

Syncrocloser[®] Check Relay M-0188A



- **Accurate, independent controls require no additional instrumentation for field setting**
- **Voltage limit ranges and dead line/dead bus closing features are optional**
- **Remote contacts to shift phase angle or time setpoints are standard**
- **Transducer analog outputs are SCADA compatible**

M-0188A Syncrocloser Check Relay

Inputs

Line Voltage: 120 V ac nominal, 145 V ac maximum continuous. Will withstand 240 V ac for 1 second.

Bus Voltage: 120 V ac nominal, 145 V ac maximum continuous. Will withstand 240 V ac for 1 second.

Select Dead Bus Close (by closing contact)*

Select Dead Line Close (by closing contact)*

* **NOTE:** One input must be greater than 100 V ac to ensure output relay closure.

Jump to wider Phase Angle and/or Time (by opening contact)

Enable Sync-Check

■ **NOTE:** Line and Bus voltage inputs are transformer-isolated, allowing greater flexibility in applications.

Burden

Whichever input voltage is high, 11 VA; the other input 1 VA.

Controls

UPPER VOLTAGE LIMIT, either input: 100 to 140 V ac, accuracy $\pm 2\%$ of full scale

LOWER VOLTAGE LIMIT, either input: 90 to 120 V ac, accuracy $\pm 2\%$ of full scale

DELTA V LIMIT: 1 to 4 V, accuracy $\pm 5\%$ of full scale (other ranges available)

DEAD LINE LIMIT: 10 to 60 V, accuracy $\pm 7\%$ of full scale

DEAD BUS LIMIT: 10 to 60 V, accuracy $\pm 7\%$ of full scale

PHASE ANGLE LIMIT: \pm degrees, 0 to 30°, accuracy $\pm 5\%$ of full scale (other ranges available)

TIME to close after **PHASE ANGLE LIMIT OK**, 0 to 15 seconds (0 to 1.5 seconds available), accuracy $\pm 5\%$ of full scale

LED Indicators

All LEDs are lit when conditions are met to close the breaker.

BUS UPPER VOLTAGE LIMIT OK
LINE UPPER VOLTAGE LIMIT OK
BUS LOWER VOLTAGE LIMIT OK
LINE LOWER VOLTAGE LIMIT OK
DELTA V OK
LINE HOT
BUS HOT
ANGLE OK

■ **NOTE:** All LED indicators except **ANGLE OK**, included when related option is chosen.

Breaker Close Relay

Dry output contacts rated to make and carry 20 A at 250 V dc, and interrupt 0.9 A at 120 V dc or 0.4 A at up to 250 V dc inductive load. Open contacts will withstand 1500 V ac for 1 minute. Contacts to ground will withstand 1500 V ac for 1 minute.

Response Time

When the Line and Bus inputs are first applied to the unit, the voltage magnitude circuits require approximately 0.5 seconds to sense the correct voltage. The unit will simultaneously measure phase angle and close the breaker with proper phase angle only after the time set by the **TIME** dial. In closing on dead line or dead bus, the phase condition is ignored so that the unit will close upon a voltage below the set threshold in approximately 0.5 seconds.

Status Relay Contact

Phase Angle Status Relay: Closed when phase angle is within limits.

Voltage Status Relay: Closed when voltage conditions are within limits.

These are light duty contacts intended primarily for status interrogation by supervisory. They can be used to light local lights that do not exceed 1/2 A at 125 V dc resistive, 1 A at 120 V ac or 250 V dc across open contacts.

Phase Angle and Time Reduction

The M-0188A provides a feature for programming an external contact closure to change the Phase Angle Limit, the Time setpoint, or both. When the circuit from terminal TB1-15 to terminal TB1-21 is closed the phase angle function, timing function, or both, may be reduced by a specified ratio. Of course this can be used as a widening function by operating with terminals TB1-15 to TB1-21 normally closed.

Analog Outputs

Various dc analog outputs are provided for Bus Voltage, Line Voltage, Delta V and Phase Angle. These analog outputs can interface with most SCADA systems. The accuracy of Bus voltage, Line voltage, and Phase Angle is 1.5% of full scale; the accuracy of Delta V is 2.5 % of full scale.

Reliability

The M-0188A Syncrocloser® Check Relay is assembled on two glass-epoxy printed circuit boards. All semiconductor components are hermetically sealed, and of the highest and most reliable quality available. Highly stable, instrument grade capacitors and resistors are used in critical measurements circuits to minimize the possibility of error.

Transient Protection

All inputs and outputs are fully transient protected and will pass the ANSI C37.90.1-1989 Surge Withstand Capability (SWC) Test, which includes the Fast Transient SWC test. The Bus and Line Input voltages and Breaker Close contacts will withstand 1500 V ac, 60 Hz to chassis or instrument ground for one minute; the Voltage and Phase OK Relay contacts will withstand 2121 V dc to chassis or instrument ground for one minute. Voltage inputs are isolated from each other, from other circuits, and from ground.

All faces of the relay, with the chassis solidly grounded, have been exposed to Radio Frequency Immunity testing and have successfully passed with a field intensity of 20 volts per meter at typical utility frequencies of 144 MHz, 438 MHz, and at 450 MHz.

Environmental

Temperature Range: Units will operate properly over a temperature range of –40 to +80° C.

Humidity: Stated accuracies are maintained at up to 95% relative humidity (non-condensing).

Fungus Resistance: A conformal printed circuit board coating inhibits fungus growth.

Physical

Size: 19" wide x 3–1/2" high x 13" deep (48.3 cm x 8.9 cm x 33.0 cm). Requires two rack units space in a standard 19" rack. May also be panel mounted horizontally or vertically.

Approximate Weight: 15 lbs (6.8 kg)

Approximate Shipping Weight: 20 lbs (9.1 kg)

The M-0188A includes a transparent plastic cover to protect the knobs and to prevent accidental resetting.

Patent

The M-0188A Syncrocloser® Check Relay is covered by U.S. Patent 4,218,625.

Warranty

The M-0188A Syncrocloser Check Relay is covered by a five year warranty from date of shipment.

Specification is subject to change without notice.

