SIKKERHEDSSTYRELSEN

TYPEGODKENDELSESATTEST

(Type approval Certificate)

J.nr.: (J. No.)	573-03-00027
Udgave nr.: (Revision no.)	1 (Original) (Original)
Udstedelsesdato: (Date of issue):	2016-02-03
Gyldig til: (Valid until):	2018-02-03
Systembetegnelse: (System designation)	TS 27.02 008

Typegodkendelse udstedt i henhold til BEK nr. 1178 af 06/11/2014, Bekendtgørelse om måleteknisk kontrol med målere, der anvendes til måling af forbrug af køleenergi i fjernkøleanlæg og centralkøleanlæg.
(This approval is issued in accordance to Danish law, BEK No. 1178 of 06/11/2014, Ordinance on metrological control of meters used for measuring consumption of cooling energy in district cooling systems and central cooling systems).

FLOWFØLER TIL KØLEENERGIMÅLER

(FLOWSENSOR FOR COOLING METER)

SITRANS F M MAG 5100W with MAG 5000/6000CT SITRANS F M MAG 8000CT

Producent (Manufacturer):	Siemens A/S Flow Instruments
Ansøger (Applicant):	Siemens A/S Flow Instruments
Art (Category):	Flowføler til køleenergimåler (Flow sensor for cooling meter,)
Type (Type):	MAG 5100W with MAG 5000/6000CT, MAG 8000CT

Anveldelse:
Kølemåling i lukkede systemer med vand som det energibærende medium.
(Application: Cooling metering in closed systems with water as the thermal conveying medium.

In case of any differences in the meaning between the Danish and the English version, the Danish version is valid.

LEGALE MÅLEDATA (Legal measuring data)

Målertype i henhold til: (Instrument type according to) : EN1434:2007

Målertyper: (Instrument types) : Flowmåler; del af en kombineret måler (Combined instrument part: Flow sensor)

Medietemperatur, flowmåler: (Temperature of medium, flow sensor) : θ_{min} - θ_{max} : 0,1°C...50°C eller mindre område (or narrower range)

Tryktrin: (Pressure stage) : PN10, PN16
DN15 - DN150: 0,03 – 16 bar
DN200 – DN300: 0,03 – 10 bar eller (or) 0,03 – 16 bar

Nøjagtighedsklasse (Accuracy class) : 1 , 2 og 3 (1,2 and 3) Iht. MI-004, 2004/22/EF 31. marts 2004 Acc. to MI-004, 2004/22/EC 31. march 2004)

Flowmålere, nominelle størrelser og dynamikområde:
(Flow sensor, nominal sizes and dynamic range)

DN	15	25	40	50	65	80	100	125	150	200	250	300
q_P/q_I	25	25	25	25	25	25	25	25	25	25	25	25
q_S (1.25*q_P)	1.9	4.4	12.5	20	31.25	50	78.75	125	200	312.5	500	787.5
q_P	1.5	3.5	10.0	16	25	40	63	100	160	250	400	630
q_I	0.06	0.14	0.4	0.64	1	1.6	2.52	4	6.4	10	16	25.2

DN	15	25	40	50	65	80	100	125	150	200	250	300
q_P/q_I	50	50	50	50	50	50	50	50	50	50	50	50
q_S (1.25*q_P)	1.9	4.4	12.5	20	31.25	50	78.75	125	200	312.5	500	787.5
q_P	1.5	3.5	10.0	16	25	40	63	100	160	250	400	630
q_I	0.03	0.07	0.2	0.32	0.5	0.8	1.26	2	3.2	5	8	12.6

DN	15	25	40	50	65	80	100	125	150	200	250	300
q_P/q_I	100	100	100	100	100	100	100	100	100	100	100	100
q_S (1.25*q_P)	1.9	4.4	12.5	20	31.25	50	78.75	125	200	312.5	500	787.5
q_P	1.5	3.5	10.0	16	25	40	63	100	160	250	400	630
q_I	0.02	0.04	0.1	0.16	0.25	0.4	0.63	1	1.6	2.5	4	6.3

DN	15	25	40	50	65	80	100	125	150	200	250	300
q_P/q_I	100	100	100	100	100	100	100	100	100	100	100	100
q_S (1.25*q_P)	5	11	31	50	78.75	125	200	312.5	500	787.5	1250	2000
q_P	4	9	25	40	63	100	160	250	400	630	1000	1600
q_I	0.04	0.09	0.3	0.64	0.63	1	1.6	2.5	4	6.3	10	16

Miljøklasse (Environment class)	:	E2
Mekanisk klasse (Mechanical class)	:	M1

I henhold til Måleinstrumentdirektivet MID

(Acc. to Measuring Instruments Directive, MID)

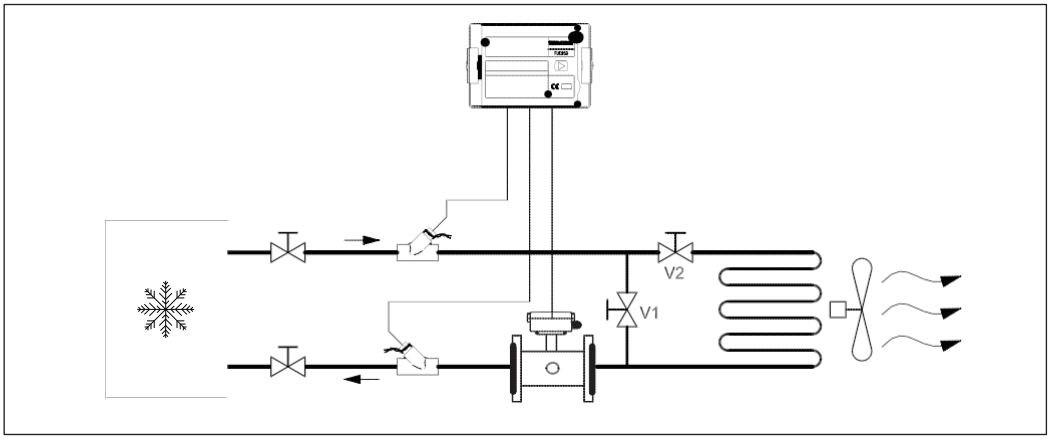
Klimatisk klasse (Climatic class)	:	-25...55°C Kondenserende, lukket (Condensing, closed)

Indkapsling (Enclosure):

SITRANS F M MAG 5100W with MAG 5000/6000CT:		IP67
SITRANS F M MAG 8000CT	:	IP68

Installationsforhold (Installation conditions)

Orientering (Orientation)	:	DN15-DN40: Horisontalt (Horizontal) DN50-DN150: Alle retninger (All orientations) DN200-300: Horisontalt (Horizontal)
SITRANS F M MAG 5100W with MAG 5000/6000CT:		Kompakt eller adskilt med max. 500 m kabel (Compact or remote with max. 500 m cable)
SITRANS F M MAG 8000CT	:	Kompakt eller adskilt med max. 30 m kabel (Compact or remote with max. 30 m cable)
SITRANS F M MAG 8000CT	:	DN > DN400: 3xD lige rør før og efter sensor (DN >DN400: 3xD straight pipe upstream and downstream)
Forbindelse til regneværk (Connection to calculator)	:	Max. 10 m kabel (max. 10 m cable)
SITRANS F M MAG 5100W with MAG 5000/6000CT:		115-230V AC 50-60Hz eller (or) DC 11-30V / AC 11-24V
SITRANS F M MAG 8000CT	:	AC/DC 12-24V eller (or) 115-230 V AC 50-60Hz eller internt eller eksternt Litium batteri 3,6V (or internal or external Lithium battery 3.6V)



SOFTWARE IDENTIFIKATION (SOFTWARE IDENTIFICATION)

Software udgaven er relateret til målertypen, som er skrevet på flowmålerens front.
(The software version is related to the meter type, which is written on the front of the flow sensor).

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

Udgave (version)	Checksum
3.03	057A9FFF
4.09 X02	A39561F596DE3DCC2C554698584DC083

SITRANS F M MAG 8000CT

Udgave (version)	Checksum
3.03	Not available
3.04	BF3CB5ECCC13070E1FE84C069A04418A
3.07	B400612EAB7877459BF1648CEF5DABB4

KONSTRUKTION

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

SITRANS F M MAG 8000CT

Flowmåleren består af en elektromagnetisk flowsensor, MAG5100W, og en signaltransmitter, MAG5000CT eller MAG6000CT.

Flowmåleren består af en elektromagnetisk flowsensor, MAG5100W, og en signaltransmitter, MAG8000CT eller MAG8000CT (GSM).

Princippet er, som for enhver elektromagnetisk flowsensor, at en elektrisk jævnstrøm (DC) igennem et spolekredsløb resulterer i et elektromagnetisk felt igennem sensorrøret med retning fra spole til spole. Når en ledende væske passerer igennem det magnetiske felt induceres en differential spænding (DC) mellem måleelektroderne.

Sensorens målerør og flanger er af stål. Indvendigt er målerøret belagt med en elektrisk isolerende liner, som er konet for at optimere hastighedsprofilen af den strømmende væske. Mellem lineren og målerøret af stål er monteret de spoler, som genererer det magnetiske felt.

(CONSTRUCTION)

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

SITRANS F M MAG 8000CT

The flow meter consists of an electromagnetic flow sensor, MAG5100W, and a signal transmitter, MAG5000CT or MAG6000CT.

The flow meter consists of an electromagnetic flow sensor, MAG5100W, and a signal transmitter, MAG8000CT or MAG8000CT (GSM).

The design principle is, as for any electromagnetic flow sensor, that an electrical direct current (DC) through the coil circuit results in a magnetic field through the sensor bore with direction from coil to coil. When a conductive liquid passes through the magnetic field, a differential voltage (DC) is introduced between the measuring electrodes.

The sensor has a steel tube and steel flanges. The bore is fitted with an electrically insulating lining, which is coned to optimize the velocity profile of the fluid. Between the lining and the steel tube are fitted coils, which generate the magnetic field.

MAG8000CT (GSM) may be equipped with an optional remote data read out module type SITRANS F M MAG 8000 GSM/GPRS Wireless Communication Module. The GSM module is approved both as a factory mounted variant in a MAG8000CT GSM as well as for retrofitting into an existing MAG8000CT without damage to the internal verification sealing.

UDGANGSSIGNAL (OUTPUT)

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

Frekvens (Frequency): 0 ... 10 kHz Programmerbar (programmable)

Puls, aktiv (Pulse, active): Programmerbar, 24 V DC, 30 mA, kortslutningssikret, strømforsyning fra flowmåler
(Programmable, 24 V DC, 30 mA, short-circuit-protected, power supplied from Flowmeter)

Puls, passiv (Pulse, Passive): Programmerbar, 3 ... 30 V DC, max. 110 mA, strøm fra tilsluttet udstyr.
(Programmable, 3 ... 30 V DC, max. 110 mA, powered from connected equipment

Tidskonstant (Time constant): 0.1 ... 30 s Justerbar (adjustable)

SITRANS F M MAG 8000CT

2 udgange, passive: (2 outputs, passive) Programmerbar, individuelle galvanisk adskilte
(Programmable, individual galvanically isolated)

Maks. Strøm (Max. load): 35 V DC, 50 mA, kortslutningssikret (short-circuit-protected)

Udgang (Output) A: Pulsvolumen (Pulse volume)

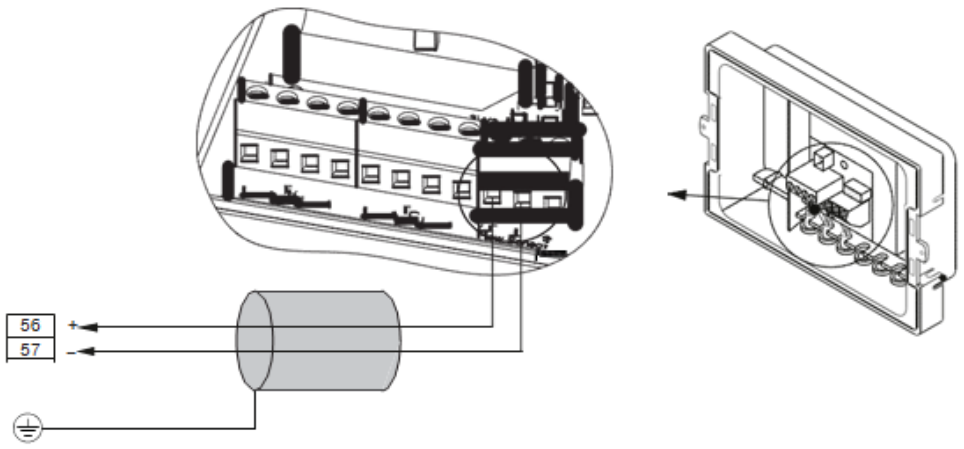
Udgang (Output) B: Programmerbar som pulsvolume (som udgang A), alarm
(Programmable as pulse volume (as output A), alarm)

Maks. pulsfrekvens: (Max pulse rate) 50 Hz, Standard version (standard version)
100 Hz, Avanceret version (advanced version)

Impulsvidde (Impulse width): 5, 10, 50, 100, or 500 ms, Justerbar (adjustable)

Høj pulsudgangssignal ved verifikation (maks. pulsfrekvens 1000 Hz)
(High pulse output for verification (max pulse rate 1000 Hz)

Elektrisk forbindelse (Electrical connection):



VERIFIKATION (VERIFICATION)

Fejl (Errors)	Maksimalt tilladte fejl i henhold til (Maximum permissible errors according to)	MI-004 2004/22/EF 31. marts 2004
Klasser (Classes)	Klasse 1,2 eller 3 i henhold til (Class 1.2 or 3 according to)	(MI-004 2004/22/EC 31. march 2004)

Verifikationsprocedure (Verification prodcedure)

Verifikationen af flowmåleren foretages med vand med en vandtemperatur på 15 ±5°C.

Verifikationen foretages i følgende punkter:

$q_i \leq q \leq 1{,}1\ q_i$

$0{,}1\ q_p \leq q \leq 0{,}11\ q_p$

$0{,}9\ q_p \leq q \leq 1{,}0\ q_p$

Under verifikation af flowsensoren benyttes frekvensudgangen henholdsvis impulsudgangen af den tilhørende signaltransmitter.

Efter verifikationen plomberes måleren som beskrevet i afsnittet "Plombering".

(The verification of the meter is performed with water having a temperature at 15 ±5°C.

The verification is performed in the following points:

$q_i \leq q \leq 1.1\ q_i$

$0.1\ q_p \leq q \leq 0.11\ q_p$

$0.9\ q_p \leq q \leq 1.0\ q_p$

During the verification of the flow sensor, the frequency output respectively the impulse output of the matching signal transmitter is used.

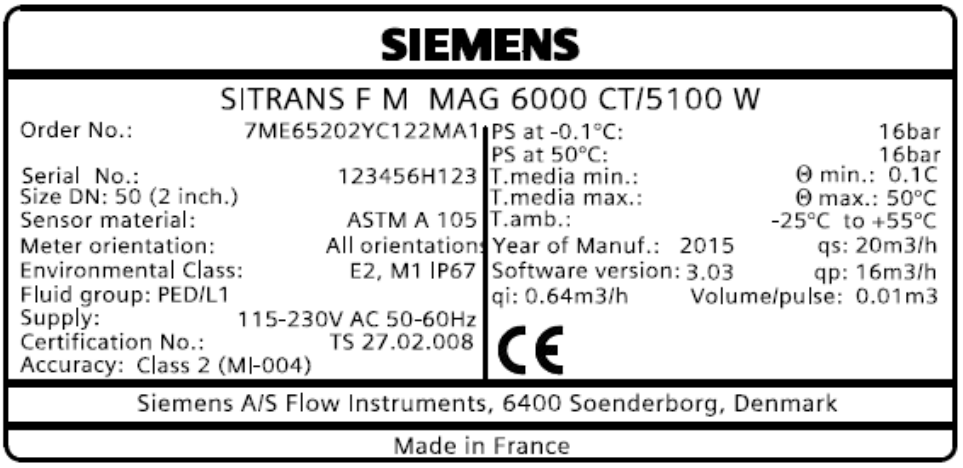
After the verification the meter is sealed as described in the paragraph "Sealing")

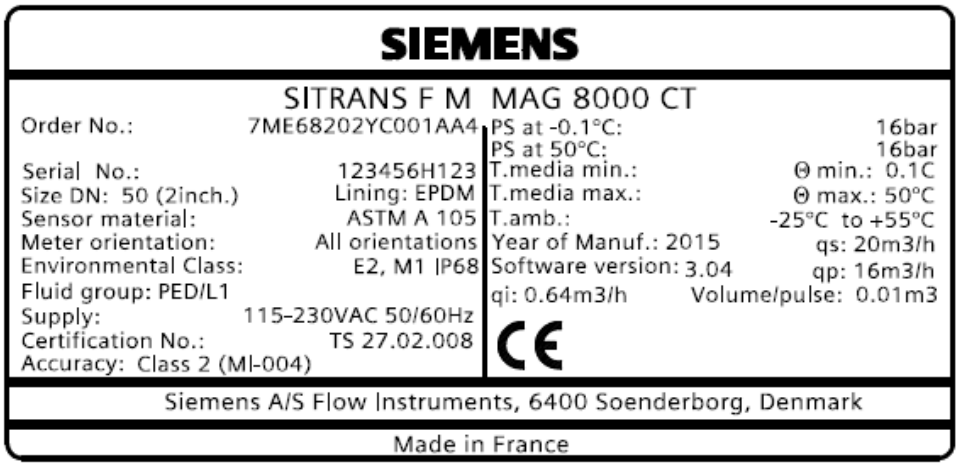
MÆRKNING OG INSKRIPTIONER
(LABELING AND INSCRIPTIONS)

Typeskiltet med følgende inskriptioner er placeret på flowmåleren
(Type label is placed on the flow sensor with the following inscriptions):

Certifikatnummer/Systembetegnelse (Certificate no/.System designation) [TS 27.02 008]
Producentens logo og navn (Manufacturer´s mark and name)
Produktnavn (Product name)
Produktkode/order no.: (Product code / order no.)
Serie/systemnummer (serie/Serial no.)
Produktionsår (Production year)
Nøjagtighedsklasse (Accuracy class)
Mekaniske og elektromagnetiske miljøklasser (Mechanical and electromagnetic environment classes)
Flowgrænser (Flow limits) [q_i, q_p, q_s]
Medietemperatur (Temperature of medium) (θ_{min} - θ_{max})
Ambient temperatur (Ambient temperature)
Tryktrin (Pressure stage) PS
Software identification (Software identification)
Flowmåler retning (Meter orientation)
Pulsudgang [Volumen/puls] (Pulse output [Volume/pulse])

Eksempler på typeskilte (Examples of type labels)





PLOMBERING
(SEALING)

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

Intern plombering (Internal sealing)

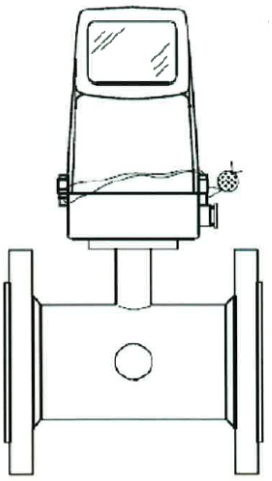
Terminalpladen i sensor og transmitter er plomberet for at forhindre adgang til SENSORPROM hukommelsesenheden (Billede 1 & 2)
(The connection plate in the sensor and transmitter is sealed to prevent access to the SENSORPROM memory unit (Picture 1 & 2))

Ekstern plombering (External sealing)

Den eksterne plombering foretages med plombetråd og plombe (Billede 3)
(The external sealing is done using thread and seal (Picture 3)

Tekst på label (Text on label): **Calibration Void IF BROKEN**

Billede 1 (Picture 1)



Billede 3 (Picture 3)

Billede 2 (Picture 2

SITRANS F M MAG 8000CT

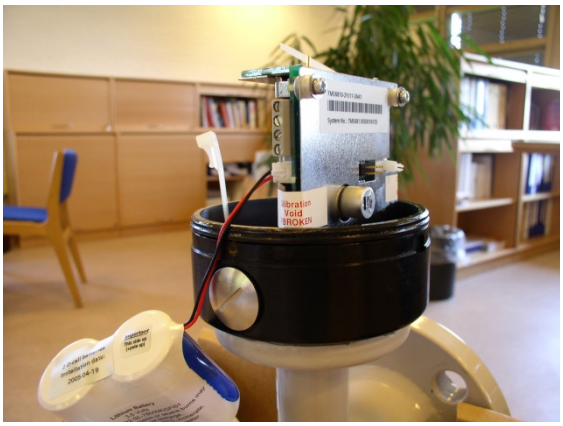
Intern plombering (Internal sealing)

Den interne plombering foretages ved at den forreste og bagerst skærmplade bliver låst med to labels (Billede 1 & 2). Derudover bliver JTAG stik plomberet med en label (Billede 3).
(The internal sealing is carried out by locking the front and back shielding plate using two labels (Picture 1 & 2). Furthermore the JTAG connector is sealed with a label (Picture 3))

Ekstern plombering (External sealing)

Den eksterne plombering foretages med plombetråd og plombe (Billede 4)
(The external sealing is done using thread and seal (Picture 4)

Tekst på label (Text on label): **Calibration Void IF BROKEN**



Billede 1 (Picture 1)

Billede 2 (Picture 2)

Billede 3 (Picture 3)

Billede 4 (Picture 4)

Udgave (Version)	**Udstedelsesdato** (Date of issue)	**Ændringer** (Changes)
1 J. nr. (J.No.):573-03-00027	2016-02-03	Original attest (Original certificate)

DOKUMENTATION
(DOCUMENTATION)

Ansøgning nr.: 573-03-00027

Dokumentation:
(Documentation)

Typegodkendelse, PTB Tyskland
Godkendelsesnummer: 22.76 / 10.02
(Type approval Certificate, PTB Germany
Approval no.: 22.76 / 10.02)

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