



TRANE™

General Service Bulletin

CVHE-SB-15

Library	Service Literature
Product Section	Refrigeration
Product	Centrifugal Liquid Chillers
Model	CVHE
Literature Type	General Service Bulletin
Sequence	15
Date	10/14/86
File No.	SV-RF-CTV-CVHE-SB-15-1086
Supersedes	

SUBJECT: "STARTER-FAULT" BREAKER/K10 RELAY RACE (CVHEs OF "A" THRU "J" DESIGNS)

INTRODUCTION:

Nuisance tripping of the unit control panel's "starter-fault" circuit breaker may occur in CVHEs of "A" through "J" design as a result of a "relay race" between the K10 relay and the auxiliary contacts on the 1M (K27) contactor. This service bulletin discusses why these nuisance trips occur, as well as what can be done to prevent them.

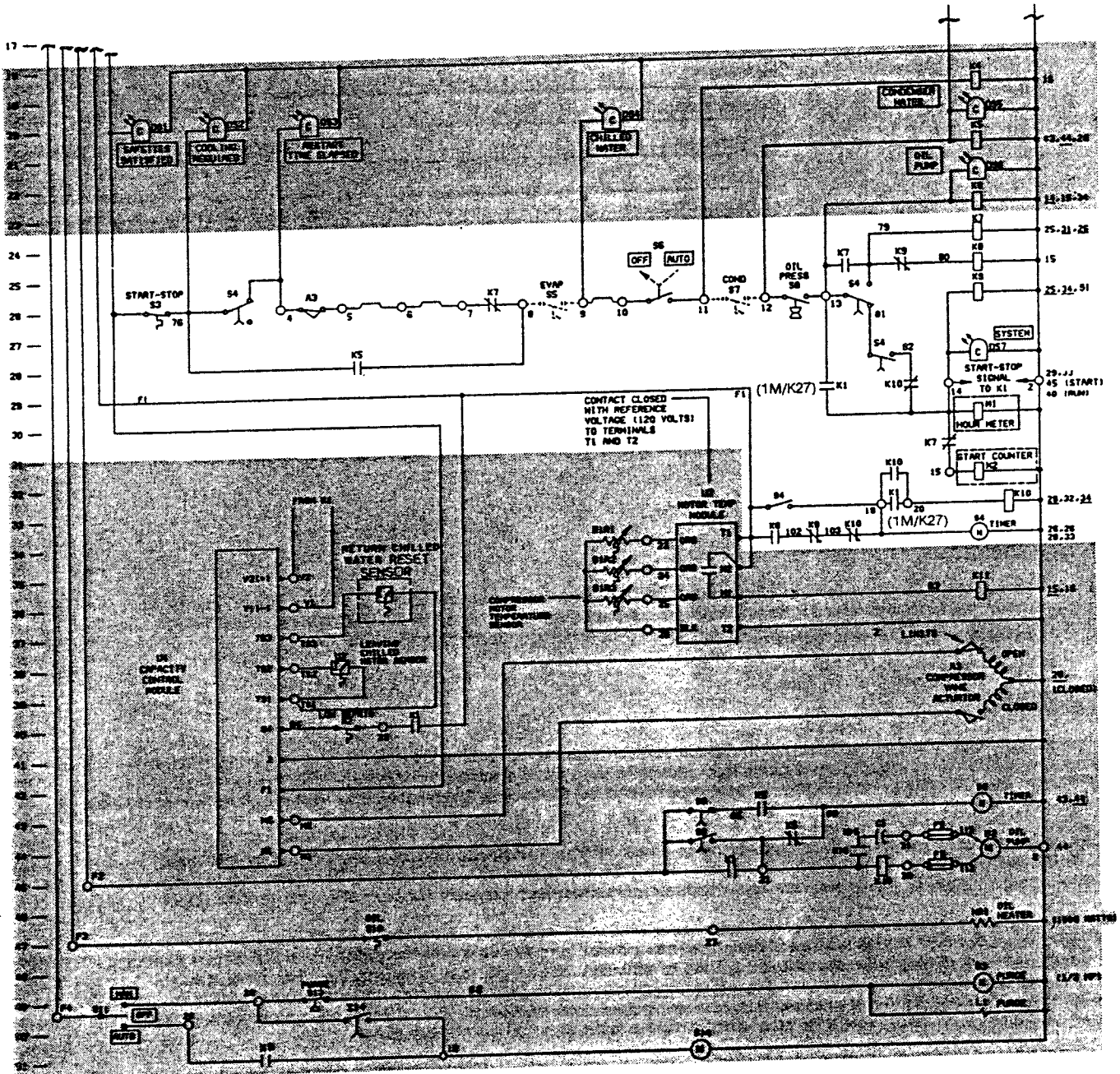
DISCUSSION:

Ordinarily, a normal "start" signal from Terminal 14 of the unit control panel energizes the 1M (K27) contactor which, in turn, closes 2 sets of normally-open auxiliary contacts. (Refer to the typical electrical schematic in Figure 1.) The auxiliary contacts located between Wires 13 and 14 (Lines 26 and 29) close first, followed by those located between Wires 19 and 20 (Line 33).

Notice that closure of the auxiliary contacts between Wires 13 and 14 establishes a "holding" circuit for the "start" signal before the contacts between Wires 19 and 20 can close. This sequence of events assures that the "start" signal is not interrupted when the K10 relay energizes and opens its normally-closed contacts between Wires 82 and 14 (Line 29).

Let's look at what would happen if the contact closure sequence were reversed. Once the inhibit circuit (Line 26) is satisfied (i.e., evaporator and condenser water flows are proven, and oil pressure is established), a "start" signal is sent to the starter panel through the normally-closed set of K10 contacts. If the K10 relay energizes (via closure of the auxiliary contacts between Wires 19 and 20) before the "holding" circuit is established, the starter energizes—but only momentarily. As soon as the normally-closed K10 contacts between Wires 82 and 14 open, the starter panel drops out of the circuit, and the unit control panel's "starter fault" circuit breaker trips 15 to 20 seconds later.

Figure 1
 Typical Electrical Schematic
 for CVHE Units w/Electronic
 Capacity Control
 ("F" thru "J" Designs Shown)



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

CAUTION
 Use copper conductors only
 to prevent equipment damage

Drwg. X39470376

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

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CORRECTIVE ACTION:

Following are 2 solutions designed to eliminate nuisance "starter fault" circuit breaker trips caused by a "relay race" between the K10 relay and the 1M (K27) contactor:

1. Establish the correct wiring sequence for Wires 13 and 14, and Wires 19 and 20.

Ensure that Wires 13 and 14 are connected to a set of normally-open, auxiliary contacts on the 1M (K27) contactor; contacts selected for this purpose should be located as close to the auxiliary-contact actuator as possible (i.e., the auxiliary switch located nearest the starter back panel). Then, connect Wires 19 and 20 to a set of normally-open auxiliary contacts located farther out on the auxiliary contact stack.

This wiring arrangement encourages establishment of the "holding" circuit before the normally-closed contacts of the K10 relay can open.

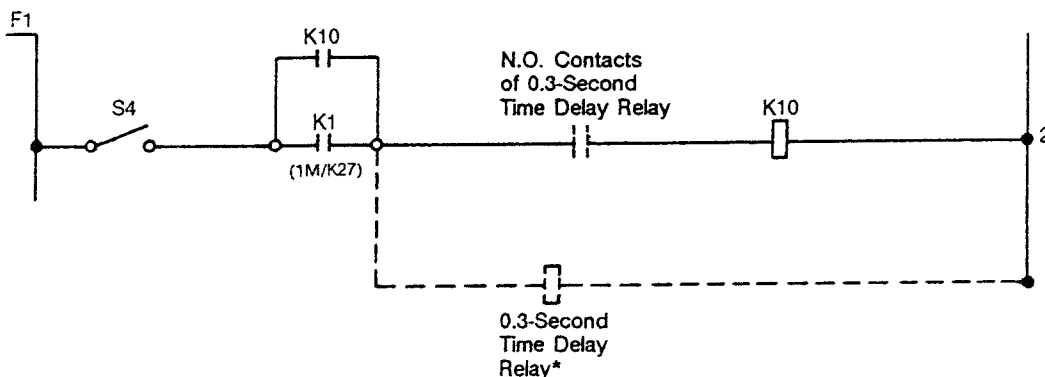
Note: The corrective action recommended above will successfully eliminate nuisance "starter fault" circuit breaker trips in most instances. However, if adjustments to the wiring sequence of Wires 13-14 and Wires 19-20 do not prevent this type of nuisance trip from recurring, it may be necessary to install a time delay relay. See Item 2 below for instructions.

2. Add a 0.3-second time delay relay to the K10 relay circuit.

Connect the normally-open contacts of 0.3-second time delay relay in series with the K10 relay; make sure that the contacts of the time delay relay are installed upstream of the K10 relay coil. Figure 2 illustrates this wiring arrangement.

The addition of this relay postpones the energizing of the K10 relay by 0.3 seconds, thereby assuring that the start signal "holding" circuit is established before the normally-closed K10 contacts open.

Figure 2
Addition of a 0.3-Second
Time Delay Relay to the
K10 Relay Circuit



*The 0.3-second time delay relay typically used for this purpose is RLY-872.

For further information on this product or other Trane products, refer to the "Trane Service Literature Catalog", ordering number IDX-IOM-1. This catalog contains listings and prices for all service literature sold by Trane. The catalog may be ordered by sending a \$20.00 check to: The Trane Company, Service Literature Sales, 3600 Pammel Creek Road, La Crosse, WI 54601.