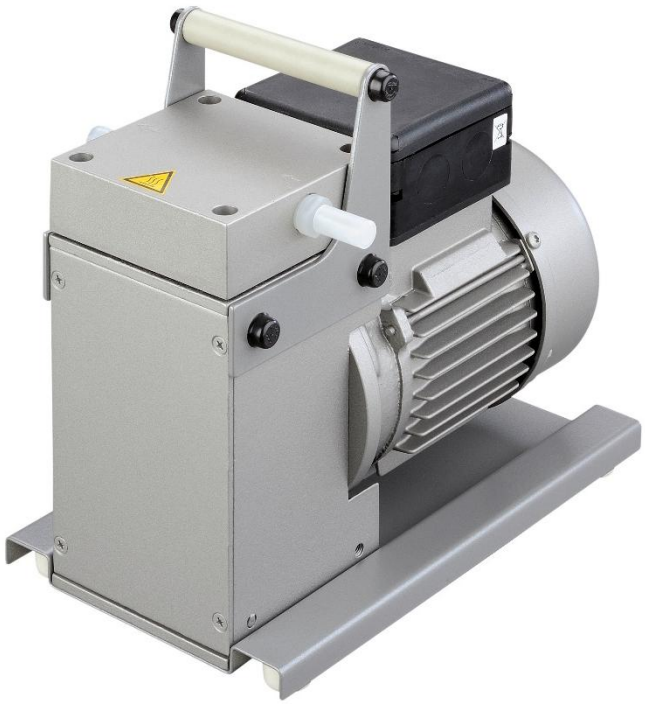
WELCH
by Gardner Denver

**Operation Manual** (EN)
Translation of the german original manual

# Diaphragm pumps
# 1 - headed

Models:

- ► MP 301 E
- ► MPC 301 E
- ► MPC 301 E - X2



412711
2017-03-01

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# Contents

# 1 Important Information

## 1.1 General Information

The Diaphragm Pumps conform to the following directives:

| | |
|---|---|
| **2006 / 42 / EC** | Machinery Directive |
| **2014 / 30 / EU** | Electromagnetic Compatibility Directive |

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

Our products are sold worldwide and can therefore be equipped with the typical national plugs and for the various voltages. You will find more information about the available pump designs on our web page in the internet.

## 1.2 Target Groups

This Operating Manual is intended for the personnel planning, operating and maintaining Diaphragm Pumps.
This group of people includes:

- Designers and fitters of vacuum apparatus,
- Employees working on commercial laboratory and industrial vacuum technology applications and
- Service personnel for diaphragm pumps

The personnel operating and maintaining the diaphragm 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 diaphragm 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 diaphragm pump must be appropriate for the conditions of use. The user bears the sole responsibility for this.
- The diaphragm pump 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.
- Diaphragm 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. Special types of diaphragm pumps are available for aggressive and explosive gases.

## 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 switch (thermal) and
- “Hot Surface" label on the pump body - warning notice 

The diaphragm pump must not be operated without these elements.

## 1.6 Meaning of the Warning notes

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

|  | **CAUTION ! / WARNING !** |
|---|---|
| **Hazard which may lead to serious injuries or material damage.** | |

## 1.7 Product Standards, Safety Regulations

**The Diaphragm Pumps meet the following product standards:**

| | |
|---|---|
| **DIN EN ISO 12100:2011-03** | Safety of machinery -<br>General principles for design - Risk assessment and risk reduction |
| **DIN EN ISO 13857:2008-06** | Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs |
| **DIN EN 1012-2:2011-12** | Compressors and vacuum pumps - Safety requirements -<br>Part 2: Vacuum pumps |
| **DIN EN ISO 2151:2009-01** | Acoustics - Noise test code for compressors and vacuum pumps - Engineering method (grade 2) |
| **DIN EN 60204-1:2014-10** | Safety of machinery - Electrical equipment of machines -<br>Part 1: General requirements |
| **DIN EN 61000-6-2:2011-06**<br>**DIN EN 61000-6-4:2011-09** | Electromagnetic compatibility (EMC) -<br>Part 6-2: Generic standards - Immunity for industrial environments<br>Part 6-4: Generic standards - Emission standard for industrial environments |
| **DIN EN 61010-1/A1:2015-04** | Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements |
| **DIN EN 50110-1:2014-02** | Operation of electrical installations |
| **Directive 2012/19/EU** | Electrical and electronics - old devices (WEEE) |
| **Directive 2011/65/EU** | Dangerous materials in electrical and electronics devices (RoHS II) |
| **China - RoHS II** | Environment protection law - China 2016-01 |

**The following additional safety regulations apply in the FR Germany:**

| | |
|---|---|
| **BGV A3** | Electrical equipment and operating materials |
| **VBG 5** | Power-driven machines |
| **BGR 120** | Guidelines for laboratories |
| **BGI 798** | Hazard assessment in the laboratory |
| **BGG 919 (VBG 16)** | Accident prevention regulations for "compressors" |
| **BGR 189 (BGR 195;192;197)** | Use of protective working clothes |

Observe the standards and regulations applying in your country when you use the diaphragm 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 diaphragm pumps must be operated by personnel who can detect impending dangers and take action to prevent them from materialising.
The manufacturer or authorized authorised workshops will only service or maintain the diaphragm pump 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 diaphragm pump are legally binding parts of the contract.
Contaminated diaphragm 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 diaphragm 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 BGV A2.
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 VDE 0100-410 (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 diaphragm pumps with hoses of the specified dimensions.
- The maximum permissible pressure of 1 bar at the intake 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 NW 8 laboratory hoses for connecting diaphragm pumps.
- The overpressure generated at the exhaust port must not exceed 1 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

The operating company bears the responsibility for the use of the diaphragm pump.
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 Gases**
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.

**Explosive gases**
The diaphragm pumps are not certified according to ATEX guidelines 2014/34/EU.

**Aggressive gases**
The **MPC** series is designed for extracting contaminated gases!
The use of diaphragm pumps of the series **MP** cannot be recommended for such cases of application!
Especially aggressive gases have to be explicitly checked for material resistance as described *in chapter 3.5* and, if necessary, modified.

**Poisonous gases**
Use a separator 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 diaphragm pumps.

Fulfil the requirements, for example:
- German Hazardous Substances Regulation (GefStoffV) of 01. December 2010
- Regulations 2016/1179/EU
  (classification, packaging and identification of hazardous substances),
- Manufacturer's safety data sheets on hazardous substances.

## 2.5 High Temperatures

The diaphragm pump 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
- + 60 °C for the gas to be pumped.

The motor for single phase alternating current is protected against overload by an integrated motor protection switch.

# 3 Description

## 3.1 Design

The one-stage diaphragm pump consists of a pump body **(1)** and a drive motor **(2)**.

The pump casing contains the drive unit and one pump head **(3)**.
The pump head contains a diaphragm and the work valves.

The pump heads are driven via an eccentric shaft with a connecting rod.


*Fig. 1 Diaphragm pump MPC 301 E*

## 3.2 Principle of Operation

Motor, eccentric shaft and connecting rod set the diaphragms in stroke movement. This changes the size of the space between the diaphragms and pump head (pump chamber).

Increasing the size of the pump chamber opens the inlet valve while the outlet valve is closed (intake process).

Decreasing the size of the pump chamber ejects the gas through the outlet valve.

The valves are actuated by the gas being pumped. A large proportion of fluid in the diaphragm pump minimizes the pumping efficiency.

## 3.3 Areas of Application

**The Diaphragm Pumps are intended to:**

- Pumping and compressing neutral and aggressive gases and vapours.
- Generating a vacuum down to an ultimate pressure < 75 mbar.
- Use in physical and chemical laboratories in trade and industry.
- Use for vacuum filtration, vacuum distillation and vacuum drying, and other vacuum technology applications.

## 3.4 Scope of Delivery

The scope of delivery is specified in the supply contract.

## 3.5 Materials of the medium-affecting pump parts

| Component | Standard design | Chemical model *(resistant to aggressive gases)* | |
|---|---|---|---|
| | **MP** | **MPC** | **MPC - X2** |
| **Seal** | EPDM | EPDM | FFKM, PTFE |
| **Screw fitting / Connecting element** | PA, PP | PP, PVDF | PVDF |
| **Valve** | PEEK | PEEK | PFA |
| **Diaphragm** | Elastomer + PTFE Layer | Elastomer + PTFE Layer | PTFE mod. |
| **Connection head / Pump head** | Aluminium | PTFE with carbon-fibre reinforcing *) | |

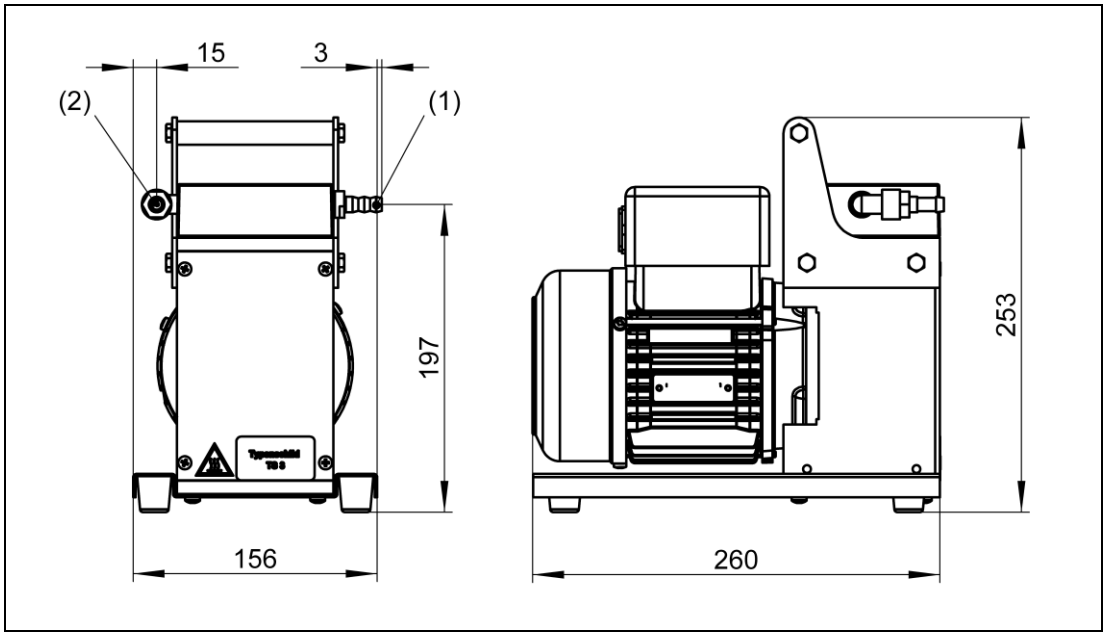
*) electrically conductive (with manufacturer's certificate of electrical conductivity)
Material resistance to aggressive media see: Publisher Hoppenstedt Publishing (18. September 2007)

## 3.6 Accessories

| Designation | Usage | Order no. |
|---|---|---|
| **Vacuum Control Box VCB 521 cv** | for measuring and regulation of vacuum | 600053 |
| **Vacuum Regulator with dial gauge DBR-A** | for intake allows the adjustment of the ultimate pressure | 700458-01 |
| **Mains connection cable IEC with plug type 12 (CH)** | for diaphragm pumps of model MP/MPC in 230 V | 825877 |

# 4 Technical Data

## 4.1 Dimensions




| | | |
|---|---|---|
| **(1)** | **Intake connection** | Hose nozzle DN 8 for hose inside diameter 8 mm |
| **(2)** | **Exhaust connection** | Hose sleeve A 10 - 8 *or optional* Exhaust silencer A 10 *(enclosed)* |

*Fig. 2 Dimensions*

## 4.2 Intake Pressure / Pumping Speed – Diagram

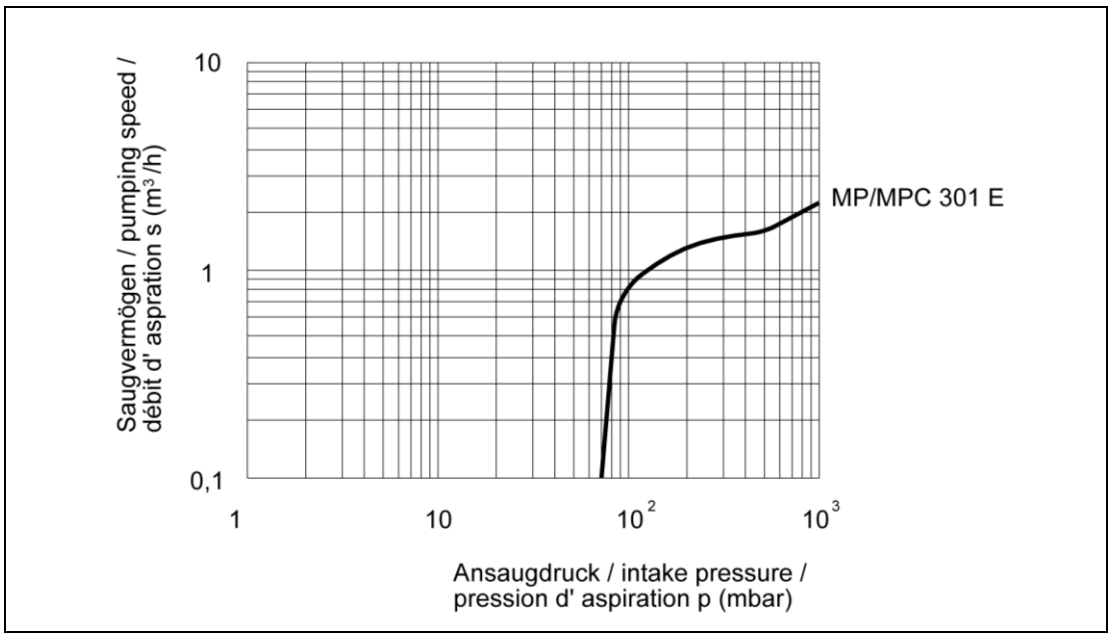



*Fig. 3 Intake Pressure / Pumping Speed - Diagram*

## 4.3 Device Data

| Parameter | Unit | MP 301 E | MPC 301 E |
|---|---|---|---|
| **Pumping speed 50/60 Hz** DIN 28432 | $m^3$ / h | 2.3 / 2.5 | |
| | l / min | 38 / 41 | |
| **Ultimate pressure** | mbar | < 75 | |
| **Max. inlet pressure** | bar | 1 | |
| **Max. outlet pressure** | | 1 | |
| **Intake connection** | - | Hose nozzle DN 8 for hose inside diameter 8 mm | |
| **Exhaust connection** | | Hose sleeve A 10 – 8 *or optional (enclosed)* Exhaust silencer A 10 | |
| **Ambient temperature** | °C | + 10 to + 40 | |
| **Max. operating gas temperature** | | + 60 | |
| **Bearing** | - | maintenance-free | |
| **Reference surface sound pressure level** DIN EN ISO 2151 | dB (A) | < 45 | |
| **Voltage / Frequency** (different data upon customer request) | V, Hz | 230, 50/60 / 115, 50/60 (generally with motor protection switch, switch and plug IEC) | |
| **Power** | W | 180 | |
| **Operating mode** | - | S 1 | |
| **Type of protection (Motor)** DIN EN 60529 | | IP 54 | |
| **Class of insulation** DIN EN 600034-1 | | F (160°C) | |
| **Weight** | kg | 8.9 | |
| **Dimensions (W/D/H)** | mm | 156 / 260 / 253 | |
| **Order numbers for :** | - | | |
| - Diaphragm pump 230 V *inclusive mains connection cables with plug CEE, UK* | | 411711 | 412711 |
| - Diaphragm pump 115 V *inclusive mains connection cable with plug US* | | 411711-01 | 412711-01 |
| - Diaphragm pump 230 V – X2 *inclusive mains connection cables with plug CEE, UK* | | - | 412711-03 |

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 diaphragm pump. Check the pump for:

- Transport damage,
- Conformity with the specifications of the supply contract (model, 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 Installation and Connection

1. Set the diaphragm pump on a flat and horizontal surface.
2. Remove the protective caps on the intake port.
3. Prepare the connections.
4. Connect the DN 8 vacuum line to the intake connection.
5. Connect the diaphragm pump to the electrical supply.
6. If the exhaust pipe is to be connected, fit the supplied hose nozzle. The sound absorber is to be mounted when the exhaust pipe is free.

|  | **CAUTION !** |
|---|---|
| **The muffler used in the chemical area has only a limited chemical durability.** | |

## 5.3 Operation

**Observe the basic safety instructions when using the pump.**

The diaphragm pump is switched on and off at the operating 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 intake and exhaust ports. Another equally good protection may be used.

## 5.5 Scrap Disposal

|  | **CAUTION !** |
|---|---|
| **The diaphragm pumps must be disposed of in accordance with the 2012/19/EU guideline and the specific national regulations.<br>Contaminated diaphragm pumps must be decontaminated according to the laws.** | |

# 6 Maintenance and Servicing

## 6.1 General Requirements

- Check the pump daily for unusual running noises and heat building up on the surface of the pump.
- We recommend changing the diaphragm after 10,000 operating hours. The user may specify that the exchange be made earlier, depending upon the application process.
- Check the electrical and vacuum connections daily.

## 6.2 Maintenance Performed by the User

**WARNING !**

**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.**

**Scope of permissible work:**

- Open and remove the pump heads
- Inspect the pump chambers, diaphragms and valves
- Deposits in the inside of the pump must be cleaned out
- If necessary change the diaphragms, valves and seals.

**Tools required:**

- Order no. 826801 Pin type face wrench, adjustable, size 3
- Order no. 826801-6 Allan key, size 4

### 6.2.1 Disassembly

1. Disconnect the power supply and ensure that it cannot be switched on again.
2. Remove four machine screws **(1)** from each connection head with an Allan key, size 4.
3. Lift off the connection head **(2)** and the pump head **(5)**. The valves **(3)**, o-rings **(4)** and diaphragm **(7)** are now freely exposed.
4. Loosen the diaphragm **(7)** at the strain washer **(6)** by turning the size 3 pin type face wrench anticlockwise.
5. Clean the valves **(3)**, the pump head **(5)** and the diaphragm **(7)** with a soft cloth and acetone.
6. Check that the drive is in good working order.

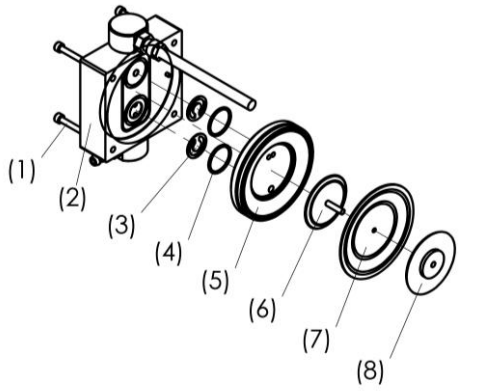



*Fig. 4 Disassembly, assembly*

| | |
|---|---|
| | **WARNING !** |
| **Renew defective parts, if necessary! Wear protective gloves!**<br>**Parts must be renewed at the intervals stated in this Operating Manual or as specified by the user internally! Do not clean with compressed air!** | |

### 6.2.2 Assembly *(see Fig. 4)*

1. Use the size 3 pin-type face wrench to tighten the pressure disc **(8)**, the diaphragm **(7)** and the strain washer **(6)** with the correct torque of 5 - 6 Nm.
2. Bring the connecting rod *(see Fig. 5)* and the diaphragm **(7)** into the central position.
3. Replace the pump head **(5)**.
4. Insert the valves **(3)** and the o-rings **(4)**.
   Ensure that they are lying completely flat. Do not insert the burred side facing the sealing surface. Align the connection head flush with the pin.
5. Tighten the four machine screws **(1)** symmetrically with a torque of 3 to 4 Nm.

### 6.2.3 Test

- Connect a vacuum measuring device to the intake connector and measure the ultimate pressure.
  If the device is working properly, then the figure stated in the technical data must be attained within a maximum of one minute.
- The pump must not make any abnormal noises.
- Moving parts must not touch each other.

## 6.3 Maintenance by the Manufacturer

Repairs and maintenance going beyond the extent of the work described *in chapter 6.2* or reconditioning or modification may only be performed by the manufacturer or authorized workshops.

|  | **WARNING !** |
|---|---|
| **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.** | |

## 6.4 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.

|  | **WARNING !** |
|---|---|
| **Incomplete or incorrectly completed damage reports may endanger the service personnel!**<br>**Give full information in the damage report, in particular regarding a possible contaminating.** | |

# 7 Troubleshooting

Only manufacturing firm and authorized service workshops may work on the diaphragm pump and their accessories during the warranty period.

| Trouble | Cause | Remedy | |
|---|---|---|---|
| | | ***by:*** | ***with:*** |
| **Vacuum pump does not start** | No power supply | ***Qualified electrician*** | Check electrical installation |
| | Motor defective | ***Service workshop*** | Exchange |
| | Pump body defective | | Repair and/or exchange |
| **Vacuum pump does not generate a vacuum or only an inadequate one** | Connected apparatus and/or connecting elements leaking | ***User or Service workshop*** | Identify and seal the leak, replace the seals and/or hoses if necessary. |
| | Vacuum pump leaking | | Check the hose connections between the pump heads, replace the hoses and/or fittings if necessary. |
| | Pump head leaking | ***Service workshop*** | Repair and/or exchange |
| | Diaphragm defective | ***User or Service workshop*** | Exchange of the diaphragm *(see chapter 6.2)* |
| | Valve defective | | Exchange of the valve *(see chapter 6.2)* |
| | Vacuum pump dirty | | General maintenance / cleaning |
| | Valves dirty | | Cleaning condensates and foreign objects out of the valves. |
| **Running noise** | Vacuum pump dirty | ***User or Service workshop*** | General maintenance / cleaning |
| **Glass components** | defective and/or leaking | ***User*** | Exchange of the glass parts or seals |
| **Cable(s)** | defective and/or brittle | ***Qualified electrician*** | Exchange of the cable(s) |

# 8 Spare Parts Overview

The spare parts lists contain all the spare parts and all the information necessary for ordering.
When ordering, please quote the description, quantity, serial number and order number!

|  | **CAUTION !** |
|---|---|
| **We are not liable for any damage caused by the installation of any parts not supplied by the manufacturer.** | |

## 8.1 Service kit

| Designation | Order no. |
|---|---|
| Service kit for MP/MPC | 402046 |
| Service kit for MPC – X2 | 402046-02 |

**The service kit consists of:**

| Designation | Piece | Order numbers for: | |
|---|---|---|---|
| | | 402046 | 402046-02 |
| O-Ring ø 25 x 2 | 2 | 829250-1 | 829250-4 |
| Valve | 2 | 400656 | 400656-03 |
| Diaphragm | 1 | 400732 | 400732-04 |

## 8.2 Exploded view

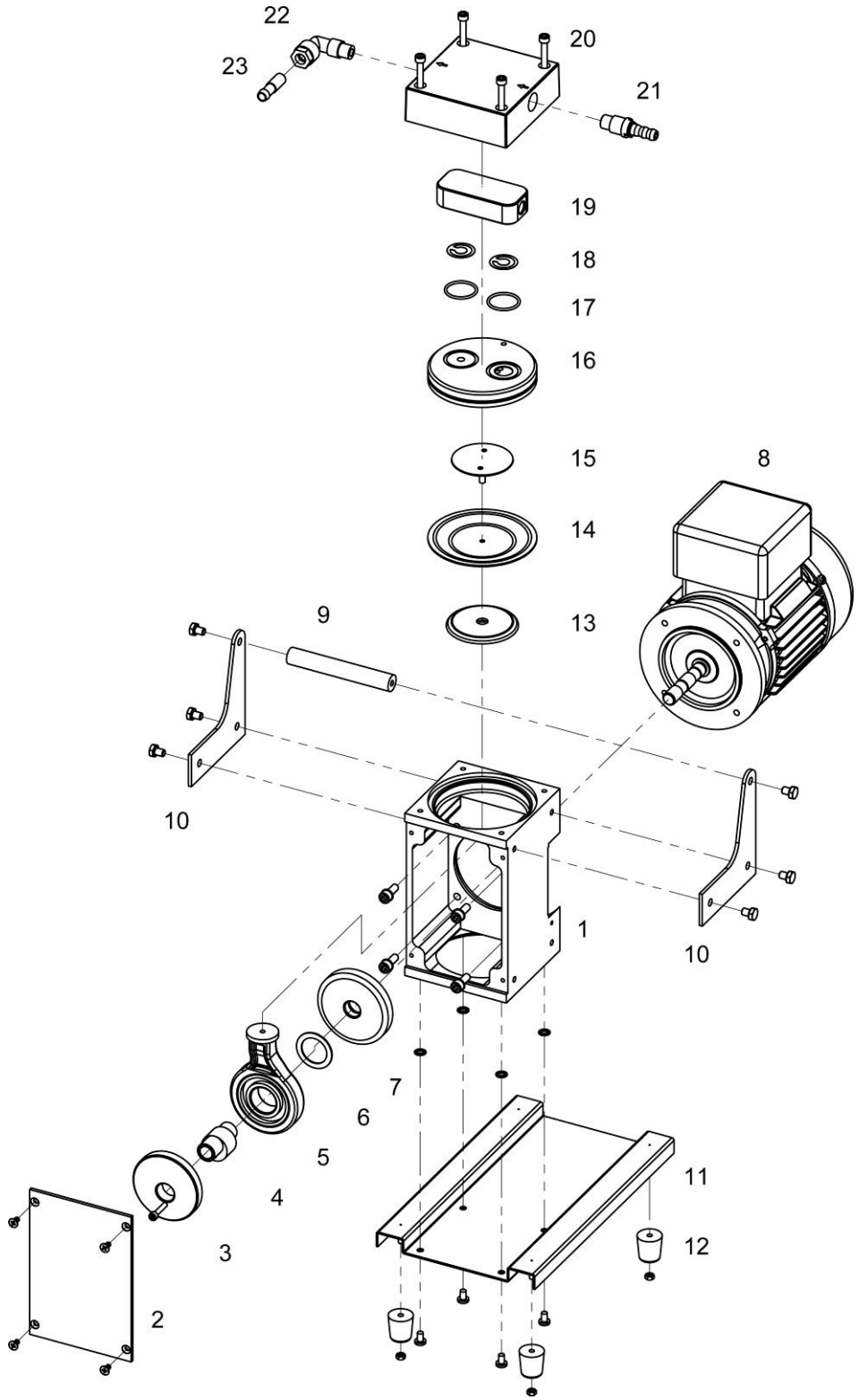



*Fig. 5 Exploded view (MPC 301 E)*

### 8.2.1 Part list diaphragm pumps MP 301 E

| Item no. | Designation | Piece | MP 301 E |
|---|---|---|---|
| | | | Order no. 411711 |
| | | | **Order no.** |
| - ***)** | Basic pump complete *(consisting of position: 1 – 8)* | 1 | 410401 |
| 1 | - Pump casing | 1 | 400640 |
| 2 | - Cover plate | 1 | 400641-02 |
| - | - Drive complete *(consisting of position: 3 – 7)* | 1 | 400843-02 |
| 3 | - Centrifugal mass | 1 | 400649 |
| 4 | - Eccentric | 1 | 400648-01 |
| 5 | - Piston rod with ball bearing | 1 | 400647-01 |
| 6 | - Close tolerance spacer 25 x 35 x 1 | 1 | 824957-1 |
| 7 | - Mass balance | 1 | 400678-2 |
| 8 | - Alternating-current motor | 1 | 826420 |
| 9 | Handle | 1 | 400964 |
| 10 | Handle bracket | 2 | 410434 |
| 11 | Pump bracket | 1 | 410433 |
| 12 | Rubber pad | 4 | 829150 |
| 13 | Pressure washer | 1 | 400680 |
| 14 | Diaphragm | 1 | 400732 |
| 15 | Tightening washer | 1 | 400707 |
| 16 | Pump head | 1 | 400643-01 |
| 17 | O-Ring EPDM, ø 25 x 2 | 2 | 829250-1 |
| 18 | Valve | 2 | 400656 |
| 19 | Aluminium insert | 2 | 400902-01 |
| 20 | Connection head | 2 | 400901 |
| 21 | Hose nozzle PP, DN 8 – 10, external thread M12 x 1 *(enclosed)* | 1 | 710963-02 |
| 22 | Threaded elbow joint PVDF, 10 - M12 x 1 | 1 | 829972 |
| 23 | Hose sleeve PVDF, A10 - 8 | 1 | 829924-1 |
| 24 | Exhaust-Silencer, connection A 10 *(enclosed)* | 1 | 400941 |
| - | Mains connection cable IEC with plug CEE (D) | 1 | 825885 |
| | Mains connection cable IEC with plug BS (UK) | 1 | 825878 |

***)** The “basic pump” module (items 1 – 8) can only be supplied complete under order number 410401.

### 8.2.2 Part list diaphragm pumps MPC 301 E, MPC 301 E – X2

| Item no. | Designation | Piece | MPC 301 E | MPC 301 E – X2 |
|---|---|---|---|---|
| | | | Order no. 412711 | Order no. 412711-03 |
| | | | **Order no.** | **Order no.** |
| - ***)** | Basic pump complete *(consisting of position: 1 – 8)* | 1 | 410401 | 410401 |
| 1 | - Pump casing | 1 | 400640 | 400640 |
| 2 | - Cover plate | 1 | 400641-02 | 400641-02 |
| - | - Drive complete *(consisting of position: 3 – 7)* | 1 | 400843-02 | 400843-02 |
| 3 | - Centrifugal mass | 1 | 400649 | 400649 |
| 4 | - Eccentric | 1 | 400648-01 | 400648-01 |
| 5 | - Piston rod with ball bearing | 1 | 400647-01 | 400647-01 |
| 6 | - Close tolerance spacer 25 x 35 x 1 | 1 | 824957-1 | 824957-1 |
| 7 | - Mass balance | 1 | 400678-2 | 400678-2 |
| 8 | - Alternating-current motor | 1 | 826420 | 826420 |
| 9 | Handle | 1 | 400964 | 400964 |
| 10 | Handle bracket | 2 | 410434 | 410434 |
| 11 | Pump bracket | 1 | 410433 | 410433 |
| 12 | Rubber pad | 4 | 829150 | 829150 |
| 13 | Pressure washer | 1 | 400680 | 400680-2 |
| 14 | Diaphragm | 1 | 400732 | 400732-04 |
| 15 | Tightening washer | 1 | 400707 | 400707-01 |
| 16 | Pump head | 1 | 400705-02 | 400705-02 |
| 17 | O-Ring ø 25 x 2 | 2 | 829250-1 | 829250-4 |
| 18 | Valve | 2 | 400656 | 400656-3 |
| 19 | PTFE insert | 1 | 400902 | 400902 |
| 20 | Connection head | 2 | 400901 | 400901 |
| 21 | Hose nozzle PP, DN 8 – 10, external thread M12 x 1 *(enclosed)* | 1 | 710963-02 | - |
| | Hose nozzle PVDF, DN 8, external thread M12 x 1 | 2 | - | 710798-05 |
| 22 | Threaded elbow joint PVDF, 10 - M12 x 1 | 1 | 829972 | - |
| 23 | Hose sleeve PVDF, A10 - 8 | 1 | 829924-1 | - |
| 24 | Exhaust silencer, connection A 10 *(enclosed)* | 1 | 400941 | - |
| - | Mains connection cable IEC with plug CEE (D) | 1 | 825885 | 825885 |
| | Mains connection cable IEC with plug BS (UK) | 1 | 825878 | 825878 |

***)** The “basic pump” module (items 1 – 8) can only be supplied complete under order number 410401.

# EG - Konformitätserklärung

## EC Declaration of Conformity / *CE Déclaration de Conformité*

## DIN EN ISO / IEC 17050

| | | | |
|---|---|---|---|
| ***(de)***<br><br>**Hiermit erklären wir** | WELCH<br>by Gardner Denver | **Gardner Denver Thomas GmbH**<br>Am Vogelherd 20<br>98693 Ilmenau<br>Germany | T +49 3677 604 0<br>F +49 3677 604 131<br>welch.emea@gardnerdenver.com<br>www.welchvacuum.com |

**unter eigener Verantwortung, dass nachstehendes Produkt aufgrund seiner Konzipierung und Bauart sowie in den von uns in Verkehr gebrachten Unterlagen den nachfolgend aufgeführten EG-Richtlinien und Normen entspricht.**
**Bei einer nicht mit uns abgestimmten Änderung des Produkts verliert diese Erklärung ihre Gültigkeit.**

***(en)*** We (Gardner Denver Thomas GmbH) herewith declare under our sole responsibility that the product described below is in accordance with the following Directives standards and other technical specifications regarding design and version when delivered from our factory.
This declaration becomes invalid whenever the product has been modified without our consent.

***(fr)*** *Nous (Gardner Denver Thomas GmbH) certifions par la présente, que le produit décrit ci-après est conforme, tant dans sa conception que dans sa réalisation, aux normes de sécurité et d'hygiène exigées par les standards de la CE.*
*En cas de modification du produit sans notre accord, cette déclaration devient caduque.*

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| **Bezeichnung des Produkts (Pumpen / Pumpstände)**<br>Description of product (pumps / pump systems)<br>*Description du produit (pompes / pompe systèmes)* | **Membranpumpen** / Diaphragm pumps / *Pompes à membrane*<br>**MP 301 E, MPC 301 E, MPC 301 E-X2** |
| **Artikel-Nr.** / Fabrication No. / *No. de fabrication* | 411711, 411711-01, 412711, 412711-01, 412711-03 |
| **Baujahr** / Year of manufacture / *Annee de fabrication* | **2017** |

**Das Produkt entspricht folgenden Richtlinien und Normen:** / The product is in conformity with the following Directives and standards: / *Le produit est conforme aux directives et standards suivants:*

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| X | **2006/42/EG** | **Maschinenrichtlinie** / EC machinery directive / *directive CE sur les machines* (17.05.2006) |
| | **2014/34/EU** | **ATEX-Richtlinie für Verwendungen in explosionsgefährdeten Bereichen, Anhang III** / ATEX Guideline for use in potentially explosive atmospheres, Appendix III / *ATEX Directive for applications in hazardous areas, Annex III* |
| X | **2014/30/EU** | **Elektromagnetische Verträglichkeit** / EC Electromagnetic Compatibility Directive / *Directive CE relative à la compatibilité électromagnétique* |
| X | **2011/65/EU** | **Gefährliche Stoffe in Elektro- und Elektronikgeräten (RoHS) /** Dangerous materials in electrical and electronics devices (RoHS II) / *Substances dangereuses dans les appareils électriques et électroniques (RoHS II)* |
| X | **2012/19/EU** | **Elektro- und Elektronik - Altgeräte (WEEE)** / Electrical and electronics - old devices (WEEE) / *Électro et électronique - appareils de contralto (WEEE)* |
| X | **China – RoHS II** | **Umweltschutzgesetz** – China 2016-01 / Environment protection law / *Loi sur la protection de environnement* |

**Angewandte harmonisierte Normen:** / Applied harmonized standards: / *Standards appliques et harmonises:*

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| | **DIN EN 1127-1: 2011-10** | **Explosionsfähige Atmosphären – Explosionsschutz - Teil 1: Grundlagen und Methodik** /<br>Explosive atmospheres - Explosion prevention and protection - part 1: Basic concepts and methodology /<br>*Atmosphères explosives - Protection contre les explosions - partie 1 : prescriptions et méthodologie* |
| | **DIN EN 13463-1: 2009-07** | **Nicht-elektrische Geräte für den Einsatz in explosionsgefährdeten Bereichen - Teil 1: Grundlagen und Anforderungen /** Non-electrical equipment for use in potentially explosive atmospheres - part 1: Basic method and requirements / *Appareils non électriques destinés à être utilisés en atmosphères explosibles - partie 1 : prescriptions et méthodologie* |
| | **DIN EN 13463-5: 2011-10** | **Nicht-elektrische Geräte für den Einsatz in explosionsgefährdeten Bereichen - Teil 5: Schutz durch konstruktive Sicherheit ‚c' /** Non-electrical equipment for use in potentially explosive atmospheres - part 5: Protection by constructional safety 'c' / *Appareils non électriques destinés à être utilisés en atmosphères explosibles - partie 5 : protection par sécurité de construction « c »* |
| X | **DIN EN ISO 12100: 2011-03** | **Sicherheit von Maschinen - Allgemeine Gestaltungsleitsätze Risikobeurteilung und Risikominderung /**<br>Safety of machinery - General principles for design - Risk assessment and risk reduction /<br>*Sécurité des machines - / Principes généraux pour l'évaluation des risques et la réduction des risques* |
| X | **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 /<br>*Sécurité des machines - Distances de sécurité empêchant les membres supérieurs et inférieurs d'atteindre les zones dangereuses* |
| X | **DIN EN 1012-2: 2011-12** | **Kompressoren und Vakuumpumpen - Sicherheitsanforderungen - Teil 2: Vakuumpumpen** /<br>Compressors and vacuum pumps - Safety requirements - part 2: Vacuum pumps /<br>*Compresseurs et pompes à vide - Exigences de sécurité - partie 2: pompes à vide* |
| X | **DIN EN ISO 2151: 2009-01** | **Akustik - Geräuschmessnorm für Kompressoren und Vakuumpumpen - Verfahren der Genauigkeitsklasse 2** /<br>Acoustics - Noise test code for compressors and vacuum pumps – Engineering method (grade 2) / *Acoustique - norme de mesure des émissions pour les compresseurs et les pompes à vide - Procédé de classe de précision 2* |
| X | **DIN EN 60204-1: 2014-10** | **Sicherheit von Maschinen - Elektrische Ausrüstung von Maschinen - Teil 1: Allgemeine Anforderungen** /<br>Safety of machinery - Electrical equipment of machines - part 1: General requirements /<br>*Sécurité des machines - Equipement électrique des machines - partie 1: Prescriptions générales* |
| X | **EN 61000-6-2: 2011-06** | **Elektromagnetische Verträglichkeit (EMV) - Teil 6-2: Fachgrundnormen - Störfestigkeit für Industriebereiche** /<br>Electromagnetic compatibility (EMC) - part 6-2: Generic standards - Immunity for industrial environments / *Compatibilité électromagnétique (EMV) - partie 6-2: Normes génériques - Immunité pour les environnements industriels* |
| X | **EN 61000-6-4: 2011-09** | **Elektromagnetische Verträglichkeit (EMV) - Teil 6-4: Fachgrundnormen - Störaussendung für Industriebereiche** / Electromagnetic compatibility (EMC) - part 6-4: Generic standards - Emission standard for industrial environments environments / *Compatibilité électromagnétique - partie 6-4: Normes génériques - Emissions de parasites pour les activités industrielles* |
| X | **DIN EN 50110-1: 2014-02** | **Betrieb von elektrischen Anlagen /** Operation of electrical installations / *Fonctionnement des installations électriques* |
| X | **DIN EN 61010-1/A1:2015-04** | **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: Prescriptions générales* |

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| **Datum / Data** | | **2017-02-17** |
| **Qualitätsbeauftragter /** Quality representative / *Délégué de qualité* | **Name** / Name / *Nom*<br>**Gerd Reinhardt** | |
| **Produktmanager /** Product manager / *Directeur de produit* | **Name** / Name / *Nom*<br>**Oliver Fickert** | |