

QD-200 QUINTUPLEX POWER PUMP

GENERAL DESCRIPTION

The QD-200 - an advanced-design quintuplex pump with exceptional flexibility and versatility to efficiently meet the requirements of a wide variety of pumping services. The unit is of simplified, rugged design to meet the heavy-duty requirements of continuous duty operation and to minimize maintenance.

FEATURES

1. DESIGN RATINGS: Continuous Duty - 173 HP input at 350 rpm, pressures to 10,000 psig, capacities to 320 U.S. gpm.

Intermittant Duty - Up to 200 HP at 400 rpm.

2. LIQUID END - The "SL" design minimizes stresses and maximizes volumetric efficiency. Both suction and discharge manifolds are separate from, and bolted to, the fluid cylinder. Each manifold has two (2) connections -- one at each end.

The manifolds clamp the valve assemblies against the fluid cylinder, eliminating the need for pressed-in seats, and eliminating the possibility of seat by-passing and fluid cylinder wash-out.

Sealing is achieved by use of "O" ring seals between valve retainer flanges, manifolds and cylinder, and between stuffing boxes and cylinder. These "O" rings are contained in face-type grooves to provide maximum sealing and to minimize "O" ring flexing when exposed to oscillating pressures.

3. STUFFING BOXES - Glandless for spring-loaded self-adjusting packing. Boxes are readily removable for bench replacement of plungers, packing, and other box internals. The same box is used for chevron or square packing, lubricated or nonlubricated operation. Lubrication of packing is accomplished on atmospheric side of packing, allowing use of low-pressure mechanical lubricators, or drip-type lubricators; putting the oil mostly under the last ring of packing (where it's needed most); and minimizing oil contamination of pumpage.

Each stuffing box is suitable for a range of plunger diameters. Several boxes are provided to cover the entire range of plungers in each cylinder. Changing plungers within a stuffing box range requires only plungers, throats, and new packing. Changes outside of a stuffing box range, but within same cylinder, can be accomplished by the addition of stuffing boxes and stuffing box springs to the above parts.

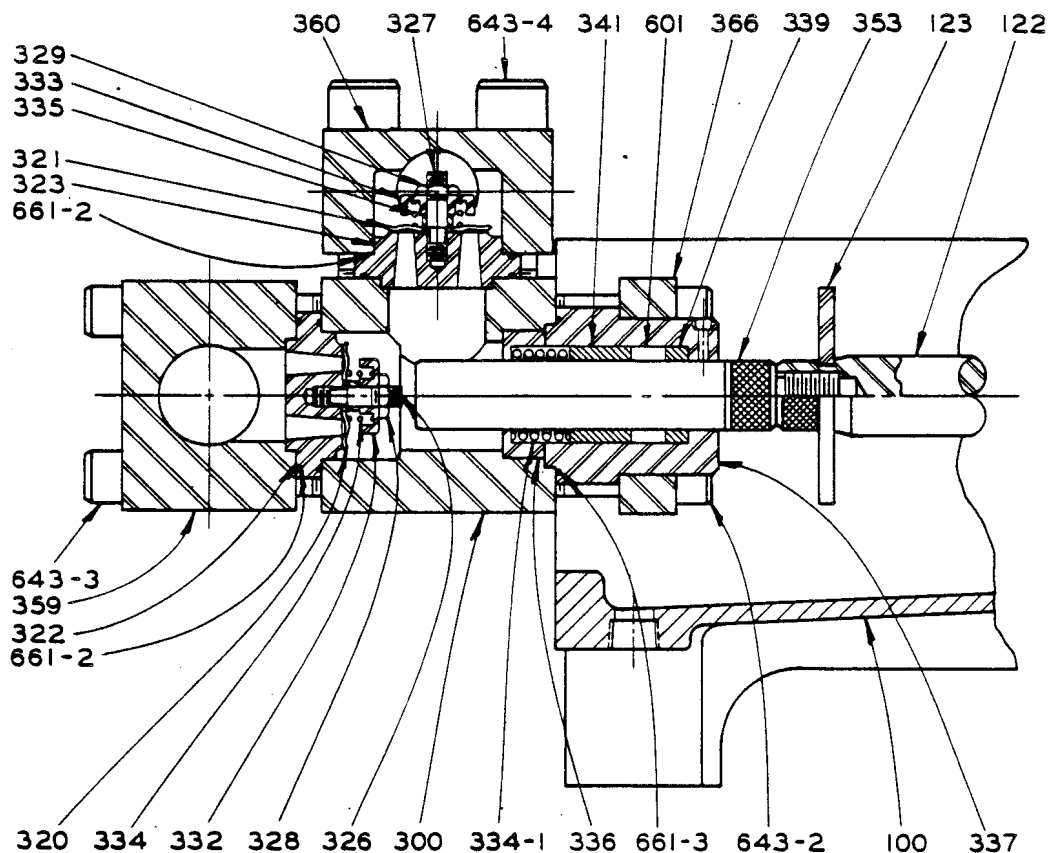
4. PLUNGERS - Threaded to crosshead extensions outside the frame housing to simplify assembly and minimize cost of replacement plungers. A 60 Rc hard nickel-base alloy is fused to the plunger surface, then ground to an 8 micro-inch rms mirror finish for long packing and plunger life.
5. VALVE ASSEMBLIES - Valves for the "A" cylinder are wing guided for quiet performance. "B" and "C" cylinder valves are disc type, light-weight, quiet, and quick-acting. All valve assemblies are interchangeable between suction and discharge for ease in maintenance.

6. CONNECTIONS - Each fluid end assembly has two suction and two discharge connections. On the #A and #B manifolds, connections are pipe tapped (N.P.T.); and on #C fluid cylinder they are flanged (A.N.S.I. 600# R.F.). Flanges are also available for #A and #B cylinders.
7. POWER FRAME - ASTM grade cast iron with generous oil reservoir and provisions for adding oil heater and thermostat. Full cylindrical crosshead bores are cast with sufficient extra thickness to allow for overboring and installation of liners in case the bores become scored due to improper lubrication.
8. CRANKSHAFT - Alloy ductile iron selected for toughness and high endurance limit. Reversible in power frame for drive input on opposite side.
9. MAIN BEARINGS - Two outside tapered roller bearings designed for an L₁₀ life of 30,000 hours (3.4 years) (150,000 hour average life). Two center bab-bitted bronze sleeve bearings for additional crankshaft support.
10. CONNECTING RODS AND BEARINGS - Carry loads in compression only. Rods are the "marine type" (bolted caps at crank end).

Crank bearings are the split, replaceable, precision type (babbitted bronze). Pin bearings are oil-impregnated bronze. Rods and rod bearings are inter-changeable with the TX-90 and TX-115, *STD 115*
11. CROSSHEADS - Full piston type, extra long for maximum guiding action and large bearing areas. Operate in full cylindrical guides accurately bored in the frame. Entire cylindrical surface is lubricated, which, in combi-nation with large bearing area, reduces wear to negligible proportions.
12. CROSSHEAD EXTENSIONS - Threaded into crosshead for ease of replacement, stainless steel.
13. CROSSHEAD EXTENSION DEFLECTORS - Neoprene rubber, located in grooves in extensions.
14. CROSSHEAD EXTENSION SEALS - Press fit into seal cap. Spring-loaded lip type, interchangeable with TX-90 and TX-115.
15. CROSSHEAD PINS - Slip fit into crosshead, locked with a set screw. Alloy steel, carburized, hardened and accurately ground, interchangeable with the TX-90 and TX-115.
16. POSITIVE POWER END LUBRICATION - The simple and sure scoop-gravity system used on Union power pumps for decades provides positive lubrication to crossheads and rod bearings.
17. STANDARD DRIVE METHODS - Top-mounted V-belt drive, separate gear reducer. Top-mounted motor with V-belt drive permits a compact and economical drive.
18. OPTIONAL DRIVE METHODS - Rear-mounted "V"-belt drive. Variable speed units. Separate speed reducer or gear-head motor.
19. TYPES OF DRIVERS - Electric motor, air motor, turbine or engine may be used with any standard or optional drive method, except the top-mounted drive arrangement which will not accept an engine.

QD-200 QUINTUPLEX POWER PUMP

#B AND #C FLUID ENDS



PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
100	POWER FRAME	334-1	STUFFING BOX SPRING
122	CROSSHEAD STUB	335	DISCHARGE VALVE SPRING
123	CROSSHEAD STUB DEFLECTOR	336	STUFFING BOX SPRING RETAINER
300	FLUID CYLINDER	337	STUFFING BOX
320	SUCTION VALVE	339	PACKING BACK-UP BUSHING
321	DISCHARGE VALVE	341	STUFFING BOX THROAT BUSHING
322	SUCTION VALVE SEAT	353	PLUNGER
323	DISCHARGE VALVE SEAT	359	SUCTION MANIFOLD
326	SUCTION VALVE STUD	360	DISCHARGE MANIFOLD
327	DISCHARGE VALVE STUD	366	STUFFING BOX FLANGE
328	SUCTION VALVE STUD NUT	601	PLUNGER PACKING
329	DISCHARGE VALVE STUD NUT	643-2	STUFFING BOX BOLT
332	SUCTION VALVE SPRING RETAINER	643-3	SUCTION MANIFOLD BOLT
333	DISCHARGE VALVE SPRING RETAINER	643-4	DISCHARGE MANIFOLD BOLT
334	SUCTION VALVE SPRING	661-2	VALVE SEAT "O" RING
		661-3	STUFFING BOX "O" RING

ENGINEERING DATA SHEET

QD-200 QUINTUPLEX PLUNGER PUMP

4-1/4" STROKE - 10,000 LB. FRAME LOAD

MAXIMUM TEMP. 260°F. - MINIMUM TEMP. -20°F.

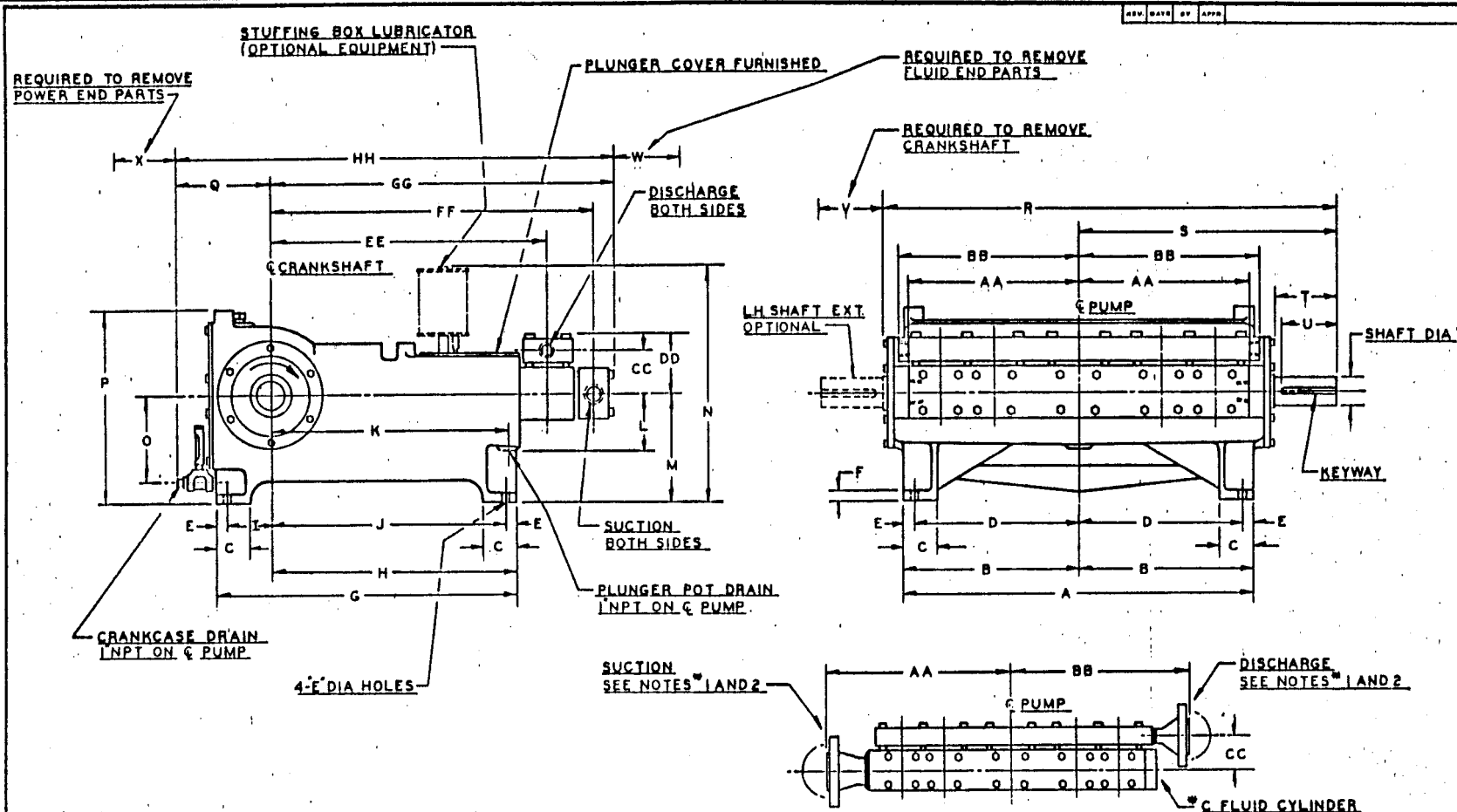
CYLINDER NO.	PLUNGER DIAMETER	DISPLACEMENT (GAL/REV.)	PERCENT VOLUMETRIC CLEARANCE (C/D)	MAXIMUM DISCHARGE PRESSURE PSI	VALVE DATA		
					WING DIA.		SEAT HOLE AREA
A	1	0.0724	311	10,000	1-1/2"	Suct. 2-1/2" NPT Disch. 1-1/2" NPT	0.994 IN ²
	1-1/8	0.0923	232	10,000	1-1/2"		0.994 IN ²
	1-1/4	0.1128	197	8,150	1-1/2"		0.994 IN ²
	1-3/8	0.1365	143	6,730	1-1/2"		0.994 IN ²
	1-1/2	0.1625	113	5,650	1-1/2"		0.994 IN ²
B	1-5/8	0.190	456	4,000	2-1/2"	Suct. 4" NPT Disch. 2-1/2" NPT	1.97 IN ²
	1-3/4	0.222	379	4,000	2-1/2"		1.97 IN ²
	1-7/8	0.253	338	3,620	2-1/2"		1.97 IN ²
	2	0.288	285	3,180	2-1/2"		1.97 IN ²
	2-1/8	0.327	241	2,820	2-1/2"		1.97 IN ²
	2-1/4	0.365	233	2,520	2-1/2"		1.97 IN ²
	2-3/8	0.408	199	2,260	2-1/2"		1.97 IN ²
	2-1/2	0.452	170	2,040	2-1/2"		1.97 IN ²
	2-5/8	0.497	---	1,850	2-1/2"		1.97 IN ²
C	2-3/4	0.546	407	1,400	4"	Suct. 6" 600# R.F. Disch. 4" 600# R.F.	5.70 IN ²
	3	0.650	326	1,400	4"		5.70 IN ²
	3-1/4	0.765	275	1,210	4"		5.70 IN ²
	3-3/8	0.823	250	1,120	4"		5.70 IN ²
	3-1/2	0.885	223	1,040	4"		5.70 IN ²
	3-3/4	1.015	201	910	4"		5.70 IN ²
	4	1.158	165	800	4"		5.70 IN ²

NOTE: Maximum NEMA motor frame for top mount V-belt drive is 447T.
Reference standard speeds on selection graph 4140-5.1.
Maximum pressure on smaller plungers is limited by cylinder design pressure.

CYLINDER	DESIGN PRESSURE	HYDROSTATIC TEST
A	5,000 PSIG Suction 10,000 PSIG Discharge	7,500 PSIG Suction 15,000 PSIG Discharge
B	4,000 PSIG Suction & Discharge	6,000 PSIG Discharge
C	1,400 PSIG Suction & Discharge	2,100 PSIG Discharge

NOTES:

(1) Reference selection graph 4140-5.1 for maximum RPM's for various plunger diameters



± 0.12 (3MM) TOLERANCE ON LOCATING DIMENSIONS.

UNIT OF MEASURE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	SHAFT DIA	KEYWAY
INCH	42	21	4	19.87	1.12	1	36	29.50	5.37	28.37	28	6.50	12.50	31	10	22.62	10.50	54.50	30.75	7	8	51.75	5.75	19.50	3.375/3.374	0.87 X 0.43
MM	1067	533	102	505	29	25	914	749	137	721	711	165	318	787	254	575	267	1384	781	178	152	1314	146	495	85.725/85.700	22 X 11

CYL NO	UNIT OF MEASURE	AA	BB	CC	DD	EE	FF	GG	HH	SUCTION	DISCHARGE
A	INCH	20.37	21.62	5	7.62	33.25	38.81	41.50	52	2 1/2" NPT	1 1/2" NPT
	MM	518	549	127	194	845	986	1054	1321		
B	INCH	21	21.31	5.50	8.25	33.18	39.56	42.31	52.81	4" NPT	2 1/2" NPT
	MM	533	541	140	210	843	1005	1075	1341		
C	INCH	26.06	25.75	7.81	11.68	33.75	41.5	45.75	56.25	6" 600" R.F. FLANGE	4" 600" R.F. FLANGE
	MM	662	654	198	297	857	1054	1162	1429		

IMPORTANT-REFER TO UNION INSTRUCTION SHEETS IN-4100-18 AND 19 OR INSTALLATION MANUAL FOR PIPING GUIDELINES.

NOTE:
1-SUCTION AND/OR DISCHARGE MANIFOLDS MAY BE REVERSED TO PROVIDE CONNECTIONS OPPOSITE THAT SHOWN.
2-COMPANION FLANGES TO BE FURNISHED BY OTHERS

CERTIFIED CORRECT FOR THE FOLLOWING-

CUSTOMER-		UNION PUMP COMPANY	
LOCATION-		BATTLE CREEK, MICHIGAN	
SERVICE-		OUTLINE DIMENSIONS FOR X4 1/4 QD-200	
CUST. P. O.-		QUINTUPLEX POWER PUMP	
UPC No.-	UPCO No.-	ITEM No.-	DATE-
5-8-85	0-8-85	0-8-85	0-8-85