

	FlexSys Underfloor Air System		
Guide Specifications	Supersedes: 130.15-GS2 (1298)	503	Form: 130.15-GS2

ANNOTATED GUIDE MECHANICAL SPECIFICATION FOR THE YORK FLEXSYS UNDERFLOOR AIR CONDITIONING SYSTEM

These guide specifications are annotated to assist in editing the specifications for a particular project. There are in the CSI 3 part format. Section/paragraph numbering may change as needed to address coordination with other sections of the project specifications.

SECTION 15740 ACCESS FLOOR AIR TERMINAL UNITS (or other number depending on numbering system used)

PART 1 – GENERAL

1.01 - Mechanical General Provisions

Provisions of Section 15010, Mechanical General Provisions, shall be made an integral part of this Section.

1.02 - Work Included

- A. The Contractor shall furnish and install a complete access floor air terminal system as shown on the drawings. All wiring, controls and other accessories required for a complete system shall be included. Contractor shall provide submittals, samples, and operation and maintenance documentation. Specific equipment includes: *(List each type of terminal required on the project.)*
- MIT-A, A-S, A-R or A-S-R** Constant Volume Units
 - MIT-B, B-S, B-R or B-S-R** Constant Volume Units with Duct Collar
 - MIT-C, C-S, C-R, C-S-R or C-NS** Variable Volume Units
 - MIT-D, D-S, D-R or D-S-R** Variable Volume Units with Duct Collar
 - MIT-E or E-R** Variable Volume Induction Units
 - MIT-F** Variable Volume, Pressure-independent, Low Profile Units
 - MIT-G, G-S, G-R, G-S-R or G-NS** Perimeter Zone or Conference Room Heating/Cooling Units
 - MIT-H, H-S, H-R, H-S-R or H-NS** Constant Volume Units with Manual Volume Adjustment
 - MFT-A, AS, B or C** 150, 300 or 600 CFM Fan-Powered Underfloor Electric/Hydronic Heating Units

PCM-A Power and Control Module for up to four (4) MIT units.

PCM-C Power and Control Module for up to fourteen (14) MIT Units

PAP-A 25' Plug and Play Cable Set for Connection of MIT Actuators, PCM, MFT and/or FlexCool

PAP-B 50' Plug and Play Cable Set for Connection of Controller to Thermostat

PAP-C 25' Plug and Play Cable Set for Extension of PAP-A or PAP-B Cable Sets

PAP-D 25' Plug and Play Cable Set for Connection of Auxiliary Sensor to FlexHeat

PAP-E 5' Plug and Play Cable Set for Connection of MFT and FlexHeat

T-STAT-1 Space Thermostat and Electronic Controller for use in cooling only zones.

T-STAT-2 Space Thermostat and Electronic Controller for use in cooling/heating zones with 2 position heat.

T-STAT-3 Space Thermostat and Electronic Controller for use in cooling/heating zones with MFT heating.

DDC-1 Space Thermostat and DDC Controller with Echelon bus compatibility for use in cooling only zones and cooling/heating zones with MFT, 1 or 2 stage electric, or 2 position hot-water heat.

DDC-2 Space Thermostat and DDC Controller with Echelon bus compatibility for use in cooling/heating zones with modulating heat.

1.03 - Related Work Not Included

- A. The floor holes required for installation of floor air terminals shall be coordinated with the Access Floor Contractor. All floor openings shall be prepared by the Access Floor Contractor, as shown on the floor plan drawings. Required plenum barriers, sealing of plenum, structural supports, carpet cutouts and any other floor related appurtenances shall be prepared by the Access Floor Contractor as shown on the drawings.
- B. All electrical power needed for terminal operation shall be coordinated with the Electrical Contractor. The electrical power shall be furnished by the Electrical Contractor and installed as shown on the drawings.
- C. Control interfaces and/or integration with the Building Automation System (BAS) or other control system shall be furnished by the Controls Contractor.

1.04 - Quality Assurance

- A. All equipment and components shall be suitable for use in an environmental air plenum.
- B. All components within the air stream including under-floor terminals shall conform to the NFPA 90A Standard for Flame/Smoke/Fire contribution of 25/50/0.
- C. All units shall be the product of a manufacturer regularly engaged in the production of terminal units and all supplied units shall be from the same manufacturer.
- D. Units shall be specifically designed for an access floor installation and complete with all necessary controls and wiring as required to provide operation according to manufacturer's recommendations.
- E. Terminal operation shall be coordinated with air handling system and control system to assure complete compatibility.
- F. Equipment shall be listed under and conform to appropriate sections of U.L., CSA, E.T.L. and other testing laboratory requirements.

1.05 - Submittals

- A. Submit dimensioned drawings, performance and product data for approval. Include listing of discharge and radiated sound power level for each of second through sixth octave. Data shall include all wiring diagrams, control sequences and power requirements as applicable to the product and coordination with other systems.

1.06 - Operation and Maintenance Data

- A. Quantity: 6
- B. Content:
 - 1. Maintenance and Service Contracts: Provide a list, with each product, name, address and telephone number of:
 - a. Subcontractor or installer.
 - b. Maintenance contractor, as appropriate. Identify area of responsibility of each.
 - c. Local source of supply for parts and replacement.
 - 2. Table of Contents: List all products in the order in which they appear in the specifications and label accordingly.
 - 3. Sections: All sections shall be separated with an appropriate tabbed section divider with the appropriate specification section number. Provide the manufacturer's written installation and maintenance instructions for all items required.
 - 4. Routine Maintenance: Provide a list indicating all routine maintenance procedures based on recommended intervals.
 - 5. Contents: Include copies of approved submittal data, installation instructions, operation and maintenance instructions and parts lists.

1.07 - Warranty

- A. The air terminal materials and workmanship shall be guaranteed to be free from defects for a period of one year after startup or 18 months from date of shipment from the factory whichever occurs first.
- B. Contractor and/or vendor shall maintain availability of replacement parts compatible with the terminals for no less than ten years after acceptance.

PART 2 – PRODUCTS

2.01 - General Description

- A. The Contractor shall furnish a pre-engineered, prefabricated, access floor air terminal system that includes all necessary components from a single source of responsibility/manufacturer. All components including any controls and wiring shall be furnished as a "plug-and-play" system of modular and interchangeable components that are factory prepared to operate as a complete system. *(Because some owners may want special controls this section may need to be modified to address this issue.)*

2.02 - Fabrication

(Each of the following items should be listed if required for the specific project.)

MIT-A, A-S, A-R or A-S-R; CAV Terminal Units
(These are air grilles in the floor with no dampers or controls.)

1. Unit chassis shall be minimum 18-gauge galvanized steel that shall enclose and support all components. Chassis construction shall admit plenum air from only one direction to provide a method of adjusting delivery volume for floor velocity pressure.
2. Unit shall have a die cast aluminum trim ring that shall engage with the chassis and floor to provide complete support for the air grilles. Die cast ring color shall be as shown on the finish schedule or manufacturer's standard color to be selected from submittal data. Trim ring shall be attached to chassis and floor panel by means of concealed removable screws. *(A round trim ring option is available at no additional cost. Special colors are available at additional cost.)*
3. Unit shall have one or more removable grilles made of die cast aluminum material that matches the trim ring in color. Grilles shall include a means for adjusting air throw and pattern and shall fit securely within the trim ring and chassis without mechanical fasteners. Grilles shall be capable of supporting a load of 1250 pounds (565 kg) without permanent damage. No openings in the grilles shall be larger than .30 inches (7.6 mm) for shoe heel penetration protection.
4. MIT-A and A-S units shall be rated for 150 CFM for a nominal unit size of 10.5 by 10.5 inches (267 by 267 mm) at a static pressure not to exceed 0.05 inches w.g. MIT-A-R and A-S-R units shall be rated for 150 CFM for a nominal unit size of 10.5 inches (267 mm) in diameter at a static pressure not to exceed 0.06 inches w.g.
5. Construction of unit shall permit easy cleaning and prevent dirt and debris from entering system; and no plastic dampers, grilles or other parts shall be exposed to the plenum or airstream in accordance with NFPA 90A.

MIT-B, B-S, B-R or B-S-R; CAV Terminal Units
(These are air grilles in the floor with duct collar for ducted distribution.)

1. Unit chassis shall be minimum 18-gauge galvanized steel that shall enclose and support all components. Chassis construction shall admit ducted air from a source independent of the raised floor plenum.
2. Unit shall have a die cast aluminum trim ring that shall engage with the chassis and floor to provide complete support for the air grilles. Die cast ring color shall be as shown on the finish schedule or manufacturer's standard color to be selected from submittal data. Trim ring shall be attached to chassis and floor panel by means of concealed removable screws. *(A round trim ring option is available at no additional cost. Special colors are available at additional cost.)*
3. Unit shall have one or more removable grilles made of die cast aluminum material that matches the trim ring in color. Grilles shall include a means for adjusting air throw and pattern and shall fit securely within the trim ring and chassis without mechanical fasteners. Grilles shall be capable of supporting a load of 1250 pounds (565 kg) without permanent damage. No openings in the grilles shall be larger than .30 inches (7.6 mm) for shoe heel penetration protection.
4. MIT-B and B-S units shall be rated for 150 CFM for a nominal unit size of 10.5 by 10.5 inches (267 by 267 mm) at a static pressure not to exceed 0.05 inches w.g. MIT-B-R and B-S-R units shall be rated for 150 CFM for a nominal unit size of 10.5 inches (267 mm) in diameter at a static pressure not to exceed 0.06 inches w.g.
5. Construction of unit shall permit easy cleaning and prevent dirt and debris from entering system; and no plastic dampers, grilles or other parts shall be exposed to the plenum or airstream in accordance with NFPA 90A.

MIT-C, C-S, C-R, C-S-R or C-NS; VAV Terminal Units
(These units provide automatic control of the air flow and include a damper and damper motor.)

1. Unit chassis shall be minimum 18-gauge galvanized steel that shall enclose and support all components. Chassis construction shall admit plenum air from only one direction to provide a method of adjusting delivery volume for floor velocity pressure.
2. Unit shall have a die cast aluminum trim ring that shall engage with the chassis and floor to

provide complete support for the air grilles. Die cast aluminum ring color shall be as shown on the finish schedule or manufacturer's standard color to be selected from submittal data. Trim ring shall attached to chassis and floor panel by means of concealed removable screws. *(A round trim ring option is available at no additional cost. Special colors are available at additional cost.)*

3. Unit shall have one or more removable grilles made of die cast aluminum material that matches the trim ring in color. Grilles shall include a means for adjusting air throw and pattern and shall fit securely within the trim ring and chassis without mechanical fasteners. Grilles shall be capable of supporting a load of 1250 pounds (565 kg) without permanent damage. No openings in the grilles shall be larger than .30 inches (7.6 mm) for shoe heel penetration protection.
4. MIT-C and C-S units shall be rated for 150 CFM for a nominal unit size of 10.5 by 10.5 inches (267 by 267 mm) at a static pressure not to exceed 0.05 inches w.g. MIT-C-R and C-S-R units shall be rated for 150 CFM for a nominal unit size of 10.5 inches (267 mm) in diameter at a static pressure not to exceed 0.05 inches w.g. MIT-C-NS unit shall be rated for 100 CFM for a nominal unit size of 5.5 by 10.5 inches (138 by 267 mm) at a static pressure not to exceed 0.06 inches w.g.
5. Unit shall include an integral damper and damper operator. Damper shall be made of 20-gauge galvanized steel and be sealed with felt or foam type gasket material. Damper operation shall provide a throttling of the airflow that produces a nominal constant velocity, variable volume flow from full shut-off to full open condition. The damper shall vary the active outlet area of the grilles while maintaining velocity of the supply air through the grille. Damper operator shall operate on 24VAC and use no more than 6 volt-amperes per unit. Damper motor electrical connection shall be by means of a modular connector, polarized to prevent incorrect connection.

MIT-D, D-S, D-R or D-S-R; VAV Terminal Units
(These units provide control of the air flow for a ducted system.)

1. Unit chassis shall be minimum 18-gauge galvanized steel that shall enclose and support all components. Chassis construction shall admit plenum air from only one direction to provide a method of adjusting delivery volume for floor velocity pressure.
2. Unit shall have a die cast aluminum trim ring that shall engage with the chassis and floor to provide complete support for the air grilles. Die cast aluminum ring color shall be as shown on the finish schedule or manufacturer's standard color to be selected from submittal data. Trim ring shall attached to chassis and floor panel by means of concealed removable screws. *(A round trim ring option is available at no additional cost. Special colors are available at additional cost.)*
3. Unit shall have one or more removable grilles made of die cast aluminum material that matches the trim ring in color. Grilles shall include a means for adjusting air throw and pattern and shall fit securely within the trim ring and chassis without mechanical fasteners. Grilles shall be capable of supporting a load of 1250 pounds (565 kg) without permanent damage. No openings in the grilles shall be larger than .30 inches (7.6 mm) for shoe heel penetration protection.
4. MIT-D and D-S units shall be rated for 150 CFM for a nominal unit size of 10.5 by 10.5 inches (267 by 267 mm) at a static pressure not to exceed 0.05 inches w.g. MIT-D-R and D-S-R units shall be rated for 150 CFM for a nominal unit size of 10.5 inches (267 mm) in diameter at a static pressure not to exceed 0.06 inches w.g.
5. Unit shall include an integral damper and damper operator. Damper shall be made of 20-gauge galvanized steel and be sealed with felt or foam type gasket material. Damper operation shall provide a throttling of the airflow that produces a nominal constant velocity, variable volume flow from full shut-off to full open condition. The damper shall vary the active outlet area of the grilles while maintaining velocity of the supply air through the grille. Damper operator shall operate on 24VAC and use no more than 6 volt-amperes per unit. Damper motor electrical connection shall be by means of a modular connector, polarized to prevent incorrect connection.

6. The chassis design shall include a removable end panel for attachment of a supply air duct using standard duct size of 6 inches (152 mm) round for a 10 inch deep unit and 5 inches (127 mm) round for a 7 inch deep unit. *(Include end panel for duct connection only if needed by ducted distribution system.)*

MIT-E or E-R; VAV Low Temperature Induction Terminal Units *(These units provide conditioned air to the space that is a mixture of very cold supply air from a duct and return air from the floor plenum.)*

1. Unit chassis shall be minimum 18-gauge galvanized steel that shall enclose and support all components. The chassis design shall include an end panel for attachment of a supply air duct using standard duct size of 5 inches (127 mm) round, and openings for the entrance of plenum air. Chassis construction shall admit plenum air from only one direction to provide a method of adjusting delivery volume for floor velocity pressure.
2. Unit shall have a die cast aluminum trim ring that shall engage with the chassis and floor to provide complete support for the air grilles. Die cast aluminum ring color shall be as shown on the finish schedule or manufacturer's standard color to be selected from submittal data. Trim ring shall attached to chassis and floor panel by means of concealed removable screws. *(A round trim ring option is available at no additional cost. Special colors are available at additional cost.)*
3. Unit shall have one or more removable grilles made of die cast aluminum material that matches the trim ring in color. Grilles shall include a means for adjusting air throw and pattern and shall fit securely within the trim ring and chassis without mechanical fasteners. Grilles shall be capable of supporting a load of 1250 pounds (1565 kg) without permanent damage. No openings in the grilles shall be larger than .30 inches (7.6 mm) for shoe heel penetration protection.
4. MIT-E unit shall be rated for 150 CFM for a nominal unit size of 10.5 by 10.5 inches (267 by 267 mm) at a static pressure not to exceed 0.05 inches w.g. MIT-E-R unit shall be rated for 150 CFM for a nominal unit size of 10.5 inches (267 mm) in diameter at a static pressure not to exceed 0.06 inches w.g.

5. Unit shall include an induction sleeve or nozzle unit that varies and mixes the cold, ducted supply air with warm return air from the floor plenum to produce tempered air that is discharged from the unit grille. The induction/mixing process shall properly proportion the ratio of cold supply air to tempering air to maintain a relatively uniform unit discharge temperature throughout the unit throttling range of 0 to 100 percent. Adjustment of the mixing ratio shall be obtained through adjustment of the cold air and tempering air static pressures.

MIT-F; VAV Pressure Independent Terminal Units *(These units provide control of the air flow in low profile floors where there is a substantial variance in the floor static and velocity pressure.)*

1. Unit chassis shall be minimum 18-gauge galvanized steel that shall enclose and support all components. Chassis construction shall admit plenum air from only one direction to provide a method of adjusting delivery volume for floor velocity pressure.
2. Unit shall have a die cast aluminum trim ring that shall engage with the chassis and floor to provide complete support for the air grille. Die cast aluminum ring color shall be as shown on the finish schedule or manufacturer's standard color to be selected from submittal data. Trim ring shall attached to chassis and floor panel by means of concealed removable screws. *(Special colors are available at additional cost.)*
3. Unit shall have a removable grille made of die cast aluminum material that matches the trim ring in color. Grille shall include a means for adjusting air throw and pattern and shall fit securely within the trim ring and chassis without mechanical fasteners. Grille shall be capable of supporting a load of 1250 pounds (565 kg) without permanent damage. No openings in the grille shall be larger than .30 inches (7.6 mm) for shoe heel penetration protection.
4. Unit shall be rated at 150 CFM for a nominal unit size of 10.5 by 10.5 inches (267 by 267 mm) at a static pressure from .10 to .57 inches w.g.
5. Unit shall include an integral damper and damper operator. Damper shall be made of 20-gauge galvanized steel and be sealed with felt

or foam type gasket material. Damper operation shall provide a throttling of the airflow that produces a nominal constant velocity, variable volume flow from full shut-off to full open condition. The damper shall vary the active outlet area of the grilles while maintaining velocity of the supply air through the grille. Damper operator shall operate on 24VAC and use no more than 6 volt-amperes per unit. Damper motor electrical connection shall be by means of a modular connector, polarized to prevent incorrect connection.

6. Unit shall include an automatic pressure compensation damper and controller that senses the floor supply air static pressure and adjusts the entering air flow to produce a pressure independent operation of the unit throughout the unit throttling range.
7. Unit shall come pre-assembled from the factory attached to a floor panel furnished by the access floor contractor/supplier.

MIT-G, G-S, G-R, G-S-R or G-NS; Perimeter Zone Heating/Cooling VAV Terminal Units (*These units provide control of the air flow from the plenum for cooling and from an attached duct for heating with a switchover mode of control.*)

1. Unit chassis shall be minimum 18-gauge galvanized steel that shall enclose and support all components. The chassis design shall include an end panel for attachment of a supply air duct using standard duct size of 6 inches (152 mm) round for a 10 inch deep unit and 5 inches (127 mm) round for a 7 inch deep unit. Chassis construction shall admit plenum air from only one direction to provide a method of adjusting delivery volume for floor velocity pressure. Plenum air admittance openings shall be on opposite end of the chassis from the duct connection.
2. Unit shall have a die cast aluminum trim ring that shall engage with the chassis and floor to provide complete support for the air grilles. Die cast aluminum ring color shall be as shown on the finish schedule or manufacturer's standard color to be selected from submittal data. Trim ring shall attached to chassis and floor panel by means of concealed removable screws. (*A round trim ring option is available at no additional cost. Special colors are available at additional cost.*)

3. Unit shall have one or more removable grilles made of die cast aluminum material that matches the trim ring in color. Grilles shall include a means for adjusting air throw and pattern and shall fit securely within the trim ring and chassis without mechanical fasteners. Grilles shall be capable of supporting a load of 1250 pounds (565 kg) without permanent damage. No openings in the grilles shall be larger than .30 inches (7.6 mm) for shoe heel penetration protection.
4. MIT-G and G-S units shall be rated for 150 CFM for a nominal unit size of 10.5 by 10.5 inches (267 by 267 mm) at a static pressure not to exceed 0.05 inches w.g. MIT-G-R and G-S-R units shall be rated for 150 CFM for a nominal unit size of 10.5 inches (267 mm) in diameter at a static pressure not to exceed 0.06 inches w.g. MIT-G-NS unit shall be rated for 100 CFM for a nominal unit size of 5.5 by 10.5 inches (138 by 267 mm) at a static pressure not to exceed 0.05 inches w.g.
5. Unit shall include an integral damper and damper operator. Damper shall be made of die cast aluminum material and be sealed with felt or foam type gasket material. Damper operation shall provide a throttling of the airflow that produces a nominal constant velocity, variable volume flow from full shut-off to full open condition. The damper shall vary the active outlet area of the grilles while maintaining velocity of the supply air through the grille. Damper operator shall operate on 24VAC and use no more than 6 volt amperes per unit. Damper motor electrical connection shall be by means of a modular connector, polarized to prevent incorrect connection.
6. Unit damper shall be sequenced to admit heating air from duct connection and cooling air from the plenum. In switchover mode, unit shall also act as a return air grille to remove air from the space and deliver it through the duct connection to a heating terminal under the floor.

MIT-H, H-S, H-R, H-S-R or H-NS; CAV Terminal Units (*These are simple air grilles in the floor with a means to vary the air flow by adjusting a manually operated damper.*)

1. Unit chassis shall be minimum 18-gauge galvanized steel that shall enclose and support all components. Chassis construction shall

admit plenum air from only one direction to provide a method of adjusting delivery volume.

2. Unit shall have a die cast aluminum trim ring that shall engage with the chassis and floor to provide complete support for the air grilles. Die cast ring color shall be as shown on the finish schedule or manufacturer's standard color to be selected from submittal data. Trim ring shall be attached to chassis and floor panel by means of concealed removable screws. *(A round trim ring option is available at no additional cost. Special colors are available at additional cost.)*
3. Unit shall have one or more removable grilles made of die cast aluminum material that matches the trim ring in material and color. Grilles shall include a means for adjusting air throw and pattern and shall fit securely within the trim ring and chassis without mechanical fasteners. Grilles shall be capable of supporting a load of 1250 pounds (565 kg) without permanent damage. No openings in the grilles shall be larger than .30 inches (7.6 mm) for shoe heel penetration protection.
4. MIT-H and H-S units shall be rated for 150 CFM for a nominal unit size of 10.5 by 10.5 inches (267 by 267 mm) at a static pressure not to exceed 0.05 inches w.g. MIT-H-R and H-S-R units shall be rated for 150 CFM for a nominal unit size of 10.5 inches (267 mm) in diameter at a static pressure not to exceed 0.06 inches w.g. MIT-H-NS unit shall be rated for 100 CFM for a nominal unit size of 5.5 by 10.5 inches (138 by 267 mm) at a static pressure not to exceed 0.05 inches w.g.
5. Unit shall have a means to vary the air volume by removing an air grill and adjusting a damper from above the floor.

MFT – A, AS, B, C; Fan Powered Underfloor Heating Terminal Unit – 150 CFM Nominal Size *(These units are required when using MIT-G terminals for perimeter heating. They include a power transformer to provide power to up to 14 MIT terminals and chaining ports for zones with up to 3 MFTs)*

1. Unit casing: 22-gauge minimum galvanized steel lined with 1/2 in. thick, 1-1/2 lb./ft.³ density, dual thermal/acoustical fiberglass insulation meeting NFPA 90A requirements and U.L. 181 erosion control requirements. Insulation shall be protected with continuous

vapor barrier. Casing shall have a removable side or top panel suitable for equipment service. Leakage not to exceed 2% of design flow at 2.0" w.g. For connection of inlet and discharge ducting: unit to have a 7" x 15.5" rectangular duct connection on the 10 inch deep MFT-A or MFT-B unit, 5 inch dia. (127 mm) round duct connection for the 6 inch deep MFT-AS unit, or 7" x 20.5" rectangular duct connection on the 10 inch deep MFT-C unit. Enclosure to have MIT Plug and Play connectors for attachment of thermostat inputs, thermostat outputs, and outputs to MITs in zone.

2. Fan assembly: Direct drive centrifugal with forward curved blades, internally suspended on rubber isolators. Motor to be permanent split capacitor with thermal overload protection and toggle disconnect.
3. Return air filter frame and 1" throw-away filter.
4. Discharge and radiated sound power levels shall not exceed those shown on the schedule.
5. Hydronic Heating Coil *(NOT available for the MFT-AS), (Use this section only if a hot water coil is used for heating source.)*
 - a. Heating coil shall be integral with the terminal unit, with coils having one row, same end connections. Tube-to-header joints shall be expanded and reinforced with brass bushing for pressure-tight joint. Maximum working ratings shall be 225 PSIG, 325°F. Plate-type aluminum fins with full fin collars for maximum fin-tube contact and accurate spacing, mechanically bonded to tubes for permanent fin-tube bond.
 - b. Galvanized steel casing with flanged or drive and slip connection.
6. Electric Heating Coil *(Use this section only if an electric coil is used for heating source.)*
 - a. Tested with the fan terminal in accordance with E.T.L. standards. Meet all N.E.C. requirements. E.T.L. Listed. Nominal capacity requirement is a 40 degree F. (22 degree C) rise.
 - b. NEMA 1 electrical enclosure with single-point connection for heater and fan. Wiring diagram with specific wiring for each unit included with

unit. Provide voltage and wattage as shown on the drawings.

- c. Automatic reset thermal cutouts for each element, nickel chrome heating element, magnetic contactor, line and control terminal blocks, interlocking, disconnect, and main supply fuses.
 - d. Galvanized steel casing, with heating coil integral with terminal unit.
7. Control transformers rated for specified line voltage input and 24VAC output at 40VA for thermostat operation and 100 VA for MIT operation (adequate power for up to 14 MITs in zone.)

PCM-A, Power and Control Module, (*This unit can serve up to 4 MITs with T-STAT-1, T-STAT-2, or T-STAT-3 control or up to 2 MITs with DDC-1 or DDC-2 control.*)

1. 120 Volt, single-phase power input.
2. Integral Transformer, 24VAC, 40 volt-ampere output rating.
3. One modular output plug and play connector compatible with MIT Plug and Play wiring system.
4. Modular input connector for thermostat connection using MIT Plug and Play wiring system.
5. Steel housing, minimum 24-gauge with knockouts.

PCM-C, Power and Control Module, (*This unit can serve up to 14 MITs.*)

1. 120 or 277 Volt, single-phase power input.
2. Integral Transformer, 24VAC, 90 volt-ampere rated output with 3-amp switching module.
3. Two modular output plug and play connectors compatible with MIT Plug and Play wiring system.
4. One modular input connector for thermostat connection using MIT Plug and Play wiring system (One is used for daisy-chaining zones larger than 14 terminals).
5. One modular output connector for daisy-chaining PCM-C units (up to 3 total) using a single controller for use in zones larger than 14 MIT boxes.
6. Steel housing, minimum 24-gauge with knockouts.

PAP-A, Plug and Play Cable Set for MIT connection (*This item could be included in Division 16, to require the Electrical Contractor to furnish it, if desired.*)

1. Plenum rated, 4 conductor, 16-gauge, 25 feet (8 m) long, with MIT Plug and Play wiring connectors attached on each end.
2. Factory tested for continuity, shorts, opens and proper impedance.

PAP-B, Plug and Play Cable Set for Thermostat Connection (*This item could be included in Division 16, to require the Electrical Contractor to furnish it, if desired.*)

1. Plenum rated, 4 conductor, 16-gauge, 50 feet (16 m) long, with MIT Plug and Play wiring connector attached on one end and pig tail on the other.
2. Factory tested for continuity, shorts, opens and proper impedance.

PAP-C, Plug and Play Extension Cable Set for Either PAP-A, or PAP-B Cable sets (*This item could be included in Division 16, to require the Electrical Contractor to furnish it, if desired.*)

1. Plenum rated, 4 conductor, 16-gauge, 25 feet (8 m) long, with male MIT Plug and Play wiring connector attached on one end and female connection on the other end.
2. Factory tested for continuity, shorts, opens and proper impedance.

PAP-D, Plug and Play Cable Set for FlexHeat connection to auxiliary input sensor (*This item could be included in Division 16, to require the Electrical Contractor to furnish it, if desired.*)

1. Plenum rated, 2 conductor, 18-gauge, 25 feet (8 m) long, with MIT Plug and Play wiring connector attached on one end and pig tail on the other.
2. Factory tested for continuity, shorts, opens and proper impedance.

PAP-E, Plug and Play Cable Set for FlexHeat connection to MFT (*This item could be included in Division 16, to require the Electrical Contractor to furnish it, if desired.*)

1. Plenum rated, 4 conductor, 16-gauge, 5 feet (2 m) long, with MIT Plug and Play wiring connectors attached on each end.
2. Factory tested for continuity, shorts, opens and proper impedance.

T-STAT-1, Electronic Space Cooling Only Thermostat (*Required when using MIT's without controllers and network communications. Provides local control only.*)

1. Plastic enclosure, UL 94-5V rated, suitable for wall mounting with control setpoint consisting of an adjustable setpoint knob. Size of enclosure shall be suitable for mounting on a single/double gang electrical box in either the horizontal orientation. Provide terminal block connection to wiring. Thermostat enclosure shall consist of a base and separate enclosure to permit attachment of wiring independently of the electronics.
2. Device shall provide proportional-integral, PI, control and use an NTC thermistor with low drift and have compatible output/input with MIT controller or Honeywell Excel family of controllers. Setpoint knob shall have optional range stops with maximum range of 55 to 90 degrees F. (12.8 to 32.2 C).
3. Unit shall comply with FCC Part 15, NEC Class B, and be listed by UL.

T-STAT-2, Space Thermostat and Electronic Cooling/Heating Zone Controller with 2 position heat (*Required when using MIT's without controllers and network communications. Provides local control only.*)

1. Plastic enclosure, UL 94-5V rated, suitable for wall mounting with control setpoint consisting of an adjustable setpoint knob. Size of enclosure shall be suitable for mounting on a single/double gang electrical box in either the horizontal orientation. Provide terminal block connection to wiring. Thermostat enclosure shall consist of a base and separate enclosure to permit attachment of wiring independently of the electronics.
2. Device shall provide proportional-integral, PI, control and use an NTC thermistor with low drift and have compatible output/input with MIT controller or Honeywell Excel family of controllers. Setpoint knob shall have optional range stops with maximum range of 55 to 90 degrees F. (12.8 to 32.2 C).
3. Unit shall comply with FCC Part 15, NEC Class B, and be listed by UL.

T-STAT-3, Space Thermostat and Electronic Cooling/Heating Zone Controller with MFT heat (*Required when using MIT's and MFT's without controllers and network communications. Provides*

local control only.)

1. Plastic enclosure, UL 94-5V rated, suitable for wall mounting with control setpoint consisting of an adjustable setpoint knob. Size of enclosure shall be suitable for mounting on a single/double gang electrical box in either the horizontal orientation. Provide terminal block connection to wiring. Thermostat enclosure shall consist of a base and separate enclosure to permit attachment of wiring independently of the electronics.
2. Device shall provide proportional-integral, PI, control and use an NTC thermistor with low drift and have compatible output/input with MIT controller or Honeywell Excel family of controllers. Setpoint knob shall have optional range stops with maximum range of 55 to 90 degrees F. (12.8 to 32.2 C).
3. Unit shall comply with FCC Part 15, NEC Class B, and be listed by UL.

DDC-1, Space Thermostat and DDC Controller (Required when using Echelon bus for local and remote setpoint adjustment and monitoring of a FlexSys cooling only zone or cooling/heating zone with MFT, 1 or 2 stage electric, or 2 position hot-water heat.)

1. Plastic enclosure, UL 94-5V rated, suitable for wall mounting with control setpoint consisting of an adjustable setpoint knob. Size of enclosure shall be suitable for mounting on a single/double gang electrical box in either the horizontal orientation. Provide terminal block connection to wiring. Thermostat enclosure shall consist of a base and separate enclosure to permit attachment of wiring independently of the electronics.
2. Device shall provide proportional-integral, PI, control and use an NTC thermistor with low drift and have compatible output/input with MIT controller or Honeywell Excel family of controllers. Setpoint knob shall have optional range stops with maximum range of 55 to 90 degrees F. (12.8 to 32.2 C).
3. Unit shall comply with FCC Part 15, NEC Class B, and be listed by UL.
4. Device shall include an interface and jack for connection of Echelon bus.

DDC-2, Space Thermostat and DDC Controller (Required when using Echelon bus for local and remote setpoint adjustment and monitoring of a

FlexSys cooling only zone or cooling/heating zone with modulating heat.)

1. Plastic enclosure, UL 94-5V rated, suitable for wall mounting with control setpoint consisting of an adjustable setpoint knob. Size of enclosure shall be suitable for mounting on a single/double gang electrical box in either the horizontal orientation. Provide terminal block connection to wiring. Thermostat enclosure shall consist of a base and separate enclosure to permit attachment of wiring independently of the electronics.
2. Device shall provide proportional-integral, PI, control and use an NTC thermistor with low drift and have compatible output/input with MIT controller or Honeywell Excel family of controllers. Setpoint knob shall have optional range stops with maximum range of 55 to 90 degrees F. (12.8 to 32.2 C).
3. Unit shall comply with FCC Part 15, NEC Class B, and be listed by UL.
4. Device shall include an interface and jack for connection of Echelon bus.