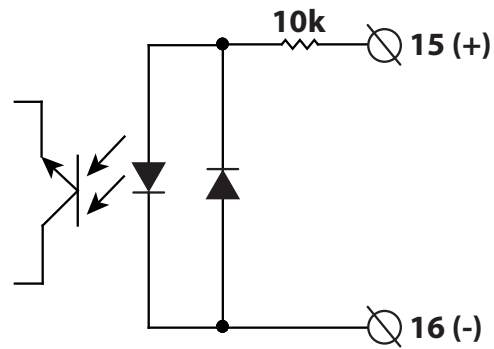


ELECTRICAL CONNECTIONS

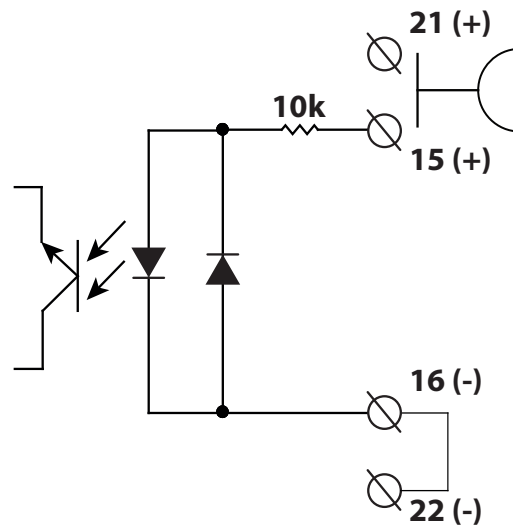


DIGITAL INPUT

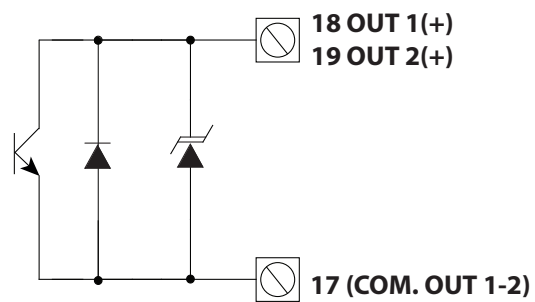
on/off input
(external power supply)



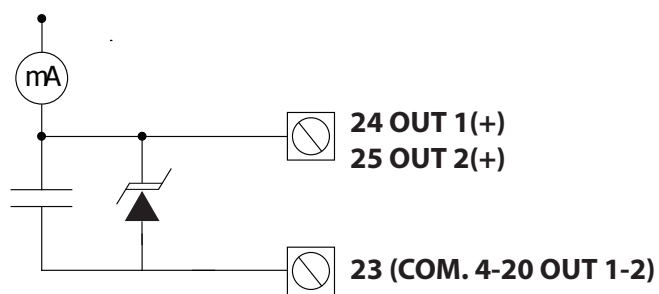
on/off input
(internal power supply)



DIGITAL OUTPUTS



ANALOG OUTPUTS



FUNCTIONS MENU

SENSOR

MAIN MENU			
1	1-Sensor		
2	2-Units		
3	3-Totalizer		
4	4-Configuration		
5	5-About		
6	6-Factory Reset		
7	7-Flow Rate		
8	8-Flow Rate		
9	9-Flow Rate		
10	10-Flow Rate		
11	11-Flow Rate		
12	12-Flow Rate		
13	13-Flow Rate		
	SENSOR		
	S. model =	0	1.1 Sensors model: Enter the first two characters of the serial number of the sensor
	Lining =	UNSPEC.	1.2 Flow sensor lining material type
	S. type =	FULL BORE	1.3 Type of sensor: fullbore or insertion
	u. type =	METRIC	1.4 Type of measure units for sensor parameter: metric or imperial
	Diam	mm 00025.0	1.5 Insert ND of sensor (0-2500)
	KA =	+00.9637	1.6 Calibration data of sensor visualized on sensor's label
	KA- =	-04.4904	1.7 Sensor coefficient KZ (zero point)
	KZ =	+0000000	1.8 Sensor coefficient KD
	KD =	+0000000	1.9 Insertion position
	Ins. position =	0	1.10 KP dynamic, coefficient for insertion
	KP Dinamic =	OFF	1.11 Sensor coefficient Ki
	Ki =	01.8727	1.12 Sensor coefficient Kp
	Kp =	01.0000	1.13 Sensor coefficient KC
	KC =	1.00000	1.14 CW volume total. decimal point position
	C.curr =	025.0	1.15 Current regulator proportional band
	C.Reg.PB =	004	1.16 Current regulator derivation constant
	C.Reg.DH =	008	1.17 Measure sampling frequency
	S. Freq. = Hz	50	1.18 Enables the preamplifier
	Preamplif.	OFF	1.19 Enables the empty pipe detection feature
	E.P Detect =	ON	1.20 Empty pipe detection threshold
	R max = kohm	0500	1.21 Electrode cleaning
	El. Cleaning =	OFF	1.22 Sensor connecting cable length
	S. cable =	m 000	1.23 Signal error delay (n. sample)
	S. err. delay =	010	1.24 Automatic sensor verify enable
	Sens. verify =	OFF	1.25 Pipe hydraulic zero calibration
	Zero point cal.		1.27 Coefficient KL values
	KL	00.00000000	

MAIN MENU			
1	1-Sensor		
2	2-Units		
3	3-Totalizer		
4	4-Configuration		
5	5-About		
6	6-Factory Reset		
7	7-Flow Rate		
8	8-Flow Rate		
9	9-Flow Rate		
10	10-Flow Rate		
11	11-Flow Rate		
12	12-Flow Rate		
13	13-Flow Rate		
	UNITS		
	Diam.	mm	2.1 Nominal diameter measure unit
	S.cable	m	2.2 Cable length on separate version
	FR.unit	METRIC	2.3 Flowrate type measure unit: metric or not metric
	PI1 unit	METRIC	2.4 Pulse 1 type measure unit: metric or not metric
	PI2 unit	METRIC	2.5 Pulse 2 type measure unit: metric or not metric
	T+ unit	METRIC	2.6 Total direct totalizer measure unit type: metric or not metric
	T+ unit	g	2.7 Total direct totalizer measure unit
	T+ D.P	3	2.8 Total direct totalizer decimal point position
	P+ unit	METRIC	2.9 Partial direct totalizer measure unit type: metric or not metric
	P+ unit	g	2.10 Partial direct totalizer measure unit
	P+ D.P	3	2.11 Partial direct totalizer decimal point position
	T- unit	METRIC	2.12 Total reverse totalizer measure unit type: metric or not metric
	T- unit	g	2.13 Total reverse totalizer measure unit
	T- D.P	3	2.14 Total reverse totalizer decimal point position
	P- unit	METRIC	2.15 Partial reverse totalizer measure unit type: metric or not metric
	P- unit	g	2.16 Partial reverse totalizer measure unit
	P- D.P	3	2.17 Partial reverse totalizer decimal point position
	Temp.unit	°C	2.18 Temperature measure unit
	Mass units	ON	2.19 Enable/disable the selection of mass units on full scale set
	Sg=kg/dm3	1.0000	2.20 Specific gravity coefficient

UNITS

SCALES

MAIN MENU	
1-Sensor	
2-Units	
3-Scales	
4-Measure	
5-Alarms	
6-Inputs	
SCALES	
7-FS1 g/s	4908.7
8-FS2 g/s	4908.7
9-Pls1=g	1000.00
10-Tpls1=ms	0050.0
11-Pls2=g	1000.00
12-Tpls2=g	0050.0
13-Frq1=Hz	1000.00
14-Frq2=Hz	1000.00

3.1	Full scale flow rate 1
3.2	Full scale flow rate 2
3.3	Pulse value on channel 1
3.4	Duration of the pulse generated on channel 1
3.5	Pulse value on channel 2
3.6	Duration of the pulse generated on channel 2
3.7	Full scale frequency for channel 1 (0.1Hz-1000.0Hz)
3.8	Full scale frequency for channel 2 (0.1Hz-1000.0Hz)

MEASURES

MAIN MENU	
1-Sensor	
2-Units	
3-Scales	
4-Measure	
5-Alarms	
6-Inputs	
MEASURES	
7-Damping	SMART
8-Cut-off= %	00.1
9-DT Min.	ON
10-T1HC enable	ON
11-T1HC	OFF

4.1	Measure filter
4.2	Low flow zero threshold: 0-25% of full scale value
4.3	Automatic calibration verify
4.4	Automatic change of measurement range
4.5	High immunity inputs

ALARMS

MAIN MENU	
1-Sensor	
2-Units	
3-Scales	
4-Measure	
5-Alarms	
6-Inputs	
ALARMS	
7-Max+ = dm3/s	OFF
8-Max- = dm3/s	OFF
9-Min+ = dm3/s	OFF
10-Min- = dm3/s	OFF
11-Hysteresis=%	03
12-mA v.alarm=%	000
13-Hz v.alarm=%	000

5.1	Maximum value alarm set for direct flow rate
5.2	Maximum value alarm set for reverse flow rate
5.3	Minimum value alarm set for direct flow rate
5.4	Minimum value alarm set for reverse flow rate
5.5	Hysteresis threshold set for the minimum and maximum flow rate alarms
5.6	Current output value in case of failure
5.7	Frequency output value in case of alarms

INPUTS

MAIN MENU	
1-Sensor	
2-Units	
3-Scales	
4-Measure	
5-Alarms	
6-Inputs	
INPUTS	
7-T+ reset	OFF
8-P+ reset	OFF
9-T- reset	OFF
10-P- reset	OFF
11-Count lock	OFF
12-Meas.lock	OFF
13-Calibration	OFF
14-Range change	OFF

6.1	Total direct (positive) flow totalizer reset enable
6.2	Partial direct (positive) flow totalizer reset enable
6.3	Total reverse (negative) flow totalizer reset enable
6.4	Partial reverse (negative) flow totalizer reset enable
6.5	Totalizer counting lock command
6.6	Measure zero lock command
6.7	Calibration external command
6.8	Range change external command

OUTPUTS

```

MAIN MENU
1-Sensor
2-Units
3-Scales
4-Measure
5-Alarms
6-Inputs
7-Outputs
8-Communication
9-Display
10-Data logger
11-Communication
12-Display
13-Data logger

```

OUTPUTS

```

10- Out1          PULSES+
11- Out2          PULSES-
12- Out mA1       4_22 +/-
13- Out mA2       4_22 +/-
    A1S           4.9087
    A2S           4.9087

```

7.1 Output 1 functions
 7.2 Output 2 functions
 7.3 Choice of the function and the range of current output n.1
 7.4 Choice of the function and the range of current output n.2
 7.5 Full Scale value for analog out1
 7.6 Full Scale value for analog out2

COMM.

```

MAIN MENU
1-Sensor
2-Units
3-Scales
4-Measure
5-Alarms
6-Inputs
7-Outputs
8-Communication
9-Display
10-Data logger
11-Communication
12-Display
13-Data logger

```

COMMUNICATION

```

1- HART pr.       05
2- HART O. C.     ON
3- Dev. Addr      001
4- Speed=bps      9600
5- Parity=        NO
6- Delay=ms       00
7- C. timeout     2
8- MBUS ID =      220483
9- MBUS Dev.T =   7

```

8.1 HART packet byte preambles
 8.2 HART bus output control
 8.3 Device communication address number
 8.4 MODBUS link speed
 8.5 MODBUS link parity
 8.6 MODBUS reply delay
 8.7 Maximum delay between chars (frames)
 8.8 MeterBus Id.Number (Second.Add.)
 8.9 MeterBus Device Type (Media)



DISPLAY

```

MAIN MENU
1-Sensor
2-Units
3-Scales
4-Measure
5-Alarms
6-Inputs
7-Outputs
8-Communication
9-Display
10-Data logger
11-Communication
12-Display
13-Data logger

```

DISPLAY

```

11- Language      EN
12- Contrast      5
13- Disp.time=s   020
    D.rate=Hz     5
    Disp. Fn.     1
    Disp.lock     ON
    Part. Tot     ON
    Neg. Tot      ON
    Net tot.      ON
    Disp.date     ON
    Quick start   ON

```

9.1 Choice of the language
 9.2 Display contrast
 9.3 Display/keyboard inactivity time
 9.4 Display updating frequency: 1-2-5-10 Hz
 9.5 Display function number
 9.6 Display function selection lock
 9.7 Partial totalizer enable
 9.8 Negative totalizer enable
 9.9 Net totalizer enable
 9.10 Time and date display enable
 9.11 Quick start menu visualization

DATA LOGGER

DATA LOGGER

D.logger en.	ON
Meas. units	ON
Field separat.	;
Decimal separ.	.
Interv.	01:01:00
Log T+	ON
Log P+	ON
Log T-	ON
Log P-	ON
Log TN	ON
Log PN	ON
Log Q (UM)	ON
Log Q (%)	ON
Log AL.EV	ON
Log STR	ON
Log BTS	ON
Log IBV	ON
Log EDC	ON
Log EAC	ON
Log EIZ	ON
Log SCU	ON

10.1	Data logger enabling
10.2	Measure units recording enable
10.3	Field separator character
10.4	Decimal separator character
10.5	Sampling interval
10.6	Enable logging of total direct totalizer
10.7	Enable logging of partial direct totalizer
10.8	Enable logging of total reverse totalizer
10.9	Enable logging of partial reverse totalizer
10.10	Enable logging of total net totalizer
10.11	Enable logging of partial net totalizer
10.12	Enable logging of flow rate in measure unit
10.13	Enable logging of flow rate in percentage
10.14	Enable logging of alarm events
10.15	Enable logging of sensor test results
10.16	Enable logging of board temperature
10.17	Enable logging of internal board voltage
10.18	Enable logging of electrodes DC voltage
10.19	Enable logging of electrodes AC voltage
10.20	Enable logging of electrodes impedance
10.21	Enable logging of sensor coils value

```

MA 1
2
3
4
5
6
7
8-Communication
9-Display
10-Data logger
11-Functions
12-Diagnostic
13-System

```

FUNCTIONS

FUNCTIONS

T+ reset	
P+ reset	
T- reset	
P- reset	
Load Sens. F. def	
Load Conv. F. def	
Save Sens. F. def	
Save Conv. F. def	
Calibration	

11.1	Execute immediate reset of total direct totalizer
11.2	Execute immediate reset of partial direct totalizer
11.3	Execute immediate reset of total reverse totalizer
11.4	Execute immediate reset of partial reverse totalizer
11.5	Load sensor factory default
11.6	Load converter factory default
11.7	Save sensor factory default values
11.8	Save converter factory default values
11.9	Execute immediate internal circuit calibration

```

MA 1
2
3
4
5
6
7
8-Communication
9-Display
10-Data logger
11-Functions
12-Diagnostic
13-System

```

DIAGNOSTIC

DIAGNOSTIC

Self test	
Test display	
Sens. verify	
Flow sim. =	ON
Display measures	
Disp. Comm. Vars	
Display graphs	
Gen. sens. set	
SD card info	
Firmware info	
S/N=	999001
WT=	0002:21:00 : 22

12.1	Self test diagnostic function
12.2	Function tests physical display
12.3	Sensor verify diagnostic function
12.4	Flow rate simulation enabling
12.5	Display internal measured value
12.6	Display comm. diagnostic values
12.7	Display measure as graphs
12.8	Generic sensor parameters set
12.9	Sd card status informations
12.10	Firmware version/revision
12.11	Board serial number
12.12	Total working time

```

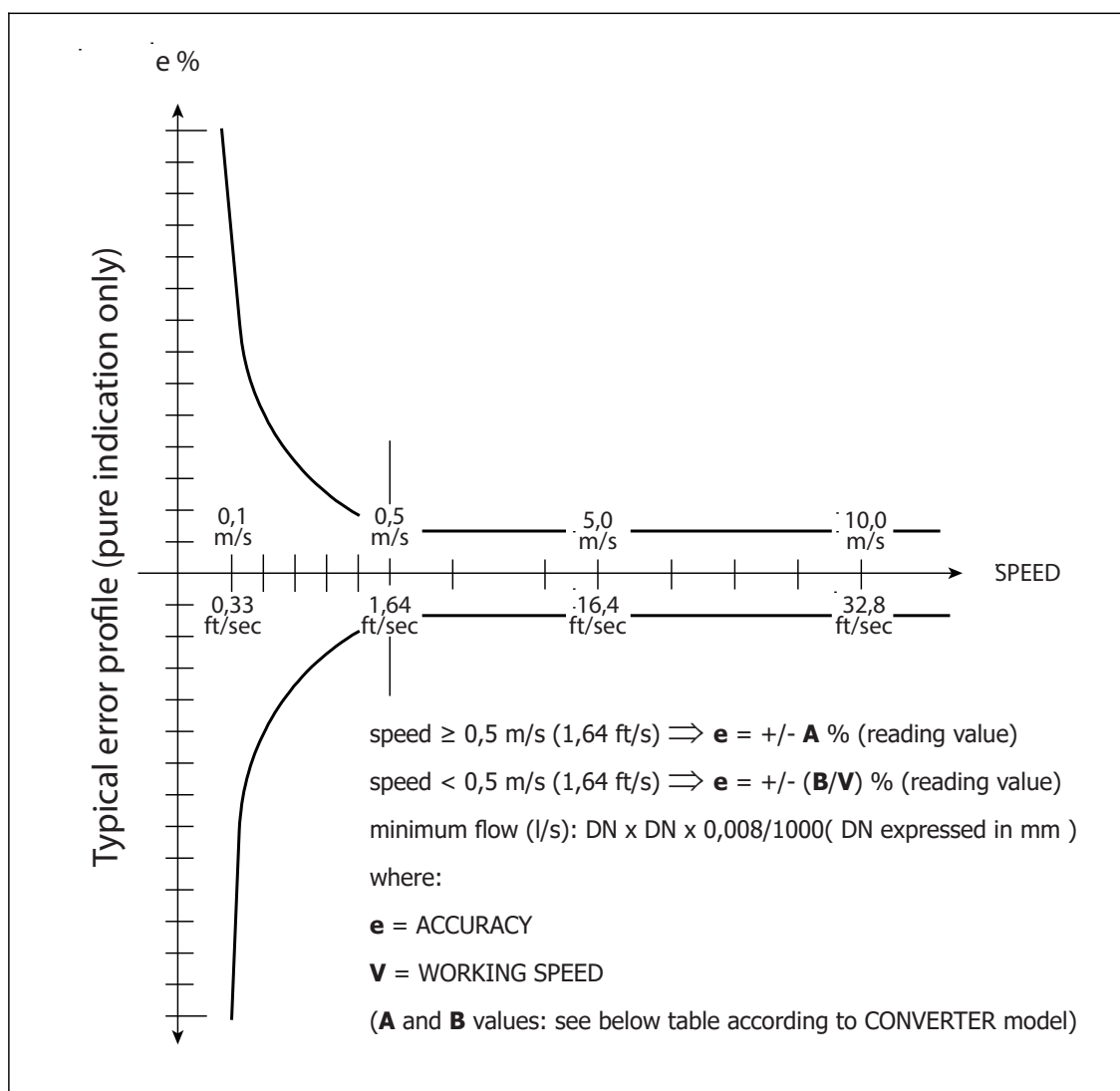
MA 1
2
3
4
5
6
7
8-Communication
9-Display
10-Data logger
11-Functions
12-Diagnostic
13-System

```

SYSTEM

SYSTEM		
Dayl. Saving =	ON	13.1 Daylight saving time change
Time zone =	h+01.00	13.2 Localized time zone
2016/04/04-16:07		13.3 System date and time
L1 code =	*****	13.4 Access level 1 code
L2 code =	*****	13.5 Access level 2 code
L3 code =	*****	13.6 Access level 3 code
L4 code =	*****	13.7 Access level 4 code
L5 code =	*****	13.8 Access level 5 code
L6 code =	*****	13.9 Access level 6 code
Restr. Access=	ON	13.10 Restricted access level
010.011.012.013		13.11 Device IP network address
010.011.012.014		13.12 Client IP network address
255.255.255.000		13.13 Network mask
HT	0.96469	13.14 Calibration coefficient KT
HS	1.00000	13.15 Calibration coefficient KF
HR	1.00000	13.16 Calibration coefficient KR
DAC1	(°C)	13.17 DAC1 out 4mA calibration point
DAC1	(°C)	13.18 DAC1 out 20mA calibration point
DAC2	661	13.19 DAC2 out 4mA calibration point
DAC2	3327	13.20 DAC2 out 20mA calibration point
Stand-by	3453	13.21 Stand-by
FW update	14718	13.22 firmware update
10-Data logger 11-Functions 12-Diagnostic 13-System		

ACCURACY



Full bore Sensor

MS501/MS1000/MS2410/MS2500			MS600			MS5000		
A	B(m/s)	B(ft/s)	A	B(m/s)	B(ft/s)	A	B(m/s)	B(ft/s)
0,8*	0,4**	1,31**	0,8*	0,4**	1,31**	2	1	3,28

* = 0,4 (special)

** = 0,2(m/s) ; 0,66(ft/s) - special

Insertion sensor

See sensor DATA SHEET

Reference conditions below and as per internal testing procedures:

- ☐ Constant flow rate during the test
- ☐ Pressure: >30 Kpa
- ☐ Flow condition : fully developed flow profile
- ☐ Zero stability +/- 0,005 %

MI-001 OIML R49 CLASS1: MV110

The **MS2500** sensor's diameters listed below, coupled with **MV110** comply with the European directive: DIRECTIVE 2014/32/EU (MID) ANNEX III (MI-001) AND 2015/13/EU- OIML R49

SIZE		Q3	Q2	Q1	R
mm	inch	m3/h			Q3/Q1
25	1	16	0,26	0,16	100
32	1 ¼	25	0,40	0,25	
40	1 ½	40	0,64	0,40	
50	2	63	1,01	0,63	
65	2 ½	100	1,6	1,00	
80	3	160	2,6	1,60	
100	4	250	4,0	2,50	
125	5	400	6,4	4,00	
150	6	630	10,1	6,30	
200	8	1000	16	10,00	
250	10	1600***	26	16,0	
300	12	2500**	40	25	
350	14	2500**	40	25	
400	16	4000**	64	40	
450	18	4000**	64	40	
500	20	6300	101	63	
600	24	10000	160	100	
700	28	10000	160	100	
800	32	16000*	256	160	
900	36	16000*	256	160	
1000	42	25000*	400	250	

SIZE		Q3	Q2	Q1	R
mm	inch	m3/h			Q3/Q1
25	1	16	0,10	0,064	250
32	1 ¼	25	0,16	0,10	
40	1 ½	40	0,26	0,16	
50	2	63	0,40	0,25	
65	2 ½	100	0,64	0,40	
80	3	160	1,0	0,64	
100	4	250	1,6	1,0	
125	5	400	2,6	1,6	
150	6	630	4,0	2,5	
200	8	1000	6,4	4,0	
250	10	1600***	10	6,4	
300	12	2500**	16	10	
350	14	2500**	16	10	
400	16	4000**	26	16	
450	18	4000**	26	16	
500	20	6300	40	25	
600	24	10000	64	40	
700	28	10000	54	40	
800	32	16000*	102	64	
900	36	16000*	102	64	
1000	42	25000*	160	100	

(*) : Calibration flowrate 14000 m3/h - as for max rig flowrate L8

(**) : Calibration flowrate 1400 m3/h - as for max test rig flowrate L7

(***) Calibration flowrate 1100 m3/h - as for max test rig flowrate L6

MI-001 OIML R49 CLASS 2: MV110

The **MS2500** sensor's diameters listed below, coupled with **MV110** comply with the European directive:
DIRECTIVE 2014/32/EU (MID) ANNEX III (MI-001) AND 2015/13/EU- OIML R49

SIZE		Q3	Q2	Q1	R
mm	inch	m3/h			Q3/Q1
25	1	16	0,16	0,10	160
32	1 ¼	25	0,25	0,16	
40	1 ½	40	0,40	0,25	
50	2	63	0,63	0,39	
65	2 ½	100	1,0	0,63	
80	3	160	1,6	1,0	
100	4	250	2,5	1,6	
125	5	400	4,0	2,5	
150	6	630	6,3	3,9	
200	8	1000	10	6,3	
250	10	1600***	16	10	
300	12	2500**	25	15,625	
350	14	2500**	25	15,625	
400	16	4000**	40	25	
450	18	4000**	40	25	
500	20	6300	63	39,375	
600	24	10000	100	62,5	
700	28	10000	100	62,5	
800	32	16000*	160	100	
900	36	16000*	160	100	
1000	42	25000*	250	156,25	

SIZE		Q3	Q2	Q1	R
mm	inch	m3/h			Q3/Q1
25	1	16	0,10	0,06	250
32	1 ¼	25	0,16	0,10	
40	1 ½	40	0,26	0,16	
50	2	63	0,40	0,25	
65	2 ½	100	0,64	0,40	
80	3	160	1,0	0,64	
100	4	250	1,6	1,0	
125	5	400	2,6	1,6	
150	6	630	4,0	2,5	
200	8	1000	6,4	4,0	
250	10	1600***	10	6,4	
300	12	2500**	16	10	
350	14	2500**	16	10	
400	16	4000**	26	16	
450	18	4000**	26	16	
500	20	6300	40	25	
600	24	10000	64	40	
700	28	10000	54	40	
800	32	16000*	102	64	
900	36	16000*	102	64	
1000	42	25000*	160	100	

(*) : Calibration flowrate 14000 m3/h - as for max rig flowrate L8

(**) : Calibration flowrate 1400 m3/h - as for max test rig flowrate L7

(***) Calibration flowrate 1100 m3/h - as for max test rig flowrate L6

SIZE		Q3	Q2	Q1	R
mm	inch	m3/h			Q3/Q1
25	1	16	0,06	0,04	400
32	1 ¼	25	0,10	0,06	
40	1 ½	40	0,16	0,10	
50	2	63	0,25	0,16	
65	2 ½	100	0,40	0,25	
80	3	160	0,64	0,40	
100	4	250	1,0	0,63	
125	5	400	1,6	1,0	
150	6	630	2,5	1,6	
200	8	1000	4,0	2,5	
250	10	1600***	6,4	4,0	
300	12	2500**	10	6,3	
350	14	2500**	10	6,3	
400	16	4000**	16	10	
450	18	4000**	16	10	
500	20	6300	25	16	
600	24	10000	40	25	
700	28	10000	40	25	
800	32	16000*	64	40	
900	36	16000*	64	40	
1000	42	25000*	100	63	

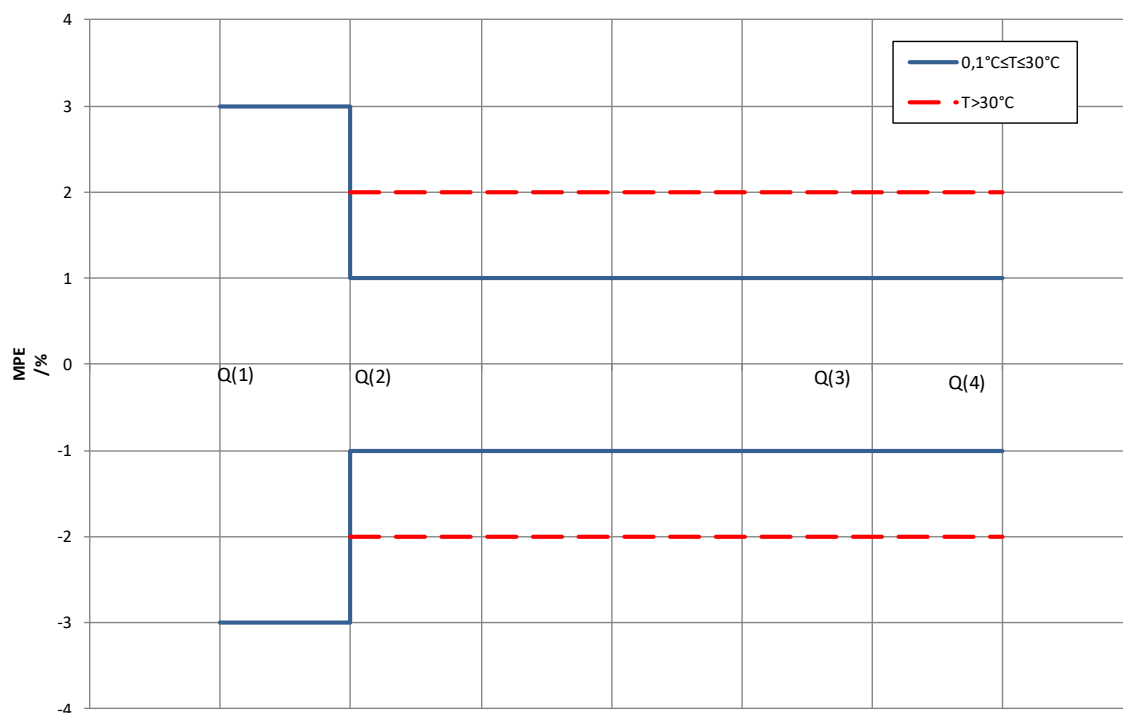
(*) : Calibration flowrate 14000 m3/h - as for max rig flowrate L8

(**) : Calibration flowrate 1400 m3/h - as for max test rig flowrate L7

(***) Calibration flowrate 1100 m3/h - as for max test rig flowrate L6

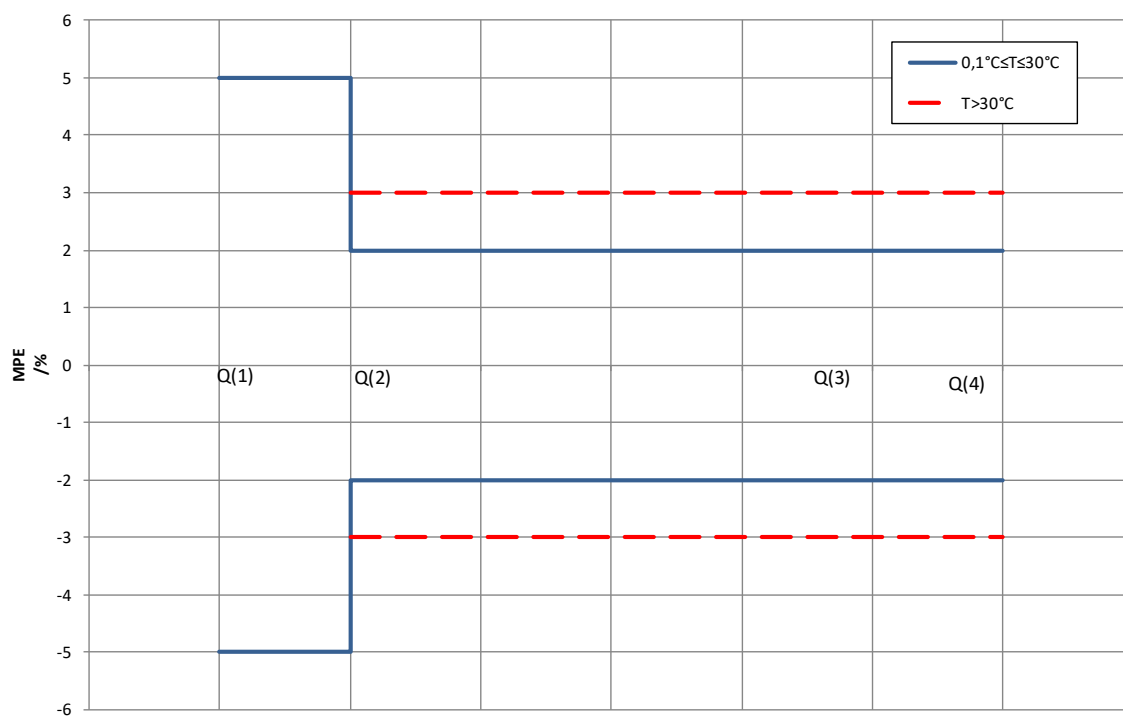
MPE - MI 001 - OIML R49 ACCURACYCLASS 1

(OIML R 49-1:2013 (E) - ISO4064-1:2017)



MPE - MI 001 - OIML R49 ACCURACYCLASS 2

(OIML R 49-1:2013 (E) - ISO4064-1:2017)



MI-004 OIML R75 CLASS1: MV110

The **MS2500** sensor's diameters listed below, coupled with **MV110** comply with the European directive:
DIRECTIVE 2014/32/EU (MID) ANNEX VI (MI-004) - OIML R75

SIZE		q _p	q _s	0,1 q _p	q _i	MC
mm	inch	m3/h				q _p /q _i
25	1	16	16	1,6	0,16	100
32	1 ¼	25	25	2,5	0,25	
40	1 ½	40	40	4	0,40	
50	2	63	63	6,3	0,63	
65	2 ½	100	100	10	1,00	
80	3	160	160	16	1,60	
100	4	250	250	25	2,50	
125	5	400	400	40	4,0	
150	6	630	630	63	6,3	
200	8	1000	1000	100	10	
250	10	1600*	1600	160	20,00	80
300	12	2500*	2500	250	31,25	
350	14	2500*	2500	250	31,25	
400	16	4000*	4000	400	50,00	

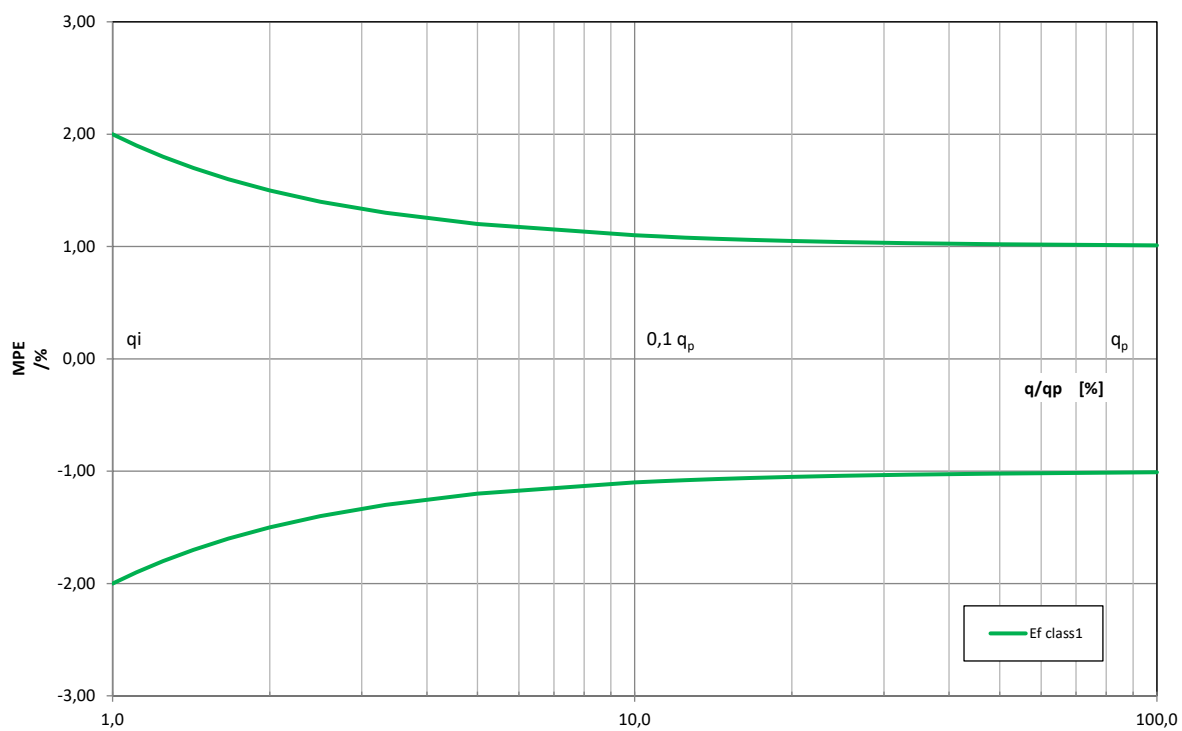
SIZE		q _p	q _s	0,1 q _p	q _i	MC
mm	inch	m3/h				q _p /q _i
25	1	10	16	1	0,2	50
32	1 ¼	16	25	1,6	0,32	
40	1 ½	25	40	2,5	0,5	
50	2	40	63	4	0,8	
65	2 ½	63	100	6,3	1,26	
80	3	100	160	10	2	
100	4	160	250	16	3,2	
125	5	250	400	25	5	
150	6	400	630	40	8	
200	8	630	1000	63	12,6	
250	10	1000	1600	100	20	10
300	12	1600*	2500	160	32	
350	14	2500*	2500	250	50	
400	16	2500*	4000	250	50	

SIZE		q _p	q _s	0,1 q _p	q _i	MC
mm	inch	m3/h				q _p /q _i
25	1	10	16	1	0,4	25
32	1 ¼	16	25	1,6	0,64	
40	1 ½	25	40	2,5	1	
50	2	40	63	4	1,6	
65	2 ½	63	100	6,3	2,52	
80	3	100	160	10	4	
100	4	160	250	16	6,4	
125	5	250	400	25	10	
150	6	400	630	40	16	
200	8	630	1000	63	25,2	
250	10	1000	1600	100	40	10
300	12	1600*	2500	160	64	
350	14	2500*	2500	250	100	
400	16	2500*	4000	250	100	

SIZE		q _p	q _s	0,1 q _p	q _i	MC
mm	inch	m3/h				q _p /q _i
25	1	10	16	1	1	10
32	1 ¼	16	25	1,6	1,6	
40	1 ½	25	40	2,5	2,5	
50	2	40	63	4	4	
65	2 ½	63	100	6,3	6,3	
80	3	100	160	10	10	
100	4	160	250	16	16	
125	5	250	400	25	25	
150	6	400	630	40	40	
200	8	630	1000	63	63	
250	10	1000	1600	100	100	10
300	12	1600*	2500	160	160	
350	14	2500*	2500	250	250	
400	16	2500*	4000	250	250	

(*) : Flow rates reduced to the limits of the system

MI 004 - MPE - ACCURACY CLASS 1 (UNI EN 1434-1:2016)



HOW TO ORDER

CODE EXAMPLE		CODE/DESCRIPTION
Display		
A	A	Blind version (without display and programming keys, cable USB type A/USB MINI B is REQUIRED TO PROGRAMMING)
	B	Graphic LCD WSTN - B/W - back light display, point matrix 128 x 64, 8 line/16 characters and 3 programming keys (mandatory for MI001)
Housing material / Protection rate		
0	0	Nylon PA6 with fiber glass, protection rate IP 67
	1	Painted aluminum die casting, protection rate IP67
	2	Painted aluminum die casting, protection rate IP68 1,5 meters under water, Compact Version, n° 1 IP 68 MIL connector for power supply (CONNECTORS SUPPLIED: MALE + FEMALE)
	3	Painted aluminum die casting, protection rate IP68 1,5 meters under water, Compact Version, Complete of n° 1 of 10 poles IP68 MIL connector (outputs connections to be specified) and n° 1 IP 68 MIL connector for power supply (CONNECTORS SUPPLIED: MALE + FEMALE)
	4	Painted aluminum die casting, protection rate IP68 1,5 meters under water, Separate Version, Complete of n° 1 IP 68 MIL connectors for cable from the sensor and n° 1 IP 68 MIL connector for power supply (CONNECTORS SUPPLIED: MALE + FEMALE)
	5	Painted aluminum die casting, protection rate IP68 1,5 meters under water, Separate Version, Complete of n° 1 IP 68 MIL connectors for cable from the sensor, n° 1 of 10 poles IP68 MIL connector (outputs connections to be specified) and n° 1 IP 68 MIL connector for power supply (CONNECTORS SUPPLIED: MALE + FEMALE)
	6	AISI304 Stainless Steel housing, protection rate IP67 (DISPLAY NOT ROTABLE) - NO CONNECTORS AVAILABLE
	7	Painted aluminum die casting, ONLY COMPACT, protection rate IP68 (NO CONNECTORS)
Version		
A	A	Compact version with sensor MS.... (liquid maximum temperature 100 °C)
	B	Separate version (CABLE C014) for wall monting, complete with mounting accessories in Aluminum
	C	Compact version with display visible from the top
	D	Separate version (CABLE C014) for wall monting, complete with mounting accessories in AISI 304
Power supply		
1	1	Power supply : 100 ... 240 VAC 44/66 Hz (NOT FOR MI001)
	2	Power supply : 24 ... 36 VAC/VDC 0...44/66 Hz (NOT FOR MI001)
	3	Power supply : 12...48 VDC (NOT FOR MI001)
	4	Power supply : 100 ... 240 VAC 44/66 Hz + 1 Rechargeable back-up Battery (the use of battery supports only the measure UP TO 30 days; all the outputs are set to OFF) (NOT FOR MI001)
	5	Power supply : 24 ... 36 VAC/VDC 0...44/66 Hz + 1 Rechargeable back-up Battery (the use of battery supports only the measure UP TO 30 days; all the outputs are set to OFF) (NOT FOR MI001)
	6	Power supply : 12...48 VDC + 1 Rechargeable back-up Battery (the use of battery supports only the measure UP TO 30 days; all the outputs are set to OFF) (NOT FOR MI001)
	7	Power supply : 100 ... 240 VAC 44/66 Hz + n° 1 SETTINGS FOR Rechargeable back-up Battery (the Rechargeable Battery is NOT included) (NOT FOR MI001)
	8	Power supply : 24 ... 36 VAC/VDC 0...44/66 Hz + n° 1 SETTINGS FOR Rechargeable back-up Battery (the Rechargeable Battery is NOT included) (NOT FOR MI001)
	9	Power supply : 12...48 VDC + n° 1 SETTINGS FOR Rechargeable back-up Battery (the Rechargeable Battery is NOT included) (NOT FOR MI001)
	a	Power supply : 100 ... 240 VAC 44/66 Hz + 1 Pack of n° 2 SUPERCAP (the use of it supports only the measure UP TO 3 minutes; all the outputs are set to OFF) Suitable for MI001
	b	Power supply : 24 ... 36 VAC/VDC 0...44/66 Hz + 1 Pack of n° 2 SUPERCAP (the use of battery supports only the measure UP TO 3 minutes; all the outputs are set to OFF) Suitable for MI0011
	c	Power supply : 12...48 VDC + 1 Pack of n° 2 SUPERCAP (the use of battery supports only the measure UP TO 3 minutes; all the outputs are set to OFF) Suitable for MI001
Analogue output		
A	A	Without Analogue output
	B	n° 1 Analogue output 0/4...20/22 mA (Hart optional)
	C	n° 2 Analogue outputs 0/4...20/22 mA (Hart optional over Out.1)



Digital Input/Output		
0	0	With Digital Input only
	1	With n° 1 PROGRAMMABLE Digital Output/n°1 Digital Input (mandatory for MI004)
	2	With n° 2 PROGRAMMABLE Digital output/n°1 Digital Input
Communication Gateway		
A	A	Without Gateway
	B	RS485 port - Protocol MODBUS required
	C	Hart (4/20 mA/ Analog OUT n° 1 is required)
	D	Wi-Fi (for programming)
	E	M-Bus Module
	Z	Others
Protocols		
0	0	Without Protocol
	1	Modbus (over RS485) requires RS485 port
Accuracy		
A	A	Standard accuracy 0,8 %
	B	Special accuracy 0,4 %
	C	Special accuracy (to be defined)
Data Logger		
0	0	Without Data Logger
	1	MicroSD Memory 4 GB : Data Logger + RTC (Real Time Clock)
	2	MicroSD Memory 4 GB : Data Logger + RTC (Real Time Clock) + BIV (Built In Verifactor)
	3	MicroSD Memory 4 GB : Data Logger + RTC (Real Time Clock) + Meter Data (Real Time Converter & Sensor Data on SD Memory)
	4	MicroSD Memory 4 GB : Data Logger + RTC (Real Time Clock) + BIV + Meter Data
Special Features		
A	A	NONE
	B	WITH ANTICONDENSE CAP
	C	n° 5 CABLE GLAND 1/2" NPT - Nickel plated brass CODE 1.609.1200.70 (CABLE 6 - 12 mm)
	D	n° 5 HOLES FOR CABLE GLAND 1/2" NPT (WITHOUT CABLE GLAND)
MID Approval		
0	0	NONE
	1	MI-001/OIMLR49-CLASS 1 (Pover Supply Code shall be a or b or c)
	2	MI-001/OIMLR49-CLASS 2 (Pover Supply Code shall be a or b or c)
	3	MI-004-CLASS 1
	4	MI-004-CLASS 2
	5	PTB K 7.2-CLASS 2

Complete code
example for
order

MV110-A0A1A0A0A0A0

ISOIL INDUSTRIA S.p.A.

HEAD OFFICE	SERVICE
Via Fratelli Gracchi, 27 20092 Cinisello Balsamo (MI) Tel +39 02 66027.1 Fax +39 02 6123202 sales@isoil.it	service@isoil.it

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<http://www.isoil.it/en>



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Dados atualizados até: 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - CEIS) , 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - CNEP) , 09/2025 (Sistema Integrado de Administração Financeira do Governo Federal (SIAFI) - CEPIM) , 09/2025 (Diário Oficial da União - CEAF) , 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - Acordos de Leniência)

Dados da consulta: 24/09/2025 11:13:47

FILTROS APLICADOS:

Busca Livre: 14.502.966/0001-31

Cadastro: CEIS

Consulta

DETALHAR	CADASTRO	CNPJ/CPF SANCIONADO	NOME SANCIONADO	UF SANCIONADO	ÓRGÃO/ENTIDADE SANCIONADORA	CATEGORIA SANÇÃO	DATA DE PUBLICAÇÃO DA SANÇÃO	VALOR DA MULTA	QUANTIDADE
Nenhum registro encontrado									

 DADOS ATUALIZADOS

Dados atualizados até: 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - CEIS) , 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - CNEP) , 09/2025 (Sistema Integrado de Administração Financeira do Governo Federal (SIAFI) - CEPIM) , 09/2025 (Diário Oficial da União - CEAF) , 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - Acordos de Leniência)

Dados da consulta: 24/09/2025 11:13:47

FILTROS APLICADOS:

Busca Livre: 227.525.446-34

Cadastro: CEIS

Consulta

DETALHAR	CADASTRO	CNPJ/CPF SANCIONADO	NOME SANCIONADO	UF SANCIONADO	ÓRGÃO/ENTIDADE SANCIONADORA	CATEGORIA SANÇÃO	DATA DE PUBLICAÇÃO DA SANÇÃO	VALOR DA MULTA	QUANTIDADE
Nenhum registro encontrado									

 DADOS ATUALIZADOS

Dados atualizados até: 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - CEIS) , 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - CNEP) , 09/2025 (Sistema Integrado de Administração Financeira do Governo Federal (SIAFI) - CEPIM) , 09/2025 (Diário Oficial da União - CEAF) , 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - Acordos de Leniência)

Dados da consulta: 24/09/2025 11:13:47

FILTROS APLICADOS:

Busca Livre: 008.471.516-20

Cadastro: CEIS

Consulta

DETALHAR	CADASTRO	CNPJ/CPF SANCIONADO	NOME SANCIONADO	UF SANCIONADO	ÓRGÃO/ENTIDADE SANCIONADORA	CATEGORIA SANÇÃO	DATA DE PUBLICAÇÃO DA SANÇÃO	VALOR DA MULTA	QUANTIDADE
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Nenhum registro encontrado

 DADOS ATUALIZADOS

Dados atualizados até: 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - CEIS) , 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - CNEP) , 09/2025 (Sistema Integrado de Administração Financeira do Governo Federal (SIAFI) - CEPIM) , 09/2025 (Diário Oficial da União - CEAF) , 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - Acordos de Leniência)

Dados da consulta: 24/09/2025 11:13:47

FILTROS APLICADOS:

Busca Livre: 034.115.056-80

Cadastro: CEIS

Consulta

DETALHAR	CADASTRO	CNPJ/CPF SANCIONADO	NOME SANCIONADO	UF SANCIONADO	ÓRGÃO/ENTIDADE SANCIONADORA	CATEGORIA SANÇÃO	DATA DE PUBLICAÇÃO DA SANÇÃO	VALOR DA MULTA	QUANTIDADE
Nenhum registro encontrado									

 DADOS ATUALIZADOS

Dados atualizados até: 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - CEIS) , 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - CNEP) , 09/2025 (Sistema Integrado de Administração Financeira do Governo Federal (SIAFI) - CEPIM) , 09/2025 (Diário Oficial da União - CEAF) , 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - Acordos de Leniência)

Dados da consulta: 24/09/2025 11:13:47

FILTROS APLICADOS:

Busca Livre: 037.699.476-22

Cadastro: CEIS

Consulta

DETALHAR	CADASTRO	CNPJ/CPF SANCIONADO	NOME SANCIONADO	UF SANCIONADO	ÓRGÃO/ENTIDADE SANCIONADORA	CATEGORIA SANÇÃO	DATA DE PUBLICAÇÃO DA SANÇÃO	VALOR DA MULTA	QUANTIDADE
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Nenhum registro encontrado

 DADOS ATUALIZADOS

Dados atualizados até: 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - CEIS) , 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - CNEP) , 09/2025 (Sistema Integrado de Administração Financeira do Governo Federal (SIAFI) - CEPIM) , 09/2025 (Diário Oficial da União - CEAF) , 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - Acordos de Leniência)

Dados da consulta: 24/09/2025 11:13:47

FILTROS APLICADOS:

Busca Livre: 14.170.927/0001-84

Cadastro: CEIS

Consulta

DETALHAR	CADASTRO	CNPJ/CPF SANCIONADO	NOME SANCIONADO	UF SANCIONADO	ÓRGÃO/ENTIDADE SANCIONADORA	CATEGORIA SANÇÃO	DATA DE PUBLICAÇÃO DA SANÇÃO	VALOR DA MULTA	QUANTIDADE
Nenhum registro encontrado									

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Dados atualizados até: 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - CEIS) , 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - CNEP) , 09/2025 (Sistema Integrado de Administração Financeira do Governo Federal (SIAFI) - CEPIM) , 09/2025 (Diário Oficial da União - CEAF) , 09/2025 (Sistema Integrado de Registro do CEIS/CNEP - Acordos de Leniência)

Dados da consulta: 24/09/2025 11:13:47

FILTROS APLICADOS:

Busca Livre: 14.170.926/0001-30

Cadastro: CEIS

Consulta

DETALHAR	CADASTRO	CNPJ/CPF SANCIONADO	NOME SANCIONADO	UF SANCIONADO	ÓRGÃO/ENTIDADE SANCIONADORA	CATEGORIA SANÇÃO	DATA DE PUBLICAÇÃO DA SANÇÃO	VALOR DA MULTA	QUANTIDADE
Nenhum registro encontrado									