TRANE

General Service Bulletin

CTV-SB-74

Library	Service Literature
Product Section	Refrigeration
Product	Centrifugal Liquid Chillers
Model	CTV
Literature Type	General Service Bulletin
Sequence	74
Date	10/25/85
File No.	SV-RF-CTV-CTV-SB-74-1085
Supersedes	

SUBJECT: INSTALLATION OF THE DISTRIBUTION FAULT AUTOMATIC RESET OPTION USED ON CENTRIFUGAL UNITS

INTRODUCTION:

This service bulletin provides instructions for installing a distribution fault automatic reset option on centrifugal units that use the Cutler Hammer solid state overload. This option is designed to automatically restart the unit after line power has been restored following a power loss.

Also discussed is a possible nuisance condition with the timing relationship between the Model CVHE oil pump, the anti-recycle timer, and the distribution fault timing.

DISCUSSION:

This section explains the function of the standard distribution fault option and the need for automatic reset.

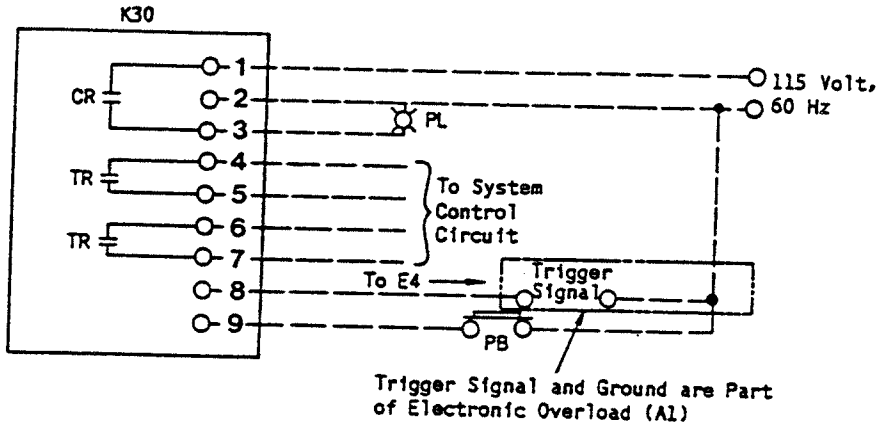
A distribution fault is defined as a loss of three-phase line voltage due to a distribution system failure. When a power failure occurs during unit operation, the solid state overload senses the immediate drop in line current while the starter remains energized. The overload responds by tripping the distribution fault breaker to stop unit operation. The breaker must be manually reset to restart the unit. Since some buildings require continuous cooling, it is not practical to manually reset the breaker every time the power is interrupted. To eliminate the manual reset, an automatic reset module can be installed to restart the unit within two minutes after the main supply power is restored.

Manual Reset Operation

As soon as line voltage is lost, a trigger voltage generated by the solid state overload (A1) is applied to Terminal 8 of the reset control. This 28 VDC signal causes the normally closed TR contacts (Terminals 4 to 5 and 6 to 7 of K30) to open. When these contacts open, the unit shuts down. Two minutes after the trigger voltage has disappeared and line voltage has been restored, the TR contacts will reclose, allowing restart of the unit, provided the 30-minute anti-recycle timer has timed out.

Simultaneously with the generation of the trigger signal, the CR contacts will close, applying power to Terminal 3 which activates a pilot light. This CR is a latching relay which means that the pilot light will remain energized as long as the 115 volt supply power is on. Closure of the push button contacts will reset this CR circuit and extinguish the pilot light. The push button may have to remain depressed for two or three seconds to allow the capacitor in the latching circuit to completely discharge. See Figure 1.

Figure 1
Automatic Reset Control
Wiring Connections



AUTOMATIC RESET INSTALLATION:

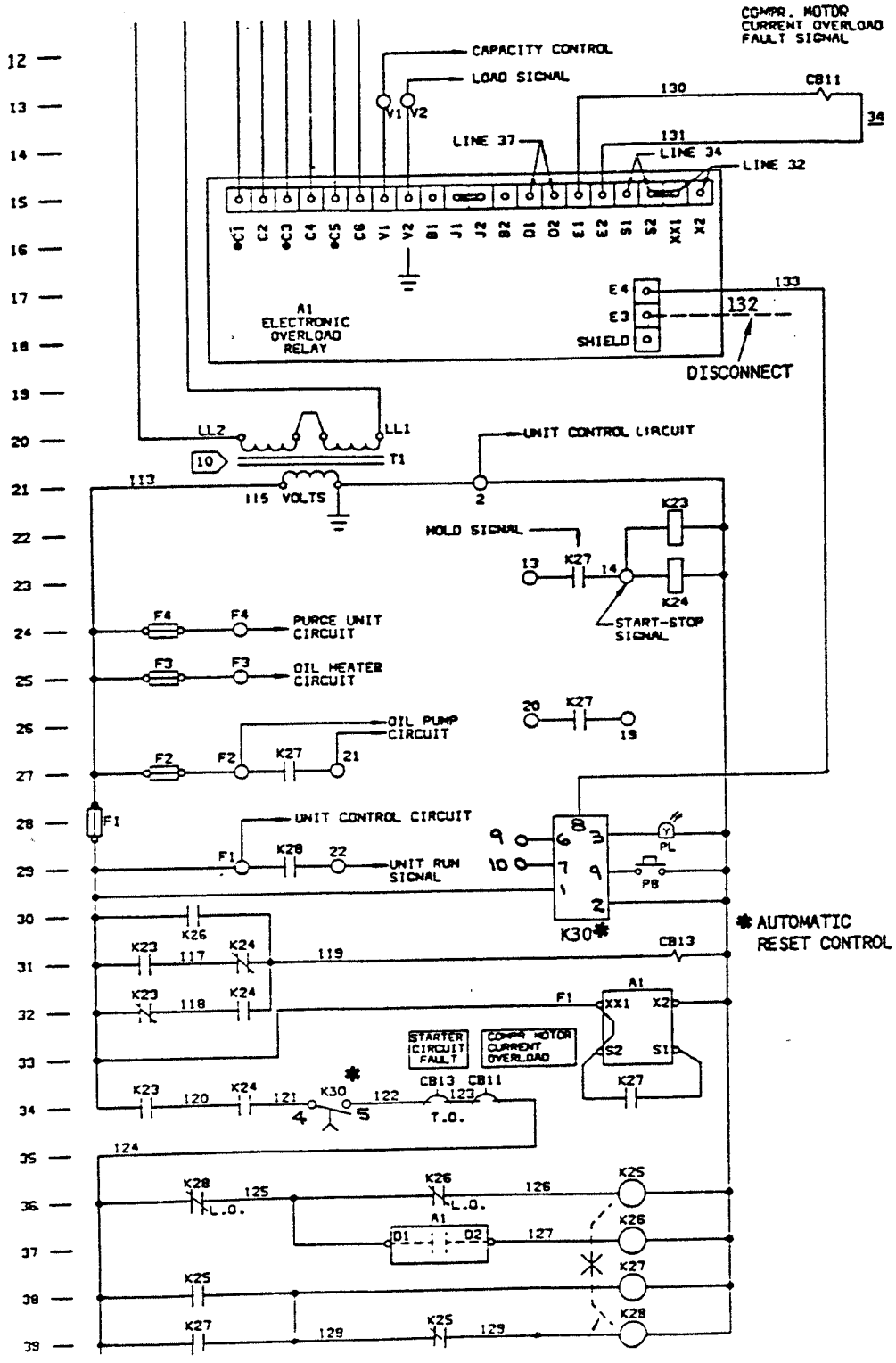
To install the automatic reset option, use the following procedure:

CVHE Control System

1. Remove the jumper from Terminals 9 and 10 of the unit control panel.
2. Connect the leads from Terminals 6 and 7 of the automatic reset control (K30) to Terminals 9 and 10. See Figure 2.
3. Disconnect wires 121, 122, 132 and 133 from the distribution fault circuit breaker (CB15) which is mounted on the starter panel door.
4. Remove CB15 from the starter panel door.

The Trane Company
La Crosse, Wisconsin 54601-7599
Printed in U.S.A.

Figure 2
Typical Starter
Schematic Diagram



5. Mount the automatic reset control (K30) in an easily accessible location inside of the starter panel.

   To install the automatic reset control, two 3/16-inch diameter holes must be drilled as shown in Figure 3. Mount the control using two #8-32 screws with washers and nuts.

6. The push button pilot light assembly (PB/PL) should be mounted in the location that was occupied by CB15. A hole must be cut in the panel as shown in Figure 4. A ring is provided for mounting the assembly to the starter panel door.

   Figure 5 illustrates the push button pilot light assembly and Figure 6 shows the wiring connections for the assembly.

7. Wire the automatic reset control according to the schematic diagrams shown in Figures 2 and 7. Wires 121 and 133 that were removed from CB15 can be reused. Connect wire 121 to K30 (Terminal 4), wire 122 to K30 (Terminal 5) and wire 133 to K30 (Terminal 8). Additional 16 gauge wire may be required. Remove or insulate wire 132.

Figure 3
Automatic Reset Control
Mounting Detail

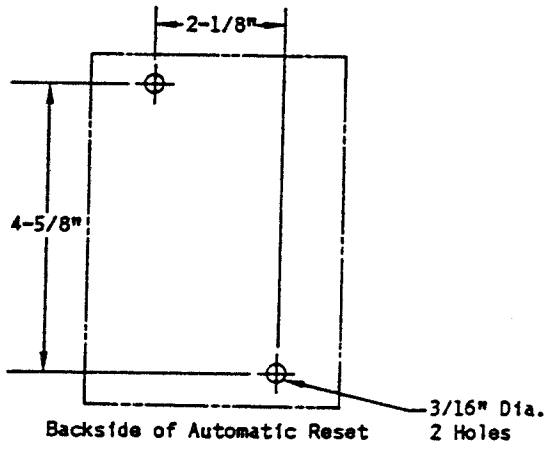


Figure 4
Hole for Mounting Push Button
Pilot Light Assembly

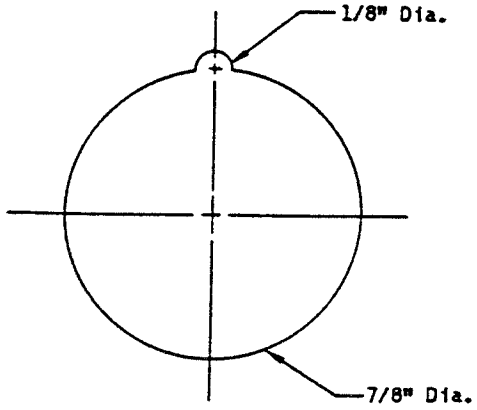


Figure 5
Push Button Pilot
Light Assembly

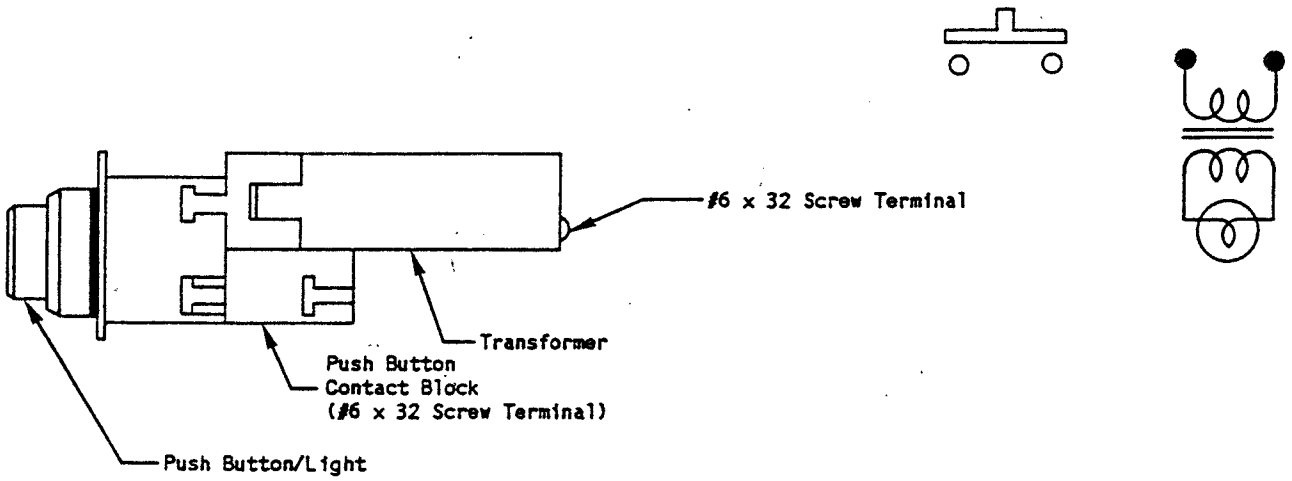
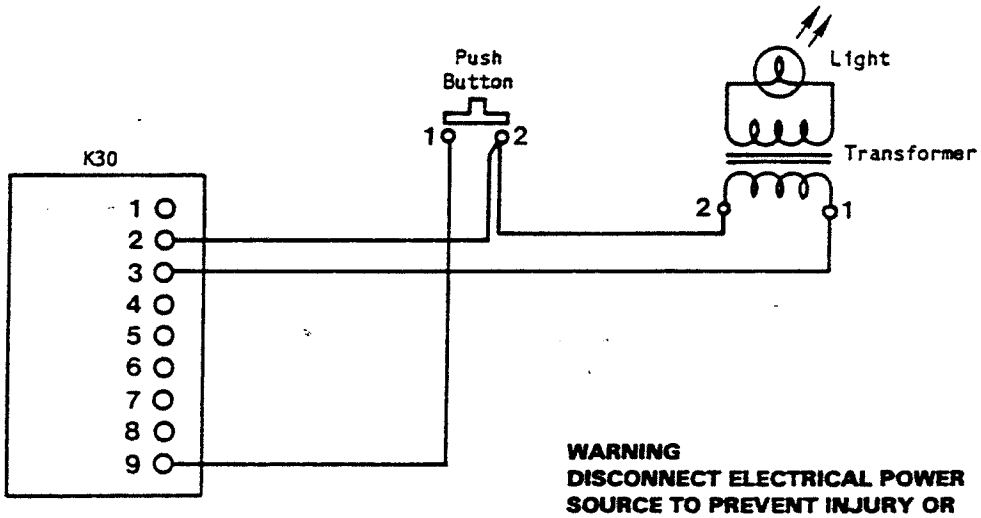


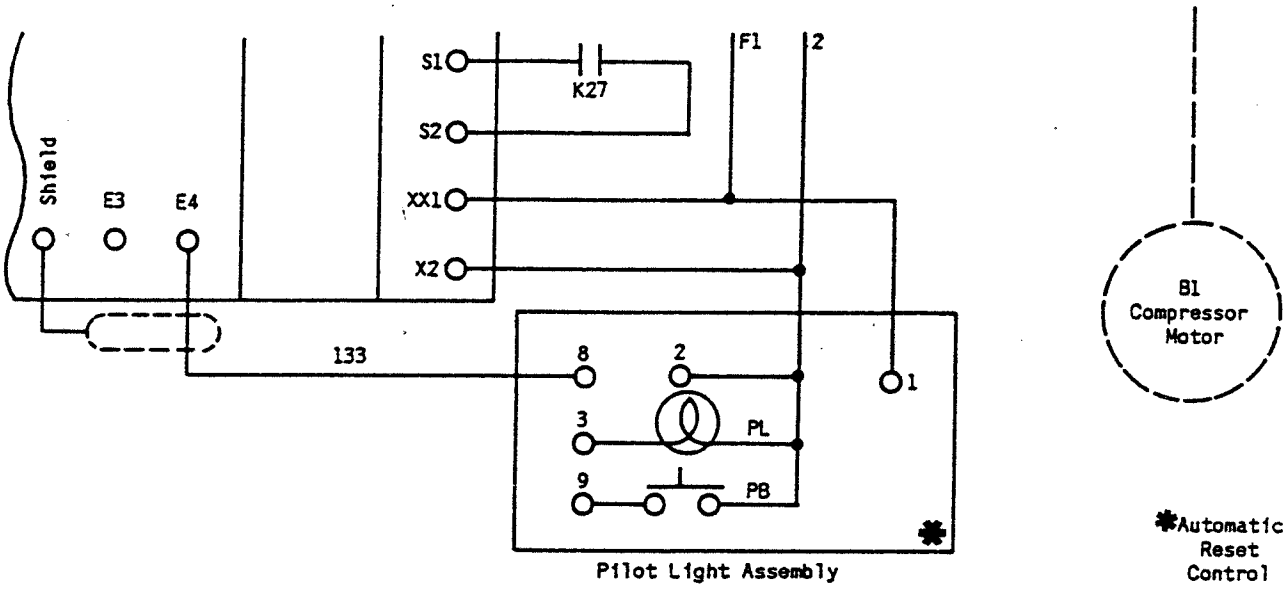
Figure 6
Wiring for Push Button
Pilot Light Assembly

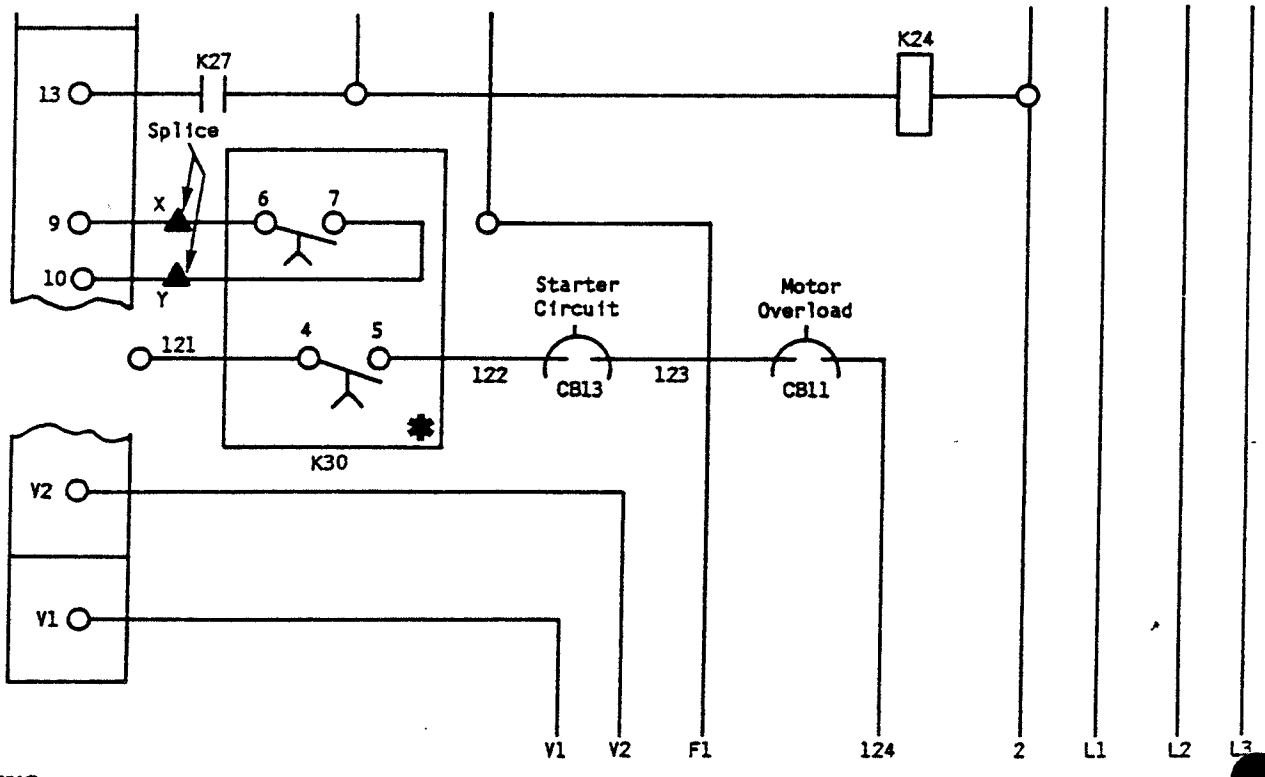


WARNING
DISCONNECT ELECTRICAL POWER SOURCE TO PREVENT INJURY OR DEATH FROM ELECTRICAL SHOCK

CAUTION
Use copper conductors only to prevent equipment damage

Figure 7
Automatic Reset Control
Schematic Diagram





WARNING
DISCONNECT ELECTRICAL POWER SOURCE TO PREVENT INJURY OR DEATH FROM ELECTRICAL SHOCK

CAUTION
Use copper conductors only to prevent equipment damage

"A" and "B" Design Motor/Starter Protection System (MSPS)

1. Mount the automatic reset control (K30) in the upper right-hand corner of the MSPS. The mounting holes are pre-drilled on the "B" design MSPS.

2. Remove the knockout in the MSPS panel door and install the pilot light and push button switch. When the installation is complete, this light will indicate that automatic reset has occurred.

3. Run the two wires from the pilot light to terminals 2 and 3 of the automatic reset control.

4. Run one wire from the push button to the ground side of the pilot light. Run a second wire from the push button to terminal 9 on the automatic reset control.

5. Remove the jumper between terminals 2 and 2A on the MSPS. Run wires from terminals 2 and 2A to terminals 6 and 7 respectively on K30.

6. Disconnect the shielded wires E3 and E4 from the distribution fault circuit breaker (CB14). Reconnect wire E4 to terminal 8 of the automatic reset control (K30). Wire E3 is not needed, so it should be well insulated and tucked out of the way.

7. Run a 120 volt wire from terminal XX1 of the MSPS to terminal 1 of the automatic reset control.

8. Connect terminal 2 of the automatic reset control to terminal X2 of the MSPS.

Terminals 4 and 5 of the automatic reset control are not used. Refer to Figure 1 for wiring details.

Nuisance Tripping of the Low Oil Pressure Fault Indicator

Nuisance tripping of the low oil pressure fault indicator can occur due to improper timing between the automatic reset control, the anti-recycle timer and the oil pump timer of Model CVHE units. This condition can occur when unit attempts to restart after a distribution fault has occurred. The automatic restart control allows for a two minute delay after power has been restored, during which time the oil pump timer is in the post-lube timing cycle. If the anti-recycle timer has timed out, it will begin its normal timing cycle after the two minute lockout cycle of the automatic reset control. In some cases, the post-lube timing cycle of the oil pump timer is completed before the anti-recycle timer can initiate a restart. As the oil pump timer recycles, it interrupts the low oil fault indicator.

To insure that the automatic reset control does not interfere with the timing of the oil pump, the timing of the automatic reset control should be changed from two minutes to thirty seconds, which allows the start signal to be received before the oil pump timer has timed out.

To change the timing of the automatic reset control (Figure 8) to thirty seconds, remove the four cover screws and lift out the panel. The control components are located on the back side of the panel. Remove the resistor shown in Figure 9 and replace it with a 1/2-watt, 120K ohm resistor.

Figure 8
Automatic Reset Control

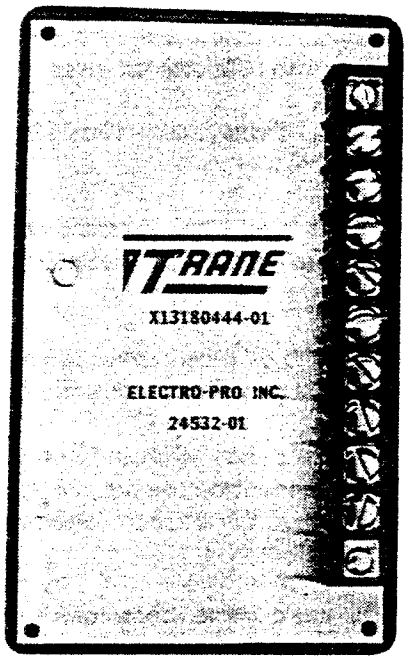


Figure 9
Automatic Reset Control
Replacement Resistor Location