

MSSB design for Monitoring



Outline

- **Metering objectives**
- **Metering types**
- **Switchboard design for metering**
- **Switchboard construction**

Metering objectives

- **Measure energy use**
- **Comparison to benchmark**
- **What benchmark?**
- **Energy modelling outputs**
 - Heat rejection
 - Cooling towers
 - Condenser Water Pumps
 - Chillers
 - Chilled water pumps
 - AHU
- **Static calculations for non-dynamics loads**
- **Modelling should reflect actual controls, occupancy etc.**
 - Not JV3
 - Not NABERS
 - Not GreenStar

Metering types

→ Direct current

- Up to 100A

→ Current transformers

- Allows meters to be separate from conductors

→ kWhr Meters

→ 'Smart' Meters

→ VSD

- Not preferred
- Virtual meter to consolidate

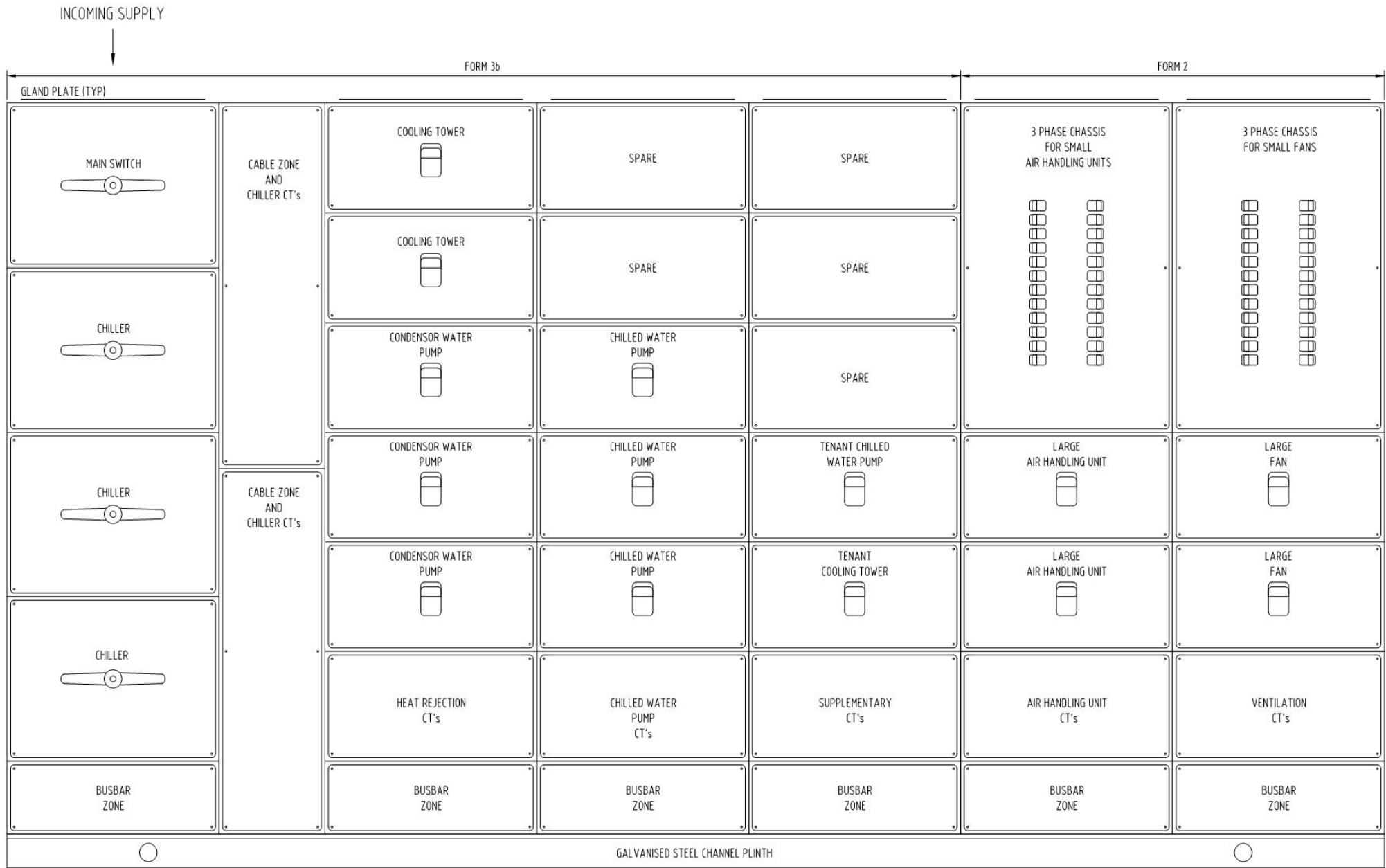
→ Pulse Meters

- Don't

→ High Level Interface (RS485)

- Do
- Only map what you need (kWhrs, kW)

Switchboard Layout



→ Form 1

- No physical isolation of components
- Typical tenant distribution board

→ Form 2

- Separate busbar zone
- Multiple breakers in one compartment

→ Form 3

- Separate busbar zone
- One compartment per breaker

→ Form 4

- Separate bus bar zone
- Outgoing cables separated from incoming cables

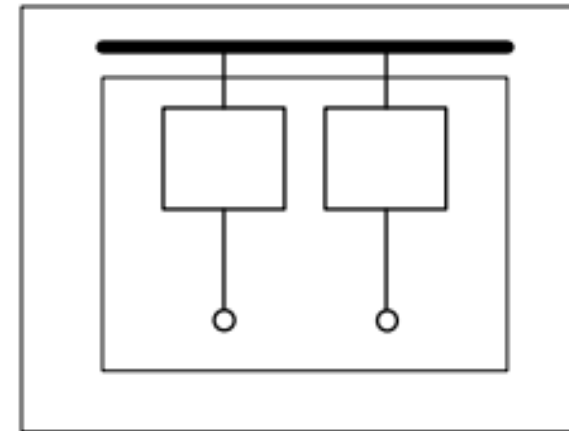
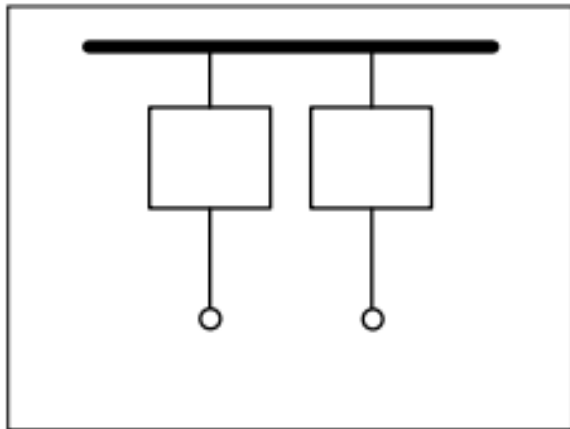
→ **Alternative may compromise future function**

- i = separation by insulation
- h = separation by housing

Switchboard Construction

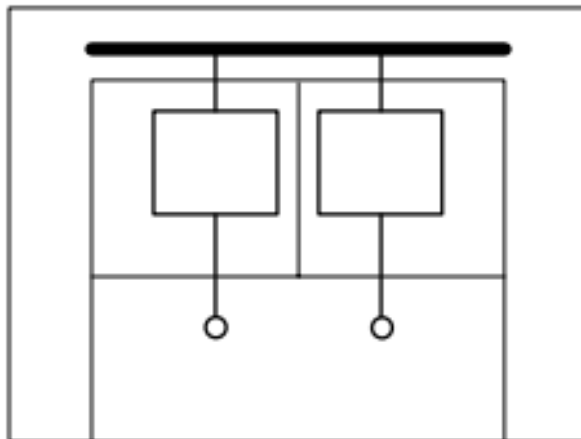
Form 1

No internal separation

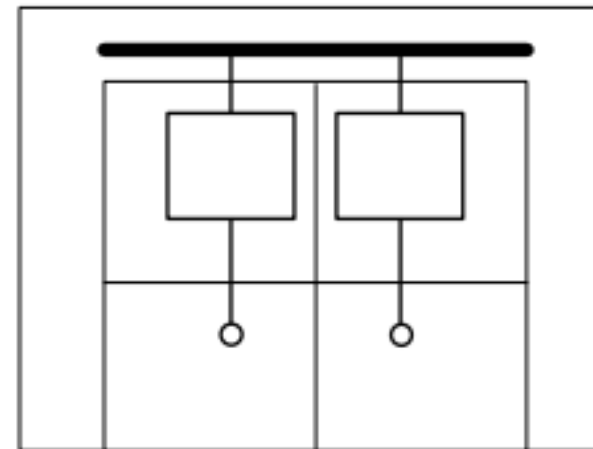


IEC 1121/99

Form 2b:
Terminals separated from busbars



Form 3b:
Terminals separated from busbars



IEC 1123/99

Form 4b:
Terminals not in same compartment
as associated functional unit