
PART 1 GENERAL

1.1 SUMMARY

- .1 Section Includes:
 - .1 Materials and installation procedures for electric heating and cooling controls.

1.2 RELATED SECTIONS:

- .1 Section 01 33 00 – Submittal Procedures.
- .2 Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

1.3 REFERENCES

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.4 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 33 00 – Submittal Procedures. Include product characteristics, performance criteria, and limitations.
 - .1 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) in accordance with Section 01 33 00 – Submittal Procedures.
 - .2 Quality assurance submittals: submit following in accordance with Section 01 33 00 – Submittal Procedures.
 - .1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .2 Instructions: submit manufacturer's installation instructions.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle in accordance with Section 01 61 00 – Common Product Requirements.
 - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Waste Management and Disposal:
 - .1 Construction/Demolition Waste Management and Disposal: separate waste materials for reuse and recycling in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

PART 2 PRODUCTS

2.1 THERMOSTAT (LINE VOLTAGE-HEATING AND COOLING)

- .1 Line voltage, wall-mounted thermostat, for heating or cooling or heating-cooling as indicated with:
 - .1 Full load rating: 6 A at 120 V.
 - .2 Temperature setting range: 5 EC to 30 EC.
 - .3 Thermometer range: 5 EC to 30 EC.
 - .4 Markings in 5 degree increments.
 - .5 Differential temperature fixed at 1.1 EC.

2.2 THERMOSTAT (HEAVY-DUTY, LINE VOLTAGE, HEATING AND COOLING)

- .1 Heavy-duty line voltage thermostat for heating, cooling, heating/cooling with manual changeover two- stage heating or coolingheating/cooling automatic changeover as indicated with:
 - .1 Full load rating: 16 A at 120 V.
 - .2 Temperature setting range: 5 EC to 30 EC.
 - .3 Thermometer range: 5 EC to 30 EC.
 - .4 Markings in 5 ° degree increments.
 - .5 Differential temperature fixed at 1.1EC.

2.3 THERMOSTAT (LINE VOLTAGE, HEATING)

- .1 Line voltage wall mounted integral electric heating thermostat with:
 - .1 Full load rating: 22 A at 120 V.
 - .2 Temperature setting range: 5 EC to 30 EC.
 - .3 Single pole.
 - .4 Thermometer range: 5 EC to 30 EC.
 - .5 Scale markings: Off-5-10-15-20-25EC.

2.4 THERMOSTAT (LOW VOLTAGE)

- .1 Low voltage wall thermostat:
 - .1 For use on 24 V circuit at 1.5 A capacity.
 - .2 With heat anticipator adjustable 0.1 to 1.2 A.
 - .3 Temperature setting range: 10EC to 25EC.
 - .4 Without sub-base.

2.5 THERMOSTAT (REMOTE BULB)

- .1 Line voltage remote bulb type thermostat with:
 - .1 30 A rating on 120 V.

- .2 3 m copper capillary tube.
- .3 Moisture and dust-resistant enclosure.

2.6 THERMOSTAT (FAN COIL)

- .1 Line voltage fan coil heating-cooling thermostat with:
 - .1 Full load rating: 6 A at 120 V.
 - .2 Two rocker switches for "Heat-Off-Cool" and "Low-Medium-High" fan switching. Isolate heating and cooling circuits. "Off" switch to break power to fan and thermostat.

2.7 THERMOSTAT GUARDS

- .1 Thermostat guards: lockable, clear opaque plastic cast metal. Slots for air circulation to thermostat.

2.8 LOW LIMIT TEMPERATURE ALARM

- .1 Low limit temperature alarm with:
 - .1 Rating: 10.2 A at 120 V.
 - .2 Sensing bulb and 6 m long capillary tube.
 - .3 Switching action: manual reset.
 - .4 Temperature setting range: 0 EC to 15 EC.

2.9 HIGH LIMIT TEMPERATURE ALARM

- .1 High limit temperature alarm with:
 - .1 Rating 10 A at 120 V 6 A at 240 V.
 - .2 Positive lock-out.
 - .3 Manual reset only after 14 EC drop-in temperature.
 - .4 Cutout setting: 50 EC.

2.10 SAIL SWITCH

- .1 Sail switch, mercury bulb type with stainless steel sail 79 mm width, adjustable range set for 3.8 m/s air velocity with upward flow. Full load: 16 A at 120 V. Maximum ambient temperature: 82 EC.
- .2 Flow switch for water or glycol, pipe size as indicated, CSA Enclosure 1, rated at 16 A at 120 V. Maximum liquid temperature: 121EC. Maximum liquid gauge pressure of 1034 kPa ambient temperature range 0 EC to 82 EC. Ensure flow rate can activate flow switch at its minimum flow setting.

2.11 PRESSURE SWITCH

- .1 Pressure switch for water, steam, air at range to suit application with auto manual reset, contacts open on rise. Maximum allowable gauge pressure of 1.2 MPa. Full load 16 A at 120 V, ULC rated.

2.12 TEMPERATURE SENSORS

- .1 Temperature sensors supplied, installed and wired by Division 25. Component of EMCS System. Electrical Division to provide box and conduit to ceiling space only.

2.13 Electric Heating Relays

- .1 Low voltage solid state electric heating relays installed in ventilated enclosure, recess mounted, complete with power supply. Complete assembly to be CSA approved.
- .2 Heating relays, c/w integral heat sink, over voltage protection and status LED.
- .3 Relay to have veiled conductor connections. No exposed terminals permitted.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.2 INSTALLATION

- .1 Install control devices.
- .2 On outside wall, mount thermostats on bracket or insulated pad 25 mm from exterior wall.
- .3 Install remote sensing device and capillary tube in metallic conduit. Conduit enclosing capillary tube must not touch heater or heating cable.

3.3 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION