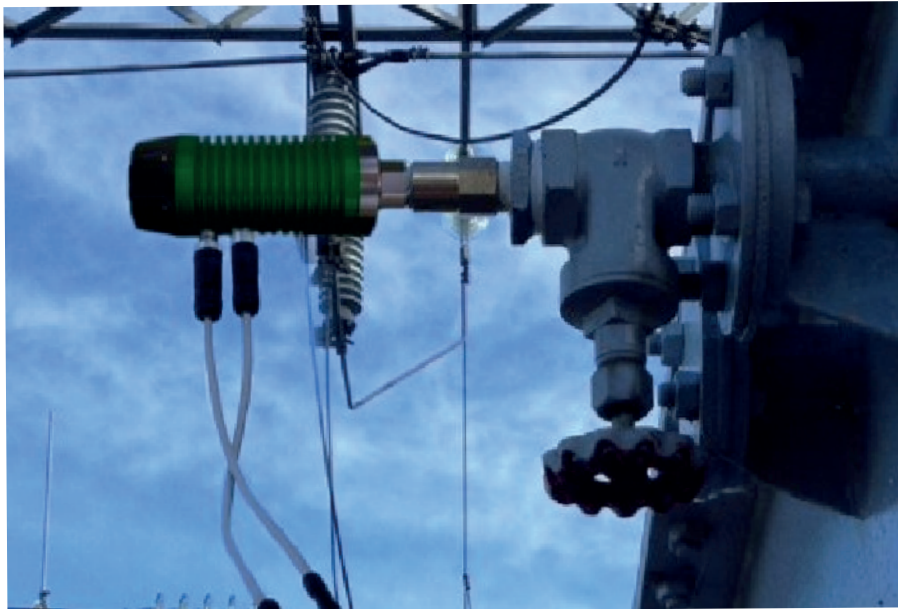


EcoStruxure Transformer Expert Probe EcoStruxure Transformer Expert Probe Dual H2

Installation and Commissioning Guide

ETE-UM01-03
04/2024



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The information provided in this document contains general descriptions, technical characteristics and/or recommendations related to products/solutions.

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Foreword

Safety Information

Important Information

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

Safety Precautions

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Before Starting Work

Before starting work, qualified personnel and the operator must have read and understood this document. Follow all instructions.

NOTE: The term **Operator** refers to personnel responsible for the installation and maintenance of the transformer.

Modifications and repairs to the product may only be carried out by Schneider Electric employees, if expressly permitted by the instructions of this document.

Instructions and symbols directly attached to the product must be observed. They must not be removed and must be kept in a fully legible condition.

People Authorized to Install the Probe

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- The installation and commissioning of the probe must be carried out only by skilled, professional and qualified electrical personnel.
- In addition to site requirements, all work is carried out in accordance with the current revision of Schneider Electric Electrical and Mechanical Safety Rules.
- The following parts related to Safety must be considered and applied by Schneider Electric employees.

Failure to follow these instructions will result in death or serious injury.

Safety Checklist

- Is the transformer de-energized and lines grounded (**LockOut TagOut** procedure followed)?
- Is the transformer temperature less than 40 °C (104 °F)? Record the temperature by reading the transformer oil temperature indicator or by using a laser thermometer.
- The EcoStruxure™ Transformer Expert probe (hereafter referred to as ETE probe) may be installed in the top oil valve or the External Temperature Sensor installed around the top pipe to the radiator. Are these parts safely accessible from ground-level?
- Is appropriate personal protective equipment (PPE) available and used?

NOTE: Appropriate PPE includes (but is not limited to):

- Hard hat
- Safety shoes
- Flame retardant overalls
- Protective glasses
- High-visibility jacket
- Oil resistant gloves

Transformer Operator's Responsibility

⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electric work practices. See NFPA 70E or CSA Z462.
- Make sure that the equipment is only installed and serviced by qualified electrical personnel.
- Turn off all power supplies to equipment and the transformer before working on or inside it.
- Respect the LOTO (**Lock Out Tag Out**) procedure.
- Always use a properly rated voltage sensing device to confirm that power is off.
- Before turning on the switch, check that all devices, covers, and doors are in the correct position. In addition, check that the downstream circuit is not earthed and ready to be energized.
- Before operating the switch, check that interlocks and protective barriers are not removed.
- Never go near the equipment when the transformer is energized.
- The transformer operator is responsible for checking that the following points are adhered to.

Failure to follow these instructions will result in death or serious injury.

- Select appropriate probe to help ensure the proper functioning of the system or machine. Schneider Electric can only make recommendations based on our experience with similar applications.
- Follow all safety instructions in this manual and additionally apply all local regulations.
- Advise the installation team of installation risks and provide suitable control measures to help ensure the safety of staff.
- Identify hazardous processes in the vicinity of the workplace and provide suitable control measures to help ensure the protection of installation staff.
- Provide site-specific training before commencement of work, including site access and egress.
- Provide emergency procedures and associated emergency telephone numbers (if applicable).
- Check the legibility of the type plate.

Cleaning Instructions

The ETE probe is IP65-rated and requires cleaning once a year. Cleaning frequency increases in harsh environmental conditions (extreme cold or heat). During scheduled transformer maintenance, the probe may be cleaned to remove any accumulation of dust, oil, snow, or any other pollutants.

NOTE: After cleaning, check the cable connections and tighten them if necessary.

NOTICE

UNINTENDED EQUIPMENT OPERATION

Do not use a high pressure water jet or any kind of chemicals during cleaning.

Failure to follow these instructions can result in equipment damage.

NOTE: While cleaning the probe, follow the Safety Checklist, page 6 and Safety Precautions, page 6 described in this document

End-of-Life Disposal of Equipment

This kit (including all accessories) is not intended for household use. At the end of its service life, do not dispose of the kit with household waste.

For customers in EU countries (including the European Economic Area), Schneider Electric is subject to the EU Waste Electrical and Electronic Equipment Directive 2012/19/EU (WEEE directive). As part of our legal obligations under this legislation, contact a Schneider Electric representative to recover the kit and make sure that it is disposed of by authorized recycling agents.

For customers outside the European Economic Area, contact a Schneider Electric representative to recover the kit and make sure that it is disposed of by authorized recycling agents in accordance with the local legal requirements.

For information:

- The body of the ETE probe is made of aluminum, and the probe is made of stainless steel. The body and probe can be recycled.
- Electronics (PCBA) are located inside the body of the sensor, which can be recycled according to local electronics rules.
- The black end cap is made of plastic and can be recycled accordingly.

Improper Use

NOTICE

HAZARD OF UNINTENDED OPERATION

- Do not step on the probe.
- Do not use the probe as a fastening device or holder for tools, pipelines, etc.

Failure to follow these instructions can result in equipment damage.

The following chapters provide information on the installation requirements of the ETE probe kit.

About this Document

Document Scope

The purpose of this document is to provide instructions for the correct installation of the EcoStruxure Transformer Expert Probe and EcoStruxure Transformer Expert Probe Dual H2.

This document describes the installation and commissioning of the probe and is intended for use by qualified personnel. It must be made available to operators.

This document describes installation of the probe hardware. To learn more about the application and software manual, visit <http://install.aurtra.net/>.

Validity Note

This document applies to the following devices:

- EcoStruxure Transformer Expert Probe
- EcoStruxure Transformer Expert Probe Dual H2

The characteristics of the products described in this document are intended to match the characteristics that are available on www.se.com. As part of our corporate strategy for constant improvement, we may revise the content over time to enhance clarity and accuracy. If you see a difference between the characteristics in this document and the characteristics on www.se.com, consider www.se.com to contain the latest information.

Refer to EcoStruxure Transformer Expert.

Related Document

Title of documentation	Reference number
EcoStruxure Transformer Expert Probe Datasheet	998-22500700

To find documents online, visit the Schneider Electric download center (www.se.com/ww/en/download/).

Information on Non-Inclusive or Insensitive Terminology

As a responsible, inclusive company, Schneider Electric is constantly updating its communications and products that contain non-inclusive or insensitive terminology. However, despite these efforts, our content may still contain terms that are deemed inappropriate by some customers.

Commercial Reference

This document is applicable for the following Ecostruxture Transformer Expert reference model:

DTS-BSPP-M-NA-B	DTS-BSPP-M-EUR-B
DTS-BSPP-L-NA-B	DTS-BSPP-L-EUR-B

Generalities

System Description

- The ETE probe comes with full provision telecommunications functions requiring no configuration at installation time.
- The ETE probe uses a local 3G/4G network.
- 3G/4G communications are fault-tolerant to cope with situations where coverage is poor or inconsistent.
- Contact Schneider Electric Support in your respective country to identify the local network used by the probe.

The ETE probe communicates with the Cloud platform via 3G/4G signals. This is done by a plug and play dongle that is configured by the Schneider Electric factory before the probe is dispatched.

Type of Dongle

Two different types of dongle are available, depending on geographic location:

- Europe and Asia Pacific: IK41VE modem (commercial reference includes EU)
- North America: 1K41US modem (commercial reference includes NA)

Inserting the SIM Card into the Dongle

1. Remove the SIM card cover.



- Insert the SIM card at its location.



- Close the cover.

Inserting the Dongle in the Probe

A cover helps protect the plug and play dongle and its SIM card against atmospheric phenomena.

This cover can be easily removed using a screwdriver.

NOTICE

HAZARD OF UNINTENDED EQUIPMENT OPERATION

When opening the cover, ensure that the gasket sealing cover to the main body is not damaged.

Failure to follow these instructions can result in equipment damage.

Protective cover open



Dongle setting



Protective cover closed



EcoStruxure Transformer Expert Probe Kit

Intended Use

The EcoStruxure Transformer Expert (ETE) Probe kit enables you to monitor the health of oil-based transformers through online condition monitoring. This allows you to make appropriate decisions related to operations, maintenance, or replacement of a transformer and helps to extend the life of the transformer.

Two different probes are available:

- **EcoStruxure Transformer Expert probe** – Measure water activity, temperature, partial discharge (PD), and vibration from the oil flow inside the tank.
- **EcoStruxure Transformer Expert probe H2** – Measure water activity, temperature, partial discharge (PD), vibration, and hydrogen levels from the oil flow inside the tank.

The External Temperature Sensor (ETS) provides complimentary oil temperature measurements, such that, in combination with the probe temperature measurements, the thermal gradient for the transformer can be determined.

Measurements transmitted by the probe are for informational purposes only. The probe itself has no safety function. The evaluation of the data and any resulting actions are the responsibility of the operator.

NOTICE

HAZARD OF UNINTENDED EQUIPMENT OPERATION

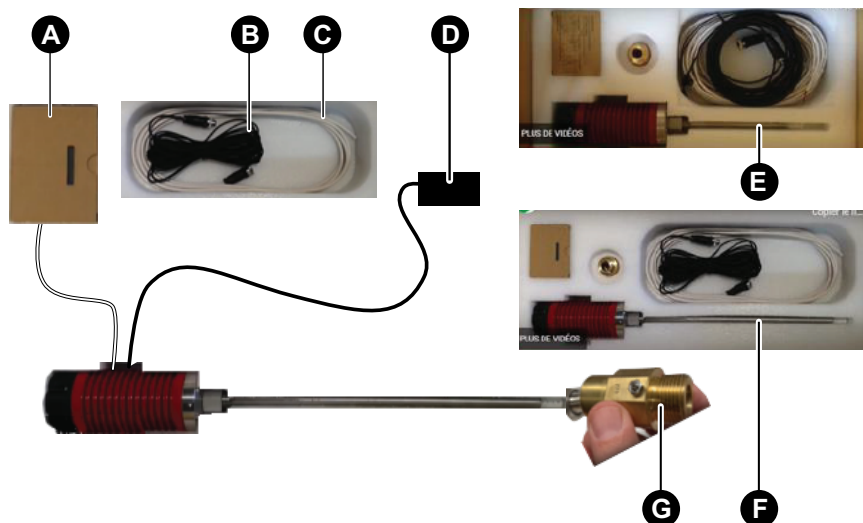
- Use the probe exclusively within the technical limits specified on the type plate and in the data sheets.
- Do not install the probe in an explosive environment.

Failure to follow these instructions can result in equipment damage.

EcoStruxure Transformer Expert Probe Kit Description

The ETE probe kit is comprised of the following:

- ETE probe: Available lengths: 315 mm (12.4 in), 400 mm (15.75 in)
- ETE adapter: 1/2 in (15/21) socket BSPP to 3/4 in (20/27) plug BSPP / NPT machined connector with bleed valve
- Power supply type: HDR-15-24 (optional)
- 10 m (33 ft) low voltage power cable: Diameter 4.8 mm (0.18 in) with M12 socket-type connector
- ETS with 10 m (33 ft) cable and M12 connector



- A. Power supply (optional AC/DC converter)
- B. Black cable
- C. White cable
- D. Thermal sensor
- E. Short probe: 1 = 230 mm (9 in)
- F. Medium probe: 1 = 400 mm (15.75 in)
- G. 3/4 in (20/27) thread BSPP

Storage Conditions








The ETE probe kit is supplied in a box. Store in a clean and dry place at an ambient temperature between -5°C (41°F) and 40°C (104°F).

Installation Instructions

Preparation for Installation

NOTICE	
HAZARD OF UNINTENDED EQUIPMENT OPERATION	
<ul style="list-style-type: none"> • Check that the components of the ETE probe kit have not been damaged in transport or during a previous installation attempt. • If there is any indication of damage, or if the tip or shaft is loose or out of shape, do not proceed with the installation. Contact Schneider Electric at support.dts@se.com for a replacement. 	
Failure to follow these instructions can result in equipment damage.	

Tools and Accessories

Purpose	Tools / Accessories	Description
To bleed air from ETE adapter		Hexagon key 2 mm (0.08 in)
		Open end or combination or ring wrench N° 7
Connecting the power supply		Insulated cutting plier
		Insulated wire stripper
		Insulated screwdriver (slotted head screw)
Oil spill		Basin / bucket (to be placed under the valve where the probe will be set)
		Cleaning tissue

Work Process Overview

1. Review and sign the Risk Assessment and Method statement according to local safety regulation.
2. Refer to the transformer operator who confirms where the ETE probe will be installed and issues the required documentation for work to begin.
3. Refer to the safety checklist, page 6.
4. Locate emergency exits.
5. Visually check the integrity of the transformer earthing. If in any doubt, vacate the substation. Immediately inform the site contact.
6. Wear the correct oil resistant gloves and other standard PPE. Refer to the safety checklist, page 6.
7. Locate the transformer valve in which the ETE probe is to be installed.
8. Check that an emergency spill kit is prepared and ready for use.
9. Carry out a final check of the selected valve.

⚠ WARNING

HAZARD OF UNDETECTED LEAK OR INOPERABLE VALVE

Carry out a final check for leaks on the selected valve. If a leak or a suspected leak is present, do not touch the valve, nor start the installation. Inform the site contact to take appropriate measures.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

For full installation procedures, refer to *Installing the EcoStruxure Transformer Expert Probe*, page 23.

Minimum Requirements

Insertion Point

Install the ETE probe preferably in the top oil valve. Place it 0–30 mm (0–1.18 in) inside the tank wall. Understand the types of valves that are compatible for installation.

NOTE: Compatible valves have the following minimum diameter.

- Flange valve: DN25
- Threaded valve: 3/4 in (20/27)




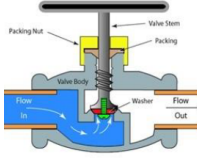
Valve Types


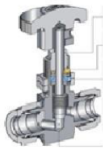


Schneider Electric provides an ETE adapter (1/2 in (15/21) socket BSPP to 3/4 in (20/27) plug BSPP / NPT machined connector with bleed valve) to interface the ETE probe with the transformer oil valve.

NOTE: NPT threading is compatible with transformers manufactured in the USA. BSPP threading is compatible with transformers manufactured elsewhere.

The following table presents the compatibility of valves where ETE probe can be installed:

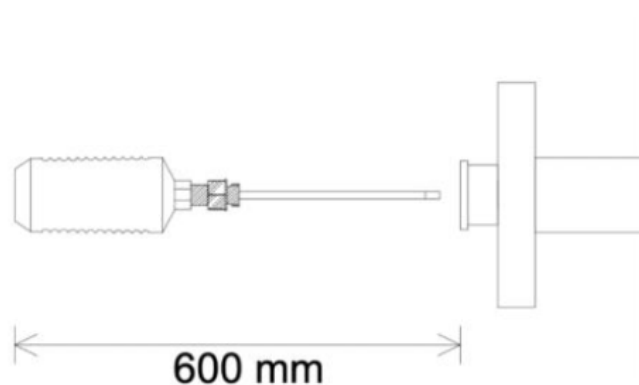
- compatible
- not compatible

Valve description	Image	Compatibility
Ball valve with thread fitting or flange fitting		●
Ball valve with flange fitting		●
Knife gate valve thread fitting or flange fitting or with cathead fitting		●
Globe valves whatever the fitting type		●

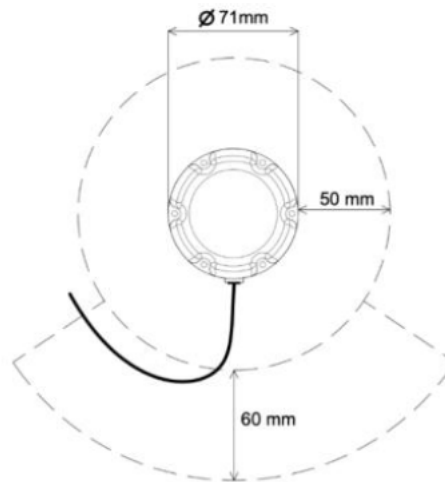
Valve description	Image	Compatibility
		●
Needle valve		●
Flap valve		●
Butterfly valve		● With difficulty

Clearance around the Oil Valve

- A clearance of at least 600 mm (23.62 in) is required for the insertion of the ETE probe into the transformer valve pipe.



- To be able to connect the LV power supply cable and the ETS, a clearance of 50 mm (1.10 in) around the probe and an additional 60 mm (2.36 in) under the probe is required.



On-Site 3G to 4G Coverage

The ETE probe reports collected data back to a protected server over the 3G/4G mobile data network. Good 3G/4G signal strength is required for its successful operation.

LV Power Supply

The ETE probe operates at 18–30 Vdc. A standard AC/DC converter can be included inside the kit as an option, with the following characteristic: 110–220 Vac / 24 Vdc DIN rail-mount power supply. A suitable power source needs to be identified for the installation of this device. A control box with enough space to set the power supply and its protective circuit breaker (not part of the kit) is also required.

Hardware Requirements


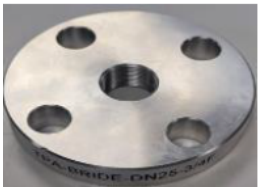

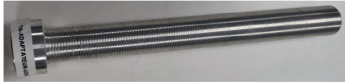
The following hardware parts are required:

- ETE probe kit
- DIN rail to mount power supply
- DC power supply 24 V / 10 W with its protection device
- PTFE sealing tape or sealing glue to seal the thread connection
- When AC/DC converter option is present, cable with two wires 1.5 mm² to connect the circuit breaker and the AC/DC converter to the AC power supply available
- If cables cannot be installed in the existing control cabinet, an IP45 cable box 300 x 300 x 100 mm (11.81 x 11.81 x 3.93 in) is required
- Hook and loop tape to install the external temperature sensor

To interface the ETE probe with the oil valve, a 3/4 in (20/27) thread socket-type connector is required at the insertion point of the transformer oil valve.

NOTE: For transformers manufactured in the USA, NPT threading is suitable, for transformers manufactured elsewhere, BSPP threading is suitable.

Based on the type of valve and selected length of probe, page 31, one of the following additional adapters is required:

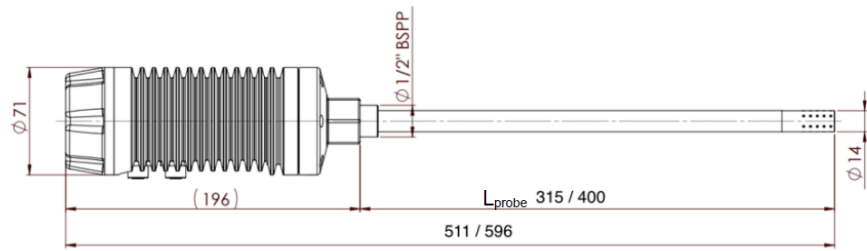
Adapter	Description		Example
Set of threaded reduction adapters	Threaded adapters are used to reduce the thread on the transformer oil valve from X to 3/4 inch thread. The length of these adapters needs to be considered when calculating probe length. Threaded adapters can be sourced at a hardware shop.		 <p>Thread reduction plug - 2 inch type connector / 3/4 inch socket-type connector</p>
Set of flange and gaskets with suitable bolts	Flange and gaskets are required when the transformer oil valve has a blank flange. The blank flange can be of any DN rating. The new flange plate must match the existing one. NOTE: New flange plates have a 3/4 in (20/27) central thread. If the flange has a different thread size in the center, use threaded reduction adapters. Not supplied.		 <p>Flange DN 40 / 3/4 in (20/27) socket-type connector thread</p>
Set of cathead fitting adapters	-		 <p>Cathead fitting DN 40 / 38 mm (1.5 in) socket thread</p>
Set of length adapters	Two types of adapters to limit the probe length inside the tank to 30 mm (1.18 in) are available.		
	Standard ETE spacers	Two available different sizes are: DTS 45 mm (1.77 in) and DTS 90 mm (3.54 in). The spacers reduce the probe length inside the tank by 45 mm (1.77 in) and 90 mm (3.54 in), respectively. This can be ordered with the ETE kit.	-
	Threaded pipe	The threaded pipe is a tube where one end is equipped with a plug-type connector thread 19 mm (0.75 in) and the other end is equipped with a socket 19 mm (0.75 in) thread. This pipe can be cut to the required length and installed with the ETE probe. The length of this adapter is calculated in the length of probe, page 31.	 <p>Adjustable threaded pipe (cut to adapt the length)</p>

Probe Length

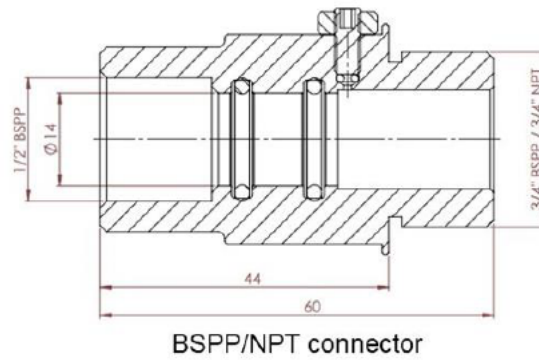
The ETE probe is available in two lengths:

- 315 mm (12.4 in)
- 400 mm (15.75 in)

The length of the probe depends on the type of valve and the distance from the tank wall to the insertion point.



Schneider Electric provides an ETE connector of type 1/2 in (15/21) BSPP socket / 3/4 in (20/27) BSPP plug with oil bleeder valve, to interface the ETE probe with the transformer oil valve.



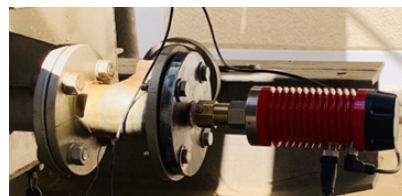
NPT threading is suitable for transformers manufactured in the USA, while BSPP threading is suitable for transformers manufactured elsewhere.

Selecting the ETE Probe Length

1. Measure the pipe length **D** from the tank wall to the insertion point.

NOTE: To receive accurate readings and avoid impinging on internal windings, install the probe 0–30 mm inside the internal tank wall.

- In case of an oil valve with flange plate, there is no need for additional thread adapters or thread converter adapter. Use a flange plate with 3/4 in (20/27) BSPP thread.



- In case of an oil valve with thread adapter, there may be a need for additional thread adapters to reduce the thread size. Take the additional adapters into consideration when determining the length **D**. In the previous case, the length **D** is 190 mm (7.5 in), as shown on the picture.

NOTE: The use of thread adapter to reduce the thread size to 3/4 in (20/27) can add 15 mm (0,59 in) to the length **D**.



2. Use the following table to make the right ETE probe choice:

D < 230 mm (9 in)	Medium ETE probe
D > 230 mm (9 in)	Long ETE probe

NOTE: If **D** > 350 mm (13.78 in), no probe is suitable for this type of installation.

Determining the Adapter Length

To adjust the position of the sensor part at the end of the probe inside the tank, an additional adaptor may be needed. Therefore, set an assembly of the connector (supplied in the kit) and the additional adaptor (not supplied in the kit) between the connecting point (flange or thread of the valve) and the ETE probe thread. The length of this additional adaptor is calculated as follows:

1. Measure the length **D** from the tank wall to the insertion point. Refer to *Selecting the ETE Probe Length*, page 20.
2. Calculate the adapter length: sum of the connector length and the additional adapter length. Refer to the following picture.

$$X = L_{\text{probe}} - (D + L_{\text{adapter}})$$

X: from 10 mm to 30 mm (0.39 to 1.18 in)

L_{probe} = 315 mm (12.40 in) (medium) or 400 mm (15.75 in) (long). Refer to *Probe Length*, page 18 for probe dimension.

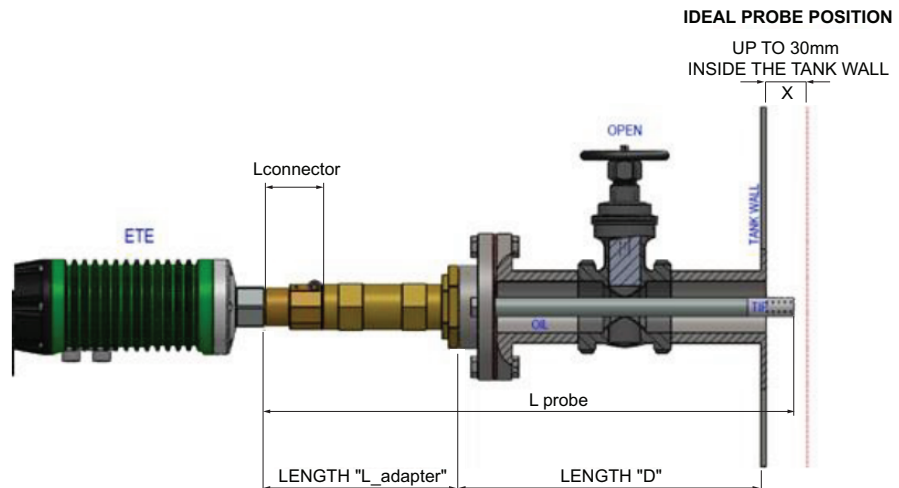
Length of the additional adapter = $L_{\text{adapter}} - L_{\text{connector}}$

$L_{\text{connector}}$ = 44 mm (1.73 in). Refer to *Probe Length*, page 18 for probe dimension.

If the dimension **D** from the external side of the tank wall to the connecting point is 300 mm (11.81 in) and the long ETE probe is selected:

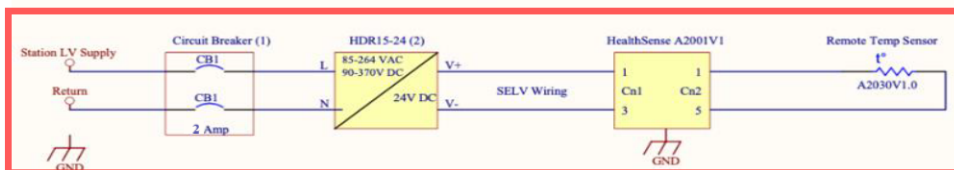
- $L_{\text{adapter}} = L_{\text{probe}} - X - D$
- $L_{\text{adapter}} = 400 \text{ mm} - 30 \text{ mm} - 300 \text{ mm}$
(15.75 in - 1.18 in - 11.81)
- $L_{\text{adapter}} = 370 \text{ mm} - 300 \text{ mm}$ (14.57 in - 11.81 in)
- Minimum length of the additional adapter = $70 \text{ mm} - 44 \text{ mm} = 26 \text{ mm}$
(2.75 in - 1.73 in = 1.02)

NOTE: The position of the sensor part (tip) inside the tank (X) can vary from 10 to 30 mm (0.39 to 1.18 in). Therefore the length of the additional adaptor can vary from 26 mm (1.02 in) (in case of the maximum penetration of the tip inside the tank) to 46 mm (1.81 in) (in case of the minimum penetration of the tip inside the tank).



Electrical Connections

Connecting the LV supply to the ETE probe and ETS sensor:



The control cabinet electrical scheme is modified with this wiring diagram, and an additional label is set on the additional MCB and AC/DC converter.

Tightening Torque Values

Part	Size	Torque
ETE probe	1.2 in (15/21) BSPP	15–20 N.m
ETE adapter	3/4 in (20/27) BSPP or NPT	30–40 N.m
H2 sensor	3/4 in (20/27) NPT	30–40 N.m
Power supply connector	M12	Tight the connector manually and finalize the tightening with an M12 wrench by tightening the connector one-quarter turn (equivalent to 1.2–1.5 N.m).
External sensor connector		

Installing the EcoStruxure Transformer Expert Probe

Install the ETE probe and ETS in an oil-filled transformer.

⚠️ ⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Only mount the probe when the transformer is de-energized.

Failure to follow these instructions will result in death or serious injury.

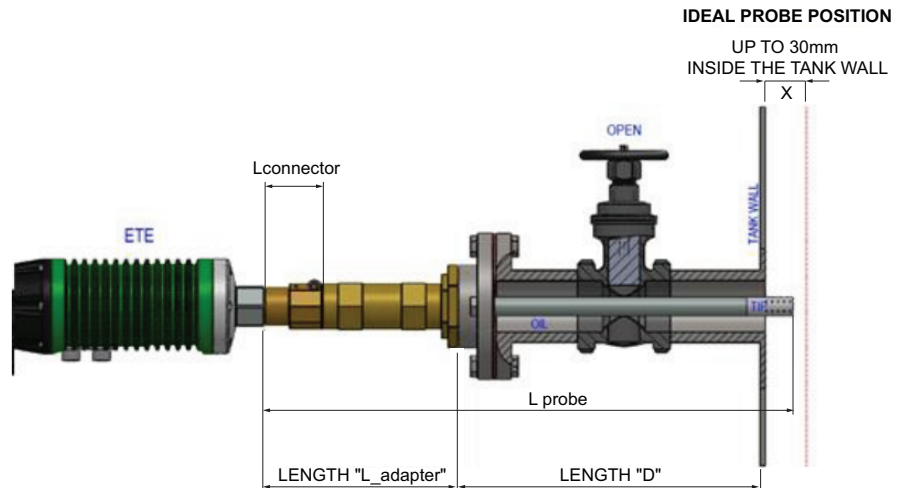
NOTICE

UNINTENDED EQUIPMENT OPERATION

Do not install the sensor with more than 30 mm (1.18 in) of the sensor tip extending into the transformer tank.

Failure to follow these instructions can result in equipment damage.

Insert the probe tip up to 30 mm (1.18 in) into the transformer tank to help prevent exposure to excessively high magnetic fields. Before installation, double-check the length of the supplied probe against the length of the transformer pipe. If the sensor is likely to extend too far into the tank, consider using a plug-to-socket 3/4 in (20/27) extension adapter to extend the length of the mount assembly. Refer to Determining the Adapter Length, page 21.



1. Clean the selected valve. Confirm that it is closed, and position the drip collector beneath it.
2. Place the basin or bucket under the valve connection side to avoid any oil spillage on the ground when removing the cap or blank flange of the valve.
3. Firmly close the oil valve.
4. Remove the cap or blank flange, inspecting for oil leak along the threads.
5. Clean the valve orifice, valve flange, and thread.
6. Inspect the two O-rings inside the ETE adapter for any signs of damage.

7. Lubricate the O-rings with oil and then install them as indicated below.

NOTICE

HAZARD OF INCORRECT INSERTION OF O-RINGS

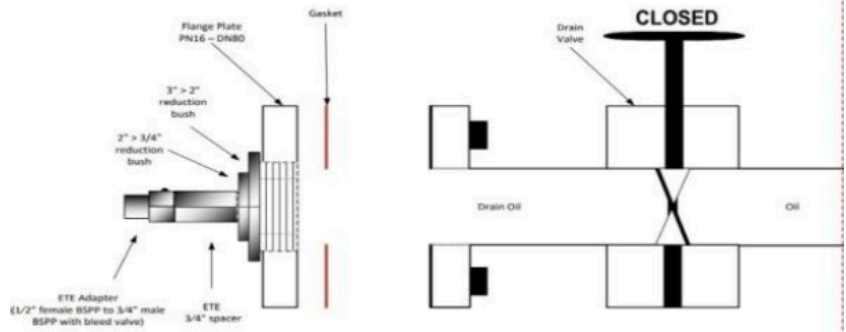
Use lubricant on the O-rings to avoid damage to the gaskets during the insertion of the sensor pipe.

Failure to follow these instructions can result in equipment damage.



8. Using a sealing glue or PTFE tape, screw the ETE adapter (plug, 3/4 in (20/27) BSPP/NPT) into the socket thread on the oil valve.
9. After tightening, check that the bleeder valve or oil sample valve in the adapter faces upwards.

10. If the transformer does not have a 3/4 in (20/27) socket thread, use an oil sample valve is required, and if the valve is protruding more than 30 mm (1.18 in) inside the tank wall, install additional adapters with the ETE adapter. In the following example, two reducing adapters are used to get the 3/4 in (20/27) F thread and a 45 mm (1.17 in) ETE spacer to limit the probe tip inside the tank.

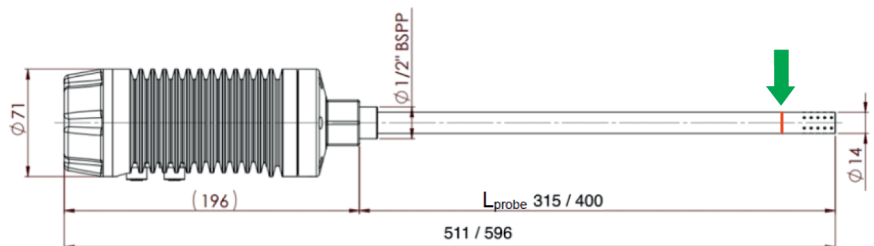


Example of installation of a valve equipped with flange

In the following example, the oil sample valve is installed with the ETE adapter.



- Image 1: Transformer oil valve
 - Image 2: With flange plate cover removed
 - Image 3: Oil valve after cleaning
 - Image 4: New flange plate cover with ETE adaptor and oil sample valve installed
11. Before inserting the ETE probe, make a mark with a pen on the ETE probe tube at 60 mm (2.36 in) from the end tip of the tube, as indicated below (red mark).

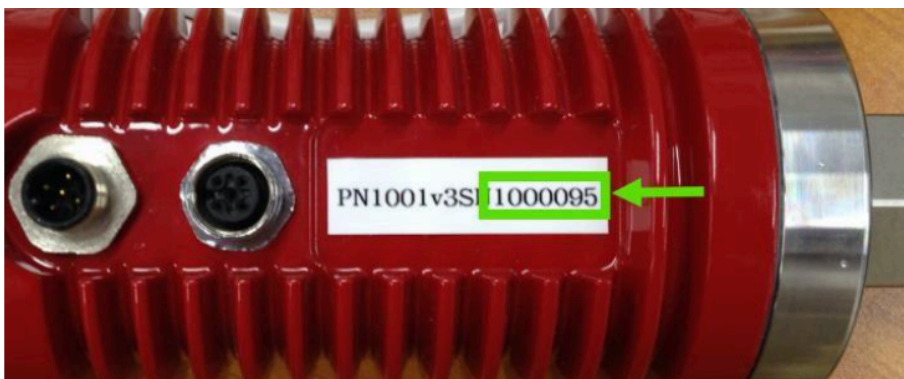


12. Lubricate the probe to facilitate insertion.

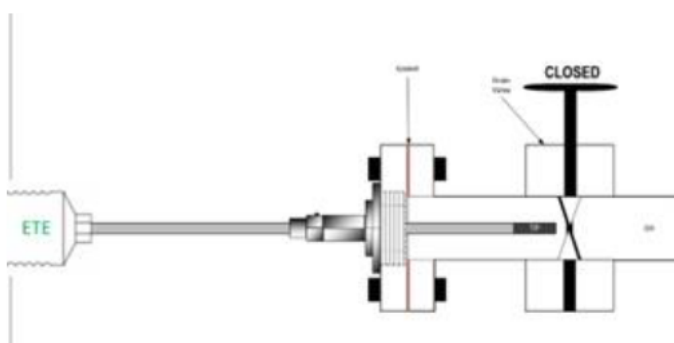
NOTICE
HAZARD OF INCORRECT INSERTION
Use lubricant on the probe to facilitate insertion.
Failure to follow these instructions can result in equipment damage.

13. Make a note of the seven-digit logger ID, to check the status of the probe through the website.

NOTE: After mounting on the transformer, you cannot read the ID.



14. Insert the ETE probe into the connector by pushing firmly up to the white Teflon end-tip, past the two O-rings (approx. 60 mm (2.36 in)).



NOTE: The probe is mounted such as the tip is clear of the valve-opening mechanism and it passes the O-rings (approx. 60 mm (2.36 in)).

⚠ WARNING

HAZARD OF INCORRECT INSERTION OF PROBE

- Check that the oil valve is open before pushing the probe past the O-rings.
- Do not push in the probe with the oil valve closed. This can cause damage to the probe tip.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

15. Open the bleed valve.
 - a. If the bleed valve has a nut, open the bleed valve by removing the nut and loosening the screw (or open the oil sample valve slightly).

NOTE: This method requires a 2.0 mm (0.07 in) (5/64) hex screwdriver.

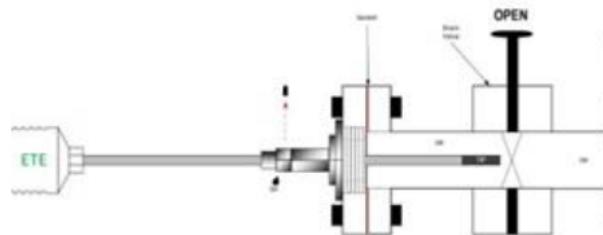
- b. If the bleed valve has a bolt and washer, loosen the bolt.

NOTE: This method requires a PH2 screwdriver.



ETE adapter version with bolt and washer

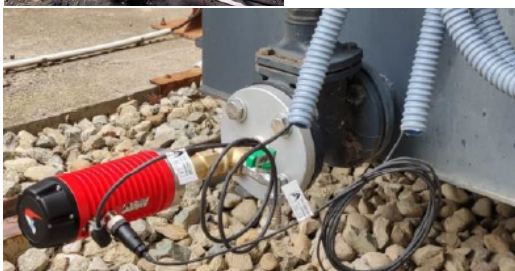
16. Open the transformer valve.
17. Fill the valve and adapter with oil and allow any trapped air to escape.
18.
 - a. If the bleed valve has a nut, tighten the bleed valve screw or oil sample valve to help prevent the loss of excess oil. Add the nut to the tightened screw.
 - b. If the bleed valve has a bolt and washer, tighten the bolt once the air has escaped using a PH2 screwdriver.



19. Push the probe further through the ETE adapter and into the oil valve, stopping just before the thread on the probe.
20. Put Teflon tape on the plug thread of the ETE probe.

NOTE: The ETE probe has a right-hand clockwise thread. The tape should be wound anti-clockwise so that it presses against the thread when the ETE probe is screwed in.

21. Screw the ETE probe into the adapter and adjust the angle of the probe so that the M12 connectors are angled downward. This helps prevent the pooling of water around the connectors and allows the cables to enter with a sufficient drip angle.



Example: Assembly completed

Finishing Tasks

Complete the ETE probe installation by following these steps:

1. Empty the contents of the drip tray into a special storage container.
2. Place all oil contaminated waste material in a bag for disposal in accordance with local regulations.
3. On completion, clear all tools and materials and cancel any work permits issued by the operator.

Fitting the ETE Probe and Sensor

- Install the ETE probe in a location where the tip of the probe measures the top oil temperature.
- For transformers equipped with radiators, this is on the top of the tank, and for transformers with corrugated wall tanks, this is on the cover.
- When the transformer is designed with a gas cushion, the probe fitting is designed to improve the immersion of the probe tip in the oil flow.

- The dedicated fitting for the ETE probe is composed of:
 - Inside a control cabinet, an additional MCB 2A (not supplied) is installed for the AC/DC converter, and a dedicated space is provided to fix the AC/DC converter. A dedicated cable gland (power cable of the ETE probe diameter of 4.8 mm (0.19 in)) is fitted on the cable gland plate.
 - The external temperature sensor is fixed to the bottom pipe of a radiator (or other type of cooling system). In the case of a corrugated wall, fix it on a short piece of tube (DN 50) welded as near as possible to the bottom of the fins.
 - A mechanical and thermal protection of the external temperature sensor is needed.
 - Cable trays or cable supports are also needed to route the power supply cable and the cable for the external temperature sensor.

<i>NOTICE</i>

HAZARD OF UNINTENDED EQUIPMENT OPERATION

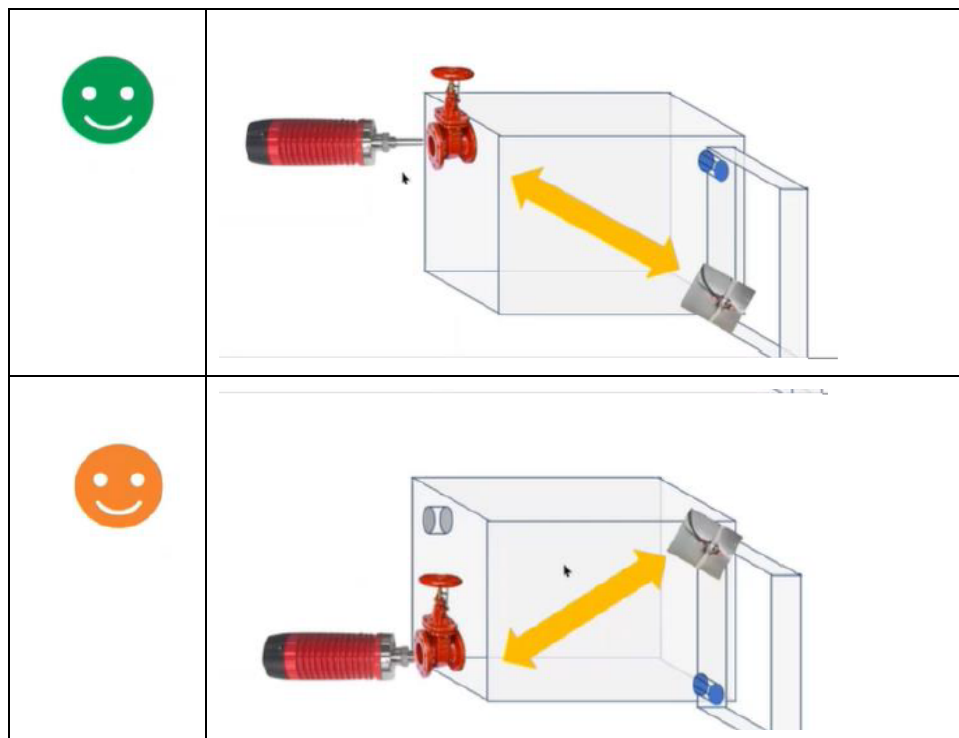
Cable trays or supports must respect the minimum dielectric distance to the live parts according to the voltage level of the transformer (refer to the IEC 60076 standard).

Failure to follow these instructions can result in equipment damage.

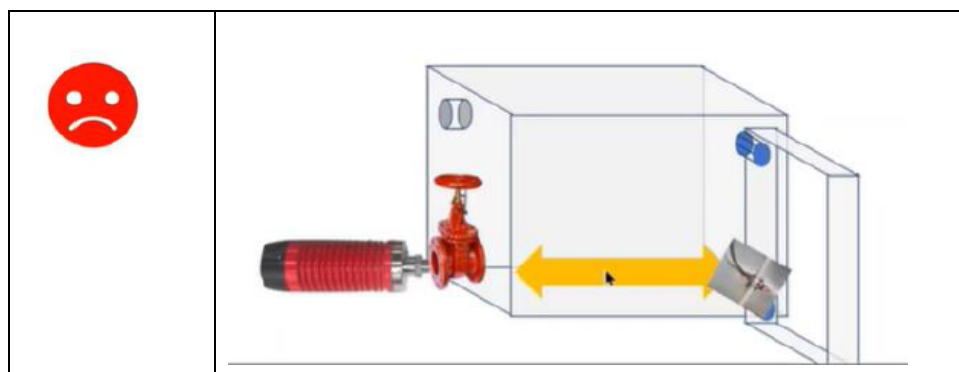
Mounting the ETE Probe and External Temperature Sensor (ETS)

The purpose of the probe is to take measurements from the oil flow. Mount the probe in active oil flow inside the transformer tank. It can be installed in either the top oil valve (preferred) or the bottom oil valve. The ETE algorithms require both top and bottom oil temperatures to determine the thermal gradient for the transformer loading and temperature model. Install the ETS sensor opposite the ETE probe to facilitate this. For example, if the ETE probe is installed in the top oil valve, install the ETS sensor at the bottom.

Ideal Mounting



Incorrect Mounting



Installing the EcoStruxure Transformer Expert Dual H2 Probe

The H2 Dual sensor model has a different packing list from the standard model. Before installation, confirm that all the necessary parts have been included.

Follow all installation instructions described in *Installing the EcoStruxure Transformer Expert Probe*, page 23 before completing the installation process specific to the ETE Dual H2 Probe described here.

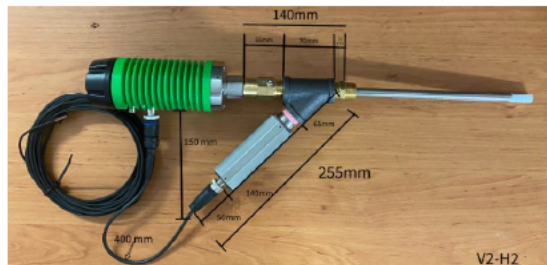
Components

The ETE probe Dual H2 kit is comprised of the following:

- ETE probe: Available lengths: 315 mm (12.40 in), 400 mm (15.74 in)
- H2 sensor
- ETE adapter: 1/2 in (15/21) socket BSPP to 3/4 in (20/27) plug BSPP/NPT machined connector with bleed valve
- H2 Dual splitter: Y-Adapter Socket 3/4 in (20/27) NPT
- Brass cap: 3/4 in (20/27) NPT-BSPP plug or 3/4 in (20/27) NPT-NPT plug
- Power supply: HDR-15-24
- 10 m (32.80 ft) low voltage power cable with M12 connector
- ETS with 10 m (32.80 ft) cable and M12 connector with H2 augmented cable for hydrogen sensor

Probe Length

The installation of the ETE Dual H2 probe requires an additional sensor to be connected to the probe using the H2 option Dual splitter.



The probe length can be selected with the help of the formula below.

$$\text{Length inside tank wall} = X = L_{\text{probe}} - (\text{Length } d + L_{\text{adapters}})$$

If no additional adapters are required, $L_{\text{adapter}} = L_{\text{connector}} + L_{\text{Dual Splitter}} = 140 \text{ mm}$ (5.51 in)

$X < 0$	Probe is too short to go inside tank wall.
$X = 0-30 \text{ mm}$ (1.18 in)	Right probe choice
$X > 30 \text{ mm}$ (1.18 in)	Use spacers or adapters to limit probe insertion in tank

Additional Installation Steps

The following instructions explain how to install the components of the ETE Dual H2 probe sensor onto an oil valve.

NOTE: Service representatives may find it easier to assemble all the parts prior to installing them in the oil valve.

1. Use the brass nipple (plug 3/4 in (20/27) BSPP/NPT) provided to attach the H2 dual splitter to all the adapters to be installed on the oil valve.
2. Attach the ETE adapter to the H2 dual splitter.



3. Connect the H2 sensor to the H2 dual splitter.
4. Connect the ETE probe to the ETE adapter.



5. The ETS is provided with an H2 augmented cable, which powers the hydrogen sensor and connects it to the data port.

NOTE: Connect the ETS to the hydrogen sensor.

6. Apply suitable thread tape where needed.

Installing the External Temperature Sensor

The External Temperature Sensor (ETS) is attached opposite the ETE probe. If the probe is inserted in the bottom oil valve, the external sensor is attached at the top, around a pipe or on the tank, to obtain oil temperature readings. In the following example, the ETS sensor is connected to a radiator pipe.

NOTICE

HAZARD OF UNINTENDED EQUIPMENT OPERATION

The ETS sensor does not attach to the tank surface magnetically and needs to be wrapped around a pipe to reach the radiator.

Failure to follow these instructions can result in equipment damage.

1. Attach the ETS sensor to a suitable radiator pipe on the opposite side from the ETE probe by using cable ties. Refer to the ideal mounting scheme, page 30.

NOTE: Check that the exposed metal pad of the sensor is in direct contact with the pipe to optimize thermal connection.



2. Cover the sensor by using additional adhesive tape.



3. Route the ETS cable to the main ETE unit.



4. Secure with split conduit or cable ties in accordance with internal company procedures.
5. Screw the plug 5-pin M12 connector of the ETS sensor to the ETE unit.

Installing the Power Supply (AC/DC Converter)

1. Install the DIN rail mount power supply in the transformer control cabinet or any other weatherproof cabinet close to the transformer. Check that the AC/DC converter fits with the input voltage of the LV network available in the control cabinet. Output voltage is 24 Vdc 10 W minimum.



2. To help protect and isolate the system, add a 2A circuit breaker to the supply line (not shown).
3. Run the power cable from the ETE connection to the installed power supply using flexible conduit.
4. Screw the 5-pin M12 socket-type connector of the power cable to the ETE unit.

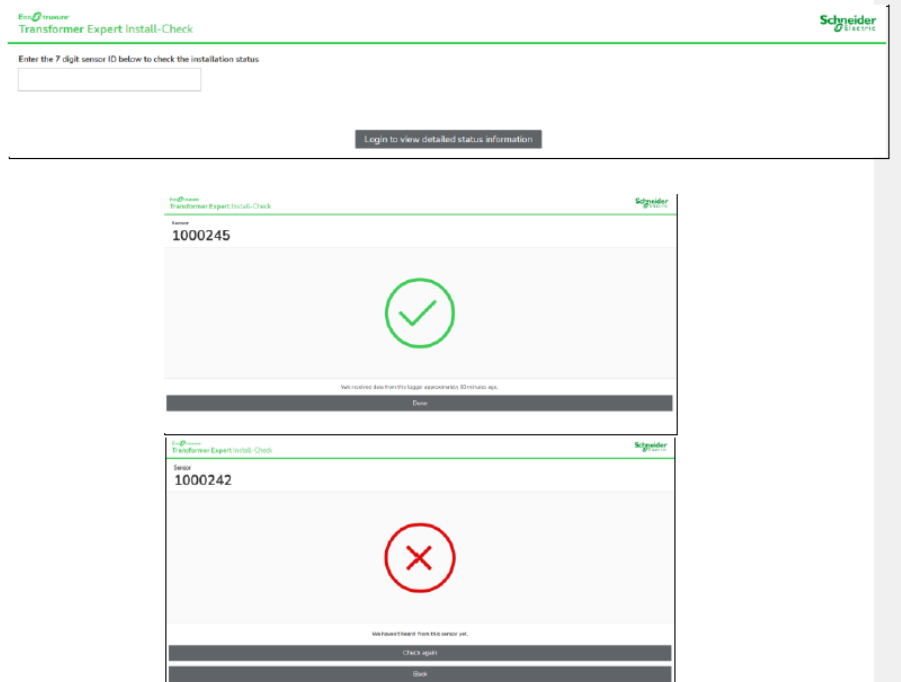
NOTE: The red core on the cable provided is connected to the +ve terminal, and the black core is connected to the -ve terminal.

Powering the EcoStruxure Transformer Expert Probe

1. After the sensor is fully installed, power on the device. The black end cap on the probe body has an LED indicator.
NOTE: After turning on, wait for 2 minutes before turning off. After turning off, wait for 20 seconds before turning on.
2. Wait for 5 to 10 minutes for the probe to complete its first upload.

Connecting to the Website

1. On a phone, laptop, or tablet, go to <http://install.aurtra.net/> and enter the seven-digit log-on ID, to check the status of the probe through the website.
NOTE: After mounting the probe on the transformer, you cannot read the ID.
2. The <http://install.aurtra.net/> website confirms if the unit has successfully uploaded and displays the initial temperature and moisture readings from the probe.
NOTE: The record lasts for an hour after the upload has occurred.



3. If the installation is successful, data is available on the Schneider Electric website <http://install.aurtra.net/> within 30 hours of powering the ETE unit.
4. Authorized users receive an email containing their account information, which can be used to login and view data pertaining to the transformer.

Troubleshooting

Correct Operating State

After powering up, the LED, located in the center of the black end cap, turns on within approximately 1 minute. The LED remains on lit until the logger boots up and completes its first upload. After this initial period, the LED goes into a steady state where it flashes once every 5 seconds. After 10 minutes, the logger completes its upload, and install.aurtra.net displays successfully installed.

If the LED does not follow this operating sequence, monitor the LED and be ready to report the off-flash rates for the diagnosis process:

Diagnosis Process

1. LED is not on: Check that the power is on at the logger. After powering up, the LED turns on within about a minute and stays on while the sensor completes its initial upload.
2. LED is rapidly flashing: If there is an interruption in network or hardware not working, then the LED begins to flash rapidly in 3-second bursts. Turn Off the power to the sensor, leave it Off for at least 20 seconds, then turn On the power again. On start-up, observe the LED. If the LED re-enters this flashing state, it has likely been unable to connect to the mobile data network. This issue can often resolve itself within 24 hours and relates to the SIM registering with the local 3G or 4G network. If possible, leave the unit in place, powered on, and check operation after 24 hours. At that time, data is available on the ETE web site (<https://www.aurtra.net>), which can be accessed using your personal login.
3. Other LED behavior: Turn off the power to the sensor, leave it off for at least 20 seconds, then turn on the power again.

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