

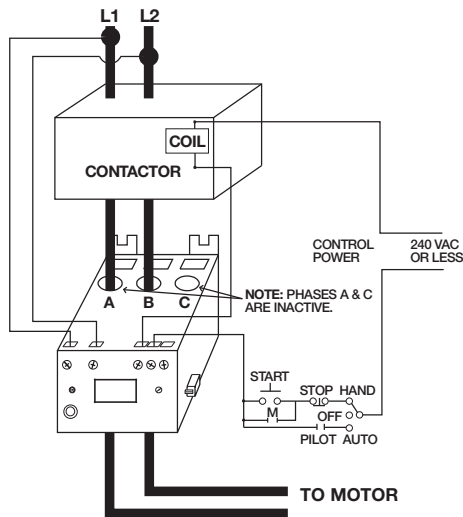
77C-KW/HP SERIES

Single-Phase Current & Voltage Monitor

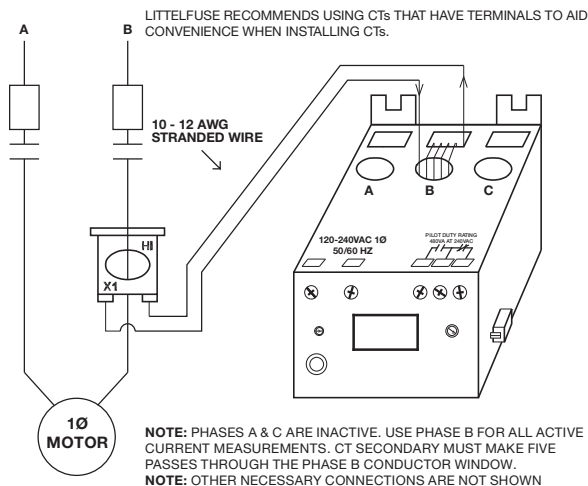


Wiring Diagram

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

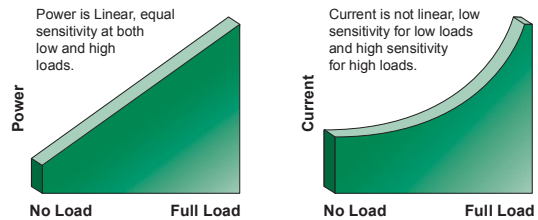


TYPICAL WIRING DIAGRAM FOR MODEL 77C-KW/HP WITH EXTERNAL CT



Description

The 77C-KW/HP and 77C-LR-KW/HP are fully programmable pump protection relays which will monitor the voltage and current for high or low voltage, overload and underload conditions based on power, in one package. 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 around 3400 rpm and usually have small current vs load changes; such as slow speed mixer or agitator motors up to 50 hp, and magdrive or can pumps.



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

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 in any application.
Last fault memory	Provides instant troubleshooting diagnostics
Remote display compatibility	Increases safety through remote display of real-time data and fault history, without the need to open the cabinet. Aids with arc flash safety regulations.
Flexible reset	Reset options: automatic, manual using pushbutton on relay, or remotely with optional 777-MRSW or OL-RESET remote reset kit.
Network communications capability	Compatible with Modbus using optional communications module (RS485MS-2W)

Ordering Information

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

For dimensional drawing see: Appendix page 507, Figure 1.

77C-KW/HP 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.

Specifications

Input Characteristics

Supply Voltage 100-240 VAC, 1Ø
Frequency 50-60 Hz

Motor Full Load Amp Range

77C-KW/HP 2-25 Amps (Loops Required)
 26-90 Amps (Direct)
 91-800 Amps (External CT's)

77C-LR-KW/HP 1.0 Amps - 2.0 Amps (additional Loop)
 2.0 Amps - 9.0 Amps (Direct)

Short Circuit Withstand Rating

100kA per UL and CSA

Power Consumption

5W (Maximum)

Output Contact Rating SPDT (Form C)

Pilot duty rating: 480 VA @ 240 VAC

General purpose: 10A @ 240 VAC

Expected Life

Mechanical

Electrical

Accuracy at 25° C (77° F)

Voltage

Current

Timing

Repeatability

Voltage

Current

Safety Marks

UL

CE

CSA

Standards Passed

Electrostatic Discharge (ESD)

Radio Frequency Immunity (RFI), Conducted

Radio Frequency Immunity (RFI), Radiated

Fast Transient Burst Surge

IEC

ANSI/IEEE

Hi-potential Test

Vibration

Shock

Mechanical

Dimensions

Maximum conductor size through holes

Terminal Torque

Enclosure Material

Weight

Mounting Methods

±1%
 ±3% (Direct, No External CTs)
 5% ± 1 second

± 0.5% of nominal voltage
 ± 1% (Direct, No External CTs)

UL508, UL1053
 IEC 60947-1, IEC 60947-5-1
 C22.2 No. 14

IEC 61000-4-2, Level 3, 6kV contact, 8kV air
 IEC 61000-4-6, Level 3 10V/m
 IEC 61000-4-3, Level 3 10V/m
 IEC 61000-4-4, Level 3, 3.5kV input power
 IEC 61000-4-5, Level 3, 2kV line-to-line;
 Level 4, 4kV line-to-ground
 C62.41 Surge and Ring Wave compliance to a level of 6kV line-to-line
 Meets UL508 (2 x rated V +1000V for 1 min.)
 IEC 68-2-6, 10-55Hz, 1mm peak-to-peak, 2 hours, 3 axis
 IEC 68-2-27, 30g, 3 axis, 11ms duration, half-sine pulse

H 77.47 mm (3.05"); **W** 97.79 mm (3.85");
D 128.27 mm (5.05")

0.65" (with insulation)
 7 in.-lbs.
 polycarbonate
 1.2 lbs
 35mm DIN rail or surface mount

7

MOTOR & PUMP PROTECTION

77C-KW/HP SERIES

Environmental

Temperature Range	
Ambient Operating	-20° - 70° C (-4° - 158°F)
Ambient Storage	-40° - 80° C (-40° - 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	85V - HV Setting
HV- High Voltage Threshold	LV Setting - 264V
MULT- # of Conductors or CT Ratio (XXX:5)	
77C:	1-10 Conductors or 100-800 Ratio
77C-LR:	1 or 2
OC- Overcurrent Threshold	(20-100A) ÷ MULT or 80-120% of CT Primary
TC- Overcurrent Trip Class *	5, J5, 10, J10, 15, J15, 20, J20, 30, J30, or LIn (linear)
RD1- Rapid Cycle Timer	0, 2 - 500 Seconds
RD2- Restart Delay After All Faults Except Undercurrent (motor cool down timer)**	2 - 500 Minutes/Seconds
RD3- Restart Delay After Undercurrent (dry well recovery timer)	2 - 500 Minutes/Seconds
#RU- Number of Restarts After Undercurrent	0, 1, 2, 3, 4, A (Automatic)
ADDR- RS485 Address	A01- A99
#RO- Number of Restarts After Overcurrent	0, 1, 2, 3, 4, A (Automatic)
LP/PWS (PWS = LP Range)	1 = 0.01 - 0.99 KW 5 = 0.01 - 1.30 HP 2 = 1.00 - 9.95 KW 6 = 1.34 - 13.3 HP 3 = 10.0 - 99.5 KW 8 = 13.4 - 133 HP 4 = 100 - 650 KW 9 = 134 - 871 HP

* 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.

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