Pioneering for You

SK 601N

de Einbau- und Betriebsanleitung
en Installation and operating instructions
fr Notice de montage et de mise en service
es Instrucciones de instalación y funcionamiento
it Istruzioni di montaggio, uso e manutenzione
pl Instrukcja montażu i obsługi
cs Návod k montáži a obsluze
ru Инструкция по монтажу и эксплуатации

2 129 141-Ed.02 / 2013-11

Fig. 1:

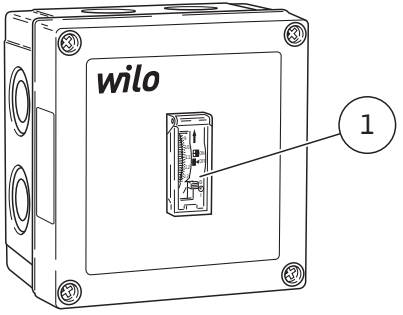


Fig. 2:

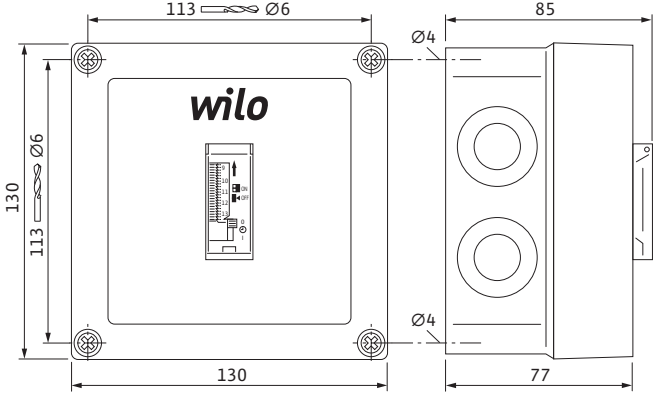


Fig. 3:

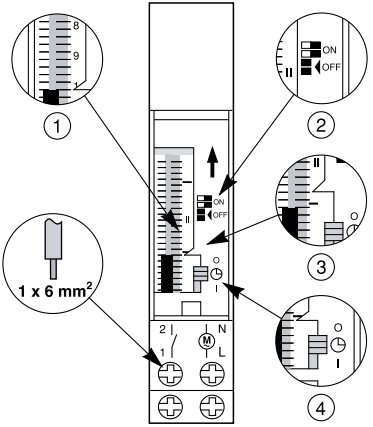


Fig. 4:

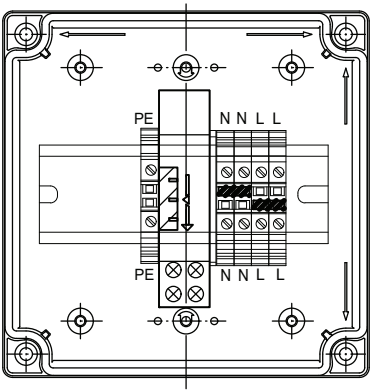
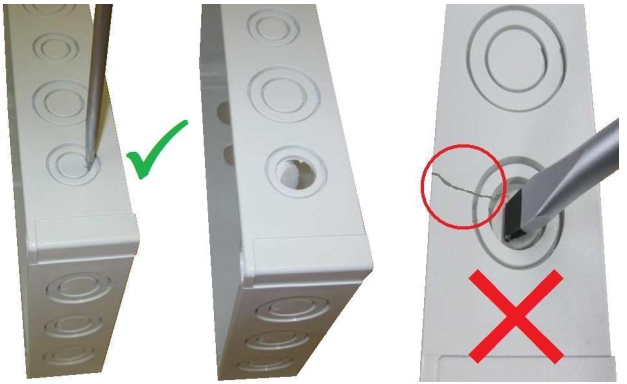


Fig. 5: a.) b.) c.)



10 Ersatzteile

Die Ersatzteil-Bestellung erfolgt über örtliche Fachhandwerker und/oder den Wilo-Kundendienst.
Um Rückfragen und Fehlbestellungen zu vermeiden, sind bei jeder Bestellung sämtliche Daten des Typenschildes anzugeben.

11 Entsorgung

Mit der ordnungsgemäßen Entsorgung und des sachgerechten Recycling dieses Produktes werden Umweltschäden und eine Gefährdung der persönlichen Gesundheit vermieden.

1. Zur Entsorgung des Produktes, sowie Teile davon, die öffentlichen oder privaten Entsorgungsgesellschaften in Anspruch nehmen.
2. Weitere Informationen zur sachgerechten Entsorgung werden bei der Stadtverwaltung, dem Entsorgungsamt oder dort wo das Produkt erworben wurde, erteilt.

HINWEIS: Das Schaltgerät gehört nicht in den Hausmüll!

Technische Änderungen vorbehalten!

1 General

About this document

The language of the original operating instructions is German. All other languages of these instructions are translations of the original operating instructions.

These installation and operating instructions are an integral part of the product. They must be kept readily available at the place where the product is installed. Strict adherence to these instructions is a precondition for the proper use and correct operation of the product.

The installation and operating instructions correspond to the relevant version of the product and the underlying safety regulations and standards valid at the time of going to print.

EC declaration of conformity:

A copy of the EC declaration of conformity is a component of these operating instructions.

If a technical modification is made on the designs named there without our agreement or the declarations made in the installation and operating instructions on product/personnel safety are not observed, this declaration loses its validity.

2 Safety

These operating instructions contain basic information which must be adhered to during installation, operation and maintenance. For this reason, these operating instructions must, without fail, be read by the service technician and the responsible specialist/operator before installation and commissioning.

It is not only the general safety instructions listed under the main point “safety” that must be adhered to but also the special safety instructions with danger symbols included under the following main points.

2.1 Indication of instructions in the operating instructions

Symbols:
General danger symbol

Danger due to electrical voltage

NOTE:

Signal words:

DANGER!
Acutely dangerous situation.
Non-observance results in death or the most serious of injuries.

WARNING!
The user can suffer (serious) injuries. “Warning” implies that (serious) injury to persons is probable if this note is disregarded.

CAUTION!
There is a risk of damaging the product/unit. “Caution” concerns possible damage to the product that could occur if this note is disregarded.

NOTE: Useful information on handling the product. It draws attention to possible problems.

Information that appears directly on the product, such as:
- identification for connections
- rating plate
- warning stickers,

must be strictly complied with and kept in legible condition.

2.2 Safety instructions for installation and maintenance work

The safety instructions included in these installation and operating instructions, the existing national regulations for accident prevention together with any internal working, operating and safety regulations of the operator are to be complied with.
The operator must ensure that all installation and maintenance work is carried out by authorised and qualified personnel, who are sufficiently informed due to their own detailed study of the operating instructions.

Safety instructions of the operating instructions for the pump are to be observed at all times when working on the switchgear and the pump!

DANGER! Danger of electric shock!
The work on the product/system may only be carried out when they are switched off and secured against being switched on again.
Immediately on conclusion of the work, all safety and protective devices must be put back in position and/or recommissioned.

2.3 Unauthorised modification and manufacture of spare parts

Unauthorised modification and manufacture of spare parts will impair the safety of the product/personnel and will make void the manufacturer's declarations regarding safety.
Modifications to the product are only permissible after consultation with the manufacturer. Original spare parts and accessories authorised by the manufacturer ensure safety. The use of other parts will absolve us of liability for consequential events.

3 Transport and interim storage

Immediately check the product for any transit damage on arrival. If transport damage is found, the necessary procedures involving the forwarding agent must be taken within the specified period.

CAUTION! Risk of damage to property!
Incorrect transport and interim storage can cause damage to the product.

- **The switchgear must be protected against moisture and mechanical damage caused by blows/impact.**
- **It must not be exposed to temperatures outside the range from –10 °C to +50 °C.**

4 Intended use

Wall-mounted device for the automatic, time-dependent ON/OFF switching of Wilo heating and potable water pumps of all series with AC and three-phase AC motors at pre-scheduled, low-consumption times.

DANGER! Risk of fatal accident!
The switchgear is not protected against explosions and may not be operated in the explosive area.
Always install the switchgear outside the explosive area.

Intended use also includes following these instructions.
Any other use is not regarded as intended use.

5 Product information

5.1 Type key

SK 601N	
SK	= switchbox
601N	= device type

5.2 Technical data

Operating voltage	1~230 V ±10 %
Frequency	50/60 Hz
Protection class	IP31
Switching capacity	16 A/250 V (for cos φ = 1) 4 A/250 V (for cos φ = 0.6)
Power dissipation	1.7 W/2.5 VA
Temperature range	–10°C to +50°C
Clock precision	±1 s per day
Battery backup	100 hours/rechargeable Ni–MH battery (button cell, type V80H)
Switching segments	4x 15 min per hour
Housing	Polycarbonate/polyamide, RAL 7035 4x punch stampings for M16
Housing dimensions (W x H x D)	130 x 130 x 85 mm

5.3 Scope of delivery

- Switchbox, complete
- 2x M16 threaded cable connections
- Installation and operating instructions

5.4 Accessories

Accessories must be ordered separately:

- SK 602N, SK 622N
  See the catalogue for a detailed list

6 Description and function

6.1 Switchbox description

The switchbox SK 601N provides a 24-hour time switch for the time-dependent connection of Wilo heating and potable water pumps of all series at pre-scheduled times. The time switch is enclosed in a housing for wall-mounted installation with terminals and terminal compartment for wiring. The cables are fed via cable feedthroughs with screwed connections. The time switch can be set under a transparent cover flap, which can be opened from the outside.

6.2 Switchbox function

The electromechanical time switch switches the connected phase to the mechanically set switching times. To save energy on the timer, the neutral conductor is also required, in addition to the switching phase. The timer has a battery backup for 100 hours. The ON and OFF switching times of the time switch are mechanically set by switching the segments on the 24-hour wheel. Switching times are possible in 15-minute intervals. The time switch has a position switch, which allows a permanent ON or OFF connection, as well as a third option which allows a timer function.

With the switched phase, smaller single phase, connected pumps can be switched directly. For higher power and pumps connected with several phases, the switchbox SK 602N or SK 622N can be used with a three-phase contactor. The contactor is then controlled by the time switch.

7 Installation and electrical connection

DANGER! Risk of fatal accident!
Improper installation and electrical connection can result in fatal injury.

- **Installation and electrical connection may only be carried out by qualified personnel and in accordance with the applicable regulations.**
- **Adhere to regulations for accident prevention**

7.1 Installation

Install the switchgear in a dry, vibration-free and frost-safe location.
Protect the place of installation from direct sunlight.
To fasten the switchgear, open the upper part of the housing:

- Loosen the 4 cover fixing screws

CAUTION! Risk of damage to property!
Incorrect handling of the switchgear can result in property damage.
Do not drill through the housing into the wall!

- **The housing and electronic components might be damaged.**
- **Damage to the housing (cracks) can lead to leaks.**

- For wall-mounted installation, fasten the switchgear to the wall with dowels and screws. Dimensions for the drilling pattern in acc. with Fig. 2, screw diameter 4 mm, bore diameter 6 mm.

  Before mounting the switchgear, break out the required punch stampings on the side of the electric cable inlet and outlet for mounting the threaded cable connections.

WARNING! Risk of injury!
Improper work on the housing can cause injuries.

- **When opening the housing punch stampings, wear protective goggles, since housing parts can chip off.**

- **When opening the housing punch stampings, wear protective gloves to protect your hands from sharp edges.**

  To open the punch stampings, use a slotted screwdriver with a 5.5 mm blade, a 300 g hammer as well as a deburrer.

  To open the pre-punched holes, place the screwdriver blade perpendicular on the marked edge of the inner punch stamping (Fig. 5a) and punch the punch stamping out with a light hammer tap on the head of the screwdriver (Fig. 5b).

CAUTION! Risk of damage to property!
Improper work on the housing can result in property damage (Fig. 5c).

- **Damage to the housing (cracks) can lead to leaks.**
- **Burrs on the breakouts can impair the mounting of the threaded cable connections. To use safely, deburr the breakthroughs.**

  Use the threaded cable connections (M16) included in delivery as needed and fasten to the housing.

7.2 Electrical connection

DANGER! Risk of fatal accident!
A fatal shock may occur if the electrical connection is not made correctly.

- **Only allow the electrical connection to be made by an electrician approved by the local power supply company and in accordance with the local regulations in force.**
- **Observe the installation and operating instructions for the pumps and accessories.**
- **Disconnect the power supply before any work.**
- **Check to ensure that all connections (including potential-free contacts) are voltage-free.**

CAUTION! Risk of damage to property!
An incorrect electrical connection can cause damage to property.

- **If the wrong voltage is applied, the motor or switchgear can be damaged!**
- **Control via the triac/semiconductor relay is not possible.**

- The type of mains, current and voltage of the mains connection must match the details on the rating plate of the pump as well as the rating plate specifications and documentation of the switchgear.
- The electrical connection must be established via a fixed power cable (3 x 1.5 mm^2, minimal cross-section), equipped with a plug connector or an all-pole switch with a minimum contact opening width of 3 mm.
- To ensure drip protection and strain relief on the threaded cable connection, use cables with a sufficient outer diameter and screw the threaded cable connection tightly. In addition, the cables near the screwed connection are to be bent to form a drainage loop, to drain any accumulated drips.
- Ground the switchgear according to regulations.
- L, N, ⏚: mains connection voltage: 1~230 VAC, 50/60 Hz, DIN IEC 60038, alternatively, the mains connection between two phases of a three phase net earthed in a star point is possible with a delta voltage of 3~230 Vac, 50/60 Hz.

7.2.1 Single phase mains connection 1~230 V (L, N, PE)

Power supply connection:

- Terminals L, N and PE
  Connect the phase connection to terminal L and the protective earth conductor to terminal PE of the terminal block (Fig. 4).
  To provide the timer with 230 V of electricity, connect the neutral conductor to N on the terminal block (Fig. 4).

Pump connection:

- Terminals 2, N and PE
  The pump is connected directly to terminal 2 of the time switch and N, PE on the terminal block (Fig. 4).

7.2.2 Two-phase mains connection 3~230 V (L1, L2, PE) / (L2, L3, PE) / (L3, L1, PE) for AC pumps, 230 V

CAUTION! Risk of damage to property!
An incorrect electrical connection can cause damage to property.

- **If the wrong voltage is applied, the motor or switchgear can be damaged!**
- **This connection to two phases is only permissible for these switchboxes and for AC pumps when the delta voltage in the supply system is 230 V.**

Power supply connection:

- Terminals L, N and PE
  When the delta voltage in the system is 230 V
  Connect the connection of one of the phases L1, L2 or L3 to the terminal L and one of the other phases L1, L2 or L3 to terminal N of the terminal block. PE is connected to the terminal PE of the terminal block (Fig.4).

Pump connection:

- Terminals 2, N and PE
  The pump is connected directly to terminal 2 of the time switch and N, PE on the terminal block (Fig. 4).

7.2.3 Connection to switchbox SK 602N/SK 622N

For pumps with higher power consumption or pumps with a three-phase power supply, the time switch can be used together with SK602N/SK622N to switch the pump via a three-phase power contactor.

NOTE: Observe the installation and operating instructions of the switchgears SK602N/SK622N!
For switchbox SK602N/SK622N, the installed cable jumper between terminals 1 and 2 of terminal block (X1) must be removed.

Between the switchbox SK601N and the switchbox SK602N/622 N, connect the terminals as follows.

SK 601N			SK 602N/SK 622N	
Terminal block	L	← →	1	Terminal block (X1)
	N	← →	N	
	PE	← →	PE	
Time switch	2	← →	2	

8 Commissioning

WARNING! Risk of injury and damage to property!
Incorrect commissioning can lead to injuries to persons and damage to property.

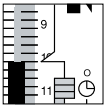
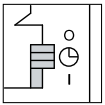
- **Commissioning by qualified personnel only!**
- **Observe the installation and operating instructions for the pumps and accessories.**
- **It is imperative that the warnings from chapter 7 be heeded!**
- **Before commissioning the switchgear and the pump, check whether these have been properly installed and connected.**

8.1 Setting the timer

The time switch opens or closes an electric circuit for a programmable period of time.
The shortest On/Off switching interval is 15 min. over 24 h.
The hinged cover of the device can be sealed.
Time switch description (Fig.3)

- Item 1: Hours display
- Item 2: Switching segments (1 segment = 15 min)
- Item 3: Time indicator
- Item 4: Position switch Off-Auto-On

Programming

	Settings
	Setting the switching times: On: Segment to the right (contact closed) Off: Segment to the left (contact opened)
	Setting the time: Turn the hand wheel upward in the direction of the arrow until the pointer is at the current time.
	Position switch: Always off: Switch upward Program run “Auto": Switch in the middle Always on: Switch downward

The pump is commissioned according to the corresponding pump documentation.

9 Faults, causes and remedies

For faults, causes and remedies, see also the operating instructions of the respective pumps

Faults	Causes	Remedy
SK601N in connection with the pump Pump is not running although the power supply is switched on.	Time switch is on the “Clock” symbol and all segments are in the “Off” position.	Set segments to “On”
	Time switch is switched off, “0”	Set the time switch to the “Clock” symbol or “I” “Clock” → Timer program is active “I” → permanent operation
SK601N+SK602N/622N in connection with the pump Pump is not running although the power supply is switched on.	WSK of the pump not connected	Connect the WSK
	WSK of the pump was tripped	After the motor cools off, the pump starts up on its own.
	For pumps without a WSK, contacts 15 and 10 on switchgear SK602N or SK622N are not bridged.	Bridge contacts 15 and 10 on switchgear SK602N or SK622N.
	Switchgear SK602N or SK622N not switched on	Switch on the green pushbutton.
Time switch stopped.	The time switch has not has a power supply for more than 100 hours.	Check the voltage.
		Change the battery for the battery backup.

If the operating fault cannot be remedied, please contact a specialist technician or the nearest Wilo Customer Service location or representative.

10 Spare parts

Spare parts are ordered via local specialist retailers and/or Wilo customer service.
In order to avoid queries and incorrect orders, all data on the rating plate should be submitted for each order.

11 Disposal

Damage to the environment and risks to personal health are avoided by the proper disposal and appropriate recycling of this product.

1. Use public or private disposal organisations when disposing of the entire product or part of the product.
2. For more information on proper disposal, please contact your local council or waste disposal office or the supplier from whom you obtained the product.

NOTE: The switchgear must not be disposed of with household waste.

Subject to change without prior notice!

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