



Installation Instructions for Undervoltage Release Mechanism (Handle Reset) for F-Frame Motor Circuit Protectors (HMCP)



WARNING

DO NOT ATTEMPT TO INSTALL OR PERFORM MAINTENANCE ON EQUIPMENT WHILE IT IS ENERGIZED. DEATH, SEVERE PERSONAL INJURY, OR SUBSTANTIAL PROPERTY DAMAGE CAN RESULT FROM CONTACT WITH ENERGIZED EQUIPMENT. ALWAYS VERIFY THAT NO VOLTAGE IS PRESENT BEFORE PROCEEDING WITH THE TASK, AND ALWAYS FOLLOW GENERALLY ACCEPTED SAFETY PROCEDURES.

CUTLER-HAMMER IS NOT LIABLE FOR THE MISAPPLICATION OR MISINSTALLATION OF ITS PRODUCTS.

The user is cautioned to observe all recommendations, warnings, and cautions relating to the safety of personnel and equipment as well as all general and local health and safety laws, codes, and procedures.

The recommendations and information contained herein are based on Westinghouse experience and judgement, but should not be considered to be all-inclusive or covering every application or circumstance which may arise. If any questions arise, contact Westinghouse Electric Corporation for further information or instructions.

1. INTRODUCTION

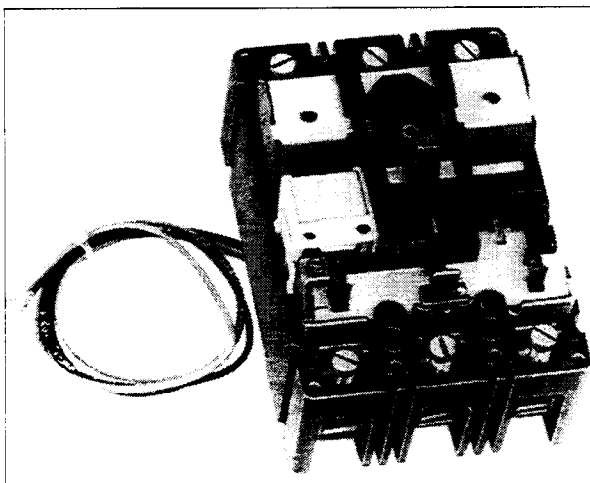


Fig. 1-1. Undervoltage Release Mechanism (Handle Reset) Installed in F-Frame Motor Circuit Protector

GENERAL INFORMATION

The undervoltage release mechanism (UVR) (Fig. 1-1) monitors a voltage (typically a line voltage) and trips the motor circuit protector (HMCP) when the voltage falls to between 70 and 35 percent of the solenoid coil rating. The UVR consists of a continuous rated solenoid with a plunger and tripping lever mounted in a plug-in module. The tab on the tripping lever resets the UVR when normal voltage is restored and the HMCP handle is moved to the reset (OFF) position. With no voltage applied to the UVR, the HMCP contacts will not touch when a closing operation is attempted.

The UVR is available with several voltage ratings for most AC and DC requirements. Table 1-1 lists application and electrical operating rating data for the UVR.

Depending on the model ordered, connections for the UVR are in one of four forms. The standard wiring configuration is pigtail leads exiting the rear of the base directly behind the UVR. Optional configurations include a terminal block mounted on the same side of the base as the accessory, leads exiting the side of the base where the accessory is mounted, and leads exiting the rear of the base on the side opposite the accessory. The 18-inch long pigtail leads are color coded for identification; identification labels are provided for pigtail leads and terminal block terminal points. For allowable locations of all accessories, refer to Frame Book 29-111.

Note: No more than three pigtail leads can be routed through the rear trough in the HMCP base. When the walking beam interlock is used with the HMCP, the rear trough cannot be used for accessory pigtail leads.

This instruction leaflet (IL) gives detailed procedures to install the UVR.

2. INSTALLATION

Note: For sealed HMCP's, Underwriters Laboratories, Inc. UL489 requires that internal accessories be installed at the factory. The UVR is listed only for factory installation under UL File E7819.

Where local codes and standards permit and UL listing is not required, internal accessories can be field installed.

Before attempting to install the UVR, check that the catalog number is correct and the rating of the accessory satisfies job requirements.

The UVR is shown in kit form in Fig. 2-1 and can be supplied as either a right- or left-hand assembly. Depending on the catalog number ordered, the UVR can be installed in the led or right accessory mounting cavity of a 3-pole HMCP. A UVR must be installed in the HMCP before the HMCP is mounted in an electrical system. To install the UVR, perform the following procedures:

Note: A HMCP that is mounted in an electrical system must be removed to install the accessory. To ensure correct accessory installation, the HMCP must be placed on a horizontal surface.



WARNING

BEFORE REMOVING A HMCP INSTALLED IN AN ELECTRICAL SYSTEM, MAKE SURE THE HMCP IS SWITCHED TO THE OFF POSITION AND THERE IS NO VOLTAGE PRESENT WHERE WORK IS TO BE PERFORMED. SPECIAL ATTENTION SHOULD BE PAID TO REVERSE FEED APPLICATIONS. THE VOLTAGES IN ENERGIZED EQUIPMENT CAN CAUSE DEATH OR SEVERE PERSONAL INJURY.

- 2-1. Switch HMCP to the OFF position.
- 2-2. Disconnect and remove HMCP from installation and terminal connections.
- 2-3. Remove eight cover screws and cover. The handle must be in the OFF position if the HMCP has a cover interlock.



CAUTION

DURING INSTALLATION AND FUNCTIONAL CHECKS OF THE UVR, DO NOT PUT PRESSURE ON THE HMCP TRIP MECHANISM ADJUSTING BAR. UNDUE PRESSURE ON THE TRIP MECHANISM ADJUSTING BAR COULD CHANGE TRIP CHARACTERISTICS.

Note: For a UVR having rear or opposite-side exiting pigtail leads, thread leads through trough in side of base before attempting to install the accessory. Pigtail leads exiting in this manner must be eased

through trough as UVR is inserted into mounting cavity.

- 2-4. Press PUSH-TO-TRIP button below escutcheon to trip the operating mechanism. To install the UVR, the HMCP operating mechanism must be in the tripped position.
- 2-5. Route wiring to meet installation requirements (see Fig. 2-2).

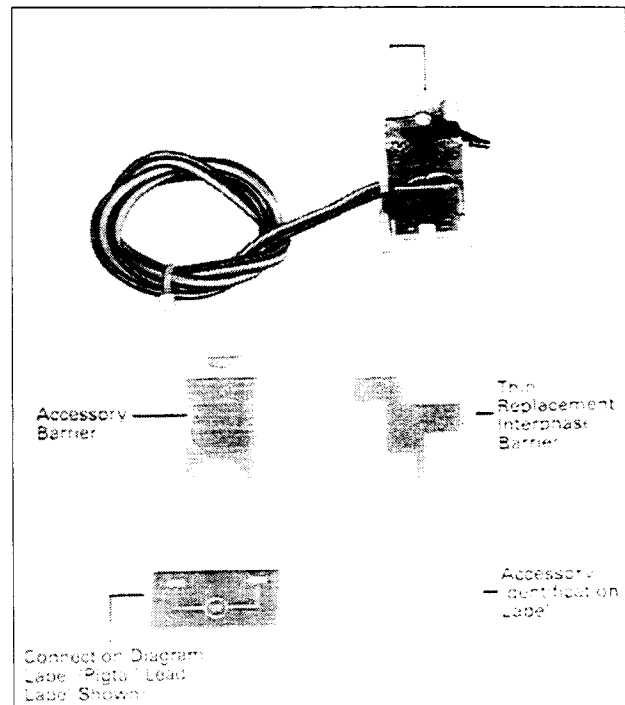


Fig. 2-1. Undervoltage Release Mechanism (Handle Reset) Kit

- 2-6. Insert UVR as described in the following steps (see Fig. 2-3):

Note: Observe position of thin interphase barrier before it is removed. Replacement interphase barrier must be installed in the same slot after the accessory is installed.

- a. Lift out arc extinguisher on the same side of the HMCP as the accessory installation.
- b. Remove thin interphase barrier positioned between molded bearing and thick interphase barrier as shown in Fig. 2-4.

- c. Slide fiberglass barrier into position between molded crossbar (white) and trip bar (red). Long leg of barrier must go into angle in base molding. Bend barrier over and put T-shaped end into moving contact slot in base (see Fig. 2-5).
- d. Install arc extinguisher. Legs of arc extinguisher flexible barrier are positioned under T-shaped end of fiberglass barrier.

IMPORTANT

- e. **Slide UVR plug-in module slowly into mounting slots in base. Gentle pressure on the HMCP handle towards the arc extinguishers will assist the UVR reset tab past the handle.** For terminal block assemblies, slide terminal block into mounting slot in side of base as plug-in module is being positioned.
- f. **Before plug-in module seats fully in mounting slots, reset the circuit breaker and put the handle in the OFF position. Press down UVR module to seat accessory. Make sure UVR trip lever touches flat surface of trip bar (see Fig. 2-7) and reset tab is operated by the handle arm. (See Fig. 1-1.)**

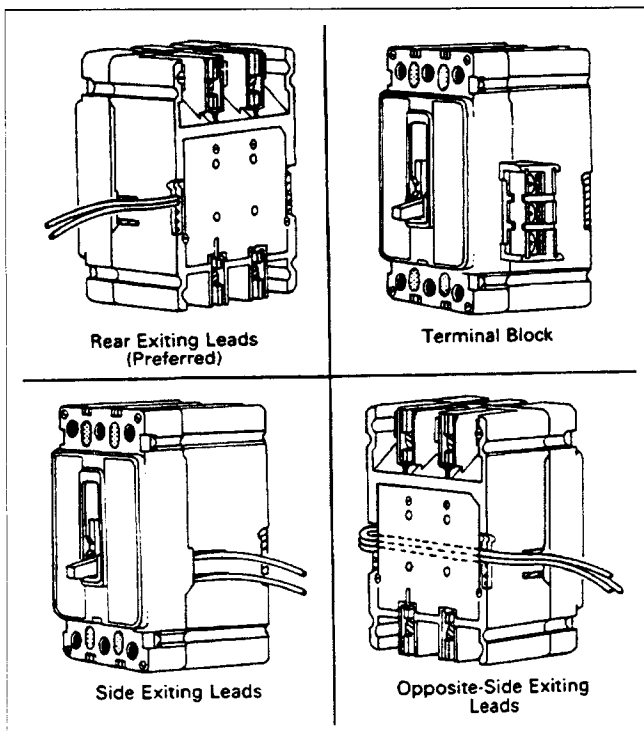


Fig. 2-2. Accessory Wiring Options

Note: When installing replacement interphase barrier after the UVR, make sure the thick interphase barrier remains in position in the HMCP base mounting slots. (See Fig. 2-4.)

- g. Slide thin replacement interphase barrier into position between thick interphase barrier and molded bearing (see Fig. 2-8).
- h. If required, complete routing of opposite-side exiting leads.

**WARNING**

WHEN CHECKING THE ACCESSORY, DO NOT PUT FINGERS NEAR MOVING PARTS INSIDE THE HMCP CASE. SPRINGS CAUSE INTERNAL PARTS TO MOVE QUICKLY AND WITH FORCE. CONTACT WITH MOVING PARTS CAN CAUSE INJURY.

- 2-7. Perform an installation and mechanical check of the UVR after installation.
 - a. Installation check. Hold accessory in base. Reset HMCP. Check that UVR tripping lever pushes plunger into solenoid. HMCP must trip when handle is moved towards the ON position.
 - b. Mechanical check. Hold UVR plug-in module firmly in position in the base. Using a small flat-blade screwdriver as shown in Fig. 2-6, push in and hold solenoid plunger. Reset and switch HMCP to ON. Release solenoid plunger and check that HMCP trips.
 - c. Reset HMCP handle and check that handle arm moves UVR reset tab and tripping lever to reset position.
 - d. If mechanical check does not trip the HMCP, check that the UVR is correctly installed. If UVR appears to be correctly installed and problem persists, contact Westinghouse.



CAUTION

WHEN INSTALLING THE HMCP COVER, MAKE SURE THAT ALL INTERNAL PARTS ARE IN PLACE:

- TOP SHIELDS OF EACH ARC EXTINGUISHER ARE IN THE ARC EXTINGUISHER CAVITIES.
- INTERPHASE BARRIERS ARE FULLY INSERTED IN BASE.
- SLIDING HANDLE BARRIER IS CORRECTLY INSTALLED WITH 0 ON BARRIER OVER ARC EXTINGUISHER.
- PUSH-TO-TRIP BUTTON GOES THROUGH HOLE IN COVER.
- COVER BAFFLE(S) IS IN PLACE IN COVER.
- PIGTAIL LEADS ARE IN BASE SLOTS AND CLEAR OF THE COVER.

2-8. With HMCP handle in the OFF position and pigtail leads (if used) routed as required, install cover and eight cover screws. PUSH-TO-TRIP button should be guided through hole in cover using small flat-blade screwdriver. Start reinstallation of the cover screws carefully to avoid cutting new threads in the base. The torque value for the cover screws is 12-15 in-lb.

2-9. Place labels supplied with kit on HMCP (see Fig. 2-9). When installing UVR in HMCP's with cover mounted accessories, alternate label mounting positions on side of HMCP should be selected.

2-10. Where practical and after taking all necessary safety precautions, apply UVR rated voltage to the UVR. Reset and close HMCP. Confirm HMCP trips when voltage is removed.

2-11. Install HMCP.

Note: Labels on HMCP show connection diagram for UVR contacts. Pigtail leads are color coded orange and brown.

No external resistors are required.

2-12. Connect UVR to power source to be monitored (see Fig. 2-10).

Westinghouse assumes no responsibility for malfunctioning accessories installed by the customer.

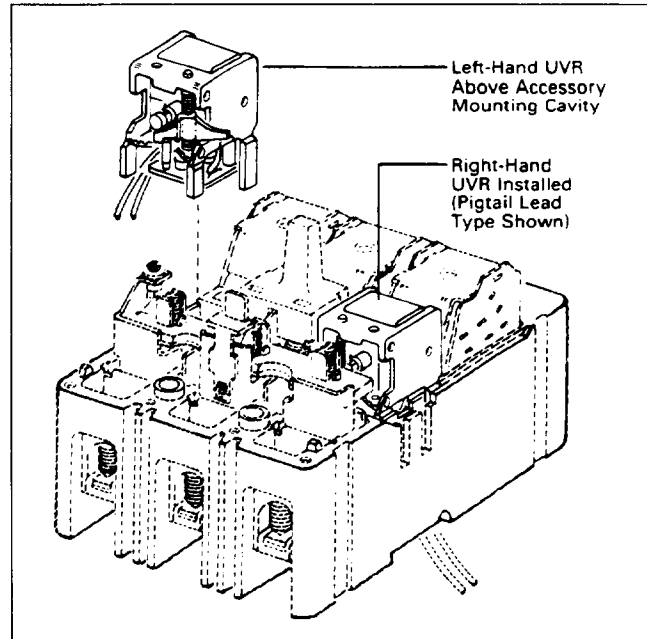


Fig. 2-3. UVR Installation Positions

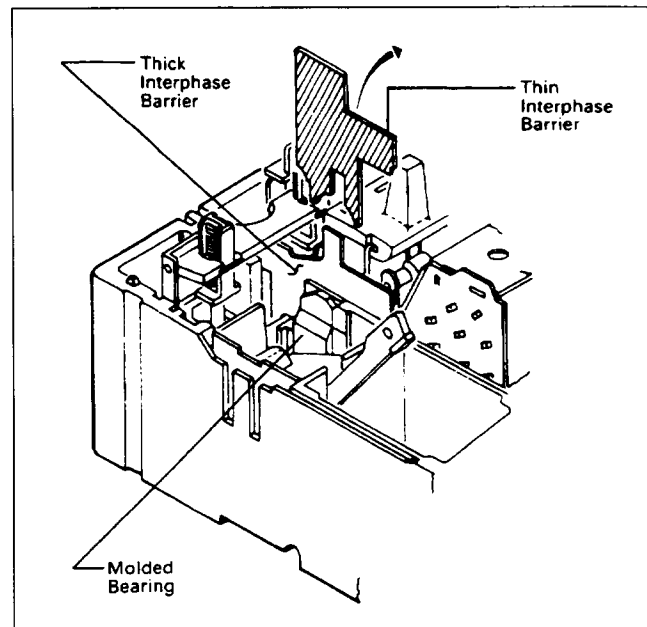


Fig. 2-4. Removal of Thin Interphase Barrier

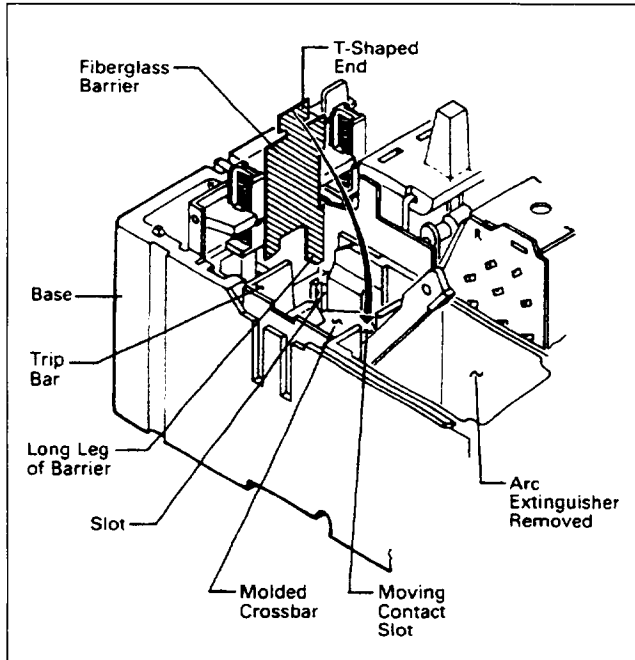


Fig. 2-5. Fiberglass Barrier Installation Position (Right Accessory Mounting Cavity Shown)

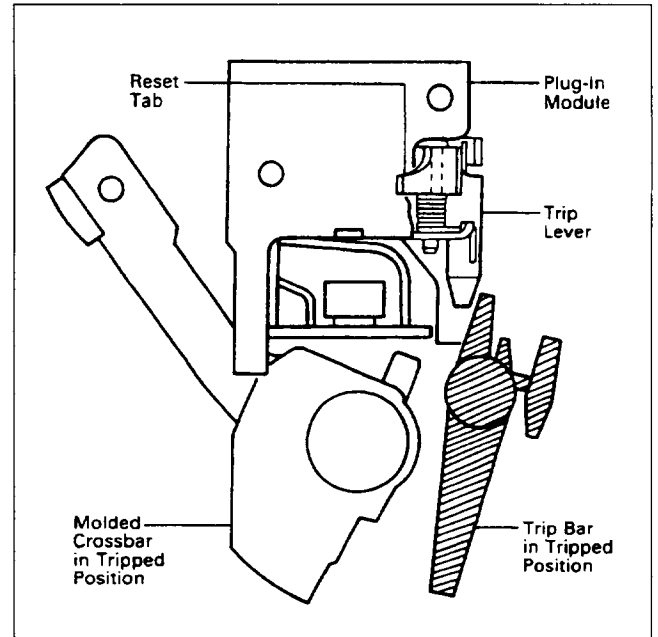


Fig. 2-7. Correct Position for Trip Lever and Trip Bar

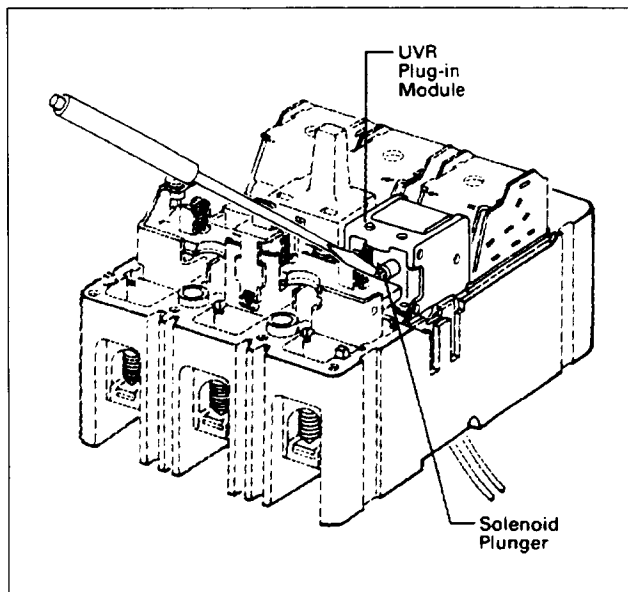


Fig. 2-6. Screwdriver Depressing Undervoltage Release Mechanism Solenoid Plunger

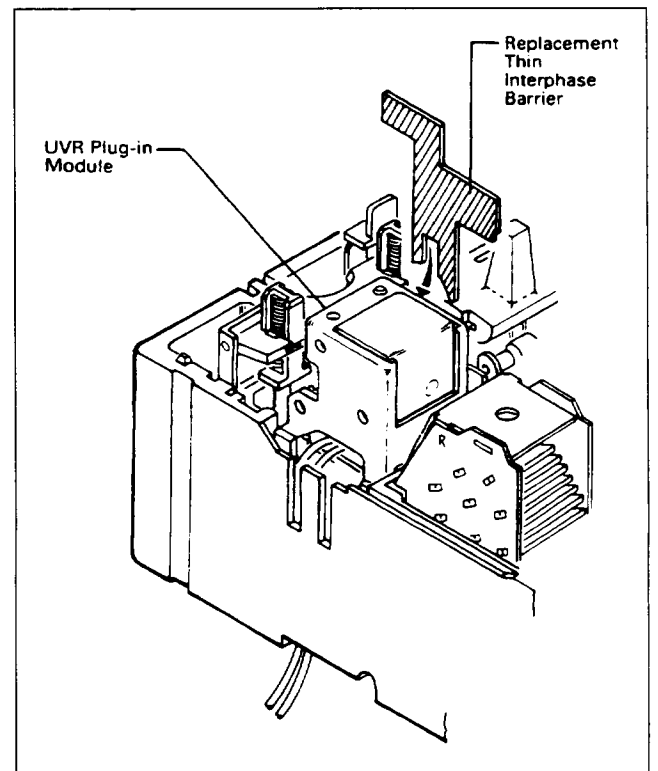


Fig. 2-8. Interphase Barrier Installation

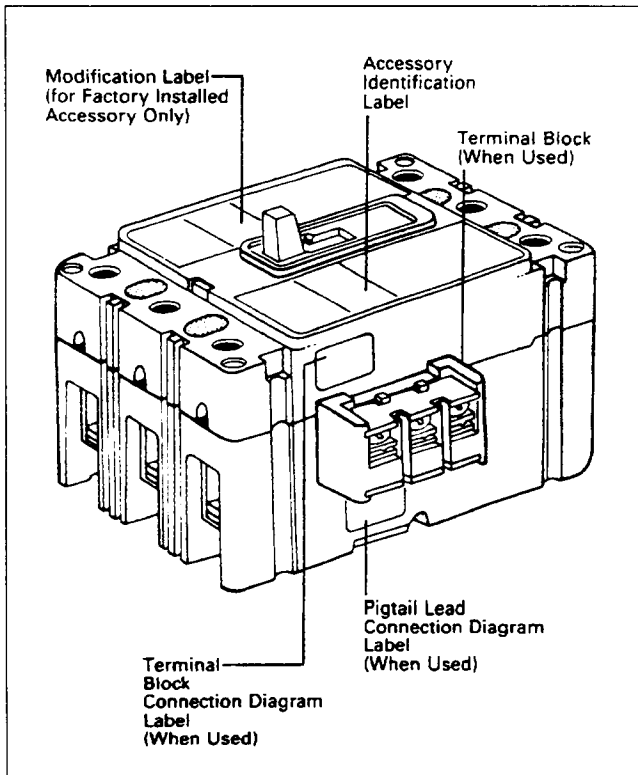


Fig. 2-9. Preferred Mounting Locations for Accessory Name plate Labels

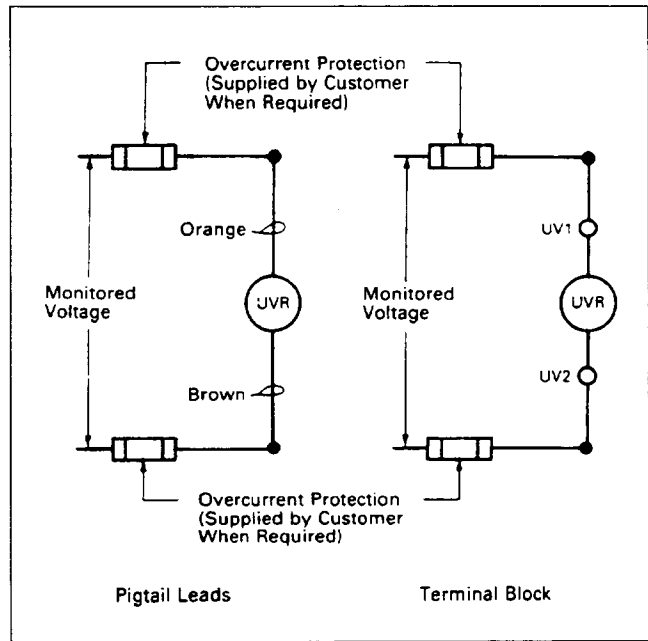


Fig. 2-10. Undervoltage Release Mechanism (Handle Reset) Connection Diagram

TABLE 1-1. UNDER VOLTAGE RELEASE MECHANISM (HANDLE RESET) RATINGS^{①②③}

Catalog Suffix	Application Ratings		Electrical Operating Ratings				Dielectric ^④ Withstand Voltage (V)	
	Voltage (V)	Freq. (Hz)	Supply Voltage (V)	Dropout Voltage (V) Min.	Max.	Pickup Voltage (V) Max.		VA
02	9-12	50-60	9 12	4.2	6.3	7.6	1.3 2.5	1024
03	24	50-60	24	8.4	16.8	20.4	1.4	1048
22	48	50-60	48	16.8	33.6	40.8	1.2	1096
24	60	50-60	60	21	42	51	1.9	1120
08	110-127	50-60	110 120 127	44.5	77	93.5	1.3 1.5 1.7	1254
11	208-240	50-60	208 220 240	85	145.6	176.8	2.2 2.4 2.9	1480
15	380-480	50-60	380 415 440 480	168	266	323	2.9 3.5 3.9 4.6	1960
18	525-600	50-60	525 550 600	210	367	446	4.3 4.8 5.8	2200
20	12	DC	12	4.2	8.4	10.2	2.8	1024
21	24	DC	24	8.4	16.8	20.4	1.6	1048
22	48	DC	48	16.8	33.6	40.8	1.3	1096
24	60	DC	60	21	42	51	2.0	1120
26	110-125	DC	110 120 125	44.5	77	93.5	1.5 1.7 1.9	1250
28	220-250	DC	220 250	87.5	154	187	2.6 3.4	1500

① Terminal block is approved for use with one or two No. 18 to N0. 14 AWG solid or stranded copper wire. Torque is 7 pound-inches (0.8 N. m).

② Endurance - 6000 electrical operations plus 4000 mechanical operations.

③ Initiation of HMCP contact separation begins 8 to 38 ms after voltage drop. Maximum HMCP contact opening occurs within 10 ms after initial separation.

④ For 1 minute.

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