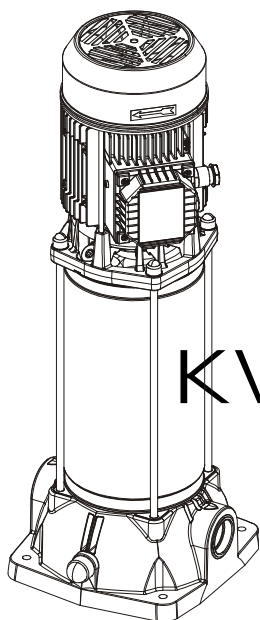
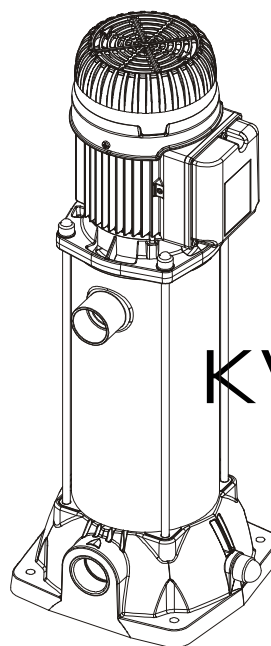
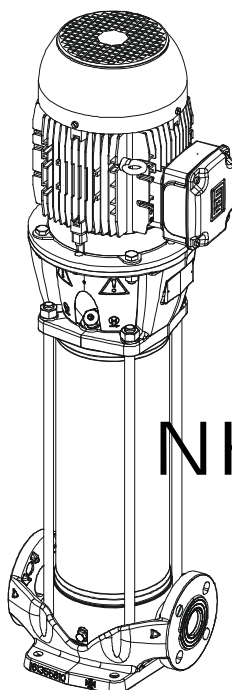

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INSTRUCTIONS POUR L'INSTALLATION ET LA MAINTENANCE (FR)
INSTRUCTIONS FOR INSTALLATION AND MAINTENANCE (GB)
INSTALLATIONS- UND WARTUNGSANLEITUNGEN (DE)
INSTALLATIE- EN ONDERHOUDSINSTRUCTIES (NL)
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ΟΔΗΓΙΕΣ ΓΙΑ ΤΗΝ ΕΓΚΑΤΑΣΤΑΣΗ ΚΑΙ ΣΥΝΤΗΡΗΣΗ (GR)
KURMA VE BAKIM İÇİN BİLGİLER (TR)
NÁVOD NA INŠTALÁCIU A ÚDRŽBU (SK)
РУКОВОДСТВО ПО МОНТАЖУ И ТЕХНИЧЕСКОМУ ОБСЛУЖИВАНИЮ (RU)
INSTRUCȚIUNI PENTRU INSTALARE ȘI ÎNȚEȚINERE (RO)
INSTRUKCJA MONTAŻU I KONSERWACJI (PL)
إرشادات للتركيب والصيانة
INSTALLÁCIÓS ÉS KARBANTARTÁSI KÉZIKÖNYV (HU)
ИНСТРУКЦИЯ ЗА МОНТИРАНЕ И ПОДДРЪЖКА (BG)



KVC



KVCX



NKV

KVC – 50/60Hz

KVC 15/30 – KVC 15/306
 KVC 25/30 – KVC 25/306
 KVC 35/30 – KVC 35/306
 KVC 45/30 – KVC 45/306
 KVC 50/30 – KVC 50/306
 KVC 60/30 – KVC 60/306
 KVC 65/30 – KVC 65/306

KVC 20/50 – KVC 20/506
 KVC 30/50 – KVC 30/506
 KVC 40/50 – KVC 40/506
 KVC 55/50 – KVC 55/506
 KVC 65/50 – KVC 65/506
 KVC 75/50 – KVC 75/506

KVC 15/80 – KVC 15/806
 KVC 20/80 – KVC 20/806
 KVC 30/80 – KVC 30/806
 KVC 40/80 – KVC 40/806
 KVC 45/80 – KVC 45/806
 KVC 55/80 – KVC 55/806
 KVC 65/80 – KVC 65/806

KVC 25/120 – KVC 25/1206
 KVC 35/120 – KVC 35/1206
 KVC 45/120 – KVC 45/1206
 KVC 60/120 – KVC 60/1206
 KVC 70/120 – KVC 70/1206
 KVC 85/120 – KVC 85/1206

KVCX – 50/60Hz

KVCX 15/30 – KVCX 15/306
 KVCX 25/30 – KVCX 25/306
 KVCX 35/30 – KVCX 35/306
 KVCX 45/30 – KVCX 45/306
 KVCX 50/30 – KVCX 50/306
 KVCX 60/30 – KVCX 60/306
 KVCX 65/30 – KVCX 65/306

KVCX 20/50 – KVCX 20/506
 KVCX 30/50 – KVCX 30/506
 KVCX 40/50 – KVCX 40/506
 KVCX 55/50 – KVCX 55/506
 KVCX 65/50 – KVCX 65/506
 KVCX 75/50 – KVCX 75/506

KVCX 15/80 – KVCX 15/806
 KVCX 20/80 – KVCX 20/806
 KVCX 30/80 – KVCX 30/806
 KVCX 40/80 – KVCX 40/806
 KVCX 45/80 – KVCX 45/806
 KVCX 55/80 – KVCX 55/806
 KVCX 65/80 – KVCX 65/806

KVCX 25/120 – KVCX 25/1206
 KVCX 35/120 – KVCX 35/1206
 KVCX 45/120 – KVCX 45/1206
 KVCX 60/120 – KVCX 60/1206
 KVCX 70/120 – KVCX 70/1206
 KVCX 85/120 – KVCX 85/1206

NKV 10-15-20 – 50/60Hz

NKV 10/2 – NKV 10/26
 NKV 10/3 – NKV 10/36
 NKV 10/4 – NKV 10/46
 NKV 10/5 – NKV 10/56
 NKV 10/6 – NKV 10/66
 NKV 10/7 – NKV 10/76
 NKV 10/8 – NKV 10/86
 NKV 10/9 – NKV 10/96

NKV 10/10 – NKV 10/106
 NKV 10/12 – NKV 10/126
 NKV 10/14 – NKV 10/146
 NKV 10/16

– NKV 10/176

NKV 10/18
 NKV 10/20
 NKV 10/22

NKV 15/2 – NKV 15/26
 NKV 15/3 – NKV 15/36
 NKV 15/4 – NKV 15/46
 NKV 15/5 – NKV 15/56
 NKV 15/6 – NKV 15/66
 NKV 15/7 – NKV 15/76

NKV 15/8 – NKV 15/86
 NKV 15/9 – NKV 15/96
 NKV 15/10 – NKV 15/106
 NKV 15/12 – NKV 15/126
 NKV 15/14
 NKV 15/16
 NKV 15/17

NKV 20/2 – NKV 20/26
 NKV 20/3 – NKV 20/36
 NKV 20/4 – NKV 20/46
 NKV 20/5 – NKV 20/56
 NKV 20/6 – NKV 20/66
 NKV 20/7 – NKV 20/76
 NKV 20/8 – NKV 20/86

NKV 20/9
 NKV 20/10 – NKV 20/106
 NKV 20/12
 NKV 20/14
 NKV 20/16
 NKV 20/17

NKV 32-45 – 50/60Hz

NKV 32/2-2 – NKV 32/26-2
 NKV 32/2 – NKV 32/26
 NKV 32/3-2 – NKV 32/36-2
 NKV 32/3 – NKV 32/36
 NKV 32/4-2 – NKV 32/46-2
 NKV 32/4 – NKV 32/46
 NKV 32/5-2 – NKV 32/56-2
 NKV 32/5 – NKV 32/56
 NKV 32/6-2 – NKV 32/66-2
 NKV 32/6 – NKV 32/66
 NKV 32/7-2 – NKV 32/76-2
 NKV 32/7 – NKV 32/76
 NKV 32/8-2 – NKV 32/86-2
 NKV 32/8 – NKV 32/86
 NKV 32/9-2
 NKV 32/9
 NKV 32/10-2
 NKV 32/10
 NKV 32/11-2
 NKV 32/11
 NKV 32/12-2
 NKV 32/12
 NKV 32/13-2
 NKV 32/13

NKV 45/2-2 – NKV 45/26-2
 NKV 45/2 – NKV 45/26
 NKV 45/3-2 – NKV 45/36-2
 NKV 45/3 – NKV 45/36
 NKV 45/4-2 – NKV 45/46-2
 NKV 45/4 – NKV 45/46
 NKV 45/5-2 – NKV 45/56-2
 NKV 45/5 – NKV 45/56
 NKV 45/6-2 – NKV 45/66-2
 NKV 45/6 – NKV 45/66
 NKV 45/7-2 – NKV 45/76-2
 NKV 45/7 – NKV 45/76
 NKV 45/8-2
 NKV 45/8
 NKV 45/9-2
 NKV 45/9
 NKV 45/10-2
 NKV 45/10
 NKV 45/11-2
 NKV 45/11
 NKV 45/12-2
 NKV 45/12
 NKV 45/13-2

NKV 65-95 – 50/60Hz

NKV 65/2-2 – NKV 65/26-2
 – NKV 65/26-1
 NKV 65/2 – NKV 65/26
 NKV 65/3-2 – NKV 65/36-2
 NKV 65/3 – NKV 65/36
 NKV 65/4-2 – NKV 65/46-2
 NKV 65/4 – NKV 65/46
 NKV 65/5-2 – NKV 65/56-2
 NKV 65/5
 – NKV 65/56-1
 NKV 65/6-2
 NKV 65/6
 NKV 65/7-2
 NKV 65/7
 NKV 65/8-2
 NKV 65/8

NKV 95/2-2 – NKV 95/26-2
 – NKV 95/26-1
 NKV 95/2 – NKV 95/26
 NKV 95/3-2 – NKV 95/36-2
 – NKV 95/36-1
 NKV 95/3 – NKV 95/36
 NKV 95/4-2 – NKV 95/46-2
 NKV 95/4
 NKV 95/5-2
 NKV 95/5
 NKV 95/6-2
 NKV 95/6

KVCE

KVCE 35/30
KVCE 45/30
KVCE 50/30
KVCE 60/30
KVCE 65/30

KVCE 30/50
KVCE 40/50
KVCE 55/50
KVCE 65/50
KVCE 75/50

KVCE 30/80
KVCE 40/80
KVCE 45/80
KVCE 55/80
KVCE 65/80

KVCE 35/120
KVCE 45/120
KVCE 60/120
KVCE 70/120
KVCE 85/120

NKVE 10-15-20

NKVE 10/2
NKVE 10/3
NKVE 10/4
NKVE 10/5
NKVE 10/6
NKVE 10/7
NKVE 10/8
NKVE 10/9
NKVE 10/10
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NKVE 10/18
NKVE 10/20
NKVE 10/22

NKVE 15/2
NKVE 15/3
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NKVE 15/17

NKVE 20/2
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NKVE 20/4
NKVE 20/5
NKVE 20/6
NKVE 20/7
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NKVE 20/9
NKVE 20/10
NKVE 20/12
NKVE 20/14

NKVE 32-45-65-95

NKVE 32/2
NKVE 32/3-2
NKVE 32/3
NKVE 32/4
NKVE 32/5-2
NKVE 32/5
NKVE 32/6
NKVE 32/7-2

NKVE 45/2-2
NKVE 45/2
NKVE 45/3
NKVE 45/4

NKVE 65/2-2
NKVE 65/2
NKVE 65/3-2

NKVE 95/2-2
NKVE 95/2

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1. GENERAL



Read this documentation carefully before installation.

Installation, electrical connection and commissioning must be carried out by skilled personnel in compliance with the general and local safety regulations in force in the country of installation of the product. Failure to comply with these instructions not only causes risk to personal safety and damage to the equipment, but invalidates every right to assistance under guarantee.

The appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

2. APPLICATIONS

Multistage centrifugal pumps indicated for booster sets for water systems of small, medium and large utilities. They may be used in various fields of applications such as:

- for fire-fighting and washing systems,
- for supplying drinking water and feeding autoclaves,
- for feeding boilers and circulating hot water,
- for conditioning and chilling systems,
- for circulating and industrial processing plants.

3. PUMPED FLUIDS

The machine has been designed and built for pumping water, free from explosive substances and solid particles or fibres, with a density of 1000 kg/m³ and a kinematic viscosity of 1 mm²/s, and chemically non-aggressive liquids.

Small quantities of sand, up to 50 ppm, are accepted.

4. TECHNICAL DATA KVC – KVCX

4.1 Electrical data

- Supply voltage: 1x 220-240V – 50Hz
3x 230-400V – 50Hz
1x 115V – 60Hz
1x 220-230V – 60Hz
3x 220-230/380-400V – 60Hz
- Absorbed power: see electric data plate
- Degree of protection: IP55
- Insulation class: F

4.2 Operating conditions

- Delivery: 50 ÷ 200 l/min.
- Head up: pag. 134
- Liquid temperature: 0 ÷ 35°C domestic use (EN 60335-2-41)
- Liquid temperature: 0 ÷ 40°C for other uses
- Environment temperature: 0 ÷ 40°C
- Storage temperature: -10 ÷ 40°C
- Maximum working pressure: 12 bar (1200 kPa)
- Relative humidity in air: Max. 95%
- Motor construction: Cei 2-3 / Cei 61-69 (EN 60335-2-41)
see plate on package
- Weight: 60 min. max.
- Limit of operation with closed mouth:

5. TECHNICAL DATA NKV

5.1 Electrical data

- Supply voltage: 3x 230-400V – 50Hz
3x 400V Δ – 50Hz
3x 380-480V Δ – 60Hz
3x 220-277V Δ / 380-480V – 60Hz
- Absorbed power: see electric data plate
- Degree of protection: IP55
- Insulation class: F

5.2 Operating conditions

- Delivery: 160 ÷ 1166 l/min.
- Head up: pag. 134
- Liquid temperature: -15°C ÷ 120°C
- Max. environment temperature: 40°C
- Storage temperature: -20°C ÷ 60°C
- Maximum working pressure: 25 bar (2500 kPa)
- Maximum working pressure NKV 32-45: 32 bar (3200 kPa)
- Relative humidity in air: Max. 95%
- Motor construction: Cei 2-3 / Cei 61-69 (EN 60335-2-41)
- Weight: see plate on package

6. MANAGEMENT



Observe the current accident prevention standards. Risk of crushing. The pump may be heavy. Use suitable lifting methods and always wear personal protection equipment.

Before handling the product, check its weight to identify suitable lifting equipment.

6.1 Storage

All the pumps must be stored indoors, in a dry, vibration-free and dust-free environment, possibly with constant air humidity. They are supplied in their original packaging and must remain there until the time of installation. If this is not possible, the intake and delivery aperture must be accurately closed.

6.2 Handling KVC-KVCX / NKV 10-15-20

Avoid subjecting the products to needless jolts or collisions. To lift and transport the unit, use lifting equipment and the pallet supplied standard (if applicable). Use suitable hemp or synthetic ropes only if the part can be easily slung, connecting them if possible to the eyebolts provided.

In the case of coupled pumps, the eyebolts provided for lifting one part must not be used to lift the pump-motor assembly.

6.3 Handling NKV 32-45-65-95

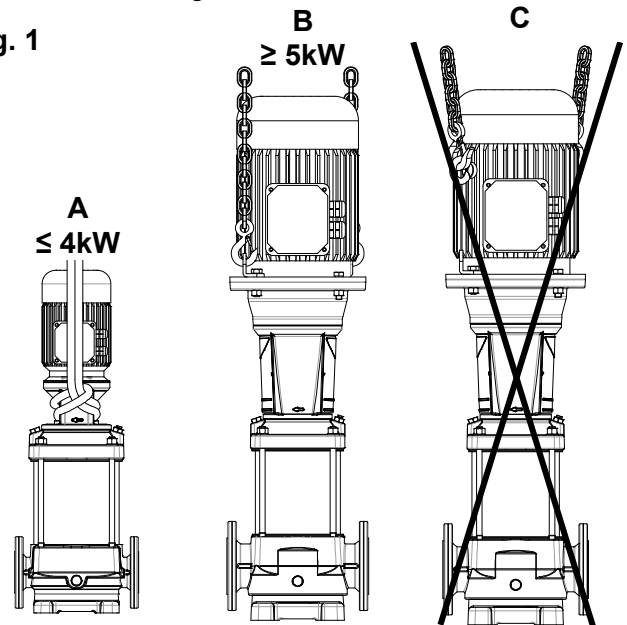


The pump motors supplied with eyebolt should not be used to handle the whole assembled electric pump (fig. 1C).

For handling pumps with motor of up to 4kW, use the belts wound around the motor as shown in fig. 1A. For pumps with motor power greater or equal to 5.5kW, use the belts attached to the two flanges

located in the coupling area between the pump and the motor as shown in fig. 1B.

Fig. 1



There is a risk that the pump may overturn during handling; make sure that the pump remains in a stable position during handling.

7. WARNINGS

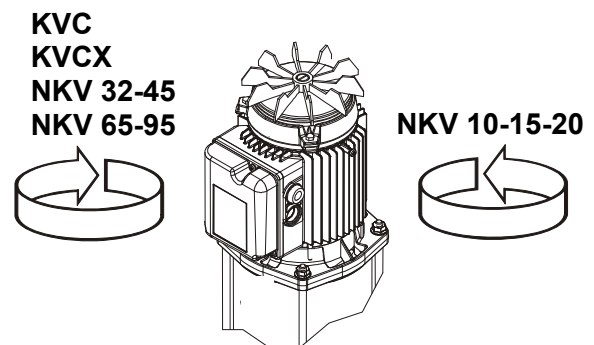
7.1 Safety

Use is allowed only if the electric system is in possession of safety precautions in accordance with the regulations in force in the country where the product is installed (for Italy, CEI 64/2).

7.2 Checking motor shaft rotation

Before installing the pump you must check that the rotating parts turn freely. For this purpose, remove the fan cover from its seat in the motor end cover. Insert a screwdriver in the notch on the motor shaft from the ventilation side.

Fig. 2



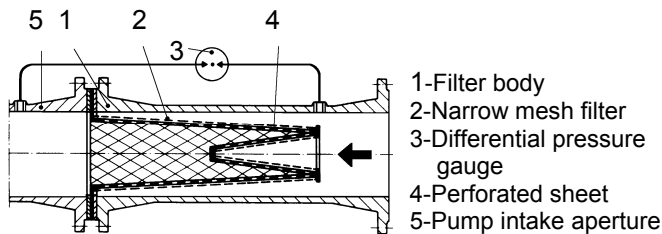
Do not force the fan with pliers or other tools to try to free the pump as this could cause deformation or breakage of the pump.

7.3 New systems

Before running new systems the valves, pipes, tanks and couplings must be cleaned accurately.

To avoid welding waste or other impurities getting into the pump, the use of TRUNCATED CONICAL filters made of corrosion resistant materials (DIN 4181) is recommended.

Fig. 3



8. PROTECTIONS

8.1 Moving parts

Before starting the pump all the moving parts have to be properly protected with dedicated components (fan, cover, etc.).



During pump operation, keep well away from the moving parts (shaft, fan, etc.).

If getting closed to the running pump is necessary, be properly dressed as from laws rules, in order to avoid injuries.

8.2 Noise level

See table A, pag. 130.

In cases where the LpA noise levels exceed 85 dB(A), suitable HEARING PROTECTION must be used in the place of installation, as required by the regulations in force.

8.3 Hot and cold parts

DANGER OF BURNING !!



As well as being at high temperature and high pressure, the fluid in the system may also be in the form of steam!

It may be dangerous even to touch the pump or parts of the system.

If the hot or cold parts are a source of danger, they must be accurately protected to avoid contact with them.

9. INSTALLATION

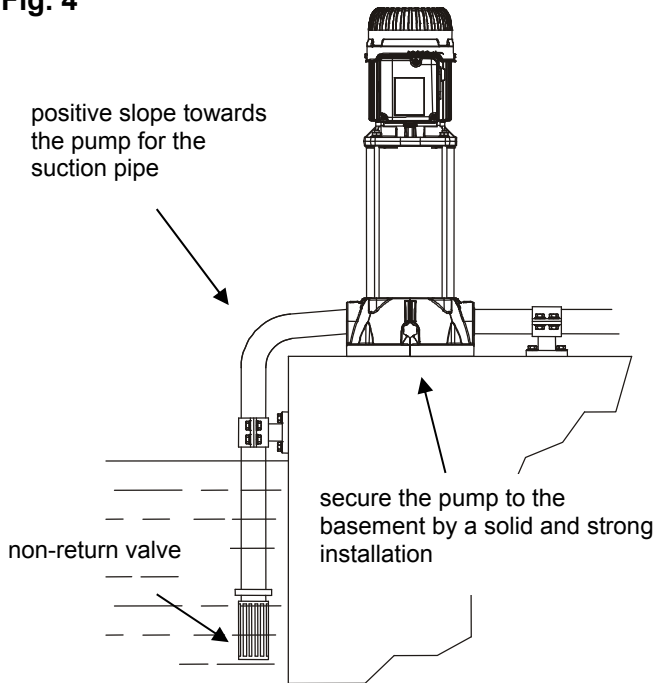


The pumps may contain small quantities of residual water from testing. We advise flushing them briefly with clean water before their final installation.

9.1 Pump installation

- The electropump must be fitted in a well ventilated place and with an environment temperature not exceeding 40°C.
- Electropumps with degree of protection IP55 may be installed in dusty and damp environments, without any specific protection.
- It is always good practice to place the pump as close as possible to the liquid to be pumped.
- The installation baseplate, provided by the customer, if they are metallic they have to be painted rust and corrosion. They have to be flat and stiff enough to resist to short circuit forces and avoid resonance due to vibrations.
- Concrete basements have to be well solid and dry before installing the pumps.
- A firm anchoring of the feet of the pump assembly on the base helps absorb any vibrations created by pump operation.
- The pump may be installed in either horizontal or vertical position, **as long as the motor is always above the pump.**
- Ensure that the metal pipes do not transmit excess force to the pump apertures, so as to avoid causing deformations or breakages.
- Use pipes with a suitable thread to avoid damage to the inserts.
- The internal diameter of the pipes must never be smaller than that of the apertures of the pump
- If the head at intake is negative, it is indispensable to fit a foot valve with suitable characteristics at intake.
- For suction depths of over four metres or with long horizontal stretches it is advisable to use an intake pipe with a diameter larger than that of the intake aperture of the pump.
- Any passage from a pipe with a small diameter to one with a larger diameter must be gradual. The length of the passage cone must be 5 to 7 times the difference in diameter.
- Check accurately to ensure that the joints in the intake pipe do not allow air infiltrations.
- To prevent the formation of air pockets, the intake pipe must slope slightly upwards towards the pump.

Fig. 4

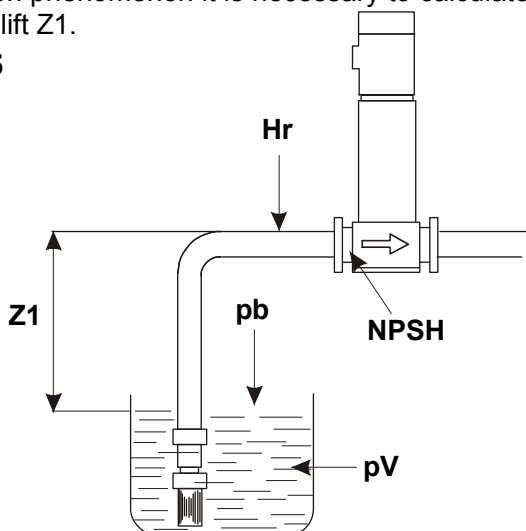


- Interception valves must be fitted upstream and downstream from the pump so as to avoid having to drain the system when carrying out pump maintenance. **Do not run the pump with closed valve on the plant.**
- If there is any possibility of the pump operating with the interception valves closed, provide a by-pass circuit or a drain leading to a liquid recovery tank.
- To reduce noise to a minimum it is advisable to fit vibration-damping couplings on the intake and delivery pipes and between the motor feet and the foundation.
- If more than one pump is installed, each pump must have its own intake pipe. The only exception is the reserve pump (if envisaged).

**9.2 Minimum inlet pressure (Z1)
(negative suction head pump)**

To have good performances of the pump avoiding cavitation phenomenon it is necessary to calculate the suction lift Z1.

Fig. 5



To determine the suction level Z1, the following formula must be applied:

$$Z1 = pb - \text{reqd. N.P.S.H} - Hr - \text{correct pV} - Hs$$

where:

- Z1 =** difference in level in metres between the intake mouth of the pump and the free surface of the liquid to be pumped.
- pb =** barometric pressure in mcw of the place of installation. (chart 1, pag. 132)
- NPSH =** net load at intake of the place of work.
- Hr =** load loss in metres on the whole intake duct.
- pV =** vapour tension in metres of the liquid in relation to the temperature expressed in °C. (chart 2, pag. 133)
- Hs =** safety margin = minimum 0.5 metres head.

If the calculated “Z1” is positive, the pump can operate at a suction lift of maximum “Z1” metres head.

If the calculated “Z1” is negative, than the pump has to be fitted with a positive lift of at least “Z1” mt.

**Ex. : installation at sea level
and fluid at 20°C**

- required N.P.S.H: 3,25 m
- pb : 10,33 mcw (chart 1, pag. 132)
- Hr : 2,04 m.
- t : 20°C
- pV : 0,22 m. (chart 2, pag. 133)
- Z1 : 10,33 – 3,25 – 2,04 – 0,22 – 0,5 = 4,32 approx.**

This means that the pump can operate at a suction lift of maximum 4,32 metres head.

**9.3 Minimum suction pressure
(positive suction head pump)**

It is important to maintain the sum of the inflow pressure and that developed by the pump, the latter with feeder closed, always lower than the maximum pressure rating (PN) permitted by the pump.

$$P1_{max} + P2_{max} \leq PN \text{ (fig.6A)}$$

$$P1_{max} + P2_{max} + P3_{max} \leq PNHP \text{ (fig.6B)}$$

9.4 Minimum nominal capacity

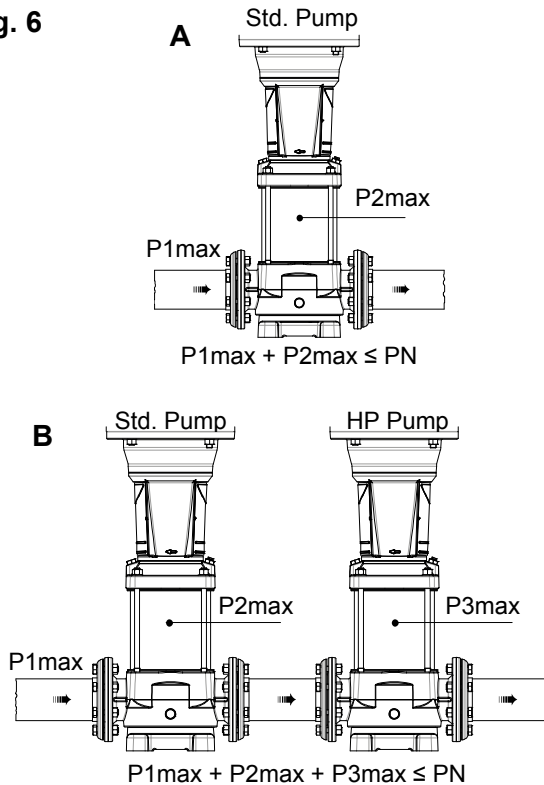
The function of the pump at a lower level than the minimum permitted nominal capacity may cause excessive and detrimental overheating of the pump.

For liquid temperatures higher than 40°C, the minimum capacity should be increased in relation to the temperature of the liquid (see fig. 6A)



The pump must never operate with the delivery valve closed.

Fig. 6



9.5 Electrical connections



**ATTENTION!!
ALWAYS OBSERVE THE SAFETY
REGULATIONS!!**

Electrical installation must be carried out by an authorised, skilled electrician who assumes all responsibility.



**THE SYSTEM MUST BE
CORRECTLY AND SAFELY
EARTHED!!**

Scrupulously follow the wiring diagrams inside the terminal board box and those on table C, pag. 131.

- Ensure that the mains voltage is the same as that shown on the motor data plate.
- The pumps must always be connected to an external switch.
- Three-phase motors must be protected with an automatic switch (e.g. circuit breaker) calibrated at the values shown on the data plate of the electropump.
- In the case of three-phase motors with star-delta start, ensure that the switch-over time from star to delta is as short as possible. (see table B, pag. 130).

In NKV electropumps the terminal board may face in four different positions: slacken and remove the four retaining screws between the motor flange and the support. Turn the motor into the desired position and replace the screws.



9.6 Starting



Before starting the pump and the suction pipe have to be properly primed pump and pipe have to be fully filled with clean water.

Starting NKV



In accordance with accident-prevention regulations, the pump must be run only if the coupling (where provided) is suitably protected. So the pump must be started only after having checked that the coupling protections are correctly fitted.

To obtain priming, proceed as follows:

KVC – KVCX (Fig.7) :

- After having removed the cap, fill the pump slowly through the filling hole so as to discharge any air pockets present inside.

NKV (Fig.8) :

- Before filling the pump through the filling hole **you must first partially unscrew the drainage pin/cap** (when filling just unscrew it by 3 or 4 turns) without forcing it.
- After having removed the cap, fill the pump slowly through the filling hole so as to discharge any air pockets present inside.
- Before starting the pump, close the filling cap and screw the drainage pin/cap all the way, without forcing it.
- Vent by means of the screw on the part opposite the filling cap, as indicated in Fig. 8.
- Fully open the gate valve on intake and keep the one on delivery almost closed.
- Switch on and check that the direction of rotation is correct, as indicated in Fig. 2. If not, invert any two phase leads, after having disconnected the pump from the power mains.
- Once the hydraulic circuit has been completely filled with liquid, gradually open the delivery gate valve until its maximum opening.
- With the pump running, check the supply voltage at the motor terminals, which must not differ from the rated value by +/- 5%.
- With the unit at regular running speed, check that the current absorbed by the motor does not exceed the value on the data plate.

Fig. 7 KVC - KVCX

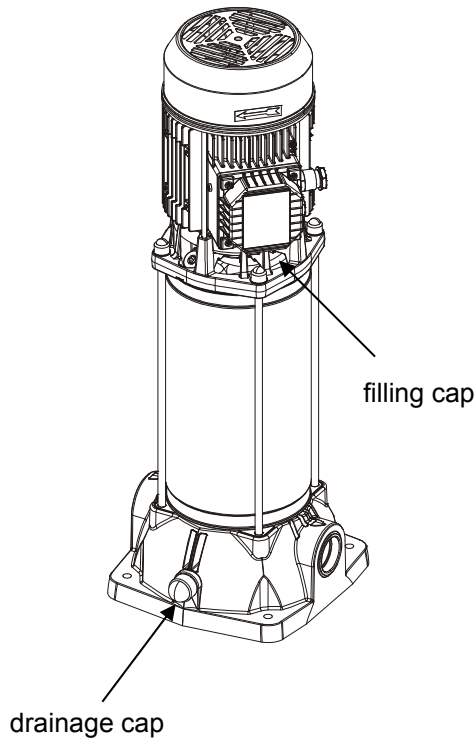
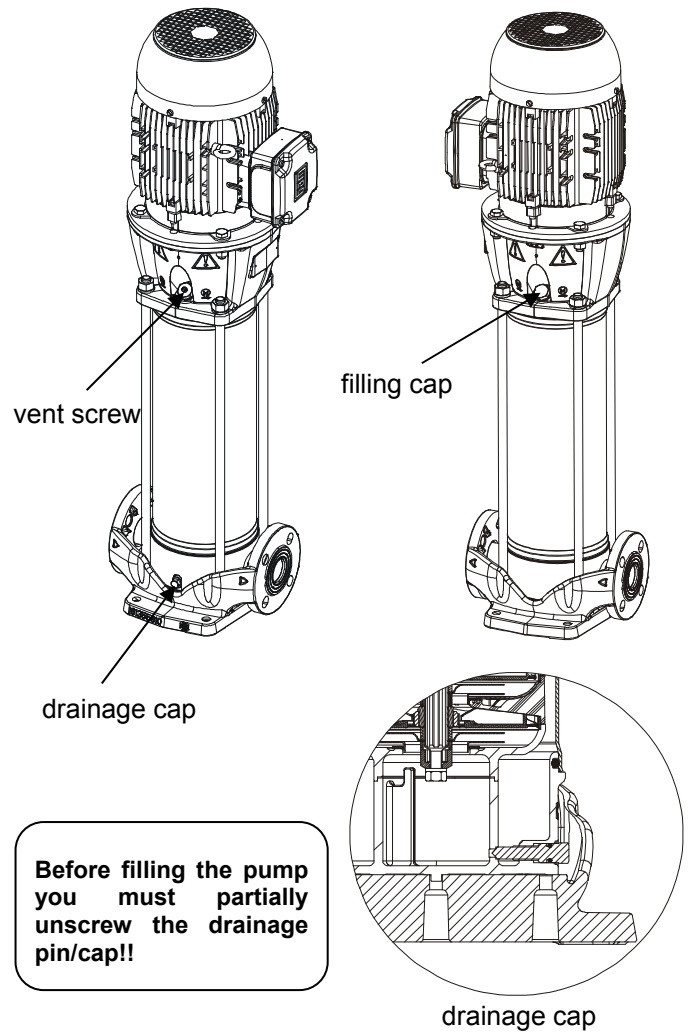


Fig. 8 NKV



9.7 Stopping

Close the interception device on the delivery pipe. If there is a check device on the delivery pipe, the interception valve on the delivery side may remain open as long as there is back.

For a long period of inactivity, close the interception device on the intake pipe and, if supplied, all the auxiliary control connections.

9.8 Precautions

- The electropump should not be started an excessive number of times in one hour. The maximum admissible value is as follows:

Type of pump	Maximum number of starts per hours
KVC - KVCX	30
NKV 10	10 ÷ 15
NKV 15 - NKV 20 NKV 32 - NKV 45 NKV 65 - NKV 95	5 ÷ 10

- When the pump remains inactive for a long time at temperatures of less than 0°C, the pump body must be completely emptied through the drain cap.



Check that the leakage of liquid does not damage persons or things, especially in plants that use hot water.

- It is recommended to empty the pump when it is not running for a long time at normal temperature.
- The drain plug shall be opened until the pump will be utilized again.
- When restarting after long periods of inactivity it is necessary to repeat the operations described above in the paragraphs **WARNINGS** and **STARTING UP**.

10. MAINTENANCE

- In normal operating conditions the electropump does not require any kind of maintenance.
- It is recommended to check time by time current absorption, pressure head at closed valve and maximum flow.
- **The electropump can only be dismantled by specialised, skilled personnel in possession of the qualifications required by the specific regulations.**

- In any case all repair and maintenance jobs must be carried out only **after having disconnected the pump from the power mains.**



If the liquid has to be drained out maintenance, ensure that the liquid coming out cannot harm persons or things, especially in using hot water. The legal requirements on the disposal of any harmful fluids must also be complied with.

10.1 Modifications and spare parts

Any modification not authorised beforehand relieves the manufacturer of all responsibility. All the spare parts must be authentic and all the accessories must be authorised by the manufacturer.



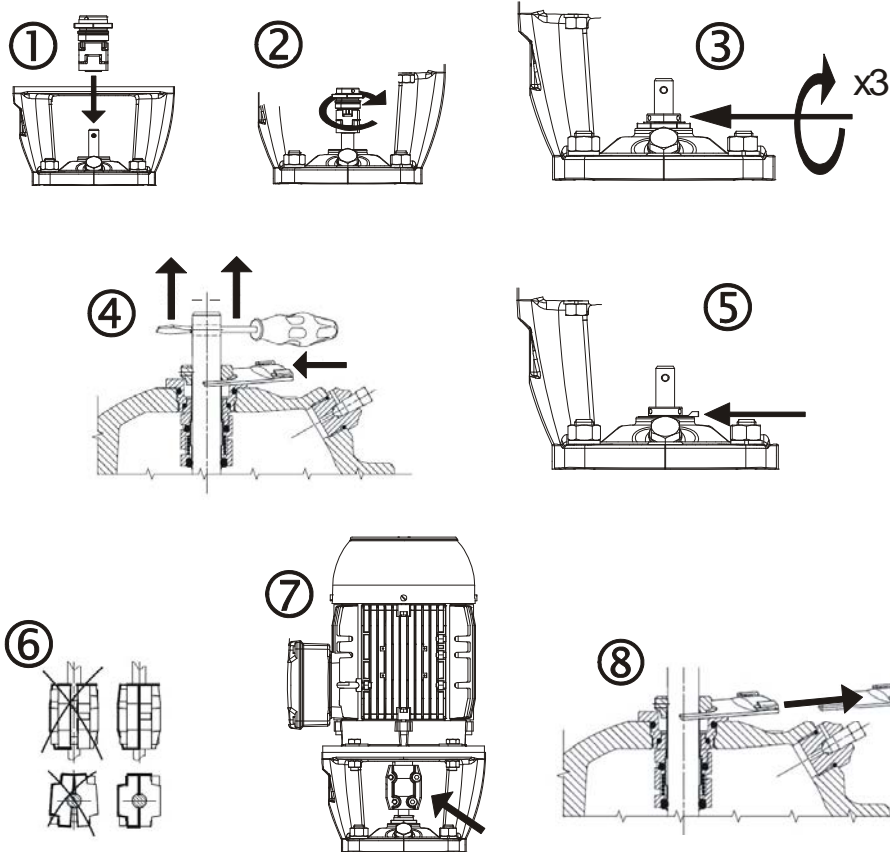
Carry out maintenance based on the type of bearing indicated on the technical data plate.

11. TROUBLESHOOTING

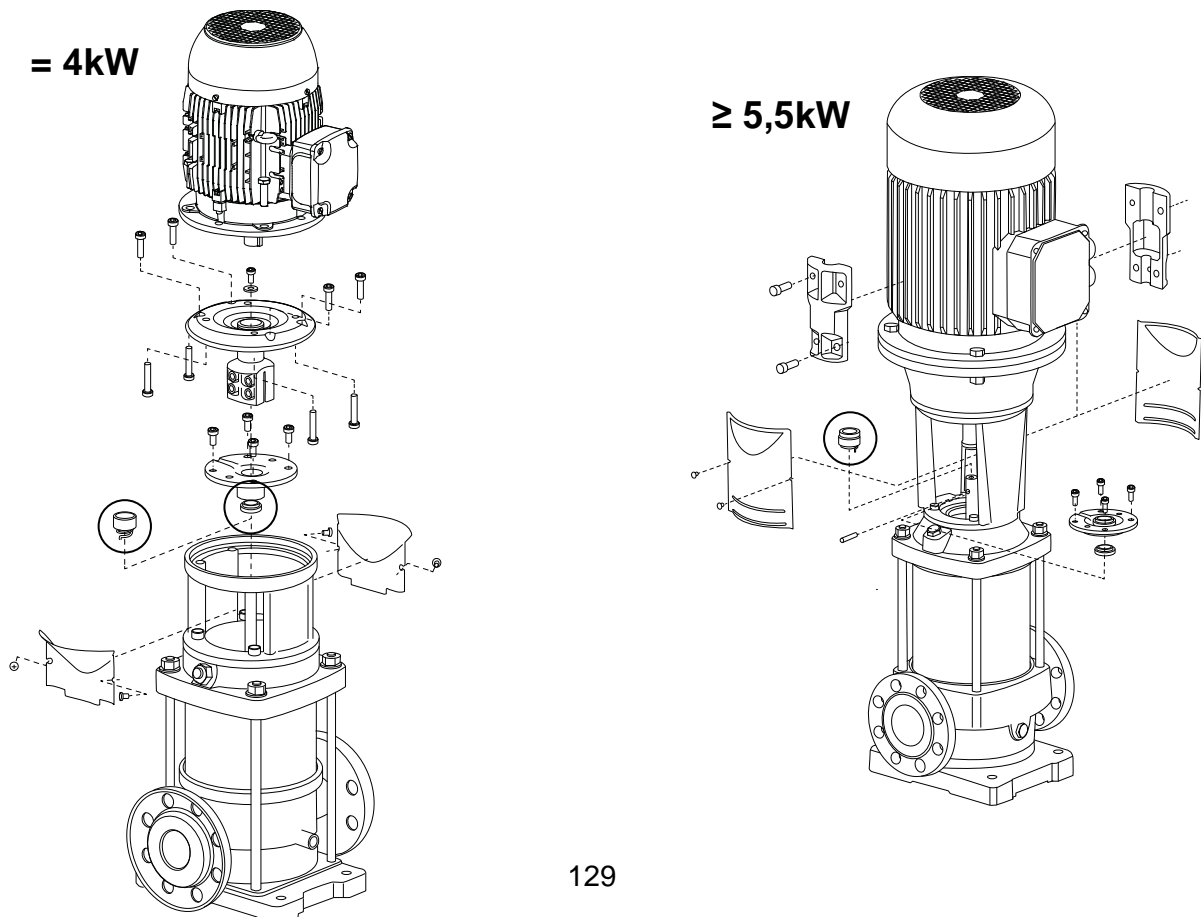
Fault	Check (possible cause)	Remedy
The motor does not start and makes no noise.	- Check the protection fuses.	If they are burnt-out, change them.
	- Check the electric connections.	Correct any errors.
	- Check that the motor is live.	
	- Motor protector cut-off the motor, for the single-phased motors, due to over heating of tag windings.	Wait for automatic reset of the motor protector once the temperature has fallen below the maximum limit.
The motor does not start but makes noise.	- Check that supply voltage correspond with voltage on the pump label.	
	- Check the electrical connections.	Correct any errors.
	- Check that all the phases are present.	Restore the missing phase.
	- Check for obstructions in the pump or motor.	Remove any obstructions.
The motor turns with difficulty.	- Verify that supply voltage is at an acceptable value.	
	- Check whether any moving parts are scraping against fixed parts.	Eliminate the cause of the scraping.
	- Check the state of the bearings.	Change any worn bearings.
The (external) motor protection trips immediately after starting.	- Check that all the phases are present.	Restore the missing phase.
	- Look for possible open or dirty contacts in the protection.	Change or clean the component concerned.
	- Look for possible faulty insulation of the motor, checking the phase resistance and insulation to earth.	Change the motor casing with the stator or reset any cables discharging to earth.
The motor protection trips too frequently.	- Ensure that the environment temperature is not too high.	Provide suitable ventilation in the environment where the pump is installed.
	- Check the calibration of the protection.	Calibrate at a current value suitable for the motor absorption at full load.
	- Check the state of the bearings.	Change any worn bearings.
	- Check the motor rotation speed.	

Fault	Check (possible cause)	Remedy
The pump does not deliver.	– Check priming.	
	– On three-phase motors, check that the direction of rotation is correct.	Invert the connection of two supply wires.
	– Difference in suction level too high.	
	– The diameter of the intake pipe is insufficient or the horizontal stretch is too long.	Replace the intake pipe with one with a larger diameter.
The pump does not prime.	– Foot valve or intake pipe blocked.	Clean the foot valve and the intake pipe.
	– The intake pipe or the foot valve is taking in air.	Check the suction pipe, repeat the priming operations.
The pump supplies insufficient flow.	– Check the slope of the suction pipe.	Correct the inclination of the intake pipe.
	– Foot valve or impeller blocked.	Remove clog. Replace the impeller if worn down.
	– The diameter of the intake pipe is insufficient.	Replace the pipe with one with a larger diameter.
The pump flow rate is not constant.	– Check that the direction of rotation is correct.	Invert the connection of two supply wires.
	– Intake pressure too low.	
The pump turns in the opposite direction when switching off.	– Intake pipe or pump partly blocked by impurities.	Remove clog.
	– Leakage in the intake pipe.	
The pump vibrates and operates noisily.	– Foot valve or check valve faulty or blocked in partly open position.	Repair or replace the faulty valve.
	– Check that the pump and/or the pipes are firmly anchored.	
	– There is cavitation in the pump.	Reduce the intake height or check for load losses.
	– The pump is running above its plate characteristics.	Reduce the flow rate.
	– The pump is not turning freely.	Check the state of wear of the bearings.

NKV 10-15-20 Mechanical Seal Maintenance



NKV 32-45-65-95 Mechanical Seal Maintenance



Rumore aereo prodotto dalle pompe dotate con motore di serie
Bruit aérien produit par les pompes équipées d'un moteur de série
Airborne noise produced by the pumps with standard motor
Geräuschemission der Pumpe mit serienmäßigem Motor
Luchtgeluid geproduceerd door pompen met standaard motoren
Ruido aéreo producido por las bombas provistas de motor de serie
Luftburet buller från pumpar med standardmotor
Εναέριος θόρυβος από τις αντλίες με στάνταρτ κινητήρα
Standart üretim motorlar ile donatılmış pompaların çıkardığı gürültü
Hluk vyprodukovaný čerpadlymi vybavenými sériovým motorom
Воздушный шум, производимый насосами с серийным двигателем
Zgomot aerian produs de pompele dotate cu motor de serie
Hałas wytwarzany przez pompę wyposażoną w silnik seryjny
ضجيج هوائي ناتج عن المضخات المزودة بمحرك اعتيادي
Széria jellegű motorral szerelt szivattyúk zajszintje
Ниво на шум на помпи със стандартен мотор

TAB. A

KVC - KVCX

Motor	Lpa [dB(A)]	Lwa [dB(A)]
MEC 71	72,2	75,2
MEC 80	74,3	77,3

NKV

Motor	Power kW	Lpa [dB(A)]
MEC 80S	0,75	62
MEC 80M	1,1	62
MEC 90S	1,5	67
MEC 90L	2,2	67
MEC 100L	3	66
MEC 112M	4	69
MEC 132S	5,5	71
MEC 132S	7,5	71
MEC 160M	11	73
MEC 160M	15	73
MEC 160L	18,5	73
MEC 180M	22	75
MEC 200 L	30	76
MEC 200 L	37	76
MEC 225 M	45	76

Tempi commutazione stella-triangolo / Temps de commutation étoile/triangle
Star-delta switch-over times / Umschaltzeiten Stern-Dreieck
Ster-driehoek schakeltijden / Tiempos de conmutación estrella-triángulo
Omkopplingstider stjärna/triangel / Χρόνοι μεταγωγής αστέρα-τριγώνου
Yıldız-üçgen komütasyon süreleri / Časy komutácie hviezda-trojuholník
Время переключения со звезды на треугольник / Timpi de comutare stea-triunghi
Czas komutacji gwiazda-trójkąt / أزمان التحويل نجمة - مثلث / Csillag-delta átkapcsolási idő
Време за превключване звезда-триъгълник

TAB. B

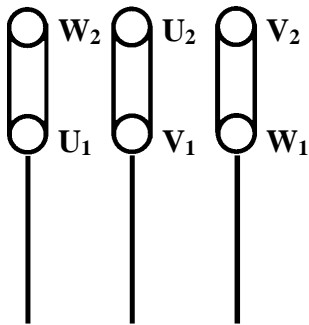
Motor		λ//Δ
(kW)	(Hp)	
≤ 30	≤ 40	< 3"
> 30	> 40	< 5"

Collegamento TRIFASE per motori
Connexion TRIPHASÉE pour moteurs
THREE-PHASE motor connection
DREIPHASEN-Anschluss für Motoren
DRIEFASE aansluiting voor motoren
Conexión trifásica para motores
TREFASANSLOTNING för motorer
ΤΡΙΦΑΣΙΚΗ σύνδεση κινητήρων
Motorlar için TRİFAZ bağlantı
TROJFÁZOVÉ zapojenie motorov
ТРЕХФАЗНОЕ соединение двигателей
Racordare TRIFAZATĂ pentru motoare
Połączenie TRÓJFAZOWE dla silników
 ربط ثلاثي الطور للمحركات
Motorok háromfázisú bekötése
Свързване на 3-фазен мотор

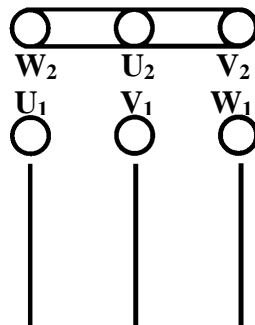
TAB. C

3 ~ 230/400 V

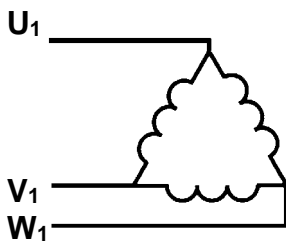
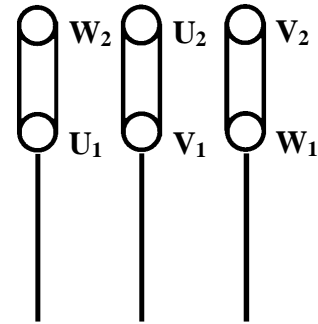
3 ~ 400 Δ V



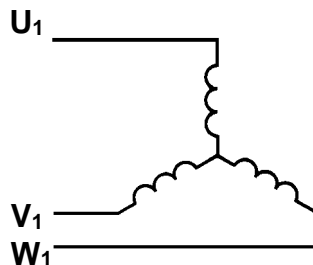
230V



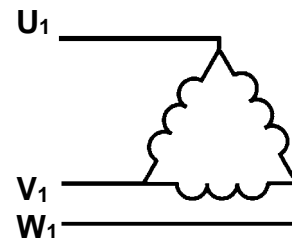
400V



Δ



Y



Δ

Grafico 1 : Pressione Barometrica (pb)
 Graphique 1 : Pression Barométrique (pb)
 Chart 1 : Barometric Pressure (pb)
 Grafik 1 : Barometrischer Druck (pb)
 Grafiek 1 : Barometerdruk (pb)
 Gráfico 1 : Presión Barométrica (pb)
 Diagram 1: Barometertryck (pb)
 Διάγραμμα 1 : Βαρομετρική πίεση (pb)
 Grafik 1 : Barometrik basınç (pb)
 Graf 1 : Barometrický tlak (pb)
 График 1 : Барометрическое давление (pb)
 Graficul 1 : Presiune Barometrică (pb)
 Rysunek 1 : Ciśnienie barometryczne (pb)

رسم بیان ۱: ضغط بارومتري (Pb)

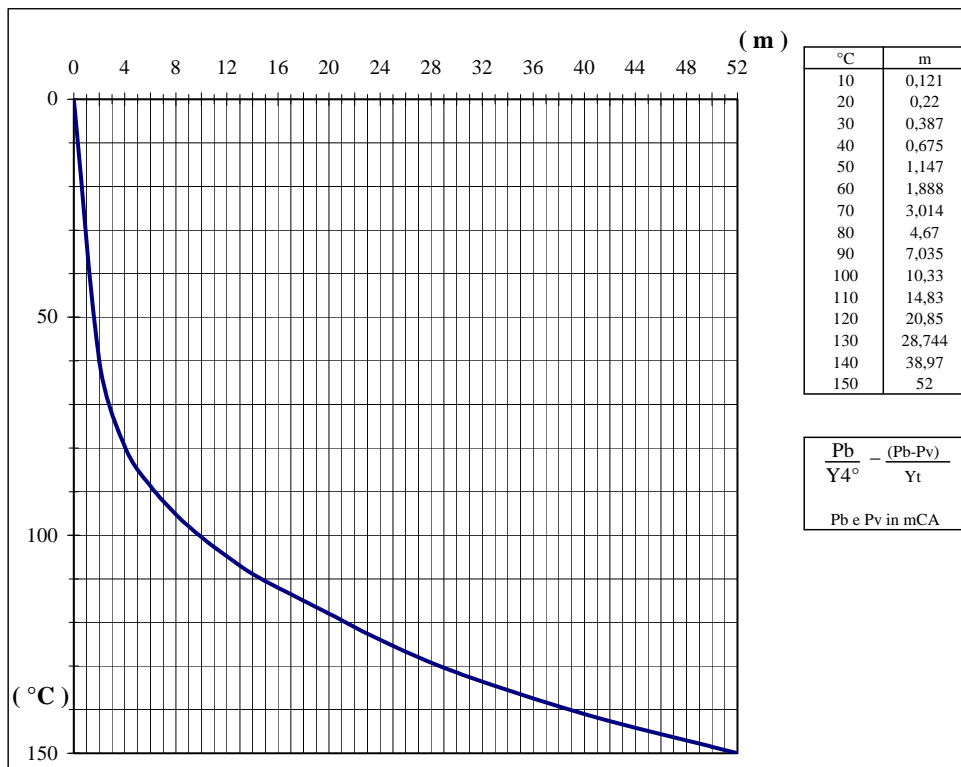
1.grafikon : Barometrikus nyomás (pb)
 диаграма 1 : Барометрично налягане (pb)



Grafico 2 : Tensione di vapore (pV)
Graphique 2 : Pression de vapeur (pV)
Chart 2 : Vapour Tension (pV)
Grafik 2 : Dampfspannung (pV)
Grafiek 2 : Dampspanning (pV)
Gráfico 2 : Tensión de vapor (pV)
Diagram 2: Ångspänning (pV)
Διάγραμμα 2 : Τάση ατμών (pV)
Grafik 2 : Buhar gerilimi (pV)
Graf 2 : Tenzia pary (pV)
График 2 : Напряжение пара (pV)
Graficul 2 : Tensiune de abur (pV)
Rysunek 2 : Prężność pary (pV)

رسم بیان ۲: جهد البخار (Pv)

2.grafikon : Gőzfeszültség (pV)
диаграма 2 : Усилие от парите (pV)



Modello / Modèle / Model Modell / Model Modelo / Modell / Model Modell / Model / نموذج / Modell / Model	Prevalenza / Hauteur d'élévation / Head up Förderhöhe / Overwicht / Prevalencia Maximal pumphöjd / Manometrik yükseklik Напор / Прężność pary (pV) / التفتوق / Emelési magasság / Напор	
	Hmax (m.) 2 poles 50 Hz	Hmax (m.) 2 poles 60 Hz
KVC 15/30 – 15/306	22.4	23
KVC 25/30 – 25/306	33.9	35
KVC 35/30 – 35/306	45.6	46
KVC 45/30 – 45/306	56.6	58
KVC 50/30 – 50/306	69.8	71
KVC 60/30 – 60/306	82	85
KVC 65/30 – 65/306	95	--
KVC 20/50 – 20/506	27.4	25
KVC 30/50 – 30/506	41.1	37
KVC 40/50 – 40/506	54.9	50
KVC 55/50 – 55/506	68.6	65
KVC 65/50 – 65/506	82.3	78
KVC 75/50 – 75/506	96	91
KVC 15/80 – 15/806	22.8	23
KVC 20/80 – 20/806	34.6	34
KVC 30/80 – 30/806	46.6	47
KVC 40/80 – 40/806	58.8	59
KVC 45/80 – 45/806	71.3	70
KVC 55/80 – 55/806	84	82
KVC 65/80 – 65/806	97	94
KVC 25/120 – 25/1206	30.4	29
KVC 35/120 – 35/1206	46.2	45
KVC 45/120 – 45/1206	62.4	61
KVC 60/120 – 60/1206	78	76
KVC 70/120 – 70/1206	95	92
KVC 85/120 – 85/1206	112.7	--
KVCX 15/30 – 15/306	22.4	23
KVCX 25/30 – 25/306	33.9	35
KVCX 35/30 – 35/306	45.6	46
KVCX 45/30 – 45/306	56.6	58
KVCX 50/30 – 50/306	69.8	71
KVCX 60/30 – 60/306	82	85
KVCX 65/30 – 65/306	95	--
KVCX 20/50 – 20/506	27.4	25
KVCX 30/50 – 30/506	41.1	37
KVCX 40/50 – 40/506	54.9	50
KVCX 55/50 – 55/506	68.6	65
KVCX 65/50 – 65/506	82.3	78
KVCX 75/50 – 75/506	96	91
KVCX 15/80 – 15/806	22.8	23
KVCX 20/80 – 20/806	34.6	34
KVCX 30/80 – 30/806	46.6	47
KVCX 40/80 – 40/806	58.8	59

Modello / Modèle / Model Modell / Model Modelo / Modell / Model Модель / Model / نموذج / Modell / Model	Prevalenza / Hauteur d'élévation / Head up Förderhöhe / Overwicht / Prevalencia Maximal pumphöjd / Manometrik yükseklik Напор / Prężność pary (pV) / التفوق / Emelési magasság / Напор	
	<i>Hmax (m.) 2 poles 50 Hz</i>	<i>Hmax (m.) 2 poles 60 Hz</i>
KVCX 45/80 – 45/806	71.3	70
KVCX 55/80 – 55/806	84	82
KVCX 65/80 – 65/806	97	94
KVCX 25/120 – 25/1206	30.4	29
KVCX 35/120 – 35/1206	46.2	45
KVCX 45/120 – 45/1206	62.4	61
KVCX 60/120 – 60/1206	78	76
KVCX 70/120 – 70/1206	95	92
KVCX 85/120 – 85/1206	112.7	--
NKV 10/2	20	29
NKV 10/3	31	44
NKV 10/4	41	59
NKV 10/5	51	73
NKV 10/6	61	87
NKV 10/7	72	106
NKV 10/8	82	119
NKV 10/9	92	132
NKV 10/10	102	148
NKV 10/12	123	176
NKV 10/14	143	209
NKV 10/16	164	242
NKV 10/17	--	253
NKV 10/18	184	--
NKV 10/20	205	--
NKV 10/22	225	--
NKV 15/2	26	38
NKV 15/3	40	56
NKV 15/4	53	75
NKV 15/5	66	97
NKV 15/6	79	113
NKV 15/7	92	133
NKV 15/8	106	154
NKV 15/9	119	172
NKV 15/10	132	195
NKV 15/12	158	231
NKV 15/14	185	--
NKV 15/16	211	--
NKV 15/17	225	--
NKV 20/2	28.6	39
NKV 20/3	42.9	59
NKV 20/4	57.2	80
NKV 20/5	71.5	101

Modello / Modèle / Model Modell / Model Modelo / Modell / Model Модель / Model / نموذج / Modell / Model	Prevalenza / Hauteur d'élévation / Head up Förderhöhe / Overwicht / Prevalencia Maximal pumphöjd / Manometrik yükseklik Напор / Прężność pary (pV) / التفتوق / Emelési magasság / Напор	
	<i>Hmax (m.) 2 poles 50 Hz</i>	<i>Hmax (m.) 2 poles 60 Hz</i>
NKV 20/6	85.8	120
NKV 20/7	100.1	141
NKV 20/8	114.4	162
NKV 20/9	128.8	--
NKV 20/10	143.1	202
NKV 20/12	171.7	--
NKV 20/14	200.3	--
NKV 20/16	228.9	--
NKV 20/17	243.2	--
NKV 32/2-2	36	
NKV 32/2	48,5	
NKV 32/3-2	60	
NKV 32/3	73	
NKV 32/4-2	84,5	
NKV 32/4	98	
NKV 32/5-2	109,5	
NKV 32/5	122,5	
NKV 32/6-2	134	
NKV 32/6	146,5	
NKV 32/7-2	158	
NKV 32/7	171	
NKV 32/8-2	182,5	
NKV 32/8	194,5	
NKV 32/9-2	208,5	
NKV 32/9	221	
NKV 32/10-2	233	
NKV 32/10	246,5	
NKV 32/11-2	258	
NKV 32/11	271	
NKV 32/12-2	282,5	
NKV 32/12	295	
NKV 32/13-2	307	
NKV 32/13	319,5	
NKV 45/2-2	38,5	
NKV 45/2	48,5	
NKV 45/3-2	63	
NKV 45/3	73,5	
NKV 45/4-2	87,5	
NKV 45/4	97,5	
NKV 45/5-2	112	
NKV 45/5	122	
NKV 45/6-2	137,5	
NKV 45/6	147,5	

Modello / Modèle / Model Modell / Model Modelo / Modell / Model Модель / Model / نموذج / Modell / Model	Prevalenza / Hauteur d'élévation / Head up Förderhöhe / Overwicht / Prevalencia Maximal pumphöjd / Manometrik yükseklik Наноп / Prężność pary (pV) / التفوق / Emelési magasság / Наноп	
	<i>Hmax (m.) 2 poles</i> <i>50 Hz</i>	<i>Hmax (m.) 2 poles</i> <i>60 Hz</i>
NKV 45/7-2	162,5	
NKV 45/7	172,5	
NKV 45/8-2	187	
NKV 45/8	197	
NKV 45/9-2	211,5	
NKV 45/9	221,5	
NKV 45/10-2	235,5	
NKV 45/10	246	
NKV 45/11-2	261	
NKV 45/11	271	
NKV 45/12-2	285,5	
NKV 45/12	295,5	
NKV 45/13-2	309,5	
NKV 32/26-2		52
NKV 32/26		71
NKV 32/36-2		88
NKV 32/36		106
NKV 32/46-2		123
NKV 32/46		141
NKV 32/56-2		158
NKV 32/56		176
NKV 32/66-2		193
NKV 32/66		213
NKV 32/76-2		230,5
NKV 32/76		248,5
NKV 32/86-2		265,5
NKV 32/86		284
NKV 45/26-2		56
NKV 45/26		70,5
NKV 45/36-2		91,5
NKV 45/36		106
NKV 45/46-2		126
NKV 45/46		142,5
NKV 45/56-2		163
NKV 45/56		178
NKV 45/66-2		198,5
NKV 45/66		213
NKV 45/76-2		234
NKV 45/76		249
NKV 65/2-2	39	57

Modello / Modèle / Model Modell / Model Modelo / Modell / Model Модель / Model / نموذج / Modell / Модел	Prevalenza / Hauteur d'élévation / Head up Förderhöhe / Overwicht / Prevalencia Maximal pumphöjd / Manometrik yükseklik Напор / Прężność pary (pV) / التفتوق / Emelési magasság / Напор	
	<i>Hmax (m.) 2 poles</i> 50 Hz	<i>Hmax (m.) 2 poles</i> 60 Hz
KVCE 35/30	45.6	
KVCE 45/30	56.6	
KVCE 50/30	69.8	
KVCE 60/30	82	
KVCE 65/30	95	
KVCE 30/50	41.1	
KVCE 40/50	54.9	
KVCE 55/50	68.6	
KVCE 65/50	82.3	
KVCE 75/50	96	
KVCE 30/80	46.6	
KVCE 40/80	58.8	
KVCE 45/80	71.3	
KVCE 55/80	84	
KVCE 65/80	97	
KVCE 35/120	46.2	
KVCE 45/120	62.4	
KVCE 60/120	78	
KVCE 70/120	95	
KVCE 85/120	112.7	
NKVE 10/2	20	
NKVE 10/3	31	
NKVE 10/4	41	
NKVE 10/5	51	
NKVE 10/6	61	
NKVE 10/7	72	
NKVE 10/8	82	
NKVE 10/9	92	
NKVE 10/10	102	
NKVE 10/12	123	
NKVE 10/14	143	
NKVE 10/16	164	
NKVE 10/18	184	
NKVE 10/20	205	
NKVE 10/22	225	
NKVE 15/2	26	
NKVE 15/3	40	
NKVE 15/4	53	
NKVE 15/5	66	
NKVE 15/6	79	
NKVE 15/7	92	
NKVE 15/8	106	

Modello / Modèle / Model Modell / Model Modelo / Modell / Model Model / Modell / Model Модель / Model / نموذج / Modell / Model	Prevalenza / Hauteur d'élévation / Head up Förderhöhe / Overwicht / Prevalencia Maximal pumphöjd / Manometrik yükseklik Напор / Прężność pary (pV) / التفوق / Emelési magasság / Hanop	
	<i>Hmax (m.) 2 poles 50 Hz</i>	<i>Hmax (m.) 2 poles 60 Hz</i>
NKVE 15/9	119	
NKVE 15/10	132	
NKVE 15/12	158	
NKVE 15/14	185	
NKVE 15/16	211	
NKVE 15/17	225	
NKVE 20/2	28.6	
NKVE 20/3	42.9	
NKVE 20/4	57.2	
NKVE 20/5	71.5	
NKVE 20/6	85.8	
NKVE 20/7	100.1	
NKVE 20/8	114.4	
NKVE 20/9	128.8	
NKVE 20/10	143.1	
NKVE 20/12	171.7	
NKVE 20/14	200.3	
NKVE 32/2	48,5	
NKVE 32/3-2	60	
NKVE 32/3	73	
NKVE 32/4	98	
NKVE 32/5-2	109,5	
NKVE 32/5	122,5	
NKVE 32/6	146,5	
NKVE 32/7-2	158	
NKVE 45/2-2	38,5	
NKVE 45/2	48,5	
NKVE 45/3	73,5	
NKVE 45/4	97,5	
NKVE 65/2-2	39	
NKVE 65/2	56,5	
NKVE 65/3-2	67,5	
NKVE 95/2-2	44,5	
NKVE 95/2	62	