

# High Pressure Control Valve

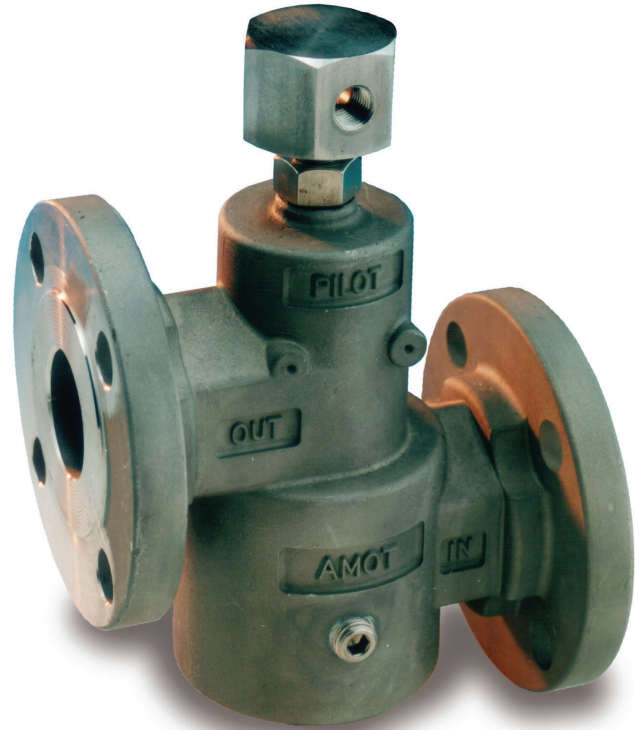
## Model 4418F

### Typical applications

- Starting air/gas valve
- Vented fuel gas valve
- Control valve


### Key features and benefits

- Vent port eliminates need for separate bleed valve
  - Reduced system cost
- Optional open/close indication switch
  - Simple system set up and diagnostics
- Fully adjustable for optimized system operation



**Model 4418F**

### Accreditations available

- PED Suitable for Group 1 & 2 gases (Ensure materials are compatible)
- ATEX  II 2G TX X
- CE Complies with all relevant EU directives

# High Pressure Control Valve - Model 4418F

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# High Pressure Control Valve - Model 4418F

## Overview

The 4418F has been designed specifically for use as an air start valve for diesel engines or as a fuel shut-off valve for gas turbine applications.

Its durable, high quality construction and compact size make it ideal for use with gas turbines in the 0 to 15 MW size range.

## Operation

### 2-way normally closed version

When pressure is applied to the PILOT port, the main ports (IN and OUT) are opened to allow flow through the valve. When the pilot pressure is released, a spring closes the main ports.

### 2-way vented normally closed version

When pressure is applied to the PILOT port, the main ports (IN and OUT) are opened to allow flow through the valve. When the pilot pressure is released, a spring closes the main ports.

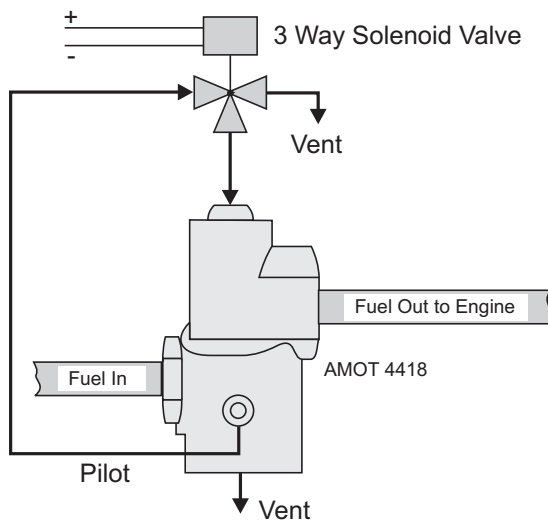
When used on a fuel gas system, the fuel intake manifold is vented causing quick shut down of the engine.

### 2-way normally open version

When pressure is applied to the PILOT port, the main ports (IN and OUT) are closed to stop the flow through the valve. When the pilot pressure is released, a spring opens the ports (IN and OUT) to allow flow through the valve.

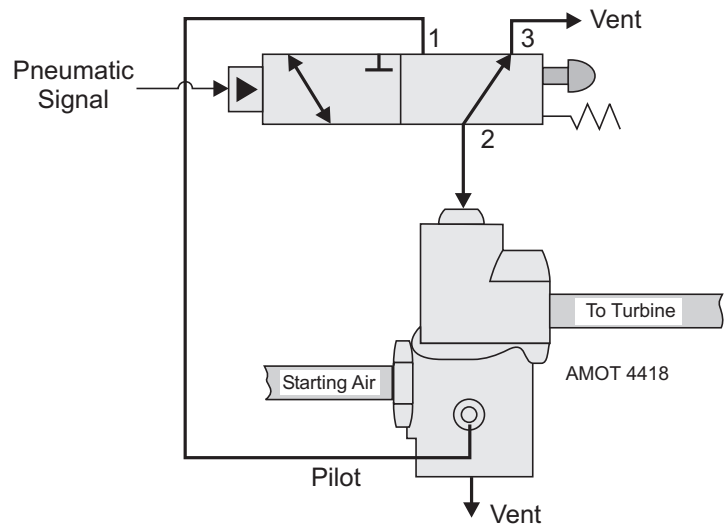
## Applications

### Fuel valve for turbine or engine



Energise to open fuel valve

### Starting air for turbine or engine

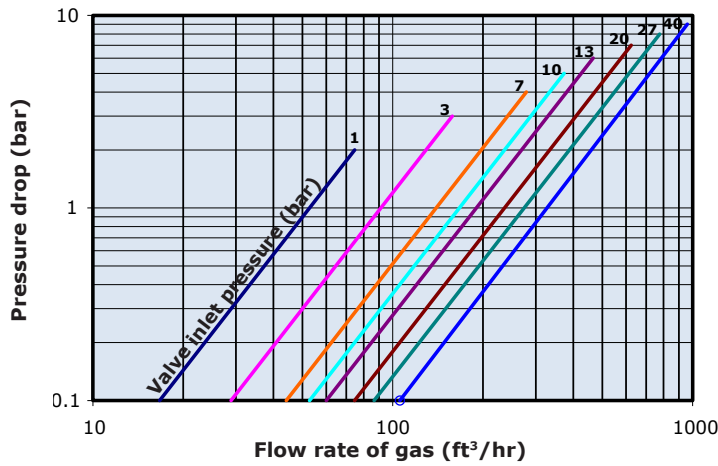


Pneumatic signal or manual pull to start turbine

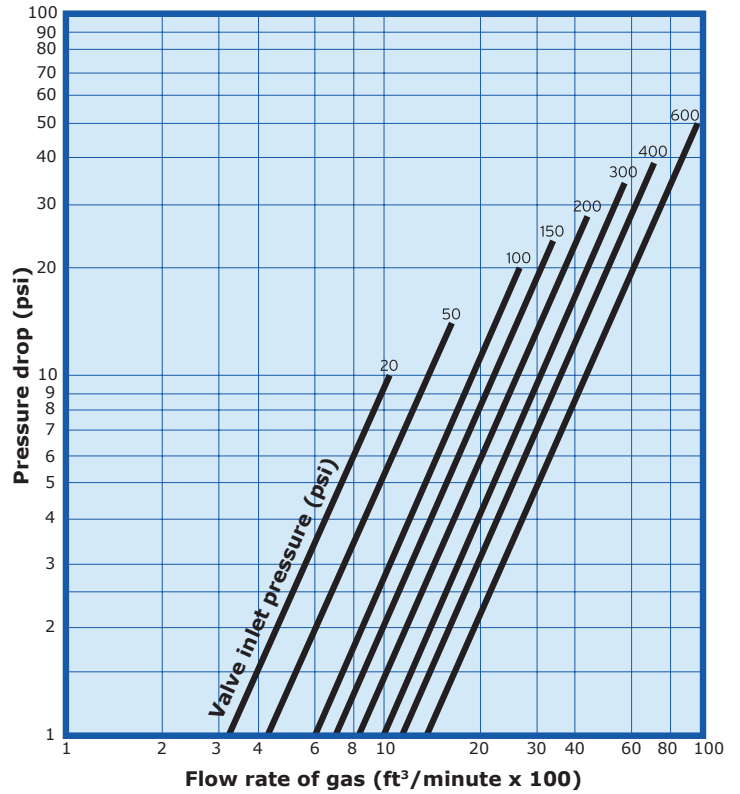
# High Pressure Control Valve - Model 4418F

## Valve Characteristics

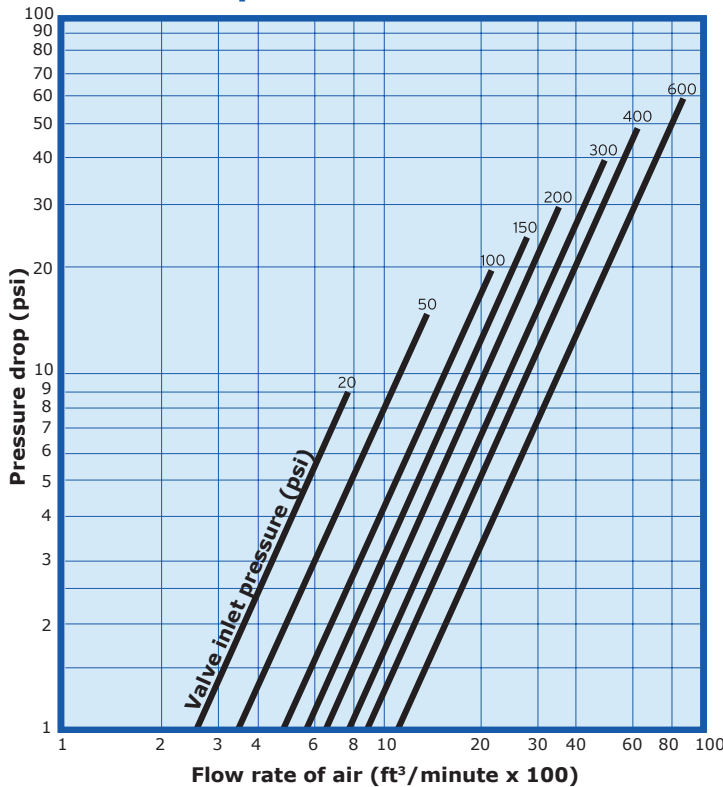
### Pressure drop for natural gas



1", 1 1/2" and 2"  
Specific gravity of 0.65 at 60°F (15°C)



### Pressure drop for air



1", 1 1/2" and 2"  
Air at 60°F (15°C)

# High Pressure Control Valve - Model 4418F

## Valve Characteristics Continued

### Valve size, type, and approval

Code	Valve size (inches)	Valve Type	Valve Approvals (See Other customer requirements (H) code)	
			[BLANK]	-AA
1	1"	2-way normally closed	None (not suitable for use in the EU)	NACE MR0175 (Not suitable for use in the EU)
2	1 1/2"			
3	2"			
4	1"	2-way vented normally closed		
5	1 1/2"			
6	2"			
7 <sup>(1)</sup>	1"	2-way normally open		
8 <sup>(1)</sup>	1 1/2"			
9 <sup>(1)</sup>	2"			
A <sup>(1)</sup>	1"	2-way normally closed		PED Category IV ATEX II 2G TX X NACE MR0175
B <sup>(1)</sup>	1 1/2"			
C <sup>(1)</sup>	2"			
D <sup>(1)</sup>	1"	2-way vented normally closed		
E <sup>(1)</sup>	1 1/2"			
F <sup>(1)</sup>	2"			
G <sup>(1)</sup>	1"	2-way normally open		
H <sup>(1)</sup>	1 1/2"			
J <sup>(1)</sup>	2"			

### Internal materials

Code	Spool component	Valve type
2	Aluminum <sup>(2)</sup>	2-way normally open/closed
4	Stainless steel	
6	Aluminum <sup>(2)</sup>	2-way vented normally closed
8	Stainless steel	

### Proximity switch

Code	Position indicator	Switch approvals
0	None	
E	Open	CSA Class I, Div 1, Groups C & D
F	Closed	
G	Open/Closed	
H	Open	UL Class I, Div 1, Groups C & D
J	Closed	
K	Open/Closed	
P <sup>(1)</sup>	Open	PED Category IV ATEX II 2G TX X
Q <sup>(1)</sup>	Closed	
R <sup>(1)</sup>	Open/Closed	

**NOTES:**

<sup>(1)</sup> Not available with aluminum spool.

<sup>(2)</sup> Do not use aluminum spool version above 240 psi (16.55 bar) @ 200°F (94°C).

# High Pressure Control Valve - Model 4418F

## How to Order

Use the table below to select the unique specification of your 4418F High Pressure Control Valve.

Example	4418F	1	A	2	X	0	02	-AA	Code description	Comments
<b>Valve model (A)</b>										
<b>Valve model (A)</b>	4418F									
<b>Valve size and type (B)</b>										
<b>Valve size, type, approvals (B)</b>		*							For valve sizes and types available, refer to the valve size and type table on page 5.	
<b>Connections (C)</b>										
<b>IN and OUT ports</b>										
<b>Pilot 'A' and vent ports</b>										
<b>Connections (C)</b>	A								NPT threaded	NPT
	B								BSP (PL) threaded	BSP (PL)
	C								DIN ND40 flanged	BSP (PL)
	E								ANSI 300 lb. RF flanged	NPT
	J								ANSI 150 lb. RF flanged	NPT
	K								ANSI 600 lb. RF flanged	NPT
<b>Internal materials and approvals (D)</b>										
<b>Internal materials (D)</b>			**						For internal materials available, refer to the internal materials table on page 5.	
<b>Pilot pressure (E)</b>										
<b>Pilot pressure (E)</b>				X					30 to 150 psi	Normally closed
									50 to 150 psi	Normally open
<b>Proximity switch options (F)</b>										
<b>Proximity switch options (F)</b>					***				For proximity switches available, refer to the proximity switch table on page 5.	
<b>Pilot options (G)</b>										
<b>Pilot accessories <sup>(3)</sup></b>										
<b>Accessories approvals</b>										
<b>Pilot options (G)</b>	00								None	
	02								3-Way QE Solenoid 24VDC	UL/CSA + Regulator <sup>(4)</sup> <sup>(5)</sup>
	03								3-Way QE Solenoid 120VDC	UL/CSA + Regulator <sup>(4)</sup> <sup>(5)</sup>
	04								3-Way QE Solenoid 24VDC	UL/CSA
	05								3-Way QE Solenoid 120VDC	UL/CSA
	06								3-Way QE Solenoid 24VDC	ATEX + Regulator <sup>(4)</sup> <sup>(5)</sup>
	07								3-Way QE Solenoid 115VDC	ATEX + Regulator <sup>(4)</sup> <sup>(5)</sup>
	08								3-Way QE Solenoid 24VDC	ATEX
	09								3-Way QE Solenoid 115VDC	ATEX
	10								4-Way QE Solenoid 24VDC	UL/CSA + Regulator <sup>(4)</sup> <sup>(5)</sup>
	11								4-Way QE Solenoid 120VDC	UL/CSA + Regulator <sup>(4)</sup> <sup>(5)</sup>
	12								4-Way QE Solenoid 24VDC	UL/CSA
	13								4-Way QE Solenoid 120VDC	UL/CSA
<b>Other customer requirements (H)</b>										
<b>Type</b>										
<b>Valve body approvals</b>										
<b>Other customer requirements (H)</b>	[blank]								Standard	None
	-AA								Standard	See valve size, types, approvals table
	-***								Customer special code	Contact factory

### NOTES:

<sup>(3)</sup> All pilot accessories include stainless steel tubing & fittings mounted onto the valve.

<sup>(4)</sup> Self-piloted accessory.

<sup>(5)</sup> Available with normally closed valves ONLY.

# High Pressure Control Valve - Model 4418F

## Operating Pressure/Temperature Ratings

Measurements in bar (psi)

Temperature		Connections (C) - see page 6								
		A - NPT threaded		B - BSP (PI) threaded		C - DIN PN 40 flanged	E - ASME Class 300 RF Flanged	J- ASME Class 150 RF Flanged	K - ASME Class 600 RF Flanged	
		Spool version								
		Aluminum	Stainless steel	Aluminum	Stainless steel	Stainless steel	Stainless steel	Aluminum	Stainless steel	Stainless steel
°C	°F	Maximum working pressure - bar (psi)								
-29-38	-20-100	19 (276)	50 (725)*	19 (276)	50 (725)*	40 (580)	50 (725)*	19 (276)	19 (276)	50 (725)*
93	200	16.55 (240)	43 (623)	16.55 (240)	43 (623)	34 (493)	43 (623)	16 (232)	16 (232)	43 (623)
149	300	15 (218)	39 (566)	15 (218)	39 (566)	31 (450)	39 (566)	15 (218)	15 (218)	39 (566)
204	400	13 (189)	36 (522)	13 (189)	36 (522)	28 (406)	36 (522)	13 (189)	13 (189)	36 (522)

\* Maximum pressure for normally open = 45 bar (653 psi)

## Specification

		Metric units	English units
<b>Body materials</b>	Stainless steel		
<b>Standard internal materials</b>	Stainless steel		
<b>Optional internal materials</b>	Aluminum		
<b>Seals</b>	Viton		
<b>Operating temperatures</b>		-29°C - 204°C	-20°F - 400°F
<b>Valve pressure rating</b>		13 - 50 bar	189 - 725 psi
<b>Max. working pressure</b>		50 bar	725 psi
<b>Pilot pressure (standard)</b>	Depends on process working pressure	2.1 - 10.3 bar	30 - 150 psi
<b>Flow coefficient</b>	IN to OUT	1"	Kv = 15.5 Cv = 18
		1 1/2"	Kv = 28.5 Cv = 33
		2"	Kv = 29.4 Cv = 34
	OUT to VENT ALL	Kv = 1.7 Cv = 2.0	
<b>Close time**</b>	Less than 100 ms		

\*\* Contact AMOT for advice on suitable solenoid valves and pilot pressures

## Weight

Approximate weight in kg (lbs)

Connection type	Threaded		Flanged	
	1" & 1 1/2"	2"	1" & 1 1/2"	2"
Valve size	3.6 (8)	4.1 (9)	7.72 (17)	10.4 (23)

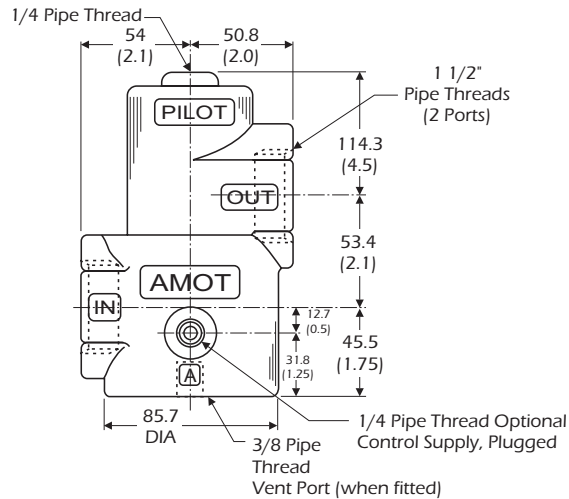
# High Pressure Control Valve - Model 4418F

## Valve Dimensions

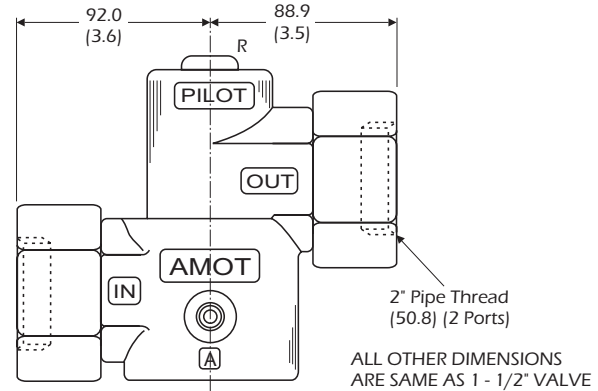
Dimensions - mm (inches)

### Threaded valves

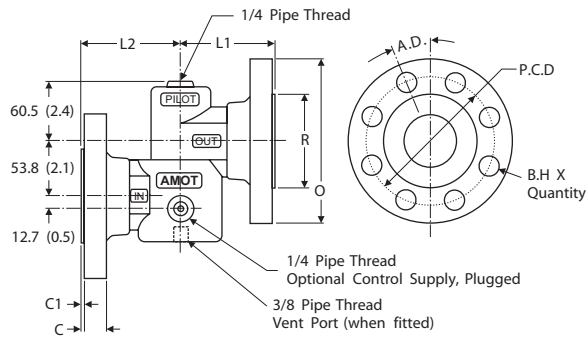
#### 1" & 1 1/2" valve



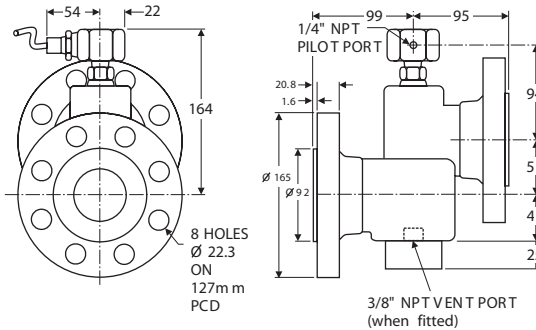
#### 2" valve



### Flanged valves



#### Valve showing solenoid



Flanged connections										
Valve size	1"			1 1/2"			2"			
Connection (C)	E	J	K	E	J	K	C	E	J	K
L1	79.25 (3.12")	76.20 (3.00")	91.95 (3.62")	82.55 (3.25")	79.25 (3.12")	95.25 (3.75")	95.25 (3.75")	95.25 (3.75")	91.95 (3.62")	104.65 (4.12")
L2	82.55 (3.25")	79.25 (3.12")	95.25 (3.75")	85.85 (3.38")	82.55 (3.25")	98.55 (3.88")	98.55 (3.88")	98.55 (3.88")	95.25 (3.75")	107.95 (4.25")
Flange diameter (O)	123.95 (4.88")	107.95 (4.25")	123.95 (4.88")	155.45 (6.12")	127.00 (5.00")	155.45 (6.12")	165.10 (6.50")	165.10 (6.50")	152.40 (6.00")	165.10 (6.50")
Flange thickness (C)	17.53 (0.69")	14.22 (0.56")	17.53 (0.69")	20.57 (0.81")	17.53 (0.69")	22.35 (0.88")	22.35 (0.88")	22.35 (0.88")	19.05 (0.75")	25.40 (1.00")
Raised face thickness (C1)	1.57 (0.062")	1.57 (0.062")	6.35 (0.25")	1.57 (0.062")	1.57 (0.062")	6.35 (0.25")	3.18 (0.13")	1.57 (0.062")	1.57 (0.062")	6.35 (0.25")
Bolt hole size	19.05 (0.75")	15.75 (0.62")	19.05 (0.75")	22.35 (0.88")	15.75 (0.62")	22.35 (0.88")	18.03 (0.71")	19.05 (0.75")	19.05 (0.75")	19.05 (0.75")
Bolt hole quantity	4X	4X	4X	4X	4X	4X	4X	8X	4X	8X
PCD	88.90 (3.50")	79.25 (3.12")	88.90 (3.50")	114.30 (4.50")	98.55 (3.88")	114.30 (4.50")	124.97 (4.92")	127.00 (5.00")	120.65 (4.75")	127.00 (5.00")
R	50.80 (2.00")	50.80 (2.00")	50.80 (2.00")	73.15 (2.88")	73.15 (2.88")	73.15 (2.88")	102.11 (4.02")	91.95 (3.62")	91.95 (3.62")	91.95 (3.62")
AD	45°	45°	45°	45°	45°	45°	45°	22.5°	45°	22.5°



# High Pressure Control Valve - Model 4418F

## 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 valve. At such time, AMOT High Pressure Control Valves can be restored to original performance simply by installing an AMOT high pressure control valve service kit. Service kits include all new seals and seal components required for normal maintenance. In the event the spool needs to be replaced, AMOT offers spool replacement kits.

**AMOT recommends the valves to be checked monthly for proper operation when it is used as a control valve in a Safety Control System.**

### How to order service kits and spool replacement kits

#### Service kits

Service kits are available with seals required to service the valve. Order service kits by service kit model number, which is identified by the valve size code and proximity switch code found in the AMOT valve part number. Refer to the valve nameplate and the AMOT valve part number structure on page 6.

#### Service kit model number structure

1) Identify the valve size code and proximity switch code, located in the Valve size and type (B) and Proximity switch options (F) sections of the AMOT valve part number, respectively.

Replacement of the PTFE main seal ④ requires disassembly of the valve spool for which AMOT uses specialized tooling. If preferred this can be done by AMOT, for contact details refer to page 13. 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.

#### Spool replacement kits

Spool replacement kits are available with spool parts and seals only. Order spool kits by spool kit model number, which is identified by the valve size code, proximity switch code and internal materials code found in the AMOT valve part number. Refer to the valve nameplate and the AMOT valve part number structure on page 6.

2) Find those codes in Table 1 to identify the proper service kit required for your specific valve.

**Table 1 - Service kit identification**

Table 1 - Service kit identification							
	Valve size (B)			Proximity switch (F)		Service kit model number	Comments
	1,2,3,A,B,C			ALL		10450X005	USA ONLY
						81050X005	UK ONLY
	4,5,6,D,E,F			F,J,Q		10450X001	USA ONLY
						81050X001	UK ONLY
				O,E,H,P		10450X003	USA ONLY
						81050X003	UK ONLY
	7,8,9,G,H,J			ALL		81050X007	UK ONLY
Examples							
Valve part number						Service kit model number	
4418F	5	E	8	X	F	04	10450X001
4418F	7	J	4	X	0	00	81050X007

# High Pressure Control Valve - Model 4418F

## Maintenance and Service Parts Continued

### Spool replacement kit model number structure

- 1) Identify the valve size code, located in the Valve size and type (B) section of the AMOT valve part number.
- 2) Identify the internal materials code, located in the Internal materials (D) section of the AMOT valve part number.
- 3) Identify the proximity switch code, located in the Proximity switch options (F) section of the AMOT valve part number.
- 4) Find all 3 codes in Table 2 to identify the proper spool replacement kit required for your specific valve.

**Table 2 - Spool Kit Identification**

	Valve size (B)		Internal materials (D)		Proximity switch (F)		Spool replacement kit model number	Comments					
	1,2,3		2		ALL		10451X009	USA ONLY					
			4				81051X009	UK ONLY					
							10451X011	USA ONLY					
							81051X011	UK ONLY					
	A,B,C			2		ALL		10451X009-BWZ	USA ONLY				
				4				81051X009-BWZ	UK ONLY				
								10451X011-BWZ	USA ONLY				
								81051X011-BWZ	UK ONLY				
	4,5,6			6		F,J,Q		10451X001	USA ONLY				
						0,E,H,P		81051X001	UK ONLY				
				8		F,J,Q		10451X005	USA ONLY				
						0,E,H,P		81051X005	UK ONLY				
				D,E,F					6	F,J,Q		10451X003	USA ONLY
										0,E,H,P		81051X003	UK ONLY
									8	F,J,Q		10451X007	USA ONLY
										0,E,H,P		81051X007	UK ONLY
	7,8,9			4	ALL		10451X001-BWZ	USA ONLY					
	G,H,J						81051X001-BWZ	UK ONLY					
								10451X005-BWZ	USA ONLY				
								81051X005-BWZ	UK ONLY				
								10451X003-BWZ	USA ONLY				
								81051X003-BWZ	UK ONLY				
								10451X007-BWZ	USA ONLY				
								81051X007-BWZ	UK ONLY				
							81051X013	UK ONLY					
							81051X013-BWZ	UK ONLY					

### Examples

Valve part number							Spool replacement kit model number	
4418F	5	E	8	X	F	04	10451X003	
4418F	7	J	4	X	0	00	81051X013	
4418F	C	A	4	X	0	04	10451X011-BWZ	

# High Pressure Control Valve - Model 4418F

## Maintenance and Service Parts Continued

**Service parts** (refer to diagrams on page 12)

Service kit parts								
Ref no.	Qty.							Description
	10450X(---)			81050X(---)				
	001	003	005	001	003	005	007	
2	1	1	-	1	1	-	-	Vent piston seal
4	1	1	1	1	1	1	1	PTFE main seal
8	1	1	1	1	1	1	1	Body seal
12	-	-	1	-	-	1	-	BP piston seal
13	1	1	1	1	1	1	1	Spool thread seal
14	1	1	-	1	1	-	-	Under PTFE vent seal
15	1	1	1	1	1	1	1	Under PTFE main seal
21	1	1	1	1	1	1	-	PTFE vent seal
22	2	2	2	2	2	2	2	Spool seal
23	1	-	-	1	1	-	-	Target rod seal
28	-	1	-	-	-	-	-	Self sealing screw
35	1	1	-	1	1	-	-	Vent seal cup seal
41	-	-	-	-	-	-	1	Spool bumper
90	-	-	-	-	1	-	-	Seal
AN	1	1	1	1	1	1	1	Krytox GPL206 grease
AC	1	1	1	1	1	1	1	Loctite 242

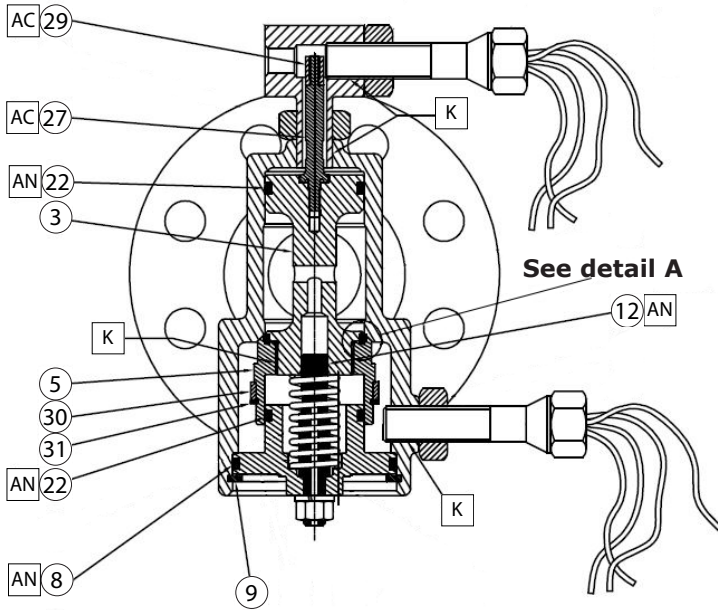
Spool replacement kit parts															
Ref no.	Qty.														Description
	10451X(---)			81051X(---)				10451X(---)-BWZ			81051X(---)-BWZ				
	001 & 003	005 & 007	009 & 011	001 & 003	005 & 007	009 & 011	013	003	007	011	003	007	011	013	
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Upper spool
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Lower spool
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Internal retaining ring
16	1	1	-	1	1	-	-	1	1	-	1	1	-	-	Vent seal retainer
17	1	1	-	1	1	-	-	1	1	-	1	1	-	-	Vent seal cup
18	1	1	-	1	1	-	-	1	1	-	1	1	-	-	Vent stem
19	1	1	-	1	1	-	-	1	1	-	1	1	-	-	Pilot return spring
20	1	1	-	1	1	-	-	1	1	-	1	1	-	-	Vent piston
27	1	-	1	1	-	1	1	1	-	1	1	-	1	1	Target rod
28	-	-	-	-	1	-	-	-	-	-	-	1	-	-	Self sealing screw
29	1	-	1	1	-	1	1	1	-	1	1	-	1	1	Post
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Sleeve
31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Retaining ring
42	-	-	-	-	-	-	1	-	-	-	-	-	-	1	Shoulder bolt
-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	10450X001
-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	10450X003
-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	10450X005
-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	81050X001
-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	81050X003
-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	81050X005
-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	81050X007

# High Pressure Control Valve - Model 4418F

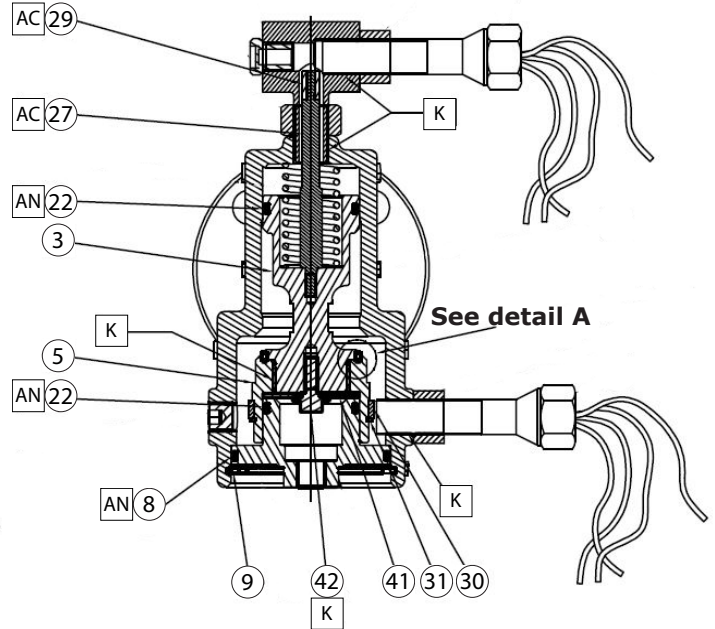
## Service Kits Continued

### Service parts continued

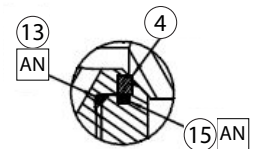
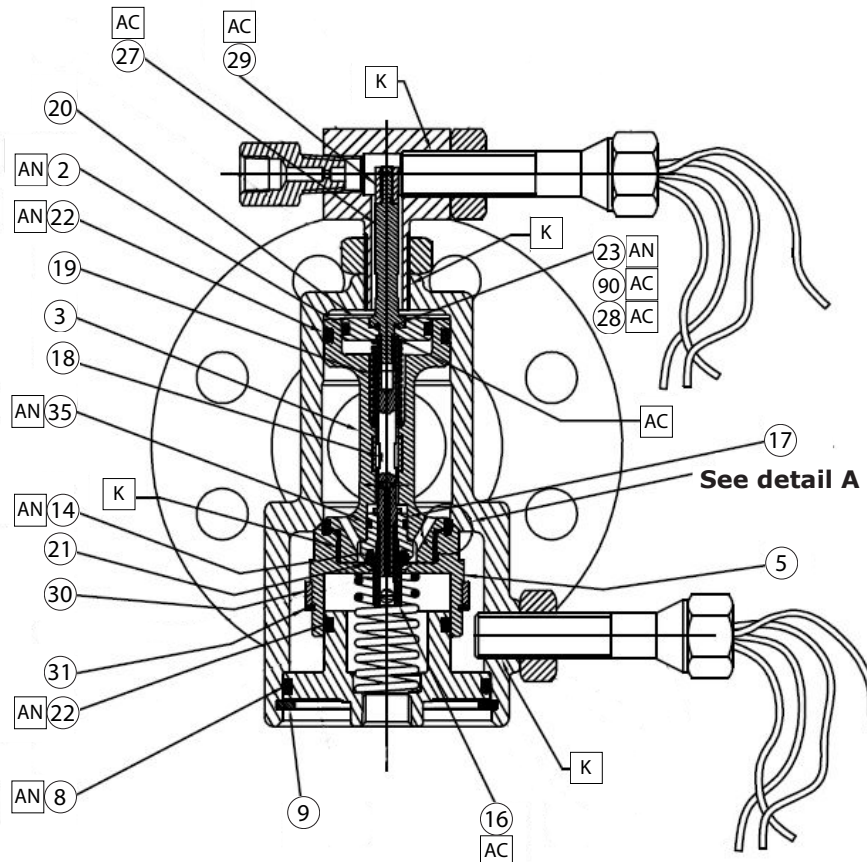
2-way normally closed



2-way normally open



2-way vented normally closed



# High Pressure Control Valve - Model 4418F

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 **WARNING**

These products can expose you to chemicals including carbon black (airborne and extracts), antimony trioxide, titanium dioxide, silica (crystalline), di(2-ethylhexyl)phthalate, ethylene thiourea, acrylonitrile, 1,3-butadiene, epichlorohydrin, toluenediisocyanate, tetrafluoroethylene, ethylbenzene, formaldehyde, furfuryl alcohol, glass fibers, methyl isobutyl ketone, nickel (metallic and compounds), lead and lead compounds which are known to the state of California to cause cancer; and 1,3 butadiene, epichlorohydrin, di(2-ethylhexyl)phthalate, di-isodecyl phthalate, ethylene thiourea, methyl isobutyl ketone, toluene, lead and lead components which are known to the state of California to cause birth defects and other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

[www.amot.com](http://www.amot.com)

