

- 1 General
  - 1.1 **SUMMARY**
    - .1 Section Includes
      - .1 Labour, Products, equipment and services necessary to complete the Work of this section.
  - 1.2 **REFERENCE STANDARDS**
    - .1 Comply with the latest edition of the following:
      - .1 ANSI/ASHRAE/IESNA 90.1
      - .2 ANSI/ARI Standard 390
      - .3 CSA C22.2
  - 1.3 **SUBMITTALS**
    - .1 Shop Drawings
      - .1 Submit Shop Drawings in accordance with Section 01 33 00.
    - .2 Operation and Maintenance Data
      - .1 Submit printed operation instructions and maintenance data in accordance with Section 01 33 00.
- 2 Products
  - 2.1 **SPLIT-SYSTEM HEAT PUMP UNIT**
    - .1 Capacity, performance requirements, and configuration shall be as scheduled and specified.
    - .2 Provide fully packaged and factory tested indoor evaporator unit complete with control system, DX refrigeration system, supply air fan, filters.
    - .3 Provide fully packaged and factory tested remote outdoor condensing unit complete with built-in starter, contactors, controls, transformers, and weatherproof disconnect switch.
    - .4 Compressor to be inverter.
    - .5 Ship units fully charged with refrigerant R410A.
    - .6 Interconnect indoor evaporator unit and outdoor condensing unit with liquid and suction refrigerant lines. Refrigerant lines shall be insulated with cellular elastomer.
    - .7 Provide wired controller. Controller to be interlocked with electric heater where indicated on Drawings.
    - .8 Provide low (-20°C) ambient operation kit.
    - .9 Auto restart after power failure.

- .10 Acceptable Manufacturers
  - .1 Mitsubishi
  - .2 Daikin
- 2.2 **CONTROL AND MONITORING SYSTEMS ~~(FUTURE BAS INTEGRATION)~~**
  - .1 Any vendors that are authorized dealers or distributors of the following control systems are acceptable:
    - .1 Delta Controls
    - .2 Reliable Controls
    - .3 Schneider Electric SmartX Series
    - .4 Distech Controls
    - .5 Johnson Controls Facility Explorer
    - .6 Honeywell CIPer series, Spyder Models 5 or 7
  - .2 BAS System Integration:
    - .1 All control systems must be integrated to the City's J2 Innovations Fluid Integration (FIN) serve, including but not limited to the following:
      - .1 Graphical user interface (monitoring and control)
      - .2 Alarming
      - .3 Data Trending
      - .4 Data Archiving
      - .5 Project Haystack naming convention
    - .2 The installer must be licensed by J2 Innovations to sell, install, program and configure Fluid INtegration (FIN).
    - .3 Building Controllers (BC) must be Tridium Niagara JACE with the Haystack module and driver. The installer must be a licensed Tridium system integrator for any Tridium BCs or embedded or edge Niagara Framework products used. Soft JACE is not accepted.
  - .3 Licensing Requirements
    - .1 Licenses shall be provided to and in the name of the City of Toronto
    - .2 Licenses shall be perpetual, transferrable, assignable and royalty free.
    - .3 **Tridium Licenses shall allow all workbench/supervisor brands complete system access and functionality.**

**.4 Installer and Manufacturer Qualifications**

- .1 Installer shall have an established working relationship with Control System Manufacturer.**
- .2 Installer shall have successfully completed control system's control system training. Upon request, installer shall present record of completed training including course outlines.**
- .3 It is the intent of these specifications to define an open protocol state-of-the-art distributed computerized Building Management and Control System, which is user friendly, has known reliability, is extremely responsive, and which is to be designed, installed, implemented, and supported by a local office of approved bidders.**
- .4 BAS Contractor provides three locations for successful installations of similar open protocol computer-based systems. Sites provided must consist of more than 150 hardware inputs/outputs. Project sites must be local to the location of this project.**

3 Execution

3.1 **GENERAL**

- .1 Install unit and accessories as per manufacturer's instructions.
- .2 Manufacturer to certify installation, and start-up and commission units.
- .3 Install miscellaneous steel framing, supports, braces, etc. as required to hang or support equipment and ductwork as specified herein, and as shown on Drawings.
- .4 Install and wire all accessories shipped loose with units for fully operating systems.

End of Section

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