



## *Pilot Valve Enclosures for Hazardous Locations*



Your Portal to the Industrial World

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## 3-6VFD Combination Flame and Dust Ignition Proof Enclosures

Goyen pilot valve enclosures for hazardous locations are available in a combination of flame proof and dust ignition proof assemblies, where 4, 5 and 6 pilot valves are available. The 3-6VFD can be supplied with combined international approvals: Canadian CSA/Underwriters Laboratory UL and European ATEX/International IECEx.

In addition, in Canada and Europe, Goyen offers enclosures that meet the requirements of both flame proof and explosion proof designs simultaneously. This has the advantage of simplifying assembly designs when using the Goyen enclosures.

### Construction

Body: Diecast Aluminium AS313, LM24, 308

Ferrule: AISI 302 SS

Armature: 430FR SS

Seals: Nitrile

Screws: AISI 302 SS

### Operation

Recommended on time: 50 - 150ms

On time range: 50 - 500ms

Recommended time between pulses: 1 minute or more, if maximum on time is used.

### Pilot Performance

Flow: 0.27 Kv/0.32 Cv

Maximum Working Pressure: 860 kPa/125 psi

Minimum Working Pressure: 0 kPa/0 psi

Minimum Temperature: -40oC/-40oF

Maximum Temperature: 82oC/-180oF

Fluid Media: Air or inert gas

### Solenoid Performance

Voltage	Inrush Current mA	Hold Current mA	Power
220/240 50/60 Hz	148/143	105/94	23.1 VA
100/120 50/60 Hz	234/255	180/152	19.8 VA
24 VDC	873	873	20 W
24 VAC	1338	963	13 W
110 VDC	212	212	24 W

### Certification

CSA/UL: NEC500 Div 1, NEC505 Zone 1

ATEX/IECEx: II Category 2G, II Category 2D

### Restrictions

This product's hazardous areas certifications are valid only for product that has not been modified since leaving the factory. Modifications made to the enclosure such as the fitment of additional seals, the addition or removal of pilot valves and coils, changes in markings, or physical modifications made to the enclosure itself will invalidate the product certifications. Only activities described in 'Installation' and 'Maintenance' may be conducted without affecting the certification of the product.

### Maintenance

Annual maintenance of serviceable parts is recommended. Serviceable items are the pilot armature, armature spring, pilot valve body o-ring. The same model Goyen coil may also replace damaged coils. All other items are non-serviceable. Goyen recommend that appropriately qualified personnel conduct all maintenance activities. Certification of maintenance staff and facilities may be required under some certification schemes. Inappropriate service invalidates the product certifications.

## Product Warning Labels

### 3-6VFD Series

#### CSA/UL

CAUTION: open circuit before removing cover

ATTENTION: ouvrir le circuit avant d'enlever le couvercle

WARNING: more than one live circuit. see diagram.

AVERTISSEMENT: cet équipement renferme plusieurs circuits sous tension. voir le schema

#### ATEX/IECEx

Warning do not open whilst energised, do not open when explosive atmosphere is present. Use cables rated at 135°C when anti-condensation heater is installed.

## Guide to Hazardous Areas Application Within Dust Collectors

### Example zones around a dust collector

The following examples assume that the particulate being collected is a combustible dust.

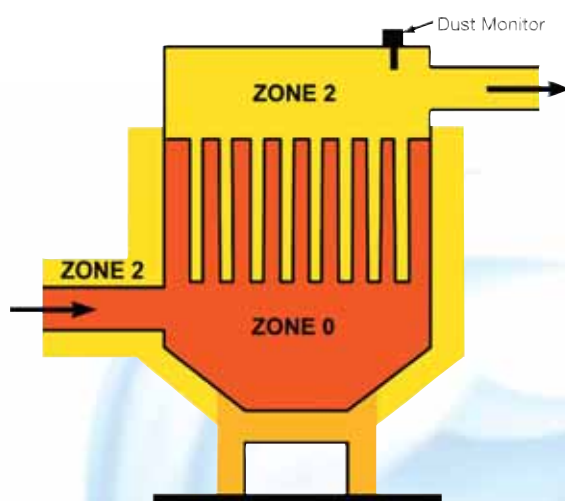
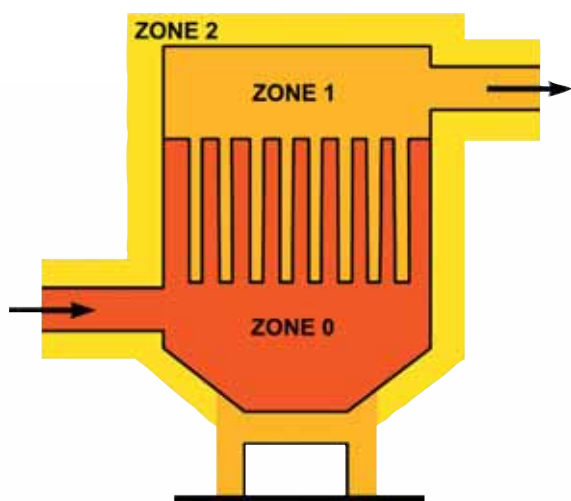
Note that the responsibility for correctly assessing the hazardous zones around the dust collection equipment remains with the plant operator.

In the event of a filter breakage, dust will enter the clean side of the dust collector. The migration of dust may be in sufficient concentration to present a dust explosion risk.

Where there are no dust monitors in place on the clean side of the dust collector, a broken bag condition may exist for more than 10 hours before rectification. Therefore the clean side is classed as Zone 1 (NEC505) or Zone 21 (Atex).

Goyen supplies intrinsically safe and Atex 3G/D dust monitors to raise an alarm in the case of a filter break. In this case the clean air plenum is classified as Zone 2 if the system will be rectified within 10 hours.

The area surrounding the dust collector housing may be classified as Zone 2. If there is adequate ventilation around the dust collector the Zone 2 classification may be eliminated. The area around the dust collection point is usually classified as Zone 1.



### Comparing area classification schemes

#### North America

#### NEC 500 Divisions

NEC 500 Divisions	NEC 505 & CEC Zones
1	0
	1
2	2

#### Europe (ATEX Scheme)

Gas Zones	Dust Zones	Equipment Category*	Group**
0	20	1	II
1	21	2	II
2	22	3	II

\* Under the ATEX scheme equipment categories for use in gas environments are denoted by a 'G' suffix, and equipment categories for dust environments are denoted by a 'D' suffix. Examples: Equipment category 2G is suitable for use in ATEX zone 1 areas. Equipment category 2D is suitable for use in ATEX zone 21 areas.

\*\* Only Group II zones are shown. Group I zones are relevant to mining applications only.

### Hazardous zone definitions

Division	Zone	Hazardous area characteristic
1	0 or 20	Hazardous condition is present continuously, for long periods, or frequently (more than 1000 hours per year)
	1 or 21	Hazardous condition is likely to occur in normal operation occasionally (between 10 and 1000 hours per year)
2	2 or 22	Hazardous condition is unlikely to occur in normal operation, or infrequently and for short periods (less than 10 hours per year)



## 3-6VFD Series Combination Flame and Explosion Proof Pilot Valve Enclosure

Diecast aluminium enclosure with explosion proof (Ex-e) and flame proof (Ex-d) protection suitable for use in hazardous areas, available optionally with anti-condensation heater.

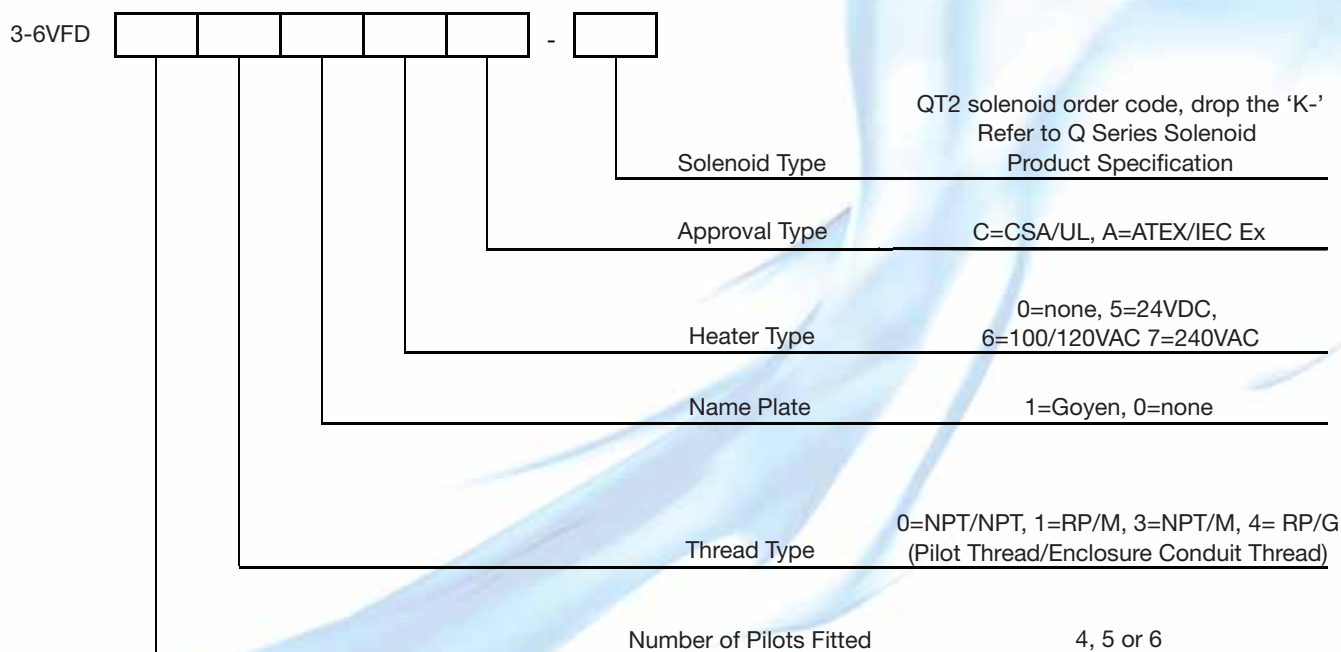
### Suitable for

NEC500 Division 1, NEC505 Zone 1 and ATEX/IECEx Zone 20 and 21 (II Cat 2G and 2D equipment) hazardous environments, for piloting Goyen diaphragm valves.

### Spare parts

K0383	Single armature kit. Includes, spring, armature, and o-ring.
G604718	DP Seal

### How to Order



## 3-6VFD Product Certifications

### With heater kit fitted

### Without heater kit fitted

#### CSA

LR26709

LR26709

Class I, Group D

Class II Groups E, F, G

Temp Code T2C

Temp Code T4

#### UL

Listed 823N

Listed 823N

Class I, Group D

Class I, Group D

Nema 7

Nema 9

Class II Groups E, F, G

Class II Groups E, F, G

Temp Code T3C

Temp Code T3C

#### IECEx

Ex d IIB T3 Gb

Ex d IIB T6 Gb

Ex tb IIIC T192°C Db IP6X

Ex tb IIIC T85°C Db IP6X

IECEx SIR 08.0045X

IECEx SIR 08.0045X

#### ATEX

II 2 G D

II 2 G D

Ex d IIB T3 Gb

Ex d IIB T6 Gb

Ex tb IIIC T192°C Db IP6X

Ex tb IIIC T85°C Db IP6X

SIRA 02ATEX1408X

SIRA 02ATEX1408X



## CSA/UL Rated Enclosures

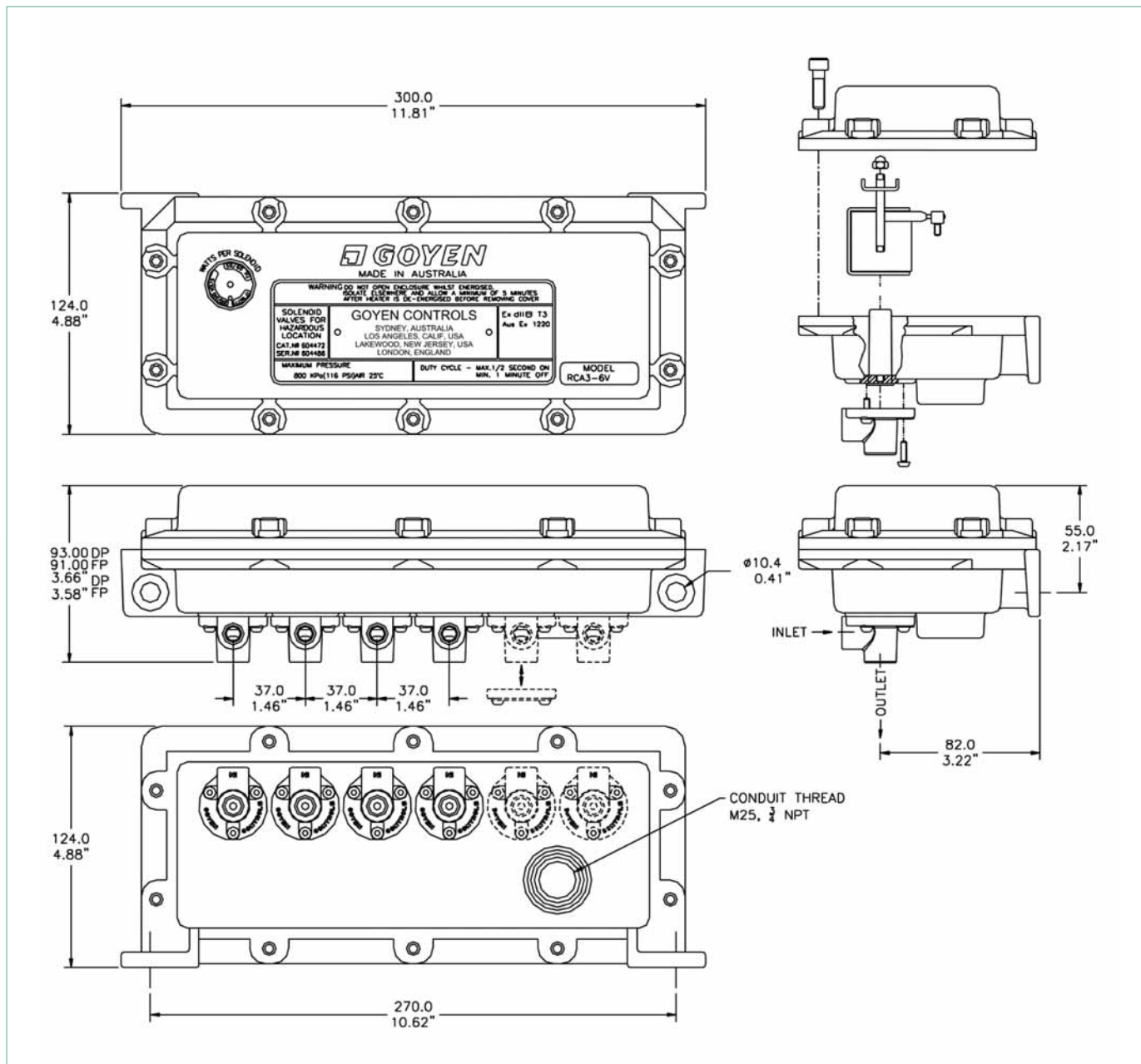
Part No.	No. of Valves	Thread Sizes	Goyen Nameplate	Heater Type	Coil Voltage
3-6VFD4000C-330	4	1/8-3/4NPT	No	No	220/240VAC
3-6VFD4000C-331	4	1/8-3/4NPT	No	No	100/1 20V AC
3-6VFD4000C-336	4	1/8-3/4NPT	No	No	24VDC
3-6VFD5000C-330	5	1/8-3/4NPT	No	No	220/240VAC
3-6VFD5000C-331	5	1/8-3/4 NPT	No	No	100/120VAC
3-6VFD5000C-336	5	1/8-3/4NPT	No	No	24VDC
3-6VFD6000C-330	6	1/8-3/4NPT	No	No	220/240VAC
3-6VFD6000C-331	6	1/8-3/4NPT	No	No	100/1 20V AC
3-6VFD6000C-336	6	1/8-3/4NPT	No	No	24VDC
3-6VFD4007C-330	4	1/8-3/4NPT	No	220/240VAC	220/240VAC
3-6VFD4006C-331	4	1/8-3/4NPT	No	100/120VAC	100/1 20V AC
3-6VFD4005C-336	4	1/8-3/4NPT	No	24VDC	24VDC
3-6VFD5007C-330	5	1/8-3/4NPT	No	220/24QVAC	220/240VAC
3-6VFD5006C-331	5	1/8-3/4 NPT	No	100/120VAC	100/120VAC
3-6VFD5005C-336	5	1/8-3/4 NPT	No	24VDC	24VDC
3-6VFD6007C-330	6	1/8-3/4NPT	No	220/240VAC	220/240VAC
3-6VFD6006C-331	6	1/8-3/4NPT	No	100/120VAC	100/1 20V AC
3-6VFD6005C-336	6	1/8-3/4NPT	No	24VDC	24VDC

## ATEX/IECEX Rated Enclosures

Part No.	No. of Valves	Thread Sizes	Goyen Nameplate	Heater Type	Coil Voltage
3-6VFD4110A-331	4	1/8RP-M25	Yes	No	100/120VAC
3-6VFD4110A-330	4	1/8RP-M25	Yes	No	220/240VAC
3-6VFD4110A-332	4	1/8RP-M25	Yes	No	24VAC
3-6VFD4110A-334	4	1/8RP-M25	Yes	No	110VDC
3-6VFD4110A-336	4	1/8RP-M25	Yes	No	24VDC
3-6VFD5110A-331	5	1/8RP-M25	Yes	No	100/120VAC
3-6VFD5110A-334	5	1/8RP-M25	Yes	No	110VDC
3-6VFD5110A-336	5	1/8RP-M25	Yes	No	24VDC
3-6VFD6110A-331	6	1/8RP-M25	Yes	No	100/1 20V AC
3-6VFD6110A-330	6	1/8RP-M25	Yes	No	220/240VAC
3-6VFD6110A-336	6	1/8RP-M25	Yes	No	24VDC
3-6VFD5115A-336	5	1/8RP-M25	Yes	24VDC	24VDC
3-6VFD5117A-330	5	1/8RP-M25	Yes	220/240VAC	220/240VAC
3-6VFD5110A-332	5	1/8RP-M25	Yes	No	24VAC
3-6VFD4100A-331	4	1/8RP-M25	No	No	100/1 20V AC
3-6VFD4100A-336	4	1/8RP-M25	No	No	24VDC
3-6VFD6117A-330	6	1/8RP-M25	Yes	220/240VAC	220/240VAC
3-6VFD6110A-332	6	1/8RP-M25	Yes	No	24VAC
3-6VFD6100A-330	6	1/8RP-M25	No	No	220/240VAC
3-6VFD4100A-330	4	1/8RP-M25	No	No	220/240VAC
3-6VFD5100A-331	5	1/8RP-M25	No	No	100/1 20V AC
3-6VFD5100A-336	5	1/8RP-M25	No	No	24VDC
3-6VFD5100A-330	5	1/8RP-M25	No	No	220/240VAC
3-6VFD6100A-331	6	1/8RP-M25	No	No	100/1 20V AC
3-6VFD6100A-336	6	1/8RP-M25	No	No	24VDC
3-6VFD6116A-331	6	1/8RP-M25	Yes	100/1 20V AC	100/120VAC
3-6VFD6115A-336	6	1/8RP-M25	Yes	24VDC	24VDC
3-6VFD5017A-330	5	1/8RP-3/4 NPT	Yes	220/240VAC	220/240VAC

## 3-6VFD

Dimensions and Weights [in mm and (inches)]



## Weights

### 3-6VFD Series

Mass = 2.21 Kg + 0.08 Kg per fitted pilot  
(4.87 lbs + 0.18 lbs per fitted pilot)

## Installation

**WARNING:** Ensure that power is isolated from the system prior to installing or opening this product. Where a heater kit is installed, ensure that the heater has been de-energised for a minimum of 5 minutes prior to opening the enclosure. Ensure that the enclosure is properly assembled with all flange screws fully tightened (minimum 10Nm (7.4 ft.lbs)) prior to applying power in a hazardous area.

## Mounting

Enclosures should be mounted in a horizontal position, where the pilot valves and solenoid assemblies are in the preferred vertical orientation.

## Threads

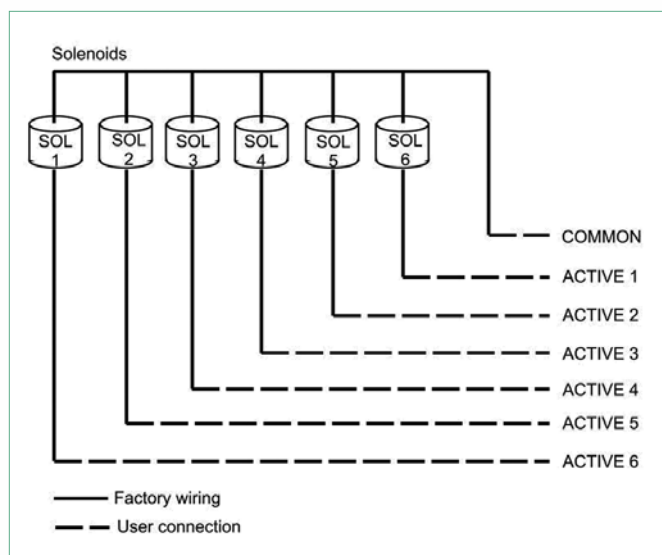
Pilot valve inlet and exhaust outlets are offered in both 1/8" BSPP (Rp) and NPT. The enclosure base has one conduit entry with either M25 or 3/4" NPT thread.

## Electrical connections

Refer to diagram below. The included Goyen QT2 solenoids are provided with screw/spade terminals. These solenoids are neutrally linked at the factory for customer convenience.

## Pneumatic connections

These pilot valves are connected to the dust collector reverse pulse jet valves using metric 4mm tubing (ID 0.157") or imperial 1/4" tubing (ID 0.162") and maximum length of 1.5m (4.9 ft).



## Anti-Condensation Heater Elements

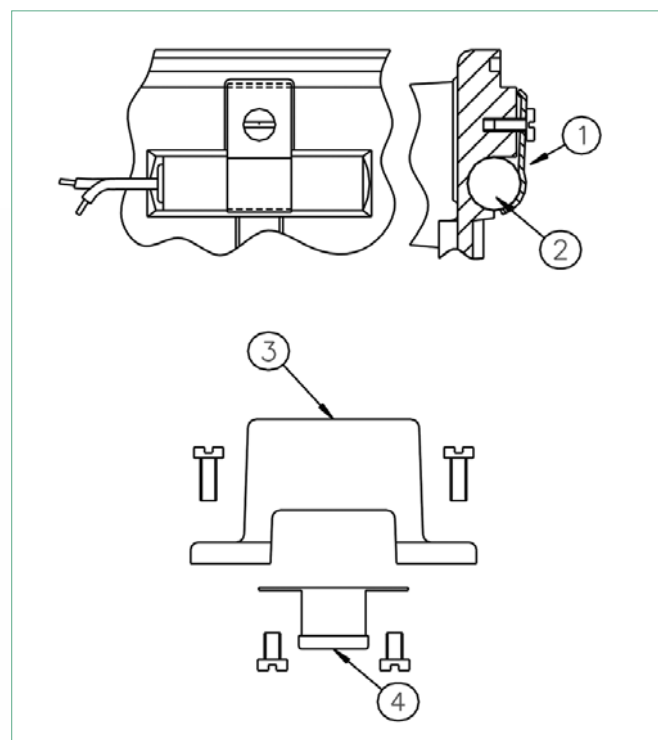
According to model specification numbers, the enclosure type may be factory fitted with a heater element to assist in the prevention of condensation within the enclosure.

## Heater ratings

Voltage	Watts
24VDC	48
110/120VAC	100
220/240VAC	100

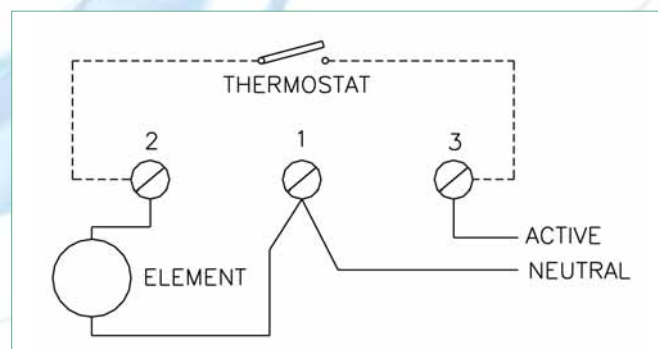
*Note that heater voltage matches solenoid voltages.*

## Heater Installation



- (1) Heater retaining clip
- (2) Heater element
- (3) Wiring terminal block
- (4) Thermostat element

## Heater terminal block connections





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