

EU-Type Examination Certificate

Measuring Instrument Directive

Certificate number: DK-0200-MI004-008

Issued by FORCE Certification A/S, Denmark
EU-notified body number 0200

In accordance with The Danish Safety Technology Authority's statutory order no. 1382 of November 25, 2016 which implements the Directive 2014/32/EU of the European Parliament and Council of February 26, 2014 on measuring instruments (MID).

Issued to: **Kamstrup A/S**
Industrivej 28, Stilling
DK-8660 Skanderborg

Type of instrument: Heat meter, flow sensor

Type designation: ULTRAFLOW® 54, ULTRAFLOW® 34

Valid until: 2027-10-05

Number of pages: 13, including appendix

Date of issue: 2017-10-05

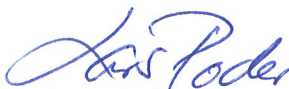
Version: 11
This new version of DK-0200-MI004-008 is issued due to updating to EN 1434:2015.
All previous certificates are withdrawn.

Approved by



Michael Møller Nielsen
Certification Manager

Processed by



Lars Poder
Examiner

The conformity markings may only be affixed to the above type approved equipment. The manufacturer's Declaration of Conformity may only be issued and the notified body identification number may only be affixed on the instrument when the production/product assessment module (D or F) of the directive is fully complied with and controlled by a written inspection agreement with a notified body. This EU-type examination certificate may not be reproduced except in full, without written permission by FORCE Certification A/S.

FORCE Certification references:
TASK no.: 117-33255.01 and ID no.: 0200-MID-02913

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Appendix to

EU-Type Examination Certificate Measuring Instrument Directive

Number: DK-0200-MI004-008Issued by FORCE Certification A/S, Denmark
EU-notified body number 0200

Revision history

Revision	Issue date	Changes
DK-0200-MI004-008	2007-12-06	Original certificate.
DK-0200-MI004-008	2009-08-28	Serial version added, labeling changed, DN 100 added, PN40 models added.
DK-0200-MI004-008 rev 1-2011	2011-02-22	Program meter factor, pulse length, 'SVM' added.
DK-0200-MI004-008 rev 1-2012	2012-04-10	Adding output module.
DK-0200-MI004-008 rev 2-2012	2012-09-18	New section concerning cooling and heating/cooling added to 'Description'.
DK-0200-MI004-008 rev 1-2014	2014-02-04	Description updated, Technical Data updated, Verification procedure updated.
DK-0200-MI004-008 rev 2-2014	2014-04-25	New pulse transmitter and pulse divider added, labelling examples corrected.
DK-0200-MI004-008 rev 3-2014	2014-09-22	Correction of type numbers, labeling examples updated.
DK-0200-MI004-008 rev 9	2015-02-27	DN300x500_PN16_qp 1000 m ³ /h added, SW update DN15...125.
DK-0200-MI004-008 ver 10	2016-05-27	DN20x190_PN16/PN25_qp 0.6 m ³ /h added, SW version for pulse divider added.
DK-0200-MI004-008 ver 11	2017-10-05	Updated to EN 1434:2015, validity extension, cable extension added, environmental data updated, various textual corrections.

Applied standards and documents:

EN 1434:2015

The instruments/measuring systems shall correspond with the following specifications:

Type designation:

ULTRAFLOW® 54, (34)

DK-0200-MI004-008**Description:**

The flow sensor functions according to the ultrasonic principle. The measuring unit consists of a body in brass, red brass or stainless steel. The meter housing includes two or four ultrasound transducers depending on the meter size. The position of these transducers as well as their sound track depends on the meter size. A plastic cabinet including a PCB, to which the signal cable is connected, is mounted on the meter. This PCB also includes a four-pinned plug. In connection with verification this plug can be used to supply the meter, pick-up pulses, change to high-resolution condition, control start/stop during serial verification as well as read serial data, the flow sensor can be connected to a separate Pulse Transmitter or Pulse Divider. The flow sensor is supplied by a build in supply module a separate Pulse Transmitter, Pulse Divider or a calculator e.g. MULTICAL® 603.

Technical documentation:

Reference No.:

- 117-33255.01
- 114-33017.04.16
- 114-33017.04.04
- 114-21535.0004.0022
- 114-21535.0004.0014
- 114-21535.0004.0012
- 112-23383.0004.0006
- 112-23383.0004.0001

Force Certification A/S File No.:

- 80.976-210/11
- 80.976-105/09
- 80.976-024/07

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Technical data

Instrument type according to	: EN 1434:2015
Instrument type	: Combined instrument Part: Flow sensor with possibility of build in sensor (M10x1 connection): G $\frac{3}{4}$ B and G1B flow sensors (threaded).
ULTRAFLOW® 54, Temperature of medium, flow sensor	: $\theta_{\min} - \theta_{\max}$: 15...130 °C or narrower range
ULTRAFLOW® 34, Temperature of medium, flow sensor	: $\theta_{\min} - \theta_{\max}$: 2...130 °C or narrower range
Temperature of medium, flow sensor q_p 150...1000 m ³ /h	: $\theta_{\min} - \theta_{\max}$: 2...150 °C or narrower range
Pressure stage q_p 0,6...1000 m ³ /h	: PN16 and PN25
Pressure stage q_p 3,5, 10, 15, 25, 40, 60 and 100 m ³ /h	: PN40

Nom. flow q_p [m ³ /h]	Installation dimensions				
0,6	G $\frac{3}{4}$ Bx110 mm	G1Bx130 mm	G1Bx190 mm	DN20x190 mm	
1,5	G $\frac{3}{4}$ Bx110 mm	G $\frac{3}{4}$ Bx165 mm	G1Bx110 mm	G1Bx130 mm	G1Bx165 mm
1,5	G1Bx190 mm	DN20x190 mm			
2,5	G1Bx130 mm	G1Bx190 mm	DN20x190 mm		
3	G1Bx130 mm	G1Bx190 mm	DN20x190 mm		
3,5	G5/4Bx260 mm	DN25x220 mm	DN25x260 mm		
6	G1Bx190 mm	G5/4Bx260 mm	G1 $\frac{1}{2}$ Bx260 mm	DN25x260 mm	DN32x260 mm
10	G2Bx300 mm	DN40x250 mm	DN40x256 mm	DN40x300 mm	
15	DN50x250 mm	DN50x270 mm			
25	DN65x300 mm				
40	DN80x300 mm	DN80x350 mm			
60	DN100x360 mm	DN100x400 mm			
100	DN100x360 mm	DN100x400 mm	DN125x350 mm		

Nom. flow q_p [m ³ /h]	Installation dimensions		
150	DN150x500 mm		
250	DN150x500 mm		
400	DN150x500 mm	DN200x500 mm	DN250x600 mm
600	DN200x500 mm	DN250x600 mm	
1000	DN250x600 mm	DN300x500 mm	

Dynamic range q_p 0,6...1000 m ³ /h	$q_i:q_p$ $q_s:q_p$	: 1:100, 1:50 and 1:25 : 2:1 and 1,8:1
Dynamic range q_p 1,5, 6,0, 15, 25, 40, (DN80x350, $\varnothing$ 40) and q_p 100 m ³ /h	$q_i:q_p$ $q_s:q_p$	: 1:250, 1:100, 1:50 and 1:25 : 2:1 and 1,8:1
Accuracy class		: 2 and 3
Environment class q_p 0,6...100 m ³ /h		: E1 and E2, M1

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Environment class q_p 150...1000 m³/h

Climatic class

Protection Class

Durability specification

Installation angle

Power supply

Power supply

(Build in supply module,

Pulse Transmitter or Pulse Divider)

Software version

: E1 and E2, M1 and M2

: 5...55 °C, non-condensing, closed location and
5...55 °C, condensing, closed location.

: ULTRAFLOW® 34 – IP67

ULTRAFLOW® 54 DN15...125 – IP65

ULTRAFLOW® 54/34 DN150...300 – IP67

Pulse Transmitter 66-99-903 – IP67

Pulse Divider 66-99-907 – IP67

Pulse Transmitter 66-99-603 – IP54

: Minimum 8 years (Long life flow sensor)

: Horizontally, vertically or at an angle

: 3,6 V $\pm$ 0,1 V

: 230 VAC

24 VAC

3,65 VDC, Lithium battery, D-cell

: ULTRAFLOW® q_p 0,6... 100 m³/h

Version	Checksum
5098-467 ver. B1	0x7F8A
5098-467 ver. C1	0x5C16
5098-467 ver. D1	0x9898

ULTRAFLOW® q_p 150... 1000 m³/h

Version	Checksum
5098-700 ver. B1	0x15F1

Pulse Divider type: 66-99-907-YZ-XXX

Version	Checksum
5098-1026 ver. B1	(Dec) 27343

Cable length

: From flow sensor to galvanic connected calculators
Max. 10 m

From flow sensor to galvanic connected calculators
using cable extender box Max. 30 m

From flow sensor to Pulse Transmitter / Pulse
Divider Max 10 m

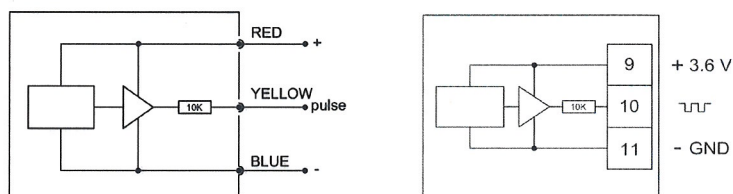
From galvanic separated output module
Depending on calculator.

Pulse output ULTRAFLOW®:

(Galvanic connected)

Type	Push-Pull
Output impedance	~10 k Ω
Meter factor	0,0004...300 pulses/l
Pulse duration	2...100 ms
Pause	Depending on current pulse frequency

Block diagram pulse output ULTRAFLOW®:



Pulse output:

(Galvanic separated)

Meter factor 0,0004...300 imp/l
Pulse duration 2...100 ms
Pause Depending on current pulse frequency

Pulse Transmitter type 66-99-903-YZ-XXX,

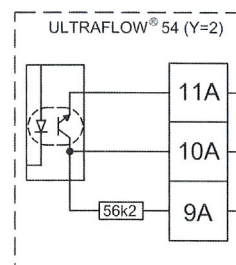
Pulse Divider type 66-99-907-YZ-XXX

and q_p 150...1000 m³/h

Galvanic separated output module (Y=2)

Open collector. 2-wire connection or 3-wire connection via the integrated pull-up resistor of 56,2 k Ω

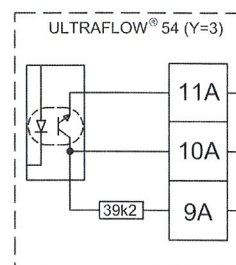
Module Y=2	OC and OD	(OB) Kam
Max input voltage	6 V	30 V
Max input current	0,1 mA	12 mA
ON condition	$U \leq 0,3 \text{ V @ } 0,1 \text{ mA}$	$U_{CE} \leq 2,5 \text{ V @ } 12 \text{ mA}$
OFF condition	$R \geq 6 \text{ M}\Omega$	$R \geq 6 \text{ M}\Omega$



Galvanic separated output module (Y=3)

Open collector. 2-wire connection or 3-wire connection via the integrated pull-up resistor of 39,2 k Ω

Module Y=3	OC and OD
Max input voltage	6 V
Max input current	0,1 mA
ON condition	$U \leq 0,3 \text{ V @ } 0,1 \text{ mA}$
OFF condition	$R \geq 6 \text{ M}\Omega$



Pulse Transmitter type 66-99-603

Type:

Open collector. 2 or 3-wire connection via the integrated pull-up resistance of 33 k Ω .

Output impedance

~2 k Ω

I_{max}

0,2 mA

Supply (9A)

3...10 VDC

Meter factor

0,004...300 pulses/l

Pulse duration

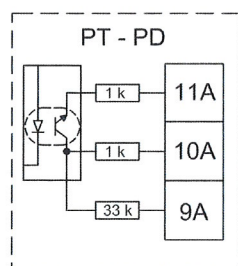
2...100 ms

Pause time

Depending on the actual pulse frequency

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2-wire connection	Voltage range	3...6 VDC
	Max leak current	1 μ A
	Min R_{load}	30 k Ω
	Max R_{load}	1 M Ω
3-wire connection	Supply (9A)	3...6 VDC
	I_{max}	0,2 mA



Verification procedure

According to EN 1434-5 and EN 1434-1

The flow sensor can be verified by picking up the volume proportional pulses in either standard or high-resolution condition. Furthermore, verification can be carried out using the serial data output.

Initial verification can be carried out via the four-pin plug of the measuring electronics.

For dynamic ranges $q_i:q_p$ 1:25 ,1:50 and 1:100, 1:100 can be used.

For dynamic ranges $q_i:q_p$ 1:25 ,1:50, 1:100 and 1:250, 1:250 can be used.

During verification a water temperature of 20 ± 5 °C can be used.

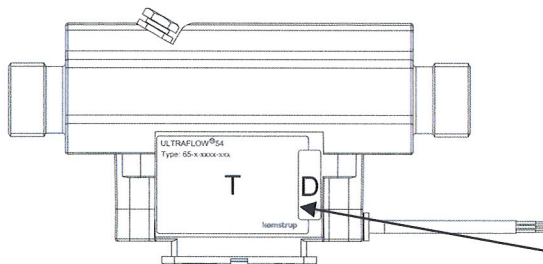
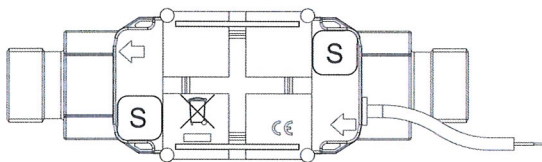
After verification before sealing Meter factor and Pulse duration can be configured.

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Seals and markings

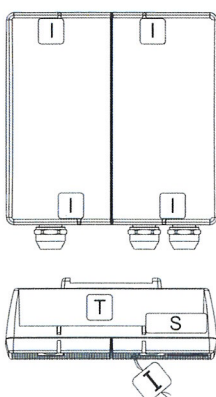
- D** Security seal or module D/F label (Depending on type label)
- S** Security seals. Covering screws or parts of type label
- T** Type label (as void label or with security seal D)
- I** Installation seals (wire and seal or sealing label)

q_p 0.6...100 m³/h

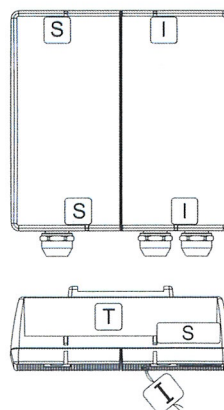


Covering part of type label

Pulse Transmitter type 66-99-903-YZ-XXX

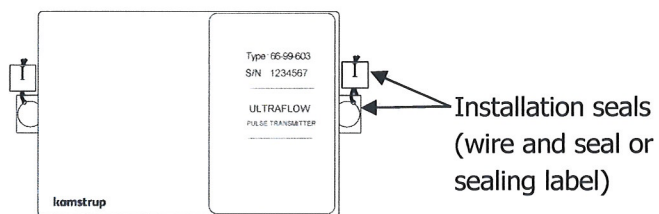


Pulse Divider type 66-99-907-YZ-XXX

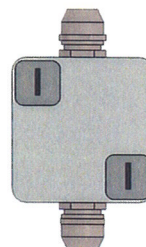


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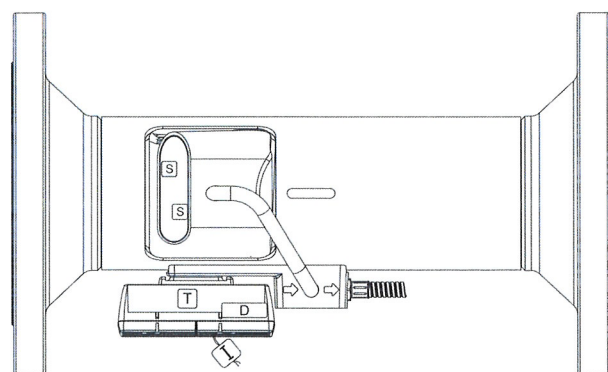
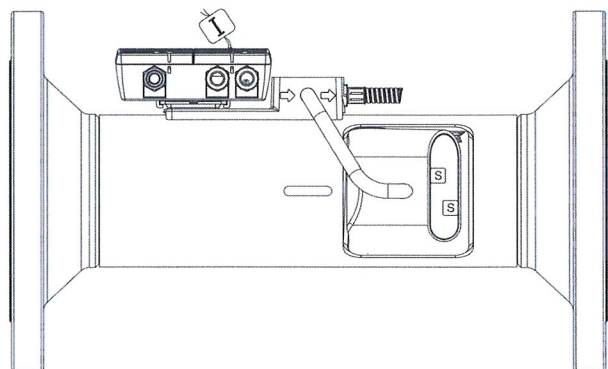
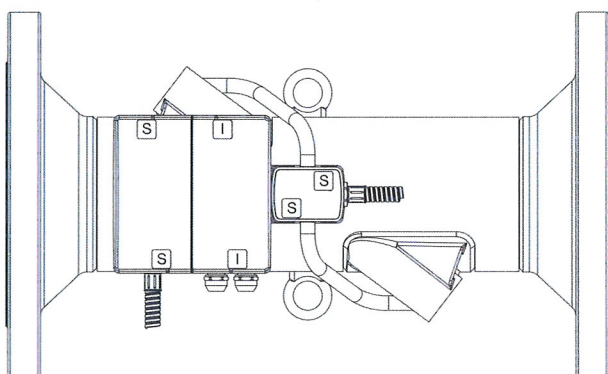
Pulse Transmitter type 66-99-603



Cable Extension Box type 66-99-036



$q_p \geq 150 \text{ m}^3/\text{h}$



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Labeling and inscriptions

Type label placed on the flow sensor with the following imprint:

System designation
Manufacturers name or logo
Manufacturers postal address
Type, production year and serial number
Accuracy class
Mechanical and electromagnetic environment classes
Flow limits q_l , q_p , q_s
Temperature of medium (θ_{min} - θ_{max})
Maximum working pressure (PN)
Meter factor
Software version
Arrow for flow direction

Additional inscriptions for Pulse Divider:

Meter factor input
Meter factor output
Duration of output pulse
Software version

Modules

Output modules q_p 150...1000 m³/h, Pulse Transmitter type 66-99-903-yz-xxx and Pulse Divider type 66-99-907-yz-xxx:

5550-1061	Galvanic connected output module (Y=1) (q_p 150...1000 m ³ /h only)
5550-1062	Galvanic separated output module (Y=2)
5550-1219	Galvanic separated output module "Low power" (Y=3)

Supply modules for q_p 150...1000 m³/h Pulse Transmitter and Pulse Divider:

1606-064	Battery, D-cell
5550-1052	230 VAC supply module
5550-1051	24 VAC supply module

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Example of type label

q_p 0,6...100 m³/h

ULTRAFLOW® 54 S/N:2015/301234567
TYPE: 65-5-CDAA-219
DK-0200-MI004-008 Cl: 2(M1, E2)
SW: D1
G3/4B (R½) x 110 mm 100 imp/l
PN16, PS16 qp: 1.5 m³/h
θ 15 ... 130°C qi: 0.015 m³/h
Δp: 0.22 bar qs: 3.0 m³/h
5925123
 ← kamstrup

ULTRAFLOW® 54 S/N:2011/301234567
TYPE: 65-5-CDAA-219
DK-0200-MI004-008 Cl:2(M1, E2)
SW:C1
G3/4B (R½) x 110 mm 100 imp/l
PN16, PS16 qp: 1.5 m³/h
θ 15 ... 130°C qi: 0.015 m³/h
Δp:0.22 bar qs: 3.0 m³/h
5925123
 ← Kamstrup

ULTRAFLOW® 54 S/N:2015/301234567
TYPE: 65-5-CDAA-295
DK-0200-MI004-008 Cl: 2(M1, E2)
SW: D1
G3/4B (R½) x 110 mm 1 l/imp
PN16, PS16 qp: 1,5 m³/h
θ 15 ... 130°C qi: 0,015 m³/h
Δp: 0,22 bar qs: 3,0 m³/h
5925123
 ← **SVM**

$q_p \geq 150$ m³/h

ULTRAFLOW® 54 TYPE: 65-5-FCCN-219 S/N: 2015/301234567
qp: 150 m³/h DN150x500 DK-0200-MI004-008 987654321
qi: 1.5 m³/h PN25, PS25 Cl:2(M2, E2) SW:B1
qs: 300 m³/h Δp: 0,02 bar
1 imp/l
θ: 2 ... 150°C 5925123
 kamstrup

ULTRAFLOW® 54 TYPE: 65-5-FCCN-27-219 Prog: 36-4 S/N: 2015/123456789
qp: 150 m³/h DN150x500 DK-0200-MI004-008 987654321
qi: 1.5 m³/h PN25, PS25 Cl: 2(M2, E2) SW: B1
qs: 300 m³/h Δp: 0.02 bar
1000 l/imp 20 ms Galv. separated 5925341
θ: 2...150°C 230 VAC
 kamstrup

ULTRAFLOW® 54 TYPE: 65-5-FCCN-28-295 Prog: 35-5 S/N: 2015/123456789
qp: 150 m³/h DN150x500 DK-0200-MI004-008 987654321
qi: 1.5 m³/h PN25, PS25 Cl: 2(M2, E2) SW: B1
qs: 300 m³/h Δp: 0.02 bar
100 l/imp 50 ms Galv. separated 5925341
θ: 2...150°C 24 VAC
 **SVM**

Pulse Transmitter type 66-99-603

Pulse Transmitter type 66-99-903-YZ-XXX

Pulse Transmitter Type: 6699903-32-219 000-00-0-001 S/N: 2015/70500000
Supply: Battery
 kamstrup

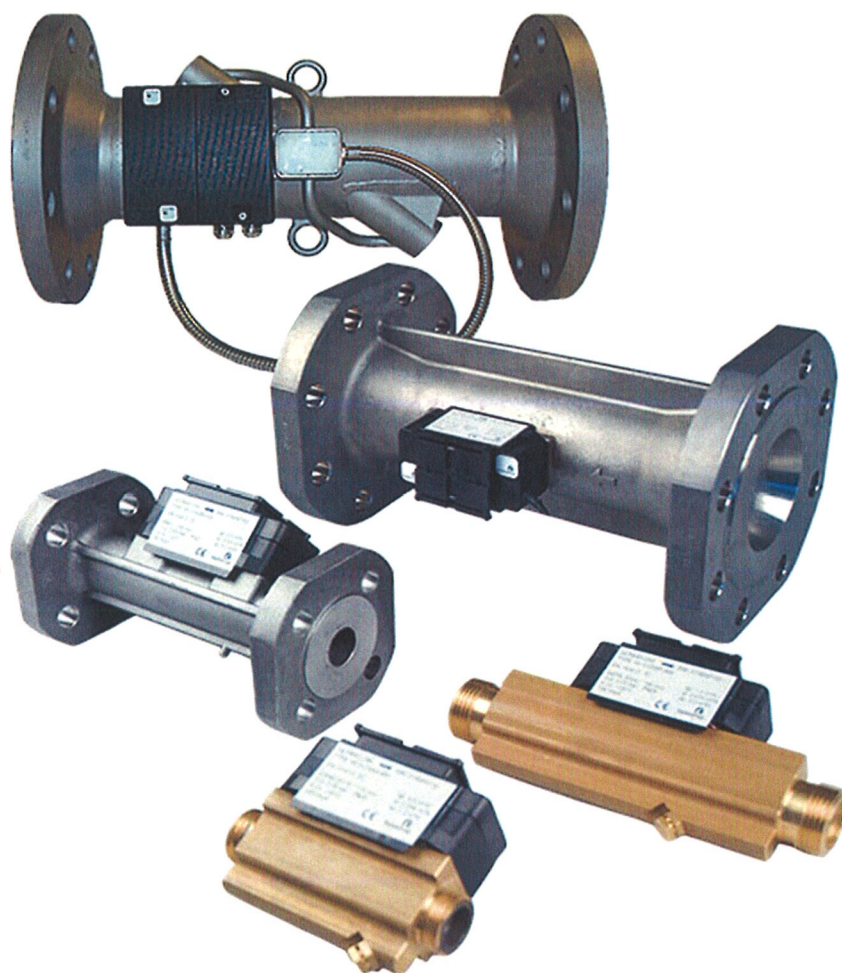
Pulse Divider type 66-99-907-YZ-XXX

Pulse Divider Type: 6699907-32-219 119-33-4-001 S/N: 2015/70500000
Pulse Input: 100 imp/l
Pulse Output: 1.0 l/imp, 20 ms
Supply: Battery
 SW:B1 kamstrup

Type: 66-99-603
S/N: 123456
ULTRAFLOW®
PULSE TRANSMITTER

DK-0200-MI004-008

Photos of ULTRAFLOW® X4



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Informative Annex

Integrated functions not subject to the Measuring Instruments Directive:

The flow sensors ULTRAFLOW® 34 and ULTRAFLOW® 54/34 qp 150...1000 m³/h are type tested as Heating, Cooling and as bi-functional Heating/Cooling flow sensors according to EN 1434-4:2015. On this basis, the flow sensors are national type approved for Cooling according to the Danish law ¹, System designation TS 27.02 002.

The integrated bi-functional Heating/Cooling function can therefore be utilized under the operating conditions as described in this certificate.

¹ 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 as amended by BEK. No. 549 of 01/06/2016.