

S.T.A.R.™ delayed reset faulted circuit indicators



Description

Eaton designs its Cooper Power™ series S.T.A.R.™ delayed reset (DR) faulted circuit indicators to quickly and easily locate faulted sections of cable systems. These faulted circuit indicators (FCI) can be installed on pad-mounted distribution transformers, sector cabinets, switchgear and overhead bare conductors. A long-life Lithium Ion battery provides power to indicate the faulted conditions using a high intensity LED display. The unit automatically resets back to the normal position when reset time has expired. The unit can also be reset using the optional manual testing/reset tool. DR FCIs provide a reliable means of fault location and isolation. They also eliminate fault chasing methods that are costly and time consuming, and very stressful on system components exposed to fault currents. The DR FCI is ideally suited for temporary use as a testing tool. The delayed reset also allows the unit to be used to detect general fault location in applications where an intermittent fault causes recloser operation, but power is restored before the unit is interrogated.

Construction

S.T.A.R. delayed reset fault indicators consist of a sensor unit with an integral high intensity LED display powered by a Lithium Ion battery. DR FCIs feature an economical reed switch design. Installation can be achieved on a wide range of cable diameters with a single hot stick. The sensor unit itself features a clamping mechanism design that allows easy snap-on connection to the live conductor with the use of a single shotgun stick.

Trip rating

S.T.A.R. FCIs are available with either a high or a low trip rating. The very same FCI can be used on cable diameters from 0.7 (17 mm) to 2.0 inches (51 mm). Therefore, it is not necessary to specify a cable diameter when placing an order. Refer to Figure 3 for applicable trip value versus cable diameter information.

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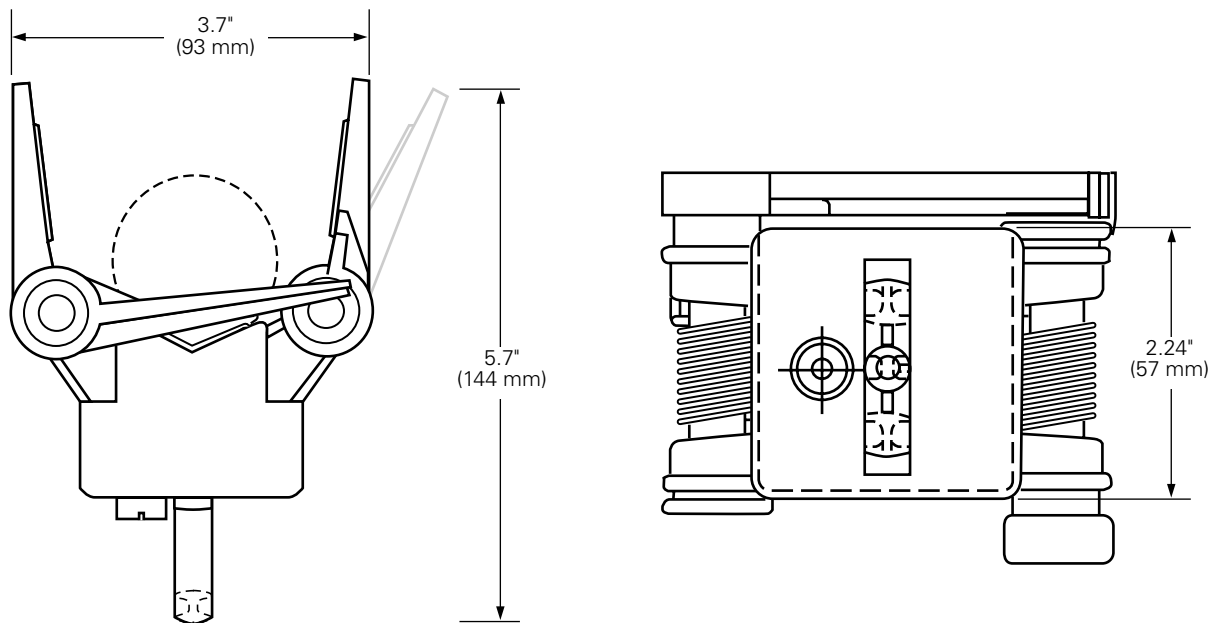


Figure 1. Features and dimensions of a DR faulted circuit indicator (shown in the “armed” position).

Design features

The S.T.A.R. delayed reset faulted circuit indicator automatically resets back to the normal position when the reset time has expired. The unit is available in factory preset delay times of 1, 2, 4, or 6 hours.

The DR FCI is constructed using tough, durable, corrosion-proof, submersible materials.

The Lithium Ion battery provides 800 hours of flashing time for the high intensity LED display.

The quick response time of the S.T.A.R. delayed reset faulted circuit indicator provides easy coordination with current-limiting fuses and other protection devices (See Figure 2).

The unit is insensitive to primary line voltage and will operate on any cable system. 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 and meet or exceed ANSI/IEEE Std 495™-1986 standard “Guide for testing Faulted Circuit Indicators”.

100% automated production testing verifies the trip rating and the reset time.

The electronic components are completely encapsulated to prevent any environmental damage.

Installation

Installation is quick and easy. No special tools are required. The patented clamping mechanism of the sensor provides for easy installation on an energized system using a single clampstick.

Testing and resetting the DR FCI can be done by touching the reset tool (catalog number SMRT) to the face of the fault indicator. Touching the lower right corner at the location “T” and removing the reset tool causes the unit to “flash back” until manually reset or until the delay time expires.

The unit is manually reset by touching the upper left corner marked “R” with the reset tool. Upon manual reset, the unit will “flash back” the number of reset hours that the FCI is set for. The reset procedure also provides positive indication of battery operation.

Refer to *Service Information S320-65-1 S.T.A.R. DR Faulted Circuit Indicator Installation Instructions* for more information.

Options

Testing/reset tool

The manual testing/reset tool can be ordered using catalog number SMRT.

Table 1. Electrical Ratings and Characteristics

Description	Ratings and Characteristics
Power Source	1.2 AH Lithium Ion Battery (non-replaceable)
Flashing Time	800 Hrs.
Reset Time	Factory Preset 1,2,4,6 Hrs.
Trip Current	Factory Preset (High or Low)
Trip Accuracy	+/- 10%
Trip Response Speed	Response Curve, Figure 2, Sec. 320-65
Fault Withstand Capability	10 kA for 10 Cycles per ANSI/IEEE Std 495™-1986 standard
Temperature Range	-40 °C to +85 °C per ANSI/IEEE Std 495™-1986 standard
Materials	Corrosion-resistant & submersible per ANSI/IEEE Std 495™-1986 standard
Weight	8.32 ounces (0.24 kg)
Conductor Size	0.70" through 2.0"

Table 2. Standard Cable Diameters in Inches (Millimeters)

Cable Size	175 MIL* 15 kV	220 MIL* 15 kV	260 MIL* 25 kV	345 MIL* 35 kV
#2	.700 (17.8)	.790 (20.1)	.870 (22.1)	–
#1	.740 (18.8)	.830 (21.1)	.910 (23.1)	–
1/0	.785 (19.9)	.875 (22.2)	.955 (24.3)	1.125 (28.6)
2/0	.830 (21.1)	.920 (23.4)	1.000 (25.4)	1.170 (29.7)
3/0	.880 (22.4)	.970 (24.6)	1.050 (26.7)	1.220 (31.0)
4/0	.940 (23.9)	1.030 (26.2)	1.110 (28.2)	1.280 (32.5)
250 MCM	.995 (25.3)	1.085 (27.6)	1.175 (29.8)	1.350 (34.3)
350 MCM	1.100 (27.9)	1.190 (30.2)	1.280 (32.5)	1.455 (37.0)
500 MCM	1.235 (31.4)	1.325 (33.7)	1.415 (35.9)	1.590 (40.4)
600 MCM	1.325 (33.7)	1.415 (35.9)	1.505 (38.2)	1.680 (42.7)
750 MCM	1.430 (36.3)	1.525 (38.7)	1.610 (40.9)	1.785 (45.3)
1000 MCM	1.580 (40.1)	1.680 (42.7)	1.760 (44.7)	1.935 (49.1)

* Insulation thickness

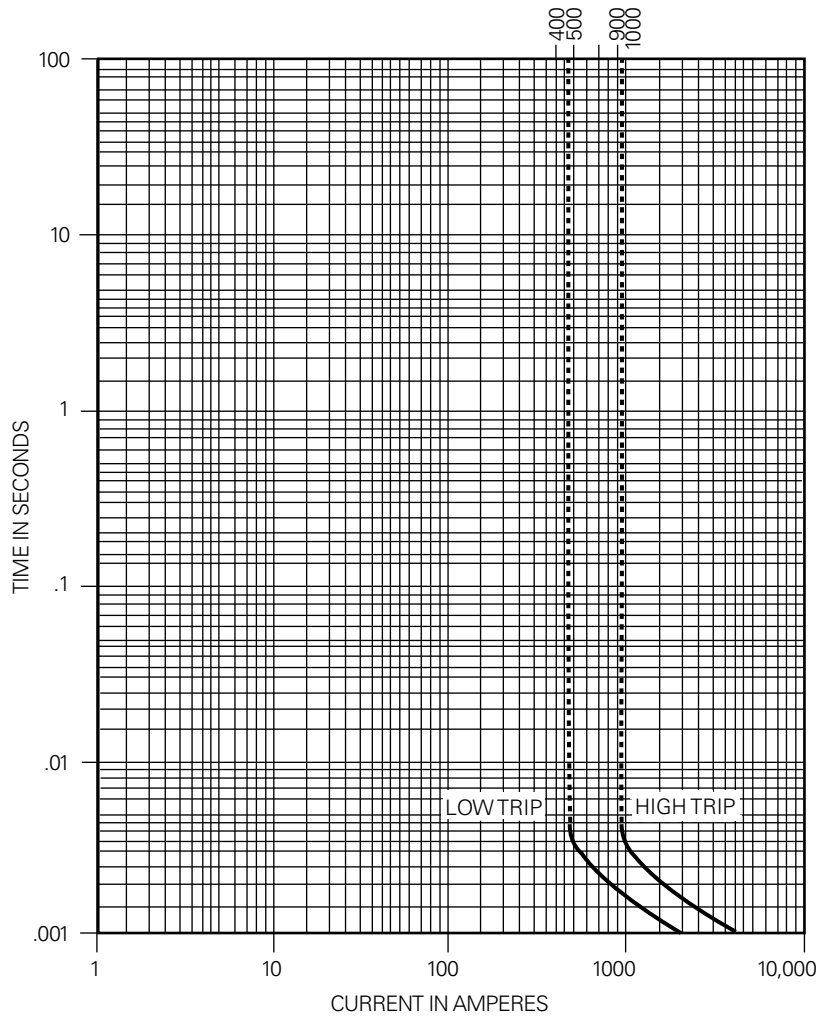


Figure 2. DR faulted circuit indicator response curve.

The curves will shift for various cable diameters; refer to Figure 3.

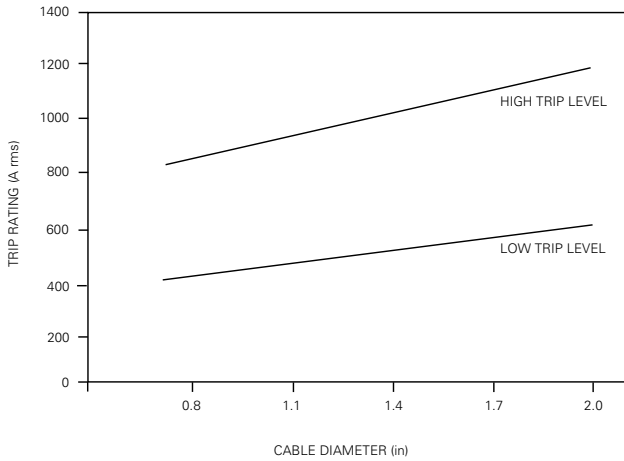


Figure 3. S.T.A.R. DR faulted circuit indicator cable diameter vs. trip value curves.

Table 3. S.T.A.R. Delayed Reset Faulted Circuit Indicator Ordering Information

S.T.A.R. Delayed Reset FCI Ordering Information

Example: A Delayed Reset FCI with a high trip rating and 4-hour reset time would have a catalog number SDHI4 (as shown below).

Digits: 1 2 3 4 5 6 7

← Standard → | ← Options →

S.T.A.R. FCI Line: S D H I 4 - -

FCI Type: D

Digit 2	Type
D	Delayed Reset

Trip Rating:

Digits		Trip Rating
3	4	
L	0	Low
H	I	High

Options:

Digits			Description
5	6	7	
1			1-Hr. Reset Time
2			2-Hr. Reset Time
4			4-Hr. Reset Time
6			6-Hr. Reset Time

- Notes:**
1. The S.T.A.R. FCI catalog number may vary in length from 5 digits to 7 digits.
 2. The standard S.T.A.R. FCI catalog number may be truncated after entering digits 1-5.

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