

### Tio APM-12F Series Pump

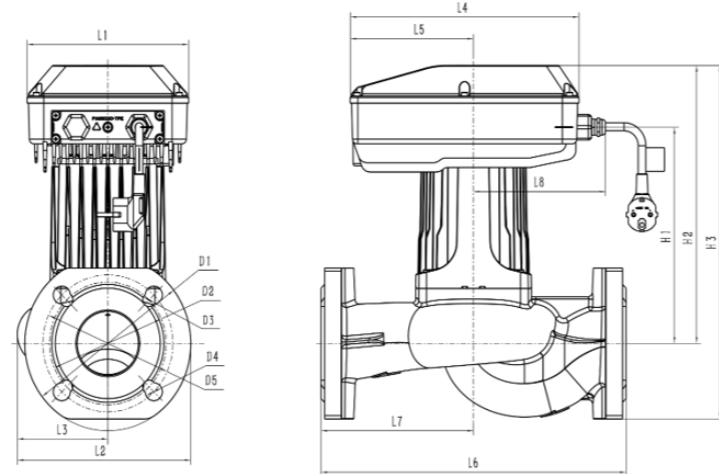
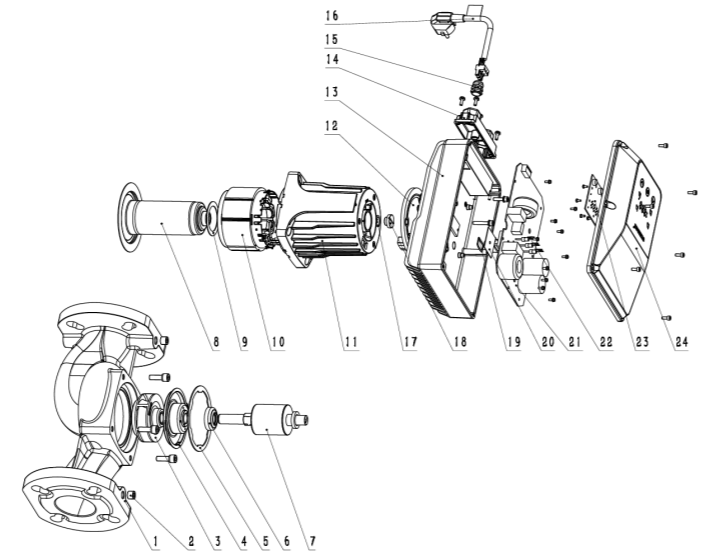
Intelligent frequency conversion circulation pump. For systems which require a more powerful pump.

Used in HVAC and hot water circulation systems, such as floor heating mixed water systems, air energy hot water circulation systems, solar hot water circulation systems, household cold and hot water circulation and pressurisation systems.



Product Code	Product Description
TIOAPM40-12F-250	40 x 250mm Connection - 12m head
TIOAPM50-12F-280	50 x 280mm Connection - 12m head

1	Pump Body	13	Control Box
2	Throat Blockage	14	Junction Box
3	Impeller	15	Cable Lock
4	Pump Cover	16	Plug Cable
5	Flat Gasket I	17	O-Ring
6	Thrust Bearing	18	Vent
7	Rotor	19	Junction Box Seal
8	Shielding Sleeve	20	Silicon Pad
9	Flat Gasket II	21	Driver Board
10	Stator Core	22	Control Box Terminal
11	Chassis	23	Display Panel
12	Insulation Cover	24	Faceplate



Model	L1	L2	L3	L4	L5	L6	L7	L8
APM4012F250	180	158	83	255	138	250	125	147
Model	D1	D2	D3	D4	D5	H1	H2	H3
APM4012F250	Ø150	Ø100	Ø14	Ø19	Ø110	233	299	256

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

**Warning:** Do not install in bathroom to prevent vapor or water or moisture from going into the junction box resulting in electric leakage.

- It's strongly suggest that shutoff valves to be installed at inlet and outlet ports for the sake of following pump service and maintenance.

- When complete installing the pump, connect the power supply as pilot run and set the speed adjusting switch at max grade to check if the starting is normal. But the pilot running time can not be over 10 seconds so as to avoid idle running influencing working life of the bearing.

- When the pump is supplying water to the heating system, do not touch the pump and/or other pipes to avoid burning.

- The power plug must be strictly grounded. Securely connect the GND pin of the power plug to the power plug grounded hole. Do not attempt to change the GND plug of the pump.

- The striking security caution markings must be set up during pump working to avoid any accident.

- The power supply must be firstly disconnected before adjusting pump location or before any action that may touch the pump when the pump is working to avoid any accident.

- The power cable can only be replaced with corresponding cords or dedicated components.

- In winter, when the environment temperature is below 0°C, the water within the pipes must be exhausted thoroughly if the pump ceases working to avoid pump frost crack.

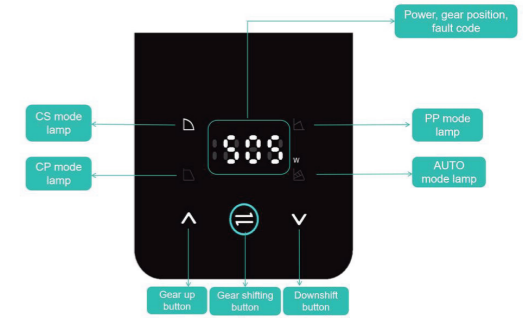
- The heat supply pipes can not be frequently supplemented with non-soft water to avoid the accumulated calcium inside the pipe system that that may block the rotor.

### Operation and Panel display

After the power is turned on, all the green LED lights in area A flash 4 times.

Mode switching sequence: S5 → P10 → SAU → C10 → S5

After 6 seconds of no operation, the gear display will be exited, and realtime operating mode of the water pump will be displayed; when exiting the gear setting, the gear will change from flashing to long lighting, and the pump will display the current operating power and mode after 2 seconds of long lighting.



Gears are shown in the table below:

Mode	Panel Display	Gear	Panel Display
Gear position display interface CS1 - CS5		Realtime power display	
Gear position display interface PP1 - PP10		Fault Display	
Gear position display interface CP1 - CP10		Gear position display interface SAU	
Exhaust Display			

#### Troubleshooting:

Fault	Panel Display	Cause	Solution
Over Temperature Protection	E18	Heat dissipation failure causes the pump to over heat	Replace pump
Overvoltage Protection	E05	Input voltage too high	Check whether the power supply voltage is within normal range. If not, adjust the power supply voltage back to the normal range. (230V+10%)
Undervoltage Protection	E04	Input voltage too low	
Locked Rotor	E07	Try to restart. Failure to start will display warning and stop the pump.	Clear blockage
Dry Running	E11	No water during pump operation	Add operating medium to pipeline
PFC	E29	PFC circuit damage.	Pump replacement
Overcurrent	E01	Internal connections have short circuited.	Pump replacement