

# DATA SHEET

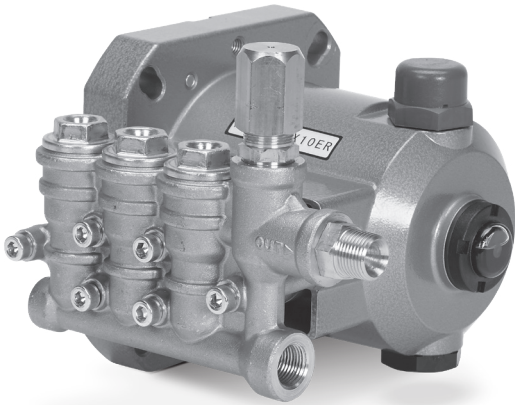
## DIRECT DRIVE PLUNGER PUMPS



**Brass Models:**      **4DX10ER, 4DX15ER,  
4DX20ER, 4DX27ER,  
4DX30ER**



See page 8 for complete pump model number selection.



Model 4DX10ER Shown

### FEATURES

- Fits standard 56C face motors.
- Stacked stainless steel valve design promotes long-life and easy servicing.
- Integral pressure regulator or unloader with built-in bypass standard on all units to assure system pressure control and pump protection.
- Standard pumps are fitted with NBR seals. Optional seals are available for higher temperatures or chemical compatibility.
- Includes crankcase oil.

### COMMON SPECIFICATIONS

	U.S.	Metric
Max. Discharge Pressure	2000 psi	138 bar
Inlet Pressure Range	Flooded to 60 psi	Flooded to 4.1 bar
Bore	0.630"	16 mm
Max Liquid Temp. (NBR)	140° F	60° C

### Alternate Seals Available for Higher Temperatures up to 180° F

Crankcase Capacity	8.5 oz	0.25 l
Inlet Port (1)	3/8" NPT(F)	3/8" NPT(F)
Accessory Port (1)	1/4" NPT(F)	1/4" NPT(F)
Discharge Ports (1)	3/8" NPT(M)	3/8" NPT(M)
Shaft Diameter	5/8"	15.8 mm
Weight	10.7 lbs	4.9 kg
Dimensions (ER versions)	7.17 x 7.72 x 6.22"	182 x 196 x 158 mm

### SPECIFICATIONS

	U.S. Measure	Metric Measure
<b>4DX10ER</b>		
Flow	1.0 gpm	3.8 lpm
Pump RPM	3450 rpm	3450 rpm
Stroke	0.078"	2.0 mm
<b>4DX15ER</b>		
Flow	1.5 gpm	5.7 lpm
Pump RPM	3450 rpm	3450 rpm
Stroke	0.118"	3.0 mm
<b>4DX20ER</b>		
Flow	2.0 gpm	7.6 lpm
Pump RPM	3450 rpm	3450 rpm
Stroke	0.157"	4.0 mm
<b>4DX27ER</b>		
Flow	2.7 gpm	10.2 lpm
Pump RPM	3450 rpm	3450 rpm
Stroke	0.220"	5.6 mm
<b>4DX30ER</b>		
Flow	3.0 gpm	11.4 lpm
Pump RPM	3450 rpm	3450 rpm
Stroke	0.244"	6.2 mm

### ALTERNATIVE SEAL CONFIGURATION

MATERIAL	SUFFIX CODE	MAXIMUM TEMPERATURE
NBR	—	140° F (60° C)
FPM	.0110	180° F (82° C)

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

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

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

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

## PARTS LIST

ITEM	PART NUMBER	MATERIAL	DESCRIPTION	QTY
5	549360	STCP R	Screw, HH (M6 x 14) (See Tech Bulletin 074)	3
8	547153	AL	Cover, Bearing	1
10	14041	NBR	O-Ring, Bearing Cover-70D	1
11	55337	NBR	Seal, Oil	1
15	14488	STL	Bearing, Ball Inner	1
20	547048	TNM	Rod, Connecting	3
25	<b>132183</b>	CM	Crankshaft, 3450 RPM, 5/8", 2.0 mm, 4DX10ER	1
	<b>132185</b>	CM	Crankshaft, 3450 RPM, 5/8", 3.0 mm, 4DX15ER	1
	<b>132186</b>	CM	Crankshaft, 3450 RPM, 5/8", 4.0 mm, 4DX20ER	1
	<b>132187</b>	CM	Crankshaft, 3450 RPM, 5/8", 5.6 mm, 4DX27ER	1
	<b>132188</b>	CM	Crankshaft, 3450 RPM, 5/8", 6.2 mm, 4DX30ER	1
27	15710	STL	Bearing, Ball Outer	1
32	549726	—	Cap, Vented with O-Ring (Rain Cap)	1
33	14179	NBR	O-Ring, Oil Filler Cap-70D	1
37	92241	PC	Gauge, Bubble Oil with Gasket (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	49801	AL	Crankcase	1
64	46229	CM	Pin, Crosshead	3
65	132190	BB	Rod, Plunger	3
70	47215	NBR	Seal, Oil	3
90	542403	CC	Plunger (M16 x 27)	3
98	46730	NBR	Washer, Seal-90D	3
	48394	FPM	Washer, Seal-90D	3
99	542405	S	Retainer, Plunger (M6 x 35) (See Tech Bulletin 074)	3
100	46233	D	Retainer, Seal	3
106	† 48222	NBR	Seal, LPS with S-Spring	3
	670019	FPM	Seal, LPS with S-Spring	3
	76089	ST2	Seal, LPS with SS-Spring	3
120	547357	BB	Case, Seal	3
121	13976	NBR	O-Ring, Seal Case-70D	3
	48522	FPM	O-Ring, Seal Case	3
125	46240	NBR	Seal, HPS with S	3
	76088	ST2	Seal, HPS	3
160	13965	NBR	O-Ring, Seat, Inlet-70D	3
	76656	FPM	O-Ring, Seat, Inlet-70D	3
161	545177	S	Seat, Inlet	3
163	19285	NBR	O-Ring, Seat, Discharge-70D	3
	14166	FPM	O-Ring, Seat, Discharge	3
164	545178	S	Seat, Discharge	3
166	† 46764	S	Valve	6
167	134579	S	Spring	6
168	543988	PVDF	Retainer, Spring, Inlet	3
169	49764	PVDF	Retainer, Spring, Discharge	3
172	142807	NBR	O-Ring, Plug-90D	3
	547743	FPM	O-Ring, Plug-90D	3
174	547104	BB	Plug, Valve (M20 x 1.5) (See Tech Bulletin 074)	3
185	132192	FBB	Head, Manifold with Integral Regulator/Unloader Body	1
188	549357	STCP R	Screw, HSH (M6 x 60) (See Tech Bulletin 074)	6
196	101556	BB	Plug, Accessory	1
197	941516	BB	Assembly, GH [3/8" NPT(M) x 3/4" GH(F)]	1
255	30516	STZP R	Assembly, Bolt Mount	1
300	33053	NBR	Kit, Seal (Includes: 98, 106, 121, 125) <b>Standard</b>	1
	76453	FPM*	Kit, Seal (Includes: 98, 106, 121, 125) <b>.0110</b>	1
310	76978	NBR	Kit, Valve (Includes: 160, 161, 163, 164, 166, 167, 168, 169, 172) <b>Standard</b>	1
	76463	FPM	Kit, Valve (Includes: 160, 161, 163, 164, 166, 167, 168, 169, 172) <b>.0110</b>	1
400	—	—	Regulator/Unloader, Integral (See Individual Parts)	1
460	107681	BB	Fitting, Discharge [3/8" NPT(M)]	1
469	7231	BB	Injector, Chemical, Fixed (1.8 mm)	1
	7232	BB	Injector, Chemical, Fixed (2.1 mm)	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. † Production parts are different than repair parts.

\*Review individual parts in each kit for material code identification. For additional technical information see [www.catpumps.com/literature/tech-bulletins](http://www.catpumps.com/literature/tech-bulletins).

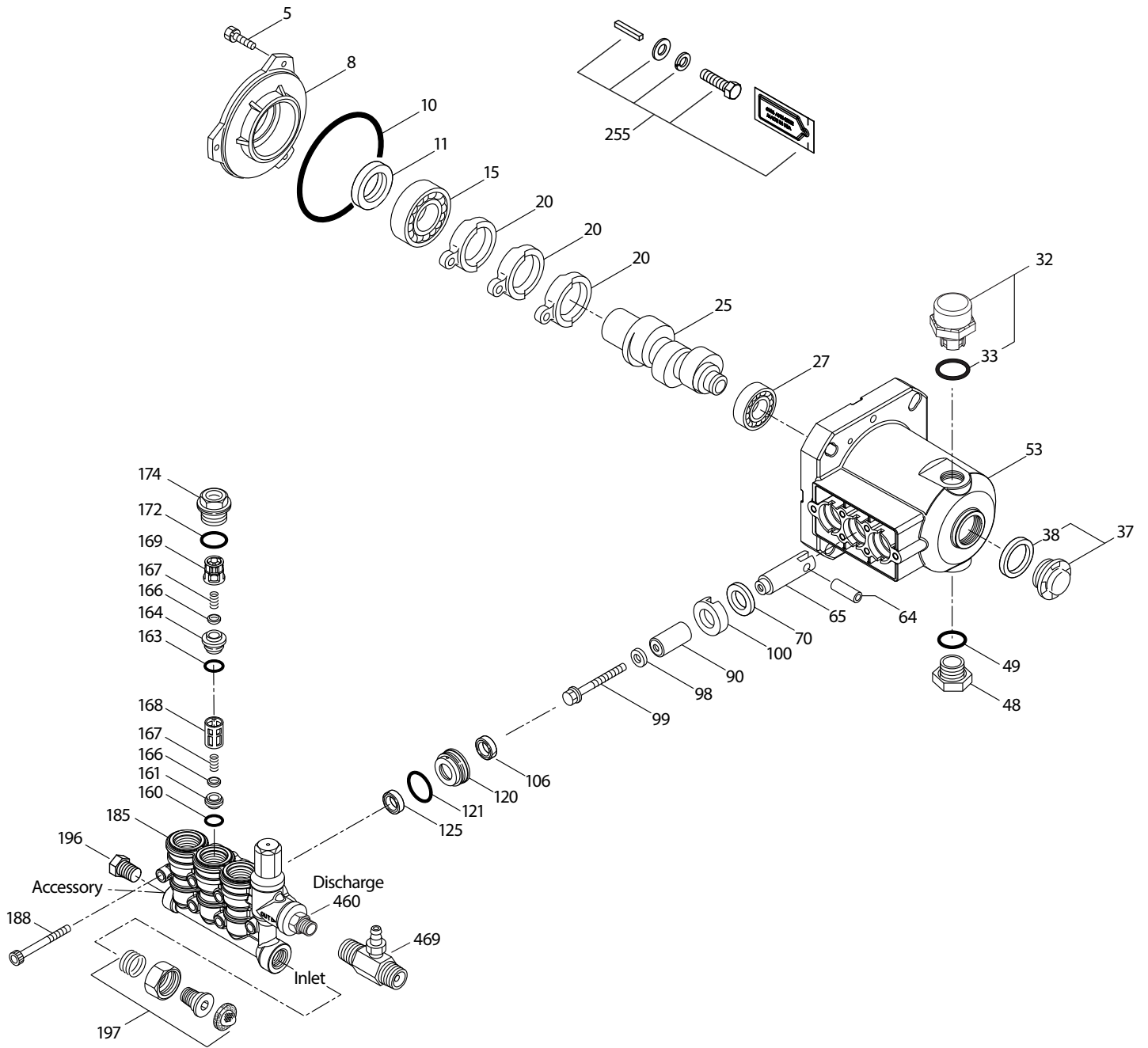
MATERIAL CODES (Not Part of Part Number): AL=Aluminum BB=Brass CC=Ceramic CM=Chrome-moly D=Acetal FBB=Forged Brass

FPM=Fluorocarbon NBR=Medium Nitrile (Buna-N) NY=Nylon PC=Poly Carbonate PVDF=Polyvinylidene Fluoride S=304SS ST2=Special PTFE 2 STL=Steel

STCP=Steel/Chrome Plated STZP=Steel/Zinc Plated TNM=Special High Strength

**NOTE:** Discard Key which may come standard with most motors and **use only the key included in this kit.**

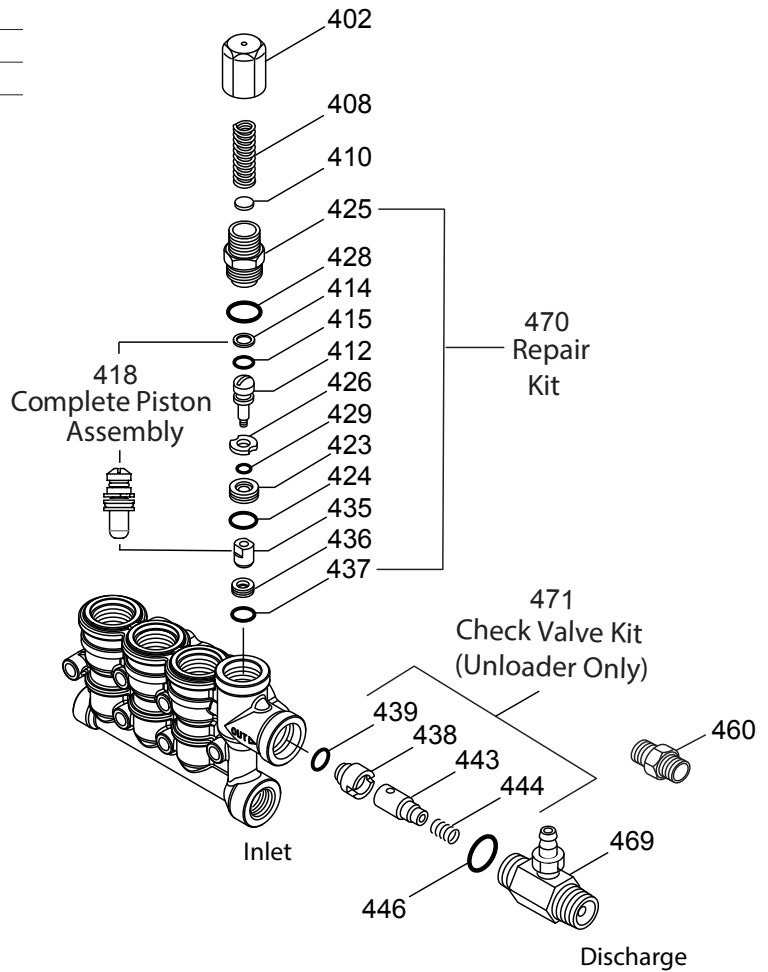
# EXPLODED VIEW



**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.**

# INTEGRAL REGULATOR/UNLOADER

SPECIFICATIONS	U.S.	Metric
Flow	3.1 gpm	11.7 lpm
PSI Range	100–2000 psi	6.9–138 bar
Inlet Port	3/8" NPT(F)	3/8" NPT(F)
Discharge Port	3/8" NPT(M)	3/8" NPT(M)



## PARTS LIST

ITEM	PN	MATL	DESCRIPTION	QTY
401	32088	NY	Handle, Adjustable (Not Shown)	1
402	46570	BB	Cap, Adjusting	1
408	33394	STZP R	Spring, Pressure	1
410	549352	STCP R	Retainer, Spring	1
412	46251	BB	Stem, Piston	1
414	28338	PTFE	Backup Ring, Piston Stem	1
415	22056	NBR	O-Ring, Piston Stem–70D	1
	76643	FPM	O-Ring, Piston Stem–70D	1
418	—	—	Assembly, Piston (Included In Repair Kit)	1
423	46249	BB	Retainer, Valve	1
424	13966	NBR	O-Ring, Valve Retainer (Outer)–70D	1
	76638	FPM	O-Ring, Valve Retainer (outer)–70D	1
425	46248	BB	Retainer, Piston	1
426	46250	S	Washer	1
428	26133	NBR	O-Ring, Piston Retainer–80D	1
	14320	FPM	O-Ring, Piston Retainer (Outer)–75D	1
429	17399	NBR	O-Ring, Valve Retainer (Inner)–80D	1
	14160	FPM	O-Ring, Valve Retainer (Inner)–80D	1
435	548193	S	Valve	1

ITEM	PN	MATL	DESCRIPTION	QTY
436	46253	S	Seat	1
437	13963	NBR	O-Ring, Seat–70D	1
	14303	FPM	O-Ring, Seat–70D	1
438	46254	NY	Seat, Check Valve	1
439	13963	NBR	O-Ring, Seat, Check Valve–70D	1
	14303	FPM	O-Ring, Seat, Check Valve–70D	1
443	541060	BB	Valve, Check with O-Ring	1
444	45924	S	Spring	1
446	26133	NBR	O-Ring, Body–80D	1
	14320	FPM	O-Ring, Body–75D	1
460	107681	BB	Fitting, Discharge [3/8" NPT(M)]	1
468	76754	NBR	Kit, O-Ring (Includes: 414, 415, 424, 428, 429, 437) <b>Standard</b>	1
	76467	FPM	Kit, O-Ring (Includes: 414, 415, 424, 428, 429, 437) <b>.0110</b>	1
469	7231	BB	Injector, Chemical Fixed (1.8 mm)	1
	7232	BB	Injector, Chemical Fixed (2.1 mm)	1
470	76031	NBR	Kit, Repair (Includes: 418, 425, 428, 436, 437) <b>Standard</b>	1
	76468	FPM	Kit, Repair (Includes: 418, 425, 428, 436, 437) <b>.0110</b>	1
471	† 76146	NBR	Kit, Check Valve (Includes: 438, 439, 443, 444, 446) <b>Standard</b>	1

*Italics are optional items.* R Components comply with RoHS Directive. † Production parts are different than repair parts.

MATERIAL CODES (Not Part of Part Number): BB=Brass FPM=Fluorocarbon NBR=Medium Nitrile (Buna-N) NY=Nylon PTFE=Pure Polytetrafluoroethylene S=304SS STCP=Steel/Chrome Plated STZP=Steel/Zinc Plated

## MODELS 7231, 7232 FIXED CHEMICAL INJECTOR

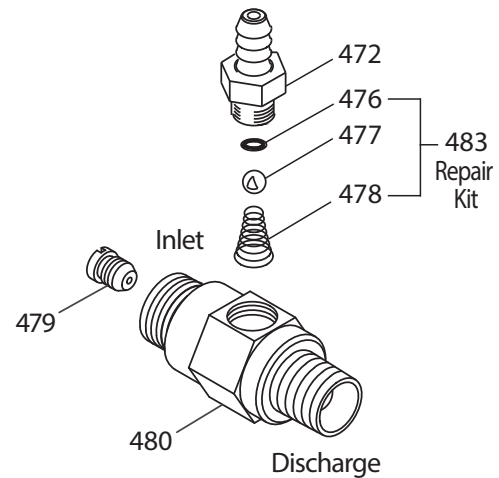
SPECIFICATIONS	U.S.	Metric
GPM	3.1 gpm	11.7 lpm
Nozzle Orifice (7231)	1.8 mm	1.8 mm
Nozzle Orifice (7232)	2.1 mm	2.1 mm
Hose Barb	1/4"	1/4"
Tapped Barb	8/32" UNF	8/32" UNF
Inlet Port	M18 x 1.0	M18 x 1.0
Discharge Port	3/8" NPT(M)	3/8" NPT(M)
Weight	5.3 oz.	0.15 kg
Dimensions	2 x 1 x 1.75"	52 x 25 x 45 mm

### PARTS LIST

ITEM	PN	MATL	DESCRIPTION	QTY
472	46630	BB	Barb, Tapped	1
476	—	NBR	O-Ring, Barb-70D	1
	—	FPM	O-Ring, Barb	1
477	—	S	Ball	1
478	—	S	Spring	1
479	46257	S	Orifice (1.8 mm)	1
	—	S	Orifice (2.1 mm)	1
480	—	BB	Body	1
483	76176	NBR	Kit, Repair (Includes: 476, 477, 478) Standard	1
	76476	FPM	Kit, Repair (Includes: 476, 477, 478) .0110	1

MATERIAL CODES (Not Part of Part Number):

BB=Brass FPM=Fluorocarbon NBR=Medium Nitrile (Buna-N) S=304SS



### CHEMICAL INJECTOR PERFORMANCE CHART

Optional Special Ported Chemical Injector for Unloader Mounting

Orifice Size	Maximum Injecting Pressure	Minimum Chemical Draw	Pressure Drop Across Injector at System Pressure
1.8 mm	100 psi	52 oz/min	100 psi
2.1 mm	250 psi	37.2 oz/min	141 psi

Optimum performance of chemical injector occurs with a 35 ft. high-pressure hose and a minimum 3/8" I.D. The type of hose, extended lengths, reduced I.D. and fittings may create back pressures in excess of the low-pressure nozzle rating and prevent the injector from drawing chemical. **Deduct hose friction loss from above low psi nozzle. Consult Cat Pumps for assistance with other options.**

**CAUTION:** Deduct the pressure drop shown in the performance chart from your desired system pressure to arrive at the maximum high-pressure nozzle rating. This is essential to avoid over-pressurizing the pump.

### REGULATING DEVICE

An integral regulator or unloader with built-in bypass is part of the discharge manifold to provide system pressure regulation and pump protection. An optional fixed chemical injector is available. (See back page for proper model identifications)

### OPERATION

Pump should be purged of air before commencing with operation. Liquid must flow through the pump without discharge restriction to ensure full system pressure is reached. Install a pressure gauge close to the manifold head of the pump to assist in setting system pressure and to periodically monitor system pressure. Setting and adjusting the regulator or unloader pressure must be done with the system turned on. Start the system with the regulator or unloader backed off to the lowest pressure setting (counterclockwise direction). Squeeze the trigger and read the pressure on the gauge at the pump. Do not read pressure at the gun or nozzle. If more pressure is desired, release the trigger, turn adjusting cap one quarter turn in a clockwise direction. Squeeze the trigger and read the pressure. Repeat this process until the desired system pressure is reached.

**NOTE:** Pressure is not set at the factory.

### SERVICE

The regulator or unloader should be serviced on the same schedule as the seals in the pump. Refer to 4DX Service Manual or start-up, servicing of seals and valves, torque requirements and diagnosis and maintenance chart.

## ELECTRIC MOTOR OPTIONS

### 60 HERTZ

#### 1750 RPM, 1PH

HP	Part #	Voltage	Enclosure
0.5	8105	115/208-230	TEFC
0.75	8175	115/208-230	TEFC
1	8110	115/208-230	TEFC
1.5	8060	115/230	TEFC
2	8062	115/230	TEFC
2.5	8125	115/230	TEFC

#### 3450 RPM, 1PH

HP	Part #	Voltage	Enclosure
1.5	8050	115/230	TEFC
2	8052	115/208-230	TEFC
3	992139	115/208-230	ODP

### 50 HERTZ

#### 1450 RPM, 1PH

HP	Part #	Voltage	Enclosure
1	8064	110/220	TEFC
1.5	8066	110/220	TEFC
2.5	8125	110/220	TEFC

#### 1750 RPM, 3PH

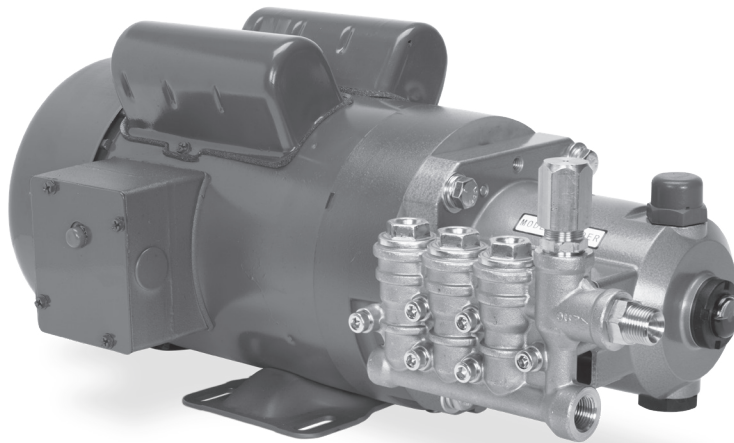
HP	Part #	Voltage	Enclosure
0.33	990324	208-230/460	TEFC
0.5	997671	208-230/460	TEFC
1	999189	230/460	TEFC
1.5	998843	208-230/460	TEFC
2	899247	208-230/460	TEFC
2.5	8126	208-230/460	TEFC

#### 3450 RPM, 3PH

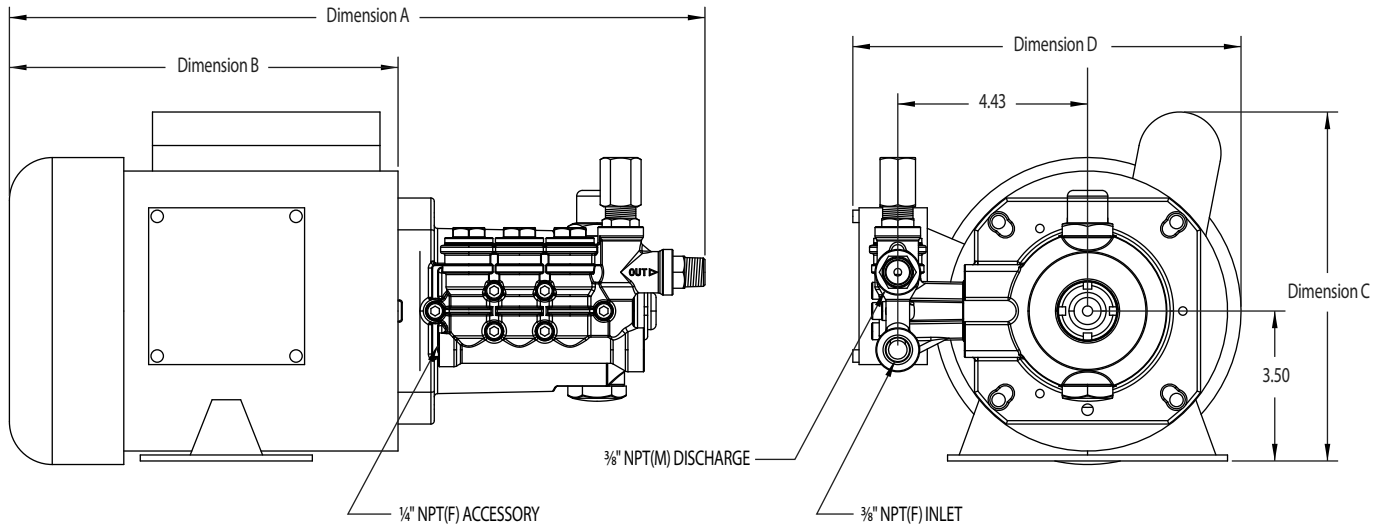
HP	Part #	Voltage	Enclosure
1.5	994794	208-230/460	TEFC
3	8053	230/460	TEFC

#### 2850 RPM, 1PH

HP	Part #	Voltage	Enclosure
1.5	999943	110/220	TEFC

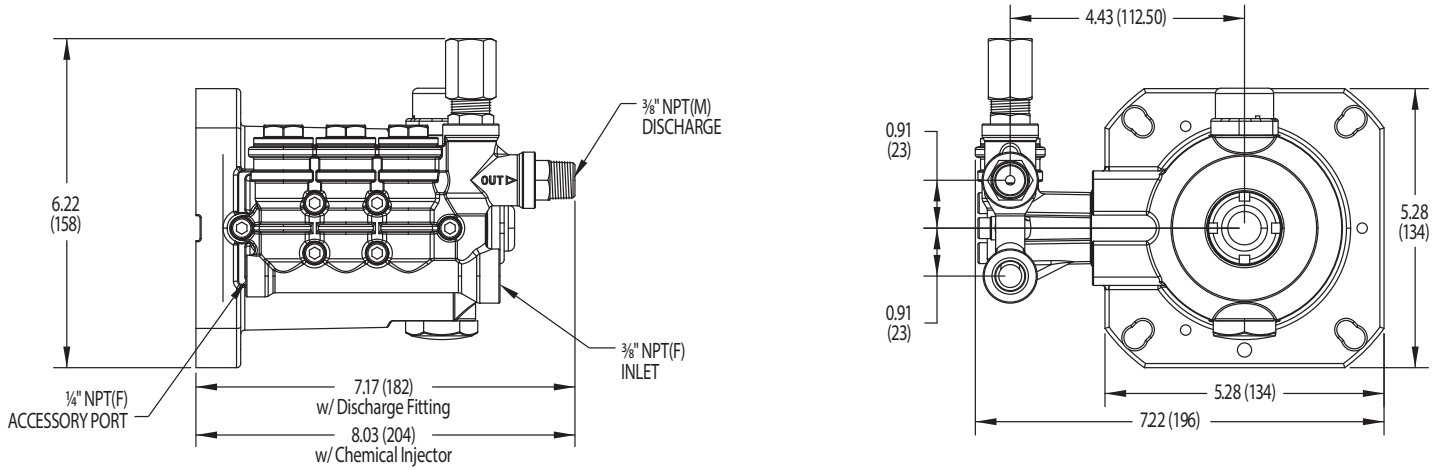


# MOTOR DIMENSION 4DX SERIES



MODEL	8053	8062	8064	8066	8105	8110	8125
Dimension A	18.8"	19.2"	18.0"	19.0"	16.2"	19.0"	19.1"
Dimension B	11.7"	12.3"	10.8"	11.8"	9.1"	11.8"	12.2"
Dimension C	7.3"	8.1"	8.7"	8.7"	8.2"	18.8"	9.6"
Dimension D	9.7"	9.5"	9.3"	9.3"	9.1"	9.7"	9.7"

MODEL	8126	8175	899247	994794	997671	998843	999189	999943
Dimension A	21.7"	16.2"	18.6"	18.0"	16.5"	17.4"	17.4"	18.0"
Dimension B	14.0"	9.1"	11.4"	10.9"	9.3"	10.3"	10.3"	10.8"
Dimension C	7.3"	8.2"	7.1"	7.3"	7.3"	7.1"	8.2"	8.7"
Dimension D	9.7"	9.1"	9.0"	9.7"	9.7"	9.7"	9.1"	9.3"



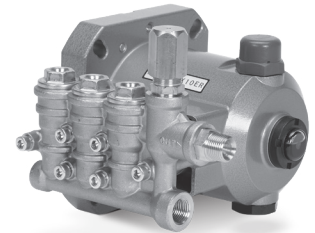
Base Models 4DX10ER, 4DX15ER, 4DX20ER, 4DX27ER, 4DX30ER

### 4DX Pump Series Selection Chart

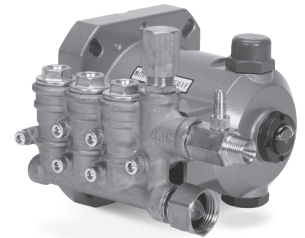
Pump Series										Pump Flow/RPM			
4	D	X								GPM	RPM	Alt. GPM	Alt. RPM
			1	0						1.0	3450	0.5	1750
			1	5						1.5	3450	0.75	1750
			2	0						2.0	3450	1.0	1750
			2	7						2.7	3450	1.35	1750
			3	0						3.0	3450	1.5	1750
								E		Electric, 5/8" Hollow Shaft			
								R		Regulating Device = Regulator			
								U		Regulating Device = Unloader			
								I		Fixed Chemical Injector			
								F		Garden Hose Fitting			
									.0110	FPM Seals			

#### Examples:

4DX10ER = 1 gpm (3450 rpm), regulator, standard inlet - 3/8" NPT(F)  
 4DX15EUIF = 1.5 gpm (3450 rpm), unloader, chemical injector, garden hose inlet fitting  
 4DX30ER.0110 = 3 gpm (3450 rpm), regulator, standard inlet - 3/8" NPT(F), with FPM Seals



Model 4DX10ER



Model 4DX15EUIF

#### 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 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 on-line at [www.catpumps.com/literature/cat-pumps-limited-warranty](http://www.catpumps.com/literature/cat-pumps-limited-warranty)



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