INSTRUCTION MANUAL AND REPLACEMENT PARTS LIST

BAUER COMPRESSORS

C-E1, C-E3, C-G, C-D

HIGH PRESSURE BREATHING AIR COMPRESSOR UNIT

Model _____

Serial no. _____

Edition September 1995

MNL-0044

BAUER COMPRESSORS, INC.
1328 Azalea Garden Road
Norfolk, Virginia 23502-1944
Telephone: (757) 855-6006 • Telefax: (757) 855-6224

Underwriters Laboratories Inc.®
LISTED


BAUER
COMPRESSORS

This manual contains operating instructions and maintenance schedules for **Horizontal Capitano** high pressure breathing air-compressor unit manufactured by Bauer Compressors, Inc. of Norfolk, Virginia, USA.

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

If these operating instructions are not followed and/or changes are made to the unit without prior written authorization, including the use of maintenance parts not supplied by Bauer, any claims under warranty shall be void. Please contact our customer service department at the numbers listed on the front of this manual should you need any further assistance.

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

NOTICE

Layout and use of instruction manuals

Operating this unit can be dangerous unless the operator possesses a sufficient knowledge of high pressure compressor systems. For this reason, it is advised that the personnel using the unit read this instruction manual first.

This instruction manual and spare parts catalog incorporates a building block format. This means that the table of contents may contain headings which are not applicable to your unit, and that the text may contain information on options which you have not requested. Any information on options not included on your unit may be safely ignored. When ordering spare parts, be certain that the items you order are relevant to your specific unit.

The organization of the instruction manuals is such that from one manual to the next, the section numbers always correspond to the same section titles, i.e., Section 1 always covers Operation and Safety Precautions, Section 2 is General Information, Section 3 is Installation, etc.

If your unit is equipped with non-standard accessories and/or options, information thereon will be included in the annex.

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

24. ANNEX

Glossary of Abbreviations

Drawings and accessory documentation — Document no.

- Purification system operating schedule FOR-0018
- Explanation of model name FOR-0267
- Electrical wiring diagram (electric drive) DGM-0008
- Electrical wiring diagram (electric drive w/options) DGM-0290
- Electrical wiring diagram (gasoline drive) DGM-0282
- Electrical wiring diagram (gasoline drive w/options, no PCB) DGM-0590
- Electrical wiring diagram (gasoline drive w/opts, no PCB, ES) ... DGM-0588
- Electrical wiring diagram (gasoline drive w/options, PCB, ES) ... DGM-0589
- Electrical wiring diagram (diesel drive w/options, no PCB) DGM-0586
- Electrical wiring diagram (diesel drive w/options, PCB, ES) DGM-0587
- Air-flow diagram (standard) DGM-0637
- Air-flow diagram (with options) DGM-0370

Edition/Revision	Date	Notes	Approval
Basic Edition Revision 0	January 1994		
Revision 1	September 1995		
Revision 2	March 2000	Area Code change and Section E deletion	JH

Edition/Revision	Pages		Edition/Revision	Pages

1. OPERATING AND SAFETY PRECAUTIONS

BAUER COMPRESSORS

1.1 GENERAL SAFETY PROCEDURES & WARNINGS

- Read the operating manual before installing or operating this compressor unit. Follow appropriate handling, operation and maintenance procedures from the very beginning. The maintenance plan 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.
- Consult and follow all federal, state, and local regulations, laws and codes covering the installation and operation of this compressor and accessories before operating this unit.
- Refer to NFPA 70 concerning the installation of this compressor unit.
- For units equipped with internal combustion engines, reference also NPFA 37.
- This compressor unit must be installed, operated, maintained and repaired only by authorized, trained and qualified personnel.
- The use of plastic or non-metallic bowls on line filters without metal guards can be hazardous.
- Installer must provide an earth ground and maintain proper clearance for all electrical components (OSHA 1910.302 - 308). All electrical installation must be in accordance with recognized national, state, and local electrical codes.
- Before working on the electrical system, be sure to disconnect the electrical supply from the system by use of a manual disconnect switch. Do not rely on the starter to disconnect the electrical supply. For engine driven units, the battery cables should be disconnected before working on the compressor unit.
- Do not operate this unit in excess of its 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
- 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 discharge valves in a compressor cylinder head can cause an extremely hazardous condition. Refer to the appropriate chapter of this instruction manual before installing or replacing valves.
- A pressure safety valve must be installed in the discharge piping between the compressor and any possible restriction, such as a block valve, check valve, aftercooler, or air dryer. Failure to install such a relief valve could result in personal injury or damage to the compressor.

- If any of the provisions contained in this list (especially concerning safety) do not comply with local provisions of law, the safer provision must be applied.
- Piping subject to temperatures in excess of 175° F (80° C) which may be exposed to personnel must be suitably guarded or insulated.
- Allow the compressor to cool before servicing.
- Limits (pressure values, temperature values, time settings, etc.) must be permanently marked.
- Do not operate the compressor on other than nameplate voltage. Serious bodily harm and/or system damage may occur.
- Do not operate the compressor in areas where there is a possibility of drawing in inflammable or toxic fumes.
- Do not play with compressed air. Pressurized air can cause serious injuries.
- Avoid ignition voltage shock. Avoid contacting breakerless magneto and battery ignition systems.
- Provide adequate fire protection. Make sure fire extinguishers are accessible. Select alternate routes of escape and post such routes.
- Keep safety guards in place.
- Make sure you are equipped with all required safety equipment; hearing protection, safety glasses, hard hats, safety shoes and fire extinguisher.
- Visually inspect the compressor or unit before restarting. Remove and or replace any loose or broken components, tools, valves, missing equipment, etc.
- Do not modify the compressor unit or its systems.
- Do not tamper with, modify or bypass the compressor unit and shutdown equipment.
- Do not exceed maximum allowable compressor unit pressures and temperatures.
- The operator is responsible for keeping the machine in safe operating condition. If parts and accessories are not considered to be reliable for safe operation, they must be replaced immediately. Periodically check all safety devices, temperature and pressure gauges to make sure that the control system is governing the unit operation within the proper limits.
- Keep the operating manual available for the operators, and take care that operation and maintenance are performed according to the instructions. Enter all operating data, executed maintenance measures, etc. in a log. Observe all relevant safety provisions.
- Failure to follow any of these procedures or the following warnings may result in an accident causing personal injury or property damage.

- Do not wear loose clothing around machinery. Loose clothing; neckties, rings, wrist watches, bracelets, hand rags, etc. are potential hazards.
- Replace damaged fan blades promptly. Fan assemblies must remain in proper balance. An unbalanced fan can fly apart and create an extremely dangerous condition.
- Properly ventilate the engine operating area. Internal combustion engine exhaust products are toxic and can cause injury or death when inhaled.
- [1]A compressor used for breathing air service must be fitted with specialized equipment to properly filter and purify the air to meet all applicable federal, state, and local laws, rules, regulations and codes, such as, but not limited to, OSHA 29 CFR 1910.134, Compressed Gas Association commodity specification G-7.1-1989, Grade E breathing air, and/or Canadian Standards Association. The presence of a purification system does not end the requirement for suitable air intake to ensure high quality breathing air.
- Bauer air-compressors equipped with a Bauer purification system and meeting proper air intake conditions, exceed the CGA Grade E breathing air requirements and are suitable for use in breathing air service.
- While operating the compressor unit for breathing air service, the purchaser/user assumes all liability resulting from modification to the air intake conditions or compressor equipment design and/or failure to add a Bauer purification system to the compressor unit. Bauer Compressors, Inc will not assume any liabilities resulting from operation of modified equipment.
- The purchaser is urged to include this provision in any agreement for the resale of this compressor unit.
- The use of repair parts other than those included within the Bauer approved parts list may create hazardous conditions over which Bauer has no control. Such hazardous 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.
- 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.
- Compressed air and electricity are a dangerous combination:

  Before doing any work involving maintenance or adjustment, be sure the electrical supply has been cut off and the entire 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.

1. Changed March 3, 1998 CLA

- Disconnect the main power before opening any access door or attempting any service. The compressor could start automatically. Compressed air and electricity are a dangerous combination.
- Use only recommended oil in your compressor. Failure to do so may cause excessive carbon deposits and system damage and may void your warranty.
- Inspect the air/oil separator, oil, and air-filter according to the maintenance schedule. Dirt, oxidized oil and increased air velocity may cause carbon build-up, property damage and/or severe injury or death.
- Extreme care should be taken when the compressor is not operating. With the selector switch in the "ON" or "AUTO" position, it may start automatically.
- This compressor system is not suitable for EAN, Nitrox, or any other gas-mix application.
- When planning the installation of a Bauer high pressure compressor, it is both essential and desirable that a high pressure receiver be included in the system downstream of the compressor. The receiver should be sized so that the compressor is stopped and restarted no more than four times each hour. The primary reasons are for (1) economics and (2) motor protection.

  The usual operating protocol for a high pressure compressor system is to control the compressor by turning it on or off via start/stop device such as a pressure switch. In this case the pressure switch is set to turn off the compressor at the customer's required working pressure and to automatically restart the compressor when the pressure in the receiver falls to a predetermined lower pressure. By operating the system in this energy conserving manner, the compressor is running only when it needs to re-charge the receiver.

  It is our position that the inclusion of an adequately sized receiver is of sufficient importance in establishing a trouble free system that we have addressed the issue in our warranty policy; which states that AN INAPPROPRIATE SERVICE OR DUTY CYCLE OR AN IMPROPER INSTALLATION CAN BE CAUSE FOR REJECTING WARRANTY CLAIMS.

  If the purchaser needs assistance in sizing a receiver or needs advice as to the suitability of a compressor model for a specific application, service or duty cycle, we urge you to call us. Our Engineering Department will be happy to assist you.

  Listed regulations were selected based on possible relationship to equipment supplied by **BAUER** Compressors, Inc. and is by no means a complete listing of all applicable rules and regulations governing the uses of compressed air and gases. Consult and follow all national, state, and local regulations, laws, and codes governing the installation and operation of this compressor and/or accessories before operating this equipment.

The following are selected excerpts from the "Code of Federal Regulations" (CFR) for the 'USE, SAFETY, AND MAINTENANCE OF DIVING COMPRESSORS, SUPPLY HOSES, AND COMPRESSED GAS CYLINDERS'.

197.310 AIR-COMPRESSOR SYSTEM.

A compressor used to supply breathing air to a diver must have a volume tank that is built and stamped in accordance with section VIII, division1 of the ASME code with a check valve on the inlet side, a pressure gauge, a relief valve, and a drain valve. It must be tested after every repair, modification, or alteration to the pressure boundaries as required by 197.462, and have intakes that are located away from areas containing exhaust fumes of internal combustion engines or other hazardous contaminants, an efficient filtration system, and slow-opening shut-off valves when the allowable working pressure of the system exceeds 500 psig.

197.312 BREATHING SUPPLY HOSE

Each breathing supply hose must have a maximum working pressure that is equal to or exceeds the maximum working pressure of the section of the breathing supply system in which used, and the pressure equivalent of the maximum depth of the dive relative to the supply source plus 100 psig. It must have a bursting pressure of four times its maximum working pressure, have connectors that are made of corrosion resistant material and are resistant to accidental disengagement, and have a maximum working pressure that is at least equal to the maximum working pressure of the hose to which they are attached, and resist kinking by being made of kink-resistant materials or having exterior support.

Each umbilical must meet requirements of the paragraph above and be marked from the diver or open bell end in 10-foot intervals to 100 feet and in 50-foot intervals thereafter.

197.336 PRESSURE PIPING

Piping systems that are not an integral part of the vessel or facility, carrying fluids under pressures exceeding 15 psig must meet the ANSI Code, have the point of connection to the integral piping system of the vessel or facility clearly marked, and be tested after every repair, modification or alteration to the pressure boundaries as set forth in 197.462.

197.338 COMPRESSED GAS CYLINDERS

Each compressed gas cylinder must meet the following specifications:

- Be stored in a ventilated area
- Be protected from excessive heat
- Be prevented from falling
- Be tested after any repair, modification, or alteration

  to the pressure boundaries as set forth in 197.462
- Meet the requirements of 49CFR 173.34 and 49 CFR 178 subpart C

197.340 BREATHING GAS SUPPLY

A primary breathing gas supply for SCUBA diving must be sufficient to support the diver for the duration of the planned dive through his return to the dive location or planned pick-up point. A diver-carried reserve breathing gas supply for SCUBA diving must be sufficient to allow the diver to return to the dive location or planned pick-up point from the greatest depth of the planned dive.

Compressed air used for breathing mixtures must possess the following:

- Be 20 to 22 percent oxygen by volume
- Have no objectionable odor
- Have no more than 1,000 parts per million of carbon dioxide, 20 parts per million carbon monoxide, 5 milligrams per cubic meter of solid and liquid particulate including oil, and 25 parts per million of hydro-carbons (includes methane and all other hydrocarbons expressed as methane).

197.346 DIVER'S EQUIPMENT.

Each diver using SCUBA must have the following:

- Self-contained underwater breathing equipment

  A primary breathing gas supply with a cylinder pressure gauge readable by a diver during the dive

  A diver-carried reserve breathing gas supply provided by a manual reserve (J valve) or an independent reserve cylinder connected and ready for use

- Face mask
- Inflatable flotation device
- Weight belt capable of quick release
- Knife
- Swim fins or shoes
- Diving wristwatch
- Depth gauge

Each diver diving outside the no-decompression limits, deeper than 130 fsw, or using mixed-gas must have a diver-carried reserve breathing gas supply except when using a heavy-weight diving outfit or when diving in a physically confining area.

197.450 BREATHING GAS TESTS

The diving supervisor shall insure for the following:

- The output of each air-compressor is tested and meets the requirements of 197.340 for quality and quantity by means of samples taken at the connection point to the distribution system every 6 months, and after every repair or modification.
- Purchased supplies of breathing mixtures supplied to a diver are checked before being placed on line for certification that the supply meets the requirements of 197.340, and (2) noxious or offensive odor and oxygen percentage.
- Each breathing supply system is checked, prior to commencement of diving operations, at the umbilical or underwater breathing apparatus point for the diver, for noxious or offensive odor and presence of oil mist.
- Each breathing supply system, supplying mixed-gas to a diver, is checked, prior to the commencement of diving operations, at the umbilical or underwater breathing apparatus connection point for the diver and for the percentage of oxygen.

197.456 BREATHING SUPPLY HOSES

The diving supervisor shall insure the following:

- Each breathing supply hose is pressure tested prior to being placed into initial service and every 24 months thereafter to 1.5 times its maximum working pressure.
- Each breathing supply hose assembly, prior to being placed into initial service and after any repair, modification, or alteration, is tensile tested by subjecting each hose-to-fitting connection to a 200 pound axial load, and passing a visual examination for evidence of separation, slippage or other damage to the assembly.
- Each breathing supply hose is periodically checked for damage and contamination which is likely to affect pressure integrity, and the purity of the breathing mixture delivered to the diver.
- The open ends of each breathing supply hose are taped, capped, or plugged when not in use.

To meet the requirements of checking for damaged hose, each breathing supply hose must be carefully inspected before being shipped to the dive location, visually checked during daily operation, and checked for noxious or offensive odor before each diving operation.

197.462 PRESSURE VESSELS AND PRESSURE PIPING

The diving supervisor shall insure that each volume tank, cylinder, PVHO, and pressure piping system has been examined and tested every 12 months; and after any repair, modification or alteration to the extent necessary to determine that they are in condition and fit for the service intended.

The following test must be made to meet the annual requirements of the above paragraph:

- Internal and external visual examination for mechanical damage or deterioration.

If a defect is found that may impair the safety of the pressure vessel, a hydrostatic test must be performed.

- Leak test
- Pneumatic test
- Hydrostatic test every fifth year instead of the pneumatic test

The following tests must be made after any repair, modification or alteration to meet the annual requirements of this section:

- Internal and external visual examination for correctness and adequacy of repair, modification, or alteration
- Leak test
- Hydrostatic test when the repair, modification or alteration affects the pressure boundary

When the pneumatic test on pressure vessels is conducted, proceed as follows:

- The test pressure must be the maximum allowable working pressure stamped on the pressure vessel
- The test may be conducted only after suitable precautions are taken to protect personnel and equipment.

When the pneumatic test on pressure piping is conducted:

- The test pressure must be no less than 90 percent of the setting of the relief device.
- The test may be conducted only after suitable precautions are taken to protect personnel and equipment.

When a hydrostatic test on a pressure vessel is made, the test pressure must be the following:

- 1¼ times the pressure stamped on the pressure vessel built to division 2 of the ASME Code.
- 1½ times the pressure stamped on the pressure vessel built to division 1 of the ASME Code.

When a hydrostatic test on pressure piping is conducted, the test must be conducted in accordance with the ANSI Code.

When the leak test on pressure vessels or pressure piping is conducted proceed as follows:

- The test must be conducted with the breathing mixture normally used in service.
- The test must be conducted at the maximum allowable working pressure.

- The test pressure must be maintained for a minimum of 10 minutes to allow for checking all joints, connections, and regions of high stress for leakage.

The following are excerpts from the "Code of Federal Regulations" (CFR) 29 as used by OSHA. Because of differing uses and compressor types; please refer to CFR 29 1910.95 (Occupational Noise Exposure) to determine whether or not hearing protection will be required.

1910.101 COMPRESSED GASES (GENERAL REQUIREMENTS)

Inspection of Compressed Gas Cylinders

Each employer shall determine that compressed gas cylinders under his control are in a safe condition to the extent that this can be determined by visual inspection. Visual and other inspections shall be conducted as prescribed in the Hazardous Materials Regulations of the Department of Transportation (49 CFR parts 171-179 and 14 CFR part 103). Where those regulations are not applicable, visual and other inspections shall be conducted in accordance with Compressed Gas Association Pamphlets C-6-1968 and C-8-1962.

Compressed Gases

The in-plant handling, storage, and utilization of all compressed gases in cylinders, portable tanks, rail tank cars, or motor vehicle cargo tanks shall be in accordance with Compressed Gas Association Pamphlet P-1-1965.

Safety Relief Devices for Compressed Gas Containers

Compressed gas cylinders, portable tanks, and cargo tanks shall have pressure relief devices installed and maintained in accordance with Compressed Gas Association pamphlets S-1.1-1963 and 1965 addenda and S-1.2-1963.

1910.134 RESPIRATORY PROTECTION

Air Quality

Compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration shall be of high purity. Oxygen shall meet the requirements of the United States Pharmacopoeia for medical or breathing oxygen. Breathing air shall meet at least the requirements of the specification for Grade D breathing air as described in Compressed Gas Association Commodity Specification G-7.1-1966. Compressed oxygen shall not be used in supplied-air respirators or in open circuit self-contained breathing apparatus that have previously used compressed air. Oxygen must never be used with air line respirators.

Breathing air may be supplied to respirators from cylinders or air-compressors. Cylinders shall be tested and maintained as prescribed in the Shipping Container Specification Regula-

tions of the Department of Transportation (49 CFR part 178). The compressor for supplying air shall be equipped with the necessary safety and standby devices. A breathing air-type compressor shall be used. Compressors shall be constructed and situated so as to avoid entry of contaminated air into the system and suitable in-line air purifying sorbent beds and filters installed to further assure breathing air quality. A receiver of sufficient capacity to enable the respirator wearer to escape from a contaminated atmosphere in event of compressor failure, and alarms to indicate compressor failure and overheating shall be installed in the system. If an oil-lubricated compressor is used, it shall have a high-temperature or carbon monoxide alarm, or both. If only a high-temperature alarm is used, the air from the compressor shall be frequently tested for carbon monoxide to insure that it meets specifications.

Air line couplings shall be incompatible with outlets for other gas systems to prevent inadvertent servicing of air line respirators with non-respirable gases or oxygen.

Breathing gas containers shall be marked in accordance with the American National Standard Method of Marking Portable Compressed Gas Containers to Identify the Material Contained,Z48.1-1954; Federal Specification BB-A-1034a, June 21, 1968, Air, Compressed for Breathing Purposes; or Interim Federal Specification GG-B-00675b, April 27, 1965, Breathing Apparatus, Self-Contained.

1910.169 Air-receivers

General Requirements

Application

This section applies to compressed air receivers, and other equipment used in providing and utilizing compressed air for performing operations such as cleaning, drilling, hoisting, and chipping. This section does not deal with the special problems created by using compressed air to convey materials nor the problems created when men work in compressed air as in tunnels and caissons. This section is not intended to apply to compressed air machinery and equipment used on transportation vehicles such as steam railroad cars, electric railway cars, and automotive equipment.

New and existing equipment

All new air-receivers installed after the effective date of these regulations shall be constructed in accordance with the 1968 edition of the A.S.M.E. Boiler and Pressure Vessel Code, Section VIII. All safety valves used shall be constructed, installed, and maintained in accordance with the A.S.M.E. Boiler and Pressure Vessel Code, Section VIII Edition 1968.

Installation and Equipment Requirements

Installation

Air-receivers shall be so installed that all drains, hand holes, and manholes therein are easily accessible. Under no circumstances shall an air-receiver be buried underground or located in an inaccessible place.

Drains and traps

A drain pipe and valve shall be installed at the lowest point of every air receiver to provide for the removal of accumulated oil and water. Adequate automatic traps may be installed in addition to drain valves. The drain valve on the air-receiver shall be opened and the receiver completely drained frequently and at such intervals as to prevent the accumulation of excessive amounts of liquid in the receiver.

Gauges and valves

Every air receiver shall be equipped with an indicating pressure gauge (so located as to be readily visible) and with one or more spring-loaded safety valves. The total relieving capacity of such safety valves shall be such as to prevent pressure in the receiver from exceeding the maximum allowable working pressure of the receiver by more than 10 percent. No valve of any type shall be placed between the air-receiver and its safety valve or valves. Safety appliances, such as safety valves, indicating devices and controlling devices, shall be constructed, located, and installed so that they cannot be readily rendered inoperative by any means, including the elements. All safety valves shall be tested frequently and at regular intervals to determine whether they are in good operating condition.

1910.219 MECHANICAL POWER TRANSMISSION APPARATUS

CARE OF EQUIPMENT

General

All power-transmission equipment shall be inspected at intervals not exceeding 60 days and kept in good working condition at all times.

Shafting

Shafting shall be kept in alignment, free from rust and excess oil or grease. Where explosives, explosive dusts, flammable vapors or flammable liquids exist, the hazard of static sparks from shafting shall be carefully considered.

Bearings

Bearings shall be kept in alignment and properly adjusted.

Pulleys

Pulleys shall be kept in proper alignment to prevent belts from running off.

Care of Belts

Inspection shall be made of belts, lacings, and fasteners and such equipment kept in good repair.

1910.243 GUARDING OF PORTABLE POWERED TOOLS

PNEUMATIC POWERED TOOLS AND HOSE

Air Hose

Hose and hose connections used for conducting compressed air to utilization equipment shall be designed for the pressure and service to which they are subjected.

2.1 TECHNICAL DATA[1]

Compressor unit	**C-E1**
Medium	air
Delivery	5.0 scfm (140 *l*/min)[2]
Inlet pressure	atmospheric
Operating pressure, max.	5000 psig (350 bar)
Ambient temperature range	40° to 105° F (5° to 40° C)
Air discharge temperature	20 to 30° F above ambient temp.
Compressor block	**KC-FH (Capitano)**
No. of stages	3
No. of cylinders	3
Cylinder bore, 1st stage	2.76 in. (70 mm)
Cylinder bore, 2nd stage	1.42 in. (36 mm)
Cylinder bore, 3rd stage	0.58 in. (14 mm)
Piston stroke	1.57 in. (40 mm)
Direction of rotation, viewing flywheel	CCW
Oil capacity	1.5 quarts (1.42 *l*)
Oil, petroleum	Bauer P/N: OIL-0001
Oil, synthetic	Bauer P/N: OIL-0002
ODP motor	**MTR-0023**
Operating voltage	208 - 460 V, 1 phase
Power	5 hp (3.7 kW)
Speed	3510 rpm
Frequency	60 Hz
Frame size	184-T

1. Subject to change without prior notice.
2. Compressor capacity referenced to standard inlet conditions.

Compressor unit	**C-E3**
Medium	air
Delivery	5.0 scfm (140 *l*/min)[3]
Inlet pressure	atmospheric
Operating pressure, max.	5000 psig (350 bar)
Ambient temperature range	40° to 105° F (5° to 40° C)
Air discharge temperature	20 to 30° F above ambient temp.
Compressor block	**KC-FH (Capitano)**
No. of stages	3
No. of cylinders	3
Cylinder bore, 1st stage	2.76 in. (70 mm)
Cylinder bore, 2nd stage	1.42 in. (36 mm)
Cylinder bore, 3rd stage	0.58 in. (14 mm)
Piston stroke	1.57 in. (40 mm)
Direction of rotation, viewing flywheel	CCW
Oil capacity	1.5 quarts (1.42 *l*)
Oil, petroleum	Bauer P/N: OIL-0001
Oil, synthetic	Bauer P/N: OIL-0002
ODP motor	**MTR-0022**
Operating voltage	208 - 460 V, 3 phase
Power	5 hp (3.7 kW)
Speed	3435 rpm
Frequency	60 Hz
Frame size	182-T

3. Compressor capacity referenced to standard inlet conditions.

Compressor unit	**C-G**
Medium	air
Delivery	5.0 scfm (140 *l*/min)[4]
Inlet pressure	atmospheric
Operating pressure, max.	5000 psig (350 bar)
Ambient temperature range	40° to 105° F (5° to 40° C)
Air discharge temperature	20 to 30° F above ambient temp.
Compressor block	**KC-FH (Capitano)**
No. of stages	3
No. of cylinders	3
Cylinder bore, 1st stage	2.76 in. (70 mm)
Cylinder bore, 2nd stage	1.42 in. (36 mm)
Cylinder bore, 3rd stage	0.58 in. (14 mm)
Piston stroke	1.57 in. (40 mm)
Direction of rotation, viewing flywheel	CCW
Oil capacity	1.5 quarts (1.42 *l*)
Oil, petroleum	Bauer P/N: OIL-0001
Oil, synthetic	Bauer P/N: OIL-0002
Gasoline engine	**ENG-0024 (ENG-0054)[5]**
Fuel tank capacity	0.95 gal (3.6 l)
Oil sump capacity	0.63 qt (0.6 l)
Power	5.5 hp (4.1 kW)
Speed	3600 rpm
No. of cylinders	1

4. Compressor capacity referenced to standard inlet conditions.
5. With electric start option.

Compressor unit	**C-D**
Medium	air
Delivery	5.0 scfm (140 *l*/min)[6]
Inlet pressure	atmospheric
Operating pressure, max.	5000 psig (350 bar)
Ambient temperature range	40° to 105° F (5° to 40° C)
Air discharge temperature	20 to 30° F above ambient temp.
Compressor block	**KC-FH (Capitano)**
No. of stages	3
No. of cylinders	3
Cylinder bore, 1st stage	2.76 in. (70 mm)
Cylinder bore, 2nd stage	1.42 in. (36 mm)
Cylinder bore, 3rd stage	0.58 in. (14 mm)
Piston stroke	1.57 in. (40 mm)
Direction of rotation, viewing flywheel	CCW
Oil capacity	1.5 quarts (1.42 *l*)
Oil, petroleum	Bauer P/N: OIL-0001
Oil, synthetic	Bauer P/N: OIL-0002
Diesel engine	**ENG-0045 (ENG-0053)[7]**
Fuel tank capacity	3.7 quarts (3.5 l)
Oil sump capacity	1.16 quarts (1.1 l)
Power	6 hp (4.4 kW)
Speed	3600 rpm
No. of cylinders	1

6. Compressor capacity referenced to standard inlet conditions.
7. With electric start option.

2.2 COMPRESSOR BLOCK DESIGN

2.2.1 General

The **KC-FH** compressor block is used to compress air in the high pressure range up to 5000 psi. It is a three stage, air-cooled reciprocating piston compressor. The 3rd stage cylinder is lubricated by means of the forced-feed lubrication system, the other cylinders are splash-lubricated. The cylinders are arranged in a 'W' configuration, the first stage being situated in the center, the second stage on the left, and the third stage on the right, when facing the flywheel.

This compressor block is particularly suitable for continuous operation because of its rugged design and the corrosion resistant intermediate filter and cooler assemblies. Smooth running is a particular feature of this BAUER design. The balance of masses of the first rank is zero. The moving parts of the crankshaft are all equally balanced. This results in low vibration while running. The crankshaft is fitted with three roller bearings, while the upper connecting rod uses needle bearings. The lower connecting rod also utilizes the energy saving roller bearings. This allows for longer life. All valves have free access for time saving maintenance, there is no need for dismantling of pipes or pressure gauges.

2.2.2 Compressor Block Components

The design of the compressor block and its major components are shown in the following illustrations.

1 Intercooler, 2nd/3rd stage
2 Inter-filter, 2nd/3rd stage
3 Oil pressure regulator
4 Cylinder, 3rd stage
5 Oil filler cap/dipstick
6 Safety valve, 2nd stage
7 Air-intake filter
8 Cylinder, 1st stage
9 Safety valve, 1st stage
10 Cylinder, 2nd stage
11 Intercooler, 1st/2nd stage
12 Oil drain plug
13 Manual condensate drain tap

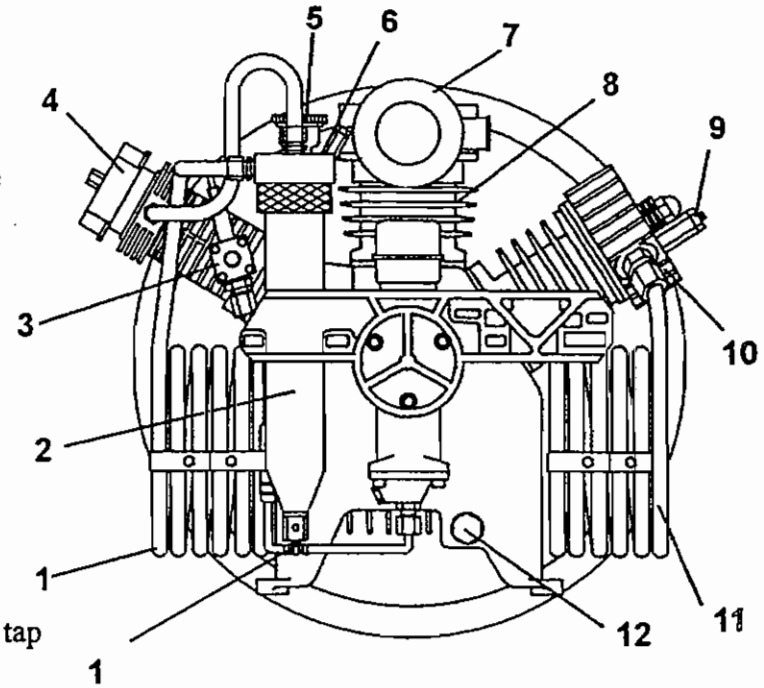


Fig. 2.1 KC-FH compressor block, rear view (oil pump side)

2.3 COMPRESSOR UNIT DESIGN

2.3.1 General

These high pressure air-compressor units are used for application in the high pressure range, up to 5000 psig (350 bar), to compress and purify air for breathing air purposes. The units feature a three-stage, three-cylinder, air-cooled KC-FH high pressure air compressor block.

The compressor units of the Capitano series are manufactured with the drive motor/ engine arranged parallel to the compressor block. The system is enclosed within a frame and belt guard assembly. Standard equipment includes an oil and water separator after the final stage, a Triplex purifier chamber, an electrical enclosure with a selector switch, an intake filter maintenance indicator, a final pressure safety valve, pressure maintaining valve and air outlet with fittings.

Approximate weight:

C-E1 compressor unit	290 lbs.
C-E1 compressor unit (w/options)	350 lbs.
C-E3 compressor unit	280 lbs.
C-E3 compressor unit (w/options)	345 lbs.
C-G compressor unit	475 lbs.
C-G compressor unit (w/options)	540 lbs.
C-D compressor unit	525 lbs.
C-D compressor unit (w/options)	590 lbs.

2.3.2 Compressor Unit Components

The compressor unit comprises the following major assemblies:

- compressor block
- frame assembly
- instrument panel[8]
- up to P5 SECURUS purification[8]
- fill hose assembly
- drive motor or engine
- automatic condensate drain system[8]
- P0 purification system w/triplex
- electric control system

The design of the compressor unit and its components are shown in the following illustration and in the drawings in the annex.

8. optional accessory

1 Compressor
2 Instrument panel[9]
3 Frame
4 ACD[9]
5 Electrical box
6 Electric motor
7 Belt guard

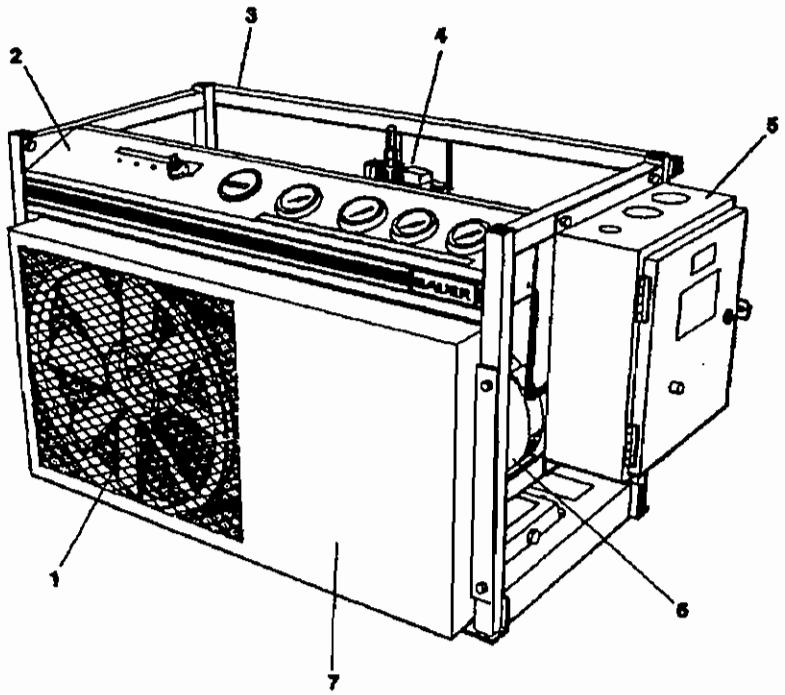


Fig. 2.2 C-E1/E3 air-compressor unit

1 Air-compressor
2 Gasoline or diesel engine
3 Frame
4 Electrical enclosure[9]
5 Instrument panel[9]
6 Automatic condensate drain[9]
7 Belt guard

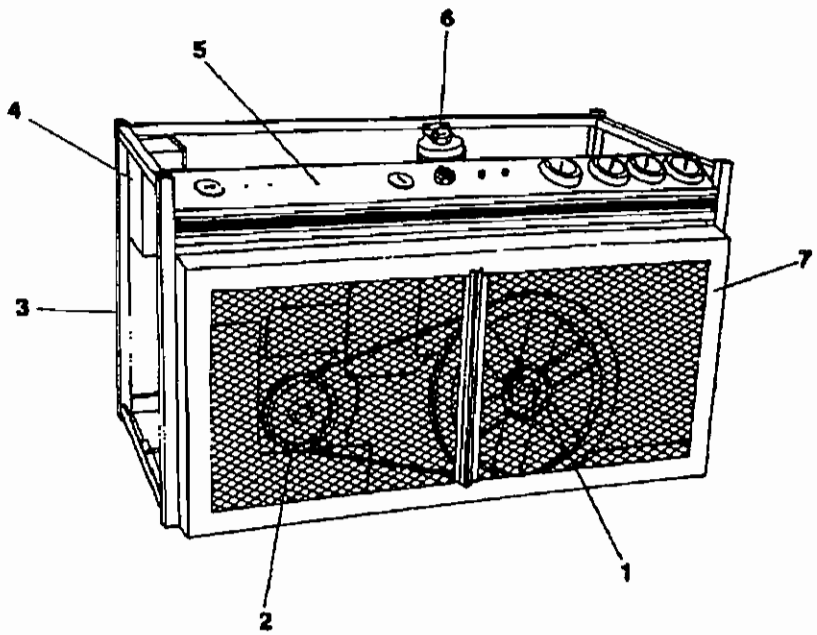


Fig. 2.3 C-G/C-D air-compressor unit

9. optional accessory

2.3.3 Compressor Unit Air-Flow

Reference the flow diagram in the annex, section 24.

Ambient air is drawn into the compressor unit through the intake filter (F1) by the compressor first stage (I) where it is compressed to a pressure of approximately 90 to 95 psi (6 to 6.5 bar).

Compressed air from the first stage (I) then passes through an intercooler to the second stage (II) where is it further compressed to approximately 640 to 685 psi (45 to 50 bar).

The compressed air leaving the second stage (II) is routed through another intercooler and an inter-filter before entering the third stage (III) where it is compressed to the final operating pressure of the compressor unit (see the compressor unit data plate).

Air from the third stage (III) then flows through an aftercooler to the P0 purification system or to an optional purification system and through a pressure maintaining valve to the compressor unit air outlet.

3.1 UNPACKING AND HANDLING

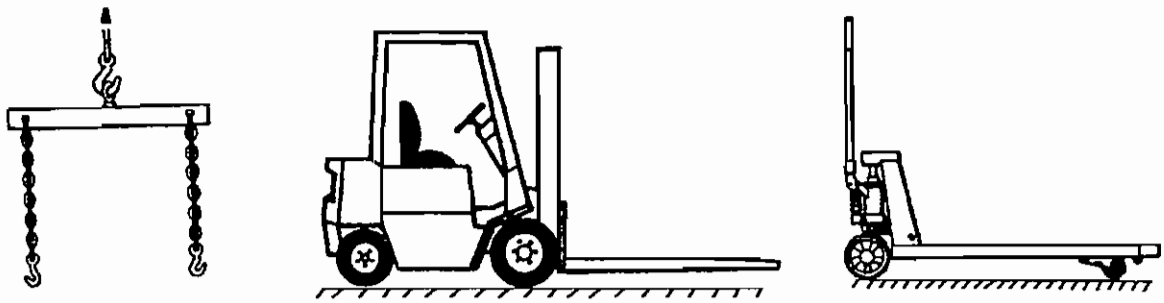
This compressor unit is packaged according to the requirements for shipping via the requested type of carrier service. It is possible that the compressor unit could have been damaged during shipping. For this reason, we urge you to thoroughly examine the unit for possible damage and report any such damage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

Handling of the unpacked unit should be performed only by the following methods if applicable. Note, for trailer mounted compressor units, ensure that the towing vehicle is capable of pulling the weight of the trailer unit.

CAUTION

Be sure that the lifting devices are capable of handling the weight of the unit (see section 2 for the weight of the compressor unit). Before lifting the unit, secure all loose or swinging parts to keep them from moving. Stay clear of lifted load.



a) over head hoist b) forklift c) pallet jack

Fig. 3.1 Lifting devices

3.2 INSTALLATION OF THE COMPRESSOR UNIT

3.2.1 General

A machine base is not necessary; however, for units with a fill station, you should bolt the unit to the floor using ½" lag bolts. In the event of a bottle failure, a substantial amount of energy will be released; this additional measure will help secure the unit.

The floor/site must be capable of supporting the weight of the unit. Position the unit so that it is level. Permissible inclination of the compressor unit is 10° forward/backward, 10° right/left.[1]

1. These values are valid only if the oil level of the compressor in normal position 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 inflammable vapors or exhaust 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.

For units with insular pneumatic controls, connect an instrument grade air supply line of the correct pressure to the pneumatic air inlet port for operation of the pneumatic controls.

If a remote control is provided, the unit must be equipped with a clearly visible plate warning the possibility of the unit starting. e.g.

WARNING
This unit is operated by remote control and could start without warning.

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.

For units with a hydraulic motor, connect the appropriate hydraulic lines to the inlet and outlet ports. Consult the factory for proper flow and pressure specifications. The hose or tube should be suitable for use with hydraulic oils and of correct size.

For bare head models, make sure that the discharge pipe from the compressor to the outlet has room to expand due to heat and does not come into contact with inflammable materials. Do not exert force at the air outlet valve; the connecting pipe must be fitted without tension.

Observe and maintain an ambient temperature range of 32° to 105° F. For installation in temperatures outside of this ambient temperature range, the unit can be modified for correct operation. Such technical modifications should be made in the proposal stage.

The compressor unit should be well lit and easily accessible to facilitate servicing and routine maintenance.

This 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 accordingly.

3.2.2 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.

Outdoor installation

It is recommended that all gasoline and diesel engine[2] driven compressor units be installed outdoors. Additionally, electrically driven compressor units may installed outdoors only if enclosed with weatherproof enclosure panels.[2]

It is important that units equipped with a gasoline or diesel engine[2] 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. Situate the compressor unit such that the engine exhaust is located down-wind of the compressor air-intake so that the engine exhaust is blown away from the unit.

If applicable, the pre-filter should be located 6 ft. above the ground and 7 ft. upwind from the engine exhaust muffler (see fig. 3.2).Turn the compressor unit when the direction of the wind changes. In inclement weather, a compressor unit installed outdoors should be located under a tarp or lean-to structure if it is not equipped with weatherproof enclosure panels.

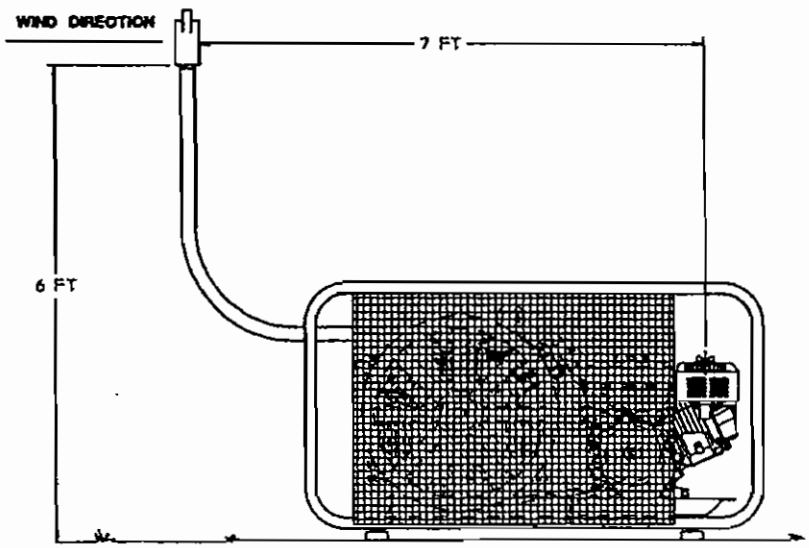


Fig. 3.2 Locating the compressor prefilter of engine driven units[2] (C-G/DV shown)

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.

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, consider the following table:

2. not available on all models

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 (ft^2)	Exhaust (ft^2)	Intake (ft^2)	Exhaust (ft^2)	Intake (ft^2)	Exhaust (ft^2)
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

If the natural ventilation is insufficient, the circulation of cooling air can be increased by the installation of a fan in the exhaust opening. To determine the required intake opening and exhaust flow required with a fan, consider 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 (ft^2)	Exhaust cfm	Intake (ft^2)	Exhaust cfm	Intake (ft^2)	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.

3.2.3 Electrical Installation

3.2.3.1 Electric drive

When making the electrical connections to the system, it is mandatory to observe the following instructions:

- 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 nameplate.
- Provide all necessary cables and main fuses and a master disconnect switch. The fusing of the compressor must be carried out in compliance with the regulations of the local, state and national electrical authorities.

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.

The only customer wiring necessary is the leads from the power cable which must be connected to L1/L2/L3 (or L1/L2 for 1 phase) and ground and the wiring between the electrical enclosure and the compressor unit. See the wiring diagrams in the Annex.

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 table is provided as a guide for proper wire size.

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

3 PHASE									
Motor hp	Full Load Amps			Fuse Amps[a]			Minimum Wire Size[b]		
	208V	230V	460V	208V	230V	460V	208V	230V	460V
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
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

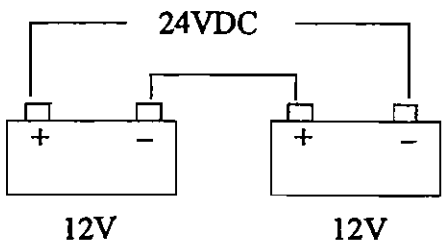
a . Dual element time delay fuse amps.
b . Normal copper wire with THW, THWN or XHHW insulation.

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

3.2.3.2 Gasoline or diesel drive[3]

Units w/24VDC:

This compressor unit requires two 12VDC batteries installed in series for a total of 24VDC. Batteries of 600 CCA or greater are recommended.



Units w/12VDC:

This compressor unit requires one 12VDC battery. We suggest a battery of 600 CCA or greater.

3. Not available on all models.

3.2.3.3 Hydraulic drive[4]

This unit must be connected electrically with a 12 volt negative ground electrical system. A terminal board is provided within the electrical junction box on the compressor unit

WARNING

The electrical junction box should only be opened by a qualified electrician and only after the battery has been disconnected. Failure to comply with this warning can cause injury to personnel or damage to property.

On the terminal board provided for customer connection in the electrical junction box, there are two connections labelled no. 1 and no. 2. Using wires of a minimum size of 14 gauge, connect a positive line from the 12 volt system to no. 1 and a negative line to connection no. 2.

4. Not available on all models.

4.1 FUNCTIONAL DESCRIPTION

The compressor is provided with force-feed lubrication for the third stage (fig. 4.1). The oil pump (1) is driven by a cam of the crankshaft. It pumps oil into the oil pressure regulator (2) at the 3rd stage. The oil pressure regulator maintains the proper working pressure.

Any oil not needed by the 3rd stage cylinder returns to the crankcase through the feedback tube (3). The oil, splashed by the drive gear, lubricates the other moving parts, such as the crankshaft, connecting rods, cylinders and pistons, and returns into the oil sump. The cylinder and piston of the 1st stage are additionally lubricated by oil vapors from the crankcase vent feedback line (4).

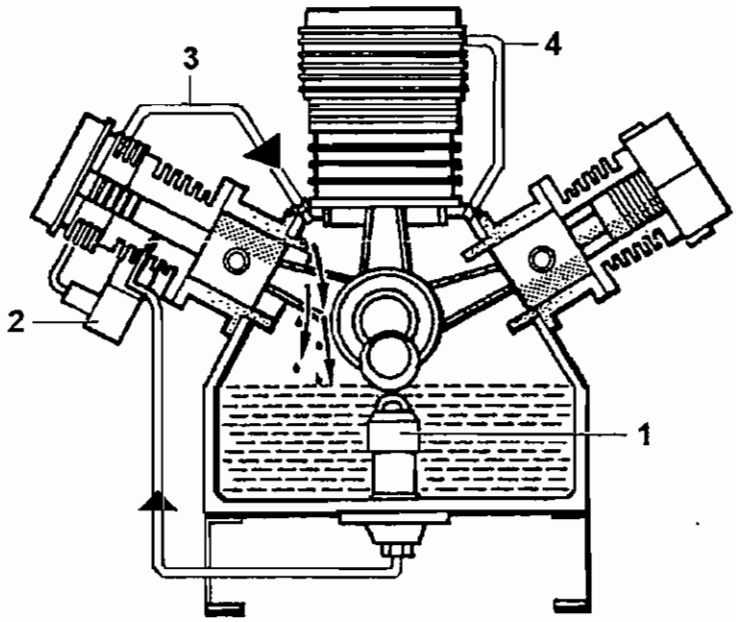


Fig. 4.1 Lubricating oil circuit

4.2 TYPE OF OIL

For proper care and maintenance of the compressor, using an oil of the correct viscosity is of vital importance. Depending on the application of the compressor, the requirements placed on the lubricating oils are as follows:

- Low deposits
- No carbonizing effect, especially in the valves
- Good anti-corrosive properties
- Minimal emulsification of the condensate in the crankcase
- Physiological and toxicological suitability, if applicable

Due to the thermal load on the compressor, only high quality oil should be used. It is recommended that you restrict oils to those which have a proven record of success and are specified with the above characteristics.

4.2.1 Operation under normal conditions

For operation during the run-in period, to ensure proper seating of the piston rings, and for operation under normal conditions, use petroleum-based compressor oil (for

BAUER P/N, see section 2). It is suitable for operation under ambient temperatures between 40°F (5°C) and 95°F (35°C).

4.2.2 Operation under severe conditions

For operation under severe operating conditions such as continuous running and/or high ambient temperatures, we recommend the use of synthetic compressor oil (for BAUER P/N, see section 2). This oil can also be used under normal conditions. When using this oil, the change intervals are longer than that of petroleum-based oil.

4.3 OIL CHANGE

The oil should be changed regularly according to the maintenance schedule (section 19). See section 2 for oil type and crankcase capacity.

4.3.1 Changing the Type of Oil

If a petroleum oil is used on subsequent oil changes, no problems should arise, but:

To avoid severe damage to the compressor unit when changing from a petroleum oil to a synthetic oil, the following measures must be followed:

- Drain the petroleum oil completely, following the instructions in section 4.3.2.
- Flush the crankcase and clean the separator to remove oil deposits.
- Fill the compressor with synthetic oil.
- If after approximately 100 operating hours the oil has not been changed, check the oil for contamination. Change the oil again if necessary.

4.3.2 Oil Change Procedure

- Run the compressor until it is warm. Turn off the compressor. Disconnect the electrical power. Shut off the inlet supply, if applicable.
- Vent any residual pressure from the system by opening and then closing the manual drain valves/bleed valves on the buffer tank,[1] separators and purification system.[1]
- Open the filler cap slowly, allowing any residual pressure to vent from the crankcase. Remove the cap/dipstick from the oil filler neck.
- Place a suitable oil drain pan beneath the drain plug on the side of the unit. Remove the oil drain plug (1) labelled "OIL DRAIN" located at the bottom of the service end of the unit.
- Open the oil drain valve, if so equipped, by rotating the hand lever (2) counterclockwise (the valve in the following illustration is shown in the closed position).

1. Not standard on all models.

- Allow the warm oil to drain.
- Close the oil drain valve, if so equipped, by rotating the hand lever (2) clockwise.
- Reinstall the oil drain plug.
- Remove the oil pan. Dispose of the used oil in a safe manner complying with all local waste disposal codes.

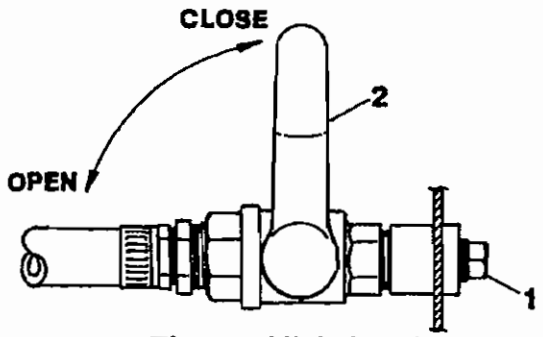


Fig. 4.2 Oil drain valve

- To fill with oil, pour oil slowly into the oil filler neck. Wait five (5) minutes after filling, reinstall the filler cap and inlet supply (if applicable) and reconnect the electric power, then start the compressor unit.
- Check the operation of the oil pump. It is working properly if no bubbles are visible in the oil pressure regulating valve sight glass. Vent the pump if bubbles are visible, see section 4.5.

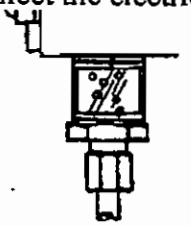


Fig. 4.3 Sight glass

4.4 OIL LEVEL CHECK

Check the oil level daily before starting the compressor. To check the oil level, vent any residual pressure from the system by opening and then closing the manual drain valves/bleed valves on the buffer tank, separators and purification system. Open the filler cap slowly, allowing any residual pressure to vent from the crankcase. Remove the cap/dipstick from the oil filler neck. Wipe the dipstick with a lint-free cloth. Return the oil cap/dipstick to the filler neck completely, then remove and note the oil level on the dipstick. Add or drain as necessary.

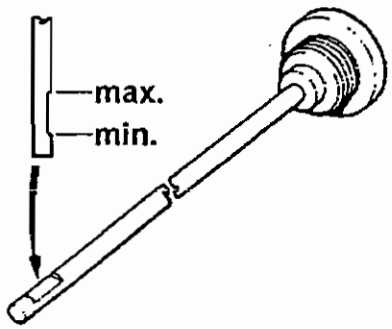


Fig. 4.4 Oil dipstick

Turn off the compressor. Vent any residual pressure from the system by opening and then closing the manual drain valves/bleed valves on the buffer tank, separators and purification system. Open the filler cap slowly, allowing any residual pressure to vent from the crankcase. Remove the cap/dipstick from the oil filler neck.

The oil level must not exceed the maximum level mark on the dipstick, as this will cause excessive lubrication of the compressor and may result in coking of the valves.

4.5 VENTING THE OIL PUMP

If little or no oil pressure builds up after starting the unit, especially after maintenance or repair work, venting the oil pump will be necessary. Refer to fig. 4.5 and proceed as follows:

- With the compressor and the inlet supply (if applicable) shut off, the power disconnected and the crankcase vented, remove the tube nut and tube (1) from the oil pump.
- Loosen the fitting (2). Turn the compressor by hand until bubble-free oil emerges from the fitting. This should only take a few seconds.
- Tighten the fitting. Position the tube and tube nut (1) and retighten.

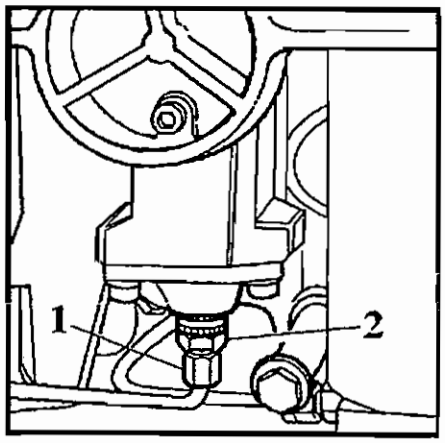


Fig. 4.5 Venting the oil pump

4.6 OIL PRESSURE REGULATOR

The oil pressure regulator is mounted on the 3rd stage cylinder (see section 2 for oil pressure). The regulator valve can be adjusted by removing the cap nut (1) and turning the set screw (2) in the oil pressure regulator block (3) (see fig. 4.6). Adjustment should only be performed by a trained technician. The oil pressure regulator should be adjusted while the unit is in operation.

Turning the screw clockwise increases pressure; counterclockwise reduces pressure.

Use an oil pressure gauge connected to the oil pressure regulator test connector (4) to read the oil pressure. For units with an installed oil pressure gauge, observe the oil pressure indicated on the instrument panel.

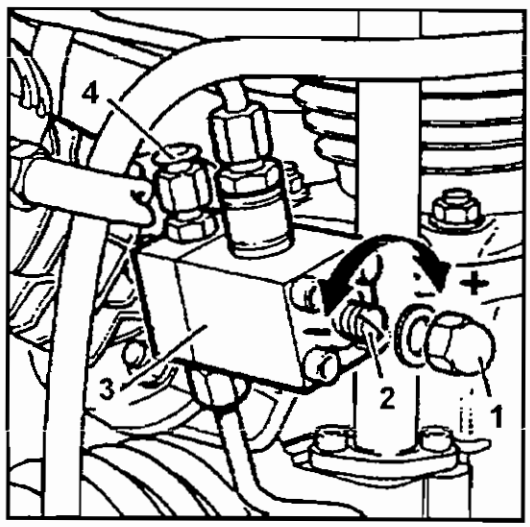


Fig. 4.6 Oil pressure regulator

5.1 INTAKE FILTER

5.1.1 Description

A dry micronic filter is used to filter the intake air (fig. 5.1) or when the intake filter maintenance indicator[1] shows red.

5.1.2 Maintenance

The filter element must be changed at regular intervals according to the maintenance schedule in chapter 19.

- To clean, remove the filter element (2) and clean it with a brush or by blowing low pressure compressed air from the inside out.
- Turn the element 90° on reinstallation. Replace a dirty element once it has been turned three times.
- Clean the inside of the filter housing with a damp cloth. Take care to prevent dust from entering the intake pipe.
- Replace the o-ring (3) if it is damaged.
- When replacing the element, make sure the spring (1) on the top cover is installed properly.

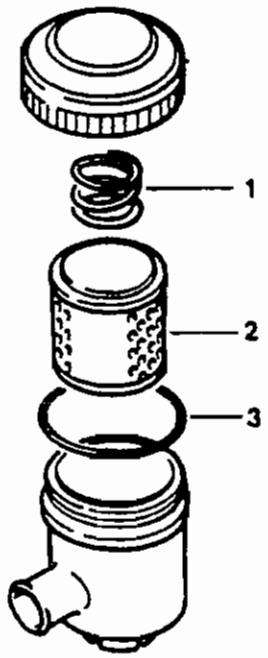


Fig. 5.1 Intake filter

5.2 REMOTE INTAKE CONNECTION[1]

The room must not only have fresh air, but also air which is free of toxic gases, especially carbon monoxide.

If the installation is near a busy street, it is possible for the exhaust gases from the vehicles to enter the room.

It is important to realize that these gases, particularly carbon monoxide, are heavier than air and collect near the ground. For this reason, it may be necessary to install an intake extension.

A ¾" pipe is the minimum acceptable size for short runs (up to 10 feet with no elbows). A female ell or two can be added using the following rule to adjust the allowable length, but street ells and longer runs with this size pipe should be avoided. 1" pipe should be used for runs up to 30 feet. Use 1¼" or 1½" pipe size for longer runs or if multiple turns are involved.

1. Not standard on all models.

A good rule of thumb is, when in doubt, use the next larger pipe size. Subtract 2 feet for each 90° female elbow or 6 feet for each street ell.

You may wish to use a pipe union near the unit just in case it is necessary to move the unit away from the wall for maintenance.

6.1 INTERMEDIATE FILTERS

6.1.1 Functional Description

An inter-filter (fig. 6.1) is mounted on the compressor between the compressor stages.[1] Inter-filters are designed to remove excessive water and oil accumulation due to cooling in the compression process. Separation is achieved by means of centrifugal action provided by a centrifugal insert or by a baffle (4). A sintered metal filter (1), if provided, helps remove dirt contamination.

6.1.2 Maintenance

Proper operation of the individual stages will depend on the intermediate filter having been properly serviced.

For manual condensate drain systems, drain the condensation every 15 to 30 minutes of operation. Also, drain the system before and after operation.

For automatic condensate drain systems, ensure that the automatic condensate drain unit drains regularly (see section 12).

Clean the sintered filter elements of inter-filters according to the maintenance schedules (section 19) as follows:

- Vent pressure via the manual drain valve.
- To remove the sintered metal filter element, remove the piping connected to the filter head. Unscrew the tube nut. Remove the filter head (2) along with the sintered metal filter element (1).
- Remove the center screw (3) and separate the sintered filter element (1) from the filter head.
- To clean the filter element, use hot soapy water and blow dry with low pressure compressed air.

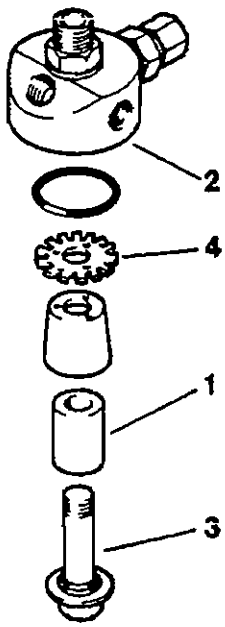


Fig. 6.1 Inter-filter

1. An inter-filter after the 1st stage is not necessarily standard on all models.

6.2 FINAL SEPARATORS

6.2.1 Mechanical Oil and Water Separator[2]

A mechanical oil and water separator is provided after the final stage on the 220 and larger units only. Elimination of liquid oil and water droplets is performed by the centrifugal action of a helical insert (fig. 6.2). The oil and water separator is mounted at the filter mounting rack of the compressor frame.

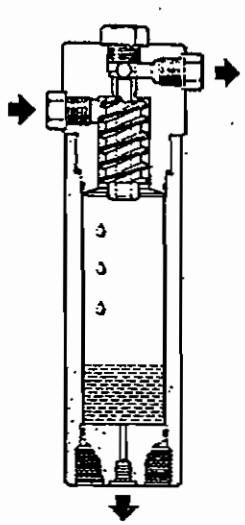


Fig. 6.2
Mechanical oil and water separator

6.2.2 Coalescing Oil and Water Separator

CAUTION

The coalescing oil and water separator is subject to dynamic loading. It is designed to operate for up to 55,000 load cycles (1 load cycle = 1 pressurization and 1 depressurization). After reaching the maximum number of load cycles, the oil and water separator should be replaced.

The compressed gas leaving the mechanical separator after the final stage enters a coalescing oil and water separator. The oil and water separator works by means of a sintered micro filter element which reliably separates liquid oil and water particles from the compressed gas.

During operation of the unit, do not exceed the maximum recommended amount of four cycles per hour. If it is possible to regulate the operation of the unit to such a degree as to achieve one cycle every two hours, this would be an optimum between usage and actual life.

6.2.3 Maintenance of the Mechanical Oil and Water Separator

The mechanical oil and water separator is maintenance-free with the exception of an annual visual inspection. Replace the separator if corrosion is detected during this inspection. The condensation is drained at regular intervals by the automatic condensate drain.

2. Not supplied on all models.

NOTE

The condensation produced during the compression process must be drained regularly by means of the automatic condensate drain; see section 12.

6.2.4 Maintenance of the Coalescing Oil and Water Separator

The sintered metal micro-filter element requires maintenance every 1000 hours. To remove the sintered filter element, proceed as follows.

- Disconnect the power and shut off the inlet supply line. Depressurize the system by means of the bleed valve.
- Remove the tubes connected to the side of the filter head (2). Unscrew and remove the filter head.
- Unscrew the micro-filter element (1) from the filter head. Remove the center screw (3) to remove the filter element.
- Clean the sintered filter element using hot soapy water. Blow dry with compressed air. When cleaning the element, record the number of operating hours as indicated on the hourmeter to ensure exact attention to the maintenance intervals.
- Lubricate the threads and o-rings as well as the threaded part of the micro-filter with petroleum jelly. Apply sparingly.
- Dry the inside of the filter housing with a clean cloth and check for corrosion before reinstalling the micro-filter element. In the event you discover corrosion, replace the corroded parts with new BAUER parts.

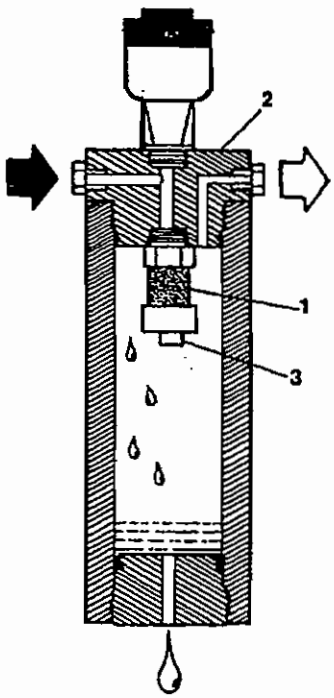


Fig. 6.3 Coalescing oil and water separator

7.1 GENERAL

All compressor units are equipped with a coalescing oil and water separator after the final stage (P0 purification units have the separator integrated in the TRIPLEX® assembly). In addition, the larger units may be equipped with a mechanical oil and water separator. All **BAUER** breathing air application compressor units are equipped with a purification system; purification systems are optional for industrial compressor units. Refer to the compressor unit purification label to determine the purification system. If an optional regenerative dryer is supplied with the unit, refer to the dryer manual added to the Annex, chapter 24.

7.2 OVERVIEW OF THE PURIFICATION SYSTEMS

7.2.1 P0 Purification System

The processing capability of this purification system is approximately 3200 cubic feet.[1] See fig. 7.1 for the arrangement of the system components.

CAUTION

The filter system is subject to dynamic load. It is designed for a certain amount of load cycles (1 load cycle= 1 pressurization, 1 depressurization). After reaching the maximum number of load cycles, the filter should be replaced.

The maximum number of load cycles for the P0 Central Filter Assembly is 4,500 if operated at the maximum allowable pressure difference range of 4,700 psi (330 bar). For a pressure difference of 3,200 psi (225 bar), the maximum no. of load cycles is 63,000.

For the operation of the compressor unit, it should be noted that the recommended amount of four load cycles per hour should not be exceeded, i.e. condensate drain every 15 minutes for example, or four times start/stop operation of the unit.

If it is possible to regulate the operation of the unit to such a degree as to achieve four load cycles per hour, this would be an optimum between usage and actual lifetime.

1 Separator
2 Filter chamber
3 Pipe nozzle
4 TRIPLEX® element
5 Safeguard for element installation
6 Pressure maintaining valve
7 Cylinder cover
8 Safety valve

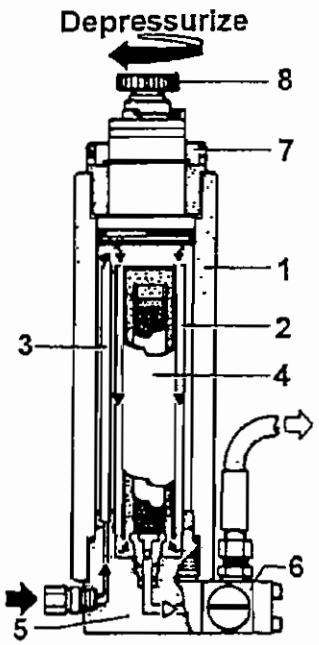


Fig. 7.1 P0 with TRIPLEX® purification

1 Based on a 70°F inlet temperature.

7.2.2 P1 Purification System

The processing capacity of this purification system is approximately 15,000 cubic feet.[2] See fig. 7.2 for the arrangement of the system components.

1 Oil and water separator
2 Safety valve
3 Condensate drain connection
4 Check valve
5 Purifier chamber
6 Bleed valve
7 Pressure maintaining valve

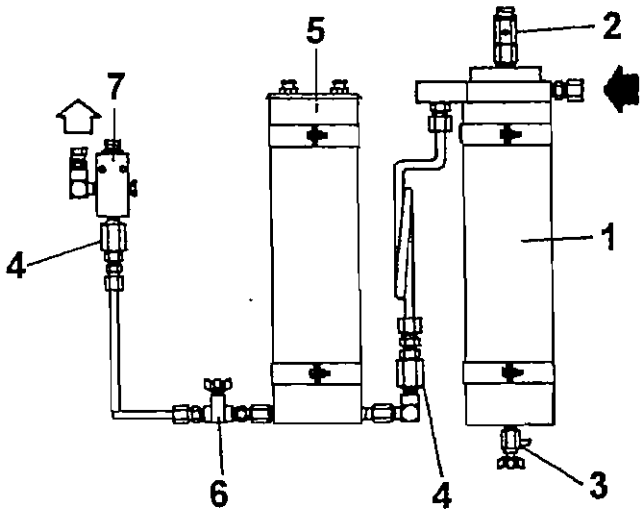


Fig. 7.2 P1 purification system

7.2.3 P2 Purification System

The processing capacity of this purification system is approximately 40,000 cubic feet.[3] See Figure 7.3 for the arrangement of the system components

1 Oil and water separator
2 Safety valve
3 Condensate drain connection
4 Check valve
5 Purifier chamber
6 SECURUS® indicator[4]
7 Bleed valve
8 Pressure maintaining valve

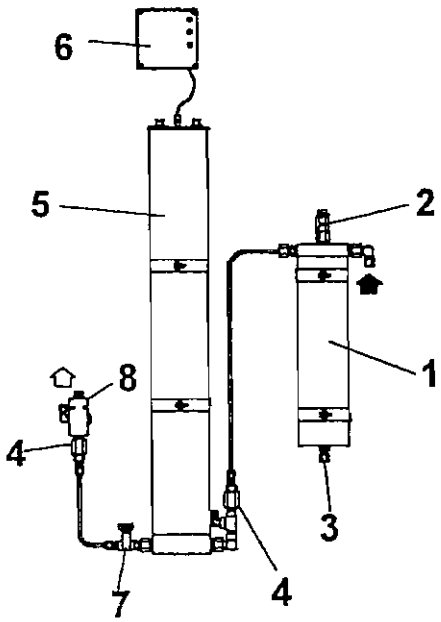


Fig. 7.3 P2 purification system

2. Based on a 70°F inlet temperature.
3. Based on a 70°F inlet temperature. SECURUS® electronic purification system monitor increases the air processing capacity to 67,000 cubic ft.
4. Not standard on all models.

7.2.4 P4 Purification System

The processing capacity of this purification system is approximately 60,000 cubic feet.[5] See See Figure 7.4 for the arrangement of the system components.

1 Oil and water separator
2 Safety valve
3 Condensate drain connection
4 Check valve
5 Dryer chamber
6 Purifier chamber
7 Bleed valve
8 Pressure maintaining valve

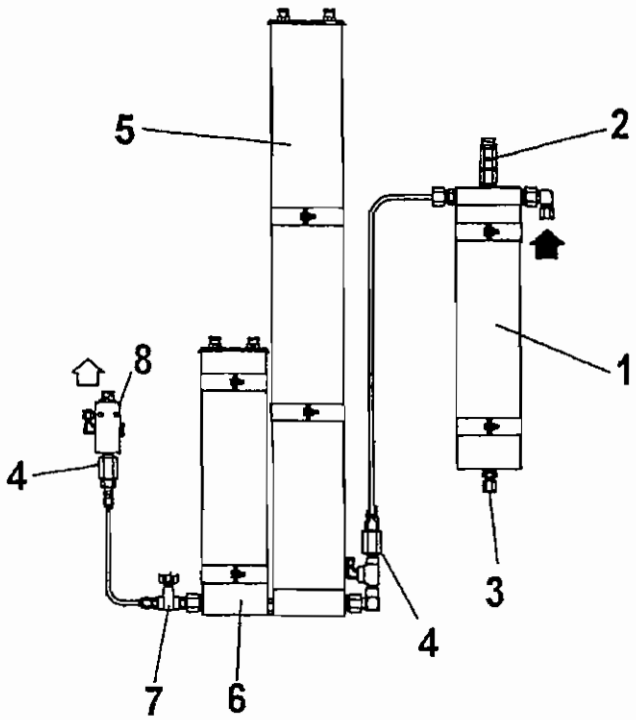


Fig. 7.4 P4 purification system

7.2.5 P5 Purification System

The processing capacity of this purification system is approximately 90,000 cubic feet.[6] See Figure 7.5 for the arrangement of the system components.

1 Oil and water separator
2 Safety valve
3 Condensate drain connection
4 Check valve
5 Dryer chamber
6 Purifier chamber
7 SECURUS® indicator[7]
8 Bleed valve
9 Pressure maintaining valve

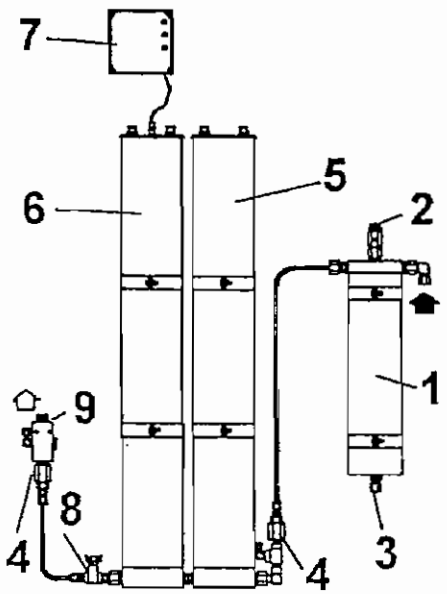


Fig. 7.5 P5 purification system

5. Based on a 70°F inlet temperature.
6. Based on a 70°F inlet temperature. SECURUS® electronic purification system monitor increases air processing capacity to 150,000 cubic ft.
7. Not standard on all models.

7.2.6 P10 Purification System

The processing capacity of this purification system is approximately 140,000 cubic feet.[8] See Figure 7.6 for the arrangement of the system components.

1 Oil and water separator
2 Safety valve
3 Condensate drain connection
4 Check valve
5 Dryer chamber
6 Purifier chamber
7 SECURUS® indicator[9]
8 Bleed valve
9 Pressure maintaining valve

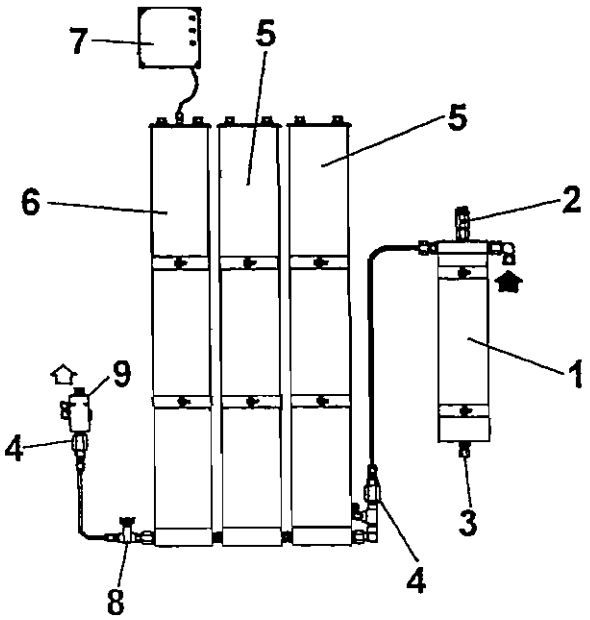


Fig. 7.6 P10 purification system

7.2.7 P12 Purification System

The processing capacity of this purification system is approximately 420,000 cubic feet.[10] See Figure 7.7 for the arrangement of the system components.

1 Coalescing oil and water separator
2 Pressure gauge
3 Bleed valve
4 Dryer chamber
5 Purification chamber
6 SECURUS® purification monitor
7 Pressure maintaining valve
8 Check valve

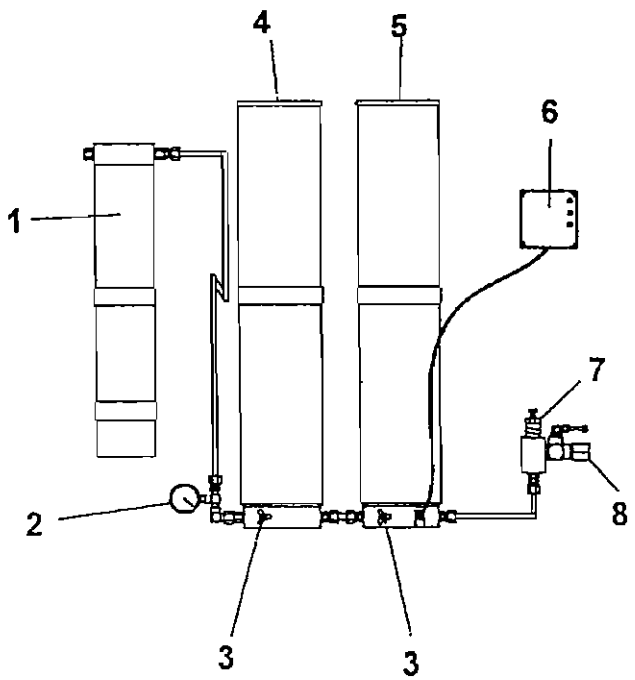


Fig. 7.7 P12 purification system

8. Based on a 70°F inlet temperature. SECURUS electronic purification system monitor increases air processing capacity to 230,000 ft.
9. Not standard on all models.
10. Based on a 70°F inlet temperature.

7.2.8 P14 Purification System

The processing capacity of the purification system is approximately 650,000 cubic feet.[11] See Figure 7.8 for the arrangement of the system components.

1 Coalescing oil and water separator
2 Pressure gauge
3 Bleed valve
4 Dryer chamber
5 Purification chamber
6 SECURUS® purification monitor
7 Pressure maintaining valve
8 Check valve

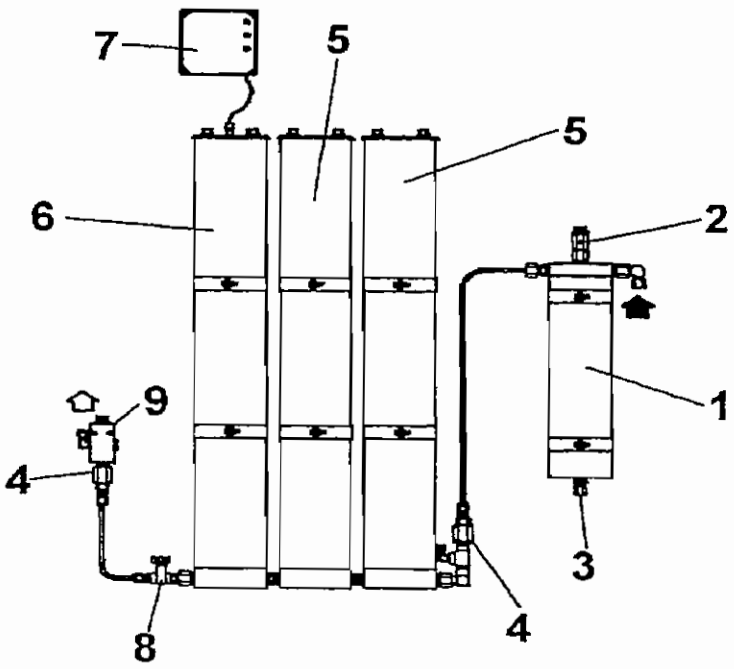


Fig. 7.8 P14 purification system

7.3 DESCRIPTION OF THE PURIFICATION SYSTEM COMPONENTS

7.3.1 Mechanical Oil and Water Separator[12]

A mechanical oil and water separator provided after the final stage eliminates liquid oil and water by the centrifugal action of its helical insert (fig. 7.9). The oil and water separator is mounted at the filter mounting rack of the compressor frame.

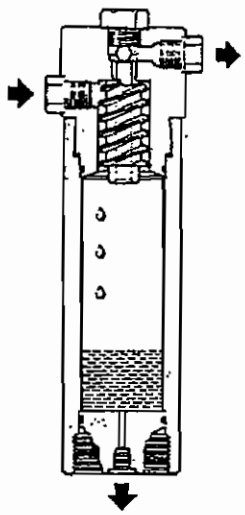


Fig. 7.9 Mechanical oil and water separator

7.3.2 Coalescing Oil and Water Separator[12]

WARNING

Coalescing oil and water separators are subject to dynamic loading. They are designed to operate for up to 55,000 (P2 and up) and 85,000 (P1) load cycles.

(1 load cycle = 1 pressurization, 1 depressurization)

After reaching the maximum number of load cycles, the oil and water separator should be replaced.

11. Based on a 70°F inlet temperature.
12. Not standard or necessarily available on all models.

The compressed air leaving the final stage is cooled in the aftercooler to approximately 20° to 30° F (10° to 15° C) above ambient temperature and then enters a coalescing oil and water separator. The oil and water separator works by means of a sintered metal micro-filter element which reliably separates liquid oil and water particles from the compressed air.

During operation of the unit, do not exceed the maximum recommended amount of four cycles per hour.

7.3.3 Dryer and Purifier Chambers[13]

The chambers are made of anodized aluminum alloy. The casings of the dryer and purifier cartridges as well as the cover and bottom are aluminum. The dryer cartridges are packed with molecular sieve (MS) which absorbs oil and water. The purifier cartridges are packed with hopcalite (HP), a catalyst which converts carbon monoxide to carbon dioxide, activated carbon (AC), which absorbs oil vapors effecting taste and odor, molecular sieve (MS), as in the dryer cartridges, and, for units with a SECURUS® indicator,[12] a SECURUS® sensor (SC).

7.3.4 Securus Indicator[13]

The SECURUS® indicator receives signals concerning the condition of the drying agent inside the purifier element from the attached sensors and furnishes appropriate control signals whenever the preset threshold values have been reached.

The annular sensor inside the purifier element head senses changes in capacitance caused by the saturation within the surrounding drying agent. The signal path from the sensor leads through a spring pin contact, which forms the connection between the element and the filter head, to the pressure-resistant bushing in the filter head and continues through the center conductor of the coaxial cable to the SECURUS indicator. The signal return is effected through the cable shield to the element tube.

The four operating conditions of the SECURUS® system are reported by three relays (normally open contacts). Simultaneously with the closing of the relay contacts, the following built-in luminescent diodes illuminate:

1. Continuous green - unit in operation
2. Flashing yellow - element change pre-warning
3. Flashing red - compressor shut down because the element is saturated
4. Continuous red - compressor shut down because of missing element or cable failure

If the yellow diode is flashing, the green diode will continue to illuminate because the unit is still operational with the yellow light on.

13. Not standard or necessarily available on all models.

If none of the lamps are illuminated, indicating that no relay contact is closed, the SECURUS® indicator is either not receiving operating voltage or the electronics within the unit have failed.

After applying operating voltage to the indicator, it will take about 0.5 seconds to close the respective relay contact and to light the applicable diode. During this time interval, the status of the element is checked. An erroneous lighting or flickering of the lamps should not occur.

Terminal utilization (AC version)

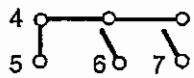
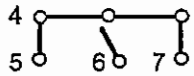
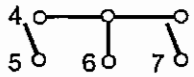
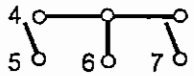
Terminal 1:	Main connection, hot	Terminal 5:	Contact, green light
Terminal 2:	Main connection, neutral	Terminal 6:	Contact, red
Terminal 3:	System ground wire	Terminal 7:	Contact, yellow light
Terminal 4:	Common		

Maximum permissible contact load is 250 V AC, 6 amps.

Terminal utilization (12 - 24V DC version)

Terminal 1:	Positive polarity, power supply
Terminal 2 or 3:	Negative polarity, power supply (Terminals 2 and 3 are connected inside the unit.)

The other terminals are utilized in the same manner as in the AC version. The cable shield is connected to terminal 3 inside the unit.

Mode of operation	System status	Indicator light	Contact position[i]
Normal	Element serviceable	green	
Pre-warning	Element approaching saturation	green + flashing yellow	
Shut off	Element saturated	flashing red	
Shut off	Element missing or cable failure	continuous red	

i. Connection for external warning lamps.

7.4 MAINTENANCE OF THE PURIFICATION SYSTEM

7.4.1 Mechanical Oil and Water Separator

The mechanical oil and water separator is maintenance-free with the exception of an annual visual inspection. Replace the separator if corrosion is detected during this inspection. The condensation is drained at regular intervals by the automatic condensate drain.

7.4.2 P0 Purification

WARNING

The PO purification system filter housing is subject to dynamic loading. They are designed to operate for up to 4,500 (@ 4,700 psi) and63,000 (@ 3,200 psi) load cycles.

(1 load cycle = 1 pressurization, 1 depressurization)
After reaching the maximum number of load cycles, the PO filter housing should be replaced.

Before starting the compressor and every 15 to 30 minutes during operation, open the condensate drain valves at the base of the purifier cylinder and allow the accumulated condensation to drain. At start up, this serves a double purpose, as the drain valves must be open to provide an unloaded start. If your compressor is equipped with an automatic condensate drain,[14] this step is not necessary.

To replace the cartridge (see fig. 7.1):

- Disconnect the power and depressurize the system by means of the bleed valve.
- Unscrew and remove the top section (7) of the cylinder. Remove and discard the old cartridge.
- Remove and discard the plug on the end of the new cartridge.
- Place the new cartridge into the cylinder and press it down to snap it into place.

NOTE

Never remove the spare element from its packaging prior to actual use. Otherwise the highly sensitive filling material will absorb moisture from the ambient air and become saturated and therefore useless.

14. Not standard or necessarily available on all models.

7.4.3 Coalescing Oil and Water Separator (Single Element Type) (P1 through P10)

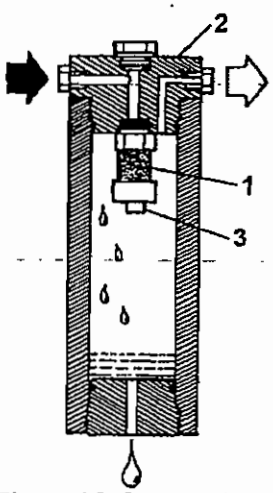


Fig. 7.10 Coalescing oil and water separator, single element type

The sintered metal micro-filter element requires maintenance every 1000 hours. To remove the sintered filter element, proceed as follows (fig. 7.10):

- Disconnect the power and shut off the inlet supply line if applicable. Depressurize the system by means of the bleed valve.
- Remove the tubes connected to the side of the filter head (2). Unscrew and remove the filter head.
- Unscrew the micro-filter element (1) from the filter head. Remove the center screw (3) to remove the filter element.
- Clean the sintered filter element using hot soapy water. Blow dry with compressed air. When cleaning the element, record the number of operating hours as indicated on the hourmeter to ensure exact attention to the maintenance intervals.
- Lubricate the threads and o-rings as well as the threaded part of the micro-filter with petroleum jelly. Apply sparingly.
- Dry the inside of the filter housing with a clean cloth and check for corrosion before reinstalling the micro-filter element. In the event you discover corrosion, replace the corroded parts with new **BAUER** parts.

NOTE

The condensation produced during the compression process must be drained every 15 minutes or automatically if equipped with an automatic condensate drain. See chapter 12.

7.4.4 Coalescing Oil and Water Separator (Dual Element Type) (P12 and P14)

The sintered metal micro-filter requires maintenance every 1000 hours. To remove the micro-filter element (fig. 7.11), proceed as follows:

- Disconnect the power and shut off the inlet supply line if applicable. Depressurize the system by means of the bleed valve.
- Remove the tubes connected to the side of the filter head. Unscrew and remove the filter head (1).

- Unscrew the micro-filter element (2) from filter head. Unscrew the acorn nut (3) from the center stud to remove the micro-filter element. Unscrew the hex nuts (4) from the end plate to remove the filter inserts.
- Clean the sintered filter element using hot soapy water. When cleaning the element, record the number of operating hours as indicated on the hourmeter to ensure exact attention to the maintenance intervals. Blow dry with compressed air.
- Lubricate the o-rings with petroleum jelly. Apply sparingly. Dry the inside of the filter housing with a clean cloth and check for corrosion before reinstalling the micro-filter element. In the event you discover corrosion, replace the corroded parts with new **BAUER** parts.

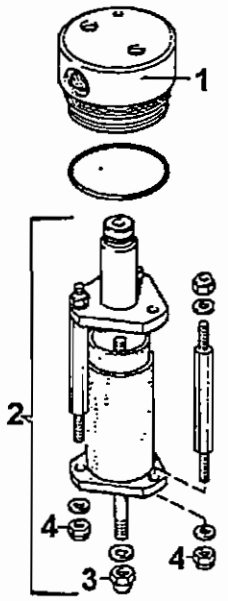


Fig. 7.11 Coalescing oil and water separator, dual element type

NOTE

The condensation produced during the compression process must be drained regularly by means of the automatic condensate drain; see chapter 12.

7.4.5 Dryer and Purification Chambers (P1 through P14)

Maintenance Intervals

CAUTION

On units with the optional SECURUS® indicator, when the preliminary warning signal appears, the cartridges of all filters within the system should be changed. When the SECURUS® indicator shuts down the system, the filters **must** be changed.

If your unit is **not** equipped with a SECURUS®, the life-span of the filter system must be calculated and recorded on FOR-0018 in the annex, chapter 24, using the cfm of the unit (see chapter 2) and the processing capacity of the system (section 7.2).

There is no set time of filter element exhaustion unless testing equipment capable of measuring the quality of the air at the outlet is available. If your unit is equipped with a SECURUS® system, you have positive indication (the warning light) when element replacement is needed. If not, operator experience and accurate record keeping of operating hours is necessary.

A useful form is provided in the annex for record keeping of purification operating hours. We suggest you place a copy of it in a protective folder and keep it on hand for recording operating hours daily.

When operating at temperature other than 68°F, divide the number of hours operated at that temperature by the correction factor as indicated in the chart and graph below.

The entries in this table and graph are based on estimated filter element life time. On units equipped with a SECURUS® system monitor, the actual saturation of the element is reported by the electronic monitor.

For example, if the unit were operated for three hours at 85°F, rather than record three hours of operation on FOR-0018 in the annex the effective hours of operation would be calculated and recorded: 3 hours divided by a factor of 0.57 yields 5.3 hours.

Maintenance Instructions

To change the dryer and purifier elements, proceed as follows.

- Disconnect the power and shut off the inlet supply line if applicable. Depressurize the system by means of the bleed valve.
- Unscrew the filter head using the special wrench supplied. See fig. 7.12.
- Pull out the cartridge. Smaller diameter cartridges (P1 through P10) are fitted with a lifting ring to facilitate removal.
- Dry the inside of the filter housing with a clean cloth and check for corrosion. Replace all corroded parts with new **BAUER** parts. Lubricate the o-rings with white petroleum jelly. Apply sparingly.
- Remove and discard the plug on the end of the new cartridge.
- Install the new filter cartridge.[15] Reinstall the filter head.
- Close the bleed valve, restore the power and reconnect the inlet supply line, if applicable.

CAUTION

If the new cartridge is installed incorrectly air will vent through the vent hole on the purifier chamber. If this occurs the cartridge must be reinstalled properly.

15. The larger diameter purification cartridges (P12 and P14) may be re-packed by a qualified factory trained technician (contact **BAUER** Compressors, Inc. for details) or sent back to the factory for re-packing.

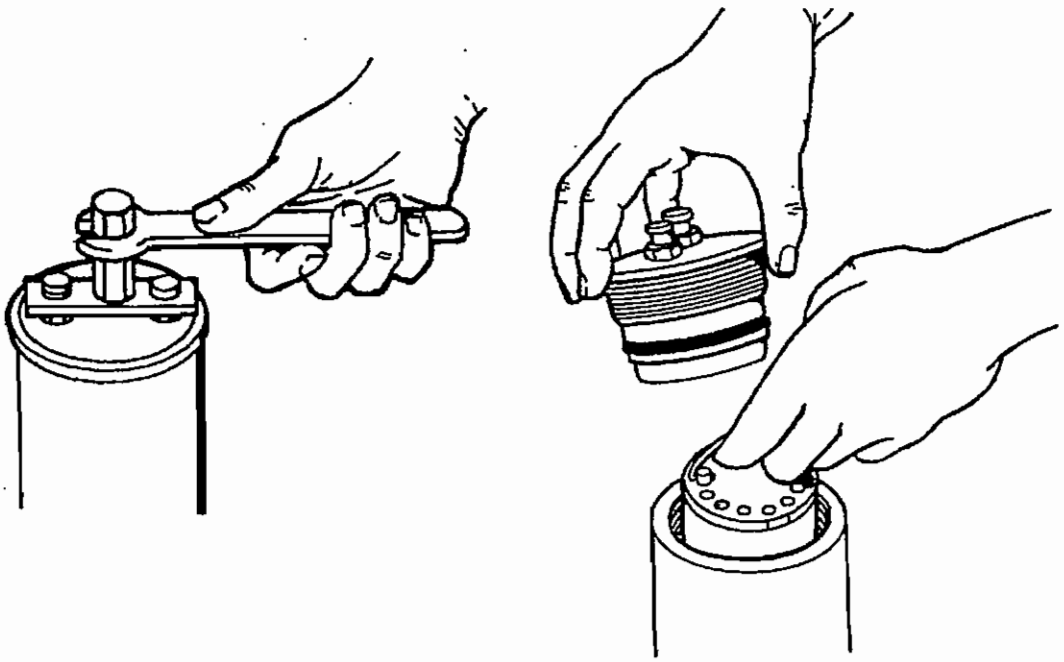


Fig. 7.12 Element change

8.1 DESCRIPTION

A pressure maintaining and a check valve are provided downstream of the oil and water separator or filter system, respectively. Refer to the flow diagram in the annex.

The pressure maintaining valve ensures that pressure is built-up in the filters even from the start of delivery, thus achieving a constant, optimum filtration. It will also assure proper working conditions for the final stage cylinder.

The PMV is adjusted to approximately 2,000 psi (138 bar).

The check valve prevents compressed air from flowing back from filled storage cylinders or tanks.

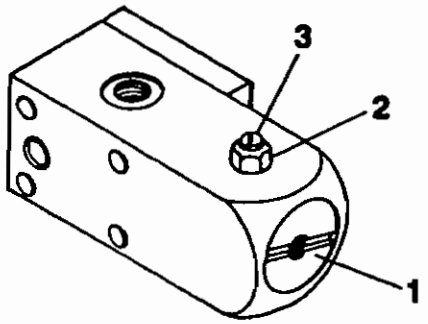


Fig. 8.1 Pressure maintaining valve

8.2 MAINTENANCE

8.2.1 Units with PO[1] Purification

The pressure maintaining valve is adjusted at the factory to the required pressure and normally does not require regular maintenance or readjustment. In case readjustment becomes necessary, loosen the jam nut (2, fig. 8.1) and set screw (3). Set the adjusting screw (1) to the required pressure using a suitable screwdriver.

Turn clockwise to increase pressure, counterclockwise to decrease pressure.

8.2.2 Units with other than PO Purification

The pressure maintaining valve is adjusted at the factory to the required pressure and normally does not require regular maintenance or readjustment. In case readjustment becomes necessary, loosen the locking ring (2, fig. 8.2). Set the adjusting screw (1) to the required pressure using an appropriate hex type wrench.

Turn clockwise to increase pressure, counterclockwise to decrease pressure.

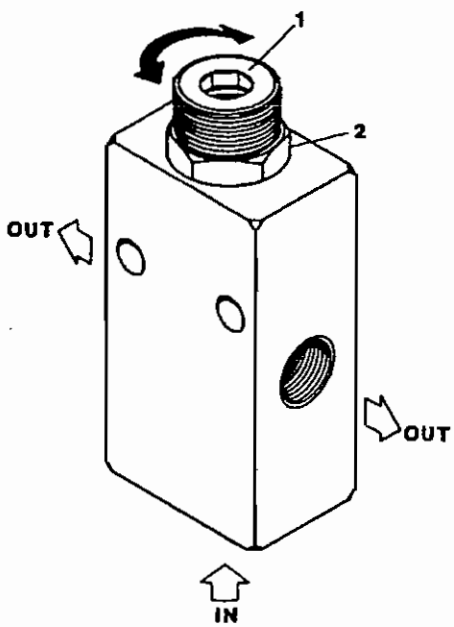


Fig. 8.2 Pressure maintaining valve

1. Not standard on all models.

9.1 FUNCTIONAL DESCRIPTION

All compressor stages are protected by safety valves. The intermediate pressure safety valves are adjusted at the factory and set, generally 10% over the proper operating pressure of the corresponding compression stage.

The safety valve for protection of the **final stage** (fig. 9.1) is adjusted at the factory to the operating pressure of the unit according to the order. For example, for a final pressure of 3200 psi, the safety valve pressure would be set at 3500 psi. The maximum allowable adjustment on this compressor unit is 5000 psi (350 bar).

For units with purification other than PO, a safety valve[1] is located on the oil and water separator and functions as the final safety valve for the compressor. It acts as a backup if the pressure switch fails.

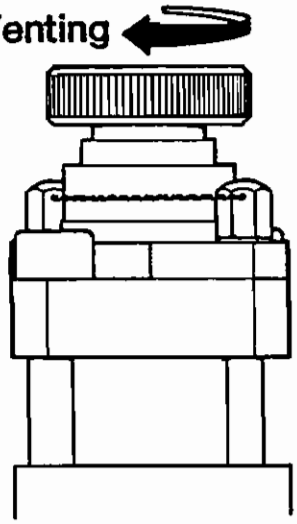


Fig. 9.1 Final pressure safety valve[1]

9.2 MAINTENANCE

If a safety valve is found to be defective, replace it with a new one.

9.2.1 Units with PO[1] Purification

Check the function of the final safety valve before filling bottles. To do this, turn the milled knob to the right until the valve vents.

9.2.2 Units with Optional Purification

The final stage safety valve must be checked periodically for proper functioning. Operate the compressor with the shut-off valve closed until the safety valve vents. Note the pressure registered on the pressure gauge when the safety valve vents.

The final pressure safety valve set pressure has been preset at the factory to the required pressure and normally does not require regular maintenance or readjustment. In case readjustment becomes necessary, loosen the locking ring (1) and set the adjusting screw (2) to the required pressure using an appropriate allen wrench.

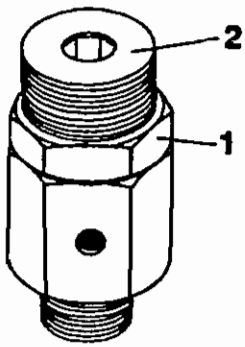


Fig. 9.2 Final pressur safety valve[1]

Turn clockwise to increase the pressure; counterclockwise to decrease pressure.

1. Not standard on all models.

10.1 DESCRIPTION

This compressor may be equipped with the following gauges:

- Intermediate pressure gauges, one for each stage of compression, to indicate the pressure after the corresponding stage.[1]
- A final pressure gauge to indicate the final operating pressure.[1]
- An oil pressure gauge to indicate the compressor oil pressure.[1]
- An inlet pressure gauge to indicate the pressure applied to the inlet of the compressor.[1]

The pressure gauges are mounted in the instrument panel. For correct pressure ranges for the above gauges see section 2.

10.2 MAINTENANCE

Observe the pressure gauges daily to be sure that the automatic control system is governing the compressor within its proper limits. If a pressure gauge indicates excessive pressure and the corresponding safety valve does not vent, check the pressure gauge for proper operation. Also, if the pressure gauge indicates the pressure as being too low, check the gauge for proper operation.

To check a suspect gauge, remove the gauge and check for wear and tear, accuracy, and proper functioning by comparing it to a precision test gauge or a dead weight tester. Replace all broken or damaged gauges immediately.

1. Not standard on all units.

11.1 FUNCTIONAL DESCRIPTION

The valve heads of the individual stages form the upper part of the cylinders. The inlet and discharge 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 discharge valve opened by the pressure created in the compression process.

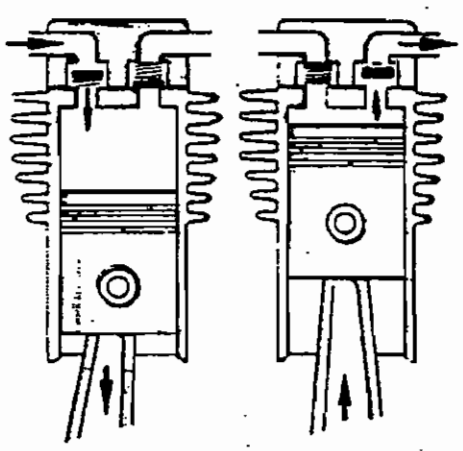


Fig. 11.1 Valve function

11.2 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. **Do not touch the outlet piping with bare hands, use a thermometer.**[1] Note that the inlet line to the valve heads should be warm to the touch.

If the inlet pipe to the second stage valve head heats up excessively and the first stage safety valve opens, either the inlet or the discharge valve of the second stage is malfunctioning. It is therefore necessary to remove the valve head and to check and clean these valves or replace them.

11.3 GENERAL INSTRUCTIONS FOR CHANGING THE VALVES

Please observe the following instructions for all valve maintenance:

- Always replace valves as a complete set.
- Observe the correct sequence when reassembling.
- Remove and check the valves every 750 - 800 operating hours.
- Replace the valves every 2000 operating hours to avoid fatigue failure.
- When necessary, use the assembly tool provided with the compressor unit for work on the valve heads.

1. Some units are provided with a temperature gauge on the outlet piping.

Torque Sequence

Tighten the screws and nuts for the valve heads and cylinders equally as illustrated by the sequence shown below (fig. 11.2).

Be sure that the valves are cold prior to tightening.

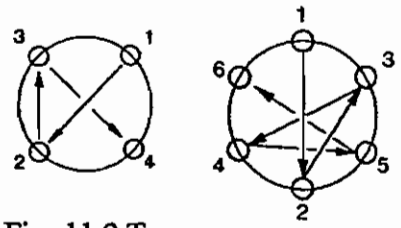


Fig. 11.2 Torque sequences

11.4 CHANGING THE 1ST STAGE VALVES, KU-FH

11.4.1 Removal of the 1st Stage Discharge Valve, KU-FH

To remove the 1st stage discharge valve (fig. 11.3), proceed as follows:

- should be replaced if damaged.
- Unscrew and remove the socket set screw (13) and the discharge valve cover (12).
- Remove the spring washer (11) and the o-ring (10). The o-ring should be in perfect condition: undamaged and non-porous. Replace it if necessary.
- Extract the discharge valve assembly (3).
- Discard the valve gasket (5) and replace it with a new one. The valve gasket should always be replaced.
- Inspect the valve seat (6). The sealing surface must be in good condition: devoid of pitting or cracking. The maximum valve seat width is 3/64" (1.0 mm). See fig. 11.6.
- Clean and inspect the valve plate (7). The maximum acceptable groove depth must not exceed 1/128" (0.2 mm). See fig. 11.8.
- Check the tolerance of the inside diameter of the valve body (9). The valve body must not show any grooves at ID 17 + 0.1 mm. See fig. 11.7.
- The valve spring (8) is reusable if it shows no outside scuffing and the spring ends have not picked up on the next coil

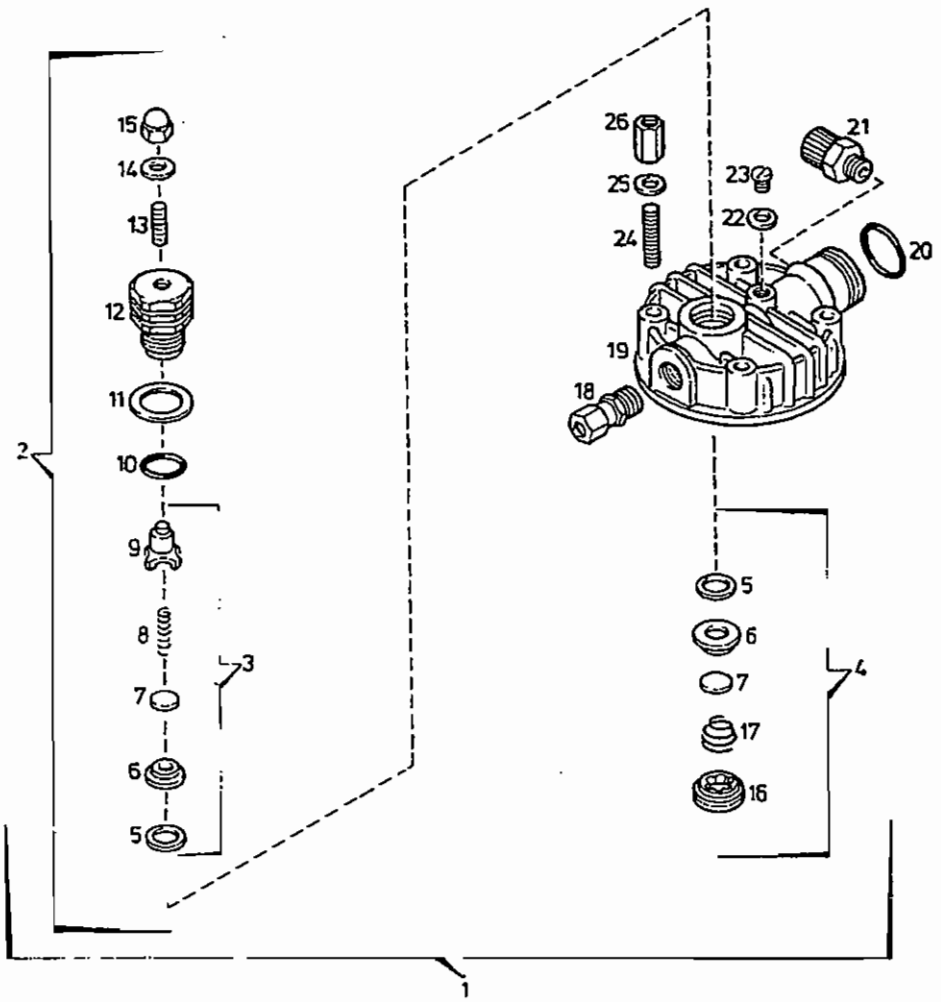


Fig. 11.3 Valve head and valves, 1st stage KU-FH

1 1st stage valve head assembly
2 Discharge valve assembly
3 Discharge valve
4 Inlet valve
5 Valve gasket
6 Valve seat
7 Valve plate
8 Discharge valve compression spring
9 Discharge valve body
10 O-ring
11 Disc spring
12 Discharge valve cover
13 Set screw
14 Copper gasket
15 Dome nut
16 Inlet valve cover
17 Inlet valve compression spring
18 Male connector
19 Valve head
20 O-ring
21 Plastic connector
22 Copper gasket
23 Slotted pan head screw
24 Stud
25 Flat washer
26 Hex bushing

The following limits should also be observed:

Discharge valve spring	Specified length ..... 24 mm Limit ..... 21 mm
Discharge valve stroke	Minimum ..... 1.0 mm Maximum ..... 1.25 mm
Valve seat bore diameter	..... 12.5 mm

If the above tolerances have been exceeded, the valve assembly (3) should be replaced.

11.4.2 Removal of the Inlet Valve, KU-FH

To remove the 1st stage inlet valve, it is necessary to first dismantle the valve head. Reference fig. 11.3.

- Remove the tube nuts, tubes and ferrules from the tube connections (18 & 21) to the valve head (19) and the inlet connection (not shown).
- Inspect the o-ring. Replace it if it is damaged.
- Unscrew and remove the hex bushings (26).
- Lift the valve head (19) from the piston cylinder.
- Unscrew the valve cover (16) from the bottom of the valve head using the assembly tool which is provided with the unit. See fig. 11.4.
- Extract the inlet valve assembly (4) and discard the valve gasket (5). Replace the valve gasket with a new gasket.

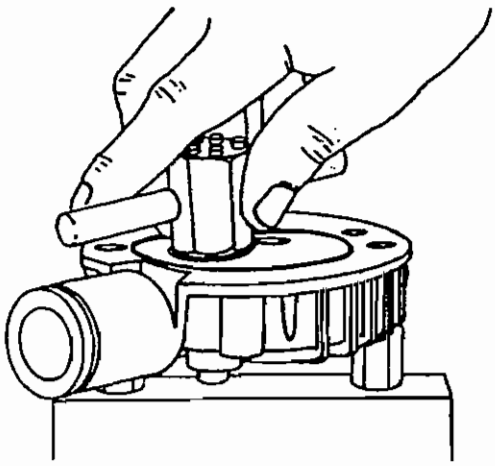


Fig. 11.4 Inlet valve removal

- Inspect the valve seat (6). The sealing surface must be in good condition: devoid of pitting or cracking. The maximum valve seat width is 3/64" (1.0 mm). See fig. 11.6.
- Clean and inspect the valve plate (7). The maximum acceptable groove depth must not exceed 1/128" (0.2 mm). See fig. 11.8.
- Check the tolerance of the inside diameter of the valve cover (16). It must not show any grooves at ID 17 + 0.1 mm. See fig. 11.7.
- The valve spring (17) is reusable again if it shows no outside scuffing and the spring ends have not picked up on the next coil.

The following tolerances should also be observed:

Inlet valve spring	Specified length..... 10.5 mm Limit..... 9 mm
Inlet valve stroke	Minimum..... 1.0 mm Maximum ..... 1.25 mm
Valve seat bore diameter	..... 12.5 mm

If any of the above tolerances have been exceeded, the valve assembly (4) should be replaced.

11.4.3 Reassembly of the 1st Stage Valve Head and Valves, KU-FH

To reassemble the valve head and valves, reference fig. 11.9 and proceed as follows:

- Before fitting the intake valve to the valve head, grease the valve plate (7) slightly and place it correctly on the valve seat to make reassembly easier.
- After having assembled the inlet valve, peen the valve head twice, once on either side of the valve, to lock the threads in place.
- Apply a temperature-resistant, non-age-hardening RTV sealing compound to the sealing surface of the valve head (fig. 11.5).
- Torque the valve head hex bushings (26) to 18 ft-lb (25 Nm) in accordance with the sequence shown in fig. 11.2 **before** tightening the socket set screw (13) in order to avoid damage to the valve body (9).
- Tighten the socket set screw (13) with the appropriate sized allen wrench.
- Position the gasket (14) and dome nut (15) and tighten it with an open end wrench.
- Reinstall the tube connections (18,21) to the valve head (19).

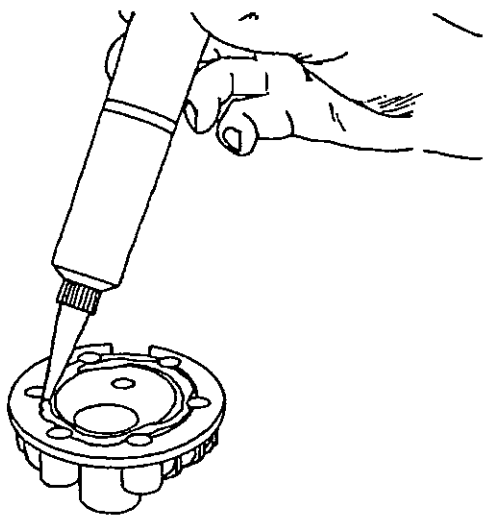


Fig. 11.5 Application of sealing compound

11.5 CHANGING THE 1ST STAGE VALVES, KC-FH

11.5.1 Removal of the 1st Stage Discharge Valve, KC-FH

To remove the 1st stage discharge valve (fig. 11.9), proceed as follows:

- Remove the dome nut (14) and the gasket (13) and inspect the gasket. The gasket should be replaced if it is damaged.
- Unscrew and remove the socket set screw (12) and the discharge valve cover (11).
- Remove the disc spring (10) and the o-ring (9). The o-ring should be in perfect condition: undamaged and non-porous. Replace it if necessary.
- Extract the discharge valve assembly (3).
- Discard the valve gasket (4) and replace it with a new one. The valve gasket should always be replaced.
- Inspect the valve seat (5). The sealing surface must be in good condition: devoid of pitting or cracking. The maximum valve seat width is 3/64" (1.0 mm). See fig. 11.6.
- Clean and inspect the valve plate (6). The maximum acceptable groove depth must not exceed 1/128" (0.2 mm). See fig. 11.8.
- Check the tolerance of the inside diameter of the valve body (8). The valve body must not show any grooves at ID 17 + 0.1 mm. See fig. 11.7.
- The valve spring (7) is serviceable again if it shows no outside scuffing and the spring ends have not picked up on the next coil.

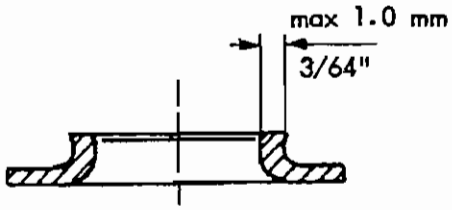


Fig. 11.6 Permissible tolerances, valve seats

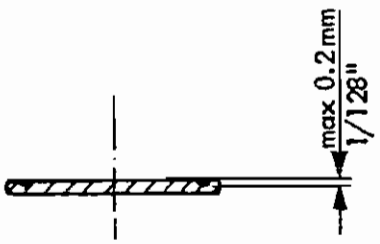


Fig. 11.8 Permissible tolerances, valve plates

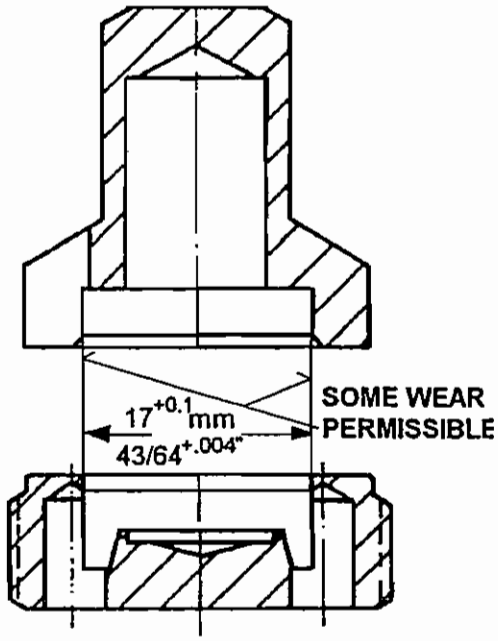


Fig. 11.7 Permissible tolerances, valve body and cover

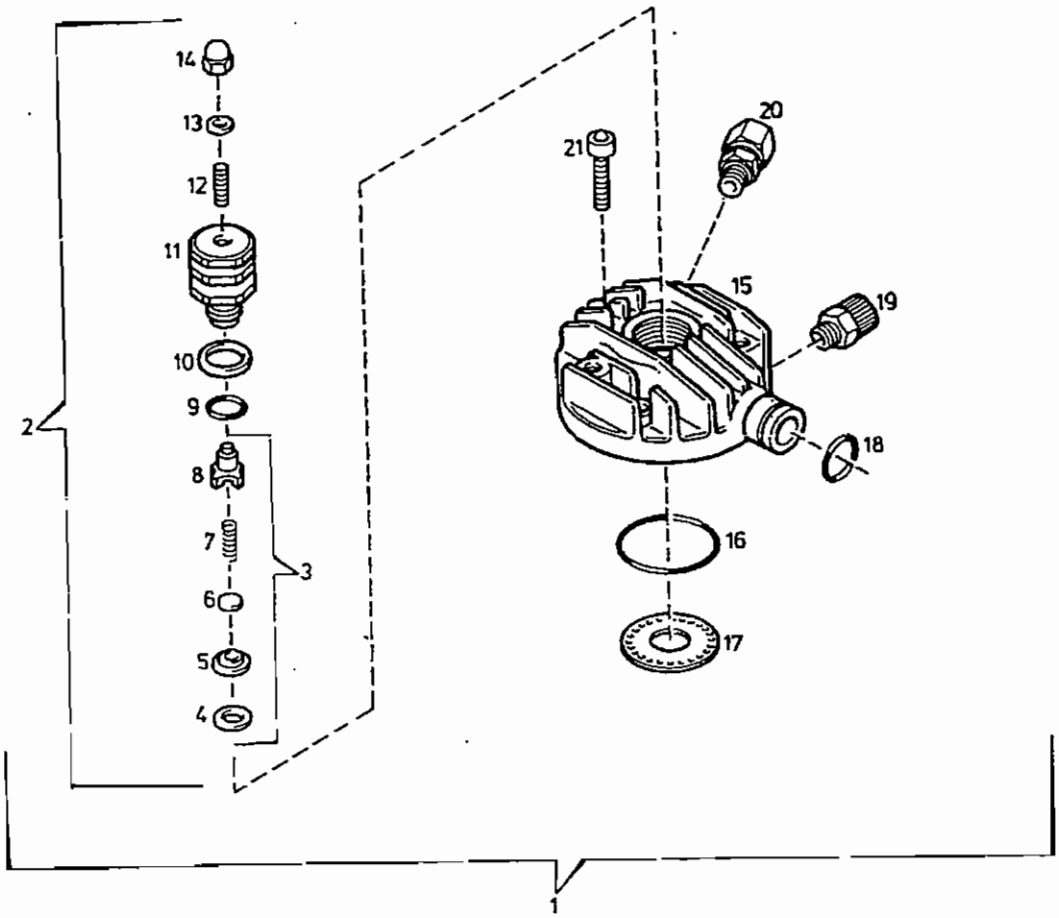


Fig. 11.9 Valve head and valves, 1st stage KC-FH

1 1st stage valve head assembly
2 Discharge valve assembly
3 Discharge valve
4 Valve gasket
5 Valve seat
6 Valve plate
7 Compression spring
8 Discharge valve body
9 O-ring
10 Disc spring
11 Discharge valve cover
12 Set screw
13 Copper gasket
14 Dome nut
15 Valve head
16 O-ring
17 Intake valve plate
18 O-ring
19 Plastic connector
20 Male connector
21 Socket head cap screw

The following limits should also be observed:

Discharge valve spring	Specified length ..... 24 mm Limit ..... 21 mm
Discharge valve stroke	Minimum ..... 1.0 mm Maximum ..... 1.25 mm
Valve seat bore diameter	..... 12.5 mm

If the above tolerances have been exceeded, the valve assembly (3) should be replaced.

11.5.2 Removal of the Inlet Valve, KC-FH

To remove the 1st stage inlet valve, it is necessary to first dismantle the valve head. Reference fig. 11.9.

- Remove the tube nuts, tubes and ferrules from the tube connections (19,20) to the valve head (15) and the intake filter (not shown).
- Inspect the o-ring (18). Replace it if it is damaged.
- Unscrew and remove the socket head cap screws (21).
- Lift the valve head (15) from the piston cylinder. The valve plate (17) rests free on the piston cylinder; it is not spring operated.
- Inspect the valve plate. It should be plane and free of grooves. The maximum concentric groove depth should not exceed 0.05 mm (0.002"). The top of the piston should be flush with the valve seat (see fig. 11.10).
- Inspect the o-ring (16). It should be in perfect condition: undamaged and non-porous. Replace it if necessary.

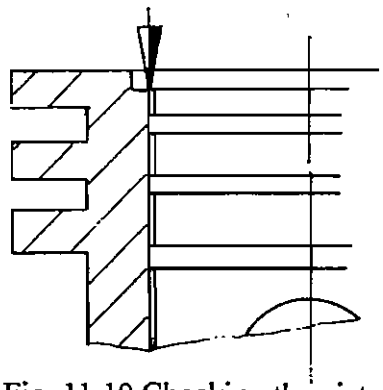


Fig. 11.10 Checking the piston

11.5.3 Reassembly of the 1st Stage Valve Head and Valves, KC-FH

To reassemble the valve head and valves, reference fig. 11.9 proceed as follows:

- Place the valve plate (17) and o-ring (16) into the valve seat of the piston cylinder.
- Apply a temperature-resistant, non-age-hardening RTV sealing compound to the sealing surface of the valve head (fig. 11.5).
- Torque the valve head cap screws (21) to 18 ft-lb (25 Nm) **before** tightening the socket set screw (12) in order to avoid damage to the valve body (8).

- Tighten the socket set screw (12) with the appropriate sized allen wrench.
- Position the gasket (13) and acorn nut (14) and tighten it with an open end wrench.
- Reinstall the tube connections (19 & 20) and the inlet connection to the valve head (15).

11.6 CHANGING THE 1ST STAGE VALVES, KM-FH

11.6.1 Removal of the 1st Stage Valves, KM-FH

The 1st stage inlet and discharge valves are combined in one plate valve under the valve head. To remove and reinstall the valves, proceed as follows (see fig. 11.12).

- Remove the tube nuts, tubes and ferrules from the fittings (7 & 3) on the valve head (1).
- Unscrew the socket head cap screws (9), hex bushings (11), flat washers (10) and set screws (8).
- Lift the valve head from the piston cylinder.
- Remove the gaskets (4 & 6) and the valves assembly (5). Discard the gaskets and replace them with new gaskets.
- The 1st stage inlet and discharge valves are a combined reed valves assembly and must be replaced as a complete set if they are malfunctioning. Check for leaks by filling the inlet and discharge valve cavities with water (see fig. 11.11) and allow to stand for 10 minutes. If the water has leaked out, the valves assembly should be replaced.

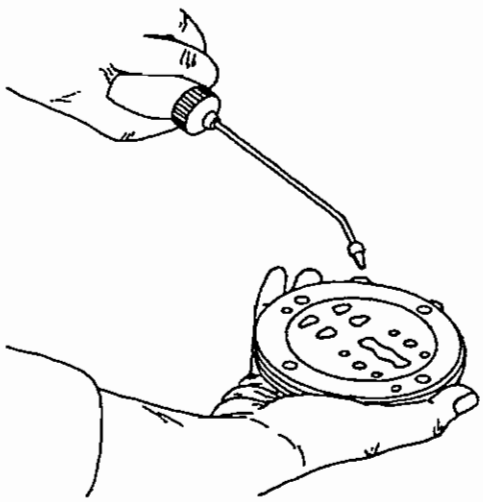


Fig. 11.11 Checking the 1st stage valves for leakiness

- Clean the valves assembly thoroughly before reassembling the valve head and valves. Blow the valves assembly dry with low pressure compressed air (125 psi).

11.6.2 Reassembly of the 1st Stage Valves, KM-FH

Reference fig. 11.12 and reinstall the valves of the 1st stage in the reverse sequence as follows:

- Apply a temperature-resistant, non-age-hardening RTV sealing compound to the sealing surfaces of the valve head (1) and the piston cylinder. See fig. 11.5.
- Return the studs (8) to the piston cylinder.

- Position the new cylinder gasket (6) onto the sealing surface of the piston cylinder.
- Position the reed valves assembly (5) on the cylinder gasket. Ensure that the side marked "Top" is facing up when installed.
- Position the new valve head gasket (4) on top of the valves assembly.
- Reinstall the valve head (1) onto the piston cylinder.
- Return the socket head cap screws (9), flat washers (10) and hex bushings (11) to the valve head and tighten them to 18 ft-lbs (25 Nm = 2.5 kgm) according to the pattern shown in fig. 11.2.
- Inspect the o-ring (2) for abrasion. Replace it if it is damaged.
- Reinstall the tube connections (7 & 3) and the inlet connection to the valve head (1).

1 1st stage valve head
2 O-ring
3 Plastic connector
4 Valve head gasket
5 Valves assembly
6 Cylinder gasket
7 Male connector
8 Stud
9 Socket head cap screw
10 Flat washer
11 Hex bushing
12 Valve head assembly, 1st stage
13 Flexible tube

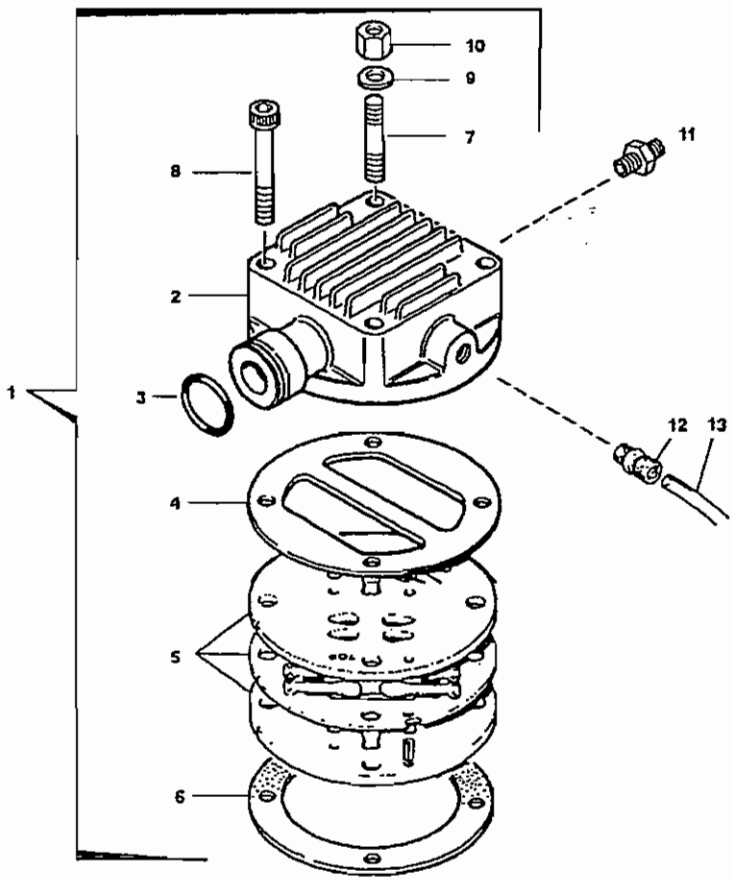


Fig. 11.12 Valve head and valves, 1st stage KM-FH

11.7 CHANGING THE 2ND STAGE VALVES, KU-FH, KC-FH and KM-FH

11.7.1 Removal of the 2nd Stage Discharge Valve

To remove the 2nd stage discharge valve, reference fig. 11.13 and proceed as follows:

- Remove the dome nut (1) and the gasket (2). Inspect the gasket. The gasket should be replaced if it is damaged.
- Unscrew and remove the socket set screw (3) and the discharge valve cover (4).
- Remove the spring washer (5) and the o-ring (6). The o-ring should be in perfect condition: undamaged and non-porous. Replace it if necessary.
- Extract the discharge valve assembly (7).
- Discard the valve gasket (12) and replace it with a new gasket.
- Inspect the valve seat (11). The sealing surface must be in good condition: devoid of pitting or cracking. The maximum valve seat width is 3/64" (1.0 mm). See fig. 11.6.
- Clean and inspect the valve plate (10). The maximum acceptable groove depth must not exceed 1/128" (0.2 mm). See fig. 11.8.
- Check the tolerance of the inside diameter of the valve body (8). The valve body must not show any grooves at ID 17 + 0.1 mm. See fig. 11.7.
- The valve spring (9) is reusable if it shows no outside scuffing and the spring ends have not picked up on the next coil.

The following limits should also be observed:

Discharge valve spring	Specified length ..... 24 mm Limit ..... 21 mm
Discharge valve stroke	Minimum ..... 0.8 mm Maximum ..... 1.05 mm
Valve seat bore diameter	..... 8.0 mm

If the above tolerances have been exceeded, the valve assembly (7) should be replaced.

1 Dome nut
2 Copper gasket
3 Socket set screw
4 Discharge valve cover
5 Spring washer
6 O-ring
7 Discharge valve assembly
8 Discharge valve body
9 Compression spring
10 Discharge valve plate
11 Discharge valve seat
12 Valve gasket
13 Tube connections
14 Socket head cap screw
15 Safety valve connection
16 Copper gasket
17 Inlet valve assembly
18 Inlet valve cover
19 Compression spring
20 Inlet valve plate
21 Inlet valve seat
22 Valve head

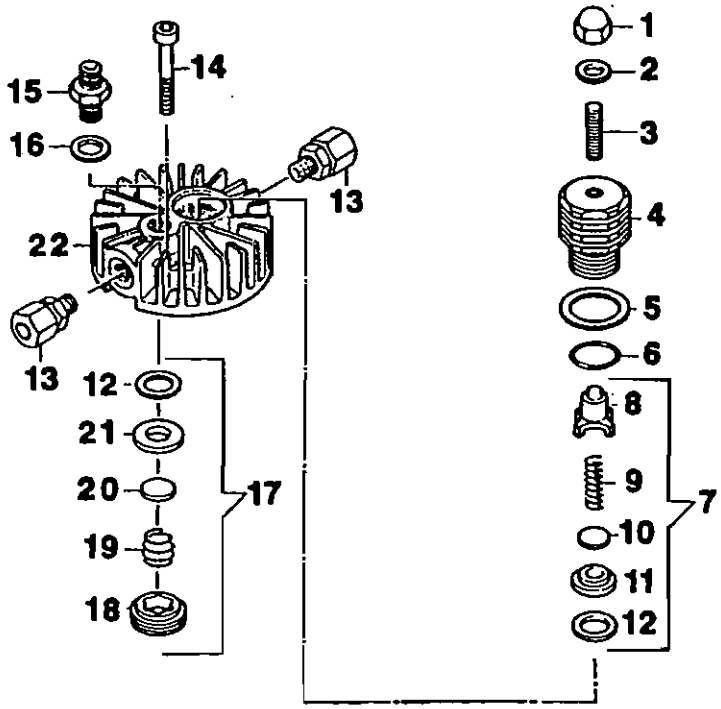


Fig. 11.13 Valve head and valves, 2nd stage

11.7.2 Removal of the 2nd Stage Inlet Valve

To remove the 2nd stage inlet valve, it is necessary to first dismantle the valve head. Refer to fig. 11.13 and proceed as follows.

- Remove the tube nuts, tubes and ferrules from the tube connections (13) to the valve head (22).
- Unscrew and remove the socket head cap screws (14).
- Lift the valve head off the piston cylinder.
- Unscrew the valve cover (18) from the bottom of the valve head (22) using the valve tool provided with the compressor unit. See fig. 11.4.
- Extract the inlet valve assembly (17) and discard the valve gasket (12). Replace the old gasket with a new gasket.
- Inspect the valve seat (21). The sealing surface must be in good condition: devoid of pitting or cracking. The maximum valve seat width is 3/64" (1.0 mm). See fig. 11.6.
- Clean and inspect the valve plate (20). The maximum acceptable groove depth must not exceed 1/128" (0.2 mm). See fig. 11.8.

- Check the tolerance of the inside diameter of the valve cover (18). It must not show any grooves at ID 17 + 0.1 mm. See fig. 11.7.
- The valve spring is reusable if it shows no outside scuffing and the spring ends have not picked up on the next coil.

The following tolerances should also be observed. If any of these tolerances have been exceeded, the valve assembly (17) should be replaced.

Inlet valve spring	Specified length ..... 10.5 mm Limit ..... 9 mm
Inlet valve stroke	**(KU-FH):** Minimum ..... 0.8 mm Maximum ..... 1.05 mm **(KC-FH and KM-FH):** Minimum ..... 1.0 mm Maximum ..... 1.25 mm
Valve seat bore diameter	**KU-FH** ..... 8.0 mm **KC-FH and KM-FH** .... 12.5 mm

11.7.3 Reassembly of the 2nd Stage Valve Head and Valves

To reassemble the valve head and valves, refer to fig. 11.13 and proceed as follows.

- Before fitting the inlet valve to the valve head, grease the inlet valve plate slightly and place it correctly on the valve seat to make reassembly easier.
- After having assembled the inlet valve, peen the valve head twice, once on each side of the valve, to lock the threads in place.
- Apply a temperature-resistant, non-age-hardening RTV sealing compound to the sealing surface of the valve head (fig. 11.5).
- Torque the valve head cap screws (14) to 18 ft-lb (25 Nm) in accordance with the sequence shown in fig. 11.2 **before** tightening the socket set screw (3) in order to avoid damage to the valve body (8).
- Tighten the socket set screw (3) with the appropriate size allen wrench.
- Position the gasket (2) and acorn nut (1) and tighten it with an open end wrench.
- Reinstall the tube connections (13) to the valve head (22).

11.8 CHANGING THE 3RD STAGE VALVES, KU-FH, KC-FH and KM-FH

11.8.1 Removal of the 3rd Stage Discharge Valve

Reference fig. 11.15 to note that the discharge valve (5) is inserted into the valve head (7). It is sealed by an o-ring (4) and fixed to the valve head with a set screw (3). To remove the 3rd stage discharge valve, proceed as follows.

- Remove the dome nut (1) and the gasket (2). Unscrew the socket set screw (3) three or four turns. If the gasket is damaged, replace it with a new gasket.
- Remove the socket set cap screws (9) that secure the valve head (7), then remove the valve head cover (8).
- Place two screwdrivers into the groove of the discharge valve body (see fig. 11.14) and lift out the discharge valve (5) together with the o-ring (4). If necessary, loosen the valve first, using a 13 mm open-end wrench on the flat surfaces.
- Check the o-ring. It should be in perfect condition (undamaged and non-porous). Replace it if necessary.

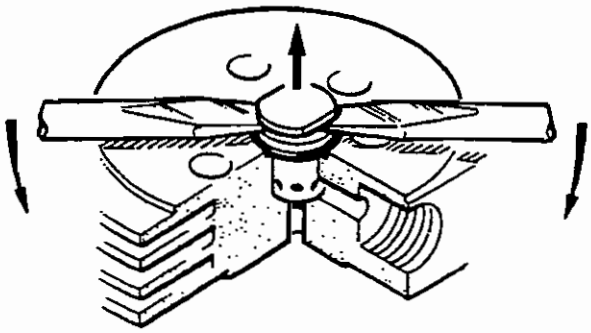


Fig. 11.14 Removal of the3rd stage discharge valve

- If the discharge valve does not close tightly, it should be replaced. The bore diameter of the valve seat should be 4.0 mm.

1 Dome nut
2 Gasket
3 Set screw
4 O-ring
5 Discharge valve
6 Inlet valve
7 Valve head
8 Valve head cover
9 Valve head screw

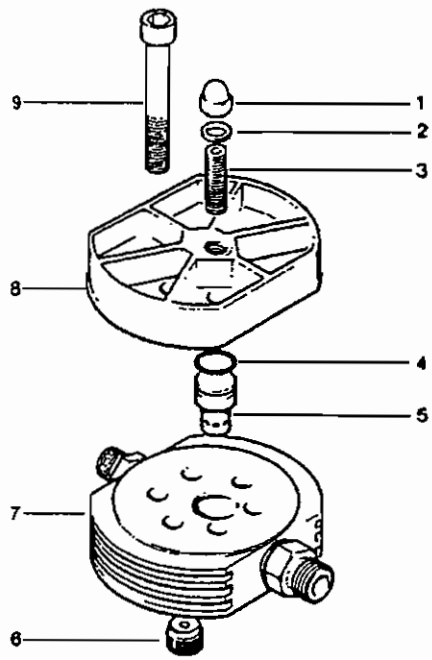


Fig. 11.15 Valve head, 3rd stage

11.8.2 Removal of the Inlet Valve

To remove the inlet valve (6), it is necessary to dismantle the valve head (7). Reference fig. 11.15 and proceed as follows:

- Remove the tube connections to the valve head (7).
- Unscrew and remove the socket head cap screws (9).
- Remove the valve head cover (8).
- Extract the inlet valve (6) using the valve tool provided with the unit. See fig. 11.4.
- The inlet valve should be replaced if it no longer closes tightly. The bore diameter of the valve seat should be 4.0 mm.

11.8.3 Reassembly of the 3rd Stage Valves and Valve Head

To reassemble the 3rd stage valves and valve head, reference fig. 11.15 and proceed as follows.

- Reassemble the inlet valve (6) in the reverse sequence of its removal.
- After reassembling the inlet valve, peen the valve head twice, once on each side of the valve, to lock the threads in place.
- Insert the discharge valve (5) with the o-ring (4) into the valve head (7).
- Position the valve head cover (8). **Do not** use a sealing compound on the third stage valve head.
- Insert and torque the valve head cap screws (9) to 18 ft-lb (25 Nm = 2.5 kgm) in accordance with the sequence shown in fig. 11.2 **before** tightening the socket set screw (3) in order to avoid damage to the valve body (8).
- Screw in the set screw (3) by hand. Fit the copper gasket (2) and the cap nut (1) and tighten with an open end wrench.
- Reinstall the tube connections to the valve head (7).

Check the valves against the following:

Inlet valve stroke	Minimum ..... 0.8 mm Maximum ..... 1.2 mm
Discharge valve stroke	Minimum ..... 0.9 mm Maximum ..... 1.2 mm

12.1 MANUAL CONDENSATE DRAIN SYSTEM

12.1.1 Description

The purpose of the manual condensate drain system is to provide a means to drain the filters of accumulated condensation.

The manual condensate drain system consists of the following items:

- Manual condensate drain valves on the intermediate filter and the oil and water separator.
- Interconnecting tubing.

The manual drains on the intermediate filter and the oil and water separator may be tubed to a condensate collection tank or to an outlet on the frame of the compressor unit.

12.1.2 Operation

Due care must be taken to ensure that any oil which is drained with the condensation is disposed of properly.

12.1.3 Unloaded start

On shut-down, open the intermediate and final separator manual condensate drain valves to drain condensation and remove pressure from the block. Close the drain valves prior to start up.

This operation performs two functions:

1. As pressure builds, the separators are cleared of accumulated condensation.
2. There is no load on the compressor during start-up.

12.2 AUTOMATIC CONDENSATE DRAIN SYSTEM[1]

12.2.1 Description

The automatic condensate drain system drains the intermediate filters after the second stage and the oil and water separator after the 3rd stage every 15 minutes during operation. In addition, the automatic condensate drain is designed to drain these filters after shut-down of the compressor unit and to unload the compressor during the starting phase.

The automatic condensate drain system operates electro-pneumatically and is comprised of the following main items (see fig. 12.1):

1. Used in place of the manual condensate drain system. Optional accessory for some models; not necessarily available on all models.

- one solenoid valve, normally open type, functioning as the condensate drain valve for the 2nd stage
- one pneumatically operated condensate drain valve, normally open type, for the oil and water separator after the last stage
- a condensate manifold
- a pre-separator elbow
- a condensate separator/silencer
- a condensate collector bottle
- a bracket for mounting the drain unit
- an electrical timer (see section 13).

1 Automatic condensate drain valve, final stage
2 Condensate outlet
3 Manual condensate drain valve, final stage
4 Condensate inlet from final separator
5 Condensate inlet from 2nd stage inter-filter
6 Condensate drain manifold
7 Solenoid valve coil
8 Control air connection from 2nd stage

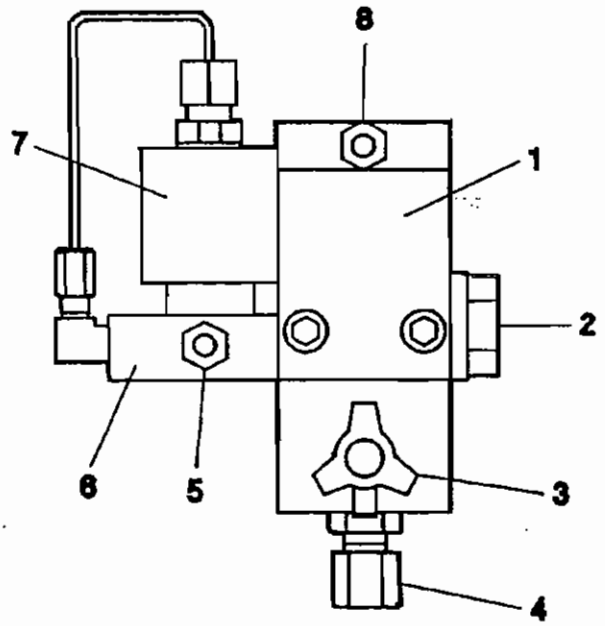


Fig. 12.1 Automatic condensate drain system

12.2.2 Operation

All positions in the following text refer to the flow diagram in the Annex, section 24.

The normally open condensate drain valves are connected in cascade mode. The condensation from the inter-filter after the 2nd stage is applied to the solenoid valve (SV1).

The solenoid valve (SV1) is normally open.

The condensation from the oil and water separator is applied to the pneumatically operated condensate drain valve (CDV1).

The control air for the oil and water separator drain valve is taken from the inter-filter after the 2nd stage.

At compressor start, the solenoid valve (SV1) is open and so is the condensate drain valve (CDV1) because there is no control air available at this moment.

At start-up of the compressor, the solenoid valve is energized and closes: due to build-up of pressure by the operation of the compressor, control air is forced into the condensate drain valve (CDV1). The servo-piston is pressed onto the valve seat and the condensate drain valve closes.

12.2.3 Condensate Drain

All positions refer to the flow diagram in the Annex, section 24.

Every 15 minutes, the 3-way solenoid valve (SV1) is de-energized for approximately 10 seconds by the timer. The solenoid valve (SV1) opens and drains the condensation from the 2nd stage inter-filter. Due to the pressure loss in the inter-filter, the control pressure for the condensate drain valve (CDV1) for the oil and water separator after the 3rd stage is removed. The servo-piston of the drain valve is unloaded and the control pressure is vented through the relief port.

The piston of the drain valve is raised by pressure from the final separator, the valve opens and the condensation is drain.

12.2.4 Start Unloading

The unloading of the compressor during the starting phase is effected through the lack of control air immediately after switching on the unit. After the compressor has attained nominal speed, the control air starts to flow to the condensate drain valve. The valve then closes, and the compressor delivers to the consuming device.

12.2.5 Standstill Drainage

At compressor shut-down, the solenoid valve (SV1) is de-energized and opens.

The valve piston is raised by the residual pressure within the inter-filter and separator. The valve opens and the filters are drained at standstill of the compressor unit.

12.2.6 Condensate Drain Piping

The outlet opening of the condensate drain manifold is equipped with a tube connector. From here the condensation is directed into a collecting bottle by means of a tube to the pre-separator elbow and a separator/silencer.

12.2.7 Electrical Connection

For electrical connection of the automatic condensate drain, refer to the schematic diagrams in the annex, section 24.

CAUTION

The condensate drain interval is adjusted in the factory. If the regular operating time of the compressor unit normally is less than the set drain cycle, adjust the timing relay accordingly to ensure regular draining of the oil and water separator. If the compressor is shut off before the first drain cycle is completed, the timing relay would be reset each time causing the drain cycle to be started again. The condensate drain cycle would never be completed, which could result in flooding of the separator and cause damage to the connected systems.

12.2.8 Separator/silencer

The operation of the separator/silencer has three steps.

1. The moisture and oily air flows through the input into a conical distribution system for a uniform flow against the filter element and reduction of the flow velocity.
2. When flowing through the filter medium made from micro glass fibre mater, the oil particles are formed into larger drops. This is caused by the coalescing effect of the outer foam material shell. From there they can drop smoothly into the translucent oil collector. The obtained efficiency amounts to more than 99.9% of all oil aerosols.
3. The cleaned compressed air can vent to the ambient pressure. The purposeful slowing down of the flow velocity leads to the desired silencing by more than 35 dB(A). The expanding noise level of 100 psi to atmospheric can reach about 125 dB(A). The end result is clean and silent ambient air.

The fine construction of the filtration material with an extensive hollow volume (approx. 90%) results in a substantial collection of solid matter particles. The service life is accordingly high and the pressure drop is extremely low.

The coalesced oil and water exits the collector and is tubed to a condensation collection bottle.

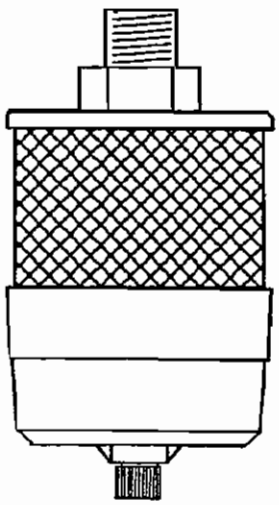


Fig. 12.2 ACD separator/ silencer

12.2.9 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:

- Open all manual drain valves one after the other.
- Observe the drainage of condensation. 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. Find the fault and remedy accordingly.

If little or no condensation emerges, the automatic system is operating properly.

To remedy problems, see Troubleshooting, section 22.

The condensate collection bottle should be emptied regularly. Due care must be taken to ensure that any oil which is drained with the condensation is disposed of properly. Check local, state and federal regulations.

Replace the silencer/separator element with each oil change, or more frequently if required.

13.1 GENERAL

This section describes the standard electric control and electronic monitoring system of the compressor unit. For schematic diagrams refer to the annex, section 24. The electrical equipment of the compressor unit consists of the following.

- Control relay
- Printed circuit board (120V)[1]
- On/off switch (electric drive)
- Hand/off/auto switch[1]
- Final pressure switch
- Oil pressure switch[1]
- High temperature switch (N.O.)
- ACD timer (120VAC)[1]
- Hourmeter[1]
- Ammeter[1]
- Control relay (3-position)[1]
- Printed circuit board (12V)[1]
- On/off switch (gasoline drive)[1]
- Keyed ignition switch (diesel drive)[1]
- Final pressure switch (low pressure)[1]
- High temperature switch (N.C.)
- Audible alarm[1]
- ACD timer (12VDC)[1]
- Emergency stop push-button[1]

Unless specially ordered with the compressor, a main switch and fuse must be supplied by the customer (see section 3 for electrical installation).

13.2 CONTROL RELAY

The control relay controls the operation of the compressor unit by sending and receiving electrical signals from the various components of the electrical system.

It is a 120VAC, medium power, multi-contact DPDT or 4PDT[1] holding relay.

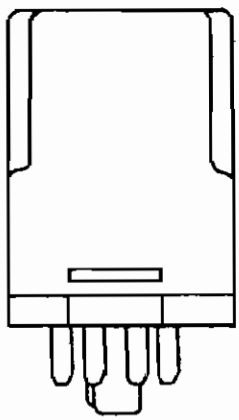


Fig. 13.1 Control relay

Technical Data

Ambient temperature range, DPDT:	-45° to 55° C
Ambient temperature range, 4PDT:	-45° to 70° C
Contact current rating	10A
Frequency	50/60 Hz

13.3 MONITORING MODULE[1]

The BAUER control module monitors up to six (6) operating conditions of the compressor. It receives signals from the pressure and temperature switches. Faults are indicated by means of warning lamps.

1. Optional accessory.

13.3.1 Design

The BAUER monitor system is comprised of the following:

- BAUER control module with power supply, time relay element, power relay, electronic control and interlocking circuit.
- Terminal block connectors.
- Solid state construction.

13.3.2 Technical Data

Supply voltage	110-127 VAC/50-60 Hz or 12 VDC[2]
Electronic circuit supply voltage	120 VAC or 12 VDC[2]
Relay type	single-pole, double throw
Contact rating	8 Amps
Ambient temperature rating	-25° to 120° F

13.3.3 Mode of Operation

The electronic control module is an electronic printed circuit board. When the compressor is started, the electronic control compensates for low oil pressure fault signals for approximately 40 seconds to allow the compressor to establish oil pressure. If the operational conditions at the monitored positions are not established during this period, the electronic control will shut down the drive motor or engine. During operation, shut-down of the compressor occurs immediately after the fault signal has been applied to the monitoring unit.

The unit is designed to fail safe, i.e., any interruption of the control or monitoring circuit results in the system being disabled, thus protecting the monitoring and control system against wire breakage or loose terminals. When the system is disabled, it is a good practice to check the wiring for continuity. The monitoring unit requires no servicing. In case of a fault in the control module, it must be replaced.

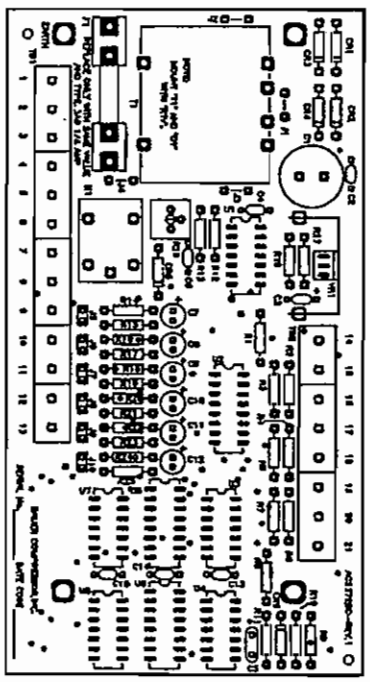


Fig. 13.2 Monitoring module

After correcting the fault, the fault signal must be cancelled by switching the on-off switch first to "OFF," then back to "ON." Units with a push-button type switch, switching from the center position to "ON" will **not** restart the compressor unit. Here also, switch first to "OFF," then to "ON."

2. 120 VAC is for electrically driven units only, 12 VDC is for gasoline or diesel driven units only.

13.4 SELECTOR SWITCHES

13.4.1 Off/On Selector Switch (Electrically Driven Compressor Units)

The off/on selector switch controls the operation of electrically driven compressor units. If the selector switch is in the "OFF" position, the unit will not operate.

When the selector switch is turned to the "ON" position, the unit will automatically start and stop to maintain the final pressure between the high and low set points of the final pressure switch.

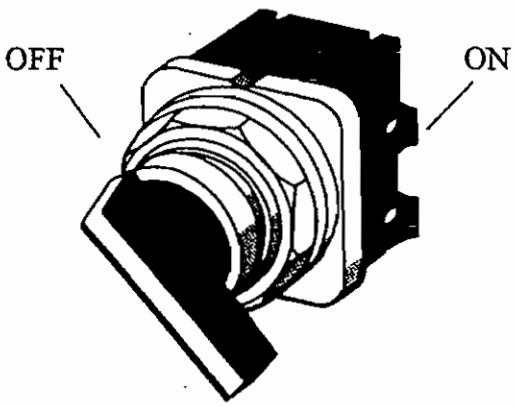


Fig. 13.3 Off/on selector switch

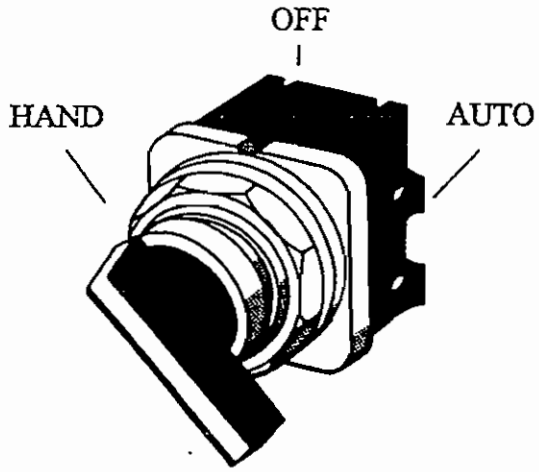


Fig. 13.4 Hand/off/auto selector switch

13.4.2 Hand/Off/Auto Selector Switch[3]

The hand/off/auto selector switch controls the operation of the unit. If the selector switch is in the "OFF" position, the unit will not operate. When the selector switch is turned to the "AUTO" position, the unit will automatically start and stop to maintain the final pressure between the high and low set points of the final pressure switch. When the selector switch is in the "HAND" position, the automatic switch-off function is disabled to allow the unit to build and unload pressure while the motor continues to run.

13.4.3 Off/On Selector Switch (Gasoline Driven Compressor Units)

Gasoline driven units are equipped with an off/on selector switch and a push-button start switch. To start the unit, turn the off/on switch to the "ON" position and depress the push-button start switch until the unit starts. If the unit is equipped with an oil pressure switch, a mechanical timer is provided to override the oil pressure switch during start-up to allow the compressor to attain sufficient operating pressure. The timer should be set for approximately 40 seconds before starting the unit. when the off/on toggle switch is in the "OFF" position the unit will not operate.

3. Optional accessory.

13.4.4 Keyed Ignition Switch (Diesel Drive)

Diesel driven units are equipped with a keyed ignition switch. To start the compressor unit, turn the switch to the start position until the engine turns over, then release. The switch will rest in the "RUN" position while the unit is in operation.

13.5 PRESSURE SWITCHES

13.5.1 Final Pressure Switch

The automatic switching of the compressor unit off and on is governed by the final pressure switch. The value of this switch is adjustable.

The approximate actuation value (differential) of the final pressure switch is fixed at whatever pressure setting is required for proper operation of the unit. This switch must never be set above the original order pressure.

If the pressure actuator is exposed to system or surge pressures greater than the maximum pressure rating printed on the device nameplate, leakage from the actuator and/or a change of operating set points may result.

13.5.2 Oil Pressure Switch

The compressor oil pressure is monitored by the compressor oil pressure switch. At zero pressure, the pressure switch is open. If the compressor does not build sufficient oil pressure within 40 seconds after start-up or if the oil pressure drops below the preset value during operation, the pressure switch will open, the warning lamp will light and the compressor unit will shut down.

The approximate actuation value (differential) of the oil pressure switch is fixed at whatever pressure setting is required for proper operation of the unit. This switch must never be set above the original order pressure.

If the pressure actuator is exposed to system or surge pressures greater than the maximum pressure rating printed on the device nameplate, leakage from the actuator and/or a change of operating set points may result.

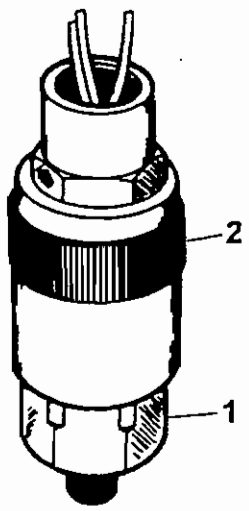


Fig. 13.5 Pressure switch

13.5.3 Set Point Adjustment

Secure the hex body (1) with an open end wrench. Hand turn the adjustment sleeve (2) clockwise to increase the set point, counterclockwise to decrease the set point (note the orientation of the switch in the figure).

The differential is fixed though the range varies according to the pressure setting.

13.5.4 Switch characteristics

Adjustable range, final pressure	4000 to 7500 psig
Adjustable range, final pressure (low[4])	1650 to 4400 psig
Adjustable range, oil pressure	430 to 1700 psig
Actuation differential range, final pressure	350 to 800 psig
Actuation differential range, final pressure (low[4])	200 to 500 psig
Actuation differential range, oil pressure	70 to 250 psig
Contact rating	5 Amps @ 125/250VAC
Temperature range	-40° to 165° F

WIRE CODE	
Lead	Color
Normally Closed	Blue
Common	Purple
Normally Open	Red

13.6 FINAL STAGE TEMPERATURE SWITCH

This temperature switch is a positive-acting, bimetal snap disc which is **closed** during operation on electrically driven compressor units and **open** during operation on gasoline and diesel driven compressor units. The temperature switch is located in the output pipe of the final stage cylinder.

As the temperature reaches the tamper-proof predetermined set point, the disc snaps to provide a rapid positive contact action (opens or closes). When the temperature becomes excessive, the system will be shut down. A warning light will indicate the fault.

13.7 AUDIBLE ALARM[5]

13.7.1 Description

The audible alarm is either a 120V, 60 Hz vibration horn on electrically driven units or a 12 VDC vibration horn on gas or diesel driven units. The horn is designed for use in non-hazardous locations. Whenever a fault occurs during operation of the unit, the alarm will sound in a continuous monotone at 68 to 80 dB(A) at 2 ft. until the selector switch is returned to the "OFF" position.

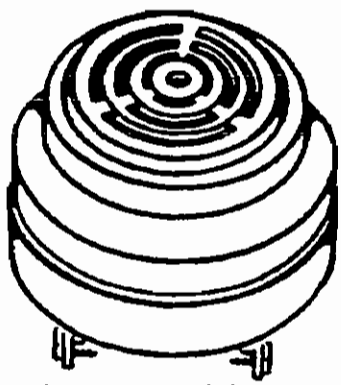


Fig. 13.6 Audible alarm

For electrical connections, reference the wiring diagrams in the annex of this manual.

13.7.2 Maintenance

The horn should be tested monthly to ensure continuous service.

4. Low final pressure setting is optional.
5. Optional accessory.

13.8 ACD TIMER[6]

The automatic condensate drain timer controls the frequency of the drain intervals and the duration of the drain period of the automatic drain valve. It is either a 120V on electrically driven units or a 12V on gasoline or diesel driven units, solid state, encapsulated, recycling timer. Both the on and the off times are adjustable. Its range is 1-100 minutes on, 0.1-10 seconds off.

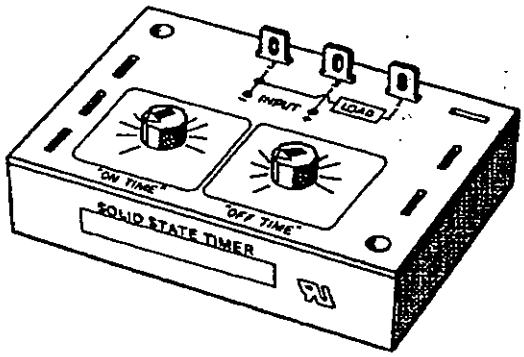


Fig. 13.7 ACD timer

13.9 HOURMETER[6]

The compressor unit is equipped with an hourmeter. It is mounted on the electrical enclosure or on the instrument panel at the front of the compressor unit. The hourmeter is provided to record the number of hours the unit is in operation. The hourmeter will be in operation while the compressor unit is running. 120 V, 12 V or vibration type hourmeters are available.

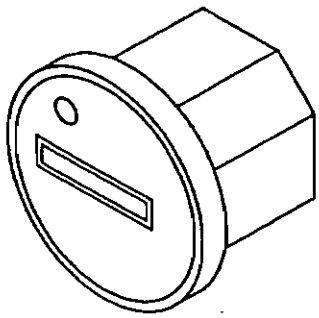


Fig. 13.8 Hourmeter

13.10 EMERGENCY STOP PUSH-BUTTON[6]

13.10.1 Description

The emergency stop switch is a maintained push-pull type push-button switch. It is supplied with a normally closed single pole single throw contact block. The red mushroom cap type head of the emergency stop switch is highly visible and offers a large target which is convenient for gloved hand operation or emergency situations.

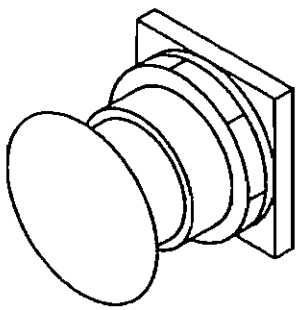


Fig. 13.9 Emergency stop push-button

13.10.2 Operation

To stop the compressor in case of emergency, depress the emergency stop push-button. The unit will shut down.

13.11 AMMETER[6]

The ammeter, located on the instrument panel, indicates whether or not the alternator is charging the battery during operation. While the unit is in operation, the ammeter needle should lean toward the positive range (to the right of the zero). If not, the alternator, the battery and/or the electrical connections should be checked.

6. Optional accessory.

14.1 ELECTRIC MOTOR DRIVE CONFIGURATION

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 section 19). Replace it if necessary. The highest rate of v-belt stretching is normally during the running-in period; therefore, it is advisable to check and re-tighten the drive belt during the first inspection of the compressor.

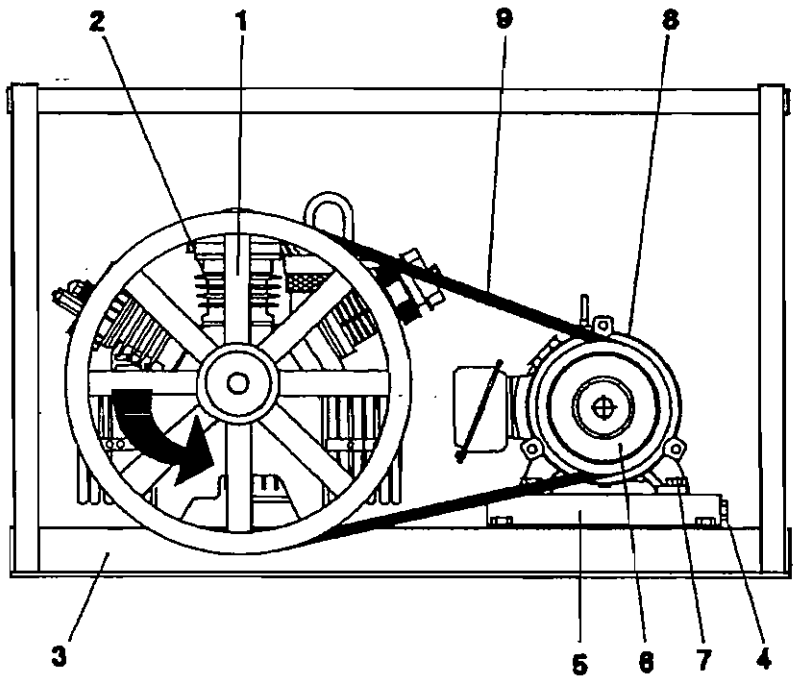


Fig. 14.1 Compressor drive system with electric motor

1 Compressor flywheel
2 Compressor block
3 Frame
4 Tensing screw
5 Sliding motor base
6 V-belt sheave
7 Motor securing screw
8 Electric drive motor
9 Drive v-belt

14.2 DIESEL OR GASOLINE ENGINE DRIVE CONFIGURATION

The compressor is driven by the engine 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 section 19). Replace it if necessary. The highest rate of v-belt stretching is normally during the running-in period; therefore, it is advisable to check and re-tighten the drive belt during the first inspection of the compressor.

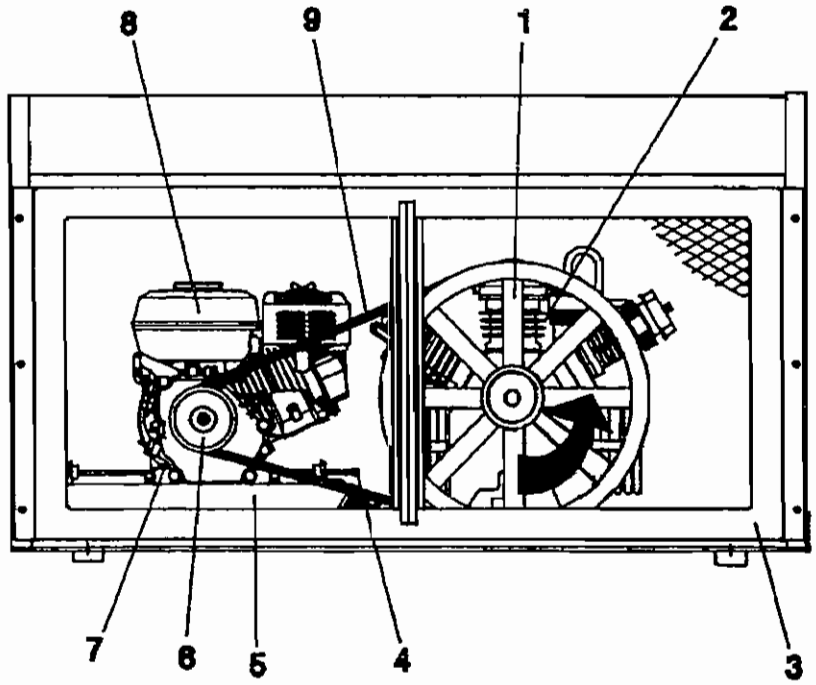


Fig. 14.2 Compressor drive system with gasoline engine

1 Compressor flywheel
2 Compressor block
3 Belt guard assembly
4 Tensing screw
5 Engine mount
6 V-belt sheave
7 Engine securing screw
8 Gasoline or diesel engine
9 Drive v-belt

14.3 V-BELT MAINTENANCE

14.3.1 Inspection of the V-belt Sheaves

Check the Sheaves. Before a new drive belt is installed, the condition of the sheaves should be checked. Dirty or rusty sheaves impair the drive's efficiency and abrades the cover of the belt, 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 belt may burn. If the side walls are "dished out," the bottom shoulder ruins the belt prematurely by wearing off the bottom corners.

Check the Sheave Alignment (fig. 14.3). Sheave adjustment should be checked by placing a straight edge or tight cord across the sheave faces so that it touches all four points of contact. Ordinarily, a misalignment of more than one-half of one degree (one-eighth inch in one foot) will adversely affect belt life. Improper sheave alignment produces uneven wear on one side of the belt, causes the belt to roll over in the sheave, or throws all the load on one side of the belt, stretching or breaking the cords on that side.

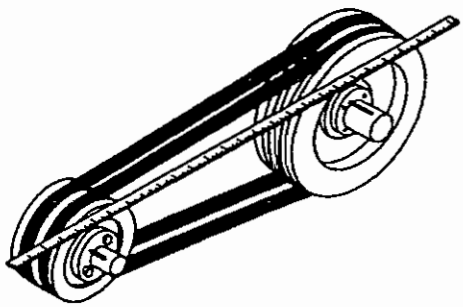


Fig. 14.3 Checking the sheave alignment

14.3.2 Replacing the V-belt

Loosen the securing screws that secure the motor/engine to the motor/engine mount to reduce the center distance so that the belt may be placed over the sheaves and in the grooves without forcing it over the sides of the grooves.

Arrange the belt so that both the top and bottom spans have about the same sag. Apply tension to the belt by increasing the center distance until the belt is snug. To tense the v-belt, use the two adjustment screws. Turn the screws clockwise to tighten, counterclockwise to loosen.

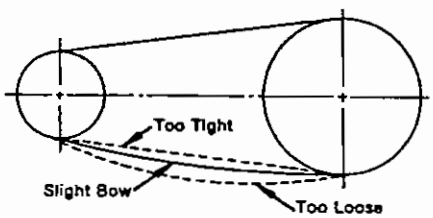


Fig. 14.4 Tensing the drive v-belt

Before tightening the securing screws (6), make sure the pulleys are in alignment (check with a ruler on the compressor pulley).

Operate the drive a few minutes to seat the belt in the sheave grooves. Observe the operation of the drive under its highest load condition (usually starting). A slight bowing of the slack side of the drive indicates proper tension. If the slack side remains taut during peak load, the drive is too tight. Excessive bowing or slippage indicates

insufficient tension. If the belt squeals as the motor comes on or at some subsequent peak load, it is not tight enough to deliver the torque demanded by the compressor. The unit should be stopped and the belt tightened.

NOTE

V-belts which are tightened insufficiently slip, knock and wear away quickly. V-belts which are too tight may cause bearing damage on both the motor and the compressor.

After proper operating tension has been applied to the belt, a double check should be made to ascertain the following:

- Parallel position of the drive shafts.
- Correct alignment of sheave grooves.

Check the tension on a new drive frequently during the first day by observing the slack side span. After a few days of operation, the belt will seat itself in the sheave grooves after which it may become necessary to readjust so that the drive again shows a slight bow in the slack side.

14.4 MAINTENANCE OF THE DRIVE MOTOR/ENGINE

WARNING

Always disconnect the power before working on motor/engine.

14.4.1 Single Phase Motor

This is a ball bearing motor. The bearings have been given initial lubrication at the factory.

New motors which have been in storage for over a year should be relubricated by the procedure noted below. The following lubrication intervals are suggested as a guide for long operating life.

- For 500 operating hours/year, lubricate annually.
- For 8 hrs/day (continuous operation), lubricate every 6 months.
- Seasonal service (motor is idle for 6 months or more), lubricate annually at the beginning of the season.
- In severe duty, high ambient temperature, dirty or dusty locations, lubricate every 3 months.

CAUTION

Lubricate motors at a standstill. Keep grease clean.
Do not mix petroleum grease and silicone grease in the motor bearings.

It is recommended that one of the following greases or an equivalent be used for motor lubrication.

Grease type	Manufacturer
SRI no. 2	Chevron
Dolium R	Shell Oil Co.
Premium RB	Texaco Inc.

To lubricate:

NOTE

If lubrication instructions are shown on the motor, they will supersede this general instruction.

1. Wipe all grease fittings (fill and drain) clean.
2. Remove the fill and drain plugs from the bearing hub.
3. Free the drain hole of any hard grease. Use a piece of wire if necessary.
4. Add grease using a low pressure grease gun. The amount and type of grease added is very important. Only enough grease should be added to replace the grease used by the bearing. Too much grease can be as harmful as insufficient grease. The grease cavity should be filled 1/3 to 1/2 full.
5. Start the motor and let it run for approximately 30 minutes.
6. Stop the motor, wipe off any drained grease and replace the filler and drain plugs.
7. The motor is ready for operation.

14.4.2 3 Phase Motor

WARNING

Always disconnect the power before working on the motor.

Inspect the motor at regular intervals. Keep the motor clean and the vent openings clear.

The motor bearings are prelubricated prior to installation and are designed for an average of 100,000 hours of operation under standard conditions (8 hours per day operation). For severe operating conditions, such as 24 hour/day continuous operation or exposure to dirty or dusty conditions, the interval is 33,000 hours. After this period, it is recommended that the bearings be replaced.

14.4.3 Gasoline or Diesel Engine

Reference the gasoline or diesel engine operator's manual for maintenance instructions and intervals.

15.1 DESCRIPTION

The cylinders of the compressor as well as the intercoolers and aftercooler are air-cooled. For this purpose, the compressor is equipped with a fan which draws cooling air through the fan cover from the surroundings. The fan is driven by the drive engine/ motor by means of one or more v-belts and is also used as the flywheel.

Refer to section 3, compressor installation, for proper cooling air supply.

15.2 MAINTENANCE

When dirty, clean the finned tubes, valve heads, and cylinders by blowing off the dirt and dust with low pressure compressed air (80-125 psi).

16.1 DESCRIPTION

The air storage system[1] consists of one or more D.O.T. or A.S.M.E. storage vessels with line valves, safety valves, interconnecting tubing, pressure gauges, check valves and a bottle rack.

D.O.T. vessels are approved by the Department of Transportation for portable usage. D.O.T. systems are available at 4500 psi and 6000 psi.

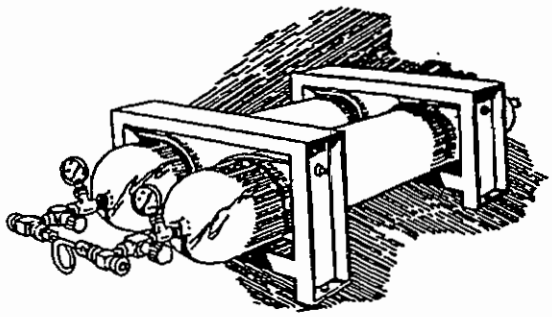


Fig. 16.1 Typical two bottle A.S.M.E. storage system

A.S.M.E. vessels conform to the American Society of Mechanical Engineers codes for permanent installation. These vessels have working pressures of 5250 psig with a safety factor of 4 to 1 and 6600 psig with a safety factor of 3 to 1.

A safety valve is provided on each vessel to protect against excess pressure. It is preset at the factory and sealed. It should not be adjusted.

Specifications

VESSEL	DOT 4500 PSI	DOT 6000 PSI	ASME 5000 PSI	ASME 6600 PSI
Material	Lightweight steel alloy	Lightweight steel alloy	Steel ASME SA 372 Class V Type A AISI 4130	Steel ASME SA 372 Class V Type A AISI 4130
Volume	444 cf @ 4500 psi	509 cf @ 6000 psi	424 cf @ 5000 psi	481 cf @ 6000 psi
Working pressure	4500 psi	6000 psi	5000 psi	6000 psi
Test pressure	6750 psi	9,000 psi	7875 psi	10,500 psi
Diameter	9 5/16"	9 9/32"	9 5/8"	9 5/8"
Height	55" w/valve	55" w/valve	57" w/o valve	57" w/o valve
Weight	144 lbs.	188 lbs.	400 lbs.	400 lbs.
Valve	CGA 347	CGA 702	Standard valve supplied	Standard valve supplied
Finish	Primer and Topcoat	Primer and Topcoat	Primer and Topcoat	Primer and Topcoat

1. Optional accessory.

16.2 OPERATION

16.2.1 Slow and Fast Fill

To slow fill (fill directly from the compressor), open the shut-off valve located on the gauge panel and close the bottle valves; turn counterclockwise to open, clockwise to close valves.

To fast fill, open the bottle valves and the shut-off valve located on the gauge panel. Turn counterclockwise to open valves, clockwise to close.

16.2.2 To Fill Storage Vessels

Close the shut-off valve and open the bottle valves. Turn counterclockwise to open, clockwise to close valves.

16.3 MAINTENANCE

16.3.1 Pressure Gauges

Observe the pressure gauges daily. If the readings of any of the gauges seem to be incorrect, remove the gauge and check for wear and tear, accuracy, and proper functioning by comparing it to a precision test gauge or a dead weight tester. Replace all broken or damaged gauges immediately.

16.3.2 Storage Bottles

All storage bottles should be visually inspected internally every year. Every five (5) years, D.O.T. bottles must be hydrotested. Check local and state regulations regarding testing of ASME and/or D.O.T. bottles. Some states require an annual visual inspection, and hydrotesting requirements also differ from state to state.

16.3.3 Safety Valves

Develop a regular program of visual inspection, looking for clogged drains and discharge pipe, dirt build-up in and around the valve seat, and broken or missing parts. Avoid operating the safety valve, as even one opening can result in leakage.

Do not paint, oil or otherwise cover any interior or working parts of any safety valve. They do not require any lubrication or protective coating to work properly. When safety valves require repair, service adjustments or set pressure changes, work must be accomplished by the manufacturer or holders of "V", "UV" and/or "VR" certifications.

16.3.4 Tube Connections

Pipe connections (swivel nuts): Tighten *just firmly enough* so that leakage is stopped (finger tight plus up to an additional 1/2 turn as necessary).

17.1 AIR OUTLET

The air outlet on this compressor unit consists of either a bulkhead connector in the panelling or a swivel connector after the pressure maintaining valve. For the location of the air outlet, refer to the outline dimensional drawing(s) in the Annex, section 24.

17.2 FILLING PROCEDURE

17.2.1 Connecting the Air Bottle

Connect to the air bottle valve (fig. 17.1) using a fill hose with the CGA-346 fill adapter for 2215 psi SCBA bottles, the CGA-347 adapter for 4500 psi SCBA bottles or a DIN or yoke adapter for SCUBA bottles.

Note: The CGA-347 fill adapter seals on 4500 psi rated bottle valves, but vents on lower rated pressure bottles. Also, the illustrations below might differ slightly from actual fill assembly due to variations in design.

17.2.2 Filling the Air Bottle

Close the bleed valve (1) on the fill hose (fig. 17.2) or on the adapter. Open the filling valve (2) and then the bottle valve (3). Start the compressor unit and drain the condensation from the compressor regularly during filling.

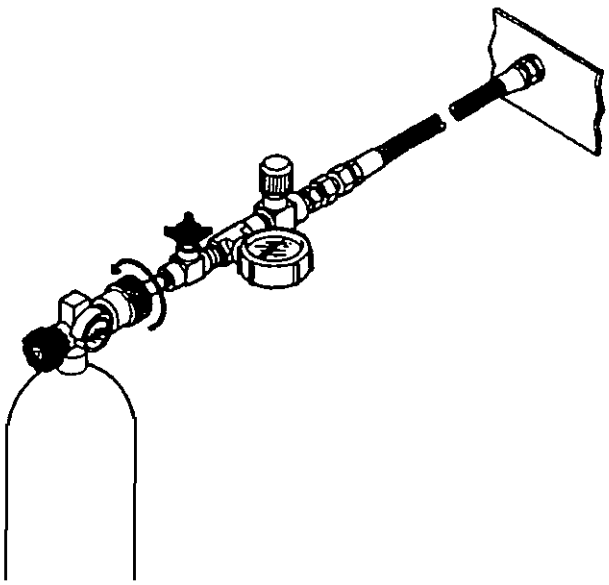


Fig. 17.1 Connecting the air bottle

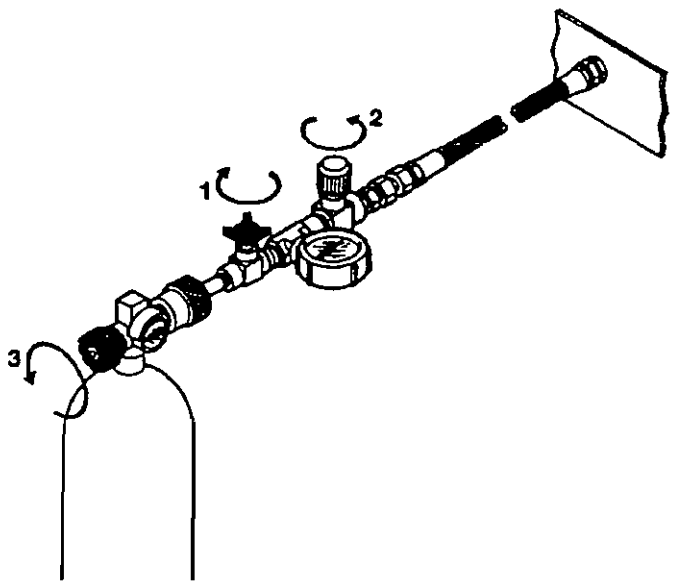


Fig. 17.2 Filling the air bottle

17.2.3 Removing the Air Bottle

After reaching the final bottle pressure, turn off the compressor unit. Close the bottle valve (1) and then close the filling valve (2). See fig. 17.3.

Open the bleed valve (3) to vent the residual pressure in the fill hose or in the adapter.

Disconnect the fill adapter (4) from the air bottle valve.

During the filling procedure, the bottles will warm up due to the compression process. After removal, allow the bottles to cool down and the bottle pressure to drop. The bottles may then be reconnected and topped off to the respective maximum filling pressure.

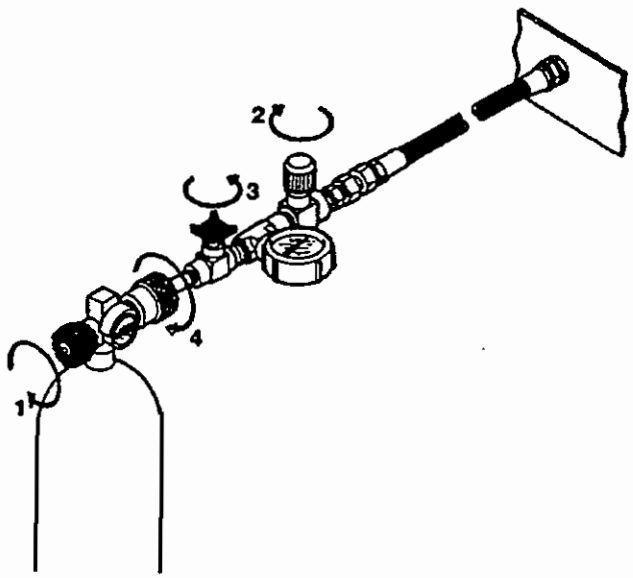


Fig. 17.3 Removing the air bottle

Both adapters for SCBA bottle valves use a unique o-ring sealed tip. Light finger tightening assures a complete bubble-tight seal to the bottle valve, even when the valve seating area has been slightly scratched or dented.

Compressed air SCBA bottle filling valves for a pressure in excess of 2215 psi (155 bar) are standardized (CGA). Connectors for 2215 psi and 4500 psi are different and cannot be accidentally used with the wrong type bottle.

18.1 PREPARATION FOR OPERATION

All compressor units are tested prior to delivery to the customer, so there should be no problem putting the unit into operation after correct installation. Observe the following points:

NOTE

Prior to initial operation read the Instruction Manual carefully.

- All compressor units are delivered with oil in the crankcase. Prior to first operation check the oil level according to chapter 4. When putting the unit into operation following a storage period of three (3) months or more, drain the preservative oil and fill with compressor oil according to the instructions in chapter 4.
- Prior to initial operation or immediately following maintenance work, turn the compressor manually using the flywheel to ensure that all parts are turning freely.
- **Immediately** after switching on the system for the first time, check the rotation of the motor for agreement with the arrow on the unit. If the motor turns in the wrong direction, the phases are not connected properly. Shut down the unit immediately, disconnect the power supply and inter-change two of the three phase leads in the switch box. Never change leads at the motor terminals.[1]
- Prior to each operation check the oil level according to chapter 4 and determine whether maintenance is necessary in accordance with chapter 19.
- Open the outlet valve.[2]This valve must be open during operation. Close only for servicing the compressor to prevent air escaping from connected receivers.

18.2 START-UP AND SHUT-DOWN

NOTE

Audible knocking during start-up is due to the final stage floating piston. This knocking disappears as soon as there is pressure between the stages and the piston is running synchronous with the other pistons. Therefore, this knocking can be ignored.

To start:	Energize the main power source. Turn the selector switch to "ON".
To stop:	Turn the selector switch to "OFF". Disconnect main power source.
Emergency stop:[3]	Depress the emergency stop push-button. Unit will shut down.

1. Three phase units only.
2. Not standard on all models.
3. Optional accessory.

Safety shut-downs

The unit will automatically shut off for any one of the following malfunctions:

	Malfunction light
• High CO content[4]	High CO[4]
• High temperature, compressor	High temperature[5]
• Insufficient oil pressure[5]	Low oil pressure[5]
• Excessive motor current	No light

Correct the malfunction before restarting the compressor unit.

To restart after a malfunction shutdown other than excessive motor current, turn the selector switch to "OFF" and back to "ON".

To restart after shutdown for excessive motor current, turn the selector switch to "OFF", press the reset button, then turn the selector switch back to "ON".

18.3 SEQUENCE OF OPERATION, STANDARD UNITS

All item designations and line numbers in the following text refer to electrical wiring diagram #DGM-0008 in the annex, section 24.

- By applying power to lines L1, L2 and L3, the control circuit is energized through control transformer 1TRR and fuse 1FU (line 1). Amber power on light 1LT (line 14) illuminates.
- Turn selector switch 1SS (line 7) to the "ON" position. The motor starter coil 1M (line 7) is energized; the starter contacts 1M (lines L1, L2, L3) close to start the motor 1MTR.
- The air pressure switch 1PS opens at the preset pressure to de-energize the motor starter coil 1M and will stop motor 1MTR and hourmeter 1HM. When the system pressure drops below the differential of pressure switch 1PS (closing 1PS), the unit will start automatically and begin to pressurize the system.

18.3.1 Safety Shutdowns

The unit will automatically shut off for any one of the following malfunctions:

NOTE

When the compressor shuts down due to a fault, always remedy the problem before restarting the compressor. Refer to Troubleshooting, section 22, for assistance.

4. Optional accessory.
5. Not standard on all models.

- 1OL (line 3) Thermal overload relay: When motor is drawing too many amperes, 1OL will open to stop the motor 1MTR. To restart the compressor, turn selector switch 1SS (line 7) to the "OPEN" position to cool down the motor. Press reset button and then turn 1SS to the "ON" position.
- 1TS (line 7) High temperature switch: When the final stage cylinder head exceeds a preset temperature, 1TS will open to stop the motor 1MTR. To restart the compressor, turn selector switch 1SS (line 7) to the "OFF" position to cool down the compressor and then turn 1SS to the "ON" position.

18.3.2 Optional Controls

- 1CR or 2 CR, Control relay: Prevents the motor from restarting automatically when the power is restored after a power failure.
- 1SC (line 6) SECURUS purification monitor system: Monitors the rising moisture level in the purifier and indicates when the purifier cartridge requires replacement before the cartridge life expires completely.
- 1AL (line 5) Audible alarm: Sounds an audible alarm on all fault shutdowns.
- 1TGS (line 2): On/off toggle switch for CO monitor.
- 1CO (line 2, 8, 9) CO monitor: Shuts down the compressor when excessive carbon monoxide is present in the compressed air.
- 1PB (line 6): A push button emergency stop switch.
- 2SS "HAND/OFF/AUTO" selection switch: Allows for constant speed in the "HAND" position, start-stop operation in the "AUTO" position. 2SV (line 4) must be used for optional constant speed unloading.
- 1HM (line 22) Hourmeter: Registers the running time of both the motor and the compressor.
- 2 PS: A cut-in pressure for dual pressure option.
- 3PS: A low pressure switch for the high/low pressure option.
- 2TGS (line 12) Toggle switch: Manual bypass for the ACD system. Allows the operator to check the function of the ACD.
- 1TMR (lines 11, 12, 13) ACD timer: De-energizes 1SV at set time intervals to automatically drain the condensation.
- 1SV (line 11): ACD Solenoid valve.
- 2SV (line 4): Constant speed unloader solenoid valve.

18.4 SEQUENCE OF OPERATION, UNITS W/PCB

All item designations and line numbers in the following text refer to electrical wiring diagram #DGM-0290 in the annex, section 24.

- By applying power to lines L1, L2 and L3, the control circuit is energized through the control transformer 1TRR (line 1) and fuse 1FU (line 1). Amber power on light 1LT (line 32) illuminates.
- Turn selector switch 1SS (lines 7) to the "ON" position. 1PCB (line 9) is energized through 1PS and 1OL (line 7). 1PCB internal switch on terminal 5 switches to terminal 6 to energize 1M coil (line 12) and close contacts 1M (lines L1, L2, L3 and 22) to start 1MTR and energize 1HM (line 22).

  An internal timer in 1PCB between terminals 8/16 and 9/17 starts. If during this time 2PS (line 14) does not close, 1PCB internal switch on terminal 6 will open to stop 1MTR and 1HM. 2LT (line 14) will light and remain lit to indicate the fault.

18.4.1 Safety Shutdowns

The unit will automatically shutdown for any one of the following malfunctions:

NOTE

When the compressor shuts down due to a fault, always remedy the problem before restarting the compressor. Refer to Troubleshooting, section 22, for assistance.

- 10L (line 7) Thermal overload relay: When motor is drawing too many amperes, 10L will open to stop the motor 1MTR. To restart the compressor, turn the selector switch 1SS (line 7) to the "OFF" position to cool down the motor. Press reset button and then turn 1SS to the "ON" position.
- 2PS (line 14) Low oil pressure switch: When the compressor oil falls below a preset pressure, 2PS will open to stop the motor 1MTR. Fault is indicated by 2LT (line 14). To restart the compressor, turn the selector switch 1SS (line 7) to the "OFF" position. After correcting the fault, turn 1SS to the "ON" position.
- 1TS (line 16) High temperature switch: When the final stage cylinder head exceeds a preset temperature, 1TS will open to stop the motor 1MTR. Fault is indicated by 3LT (line 16). To restart the compressor, turn the selector switch 1SS (line 7) to the "OFF" position to cool down the compressor and then turn 1SS to the "ON" position.

18.4.2 Standard Controls

- 1PS (line 7) Air pressure switch: Will open at preset pressure to de-energize 1PCB and stop 1MTR and 1HM. When the system pressure drops below the differential of 1PS (closing 1PS), the unit will start automatically and begin to pressurize the system.

- 1HM (line 22) Hourmeter: Registers the running time of both the motor and the compressor.
- 1CTR (lines 24, 29) Counter:[6] Registers the number of operations of the automatic condensate drain.
- 1SC (line 6) SECURUS purification monitor system:[6] Monitors the rising moisture level in the purifier and indicates when the purifier cartridges require replacement before the cartridge's life expires completely.
- 1SV (line 25): The ACD solenoid valve.[6]
- 2SV (line 28): The ACD solenoid valve.[6]
- 3SV (line 4): A constant speed unloader solenoid valve.[6]
- 1TDR (lines 28, 29) Time delay relay:[6] Delays power to 2TMR (lines 28, 29, and 30) to allow pressure to build in the compressor.
- 1TMR (lines 23, 24, and 25) ACD timer:[6] De-energizes 1SV (line 25) at set time intervals to automatically drain the condensation.
- 2TMR (lines 28, 29, and 30) ACD timer:[6] Energizes 2SV (line 28) at set time intervals to automatically drain the condensation.
- 2SS "HAND-OFF-AUTO" Selector switch:[6] Allows for constant speed in the "HAND" position and start-stop operation in the "AUTO" position. 3SV (line 4) must be used for optional constant speed unloading.

18.4.3 Optional Controls

- 1AL (line 5) Audible alarm: Sounds an audible alarm on fault shutdown.
- 1CO (line 2, 19) CO monitor: Shuts down the compressor when excessive carbon monoxide is present in the compressed air.
- 1 CR or 2CR control relay: Prevents the motor from restarting automatically when the power is restored after a power failure.
- 3CR: The control relay for ACD drain light.
- 1PB (line 6): A push button emergency stop switch.
- 3PS: A cut- in pressure switch for the dual pressure option.
- 4PS: A low pressure switch for the high/low pressure option.
- 1TGS (line 2): The on/off toggle switch for CO monitor.
- 2TGS (lines 26, 27)) Toggle switch: Manual bypass for the ACD system, allows the operator to check the function of the ACD.

6. Standard on some models.

- 2TDR, Overtime timer: Shuts down the compressor if it runs for five (5) hours continuously without the pressure switch being satisfied. This protects the compressor from accidental continuous running in the event of a serious leak, etc. 6LT will light to indicate the fault.
- 3TMR, Maintenance timer: Shuts down the compressor every 100 hours for routine oil changes and general services. Fault is indicated by 9LT.

18.5 SEQUENCE OF OPERATION, STANDARD UNITS W/GASOLINE DRIVE

All item designations and line numbers in the following text refer to electrical wiring diagram DGM-0282 located in the annex, section 24.

- 1TGS:"OFF-ON" toggle switch for the engine.
- 1TS:When the final stage cylinder head temperature exceeds a preset temperature, the high temperature switch will close, stopping the engine. To restart the unit after the compressor cool-down, turn toggle switch 1TGS to the "ON" position and pull the starter grip of the engine recoil starter.

18.6 SEQUENCE OF OPERATION, DIESEL DRIVEN UNITS W/PCB

All item designations and line numbers in the following text refer to electrical wiring diagram DGM-0587 located in the annex, section 24.

- By supplying power with 1BAT (line 1), the control circuit is energized through 1AM (line 4) and 2FU to 1SS (line 6) and 3SOL contact (line 7).
- Turn 1SS (line 6) to the "START" position to energize 1SOL coil (line 5) closing 1SOL contact (line 4) which energizes 1STR (line 4) to start the engine. 1PCB (line13 is energized through terminal 1 and an internal switch on terminal 5 switches to terminal 6 to energize 1HM (line 15) and 3SOL coil (line 16), closing 3SOL contact (line7) to energize 2SOL (line7) to run the unit.
- Release 1SS (line 6) to "RUN" position.
- To stop the unit, turn 1SS (line 6) to the "OFF" position.
- 1PS (line 12): Will open at a preset pressure to de-energize 1PCB and stop the engine and 1HM. 1SS must be manually turned to the "OFF" position after automatic shutdown to prevent draining of the battery.

18.6.1 Standard Fault Shutdowns

When a fault occurs, 1PCB internal switch on terminal 6 will open to de-energize 1HM (line 15) and 3SOL coil (line 16), opening 3SOL contact (line 7) to de-energize 2SOL (line 7) to stop the engine. The proper fault indication light (1LT or 2LT) will be lit to indicate the fault.

To restart the compressor, turn 1SS (line 6) to the "OFF" position and back to the "START" position.

- 2PS (line 18): Will open when the compressor oil pressure falls below a preset pressure. On start-up, the internal timer of 1PCB allows the oil pressure to build.
- 1TS (line 20): Will open when the compressor final stage cylinder head temperature exceeds a preset temperature.

18.6.2 Optional Controls

- 1AL (line 13): Audible alarm on fault shutdown.
- 1CO (lines 23 and 26): Fault shutdown on excessive carbon monoxide in the compressed air.
- 1SC (line 11): Securus purification monitor system. Monitors the rising moisture level in the purifier and indicates when the purifier cartridges require replacement before the cartridge life expires completely.
- 1TGS (line 9) Manual bypass for the ACD system. Allows operator to check function of ACD.
- 2TGS (line 26): CO monitor off-on switch.
- 1TMR (lines 8, 9 and 10): ACD timer, de-energizes 4SOL (line 8) at set time intervals to automatically drain the condensate.
- 3SOL (line 21): 2nd and 3rd stage solenoid valve.

18.7 SEQUENCE OF OPERATION, GASOLINE DRIVEN UNITS W/O PCB

All item designations and line numbers in the following text refer to electrical wiring diagram, DGM-0588 located in the annex, section 24.

- By supplying power with 1BAT (line 1), the control circuit is energized through fuse (line 3) to combination switch (line 6).
- Turn combination switch to the "START" position to energize solenoid coil (line 4), closing solenoid contact (line 3).
- Release combination switch to "RUN" position.
- To stop unit, turn combination switch to "OFF" position.
- 1PS (line 19); will open and shutdown the compressor when the system pressure reaches the set point of final pressure. To start the compressor, turn combination switch to the "OFF" position and back to the "START" position.

18.7.1 Safety Shutdown

When the compressor shuts down due to a fault, always remedy the problem before restarting the compressors. Refer to the Troubleshooting section of this manual for assistance.The unit will automatically shutdown for the following malfunctions:

- 1TS (line 18); will close and shutdown the compressor when the compressor's final stage cylinder head temperature exceeds the preset temperature.
- To restart the compressor, turn the combination switch to the "OFF" position and back to the "START" position.

18.7.2 Optional Controls

- 1HM (line 11): Registers the running time of both the engine and the compressor.
- 1TMR (line12, 13, 14): Closes when energized to energize 2nd stage solenoid valve, 1SOL. Every 15 minutes, 1TMR contact #1 to # 2 opens for 5 to 7 seconds to de-energize the solenoid valve, 1SOL.
- 1TGS (line 12): Manual bypass for the ACD system, allows the operator to check the function of the ACD.
- 1CO (lines 20, 21): Shuts down the compressor units whenever carbon monoxide is detected in the compressed air.
- 1SC (line 15): Monitors the rising moisture level in the purifier and indicates when the purifier cartridge requires replacement.
- 1CR (lines 16, 17): Controlled by SECURUS 1SC on shutdown.
- 2TGS (line 20); CO monitor off-on switch.
- 1SOL (line 11): 2nd and 3rd stage solenoid valve.

18.8 SEQUENCE OF OPERATION, DIESEL DRIVEN UNITS W/O PCB

All items designations and line numbers in the following text refer to electrical wiring diagram DGM-0586 located in the annex, section 24.

- By supplying power with 1BAT (line 1), the control circuit is energized through 1AM (line 4) and 2FU to 1SS (line 6).
- Turn 1SS (line 6) to the "START" position to energize 1SOL coil (line 5) closing 1SOL contact (line 4) which energizes 1STR (line 4) to start the engine.
- Release 1SS (line 6) to "RUN" position.
- To stop the unit, turn 1SS (line 6) to the "OFF" position.

- 1PS (line 8): Will open and shutdown the compressor when the system pressure reaches the set point of final pressure. To restart the compressor, turn 1SS to the "OFF" position and back to "START" position.

18.8.1 Safety Shutdown

When the compressor shuts down due to a fault, always remedy the problem before restarting the compressor. Refer to the Troubleshooting section of this manual for assistance. The unit will automatically shutdown for the following malfunction:

- 1TS (line 8); Will open and shutdown the compressor when the compressor final stage cylinder head temperature exceeds the preset temperature. To restart the compressor, turn 1SS to the "OFF" position and back to the "START" position.

18.8.2 Optional Controls

- 1HM (line 12): Registers the running time of both the engine and compressor.
- 1TMR (lines 9, 10, 11); Closes when energized to energize the 2nd and 3rd solenoid valve, 3SOL. Every 15 minutes, 1TMR contact #1 to # 2 opens for 5 to 7 seconds to de-energize the solenoid valve, 1SOL.
- 1TGS (line 10): Manual bypass for the ACD system allows the operator to check the function of the ACD drain.
- 1CO (lines 7, 13): Shuts down the compressor unit whenever carbon monoxide is detected in the compressed air.
- 1SC (line 6): Monitors the rising moisture level in the purifier and indicates when the purifier cartridge requires replacement.
- 2TGS (line 13): CO monitor off-on switch.
- 3SOL (line 9): 2nd and 3rd stage solenoid valve.

18.9 SEQUENCE OF OPERATION, GASOLINE DRIVEN UNITS W/PCB

All item designations and line numbers in the following text refer to electrical wiring diagram DGM-0589 in the Annex, section 24.

- By supplying power with 1BAT (line 1), the control circuit is energized through fuse (line 3) to combination switch (line 6).
- Turn combination switch to the "START" position to energize solenoid (line 4), closing the solenoid contact (line 3).
- Release combination switch to "RUN" position.
- To stop unit, turn combination switch to "OFF" position.

- 1PS (line 19): Will open and shutdown the compressor when the system pressure reaches the set point of final pressure to restart the compressor. Turn combination switch to the "OFF" position.

18.9.1 Safety Shutdowns

When the compressor shuts down due to a fault, always remedy the problem before restarting the compressor. Refer to the Troubleshooting section of this manual for assistance. The unit will automatically shutdown for any one of the following malfunctions:

- 2PS (line 17): Will open when the compressor oil pressure falls below a preset pressure. On start up, the internal timer of 1PCB allows the oil pressure to build.
- 1TS (line 19): Will close and shutdown the compressor when the compressor's final stage cylinder head temperature exceeds the preset temperature.

To restart the compressor, turn the combination switch to the "OFF" position and back to "START" position.

18.9.2 Optional Controls

- 1HM (line 10): Registers the running time of both the engine and the compressor.
- 1TMR (lines 25, 26, 27): Closes when energized to energize 2nd stage solenoid valve 1SOL. Every 15 minutes, 1TMR contact # 1 to # 2 opens for 5 to 7 seconds to de-energize the solenoid valve, 1SOL.
- 1TGS (lines 28, 29): Manual bypass for the ACD system. Allows the operator to check the function of the ACD.
- 1CO (lines 22, 34): Shuts down the compressor units whenever carbon monoxide is detected in the compressed air.
- 1SC (line 11): Monitors the rising moisture level in the purifier and indicates when the purifier cartridge require replacement.
- 1TDR (lines 31, 33): Delays power to 2TMR (lines 30, 31, 32) to allow pressure to build in compressor. Because of this, when 2TMR is energized and starts with its "ON" time (or drain time first), it gives it sufficient pressure to dump the accumulated condensation (K14.11 only).
- 2TDR (line 18, 28); Bypasses 2PS (line 17) when 1SOL (line 27) is in drain cycle (K14.11 only).
- 2TMR (lines 30, 31, 32): Energizes 2SOL (line 30) at set time intervals to automatically drain the condensation (K14.11 only).
- 1SOL (line 27): 2nd and 3rd stage solenoid valve.
- 2SOL (line 30): 3rd and 4th stage solenoid valve.

19.1 GENERAL

The maintenance schedule is separated into three sections. The first lists maintenance work which should be performed within a specific calendar period. The second lists maintenance work which should be performed according to the hours of operation as indicated on the hourmeter. The third addresses 'as required' maintenance. All sections require careful attention, as none precludes the others.

NOTE

For units with a gasoline or diesel drive engine, refer to the engine owner's manual for maintenance intervals.

19.2 CALENDAR SCHEDULE

Interval	Maintenance work	Section
Before putting the unit into operation	Operate the unit to final pressure and check the function of the final pressure switch before opening the outlet valve.	13
Before each start-up and as required	Drain condensate collection tank.	12
Daily	Check the compressor oil level.	4
	Check the functioning of the oil pump[1] through the sight glass on oil pressure regulating valve.	4
Weekly	Check the operation of the automatic condensate drain by opening the manual drain valves.	12
Monthly	Test the audible alarm.[2]	13
Every 3 months	Lubricate the single phase drive motor (severe duty).	14
Every 6 months	Relubricate the single phase drive motor (continuous operation).	14
Annually	Lubricate the single phase drive motor (seasonal service).	14
	Check the operation of safety valves.	9, 16
	Lubricate the single phase drive motor (light duty).	14
	Check all connections for leaks.	21
	Have ASME vessels[2] visually inspected.	16
Every five years	Inspect and test D.O.T. storage bottles.[2]	16

1. Not available on all models.
2. Not standard on all models.

19.3 HOURS OF OPERATION SCHEDULE

Interval	Maintenance work	Section
½ hour after start-up	Manually check the valves.	11
25 hrs	First oil change.	4
	Check all connections for leaks.	21
Every 250 hrs	Check the compressor oil level.	4
	Clean or replace the intake filter element.	5
	Inspect the drive v-belt. Replace if worn.	14
	Check for leaks.	21
Every 500 hrs (or annually)[1]	Change oil (petroleum).	4
Every 750 - 800 hrs	Inspect and clean valves. Replace if necessary.	11
Every 1000 hrs (or annually)[1]	Change oil (synthetic).	4
Every 1000 hrs	Clean the sintered metal filter element for the oil and water separator.	7
	Clean or replace the valves.	11
	Clean or replace the inter-filter element.	6
Every 2000 hrs	Replace the valves.	11
Every 3000 hrs.	Check pistons and piston rings.	21
Every 100,000 hrs	Replace motor bearings on 3 phase motor.	14

1. Whichever comes first.

19.4 MAINTENANCE AS REQUIRED

Interval	Maintenance work	Section
When dirty	Clean the audible alarm.[1]	13
	Clean coolers and cooling fins.	15
	Clean the drive motor.	14
If setting changes	Adjust the final pressure switch.	13
	Adjust the inlet pressure switch.[1]	13
	Adjust the oil pressure/level switch.	13
	Adjust the time delay relay.[1]	13
	Adjust the pressure maintaining valve.	8
If solenoid valve[1] is sluggish in operation, leaks or makes excessive noise	Clean or replace the solenoid valve.[1]	12
When replacing v-belts	Inspect the sheaves.	14
When incorrect pressure indication is suspected	Recalibrate, repair or replace the pressure gauges.	10, 16
After 55,000 cycles	Replace final separator.	7
When indicator[1] shows red	Service the air-intake filter element.	5
On shut-down or as required	Open the condensate drain valves.	12

1. Not standard on all models.

20.1 GENERAL

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

Make sure that the compressor is kept indoors in a dry, dust-free room. Cover the compressor with plastic sheets only if no condensation will form under the sheet. Remove the sheet from time to time and dry the outside of the unit.

If this procedure cannot be followed, or if the compressor will be out of service for more than 24 months, please contact the Bauer Service Department for special instructions.

20.2 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:

- Check all pipes, filters and valves (including safety valves) for leakage.
- Tighten all couplings, as required.
- After 10 minutes, open the outlet valve and operate the compressor at adjusted minimum pressure (see section 8) using the pressure maintaining valve for approximately 5 minutes.
- After the 5 minutes, shut the compressor unit down and completely drain all separators and filters. Close all valves.
- Remove filter heads and lubricate the threads with white petroleum jelly.

For units equipped with a filter system:

- Ensure that *filter elements remain in the filters!* This will prevent oil from entering the outlet lines as a result of preservation procedures.
- Remove the intake filter/intake pipe completely.

20.3 PRESERVING THE COMPRESSOR

- Operate the compressor again and slowly spray approximately 0.35 oz. (10 cc) of oil into the inlet port while the compressor is running (for oil type, see section 2). Keep the shut-off valve open and the condensate drain valves closed.
- After spraying the oil into the inlet port, run the compressor unit for an additional 5 minutes before shutting the compressor unit down.
- Close the shut-off valve.

- Close the inlet port with a dust cap and/or tape.

20.4 PRESERVING THE DRIVE

20.4.1 Units with an Electric Motor

Store the motor in a clean, dry location. Cover completely with plastic. Leave an opening for ventilation.

Maintenance during storage

Every two months, rotate the shaft.

Every six months, give the winding a megger test. A minimum of 10 megohms are recommended.

For motors with grease fittings, add grease as necessary (see section 14).

20.4.2 Units with an Hydraulic Motor[1]

For preservation instructions during storage of hydraulic motors, reference the Hydraulic Motor Manual.

20.4.3 Units with a Combustion Engine[1]

For preservation instructions during storage of combustion engines, reference the Engine Owner's Manual.

20.5 PREVENTIVE MAINTENANCE DURING STORAGE

Operate the compressor once every three months as follows:

- Remove the dust cap from the inlet port and install the inlet filter.
- 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.
- Shut down the compressor.
- Open the condensate drain valves, depressurize the unit, then close the drain valves again.
- Remove the intake filter and replace the dust cap on the inlet port.

1. Not available on all models.

Lubrication Oils for Preservation

- After prolonged storage periods, the oil will age in the compressor. The oil must be drained at least every 36 months and replaced with fresh oil.
- The stated period can only be attained when the crankcase is sealed during the preservation period in accordance with the preservation requirements.
- After changing the oil, the compressor must be operated according to the instructions above.
- Check the lubrication of the compressor in accordance with section 4 during the every-three-month brief operation or when turning the compressor.

20.6 REACTIVATING THE COMPRESSOR UNIT

- Remove the dust cap from the inlet port and install the intake filter.
- Check the oil level of the compressor. If necessary, change the oil and oil filter.
- The motor must be thoroughly dry before applying power.
- For units with a filter system, change all filter cartridges.
- Run the compressor with open outlet valve for approximately 5 minutes. Check for proper operation of the lubricating system.
- After 5 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.
- Check the interpressure safety valves for leakage.
- Establish the cause of any faults from the troubleshooting table, section 22, and remedy.
- Stop the unit when it is running properly. The compressor is then ready for operation.

21.1 REPAIR

Preventive maintenance usually involves replacing the gaskets and sealing rings and carrying out the maintenance work (see section 19).

Maintain your unit and carry out minor repairs as recommended in this instruction manual. For major repairs and/or overhaul, call Bauer Compressors, Inc. or a factory authorized service representative.

Safety valves may not be repaired. They must be replaced.

21.1.1 General rules for servicing the compressor block

- Always clean the compressor externally before starting a repair.
- Check the hoses and fittings regularly for leaks. Use soapy water to detect leaks. Repair leaky equipment immediately. A small hairline crack could suddenly burst and cause serious injury.
- Never repair any high pressure components by soldering or welding.
- Assembly is basically carried out in the reverse order of the disassembly. Any additional procedures will be noted.

21.1.2 Tubing and pipe connections

Leaks at the fittings will be the most common. These may generally be repaired by tightening the joint. Please note that the compression type coupling fittings are capable of exerting extreme force on the tubing and should not be tightened more than is required to seal the joint. To improve the sealing of the pipe connections and to facilitate installation, the following should be observed:

- Apply a thin layer of Never-Seez NSWT or equivalent (refer to the table in chapter 23) on the outside of the ferrule during assembly.
- Lubricate the threads of the connector with Never-Seez NSWT or similar PFTE base grease to facilitate future disassembly.

CAUTION

Small diameter, thick wall tubing can be severely distorted by excessive tightening. After constructing a new joint and inspecting it for leaks, it should be opened and inspected for distortion, then retightened no more than is required to seal the joint.

22.1 GENERAL INSTRUCTIONS

This troubleshooting guide has been prepared to assist you with your compressor. If you need parts or further assistance, call your nearest BAUER distributor.

Isolation of the problem encountered should normally proceed from the general to the specific, beginning with the determination of the area in which the particular fault occurs. The next step in the isolation process is to determine the specific part suspected of being faulty. When such isolation procedures are followed logically and correctly through a step-by-step pattern of check and elimination, the fault can be traced accurately to its source without unnecessary delay or replacement of parts.

Problem	Cause	Remedy
Drive motor/engine		
Motor does not start	Failure of phase.	Check motor protection switch.
		Check fuse.
		Check power supply.
	Motor overload (no indicator light).	Check voltage
		Check for loose or corroded connections.
	High motor temperature.	Check voltage.
		Check connections.
		Clean motor ventilation openings.
	Final pressure switch defective.	Adjust or replace.
	Faulty "off-on" switch.	Tighten connections.
		Replace switch.
Motor becomes over-loaded during operation	Cylinders, pistons or piston pins are scored.	Replace scored parts.
Engine[1] does not operate properly	Engine problem.	Reference the engine owner's manual.

1. Not standard on all models.

Problem	Cause	Remedy
Compressor block		
Compressor running too hot.	Insufficient supply of fresh cooling air.	Check location - max. ambient temp. 105°F (40°C).
	Inlet or discharge valves not closing properly.	Check and clean valves. Replace worn parts.
	Wrong direction of rotation.	See arrow on compressor. Remedy accordingly.
	Pressure higher than normal due to inlet and discharge valve operating improperly.	Remove inlet and discharge valves. Clean or replace.
	Intercoolers clogged.	Remove and clean.
	Aftercooler dirty.	Clean finned tubes by blowing with low pressure air (80-125 psi).
	Cooling air fan running but not delivering due to worn or loose v-belt.	Tighten or replace v-belt.
No oil pressure available	Air trapped in oil pump.[2]	Vent pump and line.
	No oil in compressor.	Check oil level. Fill.
Oil sight glass[2] exhibits bubbles	Oil pressure regulator[2] dirty.	Clean and readjust oil pressure regulator.
	Air trapped in oil pump.[2]	Vent pump and line.
Oil foam in the crankcase	Final stage piston worn.	Rotate flywheel by hand with final valve head removed. If oil flows continuously from cylinder, replace piston and liner.
	Final stage discharge valve defective.	Replace.

2. Not standard on all models.

Problem	Cause	Remedy
Oil residue in delivered air	Improper maintenance of filters. Filter cartridge saturated.	Service filters. Change filter cartridges.
	Wrong oil type.	Use correct oil and clean sooted valves.
Compressor does not attain final pressure.	Condensate drain valves or fittings leaking.	Tighten and reseal.
	Premature opening of final safety valve.	Replace safety valve.
	Piston rings worn.	Replace.
	Excessive piston clearance.	Replace
Compressor output insufficient.	Intake filter clogged.	Replace filter element.
	1st stage valves not closing properly.	Check and clean. Replace if necessary.
	Pipes leaking.	Re-tighten.
Compressor works irregularly.	Drive belt slipping.	Check drive belt. Replace as required.
Outlet flow restriction.	Clogged final separator.	Remove filter. Replace element.
	Pressure maintaining valve set too high.	Check PMV for correct opening pressure.
PMV operates at wrong pressure.	Incorrect setting.	Reset.
	Dirt on valve seat.	Clean. Reset.
	Damaged valve seat.	Replace.
Safety valves between stages releasing pressure	Intermediate pressure too high.	Check valves, section 9.
	Valves not closing properly.	Replace valves.

Problem	Cause	Remedy
Compressor fails to pressurize	Faulty pressure switch.	Remove, clean and inspect switch. Repair or replace.
	ACD[3] not working properly.	Check solenoid function.
		Check drain valves. Clean, repair or replace.
	Purification element[3] missing or improperly installed.	Install element correctly.
Excessive oil consumption	Check all cylinders.[3]	Replace rings and pistons as required.
Incorrect oil pressure indicated on oil pressure gauge[3]	Air trapped in oil pump.[3]	Vent pump and line.
	Incorrect regulator setting.[3]	Reset regulator.
	Foreign material in oil pressure regulator[3] seat.	Remove regulator and clean the seat.
	Oil pump[3] is worn.	Replace pump.
Incorrect interstage pressure indicated on intermediate pressure gauge[3]	Inlet or discharge valve in preceding cylinder not operating properly.	Remove, inspect. Repair or replace faulty parts.
	Safety valve leaking.	Replace safety valve.
	Piston in final stage seizing in the bushing.	Check piston and bushing for correct tolerance.

Electric Control System

Control does not switch off, final pressure safety valve vents	Final pressure switch set too high.	Correct setting.
	Final pressure safety valve defective.	Replace safety valve.
	Final pressure switch defective.	Replace switch.

3. Not standard on all models.

Problem	Cause	Remedy
Control does not switch on	No control voltage.	Check feed line.
	Control fuse defective.	Replace fuse, eliminate cause.
	Control current line cut off; line or terminal loose.	Tighten terminal or repair line.
	Thermal overload relay triggered.	Clear faults as described in the following.
Thermal overload relay for drive motor triggered	Current consumption too high.	Check compressor drive.
	Overload relay set too low.	Correct setting.

Automatic Condensate Drain[4]

Condensate drain valve not opening	2-way solenoid valve faulty or not receiving electrical signal.	Check solenoid valve. Replace if necessary.
		Check for voltage to solenoid valve.
	No control medium available.	Check supply lines.
	Solenoid valve not venting due to continuous electrical signal.	Check electrical control.
	Condensate drain valve piston jammed.	Dismantle drain valve. Clean or replace.
Automatic condensate drain valve not closing.	2-way solenoid valve not venting drain valve.	Check solenoid valve. Replace if necessary.
	Condensate drain valve dirty and/ or leaking/stuck.	Dismantle and clean drain valve.

4. Not standard on all models.

23.1 TIGHTENING TORQUE VALUES

NOTE: Unless otherwise specified in text, the following tightening torque values apply. The indicated torque values are valid for bolts in greased condition. Replace self-retaining nuts on reassembly.

Bolt or screw	Thread	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)

Pipe connections (swivel nuts): Tighten just firmly enough so that leakage is stopped (finger tight plus up to an additional 1/2 turn as necessary).

NOTE:

Check for leakage of the complete system from time to time by brushing all fittings and couplings with soapy water or spraying with leak test spray. Repair any leaks.

23.2 LUBRICATION CHART

If not stated elsewhere, use the following lubricants:

Usage	Lubricants
O-rings, rubber and plastic parts; filter housing threads	Parker "O" Lube
Sealing rings	Parker "O" Lube
Bolts, nuts, studs, valve parts, copper gaskets and tube connections (threads, cap nut and compression rings)	Never-Seez NSWT, Pipe Dope or teflon tape
Paper gaskets	Apply silicon compound on both sides before assembly, i.e., DOW Corning 732
High temperature connections	Temperature resistant compound, i.e., DOW Corning 732
Ferrules of tube connections	Never-Seez NSWT

23.3 CONVERSION TABLE PSI TO BAR

psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
1	0.07	61	4.21	310	21.4	910	63	3400	234
2	0.14	62	4.28	320	22.1	920	63	3500	241
3	0.21	63	4.34	330	22.8	930	64	3600	248
4	0.28	64	4.41	340	23.5	940	65	3700	255
5	0.34	65	4.48	350	24.1	950	66	3800	262
6	0.41	66	4.55	360	24.8	960	66	3900	269
7	0.48	67	4.62	370	25.5	970	67	4000	276
8	0.55	68	4.69	380	26.2	980	68	4100	283
9	0.62	69	4.76	390	26.9	990	68	4200	290
10	0.69	70	4.83	400	27.6	1000	69	4300	297
11	0.76	71	4.90	410	28.3	1010	70	4400	303
12	0.83	72	4.97	420	29.0	1020	70	4500	310
13	0.90	73	5.03	430	29.7	1030	71	4600	317
14	0.97	74	5.10	440	30.3	1040	72	4700	324
15	1.03	75	5.17	450	31.0	1050	72	4800	331
16	1.10	76	5.24	460	31.7	1060	73	4900	338
17	1.17	77	5.31	470	32.4	1070	74	5000	345
18	1.24	78	5.38	480	33.1	1080	74	5100	352
19	1.31	79	5.45	490	33.8	1090	75	5200	359
20	1.38	80	5.52	500	34.5	1100	76	5300	366
21	1.45	81	5.59	510	35.2	1110	77	5400	372
22	1.52	82	5.66	520	35.9	1120	77	5500	379
23	1.59	83	5.72	530	36.6	1130	78	5600	386
24	1.66	84	5.79	540	37.2	1140	79	5700	393
25	1.72	85	5.86	550	37.9	1150	79	5800	400
26	1.79	86	5.93	560	38.6	1160	80	5900	407
27	1.86	87	6.00	570	39.3	1170	81	6000	414
28	1.93	88	6.07	580	40.0	1180	81	6100	421
29	2.00	89	6.14	590	40.7	1190	82	6200	428
30	2.07	90	6.21	600	41.4	1200	83	6300	434
31	2.14	91	6.28	610	42.1	1210	83	6400	441
32	2.21	92	6.34	620	42.8	1220	84	6500	448
33	2.28	93	6.41	630	43.5	1230	85	6600	455
34	2.34	94	6.48	640	44.1	1240	86	6700	462
35	2.41	95	6.55	650	44.9	1250	86	6800	469
36	2.48	96	6.62	660	45.5	1260	87	6900	476
37	2.55	97	6.69	670	46.2	1270	88	7000	483
38	2.62	98	6.76	680	46.9	1280	88	7100	490
39	2.69	99	6.83	690	47.6	1290	89	7200	497
40	2.76	100	6.90	700	48.3	1300	90	7300	503
41	2.83	110	7.59	710	49.0	1400	97	7400	510
42	2.90	120	8.28	720	49.7	1500	103	7500	517
43	2.97	130	8.97	730	50.3	1600	110	7600	524
44	3.03	140	9.66	740	51.0	1700	117	7700	531
45	3.10	150	10.3	750	51.7	1800	124	7800	538
46	3.17	160	11.0	760	52	1900	131	7900	545
47	3.24	170	11.7	770	53	2000	138	8000	552
48	3.31	180	12.4	780	54	2100	145	8100	559
49	3.38	190	13.1	790	54	2200	152	8200	566
50	3.45	200	13.8	800	55	2300	159	8300	572
51	3.52	210	14.5	810	56	2400	166	8400	579
52	3.59	220	15.2	820	57	2500	172	8500	586
53	3.66	230	15.9	830	57	2600	179	8600	593
54	3.72	240	16.6	840	58	2700	186	8700	600
55	3.79	250	17.2	850	59	2800	193	8800	607
56	3.86	260	17.9	860	59	2900	200	8900	614
57	3.93	270	18.6	870	60	3000	207	9000	621
58	4.00	280	19.3	880	61	3100	214	9100	628
59	4.07	290	20.0	890	61	3200	221	9200	634
60	4.14	300	20.7	900	62	3300	228	9300	641

23.4 CONVERSION TABLE °F TO °C

°F	°C
- 40	- 40
- 30	- 34
- 20	- 29
- 10	- 23
- 5	- 21
0	- 18
+ 5	- 15
10	- 12
15	- 9
20	- 7
25	- 4
30	- 1
40	+ 4
50	10
60	16
70	21
80	27
90	32
100	38
150	66
200	93

°C	°F
- 40	- 40
- 30	- 22
- 20	- 4
- 10	+ 14
- 5	23
0	32
+ 5	41
10	50
15	59
20	68
25	77
30	86
40	104
50	122
60	140
70	158
80	176
90	194
100	212
150	302
200	392

- **Glossary of abbreviations**
- **Schematic wiring diagram(s)**
- **Drawing(s)**
- **Flow diagram(s)**
- **Accessory documentation**
- **Special drawings, if applicable**

Any special documentation supersedes and/or supplements the respective paragraphs/ figures of this Instruction Manual.

Glossary of Abbreviations and Acronyms

ACD automatic condensate drain
ASME American Society of Mechanical Engineers
BCI Bauer Compressors, Inc.
BSPP British standard pipe, parallel
BSPT British standard pipe, tapered
BKM Bauer Kompressoren München (GmbH)
CCW counterclockwise
CGA Compressed Gas Association
CNG compressed natural gas
CSA Canadian Standards Association
CW clockwise
DIN Deutsches Institut für Normung
DOT Department of Transportation
E1 single phase electrical supply
E3 three phase electrical supply
EXP explosion proof (motor)
FAD free air delivered
FGD free gas delivered
FLA full load amperes
ISO International standards organization
NC normally closed
NEC National Electrical Code
NFPA National Fire Protection Association
NEMA National Electrical Manufacturers Association
NO normally open
NPT National pipe thread
OSHA Occupational Safety & Health Administration
ODP open drip-proof (motor)
PCB printed circuit board
PLC programmable logic controller
PMV pressure maintaining valve
PRS priority/sequential (system)
SAE Society of Automative Engineers
TEFC totally enclosed fan cooled (motor)
VRS vapor recovery system

BAUER COMPRESSORS

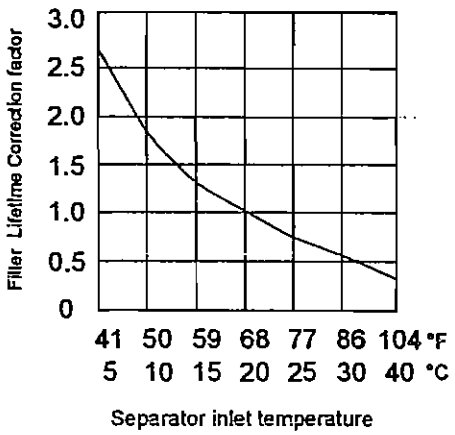
Date	Operating hours	Ambient temp. during compression	Correction factor	Adjusted cartridge hours	
				Today	Total

BAUER COMPRESSORS

OPERATING SCHEDULE FOR PURIFICATION SYSTEM

When operating at temperatures other than 68°F, divide the number of hours operated at that temperature by the correction factor as indicated in the chart and graph below.

Separator inlet temperature		Correction factor
°F	°C	
32	0	3.80
41	5	2.62
50	10	1.85
59	15	1.34
68	20	1.00
77	25	0.75
86	30	0.57
104	35	0.43
122	40	0.34



Date	Operating hours	Ambient temp. during compression	Correction factor	Adjusted cartridge hours	
				Today	Total
e.g., 7/19/99	8	92°F	0.48	16.66	16.66
11/21/99	4	45°	2.25	1.78	18.44

BAUER COMPRESSORS

MODEL NAME BREAKDOWN

STANDARD UNITS

K 2 3 0 V - 4 0 - E 3

- **E3**
  - E1 = Single phase electric motor driven
  - E3 = Three phase electric motor driven
  - D = Diesel engine driven
  - G = Gasoline engine driven
  - HYD = Hydraulic motor driven
  - NG = Natural gas engine driven
- **40** = Motor/engine horse power
- **V** = Vertical
- **230** = Compressor block numbers
- **K**
  - B = Medium pressure air
  - BK = Booster
  - C = Natural gas
  - CB = Medium pressure natural gas
  - G = Inert/non-aggressive gas
  - I = Industrial air
  - K = Breathing air
  - KV = Medium pressure (2 cylinder)
  - KVB = Medium pressure (2 cylinder)
  - KWB = Medium pressure (3 cylinder)
  - O = Offshore application

BAUER COMPRESSORS

MODEL NAME BREAKDOWN

AIRSTREAM/UNICUS II/VERTICUS

F S 3 6 - E 3

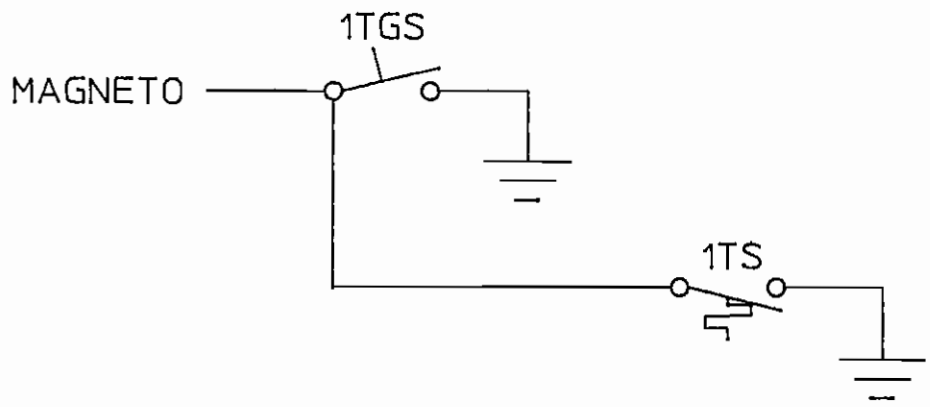
- **E3** = E1 = Single phase electric motor driven; E3 = Three phase electric motor driven
- **36** = Charging rate (scfm)
- **FS** = FS = AIR-STREAM; UNII = UNICUS II; VT = VERTICUS

UTILUS/CAPITANO/MARINER

C - E 3

- **E3** = E1 = Single phase electric motor driven; E3 = Three phase electric motor driven; G = Gasoline engine driven; G/DV = Gasoline engine driven/dive version; D = Diesel engine driven; D/DV = Diesel engine driven/dive version; HYD = Hydraulic motor driven
- **C** = C = Capitano; M = Mariner; U = Utilus; DOM II=Dominus-II

ISSUE	REVISION	DATE	BY	APVD.
A	REDRAWN ON CAD, REF ECN#1249	8-9-93	TD	TR



LEGEND

1TGS "OFF-ON" TOGGLE SWITCH
1TS HIGH TEMPERATURE SWITCH

NOTE: FOR UNITS WITH HONDA ENGINES SPLICE INTO THE BLACK WIRE GOING INTO THE "OFF-ON" SWITCH.

DRAWN BY: TED	BAUER COMPRESSORS, INC. NORFOLK, VIRGINIA
DATE: 8-9-93	
APVD. BY: TR	TITLE: WIRING DIAGRAM
DATE: 8-9-93	
SCALE: N/A	
PAINT: N/A	USAGE: U, C, M, K14-G & U, C, M-G/DV
CAGE NUMBER : 57328	DRAWING NUMBER : DGM-0282 — SHT. 1 OF 1

BAUER COMPRESSORS

REPLACEMENT PARTS LIST

C-E1, C-E3, C-G, C-D

HIGH PRESSURE BREATHING AIR COMPRESSOR UNIT

Edition September 1995

BAUER COMPRESSORS, INC.
1328 Azalea Garden Road • Norfolk, Virginia 23502-1944
Phone: (757) 855-6006 • Fax: (757) 855-6224

Underwriters Laboratories Inc.®
LISTED


BAUER
COMPRESSORS

TABLE OF CONTENTS

Illustrated parts not having item numbers are shown for assembly purposes only and are not available for sales as individual components. These parts can be attained by ordering the complete assembly.

N.S. in the item column indicates an item which is **not shown** in the illustration, but is nevertheless available.

When placing an order for spare parts, please give the following information to ensure correct delivery.

1. Unit model and year
2. Serial number
3. Quantity required
4. Description and part number

Example:

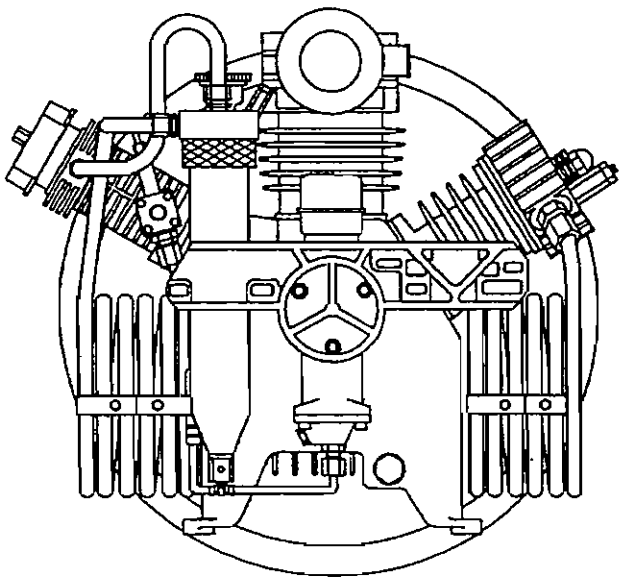
For unit C-E3, 1995 model, S/N 24416, 2 o-rings, part number N04385 are required.

* Section E has no technical content and is included for editorial consistency only

Revision Record

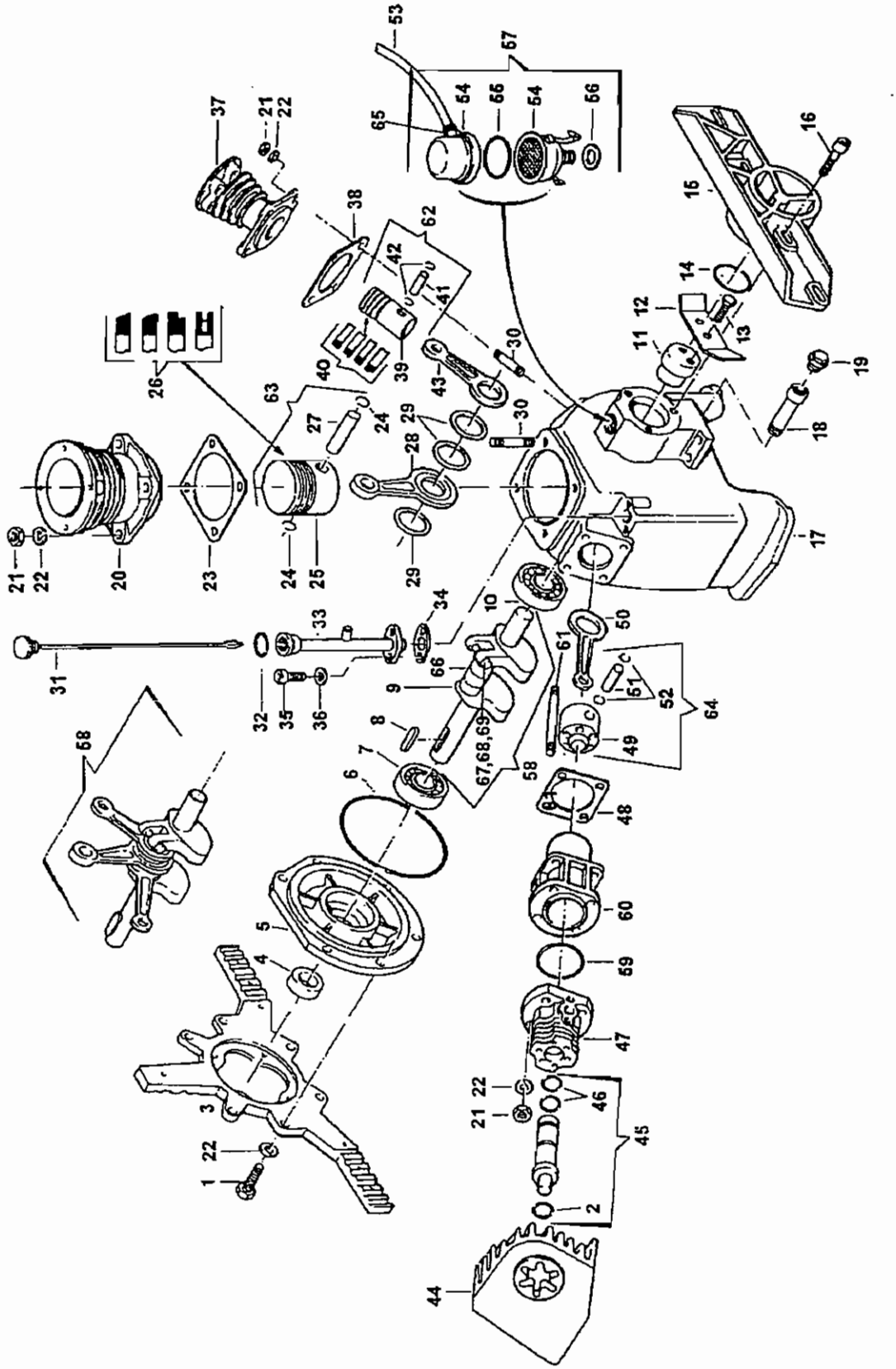
Edition/Revision	Date	Notes	Approval
Basic Edition revision 0	January 1994		
Revision 1	September 1995		
Revision 2	April 2000	Area Code Change & Section E deletion	JH

Edition/Revision	Pages		Edition/Revision	Pages



SECTION A
Compressor block

Crankcase assembly; KM-FH, KC-FH and KU-FH



Crankcase assembly

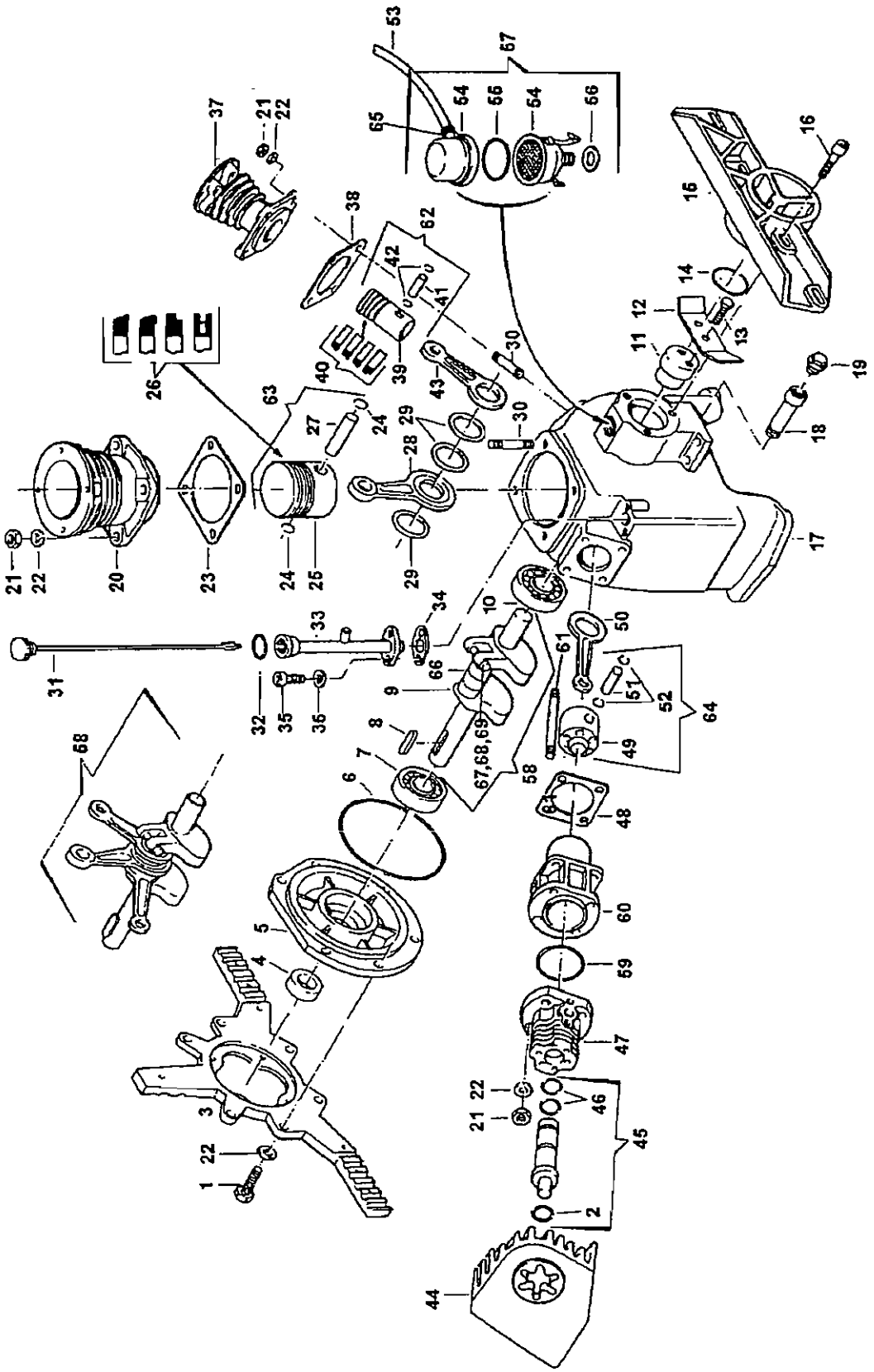
KM-FH, KC-FH and KU-FH

Item	Qty	Part no.	Description	Notes
1	6	SCR-0025	Hex head cap screw	M8x30mm lg, DIN 933
2	1	N03860	O-ring[1]	Ø25.12x1.78, Viton, 75 Duro
3	1	014998	Bracket for cooler	KU-FH, KC-FH, KM-FH
4	1	N00220	Shaft seal	Ø25x40x7mm
5	1	014878	Bearing cover	KU-FH, KC-FH, KM-FH
6	1	N03705	O-ring	Ø140x3, Buna-N, 70 Duro
7	1	N03703	Roller bearing	Ø25x62x17mm
8	1	N00166	Shaft key	8x7x40, DIN 6885
9	1	----	Crankshaft assembly[2]	Complete
10	1	N03702	Roller bearing	Ø20x52x15mm
11	1	003196	Cam	KU-FH, KC-FH, KM-FH
12	1	014888	Retaining plate	M6 (x2)
13	2	SCR-0065	Hex head cap screw	M6x16mm lg, DIN 933
14	1	N03726	O-ring	Ø40.2x3, Buna-N, 70 Duro
15	1	058159	Filter mount	KU-FH, KC-FH, KM-FH
16	3	SCR-0179	Socket head cap screw	M8x30mm lg, DIN 912
17	1	014874	Crankcase	KU-FH, KC-FH, KM-FH
18	1	073270	Oil drain pipe	3/8"BSPPm x 3/8" BSPPf x 120mm lg
19	1	N03707	Hex head pipe plug	3/8" BSPP, DIN 910
20	1	058258	1st stage piston cylinder	Ø88 KM-FH
	1	006540	1st stage piston cylinder	Ø70 KC-FH
	1	014913	1st stage piston cylinder	Ø60 KU-FH
21	12	NUT-0119	Hex lock nut	8mm, DIN 985
22	18	WAS-0021	Flat washer	8mm, DIN 125
23	1	001867	Piston cylinder gasket	1st stage, Ø60mm
24	2	----	Retaining ring[2]	For piston pin
25	1	011612	1st stage piston[2]	Ø88 KM-FH
	1	010704	1st stage piston[2]	Ø70 KC-FH
	1	002002	1st stage piston[2]	Ø60 KU-FH

1. not used on KU-FH
2. not sold separately

Crankcase assembly (continued), KM-FH, KC-FH and KU-FH

BAUER COMPRESSORS



Crankcase assembly (continued)

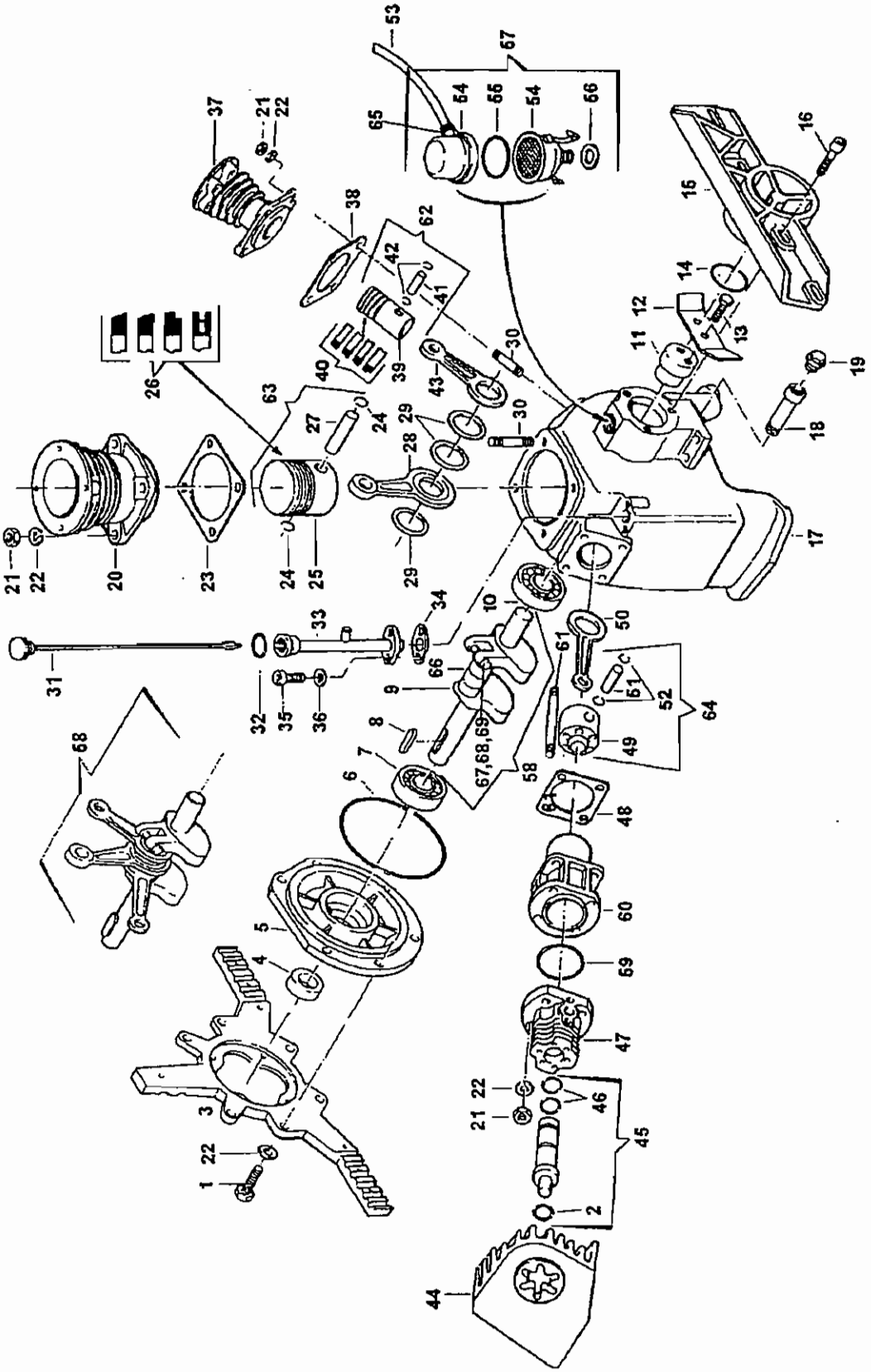
KM-FH, KC-FH and KU-FH

Item	Qty	Part no.	Description	Notes
26	1	N01787	Piston ring set	Ø88 KM-FH
	1	N03856	Piston ring set	Ø70 KC-FH
	1	N02001	Piston ring set	Ø60 KU-FH
27	1	----	Piston pin[1]	1st stage
28	1	072883	Connecting rod	1st stage, KM-FH
	1	072886	Connecting rod	1st stage, KU-FH
	1	072887	Connecting rod	1st stage, KC-FH
29	3	004180	Shaft spacer[1]	For connecting rods
30	8	N00215	Stud	M8x25, DIN 835-8.8
31	1	014886	Oil dipstick/filler cap	KU-FH, KC-FH, KM-FH
32	1	N03521	O-ring	Ø21.82x3.53, Viton, 75 Duro
33	1	014887	Oil filling neck	KU-FH, KC-FH, KM-FH
34	1	012560	Flange gasket	KU-FH, KC-FH, KM-FH
35	2	SCR-0145	Socket head cap screw	M6x20mm lg, DIN 912
36	2	N03026	Wave washer	6mm, DIN 137
37	1	010875	2nd stage piston cylinder	Ø36mm
38	1	003110	Piston cylinder gasket	Ø36mm
39	1	----	Piston, 2nd stage[1]	Ø36mm
40	1	N04158	Piston ring set	Ø36mm
41	1	----	Piston pin[1]	2nd stage
42	2	----	Retaining ring[1]	For piston pin
43	1	072884	Connecting rod	2nd stage, KM-FH, KC-FH, & KU-FH
44	1	065094	Finned cooling plate[2]	Air-cooled
45	1	066934	Floating piston assembly	Ø14mm, KM-FH, KC-FH
	1	014609	Floating piston assembly	Ø12mm, KU-FH
46	2	N02320	O-ring[3]	Ø21.95x1.78, Viton, 75 Duro
	2	N02507	O-ring	Ø18.77x1.78, Viton, 75 Duro
47	1	056189	Piston cylinder	Ø14mm, KC-FH, KM-FH
	1	056352	Piston cylinder	Ø12mm, KU-FH
48	1	001866	Guide cylinder gasket	Ø45mm
49	1	N00823	Guide piston	Ø45x55mm lg.

1. not sold separately
2. not used on KU-FH
3. not used on KU-FH

Crankcase assembly (continued), KM-FH, KC-FH and KU-FH

BAUER COMPRESSORS

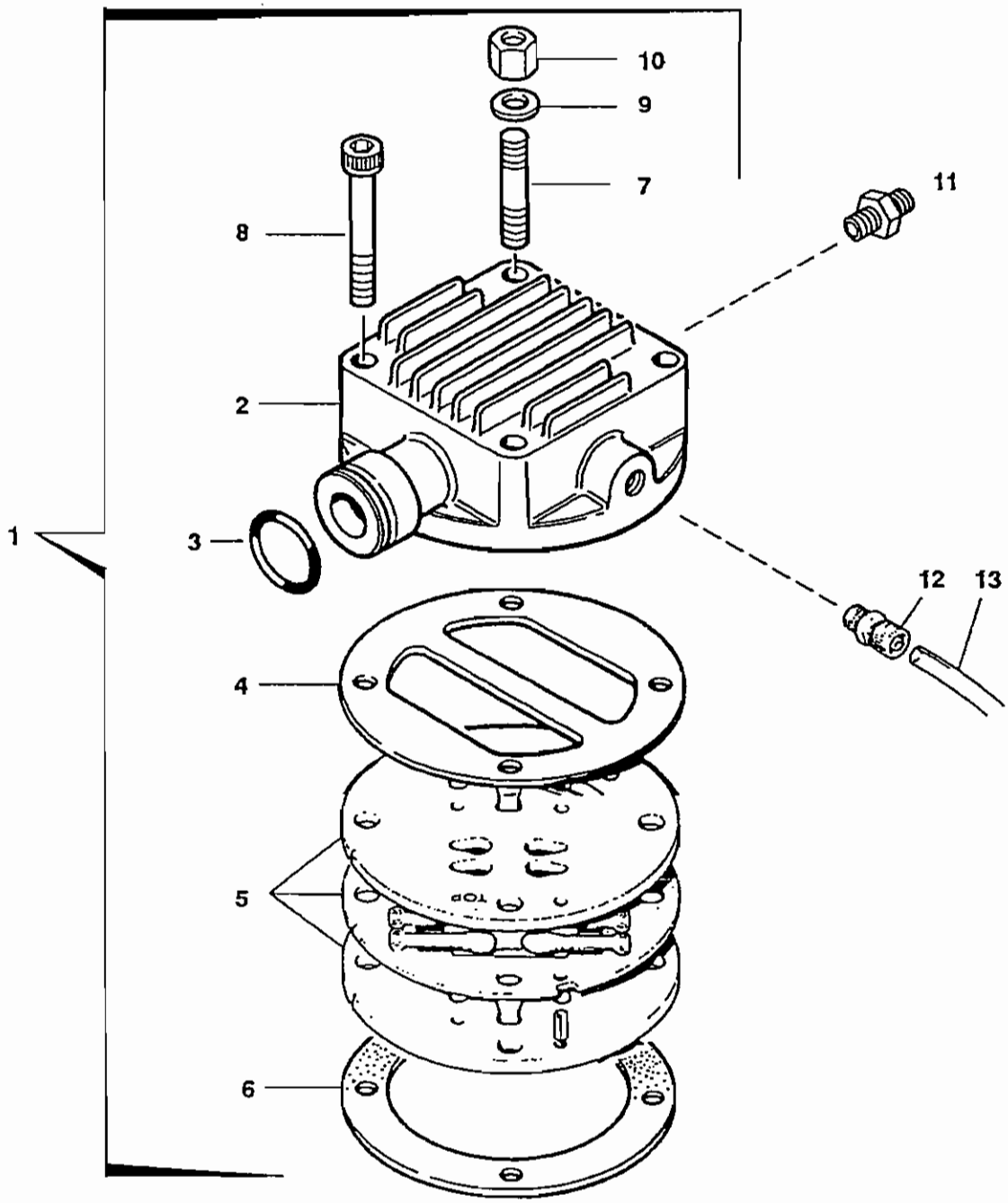


Crankcase assembly (continued)

KM-FH, KC-FH and KU-FH

Item	Qty	Part no.	Description	Notes
50	1	072885	Connecting rod	3rd stage, KM-FH, KU-FH & KC-FH
51	1	----	Piston pin[1]	3rd stage
52	2	----	Retaining ring[1]	For piston pin
53	1	HOS-R-0015	Flexible tube[2]	8mm OD x 6mm ID, polyamide black
54	1	N03207	Crankcase demister	1/2" BSPP
55	1	N03712	O-ring	Ø63.22x1.78, Buna-N, 75 Duro
56	1	N00293	Copper gasket	A21x28x2, DIN 7603
57	1	014892	Demister assembly	Complete
58	1	055653	Crankshaft and connecting rod assy.	Complete, KM-FH
	1	014030	Crankshaft and connecting rod assy.	Complete, KC-FH
	1	013987	Crankshaft and connecting rod assy.	Complete, KU-FH
59	1	N04064	O-ring	Ø50x2, Buna-N, 70 Duro
60	1	056141	Guide cylinder, 3rd stage	Ø45mm
61	4	N04065	Stud	M8x70mm lg, DIN 835
62	1	069949	Piston assembly, 2nd stage	Ø35mmx53.5mm lg
63	1	069975	Piston assembly, 1st stage	KM-FH, Ø88mm
	1	069948	Piston assembly, 1st stage	KC-FH, Ø70mm
	1	069982	Piston assembly, 1st stage	KU-FH, Ø60mm
64	1	069950	Piston assembly, 3rd stage	Ø45mm
65	1	N03737	Male connector	8mm flex tube x ¼" BSPPm
66	1	001529	Shim	Crankshaft
67	1	SCR-0138	Socket head cap screw	M8x55mm, DIN 912
68	1	WAS-0001	Split lock washer	8mm, DIN 1278
69	1	NUT-0119	Hex lock nut	8mm, DIN 985

1. not sold separately
2. specify length when ordering

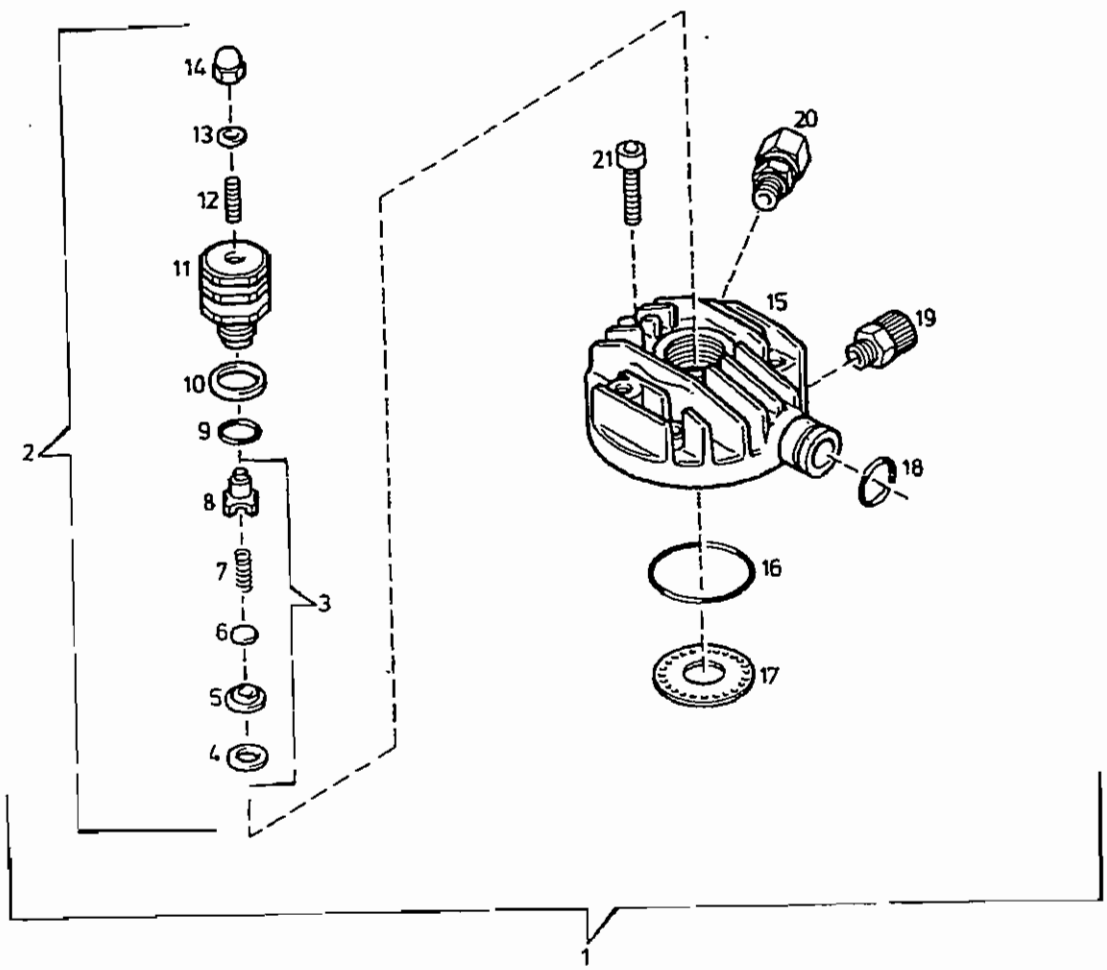

10
9
7
11
8
2
1
3
12
13
4
5
6

1st stage valve head

KM-FH

Item	Qty	Part no.	Description	Notes
1	1	069977	Valve head assembly	KM-FH, Complete
2	1	058261	Valve head	Bare, KM-FH
3	1	N01539	O-ring	Ø30.3x2.4, Buna-N, 70 Duro
4	1	063340	Valve head gasket	1st stage
5	1	N04670	Reed valve assembly	130x110.4x9.304 SLV
6	1	058262	Cylinder gasket	1st stage
7	1	N04065	Stud	M8x70mm, DIN 835
8	3	N01282	Socket head cap screw	M8x75mm, DIN 912
9	1	WAS-0021	Flat washer	8mm, DIN 125
10	1	005290	Hex bushing	M8x25mm lg.
11	1	N20341	Male connector	12mm LL tube x ¼" BSPTm
12	1	N03737	Male connector	8mm flex tube x ¼" BSPPm
13	1	HOS-R-0015	Flexible tube[1]	8mm OD x 6mm ID

1. specify length on order

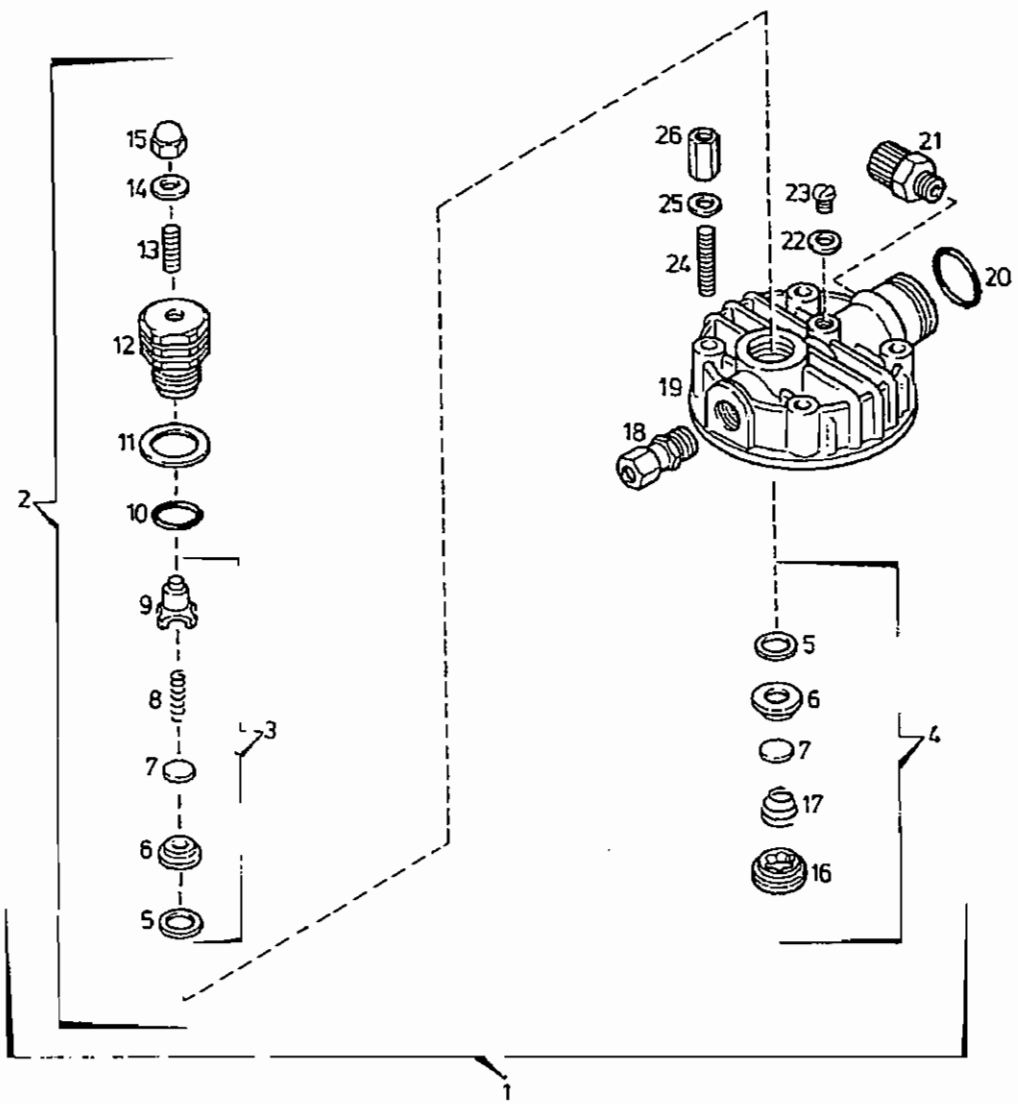

14
13
12
11
10
9
8
7
6
5
4
2
3
21
20
15
19
18
16
17
1

1st stage valve head

KC-FH

Item	Qty	Part no.	Description	Notes
1	1	014906	Valve head assembly, 1st stage	KC-FH, Complete
2	1	014583	Discharge valve assembly	Complete
3	1	012840	Discharge valve	Complete
4	1	000240	Valve gasket	Ø16x25x1.5mm
5	2	----	Valve seat[1]	
6	2	----	Valve plate[1]	
7	1	----	Compression spring[1]	Cylindrical
8	1	----	Discharge valve body[1]	
9	1	N03521	O-ring	Ø21.82x3.53, Viton, 75 Duro
10	1	014332	Disc spring	Ø35.5x29.1x1.25mm
11	1	014124	Discharge valve cover	Finned, M28-1.5xM8, DIN 7168
12		071064	Socket set screw	M8x25mm lg, DIN 913
13	1	N03625	Copper gasket	A8x14x1.5, DIN 7603
14	1	N00084	Dome nut	8mm, DIN 1587
15	1	014907	Valve head	KC-FH, Bare
16	1	N02169	O-ring	Ø79.0x1.78, Viton, 75 Duro
17	1	009884	Inlet valve plate	KC-FH
18	1	N01539	O-ring	Ø30.3x2.4, Buna-N, 70 Duro
19	1	N03737	Male connector	8mm flex. tube x 1/4" BSPPm
20	1	N07838	Male connector	12mm LL tube x 1/4" BSPTm
21	3	SCR-0180	Socket head cap screw	M8x35mm lg, DIN 912

1. parts not sold separately

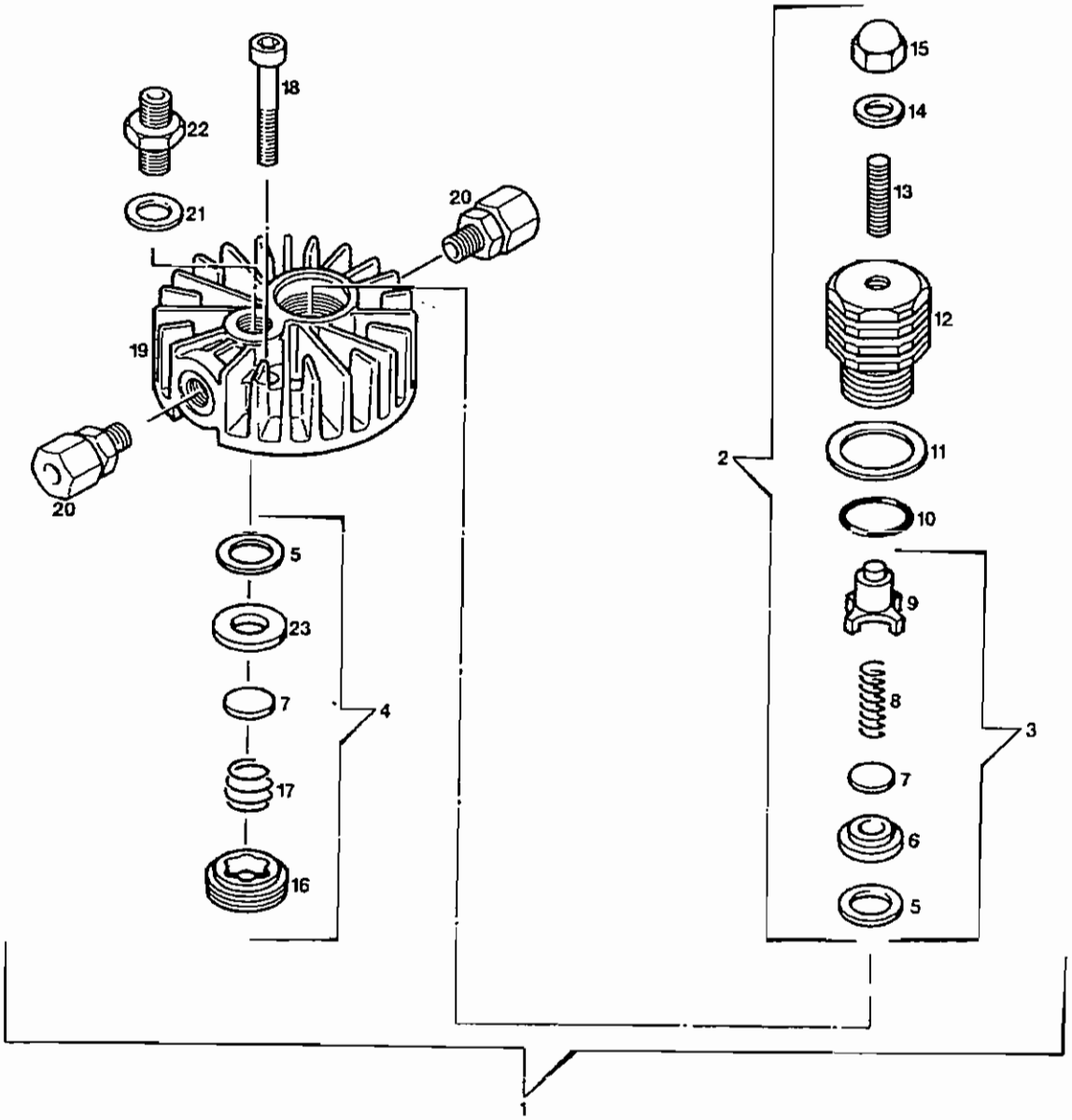

15
14
13
12
11
10
9
8
7
6
5
2
3
26
25
24
23
22
21
20
19
18
5
6
7
17
16
4
1

1st stage valve head

KU-FH

Item	Qty	Part no.	Description	Notes
1	1	014910	Valve head assembly, 1st stage	KU-FH, Complete
2	1	014583	Discharge valve assembly	Complete
3	1	012840	Discharge valve	Complete
4	1	012841	Intake valve	Complete
5	2	000240	Valve gasket	Ø16x25x1.5mm
6	2	----	Valve seat[1]	
7	2	----	Valve plate[1]	
8	1	----	Compression spring[1]	Cylindrical
9	1	----	Discharge valve body[1]	
10	1	N03521	O-ring	Ø21.82x3.53, Viton, 75 Duro
11	1	014332	Disc spring	Ø35.5x29.1x1.25mm
12	1	014124	Discharge valve cover	Finned, M28-1.5xM8, DIN 7168
13	1	071064	Socket set screw	M8x25mm lg, DIN 913
14	1	N03625	Copper gasket	A8x14x1.5, DIN 7603
15	1	N00084	Dome nut	8mm, DIN 1587
16	1	----	Inlet valve cover[1]	
17	1	----	Compression spring[1]	Conical
18	1	N20189	Male connector	12mm L tube x 1/4" BSPTm
19	1	014911	Valve head	1st stage, Bare
20	1	N01539	O-ring	Ø30.3x2.4, Buna-N, 70 Duro
21	1	N03737	Male connector	8mm flex.tube x 1/4" BSPPm
22	1	N02714	Copper gasket	C6.5x9.5x1.5, DIN 7603
23	1	N00730	Slotted pan head screw	A6x10mm lg, DIN 84
24	4	STU-0001	Stud	M8x40mm lg, DIN 939
25	4	WAS-0021	Flat washer	8mm, DIN 125
26	4	005290	Hex bushing	M8x25mm lg.

1. not sold separately

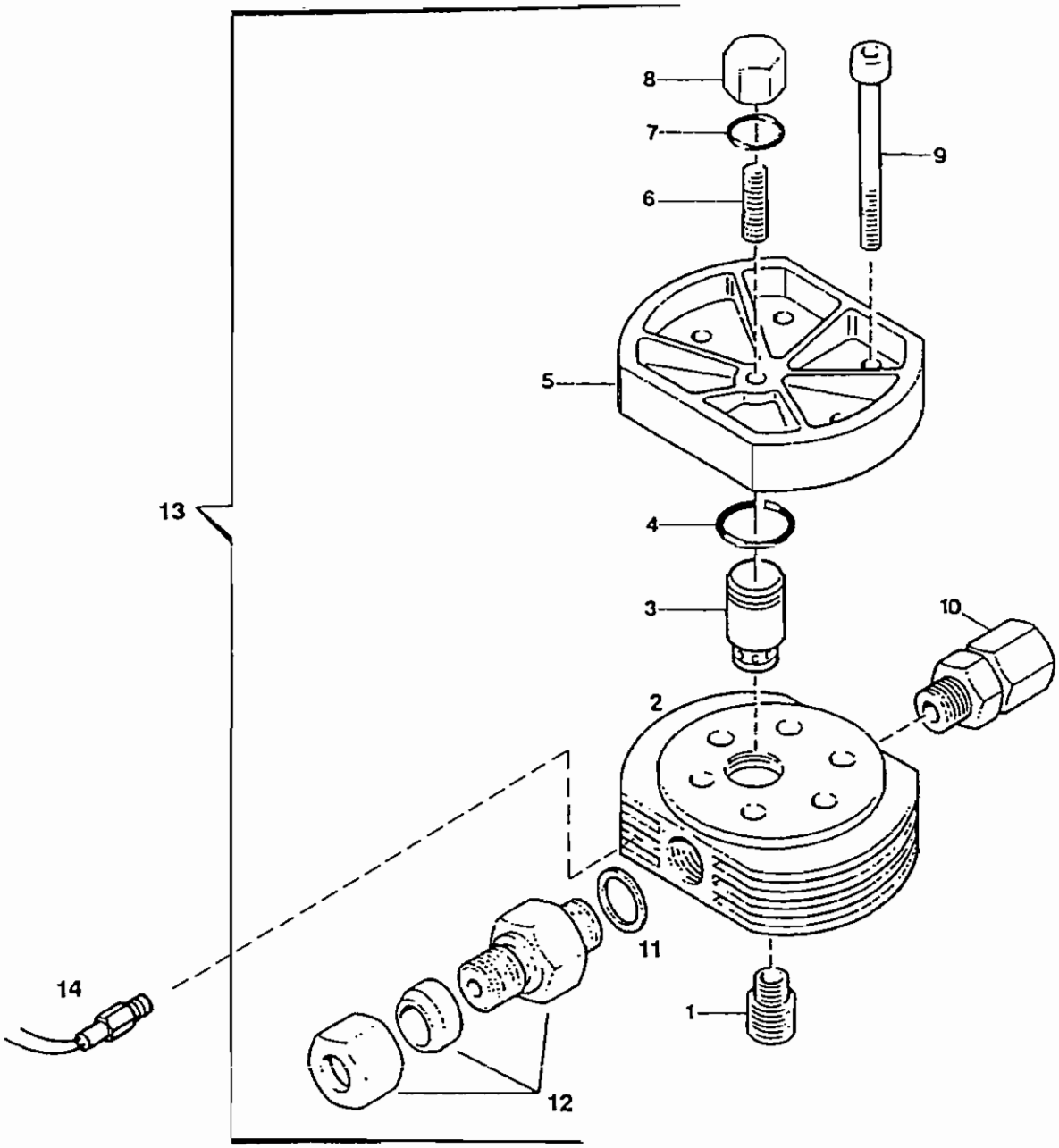

18
22
21
20
19
20
5
23
7
17
16
4
15
14
13
12
11
10
9
8
7
6
5
3
2
1

2nd stage valve head

KM-FH, KC-FH and KU-FH

Item	Qty	Part no.	Description	Notes
1	1	014696	Valve head assembly	Complete
2	1	014582	Discharge valve assembly	Complete
3	1	012835	Discharge valve	Complete
4	1	012841	Intake valve assembly	Complete
5	2	000240	Valve gasket	Ø16x25x1.5mm
6	1	----	Discharge valve seat[1]	
7	2	----	Valve plate[1]	
8	1	----	Compression spring[1]	Cylindrical
9	1	----	Discharge valve body[1]	
10	1	N03521	O-ring	Ø21.82x3.53, Viton, 75 Duro
11	1	014332	Disc spring	Ø35.5x29.3x1.25mm
12	1	014124	Discharge valve cover	Finned, M28-1.5xM8, DIN 7168
13	1	071064	Socket set screw	M8x25mm lg, DIN 913
14	1	N03625	Copper gasket	A8x14x1.5, DIN 7603
15	1	N00084	Dome nut	8mm, DIN 1587
16	1	----	Inlet valve cover[1]	
17	1	----	Compression spring[1]	Conical
18	6	SCR-0180	Socket head cap screw	M8x35mm lg, DIN 912
19	1	014123	Valve head	Bare
20	2	N20341	Male connector	12mm LL tube x 1/4" BSPTm
21	1	N01316	Copper gasket	A13x20x1.5, DIN 7603
22	1	N20195	Male connector	6mm S tube x 1/4" BSPPm
23	1	----	Inlet valve seat[1]	

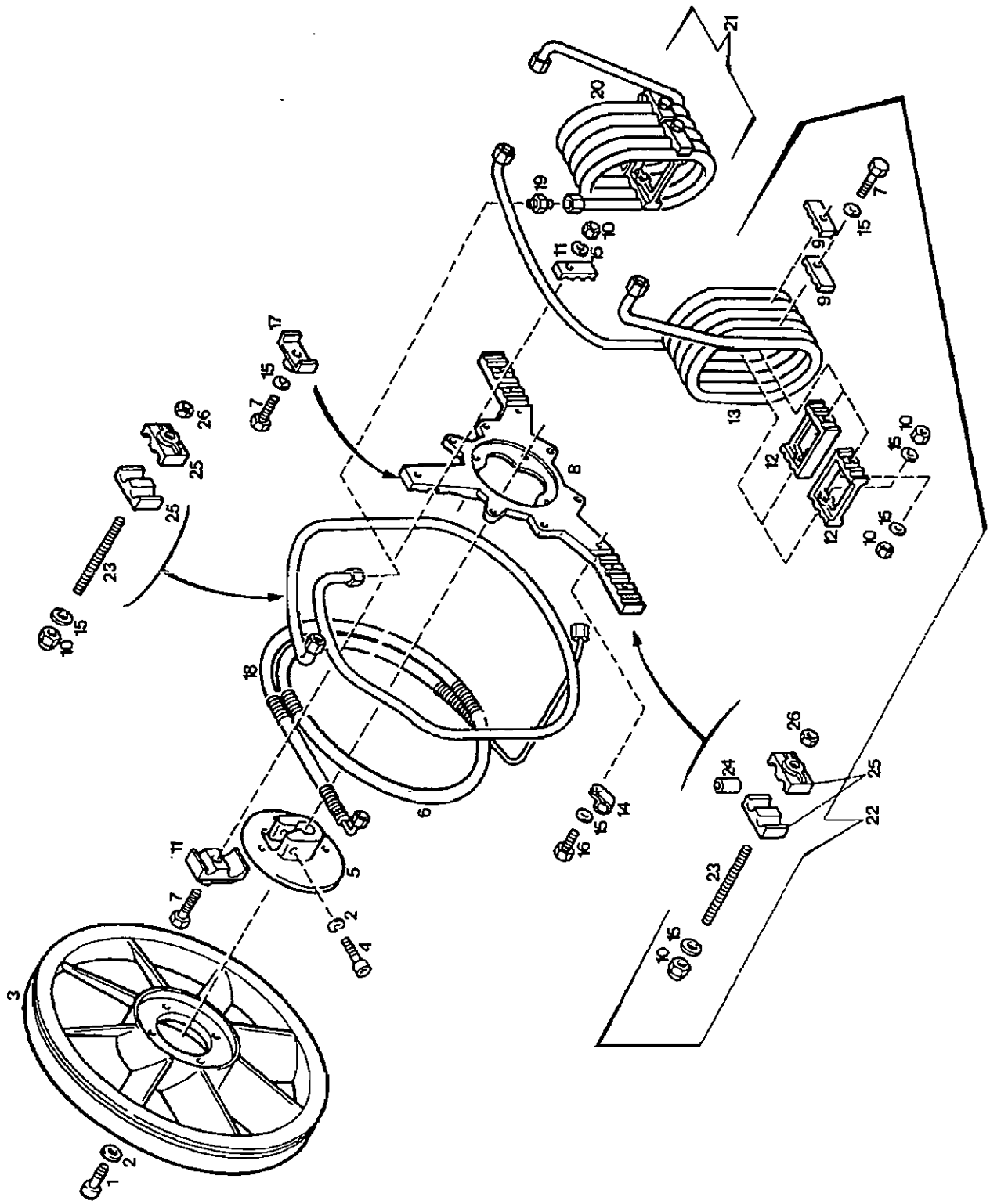
1. not sold separately


8
7
6
9
5
13
4
3
10
2
11
14
1
12

3rd stage valve head

KM-FH, KC-FH and KU-FH

Item	Qty	Part no.	Description	Notes
1	1	007790	Intake valve	Final stage
2	1	014117	Valve head	Final stage, Bare
3	1	014121	Discharge valve	Final stage
4	1	N02789	O-ring	Ø15.6x1.78, Viton, 90 Duro
5	1	014118	Valve head cover	Final stage
6	1	071065	Socket set screw	M8-1x25mm lg, DIN 913
7	1	N03625	Copper gasket	A8x14x1.5, DIN 7603
8	1	N03623	Cap nut	M8-1, DIN 917
9	6	N01282	Socket head cap screw	M8x75mm lg, DIN 912; KM-FH, KC-FH
	6	SCR-0139	Socket head cap screw	M8x60mm lg, DIN 912; KU-FH
10	1	N20341	Male connector	12mm LL tube x 1/4" BSPTm
11	1	N01316	Copper gasket	A13x20x1.5, DIN 7603
12	1	N20209	Male connector	8mm S tube x ¼" BSPPm
13	1	069954	Valve head assembly	Complete
14	1	SWT-0006	Temperature switch	N.O.
	1	SWT-0015	Temperature switch	N.C.

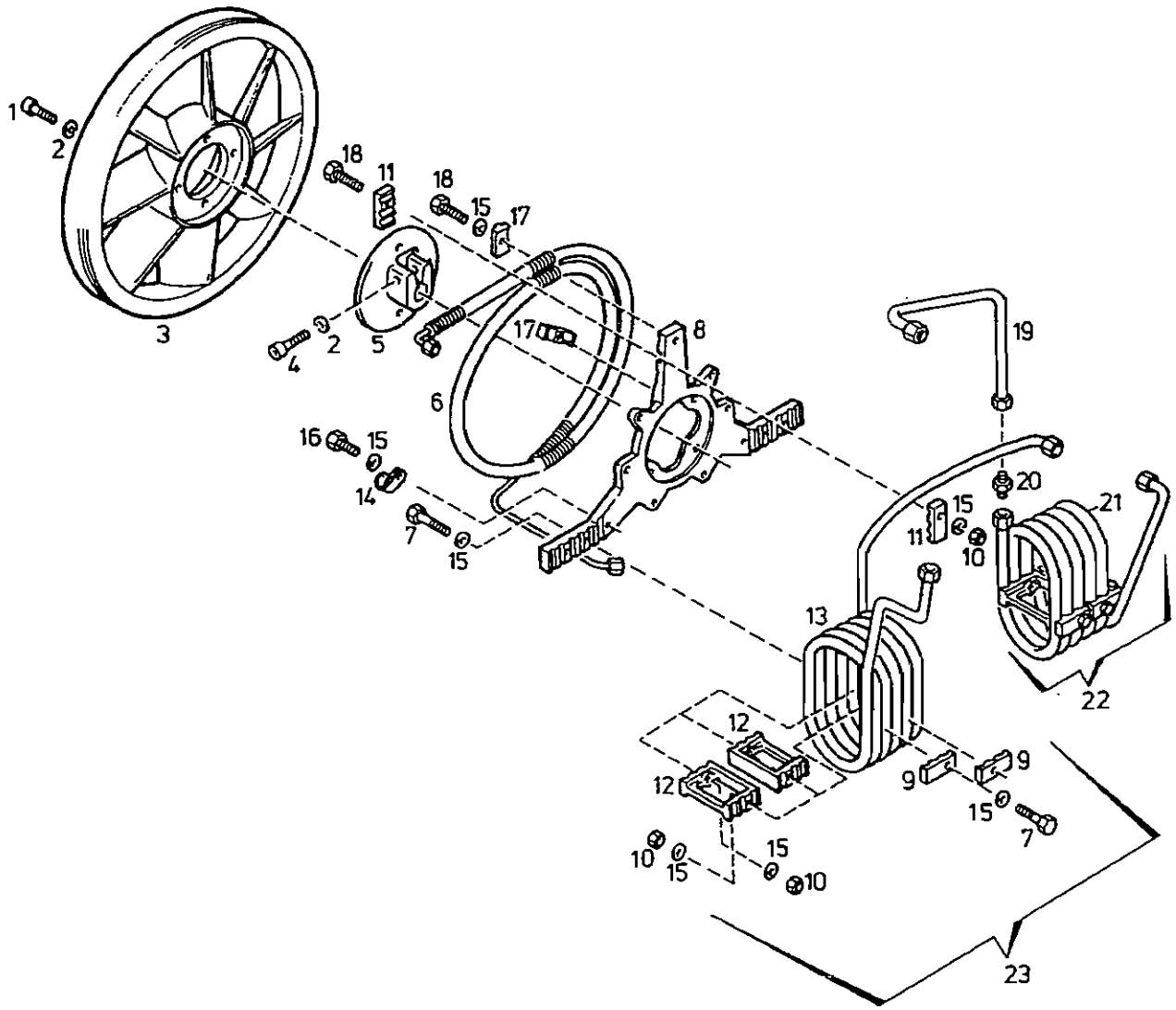


Cooling system

KM-FH

Item	Qty	Part no.	Description	Notes
1	4	SCR-0159	Socket head cap screw	M8x20mm lg, DIN 912
2	5	WAS-0001	Split lock washer	8mm, DIN 127
3	1	012754	Cooling fan/compressor flywheel	"A" only, 1 gr., 17.47" PD
4	1	SCR-0182	Socket head cap screw	M8x45mm lg, DIN 912
5	1	013666	Cooling fan hub	KU-FH, KC-FH, KM-FH
6	1	069960	Aftercooler	KU-FH, KC-FH, KM-FH
7	10	SCR-0051	Hex head cap screw	M6x45mm lg, DIN 933
8	1	014998	Cooler mounting bracket	KU-FH, KC-FH, KM-FH
9	8	013662	Tube clamp	3-groove
10	9	NUT-0118	Hex lock nut	6mm, DIN 985-plated
11	2	069905	Tube clamp	2-groove
12	4	013663	Intercooler bracket	KU-FH, KC-FH, KM-FH
13	1	----	Intercooler[i]	2nd stage
14	2	CMP-0068	P-clamp	7/8" ID, insulated
15	22	WAS-0024	Flat washer	6mm, DIN 125-ST
16	2	SCR-0192	Hex head cap screw	M6x20mm lg, DIN 933
17	2	014139	Tube clamp	2-groove
18	1	069978	Intercooler	1st stage, Complete
19	1	N20193	Tube union	12mm LL tube
20	1	----	Intercooler[1]	1st stage
21	1	056716	Intercooler assembly	1st stage, KM-FH
22	1	058992	Intercooler assembly	2nd stage, KM-FH
23	2	055699	Threaded rod	M6
24	1	TUB-R-0021	Round tube[2]	12mm OD x 1.5mm wall, 304SS
25	4	055698	Tube clamp	2-groove
26	2	NUT-0037	Hex nut	6mm, DIN 934

1. not sold separately
2. specify length on order


1
2
3
18
11
18
15
17
4
2
5
17
8
6
19
16
15
14
7
15
20
21
11
15
10
13
22
12
12
9
9
15
7
10
15
15
10
23

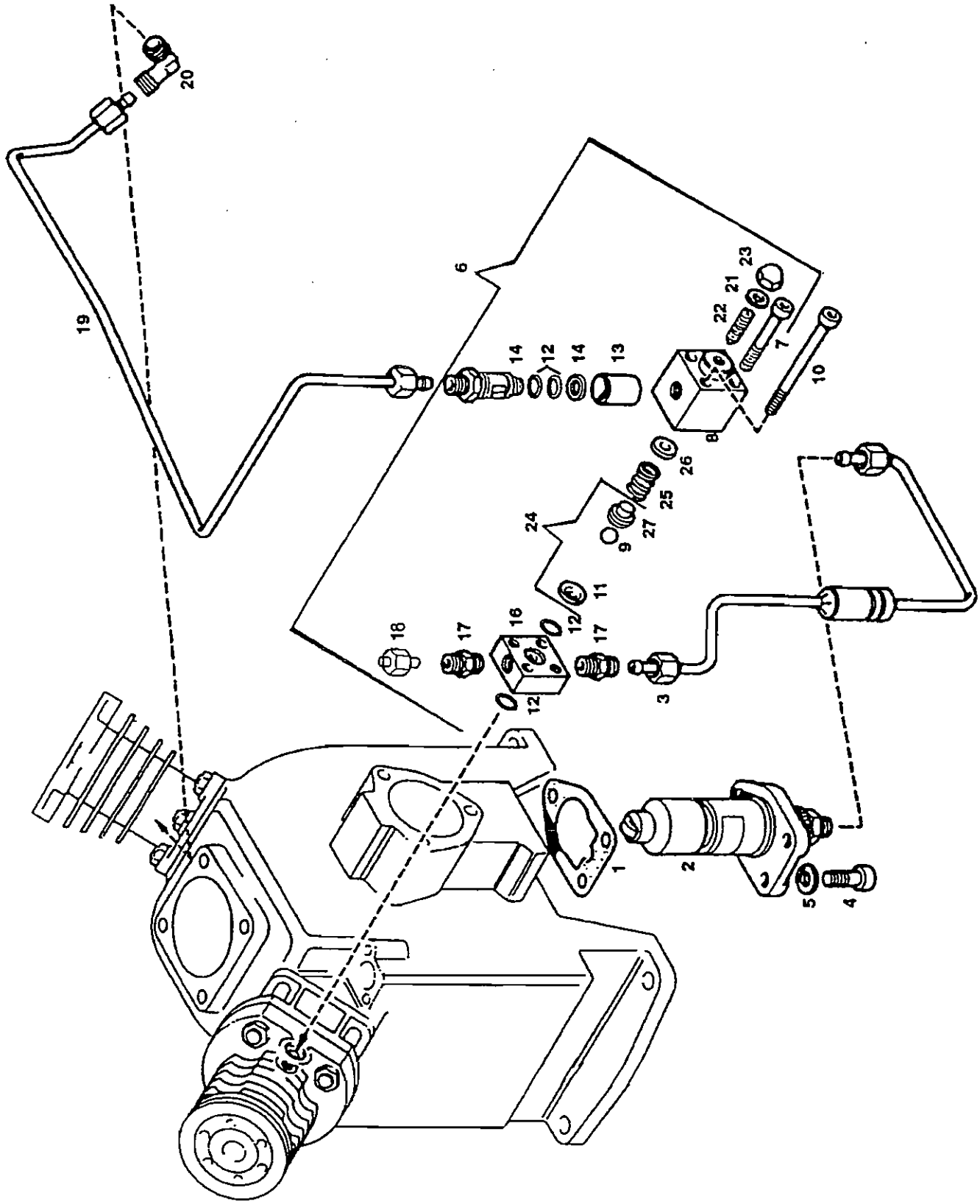
Cooling system

KC-FH and KU-FH

Item	Qty	Part no.	Description	Notes
1	4	SCR-0159	Socket head cap screw	M8x20mm lg, DIN 912
2	5	WAS-0001	Split lock washer	8mm, DIN 127
3	1	013623	Cooling fan/compressor flywheel	"A" only, 1 gr.; 15.50" PD; KU-FH
	1	012754	Cooling fan/compressor flywheel	"A" only, 1 gr.; 17.47" PD KC-FH
4	1	SCR-0182	Socket head cap screw	M8x45mm lg, DIN 912
5	1	013666	Cooling fan hub	KU-FH, KC-FH, KM-FH
6	1	069960	Aftercooler	KU-FH, KC-FH, KM-FH
7	8	SCR-0051	Hex head cap screw	M6x45mm lg, DIN 933
8	1	014998	Cooler bracket	KU-FH, KC-FH, KM-FH
9	8	013662	Tube clamp	3-groove
10	9	NUT-0118	Hex lock nut	6mm, DIN 985-plated
11	2	014564	Tube clamp	2-groove
12	4	013663	Intercooler bracket	KU-FH, KC-FH, KM-FH
13	1	----	Intercooler[1]	2nd stage
14	2	CMP-0068	P-clamp	7/8" ID, insulated
15	20	WAS-0024	Flat washer	6mm, DIN 125-ST
16	2	SCR-0192	Hex head cap screw	M6x20mm lg, DIN 933
17	2	014139	Tube clamp	2-groove
18	2	SCR-0110	Hex head cap screw	M6x40mm lg, DIN 933
19	1	069988	Connecting tube	12mm OD x 1.5mm wall; KU-FH
	1	069957	Connecting tube	12mm OD x 1.5mm wall; KC-FH
20	1	N20189	Male connector	12mm L tube x ¼" BSPTm
21	1	----	Intercooler[1]	1st stage
22	1	014624	Intercooler assembly	1st stage, KU-FH & KC-FH
23	1	058991	Intercooler assembly	2nd stage, KU-FH & KC-FH

1. not sold separately

Lubrication system; KM-FH, KC-FH and KU-FH

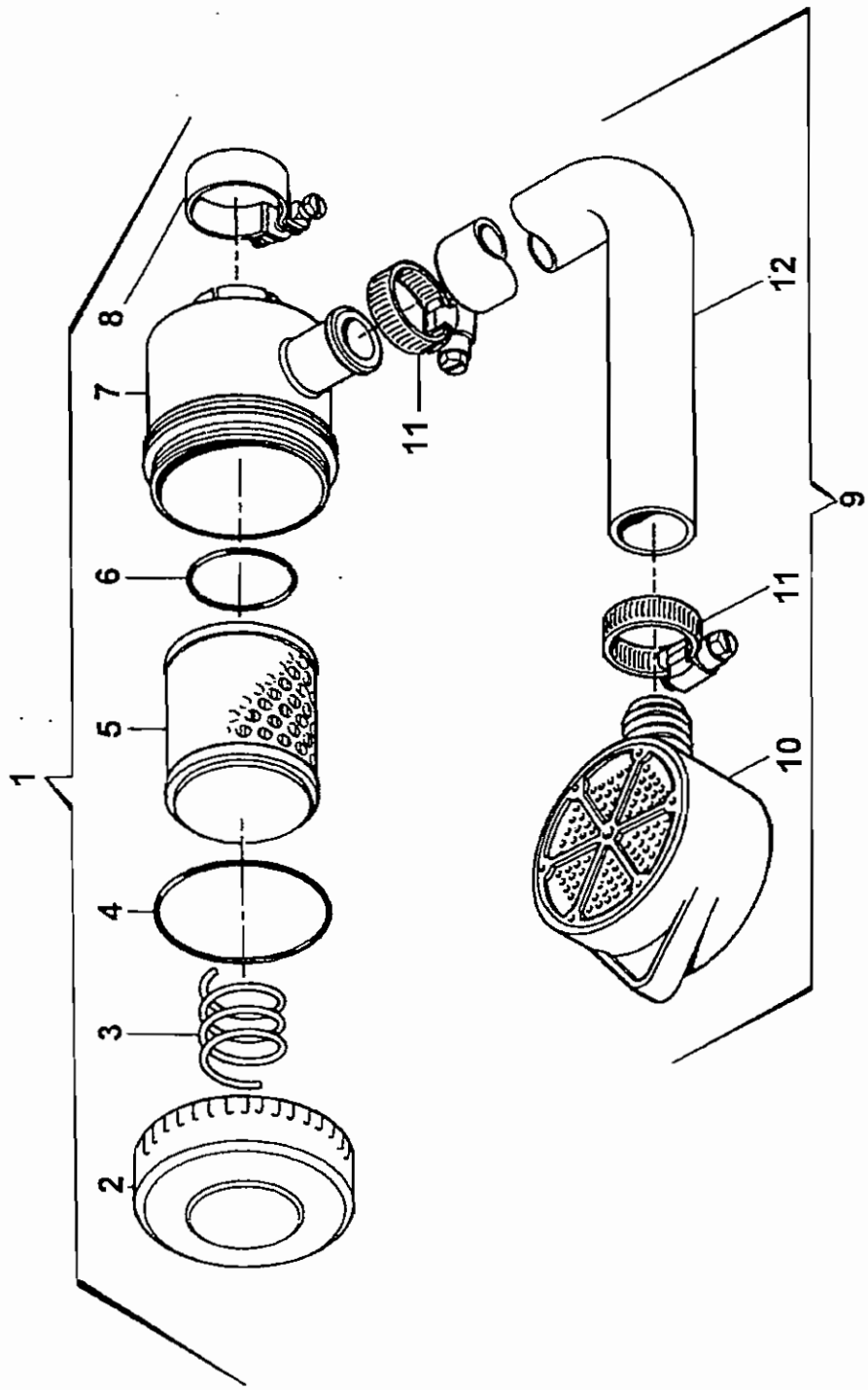


Lubrication system

KM-FH, KC-FH and KU-FH

Item	Qty	Part no.	Description	Notes
1	1	002010	Oil pump gasket	For N00083
2	1	N00083	Oil pump	Bosche
3	1	069966	Oil supply tube	6mm OD x 1mm wall
4	3	SCR-0136	Socket head cap screw	M8x25mm lg, DIN 912
5	3	WAS-0021	Flat washer	8mm, DIN 125
6	1	058138	Oil pressure regulator	Complete
7	2	SCR-0177	Socket head cap screw	M6x60mm lg, DIN 912
8	1	058102	Oil pressure regulator body[1]	For 058138
9	1	N02768	Precision ball	Ø8mm SS, DIN 5401
10	2	N03407	Socket head cap screw	M6x80mm lg, DIN 912
11	1	058119	Ball valve seat[1]	For 058138
12	4	N07091	O-ring	Ø9.25x1.78, Viton, 75 Duro
13	1	056302	Glass tube	Ø18x13x22.5mm lg.
14	1	N04051	Copper gasket	A10x15x1, DIN 7603
15	1	056301	Oil sight glass fitting	6mm L tube x 1/8" BSPPm
16	1	057132	Square flange[1]	1/8" BSPPf
17	2	N20237	Male connector w/seal	6mm L tube x 1/8" BSPPm
18	1	N04530	Tube plug	6mm L tube
19	1	069965	Oil return tube	6mm OD x 1mm wall;
20	1	N20003	Male elbow	6mm L tube x 1/8" BSPTm
21	1	N03625	Copper gasket	A8x14x1.5, DIN 7603
22	1	N01969	Slotted set screw	M8
23	1	N00084	Dome nut	8mm, DIN 1587
24	1	072439	Ball valve assembly	With ball seat and guide
25	1	002623	Compression spring	Cylindrical
26	11	058121	Valve plate[1]	Ø15.5mm
27	1	----	Ball guide[1]	For 8mm ball

1. not sold separately

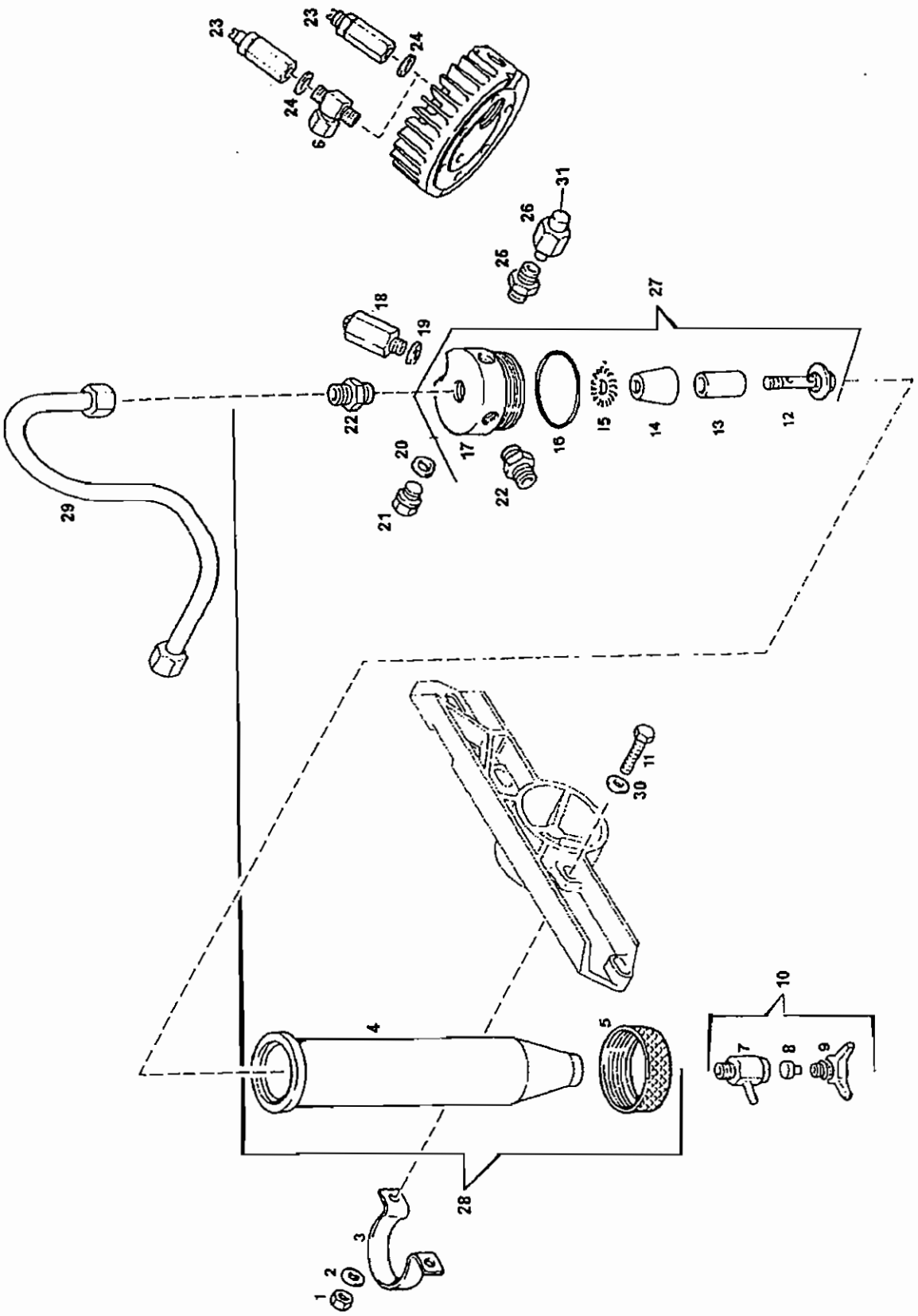

1
2
3
4
5
6
7
8
9
10
11
11
12

Air-intake filter

1" neck

Item	Qty	Part no.	Description	Notes
1	1	013758	Intake filter assembly	Complete
2	1	012771	Intake filter cover	For 013758
3	1	010528	Compression spring	Cylindrical
4	1	N04451	O-ring	∅75x3, Buna-N, 70 Duro
5	1	N00070	Filter element	For 013758
6	1	013757	O-ring	∅35x5
7	1	012770	Intake filter housing	For 013758
8	1	N03374	Hose clamp	S 40-15 SKZ
9	1	014539	Pre-filter assembly	With tube
10	1	057691	Pre-filter w/clamp	1" neck
11	2	CMP-0025	Worm gear hose clamp	1 1/16" to 2" dia.
12	1	TUB-R-0034	Flexible tube[1]	1" ID x 1 1/4" OD, PVC

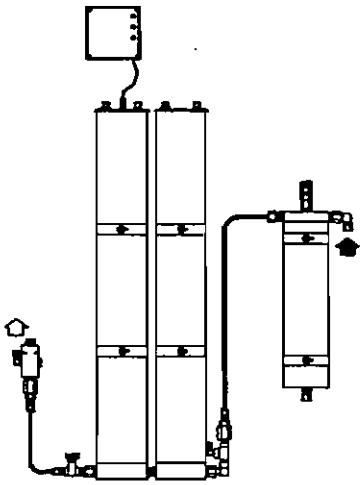
1. specify length on order


23
23
24
24
6
31
26
25
27
18
19
22
20
21
17
16
22
15
14
13
12
29
11
30
10
4
5
7
8
9
28
3
2
1

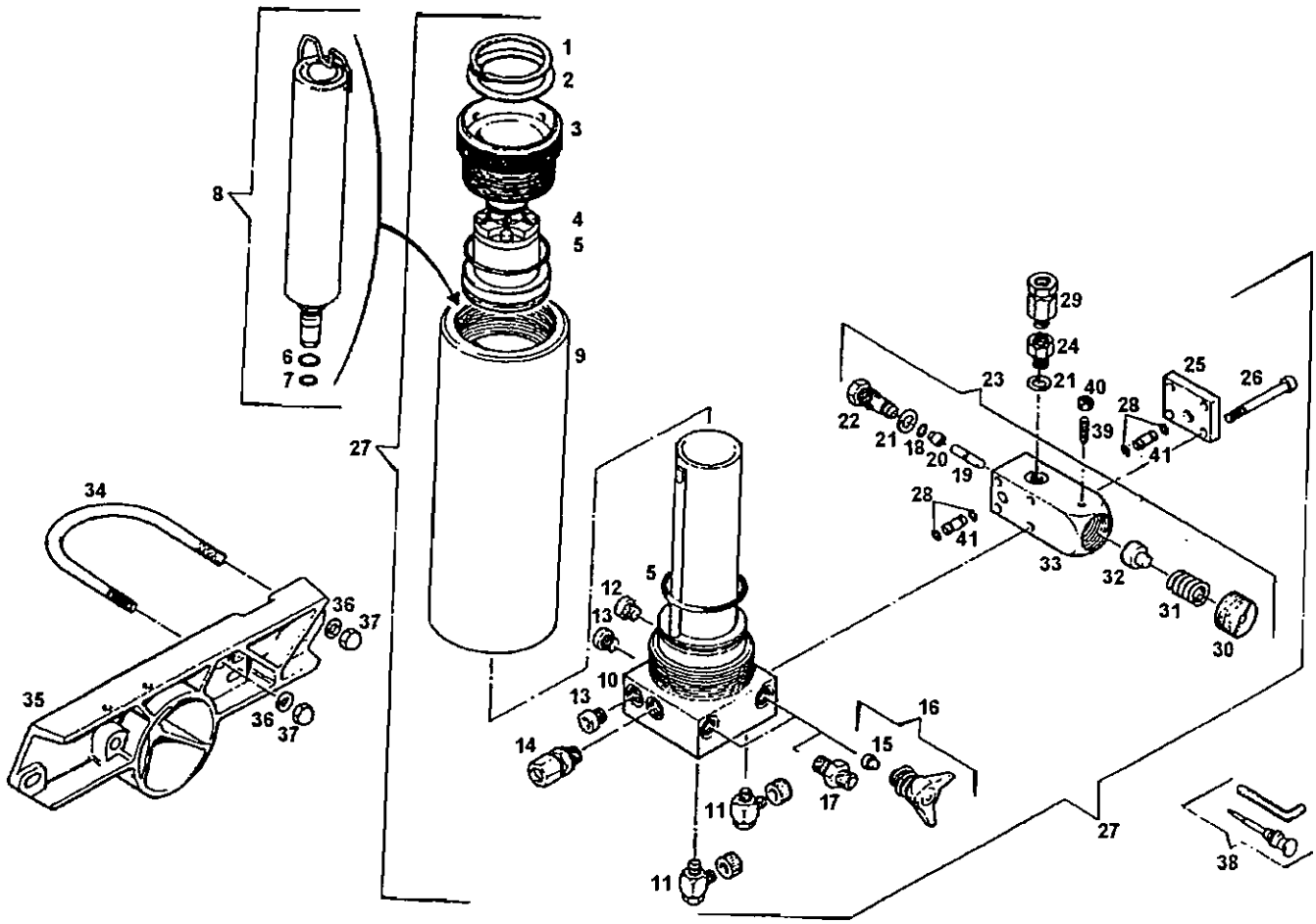
Intermediate filter

1160 psi

Item	Qty	Part no.	Description	Notes
1	2	NUT-0062	Hex nut	8mm, DIN 934-plain
2	2	N02862	Flat washer	8mm, DIN 7349
3	1	014368	Inter-filter bracket	KU-FH, KC-FH, KM-FH
4	1	014150	Inter-filter housing	1160 psi (80 bar)
5	1	013937	Threaded collar	Knurled, M54-1.5
6	1	TEE-0021	Male run tee	6mm S tube
7	1	068410	Drain tap housing	For 011430
8	1	013283	Drain valve gasket	For 011430
9	1	055888	Drain valve tap w/spring	For 011430
10	1	011430	Manual condensate drain valve	Complete, ¼" BSPPm
11	2	SCR-0025	Hex head cap screw	M8x30mm lg, DIN 933
12	1	012786	Center screw	M10-1x53mm lg.
13	1	N02726	Inter-filter element	Ø17x13x30mm lg
14	1	012785	Baffle cone	Ø27x24.5mm lg
15	1	012784	Vortex plate	Ø32x10.5x1mm
16	1	N03556	O-ring	Ø45x2, Buna-N, 70 Duro
17	1	013930	Inter-filter head	V-150 & V-177
18	1	011656	Safety valve	725 psi (50 bar)
19	1	004479	Copper gasket	Ø8x14x2
20	1	N04051	Copper gasket	A10x15x1, DIN 7603
21	1	PLU-0028	Hex head pipe plug	1/8" BSPP, DIN 910
22	1	N20341	Male connector	12mm LL tube x 1/4" BSPTm
23	1	010670	Safety valve	116 psi (8 bar)
24	1	008264	Copper gasket	3/8" BSP
25	1	N20237	Male connector w/seal	6mm L tube x 1/8" BSPPm
26	1	NUT-0055	Tube nut	6mm L tube
27	1	067611	Inter-filter head assembly	Complete
28	1	067612	Inter-filter assembly	Complete
29	1	069959	Connecting tube	12mm OD x 1.5mm wall
30	2	WAS-0021	Flat washer	8mm, DIN 125
31	1	N04530	Tube plug	6mm L tube



SECTION B
Purification systems

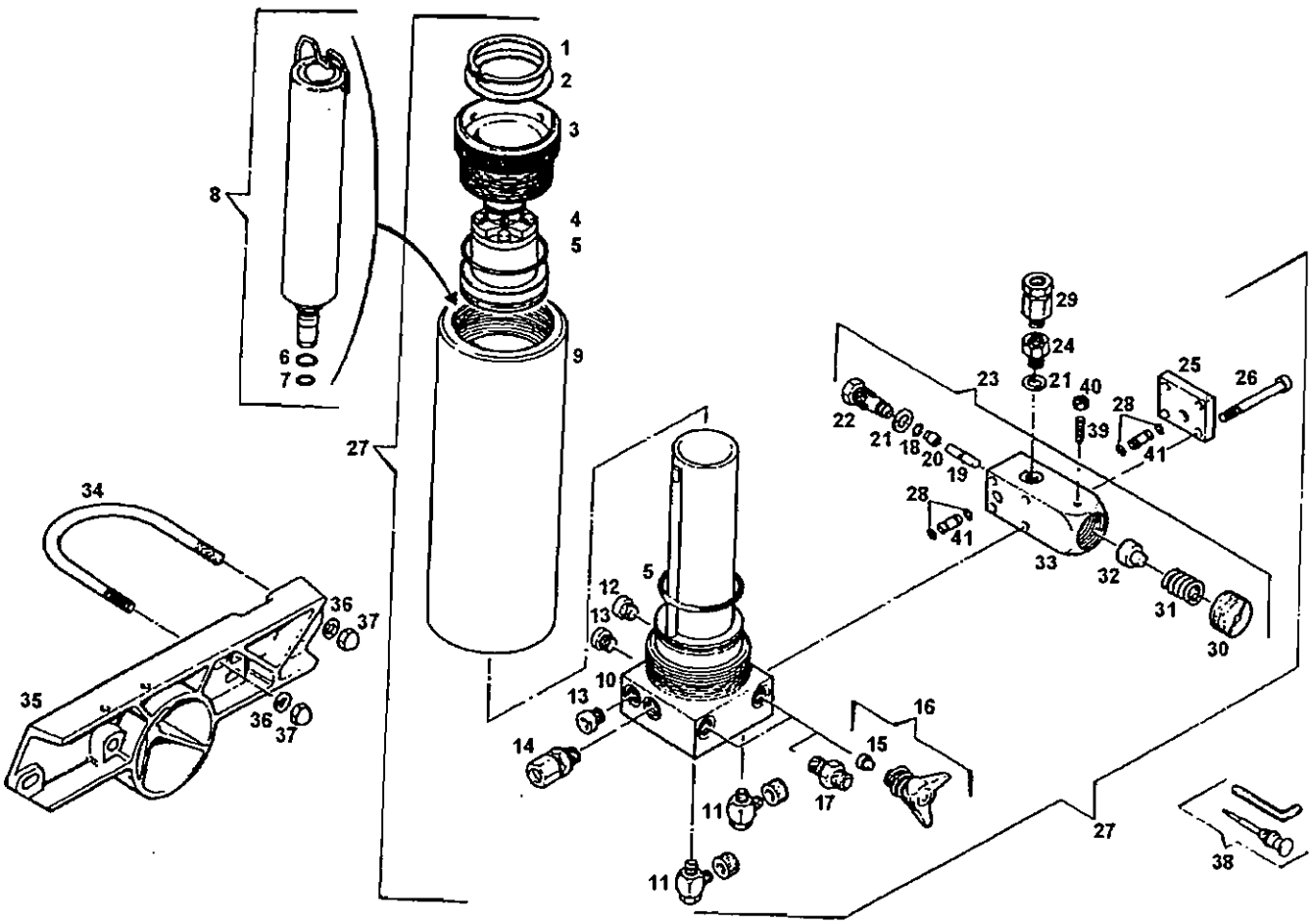

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41

Purification system

P0 w/TRIPLEX®

Item	Qty	Part no.	Description	Notes
1	1	N15598	Retaining ring	Ø55x2, DIN 472
2	1	063438	Rectangular seal	
3	1	----	Filter cover[1]	Knurled
4	1	061114	Safety valve[2]	1450-5076 psi (100-350 bar)
5	2	N04586	O-ring	Ø59.92x3.53 Viton, 90 Duro
6	1	N04566	O-ring	Ø9.19x2.62 Viton, 75 Duro
7	1	N03824	O-ring	Ø7.59x2.62 Viton, 75 Duro
8	1	059183	TRIPLEX® filter element	MS/AC/HP/MS
	1	057679	TRIPLEX® filter element	AC/MS/MS
	1	058596	TRIPLEX® filter element	AC/MS
	1	059491	TRIPLEX® filter element	MS/AC/HP
9	1	----	Filter housing[1]	P0 purification
10	1	----	Filter base[1]	P0 purification
11	2	N16334	Banjo fitting	125M-6/4S-M5N
12	1	N16954	Socket head pipe plug w/seal	1/8" BSPP, DIN 908 -steel
13	2	N16394	Socket head pipe plug w/seal	1/4" BSPP, DIN 908 -steel
14	1	CON-0061	Male connector w/seal	8mm S tube x 1/4" BSPPm
15	1	064498	Drain tap seat	For 073793
16	1	073793	Condensate drain tap	Complete
17	1	063666	Male connector w/seal	6mm S tube x 1/4" BSPPm
18	1	N16554	O-ring	Ø6x1.5 Viton, 90 Duro
19	1	066112	Pressure pin assembly	Complete
20	1	057735	Valve piston	For 058037
21	2	N04602	Fitting gasket	U14x18.7x1.5
22	1	057741	Pressure maintaining valve seat	For 058037
23	1	058037	Pressure maintaining valve	Complete, ¼" BSPPf
24	1	ADP-0021	Adapter	1/4" ISOm x 1/4" NPTf
25	1	057937	PMV cover	For 058037
26	4	SCR-0177	Socket head cap screw	M6x60mm lg, DIN 912

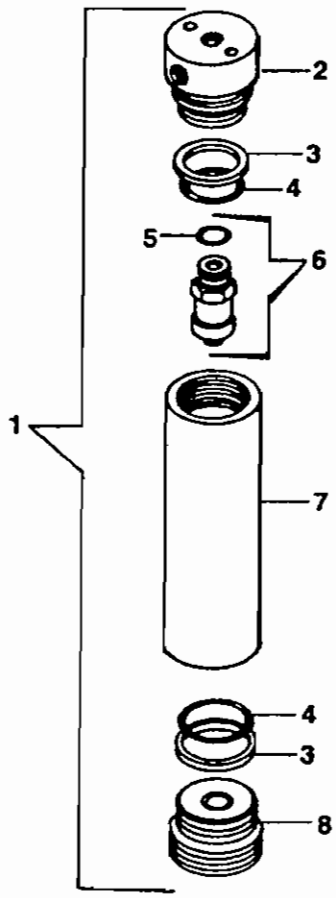
1. not sold separately
2. specify final pressure on order


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41

Purification system (continued)

P0 w/**TRIPLEX®**

Item	Qty	Part no.	Description	Notes
27	1	062211	Filter housing w/PMV	Complete
28	4	N16591	O-ring	∅5x1.5 Viton, 90 Duro
29	1	VAL-0176	Check valve	1/4"NPTm in x 1/4"NPTf out
30	1	057935	Adjustment screw	For 05803
31	1	026236	Compression spring	Cylindrical
32	1	057762	Spring seat	For 058037
33	1	057997	Valve body	For 058037
34	1	058165	U-bolt	M8
35	1	058159	Separator mount	KU-FH/KC-FH/KM-FH
36	2	N02862	Flat washer	8mm, DIN 7349
37	2	N00084	Dome nut	8mm, DIN 1587
38	1	067458	Tool set	For 065500
39	1	N04465	Slotted set screw	M4x10mm, DIN 553
40	1	N03837	Hex lock nut	M4, DIN 985
41	2	057904	Nozzle	For 057997

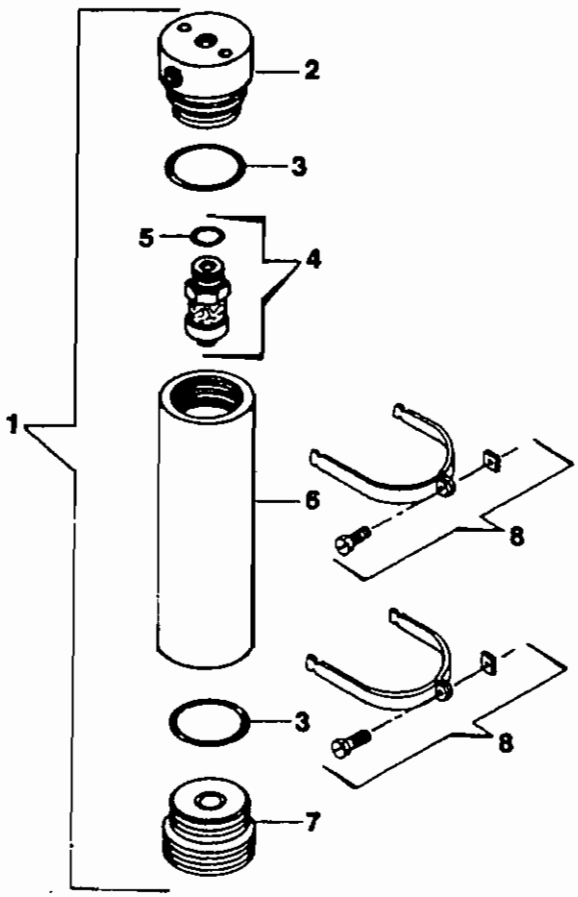

2
3
4
5
6
1
7
4
3
8

Oil and water separator[1]

5000 psi

Item	Qty	Part no.	Description	Notes
1	1	090050	Oil and water separator	5000 psi
2	1	----	Separator head[2]	9/16" -18 UNF female
3	2	N04736	Back-up ring	Ø63.96x1.52, Buna-N, 90 Duro
4	2	N04735	O-ring	Ø62.87x5.33 Viton, 75 Duro
5	1	N15133	O-ring	Ø28.24x2.62, Buna-N, 70 Duro.
6	1	061860	Micro-filter element	Coalescing
7	1	----	Separator housing[2]	100mm OD x 73mm ID
8	1	----	Bottom plug[2]	¼" BSPPf
9	2	CMP-0004	Unistrut clamp	3½" pipe, 4" tube

1. optional accessory
2. not sold separately

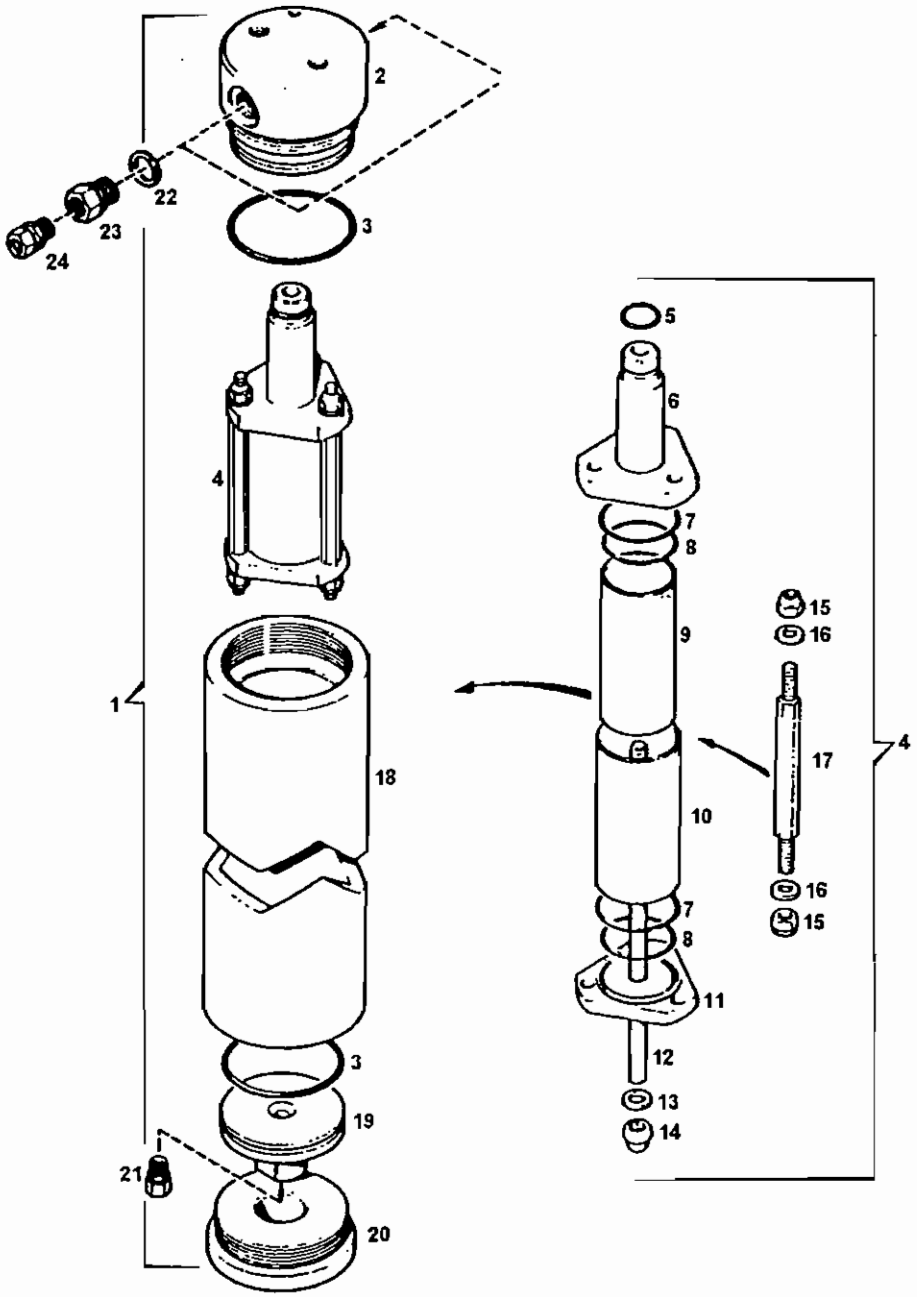

1
2
3
4
5
6
7
8
3
8

Oil and water separator

6000 psi

Item	Qty	Part no.	Description	Notes
1	1	090150	Oil and water separator	6000 psi
2	1	----	Separator head[1]	9/16" -18 UNF female
3	2	N04586	O-ring	Ø59.92x3.53 Viton, 90 Duro.
4	1	061860	Micro-filter element	Coalescing
5	1	N15133	O-ring	Ø28.24x2.62 Buna-N, 70 Duro.
6	1	----	Separator housing[1]	95mm OD x 85mm ID
7	1	----	Bottom plug	¼" BSPPf
8	2	CMP-0067	Unistrut clamp	3¾" OD tube

1. not sold separately

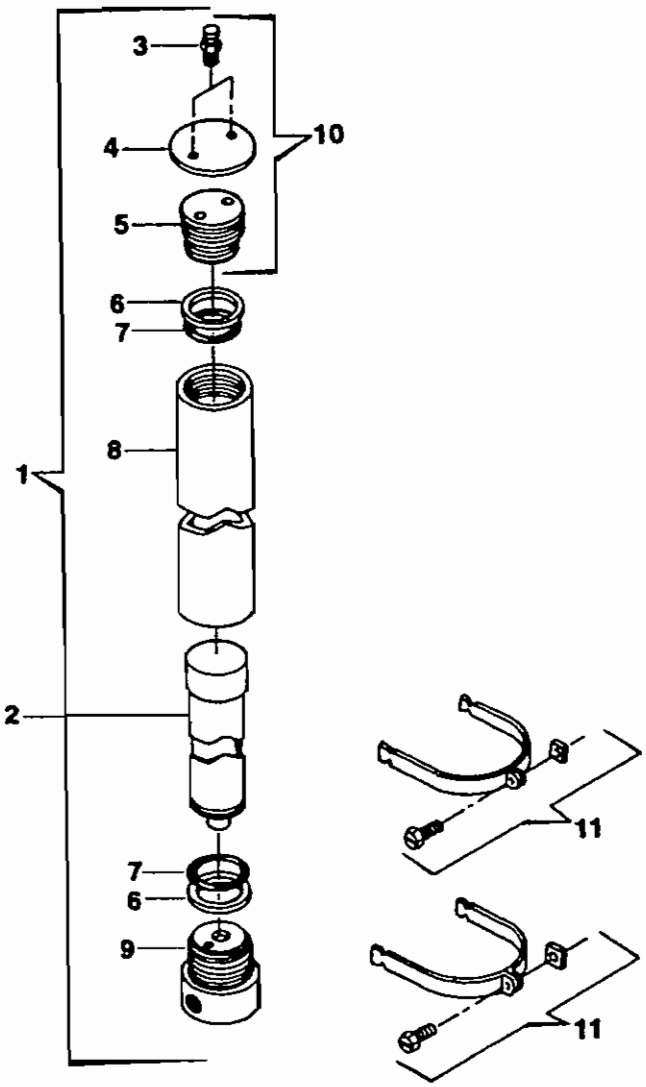

2
22
23
24
3
4
5
6
7
8
9
15
16
17
1
18
10
16
15
7
8
11
3
12
19
13
14
21
20

Oil and water separator

coalescing (high-flow type)

Item	Qty	Part no.	Description	Notes
1	1	055719	Oil and water separator assembly	Coalescing (high-flow type)
2	1	----	Separator head[1]	For 055719
3	2	N02894	O-ring	Ø85.32x3.63, Buna-N, 90 Duro.
4	1	061839	Micro-filter element	Complete, dual insert
5	1	N03860	O-ring	Ø25.12x1.78 Viton, 75 Duro.
6	1	061830	Filter element top end	For 061839
7	2	N15541	O-ring	Ø47.29x2.62 Viton, 75 Duro.
8	2	N15540	O-ring	Ø37.77x2.62 Viton, 75 Duro.
9	1	061836	Sintered metal insert	Coalescing
10	1	061837	Sintered metal insert	Coalescing
11	1	061831	Filter element bottom end	For 061839
12	1	061832	Threaded rod	M8
13	1	N15542	Fitting gasket	U9.3x13.3x1
14	1	N00084	Dome nut	M8, DIN 1587
15	6	NUT-0118	Hex locknut	M6, DIN 985-plated
16	6	WAS-0024	Flat washer	6mm, DIN 125-steel
17	3	061833	Hex shaft spindle	M6
18	1	----	Separator housing[1]	For 055719
19	1	----	Separator bottom plate[1]	For 055719
20	1		Separator bottom plug[1]	For 055719
21	1	CON-0040	Male connector	6mm S tube x ¼" BSPPm
22	2	N04616	Fitting gasket	U21.5x28.7x2.5
23	2	ADP-0022	Adapter	1/2" ISOm x 1/2" NPTf
24	1	CON-0142	Male connector	12mm S tube x 1/2" NPTm

1. item not sold separately

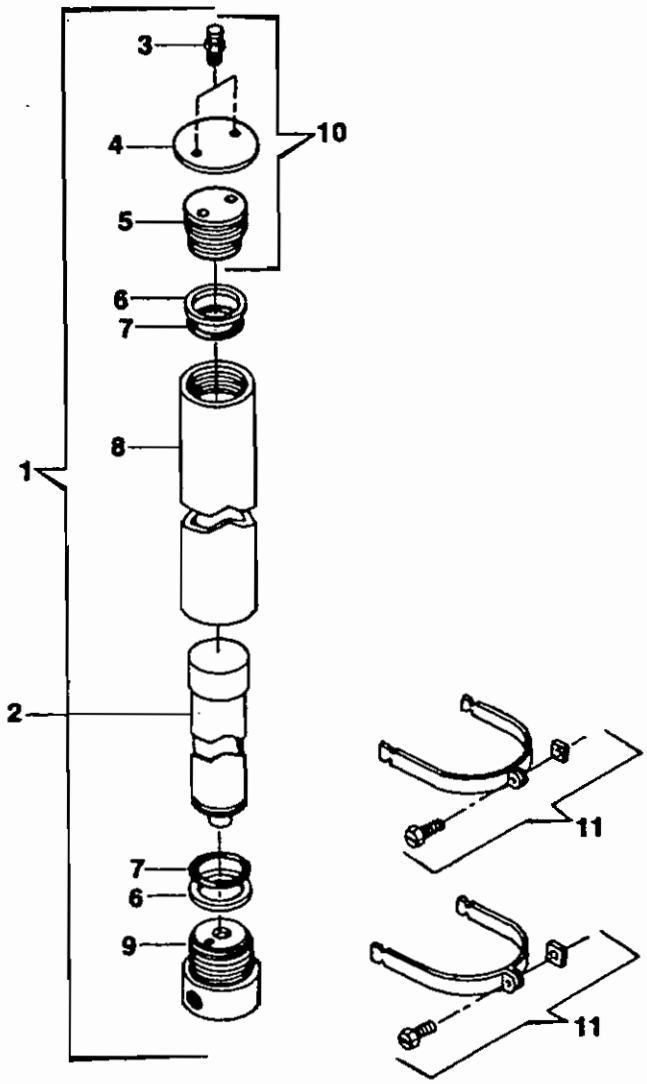

3
4
10
5
6
7
8
1
2
7
6
9
11
11

Purifier/dryer assembly

P1 through P10, 5000 psi

Item	Qty	Part no.	Description	Notes
			P1 and P4	
1	1	058813	Purifier assembly w/o element	P1 and P4, 10", 5000 psi
2	1	058821	Purifier element	MS/AC/HP, 10"
	1	058819	Dryer element	MS.10"
3	2	012293	Tool post screw	M10
4	1	061237	Cover plate	5000 psi purifiers
5	1	-------	Filter head[1]	
6	2	N04736	Back-up ring	Ø63.76x1.52, Buna-N, 90 Duro
7	2	N04735	O-ring	Ø62.87x5.33 Viton, 90 Duro
8	1	----	Filter housing[1]	
9	1	----	Filter bottom[1]	
10	1	061231	Filter head assembly	Complete
11	2	CMP-0004	Unistrut clamp	3½" pipe, 4" tube
N.S.		N04731	O-ring	Ø12.37x2.62 Viton, 75 Duro.
N.S.		N04566	O-ring	Ø9.19x2.62 Viton, 75 Duro.
			P2, P5 and P10	
1	1	058814	Purifier chamber assembly	27", 5000 psi
2	1	058827	Purifier element	MS/AC/MS/HP, 27"
	1	058825	Dryer element	MS.10"
3	2	012293	Tool post screw	M10
4	1	061237	Cover plate	5000 psi purifiers
5	1	----	Filter head[1]	
6	2	N04736	Back-up ring	Ø63.96x1.52, Buna-N, 90 Duro
7	2	N04735	O-ring	Ø62.87x5.33 Viton, 90 Duro
8	1	----	Filter housing[1]	
9	1	----	Bottom plug[1]	
10	1	061231	Filter head assembly	Complete
11	2	CMP-0004	Unistrut clamp	3½" pipe, 4" tube

1. not sold separately

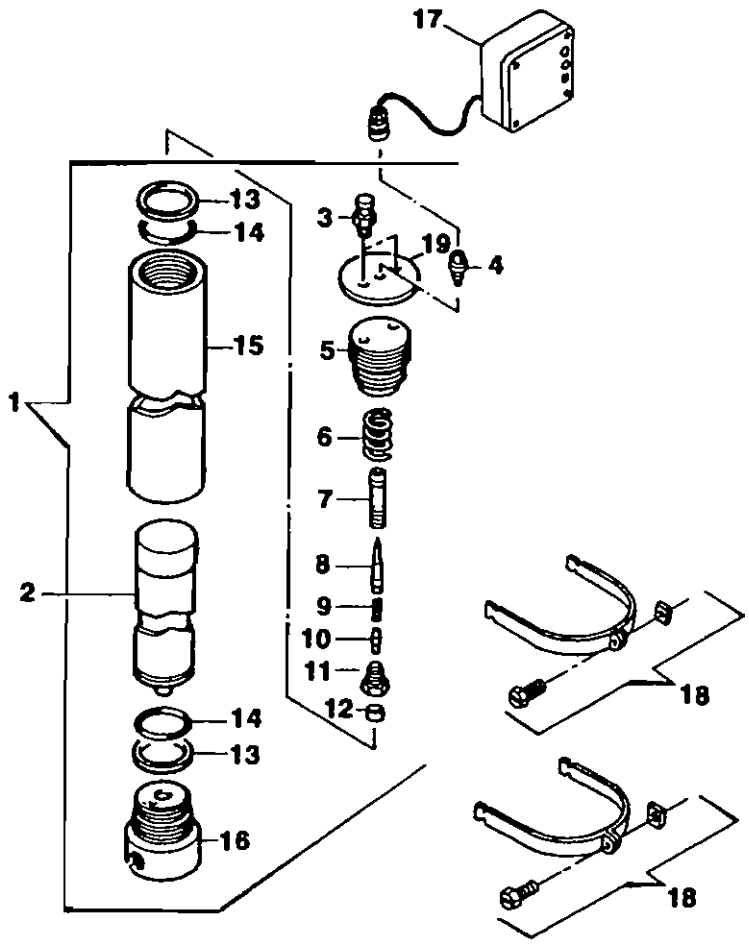

3
4
10
5
6
7
8
1
2
7
6
9
11
11

Purifier/dryer assembly

P1 through P10, 6000 psi

Item	Qty	Part no.	Description	Notes
			P1 and P4	
1	1	065481	Purifier assembly w/o element	P1 and P4, 10", 6000 psi
2	1	058821	Purifier element	MS/AC/HP, 10"
	1	058819	Dryer element	MS.10"
3	2	012293	Tool post screw	M10
4	1	065490	Cover plate	6000 psi purifiers
5	1	--------	Filter head[1]	
6	2	N04736	Back-up ring	Ø63.76x1.52, Buna-N, 90 Duro
7	2	N04735	O-ring	Ø62.87x5.33 Viton, 90 Duro
8	1	----	Filter housing[1]	
9	1	----	Filter bottom[1]	
10	1	----	Filter head assembly[1]	
11	2	CMP-0039	Unistrut clamp	4" pipe, 4½" tube
N.S.		N04731	O-ring	Ø12.37x2.62 Viton, 75 Duro.
N.S.		N04566	O-ring	Ø9.19x2.62 Viton, 75 Duro.
			P2, P5 and P10	
1	1	065485	Purifier chamber assembly	27", 6000 psi
2	1	058827	Purifier element	MS/AC/MS/HP, 27"
	1	058825	Dryer element	MS, 27"
3	2	012293	Tool post screw	M10
4	1	065490	Cover plate	6000 psi purifiers
5	1	----	Filter head[1]	
6	2	N04736	Back-up ring	Ø63.96x1.52, Buna-N, 90 Duro
7	2	N04735	O-ring	Ø62.87x5.33 Viton, 90 Duro.
8	1	----	Filter housing[1]	
9	1	----	Bottom plug[1]	
10	1	----	Filter head assembly[1]	
11	2	CMP-0039	Unistrut clamp	4" pipe, 4½" tube

1. not sold separately

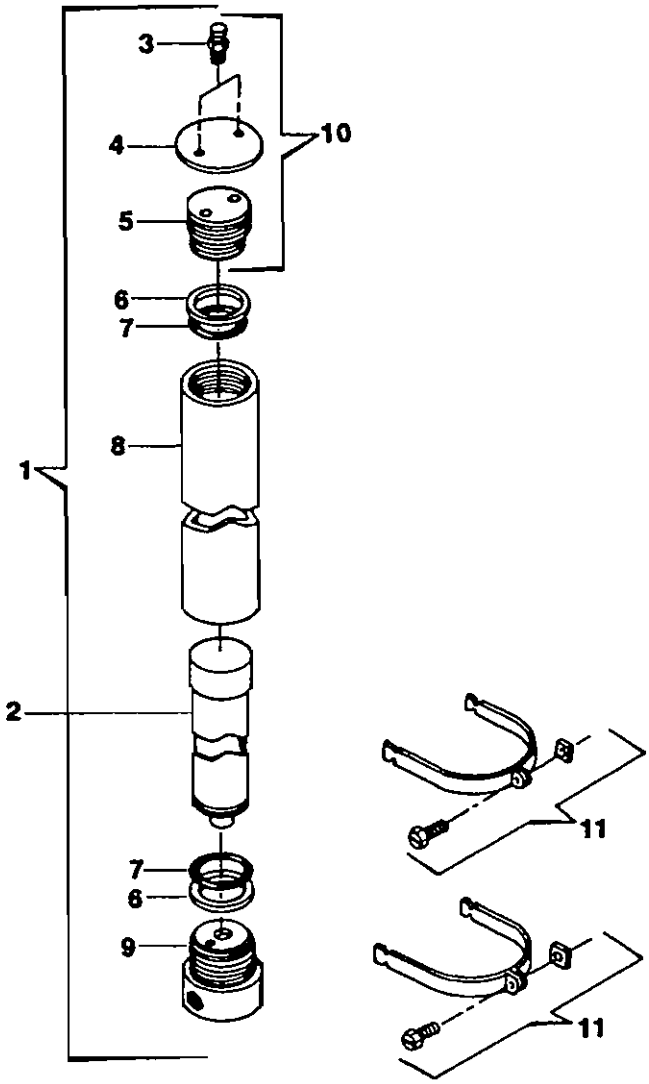

17
13
14
3
19
4
15
5
1
6
7
8
2
9
10
11
12
14
13
16
18
18

SECURUS® assembly

P2, P5 and P10, 5000 psi

Item	Qty	Part no.	Description	Notes
1	1	060082	SECURUS® chamber assembly	27", 5000 psi
2	1	060037	Filter element, SECURUS®	MS/AC/MS/SC/HP, 27"
3	2	012293	Tool post screw	M10
4	1	059850	Socket	RF type
5	1	----	Filter head[1]	
6	1	002181	Compression spring	Cylindrical
7	1	059851	Bolt	
8	1	059853	Fixed pin	
9	1	060062	Compression spring	Cylindrical
10	1	059854	Loose pin	
11	1	059852	Drawback screw	
12	1	059855	Nut	
13	2	N04736	Back-up ring	Ø63.96x1.52, Buna-N, 90 Duro
14	2	N04735	O-ring	Ø62.87x5.33 Viton, 90 Duro
15	1	----	Filter housing[1]	
16	1	----	Bottom plug[1]	
17	1	N15095	SECURUS® indicator	110-127 VAC, 50/60 Hz
	1	N15096	SECURUS® indicator	12-24 VDC, GS
18	2	CMP-0004	Unistrut clamp	3 1/2" pipe, 4" tube
19	1	060135	Cover plate	For 5000 psi SECURUS®

1. not sold separately

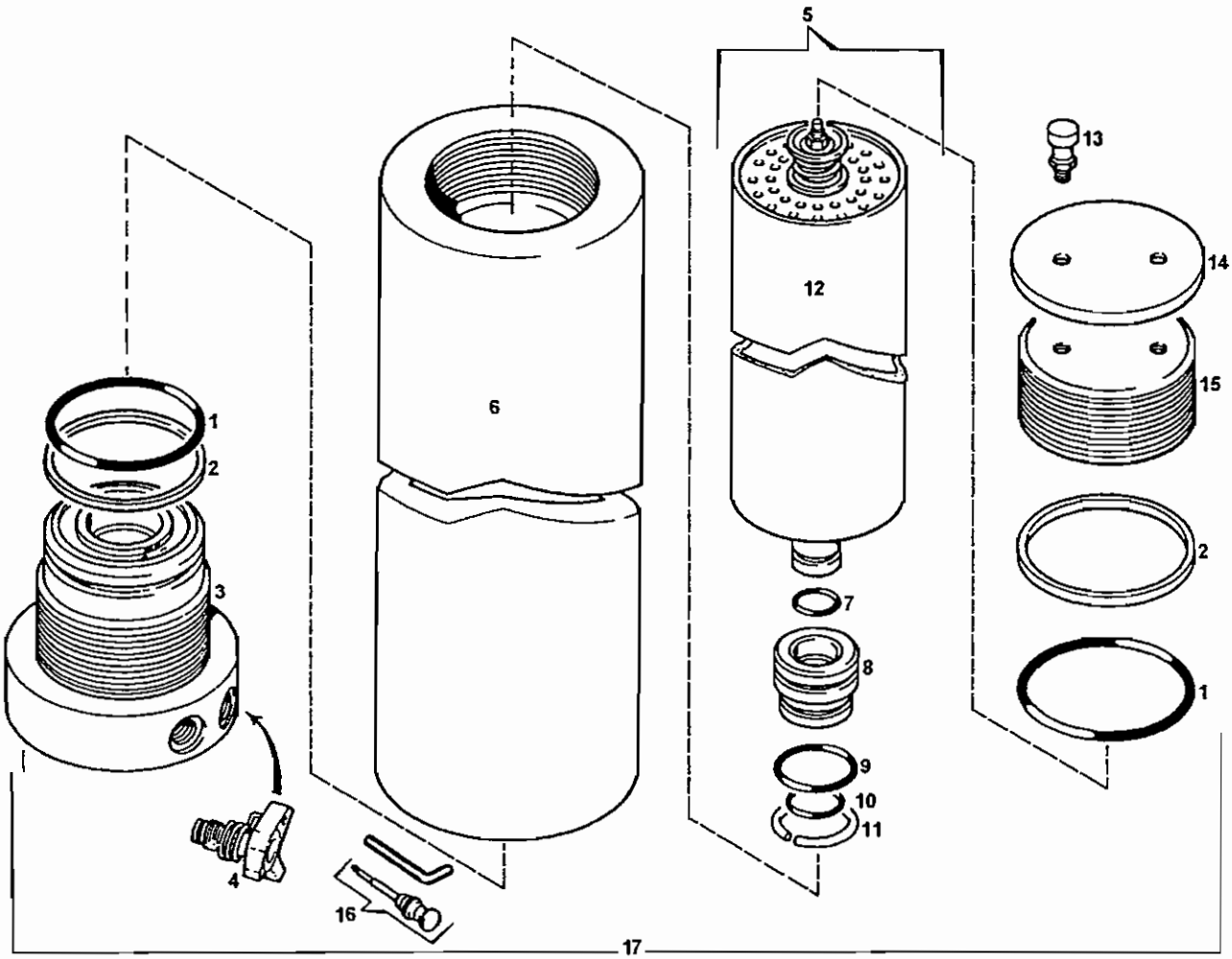

3
4
10
5
6
7
8
1
2
7
6
9
11
11

SECURUS® assembly

P4, P5 and P10, 6000 psi

Item	Qty	Part no.	Description	Notes
1	1	060082	SECURUS® chamber assembly	27", 6000 psi
2	1	060037	Filter element, SECURUS®	MS/AC/MS/SC/HP, 27"
3	2	012293	Tool post screw	M10
4	1	059850	Socket	RF type
5	1	----	Filter head[1]	
6	1	002181	Compression spring	Cylindrical
7	1	059851	Bolt	
8	1	059853	Fixed pin	
9	1	060062	Compression spring	Cylindrical
10	1	059854	Loose pin	
11	1	059852	Drawback screw	
12	1	059855	Nut	
13	2	N04736	Back-up ring	Ø63.96x1.52, Buna-N, 90 Duro
14	2	N04735	O-ring	Ø62.87x5.33 Viton, 90 Duro
15	1	----	Filter housing[1]	
16	1	----	Bottom plug[1]	
17	1	N15095	SECURUS® indicator	110-127 VAC, 50/60 Hz
	1	N15096	SECURUS® indicator	12-24 VDC, GS
18	2	CMP-0039	Unistrut clamp	4" pipe, 4½" tube
19	1	065490	Cover plate	For 6000 psi chamber

1. not sold separately

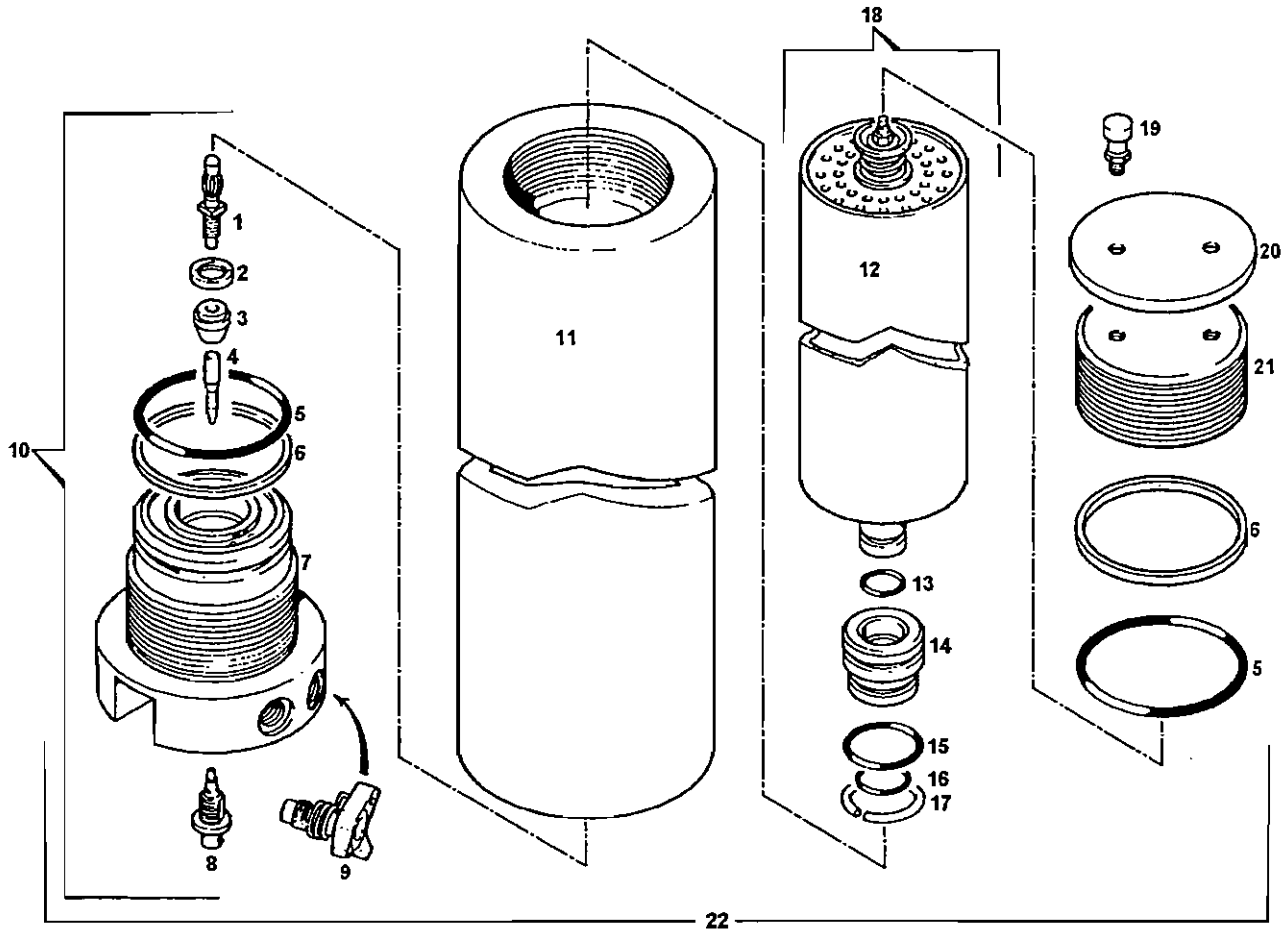

5
13
14
12
6
15
1
2
3
2
7
8
1
9
10
11
4
16
17

Dryer chamber

P12 and P14

Item	Qty	Part no.	Description	Notes
1	2	N17455	O-ring	∅123.19x5.33, Buna-N, 90 Duro.
2	2	N17456	Back-up ring	∅124.54x1.52, Buna-N, 90 Duro
3	1	-----	Bottom plug[1]	For high-flow purifiers
4	1	073793	Bleed valve	With valve seat P/N: 064498
5	1	067099	Dryer cartridge	MS/AC, high-flow, 27"
6	1	-----	Filter housing[1]	High-flow type
7	1	N15205	O-ring	∅40.87x3.53, Buna-N, 90 Duro.
8	1	067070	Sealing cuff	For purification cartridges
9	1	N17454	O-ring	∅53.57x3.53, Buna-N, 90 Duro.
10	1	N17453	O-ring	∅47.22x3.53, Buna-N, 90 Duro.
11	1	N17457	Retaining ring	A40, DIN 7993
12	1	----	Cartridge casing[1]	Without filter compounds
13	1	012293	Tool post screw	M10
14	1	----	Cover plate[1]	For filter head
15	1	057065	Filter head	For purifiers, high-flow type
16	1	067458	Tool kit	For 065500
17	1	067105	Purifier chamber[2]	High-flow 27", complete

1. not sold separately
2. cartridge not included

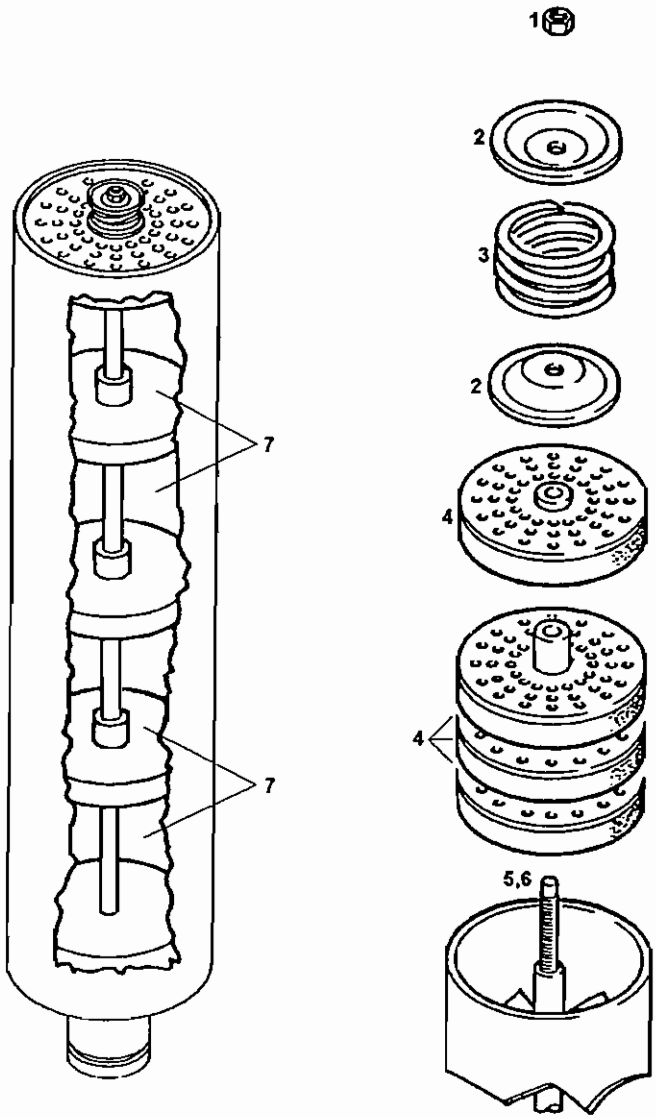

18
19
1
2
3
4
5
6
7
10
11
12
20
21
6
13
14
5
15
16
17
8
9
22

SECURUS® chamber

P12 and P14

Item	Qty	Part no.	Description	Notes
1	1	N17458	Finned plug	Type SA 401
2	1	067088	Round nut	For SECURUS® chamber
3	1	067072	Packing sleeve	For SECURUS® chamber
4	1	067093	Tapered pin	For SECURUS® chamber
5	2	N17455	O-ring	Ø123.19x5.33, Buna-N, 90 Duro.
6	2	N17456	Back-up ring	Ø124.54x1.52, Buna-N, 90 Duro
7	1	----	Filter bottom plug[1]	For SECURUS® chamber
8	1	059850	Socket	RF type
9	1	073793	Drain tap	Complete
10	1	----	Filter bottom plug assembly[1]	Complete
11	1	----	Filter housing[1]	5000 psi, 27"
12	1	----	Filter cartridge casing[1]	Without filtering compounds
13	1	N15205	O-ring	Ø40.87x3.53, Buna-N, 90 Duro.
14	1	067070	Sealing cuff	For purification cartridges
15	1	N17454	O-ring	Ø53.57x3.53, Buna-N, 90 Duro.
16	1	N17453	O-ring	Ø47.22x3.53, Buna-N, 90 Duro.
17	1	N17457	Retaining ring	A40, DIN 7993
18	1	067097	SECURUS® cartridge	MS/AC/MS, High-flow, 27"
19	2	012293	Tool post screw	M10
20	1	----	Cover plate[1]	For filter head, high-flow
21	1	----	Filter head[1]	For high-flow type
22	1	067106	SECURUS® chamber	Complete, high-flow, 27"

1. not sold separately

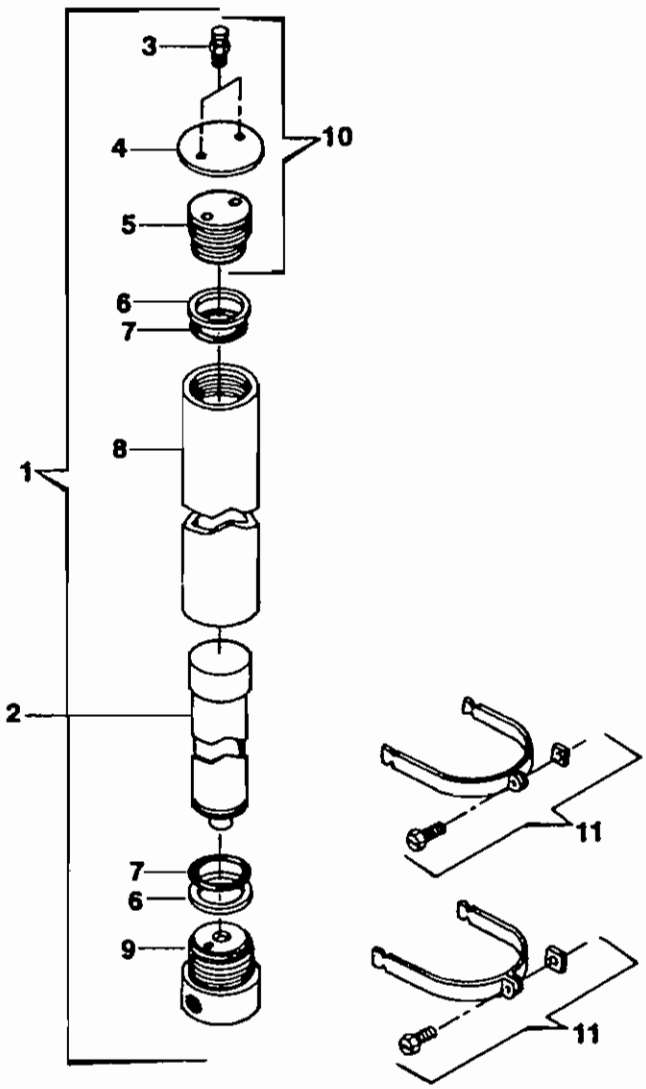

1
2
3
2
4
4
5,6
7
7

Dryer cartridges

P12 and P14

Item	Qty	Part no.	Description	Notes
1	1	NUT-0033	Hex nut	12mm, DIN 934-plain
2	2	067082	Spring pad	For 067098
3	1	067098	Compression spring	Cylindrical
4	4	067117	Baffle plate	For purifier cartridges
5	1	067100	Threaded rod	For MS cartridge
6	1	067077	Threaded rod	For MS/AC cartridge
7	4	----	Molecular sieve and/or Activated Carbon[1]	Cartridge contents

1. This cartridge may be repacked by a qualified factory trained technician (contact BAUER Compressors, Inc. for details) or sent back to the factory for repacking.


3
4
10
5
6
7
8
1
2
7
6
9
11
11

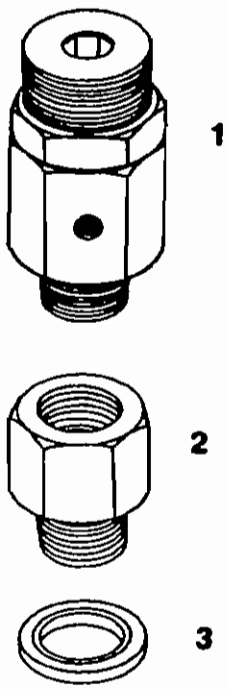
CO removal chamber

P12 and P14

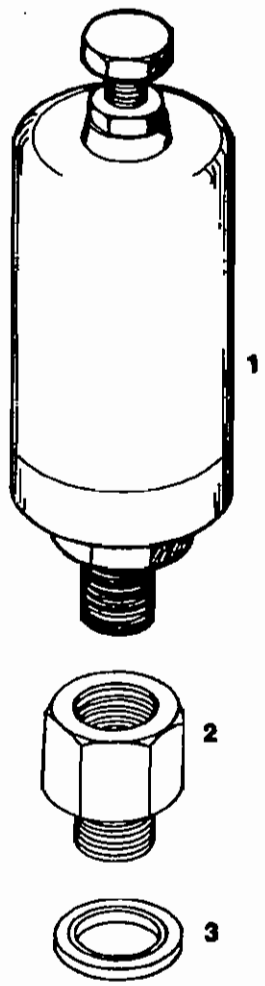
Item	Qty	Part no.	Description	Notes
1	1	061082	CO removal chamber	Complete
2	1	065562	CO removal cartridge	HP, high-flow
3	2	012293	Tool post screw	M10
4	1	061237	Cover plate	For filter head
5	1	----	Filter head[1]	For 061082
6	2	N04736	Back-up ring	Ø63.96X1.52, Buna-N, 90 Duro
7	2	N04735	O-ring	Ø62.87x5.33 Viton, 90 Duro
8	1	----	Filter housing[1]	For 061082
9	1	----	Filter bottom[1]	For 061082
10	1	----	Filter head assembly[1]	Complete
11	2	CMP-0004	Unistrut clamp	3½" pipe, 4" tube

1. not sold separately

300 to 6000 psi



6500 psi



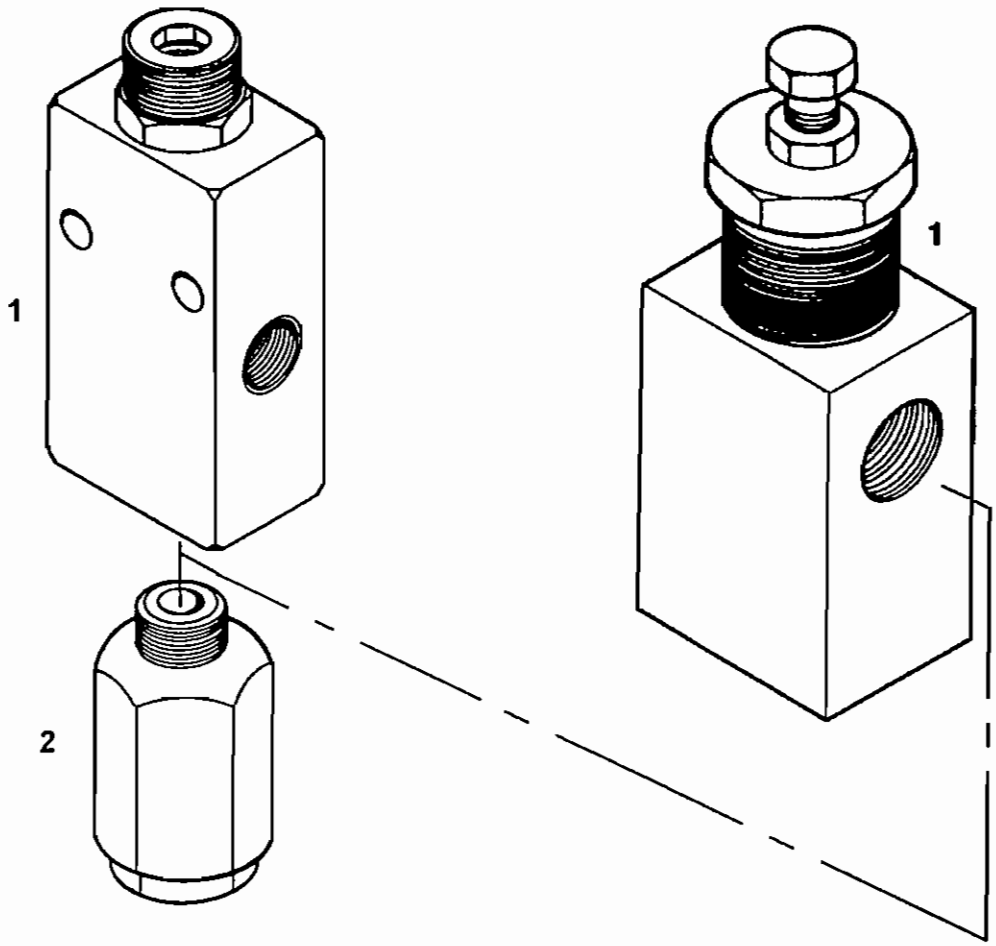
Safety valves

300 to 6500 psi

Item	Qty	Part no.	Description	Notes
			300 to 6000 psi	
1	1	VAL-0169	Safety valve	300 to 6000 psi, ¼" NPTm
2	1	ADP-0020	Adapter	3/8" ISOm x ¼" NPTf
3	1	N04499	Fitting gasket	Ø16.7x24x1.5-U
			6500 psi	
1	1	VAL-0154	Safety valve	6500 psi, ¼" NPTm
2	1	ADP-0020	Adapter	3/8" ISOm x ¼" NPTf
3	1	N04499	Fitting gasket	Ø16.7x24x1.5-U

2 to 50 SCFM

50 to 300 SCFM



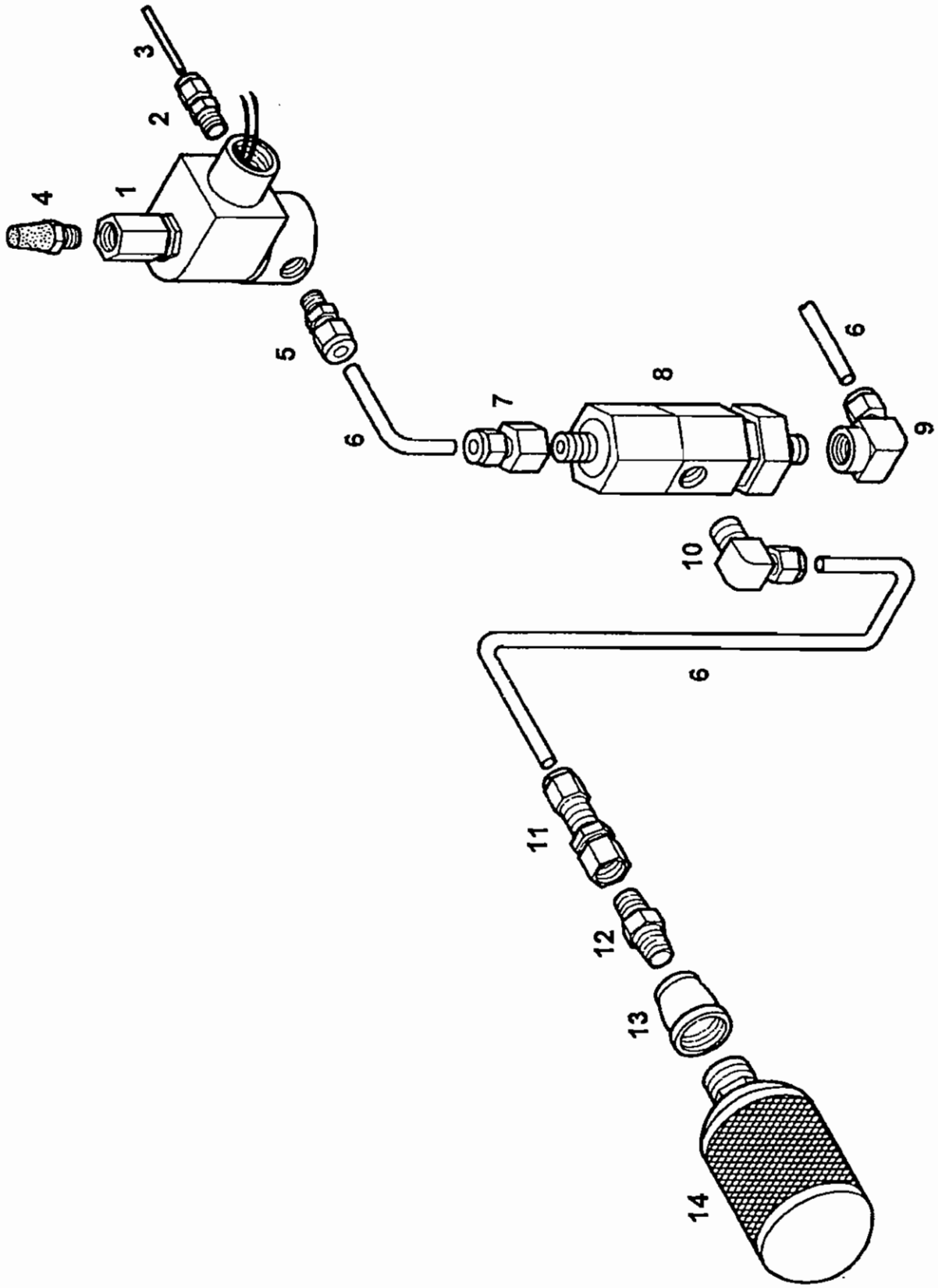
Pressure maintaining valve

2 to 300 SCFM

Item	Qty	Part no.	Description	Notes
			2 to 50 SCFM	
1	1	VAL-0053	Pressure maintaining valve	2 to 50 SCFM, ¼" NPTf
2	1	VAL-0007	Check valve	¼" NPTf in x ¼" NPTm out
			50 to 300 SCFM	
1	1	VAL-0142	Pressure maintaining valve	50 to 300 SCFM, ½" NPTf, 6000 psi
2	1	VAL-0174	Check valve	½" NPTm in x ½" NPTf out

Constant speed unloader device; for units w/3-position switch

BAUER COMPRESSORS

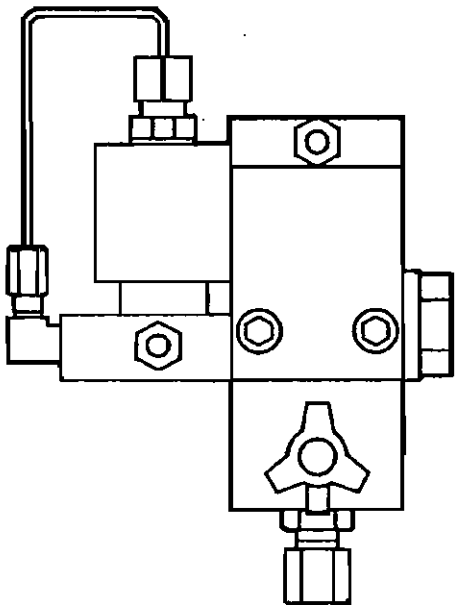


Constant speed unloader device

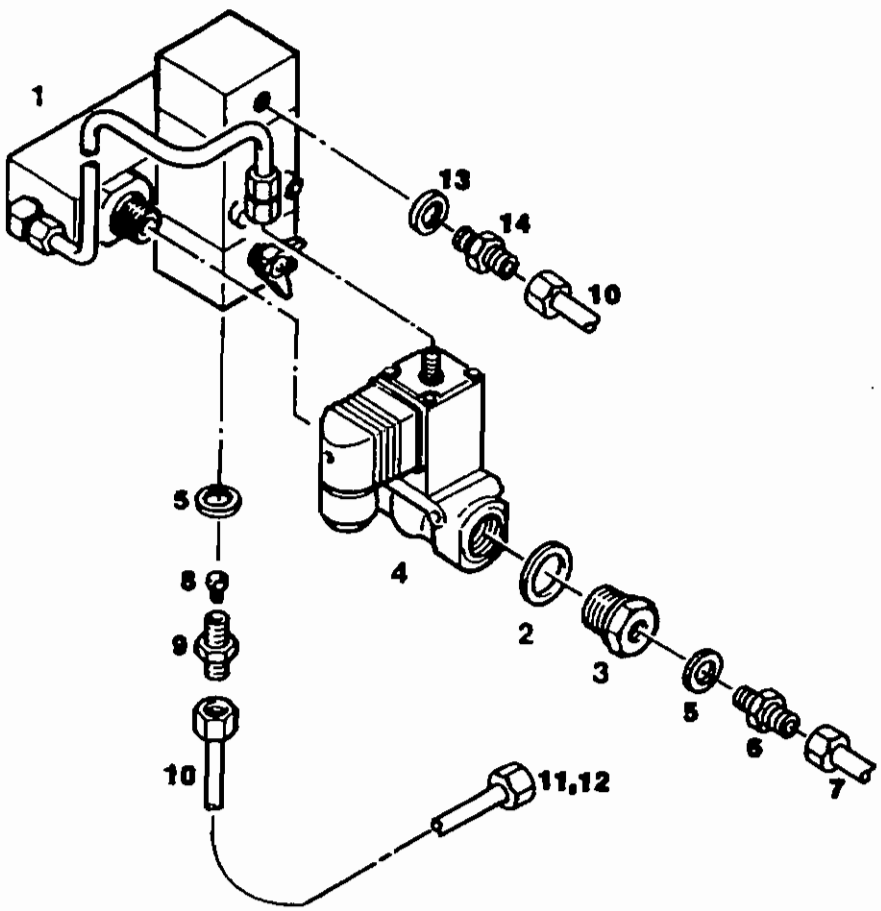
for units w/3-position switch

Item	Qty	Part no.	Description	Notes
1	1	VAL-0276	Solenoid valve	3-way, NC, 120 V AC, ¼" NPTf, water-tight
	1	VAL-0209	Solenoid valve	3-way, NC, 12 V DC, ¼" NPTf, water-tight
	1	VAL-0282	Solenoid valve	3-way, NC, 24 V DC, ¼" NPTf, water-tight
2	1	CON-0035	Male connector	1/8" tube x ¼" NPTm
3	1	TUB-R-0009	Round tube[1]	1/8" OD x 0.035" Wall, 304SS
4	1	MUF-0006	Exhaust muffler	¼" NPTm, pneumatic
5	1	CON-0030	Male connector	¼" tube x ¼" NPTm
6	3	TUB-R-0011	Round tube[1]	¼" OD x 0.035" Wall, 304SS
7	1	CON-0032	Female connector	¼"tube x ¼" NPTf
8	1	VAL-0191	Air-operated valve	¼" NPT, NC, 6000 psi
9	1	ELL-0056	Female elbow	¼" tube x ¼" NPTf
10	1	ELL-0028	Male elbow	¼" tube x ¼" NPTm
11	1	CON-0033	Bulkhead connector	¼" tube x ¼" NPTf
12	1	CON-0017	Hex nipple connector	¼" NPTm
13	1	RED-0061	Coupling reducer	½" NPTf x ¼" NPTf, galvanized
14	1	N01139	Exhaust muffler	½" BSPPm, 1 bar

1. specify length



SECTION C
Automatic Condensate Drain

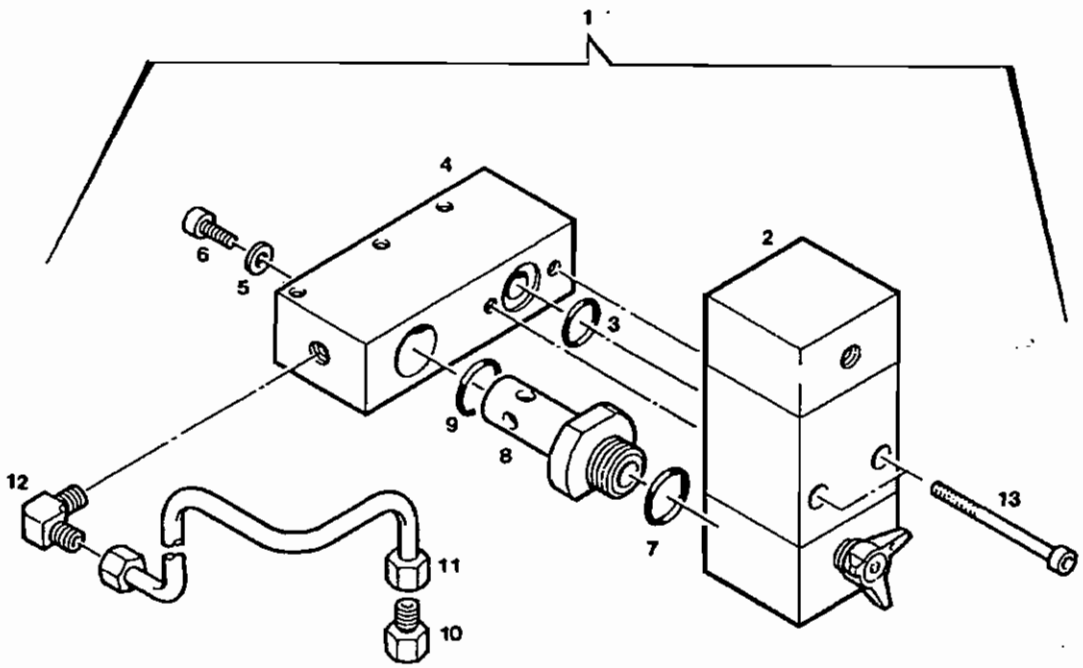

1
13
14
10
5
8
9
10
4
2
3
5
6
7
11,12

Automatic condensate drain valve assembly[1]

3-stage units

Item	Qty	Part no.	Description	Notes
1	1	063760	ACD valve and manifold assy.	3-stage units
2	1	N01028	Copper gasket	A21x26x1.5, DIN 7603
3	1	RED-0058	Bushing reducer	½" BSPPm x ¼" BSPPf
4	1	N16382	Solenoid valve	2-way, 115V, 50/60 Hz, ½" BSPPf
	1	N16270	Solenoid valve	2-way, 220V, 40/60 Hz, ½" BSPPf
	1	N16384	Solenoid valve	2-way, 240V, 50/60 Hz, ½" BSPPf
	1	N16381	Solenoid valve	2-way, 12 VDC, ½" BSPPf
	1	N16387	Solenoid valve	2-way, 24 VDC, GS, ½" BSPPf
	1	N18364	Solenoid valve	2-way, 24 VAC, ½" BSPPf
5	2	N01316	Copper gasket	A13x20x1.5, DIN 7603
6	1	CON-0061	Male connector	8mm S tube x ¼" BSPPm
7	1	TUB-R-0013	Round tube[2]	8mm OD x 1mm wall, 304SS
8	1	066550	Orifice fitting	∅0.8mm
9	1	070615	Male connector w/nozzle	6mm S tube x ¼" BSPPm
10	2	TUB-R-0010	Round tube[2]	6mm OD x 1mm wall, 304SS
11	1	NUT-0012	Tube nut	6mm S
12	1	FER-0002	Ferrule	6mm S, steel
13	1	GKT-0016	Copper gasket	1/8" BSP
14	1	CON-0143	Male connector	6mm L tube x 1/8" BSPPm

1. optional accessory
2. specify length on order

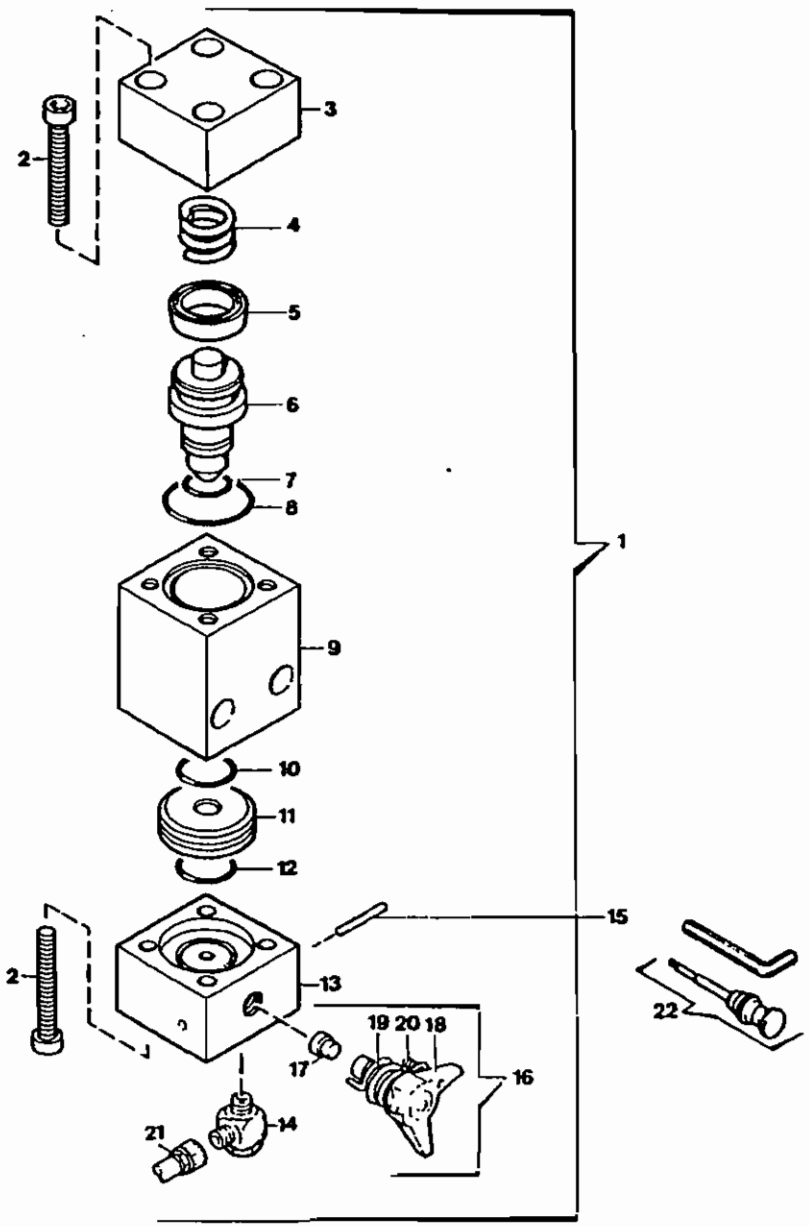

1
2
3
4
5
6
7
8
9
10
11
12
13

ACD valve and manifold assembly[1]

3-stage units

Item	Qty	Part no.	Description	Notes
1	1	063760	ACD valve and manifold assy.	3-stage units
2	1	064008	Automatic condensate drain valve assy.	Complete
3	1	N00638	O-ring	Ø11x2.5, Viton, 75 Duro
4	1	064006	Condensate manifold	3-stage units
5	2	N03625	Copper gasket	A8x14x1.5, DIN 7603
6	2	N00829	Socket head cap screw	M8x16mm lg, DIN 912
7	1	N02320	O-ring	Ø21.95x1.78, Viton, 75 Duro
8	1	064004	Valve connector	For ACD solenoid valve
9	1	N02507	O-ring	Ø18.77x1.78, Viton, 75 Duro
10	1	064010	Female connector	6mm LL tube x 1/8" BSPTf
11	1	TUB-R-0010	Round tube[2]	6mm OD x 1mm wall, 304SS
12	1	ELL-0117	Male elbow	6mm LL tube x 1/8" BSPTm
13	2	SCR-0133	Socket head cap screw	M6x40mm lg, DIN 912

1. optional accessory
2. specify length on order

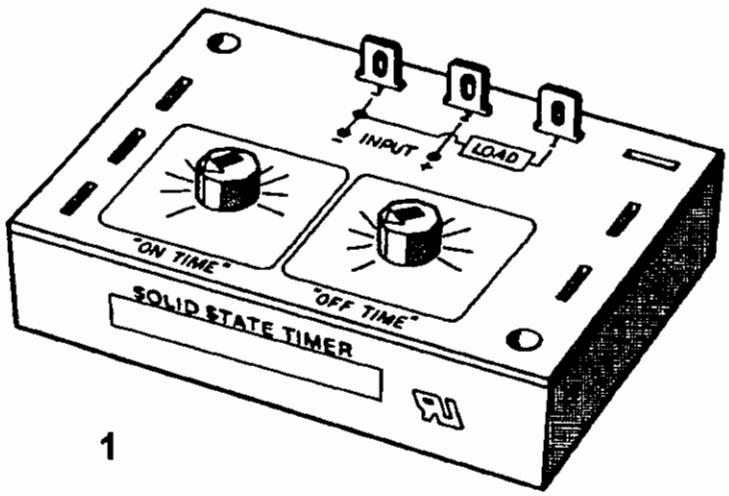

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22

Condensate drain valve[1]

Complete

Item	Qty	Part no.	Description	Notes
1	1	064008	Condensate drain valve	Complete
2	8	SCR-0150	Socket head cap screw	M6x30mm lg, DIN 912
3	1	064000	Top flange	For ACD valves
4	1	064011	Compression spring	Cylindrical
5	1	N16269	Seal ring	Ø25x17x5.5mm
6	1	064003	Valve piston	ACD
7	1	N00638	O-ring	Ø11x2.5, Viton, 75 Duro
8	1	N04881	O-ring	Ø25x2, Buna-N, 70 Duro
9	1	064001	Valve body	ACD
10	1	N02507	O-ring	Ø18.77x1.78, Viton, 75 Duro
11	1	064005	Valve seat	ACD
12	1	N04496	O-ring	Ø14x1.78, Viton, 75 Duro
13	1	064002	Base flange	ACD
14	1	N16334	Banjo fitting	125M-6/4S-M5N
15	1	N16438	Parallel pin[2]	Ø2x18, DIN 6325
16	1	065500	Drain tap assembly	Complete
17	1	064498	Drain tap seat	For 065500
18	1	011392	Petcock	For 065500
19	1	065310	Compression spring	For 065500
20	1	N16947	Socket set screw	M3x16mm lg, Niro, DIN 914
21	1	TUB-R-0038	Polyethylene tube[3]	4mm ID x 6mm OD
22	1	067458	Tool set	For 065500

1. optional accessory
2. Not used on all models
3. specify length on order



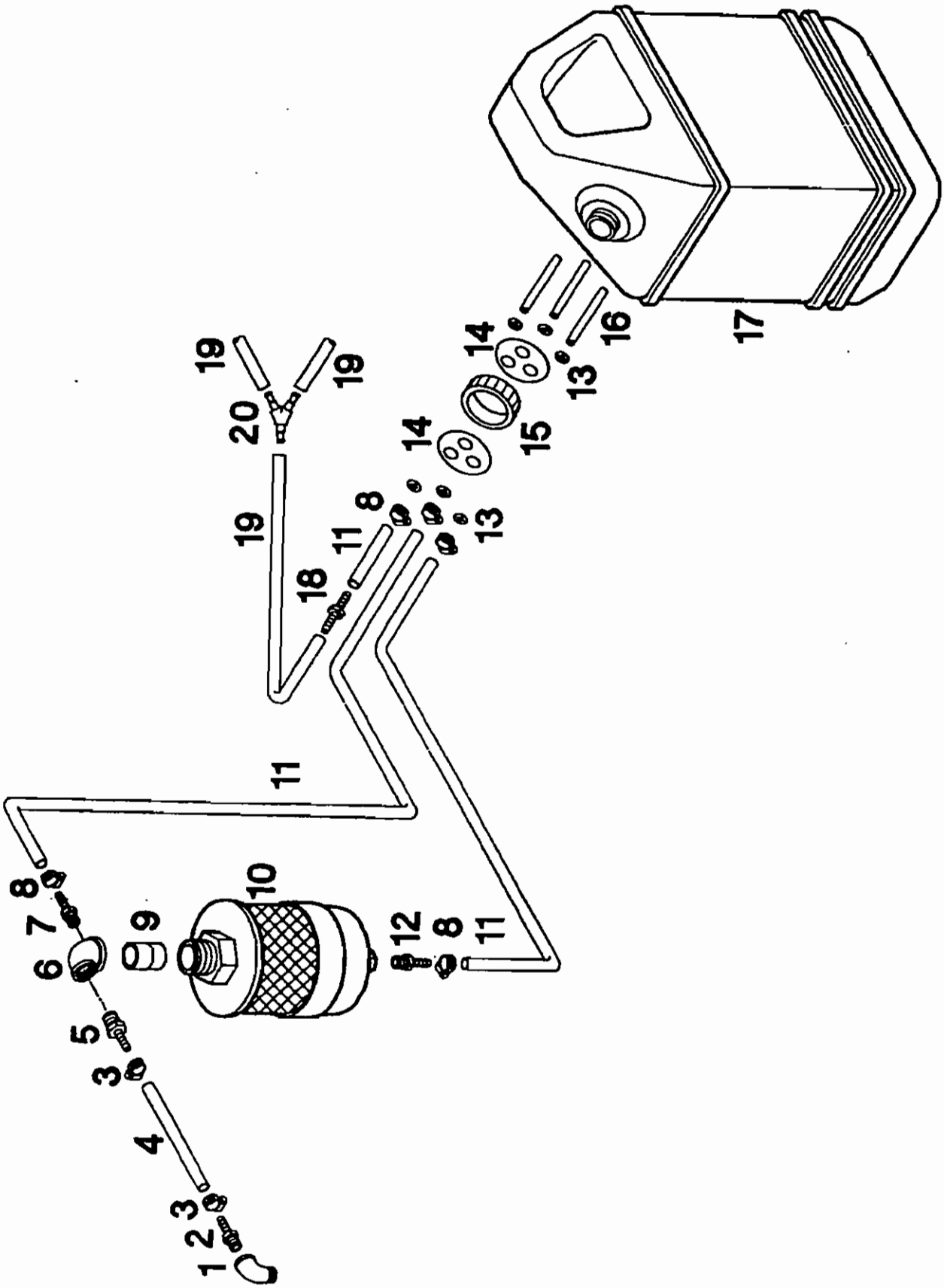
1

Electrical timer[1]

100 min. on x 10 sec. off

Item	Qty	Part no.	Description	Notes
1	1	TMR-0008	Solid state timer	100 min. on x 10 sec. off, 120V
2	1	TMR-0010	Solid state timer	100 min. on x 10 sec. off, 12V DC

1. optional accessory


17
16
13
14
15
14
13
8
11
18
19
19
20
19
11
8
12
10
9
6
7
8
5
3
4
3
2
1

Separator/collection system

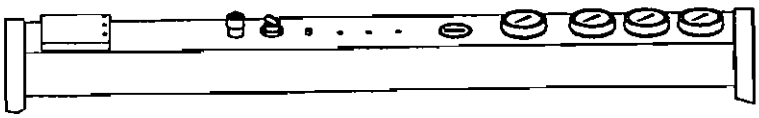
SEP-0016/ELL-0234

Item	Qty	Part no.	Description	Notes
1	1	ELL-0110	Street elbow	3/8" NPT, galvanized
2	1	FTG-0092	Hose barb fitting	3/8" NPTm x ½" Hose
3	2	CMP-0003	Worm gear hose clamp	Ø3/8" - 7/8"
4	1	HOS-R-0034	Oil hose[1]	½" ID, 200 psi
5	1	FTG-0093	Hose barb fitting	¾" NPTm x ½" hose
6	1	ELL-0234	Reducing elbow with port	¾" NPTf x 1" NPTf x 1/8" NPTf
7	1	FTG-0098	Hose barb fitting	1/8" NPTm x 5/16" hose
8	5	CMP-0007	Worm gear hose clamp	Ø7/32" - 5/8"
9	1	TUB-0338	Insert tube	PVC pipe
10	1	SEP-0016	Silencer/separator w/mounting bracket	1" NPTm in x ¼" NPTf out
11	3	TUB-R-0033	Flexible tube[1]	5/16" ID x 7/16" OD, PVC
12	1	FTG-0050	Hose barb fitting	¼" NPTm x 5/16" hose
13	6	NUT-0046	Push nut	Ø5/16"
14	2	WAS-0073	Flat washer	Ø2" w/holes, for CNS-0004
	2	WAS-0078	Flat washer	Ø1½" w/holes, for CNS-0005
15	1	CAP-0047	Bottle cap	For CNS-0004
	1	CAP-0048	Bottle cap	For CNS-0005
16	3	TUB-0294	ACD cap tube	8mm OD x 2" lg., 304SS
17	1	CNS-0004	Condensate collector	3 gallon cap.
	1	CNS-0005	Condensate collector	1 gallon cap.
18	1	FTG-0085	Hose barb reducer [2]	Ø1/8" x 5/16"
19	3	TUB-R-0038	Flexible tube[1,2]	4mm ID x 6mm OD, Polyethylene
20	1	CON-0149	Hose barb "Y" connector[2]	4mm hose

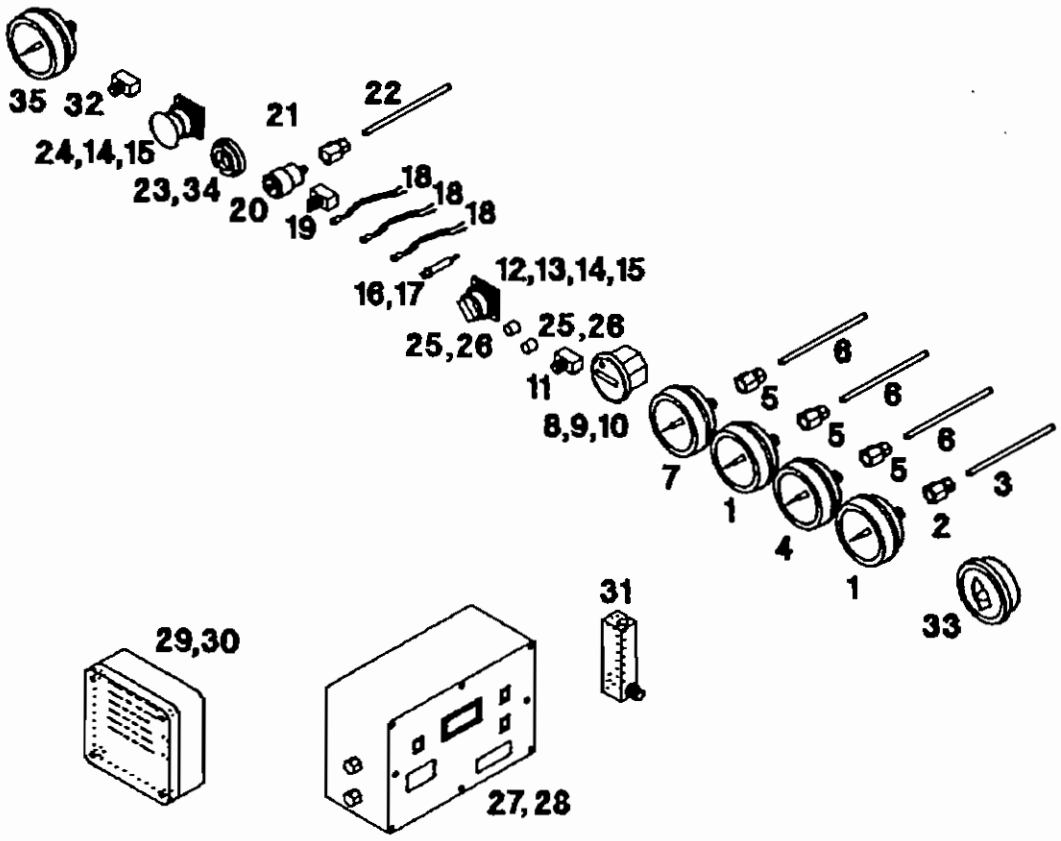
1. specify length
2. not supplied on all models

SECTION D

Instrument panel



Assembly **Page**

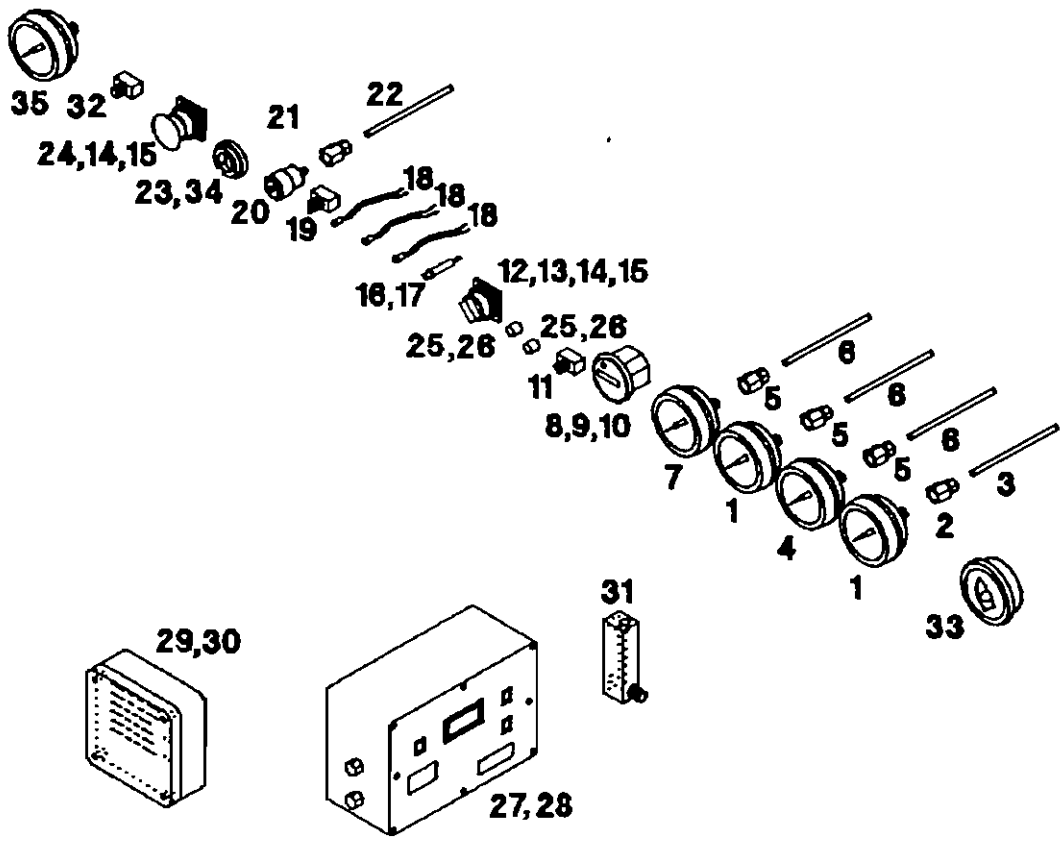

35
32
24,14,15
23,34
21
20
19
22
18
18
18
16,17
12,13,14,15
25,26
25,26
11
8,9,10
7
1
4
1
5
5
5
6
6
6
3
2
33
31
29,30
27,28

Instrument panel[1]

3-stage horizontal units

Item	Qty	Part no.	Description	Notes
1	2	GAG--0008S	Pressure gauge[1]	0-1500psi, 2½", ¼"NPTm, UC
2	1	CON-0211	Female connector[1]	6mm tube x ¼" NPTf
3	1	TUB-R-0010	Round tube[1,2]	6mm OD x 1mm wall, 304SS
4	1	GAG-0006S	Pressure gauge[1]	0-200psi, 2½", ¼" NPTm, UC
5	3	CON-0019	Female connector[1]	1/8" tube x ¼" NPTf
6	3	TUB-R-0009	Round tube[1,2]	1/8" OD x .035" wall, 304SS
7	1	GAG-0009S	Pressure gauge[1]	0-7500psi, 2½",¼" NPTm, UC
8	1	HMR-0005	Hourmeter[1]	12V DC
9	1	HMR-0006	Hourmeter[1]	Vibration type
10	1	HMR-0021	Hourmeter[1]	110V AC
11	1	SWT-0109	Off/on toggle switch[1]	DPDT
12	1	SWT-0017	Selector switch	2-position
13	1	SWT-0094	Selector switch[1]	3-position, G cam
14	1	BLK-0020	Contact block	N.O.
15	1	BLK-0021	Contact block	N.C.
16	1	LIT-0041	Indicator light	120V, yellow 3/16" push-on terminal
17	1	LIT-0042	Indicator light[1]	120V, green 3/16" push-on terminal
18	3	LIT-0040	Indicator light[1]	LED, red, 6" leads
19	1	SWT-0035	Test toggle switch[1]	Momentary, N.C. or N.O.
20	1	IND-0004	Maintenance indicator[1]	20" H_2O
21	1	CON-0250	Female connector[1]	¼" tube x 1/8" NPTf, brass
22	1	TUB-R-0084	Flexible tube[1,2]	¼" OD x 0.035" wall
23	1	IND-0005	Acoustical indicator[1]	120V
24	1	SWT-0088	Emergency stop push-button[1]	Maintained, push/pull
25	2	FUS-0012	Fuse[1]	AGC, 10 amp, 32 volts
26	2	HOL-0001	Fuse holder[1]	¼" x 1¼"
27	1	MNR-0011	CO monitor[1]	120V AC
28	1	MNR-0012	CO monitor[1]	12V DC

1. optional accessory
2. specify length


35
32
24,14,15
23,34
21
20
19
22
18
18
18
16,17
12,13,14,15
25,26
25,26
11
8,9,10
6
5
6
5
6
5
3
2
7
1
4
1
33
31
29,30
27,28

Instrument panel (continued)[1]

3-stage horizontal units

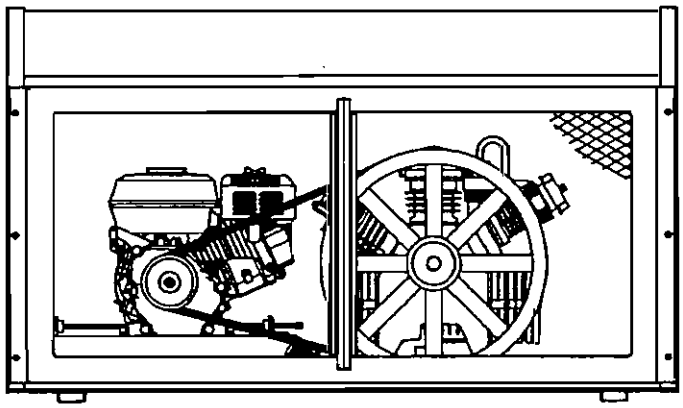
Item	Qty	Part no.	Description	Notes
29	1	N15095	Securus indicator[1]	110-127 V AC
30	1	N150-96	Securus indicator[1]	12 V DC
31	1	GAG-0068	Flow meter[1]	0.2 to 2 SCFH air
32	1	SWT-0067	Start push-button[1]	Momentary
33	1	TMR-0007	Timer[1]	0-5 minutes
34	1	IND-0007	Acoustical indicator[1]	12 V DC
35	1	GAG-0023	Ammeter[1]	

1. optional accessory

Section E
Frame and panels

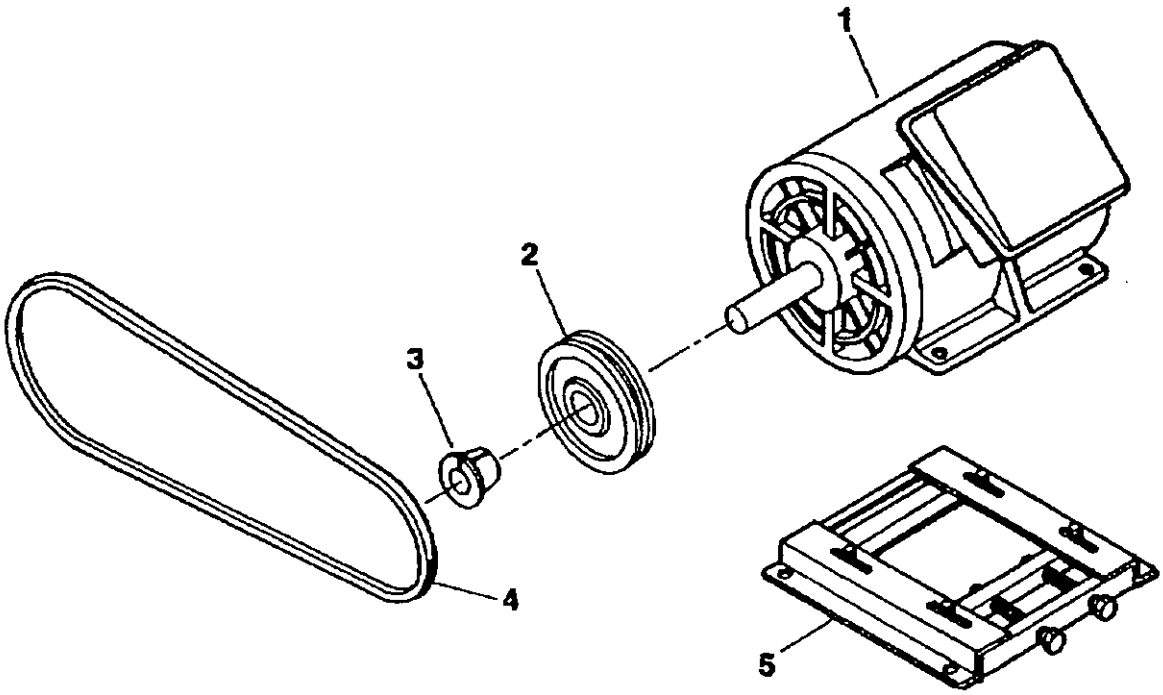
This section has no technical content and is included in the manual for editorial consistency only.


BAUER
COMPRESSORS



SECTION F
Drive system

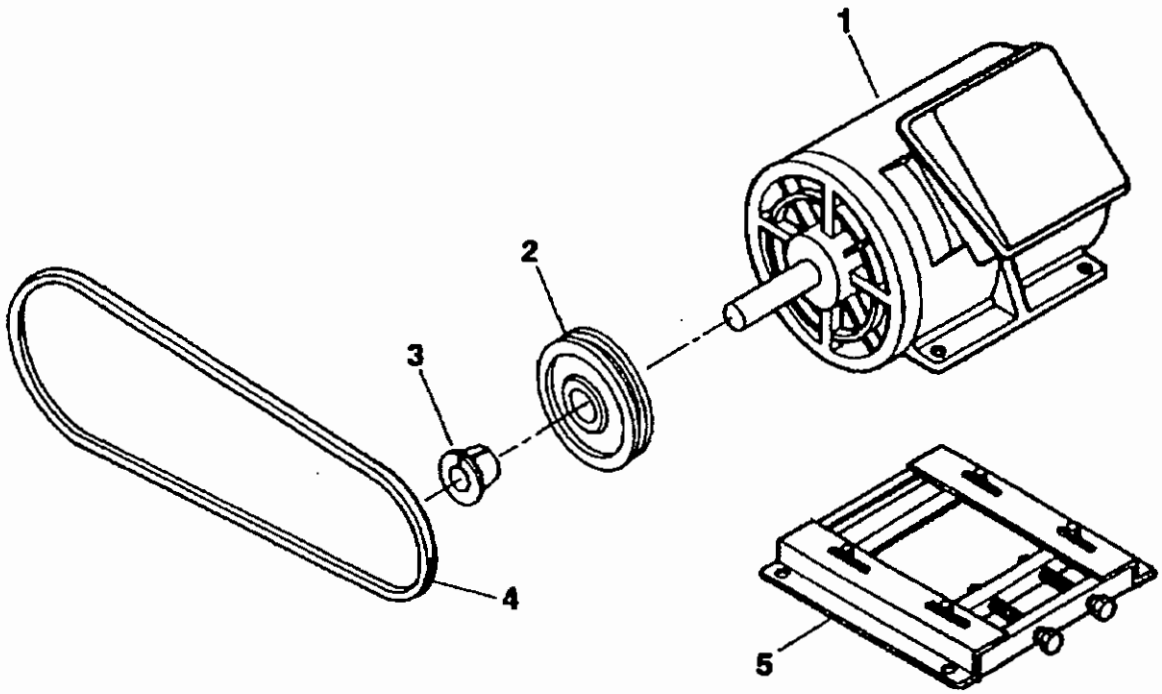
Assembly	Page


1
2
3
4
5

Drive system

U,C,M-E1/E3

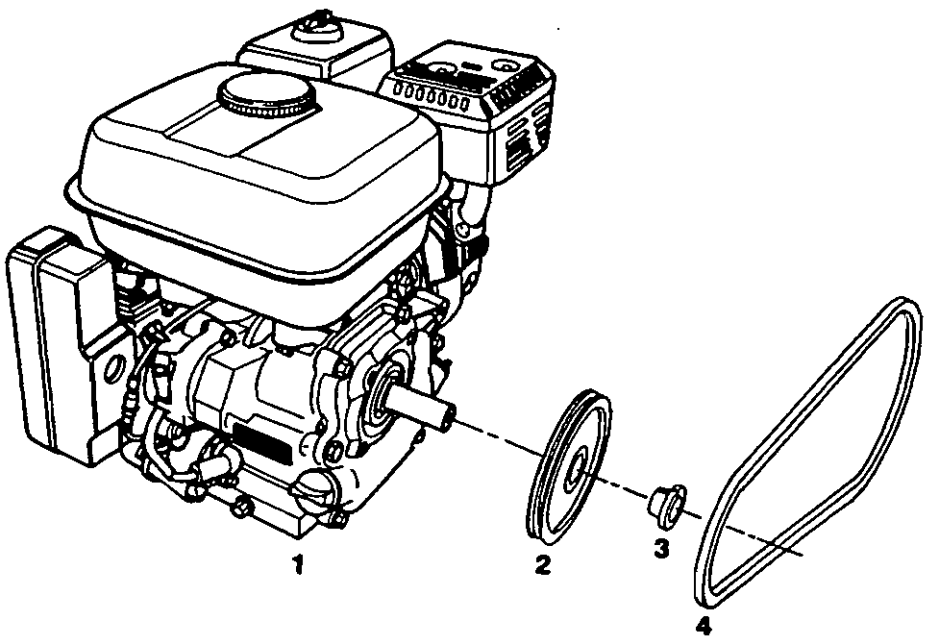
Item	Qty	Part no.	Description	Notes
			U-E1	
1	1	MTR-0027	Electric drive motor	3 hp, 3600 rpm, 208-230V, 1 phase, 60 Hz, ODP
2	1	SHE-0144	V-belt sheave	"3V" only, 1 gr, 5.60 PD
3	1	BUS-0034	Sheave bushing	SH-1 1/8"
4	1	BET-0052	V-belt	3Vx750
5	1	BAS-0003	Sliding motor base	182-T frame
			U-E3	
1	1	MTR-0028	Electric drive motor	3 hp, 3600 rpm, 208-460V, 3 phase, 60 Hz, ODP
2	1	SHE-0144	V-belt sheave	"3V" only, 1 gr, 5.60 PD
3	1	BUS-0038	Sheave bushing	SH-7/8"
4	1	BET-0052	V-belt	3Vx750
5	1	BAS-0009	Sliding motor base	145-T frame
			C-E1	
1	1	MTR-0023	Electric drive motor	5 hp, 3600 rpm, 208-230V, 1 phase, 60 Hz, ODP
2	1	SHE-0142	V-belt sheave	"A" only, 1 gr, 6.00 PD
3	1	BUS-0006	Sheave bushing	H-1 1/8"
4	1	BET-0013	V-belt	A-76
5	1	BAS-0001	Sliding motor base	184-T frame
			C-E3	
1	1	MTR-0022	Electric drive motor	5 hp, 3600 rpm, 208-460V, 3 phase, 60 Hz, ODP
2	1	SHE-0142	V-belt sheave	"A" only, 1 gr, 6.00 PD
3	1	BUS-0006	Sheave bushing	H-1 1/8"
4	1	BET-0013	V-belt	A-76
5	1	BAS-0003	Sliding motor base	182-T frame


1
2
3
4
5

Drive system (continued)

U,C,M-E1/E3

Item	Qty	Part no.	Description	Notes
			M-E1	
1	1	MTR-0052	Electric drive motor	7.5 hp, 3600 rpm, 208-230V, 1 phase, 60 Hz, ODP
2	1	SHE-0142	V-belt sheave	"A" only, 1 gr, 6.00 PD
3	1	BUS-0001	Sheave bushing	H-1 3/8"
4	1	BET-0013	V-belt	A-76
5	1	BAS-0002	Sliding motor base	213-T frame
			M-E3	
1	1	MTR-0033	Electric drive motor	7.5 hp, 3600 rpm, 208-460V, 3 phase, 60 Hz, ODP
2	1	SHE-0142	V-belt sheave	"A" only, 1 gr, 6.00 PD
3	1	BUS-0006	Sheave bushing	H-1 1/8"
4	1	BET-0013	V-belt	A-76
5	1	BAS-0001	Sliding motor base	184-T frame

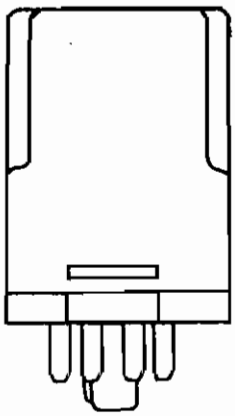

1
2
3
4

Drive system

U,C,M-G/D

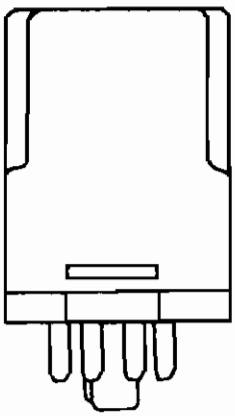
Item	Qty	Part no.	Description	Notes
			U-D and C-D	
1	1	ENG-0045	Diesel engine	6 hp, recoil start
	1	ENG-0053	Diesel engine[1]	6 hp, electric start
2	1	SHE-0142	V-belt sheave	"A" only, 1 groove, 6.00 PD
3	1	BUS-0011	Sheave bushing	H-1"
	1	CLT-0012	Centrifugal clutch[1]	1" bore, 1 gr., 6 PD, "A" sect.
4	1	BET-0027	V-belt	A-79
			U-G and C-G	
1	1	ENG-0024	Gasoline engine	5.5 hp, recoil start
	1	ENG-0054	Gasoline engine[1]	5.5 hp, electric start
2	1	SHE-0142	V-belt sheave	"A" only, 1 groove, 6.00 PD
3	1	BUS-0009	Sheave bushing	H-¾"
4	1	BET-0024	V-belt	A-70
			M-D	
1	1	ENG-0046	Diesel engine	9 hp, recoil start
	1	ENG-0052	Diesel engine[1]	9 hp, electric start
2	1	SHE-0142	V-belt sheave	"A" only, 1 groove, 6.00 PD
3	1	BUS-0011	Sheave bushing	H-1"
	1	CLT-0012	Centrifugal clutch[1]	1" bore, 1 gr., 6 PD, "A" sect.
4	1	BET-0027	V-belt	A-79
			M-G	
1	1	ENG-0042	Gasoline engine	8 hp, recoil start
	1	ENG-0043	Gasoline engine[1]	8 hp, electric start
2	1	SHE-0142	V-belt sheave	"A" only, 1 groove, 6.00 PD
3	1	BUS-0011	Sheave bushing	H-1"
4	1	BET-0013	V-belt	A-76

1. optional accessory



SECTION G
Accessories

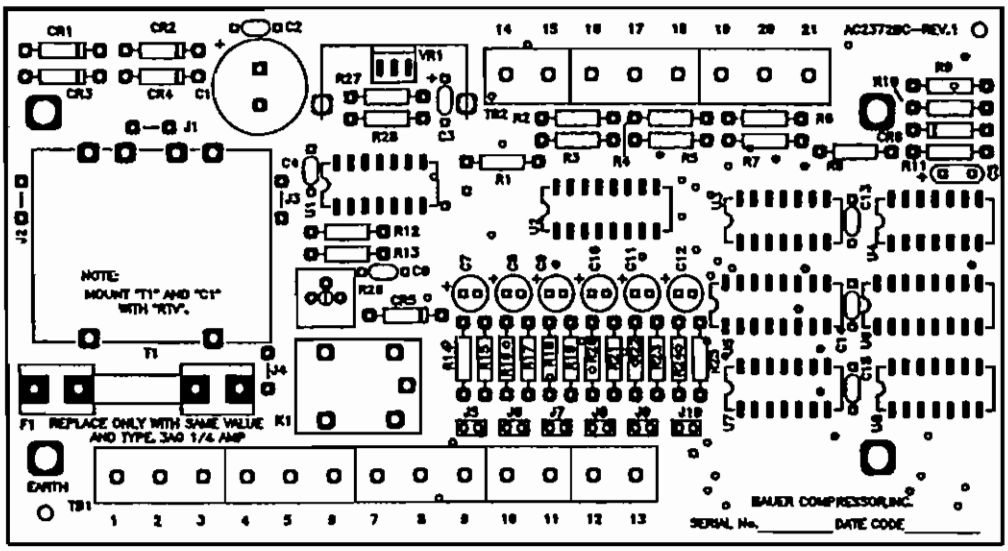
Assembly	Page



1,2

3,4,5

6,7

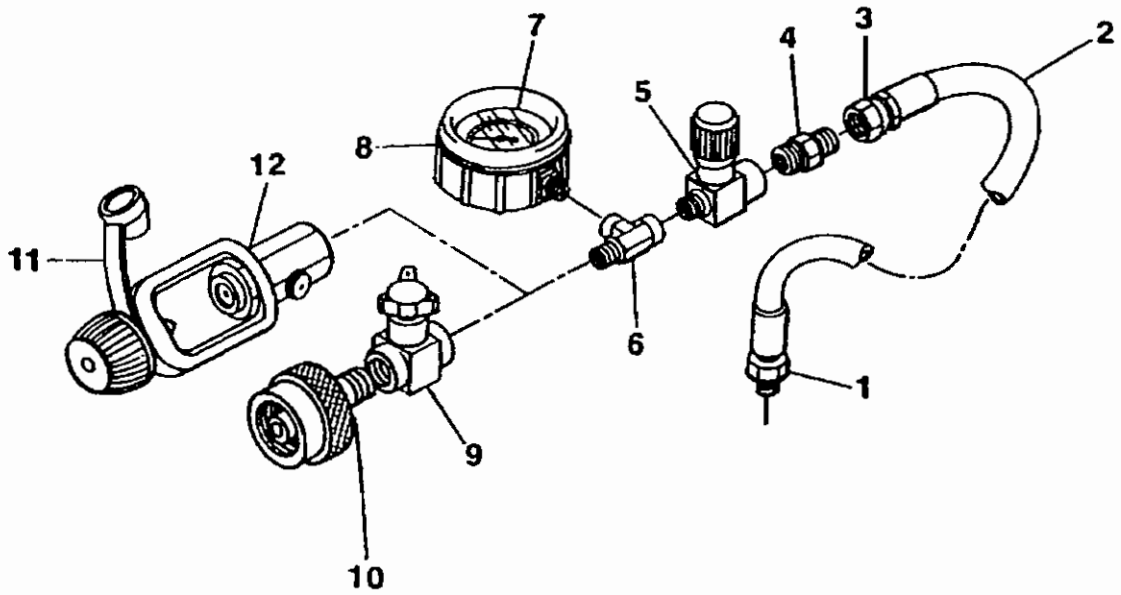

CR1
CR2
CR3
CR4
C1
C2
VR1
R27
R28
C3
J1
J2
C4
C5
R12
R13
C6
C7
C8
C9
C10
C11
C12
C13
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
CR5
TB2
14 15 16 17 18 19 20 21
AC2372BC-REV.1
NOTE:
MOUNT "T1" AND "C1"
WITH "RTV".
T1
J4
F1
REPLACE ONLY WITH SAME VALUE
AND TYPE, 3AG 1/4 AMP
K1
J5
J6
J7
J8
J9
J10
EARTH
TB1
1 2 3 4 5 6 7 8 9 10 11 12 13
BAUER COMPRESSORS,INC.
SERIAL No._____DATE CODE_____

Electrical accessories

U,C,M-E1/E3/G/D

Item	Qty	Part no.	Description	Notes
1	1	RLY-0004	Control relay	120V
2	1	RLY-0006	Control relay[1]	4PDT, 115VAC
3	1	SWT-0160	Final pressure switch	4000-7500 psi, ¼" NPTf
4	1	SWT-0145	Final pressure switch (low)[1]	1650-4500 psi, ¼" NPTf
5	1	SWT-0119	Oil pressure switch[1]	430-1700 psi, ¼" NPTf
6	1	CNT-0014	Printed circuit board[1]	120VAC, 6-position
7	1	CNT-0015	Printed circuit board[1]	12VDC, 6-position

1. optional accessory

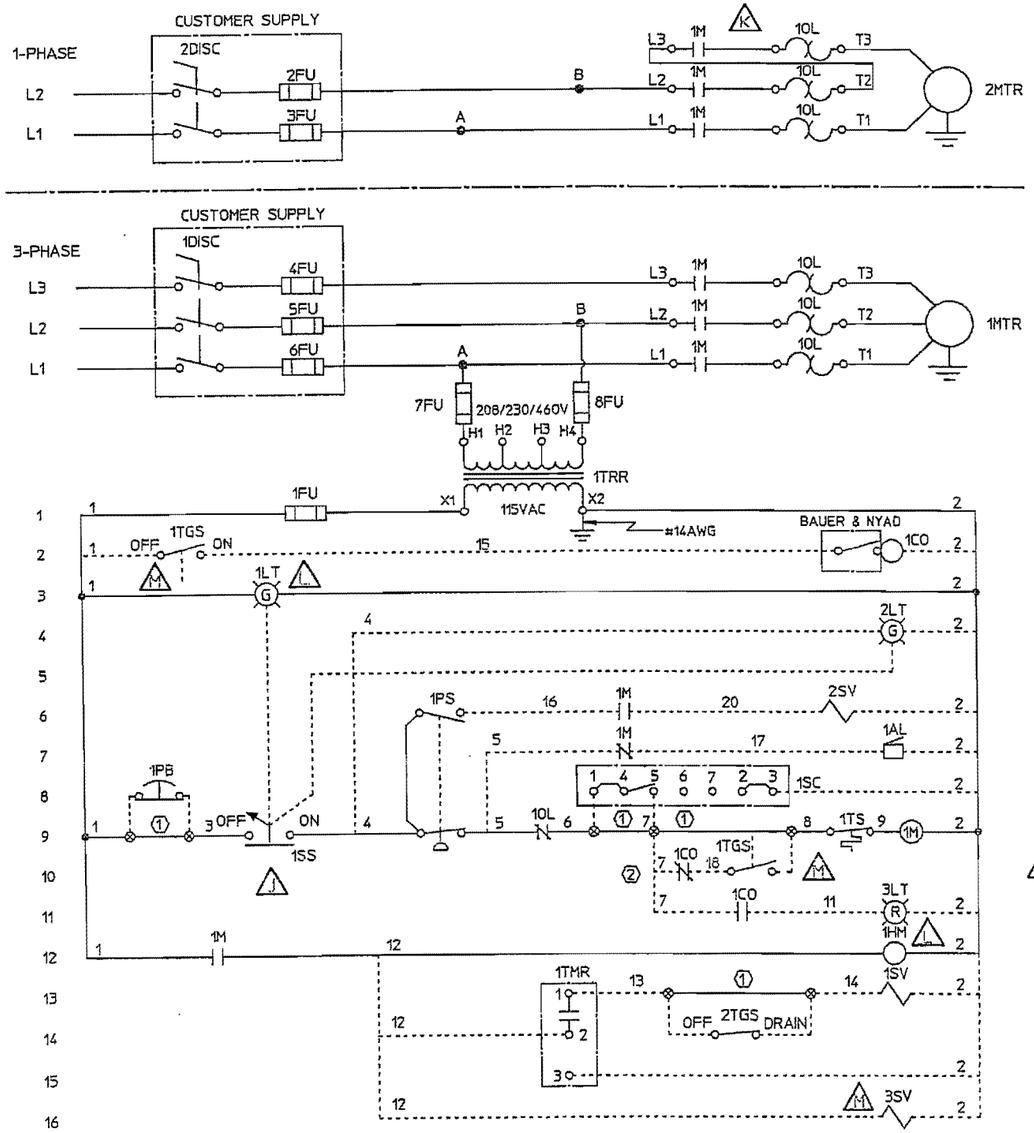

7
4
3
2
5
8
12
11
6
1
9
10

Fill hoses

BFFD-346, BFFD-347 and BFDV

Item	Qty	Part no.	Description	Notes
1	1	CPL-0070	Hose coupling	3/16" ID hose x 1/4" NPTm
2	1	HOS-R-0038	High pressure hose[1]	3/16" ID
3	1	CPL-0067	Hose coupling	3/16" ID hose x 7/16" -20 swvl
4	1	CON-0039	Male connector	1/4" 37° flare x 1/4" NPTm
5	1	VAL-0006	Line valve	5000 psi
6	1	TEE-0012	Male run tee	1/4" NPT
7	1	GAG-0010	Pressure gauge	0-5000 psi, 2½" 1/4" NPTm
8	1	CVR-0002	Protection cover	Rubber
9	1	065126	Bleed valve	1/4" NPTf
10	1	ADP-0112	Fill adapter	For 4500/2215 psi cylinders
	1	ADP-0113	Fill adapter	For 4500 psi
11	1	CAP-0023	SCUBA yoke dust cap	Rubber
12	1	YOK-0001	SCUBA fill yoke w/bleeder	Plated

1. specify length on order



⚠ USE #16 AWG ON ALL CONTROL CIRCUIT WIRING, UNLESS OTHERWISE NOTED

ISSUE	REVISION	DATE	BY	APVD.
J	REFERENCE ECN #1818	2-20-95	TR	JB
K	REF ECN #2620	6-30-97	JB	J B
L	REF ECN #3315	8-23-99	TR	JB
M	REF ECN #3426	3-7-00	JB	VSL

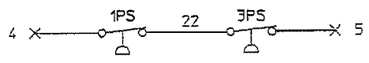
LEGEND

ITEM	DESCRIPTION	
1AL	AUDIBLE ALARM	(OPTIONAL)
1CO	CO MONITOR	(OPTIONAL)
1CR	CONTROL RELAY, UL LOCKOUT, DPDT	(OPTIONAL)
2CR	CONTROL RELAY, UL LOCKOUT, 4PDT	(OPTIONAL)
1DISC	DISCONNECT, 3-PHASE (CUSTOMER SUPPLY)	
2DISC	DISCONNECT, 1-PHASE (CUSTOMER SUPPLY)	
1FU	FUSE, SECONDARY	
2FU-3FU	FUSE, 1-PHASE (CUSTOMER SUPPLY)	
4FU-6FU	FUSE, 3-PHASE (CUSTOMER SUPPLY)	
7FU-8FU	FUSE, PRIMARY	
1HM	HOURMETER	
1LT	POWER ON LIGHT (GREEN)	
2LT	POWER ON LIGHT/ON WITH SWITCH (GREEN)	(OPTIONAL)
3LT	HIGH CO LIGHT (RED)	(OPTIONAL)
4LT	FINAL PRESSURE LIGHT (AMBER)	(OPTIONAL)
1M	MOTOR STARTER	
1MTR	MOTOR, 3-PHASE	
2MTR	MOTOR, 1-PHASE	
10L	THERMAL OVERLOAD RELAY	
1PB	PUSH BUTTON SWITCH, EMERGENCY STOP	(OPTIONAL)
1PS	AIR PRESSURE SWITCH (FOR FINAL PRESSURE)	
2PS	AIR PRESSURE SWITCH (FOR CUT-IN PRESSURE)	(OPTIONAL)
3PS	AIR PRESSURE SWITCH (FOR DUAL PRESSURE W/ 3-WAY VALVE)	(OPTIONAL)
1SC	SECURUS CONTROL	(OPTIONAL)
1SS	SELECTOR SWITCH (OFF/ON)	
2SS	SELECTOR SWITCH (HAND/OFF/AUTO)	(OPTIONAL)
1SV	A.C.D. SOLENOID VALVE, 2ND & 3RD STAGE	(OPTIONAL)
2SV	UNLOADER SOLENOID VALVE (STANDARD W/ 3-WAY SW.)	
⚠M 3SV	CO MONITOR SOLENOID VALVE	(OPTIONAL)
1TGS	TOGGLE SWITCH (OFF/ON) CO MONITOR	(OPTIONAL)
2TGS	TOGGLE SWITCH (OFF/DRAIN) MOMENTARY	(OPTIONAL)
1TMR	A.C.D. TIMER, 2ND & 3RD STAGE	(OPTIONAL)
1TRR	CONTROL TRANSFORMER	
1TS	HIGH TEMPERATURE SWITCH	

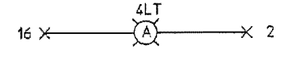
NOTES:

① REMOVE JUMPER WHEN ADDING OPTIONAL FEATURES.
② BAUER, NYAD, DYNAMATION AND ECOLYZER CO MONITOR ARE N.C., NEOTRONICS IS N.O..
⚠K
⚠M

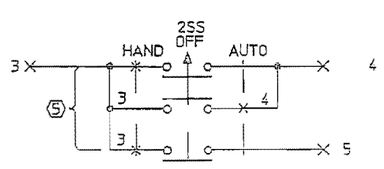
DUAL PRESSURE WITH 3-WAY VALVE



FINAL PRESSURE LIGHT

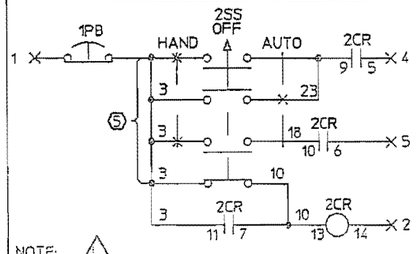


3-WAY SWITCH



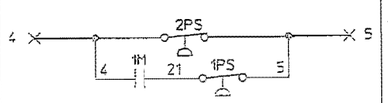
NOTE: ⚠L
⑤ HAND/OFF/AUTO SWITCH, POWER ON LIGHT W/ SWITCH OR CONSTANT SPEED UNLOADER

EMERGENCY STOP PER NFPA 79
3-WAY SWITCH & UL LOCKOUT

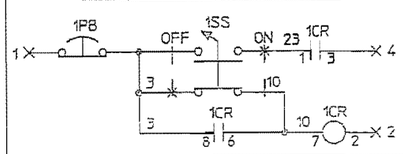


NOTE: ⚠L
⑤ HAND/OFF/AUTO SWITCH, POWER ON LIGHT W/ SWITCH OR CONSTANT SPEED UNLOADER

DUAL PRESSURE CUT-IN/CUT-OUT
(FOR ABOVE 1PS DIFFERENTIAL)



EMERGENCY STOP PER NFPA 79
OFF/ON SWITCH & UL LOCKOUT



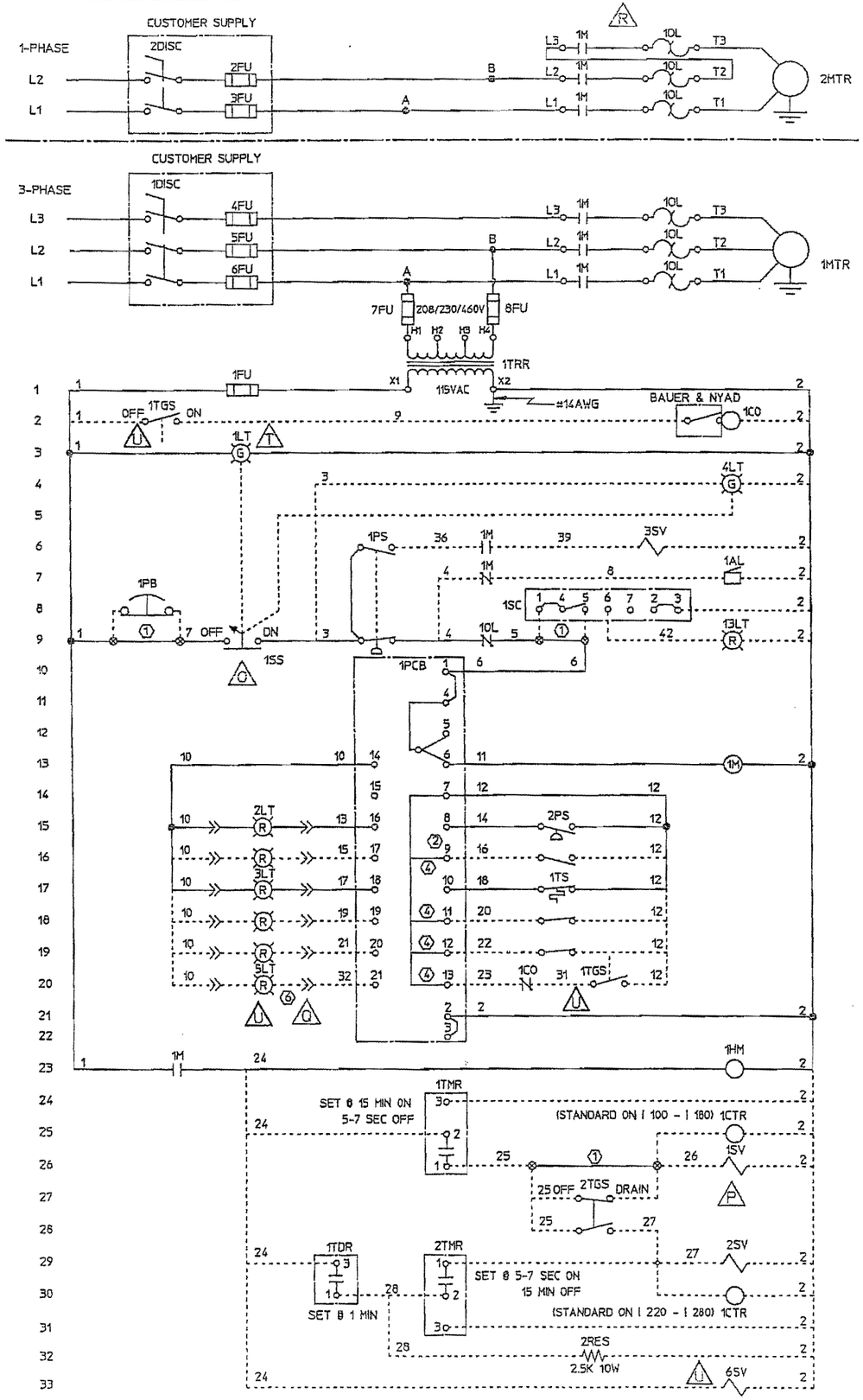
DRAWN BY:	TR
DATE:	6-10-92
APVD. BY:	VSL
DATE:	6-16-92
SCALE:	-
PAINT:	-
CAGE NUMBER:	57328

BAUER COMPRESSORS, INC.
NORFOLK, VIRGINIA

TITLE: WIRING DIAGRAM

USAGE: 3-STAGE UNITS W/ OPTIONS

DRAWING NUMBER: DGM-0008 SHT. 1 OF 1



USE #16 AWG ON ALL CONTROL CIRCUIT WIRING, UNLESS OTHERWISE NOTED

ISSUE	REVISION	DATE	BY	APVD.
Q	REF ECN #2524	4-14-97	JB	J B
R	REF ECN #2620	7-1-97	JB	J B
S	REF ECN #3082	10-27-98	TR	J B
T	REF ECN #3315	8-23-99	TR	J B
U	REF ECN #3426	3-7-00	JB	VSL

LEGEND

ITEM	DESCRIPTION	
1AL	AUDIBLE ALARM	(OPTIONAL)
1CO	CO MONITOR	(OPTIONAL)
* 1CTR	DRAIN CYCLE COUNTER	
1DISC	DISCONNECT, 3-PHASE (CUSTOMER SUPPLY)	
2DISC	DISCONNECT, 1-PHASE (CUSTOMER SUPPLY)	
1FU	FUSE, SECONDARY	
S 2FU-3FU	FUSE, 1-PHASE (CUSTOMER SUPPLY)	
4FU-6FU	FUSE, 3-PHASE (CUSTOMER SUPPLY)	
7FU-8FU	FUSE, PRIMARY	
1HM	HOURMETER	
1LT	POWER ON LIGHT (GREEN)	
2LT	LOW OIL PRESSURE LIGHT (RED)	
3LT	HIGH TEMPERATURE LIGHT (RED)	
4LT	POWER ON LIGHT/ON WITH SWITCH (GREEN)	(OPTIONAL)
5LT	HIGH CO LIGHT (RED)	(OPTIONAL)
13LT	SECURUS SHUTDOWN LIGHT (RED)	(OPTIONAL)
1M	MOTOR STARTER	
1MTR	MOTOR, 3-PHASE	
2MTR	MOTOR, 1-PHASE	
10L	THERMAL OVERLOAD RELAY	
1PB	PUSH BUTTON SW, EMERGENCY STOP	(OPTIONAL)
1PCB	PRINTED CIRCUIT BOARD	
1PS	AIR PRESSURE SWITCH (FOR FINAL PRESSURE)	
2PS	LOW OIL PRESSURE SWITCH	
* 2RES	RESISTOR, 2.5K 10W	
* 1SC	SECURUS CONTROL	
1SS	SELECTOR SWITCH (OFF/ON) COMPRESSOR	
1TGS	TOGGLE SWITCH (OFF/ON) CO MONITOR	(OPTIONAL)
2TGS	TOGGLE SWITCH (OFF/DRAIN) MOMENTARY	(OPTIONAL)
* 1SV	A.C.D. SOLENOID VALVE, 2ND & 3RD STAGE (2ND STAGE FOR K220-K280 BLOCKS)	
* 2SV	A.C.D. SOLENOID VALVE, 4TH & FINAL STAGE FOR K220-K280 BLOCKS (3RD & 4TH STAGE FOR K14.11 BLOCK) (4TH & 5TH STAGE FOR K18.1 BLOCK)	
* 3SV	UNLOADER SOLENOID VALVE (STANDARD W/ 3-WAY SW.)	
U 6SV	CO MONITOR SOLENOID VALVE	(OPTIONAL)
* 1TDR	TIME DELAY RELAY (DELAY ON MAKE)	
* 1TMR	A.C.D. TIMER, 2ND & 3RD STAGE (2ND STAGE FOR K220-K280 BLOCKS)	
* 2TMR	A.C.D. TIMER, 4TH & FINAL STAGE FOR K220-K280 BLOCKS (3RD & 4TH STAGE FOR K14.11 BLOCK) (4TH & 5TH STAGE FOR K18.1 BLOCK)	
1TRR	CONTROL TRANSFORMER	
1TS	HIGH TEMPERATURE SWITCH	

NOTES:

① REMOVE JUMPER WHEN ADDING OPTIONAL FEATURES.

② REACTION TO SENSOR TERMINALS #8 & #9, IS TIME DELAYED FOR STARTING.

R

U ④ REMOVE SHUNT ON PRINTED CIRCUIT BOARD WHEN ADDING OPTIONAL FEATURES.

R U ⑥ USE 5LT WHEN CO MONITOR IS NOT MOUNTED ON FRONT OF THE UNIT.

* STANDARD ON SOME UNITS

T LAYOUT FOR INDICATOR LIGHTS

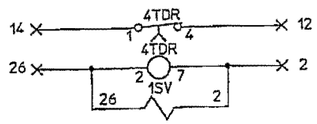
HIGH TEMPERATURE	LOW OIL PRESSURE

DRAWN BY: TR	BAUER COMPRESSORS, INC. NORFOLK, VIRGINIA
DATE: 9-24-91	
APVD. BY: VSL	TITLE: WIRING DIAGRAM
DATE: 9-24-91	
SCALE: -	
PAINT: -	USAGE: ALL HIGH PRESSURE UNITS USING PRINTED CIRCUIT BOARD
CAGE NUMBER: 57328	DRAWING NUMBER: DGM-0290-1-1 SHT. 1 OF 2

ISSUE	REVISION	DATE	BY	APVD.
S	REF ECN #3082	10-27-98	TR	JB
T	REF ECN #3315	8-23-99	TR	JB
U	REF ECN #3426	3-7-00	JB	VSL

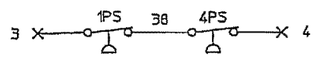
⚠1 USE #16 AWG ON ALL CONTROL CIRCUIT WIRING, UNLESS OTHERWISE NOTED

2ND & 3RD STAGE DRAIN FOR K14.11 BLOCK



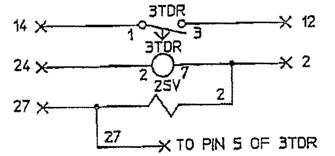
1SV A.C.D. SOLENOID VALVE, 2ND & 3RD STAGE
4TDR TIME DELAY RELAY, DELAY ON MAKE

DUAL PRESSURE WITH 3-WAY VALVE **



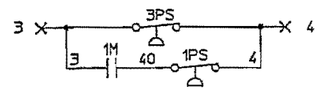
1PS AIR PRESSURE SWITCH (FOR FINAL PRESSURE)
4PS AIR PRESSURE SWITCH (FOR DUAL PRES. W/ 3-WAY VALVE)

4TH & 5TH STAGE DRAIN FOR K18.1 BLOCK



2SV A.C.D. SOLENOID VALVE, 4TH & 5TH STAGE
3TDR TIME DELAY RELAY, DELAY ON BREAK

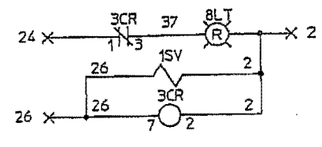
⚠U ADJUSTABLE DIFFERENTIAL PRESSURE * (CUT-IN/CUT-OUT) (FOR ABOVE 1PS DIFFERENTIAL)



1M MOTOR STARTER AUX INTERLOCK
1PS AIR PRESSURE SWITCH (FOR FINAL PRESSURE)
3PS AIR PRESSURE SWITCH (FOR CUT-IN PRESSURE)

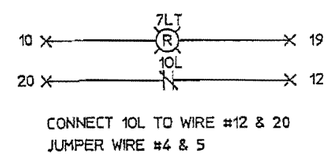
⚠U STANDARD FOR :
K220, K230, K250 & K280
K220V, K230V

A.C.D. DRAIN LIGHT **



3CR CONTROL RELAY, DPDT
8LT A.C.D. DRAIN LIGHT (RED)
1SV A.C.D. SOLENOID VALVE, 2ND & 3RD STAGE

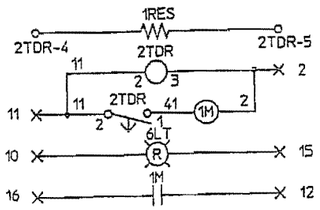
MOTOR OVERLOAD LIGHT **



CONNECT 10L TO WIRE #12 & 20
JUMPER WIRE #4 & 5

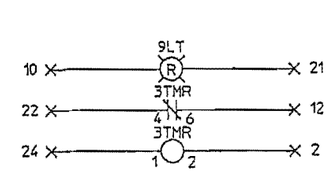
7LT MOTOR OVERLOAD LIGHT (RED)
10L THERMAL OVERLOAD RELAY

OVERTIME TIMER **



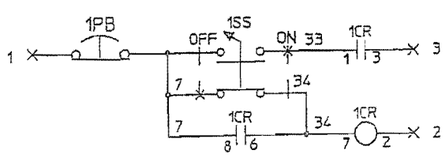
6LT OVERTIME RUNNING LIGHT (RED)
1M MOTOR STARTER COIL & AUX INTERLOCK
1RES RESISTOR, 560K 1/4W
2TDR TIME DELAY RELAY, INTERVAL

MAINTENANCE TIMER **



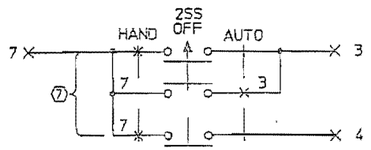
9LT SERVICE COMPRESSOR LIGHT (RED)
3TMR MAINTENANCE TIMER

EMERGENCY STOP PER NFPA 79 ** OFF/ON SWITCH & UL LOCKOUT



1PB PUSH BUTTON SW, EMERGENCY STOP
1CR CONTROL RELAY, UL LOCKOUT, DPDT
1SS SELECTOR SWITCH (OFF/ON)

3-WAY SWITCH *

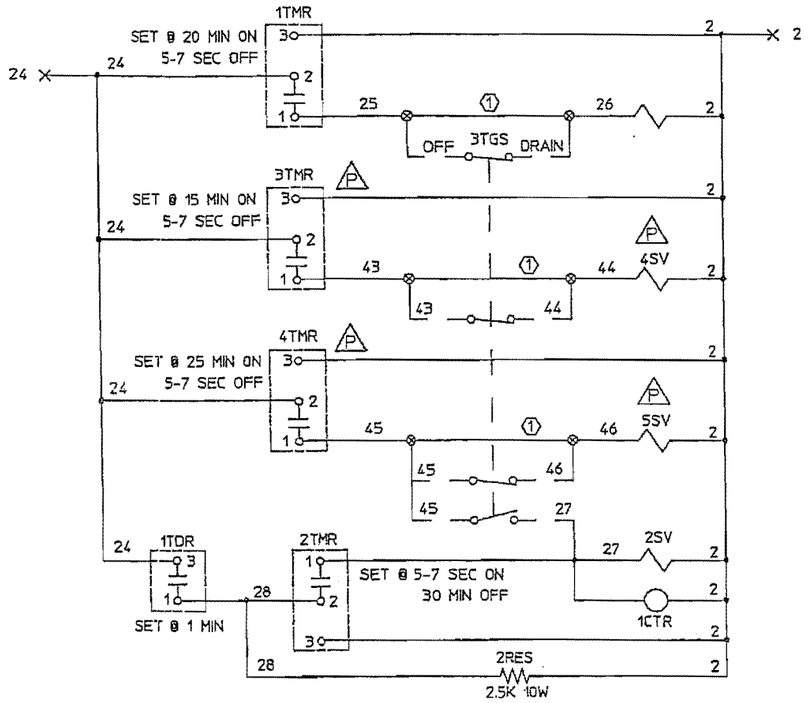


2SS SELECTOR SWITCH (HAND/OFF/AUTO)

NOTES: ⚠1
⑦ HAND/OFF/AUTO SWITCH, POWER ON LIGHT W/ SWITCH OR CONSTANT SPEED UNLOADER

AUTOMATIC CONDENSATE DRAIN *

FOR: K220, K230, K250 & K280
I220, I230, I250 & I280
K220V, K230V, K250V & K280V
I220V, I230V, I250V & I280V

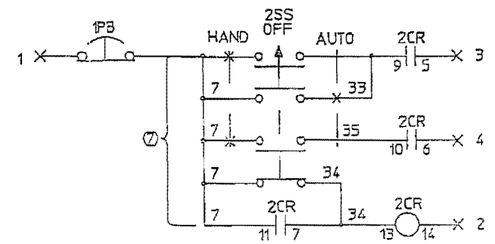


1CTR DRAIN CYCLE COUNTER, I220-I280 ONLY
2RES RESISTOR, 2.5K 10W
1SV A.C.D. SOLENOID VALVE, 2ND STAGE
2SV A.C.D. SOLENOID VALVE, 4TH & FINAL STAGE
4SV A.C.D. SOLENOID VALVE, 1ST STAGE
5SV A.C.D. SOLENOID VALVE, 3RD STAGE
1TDR TIME DELAY RELAY (DELAY ON MAKE)
3TGS TOGGLE SW. (OFF/DRAIN), MOM, 4PDT (OPTIONAL)
1TMR A.C.D. TIMER, 2ND STAGE
2TMR A.C.D. TIMER, 4TH & FINAL STAGE
3TMR A.C.D. TIMER, 1ST STAGE
4TMR A.C.D. TIMER, 3RD STAGE

NOTE:
① REMOVE JUMPER WHEN ADDING OPTIONAL FEATURE.

⚠S * (OPTIONAL) STANDARD ON SOME UNITS
** OPTIONAL FEATURES

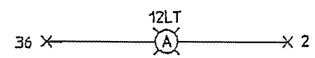
EMERGENCY STOP PER NFPA 79 ** 3-WAY SWITCH & UL LOCKOUT



1PB PUSH BUTTON SW, EMERGENCY STOP
2CR CONTROL RELAY, 4PDT
2SS SELECTOR SWITCH (HAND/OFF/AUTO)

NOTES: ⚠1
⑦ HAND/OFF/AUTO SWITCH, POWER ON LIGHT W/ SWITCH OR CONSTANT SPEED UNLOADER

FINAL PRESSURE LIGHT **



12LT FINAL PRESSURE LIGHT (AMBER)

DRAWN BY:	TR
DATE:	9-24-91
APVD. BY:	VSL
DATE:	9-24-91
SCALE:	-
PAINT:	-
CAGE NUMBER:	57328

BAUER COMPRESSORS, INC.
NORFOLK, VIRGINIA

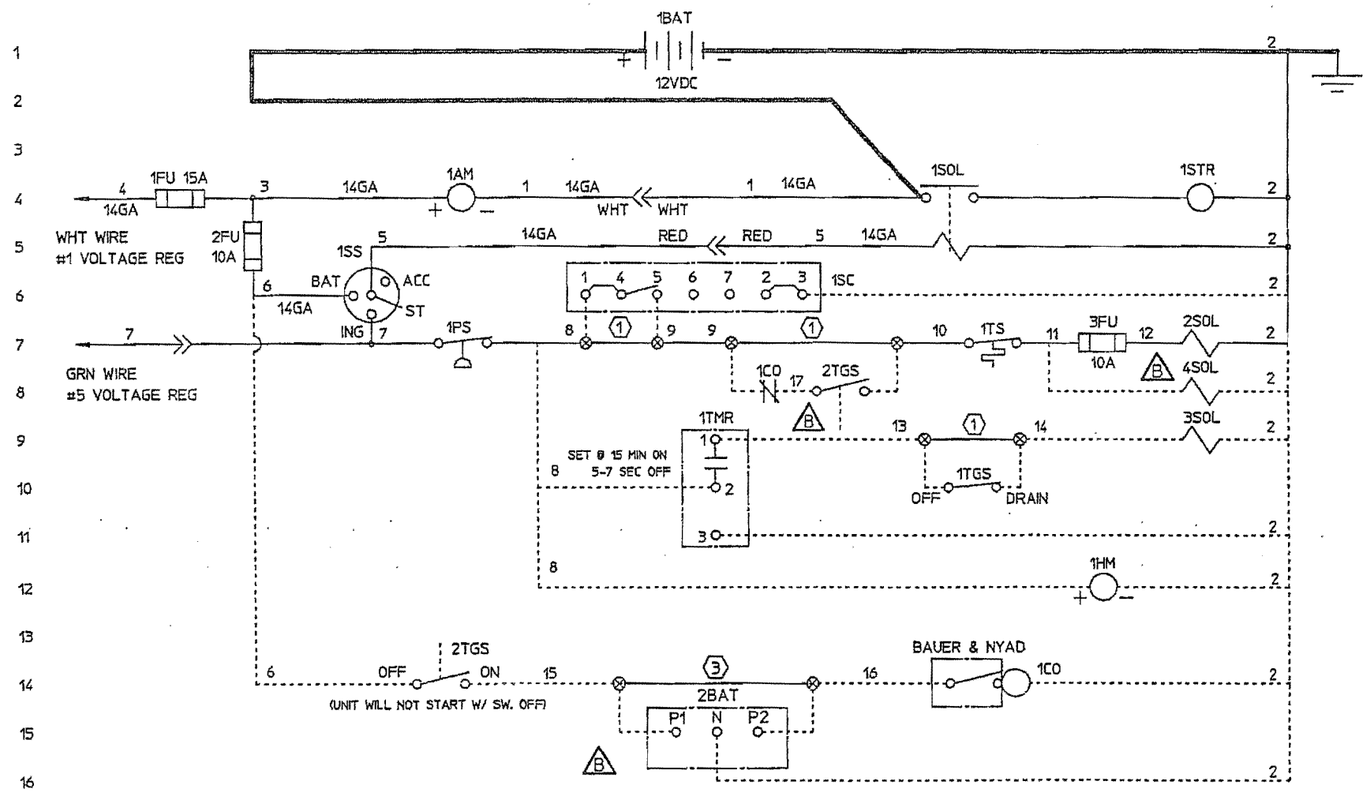
TITLE: WIRING DIAGRAM

USAGE: ALL HIGH PRESSURE UNITS USING PRINTED CIRCUIT BOARD

DRAWING NUMBER: DGM-0290-1-2 SHT. 2 OF 2

ISSUE	REVISION	DATE	BY	APVD.
A	REFERENCE ECN#1570	7-7-94	TR	VSL
B	REF ECO #3450	5-4-00	TR	JB

(B) USE #16 AWG ON ALL CONTROL CIRCUIT WIRING, UNLESS OTHERWISE NOTED



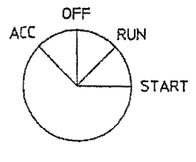
LEGEND

ITEM	DESCRIPTION	
1AM	AMMETER	
1BAT	BATTERY, 12VDC (CUSTOMER SUPPLY)	
(B) 2BAT	BATTERY, CO MONITOR	(OPTIONAL)
1CO	HIGH CO MONITOR	(OPTIONAL)
1FU	FUSE, 15A (COMES W/ ENGINE)	
2FU	FUSE, 10A (CONTROL CIRCUIT)	
3FU	FUSE, 10A (SPEED SOLENOID_)	
1HM	HOURMETER (STANDARD W/ GAUGE PANEL)	(OPTIONAL)
1PS	AIR PRESSURE SWITCH	
1SC	SECURUS CONTROL	(OPTIONAL)
1SOL	SOLENOID (START)	
2SOL	SOLENOID (SPEED)	
3SOL	SOLENOID (A.C.D.) 2ND & 3RD STAGE	(OPTIONAL)
(B) 4SOL	CO MONITOR SOLENOID VALVE	(OPTIONAL)
1SS	SELECTOR SWITCH (OFF/RUN/START)	
1TGS	TOGGLE SWITCH (OFF/DRAIN)	(OPTIONAL)
2TGS	TOGGLE SWITCH (OFF/ON) CO MONITOR	(OPTIONAL)
1STR	STARTER	
1TMR	A.C.D. TIMER, 2ND & 3RD STAGE	(OPTIONAL)
1TS	HIGH TEMP. SWITCH (COMPRESSOR)	

NOTES:

(1) REMOVE JUMPER WHEN ADDING OPTIONAL FEATURES.

(B) (3) REMOVE JUMPER WHEN USING NYAD CO MONITOR.



SELECTOR SWITCH

BAT	ACC	ING	ST
ACC	X	0	0
OFF	0	0	0
RUN	X	X	0
START	0	X	X

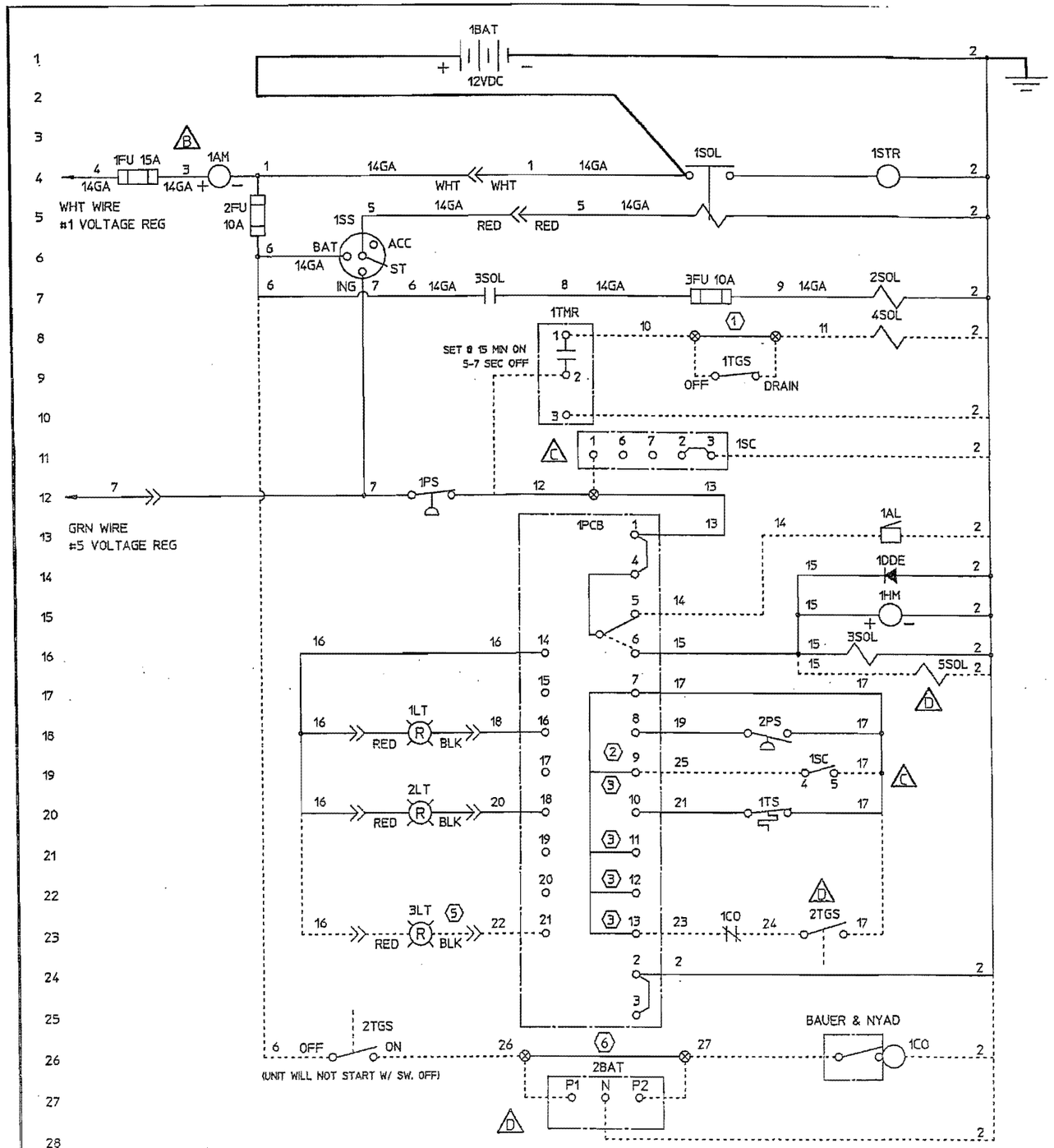
DRAWN BY:	TR
DATE:	3-4-94
APVD. BY:	VSL
DATE:	4-6-94
SCALE:	-
PAINT:	-
CAGE NUMBER:	57328

BAUER COMPRESSORS, INC.
NORFOLK, VIRGINIA

TITLE: WIRING DIAGRAM

USAGE: U,C & M DIESEL (YANMAR) W/ OPTIONS, ES, NO PCB

DRAWING NUMBER: DGM-0586 SHT. 1 OF 1



ISSUE	REVISION	DATE	BY	APVD.
A	REFERENCE ECN #1570	7-11-94	TR	VSL
B	REFERENCE ECN #2783	2-18-98	TR	JB
C	REFERENCE ECN #3414	2-10-00	GB	JB
D	REF ECO #3450	5-4-00	TR	JB

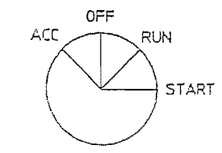
USE #16 AWG ON ALL CONTROL CIRCUIT WIRING, UNLESS OTHERWISE NOTED

LEGEND

ITEM	DESCRIPTION	
1AL	AUDIBLE ALARM	(OPTIONAL)
1AM	AMMETER	
1BAT	BATTERY, 12VDC (CUSTOMER SUPPLY)	
2BAT	BATTERY, CO MONITOR	(OPTIONAL)
1CO	HIGH CO MONITOR	(OPTIONAL)
1DDE	DIODE	
1FU	FUSE, 15A (COMES W/ ENGINE)	
2FU	FUSE, 10A (CONTROL CIRCUIT)	
3FU	FUSE, 10A (SPEED SOLENOID)	
1HM	HOURMETER (STANDARD W/ GAUGE PANEL)	(OPTIONAL)
1LT	COMPRESSOR LOW OIL LIGHT (RED)	
2LT	COMPRESSOR HIGH TEMP. LIGHT (RED)	
3LT	HIGH CO LIGHT (RED)	(OPTIONAL)
1PCB	PRINTED CIRCUIT BOARD	
1PS	AIR PRESSURE SWITCH	
2PS	LOW OIL PRES. SWITCH (COMPRESSOR)	
1SC	SECURUS CONTROL	(OPTIONAL)
1SOL	SOLENOID (START)	
2SOL	SOLENOID (SPEED)	
3SOL	SOLENOID (RUNNING)	
4SOL	SOLENOID (A.C.D.) 2ND & 3RD STAGE	(OPTIONAL)
5SOL	CO MONITOR SOLENOID VALVE	(OPTIONAL)
1SS	SELECTOR SWITCH (OFF/RUN/START)	
1STR	STARTER	
1TGS	TOGGLE SWITCH (OFF/DRAIN)	(OPTIONAL)
2TGS	TOGGLE SWITCH (OFF/ON) CO MONITOR	(OPTIONAL)
1TMR	A.C.D. TIMER, 2ND & 3RD STAGE	(OPTIONAL)
1TS	HIGH TEMP. SWITCH (COMPRESSOR)	

NOTES:

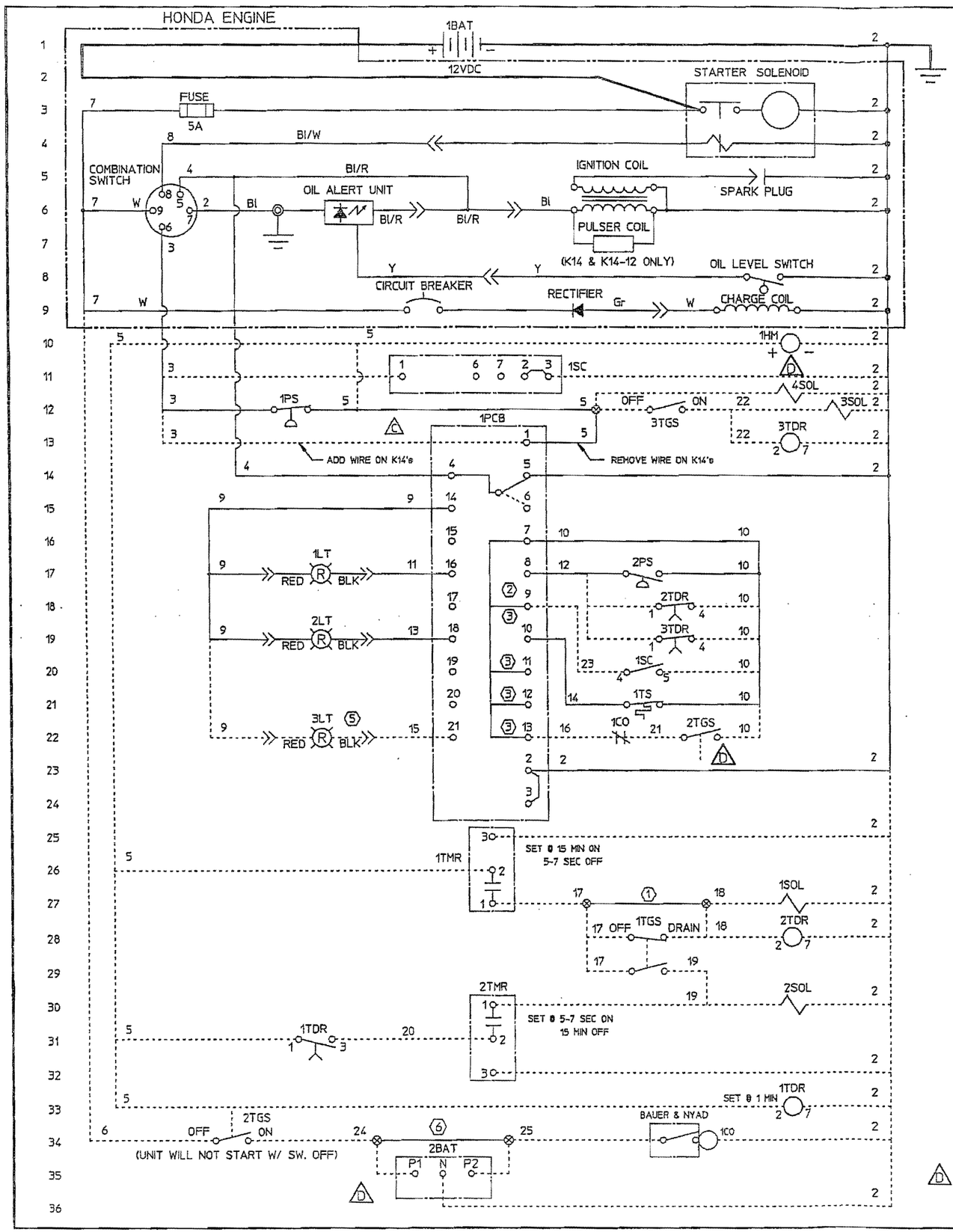
1. REMOVE JUMPER WHEN ADDING 1TGS.
2. REACTION TO SENSOR TERMINALS, #8 AND #9, IS TIME DELAYED FOR STARTING.
3. REMOVE SHUNT ON PRINTED CIRCUIT BOARD WHEN ADDING OPTIONAL FEATURES.
5. USE 3LT WHEN CO MONITOR IS NOT MOUNTED ON FRONT OF THE UNIT.
6. REMOVE JUMPER WHEN USING NYAD CO MONITOR.



SELECTOR SWITCH

BAT	ACC	ING	ST
ACC	X	0	0
OFF	0	0	0
RUN	X	X	0
START	0	X	X

DRAWN BY: TR	BAUER COMPRESSORS, INC. NORFOLK, VIRGINIA
DATE: 11-10-93	
APVD. BY: VSL	
DATE: 1-18-94	TITLE: WIRING DIAGRAM
SCALE: –	
PAINT: –	USAGE: U.C & M DIESEL (YANMAR) WITH OPTS, PCB & ES
CAGE NUMBER: 57328	DRAWING NUMBER: DGM-0587 SHT. 1 OF 1



USE #16 AWG ON ALL CONTROL CIRCUIT WIRING, UNLESS OTHERWISE NOTED

ISSUE	REVISION	DATE	BY	APVD.
A	REFERENCE ECN#1570	7-11-94	TR	VSL
B	REF ECN #1947	6-14-95	JB	J B
C	REF ECN #1983	7-27-95	TR	J B
D	REF ECO #3450	5-10-00	TR	JB

(LEGEND)

ITEM	DESCRIPTION	
1BAT	BATTERY, 12VDC (CUSTOMER SUPPLY)	
2BAT	BATTERY, CO MONITOR	(OPTIONAL)
1CO	HIGH CO MONITOR	(OPTIONAL)
1HM	HOURMETER (STANDARD WITH GAUGE PANEL)	(OPTIONAL)
1LT	COMPRESSOR LOW OIL LIGHT (RED)	
2LT	COMPRESSOR HIGH TEMP. LIGHT (RED)	
3LT	HIGH CO LIGHT (RED)	(OPTIONAL)
1PCB	PRINTED CIRCUIT BOARD	
1PS	AIR PRESSURE SWITCH	
2PS	LOW OIL PRES. SWITCH (COMPRESSOR)	
1SC	SECURUS CONTROL	(OPTIONAL)
1SOL	A.C.D. SOLENOID, 2ND & 3RD STAGE	(OPTIONAL)
2SOL	A.C.D. SOLENOID, 3RD & 4TH STAGE (K14.11 ONLY)	
3SOL	SPEED SOLENOID (K14's ONLY)	
4SOL	CO MONITOR SOLENOID VALVE	(OPTIONAL)
1TGS	TOGGLE SWITCH (OFF/DRAIN)	(OPTIONAL)
2TGS	TOGGLE SWITCH (OFF/ON) CO MONITOR	(OPTIONAL)
3TGS	TOGGLE SWITCH (SPEED CONTROL, K14's ONLY)	
1TMR	A.C.D. TIMER, 2ND & 3RD STAGE	(OPTIONAL)
2TMR	A.C.D. TIMER, 3RD & 4TH STAGE (K14.11 ONLY)	
1TDR/2TDR	TIME DELAY RELAY, DELAY ON MAKE (K14.11 ONLY)	
3TDR	TIME DELAY RELAY, DELAY ON MAKE (K14's ONLY)	
1TS	HIGH TEMP. SWITCH (COMPRESSOR)	

NOTES:

1. REMOVE JUMPER WHEN ADDING 1TGS.
2. REACTION TO SENSOR TERMINALS #8 & #9 IS TIME DELAYED FOR STARTING.
3. REMOVE SHUNT ON PRINTED CIRCUIT BOARD WHEN ADDING OPTIONAL FEATURES.

5. USE 3LT WHEN CO MONITOR IS NOT MOUNTED ON FRONT OF THE UNIT.
6. REMOVE JUMPER WHEN USING NYAD CO MONITOR.

COMBINATION SWITCH

	IG 5	E 7	ST 8	BAT 9	ON 6
OFF	o—o				
RUN				o—o	o—o
START			o—o	o—o	o—o

Bl	BLACK	Gr	GRAY
Y	YELLOW	R	RED
W	WHITE	G	GREEN

DRAWN BY:	TR
DATE:	11-2-93
APVD. BY:	VSL
DATE:	12-15-93
SCALE:	–
PAINT:	–
CAGE NUMBER:	57328

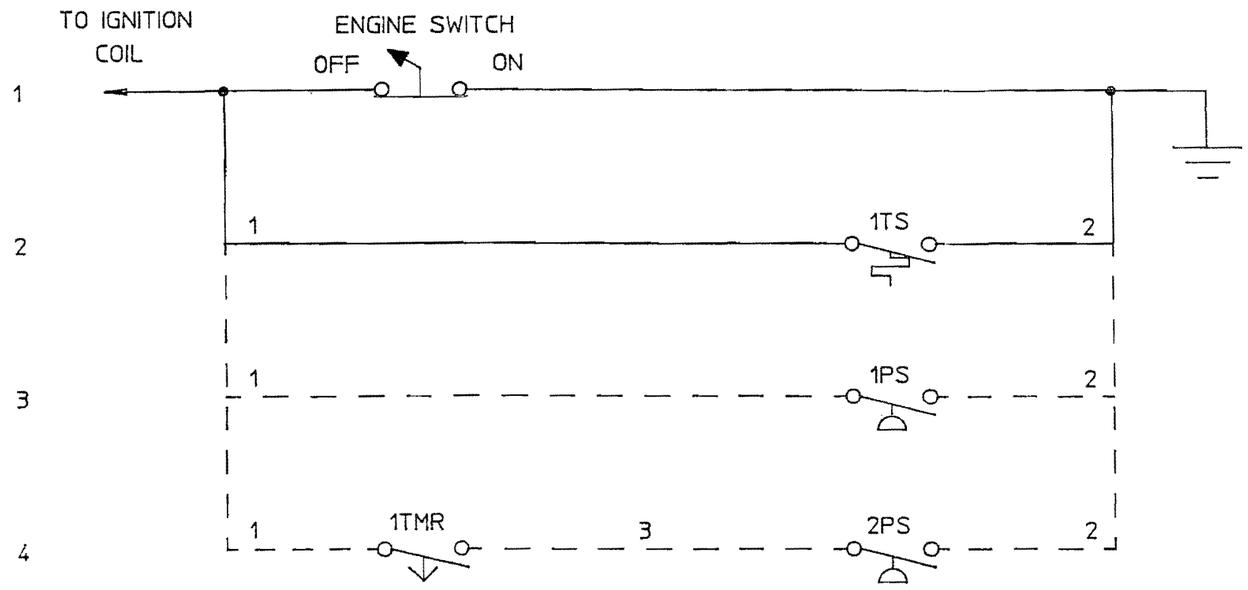
BAUER COMPRESSORS, INC.
NORFOLK, VIRGINIA

TITLE: WIRING DIAGRAM

USAGE: U, C, M, K14, K14.11 & K14-12 GAS (HONDA) WITH OPTS, ES & PCB

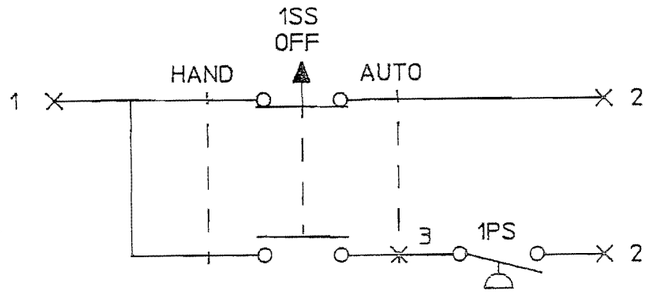
DRAWING NUMBER: DGM-0589 SHT. 1 OF 1

ISSUE	REVISION	DATE	BY	APVD.



LEGEND

ITEM	DESCRIPTION	
1PS	AIR PRESSURE SWITCH	(OPTIONAL)
2PS	LOW OIL PRESSURE SWITCH (COMP)	(OPTIONAL)
1SS	SELECTOR SWITCH (HAND/OFF/AUTO)	(OPTIONAL)
1TMR	LOW OIL BYPASS TIMER	(OPTIONAL)
1TS	HIGH TEMPERATURE SWITCH	

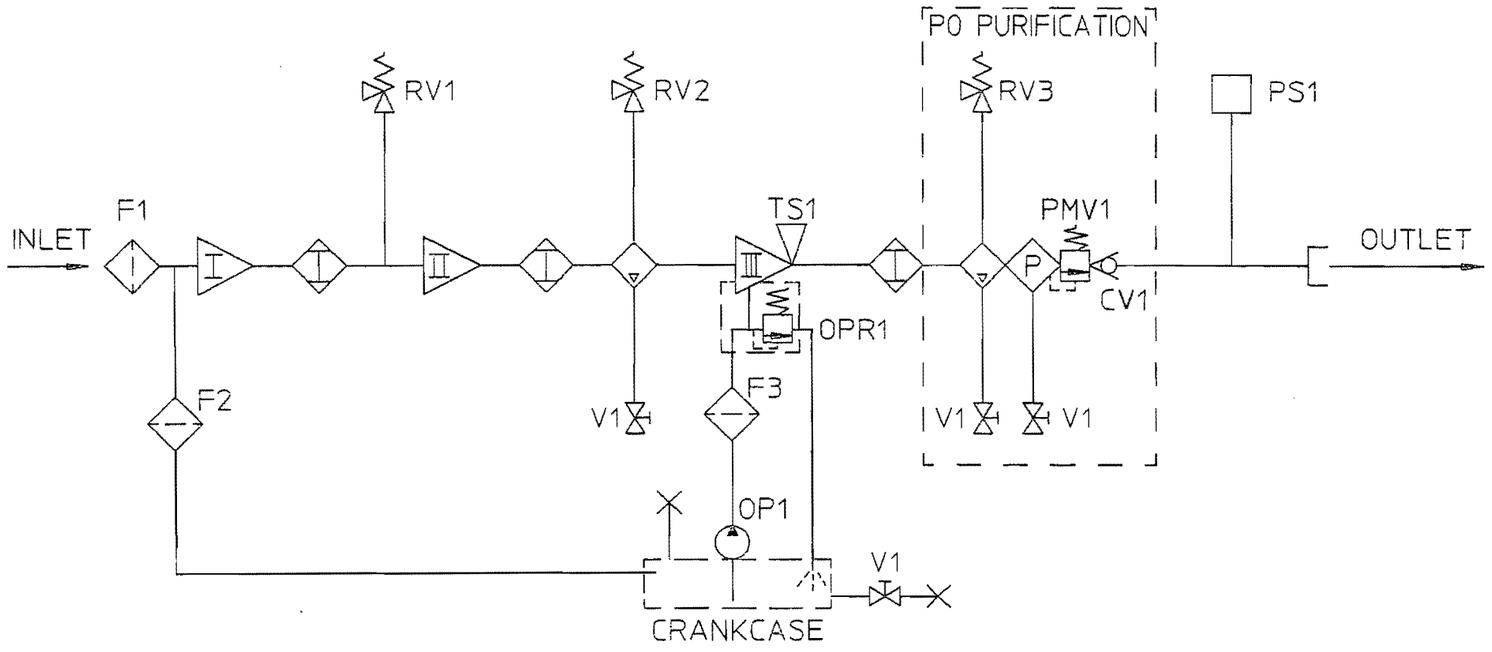


FOR OPTIONAL 3-WAY SWITCH
AND AIR PRESSURE SWITCH

USE #16 AWG UNLESS OTHERWISE NOTED

DRAWN BY: TR	BAUER COMPRESSORS, INC. NORFOLK, VIRGINIA
DATE: 11-8-93	
APVD. BY: VSL	TITLE: WIRING DIAGRAM
DATE: 12-15-93	
SCALE: -	
PAINT: -	USAGE: U,C & M - G W/HONDA ENG. & OPTS
CAGE NUMBER : 57328	DRAWING NUMBER : DGM-0590 SHT. 1 OF 1

ISSUE	REVISION	DATE	BY	APVD.
A	REFERENCE ECN #1798	2-9-95	TD	JH



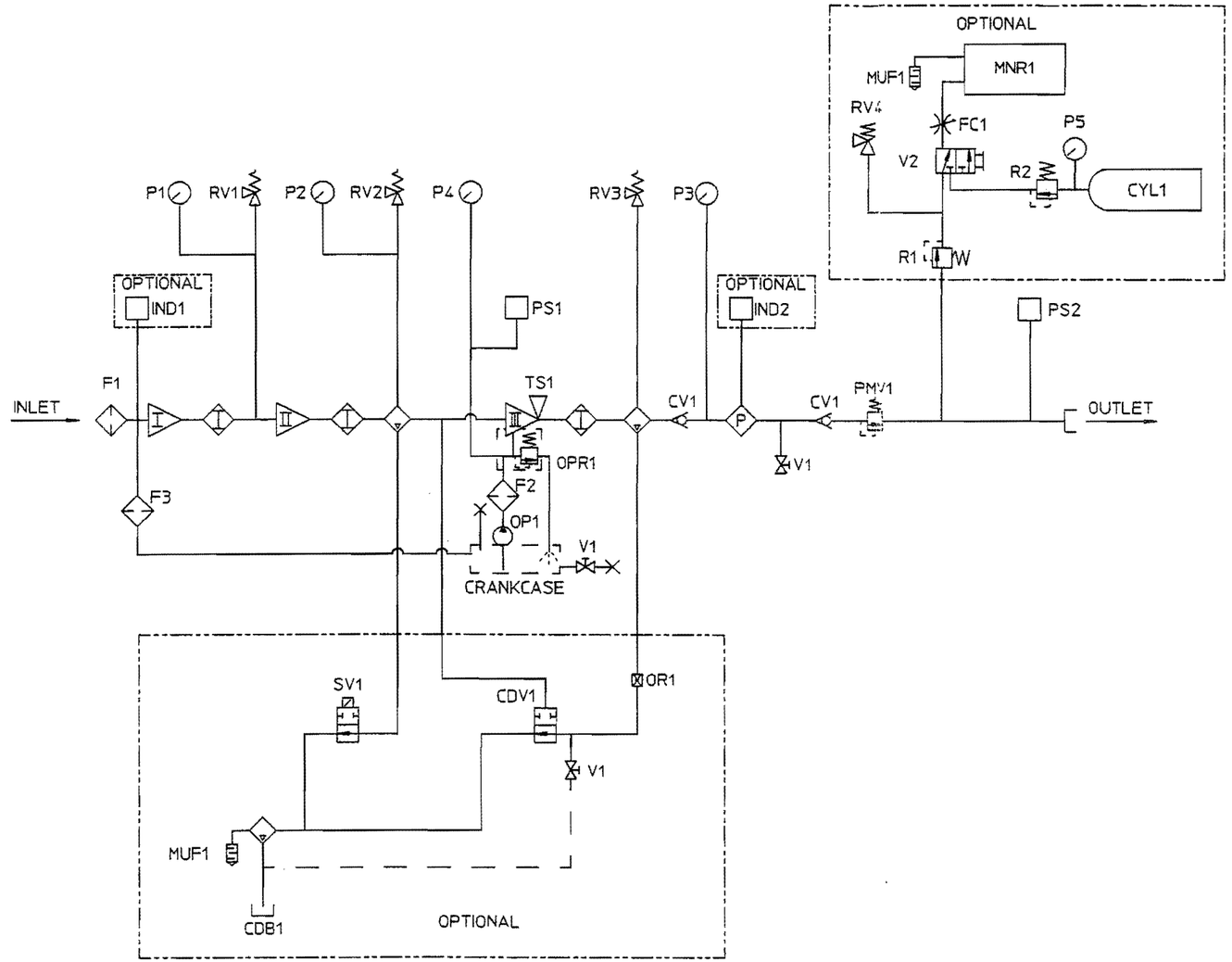
V1	DRAIN/BLEED VALVE
TS1	TEMPERATURE SWITCH
RV3	THIRD STAGE RELIEF VALVE
RV2	SECOND STAGE RELIEF VALVE
RV1	FIRST STAGE RELIEF VALVE
PS1	FINAL PRESSURE SWITCH
PMV1	PRESSURE MAINTAINING VALVE
OPR1	OIL PRESSURE REGULATOR
OP1	OIL PUMP
F3	OIL FILTER
F2	CRANKCASE VENT FILTER
F1	INTAKE FILTER
CV1	CHECK VALVE
P	PURIFIER/DRYER CHAMBER
	CONDENSATE SEPARATOR
	INTERCOOLER/AFTERCOOLER
II	COMPRESSOR STAGE

NOTES:
OIL DRAIN VALVE NOT SUPPLIED ON VERTICAL MODELS.

REFERENCE DGM-370 FOR UTILUS/ CAPITANO/MARINER W/OPTIONS.

DRAWN BY: DAB	BAUER COMPRESSORS, INC. NORFOLK, VIRGINIA
DATE: 3-5-93	
APVD. BY: JB	
DATE: 4-16-93	TITLE: FLOW DIAGRAM
SCALE: -	
PAINT: -	USAGE: UTILUS/CAPITANO/MARINER STANDARD
CAGE NUMBER : 57328	DRAWING NUMBER : DGM-0637 SHT. 1 OF 1

ISSUE	REVISION	DATE	BY	APVD.
A	REFERENCE ECN #1180	3-4-93	DAB	JB
B	REFERENCE ECN #1798	2-9-95	TD	



V2	CO MONITOR TEST VALVE
V1	DRAIN/BLEED VALVE
TS1	TEMPERATURE SWITCH
SV1	ACD SOLENOID VALVE
RV4	CO MONITOR RELIEF VALVE
RV3	THIRD STAGE RELIEF VALVE
RV2	SECOND STAGE RELIEF VALVE
RV1	FIRST STAGE RELIEF VALVE
R2	CO MONITOR TEST GAS CYLINDER PRESSURE REGULATOR
R1	CO MONITOR REGULATOR
PS2	FINAL PRESSURE SWITCH
PS1	OIL PRESSURE SWITCH
PMV1	PRESSURE MAINTAINING VALVE
P5	CO MONITOR TEST GAS CYLINDER PRESSURE GAUGE
P4	OIL PRESSURE GAUGE
P3	THIRD STAGE PRESSURE GAUGE
P2	SECOND STAGE PRESSURE GAUGE
P1	FIRST STAGE PRESSURE GAUGE
OR1	ORIFICE FITTING
OPR1	OIL PRESSURE REGULATOR
OP1	OIL PUMP
MUF1	EXHAUST MUFFLER
MNR1	CO MONITOR
IND2	SECURUS INDICATOR
IND1	INLET FILTER MAINTENANCE INDICATOR
FC1	FLOW CONTROL VALVE
F3	CRANKCASE VENT FILTER
F2	OIL FILTER
F1	INTAKE FILTER
CYL1	CO MONITOR TEST GAS CYLINDER
CV1	CHECK VALVE
CDV1	CONDENSATE DRAIN VALVE
CDB1	CONDENSATE DRAIN BOTTLE
P	PURIFICATION
	CONDENSATE SEPARATOR
	INTERCOOLER/AFTERCOOLER
II	COMPRESSOR STAGE

NOTES:
OIL DRAIN VALVE NOT SUPPLIED ON VERTICAL MODELS.

REFERENCE DGM-637 FOR UTILUS/ CAPITANO/MARINER, STANDARD.

DRAWN BY: DAB	BAUER COMPRESSORS, INC. NORFOLK, VIRGINIA	
DATE: 3-4-93		
APVD. BY: JB	TITLE: FLOW DIAGRAM	
DATE: 4-16-94		
SCALE: -		
PAINT: -	USAGE: UTILUS/CAPITANO/MARINER W/OPTIONS	
CAGE NUMBER: 57328	DRAWING NUMBER: DGM-0370	SHT. 1 OF 1