

IRIS

The new temperature controller of the
MATIC temperature control unit line

More than just a temperature controller



SMART AND INTELLIGENT

- the IRIS controller of the MATIC temperature control units

Temperature control has a great influence on your product quality, productivity, energy efficiency and your production costs. The IRIS control system has been specifically developed to provide you with optimum support in all these areas.

IRIS is more than just a controller. IRIS monitors and regulates the temperature control process comprehensively, in doing so, the control system rapidly reacts and permanently adapts to new conditions.

Model-based control

IRIS is model-based control. A physics-based model is constantly comparing with the current sensor data, even during the control process. This enables predictive control adapted to every situation. The temperature control is based on high-precision temperature sensors in the flow and return. The heaters are controlled entirely by solid-state relays, which means that the heat output can be finely adjusted as required. The models for cooling enable anticipatory, intelligent timing of the cooling valves and thus enabling stable temperature control.

Focus on energy saving

IRIS follows the economical idea and regulates energy efficiently in every respect. The system succeeds in keeping the energy balance low by only switching the heating or cooling for control. This is achieved without any loss of control accuracy.

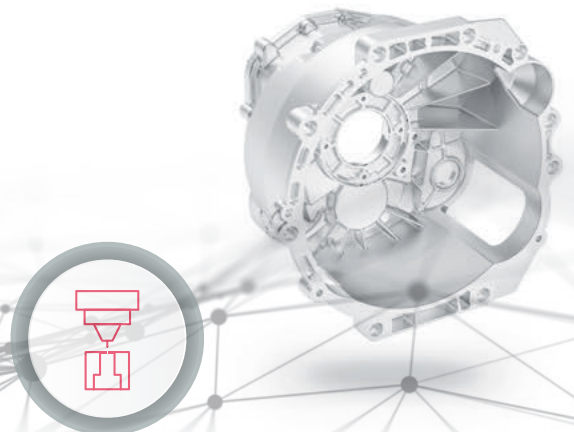
Intelligent monitoring

The availability of constantly updated models makes it possible to monitor the entire system. Problems can be clearly identified and localised, along with troubleshooting hints that can be provided to the user with the associated error message. Continual monitoring of the system behaviour as well as the reaction to any problem can be flexibly configured.

Easily extendable and OEM protocols

Connectivity can be extended to different standards through add-on modules. The IRIS development environment allows OEM protocols as well as customised actions to be integrated quickly and easily.

There are no limits to the system – contact us with your ideas.



THE KEY FEATURES

EASY TO USE

- › Intuitive operation thanks to a flat menu structure.
- › Predefined actions (programmes) for ease of use.

CONNECTIVITY

- › IRIS is WLAN-capable and can be controlled remotely or locally.
- › Web interface via TCP/IP, REST-API and OPC-UA built in as standard.

ECONOMICAL CONTROL SYSTEM

- › The control system is efficient, smart and energy-saving. There is no simultaneous heating and cooling.
- › IRIS controls the pump and ensures that it only consumes as much energy as necessary.
- › The energy demand is displayed and can be read out.

PREDEFINED ACTIONS AND CONFIGURABLE RECIPES

- › Fully automated sub-steps and recipes adapted to your process can be stored.
- › Activation of an action with just one touch.

MODULAR DESIGN

- › The range of functions can be easily extended by additional modules.
- › The complexity of the control process can be easily mapped by combining different modules.

PREDICTIVE MAINTENANCE

- › Monitoring of pump status and early warning of possible failure.
- › IRIS monitors the condition of the entire system and issues recommendations for action.



MODULAR DESIGN

For maximum flexibility and serviceability

IRIS consists of several modules. The core is the main module, which provides the essential computing power and storage capacity and contains the entire operating logic. Connected to this is the display module for operation via a dedicated data connection.

The central control system is provided by input-output modules connected via a fast CAN bus, the sensors and actuators are connected using this technology. IRIS can therefore adapt to the complexity of the device. Communication with the outside world is also expandable by additional modules. Various communication modules can be connected to a second CAN bus in the field and by the customer.

MODULAR, FLEXIBLE, SERVICE-FRIENDLY

The modular design offers many advantages

- › **Service-friendly**
The individual IRIS modules can be easily exchanged.
- › **Expandable**
Customised programmes and interfaces can be flexibly adapted to operational changes.
- › **Maximum operational safety**
The CPU of IRIS is protected, important data cannot be lost.

IRIS Display Module

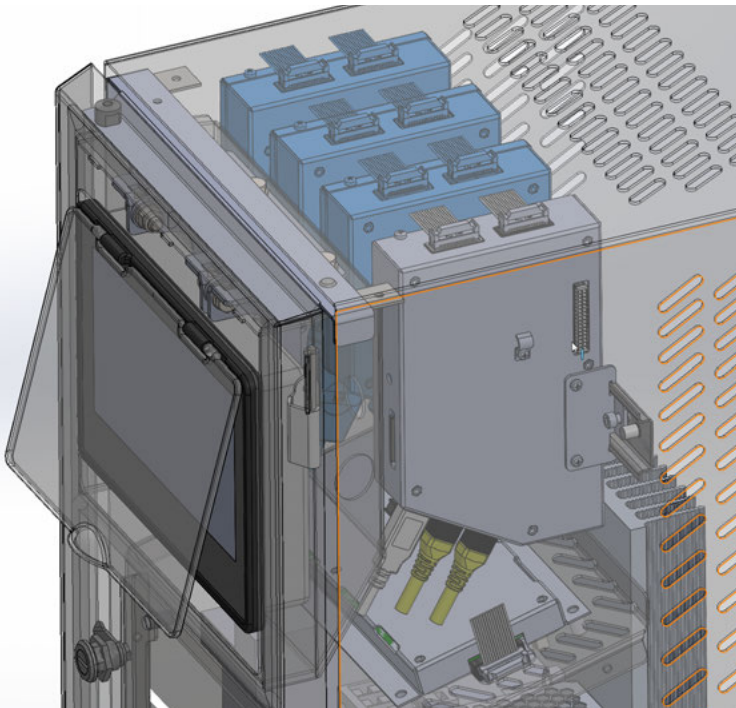
Ergonomic, swivel-mounted display houses the control input and display function

IRIS System Controller

The main data processing centre of IRIS controls all sensor inputs and compares them with the stored models. IRIS regulates in advance and provides the user with important system information required to work even more resource efficient.

IRIS Peripheral Module

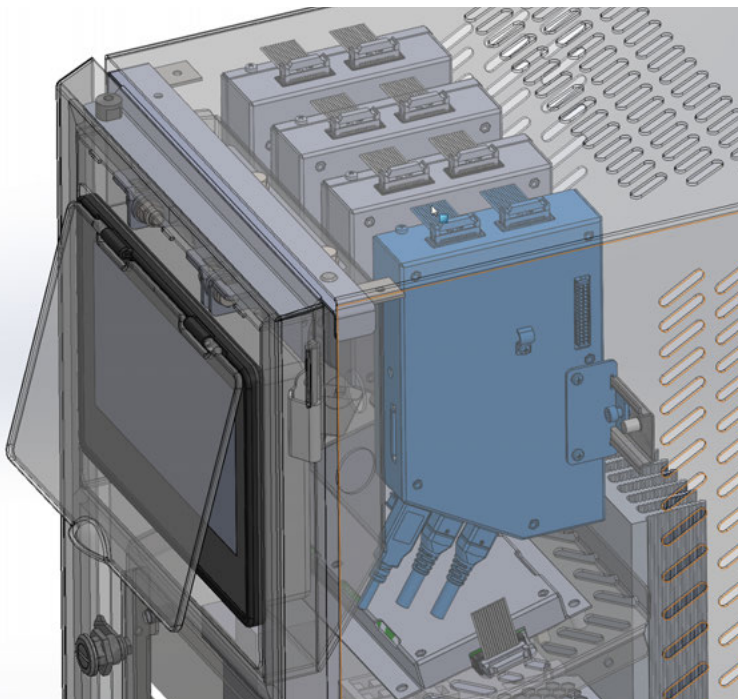
All actuators and consumers such as SSRs, contactors, solenoid valves and sensors are connected to the sensor module. As a protective shield to the actual computer, it forms the system boundary between 400 V and 24 V DC.



Additional module: IRIS-IO modules 1-3.

IRIS Input Output Modules

Unlimited possibilities are opened up to the user by the various communication modules which can be easily combined with each other. OPC-UA, web interface (LAN cable, WLAN) are always included on the main module of IRIS. Further interfaces (Profibus, ProfiNet, CAN bus, RS-485, RS-232, Current Loop) can be added by additional IO modules.



Main module with OPC-UA.



USER-FRIENDLINESS

Ease of use is at the heart of the user experience

The clear and high-contrast definition on the 7" display ensures that the controller is visible even in difficult lighting conditions.

Temperature control units installed with the IRIS controller system do not require any initial configuration by the user.

The 7" touch screen

- › Highly responsive capacity display, – can also be operated with gloves.
- › Ergonomic operation thanks to swivelling display.
- › Automatic screen saver.

One touch thought

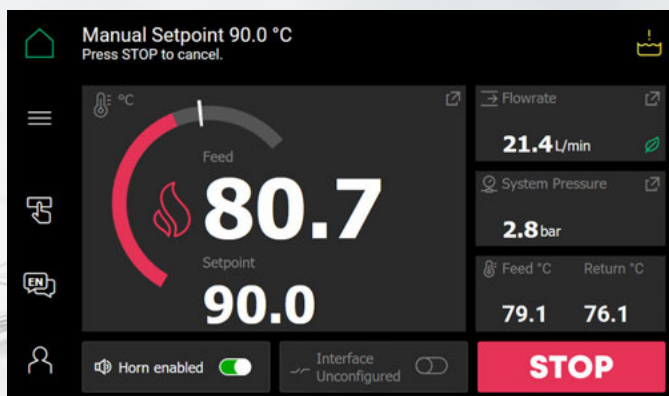
- › Flat navigation – the user is guided intuitively.
- › Three different user levels help to keep the focus on the essentials.
- › Individual work steps are stored as actions and can be carried out fully automatically by, "one touch".

Simple user management

- › Simple and intuitive operation – can be quickly set and edited.
- › Errors and information are displayed and guide the operator with a clear recommended action.
- › Quick selection of recipes and of automated partial sequences.

Safety and data logging

- › Continuous data logging supports compliance with ISO standards.
- › IRIS logs all errors and system indications – the unit status can be read at any time.
- › Data log can be exported to a USB stick or remotely in an open format.



Main screen



RECIPES, ACTIONS AND TIMER

Allow you to work in a semi-automated way

Actions available to support the user

An action is a sequence of steps designed to automate repetitive or time-consuming tasks for the operator.

The following actions are available:

- › Mould change
- › Mould change hot mould
- › End of shift
- › Leak stopper
- › Function test
- › Others on request

Recipes for more process reliability

A recipe contains all the information on how a customer product must be produced. IRIS can store an infinite number of recipes, so a separate recipe can be managed for each product. A recipe can be started manually or controlled via the timer function.

The conclusion of a recipe is a selected action. This defines whether the process is repeated after all sequences have been completed or how it is ended.

IRIS distinguishes between two types of recipes

1. Ramp recipes

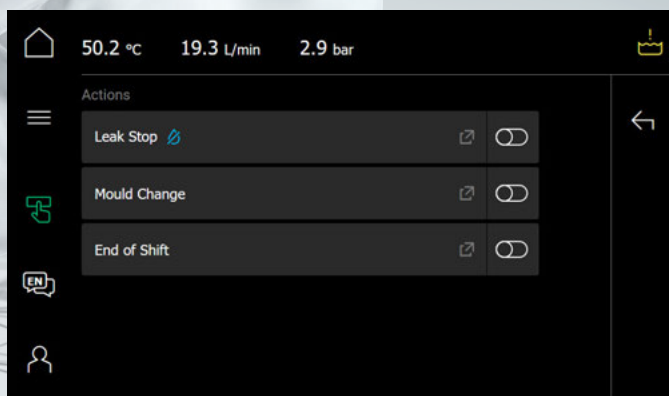
The user specifies different, time-dependent temperature points.

2. Setpoint recipes

A single, time-independent temperature point is specified.

Timer functions help to automate processes

Extensive timer functions allow recipes and actions to be started and stopped as desired. Without manual intervention, the temperature control unit automatically starts working at a predefined time and also goes back into stand-by mode.



Actions support the user



SAFETY AND DATA LOG

Process data are stored

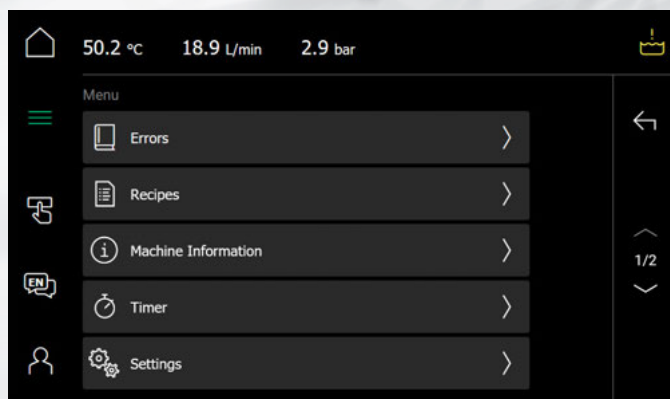
In the new controller, all processes and operating data such as temperatures, pressures, flow rates, operating states, status messages, diagram data and data histories are stored and logged, making them available to you at any time. IRIS supports, informs, warns, reports and continuously optimises the operation of your temperature control unit. You control, manage and analyse with just one finger – quickly and intuitively.

Error log can be read out

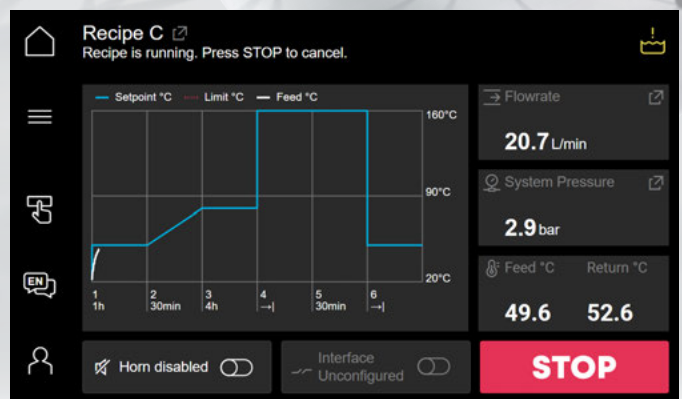
In addition to the standard display of the most important parameters on the main screen, the behaviour of the unit can be analysed directly on the touch screen in a graphic visualisation of historical data. Furthermore, a data file with all sensor signals as well as an error log can be downloaded for detailed analysis or documentation.

Different user levels

With three predefined access levels, you can ensure that everyone has the authorisation they need. The different access levels allow the user interface to access essential tasks and make it possible to limit or even completely block operations.



Simple menu navigation



Graphical display diagrams

PREDICTIVE MAINTENANCE

For even more security

Self-diagnosis algorithm

IRIS has self-diagnosis algorithms and performs plausibility checks on sensor readings. Conditions such as cavitation, water in the oil or a consumer that is too large are detected and a message with a recommendation for action is highlighted to the user.

Monitoring the pump condition

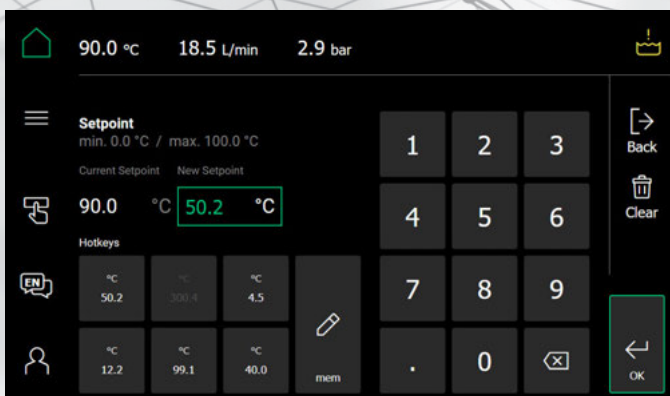
The system compensates for pump wear and thus ensures the same power output over the entire life cycle. IRIS also provides information on the pump's condition at all times.

Capture of environmental data

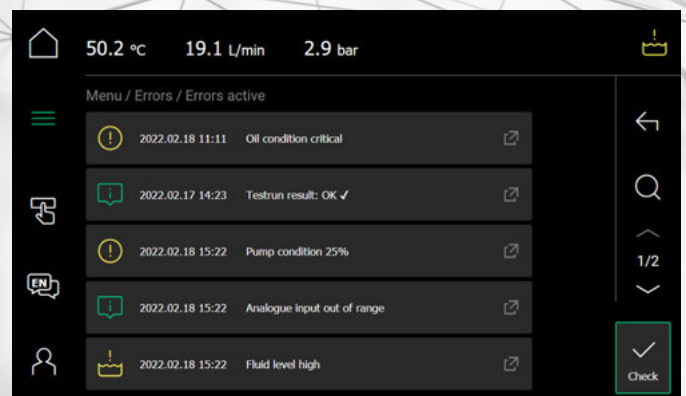
Increased load values are detected by IRIS. The system counteracts these even before a fault or production stop occurs.

Condition monitoring of the heat transfer medium

IRIS reports the condition and indicates an oil change is required.



Temperature input



Status display of the system

INDUSTRIAL CONNECTIVITY

- the communication protocols of IRIS

IRIS comes standard with the WLAN accessible web-based interfaces TCP/IP, REST-API and OPC-UA.

Interfaces

- › External Ethernet connection to the company network
- › Ethernet OPC UA for connecting temperature control units
- › USB for service purposes, downloading data logs, uploading new firmware
- › WLAN for remote control

All other interfaces require a corresponding communication module.
Three communication modules are available:

Communication module 1

- › ProfiNet
- › EtherNet/IP
- › Profibus

Communication module 2

- › RS-232
- › RS-485
- › CAN-Bus
- › Current-Loop

Over 30 protocols available from worldwide machine manufacturers.

Communication module 3

- › 3 digital inputs 24 V Contact potential free
- › 3 pcs. digital outputs 230 V Contact potential free
- › 2 analogue input 0-10 V or 0-20 mA resp. 4-20 mA
- › 2 analogue outputs 0-10 V or 0-20 mA resp. 4-20 mA
- › 1 temperature sensor



IRIS IS INDUSTRY 4.0 – READY

The control concept holistically covers the Industry 4.0 concepts

Networking

- › IRIS networks various devices with each other and can be easily integrated into machine control systems. Networking takes place via WLAN or plug connection.

Information transparency

- › Sensor data is evaluated and continuously expands the control models.
- › Important parameters are stored and can be output at any time.

Technical assistance

- › The system supports the user by issuing error messages with recommendations for action.

Decentralised decision-making

- › The system performs the control tasks independently. It reacts to external inputs and acts largely autonomously.



HERE FOR OUR COSTUMERS



Tool-Temp AG

Industriestrasse 30
CH-8583 Sulgen
Switzerland

T +41 71 644 77 77

F +41 71 644 77 00

E info@tool-temp.ch

