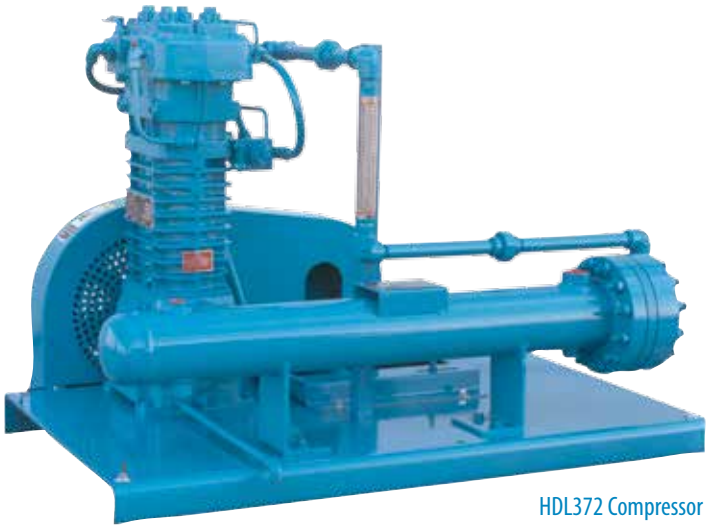
Blackmer
Part of Pump Solutions Group
A DOVER COMPANY

Spec Sheet 901-001

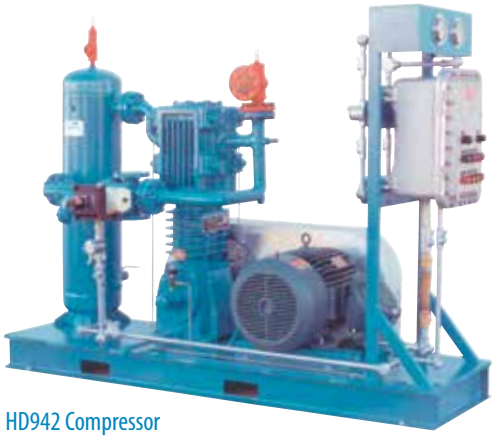
Section: 901
Effective: June 2013
Replaces: March 2012

# HD Compressors

## Experts in Mission Critical Industrial Gas Process Compressor Solutions



HDL372 Compressor



HD942 Compressor

### Applications for:

- Gas Transfer
- Liquefied Gas Transfer
- Vapor Recovery
- Gas Gathering
- Gas Evacuation
- Gas Blanketing
- Pressure Boosting
- Flare Elimination
- Leak Test Recovery
- Enhanced Recovery

# Blackmer® Oil-free HD Compressors for Industrial Gas Applications

## Heavy-duty, high efficiency, low maintenance and quiet operation

Blackmer process compressors provide efficient and quiet delivery of oil-free gas or air. These heavy-duty single and two-stage stationary compressors combine advanced design technology and state of the art materials to give maximum performance with minimum maintenance.

## Single-Stage & Two-Stage Models

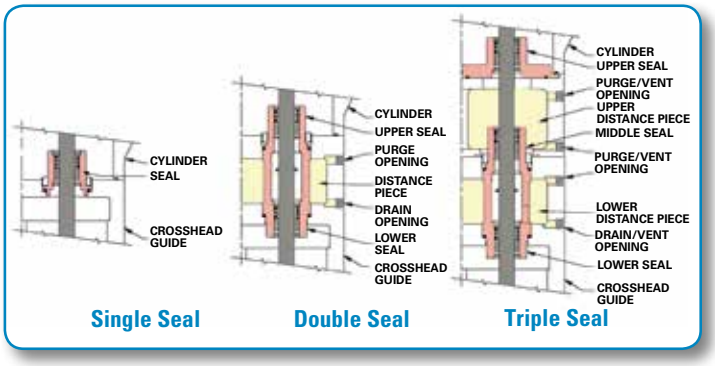
Single-stage models are available in 7 sizes with piston displacements to 125 cfm (212 $m^3$/hr) and working pressures to 1,000 psia (69 bara) for use on low to moderate compression ratio applications. Three sizes of two-stage models are available for higher compression ratio requirements.

## Air-Cooled & Liquid-Cooled Models

The HD air-cooled models are suitable for most applications, especially for operation at lower compression ratios and for liquefied gas transfer applications. HDL models have a liquid-cooled head and cylinder for more demanding applications.

## Single, Double & Triple Seal Models

The standard double-seal models are constructed with a single distance piece between two sets of piston rod seals. The distance piece provides leakage control and prevents oil contamination of the compressed gas stream. Triple seal models use two distance pieces for maximum leakage control and are well suited for handling toxic, hazardous or corrosive gases. Ports are provided in each distance piece chamber for purging, pressurizing or venting. Single-seal models are also available.




## Blackmer HD Compressors are designed for the transfer, boosting and recovery of a wide range of industrial gases:

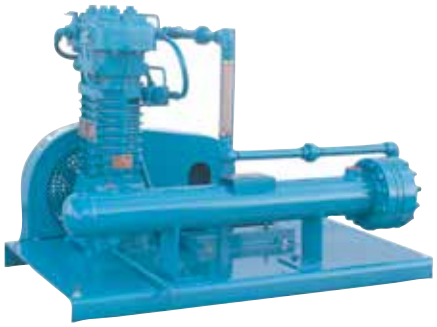
Air, Ammonia, Argon, Butadiene, Butane, Carbon Dioxide, Carbon Monoxide, CFC's, Chlorine, Cyclohexane, Cyclopropane, Dimethylamine, Dimethyl Ether, Ethane, Ethyl Alcohol, Ethyl Chloride, Ethylene, Ethylene Oxide, HCFC's, Helium, n-Heptane, n-Hexane, Hydrogen, Hydrogen Chloride, Hydrogen Sulfide, Isobutane, Isobutene, Isobutylene, Isopentane, Methane, Methanol, Methyl Chloride, Methyl Mercaptan, Monoethylamine, Natural Gas, Nitrogen, Nitrogen Dioxide, Nitrous Oxide, Oxygen, Ozone, n-Octane, n-Pentane, Propane, Propylene, Refrigerants, Sulfur Dioxide, Sulfur Hexafluoride, Trichloroethane, Tetrafluoroethylene, Trimethylamine, Vinyl Chloride, Xenon and other gases.

## Blackmer® HD Compressors - Custom Made Units

Complete custom packages are available. Engineering, fabrication and drawings are all provided per specifications to meet the application requirements.

**HD942** compressor with explosion-proof control panel and electrically actuated 4-way flow control valve for LPG transfer.

**Duplex HD613** two-stage triple-seal compressors with control panel for natural gas pressure boosting operation.



**HDL372** two-stage water-cooled compressor with water-cooled aftercooler for Helium recovery service.

# Single and Multi-Stage Compressors

## The inside view on why Blackmer compressors are superior in handling industrial gases

### High efficiency, PEEK valves

Blackmer valves are specifically designed for oil-free gas applications. Standard valve plates are constructed of self-lubricating PEEK (Poly Ether Ketone) material that provides superior sealing characteristics, high efficiency and durability. Optional stainless steel valves are also available. **Note:** *Series HD160 and HD170 have TNT-12 impregnated steel valves.*

### Live loaded piston rod seals

Filled PTFE seals are wear compensating and maintain a constant sealing pressure around the piston rods with minimum friction. This special seal design prevents crankcase oil contamination and cylinder blow-by.

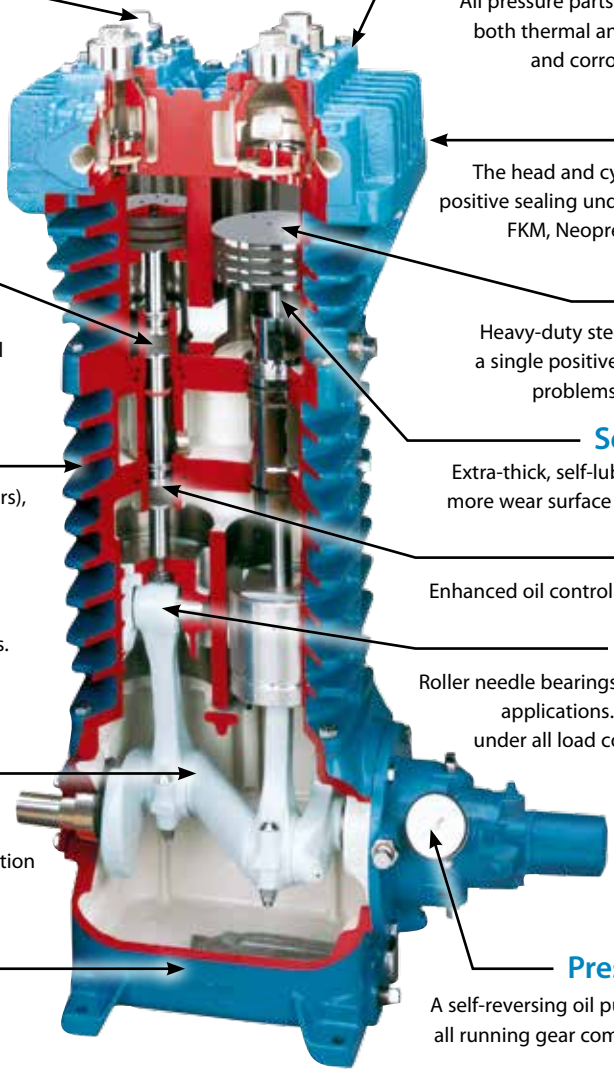
### Single or double-distance piece

Single or double distance pieces (isolation chambers), control contamination of the compressed gas from crankcase lubricant, even at high vacuum inlet conditions. Each isolation chamber may be independently purged, pressurized or vented for maximum containment of toxic or hazardous gases.

### Heavy-duty precision ground crankshaft

The ductile iron crankshaft features roller bearings and integral counterweights for smooth, quiet operation. Rifle drilling ensures positive oil distribution to the wrist pin andconnecting rod bearings.

### Two-part epoxy paint



### Ductile iron construction

All pressure parts are ductile iron for greater resistance to both thermal and mechanical shock. For extended wear and corrosion resistance, specify the TNT-12 PTFE and Nickel impregnation option.

### O-Ring seals

The head and cylinder are sealed with O-rings to ensure positive sealing under severe operating conditions. Buna-N, FKM, Neoprene, PTFE or Ethylene-Propylene O-rings are available.

### One piece piston

Heavy-duty steel pistons are connected to the rod with a single positive locking nut, which eliminates potential problems associated with multiple piece designs.

### Self-lubricating piston rings

Extra-thick, self-lubricating filled PTFE piston rings provide more wear surface for maximum sealing and extended life.

### S3R Seal (600/900 Series)

Enhanced oil control providing even greater leakage control.

### Wrist pin needle bearings

Roller needle bearings provide longer life under high rod load applications. Superior wrist pin lubrication is assured under all load conditions. All HD/HDL/HDS compressors are free of yellow metals

### ANSI flanges

Many models are available with ANSI flanges for compatibility with CPI and refinery industry standards.

### Pressure lubricated crankcase

A self-reversing oil pump provides positive oil distribution to all running gear components for long life and minimal wear. A full-flow spin-on oil filter is standard.

## Options

- **Wear and Corrosion-Resistant Components** TNT-12 impregnated parts
- **Switches:** Automatic pressure, temperature shut-down, alarm switches
- **Suction Valve Unloader:** Loadless starting and constant speed unloading packages
- **Poly-Filled PTFE Piston Rings** for dry-gas service
- **Alternate O-Ring Materials** available
- **Extended Crankshaft** for direct drive mounting
- **Vapor Strainer Assembly** features 30-mesh stainless steel screen
- **Liquid Traps available** with mechanical valve or electric float switch (or both). ASME code construction also available
- **Piping:** Threaded or welded steel piping systems
- **Heat Exchangers:** pre-coolers, inter-coolers and after-coolers available
- **Four-Way Valve** with handle and easy-to-read flow direction indictor
- **Base Plates** of formed steel or fabricated skid
- **Motors** can be customized for any application
- **Control Panels** can be explosion-proof or weather-proof
- **Tests** certificates available for each compressor

# Oil-Free Compressors

## HD Models are air-cooled and HDL Models have liquid-cooled head and cylinders

## Single-Stage Models

| Single-Seal<br>Double-Seal<br>Triple-Seal | HD161<br>HD162<br>HD163 | HDL322 | HDL342<br>HDL343 | HD361<br>HD362/HDL362<br>HD363/HDL363 | HDL642<br>HDL643 | HD602/HDL602<br>HD603/HDL603 | HD942/HDL942 |
|---|---|---|---|---|---|---|---|
| Number of Cylinders | 2 | 2 | 2 | 2 | 2 | 2 | 2 (Double Acting) |
| Bore - in. (mm) | 3.0 (76) | 2.0 (51) | 2.69 (68) | 4.0 (102) | 3.25 (83) | 4.625 (117) | 4.625 (117) |
| Stroke in. (mm) | 2.5 (64) | 3.0 (76) | 3.0 (76) | 3.0 (76) | 4.0 (102) | 4.0 (102) | 4.0 (102) |
| Maximum Allowable Working Pressure - psia (bara) | 350 (24.1) | 1,000 (69) | 750 (51.7) | 350 (24.1) | 750 (51.7) | 350 (24.1) | 350 (24.1) |
| Minimum/Maximum rpm | 350 / 825 | 350 / 825 | 350 / 825 | 350 / 825 | 350 / 825 | 350 / 825 | 350 / 825 |
| Piston Displacement<br>@100 rpm - CFM ($m^3$/hr)<br>@Min rpm - CFM ($m^3$/hr)<br>@Max rpm - CFM ($m^3$/hr) | <br>2.05 (3.48)<br>7.16 (12.2)<br>16.9 (28.7) | <br>1.09 (1.85)<br>3.81 (6.49)<br>9.00 (15.3) | <br>1.97 (3.34)<br>6.89 (11.71)<br>16.25 (27.61) | <br>4.36 (7.41)<br>15.3 (26.0)<br>36.0 (61.2) | <br>3.84 (6.5)<br>13.4 (22.8)<br>31.7 (53.8) | <br>7.78 (13.2)<br>27.2 (46.3)<br>64.2 (109.0) | <br>14.99 (25.47)<br>52.46 (89.1)<br>125.2 (212) |
| Max. bph (kW) | 10 (7.5) | 15 (11) | 15 (11) | 15 (11) | 40 (30) | 40 (30) | 50 (37) |
| Wt. w/Flywheel - lb. (kg) | ~225 (102) | ~385 (175) | ~375 (170) | ~365 (166) | ~705 (320) | ~705 (320) | ~905 (410) |
| Inlet / Outlet Connections | 0.75" NPT | 1.5" 600# ANSI | 1.5" 600# ANSI | 1.5" 300# ANSI | 2" 600# ANSI | 2" 300# ANSI | 2" 300# ANSI |

## Two-Stage Models

| Double-Seal<br>Triple-Seal | HD172 / HDL172<br>HD173 / HDL173 | | HD372 / HDL372<br>HD373 / HDL373 | | HD612 / HDL612<br>HD613 / HDL613 | |
|---|---|---|---|---|---|---|
| | 1st Stage | 2nd Stage | 1st Stage | 2nd Stage | 1st Stage | 2nd Stage |
| # Cyl. per Stage | 1 | 1 | 1 | 1 | 1 | 1 |
| Bore - in. (mm) | 3.0 (76.2) | 1.75 (44.5) | 4.625 (117) | 2.687 (68) | 6 (152) | 3.25 (.83) |
| Stroke in. (mm) | 2.5 (63.5) | | 3.0 (76) | | 4.0 (102) | |
| Maximum Allowable Working Pressure - psia (bara) | | 615 (42.4) | | 615 (42.4) | | 415 (28.6) |
| Minimum/Maximum rpm | 350 / 825 | | 350 / 825 | | 350 / 825 | |
| Piston Displacement<br>@100 rpm - CFM ($m^3$/hr)<br>@Min rpm - CFM ($m^3$/hr)<br>@Max rpm - CFM ($m^3$/hr) | <br>1.02 (1.73)<br>3.57 (6.07)<br>8.42 (14.3) | | <br>2.92 (4.96)<br>10.2 (17.3)<br>26.1 (40.8) | | <br>6.54 (11.1)<br>22.9 (38.9)<br>53.7 (91.2) | |
| Max. bph (kW) | 10 (7.5) | | 15 (11) | | 40 (30) | |
| Wt. w/Flywheel - lb. (kg) | ~290 (132) | | ~405 (184) | | ~775 (352) | |
| Inlet / Outlet NPT - in. | 0.75/0.75 | | 1.25/1.00 | | 2.00*/1.50*<br>*Weld type flanges available | |

Compression Ratios are normally limited by discharge temperature. High compression ratios and certain gases can cause excessive heat, i.e. over 350°F (177°C). The duty cycle must provide for adequate cooling time between periods of operation to prevent excessive operating temperature.

**Note:** ***HDS series compressors are now available for sour natural gas applications. Consult factory for additional information***

## Contact your Blackmer Distributor

*Our Application Engineers can provide expert assistance in selecting the right compressor, the right options and the right accessories for your specific application.*

Blackmer
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Process | Energy | Military & Marine


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