

ACCESSORY KIT INSTALLATION INSTRUCTIONS

Low Ambient Accessory For Air Cooled Split-System Air Conditioners HA 300, HB 360 / 480 / 600, HF-25, HL-30 / -40 / -50 Models

GENERAL

These split-system condensing units are designed to operate at ambient temperatures down to 40°F. This accessory will insure safe operation at ambient temperatures down to 0°F. The VFD66 control monitors the refrigerant system and will vary the condenser fan speed based on the discharge pressure. One controller is required for each fan to be controlled. Therefore, one accessory kit would be required to control each refrigerant circuit. Two kits are required if both refrigerant circuits are to be operated below 40°F. This instruction provides all the necessary information to properly field-install a low ambient accessory on the condensing units listed in Table 1. Components that are supplied in the respective accessory are listed in Table 2, and pictured in Figure 1.

TABLE 1: APPLICATION DATA

ACCESSORY MODEL #	VOLTAGE	UNIT
2LA04702625	208/230	HA 300
2LA04702646	460	HA 300
2LA04702825	208/230	HB 360
2LA04702846	460	HB 360
2LA04702925	208/230	HB 480
2LA04702946	460	HB 480
2LA04703025	208/230	HB 600
2LA04703046	460	HB 600

TABLE 2: ACCESSORY COMPONENTS

ITEM	QTY.	PART NO.	DESCRIPTION
1 ¹	1 ea	473-24615-00X	VFD66X Condenser Fan Speed Control and Enclosure
2	1 ea	025-37463-000	Pressure Transducer P399BAC-1CY
3	1 ea	025-37464-000	Wire Harness Assembly WHA-P399-500C
4	1 ea	025-38411-000	Power wire Harness
5	1 ea	023-20566-000	Tee Connector
6	2 ea	021-15529-000	Screw HEX ¼-14 X.75
7	1 ea	025-09848-000	Bushing
8	6 ea	025-09607-000	Wire Tie
9	1 ea	025-37455-000	0° Degree Switch
10 ²	2 ea	025-37423-240	30/40 Ton Crankcase Heater
		025-37424-460	30/40 Ton Crankcase Heater
		025-37474-240	25/50 Ton Crankcase Heater
		025-37474-460	25/50 Ton Crankcase Heater
11 ³	3 ea	025-XXXXX-XXX	Fuses

- "X" denotes Model number needed for application.
- Crankcase Heaters supplied are dependent on accessory ordered.
- Fuses supplied are dependant on accessory ordered.



FIGURE 1 - ACCESSORY COMPONENTS

⚠ WARNING

The 2LA047 series low ambient accessories are intended for use with the 25-50 Ton Split System condensing units only. UPG cannot guarantee proper operation for any application of this VFD 66X controller for other equipment or applications. Contact your local branch or distributor for any application related questions.

⚠ WARNING

Improper installation, adjustment, service or maintenance can cause injury or property damage. Therefore, only a qualified installer or qualified service personnel should perform this conversion.

⚠ WARNING

If the unit is connected to power sources, make sure that all electrical power to the unit has been disconnected.

- Disconnect all electrical power to the unit.
- Remove the condensing unit control box access panel.

WARNING

Before installing accessory read all of this installation instruction.

3. Install the VFD66 enclosure with the provided screws. Mounting holes are pre-punched in the top rails to locate the enclosure near the condensing unit control box. See Figure 7.

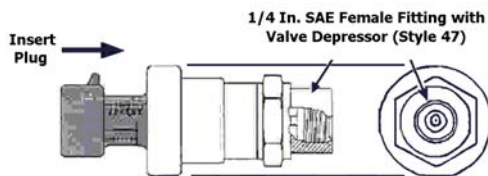


FIGURE 2 - P399 PRESSURE TRANSDUCER

CAUTION

Do not remove the plastic plugs from the transducers until they are ready to be installed.

4. Attach the pressure transducers to the connection tee (provided in accessory). The pressure transducer has a 1/4 In. SAE female flare with Schrader valve depressor for mounting to the tee. See Figure 2.
 - Hand thread the transducer to the tee.
 - Tighten and secure the connection.
 - Remove the Schrader valve cap from the discharge line port (provided).
 - Hand thread the tee to the discharge line port.
 - Tighten and secure the connection, making sure the transducer is mounted vertically. See Figure 3.
 - Perform a leak test on fittings and connections before putting the system into operation.

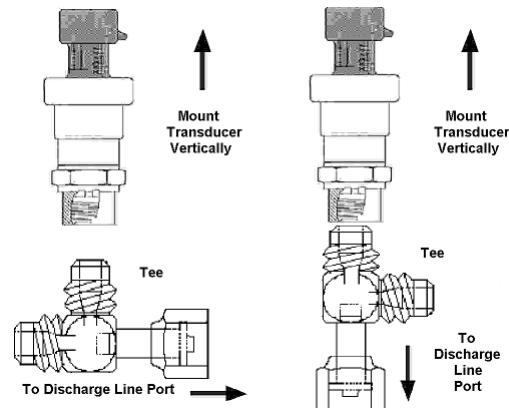


FIGURE 3 - P399 PRESSURE TRANSDUCER MOUNTING

NOTE: Note: This procedure must be repeated for each system.

5. Attach wiring harness assembly plug to (P399) transducer. See Figure 4. Route sensor wires back to VFD66 enclosure.

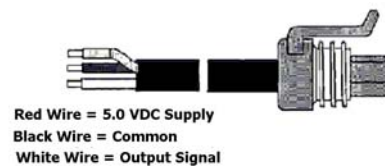


FIGURE 4 - WIRE HARNESS ASSEMBLY

6. Remove VFD66 enclosure lid.
7. Pass wires through the bushing (provided), using knock out located in the bottom of the VFD66 enclosure.
8. Access the VFD66 control terminal blocks. See Figure 5.
 - Remove the terminal access cover screws.
 - Push downward on the ventilation holes while pulling outward on the top of the terminal access cover.

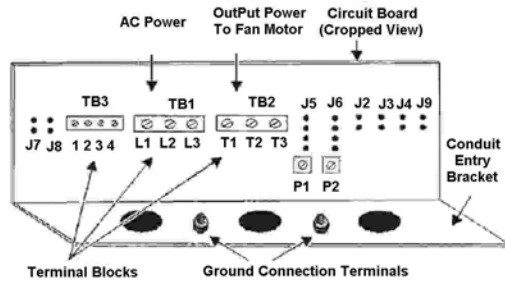


FIGURE 5 - VFD66 CONTROL TERMINAL BLOCKS

9. Wire transducers to the VFD66 control.
See Figure 6.

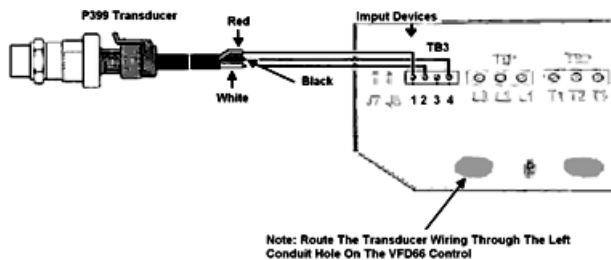


FIGURE 6 - P399 PRESSURE TRANSDUCER WIRING

- Cut hole in the left most bushing in the bottom of the VFD66 control. See Figure 6. Push transducer sensor wires through this bushing.
- Connect red wire from transducer to terminal (1) on terminal block (TB3) located on the VFD66 Control.
- Connect black wire from transducer to terminal (4) on terminal block (TB3).
- Connect white wire from transducer to terminal (2) on terminal block (TB3).
- Connect bare wire from transducer to the grounding terminal on VFD66 control.

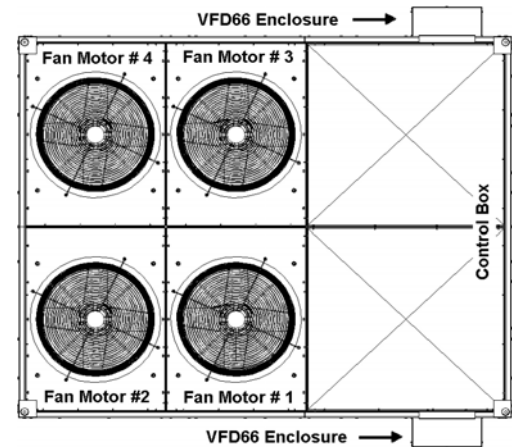


FIGURE 7 - FAN MOTOR #1 LOCATION

NOTE: All Wiring must comply with prevailing Local and National wiring codes and ordinances.

10. Cut two lengths of flexible conduit (Field Supplied) to connect from the VFD66 Control to the condensing unit control box.
- Conduit #1 should run from the bottom of the VFD66 enclosure to the condensing unit control box, using knock outs provided.
 - In conduit #1 insert three # 14 Gage wires marked on both ends (field supplied).
 - Conduit #2 should run from the bottom of the VFD66 enclosure to the condensing unit control box, using knock outs provided.
 - In conduit #2 insert shielded power cable supplied in accessory.
 - Allow additional conduit length to remove the VFD Control enclosure from the top rail and place on side for servicing.

11. Wire condenser fan motor #1 to the VFD66 control. See Figures 5, 7, and the wiring diagrams in Figures 10,11 and 12. The VFD66 must be wired to operate fan motor #1. Factory installed pressure switches control fan motor #2.

- Disconnect wire 136/BLK from terminal (T1) on contactor (M5).
- Disconnect wire 137/BRN from terminal (T2) on contactor (M5).
- Disconnect wire 138/PR from terminal (T3) on contactor (M5).
- Extend wire 136/BLK to terminal (T1) on terminal block (TB2) located on the VFD66 control using wires in conduit #1.
- Extend wire 137/BRN to terminal (T2) on terminal block (TB2).
- Extend wire 138/PR to terminal (T3) on terminal block (TB2).
- Connect (BLK) wire of power harness to terminal (T1) on contactor (M5) and to terminal (L1) on terminal block (TB1) located on the VFD66 control using shielded cable in conduit #2.
- Connect (RED) wire of power harness to terminal (T2) on contactor (M5) and to terminal (L2) on terminal block (TB1).
- Connect (WHT) wire of power harness to terminal (T3) on contactor (M5) and to terminal (L3) on terminal block (TB1).
- Connect bare wire of power harness to the grounding terminal on VFD66 control.

12. Check positioning of two jumpers to assure proper operation of VFD66 control. See Figure 8.

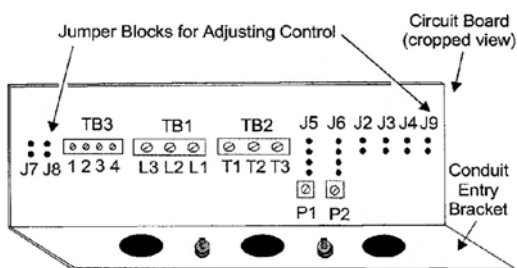


FIGURE 8 - JUMPER BLOCK LOCATIONS

- To remove a jumper, reposition the jumper so that it is connected to only one pin on the jumper block. Keep the jumper because it may be

needed in the future. To install a jumper, position the jumper on both pins. See Figure 9.

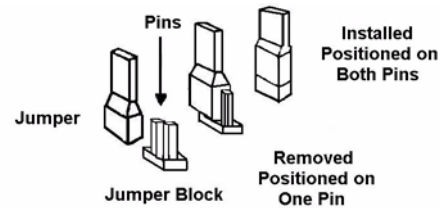


FIGURE 9 - JUMPER PLACEMENT ON PINS

- Jumper block (J9) selects maximum frequency output of the control. Remove the jumper for 50 Hz motors. Install the jumper for 60 Hz motors. Power must be removed and reapplied before frequency changes will have effect.
- Jumper block (J8) establishes single or dual input signal operation.

NOTE: The VFD66 is factory configured to accept single input operation.

Therefore, (J8) jumper should be installed on both pins for this application.

- Jumper blocks (J2), (J3), (J4), (J5), (J6), and (J7) are preset at the factory and cannot be field adjusted.
- The activation pressures are preset at the factory.

13. Remove existing low ambient switch (LAS)(See Fig. 10), located in the unit control box, and replace with new 0° ambient switch (provided).

14. Remove existing fuses of the condenser fan motor to which the VFD66 control is being applied. Replace with new fuses (provided).

15. Install additional crankcase heaters on the compressors of the system to which the VFD66 control is to be applied. Wire each additional heater parallel to the existing heater, utilizing the existing ground.

16. Secure wiring in the unit control box in a neat workman like manner using wire ties.

17. Replace terminal access cover on VFD66 control.

18. Replace lid on VFD66 enclosure.

19. Close unit control box by replacing unit access panel and restore power to the unit.
20. Verify proper unit operation.

A call for cooling closes the (M5) contactor powering the VFD66 control. As the discharge pressure rises above 210 PSI. during startup, the VFD66 control will increase the speed of the condenser fan accordingly.

The unit's scroll compressor produces a rapid rise in discharge pressure upon startup and this, depending on the ambient temperature, will result in full speed operation of the condenser fan. After the discharge pressure has stabilized, the speed of the condenser fan may decrease especially during times when the ambient temperature is below 80°F. If the discharge pressure has stabilized and an additional compressor is energized, the speed of the condenser fan may increase, compensating for the rise in discharge pressure.

As the discharge pressure begins to fall below the 270 PSI. setpoint, the drive will reduce the speed of the condenser fan.

As the ambient temperature drops below 40°F the condenser fan will slow to the minimum speed. The pressure controlled condenser fan will disengage when the discharge pressure drops below 180 PSIG as the ambient temperature falls. The system discharge pressure will increase when the condenser fan is disengaged causing the VFD66 control to increase the condenser fan speed.

21. Contact your local branch or distributor for questions regarding installation.

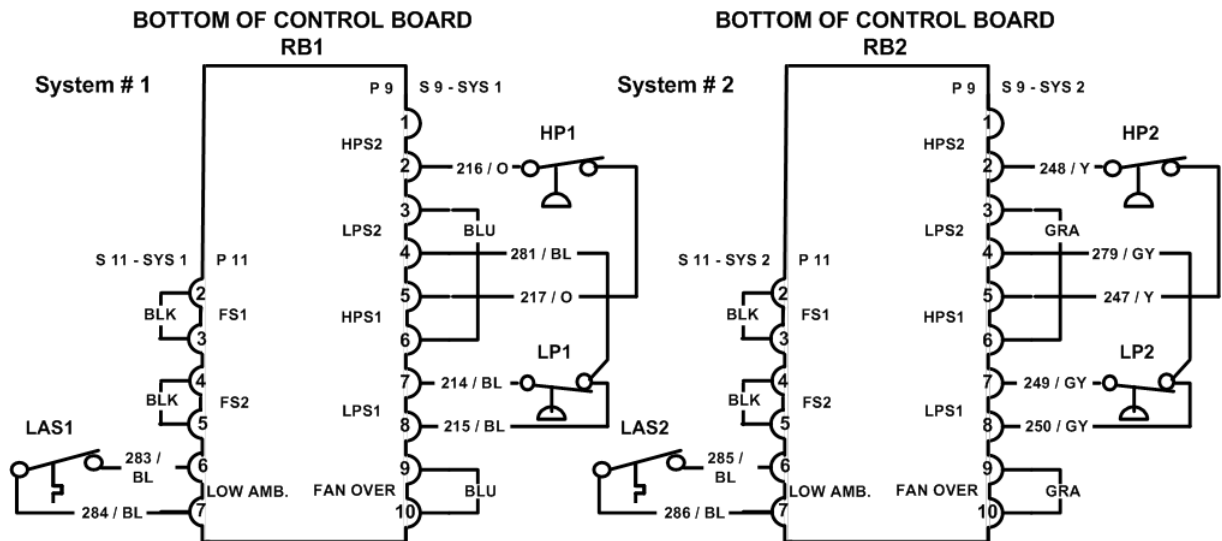


FIGURE 10 - LAS-LOW AMBIENT SWITCH WIRING LOCATIONS

* Single control board (RB1) applies to 25-Ton unit only.

**Dual control board (RB1 & 2) apply to 30, 40 & 50 ton units.

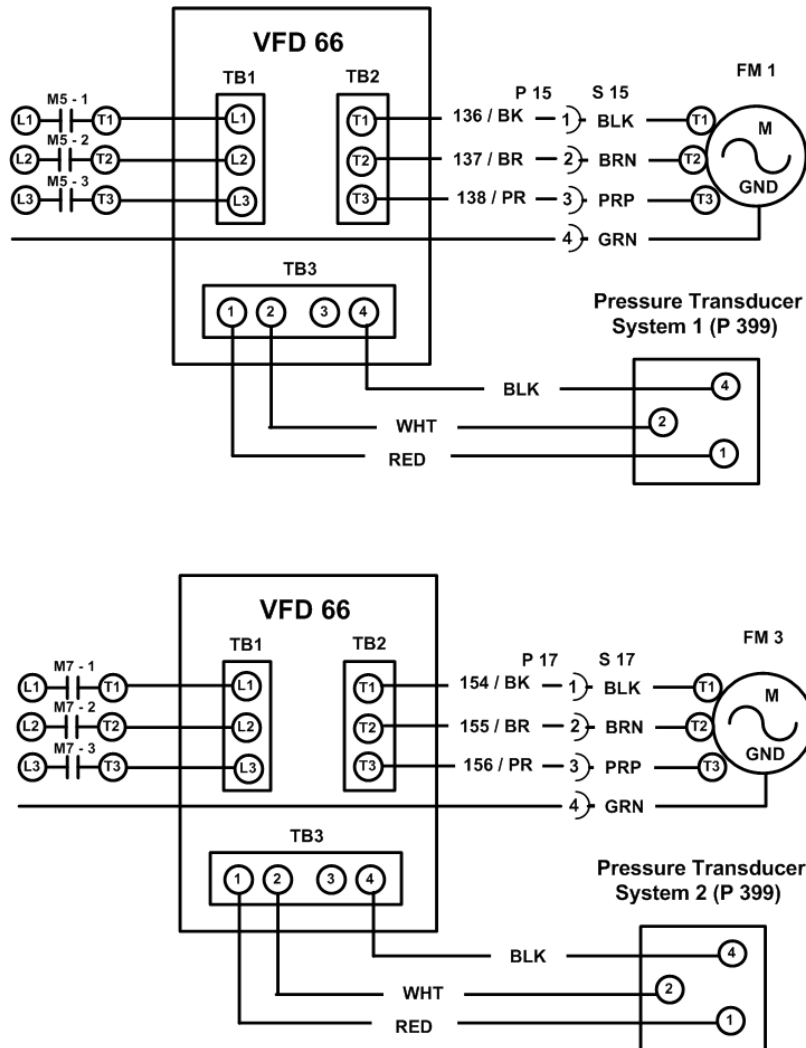


FIGURE 11 - 25, 30, 40 & 50 TON LOW AMBIENT KIT DIAGRAM

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