

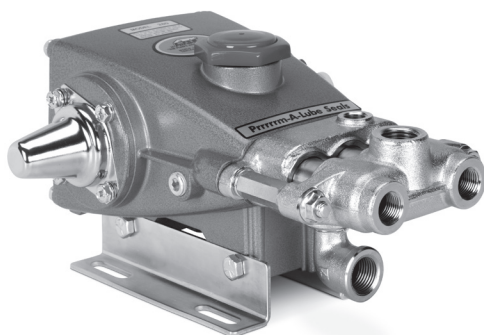
# DATA SHEET

## 3 FRAME PISTON PUMPS



**Brass Models: 280, 290**

**Stainless Steel Models: 281, 291**



Model 280 Shown  
(Shaft protector and mounting rails sold separately)

### FEATURES

- Triplex Uniflow design provides continuous forward liquid flow, promoting smooth operation.
- Wetted cups and floating pistons are lubricated and cooled by pumped liquid, resulting in longer cup life.
- Mechanically-actuated inlet valves create strong lift, helping to prime the pump.
- Optional 316 stainless steel manifolds provide added corrosion resistance.
- Pump comes standard with NBR seals. Alternative seal materials are available for higher temperature or chemical compatibility.

### COMMON

| SPECIFICATIONS                                                          | U.S.                 | Metric             |
|-------------------------------------------------------------------------|----------------------|--------------------|
| Crankcase Capacity                                                      | 10 oz                | 0.3 l              |
| Max. Liquid Temperature (NBR)                                           | 160° F               | 71° C              |
| <b>Alternative seals available for higher temperatures up to 180° F</b> |                      |                    |
| Inlet Pressure Range                                                    | -8.5–40 psi          | -0.6–2.8 bar       |
| Inlet Port (1)                                                          | ½" NPT(F)            | ½" NPT(F)          |
| Auxiliary Port (1)                                                      | ¼" NPT(F)            | ¼" NPT(F)          |
| Discharge Ports (2)                                                     | ¾" NPT(F)            | ¾" NPT(F)          |
| Discharge Port (1)                                                      | ½" NPT(F)            | ½" NPT(F)          |
| Shaft Diameter                                                          | 0.650"               | 16.5 mm            |
| Pulley Mounting                                                         | Either Side          | Either Side        |
| Dimensions (280, 281)                                                   | 10.62 x 8.78 x 5.30" | 270 x 223 x 135 mm |
| Dimensions (290, 291)                                                   | 10.83 x 8.78 x 5.30" | 275 x 223 x 135 mm |

### SPECIFICATIONS

|                        | U.S. Measure | Metric Measure |
|------------------------|--------------|----------------|
| <b>Models 280, 281</b> |              |                |
| Flow                   | 3.0 gpm      | 11.4 lpm       |
| Pressure Range         | 100–1000 psi | 6.9–69 bar     |
| Pump RPM*              | 1330 rpm     | 1330 rpm       |
| Bore                   | 0.787"       | 20 mm          |
| Stroke                 | 0.394"       | 10 mm          |
| Weight                 | 11.7 lbs     | 5.3 kg         |
| <b>Models 290, 291</b> |              |                |
| Flow                   | 3.5 gpm      | 13.2 lpm       |
| Pressure Range         | 100–1200 psi | 6.9–83 bar     |
| Pump RPM*              | 1200 rpm     | 1200 rpm       |
| Bore                   | 0.787"       | 20 mm          |
| Stroke                 | 0.472"       | 12 mm          |
| Weight                 | 12.1 lbs     | 5.5 kg         |

\*Pump minimum is 100 RPM.

### ALTERNATIVE SEAL CONFIGURATION

| MATERIAL | SUFFIX CODE | MAXIMUM TEMPERATURE |
|----------|-------------|---------------------|
| NBR      | —           | 160° F (71° C)      |
| FPM      | .0110       | 180° F (82° C)      |
| HT       | .3000       | 180° F (82° C)      |

See **Tech Bulletin 002** for inlet conditions and RPM at high-temperature.

### DETERMINING THE PUMP RPM

$$\frac{\text{Rated gpm}}{\text{Rated rpm}} = \frac{\text{Desired gpm}}{\text{Desired rpm}}$$

### DETERMINING THE REQUIRED HP

$$\frac{\text{hp (Electric Brake)}}{1460} = \frac{\text{gpm} \times \text{psi}}{1460}$$

### DETERMINING MOTOR PULLEY SIZE

$$\frac{\text{Motor Pulley OD}}{\text{Pump rpm}} = \frac{\text{Pump Pulley OD}}{\text{Motor rpm}}$$

Refer to pump **Service Manual** for repair procedure and additional technical information.

## PARTS LIST

| ITEM | PART NUMBER |        | DESCRIPTION |        | QTY                                                     |     |
|------|-------------|--------|-------------|--------|---------------------------------------------------------|-----|
|      | 280, 281    | MATL   | 290, 291    | MATL   |                                                         |     |
| 5    | 125824      | STCP R | 125824      | STCP R | Screw, HHC Sems (M6 x 16) (See Tech Bulletin 074)       | 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    | Assembly, Connecting Rod (See Tech Bulletin 074)        | 3   |
| 25   | 26239       | FCM    | 43804       | FCM    | Crankshaft                                              | 1   |
| 32   | 43211       | ABS    | 43211       | ABS    | Cap, Oil Filler                                         | 1   |
| 33   | 14177       | NBR    | 14177       | NBR    | O-Ring, Oil Filler Cap-70D                              | 1   |
| 37   | 92241       | PC     | 92241       | PC     | Gauge, Oil Bubble with Gasket-80D                       | 1   |
| 38   | 44428       | NBR    | 44428       | NBR    | Gasket, Flat, Oil Gauge-80D                             | 1   |
| 40   | 126541      | STCP R | 126541      | STCP R | Screw, HHC Sems (M6 x 20) (See Tech Bulletin 074)       | 4   |
| 48   | 25625       | STCP   | 25625       | STCP   | Plug, Drain (¼" x 19 BSP)                               | 1   |
| 49   | 23170       | NBR    | 23170       | NBR    | O-Ring, Drain Plug-70D                                  | 1   |
| 50   | 48772       | AL     | 48772       | AL     | Cover, Rear (See Tech Bulletin 104)                     | 1   |
| 51   | 48773       | NBR    | 48773       | NBR    | O-Ring, Rear Cover (See Tech Bulletin 104)              | 1   |
| 53   | 128361      | AL     | 128361      | AL     | Crankcase, 4 Screws (See Tech Bulletin 104)             | 1   |
| 55   | 126546      | STCP R | —           | —      | Stud (M8 x 41.4)                                        | 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                                               | 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-70D                                      | 6   |
| 80   | 29614       | SCP    | 29614       | SCP    | Sleeve                                                  | 3   |
|      | 29743       | S      | 29743       | S      | Sleeve (Unchromed)                                      | 3   |
| 81   | —           | —      | 29003       | PTFE   | Backup Ring, Sleeve                                     | 3   |
| 100  | 28597       | PVDF   | 28597       | PVDF   | Retainer, Seal                                          | 3   |
| 106  | 30315       | NBR    | 30315       | NBR    | Seal, Low-Pressure                                      | 3   |
| 109  | 22177       | BBCP   | 22177       | BBCP   | Plug HH (¼" NPT[M])                                     | 1   |
| 110  | 25128       | BBCP   | 25128       | BBCP   | Manifold, Inlet                                         | 1   |
|      | 25635       | SS     | 25635       | SS     | Manifold, Inlet                                         | 1   |
| 117  | —           | —      | 85680       | STCP   | Stud (M8 x 99.5) (Models 290, 291)                      | 2   |
| 118  | 22160       | BBCP   | —           | —      | Elbow (½" NPT[F]) (Model 280)                           | 1   |
| 119  | 27004       | S      | 27004       | S      | Valve, Inlet                                            | 3   |
| 130  | 22021       | S      | —           | —      | Piston                                                  | 3   |
| 133  | 43172       | FPM    | —           | —      | Bac-Cup                                                 | 3   |
|      | —           | —      | 43474       | FPM    | Assembly, Bac-Cup (Includes: Piston, Bac-Cup Ring, Cup) | 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 (M1.6 x 10)                                   | 3   |
| 143  | 23172       | NBR    | 23172       | NBR    | O-Ring, Cylinder-70D                                    | 6   |
| 150  | 26112       | SCP    | 101802      | SCP    | Cylinder                                                | 3   |
|      | 28774       | S      | 43834       | S      | Cylinder (Unchromed)                                    | 3   |
| 153  | —           | —      | 21985       | PTFE   | Backup Ring, Cylinder                                   | 3   |
| 164  | 43434       | S      | 43434       | S      | Seat                                                    | 3   |
| 166  | 43723       | S      | 43723       | S      | Valve                                                   | 3   |
| 167  | 43360       | S      | 43360       | S      | Spring                                                  | 3   |
| 168  | 43442       | S      | 43442       | S      | Retainer, Spring                                        | 3   |
| 184  | —           | —      | 126521      | STCP R | Nut, Hex (M8) (Models 290, 291)                         | 2   |
| 185  | 24459       | BBCP   | 24459       | BBCP   | Manifold, Discharge                                     | 1   |
|      | 25634       | SS     | 25634       | SS     | Manifold, Discharge                                     | 1   |
| 186  | 126232      | STCP R | —           | —      | Lockwasher (M8)                                         | 2   |
| 187  | 126565      | STCP R | —           | —      | Bolt, Cylinder (M8 x 62.5) (Models 280, 281)            | 2   |
| 188  | 126813      | STCP R | —           | —      | Shim (M8 x 13 x 1.0)                                    | 2-4 |
| 189  | 126576      | STCP R | —           | —      | Shim (M8 x 13 x 0.5)                                    | 2-4 |
| 190  | 126590      | STCP R | —           | —      | Shim (M8 x 13 x 0.3)                                    | 2-4 |
| 191  | 126591      | STCP R | —           | —      | Shim (M8 x 13 x 2.0)                                    | 2-4 |
| 192  | 26676       | S      | —           | —      | Retainer, Shim (M8)                                     | 2   |
| 194  | 126201      | STCP R | 126201      | STCP R | Nut, Hex Flange (M8) (See Tech Bulletin 074)            | 2   |
| 196  | 22187       | BBCP   | 22187       | BBCP   | Plug HH (⅜" NPT[M])                                     | 1   |

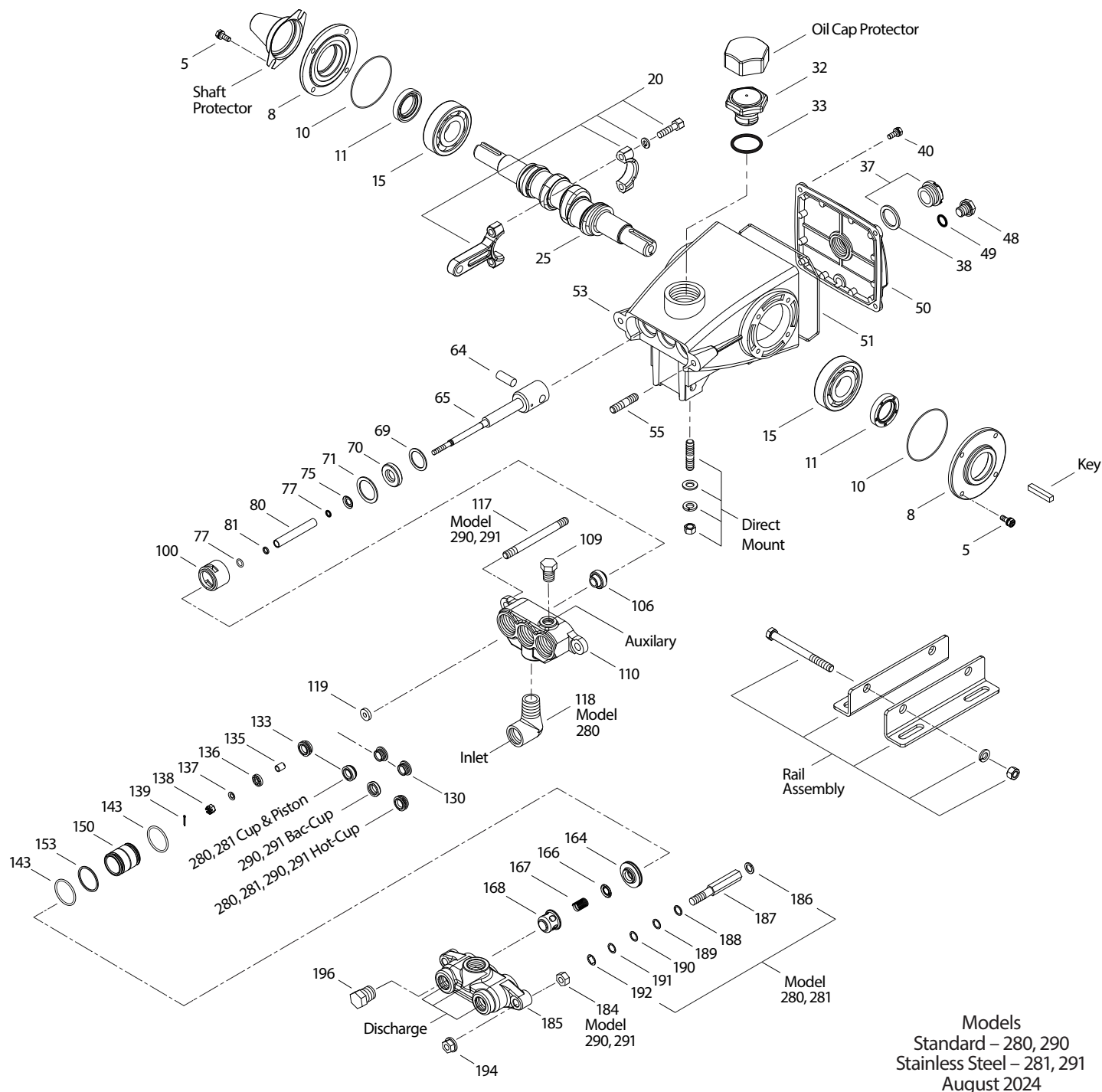
**Bold part numbers are unique to a particular pump model.** *Italics are optional items.* [ ] Date of latest production change.

R Components comply with RoHS Directive. For additional technical information see [www.catpumps.com/literature/tech-bulletins](http://www.catpumps.com/literature/tech-bulletins).

MATERIAL CODES (Not Part of Part Number): ABS=ABS Plastic ALE=Aluminum Epoxy BBCP=Brass/Chrome Plated CM=Chrome-Moly  
FCM=Forged Chrome-Moly FPM=Fluorocarbon NY=Nylon PC=Poly Carbonate 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

**Optional Parts and Accessories and Service parts listed on page 3. Standard and optional Seal Kits, Sleeve and Seal Kits, Cup Kits, Piston Kits and Valve Kits listed on page 4.**

## EXPLODED VIEW



### OPTIONAL PARTS AND ACCESSORIES

| PART   | DESCRIPTION                         | QTY |
|--------|-------------------------------------|-----|
| 30047  | Key (M5 x 5 x 24)                   | 1   |
| 30612  | Assembly, Rail                      | 1   |
| 30243  | Mount, Direct                       | 1   |
| 828710 | Protector, Oil Cap                  | 1   |
| 25130  | Protector, Shaft                    | 1   |
| 34334  | Kit, Oil Drain (Not Shown)          | 1   |
| 30246  | Pulley and Key Assembly (Not Shown) | 1   |
| 30942  | Hub and Key Assembly (Not Shown)    | 3   |

### SERVICE PARTS

| PART  | DESCRIPTION                                                                                      | QTY |
|-------|--------------------------------------------------------------------------------------------------|-----|
| 30305 | Kit, Seal - Standard NBR                                                                         | 1   |
| 30686 | Kit, Valve - Standard NBR                                                                        | 1   |
| 6107  | Oil, Bottle (21 oz) ISO 68 Hydraulic<br>(Fill to Specified Crankcase Capacity Prior to Start-up) | 1   |
| 6124  | Gasket, Liquid (3 oz)                                                                            | 1   |
| 6139  | Lubricant, Anti-Seize (8 oz) (Models 281, 291)                                                   | 1   |

## SEAL KITS One (1) seal kit required per pump

| Pump Models                  | 280, 281, 290, 291 | 280, 281, 290, 291 |                       |     |
|------------------------------|--------------------|--------------------|-----------------------|-----|
|                              | NBR (STD)          | FPM (.0110)        |                       |     |
|                              | 30305              | 30355              |                       |     |
| ITEM (Included in Seal Kits) |                    |                    | DESCRIPTION           | QTY |
| 106                          | 30315              | 30325              | Seal, Low-Pressure    | 3   |
| 139                          | 14158              | 14158              | Cotterpin             | 3   |
| —                            | 30168              | 30168              | Paper, Abrasive (400) | 2   |

## SLEEVE AND SEAL KIT One (1) sleeve and seal kit required per pump

| Pump Models                             | 280, 281, 290, 291 | 280, 281, 290, 291 |                    |     |
|-----------------------------------------|--------------------|--------------------|--------------------|-----|
|                                         | NBR (STD)          | FPM (.0110)        |                    |     |
|                                         | 30431              | 76901              |                    |     |
| ITEM (Included in Sleeve and Seal Kits) |                    |                    | DESCRIPTION        | QTY |
| 75                                      | 25327              | 25327              | Slinger, Barrier   | 3   |
| 77                                      | 25392*             | 28771              | O-Ring, Sleeve     | 6   |
| 80                                      | 29614              | 29614              | Sleeve             | 3   |
| 106                                     | 30315              | 30325              | Seal, Low-Pressure | 3   |
| 139                                     | 14158              | 14158              | Cotterpin          | 3   |

\* Use PN 702026 for PTFE

## CUP KITS One (1) cup kit required per pump

| Pump Models                 | 280, 281  | 280, 281  | 280, 281        | 280, 281    | 290, 291  | 290, 291  | 290, 291        |                  |                 |
|-----------------------------|-----------|-----------|-----------------|-------------|-----------|-----------|-----------------|------------------|-----------------|
|                             | NBR (STD) | NBR (HOT) | TG (Cup-Piston) | FPM (.0110) | NBR (STD) | NBR (HOT) | TG (Cup-Piston) |                  |                 |
|                             | 30023     | 30272     | 701443*         | 76898       | 76023     | 30272     | 701443*         |                  |                 |
| ITEM (Included in Cup Kits) |           |           |                 |             |           |           |                 |                  | DESCRIPTION QTY |
| 131                         | —         | —         | —               | —           | 30544     | —         | —               | Ring, Bac-Cup    | 3               |
| 133                         | 43172     | 29089     | 76515           | 43172       | 43172     | 29089     | 76515           | Cup              | 3               |
| 139                         | 14158     | 14158     | 14158           | 14158       | 14158     | 14158     | 14158           | Cotterpin        | 3               |
| 143                         | 23172**   | 23172**   | 11377           | 11377       | 23172**   | 23172**   | 11377           | O-Ring, Cylinder | 6               |
| 355                         | 22130     | —         | —               | 22130       | 22130     | —         | —               | Insertor, Cup    | 1               |

\* 76515 comes with a FPM O-ring, \*\* Use PN 703244 for PTFE

## PISTON KITS One (1) piston kit required per pump

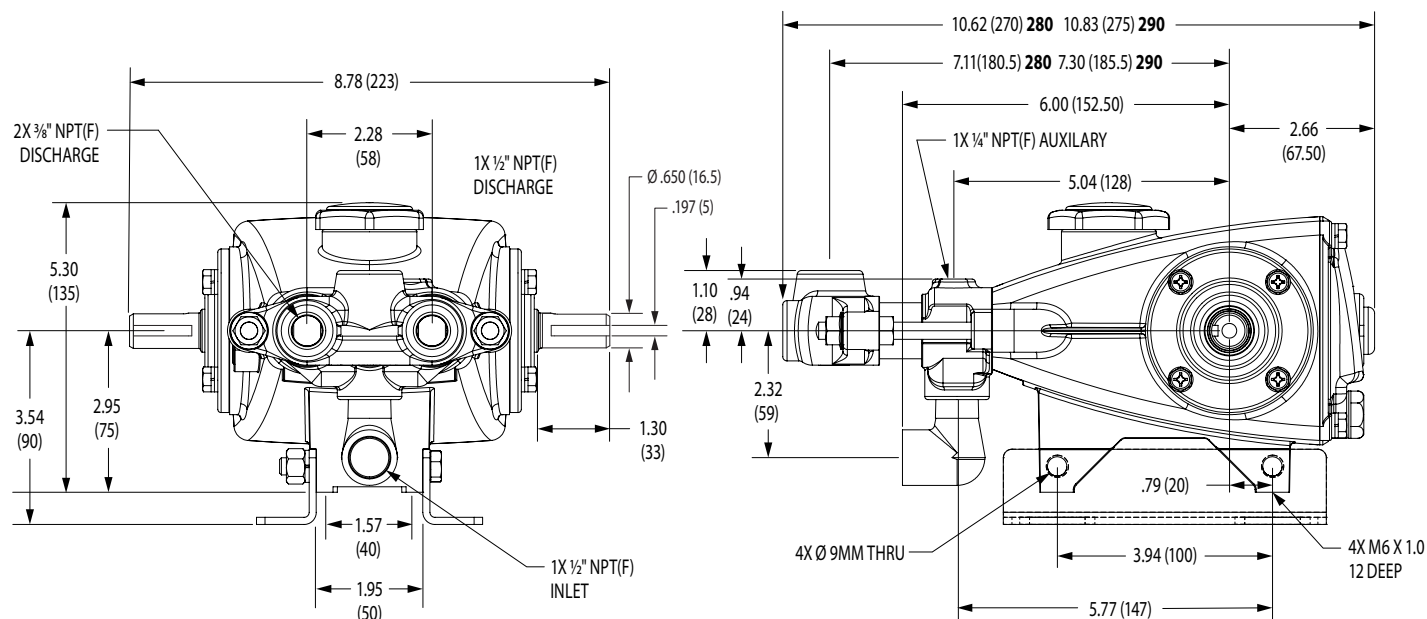
| Pump Models                    | 280, 281  | 290, 291  | 280, 281    |                                                         |     |
|--------------------------------|-----------|-----------|-------------|---------------------------------------------------------|-----|
|                                | NBR (STD) | NBR (STD) | FPM (.0110) |                                                         |     |
|                                | 30202     | 30860     | 76891       |                                                         |     |
| ITEM (Included in Piston Kits) |           |           |             | DESCRIPTION                                             | QTY |
| 119                            | 27004     | 27004     | 27004       | Valve, Inlet                                            | 3   |
| 130                            | 22021     | —         | 22021       | Piston                                                  | 3   |
| 133                            | —         | 43474     | —           | Assembly, Bac-Cup (Includes: Piston, Bac-Cup Ring, Cup) | 3   |
| 133                            | 43172     | —         | 43172       | Cup                                                     | 3   |
| 135                            | 27003     | 27983     | 27003       | Spacer, Piston                                          | 3   |
| 136                            | 27002     | 27002     | 27002       | Retainer, Piston                                        | 3   |
| 137                            | 27006     | 27006     | 27006       | Washer, Conical                                         | 3   |
| 138                            | 27000     | 27000     | 27000       | Nut, Slotted                                            | 3   |
| 139                            | 14158     | 14158     | 14158       | Cotterpin                                               | 3   |
| 143                            | 23172*    | 23172*    | 11377       | O-Ring, Cylinder                                        | 6   |
| 153                            | —         | 21985     | —           | Backup Ring, Cylinder                                   | 3   |
| 355                            | 22130     | —         | 22130       | Insertor, Cup                                           | 1   |

\*Use PN 703244 for PTFE

## VALVE KITS One (1) valve kit required per pump

| Pump Models                   | NBR (Quiet) | NBR (Flat) | FPM (.0110) |                  |     |
|-------------------------------|-------------|------------|-------------|------------------|-----|
| 280, 281, 290, 291            | 30686       | 30024      | 76889       |                  |     |
| ITEM (Included in Valve Kits) |             |            |             | DESCRIPTION      | QTY |
| 143                           | 23172 *     | 23172 *    | 11377       | O-Ring, Cylinder | 6   |
| 164                           | 43434       | 29487      | 43434       | Seat             | 3   |
| 166                           | 43723       | 22842      | 43723       | Valve            | 3   |
| 167                           | 43360       | 22031      | 43360       | Spring           | 3   |
| 168                           | 43442       | 22841      | 43442       | Retainer, Spring | 3   |

\*Use PN 703244 for PTFE



Models 280, 281

#### ⚠ CAUTIONS AND WARNINGS

All high-pressure systems require a primary pressure regulating device (e.g. regulator, unloader) and a secondary pressure relief device (e.g. 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 Accessory Data sheet. CAUTIONS and WARNINGS can also be viewed online at [www.catpumps.com/dynamic-literature/cautions-and-warnings](http://www.catpumps.com/dynamic-literature/cautions-and-warnings) or can be requested directly from Cat Pumps.

#### WARRANTY

View the Limited Warranty online at [www.catpumps.com/literature/cat-pumps-limited-warranty](http://www.catpumps.com/literature/cat-pumps-limited-warranty)