

DATA SHEET

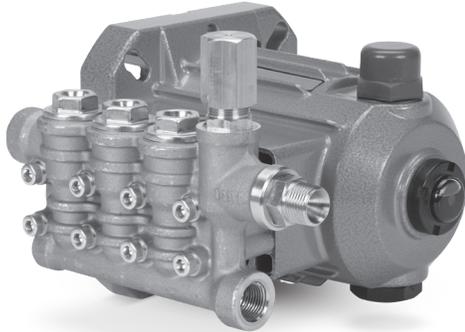
DIRECT DRIVE PLUNGER PUMPS



Brass Electric Models:

**4SP21ELR, 4SP21ELU
4SP29ELR, 4SP29ELU**

See page 4 for complete model number selection



Model 4SP21ELR Shown

FEATURES

- Triplex plunger design provides a smooth liquid flow.
- Specially formulated high-pressure seals and concentric, polished ceramic plungers ensure maximum seal life.
- Compact, direct mounting to NEMA 56C motor with 5/8" shaft.
- Stacked valve design for ease of servicing.
- Integral pressure control with built-in by-pass.
- Can be configured as a pressure regulator, pressure regulating unloader or safety relief valve.
- Includes crankcase oil.

COMMON SPECIFICATIONS

	U.S.	Metric
Inlet Pressure Range	Flooded – 60 psi	Flooded – 4.1 bar
Max. Liquid Temp. (NBR)	140°F	60°C
Alternative seals available for high-temperatures up to 180° F		
Crankcase Capacity	10.1 oz.	0.30 l
Inlet Port (1)	3/8" NPT(F)	3/8" NPT(F)
Accessory Port (1)	1/4" NPT(F)	1/4" NPT(F)
Discharge Port (1)	3/8" NPT(M)	3/8" NPT(M)
Discharge Port (1)	3/8" NPT(F)	3/8" NPT(F)
Shaft Diameter (Hollow - Electric)	5/8"	15.9 mm
Weight	11.7 lbs.	5.3 kg
Dimensions	7.5 x 7.7 x 6.3"	190 x 195 x 160 mm

SPECIFICATIONS

U.S. Measure

Metric Measure

4SP21ELR, 4SP21ELU

Flow	2.1 gpm	7.9 lpm
Pressure Range	100 to 2000 psi	6.9 to 138 bar
Pump RPM	1750 rpm	1750 rpm
Bore	0.630"	16 mm
Stroke	0.319"	8.1 mm

4SP29ELR, 4SP29ELU

Flow	2.85 gpm	10.8 lpm
Pressure Range	100 to 1200 psi	6.9 to 83 bar
Pump RPM	1725 rpm	1725 rpm
Bore	0.708"	18 mm
Stroke	0.335"	8.5 mm

ALTERNATIVE SEAL CONFIGURATION

MATERIAL	SUFFIX CODE	MAXIMUM TEMPERATURE	
NBR	—	140° F	(60° C)
FPM	.0110	180° F	(82° C)
ST	.4400	180° F	(82° C)
	.4410	180° F	(82° C)

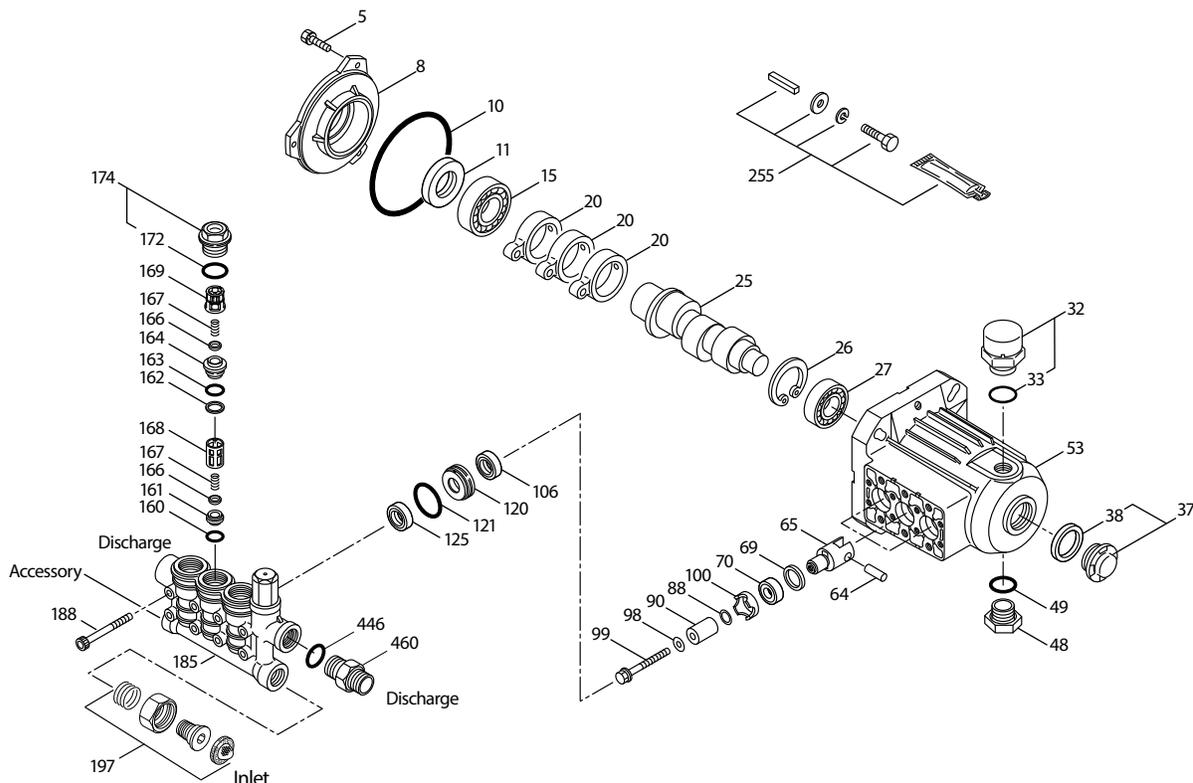
See **Tech Bulletin 002** for inlet conditions and RPM at high-temperature.

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

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

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

EXPLODED VIEWS



PARTS LIST

ITEM	P/N	MATL	DESCRIPTION	QTY
5	549360	STCP R	Screw, HHC Sems (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	547020	TNM	Rod, Connecting Assembly	3
25	132605	CM	Crankshaft, 1750 RPM, (8.1 mm) (Models 4SP21ELR, ELU)	1
	133987	CM	Crankshaft, 1725 RPM, (8.5 mm) (Models 4SP29ELR, ELU)	1
26	12385	STL	Ring, Retaining	1
27	15710	STL	Bearing, Ball, Outer	1
32	549726	—	Cap, Vented with O-Ring	1
33	14179	NBR	O-Ring, Oil Filler Cap – 70D	1
37	92241	PC	Gauge, Oil, Bubble with Gasket – 80D (See Tech Bulletin 074)	1
38	44428	NBR	Gasket, Flat, Oil Gauge – 80D	1
48	44842	NY	Plug, Drain	1
49	14179	NBR	O-Ring, Drain Plug – 70D	1
53	547099	AL	Crankcase	1
64	16948	CM	Pin, Crosshead	3
65	49982	BB	Rod, Plunger	3
69	126259	STCP R	Washer, Oil Seal	3
70	25301	NBR	Seal, Oil – 80D	3
88	132607	S	Washer	3
90	132606	CC	Plunger (M16 x 24.6) (Models 4SP21ELR, ELU)	3
	133988	CC	Plunger (M18 x 24.6) (Models 4SP29ELR, ELU)	3
98	46730	NBR	Washer, Seal – 90D	3
99	542405	S	Retainer, Plunger (M6 x 35) (See Tech Bulletin 074)	3
100	44869	PVDF	Retainer, Seal (Models 4SP21ELR, ELU)	3
	133989	PVDF	Retainer, Seal (Models 4SP29ELR, ELU)	3

ITEM	P/N	MATL	DESCRIPTION	QTY
106	48222	NBR	Seal, LPS with S–Spring (Models 4SP21ELR, ELU)	3
	43243	NBR	Seal, LPS with S–Spring (Models 4SP29ELR, ELU)	3
120	132608	BB	Case, Seal (Models 4SP21ELR, ELU)	3
	133990	BB	Case, Seal (Models 4SP29ELR, ELU)	3
121	13977	NBR	O-Ring, Seal Case – 70D (Models 4SP21ELR, ELU)	3
	13978	NBR	O-Ring, Seal Case – 70D (Models 4SP29ELR, ELU)	3
125	547157	SNG	Seal, HPS (Models 4SP21ELR, ELU)	3
	43245	SNG	Seal, HPS (Models 4SP29ELR, ELU)	3
160	17428	NBR	O-Ring, Inlet Seat – 80D	3
161	547077	S	Seat, Inlet	3
162	48361	D	Back-up Ring, Discharge Seat	3
163	43358	NBR	O-Ring, Discharge Seat – 70D	3
164	547076	S	Seat, Discharge	3
166	547098	S	Valve	6
167	46865	S	Spring	6
168	543988	PVDF	Retainer, Spring, Inlet	3
169	49764	PVDF	Retainer, Spring, Discharge	3
172	142807	NBR	O-Ring, Valve Plug – 90D	3
174	547104	BB	Plug, Valve (M20) (See Tech Bulletin 074)	3
185	132973	FBB	Head, Manifold (Models 4SP21ELR, ELU)	1
	133991	FBB	Head, Manifold (Models 4SP29ELR, ELU)	1
188	549357	STCP R	Screw, HSH (M6 x 60) (See Tech Bulletin 074)	8
197	941516	BB	Assembly, GH 3/8"	1
255	30516	STZP R	Mount, Bolt Assembly.	1
300	76968	NBR	Kit, Seal (Includes: 98,106,121,125) (Models 4SP21ELR, ELU)	1
	76295	NBR	Kit, Seal (Includes: 98,106,121,125) (Models 4SP29ELR, ELU)	1
310	76976	NBR	Kit, Valve (Includes: 160,161,162,163,164,166,167,168,169,172)	1
—	6107	—	Oil, Bottle (21 oz.) ISO 68 Hydraulic (Fill to specific crankcase capacity prior to start-up)	1

Italics are optional items. [] Date of latest production change. R Components comply with RoHS Directive.

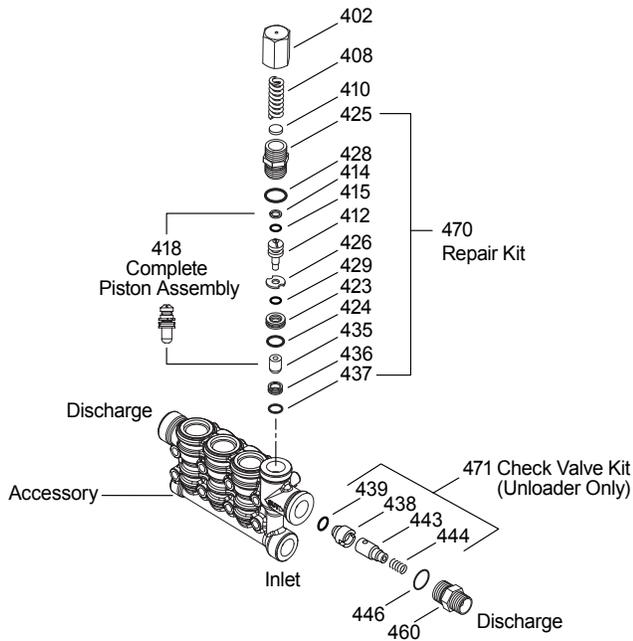
For additional technical information see www.catpumps.com/literature/tech-bulletins. MATERIAL CODES (Not Part of Part Number): AL=Aluminum BB=Brass CC=Ceramic CM=Chrome-Moly D=Acetal FBB=Forged Brass NBR=Medium Nitrile (Buna-N) NY=Nylon PC=Poly Carbonate PVDF=Polyvinylidene Fluoride S=304SS SNG=Special Blend (Buna) STCP=Steel/Chrome Plated STL=Steel STZP=Steel/Zinc Plated TNM=Special High Strength.

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

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. Measure	Metric Measure
Flow	2.85 gpm	10.8 lpm
Pressure Range	100 – 2000 psi	6.9 – 138 bar
Inlet Port	3/8" NPT(F)	3/8" NPT(F)
Accessory Port	1/4" NPT(F)	1/4" NPT(F)
Discharge Port	3/8" NPT(M)	3/8" NPT(M)
Discharge Port	3/8" NPT(F)	3/8" NPT(F)



PARTS LIST

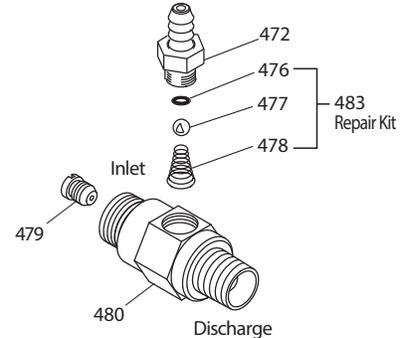
ITEM	P/N	MATL	DESCRIPTION	QTY
401	32088	NY	Handle, Adjustable (Not Shown)	1
402	46570	BB	Cap, Adjusting	1
408	33394	STZP R	Spring, Pressure	1
410	549352	STCP R	Retainer, Spring	1
412	46251	BB	Stem, Piston	1
414	28338	PTFE	Back-up Ring, Piston Stem	1
415	22056	NBR	O-Ring, Piston Stem – 70D	1
418	—	—	Assembly, Piston (included in Repair Kit)	1
423	46249	BB	Retainer, Valve	1
424	13966	NBR	O-Ring, Valve Retainer (Outer) – 70D	1
425	46248	BB	Retainer, Piston	1
426	46250	S	Washer	1
428	26133	NBR	O-Ring, Piston Retainer – 80D	1
429	17399	NBR	O-Ring, Valve Retainer (Inner) – 80D	1
435	548193	S	Valve	1
436	46253	S	Seat	1
437	13963	NBR	O-Ring, Seat – 70D	1
438	46254	NY	Seat, Check Valve (ELU Models)	1
439	13963	NBR	O-Ring, Seat, Check Valve – 70D (ELU Models)	1
443	541060	BB	Valve, Check with O-Ring (ELU Models)	1
444	45924	S	Spring (ELU Models)	1
446	26133	NBR	O-Ring, Discharge Fitting – 80D	1
460	107681	BB	Fitting, Discharge (3/8" NPT(M))	1
468	76754	NBR	Kit, O-Ring (Includes: 414, 415, 424, 428, 429, 437)	1
470	76031	NBR	Kit, Repair (Includes: 418, 425, 428, 436, 437)	1
471	† 76146	NBR	Kit, Check Valve (Includes: 438, 439, 443, 444, 446) (ELU Models)	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 NBR = Medium Nitrile (Buna-N)
 NY = Nylon PTFE = Pure Polytetrafluoroethylene S = 304SS STCP = Steel/Chrome Plated
 STZP = Steel/Zinc Plated

MODEL 7231 FIXED CHEMICAL INJECTOR

SPECIFICATIONS	U.S. Measure	Metric Measure
GPM	3.1 gpm	11.7 lpm
Nozzle Orifice	1.8 mm	1.8 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 (1.8mm)	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	Maximum Chemical Draw	Pressure Drop Across Injector at System Pressure
1.8 mm	100 psi	52 oz./min	100 psi

Optimum performance of chemical injector occurs with a 35 ft. high-pressure hose and a minimum 3/8" inner diameter The type of hose, extended lengths, reduced inner diameter 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. Contact 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 by-pass 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)

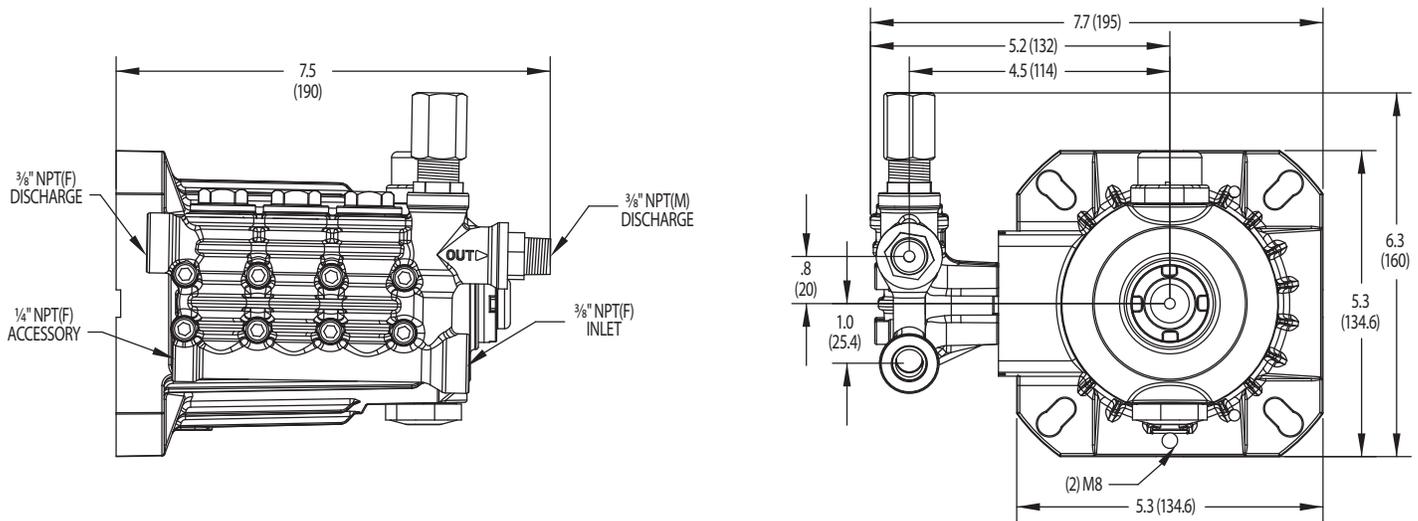
OPERATION

Pump should be purged of air before commencing with operation. Liquid must flow through the pump without discharge restriction to assure 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 4SP Service Manual or start-up, servicing of seals and valves, torque requirements and diagnosis and maintenance chart.



Base Models 4SP21ELR, 4SP29ELR

4SP Pump Series Selection Chart

Pump Series									Pump Flow/RPM	
4	S	P							GPM	RPM
			2	1					2.1	1750
			2	9					2.85	1725
					E	L			Electric, 3/8" Hollow Shaft	
							R		Regulating Device = Regulator	
							U		Regulating Device = Unloader	
								I	Fixed Chemical Injector (PN 7231)	
								F	Garden Hose Fitting	

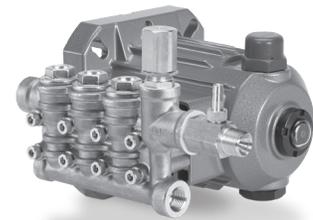
Examples:

4SP21ELR = 2.1 gpm (1750 rpm), Regulator, Standard Inlet – 3/8" NPT(F)

4SP29EUIF = 2.9 gpm (1725 rpm), Unloader, Chemical Injector, Garden Hose Inlet Fitting



Model 4SP21ELR



Model 4SP21ELUI

⚠ 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 or can be requested directly from Cat Pumps.

WARRANTY

View the Limited Warranty on-line at www.catpumps.com/literature/cat-pumps-limited-warranty