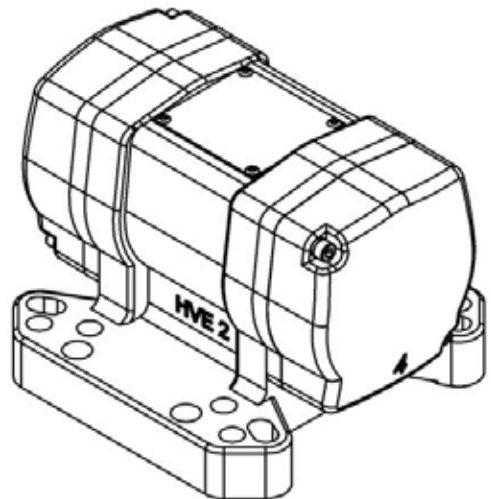
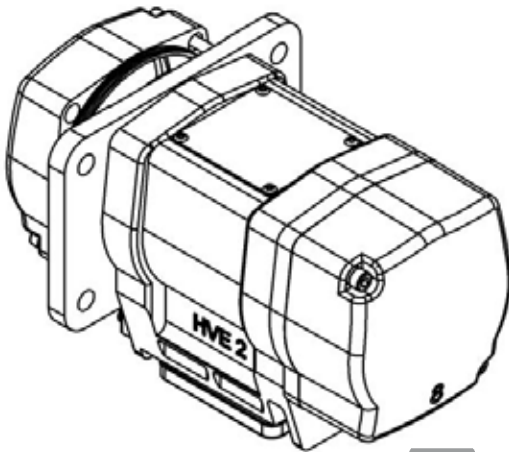


Installation and Operating Instructions

Electric Vibrators HVE/VFLE Series



Translation of the Original Instruction Manual



II 2G Ex e II T3
II 2D Ex tD A21 IP65 T120°C

Würges Vibrationsmotoren GmbH

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Contents

1. General Information	Page 3
2. Symbols Used	Page 4
3. Safety	Page 5
3.1. Intended use	
3.2. Skilled personnel qualifications	
3.3. General safety instructions	
4. Technical Data	Page 7
4.1. Type designation	
4.2. Nameplates	
4.3. Design and function	
5. Transport and Storage	Page 9
6. Installation and Startup	Page 10
6.1. Assembly/Installation	
6.2. Electrical connection	
6.3. Temperature monitoring	
7. Centrifugal Force Setting	Page 13
8. Servicing and Maintenance	Page 15
9. Spare Parts	Page 16
10. Disposal and Recycling	Page 19
11. Warranty	Page 19
Appendix	Page 20
• EU Declaration of Conformity	

1. General Information

Würges electric vibrators HVE/VFLE are designed and built to state-of-the-art standards and operate safely if used as intended.

They conform to Category 2 for explosion hazardous areas of Dust Zone 21/22 and Gas Zone 1/2.

The provisions of EN 61241-1-2 have to be heeded, e.g. pertaining to temperatures and dust accumulations.

The Operating Instructions have to be read and understood by every person at the user's company who is assigned with assembly, setting up, start up, the maintenance and repair of vibration motors. This also applies for additional instructions in case of modified devices.



The instruction manual must be read carefully and in full before using the vibrator motors.

2. Symbols Used

The following information and hazard symbols are used in these installation and operating instructions:



ATTENTION

Important information regarding operations or procedures to which particular attention is to be paid.



EXPLOSION HAZARD

Refers to the possibility of fatal, severe or irreversible injuries caused by use of the product in an explosive atmosphere.



HAZARD

Refers to the possibility of fatal, severe or irreversible injuries caused by live parts.



WARNING

Refers to the possibility of fatal, severe or irreversible injuries caused by general hazards.



HOT SURFACE

Refers to the possibility of severe or irreversible injuries caused by touching hot surfaces.



DISCONNECT
MOTOR FROM MAINS

Refers to the fact that the motor must be disconnected from the electricity mains and secured against being switched back on again before any work is carried out on the motor.



ENVIRONMENTALLY
COMPATIBLE DISPOSAL

Refers to the obligation to ensure environmentally compatible disposal.

3. Safety

3.1. Intended use

Electric vibrators are not independently functioning machines. They are used as the drives of vibrating machines such as vibratory conveyor troughs, conveyor pipes, screening machines, grading/sorting machines and knock-out grids.

These machines use vibrations to screen, convey, remove, compact and sort or grade. Any other use is deemed to be not as intended or misuse.

Electric vibrators are designed to generate forces that can be destructive.

The vibrating machine must be designed for the forces generated by the electric vibrators.

The operator shall bear responsibility for the operation of vibration motors in explosion hazardous areas.

3.2. Skilled personnel qualifications

The installation/assembly, startup and maintenance may only be carried out by authorised and qualified skilled personnel.

3.3. General safety instructions



Electric vibrators generate vibrations. The owner of vibration machines must protect their employees against actual or possible risks to their health and safety caused by the effect of vibrations.



Würges Vibrationsmotoren GmbH refuses to accept the responsibility for any damage to property or personal injuries if technical changes have been made to the product or the instructions and regulations in this instruction manual have not been noted and followed.



Live parts can cause severe or fatal injuries.



Electric vibrators must be safely disconnected from the electricity mains before any work is carried out on them. The required procedure is as follows:



1. Switch off vibrator motor
2. Secure against being switched back on again
3. Test for safe disconnection from the power supply
4. Allow the vibrator motor to cool



Do not touch the vibrator motors while they are running or soon after switching them off. The surface temperature of the vibrator motors can reach such high values during operation that there is a risk of burns.



Always use a torque wrench when tightening screws or bolts! Tightening torques see page 10. Attention to maximum tightening torques on page 14.

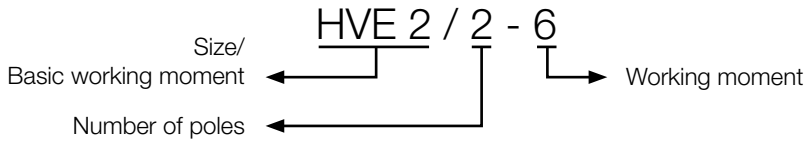


Vibrator motors of the HVE/VFLE series may be deployed in the explosion hazardous areas 1/2 and 21/22.

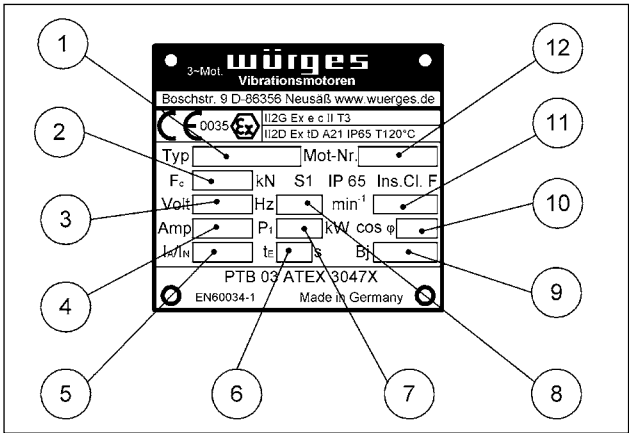
The permissible ambient temperature must be between -20°C and $+40^{\circ}\text{C}$.

4. Technical Data

4.1. Type designation



4.2. Nameplate



- 1 Type designation
- 2 Centrifugal force
- 3 Mains voltage
- 4 Nominal current
- 5 Starting current/nominal current ratio
- 6 Heating time
- 7 Power input
- 8 Mains frequency
- 9 Year built
- 10 Power factor cos φ
- 11 Speed
- 12 Serial number

Possible voltage variants:

Motor type	Hz	V
HVE/VFLE 2/2	50	42 – 550
HVE/VFLE 2/2	60	42 – 550
HVE/VFLE 2/4	50	42 – 400
HVE/VFLE 2/4	60	42 – 440

4.3 Design and function

The electric drive of the HVE model range is an asynchronous motor.

The stator in the HVE 2 and VFLE 2 sizes was cast under vacuum thus forming a fixed assembly with the housing. There are unbalanced eccentric discs on the motor shaft ends.

The unbalance is a rotating body whose mass is unequally distributed in its rotational symmetry, and so causes a vibration as it turns. This vibration can be dosed via weights and counterweights.

Please see the data sheet of the motor for additional technical specifications, or our catalogue.

5. Transport and Storage

When they are delivered the motors must be checked for visible transport damage!



If the motor is visibly damaged it must not be started up. The vibratory motor must be examined and if necessary returned to the manufacturer for repair.

Until they are installed the electric vibrators should be stored in enclosed, dry rooms at a max. ambient temperature of 40 °C.

Vibrator motors must always be stood on their bases or footings!

Do not stack vibrator motors!



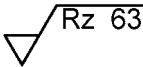
Do not lift up the motor by its installed connection cable.

Note and follow the local accident prevention regulations.

6. Installation and Startup

6.1. Assembly/Installation

Electric vibrators can be installed in any installation position. Vibrator motors may only be built on to machines with flat, oil, grease and paint-free and flexurally rigid mounting surfaces.

Surface quality 

Only bolts in quality class 8.8 > EN ISO 4014 (DIN 931); EN ISO 4017 (DIN 933) and nuts in quality class 6 > 8.8 EN ISO 4032 (DIN 934) may be used.

The bolts must be secured against mechanical loosening by means of spring lock washers DIN 127 Form A, DIN 7980 or Schnorr washers.



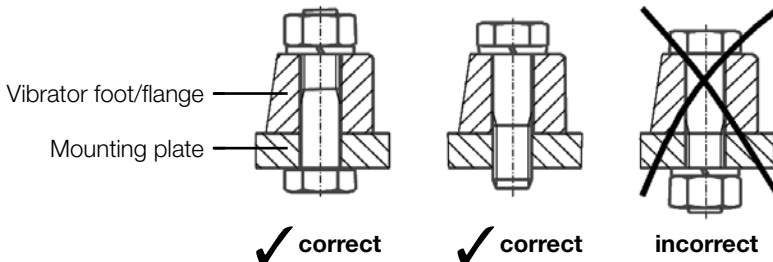
The fixing bolts must be checked for secure fit after approx. two operating hours and if necessary retightened. Other checks should be carried out daily!



Improper fixing results in the breakage of the feet of the vibratory motor.

Minimum tightening torques

M 5	M 8	M 10	M 12
8 Nm	30 Nm	55 Nm	90 Nm



6.2. Electrical connection



Electric vibrators must be safely disconnected from the electricity mains before work is carried out on them. The required procedure is as follows:



1. Switch off vibrator motor and secure against being switched back on again
2. Check for safe isolation from supply
3. Allow the motor to cool



The electric connection may only be carried out by an electrician or electrically instructed person acc. to EN-60204-1.

The mains voltage and frequency must correspond to the data on the type plate. Device may only be connected to an electrical power system that corresponds to the VDE regulations. HVE 2/VFLE 2 equipment is factory-equipped with flexible cable.

Use only cable type **OELFLEX FD robust C 4G1,5²** or **H07 RN-F 4G1,5²**.

Use a conductor with a cross section of $4 \text{ mm}^2 \leq A \leq 6 \text{ mm}^2$ to connect the external equipotential equalisation.

The motor connection line has to be securely fastened approx. 0.5 m after leaving the motor. The first line attachment point and the motor shall not be moveable against each other. The connecting cable has to be laid in such a way that natural vibrations are being avoided and there will be no tensile load.

Check the current input when the motor is operated for the first time. It should be greater than the value stated on the type plate, remedy the situation by decreasing the centrifugal force (see Chapter 7).

Check the line for chafe marks from time to time and eliminate the cause for this where applicable.

If two counter-rotating motors are installed, it is necessary to ensure that if one motor fails, both motors are switched off.



Speed control

Speed control using frequency converters is prohibited!

6.3. Temperature monitoring

The permitted ambient temperature range is from -20°C to $+40^{\circ}\text{C}$. Even when affected by an external source of heat or cold, the temperature must not fall below or rise beyond those limits.

To protect against inadmissible temperature rise in overload conditions, a protective device must be installed with current-controlled, delayed breaking capacity. The installed controlling and breaking device must be adjusted to the nominal current of the motor.

If the motor is used in potentially explosive gas zones, the controlling and breaking device must be certified in compliance with Directive 2014/34/EU and the marking must include the symbol II(2)G. If the motor is used in potentially explosive dust zones, the marking must include the symbol II(2)D. In addition, such

protective device must be chosen so that the motor is provided with thermal protection on the occurrence of a short circuit, with the rotor being locked. This requirement is regarded as being fulfilled, if the breaking time is less than the permitted temperature rise time appropriate to the Temperature Class. The motors must only be used for continuous operation (S1) and only for normal starting duties, with the latter occurring only infrequently and during which there is no significant temperature rise.

Should the specified current be exceeded, the speed indicated on the marking plate is probably not reached. A possible cause for that can be too high a force for the application or a construction which is insufficiently resistant to bending. By reducing the centrifugal force it can be corrected.

7. Centrifugal Force Setting



Crushing hazard when setting the centrifugal force. Ensure that the armature is fixed. Note and follow the safety instructions on page 6!

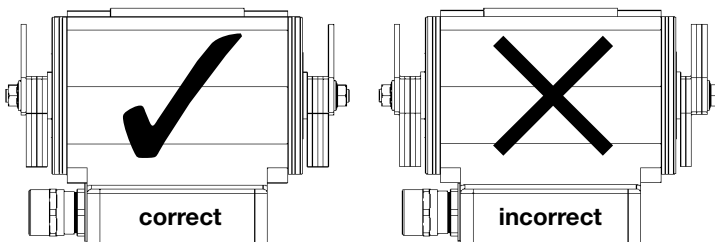
If no special centrifugal force setting has been ordered, the motor is set to maximum centrifugal force in the factory.

The centrifugal force has a direct effect on the vibration amplitude of the machine and the power input of the motor.

To adjust the centrifugal force, dismantle both protective covers and undo the unbalance fixing.

With HVE 2 and VFLE 2 motors the centrifugal force is adjusted in steps by means of push-on unbalance plates.

The centrifugal force is reduced by turning the unbalance plates through 180° at both ends.



The number of plates changed rotated through 180° must be the same at both ends of the shaft, i. e. they must be symmetrical (see Fig.). The unbalance plates can also be removed for fine adjustment, they must then be replaced by spacer discs.

Centrifugal force adjustment by means of push-on unbalance plates

The centrifugal force of the motor reduces as follows if the push-on unbalance plates are rotated through 180° or removed:

Speed **2-pole**, 3000 min⁻¹

Motor	Centrifugal force	
	rotated through 180°	removed
HVE/VFLE 2/2	220 N	110 N

Speed **4-pole**, 1500 min⁻¹

Motor	Centrifugal force	
	rotated through 180°	removed
HVE/VFLE 2/4	55 N	27,5 N

Maximum tightening torque of screw at the shaft end

M 8
15 Nm



After the centrifugal force has been adjusted the loosened bolts and nuts must be retightened and the protective covers must be refitted (see page 10 for tightening torques). Otherwise there is a risk of accidents! To ensure watertightness ensure that the seals are intact when dismantling and installing the protective covers. Damaged seals must be replaced.



Never operate motors without unbalance plates. This causes damage to the bearings.



Running the motors without the protective covers is forbidden!

8. Servicing and Maintenance



The electric vibrators must always be disconnected from the electricity mains before any work is carried out on it!



1. Switch off vibrator motor
2. Secure against being switched back on again
3. Test for safe disconnection from the power supply



4. Allow the vibratory motor to cool

Maintenance work to be carried out regularly

- The surfaces of the motors must be kept free from dirt in order to ensure adequate cooling.
- Check the connection cable for chafe marks and if applicable remove whatever is causing them.
- Check fixing bolts for secure fit and if necessary retighten.
- Check the seals.



The fixing bolts must be retightened after approx. two operating hours (following startup). Other checks should be carried out daily.

Lubrication

The bearings of the vibrating motors of the HVE series are lubricated for life. Maintenance of the bearings for this equipment is not required.

The theoretical bearing life is:

Motor type	f = 50 Hz	f = 60 Hz
HVE/VFLE 2/2-6	7500 h	5500 h
HVE/VFLE 2/2-4	30000 h	20000 h
HVE/VFLE 2/2-2	65000 h	65000 h
HVE/VFLE 2/4	150000 h	150000 h

If there are any signs of wear or when the theoretical bearing life is being reached, the equipment should immediately be removed from operation and the special bearings replaced.

In this case, we recommend the equipment to be sent to the manufacturer for repair (or with any other damage). It is the only way to ensure professional repair.

9. Spare Parts

To order spare parts, please refer to the spare parts list of the respective motor (see drawings on pages 17/18).

Please always give the following information with each order for spare parts:

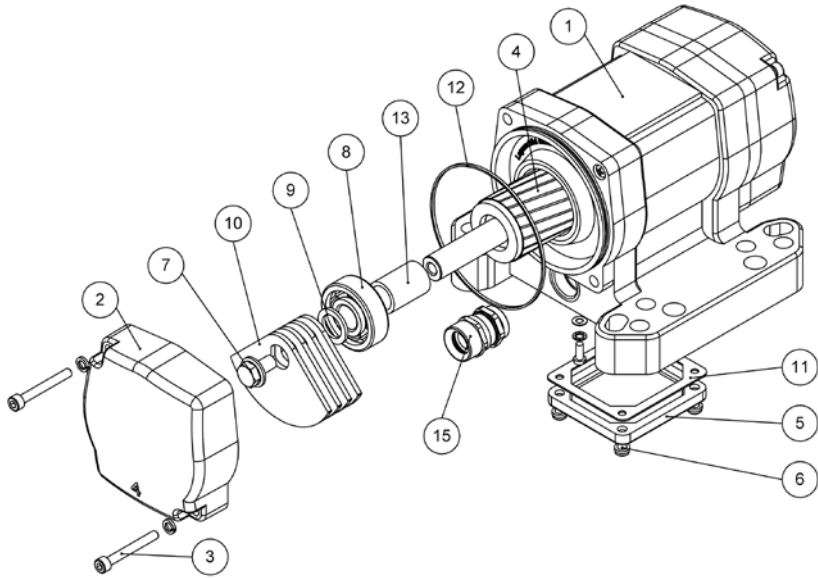
- Motor type
- Motor number
- Description, item and position number of the part
- Required quantity

For further information, please refer to the exploded views given in the spare parts list.

We only provide warranty for the original spare parts supplied by us.

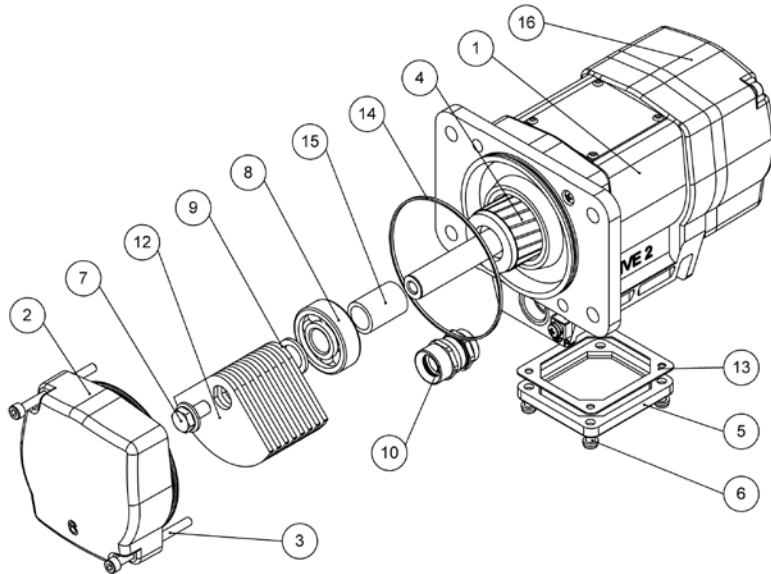
We expressly point out that spare parts and accessories that are not original parts supplied by us have not been tested and approved by us. Installing and/or using such products can therefore cause negative changes to the specified design properties and therefore impair active and/or passive safety.

Würges does not accept any liability whatsoever or provide any warranty for damage caused by the use of non-original spare parts and accessories.



Spare parts list HVE 2

Pos.	Nomenclature	Ord.-No.	Pieces							
			HVE 2/2	HVE 2/2-2	HVE 2/2-4	HVE 2/2-6	HVE 2/4	HVE 2/4-4	HVE 2/4-6	HVE 2/4-9
1	Housing complete HVE 2/2	–	1	1	1	1	–	–	–	–
1	Housing complete HVE 2/4	–	–	–	–	–	1	1	1	1
2	Protective cap HVE	–	2	2	2	2	2	2	2	2
3	Screw for protective cap	–	4	4	4	4	4	4	4	4
4	Armature	–	1	1	1	1	1	1	1	1
5	Terminal box lid	00401	1	1	1	1	1	1	1	1
6	Screw for terminal box lid	21301	4	4	4	4	4	4	4	4
7	Anchor securing screw	22551	2	2	2	2	2	2	2	2
8	Bearing	24301	2	2	2	2	2	2	2	2
9	Washer	27001	2	2	2	2	2	2	2	2
10	Flyweight	75311	8	12	16	26	8	16	26	40
11	Terminal box seal	75801	1	1	1	1	1	1	1	1
12	O-ring	75911	2	2	2	2	2	2	2	2
13	Spacer tube	76401	2	2	2	2	2	2	2	2
	Cable	–	2 m	2 m	2 m	2 m	2 m	2 m	2 m	2 m
15	ATEX cable gland	29711	1	1	1	1	1	1	1	1



Spare parts list VFLE 2

Pos.	Nomenclature	Ord.-No.	Pieces					
			VFLE	VFLE	VFLE	VFLE	VFLE	VFLE
			2/2	2/2-2	2/2-4	2/4	2/4-2	2/4-4
1	Housing complete VFLE 2/2	–	1	1	1	1	1	1
1	Housing complete VFLE 2/4	–	1	1	1	1	1	1
2	Protective cap VFLE	–	2	2	2	2	2	2
3	Screw for protective cap	–	4	4	4	4	4	4
4	Armature	–	1	1	1	1	1	1
5	Terminal box lid	00401	1	1	1	1	1	1
6	Screw for terminal box lid	21301	4	4	4	4	4	4
7	Anchor securing screw	22551	2	2	2	2	2	2
8	Bearing	24301	2	2	2	2	2	2
9	Washer	27001	2	2	2	2	2	2
10	ATEX cable gland	29711	1	1	1	1	1	1
	Cable	–	2 m	2 m	2 m	2 m	2 m	2 m
12	Flyweight	75311	8	12	16	8	12	16
13	Therminal box seal	75801	1	1	1	1	1	1
14	O-ring	75911	2	2	2	2	2	2
15	Spacer tube	76401	2	2	2	2	2	2
16	Protective cap HVE	–	1	1	1	1	1	1

10. Disposal and Recycling

Packaging materials and motor components must be disposed of in an environmentally compatible way.

Steel:

Unbalance plates, armature and rotor, bolts, nuts and bearing

Aluminium:

Housing, protective covers, terminal box cover and nameplate

PE:

Seals/gaskets

Copper and synthetic resin:

Winding



You can return the motors to us for proper disposal! They must be delivered to us carriage paid.

11. Warranty

Würges provides warranty for 1 year, beginning with delivery, for all new vibrating motors. Warranty expires when:

- the motor is connected wrong, or connected with wrong voltage,
- the motor fails because of missing or wrong electric protection,
- there were changes made to the motor,
- the motor was damaged during transport,
- the motor was not installed as shown in chapter 6,
- the motor was connected with wrong cable,
- there is misuse/not intended use,
- the instructions of the manual are not followed.

EU Declaration of Conformity

The manufacturer

Würges Vibrationsmotoren GmbH, Boschstr. 9, 86356 Neusäß hereby declares:

The explosion-proof electric vibrator motors of the series

HVE / VFLE

are conform with the following directives:

2014/34/EU (ATEX)

2014/30/EU (EMC)

2011/65/EU (RoHS)

Following harmonised standards were applied:

EN ISO 12100 / 2011*

EN 60079-7 / 2007*

EN 60034-1 / 2015*

EN 61241-0 / 2007

EN 61000-6-2 / 2011

EN 61241-1 / 2005

EN 61000-6-4 / 2011

EN 60079-0 / 2007*

(The standard mentioned in the EC-type Examination Certificate PTB 03 ATEX 3047 has already been replaced by this later issue. The Manufacturer declares compliance for the product also being in line with the requirements of the current issue of the standard since the changed requirements of the new issue of the standard are not relevant for this product.)

Following notified bodies have been involved:

TÜV Rheinland

Nr. 0035 (QS-System Test)

PTB Braunschweig

Nr. 0102 (Prototype Text)

Commissioning is prohibited until it has been determined that the machine(s) stated overleaf into which the incomplete machine(s) will be installed conform to the provisions of the Machine Directive.

Neusäß, 31.10.2019

Würges Vibrationsmotoren GmbH



Dipl.-Ing.(FH)

Philipp Würiges

Managing Director

Notes

Notes

Notes

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