



**Use in HVAC Systems Suitable  
Electronic, Intelligent Circulators User Manual  
ECP-F Series**

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## 1. Instructions for use

Dear users, thank you for choosing the ECP-F series circulation pump. Please check carefully whether the received product is compatible with the ordered product, whether the accessories and user manuals are complete, and whether there is any damage during transport. If you encounter the above situation or situations, please contact our sales department or our dealer in time.

In order to ensure the long-term stable operation of the product, before you install, operate, overhaul or maintain, please read this manual carefully, so as to fully understand the relevant safety issues and the technical parameters and operation methods of the pump.



### **Warning**

Indicates a clause that there is a possibility of endangering personal safety and must be strictly observed.



### **Attention**

Indicates a clause that requires special attention to prevent damage to the pump.



This warning label indicates that there may be a risk of electronic shock. When wiring, repairing, or maintaining, please disconnect the



This warning label indicates that please do not touch the pump while the pump is running and when the temperature of the entire pump is still very high after the operation is stopped.



This warning label indicates that the piping inside the pump contains high-pressure liquid, and the valves on both sides need to be closed before operation during maintenance and disassembly.



### **Attention**

Before using this product, please be sure to read this manual carefully and follow the product operating procedures. Please note that the product (including the instruction manual) is subject to any future changes without notice.

## 2. Cautions

In order to ensure personal safety, please read the following information carefully before you install, operate, repair or maintain.



### **Warning**

The power supply used must be consistent with the power supply identified on the product. The user must confirm that only qualified personnel with professional certification and proficiency in this manual can install and maintain this product.



### **Warning**

When checking and repairing the pump, the power must be cut off before operation. This can avoid electronic shock or sudden start of the pump, which may cause injury or death.



### **Warning**

Before starting the pump, the motor must be effectively grounded and a properly rated motor protection switch must be connected.



### **Warning**

The pump must not be installed in a wet or potentially splashable area.



### **Attention**

To facilitate maintenance, a shut-off valve should be installed on each side of the pump.



### **Warning**

The heating pipes should not be filled with non-softened water frequently to avoid the increase of calcium content in the circulating water in the pipes and blocking the impeller.



### **Attention**

The operating ambient temperature of the pump is 0~40°C. Storage ambient temperature is 0~70°C



### **Attention**

In summer or in hot environments, ventilation must be ensured to avoid possible failures caused by condensation.

**Attention**

The liquid may be high temperature and high pressure, and the system must be completely drained of liquid or the valves on both sides must be closed before moving and dismantling the pump.

**Attention**

Do not start the pump without fluid.

**Attention**

In winter, when the pump system does not work or the ambient temperature drops below 0°C, the liquid in the system should be completely emptied to avoid freezing and cracking of the pump body.

**Attention**

If the pump is not used for a long time, close the pump inlet and outlet pipe valves and disconnect the power supply.

**Attention**

If the cable is damaged, it must be replaced by qualified personnel.

**Attention**

If the pump overheats, close the pump inlet valve and cut off the power immediately. If you find that the motor is abnormal, please contact your supplier or service center immediately.

**Attention**

If the fault cannot be solved according to the manual, please immediately close the inlet and outlet valves of the pump, cut off the power supply, and contact the supplier or service center immediately.

**Attention**

This product should be placed out of the reach of children. After installation, take isolation measures to avoid children's proximity

**Attention**

This product should be stored in a dry, well-ventilated place with low temperature.

### 3. Product Overview

ECP-F series variable frequency shielded circulation pump (hereinafter referred to as electronic pump), the electronic pump is mainly composed of four parts: motor, pump, seal and controller. The motor is a shielded motor with a permanent magnet rotor, and the drive is controlled by a special inverter. The water pump and the motor are sealed by a shielding sleeve, and a rubber sealing ring is used for static sealing at the sealing part of the fixed stop. This product is suitable for the following systems:

- Stable variable flow heating system
- Variable temperature pipeline heating system HVAC system
- Industrial circulation system
- Domestic heating and domestic water supply system

The pump is equipped with a control panel and knob on the front for user-friendly operation.

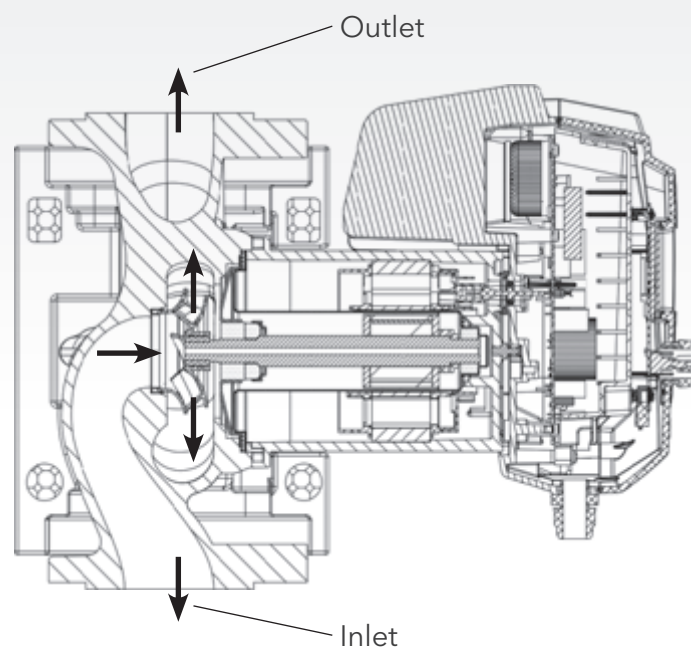
#### **Pumped liquids**

- Water that is clean, free of solid abrasive particles, not viscous and hard, chemically neutral.
- The maximum amount of glycol that can be added to the circulating water is 30%.

## Outline structure diagram



## Internal structure diagram



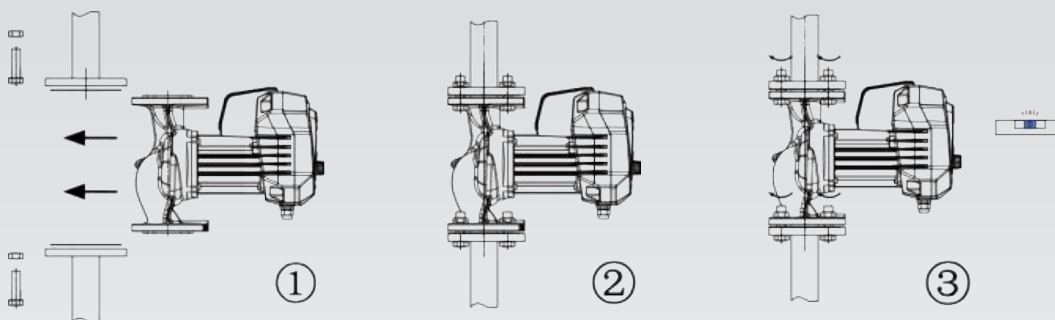
## 4. Product Installation

### 4.1 Installation location

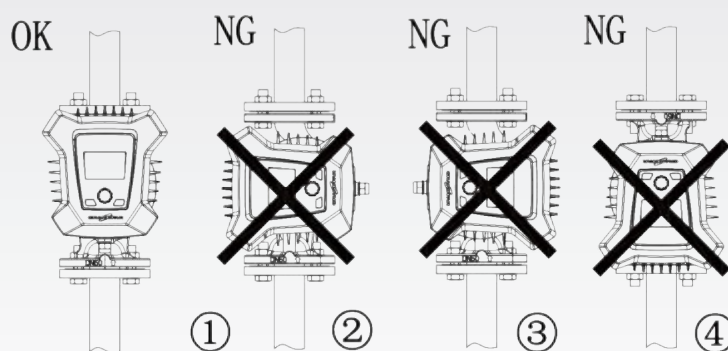
The pump should be installed indoors.

### 4.2 Installation

When installing a circulation pump, the arrow on the pump casing indicates the direction of flow of the liquid through the pump. When installed, the shaft of the electronic pump must be horizontal.



### 4.3 Installation direction



#### Warning

The pumped liquid may be high temperature and high pressure. Before removing the socket head cap screws, the liquid in the system must be drained or the valves on both sides of the electronic pump must be closed.



#### Warning

When changing the position of the junction box, the electronic pump can only be started after the system is full of pumped liquid or the valves on both sides of the electronic pump are open.



We strongly recommend that you use stainless-steel pumps in domestic hot-water applications to avoid corrosion.

In domestic hot-water systems, we recommend that you use the pump only for water with a degree of hardness lower than approximately 14 °dH.

In domestic hot-water systems, we recommend that you keep the liquid temperature below 65 °C to eliminate the risk of lime precipitation.



Do not pump aggressive liquids.



Do not pump flammable, combustible or explosive liquids.

If a non-return valve is fitted in the pipe system, make sure that the set minimum outlet pressure of the pump is always higher than the closing pressure of the valve. This is especially important in proportional-pressure control mode with reduced head at low flow.



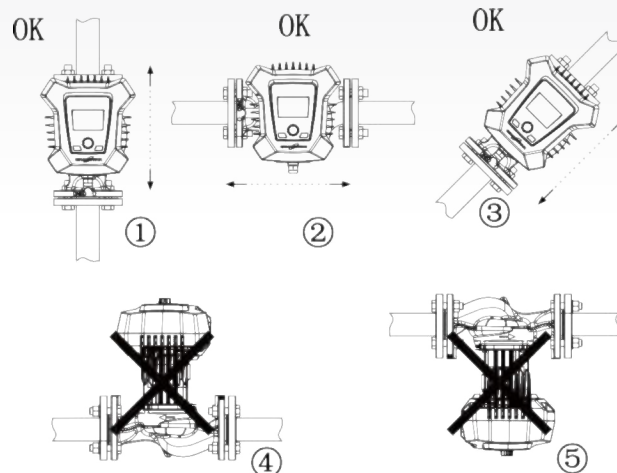
Non-return valve

#### 4.4 Control box position

Junction box can be rotated within 90°

The procedure for changing the position of the junction box is as follows:

- a. Close the inlet and outlet valves and relieve pressure;
- b. Unscrew and remove the four socket head cap screws securing the pump body;
- c. Rotate the motor to the desired position and align the four screw holes;
- d. Reinstall the screws and tighten them diagonally clockwise;
- e. Open the inlet and outlet valves.



## 4.5 Electrical installation



### Attention

Perform electrical connection and protection according to local regulations. Check that the supply voltage and frequency values match those listed on the nameplate.



### Warning

- Electronic shock
- Death or serious injury

- Connect the pump to an external electrical switch with a minimum contact gap of 3 mm between the electrodes.
- Grounding or electrical neutralization can be used for protection against non-direct contact.
- Make sure that the pump is connected to the external main switch. The pump does not require an external motor switch.
- If the pump is connected to an electric installation where an electrical circuit breaker (voltage sensing ELCB, residual-current device RCD or residual-current circuit device RCCB) is used as an additional protection, this circuit breaker must be marked with the first or both of the symbols shown below:






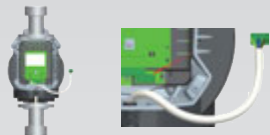
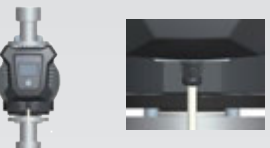

- Make sure that the pump is connected to an external main switch.
- The pump requires no external motor protection.
- After the pump is energized, the pump starts in approximately 5 seconds.

### Supply voltage

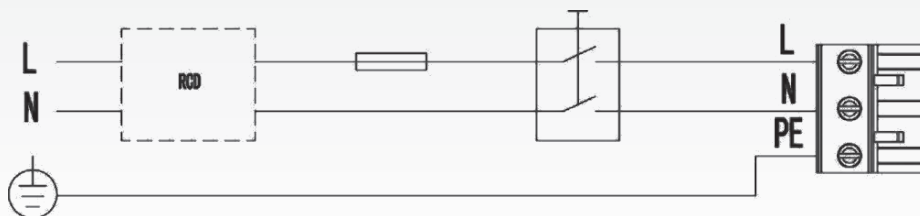
1x230V±%10, 50/60Hz, PE.

The voltage tolerance is only for the variation range of the power supply voltage, and the pump must not be operated at a voltage other than the voltage indicated on the nameplate.

Step	Measures	Illustrations
1	Remove the screws from the housing and cover	
2	Removing the cover	

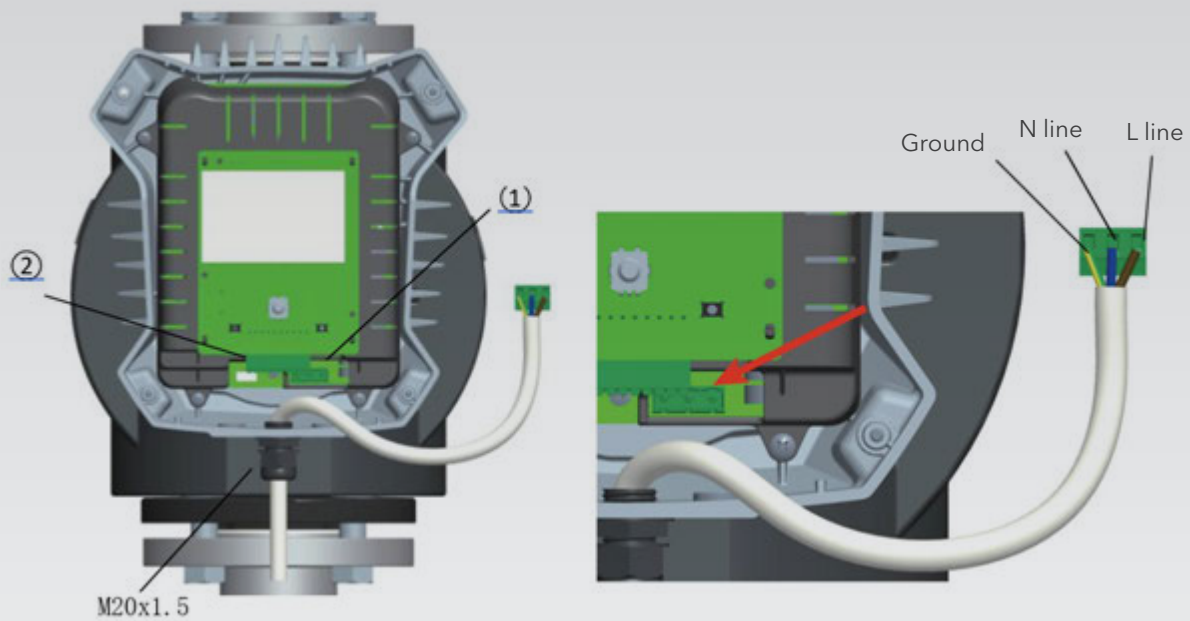
Step	Measures	Illustrations
3	Strip the cable conductor according to the diagram and connect the cable conductor to the plug.	
4	Insert the power plug into the female socket in the control box.	
5	Fasten the cable connector and reassemble the cover.	
6	Rotate the knob slowly, after the knob hole on the mask is aligned with the control rod, fasten the cover with the housing screw	

## 5. Wiring Diagram



Example diagram of a plug-connected motor with mains switch, backup fuse and additional protective equipment

## 5.1 Power cord wiring method

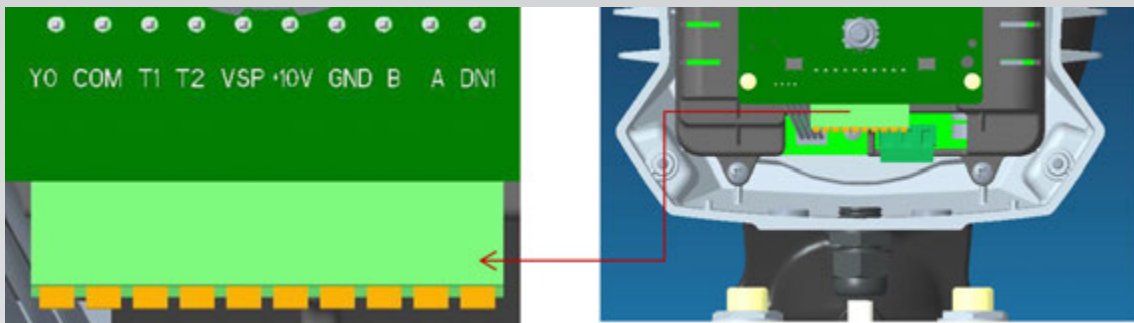


Serial number	Describe
1	Connect the pull-out terminal of the power supply line: 1x220 - 240V, 50/60Hz
2	Pull-out terminals for connecting the control board (10 pcs.)

The brown wire of the power cord is connected to the L mark (live wire) on the control panel, the blue wire is connected to the N mark (neutral wire), and the yellow-green wire is connected to the PE mark (ground).

Cable harness specification: 3\*0.75mm<sup>2</sup>.

## 5.2 Signal line wiring method

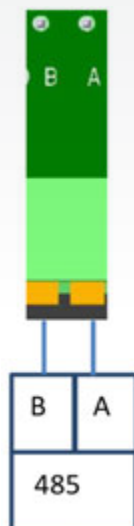


Sign	Describe
<b>GND</b>	Reference ground
<b>B</b>	RS485 negative terminal
<b>A</b>	RS485 positive terminal

## 5.3 Connect external control

### 5.3.1 External communication is RS485 and the protocol is Modbus RTU

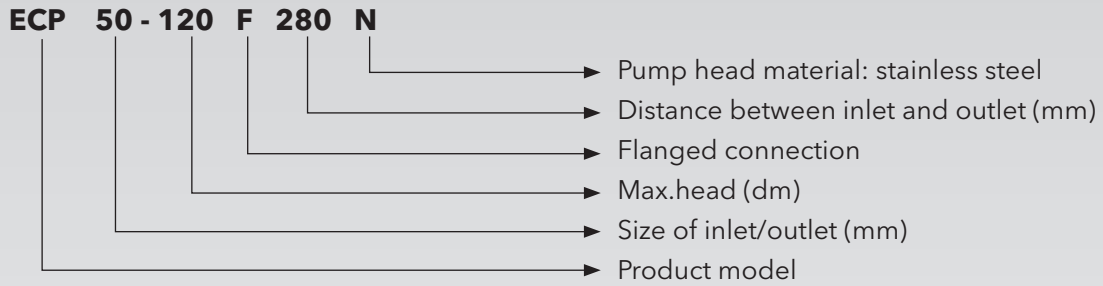
The communication line of the water pump needs to correspond to the A and B signals of the external controller.



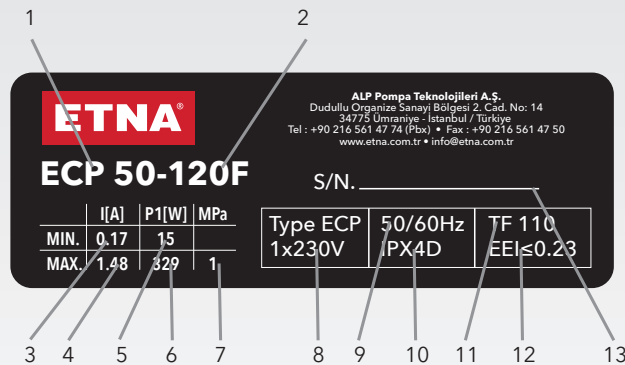
New sletter

## 6. Product introduction

### 6.1 Identification Code



### 6.2 Nameplate



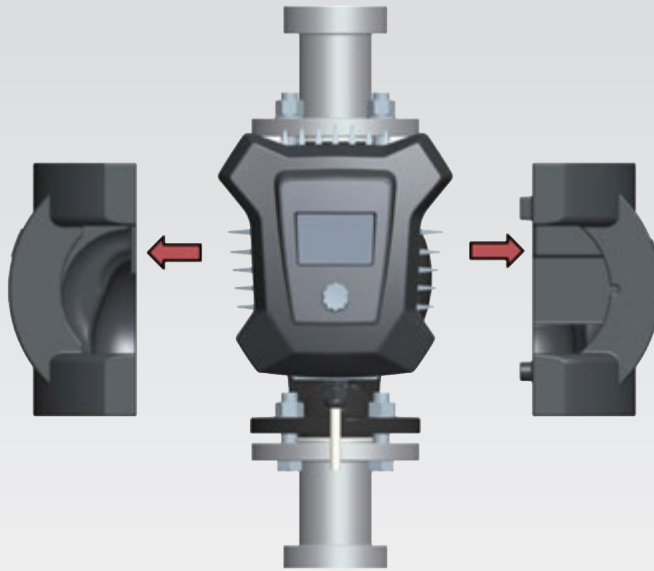
No	Name
1	Product Name
2	Model
3	Minimum current(A)
4	Maximum current(A)
5	Minimum power(W)
6	Maximum power(W)
7	Maximum system pressure
8	Voltage(V)
9	Frequency(Hz)
10	Enclosure protection grade
11	Ambient temperature
12	Energy Efficiency Index, EEI
13	Serial number
14	CE mark and approvals

### 6.3 Insulation foam

**Attention**

Limit heat loss from the pump body.

Reduce heat loss from the pump by physically isolating the pump casing from the surrounding environment.



The water pump foam for the heating system is attached with the pump. Before installing the water pump, remove the heat insulating foam, and then put the foam on the pump body after the installation is completed.

## 6.4 Pump Control Modes (Take ECP-F 50-120 as an example)

### Proportional pressure curve(PP1,PP2 or PP3)

Proportional pressure control is used to adjust the pump performance according to the actual system heat demand, but the pump performance depends on the required pump curve PP1, PP2 or PP3. Three adjustable speed, low, medium ,high. Three adjustable gears, low, medium ,high.

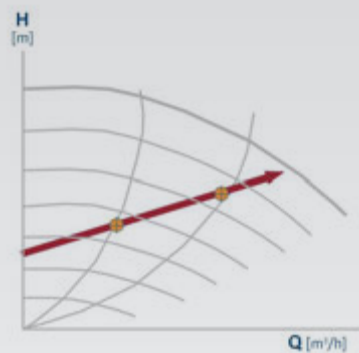


Figure 1: Three proportional pressure curves/settings

Choosing the correct proportional pressure setting depends on the characteristics of the heating system and the actual heat demand.

### Constant pressure curve

Constant pressure control is used to adjust pump performance based on actual system heat demand, but the pump performance curve will depend on the desired pump curve. The pressure setting range of the pump is 0-12m, which can be set by yourself.

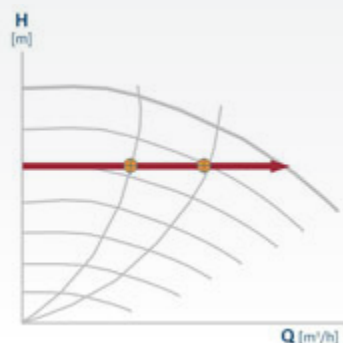


Figure 2: Constant pressure curve/setting

Choosing the correct constant pressure setting depends on the characteristics of the heating system and the actual heat demand.



## Constant speed curve

At constant speed, the pump runs at a constant speed regardless of the actual flow demand of the system runs and the pump performance is determined according to the desired performance curve. Pump speed adjustment range 1200-4200 rpm, 60 rpm, user adjustable.

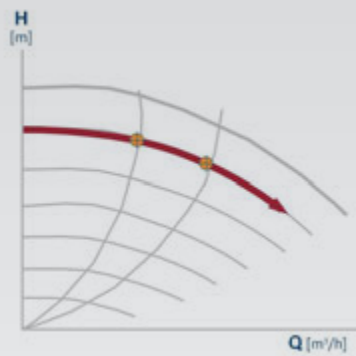


Figure 3: Constant speed curve/setting

Choosing the correct constant speed setting depends on the characteristics of the heating system.

## 7. Initial startup and operation

### 7.1 Before start






#### Warning

Before starting the electronic pump, make sure the system is full of liquid, air has been completely removed, and the inlet of the electronic pump must reach the minimum inlet pressure.

### 7.2 Evacuate the pump

The electronic pump is vented through the system, which must be vented at the highest point. The air in the electronic pump can be noisy, which will disappear after a few minutes of operation.





### 7.3 Start-up products

Step	Measures	Illustrations
1	Turn on the power of the water pump, the water pump will start after about 5 seconds.	
2	LCD display starts and sets the language.	
3	The factory setting is medium proportional pressure curve, please select the control mode according to the system application.	

## 7.4 Product Setup

### 7.4.1 Operation Panel



Button	Function
	Back to "Home" interface
	Return to the previous menu
	Navigate between the main menu, submenus, and numbers, adjust the numbers
	Press to save the changed settings and expand the menu


### 7.4.2 Menu Overview

Home	Status	Set	Assist
Control Mode	Running Status	Running mode	Tarih ve saat ayarları
Setpoint	Control Mode	Normal	Tarih ayarı
Estimated flow	Motor speed	Stop	Saat ayarı
Head	Estimated flow	Min speed	Kontrol modu talimatı
	Head	Max speed	Orantılı basınç talimatı
	Power and power consumption	Control Mode	Sabit basınç talimatı
	Warning and Alarms	Proportional pressure	Sabit hız talimatı
	Current Failure	Low	Yardımcı arıza önerisi
	Fault Log	Medium	F0,F6,F8,F12,F14
	Fault Code	High	F1,F2,F3,F7,F13
		Constant pressure	F9,F10,F11
		Constant pressure setting	F4
		Constant speed	F5
		Constant speed setting	Versiyon
		Language set	
		English	
		Default set	
		LCD off time	

### 7.4.3 "Home"



#### Index "Home"

 Press Open the "Home" menu

This menu provides the following functions

- "Control Mode"
- "Set point"
- "Estimated Flow"
- "Head"

#### "Low flow indication"




The pump may experience low flow due to, for example, closed valves. In the case of flow below 3m<sup>3</sup>/h, it will be displayed in the "Home" menu due to the large measurement error of the pump's algorithm. The speed is below the low flow indication indicating that the pump is still running. When the flow is high enough for the pump to measure, the "home" display will return to normal.

#### 7.4.4 "Status"



##### Index "Home">"Status"


Press  and turn the knob clockwise to enter the "Status" This menu provides the following functions

- "Running Status"
- "Performance Parameter"
- "Warnings and Alarms"

#### 7.4.5 "Settings"

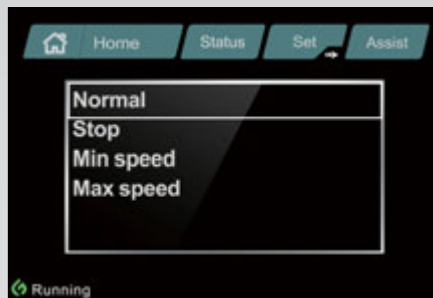


##### Index "Home">"Status"

Press  and turn the knob clockwise to enter the "Status" This menu provides the following functions

- "Running mode"
- "Control Mode"
- "Language set"
- "Default set"
- "LCD off time"

## Operation mode



Index


"Home">"Settings">"Operation mode" This menu provides the following functions

- "Normal"
- "Stop"
- "Min speed"
- "Max speed"

## Control mode



Index

"Home">"Status">"Control mode" press  and turn the knob clockwise to enter the "Status" This menu provides the following functions;

- Proportional pressure
- Constant pressure
- Constant speed
- Auto adapt
- Flow adapt

## Language setting



Index

"Home">"Set">Language setting

This menu provides the following functions

- "□□"
- "English"

Restore default settings

"Home">"Assist">Default set

This menu allows you to return to the default factory setting, which sets the proportional pressure of the control mode to "Medium".

### LCD off time

"Home">"Assist">LCD off time

This menu allows you to return to the default factory setting, which sets the LCD off time to 60s

## 7.4.6 "Assist"



Index "Home">"Assist"

This menu provides the following functions

"Date,time set"

"Control mode instruction"

"Assisted fault advice"

"Version"

### **Date,time set**

"Home">"Assist">Date,time set

This menu enables date and time setting.

### **Control mode instruction**

"Home">"Assist">Control mode instruction

This menu describes the characteristics of the control mode

### **Assisted fault advice**

"Home">"Help">Assisted fault advice

This menu gives instructions and corrective actions for pump failures.



## 8. 7. Troubleshooting table

### 8.1 Operation Status

Status	Instructions	Reason
None displayed	Screen off	Power is off. Water pump is not running.
Power on	Green icon +Power on	Power on
Running	Green icon +Running	Power on (pump running)
Fault	Red icon +Fault	Alarm (pump stopped working)



#### Warning

Electronic shock

Death or more serious personal injury

The power must be disconnected for at least 3 minutes before any operation is performed on the product.



#### Attention

Pressurization system

Mild or moderate personal injury

Before disassembling the pump, drain the system or close the isolation valves at both ends of the pump. The pumped liquid can be hot and under high pressure.

## 8.2 Fault Cause and Finding

Alarm Codes	Fault	Auto reset & restart	Exclusion method
F0	EEPROM failure	-	Contact the after-sales department
F1	Busbar over voltage fault	YES	The alarm is automatically cleared within 30s, confirm whether the fault still exists.
F2	Busbar under voltage fault	YES	The alarm is automatically cleared within 30s, confirm whether the fault still exists.
F3	Overcurrent	YES	The alarm is automatically cleared within 30s, confirm whether the fault still exists.
F4	Overheating	YES	Contact the after-sales department
F5	Stalled	-	Clean the pump and remove any foreign objects or impurities that prevent the pump from rotating.
F6	Phase loss	-	Contact the after-sales department
F7	Flux linkage out of control	YES	The alarm is automatically cleared within 30s, confirm whether the fault still exists.
F8	PFC over-current	YES	The alarm is automatically cleared within 30s, confirm whether the fault still exists.
F9	Input frequency fault	-	Check whether the input voltage frequency is $50\text{Hz}\pm 3\text{Hz}$ , or $60\text{Hz}\pm 3\text{Hz}$ .
F10	Input AC overvoltage	-	Check if the input voltage is too high.
F11	Input AC under voltage	-	Check if the input voltage is too low.
F12	Communication failure	-	Contact factory for repair.
F13	PFC over voltage	YES	The alarm is automatically cleared within 30s, confirm whether the fault still exists.
F14	PFC under voltage	YES	The alarm is automatically cleared within 30s, confirm whether the fault still exists.

## 9. Technical Data

Voltage	1x230 V ± %10, 50/60 Hz, PE	
Motor protection	The pump does not require external motor protection.	
Protection grade	IPX4D	
Insulation class	F	
Relative humidity	Max. %95	
Max. ambient temperature	0~+40°C	
Temperature environment	TF110 (EN60335-2-51)	
Liquid temperature	2~+110°C	
System pressure	1,0 MPa	
Pumps can withstand the test pressure of EN 60335-2-51	PN10:1,2 MPa	
Inlet pressure	Liquid temperature	Min inlet pressure
	75°C	0,01 Mpa
	95°C	0,05 Mpa
	110°C	0,1 MPa
Surface temperature	The maximum. surface temperature is not higher than 125°C	



### Attention

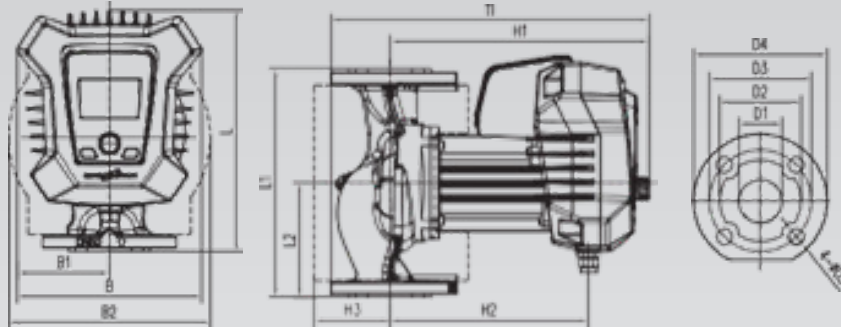
The actual inlet pressure plus the closing pressure of the pump should always be lower than the maximum system pressure allowed by the pump.



### Attention

The minimum relative inlet pressure applies to pumps installed at sea level up to 300 m. For altitudes above 300 m, the required relative inlet pressure must be increased by 0.01 bar for every 100 m of altitude.

## 10. Dimensions



Pump type	Dimensions														
	L	L1	L2	B	B2	B3	H	H1	H2	H3	D1	D2	D3	D4	D5
ECP32-120F	266	220	110	226	113	212	379	312	242	79	32	76	100	140	19
ECP40-80F	266	220	110	226	113	212	382	312	242	79	40	84	110	150	19
ECP40-100F	266	220	110	226	113	212	382	312	242	79	40	84	110	150	19
ECP40-120F	281	220	125	226	113	212	382	312	242	79	40	84	110	150	19
ECP40-150F	281	250	125	226	113	212	382	312	242	79	40	84	110	150	19
ECP40-180F	281	250	125	226	113	212	382	312	242	79	40	84	110	150	19
ECP50-40F	276	250	120	226	113	248	387	312	242	93	50	102	125	164	19
ECP50-60F	276	240	120	226	113	248	387	312	242	93	50	102	125	164	19
ECP50-80F	276	240	120	226	113	248	387	312	242	93	50	102	125	164	19
ECP50-100F	296	240	140	226	113	248	389	312	242	93	50	102	125	164	19
ECP50-120F	296	280	140	226	113	248	389	312	242	93	50	102	125	164	19
ECP50-150F	296	280	140	226	113	248	389	312	242	93	50	102	125	164	19
ECP50-180F	296	280	140	226	113	248	389	312	242	93	50	102	125	164	19
ECP65-40F	326	280	170	226	113	266	399	320	250	90	65	119	145	185	19
ECP65-60F	326	340	170	226	113	266	399	320	250	90	65	119	145	185	19
ECP65-80F	326	340	170	226	113	266	399	320	250	90	65	119	145	185	19
ECP65-100F	326	340	170	226	113	266	399	320	250	90	65	119	145	185	19
ECP65-120F	326	340	170	226	113	266	399	320	250	90	65	119	145	185	19
ECP65-150F	326	340	170	226	113	266	399	320	250	90	65	119	145	185	19
ECP80-40F	336	340	180	226	113	326	426	326	256	111	80	128	160	200	19
ECP80-60F	336	360	180	226	113	326	426	326	256	111	80	128	160	200	19
ECP80-80F	336	360	180	226	113	326	426	326	256	111	80	128	160	200	19
ECP80-100F	336	360	180	226	113	326	426	326	256	111	80	128	160	200	19
ECP80-120F	336	360	180	226	113	326	426	326	256	111	80	128	160	200	19
ECP100-40F	381	360	225	226	113	356	446	338	268	116	100	170	170	220	19
ECP100-60F	381	450	225	226	113	356	446	338	268	116	100	170	170	220	19
ECP100-80F	381	450	225	226	113	356	446	338	268	116	100	170	170	220	19
ECP100-100F	381	450	225	226	113	356	446	338	268	116	100	170	170	220	19
ECP100-120F	381	450	225	226	113	356	446	338	268	116	100	170	170	220	19

## 11. Maintenance

After 2000 hours of normal use, the electronic pump should be repaired and maintained according to the following steps:

1. Disassembly: Check whether there are knots or foreign objects inside the motor, and clean it up in time if there is.
2. Air tightness test: After disassembling the machine to repair or replace various seals, the water (air) pressure test must be carried out on the pump. The test pressure is 0.2Mpa (megapascal), and there should be no leakage and sweating for 3 minutes.
3. When the temperature is below 4°C, anti-freeze work should be done to avoid freezing and cracking the pump body.
4. If the electronic pump is not used for a long time, the pipeline should be removed, the water accumulated in the pump should be drained, the main parts should be scrubbed clean, and rust-proof treatment should be carried out. Place the pump in a dry and ventilated place and keep it properly.

## 12. Warranty Terms

The warranty period of ECP-F series circulation pump is 2 (two) years from the date of purchase. During the warranty period, free repair and maintenance service will be provided for malfunctions caused by manufacturing defects. Failures caused by operating conditions will also provide paid service.

1. Malfunctions caused by operating conditions.
2. Damages caused by installation pollution.
3. Faults caused by faulty wiring or unsuitable power supply.
4. Disassembly or intervention of the product outside the authorised service.
5. Failures caused by improper installation shall be considered outside the scope of warranty.

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