LOWARA

ESHE

ESHS

Applicare qui il codice a barre

Apply the adhesive bar code nameplate here

cod. 001080078 rev. A ed. 03/2016/KPA/0820

7.8 La pompa funziona, ma la portata è scarsa o nulla

Causa	Soluzione
Presenza di aria nella pompa o nelle tubazioni.	• Spurgare l'aria
La pompa non è adescata correttamente.	Arrestare la pompa e ripetere la procedura di adescamento. Se il problema persiste: • Verificare che la tenuta meccanica non perda. • Verificare la perfetta tenuta della tubazione di aspirazione • Sostituire eventuali valvole che perdono.
Lo strozzamento in mandata è eccessivo.	Aprire la valvola.
Le valvole sono bloccate in posizione chiusa o parzialmente chiusa.	Smontare e pulire le valvole.
La pompa è ostruita.	Rivolgersi al rappresentante di vendita e assistenza di zona.
I tubi sono ostruiti.	Controllare e pulire i tubi.
Il senso di rotazione della girante è errato .	Cambiare la posizione di due delle fasi sulla morsettiera del motore o nel quadro elettrico di comando.
L'aspirazione soprabattente è eccessiva o la perdita di carico nei tubi di aspirazione è eccessiva.	Verificare le condizioni di esercizio della pompa. Se necessario, procedere come segue: • Diminuire il dislivello • Aumentare il diametro del tubo di aspirazione

7.9 L'elettropompa si ferma e poi ruota nel senso sbagliato

Causa	Soluzione
Presenza di una perdita in uno o entrambi i seguenti componenti: • Il tubo di aspirazione • La valvola di fondo o la check valvola di ritegno	Riparare o sostituire i componenti guasti.
È presente dell'aria nel tubo di aspirazione.	Spurgare l'aria

7.10 La pompa si avvia troppo frequentemente.

Causa	Soluzione
Presenza di una perdita in uno o entrambi i seguenti componenti: • Il tubo di aspirazione • La valvola di fondo o la check valvola di ritegno	Riparare o sostituire i componenti guasti.
Autoclave con la membrana rotta o privo di precarica d'aria.	Vedere le apposite istruzioni nel manuale dell'autoclave.

7.11 La pompa vibra e genera troppo rumore

Causa	Soluzione
Pompa in cavitazione	Ridurre la portata richiesta chiudendo parzialmente la valvola di intercettazione a valle della pompa. Se il problema persiste verificare le condizioni di esercizio della pompa (dislivelli, perdite di carico, temperatura del liquido, ecc...)
I cuscinetti del motore sono usurati.	Rivolgersi al rappresentante di vendita e assistenza di zona.
Presenza di corpi estranei all'interno della pompa.	Rivolgersi al rappresentante di vendita e assistenza di zona.
Il girante striscia contro l'anello di usura	Rivolgersi al rappresentante di vendita e assistenza di zona.

Per ogni situazione non contemplata, fare riferimento al rappresentante di vendita e assistenza di zona.

1 Introduction and Safety

1.1 Introduction

Purpose of this manual

The purpose of this manual is to provide necessary information for:

- Installation
- Operation
- Maintenance

CAUTION:

Read this manual carefully before installing and using the product. Improper use of the product can cause personal injury and damage to property, and may void the warranty.

NOTICE:

Save this manual for future reference, and keep it readily available at the location of the unit.

1.1.1 Inexperienced users

WARNING:

This product is intended to be operated by qualified personnel only.

Be aware of the following precautions:

- This product is not to be used by anyone with physical or mental disabilities, or anyone without the relevant experience and knowledge, unless they have received instructions on using the equipment and on the associated risks or are supervised by a responsible person.
- Children must be supervised to ensure that they do not play on or around the product.

1.2 Safety terminology and symbols

About safety messages

It is extremely important that you read, understand, and follow the safety messages and regulations carefully before handling the product. They are published to help prevent these hazards:

- Personal accidents and health problems
- Damage to the product and its surroundings
- Product malfunction

Hazard levels

Hazard level	Indication
 **DANGER:**	A hazardous situation which, if not avoided, will result in death or serious injury
 **WARNING:**	A hazardous situation which, if not avoided, could result in death or serious injury
 **CAUTION:**	A hazardous situation which, if not avoided, could result in minor or moderate injury
NOTICE:	Notices are used when there is a risk of equipment damage or decreased performance, but not personal injury.

Special symbols

Some hazard categories have specific symbols, as shown in the following table.

Electrical hazard	Magnetic fields hazard
 **Electrical Hazard:**	 **CAUTION:**

Hot surface hazard

Hot surface hazards are indicated by a specific symbol that replaces the typical hazard level symbols:

CAUTION:

Description of user and installer symbols

	Specific information for personnel in charge of installing the product in the system (plumbing and/or electrical aspects) or in charge of maintenance.
	Specific information for users of the product.

Instructions

The instructions and warnings that are provided in this manual concern the standard version, as described in the sales document. Special version pumps may be supplied with supplementary instruction leaflets. Refer to sales contract for any modifications or special version characteristics. For instructions, situations, or events that is not considered in this manual or the sales document, contact the nearest Service Center.

1.3 Disposal of packaging and product

Observe the local regulations and codes in force regarding sorted waste disposal.

1.4 Warranty

For information about warranty, see the sales contract.

1.5 Spare parts

WARNING:

Only use original spare parts to replace any worn or faulty components. The use of unsuitable spare parts may cause malfunctions, damage, and injuries as well as void the guarantee.

CAUTION:

Always specify the exact product type and part number when requesting technical information or spare parts from the Sales and Service Department.

For more information about the product's spare parts, visit sales network's website.

1.6 DECLARATIONS OF CONFORMITY

1.6.1 EC Declaration of Conformity (Original)

Xylem Service Italia S.r.l., with headquarters in Via Vittorio Lombardi 14 - 36075 Montecchio Maggiore VI - Italy, hereby declares that the product:

Electric pump unit (see label on first page)

fulfills the relevant provisions of the following European directives:

- Machinery 2006/42/EC (ANNEX II - natural or legal person authorised to compile the technical file: Xylem Service Italia S.r.l.)
- Eco-design 2009/125/EC, Regulation (EC) No 640/2009 & Regulation (EU) No 4/2014 (Motor 3 ~, 50 Hz, PN ≥ 0,75 kW) if IE2 or IE3 marked, Regulation (EU) No 547/2012 (Water pump) if MEI marked

and the following technical standards

- EN ISO 12100:2010, EN 809:1998+A1:2009, EN 60204-1:2006+A1:2009
- EN 60034-30:2009, EN 60034-30-1:2014

Montecchio Maggiore, 11.03.2016
Amedeo Valente
(Director of Engineering and R&D)
rev.01

1.6.2 EU Declaration of Conformity (No EMCD02)

1. Apparatus model/Product:
   see label on first page
2. Name and address of the manufacturer:
   Xylem Service Italia S.r.l.
   Via Vittorio Lombardi 14
   36075 Montecchio Maggiore VI
   Italy
3. This declaration of conformity is issued under the sole responsibility of the manufacturer.
4. Object of the declaration:
   electric pump
5. The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:
   Directive 2014/30/EU of 26 February 2014 (electromagnetic compatibility)
6. References to the relevant harmonised standards used or references to the other technical specifications, in relation to which conformity is declared:
   EN 61000-6-1:2007, EN 61000-6-3:2007 +A1:2011
7. Notified body: -
8. Additional information: -

Signed for and on behalf of:
Xylem Service Italia S.r.l.

Montecchio Maggiore, 11.03.2016
Amedeo Valente
(Director of Engineering and R&D)
rev.01

Lowara is a trademark of Xylem Inc. or one of its subsidiaries.

2 Transportation and Storage

2.1 Inspect the delivery

1. Check the outside of the package for evident signs of damage.
2. Notify our distributor within eight days of the delivery date, if the product bears visible signs of damage.

Unpack the unit

1. Follow applicable step:
   – If the unit is packed in a carton, then remove the staples and open the carton.
   – If the unit is packed in a wooden crate, then open the cover while paying attention to the nails and straps.
2. Remove the securing screws or the straps from the wooden base.

2.1.1 Inspect the unit

1. Remove packing materials from the product.
   Dispose of all packing materials in accordance with local regulations.
2. Inspect the product to determine if any parts have been damaged or are missing.
3. If applicable, unfasten the product by removing any screws, bolts, or straps.
   For your personal safety, be careful when you handle nails and straps.
4. Contact the local sales representative if there is any issue.

2.2 Transportation guidelines

Precautions

WARNING:
- Observe accident prevention regulations in force.
- Crush hazard. The unit and the components can be heavy. Use proper lifting methods and wear steel-toed shoes at all times.

Check the gross weight that is indicated on the package in order to select proper lifting equipment.

Position and fastening

The pump or pump unit can be transported only horizontally. Make sure that the pump or pump unit is securely fastened during transportation and cannot roll or fall over.

WARNING:
Do not use eyebolts screwed on the motor for handling the whole electric pump unit.
Do not use the shaft end of the pump or of the motor to handle the pump, the motor or the unit.

- Eyebolts screwed onto the motor may be exclusively used to handle the individual motor or, in case of a not balanced distribution of weights, to partially lift the unit vertically starting from a horizontal displacement.

Pump unit must always be fixed and transported as shown in *Figure 5* (page 324), and the pump with-

out motor must be fixed and transported as shown in *Figure 6* (page 324).

In this last case remove coupling guards from drive lantern and cross the lifting ropes/bands.

2.3 Storage guidelines

Storage location

The product must be stored in a covered and dry location free from heat, dirt, and vibrations.

NOTICE:

Protect the product against humidity, heat sources, and mechanical damage.

NOTICE:

Do not place heavy weights on the packed product.

2.3.1 Long-term storage

If the unit is stored for more than 6 months, these requirements apply:

- Store in a covered and dry location.
- Store the unit free from heat, dirt, and vibrations.
- Rotate the shaft by hand several times at least every three months.

For questions about possible long-term storage treatment services, please contact your local sales and service representative.

Ambient temperature

The product must be stored at an ambient temperature from -5°C to +40°C (23°F to 104°F).

3 Product Description

3.1 Pump design

The pump is a horizontal pump with volute casing close coupled to standard electric motors.

The pump can be used for handling:

- Cold or warm water
- Clean liquids
- Liquids which are not chemically and mechanically aggressive to the pump materials.
- Liquids which are moderately aggressive to the pump materials.

Intended use

The pump is suitable for:

- Water supply and water treatment
- Cooling and hot water supply in industries and building services
- Irrigation and sprinkler systems
- Heating systems

Additional uses for optional material:

- District heating
- General industry

Improper use

WARNING:

Improper use of the pump may create dangerous conditions and cause personal injury and damage to property.

An improper use of the product leads to the loss of the warranty.

Examples of improper use:

- Liquids not compatible with the pump construction materials
- Hazardous liquids (such as toxic, explosive, flammable, or corrosive liquids)
- Potable liquids other than water (for example, wine or milk)

Examples of improper installation:

- Hazardous locations (such as explosive, or corrosive atmospheres).
- Location where the air temperature is very high or there is poor ventilation.
- Outdoor installations where there is no protection against rain or freezing temperatures.

DANGER:

Do not use this pump to handle flammable and/or explosive liquids.

NOTICE:

- Do not use this pump to handle liquids containing abrasive, solid, or fibrous substances.
- Do not use the pump for flow rates beyond the specified flow rates on the data plate.

Special applications

Contact the local sales and service representative in the following cases:

- If the density and/or viscosity value of the pumped liquid exceeds the value of water, such as water with glycol; as it may require a more powerful motor.
- If the pumped liquid is chemically treated (for example softened, deionized, demineralized etc.).
- Any situation that is different from the ones that is described and relate to the nature of the liquid.

3.2 Pump denomination

See *Figure 2* (page 311) for an explanation of the denomination code for the pump and one example.

3.3 Nameplate

The nameplate is located on the fan cover. The name plate lists key product specifications. For more information, see *Figure 1* (page 307)

The nameplate provides information regarding the impeller and casing material, the mechanical seal and their materials. For more information, see *Figure 3* (page 320).

IMQ or TUV or IRAM or other marks (for electric pump only)

Unless otherwise specified, for products with a mark of electrical-related safety approval, the approval refers exclusively to the electrical pump.

3.4 Pump description

- Connection dimensions according EN 733 (models 32-125…-200; 40-125…-250; 50-125…-250; 65-160…-250; 80-160…-250).
- Volute casing pump with back pull out power end.

3.5 Material

The metallic parts of the pump that come in contact with water are made of the following:

Material code	Material casing / impeller	Standard/ Optional
SS	Stainless steel / Stainless steel	Standard
SN	Stainless steel / Stainless steel	Standard

3.6 Mechanical seal

Unbalanced single mechanical seal acc. EN 12756, version K.

3.7 Application limits

Maximum working pressure

Figure 4 (page 323) shows the maximum working pressure depending on the pump model and the temperature of the pumped liquid.

$P_{1max} + P_{max} \leq PN$

P_{1max}	Maximum inlet pressure
P_{max}	Maximum pressure generated by the pump
PN	Maximum operating pressure

Liquid temperature intervals

Figure 4 (page 323) shows the working temperature ranges.

For special requirements, contact the Sales and Service Department.

Maximum number of starts per hour

kW	0.25 - 3.00	4.00 - 7.50	11 - 15	18.5 - 22	30 - 37	45 - 75	90 - 160
Starts per hour	60	40	30	24	16	8	4

Noise level

For the sound pressure levels of pump equipped with standard supplied motor, see *Table 7* (page 324)

4 Installation

Precautions

WARNING:
- Observe accident prevention regulations in force.
- Use suitable equipment and protection.
- Always refer to the local and/or national regulations, legislation, and codes in force regarding the selection of the installation site, plumbing, and power connections.

Electrical Hazard:
- Make sure that all connections are performed by qualified installation technicians and in compliance with the regulations in force.
- Before starting work on the unit, make sure that the unit and the control panel are isolated from the power supply and cannot be energized. This applies to the control circuit as well.

Grounding (earthing)

Electrical Hazard:
- Always connect the external protection conductor to ground (earth) terminal before making other electrical connections.
- You must ground (earth) all electrical equipment. This applies to the pump equipment, the driver, and any monitoring equipment. Test the ground (earth) lead to verify that it is connected correctly.
- If the motor cable is jerked loose by mistake, the ground (earth) conductor should be the last conductor to come loose from its terminal. Make sure that the ground (earth) conductor is longer than the phase conductors. This applies to both ends of the motor cable.
- Add additional protection against lethal shock. Install a high-sensitivity differential switch (30 mA) [residual current device RCD].

4.1 Facility requirements

4.1.1 Pump location

DANGER:
Do not use this unit in environments that may contain flammable/explosive or chemically aggressive gases or powders.

Guidelines

Observe the following guidelines regarding the location of the product:
- Make sure that no obstructions hinder the normal flow of the cooling air that is delivered by the motor fan.
- Make sure that the installation area is protected from any fluid leaks, or flooding.
- If possible, place the pump slightly higher than the floor level.
- The ambient temperature must be between 0°C (+32°F) and +40°C (+104°F).
- The relative humidity of the ambient air must be less than 50% at +40°C (+104°F).
- Contact the Sales and Service Department if:
  - The relative air humidity conditions exceed the guidelines.
  - The room temperature exceeds +40°C (+104°F).
  - The unit is located more than 1000 m (3000 ft) above the sea level. The motor performance may need to be de-rated or replaced with a more powerful motor.

For information about which value to de-rate the motor with, see *Table 8* (page 326).

Pump positions and clearance

Provide adequate light and clearance around the pump. Make sure that it is easily accessible for installation and maintenance operations.

Installation above liquid source (suction lift)

The theoretical maximum suction height of any pump is 10.33m. In practice, the following affect the suction capacity of the pump:

- Temperature of the liquid
- Elevation above the sea level (in an open system)
- System pressure (in a closed system)
- Resistance of the pipes
- Own intrinsic flow resistance of the pump
- Height differences

The following equation is used to calculate the maximum height above the liquid level which the pump can be installed:

$(p_b*10.2 - Z) \geq NPSH + H_f + H_v + 0.5$

p_b	Barometric pressure in bar (in closed system is system pressure)
NPSH	Value in meter of the pump intrinsic flow resistance
H_f	Total losses in meters caused by passage of liquid in the suction pipe of the pump
H_v	Steam pressure in meters that correspond to the temperature of the liquid T °C
0.5	Recommended safety margin (m)
Z	Maximum height at which the pump can be installed (m)

$(p_b*10.2 - Z)$ must always be a positive number.

For more information, see *Figure 9* (page 327).

NOTICE:

Do not exceed the pumps suction capacity as this could cause cavitation and damage the pump.

4.1.2 Piping requirements

Precautions

WARNING:

- Use pipes suited to the maximum working pressure of the pump. Failure to do so can cause the system to rupture, with the risk of injury.
- Make sure that all connections are performed by qualified installation technicians and in compliance with the regulations in force.

NOTICE:

Observe all regulations issued by authorities having jurisdiction and by companies managing the public water supplies if the pump is connected to a public water system. If required, install appropriate backflow-prevention device on the suction side.

Piping checklist

Check that the following requirements are met:

- All piping is independently supported, piping must not place a burden on the unit.
- Flexible pipes or unions are used, in order to avoid transmission of pump vibrations to the pipes and vice versa.
- Use wide bends, avoid using elbows which cause excessive flow resistance.
- The suction piping is perfectly sealed and airtight.
- If the pump is used in an open circuit, then the diameter of the suction pipe is suited to the installation conditions. The suction pipe must not be smaller than the diameter of the suction port.
- If the suction piping must be larger than the suction side of the pump, then an eccentric pipe reducer is installed.
- If the pump is placed above liquid level, a foot valve is installed at the end of the suction piping.
- The foot valve is fully immersed into the liquid so that air cannot enter through the suction vortex, when the liquid is at the minimum level and the pump is installed above the liquid source.
- Appropriately sized on-off valves are installed on the suction piping and on the delivery piping (downstream to the check valve) for regulation of the pump capacity, for pump inspection, and for maintenance.
- Appropriately sized on-off valve is installed on the delivery piping (downstream to the check valve) for regulation of the pump capacity, for pump inspection, and for maintenance.
- In order to prevent back flow into the pump when pump is turned off a check valve is installed on the delivery piping.

WARNING:

Do not use the on-off valve on the discharge side in the closed position in order to throttle the pump for more than a few seconds. If the pump must operate with the discharge side closed for more than a few seconds, a bypass circuit must be installed to prevent overheating of the liquid inside the pump.

For illustrations that show the piping requirements, see *Figure 10* (page 327) and *Figure 11* (page 327).

4.2 Electrical requirements

- The local regulations in force overrule these specified requirements.
- In the case of fire fighting systems (hydrants and/or sprinklers), check the local regulations in force.

Electrical connection checklist

Check that the following requirements are met:

- The electrical leads are protected from high temperature, vibrations, and collisions.
- The power supply line is provided with:
  - A short-circuit protection device
  - A mains isolator switch with a contact gap of at least 3 mm

The electrical control panel checklist

NOTICE:

The control panel must match the ratings of the electric pump. Improper combinations could fail to guarantee the protection of the motor.

Check that the following requirements are met:

- The control panel must protect the motor against overload and short-circuit.
- Install the correct overload protection (thermal relay or motor protector).

Pump Type	Protection
Single phase standard electric pump ≤ 2.2 kW	– Built-in automatic reset thermal-amperometric protection (motor protector) – Short circuit protection (must be supplied by the installer)[3]
Three phase electric pump[4]	– Thermal protection (must be supplied by the installer) – Short circuit protection (must be supplied by the installer)

- The control panel must be equipped with a dry-running protection system to which a pressure switch, float switch, probes, or other suitable device is connected.
- The following devices are recommended for use on the suction side of the pump:
  - When the liquid is pumped from a water system, use a pressure switch.
  - When the liquid is pumped from a storage tank or reservoir, use a float switch or probes.
- When thermal relays are used, relays that are sensitive to phase failure are recommended.

The motor checklist

WARNING:

- Read the operating instructions in order to ensure whether a protection device is provided if another motor other than the standard is used.
- If the motor is equipped with automatic thermal protectors, be aware of the risk of unexpected starts in connection to overload. Do not use such motors for fire-fighting applications.

NOTICE:

- Only use dynamically balanced motors with a half-sized key in the shaft extension (IEC 60034-14) and with normal vibration rate (N).
- The mains voltage and frequency must agree with the specifications on the data plate.

In general, motors can operate under the following mains voltage tolerances:

Frequency Hz	Phase ~	UN [V] ± %
50	1	220 – 240 ± 6
	3	230/400 ± 10
		400/690 ± 10
60	1	220 – 230 ± 6
	3	220/380 ± 5
		380/660 ± 10

Use cable according to rules with 3 leads (2+earth/ground) for single phase versions and with 4 leads (3+earth/ground) for three phase version.

4.3 Install the pump

4.3.1 Mechanical installation

Check the following before installation:

- Use a concrete of compressive strength class C12/15 which meets the requirements of exposure class XC1 to EN 206-1.
- The mounting surface must have set and must be completely horizontal and even.
- Observe the weights indicated.

Install the pump set

For examples of horizontal and vertical installations, see *Figure 12* (page 330).

Check that the foundation has been prepared in accordance with the dimensions given in the outline drawing/general arrangement drawing.

Type	Motor Size	Number of Poles	Type of Fastening
A	Up to 132	2– and 4–pole	Mount on ground using the pump feet.
B	From 160 to 200	2–pole	Mount on ground using the motor feet. Shims are required under the motor feet.
	160	4–pole	
C	Up to 132	2– and 4–pole	Mount on ground using the pump feet.
D	From 160 to 200	2–pole	Mount on ground using the motor feet. Shims are required under the motor feet.

[3] fuses aM (motor starting), or magneto-thermal switch with curve C and Icn ≥ 4,5 kA or other equivalent device.

[4] Overload thermal relay with trip class 10A + fuses aM (motor starting) or motor protection magneto-thermal switch with starting class 10A.

1. Position the pump set on the foundation and level it with the help of a spirit level that is placed on the discharge port.

   The permissible deviation is 0.2 mm/m.
2. Remove the plugs covering the ports.
3. Align the pump and piping flanges on both sides of the pump. Check the alignment of the bolts.
4. Fasten the piping with bolts to the pump. Do not force the piping into place.
5. Use shims for height compensation, if necessary.
6. Tighten the foundation bolts evenly and firmly.

Note:

- If the transmission of vibrations can be disturbing, provide vibration-damping supports between the pump and the foundation.

4.3.2 Piping checklist

Check that the following are adhered to:

- The suction lift line has been laid with a rising slope, at positive suction head line with a downward slope towards the pump.
- The nominal diameters of the pipelines are at least equal to the nominal diameters of the pump ports.
- The pipelines have been anchored in close proximity to the pump and connected without transmitting any stresses or strains.

CAUTION:

Welding beads, scale and other impurities in the piping damage the pump.

- Free the piping from any impurities.
- If necessary, install a filter.

4.3.3 Electrical installation

1. Remove the screws of the terminal box cover.
2. Connect and fasten the power cables according to the applicable wiring diagram.

   For wiring diagrams, see *Figure 13* (page 330). The diagrams are also available on the back of the terminal box cover.

a) Connect the ground (earth) lead.

   Make sure that the ground (earth) lead is longer than the phase leads.

b) Connect the phase leads.

3. Mount the terminal box cover.

NOTICE:

Tighten the cable glands carefully to ensure protection against cable slipping and humidity entering the terminal box.

4. If the motor is not equipped with automatic reset thermal protection, then adjust the overload protection according to the list below.
   - If the motor is used with full load, then set the value to the nominal current value of electric pump (data plate)
   - If the motor is used with partial load, then set the value to the operating current (for example measured with a current pincer).
   - If the pump has a star-delta starting system, then adjust the thermal relay to 58% of the nominal current or operating current (only for three-phase motors).

5 Commissioning, Startup, Operation, and Shutdown

Precautions

WARNING:

- Make sure that the drained liquid does not cause damage or injuries.
- The motor protectors can cause the motor to restart unexpectedly. This could result in serious injury.
- Never operate the pump without the coupling guard correctly installed.

CAUTION:

- The outer surfaces of the pump and motor can exceed 40ºC (104ºF) during operation. Do not touch with any part of the body without protective gear.
- Do not put any combustible material near the pump.

NOTICE:

- Never operate the pump below the minimum rated flow, when dry, or without prime.
- Never operate the pump with the delivery ON-OFF valve closed for longer than a few seconds.
- Never operate the pump with the suction ON-OFF valve closed.
- Do not expose an idle pump to freezing conditions. Drain all liquid that is inside the pump. Failure to do so can cause liquid to freeze and damage the pump.
- The sum of the pressure on the suction side (mains, gravity tank) and the maximum pressure that is delivered by the pump must not exceed the maximum working pressure that is allowed (nominal pressure PN) for the pump.
- Do not use the pump if cavitation occurs. Cavitation can damage the internal components.

5.1 Fill the pump

For information about additional pump connections, see *Figure 14* (page 331).

Installations with liquid level above the pump (suction head)

For an illustration that shows where pump plugs are, see *Figure 15* (page 332).

1. Close the on-off valve located downstream from the pump.
2. Remove the fill plug (2) and open the on/off valve upstream until the water flows out of the hole.

a) Close the fill plug (2).

Installations with liquid level below the pump (suction lift)

For an illustration that shows where pump plugs are, see *Figure 16* (page 333).

1. All pipe system empty:

a) Open the on-off valve located upstream from the pump.
b) Remove the fill plug (2) and use a funnel to fill the pump through the fill hole until water flows out of this hole.
c) Tighten the fill plug (2).

2. Filled discharge pipe system:

a) Open the on-off valve located upstream from the pump and open the on-off valve downstream.
b) Remove The fill plug (2) until water flows out of this hole.
c) Tighten The fill plug (2).

5.2 Check the rotation direction (three-phase motor)

Follow this procedure before start-up.

1. Locate the arrows on the adaptor or the motor fan cover to determine the correct rotation direction.
2. Start the motor.
3. Quickly check the direction of rotation through the coupling guard or through the motor fan cover.
4. Stop the motor.
5. If the rotation direction is incorrect, then do as follows:

a) Disconnect the power supply.
b) In the terminal board of the motor or in the electric control panel, exchange the position of two of the three wires of the supply cable.

   For the wiring diagrams, see *Figure 13* (page 330).

c) Check the direction of rotation again.

5.3 Start the pump

The responsibility for checking the correct flow and the temperature of the pumped liquid rests with the installer or owner.

Before starting the pump, make sure that:

- The pump is correctly connected to the power supply.
- The pump is correctly filled according to instructions in *Fill the pump* (chapter 5).
- The on-off valve located downstream from the pump is closed.

1. Start the motor.
2. Gradually open the on-off valve on the discharge side of the pump.

   At the expected operating conditions, the pump must run smoothly and quietly. If not, refer to *Troubleshooting* (page 20).

6 Maintenance

Precautions

Electrical Hazard:
Disconnect and lock out electrical power before installing or servicing the unit.

WARNING:

- Maintenance and service must be performed by skilled and qualified personnel only.
- Observe accident prevention regulations in force.
- Use suitable equipment and protection.
- Make sure that the drained liquid does not cause damage or injuries.

6.1 Service

If the user wishes to schedule regular maintenance deadlines, they are dependent on the type of pumped liquid and on the operating conditions of the pump.

Contact the local sales and service representative for any requests or information regarding routine maintenance or service.

Extraordinary maintenance may be necessary to clean the liquid end and/or replace worn parts.

Motor bearings

After approximately five years, the grease in the motor bearings is so aged that a replacement of the bearings is recommended. The bearings must be replaced after 25000 operating hours or according to the motor supplier maintenance instructions, whichever is shorter.

Motor with regreasable bearings

Follow motor supplier maintenance instructions.

6.2 Inspection checklist

Check for leakage of the mechanical seal. Replace the mechanical seal if leakage is found.

6.3 Disassemble and replace the pump parts

For more information about spare parts and assembly and disassembly of the pump, contact the local sales and service representative.

7 Troubleshooting

7.1 Troubleshooting for users

The main switch is on, but the electric pump does not start.

Cause	Remedy
The thermal protector incorporated in the pump (if any) has tripped.	Wait until the pump has cooled down. The thermal protector will automatically reset.
The protective device against dry running has tripped.	Check the liquid level in the tank, or the mains pressure.

The electric pump starts, but the thermal protection trips a varying time after.

Cause	Remedy
There are foreign objects (solids or fibrous substances) inside the pump which have jammed the impeller.	Contact the Sales and Service Department.
The pump is overloaded because it is pumping liquid that is too dense and viscous.	Check the actual power requirements based on the characteristics of the pumped liquid and then contact the Sales and Service Department.

The pump runs but delivers too little or no liquid.

Cause	Remedy
The pump is clogged.	Contact the Sales and Service Department.

The troubleshooting instructions in the tables below are for installers only.

7.2 The main switch is on, but the electric pump does not start

Cause	Remedy
There is no power supply.	• Restore the power supply. • Make sure all electrical connections to the power supply are intact.
The thermal protector incorporated in the pump (if any) has tripped.	Wait until the pump has cooled down. The thermal protector will automatically reset.
The thermal relay or motor protector in the electric control panel has tripped.	Reset the thermal protection.
The protective device against dry running has tripped.	Check the: • liquid level in the tank, or the mains pressure • protective device and its connecting cables
The fuses for the pump or auxiliary circuits are blown.	Replace the fuses.

7.3 The electric pump starts, but the thermal protector trips or the fuses blow immediately after

Cause	Remedy
The power supply cable is damaged.	Check the cable and replace as necessary.
The thermal protection or fuses are not suited for the motor current.	Check the components and replace as necessary.
The electric motor is short circuit.	Check the components and replace as necessary.
The motor overloads.	Check the operating conditions of the pump and reset the protection.

7.4 The electric pump starts, but the thermal protector trips or the fuses blow a short time after

Cause	Remedy
The electrical panel is situated in an excessively heated area or is exposed to direct sunlight.	Protect the electrical panel from heat source and direct sunlight.
The power supply voltage is not within the working limits of the motor.	Check the operating conditions of the motor.
A power phase is missing.	Check the • power supply • electrical connection

7.5 The electric pump starts, but the thermal protector trips a varying time after

Cause	Remedy
There are foreign objects (solids or fibrous substances) inside the pump which have jammed the impeller.	Contact the local sales and service representative.
The pumps delivery rate is higher than the limits specified on the data plate.	Partially close the on-off valve down stream until the delivery rate is equal or less than the limits specified on the data plate.
The pump is overloaded because it is pumping liquid that is too dense and viscous.	Check the actual power requirements based on the characteristics of the pumped liquid and replace the motor accordingly.
The motor bearings are worn.	Contact the local sales and service representative.

7.6 The electric pump starts, but the system's general protection is activated

Cause	Remedy
A short circuit in the electrical system.	Check the electrical system.

7.7 The electric pump starts, but the system's residual current device (RCD) is activated

Cause	Remedy
There is an ground (earth) leakage.	Check the insulation of the electrical system components.

7.8 The pump runs but delivers too little or no liquid

Cause	Remedy
There is air inside the pump or the piping.	• Bleed the air
The pump is not correctly primed.	Stop the pump and repeat the prime procedure. If the problem continues: • Check that the mechanical seal is not leaking. • Check the suction pipe for perfect tightness. • Replace any valves that are leaking.
The throttling on the delivery side is too extensive.	Open the valve.
Valves are locked in closed or partially closed position.	Disassemble and clean the valves.
The pump is clogged.	Contact the local sales and service representative.
The piping is clogged.	Check and clean the pipes.
The rotation direction of the impeller is wrong .	Change the position of two of the phases on the terminal board of the motor or in the electric control panel.
The suction lift is too high or the flow resistance in the suction pipes is too great.	Check the operating conditions of the pump. If necessary, do the following: • Decrease the suction lift • Increase the diameter of the suction pipe

7.9 The electric pump stops, and then rotates in the wrong direction

Cause	Remedy
There is a leakage in one or both of the following components: • The suction pipe • The foot valve or the check valve	Repair or replace the faulty component.
There is air in the suction pipe.	Bleed the air.

7.10 The pump starts up too frequently

Cause	Remedy
There is a leakage in one or both of the following components: • The suction pipe • The foot valve or the check valve	Repair or replace the faulty component.
There is a ruptured membrane or no air pre-charge in the pressure tank.	See the relevant instructions in the pressure tank manual.

7.11 The pump vibrates and generates too much noise

Cause	Remedy
Pump cavitation	Reduce the required flow rate by partially closing the on-off valve downstream from the pump. If the problem persists check the operating conditions of the pump (for example height difference, flow resistance, liquid temperature).
The motor bearings are worn.	Contact the local sales and service representative.
There are foreign objects inside the pump.	Contact the local sales and service representative.
Impeller rubs on the wear ring	Contact the local sales and service representative.

For any other situation, refer to the local sales and service representative.

1 Introduction et sécurité

1.1 Introduction

Objet de ce manuel

L'objet de ce manuel est d'apporter les informations nécessaires pour :

- Installation
- Utilisation
- Entretien

ATTENTION :

Lire attentivement ce manuel avant d'installer et d'utiliser ce produit. Une mauvaise utilisation du produit peut entraîner

الأسباب	العلاج
توجد أجسام غريبة (مواد صلبة أو ليفية) داخل المضخة والتي أدت بدورها إلى انحشار الدفاعة.	اتصل بممثل المبيعات والخدمة المحلي.
معدل التسليم الخاص بالمضخات أعلى من الحدود المبينة على لوح البيانات.	قم بغلق جزئي لصمام الفتح/الغلق القادم من المضخة حتى يصبح معدل التسليم مساويًا للحدود المبينة على لوح البيانات أو أقل منها.
تتعرض المضخة لحمل زائد نظرًا لأنها تضخ سائل كثيف ولزج للغاية.	تحقق من متطلبات الطاقة الفعلية بناءً على خصائص السائل المضخوخ واستبدل الموتور حسب ذلك.
محامل الموتور بالية.	اتصل بممثل المبيعات والخدمة المحلي.

7.6 يبدأ تشغيل المضخة الكهربائية، ولكن يتم تنشيط الوقاية العامة للنظام

الأسباب	العلاج
حدوث دائرة قصر في النظام الكهربائي.	افحص النظام الكهربائي.

7.7 يبدأ تشغيل المضخة الكهربائية، لكن يتم تنشيط الأداة التي تعمل بالتيار المتبقي (RCD)

الأسباب	العلاج
هناك تسرب أرضي.	تحقق من عزل مكونات النظام الكهربائي.

7.8 تعمل المضخة ولكنها تقوم بتوصيل القليل من السائل أو لا شيء على الإطلاق

الأسباب	العلاج
يوجد هواء داخل المضخة أو الأنابيب.	• تصفية الهواء
لم يتم تحضير المضخة بشكل صحيح.	قم بإيقاف تشغيل المضخة وتكرار إجراءات التحضير. إذا استمرت المشكلة: • تحقق من عدم وجود تسريب في مانع التسرب الميكانيكي. • افحص أنبوب الشفط للتحقق من إحكام الربط. • استبدل أي صمامات يوجد بها تسريب.
الخنق على جانب التوصيل مكثف للغاية.	افتح الصمام.
الصمامات تبدو في وضع مغلق أو مغلق جزئيًا.	قم بتفكيك الصمامات وتنظيفها.
انسداد المضخة.	اتصل بممثل المبيعات والخدمة المحلي.
انسداد الأنابيب.	قم بفحص الأنابيب وتنظيفها.

الأسباب	العلاج
اتجاه دوران الدفاعة غير صحيح .	قم بتغيير الموضع لطورين من الأطوار على اللوحة الطرفية للموتور أو في لوحة التحكم الكهربائية.
رفع الشفط مرتفع للغاية أو مقاومة الضخ في أنابيب الشفط كبيرة للغاية.	تحقق من ظروف تشغيل المضخة. قم بما يلي عند الضرورة: • تقليل رفع الشفط • زيادة قطر أنبوب الشفط

7.9 توقف المضخة الكهربائية عن العمل، ثم دورانها في الاتجاه الخاطئ

الأسباب	العلاج
يوجد تسرب في أحد المكونين التاليين أو كليهما: • أنبوب الشفط • الصمام القدمي أو صمام عدم الإرجاع	إصلاح أو استبدال المكون المعيب.
وجود هواء في أنبوب الشفط.	تصفية الهواء.

7.10 بدء تشغيل المضخة بشكل متكرر للغاية

الأسباب	العلاج
يوجد تسرب في أحد المكونين التاليين أو كليهما: • أنبوب الشفط • الصمام القدمي أو صمام عدم الإرجاع	إصلاح أو استبدال المكون المعيب.
يوجد غشاء متمزق أو عدم وجود شحن مسبق في خزان الضغط.	انظر التعليمات ذات الصلة في دليل خزان الضغط.

7.11 المضخة تهتز وتصدر ضوضاء شديدة.

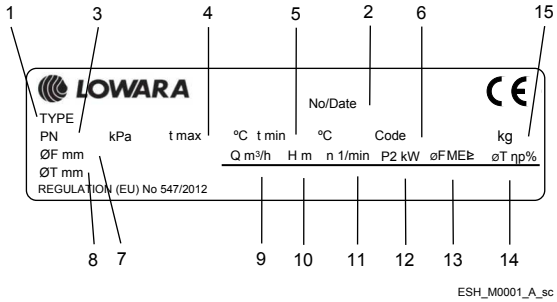
الأسباب	العلاج
تكون تجاويف بالمضخة	قلل معدل الضخ المطلوب عن طريق الغلق الجزئي لصمام الفتح/الغلق القادم من المضخة. إذا استمرت المشكلة، تحقق من ظروف تشغيل المضخة (على سبيل المثال، اختلاف الارتفاع، مقاومة الضخ، درجة حرارة السائل).
محامل الموتور بالية.	اتصل بممثل المبيعات والخدمة المحلي.
توجد أجسام غريبة داخل المضخة.	اتصل بممثل المبيعات والخدمة المحلي.
تحتك الدفاعة بحلقة التوجيه.	اتصل بممثل المبيعات والخدمة المحلي.

لأي موقف آخر، ارجع إلى ممثل المبيعات والخدمة المحلي.

Appendice tecnica • Technical appendix • Annexe technique • Technischer Anhang • Apéndice técnico • Anexo técnico • Technische bijlage • Teknisk bilag • Teknisk vedlegg • Tekniska appendix • Tekninen liite • Tæknilegur viðauki • Tehniline lisa • Tehniskais pielikums • Techninių duomenų priedas • Dodatek Dane techniczne • Technický dodatek • Technická príloha • Műszaki adatok függeléke • Anexă tehnică • Техническо приложение • Tehnična priloga •

Tehnički dodatak • Tehnički dodatak • Τεχνικό παράρτημα • Teknik ek • Техническое приложение • Технічний додаток • الملحق الفني

1.



Italiano

1. Tipo di pompa
2. Numero di serie + data di fabbricazione
3. Pressione massima d'esercizio
4. Temperatura massima operativa del liquido
5. Temperatura minima operativa del liquido
6. Codice pompa
7. Diametro intero della girante (solo per giranti non tornite)
8. Diametro ridotto della girante (solo per giranti tornite)
9. Campo della portata
10. Campo della prevalenza
11. Velocità
12. Potenza pompa nominale o massima
13. Indice di efficienza minimo
14. Efficienza idraulica nel punto di efficienza migliore (solo per giranti tornite)
15. Peso

English

1. Pump type
2. Serial number + date of manufacture
3. Maximum operating pressure
4. Maximum operating liquid temperature
5. Minimum operating liquid temperature
6. Pump code
7. Full impeller diameter (only for full impellers)
8. Reduced impeller diameter (only for trimmed impellers)
9. Flow range
10. Head range
11. Speed
12. Nominal or maximum pump power
13. Minimum efficiency index
14. Hydraulic efficiency in best efficiency point (only for trimmed impellers)
15. Weight

Français

1. Type de pompe
2. Numéro de série + date de fabrication
3. Pression maximale de fonctionnement
4. Température maximale de liquide en fonctionnement
5. Température minimale de liquide en fonctionnement
6. Code de la pompe
7. Diamètre de roue complète (seulement pour les roues complètes)
8. Diamètre de roue réduit (seulement pour les roues rectifiées)
9. Gamme de débit
10. Plage de hauteur manométrique
11. Vitesse
12. Puissance nominale ou maximale de la pompe
13. Indice de rendement minimal
14. Rendement hydraulique au point de meilleur rendement (seulement pour les roues rectifiées)
15. Poids

Deutsch

1. Pumpentyp
2. Seriennummer + Herstellungsdatum
3. Maximaler Betriebsdruck
4. Maximale Medientemperatur für den Betrieb
5. Mindest-Betriebstemperatur der Flüssigkeit
6. Pumpen-Code
7. Durchmesser des kompletten Laufrads (nur für komplette Laufräder)

Español

1. Tipo de bomba
2. Número de serie y fecha de fabricación
3. Presión máxima de funcionamiento
4. Temperatura del líquido de funcionamiento máxima
5. Temperatura del líquido de funcionamiento mínima
6. Código de la bomba
7. Diámetro del impulsor completo (solo para impulsores completos)

Português

1. Tipo de bomba
2. Número de série + data de fabrico
3. Pressão máxima de funcionamento
4. Temperatura máxima do líquido de funcionamento
5. Temperatura mínima do líquido de funcionamento
6. Código da bomba
7. Diâmetro integral do impulsor (apenas para rotores integrais)

9. Πεδίο ροής
10. Εύρος κεφαλής
11. Ταχύτητα
12. Ονομαστική ή μέγιστη ισχύς αντλίας
13. Δείκτης ελάχιστης απόδοσης
14. Υδραυλική απόδοση στο καλύτερο δυνατό σημείο απόδοσης (μόνο για αντισταθμισμένες φτερωτές)
15. Βάρος

11. Hız
12. Nominal ve maksimum pompa gücü
13. Minimum verimlilik indeksi
14. En verimli noktada hidrolik verimliliği (sadece kesilmiş çarklar için)
15. Ağırlık

8. Диаметр уменьшенного рабочего колеса (только для уменьшенных рабочих колес)
9. Диапазон расхода
10. Диапазон напора
11. Частота вращения
12. Номинальная или максимальная мощность насоса
13. Минимальный КПД
14. Гидравлический КПД в точке оптимального КПД (только для уменьшенных рабочих колес)
15. Вес

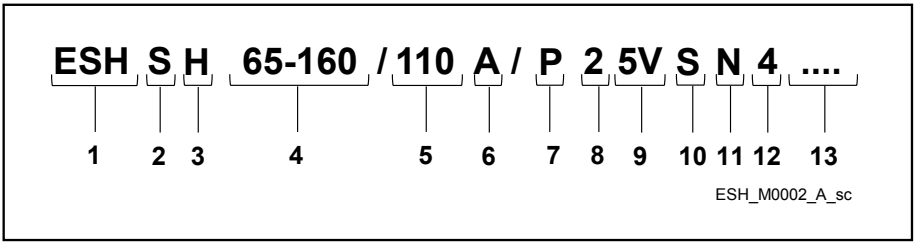
Англійська

1. Тип насоса
2. Серійний номер + дата виготовлення
3. Максимальний робочий тиск
4. Максимальна температура рідини
5. Мінімальна робоча температура рідини
6. Код насоса
7. Діаметр повнорозмірного робочого колеса (тільки для повнорозмірних робочих коліс)
8. Діаметр зменшеного робочого колеса (тільки для регульованих робочих коліс)
9. Діапазон витрат
10. Діапазон напору
11. Швидкість
12. Номінальна або максимальна потужність насоса
13. Мінімальний ККД
14. Гідравлічний ККД в точці оптимального ККД (тільки для зменшених робочих коліс)
15. Вага

العربية

1. نوع المضخة
2. الرقم التسلسلي + تاريخ التصنيع
3. الحد الأقصى لضغط التشغيل
4. الحد الأقصى لدرجة حرارة سائل التشغيل
5. الحد الأدنى لدرجة حرارة سائل التشغيل
6. رمز المضخة
7. القطر الكامل للدفاعة (للدفاعات الكاملة فقط)
8. القطر المصغر للدفاعة (للدفاعات المصغرة فقط)
9. نطاق الضخ
10. نطاق الرأس
11. السرعة
12. طاقة المضخة الاسمية أو القصوى
13. مؤشر الحد الأدنى للكفاءة
14. الكفاءة الهيدروليكية عند نقطة أفضل كفاءة (للدفاعات المصغرة فقط)
15. الوزن

2.



Italiano

1. ESH = Tipo pompa
2. Tipo di accoppiamento; E = alberoro prolunga, S = giunto rigido
3. Tipo di azionamento; niente = motore elettrico asincrono standard, H = dotato di Hydrovar, X = altro
4. 65-160 = Dimensione della pompa
5. 110 = Potenza nominale (kWx10)
6. Girante; vuoto = diametro intero, A = diametro tornito, B = diametro tornito, X = altro
7. Tipo di motore, P = PLM, S = SM, W = WEG, X = Altro
8. Numero di poli; 2 = a 2 poli, 4 = a 4 poli, 6 = a 6 poli
9. Tensione e frequenza elettrica;

50 Hz	
5H	1x220-240 V
5R	3x220-240/380-415 V
5V	3x380-415/660-690 V
5P	3x200-208/346-360 V
5S	3x255-265/440-460 V
5T	3x290-300/500-525 V
5W	3x440-460/- V
60 Hz	
6F	1x220-230 V
6E	1x200-210 V
6P	3x220-230/380-400 V
6R	3x255-277/440-480 V
6V	3x440-480/- V
6U	3x380-400/660-690 V
6N	3x200-208/346-360 V
6T	3x330-346/575-600 V

10. Materiale corpo pompa
11. Materiale girante
12. Tenuta meccanica + configurazione materiale O-ring
13. Cifre libere per le opzioni

English

1. ESH = Pump type
2. Coupling indication; E = Extended shaft, S = Stub shaft
3. Driver type; void= standard asynchronous motor, H = equipped with Hydrovar, X =other drivers
4. 65–160 = Pump size
5. 110 = Rated motor power (kWx10)
6. Impeller; void = full diameter, A = trimmed diameter, B = trimmed diameter, X = other
7. Motor type, P = PLM, S = SM, W = WEG, X = Other
8. Number of poles; 2 = 2–pole, 4 = 4–pole, 6 = 6–pole
9. Electrical voltage and frequency;

50 Hz	
5H	1x220-240 V
5R	3x220-240/380-415 V
5V	3x380-415/660-690 V
5P	3x200-208/346-360 V
5S	3x255-265/440-460 V
5T	3x290-300/500-525 V
5W	3x440-460/- V
60 Hz	
6F	1x220-230 V
6E	1x200-210 V
6P	3x220-230/380-400 V
6R	3x255-277/440-480 V
6V	3x440-480/- V
6U	3x380-400/660-690 V
6N	3x200-208/346-360 V
6T	3x330-346/575-600 V

10. Casing material
11. Impeller material
12. Mechanical seal + O-ring material configuration
13. Free digits for options

Français

1. ESH = Type de pompe
2. Indication d'accouplement ; E = Arbre rallongé, S = Arbre court
3. Type de variateur ; vide = moteur à synchrone standard, H = équipé Hydrovar, X = autres variateurs
4. 65-160 = Dimension de pompe
5. 110 = Puissance nominale du moteur (kWx10)
6. Roue ; vide = diamètre complet, A = diamètre rectifié, B = diamètre rectifié, X = autre
7. Type de moteur, P = PLM, S = SM, W = WEG, X = Autre
8. Nombre de pôles ; 2 = 2 pôles, 4 = 4 pôles, 6 = 6 pôles
9. Tension et fréquence électrique :

50 Hz	
5H	1x220-240 V
5R	3x220-240/380-415 V
5V	3x380-415/660-690 V
5P	3x200-208/346-360 V
5S	3x255-265/440-460 V
5T	3x290-300/500-525 V
5W	3x440-460/- V
60 Hz	
6F	1x220-230 V
6E	1x200-210 V
6P	3x220-230/380-400 V
6R	3x255-277/440-480 V
6V	3x440-480/- V
6U	3x380-400/660-690 V
6N	3x200-208/346-360 V
6T	3x330-346/575-600 V

10. Matériau du corps
11. Matériau de la roue
12. Configuration de joint mécanique et matériau de joint torique
13. Chiffres libres pour options

Deutsch

1. ESH = Pumpentyp
2. Kupplungsangabe; E = Verlängerte Welle, S = Stehbolzenwelle
3. Antriebstyp; leer = standardmäßiger Asynchronmotor, H = ausgestattet mit Hydrovar, X = sonstige Antriebe
4. 65–160 = Pumpengröße

Español

1. ESH = tipo de bomba
2. Indicación de acoplamiento; S = eje extendido, E = eje adaptador
3. Tipo de motor; nulo= motor asíncrono estándar, H = equipado con Hydrovar, X = otros motores
4. 65–160 = tamaño de la bomba

Português

1. ESH = tipo de bomba
2. Indicação do acoplamento; E = Eixo alargado, S = Eixo de encaixe
3. Tipo de accionamento; nulo= motor assíncrono padrão, H = equipado com Hydrovar, X =outros accionadores
4. 65–160 = Dimensão da bomba

6. Робоче колесо; void = повний діаметр, A = зменшений діаметр, B = зменшений діаметр, X = інший
7. Тип двигуна, P = PLM, S = SM, W = WEG, X = інший
8. Кількість полюсів; 2 = 2-полярний, 4 = 4-полярний, 6 = 6-полярний
9. Напруга і частота електричного струму

50 Hz	
5H	1x220-240 V
5R	3x220-240/380-415 V
5V	3x380-415/660-690 V
5P	3x200-208/346-360 V
5S	3x255-265/440-460 V
5T	3x290-300/500-525 V
5W	3x440-460/- V
60 Hz	
6F	1x220-230 V
6E	1x200-210 V
6P	3x220-230/380-400 V
6R	3x255-277/440-480 V
6V	3x440-480/- V
6U	3x380-400/660-690 V
6N	3x200-208/346-360 V
6T	3x330-346/575-600 V

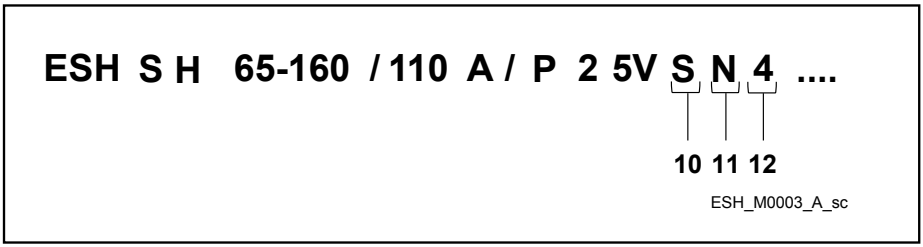
10. Матеріал корпусу
11. Матеріал робочого колеса
12. Конфігурація матеріалів збірки механічне ущільнення + ущільнювальне кільце
13. Вільні позиції для опцій

8. عدد الأقطاب؛ 2 = موتور بقطبين، 4 = موتور بأربعة أقطاب، 6 = موتور بستة أقطاب
9. الجهد والتردد الكهربيان؛

Hz 50	
1x220-240 V	5H
3x220-240/380-415 V	5R
3x380-415/660-690 V	5V
3x200-208/346-360 V	5P
3x255-265/440-460 V	5S
3x290-300/500-525 V	5T
3x440-460/- V	5W
Hz 60	
1x220-230 V	6F
1x200-210 V	6E
3x220-230/380-400 V	6P
3x255-277/440-480 V	6R
3x440-480/- V	6V
3x380-400/660-690 V	6U
3x200-208/346-360 V	6N
3x330-346/575-600 V	6T

10. مواد العلبة
11. مواد وحدة الدفع
12. مانع التسرب الميكانيكي + تكوين المواد بحلقة دائرية
13. أرقام حرة للخيارات

3.



	F	G
10	S	23
11	S	23

	F	G
	N	24
12	A	57
	B	56
	2	51
	4	50
	W	53
	Z	52

F Codice • Code • Code • Code • Código • Código • Code • Kode • Kode • Kod • Koodi • Kóði • Kood • Kods • Kodas • Kod • Kód • Kód • Kód • Cod • Код • Lestvica • Kod • Kod • Κωδικός • Kod • Код • Код • الرمز

G Materiali • Material • Matériau • Material • Material • Material • Materiaal • Materiale • Materiale • Material • Materiaali • Efni • Materjal • Materiāls • Medžiaga • Materiał • Materiál • Materiál • Anyag • Material • Материал • Material • Materijal • Materijal • Υλικό • Malzeme • Материал • Матеріал • المادة

23 Acciaio inossidabile 1.4404 / 316L — A276 • Stainless steel 1.4404 / 316L — A276 • Acier inoxydable 1.4404 / 316L — A276 • Rostfreier Stahl 1.4404 / 316L - A276 • Acero inoxidable 1.4404 / 316L — A276 • Aço inoxidável 1.4404 / 316L — A276 • Roestvrijstaal 1.4404 / 316L — A276 • Rustfrit stål 1.4404 / 316L — A276 • Rustfritt stål 1.4404 / 316L — A276 • Rostfritt stål 1.4404 / 316L — A276 • Ruostumaton teräs 1.4404 / 316L — A276 • Riðfrítt stál 1,4404 / 316L — A276 • Roostevaba teras 1.4404 / 316L — A276 • Nerūsošais tērauds 1.4404 / 316L — A276 • Nerūdijantysis plienas 1.4404 / 316L — A276 • Stal nierdzewna 1.4404 / 316L — A276 • Nerezová ocel 1.4404 / 316L — A276 • Nehrdzavejúca oceľ 1.4404/316L – A276 • Rozsdamentes acél 1.4404 / 316L – A276 • Oţel inoxidabil 1.4404/316L — A276 • Неръждаема стомана 1.4404 / 316L — A276 • Nerjavno jeklo 1.4404/316L – A276 • Nehrđajući čelik 1.4404 / 316L — A276 • Nerđajući čelik 1.4404 / 316L — A276 • Ανοξείδωτος χάλυβας 1.4404 / 316L — A276 • Paslanmaz çelik 1.4404 / 316L — A276 • Нержавеющая сталь 1,4404 / 316L - A276 • Нержавіюча сталь 1.4404 / 316L — A276 • 316 / 1.4404 لاستانلس استيل — A276

24 Acciaio inossidabile 1.4408 / 316ss — A744 CF8M • Stainless steel 1.4408 / 316ss — A744 CF8M • Acier inoxydable 1.4408 / 316ss — A744 CF8M • Rostfreier Stahl 1.4408 / 316ss — A744 CF8M • Acero inoxidable 1.4408 / 316ss — A744 CF8M • Aço inoxidável 1.4408/316 aço inoxidável — A744 CF8M • Roestvrijstaal 1.4408 / 316ss — A744 CF8M • Rustfrit stål 1.4408 / 316ss — A744 CF8M • Rustfritt stål 1.4408 / 316ss — A744 CF8M • Rostfritt stål 1.4408 / 316ss — A744 CF8M • Ruostumaton teräs 1.4408 / 316ss — A744 CF8M • Riðfrítt stál 1,4408 / 316ss — A744 CF8M • Roostevaba teras 1.4408 / 316ss — A744 CF8M • Nerūsošais tērauds 1.4408 / 316ss — A744 CF8M • Nerūdijantysis plienas 1.4408 / 316ss — A744 CF8M • Stal nierdzewna 1.4408 / 316ss — A744 CF8M • Nerezová ocel 1.4408 / 316ss — A744 CF8M • Nehrdzavejúca oceľ, 1.4408/316ss - A744 CF8M • Rozsdamentes acél, 1.4408/316ss – A744 CF8M • Oţel inoxidabil 1.4408/316ss — A744 CF8M • Неръждаема стомана 1.4408 / 316ss — A744 CF8M • Nerjavno jeklo 1.4408/316ss – A744 CF8M • Nehrđajući čelik 1.4408 / 316ss — A744 CF8M • Nerđajući čelik 1.4408 / 316ss — A744 CF8M • Ανοξείδωτος χάλυβας 1.4408 / 316ss — A744 CF8M • Paslanmaz çelik 1.4408 / 316ss — A744 CF8M • Нержавеющая сталь 1.4408 / 316ss — A744 CF8M • Нержавіюча сталь 1.4408 / 316ss — A744 CF8M • 316 / 1.4408 لاستانلس استيلss — A744 CF8M

50 BQ1EGG-WA: Carbone/Carburo di silicio/EPDM • Q1BEGG: Silicon carbide / carbon / EPDM • Q1BEGG : Carbure de silicium / carbone / EPDM • Q1BEGG: Siliziumcarbid / Kohlenstoff / EPDM • Q1BEGG: carburo de silicio / carbón / EPDM • Q1BEGG: Carboneto de silício/carbono/EPDM • Q1BEGG: Siliciumcarbide / koolstof / EPDM • Q1BEGG: Siliciumkarbid / carbon / EPDM • Q1BEGG: Silikonkarbid / karbon / EPDM • Q1BEGG: Silikonkarbid/kol/EPDM • Q1BEGG: piikarbidi/hiili/EPDM • Q1BEGG: Kísilkarbíður / kolefni / EPDM • Q1BEGG: ränikarbiid / süsinik / EPDM • Q1BEGG: silīcija karbīds / ogleklis / EPDM • Q1BEGG: silicio karbidas / anglis / etilenpropileninis kaučiukas • Q1BEGG: węglik wolframu/węgiel/EPDM • Q1BEGG: Karbid křemíku / uhlík / EPDM • Q1BEGG: karbid kremíka/uhlík/EPDM • Q1BEGG: Szilícium-karbid / szén / EPDM • Q1BEGG: Carbură de siliciu/carbon/EPDM • Q1BEGG:Силициев карбид/въглерод/EPDM • Q1BEGG: silicijev karbid/ogljik/EPDM • Q1BEGG: Silikon karbid / ugljik / EPDM • Q1BEGG: Silikon karbid / ugljenik / EPDM • Q1BEGG: Καρβίδιο πυριτίου / άνθρακας / EPDM • Q1BEGG: Silikon karbit / karbon / EPDM • Q1BEGG: Карбид кремния / углерод / EPDM • Q1BEGG: Карбід кремнію / вуглець / EPDM • Q1BEGG: كربيد السليكون / كربون / EPDM

51 BQ1VGG: Carbone/Carburo di silicio/FKM • Q1BVGG: Silicon carbide / carbon / FKM • Q1BVGG : Carbure de silicium / carbone / FKM • Q1BVGG: Siliziumcarbid / Kohlenstoff / FKM • Q1BVGG: carburo de silicio / carbón / FKM • Q1BVGG: Carboneto de silício/carbono/FKM • Q1BVGG: Siliciumcarbide / koolstof / FKM • Q1BVGG: Siliciumkarbid / carbon / FKM • Q1BVGG: Silikonkarbid / karbon / FKM • Q1BVGG: Silikonkarbid/kol/FKM • Q1BVGG: piikarbidi/hiili/FKM • Q1BVGG: Kísilkarbíður / kolefni / FKM • Q1BVGG: ränikarbiid / süsinik / FKM • Q1BVGG: silīcija karbīds / ogleklis / FKM • Q1BVGG: silicio karbidas / anglis / fluorintas elastomeras • Q1BVGG: węglik wolframu/węgiel/FKM • Q1BVGG: Karbid křemíku / uhlík / FKM • Q1BVGG: karbid kremíka/uhlík/FKM • Q1BVGG: Szilícium-karbid / szén / FKM • Q1BVGG: Carbură de siliciu/carbon/FKM • Q1BVGG:Силициев карбидвъглерод / FKM • Q1BVGG: silicijev karbid/ogljik/FKM •

Q1BVGG: Silikon karbid / ugljik / FKM • Q1BVGG: Silikon karbid / ugljenik / FKM • Q1BVGG: Καρβίδιο πυριτίου / άνθρακας / FKM • Q1BVGG: Silikon karbit / karbon / FKM • Q1BVGG: Карбид кремния / углерод / FKM • Q1BVGG: Карбід кремнію / вуглець / FKM • Q1BVGG: كربيد السليكون / كربون / FKM

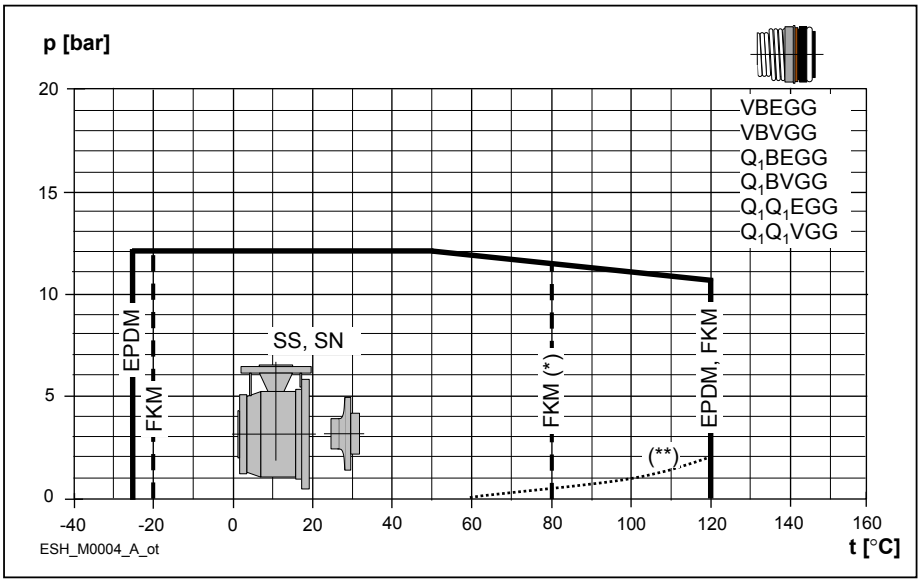
52 Q1Q1EGG: Carburo di silicio/Carburo di silicio/EPDM • Q1Q1EGG: Silicon carbide / silicon carbide / EPDM • Q1Q1EGG : Carbure de silicium / carbure de silicium / EPDM • Q1Q1EGG: Siliziumcarbid / Siliziumcarbid / EPDM • Q1Q1EGG: carburo de silicio / carburo de silicio / EPDM • Q1Q1EGG: Carboneto de silício/ carboneto de silício/EPDM • Q1Q1EGG: Siliciumcarbide / Siliciumcarbide / EPDM • Q1Q1EGG: Siliciumkarbid / siliciumkarbid / EPDM • Q1Q1EGG: Silikonkarbid / silikonkarbid / EPDM • Q1Q1EGG: Silikonkarbid/ silikonkarbid/EPDM • Q1Q1EGG: piikarbidi/piikarbidi/EPDM • Q1Q1EGG: Kísilkarbíður / kísilkarbíður / EPDM • Q1Q1EGG:ränikarbiid /ränikarbiid / EPDM • Q1Q1EGG: silīcija karbīds / silīcija karbīds / EPDM • Q1Q1EGG: silicio karbidas / silicio karbidas / etilenpropileninis kaučiukas • Q1Q1EGG: węglik krzemu/ węglik krzemu/EPDM • Q1Q1EGG: Karbid křemíku / karbid křemíku / EPDM • Q1Q1EGG: Karbid kremíka/ karbid kremíka/EPDM • Q1Q1EGG: Szilícium-karbid / szilícium-karbid / EPDM • Q1Q1EGG: Carbură de siliciu/carbură de siliciu/EPDM • Q1Q1EGG: Силиконов карбид / силиконов карбид / EPDM • Q1Q1EGG: silicijev karbid/silicijev karbid/EPDM • Q1Q1EGG: Silikon karbid / silikon karbid / EPDM • Q1Q1EGG: Silikon karbid / silikon karbid / EPDM • Q1Q1EGG: Καρβίδιο πυριτίου / καρβίδιο πυριτίου / EPDM • Q1Q1EGG: Silikon karbit / silikon karbit / EPDM • Q1Q1EGG: Карбид кремния / карбид кремния / EPDM • Q1Q1EGG: Карбід кремнію / карбід кремнію / EPDM • Q1Q1EGG: كربيد السليكون / كربيد السليكون / EPDM

53 Q1Q1VGG: Carburo di silicio/Carburo di silicio/FKM • Q1Q1VGG: Silicon carbide / silicon carbide / FKM • Q1Q1VGG : Carbure de silicium / carbure de silicium / FKM • Q1Q1VGG: Siliziumcarbid / Siliziumcarbid / FKM • Q1Q1VGG: carburo de silicio / carburo de silicio / FKM • Q1Q1VGG: Carboneto de silício/carboneto de silício/FKM • Q1Q1VGG: Siliciumcarbide / Siliciumcarbide / FKM • Q1Q1VGG: Siliciumkarbid / siliciumkarbid / FPM • Q1Q1VGG: Silikonkarbid / silikonkarbid / FKM • Q1Q1VGG: Silikonkarbid/silikonkarbid/FKM • Q1Q1VGG: piikarbidi/piikarbidi/FKM • Q1Q1VGG: Kísilkarbíður / kísilkarbíður / FKM • Q1Q1VGG: ränikarbiid / ränikarbiid / FKM • Q1Q1VGG: silīcija karbīds / silīcija karbīds / FKM • Q1Q1VGG: silicio karbidas / silicio karbidas / fluorintas elastomeras • Q1Q1VGG: węglik krzemu/węglik krzemu/FKM • Q1Q1VGG: Karbid křemíku / karbid křemíku / FKM • Q1Q1VGG: Karbid kremíka/karbid kremíka/FKM • Q1Q1VGG: Szilícium-karbid / szilícium-karbid / FKM • Q1Q1VGG: Carbură de siliciu/carbură de siliciu/FKM • Q1Q1VGG: Силиконов карбид / силиконов карбид / FKM • Q1Q1VGG: ogljik/silicijev karbid/FKM • Q1Q1VGG: Silikon karbid / silikon karbid / FKM • Q1Q1VGG: Silikon karbid / silikon karbid / FKM • Q1Q1VGG: Καρβίδιο πυριτίου / καρβίδιο πυριτίου / FKM • Q1Q1VGG: Silikon karbit / silikon karbit / FKM • Q1Q1VGG: Карбид кремния / карбид кремния / FKM • Q1Q1VGG: Карбід кремнію / карбід кремнію / FKM • Q1Q1VGG: كربيد السليكون / كربيد السليكون / FKM

56 VBEGG: Ceramica / Carbone / EPDM • VBEGG: Ceramic / carbon / EPDM • VBEGG : Céramique / carbone / EPDM • VBEGG: Keramik / Kohlenstoff / EPDM • VBEGG: cerámica/carbón/EPDM • VBEGG: Cerâmica/carbono/EPDM • VBEGG: Keramiek / koolstof / EPDM • VBEGG: Keramik / carbon / EPDM • VBEGG: Keramisk / karbon / EPDM • VBEGG: keramiskt material/kol/EPDM • VBEGG: keraaminen/hiili/EPDM • VBEGG: Keramik / kolefni / EPDM • VBEGG: keraamiline / süsinik / EPDM • VBEGG: keramika / ogleklis / EPDM • VBEGG: keramika / anglis / etilenpropileninis kaučiukas • VBEGG: ceramika/węgiel/EPDM • VBEGG: Keramika/uhlík/EPDM • VBEGG: Keramika/uhlík/EPDM • VBEGG: Kerámia / szén / EPDM • VBEGG: Ceramică/carbon/EPDM • VBEGG: Керамика/въглерод/EPDM • VBEGG: keramika/ogljik/EPDM • VBEGG: Keramika / ugljik / EPDM • VBEGG: Keramika / ugljenik / EPDM • VBEGG: Κεραμικό / άνθρακας / EPDM • VBEGG: Seramik / karbon / EPDM • VBEGG: Керамика / углерод / EPDM • VBEGG: Кераміка / вуглець / EPDM • VBEGG: خزف / كربون / EPDM

57 VBVGG: Ceramica / Carbone / FKM • VBVGG: Ceramic / carbon / FKM • VBVGG : Céramique / carbone / FKM • VBVGG: Keramik / Kohlenstoff / FKM • VBVGG: cerámica/carbón/FKM • VBVGG: Cerâmica/carbono/FKM • VBVGG: Keramiek / koolstof / FKM • VBVGG: Keramik / carbon / FKM • VBVGG: Keramisk / karbon / FMK • VBVGG: keramiskt material/kol/FKM • VBVGG: keraaminen/hiili/FKM • VBVGG: Keramik / kolefni / FKM • VBVGG: keraamiline / süsinik / FKM • VBVGG: keramika / ogleklis / FKM • VBVGG: keramika / anglis / fluorintas elastomeras • VBVGG: ceramika/węgiel/FKM • VBVGG: Keramika/uhlík/FKM • VBVGG: Keramika/uhlík/FKM • VBVGG: Kerámia / szén / FKM • VBVGG: Ceramică/carbon/FKM • VBVGG: Керамика /въглерод/FKM • VBVGG: keramika/ogljik/FKM • VBVGG: Keramika / ugljik / FKM • VBVGG: Keramika / ugljenik / FKM • VBVGG: Κεραμικό / άνθρακας / FKM • VBVGG: Seramik / karbon / FKM • VBVGG: Керамика / углерод / FKM • VBVGG: Кераміка / вуглець / FKM • VBVGG: خزف / كربون / FKM

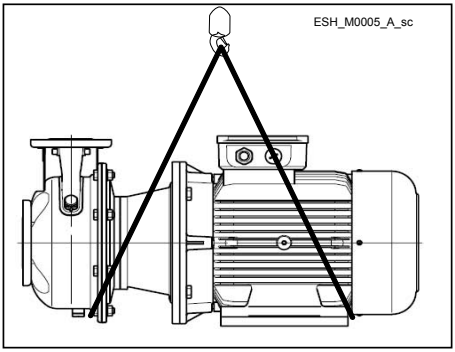
4.



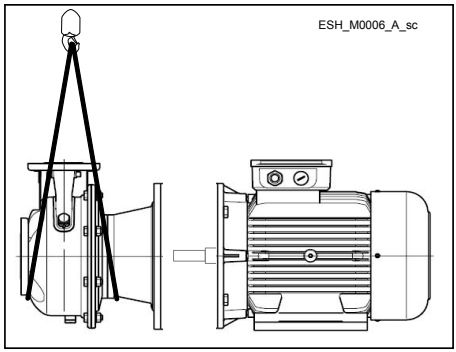
(*) acqua calda – • hot water – • eau chaude – • Heißes Wasser – • agua caliente – • água quente – • heet water – • varmt vand – • varmt vann – • varmt vatten – • kuuma vesi – • heitt vatn – • (*) kuum vesi – • Karsts ūdens – • karštas vanduo – • gorąca woda – • Horká voda - • horúca voda – • forró víz – • apă caldă – • Гореща вода - • vroča voda – • vrela voda – • vrela voda – • ζεστό νερό– • sıcak su – • горячая вода – • гаряча вода – • ماء ساخن –

(**) pressione minima richiesta alla tenuta meccanica (acqua calda); • minimum pressure required at mechanical seal (hot water); • pression minimale exigée sur le joint mécanique (eau chaude) ; • an der Gleitringdichtung (Heißwasser) minimal erforderlicher Druck; • presión mínima necesaria en el sello mecánico (agua caliente); • pressão mínima necessária no vedante mecânico (água quente); • minimale druk vereist bij mechanische sluiting (heet water); • minimum tryk krævet ved mekanisk tætning (varmt vand); • minimalt trykk som kreves ved mekanisk tetning (varmt vann); • minsta nödvändiga tryck vid mekanisk tätning (varmt vatten); • mekaanisessa tiivisteessä tarvittava vähimmäispaine (kuuma vesi); • lágmarks þrýstingur þarf við pakkdós (heitt vatn); • minimaalne mehaanilise tihendi juures nõutav rõhk (kuum vesi); • Minimālais nepieciešamais spiediens, kas nepieciešams mehāniskas aizdares gadījumā (karsts ūdens) • minimalus slėgis, kurio reikia ties mechaniniu sandarikliu (karštas vanduo); • minimalne ciśnienie wymagane na uszczelnieniu mechanicznym (gorąca woda); • minimální tlak požadovaný pro mechanickou ucpávku (horká voda); • minimálny tlak potrebný pri mechanickom tesnení (horúca voda); • a mechanikai tömítésnél szükséges minimális nyomás (forró víz); • presiune minimă necesară la garnitura de etanşare mecanică (apă caldă); • Минимално налягане необходимо за механичното уплътнение (гореща вода); • najmanjši tlak, potreben pri mehanskem tesnilu (vroča voda); • minimalni tlak potreban na mehaničkim zatvaračima (vrela voda); • minimalni pritisak potreban na mehaničkim zatvaračima (vrela voda); • ελάχιστη πίεση που απαιτείται στη μηχανική στεγανοποίηση (ζεστό νερό). • mekanik keçede gereken minimum basınç (sıcak su); • требуется минимальное давление на механическое уплотнение (горячая вода); • потрібен мінімальний тиск на механічне ущільнення (гаряча вода); • (ماء ساخن) يلزم الحد الأدنى من الضغط عند القفل الميكانيكي);

5.



6.



7.

~2900 min-1						
	LpA dB ± 2	LwA dB ± 2			LpA dB ± 2	LwA dB ± 2
25-125/07	< 70	-		50-125/22	< 70	-
25-125/11	< 70	-		50-125/30	< 70	-
25-160/15	< 70	-		50-125/40	< 70	-
25-160/22	< 70	-		50-160/55	< 70	-
25-200/30	< 70	-		50-160/75	< 70	-
25-200/40	< 70	-		50-200/92	70	-
25-250/55	< 70	-		50-200/110A	70	-
25-250/75	< 70	-		50-200/110	70	-
25-250/110	70	-		50-250/150	71	-
32-125/07	< 70	-		50-250/185	71,5	-
32-125/11	< 70	-		50-250/220	72	-
32-160/15	< 70	-		65-160/40	< 70	-
32-160/22	< 70	-		65-160/55	< 70	-
32-200/30	< 70	-		65-160/75	< 70	-
32-200/40	< 70	-		65-160/92	70	-
32-250/55	< 70	-		65-160/110A	70	-
32-250/75	< 70	-		65-160/110	70	-
32-250/110	70	-		65-200/150	71	-
40-125/11	< 70	-		65-200/185	71,5	-
40-125/15	< 70	-		65-200/220	72	-
40-125/22	< 70	-		65-250/300	74	-
40-160/30	< 70	-		65-250/370	74,5	-
40-160/40	< 70	-		80-160/110	70	-
40-200/55	< 70	-		80-160/150	71	-
40-200/75	< 70	-		80-160/185	71,5	-

~2900 min-1						
40-250/92	70	-		80-200/220	72	-
40-250/110A	70	-		80-200/300	74	-
40-250/110	70	-		80-200/370	74,5	-
40-250/150	71	-				

~1450 min-1						
	LpA dB ± 2	LwA dB ± 2			LpA dB ± 2	LwA dB ± 2
25-125/02A	< 70	-		50-125/02	< 70	-
25-125/02	< 70	-		50-125/03	< 70	-
25-160/02A	< 70	-		50-125/05	< 70	-
25-160/02	< 70	-		50-160/07	< 70	-
25-200/03	< 70	-		50-160/11	< 70	-
25-200/05	< 70	-		50-200/11	< 70	-
25-250/07	< 70	-		50-200/15	< 70	-
25-250/11	< 70	-		50-250/22A	< 70	-
25-250/15	< 70	-		50-250/22	< 70	-
32-125/02A	< 70	-		50-250/30	< 70	-
32-125/02	< 70	-		65-160/05	< 70	-
32-160/02A	< 70	-		65-160/07	< 70	-
32-160/02	< 70	-		65-160/11A	< 70	-
32-200/03	< 70	-		65-160/11	< 70	-
32-200/05	< 70	-		65-160/15	< 70	-
32-250/07	< 70	-		65-200/15	< 70	-
32-250/11	< 70	-		65-200/22	< 70	-
32-250/15	< 70	-		65-200/30	< 70	-
40-125/02A	< 70	-		65-250/40	< 70	-
40-125/02	< 70	-		65-250/55	< 70	-
40-160/03	< 70	-		80-160/15	< 70	-
40-160/05	< 70	-		80-160/22A	< 70	-
40-200/07	< 70	-		80-160/22	< 70	-
40-200/11	< 70	-		80-200/30	< 70	-
40-250/11	< 70	-		80-200/40	< 70	-
40-250/15	< 70	-		80-250/55	< 70	-
40-250/22	< 70	-		80-250/75	< 70	-
				80-250/110	< 70	-

LpA Livelli di pressione sonora misurati in un campo libero a un metro di distanza dall'elettropompa – • Sound pressure level measured in a free field at one meter's distance from the electric pump • Niveau de pression acoustique mesurée en champ libre à une distance d'un mètre de la pompe électrique – • Der Schalldruck wurde unter Freifeldbedingungen in einem Abstand von 1 Meter von der elektrischen Pumpe gemessen. • Nivel de presión acústica medido en un campo libre a 1 m de distancia de la bomba eléctrica. • Nível de pressão sonora medida num campo livre a um metro de distância da bomba eléctrica. • Juiste drukniveau in een vrij veld op één meter afstand tot de elektrische pomp – • Lydtryksniveau målt i et frit felt ved en meters afstand fra den elektriske pumpe – • Lydtrykksnivå målt i et fritt felt i en avstand på én

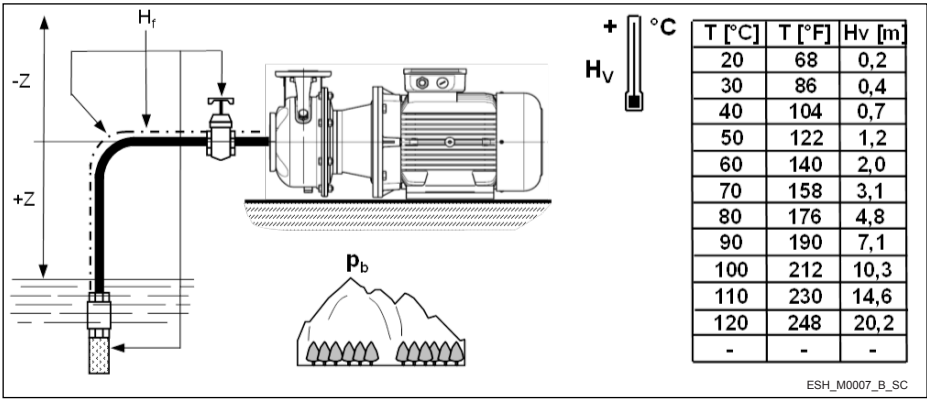
meter fra den elektriske pumpen – • Ljudtrycksnivå mätt i ett öppet område på ett avstånd på 1 m från den elektriska pumpen – • Äänenpainetaso, joka on mitattu vapaassa kentässä yhden metrin etäisyydellä sähköpumpusta. • Hljóðþrýstingur mældur á opnu svæði í eins metra fjarlægð frá rafmagnsdælunni – • Helirõhu tase mõõdetuna tühjal väljal ühe meetri kauguselt elektripumbast. • Skaņas spiediena līmenis, mērot bez ierobežojumiem viena metra attālumā no elektriskā sūkņa • Garso įtampos lygis matuojamas nepriklausomoje zonoje vieno metro atstumu nuo elektrinio siurblio. • Poziom ciśnienia akustycznego mierzony w warunkach pola swobodnego w odległości jednego metra od pompy elektrycznej. • Hladina akustického tlaku měřená na volném prostranství ve vzdálenosti 1 m od elektrického čerpadla – • Hladina akustického tlaku meraná na voľnom priestranstve vo vzdialenosti jedného metra od elektrického čerpadla – • A hangnyomásszint mérésére szabad területen kerül sor, az elektromos szivattyútól mért egy méteres távolságban – • Nivelul de presiune sonoră măsurat în câmp liber la un metru distanţă de pompa electrică - • Нивото на налягане на звука, измерено в свободно поле на един метър разстояние от електрическата помпа. • Raven zvočnega tlaka, izmerjena v prostem polju na razdalji enega metra od električne črpalke. • Razina zvučnog tlaka izmjerena u slobodnom prostoru na udaljenosti od jednog metra od električne pumpe – • Nivo zvučnog pritiska izmeren u slobodnom prostoru na udaljenosti od jednog metra od električne pumpe. • Το επίπεδο της πίεσης του ήχου μετρημένο σε ελεύθερο πεδίο σε απόστασηενός μέτρου από την ηλεκτρική αντλία. • Elektrik pompasından bir metre mesafede serbest bir alanda ölçülen ses basınç seviyesi. • Уровень давления звука измерен в свободном поле на расстоянии метра от электрического насоса. • Рівень тиску звуку визначено у вільному полі на відстані один метр від електричного насоса – • مستوى الضغط المناسب المقاس في مجال خالي على مسافة متر من المضخة الكهربائية

LwA Livello di potenza sonora (se LpA > 80 dB) - • Sound power level (if LpA > 80 dB) • Niveau sonore (si LpA > 80 dB) - • Schalleistungspegel (wenn LpA > 80 dB) - • Nivel de potencia acústica (si LpA > 80 dB) - • Nível de potência acústica (se LpA > 80 dB) - • Juiste krachtniveau (als LpA > 80 dB) - • Lydstyrkeniveau (hvis LpA > 80 dB) - • Lydtrykknivå (hvis LpA > 80 dB) - • Ljudtrycksnivå (om LpA > 80 dB) - • Äänenpainetaso (jos LpA > 80 dB) – • Hljóðþrýstistig (ef LpA > 80 dB) - • Heli võimsustase (if LpA > 80 dB) - • Skaņas intensitātes līmenis (ja LpA > 80 dB) • Garso galios lygis (jei LpA > 80 dB) – • Poziom natężenia dźwięku (przy LpA > 80 dB) — • Hladina akustického výkonu (pokud je LpA > 80 dB) – • Hladina sily zvuku (ak je LpA > 80 dB) – • Hangteljesítmény-szint (ha LpA > 80 dB) - • Nivel putere acustică (dacă LpA > 80 dB) - • Ниво на сила на звука (ако LpA > 80 dB) - • Raven zvočne moči (če je LpA > 80 dB) - • Razina zvučne snage (ako je LpA > 80 dB) - • Nivo zvučne snage (ako je LpA > 80 dB) - • Επίπεδο ισχύος ήχου (αν LpA > 80 dB) - • Ses gücü seviyesi (LpA > 80 dB ise) - • Уровень звуковой мощности (при LpA > 80 дБ) - • Рівень звукової потужності (при LpA> 80 дБ) - • مستوى قوة الصوت (إذا كان مستوى LpA أكبر من 80 ديسيبل)

8.

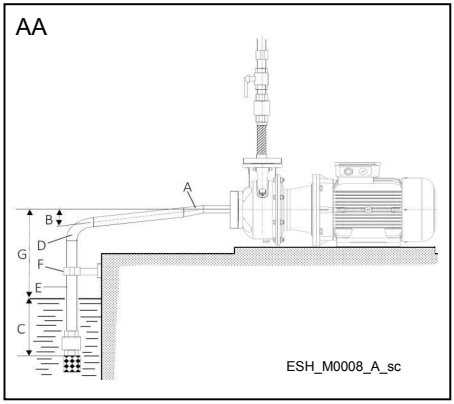
H		0°C	10°C	20°C	30°C	40°C	45°C	50°C	55°C	60°C
m	ft	32°F	50°F	68°F	86°F	104°F	113°F	122°F	131°F	140°F
0	0	1,00	1,00	1,00	1,00	1,00	0,95	0,90	0,85	0,80
500	1640	1,00	1,00	1,00	1,00	1,00	0,95	0,90	0,85	0,80
1000	3280	1,00	1,00	1,00	1,00	1,00	0,95	0,90	0,85	0,80
1500	4921	0,97	0,97	0,97	0,97	0,97	0,92	0,87	0,82	0,78
2000	6561	0,95	0,95	0,95	0,95	0,95	0,90	0,85	0,80	0,76

9.

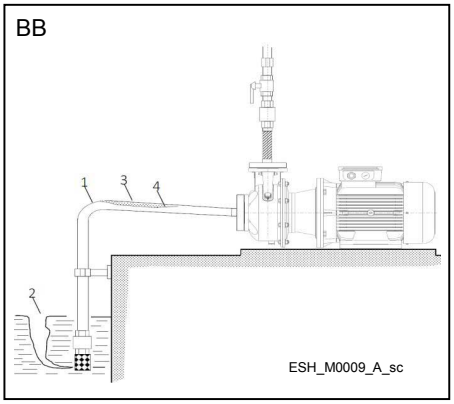


T [°C]	T [°F]	Hv [m]
20	68	0,2
30	86	0,4
40	104	0,7
50	122	1,2
60	140	2,0
70	158	3,1
80	176	4,8
90	190	7,1
100	212	10,3
110	230	14,6
120	248	20,2
-	-	-

10.



11.



AA Installazione corretta • Correct installation • Installation correcte • Korrekte Montage • Instalación correcta • Instalação correcta • Juiste installatie • Korrekt installation • Riktig installasjon • Riktig installation • Oikea asennus • Rétt uppsetning • Õige paigaldus • Pareiza uzstādīšana • Tinkamas montavimas • Poprawna instalacja • Správná montáž • Správna inštalácia • Helyes beszerelés • Instalare corectă • Правилна инсталация • Pravilna namestitev • Ispravna instalacija • Pravilna instalacija • Σωστή εγκατάσταση • Doğru kurulum • Правильная установка • Правильне встановлення • التركيب الصحيح

A Riduzione eccentrica • Eccentric reduction • Réduction excentrique • Exzentrische Reduzierung • Reducción excéntrica • Redução excêntrica • Eccentrische reductie • Excentrisk reduktion • Eksentrisk reduksjon • Excentrisk minskning • Epäkeskinen kokoonpuristuma • Minnkun rafmagns • Ekstsentriline vähendamine • Ekscentriska pāreja • Ekscentriškumo mažinimas • Redukcja mimośrodowa • Excentrická redukce • Excentrická redukcia • Excentrikus szűkítés • Reducţie excentrică • Ексцентриково редуциране • Ekscentrična redukcija • Ekscentrično smanjenje • Ekscentrično smanjenje • Έκκεντρη μείωση • Eksantriği azaltma • Эксцентриковый переходный патрубок • Ексцентриковий перехідний патрубок • تقليل اللامركزية

B Pendenza positiva • Positive gradient • Pente positive • Positive Neigung • Gradiente positiva • Gradiente positivo • Positieve helling • Positiv gradient • Positiv gradient • Positiv lutning • Positiivinen kaltevuus • Jákvæður halli • Positiivne gradient • Pozitīvs gradients • Teigiamas nuolydis • Nachylenie dodatnie • Vzrůstající gradient • Kladný sklon • Pozitív lejtés • Gradient pozitiv • Положителна скала • Pozitiven naklon • Pozitivni gradijent • Pozitivni gradijent • Θετική κλίση • Pozitif eğim • Положительный градиент • Позитивний градієнт • ميل إيجابي

C Buona immersione • Good immersion • Bonne immersion • Gutes Eintauchen • Buena inmersión • Boa imersão • Goed ondergedompeld • Korrekt nedsænkning • Bra nedsenking • Bra nedsänkning • Hyvä upo-

tus • Góð dýfing • Hea sukeldamine • Pietiekama iegrime • Tinkamas panardinimas • Dobre zanurzenie • Správné ponoření • Dobré ponorenie • Megfelelő merülés • Scufundare corectă • Добро потапяне • Dobra potopitev • Dobro potapanje • Dobro potapanje • Καλή εμβάπτιση • İyi batırma • Надлежащая глубина погружения • Належна глибина занурення • غمر كافٍ

D Curva larga • Large bend • Coude grand rayon • Großer Bogen • Gran flexión • Dobra grande • Grote bocht • Stor bøjning • Lang bøy • Stor böj • Suuri mutka • Stór sveigja • Suur paine • Plats līkums • Didelis lenkimo kampas • Duży skręt • Velký ohyb • Veľký ohyb • Tompa hajtás • Cot larg • Голяма сгъвка • Veliko koleno • Veliki zavoj • Veliki zavoj • Καμπύλη μεγάλης ακτίνας • Geniş bükme • Значительный изгиб • Значний вигин • انثناء كبير

E Diametro tubo d'aspirazione > diametro bocca della pompa • Suction pipe diameter > pump port diameter • Diamètre de canalisation d'aspiration > diamètre de port de pompe • Durchmesser des Saugrohrs > Durchmesser des Pumpenstutzens • Diámetro del tubo de aspiración > diámetro de la boca de la bomba • Diâmetro do tubo de sucção > diâmetro da porta da bomba • Diameter aanzuigleiding > diameter pompdoorgang • Indsugningsslangens diameter > pumpestudsens diameter • Sugerørdiameter > pumpeportdiameter • Sugrörsdiameter > diametern på pumpporten • Imuputken halkaisija > pumpun portin halkaisija • Þvermál sogpípu > þvermál dæluinntaks • Imipumba läbimõõt > pumba pordi läbimõõt • Iesūkšanas caurules diametrs > sūkņa porta diametrs • Siurbimo vamzdžio skersmuo > siurblio siurbimo angos skersmenį • Średnica rury ssącej > Średnica portu pompy • Průměr sacího potrubí > průměr hrdla čerpadla • Priemer sacieho potrubia > Priemer otvoru čerpadla • Szívócsőátmérő > szivattyúcsonk átmérője • Diametru conductă de aspirație > diametru orificiu pompă • Диаметър на смукателната тръба > диаметър на порта на помпата • Premer sesalne cevi > premer vrat črpalke • Promjer usisne cijevi ≥ promjera priključka pumpe • Prečnik usisne cevi ≥ prečnika priključka pumpe • Διάμετρος σωλήνα αναρρόφησης > Διάμετρος θύρας αντλίας • Emme borusunun çapı ≥ Pompanın giriş çapı • Диаметр всасывающей трубы > диаметра патрубка насоса • Діаметр труби всмоктування > діаметра впускного отвору насоса • قطر أنبوب الشفط أكبر من قطر منفذ المضخة

F Morsetto tubo • Pipe clamp • Bride de canalisation • Rohrschelle • Abrazadera del tubo • Grampo do tubo • Leidingklem • Rørklemmer • Rørklemme • Rörklämma • Putken kiinnitin • Rörklemma • Toruklamber • Caurules skava • Vamzdžio spaustuvas • Zacisk rurowy • Trubková objímka • Svorka potrubia • Csőbilincs • Colier conductă • Скоба на помпата • Objemka cevi • Obujmica cijevi • Stezaljka za cev • Σφιγκτήρας σωλήνα • Pompa kelepçesi • Трубный хомут • Трубний хомут • مشبك الأنبوب

G L'aspirazione soprabattente dipende dalla pompa e dall'installazione. In condizioni normali il dislivello non è superiore a 5-6 m. • Suction lift depends on the pump and installation. In normal conditions it should not exceed 5 to 6 m. • Le levage d'aspiration dépend de la pompe et de l'installation. Dans des conditions normales, elle ne devrait pas dépasser 5 à 6 m. • Saughöhe ist abhängig von der Pumpe und der Montage. Unter normalen Bedingungen sollte sie 5-6 m nicht überschreiten. • Desnivel de elevación relacionado con la bomba y con la instalación. En condiciones óptimas el desnivel no debe ser superior a 5 a 6 m. • A elevação da sucção depende da bomba e da instalação. Em condições normais não deve exceder os 5/6 m. • Zuighoogte hangt af van de pomp en de installatie. Onder normale omstandigheden dient deze niet hoger te zijn dan 5 tot 6 meter. • Sugeløft afhænger af pumpen og installationen. Ved optimale betingelser bør det ikke overskride 5 til 6 m. • Sugerløftet er avhengig av pumpen og monteringen. Ved normale forhold skal det ikke overstige 5 til 6 m. • Sughöjden beror på pumpen och installationen. Vid normala förhållanden bör den inte överstiga 5-6 m. • Imukorkeus riippuu pumpusta ja asennuksesta. Normaaliolosuhteissa tasoero se ei saa olla yli 5–6 m. • Soglifta er háð dælu og uppsetningu. Við eðlilegar aðstæður ætti hún ekki að fara yfir 5 til 6 m. • Imikõrgus oleneb pumbast ja paigaldusest. Tavatingimustes ei tohi see ületada 5 kuni 6 meetrit. • Sūknēšanas augstums ir atkarīgs no sūkņa un uzstādīšanas. Parastos apstākļos tam nevajadzētu pārsniegt 5–6 m. • Siurbimo aukštyn aukštis priklauso nuo siurblio ir montavimo. Įprastomis veikimo sąlygomis jis neturėtų viršyti 5–6 metrų. • Wysokość zasysania zależy od pompy i instalacji W normalnych warunkach nie powinna ona przekraczać 5 - 6 m. • Sací výška je závislá na čerpadle a instalaci. Za normálních podmínek by neměla překročit 5 až 6 m. • Sacia výška závisí od daného čerpadla a jeho montáže. V bežných podmienkach by nemala presahovať 5 až 6 metrov. • A szívómagasság a szivattyútól és a telepítéstől függ. Normál feltételek esetén ez nem haladhatja meg az 5–6 m-t. • Înălțimea de aspirație depinde de pompă și de instalare. În condiții normale nu trebuie să depășească 5 până la 6 m. • Височината за засмукване зависи от помпата и инсталацията. При нормални условия тя не трябва да превишава 5 до 6 m. • Sesalno dviganje je odvisno od črpalke in namestitve. V normalnih pogojih naj ne presega od 5 do 6 m. • Usisna visina ovisi o pumpi i instalaciji. U normalnim uvjetima ne smije prelaziti 5 do 6 m. • Usisna visina zavisi od pumpe in instalacije. U normalnim uslovima ne sme prelaziti 5 do 6 m. • Η ανύψωση της αναρρόφησης εξαρτάται από την αντλία και την εγκατάσταση. Σε κανονικές συνθήκες δεν θα πρέπει να υπερβαίνει τα 5 έως 6 m. • Emiş kaldırma pompaya ve kuruluma bağlıdır. Normal şartlarda, 5-6 m'yi geçmemesi gerekir. • Высота всасывания зависит от насоса и его монтажа. В номинальных условиях не должна превышать 5-6 м. • Висота всмоктування залежить від насоса і його монтажу. У номінальних умовах не повинна перевищувати 5-6 м. • رفع الشفط يعتمد على المضخة والتركيب. في الظروف العادية، يجب ألا يتجاوز ذلك 5 أمتار إلى 6.

BB Installazione non corretta • Incorrect installation • Installation incorrecte • Falsche Montage • Instalación incorrecta • Instalação incorrecta • Onjuiste installatie • Ukorrekt installation • Feil installasjon • Felaktig installation • Virheellinen asennus • Röng uppsetning • Vale paigaldus • Nepareiza uzstādīšana • Netinkamas montavimas • Niepoprawna instalacja • Nesprávná montáž • Nesprávna inštalácia • Helytelen beszerelés • Instalare incorectă • Неправилна инсталация • Nepravilna namestitev • Neispravna instalacija • Nepravil-

na instalacija • Λάθος εγκατάσταση • Yanlış kurulum • Неправильная установка • Неправильне встановлення • التركيب غير الصحيح

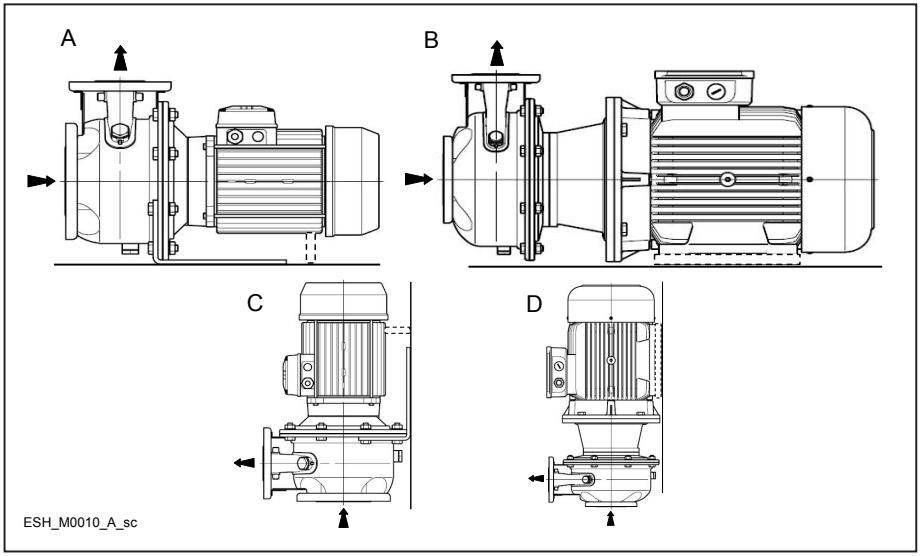
1 Curva stretta; elevata resistenza di flusso • Sharp bend; high flow resistance • Coude brusque ; forte résistance au débit • Enger Bogen; hoher Durchflusswiderstand • Codo pronunciado; alta resistencia de flujo • Curva afiada; elevada resistência de fluxo • Scherpe bocht; weerstand debiet met hoge snelheid • Skarp bøjning; høj gennemstrømningsmodstand • Skarp bøy, høy strømningsmotstand • Skarp böj, högt flödesmotstånd • Terävä mutka, korkea virtausvastus • Hvöss sveigja; mikil rennslismótstaða • Järsk paine; suure voolu takistus • Ass līkums; augsta plūsmas pretestība • Mažas lenkimo kampas; didelis hidraulinis pasipriešinimas • Ostry skręt; duża oporność przepływu • Ostrý ohyb; vysoký odpor proudění • Ostrý ohyb, vysoký prietokový odpor • Éles törés; jelentős áramlási ellenállás • Cot abrupt; rezistență ridicată la flux • Остра сгъвка; висока устойчивост към потока • Ostro koleno; visoka upornost pretoka • Oštar zavoj; visoka otpornost protoku • Oštar zavoj; visoka otpornost protoku • Καμπύλη μικρής ακτίνας, αντίσταση υψηλής ροής • Keskin bükme, yüksek akış rezistansı • Резкий изгиб; высокое сопротивление потоку • Різкий вигин; високий опір потоку • انثناء حاد، مقاومة عالية التدفق

2 Immersione insufficiente; aspirazione aria • Insufficient immersion; sucking air • Immersion insuffisante ; aspiration d'air • Unzureichendes Eintauchen: Luftansaugung • Inmersión insuficiente; se aspira aire • Imersão insuficiente; sucção de ar • Onvoldoende ondergedompeld; zuigt lucht aan • Utilstrækkelig nedsænkning; suger luft • Utilstrekkelig nedsenking, suge luft • Otillräcklig nedsänkning, suger luft • Riittämätön upotus, imee ilmaa • Ekki nóg dýfing; dregur loft að sér • Puudulik sukeldamine; õhu imemine • Nepietiekama iegrime; tiek iesūknēts gaiss • Nepakankamas panardinimas; oro siurbimas • Niewystarczające zanurzenie; powietrze zasysania • Nedostatečné ponoření; nasávání vzduchu • Nedostatočné ponorenie, nasáva sa vzduch • Nem elégséges merülés; levegőbeszívás • Scufundare insuficientă; aspirație aer • Недостатъчно потапяне; засмукване на въздух • Nezadostna potopitev; sesanje zraka • Nedovoljno potapanje; usisavanje vazduha • Nedovoljno potapanje; usisavanje vazduha • Ανεπαρκής βύθιση, αναρρόφηση αέρα • Yetersiz batırma, hava emişi • Недостаточная глубина погружения, всасывание воздуха • Недостатня глибина занурення; всмоктування повітря • غمس غير كافٍ، شفط الهواء

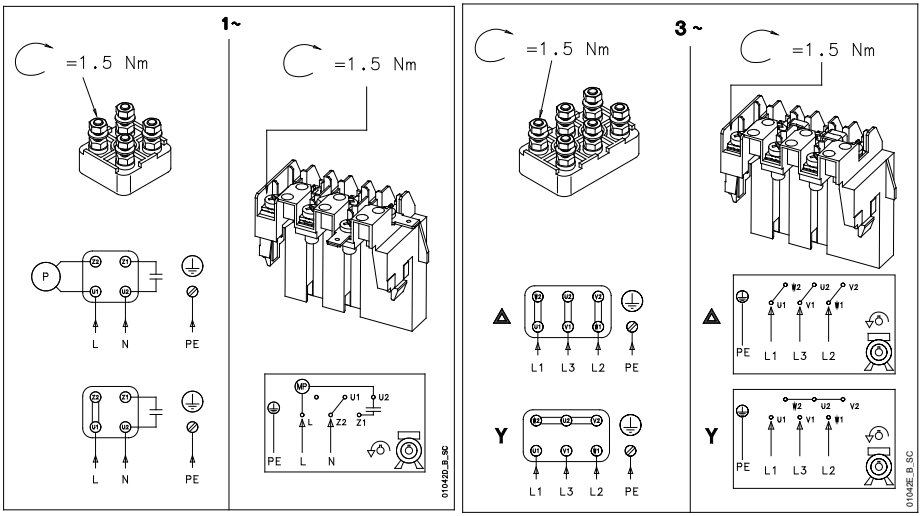
3 Pendenza negativa; sacche d'aria • Negative gradient; air pockets • Pente négative ; poches d'air • Negative Neigung; Lufteinschlüsse • Gradiente negativa; bolsas de aire • Declive negativo; bolsas de ar • Negatieve helling; luchtzakken • Negativ gradient; luftlommer • Negativ gradien, luftlommer • Negativ lutning med luftfickor • Negatiivinen kaltevuus, ilmataskuja • Neikvæður halli; loftgöt • Negatiivne gradient; õhuaugud • Negatīvs gradients; gaisa kabatas • Neigiamas gradientas; oro kišenės • Gradient ujemny; korki powietrzne • Klesající gradient; vzduchové kapsy • Záporný gradient, vzduchové bubliny • Negatív gradiens; légzsákok • Gradient negativ; pungi de aer • Отрицателен наклон; въздушни джобове • Negativen naklon; zračni žepki • Negativni gradijent; zračni džepovi • Negativni gradijent; vazdušni džepovi • Αρνητική κλίση, έγκλεισμα αέρα • Negatif eğim; hava cepleri • Отрицательный градиент; воздушные пробки • Негативний градієнт; повітряні пробки • ميل سلبي؛ جيوب هوائية

4 Diametro del tubo < diametro bocca della pompa; elevata resistenza di flusso • Pipe diameter < pump port diameter; high flow resistance • Diamètre de canalisation < diamètre de port de pompe ; forte résistance au débit • Rohrdurchmesser < Pumpenstutzendurchmesser; hoher Durchflusswiderstand • Diámetro del tubo < diámetro boca de la bomba; resistencia de alto flujo • Diâmetro do tubo < diâmetro da porta da bomba; elevada resistência de fluxo • diameter leiding < diameter pompdoorgang; weerstand debiet met hoge snelheid • Rørdiameter < pumpestudsens diameter; høj gennemstrømningsmodstand • Rørdiameter < pumpeportdiameter, høy strømningsmotstand • Rördiameter < diametern på pumpporten; högt flödesmotstånd • Putken halkaisija < pumpun portin halkaisija, korkea virtausvastus • Ummál rörs < ummál dælugáttar; mikil rennslismótstaða • Toru diameeter < pumba pordi diameeter; suure voolu takistus • Caurules diametrs < sūkņa porta diametrs; augsta plūsmas pretestība • Vamzdžio skersmuo < siurblio siurbimo angos skersmenį; didelis hidraulinis pasipriešinimas • Średnica rury < średnica portu pompy; duża oporność przepływu • Průměr potrubí < průměr hrdla čerpadla; vysoký odpor proudění • Priemer potrubia < priemer otvoru čerpadla, vysoký prietokový odpor • Csőátmérő < szivattyúcsonk átmérője; nagy áramlási ellenállás • Diametru conductă < diametru orificiu pompă; rezistență ridicată la flux • Диаметър на тръбата < диаметър на порта на помпата; висока устойчивост на потока • Premer cevi < premer vrat črpalke; visoka upornost pretoka • Promjer cijevi < promjera priključka pumpe; visoka otpornost protoku • Prečnik cevi < prečnika priključka pumpe; visoka otpornost protoku • Διάμετρος σωλήνα < διάμετρος θύρας αντλίας, αντίσταση υψηλής ροής • Boru çapı < pompa giriş çapı ; yüksek akış rezistansı • Диаметр трубы < диаметра патрубка насоса; высокое сопротивление потоку • Діаметр труби < діаметра патрубка насоса; високий опір потоку • قطر الأنبوب أقل من قطر منفذ المضخة؛ مقاومة عالية التدفق

12.


A
B
C
D
ESH_M0010_A_sc

13.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=1.5 Nm
=1.5 Nm
P
Z2
Z1
V1
U2
L
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PE
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Z2
Z1
010420_B_SC
3 ~
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L3
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PE
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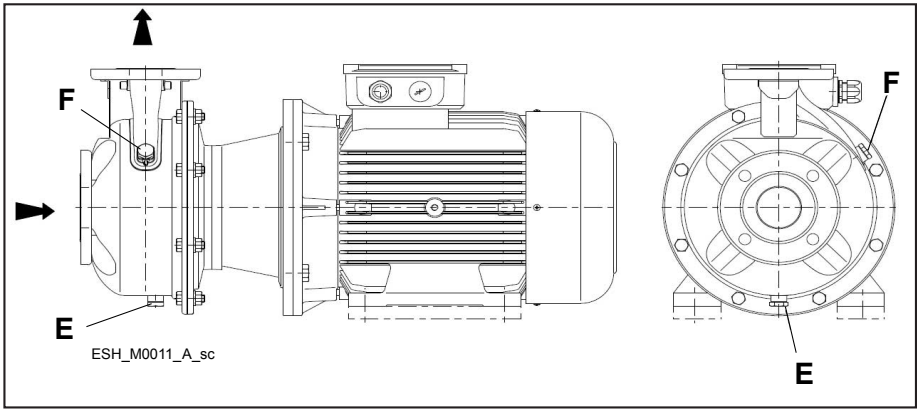
010421_B_SC

14.

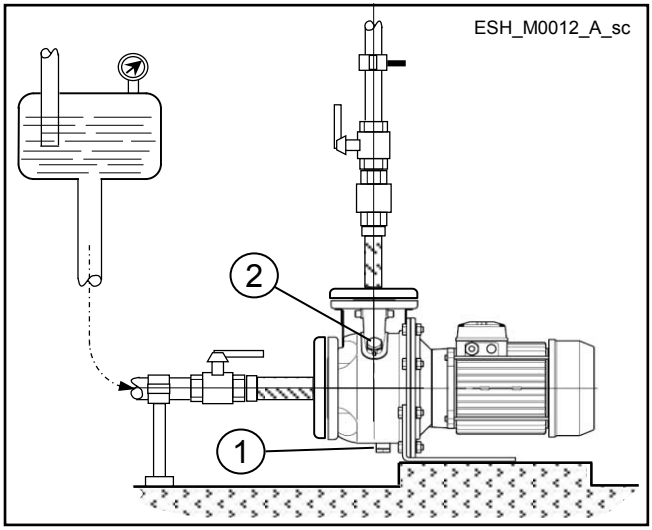


	25-125..-160..-200..-250 **32-125..-160..-200..-250** **40-125..-160..- 200..-250** **50-125..-160..- 200..-250** **65-160..- 200..-250** **80-160..- 200..-250**
	A
E	G 3/8"
F	G 3/8"

E Scarico • Drain • Vidange • Ablauf • Drenaje • Drenagem • Afwatering • Afløb • Drenering • Dränering • Tyhjennys • Niðurfall • Äravool • Drenāža • Išleidimas • Spust • Výpust • Odtok • Ürítő • Golire • Изпразване • Odtok • Ispust • Odvod • Θυρίδα αποστράγγισης • Tahliye • Сливное отверстие • Спуск • الصرف

F Punto di riempimento • Filling point • Point de remplissage • Füllpunkt • Punto de llenado • Ponto de enchimento • Vulpunt • Fyldningspunkt • Fyllpunkt • Påfyllningspunkt • Täyttöpiste • Fyllingarstaður • Täitumispunkt • Uzpildes punkts • Pildymo anga • Punkt napełniania • Místo pro plnění • Úroveň plnenia • Feltöltési pont • Punct de umplere • Точка на пълнене • Točka polnjenja • Priključak za punjenje • Priključak za punjenje • Σημείο πλήρωσης • Dolma noktası • Точка заливки • Отвір для заповнювання • نقطة التعبئة

15.



Italiano
1. Tappo di scarico E
2. Tappo di riempimento F

English
1. Drain plug E
2. Fill plug F

Français
1. Bouchon de vidange E
2. Bouchon de remplissage F

Deutsch
1. Ablassschraube E
2. Füllstopfen F

Español
1. Tapón de drenaje E
2. Tapón de llenado F

Português
1. Tampão de drenagem E
2. Tampão de enchimento F

Nederlands
1. Afvoerplug E
2. Vulplug

Dansk
1. Drænprop E
2. Fyldningsprop F

Norsk
1. Dreneringsplugg
2. Fyllplugg F

Svenska
1. Avtappningsplugg E
2. Påfyllningsplugg F

Suomi
1. Tyhjennystulppa E
2. Täyttötulppa F

Íslenska
1. Botntappi E
2. Áfyllingartappi F

Eesti
1. Äravoolukork E
2. Täitekork F

Latviešu
1. Drenāžas aizgrieznis E
2. Uzpildes aizgrieznis F

Lietuvių k.
1. Išleidimo angos kamštis E
2. Pildymo angos kamštis F

polski
1. Wtyczka spustu E
2. Wtyczka napełniania F

Čeština
1. Vypouštěcí zátka E
2. Plnicí zátka F

Slovenčina
1. Vypúšťacia zátka E
2. Zátka plniaceho otvoru F

magyar
1. Leeresztőnyílás, E
2. Feltöltőnyílás, F

Română
1. Bușon de golire E
2. Bușon de umplere F

Български
1. Пробка за източване E
2. Пробка за пълнене F

Slovenščina
1. Čep za izpust E
2. Čep za polnjenje F

Hrvatski
1. Priključak za pražnjenje E
2. Priključak za ispunu F

Srpski
1. Priključak za odvod E
2. Priključak za ispunu F

Ελληνικά
1. Τάπα αποστράγγισης E
2. Τάπα πλήρωσης F

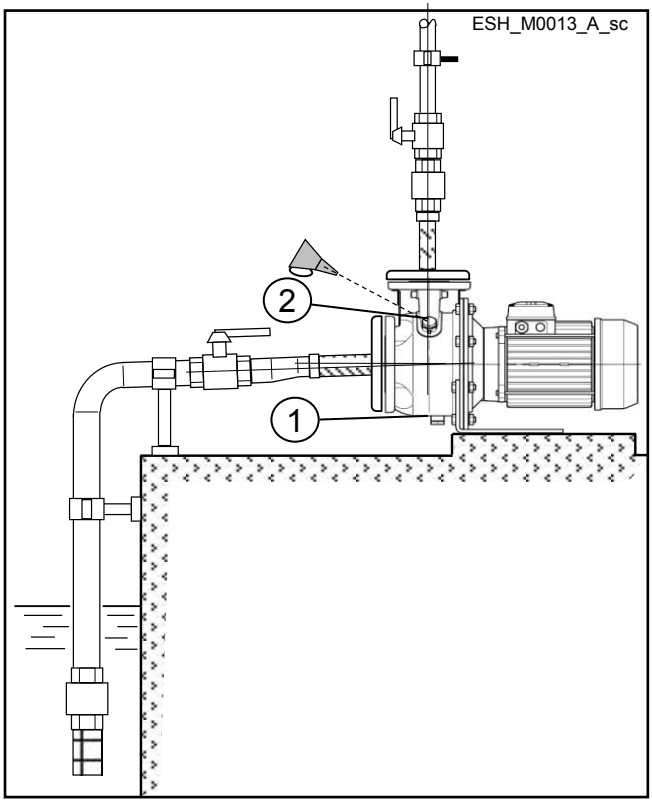
Türkçe
1. Boşaltma kapağı E
2. Doldurma kapağı F

Русский
1. Дренажная заглушка E
2. Заливная пробка F

Англійська
1. Зливна заглушка E
2. Заливна пробка F

العربية
1. سدادة التصريف E
2. سدادة التعبئة F

16.



Italiano
1. Tappo di scarico E
2. Tappo di riempimento F

English
1. Drain plug E
2. Fill plug F

Français
1. Bouchon de vidange E
2. Bouchon de remplissage F

Deutsch
1. Ablassschraube E
2. Füllstopfen F

Español
1. Tapón de drenaje E
2. Tapón de llenado F

Português
1. Tampão de drenagem E
2. Tampão de enchimento F

Nederlands
1. Afvoerplug E
2. Vulplug

Dansk
1. Drænprop E
2. Fyldningsprop F

Norsk
1. Dreneringsplugg
2. Fyllplugg F

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