

PART 1 GENERAL

- 1.1 General Requirements
 - .1 All drawings and all sections of these specifications apply to and form an integral part of this section.
- 1.2 Related Work Specified Elsewhere
 - .1 Common Work Results – Electrical Section 26 05 00
 - .2 HVAC System Section 23 54 11
 - .3 Testing, Adjusting and Balancing Section 23 05 93
 - .4 Mechanical Equipment Connections Section 26 05 47
 - .5 Electrical
- 1.3 Work Included
 - .1 Provide a complete system of INVENSYS Building Systems electric controls as installed by BARCOL Controls Ltd..
 - .2 System control shall include:
 - .1 AHU Control (typical for 5 AHU's);
 - .2 HRV Control (typical for 2 HRV's)
 - .3 Crawlspace Ventilation Control (typical for 2 systems)
 - .4 Packaged Range Hood Control
- 1.4 Reference Standards
 - .1 Conform with the requirements of the plans and specifications, the local Authorities having Jurisdiction and the National Building Code. In the case of conflicting requirements, be governed by the more severe regulations.
 - .2 Use latest edition of all referenced codes, standards, regulations, etc.
- 1.5 Requirements Of Regulatory Agencies
 - .1 Electrical equipment must bear CSA label and shall bear ULC label attesting to having met test standards of agencies and being listed on their approved lists.
 - .2 Tanks shall bear approval of Manitoba Department of Labour and where applicable shall bear approval of Underwriter's Laboratories of Canada.
- 1.6 Samples
 - .1 Submit all samples requested by the Consultant.
- 1.7 Shop Drawings
 - .1 Submit shop drawings in accordance with General Conditions of all items requiring coordination into the Work.
 - .2 Clearly indicate:
 - .1 Scales and operating ranges for temperature and pressure indicators.
 - .2 Leakage and flow characteristic data for all control dampers.

- .3 Shop drawings are required for
 - .1 Control panels.
 - .2 Control diagrams.
 - .3 Equipment.
 - .4 Dampers.
 - .5 Thermostats.
- 1.8 Co-Ordination
 - .1 Section 23 54 11 shall mount all motorized dampers supplied by this Section in their respective locations in the ductwork. Section 23 54 11 shall also be responsible for distribution of dampers to the various locations on the job site.
 - .2 All electrical control wiring, including interlock wiring required for the mechanical equipment shall be supplied and installed by the electrical Division 26.
 - .3 All temperature control wiring 50 volts or more shall be a minimum of #14 gauge wire. All temperature control wiring less than 50 volts shall be minimum #18 gauge wire. All wiring shall be run in conduit including low voltage control wiring.
 - .4 Division 26 - Electrical shall provide the following:
 - .1 All power wiring to equipment.
 - .2 One 15 amp 120/1/60 circuit and power wiring to each Mechanical Room and control panel.
- 1.9 Maintenance Data
 - .1 Provide maintenance data in English for incorporation into maintenance manuals, including diagrams, specification sheets and maintenance and repair instructions.
 - .2 Supply control diagrams mounted permanently on hard board and plasticized. Install adjacent to the equipment in each Mechanical Room.
- 1.10 Standard Of Acceptance
 - .1 Standard of Acceptance: INVENSYS Building Systems.
 - .2 INVENSYS model numbers have been used as standard, unless otherwise noted.
- 1.11 Operating Instructions
 - .1 Provide operating instructions for the temperature control system in accordance with the General Conditions of the Contract and include a description of the sequence of operation and "as-built" drawings of the system schematics.
- 1.12 Service And Guarantee
 - .1 Upon completion of the installation, all control equipment supplied under this Contract shall be adjusted to place the system in complete operating condition subject to the Contract Administrator's approval. All adjustments shall be made in co-ordination with the Contract Administrator. The control systems shall be guaranteed against defects in workmanship and material for a period of one (1) year under normal use and service from the date of beneficial occupancy.

PART 2 MATERIALS

2.1 Panels

- .1 Provide all prewired control panels, except those furnished as part of equipment under other sections.
- .2 Fabricate fully enclosed cabinets using all steel construction.
 - .1 Use bold or cover plate or hinged door with locking latch. Common key to all locks.
 - .2 Finish with two (2) coats of paint.
 - .3 Furnish wall mounted or free standing panel as indicated on the drawings.
 - .4 Mount all routinely operated, manually adjusted indicating devices on cover of door. Enclose all other devices.

2.2 Control Dampers

- .1 Provide all control dampers of the sizes and type indicated on the plans.
- .2 Leakage shall not exceed 1% with an approach velocity of 7.6 m/s when the damper is closed against 1000 Pa.

2.3 Damper Operators

- .1 Damper operators as indicated on plans.
- .2 Operators shall be direct mount type.
- .3 Valve operators shall be of type to withstand temperatures likely to be encountered in application.

2.4 AHU Thermostats

- .1 As indicated on plans.

2.5 HRV Controllers

- .1 As indicated on plans.

2.6 Miscellaneous Devices

- .1 Provide all necessary relays, positioners, clocks, transformers, etc. to make a complete and operable system.

PART 3 SEQUENCE OF OPERATION

3.1 AHU Control (Typical of 5 units)

- .1 The thermostat shall control the AHU on an occupied/unoccupied schedule. During the occupied mode the AHU will operate to maintain the space temperature set point. During the unoccupied mode, the AHU will be cycled by a space thermostat to maintain the space temperature at the night set back set point. The control Contractor to install and wire all controls provide by the AHU supplier, or shown on plans.

3.2 HRV Control (Typical of 2 units)

- .1 The HRV's shall be controlled by the wall mounted HRV controller. The HRV's shall be interlocked with the respective AHU's such that the interlock will provide speed control as required (ie. 1 AHU running – HRV will be in low speed, 2 AHU's running – HRV in medium speed, high humidity condition HRV in high speed).

- 3.3 CrawlSpace Ventilation Control (Typical Of 2 Systems)
 - .1 The crawlspace ventilation consists of 2 air intakes and 1 exhaust fan for each system;
 - .2 When the crawlspace humidity rises above the set point of the crawlspace dehumidistat, the exhaust fan will start and the air intake dampers will open.
 - .3 When the crawlspace humidity level is satisfied, the exhaust fan will not run and the air intake dampers will remain closed.
- 3.4 Range Hood Control
 - .1 Division 26 Electrical shall install and wire the packaged controls for the range hood, as per manufacturer's recommendations.