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CONNECTING AC INPUT POWER AND CAT 5 DATA CABLE TO THE SMART CONDITION MONITORING SYSTEM EDGE

The Smart Condition Monitoring System Edge device must be connected to ac power to operate. The input power specifications include:

- Nominal voltage: 110V ac 60Hz / 220V ac 50Hz
- Maximum power: 120 Watts

Figure 1 – Drawing of Smart Condition Monitoring System Edge with option cellular antenna and Andon Light. M12 sensor connections (bottom), interface box (right)

NOTE: The Smart Condition Monitoring System Edge device enclosure is rated IP66 to reliably operate in harsh environments. **OPENING THE EDGE DEVICE ENCLOSURE COVER, OR ANY OTHER INTRUSION INTO THE EDGE DEVICE ENCLOSURE, VOIDS THE WARRANTY OF THE EDGE DEVICE. ALL CONNECTIONS MUST BE MADE USING THE INTERFACE BOX.**

Remove the cover of the interface box by loosening the 4 cover fasteners shown in **Figure 1**. Using a knockout punch, remove either a ½", 1", or 1-½" hole for ac power metal conduit on the bottom or (preferably) top of the interface box and securely tighten the conduit to the box.

CAT 5 data cable is used for connectivity from the Smart Conditioning Monitoring System Edge device to a PLC (LAN connection), as well as for the connection to the internet (WAN connection). Alternatively, cellular connectivity may be used for the WAN connection, with specific versions of the SCMS Edge device equipped with a cellular antenna. As above, remove a second hole for the CAT 5 data cable(s) metal conduit on the top or (preferably) bottom of the interface box and securely tighten the conduit to the box. **It is best practice to have the data cables plugged in before power is turned on.**

Locate the ac power plug assembly and the RJ-45 connectors that are provided in the interface box. The power and data ports are shown in **Figure 2**. For correct assembly of the connectors, refer to section 1.1 for the data connectors and section 1.2 for the power connector. Remove any excess slack that is remaining in the power or data cables inside of the box and replace the cover.

Figure 2 – AC Power and Data Connections in side box

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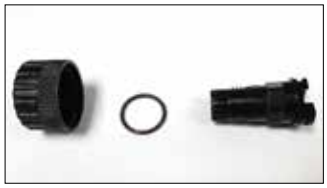
HOW TO ATTACH THE TE CONNECTIVITY 1546440-1 CONNECTOR TO CAT 5 CABLE

1. Place sealing “O” ring over connector body and slide coupling ring onto body **(Steps A, B then C).**
2. Slide sealing nut, cable grip grommet and assembly just created onto cable. Push the grommet into the connector body then loosely tighten the sealing nut **(Steps D, E then F).**
3. Strip the outer sheath of the cable back 14mm, untwist and straighten the 8 core wires and arrange the colors as required for EIA/TIA 568B (Orange/White, Orange, Green/White, Blue, Blue/White, Green, Brown/White, Brown - pins 1 to 8) then trim to a neat straight line **(Steps G, H then I to give J).**
4. Push the wires into the clear RJ45 connector. Pin 1 is to the left when the cable is facing you and the tang is under the connector as shown in **Step K**.
5. Crimp the wire cores into the RJ45 connector using suitable crimping pliers **(Step L).**
6. Gently pull the RJ45 plug back into the connector shell, slip the snap ring onto the connector body and push firmly until it snaps into place locking the plug into the connector body **(Steps M, N then O)**.
7. Test the completed cable end to end with a suitable LAN cable tester.



Step A

Step B

Step C

Step D

Step E

Step F

Step G

Step H

Step I

Step J

Step K

Step L

Step M

Step N

Step O

Step P

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HOW TO ATTACH THE AMPHENOL C016 20F003 100 12 CONNECTOR TO POWER CABLE

1. Punch suitable holes in the top or bottom surface of the small connector box attached to the side of the SED500X unit. Attach suitable conduit or install a dust tight cable gland as appropriate for the installation environment.

2. Unpack the Amphenol C016 20F003 100 12 supplied inside the small connector box **(Step A).** Choose one of the 2 sizes of rubber cord grip appropriate for the cable(s) being connected **(Step A)**.

3. Thread on the pieces of the connector onto the cable in the following order noting the correct orientation — gland nut, rubber cord grip, gland ferrule, right-angled backshell and straight backshell ensuring the angle locking fingers are facing towards the right-angled body **(Step B).**

4. Strip back the outer sheath of the cable 37mm then strip 7mm at the end of each conductor **(Step C).**

5. Connect the wire cores into the back of the connectors screwing down the terminals securely using a 1/8" or 3mm blade screwdriver. Line 110V ac goes to terminal 1, Neutral 110V ac goes to terminal 2 and Ground goes to the terminal marked with the Ground Symbol (**Step D and E)**. Note the terminal numbers are under the screw terminals inside the connector. Also note that there is a semicircular cutout in the side of the free spinning front tubular part of the connector which needs to be aligned with each screw in turn to allow screwdriver access to the terminal screws (**Step F**).

6. Screw the straight backshell onto the front of the connector and tighten. Note this must be done by holding the front keyed circular portion with soft nosed pliers and turning the backshell. Do not hold the backshell and turn the front keyed portion or the wires will twist around and break internally (**Step G and H**).

7. Pull down the right angle backshell and holding the front part assembled portion and the right angled backshell turn the large hexagonal portion of the right angled backshell which will spin independently of the right angled backshell **(Step I)**. This shows slip lock pliers on the hex portion, but hand tighten only so that the ratchet portion can still be adjusted for angle. Do not tighten at this stage (**Step J**).

8. Slip down the gland ferrule and turn until the keys on it are aligned with the slots in the right angled backshell. **(Step K)**. Push the ferrule fully home then slip down the rubber cord grip and push securely into the ferrule. **(Step L)**. Slip the cable gland nut down onto the right angled backshell and just engage the threads together. Do not tighten at this stage **(Step M)**.

9. Look at the small enclosure power connector. Typically, the keyway will be at the 3 o'clock position. Carefully turn the keyed circular connector face until the key orients the right-angled body of the connector to the

Step A

Step B

Step C

Step D

Step E

Step F

Step G

Step H

Step I

Step J

Step K

Step L

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9 o'clock, 12 o'clock or 3 o'clock position. When the keyways align then tighten the large hexagonal nut on the right-angled portion of the backshell to lock the ratchet portion, so it cannot turn **(Step N).**

10. Tighten the cable gland nut until it grips the cable tightly and is well seated and sealed **(Step O).**

11. Connect the connector onto its mating bulkhead connector turning it carefully until the keys align, push in hard and then turn the hand nut until the connector is tight and fully engaged (**Step P).**

12. If the LAN and WAN cables have already been attached and connected, apply power and check the Serial Edge Device has power (power indicating light is illuminated blue).

Step M

Step N

Step O

Step P

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CONNECTING THE REXNORD SUPPLIED CURRENT TRANSDUCER

1. ELECTRICAL CONNECTIONS (TOOL NEEDED 3 MM BLADE SCREWDRIVER)

A. INPUT CONNECTIONS

1. *Current Measurements*
   The transducers sense current in a non-contact fashion by simply running the wire carrying the current through the hole of the transducer. If installing the dc version, pay close attention to the direction as shown below **(Figure 5)**.

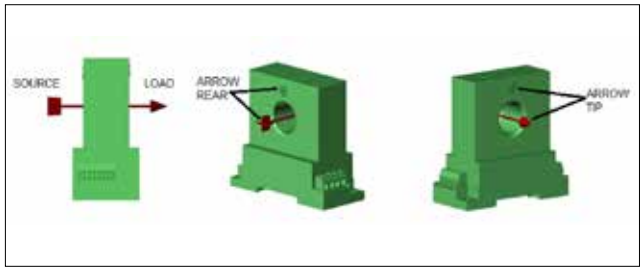


Figure 5

All non-contact current measurements are based upon a single phase wire going through the hole. Wire the CT cable to the CT as shown in **Figure 6**.

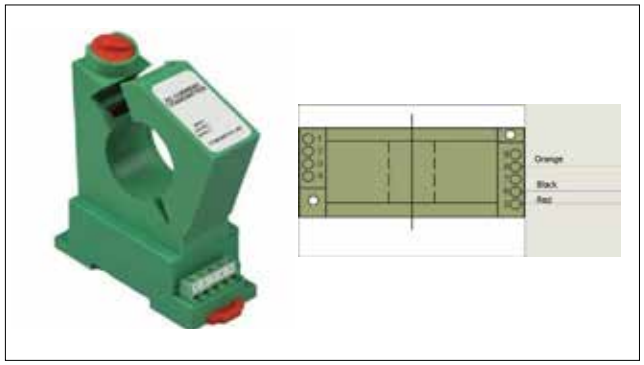


Figure 6

B. CONNECTING TO THE REXNORD EDGE

1. *Converter Box*
   If the molded connector end of the CT cable is not already connected, please attach to terminal 4 (Yellow) on the small black converter box mounted next to the Edge **(Figure 7)**.

Figure 7

2. MOUNTING AND MECHANICAL

A. DIN RAIL MOUNTING (TOOL NEEDED 3MM BLADE SCREWDRIVER)

1. Hook the stationary lip of the bottom case to one side of the 35mm DIN Rail. (The side without the orange clip.)
2. Using the blade screwdriver, push down and pull out on the orange rail clip of the bottom case till the transducer clicks over the other side of the rail.
3. Once it is latched on fully, push the clip in towards the transducer to fully seat the transducer on the rail **(Figure 8).**

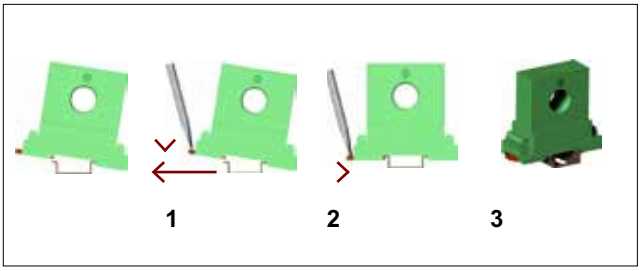
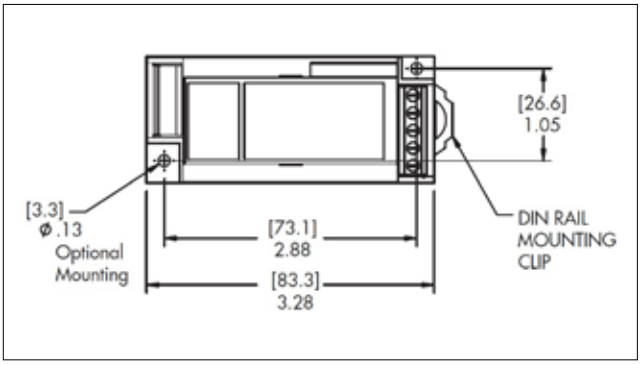


Figure 8

B. SCREW MOUNTING (SCREWS ARE NOT SUPPLIED)

1. Do Not over tighten the mounting screws.



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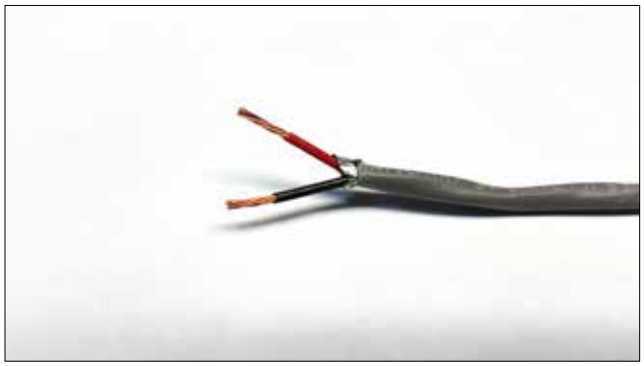
CONNECTING YOUR OWN 4-20MA CURRENT TRANSDUCER

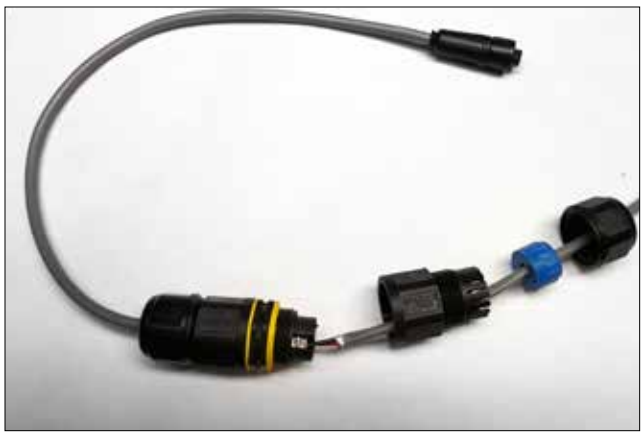
It is very important that you do not connect the cable from the 4-20mA source to the converter box box without successfully completing this procedure. If it is not possible to successfully complete this procedure, then the cable should be left disconnected and adequate protection to prevent shorting of the wires or dirt contamination be provided until such a time as a test can be completed.

1. To complete this test the cable from your 4-20mA CT or PLC providing the signal must be disconnected and isolated at the source.
2. Please provide a 2-core cable. Double check it has been disconnected from the signal source at the other end. Ensure the LCVC8001 converter box connector is not connected to either the converter box or the Loop Current Polarity Checker box then unscrew the free end of the cable joint and slip the gland nut, seal grommet and removable terminal cover up the cable **(Step A).**
3. Strip back the cable jacket 1" and strip each of the 2 core wires back ½" to bare wire **(Step B).**
4. There are only 2 screw down terminals inside the cable joint. Loosen, insert a bared core wire and tighten the terminal and repeat. It is not important at this stage which core wire is connected to which terminal **(Step C).**
5. Screw terminal cover onto cable joint, slide down blue cable gland seal and insert into "fingers" then slide down gland nut and loosely tighten **(Step D)**.
6. Connect the 4-20mA CT or PLC cable at the source end and connect the Polarity Test Box to the EN2 connector on the end of the lead from the cable joint by slowly turning the connector until the key aligns then insert and tighten the finger lock nut on the connector. Sometimes the finger nut needs to be turned slightly to allow the connector to engage fully **(Step E)**.
7. Provide either a test signal from the PLC or engage the equipment such that current is drawn by the motor. Using a Multimeter with the input and range set to around 0-20V dc (0-10V dc minimum) check whether a positive or negative voltage reading is shown on the multimeter **(Step E)**. *Note that even if the motor is not turning, the meter should read either +1V dc or -1V dc.*
8. If the meter displays a positive value less than 5V dc, this test is complete, tighten the cable gland, disconnect the cable from the test box and connected to the converter box. If the multimeter displays a negative dc voltage reading the wires inside the cable joint are reversed. Unscrew the gland nut and the screw terminal cover, disconnect the wires and swap them over tightening them securely. *Note the equipment must be turned off or the test signal deactivated before the cable joint is opened or damage to the customer PLC or CT*

Step A



Step B



Step C

Step D

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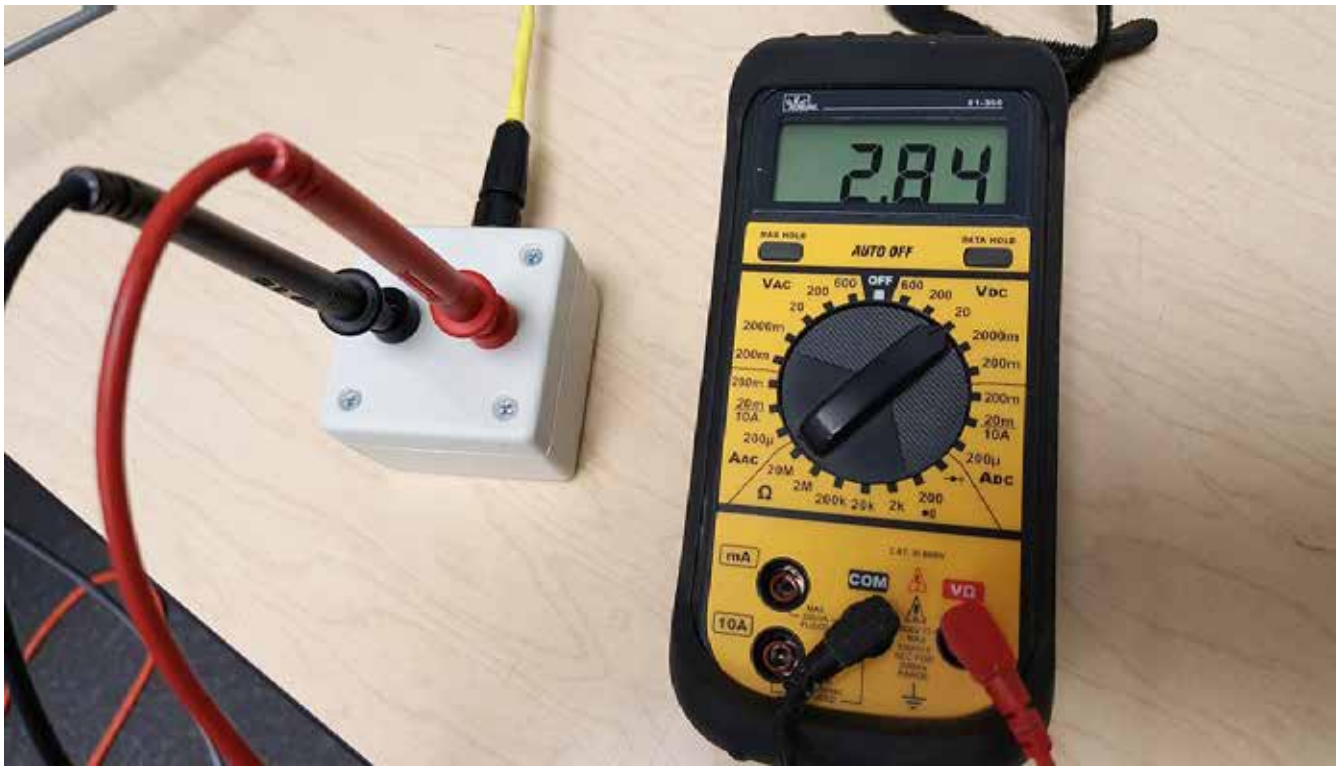
could occur. Tighten down the screw terminal cover and the cable gland nut, reconnect to the PLC or customer CT at the head end and repeat 7) above ensuring the multimeter displays a positive voltage reading then disconnect the cable from the test box and connect it to the Sensor Converter.

9. If the multimeter reads more than +5V dc or less than -5V dc, further investigation by a qualified electrical technician is required. If the signal is to the correct 4-20mA signal, a multimeter connected red to red and black to black on the test box will never show greater than +5V dc or less than -5V dc. In this case do not connect the CT cable to the converter box.
10. If, and only if, a successful test was achieved, remove the polarity test box and connect the EN2 connector on the end of the cable from the LCVC8001 to the lower Left Hand (Yellow) port on the converter box. Check that after the equipment is back in service that motor power draw is being sent to the cloud and the scaling factor has been correctly set.
11. Pack Polarity check box in toolkit and move to next job.



Step E

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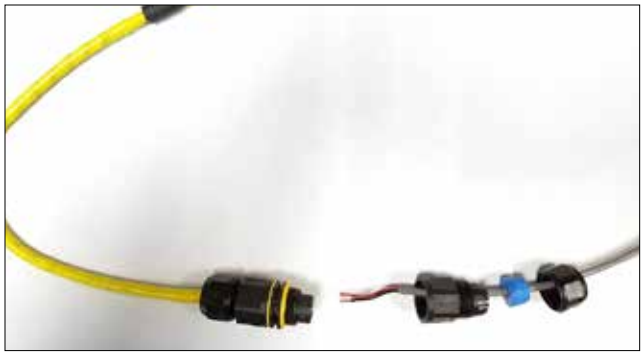
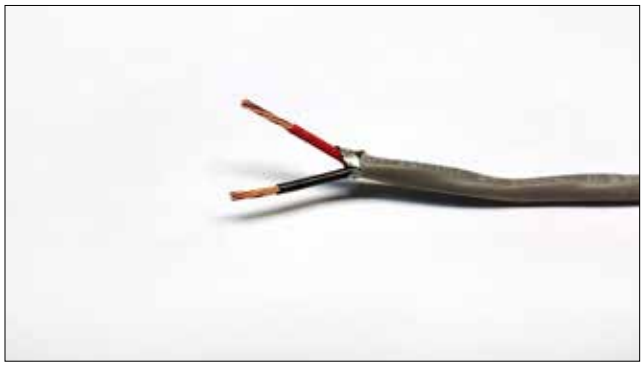
CONNECTING YOUR OWN 0-5V DC OUTPUT CURRENT TRANSDUCER

It is very important that you do not connect the cable from the current transducer to the converter box box without successfully completing this procedure. If it is not possible to successfully complete this procedure, then the cable should be left disconnected and adequate protection to prevent shorting of the wires or dirt contamination be provided until such a time as a test can be completed.

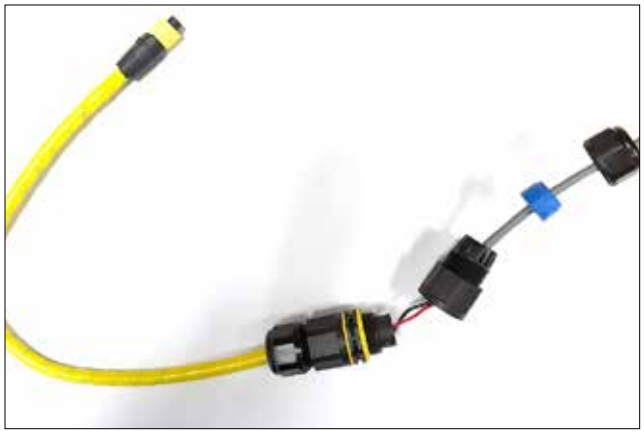
1. To complete this installation and test, the cable from the 0-5V CT or PLC providing the signal must be disconnected and isolated at the source.
2. Please provided a 2-core cable. Double check it has been disconnected from the signal source at the other end. Ensure the VSCC9001 converter box connector is not connected to either the converter box or the Polarity Checker box then unscrew the free end of the cable joint and slip the gland nut, seal grommet and removable terminal cover up the cable **(Step F)**.
3. Strip back the cable jacket 1" and strip each of the 2 core wires back ½" to bare wire **(Step B).**
4. There are only 2 screw down terminals inside the cable joint. Loosen, insert a bared core wire and tighten the terminal and repeat. It is not important at this stage which core wire is connected to which terminal **(Step G).**
5. Screw terminal cover onto cable joint, slide down blue cable gland seal and insert into "fingers" then slide down gland nut and loosely tighten **(Step H).**
6. Connect the 0-5V CT or PLC cable at the source end and connect the Polarity Test Box to the EN2 connector on the end of the lead from the cable joint by slowly turning the connector until the key aligns then insert and tighten the finger lock nut on the connector. Sometimes the finger nut needs to be turned slightly to allow the connector to engage fully **(Step E)**.
7. Provide either a test signal from the PLC or engage the equipment such that current is drawn by the motor. Using a Multimeter with the input and range set to around 0-20V dc (0-10V dc minimum) check whether a positive or negative voltage reading is shown on the multimeter **(Step E)**. *Note that if the motor is not turning, the meter will read 0V dc.*
8. If the meter displays a positive value less than 5V dc, this test is complete, tighten the cable gland, disconnect the cable from the test box and connected to the converter box. If the multimeter displays a negative dc voltage reading the wires inside the cable joint are reversed. Unscrew the gland nut and the screw terminal cover, disconnect the wires and swap them over tightening them securely. Note the equipment must be turned off or the test signal deactivated before the cable joint is opened or damage to the PLC or CT could occur. Tighten down the screw terminal cover and the cable gland nut,



Step F



Step B



Step G

Step H

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reconnect to the PLC or CT at the head end and repeat 7) above ensuring the multimeter displays a positive voltage reading then disconnect the cable from the test box and connect it to the converter box.

9. If the multimeter reads more than +5V dc or less than -5V dc, further investigation by a qualified electrical technician is required. If the incoming signal is to the correct 0 to 5V dc signal, a multimeter connected red to red and black to black on the test box will never show greater than +5V dc or less than -5V dc. In this case do not connect the CT cable to the converter box.
10. If, and only if, a successful test was achieved, remove the polarity test box and connect the EN2 connector on the end of the cable from the VSCC9001 to the lower Left Hand (Yellow) port on the converter box. Check that after the equipment is back in service that motor power draw is being sent to the cloud and the scaling factor has been correctly set.
11. Pack Polarity check box in toolkit and move to next job.

INSTALLING THE OIL QUALITY SENSOR (IF NEEDED TO CONDUCT AN OIL CHANGE)

1. The housing uses a tapered pipe thread (NPT) seal by contact of threads. A paste type anti-seize compound such as Parker Thread-Mate along with pipe thread sealing tape works most effectively with NPT threads
2. Use anti-seize compound on male thread, then 3-4 wraps of Teflon tape
3. Ensure the Oil Quality Sensor and adaptor sub-assembly stays clean and clear of all contamination in the element area of the sensor.
4. Screw in adaptor Oil Quality Sensor sub-assembly into the housing turning clockwise
5. Adaptor fittings should engage about 2 turns by hand and then be tightened to the recommended torque.
6. Tighten sub-assembly by using the flats that are on the adaptor, reference **Figure 9** for location of flats on adaptor. **Caution: Do not tighten the sub-assembly by using the flats that are on the Oil Quality Sensor**.
7. Tighten torque recommendation are shown in **Figure 9** below, based on the size of the NPT.
8. Connect the cable to the end of the Oil Quality Sensor that runs from the Smart Condition Monitoring System control box.

THREAD SIZE	RECOMMENDED TORQUE	
1 NPT	129-163 Nm	95-120 ft-lb
1-¼ NPT	176-203 Nm	130-150 ft-lb

Figure 9: NPT Torque Recommendations

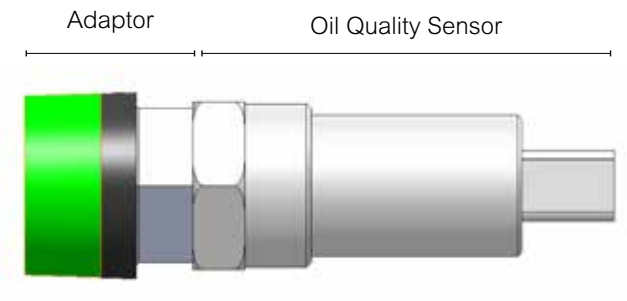

Figure 10: Oil Quality Sensor Sub-Assembly

If the element on the Oil Quality Sensor becomes contaminated, the following should be done:

1. Disconnect the cable from the end of the Oil Quality Sensor.
2. Remove the Oil Quality Sensor from the gear drive by turning the Oil Quality Sensor sub-assembly counterclockwise.
3. Loosen the sub-assembly by using the flats that are on the adaptor. **Caution: Do not loosen the sub-assembly by using the flats that are on the Oil Quality Sensor, reference *Figure 9* for location of flats on adaptor.**
4. Disassembly Oil Quality Sensor from adaptor by using the flats provided on the adaptor and Oil Quality Sensor by turning in a counterclockwise direction.
5. Once the adaptor and Oil Quality Sensor have been disassembled cleaning the sensor element is a two-step process:
   a. Rinse the sensor element with isopropyl alcohol, reference **Figure 10** for location of sensor element.
   b. Rinse the sensor element with distilled water or deionized water.
   Note: It is important NOT to use a brush or compressed air when cleaning the sensor as it can damage the element.
6. After the Oil Quality Sensor element has been cleaned, the follow should be done for reassembly of the adaptor and Oil Quality Sensor.
7. Apply a small amount of the lubricant to the face of the O-ring gasket to help ensure the O-ring gasket and the adaptor seal correctly.
8. Straight thread S.A.E. threads seal with the use of and O-ring on the male thread and a flat face at the bottom of the female thread, they do not seal on the threads. A paste type anti-seize compound such as Swagelok Blue Goop® works most effective with straight threads.

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9. Use anti-seize compound on male threads.
10. Prepared fittings should engage fully by hand turning the clockwise direction.
11. Tighten of the adaptor and Oil Quality Sensor should be done the use of the flats provided on the adaptor and the sensor.
12. Tighten torque recommendation are shown in **Figure 11** below.

THREAD SIZE	RECOMMENDED TORQUE	
¾-16 UNF	100-115 Nm	80-90 ft-lb

Figure 11: S.A.E. Torque Recommendations

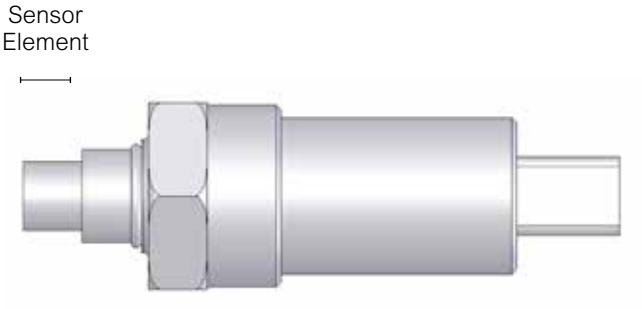

Figure 12: Oil Quality Sensor

Always observe these precautions when tightening:

- The condition of the threads is important to ensure proper engagement of strength, and threads should always be inspected before use.
- Proper tightening is important to ensue sealing and to prevent unthreading due to vibration.
- High temperature anti-seize compounds containing metallic particles are not recommended.
- Only use correctly sized open-end wrenches on the adaptor flats provided.
- Teeth from pipe wrenches can initiate cracks in hardened steel components.

ALLOWING THE EDGE DEVICE ON YOUR NETWORK (SECURITY GUIDELINES)

See supplemental document (SS5-001) for instructions on how to set up your network for secure communications.

SETTING UP YOUR PLC

See supplemental document (SS3-002) for instructions on how to set up the Edge to be visible on your PLC network.

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APPENDIX A: TROUBLESHOOTING

1. The Andon Light does not illuminate (optionally mounted on Edge Device or remotely)
   - 1.1. Check that the blue LED light located on the front of the Edge Device is illuminated.
   - 1.2. If the Andon Light is mounted separately from the Edge Device, verify that the cable connections are secure and that the cables show no sign of damage.
   - 1.3. Check that the ac input power is within specifications.
   - 1.4. If the problem persists, consult 1-866-REXNORD. Do not open the Edge Device.
2. The Andon Light illuminates, but no data is available from the cloud
   - 2.1. If the connection is cellular:
     - 2.1.1. Check that the GPS location or address of the Edge Device is discovered and currently has AT&T cellular coverage(https://www.att.com/maps/wireless-coverage.html)
     - 2.1.2. Check for excessive metal shielding around the cellular antenna that could impede cellular reception. The GPS/Cellular antenna is the black round hyperbolic stack located at top-left of the edge device as shown in **Figures 13 & 14**. If excessive metal shielding exists, the unit will have to be hard-wired.
   - 2.2. If the WAN connection is hard-wired with Ethernet:
     - 2.2.1. Check that the network settings allow functionality from the Edge Device. Please see Rexnord Smart Condition Monitoring System Security Guidelines for additional details.
     - 2.2.2. Verify external Ethernet cable to hard wired public internet is connected to “WAN/Cloud” and the PLC Ethernet connection (if provided) is connected to the port marked LAN/PLC.
     - 2.2.3. If the problem persists, contact Rexnord.

APPENDIX B:

Figure 13 – Edge device assembly with optional cellular antenna and Andon light

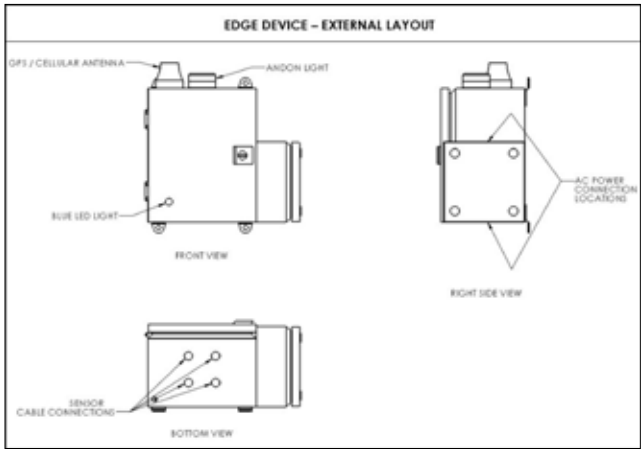

Figure 14 – Edge device external layout with optional cellular antenna and Andon light

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APPENDIX C — FCC STATEMENTS:

Modification statement

Rexnord has not approved any changes or modifications to this device by the user outside of those listed in this document. Any additional changes or modifications could void the user's warranty.

Interference statement

This device complies with Part 15 of the FCC Rules and Industry Canada license exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Wireless notice

This equipment complies with FCC and IC radiation exposure limits set forth for an uncontrolled environment. The antenna should be installed and operated with minimum distance of 20 cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

FCC Class A digital device notice

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.

Contact Information

Phone: 1-866-**REXNORD** (739-6673)

Internet: www.rexnord.com

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