CONTINENTAL HYDRAULICS

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PR*W - PR*WU

PILOT OPERATED PRESSURE RELIEF VALVE SERIES - IN-LINE MOUNTING

4895 12th Avenue East, Shakopee, MN 55379 / continentalhydraulics.com / 952-895-6400

PR*W - PR*WU

PILOT OPERATED PRESSURE RELIEF VALVE SERIES - IN-LINE MOUNTING

DESCRIPTION

PR*W valves are pilot operated pressure relief valves, for in-line mounting with SAE straight threads. Available in two 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.

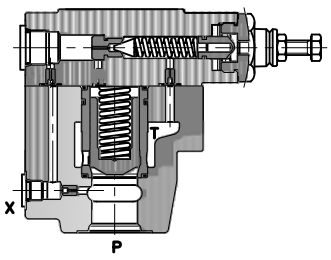
In addition, two or three setting selectable pressures are realized by adding a modular relief valve between the pilot stage and the solenoid valve.

TYPICAL PERFORMANCE SPECIFICATIONS

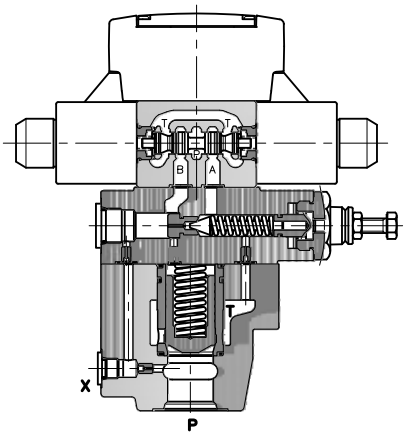
MAXIMUM OPERATING PRESSURE		5000 psi	350 bar
MAXIMUM FLOW RATE	PR16	66 gpm	250 l/min
	PR24	105 gpm	400 l/min
PORT SIZE	PR16	SAE 16 - 1 5/16 -12 UN	
	PR24	SAE 24 - 1 7/8 -12 UN	
MAX WEIGHT	PR16	16.5 lbs	7.5 kg
	PR24	23.1 lbs	10.5 kg

AVAILABLE VERSIONS

PR*W



PR*WU



IDENTIFICATION CODE FOR VALVE WITHOUT UNLOADING

PR ☐ W - ☐ - ☐ ☐ - ☐ — DESIGN LETTER

SIZE	
16	SAE 16 (ND 32)
24	SAE 24 (ND 45)

In-Line Mounting

PRESSURE RANGE	
70	up to 70 bar (1000 psi)
210	up to 210 bar (3000 psi)
350	up to 350 bar (5000 psi)

SEAL	
A	Buna (STD)
G	Viton

MECHANICAL ADJUSTMENT	
S	Screw (STD)
K	Knob

TYPICAL ORDERING CODE:
PR24W-210-AS-A

IDENTIFICATION CODE FOR VALVE WITH UNLOADING

PR ☐ WU - ☐ - ☐ ☐ ☐ ☐ - ☐ ☐ ☐ L - ☐ — DESIGN LETTER

SIZE	
16	SAE 16 (ND 32)
24	SAE 24 (ND 45)

In-Line Mounting

With unloading and pressure selection

PRESSURE RANGE	
70	up to 70 bar (1000 psi)
210	up to 210 bar (3000 psi)
350	up to 350 bar (5000 psi)

SEAL	
A	Buna (STD)
G	Viton

PRESSURE SELECTION	
1	1 Stage
2	2 Stages
3	3 Stages (Operating D only)

OPERATING	
E	Energized solenoid
D	De-energized solenoid

MECHANICAL ADJUSTMENT	
S	Screw (STD)
K	Knob

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

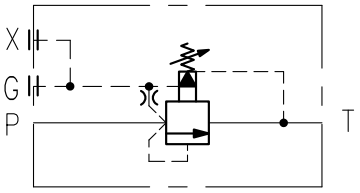
SOLENOIDS
See the codes on page 12

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

TYPICAL ORDERING CODE:
WITH CONNECTION BOX
PR24WU-210-A1DS-B5A-60L-A
WITH PLUG-IN SOLENOID
PR24WU-210-A1DS-33L-A

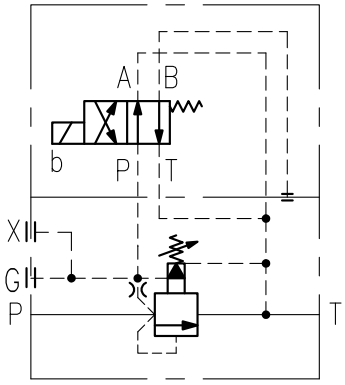
SYMBOLS AND OPERATION

PR*W



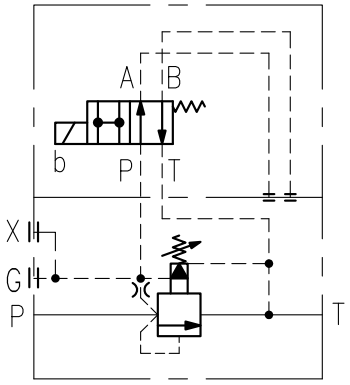
Pressure relief

PR*WU 1D



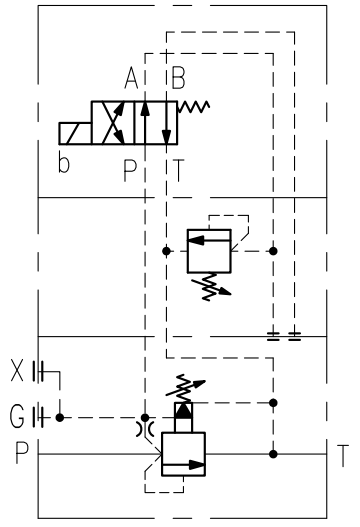
Pressure Relief, normally unloading, energize to high pressure

PR*WU 1E



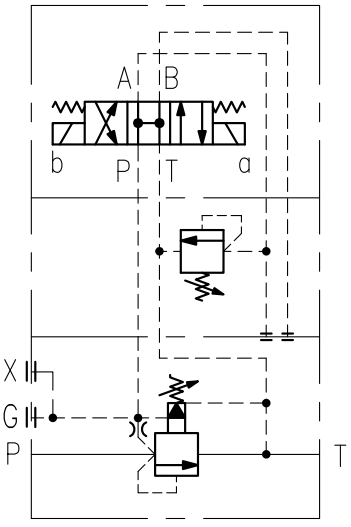
Pressure Relief, normally high pressure, energize to unload

PR*WU 2E



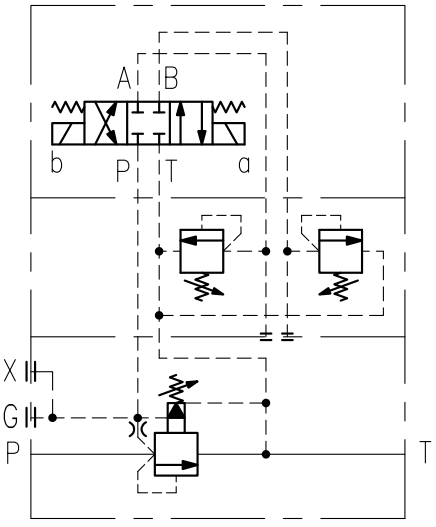
Pressure Relief, 2 pressure, normally low pressure, energize for high pressure

PR*WU 2D



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

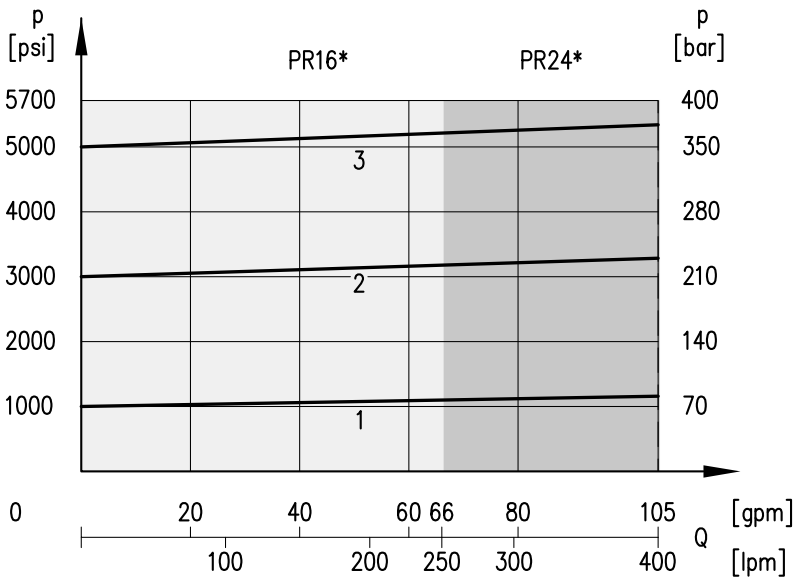
PR*WU 3D



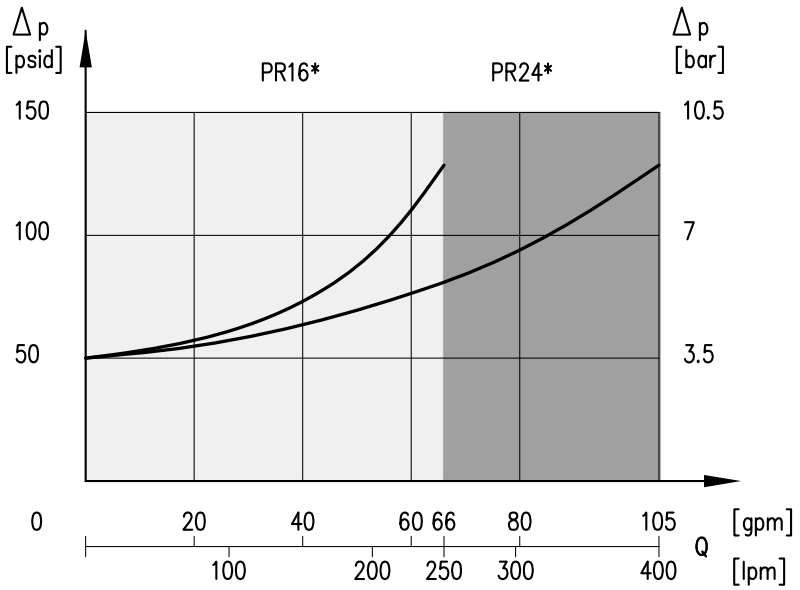
Pressure Relief, 3 pressure, normally highest pressure, energize A solenoid for pressure setting A energize B solenoid for pressure setting B

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)

OVERALL AND MOUNTING DIMENSIONS FOR PR*W

PORTS:

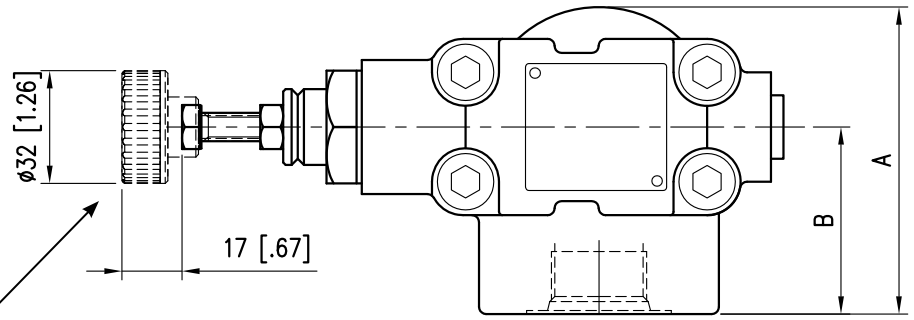
Dimensions in mm [IN]

PRESSURE: P
PR16W: SAE 16 1 5/16 -12 UN
PR24W: SAE 24 1 7/8 -12 UN

OUTLET: T
PR16W: SAE 16 1 5/16 -12 UN
PR24W: SAE 24 1 7/8 -12 UN

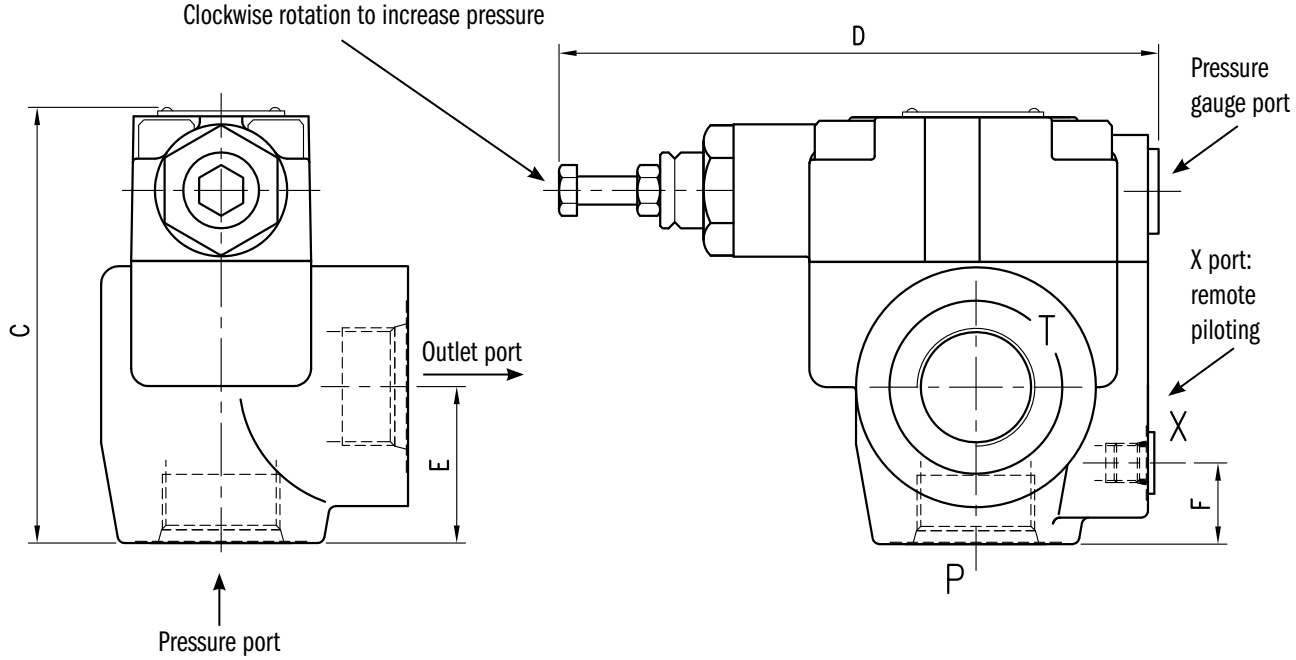
REMOTE PILOTING: X
SAE 4 7/16 - 20 UNF

PRESSURE GAUGE PORT: M
SAE 8 3/4 - 16 UNF



Knob version (code K) Clockwise rotation to increase pressure

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



VALVE	DIMENSIONS mm [in]					
	A	B	C	D	E	F
PR16W	87 [3.42]	53 [2.09]	124 [4.88]	170 [6.69]	44 [1.73]	23 [0.9]
PR24W	110 [4.33]	68 [2.68]	146 [5.75]	170 [6.69]	59.5 [2.34]	43 [1.69]

OVERALL AND MOUNTING DIMENSIONS FOR PR*WU-1E & PR*WU-1D

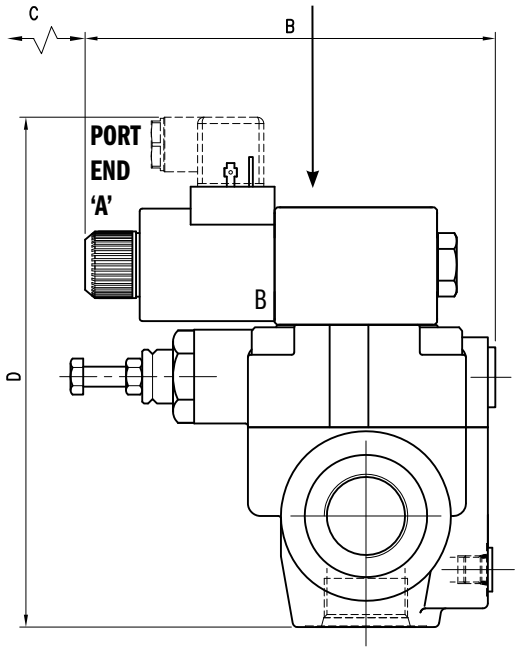
NOTES:

Dimensions in mm [IN]

Please refer to PR*W drawing for missing dimensions. See page 6.

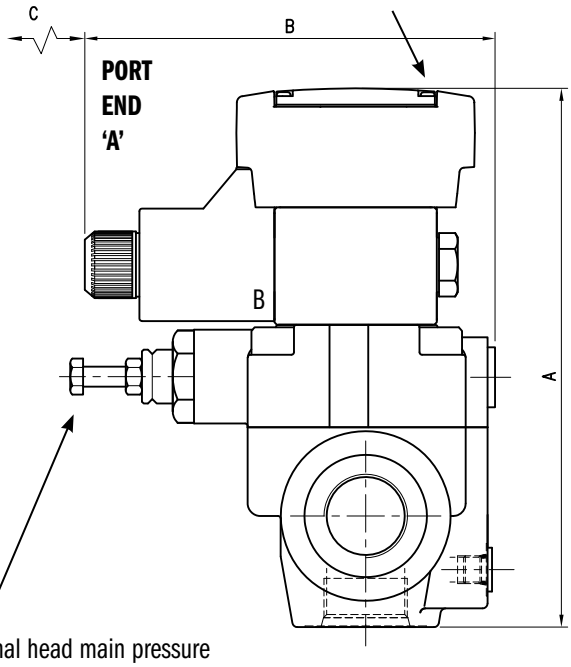
Coil Removal Space

ISO 4401-03 / NFPA T3.5.1 size D03 solenoid valve for pressure selection / unloading DIN style



Coil Removal Space

ISO 4401-03 / NFPA T3.5.1 size D03 solenoid valve for pressure selection / unloading with connection box



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
16	216 [8.5]	155 [6.1]	165 [6.5]	45 [1.77]	55 [2.16]	205 [8.07]
24	238 [9.37]					227 [8.94]

OVERALL AND MOUNTING DIMENSIONS FOR PR*WU-2E

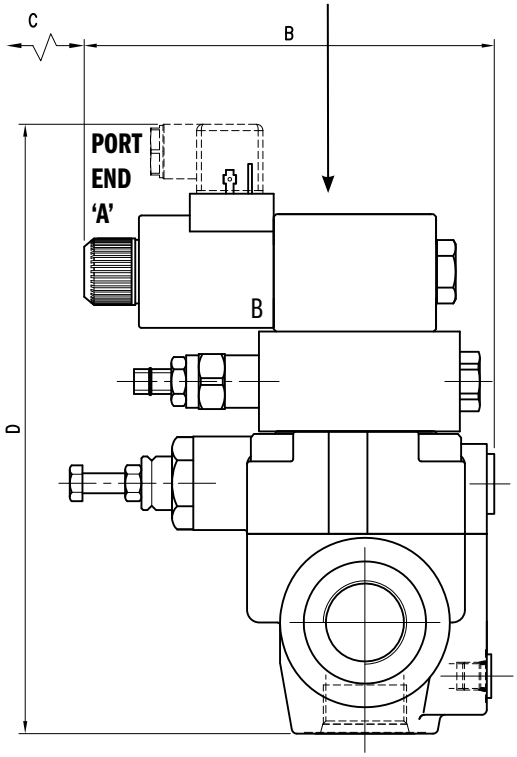
NOTES:

Dimensions in mm [IN]

1. Please refer to PR*W drawing for missing dimensions. See page 6.
2. Max pressure adjustment for second pressure stage:
   PR16WU: max 1000 PSI (70 bar)
   PR24WU: max 3000 PSI (210 bar)

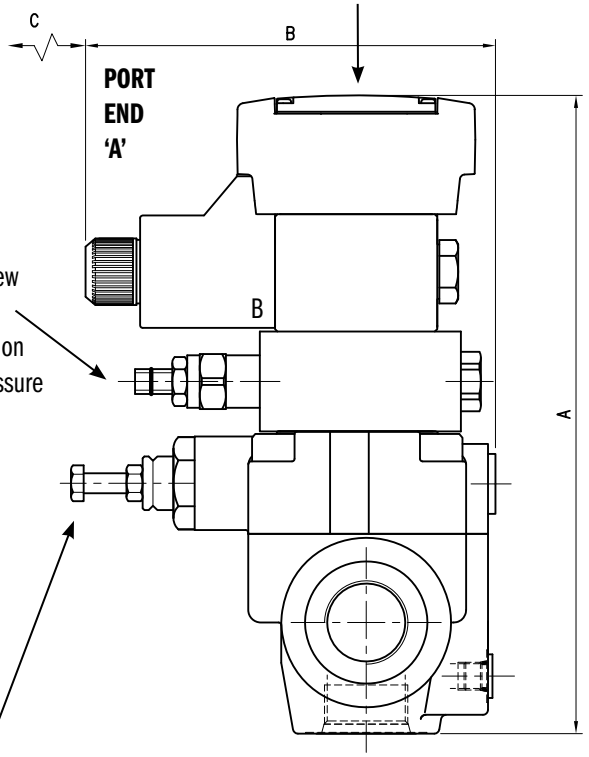
Coil Removal Space

ISO 4401-03 / NFPA T3.5.1 size D03 solenoid valve for pressure selection / unloading DIN style



Coil Removal Space

ISO 4401-03 / NFPA T3.5.1 size D03 solenoid valve for pressure selection / unloading with connection box



Low pressure adjustment screw SHC type: Clockwise rotation to increase pressure

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

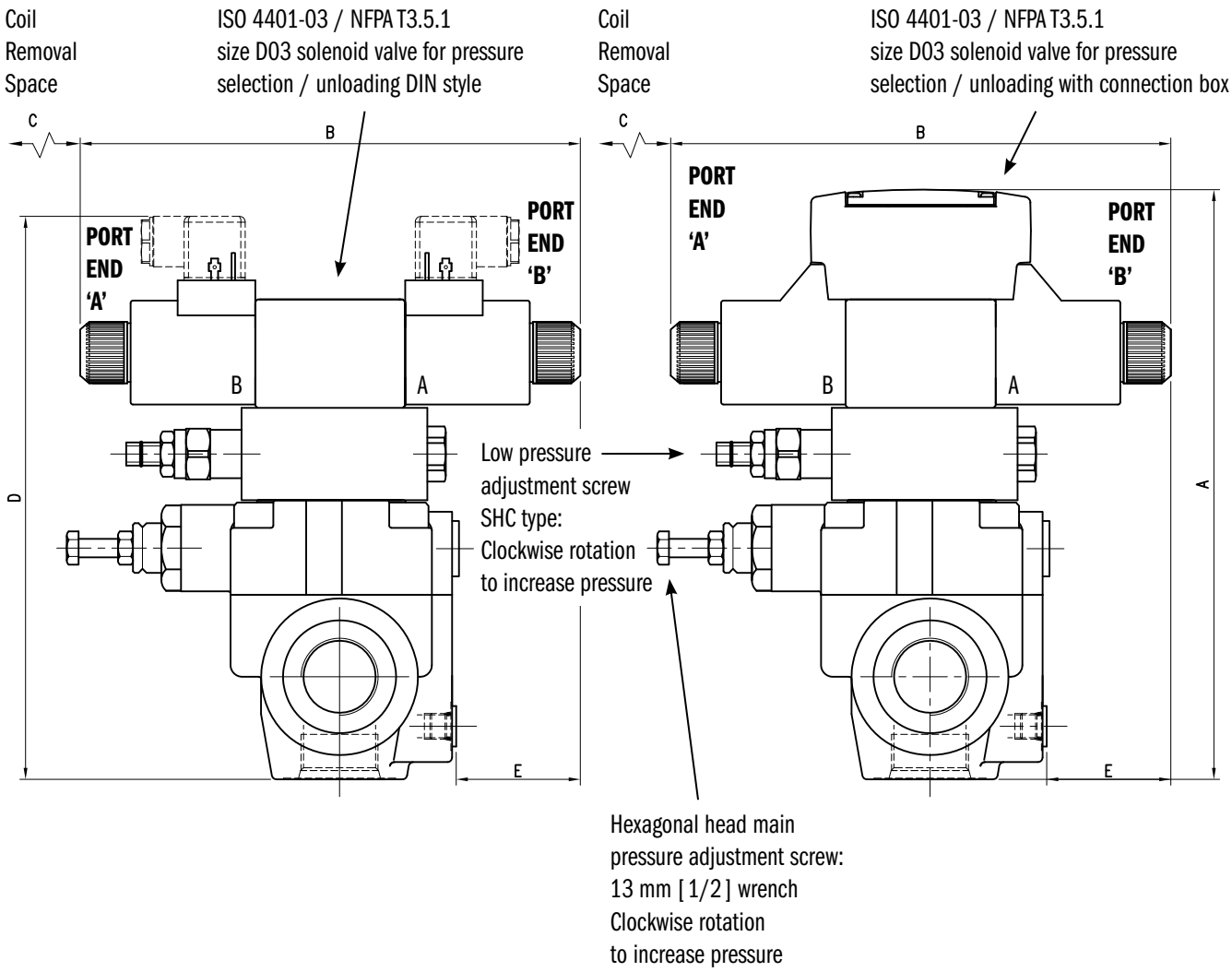
SIZE	DIMENSIONS mm [in]					
	A	B (AC COILS)	B (DC COILS)	C (AC COILS)	C (DC COILS)	D
16	256 [10.08]	155 [6.1]	165 [6.5]	45 [1.77]	55 [2.16]	245 [9.64]
24	278 [10.94]					267 [10.51]

OVERALL AND MOUNTING DIMENSIONS FOR PR*WU-2D

NOTES:

Dimensions in mm [IN]

1. Please refer to PR*W drawing for missing dimensions. See page 6.
2. Max pressure adjustment for second pressure stage:
   PR16WU: max 1000 PSI (70 bar)
   PR24WU: max 3000 PSI (210 bar)



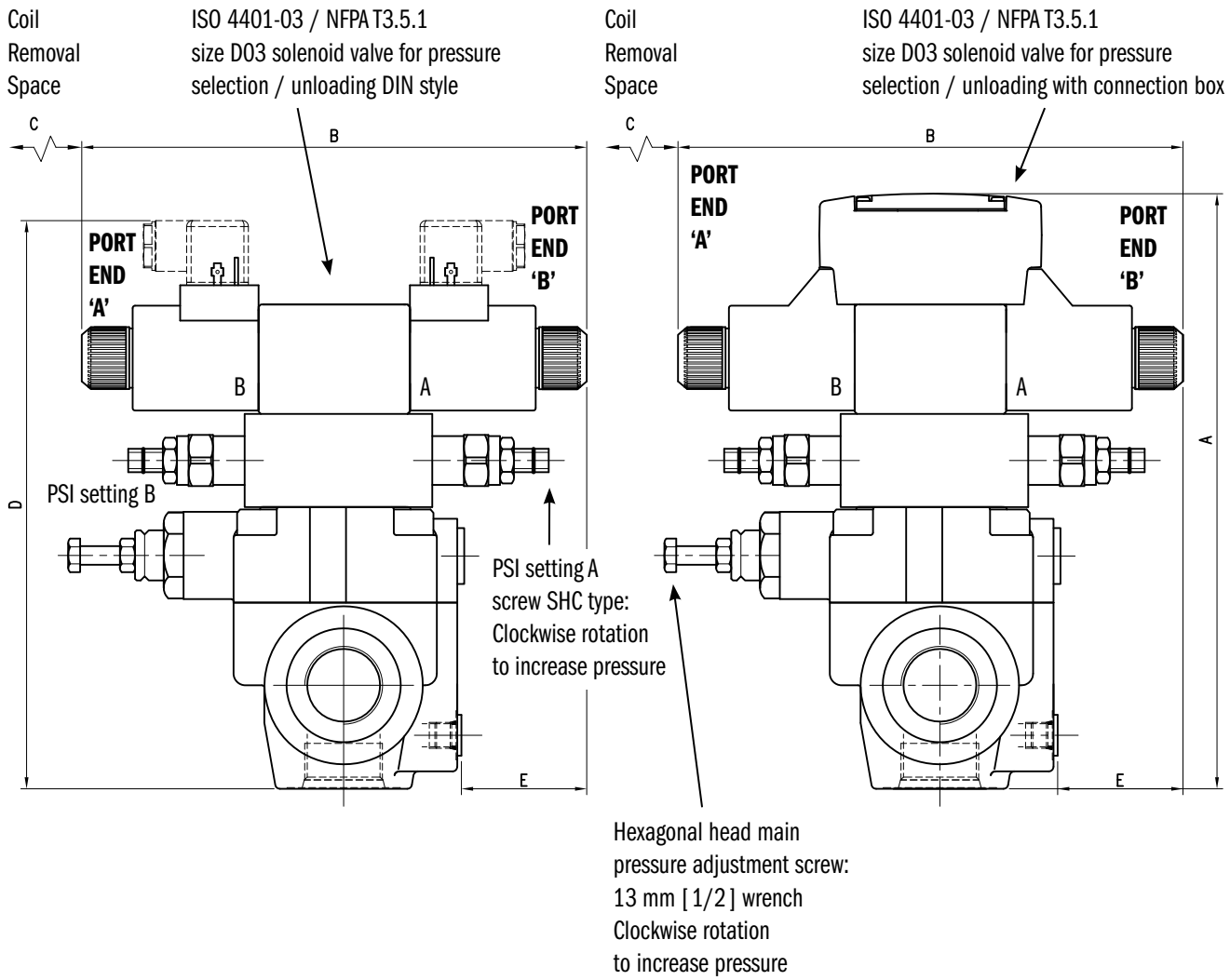
SIZE	DIMENSIONS mm [in]							
	A	B (AC COILS)	B (DC COILS)	C (AC COILS)	C (DC COILS)	D	E (AC COILS)	E (DC COILS)
16	256 [10.08]	197 [7.76]	217 [7.12]	45 [2.31]	55 [2.16]	245 [9.64]	44 [1.73]	54 [2.12]
24	278 [10.94]					267 [10.51]		

OVERALL AND MOUNTING DIMENSIONS FOR PR*WU-3D

NOTES:

Dimensions in mm [IN]

1. Please refer to PR*W drawing for missing dimensions. See page 6.
2. Max pressure adjustment for second pressure stage:
   PR16WU: max 1000 PSI (70 bar)
   PR24WU: max 3000 PSI (210 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)
16	256 [10.08]	197 [7.76]	217 [7.12]	45 [2.31]	55 [2.16]	245 [9.64]	44 [1.73]	54 [2.12]
24	278 [10.94]					267 [10.51]		

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.

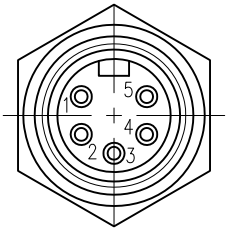
Valves are available with receptacles on port-end 'A' or 'B' (see dimensional drawings) and several connector styles.

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.

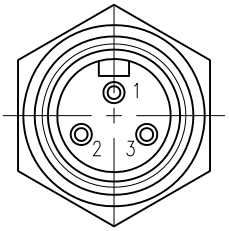


5 PIN RECEPTACLE

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 (Greem)
4	Lead to Solenoid A
5	Lead to Solenoid B

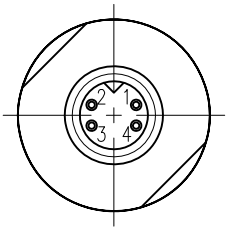


3 PIN RECEPTACLE

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 Solendoid 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 Solendoid 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 ±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

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 (ΔP) will be approx. ΔP1 = ΔP (G1/G). See the chart for other viscosities.

FLUID VISCOSITIES	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
MULTIPIER		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 degrees 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.

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

SEAL KIT FOR PR*W AND PR*WU

Buna Seal Kit	1013244
Viton Seal Kit	1013245

ABOUT CONTINENTAL HYDRAULICS

Rugged, durable, high-performance, efficient—the reason Continental Hydraulics' products are used in some of the most challenging applications across the globe. With a commitment to quality customer support and innovative engineering, Continental's pumps, valves, power units, mobile and custom products deliver what the markets demand. Continental has been serving the food production, brick and block, wood products, automotive and machine tool industries since 1962. Learn how our products survive some of the most harsh environments.

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