Operation Manual (EN)
Translation of the german original manual

WOB-L® Piston pumps

Models:

► 2511C-02
► 2511B-01
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**EC Declaration of Conformity**
1 Important Information

1.1 General Information

The WOB-L® Piston Pumps conform to the following directives:

<table>
<thead>
<tr>
<th>Year</th>
<th>Directive</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>Machinery Directive</td>
</tr>
<tr>
<td>2014</td>
<td>Electromagnetic Compatibility Directive</td>
</tr>
<tr>
<td>2014</td>
<td>Pressure Equipment Directive</td>
</tr>
<tr>
<td>2014</td>
<td>Simple Pressure Vessels Directive</td>
</tr>
</tbody>
</table>

The CE sign is located on the rating plate. Observe the binding national and local regulations when fitting the pump into installations!

1.2 Target Groups

This Operating Manual is intended for the personnel planning, operating and maintaining WOB-L® Piston Pumps. This group of people includes:

- Designers and fitters of vacuum apparatus
- Employees working on commercial laboratory and industrial vacuum technology applications
- Service personnel for WOB-L® Piston Pumps

The personnel operating and maintaining the WOB-L® Piston Pumps must have the technical competence required to perform the work that has to be done. The user must authorize the operating personnel to do the work that has to be done. The personnel must have read and understood the complete Operating Manual before using the WOB-L® Piston Pumps. The Operating Manual must be kept at the place of use and be available to the personnel when required.

1.3 Intended Use

- The layout of the WOB-L® Piston Pumps must be appropriate for the conditions of use. The user bears the sole responsibility for this.
- The WOB-L® Piston Pumps may only be operated under the conditions stated
  - in the "Technical Data" section,
  - on the type plate, and
  - in the technical specification for the order concerned.
- WOB-L® Piston Pumps are approved for extracting, pumping and compressing gases and vapours. If these gases and vapours are toxic or explosive, then the user must observe the currently valid safety regulations for this application.

1.4 Use for an Unauthorized Purpose

It is forbidden to use the pump for applications deviating from the technical data stated on the type plate or the conditions stated in the supply contract, or to operate it with missing or defective protective devices.
1.5 Safety Devices

Measures such as the following are for the safety of the operating personnel:

- electrical connection with a protective conductor (operating mode S1) and an earthing plug
- Motor protection device (thermal)
- “Hot Surface” label on the pump - warning notice

The WOB-L® Piston Pumps must not be operated without these elements.

1.6 Meaning of the Warning notes

Take note of the warning notices. They are each in the following box:

![CAUTION ! / WARNING !]

Hazard which may lead to serious injuries or material damage.

1.7 Product Standards, Safety Regulations

WOB-L® Piston Pumps meet the following product standards:

<table>
<thead>
<tr>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN EN ISO 12100:2011-03</td>
<td>Safety of machinery - General principles for design - Risk assessment and risk reduction</td>
</tr>
<tr>
<td>DIN EN ISO 13857:2008-06</td>
<td>Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs</td>
</tr>
<tr>
<td>DIN EN ISO 2151:2009-01</td>
<td>Acoustics - Noise test code for compressors and vacuum pumps - Engineering method (grade 2)</td>
</tr>
<tr>
<td>DIN EN 60204-12014-10</td>
<td>Safety of machinery - Electrical equipment of machines - Part 1: General requirements</td>
</tr>
<tr>
<td>DIN EN 61010-1/A1:2015-04</td>
<td>Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements</td>
</tr>
<tr>
<td>DIN EN 50110-1:2014-02</td>
<td>Operation of electrical installations</td>
</tr>
<tr>
<td>Directive 2012/19/EU</td>
<td>Dangerous materials in electrical and electronics devices (RoHS II)</td>
</tr>
<tr>
<td>Directive 2011/65/EU</td>
<td>China - RoHS II</td>
</tr>
</tbody>
</table>

The following additional safety regulations apply in the FR Germany:

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DGUV Regulation 1</td>
<td>Accident prevention regulations, principles of prevention</td>
</tr>
<tr>
<td>DGUV Regulation 3</td>
<td>Safety and testing of electrical equipment and equipment</td>
</tr>
<tr>
<td>DGUV Rule 100-500</td>
<td>Operation of work equipment</td>
</tr>
<tr>
<td>DGUV Information 213-850</td>
<td>Safe working in laboratories</td>
</tr>
</tbody>
</table>

Observe the standards and regulations applying in your country when you use the WOB-L® Piston Pumps.
2 Basic Safety Instructions

2.1 General Information
Warning notices must be observed. Disregarding them may lead to damage to health and property.
The WOB-L® Piston Pumps must be operated by personnel who can detect impending dangers and take action to prevent them from materialising.
The manufacturer or authorized workshops will only service or maintain the WOB-L® Piston Pumps if it is accompanied by a fully completed damage report. Precise information about the contamination (also negative information if necessary) and thorough cleaning of the WOB-L® Piston Pumps are legally binding parts of the contract. Contaminated WOB-L® Piston Pumps and their individual parts must be disposed of in accordance with the legal regulations.
The local regulations apply in foreign countries.

2.2 Electricity
The WOB-L® Piston Pumps of operation mode S1 are supplied. When the location of operation mode S1 devices is changed, please note that the testing must be repeated in accordance with DIN EN 0105, DIN EN 0702 and DGUV Regulation 3.
The local regulations apply in foreign countries.
Please note the following when connecting to the electrical power supply system:
• The electrical power supply system must have a protective connector according to DIN IEC 60364-4-41.
• The protective connector must not have any breaks.
• The connecting cable must not be damaged.

2.3 Mechanical Systems
Improper use can lead to injuries or material damage. Observe the following instructions:
• Only operate the pumps with hoses of the specified dimensions.
• The maximum permissible pressure of 1 bar at the suction connection must not be exceeded.
• Hazardous substances must be separated out as far as this is technically possible before they reach the pump.
• External mechanical stresses and vibrations must not be transmitted to the pump. Only use flexible laboratory hoses for connecting pumps.
• The overpressure generated at the pressure port must not exceed 3 bar.
• The pump must not be used to suck up fluids. Lay the exhaust pipe so that it slopes downwards, so allowing condensate to flow out of the pump. Collect the condensate and dispose of it in an environmentally compatible manner.
• Prevent dyes exuding.
• Maintain a space of least 20 mm between the pump and adjacent parts in order to enable the pump to cool.

CAUTION !
Solid particles in the pumping medium impair the pumping action and can lead to damage. Prevent solid particles penetrating into the pump.
2.4 Hazardous Substances

ACHTUNG!

The operating company bears the responsibility for the use of the WOB-L® Piston Pumps.
Hazardous substances in the gases to be pumped can cause personal injuries and property damage. Pay attention to the warning notices for handling hazardous substances.

The local regulations apply in foreign countries.

Combustible, aggressive and explosive Gases
Don’t pump combustible, especially aggressive or explosive gases or vapors or operate this pump in an atmosphere containing combustible or explosive gases or vapors.
Examine before switching on whether that can form gas combustible gas/air mixtures which can be promoted! Consider the regulations of the guideline 1999/92/EC.
The WOB-L® Piston Pumps are not certified according to ATEX guidelines 2014/34/EU.
The WOB-L® piston pumps are not recommended for pumping acidic, basic or organic vapors.

Poisonous Gases
Use a condensate separator (e.g. Woulff bottle) when pumping poisonous or harmful gases.
Prevent such substances from leaking out of the appliance or pump. Treat these substances according to the applicable environmental protection regulations.
Test the strength and leak-tightness of the connecting lines and the connected apparatus.
Prevent environmental poisons, e.g. mercury, getting into the pumps.
Fulfil the requirements, for example:
- German Hazardous Substances Regulation (GefStoffV) of 01. December 2010
- Regulation 2016/1179/EU (classification, packaging and labelling of hazardous substances),
- Manufacturer’s safety data sheets on hazardous substances.

2.5 High Temperatures
The WOB-L® Piston Pumps may heat up as a result of the temperature of the gas being pumped and through compression heat.
Prevent the following maximum permissible temperatures from being exceeded.
- +40°C for the environment, and
- +40°C for the gas to be pumped.

The electric motor has a thermal overload protection.
3 Description

3.1 Design

3.1.1 Connections - Suction-/Pressure side

<table>
<thead>
<tr>
<th>Vacuum connection</th>
<th>Suction side</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td></td>
</tr>
</tbody>
</table>

Suction side - Connection:
Hose nozzle DN 6 (1)

<table>
<thead>
<tr>
<th>Exhaust connection</th>
<th>Pressure side</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2)</td>
<td></td>
</tr>
</tbody>
</table>

Pressure side - Connection:
Hose nozzle DN 6 (2)

3.1.2 Connecting to the electricity supply

The WOB-L® Piston Pumps are supplied with complete electrical wiring. It is connected via a mains connection cable and a power plug. Mains connection cable and plug must comply with the requirements of the line disconnection devices (current, output). Motor is provided with a thermal overload protection ex works, protecting the vacuum pump from damage or destruction, respectively.

**WARNING !**

Should the user change the electrical connection, for example for fitting into a system, then this may only be performed by a electrical specialist under observance of the accident prevention regulations.

**WARNUNG !**

Please keep in mind that the barometric pressure changes from day to day. This also changes the displayed pressure values because of latent air pressure fluctuations.
3.2 Protection measure against liquids in the pump

3.2.1 Condensate separator (Suction side)

If the possibility of penetration of larger liquid quantities we recommend the installation of a larger collection vessel (e.g. Woullf bottle).

3.3 Areas of Application

The WOB-L® Piston Pumps are intended to:
- Pumping and compressing neutral and aggressive gases and vapours.
- Generating a vacuum down to a minimum ultimate pressure 292 mbar.
- Use in physical and chemical laboratories in trade and industry.
- Use for vacuum filtration, vacuum drying and other vacuum technology applications.

3.4 Scope of Delivery

The scope of delivery is specified in the supply contract.

3.5 Accessories

<table>
<thead>
<tr>
<th>Figure</th>
<th>Designation / Usage</th>
<th>Order no.</th>
</tr>
</thead>
</table>
| ![Inline filter, hydrophobic](inline_filter.png) | Inline filter, hydrophobic  
Pore size: 0.22 µm  
To protect the pump against fine dust and aerosols. Installation in the suction line. | 112555-04 |
| ![Inline filter Kit](inline_filter_kit.png) | Inline filter Kit  
Consisting of:  
- Silicone hose DN 6  
- Silicone hose DN 8  
- Inline filter, hydrophobic (0.22 µm) | 404008 |
| ![PVC-Fabric hose](pvc_fabric_hose.png) | PVC-Fabric hose  
6 x 3 mm  
For compressor- and vacuum applications as exhaust air- and suction line. | 828348 |
| ![Hose clamp](hose_clamp.png) | Hose clamp  
For fixing and sealing of PVC-Fabric hose. | 305320 |
# Technical Data

## Parameter

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>2511</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pumping speed 50/60 Hz</strong> at atmospheric pressure</td>
<td>m³ / h</td>
<td>0.55 / 0.39</td>
</tr>
<tr>
<td></td>
<td>l / min</td>
<td>9.2 / 11</td>
</tr>
<tr>
<td><strong>Ultimate pressure</strong></td>
<td>mbar</td>
<td>292</td>
</tr>
<tr>
<td><strong>Overpressure, max.</strong></td>
<td>bar (ü)</td>
<td>3.3</td>
</tr>
<tr>
<td><strong>Suction-/ Exhaust connection</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ambient temperature</strong></td>
<td>°C</td>
<td>+10 to +40</td>
</tr>
<tr>
<td><strong>Max. Operating gas temperature</strong></td>
<td></td>
<td>+40</td>
</tr>
<tr>
<td><strong>Noise level</strong></td>
<td>dB (A)</td>
<td>≤ 45</td>
</tr>
<tr>
<td><strong>Voltage / Frequency</strong></td>
<td>V / Hz</td>
<td>230 / 50; 115 / 60</td>
</tr>
<tr>
<td><strong>Motor power</strong></td>
<td>W</td>
<td>25</td>
</tr>
<tr>
<td><strong>Type of protection</strong></td>
<td></td>
<td>IP 20</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>kg</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Dimensions (W/D/H)</strong></td>
<td>mm</td>
<td>194 / 114 / 191</td>
</tr>
<tr>
<td><strong>Order No. for:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- WOB-L® Piston pump 230V, 50Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>inclusive mains connection</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cable with plug CEE and UK</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2511C-02</td>
<td></td>
</tr>
<tr>
<td>- WOB-L® Piston pump 115V, 60Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>inclusive mains connection</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cable with plug US</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2511B-01</td>
<td></td>
</tr>
</tbody>
</table>

The information presented in this material is based on technical data and test results of nominal units. It is believed to be accurate and reliable and is offered as and aid to help in the selection of products. It is the responsibility of the user to determine the suitability of the product for the intended use and the user assumes all risk and liability whatsoever in connection therewith. Gardner Denver Thomas GmbH does not warrant, guarantee or assume any obligation or liability in connection with this information.
5 Installation and Operation

5.1 Unpacking

Carefully unpack the WOB-L® Piston Pump.

Check the pump for:
- Transport damage,
- Conformity with the specifications of the supply contract (type, electrical supply data),
- Completeness of the delivery.

Please inform us without delay if there are discrepancies between the delivery and the contractually agreed scope of delivery, or if damage is detected.

Please take note of the general terms of business of the manufacturing firm.

In case of a claim under warranty, the device must be returned in packaging that is suitable for protecting it during transport.

5.2 Setting up and connecting

5.2.1 Setting up

- Set the pump on a flat and horizontal surface.
- Remove the protective caps on the suction and pressure ports.
- Note that the cooling of the pump is guaranteed, see chapter 2.3.
- Note that on the installation location no moisture acts on the pump.

5.2.2 Connecting

5.2.2.1 Electrical Connection

Before the electrical connection of the pump review the specifications on the nameplate with the existing electrical connection conditions, see chapter 2.2.

CAUTION !

The electric motor has a thermal overload protection. After triggering the protective fuse after a certain cooling occurs, an auto restart (Reset) the motor.

5.2.2.2 Vacuum connection (Suction side)

The vacuum connection (suction port) consists of a hose nozzle DN 6.

Suitable vacuum line:
- PVC fabric hose 6 x 3 mm and hose clamp, see chapter 3.5.

Make sure that the vacuum line is kept as short as possible from the pump to the apparatus.

5.2.2.3 Exhaust connection (Pressure side)

The exhaust connection (pressure port) also consists of a hose nozzle DN 6.

Suitable exhaust line for vacuum- and compressor application:
- PVC fabric hose 6 x 3 mm and hose clamp, see chapter 3.5.
5.3 Operation

CAUTION!

Use only for compressed air applications suitable conduit systems!

Observe the basic safety instructions when using the WOB-L® Piston Pump, chapter 2.

5.3.1 Start-up

- Make sure that when you start the pump, which may arise in the connection lines condensates, cannot penetrate into the pump.
  - Action: suction side condensate separator
- Always try to avoid aspiration of foreign body particles!
  - Action: suction side inline filter
- The WOB-L® Piston pump is switched on the power switch.
- It is recommended to let the pump run for a few minutes before use. The warm-up improves the eligibility of the pump.

5.3.2 Decommissioning

- If vacuum applications with special steam load, the pump needs to run after the process with an open vacuum port about 2 minutes and rinsed with atmospheric air. This measure is used to cleaning the pump chamber and minimizes the corrosive attack wetted material pump parts.
- The WOB-L® Piston pump is switched off using the power switch.

5.4 Storage

The pumps are to be stored in a low-dust, interior room within the temperature range from +5 to +40 °C and at a relative air humidity < 90%.
Leave the protective elements on the suction and pressure ports. Another equally good protection may be used.

5.5 Scrap Disposal

CAUTION!

The WOB-L® Piston Pumps must be disposed of in accordance with the 2012/19/EU guideline and the specific national regulations. Contaminated WOB-L® Piston Pumps must be decontaminated according to the laws.
6 Maintenance and Servicing

WOB-L® Piston pumps are 100% oil-free. The piston and cylinder of the pump are lubricated maintenance free. All bearings are sealed and permanently lubricated.

6.1 Maintenance Performed by the User

<table>
<thead>
<tr>
<th>WARNING !</th>
</tr>
</thead>
</table>
| Only perform the work that is described here, and that which is permitted to be done by the user.  
All other maintenance and service work may only be performed by the manufacturer or a dealer authorized by him.  
Beware of the pump parts being possibly contaminated by hazardous substances. Wear protective clothing if there is contamination.  
Renew defective parts, if necessary! Do not clean with compressed air! |

- Check the pump daily for unusual running noises and heat building up on the surface of the pump.  
- Check the electrical and vacuum connections daily.

6.2 Maintenance by the Manufacturer

Repairs and maintenance going beyond the extent of the work described in chapter 6.1 or reconditioning or modification may only be performed by the manufacturer or authorized workshops.

<table>
<thead>
<tr>
<th>WARNING !</th>
</tr>
</thead>
<tbody>
<tr>
<td>The user shall be liable for the consequences of an incorrect damage report or a contaminated pump. The statements in the damage report are legally binding.</td>
</tr>
</tbody>
</table>

6.3 Damage Report

You find the form of the damage report to the Download on our web page in the menu "service" and "Downloads": www.welchvacuum.com  
If you should not have an entrance to the Internet, you can request the form also gladly with us, under phone +49 3677 604 0.

<table>
<thead>
<tr>
<th>WARNING !</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incomplete or incorrectly completed damage reports may endanger the service personnel! Give full information in the damage report, in particular regarding a possible contaminating.</td>
</tr>
</tbody>
</table>
# Troubleshooting

During the warranty period, intervention in the WOB-L® Piston Pumps and accessory components may only be made by manufacturing firm.

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump does not start</td>
<td>No power supply</td>
<td><strong>Qualified electrician</strong> Check electrical installation</td>
</tr>
<tr>
<td></td>
<td>Motor defective</td>
<td><strong>Service workshop</strong> Exchange</td>
</tr>
<tr>
<td>Pump does not generate a vacuum or overpressure</td>
<td>Connected apparatus and/or connecting elements leaking</td>
<td><strong>User or Service workshop</strong> Identify and seal the leak, replace the seals and/or hoses if necessary.</td>
</tr>
<tr>
<td></td>
<td>Pump leaking</td>
<td><strong>User or Service workshop</strong> Exchange the hoses and/or fittings if necessary.</td>
</tr>
<tr>
<td></td>
<td>Pump dirty</td>
<td><strong>User or Service workshop</strong> General maintenance / Cleaning</td>
</tr>
<tr>
<td></td>
<td>loose screws</td>
<td><strong>User or Service workshop</strong> Tighten the screws</td>
</tr>
<tr>
<td>Running noise</td>
<td>loose screws or connectors</td>
<td><strong>User or Service workshop</strong> Tighten the screws and / or connectors</td>
</tr>
<tr>
<td>Cable</td>
<td>defective and/or brittle</td>
<td><strong>Qualified electrician</strong> Exchange of the cable</td>
</tr>
</tbody>
</table>

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"Welch" by Gardner Denver
Gardner Denver Thomas GmbH
Am Vogelherd 20
98693 Ilmenau
Germany
T +49 3677 604 0
F +49 3677 604 131
welch.emea@gardnerdenver.com
www.welchvacuum.com

Bezeichnung des Produkts (Pumpen) / Description of product (pumps) / Denominación del producto (bombas):

- WOB-L® Kolbenpumpen / Piston pumps / Pompes à piston / Bombas de pistones
  - 2511C-02, 2511B-01

Angewandte harmonisierte Normen: / Applied harmonized standards: / Standards appliquées et harmonisées: / Normas armonizadas autorizadas:


- DIN EN ISO 13857:2008-06: Sicherheit von Maschinen - Sicherheitsabstände gegen das Erreichen von Gefährdungsbereichen mit den oberen und unteren Gliedmaßen / Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs / Seguridad de las máquinas - Distancias de seguridad impidiendo que los miembros superiores e inferiores alcancen las zonas peligrosas


- DIN EN 50110-1:2014-02: Betrieb von elektrischen Anlagen / Operation of electrical installations / Fonctionnement des installations électriques / Funcionamiento de instalaciones eléctricas

- DIN EN 61010-1:2015-04: Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte - Teil 1: Allgemeine Anforderungen / Safety requirements for electrical equipment for measurement, control and laboratory use - part 1: General requirements / Consignes de sécurité pour les appareils électriques de mesure, de commande, de régulation ou de laboratoire - partie 1: Dispositions générales / Prescripciones generales / Disposiciones de seguridad para medidores, equipos de mando, equipos reguladores y equipos de laboratorio. Parte 1: Requisitos generales

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