

Pressure and Temperature Regulating Valve

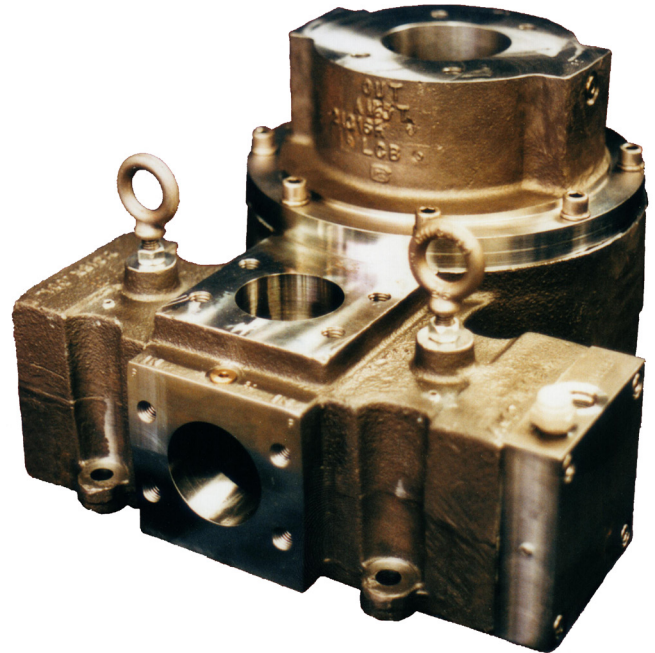
Model 4500D

Typical application

- A pressure and temperature regulating valve for lubricating oil on gas turbine generator sets.


Key features and benefits

- Combined pressure, temperature, and pressure relief in a single valve
- Remove downstream pilot pressure regulation
- 4" internally sensed 3-way temperature control valve
- Integrated pressure relief valve
- Reduces installation costs (valves, piping, fittings, flanges)
- Simplifies material planning
- Carbon steel and stainless steel construction
- Ports for instrumentation



Model 4500D

Accreditations available

- PED Suitable for Group 2 liquids
(Ensure materials are compatible)
- ATEX  II 2G Ex h IIC T6...T3 Gb X
- CE Complies with all relevant EU directives

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Pressure and Temp. Regulating Valve - Model 4500D

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Pressure and Temp. Regulating Valve - Model 4500D

Overview

The AMOT combined temperature and pressure control valve is used in applications where both temperature and pressure control are required simultaneously.

It combines temperature control, pressure regulating and pressure relief into a single manifold valve, thereby reducing installation costs and simplifying material planning. The valve is designed to be mounted directly on the oil tank to reducing piping.

Operation

The 4500D has been specifically designed and developed by AMOT as a pressure and temperature regulating valve for lubricating oil on gas turbine generator sets.

As the oil enters IN Port, the fluid is regulated by the pilot operated cartridge regulator. The pilot feed to the regulator is taken down stream of the filters to sense the oil pressure and connects to Port PP. Pressure is controlled by the dumping of excess oil through the cartridge regulator, which returns back to the main reservoir.

The oil flow is then split between (a) the thermostatic element and (b) the cooler supply Port TC. Hot oil is directed to the cooler and returns at a lower temperature through Port FC before flowing back through the elements. The cooled oil now mixes with the bypass oil to balance the temperature of the system to the nominal element temperature. The oil which has now been regulated in pressure and temperature passes out to Port TF and into the system filters. There are two Ports T1 and T2 (2 $\frac{5}{16}$ " diameter) for drainage, and two Ports G1 and G2 (SAE #6) for the attachment of pressure/temperature devices.

Installation

This valve forms part of a complex installation and as such should only be installed by competent persons, the installation should not be carried out in the presence of a hazardous atmosphere.

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

Any venting in the tank must be vented to outside of any hazardous areas regardless of whether or not the 4500D valve is mounted in a hazardous area, this is to ensure that the spill line back to the 4500D valve does not contain an explosive atmosphere.

The system into which a -BTJ type valve is installed must have an adequate pressure relief valve in it to protect the part of the system into which this valve is located so as to prevent the fluid contained in the valve exceeding the valves maximum working pressure. Standard and -BTU types of the 4500D valves have their own built in pressure relief valve.

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

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Valve Characteristics

Available temperatures

Code (°F)	Nominal regulated temp.		Start to open temp.		Fully open temp.		Max cont. operating temp.		Max operating temp. for short periods	
	°C	°F	°C	°F	°C	°F	°C	°F	°C	°F
045	7.2	45	1	33.8	11	51.8	16	60.8	35	95
055	12.8	55	8	46.4	20	68	35	95	40	104
057	13.9	57	10	50	18	64.4	30	86	40	104
075	23.9	75	20	68	30	86	38	100.4	54.5	130.1
090	32.2	90	27	80.6	35	95	43.5	110.3	60	140
095	35	95	29.5	85.1	40.5	104.9	49	120.2	68	154.4
100	37.8	100	34	93.2	42	107.6	50	122	63	145.4
105	40.6	105.1	35	95	45	113	55	131	70	158
110	43.3	109.9	37.5	99.5	47	116.6	56	132.8	74	165.2
115	46.1	115	40	104	50	122	61	141.8	79	174.2
120	48.9	120	43	109.4	54.5	130.1	65.5	149.9	76.2	169.2
130	54.4	129.9	51	123.8	60	140	68.5	155.3	82	179.6
135	57.2	135	54	129.2	63	145.4	71	159.8	84	183.2
140	60	140	57	134.6	66	150.8	74	165.2	88	190.4
145	62.8	145	60	140	69	156.2	79	174.2	94	201.2
150	65.6	150.1	62.5	144.5	71.5	160.7	82	179.6	95	203
155	68.3	154.9	65.5	149.9	74	165.2	85	185	96	204.8
160	71.1	160	68	154.4	78	172.4	88	190.4	102	215.6
165	73.9	165	71	159.8	79.5	175.1	88	190.4	102	215.6
170	76.7	170.1	74	165.2	83	181.4	93.5	200.3	107	224.6
175	79.4	174.9	76.5	169.7	85	185	101.5	214.7	118	244.4
180	82.2	180	79.5	175.1	88	190.4	104.5	220.1	121	249.8
185	85	185	82	179.6	91	195.8	106	222.8	121	249.8
195	90.6	195.1	86.5	187.7	98	208.4	107.5	225.5	121	249.8
205	96.1	205	93	199.4	101.5	214.7	107.5	225.5	121	249.8
215	101.7	215.1	98.5	209.3	107	224.6	115	239	120	248
225	107.2	225	102	215.6	113	235.4	118	244.4	125	257
230	110	230	104	219.2	115	239	118	244.4	125	257
240	115.6	240.1	108	226.4	122	251.6	123	253.4	125	257

Pressure and Temp. Regulating Valve - Model 4500D


How to Order

Use the table below to select the unique specification of your Model 4500D Pressure and Temperature Regulating Valve.

Example	4500D	2	S	140	-AA	Code description	Comments
						Basic model (A)	
Basic model (A)	4500D						
						Connections (B)	
						IN	OUT
Connections (B)		1				3" SAE	4" SAE
		2				3" SAE	3" SAE
		3				2" SAE	3" SAE
		4				2" SAE	3" SAE
		5				2" SAE	2" SAE
						Housing material (C)	
Housing material (C)		R				Stainless steel	
		S				Steel	
						Temperature °F (D)	
Temperature °F (D)			*			For temperatures available, refer to the available temperatures table on page 4.	
						Special requirements (E)	
Special requirements (E)					-AA	Standard	May be omitted
					-.***	Made-to-order	
					-BTU	Special version incorporating modified regulator sequence valve, modified regulator cartridge, 3 mm orifices and plated temperature elements.	Europe/Asia-PAC ONLY
					-BTJ	Special version as -BTU except pressure relief cartridge replaced by a second pressure regulator cartridge and pressure relief cover plate and parts replaced by slave regulator cover plate controlled by cross pipe from the single regulator sequence valve.	

Pressure and Temp. Regulating Valve - Model 4500D

Specification

		Metric units	English units
Housing material	Steel casting (ASTM A352, Grade LCB)		
Element material	Brass/bronze (electroless nickel plated)		
Finish	To suit customer requirement		
Type	Lubricating oil pressure and temperature control valve/manifold with instrumentation and filter connections		
Media	Lubricating oil (Under PED lubricating oil is a Group 2 liquid)		
Ambient temperature		-20 - 60°C	-4 - 140°F
Pressure	Max operating pressure	10 bar	150 psi
	Regulator range	2.07 - 4.83	30 - 70 psi
	Regulator range (-BTU & -BTJ ONLY)	1 - 4.83 bar	14.5 - 70 psi
	Relief setting	10 bar	150 psi
Flow rate	Inlet	90.8 m ³ /hr	400 GPM
	Outlet	81.8 m ³ /hr	360 GPM
	Bypass	4.5 - 54.5 m ³ /hr	20 - 240 GPM
Handling	3 threaded, ½ - 13 UNC, holes for lifting eyes (for lifting of valve ONLY)		
Approximate weight		120 kg	265 lbs
Accreditations available	PED	Suitable for Group 2 liquids (Ensure materials are compatible)	
	ATEX	 II 2G Ex h IIC T6...T3 Gb X	
	CE	Complies with all relevant EU directives	

Dimensions

Interface connections (refer to diagrams on pages 7 and 8)

Port	Connection and size
IN	SAE J518C 3000, either 2" or 3" depending on configuration
TC	SAE J518C 3000, either 2" or 3" depending on configuration
FC	SAE J518C 3000, either 2" or 3" depending on configuration
TF	SAE J518C 3000, either 2", 3" or 4" depending on configuration
T1	2.312" diameter port for sealing with O-ring 2-340
T2	2.312" diameter port for sealing with O-ring 2-340
T1A Vent (Reg.)	SAE #6 for ¾" O/D tube - must be an independent line back to reservoir
T2A Vent (Relief)	SAE #8 for ½" O/D tube - must be an independent line back to reservoir
PP	SAE #6 for ¾" O/D tube
G1	SAE #6 for instrumentation
G2	SAE #6 for instrumentation (2 off)

SAE port dimensions (refer to diagrams on pages 7 and 8)

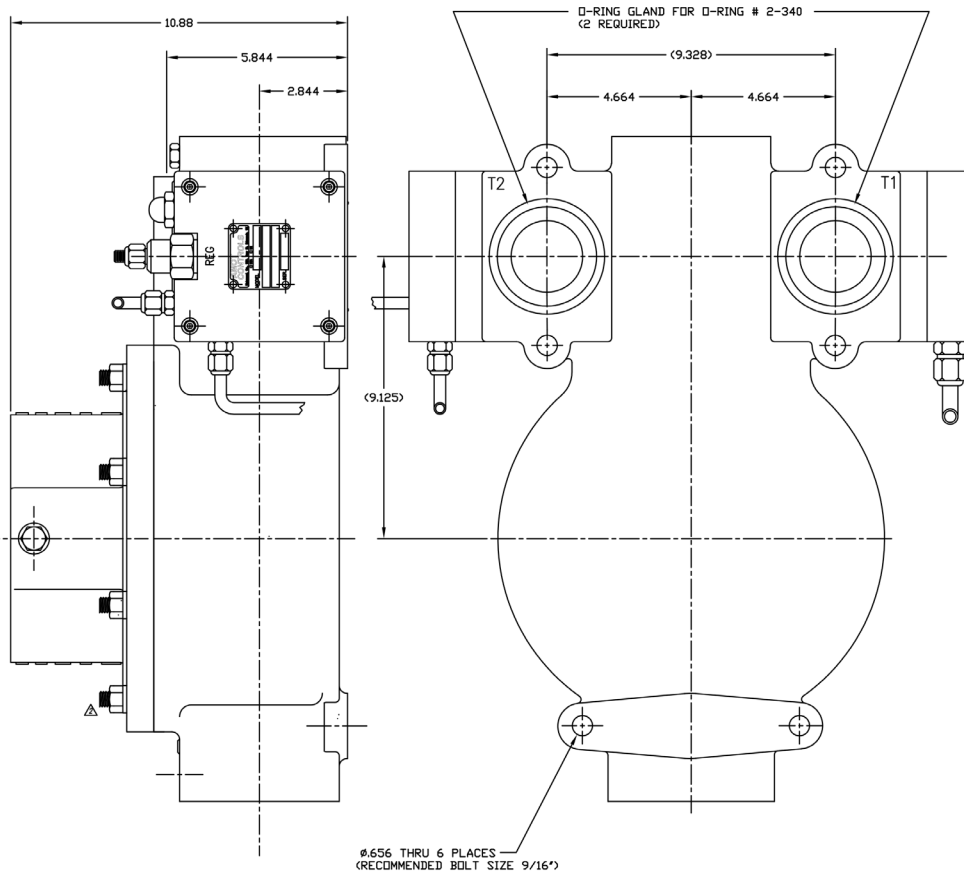
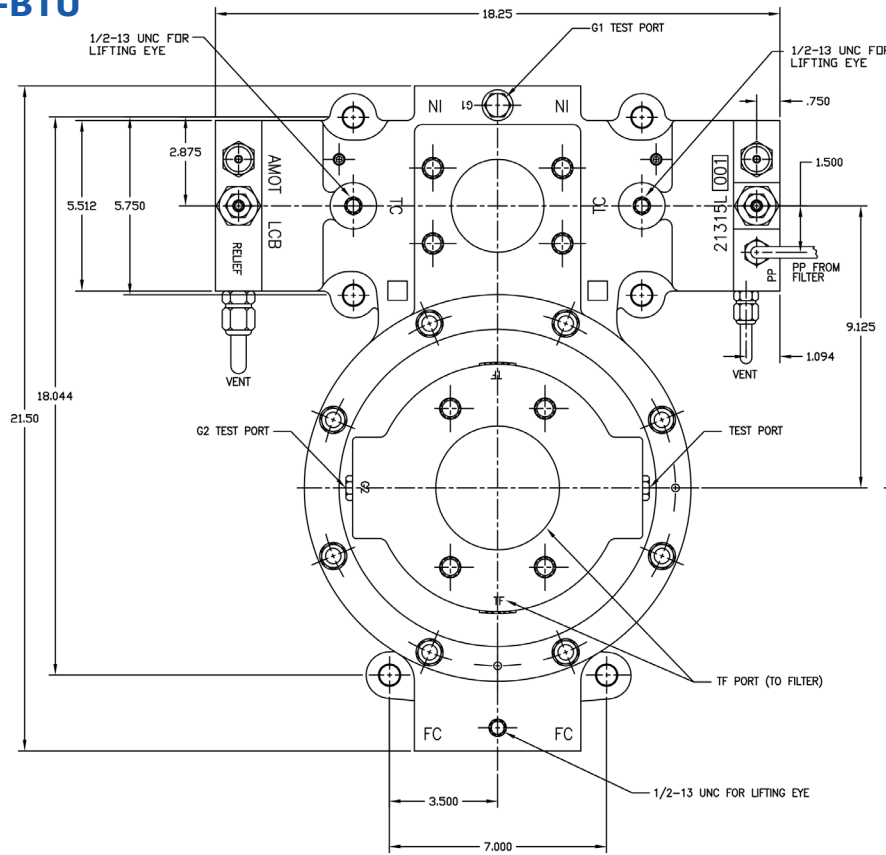
SAE port dimensions			
Port size	Thread (4 places)	"Q"	"GG"
2"	½ - 13 UNC-2B x 1" deep	3.062"	1.688"
3"	⅝ - 11 UNC-2B x 1" deep	4.188"	2.438"
4"	⅝ - 11 UNC-2B x 1.19" deep	5.125"	3.062"

Pressure and Temp. Regulating Valve - Model 4500D

Dimensions Continued

4500D & 4500D-BTU

Dimensions - inches



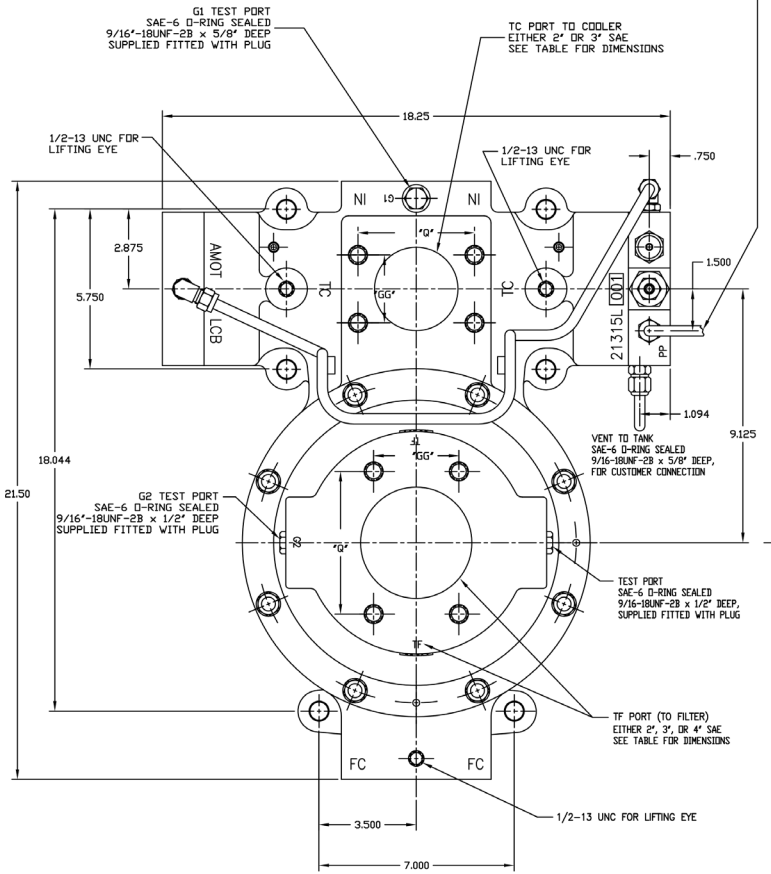
Pressure and Temp. Regulating Valve - Model 4500D

Dimensions Continued

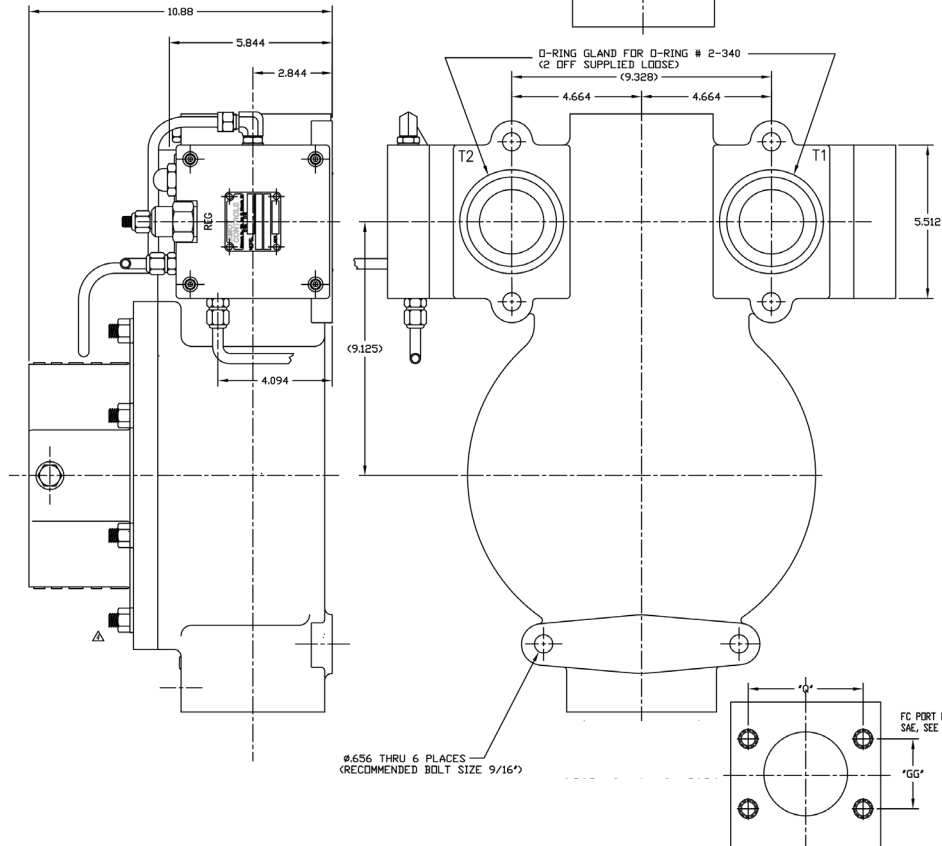
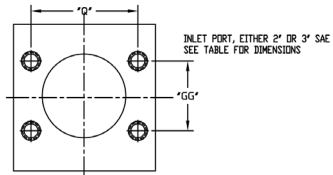
4500D-BTJ

PP FROM FILTER
SAE-6 O-RING SEALED
9/16"-18UNF-2B x 5/8" DEEP
FOR CUSTOMER CONNECTION

Dimensions - inches



SAE port dimensions			
Port size	Thread (4 places)	"Q"	"GG"
2"	1/2 - 13 UNC-2B x 1" deep	3.062"	1.688"
3"	5/8 - 11 UNC-2B x 1" deep	4.188"	2.438"
4"	5/8 - 11 UNC-2B x 1.19" deep	5.125"	3.062"



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Maintenance and Service Parts

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. Should any parts need to be replaced, please order them using the part numbers and quantities given in the service parts table in the service parts section on page 10.

For valve part numbers with Special requirements (E) = -BTJ, -BTU, or BLANK please order the service parts from our Europe and Asia-PAC facilities.

For valve part numbers with Special requirements (E) that is different from the previously listed options, please contact the facility for service parts available. Contact information is given on page 12.

Orifice conversion kits

As standard the 4500D is fitted with 1.4 mm [Ⓓ] and 1.2 mm [Ⓔ] diameter orifices, along with 3 mm [Ⓓ] [Ⓔ] diameter orifices. From January 2002 the -BTU and -BTJ types have been fitted with 3 mm diameter orifices for both positions. Prior to this date they were as standard.

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.

An upgrade kit **48022X** is available to convert valves fitted with 1.2 & 1.4 mm orifices to 3 mm. Please contact AMOT for the Orifice Conversion Kit 48022X Installation Instructions.

There is also an option to convert 3 mm orifices to 1.2 mm & 1.4 mm. This option is by request only. Please contact the factory for more information.

Orifice upgrade kit 48022X parts			
Ref no.	Qty.	Description	Comments
12	1	O RING VITON	Relief cover side
28	1	ORIFICE 3MM	
31	2		
33	1	FILTER - 17 MICRON	
50	2	O-RING, VITON	
-	1	CARTRIDGE RETAINING TOOL	
-	4	CAPHEAD SCREW	

Pressure and Temp. Regulating Valve - Model 4500D

Maintenance and Service Parts Continued

Service parts (refer to the diagrams on pages 11 and 12)

Service parts					
Ref no.	Part no.	Qty.			AMOT part description
		Blank	-BTJ	-BTU	
8	11855L002	1	1	1	ORING - VITON
9	11856L002	1	1	1	ORING - VITON
10	1183L002	4	4	4	ORING - VITON/BROWN
12	207L001	2	2	2	O RING VITON
13	1096P(***)	-	4	4	ELEMENT - PLATED
	1096X(***)	4	-	-	ELEMENT
14	9585L001-Z	4	4	4	SEAT
27	11904	1	-	1	CART - HYDRAULIC - AX90210
	47329	-	2	-	VALVE - CARTRIDGE
28	11862L014	2	-	1	ORIFICE 1.4MM MFG.# BA13355
	47710	-	1	1	ORIFICE 3 MM
29	10052	1	-	-	PILOT CARTRIDGE - PFS# ST25500
	47328X	-	1	1	SEQUENCE VALVE
30	11859L001	1	-	1	RELIEF PILOT REG - SUN RGFA-LGV
31	11862L012	2	-	1	ORIFICE - 1.2MM - MFG.#BM13816
	47710	-	2	1	ORIFICE 3 MM
32	11863	2	1	2	INDICATOR - PI61972
33	11864	2	-	-	FILTER - 10 MICRON MFG# PH59646
	47590	-	1	2	PALL FILTER - 17 MICRON
41	601L001	1	1	1	O RING VITON
49	11921	1	-	-	HYD.CART - REG. - MFG. # AX90200
	47329	-	-	1	VALVE - CARTRIDGE
50	11503L001	4	4	4	O-RING, VITON
55	47281L002	-	2	2	ORING #2-340 VITON
AC	764L015	1	1	1	LOC. 242 RETAINING COMP. 50CC

NOTES:

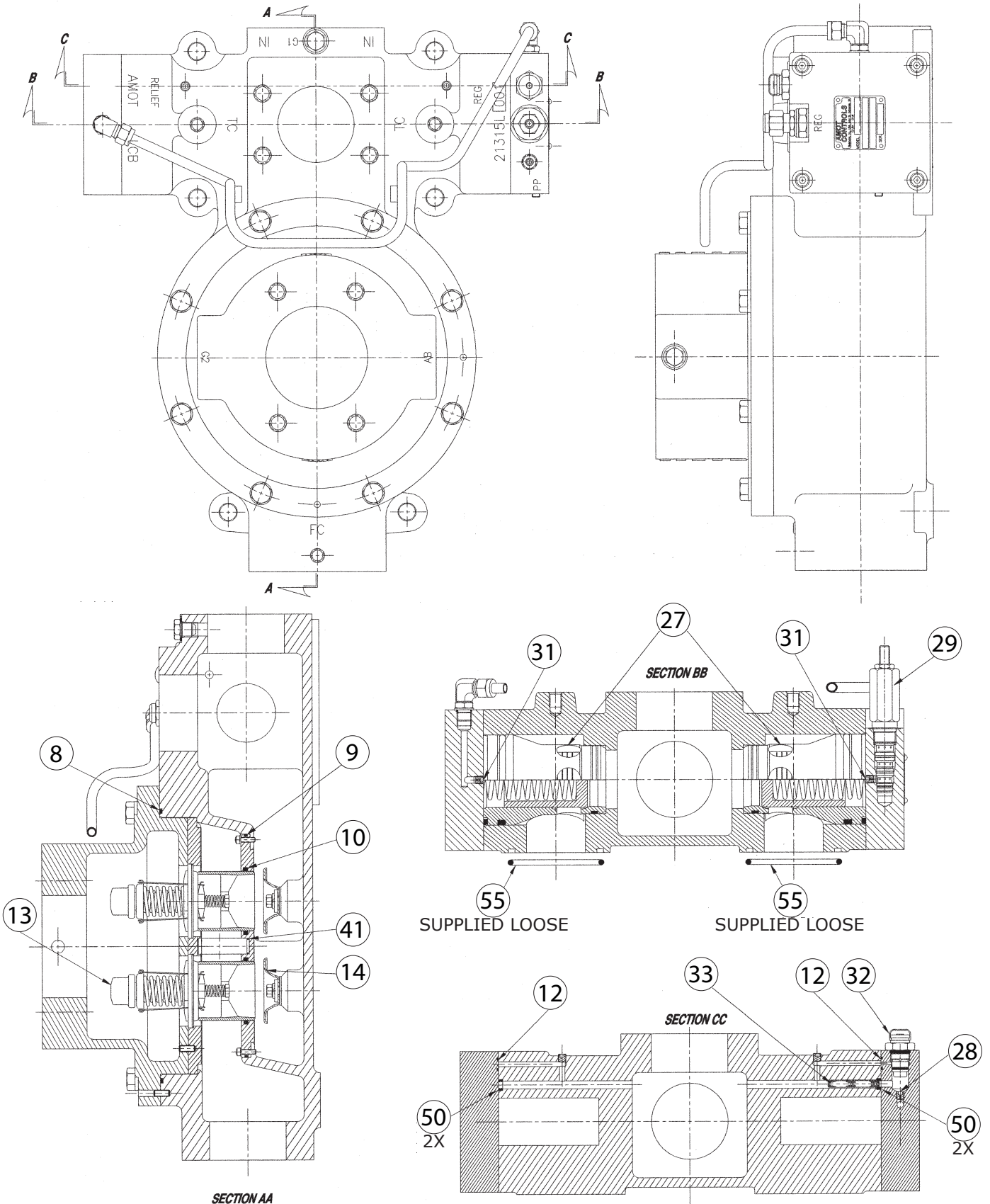
Replace *** in part number with the 3-digit temperature code, located in the Temperature °F (D) section of the AMOT valve part number. For temperatures available, refer to the available temperatures table on page 4.

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Maintenance and Service Parts Continued

Service parts continued

4500D-BTJ

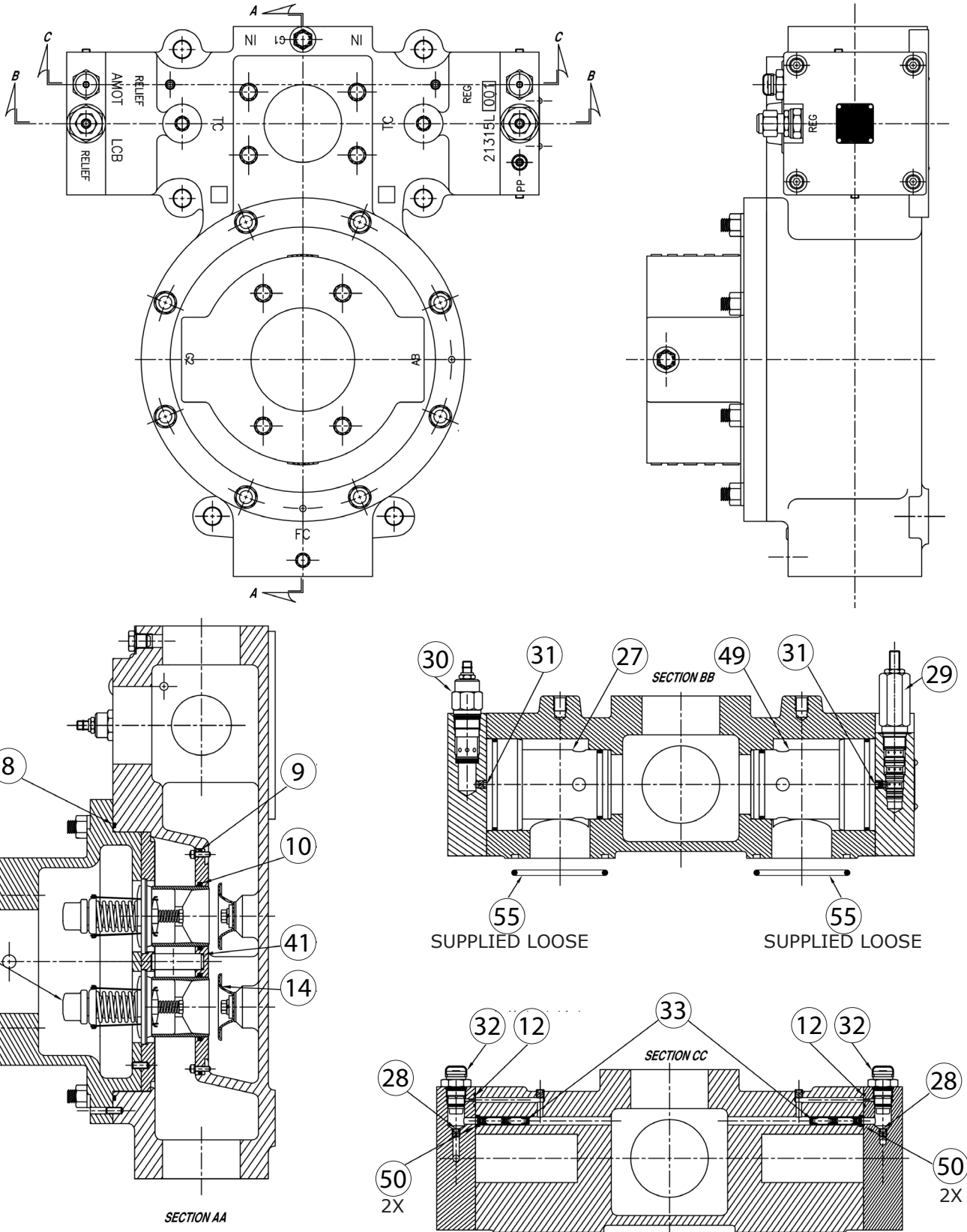


Pressure and Temp. Regulating Valve - Model 4500D

Maintenance and Service Parts Continued

Service parts continued

4500D & 4500D-BTU



Pressure and Temp. Regulating Valve - Model 4500D

Contact

Americas

AMOT USA
8824 Fallbrook Dr.
Houston, TX 77064
USA

Tel: +1 (281) 940 1800
Fax: +1 (713) 559 9419
Email: customer.service@amot.com

Asia Pacific

AMOT Shanghai
Bd. 7A, No. 568, Longpan Rd., Malu Jiading
Shanghai 201801
China

Tel: +86 21 5910 4052
Fax: +86 21 5237 8560
Email: shanghai@amot.com

Europe, Middle East and Africa

AMOT UK
Western Way
Bury St. Edmunds
Suffolk, IP33 3SZ
England

Tel: +44 1284 715739
Fax: +44 1284 760256
Email: info@amot.com

AMOT Germany
Rondenbarg 25
22525 Hamburg
Germany

Tel: +49 40 8537 1298
Fax: +49 40 8537 1331
Email: germany@amot.com



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.

www.amot.com