

Hazardous Area Temperature and Pressure Switches

4250 Series

Typical applications

- Provides snap switch action at set points on:
 - Engine coolant systems
 - Process control points
 - Alarm systems
 - Compressor coolant systems
 - Lubrication systems
 - Hazardous area applications



4250 Hazardous Area Temperature and Pressure Switch

Key features and benefits

- Flame proof protection - ATEX certified
- Single or dual pressure
- Single or dual temperature
- Snap acting

Accreditations available

- ATEX & UKEX
 -  II 2G Ex db IIB T6 Gb
 -  II 2G Ex db IIB T5 Gb Ta -20°C to +55°C
 -  II 2G Ex db IIB T4 Gb Ta -20°C to +80°C

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Hazardous Area Temp. & Pressure Switches - 4250 Series

Overview

The 4250 Series is ideal for providing a quick action switch at set points on engine and compressor coolants systems, process control points, lubrication systems and alarm systems in hazardous duty locations. These units are inexpensive and easy to install since multifunction and dual switching types share common housings.

Well established and long proven pressure and temperature sensing methods enable precise and reliable operation largely unaffected by changes in ambient conditions.

Operation

The 4250 Series is designed for use wherever explosion proof switches are needed to sense pressure or temperature. Several types are available for sensing dual temperatures, dual pressures or single pressure and temperature points. Pressure ranges from 0.34 - 17.2 bar (5 - 250 psi) and temperature ranges from 16 - 118°C (60 - 245 °F) are available.

Well established and long proven pressure and temperature sensing methods enable precise and reliable operation largely unaffected by changes in ambient conditions. These units are easy to install since multi-function and dual switching types share common housings.

Switch Installation

● General preparation

- Before installation, ensure that the switch is suitable for the purpose, checking the ATEX rating, temperature, pressure, electrical parameters, and any special approval requirements.
- Check that the intended wiring and pipe fittings are suitable for the application. Refer to the switch diagram on page 4.
- As the unit is potentially situated in an explosive atmosphere, the power supply must be disconnected whenever the unit is opened, including during wiring or disconnecting the internal switches.

● Preparation for temperature switches

- Before installing the temperature switch (Models 4251M, 4253M, 4254M) it is advisable to run an 18.25 mm ($^{23/32}$ ") diameter tap drill through the pipe fitting in which the unit is to be placed. Some commercial fittings are not drilled deep enough and may damage the temperature element cup.

● Positioning

- Temperature elements  must be placed well into the fluid stream. Horizontal installation is recommended to keep the element out of air pockets. If the standard temperature element is too short for accurate operation, an element extension should be ordered.

● Mounting

- The two mounting holes are threaded $^{5/16}$ - 18 UNC Class 2B x $^{1/2}$ " deep. Mounting screws must not bottom. The maximum thread engagement should be 10 mm (0.394").

● Temperature limitations

- For each temperature range type, the maximum continuous fluid temperature should not exceed the maximum possible setting by more than 11°C (20°F). E.g. for a unit with settable range of 15.6°C - 35.0°C (21.1°F - 40.6°F) the maximum permitted is 46°C (60.6°F).

● Connection

- Pressure sensing switches (4251M, 4252M, 4255M) are best piped with $^{3/8}$ " OD tubing ($^{5/16}$ " OD minimum recommended) when lubrication oil or other viscous fluid is being sensed. If the pressure medium is diesel fuel oil, or any fluid pressurized by a positive displacement gear-type pump causing pulsations, use an AMOT 2185L002 orifice at the bonnet.
- Apply a quality thread sealant such as Loctite™ Pipe Sealant to the pipe thread connections. Avoid introducing chips, dirt or other abrasive material into the pressure bonnet, as these will cause diaphragm leakage.
- On dual-temperature switches (4254M) and dual pressure switches (4255M), the left-hand switch is set at the factory to the lower of the two settings

● Wiring

- Switch wiring terminals are defined for the particular variant on the label inside the main cover. The switches must be removed when wiring.
- Switches have screw terminals. The switch mountings are designed to maintain correct adjustment when removed and replaced from the housing. An external Earth terminal is provided on the body, and should be used.
- Ensure the switch wires are routed through the unit away from sharp edges and moving parts. Check that the cable entry gland is secure as this is a vital part of the explosion proofing. Before refitting the front cover apply a smear of Cosmolube grease to prevent the thread binding.
- Ensure that the cover clamp plate is refitted afterwards.

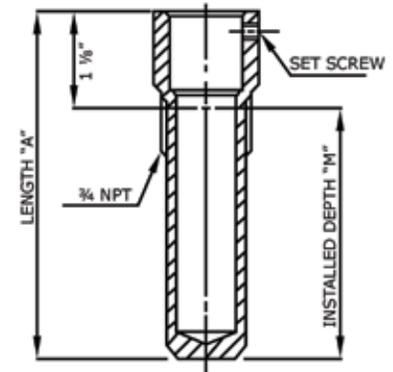
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Stainless Steel Wells

A stainless steel well may be ordered with the type 4251, 4253 and 4254 switches as an option. The model 3802L well is usable for 340 bar (5000 psi) service and has a non-threaded bore with set screws for quick installation or removal of the switch.

Wells and valves ordered at the same time will be assembled by AMOT using 40081 silicon heat transfer compound in the well. This is necessary to reduce the temperature lag experienced by controls when fitted to immersion wells. Lag will vary according to the fluid and flow conditions. Model 2766L well is also available for 681 bar (10,000 psi) service. Contact AMOT for details.

Temp. Element Extension (H)	Well part no.	Length "A"		Installed depth "M"	
		mm	Inches	mm	Inches
00	3802L901	74.6	2 15/16"	42.9	1 11/16"
01	3802L903	93.7	3 11/16"	61.9	2 7/16"
02	3802L904	106.4	4 3/16"	74.6	2 15/16"
03	3802L905	119.1	4 11/16"	87.3	3 7/16"
04	3802L906	131.8	5 3/16"	100.0	3 15/16"
05	3802L907	144.5	5 11/16"	112.7	4 7/16"

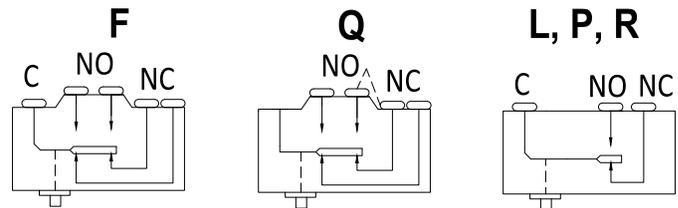


Switch Characteristics

Model types

Model type	Description
4251M	Pressure and temperature switch combination with two snap switches, one for the pressure set point and the other for temperature set point.
4252M	Pressure switch with one switch for one pressure set point.
4253M	Temperature switch with one switch for one temperature set point.
4254M	Temperature switch with two switches, each independently adjustable, providing two temperature set points, within the limits of the chosen temperature range.
4255M	Pressure switch with two switches, each independently adjustable, providing two pressure set points within the limits of the chosen pressure range.

Switch types, terminals and ratings



Voltage	AC		DC	
	Resistive	Inductive	Resistive	Inductive
15	15.0	15.0	15.0	10.0
30	15.0	15.0	5.0	5.0
50	15.0	15.0	1.25	1.25
75	15.0	15.0	0.25	0.30
125	15.0	15.0	0.75	0.05
250	15.0	15.0	0.50	0.03
380	15.0	4.0	0.25	-
480	15.0	4.0	-	-

Pressure range - PSI	Differential in PSI		
	Type F,Q,R	Type P	Type L
5 - 25	4 ± 2	1.5 ± 1	6 ± 2
15 - 75	9 ± 3	4 ± 2	12 ± 3
45 - 125	13 ± 4	7 ± 3	16 ± 4
80 - 250	7 ± 3	4 ± 3	9 ± 3

Pressure ranges shown indicate switch settings on falling pressure. For rising pressure, add the particular switch differential to the falling range limits shown.

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Switch Characteristics Continued

Switch types, terminals and ratings continued

Temperature (E) code	Temperature range °C		Temperature differential in °C		
	Without well	With well	Type F,Q,R	Type P	Type L
0	Non-temperature version				
1	15.6 - 35.0	21.1 - 40.6	1.62 ± 1	1 ± 0.5	2.16 ± 1
2	35.5 - 54.4	41.1 - 60.0	2.16 ± 1	1.62 ± 0.5	2.70 ± 1
3	55.0 - 71.1	60.6 - 76.7	2.90 ± 1	2.16 ± 0.5	3.24 ± 1
4	71.6 - 82.2	77.2 - 87.8	2.70 ± 1	2.16 ± 0.5	3.24 ± 1
5	82.7 - 98.9	88.3 - 104.4	2.70 ± 1	2.16 ± 0.5	3.24 ± 1
6	101.7 - 107.2	107.2 - 112.8	2.16 ± 1	1.62 ± 0.5	2.78 ± 0.5
7	107.7 - 118.3	113.3 - 123.9	2.70 ± 0.5	2.16 ± 0.5	3.24 ± 0.5

Temperature (E) code	Temperature range °F		Temperature differential in °F		
	Without well	With well	Type F,Q,R	Type P	Type L
0	Non-temperature version				
1	60 - 95	70 - 105	3 ± 2	2 ± 1	4 ± 2
2	96 - 130	106 - 140	4 ± 2	3 ± 1	5 ± 2
3	131 - 160	141 - 170	5 ± 2	4 ± 1	6 ± 2
4	161 - 180	171 - 190	5 ± 2	4 ± 1	6 ± 2
5	181 - 210	191 - 220	5 ± 2	4 ± 1	6 ± 2
6	215 - 225	225 - 235	4 ± 2	3 ± 1	5 ± 1
7	226 - 245	236 - 255	5 ± 1	4 ± 1	6 ± 1

Temperature ranges shown indicate settings on rising temperature. For falling temperatures subtract the particular switch differential from the given range. Temperature differentials are generally greater at the low end of a range.

Temperature element extensions

Temperature element extension (H) code	mm	Inches	Comments
00	55.6	2 ³ / ₁₆ "	Standard
01	77.8	3 ¹ / ₁₆ "	
02	84.1	3 ⁵ / ₁₆ "	
03	96.8	3 ¹³ / ₁₆ "	
04	109.5	4 ⁵ / ₁₆ "	
05	122.2	4 ¹³ / ₁₆ "	
06	134.9	5 ⁵ / ₁₆ "	
07	147.6	5 ¹³ / ₁₆ "	
08	239.7	9 ⁷ / ₁₆ "	
99	Non-temperature version		

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How to Order

Use the table below to select the unique specification of your Model 4250 Temperature and Pressure Switch.

Example	4251M	2	2	L	6	C	D	99	V	-AA	Code description	Comments
											Model (A)	
Model (A)	4251M										Pressure/Temperature	Pressure range (B) = 1-3
	4252M										Single Pressure	
	4253M										Single Temperature	
	4254M										Dual Temperature	
	4255M										Dual Pressure	
											Pressure range (B)	
											Bar	PSI
Pressure range (B)	0										Non-pressure version	
	1										0.34 - 1.72	5 - 25
	2										1.03 - 5.17	15 - 75
	3										3.10 - 8.62	45 - 125
	4										5.52 - 17.24	80 - 250
											Seal material (C)	
Seal material (C)	1										Buna N/Nitrile	
	2										Viton	
											Microswitch type (D)	
Microswitch type (D)	F										Split contact	Temperature (E) = 1-6
	L										High DC current	
	P										Standard, high temp	Temperature (E) = 1-7
	Q										Double break, low differential	
	R										Standard	Temperature (E) = 1-6
											Temperature (E)	
Temperature (E)				*							For temperatures available, refer to the temperature tables on page 5.	
											Thread finish (F)	
Thread finish (F)	A										NPT standard	
	B										NPT gulfproof	Anodized & epoxy paint
	C										BSP ¹ standard	
	D										BSP ¹ gulfproof	Anodized & epoxy paint
											Conduit thread (G)	
Conduit thread (G)	A										NPT	
	B										M20	
											Temperature element extension (H)	
Temperature element extension (H)								**			For temperature element extensions available, refer to the temperature element extensions table on page 5.	
											Calibration option (J)	
Calibration option (J)	V										Calibrated for use with thermowell	
	N										Pressure version (Not thermowell calibrated)	
											Customer special options (K)	
Customer special options (K)	-AA										Standard	May be omitted
	-***										Made-to-order	

NOTES:

¹ BSP gives parallel thread on pressure bonnet, taper thread on temperature extension.

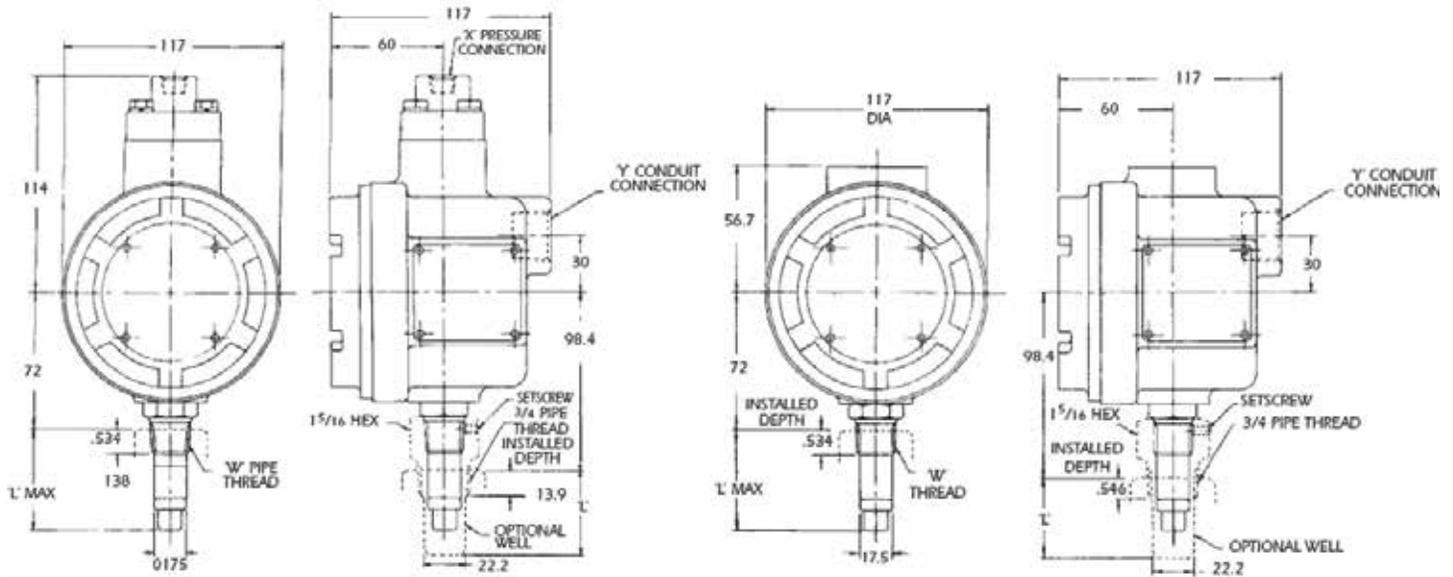
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Dimensions

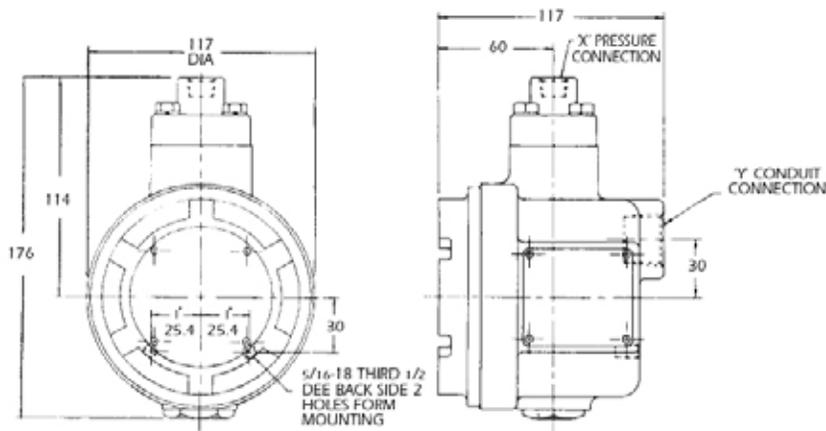
Dimensions - mm

Pressure/temperature model 4251M

Temperature models 4253M/4254M



Pressure models 4252M/4255M



Connections for all models

'W' pipe thread	'X' pressure connection	'Y' conduit connection
1/2 NPT	1/4 NPT	3/4 NPT
1/2 BSP taper	1/4 BSP PL	M20 x 2.5

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Specification

		Metric units	English units
Housing material	Cast aluminum		
Diaphragm	Buna N/Nitrile or Viton		
Maximum pressure on diaphragm		24.1 bar	350 psi
Maximum pressure on temperature element		54.04 bar	800 psi
Maximum case temperature	T6	40°C	104°F
	T5 - to special order	55°C	131°F
	T4 - to special order	80°C	176°F
Maximum net weight		2.1 kg	4.6 lbs
Maximum shipping weight		2.4 kg	5.4 lbs
EU type examination cert	Baseefa03ATEX0633X		
UK type examination cert	BAS21UKEX0378X		
ATEX/UKEX certification	<p>The ATEX Directives & UK Regulations detail equipment and work conditions allowable in an environment with an explosive atmosphere.</p> <ul style="list-style-type: none"> -  II 2G Ex db IIB T6 Gb -  II 2G Ex db IIB T5 Gb Ta -20°C to +55°C -  II 2G Ex db IIB T4 Gb Ta -20°C to +80°C 		

Maintenance and Service Parts

Over time, exposure to foreign chemicals and particulate matter as well as prolonged operation at extreme conditions may reduce the effectiveness of the switch. At such time, AMOT Temperature Switches can be restored to original performance by replacing the service parts. Service parts for AMOT Temperature/Pressure Switches include all new seals, seal components and temperature element required for normal maintenance. Please order service parts using the part numbers, quantities and descriptions given in the service parts table on page 9.

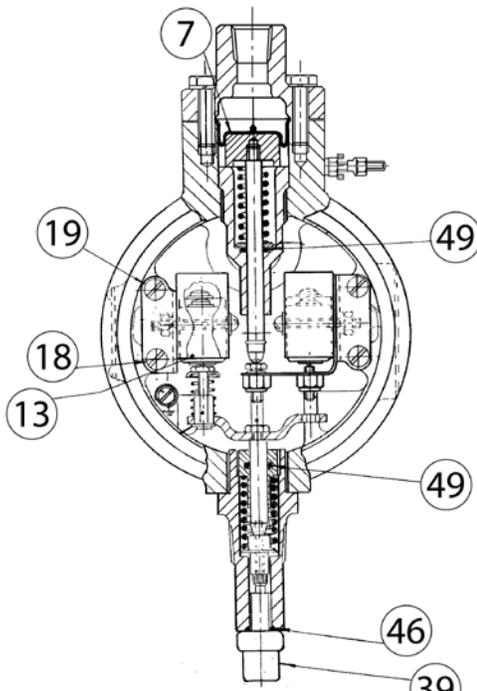
AMOT recommends checking the switch's functionality AT LEAST ANNUALLY, by simulating an unsafe condition. AMOT also recommends fully servicing 4250 switches at a MAXIMUM of 5 YEARS and should be carried out by a technician suitable trained to carry out maintenance on ATEX approved equipment.

Ensure the working fluid is not pressurized. Disconnect the pressure and/or temperature connections to the system and make the system safe as necessary. Remove the unit to a suitable safe clean location. AMOT designs and tests all its products to ensure that high quality standards are met. For good product life, carefully follow AMOT's installation and maintenance instructions; failure to do so could result in damage to the equipment being protected or controlled.

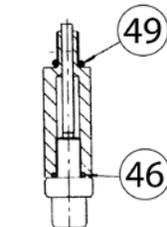
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Maintenance and Service Parts Continued

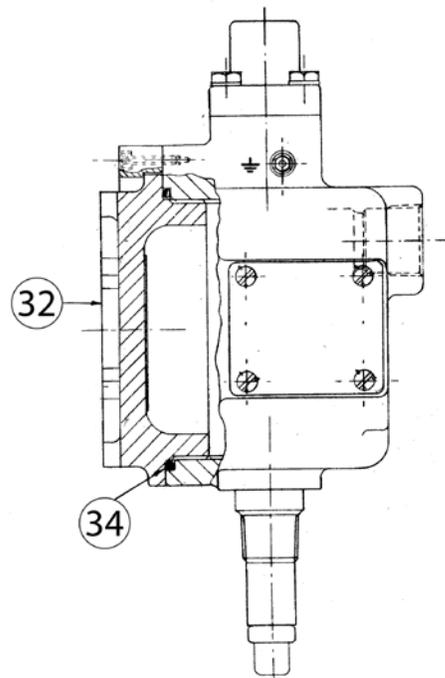
Service parts								
Ref no.	Part no.	Qty.					AMOT part description	Valve part number code restrictions
		4251M	4252M	4253M	4254M	4255M		
7	7818	1	1	-	-	1	Diaphragm - Buna N	Seal material (C) = 1
	7818L002	1	1	-	-	1	Diaphragm - Viton	Seal material (C) = 2
13	5280	2	1	1	2	2	Switch	Microswitch type (D) = F
	5636	2	1	1	2	2		Microswitch type (D) = L
	5755	2	1	1	2	2		Microswitch type (D) = P
	5993	2	1	1	2	2		Microswitch type (D) = Q
	6507	2	1	1	2	2		Microswitch type (D) = R
34	11042L001	1	1	1	1	1	O Ring Buna N	NONE
39	1981X055	1	-	1	1	-	Temperature element	Temperature (E) = 1
	1981X090	1	-	1	1	-		Temperature (E) = 2
	1981X120	1	-	1	1	-		Temperature (E) = 3
	1981X145	1	-	1	1	-		Temperature (E) = 4
	1981X175	1	-	1	1	-		Temperature (E) = 5
	1981X210	1	-	1	1	-		Temperature (E) = 6
	1981X220	1	-	1	1	-		Temperature (E) = 7
46	207	1	-	1	1	-	O Ring Buna N	NONE
49	1625	3	1	2	2	1	O Ring Buna N	NONE
-	ISB-4250-001	1	-	-	-	-	4251M Installation and Service Bulletin	Model (A) = 4251M
-	ISB-4250-002	-	1	-	-	1	4252M/4255M Installation and Service Bulletin	Model (A) = 4252M/4255M
-	ISB-4250-003	-	-	1	1	-	4253M/4254M Installation and Service Bulletin	Model (A) = 4253M/4254M



Model 4251M
Pressure and Temperature Switch

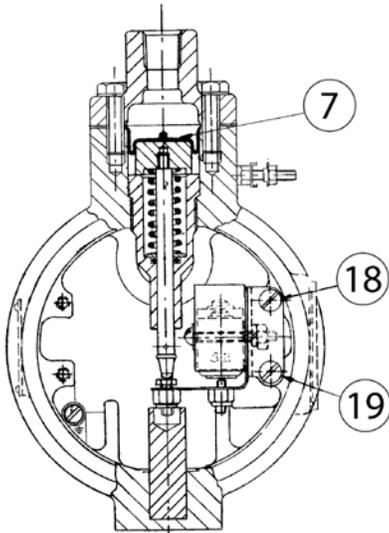


Extension

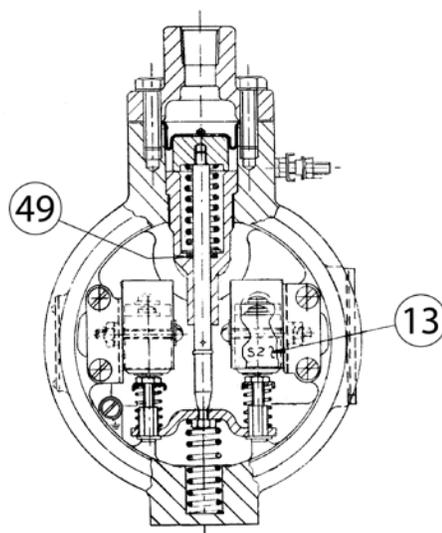


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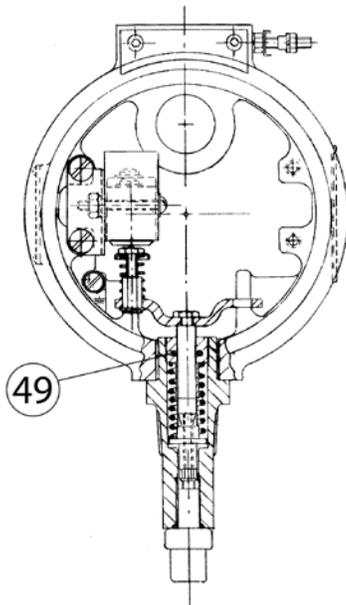
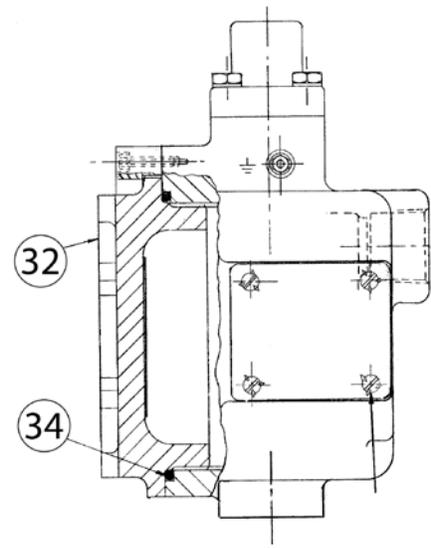
Maintenance and Service Parts Continued



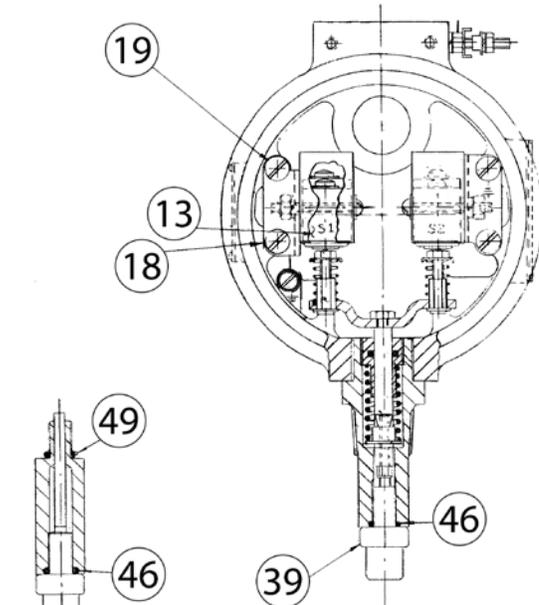
Model 4252M
Pressure Switch



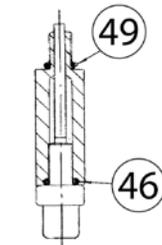
Model 4255M
Dual Pressure Switch



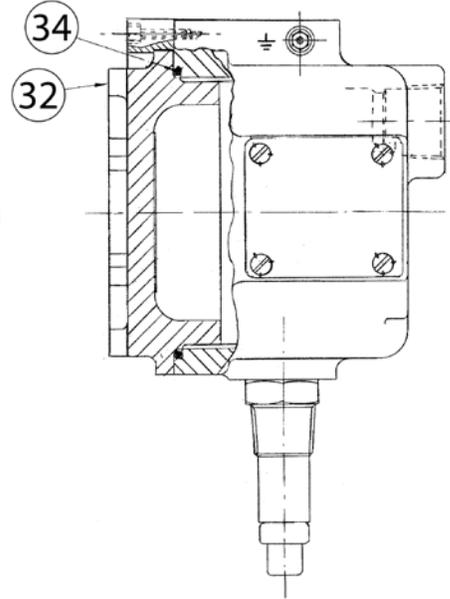
Model 4253M
Temperature Switch



Model 4254M
Dual Temperature Switch



Extension



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WARNING

This product can expose you to chemicals including Lead, which is known to the state of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.