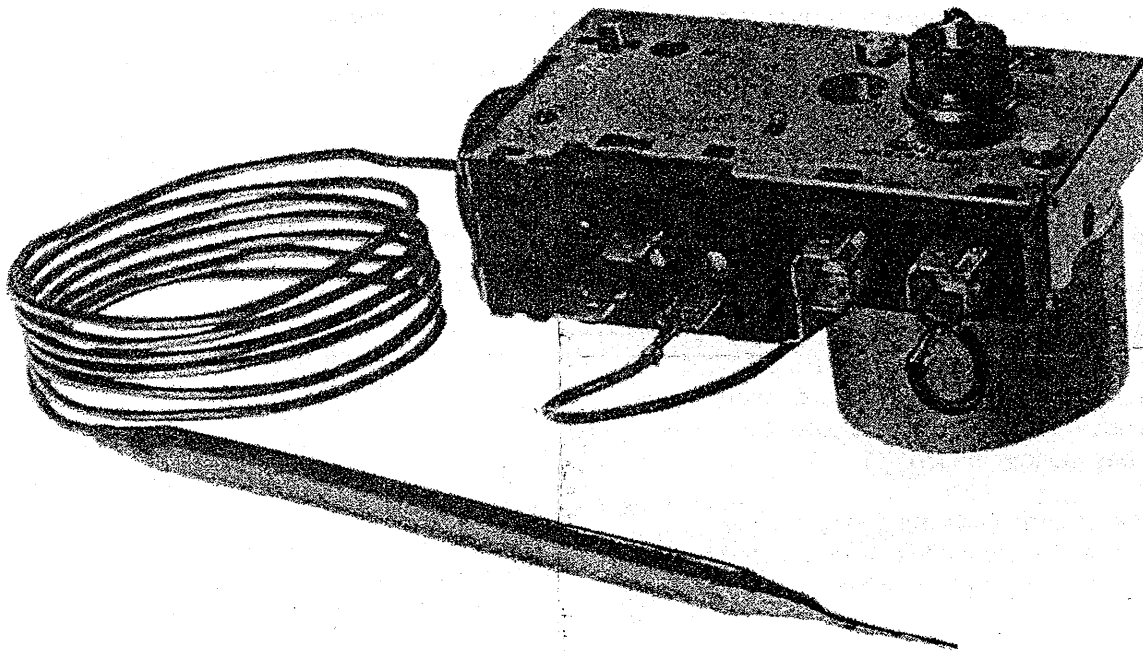




## INSTRUCTION SHEET

INSTRUCTION SHEET NO. 1520040

# Type E15 Time/Temperature Defrost Control for Heat Pumps



### APPLICATIONS

Central Heat Pumps  
Window Unit Heat Pumps

### DESCRIPTION

Type E15 Defrost Control is designed to control the removal of frost from the outdoor coil of central system and window unit heat pumps. The E15 has a temperature sensing capillary, a timer motor, and a switch mechanism.

The remote cross-ambient filled bulb senses the temperature of the outdoor coil. The timer allows for a defrost cycle only at specified intervals. The switch controls system defrost functions.

### FEATURES

- Defrost Cycle Initiation - Temperature -permissive, timed defrost cycle initiation.
- Defrost Initiation Lockout - Only one defrost cycle per time period.
- Defrost Cycle Termination - Temperature termination with backup time termination.
- Defrost Cycle Frequency - Selectable defrost cycle frequency.
- Field Check - Separate low-temperature override tool available for field checking defrost cycle.

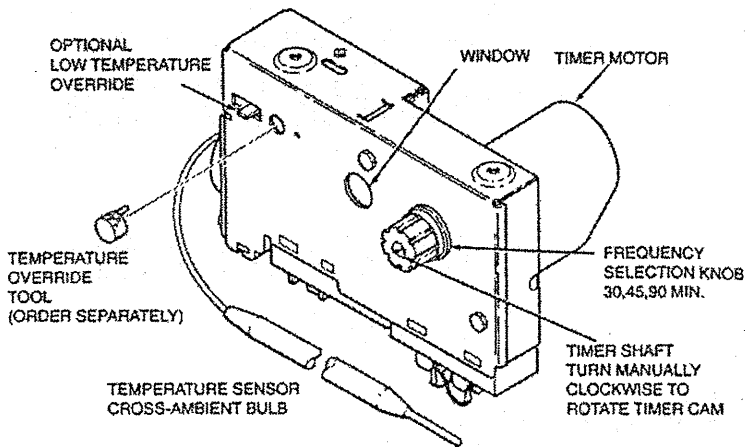


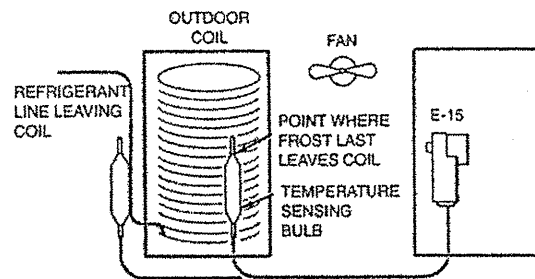
Figure 1

## OPERATION

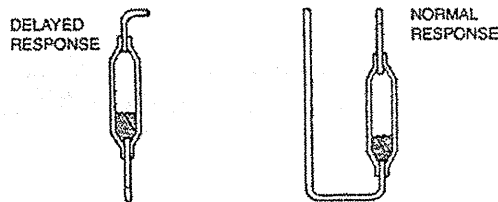
Select a time interval for defrost by turning the Selector Knob. Timer may be wired to run continuously, to run when compressor is operating, or to run when a separate sensor permits. Defrost cycle starts when the timer cam reaches an initiation point *and* the temperature of the outdoor coil is below 28°F (-2.2°C). See Figure 2.

Defrost cycle ends when the coil temperature rises to a preset termination temperature. If the outdoor coil cannot reach the termination temperature (due to weather or system malfunction), then defrost ends automatically 10 minutes after it began. This is backup termination.

After the defrost cycle ends, the heat pump returns to normal heating cycle and defrost is locked out until the timer advances to the next initiation point.



(A) Find The Point On Coil Where Frost Leaves Last



(B) Cross-Ambient Bulb Installation

Figure 3.

## INSTALLATION

Mount the E15 Defrost Control so that it is protected from moisture or spray.

Attach the temperature sensing bulb to the outdoor coil of the heat pump. Select the point where frost last leaves the coil during defrost. You may also attach bulb to refrigerant line leaving coil.

## WIRING

Timer motor may be wired to run continuously, to run when heat pump compressor is on, or to run when a sensor permits.

The timer motor leads are attached to terminals TM and TM<sub>1</sub>. Timer motor is electrically isolated from the control switch. Common power may be used for the timer and switch by inserting a jumper between terminals TM<sub>1</sub> and Terminal 2. See Figure 4 for typical wiring diagram. See heat pump manufacturer's service manual for detailed wiring diagrams.

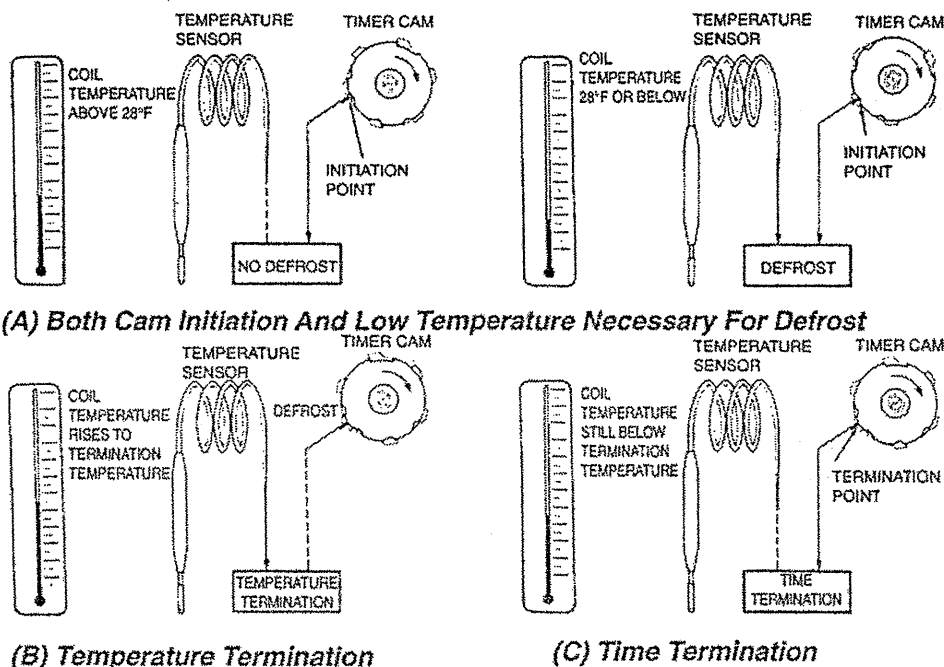
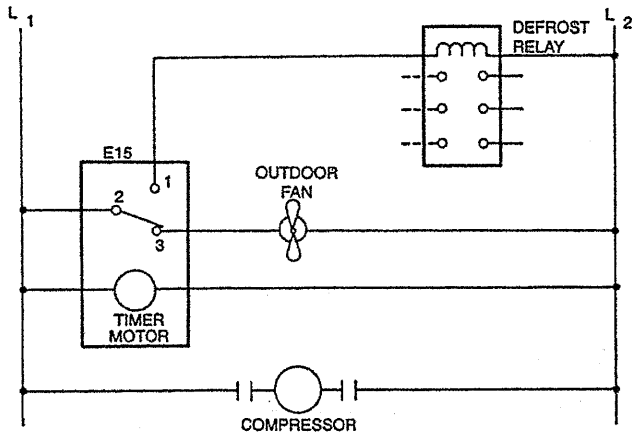
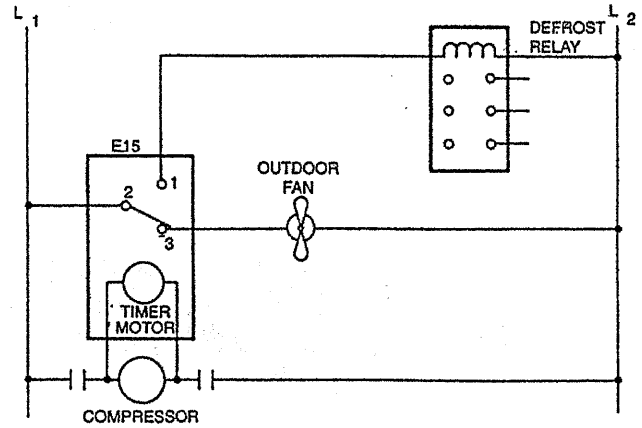


Figure 2.

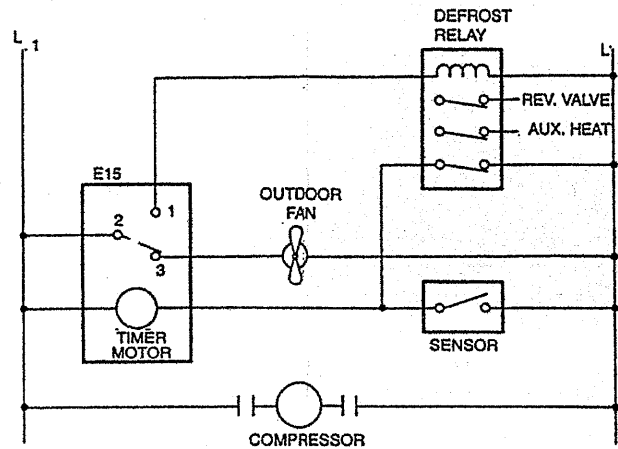
**Figure 4.**  
**Typical Heat Pump Defrost**  
**System Schematic Wiring**



**(A) Timer Motor Runs Continuously**



**(B) Timer Motor Runs With Compressor**



**(C) Timer Motor Runs With Sensor**

**SPECIFICATIONS**

**SWITCH:** SPDT 2-1 Close on Defrost initiation  
2-3 Close on Defrost termination  
Available as SPST upon request

**TERMINALS:** .25-inch male quick-connect  
**FREQUENCY SELECTION:** 30, 45 or 90 minutes

**LISTING AGENCIES:**

UL File SA512, Vol. 2, Sect. 8, 5/27/64  
CSA File LR 1942, Guide No. 361-E-0.2

**TEMPERATURE OVERRIDE:**

Optional temperature override available for field check of defrost cycle. Override tool available separately.

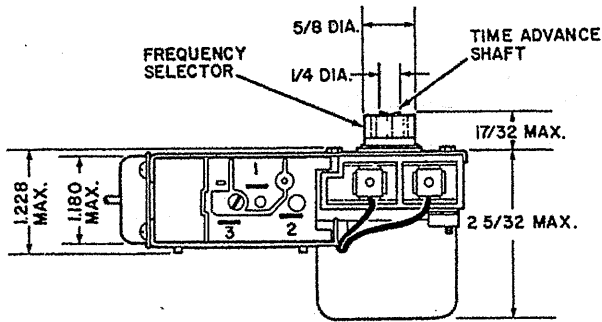
**ELECTRICAL RATINGS**

**Sequence Motor-24, 120 or 240 VAC, 4 watts**  
**Control Switch-**  
SPDT  
10 Amp Full Load  
40 Amp Locked Rotor  
25 Amp/240 VAC non-inductive  
**Pilot Duty-240 Volt-Amperes at 120/240 VAC**

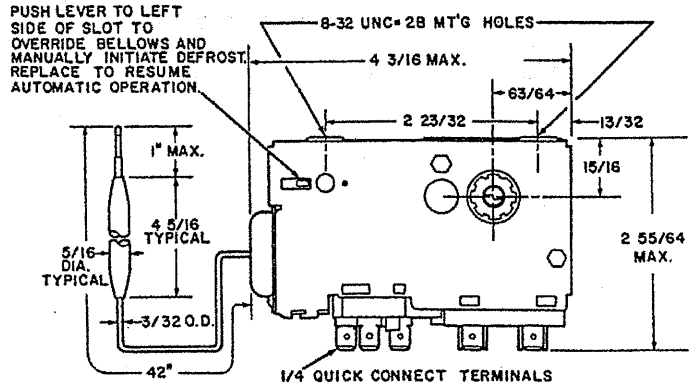
FEATURES	RANCO CODE SERIES	FOR ONE REVOLUTION OF SHAFT			INITIATION TEMPERATURE	TERMINATION TEMPERATURE		TIMER MOTOR VOLTAGE
		TIME (MIN.)	INITIATIONS	TERMINATION (MIN.)		COLD CAM	WARM CAM	
Adjustable Freq. & Term.	E15-2501	90	1,2 OR 3	10	28°F or below	55°F	78°F	240 VAC
Adjustable Freq. Only	E15-2201	90	1,2 OR 3	10	28°F or below	55°F	NONE	240 VAC
BASIC	E15-2001	90	1	10	28°F or below	55°F	NONE	240 VAC
Adjustable Freq. & Term.	E15-1501	90	1,2 OR 3	10	28°F or below	55°F	78°F	120 VAC
Adjustable Freq. Only	E15-1201	90	1,2 OR 3	10	28°F or below	55°F	NONE	120 VAC
Adjustable Freq. & Term.	E15-250	90	1,2 OR 3	10	28°F or below	55°F	78°F	24 VAC

# OUTLINE DIMENSIONS

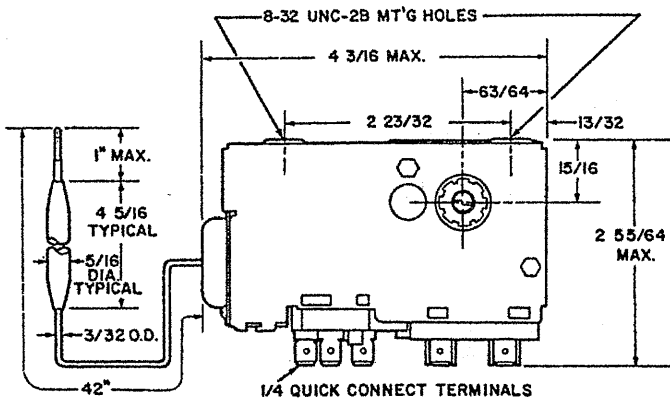
All dimensions in inches.



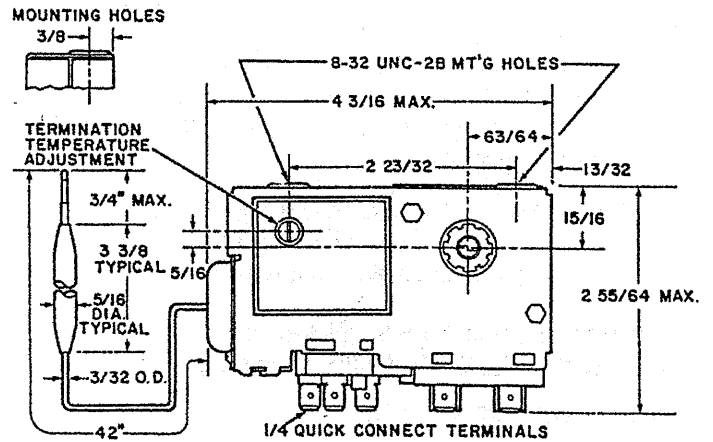
TERMINALS 2-1 Close on defrost initiation  
2-3 Close on defrost initiation



(B) Low Temperature Override



(A) Adjustable Frequency



(C) Adjustable Termination Temperature And Adjustable Frequency



**RANCO**

**CONTROLS DIVISION** 8115 U.S. Route 42 North Plain City, Ohio 43064 U.S.A.

Ranco is a multi-national manufacturer of environmental comfort, convenience and safety control devices, and systems automatically regulating temperature, pressure, time, current, flow, and humidity.