

# Vibration motors

## Standard Instructions of operation

For HV... three-phase vibration motors



### Important remark 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. The same applies to supplementary instructions for modified equipment.

For the better understanding of these instructions of operation also the list of spares for each motor type concerned must be consulted.

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, such as protective covers with

opening and extended shaft 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 system. Putting vibration motors into operation without protective cover is forbidden, because risk of accident may result.

## 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 subject to tensions.

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

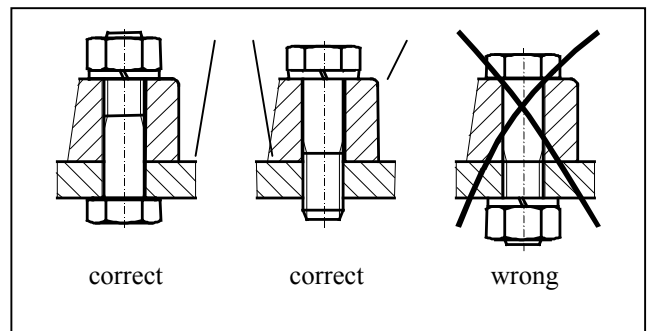
### Posterior tightening of screws and nuts

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.



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

Screw plate      vibrator foot



### Torques

The minimum torques are for:

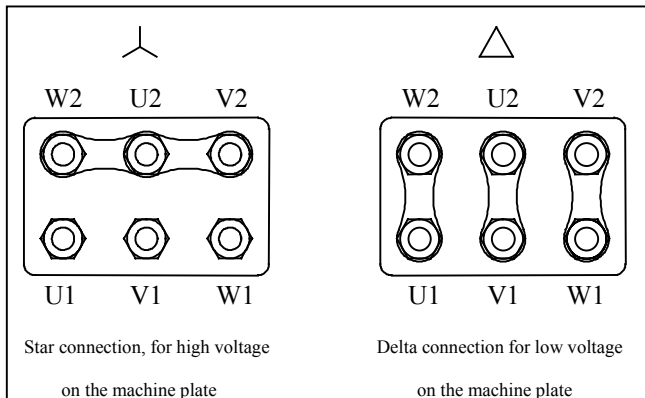
|                     |                     |                     |
|---------------------|---------------------|---------------------|
| <u>M5 = 8 Nm</u>    | <u>M8 = 30 Nm</u>   | <u>M10 = 55 Nm</u>  |
| <u>M12 = 90 Nm</u>  | <u>M16 = 150 Nm</u> | <u>M20 = 280 Nm</u> |
| <u>M24 = 450 Nm</u> |                     |                     |



## Instructions for establishing the power connection



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



### 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 power supply which is in agreement with the VDE regulations.

To secure the motor from overload, it must be connected in series with a terminal circuit breaker, the normal current of which must be set to data, given on the machine plate.

### Speed control

With our three-phase vibration motors it is possible to control the speed under reservation by means of conventional electronic frequency converters. Please observe: In any case a reduction of speed is possible.

If the speed is increased beyond the value which is indicated on the machine plate, risk of accidents is impending, due to a breakage which result from too high a centrifugal force.

The centrifugal force is increased square in accordance with the increase of the speed. For this reason, please enquire for the admitted final speed for each motor type.

### Admitted operating temperature

Outside on the housing not higher than 80°C. This limit may be surpassed by too high a power input, if the speed which is indicated on the machine plate is not reached, with the result that the winding may burn out. The reason may be too high a centrifugal force for the case

### Power connection

The power connection must be established only by a flexible cable. We recommend to use the following cable type: NSSHÖU-J 4x 1,5<sup>2</sup>, of 13 mm diameter, according to VDE 0250. Plastic cables are not suitable. The connection cable must be laid in a manner which excludes inherent vibrations and any load by traction.

1. Provide the ends of the strands with terminals or compression cable sockets. Never fasten the terminals or sockets by soldering, as in default of this the strands tend to break behind the soldered spots in case of vibration.
2. Introduce the cable into the terminal box and establish the connection as shown in the diagram. (except HV 0,4) Here the cable is connected to a lustre terminal.
3. When tightening the cap screw of the screw joint, it must be observed that the cable jacket is still fully seized by the seal. If this is not observed, the cable is not firmly clamped, not relieved from traction, and not waterproof.
4. Close again carefully the terminal box with seal and screws.
5. 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.
6. When putting the vibration motor into operation the power input must be examined. Should this be larger than the data on the machine plate, the trouble can be remedied by reducing the centrifugal force.
7. Now and again it must be checked that there are no spots which are subject to friction.

which is existing or a construction of insufficient resistance to bending. The trouble can be set by reducing the centrifugal force or by using a motor which has a stronger electric drive.

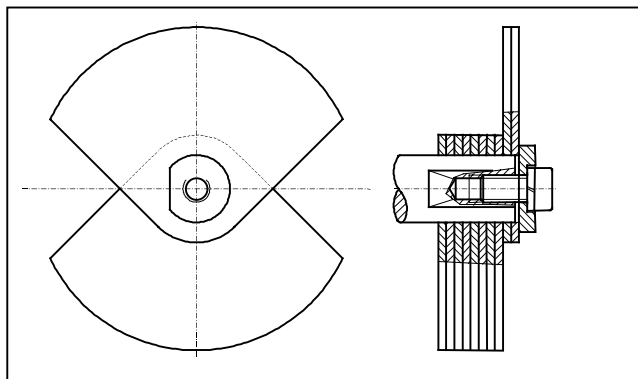


## Setting the centrifugal force

Provide 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.

With the construction sizes HV 0,4 through HV 15 an the types HV 30/2 and HV 55/2 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 the case, the removed flywheels must be replaced by spacers. (Please compare the corresponding list of spares)

From construction size HV 30 and larger (except HV 30/2 and HV 55/2) the centrifugal force can be set by turning equally the outer flywheel and the inner flywheel. The centrifugal force is the largest if the outer flywheel covers the inner one. The values of adjustment for the different motors are given in the list of spares with respect to the setting angle.



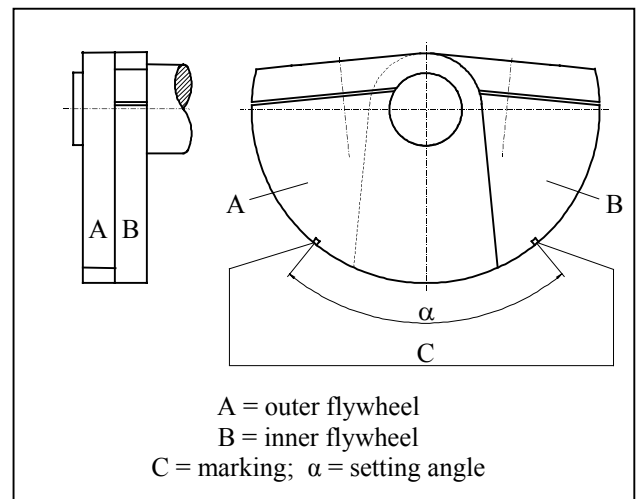
One flywheel on each side generates the following centrifugal forces, depending on the type of motor and speed:

Speed with 2 poles = 3000 min<sup>-1</sup>

|                             |                          |
|-----------------------------|--------------------------|
| <u>HV 0,4/2 = 5 daN</u>     | <u>HV 0,8/2 = 10 daN</u> |
| <u>HV 1/2 = 10 daN</u>      | <u>HV 2/2 = 22 daN</u>   |
| <u>HV 6/2 = 38 daN</u>      | <u>HV 8/2 = 38 daN</u>   |
| <u>HV 12/2 = 75 daN</u>     | <u>HV 15/2 = 75 daN</u>  |
| <u>HV 15/2-25 = 126 daN</u> | <u>HV 30/2 = 126 daN</u> |
| <u>HV 55/2 = 210 daN</u>    |                          |

Speed with 4 poles = 1500 min<sup>-1</sup>

|                           |                               |
|---------------------------|-------------------------------|
| <u>HV 1/4 = 2,5 daN</u>   | <u>HV 2/4 = 5,5 daN</u>       |
| <u>HV 6/4 = 9,5 daN</u>   | <u>HV 12/4-30 = 18,75 daN</u> |
| <u>HV12/4-42 = 35 daN</u> |                               |



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. We recommend to send these motors to the manufacturers in order to have these repaired.

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

If you proceed to disassemble the motors yourselves or to replace bearings, the workplace must be kept clean. No dirt particles must be allowed to get into the interior of the motors. Never use cleaning wool, but non-fluffy cleaning cloths for cleaning motor components.



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



For extremely high stress, some motors are delivered in special executions and provided with grease nipples of DIN 71412, by means of which the motors may be provided with grease subsequently.

Our cylindric roller bearings are provided with long-life grease ESSO UNIREX N3.

With conventional grease guns stroke is equal to 1,5 grammes of grease. The lubrication intervals are valid for 50 cps. For 60 cps we recommend to use half the quantity of grease for half the time.

Here we recommend the following lubrication intervals:

| Motor type | Lubrication Interval in hours | Quantity of grease gr. |
|------------|-------------------------------|------------------------|
| HV 15/2    | 1000                          | 3                      |
| HV 55/2    | 500                           | 4,5                    |
| HV 65/2    | 500                           | 4,5                    |
| HV 85/2    | 300                           | 3                      |
| HV 85/4    | 600                           | 3                      |
| HV 85/6    | 1000                          | 3                      |
| Supermat   | 200                           | 3                      |

## Spares

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

Further information is given in the drawings of spares. WÜRGES take over guarantee only for the use of their original spares.

We point out to the fact that spares, which are not delivered by WÜRGES have not been tested by WÜRGES. Using

spares from other manufacturers can impair predetermined qualities which are inherent in the construction and thereby influence negatively the active or passive safety. WÜRGES reject any claim whatsoever, resulting from the use of spares from other manufacturers. Please keep in mind that many cases, own specifications exist for components of WÜRGES and other manufacturers and that WÜRGES deliver always spares according to the latest art.

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