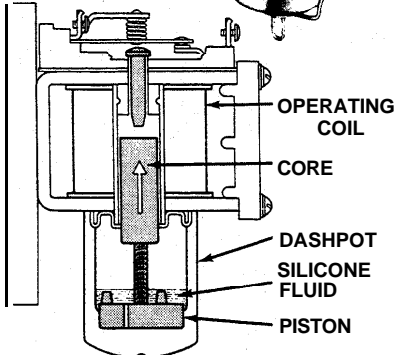
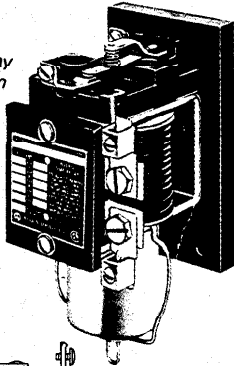




INVERSE TIME CURRENT RELAYS

IMPORTANT - Save for future reference.

Bulletin 810 relay with a maximum continuous current rating of 60 amperes.



Cross sectional view. Moving parts are shaded.

DESCRIPTION - The Bulletin 810 is a magnetically operated current relay, with time delay, for use on AC or DC applications. It has inverse time-current characteristics which are dependent upon the viscosity of the fluid in the dashpot. However, unlike thermal relays, minimum operating current is independent of ambient temperature change or cumulative heating. The relays are supplied as standard with a normally closed (NC) contact and an automatic reset. Available options are a normally open (NO) contact, hand reset, and bifurcated contacts with a clear plastic (poly-carbonate) cover. Tripping current and time delay are adjustable.

TIME DELAY TRIP - Current relays are used when it is desirable to take a motor off the line in a certain period of time after a predetermined load condition is reached. A typical application would be starting a large motor, where the Bulletin 810 is used to automatically open the motor starter control circuit if the motor is

CONTACT RATINGS -

AC						DC	
Maximum Contact Rating Per Pole NEMA Rating Designation A600						Voltage Range	Ampere Rating
Max AC Voltage 60 or 50 Hz	Amperes		Continuous Carrying Current	Volt-amperes			
	Make	Break		Make	Break		
120	60	6	10	7200	720	115-125	0.4
240	30	3	10	7200	720	230-250	0.2
480	15	1.5	10	7200	720	550-600	0.1
600	12	1.2	10	7200	720		

not up to speed in the maximum acceleration time allowed. In this and other applications of the automatic reset type relay, three wire control must be used, with a provision for interrupting the current through the relay coil immediately after the relay trips (see typical schematic diagram on page 3). On two wire control applications such as float switches, pressure switches or thermostats, a hand reset type overload relay must be used to provide this protection to the coil. The relay can carry its rated continuous current in the non-tripped position only.

OPERATION - Current through the Bulletin 810 operating coil imparts an electromagnetic force on the movable core. The vertical position of the core in the coil is adjustable, thereby providing an adjustable trip point. When the coil current increases to the trip point, the core raises to operate the contact mechanism. Time delay is provided by a silicone fluid dashpot mounted below the core and coil assembly. An adjustable valve in the dashpot piston provides for time delay adjustment.

NORMAL CURRENT - The electromagnetic force caused by normal continuous current through the operating coil is not great enough to lift the core and piston. The relay remains inoperative.

OVERCURRENT - When the current through the operating coil increases beyond the trip point, the resultant electromagnetic force causes the core and piston to raise. Upward motion is dampened through the use of the silicone fluid dashpot. The core rises slowly until the

piston reaches an increased diameter in the dashpot, where it is free, to trip the contact with a quick action. Time and current required to complete this cycle are inversely related as shown by the time-current characteristics curves on page 2.

RESET - Standard models of the Bulletin 810 are automatically reset as soon as the current through the coil is interrupted or decreased to approximately 20% of the tripping current. The core is designed to drop quickly, returning the contacts to their normal position. A check valve allows the piston to bypass the fluid in its return to the bottom of the dashpot. The action of hand reset models differs only in that the contacts do not reset until a lever on the contact block is operated. There is no waiting period as with thermal relays.

EFFECTS OF AMBIENT TEMPERATURE - The minimum operating current (100% on the time-current characteristics graph) is independent of ambient temperature at the relay. However, the operating time at overcurrent varies directly to the viscosity of the silicone fluid. Since the viscosity varies inversely with ambient temperature, the operating time is also inversely affected. The time temperature table shows the correction factors to be applied to the operating times for various temperatures.

TIME TEMPERATURE RELATIONSHIP (+40°C Reference) -

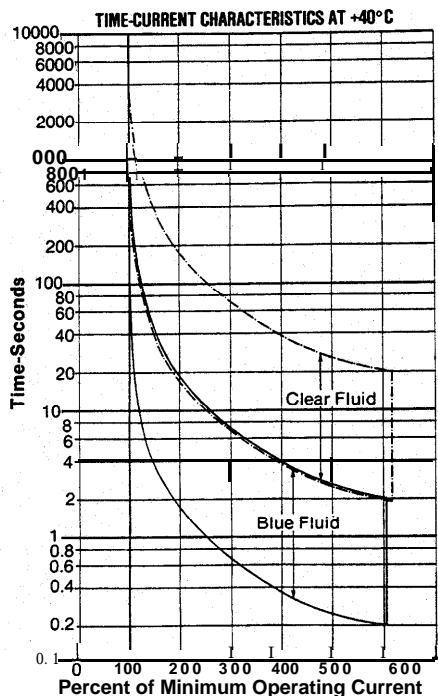
Ambient Temperature (°C)	0°	+10°	+20°	+30°	+40°
Operating Time Correction Factor	2.25	1.80	1.45	1.20	1.0

OPERATING CURRENT ADJUSTMENT - (Not necessary if factory set to user's specified value). The minimum operating current (100% on the time-current characteristics graph) is adjusted by changing the vertical position of the core within the operating coil. Calibration lines on the core correspond to current values in the table on Page 3 and

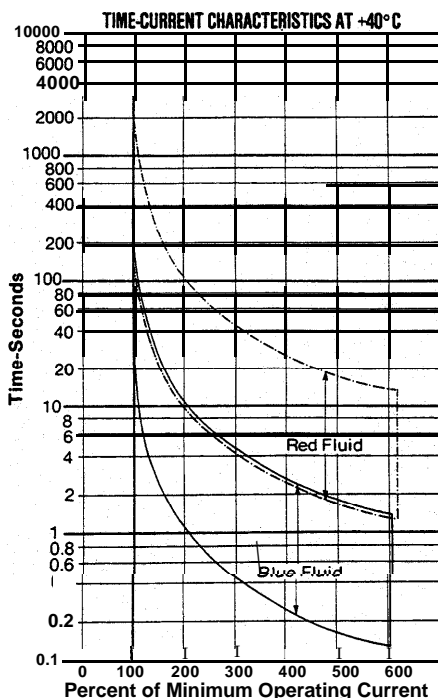
stamped on the nameplate. After the core and dashpot assembly is removed, the core is turned up or down on the piston's threaded stem till the line corresponding to the desired operating current is in line with the **top edge of the dashpot**. Currents other than those indicated by the lines are possible by interpolation.

NOTE: If electrical tests are made of current calibrations they should be done **without fluid in the dashpot** (clean and dry.)

SERIES B RELAY OR SERIES B DASHPOT ■

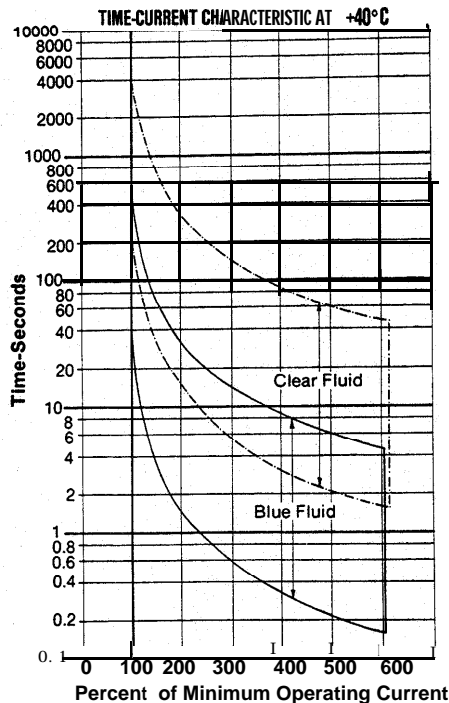


With Series B Fluid

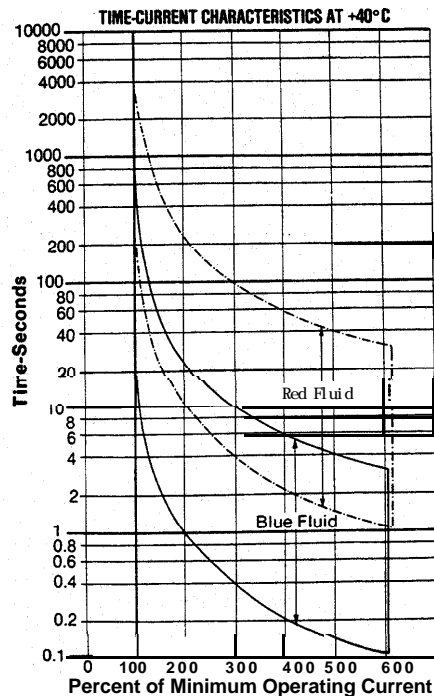


With Series A Fluid

SERIES A RELAY OR SERIES A DASHPOT ■



With Series B Fluid



With Series A Fluid

■ Series B Dashpots are identified by the rib along the side of the dashpot. Refer to photo on back page. Series A do not have this rib.

TO REPLACE THE COIL - Remove the dashpot assembly, contact block, insulator, and coil terminations. On steel panel mounted relays also remove nameplate and its insulator, and the terminal block. Remove set screw holding core guide assembly in side of frame and push core guide assembly down and out. Remove coil washers and coil. Reassemble by reversing above procedure. **Tighten** all fasteners **securely**.

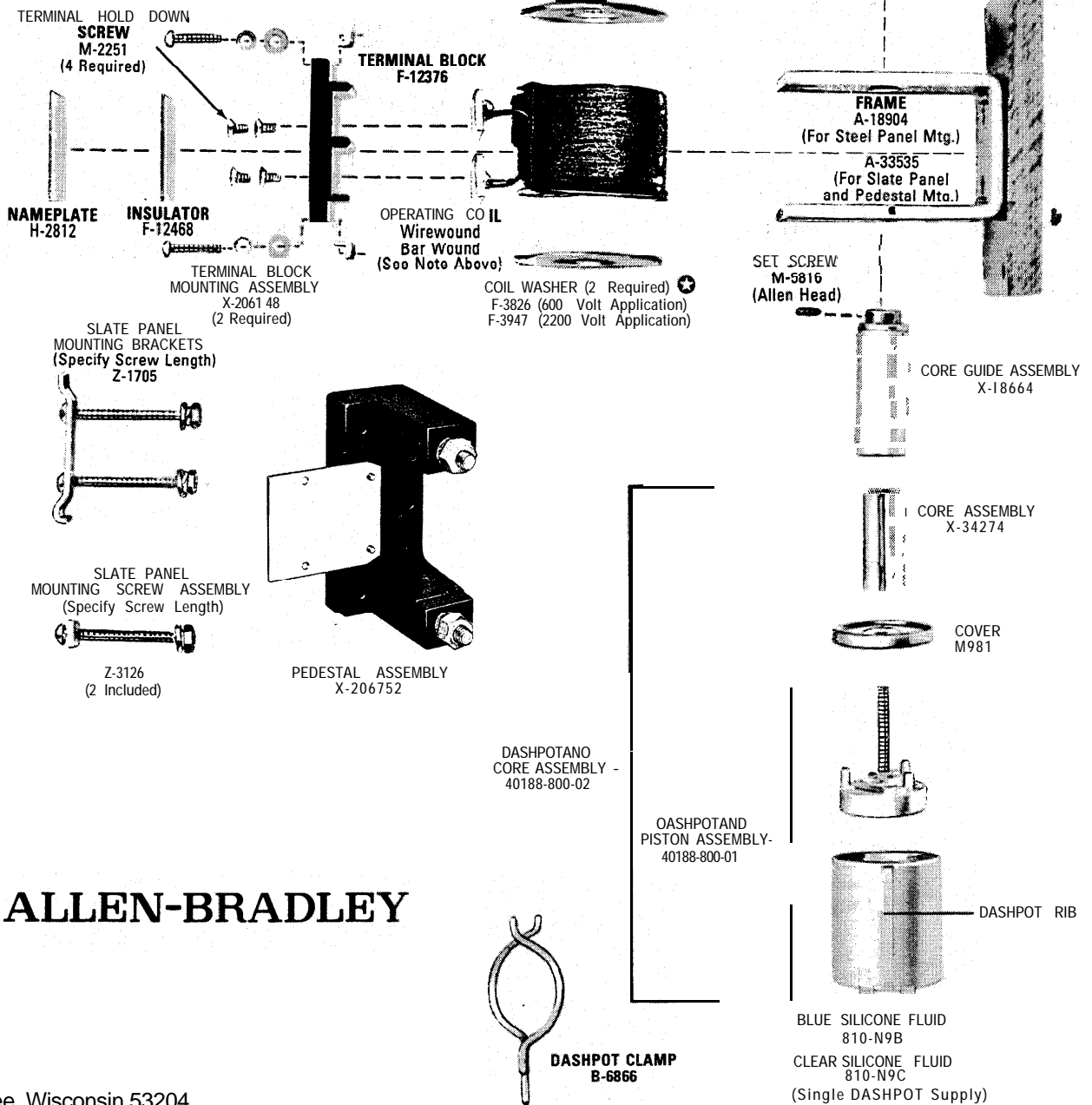
ORDERING INFORMATION - Your order cannot be entered unless the following information is given: Part number, description of part, catalog number and series letter of the relay. This instruction sheet applies also to the above relays when used on control apparatus listed under other Bulletin numbers.

- CONTACT BLOCK** *
- Z-11011 (NO Hand Reset)
 - Z-11012 (NC Hand Reset)
 - Z-11013 (NO Automatic Reset)
 - Z-11014 (NC Automatic Reset)
 - Z-15227 (NC Automatic Reset with Blowout Magnet)
- Z-33833 (NO Hand Reset Bifurcated Contacts)
 Z-33831 (NC Hand Reset Bifurcated Contacts)
 Z-33834 (NO Automatic Reset Bifurcated Contacts)
 Z-33832 (NC Automatic Reset Bifurcated Contacts)
- NO — Normally Open
 NC — Normally Closed

RENEWAL PARTS

Parts indicated with * are recommended spare parts.

DASHPOT COMPONENTS ARE AVAILABLE ONLY IN SERIES B CONSTRUCTION.



ALLEN-BRADLEY