

# DATA SHEET

## DIRECT DRIVE PLUNGER PUMPS



### Brass Models: **1CX013R, 1CX025R, 1CX050R**

See page 4 for complete pump/motor model number selection for ordering.



Model 1CX050RA2  
Motor-Pump-Unit Without Pulse Hose

### FEATURES

- Ultra-compact, direct-drive pump and motor unit great for portability and small spaces.
- Four-position head mounting allows for plumbing flexibility.
- Oil bath lubrication ensures optimum drive-end lubrication.
- Pressure regulator offers precision pressure setting and over-pressure protection.
- Includes oil in crankcase.

### COMMON SPECIFICATIONS

	U.S.	Metric
Pump RPM	1725 rpm	1725 rpm
Inlet Pressure Range	Flooded to 60 psi	Flooded to 4.1 bar
Maximum Liquid Temp. (NBR)	140° F	82° C
<b>Alternative seals available for higher temperatures up to 180° F</b>		
Bore	0.630"	16 mm
Crankcase Capacity	2.03 oz	0.06 l
Inlet Port	3/8" NPT(F)	3/8" NPT(F)
Discharge Port	1/4" NPT(F)	1/4" NPT(F)
Bypass Port	1/4" NPT(F)	1/4" NPT(F)
Shaft Diameter	1/2"	12.7 mm
Weight (Pump Only)	3.45 lbs	1.56 kg
Dimensions (Pump Only)	3.62 x 5.12 x 6.85"	92 x 130 x 174 mm

### SPECIFICATIONS

	U.S. Measure	Metric Measure
<b>1CX013R</b>		
Flow	0.13 gpm	0.49 lpm
Pressure Range	100–1250 psi	6.9–86 bar
Stroke (Single Plunger)	0.079"	2.0 mm
<b>1CX025R</b>		
Flow	0.25 gpm	0.95 lpm
Pressure Range	100–1250 psi	6.9–86 bar
Stroke (Single Plunger)	0.130"	3.3 mm
<b>1CX050R</b>		
Flow	0.50 gpm	1.89 lpm
Pressure Range	100–1250 psi	6.9–86 bar
Stroke (Single Plunger)	0.248"	6.3 mm

### ALTERNATIVE SEAL CONFIGURATION

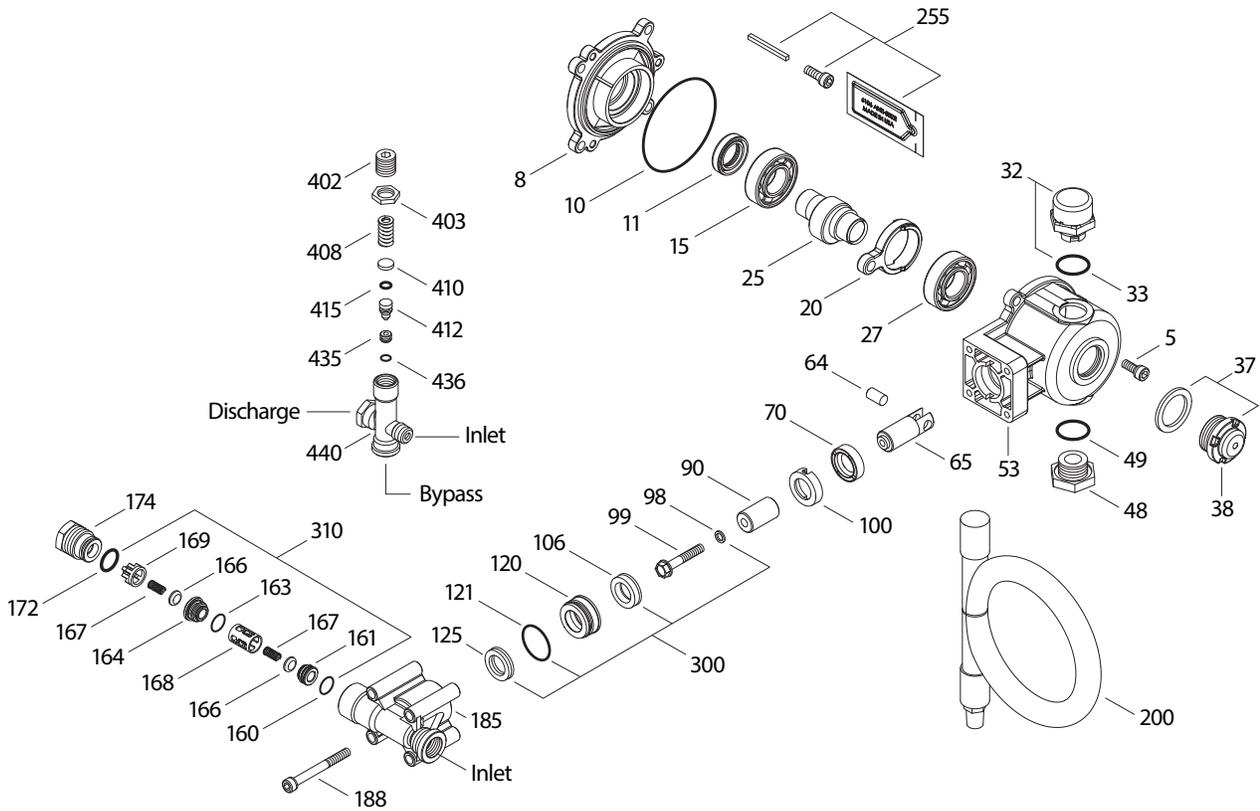
MATERIAL	SUFFIX CODE	MAXIMUM TEMPERATURE
NBR	—	140° F (60° C)
ST	.4400	180° F (82° C)

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

$$\text{DETERMINING THE REQUIRED HP} = \frac{\text{hp (Electric Brake)} \times \text{gpm} \times \text{psi}}{1060}$$

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

# EXPLODED VIEW



## PARTS LIST

ITEM	P/N	MATL	DESCRIPTION	QTY
2	76059	STL	Key (1/8" sq. x 1.5") (Included in 30555)	1
5	180318	STCP R	Screw, Bearing Cover HSH (M6 x 14) (See Tech Bulletin 074)	3
8	49563	AL	Cover, Bearing	1
10	14035	NBR	O-Ring, Bearing Cover-70D	1
11	49565	NBR	Seal, Oil	1
15	47862	STL	Bearing, Ball, Inner	1
20	49566	TNM	Rod, Connecting	1
25	<b>49602</b>	STL	Crankshaft, 1/2", (2.0 mm) 1CX013R	1
	<b>49598</b>	STL	Crankshaft, 1/2", (3.3 mm) 1CX025R	1
	<b>49560</b>	STL	Crankshaft, 1/2", (6.3 mm) 1CX050R	1
27	47862	STL	Bearing, Ball, Outer	1
32	129254	ABS	Cap, Oil Filler with O-Ring	1
33	14179	NBR	O-Ring, Oil Filler Cap-70D	1
37	92241	PC	Gauge, Bubble Oil with Gasket-80D (See Tech Bulletin 074)	1
38	44428	NBR	Gasket, Flat Flex, Oil Gauge-80D	1
48	44842	NY	Plug, Drain	1
49	14179	NBR	O-Ring, Drain Plug-70D	1
53	49554	AL	Crankcase	1
64	46229	CM	Pin, Crosshead	1
65	542402	BB	Rod, Plunger	1
70	47215	NBR	Seal, Oil	1
90	542403	CC	Plunger (M16 x 27)	1
98	46730	NBR	Washer, Seal-90D	1
99	542405	S	Retainer, Plunger (M6 x 35) (See Tech Bulletin 074)	1
100	46233	D	Retainer, Seal	1
106	48222	NBR	Seal, Low-Pressure with S-Spring	1
	<i>670019</i>	<i>FPM</i>	<i>Seal, Low-Pressure with SS-Spring</i>	<i>1</i>
	<i>76089</i>	<i>ST2</i>	<i>Seal, Low-Pressure with SS-Spring</i>	<i>1</i>
120	547357	BB	Case, Seal	1
121	13976	NBR	O-Ring, Seal Case-70D	1

ITEM	P/N	MATL	DESCRIPTION	QTY
125	46240	NBR	Seal, High-Pressure	1
	<i>76088</i>	<i>ST2</i>	<i>Seal, High-Pressure</i>	<i>1</i>
160	13965	NBR	O-Ring, Inlet Seat-70D	1
161	545177	S	Seat, Inlet	1
163	19285	NBR	O-Ring, Discharge Seat-70D	1
164	545178	S	Seat, Discharge	1
166	547098	S	Valve	2
167	134579	S	Spring	2
168	543988	PVDF	Retainer, Inlet Spring	1
169	49569	PVDF	Retainer, Discharge Spring	1
172	11346	NBR	O-Ring, Discharge Fitting-70D	1
174	49572	BB	Plug, Valve with 1/4" NPT(F) Port, O-Ring (See Tech Bulletin 074)	1
185	49515	BB	Head, Manifold	1
188	89953	STCP	Screw, HSH (M6 x 55) (See Tech Bulletin 074)	4
200	<i>76225</i>	—	<i>Hose, Pulse (3/8" x 24")</i>	<i>1</i>
255	30555	STZPR	Assembly, Bolt Mount	1
300	76063	NBR	Kit, Seal (Includes: 98, 106, 121, 125)	1
310	76033	NBR	Kit, Valve (Includes: 160, 161, 163, 164, 166, 167, 168, 169, 172)	1
400	7561	BB	Regulator	1
402	49681	BB	Adjuster, Pressure	1
403	49682	BB	Nut, Locking	1
408	49876	STZP	Spring, Coil	1
410	549352	STCP R	Retainer, Spring	1
412	49877	S	Stem, Piston	1
415	14759	NBR	O-Ring, Piston Stem	1
435	49878	S	Seat	1
436	25300	NBR	O-Ring, Seat-70D	1
440	—	BB	Body	1
468	31555	NBR	Kit, O-Ring (Includes: 172, 415, 436)	1
470	76860	NBR	Kit, Repair (Includes: 412, 415, 436, 437)	1

See Back Page For Motors

**Bold part numbers are unique to a particular pump model.** *Italics are optional items.*

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 AL=Aluminum BB=Brass CC=Ceramic CM=Chrome-Moly D=Acetal FPM=Fluorocarbon NBR=Medium Nitrile (Buna-N) NY=Nylon PC=Poly Carbonate PVDF=Polyvinylidene Fluoride S=304SS ST2=Special PTFE 2 STCP=Steel/Chrome Plated STL=Steel STZP=Steel/Zinc Plated TNM=Special High Strength

**NOTE: Pump is shipped with two black caps with O-Rings for shipping purposes. Remove black cap with O-Ring on top of pump and replace with loose red cap with O-Ring as supplied in box.**

## INLET

It is recommended to install a flexible hose at the pump inlet. Ensure there is a flooded inlet or up to 60 psi inlet pressure for optimum performance. Install an inlet filter to remove standard water debris.

## DISCHARGE

All discharge plumbing for the 1CX pump connects to the regulator outlet port.

## BYPASS

The regulator bypass is at the bottom. Connect a 1/4" flexible hose and route to inlet of pump, to tank, or to drain.

## NOTICE

Bypass to the pump inlet is designed for cold water or ambient temperature operation. **DO NOT EXCEED 6 MINUTES IN BYPASS OPERATION.** Excessive temperatures will cause premature wear or damage to the pump and **VOID THE WARRANTY.**

## PULSE HOSE MOUNTING

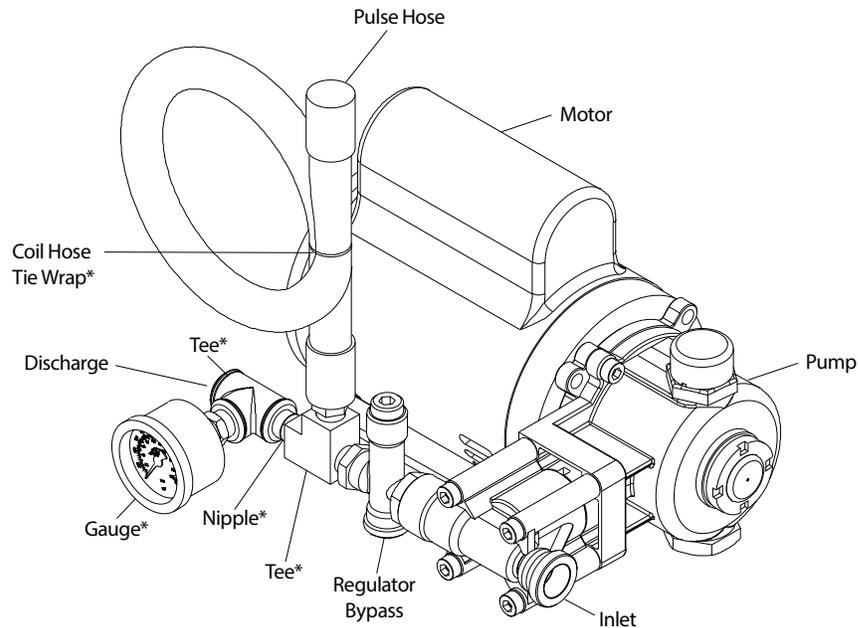
Mount the pulse hose by installing a tee fitting into the regulator outlet port. Install the pulse hose into the top port. Coil hose and tie wrap as shown. Add nipple with a tee to mount pressure gauge. The other end of the pulse hose is plugged to capture the pulse.

**NOTE:** Without a pulse hose, the pump may draw as much as 2 additional AMPS above full load AMPS.

## OPERATION

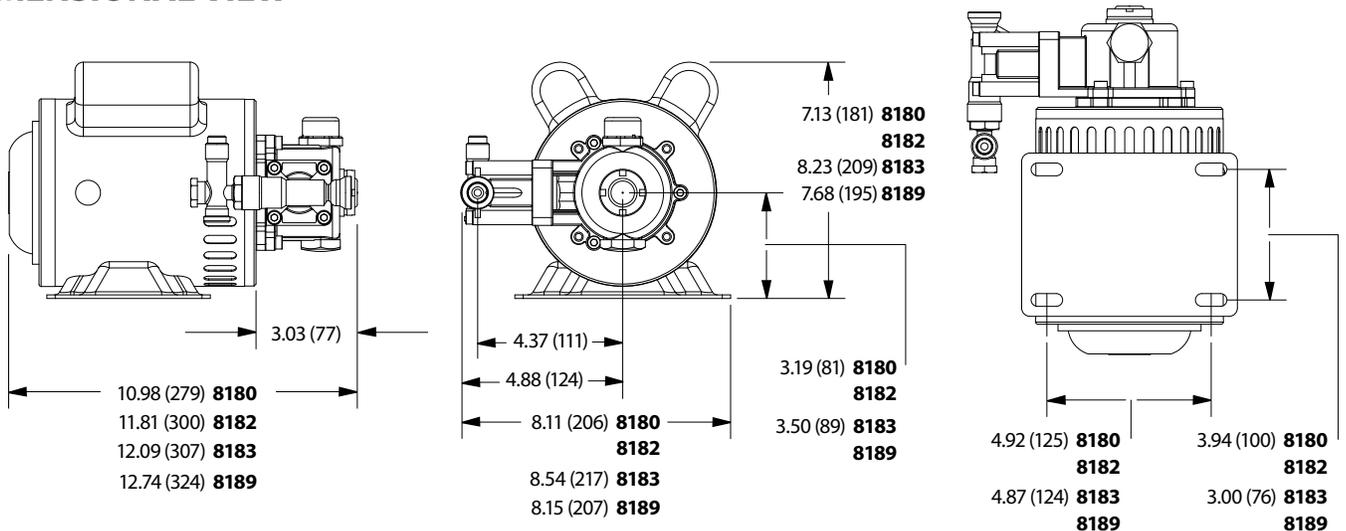
A pressure regulator is included with each 1CX plunger pump. The regulator is not pre-set at the factory. Ensure inlet line and pump are filled with water (primed). Set system pressure once the system is started. Start at the lowest pressure reading and adjust the pressure adjuster in small increments until the desired system pressure is attained. Remember to service the regulator on the same schedule as the pump seals and valves. Refer to 1CX service manual for start-up, servicing of seals and valves, torque requirements and diagnosis/maintenance chart.

## TYPICAL SET-UP



\*Not Supplied With Motorized Pump Unit

## DIMENSIONAL VIEW



## Model Number Selection Chart

Series	Flow (1750 rpm)	Regulator	Assemble Option	Motor Option*	Pulse Hose Option
1CX	013 = .13 gpm	R = Regulator Included	D = Pump and Motor not assembled	1 = 8180	Blank = No Pulse Hose
	025 = .25 gpm			2 = 8182	
	050 = .5 gpm		A = Pump and Motor assembled	4 = 8183	P = Pulse Hose Included
		5 = 8189			

**Example:** 1CX050RA2P = .5 gpm, Regulator, Assembled, 8182 Motor, Pulse Hose Included

\* See Motor Options Chart Below

## Motor Options

Motors	8180	8182	8189	8183
Horsepower**	¼ HP	½ HP	½ HP	½ HP
Phase	Single	Single	Single	Single
Hertz	60 Hz	60 Hz	50 / 60 Hz	50 Hz
Voltage	115V / 230V	115V / 230V	115V / 230V	115V / 230V
RPM	1750	1750	1450 / 1750	1450
Full load amp*	2.8 / 1.4	4.8 / 2.4	4.74 / 2.37	6.4 / 3.2
Service factor	1.0	1.0	1.15	1.0
Shaft diameter	½"	½"	½"	½"
Connection	12" Leads	12" Leads	Terminal Box	Terminal Box
Capacitors	Start and Run	Start and Run	Start and Run	Start and Run
Insulation class	E	E	F	F
Motor type	ODP	ODP	TEFC	TEFC
Compliance	RoHS CSA	RoHS CSA	RoHS, CE, UL, CSA	RoHS, CE, UL, CSA
Weight	15.80 lbs	21.75 lbs	25.80 lbs	28.85 lbs

\*NOTE: Without pulse hose amp draw will increase as much as 2 amps depending upon pump model and discharge pressure.

\*\* HP Calculation = (GPM X PSI) ÷ 1060

## Replacement Parts

Fan Cover	999525	999525	N/A	N/A
Capacitor Cover	999529	999526	N/A	N/A



**8180 and 8182**  
12" Wire Leads



**8189**  
Terminal Box



**8183**  
Terminal Box

### ⚠ 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)