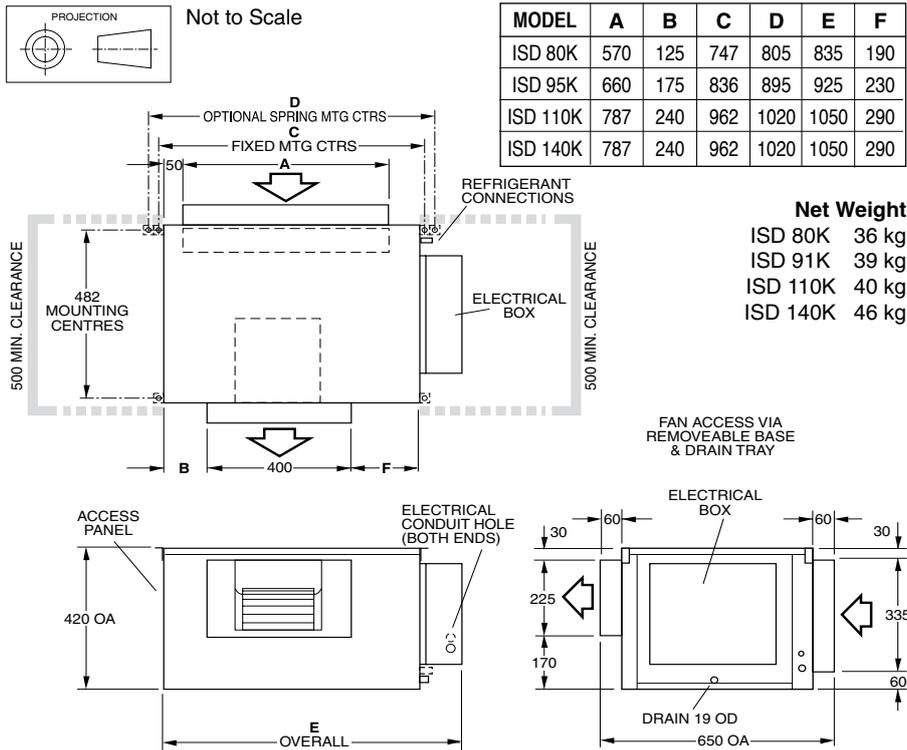


# ISD 80/95/110/140 K-DN (c/w SAT-2 Controller)

## Ducted Split System Indoor Units

## Installation & Maintenance

**Fig. 1 Dimensions (mm)**



**GENERAL**

These ISD\*K-DN indoor units are designed to be coupled with the OSA\*RK outdoor units. The '-DN' indicates the unit is supplied complete with SAT-2 room temperature controller and safety drain tray.

Units must be installed in accordance with all national and local safety codes.

**Combinations**

- One ISD 81K with one OSA 80RKs
- One ISD 95K with one OSA 95RKs
- One ISD 110K with one OSA 110RKs
- One ISD 110K with one OSA 110RKT
- One ISD 140K with one OSA 140RKT

**Options**

- Filter Box c/w polypropylene net filter
- Spring Mounting Kit
- Electric Heater Box
- Supply & Return Air Plenums
- SAT-2 Accessories (refer overleaf).

**SAFETY DRAIN TRAY**

The unit is supplied with a safety drain tray to protect your ceiling against accidental damage. The safety drain tray is best secured to the ISD unit **after** the unit has been suspended in the ceiling, however it is possible to fit it **before** if circumstances make this easier.

**AIR FILTRATION / FILTER BOX (Option)**

As air filtration requirements vary, filters are not supplied with the unit. Filters should ideally be installed on the return air side of the unit, no closer than 500mm from the back of the unit and easily accessible for cleaning. To maximise the efficiency of air flow, the return air filter should be twice the area of the ISD unit's return air spigot/s. If efficiency is less of a concern a Filter Box is available.

The Filter Box is installed by unscrewing the return air spigot and replacing it with the Filter Box's filter-integrated spigot. The filter may be accessed from either side of this spigot. This new spigot has a depth of 135 mm, instead of 60 mm.

**ELECTRIC HEATER BOX (Option)**

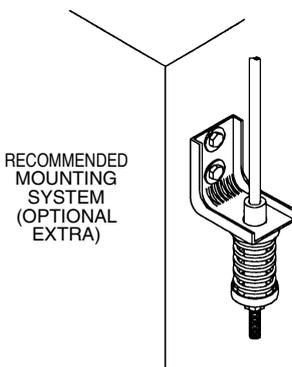
The Electric Heater Box is installed by unscrewing the supply air spigot and replacing it with the Electric Heat Box's element-integrated spigot. This new spigot has a depth of 195 mm, instead of 60 mm. A separate page of installation instructions is supplied with the Kit.

**INSTALLATION**

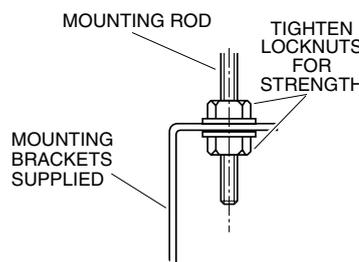
**Positioning & Mounting**

Provide 500 mm minimum clearance to both ends of the unit.

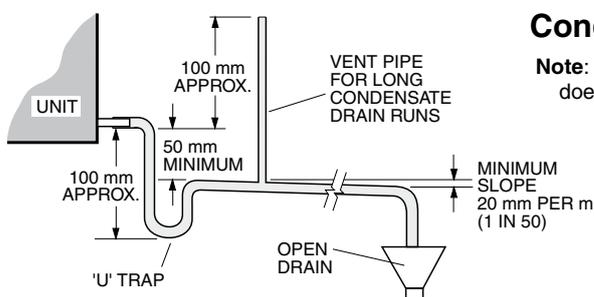
**Fig. 2 Spring Mounting**



**Fig. 3 Solid Mounting**



**Fig. 4**



**Condensate Drain**

**Note:** The Safety Drain Tray does not require trapping.

If the Electric Heater Box or Filter Box options are to be used, allow adequate clearance for servicing.

If low noise is a critical factor in the installation, refer to Figure 6 for noise isolation recommendations.

It is recommended that the unit be mounted using the spring mounting system, supplied as an optional extra (Fig.2). This system minimises transfer of vibration into the building structure.

If a more rigid installation can be tolerated, then suspend the unit from four threaded rods (not supplied) attached to the ceiling. Four 'L' shaped brackets are supplied on the unit to facilitate this method. These brackets must first be unscrewed, reversed and rescrewed to enable rod attachment.

The unit has a built-in sloping drain tray, therefore mount it level.

When finally positioned, tighten the lock nuts on the mounting rods from above and below the mounting flange to give a firm installation (see Fig. 3).

#### Condensate Drain

The condensate drain should be trapped outside the unit cabinet. The trap should have a vertical height of at least 50 mm. The drain should have a slope of at least 1 in 50 and must not be piped to a level above the unit drain tray. (Refer Fig.4).

For long condensate pipe runs, fit a vent pipe near the drain trap. The top of the vent pipe must be at least 100 mm above the ISD unit's drain tray.

It is essential that the drainage system for the evaporator is checked by pouring water in the drain tray and seeing that it discharges at the end of the drain and does not overflow the drain tray.

**Note:** The built-in drain tray can be removed for cleaning (or fan access) by first removing the unit's base.

#### INDOOR-OUTDOOR UNIT CONNECTIONS

Refer to the relevant OSA Outdoor Unit 'Installation & Maintenance' pamphlet for piping instructions. For wiring connections, refer to the Outdoor Unit wiring diagram in conjunction with the ISD wiring diagram in this pamphlet.

#### REFRIGERATION PIPING

##### Pipe Connection Sizes (mm OD) & Type

Model	Liquid	Suction
ISD 80K	10 (3/8") sweat	16 (5/8") sweat
ISD 95K	10 (3/8") sweat	16 (5/8") sweat
ISD 110K	10 (3/8") sweat	19 (3/4") sweat
ISD 140K	10 (3/8") sweat	19 (3/4") sweat

The ISD is shipped from the factory with a pressurised holding charge of nitrogen. Immediately before removing any brazed pipe connection's seal, reduce the holding charge to atmospheric pressure.

**Warning:** Failure to do so may cause injury.

Refer to the Outdoor Unit 'Installation & Maintenance' pamphlet for evacuation procedure and piping requirements.

#### ELECTRICAL WIRING

The electrical supply required (via the Outdoor Unit) is specified on the Outdoor Unit's wiring diagram.

Electrical work must be carried out by a qualified electrician in accordance with local supply authority regulations and the wiring diagram.

In a free blow or low resistance application, beware of exceeding the fan motor's full load amp limit (refer Outdoor Unit's wiring diagram).

**Note:** The SAT-2 Controller automatically switches the indoor fan off during de-ice, therefore no additional wiring is required to achieve this result.

#### INDOOR FAN SPEED

The fan speed can be set to LOW, MED, or HIGH - whichever best suits the application.

If the air returning to the indoor unit is regularly expected to be above 50%RH, then the coil face velocity should be limited to be 2.5 m/s or less (refer Air Handling graph in Technical Data pamphlet).

High humidity levels can occur in tropical or subtropical conditions, and/or when heavily moisture laden fresh air is introduced. Select a fan speed that avoids water carry-over problems.

#### SAT-2 CONTROLLER

The following components are supplied in a box taped inside the return air spigot:

1. SAT-2 Wall Control plaque, including wall mounting plate.
2. 10 m interface lead (electrical box-to-plaque).
3. User's Operating Instructions booklet.
4. Lithium CR2032 battery (3V).

Optional

1. Remote return air sensor (in box).
2. Remote return air temperature sensor lead; 1.5, 6, 12 or 25 m.
3. 20 m extended interface lead (electrical box-to-plaque).
4. ISD indoor unit-to-OSA outdoor unit interconnecting lead; 12.5 m or 25 m; 7 core.
5. SAT-2 Zone Control PCB.
6. Zone Control 24V transformer.
7. Additional SAT-2 Wall Control plaque.
8. Infra red remote control.

#### Installation

The SAT-2 Controller PCB is supplied pre-installed in the ISD unit's electrical box.

1. Isolate the ISD unit from power supply, then remove electrical box cover.
2. Remove the SAT-2 box supplied taped inside the return air spigot.
3. Remove the Wall Control's interface lead from this box and connect the bare wired end of the interface lead to the terminal block on the SAT-2 Controller board (refer wiring diagram). Trace the remaining length of the lead to the Wall Control's intended location.
4. Remove the Wall Control's backing plate by using a small screw driver to remove the single screw at the bottom edge of the plaque.
5. Install the Lithium battery, supplied loose, positive (+) side up in the Wall Control's battery holder.

6. Check the wall where the Wall Control plaque is to be located is flat before fastening the wall mounting plate. Alternatively, the mounting plate can be screwed to a standard wall socket mounted horizontally.  
**Note:** Use low profile (mush) headed screws to prevent contact with the PCB board. Fixing the plate to a distorted surface may damage the control.
7. Drill hole in wall to allow cable entry.
8. Connect the interface lead's lugs to the Wall Control board as per the wiring diagram overleaf.
9. Ensure the interface lead is run separately and away from main power supply wires, including the interconnecting cable. When installing cabling, trim any excess length to suit your location.
10. Fill around the interface lead with foam or cover hole with PVC tape to prevent draft from wall cavity affecting control operation. Do not use aluminium duct tape.
11. Secure the Wall Control body to the mounting plate by replacing the locking screw removed earlier.
12. Replace the ISD electrical box cover.

#### Remote Air Temperature Sensor/s (option)

The air temperature sensor is by default located in the Wall plaque. Optional remote air temperature sensors are available so that the measurement of the room temperature can be taken away from the wall plaque, eg. elsewhere in the room or in the return air duct.

Remote sensor's can be plugged directly into the Controller board (PCB). This board accepts up to four sensors which are designated as 'zones' one to four. The first return air sensor will automatically replace the Wall Control sensor and should be located in the same room as the Wall Control. The Controller will always use the average of the zones selected. Refer to the separate installation instructions supplied with the PCB for further details.

Ensure all remote sensor wires are run separately and away from main power supply wires, including the interconnecting cable.

#### SAFETY DRAIN TRAY

The safety drain tray is best secured to the ISD unit **after** the unit has been suspended in the ceiling, however it is possible to fit it **before** if circumstances make this easier.

1. Unscrew the supporting brackets from their temporary shipping position, inside the drain tray, and retain the screws.
2. The drain tray has pre-drilled holes designed to align with the screws on the unit. One at a time, remove a screw from each bottom corner of the ISD unit and fit a bracket using the same screws.
3. Position the drain tray's pipe exit so it is at the same end as the ISD unit's drain pipe exit.
4. Supporting the drain tray from underneath, then secure the drain tray to each bracket using the supplied screws.

cont'd...

5. Connect the drain pipe to a suitable drain line with an appropriate slope to allow free drainage. This drain line does not require trapping. Test the drain with water to ensure it clears safely.

**DO NOT** let the ISD unit's condensate drain exit into this safety drain tray.

### ISD/OSA SYSTEMS WITH ELECTRIC HEATER BOX

Replace the systems external fuse with the size recommended in the table on the Outdoor Unit's wiring diagram.

Note: Tandem indoor units with electric heat may require greater fuse sizes on the power supply.

DIP switch 2 on the SAT-2 Controller PCB, located in the ISD electrical box, must be set to 'On' (refer wiring diagram).

### COMMISSIONING

Indoor Unit

1. Check that the thermostat is correctly wired and set at the desired temperature.

2. Check that the air filter (if fitted) is clean.
3. Check that the fan runs freely without vibration.
4. Check condensate drain and safety drain tray for free drainage.

Refer to Outdoor Unit Installation Instructions in order to complete the start-up and commissioning procedure for the complete air conditioning system.

Demonstrate the SAT-2 Wall Control to the owner/user, after having first thoroughly familiarised yourself with the User's Operating Instructions. This page is to remain with the owner/user.

### MAINTENANCE

#### Weekly For First Four Weeks

1. Check air filter (if fitted); vacuum clean as necessary.
2. Check condensate drain for free drainage.

#### Monthly

Check air filter (if fitted); vacuum clean as necessary.

### Six Monthly

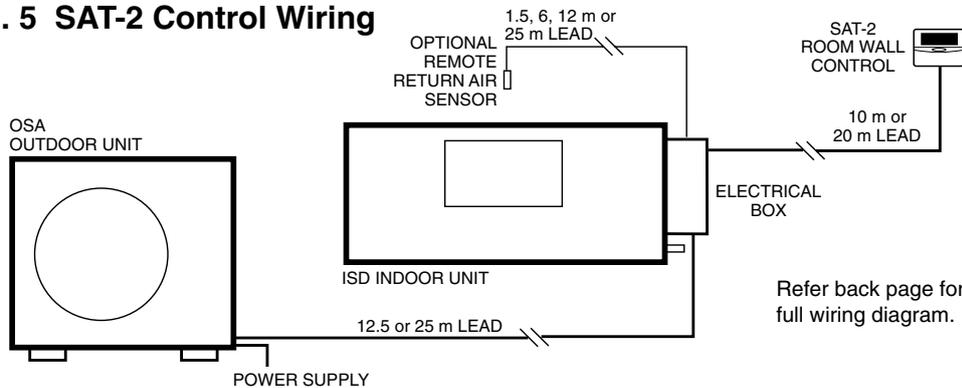
1. Check condensate drain and safety drain tray for free drainage.
2. Check heat exchanger coil; vacuum or brush clean as necessary.
3. Check the tightness of the fan.
4. Check that fan motor is free running.
5. Check tightness of electrical connections.
6. Check air supply at diffuser outlets.

### WARNING

This unit is designed for use ONLY with the refrigerant HFC-410A (R410A). The use of other refrigerants is NOT authorised or approved by the manufacturer and may cause operational problems such as poor performance and efficiency, loss of capacity, degradation of materials and refrigerant leaks.

**The use of flammable or explosive materials as a refrigerant creates the additional risks of fire and explosion which may result in property damage, personal injury or death.**

**Fig. 5 SAT-2 Control Wiring**



### NOTE

The manufacturer reserves the right to change specifications at any time without notice or obligation. Certified dimensions available on request.

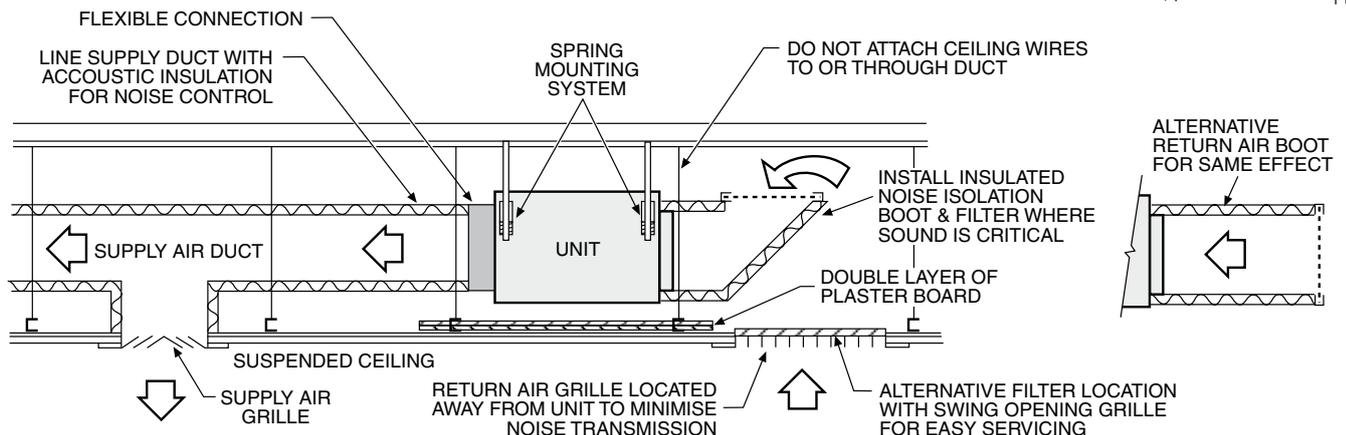
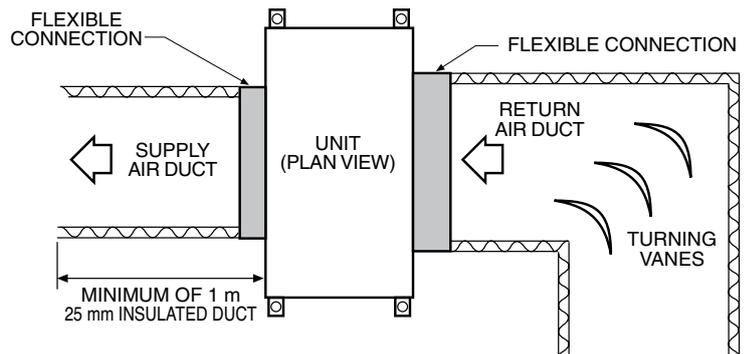
This pamphlet replaces the previous issue no. 2950 dated 08/08. Fig.1 Dimensions E & F.

**Fig. 6 Application Considerations**

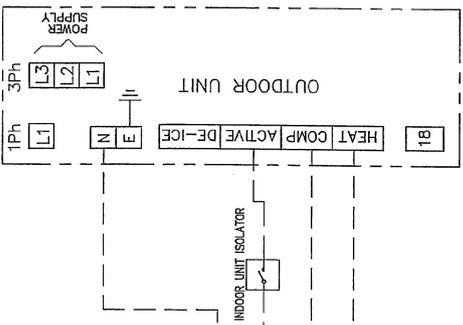
### Recommendations for Noise Isolation

- particularly for high static installations:

1. Avoid installing units, with non-ducted return air, directly above spaces where noise is critical.
2. Use flexible connections between unit and rigid ducting.
3. Use generously sized acoustically lined ducts.
4. If generous duct size is not possible, use turning vanes on bends to reduce air turbulence (regenerated noise).
5. Use 90° bends in ducting to significantly assist in noise reduction.



MODEL	ISD	ISD	ISD	ISD
INDOOR	80	95	110	140
FAN MOTOR	1.52	1.6	1.8	3.8
RUNNING AMPS	1.01	1.1	1.59	3.1
	MED/LOW	LOW		
	0.91	1.07	1.4	2.85
	0.86	0.95	1.1	2.55
CAPACITOR 8 MFD 18 MFD 10 MFD 10 MFD				

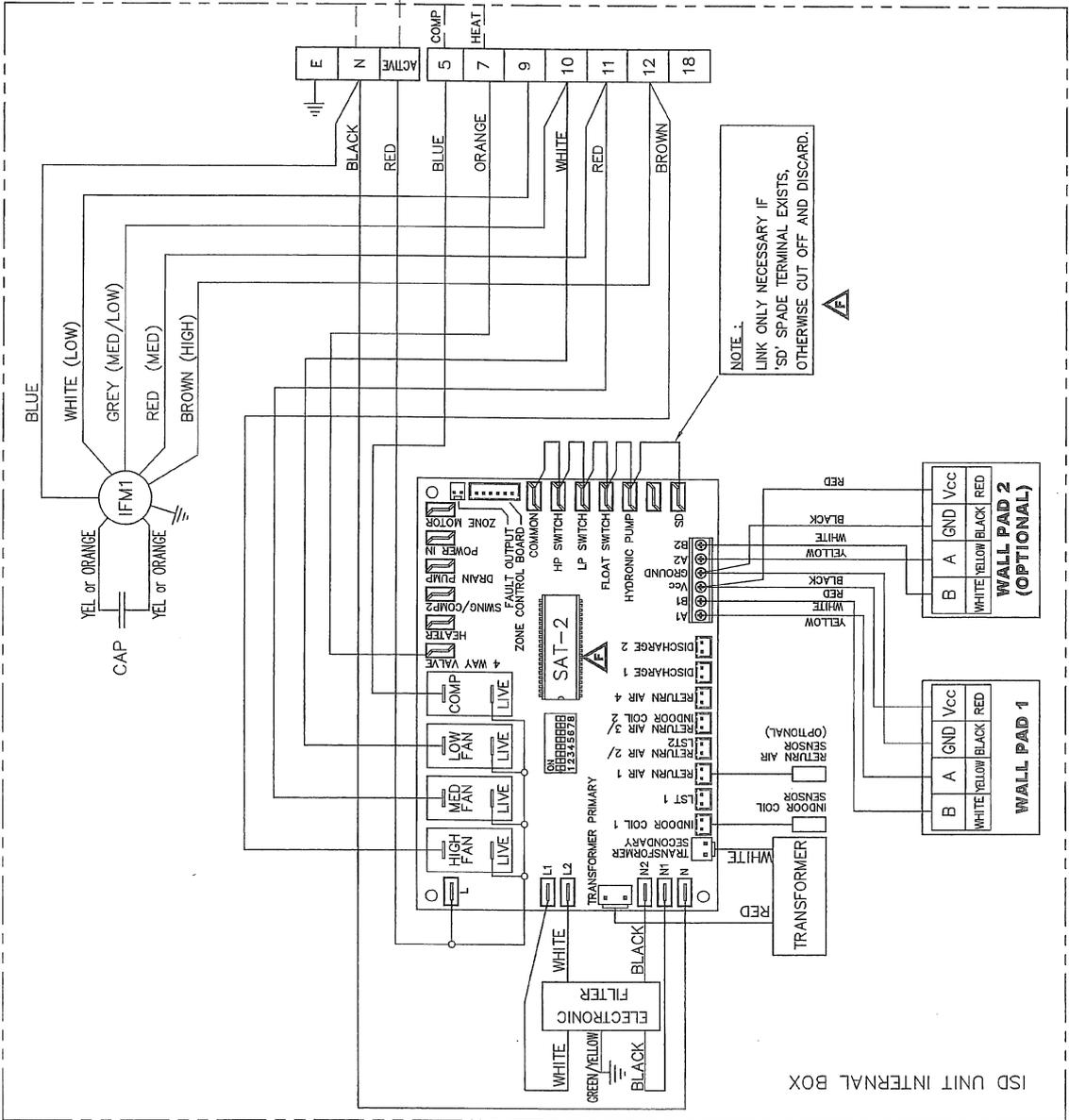


DIPSWITCH SETTINGS

STANDARD SETTING	OFF	ON
1	COOL ONLY	HEAT PUMP
2	NO ELECTRIC HEATERS	ELECTRIC HEATERS FITTED
3	1.5°C DIFFERENTIAL CONTROL	1.0°C DIFFERENTIAL CONTROL
4	FAN ON IN COOL CYCLE DEAD BAND (RECOMMENDED FOR IN-DUCT SENSORS)	FAN OFF IN COOL CYCLE DEAD BAND
5	AIR COOLED	HYDRONIC
6	TWO STAGE	SINGLE STAGE
7	ALARM RELAY TURNS ON UPON COMPLETE LOCKOUT OF SYSTEM FAULT.	ALARM RELAY TURNS ON WHENEVER THERE IS SYSTEM FAULT.
8	FAN ON IN HEAT CYCLE DEAD BAND (RECOMMENDED FOR IN-DUCT SENSORS)	FAN OFF IN HEAT CYCLE DEAD BAND

NOTE: PLEASE SELECT CORRECT POSITION WITH OR WITHOUT HEATERS ON ASSY.

NOTE 1: LINK ONLY NECESSARY IF 'SD' SPADE TERMINAL EXISTS, OTHERWISE CUT OFF AND DISCARD.



Title ISD 80 TO 140 K DN - WIRING SCHEMATIC C/W SAFETY DRAIN TRAY & SAT-2 T'STAT



Drawn B.P	Date 27.02.07	Drawing No.	Revision
Scale	<i>M. S. D.</i>	525-134-002	F

NOTE: CHECK WIRING BEFORE SWITCHING ON, INCORRECT CONNECTION WILL DAMAGE MOTORS.

CLIENT WIRING Interconnections between units by client. Double insulated multi-core cable.

ISSUE	MODIFICATION	ECN	DATE	APRVD
F	T'STAT WAS SAT-1, NOW SAT-2. NOTE ADDED FOR TERM. 'SD'	N1873	26.06.08	B.P
E	REMOVE LOOP TO TERM.13 ON SAT-1	N1692	16-11-07	ROD
D	TITLE UPDATED TO INCLUDE "-DN" "SAT-1" ADDED TO PCB BOARD	N1571	08-09-07	DMW
C	DIPSWITCH DATA CORRECTED	N1563	07-08-07	DMW