

ASHRAE Standard 90.1-2013 Electrical Energy Monitoring

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5. Summary

Section 8.4.3 Electrical Energy Monitoring



8.4.3 Electrical Energy Monitoring

8.4.3.1 Monitoring. Measurement devices shall be installed in new buildings to monitor the electrical energy use for each of the following separately:

- a. Total electrical energy
- b. HVAC systems
- c. Interior lighting
- d. Exterior lighting
- e. Receptacle circuits

For buildings with tenants, these systems shall be separately monitored for the total building and (excluding shared systems) for each individual tenant.

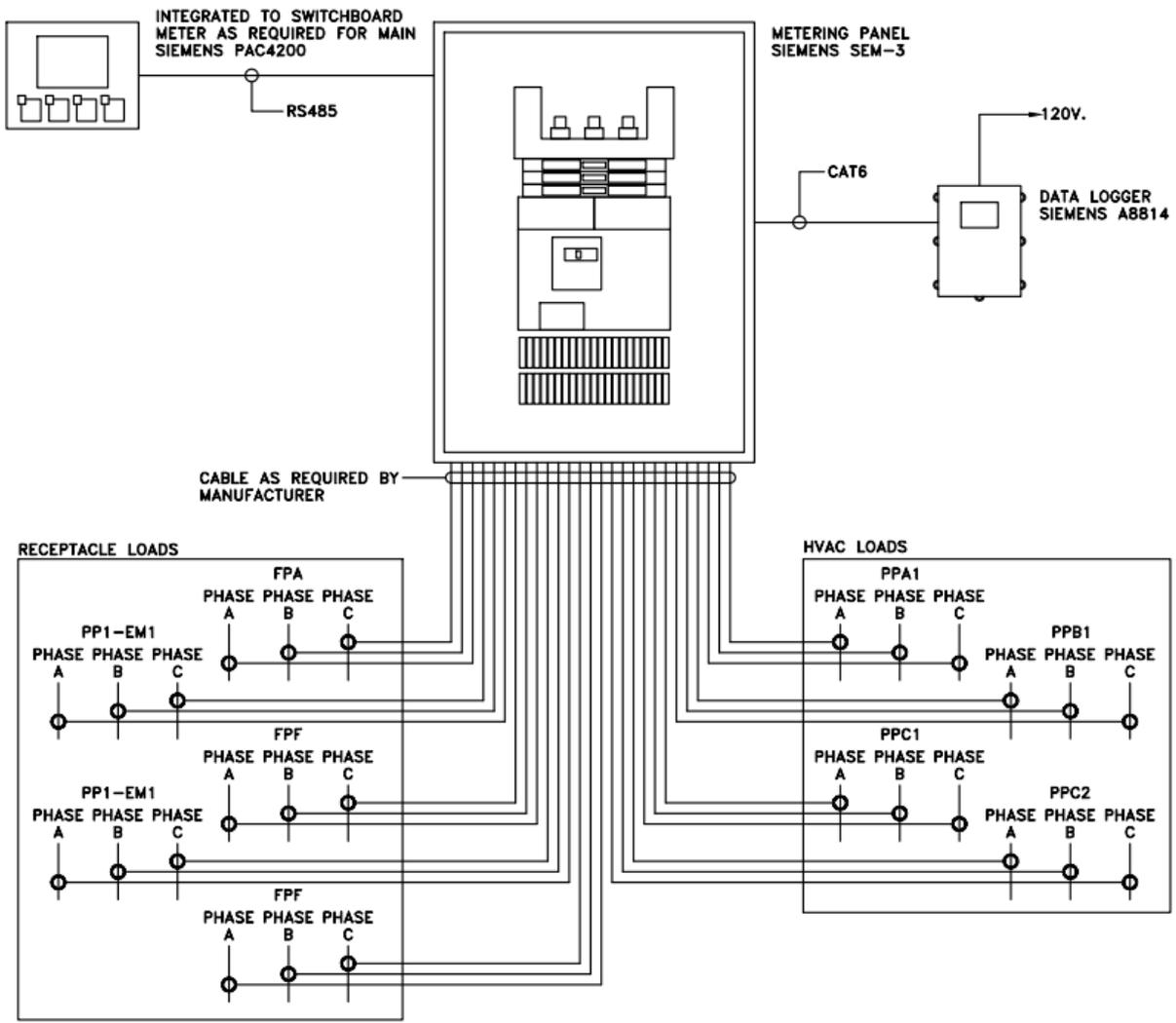
Exception: Up to 10% of the load for each of the categories (b) through (e) shall be allowed to be from other electrical loads

Section 8.4.3 Electrical Energy Monitoring



8.4.3.2 Recording and Reporting. The electrical energy usage for all loads specified in Section 8.4.3.1 shall be recorded a minimum of every 15 minutes and reported at least hourly, daily, monthly, and annually. The data for each tenant space shall be made available to that tenant. The system shall be capable of maintaining all data collected for a minimum of 36 months.

METERING DESIGN SAMPLE



Single-Circuit Meters

GE EPM7000



GE AMP1

AMP1 Power and Energy Meter



Multi-Circuit Meters

Veris Industries



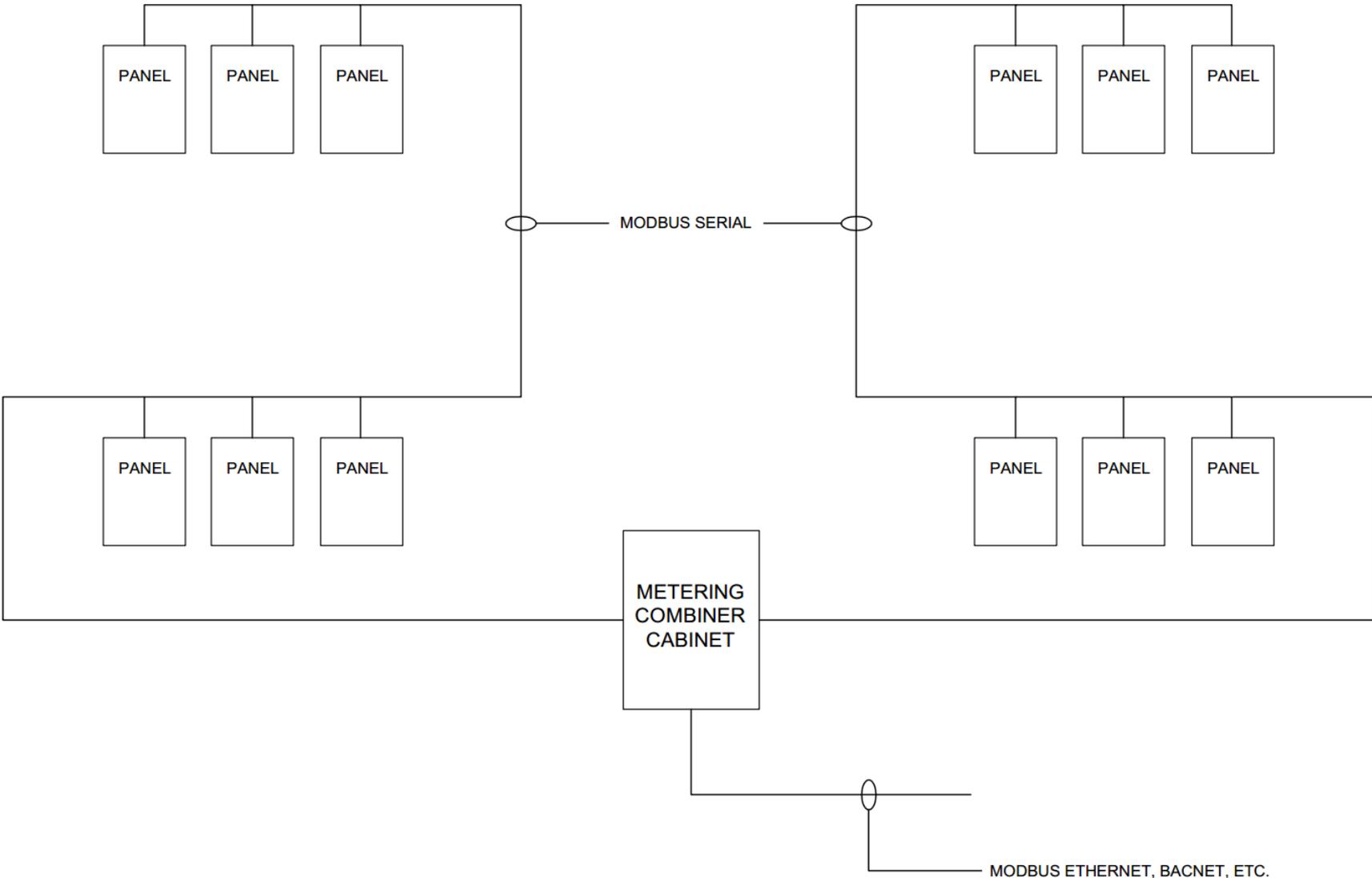
GE EPM 4500



TOUCH SCREEN HMI



L3 ASHRAE 90.1 SOLUTION



1. Meters

- a. Can be single-circuit meters or multi-circuit meters.
- b. Note that if the switchboard has breakers that have a metering option, then we can use that instead of a separate meter.

2. **2-Wire Belden or equal serial cable daisy chained between meters to the Metering Combiner Cabinet.**

- a. A couple of star topology branches are ok, but need to keep to a minimum.

3. **Metering Combiner Cabinet (Contains the following):**

- a. Wall-Mounted Enclosure
- b. Touch Screen HMI with built-in protocol conversion
- c. Terminal Blocks
- d. 120V Power
- e. Optional Ethernet switch if Ethernet meters are used in the system.

4. **Ethernet cabling from Metering Combiner Cabinet to Building EMS interface location (if part of project).**

5. Programming

- a. L3 will provide programming for all of the HMI screens as well as the Modbus maps that will have to be created for each meter type.

6. Commissioning

- a. Along with the programming and of the HMI screens and Modbus memory maps, L3 will provide onsite startup service to make sure all data is being received to the panel.
- b. If the project requires interface with the building EMS system, then the Modbus maps will be provided to the building EMS contractor for integration.

QUESTIONS?