Hydran* 201i System
Installation Guide
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Customer Service

For information on GE Energy products, please contact the Customer Service:

GE Energy, Lissue Industrial Estate East
Lissue Road, Lisburn, BT28 2RE, United Kingdom
Tel: +44 28 9262 2915
Fax: +44 28 9262 2202
Email: ge4service@ge.com
Web: www.gedigitalenergy.com/md.htm

For help and support for your Hydran* 201i, please contact the GE Energy Customer Service Center. Open 24 hours a day, 365 days a year)

Tel: +1 800 361 3652 (United States and Canada)
Tel: +1 514 339 2801 (worldwide)
Email: ge4service@ge.com
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1. INTRODUCTION

1.1 Safety Warnings in Six Languages

1.1.1 [EN] (in English) WARNINGS:

• All procedures in this manual must be strictly adhered to.
• Any deviation from these could cause irreversible damage to the transformer being monitored and/or the Hydran 201i, and could lead to property damage, personal injury and/or death.
• Installation and maintenance of the Hydran 201i must be carried out by qualified personnel only. Please advise station operator prior to maintenance. Working inside the Hydran 201i may trigger unwanted alarms due to parameter changes, power shutdown, system rebooting or electrostatic discharge.
• For a maximum distance of 15 m (50 ft) from the power source, use a 2.08 mm² (14-AWG) cable and an overcurrent protection.

1.1.2 [FR] (in French) ATTENTION:

• Toutes les procédures dans ce manuel doivent être observées rigoureusement.
• Tout écart par rapport à celles-ci pourrait causer des dommages irréversibles au transformateur surveillé et/ou au Hydran 201i, et pourrait entraîner des dommages à la propriété, des blessures corporelles et/ou la mort.
• L'installation et l'entretien du Hydran 201i doivent être effectués par du personnel qualifié seulement. Veuillez aviser l'opérateur du poste avant l'entretien. Travailler à l'intérieur du Hydran 201i peut déclencher des alarmes non voulues en raison de changements à des paramètres, d'arrêt de l'alimentation, de remise en marche du système ou de décharge électrostatique.
• Pour une distance maximale de 15 m (50 pi) de la source d'alimentation, utiliser un câble de 2,08 mm² (14-AWG) et une protection contre les surintensités.

1.1.3 [ES] (in Spanish) ADVERTENCIA:

• Se debe cumplir estrictamente con todos los procedimientos señalados en este manual.
• Cualquier desviación al respecto puede causar daños irreparables al transformador que está bajo monitoreo y/o al Hydran 201i, asimismo puede ser causa de daños materiales, lesiones corporales y/o muerte.
• La instalación y mantenimiento del equipo Hydran 201i se reserva únicamente al personal perfectamente cualificado. Aconseje por favor a operador de la estación antes del mantenimiento. El trabajo dentro del Hydran 201i puede accionar alarmas indeseadas debido a los cambios del parámetro, parada de la energía, sistema que reanuda o descarga electrostática.

• Para una distancia máxima de 15 m (50 pies) de la fuente de alimentación, utilice un cable de 2,08 mm² (14-AWG) y una protección contra las sobrecargas de corriente.

1.1.4 [DE] (in German) WARNUNG:

• Alle Abläufe in diesem Handbuch müssen strengstens befolgt werden.
• Jede Abweichung davon könnte dem zu überwachenden Transformator und/oder dem Hydran 201i unwiderrufliche Schäden zufügen, und könnte zu Sachschaden, Personenverletzung und/oder Tod führen.
• Für eine maximale Entfernung von 15 m von der Spannungsquelle, verwenden Sie ein 2,08 mm² Kabel (14 AWG) und ein Überstromschutz.

1.1.5 [IT] (in Italian) ATTENZIONE:

• Tutte le procedure del presente manuale dovranno essere eseguite in totale conformità.
• Qualsiasi deviazione dallo stesso manuale potrebbe causare danni irreversibili al trasformatore sotto monitoraggio e/o all’ Hydran 201i, e potrebbe causare danni alla proprietà, lesioni personali e/o alla morte.
• L’installazione e la manutenzione del Hydran 201i devono essere eseguite solo ed esclusivamente da personale qualificato. Avvisare l’operatore della stazione prima di manutenzione. Funzionando all’interno del Hydran 201i può fare scattare degli alarmi indesiderabili e cambiamenti dei parametri, arresto dell’alimentazione, un “reboot” del sistema o scarico elettrostatico.
• A una distanza massima di 15 m dalla fonte di energia usare un cavo 2.08 mm² (14-AWG) e una protezione di sovracorrente.

1.1.6 [SV] (in Swedish) VARNING:

• Alla procedurer i manuilen måste följas noggrant.
• Varje avvikelse från dessa procedurer kan orsaka oåterkalleliga skador på den övervakade transformatorn och/eller på Hydran 201i samt leda till egendomsförlust, personskada och/eller livsfara.

• Installation och underhåll av Hydran 201i måste utföras av behörig personal. Råd var god posterar operatören före underhåll. Funktionsduglig insida Hydran 201i kan starta oönskade parameterändringar för larm tack vare, driver avstängning, systemomstart eller elektrostatisk urladdning.

• För ett maximalt avstånd på 15 m från kraftuttaget, använd 2,08 mm$^2$ kabel (14-AWG) och ett överströmsskydd.

1.2 Safety Symbols Description

Description of safety symbols used on the Hydran M2 device:

- **Refer to the Instruction Manual to prevent injury or damage to equipment.**

- **Hazardous voltages may be present.**

- **Protective earth connection.**

Description of safety messages used in this Instruction Manual:

- **CAUTION**
  
  *A procedure, practice, or condition that could cause equipment damage or permanent loss of data, if not adhered to.*

- **WARNING**
  
  *A procedure, practice, or condition that could cause bodily injury or death, if not adhered to.*
1.3 Preface

This manual provides an overview of the installation for the Hydran 201i. For complete explanations on the installation process, see Chapter 7 in the Hydran 201i Instruction Manual.

The information in this manual may be used by:

- An installer
- An electrician

**WARNING**

- All procedures in this manual must be strictly adhered to. Any deviation from these may cause irreversible damage to the transformer being monitored and/or the Hydran 201i, and may lead to property damage, personal injury and/or death.
- Installation and maintenance of the Hydran 201i must be carried out by qualified personnel only.

Any visible signs of damage to the shipping packages should be reported to GE Energy immediately.

Please keep all documentation (model number, manuals, etc.) for reference and warranty purposes.

A Table of Contents is present at the beginning of the manual.

The Hydran 201i Installation Guide (this manual), the Hydran 201i Instruction Manual and the Hydran Host Software Manual are located in PDF format in the English/Manuals folder of the Hydran 201i installation CD. Hard copies of each manual can be purchased from GE Energy.

1.4 Revisions

Issue dates of this manual are:

<table>
<thead>
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<th>Revision</th>
<th>Date</th>
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<tr>
<td>3</td>
<td>November 2010</td>
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<tr>
<td>4</td>
<td>June 2013 (general revision)</td>
</tr>
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<td>5</td>
<td>August 2013</td>
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Any failure which is the basis for a warranty claim shall not be cause for extension of the duration of the applicable Warranty Period. GE Energy shall not be responsible for removal or replacement of systems, structures or other parts of the Buyer’s facility. If a defect in Products or part thereof cannot be corrected by GE Energy’s reasonable efforts, the parties shall negotiate an equitable adjustment in price with respect to such Products or part thereof. All decontamination work necessary for the correction of defects shall be performed by the Buyer at the Buyer’s expense. The condition of any tests shall be mutually agreed upon and GE Energy shall be notified of and may be represented at all tests that may be made.

GE Energy does not warrant Products or any repaired or replacement parts against normal wear and tear, including that due to environment or operation, including excessive operation at peak capability, frequent starting, type of fuel, detrimental air inlet conditions, or erosion, corrosion or material deposits from fluids, or which have been involved in an accident. The warranties and remedies set forth herein are further conditioned upon:

- Proper storage, installation, operation and maintenance of the Buyer’s equipment and conformance with the instruction manuals (including revisions thereto) provided by GE Energy and/or its subcontractors, as applicable
- Repair or modification pursuant to GE Energy’s instructions or approval
The Buyer shall keep proper records of operation and maintenance during the applicable Warranty Period. These records shall be kept in the form of log sheets and copies shall be submitted to GE Energy upon its request in connection with a warranty claim by the Buyer. GE Energy does not warrant any products or services of others designated by the Buyer where such products or services are not normally supplied by GE Energy.

The preceding paragraphs set forth the exclusive remedies for all claims based on failure of or defect in Products covered by this manual, whether the failure or defect arises before or during the applicable Warranty Period and whether a claim, however instituted, is based on contract, indemnity, warranty, tort (including negligence) or civil liability, strict liability or otherwise. The foregoing warranties are exclusive and are in lieu of all other warranties and guarantees whether written, oral, implied or statutory. NO IMPLIED STATUTORY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY.
2 GENERAL

2.1 Typical Installation

A typical installation of the Hydran 201i System is presented in Figure 1 below.

Figure 1: Typical Installation of the Hydran 201i System
A description of each component:

1. Hydran 201Ci Controller (Hydran 201Ci-C Communications Controller or Hydran 201Ci-1 One -Channel Controller) installed on vibration-absorbing rubber pads (see Figure 3)

2. Full-bore gate or ball valve

3. Hydran 201Ti Intelligent Transmitter

4. H201Ti’s supervisory link cable in a rigid or flexible steel conduit

5. H201Ti’s power supply cable in a rigid or flexible steel conduit

6. Cable for communications and analog outputs in a rigid or flexible steel conduit (distinct from alarm cable conduit), toward a supervisory control and data acquisition (SCADA) system

7. Cable for alarms in a rigid or flexible steel conduit, toward a SCADA system

8. H201Ci Controller’s power supply cable in a rigid or flexible steel conduit

2.2 Preferred Locations

For meaningful readings and good response time, the most important factors are proper location and installation of the H201Ti. For a typical transformer, the four most common locations to install the H201Ti are shown in Figure 2.

1. Radiator’s return pipe: The recommended location to mount the H201Ti is on the straight section of the radiator’s return pipe, which is joining the bottom of the radiator to the transformer’s main tank (on the discharge side of the pump to avoid negative pressure). This location presents the H201Ti with the best combination of oil flow, temperature and ease of access.

   **CAUTION**

   No obstructions (baffle, pipe, etc.) must exist behind the valve (inside the tank).

2. Filling valve (top of tank): In terms of performance (excellent convective oil flow), this location is a very good alternative location to install the H201Ti. However, the higher operating temperatures somewhat reduce the Hydran 201 sensor lifetime. Access to the H201Ti is also more difficult.

3. Inlet of radiator: See the comments on location 2.

4. Drain valve (bottom of tank): At this location, the H201Ti performances are good, rather than excellent. The low oil flow may affect the gas level
readings; however, the lower operating temperatures and ease of access make this location a valid alternative choice.

Figure 2: Mounting Locations of the H201Ti on a Transformer

Also, note the following points:

1. The H201Ti must always be easily accessible. The distance between the valve and the ground must exceed 30cm (12in) to install and wire the H201Ti.

2. Do not install the H201Ti on an elbow (see Figure 10) or a fitting box. The turbulent oil flow at these locations may result in inaccurate gas level readings.

3. If the H201Ti is mounted directly on the wall of the transformer tank, ensure it is installed below the oil level.

4. No obstructions (baffle, pipe, etc.) must exist behind the valve (inside the tank).

5. Regardless of the selected location, it is recommended to mount the H201Ti horizontally. If no horizontal valve is available, a vertical installation may be acceptable; contact General Electric Customer Service (contact information can be found at the bottom of page 2). If the H201Ti is installed vertically, note the following points:
   - The sensor’s threaded extremity must be oriented upward.
- The oil temperature at this location must always be below 30°C (86°F).
- Do not use a 90° elbow to convert a vertical installation to a horizontal installation.
- It is recommended to set the temperature set point (Temp SetPoint parameter in the Temperature submenu) of the H201 sensor to 45°C (113°F).

If these four recommended locations cannot be used, contact General Electric Customer Service (contact information can be found at the bottom of page 2) to help you determine an acceptable alternative location.
2.3 Vibration-Absorbing Rubber Pads

If vibrations are present, rubber pads (which can be purchased from General Electric) are used on the back of the Hydran 201Ci Controllers; an example is shown in Figure 3 below.

Figure 3: Vibration-Absorbing Rubber Pads
3 GENERAL WARNINGS

1. Do not separate the Hydran 201Ti Intelligent Transmitters from their respective Hydran 201 sensor. The H201Ti is set at the factory for a specific H201 sensor. To verify whether the two components are paired correctly, consult the serial numbers indicated on the shipping box and/or the Test Certificate and Data Sheet. The sensor’s serial number is located below the connector (see Figure 4 below); while the H201Ti’s serial number is located at the back of the heating plate (see Figure 5).

![Figure 4: Hydran 201 Sensor and Protective Cap](image)
2. **Do not remove the protective plastic caps** from the sensor and/or the brass adaptor’s threaded extremity until ready to install on the transformer valve. These caps protect the adaptor threads (see Figure 5 above) and the sensor membrane from debris and sharp objects. If the sensor is dismounted, place immediately the supplied cap onto the sensor’s threads.

![Figure 5: H201Ti’s Serial Number and Protective Cap](image)

**CAUTION**

*Mishandling of the Hydran 201 sensor (such as a perforation or scratch on the membrane or subjecting the sensor to paint or solvent) voids the warranty.*

3. **Do not touch the H201 sensor’s membrane** (located inside the threaded extremity) with a finger or an object (see Figure 6 below). The membrane is easily damaged; this would impair the sensor permanently, thus voiding the warranty.
4. Do not block or puncture the sensor’s breathing membrane. Located above the sensor’s connector (see Figure 4), this opening provides oxygen to the gas detector inside the sensor. Blocking or puncturing this membrane damages the sensor permanently, thus voiding the warranty.

5. Do not paint the sensor (see Figure 7 below). Paint fumes block the sensor’s breathing membrane and damage the sensor permanently, thus voiding the warranty.

6. Do not use hydrocarbon-based compounds near the sensor. Do not clean the sensor with any solvent or other products (see Figure 7 below). The volatile fumes of these compounds can deteriorate sensor performances. Products to avoid include: Paint, liquid Teflon, vehicle exhaust, spray can, black pitch, thinner, RTV (Room Temperature Vulcanization; silicon-based mastic) and solvent.
7. *Do not use a pipe wrench or chain wrench to install the sensor.* Doing so may cause serious damage to the sensor, thus voiding the warranty. It is recommended to use General Electric’s Hydran 201TW tube wrench (see Figure 8 below) to correctly install the Hydran 201 sensor. One Hydran 201TW tube wrench per site is recommended.
Figure 8: Use the Hydran 201TW instead of a Pipe Wrench
8. Do not install the H201Ti on the inlet side of the radiator pump (see Figure 9 below).

Figure 9: Do Not Install the H201Ti on the Inlet Side of the Radiator Pump

9. Do not use galvanized fittings to install the brass adaptor and the sensor. Galvanized fittings (pipes, reducing bushings, rings, etc.) may react with the oil and produce elevated gas level readings. Similarly, do not use galvanized fittings on transformer valves used for oil sampling.
10. Install the H201Ti horizontally; not at an angle, vertically or horizontally using an elbow (see Figure 10 below). Elbows may cause turbulence that can reduce the accuracy of gas level readings.

![Figure 10: Do Not Install the H201Ti on an Elbow](image)

11. Do not subject the H201Ti or its sensor to high-pressure water streams (see Figure 11 below). Used during the cleaning of transformers, they may cause serious damage.

![Figure 11: Avoid High Pressure Water Streams](image)

12. Do not punch additional openings in the H201Ci Controller's enclosure. This enclosure already has openings for the various cables used with the Hydran 201i System.
If additional openings are made, the protection level given by the NEMA/IP rating of the product may be compromised.

13. **Do not remove the watertight cap from unused openings of the H201Ci’s enclosure.**

### 4 BEFORE INSTALLATION

1. Visually inspect the sensor membrane before installation on the valve. Remove the protective plastic cap and look inside the opening. The membrane’s surface must be flat, without cuts or tears.

   **CAUTION**

   **Do not touch the H201 sensor’s membrane for any reason.**

2. Use only PTFE tape to seal the threads of both the adapter and the Hydran 201 sensor. Wrap at least 4 to 5 layers of tape around the threads. Always wrap the tape counter to the treads.

   **Figure 12: Always Cover the Threads with PTFE Tape**
3. It is recommended to mount the Hydran 201Ti horizontally. Ensure the bleed screw is on top (at the “12 o’clock” position); see Figure 13 below.

![Figure 13: Bleed Screw must be on top, at the 12 O’clock position](image)

4. If no horizontal valve is available, a vertical installation may be acceptable; contact General Electric Customer Service (contact information can be found at the bottom of page 2). If the H201Ti is installed vertically, note the following points:
   - The sensor’s threaded extremity must be oriented upward.
   - The oil temperature at this location must always be below 30°C (86°F).
   - It is recommended to set the temperature set point (Temp SetPoint parameter in the Temperature submenu) of the H201 sensor to 45°C (113°F).

   **CAUTION**  
   **Do not use a 90° elbow to convert a vertical installation to a horizontal installation.**

5. Always mount the H201 sensor on a full-bore gate or ball valve where there is sufficient convective oil flow. The H201Ti is installed on a valve with a 1.5-in nominal diameter (NPT female threads). If necessary, use a reducing bushing. The body of the valve must be grounded.

   *Note: To ensure sufficient oil flow past the sensor’s membrane, the nominal diameter of the valve should never be less than 25 mm (1 in). Furthermore, to ensure optimum performance of the H201Ti, the diameter should not exceed 76 mm (3 in).*
6. The total distance between the H201Ti and the mounting point of the valve must not exceed six times the nominal diameter of the valve (230mm [9 in] for a 38mm [1.5 in] valve). See Figure 14 below.

![Figure 14: Maximum Distance between the Hydran 201Ti and the Valve](image)

7. The H201Ti weighs 5.6kg (12lb). If the selected valve is subject to strong vibrations, install a supporting bracket to reduce the load on the valve. In case of doubt, consult your engineering personnel.
5 INSTALLATION

5.1 Tools and Materials Required

- Flat-blade screwdriver
- General Electric’s Hydran 201TW tube wrench to tighten the Hydran 201 sensor
- Pipe wrench to tighten the brass adaptor onto the valve
- Allen keys supplied with the Hydran 201Ti
- Bucket and oil-absorbing rags
- PTFE tape and vinyl tape
- Drill, bits and fasteners for mounting the Hydran 201Ci Controller
- If required, vibration-absorbing rubber pads, which can be purchased from General Electric
- Conduits, fittings and cables for power supply, alarms, analog outputs and communications
- Digital voltmeter/ammeter

5.2 Verifying the AC Power Supply Voltage

Verify the following values are equivalent:

- The ac power supply voltage, which is indicated on the left side of the I/O module
- The power source voltage
- The value on the Test Certificate and Data Sheet

5.3 Preparing the Hydran 201Ti

1. Unscrew the H201Ti’s aluminum cover knob.

2. Remove the cover.

3. Remove only the two screws used to fasten the CPU module and identified with arrows. See Figure 15.

4. Carefully pull out the CPU module.

CAUTION When removing the CPU module, make sure not to bend the pins of the connector located between the CPU and the I/O modules.

5. Disconnect the H201 sensor’s connector.

6. Remove the six 1/4-28 cap screws from the adaptor using the supplied 3/16-in Allen key.
7. Separate the adaptor and the heating plate.

8. Protect the adaptor’s threads with the supplied plastic cap, see Figure 7.

   **CAUTION**

   *Do not remove the protective plastic caps from the sensor and/or brass adaptor’s threaded extremity until ready to install on the transformer valve.*

9. Unscrew the sensor to separate it from the brass adapter.

   **CAUTION**

   *Do not touch the H201 sensor’s membrane for any reason.*

10. Inspect the sensor’s membrane by looking at it. Its surface must be flat, without cuts or tears.
11. Protect the sensor’s membrane by placing the supplied plastic cap over the sensor’s threads (see Figure 4)

5.4 Installing the Brass Adaptor onto the Valve

1. Wipe the inside of the transformer valve.

2. Cover the adaptor’s threads with PTFE tape; see Figure 12.

   Use only PTFE tape to seal the threads of both the adapter and the Hydran 201 sensor. Wrap at least 4 to 5 layers of tape around the threads.

   Always wrap the tape counter to the threads.

3. Screw the adaptor onto the valve and tighten it using a pipe wrench. Ensure two of the screw holes of the adaptor (used to fasten the Hydran 201Ti’s heating plate) are level (horizontal).

5.5 Installing the Hydran 201 Sensor

1. Cover the adaptor’s threads with PTFE tape; see Figure 12.

2. Slightly loosen the sensor’s bleed screw, using the supplied 5/32-in Allen key.

3. Screw the sensor manually onto the adaptor.

4. Tighten the sensor using General Electric’s Hydran 201TW tube wrench (see Figure 8) or a strap wrench. Do not use a pipe wrench. Do not use excessive force when tightening the H201 sensor onto the valve.

   Note: If the H201 sensor is installed horizontally, ensure the bleed screw is on top (at the “12 o’clock” position); see Figure 13.

5. Ensure the bleed screw is in place. Do not tighten it now.
5.6 Opening the Valve

This step should be performed according to company regulations. Proceed carefully to avoid introducing air into the transformer. Use a bucket to collect the oil.

1. Using the supplied 5/32-in Allen key, fully close the sensor’s bleed screw and then open it 1/8 of turn.

2. Slowly open the transformer valve until oil leaks out of the sensor’s sampling port (see Figure 16 below).

3. When there are no more air bubbles present in the oil, shut the bleed screw tightly.

4. Open the valve completely.
5. Wipe all traces of oil from the sensor.

**CAUTION**  
*Do not use any solvent.*

6. Inspect the adaptor and sensor for oil leaks.

7. Dispose of the collected oil according to company standards.
5.7 Fastening the Hydran 201Ti to the Brass Adaptor

1. Using the supplied 3/16-in Allen key, fasten the H201Ti’s heating plate to the brass adaptor with the six 1/4-28 cap screws. See Figure 17 below.

Be careful not to squeeze the nearby electrical wires between the lock washers and the heating plate or not to damage the supervisory link (and analog output) termination board.

Note: When the H201Ti is installed horizontally, the terminals must be facing up and located under the sensor. Also, ensure that both the bleed screw and sampling port remain easy to access.

2. Plug the twist-lock female connector of the sensor cable to the male connector behind the Hydran 201 sensor,
5.8 Installing the Cables

1. Remove the cover from the connection box located under the brass adaptor.

2. As required, install one or two watertight conduit fittings (not supplied) onto the connection box.
   - One conduit is used to run the supervisory link cable (which connects the H201Ti to the Hydran 201Ci Controller) and, if used, the cable of the H201Ti’s analog output.
   - One conduit is used to run the power supply cable and, if used, the cable of the H201Ti’s alarm contacts.

   **CAUTION** All cable connected to the H201Ti must be run through steel conduits. Otherwise, armored cables can be used.

3. Mount a conduit to each fitting.

   **CAUTION** All metallic conduits or cable shields must be connected to the ground at one point.

4. Ground the conduits and/or cable shields at some point. Follow the company regulations meticulously.

   **WARNING** The H201Ti must always be grounded, even if the transformer tank is grounded at a single point and monitored for tank-to-ground currents.

5. Run the supervisory link cable into the conduit up to the H201Ci Controller, the electrical connections drawings can be found in APPENDIX A: ELECTRICAL CONNECTIONS.

6. Connect the cable wires and shield to the H201Ti’s supervisory link (and analog output) termination board. The electrical connections drawing can be found in APPENDIX A: ELECTRICAL CONNECTIONS.

   **CAUTION** The H201Ti’s operation may be affected if wires are not connected correctly. Be careful when installing and inserting each wire. Be sure to insert all strands in the terminal; strands that touch two terminals cause problems. Strip each wire to a maximum of 8 mm before installing it. Do not leave trims of metallic strands inside the H201Ti’s enclosure.
7. Connect the analog output wires to the Supervisory Control and Data Acquisition (SCADA) system.

8. If the Hydran 201Ti's alarms are used, proceed as follows:
   • Run the alarms cable through the second conduit up to the H201Ti.
   • Connect the cable to the H201Ti's Alarm Contacts 9-Terminal Block, the electrical connections drawing can be found in APPENDIX A: ELECTRICAL CONNECTIONS.
   • Connect the cable to the SCADA system.

9. Run the three-wire ac power supply cable into the second conduit up to the Hydran 201Ti.

10. Connect the cable to the H201Ti's terminals L1/L, L2/N and E/G. For wiring details, see the electrical connections in APPENDIX A: ELECTRICAL CONNECTIONS.

11. Connect the other end of the cable to the power source.

   Note: The earth/ground terminal (E/G) must be connected to the power source ground (green wire) or directly to the transformer tank.

   Never perform high-voltage tests (mega-ohm measurements using a Megger* instrument) on cables connected to an H201Ti or a Hydran 201Ci Controller. Never apply high voltages to the components of a Hydran 201i System, as they are equipped with surge protection devices that could be damaged by Megger* tests.
5.9 Installing the CPU Module

1. Align and carefully insert the CPU module on the central post of the Hydran 201Ti until the connector (at the back of the module) is completely inserted in the mating connector.
2. Fasten the module with the two 6-32 screws (see Figure 18 below).

![Figure 18: Installing the CPU Module](image)

**CAUTION**

When fastening the CPU module, ensure not to bend the pins of the connector located between the CPU and I/O modules.
5.10 Verifying the Hydran 201Ti Operation

1. Power up the H201Ti.
2. Verify the operation of the H201Ti by observing the six small LED diagnostic indicators on the right side of the I/O module (from left to right in Figure 19 below):

   - **C Heating state LED (yellow):**
     - The LED must remain lit if the internal temperature is below the set point.
     - The LED must flash if the internal temperature is close to the set point.
     - The LED must remain off if the internal temperature exceeds the set point.

   - **-5 - Regulated -5 Vdc supply LED (green):** It must be lit.

   - **+5 - Regulated +5 Vdc supply LED (green):** It must be lit.

   - **OK - System state indicator LED (green):** It must be lit.

   - **HH - High-High alarm state LED:** (red) It must be off.

   - **H - High alarm state LED:** (red) It must be off.

Figure 19: LED Indicators on the Right Side of the I/O Module
3. Wait a few minutes and touch the back of the heating plate. It should be warm if the LED \( \text{C} \) is blinking. This indicates that the sensor is being heated.

4. After the H201Ti has performed the first-time power-up sequence and then the self-test sequence, verify it displays the following messages at the rate of one every five seconds:
   - Alarm messages (if any)
   - Gas level
   - Gas hourly trend
   - Gas daily trend
   - Date and time

5. If the H201Ti is linked to a Hydran 201Ci-C Controller, power them up and verify the H201Ci-C’s operation by observing the following LEDs:
   - The Supervisory Link Supply indicator (green, DS12) is lit.
   - The Heater indicator (yellow, DS8):
     - It must initially be lit if the ambient temperature is below approximately 25 °C (77 °F).
     - After a while, it must flash as the enclosure temperature reaches the above set point.
     - It must remain off if the ambient temperature exceeds the set point.

6. If the H201Ti is linked to a Hydran 201Ci-1 Controller, power them up and verify the H201Ci-1’s operation by observing the following LED’s and indicators:
   - The Supervisory Link Supply indicator (green, DS12) is lit.
   - The Heater indicator (yellow, DS8):
     - It must initially be lit if the ambient temperature is below approximately 25 °C (77 °F).
     - After a while, it must flash as the enclosure temperature reaches the above set point.
     - It must remain off if the ambient temperature exceeds the set point.
   - The two alarm indicators of the door-mounted push-buttons are off.
   - The Alarm 1 (Gas High) indicator (yellow, DS10) is off.
   - The Alarm 2 (Gas High-High) indicator (yellow, DS9) is off.
   - The System OK indicator (yellow, DS11) is lit.

   *Note: The H201Ci-1’s display must also be functional.*

7. The H201Ti requires set-up (alarms, temperature, data logging) and commissioning for normal use. Please refer to the Hydran 201i System Instruction Manual.
6 APPENDIX A: ELECTRICAL CONNECTIONS

Figure 20: Electrical Connections for the Hydran 201i
Figure 21: Electrical Connections for the Hydran 201Ci-C
GE Energy, Lissue Industrial Estate East
Lissue Road, Lisburn, BT28 2RE, United Kingdom
Tel: +44 28 9262 2915
Fax: +44 28 9262 2202
Email: ge4service@ge.com
Web: www.gedigitalenergy.com/md.htm

GE Energy
Digital Energy
Customer Service Center
(24 hours a day, 365 days a year)
Tel.: +1 800 361 3652 (United States and Canada)
Tel.: +1 514 339 2801 (worldwide)
Email: ge4service@ge.com