BAUER COMPRESSORS

Instruction Manual and Replacement Parts List

Open Vertical

Nitrogen Compressor Booster Package

GIB15.3II VT

July 21, 2006 1st Ed. Rev. 0 Chg. 0 MNL-71004

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⚠ WARNING ⚠

This Instruction Manual and Replacement Parts List contains safety information and instructions for the GIB15.3-II V Nitrogen Compressor Booster Package.
You must read, understand and follow all safety precautions and instructions.

1st Edition July 21, 2006

Rev	Chg	Date	Notes	Auth
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CHAPTER 1: INTRODUCTION

1.1 How To Use This Manual

This manual contains the operating and maintenance instructions for the Bauer Compressors, Inc. product(s) listed on the front cover.

All instructions in this manual should be observed and carried out as written to prevent damage or premature wear to the product or the equipment served by it.

If your unit is equipped with nonstandard accessories and/or options, supplemental information is normally included in other documentation; i.e. OEM Manuals or additional Bauer Manuals.

While every effort is made to ensure the accuracy of the information contained in this manual, Bauer Compressors, Inc. will not, under any circumstances be held accountable for any inaccuracies or the consequences thereof.

1.1.1 Manual Safety Notices

Important instructions concerning the endangerment of personnel, technical safety or operator safety will be specially emphasized in this manual by placing the information in the following types of safety notices.

⚠ DANGER ⚠
DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This is limited to the most extreme situations.

⚠ WARNING ⚠
WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or injury.

⚠ CAUTION ⚠
CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

⚠ NOTE ⚠
NOTE advise of technical requirements that require particular attention by the operator or the maintenance technician for proper maintenance and utilization of the equipment.

1.2 How to Use the Replacement Parts List

- A lozenge ◊ in the Item Number column indicates the part number for a complete assembly.
- a dagger (†) in the Qty column with or without an ellipis (…) in the Part Number column means the part is illustrated for assembly purposes only and is not available for sale as an individual component. This part can be obtained by ordering the complete assembly.
- AR in the Qty column means that the item is cut or manufactured to the size which the customer specifies.
- A dash (—) in the Item Number column indicates that there is more than one part number applicable to the preceding Item Number.
- The letter(s) in the columns labeled Kit indicate the number of operating hours when the part is to be replaced; a = replaced every 1,000 hours, b = replaced every 2,000 hours and c= replaced every 4,000 hours.
- NS in the Item Number column indicates the part is not illustrated but is available.

When placing an order for spare parts, please provide the following information to ensure delivery of the correct parts. The model number, date of manufacture and serial number can be found of the compressor unit identification plate on the compressor unit's frame.

Information		Example
Model Number		TCOM25
Serial Number		32165
Date of Manufacture		02/2005
Quantity required		2
Part Number		N04860
Part Description		Valve

⚠ WARNING ⚠

The use of repair parts other than those included in the Bauer Replacement Parts Lists may create unsafe conditions over which Bauer has no control. Such unsafe conditions can lead to accidents that may be life-threatening, cause substantial bodily injury, and/or result in damage to the equipment. Therefore, BAUER Compressors, Inc. can bear no responsibility for equipment in which unapproved repair parts are installed.

1.3 How to Use the Appendix

Information contained in the Appendix to this manual includes the following.

- The safety instructions applicable to this product. They must be read, understood and complied with prior to operating the product.
- The instructions for installing this product. They must be read, understood and complied with prior to operating the product.
- The instructions for long term storage (over 90 days) of this product.

1.4 Specifications

1.4.1 GIB15.3II VT

Medium	Nitrogen
Capacity	Up to 27 scfm
Inlet pressure	99 to 150 psig
Operating pressure, max.	Up to 5,000 psig
Ambient temperature range	43° to 113° F

1.4.2 Compressor Block

BK15.3 II	mod. 1
No. of stages	2
No. of cylinders	4 (2 per stage)
Cylinder bore, 1st stage	1.42 in. (36 mm)
Cylinder bore, 2nd stage	0.55 in. (14mm)
Piston Stroke	1.97 in. (50 mm)
Intermediate pressure, 1st stage	600 - 900 psig (42 - 68 bar)
Safety valve setting, 1st stage	1,160 psig (80 bar)
Direction of rotation when facing flywheel	CCW
Compressor speed	Up to 1,450 RPM
Oil capacity	5.28 qts.(5 l)
Recommended oil (Synthetic)	BAUER OIL-0024
Maximum Inclination	20° in all directions

1.4.3 Compressor Drive

Voltage	Frequency	Phase	Power	RPM	Type	BAUER PN
208 - 460 VAC	60Hz	3 ϕ	15 HP	3600	ODP	MTR-0024

1.4.4 Purification System Applicability

The GIB15.3-II V is equipped with the Bauer P2 Purification System with an Oil Removing.Cartridge

CHAPTER 2:PLC CONTROLLED UNIT OPERATIONS

2.1 Pre-start Checks

1. Ensure that all scheduled maintenance is completed.
2. Check compressor oil level. Refer to Chapter 3.
3. On units with a gasoline or diesel engine, check engine oil level. Refer to Original Equipment Manufacturers (OEM) manual.
4. Check Emergency Stop Switch is pulled out.

2.2 Start-up Procedure

(See Figure 2-1)

1. Verify that all connections downstream of the compressor are secure.
2. Open the condensate drain valves to relieve any remaining pressure.
3. Close the condensate drain valves.
4. Apply electric power to the unit.
5. Turn the Compressor Control Switch to the ON position.

2.3 Post Start Procedures

1. Allow the compressor to build up pressure. Monitor the pressure gauge.
2. Listen to the unit as it operates. If excessive knocking or vibrations are observed shut down the unit.
3. Allow the compressor to reach full pressure.

2.4 Shutdown Procedures

1. Verify all bottle valves and fill valves are closed.
2. Turn the Compressor Control Switch to the OFF position.
3. After shutting down the compressor drive, open the condensate drain valves to relieve any remaining pressure and drain any moisture from the intermediate separators and the oil and water separator.
4. Close the condensate valves.
5. Leave Emergency Stop Switch pulled out for at least 15 hours every 30 days to maintain the charge on the internal PLC battery and preserve the PLC operating memory.
6. If the compressor is to remain idle for six months or longer, refer to the Appendix titled, Long Term Storage for preservation instructions.

2.5 Electric Panel Components

Figure 2-1 Electrical Panel Front

1. Compressor Control Switch	3. Alarm Light	5. Starter Reset
2. Warning Light	4. Hourmeter	6. Emergency Stop Switch

2.5.1 Emergency Stop Switch.

The Emergency Stop Switch is a switch with a mushroom head. The button must be pulled out for the unit to operate. In an emergency, depress the push button, which will shutdown the electric motor and all other periphery devices. Do not use the Emergency Stop Switch for securing the equipment under normal operation, use the Compressor Control Switch. The PLC operating memory is maintained by a internal battery in the PLC. Removing all power from the compressor will allow the battery to discharge over a 30 day period. Apply power to the unit by pulling out the Emergency Stop Switch, and leave on for at least 8 hours every 30 days.

2.5.2 Starter Reset

The Starter Reset is a blue push button with the letter “R” at its center. Pushing this button will reset the thermal overload relay on the motor starter. Should the electric motor have overloaded and tripped out during normal operation, then depressing this button after giving the motor starter some time to cool, will reset the overload relay portion of the motor starter.

2.5.3 Compressor Control Switch

OFF Position - The Compressor Control Switch switch must be in the OFF position when securing the compressor system.

ON Position - The Compressor Control Switch switch must be in the ON position to operate the compressor system. When positioning the switch to the ON position, it will illuminate Green. The compressor will start and stop automatically based on the status of the pressure switch.

2.5.4 Indicator Lamps

2.5.4.1 PLC Warning and Alarm Lamps

2.5.4.1.1 Warning Lamp - Amber

The lamp (Bauer P/N LIT-0128) is a LED lamp for long trouble free life. This lamp will flash a code IAW the logic of the PLC. See Paragraph 2.6.

2.5.4.1.2 Alarm Lamp - Red

The lamp (Bauer P/N LIT-0127) is a LED lamp for long trouble free life. This lamp will flash a code IAW the logic of the PLC. See Paragraph 2.7.

2.5.5 Hour meter

The panel is supplied with an hour meter (HMR-0029). The hour meter is not resettable and used to monitor the run hours of the compressor. It is powered with a 120 VAC signal supplied from the auxiliary contact on the motor starter.

2.5.6 PLC Control

This panel will be controlled with a Telemecanique 16 I/O Twido Programmable Logic Controller. This unit will provide logical operations to the overall system that includes the high pressure compressor, purification systems, and other accessories.

2.5.6.1 PLC LED's

There are three separate groups of LED's on the PLC. See Figure 2-3.

1. The Input Status LED's are in the top row.
2. The Output Status LED's are on the right hand side of the bottom row
3. The PLC Status Lights are on the left hand side of the bottom row and indicate the following.
   a. PWR - The supply voltage to the PLC is correct.
   b. RUN - On when the program is running. Flashes when program execution is stopped.
   c. ERR - Illuminates red on application fault.
   d. STAT - Indicates the status of an application variable.

Figure 2-2 PLC CNT-0052

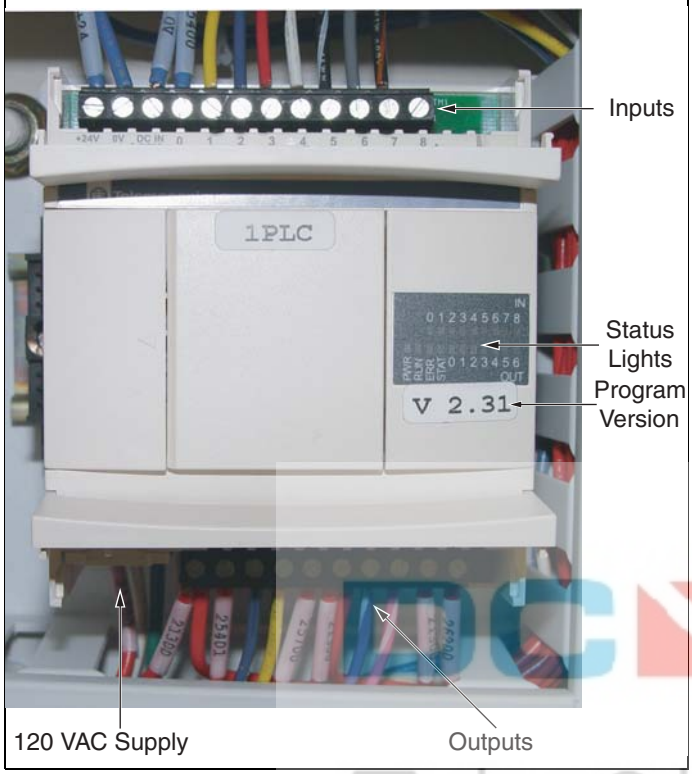
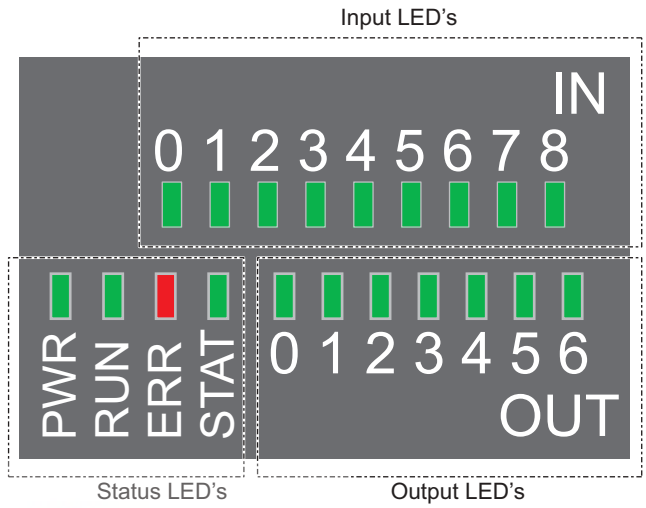


Figure 2-3 Status LEDs



2.6 Warnings

The amber Warning Light located on the control panel flashes warning codes with a 0.5 second on, 0.5 second off sequence with a distinct pause between sequences. In addition the light will illuminate on initial start up for a period of 5 seconds, to serve as a lamp test function. The lamp is a LED lamp for long trouble free life.

2.6.1 One Flash - Final Separator Warning

The compressor unit is equipped with a final separator. To prevent fatigue failure of this pressure vessel, the PLC program monitors the pressurization, de-pressurization cycles of the separator and will first issue a Warning, and then an Alarm. The program is set up to provide the warning at 90% of the maximum recommended number of cycles. The program is configured to reflect these values when it is built. When the warning is illuminated, the unit will still continue to function properly, but will prompt the operator to contact Bauer Compressors for making arrangements to replace the Final Separator. When the Alarm level has been achieved, the compressor will no longer function, and will require the replacement of the Final Separator. Once the Final Separator is replaced, the unit can be re-activated by making adjustments to the PLC. Please contact Bauer Product Support for detailed instructions on this procedure.

⚠ WARNING ⚠
Do not attempt to override the Separator Shutdown Warning. This feature is provided to protect personnel from injury or death.

2.6.2 Two Flashes - Securus Monitor

The compressor purification system may be equipped with an optional Securus® Electronic Moisture Monitor. This consists of a control module and cable connected to the purification chamber. It functions as a capacitive sensor, sensing the moisture in the purified air. When the chemicals in the purification cartridges have reached the point where they retain a set level of moisture, the Securus® monitor will issue a warning via the amber Warning Light. On a Securus® Warning condition, the compressor will run normally, the PLC I7 lamp will illuminate, and the warning code will flash. This warning is meant to prompt the operator to schedule replacement of the purification cartridge.

2.7 Alarms

The red Warning Light located on the control panel flashes warning codes with a 0.5 second on, 0.5 second off sequence with a distinct pause between sequences.In addition the light will illuminate on initial start up for a period of 5 seconds, to serve as a lamp test function. The lamp is a LED lamp for long trouble free life.

2.7.1 One Flash - Compressor High Temperature

The compressor high temperature switch is located on the compressor block, third, fourth or fifth stage head, depending on model. Under normal operating conditions, the switch is closed and the I1 lamp on the PLC is illuminated. On a high temperature condition, the compressor will shutdown, the I1 lamp will extinguish, and the alarm code will flash.

2.7.2 Two Flashes - Compressor Low Oil Pressure

The compressor oil pressure switch is located on the back of the compressor block, mounted with the oil pressure gauge. The switch is N.O., Normally Open, and is connected to the PLC on terminal I2. During startup of the compressor, the oil pressure switch is bypassed for a period of 45 seconds to allow the oil pressure to stabilize, then the switch will close. Then should the compressor lose oil pressure, the compressor will shutdown, the I2 lamp will extinguish, and the alarm code will flash.

2.7.3 Three Flashes - Compressor Overtime

The compressor has an overtime function, where if the compressor runs continuously for 5 hours, then the compressor will shutdown, and the alarm code will flash. This is done to secure the equipment if it were to be started and left unattended.

2.7.4 Four Flashes - Securus Monitor

The compressor purification system may be equipped with an optional Securus® Electronic Moisture Monitor. This consists of a control module and cable connected to the purification chamber. It functions as a capacitive sensor, sensing the moisture in the purified air. When the chemicals in the purification cartridge has reached the point where it retains a set level of moisture, the Securus® monitor will issue an alarm via the red Alarm Light. On a Securus® ALARM condition, the compressor will shutdown, the PLC I5 lamp will be illuminated, and the alarm code will flash.

2.7.5 Five Flashes - Carbon Monoxide Monitor Alarm

The compressor system may be equipped with an optional Carbon Monoxide Monitor. This consists of an electronic module that samples the compressed air supply. The unit will provide a continuous display of the CO level in PPM, parts per million. If the CO level becomes excessively high, then the red alarm light on the face of the monitor will illuminate. At the same time the alarm relay in the CO Monitor which is connected to the PLC I4 will generate a CO ALARM condition.The compressor will shutdown, the I4 lamp will illuminate, and the alarm code will flash.The unit should be calibrated with a test gas monthly. Refer to the chapter titled CO Monitor for this procedure.

2.7.6 Six Flashes - Final Separator Shutdown

⚠ WARNING ⚠

Do not attempt to override the Final Separator Shutdown. This feature is provided to protect operating personnel from injury or death.

The high pressure-breathing compressor is equipped with a final separator. To prevent fatigue failure of this vessel, the PLC program monitors the pressurization, de-pressurization cycles of the separator and will issue a Warning, and then later an Alarm. The program is set up to provide a warning at 90% of the maximum recommended number of cycles. The program is configured to reflect these values when it is built. When the warning is illuminated, the unit will still continue to function properly, but will prompt the operator to contact Bauer Compressors for making arrangements to replace the separator. When the Alarm level has been achieved, the compressor will no longer function, and will require the replacement of the separator. Once this is accomplished, the unit can be re-activated by making adjustments to the PLC. Please contact Bauer Product Support for detailed instructions

2.7.7 Seven Flashes - Condensate Fault

The compressor condensate level float switch is located in the condensate collection tank. Under normal operating conditions, the switch is open and the I4 lamp on the PLC is off. On a high condensate level the float switch will close, the compressor will shutdown, the PLC I4 lamp will illuminate, and the alarm code will flash. The operator should drain the condensate from the tank and resume operation of the equipment.

⚠ NOTE ⚠

The compressor condensate contains some oil, and accordingly, should be disposed of in accordance with state and local regulations.

2.7.8 Eight Flashes - High Inlet Pressure Fault

The high inlet and low inlet pressure switches are combined into a single unit. This switch is connected to the inlet pressure gauge tubing circuit. During normal operating conditions, the high inlet pressure switch is open and the I5 lamp on the PLC is off. If a high inlet pressure condition occurs and the switch closes, the compressor will shut down, the PLC I5 lamp will illuminate and the alarm code will flash. The operator should investigate and correct the supply gas condition before attempting to resume operation of the equipment

2.7.9 Nine Flashes - Low Inlet Pressure Fault

The high inlet and low inlet pressure switches are combined into a single unit. This switch is connected to the inlet pressure gauge tubing circuit. The low inlet pressure switch is wired normally closed. At unit start, a built-in timing function allows the inlet solenoid to open and inlet pressure to build. During normal operating conditions, the low inlet pressure switch is open and the I7 lamp on the PLC is off. If a low inlet pressure condition occurs and the switch closes, the compressor will shut down, the PLC I7 lamp will illuminate and the alarm code will flash. The operator should investigate and correct the supply gas condition before attempting to resume operation of the equipment.

2.7.10 On Steady - Motor Starter Overload Trip

The compressor overload relay is located in the electrical enclosure, directly beneath the motor starter. The relay is Normally Open and is not connected to the PLC, but is connected directly to the red Alarm Light. Under normal operating conditions, the switch is open. On an Overload Trip of the motor, the compressor will shutdown, and the Alarm Light will be illuminated steady (no flash sequence).

CHAPTER 3: BK15.3 II BOOSTER COMPRESSOR BLOCK

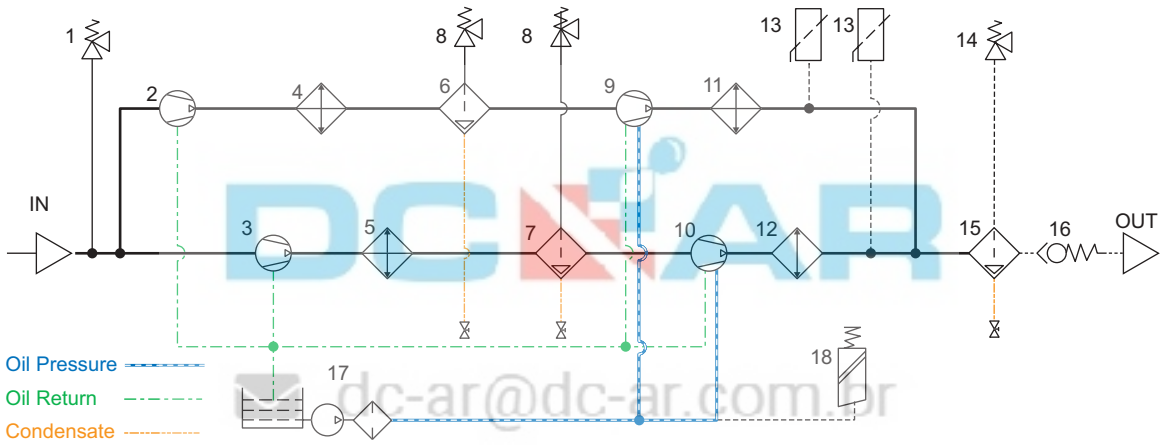
3.1 Description

The BK15.3 II compressor is used to compress air up to 5000 psi.

This compressor is a four cylinder, two stage air cooled, oil lubricated reciprocating compressor. The cylinders are arranged 90° apart, with the 1st and 2nd stage opposite each other. Each stage has two cylinders. The 2nd stage cylinders are lubricated by means of the forced feed lubrication system, while the other cylinders are splash lubricated. These compressor blocks are particularly suitable for continuous operation because of their rugged design and corrosion resistant intermediate filter and cooler assemblies.

3.1.1 Air Flow Diagram

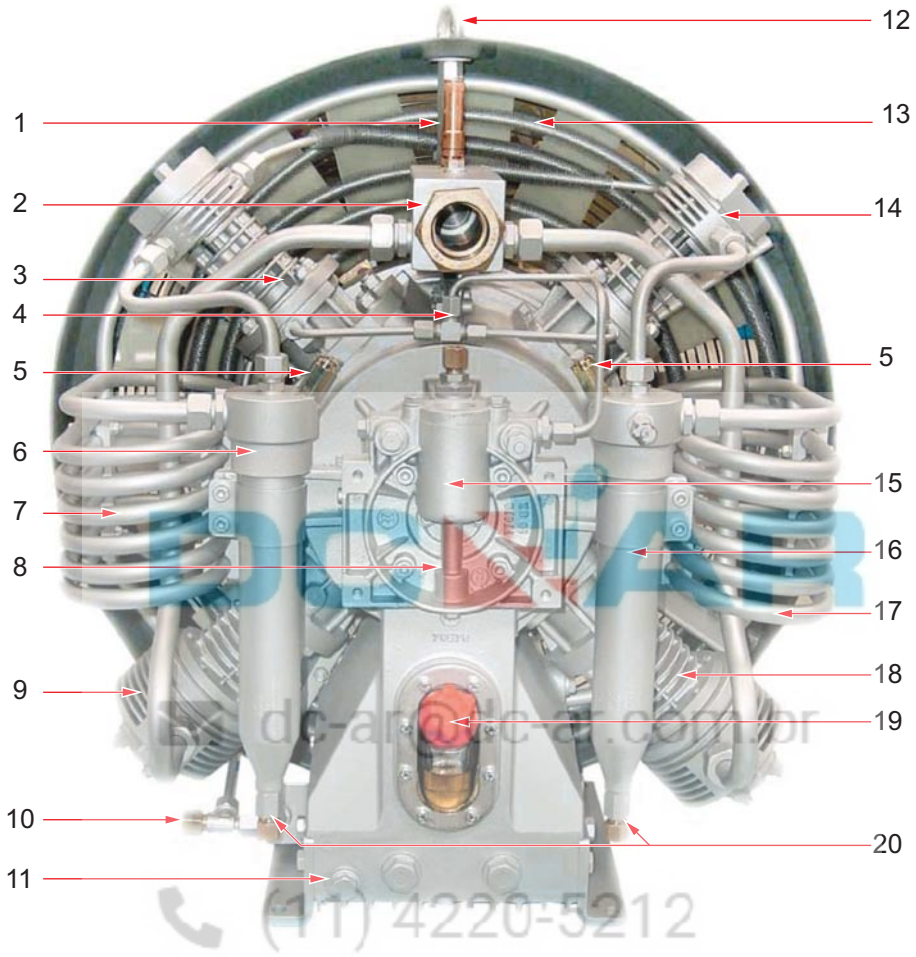
Figure 3-1 BK15.3 II Stage Compressor Air Flow



1. Inlet Safety Valve	10. 2nd Stage Cylinder 2
2. 1st Stage Cylinder 1	11. Intercooler, 2nd Stage Cylinder 1
3. 1st Stage Cylinder 2	12. Intercooler, 2nd Stage Cylinder 2
4. Intercooler, 1st Stage Cylinder 1	13. Temperature Sensors
5. Intercooler, 1st Stage Cylinder 2	14. Final Safety Valve
6. Separator, 1st Stage Cylinder 1	15. Final Separator
7. Separator, 1st Stage Cylinder 2	16. Non Return Valve
8. 1st Stage Safety Valves	17. Oil Pump Assembly
9. 2nd Stage Cylinder 1	18. Oil Pressure Switch

3.1.1.1 Component Location

Figure 3-2 Compressor Block (Front View)



1. Inlet Safety Valve	8. Oil Pump Housing	15. Oil Filter Housing
2. Intake Manifold	9. 1st Stage, Cylinder 1	16. 1st Stage Separator, Cylinder 2
3. 2nd Stage, Cylinder 1	10. Compressed Gas Outlet	17. Intercooler, 1st Stage, Cylinder 2
4. Oil Pressure Line to cylinders	11. Oil Drain Fitting	18. 1st Stage, Cylinder 2
5. 1st Stage Safety Valves	12. Lifting Eyebolt	19. Oil Filler with Sight Glass
6. 1st Stage Separator, Cylinder 1	13. Aftercooler	20. Condensate Outlets
7. Intercooler, 1st Stage, Cylinder 1	14. 2nd Stage, Cylinder 2	

3.1.2 Lubrication System

3.1.2.1 Description.

The compressor is provided with forced-feed lubrication. The oil pressure is produced by a low revving gear pump. The oil pressure is between 44 psi and 87 psi (3 to 6 bar).

⚠ CAUTION ⚠
This oil pump must be operated in the correct direction of rotation, otherwise no oil pressure will be built up and the compressor may be damaged.

(See Figure 3-3). The oil pump (1) is coupled to and driven by the crankshaft. It pumps oil from the crankcase through an oil filter (2) and the oil pressure regulating valve (3) to the 4th stage cylinder. The oil is then distributed by the guide piston of the 4th stage and lubricates all the moving parts of the compressor block. The oil pressure sensor (5) allows mounting for an optional oil pressure gauge or electronic pressure monitoring.

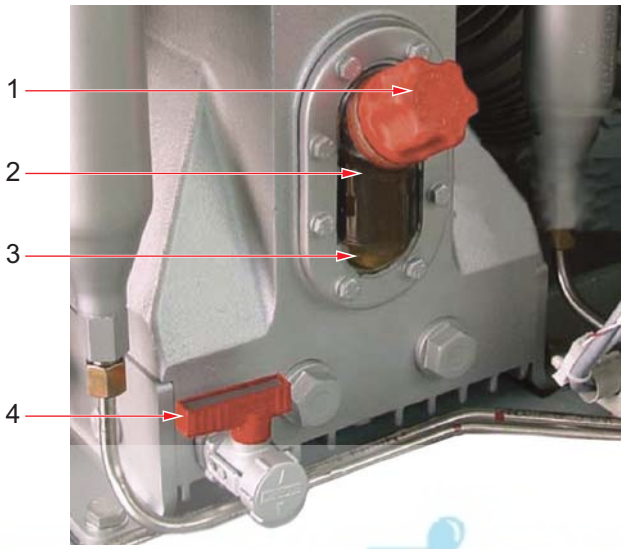
Figure 3-3 Lubrication Oil System (typical)

1. Oil Pump	4. Oil Pressure Regulating Valve
2. Oil Filter	5. Injection Line to Final Stage
3. Oil Pressure Sensor Mount	

3.1.2.2 Oil Level Check

(See Figure 3-4). Check the oil level at the oil filler sight gauge on the compressor block every day before putting the compressor into operation. Oil level must never be below the minimum mark molded into the sight gauge as this will cause severe damage due to lack of lubrication.Overfilling is prevented by the design of the filler neck; i.e. oil should be filled right to the edge of the opening.

Figure 3-4 Oil Filler Sight Gauge



3.1.2.3 Oil Change Interval

The synthetic oil should be changed every 2,000 operating hours or biennially, whichever is reached first.

3.1.2.4 Oil Capacity

The oil capacity is approximately 6.5 quarts (6.0 liters). The amount of oil between the minimum and maximum marks is approximately 1.7 quarts (1.6 liters).

3.1.2.5 Oil Change

1. Run the compressor until it is warm.
2. Remove cap from Oil Filler Sight Gauge.
3. (See Figure 3-2) Open the Oil Drain Plug.

⚠ CAUTION ⚠
Replace the oil filter at every oil change, otherwise when the filter becomes clogged a bypass valve opens and the oil circulates without being filtered.

4. (See Figure 3-5). Remove two bolts (1) with a 13mm wrench. Remove cover (2).
5. (See Figure 3-6). Remove the Oil Filter (1) from the rubber gasket at the cover.
6. Mount a new filter element and replace and fasten cover.
7. Fill new oil through filler neck to the Maximum mark on the Oil Fill Sight Gauge.
8. Pour oil in slowly, wait a few minutes until the level settles then replace cap in the Oil Fill Sight Gauge.
9. Return the unit to operation.

Figure 3-5 Removing the Oil Filter Cover

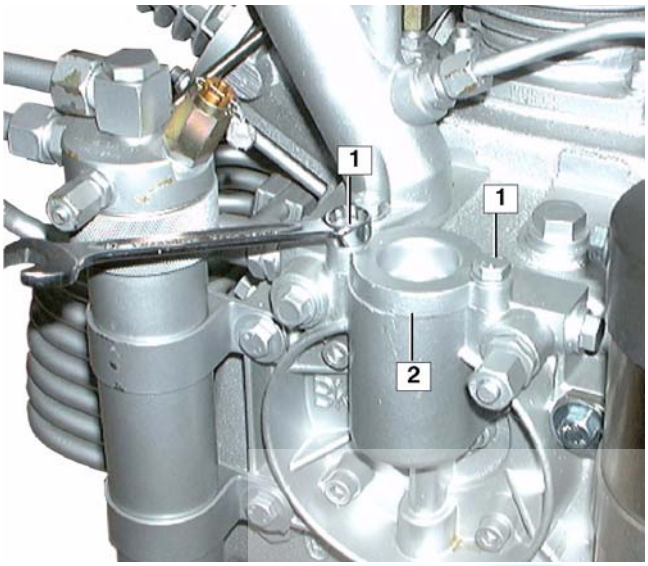
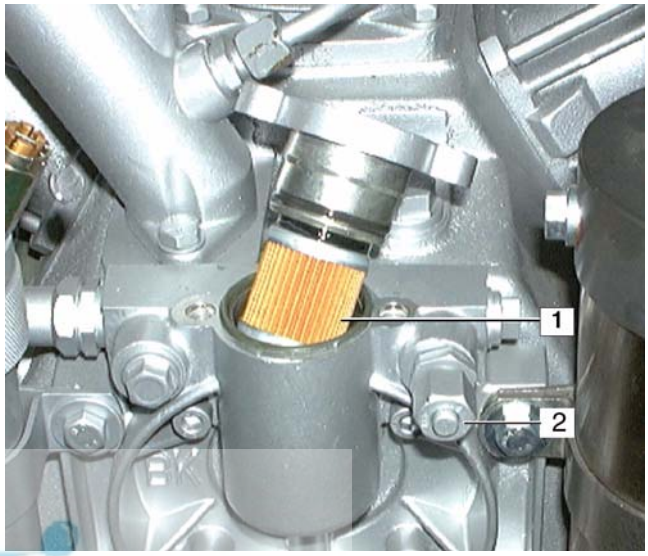


Figure 3-6 Replacing the Oil Filter



3.1.2.6 Venting the Oil Pump

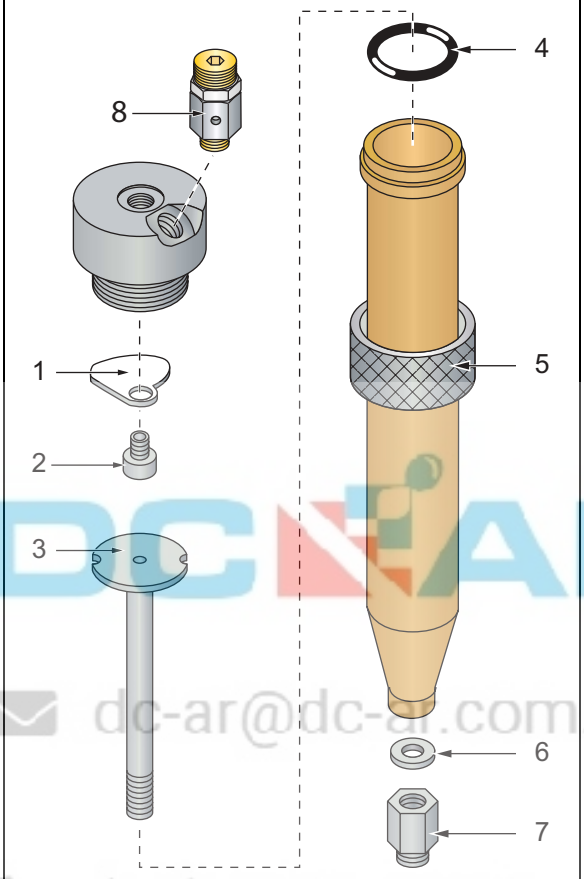
⚠ CAUTION ⚠
To avoid damage after maintenance the following measures should be strictly adhered to.

(See Figure 3-6). If after the start of the compressor no oil pressure builds up, venting the oil pump may be necessary, especially after maintenance and repair work. It may also be necessary if the unit has been operated in the wrong direction of rotation.

1. With the unit running, open the condensate drain valves.
2. Open Oil Pump Vent Plug (2) and wait until oil comes out bubble free.
3. Replace Oil Vent Plug.

3.1.3 Intermediate Separator

Figure 3-7 Intermediate Separator



1. Vortex Plate	5. Knurled Nut
2. Hollow Screw	6. Gasket
3. Center Insert	7. Fitting
4. O-ring	

3.1.3.1 Description

The intermediate separator is mounted on the compressor block. The separator is designed to remove oil and water which accumulates due to the cooling of the air after the compression process. Separation is achieved by means of centrifugal action, which is provided by a vortex plate.

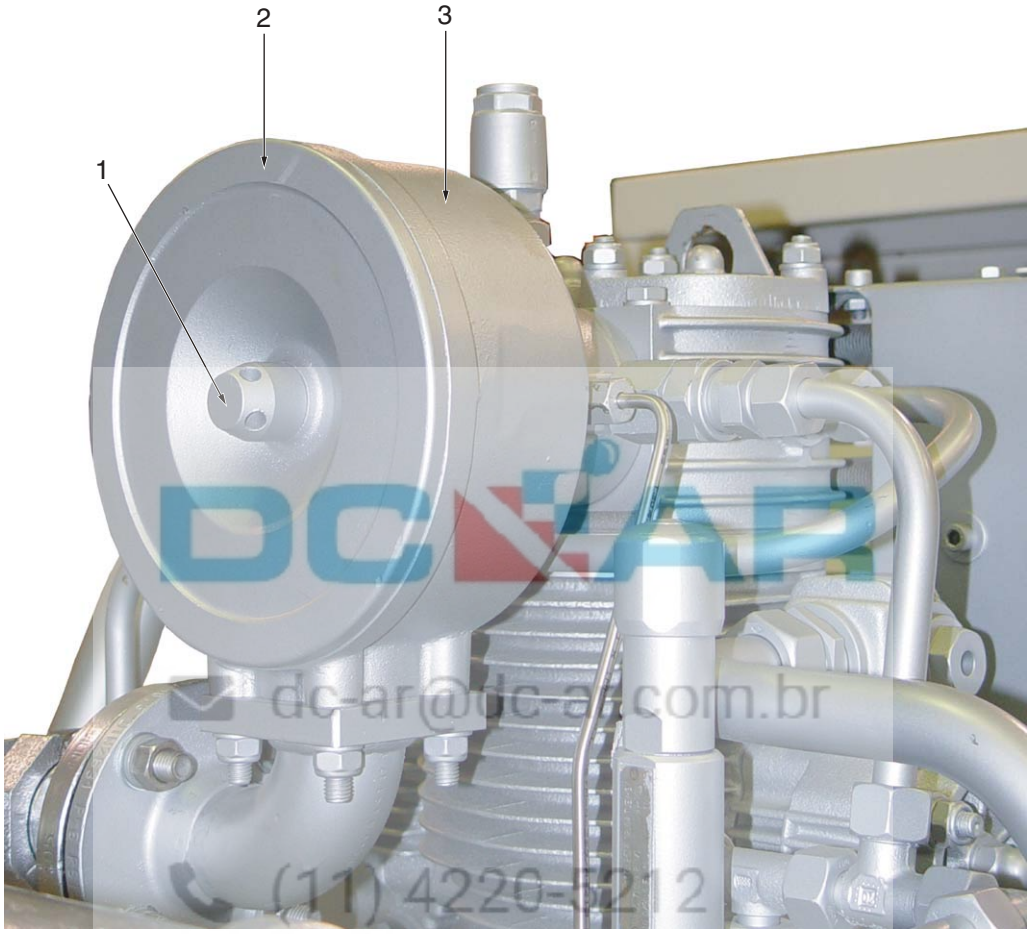
3.1.3.2 Maintenance

The intermediate separator requires no maintenance.

3.1.4 Gas Intake Filter

A dry micronic filter is used to filter intake gas, See Figure 3-8.

Figure 3-8 Intake Filter



1. Filter Housing	2. Cover	3. Nut

3.1.4.1 Intake Filter Maintenance
(See Figure 3-8)

The filter element should be replaced as follows.

4. Unscrew the nut (3) and remove the cover (2).
5. Remove filter element.
6. Clean the inside of the filter housing (1) with a damp cloth, take care to prevent dust from entering the intake manifold.
7. Replace the filter element.
8. Mount the cover.
9. Tighten the nut.

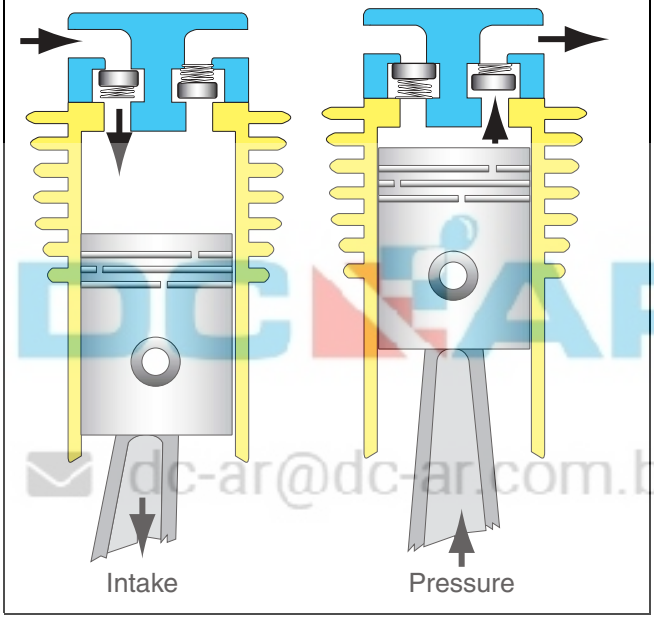
3.1.5 Compressor Valves and Valve Heads

3.1.5.1 Functional Description

The valve heads of the individual stages form the upper part of the cylinders. The inlet and pressure valves are fitted inside the valve heads.

When the piston moves downwards, the resultant vacuum in the piston cylinder opens the inlet valve. When the piston moves upwards, the inlet valve is closed and the pressure valve opened by the pressure created in the compression process. See Figure 3-9.

Figure 3-9 Valve Function



3.1.5.2 Initial Operational Check of the Valves

After roughly half an hour of operation, the valves should be checked. The outlet piping should be hot if the valves are operating properly. Note that the inlet line to the valve heads should be warm to the touch.

⚠ WARNING ⚠
Do not touch the outlet piping with bare hands, use a thermometer.

3.1.5.3 General Instructions for Changing the Valves

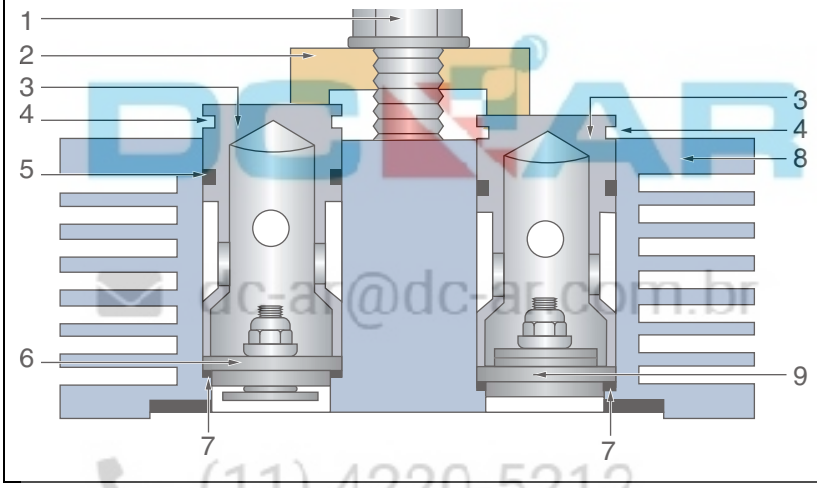
Please observe the following instructions for valve maintenance:

1. Always replace valves as a complete set.
2. Carefully clean dirty valves. Never use a sharp tool for this purpose. Soak the valves in Varsol and clean with a soft brush.
3. Check the individual components for excessive wear. If the valve seat or valve discs are dented, replace the valves.
4. Check the valve space in the valve heads for dirt, and clean if necessary.

5. Use only satisfactory gaskets and O-rings during reassembly.
6. Observe the correct sequence when reassembling.
7. After finishing all maintenance work on the valves, turn the compressor manually using the fly-wheel and check whether all items have been correctly installed.
8. 30 minutes after restarting the compressor, stop the unit, let it cool down to ambient temperature, and retighten valve studs and cap nuts. Otherwise the gasket set may cause a leak.
9. Remove and check the valves every 1000 operating hours.
10. Replace the valves every 2000 operating hours to avoid fatigue failure.
11. Use an assembly tool (BAUER P/N: 011365) for all work on valve heads (See Figure 3-12).

3.1.5.4 Changing the 1st Stage Valves.
See Figure 3-10

Figure 3-10 1st Stage Valve and Head



3.1.5.4.1 Removal Procedure

1. Unscrew and remove Hex Nut (1).
2. Remove Cap Holder (2).
3. Insert two screwdrivers into the Extraction Grooves (4) of the Valve Caps (3) and lift out the Valve Caps with O-Rings (5).
4. Check and replace O-Rings if required.
5. Take out Valves (6 & 9).
6. Check the Valve Gaskets (7) and replace if required.

3.1.5.4.2 Installation Procedure

1. Fit valves (6 & 9) with gaskets (7) and replace.
2. Fit Valve Caps (3) with O-Rings (5) and replace.

3. Replace Cap Holder (2) in the proper position.

⚠ CAUTION ⚠

The valve cap for the inlet valve protrudes 0.98 in (2.5 mm) out of the valve head more than the valve cap for the discharge valve. The cap holder is designed accordingly.

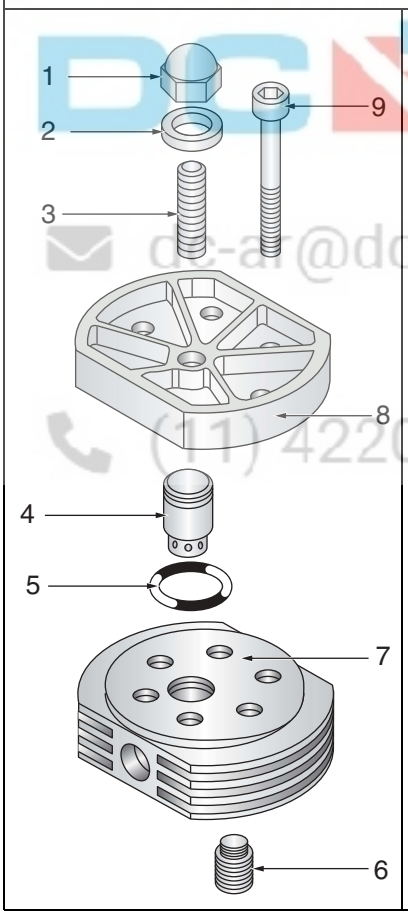
4. Screw on Hex Nut (1) and tighten with a torque wrench to the torque value listed in the Appendix.

3.1.5.5 Changing the 2nd Stage Valves
See Figure 3-11

⚠ CAUTION ⚠

Always change the intake and discharge valves of the 2nd stage at the same time.

Figure 3-11 2nd Stage Valve and Head



1. Acorn Nut
2. Gasket
3. Stud
4. O-ring
5. Discharge Valve
6. Inlet Valve
7. Valve Head
8. Valve Cover

3.1.5.5.1 Inlet Valve Removal.

1. If the assembly tool shown in Figure 3-12 is unavailable, place two 8mm diameter metal pins of any length in the holes of the Valve Head (7) and secure them in a vise with the Inlet Valve (6) facing up.
2. Unscrew the Inlet Valve (6) from the Valve Head (7) using the special tool (Bauer p/n 4555-645) supplied with your unit. See Figure 3-13.

> ⚠ CAUTION ⚠
>
> Avoid damaging the special tool or the valve when using the tool, ensure that it is pushed firmly and properly into the sockets in the valve so that it will not tilt when it is turned.

Figure 3-12 Assembly Tool

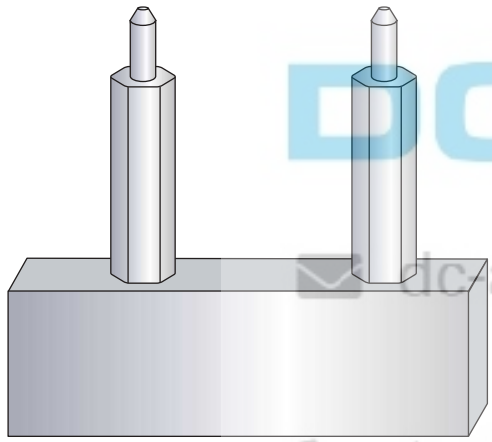
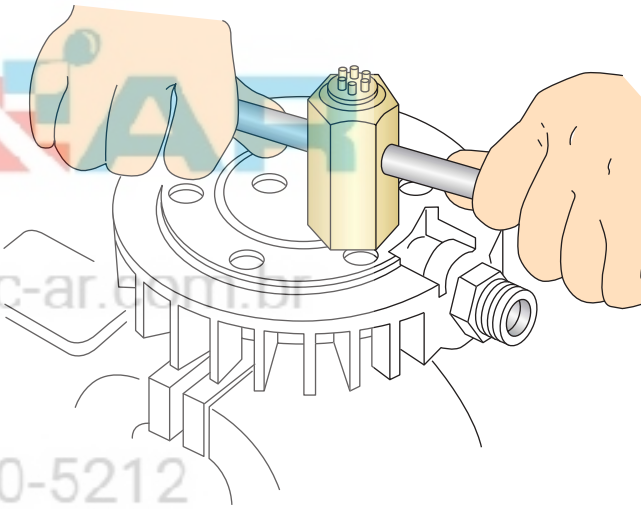


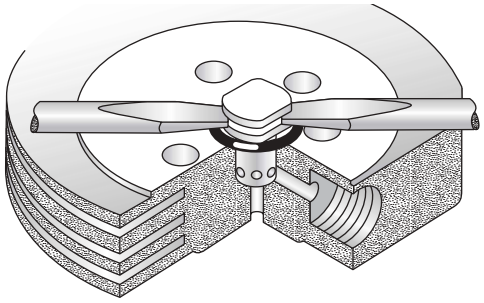
Figure 3-13 Using Special Tool



3.1.5.6 Inlet Valve Installation

1. Check condition of O-ring (4) and replace if necessary.
2. Put on Valve Cover (8).
3. Screw in Socket Head Screws (9) and tighten with a torque wrench to the value listed in the Appendix
4. Tighten Stud (3) and replace Gasket (2).
5. Tighten Acorn Nut (1) with a torque wrench to the value listed in the Appendix.

Figure 3-14 Valve Removal



3.1.5.6.1 Discharge Valve Removal Procedure

1. Remove piping connected to the Valve Head.
2. Remove Acorn Nut (1) and unscrew Stud (3) three or four turns.
3. Remove the Socket Head Screws (9) and remove the Valve Cover (8).
4. Insert two screwdrivers into the Extraction Grooves of the Valve (6) and lift out Valve.

3.1.5.6.2 Discharge Valve Installation Procedure

1. Insert Discharge Valve (6) into Valve Head (7).
2. Put on Valve Cover (8).
3. Screw in Socket Head Screws (9) and tighten with a torque wrench to the value listed in the Appendix
4. Tighten Stud (3) and replace Gasket (2).
5. Tighten Acorn Nut (1) with a torque wrench to the value listed in the Appendix.

3.1.6 Repair and Troubleshooting

3.1.6.1 Repair

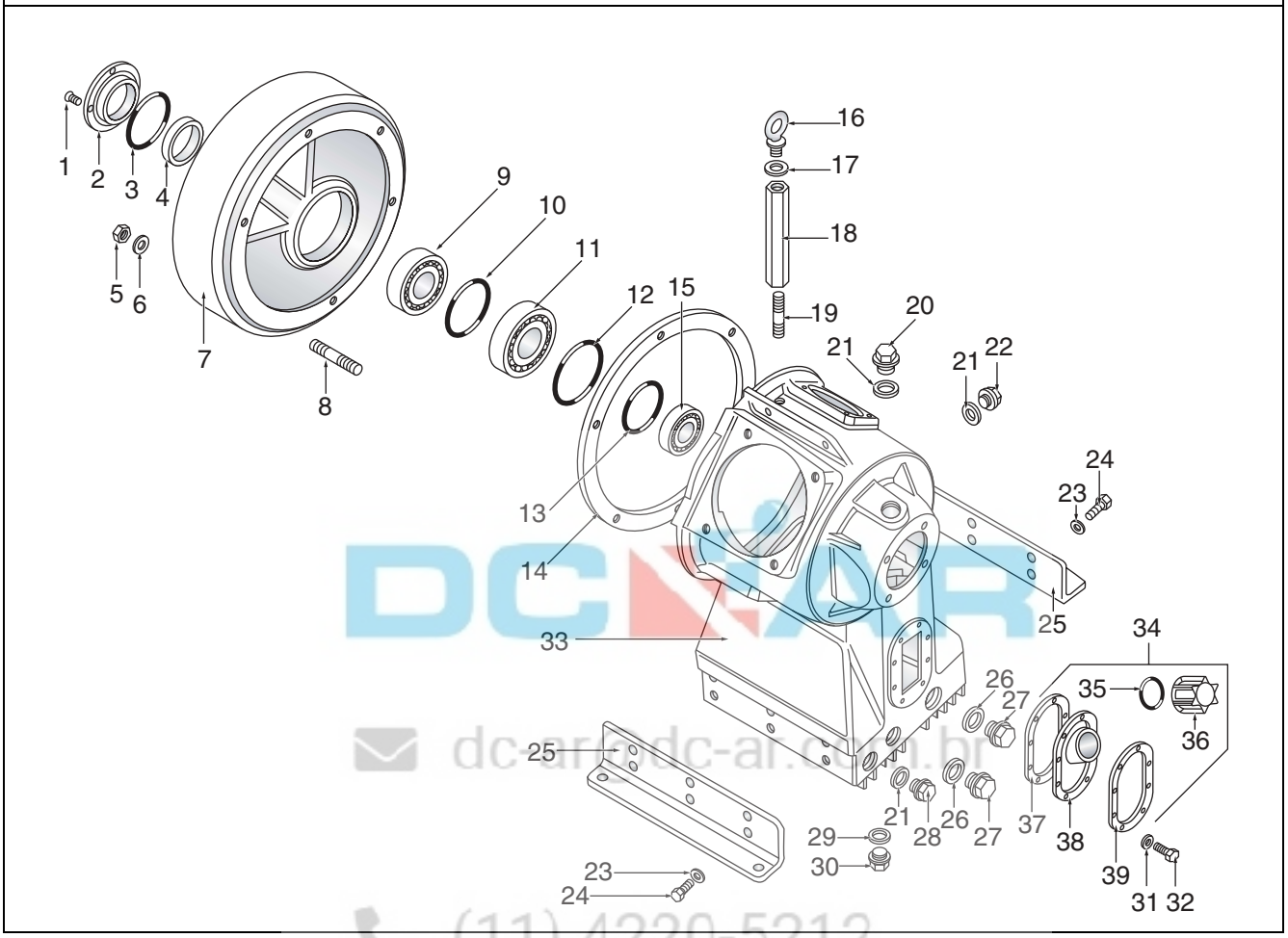
Repair work can be carried out on the compressor block to a certain extent but a certain level of experience and skill is necessary. It should be noted however that no repair should be carried out on the crankshaft nor on the bearings and safety valves are not repaired but always replaced.

3.1.6.2 Troubleshooting

Trouble	Cause	Remedy
No oil pressure	1. Low oil level 2. Air trapped in oil pump.	1. Check oil level 2. Vent Oil Pump
Oil foam in crankcase	1. Last stage piston worn 2. Last stage pressure valve defective	1. Operate compressor with final stage valve head removed. If oil flows continuously out of cylinder, replace piston and sleeve. 2. Replace last stage valves.
Compressor output insufficient	1. Condensate drain valve(s) or fittings leaking. 2. Premature opening of final safety valve. 3. Piston rings worn 4. Excessive piston clearance 5. Pipes leaking	1. Tighten and reseal. 2. Clean and adjust final safety valve. 3. Replace 4. Replace 5. Tighten
Safety valves between stages releasing pressure	1. Intermediate pressure too high 2. Valves not closing properly	1. Service and clean valves. 2. Service and clean valves.
Compressor running too hot.	1. Insufficient supply of cooling air 2. Intake or outlet valve not closing properly 3. Wrong direction of rotation.	1. Check location for adequate ventilation 2. Check and clean valves, replace as necessary 3. Check arrow on compressor and correct accordingly.
Oil residue in delivered air	1. Improper maintenance of filters, purifier cartridge saturated. 2. Wrong oil type	1. Service filters, change purifier cartridge. 2. Change to proper oil and clean valves.
Compressor rotates in the wrong direction	Electrical phases not connected properly	Reverse two of the three phase leads at the switch box. Do NOT change the leads at the motor terminal.

3.1.7 Replacement Parts List

Figure 3-15 Crankcase Assembly

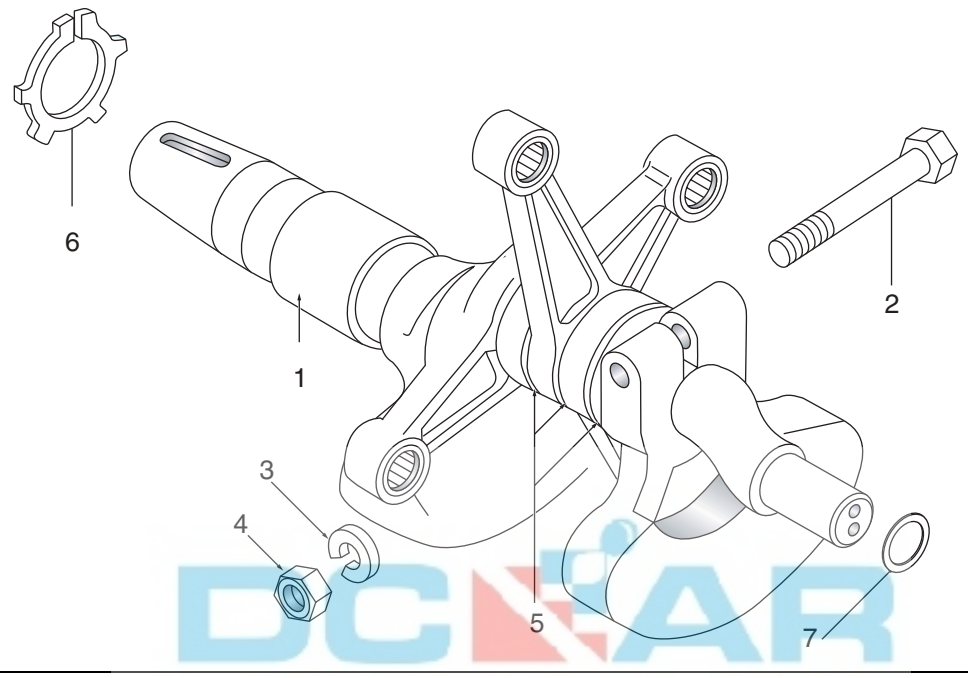


Item	Qty	Part No.	Description	Notes
◊	1	78577	Crankcase Assembly	
1	1	N20649	Screw	
2	1	68586	Cover Plate	
3	1	N15093	O-ring	
4	1	26281	Shaft Seal	
5	1	N370	Self Locking Hex Nut	
6	6	N58	Washer	
7	6	78897	Bearing Cover	
8	6	N3138	Stud	
9	1	N18303	Roller Bearing	
10	1	N3810	Circlip	
11	1	N18304	Roller Bearing	
12	1	N18432	Circlip	

Figure 3-15 (cont.) Crankcase Assembly

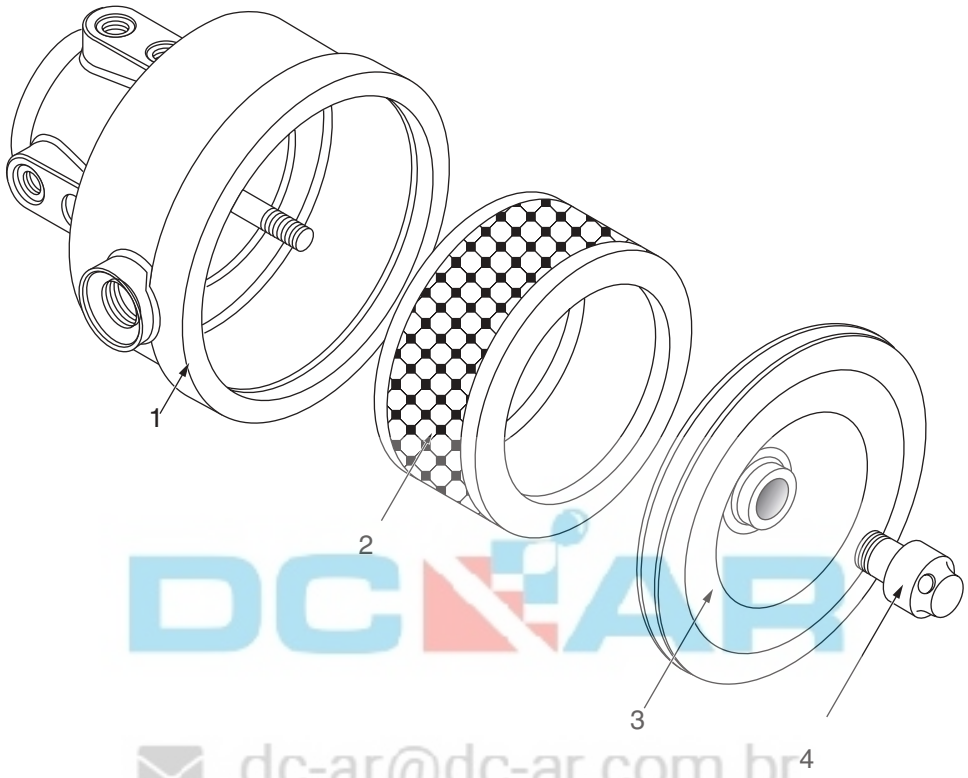
Item	Qty	Part No.	Description	Notes
13	1	N2635	Circlip	
14	1	3177	Gasket	
15	1	N2638	Roller Bearing	
16	1	N4467	Eye Bolt	
17	1	1492	Washer	
18	1	79225	Hexagonal Spacer	
19	1	N4150	Stud	
20	1	80197	Reducer	
21	2	N293	Gasket	
22	1	N314	Plug	
23	12	N16	Washer	
24	12	N312	Hex Head Screw	
25	2	78571	Bracket	
26	2	N4163	Gasket	
27	2	N2796	Plug	
28	1	N2447	Plug	
29	1	N1316	Gasket	
30	1	N4570	Plug	
31	8	N102	Washer	
32	8	N19496	Hex Screw	
33	1	78578	Crankcase	
34	1	78810	Oil Sight Gauge Assembly	Items 35 - 39
35	1	N15412	O-ring	
36	1	61054	Plug	
37	1	78808	Gasket	
38	1	78569	Oil Fill	
39	1	78570	Steel Plate	

Figure 3-16 Complete Crankshaft Assembly



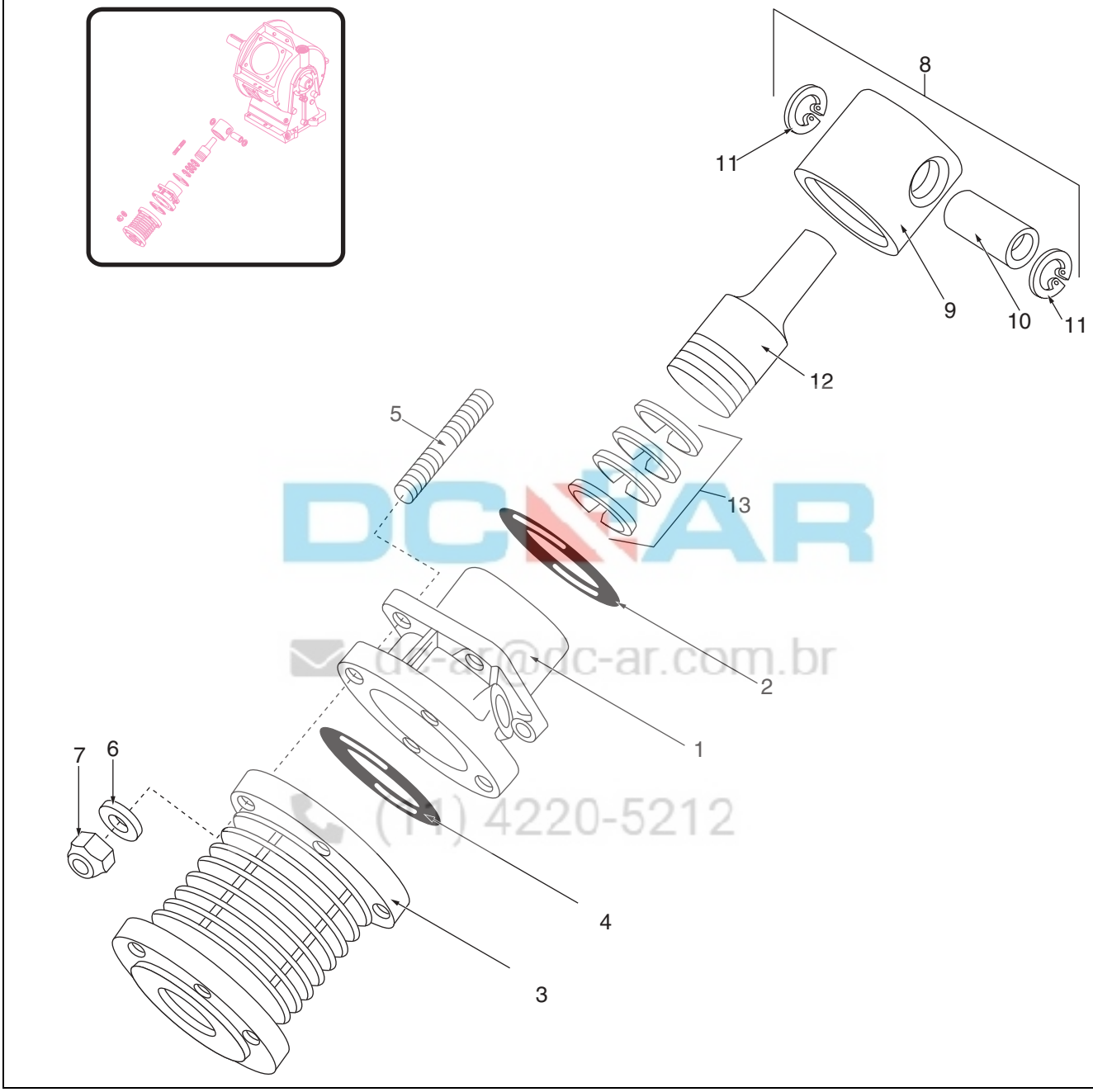
Item	Qty	Part No.	Description	Notes
◊	1	78934	Crankshaft Assembly	
1	1	68587	Bushing	
2	1	N4366	Dowel Screw	
3	1	N108	Spring Washer	
4	1	N57	Hex Nut	
5	3	4220	Spacers	
6	1	N18310	Circlip	
7	1	N423	Circlip	

Figure 3-17 Intake Filter



Item	Qty	Part No.	Description	Notes
◊	1	FLR-0008	Gas Intake Filter Assembly	
1	1	—	Filter Housing	Available only with FLR-0008
2	1	ELM-0040	Filter Element	
3	1	—	Filter Cover	Available only with FLR-0008
4	1	—	Nut	Available only with FLR-0008

Figure 3-18 1st Stage Pistons and Cylinders

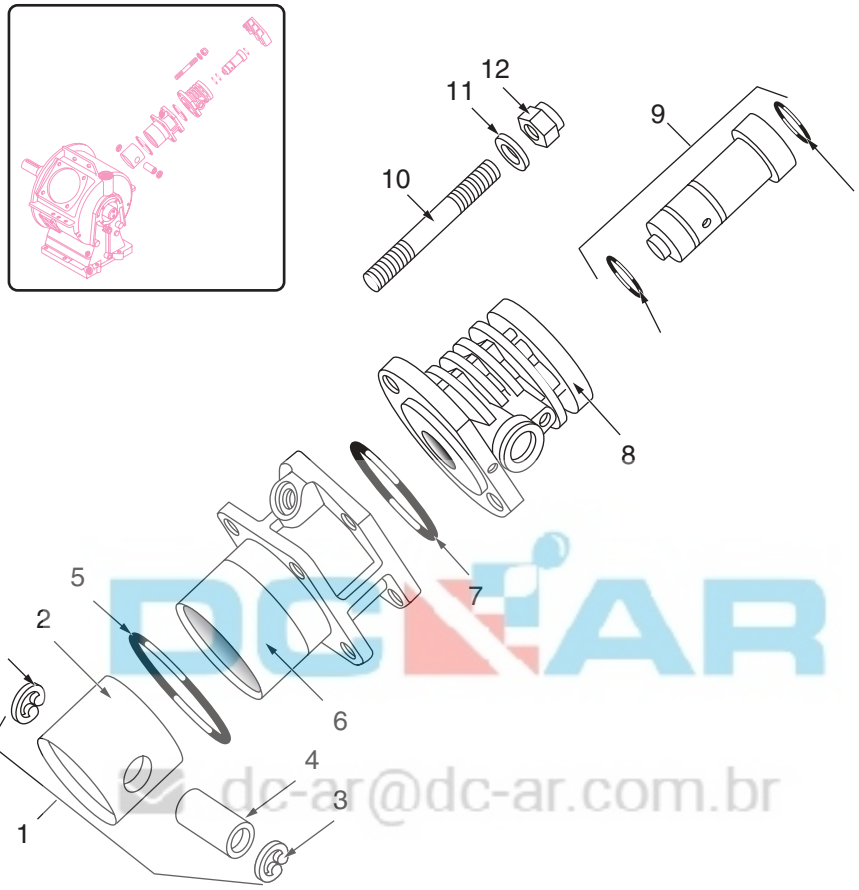


Item	Qty	Part No.	Description	Notes
◊	1	79816	1st Stage Piston and Cylinder Assembly	
1	1	67057	Guide Cylinder	
2	1	N3731	O-ring	
3	1	79641	Cylinder	
4	1	N7063	O-ring	

Figure 3-18 (cont.) 1st Stage Pistons and Cylinders

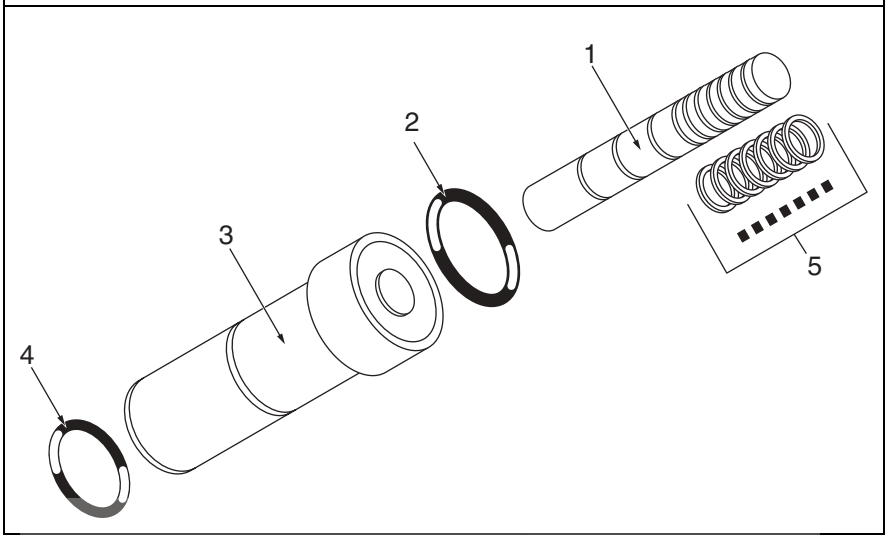
Item	Qty	Part No.	Description	Notes
5	4	N17462	Stud	
6	4	N58	Washer	
7	4	N370	Self Locking Hex Nut	
8	1	070012	Guide Piston Assembly	Items 9 thru 11
9	1	80358	Piston	
10	1	N15409	Piston Pin	
11	2	N1665	Circlip	
12	1	070012	Floating Piston	
13	1	N26380	Piston Ring Set	

Figure 3-19 2nd Stage Cylinders and Pistons



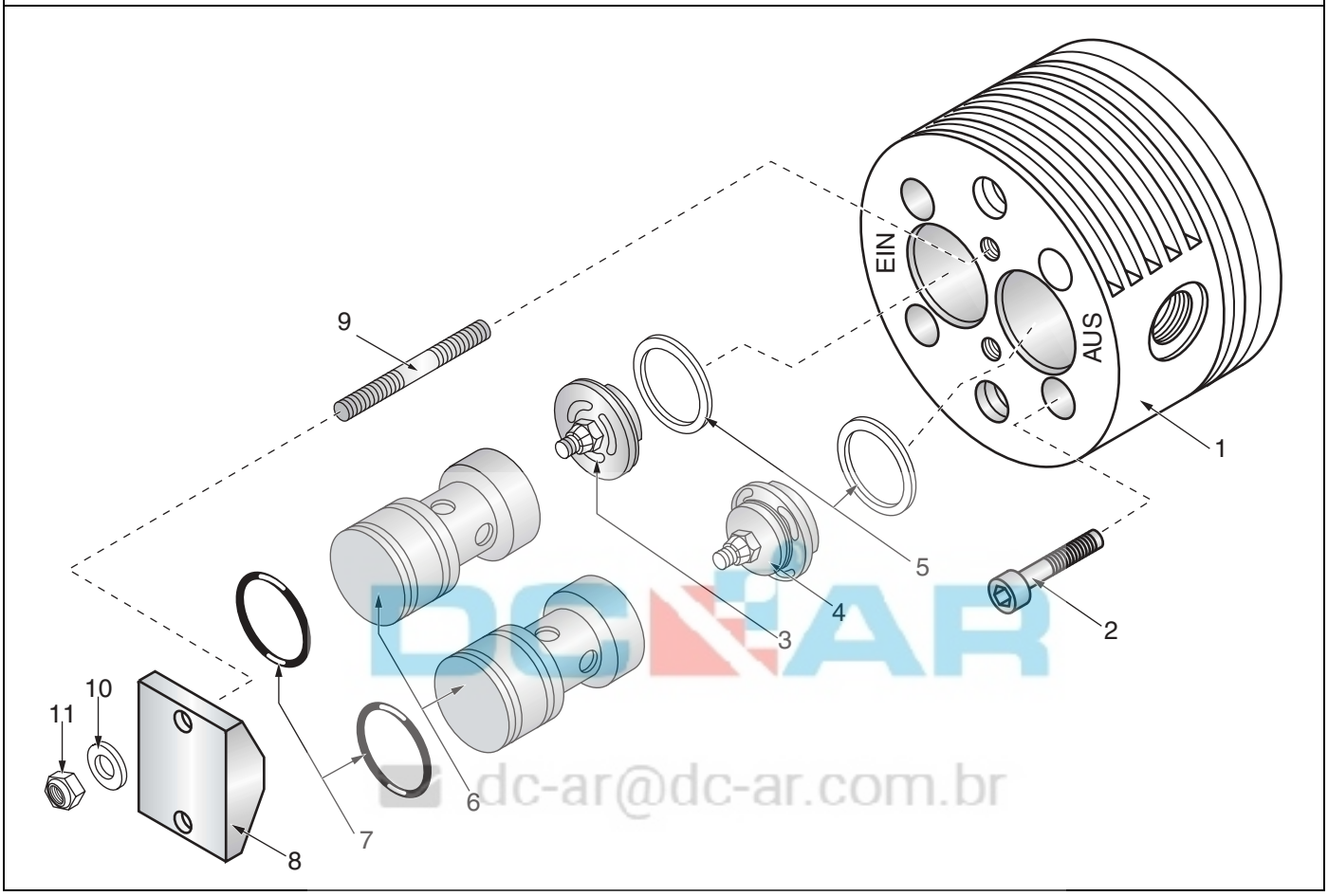
Item	Qty	Part No.	Description	Notes
◊	1	79180	2nd Stage Piston and Cylinder Assembly	
1	1	070012	Piston Assembly	Items 2 thru 4
2	1	60087	Guide Piston	
3	2	N1665	Circlip	
4	1	N15409	Piston Pin	
5	1	N3731	O-ring	
6	1	79832	Guide Cylinder	
7	1	N7063	O-ring	
8	1	76754	Cylinder	
9	1	078043	Piston and Sleeve Assembly	See Figure 3-20
10	4	N17462	Stud	
11	4	N58	Washer	
12	4	N370	Self Locking Hex Nut	

Figure 3-20 2nd Stage Piston and Sleeve Assembly



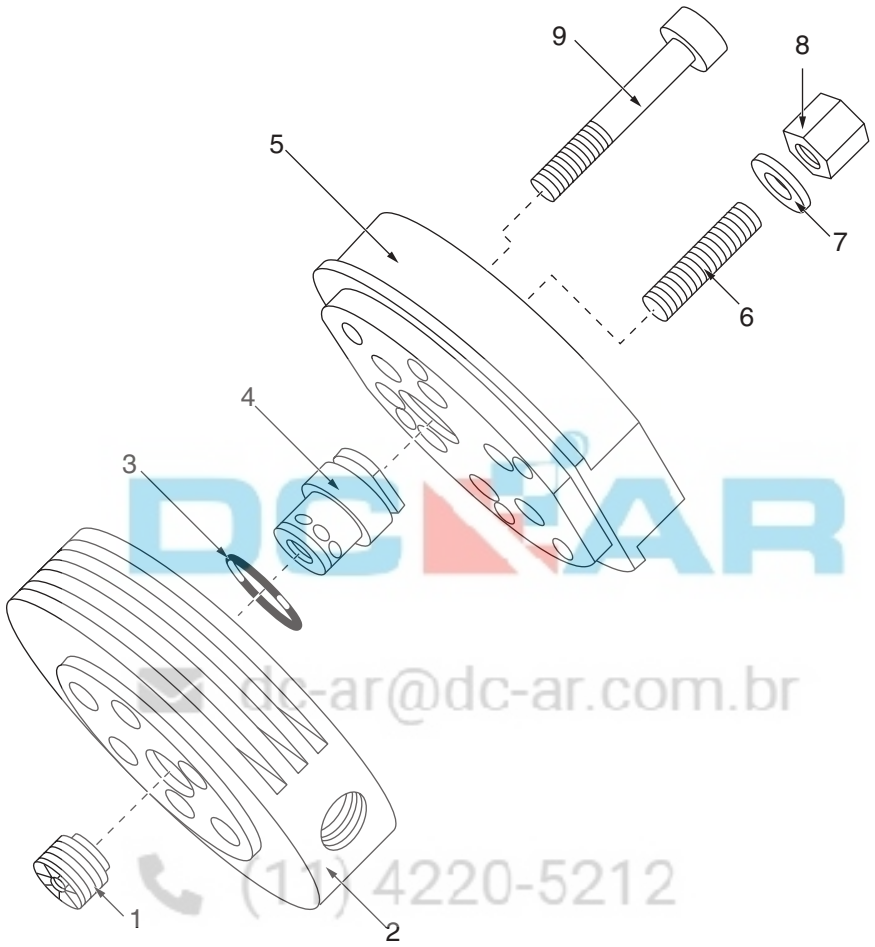
Item	Qty	Part No.	Description	Notes
◊	1	078043	Piston and Sleeve Assembly	
1	†	…	Piston	Available only as part of 078043
2	1	N23755	O-ring	
3	†	…	Piston Liner	Available only as part of 078043
4	1	N2320	O-ring	
5	†	…	Piston Ring Set	Available only as part of 078043

Figure 3-21 1st Stage Valve Head



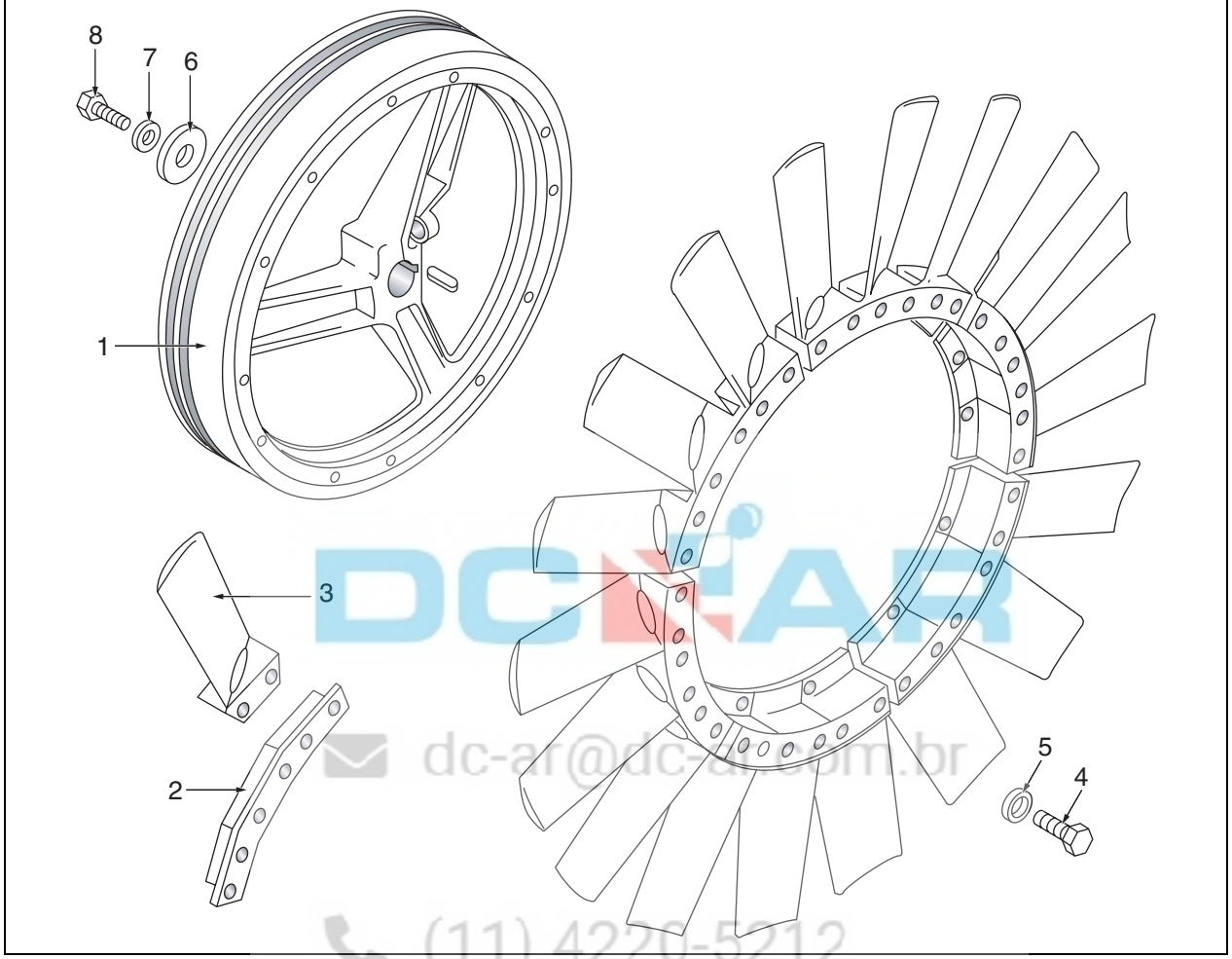
Item	Qty	Part No.	Description	Notes
◊	1	068602	1st Stage Valve Head Assembly	
1	1	60583	Valve Head	
2	6	N503	Allen Screw	
3	1	N15273	Intake Valve	
4	1	N15274	Pressure Valve	
5	2	56668	Gasket	
6	2	56183	Valve Cap	
7	2	N3997	O-ring	
8	1	62924	Pressure Pad	
9	2	N4190	Stud	
10	2	N16	Washer	
11	2	N3474	Self Locking Hex Nut	

Figure 3-22 2nd Stage Valve Head



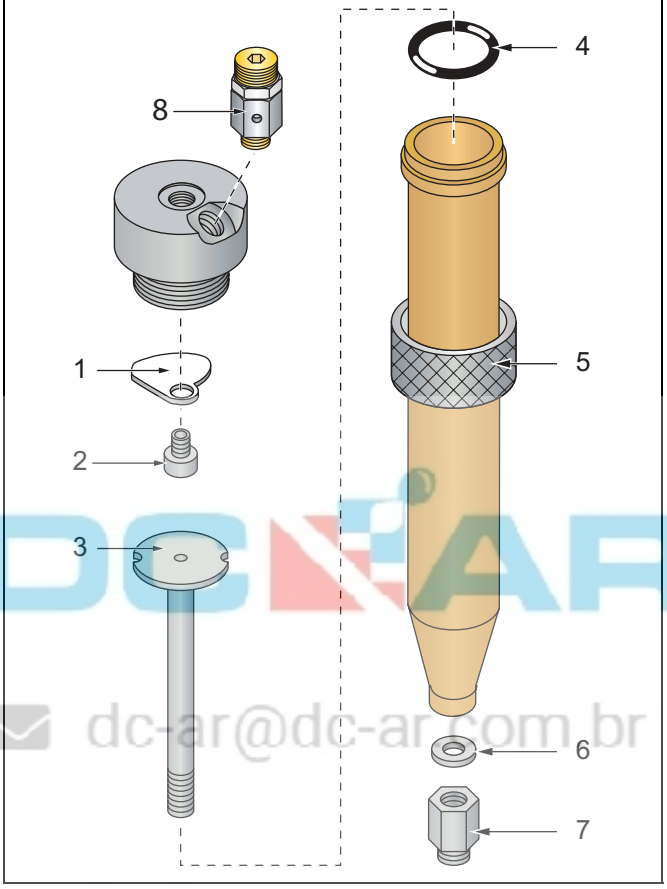
Item	Qty	Part No.	Description	Notes
◊	1	068607	2nd Stage Valve Head Assembly	Items 1-9
◊	1	073629	Valve Head Assembly	Items 1-8
1	1	07790	Intake Valve	
2	1	65191	Valve Head	
3	1	N2789	O-ring	
4	1	014121	Pressure Valve	
5	1	14118	Valve Head Cover	
6	1	71065	Stud	
7	1	N3625	Gasket	
8	1	N3623	Nut	
9	6	N1282	Allen Screw	

Figure 3-23 Flywheel Drive Assembly



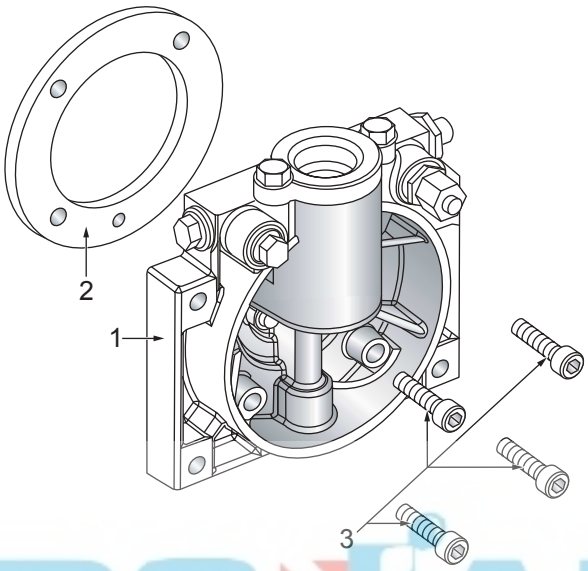
Item	Qty	Part No.	Description	Notes
◊	1	79240	Flywheel Drive Assembly	
1	1	68623	V-belt Pulley	
2	6	55425	Fan Blade Support	
3	18	79239	Blade, Fan CCW	
4	12	N19495	Hex Head Screw	M6x16
5	12	WAS-0029	Washer, Split Lock	6mm
6	1	68646	Washer	
7	1	WAS-0002	Washer, Split Lock	
8	1	N15667	Hex Head Cap Screw	M12x45

Figure 3-24 Interfilter Assembly



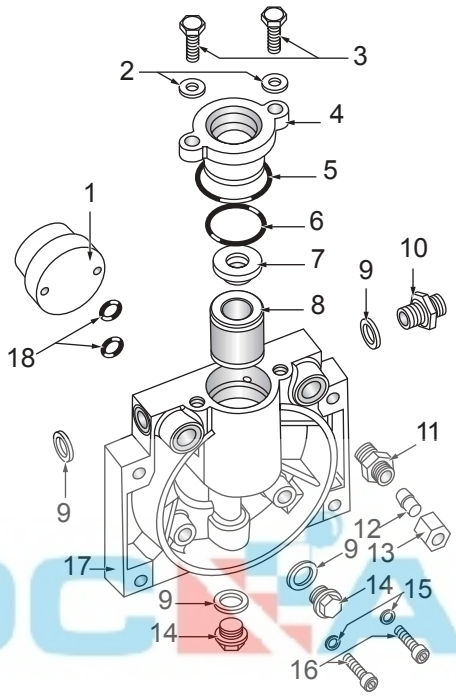
Item	Qty	Part No.	Description	Notes
◊	1	081798	Intermediate Separator Assembly	
1	1	81148	Plate	
2	1	81643	Hollow Screw	
3	1	76613	Insert Assembly	
4	1	N3556	O-ring	
5	1	13937	Knurled Nut	
6	1	N1316	Gasket	
7	1	N20215	Fitting	

Figure 3-25 Lubricating System Assembly



Item	Qty	Part No.	Description	Notes
◊	1	078940	Lubricating System Assembly	
1	1	080345	Lubricating System	See next Figure
2	1	78421	Gasket	
3	4	N503	Socket Head Screw	

Figure 3-26 Lubricating System



Item	Qty	Part No.	Description	Notes
◊	1	080345	Lubricating System	
1	1	N24585	Gear Pump	
2	2	N58	Washer	
3	2	N19506	Hex Head Screw	
4	1	77885	Oil Filter Cover	
5	1	N25327	O-ring	
6	1	N3489	O-ring	
7	1	77774	Rubber Gasket	
8	1	N25326	Filter Element	
9	4	N1316	Gasket	
10	1	81050	Regulating Valve	
11	1	N20065	Straight Male Connector	
12	1	N16309	Plug	
13	1	N1049	Screw Cap	
14	3	N52	Plug	
15	2	N2889	Gasket	
16	2	N25328	Socket Head Screw	
17	1	177878	Oil Pump Case	
18	2	N3489	O-ring	

3.2 Automatic Condensate Drain System

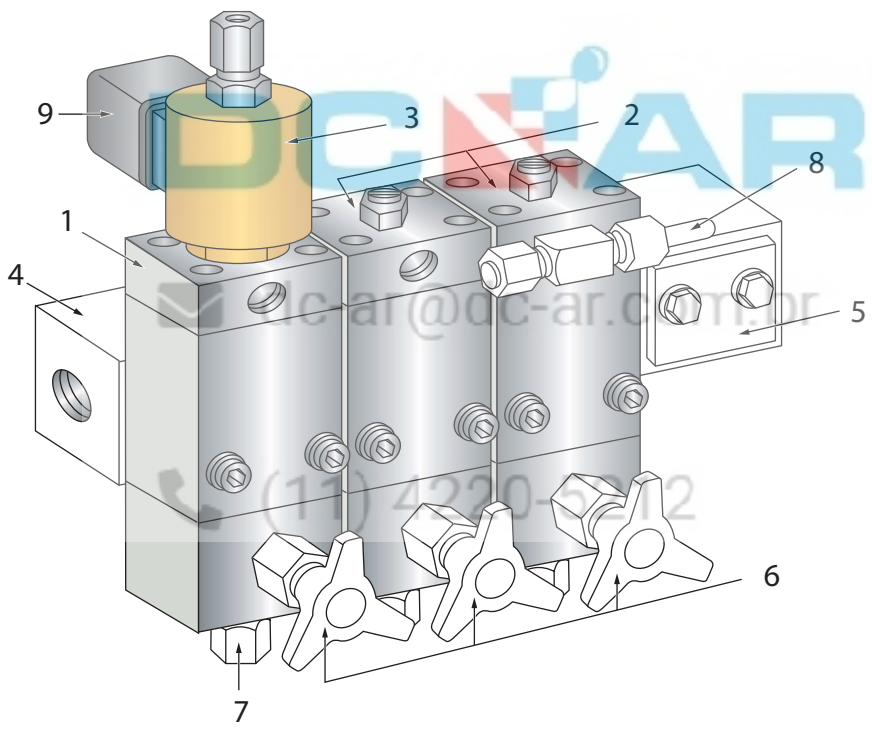
3.2.1 Description

The automatic condensate drain system operates electropneumatically and is comprised of the following:

A condensate manifold
Two pneumatically operated condensate drain valves
An electrically controlled solenoid valve
A condensate separator/silencer
A condensate collector bottle
Electronically controlled by the PLC

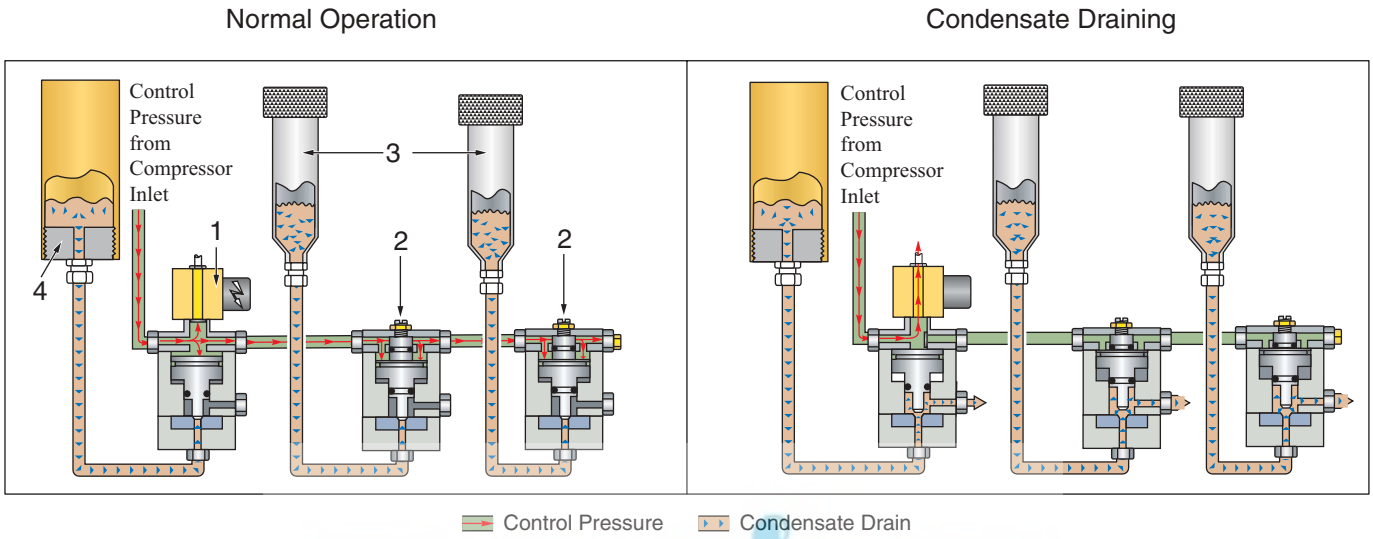
The automatic condensate drain system drains the intermediate separators and the oil and water separator every 15 minutes during operation. Additionally the automatic condensate drain system unloads the compressor during the starting phase and drains these separators at shutdown of the compressor unit.

Figure 3-27 Automatic Condensate Drain System



1. Final Separator Condensate Drain Valve	6. Manual Condensate Drain Valves
2. 1st Stage Separator Drain Valves	7. Separator Condensate Connections
3. Electrical Solenoid Valve	8. Control Pressure Connection
4. Condensate Drain Manifold	9. DIN Electrical Connector
5. Blank Off Plate	

Figure 3-28 ACD Operation



1. Electrical Solenoid Valve
2. Condensate Drain Valves
3. Intermediate Separators
4. Final Separator

3.2.1.1 Compressor Operating

The normally open Solenoid Valve (1) controls the condensate draining of the 1st stage Intermediate Separators (3). The control pressure for the ACD System comes from the inlet to the BK15.3II compressor.

As the compressor is started, the Solenoid Valve (1) is electrically energized and closes. This results in control pressure closing both Condensate Drain Valves (2).

3.2.1.2 Condensate Draining

Every 15 minutes the PLC timer deenergizes the Solenoid Valve (1) for approximately 6 seconds. The Solenoid Valve (1) opens and drains the condensation from the Final Separator (4).

As the pressure of the control air drops, the pistons of the 2nd stage Condensate Drain Valves (2) become unloaded and the pistons of the Condensate Drain Valves are fully raised and the condensate is drained from the Intermediate Separators (3).

3.2.1.3 Start Unloading

The unloading of the compressor during the starting phase is possible because of the lack of control air immediately after starting the unit. As the unit is switched on the solenoid valve (1) is energized and closes. After the compressor has attained nominal speed, pressure builds in the intermediate separators (2 and 3) and the control air closes the condensate drain valves (4 and 5). Once these valves close, the compressor delivers to the consuming device.

3.2.1.4 Standstill Drainage

After the Selector Switch is turned to OFF and the compressor stops running, the Solenoid Valve (1) is deenergized and opens. This drains the condensate and relieves the pressure in the 1st stage Intermediate Separators (2).

3.2.1.5 Condensate Drain Piping

The outlet of the Condensate Drain Manifold is directed into a Condensate Collector.

3.2.1.6 Condensate Collection

The condensate drainage is a mixture of oil, water and air. The Condensate Collection Tank is where the oil and water mixture is stored until it can be disposed of properly.

3.2.2 ACD Maintenance

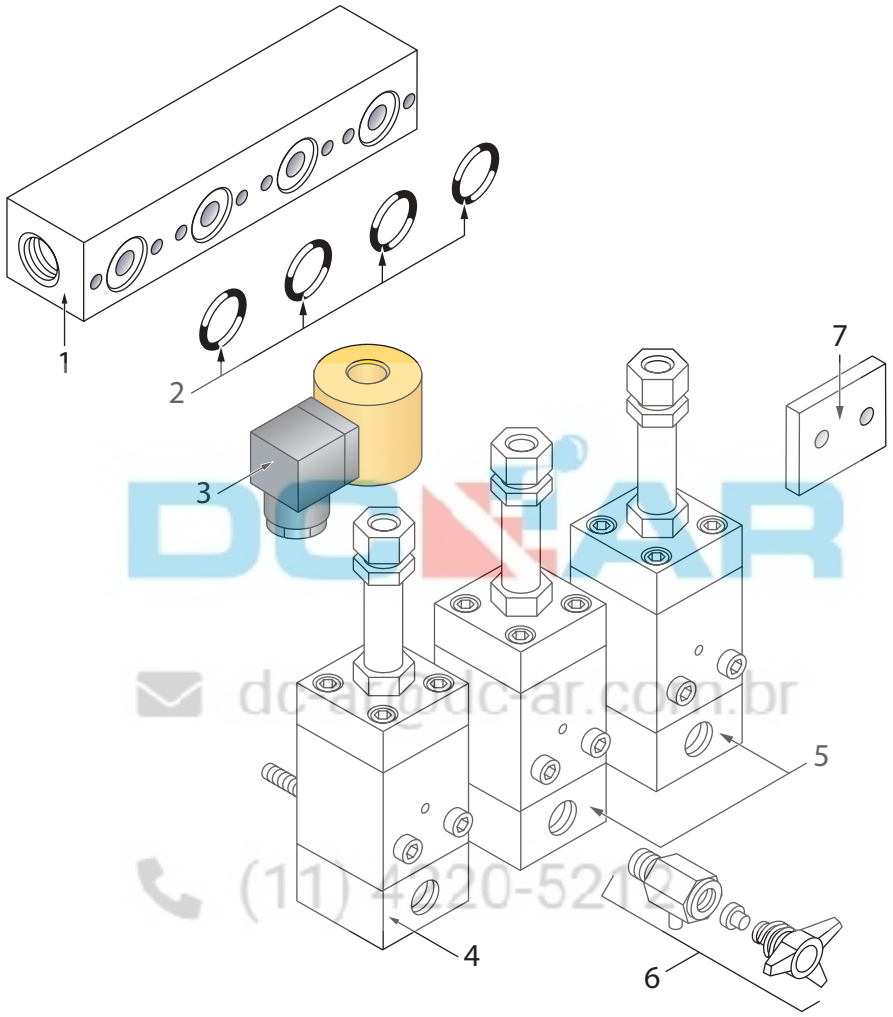
The condensate drain valves are provided with manual drain valves to verify correct operation of the automatic system.

The automatic condensate drain system must be serviced once a week as follows:

1. Open all manual drain valves one after the other.
2. Observe the drainage of condensation.
3. If the system drains more than 2 ounces of liquid per stage, either the system or the corresponding condensate drain valve is not working properly.
4. Find the fault and remedy accordingly.
5. If little or no condensation emerges, the automatic system is operating properly.
6. The Condensate Collection Tank should be emptied regularly. Due care must be taken to ensure that any oil which is drained with the condensate is disposed of properly. Check local, state and federal regulations.

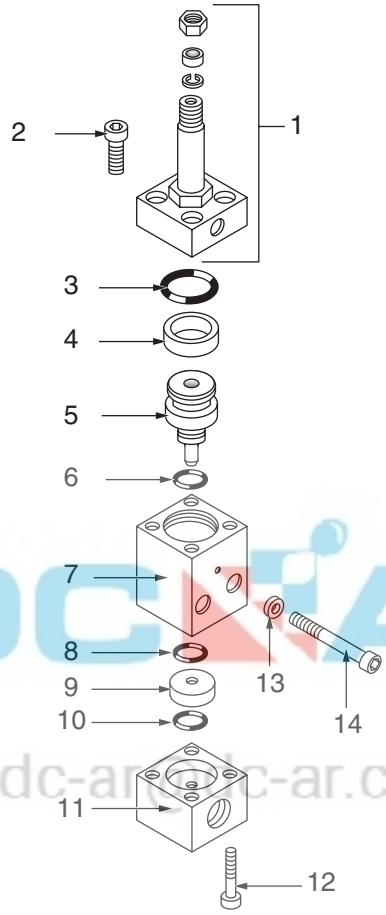
3.2.3 Replacement Parts List

Figure 3-29 ACD System



Item	Qty	Part No.	Description	Notes
◊	1	DGM-2348	Automatic Condensate Drain Sub Assembly	
1	1	MFD-0036	Manifold	
2	4	N04333	O-ring	
3	1	N4182	Electrical Solenoid	
4	1	062523	Condensate Drain Valve	See Figure 3-30
5	2	061010	Condensate Drain Valve	See Figure 3-31
6	3	011430	Manual Condensate Drain Valve	See Figure 3-32
7	1	PLT-0311	Blank Off Plate	

Figure 3-30 Final Separator Condensate Drain Valve



Item	Qty	Part No.	Description	Notes
◊	1	062523	Condensate Drain Valve	
1	1	058053	Solenoid Valve	
2	4	N210	Allen Screw	M6x20
3	1	N2720	O-ring	
4	1	N4177	Grooved Ring	
5	1	57629	Valve Piston	
6	1	N3489	O-ring	
7	†	…	Valve Body	Available only with 062523
8	1	N2507	O-ring	
9	1	56691	Valve Seat	
10	1	N4178	O-ring	
11	1	60416	Valve End	
12	4	N1511	Allen Screw	M6x60
13	2	N102	Washer	
14	2	N781	Allen Screw	M6x35

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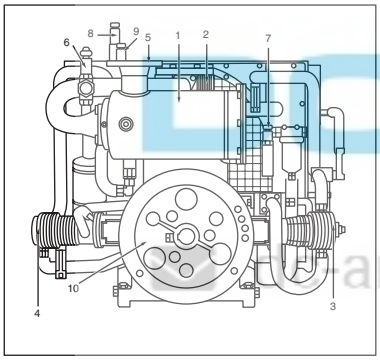
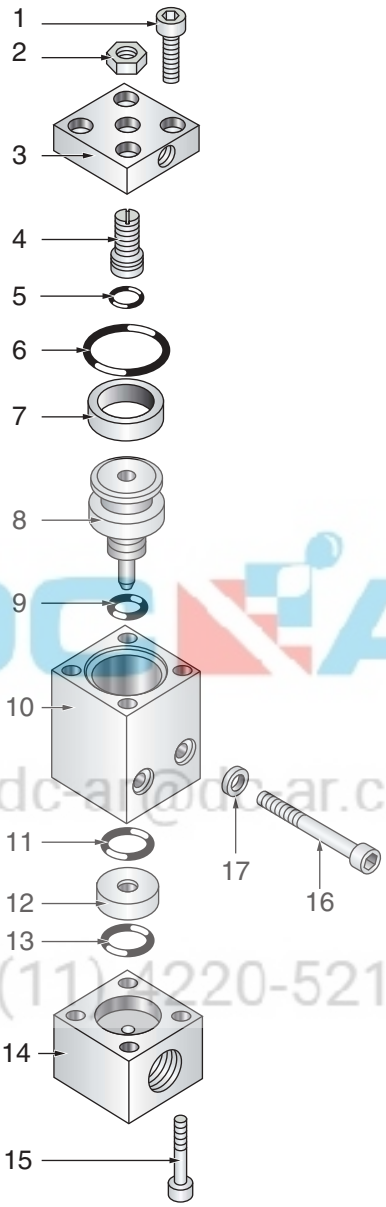


Figure 3-31 1st Stage Separators Condensate Drain Valves

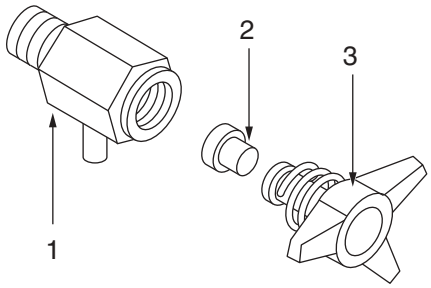


Item	Qty	Part No.	Description	Notes
◊	1	061010	Condensate Drain Valve Assembly	
1	4	N796	Socket Head Cap Screw	
2	1	N3764	Hex Nut	
3	1	61007	Top Flange	
4	1	57353	Adjusting Screw	
5	1	N7091	O-ring	
6	1	N2720	O-ring	
7	1	N04177	Sealing Ring	

Figure 3-31 (cont.) 31st Stage Separators Condensate Drain Valves

Item	Qty	Part No.	Description	Notes
8	1	057629	Valve Piston	
9	1	N03489	O-ring	
10	†	…	Valve Body, ACD	Available only with 061010
11	1	N02507	O-ring	
12	1	056691	Valve Seat	
13	1	N04178	O-ring	
14	1	060416	Base Flange	
15	4	N1511	Allen Screw	
16	2	N781	Allen Screw	
17	2	N102	Washer	

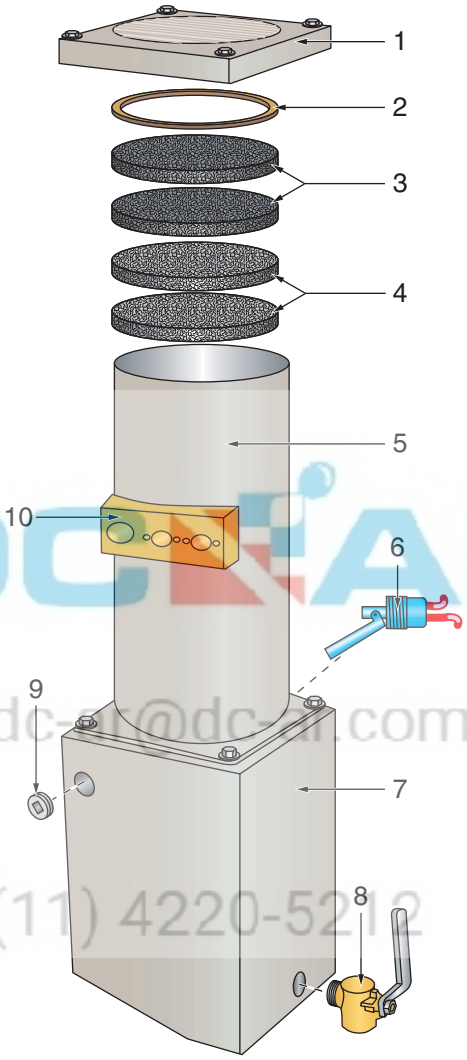
Figure 3-32 Manual Condensate Drain Valve



Item	Qty	Part No.	Description	Notes
◊	1	011430	Condensate Drain Tap	
1	1	068410	Drain Valve Body	
2	1	13283	Seal	
3	1	055888	Handle	

3.2.4 Condensate Collector Replacement Parts List

Figure 3-33 Condensate Collector



Item	Qty	Part No.	Description	Notes
1	1	CAP-0056	Condensate Collector Cover	
2	1	GKT-0050	Gasket	
3	2	ELM-0160	Fine Filter Element	
4	2	ELM-0161	Coarse Filter Element	
5	1	HUS-0050	Condensate Collector	
6	1	SWT-0265	Float Switch	
7	1	TNK-0092	Condensate Collection Tank	
8	1	VAL-0386	Manual Drain Valve	
9	1	PLU-0011	Plug	
10	1	MFD-0036	ACD Manifold	

3.2.5 Trouble shooting

Trouble	Cause	Remedy
Solenoid Valve does not drain.	1. Solenoid valve receives no electrical signal 2. Plunger of drain valve sticking	1. Check connections, timer. Replace if necessary. 2. Clean or replace valve.
Condensate Drain Valve does not drain.	1. Solenoid valve does not depressurize drain valve. 2. No control medium available. 3. Solenoid valve sticking. 4. Drain valve sticking in open position	1. Check solenoid valve, replace if necessary 2. Check supply lines 3. Clean or replace 4. Clean or replace

CHAPTER 4: BK15.3 II MAINTENANCE SCHEDULE

4.1 Preventive Maintenance Tasks

	Calendar Periods			Operating Hours							
	Daily	Annually	Biennially	500	1000	1500	2000	2500	3000	3500	4000
Check Oil Level	■										
Check V-belt				■	■	■	■	■	■	■	■
Check all connections for leakage				■	■	■	■	■	■	■	■
Check Valves					■		■		■		■
Clean Oil & Water Separator Sintered Metal Filter					■		■		■		■
Replace Valves							■				■
Change Oil and Oil Filter			■				■				■
Check Pistons & Piston Rings									■		
Check opening pressure of final pressure safety valve		■									

4.1.1 Maintenance Records

We recommend that all maintenance work be recorded, showing the date and details of the work carried out. This will help to avoid expensive repairs caused by missed maintenance work. If it is necessary to make a claim against the warranty, it will help to have proof that regular maintenance has been carried out and that the damage has not been caused by insufficient maintenance. For this purpose Maintenance Record Sheets are included in the Appendix and may be copied as required. Additionally a form for recording operating hours is included in the Appendix and may be copied as required

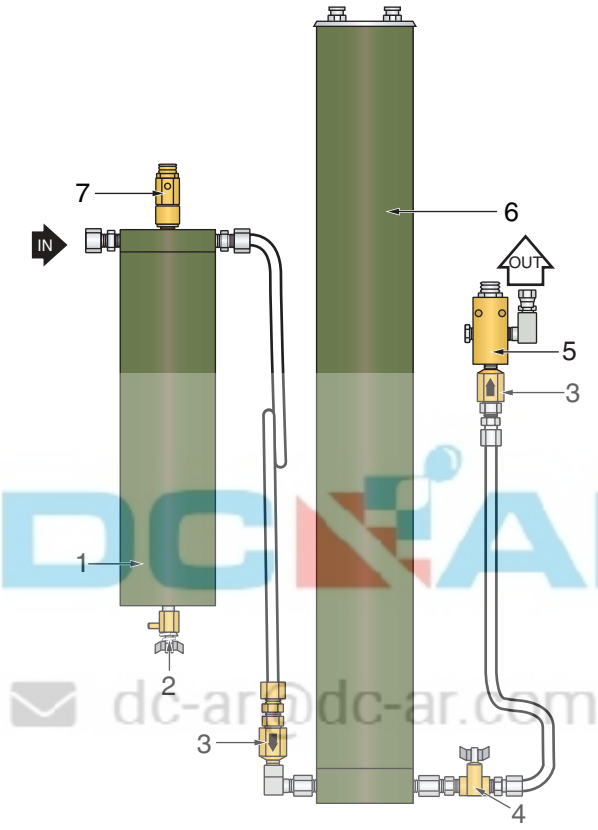
⚠ NOTE ⚠

All maintenance intervals refer to normal operating conditions. Operating the compressor under extreme conditions like high temperatures, humidity or continuous operation may shorten the intervals significantly. If in doubt, please contact the BAUER service department.

4.2 P2 Purification System Major Components

The P2 Purification System major components are a Oil and Water Separator, and a Purification Chamber. Figure 4-1 shows the functional interconnection of all the components.

Figure 4-1 IP2 Purification System



1. Oil and Water Separator
2. Condensate Drain Valve
3. Check Valves
4. Bleed Valve
5. Pressure Maintaining Valve
6. Purification Chamber
7. Safety Valve

4.3 Component Description

4.3.1 Oil and Water Separator

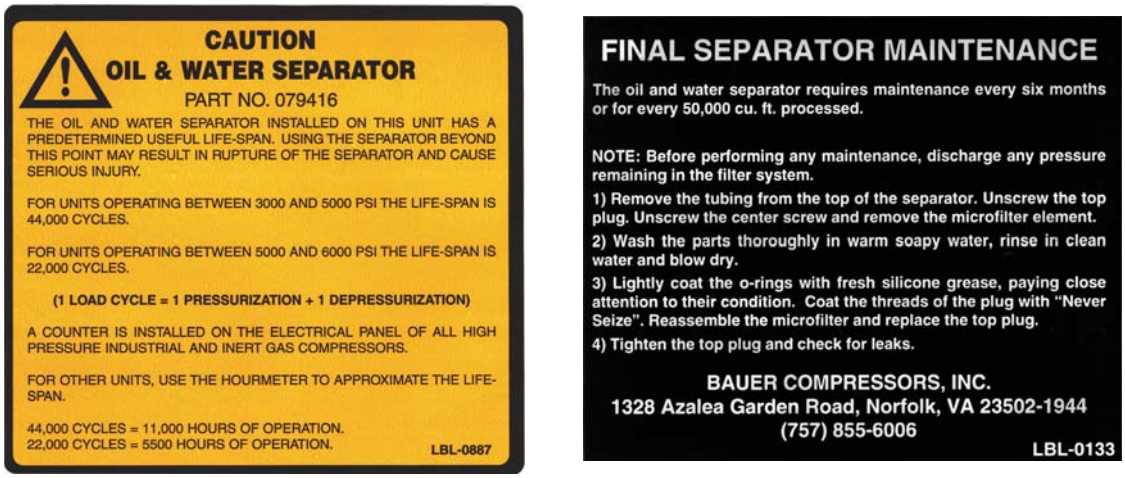
⚠ WARNING ⚠

The rapid depressurizing and repressurizing of the oil and water separator during condensate draining subjects it to metallurgical stresses. To prevent catastrophic failure with the possibility of damage, injury or death the oil and water separator (P/N 079416) must be replaced after a predetermined number of cycles. One load cycle equals one pressurization plus one depressurization.
Units operating between 3,000 and 5,000 psi = 44,000 load cycles (11,000 hours of operation)
Units operating between 5,000 and 6,000 psi = 22,000 load cycles (5,500 hours of operation
The BAUER recommended frequency of condensate draining is every fifteen minutes and is a balance between maximizing the life of the separator chamber and maintaining the quality of the delivered air.

The air leaving the final stage is cooled in the aftercooler to approximately 18 - 27°F (10 -15°C) above ambient temperature and then enters the oil and water separator. The oil and water separator works by means of a sintered metal filter which separates liquid oil and water particles from the compressed air.

Figure 4-2 Oil and Water Separator

Figure 4-3 OIl and Water Separator Labels



4.3.2 Chamber

Each chamber is made up of an anodized aluminum housing and a filtering cartridge. There are two general types of filtering cartridges, drying or purifying. The cartridge type is determined by the ingredients packed in the cartridge. The chamber is named after the type of cartridge it contains, i.e. dryer chamber or purification chamber.

4.3.3 Cartridge

4.3.3.1 Cartridge Construction

The cartridge casing, top and bottom are aluminum and are packed with one or more of the following.

1. A catalyst to convert carbon monoxide to carbon dioxide.
2. Activated carbon which absorbs oil vapors effecting taste and odor.
3. Molecular sieve to absorb oil and water.

Figure 4-4 Cartridge

4.3.3.2 Cartridge Handling

1. Never open the protective packaging a cartridge comes in prior to its actual use. The highly sensitive filter materials will absorb moisture from the atmosphere becoming saturated and useless.
2. Used cartridges must be disposed of in accordance with local regulations.

4.3.4 Condensate Drain Valve

A manually operated valve used for maintenance and before start-up to drain the condensed liquids from the coalescing oil and water separator.

4.3.5 Check Valves

Valves allowing compressed air to flow in only one direction. One is used to maintain pressure in the chamber when the compressor is not operating. The other check valve prevents back-flow from filled storage cylinders or tanks.

4.3.6 Bleed Valve

A manually operated valve used to release the pressure in the chamber before maintenance.

4.3.7 Pressure Maintaining Valve

The pressure maintaining valve ensures that pressure is built up in the system from the start of delivery, thus achieving constant optimum purification. It also assures proper working conditions for the final stage of compression.

4.3.8 Safety Valve

The safety valve is located on the coalescing oil and water separator and acts as the safety valve for the final stage of the compressor.

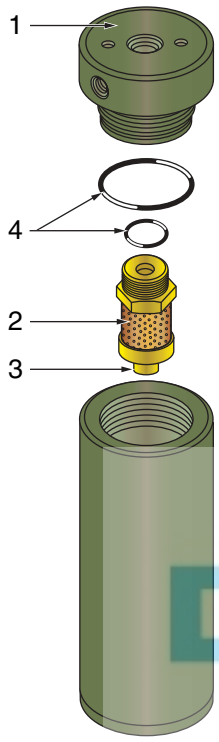
4.4 Maintenance

4.4.1 Oil and Water Separator

To remove the sintered metal filter proceed as follows: (See Figure 4-5). Disconnect the power and shut off the inlet supply line if applicable.

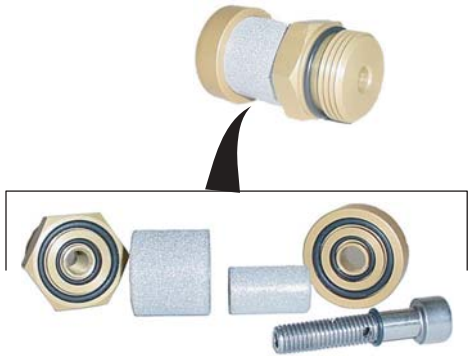
1. Depressurize the system by means of the bleed valve.
2. Remove the tubes connected to the side of the filter head (1).
3. Unscrew and remove the filter head.
4. Unscrew the sintered metal filter (2) from the filter head.
5. Remove the center screw (3) to remove the sintered metal filter.
6. Clean the sintered metal filter using hot soapy water. Blow dry with compressed air.
7. After cleaning the element, record the number of operating hours to ensure exact attention to the maintenance intervals.
8. Lubricate the threads and O-rings as well as the threaded part of the sintered metal filter with petroleum jelly. Apply sparingly.
9. Dry the inside of the filter housing with a clean cloth and check for corrosion before reinstalling the sintered metal filter.
10. In the event you discover corrosion, replace the corroded parts with new BAUER parts.
11. Reinstall the sintered metal filter assembly and filter head.
12. Replace all removed tubes, close all valves and check for leaks.

Figure 4-5 Oil and Water Separator



1. Filter Head	3. Center Screw
2. Sintered Metal Filter	4. O -rings

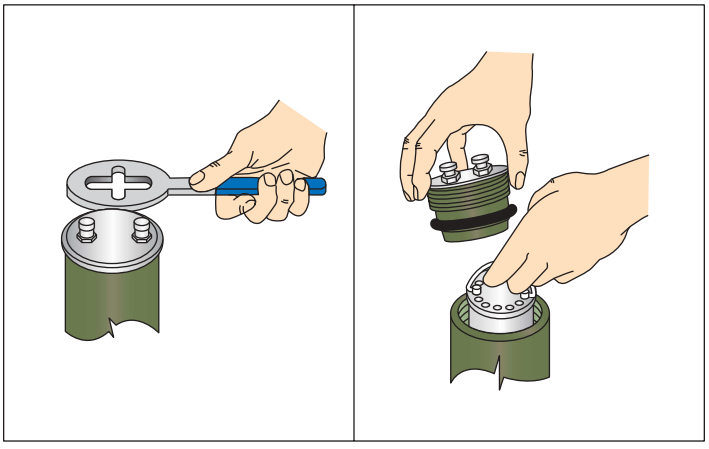
Figure 4-6 Sintered Metal Filter Assembly



4.4.2 Cartridge Replacement

To change the purification cartridge, proceed as follows. (See Figure 4-7)

Figure 4-7 Cartridge Replacement



1. Disconnect the power and shut off the inlet supply line, if applicable.
2. Depressurize the system by means of the bleed valve.

3. Unscrew the chamber head using the special wrench supplied.
4. Pull out the cartridge using the lifting ring on top of the cartridge.
5. Dry the inside of the chamber with a clean cloth and check for corrosion.
6. Replace all corroded parts with new BAUER parts.
7. Remove the shipping covering and the protective cap from the bottom of the cartridge.
8. Lubricate the O-rings with white petroleum jelly. Apply sparingly.
9. Install the new cartridge. Be sure the cartridge snaps into place.
10. Reinstall the chamber head.
11. Close the bleed valve, restore the power and reconnect the inlet supply line, if applicable.

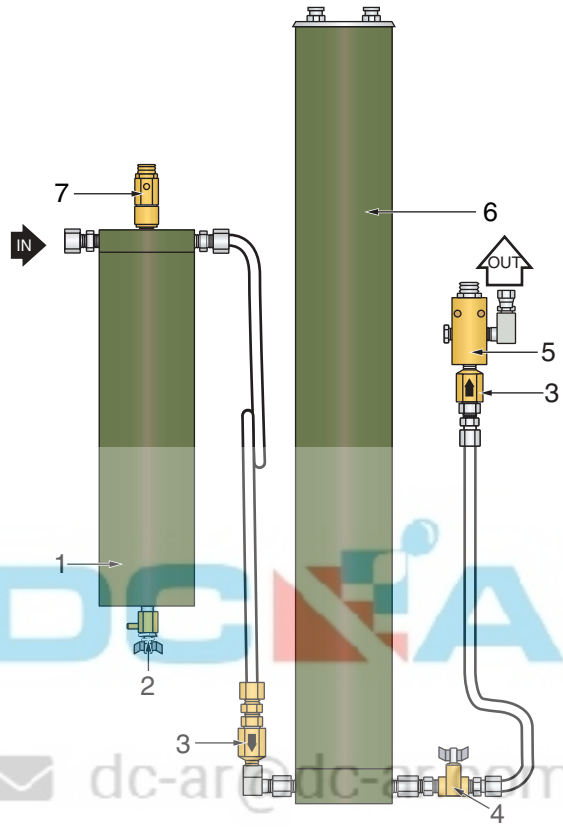
⚠ NOTE ⚠
If air is detected bleeding out from the bottom of the chamber, the cartridge has not been installed properly or is missing. Follow the instructions in Paragraph 4.4.2.1.

4.4.2.1 Leaking at the Safety Bore

1. Remove the cartridge following steps 1. to 4. in Paragraph 4.4.2.
2. Install cartridge if missing.
3. Remove cartridge and inspect O-rings.
4. Replace O-rings if necessary.
5. Ensure protective caps and devices have all been removed.
6. Replace cartridge following steps 8. to 11. in Paragraph 4.4.2

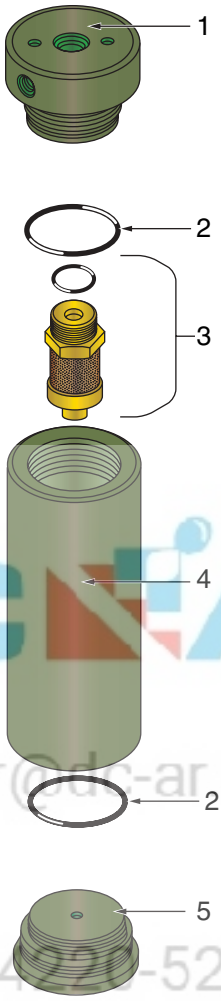
4.5 Replacement Parts List

Figure 4-8 IP2 Purification System Parts List



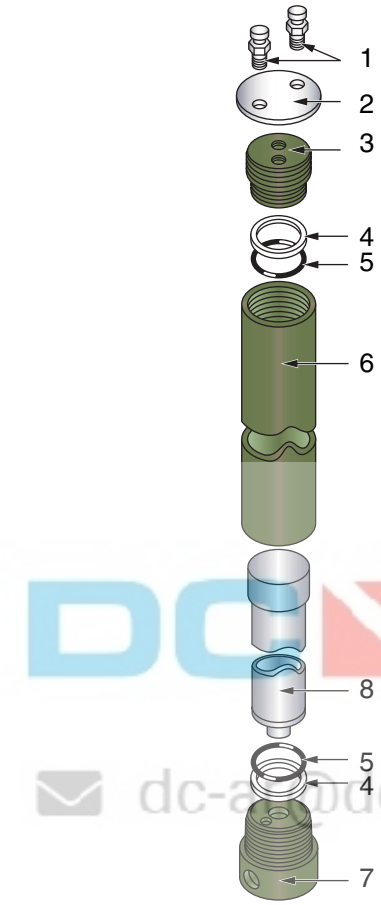
Item	Qty	Part No.	Description	Notes
1	1	079416	Oil and Water Separator	See Figure 4-9
2	1	011430	Condensate Drain Valve	
3	2	VAL-0007	Check Valves	
4	1	VAL-0140	Bleed Valve	
5	1	VAL-0053	Pressure Maintaining Valve	
6	1	080144	27” Purification Chamber	See Figure 4-10
7	1	VAL-0169	Safety Valve	

Figure 4-9 Oil and Water Separator Parts List



Item	Qty	Part No.	Description	Notes
◊	1	079416	Oil and Water Separator Assembly	
1	†	…	Separator Head	Available only with 079416
2	2	N04586	O-Ring	
3	1	061860	Sintered Metal Filter	
4	†	…	Separator Housing	Available only with 079416
5	†	…	Bottom Plug	Available only with 079416

Figure 4-10 27” Chamber Assembly Parts List



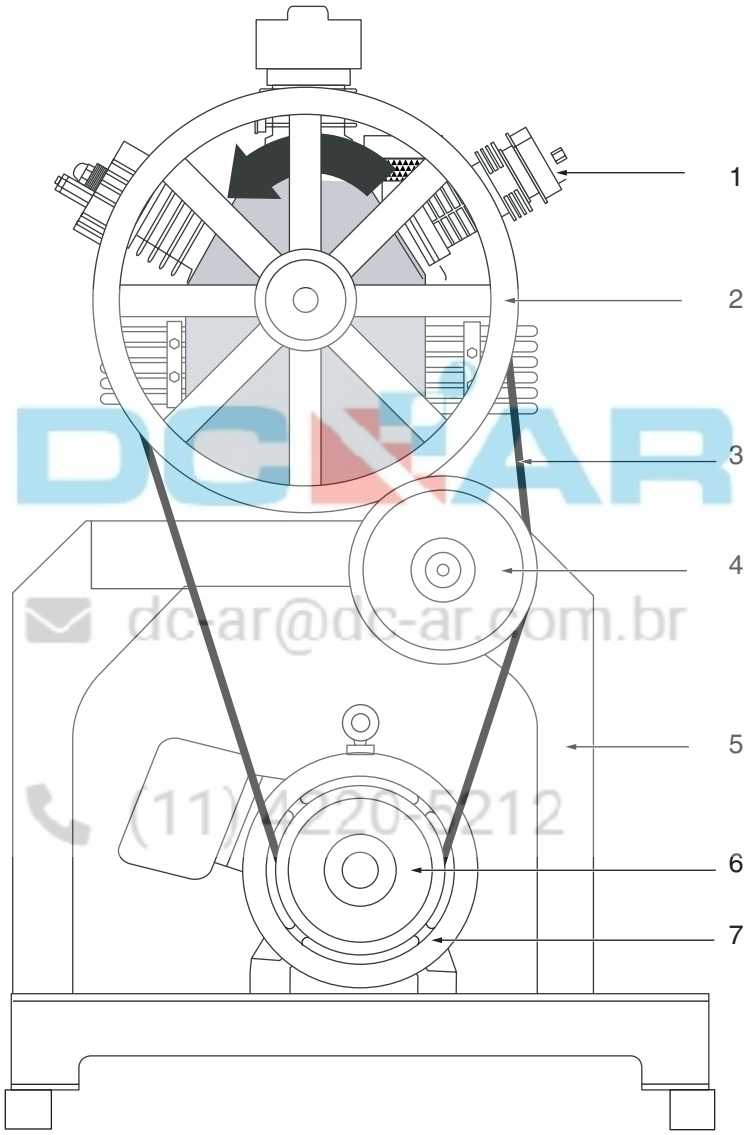
Item	Qty	Part No.	Description	Notes
◊	1	80144	Chamber Assembly	27”
1	2	012293	Tool Post Screw	
2	1	061237	Cover Plate	
3	†	…	Filter Head	Available only with 80144
4	2	N04736	Back-up Ring	
5	2	N04735	O-ring	
6	†	…	Filter Housing	Available only with 80144
7	†	…	Filter Bottom	Available only with 80144
8	1	058826A	Oil Removal Cartridge	

CHAPTER 5:COMPRESSOR DRIVE

5.1 Vertical Compressor Drive

The compressor is driven by the drive motor through a V-belt. The direction of rotation, as seen facing the flywheel, is counterclockwise. Observe the arrow on the compressor block. Check the V-belt regularly for damage and wear. See Paragraph 5.2.2. Replace if necessary.

Figure 5-1 Vertical Motor Mount (typical)



1. Compressor block	5. Compressor mount
2. Compressor flywheel	6. V-belt sheave
3. V-belt	7. Electric motor
4. Spring Tension Idler	

5.2 Maintenance of the V-belt and Sheaves

5.2.1 Check The Sheaves.

Before a new set of drive belts are installed, the condition of the sheaves should be checked. Dirty or rusty sheaves impair the drive's efficiency and abrade the cover of the belts, which results in premature failure. Worn sheaves shorten belt life as much as 50%. If the grooves are worn to the point where the belt bottoms, slippage may result and the belts may burn. If the side walls are "dished out," the bottom shoulder ruins the belt prematurely by wearing off the bottom corners.

5.2.2 Check the V-belt

Check the V-belt regularly for damage and wear. Replace if necessary. V-belt tension is adjusted automatically by the spring tension idler.

CHAPTER 6:ELECTRICAL PANEL ASSEMBLY

6.1 Overview

Figure 6-1 Electrical Panel Assembly

The Electrical Panel Assembly uses a micro Programmable Logic Controller, Motor Starter, transformer and switches manufactured by Telemecanique. This controller model is called TWIDO. The control system will provide logical control and safety shutdowns for the compressor equipment. All necessary time delays, counters, shutdowns, sequencing and safety features are incorporated into a proprietary program permanently saved into PLC memory using EEPROM technology. There are normally six PLC programs used in this Electrical Panel Assembly, based on the pressure and use of the compressor. The program version used can be identified by the white sticker on the face of the PLC. The panel is pre-wired and fused for the horsepower and voltage of the compressor. The power source for the panel is 460 volt, 3 phase, 60 Hz supply.

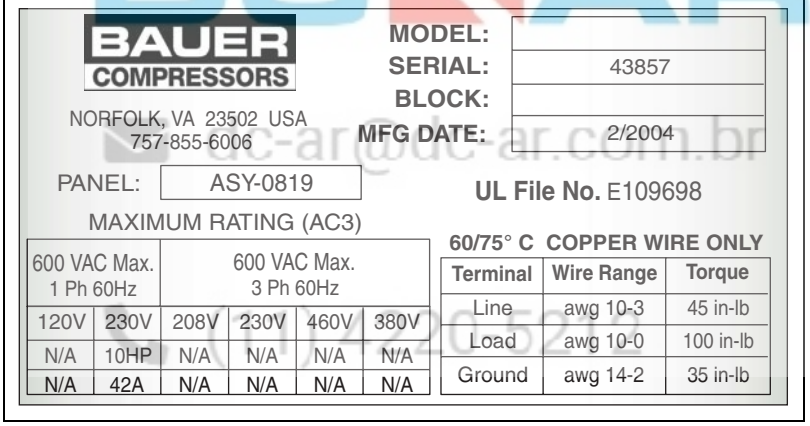
The basic panel components consist of a 16 I/O PLC Controller, Motor Starter with Overload Relay, Control Power Transformer with fuses, Alarm and Warning Lights, Compressor Control Switch, Hourmeter, Emergency Stop Switch, Starter Reset, Audible Alarm, terminal strip for wire connections and wire harness.

To run the compressor, the Emergency Stop Switch must be pulled out and the Compressor Control Switch must be in the ON position; at this point, the switch illuminates green and the compressor system is ready and able to operate. If the pressure in the system drops to approximately 4500 psi[1], the air pressure switch will close, and the compressor will start. All other functions of the compressor are automatic. When the air pressure has increased, and the pressure switch opens, then the compressor will shutdown. All of these functions are accomplished through the use of a Programmable Logic Controller. When use of the equipment is complete, the Compressor Control Switch should be placed in the Off position.

6.2 AC Power Requirements

The panel will need to be supplied with the appropriate voltage, phase, and frequency power to ensure proper operation. Wiring and conduit selection must be in accordance with all national, state and local codes. The customer is responsible for providing a disconnection means and protection from instantaneous short circuit.The pre-wired panel voltage and phase is written on a label (See Figure 6-2) on the inside of the electrical panel door. In this example shown, the panel is wired for 230 volt, single phase. If a schematic for your machine is not found inside the electrical panel, then please call Bauer Compressors Product Support Group for a replacement. Please have the Serial number of the compressor available; it is written on the same label.

Figure 6-2 Electrical Panel Label



This electrical panel will power up to a single 100 HP NEMA Design B motor at 460 VAC. The panel is provided with a 120 VAC, 200 VA, single-phase transformer for powering 120-volt loads. 120 VAC single-phase panel loads are as follows:

AC Power Available Light	Negligible
Warning & Alarm lights	Negligible
ACD coils (up to 4)	35 W each maximum, with 3 max energized
Motor Starter coil (max)	26.0 VA (sealed, max)
CO Monitor Solenoid valve	8 W
CO Monitor power	0.9 W
Securus® Electronic Moisture Monitor System	20.4 VA
PLC Controller	22.0 VA

1. The pressure mentioned is only an example; the switch differential is approximately 10% of the set-point, and is not adjustable.

Figure 6-3 Transformer and Fuses

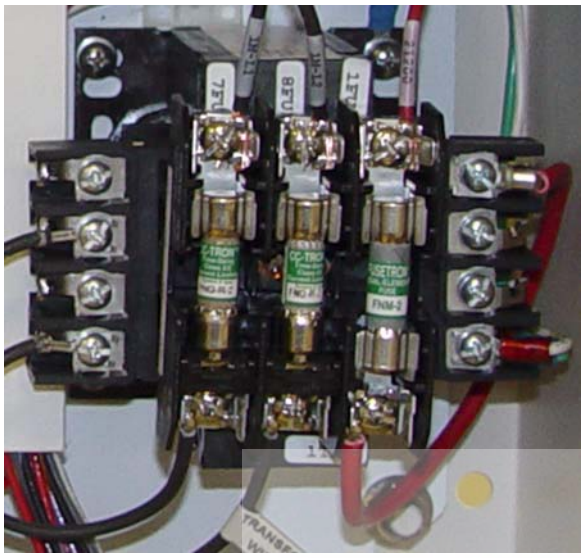
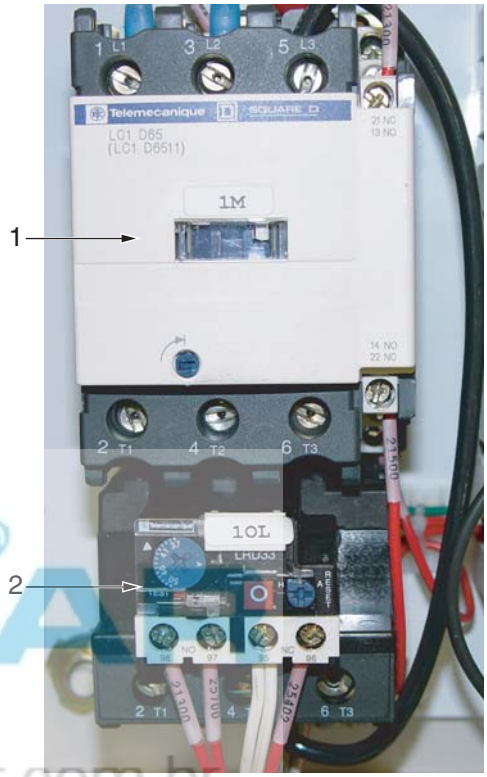


Figure 6-4 Motor Starter and Overload Relay



6.2.1 Transformer and Fuses

The transformer is fitted with three fuses. The input to the transformer has two fuses. For 460 VAC operation, use two Bauer P/N FUS-0077 rated at 1 amp. The secondary of the transformer is fitted with one fuse. Use one Bauer P/N FUS-0018, rated at 2 amps.

⚠ CAUTION ⚠

Before operating the compressor, care should be taken to ensure the voltage and phase of the power supply are the same. A qualified electrician should make these checks.

6.3 Electric Panel Components

6.3.1 Motor Starter

This application will require an across the line IEC starter with thermal overloads. Control voltage is 120 VAC. The Motor Starter is Bauer P/N SRT-0200 and will support up to 150Amps continuos. The Coil is replaceable with Bauer P/N COL-0019.

6.3.2 Overload Relay

The overload relay provides thermal overload protection and will be based on the voltage and motor horsepower. The relay must be set to match the motor's Full Load Amps and is Bauer P/N RLY-0151.

Figure 6-5 Electrical Panel Front

1. Compressor Control Switch	4. Hourmeter
2. Warning Light	5. Starter Reset
3. Alarm Light	6. Emergency Stop Switch

6.3.3 Emergency Stop Switch.

There is a Emergency Stop Switch on the panel. This is a 22 mm device with a 40mm mushroom head. The button must be pulled out for the unit to operate. In an emergency, depress the push button, which will shutdown the electric motor and all other periphery devices. Do not use the Emergency Stop Switch for securing the equipment under normal operation. Use the Compressor Control Switch. The PLC operating memory is maintained by a internal battery in the PLC. Removing all power from the compressor will allow the battery to discharge over a 30 day period. Apply power to the unit by pulling out the Emergency Stop Switch, and leave on for at least 15 hours every 30 days.

6.3.4 Starter Reset

There is a blue 22mm push button on the door of the electrical enclosure with the letter “R” at its center. Pushing this button will reset the thermal overload relay on the motor starter. Should the electric motor have overloaded and tripped out during normal operation, then depressing this button after giving some time to cool, will reset the overload relay portion of the motor starter.

6.3.5 Compressor Control Switch

6.3.5.1 2-Position

OFF Position - The selector switch must be in the OFF position when securing the compressor system.

ON Position - The selector switch must be in the ON position to operate the compressor system. When positioning the switch to the ON position, it will illuminate Green. The compressor will start and stop automatically based on the status of the pressure switch.

6.3.6 Indicator Lamps

6.3.6.1 PLC Warning and Alarm Lamps

6.3.6.1.1 Warning Lamp - Amber

The lamp (LIT-0128) has a 22 mm base and a LED lamp for long trouble free life. This lamp should flash a code IAW, In Accordance With, the logic of the controller. See Paragraph 6.4.

6.3.6.1.2 Alarm Lamp - Red

The lamp (LIT-0127) has a 22 mm base and a LED lamp for long trouble free life. This lamp should flash a code IAW the logic of the controller. See Paragraph 6.5.

6.3.7 Hour meter

The panel will be supplied with an hour meter (HMR-0029). The hour meter is not resettable and used to monitor the run hours of the compressor. It is powered with a 120 VAC signal supplied from the auxiliary contact on the motor starter.

6.3.8 PLC Control

This panel is controlled with a Telemecanique 16 I/O Twido Programmable Logic Controller. This unit provides logical operations to the overall system that includes the high pressure compressor, purification systems, and other accessories.

6.3.8.1 PLC LED's

There are three separate groups of LED's on the PLC. See Figure 6-7.

1. The Input Status LED's are in the top row.
2. The Output Status LED's are on the right hand side of the bottom row
3. The PLC Status Lights are on the left hand side of the bottom row and indicate the following.
   a. PWR - The supply voltage to the PLC is correct.
   b. RUN - On when the program is running. Flashes when program execution is stopped.
   c. ERR - Illuminates red on application fault.
   d. STAT - Indicates the status of an application variable.

Figure 6-6 PLC CNT-0052

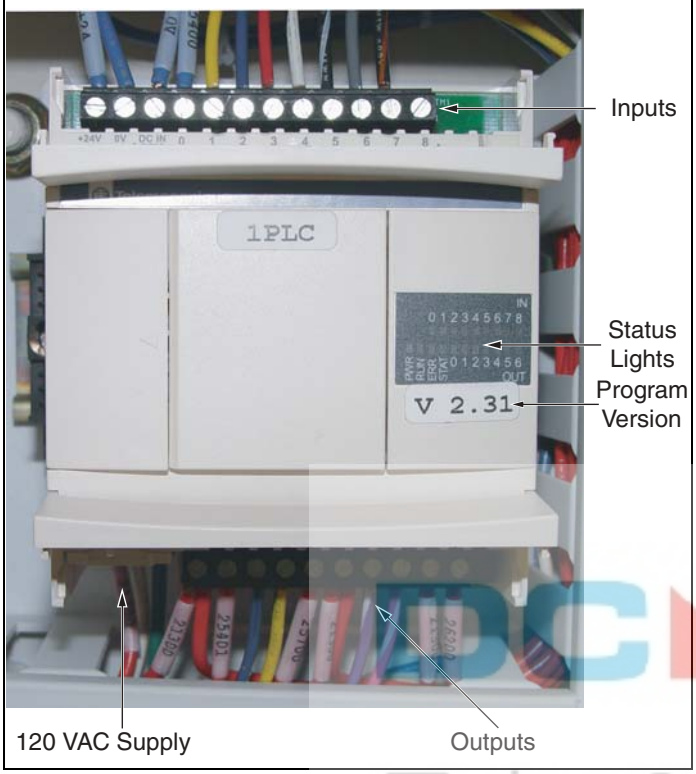
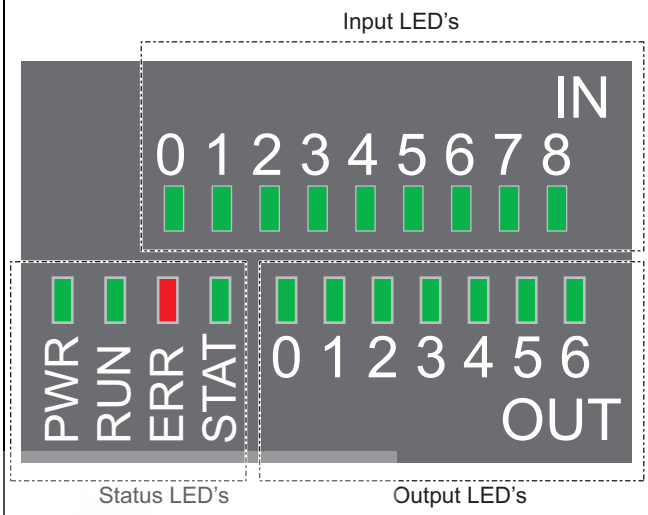


Figure 6-7 Status Lights



6.3.9 Compressor PLC Program Versions

The version of PLC program loaded into your compressor package is denoted with a small white sticker in the front of the PLC. Please refer to this number when calling Bauer Compressors Product Support.

Table 6-1: PLC Program Versions

Description	5,000 psi		6,000 psi
Breathing Air Compressor without Unloader	v2.45		v2.35
Industrial Compressor Unit with Unloader	v2.64		v2.54
Gas Compressor Unit	vG1.49		vG1.36
Unicus III with 1 ACD Solenoid	vU3.4		vU1.4
Unicus III with 2 ACD Solenoids	—		vU2.4
Industrial Unit with 4 ACD Solenoids	v3.11		v3.0

6.3.10 PLC Inputs and Outputs

All PLC inputs are 24 VDC. The power supply physically exists inside the PLC. All PLC outputs are of a relay type, and are powered through the control transformer supplying 120 VAC single phase to the various loads. Please refer to unit schematic for the as built specifications.

Table 6-2: PLC Inputs - Gas Compressor

I0	Compressor Control Switch (1SS)
I1	High Temperature Switch
I2	Oil Pressure Switch
I3	Final Air Pressure Switch
I4	Condensate Alarm
I5	High Inlet Pressure Fault
I6	—
I7	Low Inlet Pressure Fault
I8	—

Table 6-3: PLC Outputs - GAS Compressor

Q0	Motor Starter
Q1	ACD 1
Q2	ACD Final
Q3	Alarm Indicator
Q4	ACD 2
Q5	ACD 3
Q6	Warning Indicator

6.4 Warnings

Warning codes are flashed with a 0.5 second on / 0.5 second off sequence with the Amber light located on the control panel. In addition the light will illuminate on initial start up for a period of 5 seconds, to serve as a lamp test function. The lamp has a 22 mm base and a LED lamp for long trouble free life.

6.4.1 One Flash - Final Separator Warning

The high pressure-breathing compressor is equipped with a final separator. This is a stainless steel vessel, approximately 3-3/4 inch diameter, located on the purification panel, beside the compressor. To prevent fatigue failure of this vessel, the PLC program monitors the pressurization / de-pressurization cycles of this separator and will issue a Warning, and then later an Alarm function.

The program is set up for a 90% warning and a 100% shutdown alarm for this counter feature. The program would be configured to reflect the following values when it is built.

Table 6-4: Final Separator Warning and Shutdown Cycle Count

Maximum Compressor Pressure	Warning	Shutdown
5,000 psi	39,600 cycles	44,000 cycles
6,000 psi	19,800 cycles	22,000 cycles

When the warning is illuminated, the unit will still continue to function properly, but will prompt the operator to contact Bauer Compressors for making arrangements to replace the separator. When the Alarm level has been achieved, the compressor will no longer function, and will require the replacement of the separator. When this is accomplished, the unit can be re-activated by making adjustments to the PLC. Please contact Bauer Product Support for detailed instructions.

⚠ WARNING ⚠
Do not attempt to override this Separator Shutdown. This feature is provided to protect operating personnel from injury or death.

6.4.2 Two Flashes - Securus Monitor Warning

The compressor purification system may be equipped with a Securus® Electronic Moisture Monitor System. This consists of a control module and cable connected to the purification chamber. It functions as a capacitive sensor, sensing the moisture in the purified air. When the chemicals in the purification cartridges have reacted with moisture to a point where they are beginning to sense a change in the moisture content, then the Securus® Monitor will illuminate it's amber light.At the same time, the warning relay in the Securus® module which is connected to the PLC on terminal I7.

On a Securus® Warning condition, the compressor will run normally, the I7 lamp will illuminate, and the warning shows on the LCD Display. This warning is meant to prompt the operator to schedule replacement of the purification cartridges in the near future. The Warning relay is wired normally open. The relay is wired into a wire harness using the Black / Orange and Violet / Orange color wires. Refer to unit schematic for additional information. Under normal operating conditions, the relay is open and the I7 lamp on the PLC is off.

Figure 6-8 Securus® System

6.5 Alarms

Alarm codes are flashed with a 0.5 second on / 0.5 second off sequence with the Red light located on the control panel. In addition the light will illuminate on initial start up for a period of 5 seconds, to serve as a lamp test function. The lamp has a 22 mm base and a LED lamp for long trouble free life.

6.5.1 One Flash - Compressor High Temperature

The compressor high temperature switch is located on the high pressure breathing air compressor, on the third, fourth or fifth stage head, depending on model. The switch is N.C., Normally Closed, and is connected to the PLC on terminal I1. The switch is wired into a wire harness using the Yellow and Violet color wires. Refer to unit schematic for additional information. Under normal operating conditions, the switch is closed and the I1 lamp on the PLC is illuminated. On a high temperature condition, the compressor will shutdown, the I1 lamp will extinguish, and the alarm code will flash.

6.5.2 Two Flashes - Compressor Low Oil Pressure

The compressor oil pressure switch is located on the high pressure breathing air compressor, on the back of the block, mounted with the oil pressure gauge. The switch is N.O., Normally Open, and is connected to the PLC on terminal I2. The switch is wired into a wire harness using the Orange and Blue color wires. Refer to unit schematic for additional information. During startup of the compressor, the oil pressure switch is bypassed in the program for a period of 45 seconds. When the oil pressure has stabilized, the switch should be closed. Should the compressor lose oil pressure, then the compressor will shutdown, the I2 lamp will extinguish, and the alarm code will flash.

Figure 6-9 High Temperature Switch

Figure 6-10 Low Oil Pressure Switch

6.5.3 Three Flashes - Compressor Overrun Timer

The compressor has an overtime function, where if the compressor runs continuously for 5 hours, then the compressor will shutdown, and the alarm code will flash. This is done to secure the equipment if it were to be started and left unattended.

6.5.4 Four Flashes - Securus Monitor

See Figure 6-8. The compressor purification system may be equipped with an optional Securus® Electronic Moisture Monitor System. This consists of a control module and cable connected to the purification chamber. It functions as a capacitive sensor, sensing the moisture in the purified air. When the chemicals in the purification cartridges have reacted with moisture to a point where they are no longer suitable for purifying the air, then the Securus® Module will illuminate it's red light. At the same time the alarm relay in the Securus® module is connected to the PLC on terminal I5. On a Securus® alarm condition, the compressor will shutdown, the I5 lamp will be illuminated, and the alarm shows on the LCD Display. The warning relay is wired N.O., normally open. The switch is wired into a wire harness using the Black / White and Violet / Orange color wires. Refer to unit schematic for additional information. Under normal operating conditions, the relay is open and the I5 lamp on the PLC is off.

6.5.5 Five Flashes - Carbon Monoxide Monitor Alarm

The compressor system may be equipped with an optional Carbon Monoxide Monitor. This consists of an electronic module that samples the compressed air supply. The unit will provide a continuous display of the CO level in PPM, parts per million. If the CO level becomes excessively high, then the red alarm light on the face of the monitor will illuminate. At the same time the alarm relay in the CO Monitor which is connected to the PLC I4 will generate a CO ALARM condition.The compressor will shutdown, the I4 lamp will illuminate, and the alarm code will flash.The unit should be calibrated with a test gas monthly. Refer to the chapter titled CO Monitor for this procedure.

6.5.6 Six Flashes - Final Separator Shutdown

⚠ WARNING ⚠

Do not attempt to override the Final Separator Shutdown. This feature is provided to protect operating personnel from injury or death.

The high pressure-breathing compressor is equipped with a final separator. This is a stainless steel vessel, approximately 3-3/4 inch diameter, located on the purification panel, beside the compressor. To prevent fatigue failure of this vessel, the PLC program monitors the pressurization cycles of this separator and will issue a Warning, and then later an Alarm function. The program is set up for a 90% warning and a 100% shutdown alarm for this counter feature. The program would be configured to reflect these values when it is built.

Table 6-5: Final Separator Warning and Shutdown Cycle Count

Maximum Compressor Pressure	Warning	Shutdown
5,000 psi	39,600 cycles	44,000 cycles
6,000 psi	19,800 cycles	22,000 cycles

When the warning is illuminated, the unit will still continue to function properly, but will prompt the operator to contact Bauer Compressors for making arrangements to replace the separator. When the Alarm level has been achieved, the compressor will no longer function, and will require the replacement of the separator. When this is accomplished, the unit can be re-activated by making adjustments to the PLC. Please contact Bauer Product Support for detailed instructions.

6.5.7 Seven Flashes - Condensate Fault

The compressor condensate level switch is located in the condensate collection tank, below the ACD, Automatic Condensate Drain separator. The switch is N.O., Normally Open, and is connected to the PLC on terminal I6. The switch is wired into a wire harness using the Grey and Pink color wires. Refer to unit schematic for additional information. Under normal operating conditions, the switch is open and the I6 lamp on the PLC is off. On a high condensate condition, the compressor will shutdown, the I6 lamp will illuminate, and the alarm code will flash. The operator should drain the condensate from the tank and resume operation of the equipment.

Figure 6-11 Condensate Level Float Switch

⚠ NOTE ⚠

The compressor condensate contains some oil, and accordingly, should be disposed of in accordance with state and local regulations.

6.5.8 Eight Flashes - High Inlet Pressure Fault

The high inlet and low inlet pressure switches are combined into a single unit. This switch is connected to the inlet pressure gauge tubing circuit. During normal operating conditions, the high inlet pressure switch is open and the I5 lamp on the PLC is off. If a high inlet pressure condition occurs and the switch closes, the compressor will shut down, the PLC I5 lamp will illuminate and the alarm code will flash. The operator should investigate and correct the supply gas condition before attempting to resume operation of the equipment

6.5.9 Nine Flashes - Low Inlet Pressure Fault

The high inlet and low inlet pressure switches are combined into a single unit. This switch is connected to the inlet pressure gauge tubing circuit. The low inlet pressure switch is wired normally closed. At unit start, a built-in timing function allows the inlet solenoid to open and inlet pressure to build. During normal operating conditions, the low inlet pressure switch is open and the I7 lamp on the PLC is off. If a low inlet pressure condition occurs and the switch closes, the compressor will shut down, the PLC I7 lamp

will illuminate and the alarm code will flash. The operator should investigate and correct the supply gas condition before attempting to resume operation of the equipment.

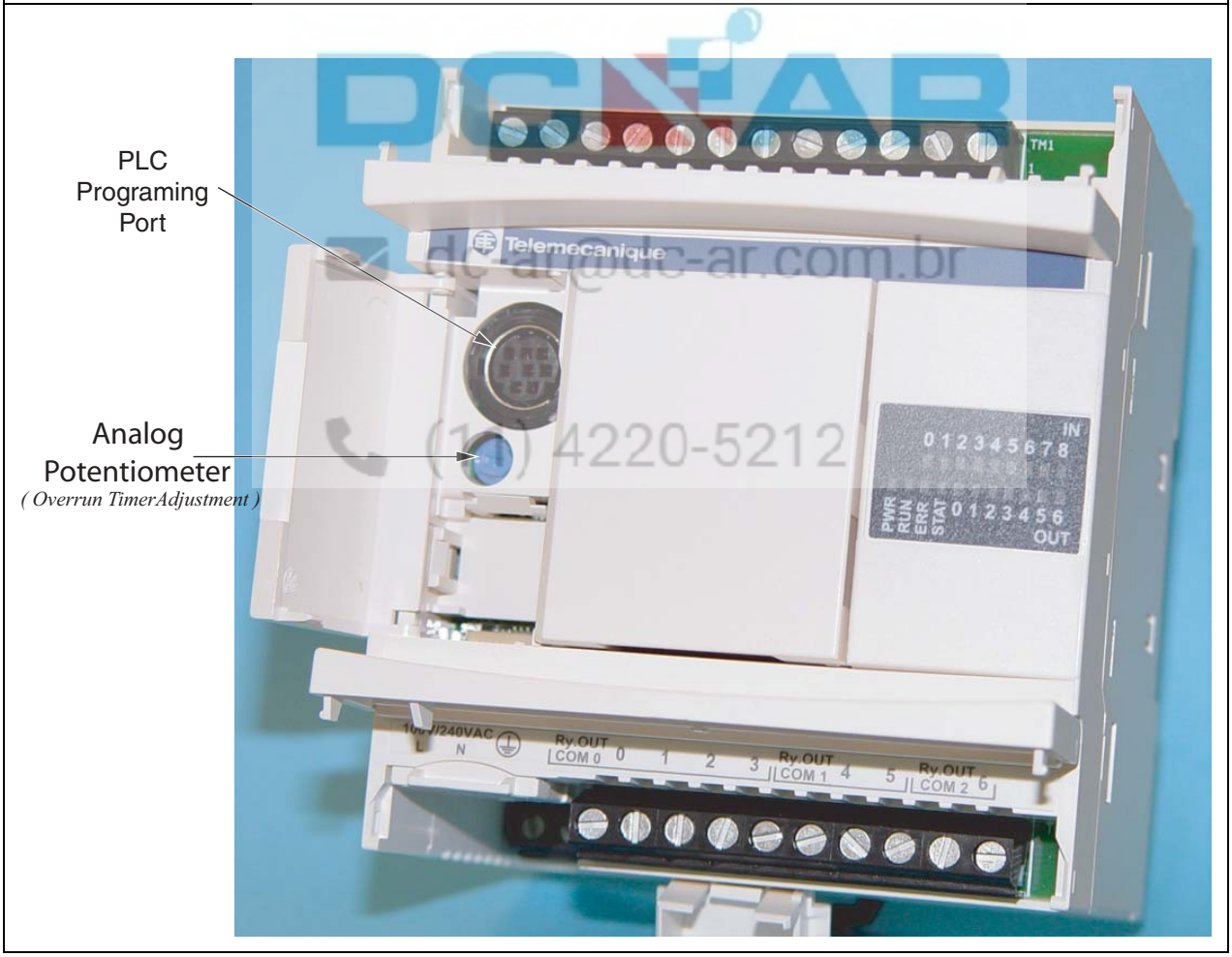
6.5.10 On Steady - Motor Starter Overload Trip

The compressor overload relay is located in the electrical enclosure, directly beneath the motor starter. See Figure 6-4. The relay is Normally Open and is not connected to the PLC, but is connected directly to the red alarm light. Under normal operating conditions, the switch is open. On an Overload Trip of the motor, the compressor will shutdown, and the Alarm light will be illuminated steady (no flash sequence).

6.6 Installing a New Program

The PLC program c an be updated in two ways. If a Bauer technician is on-site, they could connect directly to the PLC using a notebook computer. Using a licensed version of TwidoSoft® software, changes can be made and downloaded to the PLC directly.Another method to install a new program is to use an External EEPROM cartridge (CNT-0051). The EEPROM would be programmed at the Bauer factory and shipped either to the customer or to a authorized distributor.

Figure 6-12 PLC Programing Port



⚠ CAUTION ⚠

When handling the cartridge, do not touch the pins. The cartridges electrical elements are sensitive to static electricity.

Figure 6-13 PLC EEPROM

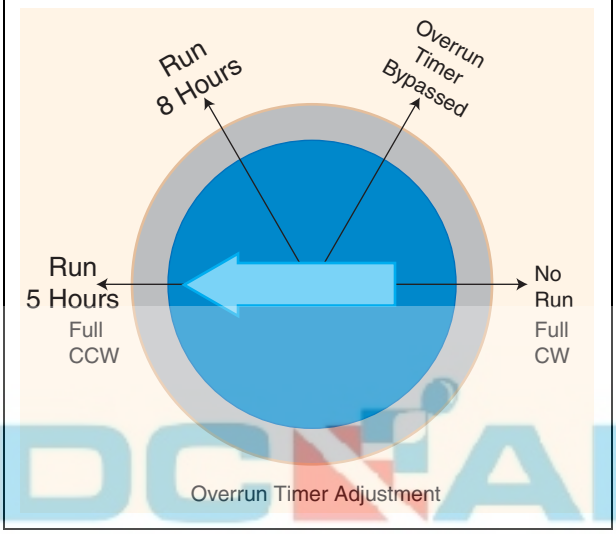
6.6.1 Installing a new program using an EEPROM cartridge

1. Disconnect main power to your unit
2. Open the electrical enclosure door
3. Open the bottom terminal cover on the Twido controller
4. Remove the cartridge cover
5. Push the EEPROM cartridge into the cartridge connector until it “clicks”.
6. Close the terminal cover.
7. Reconnect main power to the unit.
8. Pull out the Emergency Stop pushbutton.
9. At power up, the new program will automatically be downloaded to the Twido controller. When the red error light on the front of the Twido controller stops blinking, the download is complete.
10. Disconnect main power to your unit
11. Remove the EEPROM cartridge
12. Replace the cartridge cover

6.7 Overrun Timer

(See Figure 6-12). All versions of the PLC program contain an Overrun Timer that will shut the compressor off after a certain amount of continuous running. The length of time can be set to 5 hours, 8 hours (factory standard) or bypassed entirely eliminating the Overrun Timer.

Figure 6-14 Overrun Timer Adjustment



6.7.1 Adjusting the Overrun Timer

(See Figure 6-14). The setting is determined by rotating the Overrun Timer Adjustment.

1. Begin by gently rotating the Overrun Timer Adjustment fully Counter-Clockwise to 9 o'clock. If it is desired that the compressor shut down after five hours of continuous running, then leave it at this position.
2. If it is desired that the compressor shut down after eight hours of continuous running, rotate the Overrun Timer Adjustment 60° Clockwise to the 11 o'clock position.
3. If it is desired that the compressor Overrun Timer is bypassed and does not shut the compressor off, rotate the Overrun Timer Adjustment 120° Clockwise to the 1 o'clock position.

⚠ NOTE ⚠
The compressor will not operate if the Overrun Timer Adjustment is rotated fully Clockwise to the 3 o'clock position.

6.8 Wire Harness Connections

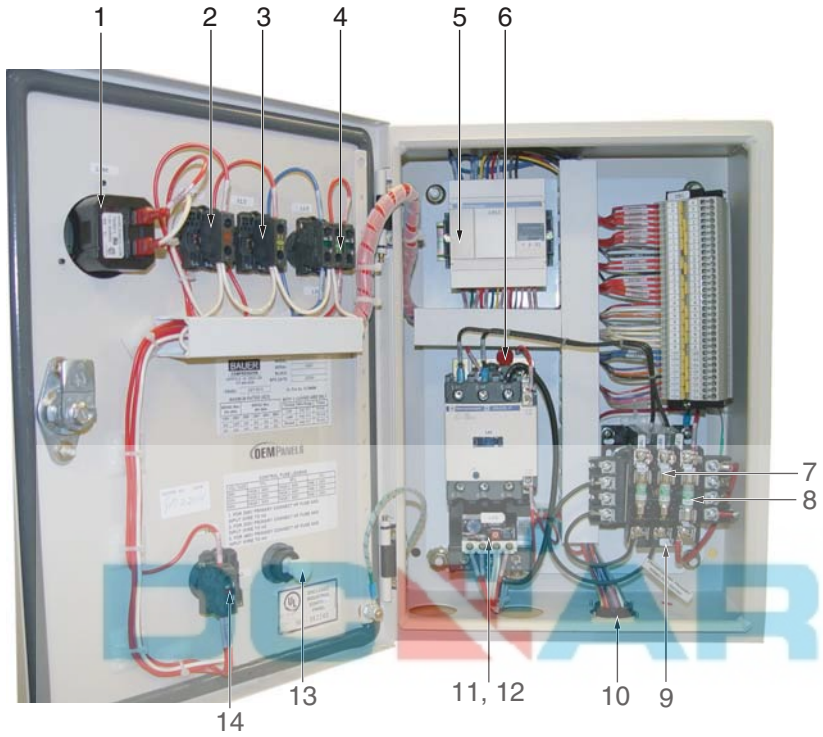
Device	Description	PLC In	PLC Out	Wire Colors	Pin
1TS	Compressor High Temp. Switch	I1	—	Yellow	23
				Violet	24
2PS	Compressor Oil Pressure Switch	I2	—	Blue	25
				Orange	26
1PS	Compressor Air Pressure Switch	I3	—	Red	29
				Brown	30
CA	Condensate High Level Switch	I4	—	White/Black	33
				Red/White	34
SEC	Securus Power	—		Black	3
	Neutral	—		White	15
SEC W	Securus® Warning	I7	—	Black/Orange	37
	Neutral	—		Violet/Orange	36
SEC A	Securus Alarm	I5	—	Black/White	35
ACD1[a]	Automatic Condensate Drain #1	—	Q1	Blue/White	4
	Neutral	—		Orange/White	21
ACD Final[b]	Final ACD Coil		Q2	Yellow/Black	5
ACD 2	Second ACD Coil		Q4	Violet/White	6
	Neutral	—		Grey/White	22
ACD 3	Third ACD Coil/Unloader Valve		Q5	Pink/White	7
3PS	High Inlet Pressure Switch	I5	—	Brown (vio/org)	36
	Neutral	—		Yellow (blu/wht)	35
5 PS	Low Inlet Pressure Switch	I7	—	Violet (pink)	32
	Neutral	—		Blue (blk/org)	37
1SV	Inlet Solenoid	—		Black/Yellow	2
	Neutral	—		White	15

a. If the unit is equipped with one ACD Solenoid, it is connected to ACD1.

b. If the unit is equipped with two ACD Solenoids, they are connected to ACD1 and ACD Final.

6.9 Replacement Parts List

Figure 6-15 Electrical Panel, Interior



Item	Qty	Part No.	Description	Notes
◊	1	ASY-0903	Electrical Panel Assembly	
1	1	HMR-0028	Hourmeter	
2	1	LIT-0127	Light Assembly	Red
3	1	LIT-0128	Light Assembly	Amber
4	1	SWT-0240	Control Switch	2 Position
—	1	SWT-0242	Control Switch	3 Position, Industrial Units
5	1	CNT-0052	PLC Controller	
6	1	SUR-0005	Surge Suppressor	
7	2	FUS-0177	Fuse, 1 Amp	Primary, 460 VAC
8	1	FUS-0018	Fuse, 2 Amp	Secondary
9	1	TRR-0062	Transformer	
10	1	HNS-0051	Socket	
11	1	SRT-0200	Motor Starter	
12	1	RLY-0151	Overload Relay	
13	1	OPR-0014	Starter Reset Button	
14	1	SWT-0244	Emergency Stop Switch	

6.10 Trouble Shooting Guide

6.10.1 Compressor Will Not Start

Possible Cause or Problem	Corrective Action
Emergency Stop Switch not pulled out.	Pull out Switch.
Selector Switch not in ON position.	Turn switch to ON.
Lights on PLC not illuminated	Check voltage and phases
Air Pressure not low enough to close pressure switch.	PLC input I3 should be illuminated.

6.10.2 Compressor Is Shutdown, Alarm Code Flashing Sequence.

6.10.2.1 One Flash - Compressor High Temperature

Investigate or Possible Cause	Corrective Action
Compressor is hot	Improve compressor ventilation
Temperature switch electrical connector unplugged	Reconnect plug
Temperature switch failure, check that PLC Input I1 is on.	Replace High Temperature Switch

6.10.2.2 Two Flashes - Compressor Low Oil Pressure

Investigate or Possible Cause	Corrective Action
Low Oil Pressure after oil and filter change.	Restart 1or 2 more times.
Check Oil Pressure with Gauge, if lower than specified	Check Oil Level
	Replace Oil Filter
	Check Compressor Rotation Direction
Check Oil Pressure with Gauge, if in specified range	Reset Pressure Switch

6.10.2.3 Three Flashes - Compressor Overtime

Investigate or Possible Cause	Corrective Action
The compressor is shut down after 5 hours of continuous operation	Turn Compressor Control Switch to OFF then back to ON.

6.10.2.4 Four Flashes - Securus® Alarm	
Investigate or Possible Cause	**Corrective Action**
Securus® Cable disconnected	Reconnect Securus® Cable
Securus® Cartridge saturated or expired.	Replace all purification system cartridges

6.10.2.5 Five Flashes - Carbon Monoxide Monitor Alarm	
Investigate or Possible Cause	**Corrective Action**
Monitor is not operating with proper pressure and flow	Adjust as required.
Monitor is not properly calibrated	Calibrate Monitor
If above checks are okay	Replace Purifications Cartridges[a]

a. A typical source of carbon monoxide is engine exhaust. Ensure compressor intake is from a fresh air source to prevent premature consumption of the purification cartridges.

6.10.2.6 Six Flashes - Final Separator Shutdown	
Investigate or Possible Cause	**Corrective Action**
Final Separator has reached maximum number of Pressurization Cycles.	Replace Final Separator

6.10.2.7 Seven Flashes -Condensate Fault	
Investigate or Possible Cause	**Corrective Action**
Check Condensate Level, if full	Drain and properly dispose of Condensate Tank contents.
Check Condensate Level, if not full	Clean switch.
If above checks are okay	Replace switch

6.10.2.8 Eight Flashes - High Inlet Pressure (Gas Compressors Only)	
Investigate or Possible Cause	**Corrective Action**
Compressor Inlet Pressure to High	Adjust pressure of feed gas
	Check setting of Inlet Pressure Switch

6.10.2.9 Nine Flashes - Low Inlet Pressure (Gas Compressors Only)	
Investigate or Possible Cause	**Corrective Action**
Inlet Pressure to compressor to low	Check operation of Inlet Solenoid Valve.
	Adjust feed rate of feed gas
	Check setting of switch
	Change Intake Filter Element

6.10.2.10On Steady - Motor Over load Trip	
Investigate or Possible Cause	**Corrective Action**
Check motor starter for tripped indication	Allow some time to cool, push reset button
Check motor current	Compare to motor current to FLA on motor nameplate
Check setting of Overload Relay to motor FLA	Adjust Overload Relay setting.

Figure 6-16 Checking Compressor Rotation Direction

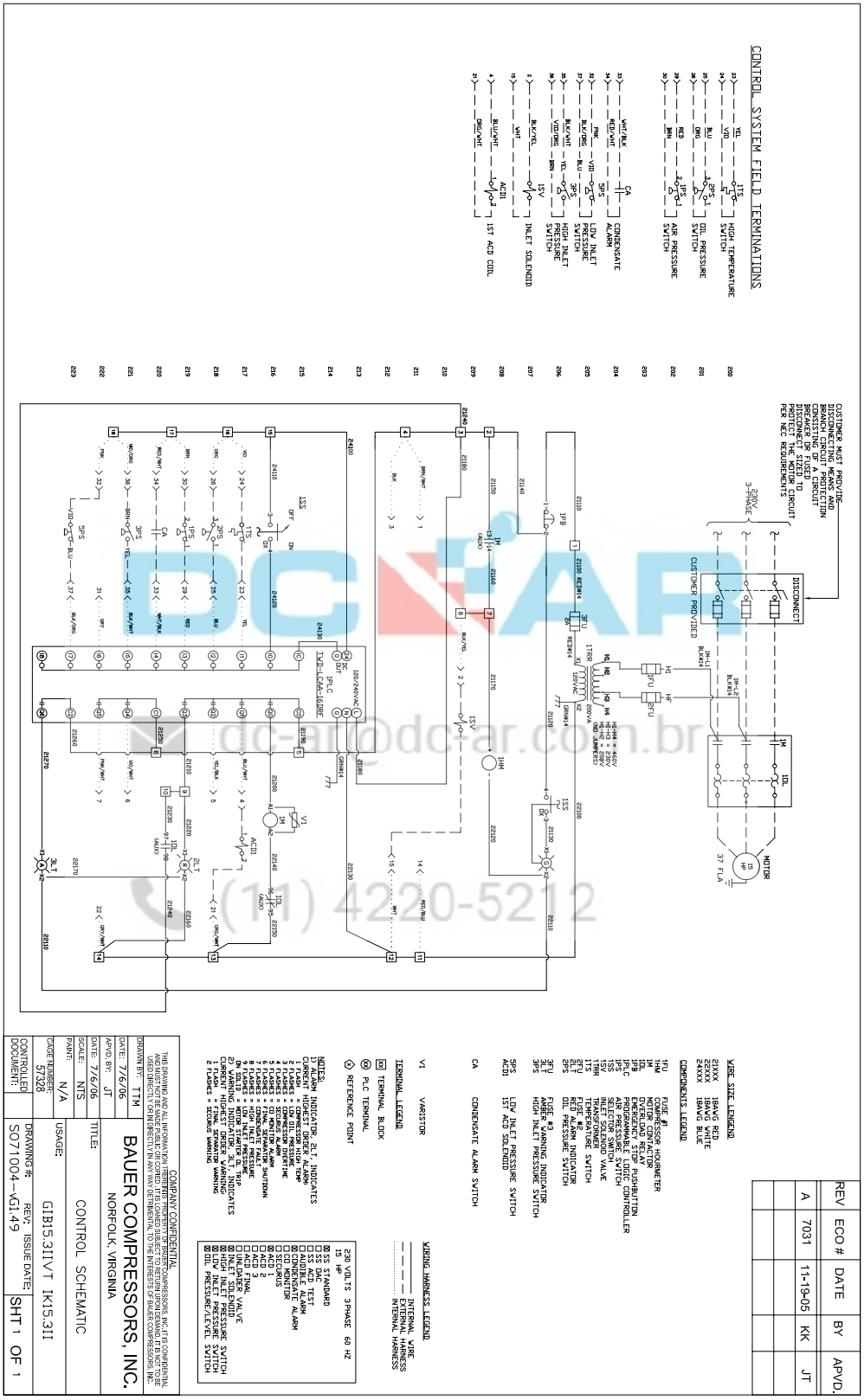
1. Cover Screw
2. Starter Armature

6.11 Check Compressor Rotation Direction.

Turn the motor one or two revolutions to ensure proper rotation of the compressor. See Figure 6-16.

1. Remove the cover from the starter by rotating the cover screw (1) counter-clockwise.
2. Remove cover, and manually depress the blue armature of the starter (2) for a second.
3. Ensure compressor rotation is in accordance with the directional arrow on the compressor fan shroud.
4. If rotation is incorrect, switch any two of the three power leads to reverse the rotation of the motor.
5. Replace starter cover.

6.12 Compressor Wiring Diagram



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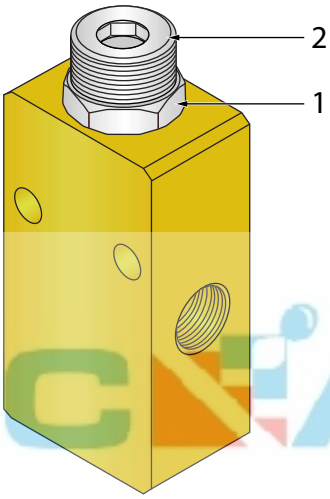
CHAPTER 7: PNEUMATIC VALVES AND CONTROLS

7.1 Nonadjustable Valves

The condensate drain valve, bleed valve and check valves are not adjustable. The condensate drain valve and bleed valve have seats and seals which should be replaced if the valve leaks. Check valves are not adjustable or repairable and must be replaced if they malfunction.

Figure 7-1 Pressure Maintaining Valve



7.2 Pressure Maintaining Valve

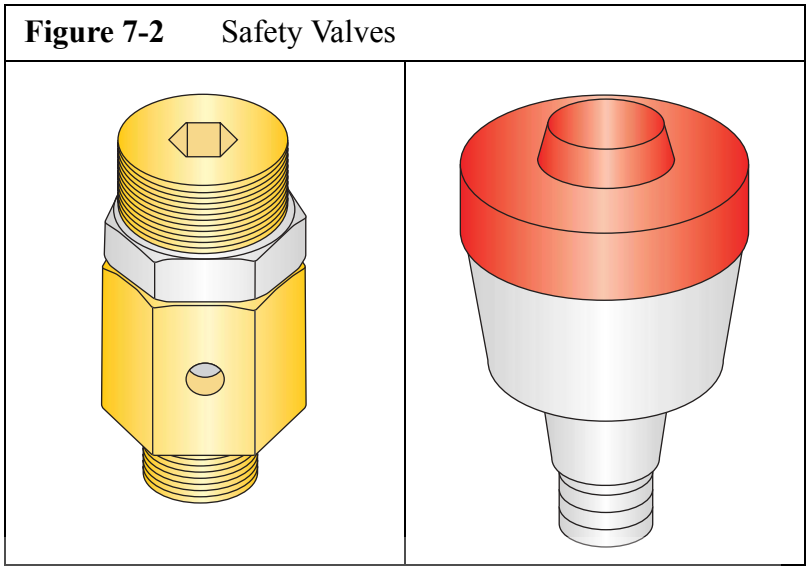
The pressure maintaining valve is adjusted at the factory to the required pressure and does not normally require maintenance or readjustment. The factory setting is 2,300 psi (159 bar) ± 100 psi (7 bar).

If readjustment does become necessary proceed as follows.

1. Loosen the locking nut (1).
2. Set the adjusting screw (2) to the required pressure using an appropriate hex type wrench.
3. Turn clockwise to increase pressure, counterclockwise to decrease pressure.
4. Determine if the PMV is properly adjusted:
   a. Depressurize the final separator and purifier chamber by slowly opening the bleed valve.
   b. Close the bleed valve and start the compressor.
   c. Observe the final pressure gauge and note the pressure at which the valve opens (delivers).
   d. If the pressure is not at the specified pressure ± 100 psi, readjust the PMV.

7.3 Safety Valves

Figure 7-2 Safety Valves



The safety valves are adjusted at the factory to the required pressure and do not normally require maintenance or readjustment. In case readjustment does become necessary, have the safety valve adjusted by a BAUER qualified technician or return the valve to the factory (contact the BAUER Product Support Department for details).

CHAPTER 8: APPENDIX

8.1 Safety

8.1.1 General Safety Precautions

- Read the operating manual before installing or operating this compressor unit. Follow appropriate handling, operation and maintenance procedures from the very beginning. The maintenance schedule contains measures required to keep this compressor unit in good condition. Maintenance is simple, but must be executed regularly to achieve safe operation, maximum efficiency and long service life.
- We recommend that all maintenance work be recorded in a service book, showing the date and details of the work carried out. This will help to avoid expensive repairs caused by missed maintenance work. If it is necessary to make a claim against the warranty, it will help to have proof that regular maintenance has been carried out and that the damage has not been caused by insufficient maintenance.
- This compressor unit must be installed, operated, maintained and repaired only by authorized, trained and qualified personnel.
- Consult and follow all OSHA, NEMA, ASME and local regulations, laws and codes covering the installation and operation of this compressor and accessories before operating the unit.
- Do not operate this unit in excess of it's rated capacity, speed, pressure, temperature, or otherwise than in accordance with the instructions contained in this manual. Operation of this unit in excess of the conditions set forth in this manual will subject the unit to limits which it may not be designed to withstand.
- Keep safety guards in place.
- Do not modify the compressor or its systems.
- Do not wear loose clothing around machinery. Loose clothing, neckties, rings, wrists watches, bracelets, hand rags, etc. are potential hazards.
- Provide adequate fire protection. Make sure fire extinguishers are accessible. Select alternate routes of escape and post such routes.
- Make sure you are equipped with all required safety equipment; hearing protection, safety glasses, hard hats, safety shoes and fire extinguisher.
- Visually inspect the unit before starting. Remove and /or replace any loose or broken components, tools, valves, missing equipment, etc.
- Do not tamper with, modify, or bypass safety and shutdown equipment.
- Do not tighten or adjust fitting or connections under pressure.
- The use of plastic pipe or rubber hose in place of steel tube or iron pipe, soldered joints or failure to insure system compatibility of flex joints and flexible hose can result in mechanical failure, property damage, and serious injury or death.
- The use of plastic or nonmetallic bowls on line filters without metal guards can be dangerous.
- Replace damaged fan blades promptly. Fan assemblies must remain in proper balance. An unbalanced fan can fly apart and create an extremely dangerous condition.

- Allow the compressor to cool before servicing. Whenever the compressor is shut down and overheating is suspected, a minimum period of 15 minutes must elapse before opening the crankcase. Premature opening of the crankcase of an overheated unit can result in an explosion.
- Incorrect placement of the inlet and pressure valves in a compressor cylinder head can cause an extremely dangerous condition. Refer to the appropriate section of this manual before installing or replacing valves.
- Before doing any work involving maintenance or adjustment, be sure the electrical supply has been disconnected, and the complete compressor system has been vented of all internal pressure. Failure to follow these warnings may result in an accident causing personal injury and/or property damage.
- Before working on the electrical system, be sure to disconnect the electrical supply from the system at the circuit breaker or other manual disconnect. Do not rely on the ON/OFF switch to disconnect the electrical supply.
- Installer must provide an earth ground and maintain proper clearance for all electrical components.
- All electrical installation must be in accordance with recognized national, state, and local electrical codes.
- Do not use gasoline, diesel fuel or other flammable products as a cleaning solution.
- A compressor which has been used for gas service is unsuitable for air applications. Should the purchaser and/or user proceed to use the compressor for air service after it has been used for gas, the purchaser/user assumes all liability resulting therefrom without any responsibility being assumed by Bauer Compressors, Inc. The purchaser is urged to include the above provision in any agreement for resale of this compressor.
- The use of repair parts other than those listed in this manual or purchased from BAUER Compressors, Inc. may create unsafe conditions over which BAUER has no control. Such unsafe conditions can lead to accidents that may be life-threatening, cause substantial bodily injury, and/or result in damage to the equipment. Therefore, BAUER Compressors, Inc. can bear no responsibility for equipment in which non-approved repair parts are installed

8.1.2 Safety Warning Labels

Notes, labels and warning signs are displayed on the compressor unit according to model, application or equipment and may include any of the following.

	HOT SURFACES DO NOT TOUCH! Danger of burning if cylinders, cylinder heads, or pressure lines of individual compressor stages are touched.
	HIGH VOLTAGE! Life threatening danger of electrical shock. Maintenance work on electric units or operating equipment should be carried out by a qualified electrician or by a person supervised by a qualified electrician according to electrical regulations.
	AUTOMATIC COMPRESSOR CONTROL UNIT MAY START WITHOUT WARNING! Before carrying out maintenance and repair work, switch off at the main switch and ensure the unit will not restart.
	THE INSTRUCTIONS MUST BE READ BEFORE OPERATING UNIT! The instruction manual and all other applicable instructions, regulations, etc. must be read and understood by the operating personnel before using the machine.
	HEARING PROTECTION MUST BE WORN! Hearing protectors must be worn when working on a machine which is running.
	DIRECTION OF ROTATION! When switching on the machine, check the arrow to ensure correct direction of rotation by the drive motor.

8.2 Unpacking, Handling and Installation

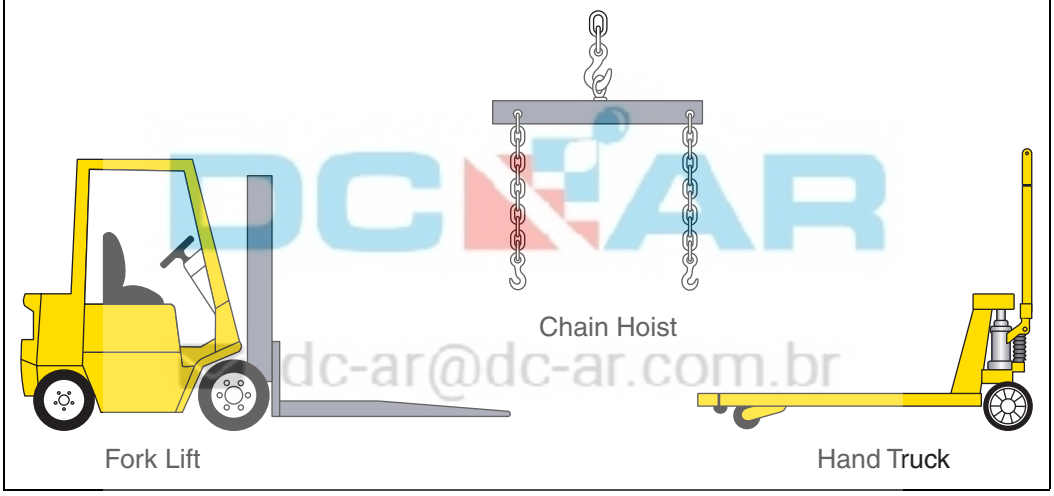
8.2.1 Unpacking and Handling

This compressor unit is packaged according to the requirements for shipping via the requested type of carrier service. It is possible that the compressor unit could have been damaged during shipping. For this reason, we urge you to thoroughly examine the unit for possible damage and report any such damage to the shipping company immediately.

Care must be taken in unpacking the compressor unit. Serious damage could result by not checking for clearance between the item being unpacked and the packaging to be removed.

Handling of the unpacked unit should be performed using only the following devices. See Figure 8-1.

Figure 8-1 Lifting Devices



⚠ WARNING ⚠

Be sure the lifting devices are capable of handling the weight of the unit (see Paragraph 1.4 for the weight of the unit). Before lifting the unit, secure all loose or swinging parts to keep them from moving. Stay clear of lifted load.

The compressor unit may be furnished with one or more shipping braces for shipping and handling only. After installation and before operation, these braces must be removed entirely. Under no circumstances should the braces remain installed during operation or the manufacturer's warranty for the compressor unit will be voided. The braces are all tagged and labeled.

8.2.2 Installation of the Compressor Unit

8.2.2.1 General

The floor/site must be capable of supporting the weight of the unit. Secure the compressor unit to the floor using ½" lag bolts. Position the unit so that it is level. Permissible inclination of the compressor unit is listed in Paragraph 1.4.

⚠ CAUTION ⚠
The inclination values listed in Paragraph 1.4 are valid only if the oil level of the compressor is level with but does not exceed the upper mark of the oil dipstick or oil level sight glass

Ensure that the compressor air intake is supplied with fresh air. The intake air must not contain any exhaust fumes or flammable vapors such as paint solvents, which may cause an internal fire. Make sure that the intake air is unobstructed and moisture in the intake air is kept to a minimum. It is important that units draw in clean air. The quality of the incoming air determines the quality of the compressed air. This is important even for industrial air, as any incoming fumes will also be compressed and will increase the toxicity to anyone working with the compressed air.

If a remote control is provided, the unit must be equipped with a clearly visible plate warning the possibility of the unit starting. As an additional measure, anyone starting the unit by remote control must make sure that no one is checking or operating the unit. For this purpose, a second warning plate should be provided at the remote control unit.

AUTOMATIC COMPRESSOR CONTROL
UNIT MAY START WITHOUT WARNING!
Before carrying out maintenance and repair work, switch off at the main switch and ensure the unit will not restart.

Observe and maintain an ambient temperature range of 43° to 113° F.

The area in which the compressor unit is installed should be well lit and easily accessible to facilitate servicing and routine maintenance.

8.2.2.2 Ventilation

During normal compression, heat is generated by the compressor and by the drive motor/engine. For air-cooled compressor units, this heat needs to be vented away by sufficient ventilation.

8.2.2.2.1 Outdoor Installation

It is recommended that all gasoline and diesel engine driven compressor units be installed outdoors. Additionally, electrically driven compressor units may be installed outdoors only if enclosed with weatherproof enclosure panels.

8.2.2.2.2 Indoor Installation

The best location to install the compressor unit indoors is against an outside wall with a suitably large air vent in front of the cooling fan. Additionally, it is necessary to position an exhaust opening in the opposite wall, close to the ceiling or in the ceiling.

As a basic rule of thumb, the room should be ventilated sufficiently so as to prevent the ambient room temperature from exceeding 105° F. Additional heat generating equipment or piping should be avoided or must be well insulated.

8.2.2.2.3 Natural Ventilation

Natural ventilation should only be used up to a maximum drive power of 20 hp. To determine the size of the required intake and exhaust openings, refer to the following table: .

Drive hp	Intake and Exhaust Openings Dependent on Room Volume (V) and Height (h)					
	V = 1750 ft³ h = 6.5 ft		V = 3500 ft³ h = 10 ft		V = 7000 ft³ h = 13 ft	
	Intake (ft²)	Exhaust (ft²)	Intake (ft²)	Exhaust (ft²)	Intake (ft²)	Exhaust (ft²)
3	1.3	1.1	---	---	---	---
5	3.2	2.7	1.3	1.1	---	---
7.5	4.5	3.8	2.6	2.2	1.3	1.1
10	9.7	8.1	6.5	5.4	2.6	2.2
15	14.5	12.4	9.7	8.1	5.8	4.8
20	20.6	17.2	15.6	12.9	9.7	8.1

8.2.2.2.4 Forced Ventilation

To determine the required intake opening and exhaust flow refer to the following table:

Drive hp	Dependence on Room Size (V) and Height of Exhaust Opening (h)[a]					
	V = 1750 ft³ h = 8 ft		V = 3500 ft³ h = 10 ft		V = 7000 ft³ h = 13 ft	
	Intake (ft²)	Exhaust cfm	Intake (ft²)	Exhaust cfm	Intake (ft²)	Exhaust cfm
25	3.3	3300	3.2	3200	3.0	3000
30	4.0	3960	3.8	3840	3.6	3600
40	5.3	5280	5.1	5120	4.8	4800
50	6.6	6600	6.4	6400	6.0	6000
60	7.9	7920	7.7	7680	7.2	7200
75	9.9	9900	9.6	9600	9.0	9000
100	13.2	13200	12.8	12800	12.0	12000
125	16.5	16500	16.0	16000	15.0	15000
150	19.8	19800	19.2	19200	18.0	18000

a. The intake sizes given in the above table are for a cooling air velocity of 1000 ft./min. BAUER recommends that the cooling air velocity be in the range of 600 ft./min. to 2000 ft./min.

8.2.2.3 Electrical Installation

8.2.2.3.1 Electric Drive

When making the electrical connections to the system, the following instructions are mandatory:

- Comply with all local, state and federal regulations concerning electrical installation.
- Arrange for the electrical connections to be made by a certified electrician only.
- Ensure that the motor voltage, control unit voltage, and frequency conform with the main voltage and frequency. Do not connect the compressor unit to a voltage other than the one specified on the name-plate.
- Provide all necessary cables and main fuses and a master disconnect switch. The fusing of the compressor must be carried out in compliance with local, state and national electrical regulations.

8.2.2.3.2 Electrical Supply

The machine is factory wired according to order. If the voltage is to be changed, consult the factory for instructions and necessary parts.

For standard models the only customer wiring necessary is from the customer supplied disconnect switch to the compressor unit's electrical enclosures All wiring should be done by a licensed electrician familiar with national, state and local electrical codes.

The use of improperly sized wire can result in sluggish operation, unnecessary tripping of overload relays and/or blowing of fuses. The following tables are provided as a guide for proper wire size.

1 PHASE									
Motor hp	Full Load Amps			Fuse Amps[a]			Minimum Wire Size[b]		
	120V	208V	230V	120V	208V	230V	120V	208V	230V
2	24	13.2	12	30	20	17.5	10	---	14
3	34	18.7	17	50	30	25	8	10	10
5	56	30.8	28	80	50	40	4	8	8
7.5	80	44	40	100	70	60	3	8	8
10	---	55	50	---	90	60	---	6	6

a. Dual element time delay fuse amps.

b. Normal copper wire with THW, THWN, or XHHW insulation.

3 PHASE									
Motor hp	Full Load Amps			Fuse Amps[a]			Minimum Wire Size[b]		
	208V	230V	460V	208V	230V	460V	208V	230V	460V
2	7.5	6.8	3.4	12	10	5.6	14	14	14
3	10.6	9.6	4.8	17.5	15	8	14	14	14
5	16.7	15.2	7.6	25	25	12	10	12	14
7.5	24.2	22	11	40	30	17.5	8	10	14
10	30.8	28	14	50	40	20	8	8	12
15	46.2	42	21	60	60	30	6	6	10
20	59.4	54	27	90	80	40	4	4	8
25	74.8	68	34	100	100	50	3	4	8
30	88	80	40	125	100	60	2	3	8
40	114	104	52	175	150	80	0	1	6
50	143	130	65	200	200	100	3/0	2/0	4
60	169	154	77	250	200	100	4/0	3/0	3
75	211.2	192	96	300	300	150	300	250	1
100	273	248	124	400	350	175	500	350	2/0
125	343.2	312	156	500	400	200	2-4/0	2-3/0	3/0
150	396	360	180	600	500	250	2-300	2-4/0	4/0

a. Dual element time delay fuse amps.

b. Normal copper wire with THW, THWN or XHHW insulation.

In the above tables, all values are based on 1996 NEC articles 430 and 310 (NFPA 70). These values are provided as a general guide; however, the information given on the motor nameplate supersedes the above information.

8.3 Long Term Storage

8.3.1 General

If the compressor unit will be out of service for more than six months, it should be preserved in accordance with the following instructions:

1. Make sure that the compressor is kept indoors in a dry, dust-free room.
2. Cover the compressor with plastic sheets only if no condensation will form under the sheet.
3. Remove the sheet from time to time and clean the outside of the unit.
4. If this procedure cannot be followed, or if the compressor will be out of service for more than 24 months, please contact Bauer Product Support for special instructions.

8.3.2 Preparations

Prior to preserving the compressor unit, it must be run until warm, i.e., up to the specified service pressure. Operate the unit for approximately 10 minutes, then carry out the following checks.

1. Check all pipes, filters and valves (including safety valves) for leakage.
2. Tighten all couplings, as required.
3. After 10 minutes, open the outlet valve and operate the compressor at adjusted minimum pressure using the pressure maintaining valve for approximately 5 minutes.
4. After the 5 minutes, shut the compressor unit down and completely drain all separators and filters. Close all valves.
5. Remove filter heads and lubricate the threads with petroleum jelly.

8.3.2.1 Units Equipped with a Filter System

1. Ensure that cartridges remain in the purification system chambers. This will prevent oil from entering the outlet lines as a result of preservation procedures.
2. Remove the intake filter/intake pipe completely.

8.3.3 Preserving the Compressor

1. Operate the compressor again and slowly spray approximately 0.35 oz. (10 cc) of oil into the inlet port while the compressor is running. Keep the shut-off valve and the condensate drain valves open.
2. After spraying the oil into the inlet port, run the compressor unit for an additional 5 minutes before shutting the compressor unit down.
3. Close the shut-off valve and condensate drain valves.
4. Close the inlet port with a dust cap and/or tape.

8.3.4 Preventive Maintenance During Storage

Operate the compressor once every six months as follows:

1. Remove the dust cap from the inlet port and install the inlet filter.
2. Open the outlet valve and allow the system to run approximately 5 minutes until there is outflow from the valve and oil is visible in the sight glass of the oil regulating valve.
3. Shut down the compressor.
4. Open the condensate drain valves, depressurize the unit, then close the drain valves again.
5. Remove the intake filter and replace the dust cap on the inlet port.

8.3.5 Lubrication Oils for Preservation

1. After prolonged storage periods, the oil will age in the compressor crankcase. The oil must be drained at least every 24 months and replaced with fresh oil.
2. The stated period can only be attained when the crankcase is sealed during the preservation period in accordance with the preservation requirements.
3. After changing the oil, the compressor must be operated according to the instructions above.
4. Check the lubrication of the compressor during the every-six-month brief operation.
5. The oil pump is functioning properly when oil can be seen flowing through the sight glass of the oil pressure regulator or if the oil pressure gauge indicates the prescribed pressure.

8.3.6 Reactivating the Compressor Unit

1. Remove any dust cap or tape from the inlet port and install an intake filter cartridge.
2. Check the oil level of the compressor. If necessary, change the oil.
3. The motor must be thoroughly dry before applying power.
4. For units with a purification system, change all cartridges.
5. Run the compressor with open outlet valve for approximately 10 minutes. Check for proper operation of the lubricating system.
6. After 10 minutes, close the shut-off valve and run the system up to final pressure until the final pressure safety valve vents. On compressor units with a compressor control system, raise the pressure switch setting the switch above normal limits to override the pressure switch. Be sure to reset the switch after checking.
7. Check the interstage safety valves for leakage.
8. Establish the cause of any faults and remedy.
9. Stop the unit when it is running properly. The compressor is then ready for operation.

8.4 Reproducible Forms

8.4.1 Scheduled Maintenance Form

Daily	Para.	Date	Signature

Weekly or as required.	Para.	Date	Signature

500 Operating Hours.	Para.	Date	Signature

1,000 Operating Hours.	Para.	Date	Signature

2,000 Operating Hours.	Para.	Date	Signature

3,000 Operating Hours.	Para.	Date	Signature

Annually.	Para.	Date	Signature

Biennially. (Every two years)	Para.	Date	Signature

8.4.2 Record of Operating Hours

Date	Minutes	Total
Subtotal:		

Date	Minutes	Total
Subtotal:		

8.5 Reference Data

8.5.1 Tightening Torque Values

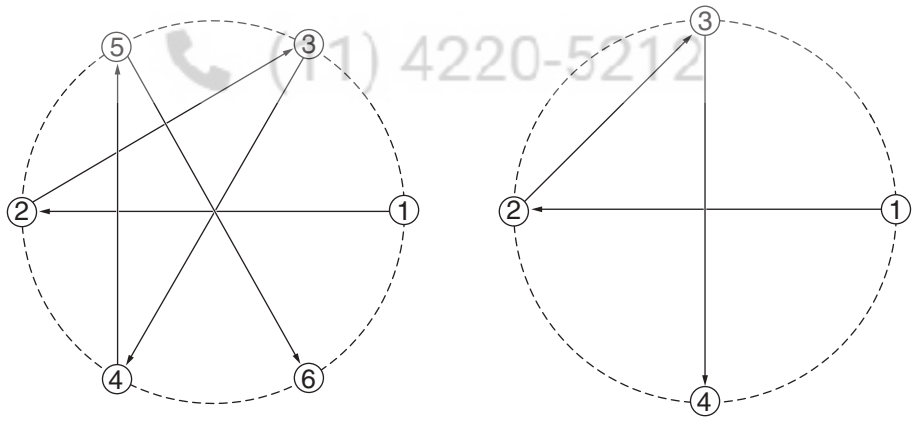
1. Unless otherwise specified in text, the torque values in Table 1 apply.
2. The indicated torque values are valid for bolts in greased condition.
3. Self locking nuts must be replaced on reassembly
4. Pipe connections (swivel nuts) should be tightened just enough so that leakage is stopped. Not more than finger tight plus up to an additional 1/2 turn.

Bolt or Screw	Size	Max. Torque
Hex and socket head	1/4” (M 6)	7 ft. lbs. (10 Nm)
Hex and socket head	5/16” (M 8)	18 ft. lbs. (25 Nm)
Hex and socket head	3/8” (M 10)	32 ft. lbs. (45 Nm)
Hex and socket head	1/2” (M 12)	53 ft. lbs. (75 Nm)
Hex and socket head	9/16” (M 14)	85 ft. lbs. (120 Nm)
Hex and socket head	5/8” (M 16)	141 ft.-lbs (200 Nm)

Table 8-1: Torque Values

8.5.2 Torque Sequence Diagrams

Figure 8-2 6 Bolt and 4 Bolt Torque Sequence



8.5.3 Conversion Formulas

°F = 9/5°C + 32 °C = 5/9 x (°F-32)

PSI = BAR x 14.5 BAR =PSI x 0.0689

8.5.4 Approved Lubricants Chart

Unless otherwise specified in text, use the lubricants in Table 2.

Usage	Lubricants
O-rings, rubber and plastic parts; filter housing threads, sealing rings	Parker Super "O" Lube
Bolts, nuts, studs, valve parts, copper gaskets and tube connection parts (threads, cap nut and compression rings)	Never-Seez® NSWT, Pipe Dope or teflon tape
Paper gaskets	DOW Corning 732 or equivalent silicon compound applied on both sides before assembly,
High temperature connections	DOW Corning 732 or equivalent temperature resistant compound,
Tube connection ferrules,	Never-Seez® NSWT

Table 8-2: Lubricant Chart

8.5.5 Glossary of Abbreviations and Acronyms

†	Available Only as Part of a Complete Assembly
AC	Activated Charcoal, removes odor and taste
ACD	automatic condensate drain
ASME	American Society of Mechanical Engineers
CW	clockwise
CCW	counterclockwise
CGA	Compressed Gas Association
DIN	Deutsches Institut für Normung
DOT	Department of Transportation
E1	single phase electrical supply
E3	three phase electrical supply
HP	Chemical Catalyst, converts carbon monoxide to carbon dioxide
IAW	In Accordance With
MS	Molecular Sieve, removes moisture
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
OSHA	Occupational Safety & Health Administration
ODP	open drip-proof (motor)
OEM	Original Equipment Manufacturer
PCB	printed circuit board
PLC	Programable Logic Controller
PMV	pressure maintaining valve
SC	Securus® Moisture Sensing Device

8.6 Additional Documents

8.6.1 Diagrams and Drawings

Any included drawings, wiring diagrams, pneumatic flow diagrams, etc., will be bound next to the back cover in a hardcopy manual or included as a separate file on a CD.

8.6.2 Other Documents

OEM Manuals and other BAUER manuals may be included in the documentation shipping package.