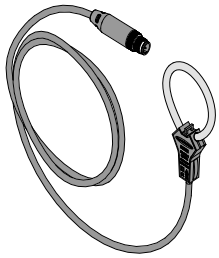
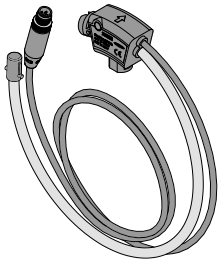
Rogowski Coil Current Sensor

Features

Rogowski coil current sensors are used to monitor AC current for various devices. The Rogowski coil takes a high current input and produces a proportional low-voltage, low-current signal that is then converted into Modbus. The compact size and the ability to easily install on conductors make them well-suited for installation on existing applications.

- Monitors AC current of motors, sub-panels, and facilities
- Pre-scaled and pre-configured sensor with a Modbus output
- Sensing loop can be opened, allowing for simple installation

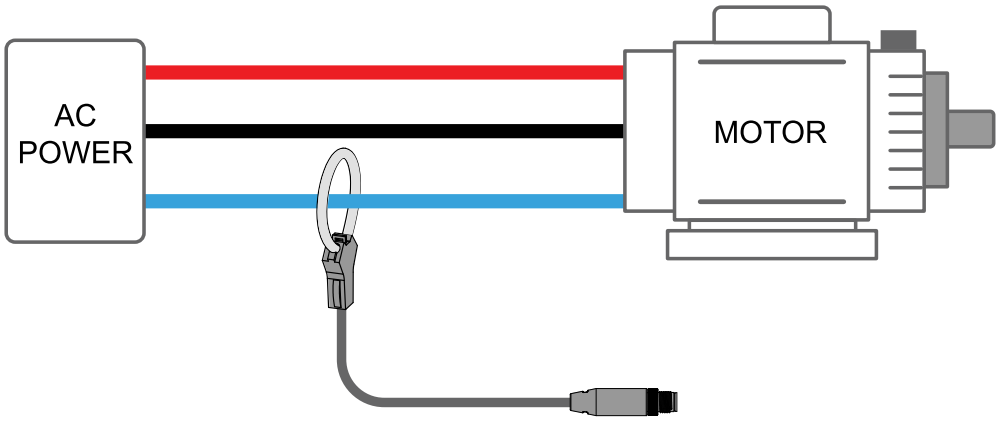
Rogowski Coil Models

Models	Coil Diameter (mm)	AC Current Range (A)	
S15S-R500-MQ	50	500	
S15S-R1000-MQ	50	1000	
S15S-R3000A-MQ	200	3000	
S15S-R6000A-MQ	200	6000	

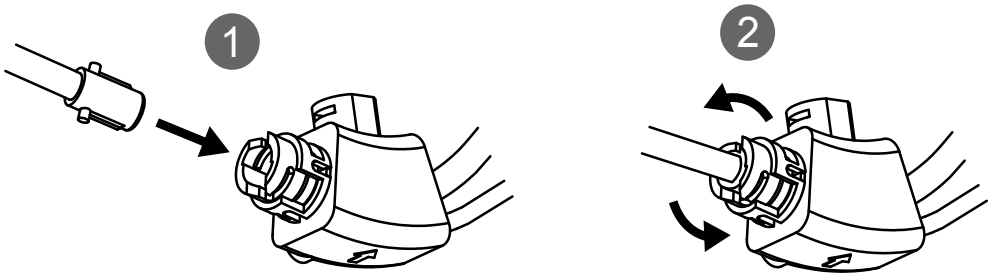
Installing the Rogowski Coil Sensor

Rogowski coil current sensors should be installed around a single conductor with the arrow pointing toward the load. The sensing loop can be opened to simplify installations on existing wiring. Refer to the diagrams below for additional instructions.

Installing a current transformer relative to the power supply/motor

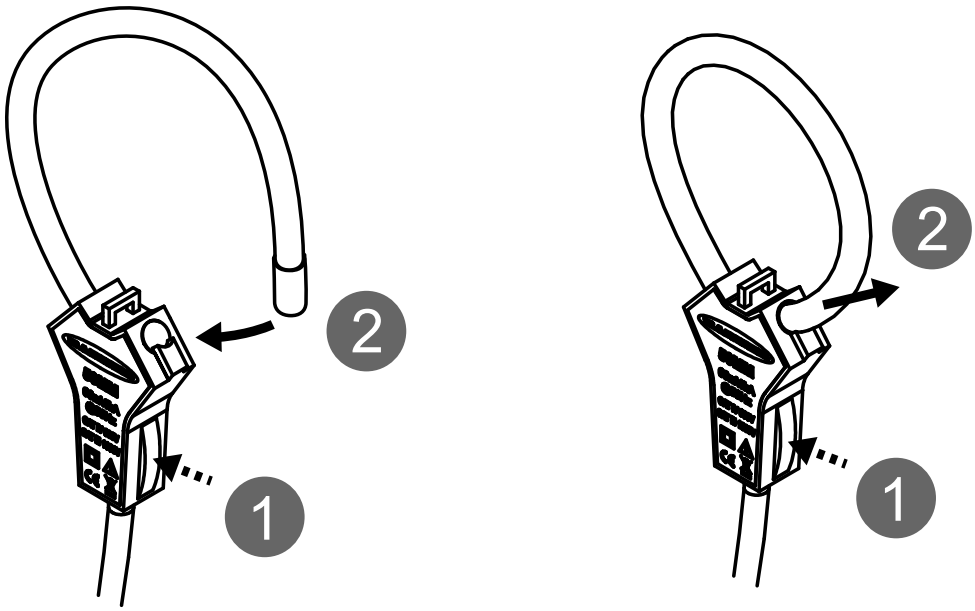


Installing a single conductor on the current transformer



1. Align tabs on the loop connector and insert as shown.
2. Twist to lock into place.
3. Twist in the opposite direction and pull out to release the connection.

Installing the 50mm current transformer loop model



To install the Rogowski coil current sensor loop model:

1. Press the button on the side of the connector.
2. Insert the loop connection and release the button.

To open the loop:

1. Press the button on the side of the connector.
2. Pull out the loop connection and release the button.

Wiring the Rogowski Coil Sensor

Male	Signal Description
Pin 1	10 V DC to 30 V DC
Pin 2	RS-485/D1/B/+
Pin 3	Ground
Pin 4	RS-485/D0/A/-

WARNING: Electrical connections must be made by qualified personnel in accordance with local and national electrical codes and regulations.

Configuration Instructions

Sensor Configuration Software

The Sensor Configuration Software offers an easy way to manage converter Modbus settings, retrieve data, and visually show converter data. The Sensor Configuration Software runs on any Windows machine and uses an adapter cable (BWA-UCT-900, p/n 19970) to connect the converter to the computer.

Download the most recent version of the Sensor Configuration Software from the Banner Engineering website: https://info.bannerengineering.com/cs/groups/public/documents/software/b_3128586.exe.

Rogowski Coil Modbus Configuration

Modbus Register Address	Type	Name	I/O Range	Description	Notes	Default[1]
IO Data Out						
40001	uint16, Read Only	IO Data	0-65535	Analog Data output	AC RMS Current (A) =Register Value/10	0-500, 0-1000, 0-3000, or 0-6000
40002	bool, Read Only	IO Alarm State	-	Alarm State for IO based on Min and Max thresholds defined in Analog In Min Value () and Analog In Max Value ()	0=Within threshold range; 1=Out of threshold range	-
40003	int16, Read Only	IO Error Status	STATUS_ERROR_TYPE_NO_ERROR=0; STATUS_ERROR_TYPE_BELOW_MIN=1 STATUS_ERROR_TYPE_ABOVE_MAX=2	Status of program	0-2 value	-
40801	uint16, Read Only	Measurement List Max			FIFO maximum	
40802	uint16, Read Only	Measurement List Min			FIFO minimum	
40803	uint16, Read Only	Measurement List Mean			FIFO mean	
40811-40820	uint16, Read Only	Measurement List	0-65535	FIFO (first in, first out) list of the past 10 measurements		
IO Data Rate						
41201	uint16, Read and Write	Sample IO	0-65535	Sample interval time for IO	Increments of 62.5 ms	16 (1 second)
Minimum Value						
41204	uint16, Read and Write	Minimum Analog Value	-	Minimum analog value for data read	Minimum value: 0	0
Maximum Value						
41205	uint16, Read and Write	Maximum Analog Value	-	Max analog value for data read	Maximum value	500, 1000, 3000, 6000
Line Frequency						
41011	int16, Read and Write	AC Line Frequency	1 = 60 Hz 2 = 50 Hz	AC Line Frequency	1 = 60 Hz 2 = 50 Hz	1
COMs Settings						
46101	Baud Rate	-	0 = 9.6k 1 = 19.2k 2 = 38.4k	-	-	1
46102	Parity	-	0 = None 1 = Odd 2 = Even	-	-	0
46103	Modbus Slave Address	-	1 to 247	-	-	1

Rogowski Coil Specifications

Supply Voltage
10 V DC to 30 V DC at 50 mA maximum

Power Pass-Through Current
4 A maximum

Supply Protection Circuitry
Protected against reverse polarity and transient voltages

Leakage Current Immunity
400 µA

Resolution
12-bits

[1] Based on the model selected

Performance

Accuracy: ≤ 5% of full scale
Full-Scale Position Error: ±1% maximum
Full-Scale Maximum Bandwidth: 1 Hz to 1 MHz
Phase Error: ≤ 5% of full scale

Electrical

Voltage Insulation- Coil: 1000V
Voltage Insulation- Cable: 500V

Connections

Integral male/female 4-pin M12 quick disconnect

Indicators

Green: power
Amber: Modbus communications

Construction

Coupling Material: Nickel-plated brass
Connector Body: PVC translucent black
Coil and Cable: TPR, UL94-V0

Vibration and Mechanical Shock

Meets IEC 60068-2-6 requirements (Vibration: 10 Hz to 55 Hz, 0.5 mm amplitude, 5 minutes sweep, 30 minutes dwell)
Meets IEC 60068-2-27 requirements (Shock: 15G 11 ms duration, half sine wave)

Environmental Rating

IP65, IP67, IP68
NEMA/UL Type 1

Operating Conditions

Temperature: –30 °C to +70 °C (–22 °F to +158 °F)
≤ 85% at +70 °C maximum relative humidity (non-condensing)
Storage Temperature: –40 °C to +80 °C (–40 °F to +176 °F)

Product Identification

Certifications

Banner Engineering BV
Park Lane, Culliganlaan 2F bus 3
1831 Diegem, BELGIUM

Turck Banner LTD Blenheim House
Blenheim Court
Wickford, Essex SS11 8YT
GREAT BRITAIN

FCC Part 15 Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

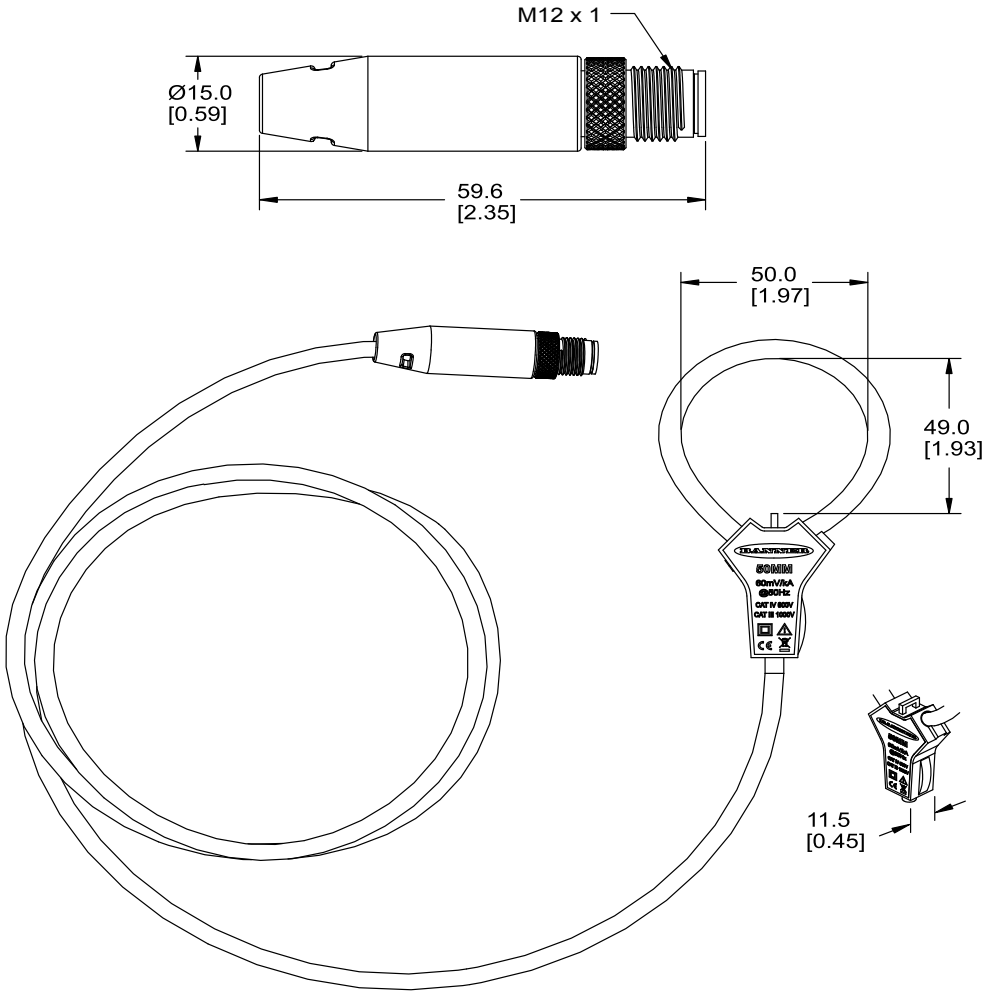
Industry Canada ICES-003(B)

This device complies with CAN ICES-3 (B)/NMB-3(B). Operation is subject to the following two conditions: 1) This device may not cause harmful interference; and 2) This device must accept any interference received, including interference that may cause undesired operation.

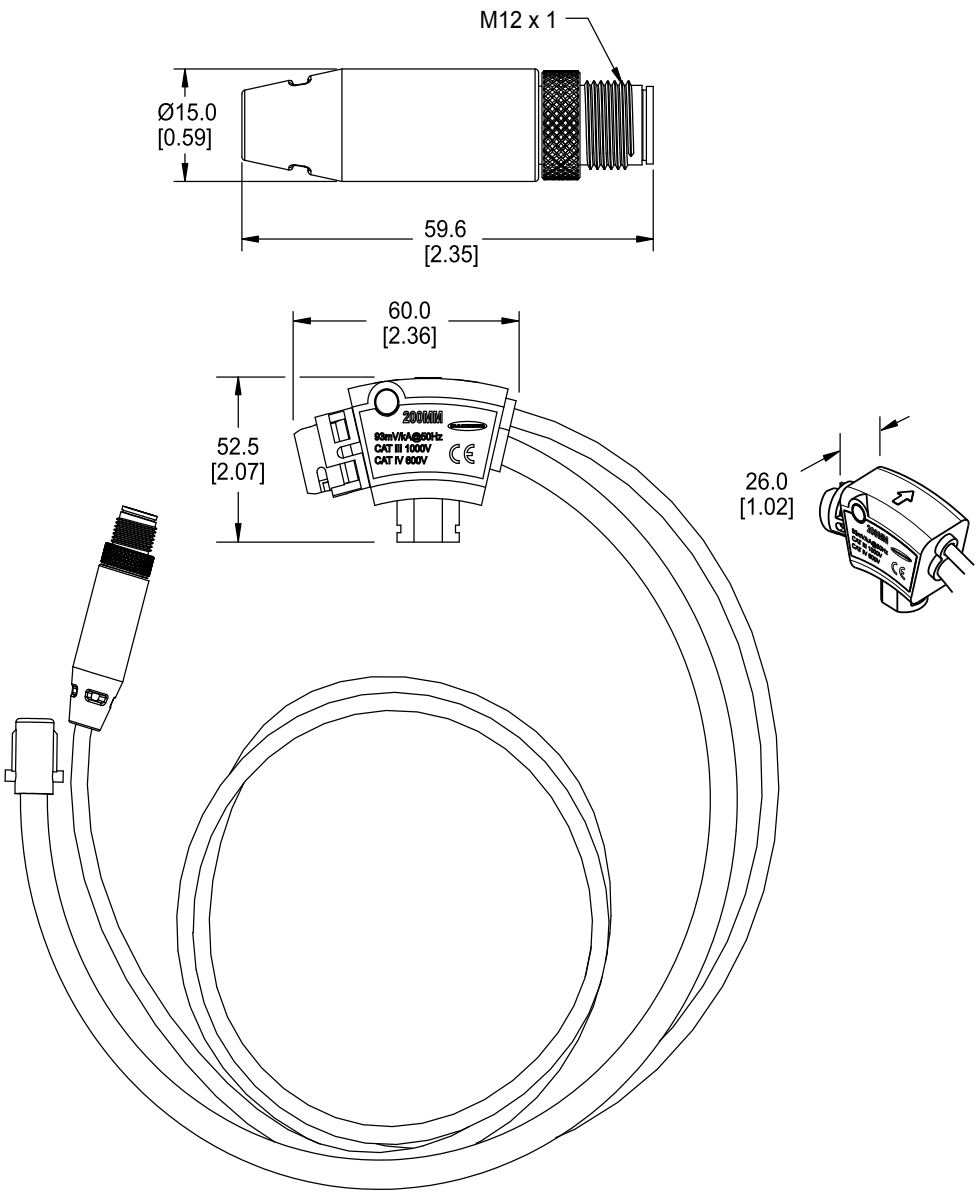
Cet appareil est conforme à la norme NMB-3(B). Le fonctionnement est soumis aux deux conditions suivantes : (1) ce dispositif ne peut pas occasionner d'interférences, et (2) il doit tolérer toute interférence, y compris celles susceptibles de provoquer un fonctionnement non souhaité du dispositif.

Rogowski Coil Dimensions

50 mm diameter model with QD

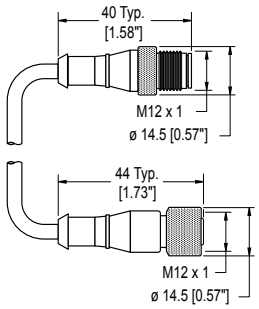
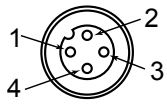
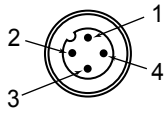


200 mm dia with QD model



Accessories

Cordsets

4-Pin Threaded M12 Cordsets—Double Ended				
Model	**Length**	**Style**	**Dimensions**	**Pinout**
MQDEC-401SS	0.31 m (1 ft)	Male Straight/Female Straight		Female  Male  1 = Brown 2 = White 3 = Blue 4 = Black
MQDEC-403SS	0.91 m (2.99 ft)			
MQDEC-406SS	1.83 m (6 ft)			
MQDEC-412SS	3.66 m (12 ft)			
MQDEC-420SS	6.10 m (20 ft)			
MQDEC-430SS	9.14 m (30.2 ft)			
MQDEC-450SS	15.2 m (49.9 ft)			

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