


it	ELETTROPOMPE SERIE TKS/... CON VARIATORE DI VELOCITÀ TEKNOSPEED	Istruzioni d'installazione e d'uso
en	TKS/..... SERIES ELECTRIC PUMPS WITH TEKNOSPEED SPEED VARIATOR	Instructions for installation and use
fr	ÉLECTROPOMPES SÉRIE TKS/..... AVEC VARIATEUR DE VITESSE TEKNOSPEED	Instructions pour l'installation et l'emploi
de	PUMPEN BAUREIHE TKS/..... MIT FREQUENZUMFORMER TEKNOSPEED	Installations- und Bedienungsanleitungen
es	ELECTROBOMBAS SÉRIE TKS/..... CON VARIADOR DE REVOLUCIONES TEKNOSPEED	Instrucciones de instalación y uso
pt	ELECTROBOMBAS SÉRIE TKS/..... COM CONVERSOR DE VELOCIDADE TEKNOSPEED	Instruções instalação e uso
nl	ELEKTROPOMPEN TKS/... .. SERIE MET TEKNOSPEED SNELHEIDSREGELAAR	Aanwijzingen voor de installatie en het gebruik
 <p>Applica qui l'adesivo col codice a barre</p> <p>Apply the bar code label here</p>		
It	Conservate con cura il manuale per future consultazioni	
en	Keep 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	



it

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INSTRUCTIONS FOR INSTALLATION AND USE

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it

« Istruzioni originali »

AVVERTIMENTI PER LA SICUREZZA DELLE PERSONE E DELLE COSE

Questi simboli indicano la potenzialità del rischio derivante dal mancato rispetto della prescrizione alla quale sono stati abbinati, come sotto specificato



PERICOLO

La mancata osservanza della prescrizione comporta un rischio di danni alle persone e alle cose.



PERICOLO RISCHIO DI SCOSSE ELETTRICHE

La mancata osservanza della prescrizione comporta un rischio di scosse elettriche.



AVVERTENZA

La mancata osservanza della prescrizione comporta un rischio di danni alle cose (pompa, impianto, quadro,...).



Leggete attentamente il manuale

en

« Translation of the original instructions »

WARNINGS FOR THE SAFETY OF PEOPLE AND PROPERTY

The following symbols indicate the potential hazards resulting from failure to observe the associated warning, as specified below.



DANGER

Failure to observe this warning may cause personal injury and/or damage to property.



DANGER RISK OF ELECTRIC SHOCK

Failure to observe this warning may result in electric shock.



WARNING

Failure to observe this warning may cause damage to property (pump, system, panel, etc.).



Read the manual carefully.

fr

« Traduction de la notice originale »

AVERTISSEMENTS POUR LA SECURITE DES PERSONNES ET DES CHOSES

Ces symboles indiquent la possibilité de danger dérivant du non respect de la prescription correspondante, suivant les spécifications suivantes



DANGER

La non observation de la prescription comporte un risque de lésion ou dommage aux personnes et/ou aux choses.



DANGER TENSION DANGEREUSE

La non observation de la prescription comporte un risque de choc électrique.



AVERTISSEMENT

La non observation de la prescription comporte un risque de dommage aux choses (pompe, installation, coffret,...).



Lire attentivement le manuel.

1. Overview

The purpose of this manual is to provide the necessary information for proper installation, operation and maintenance of the TEKNOSPEED converter connected to a LOWARA electric pump.



Read this manual before using the product.



Improper use may cause personal injury and damage to property, and lead to the forfeiture of the warranty coverage.



For information regarding the electric pumps, refer to the relevant manuals.

The instructions and warnings provided below concern the standard version.

Please refer to the sale contract for any modifications or special version characteristics.

Always specify the exact model identification code and construction number when requesting technical information or spare parts from our Sales and Service department.

For instructions, situations or events not considered in this manual or in the sale documents, please contact our Service Center nearest you.

2. Preliminary Inspection

2.1 Visual Inspection

Upon delivery, check the integrity of the packaging.

If the packaging is damaged, unpack the product and inspect it visually to make sure it has suffered no damage during transport.

Should the product be damaged, inform our dealer within 8 days from delivery.

2.2 Handling and Storage

The product is delivered in a cardboard box or wooden case. During transport and storage, protect it from humidity, heat sources and possible mechanical damage (impacts, falls, etc). Lift and handle the product carefully using suitable hoisting equipment.

Refer to chapter 4 for further information.

3. Applications

The TKS system consists of a three-phase electric pump, the TEKNOSPEED single-phase converter and an electronic pressure transmitter (also known as pressure sensor).

The TEKNOSPEED single-phase converter is suitable for the control of a three-phase electric pump according to the conditions described in this manual and the supply voltage / frequency specified in the rating plate.

The converter controls the operation of the pump in order to ensure a constant delivery pressure based on the signal received from the electronic pressure transmitter.

The TKS system can be used for domestic water supply, irrigation and pressure boosting applications.

For further information refer to chapter 12.

4. Working Limits

For storage :



- Ambient temperature: -5°C to +40°C .

For operation :



For information regarding electric pumps refer to the relevant manuals.

4.1 TKS system (TEKNOSPEED mounted on the electric pump)



Do not use the product in environments where corrosive and/or flammable powders, acids, gases, etc. are present.

Do not use the electric pump to handle dangerous or flammable liquids.

- Ambient temperature: +0°C to +40°C
- Maximum relative humidity : 50 % at + 40°C provided no condensation occurs
- Maximum height above sea level: 1000 meters
- Protection class : IP 55 (if installed on motors with at least IP55 protection)
- Maximum operating pressure : refer to the operating instructions for the electric pump
The standard version features a transmitter with 10 bar full scale (chapter 4.2)
- Temperature of pumped liquid : + 1°C to + 40 °C
- Nature of pumped liquid : water containing no chemically aggressive substances or suspended solids
- Maximum rated power of electric pump connected to the converter : 1.1 kW
- Converter supply voltage : 1 x 230 V ± 10 % 50/60 Hz
- Converter output voltage (corresponding to the motor supply voltage) :
3 x 230 V ± 10 % 12-50 Hz (these values vary according to the converter's voltage/frequency curve)
- Converter's rated input current : 6.8 A
- Converter's rated output current: 4.6 A
- Maximum number of starts per hour, evenly distributed : read the operating instructions for the electric pump

4.2 Pressure transmitter

The sensor for this transmitter is a piezo-resistive silicon element which is sensitive to pressure. It is mounted on a small flexible printed circuit (TAB) and is immersed in an oil chamber. The pressure is transmitted to the sensor through a steel diaphragm located in the oil chamber.

- Pressure range : 0 to 10 bar
- Power supply : 21 Vdc from TEKNOSPEED
- Output signal : 4 to 20 mA
- Connection : 1/4" male, made of nickel plated brass
- Electrical connector : removable, provided with 2-meter shielded cable
- Protection class : IP 55

For ambient conditions other than those specified above, please contact our Sales and Service Department.

5. Installation

Information for installers



The installation operations must be carried out by skilled and qualified personnel. Use adequate equipment and protections. Observe the accident prevention regulations in force.



Before proceeding with the installation, read these operating instructions and the manual for the electric pump.

If the product shows evident signs of damage, do not proceed with installation but contact our Customer Service Center.



Install the product in a sheltered location protected from the weather and freezing temperatures; observe the working limits in order to guarantee adequate motor cooling. For further information refer to chapters 4 and 12.



Observe all the safety standards and accident prevention regulations in force.

6. Start-up

Information for installers



The start-up operations must be performed by skilled and qualified personnel. Use adequate equipment and protections. Observe the accident prevention regulations in force.



Before starting the unit, read these operating instructions and the manual for the electric pump.

6.1 Hydraulic Connection of Electric Pump



The hydraulic connections must comply with current standards and legislation.

The product can be connected directly to the municipal water system or the water can be taken from a storage tank.

In case of connection to the municipal water system follow the regulations locally in force (issued by City, utility company, etc.). We suggest that you install a pressure switch on the suction side for deactivation of the electric pump in the event of low water system pressure (protection against dry running).



Make sure that the water system pressure added to the maximum pressure of the pump does not exceed the maximum operating pressure value (nominal pressure NP) allowed for the pump.

For example, if the system features a CA 70/33 pump we can calculate that :

Maximum head of the pump :

43 meters (equivalent to a closing contact pressure of approximately 4.3 bar)

Maximum working pressure allowed :

8 bar (NP 8)

Water system pressure (consider the maximum value):

1.5 bar

Resulting maximum working pressure :

$4.3 + 1.5 = 5.8$ less than the 8 bar limit

When using a storage tank it is necessary to install a float switch for deactivation of the electric pump in the event of low water (protection against dry running).



You must install a pressure gauge on the delivery side as it may be necessary to modify the factory settings based on the actual installation conditions.

To complete the system, flexible pipes on suction and delivery side, on-off valves on suction and delivery side, non-return valve and surge tank with diaphragm are normally installed. To avoid having to drain the system in the event that the diaphragm tank or the pressure gauge or the pressure transmitter need replacing, we advise you to install on-off valves.

If you install a check valve on the pump's delivery side, position the pressure transmitter downstream from the valve. We advise you to install a test tap to be used during the TKS system's calibration stage (chapter 6.3.3) unless a water drawing point is already present in the vicinity of the pump .

For further information refer to chapter 12.

6.1.1 Surge Tank (Diaphragm Tank)

A diaphragm tank must be installed on the delivery side of the electric pump to maintain pressure in the system when there is no water demand, in order to prevent continuous pump operation.

With the TEKNOSPEED converter there is no need for a large capacity tank. The nominal capacity of the tank, in liters, must be at least 5% of the maximum flow rate (liters per minute) of one pump, with a minimum of 8 liters of nominal capacity.

Example :

maximum flow rate of pump	= 60 liters per minute
nominal volume of tank	= $60 \times 0.05 = 3$ liters → 8 liters
maximum flow rate of pump	= 150 liters per minute
nominal volume of tank	= $150 \times 0.05 = 7.5$ liters → 8 liters



Make sure that the surge tank can handle the maximum pressure of the system.

Check and adjust the precharge pressure before connecting the surge tank to the system.

If the surge tank is already connected, you will have to drain the system before you check and adjust the precharge pressure. To avoid doing this, we suggest that you install an on-off valve between the connection to the tank and the system's pipe.

To determine the precharge value for the surge tank you can use the following formula:

if in bar → work pressure – 0.2 = precharge pressure

if in kPa → work pressure – 20 = precharge pressure

6.2 Electrical Connection of Pump



The electrical connections must comply with current standards and regulations.



Make sure that the type of power source, the supply voltage and frequency match the ratings of the TKS system shown in the rating plate. Provide suitable general protection against short circuits on the electrical power line.

WARNING : although the TKS system has single-phase power supply, the pump's motor is always a three-phase motor connected to 230 V. The missing phases are created by the converter. For further information refer to chapter 12.



Before proceeding with these operations, make sure that all the connections (even those that are potential-free) are voltage-free. Always disconnect the TEKNOSPEED converter from the power supply before carrying out any operations on the system's electrical or mechanical components.

After disconnection from the power source, wait at least 1 minute before carrying out any work on TEKNOSPEED to allow the condensers in the internal circuit to discharge.

6.2.1 Differential Magneto-thermal Switch

If local regulations require the installation of a differential magneto-thermal switch, make sure it is of a type that is suited to the system. Suitable switches are those having the characteristic curve for unidirectional alternate and pulsating DC fault current (type A or C).

They can be identified by the presence of the following symbol: 

6.2.2 Version with Cable and Plug

The TKS system is equipped with power cord and plug.



When installing the pump, make sure that the plug and corresponding outlet are easily accessible in case the system needs to be deactivated.

If the power cord is damaged, it must be replaced at a service center or by qualified personnel.

6.2.3 Input Filter

The TEKNOSPEED converter is equipped with an input filter according to the EMC directive.

6.2.4 Motor Overload Protection

The TEKNOSPEED converter has an incorporated overload protection which guarantees absolute protection when it is connected to motors featuring the same nominal protection as that of the converter. For lower power motors an auxiliary protection is used (see chapter 6.2.5)

6.2.5 Motor Overtemperature Protection (PTC)

Some models may feature an extra protection (thermistor) in addition to the overload protection incorporated in the converter. The thermistor (PTC) is attached to the base of the terminal board and connected through cables and mini-fastons. The corresponding dip-switch will be in the PTC Y position.

For further information refer to chapter 12.

6.2.6 Converter overtemperature protection

The TEKNOSPEED converter has an incorporated overtemperature protection.

6.2.7 Protection against dry running (float switch)

The TEKNOSPEED converter can be connected to an external device for protection against pump dry running (see chapter 6.1). The most conventional method consists in the use of a float switch installed in the suction tank.

To connect the cable of the external device you must remove the converter's radiator using a no. 5 Allen wrench (maximum torque 6 Nm). Turn the radiator upside down, paying attention to the connections with the removable terminal board. The terminal board may have to be extracted. Replace an M 16 x 1.5 plug with one of the cable glands supplied. Lay the float switch cable and connect it to the terminals corresponding to LOW 1 and LOW 2 (suitable for 0.5÷1 mm² conductors). Screw down the cable fastening plate and tighten the cable gland to secure the cable. If you connect the suction side of the pump to the municipal water system, you can use a pressure switch that opens its contact when the pressure drops below the set point.

If you are not using any device, two terminals must be connected with a jumper.



Use the slotted blade screwdriver (2.5 mm) provided with the TKS system for the connections on the converter's terminal board.

For further information refer to chapter 12.

6.2.8 External Enable Device

You can connect a switch instead of the float switch (chapter 6.2.7). This external device can be used to enable or disable the system. We recommend using a shielded cable. The stripping of the cable should allow the shielding to be in contact with the cable fastening plate.



Use the slotted blade screwdriver (2.5 mm) provided with the TKS system for the connections on the converter's terminal board.

For further information refer to chapter 12.

6.2.9 Alarm Relay

The TEKNOSPEED converter has a contact that can be used to obtain an external shutdown or malfunction signal.

This contact is closed when

- the pump is not running due to one of the following causes : no voltage
 - motor overload (chapter 6.2.5)
 - motor overtemperature (chapter 6.2.6)
 - converter overtemperature (chapter 6.2.7)
 - Probe faulty or disconnected (chapter 6.2.11)
- lack of water on suction side (chapters 6.2.8 and 6.2.9)

To connect the cable you must first take the radiator off the converter using a no. 5 Allen wrench (maximum torque 6 Nm). Turn the radiator upside down, paying attention to the connections with the removable terminal board. The terminal board may have to be extracted. Replace an M 16 x 1.5 plug with one of the cable glands supplied. Lay the cable and connect it to the terminals corresponding to COM and NC (suitable for 0.5÷1 mm² conductors). Screw down the cable fastening plate and tighten the cable gland to secure the cable.

We recommend using a shielded cable. The stripping of the cable should allow the shielding to be in contact with the cable fastening plate.



Use the slotted blade screwdriver (2.5 mm) provided with the TKS system for the connections on the converter's terminal board.

For further information refer to chapter 12.

6.2.10 Serial Interface

The TEKNOSPEED converter is equipped with a serial interface that can only be used on pumping systems with two pumps.



Do not connect any wires to the COM, TX, RX terminals of the serial interface.

For further information refer to chapter 12.

6.2.11 Pressure Transmitter

The TKS system comes with pressure transmitter connected to the TEKNOSPEED converter's terminal board. The transmitter is equipped with a 2-meter shielded cable. If you need to wind up the cable, do not coil it but fold it .

For further information refer to chapter 12.

6.2.12 Regulation Dip-switches

The TEKNOSPEED converter is equipped with a series of microswitches (dip-switches) that determine its operating cycle.



Do not modify the factory setting; you could damage the converter or the system on which it is installed.

For further information refer to chapter 12.

6.3 Initial Start-up

6.3.1 Priming



Read the operating instructions for the electric pump.



Fill the pump and suction pipes with water before starting the system. Dry running can damage the pump.

Start the system with the on-off valve on the delivery side closed. Then open the valve gradually. When the air in the pipe has been bled off the pump will run smoothly and silently.

6.3.2 Checking the Direction of Rotation of the Motor

There is no need to check the direction of rotation of the motor since it is pre-set at the factory.

6.3.3 Operating Pressure Calibration



A pressure gauge must necessarily be installed on the delivery side as it may be necessary to modify the factory setting according to the actual installation conditions and system requirements.

The TKS system comes with a factory setting that enables it to be used.

To modify the pressure based on the actual system requirements proceed as follows:

• Increasing the pressure value

- Make sure that the system is pressurized, no user is open and the pump is off. If there are any open users you can close the on-off valve located on the pump's delivery side.
- Unscrew the plug that protects the adjusting screw.
- Turn the adjusting screw slowly to the right using a screwdriver.



Use the slotted blade screwdriver (2.5 mm) provided with the TKS system. The adjusting screw has a limited travel, less than one turn, between the minimum value (0 bar) and the maximum value (10 bar). Do not force it beyond the limits as you could damage the adjusting screw .

- The pump starts.
- Read the pressure value on the gauge and keep turning the adjusting screw until the gauge pointer reaches the desired value.
- Make sure that the pressure has stabilized at the desired value.
- If necessary, make slight adjustments by turning the adjusting screw to the right or left. If you need to lower the pressure setting, we recommend that you open a user partially (see next section "Lowering the pressure value").





Make sure that the new value you have selected is within the head range specified in the TKS system's rating plate.

- The pump stops after approx. 60 seconds. The switch-off pressure may be slightly higher than the desired value (chapter 6.4.1)

• Lowering the pressure value

- Make sure that the system is pressurized, no user is open and the pump is off.
- Unscrew the plug that protects the adjusting screw.

- Open the on-off valve located on the pump's delivery side.
 - Open a user or the test tap (chapter 6.1) partially, allowing the pressure to drop slowly.
 - The pump starts.
 - Turn the adjusting screw slowly to the left using a screwdriver.
-  Use the slotted blade screwdriver (2.5 mm) provided with the TKS system. The adjusting screw has a limited travel, less than one turn, between the minimum value (0 bar) and the maximum value (10 bar). Do not force it beyond the limits as you could damage the adjusting screw.
- Read the pressure value on the gauge and keep turning the adjusting screw until the gauge pointer reaches the desired value.
 - Make sure that the pressure has stabilized at the desired value.
 - If necessary, make small adjustments by turning the adjusting screw to the right or left.
-  Make sure that the new value you have selected is within the head range specified in the TKS system's rating plate.
- The pump stops after approx. 60 seconds. The switch-off pressure may be slightly higher than the desired value (chapter 6.4.1).
- For further information refer to chapter 12.

6.3.4 Indicator Lights

On the adhesive plate attached to top of the radiator there are three LED's with the following functions :

Steady green light	Power	Indicates that the TKS system is powered
Steady yellow light	Run	Indicates that the pump is running
Flashing red light	Alarm	Indicates an alarm has triggered

If an alarm is triggered, the red light will flash more or less rapidly depending on what has caused the system to shut down. Except for lack of water on the suction side, in all other cases the system will automatically start again after 20 seconds. If the cause of the malfunction persists, after three attempts to restart the system will definitively shut down except in case of lack of water on the suction side. For further information refer to chapters 8.1 and 12.

6.4 Product Description

Information for users

The TKS system consists of an electric pump operated by an automatic electronic control system (frequency converter known also as speed variator) that enables the delivery of constant pressure by reducing or increasing the flow rate based on the water demand.

6.4.1 Operation

The automatic electronic control system receives a signal from a pressure sensor and compares it with the set value.

When the system is pressurized the pump is switched off. Water consumption by the users determines a decrease in system pressure which causes a reduction in the value of the signal. In this case the control system starts the pump, regulating its speed until the reference or operating pressure is re-established. If the water consumption increases the control system increases the speed of the pump, while if the water consumption diminishes the control system decreases the speed of the pump. When the maximum flow rate of the pump is reached, the control system runs the pump at its maximum nominal speed.

If the pressure increases because of decreased water consumption, the value of the signal from the sensor increases; in this case the control system reduces the speed of the pump.

If there is a swift decrease in water consumption (e.g. due to sudden closing of the faucets), the control system runs the pump at minimum speed for approx. 60 seconds and then stops it. In this case the stopping pressure coincides with the set value.

If the water consumption decreases gradually, the system runs the pump at a slightly higher pressure for approx. 60 seconds (with transmitter full scale equal to 10 bar → + 0.2 bar), and then stops it if there is no further water consumption.

If the system is powered the green (Power) light is on.

When the pump is running the yellow (Run) light is on.

If there is a shutdown or malfunction the red (Alarm) light comes on.

If an alarm is triggered, the red light will blink more or less rapidly depending on the cause of the shutdown. Except for lack of water on the suction side, in all other cases the system will automatically start again after 20 seconds. If the cause of the malfunction persists, after three attempts to restart the system will definitively shut down.



Refer to experienced and qualified personnel for any adjustments and/or maintenance operations. Do not attempt to change the settings or open the control system.



Before using the equipment, read the manuals and store them safely.
Store the screwdriver supplied with the TKS system in a safe place.

7. Maintenance

Information for maintenance personnel

Observe the following directions if you need to carry out any service operations on the product .



Maintenance operations must be performed by qualified personnel only.



Before carrying out any maintenance operations, make sure that all the connections (even those that are potential-free) are voltage-free.



Always disconnect the TEKNOSPEED converter from the power supply before carrying out any operations on the system's mechanical or electrical components.

After disconnection from the power source, wait at least 1 minute before carrying out any work on TEKNOSPEED to allow the condensers in the internal circuit to discharge.



Read this user's manual and the operating instructions for the electric pump and diaphragm tank (if installed).

7.1 Routine Maintenance

The TKS system does not require any routine maintenance provided that the working limits described in chapter 4 are observed.

The pumps do not require any routine maintenance (read the pump's manual).

Check the air pre-charge in the surge tank, if installed, at least once a year (chapter 6.1.1).

7.2 Extraordinary Maintenance



Use adequate equipment and protections. Observe the accident prevention regulations in force. Lift and handle the pumps carefully, using suitable hoisting equipment.



Use only original spare parts to replace any worn or faulty components.

WARNING !

Although the TKS system has a single-phase power supply, the pump's motor is always a three-phase motor connected to 230 V. The missing phases are created by the converter. For further information refer to chapter 12.

8. Troubleshooting

Information for users and maintenance personnel



Read this user's manual and the operating instructions for the electric pump and diaphragm tank (if installed).



Maintenance operations must be performed by qualified personnel only.

For further information refer to chapters 7 and 12.

8.1 Visual Signaling Devices

8.1.1 Operation Signals















Green light (power)	Off	No power	○
Green light (power)	On steady	Power	●
Yellow light (run)	Off	Pump off	○
Yellow light (run)	On steady	Pump running	○

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These basic signals are integrated by the alarm signals. Therefore there could be combinations of signals such as green light on (power), yellow light off (pump off) and flashing red light (alarm).

8.1.2 Alarm signals

If an alarm is triggered the red light flashes more or less rapidly (flashing – pause – flashing) depending on the cause of the system shutdown.

Red light (alarm)	Off	No malfunction	○
Red light (alarm)	Flashing	Overcurrent shutdown	 x 2 ○  x 2
Red light (alarm)	Flashing	Converter overtemperature shutdown	 x 3 ○  x 3
Red light (alarm)	Flashing	Motor overtemperature shutdown	 x 4 ○  x 4
Red light (alarm)	Flashing	Shutdown caused by lack of water on suction side Or shutdown caused by open external switch contact	 x 5 ○  x 5
Red light (alarm)	Flashing	No signal from transmitter shutdown	 x 6 ○  x 6
Red light (alarm)	Flashing	Low voltage (undervoltage) shutdown	 x 7 ○  x 7
Red light (alarm)	Flashing	Problems at serial output (for 2-pump units)	 x 8 ○  x 8

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Be careful when servicing the system as it could restart automatically.

Shutdown caused by lack of water on suction side

If the system shuts down because there is not enough water on the suction side, it will restart automatically only if the external device re-enables its operation (float switch or pressure switch or switch → chapters 6.2.7 and 6.2.8).

Shutdown caused by other problems except for lack of water on suction side

In all these cases the system restarts automatically after 20 seconds. If the cause of the malfunction persists, the system will shut down definitively after three attempts to start.

To reset the system, disconnect the power supply for at least one minute.

If 10 minutes elapse after an alarm without any other malfunctions occurring, the alarm counter is reset and three new attempts are possible.

If two or more alarms are triggered simultaneously (e.g. due to motor overtemperature and lack of water), only the first malfunction signal received by the control board is signaled.

WARNING ! The converter does not have a non-erasable alarm log, we therefore recommend that you observe the flashing frequency carefully before disconnecting the power supply to the TKS system.

For further information refer to chapters 8.1 and 12.

8.2 Troubleshooting Guide

PROBLEM	PROBABLE CAUSE	POSSIBLE REMEDY
The electric pump does not start Main switch on Green light off	No power supply	Restore the power supply
	Triggering of magneto-thermal switch	Reset the switch
The electric pump does not start or it stops if it is already running The main switch is on Green light on Red light on (***) flashes)	*** = 2 flashes	
	Motor overload	Check the working conditions of the electric pump
	Damaged motor stator	Check the motor
	*** = 3 flashes	
	Converter overtemperature	Check to see if anything is preventing the proper cooling of the converter
	*** = 4 flashes	
	Motor overtemperature (if the terminal board is equipped with the PTC protection)	Check the working conditions of the electric pump
	*** = 5 flashes	
	Triggering of dry running	Check the water level Check the external device and the related connection cables
	*** = 6 flashes	
Users closed Electric pump running with speed increasing and decreasing cyclically Green light on Yellow light on Red light off	Water leaks through the non-return valve or in the system	Check the system in order to locate the leaks. Repair or replace any faulty components.
	Undersized surge tank	Check the working conditions of the electric pump
	Ruptured surge tank diaphragm	Replace the diaphragm
Users open The electric pump does not start Green light on Yellow light off Red light off	Setting of work point not suitable for the system (the value is higher than the pressure that the pump is able to deliver)	Modify the system settings
	Setting of work point not suitable for the system (the value is equal to zero)	Modify the system settings
The electric pump is running. There are vibrations in the pump or near the pump	Setting of work point not suitable for the system (the value is lower than the minimum pressure that the pump can deliver)	Modify the system settings
Frequent starts and stops	There may be problems with the float switch in the suction tank	Check the float switch and the tank
The electric pump is running always at maximum speed	There may be problems with the pressure transmitter	Check the hydraulic connection between the transmitter and the system

Triggering of general system protection	Short circuit	Check the connection cables
Triggering of differential system protection (circuit breaker)	Ground leakage	Check the insulation of the electric pump and cables

9. Spare Parts

Information for maintenance personnel

Always state the exact model identification number and construction number when requesting technical information or spare parts from our Sales and Service Center.



Use only original spare parts when replacing any faulty components.



The use of unsuitable spare parts can cause malfunctions, personal injury and damage to property.

10. Disposal

Information for installers and maintenance personnel

After installing the unit, dispose of packaging according to legislation in force; if possible, re-utilize the packaging for other purposes.

If the motor needs to be decommissioned and dismantled, observe the current legislation regarding sorted waste disposal.

11. Warranty

Refer to the sales documents for any information.

12. Tabelle e disegni - Tables and drawings - Tableaux et dessins - Tabellen und Zeichnungen - Tablas y dibujos - Tabelas e desenhos - Tabellen en tekeningen

Composizione sistema TKS (capitoli 3 e 6.4)

TKS system composition (chapters 3 and 6.4)

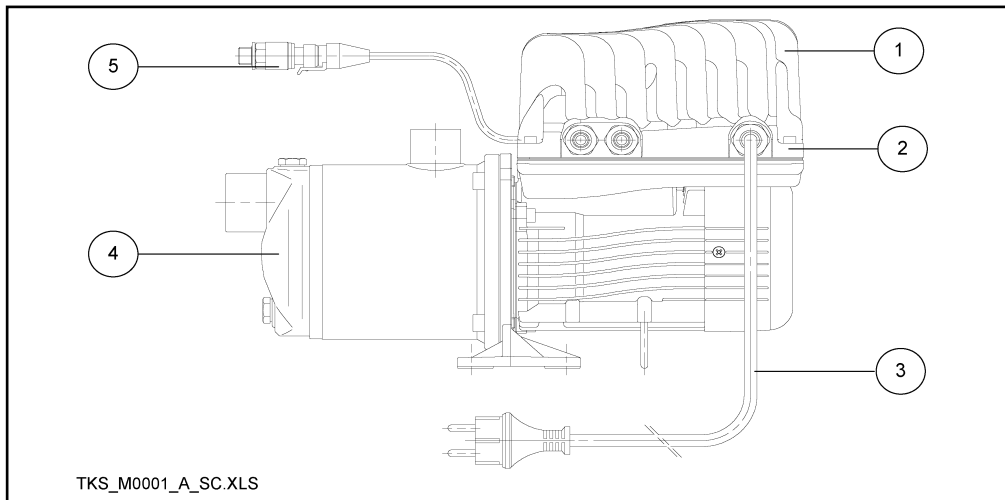
Composition système TKS (chapitres 3 et 6.4)

Zusammensetzung des TKS-Systems (Kapitel 3 und 6.4)

Composición del sistema TKS (capítulos 3 y 6.4)

Composição do sistema TKS (capítulos 3 e 6.4)

Samenstelling van het TKS systeem (hoofdstuk 3 en paragraaf 6.4)



1 Radiatore (include all'interno la scheda elettronica di controllo e comando)

2 Base

3 Cavo con spina

4 Elettropompa

5 Trasmittitore di pressione

1 Radiator (incorporates the electronic control and command board)

2 Base

3 Cable and plug

4 Electric pump

5 Pressure transmitter

1 Radiateur (il comprend, à l'intérieur, la carte électronique de contrôle et de commande)

2 Base

3 Câble avec fiche

4 Électropompe

5 Capteur de pression

1 Kühler (mit integrierter elektronischer Steuer- und Kontrollkarte)

2 Basis

3 Kabel mit Stecker

4 Motorpumpe

5 Druckübertragungsgerät

1 Radiador (en el interior incluye la tarjeta electrónica de control y mando)

2 Base

3 Cable con clavija

4 Electrobomba

5 Transmisor de presión

1 Radiador (inclui no interior a ficha electrónica de controlo e comando)

2 Base

3 Cabo com ficha

4 Electrobomba

5 Transmissor de pressão

1 Koeler (omvat de elektronische controle- en besturingsprintplaat aan de binnenzijde)

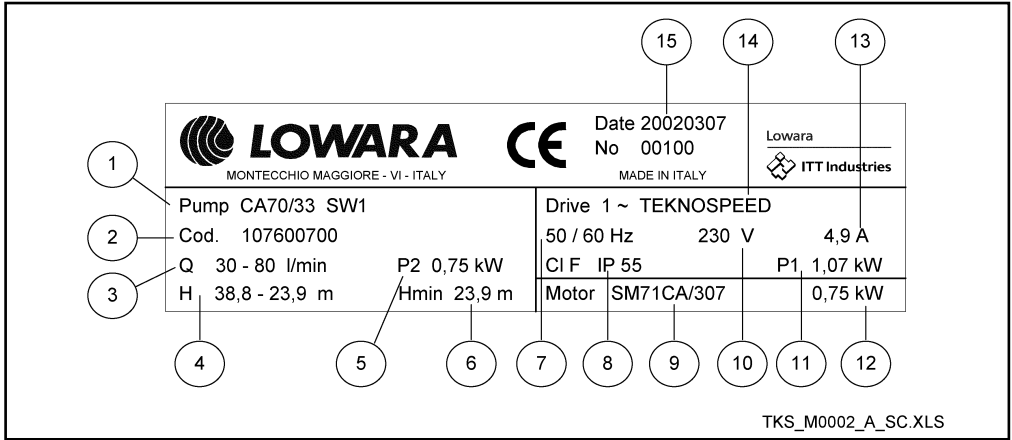
2 Voet

3 Kabel en stekker

4 Elektropomp

5 Druktransmitter

**Targa dati (capitoli 4 e 9) - Rating plate (chapters 4 and 9) - Plaque des données (chapitres 4 et 9)
Datenschild (Kapitel 4 und 9) - Placa de características (capítulos 4 y 9)
Placa dos dados (capítulos 4 e 9) - Typeplaatje (hoofdstuk 4 en 9)**



- | | | |
|-------------------------------------|----------------------------------------------|------------------------------------------|
| 1 Tipo elettropompa | 7 Frequenza | 12 Potenza nominale motore |
| 2 Codice | 8 Classe di isolamento e grado di protezione | 13 Corrente |
| 3 Campo della portata | 9 Tipo motore | 14 Tipo convertitore |
| 4 Campo della prevalenza* | 10 Tensione | 15 Data di produzione e numero di serie |
| 5 Potenza nominale | 11 Potenza assorbita | |
| 6 Prevalenza minima* | | |
| 1 Electric pump type | 7 Frequency | 12 Rated motor power |
| 2 Code | 8 Insulation class and protection class | 13 Current |
| 3 Flow range | 9 Motor type | 14 Converter type |
| 4 Head range* | 10 Voltage | 15 Manufacturing date and Serial number |
| 5 Rated power | 11 nput power | |
| 6 Minumum head* | | |
| 1 Type d'électropompe | 6 Hauteur d'élévation minimum* | 10 Tension |
| 2 Code | 7 Fréquence | 11 Puissance absorbée |
| 3 Plage de débit | 8 Classe d'isolement et indice de protection | 12 Puissance nominale moteur |
| 4 Plage de hauteur d'élévation* | 9 Moteur type | 13 Courant |
| 5 Puissance nominale | | 14 Convertisseur type |
| | | 15 Date de production et numéro de série |
| 1 Pumpentyp | 7 Frequenz | 12 Motornennleistung |
| 2 Code | 8 Isolationsklasse und Schutzart | 13 Strom |
| 3 Fördermengenbereich | 9 Motortyp | 14 Frequenzumformer Typ |
| 4 Förderhöhenbereich* | 10 Spannung | 15 Herstellungsdatum und Seriennummer |
| 5 Nennleistung | 11 Aufnahmeleistung | |
| 6 Mindest-Förderhöhe* | | |
| 1 Tipo de electrobomba | 6 Altura de elevación mínima * | 11 Potencia absorbida |
| 2 Código | 7 Frecuencia | 12 Potencia nominal del motor |
| 3 Rango del caudal | 8 Clase de aislamiento y grado de protección | 13 Corriente |
| 4 Rango de la altura de elevación * | 9 Tipo de motor | 14 Tipo de convertidor |
| 5 Potencia nominal | 10 Tensión | 15 Fecha de producción y número de serie |

1 Tipo de electrobomba	6 Altura manométrica mínima*	11 Potência absorvida
2 Código	7 Frequência	12 Potência nominal do motor
3 Campo de débito	8 Casse de isolamento e grau de protecção	13 Corrente
4 Campo de altura manométrica*	9 Tipo de motor	14 Tipo de conversor
5 Potencia nominal	10 Tensão	15 Data de fabrico e número de série
1 Type elektropomp	7 Frequentie	12 Nominaal motorvermogen
2 Code	8 Isolatieklasse en beschermingsgraad	13 Stroom
3 Opbrengstbereik	9 Type motor	14 Type omzetter
4 Opvoerhoogtebereik*	10 Spanning	15 Productiedatum en serienummer
5 Nominaal vermogen	11 Aansluitwaarde	

* nota : per l'acqua 10 metri di prevalenza equivalgono a quasi 1 bar (circa 100 KPa)

* note : for water, 10 meters of head are equivalent to almost 1 bar (approx. 100 Kpa)

* note : pour l'eau 10 mètres de hauteur d'élévation correspondent à presque 1 bar (environ 100 KPa)

* Anmerkung: Für Förderung von Wasser entsprechen 10 m Förderhöhe ca. 1 bar (etwa 100 KPa).

* nota : para el agua 10 metros de altura de elevación equivalen a casi 1 bar (unos 100 KPa)

* nota: para a água 10 metros de altura manométrica equivalem a quase 1 bar (cerca de 100 KPa)

* NB: Bij water stemt een opvoerhoogte van 10 meter overeen met bijna 1 bar (circa 100 kPa)

Distanze minime per assicurare un corretto raffreddamento (capitolo 5)

Minimum clearance required to ensure proper cooling (chapter 5)

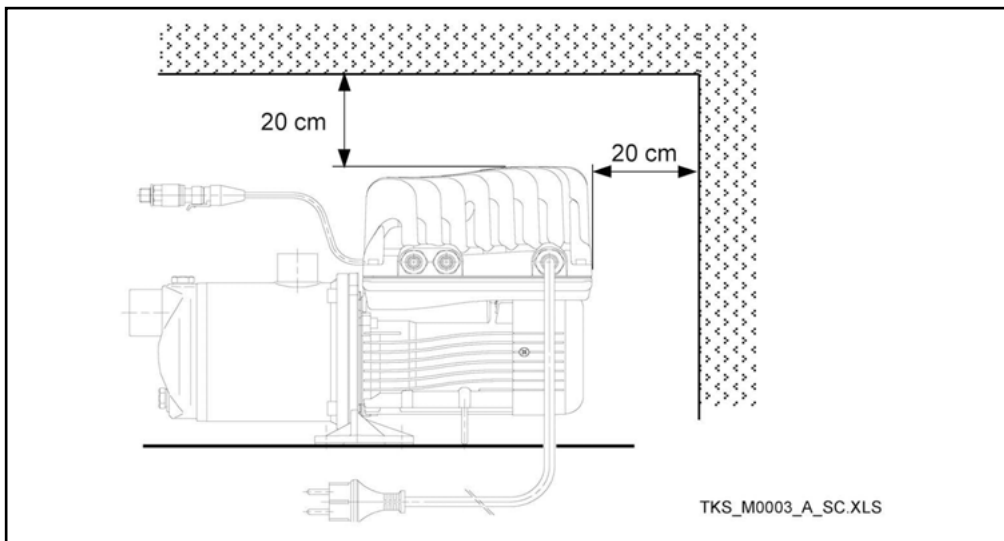
Distances minimums pour assurer un refroidissement correct (chapitre 5)

Mindestabstände für die Gewährleistung einer korrekten Kühlung (Kapitel 5)

Distancias mínimas para asegurar una refrigeración correcta (capítulo 5)

Distâncias mínimas para garantir um arrefecimento correcto (capítulo 5)

Minimum afstanden om een goede koeling te waarborgen (hoofdstuk 5)



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Esempi di installazione (capitolo 6) - Examples of installation (chapter 6)

Exemples d'installation (chapitre 6) - Aufstellungsbeispiele (Kapitel 6)

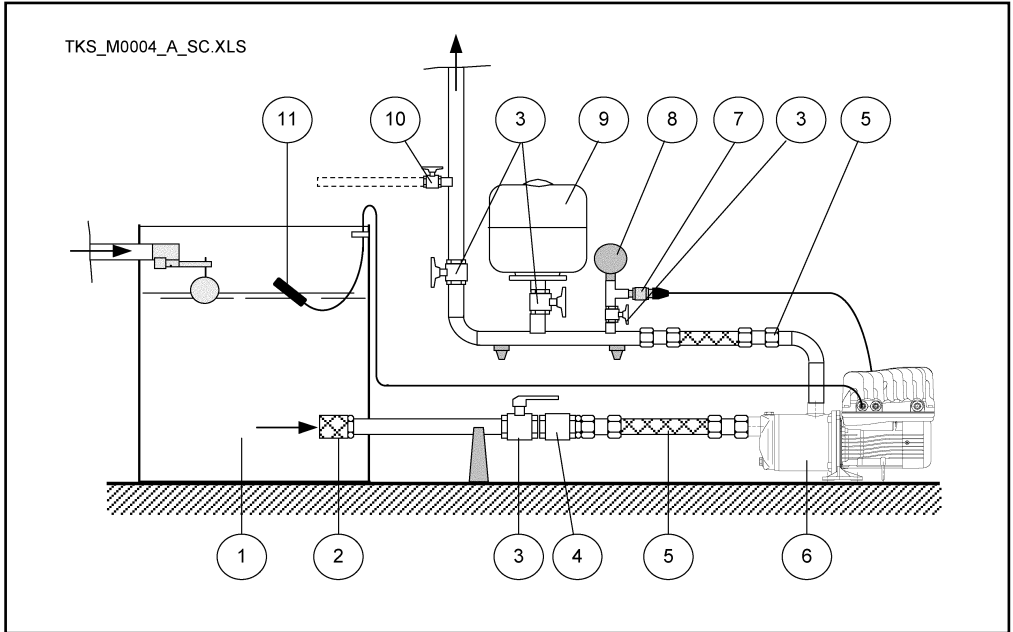
Ejemplos de instalación (capítulo 6) - Exemplos de instalação (capítulo 6)

Installatievoorbeelden (hoofdstuk 6)

Sottobattente - Positive suction head - Aspiration sous charge d'eau - Untere Saugleitung

Bomba bajo el nivel del líquido que se debe aspirar - Coluna aspirada positiva

Onder de aanzuighoogte



- 1 Vasca o serbatoio
- 2 Eventuale filtro
- 3 Valvola di intercettazione
- 4 Valvola di non ritorno
- 5 Tubo flessibile
- 6 Elettropompa con Teknospeed

- 7 Trasmettitore di pressione
- 8 Manometro
- 9 Autoclave a membrana
- 10 Rubinetto di prova
- 11 Galleggiante

- 1 Reservoir or tank
- 2 Possible filter
- 3 On-off valve
- 4 Non-return valve
- 5 Flexible pipe
- 6 Electric pump with Teknospeed

- 7 Pressure transmitter
- 8 Pressure gauge
- 9 Diaphragm tank
- 10 Test tap
- 11 Float switch

- 1 Cuve ou réservoir
- 2 Éventuel filtre
- 3 Vanne d'arrêt
- 4 Clapet anti-retour
- 5 Tuyau flexible
- 6 Électropompe avec Teknospeed

- 7 Capteur de pression
- 8 Manomètre
- 9 Surpresseur à membrane
- 10 Robinet d'essai
- 11 Flotteur

- 1 Wanne oder Behälter
- 2 Allfälliger Filter
- 3 Sperrventil
- 4 Rückschlagventil
- 5 Biegsames Rohr
- 6 Motorpumpe mit Teknospeed

- 7 Druckübertragungsgerät
- 8 Manometer
- 9 Membrandruckbehälter
- 10 Testhahn
- 11 Schwimmerschalter

- 1 Tanque o depósito
- 2 Eventual filtro
- 3 Válvula de cierre
- 4 Válvula de retención
- 5 Tubo flexible
- 6 Electrobomba con Teknospeed

- 7 Transmisor de presión
- 8 Manómetro
- 9 Acumulador hidráulico de membrana
- 10 Grifo de prueba
- 11 Interruptor de flotador

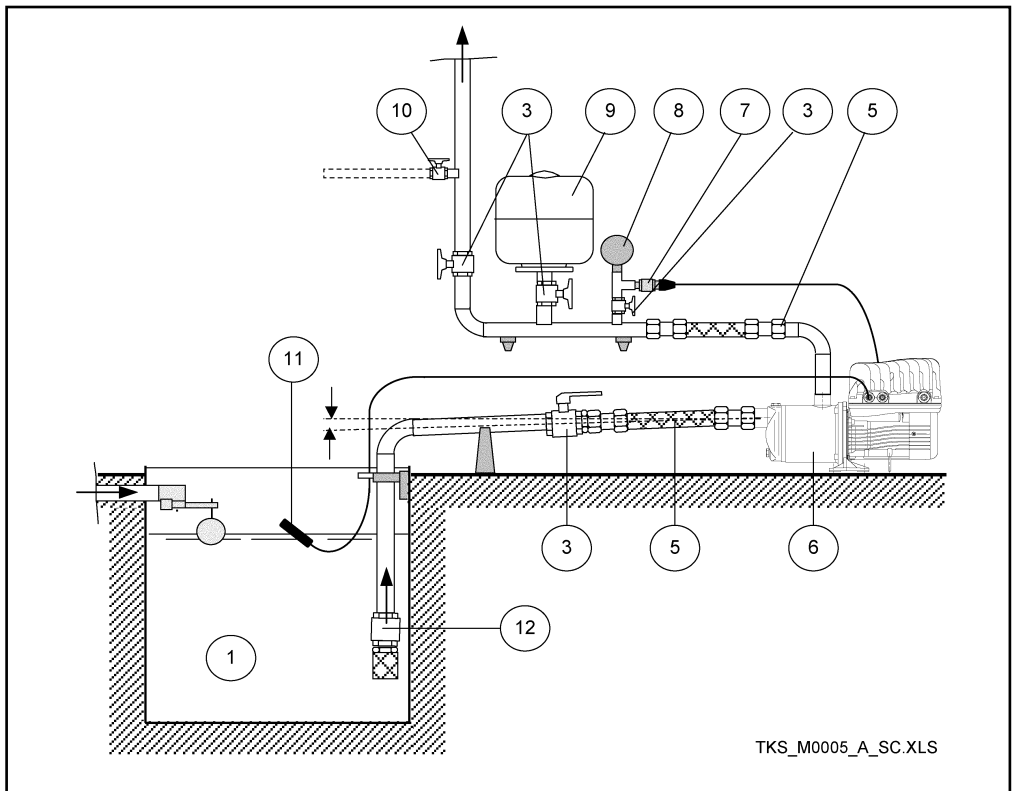
- 1 Tanque ou reservatório
- 2 Eventual filtro
- 3 Válvula de intercepção
- 4 Válvula anti-retorno
- 5 Tubo flexível
- 6 Electrobomba com Teknospeed

- 7 Transmissor de pressão
- 8 Manómetro
- 9 Autoclave de membrana
- 10 Torneira de prova
- 11 Flutuador

- 1 Bak of reservoir
- 2 Eventueel filter
- 3 Afsluiter
- 4 Balkeerlep
- 5 Flexibele slang
- 6 Elektropomp met Teknospeed

- 7 Druktransmitter
- 8 Manometer
- 9 Membraantank
- 10 Testkraan
- 11 Vlotterschakelaar

Soprabattente - Suction lift - Aspiration au-dessus du niveau de l'eau
Obere Saugleitung - Bomba sobre el nivel del líquido que se debe aspirar
Altura de aspiração - Boven de aanzuighoogte



- | | |
|-------------------------------|------------------------|
| 1 Vasca | 8 Manometro |
| 3 Valvola di intercettazione | 9 Autoclave a membrana |
| 5 Tubo flessibile | 10 Rubinetto di prova |
| 6 Elettropompa con Teknospeed | 11 Galleggiante |
| 7 Trasmettitore di pressione | 12 Valvola di fondo |
-
- | | |
|---------------------------------|------------------|
| 1 Tank | 8 Pressure gauge |
| 3 On-off valve | 9 Diaphragm tank |
| 5 Flexible pipe | 10 Test tap |
| 6 Electric pump with Teknospeed | 11 Float switch |
| 7 Pressure transmitter | 12 Foot valve |
-
- | | |
|--------------------------------|--------------------------|
| 1 Cuve | 8 Manomètre |
| 3 Vanne d'arrêt | 9 Surpresseur à membrane |
| 5 Tuyau flexible | 10 Robinet d'essai |
| 6 Électropompe avec Teknospeed | 11 Flotteur |
| 7 Capteur de pression | 12 Clapet de pied |

- 1 Wanne
- 3 Sperrventil
- 5 Biegsames Rohr
- 6 Motorpumpe mit Teknospeed
- 7 Druckübertragungsgerät

- 8 Manometer
- 9 Membrandruckbehälter
- 10 Testhahn
- 11 Schwimmerschalter
- 12 Bodenventil

- 1 Tanque
- 3 Válvula de cierre
- 5 Tubo flexible
- 6 Electrobomba con Teknospeed
- 7 Transmisor de presión

- 8 Manómetro
- 9 Acumulador hidráulico de membrana
- 10 Grifo de prueba
- 11 Interruptor de flotador
- 12 Válvula de pie

- 1 Tanque
- 3 Válvula de intercepção
- 5 Tubo flexível
- 6 Electrobomba com Teknospeed
- 7 Transmissor de pressão

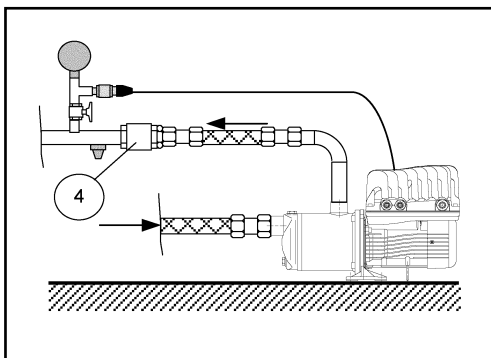
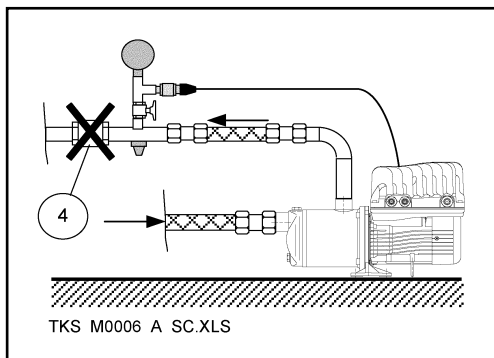
- 8 Manómetro
- 9 Autoclave de membrana
- 10 Torneira de prova
- 11 Flutuador
- 12 Válvula de pé

- 1 Bak
- 3 Afsluiter
- 5 Flexibele slang
- 6 Elektropomp met Teknospeed
- 7 Druktransmitter

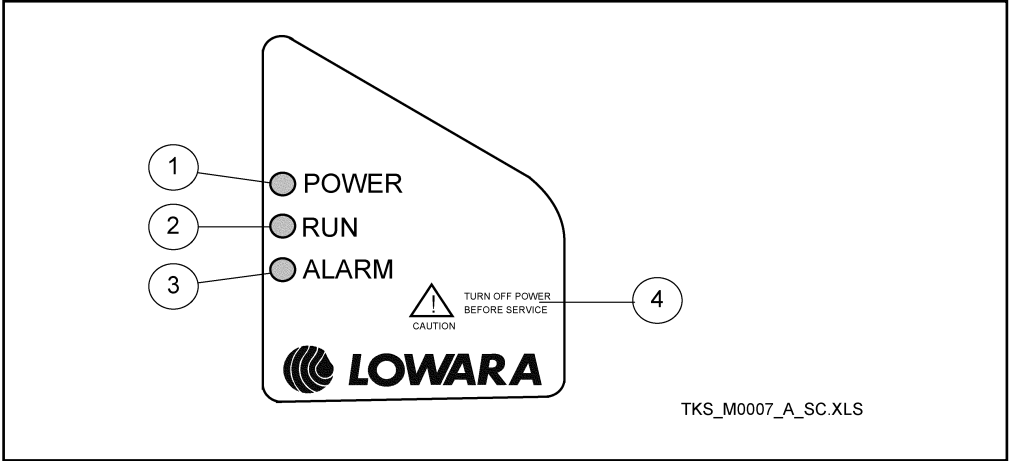
- 8 Manometer
- 9 Membraantank
- 10 Testkraan
- 11 Vlotterschakelaar
- 12 Bodemklep

Valvula di non ritorno - Non return valve - Clapet antiretour - Rückschlagventil

Válvula de retención - Válvula anti-retorno - Balkeerklep



**Adesivo (capitolo 6) - Adhesive plate (chapter 6) - Autocollant (chapitre 6) - Klebeetikette (Kapitel 6)
Adesivo (capítulo 6) - Placa adhesiva (capítulo 6) - Sticker (hoofdstuk 6)**



- 1 Spia di segnalazione presenza tensione
- 2 Spia di segnalazione pompa in marcia
- 3 Spia di segnalazione anomalia
- 4 Avvertenze

- 1 Power on indicator light
- 2 Pump running indicator light
- 3 Malfunction indicator light
- 4 Warnings

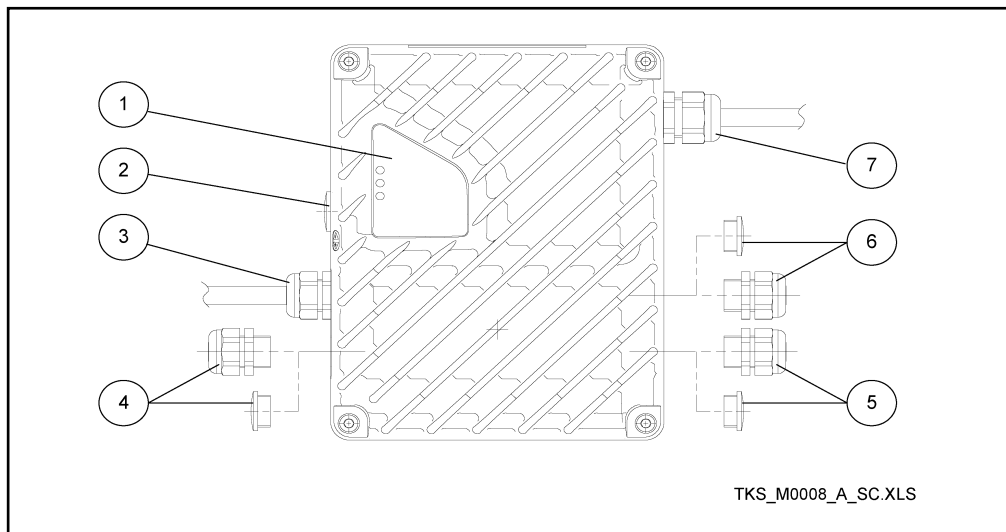
- 1 Voyant de signalisation présence tension
- 2 Voyant de signalisation pompe en marche
- 3 Voyant de signalisation anomalie
- 4 Avertissements

- 1 Kontrollleuchte Spannung vorhanden
- 2 Kontrollleuchte Pumpe in Gang
- 3 Kontrollleuchte Anomalien
- 4 Hinweise

- 1 Luz indicadora de presencia tensión
- 2 Luz indicadora de bomba en marcha
- 3 Luz indicadora de anomalía
- 4 Advertencias

- 1 Luz de aviso presença tensão
- 2 Luz de aviso bomba em funcionamento
- 3 Luz de aviso anomalia
- 4 Advertências

- 1 Waarschuwinglampje stroom ingeschakeld
- 2 Waarschuwinglampje pomp in werking
- 3 Waarschuwinglampje storing
- 4 Waarschuwingen

Schema connessioni esterne del convertitore TEKNOSPEED (capitolo 6)**Diagram of TEKNOSPEED converter's external connections (chapter 6)****Schéma de connexions externes du convertisseur TEKNOSPEED (chapitre 6)****Schema der externen Anschlüsse des Frequenzumformers TEKNOSPEED (Kapitel 6)****Esquema de conexiones exteriores del convertidor TEKNOSPEED (capítulo 6)****Esquema das conexões externas do conversor TEKNOSPEED (capítulo 6)****Schema van de uitwendige aansluitingen van de TEKNOSPEED omzetter (hoofdstuk 6)**

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- 1 Lampadine di segnalazione
- 2 Vite di regolazione pressione
- 3 Entrata cavo trasmettitore di pressione (pressacavo M16 x 1,5)
- 4 Entrata cavo dispositivo esterno per protezione contro la marcia a secco (pressacavo o tappo M16 x 1,5)

- 1 Signalling lights
- 2 Pressure adjusting screw
- 3 Inlet for pressure transmitter cable (M16 x 1.5 cable gland)
- 4 Inlet for external dry running protection device cable (M16 x 1.5 cable gland or plug)

- 1 Voyants de signalisation
- 2 Vis de réglage pression
- 3 Entrée câble capteur de pression (serre-câble M16 x 1,5)
- 4 Entrée câble dispositif extérieur pour protection contre la marche à sec (serre-câble ou bouchon M16 x 1,5)

- 5 Entrata cavo interfaccia seriale (pressacavo o tappo M16 x 1,5)
- 6 Entrata cavo relè segnalazione anomalie (pressacavo o tappo M16 x 1,5)
- 7 Entrata cavo di alimentazione (pressacavo M20 x 1,5)

- 5 Inlet for serial interface cable (M16 x 1.5 cable gland or plug)
- 6 Inlet for malfunction signalling relay cable (M16 x 1.5 cable gland or plug)
- 7 Inlet for power supply cable (M20 x 1.5 cable gland)

- 5 Entrée câble interface série (serre-câble ou bouchon M16 x 1,5)
- 6 Entrée câble relais signalisation anomalies (serre-câble ou bouchon M16 x 1,5) -
- 7 Entrée câble d'alimentation (serre-câble M20 x 1,5)

it	en	fr	de	es	pt	nl
1	Signallampen					5
2	Druckregulierungsschraube					(Kabelniederhalter oder Stopfen M16 x 1,5)
3	Kabeleingang des Druckübertragungsgerät (Kabelniederhalter M16 x 1,5)					6
4	Kabeleingang der externen Trockenlaufvorrichtung (Kabelniederhalter oder Stopfen M16 x 1,5)					Anomalien (Kabelniederhalter oder Stopfen M16 x 1,5)
1	Bombillas de indicación					7
2	Tornillo de regulación presión					Speisekabeleingang (Kabelniederhalter M20 x 1,5)
3	Entrada cable transmisor de presión (sujetacable M16 x 1,5)					5
4	Entrada cable dispositivo exterior de protec- ción contra la marcha en seco (sujetacable o tapón M16 x 1,5)					Entrada cable interfaz serial (sujetacable o tapón M16 x 1,5)
1	Lâmpadas de sinalização					6
2	Parafuso de regulação da pressão					Entrada cable relé de indicación anomalías (sujetacable o tapón M16 x 1,5)
3	Entrada cabo transmissor de pressão (prensa-cabo M16 x 1,5)					7
4	Entrada cabo dispositivo externo para proteção contra o funcionamento a seco (prensa-cabo ou tampão M16 x 1,5)					Entrada cable de alimentación (sujetacable M20 x 1,5)
1	Waarschuwingslampjes					5
2	Drukregelschroef					Entrada cabo interface série (prensa-cabo ou tampão M16 x 1,5)
3	Ingang kabel druktransmitter (kabelklem M16 x 1,5)					6
4	Ingang kabel uitwendig systeem voor beveiliging tegen drooglopen (kabelklem of plug M16 x 1,5)					Entrada cabo relé sinalização anomalias (pren- sa-cabo ou tampão M16 x 1,5)
						7
						Entrada cabo de alimentação (prensa-cabo M20 x 1,5)
						5
						Ingang kabel seriële interface (kabelklem of plug M16 x 1,5)
						6
						Ingang kabel waarschuwingsrelais storingen (kabelklem of plug M16 x 1,5)
						7
						Ingang voedingskabel (kabelklem of plug M20 x 1,5)

Sequenza apertura convertitore TEKNOSPEED (capitolo 6)

TEKNOSPEED converter opening sequence (chapter 6)

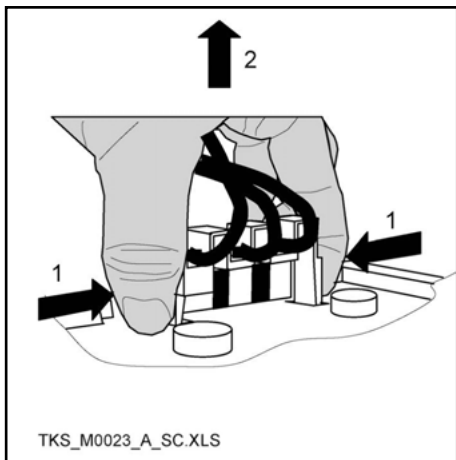
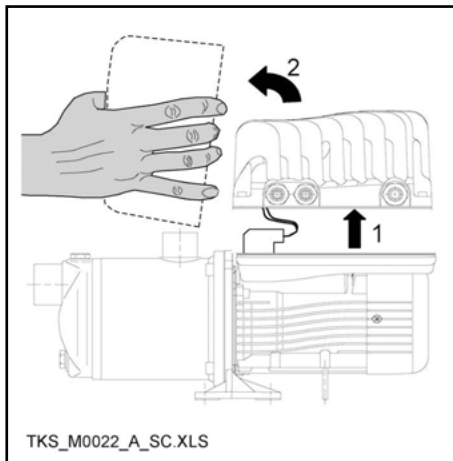
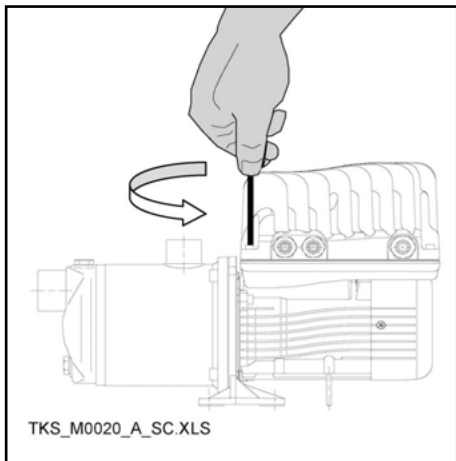
Séquence d'ouverture TEKNOSPEED (chapitre 6)

Sequenz zum Öffnen des Frequenzumformers TEKNOSPEED (Kapitel 6)

Secuencia apertura convertidor TEKNOSPEED (capítulo 6)

Sequência abertura conversor TEKNOSPEED (capítulo 6)

Openingsvolgorde TEKNOSPEED omzetter (hoofdstuk 6)



Come bloccare la schermatura del cavo (capitoli 6.2.8, 6.2.9, 6.2.11)

How to fasten the cable shielding (chapters 6.2.8, 6.2.9, 6.2.11)

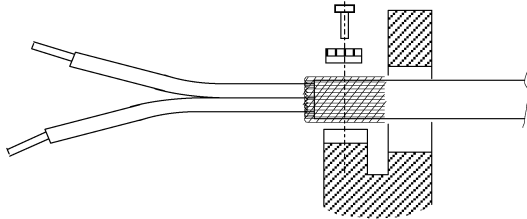
Comment bloquer le blindage du câble (chapitres 6.2.8, 6.2.9, 6.2.11)

Feststellen der Kabelabschirmung (Kapitel 6.2.8, 6.2.9, 6.2.11)

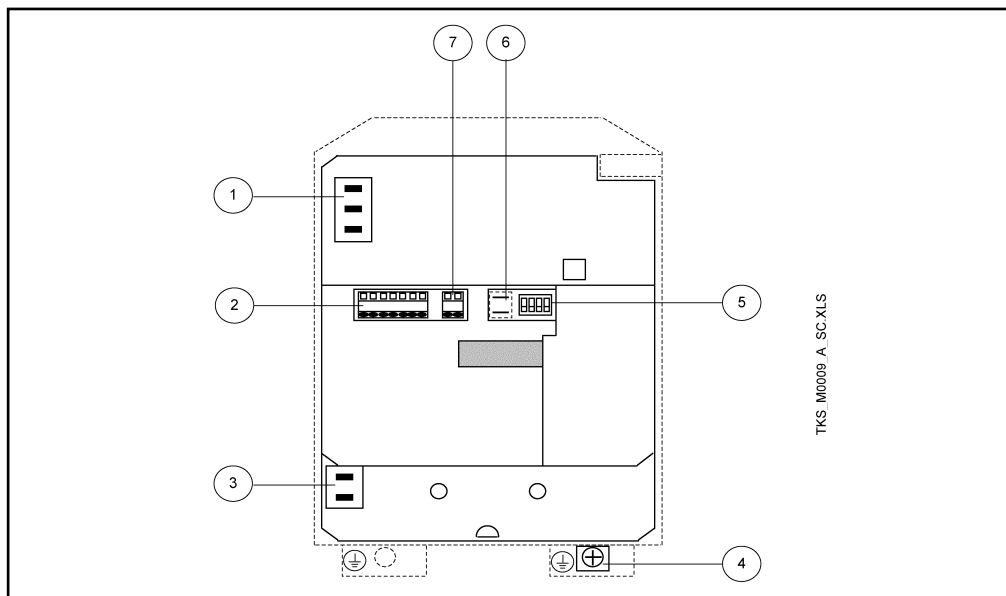
Cómo bloquear el blindaje del cable (capítulos 6.2.8, 6.2.9, 6.2.11)

Como bloquear a blindagem do cabo (capítulos 6.2.8, 6.2.9, 6.2.11)

Wijze waarop de afscherming van de vastgezet moet worden (paragraaf 6.2.8, 6.2.9 en 6.2.11)



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Schema connessioni interne del convertitore TEKNOSPEED (capitolo 6)**Diagram of TEKNOSPEED converter's internal connections (chapter 6)****Schéma des connexions internes du convertisseur TEKNOSPEED (chapitre 6)****Schema der internen Anschlüsse des Frequenzumformers TEKNOSPEED (Kapitel 6)****Esquema de conexiones interiores del convertidor TEKNOSPEED (capítulo 6)****Esquema conexões internas do conversor TEKNOSPEED (capítulo 6)****Schema van de inwendige aansluitingen van de TEKNOSPEED omzetter (hoofdstuk 6)****Vista generale delle morsettiere - Overview of terminal boards - Vue générale des borniers****Allgemeine Ansicht der Klemmenbretter - Vista general de las caja de bornes****Vista geral das placas de bornes - Overzicht van de klemmenplaten**

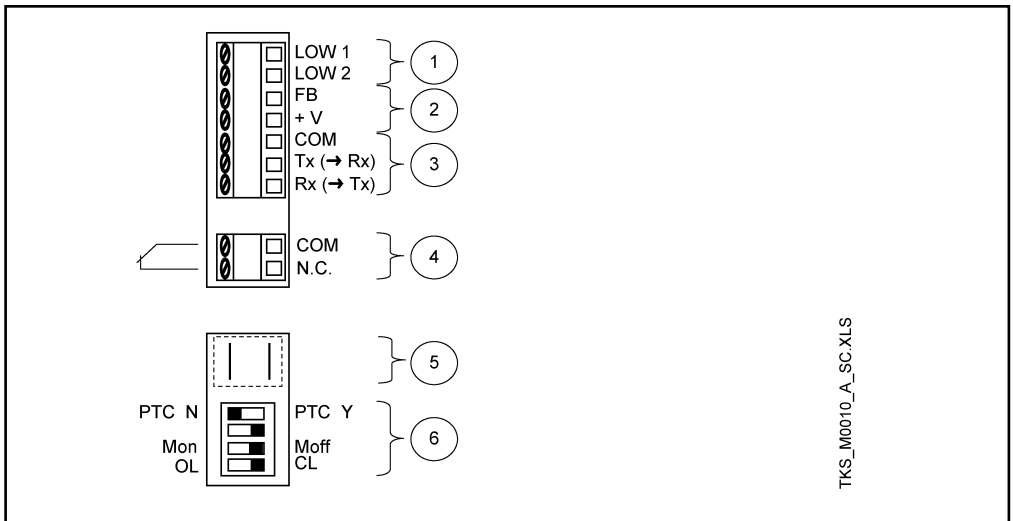
- | | |
|-------------------------------------------------------------------------------|----------------------------------------------------|
| 1 Connettori Faston maschio 6,35 mm per cavi morsettiere motore | 4 Vite di terra per cavo di alimentazione |
| 2 Morsettiere per trasmettitore, galleggiante, interfaccia seriale (IN / OUT) | 5 Dip-switch di regolazione ciclo di funzionamento |
| 3 Connettori Faston maschio 6,35 mm per fase e neutro (cavo di alimentazione) | 6 Connettori Faston maschio 2,8 mm per termistore |
| | 7 Morsettiere per segnalazione anomalie (OUT) |

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| 1 6.35 mm Faston male connectors for motor terminal board cables | 3 6.35 mm Faston male connectors for phase and neutral (power cord) |
| 2 Morsettiere per trasmettitore, galleggiante, interfaccia seriale (IN / OUT) – Terminal board for transmitter, float switch, serial interface (IN / OUT) | 4 Ground screw for power cord |
| | 5 Operating cycle adjustment dip-switch |
| | 6 2.8 mm Faston male connectors for thermistor |
| | 7 Terminal board for malfunction signals (OUT) |

- | | |
|--------------------------------------------------------------------------------|--------------------------------------------------|
| 1 Connecteurs Faston mâles 6,35 mm pour câbles bornier moteur | 4 Vis de terre pour câble d'alimentation |
| 2 Bornier pour capteur, flotteur, interface série (IN / OUT) | 5 Dip-switchs de réglage cycle de fonctionnement |
| 3 Connecteurs Faston mâles 6,35 mm pour phase et neutre (câble d'alimentation) | 6 Connecteur Faston mâles 2,8 mm pour thermistor |
| | 7 Bornier pour signalisation anomalies (OUT) |

- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1 Faston-Steckverbinder 6,35 mm für Kabel des Motor-Klemmenbretts</p> <p>2 Klemmenbrett für Übertragungsgerät, Schwimmerschalter und Serienschmittstelle (IN / OUT)</p> <p>3 Faston-Steckverbinder 6,35 mm für Phase und</p> | <p>Nullleiter (Speisekabel)</p> <p>4 Erdungsschraube des Speisekabels</p> <p>5 Dip-Switch zur Einstellung des Betriebsablaufs</p> <p>6 Faston-Steckverbinder 2,8 mm für Thermistor</p> <p>7 Klemmenbrett zur Anzeige der Betriebsanomalien (OUT)</p> |
| <p>1 Conectores Faston macho 6,35 mm para cables caja de bornes motor</p> <p>2 Caja de bornes para transmisor, interruptor de flotador, interfaz serial (IN / OUT)</p> <p>3 Conectores Faston macho 6,35 mm para fase y neutro (cable de alimentación)</p> | <p>4 Tornillo de tierra para cable de alimentación</p> <p>5 Dip-switch de regulación ciclo de funcionamiento</p> <p>6 Conectores Faston macho 2,8 mm para termistor</p> <p>7 Caja de bornes para indicación anomalías (OUT)</p> |
| <p>1 Conectores Faston macho 6,35 para cabos placa de bornes motor</p> <p>2 Placa de bornes para transmissor, flutuador, interface série (IN / OUT)</p> <p>3 Conectores Faston macho 6,35 mm. para fase e neutro (cabo de alimentação)</p> <p>4 Parafuso de terra para cabo de</p> | <p>alimentação</p> <p>5 Dip-switch de regulação ciclo de funcionamento</p> <p>6 Conectores Faston macho 2,8 mm para termistor</p> <p>7 Placa de bornes para sinalização anomalias (OUT)</p> |
| <p>1 Faston mannetjes connectoren 6,35 mm voor kabels klemmenplaat motor</p> <p>2 Klemmenplaat voor transmitter, vlotterschakelaar, seriële interface (IN / OUT)</p> <p>3 Faston mannetjes connectoren 6,35 mm voor fase en nul (voedingskabel)</p> | <p>4 Aardschroef voor voedingskabel</p> <p>5 Dipschakelaar voor regeling werkingscyclus</p> <p>6 Faston mannetjes connectoren 2,8 mm voor thermistor</p> <p>7 Klemmenplaat voor signalering storingen (OUT)</p> |

**Morsettiera ausiliaria - Auxiliary terminal board - Bornier auxiliaire - Hilfs-Klemmenbrett
Caja de bornes auxiliar - Placa de bornes auxiliar - Hulpklemmenplaat**



	it	en	fr	de	es	pt	nl
1	Connessione dispositivo esterno di protezione contro la marcia a secco (capitoli 6.2.7 e 6.2.8)						
2	Connessione trasmettitore esterno (capitolo 6.2.11)						
3	Connessione interfaccia seriale (capitolo 6.2.10)						
1	Connection to external device for dry running protection (chapters 6.2.7 and 6.2.8)						
2	Connection to external transmitter (chapter 6.2.11)						
3	Serial interface connection (chapter 6.2.10)..						
4	Connection to alarm relay (chapter 6.2.9)						
1	Connexion dispositif extérieur de protection contre la marche à sec (chapitres 6.2.7 et 6.2.8)						
2	Connexion capteur extérieur (chapitre 6.2.11)						
3	Connexion interface série (chapitre 6.2.10)						
4	Connexion au relais d'alarme (chapitre 6.2.9)						
1	Anschluss an den externen Trockenlaufschutz (Kapitel 6.2.7 und 6.2.8)						
2	Anschluss an das externe Übertragungsgeräts (Kapitel 6.2.11)						
3	Anschluss an die Serienschnittstelle (Kapitel 6.2.10)						
1	Conexión dispositivo exterior de protección contra la marcha en seco (capítulos 6.2.7 y 6.2.8)						
2	Conexión transmisor exterior (capítulo 6.2.11)						
3	Conexión interfaz serial (capítulo 6.2.10)						
4	Conexión al relé de alarma (capítulo 6.2.9)						
1	Conexão dispositivo externo de proteção contra o funcionamento a seco (capítulos 6.2.7 e 6.2.8)						
2	Conexão transmissor externo (capítulo 6.2.11)						
3	Conexão interface série (capítulo 6.2.10)						
1	Aansluiting uitwendig beveiligingssysteem tegen drooglopen (paragraaf 6.2.7 en 6.2.8)						
2	Aansluiting uitwendige transmitter (paragraaf 6.2.11)						
3	Aansluiting seriële interface (paragraaf 6.2.10)						
4	Aansluiting op alarmrelais (paragraaf 6.2.9)						
4	Connessione al relè di allarme (capitolo 6.2.9)						
5	Connessione protezione dalla sovratemperatura motore – PTC (capitolo 6.2.5)						
6	Dip-switch di regolazione ciclo di funzionamento (capitolo 6.2.12)						
5	Connection to motor overtemperature protection – PTC (chapter 6.2.5)						
6	Operating cycle adjustment dip-switch (chapter 6.2.12)						
5	Connexion protection contre la surchauffe du moteur - PTC (chapitre 6.2.5)						
6	Dip-switchs de réglage du cycle de fonctionnement (chapitre 6.2.12)						
4	Anschluss an das Alarmrelais (Kapitel 6.2.9)						
5	Anschluss an den Motorüberhitzungsschutz – PTC (Kapitel 6.2.5)						
6	Dip-Switch zur Regelung des Betriebsablaufs (Kapitel 6.2.12)						
5	Conexión protección contra la sobretemperatura motor - PTC (capítulo 6.2.5)						
6	Dip-switch de regulación ciclo de funcionamiento (capítulo 6.2.12)						
4	Conexão com o relé de alarme (capítulo 6.2.9)						
5	Conexão proteção contra a temperatura excessiva do motor - PTC (capítulo 6.2.5)						
6	Dip-switch de regulação ciclo de funcionamento (capítulo 6.2.12)						
5	Aansluiting motorbeveiliging tegen oververhitting - PTC (paragraaf 6.2.5)						
6	Dipschakelaar voor regeling werkingscyclus						

Connessione alla protezione dalla sovratemperatura motore – PTC (capitolo 6.2.5)

Connection to motor overtemperature protection – PTC (chapter 6.2.5)

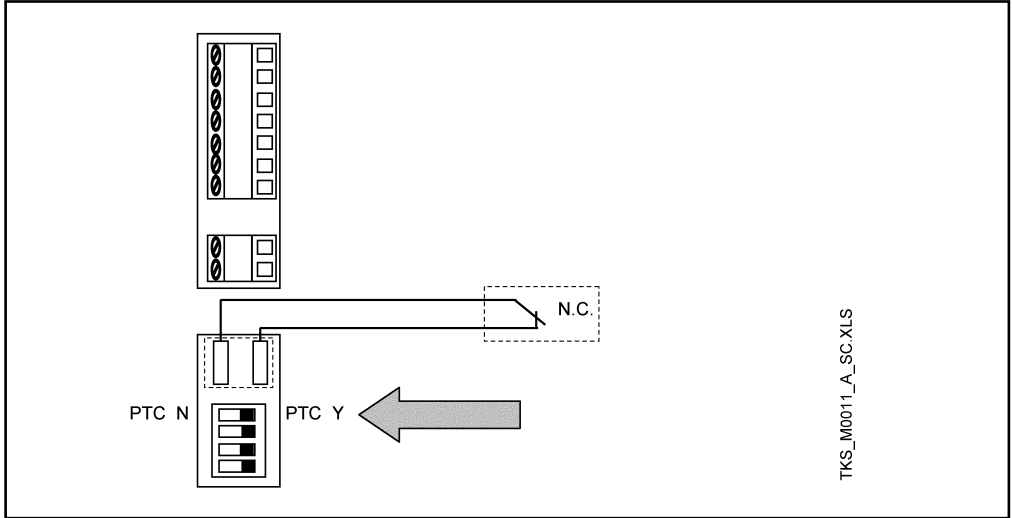
Connexion protection contre la surchauffe du moteur - PTC (chapitre 6.2.5)

Anschluss an den Motorüberhitzungsschutz – PTC (Kapitel 6.2.5)

Conexión a la protección contra la sobrettemperatura motor - PTC (capítulo 6.2.5)

Conexão com a protecção contra a temperatura excessiva do motor – PTC (capítulo 6.2.5)

Aansluiting op motorbeveiliging tegen oververhitting - PTC (paragraaf 6.2.5)



Connessione al dispositivo esterno di protezione contro la marcia a secco (capitoli 6.2.7 e 6.2.8)

Connection to external device for dry running protection (chapters 6.2.7 and 6.2.8)

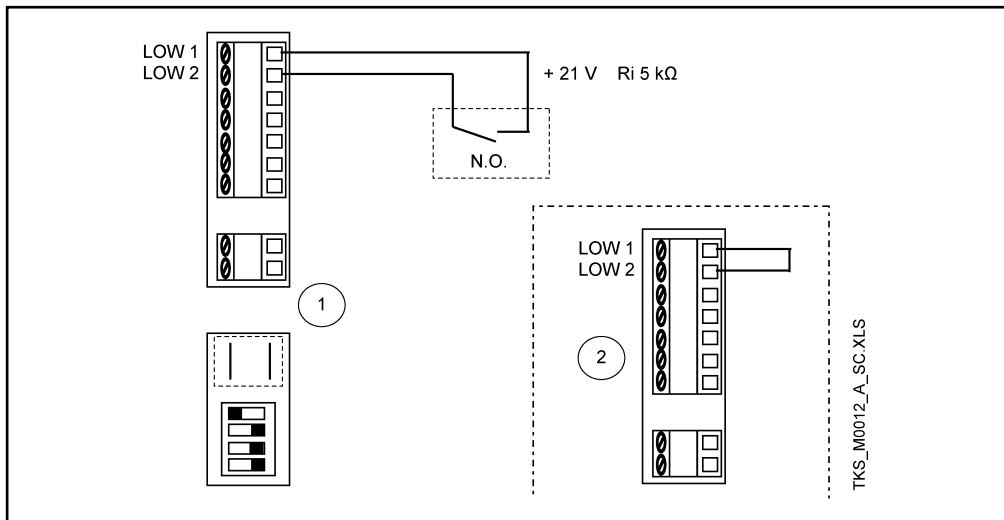
Connexion au dispositif extérieur de protection contre la marche à sec (chapitres 6.2.7 et 6.2.8)

Anschluss an den externen Trockenlaufschutz (Kapitel 6.2.7 und 6.2.8)

Conexión al dispositivo exterior de protección contra la marcha en seco (capítulos 6.2.7 y 6.2.8)

Conexão com o dispositivo externo de protecção contra o funcionamento a seco (capítulos 6.2.7 e 6.2.8)

Aansluiting op uitwendig beveiligingssysteem tegen drooglopen (paragraaf 6.2.7 en 6.2.8)



- 1 Galleggiante o pressostato
2 No external device

- 1 Float or pressure switch
2 Nessun dispositivo esterno

- 1 Flotteur ou pressostat
2 Aucun dispositif extérieur

- 1 Schwimmerschalter oder Druckwächter
2 Keine externe Vorrichtung

- 1 Interruptor de flotador o presóstat
2 Ningún dispositivo exterior

- 1 Flutuador ou pressostato
2 Nenhum dispositivo externo

- 1 Vlotterschakelaar of drukregelaar
2 Geen uitwendig systeem

Connessione al relè di allarme (capitolo 6.2.9)

Connection to alarm relay (chapter 6.2.9)

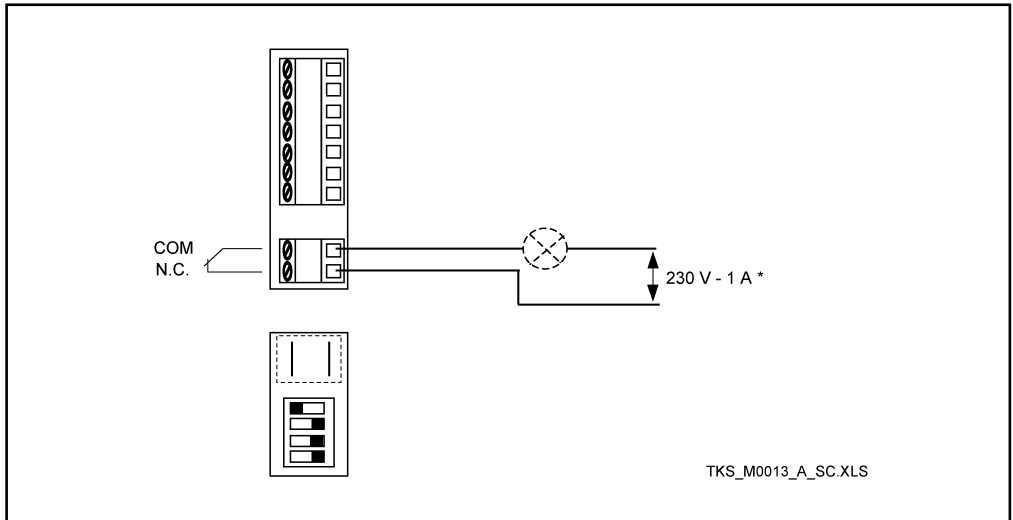
Connexion au relais d'alarme (chapitre 6.2.9)

Anschluss an das Alarmrelais (Kapitel 6.2.9)

Conexión al relé de alarma (capítulo 6.2.9)

Conexão com o relé de alarme (capítulo 6.2.9)

Aansluiting op het alarmrelais (paragraaf 6.2.9)



* massimo 230 Vca, massimo 1 A di solo carico resistivo

* maximum 230 Vac, maximum 1 A of resistive load only

* maximum 230 Vca, maximum 1 A de charge résistive uniquement

* max. 230 Vca, max. 1 A reine Ohmlast

* máximo 230 Vca, máximo 1 A de sólo carga resistiva

* máximo 230 Vca, máximo 1 A só de carga resisitiva

* maximum 230 Vac, maximum 1 A alleen weerstandsbelasting

Connessione interfaccia seriale (capitolo 6.2.10)

Serial interface connection (chapter 6.2.10)

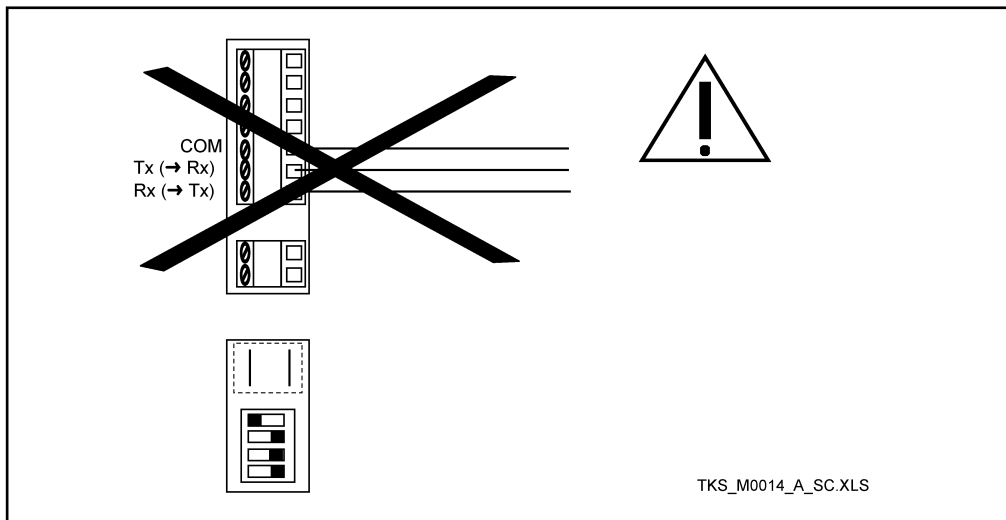
Connexion interface série (chapitre 6.2.10)

Anschluss an die Serienschnittstelle (Kapitel 6.2.10)

Conexión interfaz serial (capítulo 6.2.10)

Conexão interface série (capítulo 6.2.10)

Aansluiting seriële interface (paragraaf 6.2.10)



Connessione al trasmettitore esterno (capitolo 6.2.11)

Connection to external transmitter (chapter 6.2.11)

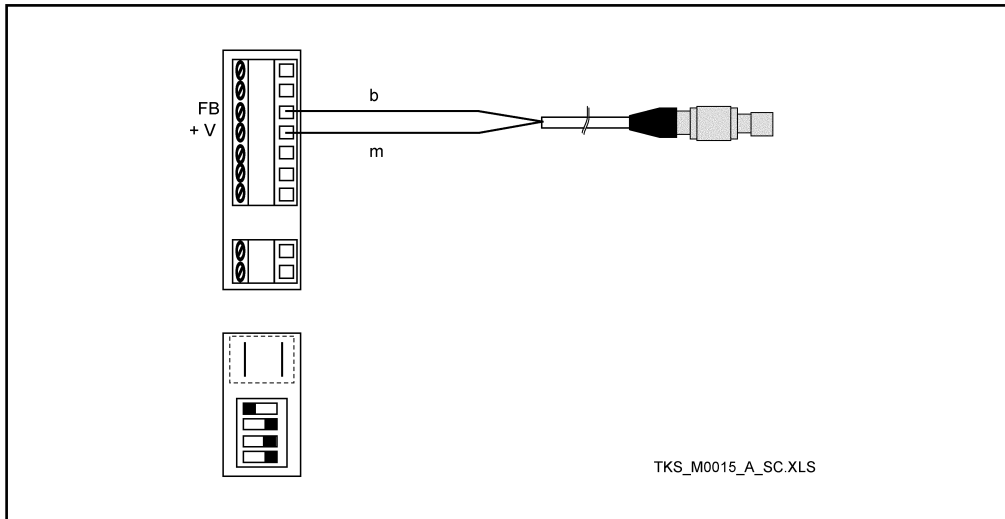
Connexion capteur extérieur (chapitre 6.2.11)

Anschluss an das externe Übertragungsgerät (Kapitel 6.2.11)

Conexión al transmisor exterior (capítulo 6.2.11)

Conexão com o transmissor externo (capítulo 6.2.11)

Aansluiting op uitwendige transmitter (paragraaf 6.2.11)



b = bianco
m = marrone

b = white
m = brown

b = blanc
m = brun

b = weiß
m = braun

b = bianco
m = marrón

b = branco
m = castanho

b = wit
m = bruin

Come piegare il cavo del trasmettitore esterno (capitolo 6.2.11)

How to fold the external transmitter cable (chapter 6.2.11)

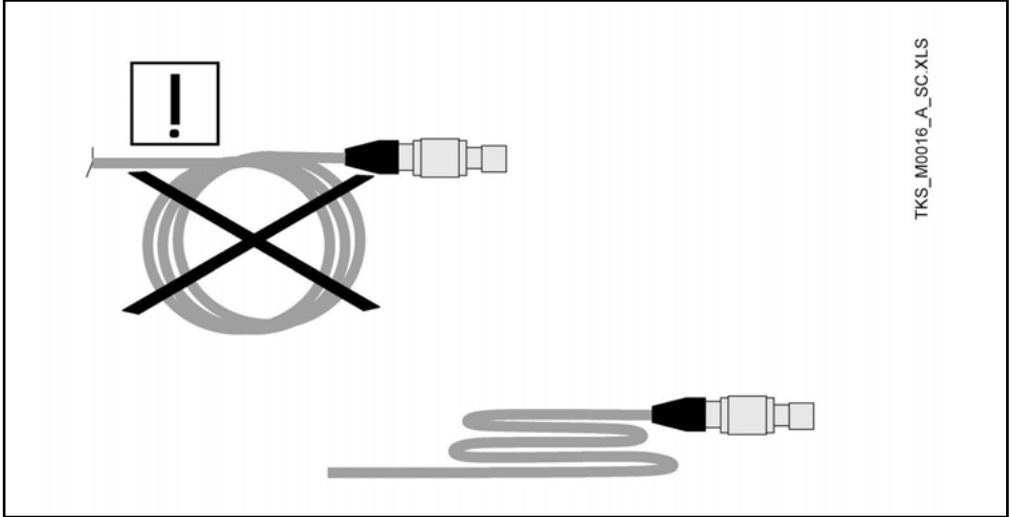
Comment plier le câble du capteur extérieur (chapitre 6.2.11)

Zusammenlegen des Kabels des externen Übertragungsgeräts (Kapitel 6.2.11)

Cómo plegar el cable del transmisor exterior (capítulo 6.2.11)

Como dobrar o cabo do transmissor externo (capítulo 6.2.11)

Wijze waarop de kabel van de uitwendige transmitter gevouwen moet worden (paragraaf 6.2.11)



Impostazioni di fabbrica per i dip-switch di regolazione ciclo di funzionamento (capitolo 6.2.12)

Factory settings of dip-switches for operating cycle adjustment (chapter 6.2.12)

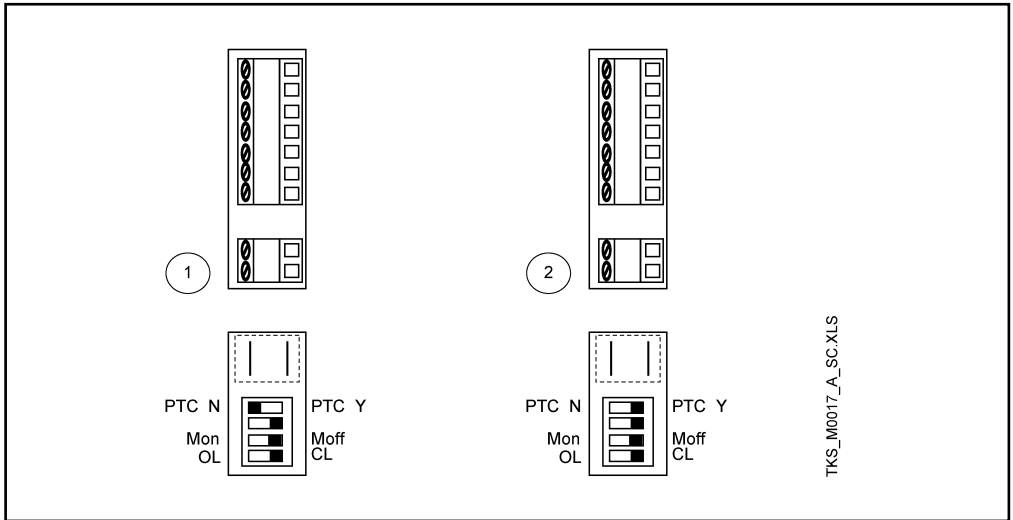
Paramétrages effectués en usine pour les dip-switchs de réglage du cycle de fonctionnement (chapitre 6.2.12)

Werkseitige Einstellungen der Dip-Switches zur Einstellung des Betriebsablaufs (Kapitel 6.2.12)

Configuraciones de fábrica para los dip-switch de regulación ciclo de funcionamiento (capítulo 6.2.12)

Ajustes de fábrica para os dip-switch de regulação do ciclo de funcionamento (capítulo 6.2.12)

Fabrieksmatige instellingen voor de dipschakelaars voor regeling van de werkingscyclus (paragraaf 6.2.12)



TKS_M0017_A_SC.XLS

1 Versione senza protezione PTC

2 Versione con protezione PTC

1 Version without PTC protection

2 Version with PTC protection

1 Version sans protection PTC

2 Version avec protection PTC

1 Ausführung ohne PTC-Schutz

2 Versione con protezione PTC

1 Versión sin protección PTC

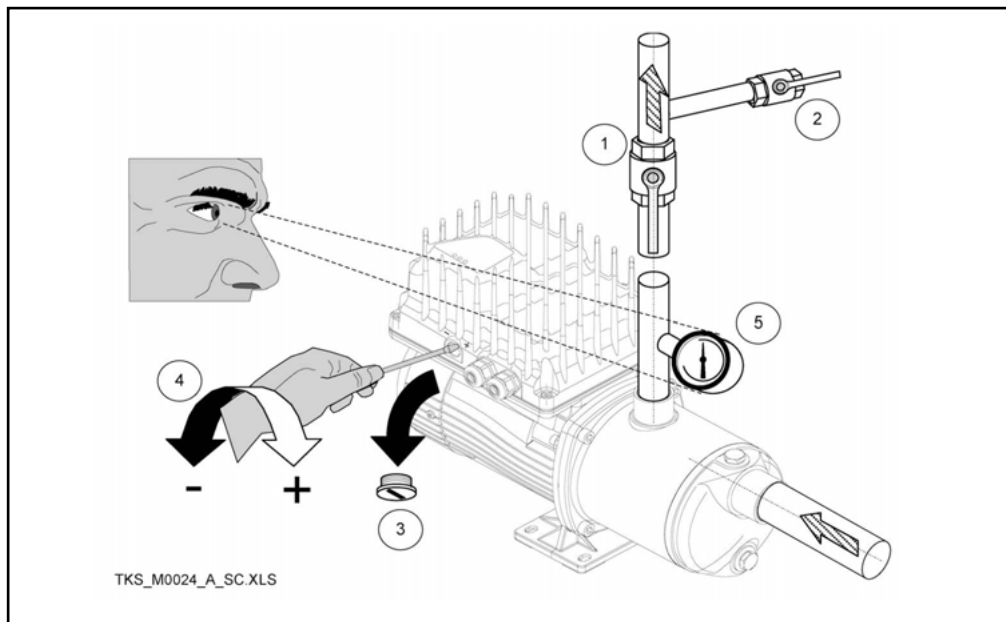
2 Ausführung mit PTC-Schutz

1 Versão sem protecção PTC

2 Versão com protecção PTC

1 Uitvoering zonder PTC beveiliging

2 Uitvoering met PTC beveiliging

Procedure di modifica taratura di fabbrica (capitolo 6.3.3)**Factory settings modification procedures (chapter 6.3.3)****Procédures de modification des réglages effectués en usine (chapitre 6.3.3)****Vorgehen zur Änderung der werkseitigen Einstellungen (Kapitel 6.3.3)****Procedimientos de modificación calibrado de fábrica (capítulo 6.3.3)****Procedimento de modificação do ajuste de fábrica (capítulo 6.3.3)****Wijzigingsprocedure van de fabrieksmatige instellingen (paragraaf 6.3.3)**

- 1 Valvola di intercettazione lato mandata
- 2 Rubinetto di prova
- 3 Tappo di protezione della vite di regolazione
- 4 Cacciavite per la regolazione
- 5 Manometro per leggere il valore della pressione nell'impianto

- 1 On-off valve on delivery side
- 2 Test tap
- 3 Adjusting screw protection plug
- 4 Adjustment screwdriver
- 5 Pressure gauge for reading of system pressure value

- 1 Vanne d'arrêt côté refoulement
- 2 Robinet d'essai
- 3 Bouchon de protection de la vis de réglage
- 4 Tournevis pour le réglage
- 5 Manomètre pour lire la valeur de la pression dans l'installation

- 1 Druckseitiges Sperrventil
- 2 Testhahn
- 3 Schutzstopfen der Stellschraube
- 4 Schraubenzieher zur Einstellung
- 5 Manometer zum Ablesen des Anlagendruckes

- 1 Válvula de cierre lado impulsión
- 2 Grifo de prueba
- 3 Tapón de protección del tornillo de regulación
- 4 Destornillador para la regulación
- 5 Manómetro para leer el valor de la presión en la instalación

- 1 Válvula de intercepção lado compressão
- 2 Torneira de prova
- 3 Tampão de protecção do parafuso de regulação
- 4 Chave de parafusos para a regulação
- 5 Manómetro para ler o valor da pressão na instalação

- 1 Afsluiter perszijde
- 2 Testkraan
- 3 Beschermkapje van de regelschroef
- 4 Schroevendraaier voor de regeling
- 5 Manometer om de drukwaarde in de installatie af te lezen

Tabella tarature di fabbrica (capitolo 6.3.3)

Factory setting chart (chapter 6.3.3)

Tableau des réglages effectués en usine (chapitre 6.3.3)

Tabelle der werkseitigen Einstellungen (Kapitel 6.3.3)

Tabla de calibrados de fábrica (capítulo 6.3.3)

Tabela dos ajustes efectuados na fábrica (capítulo 6.3.3)

Tabel van de fabrieksmatige instellingen (paragraaf 6.3)

TKS/.....	PRESSIONI - PRESSURES - PRESSIONS - DRUCKWERTE - PRESSOES - DRUKWAARDEN	
	kPa	bar
....BG7	300	3,0
....BG11	350	3,5
....CEA80/5	250	2,5
....CEA120/5	200	2,0
....CA70/33	300	3,0
....CA70/44	400	4,0
....2HMZ3T	150	1,5
....2HMZ5T	250	2,5
....2HMZ7T	400	4,0
....4HMZ4T	150	1,5
....4HMZ5T	200	2,0
....4HMZ9T	350	3,5
....SV206F07T	350	3,5
....SV208F11T	500	5,0
....SV404F07T	200	2,0
....SV407F11T	350	3,5

TKS_M0018_B_OT.XLS

Struttura base di un convertitore di frequenza TEKNOSPEED (capitolo 6.4)

Basic structure of TEKNOSPEED frequency converter (chapter 6.4)

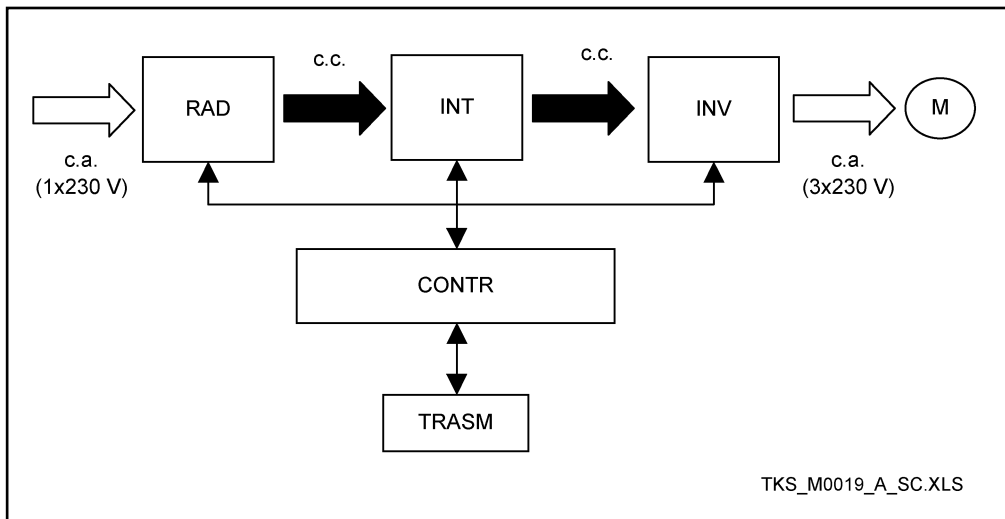
Structure de base d'un convertisseur de fréquence TEKNOSPEED (chapitre 6.4)

Grundstruktur eines Frequenzumformers TEKNOSPEED (Kapitel 6.4)

Estructura de base de un convertidor de frecuencia TEKNOSPEED (capítulo 6.4)

Estrutura de base de um conversor de frequência TEKNOSPEED (capítulo 6.4)

Basisconstructie van een TEKNOSPEED frequentieomzetter (paragraaf 6.4)



c.a.	Corrente alternata	c.a.	Alternate current	c.a.	Courant alternatif
c.c.	Corrente continua	c.c.	Direct current	c.c.	Courant continu
RAD	Raddrizzatore	RAD	Rectifier	RAD	Redresseur
INT	Circuito intermedio	INT	Intermediate circuit	INT	Circuit intermédiaire
INV	Invertitore	INV	Inverter	INV	Inverseur
MOT	Motore	MOT	Motor	MOT	Moteur
CONTR	Circuito di controllo	CONTR	Control circuit	CONTR	Circuit de contrôle
TRASM	Trasmettitore	TRASM	Transmitter	TRASM	Capteur

c.a.	Wechselstrom	c.a.	Corriente alterna	c.a.	Corrente alterada
c.c.	Gleichstrom	c.c.	Corriente continua	c.c.	Corrente contínua
RAD	Gleichrichter	RAD	Rectificador	RAD	Rectificador
INT	Zwischenkreis	INT	Circuito intermedio	INT	Circuito intermédio
INV	Wechselrichter	INV	Inversor	INV	Inversor
MOT	Motor	MOT	Motor	MOT	Motor
CONTR	Kontrollkreis	CONTR	Circuito de control	CONTR	Circuito de controlo
TRASM	Übertragungsgerät	TRASM	Transmissor	TRASM	Transmissor

c.a.	Wisselstroom
c.c.	Gelijkstroom
RAD	Gelijkrichter
INT	Tussencircuit
INV	Frequentieregelaar
MOT	Motor
CONTR	Controlecircuit
TRASM	Transmitter

it

DICHIARAZIONE CE DI CONFORMITÀ « ORIGINALE »
LOWARA SRL UNIPERSONALE, CON SEDE IN VIA LOMBARDI
14 - 36075 MONTECCHIO MAGGIORE (VI) - ITALIA, DICHIARA
CHE IL PRODOTTO:

ELETTROPOMPE SERIE TKS
(VEDETE ADESIVO SU PRIMA PAGINA)

E' CONFORME ALLE DISPOSIZIONI DELLE SEGUENTI
DIRETTIVE EUROPEE:

- MACCHINE 2006/42/CE (IL FASCICOLO TECNICO È
DISPONIBILE PRESSO LOWARA SRL UNIPERSONALE)
- COMPATIBILITÀ ELETTROMAGNETICA 2004/108/CE
E CONFORME ALLE SEGUENTI NORME TECNICHE:
- EN 60335-2-41
- EN ISO 12100
- EN 809
- EN 60204-1:2006
- EN 61000-3-2:2006, EN 61000-3-3:2008
- EN 61000-6-1:2007, EN 61000-6-3:2007

MONTECCHIO MAGGIORE, 03.05.2012
AMEDEO VALENTE
(DIRETTORE ENGINEERING e R&D)
rev.00



en

EC DECLARATION OF CONFORMITY « TRANSLATION »
LOWARA SRL UNIPERSONALE, WITH HEADQUARTERS IN VIA
LOMBARDI 14 - 36075 MONTECCHIO MAGGIORE (VI) - ITALIA,
HEREBY DECLARES THAT THE PRODUCT:

TKS ELECTRIC PUMP SERIES
(SEE LABEL ON FIRST PAGE)

FULFILLS THE RELEVANT PROVISIONS OF THE FOLLOWING
EUROPEAN DIRECTIVES:

- MACHINERY 2006/42/EC (THE TECHNICAL FILE IS
AVAILABLE FROM LOWARA SRL UNIPERSONALE)
- ELECTROMAGNETIC COMPATIBILITY 2004/108/EC
AND THE FOLLOWING TECHNICAL STANDARDS:
- EN 60335-2-41
- EN ISO 12100
- EN 809
- EN 60204-1:2006
- EN 61000-3-2:2006, EN 61000-3-3:2008
- EN 61000-6-1:2007, EN 61000-6-3:2007

MONTECCHIO MAGGIORE, 03.05.2012
AMEDEO VALENTE
(DIRECTOR OF ENGINEERING AND R&D)
rev.00



fr

DÉCLARATION CE DE CONFORMITÉ « TRADUCTION »
LOWARA SRL UNIPERSONALE, DONT LE SIÈGE EST SITUÉ 14
VIA LOMBARDI - 36075 MONTECCHIO MAGGIORE (VI) - ITALIE,
DÉCLARE QUE LE PRODUIT:

ÉLECTROPOMPES SÉRIE TKS
(VOIR L'AUTOCOLLANT SUR LA PREMIÈRE PAGE)

EST CONFORME AUX DISPOSITIONS DES DIRECTIVES
EUROPÉENNES SUIVANTES:

- MACHINES 2006/42/CE (LE DOSSIER TECHNIQUE EST
DISPONIBLE APRÈS DE LOWARA SRL UNIPERSONALE)
- COMPATIBILITÉ ÉLECTROMAGNÉTIQUE 2004/108/CE
ET EST CONFORME AUX NORMES TECHNIQUES SUIVANTES:
- EN 60335-2-41
- EN ISO 12100
- EN 809
- EN 60204-1:2006
- EN 61000-3-2:2006, EN 61000-3-3:2008
- EN 61000-6-1:2007, EN 61000-6-3:2007

MONTECCHIO MAGGIORE, 03.05.2012
AMEDEO VALENTE
(DIRECTEUR INGÉNIERIE ET R&D)
rév.00



de

EG-KONFORMITÄTSEKTLÄRUNG « ÜBERSETZUNG »
LOWARA SRL UNIPERSONALE, MIT SITZ IN VIA LOMBARDI 14
- 36075 MONTECCHIO MAGGIORE (VI) - ITALIEN, ERKLÄRT,
DASS DIE NACHFOLGEND BESCHRIEBENEN PRODUKTE:

MOTORPUMPEN BAUREIHE TKS
(SIEHE KLEBESCHILD AUF DER ERSTEN SEITE)

DEN VORSCHRIFTEN DER FOLGENDEN EUROPÄISCHEN
RICHTLINIEN:

- MACHINEN 2006/42/EG (DIE TECHNISCHES AKTE LIEGT BEI
LOWARA SRL UNIPERSONALE AUF)
- ELEKTROMAGNETISCHE KOMPATIBILITÄT 2004/108/EG
SOWIE DEN FOLGENDEN TECHNISCHEN VORSCHRIFTEN
ENTSPRECHEN:
- EN 60335-2-41
- EN ISO 12100
- EN 809
- EN 60204-1:2006
- EN 61000-3-2:2006, EN 61000-3-3:2008
- EN 61000-6-1:2007, EN 61000-6-3:2007

MONTECCHIO MAGGIORE, 03.05.2012
AMEDEO VALENTE
(LEITER TECHNIK UND R&D)
rev.00



es
DECLARACIÓN CE DE CONFORMIDAD « TRADUCCIÓN »
LOWARA SRL UNIPERSONALE, CON SEDE EN VIA LOMBARDI
14 - 36075 MONTECCHIO MAGGIORE (VI) - ITALIA, DECLARA
QUE EL PRODUCTO:

**ELECTROBOMBAS SERIE TKS
(VEA EL ADHESIVO EN LA PRIMERA PÁGINA)**

ES CONFORME A LA DISPOSICIONES DE LAS SIGUIENTES
DIRECTIVAS EUROPEAS:

- MÁQUINAS 2006/42/CE (EL EXPEDIENTE TÉCNICO ESTÁ
DISPONIBLE EN LOWARA SRL UNIPERSONALE)
- COMPATIBILIDAD ELECTROMAGNÉTICA 2004/108/CE
Y ES CONFORME A LAS NORMAS TÉCNICAS SIGUIENTES:
- EN 60335-2-41
- EN ISO 12100
- EN 809
- EN 60204-1:2006
- EN 61000-3-2:2006, EN 61000-3-3:2008
- EN 61000-6-1:2007, EN 61000-6-3:2007

MONTECCHIO MAGGIORE, 03.05.2012
AMEDEO VALENTE
(DIRECTOR ENGINEERING Y R&D)
rev.00



pt
DECLARAÇÃO CE DE CONFORMIDADE « TRADUÇÃO »
A LOWARA SRL UNIPERSONALE, COM SEDE EM VIA
LOMBARDI 14 - 36075 MONTECCHIO MAGGIORE (VI) - ITÁLIA,
DECLARA QUE O PRODUTO:

**ELECTROBOMBAS SÉRIE TKS
(VER O ADESIVO NA PRIMEIRA PÁGINA)**

ESTÁ EM CONFORMIDADE COM AS DISPOSIÇÕES DAS
SEGUINTES DIRECTIVAS EUROPEIAS:

- MÁQUINAS 2006/42/CE (O DOSSIER TÉCNICO ESTÁ À
DISPOSIÇÃO JUNTO DE LOWARA SRL UNIPERSONALE)
- COMPATIBILIDADE ELECTROMAGNÉTICA 2004/108/CE
E EM CONFORMIDADE COM AS SEGUINTE NORMAS
TÉCNICAS:
- EN 60335-2-41
- EN ISO 12100
- EN 809
- EN 60204-1:2006
- EN 61000-3-2:2006, EN 61000-3-3:2008
- EN 61000-6-1:2007, EN 61000-6-3:2007

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rev.00



nl
EG-VERKLARING VAN OVEREENSTEMMING « VERTALING »
DE FIRMA LOWARA SRL UNIPERSONALE, GEVESTIGD IN VIA
LOMBARDI 14 - 36075 MONTECCHIO MAGGIORE (VI) - ITALIË,
VERKLAART DAT HET PRODUCT:

**ELEKROPOMPEN TKS SERIE
(ZIE DE STICKER OP DE EERSTE BLADZIJDE)**

IN OVEREENSTEMMING IS MET DE BEPALINGEN VAN DE
VOLGENDE EUROPESE RICHTLIJNEN:

- MACHINERICHTLIJN 2006/42/EG (HET TECHNISCH DOSSIER
IS BESCHIKBAAR BIJ LOWARA SRL UNIPERSONALE)
- ELEKTROMAGNETISCHE COMPATIBILITEITSRICHTLIJN
2004/108/EG
- EN DE VOLGENDE TECHNISCHE NORMEN:
- EN 60335-2-41
- EN ISO 12100
- EN 809
- EN 60204-1:2006
- EN 61000-3-2:2006, EN 61000-3-3:2008
- EN 61000-6-1:2007, EN 61000-6-3:2007

MONTECCHIO MAGGIORE, 03.05.2012
AMEDEO VALENTE
(DIRECTEUR VAN ENGINEERING EN R&D)
rev.00



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تحفظ شركة لوارا Lowara بحق إجراء تعديلات بدون الالتزام بالتنبية المسبق.

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