



## **CP COMPRESSORS**

### **QRS3.0 – QRS15 SERIES**

#### **PRODUCT DESCRIPTION**

#### **GENERAL DESCRIPTION**

The QRS3.0 to QRS15 Series is a single stage, aircooled, oil injected rotary screw air compressor package. The compressor package includes the rotary screw air compressor element, main drive motor, air and oil system, filters, oil cooler, cooling fan and electro-pneumatic regulating controls for 150 psig nominal output. There is an optional choice of 125 psig nominal discharge pressure for the QRS 10 & QRS 15. The QRS rotary screw compressor is designed for continuous duty operation, at full compressor output without affecting the compressor life. The QRS is available in the HP model High Performance package (compressor only), or in the QRS HPD model High Performance package (compressor and air dryer). All units are fully enclosed with a sound attenuating cabinet and are tank mounted on a 60 gallon (QRS 3.0-7.5) or 120 gal. (QRS10-15) horizontal ASME approved tank. The QRS HPD packaged compressor has the optional integral refrigerated air dryer perfectly matched to each compressor's output and is mounted and piped on the air receiver tank.

#### **COMPRESSOR ELEMENT**

The rotary screw compressor element is the twin rotor rotary screw design consisting of:

- Male rotor with five (5) lobes
- Female rotor with six (6) flutes
- Patented asymmetric rotor design with cycloid profile at the pitch diameter
- Oil injection during the compression stage for lubrication, sealing and cooling
- High air/oil temperature sensor at discharge of compressor element.

#### **DRIVE MOTOR (3-15 HP/HPD)**

The drive motor is a horizontal AC (alternating current) squirrel cage induction motor consisting of:

- Foot mounted motor frame
- Service factor: See Product Data Page
- Insulation: Class F, Class B rise
- Enclosure: TEFC (totally enclosed fan cooled); motor housing is enclosed to protect the motor from dust and dirt entering the windings giving longer life and cooler operation with a dedicated cooling fan mounted on the motor.
- Motor speed: 3600 RPM
- Tri voltage 3/60/ 208v / 230v / 460v, 3/60/575v or single phase 1/60/230v at 3hp, 5hp and 7½hp. (only)
- Motor construction:
- Rugged cast frame
- Cast rotor
- Non-hygroscopic insulation
- Corrosion resistant hardware
- An adjustable V-Belt system drives the compressor



### **OIL SYSTEM**

The oil system is of the differential pressure type consisting of:

- ASME approved air/oil separator reservoir tank with:
- Inverted spin-on air/oil separator filter
- Oil fill opening with pressure relieving plug
- Thermostatic oil valve to regulate oil flow to the cooler
- Oil level sight glass (visible through cabinet panel)
- Oil drain valve and swivel drain tube
- Inverted spin-on oil filter rated at 10 microns
- Aircooled aluminum oil cooler which is cooled by a dedicated cooling fan driven from the main drive TEFC motor.
- Compressors are shipped from the factory with a fill of 4,000 hour petroleum based lubricant, Model QRS-4000 supplied by Chicago Pneumatic.

### **AIR SYSTEM**

The air system consists of:

- Dry type air intake filter rated at 3 microns (standard air filter is high dust rated)
- Minimum pressure/check valve
- Manual air receiver drain and drain valve piped to air receiver foot for ease of draining
- Safety relief valves on the ASME coded air receiver and air/oil tank
- 60 gal. ASME and CRN approved air receiver tank (QRS 3.0, 5.0, 7.5)
- 120 gal. ASME and CRN approved air receiver tank (QRS 10, 15)

### **ELECTRO-PNEUMATIC CONTROL PANEL**

The electro-pneumatic compressor control panel consists of the following gauges and indicators for simple and efficient operation.

- Air discharge pressure gauge
- Compressor On/Off Switch with lockout feature
- Hourmeter
- High oil temperature shutdown light (also will indicate a motor overload condition)
- Reset button for high oil temperature shutdown (and motor overload)
- Load/no load switch (QRS10-15 only)

### **STARTER CUBICLE**

All QRS3.0 – QRS15 Series compressors are certified with a UL and C-UL listed control cubicle consisting of:

- Direct on-line motor starter sized for 208v, 230v or 460v power or 575v (the D-O-L, or A-T-L across the line starter delivers full electrical power to the motor through a motor contactor mounted in the control cabinet.

The in-rush current amp draw is approximately 6-8 times the full load motor amp rating.)

- Control circuit transformer for 115V AC controls
- 6ft electric cable for connection from the compressor to the incoming power source

### **COMPRESSOR OPERATION – QRS3.0-7.5**

The QRS compressor operates with full start-stop control of the compressor and motor, controlled by a preset pressure switch which starts the compressor and motor when pressure drops to 115psig, and stops the compressor and motor when discharge pressure reaches 145psig. The compressor begins to compress air immediately when the motor starts, and stops compressing air when the motor stops. The pressure range is fixed at 30 psig but can be raised to 155 psig maximum or lowered to 65 psig minimum setting.



### **COMPRESSOR OPERATION – QR10-15**

The QRS10 and QRS15 are equipped with automatic and manual load/no-load control. In the “load” position the QRS operates continuously, automatically loading and unloading the inlet valve to meet system air pressure. After running unloaded for a preset period of time, the timer will shut the compressor and motor off, placing it in an automatic start mode. When the pressure drops below the preset limit the compressor automatically restarts. In the “manual no-load” position, the compressor can be manually unloaded at any time during its’ operating cycle. Do not manually unload the compressor during a load cycle in the automatic load position.

The QRS 10 & QRS 15 are available in either 125 psig models or 150 psig models. Both models operate the same. The 150 psig model has a maximum operating pressure of 155 psig and the 125 psig model has a maximum operating pressure of 128 psig. The 125 psig models produce 15-20% more capacity (cfm) than the 150 psig models.

### **ASSEMBLY**

The QRS3.0 – QRS15 Series units include all of the standard and/or optional equipment mounted on a fully enclosed industrial grade steel base that is tank mounted on a 60 gallon (QRS3.0-7.5) and 120 gal. (QRS10-15) ASME/CRN air receiver. The QRS HP and HPD (with dryer) are factory piped and assembled. Compressed air flows from the compressor to the air receiver tank where it is stored. On the HPD models the compressed air is dried by the refrigerated dryer as the system calls for air. Both the HP and HPD units also include sound attenuated panels that achieve 61 to 69 dB (A) noise levels.

### **QRS HPD MODELS only (with refrigerated air dryer)**

#### **REFRIGERATED AIR DRYER**

An optional tank mounted refrigerated air dryer is available when ordered with the compressor. The dryer module consists of:

- Precooler/reheater
- On/Off switch
- Evaporator, refrigerant condenser and refrigerant compressor
- Hot-gas-bypass valve
- Thermal regulator for condenser fan operation
- Capillary tube
- Environmentally approved R134a refrigerant
- Automatic condensate drain and trap with adjustable timer
- Pressure dewpoint indicator
- Voltage is 1/60/115v
- 6 ft electrical cable for connection to wall outlet

A refrigerated air dryer can be added to the customer’s air system after the QRS has been installed but can not be mounted on the air receiver. The customer must either wall mount or floor mount the QRS dryer when added after the compressor has been installed.