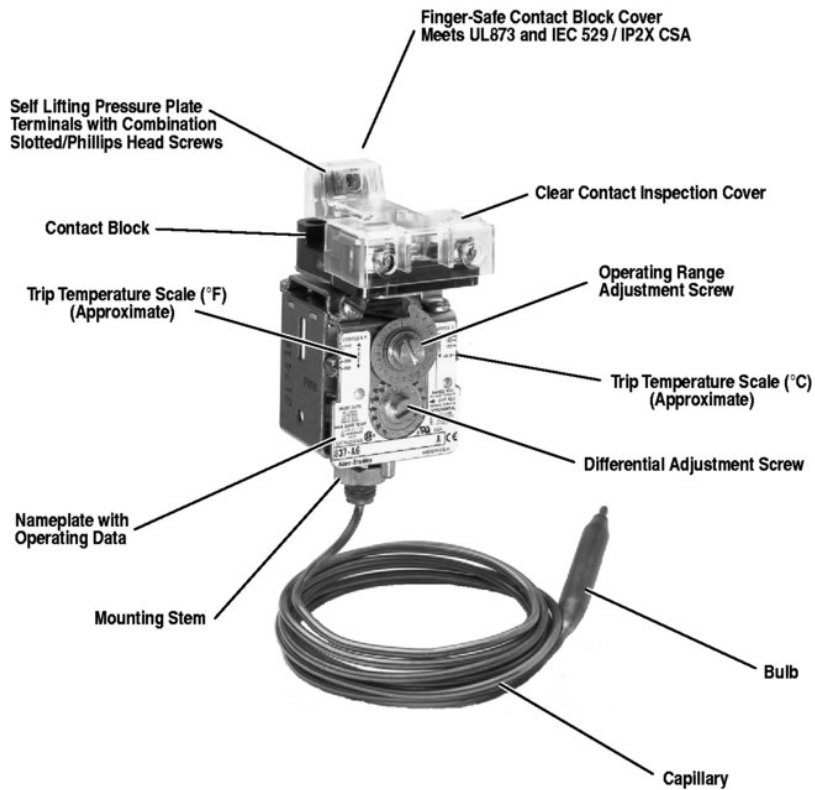


Temperature, Mechanical

Bulletin 837 Temperature Controls

- Operating ranges from -60...+570 °F
- Adjustable range and differential
- Remote bulb sensing or direct immersion types
- Stainless steel bulb, capillary, and armor available
- Variety of contact blocks available
- Open Type, Type 1, Type 4 & 13, Type 4X, and Type 7 & 9 and 4 & 13 combination enclosures



Bulletin 837 Bulb and Capillary Type without Enclosure

Description

Bulletin 837 Temperature Controls are heavy-duty control circuit devices used in industrial applications where the temperature must be maintained within preset limits. These devices use a vapor pressure technology to sense changes in temperature. The pressure change is transmitted to the bellows through a bulb and capillary tube. Pressure in the system changes in proportion to the temperature of the bulb. Vapor pressure technology provides excellent repeat accuracy and exceptionally long life. Bulletin 837 Temperature Controls are designed for long life and heavy duty operation. Standard controls have precision snap-action silver contacts, and are offered in three different styles. All styles make use of bulbs and capillaries filled with a temperature-responsive liquid for detecting temperature changes. The controls are available in a wide variety of enclosures. There are many options and modifications available to meet most application requirements.

Applications

- Ovens
- Refrigeration units
- Machine coolants
- Bearing temperature
- Die temperature
- Water freeze protection

Style A — Remote Bulb and Capillary



Copper alloy bulb and capillary

- Adjustable operating range from $-60...+360$ °F
- Bulb may be located 3, 6, 12, 20, or 30 feet from the control (standard capillary lengths)
- Adjustable range and differential
- Enclosure types: Open Type, Type 1, 4 & 13, and combined 7 & 9 and 4 & 13
- Maximum temperature up to 400 °F

Stainless steel bulb and capillary

- Adjustable operating range from 260...570 °F
- Bulb and capillary resist oxide due to high temperature
- Bulb may be located 3, 6, 12, 20, or 30 feet from the control (standard capillary lengths)
- Adjustable range and differential
- Enclosure types: Open Type, Type 1, 4 & 13, 4X, and combined 7 & 9 and 4 & 13
- Maximum temperature up to 600 °F

Style H — Direct Horizontal Immersion



Brass bulb

- Adjustable operating range from 25...290 °F
- Direct horizontal mount on equipment
- Enclosure types: Open Type, and Type 1
- Maximum temperature up to 340 °F
- Maximum pressure is 300 psi without thermostat well

Style V — Direct Vertical Immersion



Brass bulb

- Adjustable operating range from 25...290 °F
- Direct vertical mount on equipment
- Enclosure types: Open Type, Type 1 and 4 & 13
- Maximum temperature up to 340 °F
- Maximum pressure is 300 psi without thermostat well

Standards Compliance

UL 873
UL 1203 (Haz. Loc.)
CSA 22.2 No. 14
NEMA ICS-2
IEC 529/IP2X

Certifications



File and Guide Numbers

Bulletin 837	UL		CSA	
	File Number	Guide Number	File Number	Class
	E65556	XAPX	LR1234	1222-01
	E64971 (Haz.Loc.)	XBDV	LR11924 (Haz. Loc.)	3218-02
Hazardous Location enclosed devices are not CE compliant.				

Technical Data

Technical Terms

Adjustable operating range – Total span within which the contacts can be adjusted to trip and reset.

Trip setting – Higher temperature setting when the contacts transfer from their normal state to a changed state.

Reset setting – Lower temperature setting when the contacts return to their normal state.

Adjustable differential – Difference between the trip and reset values.

Minimum differential – When the differential is set to the lowest temperature difference between trip and reset.

Maximum differential – When the differential is set to the highest temperature difference between trip and reset.

Maximum temperature – The maximum temperature that can be applied to the bulb. This includes temperature override that may occur in the system. **This rating must NOT be exceeded.**

Operating range adjustment screw – This screw is used to adjust the trip setting by varying the force of the main spring.

Differential adjustment screw – This screw is used to adjust reset setting by varying the force of the differential blade spring.

Contact configuration – There are many types of contact configurations available. Bulletin 837 Temperature Controls are offered in a wide variety of contact configurations for both automatic operation and manual reset. See **Contact Blocks** — Trip temperature-indicating scales are supplied on controls with standard contact block..

Mounting – There are two methods of mounting temperature controls: remote or direct immersion.

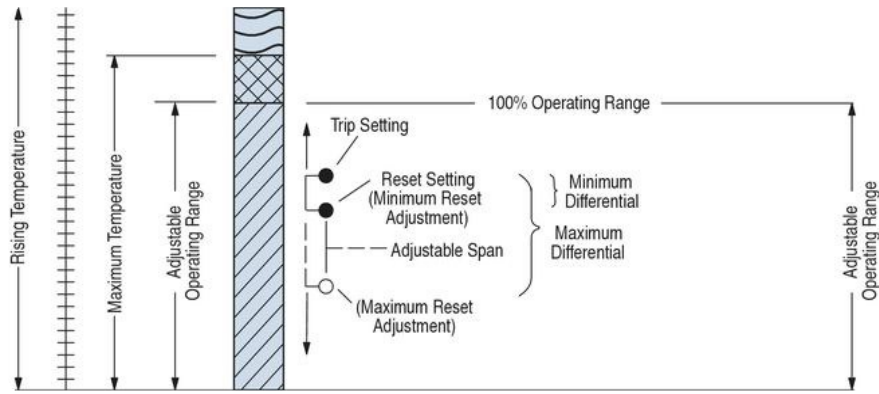
- Remote Method – A bulb and capillary system is used for mounting the control away from the machine or process.

- Direct Immersion – The control is mounted directly on the machine or process. Rockwell Automation offers both horizontal and vertical immersion types.

Conversion factor – Temperatures given in Fahrenheit can be converted to Celsius using this equation: °C = 0.56 (°F -32°)
Temperatures given in Celsius can be converted to Fahrenheit using this equation: °F = (1.8 x °C) +32°

Figure 1

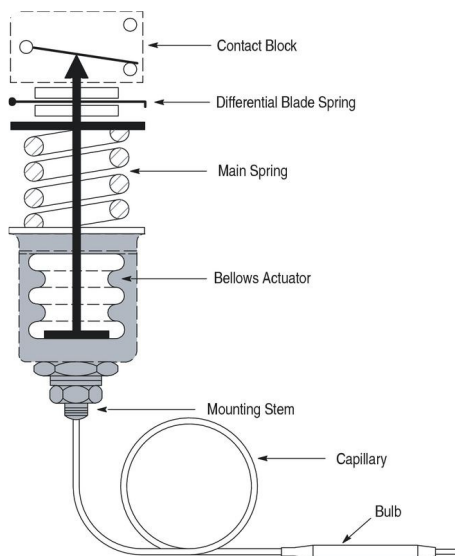
Graphics to illustrate technical terms



Theory of Operation

Bulletin 837 Temperature Controls are designed to open or close electrical circuits in response to changes in temperature. Figure 2 is a simplified drawing of a temperature control. The bellows, bulb, and capillary are filled with a temperature-responsive liquid. The vapor pressure of the liquid increases as the temperature of the bulb increases. System temperature is converted to pressure through the bulb and capillary, which are connected to the control at the mounting stem. Pressure applied to the actuator changes in proportion to the temperature of the bulb. As temperature rises, the bellows exerts force on the main spring. When the threshold force of the main spring is overcome, it transfers the motion to the contact block and actuates the contacts – this is referred to as the trip setting. As temperature decreases, the main spring will retract. When the threshold force on the differential blade spring is overcome, the contacts will return to their normal state –this is referred to as reset setting. Varying the force of the main spring (by turning the operating range adjustment screw) determines when the contacts will trip. Varying the force on the secondary differential blade spring (by turning the differential adjustment screw) determines when the contacts will reset. Setting trip and reset determines control operation.

Figure 2
Basic mechanical structure



Applications for Control

Temperature controls can be used to either control or monitor a machine or process. Figure 3 shows a typical control application. Here, temperature is controlled within predetermined high and low values. Figure 4 shows a typical monitoring application. Here, temperature is monitored between a high and low value, signaling when a preset limit has been exceeded.

Figure 3
Typical control application

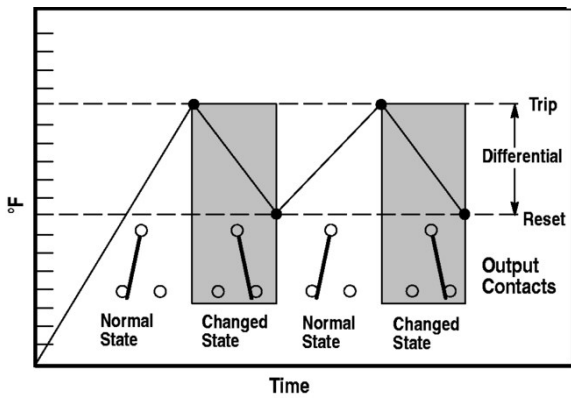
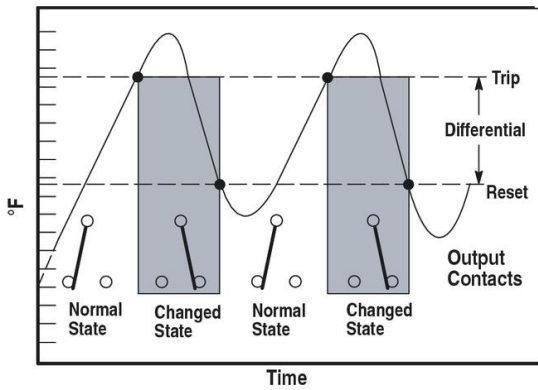


Figure 4
Typical monitoring application



Control Settings

Allen-Bradley Temperature Controls are designed for ease of setting to help minimize installation time. Standard controls shipped from the factory are set at the maximum operating range and minimum differential. By following this simple two step process, the control can be set to the specific requirements for each application. See Figure 5.

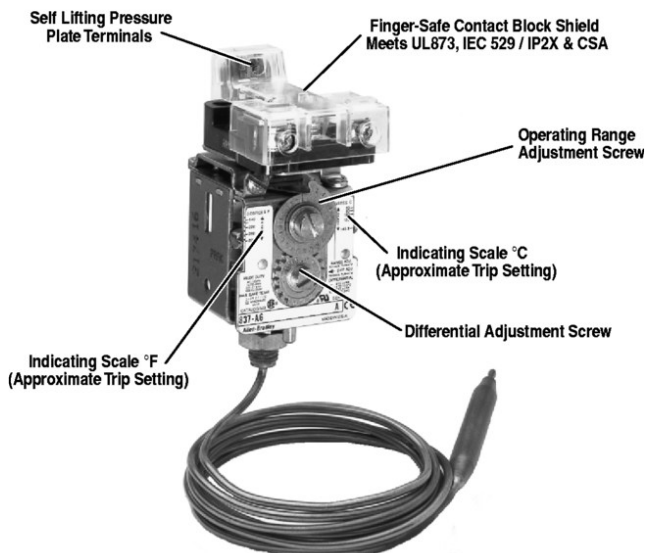
Step 1 — Adjust trip setting

The trip setting is achieved by turning the operating range adjustment screw. Turn the screw counterclockwise to lower the trip setting or clockwise to raise the trip setting. The approximate trip setting is shown on the indicating scale.

Step 2 — Adjust reset setting

The reset setting is achieved by turning the differential adjustment screw counterclockwise to increase the differential or clockwise to decrease the differential.

Figure 5
Trip and reset adjustment

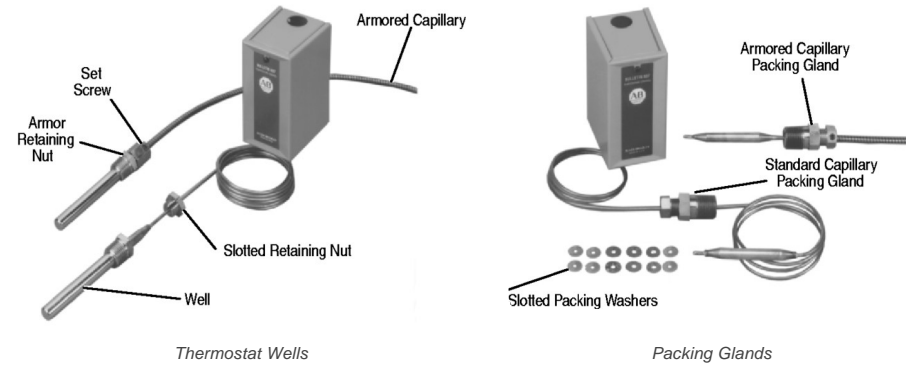


Thermostat Wells

Thermostat wells are basically sealed tubes on one end with threads on the other that allow mounting directly into a system. Thermostat wells protect the bulbs and allow installing or removing controls for calibration without discharging or draining an entire system. The bulb of a temperature control is inserted into the well which is secured with a locking nut for standard bulb and capillary devices. Bulbs for armored capillary devices are secured with a sleeve nut and set screw to prevent the armor from sliding back exposing the capillary. The bulbs of direct immersion devices are secured with a set screw which is also used to mount the control. Thermostat wells are rated for 1000 psi at 600 °F. Thermostat wells used when mounting direct horizontal immersion controls will allow mounting the control in a confined space. These devices otherwise require an 11 in. swing diameter to secure the bulb into the system. See [Thermostat Wells*](#) .

Packing Glands

Packing glands are used when the application requires the bulb to be located deeper into a process than would be possible with a thermostat well. The glands provide a seal at any desired length along a standard capillary device. The bulb must be supported to resist damage from flow or turbulence within the system. The capillary of armored capillary devices can only be sealed at the small exposed section of capillary located at the bulb. Packing glands are not intended to seal around the armor. They are designed to withstand sealing pressures up to 50 psi. The packing gland cannot be assembled into a thermostat well. See [Packing Glands‡](#) .



Bulb and Capillaries

Copper bulbs and capillaries are supplied for lower temperature ranges. Stainless steel is used for temperatures above 260 °F. Stainless steel is also available on lower ranges for more corrosive applications. Capillary lengths of 3, 6, 12, 20, and 30 feet are available for all styles of temperature control devices.

Armor

Bronze or stainless steel armor is available for added protection of the capillary. See Modifications on [Tamper-Resistant Adjustment](#) for ordering instructions.

Capillary Bending Radius

Copper and Stainless Steel –
0.5 in. (12.7 mm) minimum
with Bronze and Stainless Steel Armor –
2 in. (50.8 mm) minimum

Direct Immersion

Horizontal and vertical immersion devices are used when the controls are required to be mounted directly on the machine or in a process.

Standard Contact*

Contact Operation

Contact blocks are single-pole, double-throw and can be wired to open or close on increasing or decreasing temperature.

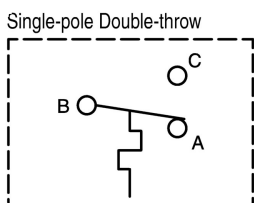
Non-Inductive Ratings

5 A, 240V
3 A, 600V

Control Circuit Ratings

AC – 125 VA, 24...600V
DC – 57.5 VA, 115...230V

Standard Contact Wiring Configuration



Repeat Accuracy

The vapor pressure technology used in Bulletin 837 controls to sense temperature provides an exceptionally long operating life. High quality chemicals and rigid control during manufacturing provide a typical repeat accuracy of ± 2 °F. Repeat accuracy is based on percent of maximum range, evaluated from test data and calculated using the formula per ICS 2-225 standards.

Special Controls

A large number of unlisted catalog modifications and complete devices are available for specific and OEM applications. Special controls and modification service is available to meet many applications unique to the OEM market.

Please consult your local Rockwell Automation sales office or AllenBradley distributor for assistance with specific modified controls and accessories.

Temperature Range

The temperature range for the mechanism at +32 °F (0 °C) or below is based on the absence of freezing moisture, water or other fluids that may solidify and impede the operation of the control. Temperature ratings are as follows:

Operating:	-22... +150 °F (-30...+66 °C)
Storage:	-22...+200 °F (-30...+93 °C)

Factory-Set Temperature Controls

Rockwell Automation will factory set temperature controls to customer-specified values if a Cat. No. 837-*C* device is ordered. Unspecified temperature controls (cat. nos. without the "C" suffix) shipped from the factory are set at the maximum operating range and minimum differential. See Factory Options, [Factory Options](#).

Application Note

When the ambient temperature surrounding the mechanism of the temperature control approaches 30 °F (-1.1 °C) on either side of the setting, a cross-ambient type control should be used. This will protect against false temperature-sensing, as the bellows within the mechanism may otherwise respond to changes in temperature. Cat. Nos. **837-A3** and **837-A4** bulb and capillary Types, all **837-V** direct vertical immersion, and all **837-H** direct horizontal immersion devices are cross-ambient.

When the bulb of cross-ambient bulb and capillary controls **837-A3** and **837-A4** is to be mounted vertically, the capillary end of the bulb should always be positioned higher than the termination end of the bulb.

When mounting the bulb horizontally, the word "TOP" stamped near the capillary of the bulb should be positioned upward toward the 12 o' clock position. The capillary end of the bulb should never be higher than the termination end of the bulb. The direct vertical immersion devices in the catalog series **837-V** are conventionally mounted with the bulb downward, below the mechanism.

They must not be mounted with the bulb up. Since the horizontal immersion device is not available in a Type 4 & 13 enclosure, the corresponding vertical immersion device can be used. When the vertical immersion device is mounted horizontally, the word "TOP" stamped on the mounting thread "hex" should point upward toward the 12 o' clock position.

The direct horizontal Immersion devices, in catalog series **837-H** should always be mounted with the mechanism above the bulb. The word "TOP" stamped on the mounting thread "hex" should point upward toward the 12 o' clock position. Cat. No. **837-A2** is not cross-ambient and should not be used if the ambient temperature approaches or crosses over the set point as false temperature may occur.

Consult your local Rockwell Automation sales office or Allen-Bradley distributor for assistance on special applications.

* NEMA does not rate contacts to switch low-voltage and current. Bulletin 837 Styles A, H and V Temperature Controls are supplied with silver contacts. The devices are designed to deliver high force snap action to the contacts. This provides exceptional contact fidelity at 24V DC I/O card current level entry when the integrity of the enclosure is maintained.

Ordering Information

Ordering Bulletin 837 Temperature Controls

When ordering Bulletin 837 Temperature Controls, consider the following:

- Device Style
- Maximum Temperature
- Adjustable Operating Range
- Mounting — Direct or Remote
- Adjustable Differential
- Enclosure Type

Build a Catalog Number

How to Order

Step 1: Basic Device

Select a catalog number for the basic device. See [Product Selection](#).

Step 2: Modifications

If required, add the appropriate modification suffix code(s) to the catalog number of the basic device.

See **Modifications**.

Step 3: Accessories

If required, select appropriate accessories. See **Accessories**.

Step 4: Factory Options

Factory set temperature controls. See **Factory Options**.

Catalog Number Explanation

Note: Catalog numbers must not include blank spaces.

837 – A 4 A X 5 08 X171 C
 a b c d e f g

a	
Style of Device	
Code	Description
A	Remote bulb and capillary
H	Direct horizontal immersion
V	Direct vertical immersion

b	
Temperature Specifications	
See Style A — Remote Bulb and Capillary* ‡ for temperature specifications.	

c	
Enclosure Type	
Code	Description
A	Type 1
E	Type 7 & 9 and 4 & 13
J	Type 4 & 13 metallic
S	Type 4X
None	Without enclosure

d	
Type of Bulb and Capillary	
Code	Description
5	Copper bulb and capillary
6	Stainless steel bulb and capillary (required for Type 4X)
7	Copper capillary and bulb bronze armor
9	Stainless steel bulb and capillary and armor (required for Type 4X)

e	
Capillary Length*	
Code	Description
03	3 ft.
06	6 ft.
12	12 ft.
20	20 ft.
30	30 ft.

* Measured in feet, from end of bellows stem to end of bulb tip

Note: Type of bulb and capillary and capillary length characteristics must be specified. Code X506 is used to denote a copper bulb and capillary that is 6 ft in length.

f

Modification to basic device selected from Modifications table.

Add suffix codes in descending order whenever possible. (Optional. See **Modifications**.)

g

Customer-Specified Trip and/or Reset Settings

Code Description

None Max. range/min. differential

C Customer-specified trip/reset setting ‡

‡ The requested trip/reset setting must be within the adjustable operating and differential ranges for the configured product. See Style A — Remote Bulb and Capillary* ‡ for more information.



Style A — Type 1 with external manual reset option



Style A — Type 7 & 9 and 4 & 13 combined

Style A — Remote Bulb and Capillary* ‡

Standard temperature controls shipped from the factory are set at the maximum operating range and minimum differential. For more information on standard pressure control settings and customer-specified pressure control settings, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

Temperature Specifications				Enclosure Type				
Adjustable Operating Range [°F]	Adjustable Differential [°F]‡			Maximum Temperature [°F]	Bulb Length [in. (mm)]	Open Type (Without Enclosure)		Type 1
	Minimum Range	Mid Range	Maximum Range			Cat. No.	Cat. No.	
-60...+50	6...46	2...38	2...16	250	3-3/4 (95)	837-A2		837-A2A
25...125	4...36	2...30	2...16	160	8-1/2 (216)	§ 837-A3	§	§ 837-A3A
80...190	14...54	7...45	3...20	240	8-1/2 (216)	§ 837-A4	§	§ 837-A4A
130...200	5...28	5...26	3...18	240	3-3/4 (95)	837-A5		837-A5A
140...290	13...63	7...52	3...24	340	3-3/4 (95)	837-A6		837-A6A
200...360	8...72	4...62	3...30	400	3-3/4 (95)	837-A7		837-A7A
260...430	9...72	5...62	3...28	470	3-3/4 (95)	♣ 837-A60	♣	♣ 837-A60A
310...490	10...78	5...67	3...21	520	3-3/4 (95)	♣ 837-A61	♣	♣ 837-A61A
380...570	12...87	5...78	4...35	600	3-3/4 (95)	♣ 837-A62	♣	♣ 837-A62A

* Minimum differentials shown are approximate values. Deviations are negligible for most applications.

‡ The vapor pressure characteristics of the chemical fill in the bellows system do not respond linearly to temperature change from minimum to the maximum range setting of the control. The result is larger differential values at minimum temperature range setting and smaller values at the maximum temperature range setting. Differentials in the table are not constant over the adjustable range of the control. Therefore, the control should be selected on the basis of the adjustable operating range and the differential based upon the setting being at minimum, mid or maximum range. It may be necessary to move up or down in the table to select the most desirable control for the application.

§ Cross-ambient controls are supplied with 8-1/2" long bulbs. Cross-ambient controls in the ranges of 25°...190°F require a larger volume of temperature-sensitive chemicals in the bulb than the additive volume contained in the capillary and bellows. For this reason, **Bulb and Capillary type cross-ambient controls cannot be supplied with bulbs shorter than 8-1/2"**.

♣ Supplied with stainless steel bulb and capillary to minimize oxides caused by elevated temperatures.

Δ The combined Type 7 & 9 and 4 & 13 Hazardous Gas and Dust service enclosure is supplied with special gasket and O-ring seal to diminish/exclude moisture, fluids, and dust from entering the enclosure. Enclosures rated 7 & 9 only are not designed to restrict moisture from entering the enclosure, which is common to outdoor service. Enclosure is Rated for the Following Environments:
 CLASS I Groups C,D
 CLASS II Groups E,F,G
 CLASS III

Style A — Remote Bulb and Capillary* ‡

Standard temperature controls shipped from the factory are set at the maximum operating range and minimum differential. For more information on standard pressure control settings and customer-specified pressure control settings, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

Temperature Specifications					Enclosure Type		
Adjustable Operating Range [°F]	Adjustable Differential [°F]‡			Maximum Temperature [°F]	Bulb Length [in. (mm)]	Type 4 & 13	Type 7 & 9 and 4 & 13Δ
	Minimum Range	Mid Range	Maximum Range			Cat. No.	Cat. No.
-60...+50	6...46	2...38	2...16	250	3-3/4 (95)	837-A2J	837-A2E
25...125	4...36	2...30	2...16	160	8-1/2 (216)	§ 837-A3J	§ 837-A3E
80...190	14...54	7...45	3...20	240	8-1/2 (216)	§ 837-A4J	§ 837-A4E
130...200	5...28	5...26	3...18	240	3-3/4 (95)	837-A5J	837-A5E
140...290	13...63	7...52	3...24	340	3-3/4 (95)	837-A6J	837-A6E
200...360	8...72	4...62	3...30	400	3-3/4 (95)	837-A7J	837-A7E
260...430	9...72	5...62	3...28	470	3-3/4 (95)	♣ 837-A60J	♣ 837-A60E
310...490	10...78	5...67	3...21	520	3-3/4 (95)	♣ 837-A61J	♣ 837-A61E
380...570	12...87	5...78	4...35	600	3-3/4 (95)	♣ 837-A62J	♣ 837-A62E

Note:Bulb and capillary controls have a 72 in. long capillary which includes the length of the bulb. Bulbs are 3/8 in. in diameter. Material is copper unless otherwise specified. See **Renewal Parts**. Special longer length capillaries, generally over 30 feet, will be equipped with longer bulbs depending upon temperature range and chemical fill. Capillary diameter (outside diameter) is 0.125 in.

* Minimum differentials shown are approximate values. Deviations are negligible for most applications.

‡ The vapor pressure characteristics of the chemical fill in the bellows system do not respond linearly to temperature change from minimum to the maximum range setting of the control. The result is larger differential values at minimum temperature range setting and smaller values at the maximum temperature range setting. Differentials in the table are not constant over the adjustable range of the control. Therefore, the control should be selected on the basis of the adjustable operating range and the differential based upon the setting being at minimum, mid or maximum range. It may be necessary to move up or down in the table to select the most desirable control for the application.

§ Cross-ambient controls are supplied with 8.5 in. long bulbs. Cross-ambient controls in the ranges of 25...190 °F require a larger volume of temperature-sensitive chemicals in the bulb than the additive volume contained in the capillary and bellows. For this reason, **bulb and capillary type cross-ambient controls cannot be supplied with bulbs shorter than 8.5 in..**

♣ Supplied with stainless steel bulb and capillary to minimize oxides caused by elevated temperatures.

Δ The combined Type 7 & 9 and 4 & 13 hazardous gas and dust service enclosure is supplied with special gasket and O-ring seal to diminish/exclude moisture, fluids, and dust from entering the enclosure. Enclosures rated 7 & 9 only are not designed to restrict moisture from entering the enclosure, which is common to outdoor service. Enclosure is rated for the following environments:

- CLASS I Groups C,D
- CLASS II Groups E,F,G
- CLASS III



Style V — Type 4 & 13
Direct vertical immersion



Style H — Type 1
Direct horizontal immersion
shown with external manual reset

Style H — Direct Horizontal Immersion* ‡

Standard temperature controls shipped from the factory are set at the maximum operating range and minimum differential. For more information on standard pressure control settings and customer-specified pressure control settings, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

Temperature Specifications					Enclosure Type	
Adjustable Operating Range [°F]	Adjustable Differential [°F]‡			Maximum Temperature [°F]	Open Type (Without Enclosure)	Type 1
	Minimum Range	Mid Range	Maximum Range		Cat. No.	Cat. No.
25...125	4...36	2...30	2...16	160	837-H1	837-H1A
110...200	8...41	6...34	3...18	240	837-H2	837-H2A
140...290	13...63	7...52	3...24	340	837-H3	837-H3A

Note:Direct immersion controls are not available in Combined Type 7 & 9 and 4 & 13 Hazardous Duty enclosures.

* Minimum differentials shown are approximate values. Deviations are negligible for most applications.

‡ The vapor pressure characteristics of the chemical fill in the bellows system do not respond linearly to temperature change from minimum to the maximum range setting of the control. The result is larger differential values at minimum temperature range setting and smaller values at the maximum temperature range setting. Differentials in the table are not constant over the adjustable range of the control. Therefore, the control should be selected on the basis of the adjustable operating range and the differential based upon the setting being at minimum, mid or maximum range. It may be necessary to move up or down in the table to select the most desirable control for the application.

Style V — Direct Vertical Immersion* ‡

Standard temperature controls shipped from the factory are set at the maximum operating range and minimum differential. For more information on standard pressure control settings and customer-specified pressure control settings, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

Temperature Specifications				Enclosure Type			
Adjustable Operating Range [°F]	Adjustable Differential [°F]‡			Maximum Temperature [°F]	Open Type (Without Enclosure)	Type 1	Type 4 & 13
	Minimum Range	Mid Range	Maximum Range		Cat. No.	Cat. No.	Cat. No.
25...125	4...36	2...30	2...16	160	837-V1	837-V1A	837-V1J
110...200	8...41	6...34	3...18	240	837-V2	837-V2A	837-V2J
140...290	13...63	7...52	3...24	340	837-V3	837-V3A	837-V3J

Note: Direct immersion controls are not available in combined Type 7 & 9 and 4 & 13 Hazardous Duty enclosures.

* Minimum differentials shown are approximate values. Deviations are negligible for most applications.










‡ The vapor pressure characteristics of the chemical fill in the bellows system do not respond linearly to temperature change from minimum to the maximum range setting of the control. The result is larger differential values at minimum temperature range setting and smaller values at the maximum temperature range setting. Differentials in the table are not constant over the adjustable range of the control. Therefore, the control should be selected on the basis of the adjustable operating range and the differential based upon the setting being at minimum, mid or maximum range. It may be necessary to move up or down in the table to select the most desirable control for the application.

Modifications

Ordering Modifications

Modifications are ordered by adding the appropriate modification suffix code to the catalog number of the basic device. Add suffix codes to the catalog number in descending order whenever possible (highest number first).

Contact Blocks — Trip temperature-indicating scales are supplied on controls with standard contact block.

Description	Rating	Symbol	Suffix Code
Automatic Operation			
Standard contact block — Single-pole, double-throw, snap-action. Supplied when a contact block suffix is not added to the catalog number.	Control circuit rating: See Control Circuit Ratings .		—
Single-pole double-throw — slow acting contact with no snap action. Contacts close on rise and close on fall with an open circuit between contact closures.	Control circuit rating: AC-125VA, 24...250V		* ‡ X171
Single-pole single-throw, normally open — closes on rise.	0.5 Hp, 115V AC 1 Hp, 230V AC Control circuit rating: AC-125VA, 24...110V		* ‡ X221
Single-pole single-throw, normally closed — opens on rise.	AC-345VA, 110...600V DC-57.5VA, 110...250V		* ‡ X231
Single-pole single-throw, normally open — closes on rise.	1 Hp, 115V AC 1.5 Hp, 230V AC Control circuit rating: AC-600VA, 110...600V		* ‡ X321
Single-pole single-throw, normally closed — opens on rise.	DC-57.5VA, 110...250V		* ‡ X331
External Manual Reset§			
Single-pole single-throw, normally open — contacts open at a predetermined setting on fall and remain open until system is restored to normal run conditions, at which time contacts can be manually reset.	Non-inductive: 5 A, 240V 3 A, 600V Control circuit rating: AC-125VA, 24...600V		* § ♣ Δ X140
Single-pole single-throw, normally closed — contacts open on rise and remain open until system is restored to normal run conditions, at which time contacts can be manually reset.	DC-57.5VA, 115...230V		* § ♣ Δ X150
Single-pole double-throw, one contact normally closed — contact opens on rise and remains open until system is restored to normal run conditions, at which time contact can be manually reset. A second contact closes when the first contact opens.			* § ♣ Δ X15A

* Contact blocks not available for field conversion or replacement.

‡ Minimum specified differential value approximately doubles.

§ Manual reset devices cannot be supplied with an adjustable differential. Differential is approximately three times the minimum published differential of the corresponding adjustable differential control. Not available on Type 4X enclosed devices.

♣ Available only for replacement of complete open type control in an existing Type 1 or 4 & 13 enclosure. Replacement in a Type 7 & 9 enclosure is not available because it would void UL and CSA.

Δ Type 7 & 9 enclosures for manual reset devices are not also rated Type 4 & 13.

Note: NEMA does not rate contacts to switch low voltage and current. Bulletin 837 Styles A, H, and V temperature controls are supplied with silver contacts. The devices are designed to deliver high force snap action to the contacts. This provides exceptional contact fidelity at 24V DC I/O card current level entry when the integrity of the enclosure is maintained.

Modifications are ordered by adding the appropriate modification suffix code to the catalog number of the basic device. Add suffix codes to the catalog number in descending order whenever possible (highest number first).

Modifications

Tamper-Resistant Adjustment

Modification	Description	Suffix Code
Neon pilot light 120V AC	A high-intensity neon pilot light is available for 120V AC, 60 Hz applications and can be wired for ON or OFF operation. The current rating is 1.0 mA.*	X9
Red LED pilot light 24V DC	A high-intensity LED 24V DC pilot light is available to meet the requirements of the automotive, machine tool builders, and other industries. The current rating is 22 mA and can be wired for ON or OFF operation.*	X15

* Not available on combined Type 7 & 9 and 4 & 13, Type 4X, and manual reset devices.

Accessories

Ordering Accessories

Accessories are ordered as separate catalog numbers. Select the required accessories from the accessories table below.

Angle Mounting Brackets

Description	Bracket Type	Cat. No.
For mounting one or two open type Bulletin 836 Style A Pressure Controls or Bulletin 837 Temperature Controls on an enclosure mounting plate.	Single bracket	836-N11
	Dual mounting bracket	836-N12

Hardware Kits for Mounting Open Type Controls in Special Enclosures

Description	Kit Contents	Material	Cat. No.
	Style A Controls		
For mounting open type controls in special enclosures by user. Allows ease of running a capillary external to the enclosure. For use with Type 1 and 4 & 13 enclosures with wall thickness up to 0.25 in. (6.35 mm).	Bulb and capillary with armored capillary	Brass	837-N17

Thermostat Wells*

Description	Material	Type of Control	Control Bulb Size [in. (mm)]	Cat. No.
Thermostat wells are used when inserting the sensing bulb into a pressurized system. This allows removal of the sensing bulb for recalibration or inspection without having to discharge the system	Brass	Remote standard capillary	3-3/4 (95)	837-N1
			8-1/2 (216)	837-N6
		Remote armored capillary	3-3/4 (95)	837-N3
			8-1/2 (216)	837-N7
		Direct immersion	3-1/2 (89)	837-N2
	Type 316 Stainless steel	Remote standard capillary	3-3/4 (95)	837-N12
			8-1/2 (216)	837-N13
		Remote armored capillary	3-3/4 (95)	837-N14
			8-1/2 (216)	837-N15
		Direct immersion	3-1/2 (89)	837-N16

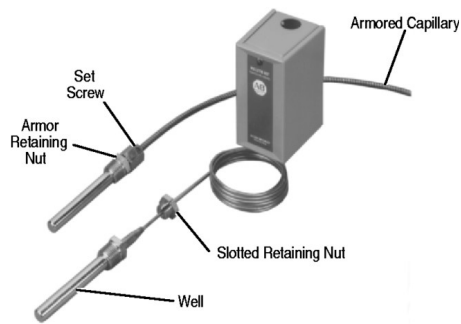
* External pressure rating — 1000 psi at 600° F maximum.

Packing Glands‡

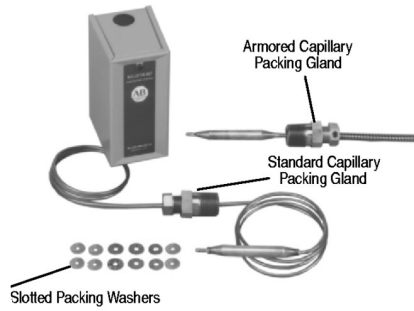
Description	Material	Type of Control	Cat. No.
Packing glands form a seal around any desired position of the capillary, allowing any length of capillary to be inserted into the vessel where temperature is to be sensed.	Brass	Remote standard capillary	837-N5
		Remote armored capillary	837-N4

‡ Maximum sealing pressure — 50 psi.

Figure 6 Thermostat Wells



Packing Glands



* External pressure rating — 1000 psi at 600°F maximum.
 ‡ Maximum sealing pressure — 50 psi.

Renewal Parts

Renewal parts are ordered as separate catalog numbers. See the table below.

Contact Block Replacement Kit

Description	Cat. No.
Kit consists of a standard contact block and instructions.	836-N2

Replacement Finger-Safe Contact Block Cover Kit

Description	Cat. No.
Clear contact block cover provides IP2X Finger-Safe protection.	41162-908-01

Factory Options

Factory-Set Temperature Controls

Standard Product Offering

Standard temperature controls shipped from the factory are set at the maximum operating range and minimum differential. These settings vary for each temperature switch family depending on the combination of Style, Operator Type, and Temperature Specification configuration options. These temperature switches do not require a custom trip / reset setting characteristic. Customers still have the ability to set the operating range and differential in the field as long as they are within the limitation of switch.

Custom Product Offering (Customer-Specified Settings)

Temperature controls shipped from the factory can be set to customer-requested values as long as they are within the limitation of the switch. See **Product Selection**, and reference Adjustable Operating Range and Adjustable Differential values in the tables. These trip and reset ranges vary depending on the Style, Operator Type, and Temperature Specification configuration. These switches require a custom trip / reset setting characteristic. To request a temperature switch with customer-specified trip and/or reset settings, order a temperature control catalog number ending with the “C” Custom Trip Reset Setting characteristic and include one of the following factory-set temperature control statements when the order is placed (within the Customer Review Request Notes field):

Ordering factory-set temperature controls

- When a specific factory setting is requested, the specific terminal connections must be specified — e.g., N.O. or N.C. It must also be specified whether the contact operation is occurring on either increasing or decreasing pressure. For example:

Normally Closed (N.C.) contacts to open at* °F increasing temperature and close at* °F decreasing temperature.

—OR—

Normally Open (N.O.) contacts to close at* °F increasing temperature and open at* °F decreasing temperature.

- If minimum differential is not critical and the inherent minimum differential satisfies the application, specify the factory setting as follows:

Normally Closed (N.C.) contacts to open at* °F increasing temperature. Minimum differential.

—OR—

Normally Open (N.O.) contacts to close at* °F increasing temperature. Minimum differential.

Note:Typical setting tolerance is ± 1 °F.

For further information on placing an order for a temperature switch with customer specified trip and reset settings, please contact the Global Product Support team or reference the Distributor Order Entry Process given on the Rockwell Automation website.

Two Controls in One Enclosure

Bulletin 837 Style A Bulb and Capillary Type temperature controls that function independently may be mounted side by side in a single Type 1 enclosure. This design is ideal for installations where two controls would ordinarily be mounted. Each dual unit can be a combination of a bulb and capillary type temperature control and a Bulletin 836 Style A pressure control. See respective product tables.

To order this arrangement, specify the two desired catalog numbers in their mounted position within the dual enclosure to form a single catalog number.

Type 4X Enclosures

Bulb and capillary controls can be furnished in Type 4X ROSITE polyester enclosures. Because of the intended protection by specifying Rosite, temperature controls will be supplied only with stainless steel bulb and capillaries or stainless steel bulb, capillary, and armor.

Special Length Capillary and Material

A price addition, varying with the specific requirements, will be added to each control when requesting non-standard length or material for capillary, bulb, or armor. The non-standard devices are those that are not listed in tables **Style A — Remote Bulb and Capillary* ‡** and **Style H — Direct Horizontal Immersion* ‡**. Consult your local Rockwell Automation sales office or Allen-Bradley distributor for pricing.

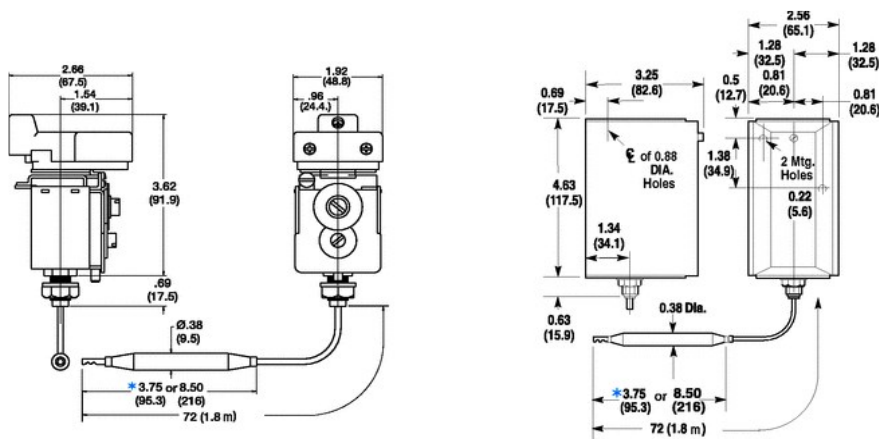
During the manufacturing process, the bellows assembly is cured in an oven at the maximum range temperature of the control to ensure long control life.

* Specify °F (Fahrenheit) unless otherwise noted.

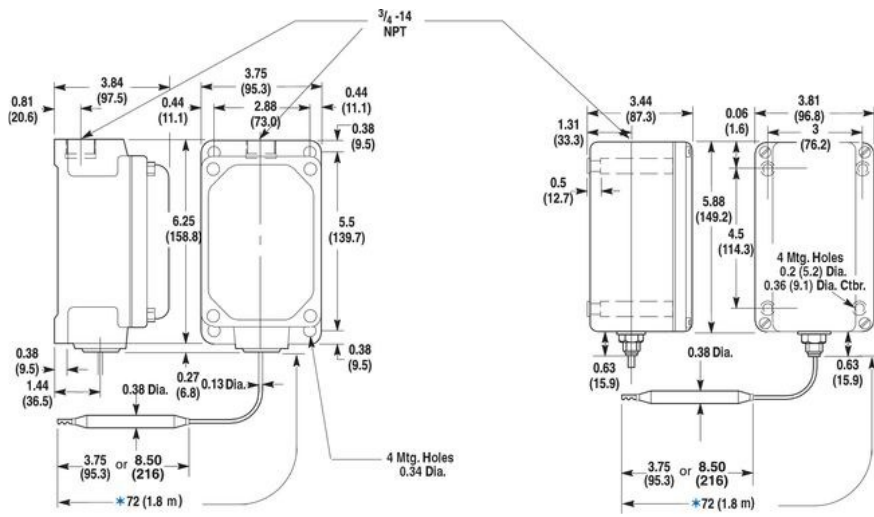
Approximate Dimensions

Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Remote Bulb and Capillary Type



Open Type
Approximate shipping weight 2-1/2 lb (1.1 kg)
Type 1
Approximate shipping weight 3 lb (1.4 kg)

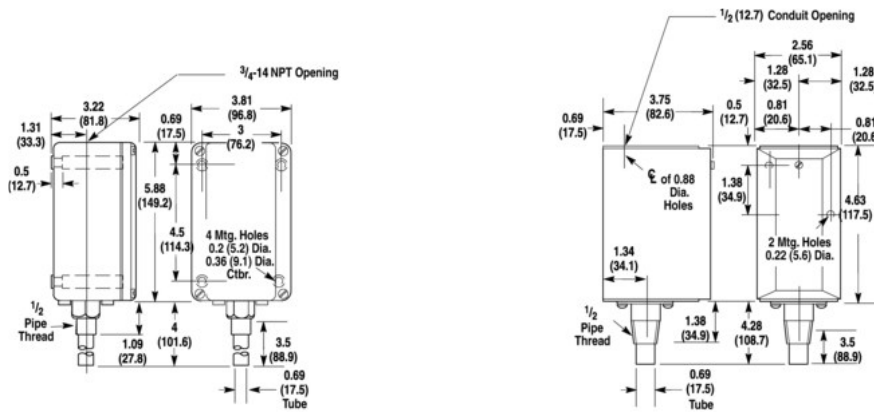


Types 7 & 9 and 4 & 13 combined
 Approximate shipping weight 9 lb (4.1 kg)
 Type 4 & 13
 Approximate shipping weight 3 lb (1.4 kg)

* Dimension is 8.5 in. for Cat. Nos. 837-A3 and 837-A4 controls.

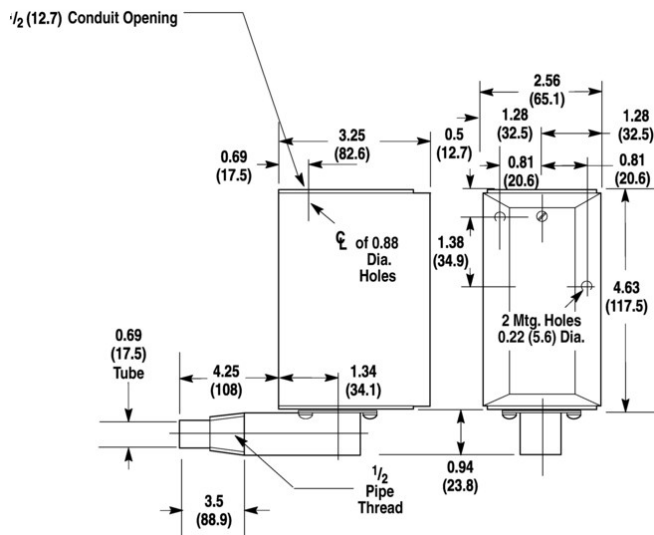
Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Direct Vertical Immersion Type



Type 4 & 13
 Approximate shipping weight 3 lb (1.4 kg)
 Type 1
 Approximate shipping weight 3 lb (1.4 kg)

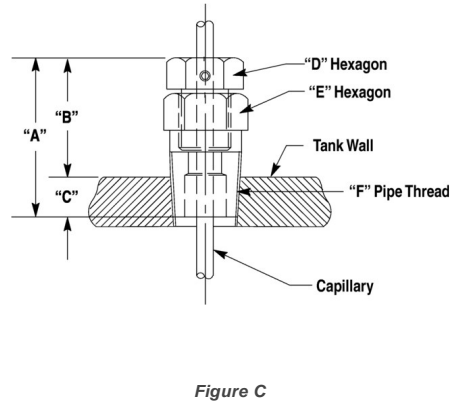
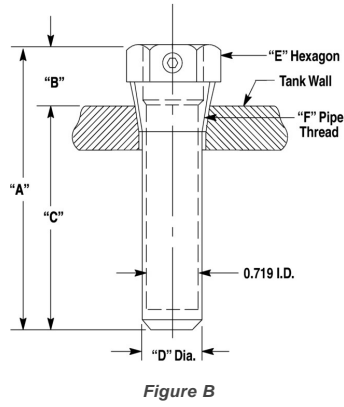
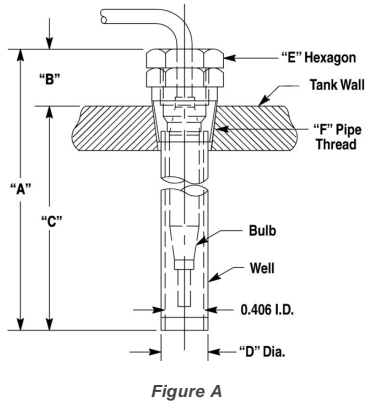
Direct Horizontal Immersion Type



Type 1
 Approximate shipping weight 4 lb (1.8 kg)

Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Thermostat Wells and Packing Glands



Note: Packing gland can be used to form a seal anywhere along length of capillary.

Cat. No.	Figure	A	B	C	D	E	F
837-N1	A	4-5/8 (117.6)	23/32 (18.3)	3-29/32 (99.2)	17/32 (13.5)	7/8 (22.2)	1/2 NPT
837-N2	B	3-27/32 (97.6)	27/32 (21.4)	3 (76.2)	27/32 (21.4)	1-1/8 (28.6)	3/4 NPT
837-N3	A	5-13/32 (137.3)	1-1/2 (38.1)	3-29/32 (99.2)	17/32 (13.5)	7/8 (22.2)	1/2 NPT
837-N4	C	2-5/32 (54.8)	1-21/32 (42.1)	7/16 (11.1)	3/4 (19.1)	7/8 (22.2)	1/2 NPT
837-N5	C	2-5/32 (54.8)	1-21/32 (42.1)	7/16 (11.1)	3/4 (19.1)	7/8 (22.2)	1/2 NPT
837-N6	A	9-5/8 (244.5)	13/16 (20.6)	8-13/16 (223.8)	5/8 (15.9)	7/8 (22.2)	1/2 NPT
837-N7	A	10-5/32 (258)	1-1/2 (38.1)	8-13/16 (223.8)	5/8 (15.9)	7/8 (22.2)	1/2 NPT
837-N12	A	4-5/8 (117.6)	23/32 (18.3)	3-29/32 (99.2)	17/32 (13.5)	7/8 (22.2)	1/2 NPT
837-N13	A	9-5/8 (244.6)	13/16 (20.6)	8-13/16 (223.8)	5/8 (15.9)	7/8 (22.2)	1/2 NPT
837-N14	A	5-13/32 (137.3)	1-1/2 (38.1)	3-29/32 (99.2)	17/32 (13.5)	7/8 (22.2)	1/2 NPT
837-N15	A	10-5/16 (262)	1-1/2 (38.1)	8-13/16 (223.8)	5/8 (15.9)	7/8 (22.2)	1/2 NPT
837-N16	B	3-27/32 (97.6)	27/32 (21.4)	3 (76.2)	27/32 (21.4)	1-1/8 (28.6)	3/4 NPT