

# ISU 90/140/160 KD (c/w SAT-2 Controller)

## Underceiling/Console Split System Indoor Units

## Installation & Maintenance

### GENERAL

The ISU Underceiling Indoor Units are designed to be coupled with the OSA outdoor units and controlled by the SAT-2 room temperature controller. Units must be installed in accordance with all national and local safety codes.

### Combinations

- One ISU 90KD with one OSA 95RKSH
- One ISU 140KD with one OSA 140RKSH
- One ISU 140KD with one OSA 140RKTH
- One ISU 160KD with one OSA 160RKSH
- One ISU 160KD with one OSA 160RKTH

### UNPACKING UNITS

The OSA outdoor unit and ISU indoor unit are cartoned separately. Unpack each item carefully. Examine for transit damage.

### ISU UNIT

#### Components

The ISU carton includes:

1. ISU indoor unit.
2. SAT-2 Wall Control (shipped inside unit behind filter panel)
3. Insulated condensate drain extension kit.
4. Right-angled suction pipe extension c/w lock nut and teflon seal.

### INSTALLATION

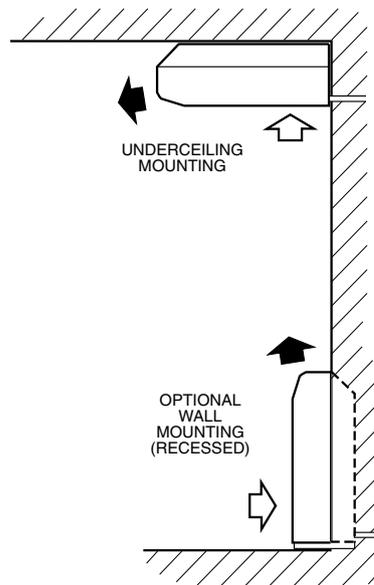
#### Positioning & Mounting

The ISU is designed to be installed :

- a. suspended horizontally beneath a level or sloping ceiling, or
- b. floor or wall mounted (i.e. vertically).

**Note:** For an extra low profile the unit can be recessed into the ceiling (or wall).

**Fig. 1 Mounting Options**



### Preparation

Prior to mounting the ISU the mounting brackets must be detached from each end of the unit.

1. Open the end filter panel and locate the screw securing the unit endcaps (refer figure 2).
2. Remove the endcap securing screw and retain.
3. Remove the endcap by first sliding it forward approx. 20 mm, then pull outwards away from end of the unit.
4. Release each mounting bracket from behind the two bolts securing them to the unit.
5. Remove the floor mounting base from the back of the ISU if when ceiling mounted it is required to fit flush to the wall.

### Underceiling Mounting

Locate the ISU near a wall to take full advantage of the long supply air throw and to hide the condensate drain pipe (and other connections) exiting at the rear of the unit.

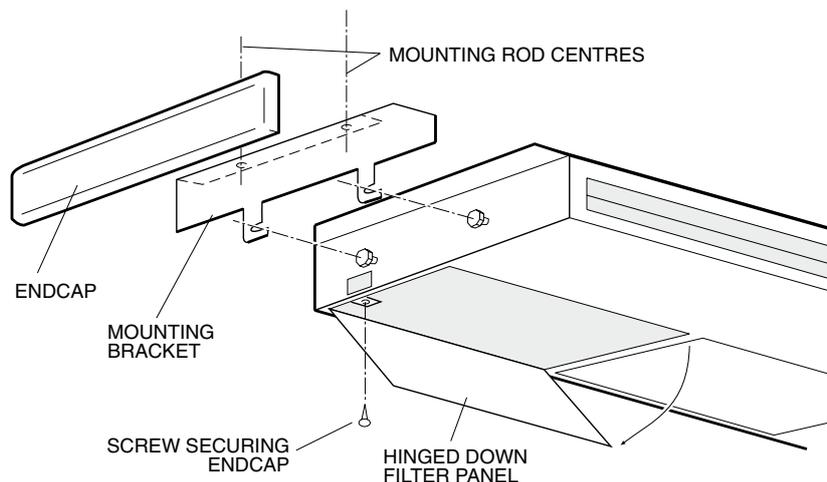
Refrigeration and wiring connections are via the top or the rear access holes. A right-angled suction pipe extension is supplied to facilitate top exit.

### Underceiling Installation

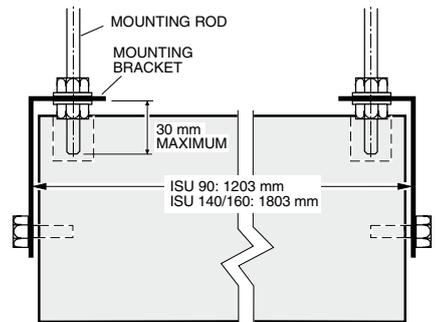
1. If an extra low profile installation is preferred, first cut the required ceiling aperture.
2. Install four M8 threaded hanging rods (not supplied) to protrude no more than 30 mm below the level of the mounting bracket flange (refer figure 3).

**Fig. 2 Mounting Bracket Detachment**

VIEWED FROM BELOW



**Fig. 3 Mounting Detail**



3. Thread on and tighten the lower washer and locknut sets (not supplied) to secure the left and right mounting brackets. **Note:** Mounting bracket flanges face inwards.
4. Adjust distance between mounting brackets to match dimensions in figure 3.

5. Lift the unit to the mounting brackets locating the two protruding bolts, at each end of the unit, securely into the two slots provided in each mounting bracket, then tighten bolts to secure the ISU unit.
6. Check that the secured ISU is installed level to facilitate condensate drainage.
7. Complete all refrigeration piping connections (refer 'Indoor-Outdoor Unit Connections').
8. Fit the insulated condensate drain extension, orientated so that the drain vent tube is at the highest point in the condensate line.
9. After completing all piping connections replace the ISU unit's left and right endcaps as follows:
  - a. Place each endcap slightly forward of the appropriate end of the unit,
  - b. Compress the endcap at its centre and slide back hooking the endcaps hook under the 'U' shaped bracket on the unit and into position .
  - c. Secure each with the screws removed earlier from behind the filter panels.

#### Wall / Floor Installation

Vertically mounted, the refrigeration and wiring connections can be made through the back or base of the unit.

1. Measure and cut wall recess, if required.
2. Secure the mounting brackets to the wall using fastenings suitable for the wall construction and weight of the ISU unit. (Note: Mounting bracket flanges to face inwards.)
3. Refer to 'Underceiling Installation' instructions, steps 4 to 9 above, to complete vertically mounted installation.

#### 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 ISU wiring diagram on this pamphlet.

#### REFRIGERATION PIPING

The ISU Underceiling is shipped from the factory with a holding charge of dry nitrogen. Refer to the Outdoor Unit 'Installation & Maintenance' pamphlet for evacuation procedure.

ISU 90 refrigerant line connections are:

Liquid: 10 mm OD (3/8") flare nut

Gas: 19 mm OD (3/4") sweat

ISU 140, 160 refig. line connections are:

Liquid: 13 mm OD (1/2") flare nut

Gas: 22 mm OD (7/8") sweat

#### Separation Limits

Maximum Pipe Length: Up to 30 m total

Indoor Unit above Outdoor Unit : 18 m

Outdoor Unit above Indoor Unit : 18 m

For line lengths in excess of the above, contact the manufacturer's nearest sales office for additional piping requirements.

#### CONDENSATE DRAIN

Connect a 19 mm ID drain pipe (not supplied) to the GME's drain connection. Maintain a downwards slope of at least 1 in 50 (20 mm/m) along the drain line. No 'U' trap is necessary.

Insulation of the ISU 140 and 160 drain pipes is recommended especially in high humidity environments.

**Note:** The unit has a right angled drain tray to allow for wall or ceiling installation.

#### 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.

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

#### SAT-2 CONTROLLER

The following components are supplied loose inside the ISU electrical box:

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. ISU/ISD indoor unit-to-OSA outdoor unit interconnecting lead; 12.5 m or 25 m; 7 core.
5. Infra red remote control.
6. Additional SAT-2 Wall Control plaque.

#### Installation

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

1. Isolate the ISU unit from power supply, then remove electrical box cover.
2. Remove the items supplied loose in the electrical box.
3. Remove the Wall Control's interface lead from its 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 ISU 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.

#### COMMISSIONING

Indoor Unit

1. Check that the thermostat is correctly wired and set at the desired temperature.
2. Check that the air filter is clean.
3. Check that the fan runs freely without vibration.
4. Check condensate drain for free drainage.
5. Refer to Outdoor Unit Installation & Maintenance instructions and Wall Thermostat User's Operating Instructions to complete the start-up and commissioning procedure for the complete air conditioning system.
6. Run the motorised louvre to check up/down air distribution. Use the switch to set up/down louvre in **fixed** position, if required. Do not try to set up/down louvre manually.
7. With the motorised louvre switched off, manually adjust the left/right louvre to throw the air in the required direction.
8. Demonstrate the SAT-2 Wall Thermostat to the owner/user, after having first thoroughly familiarised yourself with the User's Operating Instructions. These instructions to remain with the owner/user.

**MAINTENANCE**

**Weekly For First Four Weeks**

1. Check air filter; vacuum clean as necessary.
2. Check condensate drains for free drainage.

**Monthly**

Check air filter; vacuum clean as necessary.

**Six Monthly**

1. Check condensate drain for free drainage.
2. Check the tightness of the fan.
3. Check that fan motor is free running.
4. Check tightness of electrical connections.
5. Check air supply at louvre.

**WARNING**

This unit is designed for use ONLY with the refrigerant HCFC-410A. 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.**

**NOTE**

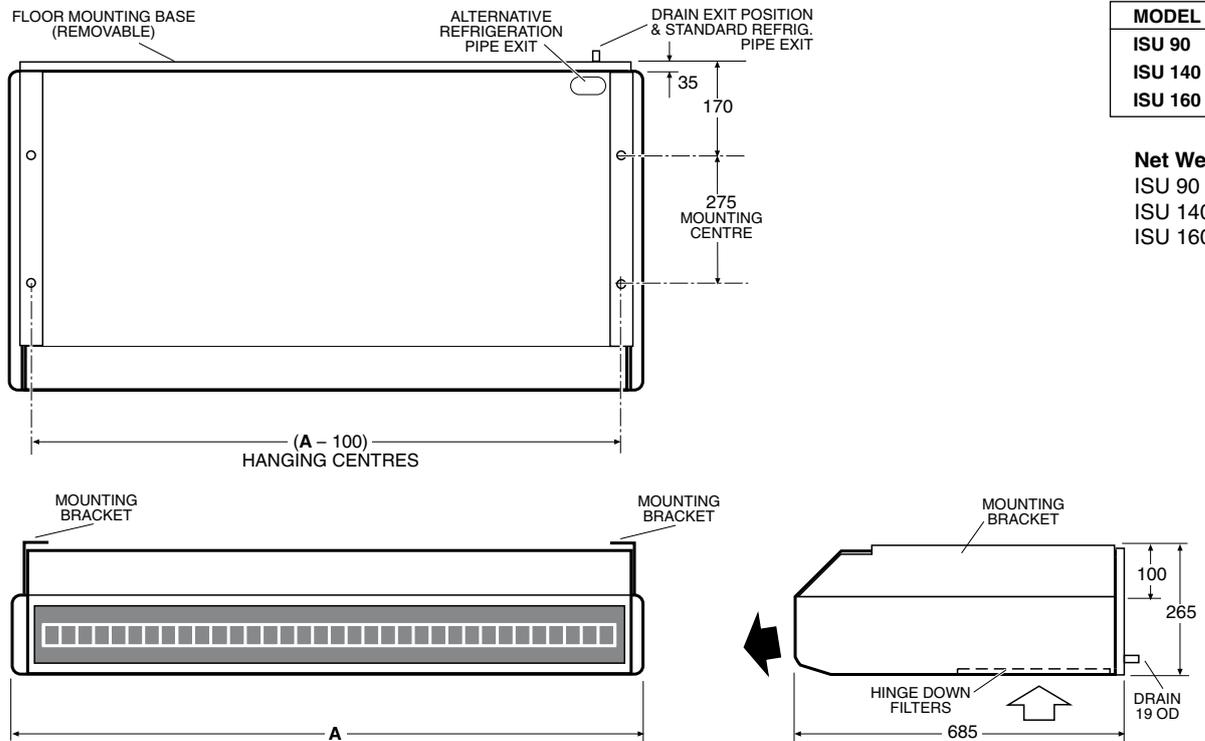
The manufacturer reserves the right to change specifications at any time without notice or obligation. Certified dimensions available on request.

This pamphlet replaces the previous issue no.s 2961 dated 08/08. Wiring revision C.

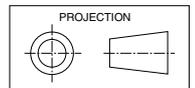
**DIMENSIONS (mm)**

**Fig. 5 ISU 90, 140, 160**

Not to Scale



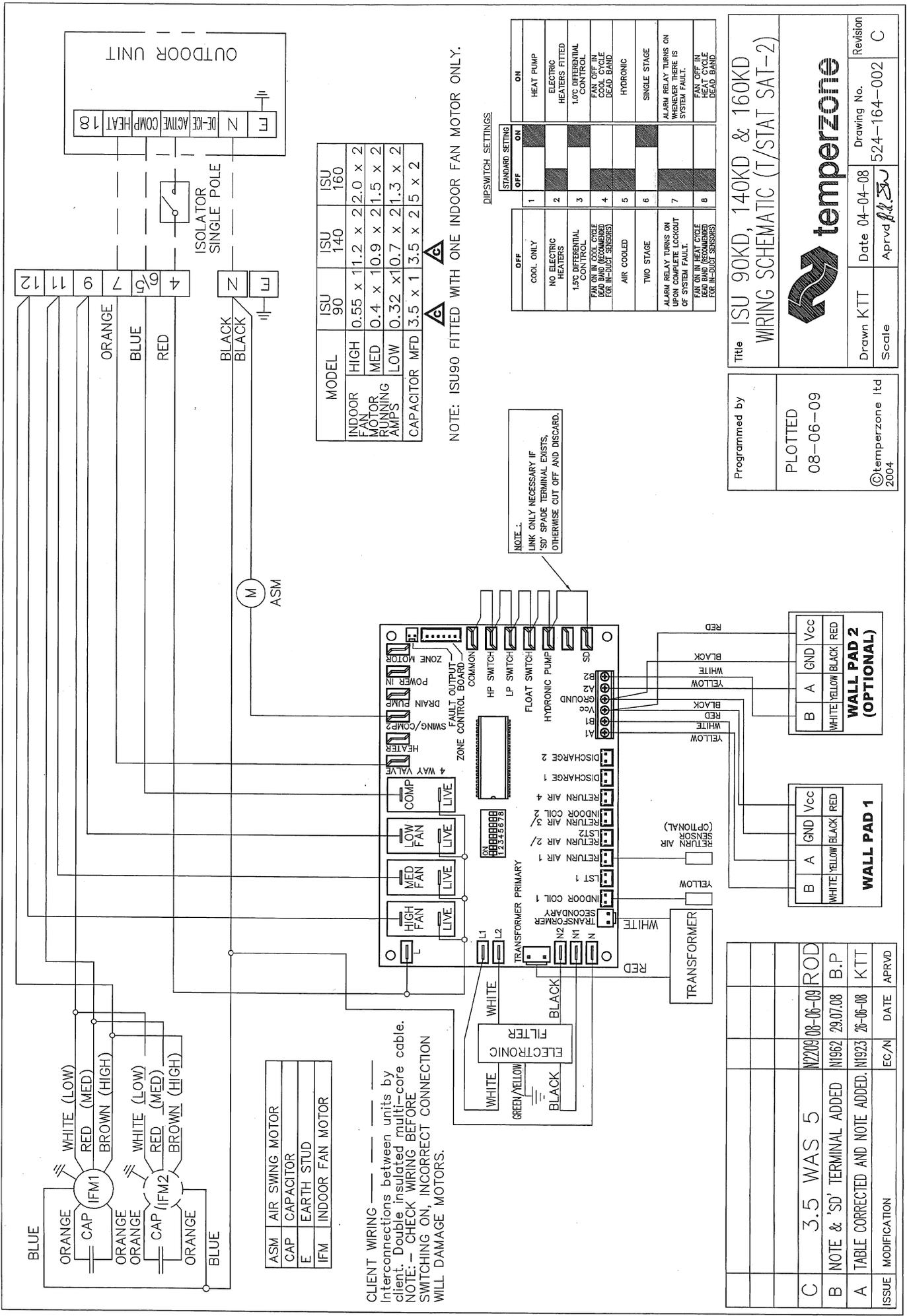
**Indoor Units**



MODEL	Dim.A
ISU 90	1260
ISU 140	1860
ISU 160	1860

**Net Weight:**

- ISU 90 48 kg
- ISU 140 74 kg
- ISU 160 74 kg



F	N	PE	ICE	ACTIVE	COMP	HEAT	18
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MODEL	ISU 90	ISU 140	ISU 160
INDOOR FAN MOTOR RUNNING AMPS	0.55 x 11.2 x 2	2.0 x 2	2.0 x 2
CAPACITOR MFD	3.5 x 1	3.5 x 2	5 x 2

NOTE: ISU90 FITTED WITH ONE INDOOR FAN MOTOR ONLY.

STANDARD SETTING	DIPSWITCH SETTINGS	
	OFF	ON
1	COOL ONLY	HEAT PUMP
2	NO ELECTRIC HEATERS	ELECTRIC HEATERS FITTED
3	15% DIFFERENTIAL CONTROL	100% DIFFERENTIAL CONTROL
4	FAN ON IN COOL CYCLE DEAD BAND (RECOMMENDED FOR IN-HIT 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-HIT SENSORS)	FAN OFF IN HEAT CYCLE DEAD BAND

Programmed by

PLOTTED 08-06-09

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Title ISU 90KD, 140KD & 160KD WIRING SCHEMATIC (T/STAT SAT-2)

Drawn KTT	Date 04-04-08	Drawing No. 524-164-002	Revision C
Scale	Aprvd <i>[Signature]</i>		

CLIENT WIRING ————  
 Interconnections between units by client. Double insulated multi-core cable. NOTE: - CHECK WIRING BEFORE SWITCHING ON, INCORRECT CONNECTION WILL DAMAGE MOTORS.

WALL PAD 1	B A GND Vcc	WHITE YELLOW BLACK RED
WALL PAD 2 (OPTIONAL)	B A GND Vcc	WHITE YELLOW BLACK RED

ISSUE	MODIFICATION	EC/N	DATE	APRVD
C	3.5 WAS 5	N2209	08-06-09	ROD
B	NOTE & 'SD' TERMINAL ADDED	N1962	29.07.08	B.P
A	TABLE CORRECTED AND NOTE ADDED.	N1923	26-06-08	KTT