SIEMENS

# Thermal Energy Metering

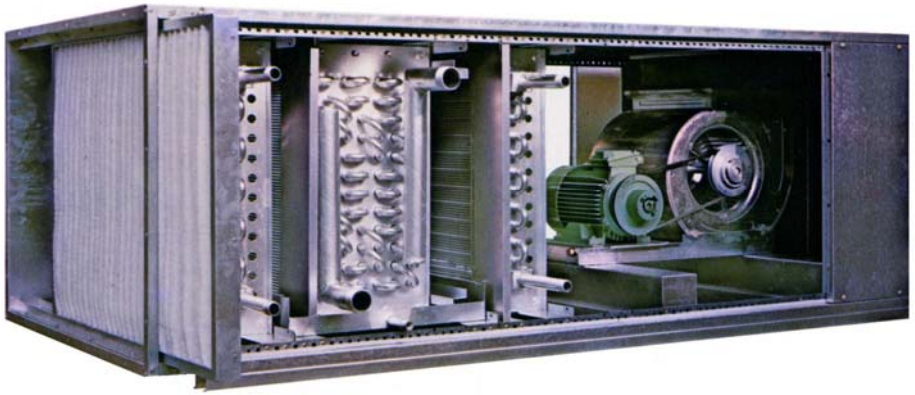
# Thermal Energy Metering - Agenda

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

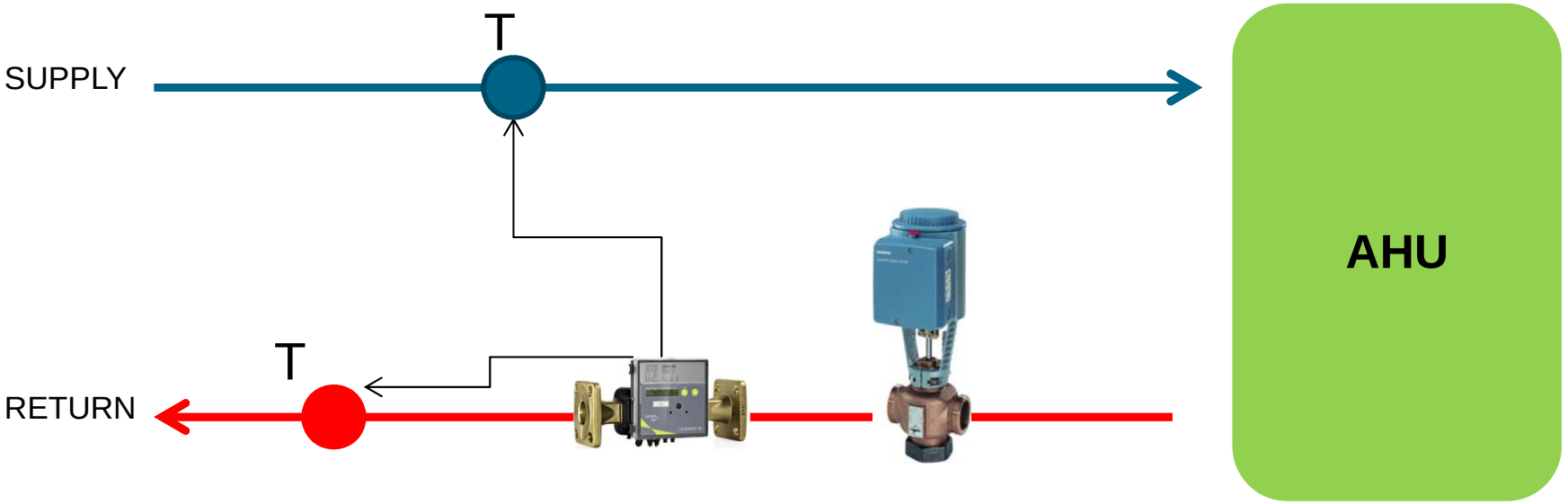
# Thermal Energy Metering

Large scale climate control via Central Energy Plants:

- Chilled Water (CHW)
- Hot Water (HHW)
- Condenser Water (CW)



# Thermal Energy Metering – Principle




Power [kW]:

$P = \rho * c_p * V * (t_{in} - t_{out})$

With :

- $\rho$ : the density [kg/m$^{33}$]
- $c_p$ : 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+

# Thermal Energy Metering – AUS Standards

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)

# Thermal Energy Metering – AUS Standards

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)"*

Australian Government
National Measurement Institute

# 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

*<u>NO</u> onsite validation or verification required.*

# Thermal Energy Metering – Integration: HLI the Future


Pulse * NOT PREFERED

M-Bus

Modbus

BACnet

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