Contents

1 EU Declaration of Conformity 29
2 Safety instructions 30
2.1 General 30
2.2 Labelling of symbols in the operating instructions 30
2.3 Personnel qualification 31
2.4 Dangers, if safety instructions are not observed 32
2.5 Safety-conscious working 32
2.6 Safety instructions for the operator 32
2.7 Safety instructions for installation and maintenance works 33
2.8 Unauthorized modification and use of spare parts 33
2.9 Inadmissible operating modes 34
3 Transport and storage 34
4 Intended use 34
5 Product data 35
5.1 Technical data 35
5.2 Scope of delivery 36
6 Pump description 37
7 Pump settings 37
7.1 Description of the operating elements. Button 37
7.2 Control panel and LED display 38
7.3 Selection of operating mode and operating level 38
7.4 Night mode 40
7.5 Venting program 40
7.6 Key lock 40
8 PWM function 41
8.1 Heating characteristic 43
8.2 Solar characteristic 44
8.3 PWM feedback signal (flow information) 45
9 Filling and venting the system 46
10 Relation between pump settings and performance 46
11 Performance characteristics 47
11.1 Internal control characteristics 47
11.2 External PWM control characteristics 48
12 Installation 50
13 Electrical connection 51
14 Maintenance and service 51
15 Faults, causes and remedies 52
16 Disposal 53
17 Additional notes 53

EU DECLARATION OF CONFORMITY

Name of the issuer:	**WITA sp. z o.o.** **Zielonka, ul. Biznesowa 22** **86-005 Białe Błota**
Subject of the declaration:	**Heating circulation pump**
Type:	**go.tec**
Design :	**40-XX, 60-XX, 70-XX, 80-XX**

We declare with sole responsibility that the products specified above, to which this EU Declaration of Conformity refers, fulfil the following standards and directives:

Electromagnetic Compatibility Directive 2014/30/EU
EN 55014-1 : 2017 + A11 : 2020
EN 55014-2: 1997 + A1 : 2001 + A2 : 2008
EN 61000-3-2 : 2014
EN 61000-3-3 : 2013
Low Voltage Directive 2014/35/EU
Directive 2009/125/EC of ecodesign requirements for energy-related products
Ecodesign requirements for energy-related products EC No 641/2009 and 622/2012.
EN 16297-1 : 2012
EN 16297-2 : 2012
EN 60335-1 : 2012 + A11:2014 + A13:2017 + A1:2019 + A14:2019 + A2:2019 + A15:2021
EN 60335-2-51 : 2003 + A1 : 2008 + A2 : 2012
RoHS 2011/65/EU and 2015/863/EU

This declaration is submitted for and on behalf of the manufacturer by:

Frank Kerstan
Management

Zielonka, 30.08.2023

2 Safety instructions

2.1 General

These installation and operating instructions are a part of the product and contain basic information that must be observed during assembly, operation and maintenance. For this reason it must be read by the installer and the responsible qualified personnel or the operator before performing assembly works. Not only the general safety instructions mentioned in section 2 must be observed, but also the special safety instructions mentioned in the other sections.
A copy of the EU Declaration of Conformity is provided with these instructions. In case of a modification, which has not been agreed with us beforehand, this declaration loses its validity.

2.2 Labelling of symbols in the operating instructions



**General danger symbol
Warning!
Danger of personal injury!
The existing regulations for accident prevention must be observed.**



Warning! Danger due to electrical voltage! Dangers due to electrical energy must be excluded. Observe the instructions in local or general regulations (e.g. IEC, VDE etc.) and those of the local energy suppliers.

NOTE

This symbol indicates useful information for handling the product. They draw attention to possible difficulties and are intended to ensure safe operation.

Notes attached directly to the product, such as:
• arrow of flow direction
• type plate
• marking of connections
must be strictly observed and kept in an easily legible condition.

2.3 Personnel qualification

The personnel, who is carrying out assembly, operation and maintenance works must provide appropriate qualifications. The area of responsibility, competence and supervision of the personnel must be ensured by the operator. If personnel do not provide the required know-how, they must be trained or instructed accordingly. This device can be used by **children** aged from 8 years and above, as well as by persons with reduced physical, sensory or mental capabilities or lack of experience and know-how, only if they have been given supervision or instruction concerning use of the device in a safe way and if they understand the hazards involved. **Children** must not play with the device. Cleaning and **user maintenance works** must not be carried out by **children** without supervision.



2.4 Dangers, if safety instructions are not observed

Failure to observe the safety instructions may endanger persons, the environment and the system. Failure to comply with the safety instructions will result in the loss of any claims for damages.
Potential dangers include:

- dangers to persons due to electrical and mechanical effects
- failure of important functions of the system
- danger to the environment due to leakage of liquids as result of a leak
- failure of prescribed repair and maintenance works.

2.5 Safety-conscious works

Observe the safety instructions detailed in these operating instructions, along with the current national accident prevention regulations. Should the system operator also have their own internal regulations, these must also be observed.

2.6 Safety instructions for the operator



- Any protection against contact with moving parts must not be removed or disabled, while the system is in operation.
- If liquids leak out, they must be collected or diverted in such a way, that no danger to persons or environment can arise.

- Hazards due to electrical energy must be excluded.
- For this purpose, observe the instructions in local or general regulations (e.g. IEC, VDE etc.) and those of the local energy suppliers.
- If hazards should occur in the system due to hot or cold parts, these must be provided with touch protection.
- Highly flammable substances must be kept away from the product.

2.7 Safety instructions for installation and maintenance works

The system operator is responsible for ensuring that all assembly and maintenance works are carried out by qualified personnel. They must have previously familiarized themselves with the product, using the operating instructions. Conducting of works on the pump is only permitted when the system is shut down.
Ensure that the device is securely disconnected from the power supply. Disconnect the device plug to achieve this. Prescribed instructions for shutting down the device can be found in the operating instructions. After completion of the works, all protective devices, such as touch guard, must be refitted in accordance with the regulations.

2.8 Unauthorised modification and use of spare parts

Modifications or alterations of the product are only permitted after prior consultation with the manufacturer. Use only original spare parts for repairs. Only accessories approved by the manufacturer can be used. If other parts are used, any liability of the manufacturer for the resulting consequences is excluded.

2.9 Inadmissible operating modes

If the pump is disconnected from the power supply, wait at least 1 minute before switching it on again. Otherwise, the pump's inrush current limit has no effect, which can lead to functional errors or damage to any connected heating controller.



The pump's operational safety can only be ensured, if it is used as intended. Section 4 of these operating instructions must be observed. Ensure compliance with the limit values detailed in the technical data.

3 Transport and storage

After receiving the product, inspect it immediately for damage caused in transport. If any transport damage is found, this must be claimed by the carrier.

Improper transport and storage can lead to personal injuries or damages to the product.



- **Protect the product against frost, moisture and damage during transport and storage.**
- **Only carry the pump by the pump housing, and never by the connection cable or terminal box.**
- **If the packaging has been softened by moisture, the pump may fall out and cause severe injuries.**

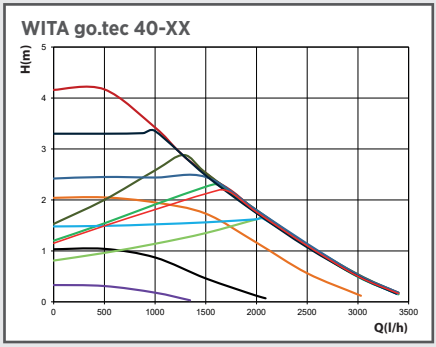
4 Intended use

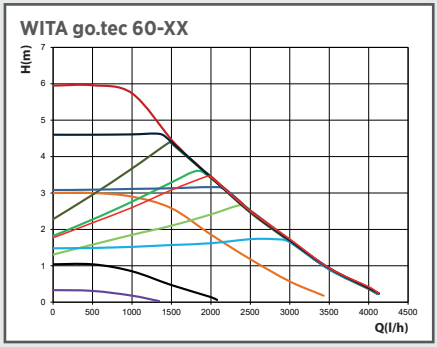
The WITA go.tec high-efficiency pumps are designed for circulating hot water in central heating systems and are also suitable for pumping low-viscosity media in industrial and commercial sector. They also can be used in solar technology systems.



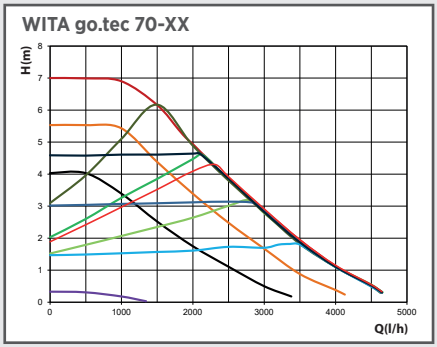
5 Product data

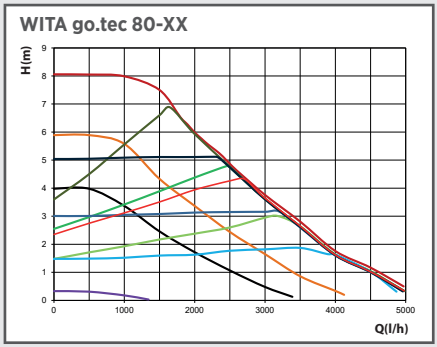
5.1 Technical data





	40-XX	60-XX
Maximum delivery head	4.0 m	6.0 m
Maximum flow rate	2600 l/h	3500 l/h
Power consumption P1 (W)	4 – 25	4 – 45
Supply voltage	1× 230V 50Hz	
Emission sound pressure level	< 43 dB(A)	
EEI	≤ 0.19	≤ 0.20
Thermal class	TF110	
Ambient temperature	0 °C to 60 °C	
Media temperature	-10 °C to 110 °C	
Maximum system pressure	10 bar (1MPa)	
Permitted pumped media	heating water according to VDI 2035. water/glycol mixture 1:1.	





	70-XX	80-XX
Maximum delivery head	7.0 m	8.0 m
Maximum flow rate	4000 l/h	4500 l/h
Power consumption P1 (W)	4 - 65	4 - 80
Supply voltage	1× 230V 50Hz	
Emission sound pressure level	< 43 dB(A)	
EEI	≤ 0.21	≤ 0.21
Thermal class	TF110	
Ambient temperature	0 °C to 60 °C	
Media temperature	-10 °C to 110 °C	
Maximum system pressure	10 bar (1MPa)	
Permitted pumped media	heating water according to VDI 2035 water/glycol mixture 1:1	

The following table applies to pump models go.tec 40-XX/60-XX/70-XX/80-XX:

Inlet pressure

Fluid temperature	Minimum inlet pressure		
< 75 °C	0.05 bar	0.005 MPa	0.5 m
75 °C - 90 °C	0.3 bar	0.03 MPa	3.0 m
90 °C - 110 °C	1.1 bar	0.11 MPa	11.0 m

Permissible range of application

Temperature range at maximum ambient temperature	Permissible fluid temperature
25 °C	-10 °C to 110 °C
40 °C	-10 °C to 95 °C
60 °C	-10 °C to 70 °C

NOTE

Caution!
The use of inadmissible pumped media can destroy the pump and cause personal injuries. Always observe the manufacturer's instructions and safety data sheets!

5.2 Scope of delivery

- Installation and operating instructions
- Pump
- 2 flat gaskets
- Mains cable
- Insulation
- PWM connection cable (optional for PWM version)

6 Pump description

In an average household, around 10 to 20% of electricity consumption is caused by conventional standard pumps. With the go.tec pump series, we have developed a circulation pump with an energy efficiency index of ≤ 0.21. By using go.tec pumps, the energy consumption can be reduced by up to approx. 80% compared to a conventional circulation pump. The hydraulic performance could be kept at almost the same level as in the case of standard pumps. The pump performance adapts to the actual demand of the system as it works according to the proportional pressure principle.

7 Pump settings

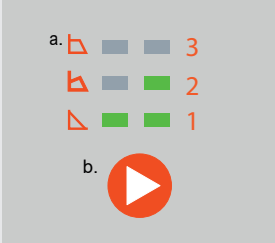
7.1 Description of the operating elements. Button

All functions of the pump can be controlled with only one button. The controls the operating modes. The selected operating mode is shown in a clear LED display field.

The button triggers different functions depending on the duration of the button press:
short press (< 1 sec): switch between different hydraulic curves
long press (all LEDs flash 2 or 3 times): special function night mode
long press (all LEDs flash 4 or 5 times): special function automatic air vent on
long press (all LEDs flash 6 or 7 times): special function key lock on or off

The pump included in this heating optimization set features a special craftsman mode, allowing the adjustment of the performance range between 4 m and 6 m or 7 m and 8 m.
Steps for adjustment:
Disconnect the pump from the 230V mains voltage for at least 1 minute until all LEDs are off.
Press and hold the button while reconnecting the pump to the 230V mains voltage to enter craftsman mode.
Select the performance range using the button:
LED 1 = 4m
LED 2 = 6m
LED 3 = 7m
LED 1 + 2 + 3 = 8m
Disconnect the pump from the 230V mains voltage for at least 1 minute.
Reconnect the pump to the 230V mains voltage.
The adjustment process is complete. The pump now operates within the selected lift head performance range.

7.2 Control panel and LED display



a. display of current characteristic curve or fault code
b. operating mode selection button

7.3 Selection of operating mode and operating level

1. Constant speed mode I, II and III

In this operating mode, the pump runs at a constant speed over the entire characteristic curve.

2. Constant pressure mode CP1, CP2 and CP3

In this control mode, the pressure generated by the pump is kept at a constant level. This control mode is particularly suitable for use in underfloor heating systems.

3. Proportional pressure mode PP1, PP2 and PP3

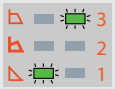
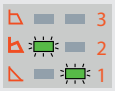
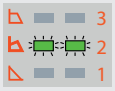
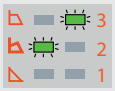
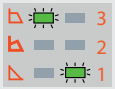
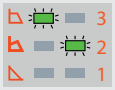
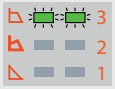
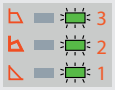
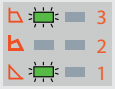
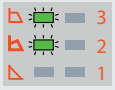
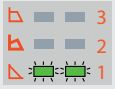
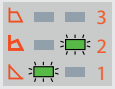
In this mode the pump is controlled according to proportional-pressure principle. In this case, the pressure generated by the pump adapts to the changing flow rate. This operating mode is particularly suitable if the pump is intended for use as a heating circulation pump.

4. AUTO SmartAdapt

The AUTO SmartAdapt function is designed for two-circuit heating systems and underfloor heating systems. In this mode the pump performance adapts automatically to the actual heat demand of the system. The adjustment of the pump performance happens gradually and can take longer then a week. If the power supply to the pump is interrupted, the pump saves the last settings and resumes the adjustment as soon as the power supply is restored.

5. External control mode
This function allows the control of the rotational speed of the pump by an external controller. See chapter 8.

On delivery, the pump is set to the constant speed control mode III. By repeatedly pressing of the selection button, the operating modes: constant speed mode, proportional pressure mode, constant pressure mode, AUTO SmartAdapt, external control mode are switched through continuously. The selected operating mode is indicated by the corresponding LED with characteristic symbols.

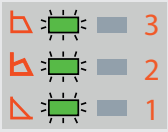
Number of button presses	Description	
0	Constant speed control mode III	
1	Proportional pressure mode 1	
2	Proportional pressure mode 2	
3	Proportional pressure mode 3	
4	Constant pressure mode 1	
5	Constant pressure mode 2	
6	Constant pressure mode 3	
7	AUTO SmartAdapt	
8	PWM1 mode. If there is no signal input or PWM%=0%, the PP symbol (left-middle) will blink	
9	PWM2 mode. If there is no signal input or PWM%=0% , the S symbol (left-bottom) will blink	
10	Constant speed control mode I	
11	Constant speed control mode II	

6. Selection of the operating level

Pressing the button ▶ switches continuously through the operating levels

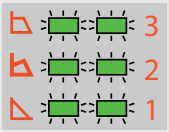
The factory setting: constant speed control mode III is reached again by pressing the button 12 times.

7.4 Night mode



Press long the mode selection button and release it after all LEDs flash 2 or 3 times to activate the night mode function. In this mode, the three LEDs on the left column light up (see figure on the left) and the pump runs at the lowest possible power (minimum operation). The pump remains permanently in night mode until the mode selection button is shortly pressed (< 1 sec). This mode will remain selected if power is reconnected.

7.5 Venting program



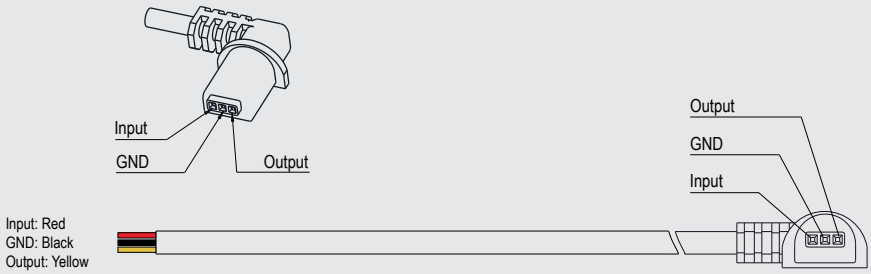
Press long the mode selection button and release it after all LEDs flash 4 or 5 times to activate the venting program. In this mode, all LEDs light up (see figure on the left) and the pump runs with different speeds and different durations. The whole venting program lasts for 10 minutes. The venting function can also be terminated prematurely by shortly pressing the mode selection button (< 1 sec). The pump then returns to the setting that was set before starting the venting program.
The venting program won't resume after shutdown.

7.6 Key lock

After the pump has been set, it is possible to switch on the key lock function. This prevents unintentional operation of the pump. Press long the mode selection button and release it after all LEDs flash 6 or 7 times to activate the key lock function. The panel still displays the setting before the key lock function has been activated. After pressing the button when this function is activated, the panel will flash 2 times shortly to indicate that the key lock function is already activated. To deactivate this function, press long the mode selection button and release it after all LEDs flash 6 or 7 time.
The locked status remains after shutdown and reconnection to power.

8 PWM function

This function allows the control of the rotational speed of the pump by an external controller. To use this function, the pump must be equipped with an appropriate input. This external input can be recognized by an additional three-pole connection line, to which a corresponding external controller can be connected.
The connection assignment is shown in the following figure:



The maximum cable length is 3m.

The signal line is galvanically separated from the pump electronics by an optocoupler.

The remote station to be connected:

• must reliably prevent direct contact to the operator with the cable cores when installed, i.e. the terminals must be touch-safe and the terminal connections must be protected against unattended contact by a firmly mounted cover,
• must comply with the protection class I (connection with protective earth).
The unit must not be put into operation until the PWM signal has been connected properly.
Warning: To prevent damage to the pump, the PWM signal cable must never be connected to 230V!

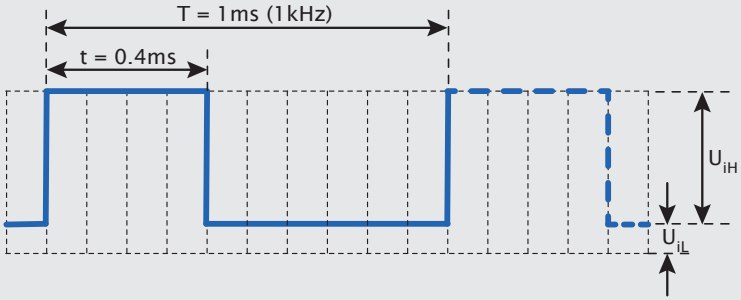
The open collector PWM output must be connected to the evaluation electronics via a suitable pull-up resistor. The operating voltage must be below 24V. In order to maintain a 1 to 2.5 mA current, the resistance of pull-up resistor R should be in the following range in kΩ (assume U as the pull-up voltage in unit Volt). Recommended pull-up resistors for different voltages:

$$\frac{U}{2.5} - 0.11 \leq R \leq U - 0.11$$

3.3 V ➔ 1.21 kΩ – 3.19 kΩ
5V ➔ 1.89 kΩ – 4.89 kΩ
15V ➔ 5.89 kΩ – 14.89 kΩ

The PWM control signal is a digital signal in which the speed information is contained in the pulse width. The control signal must meet the following requirements.

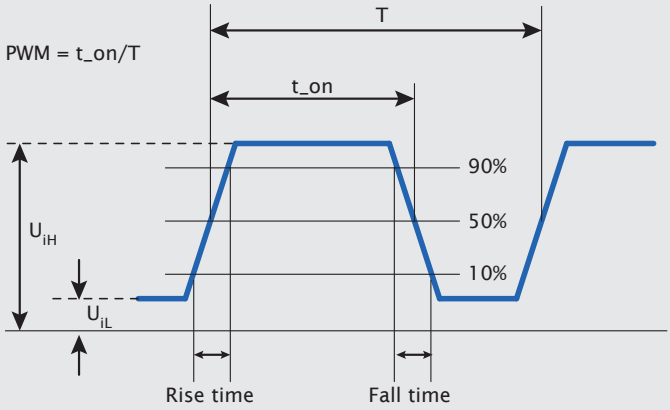
Example of a 40% PWM signal:



PWM % = 100 * t / T

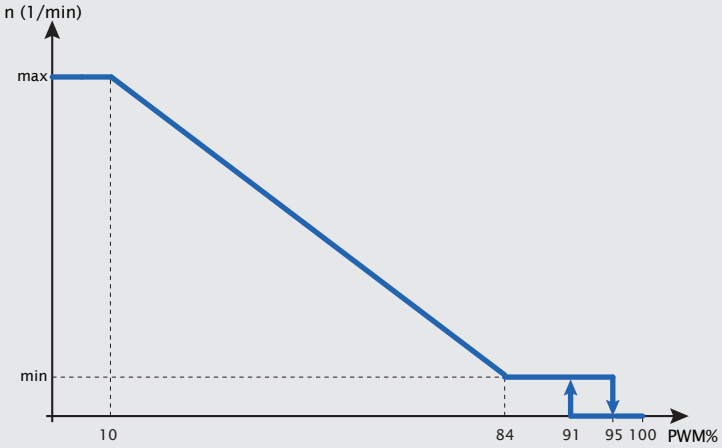
PWM % = 100 * 0,4 / 1 = 40 %

Frequencies between 100 Hz and 5000 Hz are permissible for T.
Permissible input current IH = : 3.5 - 10mA
Voltage level of the input signal UiH: 3V - 24V
Voltage level for low level UiL < 0.7V
Rise time, fall time of the signal ≤ T/1000

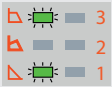


8.1 Heating characteristic

In the range between 0% and 10% of the PWM signal, the pump operates at maximum rotational speed for safety reasons. In the case of a fault in the PWM control unit or a cable break, this ensures that the heat produced by the heat generator is transferred. This measure is to prevent the system from overheating. In the range between 91% and 95% of the PWM signal, a hysteresis prevents the pump from switching continuously, when the PWM signal oscillates around the switching point.

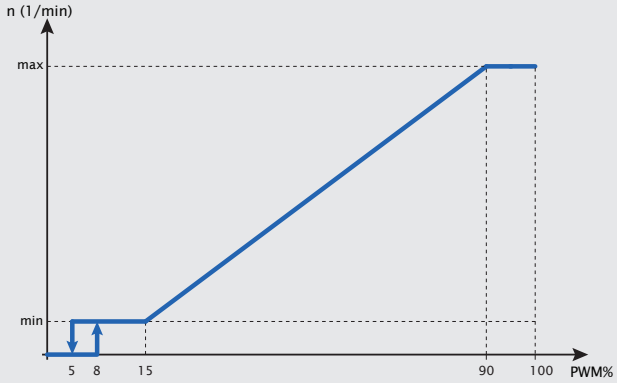


PWM input signal (%)	Pump status
0	No PWM signal input. Pump is internally controlled
0<PWM≤10	Pump running at the highest speed
10<PWM≤84	Pump running at variable speed. Speed varies linearly with input PWM signal
84<PWM≤91	Pump running at the lowest speed
91<PWM≤95	Hysteresis range: on/off
95<PWM≤100	Standby mode: off

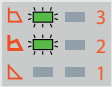
Symbol on display	Description
	PWM1 mode. If there is no signal input or PWM%=0%, the PP symbol (left-middle) will blink

8.2 Solar characteristic

In the range between 0% and 5% of the PWM signal, the pump stops for safety reasons. If the PWM signal is switched off, e.g. due to a fault in the control unit or a cable break, the pump stops, this prevents overheating of the solar system. In the range between 5% and 8% of the PWM signal, a hysteresis prevents the pump from switching continuously, when the PWM signal oscillates around the switching point.

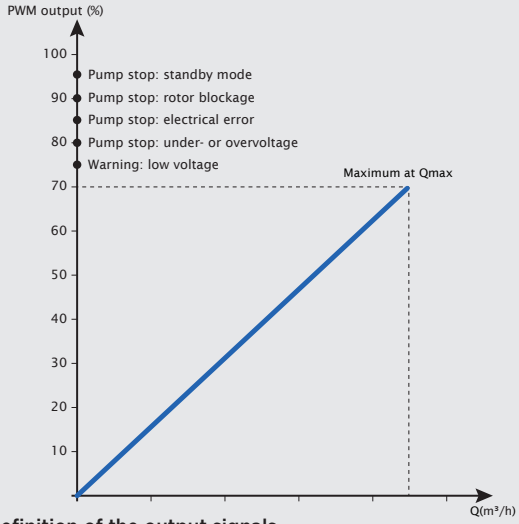


PWM input signal (%)	Pump status
0	No PWM signal input. Pump is internally controlled
0<PWM≤5	Standby mode: off
5<PWM≤8	Hysteresis range: on/off
8<PWM≤15	Pump running at the lowest speed
15<PWM≤90	Pump running at variable speed. Speed varies linearly with input PWM signal.
93<PWM≤100	Pump running at the highest speed

Symbol on display	Description
	PWM2 mode. If there is no signal input or PWM%=0%, the S symbol (left-bottom) will blink

8.3 PWM feedback signal (flow information)

The PWM feedback signal makes it possible to transmit information about the operating status of the pump to an external control system. It contains information on the current flow and fault conditions of the pump. The output signal has a fixed frequency of 75Hz and is galvanically isolated from the remaining pump electronics. The following table indicates which PWM % values correspond to which operating states:



Overview of the definition of the output signals

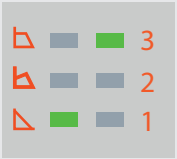
%	Definition	Type	Description
0-70	Pump running	/	Pump runs properly, flow information is returned.
75	Under- or overvoltage	Warning	Power supply voltage in undervoltage or overvoltage status
80	Pump stopped. Under- or overvoltage	Error	Power supply voltage in undervoltage (<160V) or overvoltage (>270V) status
85	Pump stopped. Electrical error	Error	Pump has an internal electrical fault. Pump must be replaced.
90	Pump stopped. Rotor blocked	Error	Pump blocked and must be cleaned.
95	Pump stopped.	/	Pump standby
PWM output frequency: 75Hz±5%			

9 Filling and venting the system

The system must be filled and vented properly. To vent the pump, the electronics should be set to constant speed level III and the pump should be operated in this position for at least 20 minutes.

Incomplete venting will result in increased noise during operation of the pump and the system.

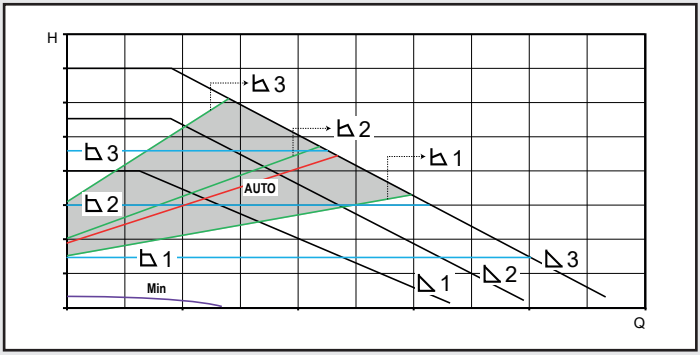
Warning! Danger of burns!
Depending on the operating status of the system, the entire pump can become very hot.





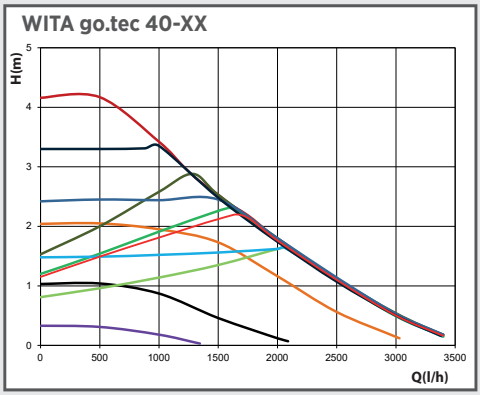
10 Relation between pump settings and performance

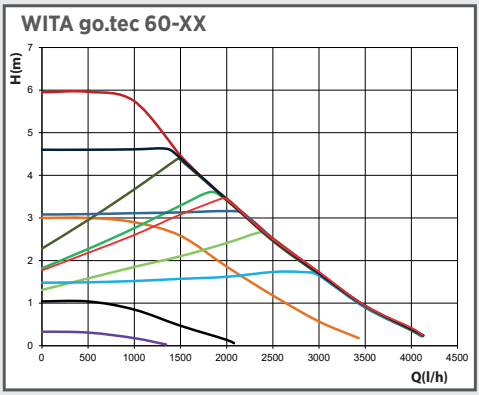
The characteristics show the relation between pump settings and performance

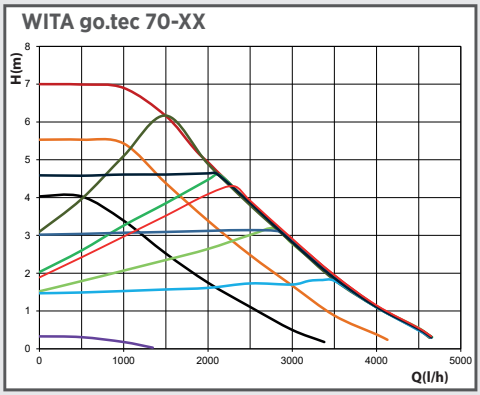


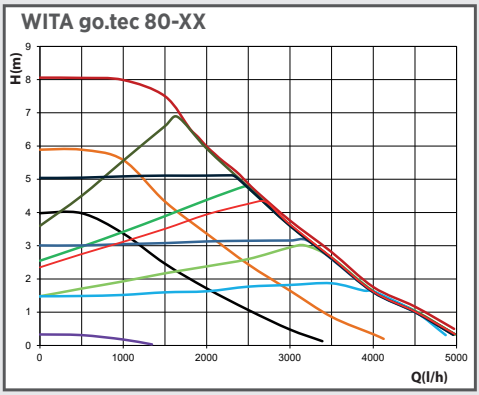
11 Performance characteristics

11.1 Internal control characteristics



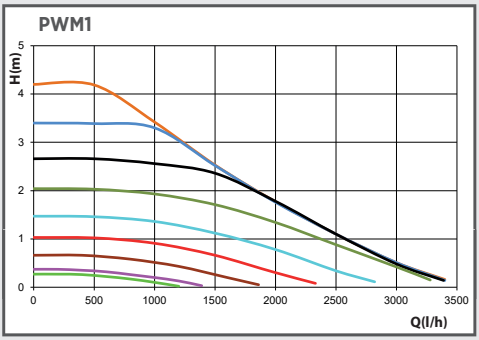


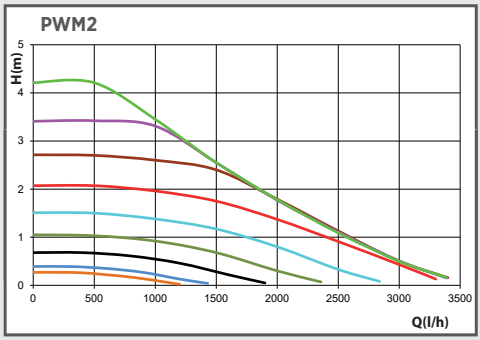




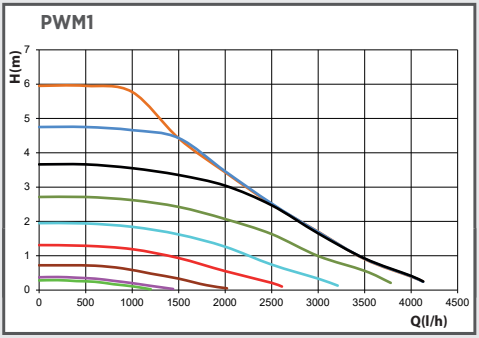
11.2 External PWM control characteristics

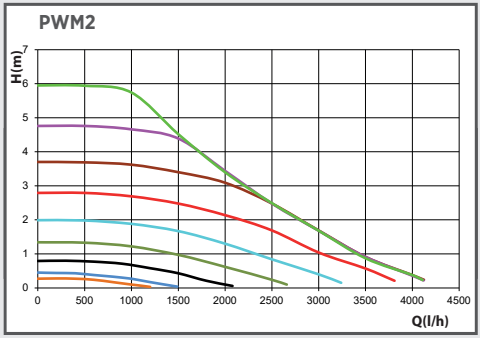
WITA go.tec 40-XX PWM

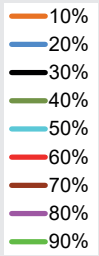




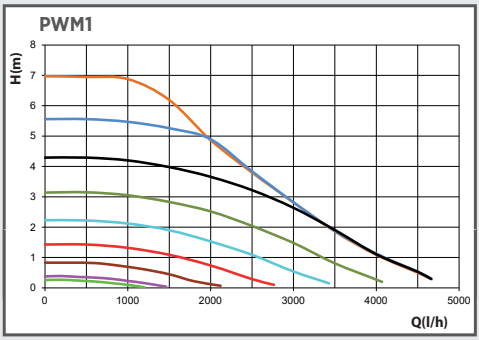
WITA go.tec 60-XX PWM

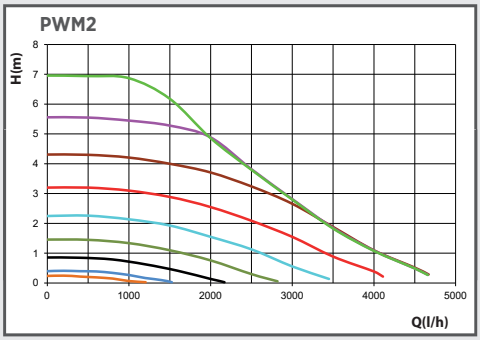




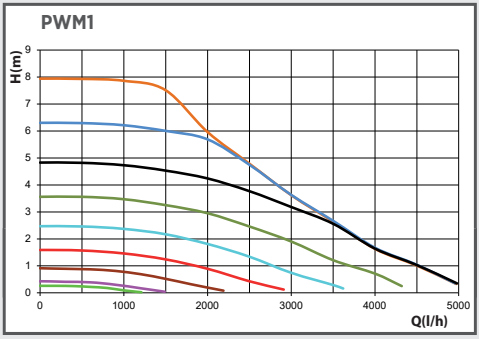


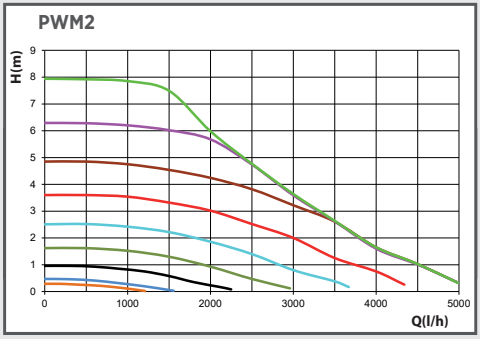
WITA go.tec 70-XX PWM

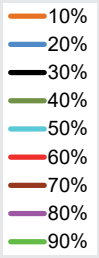




WITA go.tec 80-XX PWM

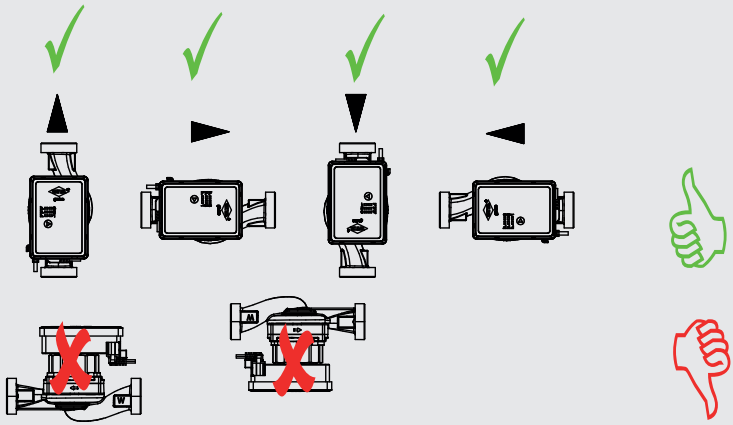






12 Installation

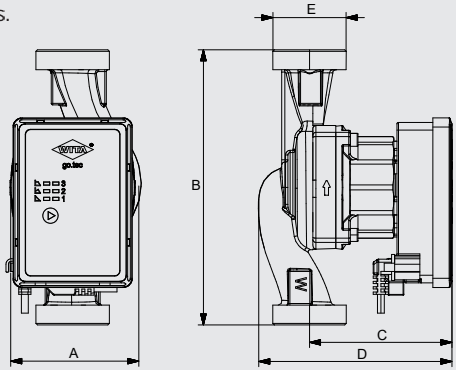
Correct installation position of the motor



A voltage-free assembly must be carried out with the pump motor in a horizontal position (the direction arrow on the pump body indicates the flow direction). When carrying out the thermal insulation works, make sure that the pump motor and the electronics housing are not insulated. If the assembly position is to be changed, the motor housing must be rotated as follows:

- loosen the hexagon socket screws
- rotate the motor housing
- rescrew and tighten the hexagon socket screws.

Installation dimensions

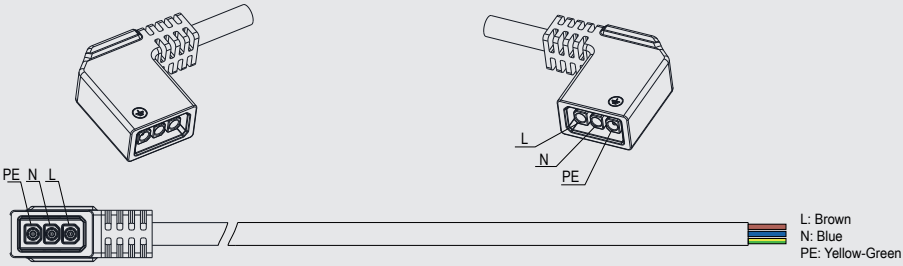


Article	A	B	C	D	E
go.tec XX-15-130	87 mm	130 mm	93 mm	126 mm	G 1“
go.tec XX-25-130					G 1½“
go.tec XX-25-180	84 mm	180 mm			
go.tec XX-32-180					G 2“

13 Electrical connection

Connect the mains cable to the pump as shown in the figure.
Caution! Mains voltage! Always observe the necessary safety measures, VDE regulations and local regulations.

The cross-section of the cable is 0.5 mm².



Caution! Danger to life!
Improper assembly and improper electrical connection can be life-threatening. Hazards due to electrical energy must be excluded.
- **Assembly and electrical connection may only be performed by qualified personnel and in accordance with the applicable regulations (e.g. IEC, VDE, etc.)!**
- **The type of current and voltage must comply with specifications on the type plate.**
- **Observe the regulations of the local energy suppliers!**
- **Observe the accident prevention regulations!**
- **Never pull on the mains cable.**
- **Do not bend the cable.**
- **Do not place any objects on the cable.**
- **When using the pump in systems with temperature above 90°C, an appropriately heat-resistant connection cable must be used.**
- **There is a danger of personal injuries due to sharp edges or burrs during performing of assembly works.**
- **Never transport the pump by carrying it by the mains cable.**
- **There is a danger of personal injuries due to dropping the pump.**

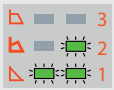
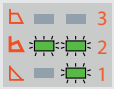
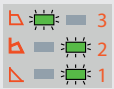
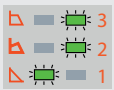
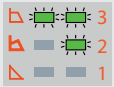
14 Maintenance and service

Before carrying out maintenance, cleaning and repair works, disconnect the system from the power supply and secure it against being switched on again by unauthorized persons.

At high water temperatures and system pressures, wait for the pump to cool down beforehand. **There is a danger of burns!**

15 Faults, causes and remedies

Maintenance works or repair attempts may only be performed by qualified personnel. Before carrying out maintenance, cleaning and repair works, disconnect the system from the power supply and secure it against being switched on again by unauthorized persons. At high water temperatures and system pressures, wait for the pump to cool down beforehand. **There is a danger of burns!**

Error pattern or pump error code	Possible cause	Remedy
The pump does not deliver, the display does not light up	Error in the power supply	Check the mains voltage at the pump. If necessary, switch on the circuit breaker again.
The pump works but delivers no water	Air in the system	Vent the system (see chapter 9 in the operating instructions).
	Slide valve closed	Open the slide valve.
The pump is making noise	Air in the pump	Vent the pump (see chapter 7.5 in the operating instructions).
	System pressure is too low	Increase the pressure on the supply
	Defective expansion vessel	Check gas volume in the expansion vessel.
Building does not get warm	Incorrect pump setting	Increase the setpoint (see chapter 7.3 in the operating instructions).
	Rotor blocked	Disconnect the pump from the power supply and secure it against being switched on again. If possible, close the shut-off valve upstream and downstream of the pump or drain the water. **Depending on the operating state of the system, hot water may escape! There is danger of burns!** Unscrew the motor head by loosening the 4 hexagon socket screws and remove the pump head. It must be possible to remove the pump impeller easily. Remove possible impurities or foreign bodies and reassemble the pump. If the fault persists, the pump must be replaced.
	Electronic fault	Disconnect the pump from the mains for at least 1 minute. If the fault persists, the pump must be replaced.
	Overvoltage or undervoltage	Disconnect the pump from the mains for at least 1 minute. If the fault persists, the pump must be replaced.
	Over current, short circuit	Replace the pump.
	Dry run protection	Increase the pressure on the supply

If the fault cannot be remedied, please contact your specialised dealer.

16 Disposal

Note



The pump and its individual parts does not belong in household waste, but must be disposed of in an environmentally friendly manner! Please use the services of public or private waste management companies for this purpose.

A list of materials used in our products (recycling information):

Assembly unit	Component	Materials used
Housing	motor head housing	aluminium, water-based exterior paint
	pump base	grey cast iron
	terminal box	plastic
	seal	rubber
	screws	steel
	type plate	plastic
Drive unit	stator	stainless steel, copper and plastic
	impeller	plastic
	gap pipe	stainless steel
	split ring	stainless steel
	bearing/drive shaft	ceramic
	rotor	stainless steel, plastic, ferrit or neodymium
Electronic module	circuit boards	diverse materials
	connection cable	copper, plastic
	connection plug	copper, plastic, rubber
Other	insulation	expanded polypropylene (EPP)

17 Additional notes

• All illustrations in these operating instructions are schematic represantations. Please understand that the electric pump and accessories you purchase, may differ from the illustrations in these operating instructions.
• The performance of the product is constantly being improved and all products (including design and colour, etc.) are subjects to physical change; in case of changes no further notice will be given.