

CONTINENTAL



CONTINENTAL HYDRAULICS

# PR\*SP - PR\*SPU

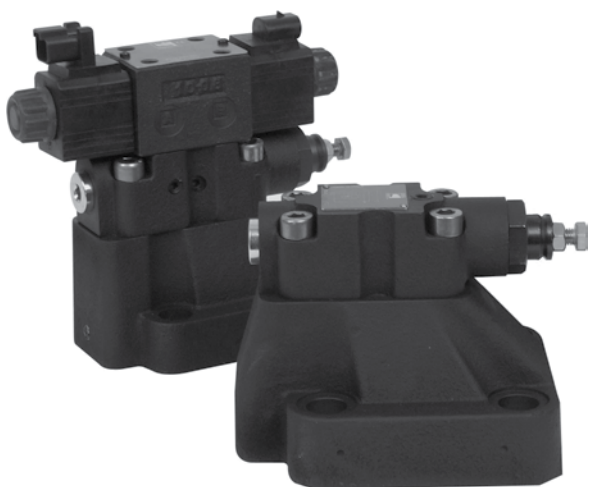
PILOT OPERATED PRESSURE RELIEF VALVE SERIES



PR\*SP - PR\*SPU - PILOT OPERATED PRESSURE RELIEF VALVE SERIES

# POWERFUL

## PR\*SP - PR\*SPU PILOT OPERATED PRESSURE RELIEF VALVE SERIES



### DESCRIPTION

PR\*SP valves are pilot operated pressure relief valves, for subplate mounting according to NFPA T3.5.1 and ISO 6264 standards.

Available in three nominal sizes, each valve incorporates a main stage poppet with a conical seal design pilot section. The pilot section is controlled via internal or external pilot (X port). A hexagonal head screw controls the pressure adjustment.

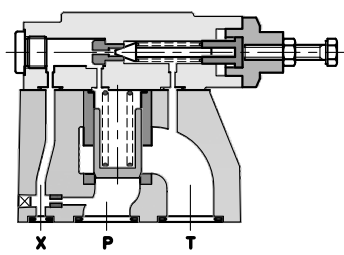
An optional solenoid valve expands the valve functionality by providing an unloading feature. In addition, two or three setting selectable pressures are realized by adding a modular relief valve between the pilot stage and the solenoid valve.

### TYPICAL PERFORMANCE SPECIFICATIONS

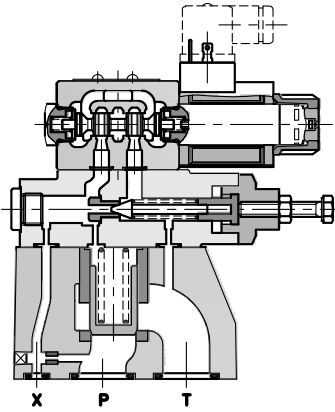
<b>MAXIMUM OPERATING PRESSURE</b>		5000 psi	350 bar
<b>MAXIMUM FLOW RATE</b>	PR06	53 gpm	200 l/min
	PR08	105 gpm	400 l/min
	PR10	132 gpm	500 l/min
<b>MOUNTING SURFACES</b>	PR06	R06 NFPA T3.5.1 - ISO 6264-06	
	PR08	R08 NFPA T3.5.1 - ISO 6264-08	
	PR10	R06 NFPA T3.5.1 - ISO 6264-10	
<b>MAX WEIGHT</b>	PR06	16.1 lbs	7.3 Kg
	PR08	17.9 lbs	8.1 Kg
	PR10	22.7 lbs	10.3 Kg

### AVAILABLE VERSIONS

PR\*SP

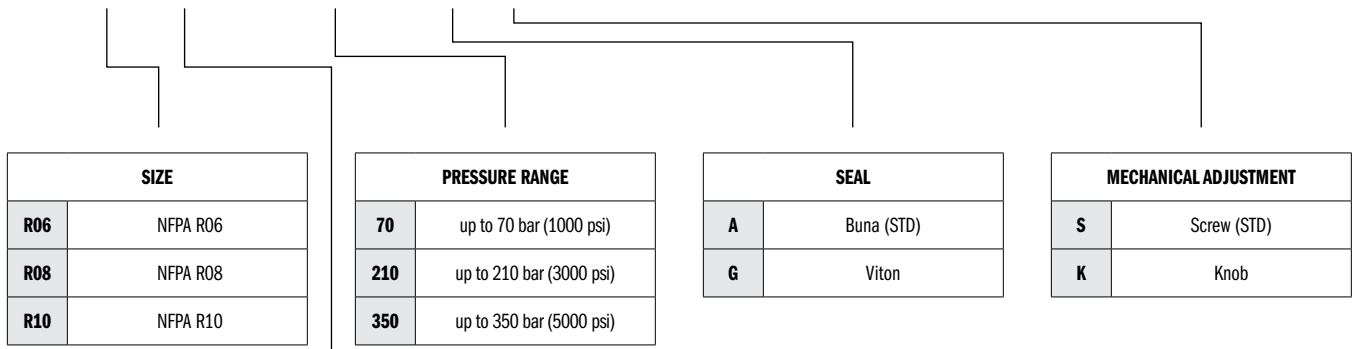


PR\*SPU



# IDENTIFICATION CODE FOR VALVE WITHOUT UNLOADING

**P**  **SP** -  -   -  \_\_\_\_\_ DESIGN LETTER



SIZE	
<b>R06</b>	NFPA R06
<b>R08</b>	NFPA R08
<b>R10</b>	NFPA R10

PRESSURE RANGE	
<b>70</b>	up to 70 bar (1000 psi)
<b>210</b>	up to 210 bar (3000 psi)
<b>350</b>	up to 350 bar (5000 psi)

SEAL	
<b>A</b>	Buna (STD)
<b>G</b>	Viton

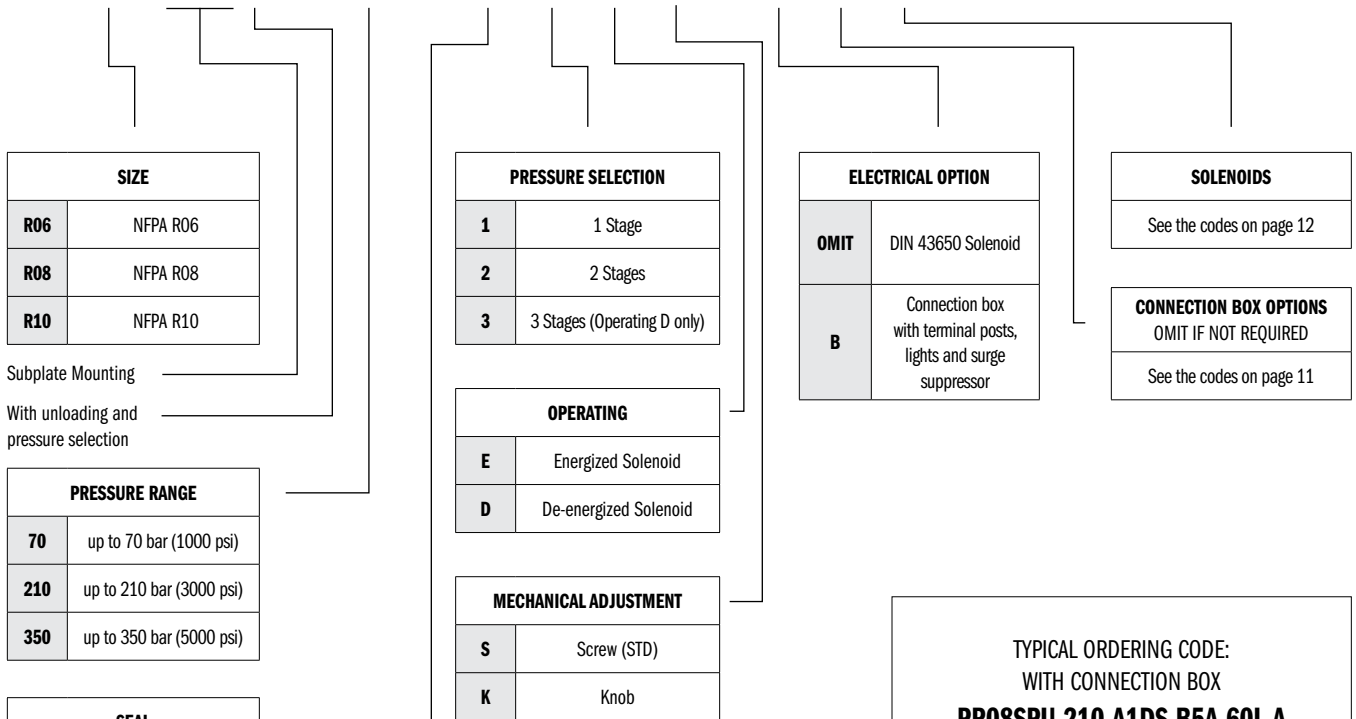
MECHANICAL ADJUSTMENT	
<b>S</b>	Screw (STD)
<b>K</b>	Knob

Subplate Mounting \_\_\_\_\_

TYPICAL ORDERING CODE:  
**PR08SP-210-AS-A**

# IDENTIFICATION CODE FOR VALVE WITH UNLOADING

**P**  **SPU** -  -     -    **L** -  \_\_\_\_\_ DESIGN LETTER



SIZE	
<b>R06</b>	NFPA R06
<b>R08</b>	NFPA R08
<b>R10</b>	NFPA R10

Subplate Mounting \_\_\_\_\_

With unloading and pressure selection \_\_\_\_\_

PRESSURE RANGE	
<b>70</b>	up to 70 bar (1000 psi)
<b>210</b>	up to 210 bar (3000 psi)
<b>350</b>	up to 350 bar (5000 psi)

PRESSURE SELECTION	
<b>1</b>	1 Stage
<b>2</b>	2 Stages
<b>3</b>	3 Stages (Operating D only)

OPERATING	
<b>E</b>	Energized Solenoid
<b>D</b>	De-energized Solenoid

SEAL	
<b>A</b>	Buna (STD)
<b>G</b>	Viton

MECHANICAL ADJUSTMENT	
<b>S</b>	Screw (STD)
<b>K</b>	Knob

ELECTRICAL OPTION	
<b>OMIT</b>	DIN 43650 Solenoid
<b>B</b>	Connection box with terminal posts, lights and surge suppressor

SOLENOIDS	
See the codes on page 12	

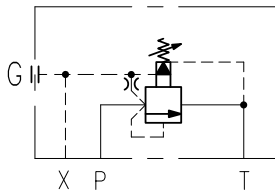
CONNECTION BOX OPTIONS OMIT IF NOT REQUIRED	
See the codes on page 11	

TYPICAL ORDERING CODE:  
WITH CONNECTION BOX  
**PR08SPU-210-A1DS-B5A-60L-A**  
WITH PLUG-IN SOLENOID  
**PR08SPU-210-A1DS-33L-A**

# SYMBOLS AND OPERATION

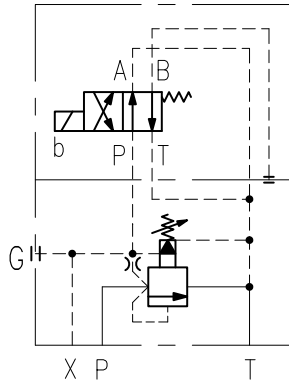
PR\*SP - PR\*SPU - PILOT OPERATED PRESSURE RELIEF VALVE SERIES

## PR\*SP



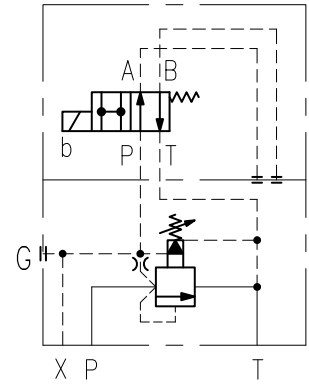
Pressure relief

## PR\*SPU 1D



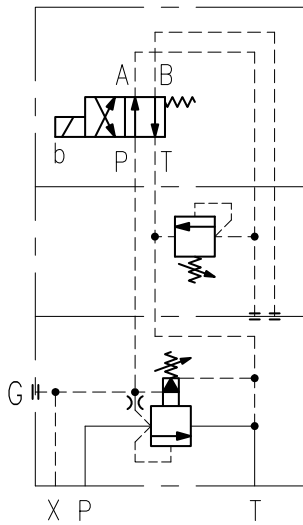
Pressure Relief, normally unloading, energize to high pressure

## PR\*SPU 1E



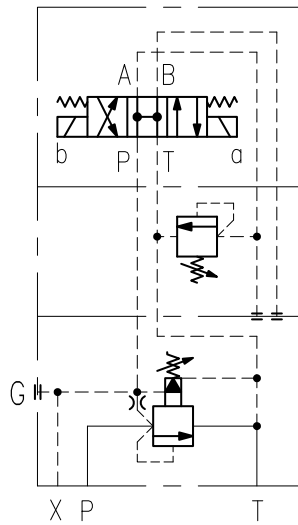
Pressure Relief, normally high pressure, energize to unload

## PR\*SPU 2E



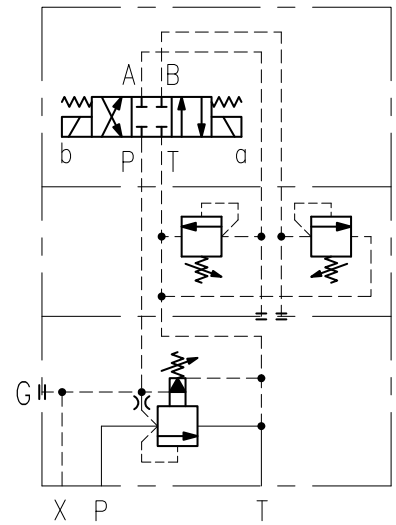
Pressure Relief, 2 pressure, normally low pressure, energize for high pressure

## PR\*SPU 2D



Pressure Relief, 2 pressure + unloading, normally unloading, energize A solenoid for low pressure, energize B solenoid for high pressure

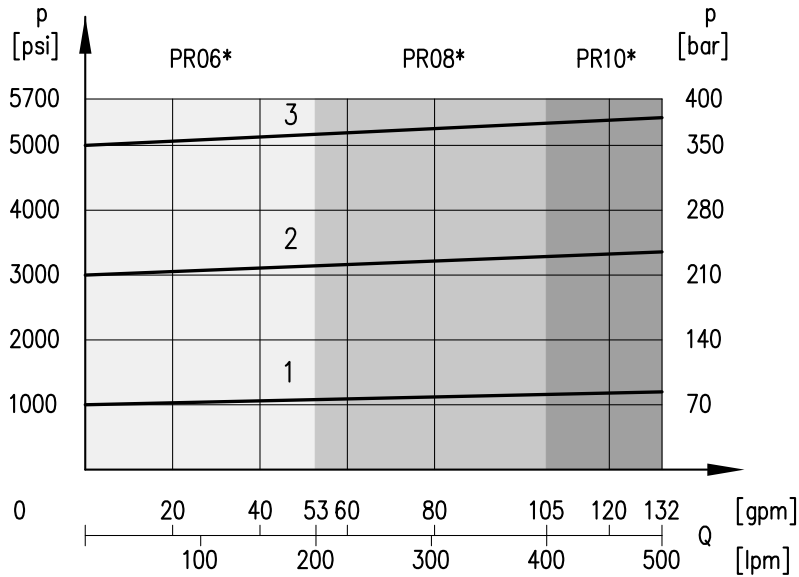
## PR\*SPU 3D



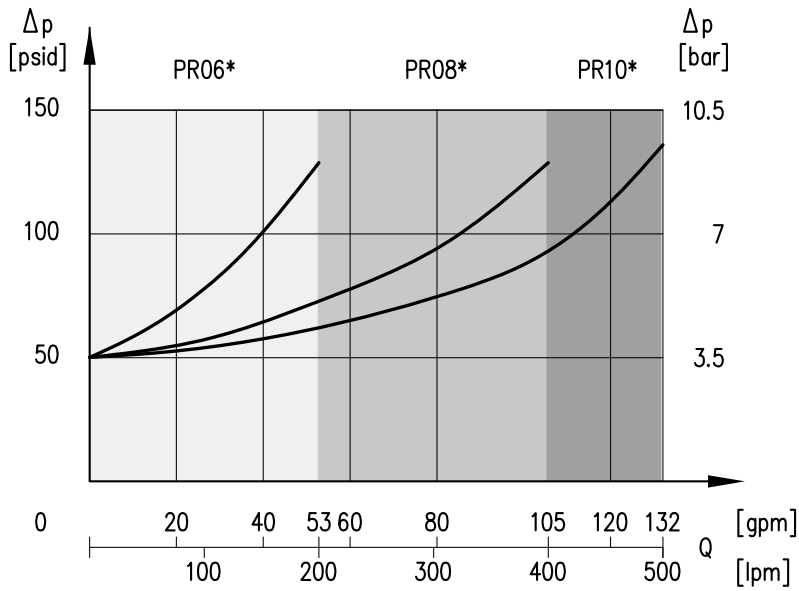
Pressure Relief, 3 pressure, normally highest pressure, energize A solenoid for pressure setting A energize B solenoid for pressure setting B

# PERFORMANCE CURVES

## ADJUSTMENT



## MINIMUM CONTROLLED PRESSURE



### NOTES:

Values obtained with oil viscosity of 170 SUS (36 cSt) at 122°F (50°C).

CURVE	PRESSURE RANGE
1	Up to 70 bar (1000 psi)
2	Up to 210 bar (3000 psi)
3	Up to 350 bar (5000 psi)

PR\*SP - PR\*SPU - PILOT OPERATED PRESSURE RELIEF VALVE SERIES

# OVERALL AND MOUNTING DIMENSIONS FOR PR\*SP

## SEALING RINGS:

Dimensions in mm [IN]

### PR06SP

2 O-Ring 17.86mm ID x 2.62mm CS 90 Shore A

1 O-Ring 9.13mm ID x 2.62mm CS 90 Shore A

### PR08SP

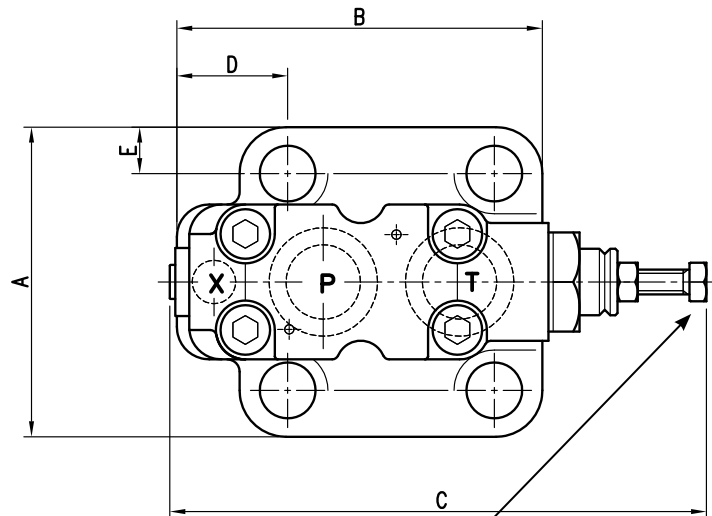
2 O-Ring AS568-123 90 Shore A

1 O-Ring 9.13mm ID x 2.62mm CS 90 Shore A

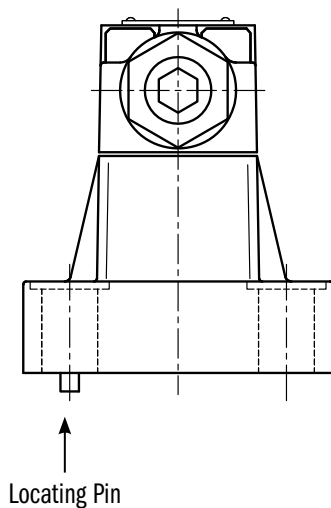
### PR10SP

2 O-Ring AS568-220 90 Shore A

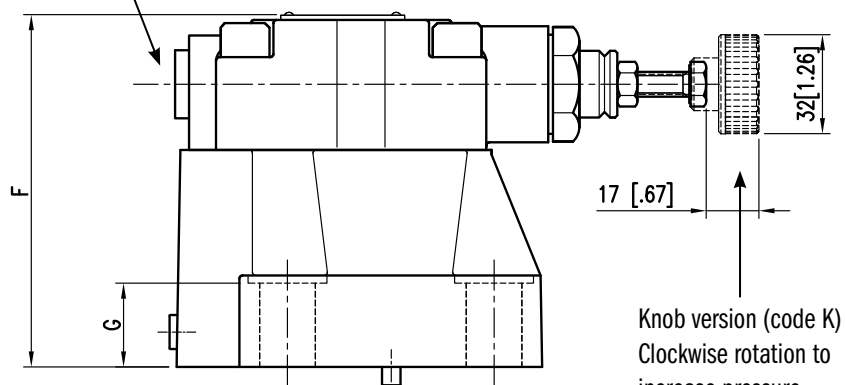
1 O-Ring 9.13mm ID x 2.62mm CS 90 Shore A



Hex cap adjustment screw (standard):  
13 mm [1/2] wrench Clockwise rotation  
to increase pressure.



Pressure Gauge Port SAE 8 3/4 - 16 UNF



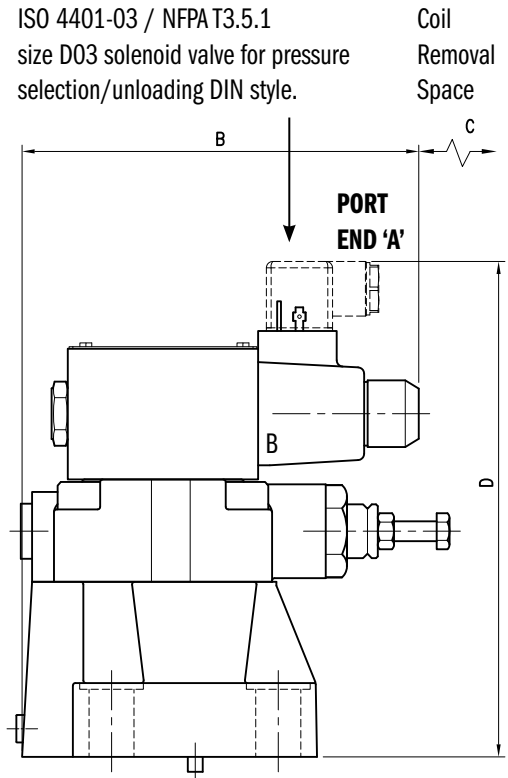
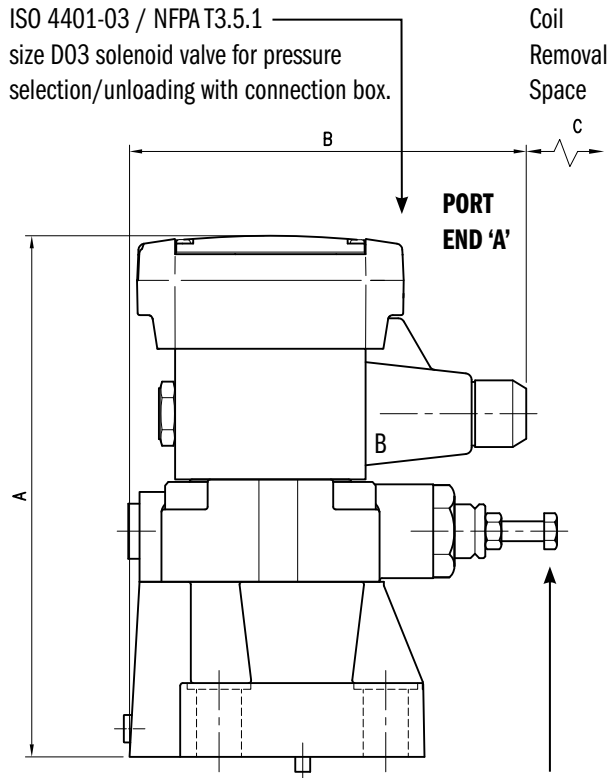
Knob version (code K)  
Clockwise rotation to  
increase pressure.

Mounting surface according to  
ISO 6264:1998 and NFPA T3.5.1 R2:2002

VALVE	DIMENSIONS mm [in]							FASTENING	
	A	B	C	D	E	F	G	n° 4 FASTENERS	TIGHTENING TORQUE
PR06SP	80 [3.15]	80 [3.15]	179 [7.05]	13 [0.51]	13 [0.51]	103 [4.05]	22 [0.87]	M12x40 [1/2 -13 UNC x 1 1/2"]	50.9 lb.ft
PR08SP	100 [3.94]	118 [4.64]	170 [6.69]	36 [1.42]	15 [0.59]	113 [4.45]	27 [1.06]	M16x50 [5/8 -11 UNC x 2"]	125.3 lb.ft
PR10SP	120 [4.72]	152 [5.98]	180 [7.09]	44 [1.73]	19 [0.74]	123 [4.84]	35 [1.38]	M18x60 [3/4 -10 UNC x 2.5"]	173.3 lb.ft

# OVERALL AND MOUNTING DIMENSIONS FOR PR\*SPU-1E & PR\*SPU-1D

Dimensions in mm [IN]



Hexagonal head main pressure adjustment screw:  
13 mm [1/2] wrench  
Clockwise rotation to increase pressure.

SIZE	DIMENSIONS mm [in]					
	A	B (AC COILS)	B (DC COILS)	C (AC COILS)	C (DC COILS)	D
06	200 [7.87]	166 [6.54]	181 [7.12]	45 [1.77]	55 [2.16]	190 [7.48]
08	210 [8.27]	157 [6.18]	172 [6.77]			200 [7.87]
10	220 [8.66]	168 [6.61]	183 [7.2]			210 [8.27]

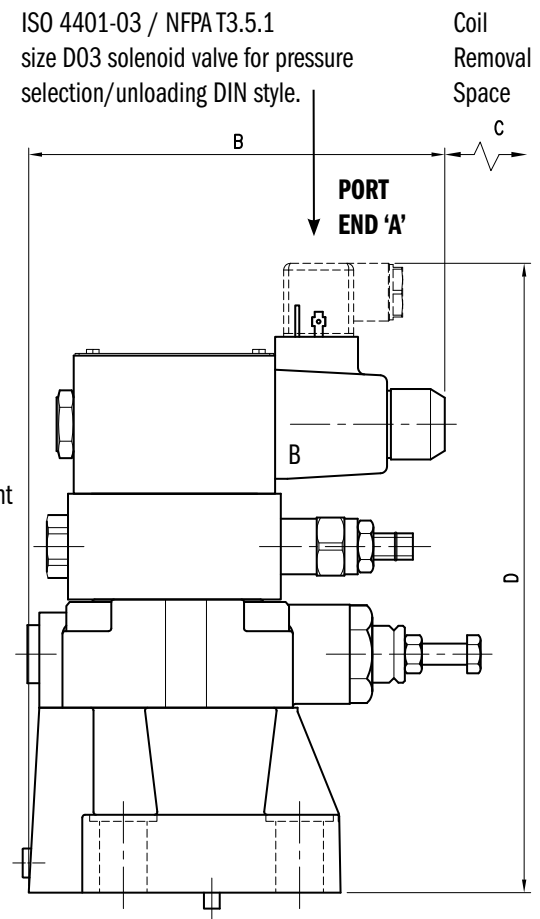
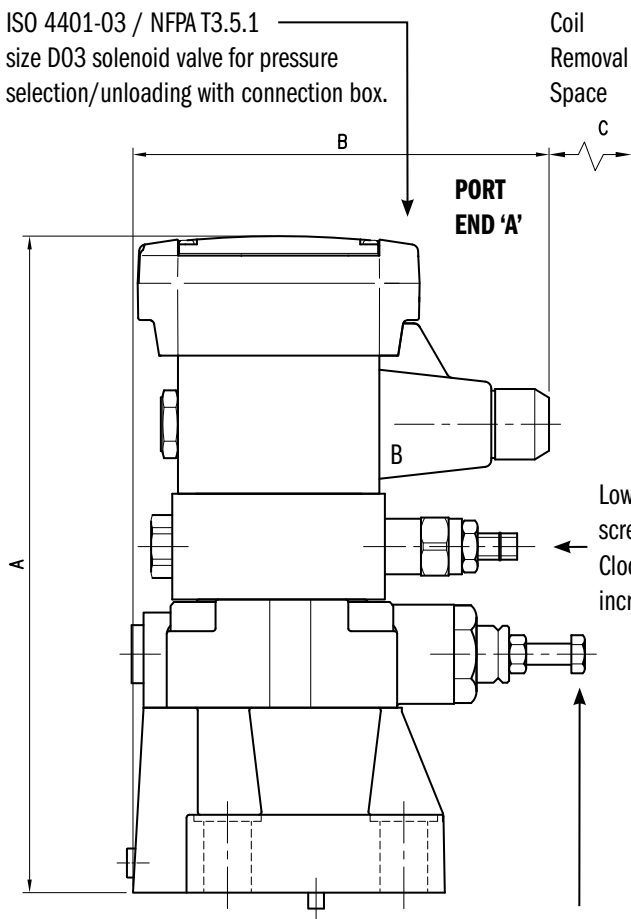
PR\*SP - PR\*SPU - PILOT OPERATED PRESSURE RELIEF VALVE SERIES

# OVERALL AND MOUNTING DIMENSIONS FOR PR\*SPU-2E

**NOTES:**

Dimensions in mm [IN]

1. Please refer to PR\*SP drawing for missing dimensions. See page 6.
2. Max pressure adjustment for low pressure stage:
  - PR06SPU: Max 1000 PSI (70 bar)
  - PR08SPU: Max 3000 PSI (210 bar)
  - PR10SPU: Max 4600 PSI (320 bar)



Hexagonal head high pressure adjustment screw:  
13 mm [1/2] wrench Clockwise rotation to increase pressure.

SIZE	DIMENSIONS mm [in]					
	A	B (AC COILS)	B (DC COILS)	C (AC COILS)	C (DC COILS)	D
06	240 [9.45]	166 [6.54]	181 [7.12]	45 [1.77]	55 [2.16]	230 [9.05]
08	250 [9.84]	157 [6.18]	172 [6.77]			240 [9.45]
10	260 [10.24]	168 [6.61]	183 [7.20]			250 [9.84]

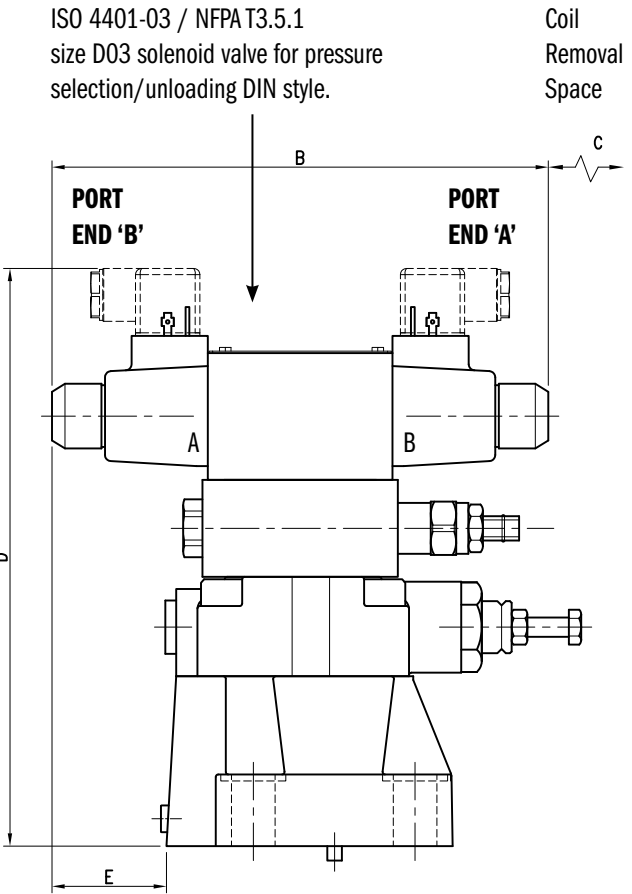
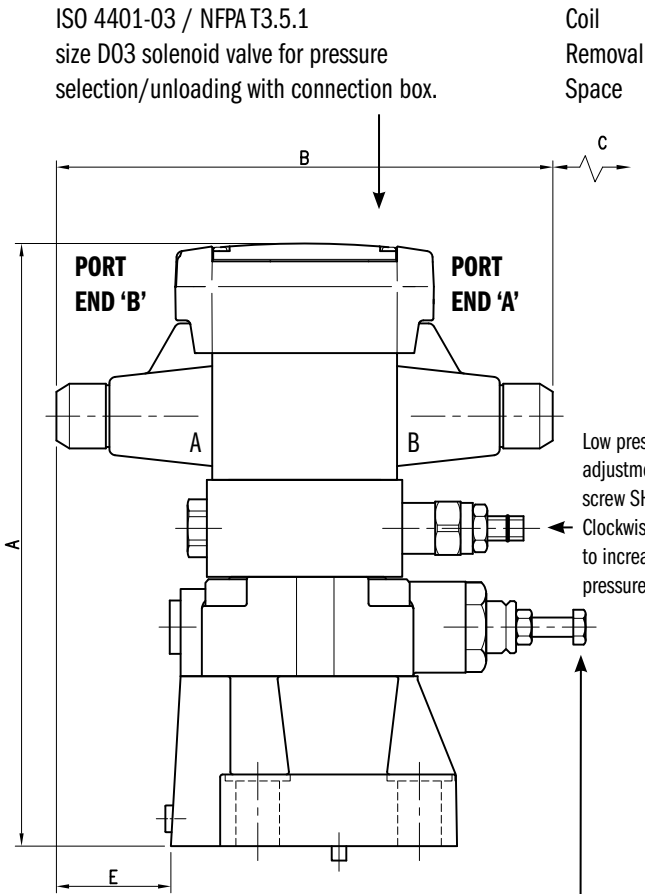


# OVERALL AND MOUNTING DIMENSIONS FOR PR\*SPU-2D

**NOTES:**

1. Please refer to PR\*SP drawing for missing dimensions. See page 6.
2. Max pressure adjustment for low pressure stage:  
 PR06SPU: Max 1000 PSI (70 bar)  
 PR08SPU: Max 3000 PSI (210 bar)  
 PR10SPU: Max 4600 PSI (320 bar)

Dimensions in mm [IN]



Hexagonal head high pressure adjustment screw:  
 13 mm [1/2] wrench Clockwise rotation to increase pressure.

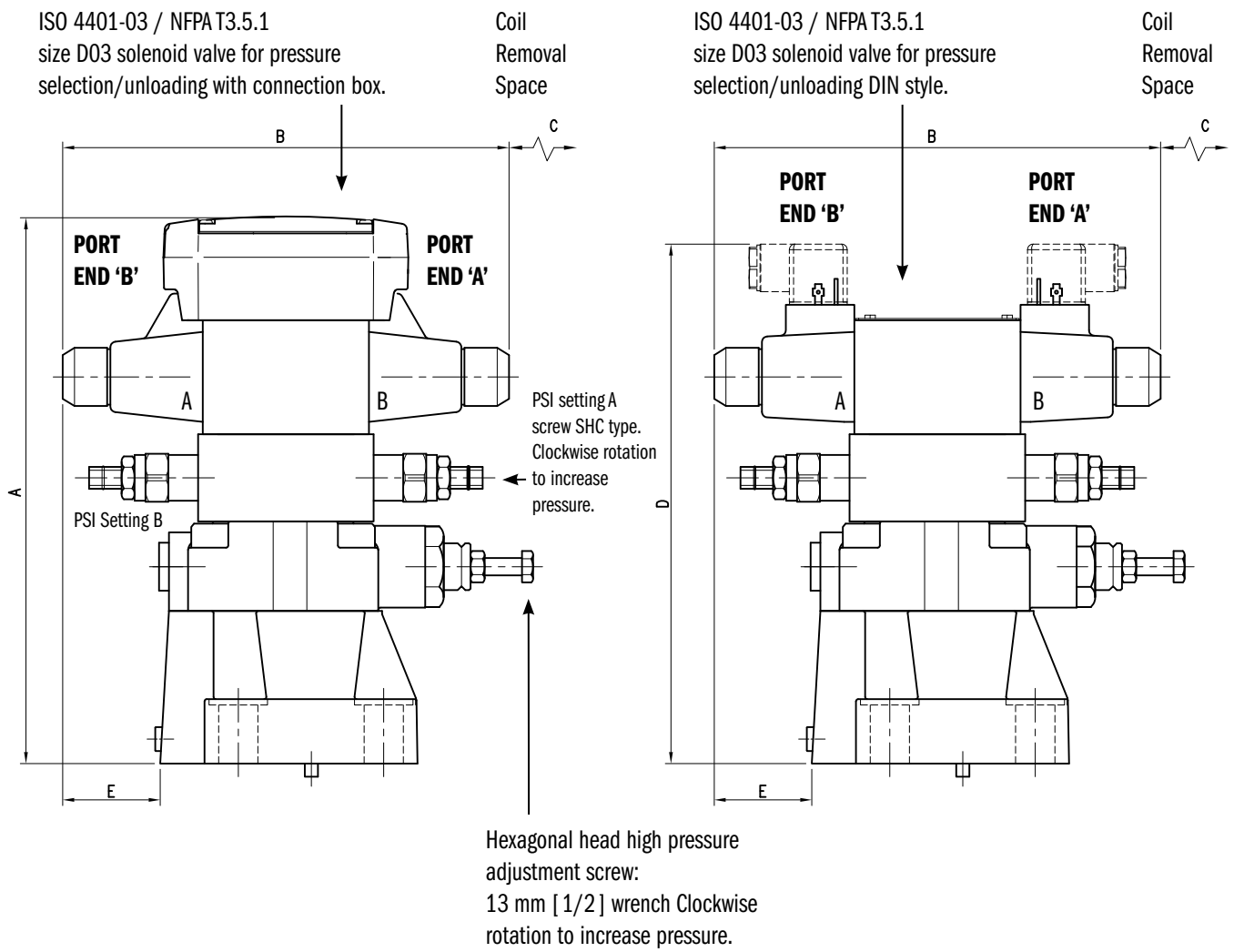
SIZE	DIMENSIONS mm [in]							
	A	B (AC COILS)	B (DC COILS)	C (AC COILS)	C (DC COILS)	D	E (AC COILS)	E (DC COILS)
06	240 [9.45]	166 [6.54]	181 [7.12]	45 [1.77]	55 [2.16]	230 [9.05]	38 [1.50]	53 [2.09]
08	250 [9.84]	157 [6.18]	172 [6.77]			240 [9.45]	47 [1.85]	62 [2.44]
10	260 [10.24]	168 [6.61]	183 [7.20]			250 [9.84]	36 [1.42]	51 [2.00]

# OVERALL AND MOUNTING DIMENSIONS FOR PR\*SPU-3D

**NOTES:**

Dimensions in mm [IN]

1. Please refer to PR\*SP drawing for missing dimensions. See page 6.
2. Max pressure adjustment for low pressure stage:  
 PR06SPU: Max 1000 PSI (70 bar)  
 PR08SPU: Max 3000 PSI (210 bar)  
 PR10SPU: Max 4600 PSI (320 bar)



SIZE	DIMENSIONS mm [in]							
	A	B (AC COILS)	B (DC COILS)	C (AC COILS)	C (DC COILS)	D	E (AC COILS)	E (DC COILS)
06	240 [9.45]	203 [8.01]	234 [9.22]	45 [1.77]	55 [2.16]	230 [9.05]	38 [1.50]	53 [2.09]
08	250 [9.84]					240 [9.45]	47 [1.85]	62 [2.44]
10	260 [10.24]					250 [9.84]	36 [1.42]	51 [2.00]

# ELECTRICAL CHARACTERISTICS

Valves are available with electrical connection box or with DIN style coils.

The basic wiring box (code B) includes a terminal strip and lights. There is a 1/2 NPT connection for conduit.

## CONNECTION BOX OPTIONS

To simplify the connections and prevent wiring mistakes, we offer the option of connection boxes with quick connect pin receptacles, already wired.

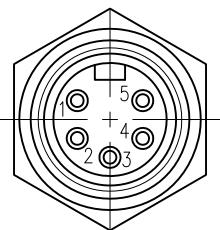
Valves are available with receptacles on port-end 'A' or 'B' (see dimensional drawings) and several connector styles.

Below are the codes to be included in the box 'option' of the ordering code, depending on the version you choose.

Wiring diagrams at right show the standard connections for 3-pin, 4-pin and 5-pin connectors. The commercially available mating "female" connectors are not included.

CODE	PIN	SHAPE	PORT END	NOTES
5A	5	Male Mini	A	Single and Dual Solenoid
5H	5		B	
3A	3	Male Mini	A	Single Solenoid Only
3H	3		B	
4A	4	Male Micro	A	For DC Current Only. Different Wiring. See Schematics.
D4A	4		A	
4	4		B	
D4	4		B	

For more detailed information about the pilot valve, please refer to Continental Hydraulics VSD03M literature.

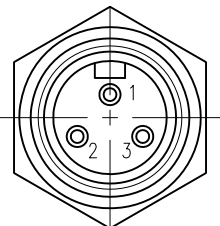


### 5 PIN RECEPTACLE

Male mini receptacles conform to NFPA/T3.5.29 R1 - 2007 used with single or double solenoid valve.

26 mm [1"] Wrench

1	Lead to Solenoid B
2	Lead to Solenoid A
3	Ground Lead (Green)
4	Lead to Solenoid A
5	Lead to Solenoid B

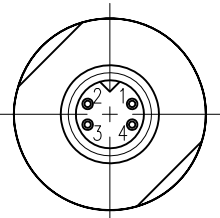


### 3 PIN RECEPTACLE

Male mini receptacles conform to NFPA/T3.5.29 R1 - 2007 used with single solenoid valve.

26 mm [1"] Wrench

1	Ground Lead (Green)
2	Lead to Solenoid
3	Lead to Solenoid



### 4 PIN RECEPTACLE

Male micro receptacles (M12x1 thread) used with DC valve only.

23 mm [7/8] Wrench

4A & 4		
1	Brown	Lead to Solenoid A
2	White	No Connection
3	Blue	Common Lead to Sol. A & B
4	Black	Lead to Solenoid B

D4A & D4		
1	Brown	No Connection
2	White	Lead to Solenoid A
3	Blue	Common Lead to Sol. A & B
4	Black	Lead to Solenoid B

## SOLENOIDS

Listed below are the types of solenoids available and the numbers to be added in the solenoid box on page 3.

### PLUG-IN TERMINAL SOLENOID

This solenoid has three terminal posts. Use bipolar connectors that meet ISO 4400 / DIN 43650 (EN 175301-803).

Connectors must be ordered separately.

### CONNECTION BOX SOLENOIDS

This is a two pin solenoid which connects to the circuit board. Wiring is done on the terminal strip inside the box.

DIN CONNECTION CODE	BOX CONNECTION CODE	VOLTAGE & FREQUENCY [VOLT - HERTZ]	VOLTAGE LIMITS [MIN - MAX]	RESISTANCE $\pm 10\%$ [OHM]	INRUSH CURRENT [A]	HOLDING CURRENT [A]	HOLDING POWER [W]
33	60	120 - 60 110 - 50	108 - 126 99 - 116	35.71	2.1	0.46 0.53	22 23
34	61	240 - 60 220 - 50	216 - 252 198 - 231	146.41	1.1	0.23 0.26	22 23
Not Available	68	120 - 60 110 - 50	108 - 132 99 - 121	75.8	0.72 0.74	0.22 0.24	10 10
42	70	24 V DC	21 - 26	19.2	1.25	1.25	30
44	75	12 V DC	10 - 13	4.8	2.5	2.5	30

# MOUNTING SURFACES

All the mounting surfaces refer to ISO 6264:1998 and NFPA T3.5.1 R2-2002 standards.

The mounting surface standards recommend metric coarse threads. However, subplates are commercially available with UNC threads. Select a bolt size that matches the threads in the mounting surface.

Dimensional tolerances are  $\pm 0.1$  mm (0.004") for bolt and pin location;  $\pm 0.2$  mm (0.008") for the other quotes.

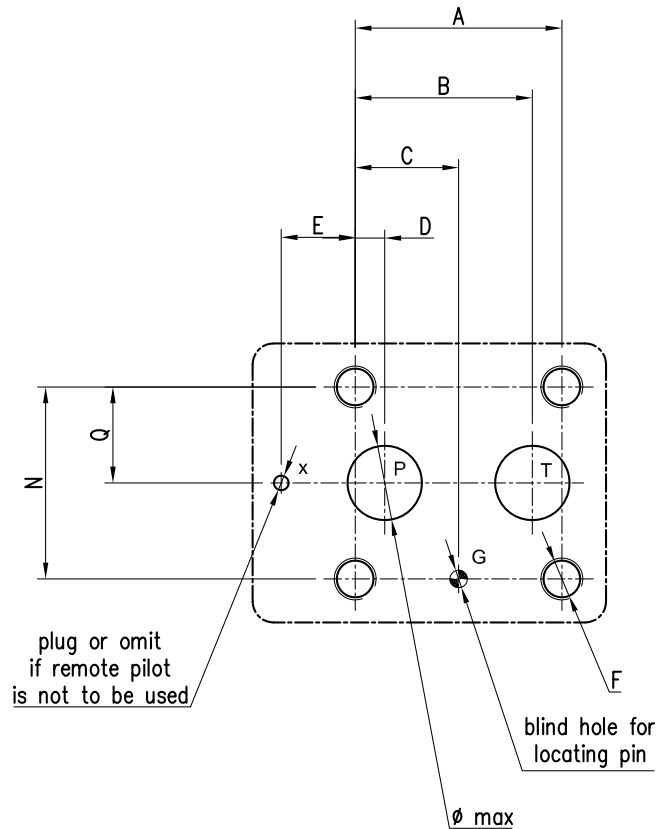
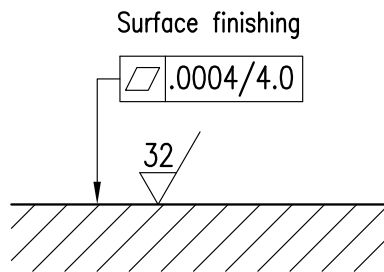
The minimum depth of the blind hole G is 8 mm (0.31 in).

### PORT FUNCTION:

P = Pressure inlet

T = Outlet to reservoir

X = Remote pilot control port



VALVE SIZE	MOUNTING SURFACE		DIMENSIONS mm [in]						
	NFPA	ISO	A	B	C	D	E	N	Q
06	R06	6264-06-09-0-97	53.8 [2.12]	47.5 [1.87]	22.1 [0.87]	22.1 [0.87]	0	53.8 [2.12]	26.9 [1.06]
08	R08	6264-08-13-0-97	66.7 [2.63]	55.6 [2.19]	33.4 [1.31]	11.1 [0.44]	23.8 [0.94]	70 [2.75]	35 [1.38]
10	R10	6264-10-17-0-97	88.9 [3.50]	76.2 [3.00]	44.5 [1.75]	12.7 [.50]	31.8 [1.25]	82.6 [3.25]	41.3 [1.63]

VALVE SIZE	MOUNTING SURFACE		DIMENSIONS mm [in]					F
	NFPA	ISO	$\emptyset_p$ max	$\emptyset_t$ max	$\emptyset_x$	$\emptyset_g$		
06	R06	6264-06-09-0-97	14.7 [0.58]	14.7 [0.58]	4.8 [0.19]	7.5 [0.295]	M12x40 [ 1/2 - 13 UNC x 1 1/2"]	
08	R08	6264-08-13-0-97	23.4 [0.92]	23.4 [0.92]	6.3 [0.25]	7.5 [0.295]	M16x50 [ 5/8 - 11 UNC x 2"]	
10	R10	6264-10-17-0-97	32 [1.26]	32 [1.26]	6.3 [0.25]	7.5 [0.295]	M18x60 [ 3/4 - 10 UNC x 2.5"]	

# APPLICATION DATA

## FLUIDS

All pressure drops shown on these data pages are based on 170 SUS fluid viscosity and 0.87 specific gravity. For any other specific gravity (G1) the pressure drop ( $\Delta P$ ) will be approx.  $\Delta P_1 = \Delta P (G1/G)$ . See the chart for other viscosities.

<b>FLUID VISCOSITIES</b>	Cst	10	14.5	32	36	43	54	65	76	86	108	216	324	400
	SUS	60	75	150	170	200	250	300	350	400	500	1000	1500	1900
<b>MULTIPLIER</b>		0.77	0.81	0.97	1.00	1.04	1.10	1.15	1.20	1.24	1.31	1.56	1.72	1.83

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code G). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 180 °F causes the accelerated degradation of seals as well as degradation of the fluids physical and chemical properties.

From a safety standpoint, temperatures above 130 degrees F are not recommended.

<b>RANGE TEMPERATURES:</b>	Ambient	-4 to +130 °F	-20 to +54 °C
	Fluid	-4 to +180 °F	-20 to +82 °C
<b>FLUID VISCOSITY</b>	Range	60 -1900 SUS	10 - 400 cSt
	Recommended	120 SUS	25 cSt
<b>FLUID CONTAMINATION</b>		ISO 4406:1999 Class 20/18/15	

## SEAL KIT FOR PR\*SP

	<b>PR06SP</b>	<b>PR08SP</b>	<b>PR10SP</b>
<b>Buna Seal Kit</b>	1013212	1013214	1013216
<b>Viton Seal Kit</b>	1013213	1013215	1013217

## SEAL KIT FOR PR\*SPU

	<b>PR06SPU</b>	<b>PR08SPU</b>	<b>PR10SPU</b>
<b>Buna Seal Kit</b>	1013218	1013220	1013222
<b>Viton Seal Kit</b>	1013219	1013221	1013223

**BOLT KITS**

<b>PR06</b>	BR06-175	1/2-13 UNC x 1 1/2"	1013240
<b>PR08</b>	BR08-200	5/8-11 UNC x 2"	1013241
<b>PR10</b>	BR10-250	3/4-10 UNC x 2.5"	1013242

**NOTES:**

Bolt Kits consist of Qty 4 bolts and Qty 4 Lock washers

**SUBPLATES**

<b>PR06 SIZE</b>	AR06SPS12S	Aluminum	SAE-12	1013128AB
	DR06SPS12S	Ductile	SAE-12	1013128AC
<b>PR08 SIZE</b>	AR08SPS16S	Aluminum	SAE-16	1013128AD
	DR08SPS16S	Ductile	SAE-16	1013128AE
<b>PR10 SIZE</b>	AR10SPS24S	Aluminum	SAE-24	1013128AF
	DR10SPS24S	Ductile	SAE-24	1013128AG

**NOTES:**

1. Max pressure for aluminum subplates: 3000 psi (210 bar)
2. Max pressure for ductile subplates: 5000 psi (350 bar)
3. Always verify subplate port size is proper for the application

POWERFUL  
ACCURATE  
INNOVATIVE  
PRECISE  
DURABLE  
EFFICIENT  
VERSATILE

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