

Pressure Temperature Regulating Valve

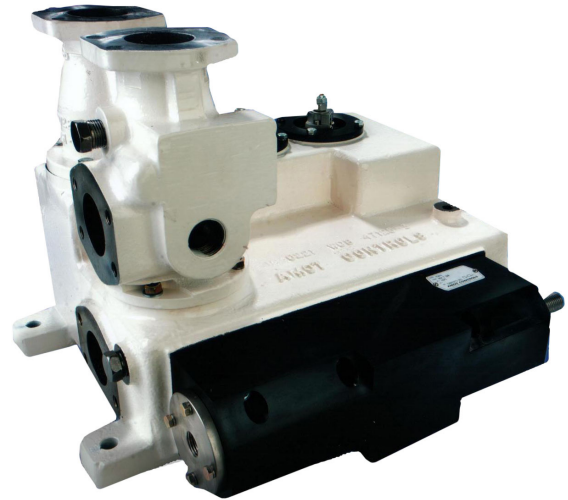
Model 4504

Overview

AMOT Model 4504 is a pressure temperature regulating valve for lubricating oil on gas generator sets.

Typical applications

- Lubricating oil on gas generator sets



**Model 4504A
Pressure Temperature
Regulating Valve**

Key features and benefits

- Easy field adjustment

Certifications

ATEX II 2G Ex h IIC T6...T3 Gb X
PED suitable for Group II liquids



Pressure Temperature Regulating Valve - Model 4504A

Operation

Oil is initially pumped into the valve from the system main pump through the inlet port (MP). As the oil enters port MP it is regulated by the pilot operated pressure regulator. The pilot feed to the regulator is taken from the system after the outlet from the 4504A valve (i.e. downstream of the filters) to sense the pressure at the point that the regulated flow is required (typically at bearings etc.) the pilot supply connects to port S1. Pressure is controlled by the dumping of excess oil through the pressure regulator unit back to the main reservoir.

port CS. Hot oil is directed to the cooler and returns at a lower temperature through port CR before flowing back through the temperature elements where it mixes with oil, which has bypassed the cooler.

The oil which has now been regulated in pressure and temperature passes out to port FI and through the filters. It returns from the filters through port FO and flows out of the valve at port G.

The oil flow is then split between (a) the thermostatic element and (b) the cooler supply

Installation

Requirements

In operation the valve should be protected by filtration, which must be 50µm or better.

Any venting in the tank must be vented to outside of any hazardous areas regardless of whether or not the 4504A valve is mounted in a hazardous area. This is to ensure that the spill line back to the 4504A valve does not contain an explosive atmosphere.

The system into which it is installed must have an adequate pressure relief valve to protect the part of the system into which this valve is located so as to prevent the fluid contained in this valve exceeding the valves maximum working pressure.

Fluid temperatures in the system where this valve is operating should be continuously monitored and a protective shut down system is to be activated when the temperatures are outside of normal operating limits.

Mounting the Valve

The 4504A valve has three feet cast onto the lower housing, each of which is designed to accept an M12 steel bolt of minimum grade 8.8. The valve should only be secured in position via these mounting points, and all three mounting positions must be used. The valve should

also be mounted in a horizontal position on a rigid approximately level face to prevent undo loading of the valve housing. It should be noted that the valve is designed to allow mounting of a filter pack of type PALL 0709 directly onto the top of the valve this combination makes for a tall heavy assembly and this has to be reflected in the mounting of the unit.

Manual Override

The manual override on the temperature elements overrides the control of the wax pill and causes all of the fluid flow in the valve to pass through the system cooler. Operation of the manual override is required during the commissioning stage and may also be operated if there is a fault somewhere in the system and temperatures are rising out of the control of the temperature elements during which time a controlled shutdown can be carried out.

Pressure Adjustment

The adjustment is made by undoing the M20 locknut on the regulator and adjusting the shaft with a screwdriver. Counter-clockwise adjustment will increase return flow to the tank and reduce the outlet pressure. Clockwise adjustment will decrease the return flow to the tank and increase the outlet pressure.

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Installation continued

Temperature Adjustment:

The thermostatic temperature control element is factory set by AMOT and cannot be adjusted, if a different regulated operating temperature is required then the temperature element will have to be replaced by one having a different rated temperature.

Temperature elements have a rated nominal temperature which is closely maintained in the diverting mode of operation, however the

4504A operates under mixing conditions and as such the regulated temperature may be up to 3°C higher than the rated temperature.

Any system operating at more than 5.5°C above or below the nominal regulating temperature is probably malfunctioning and the cause should be located and rectified immediately.

Specification

Materials:

Housing	Cast Steel, BS300 grade A1, Powder Coat Painted
Regulator housing	Aluminum, BS1474 HE30, Black Anodised
Press regulator spool/piston	Steel, BS970 220M07
Press regulator end caps	Steel, BS970 220M07, Electroless Nickel Plated
Temp element sleeve	Steel, BS970 220M07, Zinc Plated & Passivated
Temperature element	Various Brass/Bronze/Stainless steel parts (47500P - Brass & Bronze parts Electroless Nickel Plated)

Media:

Lubricating oil	Under PED lubricating oil is a Group II liquid
Flow rate:	700 litres/minute max input under normal operation 1200 litres/minute max input under start up conditions 500 litres/minute max regulated output
Pressure:	Max inlet pressure 7 barg (port MP) Regulated pressure 2 to 4 barg nominal (port G) Valve is subject to 10.5 bar hydraulic pressure test for 15 minutes
Handling:	Cast lifting hole + M12 eyebold position (for lifting valve only)
Weight (approx):	50 kg 110 lb
Temperature:	See Temperature Element Chart on page 4

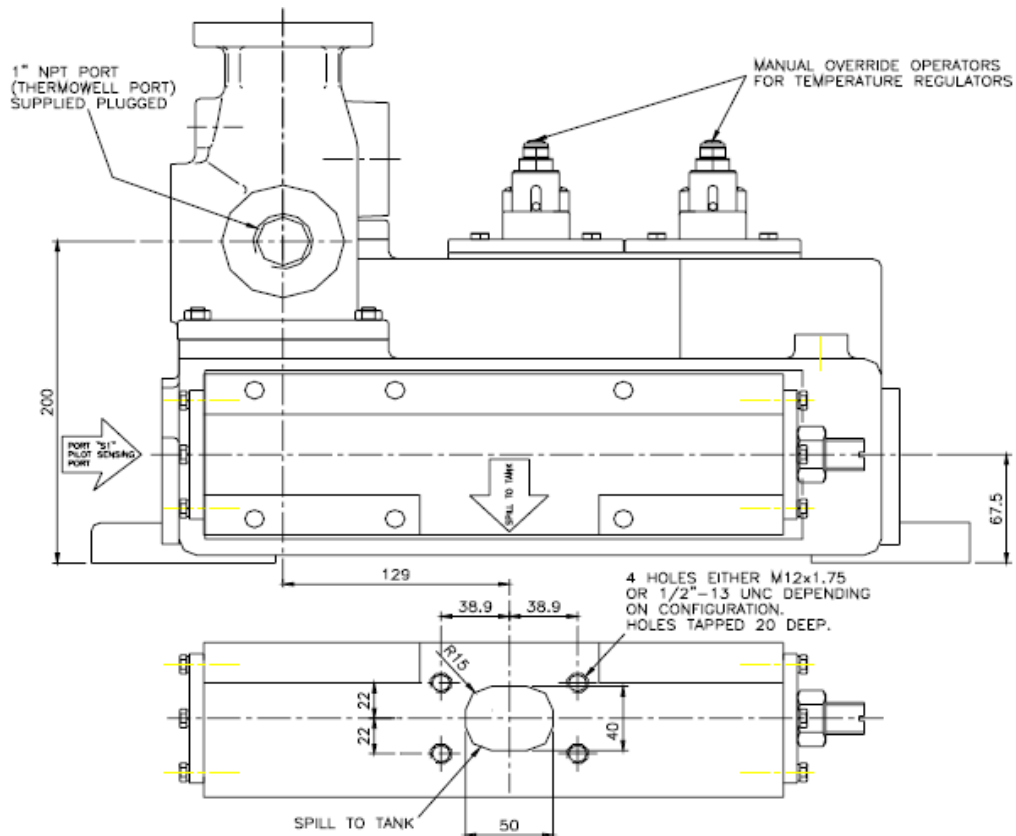
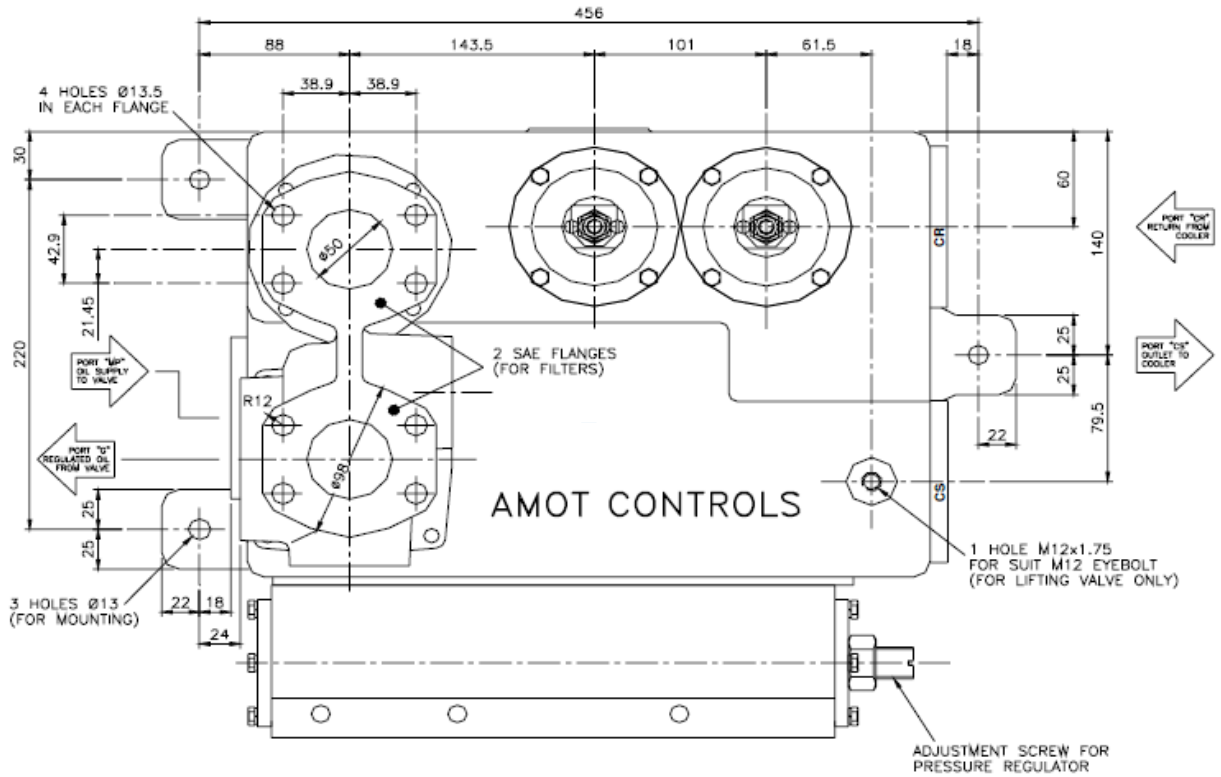
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Temperature Element Chart

Element Code	Nominal regulated temp		Start to open temp		Fully open temp		Max Continuous operating temp		Max operating temp for Short Periods	
	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F
045	7	45	1	34	11	52	16	61	35	95
055	13	55	8	46	20	68	35	95	40	104
057	14	57	10	50	18	64	30	86	40	104
075	24	75	20	68	30	86	38	100	55	130
090	32	90	27	81	35	95	44	110	60	140
095	35	95	30	85	41	105	49	120	68	154
100	38	100	34	93	42	108	50	122	63	145
105	41	105	35	95	45	113	55	131	70	158
110	43	110	38	100	47	117	56	133	74	165
115	46	115	40	104	50	122	61	142	79	174
120	49	120	43	109	55	130	66	150	76	169
130	54	130	51	124	60	140	69	155	82	180
135	57	135	54	129	63	145	71	160	84	183
140	60	140	57	135	66	151	74	165	88	190
145	63	145	60	140	69	156	79	174	94	201
150	66	150	63	145	72	161	82	180	95	203
155	68	155	66	150	74	165	85	185	96	205
160	71	160	68	154	78	172	88	190	102	216
165	74	165	71	160	80	175	88	190	102	216
170	77	170	74	165	83	181	94	200	107	225
175	79	175	77	170	85	185	102	215	118	244
180	82	180	80	175	88	190	105	220	121	250
185	85	185	82	180	91	196	106	223	121	250
195	91	195	87	188	98	208	108	226	121	250
205	96	205	93	199	102	215	108	226	121	250
215	102	215	99	209	107	225	115	239	120	248
225	107	225	102	216	113	235	118	244	125	257
230	110	230	104	219	115	239	118	244	125	257
240	116	240	108	226	122	252	123	253	125	257

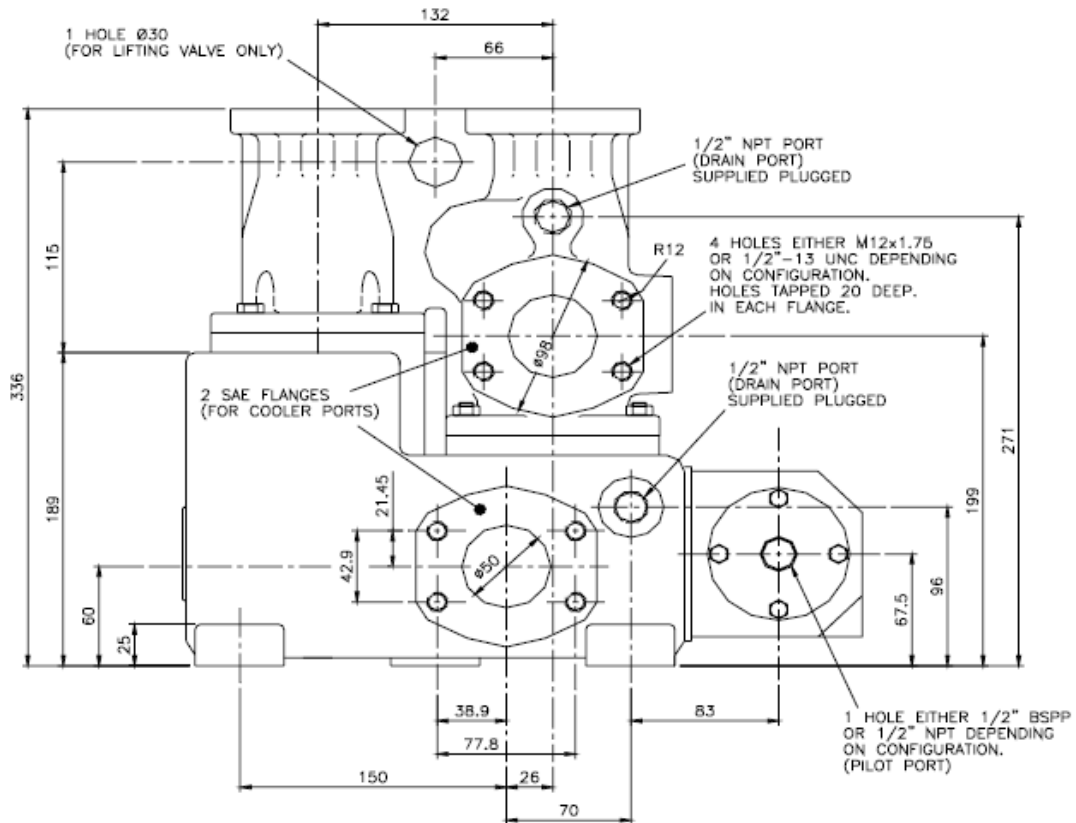
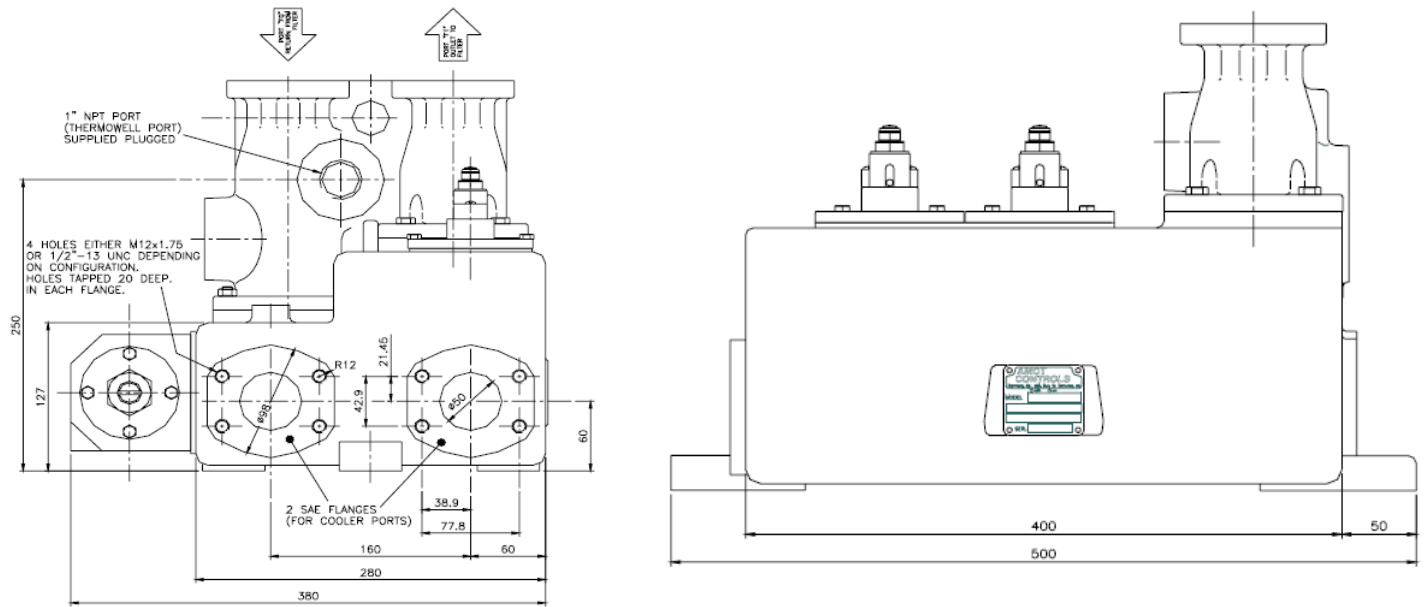
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Dimensions



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Maintenance

Unless definite problems are identified during operation, the pressure regulator and temperature element assemblies should be inspected internally every 12 months. It is recommended that seals should be inspected at this stage and replaced if necessary.

Between maintenance periods on a weekly basis the valve should be wiped over to keep it

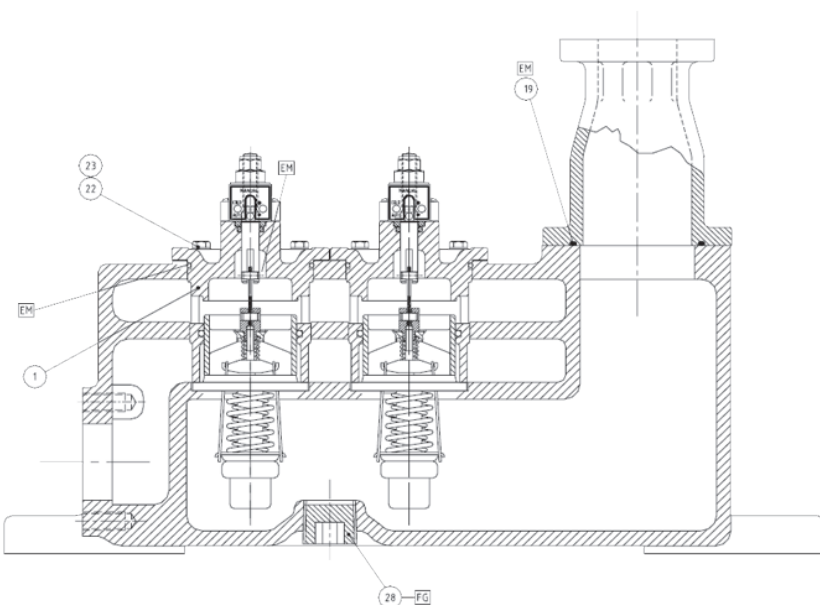
clean and the paintwork checked for chips and scratches and touched up with good quality paint when necessary to prevent rusting of the external steel parts of the valve. The valve should also be inspected for any visible signs of leakage and any leaking O-Rings are to be replaced. Before carrying out any maintenance on this valve ensure that an explosive atmosphere is not present.

Spares

Spares for 4504A P&T control valve

Item	Part Number	Description
1	47500X***	Temperature element assembly - standard Required to replace 47127X element, if valve is already fitted with 47500X element then see table for spare parts of element assembly
1	47500P***	Temperature element assembly - standard Required to replace 47127X element, if valve is already fitted with 47500X element then see table for spare parts of element assembly
	47254X	Temperature element assembly - standard Required to replace 47127X element, if valve is already fitted with 47500P element then see table for spare parts of element assembly
1		Seal kit

Where *** appears in part number replace with temperature in °F.
See Temperature Element chart for available temperatures.



Assembly Compounds

Ref	Part Number	Description
EJ	41781L009	Locking compound
EM	41781L12	Grease for o-rings

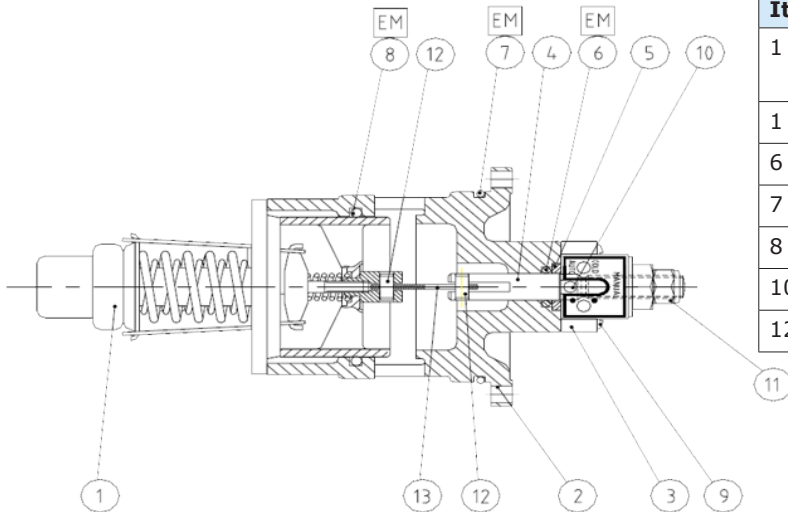
Item	Qty	Description
6	2	O-ring - temperature element
7	2	O-ring - temperature element
8	2	O-ring - temperature element
14	3	Pressure regulator
15	1	Pressure regulator to lower housing

Note - seal kit 47254X supersedes seal kit 47135L

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Spares continued

Spares for 47500X / 47500P Temperature element assembly



Item	Part Number	Description
1	46856X***M	Element - standard unplated
1	46856P***M	Element - nickel plated
6	358L001	O-ring
7	43629L002	O-ring
8	43668L004	O-ring
10	676L125	Pin
12	11105L043	Pin

Where *** appears in part number replace with temperature in °F. See Temperature Element chart for available temperatures.

Spare parts for 47137X Temperature element assembly

Item	Part Number	Description
1	43629L002	O-ring

How to order

Example	4504A	1	SA	A	115	08	
							Basic Model
Basic Model	4504A						Base model number
							Connections
Connections		1					2" SAE (M12x1.75) for In, Out, Cooler, Filter & Spill Ports. 1/2" BSPP Pilor, 1" NPT Temperature Instrument connections, 1/2" NPT Drain connetions.
		2					2" SAE (1/2" UNC) for In, Out, Cooler, Filter & Spill Ports. 1/2" BSPP Pilor, 1" NPT Temperature Instrument connections, 1/2" NPT Drain connetions.
							Material
Material			SA				Steel
							Press. Regulator
Pressure Regulator				S			Standard Regulator (Nom 2 bar)
							Temp. Regulator
Temperature regulator					***		Nominal Regulated Temperature in °F (see Temperatue Element chart)
							Features
Temperature features						07	Standard Element with Manual Override
						08	Plated Element with Manual Override

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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.