GENERAL PUMP *A member of the Interpump Group*

Industrial PN4S-450

Pneumatically-Operated Pressure Regulator

INDUSTRIAL

FEATURES

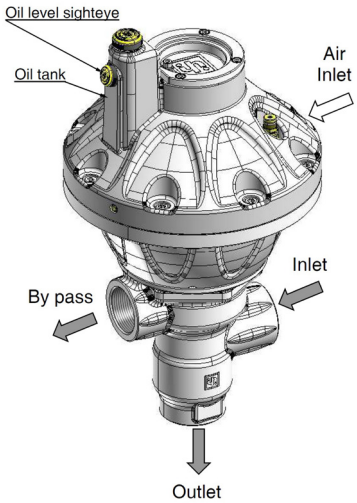
- Allows remote control of the water pressure.
- Allows off-load start up.
- When there is no air pressure water flows through the by-pass without pressure.
- No discharge leakage in bypass.
- Suitable for controlling several units at the same time,

SPECIFICATIONS

Part Number		**PN4S-450**
Max Volume		68.7 GPM
Max Pressure		6,530 PSI
Max Fluid Temperature		140º F
Inlet Port Thread		1” BSP-F
Discharge Port Thread		1” BSP-F
Bypass Port		1-1/4” BSP-F
Air Inlet Port		1/4” BSP-F
Max Air Pressure		101 PSI
Air Consumption		28 n/liter/min
Oil Capacity - oz / (Liters)		8.5 / (.25) Hydraulic
Weight		35.3 lbs
Materials	**Upper Body:**	Aluminum Alloy
	Lower Body:	SPR600 Cast Iorn
	Valve & Valve Seat:	Stellite® Coated AISI 420 SS

Specifications are subject to change without notice.

INSTALLATION DIAGRAMS



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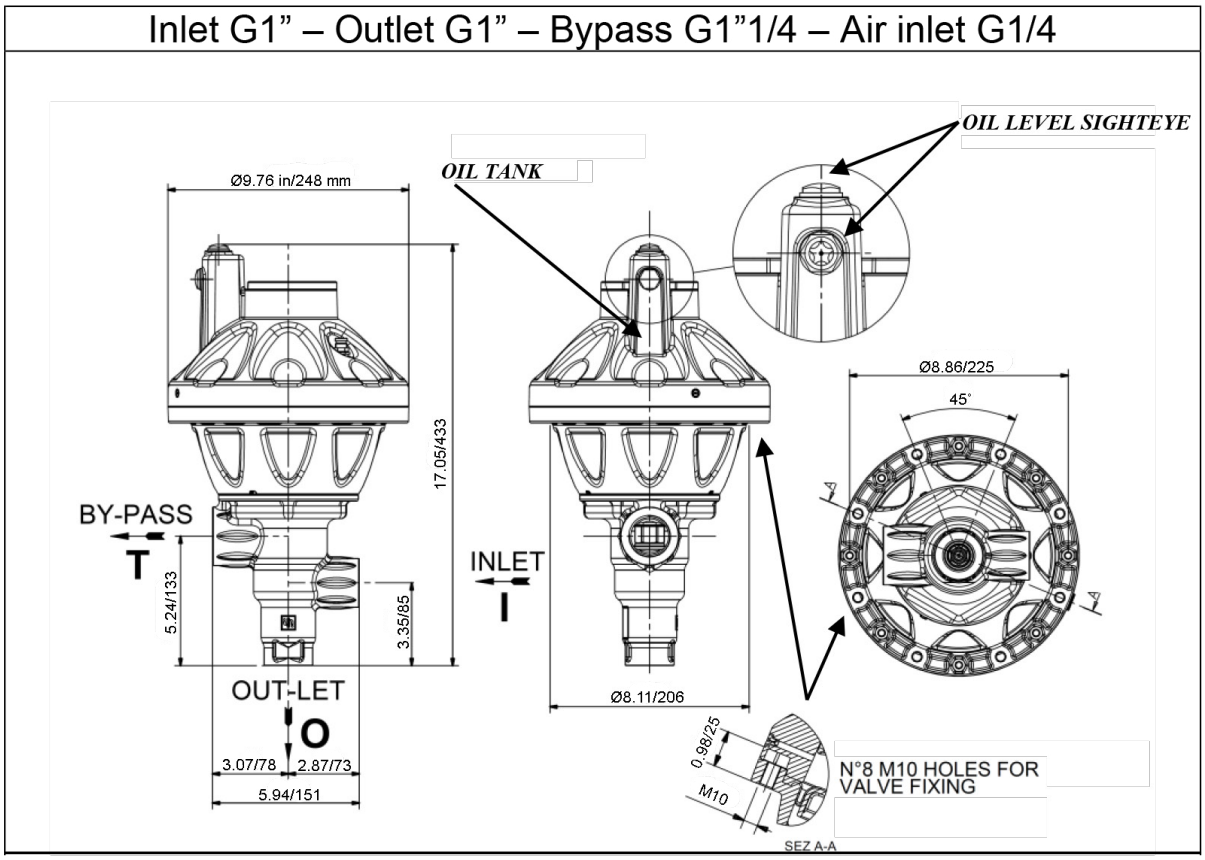
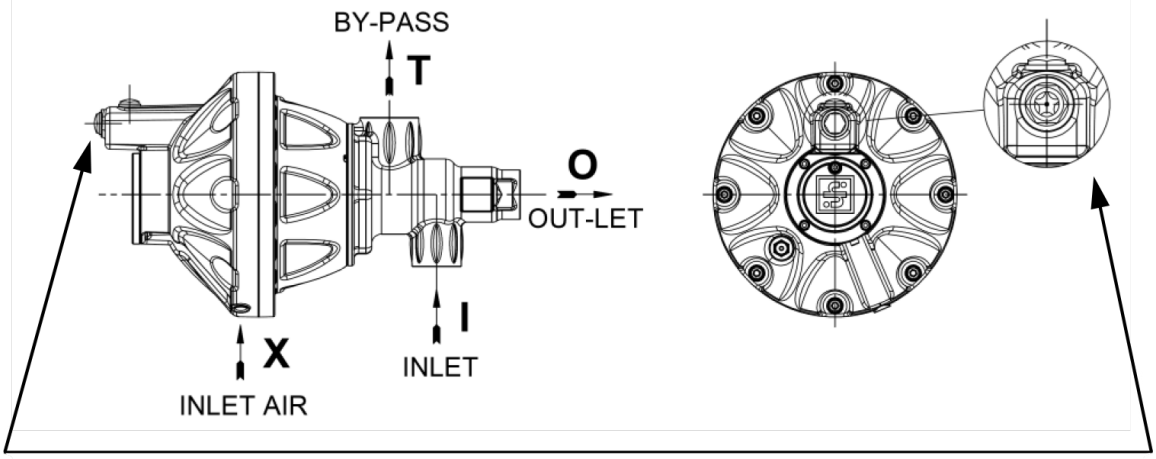
DIMENSIONS



Horizontal Installation



WARNING: The tank must always be oriented upwards. Make sure that the oil level is half the peephole.
WARNING: For other installation methods please contact GP’s Customer Service.

PN4S-450

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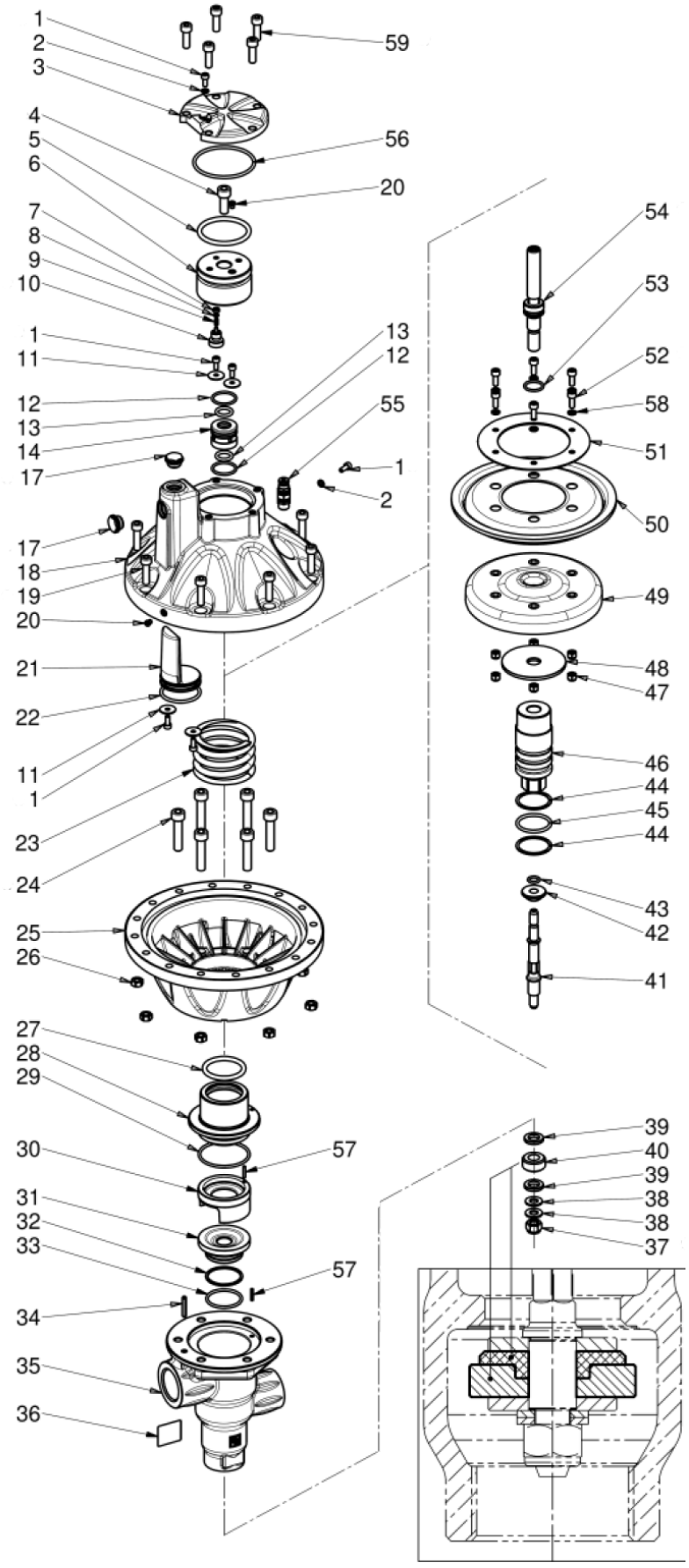
PARTS LIST

No.	Part No.	Description	QTY
1	F99153700	Screw, TCEI M5 x 12	10
2*	F96687500	Washer, Ø5 x 9 x 1.5 AL.	4
3	F36026705	Cover	4
4	F99367100	Screw, TCEI M10 x 25	1
5*	F90446000	O-ring, Ø56.52 x 5.34	1
6	F36015062	Piston	1
7*	F36014655	Valve Seat Piston	1
8*	F36014555	Valve Plate	1
9*	F94730750	Spring, Ø0.4 x 11	1
10	F36016555	Spring Guide	1
11	F96692000	Washer, Ø5.5 x 20 x 1.5	4
12*	F90386100	O-ring, Ø26.65 x 2.62	2
13*	F90403500	O-ring, Ø15.47 x 3.53	2
14	F36016470	Guide Bushing	1
17	F97593000	Sight Glass	1
18	F36026822	Upper Body	1
19	F99308400	Screw, TCEI Ø8 x 30	8
20	F98642000	Jet Ø0.4	1
21	F36349622	Closing Plug	1
22*	F90407700	O-ring, Ø44.45 x 3.53	1
23	F94776000	Spring, Ø0.69 x 80	1
24	F99372000	Screw, TCEI M10 x 45	6
25	F36015322	Lower Body	1
26	F92222300	Nut, M8-8	8
27*	F90445000	O-ring, Ø43.82 x 5.34	1
28	F36015756	Jacket	1
29*	F90398000	O-ring, Ø59 x 3	1
30	F36015805	Intermediate Ring	1
31	F36016156	Valve Seat	1
32*	F90523000	Spiralback Ring 40.8 x 46 x 1.5	1
33*	F90397300	O-ring, Ø40 x 3	1
34	F97675000	Spiral Pin	1
35	F36015405	Valve Body	1
36	F98279950	Plate	1
37	F92237400	Nut, M10	1
38	F96712100	Washer, Ø10.5 x 21 x 2	2
39	F96728300	Washer, Ø14 x 24 x 4, INOX	2
40*	F36014782	Closing Plate	1
41	F36016256	Primary Control Rod	1
42	F36014907	Valve Tab	1
43*	F90382500	O-ring, Ø10.78 x 2.62	1
44*	F90520400	Spiralback Ring, 38 x 11.26 x 1.3	2
45*	F90406500	O-ring, Ø37.69 x 3.53	1
46	F36016370	Piston	1
47	F92202100	Nut, M6	6
48	F96735800	Washer, Ø16.2 x 80 x 4	1
49	F36014022	Membrane Support	1
50	F36014148	Membrane	1
51	F36013976	Membrane Plate	1
52	F99185200	Screw, M6 x 16	6
53*	F90384700	O-ring, Ø20.24 x 2.62	1
54	F36015656	Control Rod	1
55	F98872000	Saftey Valve	1
56*	F90412500	O-ring, Ø71.44 x 3.53	1
57	F97666200	Spiral Pin	2
58	F87204030	Washer, Ø 6 x 10 x 1.5	6
59	F99306900	Screw, M8 x 25	5
*	F0304	Repair Kit	



No.	Torque	No.	Torque
1	4.43 ft-lbs (6 Nm)	37	25.81 ft-lbs (35 Nm)
4	29.5 ft-lbs (40 Nm)	41	29.5 ft-lbs (40 Nm)
10	22.13 ft-lbs (30 Nm)	52	7.38 ft-lbs (10 Nm)
17	2.95 ft-lbs (4 Nm)	54	59.0 ft-lbs (80 Nm)
19	14.75 ft-lbs (20 Nm)	59	14.75 ft-lbs (20 Nm)
24	25.81 ft-lbs (35 Nm)		

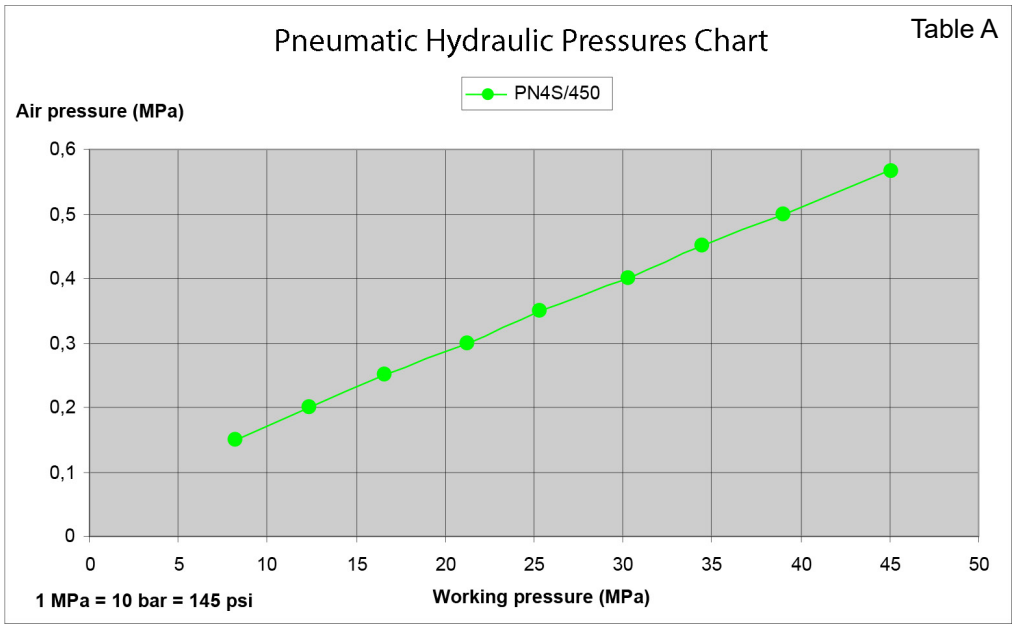


Table A

At the pneumatic pressure of 0.58 MPa the air consumption is 28 Nl/min.

Air Valve Diagram

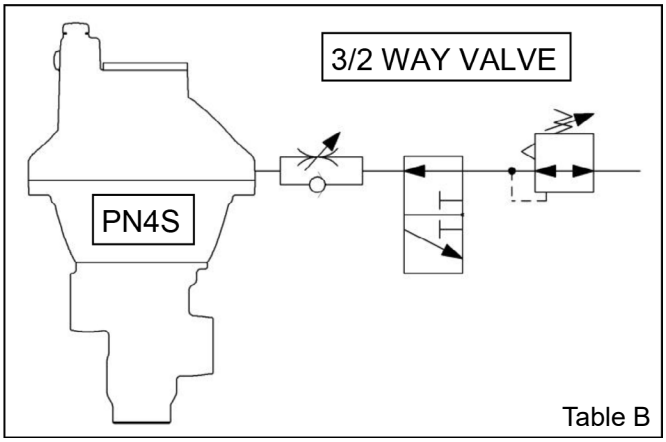


Table B

Valve Use Field Graph

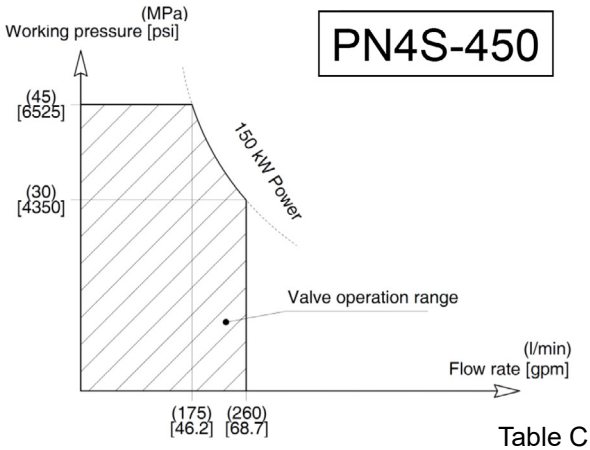


Table C

INSTALLATION AND INSTRUCTIONS FOR USE

THIS DOCUMENT PROVIDES THE INSTRUCTIONS FOR THE INSTALLATION, USE AND MAINTENANCE OF THE VALVE, THEREFORE IT IS AN INTEGRAL PART OF THE VALVE IT-SELF AND MUST BE READ CAREFULLY BEFORE ANY USE AND KEPT WITH CARE.
STRICTLY COMPLY WITH THE INSTRUCTIONS CONTAINED IN THIS DOCUMENT IN VIEW OF A SAFE AND EFFECTIVE USE OF THE VALVE.
FAILURE TO COMPLY WITH THESE INSTRUCTIONS MIGHT CAUSE EARLY FAULTS AND RESULT IN SITUATIONS OF DANGER, IN ADDITION TO VOIDING ANY WARRANTY.

1. GENERAL INFORMATION

1.1 The **PN4S** pressure regulator is a manually adjustable, pressure-operated pneumatic-control device. According to its setting, limits the pumps/system pressure by conveying the excess of water to the by-pass. Moreover, when the outlet flow is blocked, this device totally releases the flow, thus keeping the pump/system at the adjusted pressure.

1.2- The pneumatic control of the valve allows to change the hydraulic working pressure by changing the air pressure. The two pressures are proportional, i.e. when increasing the pneumatic pressure the hydraulic pressure increases and when reducing the pneumatic pressure the hydraulic pressure decreases (see table A).

1.3- The pneumatic control of the valve allows it to cut in or to cut out the adjusted hydraulic pressure. This function is particularly suited for automatic working cycles and remote controls. When the pneumatic pressure is cut out, the pump starts at zero pressure, i.e. without the motor being under stress.

1.4- In order to operate the pneumatic control of the valve it is necessary to use compressed air with a value depending on the desired hydraulic pressure. In order to correctly operate the pneumatic control we suggest you use a 3/2-way valve and a pressure regulator as shown in the diagram (table B).

2- PACKAGE AND HANDLING

2.1-To ensure the tightness of the fittings used to connect the valve to the system, use a metal washer with a rubber ring or insert an appropriate sealing on the thread and tighten them to the torque indicated in the table.

THREADING	TORQUE (ft-lbs/Nm)
G1"	70 ft-lbs/310 Nm± 5%
G1 1/4"	101 ft-lbs/450 Nm ±5%

2.2- In order to optimize the pump-valve coupling, it is necessary to keep the valve operation range, as a function of the pump pressure and flow rate, within a maximum power of 204 HP (150 kW). As shown in the chart (see Table C):

- **PN4S-200** this means using pumps producing a flow rate of approx. 46.2 GPM (175 l/min.) for maximum working pressures of 6530 psi (450 bar - 45 MPa), and generating a pressure of approx. 4350 psi (300 bar-30 MPa) for maximum flow rates of 68.68 (260 l/min.).

Important: Please contact GP's Customer Service Department in case you should decide to use the valve in the "by-pass" mode by plugging the valve outlet with a cap.

3- INSTRUCTIONS FOR PRESSURE SETTING:

3.1- In order to obtain a correct adjustment and a proper functioning of the valve, always make sure that, when working at the maximum pressure, the valve by-pass keeps releasing a quantity of water equal to 5% of the total flow-rate. In case the flow-rate at the by-pass is close to zero or exceeds 15% of the maximum flow-rate, this could cause faults, early wear and result in situations of danger.

The positions mentioned in the following instructions refer to those shown in the Parts List and Exploded View

3.2- Connect the valve to the water system and to the pneumatic circuit and set it upright or horizontal (for other positions please contact the GP's Customer Service Department), then follow these steps:

3.3- Open the pneumatic pressure regulator completely in order to control the valve.

3.4- Start the hydraulic system on which the valve is fitted and make sure that the air contained in it is fully ejected.

3.5- Open the gun or the water control device. Start the pneumatic circuit and begin adjusting the air pressure within the valve by using the pneumatic pressure regulator. Alternate the adjusting operations with a few openings and closings of the gun or of the control device. When the desired hydraulic pressure has been reached, open and close the gun/control device a few times again in order to stabilize the various components (seals, springs etc.). Check the pressure value again and correct if necessary.

3.6- In case you decide to change the adjusted hydraulic pressure later, follow the procedure stated in paragraph 3.2.3 again.

3.7- The upper body pos. 18 is equipped with a safety valve pos. 55 in order to limit the pneumatic pressure within the valve and with a permanently open breather nozzle pos. 20 in order to regulate the functioning (air consumption). The installer must adjust the safety valve so that it opens when the pneumatic pressure is approx. 10% higher than the pneumatic pressure necessary to obtain the maximum desired hydraulic pressure.

3.8- **The maximum pneumatic pressure allowed within the valve must not exceed 0.7 MPa (7.0 bar).**

4- MAINTENANCE

4.1- From time to time, check the oil window pos. 17 to verify the oil level. If necessary, add the oil by the cap pos.17 up to the middle of the oil window.

4.2- From time to time, it is necessary to check that the valve is clean outside, and that there is no sign of oil or water leakage and/or malfunctioning. If necessary, replace the involved parts. In case of doubts, contact GP's Customer Service Department.

4.3- The valve contains approx. 0.25 litres of high-viscosity hydraulic oil (cSt 40°C=44.2) containing addition agents used to grant higher performances, with an excellent level of protection against wear and high oxidation and corrosion strength. It is possible to use other oils having similar features provided that they are VG 46 DIN 51519 ISO quality (or with 15W-20 SAE degree).

4.4- The exhausted oil must be gathered in containers and disposed of contacting the authorized facilities as established by local laws. The oil must not be dispersed in the environment for any reason.

In case of doubts, do not hesitate to contact GP's Customer Service Department.

IMPORTANT: During use, never exceed the maximum values of pressure (of water and air), flow-rate and temperature as stated in this document and/or indicated on the valve.

WARNING: High Pressure Systems require a primary pressure regulating device (i.e. regulator, unloader) and a secondary pressure relief device (i.e. pop-off valve, relief valve). Failure to install such relief devices properly could result in personal injury or damage to pump or property. GP does not assume any liability or responsibility for the operation of the user's high pressure system.

WARNING: This product can expose you to chemicals including lead, which is know to the state of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov

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