

Installation, Operation & Maintenance of the T₃SQ-2 Electronic VAV Diffuser

Step 1

The units should be shipped assembled except for the backpan. The thermal T₃SQ is shipped with additional packaging to protect the actuator assembly. Remove all packaging from the components.

If the unit is not assembled, follow the steps below before proceeding (see Figure 1):

1. Insert the control disc guide into the control disc.
2. Screw the bottom of the actuator / control disc assembly into the mounting channel.

Note: The T₃SQ-2 diffuser is shipped as a dummy unit. Master and drone operation is determined by the wiring – discussed in Step 3. Master and drone locations are not needed at this point in installation.

Step 2

Place the back pan into ceiling grid. Connect duct work to back pan. Insert the supply air temperature sensor into the supply duct. If the unit has an optional inlet heater, the supply air sensor must be positioned above the heater in the supply duct.

Installation is completed by lining up the hooks on the face plaque assembly with the corresponding slot. Attach the ribbon cable on actuator / control disc assembly through wiring conduit. The hooks are inserted and the face plaque assembly is rotated clockwise, and lowered so that each hook is firmly in place. (See Figure 2)

Step 3

Plug the ribbon cable on actuator / control disc assembly into any ribbon cable connection on the wiring interface box on the backpan.

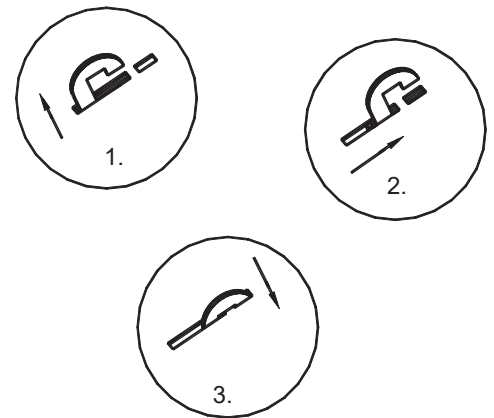


Figure 2. Face Panel Installation

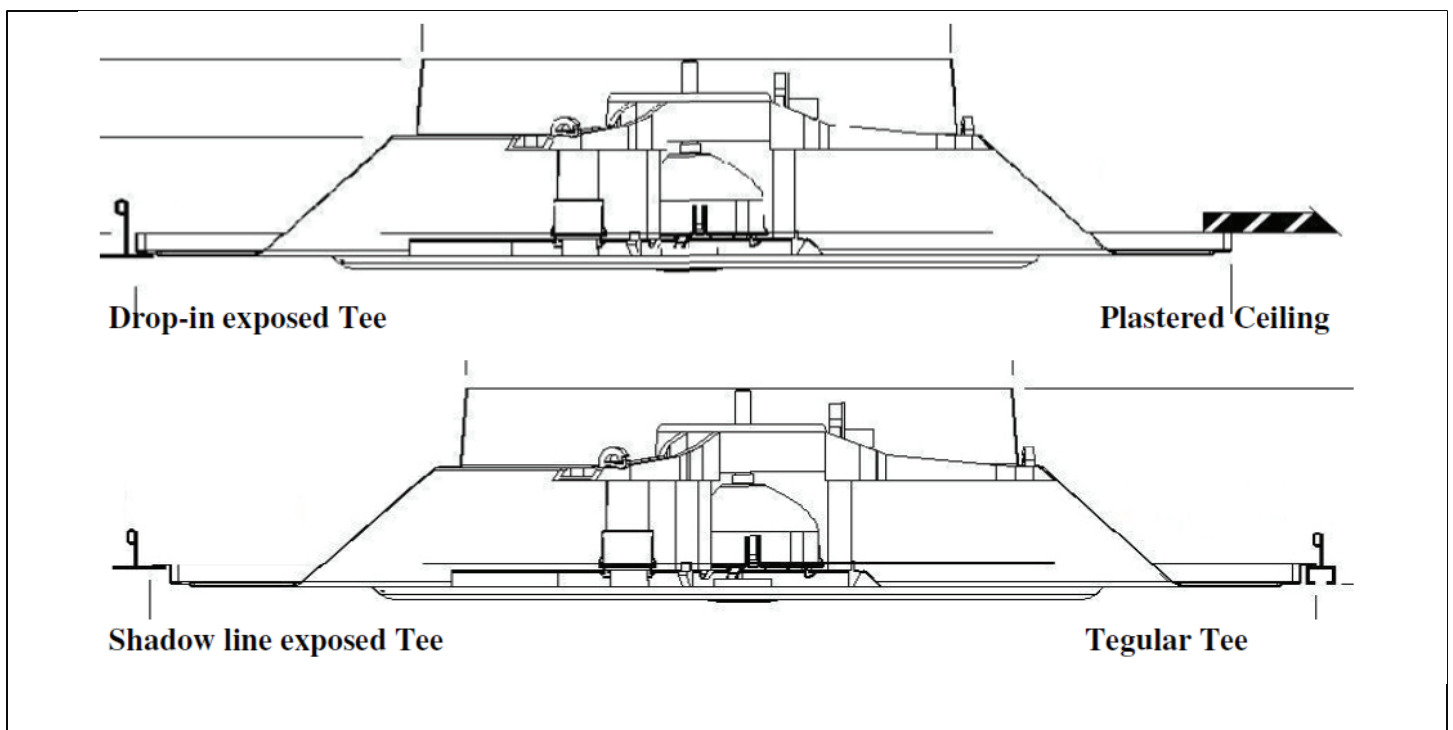
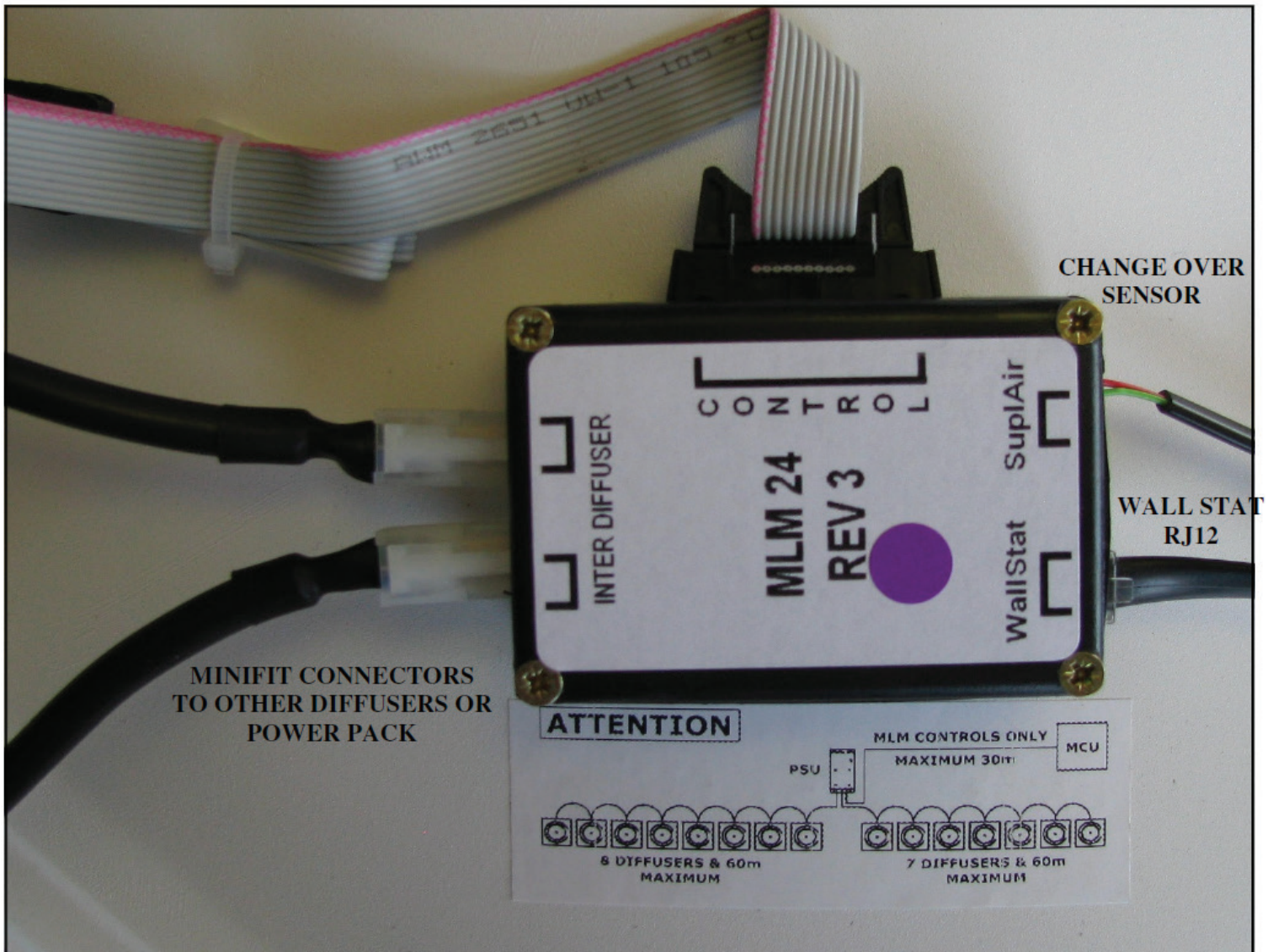


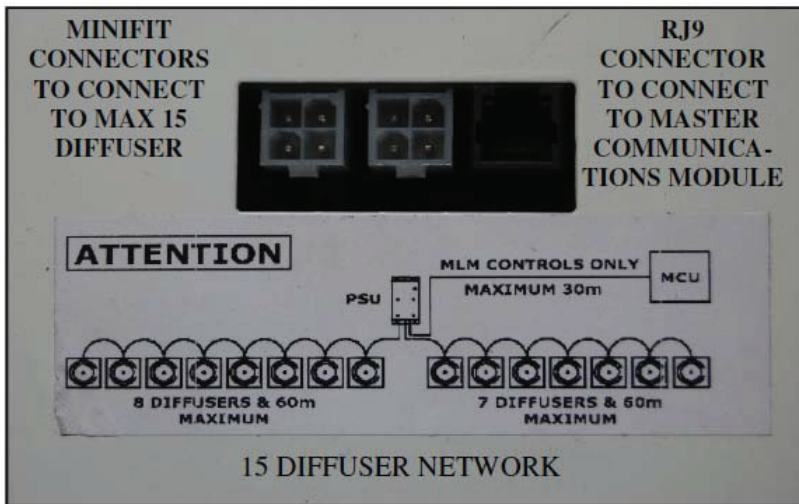
Figure 1. T₃SQ-1 Assembly

Step 4

Wiring Instructions:

The MLM diffuser is provided with a Interface board on the back of the diffuser tile for all interfacing with other diffusers and accessories. A wiring diagram is provided on the back of the diffuser. Diffusers can be daisy chained to the left and right of the power pack using slave cables with mini fit connectors to a maximum of eight to the one side and seven to the other side of the power pack. Every Interface Board on the diffuser have provision for the fitting of a change over sensor and Wall sensor/set-point adjuster as indicated below. The ribbon cable is factory fitted, and connects the interface box to the Diffuser Controller fitted inside the trim of the diffuser. Other accessories such as the heater neck when fitted to the diffuser are also connected using this ribbon cable.





MLM 24V POWER SUPPLY

The MLM power supply is also supplied with two mini fit female connectors to provide slaving to the left and right of the PSU. A maximum of 15 diffusers may be connected per PSU, but no more than 8 diffusers may be connected per PSU mini fit connector. A wiring diagram is provided on the power pack. The maximum length of cabling from the PSU to the last diffuser in the chain, must be limited to 60 m for each leg. The standard slave cable length is 6 meters, but longer lengths can be ordered when required.

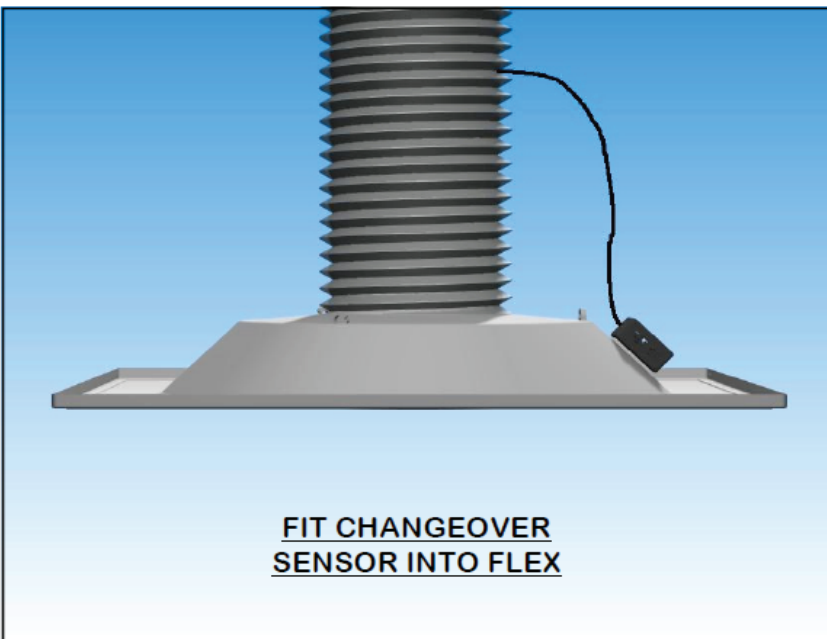


MASTER COMMUNICATIONS
BacNet MODULE

An RJ9 female connector is also provided on the PSU. This connector allows the communication cable to link the 15 diffuser network to the Master Communications Module (MCM). This cable is supplied with a maximum length of 80 meters.

Every MCM provides RJ9 connectors to accommodate 4 PSU's. (Maximum of 60 diffusers)

For commissioning of the Master Communications Module, please refer to the MLM software Operating and Installation Manual.

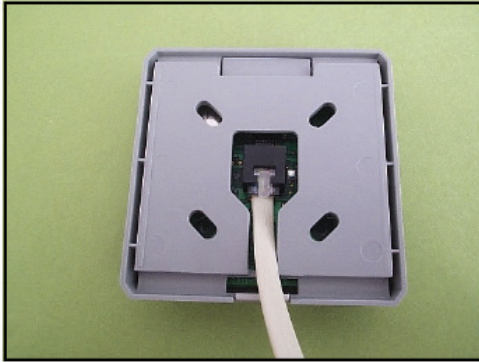


The Changeover sensor needs to be fitted if the diffuser will be supplied with both cold and hot air depending on the general requirements in the building.

It is crucial to fit the sensor as far as possible upstream from the diffuser when a heater is fitted to the neck of the diffuser.

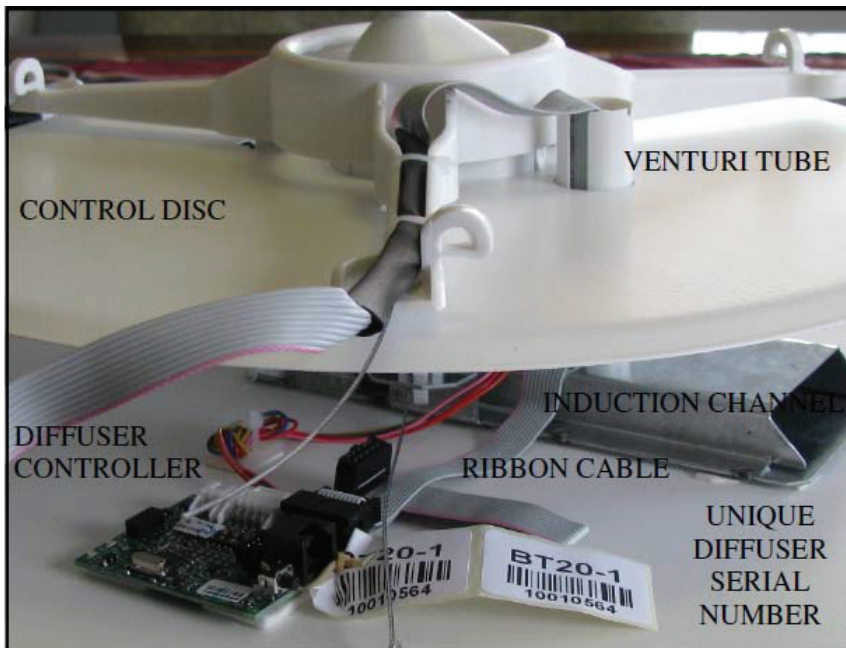
See previous page for the plug on the Interface box where the sensor must be plugged into the controls.

Please note the sensor must be activated in the MLM software before it will be operational.



The MLM wall Master Controller with sensing and set point adjustment is provided with holes in the base plate to connect to a standard round draw box.

The RJ12 cable plugs into the interface box in the back of the diffuser tile as shown on page 2.



The Diffuser Controller is mounted on the inside of the trim plate next to the induction channel.

If the control disc is in the fully open position, the control disc can be unclipped from the Control disc cap to gain access.

No Maintenance is required, but it is possible to replace the Electric motor and or other components as well. This should be handled by a skilled technician.

Optional Inlet Heater Operation

The optional SCR controlled inlet electric heater is mounted in the neck of the T₃SQ-2 diffuser. (Line voltage must be supplied to the electric heaters.)

If the inlet heater is used with the T₃SQ-2, all wiring will still be connected through the wiring interface box on the backpan of the diffuser. As shown on the diagram below, there is only 1 additional component (heater interface adapter fig. 8) and 1 additional cable (blue RJ-45). The power wiring to the heater has to be connected by removing the face from the wiring interface board enclosure per Figure 7. The wires must be routed through the grommets, connected to L & N, and then re-attach the face of the enclosure. Using the heater interface adapter in figure 8, attach the gray ribbon cable to the adapter using the extra black connector on the ribbon cable. On the opposite end of the heater interface adapter, the blue RJ-45 cable is needed to connect to the RJ-45 port on the heater interface board.

The controller / thermostat will energize the inlet heater when the zone temperature is 1°F below setpoint. The SCR heater controller will modulate a time pulsed signal from minimum output to full output over a 2°F temperature range. At 3°F over setpoint the heater will be at full output.

An airflow switch and two thermal cutouts protect the heater from operation without airflow or at temperatures above 200°F.



Figure 6. Optional Inlet Heater



Figure 7. Optional Inlet Heater Wiring

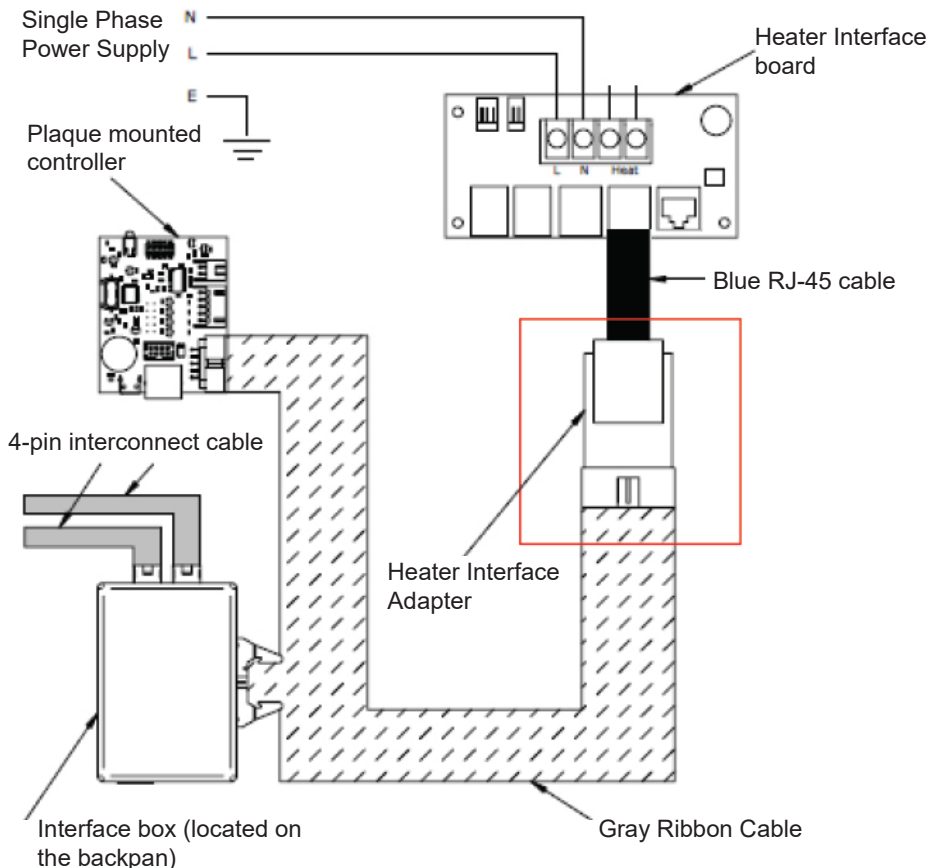


Figure 8. Heater Interface Adapter

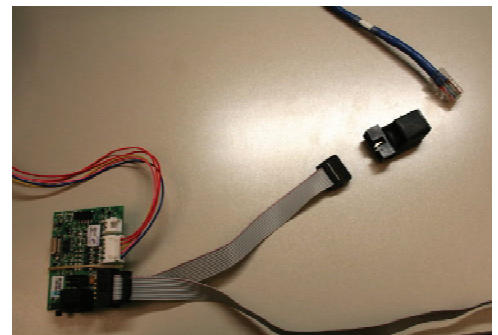
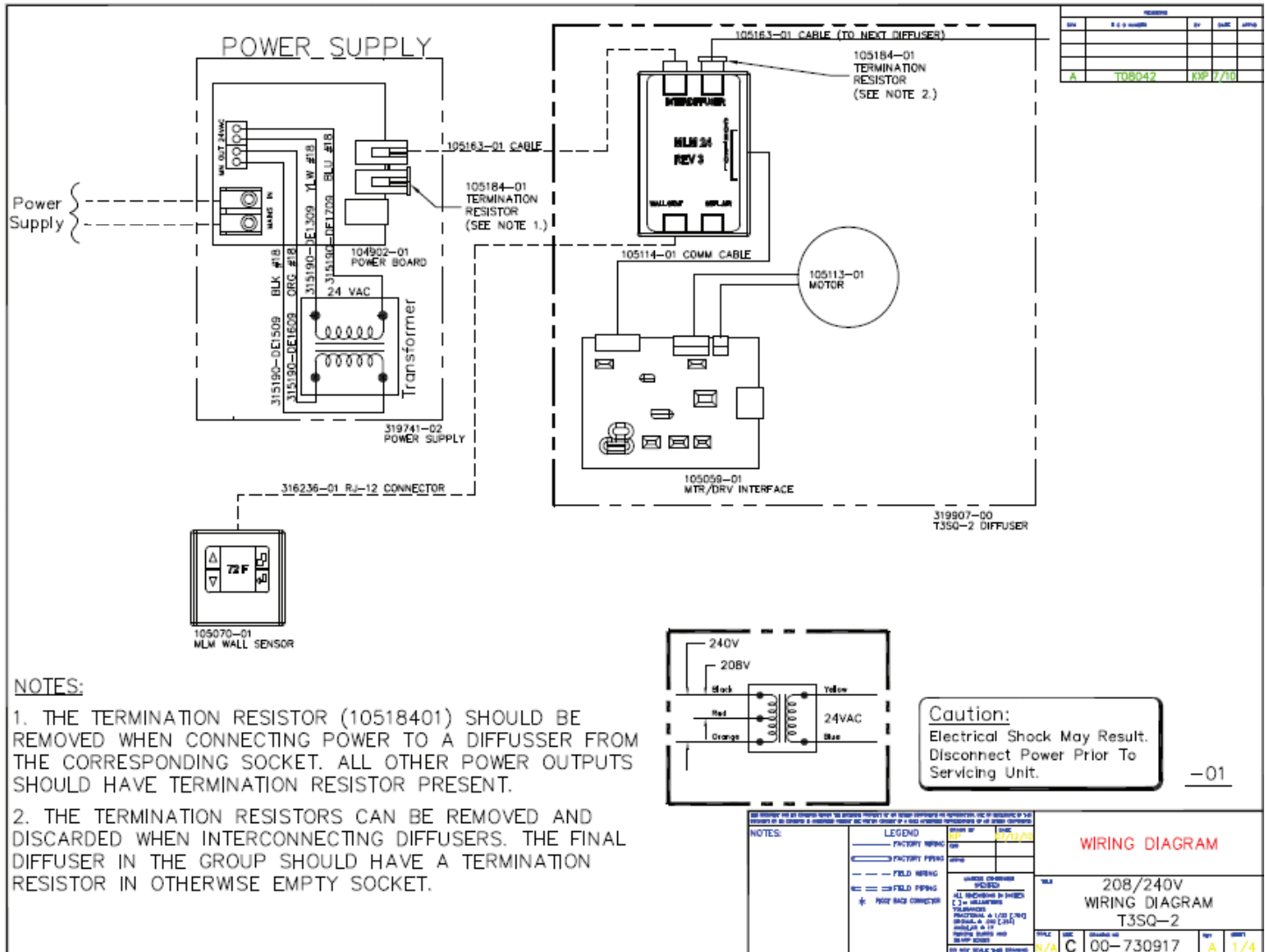


Figure 9. Wiring Pictorial

Wiring Diagrams (208V / 240V)



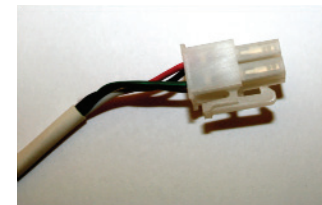
Wiring Components



105070-01 Thermostat



316236-01 RJ-12 cable
Thermostat connection

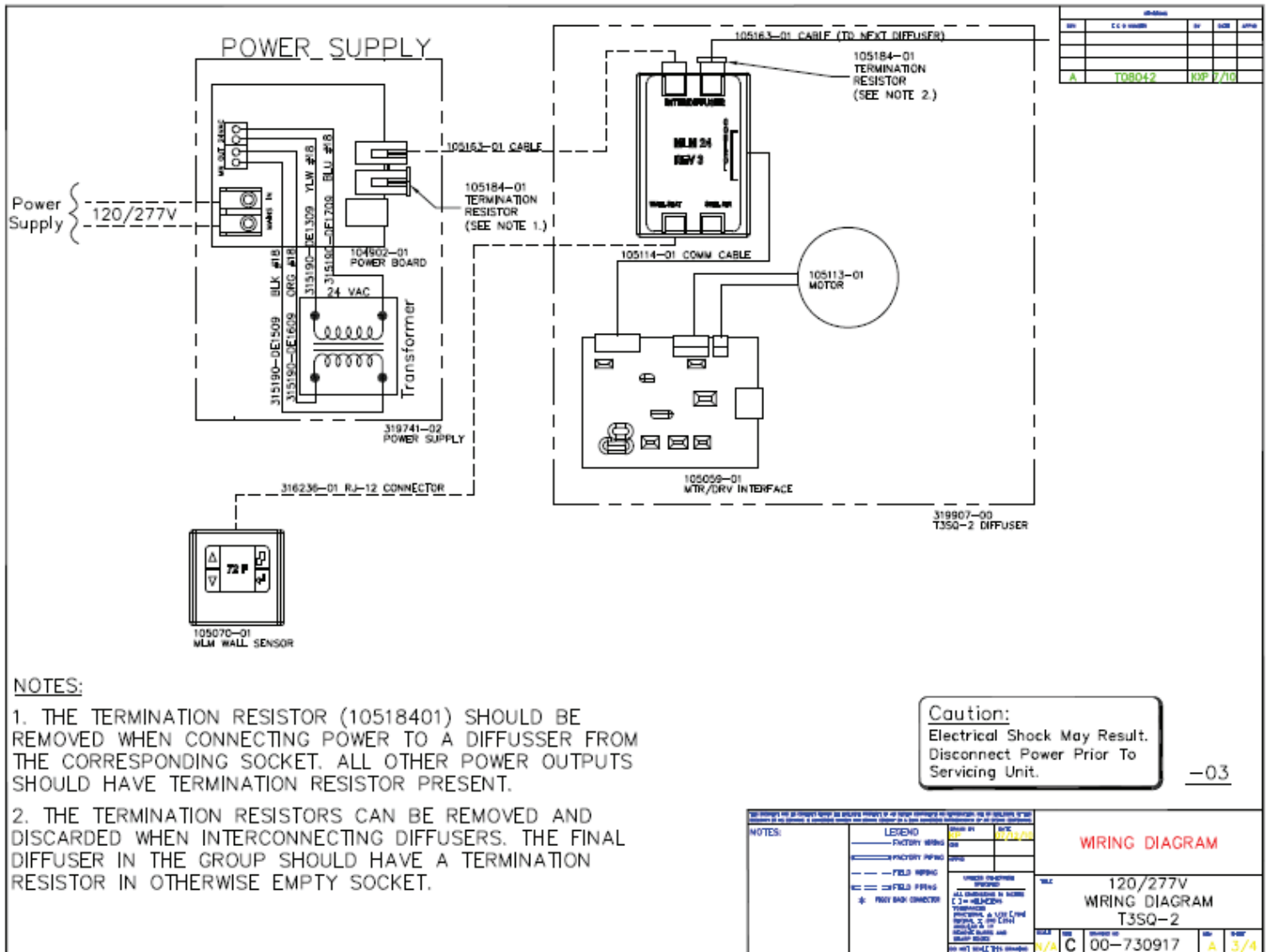


105163-01 4-pin cable
Power supply / daisy chain



105184-01 Termination resistor
(See note 1 & 2 on wiring diagram)

Wiring Diagrams (120V / 277V)



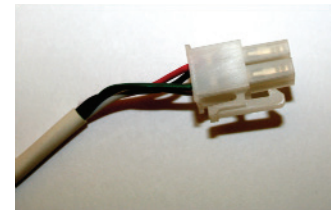
Wiring Components



105070-01 Thermostat



316236-01 RJ-12 cable
Thermostat connection



105163-01 4-pin cable
Power supply / daisy chain



105184-01 Termination resistor
(See note 1 & 2 on wiring diagram)

Diffuser airflow commissioning

- 1) Select the index duct (requiring the highest static pressure –Duct “C”) - Open the Pressure Control Damper and all the diffusers in that duct run
- 2) Select the index diffuser (Requiring the highest static pressure) and establish its actual volume flow. If sufficient flow is measured, increase the pressure and if too high, decrease the pressure in the main riser duct.
- 3) Set the static pressure sensor in duct “C” after setting the riser duct pressure. As for a simple system, this leg is effectively balanced.
- 4) Select the next index duct (duct “A”) and follow the same procedure as for a simple system. If there is insufficient pressure to satisfy the index diffuser flow rate, increase the riser pressure and set the static pressure sensor to control at the resultant pressure. This will not effect the status within duct “C” since it has already been set to control at it’s required pressure.
- 5) Proceed now to balance the diffusers in duct “B” using the same procedure as for duct “A”.
- 6) If the system (simple or complex) has been designed for a specific volume diversification factor, open only enough diffusers in each duct run to allow the maximum simultaneous air volume flow for which the system has been designed.

