

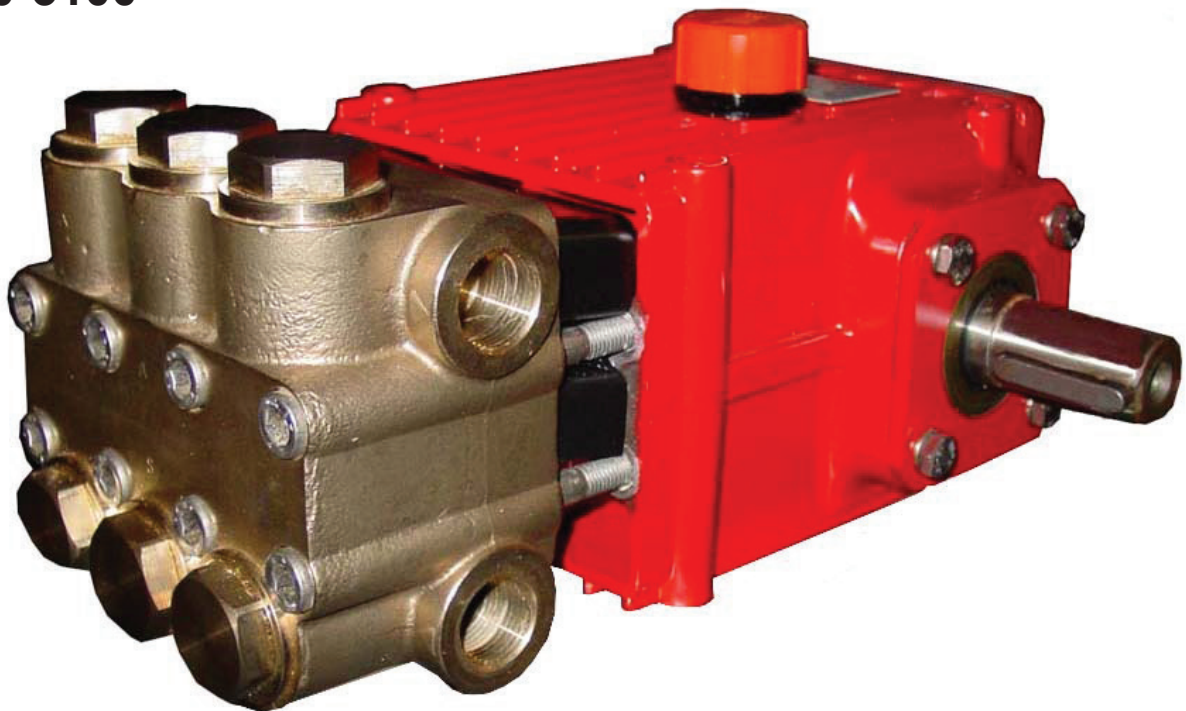
Pump Models

P400-3100 Series for Seawater Applications

Triplex Ceramic Plunger Pump
Operating Instructions
Repair and Service Manual

P420-3100
P423-3100
P425-3100
P435-3100
P450-3100

Corrosion Resistant Pumps



GIANT
Performance Under Pressure

Contents:	
Installation Instructions:	page 2
Specifications:	page 3
Exploded View:	page 4
Parts List:	page 5
Repair Kits:	page 6
Repair Instructions:	pages 7-8
Torque Specifications:	page 9
Recommended Spare Parts:	page 9
Pump Mounting Selection Guide:	page 9
Troubleshooting:	page 10
Dimensions:	page 11
Warranty Information:	back page

Updated 07/23

P400-3100 PUMPS

1. Performance

Due to potential of corrosion, the maximum temperature of 86 °F (30 °C) is applicable only for seawater; other media is 160 °F (70 °C).

Performance data for intermittent operation, data for continuous operation on request. For information on intermittent operation and calculating of the performance data, see the Giant Industries assembly instructions.

NPSHR / Inlet pressure

Required NPSH refers to water at 68 °F (20 °C) at maximum permissible pump speed.
The inlet pressure on the suction side must not exceed 145 PSI (10 bar).

Level of noise emission

Emission sound pressure level: ≤ 88 dB(A)

U.S. Measurements

	Max. Flow	Max. Pressure	Max. Speed	Power Required	Max. Temp*	Plunger Diameter	Stroke	Weight	NPSH
Model	GPM	PSI	RPM	HP	F	in	in	lbs	ft. of head
P450-3100	5.5	5100	1450	19.2	86	0.71	0.79	38.6	28.5
P435-3100	6.6	3625	1450	16.6	86	0.71	0.95	38.6	30.5
P423-3100	8.2	2900	1450	16.4	86	0.87	0.79	38.6	21.0
P425-3100	10.6	2500	1450	18.1	86	0.98	0.79	38.6	26.3
P420-3100	12.8	2200	1450	19.2	86	0.98	0.95	38.6	30.5

Metric Measurements

	Max. Flow	Max. Pressure	Max. Speed	Power Required	Max. Temp*	Plunger Diameter	Stroke	Weight	NPSH
Model	L/min	Bar	RPM	kW	C	mm	mm	kg	mWs
P450-3100	20.8	350	1450	14.3	30	18	20	17.5	8.7
P435-3100	25.0	250	1450	12.4	30	18	24	17.5	9.3
P423-3100	31.1	200	1450	12.2	30	22	20	17.5	6.4
P425-3100	40.4	170	1450	13.5	30	25	20	17.5	8.0
P420-3100	48.4	150	1450	14.3	30	25	24	17.5	9.3

Common Specifications:

Inlet Pressure 145 PSI (10 Bar)
Crankshaft Diameter..... 1.1" (28mm)
Keyway Width..... 8mm
Crankcase Oil Capacity 30 fl. oz. (0.89 L)
Inlet Ports (2) 3/4" BSP
Discharge Ports (2) 3/4" BSP
Shaft Rotation..... Top of Pulley Towards Fluid End

Materials Used for P400-3100 Pumps:

Manifold Nিকে Aluminum Bronze
Plungers Solid Ceramic Oxide
Valves 316 Stainless Steel
Seals..... Nitrile with Fabric Reinforcing
Gear End Aluminum

P400-3100 PUMPS

2. Fields of application

The pump types specified in this data sheet are suitable for pumping seawater.

Furthermore, the fields of application of these pump types correspond to the specifications in the assembly instructions GIANT INDUSTRIES.

3. Ambient conditions

Ambient temperature: $41\text{ °F (5 °C)} < T_{\text{Amb.}} < 86\text{ °F (30 °C)}$

4. Oil filling

- Filling quantity: **30 fl. oz. (0.9 L)**
- Quality: Industrial gear oil **ISO VG 220** or automotive gear oil **SAE 90 GL4 - Giant's p/n 01154**
- Intervals: First oil change after **50 operating hours**; subsequent oil changes every **500 operating hours**. In either case, change the oil at least once a year.

5. Installation/Putting into Operation

5.1 To Turn Drive Shaft to the Other Side

Remove the valve casing (26).

Turn the seal adaptors (20) and extended sleeve (20B) 180° so that the leakage holes are underneath.

Remount valve casing (26) and cover (18) rotated by 180°.

Interchange plug (5B) and oil dipstick (2) with each other.

Turn crankcase cover (3) by 180°.

5.2 Direction of pump rotation

When looking at crankshaft with valve casing mounted on left-hand side, counterclockwise direction of rotation.

When looking at crankshaft with valve casing mounted on right-hand side, clockwise direction of rotation.

5.3 Suction line filter

Recommended mesh size 150 µm

6. Operation

For information, see assembly instructions GIANT INDUSTRIES

7. Maintenance and Servicing

For the type of thread locker used and the required tightening torques, observe the table on the following page.

7.1 Special tools required

The following special tools are required for assembly:

- Fitting sleeve (Tool 12 – P420/P422/P423/P425)
- Fitting sleeve (Tool 11 – P435/P450)
- Pull-out tool size 2

7.2 Suction and Discharge Valves

Remove plugs (32) with a 12-point socket wrench. Check suction and discharge valve assemblies (27A) that are under the plugs by taking out the valves with a pair of flat tongs and then taking them apart.

Examine valve plate (28) and valve seat (27). Coat the plug thread (32) with thread locker. Tighten the plugs to the required torque. Take care to reassemble in correct sequence.

7.3 Seals and Plunger

Loosen screws (34) and remove valve casing (26) by pulling it off over the plungers. Remove seal adaptors (20) out of the valve casing (26).



The plunger unit comes with an extended sleeve (20B) having a clipped-on guide ring (20C).

Check guide ring (20C) for wear and replace if necessary.

Remove any deposits on the extended sleeve (20B) and make sure that the leakage bores remain unobstructed so that leakage can drain. Remove drip-return ring (25), support ring (24), grooved seal (23) resp. grooved seal packing (23) and spacer disc (23A – P423) out valve casing (26).

Remove grooved seal (23/23B) together with support ring (24 – P420/P425) out of seal adaptor (20).

Soak new seals and O-rings thinly with silicone grease or mineral oil and insert carefully. Pay attention to the installation position of the seals.

Check O-rings (21) and replace if necessary.



The grooved seal (23) or respectively grooved seal pack (23) on the high-pressure side is to be fitted carefully into the valve casing (26) using a fitting sleeve (Tool 12 – P420/P422/P423/P425) or (Tool 11 – P435/P450).

Alternatively, the seal can also be carefully fitted into the valve casing using a screwdriver.

Under no circumstances must the seal surface in the valve casing or the seal lip be damaged.

Check plunger surfaces (16).

Damaged surfaces cause hard wear on seals. Lime deposits or similar on the plunger must be removed.



Plunger surface must not be damaged in the process.

In the case of lime deposits in the pump, care must be taken that the drip-return bores in parts (25) and (26) ensure trouble-free drip-return.

If the plunger pipe (16B) is worn out, loosen tension screw (16D) and remove together with plunger pipe.

Check and clean contact surface on plunger (16A), fit new plunger pipe.

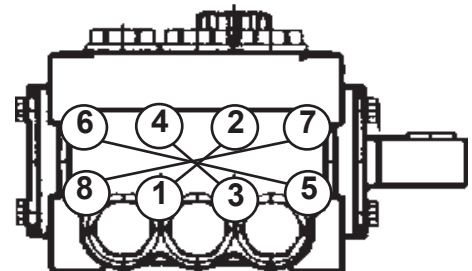
Cover thread of tension screw (16D) with a thin coat of thread locker and tighten carefully to the required torque.



Under no circumstances should thread-locker get between the plunger pipe (16B) and the centring neck on the plunger (16A). Tensioning of the plunger pipe due to eccentric tightening of the tensioning screw or due to dirt or damage to the contact surface can lead to breakage of the plunger pipe.

When assembling, tighten the screws (34) to the required torque.

If required, supplementary assembly instructions can be requested from Giant Industries.



P400-3100 SERIES PUMP REPAIR KITS

Plunger Packing Kits

09667 (P420-3100, P425-3100)

Item	Part #	Description	Qty.
20C	06182	Guide Ring	3
21	07266-0001	O-Ring	3
23	12254	Grooved Seal	3
23B	12255	Grooved Seal	3
24	08376	Support Ring	6

Oil Seal Kit

09641

Item	Part #	Description	Qty.
19	05444	Oil Seal	3

Plunger Packing Kits

09668 (P423-3100)

Item	Part #	Description	Qty.
20C	06182	Guide Ring	3
21	07266-0001	O-Ring	3
23	06249	Grooved Seal	3
23B	13390	Grooved Seal	3
24	06252	Support Ring	3

Valve Assembly Kit

09522 (P420A-3100, P423-3100, P425-3100)

Item	Part #	Description	Qty.
27A	08408-0100	Valve Assy, Complete	6
33	07214-0001	O-Ring, Viton	6

Plunger Packing Kit

09634 (P435-3100, P450-3100)

Item	Part #	Description	Qty.
20C	06182	Guide Ring	3
21	07266-0001	O-Ring	3
23	08477	Grooved Seal	6
24	07929	Support Ring	3

Valve Assembly Kit

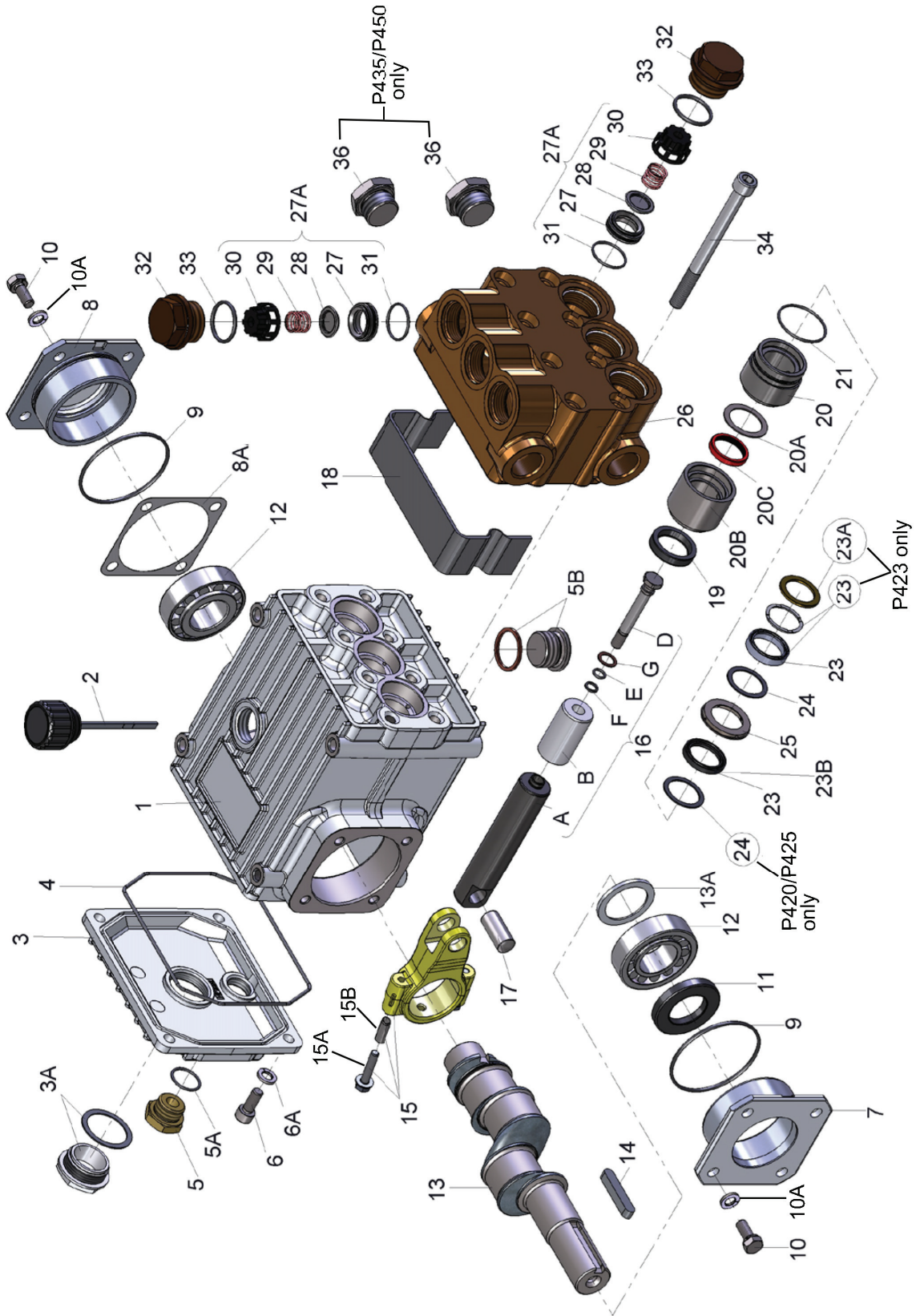
09646-0001 (P435-3100, P450-3100)

Item	Part #	Description	Qty.
27A	05578	Valve Assy, Complete	6
33	06015-0001	O-Ring	6

P400-3100 PUMP TORQUE SPECIFICATIONS

Position	Item#	Description	Thread Size	Lubrication	U.S (Metric)
3A	07186	Oil Sight Glass with Gasket	1" BSP	Loctite 5910	106 in.-lbs. (12 Nm)
5	07109-0400	Oil Drain Plug	1/2" BSP		59 ft.-lbs. (80 Nm)
5B	08092-0100	Plug with Gasket	3/4" BSP		59 ft.-lbs. (80 Nm)
6	01010-0100	Screw	M8		110 in.-lbs. (12.5 Nm)
10	07114	Screw with Washer	M8		132 in.-lbs. (15 Nm)
15B	05349	Connecting Rod Screw	M6		97 in.-lbs. (11 Nm)
16D	08399-0100	Tensioning Screw (P420/P423/P425)		Loctite 243	247 in.-lbs. (28 Nm)
16D	08399-0100	Tensioning Screw (P430/P450)			199 in. lbs. (22.5 Nm)
16G	07161-0100	Steel Washer		Loctite 577 (both sides)	
27	05576 / 08370-0100	Valve Seat		Hylomar	
32	06616	Plug (P420/P423/P425)	M30 x 1.5	Loctite 243	107 ft.-lbs. (145 Nm)
32	08406	Plug (P435/P450)	M25 x 1.5	Loctite 243	125 ft.-lbs. (170 Nm)
34	06183	Inner Hexagon Screw	M10	Lightly Oil	30 ft.-lbs. (40 Nm)

EXPLODED VIEW - P400-3100 PUMPS

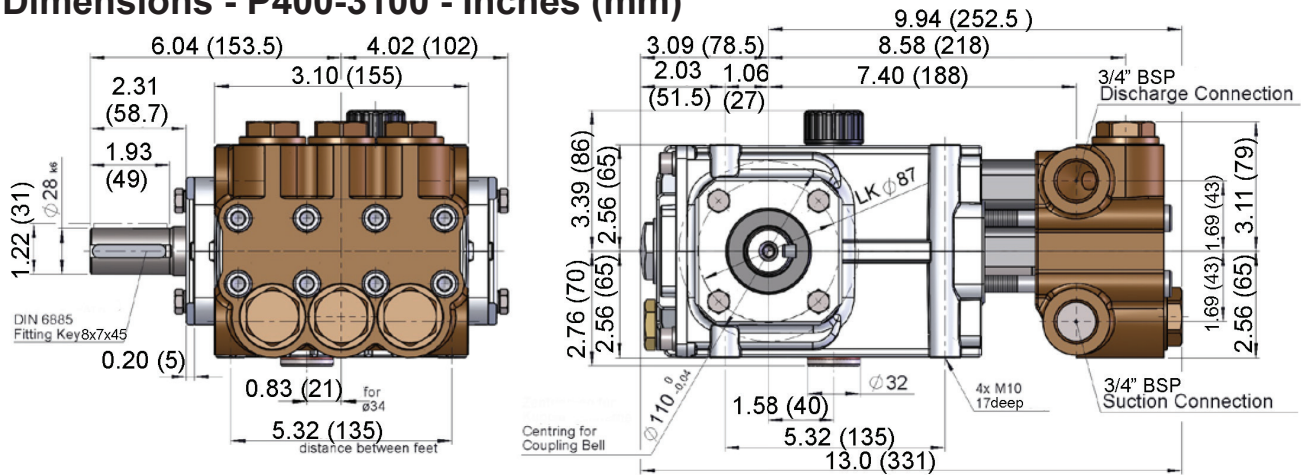


P400-3100 PUMP PARTS LIST

A=P420-3100 B= P423-3100 C=P435-3100 D=P450-3100 E=P425-3100

<u>ITEM</u>	<u>PART</u>	<u>DESCRIPTION</u>	<u>QTY.</u>	<u>ITEM</u>	<u>PART</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
1	05694	Crankcase	1	20	05443-0100	Seal Case (A,E)	3
2	08378	Oil Fill Plug with Gasket	1	20	05592-0100	Seal Case (B)	3
3	05689	Crankcase cover	1	20	05534-0100	Seal Case (C,D)	3
3A	07186	Oil Sight Glass w/ Gasket	1	20A	05696	Spacer Ring	3
4	08380	O-Ring	1	20B	05695	Extended Sleeve	3
5	07109-0400	Oil Drain Plug, 1/2" BSP	1	20C	06182	Guide Ring for 20B	3
5A	06015	O-Ring	1	21	07266-0001	O-Ring	3
5B	08092-0100	Plug with Gasket	1	23	12254	Grooved Seal (A,E)	3
6	01010-0100	Screw	4	23	06249	Grooved Seal Packing (B)	3
6A	01011-0400	Spring Washer	4	23	08477	Grooved Seal (C,D)	6
7	04739A	Bearing Cover, Open, Anodized	1	23A	06251-0100	Spacer Disc (B)	3
8	05974	Bearing Cover, Closed, Anodized	1	23B	12255	Grooved Seal (A,E)	3
8A	05292	Shim, 0.1 mm	1-6	23B	13390	Grooved Seal (B)	3
9	01016	O-Ring	2	24	08376	Support Ring (A,E)	6
10	07114-0100	Screw with Washer	8	24	06252	Support Ring (B)	3
10A	07011-0400	Spring Washer	8	24	07929	Support Ring (C,D)	3
11	07459	Radial Shaft Seal	1	25	08394-0100	Weep Return Ring (A,E)	3
12	05350	Bearing	2	25	06254-0100	Weep Return Ring (B)	3
13	04741	Crankshaft (A,C)	1	25	06804	Weep Return Ring (C,D)	3
13	04740	Crankshaft (B,D,E)	1	26	08395-3000	Manifold (A,B,E)	1
13A	04742	Spacer Ring	1	26	05574-3000	Manifold (C,D)	1
14	08091	Fitting Key	1	27A	08408-0100	Valve Assembly (A,B,E)	6
15	08390	Connecting Rod Assembly	3	27A	05578	Valve Assembly (C,D)	6
15A	05349	Connecting Rod Screw	6	27	08370-0100	Valve Seat (A,B,E)	6
15B	05348	Adapter Sleeve	6	27	05576	Valve Seat (C,D)	6
16	06178	Plunger Assy. Items 16A-16G (A,E)	3	28	06791-0100	Valve Plate (A,B,E)	6
16	05693	Plunger Assy. Items 16A-16G (B)	3	28	05542-0100	Valve Plate (C,D)	6
16	05692	Plunger Assy. Items 16A-16G (C,D)	3	29	06377-0100	Valve Spring (A,B,E)	6
16A	06179	Plunger Base	3	29	07906-0100	Valve Spring (C,D)	6
16B	08398	Plunger Pipe (A,E)	3	30	08372	Valve Spring Retainer (A,B,E)	6
16B	06247	Plunger Pipe (B)	3	30	07907	Valve Spring Retainer (C,D)	6
16B	08397	Plunger Pipe (C,D)	3	31	07212-0001	O-Ring, Viton (A,B,E)	6
16D	08399-0100	Tensioning Screw	3	31	07770-0001	O-Ring (C,D)	6
16E	07023-0001	O-Ring	3	32	06616	Plug, M30 x 1.5 (A,B,E)	6
16F	07203	Backup Ring	3	32	08406	Plug, M24 x 1.5 (C,D)	6
16G	07161-0100	Steel Washer	3	33	07214-0001	O-Ring, Viton (A,B,E)	6
17	06790	Crosshead Pin	3	33	06015-0001	O-Ring (C,D)	6
18	06180	Cover	1	34	06183	Inner Hexagon Screw	8
19	05444	Oil Seal	3	36	13150-0100	Plug, 3/4" BSP (C, D)	2

Dimensions - P400-3100 - Inches (mm)



GIANT INDUSTRIES LIMITED WARRANTY

Giant Industries, Inc. pumps and accessories are warranted by the manufacturer to be free from defects in workmanship and material as follows:

1. Five (5) years from the date of shipment for all pumps used in portable pressure washers with NON-SALINE, clean water applications.
2. Two (2) years from the date of shipment for Giant pumps used in car wash applications.
3. One (1) year from the date of shipment for all other Giant industrial and consumer pumps.
4. Six (6) months from the date of shipment for all rebuilt pumps
5. Ninety (90) days from the date of shipment for all Giant accessories.

This warranty is limited to repair or replacement of pumps and accessories of which the manufacturer's evaluation shows were defective at the time of shipment by the manufacturer. The following items are NOT covered or will void the warranty:

1. Defects caused by negligence or fault of the buyer or third party.
2. Normal wear and tear to standard wear parts.
3. Use of repair parts other than those manufactured or authorized by Giant.
4. Improper use of the product as a component part.
5. Changes or modifications made by the customer or third party.
6. The operation of pumps and or accessories exceeding the specifications set forth in the Operations Manuals provided by Giant Industries, Inc.

Liability under this warranty is on all non-wear parts and limited to the replacement or repair of those products returned freight prepaid to Giant Industries which are deemed to be defective due to workmanship or failure of material. A Returned Goods Authorization (R.G.A.) number and completed warranty evaluation form is required prior to the return to Giant Industries of all products under warranty consideration. Call (419)-531-4600 or fax (419)-531-6836 to obtain an R.G.A. number.

Repair or replacement of defective products as provided is the sole and exclusive remedy provided hereunder and the MANUFACTURER SHALL NOT BE LIABLE FOR FURTHER LOSS, DAMAGES, OR EXPENSES, INCLUDING INCIDENTAL AND CONSEQUENTIAL DAMAGES DIRECTLY OR INDIRECTLY ARISING FROM THE SALE OR USE OF THIS PRODUCT.

THE LIMITED WARRANTY SET FORTH HEREIN IS IN LIEU OF ALL OTHER WARRANTIES OR REPRESENTATION, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND ALL SUCH WARRANTIES ARE HEREBY DISCLAIMED AND EXCLUDED BY THE MANUFACTURER.



WARNING: This product might contain a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm.

For more information go to www.P65Warnings.ca.gov

GIANT
Performance Under Pressure

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