

PART 1 - GENERAL

- 1.1 REFERENCES .1 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS).
- 1.2 ACTION AND INFORMATIONAL SUBMITTALS .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
.2 Product Data:
.1 Submit manufacturer's printed product literature, specifications and datasheet. Include information as follows:
.1 Replacement data for motor element, thermostat and switch.
.2 Mounting methods.
.3 kW rating.
.4 Cabinet material thicknesses.
.5 Physical size.
.6 Finish.
.7 Cabinet surface temperature.
.8 Thermostat, transformer, controls where integral.
.3 Instructions: submit manufacturer's installation instructions.
- 1.3 QUALITY ASSURANCE .1 Health and Safety:
.1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
.2 The units shall be tested by a Nationally Recognized Testing Laboratory (NRTL).
.3 All wiring shall be in accordance with the Canadian Electrical Code and local codes as required.
.4 The units shall be rated in accordance with Air Conditioning, heating and Refrigeration Institute's (AHRI) Standard 240 and bear the AHRI Certification Label.
.5 The units shall be manufactured in a facility registered to ISO 9001 and ISO 14001, which is a set of standards applying to environmental

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- 1.3 QUALITY ASSURANCE (Cont'd) .5 (Cont'd)
protection set by the International Standard Organization (ISO).
- .6 A dry air holding charge shall be provided in the indoor section.
- .7 System efficiency shall meet or exceed SEER 16.1.
- 1.4 DELIVERY, STORAGE AND HANDLING .1 Waste Management and Disposal:
- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan (WMP).
- .4 Separate for reuse and recycling and place in designated containers Steel Metal Plastic waste in accordance with Waste Management Plan (WMP).
- .5 Handle and dispose of hazardous materials in accordance with Regional and Municipal, regulations.
- .6 Divert unused metal materials from landfill to metal recycling facility.
- .2 Unit shall be stored and handled according to the manufacturer's recommendations.
- 1.5 WARRANTY .1 The units shall have a manufacturer's parts and defects warranty for a period of five (5) years from date of installation. The compressor shall have a warranty of seven (7) years from date of installation. If, during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced or repaired at the discretion of the manufacturer.
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PART 2 - PRODUCTS

2.1 OUTDOOR UNIT

- .1 The outdoor unit shall be equipped with an electronic control board that interfaces with the indoor unit to perform all necessary operation functions.
- .2 Further, the outdoor unit shall be capable of cooling operating at -18°C ambient temperature without additional low ambient controls (optional wind baffle shall be required).
- .3 The outdoor unit shall be able to operate with a maximum height difference of 15 meters between indoor and outdoor units.
- .4 System shall operate at up to a maximum refrigerant tubing length of 75 meters between indoor and outdoor units without the need for line size changes, traps or additional oil.
- .5 The outdoor unit shall be completely factory assembled, piped, and wired. Each unit must be test run at the factory.
- .6 Outdoor unit sound level shall not exceed 52 dB(A).
- .7 Cabinet
 - .1 The casing shall be constructed from galvanized steel plate, finished with an electrostatically applied, thermally fused acrylic or polyester powder coating for corrosion protection.
 - .2 Mounting feet shall be provided and be of sufficient size to afford reliable equipment mount and stability.
 - .3 Easy access shall be afforded to all serviceable parts by means of removable panel sections.
 - .4 The fan grill shall be of ABS plastic.
 - .5 Cabinet mounting and construction shall be sufficient to withstand 100 MPH wind speed conditions.
- .8 Fan
 - .1 The fan blades shall be of high performance, aerodynamic design for quiet operation, and the fan motor bearings shall be permanently lubricated.

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- 2.1 OUTDOOR UNIT .8 (Cont'd)
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- .2 The fans shall be provided with a raised guard to prevent external contact with moving parts.
- .9 Coil
- .1 The condenser coil shall be of copper tubing with aluminum fins. The coil shall be protected with in integral metal guard.
- .2 All refrigerant lines between outdoor and indoor units shall be of annealed, refrigeration grade copper tubing ARC Type, meeting ASTM B280 requirements, individually insulated in twin-tube, flexible, closed-cell, CFC-free (ozone depletion potential of zero), elastomeric material for the insulation of refrigerant pipes and tubes with thermal conductivity equal to or better than 0.27 BTU-inch/hour per Sq Ft/°F, a water vapor transmission equal to or better than 0.08 Perm-inch and superior fire ratings such that insulation will not contribute significantly to fire and up to 25 mm thick insulation shall have a -Flame-Spread Index of less than 25 and a Smoke-development Index of less than 50 as tested by ASTM E84 and CAN/ULC S-102. All refrigerant line connections shall be flare type sized as required and tightened to manufacturers specified torque value.
- .10 Compressor
- .1 To prevent liquid from accumulating in the compressor during the off cycle, a minimal amount of current shall be automatically, intermittently applied to the compressor motor windings to maintain sufficient heat to vaporize any refrigerant.
- .2 The outdoor unit shall have an accumulator and high pressure safety switch. The compressor shall be mounted to avoid the transmission of vibration.
- .11 Electrical
- .1 The electrical power of the unit shall be as indicated on the drawings.
- .2 The outdoor unit shall be controlled by the microprocessor located in the indoor unit.
- .3 The unit shall have Pulse Amplitude Modulation circuit to utilize 98% of input power supply.
- .4 Contractor to provide all wiring required for a complete working installation.
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2.1 OUTDOOR UNIT
(Cont'd)

- .12 Operating Range
.1 Unit shall be able to provide 100% capacity when operating at -18°C outdoor air temperature and a wind baffle is used.

2.2 INDOOR UNIT

- .1 Ceiling Recessed Cassette Type
.1 The indoor unit shall be a space-saving ceiling-recessed cassette type, factory assembled, wired and tested. Contained within the unit shall be all factory wiring and internal piping, drain lift mechanism, control circuit board, fan, and fan motor. The unit, in conjunction with the wireless or wired remote controller, shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, and a test run switch. Indoor unit and refrigerant pipes shall be purged with dry nitrogen before shipment from the factory.
- .2 Cabinet
.1 The cabinet shall be formed from galvanized sheet metal coated with high-density foam insulation. Cabinet shall be for recessed mounting and provided with four (4) corner mounting supports behind removable corner pockets in Grille assembly allowing adjustment of mounting height from front of unit.
.2 A separate grill assembly shall be attached to the front of the cabinet to provide supply air vanes in four directions and a center mounted return air section. The four-way grill shall be fixed to bottom of cabinet allowing two, three or four-way blow. the grill vane angles shall be individually adjustable from the wired remote controller to customize the airflow pattern for the conditioned space. Grill assembly color shall be white.
- .3 Fan
.1 The indoor fan shall be an assembly with a turbo fan propeller, direct driven by a single motor and shall be statically and dynamically balanced to run on a motor with permanently lubricated bearings. The indoor fan shall consist of at least three (3) speed settings. The fan shall have a selectable Auto fan setting that will adjust the fan speed based on the difference between controller set-point and space temperature.

- 2.2 INDOOR UNIT .3 (Cont'd)
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- .2 Indoor unit sound level shall not exceed 34 dB(A).
 - .4 Filter
 - .1 Return air shall be filtered by means of an easily removable, long life, washable filter.
 - .5 Coil
 - .1 The indoor unit coil shall be of nonferrous construction with pre-coated aluminum strake fins on copper tubing. The tubing shall have inner grooves for high efficiency heat exchange.
 - .2 A condensate pan with drain connections shall be provided under the coil. The unit shall also include a built-in, automatic condensate lift mechanism that will be able to raise drain water 84 cm above the condensate pan. The lift mechanism shall be equipped with a positive acting liquid level sensor to shut down the indoor unit if liquid level in the drain pan reached maximum level.
 - .3 Both refrigerant lines between the indoor unit and outdoor unit shall be fully insulated.
 - .6 Electrical
 - .1 The electrical power of the unit shall be as indicated on the drawings.
 - .2 The indoor units shall not have any supplemental or "back-up" electrical heating elements.
 - .7 Performance as indicated on the drawings.
 - .8 System Control
 - .1 The system shall be capable of automatic restart when power is restored after power interruption. The system shall have self-diagnostics ability. Diagnostics codes for indoor and outdoor units shall be displayed on the wired controller panel.
 - .9 Remote Controllers
 - .1 Contractor to provide and install one (1) wired controller complete with all wiring required for a complete working installation.
 - .2 The controller shall provide the following functions at a minimum:

Item and Description

2.2 INDOOR UNIT .9 (Cont'd)
(Cont'd) .2 (Cont'd)

Item and Description

Number of Units Controllable

- 2 units as 1 group

ON/OFF

- Run and stop operation

Operation Mode

- Switches between cool/auto/fan

Temperature Setting

- Sets the setpoint temperature in the following range:

Cool: 19.5°C - 30.5°C

Auto: 19.5°C - 28°C

Fan Speed Setting

- Hi/Mid/Low/Auto

Air Flow Direction Setting

- Air flow direction angles, swing.

Weekly Scheduler

- ON/OFF/Temperature setting can be done up to 4 times one day in the week. The time can be set by the 1-minute interval.

Operating Conditions Display

- Setpoint and room temperature

Error

- When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed.

.10 The microprocessor located in the indoor unit shall have the capability of sensing return air temperature and indoor coil temperature, receiving and processing commands from the wireless or wired controller, providing emergency operation and controlling the outdoor unit.

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 in accordance with manufacturer's written instructions.
.2 Make power and control connections.
- 3.3 FIELD QUALITY CONTROL .1 Site Tests/Inspection:
.1 Perform tests in accordance Section 26 05 00 - Common Work Results for Electrical.
.2 Set controls and operate each unit.
.3 Take readings and record:
.1 Current.
.2 Air velocity at discharge.
.3 Discharge air temperature.
- 3.4 CLEANING .1 Perform cleaning operations in accordance with manufacturer's recommendations.
.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.