

Operating Instructions

Vacuum Unit VZ

Note

The Operating instructions were originally written in German. Store in a safe place for future reference. Subject to technical changes without notice. No responsibility is taken for printing or other types of errors.

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1 Important Information

1.1 Note on Using this Document

J. Schmalz GmbH is generally referred to as Schmalz in this document.

The document contains important notes and information about the different operating phases of the product:

- Transport, storage, start of operations and decommissioning
- Safe operation, required maintenance, rectification of any faults

The document describes the product at the time of delivery by Schmalz and is aimed at:

- Installers who are trained in handling the product and can operate and install it
- Technically trained service personnel performing the maintenance work
- Technically trained persons who work on electrical equipment

1.2 The technical documentation is part of the product

1. For problem-free and safe operation, follow the instructions in the documents.
2. Keep the technical documentation in close proximity to the product. The documentation must be accessible to personnel at all times.
3. Pass on the technical documentation to subsequent users.
 - ⇒ Failure to follow the instructions in these Operating instructions may result in life-threatening injuries!
 - ⇒ Schmalz is not liable for damage or malfunctions that result from failure to heed these instructions.

If you still have questions after reading the technical documentation, contact Schmalz Service at:

www.schmalz.com/services

1.3 Warnings in This Document

Warnings warn against hazards that may occur when handling the product. The signal word indicates the level of danger.

Signal word	Meaning
 DANGER	Indicates a high-risk hazard that will result in death or serious injury if not avoided.
 WARNING	Indicates a medium-risk hazard that could result in death or serious injury if not avoided.
 CAUTION	Indicates a low-risk hazard that could result in minor or moderate injury if not avoided.
NOTE	Indicates a danger that leads to property damage.

1.4 Other Applicable Documents

These operating instructions are only valid together with the operating instructions for the corresponding vacuum pump in accordance with the following table:

Vacuum unit	Pump operating instructions	Legend for pictogram
VZ-TR-4 AC/AC3	30.30.01.00130	—
VZ-TR-8 AC/AC3		
VZ-TR-8 DC	30.30.01.00855	30.30.01.01255
VZ-TR-10 AC/AC3	30.30.01.00556	
VZ-TR-16 AC/AC3		
VZ-TR-25 AC/AC3		
VZ-TR-40 AC/AC3		
VZ-TR-80 AC/AC3	30.30.01.00770	
VZ-TR-250 AC/AC3	30.30.01.00400	
VZ-OG-63 AC/AC3	30.30.01.00002	

Vacuum unit	Pump operating instructions	Legend for pictogram
VZ-OG-100 AC/AC3		—
VZ-OG-165 AC/AC3	30.30.01.00004	

1.5 Symbol



This symbol indicates useful and important information.

- ✓ This symbol represents a prerequisite that must be met prior to an operational step.
- ▶ This symbol represents an action to be performed.
- ⇒ This symbol represents the result of an action.

Actions that consist of more than one step are numbered:

1. First action to be performed.
2. Second action to be performed.

1.6 Type Plate

The type plate contains important information regarding the vacuum unit.

The type plate is attached to the exterior of the device. It is permanently attached to the vacuum unit and must always be clearly legible.

It includes the following information:

- Part sales designation/type
- Part number
- Manufacturing date
- Serial number
- Operating voltage
- Amperage
- CE label

Please specify all the information above when ordering replacement parts, making warranty claims or for any other inquiries.

2 Fundamental Safety Instructions

2.1 Noise Emissions

The continuous sound pressure output by the device is less than 80 dB(A). It is thus below the level of 85 dB(A) determined by the EU Directive 2003/10/EG.



We still advise you to use ear protection during longer periods in close proximity to the vacuum unit.

2.2 Intended Use

The vacuum unit is built in accordance with the latest standards of technology and is delivered in a safe operating condition.

The vacuum unit VZ from Schmalz is used to generate and maintain a specific vacuum.

Neutral gases in accordance with EN 983 are approved as evacuation media. Neutral gases include air, nitrogen and inert gases (e.g. argon, xenon and neon).

Before conveying a gas, check whether the gas can be conveyed safely in the specific application.

Corresponding security measures on systems and devices that are connected to the vacuum unit must be implemented in order to avoid danger to persons, animals or property caused by a drop in vacuum.

The product is intended for industrial use.

Intended use includes observing the technical data and the installation and operating instructions in this manual.

2.3 Safety Instructions



⚠ WARNING

A powerful vacuum flow creates a strong suction effect

Risk of injury to eyes or other body parts

- ▶ Wear eye protection.
- ▶ Do not look or reach into the vacuum opening.
- ▶ When the vacuum generator is switched on, maintain a safe distance from the vacuum opening.



⚠ WARNING

Extraction of hazardous media, liquids or bulk material

Personal injury or damage to property!

- ▶ Do not extract harmful media such as dust, oil mists, vapors, aerosols etc.
- ▶ Do not extract aggressive gases or media such as acids, acid fumes, bases, biocides, disinfectants or detergents.
- ▶ Do not extract liquids or bulk materials, e.g. granulates.

2.4 Modifications to the Product

Schmalz assumes no liability for consequences of modifications over which it has no control:

1. The product must be operated only in its original condition as delivered.
2. Use only original spare parts from Schmalz.
3. The product must be operated only in perfect condition.

2.5 Personnel qualification

Unqualified personnel cannot recognize dangers and are therefore exposed to higher risks!

1. Electrical work and installations may only be carried out by qualified electrical specialists.
2. Assembly and adjustment work may only be carried out by qualified personnel.

These operating instructions are intended for fitters who are trained in handling the product and who can operate and install it.

2.6 Danger Zone

Persons in the danger zone of the overall system may suffer severe injuries.

The danger zone is the area inside or in the vicinity of working equipment that poses a hazard or potential hazard to the health of persons located within this area.

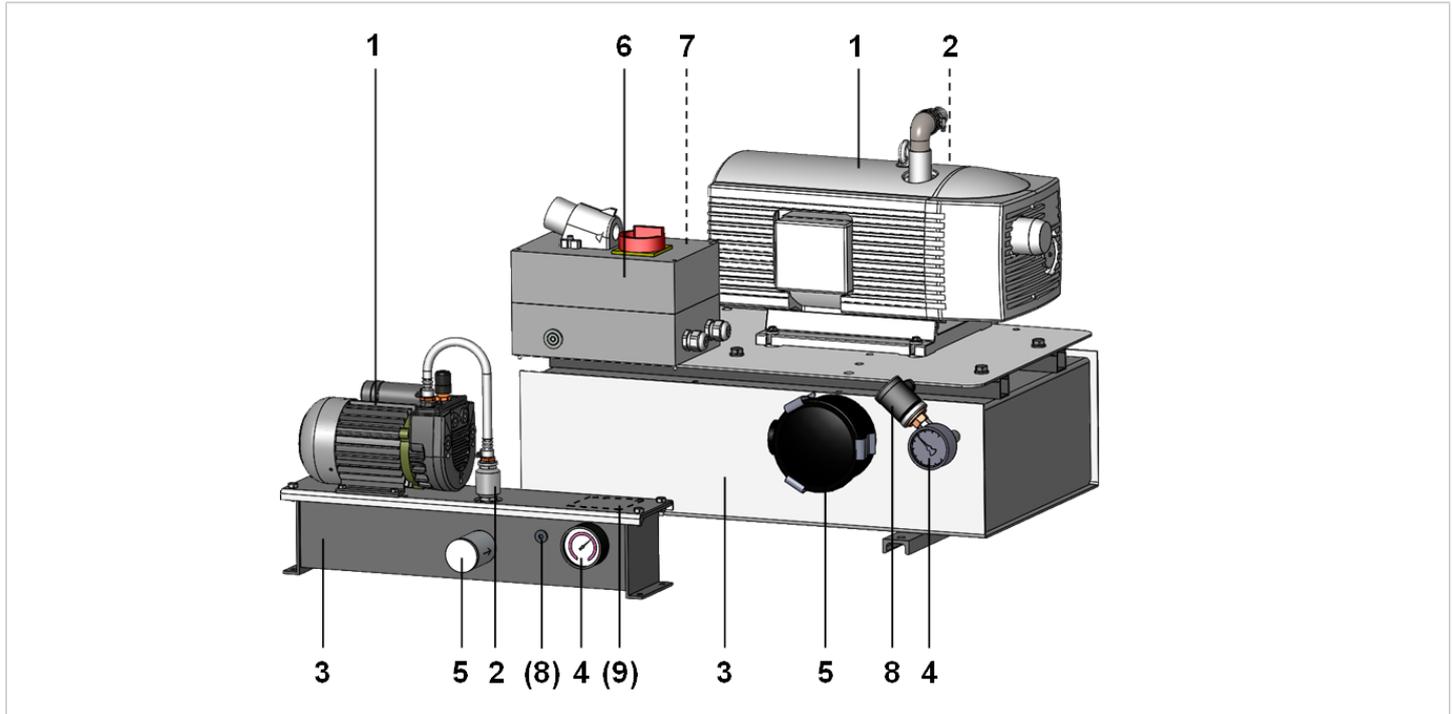
The vacuum unit supplies one or several vacuum suction cups. This means that it is possible that the load could fall during lifting or transport. The area below the gripper and the load is always considered a danger zone.

With regard to the operator's operating and maintenance personnel, note that the operator must:

- Instruct the personnel in relation to the safety equipment in the system (for example, protective barriers or sensor systems)
- Monitor compliance with the safety measures
- Prevent unauthorized persons (not operating and maintenance personnel) from entering the defined danger zone of the system.

3 Product Description

3.1 Design of the Vacuum Unit



1	Vacuum pump	2	Non-return valve (not VZ 63 – 165)
3	Vacuum reservoir	4	Gauge
5	Vacuum filter	6	Vacuum-controlled motor circuit with connection socket (optional)
7	Motor-protection switch	8	Vacuum switch (optional)
9	Terminal box for vacuum control (optional)	—	—

The items in **bold print** have safety functions.

3.2 Vacuum Pumps



NOTE

Current flow too high

Destruction of the pump motor due to overload

- ▶ Install a motor-protection switch upstream.

The vacuum pump generates the vacuum for the vacuum unit. The pump motor must be protected against overload by an upstream motor-protection switch.

For vacuum units equipped with a motor-protection switch or a vacuum-controlled motor circuit, the rated motor current is set at the factory.

3.3 Accessories for Motor-Protection Switch / Vacuum-Controlled Motor Circuit

The motor-protection switch serves as overload protection for the pump motor and as a mains switch. It is factory set to rated current depending on the operating voltage.

The vacuum control switches the vacuum pump on automatically via a vacuum switch and switches the device off again on reaching the maximum vacuum. As a result, the motor and pump do not run in continuous operation.

4 Technical Data

4.1 General Parameters

Type	Dry-running					
	VZ-TR-4 AC-5	VZ-TR-8 AC-5	VZ-TR-8 24V-DC 15 GMS	VZ-TR-10 AC3-15	VZ-TR-16 AC3-50	VZ-TR-25 AC/AC3-50
Capacity in l [liters]	5		15		50	
Pump type	EVE-TR 4	EVE-TR 8		EVE-TR 10	EVE-TR 16	EVE-TR 25
Suction rate in m ³ /hr	4	8		10	16	25
Voltage in V	230		24	400		230 / 400
Grid frequency in Hz	50					
Motor power in kW	0.2	0.35	0.5	0.37	0.55	0.80 / 0.75
Sound pressure level in dB	55	75	61	60	61	63

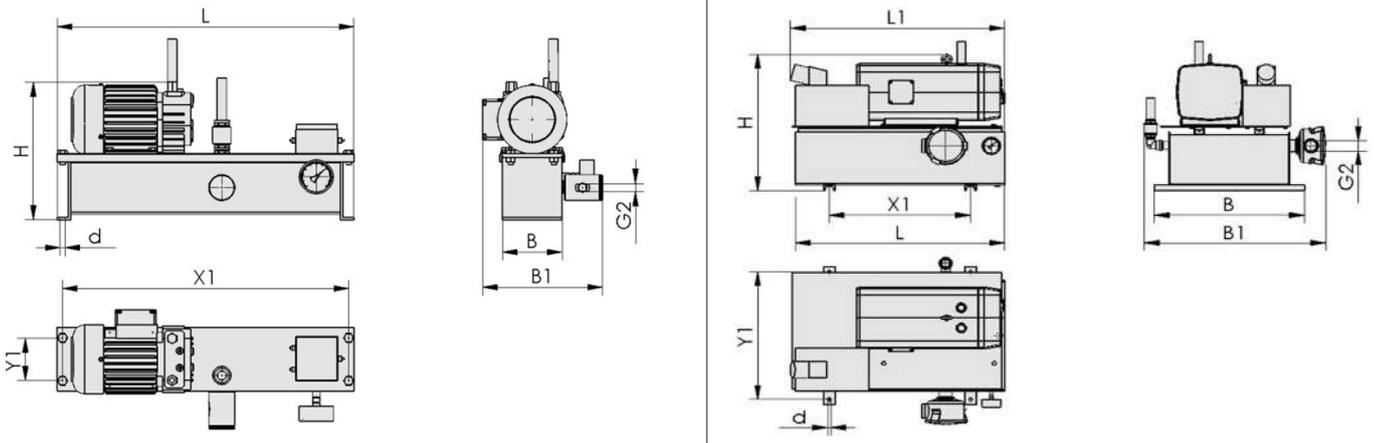
Type	Dry-running				
	VZ-TR-40 AC3-50	VZ-TR-80 AC3-100	VZ-TR-80 AC3-100 GMS	VZ-TR-80 AC3-100 MS	VZ-TR-250 AC3-200 GMS
Capacity in l [liters]	50	100			200
Pump type	EVE-TR 40	EVE-TR 80			EVE-TR 250
Suction rate in m ³ /hr	40	80			250
Voltage in V	400				
Grid frequency in Hz	50				
Motor power in kW	1.5	3			5.5
Sound pressure level in dB	67	72			77

Type	Oil-lubricated pumps		
	VZ-OG-63 AC3-100	VZ-OG-100 AC3-100	VZ-OG-165 AC3-200
Capacity in l [liters]	100		200
Pump type	EVE-OG 63	EVE-OG 100	EVE-OG 165
Suction rate in m ³ /hr	63	100	165
Voltage in V	400		
Grid frequency in Hz	50		
Motor power in kW	1.5	2.2	4.0
Sound pressure level in dB	65	67	70

4.2 Dimensions

VZ-TR-4-AC-5 ... VZ-TR-8-AC-5

VZ...10... – VZ...250...



Type	B	B1	d	G2	H	L	L1	X1	Y1
VZ-TR 4-5	120	224	9	G 3/8"	272	550	—	530	80
VZ-TR 8-5	120	224	9	G 3/8"	272	550	—	530	80
VZ-TR 10-15	400	490	11	G 3/4"	440	430	430	280	360
VZ-TR 16-50	510	624	11	G 1 1/4"	512	710	725	480	470
VZ-TR 25-50	510	630	11	G 1 1/4"	560	710	730	480	470
VZ-TR 40-50	510	630	11	G 1 1/4"	560	710	770	480	470
VZ-TR 80-...	610	720	11	G 1 1/4"	690	710	715	480	570
VZ-TR 80-...GMS	610	720	11	G 1 1/4"	690	710	715	480	570
VZ-TR 80-...MS	610	720	11	G 1 1/4"	690	710	715	480	570
VZ-TR 250-...GMS	710	1020	11	G 2 1/2"	964	1200	—	592	670
VZ-OG-63-100	610	740	11	G 1 1/4"	695	710	750	480	570
VZ-OG-100-100	610	740	11	G 1 1/4"	695	710	780	480	570
VZ-OG-165-200	710	1010	11	G 2 1/2"	930	910	1000	592	670

5 Checking the Delivery

The scope of delivery can be found in the order confirmation. The weights and dimensions are listed in the delivery notes.

1. Compare the entire delivery with the supplied delivery notes to make sure nothing is missing.
2. Damage caused by defective packaging or occurring in transit must be reported immediately to the carrier and J. Schmalz GmbH.

6 Installation

6.1 Installation Instructions



⚠ CAUTION

Improper installation or maintenance

Personal injury or damage to property

- ▶ Prior to installation and before maintenance work, the product must be disconnected from the power supply, depressurized (vented to the atmosphere) and secured against unauthorized restart.

For safe installation, the following instructions must be observed:

1. Use only the connections, mounting holes and attachment materials that have been provided.
2. Carry out mounting and removal only when the device is in an idle, depressurized state.
3. Pneumatic and electrical line connections must be securely connected and attached to the Vacuum unit.

6.2 Transport

The vacuum unit (VZ 10 – 165) can be transported or set up with the aid of a suitable lifting crane and suitable lifting slings (note the maximum lift capacity of the lifting device).

6.3 Installation Site



DANGER

Risk of fire and explosion due to components that are not explosion-proof

Serious injury or death!

- ▶ Do not use the product in environments where there is a risk of explosion!

The Vacuum unit must not be operated in rooms where there is a risk of explosion.

The ambient temperature must be between +5°C and +40°C. (Contact the manufacturer prior to operation if this range is to be exceeded).

Provide internal instructions and conduct checks to ensure that the area of the workplace is always clean and tidy.

6.4 Installation Procedure

- ▶ Screw the vacuum unit onto the installation site using fastening screws. To do so, use the mounting sockets or holes located on the reservoir.

Connecting the electrical supply line:

- Information about power and current consumption can be found on the type plate of the pump motor.
- For devices with a motor-protection switch, the electrical connection is established via the input terminals of the motor-protection switch, which is factory set to the rated current.
- ✓ For units without motor protection and without vacuum control, ensure that the pump is protected by an upstream circuit breaker set to the rated current.
- ✓ For devices with a three-phase A.C. motor and a vacuum-controlled motor circuit, the electrical connection is established via a 16 A CEKON plug.
- ▶ For devices with a three-phase A.C. motor: Connect cables to the power supply of the vacuum unit in accordance with VDE regulations. **This work may only be carried out by a qualified electrical specialist.**
- ▶ For devices with an alternating current A.C. motor: Plug the mains plug into the socket.

6.5 Checking the Oil Level

For oil-lubricated pumps, the oil level must be checked in the sight glass before the start of operations; see the pump operating instructions.

6.6 Checking the Direction of Rotation



DANGER

Electric shock from touching live components

Serious injury or death!

- ▶ Make sure that the electrical components are not live before installation, maintenance and troubleshooting.
- ▶ Switch off the mains switch and secure against unauthorized restart.



NOTE

Electric motor running in the wrong direction

Damage to the motor

- ▶ Reverse the rotational direction by reversing the polarity in the supply line.

For three-phase A.C. motors, check the direction of rotation of the motor as follows:

1. Switch on the vacuum pump.
2. Watch the motor's fan blade. It must rotate in the direction shown by the arrow on the motor housing.
3. The device is delivered with a clockwise rotation field. If the direction of rotation is incorrect, switch the unit off immediately and reverse the connection in the supply line.
4. Check the direction of rotation once again.



Damage or destruction of the motor resulting from operation with the incorrect rotational direction is not covered by the warranty.

6.7 Safety Feature

As a safety feature, the vacuum unit is equipped with a pressure gauge indicating a red danger range indicator.



Check the safety features at the start of every shift (if the unit is not operated continuously) or once a week (if operated continuously).

Checking the Vacuum Unit

1. Switch on the vacuum pump and wait until a vacuum has been established.
2. Switch off the vacuum unit and observe the pressure gauge. The vacuum should not drop by more than 100 mbar within 20 minutes.



Rectify faults before the device is put into operation. Should faults occur during operation, switch off the device and rectify the faults.

7 Starting Up the Device

Local applicable safety regulations must be observed.

The operator of the vacuum unit must take internal measures to ensure that:

- The users of the device are trained
- They have read and understood the operating instructions
- The operating instructions are accessible to them at all times

The responsibilities for the various tasks to be carried out on the device must be clearly specified and adhered to. The operating company must ensure that they have the appropriate qualifications and skills.

The following note is a supplement to local applicable safety regulations:

1. Regularly check the gauge.
 - ⇒ If the pressure gauge needle reaches the red area below -0.6 bar, there is a risk that the suction cups supplied by the vacuum unit can no longer safely hold the lifted load.
2. Check device for leaks.

For devices with a motor-protection switch, this also serves as a power switch for switching on and off.

For devices with a vacuum-controlled motor circuit, a main switch is mounted on the control. When the main switch is switched on, the vacuum generator is automatically switched on via a vacuum switch and switched off again when the maximum vacuum is reached.



DANGER

Falling objects due to insufficient vacuum supply to the system

Risk of severe injury or death as the lifted load is no longer safely held.

- ▶ Standing or sitting under the lifted load is prohibited!
- ▶ Complete the work step as safely as possible
- ▶ Shut down supply
- ▶ Check device for leaks

8 Maintenance and Cleaning

8.1 Vacuum Pumps

See the vacuum pump operating instructions

8.2 Filter



NOTE

When removing the filter cartridge, dust gets into the lines.

Damage to the vacuum generator

- ▶ When removing the filter cartridge, ensure that no dust enters the lines.
- ▶ Do not knock out the filter cartridge.

Check the filters at least once a week or in the event of dust accumulation, and blow the filter cartridge clear (from the inside to the outside).

Replace the filter cartridge if it is very dirty.

8.3 Setting the Vacuum-Controlled Motor Circuit

The control is equipped with a vacuum switch, which causes the engine to switch off when the maximum vacuum is reached. If the vacuum in the reservoir drops by approx. 100 – 150 mbar, the pump motor is switched on again.



WARNING

Electric shock from touching live components

Electric shock, serious injuries

- ▶ The vacuum switch may only be adjusted by trained specialists.
- ▶ Before working on the vacuum switch, make sure that it is disconnected from the power supply, depressurized and cooled.

Important note:

The vacuum unit is adjusted to a specific pressure via the vacuum switch in the manufacturer's factory in accordance with the stamped reference number (= upper switching pressure) with aligned spring sets. If the setting is adjusted by the user, the warranty is no longer valid.



NOTE

Adjustment screw too far in or out!

Damage to the vacuum switch

- ▶ In the event of faults, contact Schmalz Service.
- ▶ Do not alter the adjusting screws.

If the vacuum switch malfunctions, contact Schmalz Service.

9 Troubleshooting

This unit should only be installed and maintained by qualified specialist personnel. Check the safety features after repair or maintenance work is performed.

Fault	Possible cause	Solution
Vacuum pump does not start.	Electrical connection incorrect or faulty	▶ Check and adjust electrical connection.
	For versions with a motor-protection switch: Motor-protection switch triggered	1. Check whether the motor is overloaded or defective. 2. Clean the dust filter 3. Let the motor cool down 4. If necessary, adjust current of motor-protection switch 5. Switch on the motor-protection switch
	With a three-phase A.C. motor: Voltage only on two phases	▶ Check connection and fuses.
	Check connection and fuses.	▶ Check the power supply line.
Pump runs, but vacuum does not reach -0.6 bar.	With a three-phase A.C. motor: Motor's direction of rotation reversed	▶ Reverse polarity of connection line.
	Filter cover leaking	▶ Check the filter cover for leaks.
	Blind plug leaking at the reservoir	▶ Tighten blind plug, replace sealing ring.
	Screw unions not tight	▶ Check screw unions, retighten and, if necessary, replace sealing rings.
Control does not function as expected	Faulty vacuum switch	▶ Contact Schmalz Service
	Switching point not set correctly	▶ Contact Schmalz Service

10 Warranty

This system is guaranteed in accordance with our general terms of trade and delivery. The same applies to spare parts, provided that these are original parts supplied by us.

We are not liable for any damage resulting from the use of non-original spare parts or accessories.

The exclusive use of original spare parts is a prerequisite for the proper functioning of the system and for the validity of the warranty.

Wearing parts are not covered by the warranty.

11 Spare and Wearing Parts

Designation	VZ-TR-4-...	VZ-TR-8-...	VZ-TR-10...	VZ-TR-16-...	VZ-TR-25-...
Spare parts					
Non-return valve RSV	10.05.05.00002		10.05.05.00003	10.05.05.00004	
Vacuum switch	10.06.02.00269				
Vacuum gauge VAM	10.07.02.00003				
Wearing parts					
Wearing parts set for the pump (7x slides, 1x filter cartridge)	10.03.01.00108	10.03.01.00109	10.03.01.00132	10.03.01.00133	10.03.01.00134
Replacement filter cartridge	10.07.01.00014		10.07.01.00017	10.07.01.00018	

Designation	VZ-TR-40-...	VZ-TR-80-...	VZ-TR-250-...
Spare parts			
Non-return valve RSV	10.05.05.00004	10.05.05.00006	10.05.05.00008
Vacuum switch	10.06.02.00269		
Vacuum gauge VAM	10.07.02.00003		
Wearing parts			
Wearing parts set for the pump (7x slides, 1x filter cartridge)	10.03.01.00135	22.09.01.00031	22.09.01.00163
Replacement filter cartridge for pump EVE	—		10.03.01.00188
Replacement filter cartridge for dust filter STF	10.07.01.00018		10.07.01.00020

Designation	VZ-OG-63-...	VZ-OG-100-...	VZ-OG-165-...
Spare parts			
Vacuum gauge VAM	10.07.02.00003		
Vacuum switch	10.06.02.00269		
Wearing parts			
Replacement oil filter cartridge	10.03.02.00009		10.03.02.00011
Replacement air filter cartridge	10.03.02.00012		10.03.02.00013
Replacement filter cartridge for dust filter STF	10.07.01.00018		10.07.01.00020

12 Disposing of the Product

Recover the disassembled parts for recycling or reuse (provided no agreement on return or disposal has been made).

1. Dispose of the product properly after replacement or decommissioning.
2. Observe the country-specific guidelines and legal obligations for waste prevention and disposal.

13 EU Declaration of Conformity

EU Declaration of Conformity

The manufacturer Schmalz confirms that the vacuum unit VZ product described in these operating instructions fulfills the following applicable EU directives:

2006/42/EC	Machinery Directive
2014/30/EU	Electromagnetic Compatibility
2011/65/EU	RoHS Directive

The following harmonized standards were applied:

EN ISO 12100	Safety of machinery — General principles for design — Risk assessment and risk reduction
EN ISO 2151	Acoustics - Noise test code for compressors and vacuum pumps - Engineering method (grade 2)
EN 60204-1+A1+AC	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
EN 60204-1, 32	Safety of machinery – Electrical equipment of machines
EN 61000-6-2+AC	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
EN 61000-6-3+A1+AC	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments
EN IEC 63000	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances



The EU Declaration of Conformity valid at the time of product delivery is delivered with product or made available online. The standards and directives cited here reflect the status at the time of publication of the operating and assembly instructions.

14 UKCA Conformity

Declaration of Conformity (UKCA)

The manufacturer Schmalz confirms that the product described in these operating instructions fulfills the following applicable UK regulations:

2008	Supply of Machinery (Safety) Regulations
2016	Electromagnetic Compatibility Regulations
2016	Electrical Equipment (Safety) Regulations

The following designated standards were applied:

EN ISO 12100	Safety of machinery — General principles for design — Risk assessment and risk reduction
EN ISO 2151	Acoustics - Noise test code for compressors and vacuum pumps - Engineering method (grade 2)
EN 60204-1+A1+AC	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
EN 60204-1, 32	Safety of machinery – Electrical equipment of machines
EN 61000-6-2+AC	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
EN 61000-6-3+A1+AC	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments
EN IEC 63000	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances



The Declaration of Conformity (UKCA) valid at the time of product delivery is delivered with the product or made available online. The standards and directives cited here reflect the status at the time of publication of the operating and assembly instructions.