Operation Manual (en)

Translation of the german original manual

chemvac Combination Pump Systems

Models

P 6 Z – 101 chemvac
P 12 Z – 301 chemvac
P 23 Z – 301 chemvac

109030
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Contents

1 Important Information

1.1 General Information

The Combination Pump Systems conform to the following directives:

2006/95/EC	Low Voltage Directive
2006/42/EC	Machinery Directive
2004/108/EC	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 Combination Pump Systems.

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 combination pump systems.

The personnel operating and maintaining the rotary vane 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 rotary vane 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 chemvac Combination Pump System must be appropriate for the conditions of use. The user bears the sole responsibility for this.

The chemvac Combination Pump System 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.

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),
- “Hot Surface" label on the pump body - warning notice 
- glass components with a transparent plastic coating which protects them against bursting and cracking

The chemvac Combination Pump System must not be operated without these elements.

1.6 Meaning of the Warning notes

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

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

1.7 Product Standards, Safety Regulations

chemvac Combination Pump Systems meet the following product standards:

DIN EN ISO 12100-2010	Safety of machinery - 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	Compressors and vacuum pumps - Safety requirements - Part 2: Vacuum pumps
DIN EN ISO 2151	Acoustics - Noise test code for compressors and vacuum pumps - Engineering method (grade 2)
DIN EN 60204-1	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
DIN EN 61000-6-2 **DIN EN 61000-6-4**	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments Part 6-4: Generic standards - Emission standard for industrial environments
DIN EN 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements
DIN EN 50110-1	Operation of electrical installations
Directive 2012/19/EC	Electrical and electronics - old devices (WEEE)
Directive 2011/65/EC	Dangerous materials in electrical and electronics devices (RoHS)
China - RoHS	Environment protection law - China 2007-03

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 chemvac Combination Pump Systems.

2 Basic Safety Instructions

2.1 General Information

	**WARNING !**
Warning notices must be observed. Disregarding them may lead to damage to health and property.	

The chemvac Combination Pump Systems must be operated by personnel who can detect impending dangers and take action to prevent them from materialising.

The user/operator is responsible for correct installation and safe operation.

The manufacturer or authorized authorised workshops will only service or maintain the chemvac combination pump systems 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 laboratory vacuum system are legally binding parts of the contract.

Contaminated chemvac Combination Pump Systems 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 chemvac Combination Pump Systems are supplied for operating mode S1. Please note that the testing must be repeated in accordance with DIN EN 0105, DIN EN 0702 and BGV A2 in case of portable devices.

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 High Temperatures

The pumps of the chemvac combination pump system can become heated by the temperature of the gas being pumped and the heat of compression.

Prevent the following maximum permissible temperatures from being exceeded.

- + 40 ℃ for the environment, and
- + 20 ℃ for the gas to be pumped.

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

2.4 Mechanical Systems

Improper use can lead to injuries or material damage. Observe the following instructions:

- Only operate the chemvac combination pump systems with hoses of the specified dimensions.
- 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 chemvac combination pump systems.
- Pressure must not be allowed to build up at the pressure port.
- The pump system 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.
- Maintain a space of least 20 cm between the pumps and adjacent parts in order to enable the pumps to cool.

WARNING !

Do not block the exhaust port. Remove any exhaust caps or plugs. Otherwise, pressure will build up with potential of bursting hazard with possible injury to personnel.

WARNING !

Solid particles in the pumping medium impair the pumping action and can lead to damage.

Prevent solid particles penetrating into the pump.

When handling glass vessels, pay attention to:

- Only use glass vessels with a plastic coating for splinter protection.
- Only use vessels which are suitable for use with vacuums (e.g. round-bottomed flasks). We recommend that only glass components supplied by the manufacturer are used. Do not use Erlenmeyer flasks.
- Before each evacuation, check glass vessels for damage which might impair their strength, replace them if any such damage is found.
- Do not heat glass vessels on one side only.
- Retardation of the boiling of the gases to be pumped can lead to a sudden pressure increase. Prevent retardation of boiling by means of suitable measures (e.g. turbulent agitation).

2.5 Hazardous Substances

ACHTUNG !

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 operating company bears the responsibility for the use of the chemvac combination pump system.

Harmful substances must be effectively prevented from escaping.

Ensure that all lines and connections are leak tight.

Handle exhaust gases in accordance with the requirements of the emission protection regulations.

Do not operate the chemvac combination pump system without a separator. The separator can only be emptied after the apparatus has been vented.

Dispose the condensate in an environmentally compatible manner!

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.

It is not permitted to pump gases that are combustible or prone to explosion.

Explosive gases

The chemvac Combination Pump Systems is not certified according to ATEX guidelines 94/9/EC.

Aggressive gases

For the chemvac combination pump system, an MPC series diaphragm pump is used for extracting vapors and aggressive gases.

The warranty shall lapse if the chemvac combination pump system is used with diaphragm pumps from other manufacturers than those stated.

Poisonous gases

Use a suitable 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.

The pumps and hose lines can be damaged by poisonous or aggressive gases.

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
- Regulations 2006/121/EC (classification, packaging and identification of hazardous substances),
- Manufacturer's safety data sheets on hazardous substances.

3 Description

3.1 Design

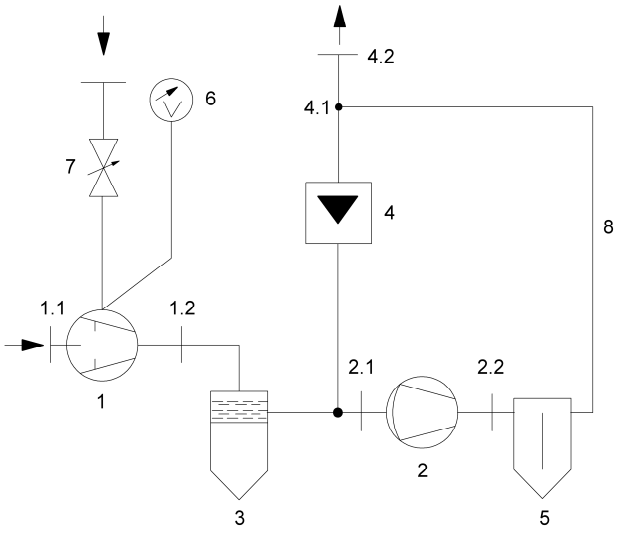
The chemvac Combination Pump System consists of a two-stage, oil-combined rotary vane pump **(1)** and a two-stage chemical diaphragm pump **(2)**. The two pumps are functionally connected to each other by suitable separators **(3; 5)** and a pressure control valve **(4)** to form a compact unit. It is still possible to connect suction-side accessories, such as filters and coolers.

The chemical durability of the chemvac combination pump system derives from the way it works and the materials selected to make the individual components. The rotary vane vacuum pumps **(1)** have a good, basic resistance to corrosion as standard. Among other things, the PTFE pump heads and PTFE- diaphragms ensure that the chemical diaphragm pumps **(2)** have high durability. The connecting elements are made of high-quality PVDF and PP plastics.

The different volumes pumped by the rotary vane pump **(1)** and the diaphragm pump **(2)** at high intake pressures and the pressure back up which this causes between the pumps is compensated for by the pressure control valve **(4)** integrated into the valve block **(3)**. The separator AKD **(3)** catches condensates forming on the pressure side. The exhaust filter integrated into the AKD reduces the emission of oil mist. Connect the pressure-side connector **(4.2)** to the laboratory-side extraction system.

The required pressure in the oil casing of the rotary vane vacuum pump can be monitored by a mechanical vacuum gauge (tube spring manometer) **(6)**.

The pump system has a bubbler (permanent gas purging apparatus) **(7)**.



1	Rotary vane pump *with bubbler set in the works*
1.1	Suction port of the rotary vane pump (= suction port of the pump system)
1.2	Pressure port of the rotary vane pump
2	Diaphragm pump
2.1	Suction port of the diaphragm pump
2.2	Pressure port of the diaphragm pump
3	Separator AKD (exhaust filter)
4	Pressure relief valve
4.1	Relief valve outlet
4.2	Pressure port of the pump system
5	Separator (bottle)
6	Mechanical vacuum gauge (tube spring manometer)
7	Bubbler (permanent gas purging apparatus)
8	Connecting line (Item 4 –> 5)

Fig. 1 Vacuum connection

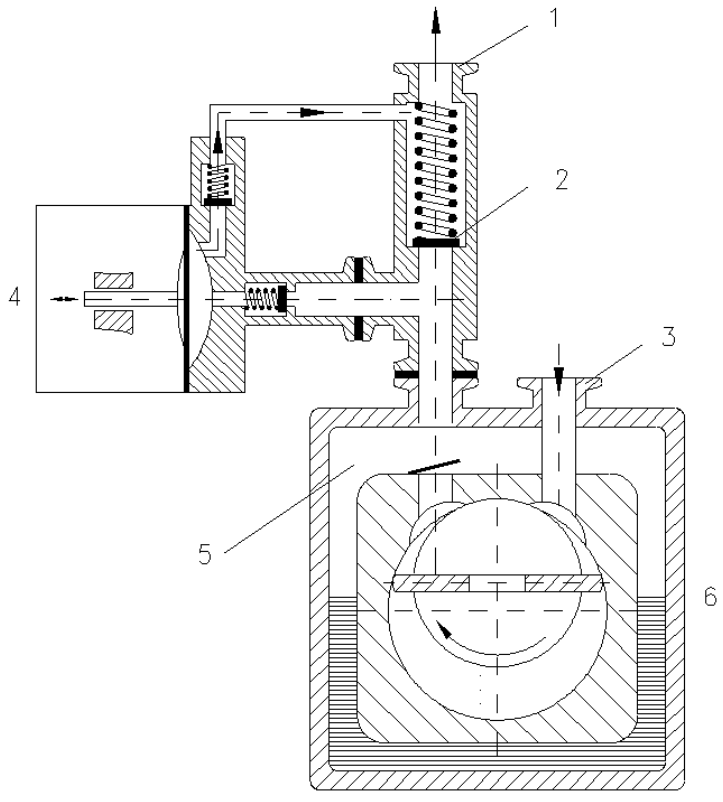
3.2 Function

The outstanding feature of chemvac Combination Pump Systems in comparison to conventional rotary vane pumps is that this special pump combination can pump solvent or acid vapors for long periods, even at low intake pressures, with hardly any problems.
The field of applications for the chemvac Combination Pump Systems can be extended by such special options as condensers on the pressure side, separators and filter.
Acidic or solvent vapors entering a vacuum pump are first compressed, but either do not or only slightly condense because of the pump operating temperature and the under pressure created in the oil casing via the diaphragm pump. (The under pressure is indicated by the manometer that on the rotary vane pump is.).

The pressure at the manometer should be after reaching the work- / ultimate pressure in the green range. This significantly lengthens the maintenance intervals.

This, in turn, substantially reduces the problems of disposing of contaminated pump oil. Condensing vapors are captured in the downstream condensate separators.

3.2.1 Diagram of the layout of a chemvac pump system



1 - Pressure port
2 - Relief valve
3 - Suction port
4 - Diaphragm pump
5 - Clearance space
6 - Rotary vane pump

Fig. 2 Function scheme

3.3 Applications

The chemvac combination pump system is intended for:

- pumping out aggressive vapours and gases with low ultimate pressure
- pumping out solvent vapours
- pumping out vapours (including those soluble in oil)
- ceramic sintering plants with aggressive by-products and plasma etching plants
- freeze drying

Special designs:

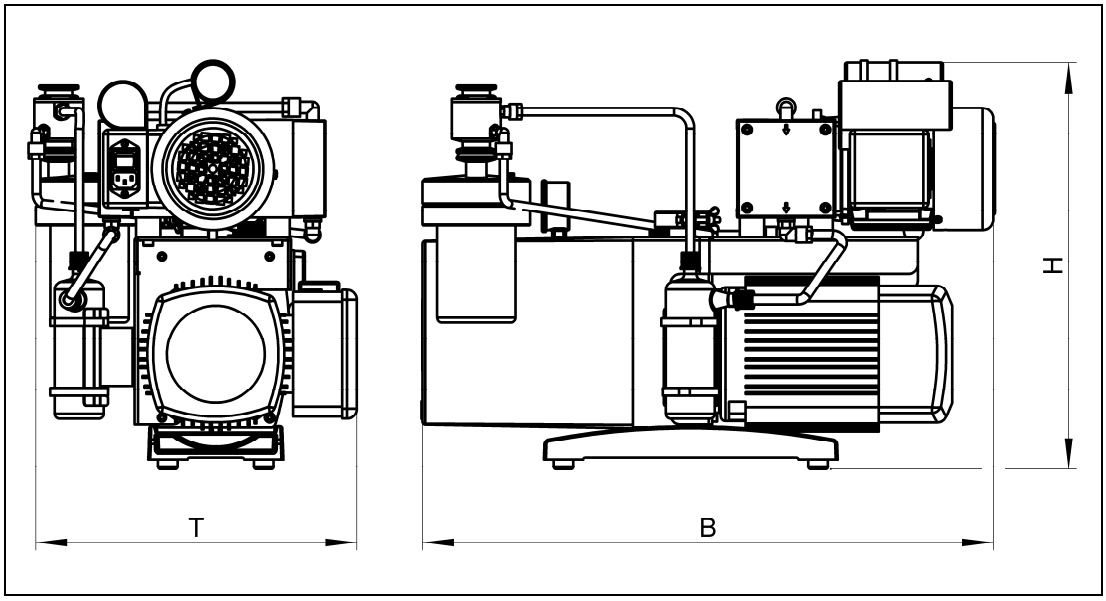
- Special chemvac combination pump systems can be supplied after consultation with the manufacturer,
- Rotary vane pumps with special oils are possible.

3.4 Scope of Delivery

The scope of delivery is specified in the supply contract.

4 Technical Data

4.1 Dimensions



chemvac models	Order no.	B	T	H
		(dimensions in mm)		
P 6 Z - 101	109030, 109030-01, 109030-03	500	330	340
P 12 Z - 301	109031, 109031-03	590	345	420
P 23 Z - 301	109032, 109031-03	590	345	420

Fig. 3 Dimensions

4.2 Intake Pressure / Pumping Speed - Diagram

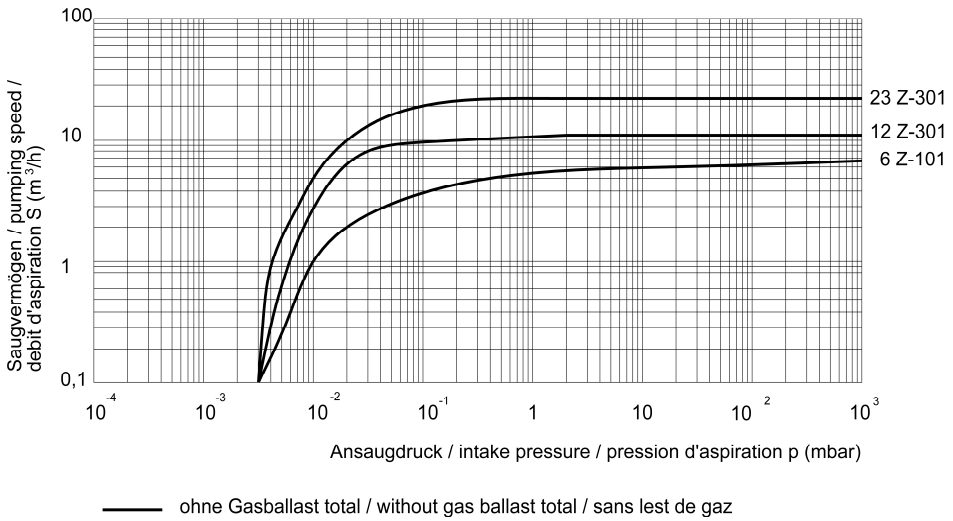


Fig. 4 Intake Pressure / Pumping Speed – Diagram

4.3 Device data - chemvac Combination Pump Systems

Parameter	Unit	chemvac		
		P 6 Z - 101	**P 12 Z - 301**	**P 23 Z - 301**
Pumping speed 50/60 Hz DIN 28432 part 1 (pneurop)	m^3 / h	5.8 / 6.6	11.0 / 13.2	21.0 / 25.2
Ultimate pressure at speed of 1500 rpm 50 Hz DIN 28432 (pneurop)	mbar			
- partial		1.5×10^{-4}		
- total		2×10^{-3}		
Max. inlet pressure	bar	1		
Max. outlet pressure		1		
Max. Leak rate of inlet valve	l / s	7×10^{-5}		
Suction- / pressure port	small flange	DN 16 KF	DN 25 KF	DN 25 KF
Ambient temperature	℃	+ 20 to + 40		
Max. operating gas temperature		+ 40		
Noise level DIN EN ISO 2151	dB (A)	< 48	< 50	< 50
Water vapour tolerance	mbar	70	80	45
Oil filling Type **LABOVAC 14** *(enclosed 1 litre-bottle)*	ml	550	1000	820
Voltage	V	100-120 / 200-240 switchable		
Frequency	Hz	50/60		
Power complete	W	400	900	900
Operating mode	-	S 1		
Type of protection DIN EN 60529		IP 54		
Class of insulation DIN EN 600034-1		F (160℃)		
Dimensions (W/D/H)	mm	500/330/340	590/345/420	590/345/420
Weight	kg	25.5	42.5	46.0
Order numbers for :	-			
- chemvac 230 V *inclusive mains connection cable IEC with plug CEE, UK*		109030	-	-
- chemvac 115 V *inclusive mains connection cable IEC with plug US*		109030-01	-	-
- chemvac 115/230 V switchable *inclusive mains connection cable IEC with plug CEE, UK, US*		-	109031	109032
- chemvac 100 V *inclusive mains connection cable IEC with plug J*		109030-03	109031-03	109032-03

Technical Data

4.3.1 Device data - Rotary vane pump

Parameter	Unit	P 6 Z	P 12 Z	P 23 Z
Pumping speed 50/60 Hz DIN 28432 part 1 (pneurop)	m^3 / h	5.8 / 6.6	11 / 13.2	21 / 25.2
Ultimate pressure at speed of 1500 rpm 50 Hz DIN 28432 (pneurop)				
- partial	mbar	2×10^{-4}	1.5×10^{-4}	1.5×10^{-4}
- total		2×10^{-3}		
Max. inlet pressure	bar	1		
Max. outlet pressure		1		
Max. Leak rate of inlet valve	l / s	7×10^{-5}		
Suction- / pressure port	small flange	DN 16 KF	DN 25 KF	DN 25 KF
Ambient temperature	℃	+ 20 to + 40		
Max. operating gas temperature		+ 40		
Noise level DIN EN ISO 2151	dB (A)	< 48	< 50	< 50
Water vapour tolerance	mbar	60	35	35
Oil filling	ml	550	1000	820
Voltage	V	100-120 / 200-240 switchable		
Frequency	Hz	50/60		
Motor power	kW	0.20	0.55	0.55
Operating mode	-	S 1		
Type of protection DIN EN 60529		IP 54		
Class of insulation DIN EN 600034-1		F (160℃)		
Dimensions (W/D/H)	mm	430/205/275	540/225/300	540/225/300
Weight	kg	19.5	35.0	38.0
Order numbers for :				
- Rotary vane pump 100 / 115 / 230 V switchable	-	322003-05	322005-05	322007-05

4.3.2 Device data - Diaphragm pumps

Parameter	Unit	MPC 101 Z	MPC 301 Z
Pumping speed 50/60 Hz DIN 28432 at speed of 1500 rpm	m^3 / h	1 / 1.1	2.3 / 2.5
	l / min	16.7 / 18	38 / 41
Ultimate pressure at speed of 1500 rpm	mbar	< 8	
Ultimate pressure with gas ballast at speed of 1500 rpm		18	
Max. inlet pressure	bar	1	
Max. outlet pressure		1	
Suction- / pressure port	-	Hose nozzle DN 8 for hose inside diameter 8 mm	
Ambient temperature	℃	+ 10 to + 40	
Max. operating gas temperature		+ 60	
Bearing	-	maintenance-free	
Noise level DIN EN ISO 2151	dB (A)	< 44	
Voltage	V	230 (115)	100-120 / 200-240 switchable
Frequency	Hz	50/60	
Motor power	kW	0.06	0.18
Operating mode	-	S 1	
Type of protection DIN EN 60529		IP 54	
Motor / Class of insulation DIN EN 600034-1		BLDC / F (160℃)	
Dimensions (W/D/H)	mm	195 / 235 / 145	230 / 265 / 169
Weight	kg	6.5	11.2
Order numbers for :	-		
- Diaphragm pump 230 V		412522-08	-
- Diaphragm pump 115 V		412522-09	-
- Diaphragm pump 100 / 115 / 230 V switchable		-	412722-09

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 Welch-Ilmvac 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. Welch-Ilmvac 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 chemvac Combination Pump System. Check the system for:

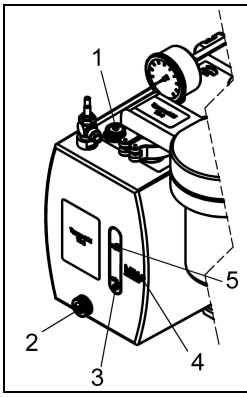
- Transport damage,
- Conformity with the specifications of the supply contract (type, electrical supply data),
- Completeness of the delivery.

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 Installation, filling up with oil and connection

1. Set the chemvac Combination Pump System on a flat and horizontal surface.

⚠	**CAUTION !**
To avoid a leakage during the transport, the chemvac combination pump system without any oil filling. **Therefore we enclose a separate bottle with one litre of our pumping oil for rotary vane pumps type LABOVAC 14 which you need to fill into the pumping system before using it.**	



1 - screw-plug for oil-filling
2 - oil drain screw plug
3 - Oil sight glass
4 - lower marking MIN
5 - upper marking MAX

(see also chapter 6)

Filling up with oil:

- Remove the oil filler plug **(1)**
- Pour in the oil until it reaches the upper mark **(5)**
- Screw in the oil filling plug together with the seal **(1)** once again

2. Remove the protective caps on the suction- and the pressure plug.
3. Connect it to the vacuum apparatus by means of the small flange DN 16 KF or DN 25 KF.
4. Connect the pressure port to the central laboratory air evacuation duct. Ensure that the substances fed in are absolutely safe and harmless.
5. Check that the connections are properly seated.
6. Connect the pump system to the electric supply mains, switch on and let it work for about 2 minutes.
7. Check the oil level when the pump is switched off, repeat if necessary.

5.3 Operation

Observe the basic safety instructions when using the chemvac combination pump system!

	**WARNING !**
Do not block the exhaust port. Remove any exhaust caps or plugs. Otherwise, pressure will build up with potential of bursting hazard with possible injury to personnel.	

In order to avoid pumping speed losses, all the vacuum connecting hoses used should have a large nominal diameter and should be laid out so that the lengths are as short as possible. Avoid rigid connections. They must be assembled carefully in order to achieve a low leak rate.
Do not start extracting aggressive media or solvent vapours until the rotary vane pump of the chemvac combination pump system has reached its operating temperature. Also check at the oil level gauge for intermittent formation of foam.

	**CAUTION !**
For optimum operation of the pump stand, the user may not change the factory Bubbler setting *(see also sign at the Bubbler)***. That is only the manufacturer and/or one of it authorized dealers reserved.**	

Also check the oil level against the relevant markings during operation. Top up the oil if necessary.
The separator must be emptied when it becomes half full. For this purpose, vent the system and remove the union nut from the glass vessel. Please comply with the disposal regulations.

5.4 Storage

The pumps are to be stored in a low-dust, interior room within the temperature range from + 5 to + 40 ℃ 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 chemvac combination pump system must be disposed of in accordance with the 2012/19/EC guideline and the specific national regulations. **Contaminated pump systems must be decontaminated according to the laws.**	

6 Maintenance and Servicing

6.1 General Requirements

Repairs of the chemvac combination pump system may only be performed by the manufacturer or authorized workshops. The prerequisites are a complete and factually correct damage report, and a clean and, if necessary, a decontaminate device.

- Check the **diaphragm 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 level and quality of the oil in the **rotary vane pump** every day. Comply with the oil change intervals, if necessary they can be defined by the user.
- Check the electrical and vacuum connections daily.
- Check the screw connections and hoses for leaks every day, and exchange if necessary.
- Check the **glass vessels of the separators** for integrity and exchange if necessary. Empty the glass vessel in good time, comply with the regulations for the disposal of hazardous substances. Check that the filter cartridge is in good working order. The filter cartridge must be exchanged if the in-built valve is actuated during operation.
- Check that the **overpressure valve** is in good working order, open the valve (4 screws) and clean the seating if necessary.

6.2 Maintenance Performed by the User

The user can perform maintenance work as described below.

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.

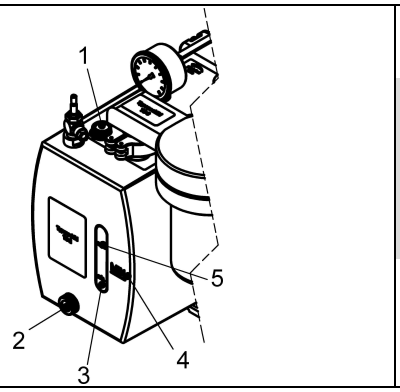
A regeneration phase is required after pumping aggressive media or solvent vapours in order to maintain the serviceability and reliability of the chemvac combination pump system. This means that you let the chemvac combination pump system run for one hour at ultimate pressure.

The ultimate pressure at the suction port must be checked by means of a vacuum gauge. The regeneration process has been completed when the maximum possible improvement of the ultimate pressure has been attained.

6.2.1 Maintenance of the rotary vane pump

Scope of permissible work:

- Check the oil level.
  The oil consumption varies according to the operating conditions of the rotary vane pump. The oil level must be checked on the oil level gauge to ensure that the vacuum pump always remains in optimal operating condition. The oil level must always be kept within the given markings on the oil level gauge. The oil must be topped up if the oil level falls to the lower mark.
- Change the oil when its quality falls.



1 -	Screw-plug for oil-filling
2 -	Oil drain screw plug
3 -	Oil sight glass
4 -	lower marking MIN
5 -	upper marking MAX

Fig. 5 Oil level control

6.2.1.1 Oil check

⚠	**CAUTION !**
The condition and quality of the pump oil have a substantial effect upon the performance and operational readiness of the vacuum pump!	

Comparing the colour of a sample of the pump oil with fresh oil provides an indication of the contamination of the pump oil.

You obtain the oil needed for testing from the oil drain aperture with the vacuum pump switched off and at operating temperature.

Brown or black oil or oil smelling as if it has burnt must be removed from the vacuum pump. Flush the vacuum pump and fill up with fresh oil.

6.2.1.2 Oil change

⚠	**WARNING !**
If the vacuum pump has been used to pump media which are dangerous to health then all measures must be taken to protect the service and operating personnel!	

Working sequence

Topping-up the oil:

- Remove the oil filler plug
- Pour in the oil until it reaches the upper mark
- Screw in the oil filling plug together with the seal once again
- Switch on the vacuum pump and let it work for about 2 minutes
- Check the oil level when the pump is switched off, repeat if necessary

Draining the oil:

- Unscrew the oil drain plug from the pump casing while the pump is at operating temperature.
- Tilt the vacuum pump slightly, catch the oil in a suitable vessel and dispose of it in accordance with the applicable regulations.

WARNING !

Avoid skin contact with the oil!
Dispose of the oil in accordance with the valid environmental protection regulations!

Filling up with oil:

- Remove the oil filler plug
- Pour in the oil until it reaches the upper mark
- Screw in the oil filling plug together with the seal once again
- Switch on the vacuum pump and let it work for about 2 minutes
- Check the oil level when the pump is switched off, repeat if necessary

Flushing:

If the oil is heavily contaminated, the vacuum pump must be flushed, e.g.

- heavy clouding by condensates
- suspended particles such as dust, fibres, abraded particles
- dark coloration of the oil

The flushing liquid should be the type of oil which is currently being used.

Procedure

- After the rotary vane pump has been filled with fresh oil, allow it to warm up by running it with the suction port closed.
- Drain the flushing oil. If the oil still appears heavily contaminated, the flushing procedure must be repeated.

6.2.1.3 Changing the LABOVAC oil type

WARNING !

To ensure a smooth working process of the combination pump system may be used excluding original ILMVAC oils of the type LABOVAC.

If you use oils different from the LABOVAC oils mentioned in this context the warranty claim terminates!

The chemvac combination pump system is checked with our original ILMVAC oil type LABOVAC 14 and we enclose a separate bottle of this oil to fill the pump.

If you want to use another type of ILMVAC Oil, please note the following:

- ILMVAC-Mineral oils **LABOVAC 10** and **LABOVAC 12S** may be exchanged among each other:
  - Drain the oil, *see chapter 6.2.1.2*
  - Flush the vacuum pump with new oil
  - Fill the vacuum pump with new oil
- The exchange of synthetic oils like **LABOVAC 11** and **LABOVAC 14** with mineral oils like **LABOVAC 10** or **LABOVAC 12S** will be executed in the same way.
- The synthetic oil **LABOVAC 13** is an exception which **CANNOT** be mixed or exchanged with other **LABOVAC** oil types.
  Even complete disassembly and cleaning of the vacuum pump always involves the risk of small quantities of oil remaining. We therefore recommend asking the manufacturer directly about vacuum pumps with a special oil filling, for example **LABOVAC 13**.

6.2.2 Maintenance of the diaphragm pump

Scope of permissible work:

- Loosen and remove the hoses
- Open and remove the pump heads
- Inspect the pump chambers, diaphragms and valves
- Deposits in the inside of the pump must be cleaned out
- Change the diaphragms, valves and seals

Tools required:

Tool kit: Order no. 402106, *consists of:*

- Order no. 826801 Pin type face wrench, adjustable, size 3,
- Order no. 826801-6 Allan key, size 4,
- Order no. 826801-5 Open spanner, size 17.

6.2.2.1 Disassembly - MPC 101 Z

1. Disconnect the power supply and ensure that it cannot be switched on again.
2. Open the screw clamps of the hoses on the pump body with the SW 17 open spanner.
3. Remove four machine screws **(1)** from each connection head with an Allan key, size 4.
4. Lift off the pressure plate **(2)**, the connection head **(3)** and the pump head **(6)**. The valve gasket **(5)** and diaphragm **(8)** are now freely exposed.
5. Loosen the diaphragm **(8)** at the strain washer **(7)** by turning the size 3 pin type face wrench anticlockwise.
6. Clean the valve gasket **(5)** the pump head **(6)** and the diaphragm **(8)** with a soft cloth and acetone.
7. Check that the drive is in good working order.

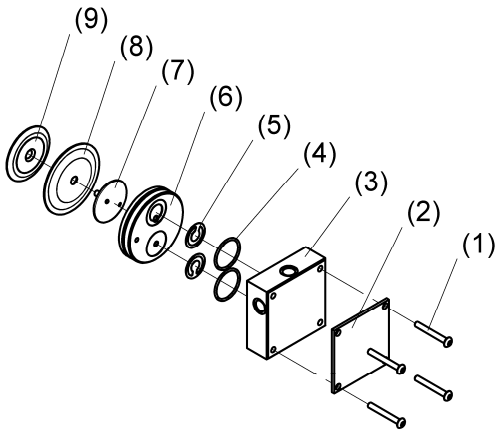


Fig. 6 Disassembly, assembly - MPC 101 Z

WARNING !

Renew defective parts, if necessary! Wear protective gloves!
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!

6.2.2.2 Assembly - MPC 101 Z

1. Place the pump so that the diaphragm is lying in a horizontal position.
2. Use the size 3 pin-type face wrench to tighten the pressure disc **(9)**, the diaphragm **(8)** and the strain washer **(7)** with the correct torque of 2 - 4 Nm.
3. Bring the connecting rod **(5)** *(see fig. 11)* and the diaphragm **(8)** into the central position.
4. Replace the pump head **(6)**. (Observe the fixing bore on the edge!)
5. Insert the valve **(5)** and the O-ring **(4)**.
   Ensure that they are lying completely flat. Do not insert the burred side facing the sealing surface. Align the connection head with pin flush to the fixing bore at pump head.
6. Replace the pressure plate **(2)** and insert and tighten the 4 machine screws with a torque of 3 - 4 Nm.
7. Reattach the hose connections with clamping ring screw fittings.

6.2.2.3 Disassembly - MPC 301 Z

1. Disconnect the power supply and ensure that it cannot be switched on again.
2. Open the fittings **(10)** of the hoses **(11)** on the pump body with the SW 17 open spanner.
3. Remove four cylinder screws **(1)** from each connection head **(2)** with an Allan key, size 4.
4. Lift off the connection head with insert **(2)** and the pump head **(6)**. The valves **(3; 4)**, o-rings **(5)** and diaphragm **(7)** are now freely exposed.
5. Loosen the diaphragm **(7)** at the strain washer **(8)** by turning the size 3 pin type face wrench anticlockwise.
6. Clean the valves **(3; 4)**, the pump head **(6)** and the diaphragm **(7)** with a soft cloth and acetone.
7. Check that the drive is in good working order.

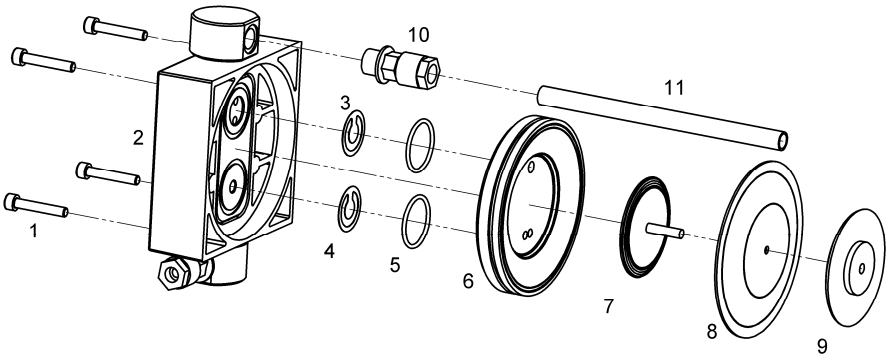
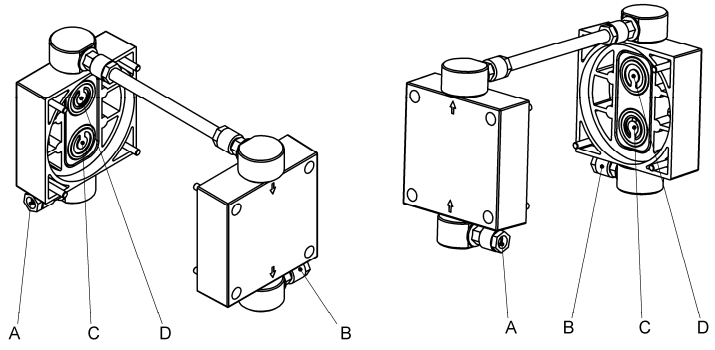


Fig. 7a Disassembly, Assembly

6.2.2.4 Assembly – MPC 301 Z

1. Place the pump so that the diaphragm **(7)** is lying in a horizontal position.
2. Use the size 3 pin-type face wrench to tighten the pressure disc **(9)**, the diaphragm **(7)** and the strain washer **(8)** with the correct torque of 2 - 4 Nm.
3. Bring the connecting rod *(see fig. 12)* and the diaphragm **(7)** into the central position.
4. Replace the pump head **(6)**. (Observe the fixing bore on the edge!)
5. Insert the valves **(3; 4)** *(see C and D fig. 7b)* and the o-rings **(5)**.
   Ensure that they are lying completely flat. Do not insert the burred side facing the sealing surface. Align the connection head with pin flush to the fixing bore at pump head.
6. Tighten the four cylinder screws **(1)** symmetrically with a torque of 3 to 4 Nm.
7. Reattach the hose connections **(11)** with fittings **(10)**.



Please pay attention to the valve arrangements C and D!

A - Connection suction side
B - Connection pressure side
C - Valve (400656)
D - Valve with hole (400656-4)

Fig. 7b Valve arrangement

6.2.2.5 Test

- Connect a vacuum measuring device to the suction 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.

Drain the oil before dispatching the pump and dispose of the oil according to the regulations.

Clean the pump aggregate and the pump housing after pumping radioactive or other media which are harmful to health and the environment.

The prerequisites for a handover are a complete and factually correct damage report, and a clean pump.

6.3.1 Servicing

	**WARNING !**
During repair or maintenance work which could endanger people because of moving or electrically live components, the vacuum pump must be made safe by removing the mains supply plug from the socket or by switching off the main contractor and preventing it from being switched on again!	

The vacuum pump must be disassembled if heavily soiled or after an operating fault. This is to be performed by the Service Department of manufacturing firm.

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.welch-ilmvac.com, www.ilmvac.eu

If you should not have an entrance to the Internet, you can request the form also gladly with us, under phone +49 (0)3677 604 0.

	**WARNING !**
Incomplete or incorrectly completed damage reports may endanger the service personnel! **Provide full information about contamination, and clean the pump thoroughly before handing it over to third parties. 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.**	

7 Troubleshooting

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

Trouble	Cause	Remedy	
		by:	***with:***
Combination pump system does not generate a vacuum	No power supply	***Qualified electrician***	Check electrical installation
	Rotary vane pump is rotating in the incorrect direction		
	Oil level too low in rotary vane pump	***User or Service workshop***	Refill oil
	Overpressure valve defective		Replace the overpressure valve
	Suction pipes of the rotary vane pump and/or diaphragm pump are defective		Check the lines and connecting elements for leaks
	Rotary vane pump defective		Repair and/or exchange
	Diaphragm pump defective		
	Oil is heavily contaminated by condensate		Change oil
Pressure in the oil casing of the rotary vane pump is too high *(outside the green range),* **condensate is therefore starting to collect** *(can be seen at the oil level gauge, increasing intake pressure can be seen on the vacuum gauge)*	Suction line of the diaphragm pump, Oil casing of the rotary vane pump leak	***User or Service workshop***	Check the line for leaks, replace lines and connecting elements if necessary
	Overpressure valve defective		Replace the overpressure valve
	Diaphragm pump defective		Repair and/or exchange
	Bubbler adjusted - Rotary vane pump	***Service workshop***	Check Bubbler setting
	Diaphragm defective - Diaphragm pump	***User or Service workshop***	Replace diaphragm
Cable(s)	defective and/or brittle	***Qualified electrician***	Exchange of the cable(s)

8 Overview of spare parts

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 Seal kit - rotary vane pumps

The seal kit contains all the seals which must be exchanged during a preventive maintenance or repair.

- for rotary vane pump P 6 Z: order no. 302081
- for rotary vane pumps P 12 Z, P 23 Z: order no. 302082

Description	**for P 6 Z** (Order no. 302081)		**for P 12 Z, P 23 Z** (Order no. 302082)	
consisting of :	**Piece**	**Order no.**	**Piece**	**Order no.**
Radial shaft seal FKM, Ø 18 x 24 x 3	1	829417	-	-
Shaft seal FKM, Ø 18 x 28 x 7 BAUMX7	1	829413	-	-
Shaft seal FKM, Ø 18 x 30 x 6 / 6.5 BABSL	1	828412	-	-
Shaft seal FKM, Ø 22 x 32 x 6 BABSL	-	-	1	829430-01
Shaft seal FKM, Ø 22 x 32 x 7	-	-	2	829430
O-ring NBR, Ø 150 x 2	1	829323	-	-
O-ring NBR, Ø 185 x 2	-	-	1	829333
O-ring FKM, Ø 3 x 1. 5	1	829190	1	829190
O-ring FKM, Ø 5 x 2	1	829196	1	829196
O-ring FKM, Ø 10 x 2	1	829214	1	829214
O-ring FKM, Ø 12 x 2	1	829217	-	-
O-ring FKM, Ø 16 x 3	-	-	1	829251
O-ring FKM, Ø 20 x 2	-	-	1	829238-1
O-ring FKM, Ø 25 x 2	-	-	1	829250-2
O-ring FKM, Ø 40 x 2	1	829262-1	-	-
O-ring FKM, Ø 55 x 3	-	-	1	829276
O-ring FKM, Ø 9.93 x 2.62	1	829215	-	-
Rubber plate	1	300167	1	300167

Caution, the number of supplied construction units in the seal kit corresponds to the maximum need of the series!

8.2 Service kit - rotary vane pumps

The service kit contains, in addition to the seals, all the spare parts which are subject to high wear and tear and therefore have to be replaced.

- for rotary vane pump P 6 Z: order no. 302076-01
- for rotary vane pump P 12 Z: order no. 302079-01
- for rotary vane pump P 23 Z: order no. 302080-01

Description	**for P 6 Z** (Order no. 302076-01)		**for P 12 Z** (Order no. 302079-01)		**for P 23 Z** (Order no. 302080-01)	
consisting of :	**Piece**	**Order no.**	**Piece**	**Order no.**	**Piece**	**Order no.**
Gasket set	1	302081	1	302082	1	302082
Gear rim green	1	829161-01	-	-	-	-
Gear rim black	-	-	1	829165	1	829165
Felt molding	1	829151	1	829151	1	829151
Spring plate	1	300165	1	300165	1	300165
Oil sight glass 87.8x24.8x13	1	828626	1	828626	1	828626
Oil filler plug M16x1.5	1	824103	1	824103	1	824103
Oil drain plug ¼“	1	824104	1	824104	1	824104
O-ring FKM, Ø 48 x 2	1	829265	1	829265	1	829265
Rotary vane - oil pump	2	300149-01	2	300072	2	300072
Rotary vane - high stage	2	300893	2	300940-03	2	300916-12
Rotary vane - pre-stage	2	300876	2	300916-11	2	300916-11
Compression spring 0.5 x 4 x 21.5 x 28	3	824977	-	-	-	-
Compression spring 0.5 x 4 x 37.5 x 50	-	-	2	824971	3	824971

Caution, the number of supplied construction units in the service kit corresponds to the maximum need of the series!

8.3 Service kit - diaphragm pumps

The service kit contains, in addition to the seals, all the spare parts which are subject to high wear and tear and therefore have to be replaced.

- for diaphragm pump MPC 101 Z: order no. 402008-01
- for diaphragm pump MPC 301 Z: order no. 402041-02

Description	**for MPC 101 Z** (Order no. 402008-01)		**for MPC 301 Z** (Order no. 402041-02)	
consisting of :	**Piece**	**Order no.**	**Piece**	**Order no.**
Diaphragm PTFE	2	400822-4	2	400732-04
Valve PEEK	4	400656	2	400656
Valve with hole PEEK	-	-	2	400656-4
O-ring EPDM, ∅ 28 x 2	4	829252-2	-	-
O-ring EPDM, ∅ 25 x 2	-	-	4	829250-1

8.4 Complete view - chemvac combination pump system

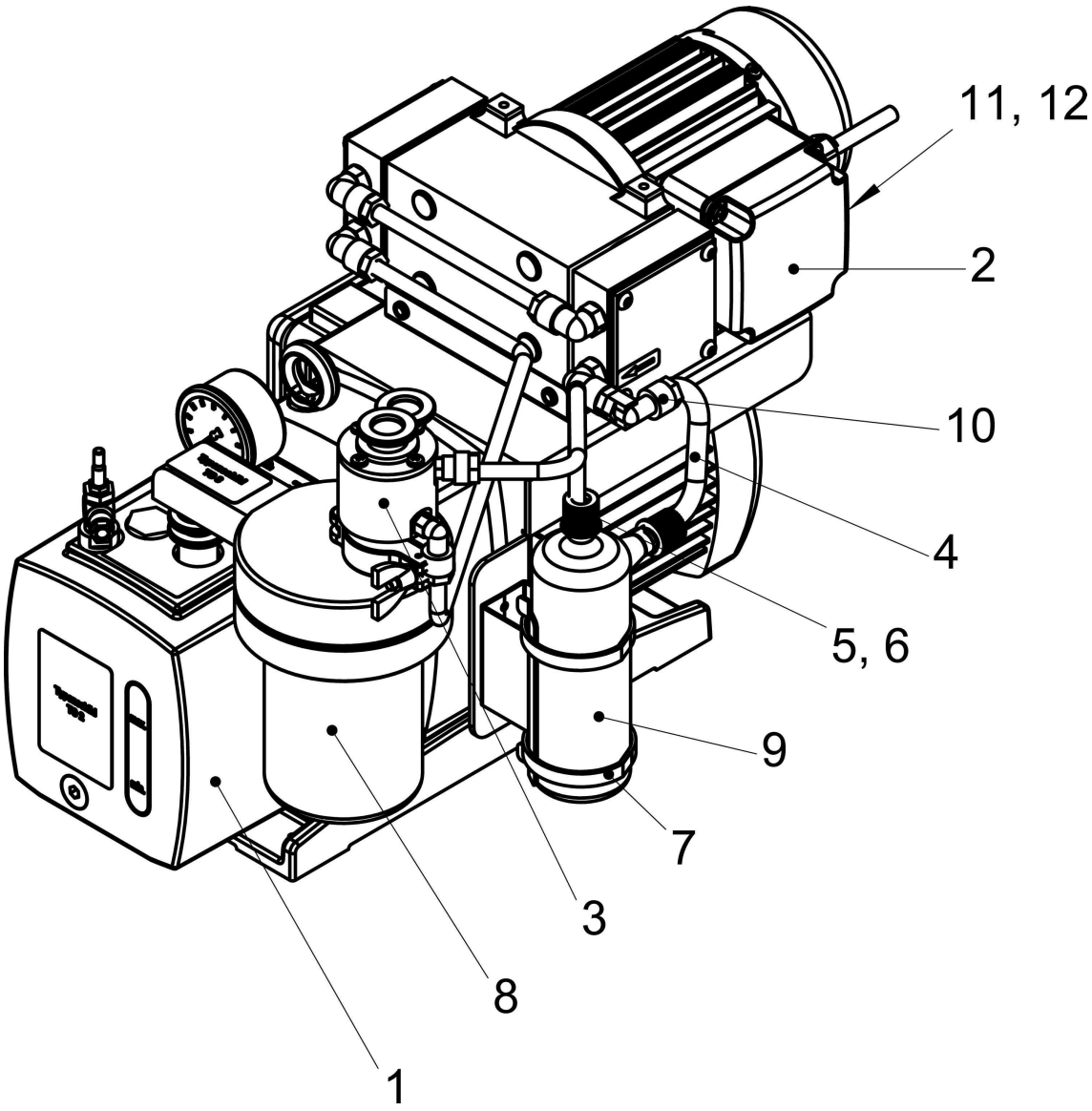


Fig. 8 Complete view - chemvac combination pump system (P 6 Z - 101)

8.4.1 List of spare parts - chemvac combination pump system

Item no.	Description	Piece	P 6 Z – 101 chemvac (Order no. 109030...)	P 12 Z – 301 chemvac (Order no. 109031…)	P 23 Z – 301 chemvac (Order no. 109032…)
			Order no.	Order no.	Order no.
1	Rotary vane pump P 6 Z (100-120 / 200-240 switchable) *consisting of - see chapter 8.5*	1	322003-05	-	-
	Rotary vane pump P 12 Z (100-120 / 200-240 switchable) *consisting of - see chapter 8.6*	1	-	322005-05	-
	Rotary vane pump P 17 Z (100-120 / 200-240 switchable) *consisting of - see chapter 8.6*	1	-	-	322007-05
2	Diaphragm pump MPC 101Z (230 V) (115 V) *consisting of - see chapter 8.7*	1	412522-08 412522-09	-	-
	Diaphragm pump MPC 301 Z (100-120 / 200-240 switchable) *consisting of - see chapter 8.8*	1	-	412722-09	412722-09
3	Safety valve complete *consisting of:*	1	109502	109508	109508
	- Insert	1	109502-03	109502-03	109502-03
	- Threaded elbow joint PVDF 8 – 1/8“	1	829936-1	829936-1	829936-1
	- Straight threaded joint PVDF 8 – 1/8“	1	829919	829919	829919
	- O-ring FKM, ∅ 30 x 2	1	829291	829291	829291
	- O-ring FKM, ∅ 18 x 5	1	829234	829234	829234
4	Vacuum hose 8 / 6x1 mm	1 m	828331	828331	828331
5	O-ring FKM, ∅ 6 x 3	2	829205	829205	829205
6	Screw cap GL 14 red	2	828872	828872	828872
7	Retaining strap 53 – 57 mm	2	824128	824128	824128
8	Separator exhaust side AKD 16	1	320015	-	-
	Separator exhaust side AKD 25	1	-	320017	320017
9	Separator 160 ml (bottle)	1	828867	828867	828867
10	Threaded elbow joint with setting stud PVDF, 8 – A8	1	829913-2	-	-
11	Plug for non-heating apparatus	1	-	825274-2	825274-2
12	Mains connection cable IEC with plug CEE (D)	1	825885	825885	825885
	Mains connection cable IEC with plug BS (UK)	1	825878	825878	825878
	Mains connection cable IEC with plug NEMA 1-15 (US)	1	825903	825903	825903
	Mains connection cable IEC with plug J/S (J)	1	825911	825911	825911
-	Rotary vane pump oil type LABOVAC 14	1 L	800135	800135	800135

8.5 Spare part view - P 6 Z

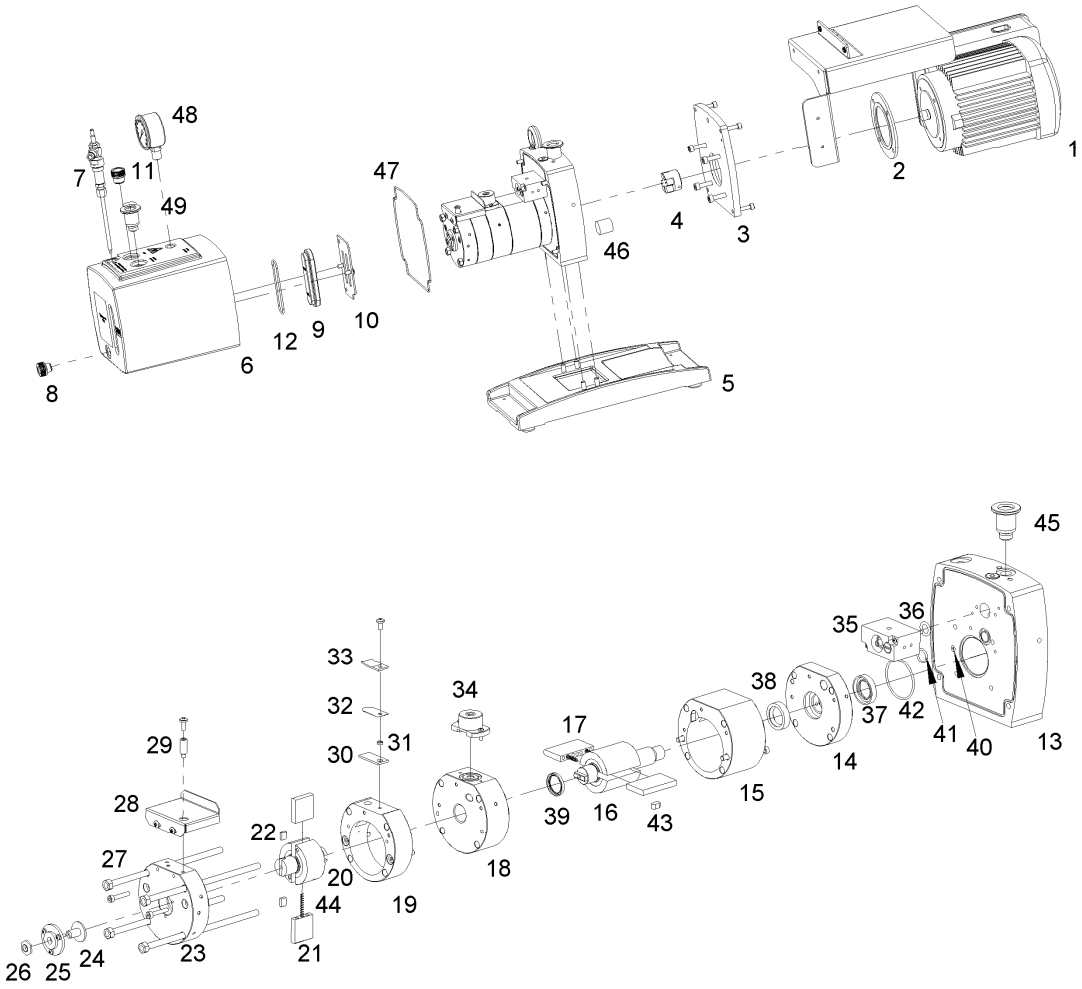


Fig. 9 Exploded view P 6 Z

8.5.1 List of spare parts - rotary vane pump P 6 Z

Item no.	Description	Module	Piece	P 6 Z (Order no. 322003-05)
				Order no.
-	**Drive complete** *consisting of :*		**1**	**109513**
1	Alternating-current motor 50/60 Hz; 0.2 kW 100-120 / 200-240 V switchable	**Drive**	1	826481
2	Distance ring		1	300955-02
3	Motor plate		1	320011-01
4	Coupling half 1		1	829161
	Gear rim green		1	829161-01
5	**Foot complete**	**Foot**	**1**	**320001-10**
6	**Oil casing** *consisting of :*		**1**	**109518**
7	Bubbler	**Oil casing**	1	700260
8	Oil drain plug G ¼“		1	824104
9	Oil sight glass 87.8 x 24.8 x 13		1	828626
10	Support plate for oil sight glass		1	300866-02
11	Oil filler plug M16 x 1.5		1	824103
12	O-Ring Ø 48 x 2 FKM		1	829265
-	**Pump body complete** *consisting of :*		**1**	**109515**
13	Motor guide	**Pump body**	1	109515-02
14	Bearing cover		1	300931-02
15	Pump casing - high stage		1	300941-01
16	Rotor - high stage		1	300941-02
17	Rotary vane - high stage		2	300893
18	Intermediate bearing		1	300931-04
19	Pump casing - pre-stage		1	300931-05
20	Rotor - pre-stage		1	300931-10
21	Rotary vane - pre-stage		2	300876
22	Rotary vane oil pump		2	300149-01
23	Oil pump		1	109509-02
24	Control piston		1	300368-01
25	Cover		1	300370
26	Hexagonal nut		1	300075
27	Stud bolt		4	300941-03
28	Oil splash sheet metal		1	300931-08
29	Absorption nozzle		1	300963-01
30	Rubber plate		1	300167
31	Bushing		1	300144
32	Spring plate		1	300165
33	Hold-on		1	300166
34	Over pressure valve complete		1	300867
35	HV valve complete *(contain item no. 36)*		1	300932
36	- O-Ring Ø 9,93 x 2,51 FKM		1	829215
37	Shaft seal Ø 18 x 30 x 6 / 6.5		1	829412
38	Shaft seal Ø 18 x 28 x 7		1	829413
39	Radial shaft seal Ø 18 x 24 x 3		1	829417
40	O-Ring Ø 3 x 1.5 FKM		1	829190
41	O-Ring Ø 12 x 2 FKM		1	829217
42	O-Ring Ø 40 x 2 FKM		1	829262-1
43	Feather key 5 x 5 x 10		1	824951
44	Compression spring 0.5 x 4 x 21.5 x 28		3	824977
45	Intake fitting DN 16 KF - ¼“ *(glued in)*		1	710227-02
to 4	Coupling half 2		1	829161
46	**Felt molding**		**1**	**829151**
47	**O-Ring Ø 150 x 2 NBR**		**1**	**829323**
48	**Tube spring chemistry manometer** NG 50 – ¼“ ($P_{soll\ (is)}$ = green range)		**1**	**827409-7**
49	**Intake fitting DN 16 KF - ¼“** *(glued in)*		**1**	**710227-02**

8.6 Spare part view - P 12 Z, P 23 Z

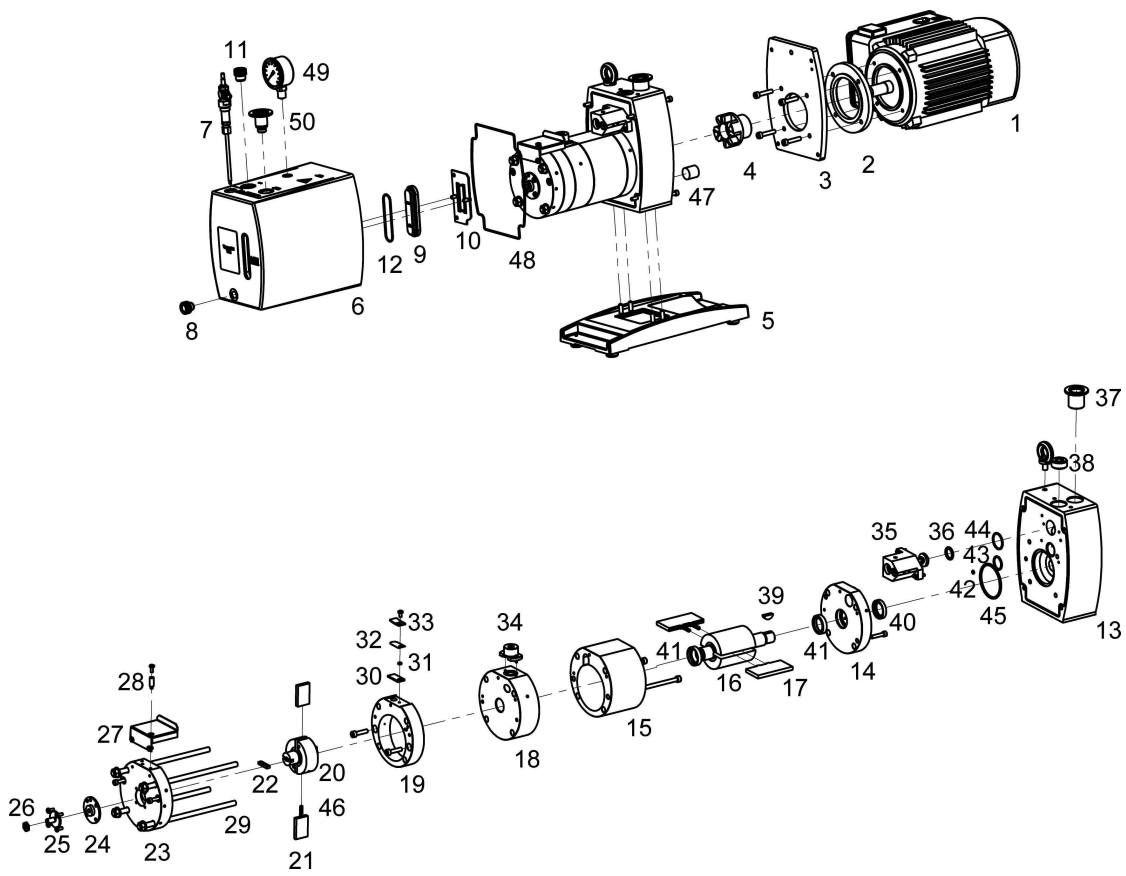


Fig. 10 Exploded view P 12 Z, P 23 Z

8.6.1 List of spare parts - rotary vane pump P 12 Z

Item no.	Description	Module	Piece	P 12 Z (Order no. 322005-05)
				Order no.
-	**Drive complete** *consisting of :*		**1**	**109514**
1	Alternating-current motor 50/60 Hz; 0.55/0.66 kW 100-120 / 200-240 V switchable	**Drive**	1	826482
2	Distance ring		1	300961-01
3	Motor plate		1	320012-01
4	Coupling half part 1		1	300879
5	**Foot complete**	**Foot**	**1**	**320001-10**
6	**Oil casing** *consisting of :*		**1**	**109523**
7	Bubbler	**Oil casing**	1	710276
8	Oil drain plug G ¼“		1	824104
9	Oil sight glass 87.8 x 24.8 x 13		1	828626
10	Support plate for oil sight glass		1	300866-02
11	Oil filler plug M16 x 1,5		1	824103
12	O-Ring Ø 48 x 2 FKM		1	829265
-	**Pump body complete** *consisting of :*		**1**	**109516**
13	Motor guide	**Pump body**	1	109516-02
14	Bearing cover		1	300916-05
15	Pump casing - high stage		1	300940-01
16	Rotor - high stage		1	300940-02
17	Rotary vane - high stage		2	300940-03
18	Intermediate bearing		1	300916-04
19	Pump casing - pre-stage		1	300916-03
20	Rotor - pre-stage		1	300916-09
21	Rotary vane - pre-stage		2	300916-11
22	Rotary vane - oil pump		2	300072
23	Oil pump		1	109510-02
24	Cover		1	300074
25	Compressing piece		1	300073
26	Hexagonal nut		1	300075
27	Oil splash sheet metal		1	300916-07
28	Absorption nozzle		1	300963-01
29	Stud bolt		4	300940-04
30	Rubber plate		1	300167
31	Bushing		1	300144
32	Spring plate		1	300165
33	Hold on		1	300166
34	Over pressure valve complete		1	300867
35	HV valve complete *(contain item no. 36)*		1	300945
36	- Ring Ø 16 x 3 FKM		1	829251
37	Threaded connector DN 25 KF - ¾“ *(glued in)*		1	701662
38	Screw plug R ¾“		1	824117
39	Disk feather		1	300121
40	Shaft seal Ø 22 x 32 x 6 BABSL		1	829430-01
41	Shaft seal Ø 22 x 32 x 7		2	829430
42	O-Ring Ø 3 x 1.5 FKM		1	829190
43	O-Ring Ø 20 x 2 FKM		1	829238-1
44	O-Ring Ø 25 x 2 FKM		1	829250-2
45	O-Ring Ø 55 x 3 FKM		1	829276
46	Compression spring 0.5 x 4 x 37.5 x 50		2	824971
to 4	Coupling half part 2		1	300879-01
47	**Felt molding**		**1**	**829151**
48	**O-Ring Ø 185 x 2 NBR**		**1**	**829333**
49	**Tube spring chemistry manometer** NG 50 – ¼“ ($P_{soll\ (is)}$ = green range)		**1**	**827409-7**
50	**Inlet fitting DN 25 KF - ¼“** *(glued in)*		**1**	**710621-01**

8.6.2 List of spare parts - rotary vane pump P 23 Z

Item no.	Description	Module	Piece	P 23 Z (Order no. 322007-05)
				Order no.
-	**Drive complete** *consisting of :*		**1**	**109514**
1	Alternating-current motor 50/60 Hz; 0.55/0.66 kW 100-120 / 200-240 V switchable	**Drive**	1	826482
2	Distance ring		1	300961-01
3	Motor plate		1	320012-01
4	Coupling half part 1		1	300879
5	**Foot complete**	**Foot**	**1**	**320001-10**
6	**Oil casing** *consisting of :*		**1**	**109523**
7	Bubbler	**Oil casing**	1	710276
8	Oil drain plug G ¼“		1	824104
9	Oil sight glass 87.8 x 24.8 x 13		1	828626
10	Support plate for oil sight glass		1	300866-02
11	Oil filler plug M16 x 1,5		1	824103
12	O-Ring Ø 48 x 2 FKM		1	829265
-	**Pump body complete** *consisting of :*		**1**	**109517**
13	Motor guide	**Pump body**	1	109516-02
14	Bearing cover		1	300916-05
15	Pump casing - high stage		1	300916-02
16	Rotor - high stage		1	300916-08
17	Rotary vane - high stage		2	300916-12
18	Intermediate bearing		1	300916-04
19	Pump casing - pre-stage		1	300916-03
20	Rotor - pre-stage		1	300916-09
21	Rotary vane - pre-stage		2	300916-11
22	Rotary vane - oil pump		2	300072
23	Oil pump		1	109510-02
24	Cover		1	300074
25	Compressing piece		1	300073
26	Hexagonal nut		1	300075
27	Oil splash sheet metal		1	300916-07
28	Absorption nozzle		1	300963-01
29	Stud bolt		4	300916-13
30	Rubber plate		1	300167
31	Bushing		1	300144
32	Spring plate		1	300165
33	Hold on		1	300166
34	Over pressure valve complete		1	300867
35	HV valve complete *(contain item no. 36)*		1	300945
36	- O-Ring Ø 16 x 3 FKM		1	829251
37	Threaded connector DN 25 KF - ¾“ *(glued in)*		1	701662
38	Screw plug R ¾“		1	824117
39	Disk feather		1	300121
40	Shaft seal Ø 22 x 32 x 6 BABSL		1	829430-01
41	Shaft seal Ø 22 x 32 x 7		2	829430
42	O-Ring Ø 3 x 1.5 FKM		1	829190
43	O-Ring Ø 20 x 2 FKM		1	829238-1
44	O-Ring Ø 25 x 2 FKM		1	829250-2
45	O-Ring Ø 55 x 3 FKM		1	829276
46	Compression spring 0.5 x 4 x 37.5 x 50		3	824971
to 4	Coupling half part 2		1	300879-01
47	**Felt molding**		**1**	**829151**
48	**O-Ring Ø 185 x 2 NBR**		**1**	**829333**
49	**Tube spring chemistry manometer** NG 50 – ¼“ ($P_{soll\ (is)}$ = green range)		**1**	**827409-7**
50	**Inlet fitting DN 25 KF - ¼“** *(glued in)*		**1**	**710621-01**

8.7 Spare part view - MPC 101 Z

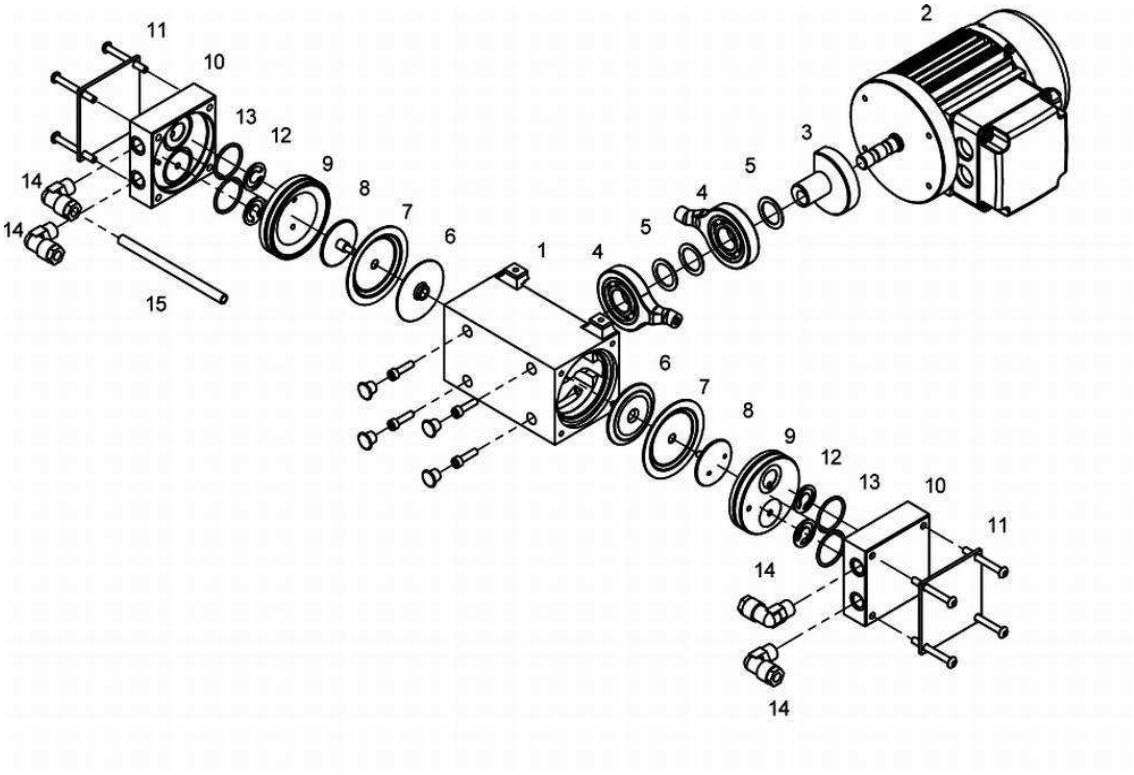


Fig. 11 Exploded view MPC 101 Z

8.7.1 List of spare parts - diaphragm pump MPC 101 Z

Item no.	Description	Piece	(412522-08) Order no.	(412522-09) Order no.
-	Basic pump complete *(Only completely available!)* *consisting of position: 1 - 5*	1	410301-02	410301-03
1	- Pump casing	1	410330	410330
2	- Alternating-current motor 230 V	1	410310-02	-
	- Alternating-current motor 115 V	1	-	410310-01
-	- Drive complete *consisting of position: 3 - 5*	1	400763-01	400763-01
3	- Eccentric	1	400770	400770
4	- Piston rod with ball bearing	2	400771-01	400771-01
5	- Close tolerance spacer 20 x 28 x 1	3	824957-2	824957-2
6	Pressure washer	2	400772-1	400772-1
7	Diaphragm	2	400822-4	400822-4
8	Tightening washer	2	400773-3	400773-3
9	Pump head 1	2	400768	400768
10	Connection head 2	2	400845	400845
11	Pressure plate	2	400769	400769
12	Valve	4	400656	400656
13	O-ring EPDM, ∅ 28 x 2	4	829252-2	829252-2
14	Threaded elbow joint PVDF, 8 - 1/4"	4	829929	829929
15	Vacuum hose 8 / 6 x 1 mm	0.9 m	828331	828331

8.8 Spare part view - MPC 301 Z

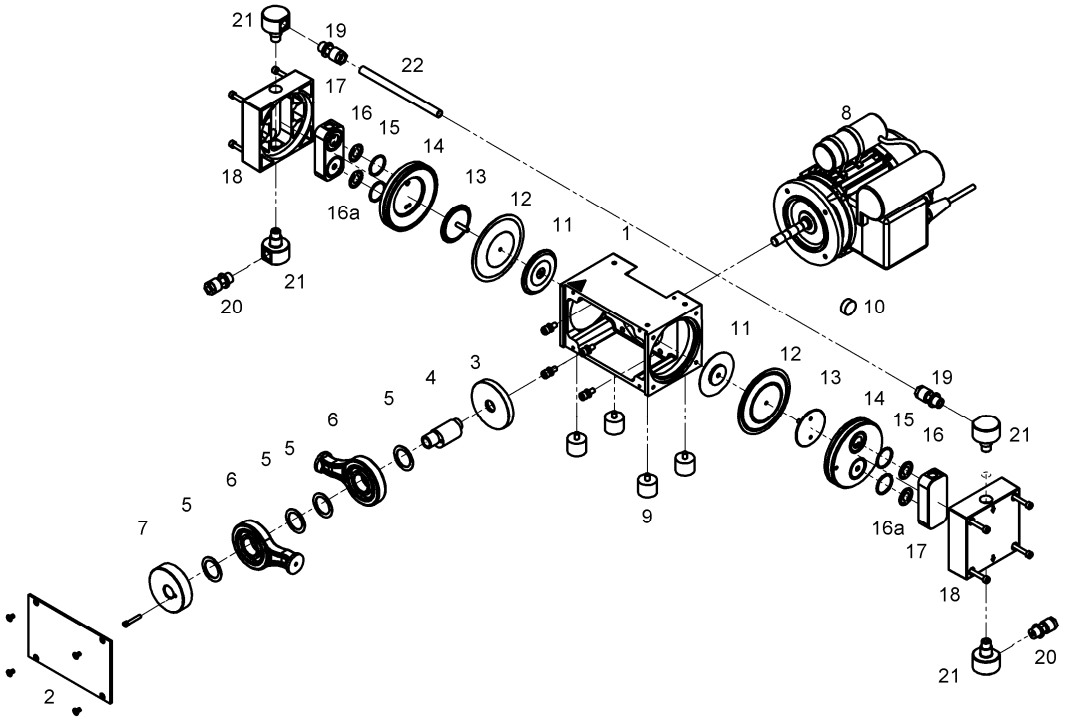


Fig. 12 Exploded view MPC 301 Z

8.8.1 List of spare parts - diaphragm pump MPC 301 Z

Item no.	Description	Piece	(412722-09) Order no.
-	Basic pump complete *(Only completely available!)* *consisting of position: 1 – 8*	1	410402-06
1	- Pump casing	1	400640
2	- Cover plate	1	400641-02
-	- Drive complete *consisting of position: 3 – 7*	1	400843
3	- Centrifugal mass	1	400649
4	- Eccentric	1	400648
5	- Close tolerance spacer 25 x 35 x 1	4	824957-1
6	- Piston rod with ball bearing	2	400647-01
7	- Mass balance	1	400678
8	- Alternating-current motor	1	826420-01
9	Rubber metal-pad	4	829139
10	Rubber pad	1	400785-01
11	Pressure washer	2	400680
12	Diaphragm	2	400732-04
13	Tightening washer	2	400707
14	Pump head	2	400705-02
15	O-Ring EPDM, ø 25 x 2	4	829250-1
16	Valve with hole	2	400656-4
16a	Valve	2	400656
17	PTFE Insert	2	400902
18	Connection head	2	410432
19	Straight threaded joint with seal edge PVDF, 10 - 1/4"	2	829931
20	Straight threaded joint with seal edge PVDF, 8 - 1/4"	2	829919
21	Manifold 1 PVDF, M12 x 1 – G1/4“	4	400905-01
21	Vacuum hose PTFE, 10 / 8 x 1 mm	0.2 m	828332

SAFETY DATA SHEET (en)

SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

As of the revision date above, this (M)SDS meets the regulations in the United Kingdom & Ireland.

1.1. PRODUCT IDENTIFIER

Product Name: Vacuum oil **LABOVAC 14**
Product Description: Synthetic Base Stocks and Additives
Product Code: 201560250510, 601609-60

1.2. RELEVANT IDENTIFIED USES OF THE SUBSTANCE OR MIXTURE AND USES ADVISED AGAINST

Intended Use: Compressor oil

Uses advised against: None unless specified elsewhere in this SDS.

1.3. DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET

Supplier:

WELCH-ILMVAC
ILMVAC GmbH
Am Vogelherd 20
D-98693 Ilmenau / Germany

Phone: +49 (0)3677 604 0
Fax: +49 (0)3677 604 131
E-mail: welch-ilmvac@gardnerdenver.com
Web: www.welch-ilmvac.com, www.ilmvac.eu

This material is not subject to Safety Data Sheet provision according to Article 31 of REACH.

SECTION 2 HAZARDS IDENTIFICATION

2.1. CLASSIFICATION OF SUBSTANCE OR MIXTURE

Classification according to EU Directive 67/548/EEC / 1999/45 EC

Not Classified

2.2. LABEL ELEMENTS

Not regulated according to EU Directive 67/548/EEC / 1999/45 EC

2.3. OTHER HAZARDS

PHYSICAL / CHEMICAL HAZARDS

No significant hazards.

HEALTH HAZARDS

Excessive exposure may result in eye, skin, or respiratory irritation. High-pressure injection under skin may cause serious damage.

ENVIRONMENTAL HAZARDS

No significant hazards. Material does not meet the criteria for PBT or vPvB in accordance with REACH Annex XIII.

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

3.1. SUBSTANCES Not Applicable. This material is regulated as a mixture.

3.2. MIXTURES

This material is defined as a mixture.

No Hazardous Substance(s) required for disclosure.

SECTION 4 FIRST AID MEASURES

4.1. DESCRIPTION OF FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

First aid is normally not required. Seek medical attention if discomfort occurs.

4.2. MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED

Local necrosis as evidenced by delayed onset of pain and tissue damage a few hours after injection.

4.3. INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED

The need to have special means for providing specific and immediate medical treatment available in the workplace is not expected.

SECTION 5 FIRE FIGHTING MEASURES

5.1. EXTINGUISHING MEDIA

Suitable Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Unsuitable Extinguishing Media: Straight streams of water

5.2. SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE

Hazardous Combustion Products: Smoke, Fume, Aldehydes, Sulphur oxides, Incomplete combustion products, Oxides of carbon

5.3. ADVICE FOR FIRE FIGHTERS

Fire Fighting Instructions: Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

FLAMMABILITY PROPERTIES

Flash Point [Method]: >218°C (424°F) [ASTM D-92]
Upper/Lower Flammable Limits (Approximate volume % in air): UEL: 7.0 LEL: 0.9 [Estimated]
Autoignition Temperature: No data available

SECTION 6 ACCIDENTAL RELEASE MEASURES

6.1. PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

PROTECTIVE MEASURES

Avoid contact with spilled material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

6.2. ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

6.3. METHODS AND MATERIAL FOR CONTAINMENT AND CLEANING UP

Land Spill: Stop leak if you can do so without risk. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do so without risk. Confine the spill immediately with booms. Warn other shipping. Remove from the surface by skimming or with suitable absorbents. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

6.4. REFERENCES TO OTHER SECTIONS

See Sections 8 and 13.

SECTION 7 HANDLING AND STORAGE

7.1. PRECAUTIONS FOR SAFE HANDLING

Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). When the material is handled in bulk, an electrical spark could ignite any flammable vapors from liquids or residues that may be present (e.g., during switch-loading operations). Use proper bonding and/or earthing procedures. However, bonding and earthing may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance. Additional references include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

Static Accumulator: This material is a static accumulator.

7.2. CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

The container choice, for example storage vessel, may effect static accumulation and dissipation. Do not store in open or unlabelled containers.

7.3. SPECIFIC END USES: Section 1 informs about identified end-uses. No industrial or sector specific guidance available.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. CONTROL PARAMETERS

Exposure limits/standards for materials that can be formed when handling this product: When mists/aerosols can occur the following is recommended: 5 mg/m³ - ACGIH TLV (inhalable fraction).

Note: Information about recommended monitoring procedures can be obtained from the relevant agency(ies)/institute(s):

UK Health and Safety Executive (HSE)

8.2. EXPOSURE CONTROLS

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

No special requirements under ordinary conditions of use and with adequate ventilation.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use

conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

No protection is ordinarily required under normal conditions of use.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

9.1. INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid
Colour: Colourless
Odour: Characteristic
Odour Threshold: No data available
pH: Not technically feasible
Melting Point: Not technically feasible
Freezing Point: No data available
Initial Boiling Point / and Boiling Range: > 316°C (600°F) [Estimated]
Flash Point [Method]: >218°C (424°F) [ASTM D-92]
Evaporation Rate (n-butyl acetate = 1): No data available
Flammability (Solid, Gas): Not technically feasible
Upper/Lower Flammable Limits (Approximate volume % in air): UEL: 7.0 LEL: 0.9 [Estimated]
Vapour Pressure: < 0.013 kPa (0.1 mm Hg) at 20 °C [Estimated]
Vapour Density (Air = 1): > 2 at 101 kPa [Estimated]
Relative Density (at 15 °C): 0.82 [test method unavailable]
Solubility(ies): water Negligible
Partition coefficient (n-Octanol/Water Partition Coefficient): > 3.5 [Estimated]

Autoignition Temperature: No data available
Decomposition Temperature: No data available
Viscosity: 29 cSt (29 mm2/sec) at 40ºC | 5.6 cSt (5.6 mm2/sec) at 100°C [test method unavailable]
Explosive Properties: None
Oxidizing Properties: None

9.2. OTHER INFORMATION

Pour Point: -54°C (-65°F) [test method unavailable]

SECTION 10 STABILITY AND REACTIVITY

10.1. REACTIVITY: See sub-sections below.

10.2. CHEMICAL STABILITY: Material is stable under normal conditions.

10.3. POSSIBILITY OF HAZARDOUS REACTIONS: Hazardous polymerization will not occur.

10.4. CONDITIONS TO AVOID: Excessive heat. High energy sources of ignition.

10.5. INCOMPATIBLE MATERIALS: Strong oxidisers

10.6. HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

SECTION 11 TOXICOLOGICAL INFORMATION

11.1. INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Conclusion / Remarks
Inhalation	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Irritation: No end point data for material.	Negligible hazard at ambient/normal handling temperatures.
Ingestion	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin	
Acute Toxicity: No end point data for material.	Minimally Toxic. Based on assessment of the components.
Skin Corrosion/Irritation: No end point data for material.	Negligible irritation to skin at ambient temperatures. Based on assessment of the components.
Eye	
Serious Eye Damage/Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on assessment of the components.
Sensitisation	
Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: No end point data for material.	Not expected to be a skin sensitizer. Based on assessment of the components.

Aspiration: Data available.	Not expected to be an aspiration hazard. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: No end point data for material.	Not expected to be a germ cell mutagen. Based on assessment of the components.
Carcinogenicity: No end point data for material.	Not expected to cause cancer. Based on assessment of the components.
Reproductive Toxicity: No end point data for material.	Not expected to be a reproductive toxicant. Based on assessment of the components.
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
Single Exposure: No end point data for material.	Not expected to cause organ damage from a single exposure.
Repeated Exposure: No end point data for material.	Not expected to cause organ damage from prolonged or repeated exposure. Based on assessment of the components.

OTHER INFORMATION

Contains:
Synthetic base oils: Not expected to cause significant health effects under conditions of normal use, based on laboratory studies with the same or similar materials. Not mutagenic or genotoxic. Not sensitising in test animals and humans.

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

12.1. TOXICITY

Material -- Not expected to be harmful to aquatic organisms.

12.2. PERSISTENCE AND DEGRADABILITY Not determined.

12.3. BIOACCUMULATIVE POTENTIAL Not determined.

12.4. MOBILITY IN SOIL

Base oil component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

12.5. PERSISTENCE, BIOACCUMULATION AND TOXICITY FOR SUBSTANCE(S)

This product is not, or does not contain, a substance that is a PBT or a vPvB.

12.6. OTHER ADVERSE EFFECTS

No adverse effects are expected.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

13.1. WASTE TREATMENT METHODS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products. Protect the environment. Dispose of used oil at designated sites. Minimize skin contact. Do not mix used oils with solvents, brake fluids or coolants.

REGULATORY DISPOSAL INFORMATION

European Waste Code: 13 02 06*

NOTE: These codes are assigned based upon the most common uses for this material and may not reflect contaminants resulting from actual use. Waste producers need to assess the actual process used when generating the waste and its contaminants in order to assign the proper waste disposal code(s).

This material is considered as hazardous waste pursuant to Directive 91/689/EEC on hazardous waste, and subject to the provisions of that Directive unless Article 1(5) of that Directive applies.

Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (ADR/RID): **14.1-14.6** Not Regulated for Land Transport

INLAND WATERWAYS (ADNR/ADN): **14.1-14.6** Not Regulated for Inland Waterways Transport

SEA (IMDG): **14.1-14.6** Not Regulated for Sea Transport according to IMDG-Code

SEA (MARPOL 73/78 Convention - Annex II):

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not classified according to Annex II

AIR (IATA): **14.1-14.6** Not Regulated for Air Transport

SECTION 15 REGULATORY INFORMATION

REGULATORY STATUS AND APPLICABLE LAWS AND REGULATIONS

Complies with the following national/regional chemical inventory requirements: AICS, DSL, ENCS, IECSC, KECI, PICCS, TSCA

15.1. SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS/LEGISLATION SPECIFIC FOR THE SUBSTANCE OR MIXTURE

Applicable EU Directives and Regulations:

1907/2006 [... on the Registration, Evaluation, Authorisation and Restriction of Chemicals ... and amendments thereto]
689/2008/EC [....concerning the export and import of dangerous substances and amendments thereto]
1272/2008 [on classification, labelling and packaging of substances and mixtures.. and amendments thereto]

Refer to the relevant EU/national regulation for details of any actions or restrictions required by the above Regulation(s)/Directive(s).

15.2. CHEMICAL SAFETY ASSESSMENT

REACH Information: A Chemical Safety Assessment has been carried out for one or more substances present in the material.

SECTION 16 OTHER INFORMATION

REFERENCES: Sources of information used in preparing this SDS included one or more of the following: results from in house or supplier toxicology studies, CONCAWE Product Dossiers, publications from other trade associations, such as the EU Hydrocarbon Solvents REACH Consortium, U.S. HPV Program Robust Summaries, the EU IUCLID Data Base, U.S. NTP publications, and other sources, as appropriate.

List of abbreviations and acronyms that could be (but not necessarily are) used in this safety data sheet:

Acronym	Full text

N/A	Not applicable
N/D	Not determined
NE	Not established
VOC	Volatile Organic Compound
AICS	Australian Inventory of Chemical Substances
AIHA WEEL	American Industrial Hygiene Association Workplace Environmental Exposure Limits
ASTM	ASTM International, originally known as the American Society for Testing and Materials (ASTM)
DSL	Domestic Substance List (Canada)
EINECS	European Inventory of Existing Commercial Substances
ELINCS	European List of Notified Chemical Substances
ENCS	Existing and new Chemical Substances (Japanese inventory)
IECSC	Inventory of Existing Chemical Substances in China
KECI	Korean Existing Chemicals Inventory
NDSL	Non-Domestic Substances List (Canada)
NZIoC	New Zealand Inventory of Chemicals
PICCS	Philippine Inventory of Chemicals and Chemical Substances
TLV	Threshold Limit Value (American Conference of Governmental Industrial Hygienists)
TSCA	Toxic Substances Control Act (U.S. inventory)
UVCB	Substances of Unknown or Variable composition, Complex reaction products or Biological materials
LC	Lethal Concentration
LD	Lethal Dose
LL	Lethal Loading
EC	Effective Concentration
EL	Effective Loading
NOEC	No Observable Effect Concentration
NOELR	No Observable Effect Loading Rate

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Revision Changes: Not Applicable

Internal Use Only
MHC: 0B, 0B, 0, 0, 0, 0 PPEC: A

DGN: 2007484XGB (547849)

ANNEX

Annex not required for this material.

EG - Konformitätserklärung

EC Declaration of Conformity / *CE Déclaration de Conformité*

DIN EN ISO / IEC 17050

(de)

Hiermit erklären wir

WELCH-ILMVAC

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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 (ILMVAC 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 (ILMVAC 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.

Bezeichnung des Produkts (Pumpen / Pumpstände) Description of product (pumps / pump systems) *Description du produit (pompes / pompe systèmes)*	**chemvac Kombipumpstände** / chemvac Combination Pump Systems / *Pompes combinée chemvac* **P6Z - 101, P12Z - 301, P23Z - 301**
Artikel-Nr. / Fabrication No. / *No. de fabrication*	109030, 109030-01, 109030-03, 109031, 109031-03, 109032, 109032-03
Baujahr / Year of manufacture / *Annee de fabrication*	**2015**

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:*

- [X] **Richtlinie 2006/42/EG Maschinenrichtlinie** / EC machinery directive / *directive CE sur les machines* (17.05.2006)
- [X] **Richtlinie 2006/95/EG Niederspannungsrichtlinie** / EC low voltage directive / *Directive CE de basse tension* (12.12.2006)
- [X] **Richtlinie 2004/108/EG Elektromagnetische Verträglichkeit** / EC Electromagnetic Compatibility Directive / *Directive CE relative à la compatibilité électromagnétique* (15.12.2004)
- [X] **Richtlinie 2011/65/EU Gefährliche Stoffe in Elektro- und Elektronikgeräten (RoHS) /** Dangerous materials in electrical and electronics devices (RoHS) / *Substances dangereuses dans les appareils électriques et électroniques (RoHS)*
- [X] **Richtlinie 2012/19/EU Elektro- und Elektronik - Altgeräte (WEEE)** / Electrical and electronics - old devices (WEEE) / *Électro et électronique - appareils de contralto (WEEE)*
- [X] **China – RoHS Umweltschutzgesetz** – China 2007-03 / Environment protection law / *Loi sur la protection de environnement*

Angewandte harmonisierte Normen: / applied harmonized standards: / *standards appliques et harmonises:*

- [X] **DIN EN ISO 12100-2010 Sicherheit von Maschinen – Allgemeine Gestaltungsleitsätze, Risikobeurteilung und Risikominderung /** Safety of machinery - General principles for design - Risk assessment and risk reduction / *Sécurité des machines - Principes généraux pour l'évaluation des risques et la réduction des risques*
- [X] **DIN EN ISO 13857:2008 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 / *Sécurité des machines - Distances de sécurité empêchant les membres supérieurs et inférieurs d'atteindre les zones dangereuses*
- [X] **DIN EN 1012-2:1996 Kompressoren und Vakuumpumpen - Sicherheitsanforderungen - Teil 2: Vakuumpumpen** / Compressors and vacuum pumps - Safety requirements - part 2: Vacuum pumps / *Compresseurs et pompes à vide - Exigences de sécurité - partie 2: pompes à vide*
- [X] **DIN EN ISO 2151:2008 Akustik - Geräuschmessnorm für Kompressoren und Vakuumpumpen - Verfahren der Genauigkeitsklasse 2** / 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 60204-1:2006 Sicherheit von Maschinen - Elektrische Ausrüstung von Maschinen - Teil 1: Allgemeine Anforderungen** / Safety of machinery - Electrical equipment of machines - part 1: General requirements / *Sécurité des machines - Equipement électrique des machines - partie 1: Prescriptions générales*
- [X] **EN 61000-6-2:2005 Elektromagnetische Verträglichkeit (EMV) - Teil 6-2: Fachgrundnormen - Störfestigkeit für Industriebereiche** / 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 61000-6-4:2007 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 Betrieb von elektrischen Anlagen /** Operation of electrical installations / *Fonctionnement des installations électriques*
- [X] **DIN EN 61010-1 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*

	Datum / Date	**2015-01-08**
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