

(Rails and Shaft Protector sold separately)

3 Frame Piston Pump

Brass Models

280

290

**Stainless Steel
Models**

281

291

FEATURES

- Triplex UNIFLOW design provides a smooth, low-pulsation flow with strong suction capabilities.
- Hard chrome-plated 304S cylinders and sleeves provide long life with mild liquids within a range of 5-9 PH.
- Optional 316 Stainless Steel manifolds for added strength and corrosion resistance.
- Optional FPM and PTFE elastomers for liquid compatibility.

COMMON SPECIFICATIONS

| | | |
|--|----------------------|------------------------|
| Inlet Pressure Range | -8.5 to 40 psi | (-0.6 to + 2.8 bar) |
| Bore | 0.787" | (20 mm) |
| Crankcase Capacity | 10 oz. | (.3 l) |
| Maximum Liquid Temperature | 160°F | (71°C) |
| Above 130°F call CAT PUMPS for inlet conditions and elastomer recommendations. | | |
| Inlet Port (1) | 1/2" NPTF | (1/2" NPTF) |
| Chemical Injection Port (1) | 1/4" NPTF | (1/4" NPTF) |
| Discharge Ports (2) | 3/8" NPTF | (3/8" NPTF) |
| Discharge Port (1) | 1/2" NPTF | (1/2" NPTF) |
| Pulley Mounting | Either side | (Either side) |
| Shaft Diameters | 0.650" | (16.5 mm) |
| Dimensions (280) | 10.63 x 8.79 x 5.30" | (270 x 223 x 134.5 mm) |
| Dimensions (290) | 10.83 x 8.79 x 5.30" | (275 x 223 x 134.5 mm) |

⚠ CAUTIONS AND WARNINGS

All 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 could result in personal injury or damage to pump or property. CAT PUMPS does not assume any liability or responsibility for the operation of a customer's high pressure system.

Read all CAUTIONS and WARNINGS before commencing service or operation of any high pressure system. The CAUTIONS and WARNINGS are included in each service manual and with each Data sheet. CAUTIONS and WARNINGS can also be viewed online at www.catpumps.com/cautions-warnings or can be requested directly from CAT PUMPS.

WARRANTY

View the Limited Warranty on-line at www.catpumps.com/warranty.

SPECIFICATIONS

U.S. Measure

Metric Measure

MODEL 280 and 281

| | | |
|----------------------|-----------------|---------------|
| Flow | 3.0 gpm | (11.4 l/m) |
| Pressure Range | 100 to 1000 psi | (7 to 70 bar) |
| RPM | 1330 rpm | (1330 rpm) |
| Stroke | 0.394" | (10 mm) |
| Weight | 11.7 lbs. | (5.3 kg) |

MODEL 290 and 291

| | | |
|----------------------|-----------------|---------------|
| Flow | 3.5 gpm | (13.2 l/m) |
| Pressure Range | 100 to 1200 psi | (7 to 85 bar) |
| RPM | 1200 rpm | (1200 rpm) |
| Stroke | 0.472" | (12 mm) |
| Weight | 12.1 lbs. | (5.5 kg) |

ELECTRIC HORSEPOWER REQUIREMENTS

| MODEL | FLOW | | PRESSURE | | | MOTOR PULLEY SIZE | |
|-------|-------------|------|------------|-------------|-------------|--|----------------|
| | U.S. gpm | l/m | psi 800 | psi 1000 | psi 1200 | Using 1725 Nom. RPM Motor & 5.0" Pump Pulley O.D. | |
| | | | bar 55 | bar 70 | bar 85 | rpm | Pulley O.D. |
| 280 | 3.0 | 11.4 | 1.6 | 2.1 | N/A | 1330 | 3.9 |
| | 2.5 | 9.5 | 1.4 | 1.7 | N/A | 1108 | 3.2 |
| | 2.0 | 7.6 | 1.1 | 1.4 | N/A | 887 | 2.8 |
| 290 | 3.5 | 13.2 | 1.9 | 2.4 | 2.9 | 1200 | 3.5 |
| | 3.0 | 11.4 | 1.6 | 2.1 | 2.5 | 1029 | 3.0 |
| | 2.5 | 9.5 | 1.4 | 1.7 | 2.1 | 858 | 2.5 |

$$\text{DETERMINING THE PUMP R.P.M.} \quad \frac{\text{Rated gpm}}{\text{Rated rpm}} = \frac{\text{"Desired" gpm}}{\text{"Desired" rpm}}$$

$$\text{DETERMINING THE REQUIRED H.P.} \quad \frac{\text{gpm} \times \text{psi}}{1460} = \text{Electric Brake H. P. Required}$$

$$\text{DETERMINING MOTOR PULLEY SIZE} \quad \frac{\text{Motor Pulley O.D.}}{\text{Pump rpm}} = \frac{\text{Pump Pulley O.D.}}{\text{Motor rpm}}$$

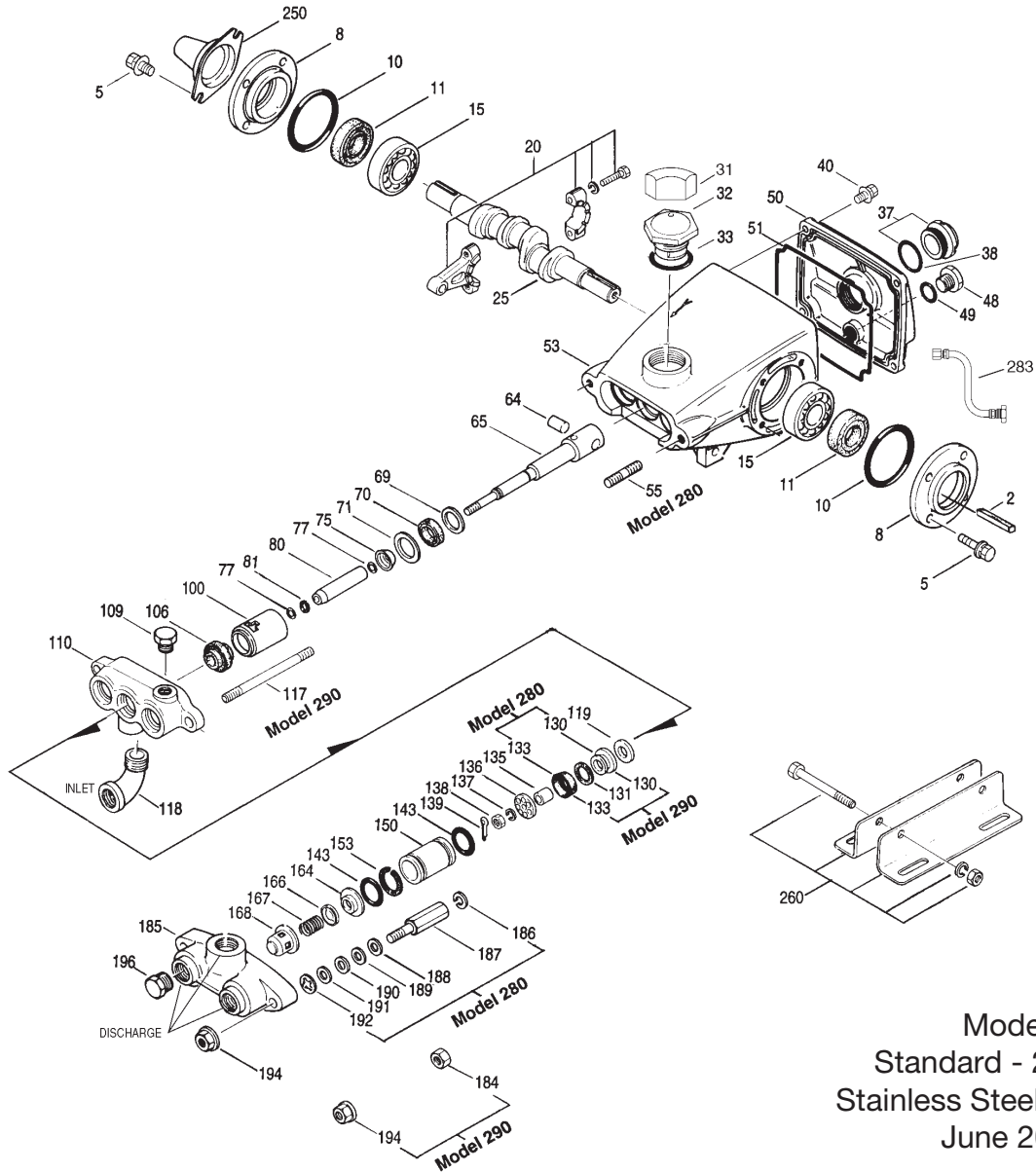
See complete Drive Packages [Incls: Pulleys, Belts, Hubs, Key] Tech Bulletin 003. Refer to pump **Service Manual** for repair procedure and additional technical information.

"Customer confidence is our greatest asset"

PARTS LIST

| ITEM | PART NUMBER | | DESCRIPTION | QTY | |
|------|---------------|---------------|-----------------------------|---|-----|
| | 280 | 290 | | | |
| | 281 | 291 | MATL | | |
| 2 | 30047 | STL | 30047 STL | Key (M5x5x24) | 1 |
| 5 | 92519 | STZP | 92519 STZP | Screw, HHC Sems (M6x16) | 8 |
| | 125824 | STCP R | 125824 STCP R | Screw, HHC Sems (M6x16) | 8 |
| 8 | 27950 | AL | 27950 AL | Cover, Bearing | 2 |
| 10 | 26536 | NBR | 26536 NBR | O-Ring, Bearing Cover - 70D | 2 |
| 11 | 24159 | NBR | 24159 NBR | Seal, Oil, Crankshaft | 2 |
| 15 | 14487 | STL R | 14487 STL R | Bearing, Ball | 2 |
| 20 | 122041 | TNM | 48867 TNM | Rod, Assy Connecting [280-8/02, 290-9/02] | 3 |
| 25 | 26239 | FCM | 43804 FCM | Crankshaft | 1 |
| 31 | 828710 | — | 828710 — | Protector, Oil Cap w/Foam Gasket | 1 |
| 32 | 43211 | ABS | 43211 ABS | Cap, Oil Filler | 1 |
| 33 | 14177 | NBR | 14177 NBR | O-Ring, Oil Filler Cap - 70D | 1 |
| 37 | 92241 | — | 92241 — | Gauge, Oil Bubble w/Gasket - 80D | 1 |
| 38 | 44428 | NBR | 44428 NBR | Gasket, Flat, Oil Gauge - 80D | 1 |
| 40 | 92520 | STZP | 92520 STZP | Screw, HHC Sems (M6x20) | 4 |
| | 126541 | STCP R | 126541 STCP R | Screw, HHC Sems (M6x20) | 4 |
| 48 | 25625 | STCP | 25625 STCP | Plug, Drain (1/4"x19BSP) | 1 |
| 49 | 23170 | NBR | 23170 NBR | O-Ring, Drain Plug - 70D | 1 |
| 50 | 48772 | AL | 48772 AL | Cover, Rear (07/08) (See Tech Bulletin 104) | 1 |
| 51 | 48773 | NBR | 48773 NBR | O-Ring, Rear Cover (07/08) (See Tech Bulletin 104) | 1 |
| 53 | 128361 | AL | 128361 AL | Crankcase, 4 Screws (07/08) (See Tech Bulletin 104) | 1 |
| 55 | 126546 | STCP R | — | Stud (M8x41.4) | 2 |
| 64 | 16948 | CM | 16948 CM | Pin, Crosshead | 3 |
| 65 | 29612 | SZZ | 101800 SZZ | Rod, Piston | 3 |
| 69 | 126259 | STCP R | 126259 STCP R | Washer, Oil Seal | 3 |
| 70 | 25301 | NBR | 25301 NBR | Seal, Oil - 80D | 3 |
| 71 | 126189 | STCP R | 126189 STCP R | Washer, Oil Seal | 3 |
| 75 | 25327 | S | 25327 S | Slinger, Barrier | 3 |
| 77 | 25392 | NBR | 25392 NBR | O-Ring, Sleeve | 6 |
| | 28771 | FPM | 28771 FPM | O-Ring, Sleeve | 6 |
| | 28772 | PTFE | 28772 PTFE | O-Ring, Sleeve | 6 |
| 80 | 29614 | SCP | 29614 SCP | Sleeve | 3 |
| | 29743 | S | 29743 S | Sleeve (Unchromed) | 3 |
| 81 | — | — | 29003 PTFE | Back-up-Ring, Sleeve | 3 |
| 100 | 28597 | PVDF | 28597 PVDF | Retainer, Seal | 3 |
| 106 | 30315 | NBR | 30315 NBR | Seal, LPS, Prrrrm-A-Lube | 3 |
| | 30325 | FPM | 30325 FPM | Seal, LPS, Prrrrm-A-Lube | 3 |
| 109 | 22177 | BBCP | 22177 BBCP | Plug HH (1/4" NPT) | 1 |
| 110 | 25128 | BBCP | 25128 BBCP | Manifold, Inlet | 1 |
| | 25635 | SS | 25635 SS | Manifold, Inlet | 1 |
| 117 | — | — | 85680 STCP | Stud (M8x99.5) | 2 |
| 118 | 22160 | BBCP | 22160 BBCP | Elbow (1/2" NPT) | 1 |
| 119 | 27004 | S | 27004 S | Valve, Inlet | 3 |
| 130 | 22021 | S | 30543 S | Piston | 3 |
| 131 | — | — | 30544 PTFE | Bac-Cup Ring | 3 |
| 133 | 43172 | FPM | 43172 FPM | Cup, Piston | 3 |
| 133 | — | — | 43474 FPM | Assy, Bac-Cup (Incls: 130, 131, 133) (290 Only) | 3 |
| 133 | 29089 | SNG | 29089 SNG | Cup, V-Hot | 3 |
| | 30145 | TG | 30145 TG | Cup-Piston, w/FPM O-Ring (1000 psi max) | 3 |
| 135 | 27003 | S | 27983 S | Spacer, Piston | 3 |
| 136 | 27002 | S | 27002 S | Retainer, Piston | 3 |
| 137 | 27006 | S | 27006 S | Washer, Conical (M6) | 3 |
| 138 | 27000 | S | 27000 S | Nut (M6) | 3 |
| 139 | 14158 | S | 14158 S | Cotterpin (M1.6x10) | 3 |
| 143 | 23172 | NBR | 23172 NBR | O-Ring, Cylinder -70D | 6 |
| | 11377 | FPM | 11377 FPM | O-Ring, Cylinder -80D | 6 |
| | 26961 | PTFE | 26961 PTFE | O-Ring, Cylinder | 6 |
| 150 | 26112 | SCP | 101802 SCP | Cylinder | 3 |
| | 28774 | S | 43834 S | Cylinder (Unchromed) | 3 |
| 153 | — | — | 21985 PTFE | Back-Up-Ring, Cylinder | 3 |
| 164 | 43434 | S | 43434 S | Seat, Q.V. | 3 |
| | 29487 | S | 29487 S | Seat, F.V. | 3 |
| 166 | 43723 | S | 43723 S | Valve, Q.V. | 3 |
| | 22842 | S | 22842 S | Valve, F.V. | 3 |
| 167 | 43360 | S | 43360 S | Spring, Q.V. | 3 |
| | 22031 | S | 22031 S | Spring, F.V. | 3 |
| 168 | 43442 | S | 43442 S | Retainer, Spring, Q.V. | 3 |
| | 22841 | S | 22841 S | Retainer, Spring, F.V. | 3 |
| 184 | — | — | 126521 STCP R | Nut, Hex (M8) | 2 |
| 185 | 24459 | BBCP | 24459 BBCP | Manifold, Discharge | 1 |
| | 25634 | SS | 25634 SS | Manifold, Discharge | 1 |
| 186 | 15845 | STZP | — | Lockwasher (M8) | 2 |
| | 126232 | STCP R | — | Lockwasher (M8) | 2 |
| 187 | 126565 | STCP R | — | Bolt, Cylinder (M8x62.5) | 2 |
| 188 | 126813 | STCP R | — | Shim (M8x13x1.0) | 2-4 |
| 189 | 126576 | STCP R | — | Shim (M8x13x0.5) | 2-4 |
| 190 | 126590 | STCP R | — | Shim (M8x13x0.3) | 2-4 |
| 191 | 126591 | STCP R | — | Shim (M8x13x2.0) | 2-4 |
| 192 | 26676 | S | — | Lockwasher (M8) | 2 |

EXPLODED VIEW



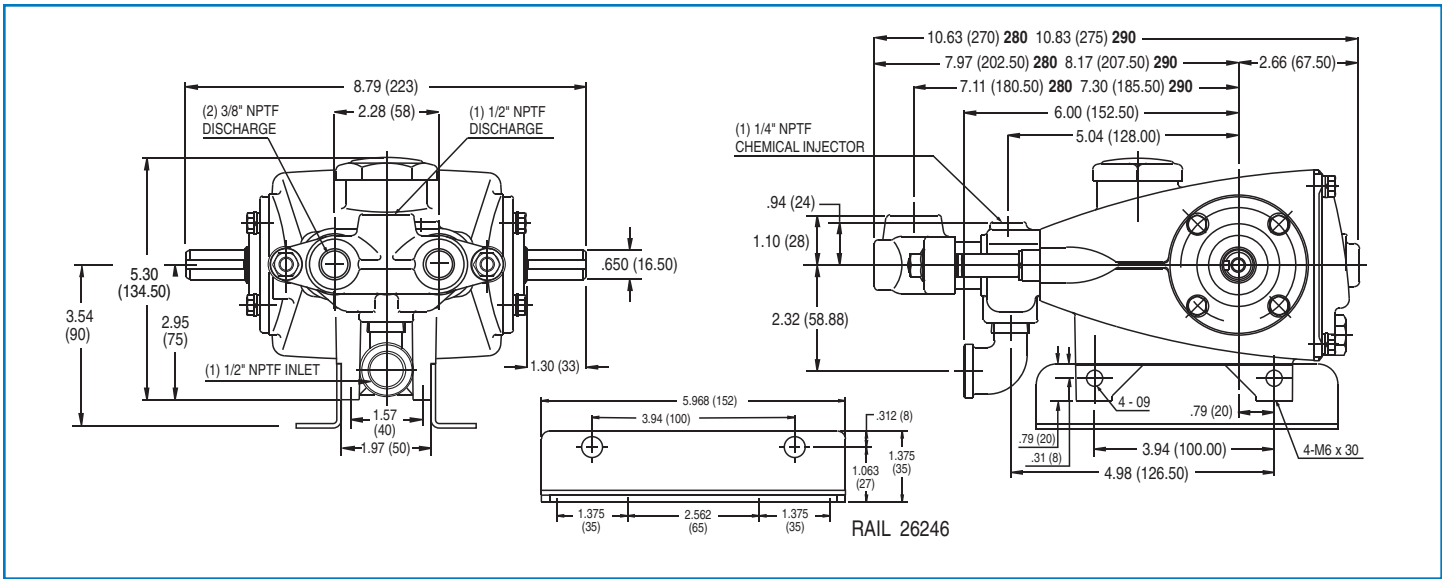
Models
Standard - 280, 290
Stainless Steel - 281, 291
June 2010

| | 280 | MATL | 290 | MATL | | | | |
|-----|------------|--------------|------------|-------------|--------------|------------|---|---|
| 194 | 281 | 126201 | STCP R | 291 | 126201 | STCP R | Nut, Hex Flange (M8) | 2 |
| 196 | | 22187 | BBCP | | 22187 | BBCP | Plug HH (3/8" NPT) | 1 |
| 250 | | 25130 | STCP | | 25130 | STCP | Protector, Shaft | 1 |
| 260 | | 30612 | STZP R | | 30612 | STZP R | Assy, Angle Rail | 1 |
| 270 | | 30246 | STL | | 30246 | STL | Pulley Assy (Incls: 30032, 30047) | 1 |
| 275 | | 30942 | STL | | 30942 | STL | Hub & Key Assy (Incls: 30943, 30047) | 1 |
| 283 | | 34334 | — | | 34334 | — | Kit, Oil Drain (3/8"x24") (See Tech Bulletin 077) | 1 |
| 298 | | 34961 | STZP | | 34961 | STZP | Clutch, Assy, Single Groove, 16.5mm, 12VDC | 1 |
| | | 34964 | STZP | | 34964 | STZP | Clutch, Assy, Dual Groove, 16.5mm, 12VDC | 1 |
| 300 | | 30023 | FPM | | — | — | Kit, Cup (Incls: 133, 139, 143, 355) | 1 |
| | | — | — | | 76023 | FPM | Kit, Cup (Incls: 131, 133, 139, 143, 355) | 1 |
| | | 701443 | TG | | 701443 | TG | Kit, Cup (Incls: 133, 139, 143) | 1 |
| 302 | | 30202 | NBR | | 30860 | NBR | Kit, Piston (Incls: 119-139, 143, 153, 355) | 1 |
| 304 | | 30272 | NBR | | 30272 | NBR | Kit, Hot Cup (Incls: 133, 139, 143) | 1 |
| 305 | | 30431 | NBR | | 30431 | NBR | Kit, Sleeve & Seal (Incls: 75, 77, 80, 106, 139) | 1 |
| 306 | | 30305 | NBR | | 30305 | NBR | Kit, Seal (Incls: 106, 139) | 1 |
| 310 | | 30686 | NBR | | 30686 | NBR | Kit, Valve, Quiet Valves (Incls: 143, 164, 166, 167, 168) | 1 |
| | | 30024 | NBR | | 30024 | NBR | Kit, Valve, Flat Valves (Incls: 143, 164, 166, 167, 168) | 1 |
| 355 | | 22130 | NY | | 22130 | NY | Insertor, Cup | 1 |
| | | 6107 | — | | 6107 | — | Oil, Bottle (21 oz.) ISO 68 Hydraulic (Fill to specified crankcase capacity prior to start-up) | 1 |

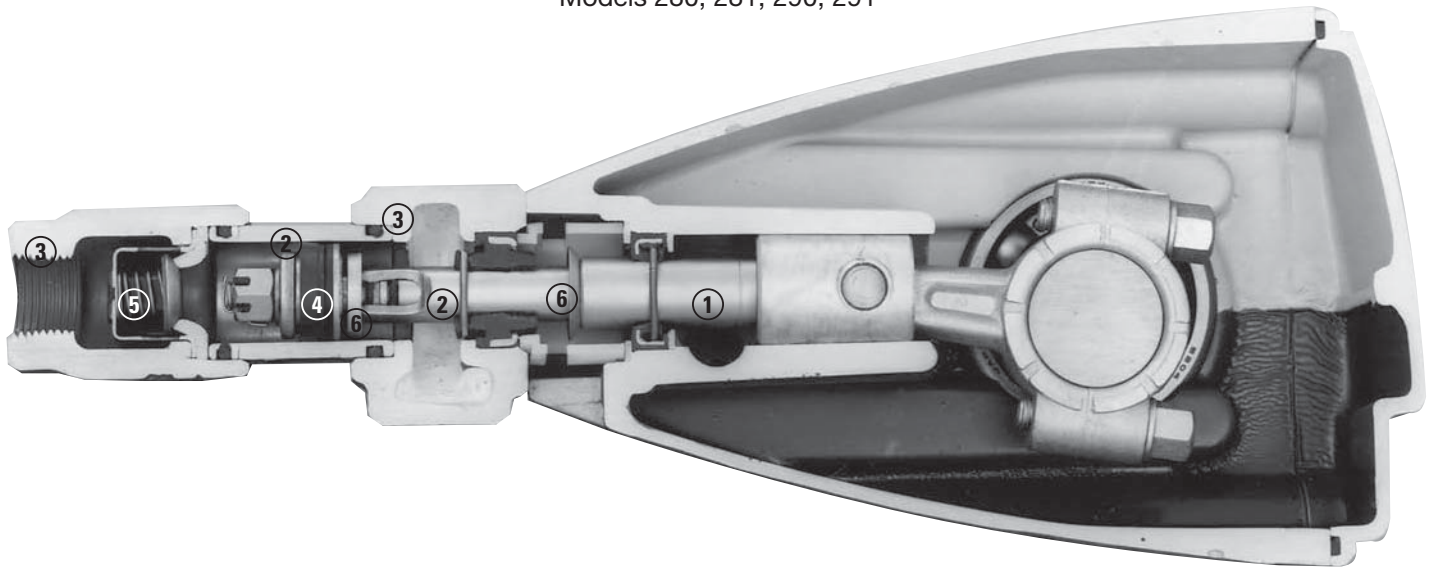
Bold print part numbers are unique to a particular pump model. Italics are optional items. [] Date of latest production change. R Components comply with RoHS Directive. View Tech Bulletins 002, 003, 012, 016, 017, 020, 024, 026, 030, 033, 034, 036, 074, 077, 083 and 104 for additional information.

All Q.V. parts are necessary for conversions, Q.V. and F.V. parts cannot be mixed.

MATERIAL CODES (Not Part of Part Number): ABS=ABS Plastic AL=Aluminum BBCP=Brass/Chrome Plated CM=Chrome-moly FCM=Forged Chrome-moly FPM=Fluorocarbon NBR=Medium Nitrile (Buna-N) NY=Nylon PTFE=Pure Polytetrafluoroethylene PVDF=Polyvinylidene Fluoride S=304SS SCP=304SS/Chrome Plated SNG=Special Blend (Buna) SS=316SS STCP=Steel/Chrome Plated STL=Steel STZP=Steel/Zinc Plated SZZ=304SS/Zamak TG= PTFE Graphite Compound (GIT) TNM=Special High Strength



Models 280, 281, 290, 291



- 1 The **patented stepped piston rod sleeve** provides a durable wear surface and easy wet-end servicing.
- 2 The **cylinder and sleeve wear surfaces** are hard chrome-plated 304 stainless steel for longer service life.
- 3 **Manifolds** are of high tensile strength chrome-plated brass or 316 stainless steel for added corrosion resistance.
- 4 100% wet **cup/seal** design adds to service life by allowing pumped liquids to cool and lubricate the elastomers on both sides.
- 5 304 stainless steel **valves, seats, and springs** provide corrosion-resistance, ultimate seating and extended life.
- 6 Mechanically actuated **inlet valves** provide strong lift and easy prime.

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