

**Operator: Save these instructions for future use!**

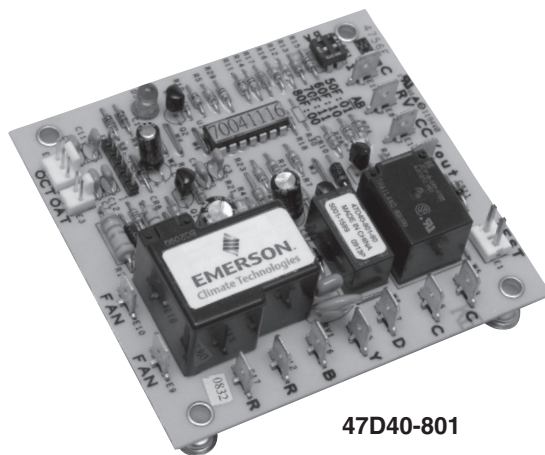
**FAILURE TO READ AND FOLLOW ALL INSTRUCTIONS CAREFULLY BEFORE INSTALLING OR OPERATING THIS CONTROL COULD CAUSE PERSONAL INJURY AND/OR PROPERTY DAMAGE.**

## DESCRIPTION

The 47D40-801 control is a microprocessor-based demand defrost controller intended for Rheem heat pump systems. This controller uses basic differential temperature means to detect degradation of system performance due to ice build-up on the outdoor coil. The controller uses “self-calibrating” principles to calibrate to the heat pump system. The defrosting is performed by reversing the refrigerant direction of flow.

The 47D40-801 is meant to replace the following controllers in Rheem heat pump systems:

47-21517-16	47-21517-82	DDL-013102-1RH
47-21517-17	47-21517-88	DDL-017002-2RH
47-21517-18	47-102685-01	DDL-017102-1RH
47-21517-23	47-102685-03	DDL-017702-1RH
47-21517-24	47-102684-01	DDL-117702-3RH
47-21517-11	47-102684-03	DDL-013002-0RH
47-21517-14	47-102684-83	DDL-013002-1RH
47-21517-13		



47D40-801

## PRECAUTIONS

### ⚠ CAUTION

- This control is intended only for Rheem heat pump systems.
- Replace 47D40-801 control as a unit - no user serviceable parts.

If in doubt about whether your wiring is millivolt, line or low voltage, have it inspected by a qualified heating and air conditioning contractor or licensed electrician.

Do not exceed the specification ratings.

All wiring must conform to local and national electrical codes and ordinances.

This control is a precision instrument, and should be handled carefully. Rough handling or distorting components could cause the control to malfunction.

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### ⚠ WARNING

- To prevent electrical shock and/or equipment damage, disconnect electric power to system at main fuse or circuit breaker box until installation is complete.
- This control is not intended for use in locations where it may come in direct contact with water. Suitable protections must be provided to shield the control from exposure to water (dripping, spraying, rain, etc.)
- Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper or loss of heat pump operation and/or shock hazard.
- Following installation or replacement, follow appliance manufacturer’s recommended installation/service instructions to insure proper operation.
- Do not use on circuits exceeding specified voltage. Higher voltage will damage control and could cause shock or fire hazard.

# SPECIFICATIONS

Electrical Ratings [ @ 77° F (25° C)]:

Rated Voltage . . . . .	24 VAC
Rated Voltage Range . . . . .	18-30 VAC
Max. Power Consumption @ 24 VAC . . . . .	4.08 VA
Nominal Frequency . . . . .	50/60 Hz

Relay Load Ratings:

Compressor Contactor Relay . . . . .	20 VA in rush, 6 VA holding
Fan Relay . . . . .	1/2 HP @ 240, 1/4 HP @ 120 VAC
Reversing Valve Relay (RV) . . . . .	24 VA
Auxiliary Heat Relay (D) . . . . .	1 Amp. 0.6 P.F.
Operating Temperature Range . . . . .	-40° to 150° F (-40° to 65° C)
Humidity Range . . . . .	5% to 95% relative humidity (non-condensing)

Timing Specifications @ 60Hz*		
	Nom	Units
Defrost Lockout Time	34	Mins.
Maximum Defrost Time	14	Mins.
Transient Delay	2	Mins.
Maximum Frosting Time	6	Hrs.
Short Cycle Lockout Time	5	Mins.
Noise Abatement Time	5	Sec.

The control is recognized by UL as an incorporated electronics control per UL 60730-1A. This control does not perform any safety/protective functions. This device is automatic, type 1 action, incorporated control.

\*50Hz Timings are 20% longer.





# OPERATION

Each controller has 24 VAC input and B, Y, and D terminals for connection to a standard thermostat. The controller has pins for connection of two temperature sensors to measure ambient and coil temperature. Controlled outputs are outdoor fan, reversing valve, and compressor contactor.

The controller has a LED to indicate system operation status.

### Option Switch

Switch labeled SW1 is used to select the defrost mode termination temperature of outdoor coil. Defrost mode is terminated when the coil temperature exceeds the selected termination temperature. Temperature options for SW1 switch settings are:

	B	A	
	On	Off	50° F
	Off	On	60° F
	On	On	70° F (default)
	Off	Off	80° F

### Test Pins

The connector labeled **TEST** can be used to change operation mode in the field. Momentarily short the test pins to force the system into the defrost mode. Momentarily short the test pins again to terminate the defrost mode. To avoid unnecessary system mode transition, do not use the test pins frequently.

### Short Cycle Protection

The control includes protection against short cycling the compressor. At power-up, and each time the Y input is interrupted, the control will enter a 5-minute short cycle lockout period. During this lockout, the control will not energize the compressor contactor, even if a call for heating or cooling is received on the Y input. The control will resume normal operation when the lockout period expires.

### Noise Abatement

When the reversing valve is switched during an active call for heating or cooling, such as when entering or leaving a defrost cycle, the control will de-energize the compressor contactor for 5 seconds in order to reduce compressor noise.

### Diagnostic Features

The control continuously monitors system operation. If a fault occurs, the red LED on the control will flash a diagnostic code, if more than one fault occurs, only the code with the higher priority will flash. The flash time is to be 0.5 seconds on and 0.5 seconds off followed by 2 seconds off. The table shows the diagnostic codes:

LED	Fault Indication	Display Priority
ON	Normal	0
1 Flash	Defrost mode	1
2 Flashes	Coil sensor fault	3
3 Flashes	Ambient sensor fault	2

On some units, the Outdoor Ambient Temperature (OAT) and Outdoor Coil Temperature (OCT) sensors may be attached permanently to the controller. The 47D40-801 includes replacement OAT and OCT sensors that plug onto the 2- and 3-pin connectors on the controller board.

Before removing the old controller, note the location of the OCT sensor on the outdoor coil. The new sensor should be attached to the coil in the same location, or as close as possible. The OAT sensor is typically 24-48" long, although some controllers have the sensor on the board. Placement of the OAT sensor is not as critical as the OCT sensor, but both sensors are required for the controller to operate.

Four metal standoffs are used to support and mount the control into the unit.

Board size is 3.375 in. x 3.625 in. and requires 1 inch of headroom (not including mounting).

## NOTE

All wiring should be installed according to local and national electrical codes and ordinances.

The 47D40-801 control may be mounted on any convenient surface using the four standoffs provided.

The control must be secured to an area that will experience a minimum of vibration and remain below the maximum ambient temperature rating of 150° F. The control is approved for minimum ambient temperatures of -40° F.

Any orientation is acceptable.

Refer to the wiring diagram and wiring table when connecting the 47D40-801 control to other components of the system.

UL approved, 105° C rated 18 gauge min., stranded 2/64" thick insulation wire is recommended for all low voltage safety circuit connections.

UL approved, 105° C rated 16 gauge min., stranded 2/64" thick insulation wire is recommended for all line voltage connections.

Following installation or replacement, follow appliance manufacturer's recommended installation or service instructions to insure proper operation.

Typical System Wiring Table		
47D40 Terminal	Type	System Component Connection
C	0.25" QC	Reversing valve common
RV	0.25" QC	Reversing valve output
CC	0.25" QC	Compressor contactor coil
Yout	0.25" QC	Compressor call output
C (2)	0.25" QC	Common, 24VAC return
D	0.25" QC	Defrost output
Y	0.25" QC	Compressor call input
B	0.25" QC	Heating mode signal input
R (2)	0.25" QC	24VAC input
Fan (2)	0.25" QC	Outdoor fan control
OAT	2-pin connector	Outdoor ambient temperature sensor
OCT	3-pin connector	Outdoor coil temperature sensor

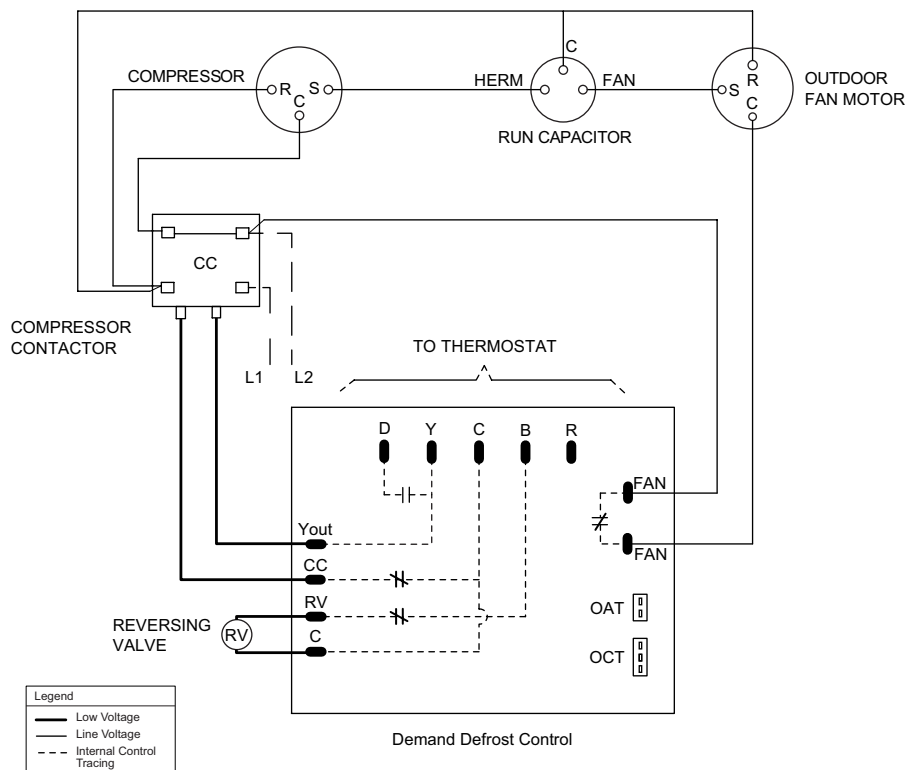


Fig 1. Typical System Wiring Diagram

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