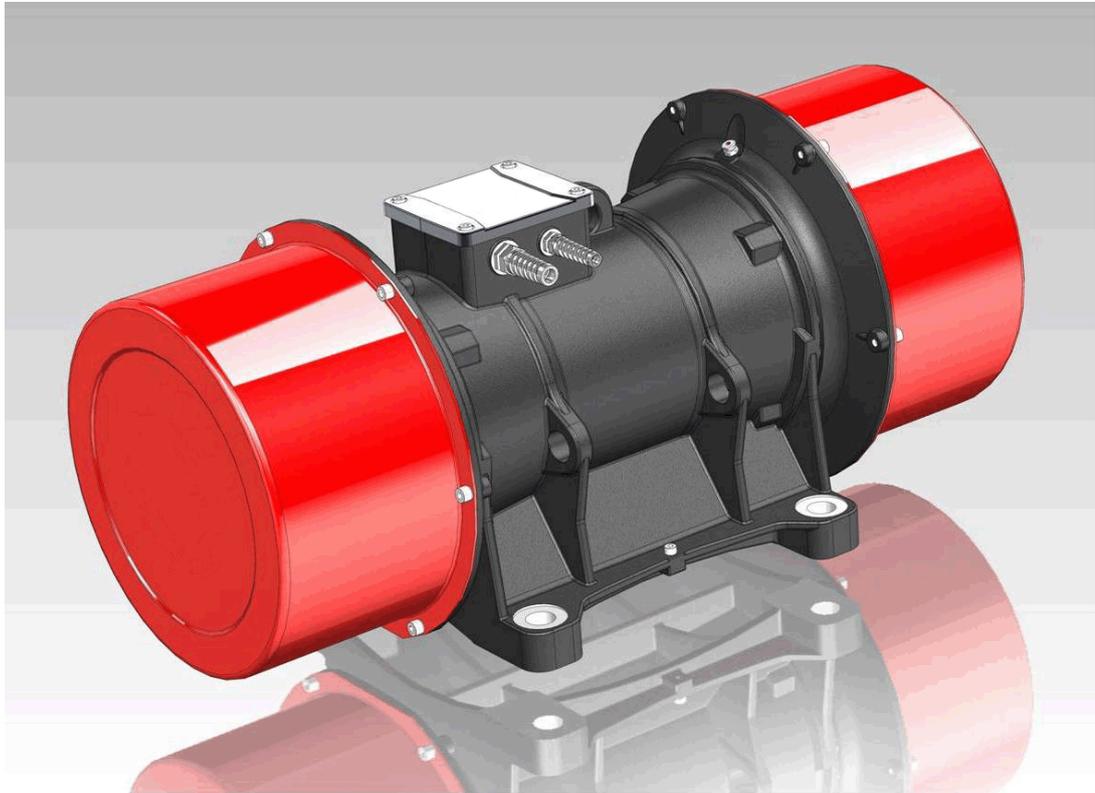


UNBALANCE VIBRATOR JX-Series



OPERATING MANUAL (Translation of the original)

Sizes 07 - 10

Manufacturer: JÖST GmbH + Co.KG, D-48249 Dülmen-Buldern

Regarding these Instructions

These instructions describe the correct assembly, operation and maintenance of the drives named on the cover sheet. To be absolutely sure that these instructions are for the drive you are using, please compare these details with the details on the type plate or rating plate or with the details given in the technical data.

These instructions form part of the product and must be kept for later use throughout the entire service life of the product. Please ensure that the users have access to these instructions. Keep the instructions ready to hand and near the drive.

Please make sure that you pass on these instructions to each successive owner or user.

If you lose the instructions, replacement copies can be ordered from the manufacturer.

The technical data refer exclusively to the point of time of the delivery and to the specified drive. All technical data are subject to alteration as technical developments advance.

For your Safety – Please Read First!

Please read the general and special safety notes before you start assembly, operation or maintenance. Make sure you are familiar with the contents of these instructions and how the drive functions before you do any work on or with the drive.

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Contacts for your Documentation

In spite of thorough checking and careful procedures, it is not possible to rule out errors being overlooked. If you do find an error or if you have any other suggestions or comments to make regarding our documentation, we shall be very pleased if you would let us know. We are always interested in optimising and improving our technical documents and your information can be of valuable assistance to us.

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1 General instructions

This operating manual is intended as reference material for the owner's assembly, operation and maintenance personnel, and for system specialists.

The manual will ensure that personnel can work with the drive safely and properly. An understanding of the way the drive works is a prerequisite here. An awareness of the safety aspects to be observed is especially important.

Any person engaged in its installation, commissioning, operation, maintenance and repair must have read and understood this manual, especially the section on basic safety precautions.

Gegebenenfalls muss eine innerbetriebliche Unterweisung unter Berücksichtigung der fachlichen Qualifikation der jeweiligen Person erfolgen..



Only trained specialists should undertake installation, assembly and commissioning.

No responsibility is assumed for damage or errors caused by improper installation, assembly and commissioning of the drive by third parties.

This manual should be available to operating personnel at all times in order to prevent operating errors and ensure the correct performance of test and maintenance procedures.

The manufacturer assumes no responsibility for damage and breakdowns resulting from non-observance of this manual.

Contact the manufacturer if you encounter difficulties that cannot be rectified by the operator of the drive.

The unbalance vibrator can only be assembled, calibrated/adjusted, operated and serviced properly and safely by following this operating manual.

We reserve the right to make technical modifications designed to improve the drive.

The characteristics max. power P1 [kW], rated current [A], rated voltage [V], working moment [kgcm] and synchronisation speed [1/min] are given on the rating plate or type plate of the drive.

2 Notes on safety operation in potentially explosive atmospheres

The unbalance vibrators JX are suitable for use in categories  II 3G Ex nAc T4 /  II 3D Ex tc IIIC T120 °C.

They may be operated in potentially explosive areas when observing the following information:



When the unbalance vibrator is used in potentially explosive areas the unbalance vibrator should be equipped with a PTC thermistor that must be connected to monitor the temperature.



The drives must be protected against overheating using the installed PTC thermistor. The PTC thermistor may only be connected to a thermistor protection relay.

**Recommended thermistor protection relay:
Made by Siemens; Type: 3 RN1....**



The unbalance vibrator in combination with a DC injection brake in the ex-area must be set so that the maximum current is not higher than the break-away starting current of the drive (see data sheet). The braking time must be set so that the DC injection brake is switched off approx. 1 sec. after machine standstill. In the case of multi-engine operation (conveying trough, sieve machine, etc.) the stator windings must be switched in series via the braking contactor for braking action.



The frequency converter and the DC injection brake must be set up in ex-free areas.

3 Basic safety instructions

3.1 General safety-related rules

The drive has been designed in accordance with the state of the technology and recognised safety regulations.

However, its use may constitute a danger to users or third parties and/or result in damage to the drive and other equipment if the drive:

- is operated by untrained or inexperienced personnel;
- is not used as intended;
- is poorly serviced or maintained.

The owner/operator of the drive must ensure that:

- the operating manual is available and is followed;
- the operating instructions and technical data are observed;
- the safety equipment is used and maintained in good condition;
- the scheduled maintenance work is carried out;
- everyone involved in the assembly or maintenance of the drive has read and understood this operating manual before starting work.

In addition to the basic safety instructions, the special instructions in the manual should be observed in relation to installation and maintenance.

Local safety and accident-prevention guidelines (UVV) should also be followed to ensure the safety of operating and maintenance personnel.

If after reading this operating manual you have any questions which could affect the proper execution of work or operation of the drive, please contact the manufacturer for clarification.

The operator is not authorised to make structural alterations to the drive, which could impact on its safety.

Electrical connections to the drive must be made safe.

Electrocution could result from damaged insulation on connecting cables. Faults of this kind should be rectified immediately.

Only Ex-protected unbalance vibrators should be used in areas where there is the risk of explosion. The Ex-protection symbol should appear on the unbalance vibrator's rating plate and on its base plate. In addition, the special requirements / conditions of this manual for the safe use must be observed.



The use of non-Ex-protected drives is prohibited in areas where there is a risk of explosion.

The unbalance vibrator must only be operated in its original condition, except for the setting of centrifugal force. If changes from the original condition are found, these must be reported by the operator to the appropriate office.

All maintenance and setting work on the unbalance vibrator must in principle only be carried at rest. Before starting work, ensure that the unbalance vibrator cannot be switched on accidentally or by unauthorized persons.

An unbalance vibrator must never be operated without the covers of the flyweights.

3.2 Proper usage

The drive is intended exclusively for use as an oscillator. Any other form of usage is regarded as improper. The operator/drive owner is responsible for a resulting damage.

Proper usage involves following the guidelines on:

- safety
- operation
- service/maintenance

as described in the operating manual.



Prevent faults and avoid personal injury and damage to property.

NOTE

3.3 Personnel qualifications

Individual responsibilities must be specified clearly when it comes to assembly, electrical connection, calibration and adjustment so safety is not compromised when handling the drive.

Work on electric drives should only be undertaken by specialists who are familiar with the relevant safety regulations. Specialists are persons who:

- possess the relevant training and experience;
- are familiar with the relevant standards, regulations and accident-prevention guidelines;
- have been instructed in the operation of the drive, and;
- are aware of the dangers and can avoid them.

Operation of the drive requires trained personnel, at a minimum.

3.4 Danger indicators and symbols used

The following danger indicators, warning signs and symbols are used in this manual (general symbols are replaced in further texts by context-dependent symbols).

3.4.1 Warning signs

Safety symbols that indicate danger.

 DANGER!	Details of danger Indicates an immediate danger with high risk of death or serious physical injury unless avoided.
---	--

 WARNING!	Details of danger Indicates a potential with medium risk of death or (serious) physical injury unless avoided.
--	--

 CAUTION!	Details of danger Indicates a low-risk danger which could result in slight or medium physical injury or property damage unless avoided.
--	---

3.4.2 Mandatory signs

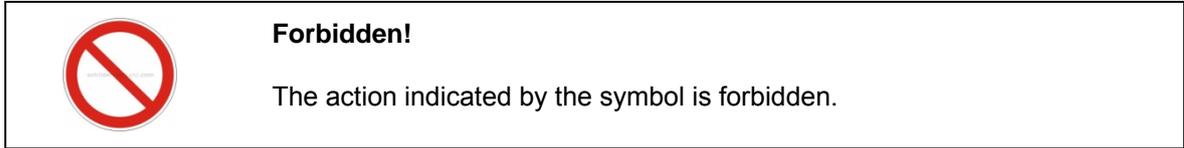
Safety symbols regulating particular actions (blue/white).

 NOTE	These instructions are to be observed in the interests of proper usage and competent operation and maintenance. By observing these instructions, you will be supporting the optimal operation, service life and long-term value of the product.
--	---

 i	User tips and useful information. These instructions contain additional details to make using the product easier, or background information to assist in understanding the product.
---	---

3.4.3 Prohibitory signs

Safety symbol warning that an action that could result in danger is forbidden (white with red border).



4 Design and Operation

4.1 General

An unbalance vibrator sets machines with conveying, screening or shaking function into mechanical vibrations.

The unbalance vibrator generates the vibratory motions by means of rotary flyweights.

4.2 Design of an unbalance vibrator

An unbalance vibrator type JX 07 - 10 consists of the following main elements:

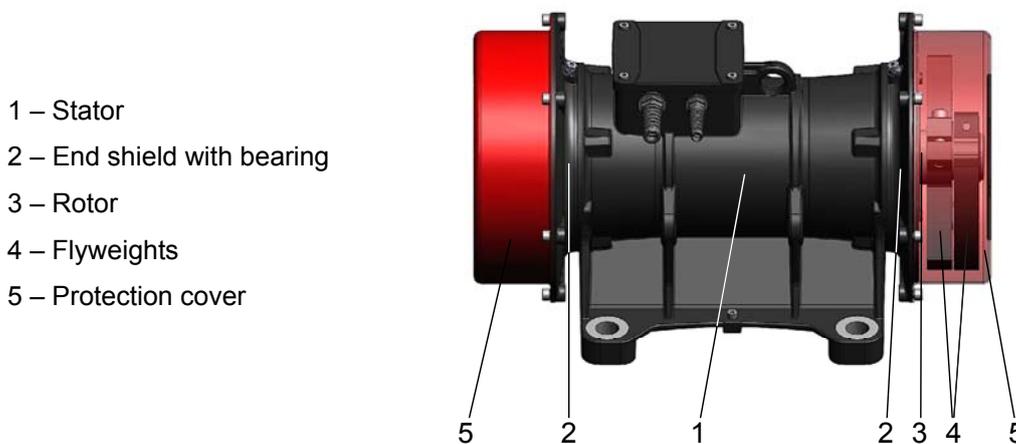


Fig. 1: Design of an unbalance vibrator

4.3 Operational characteristics

The unbalance vibrator is a three-phase squirrel-cage motor. The two shaft extensions of the rotor, which is mounted in antifriction bearings, carry adjustable flyweights.

With the unbalance vibrator switched on, the rotary motion of the rotor and its flyweights generates a centrifugal force. This causes the machine connected to the unbalance vibrator to vibrate.

Type JX unbalance vibrators are in principle designed for continuous duty in accordance with S1 to VDE 0530.

4.4 Noise information (acc. to 3. GSGV)

The sound pressure level can be taken from the data sheet of the unbalance motor.

The sound pressure level - at nominal speed and operating temperature has been determined on a testing stand by the manufacturer.

4.5 Rating plate

The unbalance vibrator JX is identified by the following rating plate:

		JÖST GmbH + Co. KG Gewerbestraße 28-32 48249 Dülmen - Germany www.j-vm.com	
DRIVES IN MOTION			
⚡ II 3G Ex nA II T4 / II 3D Ex tc IIIC T120 C IP66			
Type		M-No.	
Torque	kgcm	Force	kN
3~Mot.		V	Hz
P ₁	kW	A	cosφ
Year		min ⁻¹	Duty S1
● Caution: use supply wire suitable for ____°C ●			
 Insul. Class F DIN EN 60034-1			

5 Storage

Until its final installation, the drive should as far as possible be stored in closed rooms.

If the drive is stored in the open, it must be covered with tarpaulins open underneath, so that any condensate can drain off.

In the case seaworthy packing of the drive, this packing must not be damaged or opened during transit and storage.

The drive must be placed on a suitable base to counteract ground moisture or it must be stored in shelves.

The drive must only be placed on its foot surfaces!

	Risk of damage to the protection covers
CAUTION!	There is a risk of damage to the covers if the unbalance vibrator is placed on its side or stored in any position other than on its base. The protection covers are not designed to withstand this kind of strain.
	A damaged protection cover compromises the IP protection of the drive.
	The drive should fundamentally only be placed on its foot surfaces.

To protect against corrosion, the foot surfaces are greased before dispatch from the works. This grease coating must only be removed immediately before installation.

6 Transport



To avoid danger to persons and damage of the unbalance vibrator, the unbalance vibrator must be handled with proper care! Apart from the instructions below, the general as well as the local safety and accident prevention regulations must be observed.

Wear at least the following personal protective equipment during all transport works:



Safety helmet

The safety helmet is intended as a protection against falling or slung away objects, swinging loads and damages due to hitting obstacles.



Safety shoes EN388

Safety shoes are intended as a protection against heaving falling parts and slipping on slippery ground.



Property damage due to improper transport!

Improper transport may cause transport pieces fall or tip over. This can cause damage to property at a serious rate.

- Be careful when transporting components and packages and observe the symbols and notes on the packaging.

6.1 Symbols on packaging

When the unbalance vibrator is packed, handling gear may only be attached at the marked points. Any handling symbols must be observed:



Attach here!

This symbol indicates attachment points.



Centre of gravity!

Indicates the clear position of the centre of gravity. Obviously, the sign should be used only if the centre of gravity is not centered. The clearness is already given if the sign is attached on two areas perpendicular to each other.



Up!

Packages marked with this symbols have to be transported, handled and stored in such a way that the arrows always face upwards. Refrain from rolling, folding, heavy tilting or edging as well as other forms of transports.

6.2 Transport and lifting points

Transported items with lifting eyes can be lifted, secure and transported with a crane under the following requirements and conditions:

- Crane and hoists have to be designed for the weight of the transported items. Please pay attention to the transport weight of the transported item.
- The operator must be authorized to operate the crane.
- Attach ropes, belts or multiple-point suspensions properly.
- Make sure that the transported item is hanging straight, observe eccentric gravity centre, if necessary.

The unbalance vibrator itself must only be carried at the hitching eyes provided at the stator.

1 – Housing

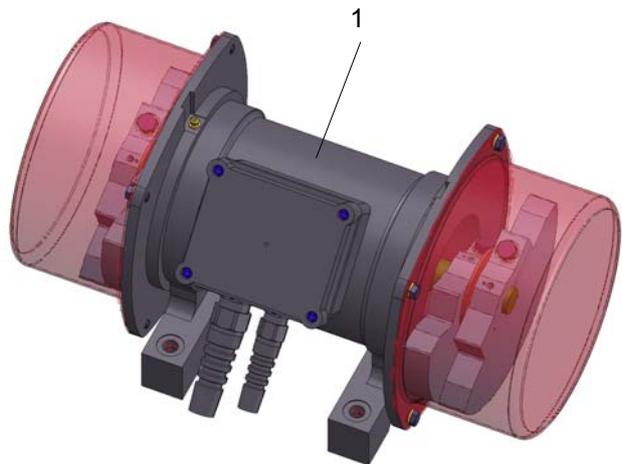


Fig. 2:: Lifting points

	<p>Risk of damage to the protection covers</p>
<p>CAUTION!</p>	<p>There is a risk of damage to the covers if the unbalance vibrator is placed on its side or stored in any position other than on its base. The protection covers are not designed to withstand this kind of strain.</p>
	<p>A damaged protection cover compromises the IP protection of the drive.</p>
	<p>The drive should fundamentally only be placed on its foot surfaces.</p>

All damage during transport must be reported to the manufacturer. Particular care must be taken that the supporting surfaces and cover are not damaged.

7 Assembly



NOTE

The unbalance vibrator must be assembled by skilled personnel.

The manufacturer shall assume **no** liability for incorrect assembly!

The base support areas of the unbalance vibrator must be bare metal and free from grease, paint or other contamination.

The support areas for the drive on the machine must be plane-parallel, feature a maximum surface roughness of $R_z = 25 \mu\text{m}$ and be bare metal, free from dirt and grease.

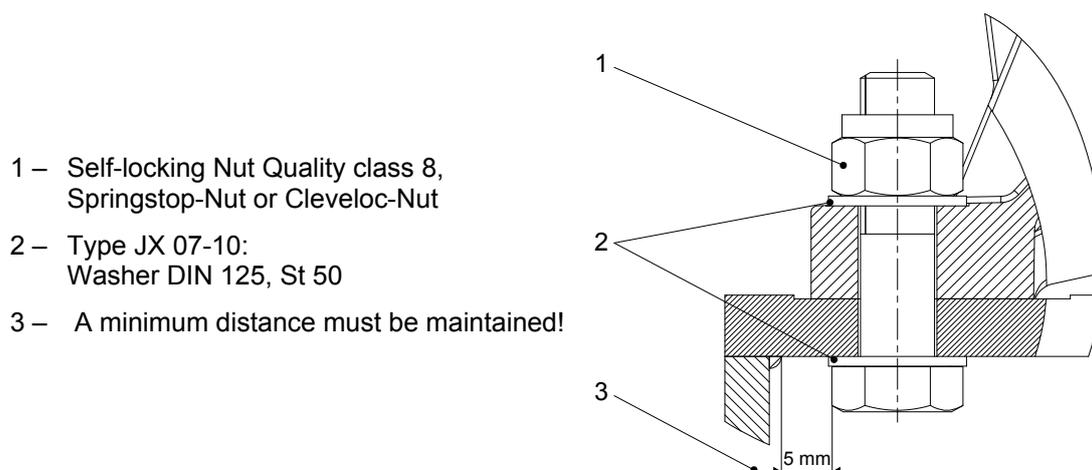


NOTE

The motor part on which the unbalance vibrator is mounted (e.g. cross beam, support plate) must be designed to be appropriately stable in order to preclude deformation (bending, torsion) between the base support areas of the drive. The unbalance vibrator is not a load-bearing component!

Unbalance vibrator	Thread	Torque MA (Nm)
JX 07	M 6	10
JX 08	M 8	25
JX 10	M 10	49

The thread size of the fixing screws, of quality class 8.8, and the required tightening torques are given in the above table. Self-locking nuts of quality class 8 must be used. One washer according to DIN 125, made at least of St-50, must be placed under the screw head and nut.



- 1 – Self-locking Nut Quality class 8, Springstop-Nut or Cleveloc-Nut
- 2 – Type JX 07-10:
Washer DIN 125, St 50
- 3 – A minimum distance must be maintained!

Fig. 3: Drive fixation



CAUTION!

Maintenance of screw connections.

After the **first 50 hours** of operation the unbalance vibrator, the fixing screws must be retightened to the correct tightening torque.

The flyweights of an unbalance vibrator must be set identically at both sides. The setting can be read off with % - scales provided on the flyweights.

If a vibratory machine is driven by two unbalance vibrators, the flyweights must on the two unbalance vibrators be set to the same %-value. With an unequal setting, damaging transverse vibrations will occur on the vibratory machine.

If an unbalance vibrator is replaced, the uniformity of the setting of the flyweights of the two unbalance vibrators must be checked and if necessary established before starting up.

8 Electrical connection

	<p>Danger from electrical current!</p> <p>There is a danger of electric shock when connecting the drive.</p> <p>WARNING! The electrical connection of the drive may only be performed by skilled personnel.</p>
---	---

Electrical connection of unbalance vibrator should be carried out only by authorised persons who have been suitably trained. When making the electrical connection of the unbalance vibrator the (German) VDE 0100 and VDE 0113 regulations must be observed. If the unbalance vibrator is to be exported the electrical regulations of the respective country are to be observed.

On the JX unbalance vibrator the regulations for installation of electrical equipment in areas endangered through potential explosions „DIN EN 60079-14“.

The unbalance vibrator is equipped with a PTC thermistor (130°) and may be connected via the auxilliary line to a trigger device (trigger temperature 130°) in order to protect the drive thermally, for example thermistor protective relay for PTC thermistor – temperature sensor (Siemens 3 RN 1010-1CM00 control voltage 230V AC).

See also the special instructions on [page 21](#) of this manual:
 „Operation by frequency converter, with brake unit“.

	<p>Risk of damage to the unbalance vibrator</p> <p>Before electrically connecting the drive the existing mains voltage and frequency should be compared with the values given on the rating plate of the drive. Correct connection of the terminals in the terminal box should be checked (see circuit diagram in this manual).</p> <p>The unbalance vibrator must not be connected if the values differ. In this case consult the manufacturer.</p>
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For JX unbalance vibrators fluctuations in voltage of the power supply of more than $\pm 10\%$ and frequency fluctuations of more than $\pm 2\%$ are not permissible.

If the unbalance vibrator is operated in Kategorie Ex II 3G Ex nAc T4 / II 3D Ex tc IIIC T120 °C fluctuations in voltage of the power supply of more than $\pm 5\%$ and frequency fluctuations of more than $\pm 2\%$ are not permissible.

In order to guarantee a reliable start of the unbalance vibrator it should only be switched on directly.

The unbalance vibrator must be connected only to a three-phase supply network with a grounding conductor. The grounding conductor of the three-phase supply network must be connected to the corresponding terminal provided in the terminal box, as indicated in the diagrams.

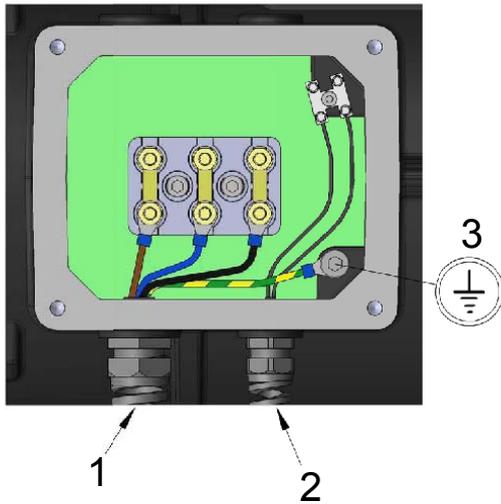
The unbalance vibrators are wired internally in such a way that with the same connection of the three phases L1-L2-L3 to terminals U1-V1-W1 this gives the same direction of rotation for all unbalance vibrators – from the same viewpoint looking towards the cable entry.



NOTE

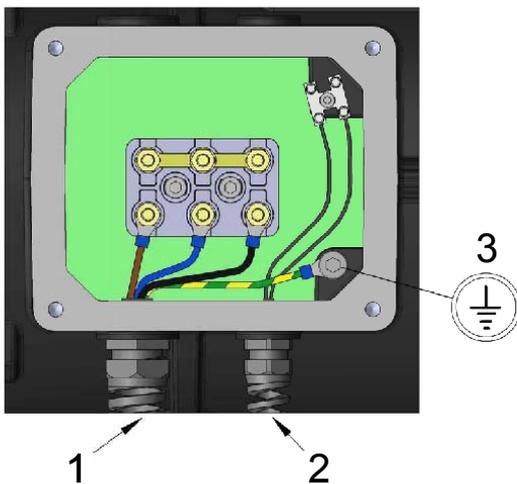
If the drive of a vibrating machine consists of two unbalance vibrators these should be connected in such a way that their direction of rotation is opposed.

To achieve this both unbalance vibrators must be connected in the same order L₁-L₂-L₃ ⇒ U₁-V₁-W₁. The arrangement on the vibrating machine from a viewpoint looking towards the protective cover and cable entries must be mirror-inverted! (see Fig. 5).



**DELTA CONNECTION
LOWER VOLTAGE**

- 1 Power cable entry
- 2 PTC control cable entry
- 3 Earthing connection



**STAR CONNECTION
HIGHER VOLTAGE**

- 1 Power cable entry
- 2 PTC control cable entry
- 3 Earthing connection

Fig. 4: Connection scheme

For the connection a highly elastic, mechanically robust hose line is to be provided as connecting line between the unbalance vibrator and the first distribution box. This should have a temperature resistance of at least 90°C. The minimum required nominal cross-section according to DIN 57100, part 523, and the connection cross-section for guaranteeing reliable operation are given in the data sheet of the unbalance vibrator.

In the terminal box the individual conductors should be led from the cable entry to the terminal board over as short a distance as possible in order to avoid damage to the conductors through vibration. The hose line should be secured against twisting and pulling in the cable entry. At the same time care should be taken that the hose line outside diameter is correct (for inside diameter of the cable gland see data sheet).

For control of the vibration by means of a frequency converter a shielded cable is required as connecting cable between the unbalance vibrator and frequency converter, in accordance with the conditions of the EMC (German Electromagnetic Compatibility) law. Unbalance vibrator of the type JX are suitable for connection under EMC conditions.

For connecting the required shielded cable the existing standard cable gland must be removed by the customer and replaced by a suitable cable gland, e.g. type SHVE, paying attention that the used cable gland is suitable to be used with the o-ring seals fitted in the original cable gland.

Recommendations for suitable cable glands threads and sizes of cables are given in the table „Connection Data”, in section 13. It should be noted that the assignment of the diameter of cables (inner and outer diameter) and the gland (sealing cone and sleeve) are subject to narrow tolerances.

After connecting the supply cable to the terminal block the terminal box cover should then be replaced. In doing so care should be taken that the rubber seal fits correctly. The fixing screws should be firmly tightened.

If the unbalance vibrator is operated in Kategorie Ex II 3G Ex nAc T4 / Ex II 3D Ex tc IIIC T120 °C the connection of the external grounding is compulsory.

The supply cable of every unbalance vibrator must sag freely between the first fixed point and the unbalance vibrator to such an extent that there is no tension of the cable in the starting and running down phases. Its length should be calculated so that there is no self-movement. The supply cable must not strike or rub against anything.

If two unbalance vibrators of one vibration machine are connected to the mains supply, the connection cables of both unbalance vibrators must be connected to the same distribution box connection, without a detachable connection (no individual plug contacts). This measure prevents operation of only one of the unbalance vibrators of the vibration machine.

If, contrary to this urgent recommendation, the two unbalance vibrators are connected to a distribution box, each with a detachable plug connection, suitable protection of the vibrating machine should be provided which prevents operation with only one unbalance vibrator. The manufacturer has provided a protection unit (cable fault relay) which should be installed for every unbalance vibrator.

The unbalance vibrator is to be protected against unacceptable heating up through overloading, non-starting, short-circuit or 2-phase running, by means of the monitoring units (motor protection switch or bimetal relay with fuses). The value for the starting current is given in the data sheet. Since unbalance vibrators start up under difficult conditions (increased working load, increased frictional losses at low temperatures in the cold state) it is recommended that a motor protection switch with delayed tripping characteristic is used.

Operation by frequency converter, with brake unit, in Category Ex II 3G Ex nAc T4 / II 3D Ex tc IIIC T120 °C

The PTC thermistor must always be connected!

If the unbalance vibrator is operated by a frequency converter the maximum speed or the maximum frequency must not exceed the nominal speed given on the rating plate. The frequency converter must be limited so that the frequency specified on the rating plate cannot be exceeded. The parameter block of the frequency converter must be switched on.

For guiding values for minimum frequency or minimum speed see the following table:

Speed range	Minimum frequency
750 – 900 min ⁻¹	80% of max. frequency
1000 – 1200 min ⁻¹	60% of max. frequency
1500 – 1800 min ⁻¹	50% of max. frequency

The unbalance vibrator JX is equipped with a PTC thermistor (130 °C).

If the unbalance vibrator is operated by a frequency converter or braking unit the PTC thermistor must be connected for temperature monitoring.

The unbalance vibrator in combination with a DC injection brake in the ex-area must be set so that the maximum current is not higher than the break-away starting current of the drive (see data sheet). The braking time must be set so that the DC injection brake is switched off approx. 1 sec. after machine standstill. In the case of multi-engine operation (conveying trough, sieve machine, etc.) the stator windings must be switched in series via the braking contactor for braking action.

The frequency converter and the DC injection brake must be set up in ex-free areas.

8.1 Rotation direction of the unbalance vibrators

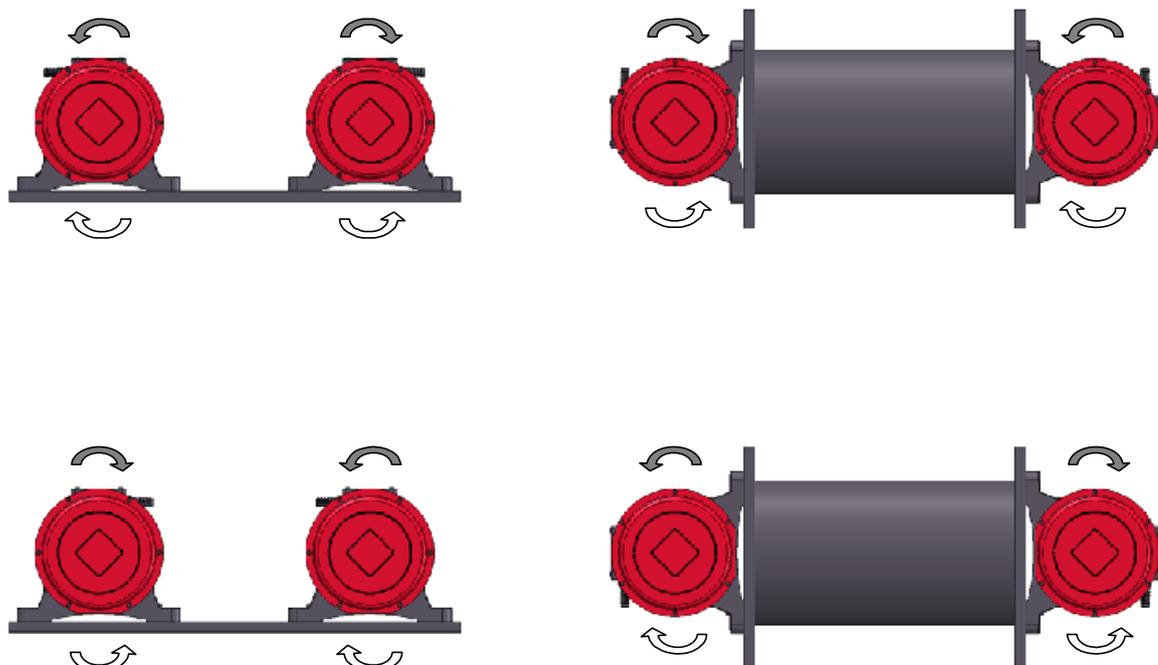


Fig. 5: Rotation direction of the unbalance vibrators (**opposed direction**)

After electrical connection of the unbalance vibrators the direction of rotation of the flyweights has to be checked. The direction of rotation must be **opposite** inwardly.

1. Secure machine against unintentional switching-on.
2. For checking the direction of rotation one protective cover of each unbalance vibrator has to be dismantled.

 <p>WARNING!</p>	<p>Danger of injury through rotating flyweights.</p> <p>The rotating flyweights can cause severe injuries.</p> <ul style="list-style-type: none"> – Do not reach into rotating flyweights. <p>Checking of the direction of rotation is performed at the dismantled protective covers of the unbalance vibrators.</p>
--	--

3. Switch on the unbalance vibrators for a short time (max. 2-3 sec.) and observe the direction of rotation of the flyweights.
4. If the direction of rotation is not counter-rotating the poles of one of the two unbalance vibrators must be reversed (e.g. L₂-L₁-L₃ ⇒ U₁-V₁-W₁ instead of L₁-L₂-L₃ ⇒ U₁-V₁-W₁).
5. Re-install the protection covers of the unbalance vibrators. In doing so care should be taken that the o-ring seal fits correctly.

Check with the vibrating machine running. The direction of vibration – as seen in the direction of conveyance – must be linear.

In exceptional cases (spiral conveyor, special machines) the unbalance vibrators run **in the same direction**. For this the arrangement of the unbalance vibrators on the machine – from a viewpoint looking towards the protective cover and cable entries, and with the same electrical connection – must be the same as in the following scheme.

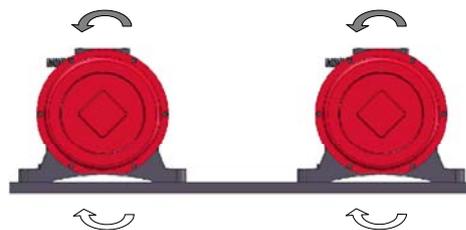


Fig. 6: Rotation direction of the unbalance vibrators in exceptional cases (**same direction**)

9 Setting the centrifugal force



NOTE

All setting operations on the unbalance vibrator must in principle only be carried out at rest.

Before starting this work, ensure that the unbalance vibrator cannot be switched on accidentally or by unauthorized persons.

9.1 Setting the centrifugal forces

The two protective covers of the unbalance vibrators should be removed so that the flyweights under these are easily accessible.

The set centrifugal force can be read off on a % scale which is fitted on the inner flyweights. The setting range is between 0% and 100%.

For the setting each outer flyweight (A) can be turned against the inner flyweight (B) after unscrewing the locking screw (C).

On the adjusting scales, there are two different areas, an area for an operation with a mains frequency of 50 Hz (black area) and a range for an operation with a mains frequency of 60 Hz (red area).

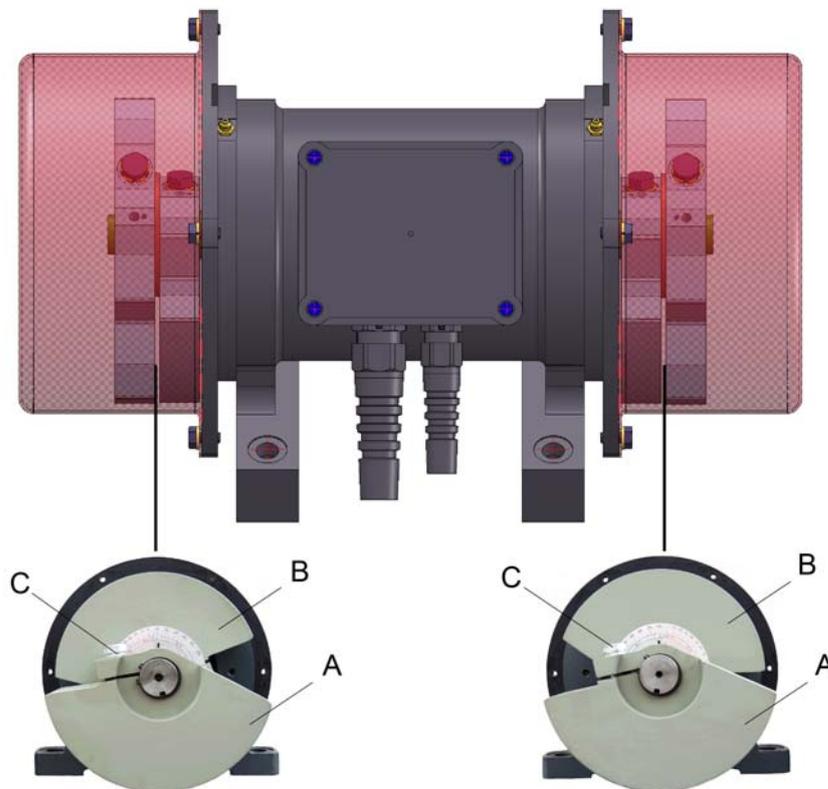


Fig. 7: Setting the centrifugal forces



Adjusting scale left

- use the black printed area for 50 Hz and red printed area for 60 Hz mains frequency

Adjusting scale right

- use the black printed area for 50 Hz and red printed area for 60 Hz mains frequency

Fig. 8: Adjusting scales (für JX 08 - JX 10; ohne Skala: JX 07)

Setting of the flyweights

JX 10: For the setting each outer flyweight (A) can be turned against the inner flyweight (B) after unscrewing the locking screw (C) (see fig.7).

JX 08: For the setting each outer flyweight (A) can be turned against the inner flyweight (B) after unscrewing the locking screw on the motor shaft.

On both sides of the unbalance vibrator the flyweights should be set to the required value (which can be read off on the % scale).

The set values must be the same on both sides.

JX 07: The JX 07 is not equipped with flyweight adjustment.



NOTE

Adjustments according to the mains frequency.

Ensure that the desired setting values for the flyweights are made according to the mains frequency.

With a mains frequency of 50 Hz the black printed range and with a mains frequency of 60 Hz the red printed red range must be used.

The clamping screws (C) of the flyweights (A) must be tightened with a torque as specified in the table below.

Clamping screw flyweight	
Thread	Torque MA (Nm)
Convention	Nm
M 8	13

Before replacing the protective covers the set values of the flyweights should be re-checked to ensure that they are the same.

The protective covers are then replaced and correct fitting of the rubber seals has to be checked. The fixing screws are hand tight, i.e. they should be tightened with the torque MA given in the table.

Unbalance vibrator	Thread	Torque MA (Nm)
JX 07	M 4	1,2
JX 08	M 6	2
JX 10	M 8	3

10 Maintenance

The unbalance vibrator must be regularly serviced. Inadequate maintenance can lead to faults or damage with consequent downtimes and repair costs. Correct maintenance ensures safety and reliability.

	All maintenance operations on the unbalance vibrator must on principle only be carried out when the unbalance vibrator is at rest.
WARNING!	Before starting work, ensure that the unbalance vibrator cannot be switched on accidentally or by unauthorized persons.

10.1 Maintenance-/Inspection operations

After the **first 50 operating hours** the fixing screws must be retightened with the tightening torque specified in the data sheet. The fixing screws of the protective covers and of the terminal box cover must also be retightened.

The connecting cable must be examined for wear and breakages regularly and replaced if necessary.

10.2 Lubrication

The unbalance vibrator is lubricated in the works with Klüber Staburags NBU 8 EP grease.

Unbalance vibrators of type JX 07 / 08 are lubricated for life time. Relubrication is not required.

Unbalance vibrators of type JX 10 are designed for re-greasing; lubricating nipples are provided on the bearing shields for this purpose.

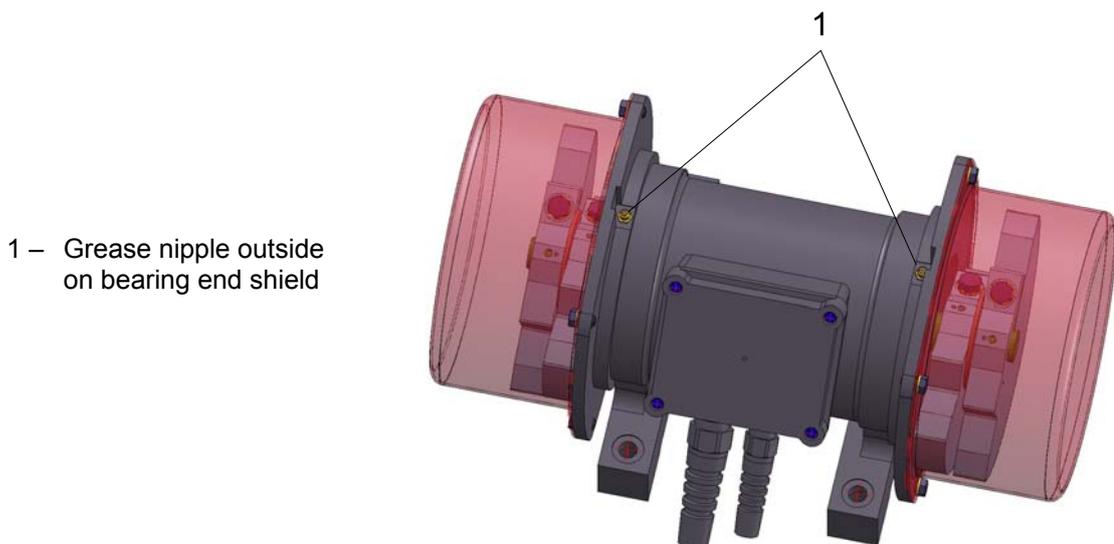


Fig. 9: Lubrication point

Re-greasing should as far as possible be carried out while the unbalance vibrator is still at its operating temperature; after which the vibrator should be started up again and run for about further 30 minutes. This procedure is particularly advisable when re-greasing is carried out at ambient temperatures below 0° C

Re-greasing should only be carried out with the grease specified in the data sheet; to mix different types of grease could cause damages to the bearings or reduce dramatically their life.

Re-greasing intervals and grease quantities are given in the data sheet for horizontal installation of the unbalance vibrators. Re-greasing should be carried out at least once a year.

JX Type	Torque	Bearing Type	Grease filling [g]	Re-lubrication [g]	Lubrication intervals [h]
JX 072	1	6201-Z.C4	3	-	-
JX 082	4	6302-Z.C4	5	-	-
JX 084	12 20	6302-Z.C4	5	-	-
JX 102	14	NJ 305E.C4	10	5	2500
JX 104	50	NJ 305E.C4	10	5	2800
JX 106	100	6305.C4	10	10	2500

The re-greasing intervals given in the table above and in the data sheets are based on a specific bearing temperature up to 85 °C.

If this temperature is exceeded by up to 15 °C in each case the re-greasing interval is halved.

For the first re-greasing after commissioning, double the grease quantity of that given in the data sheet should be used.

If longer standstill times are planned (more than 4 – 5 months) re-greasing should be carried out before shutting down.

When using an unbalance vibrator which has been out of operation for a long time (standby unbalance vibrator) re-greasing should be carried out shortly after starting up.

Roller bearings which have been cleaned or replaced should be greased with the grease quantity given in the data sheet.

Storage of the unbalance vibrators:

6 - 12 month: Re-grease the bearings according to the motor data sheets.

12 – 36 month: Remove flyweights and turn the shaft by hand every 3 month.
Re-grease the bearings 10 hours after commissioning.

More than 36 month: Remove flyweights and turn the shaft by hand every 3 month.
Re-grease bearings 60 – 70 h after commissioning.

Roller bearings which have been cleaned or replaced should be greased with the grease quantity given in the data sheet.

11 Malfunctioning

Faulty operation in the form of changed noise development can be corrected with the fault tracing chart below.

Fault	Cause of the fault	Remedy
Knocking sounds	Fixing screws of the unbalance vibrator are loose	Check foot- and bolt contact surfaces for sound condition. Tighten screws with the specified torque (see data sheet).
High running noise	Damage to bearings	Change the bearings (JX 10), Change the unbalance vibrator (JX 07 – JX 08)
Motor doesn't start	Cables not connected or broken	Check the connection and/or renew the cable
Loud noise	Damage to the housing (broken motor foot)	Change the unbalance vibrator
Electrical defect	Damage to the housing (moisture penetrating through hairline cracks)	Change the unbalance vibrator
Rubbing noise	Protective covers damaged	Change the covers

On the JX unbalance vibrator the maximum surface temperature on the stator outside housing doesn't not exceed 120°C in continuous operation (apart where different indicated on the rating plate).

12 Spare parts

12.1 Important instructions for replacement parts

 <p>NOTE</p>	<p>The manufacturer only assumes warranty for original spare parts.</p> <p>If non-original spare parts are used this can negatively change the function of the drive and/or impair safety!</p> <p>The manufacturer accepts no liability for damage resulting from the use of non-original spare parts!</p>
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The following data are required when ordering spare parts:

- Drive type
- Supply voltage and frequency (see rating plate)
- Factory No. of the manufacturer (see rating plate)
- Item – No.
- Denomination (see spare part drawing / parts list!)
- Quantity

12.2 Spare parts list

The spare parts list applies to unbalance vibrator of series JX 10 only.

There are no replacement parts foreseen for the series JX 07 and JX 08.

Item	Denomination	Quantity
1	Terminal board	1
2	Terminal box cover	1
3	Sealing for terminal box cover	1
4	Cable screw connection	1
5	Bearing end shield	2
6	Bearing	2
7	Adjusting ring, interior	2
8	Sealing for protection hood	2
9	Protection hood	2

12.3 Spare parts drawing

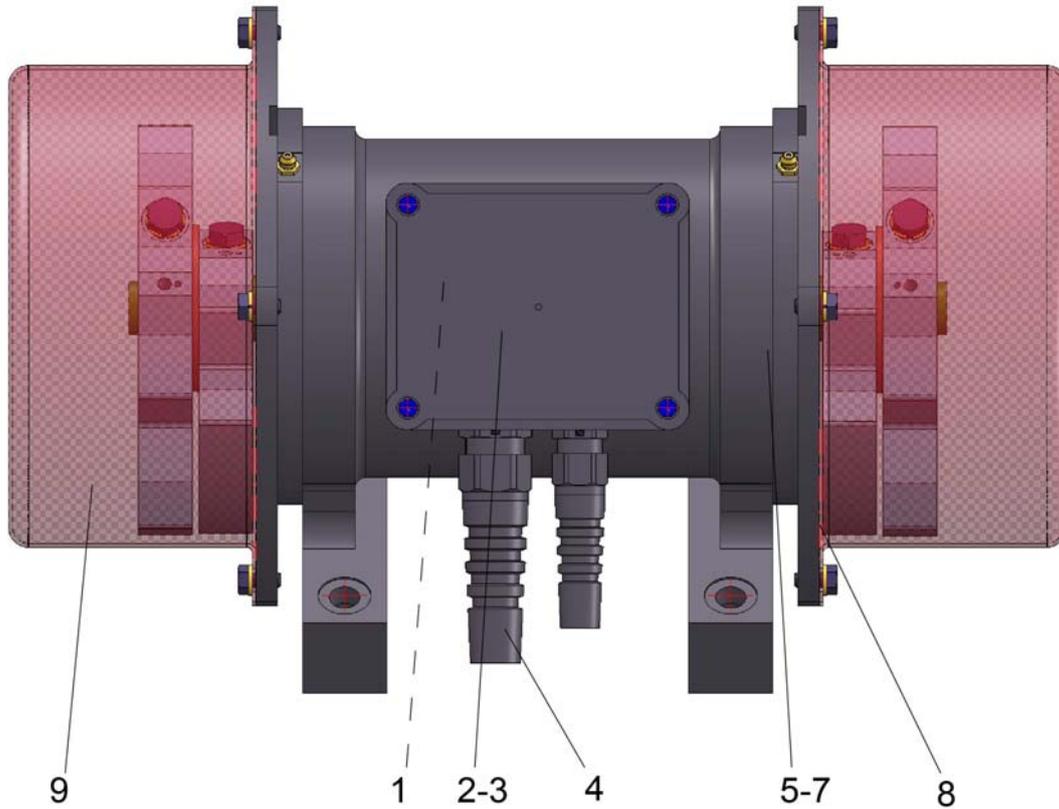


Fig. 10: Spare parts

13 Connection data for mains supply and thermistor connection

Vibrator Size	Cable Gland		Power connection		Thermistor connection	
			Connecting cable		Connecting cable	
	Thread power	Thread thermistor	Required	Allowed	Required	Allowed
			F mm ²	∅ mm	F mm ²	∅ mm
JX 072	M20x1.5	M16x1,5	4x1,5	7 ÷ 13	2 x 1,5	4,5 ÷ 10
JX 082	M20x1.5	M16x1,5	4x1,5	7 ÷ 13	2 x 1,5	4,5 ÷ 10
JX 084	M20x1.5	M16x1,5	4x1,5	7 ÷ 13	2 x 1,5	4,5 ÷ 10
JX 102	M20x1.5	M16x1,5	4x1,5	7 ÷ 13	2 x 1,5	4,5 ÷ 10
JX 104	M20x1.5	M16x1,5	4x1,5	7 ÷ 13	2 x 1,5	4,5 ÷ 10
JX 106	M20x1.5	M16x1,5	4x1,5	7 ÷ 13	2 x 1,5	4,5 ÷ 10

14 Data sheet

See following page

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