

DC Electronic Relays

Application Sheet • May 1991 • New

5370/35

Electronic Overload Relays (EOL) — Type 5370

See Specification Sheet 5370. Note that the electronic overload relay can be used in either the positive or negative line of a DC constant potential power supply. Standard application is the negative line unit, but the positive line EOL was developed for those systems which utilize a grounded negative line power supply.

Electronic Current Relay (ECR) — Type 5374

The electronic current relay monitors an isolated millivolt signal input from the ammeter shunt (AMS) connected in series with a typical DC motor power circuit. The ECR monitors the current flow and can indicate loss of signal, underload or overload conditions, and the output contacts can be used to compensate for the resultant reading.

The typical application shown in figure 1 shows the ECR used as an Electronic Jam Relay (EJR) connected into the control circuit to drop out accelerating contactor 1A (insert resistance into the circuit) and thereby decrease current flow to the motor.

Other applications of the ECR are Field Loss Relays, Field Acceleration Relays, or Field Deceleration Relays.

Electronic Voltage Relay (EVR) — Type 5373

The Electronic Voltage Relay (EVR) is a mill duty, multi-purpose DC voltage sensitive relay which can provide greater accuracy and higher repeatability than electro-mechanical DC voltage relays. While the electro-mechanical voltage relay, once adjusted, is limited to a single dedicated function, the EVR is capable of performing several functions with minor adjustments of the calibrating potentiometers.

The typical application shown in figure 2 is an electronic plugging relay. This is an excellent example of an application where ease of adjustment is an advantage in facilitating plugging action at different motor counter voltages by simply adjusting the potentiometers within the unit.

Other applications include:

Voltage Relay (VR) to establish specific pickup and drop-out voltages for motor service functions such as dynamic braking, slowdown, series/parallel transfer, etc.

Limit Switch Relay (LSR) used as a protective device in dynamic lowering circuits to prevent "runaway" if a power limit switch fails to reset.

"JK" voltage relay used in standard dynamic lowering control circuits to initiate high speed lowering under lightly loaded conditions.

Non-plugging relay applications for field weakened controls of compound wound or shunt wound DC motors.

Electronic Current Balance Relay (ECBR) — Type 5372

The Electronic Current Balance Relay has many applications in the comparison of load signals. Figure 3 uses the ECBR as a Ground Detection Relay measuring and reacting to the differences of current flow in the positive and negative lines.

Figure 4 used the ECBR as a load balance relay on two travel drive motors. Severe unbalance in the load signals here is used to shut down the system when the output contacts of the ECBR are connected in series with the low voltage (LV) relay. Other uses could be made of the relay output such as an alarm signal, decrease torque of one motor with respect to the other, system shutdown, etc.

Electronic Acceleration Module (EAM) — Type 5335

The Electronic Acceleration Module (EAM) is a true time-current acceleration relay for DC motor controllers. The EAM monitors the motor line current from a 50 mV ammeter shunt located in the motor armature circuit and provides rapid acceleration of a light load or fixed time acceleration for heavy loads. In general, the EAM system will allow the controller to accelerate the motor as fast as the loading will allow.

The typical application shown in figure 5 illustrates two points of time current acceleration utilizing the 1AR and 2AR time/current relays.

Figure 1 — Type 5374 Electronic Current Relay Application

Electronic Overload Relay as an Electronic Jam Relay

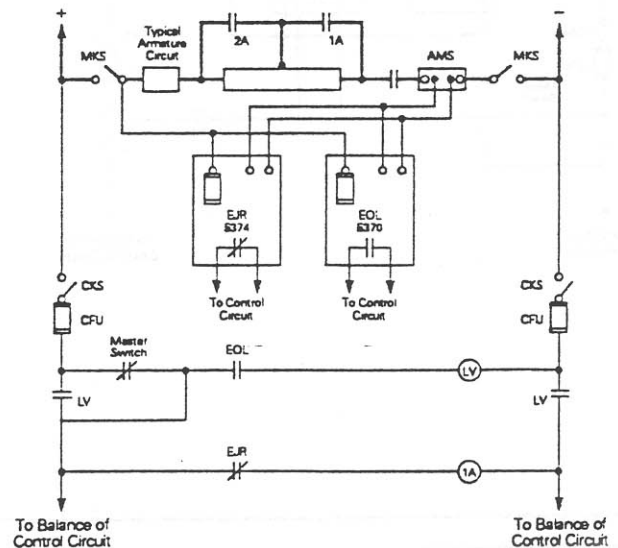


Figure 2 – Type 5373
Electronic Voltage Relay Application

Electronic Plugging Relay

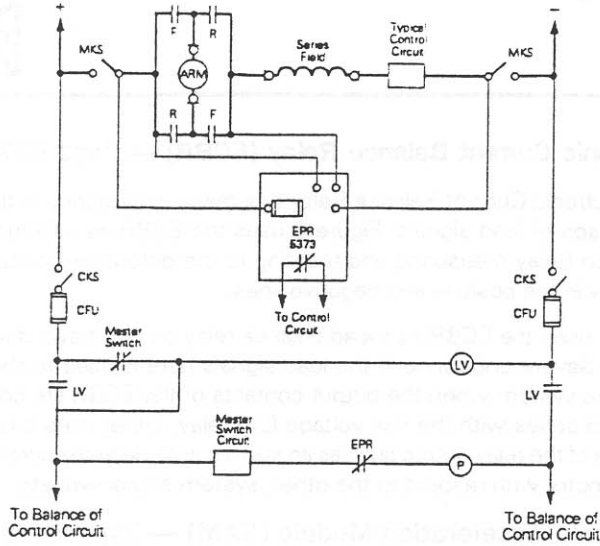


Figure 4 – Type 5372
Electronic Current Balance Relay Appl.

Typical Electronic Load Balance Relay Application

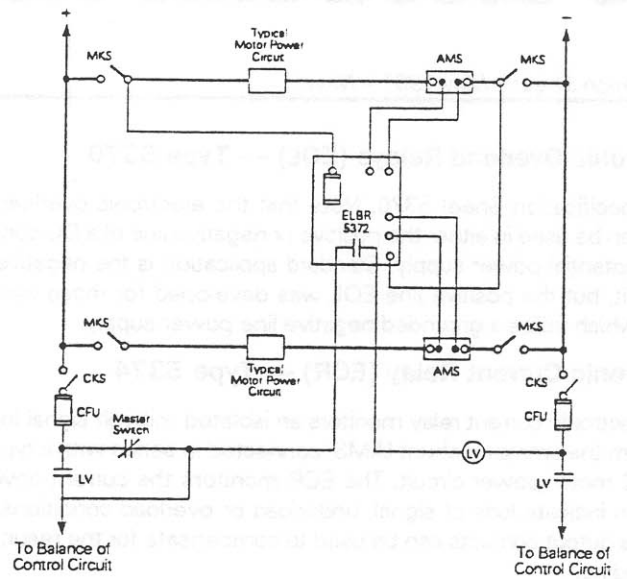


Figure 3 – Type 5372
Electronic Current Balance Relay Appl.

Electronic Ground Detection Relay w/ Shunt Isolation Module

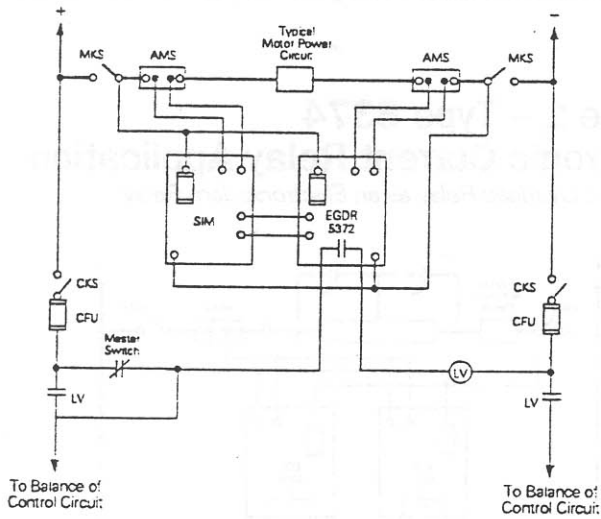
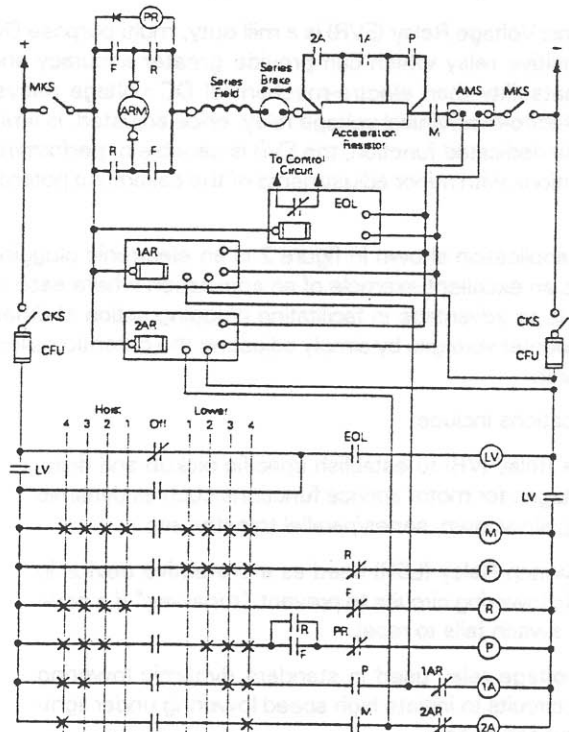


Figure 5 – Type 5335
Electronic Acceleration Module Appl.

Typical Time-Current Acceleration Relay Application



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