

Vibration motors

HVE 9



II 2GD EEx e II T4

Instructions of operation

and

List of Spares



Important remarks concerning the personal safety of operators



These instructions must be understood by each operator, who is in charge of the assembly, putting into operation, maintenance and repair work of vibration motors.

Our vibration motors have been manufactured in accordance with the latest art. In case of use as provided, they are sure to operate.

Unauthorized changes with the motors and specific execution for the client are excluded from the manufactures` guarantee for resulting damage.

Vibration motors generate destructive forces due to their design. They can become a source of great danger, if used in a way they are not intended for. They may, for instance, tumble to the ground in an uncontrolled manner, if not fastened properly. Thus it is recommended that suitable safety measures are put in place.

When performing maintenance or repair work, the vibration motor must be disconnected from the power supply. Putting vibration motors into operation without protective covers is forbidden, because risk of accident may result.

The operator is responsible for the correct, intended use in environments which are potentially explosive. Please contact the manufacturer if further clarification is needed.

The HVE 9 series motors are designed in EEx e and are among the machine group II, i.e. increased safety. They satisfy the requirements of the T4 temperature class and have a maximum surface temperature T of 120°C.

They satisfy the requirements of category 2 for the areas in danger of explosion of dust zones 21 and 22 (EN 50281-1-1), and of gas zones 1 and 2. The regulations of the standard EN 50281-1-2, concerning, for instance, temperatures and dust deposits have to be observed.

Instructions for mounting vibration motors

General

Vibration motors must be mounted only on equipment with plane surfaces, which are resistant to bending. These surfaces must not be exposed to tensional stress.

Only screws of grade 8.8 and nuts of grade 6 must be used. The screws must be secured from slackening, eg. by spring washers or the like.

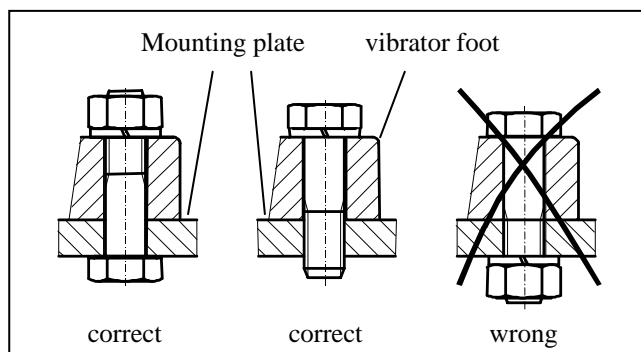
Posterior tightening of screws and nuts

After the first two hours of operation the screws or nuts must be checked for tight seating. Subsequent inspections shall be performed once daily. In case of necessity the screws or nuts must be retightened.

The minimum torques are for: M16 = 150 Nm



If the screws have slackened, danger of breakage for the feet of the feet of the vibrator is impending.



## Instructions for establishing the power connection



**Dangerous Voltage!**  
Non-compliance can cause death, serious bodily injury or property damage.

### The power connection

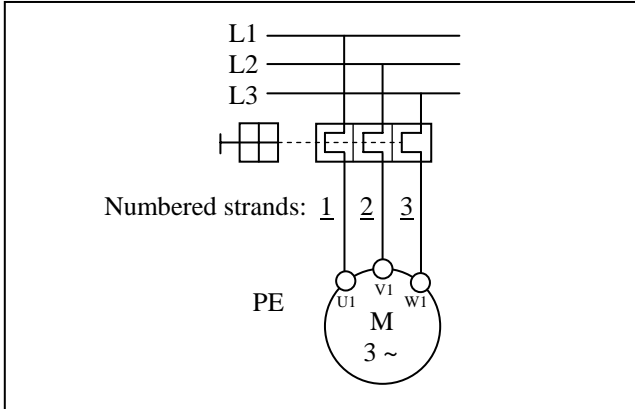
HVE 9 machines are equipped with flexible cable in the factory. Only the cable type Lapptherm 105 FD+C 4G 1.5 may be used.

Please note concerning subsequent installation or repair work:

1. The power cable must be fastened firmly shortly behind the cable gland. This first fastening of the cable and the motor should by no means be movable against each other. The cable has to be installed in such a way that it does not start vibrating itself and that it is not subject to any tractional forces.
2. The motor is to be connected according to the connection diagram on the left.
3. When putting the vibration motor into operation the power input must be examined. Should this be larger than the value given on the machine plate, the trouble can be remedied by reducing the centrifugal force.
4. The cable must be checked at regular intervals with regard to chafe marks.



In case the free end of the cable is going to be connected within an Ex zone, a terminal box has to be used which meets the respective requirements.



### General

The power connection must be established only by an electrician. The voltage and frequency must be that, which is indicated on the machine plate. The vibration motor must be connected only to a power supply which is in agreement with the VDE regulations.

Speed control by means of conventional electronic frequency converters is not allowed.

To secure the motor from overload, it must be connected in series with a terminal circuit breaker, the nominal current of which must be set to the value given on the machine plate. The motor protection device has to trip within the time  $t_E$ .

## Admissible operating temperature

The motors are intended for use at an ambient temperature ranging from  $-20^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$ .

Every motor must be protected against overload by a thermal circuit breaker, operating on the basis of delayed release, depending on the current.

The thermal circuit breaker must be set at the nominal current of the motor. Furthermore, a circuit breaker must be chosen, which, in case of a short circuit (ie. when the rotor is stalled), provides for the motor being protected thermally. This requirement is met, if the time of release does not exceed the admissible time of warming of the corresponding temperature class.

Operating mode of the motors must only be continuous (S1). They cannot thus be used for applications which are marked by frequently recurring start-ups of the motor, which would lead to substantial warming of the motor.

In case the motor draws too much current, it may be the case that the motor does not reach its rated speed. This can lead to the burning of the winding. A possible cause for that might be a centrifugal force which is too high for the application or the complete system might not be resistant enough to bending. This can be remedied by reducing the centrifugal force.



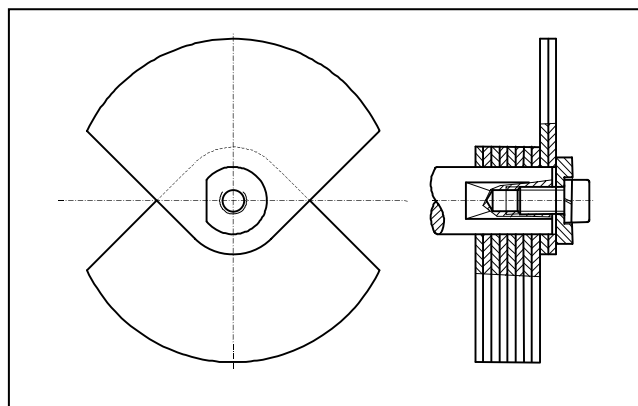
## Setting the centrifugal force

Provided that no different centrifugal force had been indicated in the order sheet, the motor has been set for the full centrifugal force. In order to be able to change the centrifugal force both protective covers must be taken off. Once the protective covers are taken off, the centrifugal force may be changed as desired. But it must be observed that the adjustment is the same on both sides.

This is achieved by removing the screws or nuts from the armature on both sides and by transposing the flywheels by 180°. With this the centrifugal force is reduced by twice the value of the transposed flywheels. But in this case, the removed flywheels must be replaced by spacers. (Please compare the corresponding list of spares).

One flywheel on each side generates the following centrifugal forces, depending on the type of motor and speed:

$$\begin{aligned} \text{Speed with 2 poles} &= 3000 \text{ min}^{-1} \quad \underline{\text{HVE 9/2} = 75 \text{ daN}} \\ \text{Speed with 4 poles} &= 1500 \text{ min}^{-1} \quad \underline{\text{HVE 9/4} = 18,75 \text{ daN}} \end{aligned}$$



After the adjustment, loosened screws must be tightened again and removed protective covers must be mounted again. If this is not observed, risk of accidents is impending.

## Maintenance

Motors surfaces must be kept free from accumulations of dirt in order to make sure sufficient cooling. Now and again, the connection cable must be checked for abrasions. After the first two hours of operation the lock screws must be retightened. Subsequent inspections for tight seating of the screws shall be performed once a day. The bearings of our motors need no maintenance in normal cases. These bearings have a grease filling for life.

In case of wear of the bearing, the motors shall be taken out of service and the special bearings shall be replaced. For that, as well as for other defects, the motors are to be returned to the manufacturer.

Only when doing so you may be sure to get motors repaired properly.



Never make the motors run without flywheels, because in such cases the bearings could be destroyed.

## Spares

When placing orders for spares, please refer to the list of spares and the drawings of spares.

Warranty is granted only if original spare parts are used.

We would like to point out that spare parts, which are not supplied by us, are not approved by us. Using parts from other manufacturers can impair predetermined qualities which are inherent in the construction and thereby influence

negatively the active or passive safety features of the motors. We reject any claim whatsoever, resulting from the use of spare parts supplied by other manufacturers.

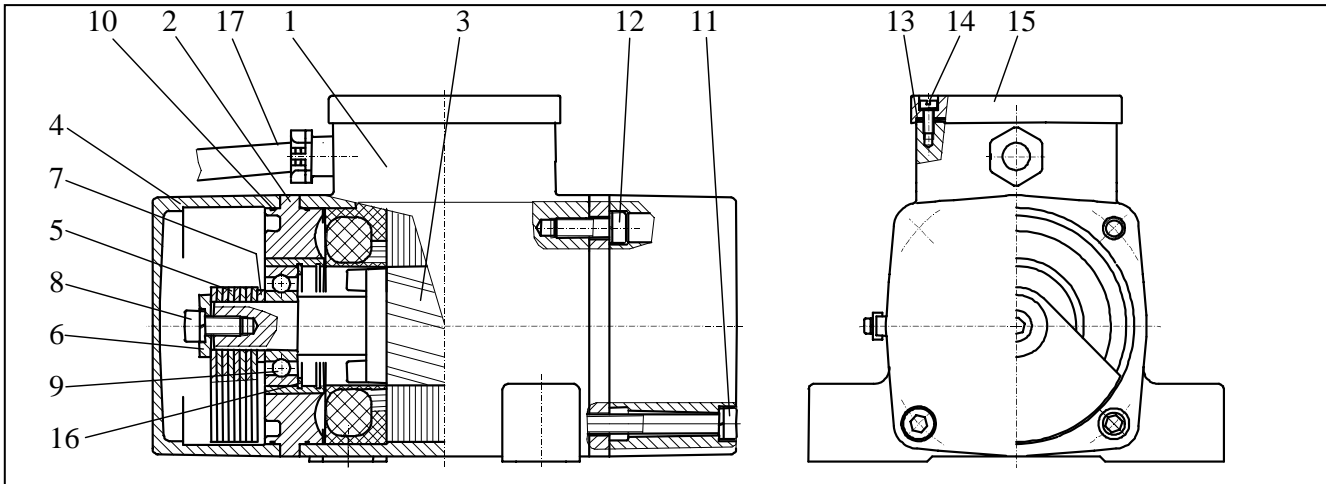
Please keep in mind that in many cases components from other manufacturers have differing specifications and that the parts we supply conform to the most recent requirements.

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When ordering spares, please indicate the type and serial number of the motor as well as the numbers of the parts required; concerning item no 1, please also mention voltage and frequency.



Item	Designation	Part no	Quantity		
			HVE 9/2	HVE 9/4-18	HVE 9/4-30
1	Housing complete with winding	-	1	1	1
2	Bearing bracket	0 3 1 0 1	2	2	2
3	Rotor	-	1	1	1
4	Protective cap	-	2	2	2
5	Eccentric weight	7 5 3 4 1	16	24	40
6	Washer	2 7 8 0 1	2	2	2
7	Washer	2 7 5 0 1	3	3	3
8	Ecc. Weights mounting screw	2 3 1 0 1	2	2	2
9	Bearings	2 4 5 0 1	2	2	2
10	O-ring gasket	7 5 9 3 1	4	4	4
11	Protective cap mounting screw	-	4	4	4
12	Bearing bracket mounting screw	2 3 2 0 1	4	4	4
13	Terminal box gasket	7 5 8 4 1	1	1	1
14	Terminal box cover screw	2 1 4 0 1	4	4	4
15	Terminal box cover	0 6 9 0 1	1	1	1
16	Retaining ring	2 6 3 0 1	2	2	2
17	Cable Lapptherm 105 FD+C 4G 1,5	6 3 1 1 1	2	2	2

The name plates are as follows:

würges		D-Mot.
<b>Vibrationsmotoren D-86356 Neusäß</b>		
CE 0035	II 2G/D EEx e II T4 T=120°	
Type	HVE 9/2	serial number
V	400 V	Hz 50 min <sup>-1</sup> 2680
A	0,69	P <sub>1</sub> kW 0,42 cos φ 0,88
Wärmkl.F-IP65-S1-EN60034-EN50014/50019		
SNCH 04 ATEX 3619 X		
I <sub>A</sub> /I <sub>N</sub>	4,4	t <sub>E</sub> 12 s
year	Made in Germany 94/9/EC (ATEX)	

würges		D-Mot.
<b>Vibrationsmotoren D-86356 Neusäß</b>		
CE 0035	II 2G/D EEx e II T4 T=120°	
Type	HVE 9/2	serial number
V	440 V	Hz 60 min <sup>-1</sup> 3280
A	0,62	P <sub>1</sub> kW 0,42 cos φ 0,88
Wärmkl.F-IP65-S1-EN60034-EN50014/50019		
SNCH 04 ATEX 3619 X		
I <sub>A</sub> /I <sub>N</sub>	4,8	t <sub>E</sub> 12 s
year	Made in Germany 94/9/EC (ATEX)	

Admissible range of voltages:

Voltages in between those specified above are admissible. The respective currents are determined according to the reciprocal relation between voltage and current.

würges		D-Mot.
<b>Vibrationsmotoren D-86356 Neusäß</b>		
CE 0035	II 2G/D EEx e II T4 T=120°	
Type	HVE 9/4-...	serial number
V	400 V	Hz 50 min <sup>-1</sup> 1365
A	0,87	P <sub>1</sub> kW 0,45 cos φ 0,75
Wärmkl.F-IP65-S1-EN60034-EN50014/50019		
SNCH 04 ATEX 3619 X		
I <sub>A</sub> /I <sub>N</sub>	3,7	t <sub>E</sub> 35 s
year	Made in Germany 94/9/EC (ATEX)	

würges		D-Mot.
<b>Vibrationsmotoren D-86356 Neusäß</b>		
CE 0035	II 2G/D EEx e II T4 T=120°	
Type	HVE 9/4-...	serial number
V	440 V	Hz 60 min <sup>-1</sup> 1665
A	0,79	P <sub>1</sub> kW 0,45 cos φ 0,75
Wärmkl.F-IP65-S1-EN60034-EN50014/50019		
SNCH 04 ATEX 3619 X		
I <sub>A</sub> /I <sub>N</sub>	4,0	t <sub>E</sub> 35 s
year	Made in Germany 94/9/EC (ATEX)	

Motor	Hz	V
HVE 9/2	50	42 - 750
HVE 9/2	60	
HVE 9/4	50	42 - 750
HVE 9/4	60	

## EC-Declaration of conformity

According to Directive 89/392/EWG (including 93/44/EWG)

We hereby declare that the explosion-proof vibration motors of the type

HVE 9...

comply with the fundamental and relevant security and health requirements.

Prior to putting the motors in operation, the machine to which they are going to be mounted has to be declared in conformity with Directive 91/386/EEC relating to machinery.

Applied standards	:	DIN EN 292-1/-2	/ 1991-11
		DIN EN 50014	/ 2000-02
		DIN EN 50019	/ 2001-06
		DIN EN 50281-1-1	/ 1999-11
		DIN EN 60034	/ 2000-09
		DIN EN 60079	/ 1998-08
		RL 94/9EG VII	/ 1994-06

Attesting authorities	:	TÜV Rheinland	No. 0035
		snch Luxemburg	No. 0499

Neusäß, 10.06.04

WÜRGES VIBRATIONSTECHNIK

gez. Reiner Würges

