Thermal Energy Metering
Thermal Energy Metering - Agenda

- Measuring Principle
- Measuring Technologies
- Australian Standards
- NABERS
- Integration – Pulse v HLI
- Installation
Thermal Energy Metering

Large scale climate control via Central Energy Plants:

- Chilled Water (CHW)
- Hot Water (HHW)
- Condenser Water (CW)
Thermal Energy Metering – Principle

Power [kW]:

\[ P = \rho \cdot c_p \cdot V \cdot (t_{in} - t_{out}) \]

With:

- \( \rho \): the density [kg/m\(^3\)]
- \( c_p \): the specific heat capacity [J/(kg*K)]
Thermal Energy Metering – Flow Measurement

Ultrasonic

2WR6 - Residential up to DN25

UH50 – Commercial: DN25 to DN100

Magnetic

MAGFLO – Large Commercial & Plant DN100+
There are no Australian standards

but

EN1434 standard is commonly adopted/referenced

• Accuracy based classification - energy
  • Class 1 ± 1%
  • Class 2 ± 2%
  • Class 3 ± 3%
• Temperature ±0.5% (can be larger at high differentials)
There are no current NMI Pattern Approval Requirements:

“... at this time NMI has no formal requirements regarding the pattern approval and verification of thermal energy meters (a.k.a. heat meters)"
Thermal Energy Metering – NABERS

Specific thermal metering information required by NABERS Accredited Assessors:

• Manufacturer’s official data & calibration information
• A better than 5% accuracy across full sensing range

NO onsite validation or verification required.
As more high level communication protocols become readily available – collecting more detailed information about the performance of your building is becoming more viable.
Thermal Energy Metering – Installation & Fault Finding

- Install the correct way around
- Not cut any wires
- Remove head on CHW
- Do not extend temp sensors
- Wire communication cards correctly
- Pipe correctly – pipe reductions, fittings etc.
- Install temp probes correctly
- Return line NOT Supply (CHW)
- Consider HLI and EMC interference
- Make sure access is available
- Straight flow path for magflo
- Size correctly