

# Tradition DS Series Compressors

High-speed reciprocating compressors readily configured for a wide range of applications

High-speed reciprocal compressors developed for natural gas applications. The familiar and proven DS Series has been redesigned and taken to a higher level through the application of Six Sigma principles. Six Sigma is GE's rigorous company-wide process for continuous improvement. Like the original FE Frame, which is widely used in a variety of natural gas applications, DS Series machines are available in three stroke configurations from 1,200 to 2,400 HP and can be readily re-sized and re-applied in the field.

## Performance features

### Type

Horizontal balanced opposed, two or four throws, with alternative cylinder sets to provide a wide choice of compression levels and flexible performance to meet changing needs.

### Frame

A heavy-ribbed frame is made from smoothly contoured iron casting with doweled, seperable crosshead guides. The sides of the frame are bolted together through the full depth main bearing caps. These caps extend to the top of the frame, adding strength and stiffness.

### Crankshaft

Forged-steel design with integral counterweights, balanced for smooth operation. Journals are precision ground to close tolerances then polished. The main and crankpin journals are both the same large diameter for maximum stiffness and torque transmission.

### Cylinders

A wide range of cylinder options are available. All 89 and 95 series cylinders for the 5" and 6" stroke frames are water cooled and feature field replaceable liners. Liners feature iron nitrided bores. The 90 Series cylinders for the 4.5" stroke frames are non-linered and air cooled.

### Compressor valves

Steel valve seats and guards; MT or PEEK valve plates are standard. 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.

### Piston/piston rods

Hard anodized aluminum alloy or cast-iron pistons. Weight is precisely controlled during manufacture to eliminate the need to match parts in the field. Carbon-filled Teflon combo piston-rider rings are standard. Piston rods are 4140 steel with rolled threads and full-floating vented rod-and-wiper packing.

### Connecting rods

Rods are made from carbon steel I-section drop forgings. The crosshead end is fitted with a solid precision type bushing. The crank end features split precision type tri-metal bearings.

### Crossheads

Single-piece ductile iron crossheads with full floating crosshead pins made from hardened and ground alloy steel.



### Compressor lubrication

Lube oil pump is driven directly by the compressor shaft – 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. A hand operated pre-lube pump is also provided. Oil passages drilled in the crankshaft carry oil to the main bearings, then through the rifle-drilled connecting rods to the crosshead pin and guides.

### Packing and cylinder lubrication

Shaft-driven force-feed lubricator with block distribution systems, cycle indicator and DFNT no-flow, shut-down switch. Stainless steel tubing to cylinders and packing. Adjustable feed rate. Rupture-relief valve.

### Standard testing

All frames receive a mechanical run test and post-test inspection to GE Infrastructure's high standards. All cylinders undergo hydrotesting to a minimum of 1.5 times the maximum allowable working pressure.

### Standard accessories

Digital maintenance/operating manuals and parts list, general arrangement drawings, lifting eyes and special tools.

### Optional items

Drive-through arrangement, materials suitable for sour gas service, vibration switches, CSA or XP no-flow switches, immersion oil heaters, flywheels and drive couplings.

### Frames in Two and Four Throw Configurations

Property	Specification	
Compressor Throws	2	4
Max BHP/kW	1200/895	2, 4/2, 4
Frame Weight lbs/kg (dry)*	4,750/2,156	7,050/3,200
Frame Length in/cm	84/2,540	147/3,734
Frame Width in/cm	71/1,778	70/1,778
Frame Height in/cm	36/914	36/914

### Two Choices of Frame Stroke Configuration

Property	Specification		
Stroke (in/mm)	4.25	5/127	6/152
Rated Speed-Max. (RPM)	1,600	1,500	1,200

### Heavy Duty Running Gear

Property	Specification	
	D50 & D60	D42
Max HP/kW per Throw	600/447	
Rod Load - Tension (lb/kg)	35,000/16,000	18,000/8,200
Rod Load - Compression (lb/kg)	35,000/16,000	22,000/10,000
Combined Rod Load (lb/kg)	70,000/32,000	40,000/18,200
Piston Rod Diameter (in/mm)	2/50.8	1.5/38.1
Crankshaft Material	4140 F.S/	
Connecting Rod Material	F.S.	
Crankpin & Main Bearing Dia (in/mm)	5/127	
Crankpin & Main Bearing Width (in/mm)	2.75/69.85	
Connecting Rod Pin Bushing Dia (in/mm)	4.25/107.95	
Connecting Rod Pin Bushing Length (in/mm)	3.5/88.9	

\*Without Cylinders F.S. = Forged Steel

DS504 = DS, 50, 4	Model Nomenclature
Model Stroke (in) Throws	

## A cylinder to fit your application

Double Acting	89 & 95 DS50, DS60 Frames (5 inch and 6 inch stroke)							MAWP PSIG	Cylinder Cooling	Material	Flange Dia Inch	Flange Rating PSIG	VVCP
	Series	Cylinder Bore - Inches											
	89	2.75	3	3.25	3.5	3.75		4700	Air	F.S.	2.5	2500	No
	89	3.5	3.75	4	4.25			3600	Air	F.S.	2.5	2500	Yes
	95	5.5	5.75	6	6.25	6.5		3600	Air	F.S.	4	1500	Yes
	89	4.5	4.75	5	5.25	5.5	6	2500	Water	D.I.	3	1500	Yes
	89	5.5	5.75	6	6.25	6.5	7	2200	Water	D.I.	4	1500	Yes
	95	6.75	7	7.25	7.5	7.75	8.25	1800	Water	D.I.	4	900	Yes
	95	8.5	9	9.5	9.75	10.25		1800	Water	D.I.	6	900	Yes
	95	10	10.5	11	11.25	11.75		1250	Water	D.I.	6	600	Yes
	95	12	12.5	13	13.5	13.75	14.25	800	Water	D.I.	8	400	Yes
	95	14	14.5	15				635	Water	D.I.	8	300	Yes
	95	15.5	16	16.5				635	Water	D.I.	8	300	Yes
	89	16.5	17	17.5	18	18.5		250	Water	C.I.	14	300	Yes
	89	19	19.5	20	20.5	21		250	Water	C.I.	14	300	Yes
	89	21.50	22	22.5				250	Water	C.I.	14	300	Yes
	89	23.5						250	Water	C.I.	14	300	Yes

Pipeline	P	9.75	10	10.25	10.5	10.75	11	1250	Water	D.I.	6	600	Yes
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SAHE	95	6.75	7	7.25	7.5			1800	Air	D.I.	4	900	No
SACE	95	12	12.5	13	13.5			800	Water	D.I.	8	400	No

Double Acting	90 Series Cylinders for D42 Frame (4.25 inch stroke)													
	90	4	4.25	4.5					1850	Air	D.I.	3	900	Yes
	90	4.75	5	5.25	5.5				1750	Air	D.I.	4	900	Yes
	90	5.75	6	6.25	6.5				1140	Air	D.I.	4	600	Yes
	90	6.75	7	7.25	7.5				840	Air	D.I.	4	600	Yes
	90	7.75	8	8.25	8.5				635	Air	D.I.	6	300	Yes
	90	9	9.5	10	10.5				525	Air	D.I.	6	300	Yes
	90	11	11.5	12	12.5	13			275	Air	C.I.	8	300	Yes
	90	13.5	14	14.5	15	15.5			200	Air	C.I.	10	150	Yes

SACE	90	6	6.5					1140	Air	D.I.	4	600	4
SAHE	90	2.75	3.25					1300	Air	C.I.	1.5	600	1

L = Nitrided Liner - Field Replaceable  
 TL = Thin Liner  
 NL = No Liner

D.I. = Ductile Iron  
 F.S. = Forged Steel  
 C.I. = Cast Iron

SAHE = Tandem Cylinder - Single Acting Head End  
 SACE = Tandem Cylinder - Single Acting Crank End

a, b, c, etc Designates cylinders have identical XYZ Flange Dimensions to assist interchangeability and package piping standardization

## Designed for field use

A heavy duty design combined with built-in flexibility in the field.

- Tradition DS is backed by 100 years of compressor design experience; more than 15,000 high-speed compressors in operation
- Part a complete line of reciprocating compressors that feature advanced technology and work-proven designs
- Stroke can be changed by replacing the crankshaft and piston assembly
- Many cylinders have identical X, Y and Z flange locations, allowing packages to be reconfigured without any changes to the piping and bottles

## Benefits of DS Series flexible design

- Flexible design 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 costs
- Lower capital cost
- Lower cost of reconfiguration

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

## Contact

For more information on DS Series Compressors, contact your GE Oil & Gas representative or visit [www.ge.com/oilandgas](http://www.ge.com/oilandgas)



GE imagination at work