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Sensus GmbH Ludwigshafen
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Your reference: **Jürgen Westphal**
Your letter of: **11.03.2020**
My reference: **PTB-1.5-ri**
My letter of:

Handled by: **Dr. Michael Rinker**
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Date: **12.03.2020**

Confirmation

Dear Sirs and Madames,

I hereby confirm that for the evaluation of the water meter type

MeiStream Plus

EC Design-examination Certificate no.DE-09-MI001-PTB012, Revision 5

Reference no PTB-1.5-4086148

the following harmonized standards, normative documents and rules have been applied:

OIML-R 49-1, Edition 2013
OIML-R 49-2, Edition 2013
OIML-R-49-3, Edition 2013
DIN EN ISO 4064-1, Edition 2017
DIN EN ISO 4064-2, Edition 2017
DIN EN ISO 4064-4, Edition 2017
DIN EN ISO 4064-5, Edition 2017
DIN EN 14154-4, Edition 2014
WELMEC Software guide 7.2:2018

Sincerely yours
on behalf

Conformity assessment Body
Subject area: Measuring instruments for liquids

Dr. Michael Rinker

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KBS
Conformity Assessment Body

[Coat of Arms]

EU-Entwurfsbescheinigung

EU Design-examination Certificate

Ausgestellt für:
Issued to: Sensus GmbH Hannover
Meineckestrasse 10
30880 Laatzen

gemäß:
in accordance with: Anhang II Modul H1 der Richtlinie 2014/32/EU des Europäischen Parlaments und des Rates vom 26. Februar 2014 zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten über die Bereitstellung von Messgeräten auf dem Markt.
Annex II Module H1 of the Directive 2014/32/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments

Geräteart:
Type of instrument: Wasserzähler
Water meter

Typenbezeichnung:
Type designation: MeiStream Plus

Nr. der Bescheinigung:
Certificate no.: DE-09-MI001-PTB012, Revision 5

Gültig bis:
Valid until: 18.06.2027

Anzahl der Seiten:
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Notifizierte Stelle:
Notified Body: 0102

Zertifizierung:
Certification: Braunschweig, 19.06.2017

Bewertung:
Evaluation:

Im Auftrag
On behalf of PTB

Siegel
Seal

im Auftrag von
on behalf of PTB

[Illegible signature]
Dipl.Ing. Rüdiger Jost

[official stamp PTB]

Dr. Michael Rinker
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Certificate History

Certificate edition	dated	Amendments
DE-09-MI001-PTB012	27.05.2009	- initial certificate
DE-09-MI001-PTB012, revision 1	06.08.2009	- complementing the technical documents - new and revised type plates
DE-09-MI001-PTB012, revision 2	19.10.2012	- complementing the technical documents; - defining the measuring insert to be the exchangeable metrological unit
DE-09-MI001-PTB012, revision 3	28.02.2014	- broadening the rated operation conditions by the additional ratio 80 - optional register without multiplier "x10" in nominal size DN 150 - making the user seal at the "opto window" obsolete
DE-09-MI001-PTB012, revision 4	21.04.2015	- 7-rollers register version "MeiStream MS – D HRI" added - electronic register "eRegister C&I" added
DE-09-MI001-PTB012, revision 5	19.06.2017	- FW release for electronic register - recertification according to Directive RL 2014/32/EU - editorial text revision

This revision 5 replaces the revision 4 of the certificate no. DE-09-MI001-PTB012 dated 27.05.2009, reference no. PTB-1.5-4040429.

Examination results:

The instruments mentioned in this certificate are subject to the following fundamental requirements of the Directive **2014/32/EU** of the European Parliament and the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of measuring instruments (official journal L 96 page 149), last amended by amendment of 20.01.2016 (official journal L 13 page 57):

- Annex I "Fundamental Requirements"
- Annex III (MI-001) "Water Meters",
in conjunction with §6 of the Metering and Calibration Act of 25.07.2013 (Federal Law Gazette I page 2722), last amended by article 1 of the Act of 11.04.2016 (Federal Law Gazette I page 718), and §8 of the Measuring and Calibration Ordinance of 11.12.2014 (Federal Law Gazette I page 2010), last amended by article 2 of the Act of 29.08.2016 (Federal Law Gazette I page 2034).

The measuring instrument's technical design specified below complies with the above mentioned fundamental requirements. This certificate entitles the holder to mark the instruments manufactured in conformity with this certificate with the number of this certificate.

The measuring instruments must comply with the following regulations:

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1 Type description

Woltman meter for cold and warm water

1.1 Construction

The meter comprises a body (connection interface) with two pipe-shaped flanged end connections and a measuring insert (exchangeable metrological unit) consisting of a Woltman rotor metering element of the version WP and a mechanical or electronic dry-dial-pointer register.

The meter is equipped with a flow straightener integrated in the body's inlet.

The cover flange of the metrological unit is reliably attached to the head flange of the corresponding body by four screws.

Metrological unit and body together form the water meter. Only bodies with flow straightener, directional arrow and MID marking cut into the flange's upper surface (the illustration to the right shows the body of nominal size DN 150 by way of example) are permitted.

[photo and legend] MID marking – body's nominal size + directional arrow – flow straightener

Metering element and register are attached together by means of a secured sliding ring.

The complete type range consists of three metrological units, where the cover flange including regulating screw can optionally be made of tin-coated brass (nominal sizes DN 40 to DN 100) or a combination of brass and grey cast iron (nominal size DN 150) or also of plastic material (nominal sizes DN 40 to DN 100) or a combination of plastic material and grey cast iron (nominal size DN150).

The smallest metrological unit represents the nominal sizes DN 40, DN 50 and DN 65. The medium-sized metrological unit represents the nominal sizes DN 80, and DN 100, and the biggest metrological unit is only fitted into the nominal size DN 150.

Within each nominal size the corresponding metrological units are identical except for the bodies. All metrological units admit full flow.

The minimum body length of each nominal size can be found in the table below:

Nominal size	Minimum body length
DN 40	220 mm
DN 50	200 mm
DN 65	200 mm
DN 80	200 mm
DN 100	250 mm
DN 150	300 mm

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1.1.1 Version MeiStream Plus DN 40, DN 50 and DN 65

Woltman meter with dry-dial pointer register and flanged end connections on both sides suitable to be fitted into horizontal pipelines.

- drawing no. SK_51567 of 26.02.2009 (cross and longitudinal sectional views, perspective and top views Woltman meter MeiStream / MeiStream Plus DN 40, DN 50 and DN 65, Q_3 16 m³/h to Q_3 40 m³/h in combination with dry-dial pointer register and flow straightener, showing MeiStream DN 50) and
- drawing no. SK_51563 of 26.02.2009 (cross and longitudinal sectional views and top view metrological unit MeiStream / MeiStream Plus DN 40, DN 50 and DN 65, Q_3 16 m³/h to Q_3 40 m³/h in combination with dry-dial pointer register, detailed views rotor bearings as well as magnet coupling, showing metrological unit MeiStream DN 50)
- together with corresponding bill of material no. 5210 page 1 of 19.12.2011.

1.1.2 Version MeiStream Plus DN 80 and DN 100

Woltman meter with dry-dial pointer register and flanged end connections on both sides suitable to be fitted in horizontal pipelines.

- drawing no. SK_51568 of 27.02.2009 (cross and longitudinal sectional views, perspective and top views Woltman meter MeiStream / MeiStream Plus DN 80 and DN 100, Q_3 40 m³/h to Q_3 100 m³/h in combination with dry-dial pointer register and flow straightener, showing MeiStream DN 100) and
- drawing no. SK_51564 of 27.02.2009 (cross and longitudinal sectional views and top view metrological unit MeiStream / MeiStream Plus DN 80 and DN 100, Q_3 40 m³/h to Q_3 100 m³/h in combination with dry-dial pointer register, detailed views rotor bearings as well as magnet coupling, showing metrological unit MeiStream DN 100)
- together with corresponding bill of material no. 5210 p. 1 of 19.12.2011.

1.1.3 Version MeiStream Plus DN 150

Woltman meter with dry-dial pointer register and flanged end connections on both sides suitable to be fitted in horizontal pipelines.

- drawing no. SK_51570 of 27.02.2009 (cross and longitudinal sectional views, perspective and top views Woltman meter MeiStream / MeiStream Plus DN 150, Q_3 160 m³/h to Q_3 250 m³/h in combination with dry-dial pointer register and flow straightener, showing MeiStream DN 150) and
- drawing no. SK_51566 of 27.02.2009 (cross and longitudinal sectional views and top view metrological unit MeiStream / MeiStream Plus DN 150, Q_3 160 m³/h to Q_3 250 m³/h in combination with dry-dial pointer register, detailed views rotor bearings as well as magnet coupling, showing metrological unit MeiStream DN 150)
- together with corresponding bill of material no. 5211 p. 1 of 19.12.2011.
- drawing no. SK_51705 of 02.09.2013 (register, MeiStream/ -Plus MS-D HRI DN150 T50, register 1 m³ without multiplier)

1.2 Measurement sensor

Woltman rotor metering element with rotor shaft situated in the pipe axis.

The water flows in through the integrated flow straightener, through the water straightening vane onto the Woltman rotor. The rotational movement of the rotor, which is positioned parallel to the flow, is transferred by a worm wheel and a transmission shaft to the magnet coupling. The magnet coupling transfers the rotational movement from the metering element to the register. The water flows out through the opposite outlet port.

Adjustment is possible by means of a by-pass regulation at the regulating bulkhead. Adjustment is only possible when the sliding ring has been removed.

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- drawing no. SK_51576 of 27.02.2009 (cross-sectional detail view regulating bulkhead MeiStream/MeiStream Plus DN 40 to DN 150, Q_3 16 m³/h to Q_3 250 m³/h, showing MeiStream Plus DN 100).

1.3 Measurement processing

1.3.1 Dry-dial pointer register

The rotations of the Woltman rotor are transferred to the register by means of a transmission shaft and magnet coupling. Within the register the rotational movement is finally transferred by gear train with worm wheel to the fastest continuously moving roller.

1.3.2 Electronic register “eRegister C&I”

The rotor’s rotational movement is transferred by a magnet coupling out of the meter’s wet area into the dry area of the electronic register. Within the register there is a concurrently rotating magnet coupling, which is scanned by an electronic sensor. The rotational movement and rotational direction are converted electronically, processed and registered on the LCD. The calculated and indicated data can be read by a coded radio protocol.

The register is equipped with a locking device allowing a maximum rotation of 359° related to the meter’s body.

- Drawing no. SK_51721 of 22.01.2015 (electronic register “eRegister” MeiStream / MeiStream Plus / MeiTwin register 30°C)
- Bill of material no. 5242 of 20.01.2015 (electronic register “eRegister C&I”)

1.4 Measurement indication

1.4.1 Register version „MeiStream Plus MS - D HRI” with inductive pulse emitting equipment HRI-Mei and opto-electronic pulse emitting equipment OD

Dry-dial pointer register with magnet coupling to the metering element.

The register has 6 white rollers with black figures for the cubic meter indication as well as 3 red pointers (circular scales) for the indication of the post decimal positions for the nominal sizes DN 40 to DN 100 or two red and one black pointer for the nominal size DN 150 as well as a reading star.

The pointer with the circle value 10 litres (ℓ) (nominal sizes DN 40 to DN 100) or 100 ℓ (nominal size DN 150) may be equipped with a modulator plate (register prepared for HRI). The indication is in cubic meters (m³). The fastest roller turns continuously. The smallest dividing value of the fastest turning counting element is 0,5 ℓ (nominal sizes DN 40 to DN 100) or 5 ℓ (nominal size DN 150).

The register is equipped with a locking device allowing a maximum rotation of 359° related to the meter body.

All gearwheels required for the necessary gear reduction are located between an upper and a lower plate, which serve as bearing plates, too. The upper plate is also the dial plate, at the same time.

The register „MeiStream Plus MS - D HRI” may, if required even at the meter’s fitting point, also be equipped in combination with a retrofittable inductive pulse emitting equipment HRI-Mei or with an opto pulse emitter OD.

Design and functionality of the inductive pulse emitting equipment HRI-Mei:

In case of the nominal sizes DN 40 to DN 100 there is a modulator plate (nonmagnetic damping plate) on the pointer with circle value 10 litres (ℓ). The pulse rate is not less than 10 ℓ per pulse.

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In case of the nominal size DN 150 the modulator plate is situated on the pointer with circle value 100 ℓ. Consequently, the pulse rate is not less than 100 ℓ per pulse.

This damping plate can be scanned by the inductive pulse emitting equipment HRI-Mei in a non-interacting way and, therefore, serves to generate pulses equivalent to the volume.

The electronic evaluator with the scanning oscillating circuit is placed in a separate casing, which is fixed by means of a bayonet onto the register bonnet and which can be locked in position by use of a sliding ring.

Within the casing there are two coils distinguishing forward and backward rotations of the non-interactively scanned pointer. The hardware includes a processor evaluating the signals of the oscillating circuit and calculating the output pulses.

The type of protection of the pulse emitter's casing is IP 68.

In order to allow mounting the pulse emitter onto the register, the sight glass is flattened around the HRI's fastening position.

Design and functionality of the optical pulse emitting equipment OD:

Some of the gearwheels are combined with magnet holders or a reflector wheel and serve for generating pulses equivalent to the volume, which can be picked up by means of a pulse emitter.

For the nominal sizes DN 40 to DN 100, the reflector wheel with 10 reflecting surfaces for the opto pulse emitter OD is placed at the counting element with circle value 10 ℓ per cycle and, for the nominal size DN 150, at the counting element with circle value 100 ℓ per cycle. The pulse rate is not less than 1 ℓ per pulse (nominal sizes DN 40 to DN 100) or 10 ℓ per pulse (nominal size DN 150).

- drawing no. SK_51572 of 27.02.2009 (sectional view dry-dial pointer register MeiStream / MeiStream Plus MS - D HRI) together with corresponding
- bill of material no. 5212 p. 1 of 18.05.2009 .

Register without multiplier "x10"

For the nominal size DN 150 with rated operation conditions $Q_3 = 160 \text{ m}^3/\text{h}$ with R40 and R160, as well as $Q_3 = 250 \text{ m}^3/\text{h}$ with R80, R315 and R400 there is the option to use a register, where transmission is adapted in such a way that the very right roller indicates m^3 . For this version the imprint "x10" is no longer required

- drawing no. SK_51705 of 02.09.2013 (register, MeiStream/ -Plus MS-D HRI DN150 T50, register 1 m^3 without multiplier)

1.4.2 Register version „MeiStream Plus MS - Encoder" with inductive pulse emitting equipment HRI

Dry-dial pointer register with magnet coupling to the metering element.

The register has 6 black rollers with white figures for the cubic metre indication as well as 3 red pointers (circular scales) for the indication of the post decimal positions for the nominal sizes DN 40 to DN 100 or two red and one black pointer for the nominal size DN 150 as well as a reading star.

The indication is in cubic metres (m^3). The fastest roller turns continuously. The smallest dividing value of the fastest turning counting element is 0,5 ℓ (nominal sizes DN 40 to DN 100) or 5 ℓ (nominal size DN 150).

The register is equipped with a locking device allowing a maximum rotation of 359° related to the meter body.

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Each roller of the register is equipped with concentric coding slits. They can be scanned by light barriers and, in that way, the meter reading can be picked up.

The reading instrument is connected via cable and interface. During read-out the electronic part of the register is externally powered.

In sleep mode this electronic part is not powered. The interface works in a non-interacting way.

The register „MeiStream Plus MS - Encoder" may, if required even at the meter's fitting point, be operated with a retrofittable inductive pulse emitting equipment HRI.

In case of the nominal sizes DN 40 to DN 100 the modulator plate is positioned on the pointer with circle value 100 ℓ. The pulse rate is not less than 100 ℓ per pulse.

In case of the nominal size DN 150 the modulator plate is positioned on the pointer with circle value 1000 ℓ. As a result, the pulse rate is not less than 1000 ℓ per pulse.

Design and functionality of the inductive pulse emitting equipment HRI is, to the greatest extent, similar to the pulse emitting equipment HRI-Mei specified under no. 1.4.1. The only difference compared to the HRI-Mei is the HRI's attachment by means of a screwed connection.

- drawing no. SK_51577 of 02.03.2009 (sectional view dry-dial pointer register MeiStream / MeiStream Plus MS - Encoder) together with corresponding
- bill of material no. 5208 p. 1 of 18.05.2009

1.4.3 Register version “MeiStream MS-D HRI” with 7-rollers register without multiplier “x10”

Optionally the meter of nominal size DN 150 is manufactured with a mechanical 7-rollers register “MeiStream MS-D HRI”. Transmission is adapted in such a way that the right roller indicates m³, and, therefore, the imprint “x10” on the dial plate is no longer required for this version.

- drawing no. SK_51742 of 24.03.2015 (register MeiStream MS – D HRI DN150/200-300 T50 7 rollers) together with corresponding
- bill of material no. 5211 p.1 of 18.05.2009.

1.4.4 Electronic register “eRegister C&I”

Electronic register with 9-digit volume indication in LCD technology with dark figures on a light background. The decimal point can be adjusted as required at the factory (3 decimal places, smallest indicated value 1 litre for DN 40 to DN125 and 2 decimal places, smallest indicated value 10 litres as from DN 150).

The display can be put into a test mode for testing purposes (smallest fractional value of the display 0,625 litres for DN40 to DN125 and 6,25 litres as from DN 150)

- drawing no. SK_51722 of 26.01.2015 (dial plate “eRegister” MeiStream / MeiStream Plus / MeiTwin register 30°C)
- drawing no. SK_51744 of 24.03.2015 (head assembly including type plate, MeiStream with eRegister C&I, DN 65, DN 100, DN 150)

1.5 Optional equipment and features, which are subject to the Measuring Instruments Directive

- none –

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1.6 Technical documents

The technical documents, which are part of this certificate, are on file at the PTB according to the corresponding set of certification documents. The table of contents of the set of certification documents has been sent to the certificate holder.

1.7 Integrated equipment and features, which are not subject to the Measuring Instruments Directive

1.7.1 Mechanical register with pulse emitting equipment

The meters are also equipped in combination with two different types of pulse emitters:

- inductive pulse emitting equipment HRI-Mei or HRI (see nos. 1.4.1 and no. 1.4.2),
- opto-electronic pulse emitter OD (see no. 1.4.1).

All emitting contactors are exchangeable at the meter's fitting location, if required.

- drawing no. SK_51586 of 14.05.2009 (cross-sectional and top views Woltman meter MeiStream / MeiStream Plus DN 40 to DN 150 with dry-dial pointer register and pulse emitting equipment HRI-Mei, HRI and OD, showing Woltman meter MeiStream DN 50, protective lid open).

1.7.2 Electronic register

The glass/copper encapsulated electronic register has an integrated radio module providing consumption data and diagnostic functions. Additional symbols show a variety of operating conditions, such as magnet influence, leakage, pipe break, low battery. These functions are provided by an independent non-interacting microcontroller, which does not affect the register's metrological part.

2 Technical data

2.1 Rated operating conditions

2.1.1 Nominal size DN 40 (R 40, R 80, R 160, R 315)

Q ₁ [m ³ /h]	0,4	0,3125	0,1	0,079
Q ₂ [m ³ /h]	0,64	0,5	0,16	0,127
Q ₃ [m ³ /h]	16	25	16	25
Q ₄ [m ³ /h]	20	31,25	20	31,25
Q ₂ /Q ₁	1,6			
Q ₃ /Q ₁	40	80	160	315

2.1.2 Nominal size DN 50 (R 40, R 80, R 160, R 315)

Q ₁ [m ³ /h]	0,4	0,3125	0,1	0,079
Q ₂ [m ³ /h]	0,64	0,5	0,16	0,127
Q ₃ [m ³ /h]	16	25	16	25
Q ₄ [m ³ /h]	20	31,25	20	31,25
Q ₂ /Q ₁	1,6			
Q ₃ /Q ₁	40	80	160	315

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2.1.3 Nominal size DN 65 (R 40, R 80, R 160, R 315, R 400)

Flow range:

Q ₁ [m ³ /h]	0,625	0,5	0,156	0,127	0,1
Q ₂ [m ³ /h]	1	0,8	0,25	0,203	0,16
Q ₃ [m ³ /h]	25	40	25	40	40
Q ₄ [m ³ /h]	31,25	50	31,25	50	50
Q ₂ /Q ₁	1,6				
Q ₃ /Q ₁	40	80	160	315	400

2.1.4 Nominal size DN 80 (R 40, R 80, R 160, R 315, R 400)

Flow range:

Q ₁ [m ³ /h]	1	0,7875	0,25	0,2	0,158
Q ₂ [m ³ /h]	1,6	1,26	0,4	0,32	0,252
Q ₃ [m ³ /h]	40	63	40	63	63
Q ₄ [m ³ /h]	50	78,75	50	78,75	78,75
Q ₂ /Q ₁	1,6				
Q ₃ /Q ₁	40	80	160	315	400

2.1.5 Nominal size DN 100 (R 40, R 80, R 160, R 315, R 400)

Flow range:

Q ₁ [m ³ /h]	1,575	1,25	0,394	0,318	0,25
Q ₂ [m ³ /h]	2,52	2,0	0,63	0,508	0,4
Q ₃ [m ³ /h]	63	100	63	100	100
Q ₄ [m ³ /h]	78,75	125	78,75	125	125
Q ₂ /Q ₁	1,6				
Q ₃ /Q ₁	40	80	160	315	400

2.1.6 Nominal size DN 150 (R 40, R 80, R 160, R 315, R 630)

Flow range:

Q ₁ [m ³ /h]	4	3,125	1	0,794	0,397
Q ₂ [m ³ /h]	6,4	5,0	1,6	1,27	0,635
Q ₃ [m ³ /h]	160	250	160	250	250
Q ₄ [m ³ /h]	200	312,5	200	312,5	312,5
Q ₂ /Q ₁	1,6				
Q ₃ /Q ₁	40	80	160	315	630

2.1.7 Accuracy class, temperature range and environment conditions

Accuracy class:	± 2 % (Q ₂ ≤ Q ≤ Q ₄) ± 5 % (Q ₁ ≤ Q < Q ₂)
Temperature range:	0,1 °C to 50 °C
Mechanical environment conditions:	M2
Climatic environment conditions:	5 °C to 70 °C
Electromagnetic environment conditions:	- not applicable -

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2.1.8 Pressure range and pressure loss

Nominal size	P_{min}	P_{max}	ΔP
40	0,3 bar (0,03 MPa)	16 bar (1,6 MPa)	0,1 bar (0,01 MPa)
50			0,1 bar (0,01 MPa)
65			0,25 bar (0,025 MPa)
80			0,1 bar (0,01 MPa)
100			0,16 bar (0,016 MPa)
150			0,16 bar (0,016 MPa)

2.2 Further operating conditions

- none -

3 Interfaces and compatibility conditions

- none -

4 Requirements for production, first operation and use

4.1 Requirements for production

The metrological verification test is carried out in accordance with OIML R 49-1, edition 2006 at the following three flow rates at a water temperature of $20\text{ °C} \pm 10\text{ °C}$:

$$Q_1 \leq Q \leq 1,1 Q_1$$

$$Q_2 \leq Q \leq 1,1 Q_2$$

$$0,9 Q_3 \leq Q \leq Q_3$$

The measured errors of indication must not exceed the maximum permissible value for any of the a.m. flow rates.

4.2 Requirements for first operation

Installation of inlet and outlet pipe lengths is not required (U_0 / D_0).

It is recommended to secure the connection points at the pipeline by means of a user seal. The user seal (adhesive stamp, lead seal or the like) preventing dismounting the meter should be designed in such a way that it cannot be removed or detached without visible damage.

Each meter is to be accompanied by descriptive operating and mounting instructions (refer to no. 7.1).

The pulse emitting equipment HRI-Mei, HRI or OD is allowed to be mounted later on, at the meter's fitting location, if required. Retrofitting with pulse emitting equipment is only allowed by fitters, who have been particularly trained for this purpose. The pulse emitting equipment should be secured against removal by means of a user seal.

4.3 Requirements for use

The user is to be instructed (e.g. in the mounting instructions) that

- for applications, which are under legal metrological surveillance in the corresponding EU member state, the measuring instrument may only be operated under the rated operating conditions specified under 2.1.
- the exchangeable metrological unit (measuring insert) in combination with one of the connection interfaces (body) specified in this design-examination forms the measuring instrument (water meter);
- the exchangeable metrological unit may only be used in combination with one of the connection interfaces specified in this design-examination certificate.

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5 Verification of instruments in operation

5.1 Documents for the test

The design-examination certificate in hand and the technical documents listed under no. 1.6.

5.2 Specific test equipment or software

The meter must correspond to the technical documents under no. 1.6, the inscriptions to the specification under no. 7.2. The software version is 1.1 and can be read via radio interface (SIRT) or indicated on the display.

5.3 Identification

The test can be carried out by volumetric or gravimetric methods or by using reference meters. The used test equipment must allow the adjustment of the flow rates specified under no. 4.1.

- a) SIRT (Sensus Interface Radio Tool) for communication with the meter under test.
- b) Opto scanning head converting the light pulses of the LED, which are proportional to the volume, into an electrical signal, which can be utilised by the test rig.

5.4 Calibrating and adjusting methods

Adjustment of the meter is carried out by means of the bypass regulating bulkhead, sliding ring removed. The functionality is also specified under no. 1.2. After adjustment the register and the sliding ring is remounted and the meter is tested. The metrological test must be carried out within the rated operating conditions.

The security measures specified in no. 6.1 prevent that the adjustment can be changed afterwards.

6 Security measures

6.1 Mechanical sealing

The security sliding ring and the register below must be snap-fitted and secured in such a way that wilful opening is only possible by force leaving visible traces.

Moreover the metrological unit is to be secured against unauthorised disassembly by covering one head flange screw with a push-in cap and/or adhesive stamp or securing it by sealing wire.

The pulse emitting equipment should be secured against removal by a user seal.

- photo no. SK_51578 of 03.02.2014 (view of seals Woltman meter MeiStream / MeiStream Plus DN 40, DN 50 and DN 65, showing MeiStream DN 65),
- photo no. SK_51579 of 03.02.2014 (view of seals Woltman meter MeiStream*/MeiStream Plus DN 80, DN 100 and DN 125*, showing MeiStream DN 100) and
- photo no. SK_51580 of 03.02.2014 (view of seals Woltman meter MeiStream / MeiStream Plus DN 150).

To prevent any soiling or damage during the transport to the fitting site the body's inlet and outlet passages must be covered.

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6.2 Electronic sealing

The instrument version with electronic register is locked electronically by a defined bit pattern after completion of production and configuration. After that, changes of the metrological configuration are no longer possible.

7 Marking and inscriptions

7.1 Information to be added to the instrument

Operating / mounting instructions:

Each meter is to be accompanied by descriptive operating / mounting instructions. They have to include the following items for particular observation:

- a) Check of the sealing surfaces and the seals before fitting. It must be ensured that, in case of need, particular measures prevent the seals at the meter from getting out of place, dropping out or being damaged during the transport from the manufacturer to the fitting site. If required, the seals are to be pasted in.
- b) Check of the readability of the meter characteristics after fitting. The visual readability of the meter indication, all characteristics of the meter and the conformity and metrological marking must not be impaired.
- c) It must be ensured by suitable measures that any possibility of soiling or damage is eliminated during the transport to the fitting site.
- d) The pulse emitting equipment HRI-Mei or HRI and OD are allowed to be mounted later on, at the meter's fitting location if required. Retrofitting with pulse emitting equipment is only allowed by fitters, who have been particularly trained for that purpose. The pulse emitting equipment should be secured against removal by means of a user seal.

Marking and inscriptions

On the meter the following information must at least be available:

- manufacturer's name or company name or his trademark and his postal delivery address,
- Q_3 and the ratio Q_3 / Q_1 ,
- year of production and individual serial number of the meter,
- number of the design-examination certificate,
- the temperature class T50,
- the pressure loss class ΔP in kPa,
- the maximum operating pressure in „bar“ or MPa,
- the operating position,
- flow direction (e.g. on the body) and
- unit of measurement m^3 .

Conformity and metrological marking is applied in accordance with article 20 of the Directive 2014/32/EU.

Additional inscriptions are allowed, as long as they cannot be mixed up with the a.m. characteristics.

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- drawing no. SK_51600 of 03.08.2009 (top views Woltman meter MeiStream / MeiStream Plus DN 40 to DN 150 with dry-dial pointer register, showing MeiStream DN 65 with pulse emitting equipment OD and HRI-Mei as well as MeiStream Plus DN 65, views of marking and inscriptions, protective lid open),
- photo no. SK_51582 of 03.03.2009 (top views Woltman meter MeiStream Plus DN 40 to DN 150, showing MeiStream Plus DN 65, DN 100 and DN 150, view of marking and inscriptions, protective lid open).

The meters are also allowed to be put on the market in the name of the companies

Aquametro AG Ringstrasse 75 CH-4106 Therwil Switzerland
or

GWF MessSysteme AG Obergrundstrasse 119 CH- 6002 Luzern Switzerland.

In that case the name „Sensus“, being the manufacturer responsible for the conformity declaration, is to be attached right beside or below the conformity and metrological marking.

Examples of the conformity and metrological marking:

[two photos]

- photo no. SK_51601 of 04.08.2009 (top views Woltman meter MeiStream Plus DN 40 to DN 150, showing MeiStream Plus DN 50, protective lid versions GWF and Aquametro),

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8 Illustration – photos (by way of example)

Woltman meter MeiStream / MeiStream Plus DN 40, DN 50 and DN 65
without and with HRI-Mei / HRI / OD

[two photos]

MeiStream DN 65 with dry-dial pointer register MeiStream MS - D HRI, flow straightener, cover flange made of metal and/or plastic material and sealing (perspective view)

[two photos]

MeiStream DN 65 with dry-dial pointer register MeiStream MS - D HRI, metal cover flange and sealing (top and side views)

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Woltman meter MeiStream / MeiStream Plus DN 40, DN 50 and DN 65
without and with HRI-Mei / HRI / OD

[two photos]

MeiStream DN 65 with dry-dial pointer register MeiStream MS - D HRI, metal cover flange, pulse emitting equipment HRI-Mei and OD (perspective view)

27.02.2009 SK_51573

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Woltman meter MeiStream*/MeiStream Plus DN 80, DN 100 and DN 125*
without and with HRI-Mei / HRI / OD

[two photos]
MeiStream DN 100 with dry-dial pointer register MeiStream MS - D HRI, flow straightener, cover flange made of metal and/or plastic, respectively, and sealing (perspective view)

[two photos]
MeiStream DN 100 with dry-dial pointer register MeiStream MS-D HRI, metal head flange and sealing (top and side views)

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Woltman meter MeiStream* / MeiStream Plus DN 80, DN 100 and DN 125*
without and with HRI-Mei / HRI / OD

[two photos]
MeiStream DN 100 with dry-dial pointer register MeiStream MS-D HRI, metal cover flange, pulse emitting equipment HRI-Mei and OD (perspective view)

27.02.2009 SK_51574

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Woltman meter MeiStream / MeiStream Plus DN 150 without and with HRI-Mei / HRI / OD

[photo]
MeiStream DN 150 with dry-dial pointer register MeiStream MS-D HRI, flow straightener, metal cover flange and sealing (perspective view)

[two photos]
MeiStream DN 150 with dry-dial pointer register MeiStream MS-D HRI, metal head flange and sealing (top and side view)

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Woltman meter MeiStream / MeiStream Plus DN 150 without and with HRI-Mei / HRI / OD

[two photos]
MeiStream DN 150 with dry-dial pointer register MeiStream MS-D HRI, metal cover flange, pulse emitting equipment HRI-Mei and OD (perspective view)

27.02.2009 SK_51575

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Woltman meter MeiStream / MeiStream Plus
dry-dial pointer registers (identical versions)

[two photos]
MeiStream MS - D HRI DN 40 to DN 125
MeiStream MS - D HRI DN 150

[two photos]
MeiStream MS – Encoder DN 40 to DN 125
MeiStream MS - Encoder DN 150

[two photos]
MeiStream Plus eRegister C&I DN 40 to DN 125
MeiStream Plus eRegister C&I DN150

24.03.2015 SK_51571

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Woltman meter MeiStream / MeiStream Plus DN 40. DN 50 and DN 65
without and with HRI-Mei / HRI / OD
securing points (sealing, adhesive stamp)

[two photos]
MeiStream / MeiStream Plus DN 65 metal flange
MeiStream / MeiStream Plus DN 65 plastic flange

[two photos]
MeiStream / MeiStream Plus DN 65 Opto OD
MeiStream / MeiStream Plus DN 65 HRI-MEI
03.02.2014 SK_51578

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Woltman meter MeiStream / MeiStream Plus DN 80. DN 100 and DN 125*
without and with HRI-Mei / HRI / OD
securing points (sealing, adhesive stamp)

[two photos]
MeiStream / MeiStream Plus DN 100 metal flange
MeiStream / MeiStream Plus DN 100 plastic flange

[two photos]
MeiStream / MeiStream Plus DN 100 HRI-MEI
MeiStream / MeiStream Plus DN 100 Opto OD

03.02.2014 SK_51579

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Woltman meter MeiStream / MeiStream Plus DN 150 without and with HRI-Mei / HRI / OD
securing points (sealing, adhesive stamp)

[photo]
MeiStream / MeiStream Plus DN 150 metal flange

[two photos]
MeiStream / MeiStream Plus DN 150 Opto OD
MeiStream / MeiStream Plus DN 150 HRI-MEI

03.02.2014 SK_51580

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Woltman meter MeiStream Plus DN 40 to DN 150
without HRI-Mei / HRI / OD
head assembly with type plate

[two photos]
MeiStream DN 65 with metal cover flange, head ring showing all significant meter specifications, conformity and metrological marking (protective lid open)
MeiStream DN 100 with metal cover flange, head ring showing all significant meter specifications, conformity and metrological marking (protective lid open)

[photo]
MeiStream DN 150 with metal cover flange, head ring showing all significant meter specifications, conformity and metrological marking (protective lid open)

03.03.2009 SK_51582

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Woltman meter MeiStream/MeiStream Plus DN 40 to DN 150
with HRI-Mei / HRI / OD
head assembly with type plate

[two photos]
MeiStream DN 65 with metal cover flange and inductive pulse emitting equipment HRI-Mei, head ring showing all significant meter specifications, conformity and metrological marking (protective lid open)
MeiStream DN 65 with metal cover flange and inductive pulse emitting equipment HRI, head ring showing all significant meter specifications, conformity and metrological marking (protective lid open)

[photo]
MeiStream DN 65 with metal cover flange and opto-electronic pulse emitting equipment OD, head ring showing all significant meter specifications, conformity and metrological marking (protective lid open)

18.05.2009 SK_51587

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Woltman meter MeiStream DN 40 to DN 150
with electronic register
head assembly with type plate

[two photos]

MeiStream DN 65 with metal cover flange, head ring showing all significant meter specifications, conformity and metrological marking (protective lid open)

MeiStream DN 100 with metal cover flange, head ring showing all significant meter specifications, conformity and metrological marking (protective lid open)

[photo]

MeiStream DN 150 with metal cover flange, head ring showing all significant meter specifications, conformity and metrological marking (protective lid open)

23.03.2015 SK_51743

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Woltman meter MeiStream/MeiStream Plus DN 40 to DN 150
without HRI-Mei / HRI / OD
further versions of protective lid

[two photos]

MeiStream DN 50 with metal cover flange, protective lid closed, version Aquametro AG

MeiStream DN 50 with metal cover flange, protective lid closed, version GWF MessSysteme AG

04.08.2009 SK_51601

PTB / Physikalisch-Technische Bundesanstalt
National Institute of Metrology

Conformity Assessment Body

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The translation from the German language is certified to be correct and complete.

Schifferstadt, 24 October 2017

Beatrix Amon

Beatrix Amon – governmentally certified translator of the English language
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Zweibruecken for legal affairs in Rhineland-Palatinate

