

# Voltage Monitoring Relays

## 601 Series

### 3-Phase Voltage & Frequency Monitor



## Description

The 601 series is a fully-programmable voltage monitor designed to protect three-phase motors from loss of any phase (single-phasing), phase reversal, low- or high-voltage, voltage unbalance, low- or high-frequency, and rapid cycling. When a harmful condition is detected, the 601's output relay is deactivated after the specified trip delay. The output relay reactivates after power line conditions return to an acceptable level for the programmed restart delay (RD2). This monitor can be used as a stand-alone product or networked with an RM-1000, RM-2000, PLC, computer, or SCADA system.

Eleven setpoints are viewable with the three-digit LED display or from a networked device:

- low voltage
- high voltage
- voltage unbalance
- low frequency
- high frequency
- RS485 address
- trip delay for voltage/frequency faults
- trip delay for single-phase faults
- rapid-cycle timer (RD1)
- restart delay after all faults (RD2)
- type of restart after all faults (manual or automatic)

Six parameters are viewable while the motor is running:

- L1-L2 voltage
- L2-L3 voltage
- L1-L3 voltage
- average voltage
- voltage unbalance (%)
- frequency

When used with the RS485MS-2W communications module, the 601 can communicate with most Modbus RTU master devices. Voltage conditions can be monitored and setpoints can be changed remotely using Solutions software, an RM1000, RM2000, or other device.

## Features & Benefits

FEATURES	BENEFITS
<b>Built-in display</b>	Provides real-time information and diagnostics to help with troubleshooting
<b>Programmable voltage and frequency settings</b>	Allows usage on wide range of systems
<b>Two programmable restart delay timers</b>	Program separate restart delay time for rapid cycle protection and motor cool down
<b>Two programmable trip delay timers</b>	One trip delay specifically for phase loss/single-phase fault condition and one trip delay for all other fault conditions
<b>Programmable restart control</b>	Choose between an adjustable automatic or manual restart to best meet individual application needs
<b>Flexible reset</b>	Reset options include push-button on relay or remote reset with optional 777-MRSW or OL-RESET remote reset kit
<b>Remote display compatibility</b>	Increases safety through remote display of real-time data and fault history without the need to open a cabinet. Aids with arc-flash safety regulations
<b>Network communications capability</b>	Compatible with RS-485 Modbus communications module

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### Applications

- Oil rigs
- Compressors and fans
- HVAC
- Heat, well, and sump pumps
- Small conveyer motors

### Specifications

#### Input Characteristics

**Frequency** 50/60 Hz

#### Functional Characteristics

##### Programmable Operating Points

**LV - Low Voltage Threshold** 170 V (450 V\*) - HV Setting

**HV - High Voltage Threshold** LV Setting - 528 V (660 V\*)

**VUB - Voltage Unbalance Threshold** 2–15% or off

**LF - Low Frequency Threshold** 35 Hz - HF Setting

**HF - High Frequency Threshold** LF Setting - 75 Hz

**TD1 - Trip Delay for Voltage/  
Unbalance/Frequency Faults** 1–50 seconds

**TD2 - Trip Delay for Single-Phase Faults** 1–50 seconds

**RD1 - Rapid-Cycle Timer** 0, 2–500 seconds

**RD2 - Restart Delay After All Faults** 2–500 seconds

**#RF - Type of Restart** Manual or Automatic

**ADDR - RS-485 Address** A01-A99

#### Fixed Reset Points

**Overvoltage Rese** 97% of HV Setting

**Low Voltage Reset** 103% of LV Setting

**Voltage Unbalance Reset** UB Setting -1%

**Low Frequency Reset** LF Setting +0.6 Hz

**High Frequency Reset** HF Setting -0.6 Hz

#### Output Characteristics

**Output Contact Rating Pilot Duty** 480 VA @ 240 V ac

#### General Characteristics

**Temperature Range** -20° to 70 °C (-4° to 158 °F)

#### Accuracy

**Voltage** ±1%

**Timing** 5% ±1 second

**Repeatability Voltage** ±0.5%

**Maximum Input Power** 5 W

**Transient Protection (Internal)** 2500 V for 10 ms

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

**Weight** 1.2 lbs. (19.2 oz., 544.31 g)

**Mounting Method** Surface mount (4 - #8 screws) or DIN-rail mount

The 601 can be preprogrammed prior to installation by applying at least 120 V to the L1 and L2 terminals.

\*575 V model

### Certification & Compliance

<b>UL</b>	UL 508 (File #E68520)
<b>CSA</b>	C22.2 No. 14 (File #46510)

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### Accessories

#### RS485MS-2W Communication Module

(for limited Modbus capabilities) Required to enable the Modbus communications function on Model 77X-type products.

#### 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.

#### 777-MRSW Manual Remote Reset Kit

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

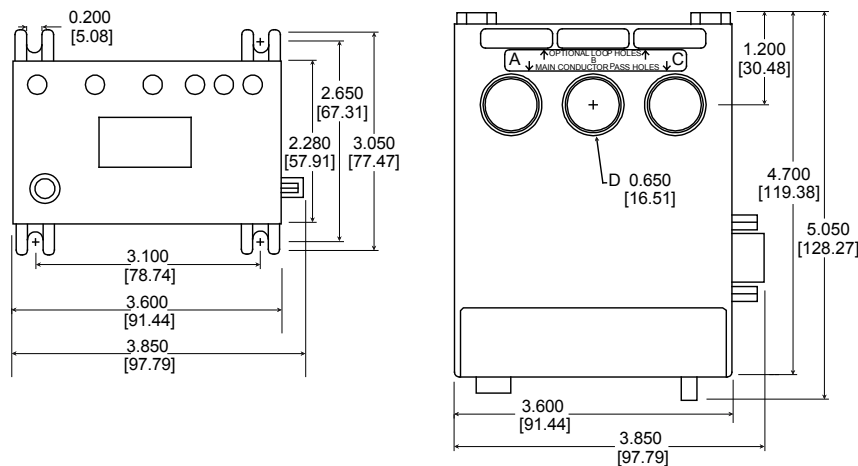
#### OL-RESET Manual Remote Reset Kit

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

### Ordering Information

MODEL	LINE VOLTAGE	DESCRIPTION
601	190–480 V ac	Universal 3-Phase Voltage & Frequency Monitor
601575	500–600 V ac	Used primarily in Canada and NE USA where 575 V utility power services are common

### Dimensions Inches (mm)

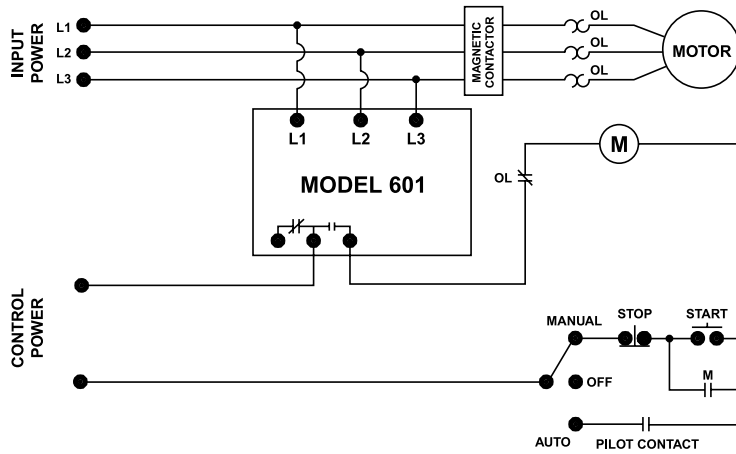


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### Wiring Diagram

MODEL 601 WITH MOTOR CONTROL



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