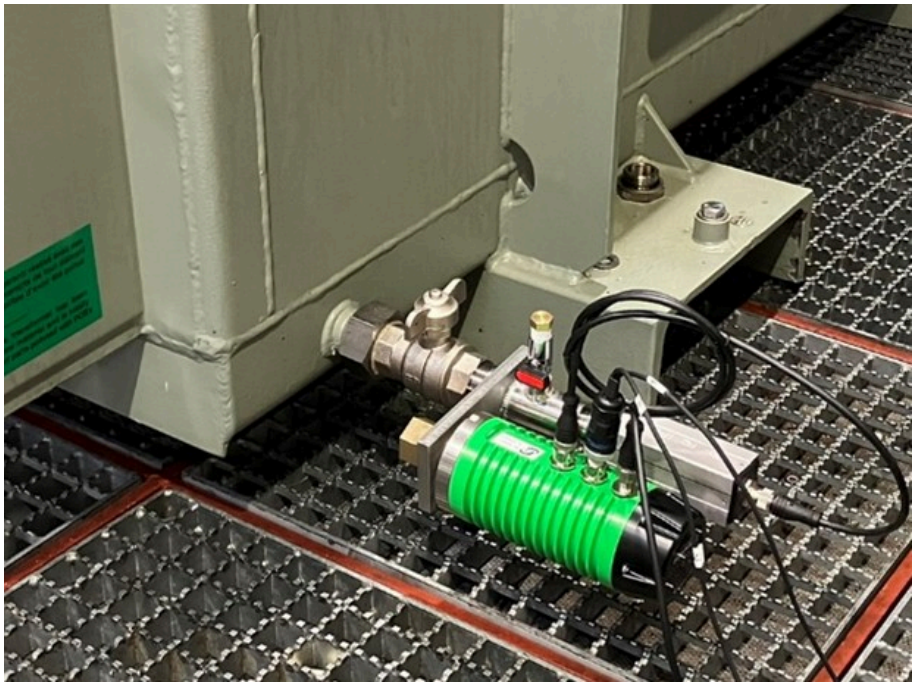
EcoStruxure Transformer Expert Sensor H2

Installation and Commissioning Guide

ETE-UM02-00
04/2025



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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 Sensor

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- The installation, removal, and commissioning of the sensor 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 Sensor H2 (hereafter referred to as ETE Sensor) may be installed on 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

- Wear 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.
- Only mount or unmount the sensor when the transformer is de-energized.
- 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.

⚠CAUTION

HAZARD OF HOT SURFACE

- Wear appropriate personal protective equipment (PPE) to protect from hot temperature.
- Do not touch the cooling system nor the tank cover without thermal protection.

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

- Select appropriate sensor 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 Sensor 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 sensor 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
HAZARD OF 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 sensor, 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 Sensor is made of aluminum, and the front cap is made of stainless steel. The body and front cap 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 (acetal 7) and can be recycled accordingly.

Improper Use

NOTICE
HAZARD OF UNINTENDED EQUIPMENT OPERATION • Do not step on the sensor. • Do not use the sensor 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 Sensor kit.

About the Book

Document Scope

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

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

This document describes installation of the sensor hardware. To learn more about the application and software manual, refer to Ecostruxure Transformer Expert Install-Check.

Validity Note

This document applies to the following devices:

- ETE-LOG-EUR
- ETE-LOG-NA

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.

For more information about both devices, refer to EcoStruxure Transformer Expert.

Related Document

Title of documentation	Reference number
EcoStruxure Transformer Expert Sensor H2 Datasheet	998-23770700

To find documents online, visit the Schneider Electric download center.

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 References

This document applies to the following commercial references. Each reference includes the device and the accessories (cables, adapters, etc.):

EcoStruxure Transformer Expert Sensor H2

- DTS-EUR-H2
- DTS-NA-H2

Generalities

System Description

- The ETE Sensor comes with full provision telecommunications functions requiring no configuration at installation time.
- The ETE Sensor 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 sensor.

The ETE Sensor 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 sensor is dispatched.

Conformity

The ETE Sensor has been developed in accordance to the requirements of standards and certified as follows:

Characteristic	Value
Certification	• CE • Federal Communications Commission, FCC ID: 2AHP8-DTSBSPPX • RoHS • UL
Conforming to standards	• EN 301 489-52 V1.1.2:2020 • EN 50566:2017 • EN 55032:2015 + A11:2020 • EN 61010-1:2014 • EN 62311:2008 • EN 62368-1:2014 + A11:2017 • EN / IEC 61326-1:2014 • EN / IEC 61326-2-3:2014 • EN / IEC 63000:2015 • ETSI EN 301 489-1 V2.2.3:2017

FCC Part 15

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception which can be determined by turning the equipment off and on, the user is encouraged to try to correct interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

⚠CAUTION

The user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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

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.

2. Insert the SIM card at the relevant location.

3. Close the cover.

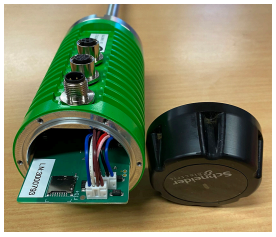
Inserting the Dongle in the Sensor

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. • In order to avoid damaging the PCBA, do not use excessive force when removing the dongle. **Failure to follow these instructions can result in equipment damage.**

Protective cover open



Dongle setting

Protective cover closed

EcoStruxure Transformer Expert Sensor H2 Kit

Intended Use

The ETE Sensor 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.

EcoStruxutre Transformer Expert Sensor H2 - Measure Hydrogen (through external sensor H2), temperature and vibration.

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

Measurements transmitted by the sensor are for informational purposes only. The sensor 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 sensor exclusively within the technical limits specified on the type plate and in the data sheets. • Do not install the ETE Sensor in explosive environments. • Do not use the ETE Sensor in hazardous or significantly corrosive environments. **Failure to follow these instructions can result in equipment damage.**

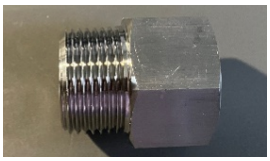
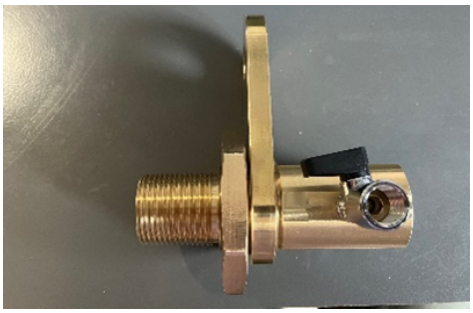
EcoStruxure Transformer Expert Sensor H2 Kit Description

The ETE Sensor comprises the following:

- ETE Logger
- ETE adapter: 1 inch NPT to 1 inch BSPP
- Mounting Kit (description hereafter)
- Sensor H2: GridScan 5000
- Power converter 220 Vac / 24 Vdc,15 W max. (product UL certified)
- Modbus Cable M12 4 pins
- 10 m (33 ft) low voltage power cable to connect sensor H2 to ETE logger: diameter 4.8 mm (0.18 inch) with M12 socket-type connector
- External Temperature Sensor (ETS) with 10 m (33 ft) cable and M12 connector
- Oil sample tube

ETE Sensor H2 Kit

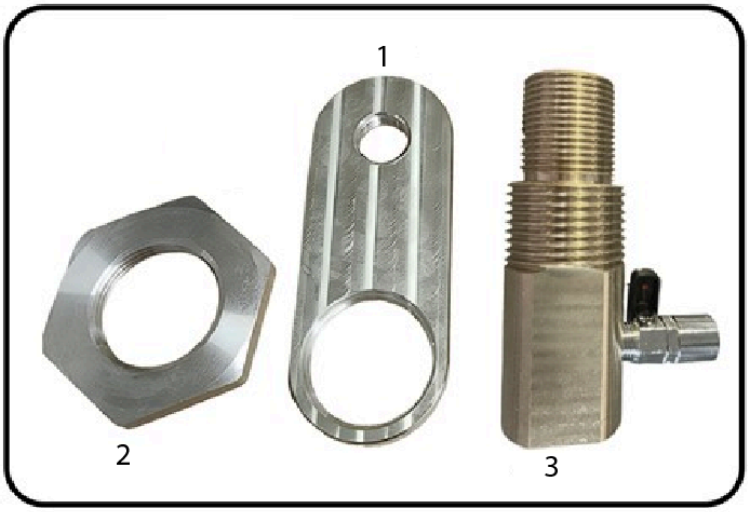
Elements of the Kit

Accessory	Description
	ETE Logger
	Adapter 1 inch NPT to 1 inch BSPP
	Mounting Kit

Elements of the Kit (Continued)

Accessory	Description
	H2 GridScan 5000
	Power Supply (Optional AC/DC Converter) 220 Vac / 24 Vdc
	H2 Cable (Modbus Cable M12 4 pins)
	Low Voltage Power Cable (M12 port 4 pins) 10 m (33 ft). Diameter 4.8 mm (0.18 inch) with M12 socket-type connector.
	External Temperature Sensor (ETS) (M12 port 8 pins) 10 m (33 ft).
	Oil sample tube

Mounting Kit Components:



Component Number	Description
1	ETE Logger Support
2	ETE M42 Nut
3	ETE sensor H2 connector equipped with oil sampling valve

Storage Conditions

The ETE Sensor Kit is supplied in a box. Store it in a clean and dry place at an ambient temperature between -5 °C (23 °F) and 40 °C (104 °F).

Installation Instructions

Preparation for Installation

NOTICE
HAZARD OF UNINTENDED EQUIPMENT OPERATION • Check that the components of the ETE Sensor 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 misshapen, do not proceed with the installation. Contact Schneider Electric at support.dts@se.com for a replacement. • The Sensor H2 tip, protected by a plastic cap during transport, contains sensors and may be susceptible to impact, being dropped, extreme heat exposure and similar factors. Conduct a visual inspection and test prior to installation, and handle the Sensor H2 carefully to help to ensure its proper functionality. **Failure to follow these instructions can result in equipment damage.**

Tools and Accessories

Purpose	Tools / Accessories	Description
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 sensor 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 Sensor is to 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 Sensor 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 Sensor H2, page 23.

Minimum Requirements

Insertion Point

Install the ETE Sensor preferably on the oil valve. Understand the types of valves that are compatible for installation.

NOTE: Compatible valves have the following minimum diameter (for larger valves, customized adaptation must be defined - not included in the kit).

- Flange valve: DN40
- Threaded valve: 1 inch

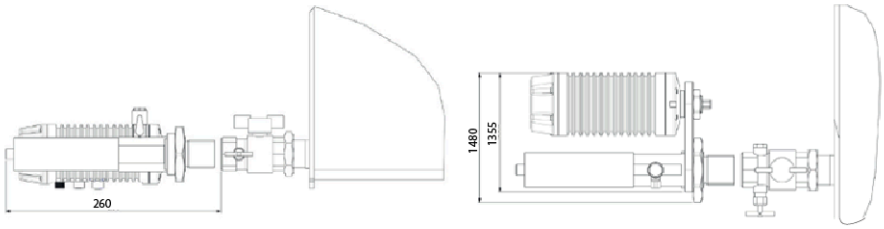
Valve Types

In case of NPT thread fitting on the transformer valve, Schneider Electric provides an ETE adapter 1 inch plug NPT to 1 inch socket BSPP to interface the ETE Sensor with the transformer oil valve through mounting kit.

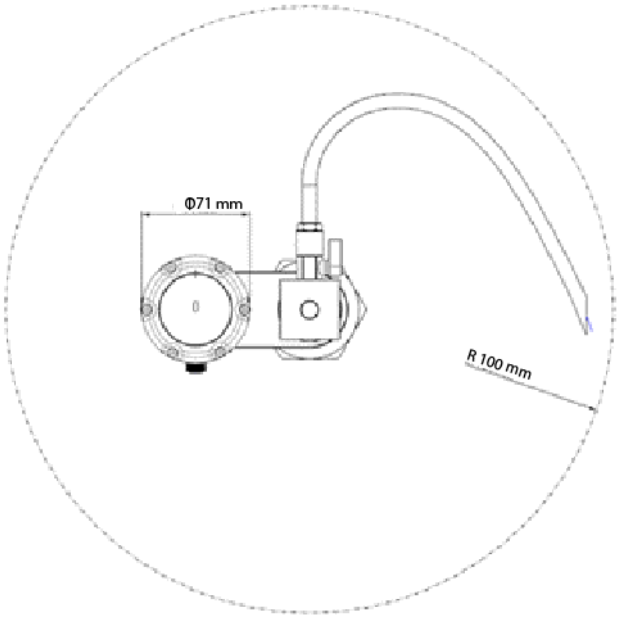
NOTE: For 1 inch BSPP fitting, ETE adapter is not used.

Clearance Around the Oil Valve

- A clearance of at least 260 mm (10.24 inches) is required for the installation of the ETE Sensor into the transformer valve pipe.



- To be able to install the ETE logger and its support, a clearance of 100 mm (4 inches) around the valve fitting is required.



On-Site 3G to 4G Coverage

The ETE Sensor 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 Sensor operates at 24 Vdc. A standard AC/DC converter is included inside the kit, with the following characteristic: 110–220 Vac / 24 Vdc,15 W max. 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.

NOTE: To avoid an incorrect installation procedure, test the ETE Sensor prior to installation on site:

1. Connect the ETE Sensor to a power supply.
2. Check that the ETE Sensor powers up and connects to the cloud.

In case of not using the AC/DC converter supplied in the kit, ETE sensor must be supplied from an isolated Limited Energy Source per UL61010-1 3rd ed cl.9.4 or limited Power Source per UL62368-1 or Class 2 per NEC.

Hardware Requirements

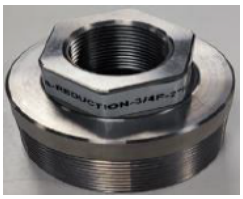
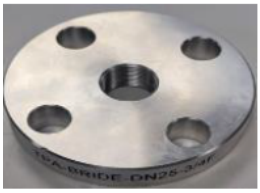
The following hardware parts are required:

- ETE Sensor kit
- DIN rail to mount power supply
- DC power supply 24 V / 10 W with its protection device
- 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
- PTFE sealing tape or sealing glue to seal the thread connection
- If electrical equipment (converter and its protection) 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 inches) is required
- Hook and loop tape to install the external temperature sensor

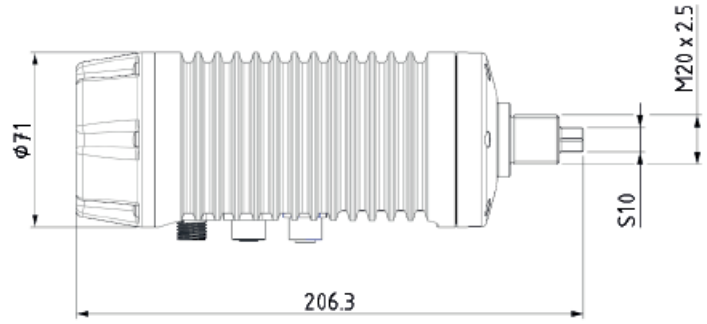
To interface the ETE Sensor with the oil valve, a 1 inch thread socket-type connector is required at the insertion point of the transformer oil valve.

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, one of the following additional adapters (not supplied in the kit) is required:

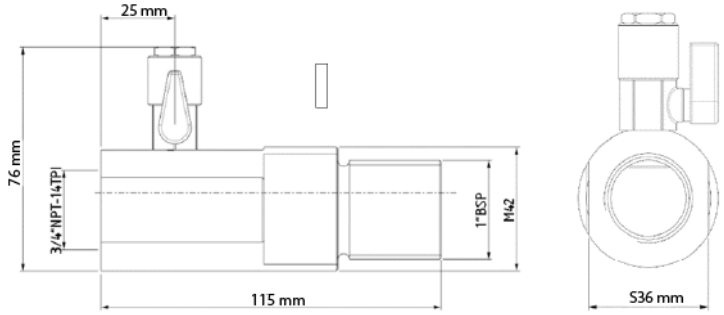
Adapter	Description	Example
Set of threaded reduction adapters	Threaded adapters are used to reduce the thread on the transformer oil valve from X to 1 inch thread. The length of these adapters needs to be considered when calculating sensor length. Threaded adapters can be sourced at a hardware shop.	 Thread reduction plug - 2 inches type connector / 3/4 inch socket-type connector
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 1 inch central thread. If the flange has a different thread size in the center, use threaded reduction adapters. Not supplied.	 Flange DN 40 / 3/4 inch (20/27) socket-type connector thread
Set of cathead fitting adapters	–	 Cathead fitting DN 40 / 38 mm (1.5 inch) socket thread

ETE Logger and Sensor H2 Connector Dimension



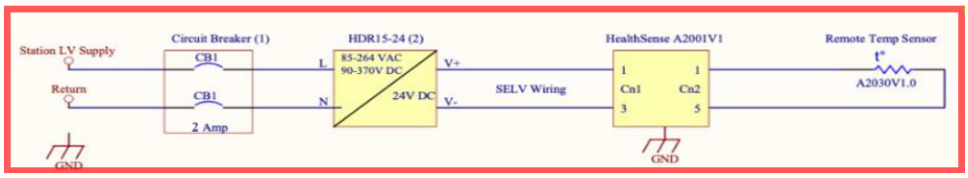
Schneider Electric provides an ETE sensor H2 connector of type 1 inch (24/32) BSPP plug/ 3/4 inch (20/27) NPT socket with oil bleeder valve, to interface the sensor H2 with the transformer oil valve.

For the transformers that are equipped with 1 inch (24/32) NPT fitting, an adapter is required to change the BSPP socket thread to NPT socket thread (provided in the kit).



Electrical Connections

Connecting the LV supply to the ETE Sensor and ETS:



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 logger	M20 nut	15–20 N.m
ETE sensor H2 connector and mounting kit	3/4 and 1 inch BSPP or NPT	30–40 N.m
Sensor H2	3/4 inch (20/27) NPT	30–40 N.m
Power supply connector	M12	Tighten 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 Sensor H2

Install the ETE H2 and ETS to an oil-filled transformer.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

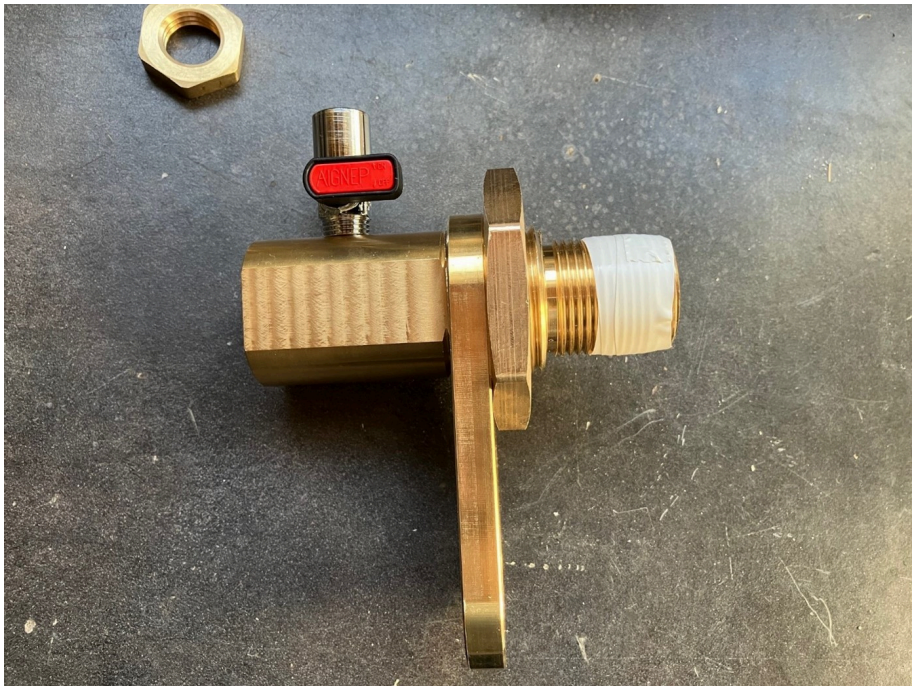
Only mount or unmount the sensor when the transformer is de-energized.

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

NOTE:

- The ETE adapter with oil sample valve is referred as “the adapter valve”.
- The transformer valve is referred as “the valve”.

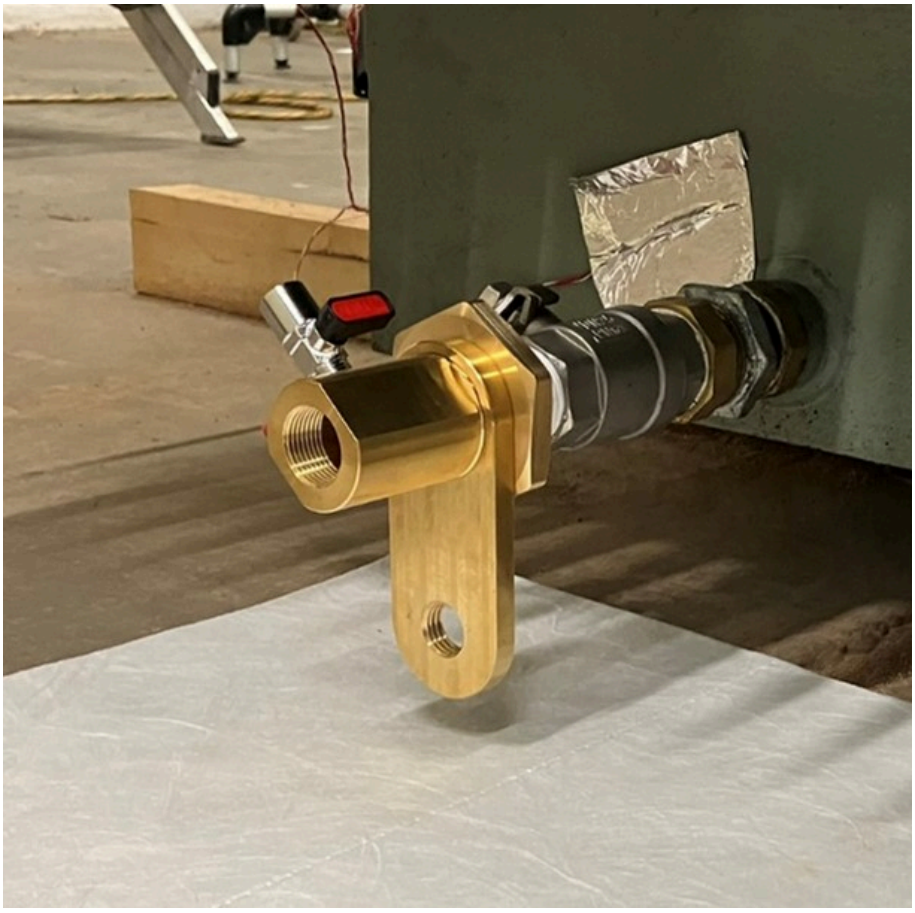
1. Clean the valve, make sure it is closed, and position.
2. Place the drip collector under the valve connector to avoid any oil spillage on the ground when removing the cap or blank flange of the valve.
3. Firmly close the oil valve.
4. Remove the cap or blank flange, and check there is no oil leak along the threads.
5. Clean the valve orifice, valve flange, and threads.
6. Assemble the body of the adapter with the ETE support and its locking nut, as shown.



Block the support and the nut to set the ETE support in the opposite way to the drain valve. Set the PTFE tape on the plug thread.

7. In the case of NPT thread socket on the valve, use PTFE tape to screw the 1 inch NPT/BSPP adapter into the valve's socket thread (if you have a BSPP thread socket, skip this operation and proceed to Step 8).
8. Using PTFE tape, screw the ETE adapter (1 inch BSPP plug) into the socket thread on the oil valve or onto the NPT/BSPP adapter that you assembled in the previous step.

9. After tightening, check that the bleeder valve or oil sample valve in the adapter faces upwards. As the adapter, ETE logger and the sensor H2 is heavy, the length of the thread plug shall be engaged by a minimum of 15 mm into the socket.



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

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

11. Screw ETE logger and check the M12 connection port are facing downward and fasten it with the ETE locking nut.

12. Using PTFE tape, screw the Gridscan sensor (plug 3/4 inch NPT) into the socket thread on the valve adapter, and tighten it firmly.

13. Bleed the air:
    a. Make sure that the valve is closed.

    b. Remove the plug and keep it aside.
    c. Remove the cap from the barb and wrap the plug thread with PTFE tape.

    d. Insert the barb fully into the tube for a secure fitment.

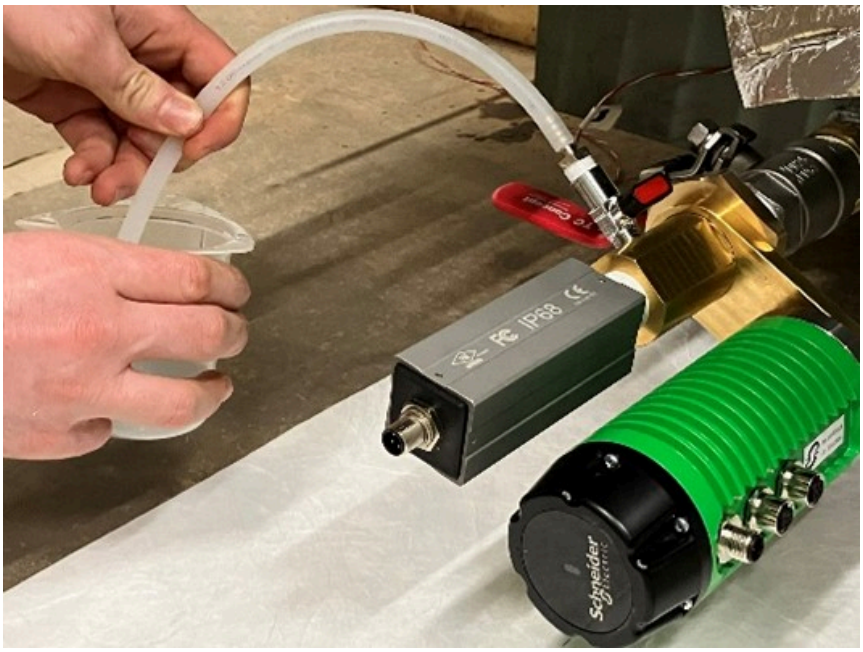
e. Turn the adapter valve to the open position.

f. Open the transformer oil valve.

IMPORTANT: For a ball or butterfly valve, open the valve slowly.

NOTE: Opening the valve too fast may induce a water hammer effect creating an extra force on the tube.

g. When oil starts to come out, it means that air has been successfully removed. Turn the valve to the closed position.

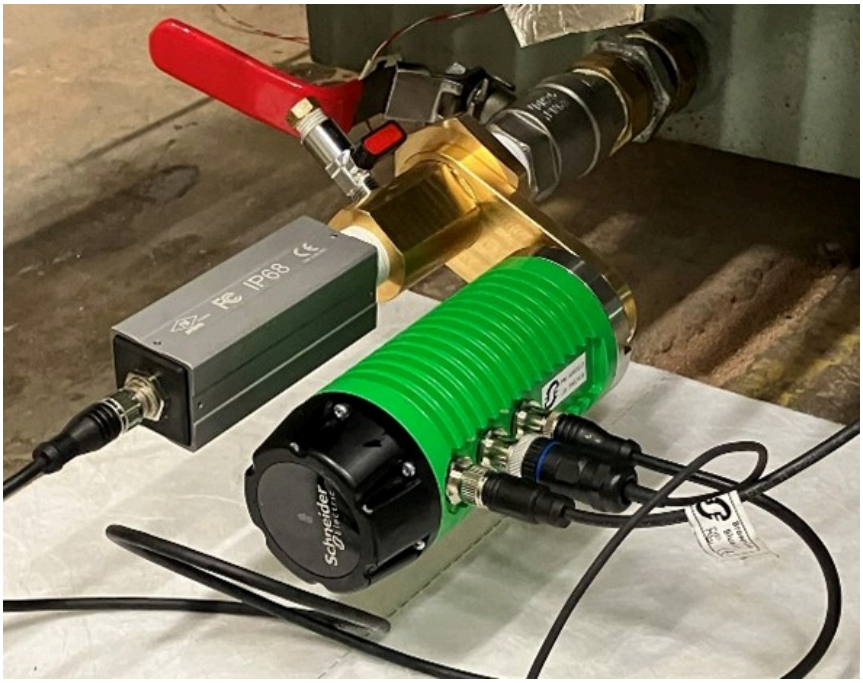


h. Remove the barb and attach the plug cap to the valve.

14. Connect all cables and tighten ETE logger facing downward.
    a. Connect the H2 cable (Modbus cable with M12 connector on both side).

    b. Plug the ETS cable (M12 port 8 pins) and route it the selected place (see “Mounting the ETE Sensor and External Temperature sensor (ETS)”, page 32) enabling to measure the opposite temperature complementary to the temperature measured by the sensor H2.

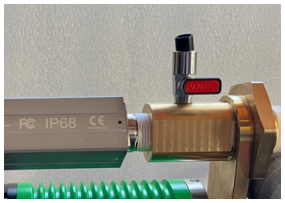
c. Plug the power cable (M12 port 4 pin) and route it to the marshalling box where the AC/DC converter is installed.



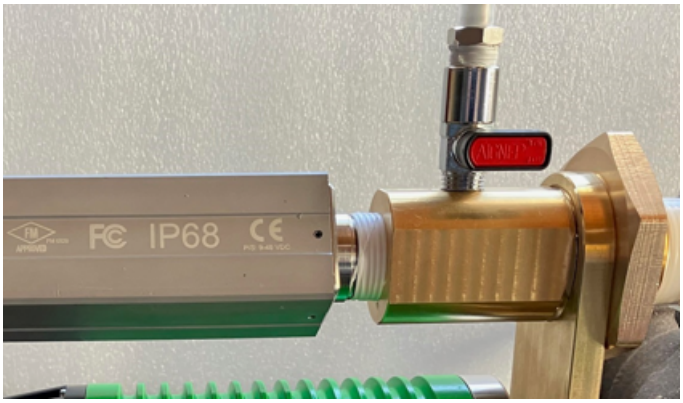
d. Turn ETE logger to have the cables facing downward and tighten the ETE logger nut firmly.

Oil Sampling Process

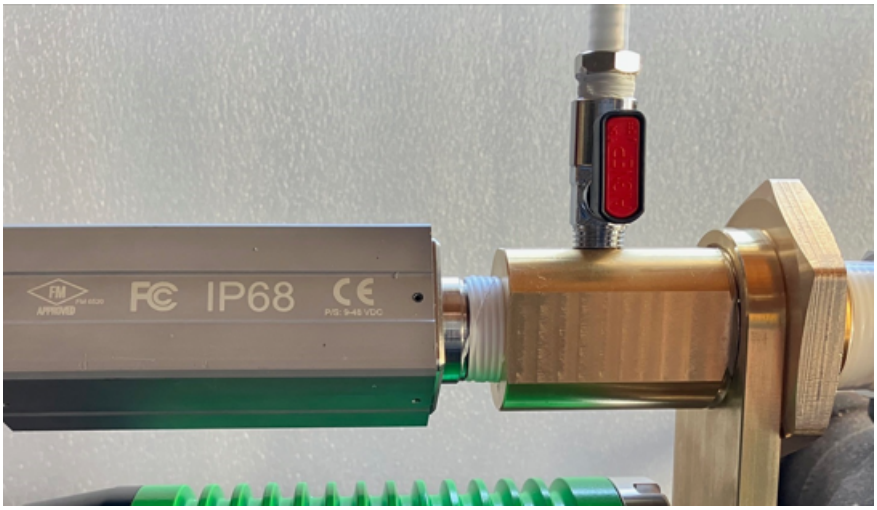
1. Make sure that the valve is closed.
2. Remove the plug and keep it aside.
3. Remove the cap off the barb.



4. Connect the barb and make sure that the sampling tube is fitted tightly on the barb.



5. Install the sampling vessel below the open end of the sampling tube.
6. Turn the valve to the open position until the necessary oil sample has been collected.



NOTE: Clean the tube before you take the sample. Let 10 cl of oil flow to remove any contaminants.

7. When sampling is done, turn the valve to the closed position.
8. Remove the barb and the sampling tube.
9. Wipe down the items.
10. Install the plug back to the adapter.

Finishing Tasks

Complete the ETE Sensor 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 External Temperature Sensor

Specific recommendations:

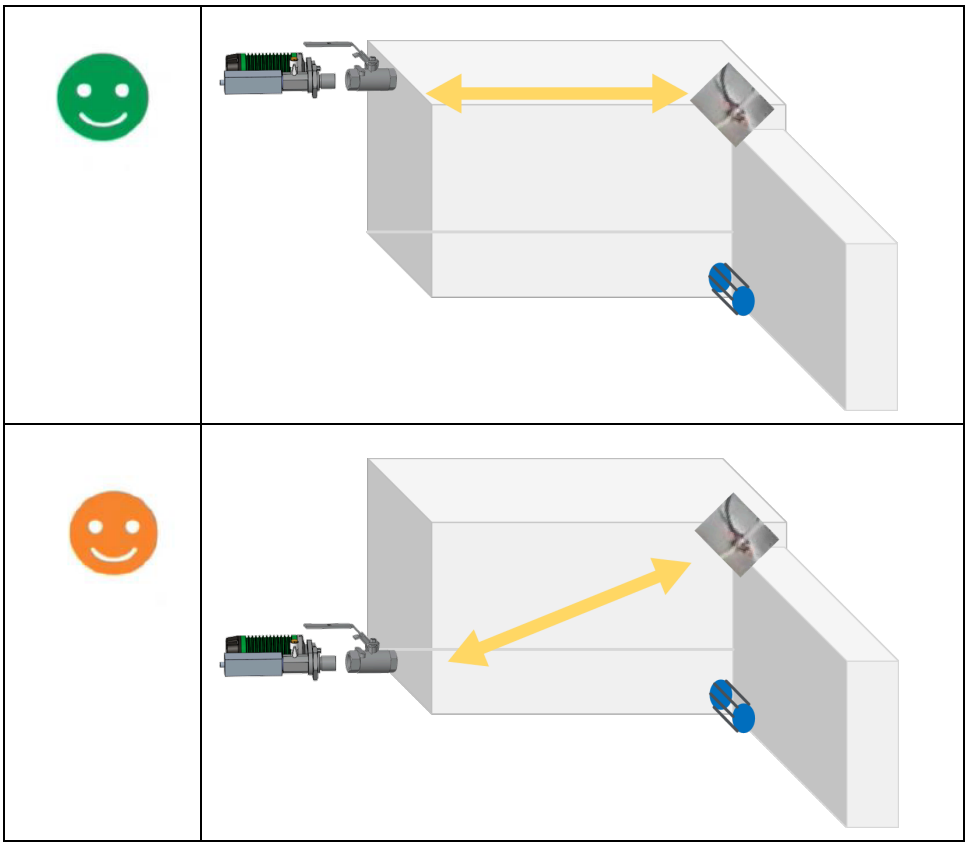
- Install the ETE External Temperature Sensor to measure the top oil temperature.
- For transformers equipped with radiators, this is on the top of the tank, and for transformers with corrugated wall tanks, this is on the cover.
- The dedicated fitting for the ETE Sensor is composed of:
  - Inside a 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 Sensor diameter of 4.8 mm (0.19 inch) is fitted on the cable gland plate.
  - 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.

NOTICE
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 Sensor and External Temperature Sensor (ETS)

The ETE sensor can be installed in either the top oil valve (preferred) or the bottom oil valve. The ETE algorithms require top oil temperature from ETS. The ETS must be installed always at the top.

Ideal mounting



Installing the External Temperature Sensor

In the following example, the ETS is connected to a radiator pipe.

NOTICE
HAZARD OF UNINTENDED EQUIPMENT OPERATION The ETS 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 to a suitable radiator pipe at the top of the transformer by using cable ties. Refer to the ideal mounting scheme, page 32.

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

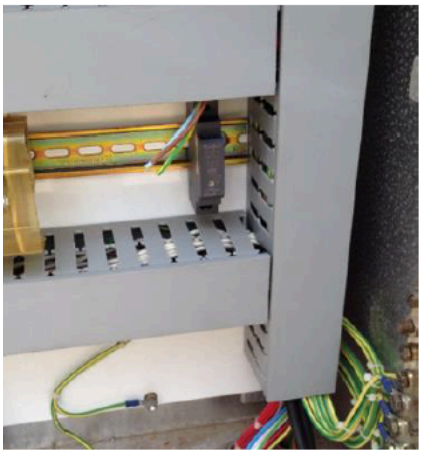
2. Cover the sensor by using additional adhesive tape.

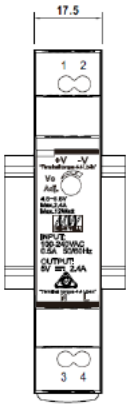
3. Route the ETS cable to the main ETE Sensor.

4. Secure with split conduit or cable ties in accordance with internal company procedures.
5. Screw the plug 8-pin M12 connector of the ETS to the ETE logger.

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 2 A 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 4-pin M12 socket-type connector of the power cable to the ETE Sensor.

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

Uninstalling the EcoStruxure Transformer Expert Sensor H2

The removal procedure is available for ETE Sensor, connected or not to the H2 Dual extension.

⚠WARNING

HAZARD OF INADEQUATE OPERATION

- Follow all steps of the removal process.
- Close the oil valve correctly when indicated.

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

IMPORTANT: Oil spillage can also result in environmental pollution.

⚠WARNING

HAZARD OF INCOMPLETE CHECKING

Carry out a final check for leaks on the 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 the appropriate measures.

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

To remove the ETE Sensor:

1. Follow the procedure about de-energizing the transformer, as when installing it.
2. Turn off the circuit breaker for the ETE Sensor.
3. Remove the ETS cable.
4. Remove the power cable.
5. Remove the H2 cable from the sensor.
6. Close the valve.
7. Fully remove the ETE Sensor (ETE logger and sensor H2)
8. Keep a bucket in handy to collect and remove oil.

   NOTE: If the mounting kit is kept in place when sensor H2 is not set on it, place a cap (plastic or metallic) to avoid pollution of the inner part of the mounting kit.

Powering the EcoStruxure Transformer Expert Sensor H2

1. After the sensor is fully installed, power on the device. The black end cap on the sensor 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 sensor to complete its first upload.

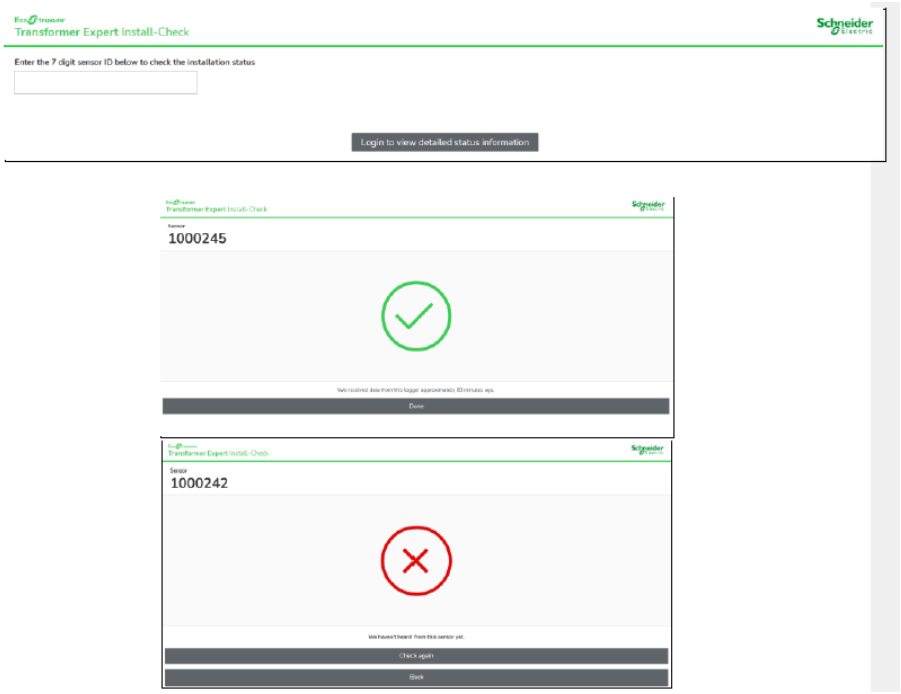
Connecting to the Website

1. On a phone, laptop, or tablet, go to Ecostruxure Transformer Expert Install-Check and enter the seven-digit log-on ID, to check the status of the sensor through the website.

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

2. The Ecostruxure Transformer Expert Install-Check website confirms if the unit has successfully uploaded and displays the initial temperature and moisture readings from the sensor.

   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 Ecostruxure Transformer Expert Install-Check within 30 hours of powering the ETE Sensor.
4. Authorized users receive an email containing their account information, which can be used to login and view data pertaining to the transformer.

Troubleshooting

The LED on the cap shows the status according to the following tables:

● / ●	solid or flashing red or green
●	off

Expected behavior

Process	LED	Description
Startup	●	If power is ON, the LED default mode is red. When logger code is working, the LED changes to solid green.
Startup success	●	If check, test, upload and update passed successfully: solid green for 5 seconds.
Checking internet	●	While checking network: flashing green for 1 second, on and off. It can take up to 10 minutes, depending on signal strength.
Uploading	●	Flashing green at 4 Hz, then off for 4 seconds repeatedly. At start up, the upload happens after 1 hour, 3 hours, 6 hours, 12 hours, then 24 hours.
Data logging - Normal operation	●	Flashing green once every 10 seconds, otherwise off.
Updating firmware	● ●	While performing updates: flashing green and red for 1 second each.

Anomaly detected

Anomaly	LED	Description
No internet	● ●	Flashing red, then green, then OFF for 10 seconds. If no internet: • Tries to connect every hour. • Continues to collect data. If the issue persists, try different locations to test network or replace the equipment.
Anomaly on STM chip	●	Flashing red 2 Hz for 1 second, then OFF for 2 seconds. It cannot perform normal operation. STM chip is not functioning as required. • A reboot is required. • If the issue persists, replace the equipment.
Unsuccessful logger code	●	Solid red. No code is running on logger but Sitara chip is powered. • A reboot is required. • If the issue persists, replace the equipment.
Data logging - Failed upload detected	●	Flashing red once every 10 seconds, otherwise off.
Failed updating firmware detected	● ●	Flashing red every second during 10 seconds, then it reverts back to previous firmware and normal operation.
No power	●	The LED is off. • Check if the power is connected correctly. • If the power is available, replace the equipment.

Schneider Electric
35 rue Joseph Monier
92500 Rueil Malmaison
France

+ 33 (0) 1 41 29 70 00

www.se.com

As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication.

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