Description
The Contactor Economizing Module (CEM) is a solid state encapsulated module that is designed to apply the proper voltage to pick-up and seal close GE CR193B, C, D and E medium voltage vacuum contactors. The CEM performs the same function as the older CTM, including the anti-pump function, except it utilizes phase control SCRs to control output voltage instead of a series capacitor.

The CEM is powered by 115 VAC nominal AC power, 50/60 Hz. Incoming power is to be applied to terminals “1” and “2” of the module. Use a separate contact in series with the AC power to switch the CEM (and contactor) on and off.

The CEM DC output terminals to the contactor coil are “3” (-) and “4” (+). It is customary to place an additional series switching contact directly in the coil circuit to minimize the contactor drop-out time. When the DC coil current is interrupted by this contact, the L/R coil time constant is greatly reduced, shortening the drop out time of the contactor to about 50 milliseconds. If this additional switching contact is omitted, the contactor drop out time will be as much as 500 milliseconds. It is also recommended to place RC suppression (SUPP, 0.1 MFD capacitor in series with 100 Ω resistor), cat. no. 302A3847P1, directly across the contactor coil terminals to reduce inductive “kick-back” voltages.

The CEM functions as follows: For one second after application of 115 VAC to terminals “1” and “2”, the output voltage between terminals “3” and “4” is in the range of 100 to 110 VDC when the contactor coil is connected. After one second, the voltage is reduced to 20 to 25 VDC for as long as AC power is applied. When AC power is removed, the DC voltage is removed from the contactor coil and the contactor drops out. The cycle is repeated when AC power is reapplied to the CEM. The purpose is to provide the high coil voltage for a long enough period of time necessary to pick up the contactor (1 second) and then transition to a much lower coil voltage to economically maintain the contactor in a sealed closed condition. This reduction in voltage reduces power consumption and greatly reduces temperature rises in the coil.
**Adjustable Power-Dip Ride-Through**

**Description**

The power-dip ride-through feature is available for critical process applications where forced motor shutdowns are very disruptive and where power system outages are expected to last less than 20 cycles (333 milliseconds).

If a loss of power occurs while the main contactor M is closed (see diagram) relays UV and MX transition to the de-energized state. The normally-closed contact of UV and the normally-open contact of MX in the coil circuit overlap as they change state, thus avoiding an interruption of the decaying coil current. The power to the main contactor coil is removed but stored energy in the magnetic armature keeps the contactor closed. After 20 cycles of outage (or less, depending on MX relay time setting), MX (T.O.) contacts time open and interrupt the decaying DC coil circuit, causing the contactor to immediately open. The contactor will now remain open until manually restarted by the START pushbutton.

If power is restored before the MX (T.O.) contacts time open, the MX relay recloses to re-energize the main contactor coil, maintaining the contactor tips closed throughout the outage interval. Use 125VDC MX coil for 115-120 VAC control power (60Hz); or 110 VDC MX coil for 105-110 VAC control power (50Hz).

For a normal STOP operation (using the STOP pushbutton), it is desired to bypass delayed contactor drop out. When the stop pushbutton is pressed, relay MX normally-open contacts open to remove power to both the AC and DC sides of the Contactor Economizing Module (CEM). [The CEM provides, among other things, the rectification of AC voltage to DC for powering the main contactor coil].

**CAUTION:** Overload and other permissive interlocks such as Multilin trip contacts must be non-failsafe. That is, they must not open on loss of control voltage.

**NOMENCLATURE**

- C – 10 MFD CAPACITOR (Cat. NKE#18F232)
- CEM - CONTACTOR ECONOMIZING MODULE
- FILTER - R-C FILTER (Cat. 302A3847P1)
- M - MAIN CONTACTOR (Types CR193 B, C, D&E)
- MX – CONTROL RELAY W/TIMING HEAD
- OL’S - PROTECTIVE RELAY CONTACTS
- PB - PUSHBUTTON
- RECT - RECTIFIER (Cat. 169B7656G2)
- TDAD - TIME DELAY DE-ENERGIZATION
- T.O. - TIME OPENING
- UV – UNDERVOLTAGE RELAY (Cat. RL4RA22TJ)

Mounting means for 10 MFD capacitor – 129B8150G1