

OIL-LESS COMPRESSOR OPERATION AND INSTRUCTION MANUAL

OIL-LESS COMPRESSOR MODELS

OL 512	SINGLE STAGE	3 H.P.
OL 512	SINGLE STAGE	5 H.P.
OL 524	TWO STAGE	5 H.P.
OL 812	SINGLE STAGE	7 1/2 H.P.
OL 812	SINGLE STAGE	10 H.P.

CAUTION

Before installing this compressor, read and understand the safety precautions contained within this manual

CURTIS - TOLEDO, INC.

1905 Kienlen Avenue, St. Louis, Missouri 63133,
PHONE(314)383-1300 ----- FAX (314)381-1439

SCREWDRIVERS

Instruction Manual Oil-Less Compressors

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INTRODUCTION

THIS MANUAL CONTAINS OPERATION AND MAINTENANCE SCHEDULES FOR THE OIL-LESS COMPRESSOR MODELS:

OL 512

OL 524

OL 812

ALL INSTRUCTIONS SHOULD BE OBSERVED AND CARRIED OUT IN THE ORDER LAID DOWN TO PREVENT DAMAGE AND PREMATURE WEAR TO THE EQUIPMENT AND THE COMPRESSORS SERVED BY IT.

WHILE EVERY EFFORT IS MADE TO ENSURE THE ACCURACY OF THE PARTICULARS CONTAINED IN THIS MANUAL, THE MANUFACTURING COMPANY WILL NOT, UNDER ANY CIRCUMSTANCES, BE HELD LIABLE FOR ANY INACCURACIES OR THE CONSEQUENCES THEREOF.

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SAFETY

At Curtis-Toledo, Inc. safety is a primary concern. Beginning with the design stage, safety is built into every "Curtis Compressor". It is the purpose of this manual to pass along the "safety first" concept to you by providing safety precautions throughout its pages.

"**WARNING!**", "**CAUTION!**", and "**DANGER!**" are displayed in large bold capital letters to call attention to areas of vital concern. They represent different degrees of hazard seriousness, as stated below. The safety precaution is spelled out in bold upper and lower case letters.

DANGER!

Immediate hazards which result in severe personal injury or death.

WARNING!

Hazards or unsafe practices that could result in personal injury or death.

CAUTION!

Hazards or unsafe practices which could result in minor personal injury, product or property damage.

Each section of the operating instruction manual, as well as any instructions supplied by manufacturers of supporting equipment, should be read and understood prior to starting the compressor. If there are any questions regarding any part of the instructions, please call your local Curtis-Toledo Distributor, or the Curtis-Toledo factory before creating a potentially hazardous situation. Life, limb, or equipment could be saved with a simple phone call, (314) 383-1300.

SAFETY PRECAUTIONS

The owner, lessor or operator of any compressor unit manufactured by Curtis-Toledo, Inc. is hereby warned that failure to observe all safety precautions may result in serious injury to personnel and/or damage to property.

Curtis-Toledo, Inc. neither states as fact, nor in any way implies that this list of safety precautions is an all inclusive list, the observance of which will prevent all damage to property or injury to personnel.

Every reasonable effort has been taken to ensure that complete and correct instructions have been included in this manual. However, possible updates and changes may have occurred since this printing. Curtis-Toledo, Inc. reserves the right to change specifications, without incurring any obligation for equipment previously or subsequently sold.

Compressors and/or units are assembled to comply with the customer's purchase order and in compliance with Curtis-Toledo, Inc. specifications; alteration must not be made to the compressor or unit without Curtis-Toledo written approval.

Provisions must be made by the owner, lessor or operator to have a pressure reducing regulator valve with air gauge in each service line to supply safe and proper air pressure for the various use and applications.

When supplying air pressure direct from air compressor to a tire chuck for public or operator use to inflate tires and so forth, a safety precaution sign in large bold print must be posted in plain view at tire chuck location, "**DANGER, AIR PRESSURE FROM THIS CHUCK MAY EXCEED SAFE PRESSURE FOR TIRES AND RELATED EQUIPMENT**". A hand operated gauge must be used to measure and not exceed safe inflated pressure.

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DANGER!

Air used for breathing or food processing must meet O.S.H.A. 29 C.F.R. 1910.134 or F.D.A. 21 C.F.R. 178.350 regulations. Failure to do so will cause severe injury or death.

WARNING!

Compressors are precision high speed mechanical equipment requiring caution in operation to minimize hazard to property and personnel. There are many obvious safety rules that must be observed in the operation of this type of equipment. Listed below (in no particular order) are some additional safety precautions that must be observed.

- Transfer of toxic, dangerous, flammable or explosive substances using Curtis-Toledo products is at the User's risk.
- Turn off and lockout/tagout the main power disconnect switch before attempting to work or perform any maintenance.
- Do not attempt to service any part of this unit while it is running.
- Relieve the system of all pressure before attempting to service any part of the unit.
- Do not operate the unit with any of its safety guards, shields, or screens removed.
- Do not remove or paint over any DANGER!, WARNING!, CAUTION!, or Instructional materials attached to the compressor. Lack of information regarding hazardous conditions can cause property damage or personal injury.
- Periodically check all pressure relief valves for proper operation.
- Do not change the pressure setting of the pressure relief valve, restrict the function of the pressure relief valve, or replace the pressure relief valve with a plug.
- Do not install a shutoff valve in the compressor discharge line without first installing a pressure relief valve of proper size and design between the shutoff valve and the compressor.
- Do not use plastic pipe, rubber hose, or lead-tin soldered joints in any part of the compressed air system.
- Alterations must not be made to this compressor without Curtis-Toledo's approval.
- Be sure that all tools, shipping and installation debris have been removed from the compressor and installation site prior to starting the compressor.
- Do not operate the compressor in excess of the A.S.M.E. pressure vessel rating for the receiver or the service rating of the compressor, whichever is lower.
- Make a general overall inspection of the unit daily and correct any unsafe situations.
- "Horseplay" of any kind involving compressed air is dangerous and can cause very serious injury to the participants.
- Do not touch the compressor during or after operation-it may be HOT
- Provisions should be made to have the instruction manual readily available to the operator and maintenance personnel. If for any reason any part of the manual becomes illegible or the manual is lost, have it replaced immediately. The instruction manual should be read periodically to refresh one's memory. It may prevent a serious or fatal accident.
- It is recommended sufficient clean-up equipment be provided and proper maintenance be performed to ensure clean, dry, oil-free air for instrumentation.

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RECEIVING DELIVERY

Immediately upon receipt of compressor equipment and prior to completely uncrating, the following steps should be taken:

1. Inspect compressor equipment for damage that may have occurred during shipment. If any damage is found, demand an inspection from the carrier. Ask the carrier how to file a claim for shipping damages. (Refer to FREIGHT DAMAGE for complete details.) Shipping damage is not covered by Curtis-Toledo's compressor warranty.

CAUTION!

Improper lifting can result in component or system damage or personal injury. Follow good shop practices and safety procedures when moving the unit.

2. Ensure that adequate lifting equipment is available for moving the compressor equipment.

3. Read the compressor nameplate to verify the model and size ordered.

4. Read the motor nameplate to be sure the motor is compatible with your electrical conditions (volts, phase, hertz).

5. Read the pressure relief valve nameplate to be sure it does not exceed the working pressure of the compressor or any other component in the system.

6. Read and understand the safety precautions contained within this manual. The successful and efficient operation of compressor equipment depends largely upon the amount of care taken to install and maintain the equipment. Curtis-Toledo strongly recommends that any or all person(s) in charge of installing, maintaining, or servicing one of our compressors read and understand entire contents of this manual and the respective compressor installation and operating instruction manual in order to perform such duties safely and efficiently.

FREIGHT DAMAGE

The transportation industry has adopted a modification with regard to the handling of obvious and concealed damage claims. Therefore, it is extremely important that you examine every carton and crate as soon as you receive it. If there is any obvious damage to the shipping container, have the delivering carrier sign the freight bill, noting the apparent damage, and request a damage report.

If concealed damage is discovered at a later date, the carrier must be notified within 15 days of initial receipt of freight. Contact the carrier as soon as possible, giving them an opportunity to inspect the shipment at the premises where the delivery was made. Do not move the damaged freight from the premises where the original delivery was made. Retain all containers and packing for inspection by the carrier.

INSTALLATION

Curtis-Toledo's air compressors should be installed in an area that is clean, well lighted, and adequately ventilated. Inspection and maintenance checks are required daily. Therefore, sufficient space needs to be provided around the compressor for safe and proper inspection, cleaning, and maintenance.

The compressor must not be installed closer than 15 inches to a wall, or 24 inches to another compressor. This allows ample circulation of air across the compressor cylinders, heads and cooler (if so equipped). If at all possible, the pulley drive system (i.e. motor pulley, compressor pulley, belts and guard) should be located next to a wall to minimize any danger created by the drive system while the compressor is operating.

Due to standard motor limitations, it is recommended that the compressor be operated in temperatures under 104° F. In cold climates, the compressor should be installed in a heated building.

CAUTION!

Do not operate this compressor in ambient temperatures lower than -15° F. A crankcase heater is recommended for a compressor that is to operate in temperatures under 32° F.

WARNING!

Under no circumstances should a compressor be used in an area that may be exposed to toxic, volatile, or corrosive atmosphere, Do not store toxic, volatile, or corrosive agents near the compressor

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ELECTRICAL SUPPLY REQUIREMENTS

The electrical installation of this unit should be performed by a qualified electrician with knowledge of the National Electrical Code (N.E.C.), O.S.H.A. code and/or any local or state codes having precedence.

Before installation, the electrical supply should be checked for adequate wire size and transformer capacity. A suitable circuit breaker or fused disconnect switch should be provided. When a 3-phase motor is used to drive a compressor, any unreasonable voltage imbalance between the legs must be eliminated and any low voltage corrected to prevent excessive current draw. **Note:** This unit must be grounded.

The installation, electric motor, wiring, and all electrical controls must be in accordance with NFPA 70-1 84 National Electric Code, National Electric Safety Code, state and local codes. Failure to abide by the national, state and local codes may

result in physical harm and/or property damage. Do not bypass motor overcurrent protection.

DANGER!

High voltage may cause personal injury or death, per O.S.H.A. regulations 1910.137, disconnect and lockout/tagout all electrical Dower supplies before opening the electrical enclosure or servicing.

WARNING!

Never assume a compressor is safe to work on just because it is not operating. It could restart at any time. Follow all safety precautions outlined. NEMA electrical enclosures and components must be appropriate to the area installed.

START-UP PROCEDURES

If the compressor is equipped with an automatic start-stop control (with pressure switch unloading), it is automatically unloaded upon starting, and will automatically load after attaining running speed. If the compressor is equipped with a constant speed control (pilot valve unloading), it is necessary to manually unload the compressor, if there is pressure in the discharge line, in order to achieve an unloaded start. The compressor must be manually loaded after the compressor has attained full running speed; thereafter, it functions automatically to maintain operation pressure until the unit is shut off.

Close the disconnect switch and start the compressor. Observe the direction of rotation, which should be counterclockwise when viewed from the flywheel side of the compressor on all models. For single-phase units, the direction of rotation is determined by the motor nameplate instructions, and is adjusted at the factory. For three-phase units, if the rotation is incorrect, stop the unit and interchange any two of the three wires to the motor at the disconnect switch. This will reverse the direction of rotation of the motor and compressor .

AIR INLET SYSTEM

AIR INTAKE

A clean, cool and dry air supply is essential to the satisfactory operation of your Curtis-Toledo air compressor. The standard air filter that the compressor is equipped with when leaving the factory is of sufficient size and design to meet normal conditions, when properly serviced, in accordance with the maintenance section of this manual.

If, however, the compressor is to be installed in a location where considerable dust, dirt and other contaminants are prevalent, consult your Curtis Toledo Distributor for advice and optional filters. It is the User's responsibility to provide adequate filtration for those conditions. Oil bath filters are not to be used. Warranty will be void if a failure is determined to be caused by inadequate filtration.

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REMOTE INLET FILTERS

Depending on the size of the compressor and the size and construction of the room in which the unit operates, the air inlet may have to be located outside of the room. If it is necessary to remotely install the air filter, make the inlet piping as short and direct as possible. Remotely installed air filters can lead to vibrations in the inlet piping. These vibrations can be minimized by adding a pulsation dampener in the inlet piping between the remote inlet filter(s) and the compressor.

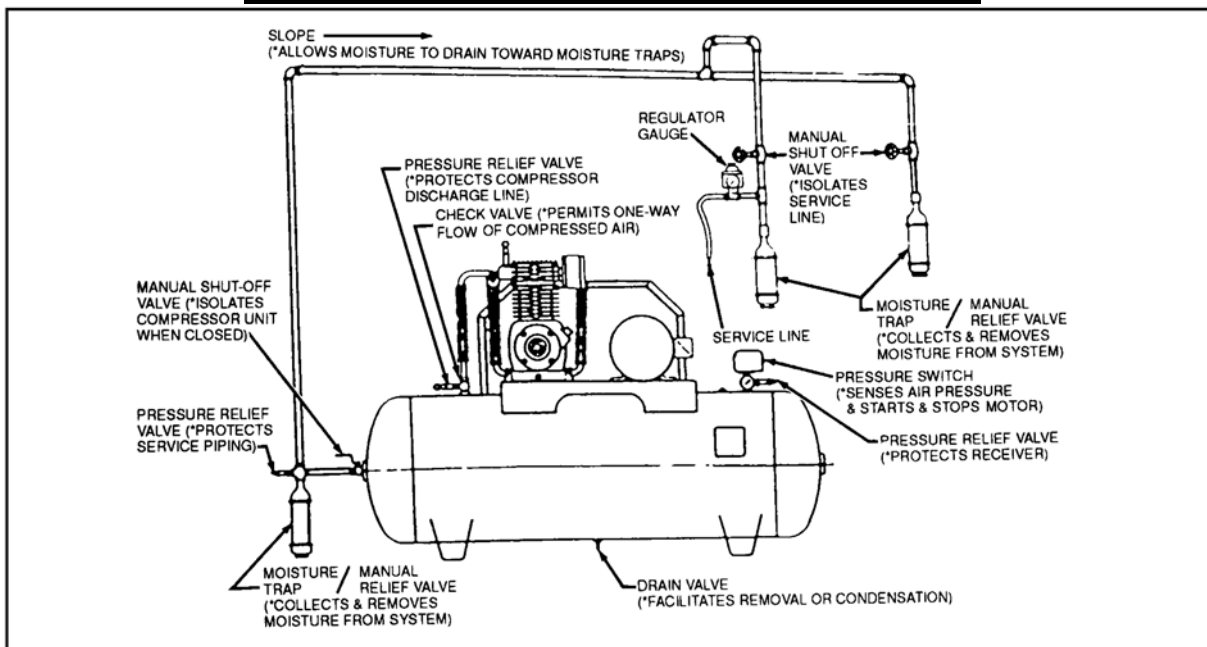
If the Intake is piped to outside atmosphere, a hooded filter should be installed to prevent water or snow from being ingested into the compressor.

All inlet piping should be at least the same size (or larger) in diameter as the inlet connection to the compressor. For every 10 feet of inlet piping or every 90° bend, increase the inlet piping diameter by one pipe size. The inlet piping must be thoroughly clean inside. Remove all weld slag, rust or dirt. Galvanized pipe with threaded or flanged fittings is preferred.

CAUTION!

Never locate the compressor air inlet system where toxic, volatile or corrosive vapors, air temperatures exceeding 104°F., water, or extremely dirty air could be ingested. These types of atmospheres could adversely affect the performance of the compressor system.

COMPRESSED AIR DISCHARGE SYSTEM



Typical Drop Leg & Component Location

The discharge piping should be of the same diameter as the compressor discharge connection, or sized so that the pressure drop at any point in the system does not exceed 10% of the air receiver pressure. Install auxiliary air receivers near heavy loads or at the far end of a long system. This will insure sufficient pressure if the use is intermittent, or sudden large demands are placed on the system.

Discharge piping should slope to a drop leg (refer to TYPICAL DROP LEG & COMPONENT LOCATION) or moisture trap to provide a collection point where moisture can be easily removed. All service line outlets should be installed above the moisture traps to prevent moisture from entering the tool or

device using the air. Manual shutoff valves, protected by pressure relief valves, should be installed at all service line outlets to eliminate leakage while the tools are not in use.

As with any piping, all parts of the discharge piping should fit so as not to create any stress between the piping and components.

WARNING!

Never join pipes or fittings with lead-tin soldering. Welded or threaded steel pipes and cast iron fittings, designed for the pressures and temperatures, are recommended.

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SYSTEM COMPONENTS

Efficiency and safety are the primary concerns when selecting components for compressed air systems. Products of inferior quality can not only hinder performance of the unit, but could cause system failures that result in bodily harm or even death. Select only top quality components for your system. Call your local Curtis-Toledo Distributor for quality parts and professional advise.

DRIVE PULLEYS

Drive pulleys must be properly aligned and drive belt tension set to specifications (refer to PULLEY ALIGNMENT & BELT TENSION). Improper pulley alignment and belt tension can cause motor overloading, excessive vibration, and premature belt and/or bearing failure.

DANGER!

Excessive compressor RPM's (speed) could cause a pulley to burst. In an Instant, the pulley could separate into fragments capable of penetrating the belt guard and causing bodily harm or death. Do not operate the compressor above the recommended RPM.

GUARDS

All mechanical action or motion is hazardous in varying degrees and needs to be guarded. Guards should be designed to achieve the required degree of protection and still allow full air flow from the compressor sheave across the unit. Guards shall be in compliance with OSHA safety and health standards 29 CFR 1910.219 in OSHA manual 2206 and any state or local codes.

WARNING!

Guards must be fastened in place before starting the compressor and never removed before cutting off and locking out the main power supply.

CHECK VALVES

Check valves are designed to prevent back-flow of air pressure in the compressed air system (air flows freely in one direction only). The check valve must be properly sized for air flow and temperature. Do not rely upon a check valve to isolate a compressor from a pressurized tank or compressed air delivery system during maintenance procedures!

MANUAL SHUTOFF VALVES

Manual shutoff valves block the flow of air pressure in either direction. This type of valve can be used to isolate a compressor from pressurized system, provided the system is equipped with a pressure relief valve capable of being manually released. The pressure relief valve should be

installed between the manual shutoff valve and the compressor.

PRESSURE RELIEF VALVES

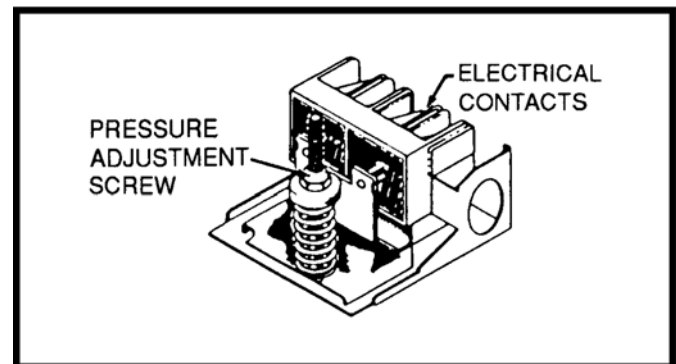
Pressure relief valves aid in preventing system failures by relieving system pressure when compressed air reaches a determined level. They are available in various pressure settings to accommodate a range of applications. A check valve and pressure relief valve are required in all compressor discharge lines. Pressure relief valves are preset by the manufacturer and under no circumstances should the setting be changed by anyone other than the manufacturer.

DANGER!

Pressure relief valves are designed to protect compressed air systems in accordance with ASME B19 safety standards. Failure to provide properly sized pressure relief valves may cause property damage, severe personal injury or even death.

PRESSURE SWITCH

The pressure switch detects the demand for compressed air and allows the motor to start. When the demand is satisfied, the unit stops. Pressure switches provided by Curtis-Toledo are pre-set at the factory and usually do not require adjustment. However, if adjustment is required (by qualified electrician) refer to instructions inside cover of switch housing,



WARNING!

The maximum discharge pressure for the various models are established by the Curtis performance data. Do not set the pressure switch or regulators to exceed the design limit.

WARNING!

Electric power always exists inside the pressure switch whenever the compressor package is connected to a power supply. Be careful not to touch any electrical leads when setting the pressure switch.

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SYSTEM COMPONENTS (CONTINUED)

WARNING!

Never exceed the designed pressure for the system or overload the motor beyond its Maximum Amp Draw.

- Full Load Amps x Service Factor = Maximum Amp Draw.
- Full Load Amps (FLA) & Service Factor can normally be found on motor nameplate.

WARNING!

Never assume a compressor is safe to work on just because it is not operating. It may be in the automatic stand-by mode and may restart any time. Follow all safety precautions outlined in STOPPING FOR MAINTENANCE.

STOPPING FOR MAINTENANCE

The following procedures should be followed when stopping the compressor for maintenance or service.

WARNING!

Never assume a compressor is safe to work on just because it is not operating. It could start at any time.

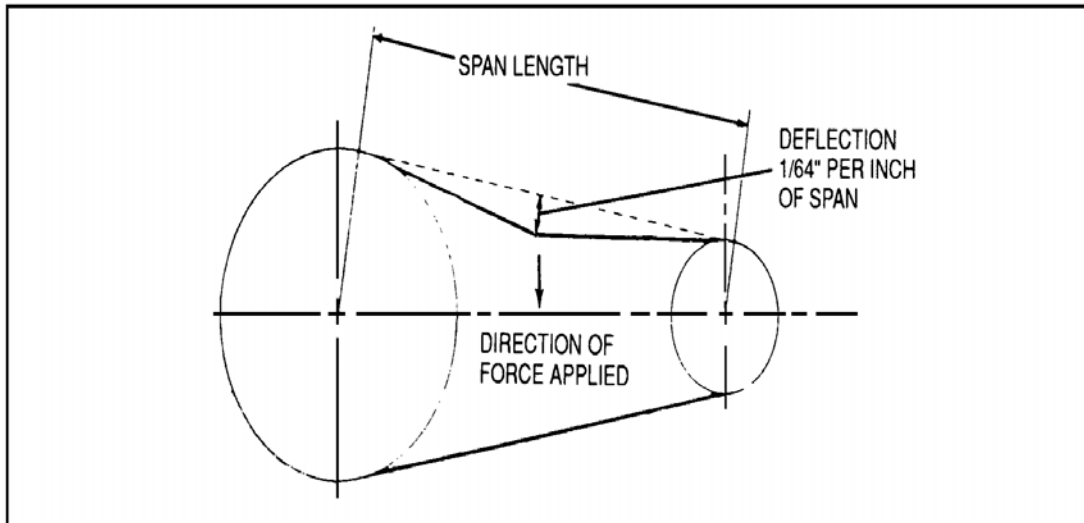
1. Per O.S.H.A. regulation 1910.147: The Control of Hazardous Energy Source (Lockout/Tagout), disconnect and lockout the main power source. Display a sign in clear view at the main power switch that the compressor is being serviced.
2. Isolate the compressor from the compressed air supply by closing a manual shutoff valve upstream and downstream from

the compressor. Display a sign in clear view at the shutoff valve stating that the compressor is being serviced.

3. Lock open a pressure relief valve within the pressurized system to allow the system to be completely de-pressurized. NEVER remove a plug to relieve the pressure!
4. Open all manual drain valves within the area to be serviced.
5. Wait for the unit to cool before starting to service. (Temperatures of 125°F can burn skin. Some surface temperatures exceed 350°F when the compressor is operating.)

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PULLEY ALIGNMENT & BELT TENSION



Setting Belt Tension

Improper pulley alignment and belt tension are causes for motor overloading, excessive vibration and premature belt and/or bearing failure. To prevent this from happening, check the pulley alignment and belt tension on a regular basis.

At this time, inspect both the motor and compressor pulleys for oil, grease, nicks or burrs. Clean or replace pulleys if necessary. Make sure the pulleys are securely fastened. Align the compressor pulley with the motor or engine pulley. Drive belt grooves of both pulleys should be in line with each-other.

Belt tension should be measured and adjusted to provide smooth operation. Step-by-step procedures are provided here to correctly measure and set the drive belt tension:

1. Measure the span length of the drive. (Refer to MAINTENANCE SCHEDULE.) See instructions in the respective model manual.

2. Determine the amount of deflection (in inches) required to measure deflection force (in pounds) by multiplying the span length \times 1/64 (i.e. 32" span length \times 1/64 = 1/2" of deflection required to measure deflection force).

3. Lay a straightedge across the top outer surface of a drive belt from pulley to pulley.

4. At the center of the span, perpendicular to the belt, apply pressure to the outer surface of the belt with a belt tension gauge. Force the belt to the predetermined deflection (refer to Step 2). Record the reading on the belt tension gauge and compare to the chart. The deflection force reading should be within the minimum and maximum values shown. Adjust belt(s) accordingly. A new belt (or new belt set) should be initially tensioned 1/3 greater than the maximum value.

5. Recheck the tension of the new belts several times in the first 50 hours of operation and adjust if necessary. Thereafter, check belt tension on a regular basis.

Instruction Manual Oil-Less Compressors

1. GENERAL

1.1. PURPOSE AND SHORT DESCRIPTION

The 1-stage oil-less compressor model OL 512, and OL 812, as well as the 2-stage oil-less compressor model OL 524, are used to compress air in the pressure ranges up to 110 psi (1-stage compressor models) to 220 psi (2-stage compressor models)

All compressors operate with three cylinders and are air-cooled (Fig. 1 to Fig. 4). The cylinders are set in Y-configuration, allowing for a small compact design.

A special feature of these models are that they operate without any oil in the crankcase. This is the result of the following construction characteristics:

- friction treated surface of the cylinders
- PTFE (polytetrafluoride ethylene) compound coated piston guiding surfaces
- piston rings made exclusively from special PTFE compound.

These compressor models need very little maintenance because of their oil-less operation, therefore an oil change or a special condensate disposal is not necessary.

The outstanding characteristic of this compressor model is their long life which is the result of

- low friction and low wear of cylinders and pistons
- the corrosion resistant material used for all parts coming into contact with the air stream
- optimal cooling of all moving parts (air intake through crankcase).

The oil-less compressor standard equipment:

- After-cooler for each cylinder and each manifold
- Air filter maintenance indicator

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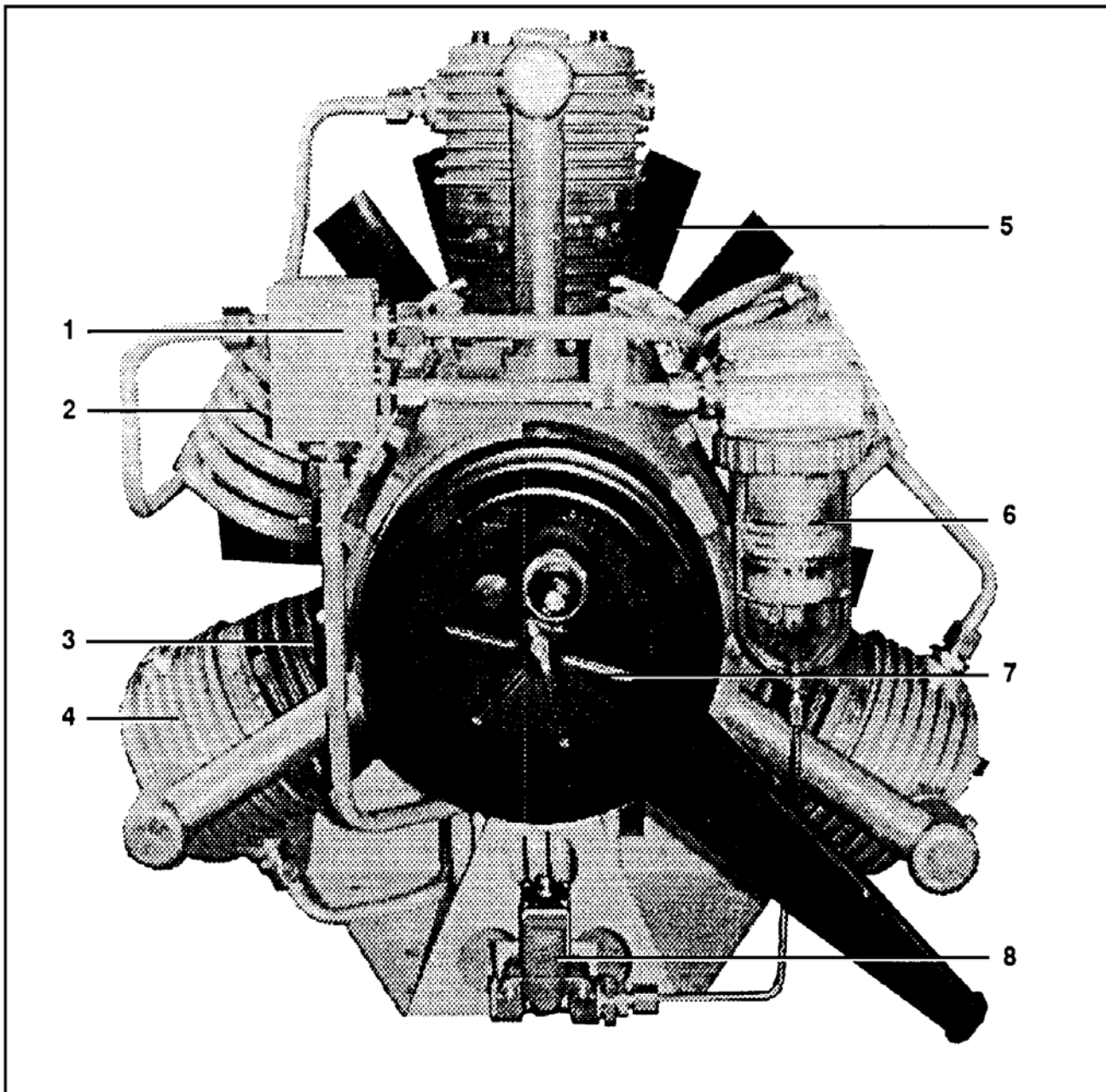


Fig. 1: OL 512 (single stage), rear view

- 1 Cooler Manifold
- 2 After-cooler
- 3 Cylinder 1st stage
- 4 Valve head 1st stage

- 5 Fan/flywheel
- 6 Final Separator (optional)
- 7 Intake filter
- 8 Condensate drain valve (optional with #6)

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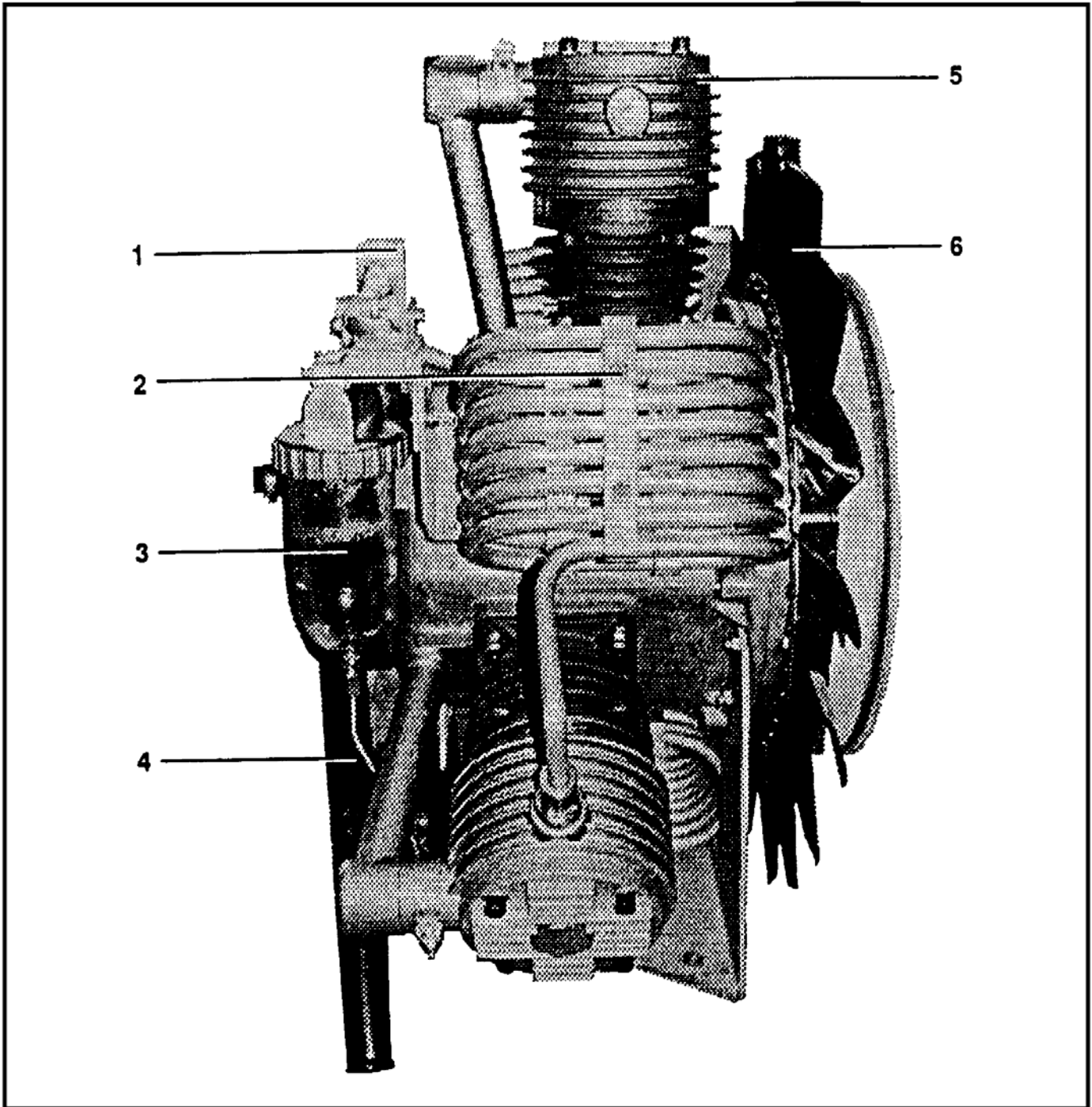


Fig. 2: OL 512 (single stage), left side view

- 1 Cooler Manifold
- 2 After-cooler
- 3 Final Separator (optional)

- 4 Intake filter
- 5 Valve Head
- 6 Fan/flywheel

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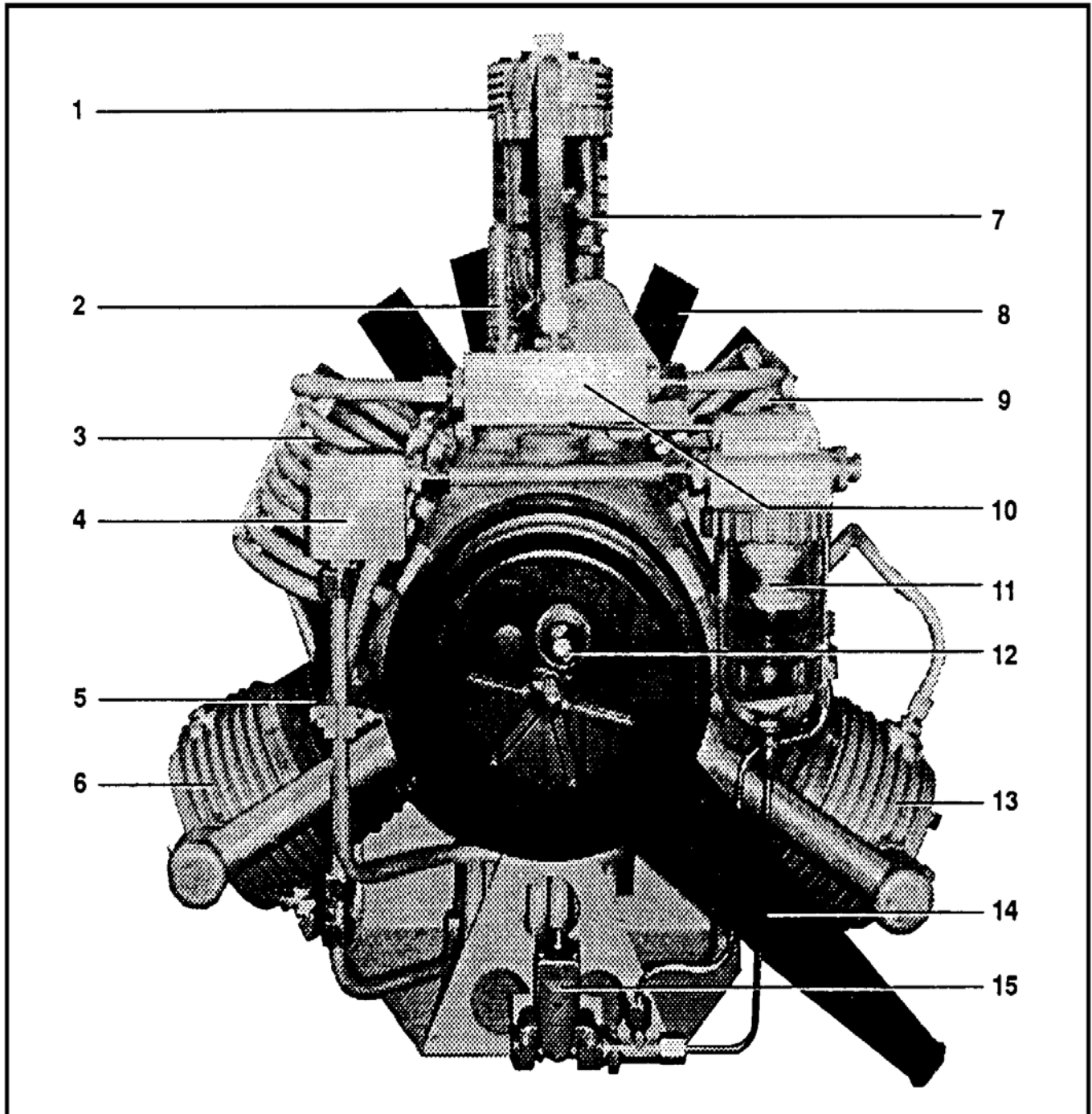


Fig. 3: OL 524 (2-stage), rear view

- | | |
|--------------------------|---------------------------|
| 1 Valve head 2nd stage | 9 Intermediate cooler |
| 2 Safety valve 1st stage | 10 Manifold 1st stage |
| 3 Intermediate cooler | 11 Final separator |
| 4 Manifold 2nd stage | 12 Maintenance indicator |
| 5 Cylinder 1st stage | 13 Valve head 1st stage |
| 6 Valve head 1st stage | 14 Intake filter |
| 7 Intermediate separator | 15 Condensate drain valve |
| 8 Fan/flywheel | |

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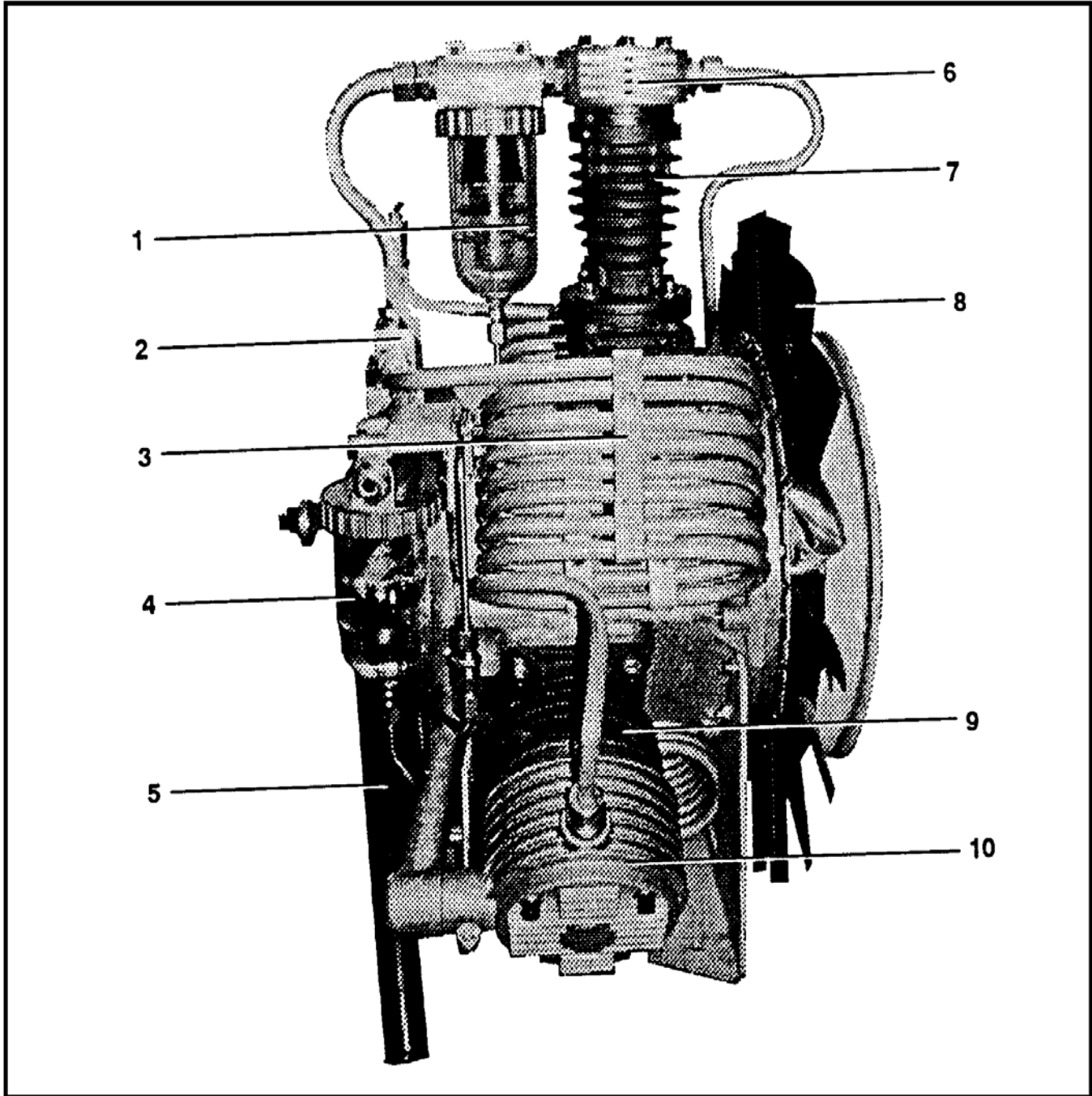


Fig. 4: OL 524 (2-stage), left side view

- | | |
|-----------------------------------|-------------------------|
| 1 Final separator | 6 Valve head 2nd stage |
| 2 Manifold | 7 Cylinder 2nd stage |
| 3 After-cooler | 8 Fan/flywheel |
| 4 Intermediate separator (option) | 9 Cylinder 1st stage |
| 5 Intake filter | 10 Valve head 1st stage |

Instruction Manual Oil-Less Compressors

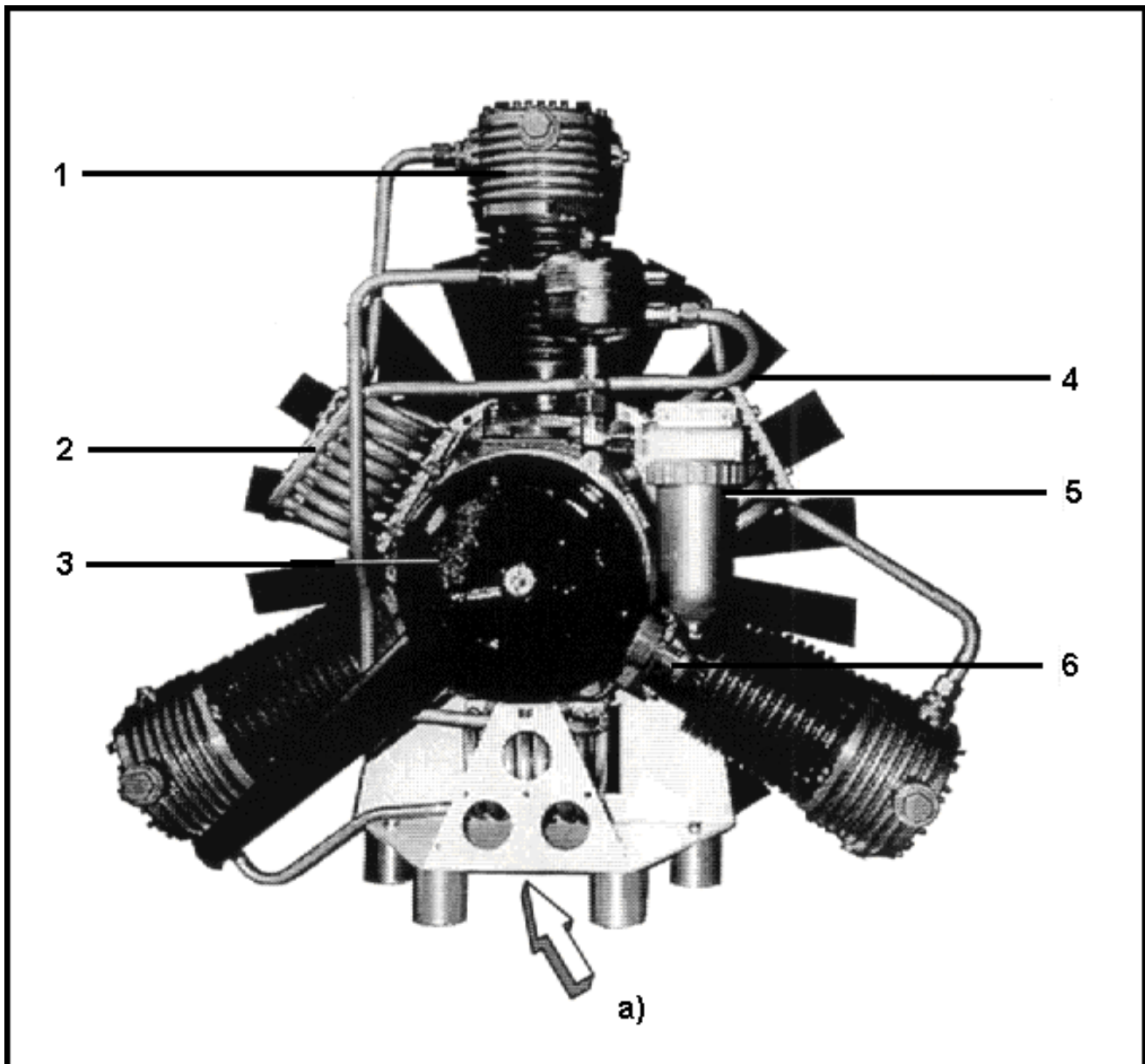


Fig. 5: OL 812 (single stage), rear view

- 1 Cylinder 1st stage
- 2 After-cooler
- 3 Intake filter

- 4 Ventilator/flywheel
- 5 Final separator
- 6 Maintenance indicator

a) position of automatic condensate drain (optional)

Instruction Manual Oil-Less Compressors

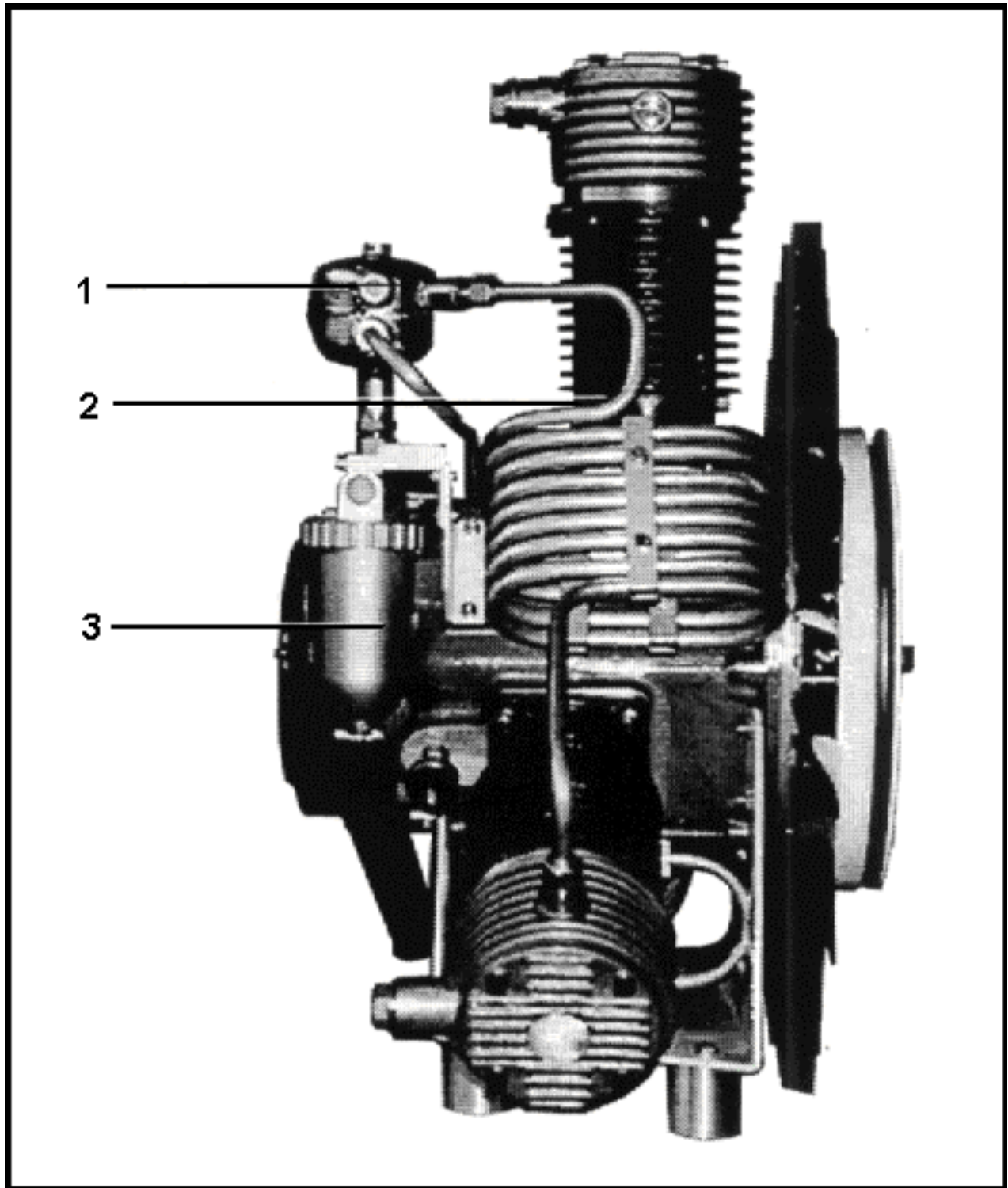


Fig. 6: OL 812 (single stage), left side view

- 1 Cooler manifold
- 2 After-cooler
- 3 Final separator

Instruction Manual Oil-Less Compressors

1.2. DESIGN AND MODE OF OPERATION

1.2.1 DESIGN

The design of the oil-less compressor is shown in Fig. 1 to Fig. 4. For drawings refer to the annex of this manual.

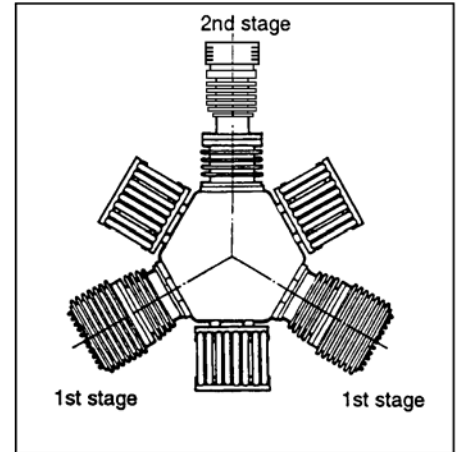


Fig. 7: Position of stages at 2-stage compressor

1.2.2. Mode of Operation

1-stage compressor

The positions stated refer to Fig. 1.

The outside air is drawn in through the three first stages (3) of the oil-less compressor via intake filter, crankcase and piston and compressed to a final pressure of max. 110 psi ^{a)}. The compressed air is cooled back to the original temperature in the after-coolers (2) and is then lead to a manifold (1). After that it reaches the final separator (6), where the condensate is filtered out. The condensate is drained regularly by the automatic condensate drain (8)(option)

Instruction Manual Oil-Less Compressors

2-stage compressor

The position stated refer to Fig. 3.

The two first stages (5) of the oil-less compressor draw in the outside air via the intake filter (14) and the crankcase and compressed to an intermediate pressure of approx. 60 to 70 psi. The compressed air is cooled back to the original temperature in the intermediate coolers (3) and is then lead to a manifold (10). The intermediate pressure safety valve (2) mounted at this manifold is adjusted to a pressure of 120 psi. The condensate is filtered out in the intermediate separator (7) and is lead to the condensate drain valve (15)(option), The 2nd stage compresses the air now to a final pressure of max. 210 psi. (Dependent on adjusted operation pressure).

A non-return valve (Fig. 6) is built into the condensate drain line of the intermediate separator.

It prevents an equalization of pressure between 1st and 2nd stage during the condensate drain.

After opening the solenoid valve the separator of the 2nd stage is drained. The separator of the 1st stage is drained after an equalization of pressure between 1st and 2nd stage.

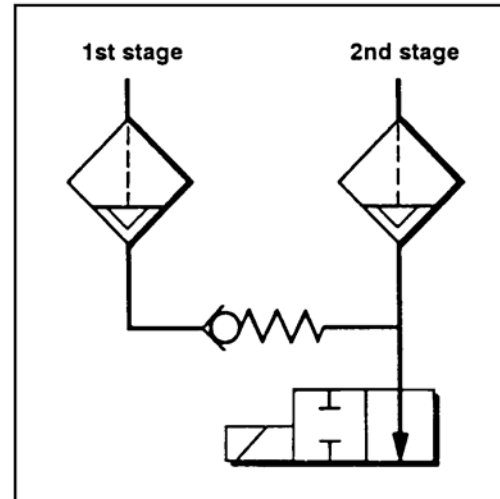


Fig 8: Function of non-return valve

Instruction Manual Oil-Less Compressors

1.3. TECHNICAL DATA

1 -stage compressor

OL 512

No. of stages	1
Intake volume ^{b)}	31.8 cfm
Intake pressure	atmospherical
Delivery	17 cfm at 110 psi
Operating pressure, max.	110 psi
No. of cylinders	3
Cylinder bore	3.3 inches
Piston stroke	2 inches
Speed	960 min. ⁻¹ (rpm)
Weight	121 lbs.
Drive input ^{c)}	5.51 H.P.
Compressor rotation	counterclockwise facing flywheel
Min./max. ambient temperature	+40...+105F ^o

2-stage compressor

OL 524

No. of stages	2
Intake volume ^{d)}	21.2 cfm
Intake pressure	atmospherical
Delivery	12 cfm at 210 psi
Operating pressure max.	240 psi
No. of cylinders	3
Cylinder bore 1st stage	3.3 inches
Cylinder bore 2nd stage	1.8 inches
Adjustment of intermediate pressure safety valve	43 psi
Piston stroke	2 inches
Speed	1,060 min. ⁻¹ (rpm)
Weight	132 lbs
Drive input ^{e)}	5.71 H.P.
Compressor rotation	counterclockwise facing flywheel
Min./max. ambient temperature	+40 .. +105°F

a) dependent on adjusted operating pressure

b) at max. speed 960 min.⁻¹ (rpm)

c) at 960 min.⁻¹ (rpm) and max. final pressure

d) at max. speed 1,060 min.⁻¹ (rpm)

e) at 1,060 min.⁻¹ (rpm) and max. final pressure

f) at max. speed 1,000 min.⁻¹ (rpm)

g) at 1,000 min.⁻¹ (rpm) and max. final pressure

Subject to change without prior notice

Instruction Manual Oil-Less Compressors

Technical Data

1 -stage compressor

OL 812

No. of stages	1
Intake volume ^{f)}	48 cfm
Intake pressure	atmospherical
Delivery	31.6 cfm at 110 psi
Operating pressure, max.	110 psi
No. of cylinders	3
Cylinder bore	3.3 inches
Piston stroke	3.1 inches
Speed	1,000 min. ⁻¹ (rpm)
Weight	132 lbs.
Drive input ^{g)}	10 H.P.
Compressor rotation	counterclockwise facing flywheel
Min./max. ambient temperature	+40...+105F ^o

Subject to change without prior notice

Instruction Manual Oil-Less Compressors

1.4. ELECTRICAL DATA

Electrical Intake filter control

Operating voltage max.	24V
Electrical power consumption	6W

Temperature sensor (option)

Operating voltage max. U_{max}	25V
Nominal response temperature NAT	+130°C (266°F)
Tolerance	± 5°C (9°F)
Cold resistance	100 Ω
PTC resistance ($U_{KI}=2.5$ V)	
PTC resistance temperature NAT-T	550 Ω
PTC resistance ($U_{KI}=2.5$ V)	
at PTC resistance temperature NAT+T	1330 Ω
PTC resistance ($U_{KI}=7.5$ V)	
at PTC resistance temperature NAT+15°C	K 4
Isolation strength U_{is}	2.5 kV
Operating temperature max.	175°C (347°F)
Color code	blue/blue

Operation characteristic PTC temperature sensor

PTC resistance as function of the PTC resistor temperature

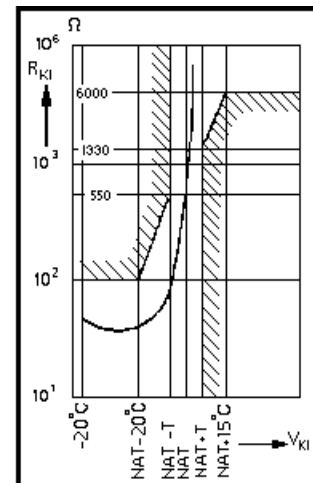


Fig. 9: Operation characteristics

Subject to change without prior notice

Instruction Manual Oil-Less Compressors

2. INTAKE FILTER

2.1. DESCRIPTION

A dry micronic filter is used to filter intake air (Fig. 8). The intake filter is equipped with a replaceable filter cartridge.

2.2. INTAKE FILTER MAINTENANCE

The filter cartridge must be serviced at regular intervals according to maintenance schedule in chapter 9.

For this purpose an optical maintenance indicator is mounted on the intake filter (Fig. 8) and an electrical maintenance indicator is mounted on the crankcase. They indicate contamination of the filter cartridge and the necessity to clean or change it. The maintenance indicator reacts at a vacuum of 1.5 in. Hg.

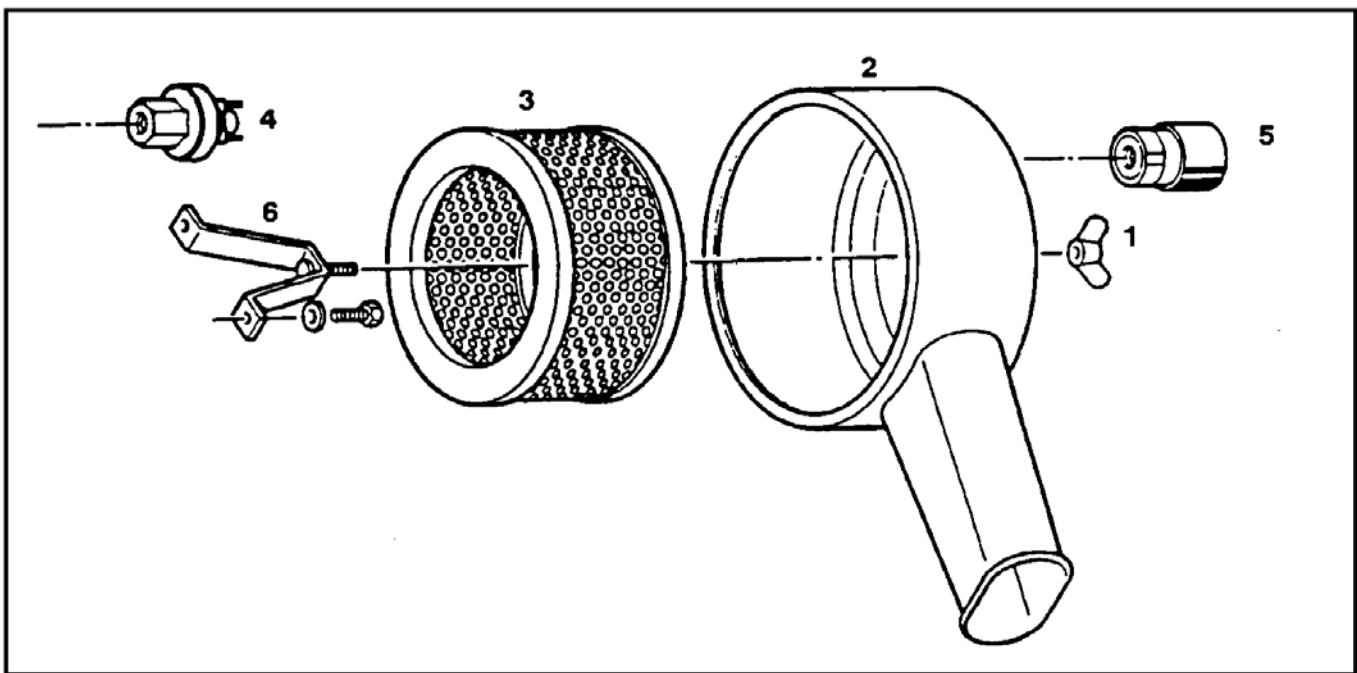


Fig. 10: Intake filter

- | | |
|--------------------|--|
| 1 Wing nut | 4 Electrical maintenance indicator (crankcase) |
| 2 Filter housing | 5 Optical maintenance indicator (option) – CCC1626 |
| 3 Filter cartridge | 6 Bracket |

Clean filter element as follows:

- Remove wing nut (1).
- Remove filter housing (2) from crankcase.
- Remove micronic filter element (3) and clean dry with brush or by blowing air from inside out. **Never clean wet!** Turn filter element 60° when replacing it.
- **Use recommended spare element VGB 596 only.**
- Clean filter housing inside using a damp cloth. Take care to prevent dust from entering the crankcase

Instruction Manual Oil-Less Compressors

3. INTERMEDIATE AND FINAL SEPARATOR

3.1. FUNCTIONAL DESCRIPTION OF INTERMEDIATE SEPARATOR (2-STAGE MODELS ONLY)

The intermediate separator (Fig. 9) is mounted after the two first stages of the 2-stage oil-less compressor. The separator is designed to remove excess water which results from the cooling down after the compressing process and thus to provide the next stage with a cleaned medium. Separation is achieved by means of a baffle (4). A sintered metal filter (2) is provided additionally to remove dirt contamination.

3.1.1. CONDENSATE DRAIN

The condensate has to be drained manually as soon as "max." mark is reached, or after each operation. Therefore open knurled nut mounted on the lower part of separator housing. After draining the condensate, firmly tighten knurled nut.

Compressors which are equipped with a condensate drain valve are drained automatically. Ensure that the separators are drained every 15 minutes. At increased humidity, intervals for draining may be shorter.

3.1.2. INTERMEDIATE SEPARATOR MAINTENANCE

Proper operation of individual stages will rely on the intermediate filter being properly serviced.

The sintered filter element of the intermediate separator is to be cleaned approx. every 4,000 operating hours.

- Remove condensate drain piping from filter. Unscrew union nut and remove filter cartridge.
- Remove center screw (1), and separate sintered filter element (2).
- To clean filter element, the best method is to use hot soapy water and to blow dry with compressed air.
- On reinstallation of filter elements take care to observe correct order.

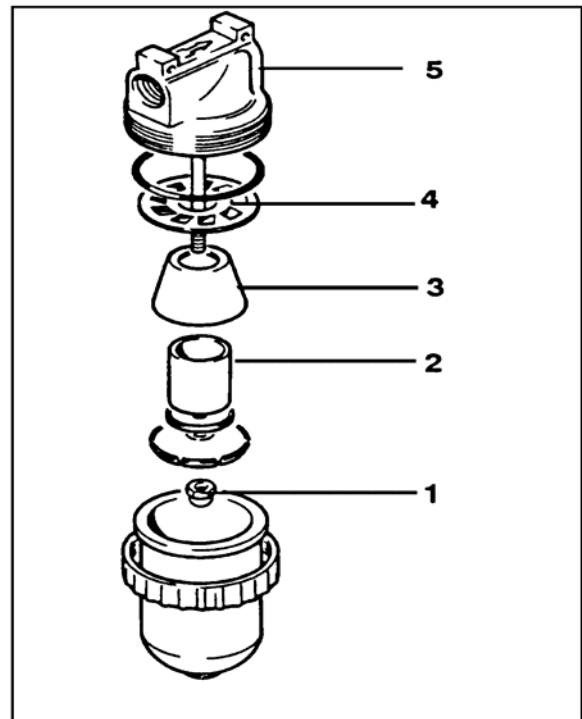


Fig. 11: Intermediate -/final separator

Instruction Manual Oil-Less Compressors

3.2. FUNCTIONAL DESCRIPTION OF FINAL SEPARATOR

A final separator is mounted after the three first stages of the single-stage oil-less compressor and after the second stage of the 2-stage oil-less compressor.

Separation is achieved by means of centrifugal action provided by a baffle (4). A sintered metal filter (2) is provided additionally to remove dirt contamination.

3.2.1. CONDENSATE DRAIN

1-stage compressor (option)

The condensate has to be drained manually every 15 minutes during operation and after each operation. At increased humidity, intervals for draining may be shorter. Therefore open knurled nut mounted on lower part of separator housing. After draining the condensate, firmly tighten knurled nut.

Compressors equipped with a condensate drain valve are drained automatically. Ensure that the filters are drained every 15 minutes. At increased humidity, intervals for draining may be shorter.

2-stage compressor (std.)

The condensate has to be drained manually every 15 minutes during operation and after each operation. At increased humidity, intervals for draining may be shorter. Therefore open knurled nut mounted at the lower part of separator housing. After draining the condensate, firmly tighten knurled nut.

Compressors which are equipped with a condensate drain valve are drained automatically. Ensure that the filters are drained every 15 minutes. At increased humidity, intervals for draining may be shorter.

3.2.2. FINAL SEPARATOR MAINTENANCE

Maintenance process is the same as for intermediate separator, see chapter 3.1.2.

Instruction Manual Oil-Less Compressors

4. VALVES

4.1. FUNCTIONAL DESCRIPTION OF 1st STAGE

The valve head of the first stage forms the top part of the cylinder. The intake valve is fitted on the top of the piston. The pressure valve is mounted between valve head and cylinder.

Note that the valves are operated by the flow of the air. On the suction stroke, the intake valves open and the air flows into the cylinders.

At the start of the compression stroke the intake valve closes and the air opens the pressure valve, see Fig. 10.

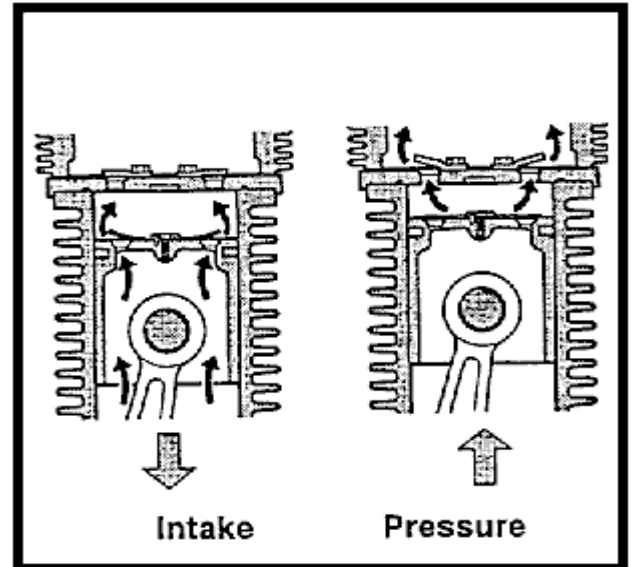


Fig. 12: Valve operation 1st stage

4.2. FUNCTIONAL DESCRIPTION OF 2nd STAGE

The intake valve is fitted between valve head and cylinder.

On the suction stroke, the intake valves open and the air flows into the cylinders. At the start of the compression stroke the intake valve closes and the air opens the pressure valve, see Fig. 11.

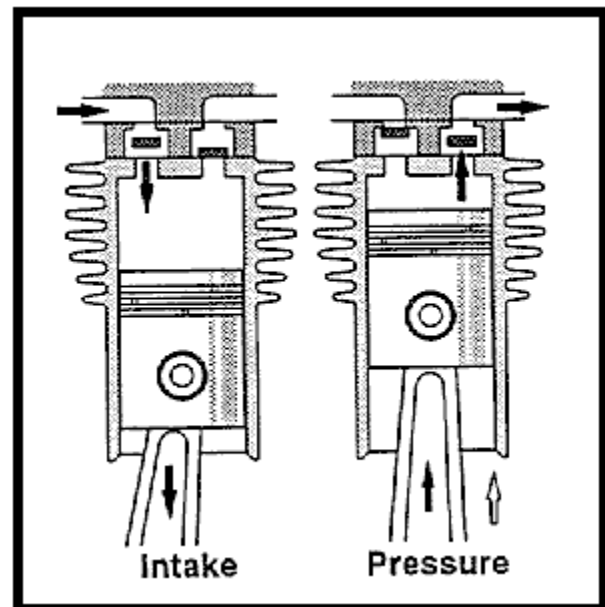


Figure 13: Valve operation 2nd stage

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4.3. INITIAL OPERATIONAL CHECK OF VALVES

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

4.4. GENERAL INSTRUCTIONS FOR CHANGING THE VALVES

- Carefully clean dirty valves. Never use a sharp tool for this purpose. Soak the valves in hot soap suds and clean with soft brush.
- Check individual components for excessive wear. If the valve seat and valve disks are dented, replace the valves.
- Valve head screws must be tightened with a torque wrench (see tightening torque values chapter 13).
- Check the valve space in the valve heads for dirt and clean, if necessary.
- Use only satisfactory gaskets and O-rings on reassembly.
- Observe the correct sequence when fitting together again.
- After finishing all maintenance work on the valves, turn the compressor manually using the flywheel and check whether all items have been correctly installed.
- 30 minutes after restarting the compressor unit after valve maintenance stop unit, let it cool down to ambient temperature and retighten valve studs and cap nuts. Otherwise valves could work loose due to setting of the gaskets.
- Remove and check the valves every 7,000 operating hours, if necessary replace them.

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4.5. CHANGING THE VALVES OF THE 1ST STAGE

The intake valve of the 1st stage is integrated into the top part of the piston. The pressure valve is fitted between valve head and cylinder.

Changing the pressure valve

Change pressure valve of 1st stage according to chapter 4.6.

Changing the Intake valve

- Loosen two cap nuts from tube connectors and remove inter-cooler and after-cooler.
- Remove counter-sunk screw (1) together with fixation nut (2) from piston head.
- Remove plate valve (3).

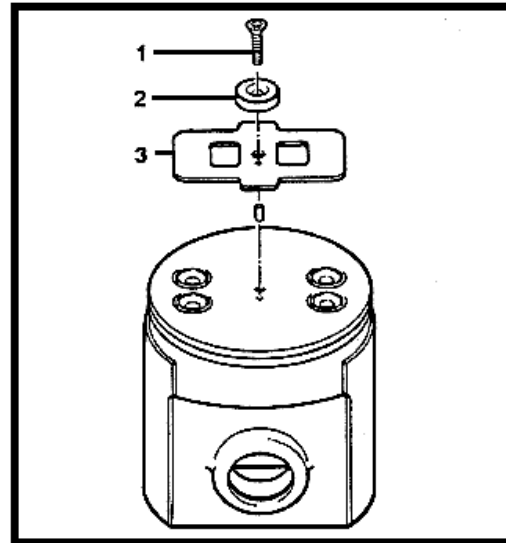


Fig. 14: valve head 1st stage

4.6. CHANGING 2ND STAGE VALVES AND VALVES OF 1ST STAGE PRESSURE VALVE

Intake and pressure valves of the 2nd stage are combined in one plate valve under the valve head.

- Loosen two cap nuts from tube connectors and remove inter-cooler and after-cooler.
- Remove four allen screws (5), together with washer (6) from valve head (1). Remove valve head.
- Remove gasket (2) and plate valve (3).
- When reinstalling valve check for right position. Countersunk screw heads have to be at the top.

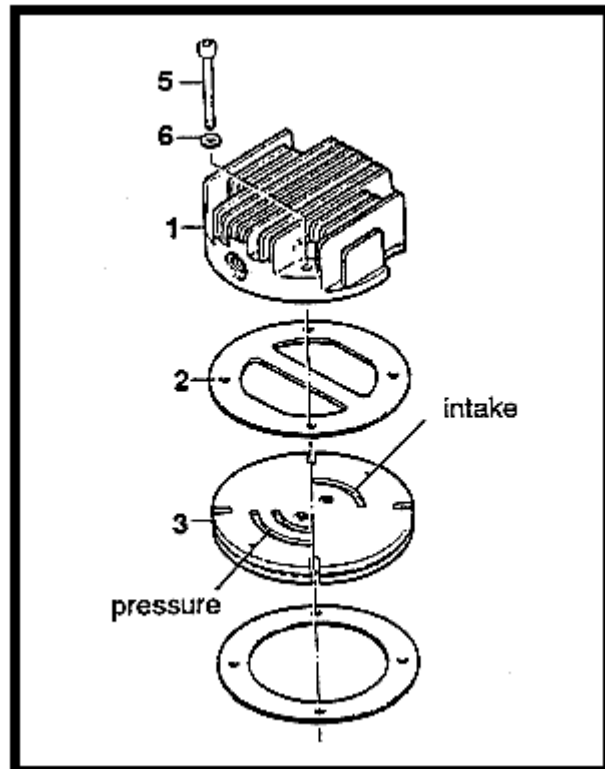


Fig. 15: valve head 2nd stage

Instruction Manual Oil-Less Compressors

5. AUTOMATIC CONDENSATE DRAIN

5.1. DESCRIPTION

The condensate drain valve should drain the final separator (1 -stage compressor) or the intermediate and final separator (2-stage compressor) every 15 minutes or earlier if necessary.

Furthermore, condensate is drained after each operation (stand still drainage).

A solenoid valve is installed as a condensate drain valve, which is open when it does not receive any power. It works electro-pneumatically.

5.2. FUNCTION

The solenoid valve closes as soon as it receives current, thus condensate can be collected in the separators. Power supply is interrupted every 15 minutes, the solenoid valve opens and condensate can be drained.

The solenoid valve is de-energized and opens after the compressor has been shut down. Thus the separators are drained at down-time.

Instruction Manual Oil-Less Compressors

6. COOLING SYSTEM

6.1. GENERAL

Cooling of the oil-less compressor is twice as efficient because of their mode of operation:

The compressor is equipped with a flywheel which draws the cooling air through the flywheel cover from the surroundings and thus cools the cylinder, both intercoolers and the after-cooler. The fan blades are mounted on the flywheel and are powered by the driving motor.

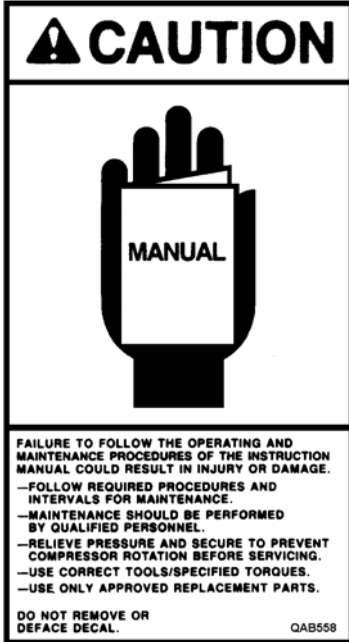
Additional cooling of all mechanic parts such as crankcase, connecting rods and pistons is effected by drawing the air in, which has to be compressed for the first stages, via the crankcase.

Refer to chapter 8 for proper installation and cooling air supply.

Instruction Manual Oil-Less Compressors

7. SAFETY REGULATIONS

7.1. GENERAL



Instruction Manual Oil-Less Compressors

⚠ WARNING



VARIOUS PARTS OF THIS EQUIPMENT MAY HAVE HOT SURFACES AND COULD CAUSE SEVERE BURNS. DO NOT TOUCH. TO AVOID BURNS, KEEP HANDS AND ALL PARTS OF THE BODY AWAY.

DO NOT REMOVE OR DEFACE DECAL.

QAB570

⚠ DANGER



DANGER: AIR USED FOR BREATHING OR FOOD PROCESSING MUST MEET OSHA 29CFR 1910.134 OR FDA 21CFR 178.3570 REGULATIONS. FAILURE TO DO SO MAY CAUSE SEVERE INJURY OR DEATH.

DO NOT REMOVE OR DEFACE DECAL.

QAB562

⚠ WARNING




DO NOT OPERATE WITH BELT GUARD REMOVED. CAN CAUSE PERSONAL INJURY. EQUIPMENT MUST BE GUARDED IN ACCORDANCE WITH OSHA REGULATION CFR 1910.219.

DO NOT REMOVE OR DEFACE DECAL.

QAB548

⚠ WARNING



TOXIC, VOLATILE, AND CORROSIVE VAPORS CAN CAUSE PERSONAL INJURY OR PROPERTY DAMAGE. LOCATE COMPRESSOR INTAKE TO AVOID SUCH CONDITIONS.

- OPERATE WITHIN RECOMMENDED TEMPERATURE RANGE.
- PROVIDE ADEQUATE VENTILATION.

DO NOT REMOVE OR DEFACE DECAL.

QAB561

Instruction Manual Oil-Less Compressors

8. INSTALLATION OPERATION

8.1. INSTALLATION OF THE COMPRESSOR

NOTE

Remove all plastic protective plugs and caps before installing compressor.

The oil-less compressor should be installed so that there is no vibration, e.g. from the drive motor.

- If possible install compressor in such a manner that the compressor fan can get fresh air from outside, for instance through an opening in the wall.
- Ensure that an adequate exhaust air opening is provided (see Fig. 16).
- When locating the compressor in rooms of less than 39.2 cu. yd. space where natural ventilation is not ensured, measures must be taken to provide artificial ventilation (this also applies when other systems having high radiation are operating in the same room (see Fig. 17).

Artificial ventilation is effected by installation of a fan in the exhaust air opening.

Instruction Manual Oil-Less Compressors

8.1.1. Natural ventilation

As warm air rises, adequate wall openings should be provided for cooling air intake (next to the floor) and for cooling air outlet (next to/ in the ceiling).

The compressor should be positioned right next to the air inlet opening.

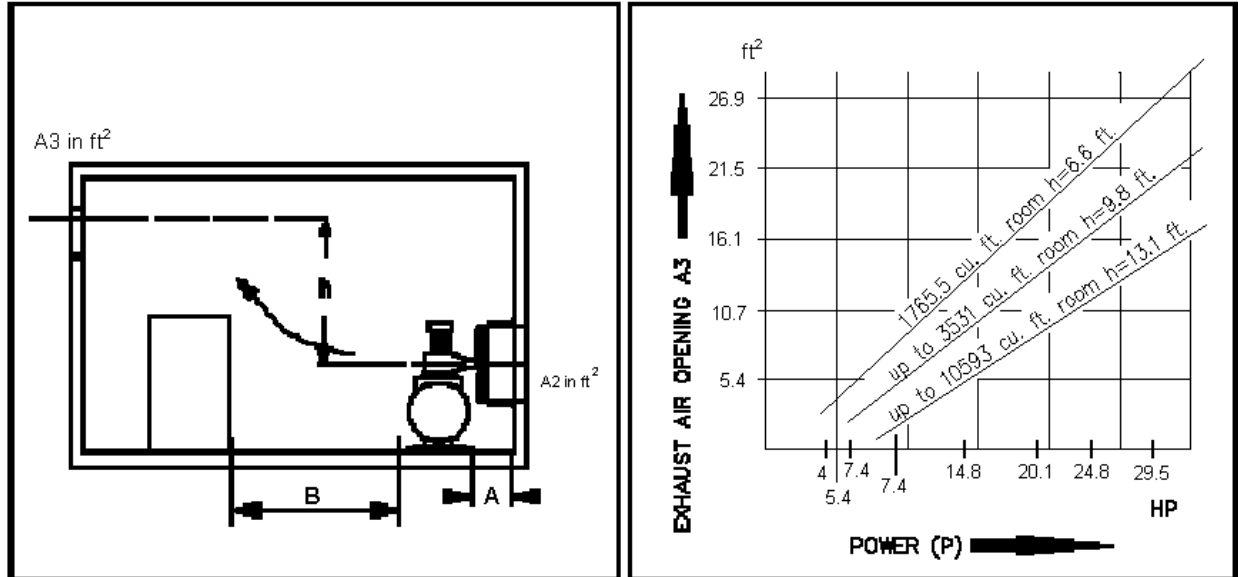


Fig. 16: Installation with natural ventilation

A Minimum distance from wall, intake side 1.6405 ft.

B Minimum distance from wall, exhaust air side 2.46075 ft

The opening for intake air A2 should be approx. 20% larger than the opening for exhaust air A3 taking into account louvers, grills, etc.

The table in Fig. 16 is based on the following values:

- Room temperature 87°F
- Temperature variation with natural ventilation 27°F
- Thickness of walls 9.8425 in.

If it is not possible to follow the recommended guide lines for natural ventilation (e.g. installation of several compressors within a very small operating room), the operating room must be ventilated artificially.

Instruction Manual Oil-Less Compressors

8.1.2. Forced ventilation

Forced ventilation facilitates a reduced variation in temperature. It is achieved, for example by using an exhaust air fan. The following information is to determine the size of the exhaust air fan:

V = required cooling air stream in ft^3/h for a drop in temperature of 18°F

$p = \Delta p$ = resistance in pa.

It is determined by the shape of the fan and the opening for intake and outlet air together with the channels connected to them (if any). For simple openings without unfavorable channels approx. $p = 100$ pa can be used.

Example: For a 10 HP unit, a fan is required which delivers 1177 cfm against 100 pa resistance.

Cooling air fan (Δp and $V1$)

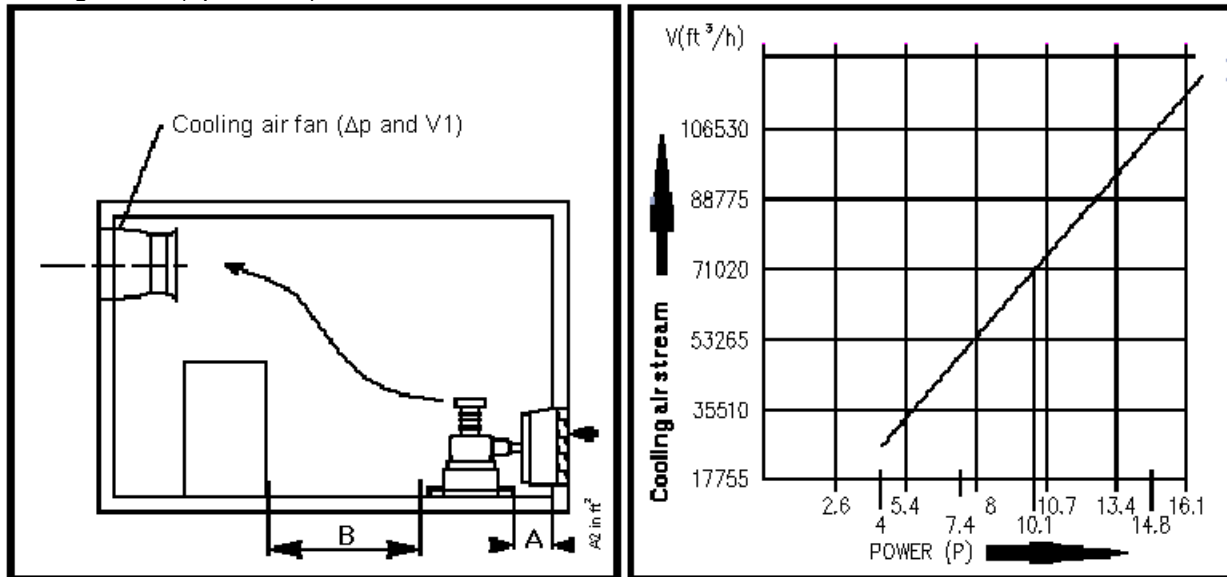


Fig. 17: Installation with forced ventilation

A Minimum distance from wall, intake side 1.6405 ft.

B Minimum distance from wall, exhaust air side 2.46075 ft

The value stated is only valid for small rooms without considering the warmth emitted by the exterior walls. Preferably an intake air velocity of 591 ft/min. should be used.

To avoid frost damage due to a very high internal condensate formation, the room temperature should not drop below $+41^\circ\text{F}$. We recommend that you provide the intake air openings with adjustable louvers to equalize fluctuation in temperature caused by season change.

The basis for the measurement of required intake and outlet air openings and fans is the VDMA standard 4363 "Ventilation of operation rooms with air cooled compressors".

Instruction Manual Oil-Less Compressors

8.2. ELECTRICAL INSTALLATION

For installation of electrical equipment attend to the following:

Follow the National Electric Code or local Electric code in providing, fusing, and disconnect switches.

Check electrical supply for voltage, phase, and frequency to see that they match the nameplate stampings on the motor, magnetic starter solenoids, and other control devices.

Ensure correct installation is carried out only by qualified personnel only.

Immediately after start-up, check direction of rotation with arrow on unit.

8.3. OPERATION

8.3.1. Preparation for operation

All compressors are tested prior to delivery to the customer, so after correct installation, there should be no problem putting it into operation, observing the following points:

CAUTION

- Prior to **first** operation read Instruction Manual carefully. Make sure that all persons handling the compressor and the filling station are familiar with the function of all controls and monitors.

- Prior to **first** operation or operation subsequent to maintenance work, turn the compressor manually using the flywheel to ensure that all parts are turning free.

8.3.2. Starting the compressor

When starting the compressor it is absolutely essential to check the direction of rotation (observe arrow for rotation direction). The correct direction of rotation is counter-clockwise, facing the flywheel

8.4. SHUT-DOWN PROCEDURE

After the shut-down of the oil-less compressors, condensate of the intermediate and final separator has to be drained manually (see chapter 3) on compressor's which are not equipped with an automatic condensate drain. Make sure that the separators are drained during shut-down on compressors with a drain valve.

Instruction Manual Oil-Less Compressors

9. MAINTENANCE SCHEDULE

9.1. MAINTENANCE INTERVALS

Interval	Maintenance Work	Sec.
1/2 hour after start-up	Manual check of valve function (at first operation and maintenance work)	4
250 operating hours	Check all connections for leakage	--
50 - 250 operating hours	Service intake filter (according to degree of pollution), never wash	2
4,000 operating hours (at least every 3 years)	Check pistons and piston rings of 2nd stage, replace if necessary	--
	Dismantle valves, clean, check, and replace if necessary	4
	Check all threaded pipe unions	--
	Clean sinter-filters of the separators	3
10,000 operating hours (at least every 3 years)	Check pistons and piston rings of 1st stage, replace if necessary	--
	Check plate valves, replace if necessary	--
	Check conrod bearing and piston pin bearing, replace if necessary	--
20,000 operating hours (at least every 3 years)	Check driving gear main bearing, replace if necessary	--

9.2. MAINTENANCE RECORD

We recommend that all maintenance work is recorded in a service book, showing the date and details of the work carried out. This will help to avoid expensive repair work caused by missed maintenance work.

If it is necessary to file a claim against the warranty, it would help to have proof that regular maintenance work has been carried out and that the damage has not been caused by insufficient maintenance. Please refer to DIS-7 "Limited Warranty Information".

For this purpose maintenance (control sheets are provided in the annex of this instruction manual. Please mark the appropriate box(es) to show what maintenance work has been carried out and the number of hours of service, then sign and date.

Instruction Manual Oil-Less Compressors

10. STORAGE, PRESERVATION

10.1. GENERAL

If the oil-less compressor is to be put out of service for more than **six months**, the unit should be preserved in accordance with the following instructions:

Make sure the compressor is kept indoors in a dry, dust free room. Only cover the compressor with plastic if it is certain that no condensation will form under the sheet. Nevertheless, the sheet should be removed from time to time and the unit cleaned on the outside.

If this procedure cannot be followed and/or the compressor is going to be taken out of service for more than 2 years, please contact our Technical Service Department for special instructions.

10.2. PREPARATION

Before preserving the oil-less compressor unit, run it warm and when unit reaches the specified service pressure, keep it running for approx. **10 minutes**.

Then carry out the following:

- Check all pipes, filters and valves (also safety valves) for leakage.
- Tighten all couplings, as required.
- Continue to run compressor for another 5 minutes at an operating pressure of 43 psi.
- On compressors equipped with a condensate drain valve, observe that condensate is drained automatically after 15 minutes operation. On compressors without a condensate drain valve, condensate has to be drained manually (see chapter 3).

Afterwards shut the system down.

- Open the couplings of the separators and lubricate them with **Aluminum based Anti-sieze compound**

10.3. PREVENTIVE MAINTENANCE DURING STORAGE

- **Every 6 months** turn the flywheel of the compressor several times.

10.4. REACTIVATING THE COMPRESSOR BLOCK

- Run the compressor warm with open filling valves or outlet valve for approx. 10 minutes.
- Check the intermediate-pressure safety valves for leakage.
- Establish cause of any fault from the trouble-shooting table, section 12, and remedy.
- Stop the system when running properly, the compressor is then ready for operation.

Instruction Manual Oil-Less Compressors

11. REPAIR INSTRUCTIONS

11.1. GENERAL

Preventive maintenance usually involves replacing the gaskets and sealing rings as well as carrying out the maintenance work.

Repair work can be carried out on the oil-less compressor to a certain extent, however certain repair work requires experience and skill. Furthermore please note that:

- repair work on crankshaft and bearing support should always be carried out by a skilled person, - safety valves are not repaired but always replaced completely.

Instruction Manual Oil-Less Compressors

12. TROUBLE-SHOOTING

TROUBLE	CAUSE	REMEDY
Compressor		
Compressor does not reach final pressure	Condensate drain valve(s) and/or fittings leaking	Tighten and reseal
	Premature opening of final safety valve	Clean final safety valve and re-adjust
	Piston rings worn	Replace
	Excessive piston clearance	Replace
Compressor output insufficient	Pipes leaking	Re-tighten
Safety valves between individual stages releasing pressure	Intermediate pressure too high	Check valves - see chapter 4 - service and clean valves
	Valves not closing properly	
Compressor running too hot	Insufficient supply of fresh cooling air	Check location max. ambient temperature + 40° C (105° F)
	Intake or outlet valves not closing properly	Check and clean valves, replace as necessary
	Wrong direction of rotation	See arrow on compressor and remedy accordingly
Control does not switch off, final pressure safety valve relieving	Final pressure switch set too high	Correct setting
	Final pressure safety valve defective	Replace safety valve
Automatic: Condensate Drain (optional)		
Drain valves do not close	No control air	Check control air line
	Drain valves leaking	Dismantle drain valve and clean
Drain valves do not open	Condensate drain valve piston seized	Dismantle drain valve, clean or replace valve
Solenoid valve does not close	Solenoid valve faulty	Check solenoid valve and replace if necessary
	No electrical signal	
Solenoid valve does not open	Solenoid valve faulty	Check solenoid valve and replace if necessary
		Continuous electrical signal

Instruction Manual Oil-Less Compressors

13. TABLES

13.1. TIGHTENING TORQUE VALUES

NOTE

Unless otherwise specified in text, the following torque values apply. All valve head screws require torque wrench tightening! The torque values indicated are valid for bolts in greased condition. Replace self-retaining nuts on reassembly

Bolt or Screw	Thread	Max. torque
Hex and allen head	M 6	10 Nm (7 ft. lbs.)
Hex and allen head	M 8	25 Nm (18 ft. lbs.)
Hex and allen head	M 10	45 Nm (32 ft. lbs.)
Hex and allen head	M 12	75 Nm (53 ft. lbs.)
Hex and allen head	M 14	120 Nm (85 ft. lbs.)
Pipe connections (swivel nuts):		Finger-tight + 1/2 turn

13.2. TORQUE SEQUENCE

Tighten valve head and cylinder bolts/nuts equally in the sequence shown in Fig. 16.

Be sure to tighten all parts in cold condition only.

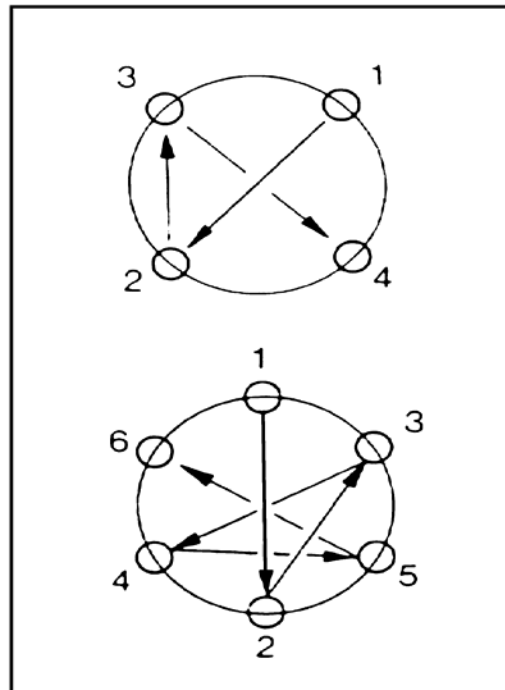


Figure 18: Torque sequence

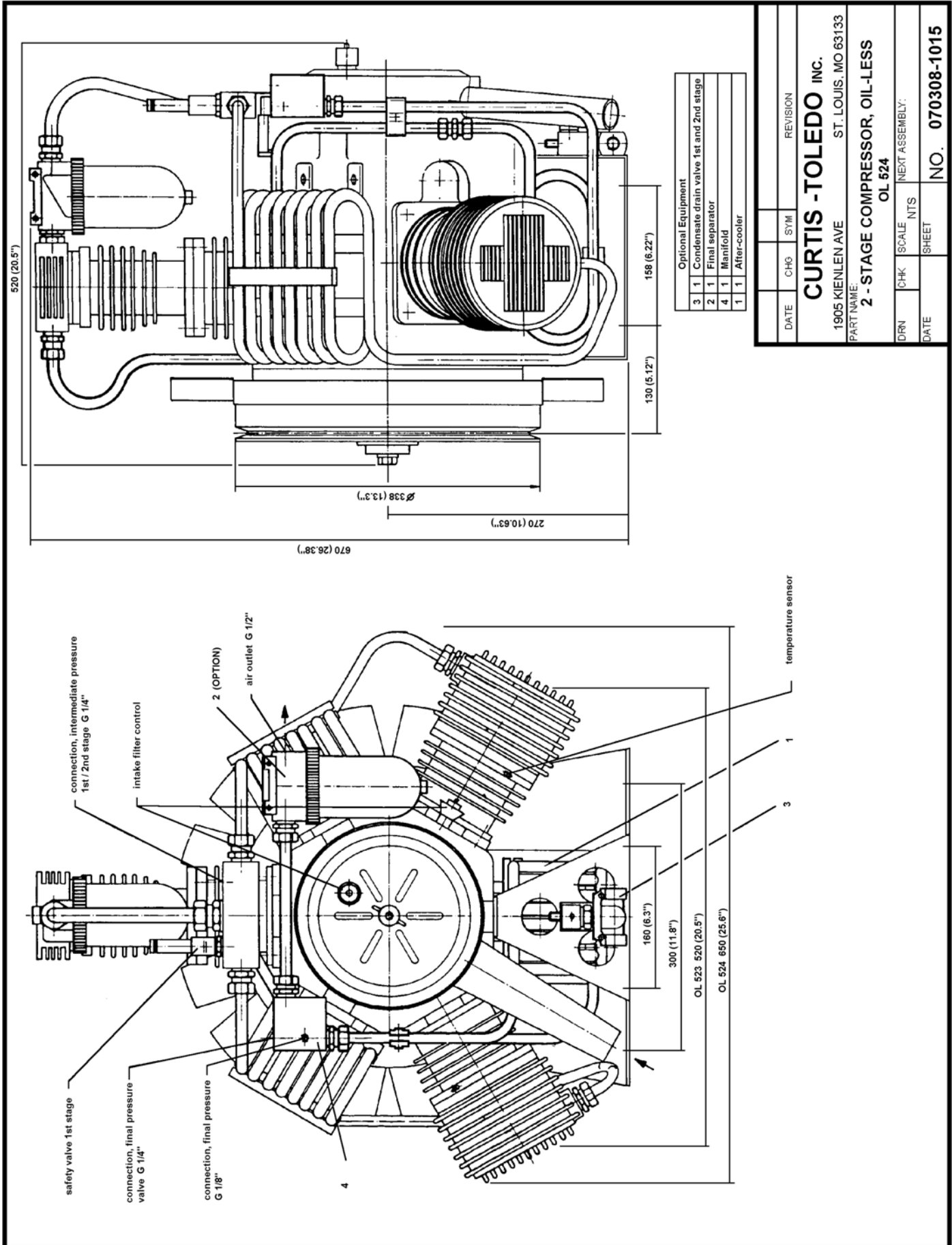
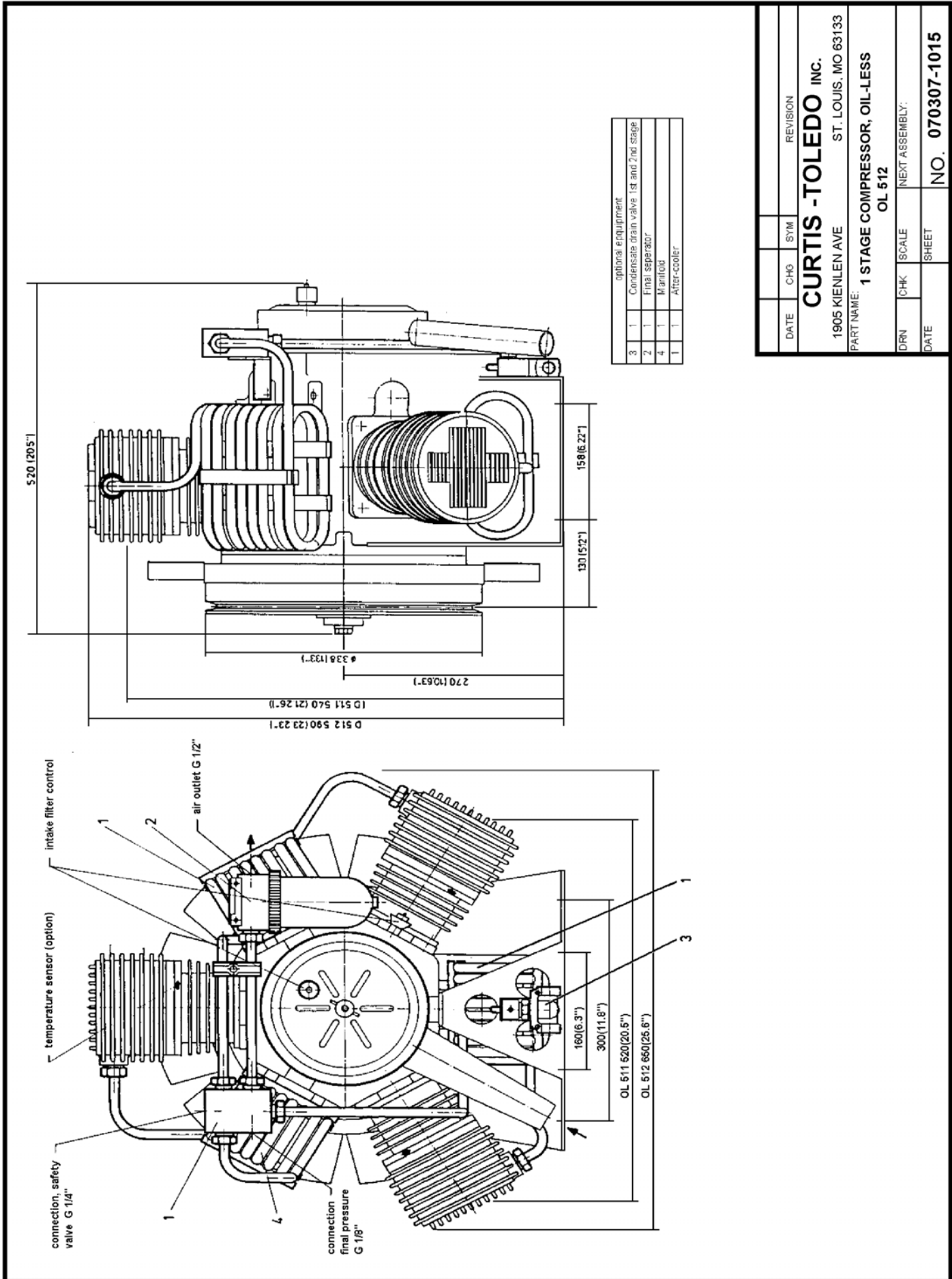
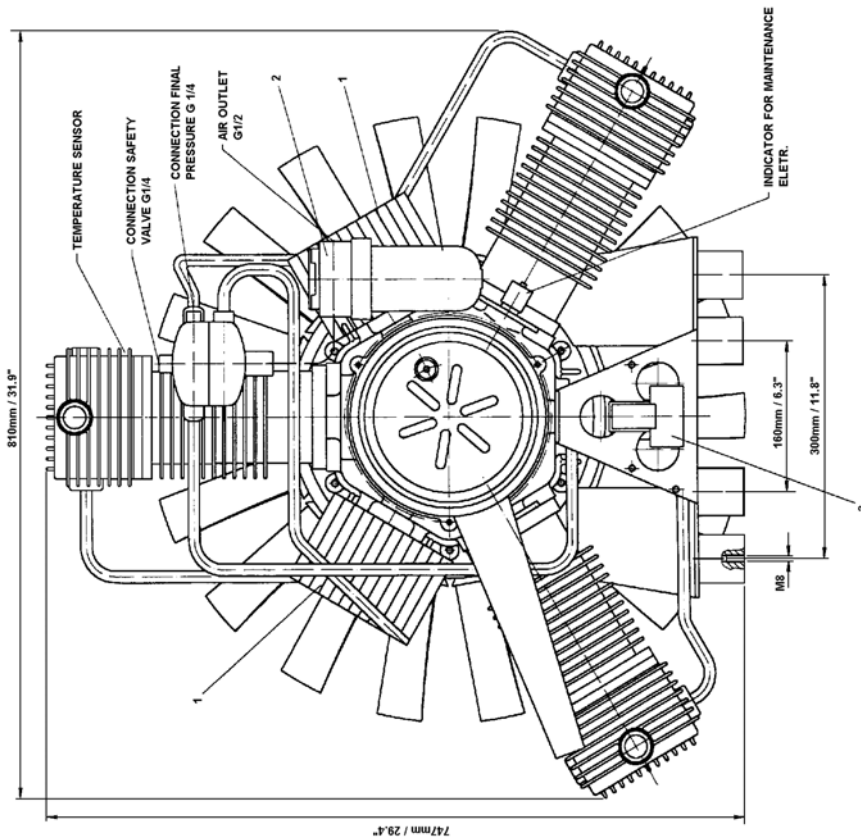
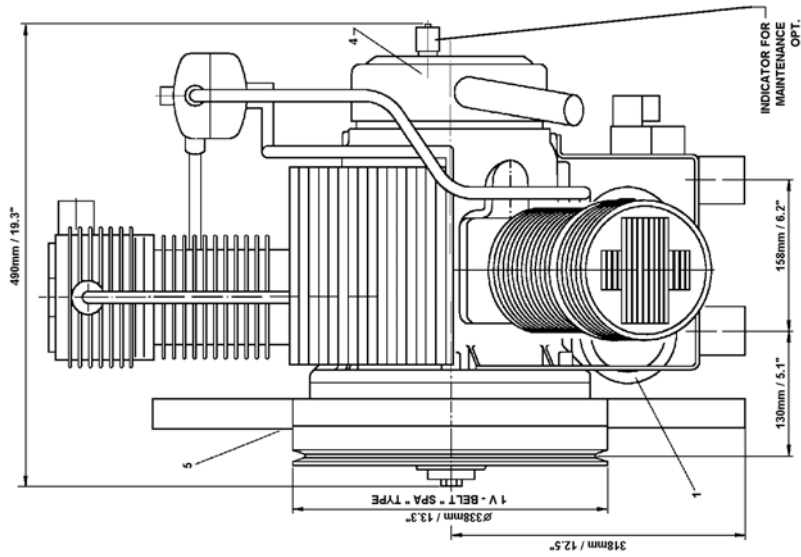


Fig. 19: 2-stage compressor dimensions (070308-1015)



DATE	CHG	SYM	REVISION
CURTIS -TOLEDO INC.			
1905 KIENLEN AVE ST. LOUIS, MO 63133			
PART NAME: 1 STAGE COMPRESSOR, OIL-LESS			
OL 512			
DRN	CHK	SCALE	NEXT ASSEMBLY:
DATE	SHEET	NO. 070307-1015	

Fig. 20: 1-stage compressor dimensions (070307-1015)



CURTIS - TOLEDO, INC

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St. Louis, MO 63133

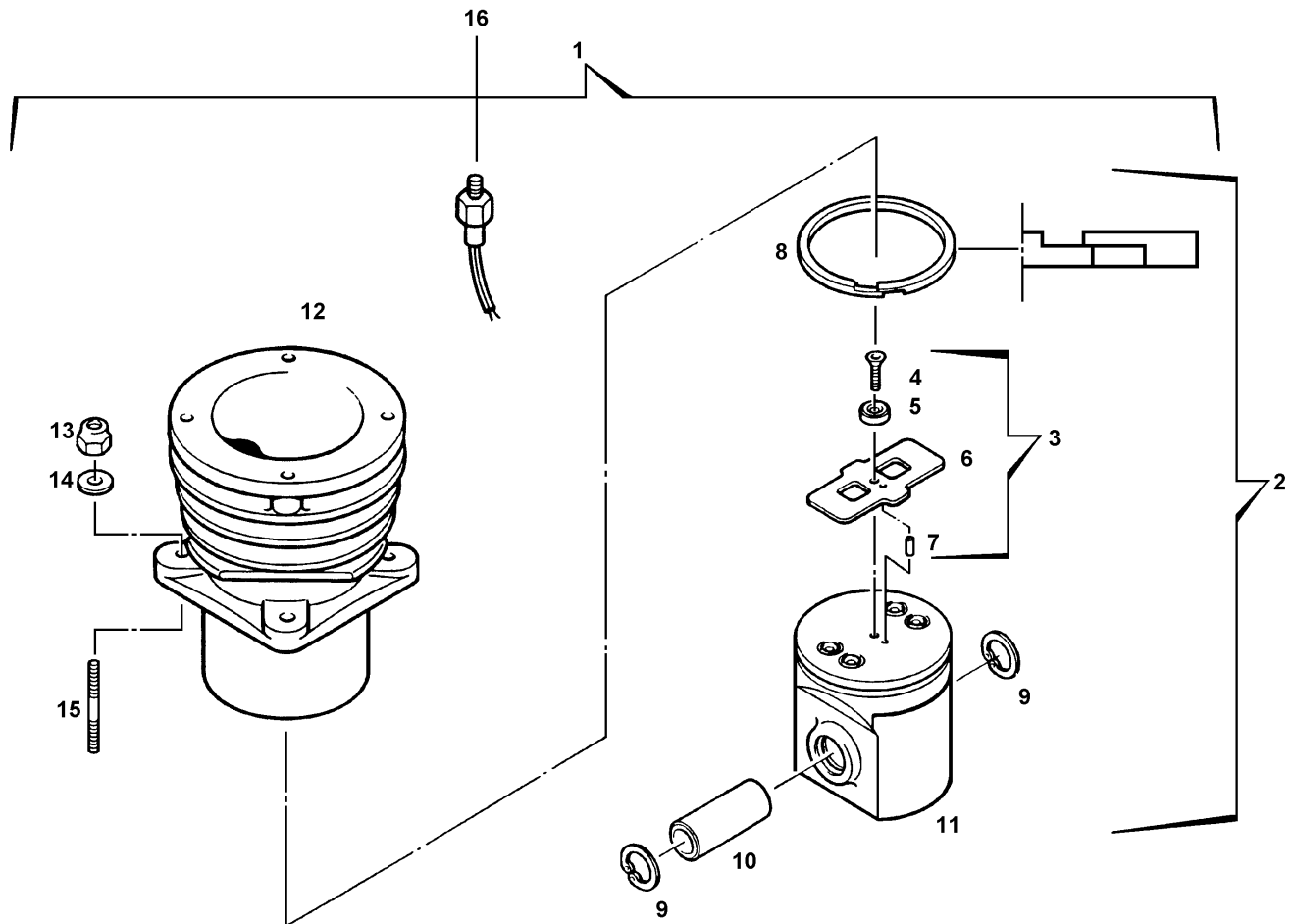
PHONE: 314 - 383 - 1300 FAX: 314 - 381 - 1439

1 - STAGE COMPRESSOR , OIL - LESS
OL 812

MACHINE: ROTARY SCREW DRAWING: 077734

DIAGRAM: DRAWN:

Fig. 21: 1-stage compressor dimensions (077734)

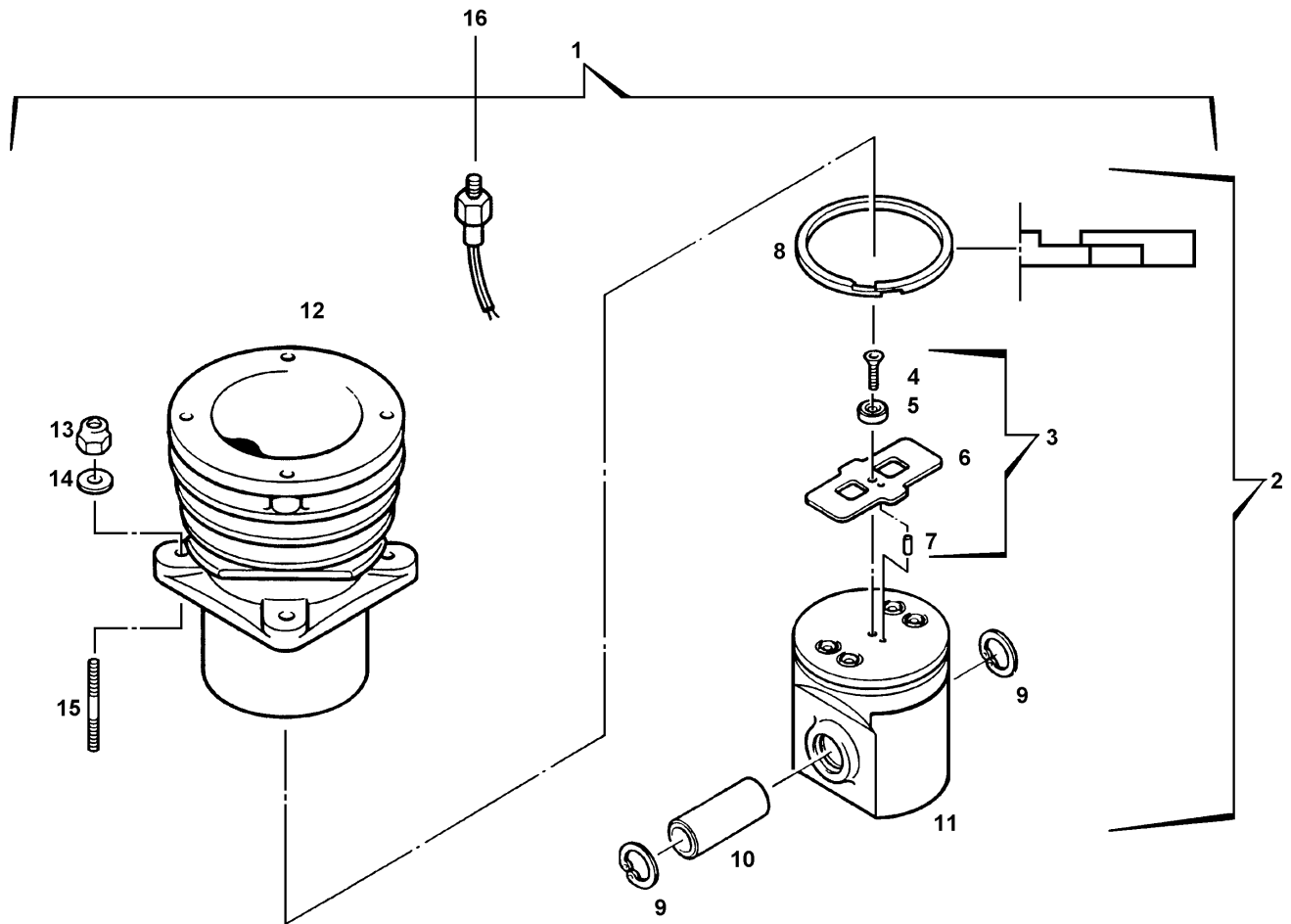


Cylinder, Piston and Intake Valve

Spare parts sets					Cylinder, piston and intake valve D51.2		
Class			Pos.	Part No.	Designation	Weight (kg)	Dimensions
0	2	5					
			1	CCC1512	Cylinder and piston assembly		Ø85
			2	CCC1513	Piston assembly		
	3	9	3	CCC1466	Intake valve assembly		
			4	CCC1619	Countersunk screw		
			5	CCC1555	Fixation nut		
			6	CCC1554	Reed valve		
			7	CCC1634	Cylinder pin		2m 6 x 4 lg. DIN 7
	3	9	8	CCC1468	Piston ring		Ø85
			9	CCC1565	Circlip		Ø25 x 1.2 DIN 472
			10	CCC1566	Piston ring		Ø25 x 14 x 52 lg.
			11	CCC1552	Piston		Ø85
			12	CCC1536	Cylinder		Ø85
			13	CCC1637	Hex nut, self-locking, NM8		NM 8 DIN 980
			14	CCC1642	Washer, 8.4mm		Ø8.4 DIN 125
			15	CCC1624	Stud, M8 x 25		M 8 x 25
			16	CCC1610	Temperature sensor (Option)		Option

Fig. 22

Note: Quantities shown are per cylinder



Cylinder, Piston and Intake Valve

Spare parts sets					Cylinder, piston and intake valve D52.4		
Class			Pos.	Part No.	Designation	Weight (kg)	Dimensions
0	2	5					
			1	CCC1512	Cylinder and piston assembly		Ø85
			2	CCC1513	Piston assembly		
	2	6	3	CCC1466	Intake valve assembly		
			4	CCC1619	Countersunk screw		
			5	CCC1555	Fixation nut		
			6	CCC1554	Reed valve		
			7	CCC1634	Cylinder pin		2m 6 x 4 lg. DIN 7
	2	4	8	CCC1468	Piston ring		Ø85
			9	CCC1565	Circlip		Ø25 x 1.2 DIN 472
			10	CCC1566	Piston ring		Ø25 x 14 x 52 lg.
			11	CCC1552	Piston		Ø85
			12	CCC1536	Cylinder		Ø85
			13	CCC1637	Hex nut, self-locking, NM8		NM 8 DIN 980
			14	CCC1642	Washer, 8.4mm		Ø8.4 DIN 125
			15	CCC1624	Stud, M8 x 25		M 8 x 25
			16	CCC1610	Temperature sensor (Option)		Option

Fig. 23

Note: Quantities shown are per cylinder

CURTIS – TOLEDO, INC.

1905 KIENLEN AVE., ST. LOUIS, MO 63133
TEL. (314) 383-1300 FAX (314) 381-1439
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