

SUPERPRESSURE

REMOTE DIAPHRAGM GAS COMPRESSION HEADS

PART NUMBER:	46-14134	10,000 PSI
	46-14136	30,000 PSI

THIS MANUAL IS FOR:

REMOTE HEAD NO.: _____

SALES ORDER NO.: _____

SERIAL NO.: _____

DATE MANUFACTURED: _____

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REMOTE DIAPHRAGM GAS COMPRESSION HEADS

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ASSEMBLY DRAWINGS:

PART NUMBER: 46-14134

46-14134 (Sheet 1 & 2)
44-11102
44-11107
62006001200

PART NUMBER: 46-14136

46-14136 (Sheet 1 & 2)
44-13100
44-13120
62006001200

CURVES:

Curve 10K SEDEAIR
Curve 10K MOT

Curve 30K AIR
Curve 30K MOT

****NOTE:** Soft-Seat check valves for 30,000 PSI are not available.

I. THEORY OF OPERATION

Gas compression takes place at the diaphragm by liquid-column pressure pulses transmitted from a hydraulic pump. This pulsing action causes the suction and discharge of gas in the Remote Head.

The hydraulic pump which transmits the hydraulic pressure delivers a measured amount of oil under the diaphragm on the pressure stroke. Displacement of the diaphragm compressed the gas in the gas chamber. On the suction stroke additional gas is drawn into the compression or gas chamber.

II. PURPOSE AND APPLICATION

A. Purpose

The Compression heads described in this manual are designed to raise gas pressure from low pressure to 10,000 PSI, 20,000 PSI, or 30,000 PSI at a maximum compression ratio of 14 to 1.

B. Application

The compression heads can be used to raise or circulate gas up to the maximum pressure of the unit. The 10,000 PSI heads, if specially cleaned, serviced, and filled with fluorocarbon oils are suitable for oxygen service. The units may also be used for intermittent liquid service by incorporating double-ball check valves (see Section XII for ordering information).

III. GENERAL DESCRIPTION

A. Cat. no. 46-14134: This head is designed for a maximum discharge pressure of 10,000 PSI. The head is supplied with a pressure-limiting device and mounting stand. The pumps which can be used with this head are:

1. Superpressure Hand-Operated Pump, Cat. No. 46-12130
2. Superpressure Motor-Driven Pump, Cat. No. 46-12232
3. Superpressure Air-Operated Pump, Cat. No. 46-13725

All the above pumps can be used to develop the maximum discharge pressure.

B. Cat. no. 46-14136: This head is designed for a maximum discharge pressure of 30,000 PSI. The head is supplied with a pressure-limiting device and mounting stand. The pumps which can be used with this head are:

1. Superpressure Hand-Operated Pump, Cat. No. 46-12155
2. Superpressure Motor-Driven Pump, Cat. No. 46-12257
3. Superpressure Air-Operated Pump, Cat. No. 46-13780

Pumps 1 and 2 above, when used with this head, develop a maximum discharge pressure of 20,000 PSI. Pump 3 can develop 30,000 PSI.

IV. SPECIFICATIONS

	PART NUMBER: 46-14134	PART NUMBER: 46-14136
Maximum Discharge Pressure	10,000 PSI	30,000 PSI
Minimum Suction Pressure for Maximum Discharge Pressure	700 PSI (1,450 PSI for 20,000 PSI)	2,000 PSI
Maximum Distance from Pump	50 feet	50 feet
Weight: Net, Shipping	37/55	64/95
Height, Width, Depth(")	8-7/8,5-1/2,6-1/2	11-9/16,10,6
Mounting Data	2 Holes, 7/16 dia., 5 inch centers	6 Holes, 11/32 dia, 4-3/4 inch centers

V. CAPACITY CURVES

The curves shown below represent typical ranges for capacity vs. discharge pressure for remote head operation with 10 feet of separation between remote head and pump. Greater separations (up to 20 feet for 20,000 and 30,000 PSI operation, and even up to 50 feet for 10,000 PSI operations) can be approximated from these curves.

46-14134 Remote Head (10,000psi) using 46-12233-1 Motor-Driven Single-End Plunger Pump as pulsing unit. See Curve Part No.: Curve 10K MOT
Test Data

Gas: Dry Nitrogen
Temperature: 70°F
Pump Speed: 58 strokes/min.
Oil: SEA 10 W

46-14136 Remote Head using 46-12252 Motor-Driven Single-End Plunger Pump as pulsing unit. of 30,000psi Remote Head and 20,000psi Motor-Driven Pump is rated at 20,000psi maximum pressure. See Curve Part No.: Curve 30K MOT
Test Data:

Gas: Dry Nitrogen
Temperature: 70°F
Pump Speed: 58 Strokes/min (constant)
Oil: SEA 10 W

46-14134 Remote Head (10,000psi) using 46-13725-2 Air-Operated Single-End Plunger as pulsing unit. See Curve Part No.: Curve 10K SEDEAIR
Test Data:

Gas: Dry Nitrogen
Temperature: 70°F
Air Drive Pressure to Pump: 90 PSI nominal
Air Drive Consumption: 30 SCFM max for 6" drive
Oil: SEA 10 W

46-14136 Remote Head (30,000psi) using 46-13720-2 Air-Operated Single-End Plunger Pump as pulsing unit. This Combination is the only air-operated plunger pump that can be used with 30,000psi Remote Head. See Curve Part No.: Curve 30K AIR

Test Data:

Gas: Dry Nitrogen
Temperature: 70°F
Air Drive Pressure to Pump: 90psi nominal
Air Drive Consumption: 45SCFM max for 8" drive
Oil: SEA 10 W

NOTE: The 10,000 PSI Remote Head is used in combination with the Superpressure 46-12130 Single-End Hand Operated Pump for 10,000 PSI gas service. The 30,000 PSI Remote Head is used in combination with the Superpressure 46-12155 Single-End Hand-Operated Pump with a maximum pressure rating of 20,000 PSI.

VI. SYSTEM PROTECTION

Superpressure recommends installation of a pressure-relief valve or rupture-disc assembly, in accordance with standard ASME practice, in the discharge line from the compressor or prior to any system line valve. (for suitable relief device, see a Superpressure Catalog.)

NOTE: Oil is introduced into the drive air to lubricate the drive cylinders of air-operated heads. When the drive air is vented to atmosphere, it contains vaporized oil. Precaution should be taken to protect the atmosphere by piping the exhaust out of the room or through a filter. The recommended air exhaust line size is 3/4" pipe with a maximum length of 10 feet. Be sure that the drive air is dry and clean.

VII. INSTALLATION

A. General

All Superpressure Remote Diaphragm Heads are tested and operated under maximum operating conditions prior to shipment from the factory. After testing, the inlet and discharge check valves are sealed with plastic plugs.

CAUTION: For oxygen service on the 10,000 PSI Head use oxygen-compatible such as Halocarbon 11/21. Other special consideration should include LOX cleaning and the use of fluorocarbon grease on bolts, etc. Write to Superpressure Engineering Department for advice concerning special applications.

B. Installation

1. Mount the Remote Head in the desired location
2. Install hydraulic line (Superpressure Tubing, Cat. No. 45-11020) from the center connection on the pump head to the Remote Head. Remove discharge check valve oil line and plug the check valve.
3. Install an oil line return from the pressure-limiting device (1/4" copper tubing) either to the oil reservoir or to some other receptacle situated outside the controlled area.
4. Install gas suction and discharge lines (Superpressure Tubing 45-11020).

C. Open gas suction tank valve to charge the compression head.

D. Prime the Head (See section IX).

E. Start pumping.

CAUTION: APPLY GAS PRESSURE TO DIAPHRAGM HEAD BEFORE STARTING PUMP.

VIII. PRIMING, REPLACING PARTS, AND ADJUSTING

A. PRIMING

1. Stop pumping.
2. Close discharge-line valve and apply gas-suction pressure to the head. (This forces the diaphragm to the bottom position.)

3. Break lock nut on pressure-limiting device and turn screw back until all tension is off the spring.
4. Disconnect hydraulic return line at the pressure-limiting device.
5. Install a short length of tubing from head if it is situated in the controlled area. Start pumping. Pump until oil is free of air bubbles.
6. Connect hydraulic return line.
7. Reset pressure-limiting device by adjusting screw to allow gas pressure of 11,000 PSI, 21,000 PSI, or 32,000 PSI, depending on the type of unit.
8. Secure lock nut.

B. REPLACING PARTS

1. Diaphragm

- a. Stop pumping. Close off gas inlet and discharge line.
- b. Crack connection to check valve to allow trapped pressure to escape.
- c. Remove all gas connections.
- d. Secure head in some form of clamping device.
- e. Remove head bolts, pull the head, and inspect. inspect the check valves; then clean and cover the check valves with a clean cloth.
- f. Remove diaphragm(s). The 10,000 PSI units have one diaphragm, the 20,000 PSI and 30,000 PSI units have 2 diaphragms.
- g. Remove preservative from new diaphragm(s); thoroughly clean and put new diaphragm(s) in place.
- h. Install head connections by reversing removal procedure (use check valves as a guide for proper head relocation).

NOTE: Lubricate washer and bolt threads with bearing grease for normal operation; use fluorocarbon grease for oxygen service.

- i. Hand tighten all head bolts, then sequentially tighten opposing bolts with a torque wrench in equal increments of 10 ft./lbs. until final tightness (torque to approximately 150 ft./lbs.)
- j. Mount and attach all gas and hydraulic lines.
- k. Prime the compressor as described in paragraph IX, A, above.

2. Gas Check-Valves

- a. Stop the compressor.
- b. Remove gas connections.
- c. Remove check valves. Examine for wear or damage.

d. Install new valve, if required.

CAUTION: The pressure-limiting device should never heat during operation.

IX. TROUBLESHOOTING

Refer to the pump instruction manual for pump troubleshooting.

X. SPARE PARTS LIST

	PART NUMBER: 46-14134	QTY.	PART NUMBER: 46-14136	QTY.
Check Valve, Inlet	44-11102	1	44-13100	1
Check Valve Discharge	44-11107	1	44-13120	1
Diaphragm	62018000500	2	62018000500	4
O-Rings, Oil Slide			P1604023900	1
O-Rings, Oil Slide			P1604022000	1
For Pressure Limiting Device:				
Seat	62006001001	1	62006001002	1
Needle	64079000200	1	64079000200	1
Spring	P1632014900	1	P1632014900	1
Gasket, Lens Ring	63038000400	1	63038000400	1

XI. ACCESSORIES

44-11100	Hard-Seat Gas Check-Valve 10,000 PSI Intake
44-11105	Hard-Seat Gas Check-Valve 10,000 PSI Discharge
44-11409	Diaphragm Pressure Regulator
44-19730	"Little Richard" Air-Operated ON-OFF Valve
47-18315	Bourdon Tube Pressure Gauge 0-15,000 PSI
47-18340	Bourdon Tube Pressure Gauge 0-40,000 PSI
49-14405	Filter