

Physikalisch-Technische Bundesanstalt



Translation:
original: German

Physikalisch-Technische Bundesanstalt
Bundesallee 100
38116 Braunschweig

Approval Certificate National Type Approval

No. 1.32.1-5.411-HMK 95.11

In accordance with § 9 of the Verification Act of July 11, 1969 (Fed. Law Gazette I, p.759) in connection with § 26 of the Verification Ordinance in its version of March 23, 1992 (Fed. Law Gazette I, p. 711), as well as §§ 16 sections 1-3 and 17 section 1 of the Verification Ordinance of August 12, 1988 (Fed. Law Gazette I, p.1657) as amended,

the following instrument pattern of the firm of

Josef Heinrichs GmbH & Co. Meßtechnik KG, Köln

is approved for national verification:

Mass meter working according to the Coriolis principle

The following approval mark is assigned to the pattern:

5.411

95.11

The main characteristics and, if applicable, the conditions for approval, time limits and general conditions as well as restrictions as to the content are given in the Appendix which is an integral part of this Approval Certificate and comprises 6 pages.

Physikalisch-Technische
Bundesanstalt

Braunschweig, February 6, 1995

- Division 1 -

by order
(signed: Mencke)
Dr.-Ing. Mencke

(Official seal)

Further information and legal remedy instructions see overleaf.
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Type Approval Certificate under German law dated 06/02/1995

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Revision 1 of the Annex

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Translation

Issued to: Josef Heinrichs GmbH & Co.
Messtechnik KG
Robert-Perthel-Str. 9
50739 Köln – Germany

Type: Mass flowmeter based on the Coriolis principle
TM..., EURO-TM...

This nine-page revision is part of the approval and replaces the Annex of the above-mentioned certificate and the following supplements:

1. No. 1 dated 19/2/1997 – reference: 1.32-97000057
2. No. 2 dated 25/3/1999 – reference: 1.32-99017687
3. No. 3 dated 30/1/2001 – reference: 1.32-01083301
4. No. 4 dated 05/6/2002 – reference: 1.32-02000633

Regulations:

The following continues to be valid for the flowmeters of the approved type:

General Stipulations of the Verification Regulations including the version of Annex 5 of the VR that was valid when the Type Approval was issued and the PTB requirements dated 5 May 1994.

1. Manufacturer and type designation of the flowmeter

1.1 Manufacturer

Josef Heinrichs GmbH & Co.
Messtechnik KG
Robert-Perthel-Str. 9
50739 Köln – Germany

1.2 Type designation

TM..., EURO-TM...

1.3 Other vendor

- none -

2. Type description

2.1 Construction

The drawings on pages 7 and 8 show the basic construction of the flowmeter.

2.2 Sensor

The sensor consists of one or two U-shaped measuring tubes, a connecting part with flanges, an excitation coil, a temperature sensor and two vibration pick-ups. All these parts are contained in a closed housing. When the fluid flows through the measuring tubes, two sinusoidal signals are created whose phase difference is proportional to the mass flow dm/dt .

2.3 Processing of the measured value

The UMC or UMC2 transmitter contains the input and excitation circuits, the signal processing components, the LCD, four push buttons, the output circuits and the power supply unit.

UMC 2 Software: Version 2.00, checksum 1023

2.4 Measured value display

2-line LCD. Apart from mass flow, processing parameters and other operating data can be displayed.

2.5 Permissible systems and functions

n/a

2.6 Approval documents

Construction and design of the devices has to correspond to the information contained in the following documents:

- Brochures "Mass Flowmeter" TM and EURO-TM, issued 3/94
- Drawing TME-PTB-169 "Type II" dated 7/6/94
- Block diagram UMCBLOCK dated 8/11/94 with stamping plate
- Further documents in accordance with PTB lists dated 07/06/94, 27/10/94 and 27/01/95.

3. Technical data

3.1 Nominal operating conditions

Measured medium: all liquids with a density between 400 kg/m and 2000 kg/m
Temperature range: -50 °C to +200 °C

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Measuring loop size (mm*mm)	Max. flow rate (kg / h)	Min. flow rate (kg / h)	Scale value (g)	Min. measured quantity (kg)
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Measuring loop size (mm*mm)	Max. flow rate (kg / h)	Min. flow rate (kg / h)	Scale value (g)	Min. measured quantity (kg)
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DN 10

1.5 * 0.3	30	1.5	0.01	0.05
2 * 0.3	100	5	0.1	0.1
3 * 0.3	140	7	0.1	0.2
3 * 0.3	160	8	0.1	0.2
3 * 0.5	280	14	0.1	0.5
3 * 0.3	300	15	0.1	0.5
3 * 0.3	320	16	0.1	0.5
3 * 0.5	200	10	0.1	0.5
3 * 0.5	400	20	0.1	1
4 * 0.5	500	25	1	1
4 * 0.4	600	30	1	1
4 * 1.0	800	40	1	1
4 * 0.3	800	40	1	1

4 * 0.3	1000	50	1	2
4 * 0.5	600	30	1	1
4 * 0.5	1200	60	1	2
4 * 0.4	1200	60	1	2
4 * 1.0	1000	50	1	2
4 * 1.0	1400	70	1	2
4 * 1.0	1600	80	1	2
4 * 0.3	1600	80	1	2
5 * 0.5	1500	80	1	2
4 * 1.0	2000	100	1	5
4.8 * 0.5	2000	100	1	5
4 * 1.0	2800	140	1	5

DN 15

6.35 * 1.06	2000	100	1	5
5 * 0.5	2400	120	1	5
5 * 0.5	3000	150	1	5
6 * 0.5	3000	150	1	5
6 * 0.4	3000	150	1	5
4.8 * 0.4	3200	160	1	5
6 * 0.5	3600	180	1	5
6 * 0.5	4000	200	1	10
6.35 * 0.9	5000	250	1	10

7 * 0.5	5000	250	1	10
6.35 * 1.06	6000	300	1	10
6 * 1.0	6000	300	1	10
6 * 0.5	4000	200	1	10
8 * 0.83	10000	500	10	20
6 * 1.0	7000	350	1	10
7.2 * 0.5	7000	350	1	10
6.35 * 0.89	7000	360	10	20
8 * 0.5	8000	400	10	20

DN 25

6.35 * 0.89	5000	250	1	10
6.34 * 0.925	5000	250	1	10
8 * 0.83	5000	250	1	10
8 * 0.5	7000	350	1	10
7.49 * 0.51	8000	400	10	20
10 * 1.0	8000	400	10	20
12 * 0.5	8000	400	1	10
10 * 0.5	10000	500	10	20
12.7 * 0.9	10000	500	10	20
7.94 * 0.51	10000	500	10	20
8 * 1.0	12000	600	10	20
10 * 0.5	12000	600	10	20
10 * 1.0	14000	700	10	20
8 * 1.0	14000	700	10	20
10 * 0.4	14000	700	10	20
10 * 0.75	16000	800	10	20

10 * 1.0	16000	800	10	20
10 * 1.0	17000	850	10	50
10 * 1.0	18000	900	10	50
12 * 0.75	16000	800	10	20
12 * 0.75	20000	1000	10	50
10 * 1.0	20000	1000	10	50
12 * 1.0	20000	1000	10	50
10 * 1.5	22000	1100	10	50
12 * 0.5	16000	800	10	20
12.7 * 0.4	16000	800	10	50
12 * 0.75	24000	1200	10	50
12.7 * 0.9	24000	1200	10	50
12 * 1.0	24000	1200	10	50
12 * 1.0	30000	1500	10	50
12.7 * 0.4	30000	1500	10	50
12 * 1.0	40000	2000	10	50

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Measuring loop size (mm*mm)	Max. flow rate (kg / h)	Min. flow rate (kg / h)	Scale value (g)	Min. measured quantity (kg)
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Measuring loop size (mm*mm)	Max. flow rate (kg / h)	Min. flow rate (kg / h)	Scale value (g)	Min. measured quantity (kg)
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DN 50

19.05 * 0.83	14000	700	10	20
19.05 * 0.9	16000	800	10	50
19.05 * 0.63	20000	1000	10	50
19.05 * 1.24	40000	2000	10	50
17.1 * 1.85	40000	2000	100	100
18 * 1.0	40000	2000	10	50
19 * 0.75	48000	2400	100	100
19.05 * 0.89	50000	2500	100	100
18 * 1.0	50000	2500	100	100

19.05 * 0.75	50000	2500	100	100
19.05 * 0.99	50000	2500	100	100
19.05 * 0.9	54000	2700	100	100
17.2 * 2.3	60000	3000	100	100
17.1 * 1.65	60000	3000	100	100
19 * 1.1	66000	3300	100	100
19.05 * 1.24	70000	3500	100	100
19.1 * 1.65	90000	4500	100	100
19 * 1.1	70000	3500	100	100

DN 80

25.4 * 1.0	70000	3500	100	100
25.4 * 1.24	80000	4000	100	100
25 * 0.8	80000	4000	100	100
24 * 1.0	80000	4000	100	100
25.4 * 1.0	100000	5000	100	100
25 * 1.5	100000	5000	100	100
24 * 1.5	100000	5000	100	100
24 * 1.0	100000	5000	100	200
25 * 1.0	100000	5000	100	200
25 * 0.8	100000	5000	100	200
25.4 * 1,24	120000	6000	100	200

25.4 * 1.24	13000	6500	100	200
24 * 1.5	14000	7000	100	200
28 * 1.25	14000	7000	100	200
25 * 1.5	18000	9000	100	500
28 * 1.5	16000	8000	100	200
25 * 2.0	16000	8000	100	200
26.9 * 2.11	18000	9000	100	500
25.4 * 1.65	18000	9000	100	500
25 * 1.6	16000	8000	100	200
20 * 2.0	20000	10000	100	500
26.7 * 2.11	28000	14000	100	500

DN 100

38 * 2.0	200000	10000	100	500
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DN 125

48 * 2.0	300000	15000	100	500
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48.26 + 2.77	400000	20000	100	500
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DN 150

60.3 * 2.9	500000	25000	100	1000
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DN 200

88.9 * 3.2	100000	70000	100	5000
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DN 250

114.4 * 3.6	1500000	100000	1000	10000
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DN 300

168.3 * 4.5	2000000	200000	1000	10000
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DN 350

168.3 * 4.5	2000000	200000	1000	10000
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DN 400

168.3 * 4.5	2000000	200000	1000	10000
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The flow range to be selected depends on the properties of the measured medium (e.g. density or viscosity). The tables on pages 3 and 4 list the maximum and minimum values for each type.

The actual range must be selected so that the ratio of the maximum and minimum flow is at least 5 (five) for liquefied gases and 10 for other liquids.

The ratios must be within the range listed in the corresponding table. In addition, the scale value (increment) and the minimum measured quantity must be mentioned in the table. The scale values can also be a decadic multiple of them. In this case, the minimum measured quantity is 200 times the amount of the scale value.

3.2 Other operating conditions

n/a

4. Technical data

4.1 Interfaces and additional devices

Analog outputs: 4 to 20 mA

Binary outputs: RS 485 (option)

4.1 Other devices

You may connect additional devices to the above-mentioned type (including devices that do not require custody transfer approval). For devices requiring custody transfer approval, a separate type approval is needed.

5. Collateral regulations

5.1 Conditions

5.1.1 Measured medium

Liquids must exhibit Newtonian flow behavior and be free of gas bubbles; the percentage of solids must be under 1 percent.

5.1.2 Temperature range

Zero point settings must be carried out at medium operating temperature. After the setting has been made, the temperature of the fluid must not deviate from this medium temperature by more than ± 30 °C.

5.1.3 Measuring systems

A straight pipe section with the same nominal size and length must be mounted at the inlet section of the flowmeter. The following regulations of the PTB Requirement for Annex 5 of the Verification Regulations (PTB-A5) in the general sense apply to measuring systems with mass flowmeters of this type:

- 1.4 Point of transfer
- 1.8 Complete filling of the measuring system
- 1.9 Variations of the internal volume of full hoses
- 1.10 Branches
- 1.11 Bypasses
- 1.12 Gate valves, valves, regulating devices
- 1.13 Configuration of measuring systems
- 1.14 Devices for on-site controls

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5.1 4 Display of measured values (indicating device)

The UMC transmitter must be equipped with an indicating device. If additional values are displayed (e.g. density and/or temperature) and if there is no special type approval for measuring these values, these values must be labeled "... value not approved for custody transfer operations."

5.2 Requirements

- none –
- Restrictions
- none –

6. Verification procedure

6.1 Verification documents

The documents listed in section 2.6 must be put at the verification authority's disposal by the approval holder on request.

6.3 Verification of state

In accordance with the "Verification Instruction for Measuring Systems for Liquids other than Water" (GM-P5) of June 2002.

To display checksum and version number: Activate the menu item "Software version". Then select the items "Transmitter settings + UMC.2" and "UMC software version" and confirm your entry with ENTER.

"UMC2-Rev" and the version number will be displayed in the first line. The message "EECS xxxx and CS1 yyyy" will appear in the second line (xxxx is the checksum stored in the EPROM and yyyy the current checksum).

6.4 Metrological control

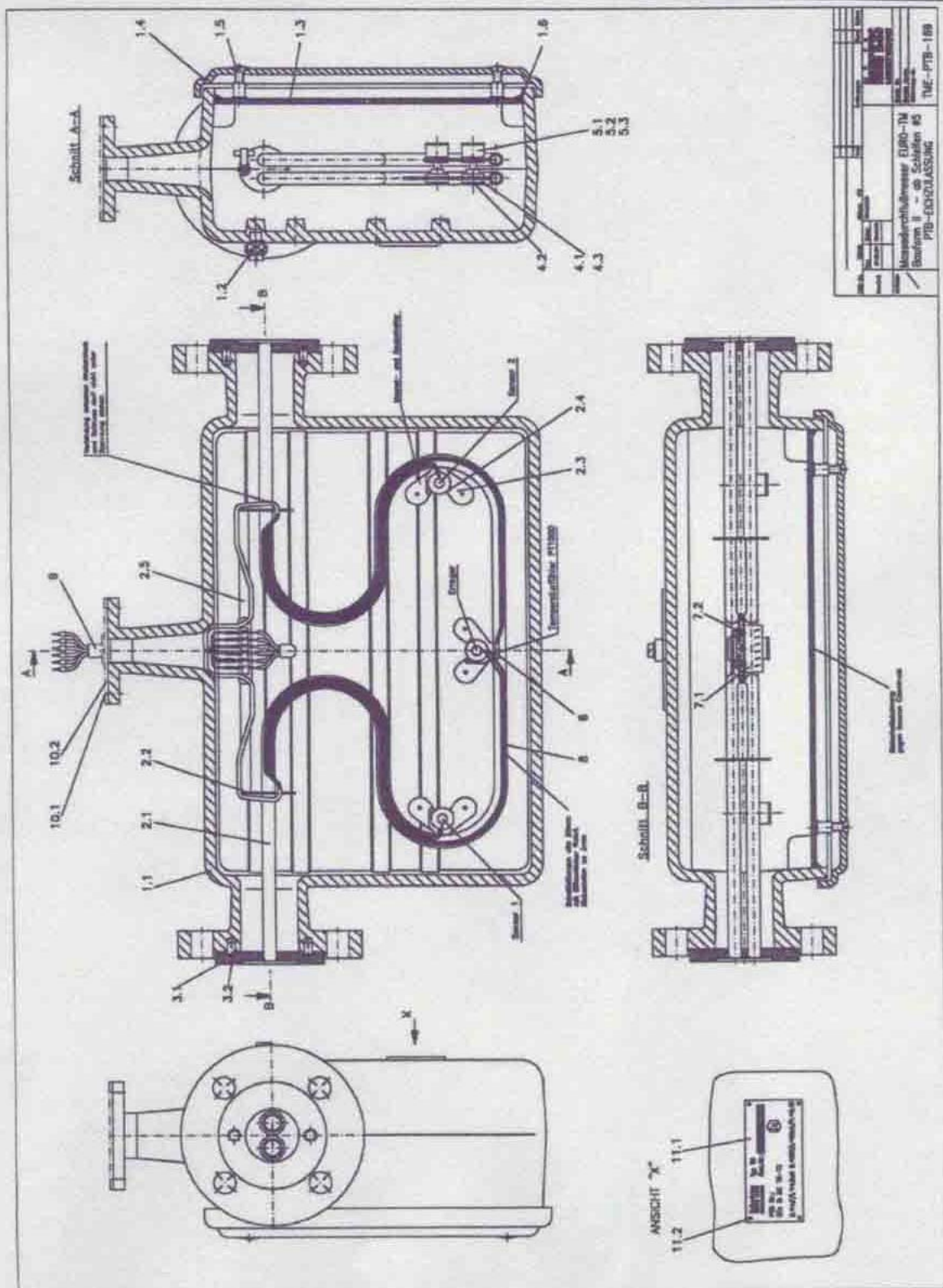
In accordance with the "Verification Instruction for Measuring Systems for Liquids other than Water" (GM-P5) of June 2002.

7 Stamping plates

The device for modifying the calibration parameters (jumper BR2) must be protected against tampering. There is no need for additional stamping plates.

8 Markings

In accordance with the Verification Regulations Annex 5 (EO 5), Part 2, No. 4 dated 18 August 2000.



Type Approval Certificate under German law dated 06/02/1995

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By order

Dr. Michael Rinker [signature]

Braunschweig, 16 Nov. 2004
Ref. no. PTB-1.5-4015414

[seal]

We confirm the correctness of the translation the German original. In the case of arbitration only the German wording shall be valid and binding.

Köln, 24.11.2010

Heinrichs Messtechnik GmbH