Measuring Instruments Directive (MID)

MID/EN14154

Short Overview

STARTING POSITION

- **Approval vs. Type examination**
  - In the past, **country specific approvals** were needed to sell measuring instruments in EU

  - For the future, only **one type examination certificate** acc. the new **Measuring Instrument Directive (MID)** for the EU

CE


Bauartprüfzertifikat Nr. CH-MI001-07005-00

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MEASURING INSTRUMENT DIRECTIVE

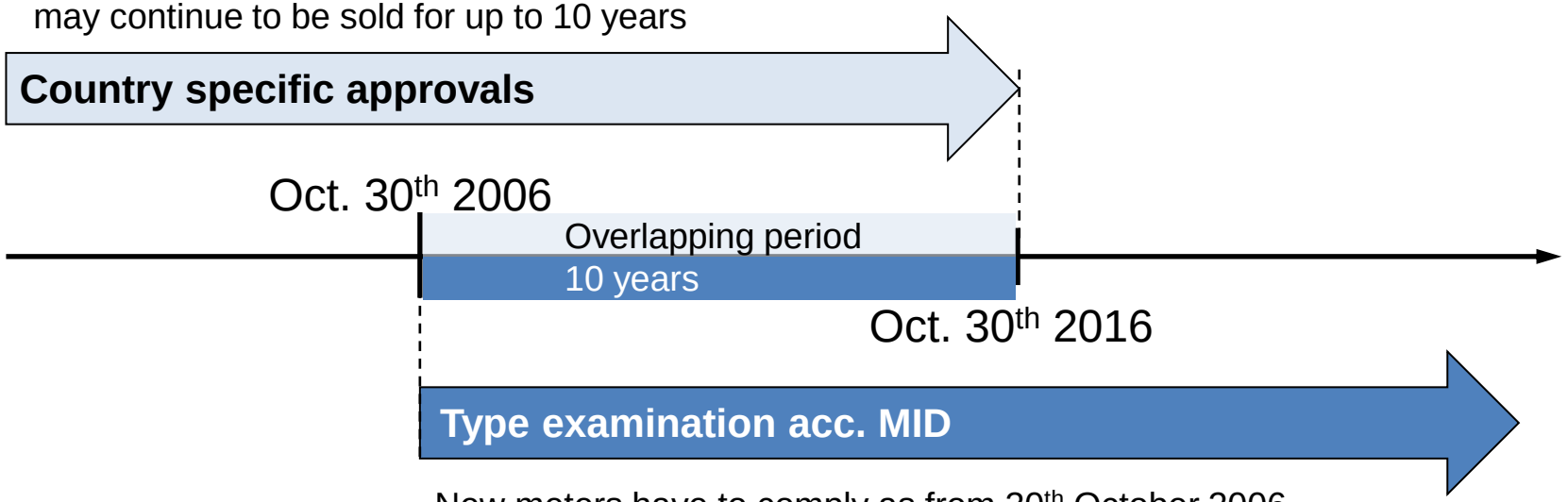
- **Facts & Figures**
  - Scope includes...
    - ...water meters (MI-001)
    - ...gas meters (MI-002)
    - ...electricity meters (MI-003)
    - ...heat energy meters (MI-004)
    - ...etc.
  - Needed for measuring instruments, where levying of consumption takes place - within the EU
  - All these measuring instruments are covered by the EU directive 2004 / 22 / EC
  - Measuring instruments acc. MID calls from now...
    - *...«Product name»* with CE Conformity (MID)
  - Declaration of CE conformity

STARTING POSITION

- **Goal**
  - The main goal for the definition and introduction of the new measuring instrument directive was the **reduction of trade barriers** within the European countries.

- **Validation period**

Instruments approved before 30th October 2006
may continue to be sold for up to 10 years



New meters have to comply as from 30th October 2006

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Harmonized norms and certification EU members under the MID

Austria
Belgium
Bulgaria
Cyprus
Denmark
Estonia
France
Finland
Germany
Greece
Hungary
Italy
Ireland
Latvia
Lithuania
Luxemborg
Malta
Poland
Portugal
Slovenia
Slovakia
Spain
Sweden
United Kingdom
The Netherlands
Switzerland
(Bilateral Agreements)

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What is required of the manufacturer?




- All new meters require a approval of the instrument (Type examination certificate (CH-MI004-07003-00))
- Audit of the production plant before instrument can be sold
- Must issue a conformity declaration
- Instrument must be marked in accordance with the directive

The MID Certification does away with the following:

MID

- PTB Type approvals
- EEC approval
- Local European certification (country specific)

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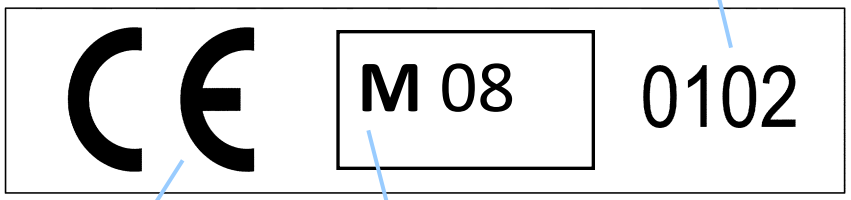
Marking of measuring instruments according to MID



Number of the certified calibration centre

CE - Marking

0862627
6

Metrology – Identification and manufacture year

Manufacturer Serial Number

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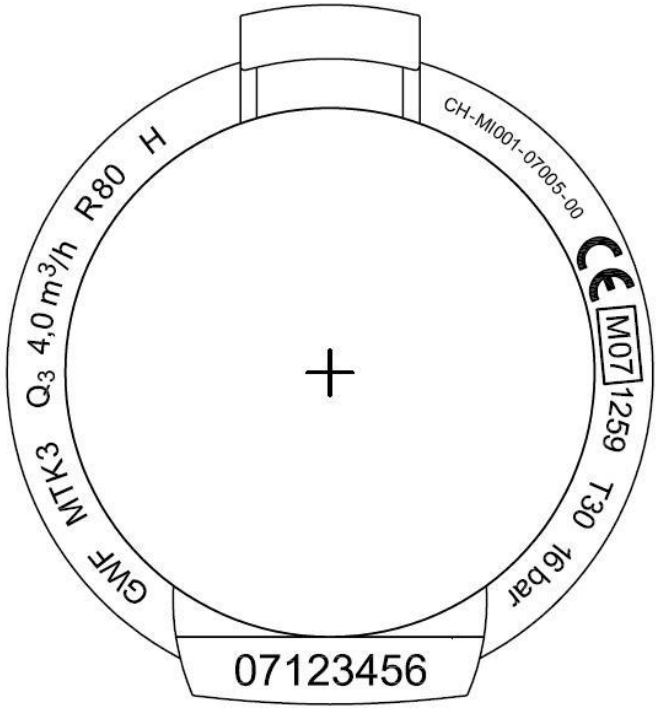
Markings MI - 001 Cold Water Meters



Markings MI-001 Consumption Meters

- Unit of measurement: cubic metre
- Numerical value of Q_3
- Ratio Q_3 / Q_1 , preceded by “R”
- Ratio Q_2 / Q_1 , where it differs from 1,6 (during transition period)
- Maximum admissible pressure if it differs from 10 bar (1 MPa)
- Direction of flow
- Letter V or H, if the meter can only be operated in the vertical or horizontal position
- Temperature class, where it differs from T30
- Pressure loss class, where it differs from DP 63
- Classes on sensitivity to irregularities in velocity field

Markings MI-001

- Name or trademark of the manufacturer
- Year of manufacture (first 2 digits) and serial number
- Pattern approval sign according to European regulations
- Climatic and mechanical environment severity level
- EMC Class
- Output signals for ancillary devices (type/levels) if any

Main changes ISO to MID – MI-001

- **Definition of flow rate points**
  - The MID has mean comprehensive changes to the terminology and points which were commonly used to refer to its flow rate range
  - New definitions for flow rate points:

Q_1	...Minimum flow rate	analogue to	Q_{min}
Q_2	...Transitional flow rate	analogue to	Q_t
Q_3	...Nominal flow rate	analogue to	Q_n
Q_4	...Maximum flow rate	analogue to	Q_{max}
R	...Measuring range	analogue to	class

Also the relationship between the points has been newly defined

$Q_2/Q_1 = 1,6$			
$Q_4/Q_3 = 1,25$		analogue to	$Q_{max}/Q_n = 2$
$Q_3/Q_1 = R$	...acc. to a normed chart	analogue to	Q_n/Q_{min}

Main changes ISO to MID – MI-001

The MID has mean comprehensive changes to the terminology and points which were commonly used to refer to its FLOWRATE RANGE

New definitions for flowrate points

Q_1	**…Minimum flowarte**	analog to	Q_{min}
Q_2	**…Transitional flowarte**	analog to	Q_t
Q_3	**…Nominal (Continuous) flowrate**	analog to	Q_n
Q_4	**…Maximum flowarte**	analog to	Q_{max}

Also the relationship between the points has been newly defined

Q_2 / Q_1 = 1.6			
Q_4 / Q_3 = 1.25		analog to	**Q_{max} / Q_n = 2**
Q_3 / Q_1 …according to a normed **R…**		analog to	**Q_n / Q_{min}** …z.B. **1:100** (Cl. C)

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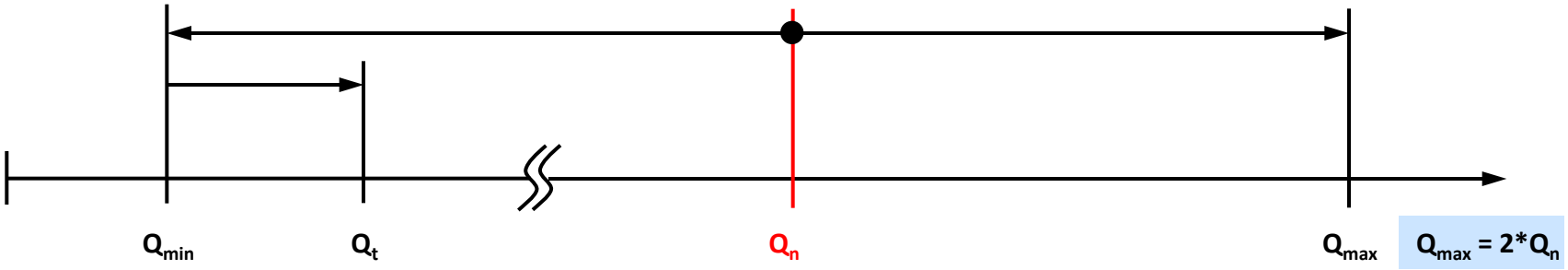
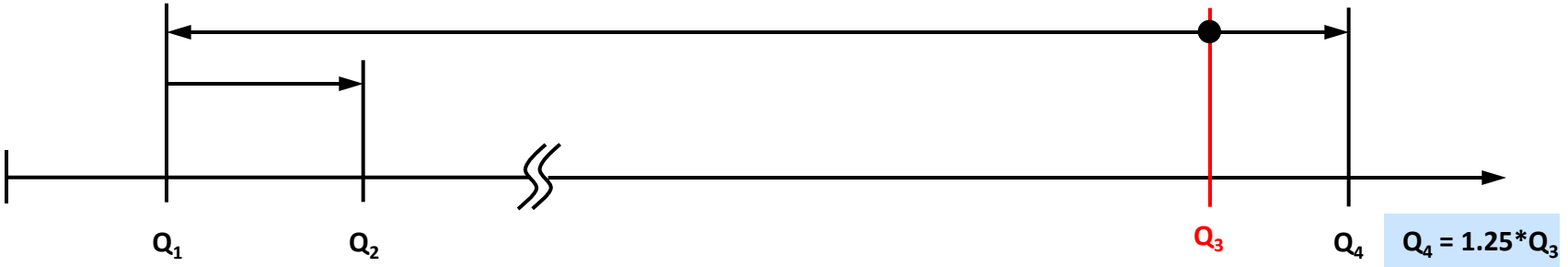
Dimensioning of Q_1 - Q_4

ISO Norm Metrological Class C, 1:100



New according to MID Measuring range R160 (Similar to 1:100)



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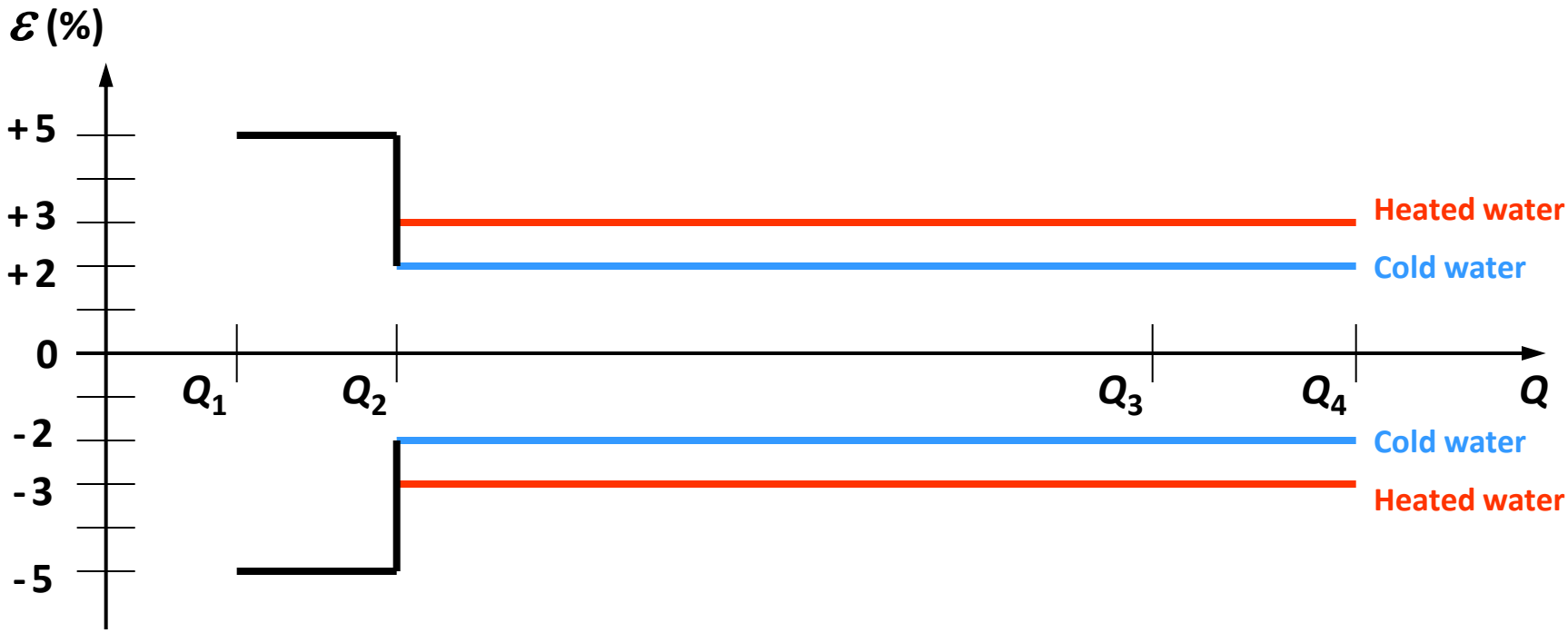
Maximum Permissible Error (MPE)



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Overview of changes ISO to MID MI-001

Old terms

Q_{min}	Q_t	Q_n	Q_{max}	Measuring range
[l/h]	[l/h]	[m^3/h]	[m^3/h]	[1:x]
15	24	1.5	3	100
25	40	2.5	5	100
35	58	3.5	7	100
60	96	6	12	100
100	160	10	20	100

New terms (according to MID)

Q_1	Q_2	Q_3	Q_4	R
[l/h]	[l/h]	[m^3/h]	[m^3/h]	[-]
15.6	25	2.5	3	160
25	40	4	5	160
39	58	6.3	7.8	160
62.5	100	10	12.5	160
100	160	16	20	160

Example

A cold water meter Q_n 2.5 Class C will be classified as follows according to MID:

Q_1 = 25 l / h; Q_2 = 40l / h; **Q_3 = 4m^3 / h**; Q_4 = 5m^3 / h; Measuring range **R** = Q_3 / Q_1 = **160**

Attention

On paper the meter seems to have a more dynamic measuring range! The meter stays the same!

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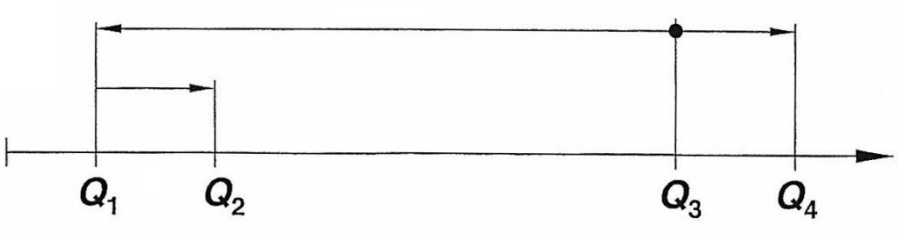
Dimensioning a water meter... MI-001



Q_3 is defined according to ISO 3 Row R5

Q1 is defined according to Q3 = Q3 / R (ISO 3 Row R 10)

Q2 is defined according to Q3 = Q1 ● 1,6

Q4 is defined according to Q4 = Q3 ● 1,25

Permanent Flow Q3

The numerical value for the permanent flowrate Q3 in m3/h is selected from the row R5 according to ISO 3.

1_n	1,6	2,5	4	6,3
10	16	25	40	63
100	160	250	400	630
1000	1600	2500	4000	6300

Measuring Range

The permanent flowrate range is defined with the Q3 / Q1 relationship. The values are selected from R10 form the ISO 3 table.

10	12,5	16	20	25	31,5	40	50	63	80
100	125	160	200	250	315	400	500	630	800

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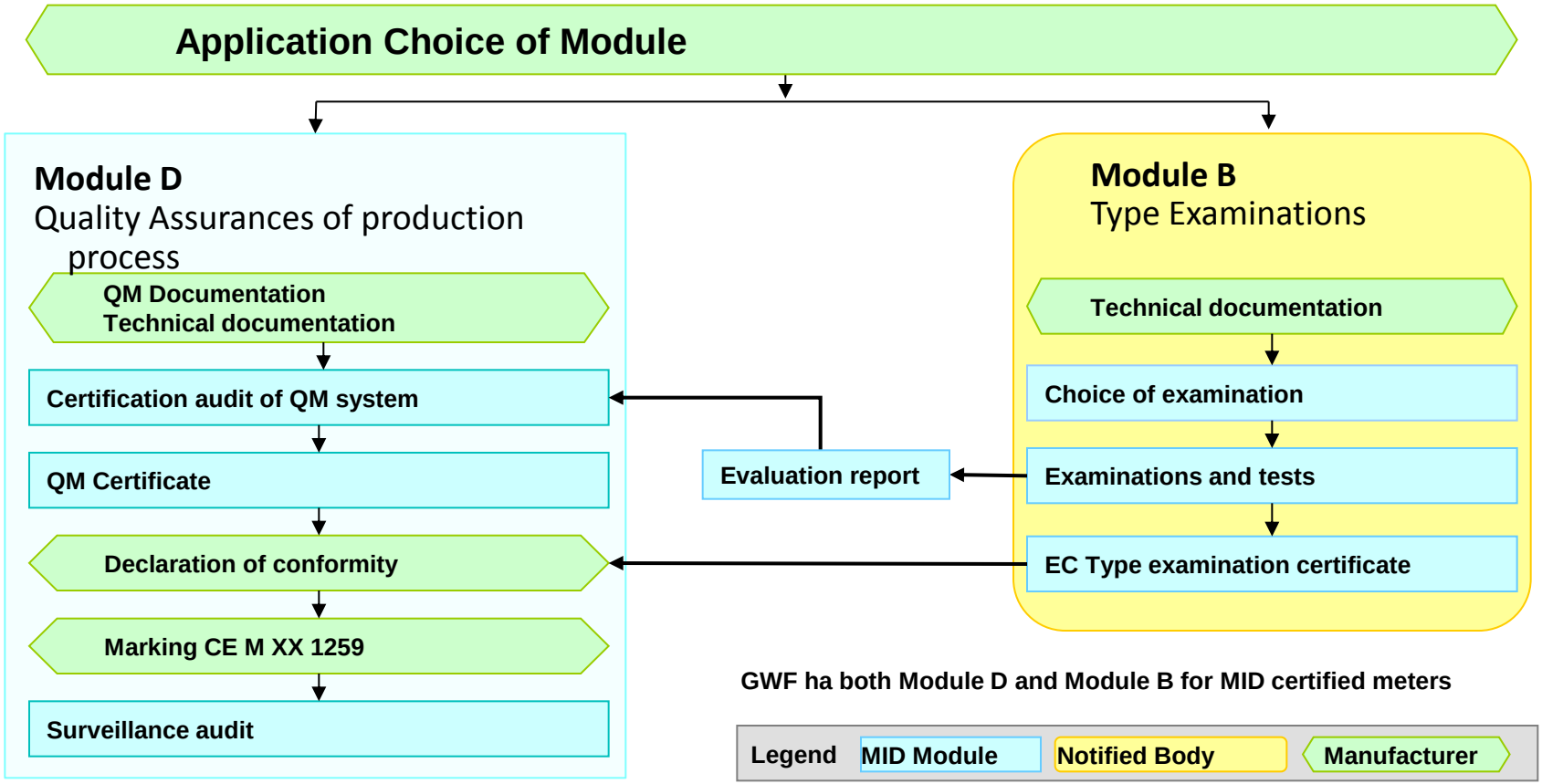
Schematic of Conformity Assessment



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