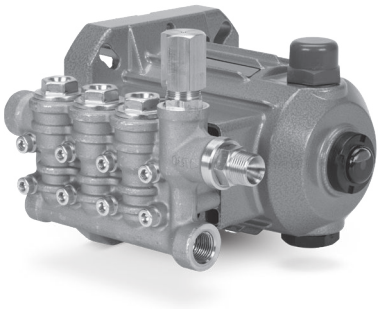
DATA SHEET
DIRECT DRIVE PLUNGER PUMPS

The Pumps with Nine Lives

Brass Models: **4SP21ELR, 4SP21ELU**
4SP29ELR, 4SP29ELU

See page 4 for complete model number selection



Model 4SP21ELR Shown

SPECIFICATIONS	U.S. Measure	Metric Measure
4SP21ELR, 4SP21ELU		
Flow	2.1 gpm	7.9 lpm
Pressure Range	100–2000 psi	6.9–138 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	100–1200 psi	6.9–83 bar
Pump RPM	1750 rpm	1750 rpm
Bore	0.708"	18 mm
Stroke	0.335"	8.5 mm

FEATURES

- Triplex plunger design ensures high efficiency and low pulsation.
- Specially-formulated high-pressure seals and concentric, solid ceramic plungers provide a true wear surface and extended seal life.
- Compact, direct mounting to NEMA 56C motor with ⅝" shaft.
- Stacked stainless steel valve design promotes long life and easy servicing.
- Integral pressure regulator or unloader with built-in bypass ensures system pressure control and pump protection.
- Pump comes standard with NBR seals. Alternative seal materials are available for higher temperature or chemical compatibility.
- Includes crankcase oil.

COMMON SPECIFICATIONS	U.S.	Metric
Inlet Pressure Range	Flooded–60 psi	Flooded–4.1 bar
Maximum Liquid Temp. (NBR)	140° F	60° C
Alternative seals available for higher temperatures up to 180° F		
Crankcase Capacity	10.1 oz	0.30 l
Inlet Port	⅜" NPT(F)	⅜" NPT(F)
Accessory Port	¼" NPT(F)	¼" NPT(F)
Discharge Port	⅜" NPT(M)	⅜" NPT(M)
Discharge Port	⅜" NPT(F)	⅜" NPT(F)
Shaft Diameter (Hollow - Electric)	⅝"	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

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.

DETERMINING THE PUMP RPM

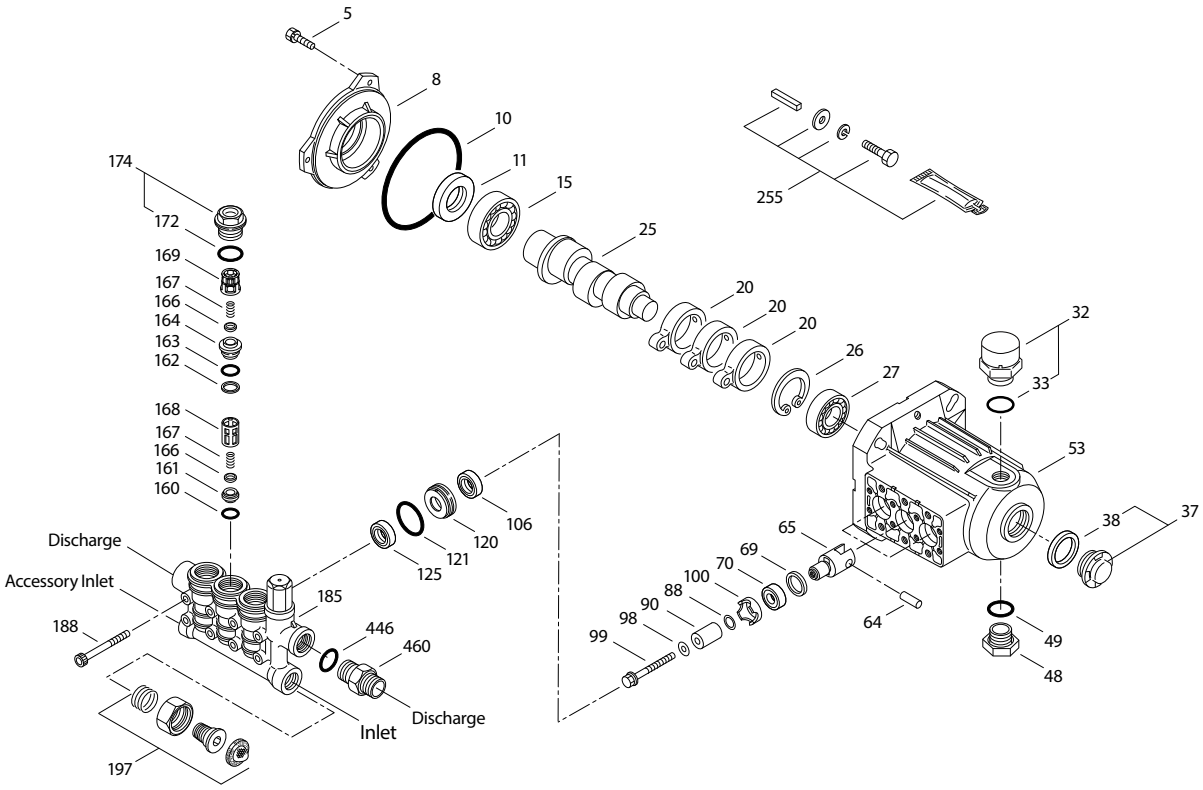
$$\frac{\text{Rated gpm}}{\text{Rated rpm}} = \frac{\text{Desired gpm}}{\text{Desired rpm}}$$

DETERMINING THE REQUIRED HP

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

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	Assembly Rod, Connecting	3
25	**132605**	CM	Crankshaft, ⅝", (8.1 mm) (Models 4SP21ELR, ELU)	1
	133987	CM	Crankshaft, ⅝", (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	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
106	**48222**	NBR	Seal, Low-Pressure with S-Spring (Models 4SP21ELR, ELU)	3
	43243	NBR	Seal, Low-Pressure 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, High-Pressure (Models 4SP21ELR, ELU)	3
	43245	SNG	Seal, High-Pressure with S-Support (Models 4SP21ELR, ELU)	3
160	17428	NBR	O-Ring, Inlet Seat–80D	3
161	547077	S	Seat, Inlet	3
162	48361	D	Backup Ring, Discharge Seat	3
163	670085	NBR	O-Ring, Discharge Seat–90D	3
164	547076	S	Seat, Discharge	3
166	547098	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, Valve Plug–90D	3
174	547104	BB	Plug, Valve with O-Ring (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, Garden Hose (⅜")*	*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: 160–164, 166–169, 172)*	*1*
—	*6107*	—	*Oil, Bottle (21 oz) ISO 68 Hydraulic (Fill to Specific Crankcase Capacity Prior to Start-up)*	*1*

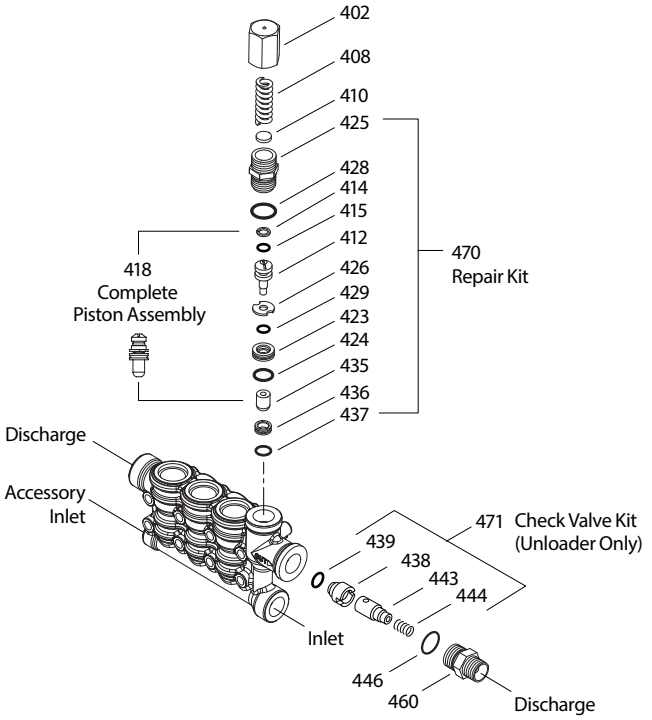
Italics are optional items. R Components comply with RoHS Directive.
For additional technical information see www.catpumps.com/literature/tech-bulletins. MATERIAL CODES (Not Part of Part Number): AL=Aluminum BB=Brass CC=Ceramic CM=Chrome-Moly D=Acetal FBB=Forged Brass NBR=Medium Nitrile (Buna-N) NY=Nylon 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 **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	⅜" NPT(F)	⅜" NPT(F)
Accessory Port	¼" NPT(F)	¼" NPT(F)
Discharge Port	⅜" NPT(M)	⅜" NPT(M)
Discharge Port	⅜" NPT(F)	⅜" NPT(F)



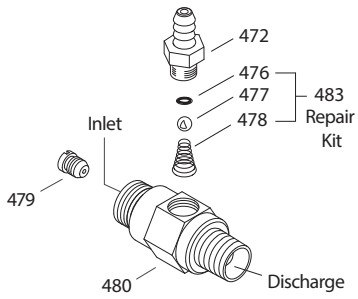
PARTS LIST

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	Backup 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 (⅜" 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	¼"	¼"
Tapped Barb	8/32" UNF	8/32" UNF
Inlet Port	M18 x 1.0	M18 x 1.0
Discharge Port	⅜" NPT(M)	⅜" 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*

MATERIAL CODES (Not Part of Part Number):
BB=Brass FPM=Flurocarbon NBR=Medium Nitrile (Buna-N) S=304SS

PERFORMANCE CHART

Orifice Size	Maximum Injecting Pressure	Minimum Chemical Draw	Pressure Drop Across Orifice
1.8 mm	100 psi	52 oz/min	100 psi

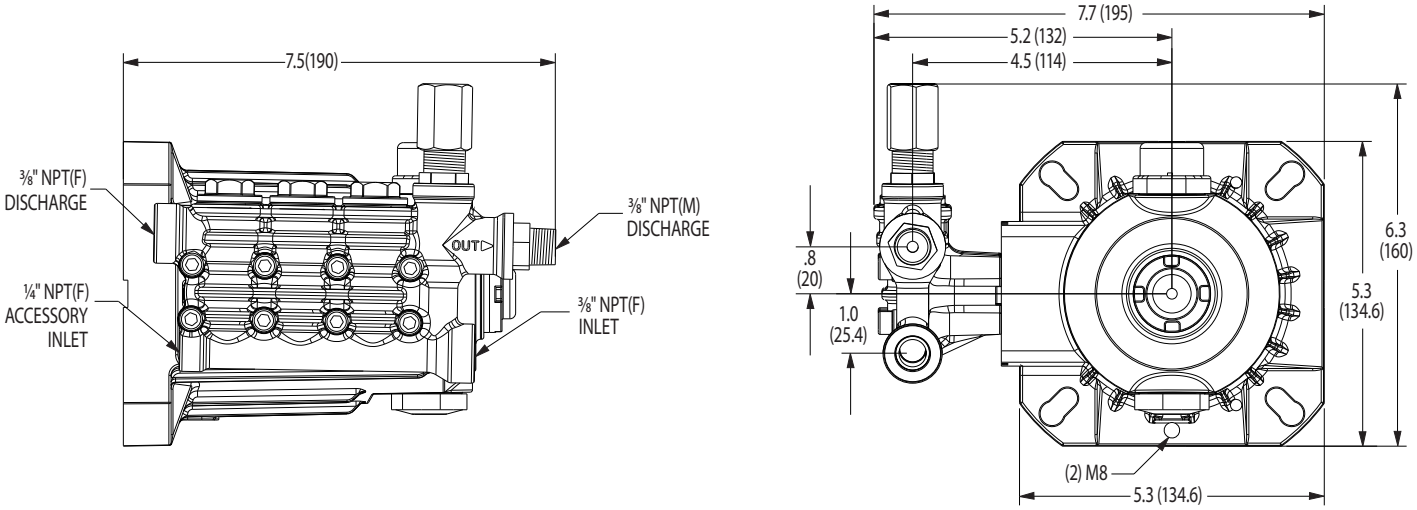
NOTE: Optimum performance of Chemical Injector occurs with a 35 ft. high-pressure hose with a minimum ⅜" ID. The type of hose, extended lengths, reduced ID and fittings may create additional backpressure above the maximum injecting pressure rating of the injector and prevent it from drawing chemicals.

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 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

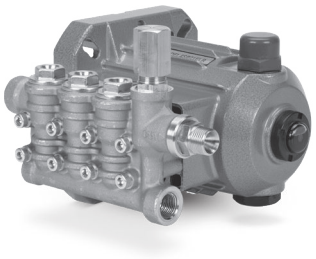
4SP Pump Series Selection Chart

Pump Series										Pump Flow/RPM	
4	**S**	**P**								GPM	RPM
			2	**1**						2.1	1750
			2	**9**						2.85	1750
					E	**L**				Electric, ⅝" Hollow Shaft	
							R			Regulating Device = Regulator	
							U			Regulating Device = Unloader	
								I		Fixed Chemical Injector **(PN 7231)**	
									F	Garden Hose Fitting	

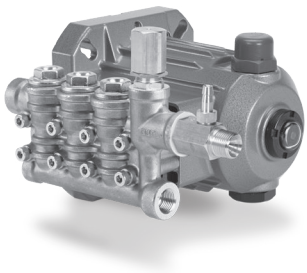
Examples:

4SP21ELR = 2.1 gpm (1750 rpm), Regulator, Standard Inlet – ⅜" NPT(F)

4SP29EUIF = 2.9 gpm (1750 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 (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 or can be requested directly from Cat Pumps.

WARRANTY

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

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