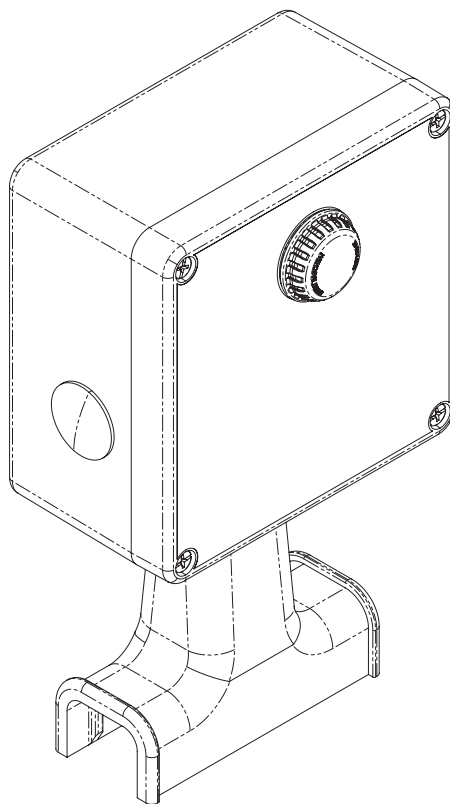


# *Raychem*

## **Elexant 3500i**

Installation Instructions



Elexant 3500i Enclosure Dimensions

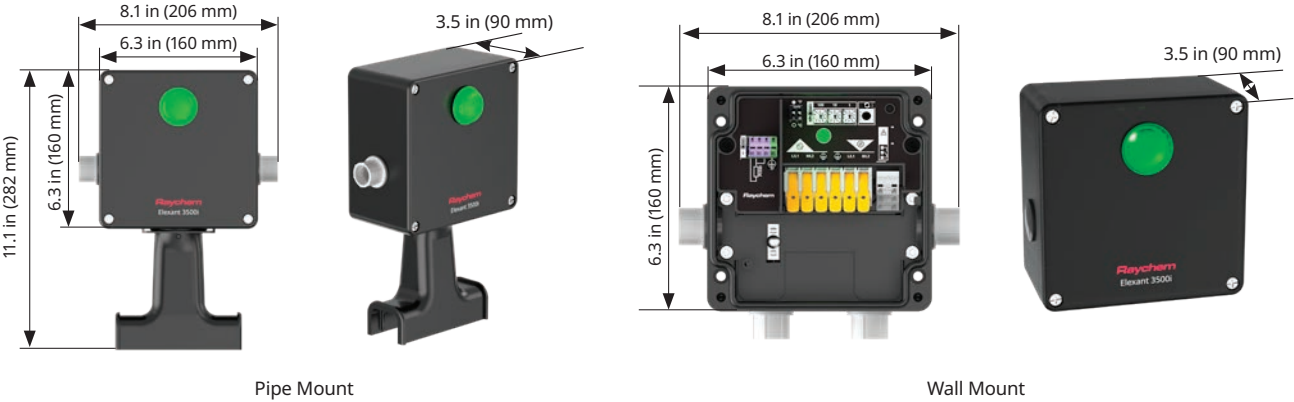


Figure 1: Dimensions of Elexant 3500i

Hazardous Area Approvals

Raychem Elexant 3500i



Class 1, Division 2, Group A, B, C, D T5 Type 4X  
Class II, Division 2, Group F, G

Non-incendive parameters for RTD output – Shall be installed in accordance with Control Drawing below

Voc = 5.88 VDC

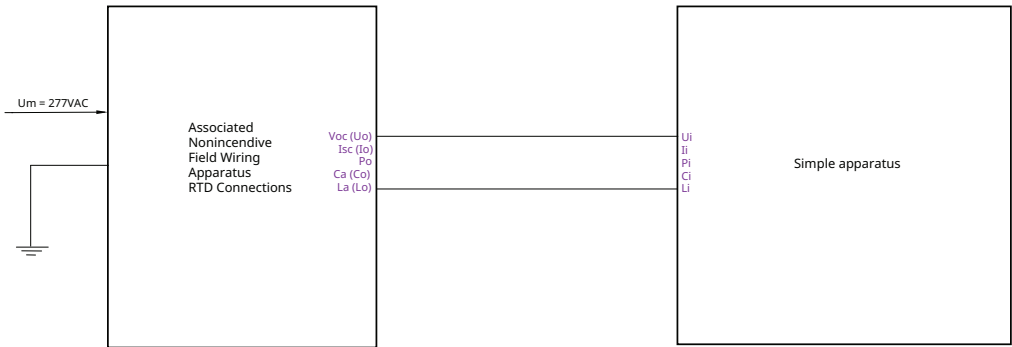
Isc = 89 mA

Po = 0.131 W

Ca = 42.7  $\mu$ F

La = 4474  $\mu$ H

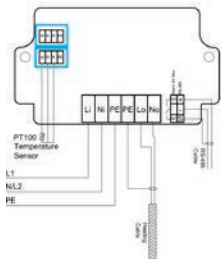
Hazardous Location  
Class I Division 2 Groups A,B,C,D



Associated Nonincendive Field Wiring Apparatus Entity Parameters:

Parameters Applicable Per RTD Channel:

Voc (Uo) = 5.88VDC  
Isc (Io) = 89mA  
Po = 0.131W  
Ca (Co) = 42.7 $\mu$ F  
La (Lo) = 4474 $\mu$ H



Entity Application

CI + Ccable <= Co  
LI + Lcable <= Lo

Capacitance and inductance of the field wiring from the nonincendive field wiring apparatus to the associated nonincendive field wiring apparatus shall be calculated and must be included in the system calculations as shown in above. Cable capacitance, Ccable, plus nonincendive field wiring apparatus capacitance, CI must be less than the marked capacitance, Ca (or Co), shown on any associated nonincendive field wiring apparatus used. The same applies for inductance (Lcable, LI and La or Lo, respectively). Where the cable capacitance and inductance per foot are not known, the following values shall be used for two or three core cables: Ccable = 60 pF/ft., Lcable = 0.2  $\mu$ H/ft

Notes:

- Must be installed per Elexant 3500i installation instructions and in accordance with NEC, CEC & local wiring regulations
- 3500i-ST, 3500i-AR, 3500i-C, 3500i-I & 3500i-GF must be installed in an enclosure suitable for the application in accordance with the National Electrical Code (ANSI/NFPA 70) for installation in the United States, the Canadian Electrical Code for installations in Canada, or other local codes, as applicable. Once installed in a suitable enclosure, system also meets requirements for installation in Class II Division 2 Groups F, G.









Drawing Number 2000003612-A

## Safety Instructions

Please read all instructional literature carefully and thoroughly before starting. Refer to the inside front cover for the listing of Liabilities and Warranties. NOTICE: The information contained in this document is subject to change without notice. Please read these Operating Instructions before Commissioning the thermostat. Keep the operating instructions in a place which is always accessible to all users. Should any difficulties arise during start-up, you are asked not to carry out any unauthorized manipulations on the instrument as this could affect your warranty rights. Please contact the nearest Chemelex subsidiary or the head office. If any servicing is required, the instrument must be returned to the head office.

During operation, do not leave this Instruction Manual or other objects inside the enclosure. Use the temperature controller or limiter only for its intended purpose and operate it only in clean, undamaged condition. Do not make any modifications to the temperature controller or limiter that are not expressly mentioned in this Instruction Manual. If the Elexant 3500i is used in a manner not specified by Chemelex, the protection provided by the equipment may be impaired. Whenever work is done on the temperature controller or limiter, be sure to observe the national safety and electrical code requirements and accident prevention regulations and the safety instructions given in this Instruction Manual.

For installation/operation, always observe the Equipment Safety Law, the rules of generally accepted engineering practice (IEC 60079-14 / EN 60079-14), and the instructions stated in this installation manual. Carry out work on the thermostats in the de-energized state only.

-  Branch circuit protection and disconnection devices shall be provided a location that is easily reached, and identified as the disconnect device for the equipment in.
-  Les dispositifs de protection et de déconnexion des circuits de dérivation doivent être placés à un endroit facilement accessible et identifiés comme étant le dispositif de déconnexion de l'équipement qu'ils contiennent.
-  The purchaser should make the manufacturer aware of any external effects or aggressive substances that the equipment may be exposed to.
-  L'acheteur doit informer le fabricant des effets externes ou des substances agressives auxquels l'appareil peut être exposé.
-  The cable glands shall only be used for fixed installations, the cables must be fixed to prevent pulling or twisting.
-  Les presse-étoupes ne doivent être utilisés que pour des installations fixes, les câbles doivent être fixés de manière à éviter toute traction ou torsion.
-  Do not disconnect while circuit is live unless area is known to be non-hazardous.
-  Ne pas débrancher tant que le circuit est sous tension à moins qu'il ne s'agisse d'un emplacement non dangereux.

## Specific Conditions of Use

1. Cable entry shall be through rated conduit hubs to maintain the ratings of the enclosure provided.
2. Unused cable entries must be filled with suitable rated conduit plugs maintaining the environmental ratings of the enclosure.
3. Leads connected to the terminals shall be insulated for the appropriate voltage and this insulation shall extend to within 1 mm (1/32") of the metal of the terminal throat.
4. The maximum permitted current of the alarm contacts is 2 A, and the maximum permitted voltage is 277 Vac.

## Area of Use

Raychem Elexant 3500i thermostats are used for temperature control of electrical heating cables in industrial environments. Alternatively they can be programmed to act as a temperature limiter. The Elexant 3500i consists of a temperature controller but can alternatively be programmed to act as a temperature limiter. Elexant 3500i electronic modules are approved for use in ordinary and Class I Division 2 Groups A, B, C, D and are required to be installed in an Elexant 3500i enclosure or approved Type 4 enclosure. Elexant 3500i units consisting of an Elexant 3500i electronics module and Elexant 3500i enclosure are approved for use in ordinary and Class I Division 2 Groups A, B, C, D and Class II Division 2 Groups F, G.

## Description

The Elexant 3500i electronic thermostats are Type 4X rated connection kits. They are designed for use with Raychem industrial heating cables.

When powering mineral insulated (MI) circuits, cold leads must be used, accounting for MI cold lead cable gland size, hub size and power cable size. Power cable gland and hubs for MI cold lead glands are not included.

The kits can be used to connect one or two heating cables to power. The Elexant 3500i power terminals are rated for a single copper conductor up to wire size 25 mm<sup>2</sup> (4 AWG), or they may accept 2 copper conductors of wire size 6 mm<sup>2</sup> (10 AWG) in 1 terminal with the use of a twin ferrule.

**Note:** For two heating cables powered by a single circuit, the length of each heating cable should not exceed the maximum allowable circuit length published in the Raychem self-regulating cables design guide and the total current of all heating cables on the circuit should equal no more than 80% of the circuit breaker current rating. These kits may be installed at temperatures as low as -55°C (-67°F). For easier installation store above freezing until just before installation. For technical support call Chemelex Technical Support Department at (800) 545-6258.

Chemelex, 899 Broadway Street, Redwood City, CA 94063, United States of America

## Technical Data




### Environmental

Ambient operating temperature	From -55°C to +60°C (T4) (-67°F to +140°F)
Maximum Pipe Temperature	205°C (401°F)

### Enclosure

Protection	Type 4X, IP 66
Installation position	Any position allowed, typical use with conduit hubs facing down When installing upside down, knock out the drain hole of the pipe-stand

### Electrical data

Power supply & own power consumption	100 to 277 Vac +/-10%, 47-63 Hz. 15 VA max.
Maximum Current	 32 A @ 40°C (104°F), linearly derated to 24 A at 60°C (140°F) (power source protected by listed branch circuit breaker rated maximum 40 A. If applicable, disconnect device shall be installed in compliance with local electrical code.)
Contact lifetime	>250K operations at 32 A / 277 VAC (resistive load) at 40°C (104°F)
Alarm output relay	Contact rated  277 Vac, 2 A, 47-63 Hz, CAT II, type of load is resistive. For the alarm variant the relay output is set to be normally closed. For the communicating, current sensing, and ground fault version, the relay output is software programmable to open, close or to toggle in case of alarm
Electrical safety	 EN 61010-1, Category III, Pollution degree 2.

### Electromagnetic compatibility

FCC	47 CFR Part 15B - Class A, Part 15C  <b>Note:</b> This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
Industry Canada (IC)	CAN ICES-003 (Class A) / NMB-003(Class A), RSS-Gen, RSS-247  <b>Note:</b> This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions: 1. This device may not cause interference. 2. This device must accept any interference, including interference that may cause undesired operation of the device.  L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : 1. L'appareil ne doit pas produire de brouillage; 2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

### Ordering information

Product name	Part Number	UPC number
Eluxant 3500i-ST-P-A	2000003757	715629422248
Eluxant 3500i-AR-P-A	2000003758	715629422255
Eluxant 3500i-C-P-A	2000002626	715629422101
Eluxant 3500i-I-P-A	2000003759	715629422262
Eluxant 3500i-GF-P-A	2000003760	715629422279
Eluxant 3500i-ST-W-A	2000003749	715629422163
Eluxant 3500i-AR-W-A	2000003750	715629422170

Elexant 3500i-C-W-A	2000002454	715629422088
Elexant 3500i-I-W-A	2000003751	715629422187
Elexant 3500i-GF-W-A	2000002924	715629422132

Table 1: Elexant 3500i

#### Variant Abbreviations:

ST = Standard

AR = Alarm

C = Communicating

I = Current Sensing

GF = Ground Fault Detecting

#### Enclosure Type Abbreviations:

P-A = Pipe Stand

W-A = Wall Mounted

## ELEXANT 3500I ALARM COLORS EXPLAINED

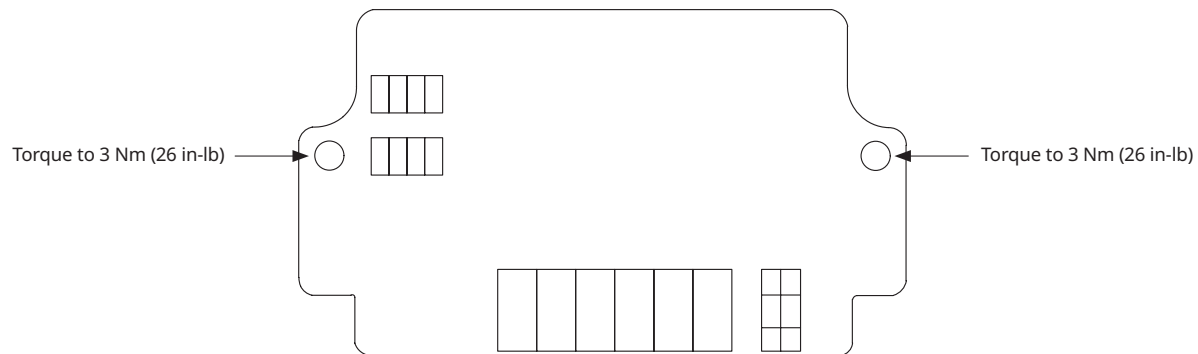
- Solid Green = Power is on
- Flashing Green = Power is on and heat tracing is on
- Solid Yellow = Alarm or problem detected
- Solid Red = A problem requires attention

## INSTALLATION

### Mechanical Installation

Elexant 3500i units comprise of either a temperature controller or a safety temperature limiter that can be set via programming. The controllers can be installed in any position on a stable structure by means of the 4 mounting holes. The Elexant 3500i unit can be mounted directly on a pipe up to a pipe temperature of 205°C (401°F). Ensure that the ambient temperature of the equipment does not exceed 60°C (140°F) at any time. To provide sufficient stability, the pipe stand shall be attached by means of 2 pipe straps.

The Elexant 3500i electronics module is shipped loose in the enclosure to allow for additional components such as conduit hubs or the pipe stand to be secured and wires pulled into the enclosure before termination. The Elexant 3500i module is secured to the enclosure via the two attachment screws noted below using a 5mm Hex connection. Install to 3Nm (26 in-lb).



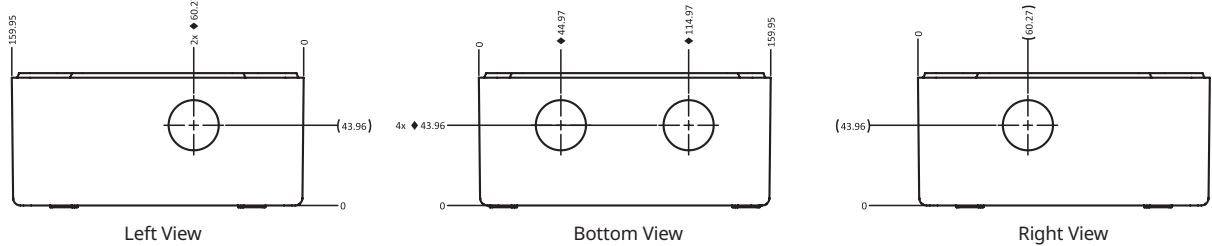
Connecting Cables and Conduit Hubs to Elexant 3500i Units

⚠ At ambient temperatures above 45°C (113°F) the cable selected should have a temperature rating of 90°C (194°F) or higher. Conduit hubs with a temperature rating of 90°C (194°F) or higher and Type 4X should be selected.

⚠ Copper (Cu) conductors shall be used.

Installation instructions for conduit hubs (threaded holes only). RTD, communications, and alarm relay wiring must be wired through separate conduit hub from high voltage power wiring.

Wall Mount Variant



Pipe Mount Variant

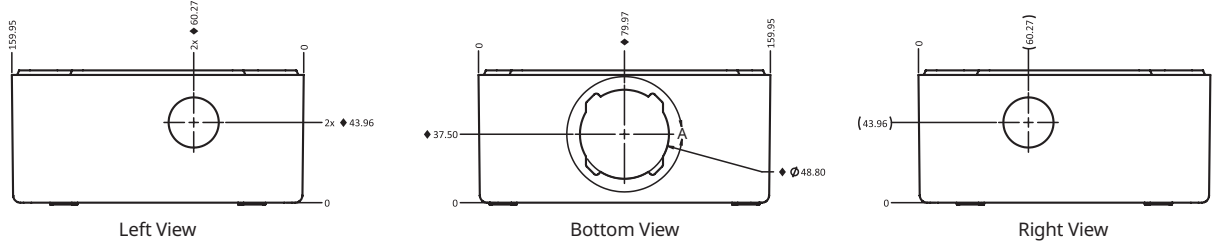


Figure 2: Elexant 3500i Hub Entry Locations

Enclosure Material Limitations	Only use approved conduit hubs, suitably certified for the intended area of use.
Permitted use and location of any hubs	For metal conduit hubs use an internal locknut to assure earth continuity with the Elexant 3500i internal earth plate.
Lock nuts	Only use Raychem locknuts or types recommended by the conduit hub manufacturer.
Recommended torque values	The installation instructions provided by the conduit hub manufacturers must be followed.

Grounding and Bonding (Earthing)

Elexant 3500i units must be earthed in accordance with the local wiring regulations.

Wiring Diagram

Elexant 3500i units must be installed in accordance with local wiring regulations. Figure 3 shows the electrical connection diagram. The optional second Pt100 temperature sensor for the control unit is omitted for clarity. Terminate cable shields on the green earth terminal.

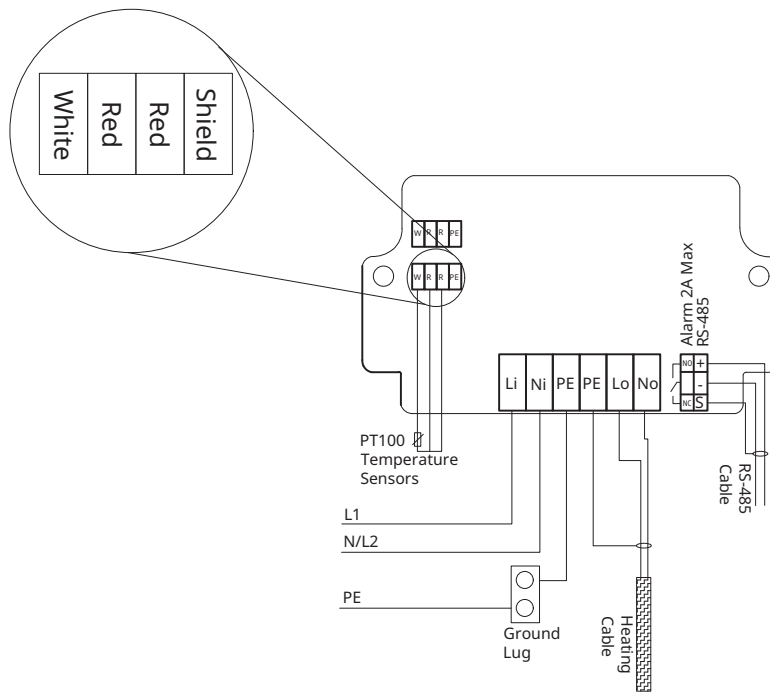


Figure 3: Electrical connection diagram Elexant 3500i

## Configuration

The Elexant 3500i electronic thermostats can be configured in a number of ways. The communicating, current sensing, and ground fault detecting variants can be configured locally by means of a handheld programming device using the Elexant Connect application or from a central location using the Touch 1500 or Raychem Supervisor software. For more information about configuring the Elexant 3500i using these software programs, please refer to the Elexant Connect Operations Manual (EU2191), Touch 1500-EX Operations Manual (H58682), or the Raychem Supervisor Operations Manual (H57576). After programming, all settings are permanently stored in the nonvolatile memory of the Elexant 3500i, avoiding loss of data in the event of power failure or after a long-term power shutdown.

The Standard and Alarm variants of the Elexant 3500i can be programmed via the digital switches and rotary dial located here:

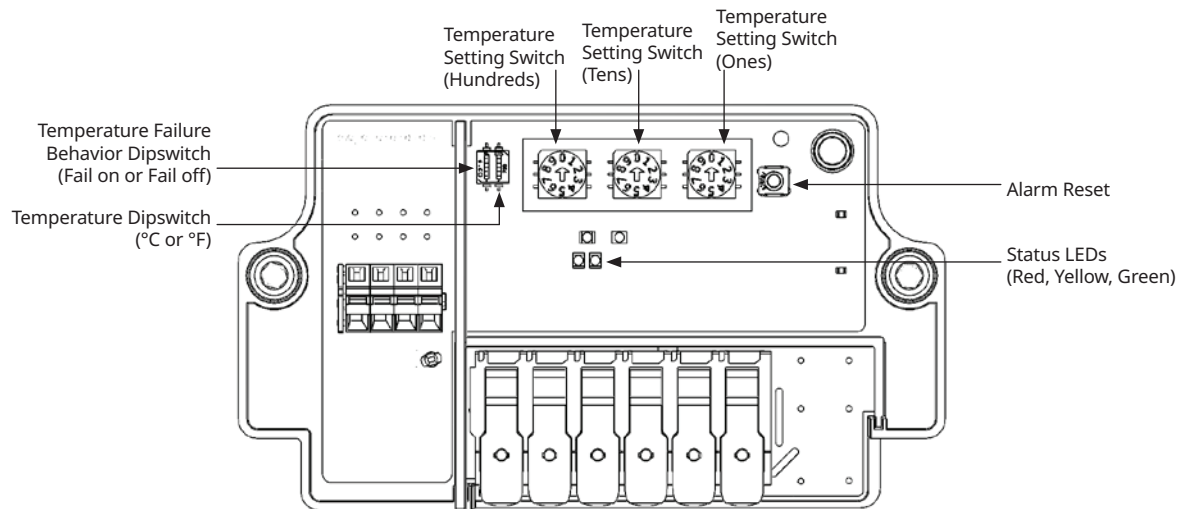


Figure 4: Elexant 3500i Standard and Alarm Variant Digital Switches and Rotary Dials

Starting from the left, the first dipswitch is to set temperature sensor failure behavior. In the case of sensor failure the Elexant 3500i can switch to an on or an off state, depending upon the users requirement. Setting the dipswitch up towards the filled circle will program the Elexant 3500i to fail on, while setting the dipswitch down towards the empty circle will program the Elexant 3500i to fail off. By default, the Elexant 3500i is shipped with a fail off setting, meaning in the event of a sensor failure, the Elexant 3500i will not energize the heat trace circuit. Setting the dipswitch up towards the filled circle will program the Elexant 3500i to energize the heat trace circuit in the event of a sensor failure.

Note that the Standard and Alarm variant of the Elexant 3500i will display a sensor failure alarm via a red status LED and the Alarm variant will engage the alarm relay in the event of a sensor failure.

The second dipswitch is used to switch between Celsius and Fahrenheit. By default, the Elexant 3500i is shipped with this dipswitch down towards the Celsius.

Finally the rotary dials are used to select a setpoint temperature. The Elexant 3500i monitors the sensor temperature and compares it to the setpoint temperature. If the measured temperature is above the control temperature setpoint by more than the Deadband value, (by default 3°C/5°F) the output is turned off. If the control temperature falls below the control temperature setpoint, the output is turned on. When the control sensor temperature is within the dead band, the output does not change its state.

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