Back EMF Monitors

CU3

Description

The CU3 is a control unit which detects stopped motion and is ideal for use with guard locking interlock switches. It is designed to interface with single or three-phase induction motors by measuring the drive voltage and the back electro-magnetic field (emf) of the motor.

The front window of the CU3 can be popped off to reveal a replaceable fuse and a potentiometer. The potentiometer sets the threshold voltage measured at terminals Z1/Z2. The maximum threshold voltage is approximately 2.5V peak (potentiometer turned fully CCW). When the voltage at Z1/Z2 exceeds the threshold voltage, the safety outputs de-energize, and the safety contacts at terminals 13/14 and 23/24 open.

When the supply to a motor is disconnected, motor speed will reduce to zero. During the run down period the back emf generated by the motor is monitored by the CU3. When the level of the back emf dips below the threshold voltage, the safety outputs close. This enables the output device (e.g., solenoid locking or unlocking switch) to be activated.

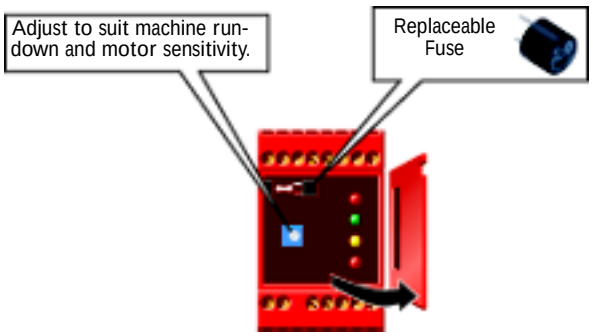
If the Z1/Z2 circuit opens, the CU3 goes into a fault state, indicated by the fault led. The fault must be corrected and the power to the CU3 cycled to clear the fault state.

The 24V DC version must be operated with an isolated supply. The CU3 is not intended for use with variable frequency drives.

Features

- Category 1 per EN 954-1
- Stop category 1
- 2 N.O. safety outputs
- 1 N.C. auxiliary output

Application Details



Specifications

Standards	EN 954-1, ISO 13849-1, IEC/EN 60204-1, IEC 60947-5-1, ANSI B11.19, AS4024.1
Category	Cat. 1 per EN 954-1 (ISO13849-1)
Approvals	C-Tick, CE marked for all applicable directives, cULus & TÜV
Power Supply	24V AC/DC or 110/230V AC
Power Consumption	< 4VA
Inputs	Z1- Z2 Motor voltage
Maximum Motor Voltage	500 V
Reset	Automatic/manual
Outputs	2 N.O. Safety; 1 N.C. Auxiliary
❶ Output Utilization per IEC 60947-5-1 (Inductive)	B300 AC-15 5A/250V AC, 5A/125V AC N300 DC-13 3A/24V DC
Fuses Power (internal, replace.) Motor Input (external) Output (external)	500mA time lag 500mA quick acting 5A quick acting
Max. Switched Current/Voltage	10mA/10V
Indication LED	Red = Power on Red/Green = Timing/Output on Yellow = Fault Red = Motor running
Impulse Withstand Voltage	2500V
Operating Temperature	-10°C to +55°C (+14°F to +131°F)
Humidity	90% RH
Enclosure Protection	IP40 DIN 0470
Terminal Protection	IP20 DIN 0470
Conductor Size	1 x 2.5mm^2 (14AWG) stranded 1 x 4mm^2 (12AWG) solid
Installation Group	C in accordance with VDE 0110
Pollution Degree	3
Torque Settings—terminal screws	1N·m (8lb·in)
Case Material	Red Polycarbonate
Mounting	35mm DIN rail
Weight	510g (1.12lbs)
Electrical Life 220V AC/4A/880VA/cosφ=3.5 220V AC/1.7A/375VA/cosφ=0.6 30V DC/2A/60W 10V DC/0.01/0.1W	 100,000 operations 500,000 operations 1,000,000 operations 2,000,000 operations
Mechanical Life	2,000,000 operations
Vibration	0.75mm (0.30in) peak, 10-55Hz
Shock	30g, 11ms half-sine

❶ See Output Ratings on page 1-29 for details. Consult factory for ratings not shown.

Product Selection

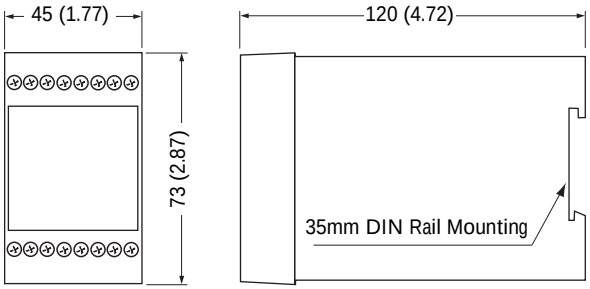
Safety Outputs	Auxiliary Outputs	CU3 Power Supply	Catalogue Number
2 N.O.	1 N.C.	24V AC/DC ❶	**440R-S35001**
		110V AC	**440R-S35002**
		230V AC	**440R-S35003**

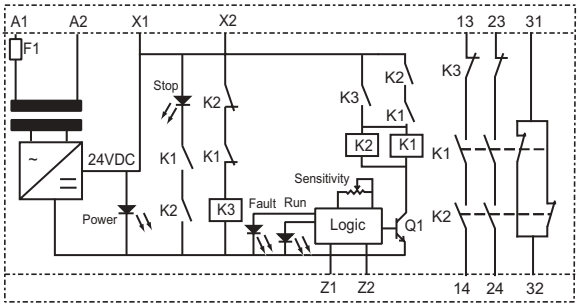
❶ The 440R-S35001 requires an isolated supply when operating on 24V DC.

Accessories

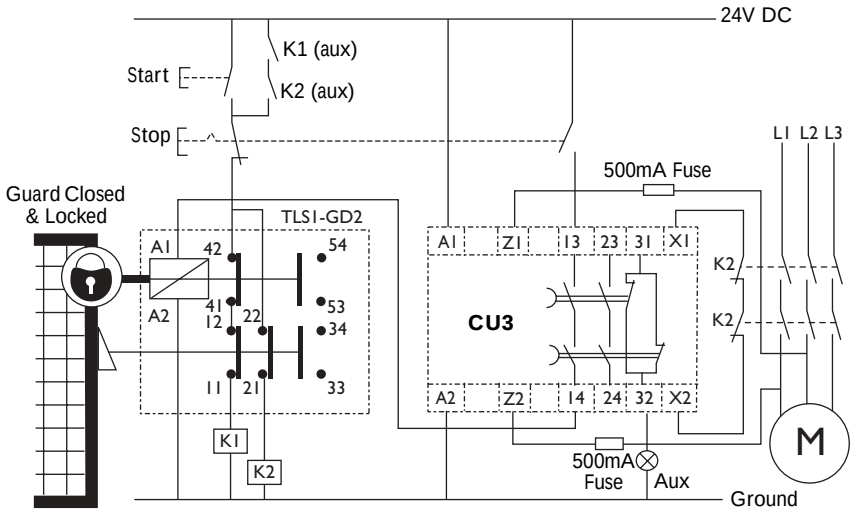
Description	Page Number	Catalogue Number
500mA Fuse	14-6	**440R-A31562**

Dimensions—mm (inches) Block Diagram





Typical Wiring Diagrams



Guardlocking Safety Gate, Back EMF Detection, Automatic Reset, Monitored Output