INSTRUCTIONS
5370
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HUBBELL

hubbell industrial controls, inc.

SERVICE AND REPAIR PARTS
ELECTRONIC OVERLOAD RELAY

General Information

The 5370-48713 Series Electronic Overload Relay consists of an electronic sensing unit, dropping resistors and an output relay. The electronic sensing unit receives line current signals from an ammeter shunt and performs both the inverse time and instantaneous trip functions normally performed by two electro-mechanical overload relays.

One configuration of the Electronic Overload Relay utilizes the ammeter shunt placed in the positive controller line, while the other configuration allows the ammeter shunt to be placed in the negative line. Each configuration is available in one of three versions offering automatic, automatic or manual, or manual reset only of the output relay. The second and third versions also offer latched trip indicators which indicate whether an instantaneous or inverse time condition caused the overload to trip.

How To Select and Set Relay

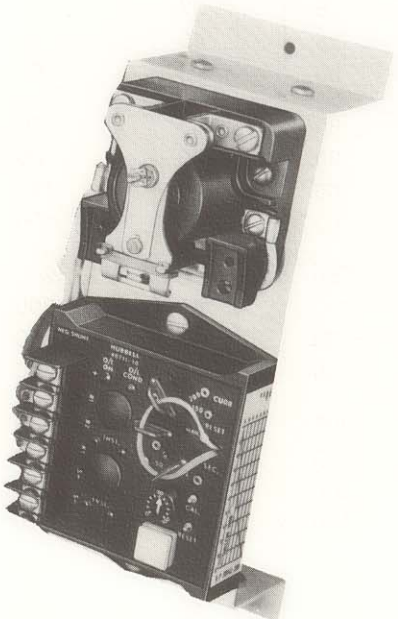
Example:

1) The electronic overload relay is being used to protect a 20 HP 230v dc crane motor. The electrical system has the negative line grounded which calls for a positive shunt configuration.

2) From the Shunt Selection Table, Fig. 3, a 100 Amp, 50mv shunt should be used. The motor's full load current will produce a shunt signal of 40mv from the 50mv shunt.

3) The 40mv shunt signal requires a Dial Setting of 65 (refer to Fig. 4).

For precise settings, the two calibration (CAL) test points next to the potentiometer may be used. With the controller power "off" and using an ohmmeter set to read "0" to "100" ohms, connect the ohmmeter across the calibration test points. Adjust the calibration potentiometer until the ohmmeter reads 65 ohms.



NEGATIVE SHUNT APPLICATION
P/N 5370-48713-10X

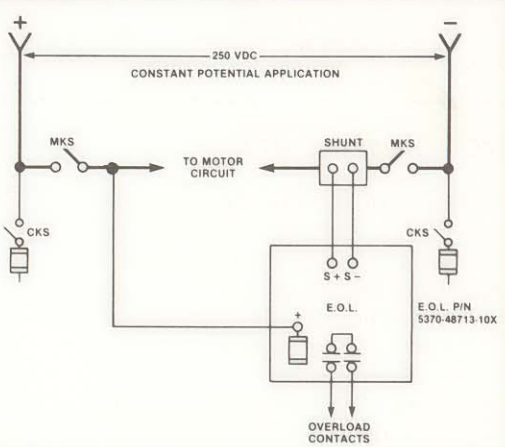


FIG. 1

POSITIVE SHUNT APPLICATION
P/N 5370-48713-20X

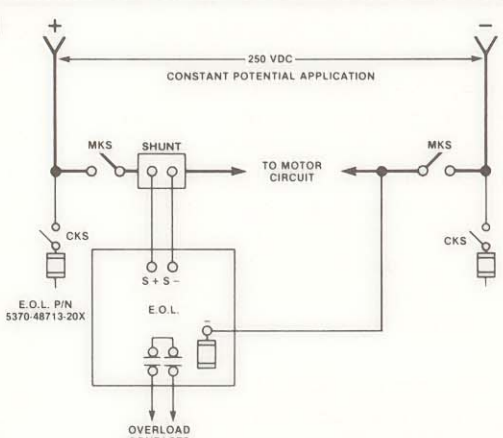


FIG. 2

50mv Shunt Selection Table: (Fig. 3)

HP	MOTOR FULL LOAD AMPS	SHUNTS FOR EOL* RELAY ONLY		SHUNTS FOR EOL* RELAY AND PANEL AMMETER	
		AMP RATING	mv @ † FULL LOAD	AMP RATING	mv @ † FULL LOAD
3	12	25	25	25	25
4	16	25	32	25	32
5	20	25	40	25	40
7½	30	60	25	60	25
10	40	60	33	60	33
15	60	60	50	100	30
20	80	100	40	150	27
25	100	100	50	150	33
30	120	150	40	200	30
35	140	150	47	200	35
40	160	150	53	250	32
45	180	200	45	250	36
50	200	200	50	300	33
60	240	250	48	400	30
75	300	300	50	500	30
100	400	400	50	600	33
125	500	500	50	750	33
150	600	600	50	1000	30
200	800	750	53	1200	33
250	1000	1000	50	1500	33
300	1200	1200	50	2000	30

* (Electronic OverLoad relay)
† Double these 50mv shunt ratings for 100mv shunt applications.
Adapter (P/N 5370-48742-101) is needed for 100mv shunt applications.

Inverse Time & Instantaneous Trip Points (Fig. 5)

The curves are selected by moving the jumper plugs located on the front of the overload relay. For crane service, as indicated in the example, a typical setting for the instantaneous trip would be 250% of full load current and the inverse time would be set for 5 sec. These settings allow for normal acceleration current peaks and acceleration time.

In the event that the jumper plugs would be removed, the electronic overload will still function and provide protection. But it reverts to the 150% instantaneous trip and the 50 sec. inverse time curve.

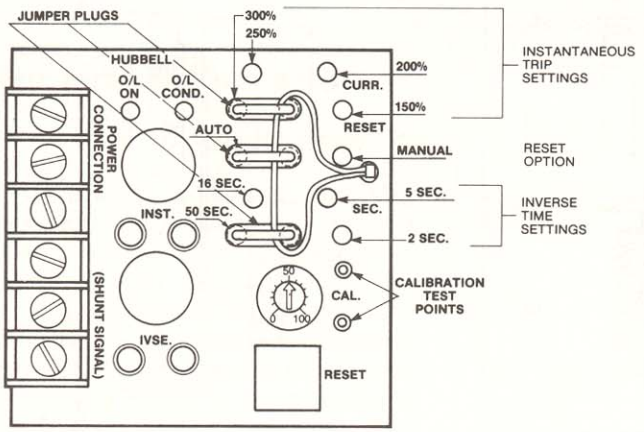
Operation of the electronic overload relay can be verified by watching the green and yellow indicators on the front of the electronic module. The green indicator will be "On" when there is power connected to the overload. The yellow indicator will be "On" when the monitored current exceeds 120% - 125% of full load current. It is normal for the yellow light to wink on and off in response to the motor acceleration current peaks.

Troubleshooting

Operation of the Electronic Overload Relay can be verified by observing the green and yellow indicating LED's on the front of the electronic module. With 250v dc control power applied to the overload module, the green "Overload On" indicating LED should be on and the output relay should be energized. When the motor controller operates and the controller motor is accelerating, the acceleration currents should activate the yellow "Overload Condition" LED momentarily. Therefore, normal operation would be indicated by the green indicator on and the yellow indicator winking on and off following the acceleration current peaks.

I. If the control power is applied and the green LED is not on and the output relay is not energized, check the following:

1. Verify that the proper polarity electronic overload relay has been selected. The 48713-101, 102, 103 relays are negative shunt types and require that the shunt be placed in the negative supply line. The positive connection is made to the "+" terminal on the electronic module. See Fig. 1. The 48713-201, 202, 203 relays are positive shunt types and require that the shunt be placed in the positive supply line. The negative connection is made to the "-" terminal on the electronic module. See Fig. 2.
2. Verify that 250v dc is present at the elctronic overload relay. For negative shunt types, Fig. 1, measure 250v dc from the "+" positive terminal to the "S+" negative terminal. For positive shunt types, Fig. 2, measure 250v dc from the "-" negative terminal to the "S-", positive terminal. If 250v dc is not present, restore power.
3. If 250v dc is present as described above, check the electronic overload relay control circuit fuse. Replace if necessary with a 1 amp 250v fuse, AGC-1 or equivalent.
4. With the control power off, measure the resistance from "+" to "R1" on the 48713-101, 102, 103 assemblies, or from "—" to "R1" on the 48713-201, 202, 203 assemblies. The resistance should read 2500 Ω. If an "open" reading is obtained, check the wiring harness connections on the fuse holder and resistor R1. See Fig. 6. Next check the resistance of resistor R1. Replace if necessary.
5. With control power off, measure the resistance from terminal "R1" to terminal "R2". The resistance should



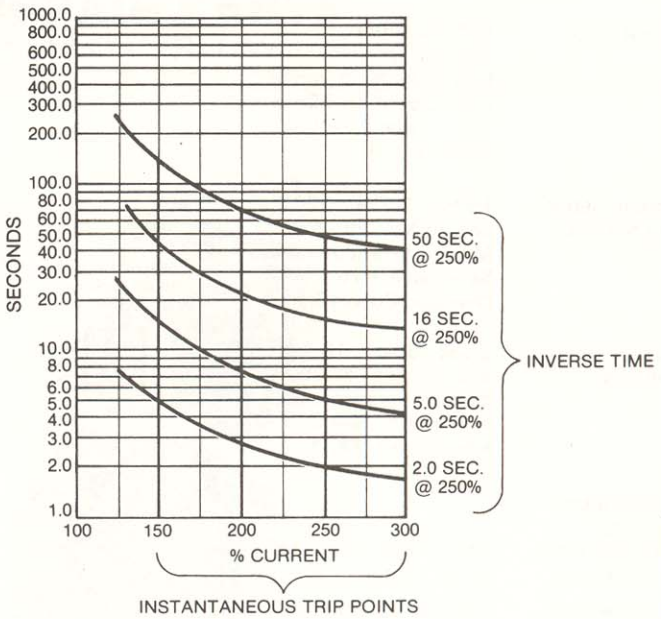
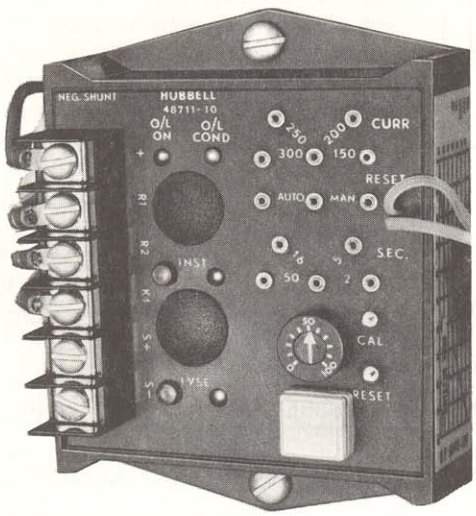


FIG. 5



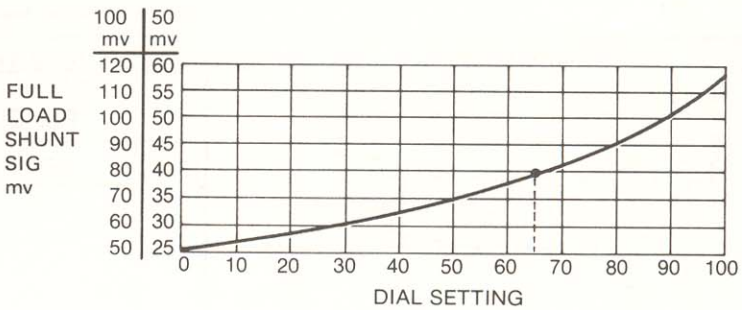


FIG. 4

Troubleshooting (continued)

read 2000 Ω . If an "open" reading is obtained, check the wiring harness connections on resistor R2. See Fig. 6. Next check the resistance of R2. Replace if necessary.

6. With control power off, measure the resistance from terminal "R1" to terminal "K1". The resistance should read about 6000 Ω . If an "open reading is obtained, check the wiring harness connections to the output relay. Next check the resistance of the relay coil. Replace the output relay if the coil measures open.
7. If all of the above tests fail to locate the problem, replace the electronic module.

II. If control power is applied and the green LED is on but the yellow indicator will not respond to the acceleration peaks, check the following:

1. Verify that the electronic overload relay calibration dial setting is properly set. Check setting with recorded setting, see nameplate setting on top of overload relay frame. Readjust if necessary.
2. Verify that the shunt wiring is in accordance with Fig. 1 for negative shunt overloads, or Fig. 2 for positive shunt overloads. Correct wiring if necessary.
3. If the above tests failed to locate the problem, replace the electronic module.

Specifications

Input Voltage	250V DC + 10% —20%
Fuse Rating	1 Amp 250V
Signal Input	50* mv shunt Scaling permits full load signals to range from 25mv to 58mv. See "dial setting" graph Fig. 4.
Instantaneous Trip Settings	150%, 200%, 250%, and 300% of Rated Motor Current Jumper Selectable ± 15%. See Overload Curves Fig. 5.
Inverse Time Settings	2 sec., 5 sec., 16 sec., and 50 sec. at 250% current. Jumper selectable ± 20%. See Overload Curves Fig. 5.
Temperature Stability	
Instantaneous Trip Setting	+3% —0% over full temp. range.
Inverse Time Setting	+3% —5% over full temp. range.
Relay Contacts Material	Silver
Interrupting Rating	0.5A Inductive @ 250V DC.
Temperature Range	—40°C to + 75°C

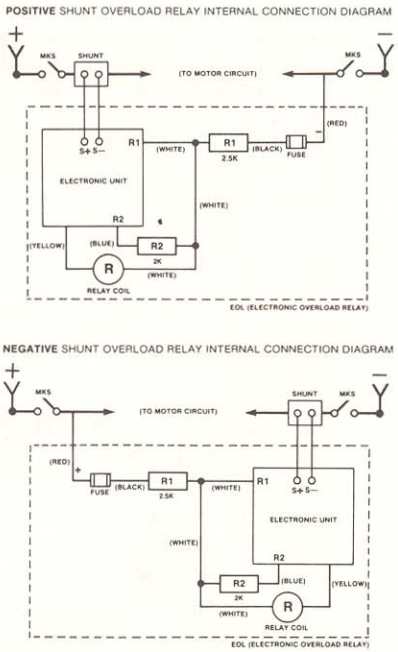
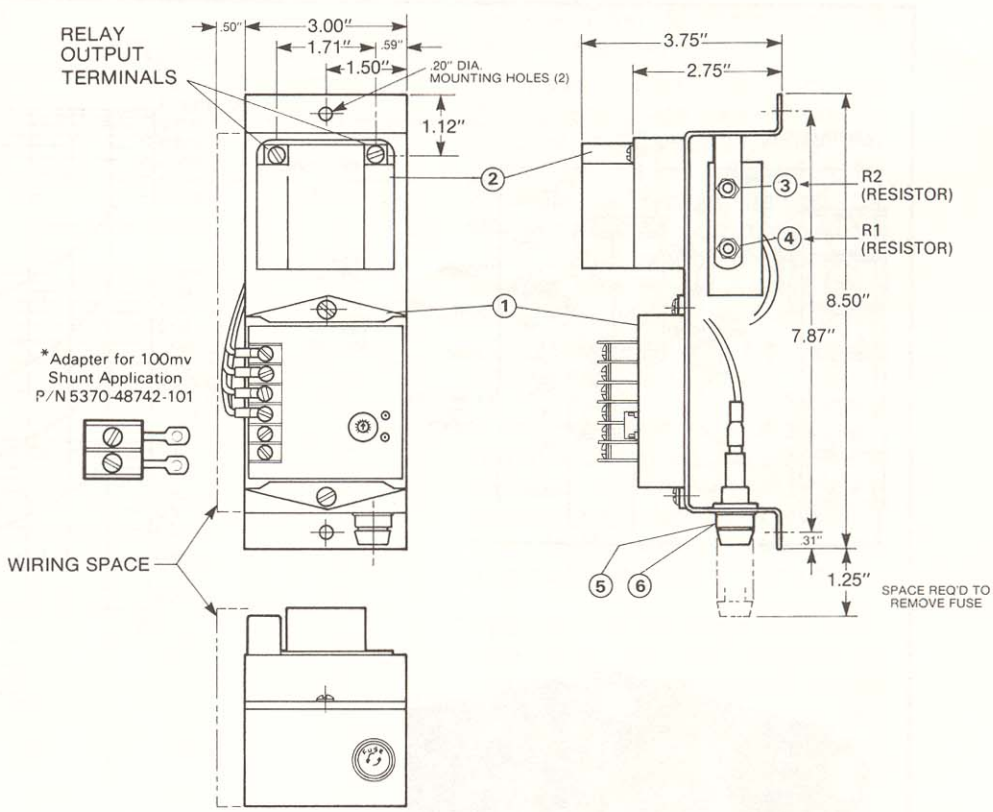


FIG. 6

*Recommended Spare Parts

Dimensions (Do Not Use for Construction Purposes)



*Optional Adapter Available for use with 100mv. Ammeter Shunt

MATERIAL LIST
For Electronic Overload Relay 5370 Series

ITEM	DESCRIPTION	HUBBELL PART NUMBER	QTY.
1	ELECTRONIC UNIT	48711-101 For Overload P/N 5370-48713-101	1
		48711-102 For Overload P/N 5370-48713-102	1
		48711-103 For Overload P/N 5370-48713-103	1
		48712-101 For Overload P/N 5370-48713-201	1
		48712-102 For Overload P/N 5370-48713-202	1
		48712-103 For Overload P/N 5370-48713-203	1
2*	RELAY	31658-038	1
3	RESISTOR 2K 25W (R2)	57419-155	1
4	RESISTOR 2.5K 25W (R1)	57419-156	1
5	FUSE HOLDER	57366-107	1
6*	FUSE 1A 250V	57361-020	1

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