

**NORDISK FJERNVÄRMESYMPOSIUM
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**“Directive and standards
of DHC-metering”**

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The MID Directive of the European Parliament and of the Council on measuring instruments

- ✓ proposal made by the Commission on 15 September 2000**
- ✓ includes water meters, gas meters, electricity meters, heat meters, fuel meters, automatic weighing instruments, taximeters**
- ✓ 150 pages**



The approval process

- ✓ the official process began in 2001 (Sweden)
- ✓ progressed well in late 2001 (Belgium)
- ✓ the final stage in early 2002 was not successful (Spain)
- ✓ reviewed by the Council in late 2002 (Denmark)
- ✓ target for reaching mutual understanding in the working group in early 2003 (Greece)
- ✓ council of ministers approved the compromise proposal of the Parliament and the Council on 26.2.2004
- ✓ published in the Official Journal on 30.4.2004

The approval process

- ✓ national legislation shall be given and published by 30.4.2006. New legal provisions have to be applied from 30.10.2006
- ✓ a 10-year transition period, starting 30.10.2006
- ✓ type approvals valid for ten years

The nature of the Directive

- ✓ **a new approach**
- ✓ **defines entry into market and commissioning**
- ✓ **unifies type approval and initial calibration**
- ✓ **the producer is able to use standards or other standardized documents to indicate that the products meet the requirements**



The Directive comprises the following

- ✓ **A memorandum, explaining the background information**
- ✓ **20 articles covering the scope, legal metrology control, markings etc.**
- ✓ **Annex I: The essential requirements that apply to all instruments,**
- ✓ **Annex II: Empty (but formerly gave the details of test programmes,**
- ✓ **Annex III: List of criteria to be satisfied by the bodies,**
- ✓ **Annex IV: List of technical documentation required,**
- ✓ **Annex A-H1: Conformity assessment procedures**
- ✓ **Annex MI-001 to MI-010: The instrument specific annexes.**



The MID Directive concerns:

- **general and essential requirements for measuring equipment**
- **documentation of compliance with requirements**
- **requirements for the testing authorities**
- **technical documentation required**
- **specific and essential requirements**
 - the accuracy requirements of new meters, including meters with surface mounted temperature sensors (according to EN 1434 standards)
- **initial calibration (made obligatory)**
- **markings**



Assessment of Conformity

The Directive permits three different methods of assessing conformity which apply to most instrument types – including heat meters:

- B+E
- B+D or
- H1,

with

B: Type examination (made by a Notified Body),

D: Declaration of conformity to type, based on quality assurance of the production process

F: Declaration of conformity to type, based on product verification,

H1: Declaration of conformity, based on full quality assurance plus design examination.



More information

- ✓ **Euroheat & Power – English Edition II/2003**
”EU-Directive for Measuring Instruments (MID)
MID with Special Focus on Heat Meters”
Søren Lang, Product Group Manager
Kamstrup A/S, Skanderborg /Denmark

Accuracy of metering

➤ accuracy and other requirements are specified in CEN standards

➤ EN 1434-1 1997/A1 = 2002

Heat Meters-Part1: General requirements

EN 1434-2 1997/A1 = 2002

Heat meters-Part2: Constructional requirements

EN 1434-3 1997/A1

Heat meters-Part3: Data exchange and interfaces

EN 1434-4 1997/A1 = 2002

Heat meters- Part 4: Pattern approval tests

EN 1434-5 1997/A1 : 2002

Heat meters- Part 5: Initial verification tests

EN 1434-6 1997/A1: 2003

Heat meters – Part 6: Installation, commissioning, operational monitoring and maintenance



- **If the EN 1434 standards are followed, metering and measuring will be done properly and accurately**
- **EN 1434 standards also concern district cooling**
- **EN 1434 standards guarantee high-quality metering when metering is introduced**



WELMEC and OIML Standards

OIML D11 approval tests (MID directive)
(May 2003) (EN 1434-4 will be updated to same level)

OIML R75 Heat meters
- includes also 2400 h durability test
(EN 1434- 4A1)
- not in MID directive)

WELMEC 7.1 Heat meters

Who is responsible for synergy of these standards ?

Reliability of Heat Metering

- ✓ **conditions affect operation**
- ✓ **faulty installation and improper use**
- ✓ **incorrect measurement technique**
- ✓ **quality of fluid**
- ✓ **age**



Reliability of Heat Metering

Measurement of fluid flow

- ✓ proper dimensioning
- ✓ velocity profile
- ✓ temperatures (fluid, environment)
- ✓ pressure
- ✓ fluid properties (viscosity, conductivity, pH)
- ✓ correct installation location

Reliability of Heat Metering

Magnetic flow meter

- ✓ velocity profile, straight sections of pipeline
- ✓ conductivity
- ✓ fluid temperature
- ✓ contamination of equipment

Ultrasonic flow measurement

- ✓ velocity profile, installation location
- ✓ fluid temperature
- ✓ electrical disturbances



Reliability of Heat Metering

Temperature difference

- ✓ mixing of fluids
- ✓ installation techniques
- ✓ insulation
- ✓ accuracy of sensors
- ✓ fluid quality



Reliability of Heat Metering

Calculators

- ✓ measurement intervals (sampling time)
- ✓ battery voltage
- ✓ quality and reliability of electricity



Reliability of Heat Metering

- **No single set of criteria exists to define reliability or unreliability; measurement results must be constantly monitored for each customer.**
- **Heat loss must also be monitored constantly in our own network.**