

DS SERIES COMPRESSORS

Legacy Gemini

High-Speed Reciprocating Compressors Configured for a Wide Range of Applications

Like the original FE frame which is widely used in a variety of natural gas applications, Cooper's proven DS Series machines are available in three-stroke configurations from 1,200 to 2,400 HP and can be readily resized and reapplied in the field.

Performance features include:

- > Horizontal balanced opposed, two or four throws, with a wide range of arrangements to meet your performance needs.
- > The frame is made from smoothly contoured iron casting with doweled, separable crosshead guides. Sides of the frame are bolted together with full depth main bearing caps that extend from the bearing to the top of the frame, adding strength and stiffness.
- > The one-piece forged steel crankshaft design offers maximum stiffness and torque transmission. The integral counterweights are balanced for smooth operation. Main and crankpin journals are precision ground and polished to close tolerances with same diameters for ease of maintenance.
- > A wide range of cylinder options are available. All 89, 95, 06, and 07 Series cylinders for the 5" and 6" stroke frames are water cooled and feature field replaceable liners. Liners feature ion nitride bores.
- > Steel compressor valve seats and guards. Valve springs and plates are easily tailored to meet your operating conditions. Valves are arranged so that the suction valve cannot fit into the discharge valve ports.
- > 07 Series pistons are made of aluminum bar stock and hard anodized. 06 Series pistons have aluminum bar stock ends and steel ring carriers. 89 Series pistons are made of cast iron. Piston rods are 4140 steel with rolled threads and flame hardened in the packing area with full-floating vented rod and wiper rings.
- > Connecting rods are made from carbon steel I-section drop forgings. The crosshead end is fitted with a solid precision type bushing. The crank end uses split precision type tri-metal bearings.

- > Single-piece ductile iron crossheads are full-floating design with integral babbitt coated crosshead shoes. Crosshead pins are hardened and ground alloy steel.
- > Compressor lubrication oil pump is driven directly by the compressor crankshaft. There are no chains to wear or go out of adjustment. The system features an oil cooler, full-flow, non-bypassing lube synthetic media oil filter, and oil pressure regulating valve.
- > The standard lubrication system consists of a shaft driven force-feed lubricator pump, hand priming device, overpressure indicating DNFT no-flow shutdown switch, and block distribution system with cycle indicator.
- > Drive-through arrangement, materials suitable for sour gas service, vibration switches, CSA or XP no-flow switches, immersion oil heaters, flywheels, and drive couplings are available. API 618 type II and III distance pieces, stainless steel piston rods with carbide coating in the packing area, Finger-type valve unloaders, and automatic VVCP are also available.

Throw Configuration

Property	Specification	
Compressor throws	2	4
Max BHP/kW	1,200/895	2,400/1,790
Frame weight (lbs/kg) (dry)*	4,700/2,156	7,050/3,200
Frame length(in/cm)	48/122	100/254
Frame width (in/cm)	61/155	61/155
Frame height (in/cm)	36/914	36/914

Stroke Configuration

Property	Specification	
Stroke (in/mm)	5/127	6/152
Rated speed-max (rpm)	1,500	1,200

Heavy Duty Running Gear

Property	Specification	
Rod load - tension	35,000 lbs-f	15,887 kg-f
Rod load - compression	35,000 lbs-f	15,887 kg-f
Combined rod load	70,000 lbs-f	31,774 kg-f
Piston rod diameter	2 inches	51 mm
Crankshaft material	4140 F.S.	
Connecting rod material	F.S.	
Crankpin & main bearing dia	5 inches	127 mm
Crankpin & main bearing width	2.75 inches	70 mm
Connecting rod pin bushing dia	4.25 inches	108 mm
Connecting rod pin bushing length	3.5 inches	89 mm

*without cylinders

F.S. = Forged Steel

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89 & 95 DS50, DS60 Frames (5" & 6" stroke)							MAWP PSIG	Cylinder Cooling	Material	Flange dia inch	Flange rating PSIG		
Series	Cylinder bore - inches												
Double acting	89	2.75	3	3.25	3.5	3.75	4,700	Gas	F.S.	2.5	2,500		
	89	3.5	3.75	4	4.25		3,600	Gas	F.S.	2.5	2,500		
	95	5.5	5.75	6	6.25	6.5		3,600	Gas	F.S.	4	1,500	
	89	4.5	4.75	5	5.25	5.5	6	2,500	Water	D.I.	3	1,500	
	89	5.5	5.75	6	6.25	6.5	7	2,200	Water	D.I.	4	1,500	
	95	6.75	7	7.25	7.5	7.75	8.25	1,800	Water	D.I.	4	900	
	95	8.5	9	9.5	9.75	10.25		1,800	Water	D.I.	6	900	a
	95	10	10.5	11	11.25	11.75		1,250	Water	D.I.	6	600	a
	95	12	12.5	13	13.5	13.75	14.25	800	Water	D.I.	8	400	
	95	14	14.5	15				635	Water	D.I.	8	300	b
	95	15.5	16	16.5				635	Water	D.I.	8	300	b
	89	16.5	17	17.5	18	18.5		250	Water	C.I.	14	300	c
	89	19	19.5	20	20.5	21		250	Water	C.I.	14	300	c
	89	21.50	22	22.5	23.5			250	Water	C.I.	14	300	c
Pipeline	P	9.75	10	10.25	10.5	10.75	11	1,250	Water	D.I.	6	600	

L = Nitrided Liner - Field Replaceable

TL = Thin Liner

NL = No Liner

D.I. = Ductile Iron

F.S. = Forged Steel

C.I. = Cast Iron

a, b, c = Designates cylinders having identical XYZ flange dimensions to assist interchangeability and package piping standardization

Designed for Flexibility

- > The DS Series is backed by 100+ years of Cooper compressor design experience.
- > The DS Series is part of a complete line of reciprocating compressors that feature advanced technology and work-proven designs.
- > The compressor stroke can be changed by replacing the crankshaft and piston assembly.
- > The cylinders can be relined to a variety of bore dimensions in the field to always match your operating conditions.
- > Many cylinders have identical X, Y, Z flange locations, allowing packages to be reconfigured without any changes to the piping and bottles.
- > Over 18,000 Cooper high-speed reciprocating compressors have been built to date.

All high-speed reciprocating compressors are packaged, serviced, and maintained by a worldwide network of authorized packagers and distributors.

Operating Benefits

- > Compressor is easily reconfigured to meet your changing requirements
- > Reduces life cycle cost and increases production
- > Reduces required inventory of machinery and parts
- > Higher efficiency, lower fuel or electricity consumption
- > Lower cost of reconfiguration
- > Greater use of driver power over a wide range of conditions.

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