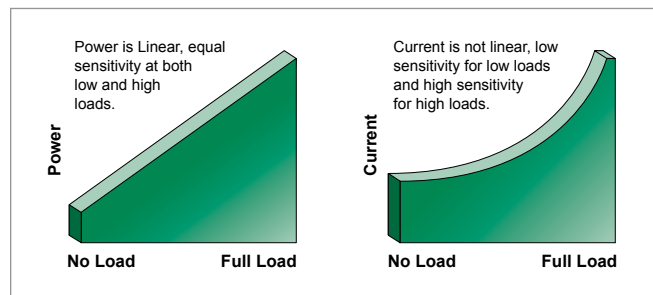


Motor and Pump Protection Relays

77C-KW Series

Single-Phase Current & Voltage Monitor



Description

The 77C-KW single-phase relay is part of the 777/77C product family. The 77C-KW, 77C-KW/HP and 77C-LR-KW/HP are fully programmable pump protection relays that monitor for high or low voltage and overload and underload conditions based on power. These overload relays are designed to protect any motor drawing 2–800 full load A (external CTs are required above 90 A). The 777-HVR-SP and 77C are for single-phase 100–240 V ac applications.

All of the overload relays provide unsurpassed protection by combining overload, underload, and voltage in one unit. For standalone applications, the units incorporate a 3-digit LED display that is used for programming, providing real-time operational information, and displaying diagnostic codes to aid in troubleshooting a fault condition.

The units also feature a network communications port that can be used with communication modules, listed in the 777 accessories section, to form a Modbus*, DeviceNet™, Profibus, or Ethernet network. Up to 99 units can be remotely monitored and controlled from a PC, PLC, or SCADA system, and data logging through a PC with the optional Solutions software. This capability allows for a simple, cost-effective way to meet new requirements for arc-flash safety.

The underpower trip feature is desirable anytime the current vs. load characteristic is non-linear or has little change. In general terms, smaller motors and slow-speed motors have little change in current over the normal load range. Larger motors that are running light loads will also show small current changes over the operating load range. Common uses include pumping applications where motors run slower than 3400 rpm and usually have small current versus load changes, such as slow speed mixers or agitator motors up to 50 hp, mag-drives, or can pumps.

Note: The Littelfuse PumpSaver® relay provides the high sensitivity of a power monitor to protect pump motors from dry run and dead head conditions.

*Compatible with Modbus using optional communications module (RS485MS-2W).

Features & Benefits

FEATURES	BENEFITS
Underload protection	Increases reliability for non-linear motors where the load characteristic has little change
Built-in display	Visual indication for programming, viewing real-time voltage, current, kilowatts or horsepower, and last fault code
15 programmable criteria settings	Allows user flexibility to fine tune the relay for maximum protection with any application
Last fault memory	Provides instant troubleshooting diagnostics
Remote display compatibility	Increases safety through remote display of real-time data and fault history. Aids with arc-flash safety regulations.
Flexible reset	Reset options: automatic, manual using pushbutton on relay, or remote with optional 777-MRSW or OL-RESET remote reset kit.

Motor and Pump Protection Relays

77C-KW Series

Applications

- Conveyor systems
- HVAC equipment
- Saws and grinders
- Fan motors

Specifications

Input Voltage	100–240 V ac, 1Ø
Frequency	50–60 Hz
Motor Full Load Amp Range	
77C-KW/HP	2–25 A (loops required); 26–90 A (direct); 91–800 A (external CTs)
77C-LR-KW/HP	1.0 A - 2.0 A (additional loop); 2.0 A - 9.0 A (direct)
Short Circuit Withstand Rating	100 kA per UL and CSA
Power Consumption	5 W (Maximum)
Output Contact Rating SPDT (Form C)	Pilot duty rating: 480 VA @ 240 V ac General purpose: 10 A @ 240 V ac
Expected Life	
Mechanical	1 x 10 ⁶ operations
Electrical	1 x 10 ⁵ operations at rated load
Accuracy at 25 °C (77 °F)	
Voltage	±1 %
Current	±3 % (Direct, No External CTs)
Timing	5 % ± 1 second
Repeatability	
Voltage	± 0.5 % of nominal voltage
Current	± 1 % (Direct, No External CTs)
Standards Passed	
Electrostatic Discharge (ESD)	IEC 61000-4-2, Level 3, 6 kV contact, 8 kV air
Radio Frequency Immunity (RFI)	
Conducted	IEC 61000-4-6, Level 3 10 V/m
Radiated	IEC 61000-4-3, Level 3 10 V/m
Fast Transient Burst	IEC 61000-4-4, Level 3, 3.5 kV input power
Surge	
IEC	IEC 61000-4-5, Level 3, 2 kV line-to-line; Level 4, 4 kV line-to-ground
ANSI/IEEE	C62.41 Surge and Ring Wave compliance to a level of 6 kV line-to-line
Hi-potential Test	Meets UL 508 (2 x rated V +1000 V for 1 min.)
Vibration	IEC 68-2-6, 10-55 Hz, 1 mm peak-to-peak, 2 hours, 3 axis
Shock	IEC 68-2-27, 30 g, 3 axis, 11 ms duration, half-sine pulse
Mechanical	
Dimensions	H 78.74 mm (3.1"); W 99.06 mm (3.9"); D 129.54 mm (5.1")
Terminal Torque	7 in.-lbs.
Enclosure Material	Polycarbonate
Weight	1.2 lbs
Maximum Conductor Size Through 777	0.65" with insulation
Environmental	
Temperature Range	
Ambient Operating	-20 °C–70° C (-4 °F–158 °F)
Ambient Storage	-40 °C–80° C (-40 °F–176 °F)
Pollution Degree	3
Class of Protection	IP20, NEMA 1
Relative Humidity	10–95 %, non-condensing per IEC 68-2-3
Programmable Operating Points	Range
LV- Low Voltage Threshold	85 V - HV Setting
HV- High Voltage Threshold	264 V - LV Setting

Motor and Pump Protection Relays

77C-KW Series

**MULT- # of Conductors or
CT Ratio (XXX:5)**

77C:

77C-LR:

OC- Overcurrent Threshold

TC- Overcurrent Trip Class*

RD1- Rapid Cycle Timer

**RD2- Restart Delay After All
Faults Except Undercurrent
(motor cool down timer)****

**RD3- Restart Delay After Undercurrent
(dry well recovery timer)**

**#RU- Number of Restarts
After Undercurrent**

ADDR- RS485 Address

**#RO-Number of Restarts
After Overcurrent**

LP/PWS (PWS = LP Range)

1–10 Conductors or 100-800 Ratio

1 or 2

$(20-100\text{ A}) \div \text{MULT}$ or 80–120 % of CT Primary

5, J5, 10, J10, 15, J15, 20, J20, 30, J30, or LIn (linear)

0, 2–500 seconds

2–500 minutes/seconds

2–500 minutes/seconds

0, 1, 2, 3, 4, A (Automatic)

A01- A99

0, 1, 2, 3, 4, A (Automatic)

1 = 0.01 - 0.99 KW

2 = 1.00 - 9.95 KW

3 = 10.0 - 99.5 KW

4 = 100 - 650 KW

5 = 0.01 - 1.30 HP

6 = 1.34 - 13.3 HP

8 = 13.4 - 133 HP

9 = 134 - 871 HP

SETTING	RD2	RD3
0	Minutes	Minutes
1	Minutes	Seconds
2	Seconds	Minutes
3	Seconds	Seconds

* If J Prefix is displayed in trip class setting, jam protection is enabled. If programmed to LIn position, overcurrent trip delays are fixed linear-type delays set in OPT1 position.

** RD2 & RD3 can be changed from minutes to seconds under program position OPT2.

Certification & Compliance

UL	UL508, UL1053 (File #E68520)
CSA	C22.2
CE	IEC 60947-1, IEC 60947-5-1

Motor and Pump Protection Relays

77C-KW Series

Accessories

RS485MS-2W Communication Module

Required to enable the Modbus communications function on Model 77X-type products.

Communication Adapters

- **RS485-RS232**—Converter with cable & plug
- **RS485-USB**—Converter with cable & plug
- **RS232-USB**—Converter

Specifications match industry standard.

RM1000 Remote Monitor

The RM1000/777 motor management system combines unsurpassed electronic motor protection and critical, user-friendly, motor monitoring for up to 16 devices.

RM2000 Remote Monitor

The RM2000/777 motor management system combines unsurpassed electronic motor protection and critical, user-friendly, motor monitoring with event storage and real-time clock for date and time stamp.

Solutions Software: Solutions-M

Software features include data logging, real-time data monitoring and fault and event monitoring.

777-MRSW Manual Remote Reset Kit

Allows the 777 line of MotorSaver® and PumpSaver® products to be manually reset without opening the panel door.

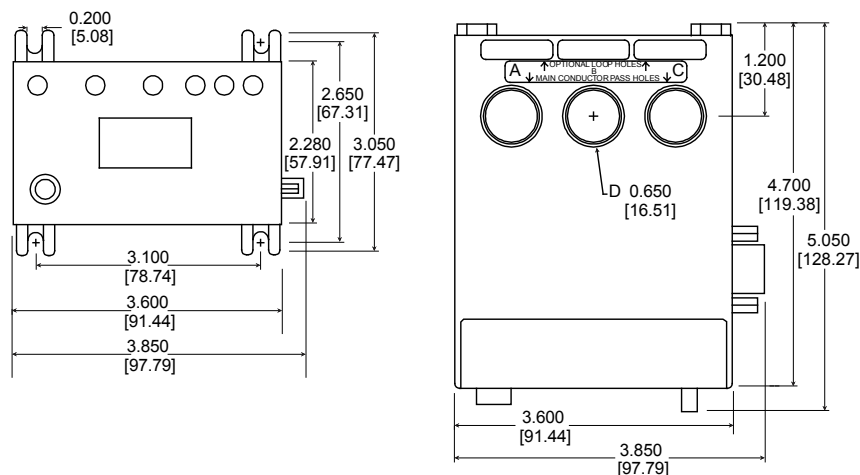
OL-RESET Manual Remote Reset Kit

Allows the 777 line of MotorSaver® and PumpSaver® products to be manually reset without opening the panel door.

Ordering Information

MODEL	LINE VOLTAGE	MOTOR FULL AMP RANGE	DESCRIPTION
77C-KW/HP	100–240 V ac	2–90 A (external CTs required above 90 A)	Provides 480 VA @ 240 V ac output SPDT (Form C) relay contacts
77C-LR-KW/HP	100–240 V ac	1–9 A (external CTs required above 9 A)	Provides 480 VA @ 240 V ac output SPDT (Form C) relay contacts

Dimensions Inches (mm)

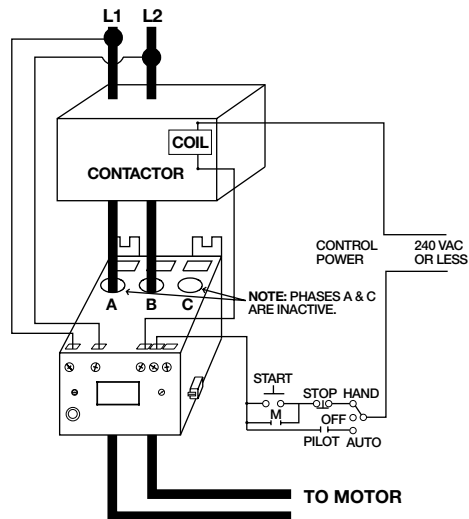


Motor and Pump Protection Relays

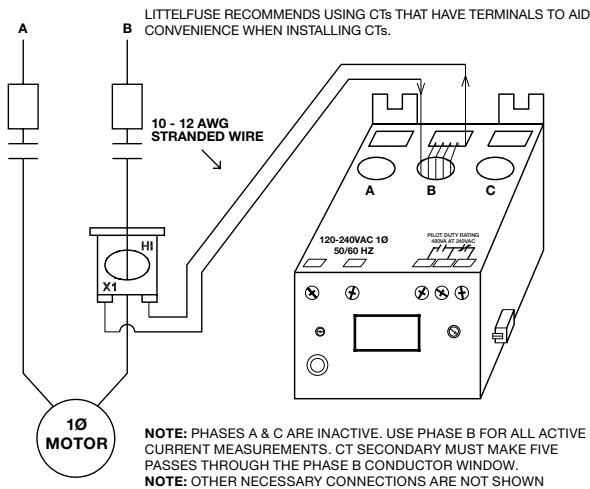
77C-KW Series

Simplified Wiring Diagram

TYPICAL WIRING DIAGRAM FOR MODEL 77C-KW/HP WITH MOTOR CONTROL



TYPICAL WIRING DIAGRAM FOR MODEL 77C-KW/HP WITH EXTERNAL CT



Disclaimer Notice – Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/product-disclaimer.