it	ELETTROPOMPE SERIE FHF E SHF	Istruzioni d'installazione e d'uso
en	FHF AND SHF SERIES PUMPS	Instructions for installation and use
fr	ELECTROPOMPES SERIE FHF ET SHF	Instructions pour l'installation et l'emploi
de	KREISELPUMPEN BAUREIHE FHF UND SHF	Installations- und Bedienungsanleitungen
es	ELECTROBOMBAS SERIE FHF Y SHF	Instrucciones de instalación y uso
pt	ELECTROBOMBAS SÉRIE FHF E SHF	Instruções instalação e uso
nl	ELEKTROPOMPEN SERIE FHF EN SHF	Aanwijzingen voor de installatie en het gebruik
da	ELEKTROPUMPER SERIE FHF OG SHF	Installations- og brugsanvisninger
no	ELEKTROPUMPER SERIE FHF OG SHF	Installasjons- og bruksanvisning
sv	ELPUMPAR SERIE FHF OCH SHF	Installations- och bruksanvisning
fi	SÄHKÖPUMPUT SARJA FHF JA SHF	Asennus- ja käyttöohjeet
ar	مضخات كهربائية سلسلة FHF و SHF	تعليمات التركيب والاستخدام
tr	FHF VE SHF SERİSİ ELEKTRİKLİ POMPALAR	Kurma ve kullanım talimatları

It	Conservate con cura il manuale per future consultazioni
en	Save this manual for future reference
fr	Conservez avec soin le manuel pour toute consultation future
de	Das Handbuch muss für zukünftige Konsultationen sorgfältig aufbewahrt werden.
es	Guardar con cuidado el manual para poderlo consultar en el futuro
pt	Conservar cuidadosamente o manual para consultas futuras
nl	Bewaar de handleiding zorgvuldig voor latere raadpleging
da	Gem manualen til senere brug
no	Les håndboken før bruk og oppbevar den med omhu
sv	Spara bruksanvisningen för framtida bruk
fi	Säilytä käyttöopas huolellisesti
ar	احتفظ بعناية في الدفتر من أجل تصفحه في المستقبل
tr	Lütfen bu el kitabını ileride başvurmak üzere güvenli bir biçimde saklayınız

cod. 001073145 rev.G ed.02/2012

it

ISTRUZIONI PER L'INSTALLAZIONE E L'USO

en

INSTRUCTIONS FOR INSTALLATION AND USE

fr

INSTRUCTIONS POUR L'INSTALLATION ET L'EMPLOI

it

AVVERTIMENTI PER LA SICUREZZA DELLE PERSONE E DELLE COSE

Di seguito trovate il significato dei simboli utilizzati nel presente manuale.

PERICOLO
Rischio di danni alle persone, e alle cose se non osservate quanto prescritto

SCOSSE ELETTRICHE
Rischio di scosse elettriche se non osservate quanto prescritto

ATTENZIONE

AVVERTENZA
Rischio di danni alle cose o all'ambiente se non osservate quanto prescritto

en

WARNINGS FOR THE SAFETY OF PEOPLE AND PROPERTY

Meaning of the symbols used in this manual

DANGER
Failure to observe this warning may cause personal injury and/or equipment damage

ELECTRIC SHOCK
Failure to observe this warning may result in electric shock

WARNING

WARNING
Failure to observe this warning may cause damage to property or the environment

fr

AVVERTISSEMENTS POUR LA SECURITE DES PERSONNES ET DES CHOSES

Vous trouvez ci-après la signification des symboles utilisés dans le présent manuel.

DANGER
La non-observation de la prescription entraîne un risque de dommages aux personnes et/ou aux choses

DÉCHARGES ÉLECTRIQUES
La non-observation de la prescription entraîne un risque de déchrges électriques

ATTENTION

AVERTISSEMENT
La non-observation de la prescription entraîne un risque de dommages aux choses ou à l'environnement

1. General

The purpose of this manual is to provide the necessary information for the installation, use and maintenance of bare shaft and FHF-SHF series pumps.
The user should read this manual before using the pump.
Improper use could damage the pump and cause the forfeiture of the warranty coverage.
When asking our sales and after-sales services for technical information or spare parts, please indicate the model identification and construction numbers found on the nameplate.
The following instructions and warnings refer to the standard model; for any variations or characteristics of the special versions please refer to the sales contract.
For any instructions or situations not referred to in this manual or in the sales documentation, please contact our sales service.

2. Preliminary inspection

Upon delivery check the integrity of the packaging.
After unpacking the pump make sure that no damage has occurred during shipping.
Should the pump be damaged, please inform our agent within 8 days from the delivery date.

3. Applications

The FHF series pumps are suitable for the pumping of liquids free of aggressive mechanical or chemical agents in many civil, agricultural and industrial applications.The SHF series pumps can also handle moderately aggressive liquids.

4. Working limits

Only the hydraulic working limits are relevant as regards the bare shaft pump.

The pump is not suitable for dangerous or flammable liquids.

WARNING

Maximum working pressure: FHF = 12 bar.
SHF = 12 bar.

Maximum temperature of pumped liquid: FHF = 85°C standard version;
120°C with FPM or Ethylen-propylene elastomers.
SHF = 120°C.

Maximum number of starts per hour: 20 for power up to 5,5 kW
15 for power up to 15 kW
12 for higher power.

Delivery and head must always be within the rated values; any continuous running beyond these values is anomalous and can damage the pump.
The nominal rotation speed is the one indicated on the pump's plate. [1]
Do not refer to the motor plate. Since the motor is suitable for connection with different voltages at 50 and 60 Hz, its plate indicates the number of revolutions for both frequencies.

The bare shaft pump cannot be coupled to the motor by means of a pulley because the base fastening supports are not designed for this use.

[1] This pump, like any other centrifugal pump, can run at a different speed than the rated one if the impeller is replaced. Please contact our sales department before carrying out such operations.

5. Installation

Use a sling for safe lifting and handling as shown in fig. 4, page 90. Do not use the eyebolts on the motor as they are not designed to bear the weight of the entire unit.

5.1 Working position

The pump must be installed horizontally.

5.2 Positioning

Install the pump allowing adequate clearance for inspection and maintenance. Make sure that there are no obstacles to the free circulation of the motor cooling air through the fan.

5.3 Foundation and anchoring

The foundation has to be strong enough to absorb the vibrations and rigid enough to keep the unit properly aligned. Provide a concrete foundation, equipped with suitable holes (see overall dimensions drawing) for the foundation bolts, to be covered with a final concrete cast. Smaller units of limited weight may be simply anchored to the floor by means of foundation bolts (fig. 5, page 90). Larger units must be anchored to the foundation in the following manner: place the unit on the foundation and fit shims or metal wedges next to the foundation bolts. The unit must be positioned horizontally and levelled with the help of a water level placed on the shaft or delivery flange (fig. 6, page 90). If the distance between the two anchoring points exceeds 800 mm, additional shims must be used (fig. 7, page 90).
Between the rough surface of the foundation and the base leave a clearance of 25 ÷ 50 mm for the final concrete cast. When the concrete has set (min 48 hours), tighten the foundation bolts uniformly.

5.4 Aligning the unit

WARNING Check the coupling before starting the pump.

Remove the coupling protection and loosen the screws of the support foot to avoid any stress or shifting of the unit's height. Use a thickness gauge or comparator to check the angle alignment, then make sure that the distance between the semi-couplings is the same along the entire periphery (fig. 8, page 90). Check the parallel alignment with a ruler or comparator (fig. 9, page 90). The unit is aligned when the distance between each shaft and the ruler, placed on the coupling, is the same at each of 4 opposite points. The maximum axial and radial deviation between the two semi-couplings must not exceed 0.1 mm. If corrections are needed, loosen or remove the screws in order to move the feet on the base and, if necessary, fit additional calibrated shims or washers.
When the alignment (checked after tightening the screws) is completed, adjust the support foot on the base surface and make sure it is fastened tightly to the base surface. First tighten the three screws between the support and the base and then the screw between the support and foot. This way the alignment is not disturbed by the support foot. Finally, reassemble the coupling protection.

5.5 Suction and delivery pipes

5.5.1 General

The internal diameter of the suction pipe must never be smaller than that of the suction port. The size of the pipe will depend on the suction conditions. Bear in mind that the maximum theoretical suction lift is reduced not only by the NPSH required by the pump, but also by the effects of the liquid temperature and elevation and by the flow resistance in the suction pipe. Make sure that the unions in the suction pipe are perfectly tight: if air leaks into the system the pump's operation will be negatively affected. Moreover, in its horizontal sections, the suction pipe must slope slightly towards the pump and any restrictions must be eccentric to avoid formation of air pockets. If the pump must operate with a negative slope on the suction side, install a foot valve at the end of the pipe to ensure and maintain proper priming. Install also a non-return valve in the delivery pipe to protect the pump from excessive back pressure or reverse rotation (after each stop). Depending on the system requirements, it may be advisable to fit an intermediate flange (supplied on request) with a G ½" connection between the pump flange and the pipe counterflange, to facilitate the filling and bleeding operations.

When the pipes have been connected to the pump, check the alignment as explained above.

5.5.2 Pipe clamping

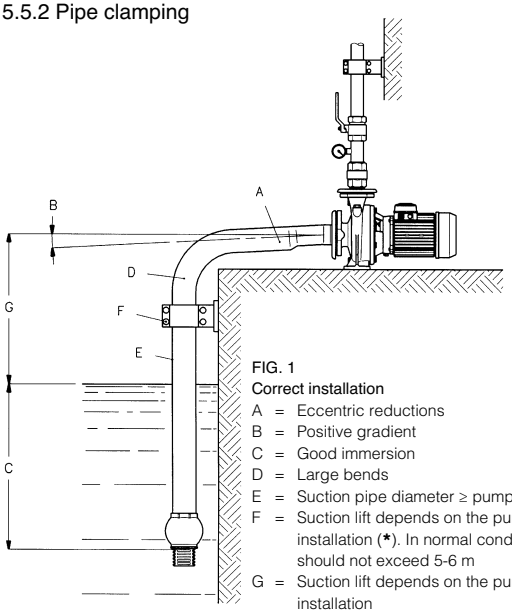


FIG. 1
Correct installation
A = Eccentric reductions
B = Positive gradient
C = Good immersion
D = Large bends
E = Suction pipe diameter ≥ pump port diameter
F = Suction lift depends on the pump and installation (*). In normal conditions this should not exceed 5-6 m
G = Suction lift depends on the pump and installation

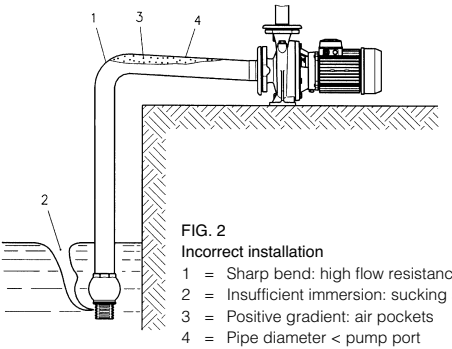


FIG. 2
Incorrect installation
1 = Sharp bend: high flow resistance
2 = Insufficient immersion: sucking air
3 = Positive gradient: air pockets
4 = Pipe diameter < pump port diameter: high flow resistance

(*) Suction lift is determined based on liquid temperature, elevation, flow resistance and NPSH required by the pump. A few pump models, at the highest capacity allowed, have a high NPSH requirement and therefore, under particular operating conditions, the maximum suction lift may be limited or even such as to require installation below the head. In such cases carefully check the suction conditions to avoid operating problems (cavitation).

6. Start-up

The pump must run smoothly and quietly. Avoid long running with the delivery gate valve closed. Always drain the pump whenever it remains inactive at freezing temperatures.

6.1 Electrical connections

WARNING **Make sure that the rated voltage corresponds to the supply voltage.**

Ground the pump before making any other connection.
We recommend that a high sensitivity differential switch (30 mA) be installed as extra protection against lethal electric shocks in the event of faulty grounding.

Remove the terminal board cover by first removing the screws.
Carry out the connections as indicated on the back of the terminal board cover, and as shown in fig. 3 -4.

The three-phase version must be equipped by the user with a magneto-thermal switch or magnetic starter with overload and undervoltage protection, a thermal relay and fuses installed upstream.
The overload relay must be set to the motor current rating. The thermal relay may be set to a current value slightly lower than the full load value when the electric pump is definitely underloaded, but the thermal overload protection must not be set to current values higher than the full load values.

Checking the rotation direction of electric pumps with three-phase motors.
The direction of rotation may be checked before the pump is filled with the liquid to be pumped, provided it is run for very short starts only.

WARNING The pump must not be run until it is filled with liquid.
Continuous dry running will damage the mechanical seal beyond repair.

If the direction of rotation is not anti-clockwise when facing the pump from the suction side interchange two supply leads.

6.2 Priming

To prime the pump, fill it and the suction pipe with the liquid to be pumped. To fill the pump, remove the fill plug and proceed as follows:
- Pump with positive suction head:
  open the suction gate valve and let the liquid in until it comes out of the fill plug.
- Pump with negative suction head, fitted with foot valve:
  fill the pump and the suction pipe through the fill plug. To speed up the operation the pump may be filled through the delivery port. Make sure to allow all air to escape. The pump is full only when there is a stable liquid level at the fill plug and all air bubbles have escaped. For twin-impeller pumps, keep the air valve on the pump body open throughout the filling operation, until the water overflows.

When the pump is full start it with the delivery gate valve closed, then open it gradually. Make sure that the pressure and flow rate are constant; if not, stop the pump and repeat the entire operation.

6.3 Running

If all the installation and filling operations have been carried out correctly, the pump will run smoothly and quietly.
The maximum noise of the electric pump when properly installed and operating within its limits is as per the table below:

MOTOR POWER 2 POLES 50 Hz	MOTOR POWER 4 POLES 50 Hz	SOUND PRESSURE LEVEL * Lp(A) dB ± 2	SOUND POWER LEVEL Lw(A) dB ± 2
≤ 3 kW	FHF up to 9,2 kW SHF up to 4 kW	< 70	
4 kW		71	81
–	SHF 5,5 - 7,5 kW	72	82
5,5 - 7,5 kW		76	86
9,2 - 22 kW		81	91
30 - 37 kW		83	94
45 - 55 kW		86	97

* Average sound pressure level at 1-metre distance from the pump in an open field.

Always drain the pump whenever it remains inactive at freezing temperatures.

During operation, the outer surface of the pump (if hot liquids are being pumped) and the outer surface of the motor can exceed 40°C. Do not touch with parts of your body (e.g.: hands) and do not put combustible material into contact with the pump.

7. Maintenance

Maintenance operations must be performed by skilled and qualified personnel only. Use suitable equipment and protection devices. Observe the accident prevention regulations in force. If you need to drain the pump, make sure that the drained liquid does not cause damage or injuries.

7.1 Checks

- Periodically check that the pump is working properly without generating any abnormal vibrations.
- Make sure there are no visible leaks in the mechanical seal.

WARNING - When the pump is off, check the alignment and wear of the flexible coupling components. If the flexible element shows signs of wear it must be replaced.

7.2 Dissasembling

The reference number of each individual component can be found in the exploded views Figs. 10-11, pages 92÷94.
The hydraulic and internal pump components can be disassembled without disconnecting the pump body and the suction and delivery pipes from the system.

Before starting to disassemble the pump, make sure that the motor is disconnected from the power supply and that the pump cannot be started accidentally.

Close the gate valves on the suction and delivery sides, then remove the drain plug and drain the pump body. Remove the coupling protection. If the coupling has no spacer, remove the motor together with its semi-coupling. If a spacer has been fitted, remove it and leave the motor fastened to the base.
Loosen the screws that fasten the support to the base, then the ones that fasten the support to the pump body. The support together with the rotating hydraulic part can be removed from the pump body to allow access to the impeller, mechanical seal and wear rings for inspection, cleaning and replacement.

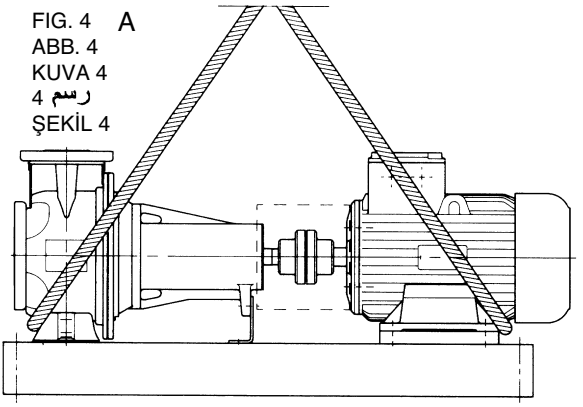
7.3 Re-assembling (see fig. 9, page 90)

Accuracy and cleanliness are essential when reassembling the mechanical seal. Remove any calcium deposits or other foreign matter from the shaft and seat of the fixed element in the seal housing. Moisten the shaft, the seat of the fixed element and the mechanical seal gaskets with alcohol to facilitate their sliding into position.
Fit the fixed seal ring into its seat in the back plate by pressing it with your fingers or by means of a clean wood or plastic tap. Insert the rotating part about 20 mm into the shaft, taking care not to damage the gaskets against the shaft edges (use a pointed guide bush of hardened stainless steel having the same external diameter as the shaft in its end section and slightly smaller in the initial section). Press the narrow part of the spring with your fingers until the two lapped surfaces touch. Mount and secure the impeller and complete the assembly following the disassembly procedures in the reverse order. Align the unit following the alignment procedure described in paragraph 5.4.

8. Fault finding chart

PROBLEM	PROBABLE CAUSE	POSSIBLE REMEDIES
1. The pump does not start	A) No power supply B) Blown fuses: B1) because they are inadequate (blowing current too low) B2) motor or supply cable are damaged C) Overload protection previously activated	A) Supply electrical power B1) Replace the fuses with suitable ones B2) Repair the motor or replace the cable C) Reset the protector (if it steps in again, see problem 4)
2. The pump does not deliver or delivers a reduced or irregular flow	A) The rotating part is partially or completely obstructed (generally the impeller is obstructed by foreign objects) B) The pump is not primed: inadequate filling or defective suction pipe or foot valve seal (Warning! The mechanical seal could have suffered serious damage) C) Excessive suction lift and/or flow resistance in the suction pipe D) Incorrect rotation direction	A) Disassemble the pump B) Fill the pump with liquid after having checked the seal of the suction pipe and foot valve. Also check the integrity of the mechanical seal. C) Reduce the suction lift. Use a larger diameter pipe. Flush the foot valve. Replace the foot valve with a bigger one D) Switch two leads in the terminal board or starter
3. The pump vibrates and is noisy	A) The pump is cavitating B) Worn motor or support bearings C) Foreign bodies between fixed and rotating parts of pump D) The unit is badly aligned E) The elastic element must be replaced	A) Choke the delivery - See probable cause 2C B) Replace the bearings C) Clean
4. The overload protector steps in: - accidentally	A) See 3B B) See 3C C) Temporary lack of a phase	
- systematically	D) Incorrect setting E) Pump delivery is higher than rated delivery F) Dense viscous liquid	D) Set to the rated current E) Close the delivery valve until the flow rate returns to the rated value F) Determine the actual power required and then replace the motor

FIG. 4 A
ABB. 4
KUVA 4
4 رسم
ŞEKİL 4



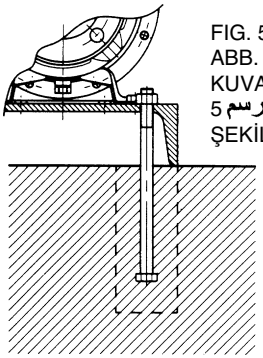


FIG. 5 B
ABB. 5
KUVA 5
5 رسم
ŞEKİL 5

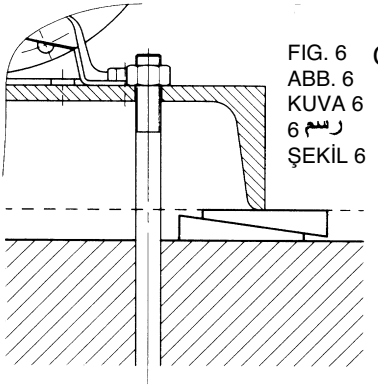


FIG. 6 C
ABB. 6
KUVA 6
6 رسم
ŞEKİL 6

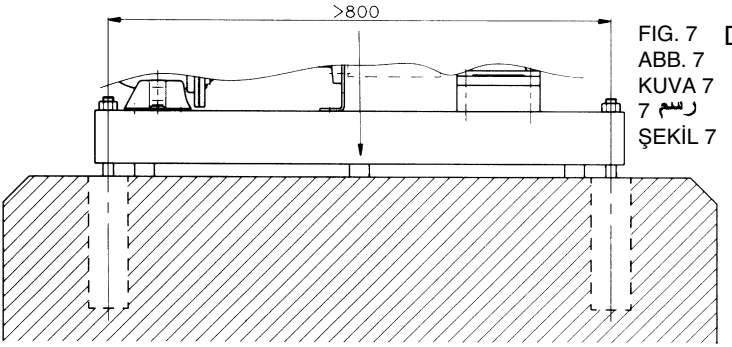


FIG. 7 D
ABB. 7
KUVA 7
7 رسم
ŞEKİL 7

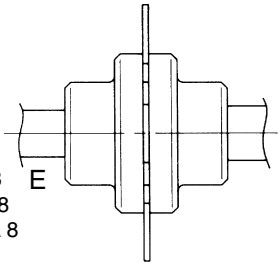


FIG. 8 E
ABB. 8
KUVA 8
8 رسم
ŞEKİL 8

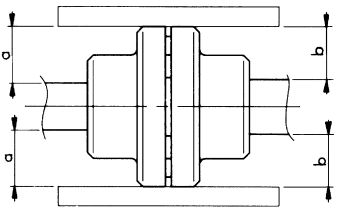


FIG. 9 F
ABB. 9
KUVA 9
9 رسم
ŞEKİL 9

LEGENDA DI PAG. 90 - LEGEND ON PAGE. 90 - LEGENDE DE LA PAGE 90 - ZEICHENERKLÄRUNG DER SEITE 90 - LEYENDA DE PÁG. 90 - LEGENDA DE PÁG. 90 - VERKLARING VAN DE TEKENS VAN BLZ 90 - TEGNFORKLARING PÅ S. 90 - TECKENFÖRKLARING 90 - SIVUN 90 KUVIEN SELITYKSET - TEGNFORKLARING PÅ SIDE 90 - 90 مصطلحات صفحة - SAYFA 90'DE BULUNAN AÇIKLAMA

A = SOLLEVAMENTO ELETTROPOMPA
PUMP LIFTING
LEVAGE DE L' ELECTROPOMPES
ABHEBUNG
LEVANTAMIENTO ELECTROBOMBA
LEVANTAMENTO DA ELECTROBOMBA
OPHIJSEN VAN DE POMP
LØFT AF ELEKTROPUMPE
LYFT AV ELPUMP
SÄHKÖPUMPUN NOSTO
LØFT AV ELEKTROPUMPEN
رفع المضخة الكهربائية
ELEKTRİKLİ POMPANIN YUKARI KALDIRILMASI

B = FISSAGGIO AL PAVIMENTO
ANCHORING TO THE FLOOR
FIXATION AU SOL
BEFESTIGUNG DER PUMPE AUF DEM BODEN
FIJACION EN EL PISO
FIXACAO NO PAVIMENTO
BEVESTIGING AAN DE VLOER
FORANKRING TIL GULV
FORANKRING VID GOLVET
LATTIAAN ANKKUROINTI
FORANKRING TIL GULVET
التثبيت على الأرضية
ZEMİNE SABİTLENMESİ

C = FISSAGGIO ALLA FONDAZIONE
ANCHORING TO THE FOUNDATION
FIXATION A FONDATION
BEFESTIGUNG DER PUMPE IM FUNDAMENT
FIJACION EN LOS CIMIENTOS
FIXACAO NA FUNDACAO
BEVESTIGING AAN DE FUNDERING
FORANKRING TIL BASE
FORANKRING VID FUNDAMENTET
PERUSTAAN ANKKUROINTI
FORANKRING TIL FUNDAMENTET
التثبيت على الأساس
TEMELE SABİTLENMESİ

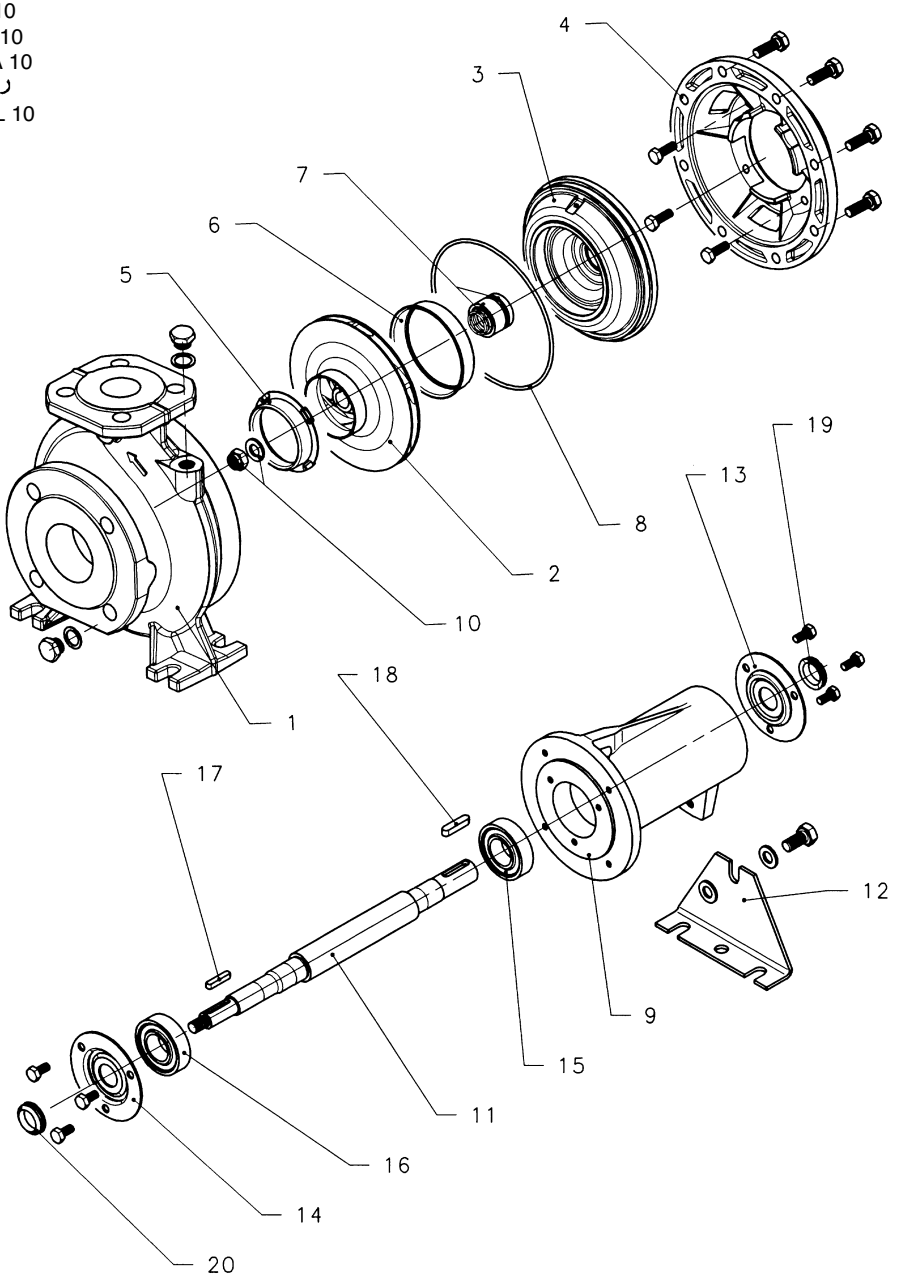
D = POSIZIONAMENTO SPESSORI
FITTING SHIMS
POSITIONNEMENT CALES D'EPAISSEUR
POSITIONIERUNG DER UNTERLEGBLECHE
EMPLAZAMIENTO DE LOS SUPLEMENTOS DE ESPESOR
POSICIONAMENTO DOS CALCOS
PLAATSING VAN TUSSENSTUKKEN
PLACERING AF TYKKELSESSKIVER
PLACERING AV MELLANLAGG
KIILOJEN ASETUS
PLASSERING AV MELLOMLAG
وضع السميكات
AYAR PULLARININ YERLEŞTİRİLMESİ

E = CALIBRO PER SPESSORI
THICKNESS GAUGE
JAUGE D'EPAISSEUR
ABSTANDSTUCK - LEHRE
CALIBRE DE ESPESOR
CALIBRE DE ESPESSURA
DIKTEKALIBER
TYKKELSESMÅLER
MATINSTRUMENT FOR MELLANLAGG
PAKSUUSTULKKI
KALIBER FOR MELLOMLAG
ضبط السميكات
E = KALINLIK ÖLÇER

F = RIGA
RULER
REGLE
LINEA
REGLA
REGUA
LINIAAL
LINEAL
LINJAL
VIIVAIN
LINJAL
مسطرة
CETVEL

FHF Serie - Series - Série - Baureihe - Sarja - سلسلة Serisi

FIG. 10
ABB. 10
KUVA 10
رسم 10
ŞEKİL 10



FHF Nomenclatura delle parti di ricambio - Spare part list - Nomenclature des pièces de rechange - Ersatzteilebezeichnung - Lista de las piezas de repuesto - Lista das peças de reposição - Lijst van de reserveonderdelen - Reservedelsliste - Reservdelslista - Varaosaluettelo - Reservedelsliste - أسماء قطع التبديل - Yedek parçaların adlandırılması

N. - رقم No.	Descrizione - Description - Description - Teilebeschreibung - Descripción - Descrição - Beschrijving - Beskrivelse - Beskrivning - Kuvaus - Beskrivelse - التسمية - Tanım
	Pompa ad asse nudo - Bare shaft pump - Pompe sans moteur - Pumpe mit freier Achse - Bomba de eje desnudo - Bomba de veio nu - Pomp met naakte as - Pumpe med ubeklædt akse - Pump med bar axel - Paljasakselinen pumppu - Pumpe med bar aksel - مضخة ذات محور مجرد - Çıplak şaftlı pompa
1	Corpo pompa - Pump body - Corps de pompe - Pumpengehäuse - Caia bomba - Corpo da bomba - Pomplichaam Pumpehus - Pumphus - Pumpun runko - Pumpehus - جسم المضخة Pompa gövdesi
* 2	Girante - Impeller - Turbine - Laufrad - Rueda de álabes - Impulsor - Waaier - Pumpehjul - Pumphjul - Juoksupyörä - Pumpehjul - دوار - Pompa çarkı
3	Disco portatenuta - Seal thousing disck - Support garniture - Dichtungsscheibe - Disco de alojamiento retén - Disco porta-vedante - Dichtingssteunplaat - Holder til tætningsskive - Tätningshållarskiva - Tiivisteen kannatuslevy - Tetningsholderskive - قرص حامل إحكام - Sızdırmazlık elemanı diski
4	Lanterna - Adaptor - Lanterne - Laterne - Adaptador - Adaptador - Motorsteun - Adapter - Adapter - Sovitin - Adapter - فانوس - Adaptör
5	Anello di rasamento - Wear ring - Anneau d'usure - Ausgleichsring - Anillo de espesor - Anel compensador de desgaste - Schraapring - Slidring - Slitring - Kulumisrengas - Slitering - طوق مسح - Aşınma halkası
6	Anello di controrasamento - Back wear ring - Contre-anneau d'usure - Gegenausgleichsring - Anillo de contraespesor - Anel compensador de desgaste posterior - Tegenschraapring - Kontraslidring - Bakre slitring - Takakulumisrengas - Bakre slitering - طوق قران مسح - Karşı aşınma halkası
* 7	Tenuta meccanica - Mechanical seal - Garniture méchanique - Gleitringdichtung - Retén mecánico - Vedante mecânico - Mechanische dichting - Mekanisk tætning - Mekanisk tätning - Mekaaninen tiiviste - Mekanisk tetning - إحكام ميكانيكي - Mekanik salmastra
* 8	Guarnizione OR - "O" Ring - Joint torique - O-Ring - Aro tórico - Vedação OR - O-dichtingsring - O-ring - O-ring - O-rengas - O-ring - حشوة أور OR - O-Ring
9	Corpo supporto - Support casing - Corps du palier - Stützgehäuse - Caja soporte - Corpo do suporte - Steunhuis - Hoveddel til støtte - Stödkropp - Tukirunko - Støttekropp - حسم سناد - Destek gövdesi
10	Dado fissaggio girante e rosetta - Impeller lock nut and washer - Ecrou de fixation roue et rondelle - Laufradfeststellmutter und Unterlegscheibe - Tuerca de fijación rueda de álabes y arandela - Porca de fixação impulsor e anilha - Bevestigingsmoer waaier en onderlegring - Låsemøtrik til pumpehjul og spændeskive - Låsmutter för pumphjul och bricka - Juoksupyörän kiinnitysmutteri ja välirengas - Låsemutter for pumpehjul og skive - عزقة تثبيت دوار والوردة - Çark tespit somunu ve rondela
11	Albero - Shaft - Arvre - Welle - Árbol - Veio - As - Aksel - Axel - Akseli - Aksel - جذع - Mil
12	Sostegno di supporto - Support foot - Support du palier - Träger - Apoyo soporte - Apoio do suporte - Steun - Stiver til støtte - Stödfäste - Tuen kannatin - Støttefeste - دعامة سناد - Destek mesnedi
13	Coperchietto lato motore - Motor side cover - Couvercle côté moteur - Lagerdeckel motorseitig - Tapa lado motor - Tampa lado motor - Kap motorzijde - Dæksel på motorside - Kåpa på motorsida - Moottoripuolen kansi - Deksel på motorsiden - غطاء جانب المحرك - Motor tarafındaki küçük kapak
14	Coperchietto lato pompa - Pump side cover - Couvercle côté pompe - Lagerdeckel pumpenseitig - Tapa lado bomba - Tampa lado bomba - Kap pompzijde - Dæksel på pumpeside - Kåpa på pumpsida - Pumppupuolen kansi - Deksel på pumpesiden - غطاء جانب المضخة Pompa tarafındaki küçük kapak
* 15	Cuscinetto lato motore - Motor side bearing - Palier côté moteur - Motorseitiges Lager - Cojinete lado motor - Rolamento lado motor - Lager motorzijde - Leje på motorside - Lager på motorsida - Moottoripuolen laakeri - Lager på motorsiden - وساد جانب المحرك - Motor tarafındaki rulman
* 16	Cuscinetto lato pompa - Pump side bearing - Palier côté pompe - Pumpenseitiges Lager - Cojinete lado bomba - Rolamento lado bomba - Lager pompzijde - Leje på pumpeside - Lager på pumpsida - Pumppupuolen laakeri - Lager på pumpesiden - وساد جانب المضخة Pompa tarafındaki rulman
17	Linguetta - Key - Clavette - Paßfeder - Lengüeta - Lingueta - Spie - Kile - Kil - Kiila - Kile - استطالة - Çıkıntı
18	Linguetta - Key - Languette - Paßfeder - Lengüeta - Lingueta - Spie - Kile - Kil - Kiila - Kile - استطالة - Çıkıntı
19	Anello V-ring lato motore - Motor side V-ring - Anneau en V côté moteur - Motorseitiger V-Ring - Anillo V-ring lado motor - Anel V-ring lado motor - V-ring motorzijde - Kilering på motorside - V-ring på motorsida - Moottoripuolen tiivistysrengas - Tetningsring på motorsiden - حلقة V طوق جانب المحرك - Motor tarafındaki V-ring halkası
20	Anello V-ring lato pompa - Pump side V-ring - Anneau en V côté pompe - Pumpenseitiger V-Ring - Anillo V-ring lado bomba - Anel V-ring lado bomba - V-ring pompzijde - Kilering på pumpeside - V-ring på pumpsida - Pumppupuolen tiivistysrengas - Tetningsring på pumpesiden - حلقة V طوق جانب المضخة - Pompa tarafındaki V-ring halkası

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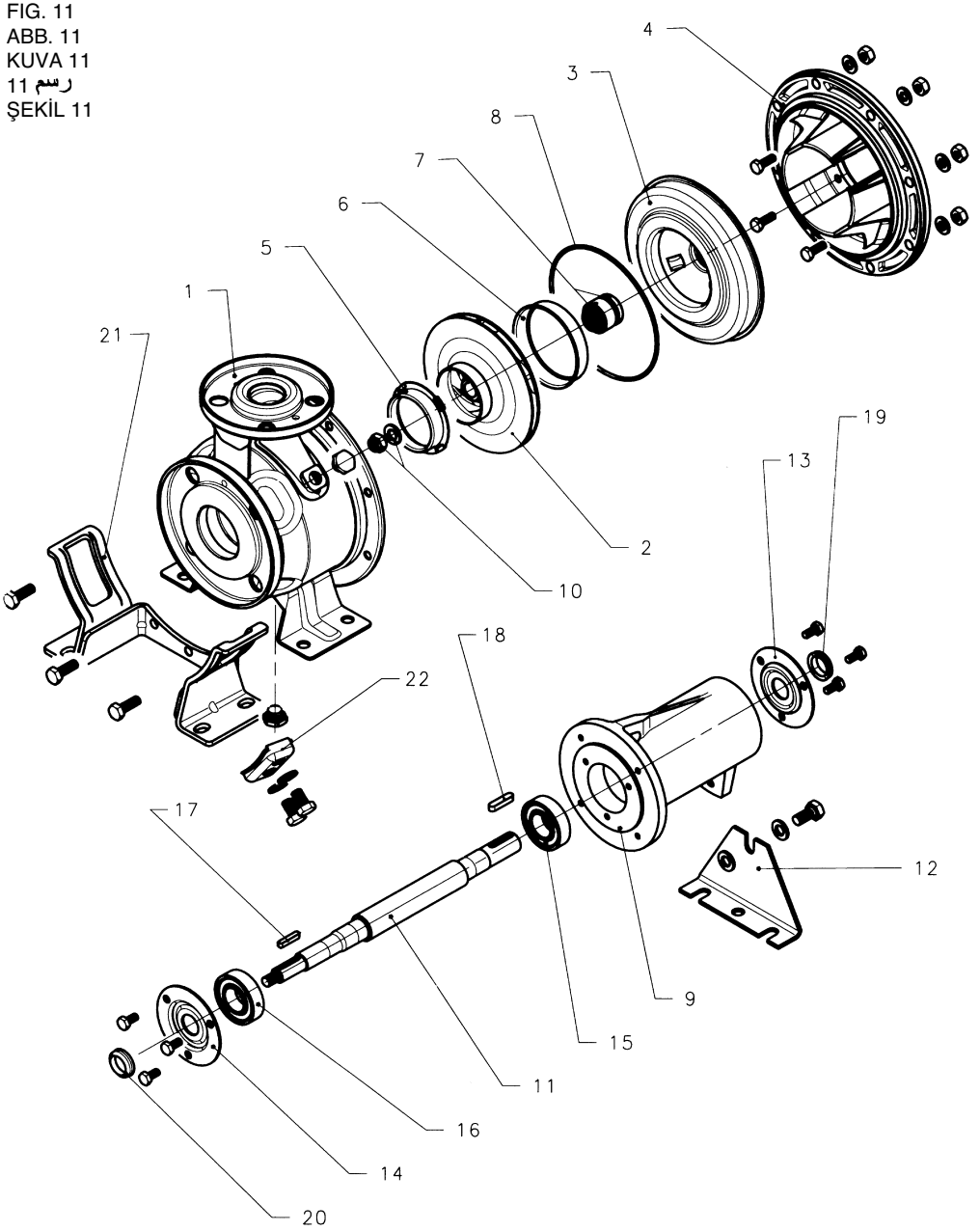
SHF Serie - Series - Série - Baureihe - Sarja - سلسلة Serisi

FIG. 11
ABB. 11
KUVA 11
رسم 11
ŞEKİL 11



SHF Nomenclatura delle parti di ricambio - Spare part list - Nomenclature des pièces de rechange - Ersatzteilebezeichnung - Lista de las piezas de repuesto - Lista das peças de reposição - Lijst van de reserveonderdelen - Reservedelsliste - Reservdelslista - Varaosaluettelo - Reservedelsliste - أسماء قطع التبديل - Yedek parçaların adlandırılması

N. - رقم No.	Descrizione - Description - Description - Teilebeschreibung - Descripción - Descrição - Beschrijving - Beskrivelse - Beskrivning - Kuvaus - Beskrivelse - التسمية - Tanım Pompa ad asse nudo - Bare shaft pump - Pompe sans moteur - Pumpe mit freier Achse - Bomba de eje desnudo - Bomba de veio nu - Pomp met naakte as - Pumpe med ubeklædt akse - Pump med bar axel - Paljasakselinen pumppu - Pumpe med bar aksel - مضخة ذات محور مجرد - Çıplak şaftlı pompa
1	Corpo pompa con rasamento - Pump body with wear ring - Corps de pompe avec régulation de niveau - Pumpenkörper mit Ausgleich - Caja bomba con espesor - Corpo da bomba com anel compensador de desgaste - Pomplichaam met schraapring - Pumpehus med slidring - Pumpstomme med mellanläggsbricka - Pumpun runko ja kulumisrengas - Pumpehus med slitering - جسم المضخة مع إنسحاج - Aşınma halkası ile pompa gövdesi
* 2	Girante - Impeller - Turbine - Laufrad - Rueda de álabes - Impulsor - Waaier -Pumpehjul - Pumphjul - Juoksupyörä - Pumpehjul - دوار - Pompa çarkı
3	Disco portatenuta con rasamento - Seal housing with wear ring - Support garniture avec anneau d'usure - Dichtungsscheibe mit Ausgleichsscheibe - Disco de alojamiento retén con espesor - Disco porta vedante com anel compensador de desgaste - Dichtingssteunplaat met schraapring - Holder til tætningsskive - Tätningshållarskiva med slitring - Tiivisteen kannatuslevy ja kulumisrengas - Tetningsholderskive med bakre slitering - فرص حامل إحكام مع طوق مسح - Aşınma halkası ile sızdırmazlık elemanı diski
4	Lanterna - Adaptor - Lanterne - Laterne - Adaptador - Adaptador - Motorsteun - Adapter - Adapter - Sovitin - Adapter - فانوس - Adaptör
5	Anello di rasamento - Wear ring - Anneau d'usure - Ausgleichsring - Anillo de espesor - Anel compensador de desgaste - Schraapring - Slidring - Slitring - Kulumisrengas - Slitering - طوق مسح - Aşınma halkası
6	Anello di controrasamento - Back wear ring - Contre-anneau d'usure - Gegenausgleichsring - Anillo de contraespesor - Anel compensador de desgaste posterior - Tegenschraapring - Kontraslidring - Bakre slitring - Takakulumisrengas - Bakre slitering - طوق قران مسح - Karşı aşınma halkası
* 7	Tenuta meccanica - Mechanical seal - Garniture méchanique - Gleitringdichtung - Retén mecánico - Vedante mecânico - Mechanische dichting - Mekanisk tætning - Mekanisk tätning - Mekaaninen tiiviste - Mekanisk tetning - إحكام ميكانيكي - Mekanik salmastra
* 8	Guarnizione OR - "O" Ring - Joint torique - O-Ring - Aro tórico - Vedação OR - O-dichtingsring - O-ring - O-ring - O-rengas - O-ring - حشوة أور OR - O-Ring
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17	Linguetta - Key - Clavette - Paßfeder - Lengüeta - Lingueta - Spie - Kile - Kil - Kiila - Kile - استطالة - Anahtar
18	Linguetta - Key - Languette - Paßfeder - Lengüeta - Lingueta - Spie - Kile - Kil - Kiila - Kile - استطالة - Anahtar
19	Anello V-ring lato motore - Motor side V-ring - Anneau en V côté moteur - Motorseitiger V-Ring - Anillo V-ring lado motor - Anel V-ring lado motor - V-ring motorzijde - Kilering på motorside - V-ring på motorsida - Moottoripuolen tiivistysrengas - Tetningsring på motorsiden - حلقة V طوق جانب المحرك - Motor tarafındaki V-ring halkası
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21	Sostegno corpo - Body support - Support corps - Pumpenhalterung - Soporte caja - Suporte do corpo - Lichaamssteun - Stiver til hoveddel - Pumphusfäste - Rungon kannatin - Pumpehusfeste - دعامة الجسم - Pompa gövdesi mesnedi
22	Coperchietto sostegno corpo - Support cover - Couvercle support du corps - Deckel - Tapa apoyo caja - Tampa suporte corpo - Kap steun lichaam - Dæksel til stiver til hoveddel - Kåpa för pumphusfäste - Rungon kannattimen kansi - Deksel for pumpehusfeste - غطاء دعامة الجسم Pompa gövdesi mesnedi küçük kapağı

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TEGNFORKLARING PÅ S. 92
TECKENFÖRKLARING 92
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SAYFA 92'TE BULUNAN AÇIKLAMA

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VERKLARING VAN DE TEKENS VAN BLZ 94
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SIVUN 94 KUVIEN SELITYKSET
TEGNFORKLARING PÅ SIDE 94
مصطلحات صفحة 94
SAYFA 94'DA BULUNAN AÇIKLAMA

I numeri identificano i ricambi come da nostro catalogo specifico.
The numbers of the spare parts correspond to the ones in our specific catalog.
Les numéros de référence susdits correspondent aux numéros de notre catalogue pièces de rechange.
Die Ersatzteil-Nummern entsprechen unseren Katalognummern.
Los números de los repuestos corresponden a los que se indican en nuestro catálogo específico.
Os números identificam as peças de reposição conforme o nosso catálogo específico.
De nummers horen bij de reserveonderdelen die in onze speciale catalogus staan.
Numrene på reservedelene svarer til numrene i reservedelskataloget.
Numren på reservdelarna överensstämmer med de i vår specifika reservdelskatalog.
Varaosien numerot vastaavat varaosaluettelomme numeroita.
Numrene på reservedelene er i overensstemmelse med de i vår spesifikke reservedelskatalog.
تميز الأرقام قطع التبديل كما هي في كتالوجنا المخصص.
Numaralar özel katalogumuzda belirtilen yedek parçalara aittir.

FIG 3 - ABB. 3 - KUVA 3 - 3 رسم - ŞEKİL 3

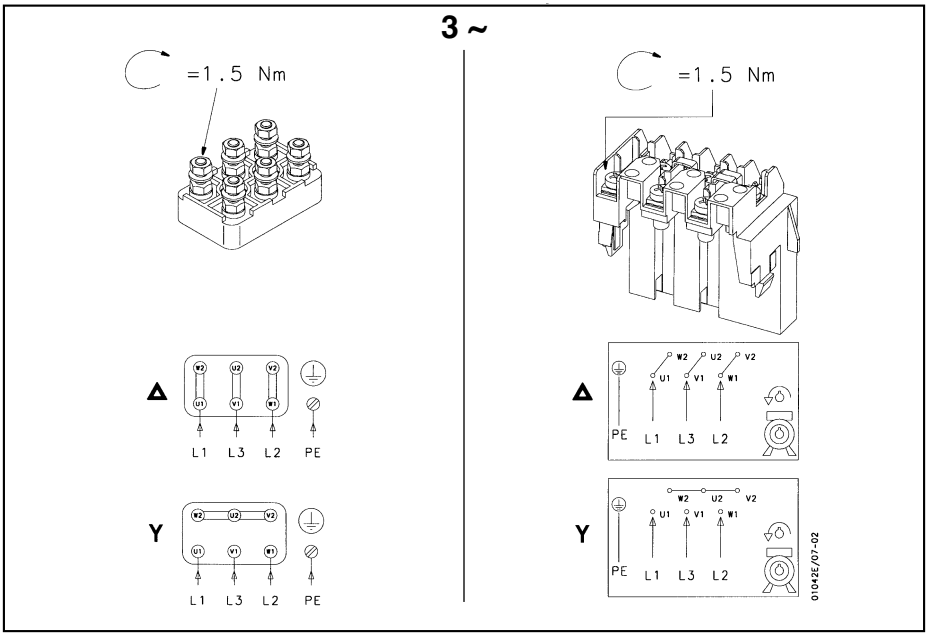
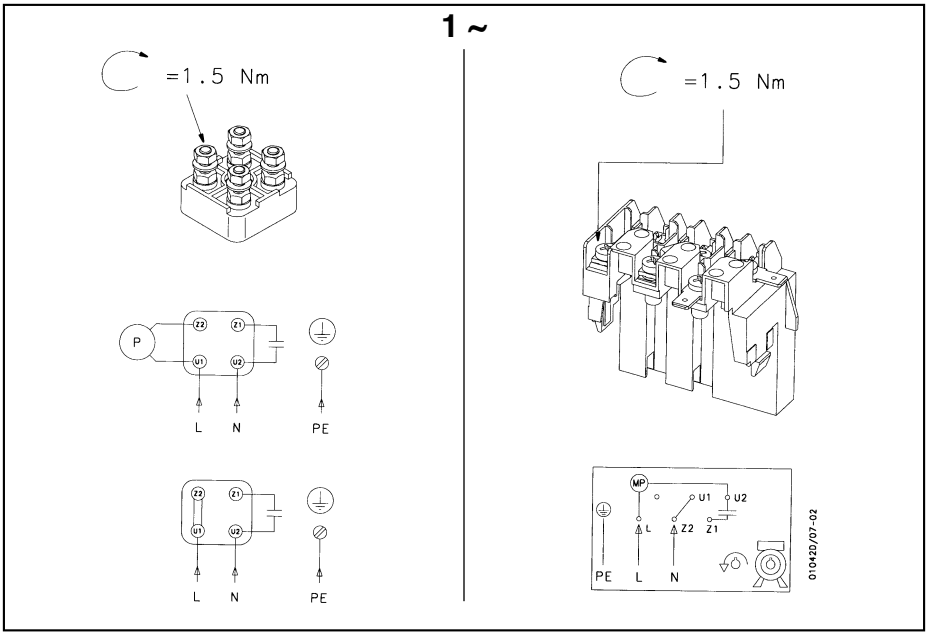


FIG 4 - ABB. 4 - KUVA 4 - 4 رسم - ŞEKİL 4



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fr	Lowara se réserve le droit d'apporter des modifications sans obligation de préavis.
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pt	A Lowara reserva-se o direito de proceder a alterações sem aviso prévio.
nl	Lowara behoudt zich het recht voor om zonder voorafgaand bericht wijzigingen aan te brengen.
da	Lowara forbeholder sig retten til at ændre specifikationerne uden meddelelse herom.
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tr	Lowara şirketi önceden haber vermeksizin değişiklikler yapma hakkını saklı tutmaktadır
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ar	تحتفظ شركة لوارا Lowara بحق إجراء تعديلات بدون الالتزام بالتنبيه المُسبق.

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