

Fault Indicators

Electrical Apparatus

S.T.A.R.™ Faulted Circuit Indicators Test Point Reset Type

320-40

DESCRIPTION

Cooper Power Systems S.T.A.R.™ Test Point Reset (TPR) faulted circuit indicators are designed to quickly and easily locate faulted sections of underground cable systems. These faulted circuit indicators (FCIs) can be used on both 200 A separable connectors and 600 A terminators with a voltage test point. The removable sleeve allows for use on major manufacturers' loadbreak elbows. S.T.A.R. TPR FCIs feature a stored energy design that utilizes the capacitively coupled voltage present at the elbow test point. This design ensures fast, reliable and accurate operation. All FCI units are shipped to the customer in the tripped position. The magnetically latched target will not change status as a result of mechanical shock or vibration. After the unit is installed, the energized system will reset the flag from the tripped position to the normal position.

CONSTRUCTION

The test point reset indicator is a one-piece housing that can be easily installed with a shotgun stick using the pulling-eye. The sensor is designed to minimize proximity effect described as the sensitivity of FCIs to fault currents on other phases of a three-phase installation. The TPR FCI indicates the passage of fault current by showing a "fault" flag in the window of the display. The standard display consists of a highly visible orange fluorescent flag to designate a fault and a black flag to designate a normal condition. The polycarbonate display is made of Lexan® giving the exposed flag window tamperproof and scratch-resistant protection. When the system is re-energized, the indicator resets automatically.

TRIP RATING

The S.T.A.R. FCI is available with either a low trip rating or a high trip rating. A low trip rating will trip at approximately 400 A rms and a high trip rating will trip at approximately 800 A rms. The trip rating varies slightly with different kV class elbows and different elbow manufacturers.



Figure 1.
S.T.A.R. Test Point Reset faulted circuit indicator.

DESIGN FEATURES

An **inrush restraint** feature eliminates false tripping and is standard on all units. The S.T.A.R. faulted circuit indicator will ignore inrush currents caused by reclosing operations of protective devices on the system. A dead time of 200 ms will activate the inrush restraint feature.

A **low pass filter**, also a standard feature, will prevent the S.T.A.R. faulted circuit indicator from tripping on high frequency transients like those caused by cable capacitive discharges.

In addition, the S.T.A.R. faulted circuit indicator is equipped with **temperature compensation** circuitry to assure accurate reliable performance over the entire specified temperature range.

The quick response time of the S.T.A.R. test point reset faulted circuit indicator allows easy coordination with current-limiting fuses (see Figure 4). This unique combination of standard features makes the S.T.A.R. faulted circuit indicator extremely reliable.

TESTING

S.T.A.R. faulted circuit indicators are made of corrosion resistant materials, meeting or exceeding ANSI/IEEE Standard 495-1986 "Guide for Testing Faulted Circuit Indicators". 100% automated production testing verifies the trip rating, the reset voltage, and the inrush restraint feature.

The electronic components are completely encapsulated to prevent environmental damage.

INSTALLATION

Installation is quick and easy using a single clamp (shotgun) stick. No special tools are required. The TPR FCI easily adapts to most manufacturers' separable connector products. An additional adapter kit may be needed for some manufacturers' older style test points. Please refer to S320-40-1 service information for installation details.

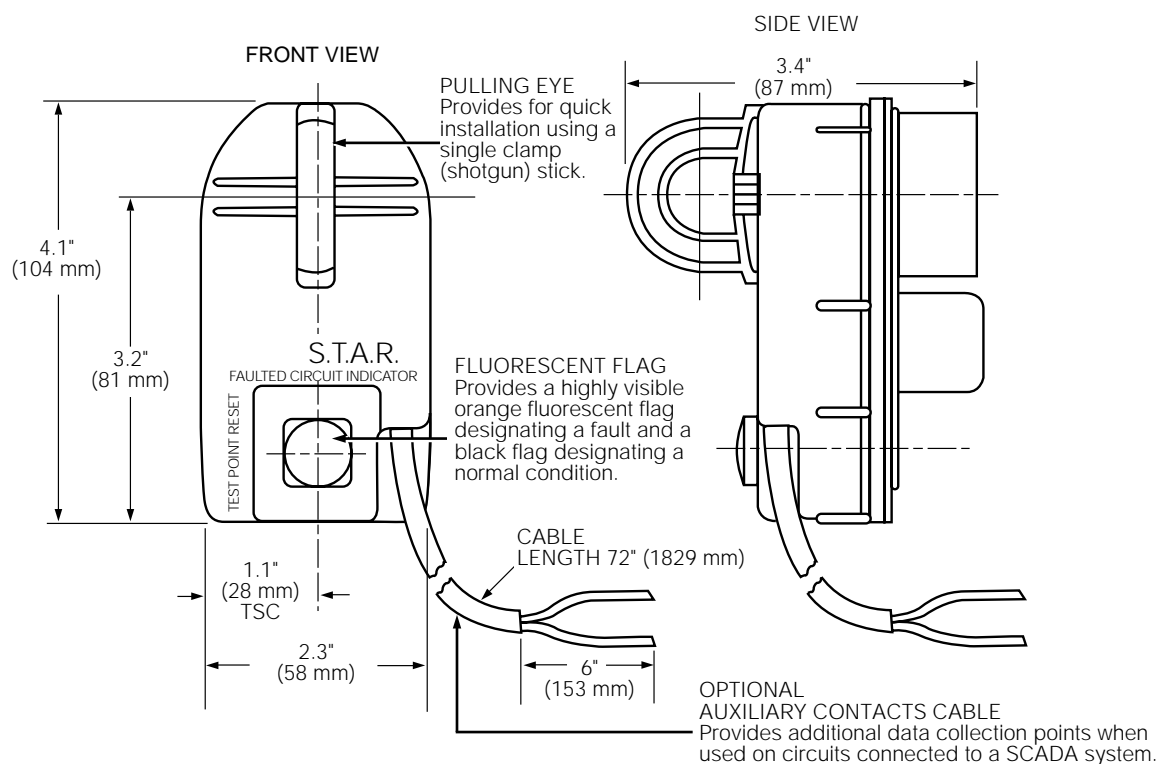


Figure 2.
Features and dimensions of a TPR faulted circuit indicator with optional auxiliary contacts cable.

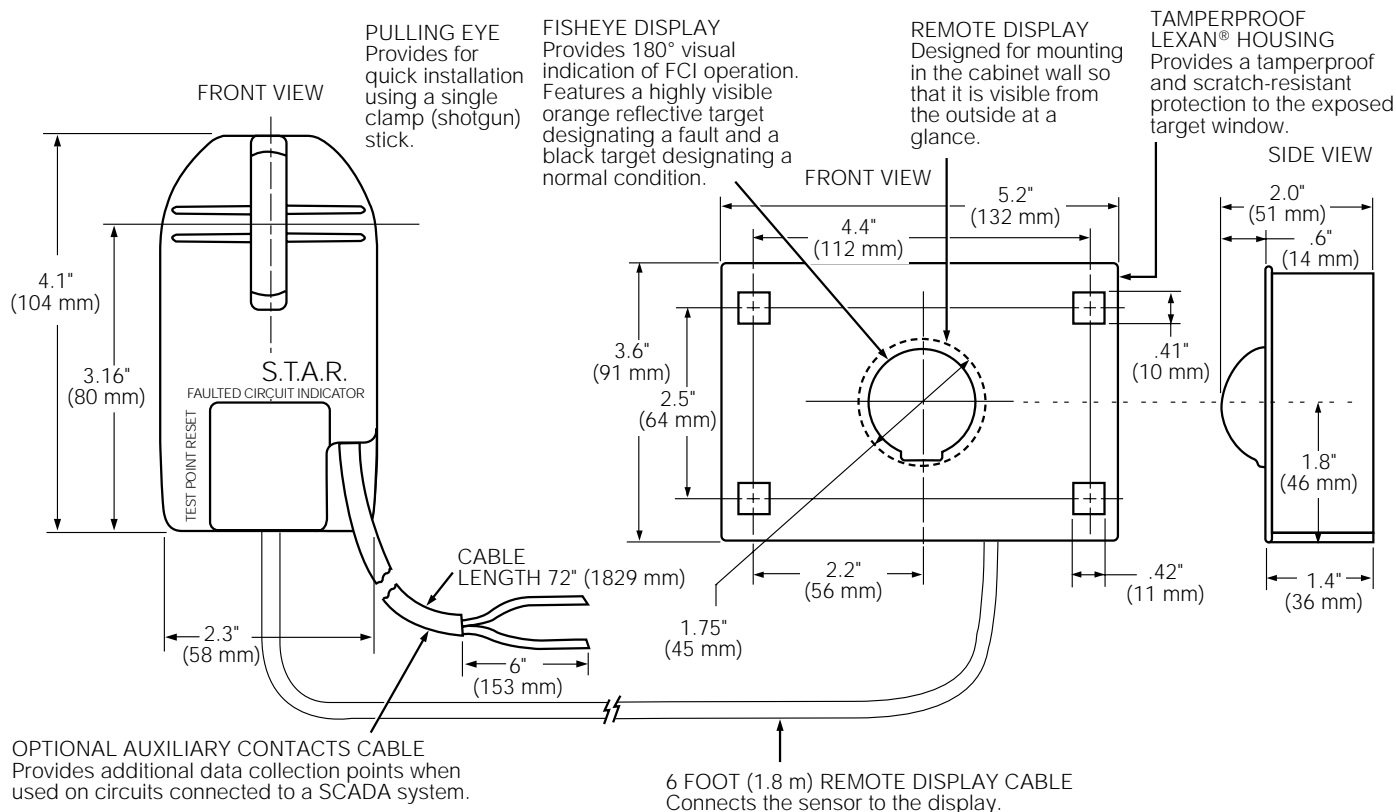


Figure 3.
Features and dimensions of a TPR faulted circuit indicator with remote FISHEYE display and auxiliary contacts.

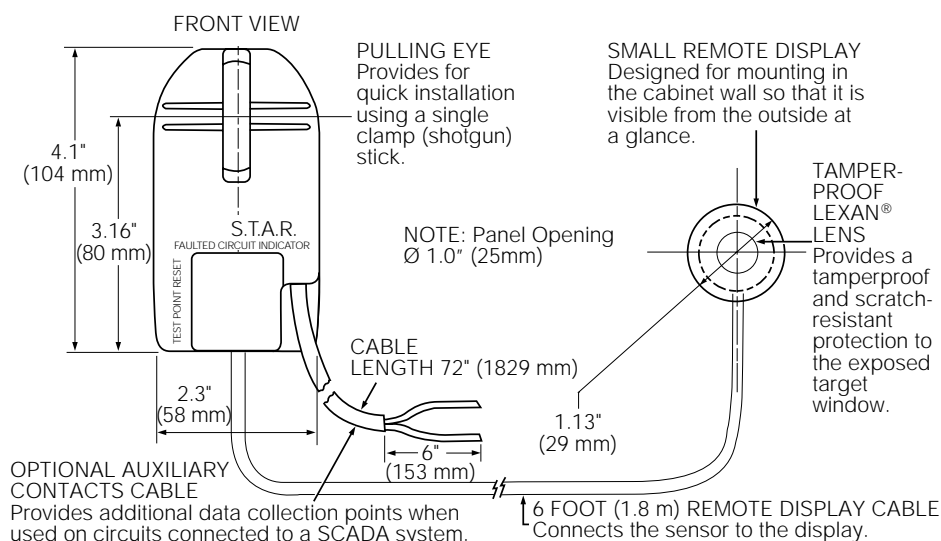


Figure 4.
Features and dimensions of a TPR faulted circuit indicator with small remote display.

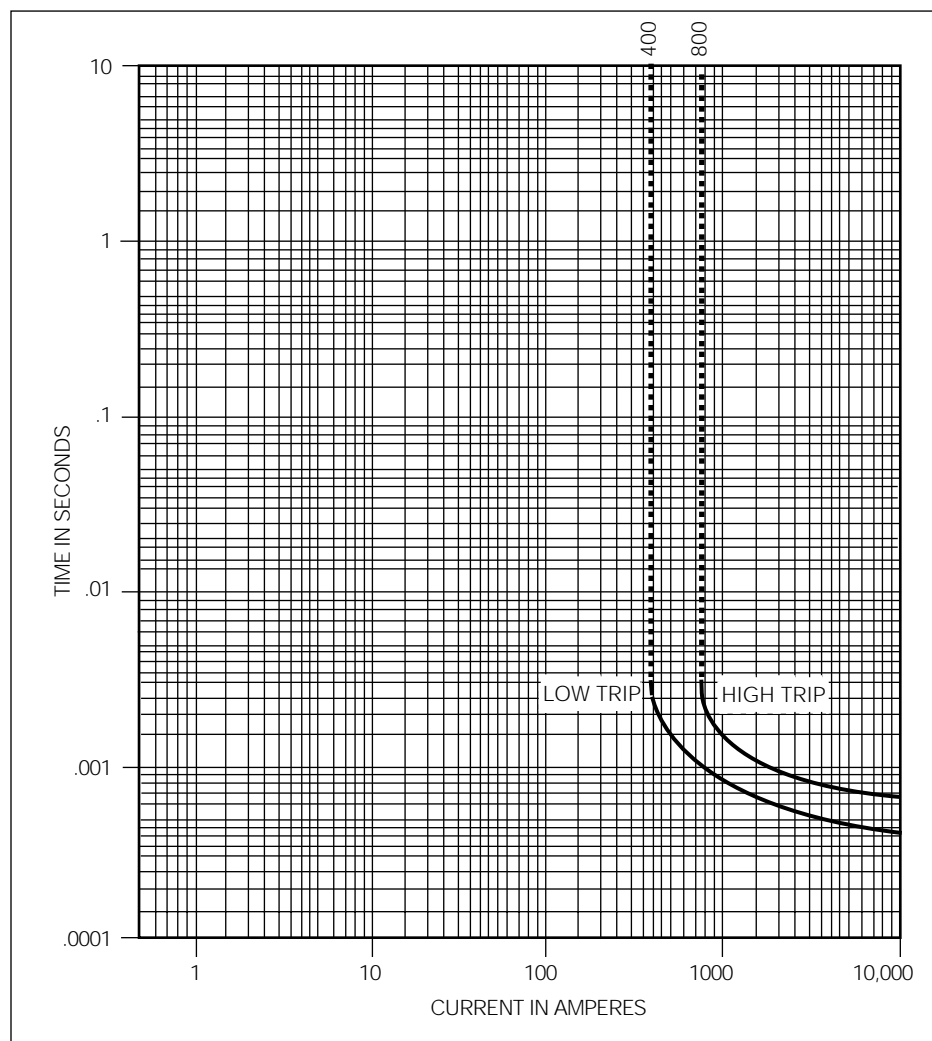


Figure 5.
TPR faulted circuit indicator response curve* developed on a 25 kV Class Cooper Power Systems elbow.

*Per Figure 3, for a 25 kV Class Cooper Power Systems elbow the low trip rating is 400 A and the high trip rating is 800 A. The curves will shift slightly with different kV class elbows and different elbow manufacturers.

OPTIONS

Auxiliary Contacts

Auxiliary contacts can be added to the standard unit and would provide an additional data collection point when used on circuits connected to a SCADA system. The magnetic latching circuit that operates the auxiliary contact ensures a reliable indication.

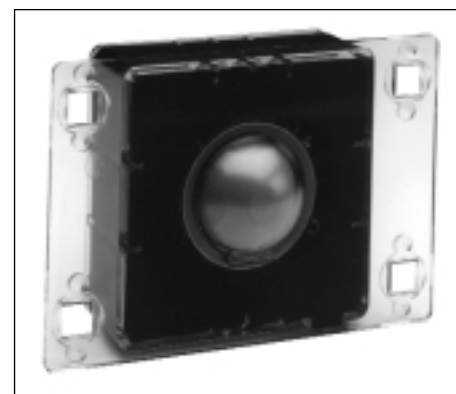


Figure 6.
Remote FISHEYE display.

Remote FISHEYE™ Display

The Cooper Power Systems remote FISHEYE display provides 180° visual indication of FCI operation. This unique orange reflective target fits a standard remote indicator window that exists in many padmount transformer specifications.

Small Remote Display

The Cooper Power Systems' TPR FCI is also available with a small remote flip-target display. This display can be easily retrofitted for padmount cabinets with a single hole installation. Refer to S320-40-1 for installation details.



Figure 7.
TPR faulted circuit indicator with small remote display.