HYDRONIC CORPORATION

Air Driven Hydraulic Pumps and Intensifiers

P720 Installation, Use and Maintenance Manual

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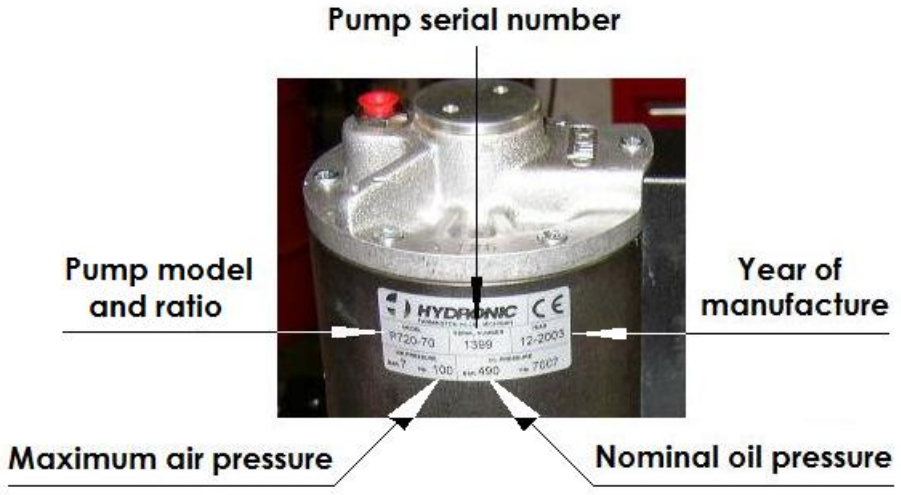
Introduction

This handbook is intended to give the operator the basic instructions for the use and maintenance of the pump. The air hydraulic pump operator must read this handbook before putting the pump into operation. After correctly installing the pump, keep this manual stored in a safe place. If you have difficulty in understanding any part of this handbook, contact Hydronic Corporation. Regular servicing and correct use of the pump are fundamental in obtaining optimum performance over its life. When contacting our service center, specify the pump model and serial number; this will help us to respond quickly and effectively.

Guarantee

Hydronic pumps are guaranteed both for the quality of materials used and for overall design. The warranty runs for six months of normal use at eight hours per day and five days per week. The warranty itself does not cover seals or defects arising out of operating with unsuitable fluids or at pressures above the specified maximum. The guarantee cannot cover pumps that may have been tampered with. Defective goods must be sent to Hydronic Corporation at Farmington Hills or to the distributor covering the area, freight pre-paid in either case. Any pump returned to us must be accompanied by a full written description of such faults or defects as have been discovered. Please also ensure that the pump's serial number is attached to the paperwork.

Identification Plate



Installation Guide

Pumps should be installed in a vertical position for optimum functioning of suction and delivery valves. Suction, pressure and airlines should be ¼" bore. Basic pumps can be controlled by a hydraulic directional valve. The manual pressure release version will stop and start the pump at the same time as opening and closing the pressure to tank line. The air-operated version will require a pneumatic four-way valve to direct air to the pump or the air-operated pressure to tank line. It may be useful in certain applications to add lubrication oil to the air inlet. If this action is taken, the following specifications are advised:

- Hydraulic oil having viscosity of 150 to 250 SSU
- Oil temperature 32º F to 150º F
- Air temperature 40º F to 100º F
- Room temperature 40º F to 100º F

Compressed Air System

It will be advisable to fit an air filter/regulator unit having minimum flow capacity of 30 scfm plus a pressure gauge in order to ensure the pump has sufficient air energy to work correctly and provide the hydraulic performance you expect.

Hydraulic System

Valves, pipes, hoses and accessories should all correspond to maximum working pressure of the pump used and be of a size that will fulfill flow requirements. Bear in mind the minimum of ¼" bore for the suction line.

Application

Hydronic air driven hydraulic pumps are designed for operating oil hydraulic circuits. The pump operates simply, a large surface area piston actuated by compressed air. Attached to it is a piston with a smaller surface area in a hydraulic chamber generating high hydraulic pressures. The continuous pumping action is produced by the compressed air being switched by a special valve assembly. By regulating the air pressure from 30 psi to 100 psi, the maximum hydraulic pressure can be adjusted by the ratio of the pump used. As the hydraulic load of the circuit increases and the oil pressure rises, the pump will slow down and eventually stop. In this way, the maximum load of the circuit will be maintained without air consumption.

Storage

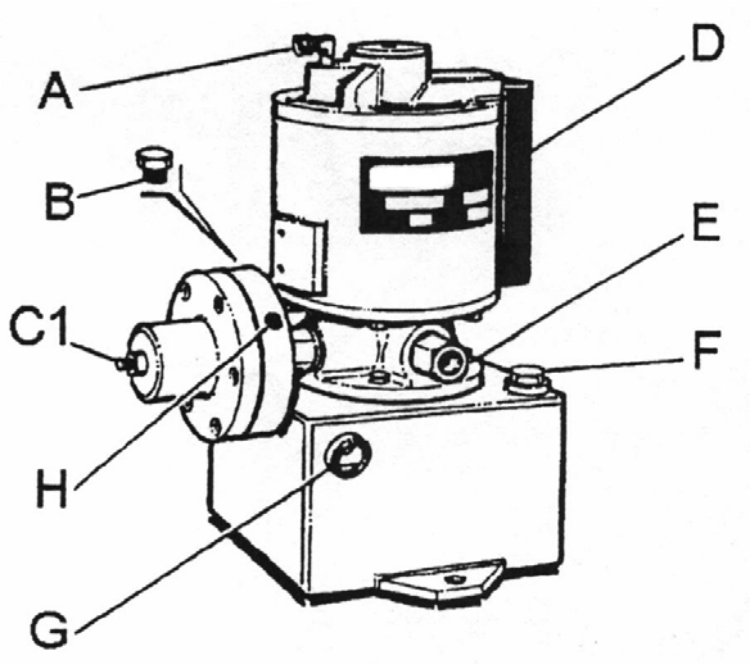
If the pump is to be kept out of use for a long period, clean the pump in general and drain the oil from the tank. Cover the pump and store it in a dry, well-protected place. It is advisable to wrap the pump in a plastic film. To put back into service, check all parts, fill tank with oil and try the pump out to ensure that it working properly. **This operation must be carried out by qualified personnel**.

Disposal

If the pump is to be scrapped, treat as a special type of waste. Dismantle it and divide it into materials of the same type and dispose of them in accordance with the local laws and regulations in your state.

Description of the standard pump components

A Air inlet 1/8" NPT



B Oil Filler/Breather

C1 Release Pressure Setting

D Exhaust Filter

E Oil outlet ¼" NPT

F Additional Oil Return Port

G Oil level sight glass

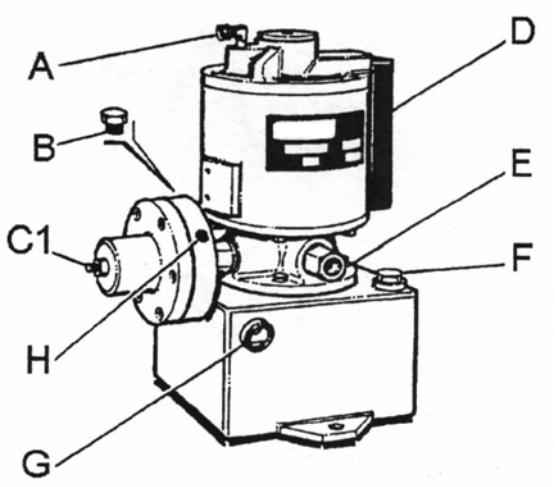
H Air Pilot 1/8" NPT

Oil suction 3/8" NPT

Air Operated Pressure Release Valve

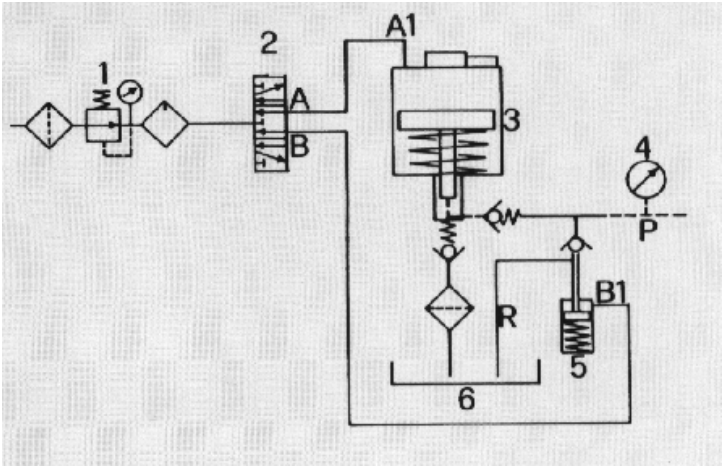
This mechanism is intended for use in systems where no directional control valves are used. Pressurized oil from the system will be released internally back to tank when pilot air pressure is applied to the 1/8" NPT connection shown here as H.

Commonly, a small pneumatic valve will be used to direct regulated air pressure either



to the pump or to the pressure release valve. In this way, the pump is started with the system intact and stopped with the oil pressure vented safely to tank. Varieties of pneumatic valve may be used including solenoid and lever, allowing the power unit to be situated away from the operator.

The adjustment C1 may be needed when the pilot air pressure is low or if the required



oil pressure is at the highest level. Adjusting the screw inward will hold the valve shut with more force but will also require more pilot air pressure to release it.

Starting - Up

Oil pressure can be determined by regulation of the compressed air, bearing in mind of course the multiplication ratio pre-selected for the pump itself.

The models are:	P720-10	RATIO 1:10
	P720-20	RATIO 1:20
	P720-40	RATIO 1:40
	P720-70	RATIO 1:70
	P720-100	RATIO 1:100

It should be remembered that the action of the piston assembly is to be powered down by the compressed air but returned by a large spring. This causes the ratio to be lower at air pressures below the maximum.

Having connected the compressed air supply at a low pressure, allow the pump to operate slowly until primed and oil comes through to the output port. Now shut off the air supply to the pump and securely connect the hydraulic circuit. Switch on the air supply again and allow the pump to run in order to bleed any air out of the hydraulic circuit.

Fault Finding Chart

Fault	Cause	Remedy
1] Pump does not cycle or runs slowly.	1.1] Low pressure in compressed air line.	1.1] Clear any blockage or restriction on the airline.
	1.2] Formation of ice on the exhaust side.	1.2] Shut off pump for an short time and drain off water from the filter.
	1.3] Accumulation of waste in the silencer.	1.3] Remove silencer, clean and replace.
	1.4] Blocked element in air filter/regulator.	1.4] Close down air-supply, dismantle and clean filter.
2] Pump loses air from silencer when stalled.	2.1] Worn valve or seal	2.1] Replace seal or valve.
3] Excess oil leakage from air silencer.	3.1] Worn hydraulic seal	3.1] Replace seal.

4] Pump cycles without pumping oil.	4.1] Blocked oil-intake 4.2] Bad connection on suction line.	4.1] Clean out filter. 4.2] Check for bad connections or air leaks on suction line.
5] Pump functions but only generates low pressure and does not stall at max. pressure.	5.1] Internal leakage in the circuit. 5.2] Suction valve seats damaged and leaking. 5.3] Output valve seats damaged and leaking. 5.4] Worn oil seal.	5.1] Find leak source and change valve. 5.2] Replace suction valve parts. 5.3] Replace output valve parts. 4.4] Replace seal.

Maintenance

Periodically release the condensation from the air filter. Replace the hydraulic oil every 1500 hours or whenever the oil is polluted.

Warning: Remember that repair work can only be made when pneumatic and hydraulic pressure has been released and you are sure that no pressure remains in the circuit.

Delivery of the pump

Transport

All the material shipped, including the detached parts, has been thoroughly checked before being consigned to the forwarding agent. The pump is shipped in double corrugated cardboard packaging, which assures protection of the product.

Unpacking

On receipt of the product, open the packaging and remove the pump. Take care not to damage any part of the pump. Make an initial check on the pump for damage in transit. In case of damage or if in doubt, do not use the pump and contact Hydronic Corporation or your distributor. The packaging [plastic bags, expanded polystyrene, nails, screws, wood, etc.] must not be left within reach of children since they are potential source of danger. Be sure to dispose of pollutant or non-biodegradable materials in the correct way. Materials must be disposed of in accordance with the laws in force.

Gross weight

P720 Basic pump	17 lbs.
P720 with R3 reservoir	22 lbs.
P720 with R4 reservoir	23 lbs.
P720 with R15 reservoir	27 lbs.
P720 with R25 reservoir	29 lbs.

Contents of the package

The packaging will always contain the following:
1 x air driven hydraulic pump
1 x installation, use and maintenance manual

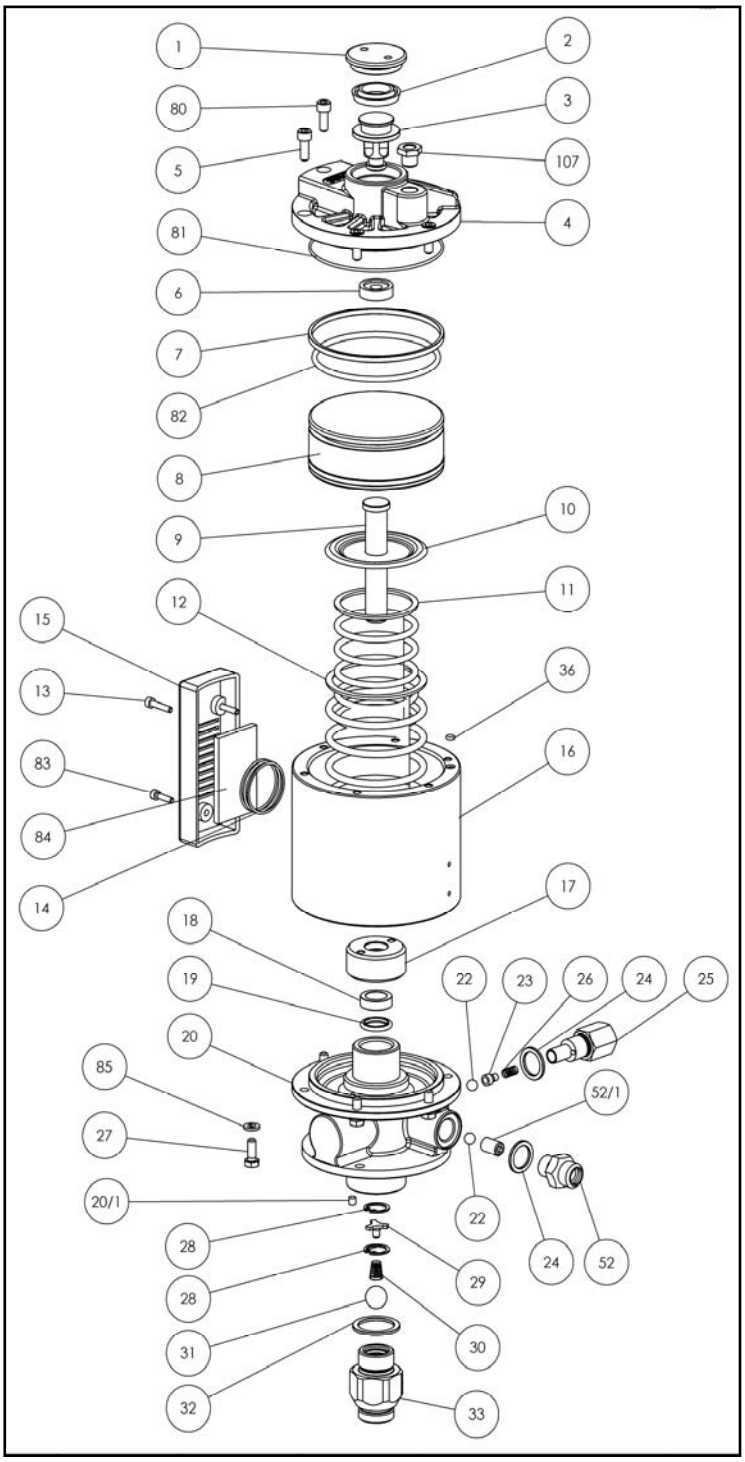
Original spare parts

Parts orders must always be accompanied by the following information:

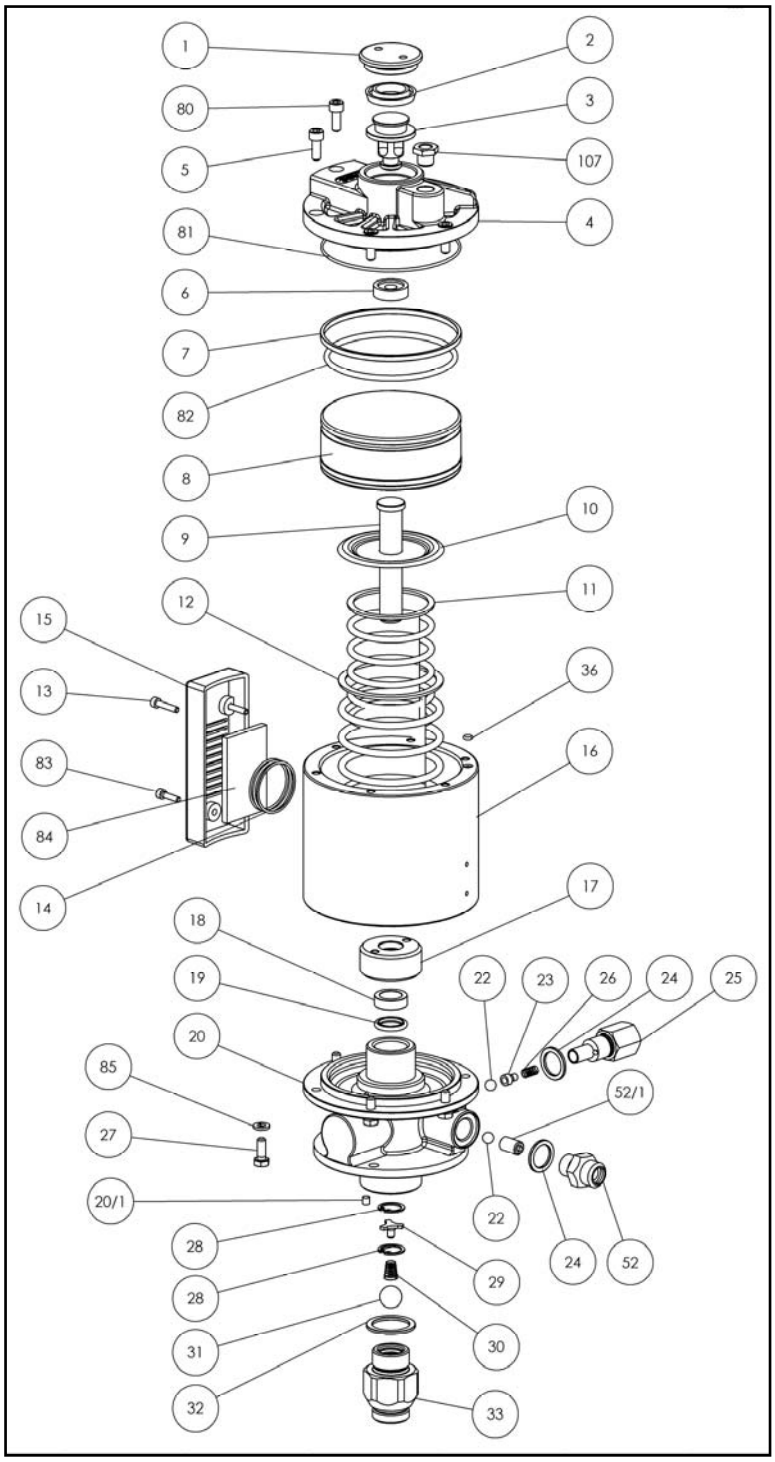
A] The pump model B] The pump serial number C] Year of construction
(all this data is given on the nameplate)
D] The part numbers E] The quantity required F] The name of the part
(All this data is given in the parts list)

A clear and correct statement of this data will allow our after-sales service to respond quickly and appropriately. Every spare part must be replaced by professionally qualified staff. The manufacturer declines all responsibility for malfunctions or accidents deriving from any failure of the product when unqualified persons have made any attempt at repair.

ITEM		CODE	DESCRIPTION	QTY
1		5.084.0001	*PLUG*	1
2	*	3.053.0101	*SEAL RING*	1
3		5.068.0067	*PISTON*	1
4		5.034.0097	*HEAD*	1
5		3.094.0008	*SCREW*	5
6	*	5.050.0001	*RUBBER*	1
7	*	3.051.0073	*SEAL RING*	2
8		5.068.0044	*PISTON*	1
9		5.068.0039	*PISTON - RATIO 1:100*	1
9		5.068.0040	*PISTON - RATIO 1:70*	1
9		5.068.0041	*PISTON - RATIO 1:40*	1
9		5.068.0042	*PISTON - RATIO 1:20*	1
9		5.068.0043	*PISTON - RATIO 1:10*	1
10		5.034.0001	*Disk - RATIO 1:100*	1
10		5.034.0001	*Disk - RATIO 1:70*	1
10		5.034.0002	*Disk - RATIO 1:40*	1
10		5.034.0003	*Disk - RATIO 1:20*	1
10		5.034.0004	*Disk - RATIO 1:10*	1
11		5.064.0024	*SPRING*	1
12		5.064.0025	*SPRING*	1
13		3.094.0006	*SCREW*	2
14		5.064.0026	*SPRING*	1
15		5.093.0001	*SILENCER*	1
16		5.018.0029	*JACKET*	1
17		5.045.0014	*RING-NUT - RATIO 1:100*	1
17		5.045.0015	*RING-NUT - RATIO 1:70*	1
17		5.034.0005	*RING-NUT - RATIO 1:40*	1
17		5.045.0016	*RING-NUT - RATIO 1:20*	1
17		5.034.0047	*RING-NUT - RATIO 1:10*	1
18		5.014.0011	*BUSHING - RATIO 1:100*	1
18		5.014.0012	*BUSHING - RATIO 1:70*	1
18		5.014.0013	*BUSHING - RATIO 1:40*	1
18		5.014.0014	*BUSHING - RATIO 1:20*	1
18		5.014.0015	*BUSHING - RATIO 1:10*	1
19	*	3.051.0067	*SEAL RING - RATIO 1:100*	1
19	*	3.051.0068	*SEAL RING - RATIO 1:70*	1
19	*	3.051.0069	*SEAL RING - RATIO 1:40*	1
19	*	3.051.0070	*SEAL RING - RATIO 1:20*	1
19	*	3.051.0235	*SEAL RING - RATIO 1:10*	1
20		5.028.0016	*PUMP BODY - RATIO 1:100*	1
20		5.028.0017	*PUMP BODY - RATIO 1:70*	1
20		5.028.0018	*PUMP BODY - RATIO 1:40*	1
20		5.028.0019	*PUMP BODY - RATIO 1:20*	1
20		5.028.0020	*PUMP BODY - RATIO 1:10*	1



ITEM		CODE	DESCRIPTION	QTY
20/1		3.041.0010	FILTER	1
22		3.076.0011	BALL	2
23		5.046.0001	CENTERING	1
24	*	3.052.0003	WASHER	2
25		5.071.0026	OUTLET CONNECTOR	1
26		5.064.0022	SPRING	1
27		3.094.0203	SCREW	6
28		3.006.0003	SEGER	2
29		5.046.0002	CENTERING	1
30		5.064.0023	SPRING	1
31		3.076.0010	BALL	1
32	*	3.052.0005	WASHER	1
33		5.071.0003	SUCTION CONNECTOR	1
36	*	3.051.0002	O-RING	1
52		5.094.0305	COUPLING	1
52/1		3.094.0403	SCREW	1
80		3.094.0009	SCREW	1
81	*	3.051.0072	O-RING	1
82	*	3.051.0039	O-RING	2
83		3.094.0007	SCREW	1
84		5.041.0005	FILTER	1
85		3.072.0103	WASHER	6
107		5.034.0054	CONNECTOR	1



Seal Kits	Ratio	Code
S720-10-N-SK	1:10	3.054.0018
s720-20-N-SK	1:20	3.054.0019
S720-40-N-SK	1:40	3.054.0020
S720-70-N-SK	1:70	3.054.0021
S720-100-N-SK	1:100	3.054.0022

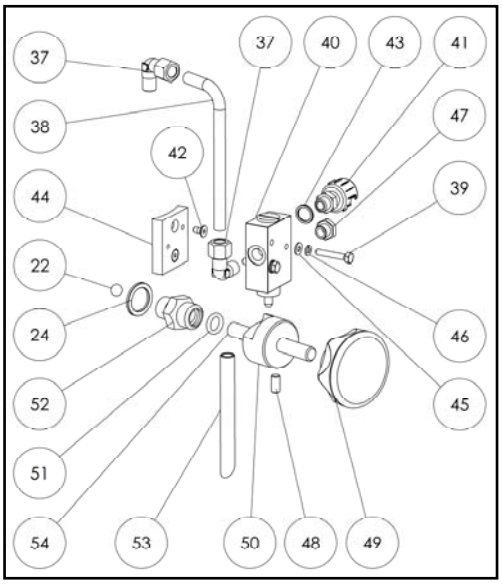
Air/Manual operated pressure release valve spare parts and seal kits

Item		Code	Description	Qty
22		3.076.0011	Ball	1
22/1		3.076.0012	Ball	1
22/2		3.076.0013	Ball	1
24	*	3.052.0003	Washer	1
37		3.070.0032	Elbow	1
38		5.090.0001	Air Pipe	1
39		3.094.0202	Screw	2
40		4.091.0001	Valve	1
41		3.070.0002	Connector	1
42		3.094.0016	Screw	2
43	*	3.052.0006	Washer	1
44		5.065.0008	Plate	1
45		3.072.0101	Washer	2
46		3.072.0001	Washer	2
47		3.070.0057	Silencer	1
48		3.094.0402	Screw	1
49		3.095.0001	Handwheel	1
50		5.008.0027	Cam	1
51	*	3.051.0074	O-Ring	1
52		5.094.0305	Coupling	1
53		5.090.0002	Pipe	1
54		5.066.0009	Pivot	1
56		5.094.0306	Coupling	1
57		5.034.0098	Head	1
59		5.011.0001	Pivot	1
60	*	5.050.0002	Air Diaphragm	1
61		5.008.0010	Disk	1
62		5.008.0011	Washer	1
63		3.031.0051	Nut	1
64		5.064.0027	Spring	1
64/1		5.064.0003	Spring	1
65		5.033.0001	Disk	1
66		5.086.0005	Head	1
67		3.094.0008	Screw	6
68		3.031.0004	Nut	1
70	*	3.005.0024	Seal Ring	1
71	*	3.051.0198	O-Ring	1
72		5.014.0049	Bushing	1
73		3.006.0023	Snap Ring	1
74		5.008.0012	Washer	1
75		3.094.0404	Screw	1
104		5.033.0009	Ball Seat	1
106		5.034.0013	Screw	1
108		5.034.0032	Pivot	1
109		5.034.0034	Coupling	1

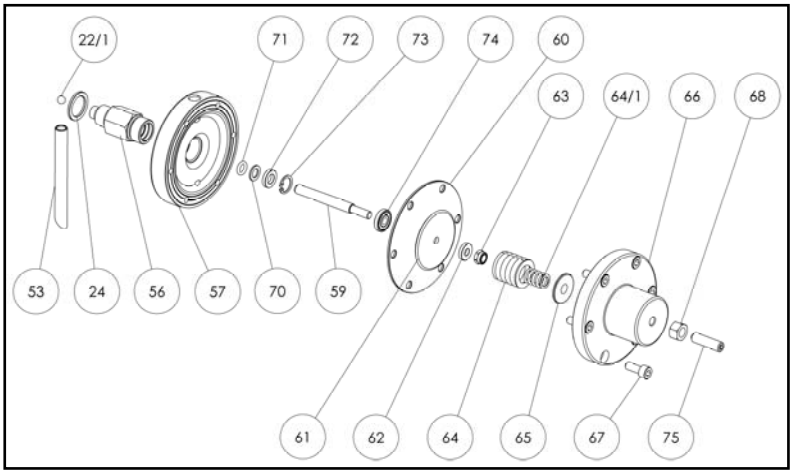
Seal Kits for Air Operated Release Valve

P720A-10	3.054.0023
P720A-20	3.054.0024
P720A-40	3.054.0025
P720A-70	3.054.0026
P720A-100	3.054.0027

Manual Release
All Ratios



Automatic Release for 10:1 / 20:1 / 40:1 / 70:1



Automatic Release for 100:1