

Vacuum Pump and Compressor Set Model 83

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Vacuum Pump and Compressor Set, Model 83

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Prior to starting any work, read the operating instructions!

Keep for later use!

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1. General Information

The Mensor Model 83 is a pump and/or compressor set that complements a pressure controller and fits on or under a bench, in a rack, or on a table. The compressor is an oil-less pump with a maximum pressure of 40 psi with an open flow of 39 scfh. The vacuum pump is also oil-less and can achieve 29 inHg of vacuum with an open flow of 20 scfh. In avionics terms, this set is capable of 65,000 feet of altitude and airspeeds in excess of 1000 knots. Both units are shock mounted to reduce noise and vibration. Each unit has a power switch/breaker and can be run independently. This same configuration can also be produced in a standard 19 inch, 4U (7" high) rack mount chassis or desktop version.

1.1 Further information:

Mensor Corporation

- Address: 201 Barnes Dr., San Marcos, TX 68666
- Internet address: www.mensor.com
- Relevant data sheet: CT 25.12
- Application consultant: Tel.: (+1) 512-396-4200
(+1) 800-984-4200 (USA only)
Fax: (+1) 512-396-1820
E-Mail: sales@mensor.com
techservices@mensor.com

Importer for Europe

WIKA Alexander Wiegand SE & Co. KG

- Address: Alexander Wiegand-Straße
63911 Klingenberg, Germany
- Internet address: www.wika.de / www.wika.com
- Relevant data sheet: CT 25.12
- Application consultant: Tel.: (+49) 9372/132-5015
Fax: (+49) 9372/132-8767
E-Mail: CTsales@wika.com

1.2 Warranty

All products manufactured by Mensor are warranted to be free of defects in workmanship and materials for a period of two year from the date of shipment. No other express warranty is given, and no affirmation of Seller, by words or actions, shall constitute a warranty. SELLER DISCLAIMS ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSES WHATSOEVER. If any defect in workmanship or material should develop under conditions of normal use and service within the warranty period, repairs will be made at no charge to the original purchaser, upon delivery of the product(s) to the factory, shipping charges prepaid. If inspection by Mensor or its authorized representative reveals that the product was damaged by accident, alteration, misuse, abuse, faulty installation or other causes beyond the control of Mensor, this warranty does not apply. The judgment of Mensor will be final as to all matters concerning condition of the product, the cause and nature of a defect, and the necessity or manner of repair. Service, repairs or disassembly of the product in any manner, performed without specific factory permission, voids this warranty.

MENSOR MAKES NO WARRANTY OF ANY KIND WITH REGARD TO THIS MANUAL, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Mensor shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

1.2.1 FCC Emission Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

1.2.2 CE Emission Notice

This equipment is of the emission class B, intended for operation in industrial, residential or commercial environments.

1.3 Software License Agreement

This product contains intellectual property, i.e. software programs, that are licensed for use by the end user/customer (hereinafter “end user”).

This is not a sale of such intellectual property.

The end user shall not copy, disassemble or reverse compile the software program.



The software programs are provided to the end user “as is” without warranty of any kind, either express or implied, including, but not limited to, warranties of merchantability and fitness for a particular purpose. The entire risk of the quality and performance of the software program is with the end user.

Mensor and its suppliers shall not be held to any liability for any damages suffered or incurred by the end user (including, but not limited to, general, special, consequential or incidental damages including damages for loss of business profits, business interruption, loss of business information and the like), arising from or in connection with the delivery, use or performance of the software program.

1.4 Mensor Service Plus

1.4.1 After the Warranty

Mensor’s concern with the performance of this instrument is not limited to the warranty period. We provide complete repair, calibration and certification services after the warranty for a nominal fee.

1.4.2 Calibration Services

In addition to servicing our own products Mensor can perform a complete pressure calibration service, up to 30,000 psi, for all of your pressure instruments. This service includes an accredited calibration.

1.4.3 Certifications and Accreditations

Mensor is registered to ISO 9001:2008. The calibration program at Mensor is accredited by A2LA, as complying with both the ISO/IEC 17025:2005 and the ANSI/NCSL Z540-1-1994 standards.

2. Safety

2.1 Explanation of Symbols

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DANGER!

... indicates a directly dangerous situation resulting in serious injury or death, if not avoided.



WARNING!

... indicates a potentially dangerous situation that can result in serious injury or death, if not avoided.



CAUTION!

... indicates a potentially dangerous situation that can result in light injuries or damage to property or the environment, if not avoided.



DANGER!

... identifies hazards caused by electrical power. Should the safety instructions not be observed, there is a risk of serious or fatal injury.



WARNING!

... indicates a potentially dangerous situation that can result in burns, caused by hot surfaces or liquids, if not avoided.



Information

... points out useful tips, recommendations and information for efficient and trouble-free operation.

2.2 Responsibility of the Operator

The instrument is used in the industrial sector. The operator is therefore responsible for legal obligations regarding safety at work.

The safety instructions within these operating instructions, as well as the safety, accident prevention and environmental protection regulations for the application area must be maintained.

The operator is obliged to maintain the product label in a legible condition.

The operator must ensure that:

- Mechanical vibration, mechanical shock are minimized
- The instrument is installed in areas without soot, vapor, dust and corrosive gases
- The instrument is not used in hazardous environments, flammable atmospheres
- The operating personnel are regularly instructed in all topics regarding work safety, first aid and environmental protection and know the operating instructions and in particular, the safety instructions contained therein
- The instrument is suitable for the particular application in accordance with its intended use
- Personal protective equipment is available

2.3 Personnel Qualification



WARNING!

Risk of injury should qualification be insufficient

Improper handling can result in considerable injury and damage to equipment.

- ▶ The activities described in these operating instructions may only be carried out by skilled personnel who have the qualifications described below.

Skilled personnel

Skilled personnel, authorized by the operator, are understood to be personnel who, based on their technical training, knowledge of measurement and control technology and on their experience and knowledge of country-specific regulations, current standards and directives, are capable of carrying out the work described and independently recognizing potential hazards.

Operating personnel

The personnel trained by the operator are understood to be personnel who, based on their education, knowledge and experience, are capable of carrying out the work described and independently recognizing potential hazards.

Special knowledge for working with instruments for hazardous areas:

The skilled (electrical) personnel must have knowledge of ignition protection types, regulations and provisions for equipment in hazardous areas.

Special operating conditions require further appropriate knowledge, e.g. of aggressive media.

2.4 Product Warnings

- The Model 83 should only be used for the purpose of pumping and evacuating air. It is not made for use with other gases or any liquids.
- The Model 83 was designed for internal use. It should be protected from inclement weather when used in uncontrolled environments.
- Verify proper power (voltage and frequency) matches power label on rear of instrument before applying power.
- Do not stay directly in line with open air stream.
- Do not block air vents in rear of the unit. Normal operating temperature is 55 °F to 104 °F (15 °C to 40 °C).

2.5 Personal Protective Equipment

The personal protective equipment is designed to protect the skilled personnel from hazards that could impair their safety or health during work. When carrying out the various tasks on and with the instrument, the skilled personnel must wear personal protective equipment.

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Follow the instructions displayed in the work area regarding personal protective equipment!

The requisite personal protective equipment must be provided by the operating company.



Wear safety goggles!

Protect eyes from flying particles and liquid splashes.



Wear a protective helmet!

Protects the head from falling objects.



Wear safety shoes!

Protect feet from falling objects or objects lying around, as well as against toxic or hazardous liquids and aggressive media.

2.5.1 Symbols



Before mounting and commissioning the instrument, ensure you read the operating instructions!



CE, Communauté Européenne

Instruments bearing this mark comply with the relevant European directives.



This marking on the instruments indicates that they must not be disposed of in domestic waste. The disposal is carried out by return to the manufacturer or by the corresponding municipal authorities (see EU directive 2012/19/EU).

2.6 Warnings and Cautions

The Model 9476 has a maximum supply pressure rating of 30 psig (45 psia). The internal transducers have a burst rating of approximately 1.5x the full scale of pressure. Each transducer range in the unit is equipped with relief valves to protect from overpressure.



WARNING!

The 9476 has a maximum supply pressure rating of 30 psi gauge (45 psi absolute). The internal transducers have a burst rating of approximately 1.5x the full scale pressure. Each transducer range in the unit is equipped with relief valves to protect from overpressure.



HIGH PRESSURE!

The 9476 can operate in system configurations containing large pressure storage tanks. Large vessels even at fairly low pressures can hold large amounts of kinetic energy. User should safely bleed all pressure stored in external volumes before servicing, removing pressure hoses, or removing transducers. Powering down the instrument isolates the instrument from external pressures, but does not vent or relieve pressure from internal or external vessels.



SHOCK!

The system uses normal power line AC voltages. User should remove the AC power cord from mains when servicing

inside the 9476 chassis.



WARNING!

Any maintenance or troubleshooting should be performed by technicians knowledgeable in pneumatic pressure instrumentation and AC powered electronic equipment.



WARNING!

The unit weighs approximately 40 lbs. and is intended as a 'two person lift.'



HOT!

Some moving mechanical devices contained within the chassis (specifically solenoid valves) can build up excessive heat during continuous operation. Care should be taken when servicing inside the instrument.

Additional Warning and Caution notices are found throughout this manual.

3. Operation

3.1 Operation

The rear panel AC input module has a master power switch. Operation of the vacuum channel, pressure channel or both channels can be initiated by applying power using the power switch/breakers on the front panel. The unit requires 85 – 264 VAC, 47 – 63 Hz. No internal regulation of the pressure or vacuum is provided in the unit. Normally, none is needed on the vacuum port, but may be required if less than the approximately 40 psi gauge pressure is needed for the pressure supply. The pressure and vacuum is automatically released by internal solenoid valves when power is removed from a channel.

4. Configurations

- Single compressor: 83-C
- Single vacuum: 83-V
- Dual compressor: 83-CC (2 independent compressor channels)
- Dual compressor: 83-2C (single channel, parallel pumps for increased flow)
- Dual vacuum: 83-VV (independent channels)
- Dual vacuum: 83-2V (single channel, parallel pumps for increased flow)
- Dual compressor & vacuum: 83-CV
- Append -D for desktop model, -R for rackmount model
- Power cord options available.
- Custom configurations with more than 2 pumps in a larger chassis are available.

5. Calibration and Maintenance



For contact details, please see Chapter 1 “General information” or the back page of the operating instructions.

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5.1 Calibration

Calibration of the pressure equipment should be done periodically. Mensor Digital Pressure Transducers used in the instrument have a recommended calibration interval of 365 days. This interval can be extended or shortened depending on the requirements of the intended application and historical data from previous calibrations.

- ▶ The transducers must be removed from the system for calibration.
- ▶ The instrument must be powered off prior removal of transducers.
- Open the front panel access doors by unscrewing the two thumb screws on the right side of the left door.
- With the left door open, the right door can open in the opposite direction. Each transducer is held in place with a single thumb screw that must be loosened.
- ▶ The first transducer on the left is the barometric transducer. The second transducer from the left is the PREF transducer.
- ▶ The remaining three dual transducers are, from left to right, DPCAL, DPMON, and AUX.
- The transducers are mated to spring loaded fittings. To remove, push the transducers inward while lifting up.
- The three dual transducers each have two DB9 connectors on top that must be disconnected by loosening the thumb screws.
- Refer to the transducer manuals for calibration instructions.

5.2 Storage and Transportation

The 9476 can be stored for a reasonable amount of time without any adverse effects. Storage temperature should not exceed 70 C or drop below -20 C. The humidity should not be so high as to cause condensation in the system. The pressure ports should be covered, but not completely sealed to prevent contamination in the system. Extended storage should ensure that no water vapor is trapped within the unit and the storage temperature remains between -20 C and 70 C in a non-condensing relative humidity.

- ▶ When returning the unit to service after an extended storage period, the unit should be inspected similar to that of a new unit and also allowed to stabilize to normal room temperatures before operation.

The unit should be transported in a suitable container typical of a precision laboratory type instrument. Mensor recommends utilizing foam inserts and box similar to the type the unit was originally shipped in. If not possible, the unit should be placed in a container (or corrugated box) of a size that allows at least 4 inches of shock attenuation material on all sides and in a manner that keeps the unit from shifting within the box. Mensor also recommends shipment on a pallet.

5.3 Maintenance

Standard maintenance may include checking for loose fittings and screws and general housekeeping. The cooling fan in the back of the unit should be inspected for operation and cleaned to remove lint and dust. Maintenance of internal components can be minimized when clean dry pressure media is always used. See Calibration section and transducer manuals for additional information.

5.3.1 Beyond the Warranty

Take advantage of Mensor's expert product care. Mensor provides complete maintenance and calibration services, available for a nominal fee. Our service staff is knowledgeable in the innermost details of all of our transmitters. We maintain units that are in operation in many different industries and in a variety of applications, and by users with a wide range of requirements. Returning your transmitter to Mensor for service benefits you in several ways:

- Our extensive knowledge of the transmitter assures you that it will receive expert care.
- Repair or replacement of the CPT6030 transmitters will be available up to 7 years after the production life cycle of the product, pending external vendor parts or equivalent parts availability. The production life cycle is defined as the time from the product series launch to the announcement of discontinuation (typically 8 to 10 years).
- All repairs should be performed by Mensor due to the complexity of performing these repairs.

5.4 Calibration Services by Mensor or WIKA worldwide

Mensor and WIKA worldwide have extensive experience and knowledge of Mensor products. Calibration of the transmitters can be performed at the addresses below or by competent internal or external labs using the procedures in this section.

Service Center USA	Service Center Europe
Mensor website: www.mensor.com tel: 1-512-396-4200 1-800-984-4200 fax: 1-512-396-1820 email: tech.support@mensor.com	WIKA Alexander Wiegand SE & Co. KG website: www.wika.de / www.wika.com tel: (+49) 9372 132-0 fax: (+49) 9372 132-406 email: CTServiceTeam@wika.com
Service Center China	
WIKA China website: www.wika.cn contact: Baggio Li tel: (+86) 512 6878 8000 fax: (+86) 512 6809 2321 email: baggio.li@wika.com	

6. Specifications

6.1 General Specifications

Power:

85 - 264 VAC, 47 - 63 Hz

0.5 Amps (1.2 start-up) with dual pumps

Main power input and switch on rear panel.

Independent pump power switches on front panel.

Porting:

¼" male tube fitting standard (additional options available)

Pressure:

Approximately 40 psi per compressor channel

Approximately 29 inHg per vacuum channel

Flow:

Approximately 39 scfh open flow per single compressor channel

Approximately 20 scfh open flow per single vacuum channel

Size:

13.5" Wide

12.5" Deep (reserve additional room for rear ports)

7" Tall (4U)

Weight:

Dual pump approximately 15 pounds

Single pump approximately 10 pounds

Noise:

Approximately 55 dB A weighted at 6 ft.

Approximately 64 dB A weighted at 1 ft.

Operating Conditions:

Ambient temperature: 15 – 40 °C

Humidity: 20 – 80% RH

7. Maintenance

7.1 General Maintenance

Rear panel fan grills should be periodically cleared of any dust/debris build up. Frequency will depend on operating environment. If the unit is to be taken out of service for an extended period of time, the Shutdown Procedure should be followed. Under normal conditions, the pump should operate in excess of 4000 hours when unit is kept within the recommended temperature operating range.

WIKA subsidiaries worldwide can be found online at www.wika.com.



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