

DUCA

Technical Guide

Model: TRE3 S-M-L



- Ground motor before connecting to power supply.
- Do not touch the pump while it is running.
- Do not run the pump without water.

“

Please read the instructions carefully
before installation and use.

Precautions

1. Carefully read this operation manual before installation and use.
2. Personal injuries might be caused if one fails to observe what has been indicated by the safe warning marking. Should pump be damaged or losses be caused to other properties, the manufacturer will not take any responsibilities or compensate.
3. The installer and operator must observe the local safe regulations.
4. The user must ensure that: the product shall only be installed and maintained by the qualified personnel fully comprehend this manual and with professional qualification certification.
5. Never install the pump in damp place or where may be splashed with water.
6. For easy maintenance, install a stop valve at both sides of the inlet and outlet of the pump respectively.
7. During installation and maintenance, it needs to cut off the pump power supply.
8. For circulating of domestic hot water, water pump made from brass must be used.
9. Non-softened water mustn't be frequently replenished inside the heating pipeline in case of increasing calcium in circulating water of the pipeline to block the impeller.
10. It is strictly forbidden to start the pump without pumping liquid.
11. The pumping liquid might be of high temperature and high pressure, it has to drain the liquid inside the pump or close the stop valves at both sides of the pump before moving and dismantling the pump to prevent from scalding.
12. In summer or when it is very hot, please pay attention to ventilation in case of moisture condensation, causing electrical fault.
13. In winter, if the pump system doesn't run or it is below 0°C, it should drain the liquid inside the pipeline system in case of frost crack of pump head.
14. If the pump will not be used for a long time, please close the inlet valve and cut off pump power supply.
15. If the flexible cable is damaged, it requires professional personnel to replace it.
16. If abnormal heat, noise or operation is detected, disconnect the power supply, close the inlet and outlet valves, allow the pump to cool down and contact authorized service personnel.
17. The product should be placed beyond reach of children and should be isolated after installation in case of being available to children.
18. The product should be stored in dry, ventilated, shady and cool place under room temperature.

I. Product Overview

1 TRE3 Circulating Pump

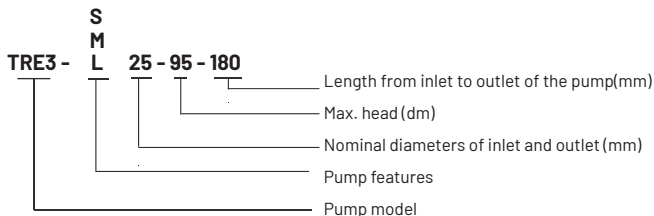
Circulation, air-source hot water systems and household hot/cold water pressurization applications.

During operation, the rotating components are immersed in clean water, allowing the pumped liquid to cool and lubricate the motor. This design helps reduce operating noise, minimize wear and improve long-term reliability.

The pump is equipped with ceramic bearings and a ceramic shaft to support smooth operation and enhanced durability. Thanks to its compact structure, low-noise performance and high sealing capability, the TRE3 Series is suitable for modern heating and water circulation systems.

When installed and operated correctly, the pump requires minimal maintenance and provides stable, energy-efficient performance.

1.1 Product meaning



I. Product Overview

1.2 Product application

The TRE3 Series circulating pump is designed for heating and hot water circulation systems. It can be used in domestic hot water systems, underfloor heating systems, HVAC applications and other water circulation systems where clean water or water-like liquids are required.

Typical application areas include:

- Underfloor heating mixed water systems
- Air-source hot water circulation systems
- Solar hot water circulation systems
- Domestic hot water circulation systems
- HVAC heating systems
- Heat pump systems
- Micro Combined Heat and Power systems

1.3 Main Feature

- High energy efficiency with $EEL \leq 0.21$
- Compact design with small installation size
- Permanent magnet motor with intelligent frequency control
- Integrated controller and motor structure
- Low-noise operation
- High sealing performance
- External PWM speed control support
- Quick-insert cable connection for easy installation and maintenance
- Multiple operating modes: Proportional Pressure, Constant Pressure, Constant Speed and AUTO Adapt
- Suitable for clean, non-toxic and water-like liquids

I. Product Overview

1.4 Operating conditions

- Liquid temperature: +2°C to +95°C
- Ambient temperature: 0°C to +40°C
- Maximum system pressure: 10 bar
- Protection level: IP44
- Rated voltage/frequency: 220-240V / 50-60Hz
- Insulation class: F
- Inrush current: < 2A
- Pumped liquid: clean liquid, free of solids and mineral oils, non-toxic, chemically neutral and similar to water properties

1.5 Pumped Liquid

The TRE3 Series is designed for clean, non-toxic and chemically neutral liquids with properties similar to water.

Suitable liquids include:

- Heating water
- Clean domestic hot water
- Glycol-water mixtures, depending on system requirements
- Liquids free from solid particles, fibers and mineral oils
- Liquids with water-like viscosity and chemical characteristics

The pumped liquid must not contain abrasive particles, solid impurities, mineral oil or chemically aggressive substances. Using unsuitable liquids may damage the pump components and reduce service life.

II Pump Installation Requirements

2.1 Pump Installation Requirements

Before installation, make sure that the piping system is clean, properly connected and free from welding residues, dirt or solid impurities.

The following installation requirements must be observed:

- The motor shaft must be installed parallel to the horizontal plane.
- Do not operate the pump without water.
- The pipeline must be flushed before installation.
- The pump must be installed in a dry, ventilated and accessible location.
- Sufficient space must be left around the pump for inspection, maintenance and replacement.
- It is recommended to install shut-off valves at the pump inlet and outlet for easier maintenance.
- Electrical connection must be performed only by qualified personnel.
- The pump must be properly grounded before connecting to the power supply.

II. Pump Installation Requirements

2.2. Installation

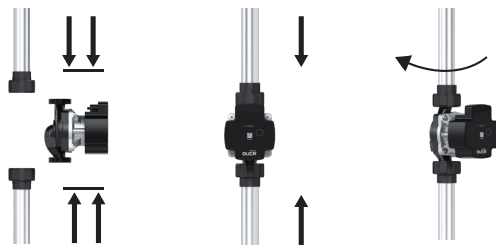


Figure 1

Correct installation location of motor

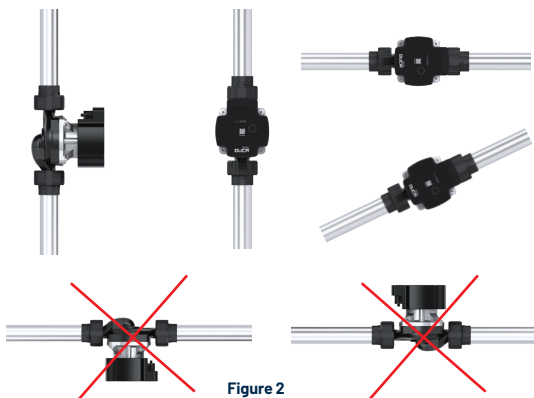


Figure 2

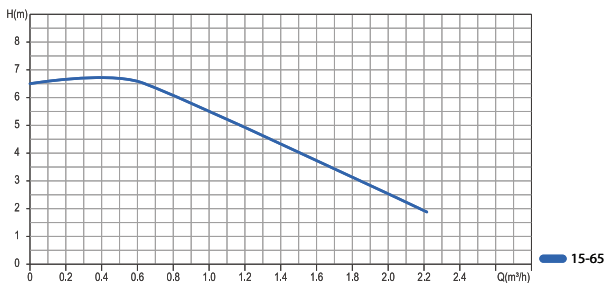


1. When installing the pump in the pipeline, it needs to install the two sealed gaskets provided.(as steps in Figure 1)
2. When installing, the motor shaft should be horizontal(as steps in Figure 2)

TRE3S Performance Curve

3.1 Hydraulic Performance Curve

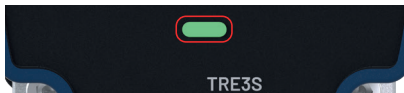
TRE3S 15-65



Model	Min/Max Temp (°C)	L (mm) H2	DN G	P1 Max	Voltage (V)	Rated Current (A)	Union
15-65-130	+2 to +95	130	15mm G1	54W	1x230	0,45	G1 to G3/4
25-65-130	+2 to +95	130	25mm G1½				G1½ to G1
25-65-180	+2 to +95	180	25mm G1½				G1½ to G1
32-65-180	+2 to +95	180	32mm G2				G2 to G1¼

TRE3S Product function

Protective Functions



Function Name	Function Description
Blocking Protection	In case of a rotor stuck situation, the pump driver board will enter the "Blocking protection" error state, stop for 1 second and start again. In case of this error condition, a disqualification time of 12 seconds is activated. If 5 or more "blocking protection" error conditions are detected during this disqualification time, the green led will turn off and the red led will flash every 200ms. In addition, each time a "blocking protection" error condition occurs, the 12-second disqualification time is reset and starts over.
Phase Protection	If the motor phase connections are not connected or are damaged, the "Phase Protection" fault condition will be activated on the pump driver board, it will stop for 1 second and start again. In case of this error condition, a disqualification time of 12 seconds is activated. If 5 or more "Phase Protection" error conditions are detected during this disqualification time, the green led will turn off and the red led will flash every 1000ms. In addition, each time a "Phase Protection" error condition occurs, the 12-second disqualification time is reset and starts over.
Over current protection	If an excessive current passes through the motor phase connections, the pump driver card will enter the "Over Current Protection" fault state, stop for 1 second and start again. In case of this error condition, a disqualification time of 12 seconds is activated. If 5 or more "Over Current Protection" error conditions are detected during this disqualification time, the green led will turn off and the red led will flash every 2000ms. In addition, each time a "Over Current Protection" error condition occurs, the 12-second disqualification time is reset and starts over.
Over voltage / Under voltage protection	If the input voltage of the pump driver board goes below 160Vac or above 270Vac, the pump driver board enters the "Overvoltage / Under voltage protection" error state and stops the motor. In the event of this error condition, the green led goes out directly and the red led starts to light continuously without waiting for any repetition. If the error condition disappears, the pump is restarted after 1 second. If the error condition does not repeat, the green led lights up continuously after 12 seconds and the red led goes out.

The pump driver board consists of two different LEDs, red and green. These LEDs provide information about operating mode, error conditions. The table below shows the status of the LEDs according to their lighting combination. Also all LEDs blinking three times each time the pump driver board is initialized. In addition, if there are no error or mode changes, the LEDs go out after one minute.

Status	Green Led	Red Led	Red Led Blink Time	Disqualification Time
Run Mode	On	Off	Always	-
Blocking Protection	Off	On	Every 200ms	12 sec
Phase Protection	Off	On	Every 1000ms	12 sec
Over Current Protection	Off	On	Every 2000ms	12 sec
Over voltage / Under voltage Protection	Off	On	Always	12 sec

LEDs status descriptions

TRE3S Operation Instructions

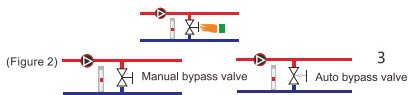


Figure 6 System installed with bypass valve

5. Bypass Valve

5.1 Function of the Bypass Valve

When all valves in the underfloor heating circuit and/or radiator temperature control valves are closed, the bypass valve helps maintain the minimum required flow in the system.

The bypass valve protects the pump and heating system by allowing water circulation to continue when the main circulation path is restricted or closed.

5.2 System Components

A bypass valve may be installed in the system to maintain minimum flow. Depending on the system design, a manually operated bypass valve or an automatic temperature-controlled bypass valve can be used. For TRE3S models, the pump does not include manual speed selection. Therefore, the bypass valve must be adjusted according to the required minimum flow of the heating system.

5.3 Manually Operated Bypass Valve

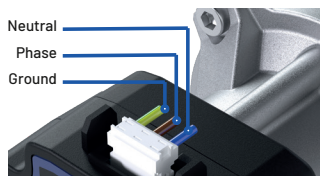
When adjusting a manually operated bypass valve, make sure that the system is completely filled with liquid and properly vented. Adjust the bypass valve according to the minimum flow requirement of the system. Refer to the bypass valve manufacturer's instructions for the correct adjustment procedure. After the bypass valve has been adjusted, check that water circulation continues properly when the main heating circuit valves are closed.

5.4. Automatic Bypass Valve

An automatic bypass valve adjusts the flow automatically according to the system condition. When using an automatic bypass valve, make sure that it is selected and adjusted according to the minimum flow requirement of the system. After installation, check that the automatic bypass valve maintains sufficient circulation when the main circulation path is restricted or closed.

TRE3S Cable Connection

Cable Connection



Power Cable

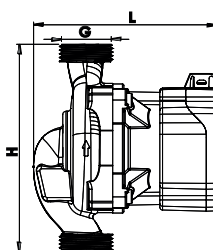
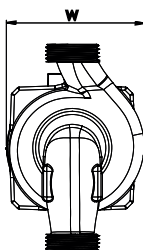


RAST2.5 Pro



Water and dust
resistant cover

Dimension



W 94 mm

L 132 mm

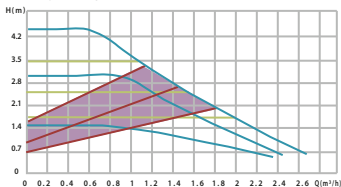
H 130 mm

G 1"

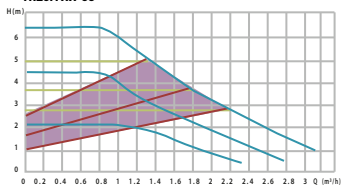
TRE3M Performance Curve

2.1 Hydraulic Performance Curve

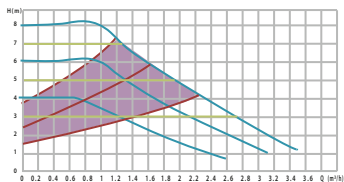
TRE3M XX-40



TRE3M XX-60



TRE3M XX-80



— PP
— CP
— S
 AUTO

Model	Min/Max Temp (°C)	L (mm) H2	DN G	P1 Max	Voltage (V)	Rated Current (A)	Union
15-40-130	+2 to +95	130	15mm G1	40W	1x230	0,37	G1 to G3/4
25-40-130	+2 to +95	130	25mm G1½				G1½ to G1
15-60-130	+2 to +95	130	15mm G1	50W	1x230	0,45	G1 to G3/4
25-60-130	+2 to +95	130	25mm G1½				G1½ to G1
25-60-180	+2 to +95	180	25mm G1½				G1½ to G1
32-60-180	+2 to +95	180	32mm G2				G2 to G1¼
15-80-130	+2 to +95	130	15mm G1	60W	1x230	0,45	G1 to G3/4
25-80-130	+2 to +95	130	25mm G1½				G1½ to G1
25-80-180	+2 to +95	180	25mm G1½				G1½ to G1
32-80-180	+2 to +95	180	32mm G2				G2 to G1¼

TRE3M Product function

4.1 PWM Mode

Pump driver board have been working in a two control modes that PWM and gear mode. In PWM mode pump speed change as a function of PWM input profile. When there is no PWM signal, pump driver board have been working in a gear mode. In gear mode, pump runs in five different speed. On the other hand pump driver board has a five LEDs for give information about operation status and error conditions.

Pump driver board has a two PWM signal that input PWM signal and output PWM. Input PWM signal works in 1 – 4 kHz range and changes the pump speed. Output PWM signal work as a feedback signal and it is fixed at 75 Hz. Output PWM give a information about the pump output power.

Optocoupler Isolation	AVAILABLE
PWM Output Frequency	75 Hz
PWM Input Frequency	1 – 4 kHz
Input voltage high level U_{IH}	4.0 – 24V
Input voltage low level U_{IL}	< 1V
High level input current I_H	3.5 mA – 10 mA
PWM adjustable range	0 – 100 %
Signal polarity	Fixed
Signal line length	< 3m
Rise and fall time	< T/1000

Table 2. PWM signal characteristics

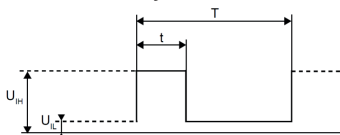


Figure 3. PWM signal characteristics waveform

TRE3M Product function

4.2 PWM Interface

The PWM interface consists of an electronic part that connects the external control signal in isolation to the microcontroller of the pump driver board. In addition, the interface allows the user to avoid contact with hazardous voltage if the signal touches the wires when power is connected to the pump.

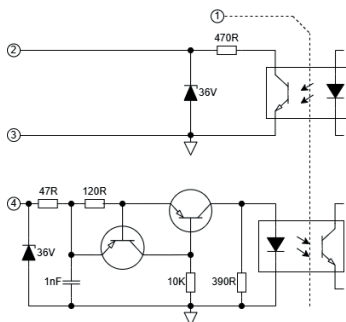


Figure 4. Interface schematic diagram

Position	Description
1	Galvanic Isolation
2	PWM Output
3	ISO GND
4	PWM Input

Table 3. Interface schematic description

TRE3M Product function

4.3 PWM Input Signal Profile

PWM mode operating principle is given in the picture below. In PWM Mode, the pump can be driven at different speeds. When the PWM signal duty cycle value is low, circulating pump rotate high speed because if the PWM connection is damaged the circulating pump must be run at maximum speed to transfer heat from primary heat exchanger. With the help of hysteresis, the pump can be prevented from switching off and on continuously at low speeds.

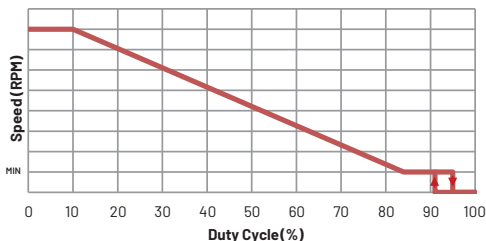


Figure 5. Input PWM waveform

Input PWM Duty Cycle (%)	Pump Driver Board Status
0	There is no PWM signal send to the pump driver board. So in this status pump driver have been work on a gear mode.
$0 < \text{Duty} \leq 10$	Pump runs in maximum speed.
$10 < \text{PWM} \leq 84$	Pump speed is linearly drops from the maximum speed to minimum speed.
$84 < \text{PWM} \leq 91$	Pump runs in minimum speed.
$91 < \text{PWM} < 95$	In this range, hysteresis is used to stop the pump above 95 and drive it at minimum speed when it falls below 91 .
$95 \leq \text{PWM} \leq 100$	Pump stops running, Standby

Table 4. Input PWM description

TRE3M Product function

4.4 PWM Output Signal Profile

The PWM output signal provides the following information about the pump driver board:

- Current power consumption
- Warning status
- Alarm status
- Operating status

Position	Value	Description
X Axis	-	Output power consumption (W)
Y Axis	-	PWM output signal percentage (%)
A	%95	Standby, Pump stop
B	%90	Alarm Stop : Blocked pump
C	%85	Alarm Stop : Electric fault
D	%75	Warning
E	%0-%70	Slope: 1 % / watt PWM signal
F	%70	Saturation at 70 W

Table 5. Output PWM description

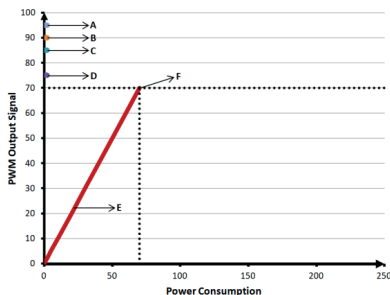


Figure 6. Output PWM Waveform

TRE3M Product function

4.5 Gear Mode

Gear mode is activated when no PWM signal is detected. In Gear Mode, the pump is operated via the external button with five different output power levels, as shown in the table below.

Gear Mode	Output Power	Output Current
1	35W	0.33A
2	40W	0.37A
3	50W	0.45A
4	55W	0.50A
5	60W	0.55A

Table 6. Gear mode output power and current description

4.6 Protective Functions

Function name	Function Description	FAILURE TYPE
Electronic unlock	When the shaft is stuck , the electric pump will start with normal torque first. If it cannot start, it will start twice at 1.2 times the maximum torque. If it cannot start again, it will start twice at 1.5 times the maximum torque. If it cannot start smoothly, Stop and report the pump blockage fault from the PWM feedback line. After 10 minutes, try to start again.	
Overvoltage / Undervoltage protection	In abnormal conditions, when the input voltage is less than 160V or a voltage higher than 270V, the motor will enter the protection state and report an electrical fault to avoid over-range use and cause damage, the voltage is restored, and the electric pump resumes operation.	
Overcurrent protection	When the electric pump is short -circuited fault occur, the electric pump reports an electrical fault and needs to be powered off and restarted	
Phase protection	When the electric pump lacks and equal fault occurs, the electric pump reports an electrical fault and needs to power off and restart.	

TRE3M Product function

4.7 Operating Mode Indicator

Pressing Times	Lighting area	Description	Displayer icon
1	PP1	Min. proportional pressure curve	
2	PP2	Medium proportional pressure curve	
3	PP3	Max. proportional pressure curve	
4	CP1	Min. Constant pressure curve	
5	CP2	Medium Constant pressure curve	
6	CP3	Max. Constant pressure curve	
7	I	Constant speed curve, speed I	
8	II	Constant speed curve, speed II	
9	III	Constant speed curve, speed III	
10	A	Autoadaptation	
11	PWM	PWM Signal Control	

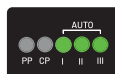
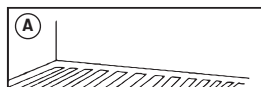
*If there are no error or mode changes, the LEDs turn off automatically after one minute.



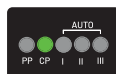
7. Pump setting

7.1 Pump setting as per system type

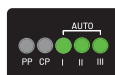
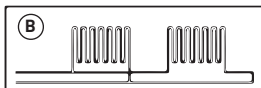
Pump setting as per system type



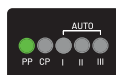
AUTO



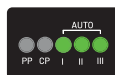
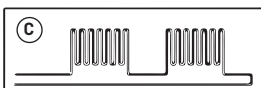
CP



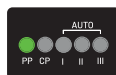
AUTO



PP



AUTO



PP

Location	System type	Pump setting	
		Optimum Setting	Other available setting
A	Floor heating system	AUTO	CP
B	Double pipeline heating system	AUTO	PP
C	Single pipeline heating system	AUTO	PP

TRE3M Operation Instructions

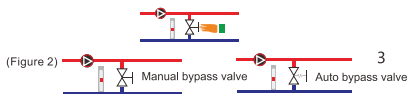


Figure 6 System installed with bypass valve

5. Bypass Valve

5.1 Function of the Bypass Valve

When all valves in the underfloor heating circuit and/or radiator temperature control valves are closed, the bypass valve helps maintain the minimum required flow in the system. The bypass valve protects the pump and heating system by allowing water circulation to continue when the main circulation path is restricted or closed.

5.2 System Components

A bypass valve may be installed in the system to maintain minimum flow. Depending on the system design, a manually operated bypass valve or an automatic temperature-controlled bypass valve can be used. The pump setting must be selected according to the type of bypass valve, the hydraulic characteristics of the system and the required minimum flow.

5.3 Manually Operated Bypass Valve

When adjusting a manually operated bypass valve, set the pump to the lowest operating level or Gear Mode 1. Make sure that the system is completely filled with liquid and properly vented before adjustment. Adjust the bypass valve according to the minimum flow requirement of the system. Refer to the bypass valve manufacturer's instructions for the correct adjustment procedure. After the bypass valve has been adjusted, select the appropriate operating mode according to the heating system requirements.

5.4. Automatic Bypass Valve

An automatic bypass valve adjusts the flow automatically according to the system condition. When using an automatic bypass valve, set the pump to the lowest operating level during adjustment and make sure that the minimum system flow is maintained. After the bypass valve has been adjusted, select the appropriate Constant Pressure Mode or AUTO Adapt Mode according to the system requirements.

TRE3M Cable Connection

Cable Connection



Pwm Cable



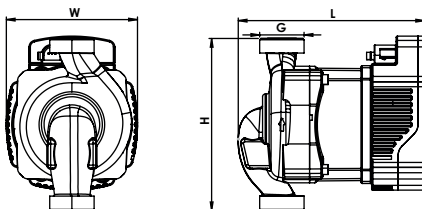
FCI

Power Cable



MOLEX 15311032

Dimension



W 99 mm

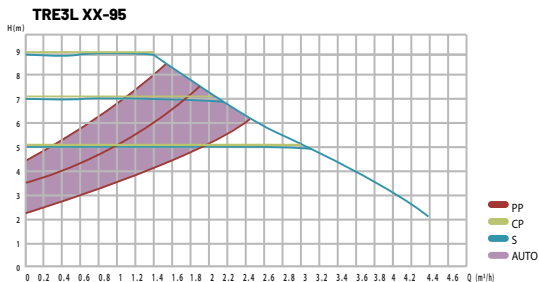
L 173,2 mm

H 130 mm

G 1½"

TRE3L Performance Curve

2.1 Hydraulic Performance Curve



Model	Min/Max Temp (°C)	L (mm) H2	DN G	P1 Max	Voltage (V)	Rated Current (A)	Union
15-95-130	+2 to +95	130	15mm G1	100W	1x230	0,65	G1 to G3/4
25-95-180	+2 to +95	180	25mm G1½				G1½ to G1
32-95-180	+2 to +95	180	25mm G1½				G1½ to G1

TRE3L

TRE3M

TRE3S

TRE3L Product function

TRE3L

4.1 PWM Mode

Pump driver board have been working in a two control modes that PWM and gear mode. In PWM mode pump speed change as a function of PWM input profile. When there is no PWM signal, pump driver board have been working in a gear mode. In gear mode, pump runs in five different speed. On the other hand pump driver board has a five LEDs for give information about operation status and error conditions.

Pump driver board has a two PWM signal that input PWM signal and output PWM. Input PWM signal works in 1 – 4 kHz range and changes the pump speed. Output PWM signal work as a feedback signal and it is fixed at 75 Hz. Output PWM give a information about the pump output power.

Optocoupler Isolation	AVAILABLE
PWM Output Frequency	75 Hz
PWM Input Frequency	1 – 4 kHz
Input voltage high level U_{IH}	4.0 – 24V
Input voltage low level U_{IL}	< 1V
High level input current I_H	3.5 mA – 10 mA
PWM adjustable range	0 – 100 %
Signal polarity	Fixed
Signal line length	< 3m
Rise and fall time	< T/1000

Table 2. PWM signal characteristics

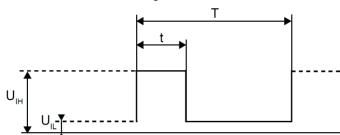


Figure 3. PWM signal characteristics waveform

TRE3L Product function

4.2 PWM Interface

The PWM interface consists of an electronic part that connects the external control signal in isolation to the microcontroller of the pump driver board. In addition, the interface allows the user to avoid contact with hazardous voltage if the signal touches the wires when power is connected to the pump.

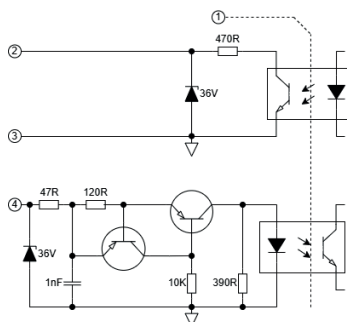


Figure 4. Interface schematic diagram

Position	Description
1	Galvanic Isolation
2	PWM Output
3	ISO GND
4	PWM Input

Table 3. Interface schematic description

TRE3L Product function

TRE3L

TRE3M

TRE3S

4.3 PWM Input Signal Profile

PWM mode operating principle is given in the picture below. In PWM Mode, the pump can be driven at different speeds. When the PWM signal duty cycle value is low, circulating pump rotate high speed because if the PWM connection is damaged the circulating pump must be run at maximum speed to transfer heat from primary heat exchanger. With the help of hysteresis, the pump can be prevented from switching off and on continuously at low speeds.

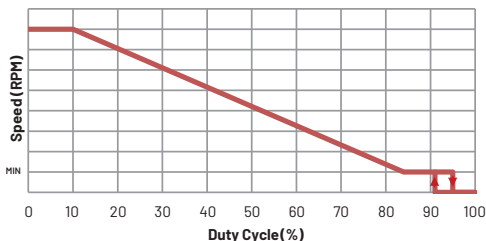


Figure 5. Input PWM waveform

Input PWM Duty Cycle (%)	Pump Driver Board Status
0	There is no PWM signal send to the pump driver board. So in this status pump driver have been work on a gear mode.
$0 < \text{Duty} \leq 10$	Pump runs in maximum speed.
$10 < \text{PWM} \leq 84$	Pump speed is linearly drops from the maximum speed to minimum speed.
$84 < \text{PWM} \leq 91$	Pump runs in minimum speed.
$91 < \text{PWM} < 95$	In this range, hysteresis is used to stop the pump above 95 and drive it at minimum speed when it falls below 91 .
$95 \leq \text{PWM} \leq 100$	Pump stops running, Standby

Table 4. Input PWM description

TRE3L Product function

4.4 PWM Output Signal Profile

The PWM output signal provides the following information about the pump driver board:

- Current power consumption
- Warning status
- Alarm status
- Operating status

Position	Value	Description
X Axis	-	Output power consumption (W)
Y Axis	-	PWM output signal percentage (%)
A	%95	Standby, Pump stop
B	%90	Alarm Stop : Blocked pump
C	%85	Alarm Stop : Electric fault
D	%75	Warning
E	%0-%70	Slope: 1 % / watt PWM signal
F	%70	Saturation at 70 W

Table 5. Output PWM description

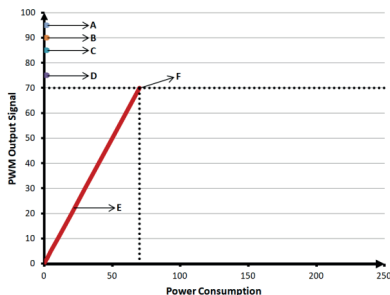


Figure 6. Output PWM Waveform

TRE3L Product function

TRE3L

TRE3M

TRE3S

4.5 Gear Mode

Gear mode is activated when no PWM signal is detected. In Gear Mode, the pump is operated via the external button with five different output power levels, as shown in the table below.

Gear Mode	Output Power	Output Current
1	35W	0.33A
2	40W	0.37A
3	50W	0.45A
4	55W	0.50A
5	60W	0.55A

Table 6. Gear mode output power and current description

4.6 Protective Functions

Function name	Function Description	FAILURE TYPE
Electronic unlock	When the shaft is stuck , the electric pump will start with normal torque first. If it cannot start, it will start twice at 1.2 times the maximum torque. If it cannot start again, it will start twice at 1.5 times the maximum torque. If it cannot start smoothly, Stop and report the pump blockage fault from the PWM feedback line. After 10 minutes, try to start again.	 PP CP I II III
Overvoltage / Undervoltage protection	In abnormal conditions, when the input voltage is less than 160V or a voltage higher than 270V, the motor will enter the protection state and report an electrical fault to avoid over-range use and cause damage, the voltage is restored, and the electric pump resumes operation.	 PP CP I II III
Overcurrent protection	When the electric pump is short -circuited fault occur, the electric pump reports an electrical fault and needs to be powered off and restarted	 PP CP I II III
Phase protection	When the electric pump lacks and equal fault occurs, the electric pump reports an electrical fault and needs to power off and restart.	 PP CP I II III

TRE3L Product function

4.7 Operating Mode Indicator

Pressing Times	Lighting area	Description	Displayer icon
1	PP1	Min. proportional pressure curve	PP CP I II III
2	PP2	Medium proportional pressure curve	PP CP I II III
3	PP3	Max. proportional pressure curve	PP CP I II III
4	CP1	Min. Constant pressure curve	PP CP I II III
5	CP2	Medium Constant pressure curve	PP CP I II III
6	CP3	Max. Constant pressure curve	PP CP I II III
7	I	Constant speed curve, speed I	PP CP I II III
8	II	Constant speed curve, speed II	PP CP I II III
9	III	Constant speed curve, speed III	PP CP I II III
10	A	Autoadaptation	PP CP I II III
11	PWM	PWM Signal Control	PP CP I II III

*If there are no error or mode changes, the LEDs turn off automatically after one minute.



7. Pump setting

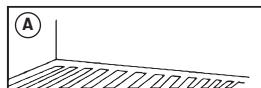
7.1 Pump setting as per system type

Pump setting as per system type

TRE3L

TRE3M

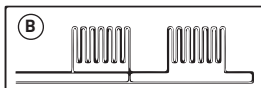
TRE3S



AUTO



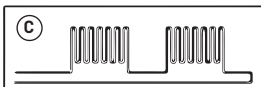
CP



AUTO



PP



AUTO



PP

Location	System type	Pump setting	
		Optimum Setting	Other available setting
A	Floor heating system	AUTO	CP
B	Double pipeline heating system	AUTO	PP
C	Single pipeline heating system	AUTO	PP

TRE3L Operation Instructions

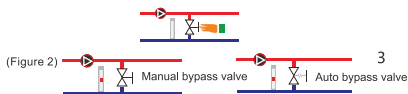


Figure 6 System installed with bypass valve

5. Bypass Valve

5.1 Function of the Bypass Valve

When all valves in the underfloor heating circuit and/or radiator temperature control valves are closed, the bypass valve helps maintain the minimum required flow in the system. The bypass valve protects the pump and heating system by allowing water circulation to continue when the main circulation path is restricted or closed.

5.2 System Components

A bypass valve may be installed in the system to maintain minimum flow. Depending on the system design, a manually operated bypass valve or an automatic temperature-controlled bypass valve can be used. The pump setting must be selected according to the type of bypass valve, the hydraulic characteristics of the system and the required minimum flow.

5.3 Manually Operated Bypass Valve

When adjusting a manually operated bypass valve, set the pump to the lowest operating level or Gear Mode 1. Make sure that the system is completely filled with liquid and properly vented before adjustment. Adjust the bypass valve according to the minimum flow requirement of the system. Refer to the bypass valve manufacturer's instructions for the correct adjustment procedure. After the bypass valve has been adjusted, select the appropriate operating mode according to the heating system requirements.

5.4. Automatic Bypass Valve

An automatic bypass valve adjusts the flow automatically according to the system condition. When using an automatic bypass valve, set the pump to the lowest operating level during adjustment and make sure that the minimum system flow is maintained. After the bypass valve has been adjusted, select the appropriate Constant Pressure Mode or AUTO Adapt Mode according to the system requirements.

TRE3L Cable Connection

Cable Connection



Pwm Cable



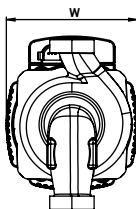
FCI

Power Cable



MOLEX 15311032

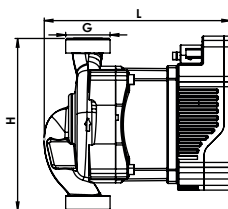
Dimension



W 99 mm

L 173,2 mm

H 130 mm



G 1½"

