Faulted Circuit Indicators
Catalog Data
CA320002EN

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COOPER POWER SERIES

S.T.A.R.™ test point reset faulted circuit indicators

Description

Eaton designs its Cooper Power™ series S.T.A.R.™ test point reset (TPR) faulted circuit indicators 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 clampstick 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.

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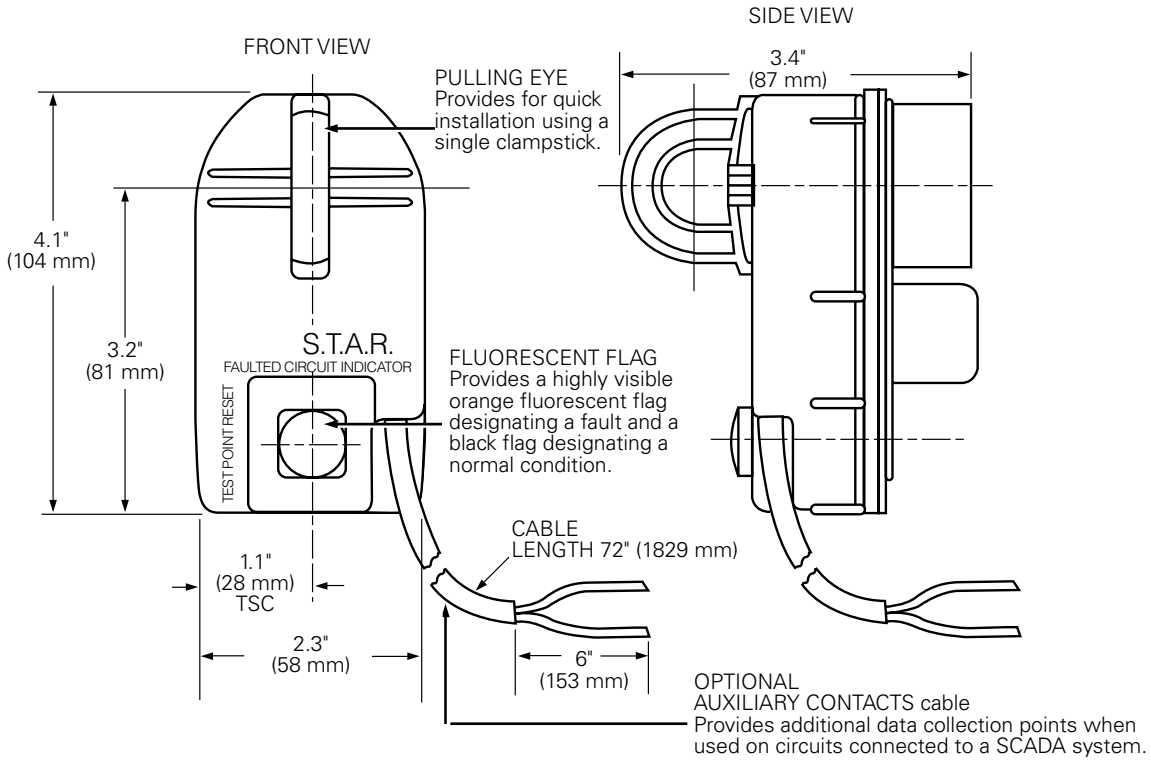


Figure 1. Features and dimensions of a TPR faulted circuit indicator with optional auxiliary contacts cable.

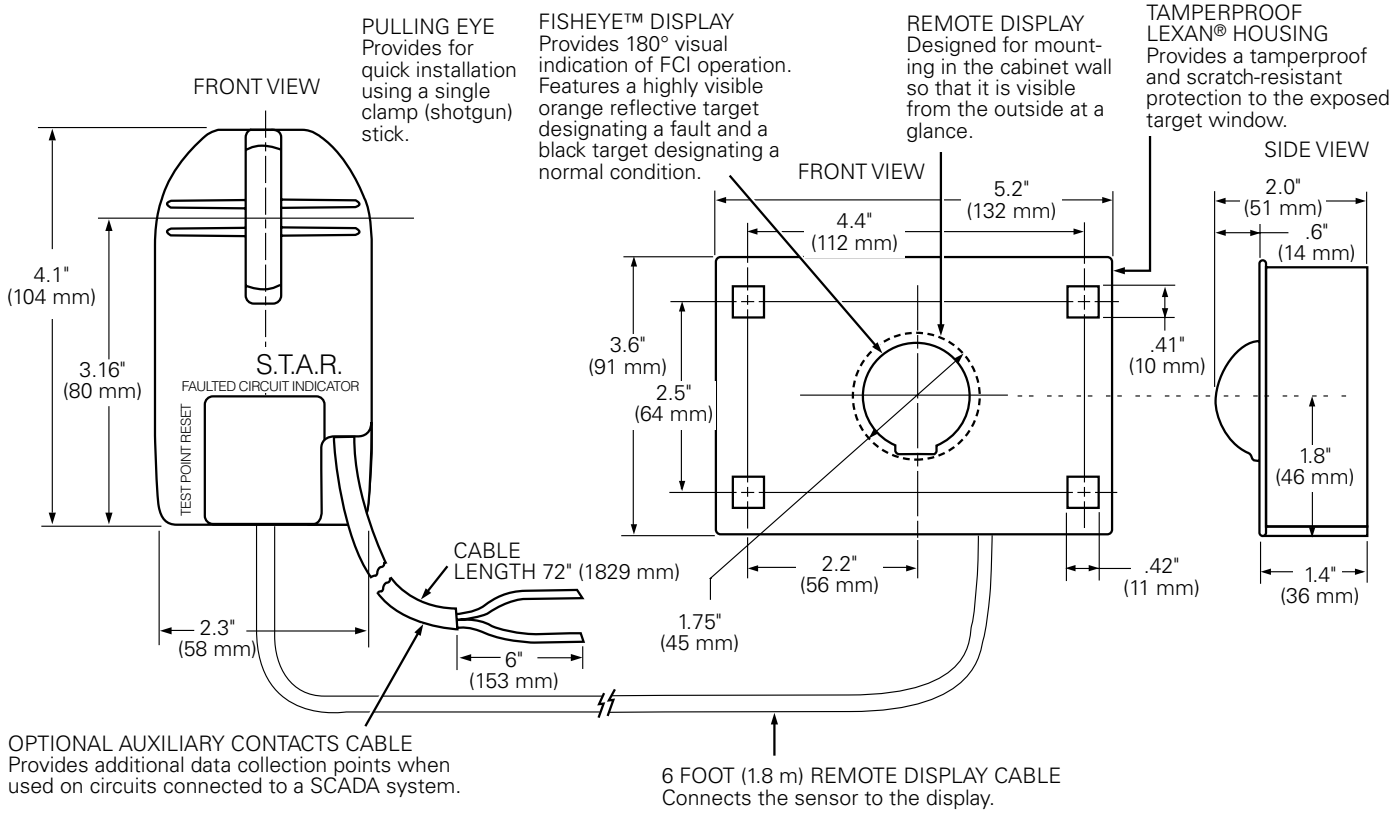


Figure 2. Features and dimensions of a TPR faulted circuit indicator with remote FISHEYE™ display and auxiliary contacts.

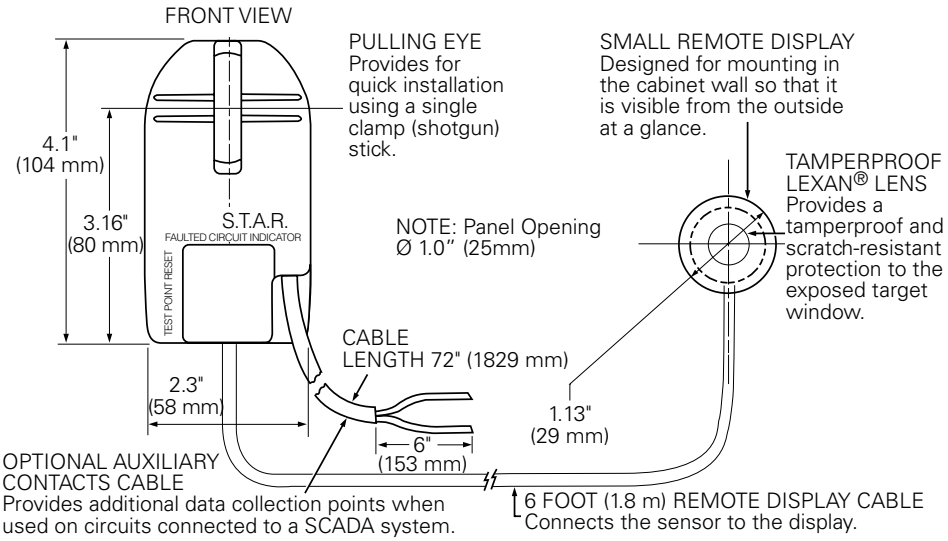


Figure 4. Features and dimensions of a TPR faulted circuit indicator with small remote display.

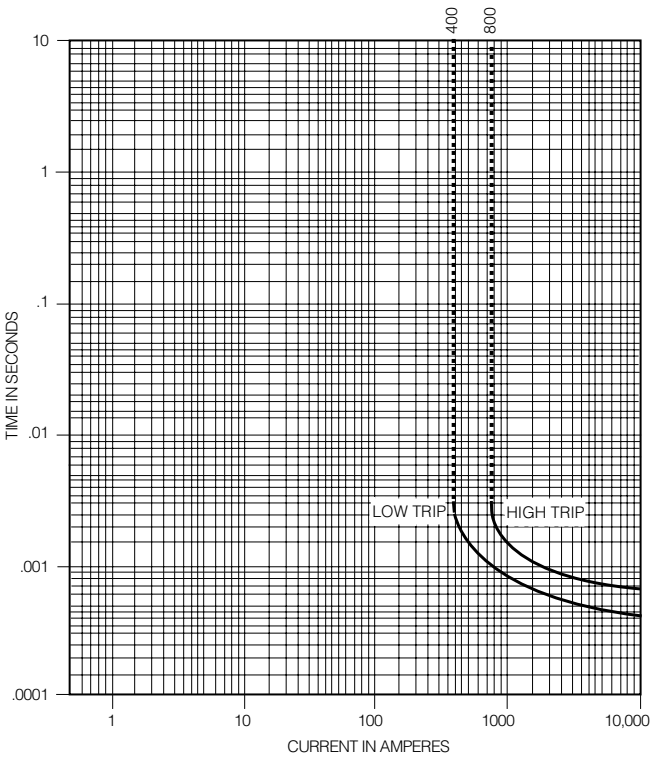


Figure 3. TPR faulted circuit indicator response curve* developed on a 25 kV Class Eaton's Cooper Power series elbow.

*Per Figure 3, for a 25 kV Class Eaton's Cooper Power series 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.

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 rms 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 3). 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 Std 495™-1986 standard "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 clampstick. 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 *Service Information S320-40-1 S.T.A.R. Type TPR Faulted Circuit Indicator Installation Instructions* for installation details.

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.

Remote FISHEYE™ display

Eaton provides 180° visual indication of FCI operation in its Cooper Power series remote FISHEYE™ display. This unique orange reflective target fits a standard remote indicator window that exists in many pad-mounted transformer specifications.

Figure 5. Remote FISHEYE display.

Small remote display

Eaton's TPR FCI is also available with a small remote flip-target display. This display can be easily retrofitted for pad-mounted cabinets with a single-hole installation. Refer to *Service Information S320-40-1 S.T.A.R. Type TPR Faulted Circuit Indicator Installation Instructions* for installation details.

Figure 6. TPR faulted circuit indicator with small remote display.

Ordering information

To order an Eaton's Cooper Power series S.T.A.R. Test Point Reset Type faulted circuit indicator specify the catalog number from Table 2 by selecting the appropriate codes.

Contact your Eaton representative for additional information.

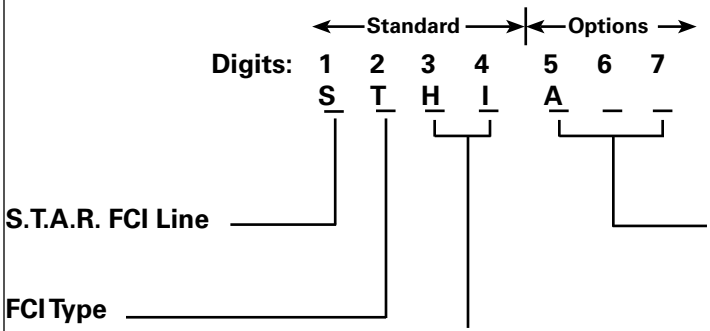
Table 1. Electrical Ratings and Characteristics

Description	Ratings and Characteristics
Power Requirements	Min. 5 kV L-G
Reset Time	Max. 3 min. at 5 kV
Trip Current	Factory Preset (High and Low)
Trip Accuracy	+/- 10%
Trip Response Speed	Response Curve, Figure 4
Fault Withstand Capability	25 kA for 10 cycles per ANSI/IEEE Std 495™-1986 standard
Temperature Range	-40 °C to +85 °C
Materials (Conductive EPDM Rubber)	Corrosion resistant & submersible per ANSI/IEEE Std 495™-1986 standard
Weight	8.56 ounces (0.24 Kg)
Elbow Rating (All Manufacturers)	200 & 600 A and 15, 25 & 35 kV Class
Auxiliary Contact Ratings	1 A 30 Vdc
	0.5 A 125 Vac
	0.3 A 110 Vac

Table 2. S.T.A.R. Faulted Circuit Indicator Ordering Information

Catalog Number

Example: A Test Point Reset FCI with a high trip rating and standard 6 ft. auxiliary contacts would have a catalog number STHIA (as shown below).



Digit 2	Type
T	Test Point Reset

Description	Catalog No.
Adapter Kit for Non-standard Test Points	STAK

Digits 3	Digits 4	Trip Rating
L	O	Low
H	I	High

Digits 5	Digits 6	Digits 7	Descriptions
A			Standard Indicator with auxiliary contacts
R			*Standard Indicator with remote FISHEYE display
A	R		*Standard Indicator with auxiliary contacts and remote FISHEYE display
S			*Standard Indicator with small remote display
A	S		*Standard Indicator with auxiliary contacts and small remote display.

* Standard indicator with remote display and/or auxiliary contacts provided with 6 ft. cable lengths as standard.

Notes:

1. The S.T.A.R. FCI catalog number may vary in length from 4 digits to 7 digits.
2. The standard S.T.A.R. FCI catalog number may be truncated after entering digits 1-4. Options may be selected by adding the appropriate code to digits 5, 6, and/or 7.

Eaton
1000 Eaton Boulevard
Cleveland, OH 44122
United States
Eaton.com

Eaton's Cooper Power Systems Division
2300 Badger Drive
Waukesha, WI 53188
United States
Cooperpower.com

Printed in USA
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For Eaton's Cooper Power series test point reset faulted circuit indicator product information call 1-877-277-4636 or visit: www.cooperpower.com.

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