Commercial
Services LLC

Please see attached

Test Procedures
RayClic proper insertion
Blank Test Report

XL IO
https://www.nvent.com/sites/default/files/acquiadam/assets/RAYCHEM-IM-H58033-XLTraceEdgePFP-EN.pdf

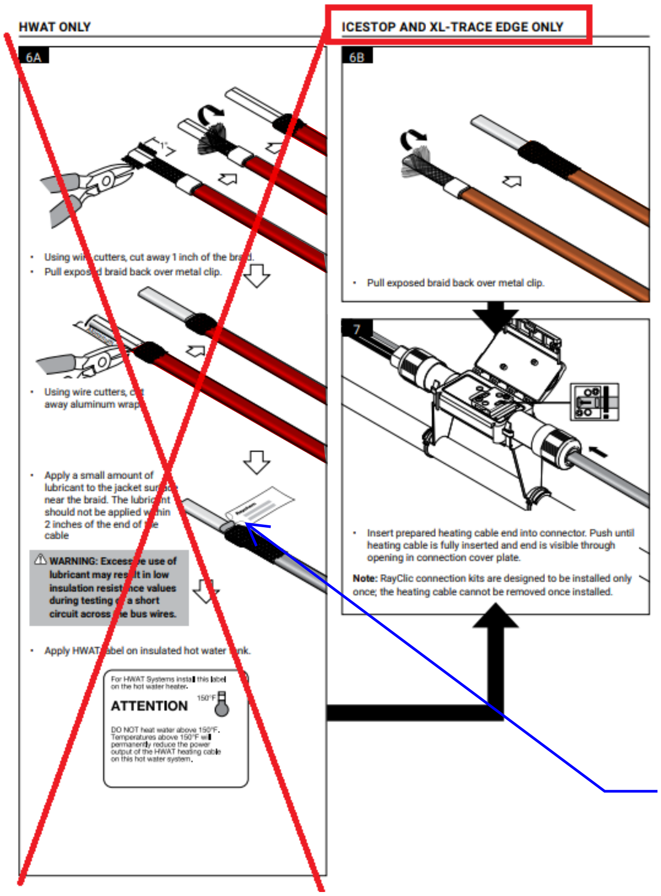
RayClic PC install video
https://www.youtube.com/watch?v=gKUq8VqPLaw

General heat trace install video (Not XLTrace, different components)
https://www.youtube.com/watch?v=AFaVGKu3FWY

RayClic PC installation instructions
https://www.nvent.com/sites/default/files/acquiadam_assets/2022-10/RAYCHEM-IM-H55092-RayClicConnectionSystem-EN.pdf

For XLTrace (orange or black cable)
Do NOT follow the HWAT step 6a
YOU WANT 6B

For the end seal you want to go
straight from step 2 to 3



HWAT ONLY

6A

- ~~Using wire cutters, cut away 1 inch of the braid.~~
- ~~Pull exposed braid back over metal clip.~~
- ~~Using wire cutters, cut away aluminum wrap.~~
- ~~Apply a small amount of lubricant to the jacket surface near the braid. The lubricant should not be applied within 2 inches of the end of the cable~~

~~**⚠ WARNING: Excessive use of lubricant may result in low insulation resistance values during testing or a short circuit across the bus wires.**~~

- ~~Apply HWAT label on insulated hot water tank.~~

~~For HWAT Systems install this label on the hot water heater.~~
~~ATTENTION~~
~~150°F~~
~~DO NOT heat water above 150°F. Temperatures above 150°F will permanently reduce the power output of the HWAT heating cable on this hot water system.~~

ICESTOP AND XL-TRACE EDGE ONLY

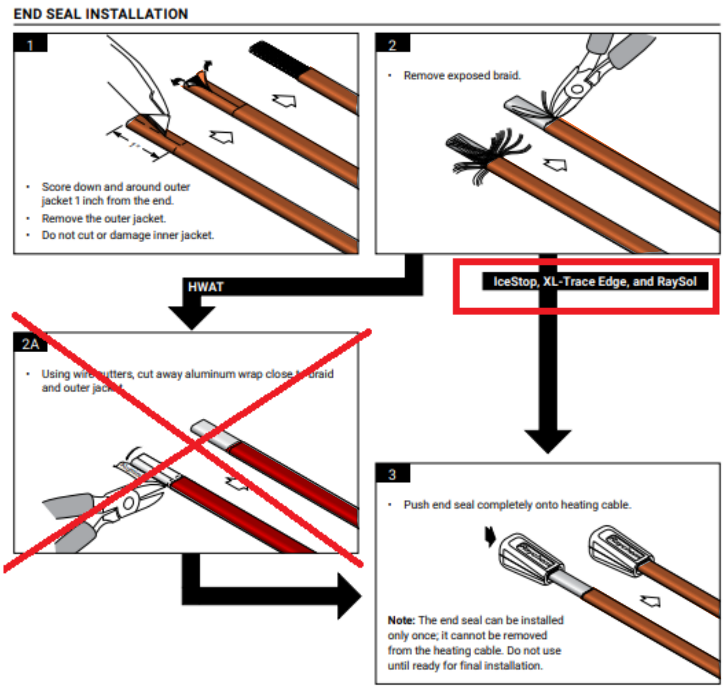
6B

- Pull exposed braid back over metal clip.

7

- Insert prepared heating cable end into connector. Push until heating cable is fully inserted and end is visible through opening in connection cover plate.

Note: RayClic connection kits are designed to be installed only once; the heating cable cannot be removed once installed.



END SEAL INSTALLATION

1

- Score down and around outer jacket 1 inch from the end.
- Remove the outer jacket.
- Do not cut or damage inner jacket.

2

- Remove exposed braid.

HWAT

IceStop, XL-Trace Edge, and RaySol

2A

- ~~Using wire cutters, cut away aluminum wrap close to braid and outer jacket.~~

3

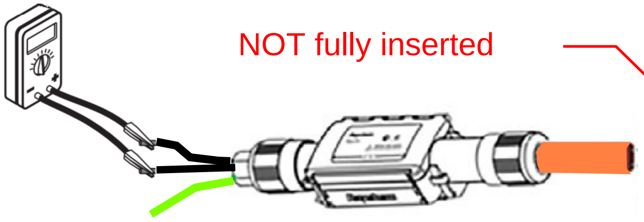
- Push end seal completely onto heating cable.

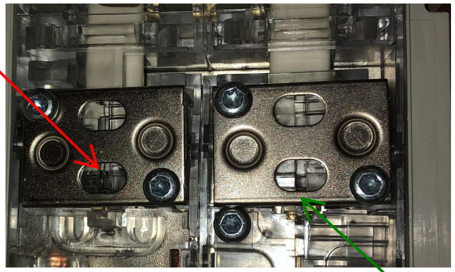
Note: The end seal can be installed only once; it cannot be removed from the heating cable. Do not use until ready for final installation.

Do NOT use lube provided!

"CORE" resistance

"CORE" resistance is read from Black to Black. This is reading across the heating core and should show 4-150 ohms depending on length and temperature. A longer cable should have a lower core resistance. If the reading is above 300 ohms be sure that the cable is fully inserted into the RayClic. Check the Rayclic screws for tightness. If below 3 ohms check for a bus wire to bus wire short or exceeded maximum circuit length.



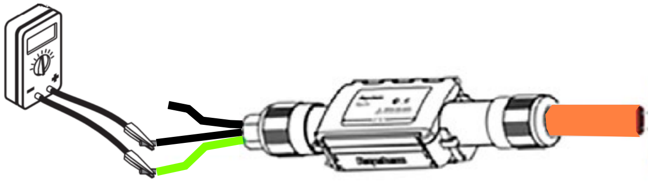


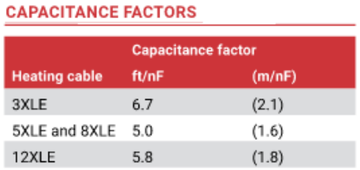
NOT fully inserted

You should see white inner jacket all the way into both windows

Capacitance Reading

The capacitance reading can be used to estimate length. The capacitance is read from the bus wire (black) to braid (green). The reading (in nano farads) times the factor (see chart to the right) will give a rough estimate of the heating cable connected length. Note that if the is a bad IR reading the indicated length will be WRONG and the you will see a cable length as long as only one bus wire is connected. This should be used as an estimate only.





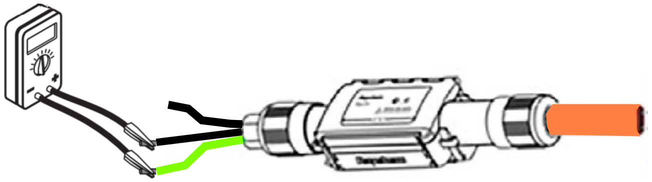
CAPACITANCE FACTORS

	Capacitance factor	
Heating cable	ft/nF	(m/nF)
3XLE	6.7	(2.1)
5XLE and 8XLE	5.0	(1.6)
12XLE	5.8	(1.8)

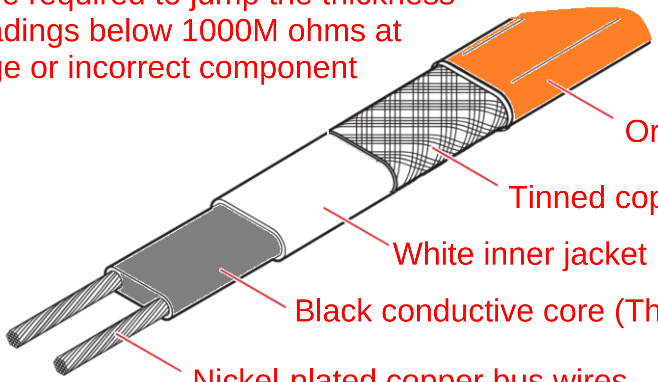
Estimated length = Capacitance reading (in nf) x Capacitance Factor

Insulation Resistance Testing (Meggering)

Insulation resistance testing is the electrical version of pressure testing a pipe. The resistance of the primary jacket is measured from the bus wire (black) to braid (green) at a high voltage to be sure there is no damage. Raychem requires this to be done up to 2500VDC because that is the voltage required to jump the thickness of the primary jacket. Readings below 1000M ohms at 2500VDC indicate damage or incorrect component installation.



Raychem requires a minimum insulation resistance (IR) of 1000 Mega ohms at 2500VDC



Orange(CR) or Black(CT) outer jacket

Tinned copper braid

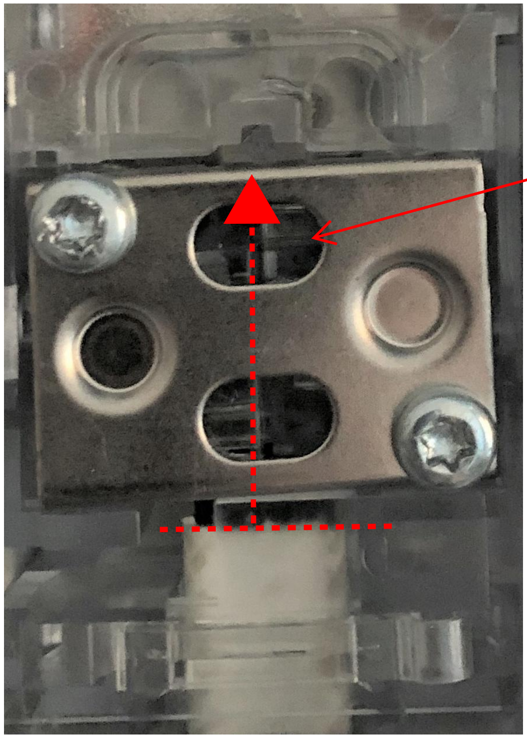
White inner jacket

Black conductive core (This is the heating element)

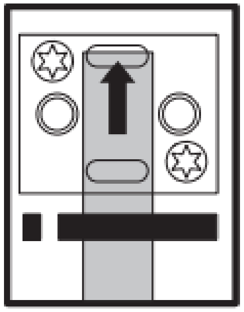
Nickel-plated copper bus wires

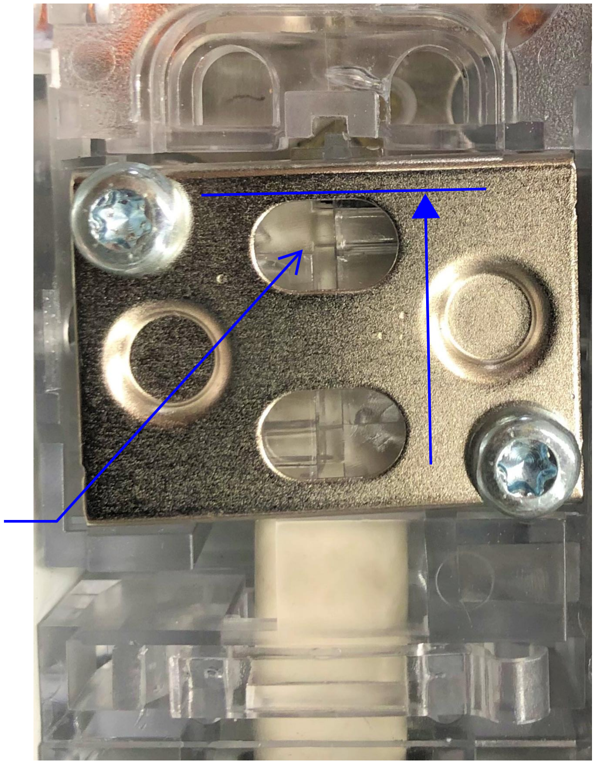
Commercial Services LLC

TITLE: RAYCHEM XLE
IO Testing Diagrams
SCALE NONE
DATE. 11/3/22
REV. A

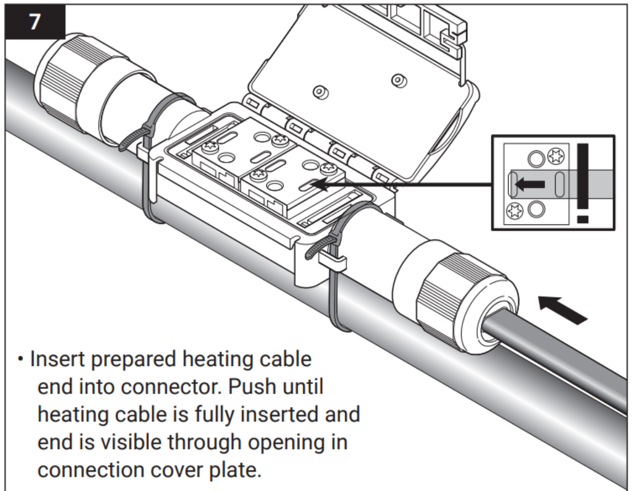


The heating cable inner jacket should be visible in both windows





Heating cable inner jacket visible in top window



- Insert prepared heating cable end into connector. Push until heating cable is fully inserted and end is visible through opening in connection cover plate.

Note: Heating cable cannot be removed. The connection and end seal are designed to be installed only once; the heating cable cannot be removed once installed.

Find the powered RayClic instructions here:

https://www.nvent.com/sites/default/files/acquiadam/assets/RAYCHEM-IM-H55388-RayClicConnectionKits-EN.pdf

Rayclic Power IO video

https://www.youtube.com/watch?v=gKUq8VqPLaw

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TITLE: Proper RayClic Cable Insertion

SCALE	DATE	REV.
NONE	2/28/23	A

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Raychem Heating Cable Test Results

Project

"Core"	Bus wire to bus wire, ohms
"Capactance"	Bus wire to braid, micro farads
"IR"	Bus wire to braid, mega ohms

insulation resistance minimum passing >1000Mohms at 2500volts

Circuit	Core	Capacitance	IR @500vdc	IR @1000vdc	IR @2500vdc	NOTES