

# Temperature Controllers TW, TO, TP Series



English

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*Customers. The core of our innovation*

## Temperature Controllers TW, TO, TP Series with high capacity of thermal exchange



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The variety of this range – which includes models with heating capacity from 6 to 24 kW, a variable cooling capacity in a wide scale and different typologies of pumps – allows complying with any temperature control necessity, not only in the injection moulding sector, but also in the demanding applications of extrusion and of thermoforming lines. The TW, TP and TO units cover a **wide range of temperatures**, up to 90°C for water models, 160°C for pressurised water versions and up to 250°C for oil units.

The temperature controllers TW, TO and TP Series ensure constant, repeatable and high quality finished products, with precise thermal conditioning. The flow of the diathermic fluid and the pressure are constantly kept at optimal levels. The reliable components and the high qualitative standards, as well as the design criteria adopted place these models at the top for performance.



### Efficient heat exchange

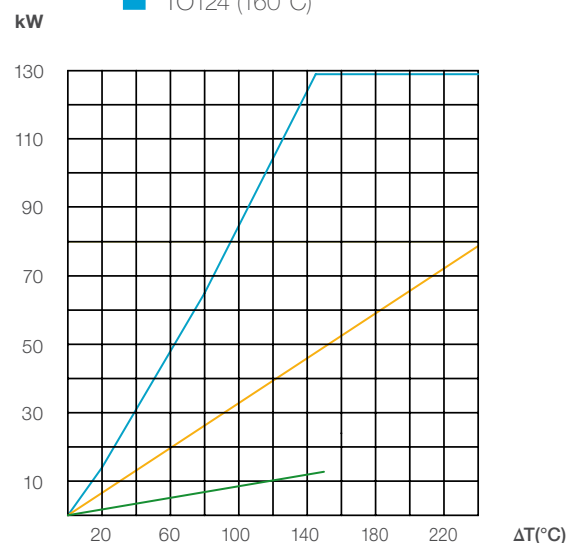
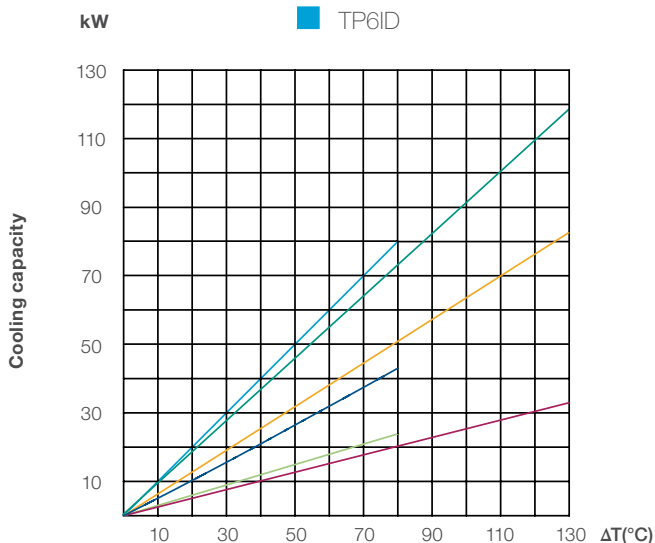
As a standard feature, all Piován temperature controllers are equipped with **high efficiency heat exchangers** which carry out an indirect thermal exchange with no heat losses in the ambient. The closed circuit between the temperature control unit and the utility always makes the same circuit circulating, thus avoiding deposits and possible reductions of the flow rate.

The range also includes **pressurised water models with direct cooling (ID)**, complying with high cooling requirements. In particular, the ID units are designed for processes with low working temperatures. Upon request, temperature controllers with **wide surface plate exchangers** are also available. They ensure a higher cooling capacity.

# Temperature Controllers TW, TO, TP Series

## Outstanding features for the highest result

- > **High and constant productivity** with no production of discarded pieces, ensured by the precise control system which keeps the set temperature with minimum fluctuations within  $\pm 0.4^{\circ}\text{C}$ .
- > **Optimisation of the running costs**, with reduced energy consumption. The unit guarantees temperature within close tolerances with no waste, both during the heating and the cooling process.
- > **Immediate and optimal usage of the unit**; the user-friendly control communicates in the operator's language with clear messages. The set temperature and the real temperature of the fluid are displayed on the main page.
- > **Constant process control** with continuous visualisation in real time of the flow and of alarm warnings in the case of significant variations on the set value.
- > Anti-corrosion materials for all the components in contact with the process fluid and low watt density heaters contribute to ensure **continuous operation and long life** of the temperature controller.
- > **No maintenance cost for the heaters' control**; the adoption of solid state relays (SSR) is a guarantee of continuous functioning of the most stressed element, with no need of periodic replacement.
- > Particularly **short production stops**. Little time is required both for maintenance operations – thanks to immediate access to all components – and for the start-up since the units feature high heating capacity.



$\Delta T(^{\circ}\text{C})$  = temperature difference between process and cooling fluids  
Cooling water capacity: 15 l/min



## Variety of pumps

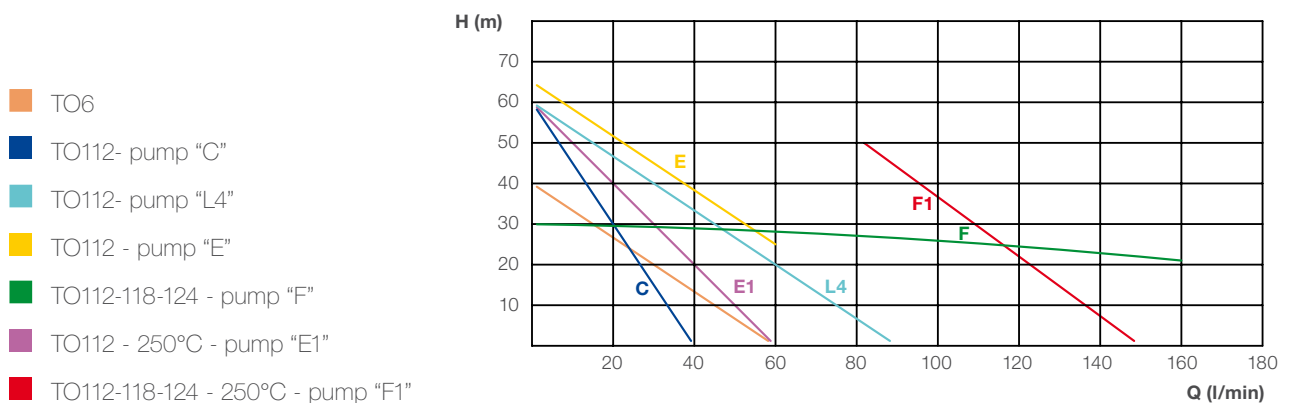
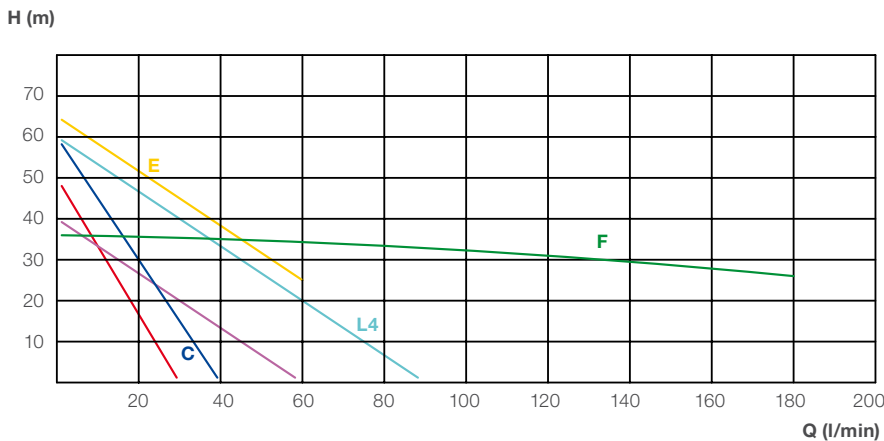
In all models, the pumps are largely sized to ensure optimal flows and thermal exchange, in any application solution. The circulation of the fluid is mainly carried with **peripheral pumps**, which ensure high pressure also in the case of piping with reduced diameter. They offer the additional advantage of reverse functioning, that is to say the mould can work continuously with fluid under positive or negative pressure with the aim to complete the cycle also in the event of micro-leakage. The pump rotation can be selected from the control board.

The water models TW9 and TW12 and the oil unit TO6 are supplied with **immersion peripheral pumps**, which reduce maintenance operations and avoid the necessity of replacing the pump's sealing. In the high temperature version (which can reach 250°C), the oil temperature controllers are equipped with **magnetic-driven pumps**, which do not require maintenance and are particularly suited to work in extreme conditions. These models are mainly dedicated to extrusion lines, where working temperatures are very high.

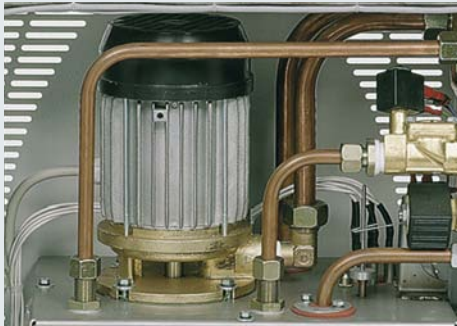
In addition, **centrifugal pumps** are also available; they are ideal for those system solutions requiring very high flow rate with minimal pressure drop.



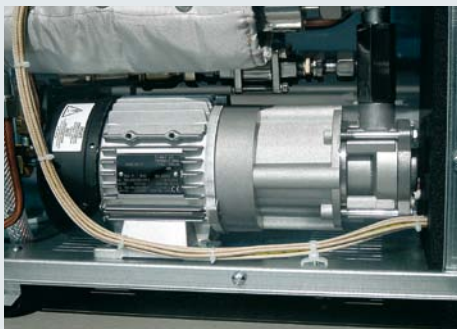
Peripheral pump



# Temperature Controllers TW, TO, TP Series



Immersion pump



Magnetic-driven pump



## Multi-function control

Piovan temperature controllers are equipped with a **microprocessor control** with **algorithm PID** (Proportional, Integrative, Derivative), which automatically calculates the correct working parameters at any moment. The technologically advanced and user-friendly version of the control system ensures top performances and utmost simplicity to set and read the working parameters and alarm warnings. The precise system allows minimising the energy requirement for heating and cooling processes. The fluctuations of the working temperature over the set value are within  $\pm 0.4^{\circ}\text{C}$  for the entire temperature scale.



The display shows the functioning status and possible alarms with clear messages in the operator's language, which can be selected at any time in a range of **10 languages**.

The set temperature, the real temperature of the process fluid and the flow (if the optional flow control is installed), are all information shown on the **main page**, from where it is also possible to activate the rapid mould emptying device. The control signals the alarm for insufficient flow rate. The minimum flow level can be automatically set or selected by the operator.

The enhanced electronics of the TW, TO and TP Series contributes to the **careful management of the maintenance operations**, by making it available the information of the total hours of functioning.

As a standard feature, all the Piovan temperature controllers offer the **multi-power function** which allows the selection from the control board of the heating capacity on two different values. This is a particularly advantageous device during the normal machine operation, because it minimises temperature fluctuations.

As an option, the control can be equipped with **serial port** to interface the unit with a processing machine or with a supervisory system; it allows management of the temperature of more than one temperature controllers with a single serial cable connected with the control system of the IMM or of the extruder, or with a single control keyboard.





## ▶ Standard features

- The **control system** includes as standard features:
- > selection of the process temperature at delivery, return or mould (if the mould probe is provided)
  - > setting of maximum working temperature
  - > cooling stop function
  - > two selectable passwords
  - > selection of the heating capacity
  - > automatic water make-up
  - > quick mould emptying device (\*)
  - > remote start/stop command
  - > setting of end of forced cooling temperature
  - > heater control with solid state relais (SSR)
  - > gradual approach to the set point
  - > pump fault alarm
  - > over-temperature alarm
  - > low fluid level alarm
  - > leakage alarm
  - > temperature deviation alarm (high and low)
  - > inefficient heating alarm
  - > inefficient cooling alarm
  - > insufficient flow alarm (\*)
  - > remote general alarm output

(\*) if the related device is included

## ▶ Options

- > acoustic alarm
- > weekly timer
- > serial interface RS 485 and Current Loop, CANBUS, Euromap, DEVICENET, PROFIBUS
- > 2- and 4- way outlet and return manifolds with shutt-off valves
- > quick mould emptying device
- > temperature control with in-mould probe
- > fluid flow control

## Technical data - TW9-12/TP6-12/THO6

		TO6	TW9	TW12	TP6	TP12	TP6 160°C	TP12 160°C	TP6ID
Max. temperature	°C	160	90		140		160		90
Operating fluid		oil	water		pressurised water				water
Heating power	kW	6	9	12	6	12	6	12	6
Cooling type		indirect							direct
Pump power	kW	0.75					0.5		0.75
Max. pump flow rate	l/min	60			40		30		40
Max. pump pressure	m	40			60		50		60
Connections - process		1/2" F							
Connections - cooling		1/2" F							
Dimensions (LxWxH)	mm	250x686x678							
Weight	kg	55			60				

Version: 230-400/3/50; 220-380-460/3/60 -  
The pump reverse mode is not available for the TP6ID unit.

# Temperature Controllers TW, TO, TP Series

## Technical data - TW/TP/TO112-118-124

		TW112	TW118	TW124	TP112	TP118	TP124	TO112	TO118	TO124	TO112 250°C	TO118 250°C	TO124 250°C	
Max. temperature	°C	90			140			160			250			
Operating fluid		water			press. water			oil						
Heating power	kW	12	18	24	12	18	24	12	18	24	12	18	24	
Pump C	kW	0.75			0.75			0.75						
Max. flow rate	l/min	40			40			40						
Max. pressure	m	60			60			60						
Pump E	kW	1.5			1.5			1.5						
Max. flow rate	l/min	60			60			60						
Max. pressure	m	65			65			65						
Pump L4	kW	1.5			1.5			1.5						
Max. flow rate	l/min	90			90			90						
Max. pressure	m	60			60			60						
Pump F	kW	1.5			1.5			1.5						
Max. flow rate	l/min	180			180			160						
Max. pressure	m	35			35			30						
Pump E1	kW										1			
Max. flow rate	l/min										60			
Max. pressure	m										60			
Pump F1	kW										2.8			
Max. flow rate	l/min										150			
Max. pressure	m										50			
Connections - process		1" F												
Connections - cooling		1/2" F												
Dimensions (LxWxH)		400x867x1000												
Weight	kg	120												

Version: 230-400/3/50; 220-380-460/3/60

The pump reverse mode is not available for the F pump.

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