



# Hot runner controller profiTEMP IM

Manual



Download the manual in additional languages at [www.profiTEMP.de](http://www.profiTEMP.de)

**meusburger**





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# 1 INTRODUCTION

## CHARACTERISTICS

- » High-performance hot runner controller for all hot runner systems
- » 12 control zones in desktop housing
- » Precise temperature control ensures improved part quality
- » Fast control algorithm shortens the heating phase and increases the operating time
- » Clear, user-friendly touch screen user interface
- » Self-explanatory operation – no training or instruction required
- » Globally applicable – user interface available in 14 languages
- » Extremely compact – fits everywhere
- » Lightweight and portable
- » Easy maintenance – the heating fuses are accessible from the outside

## GENERAL INFORMATION

The hot runner controller profiTEMP IM is suitable for heating hot runner moulds in injection moulding machines. For this purpose the hot runner controller is connected directly to the injection mould via connecting cables.

Hot runner controllers supply an electric current to the heaters of an injection mould during operation. The heating current enables an adjustable temperature increase of the heaters and thus also of the mould. In parallel, continuous temperature monitoring takes place via connected thermocouples. In the event of deviations between a currently recorded temperature and the target temperature set on the hot runner controller, the output level is automatically readjusted until both temperatures are equal.

The profiTEMP IM is available in three versions. These differ only in the design of the plug assignment of the mould connection (➔ 3.5 Mould connection).

## VARIANTS

Designation	Mould connection pin assignment
RH 1200/12/001/WI24B/32A	MEU/001
RH 1200/12/121/WI24B/32A	121
RH 1200/12/522/WI24B/32A	522

## SCOPE OF DELIVERY

- » profiTEMP IM, manual, circuit diagrams

## 1.1 FIRST READ, THEN START

### TRANSPORT

The profiTEMP IM is delivered shockproof packed in a sturdy cardboard box. This normally ensures sufficient protection. To avoid damage during transport, the device may only be transported in an UPRIGHT position.

### UNPACKING

Check the device for any transport damage. Do not connect devices that have been damaged during transport! If necessary, lodge a complaint with the transport company.

### LIFTING AND CARRYING

The device is to be carried by the handles provided in the two side panels.

### STORAGE

If the unpacked device is not put into operation immediately, it must be stored protected from dirt and moisture. The

permissible temperature is -20...70 °C, the permissible relative humidity < 95% annual average, no condensation.

### INTENDED USE

The hot runner controller is used for temperature control of heaters and is designed for precisely defined conditions, e.g. supply voltage and temperature. Therefore, the user must ensure that the controller is only used where the operating conditions correspond to the technical data. The manufacturer is not liable for damage resulting from non-compliance with the intended use.

The hot runner controller is not suitable for use outside the limits defined by the technical data and the design. In addition, the use of third party spare parts and the application of non-described maintenance activities do not count as intended use.

Changes, alterations and other modifications are carried out exclusively at the user's own risk and can lead to safety risks. The manufacturer and distributor of this device cannot be held liable for direct or indirect damage resulting from improper operation or handling.

### EXCLUSION OF LIABILITY

Observance of the operating manual is a basic prerequisite for safe operation of the device and for achieving the specified product characteristics and performance features. Meusburger accepts no liability for personal injury, damage to property or financial loss resulting from non-compliance with the operating manual. Liability for material defects is excluded in such cases.

This device has been safely designed and built by us and has left the factory in perfect safety condition. In order to maintain this condition and to ensure safe operation, the user must observe the instructions and warnings contained in this operating manual ([↗ 2 Safety Instructions](#)).

As compliance with safety regulations is beyond our control, no liability can be accepted for damage resulting from non-compliance with one or more of these regulations. The list of safety regulations cannot be comprehensive. Failure to mention any of these regulations does not mean that they are not valid.

Commissioning, maintenance and servicing work may only be carried out by persons who are recognised as specialists within the meaning of the provisions (VDE regulations, Equipment Safety Act, accident prevention regulations of the professional associations, etc.).

### GUARANTEE

This product is subject to the legal warranty periods for faults or deficiencies in manufacture.

If a malfunction occurs due to a manufacturing fault, the manufacturer/supplier will repair or replace the defective product at their own discretion.

The following repairs do not fall under the warranty and are liable to costs:

- » Malfunctions after the legal statutory periods have expired
- » Malfunctions caused through operating error and/or incorrect parameterisation by the user (if the device is not operated as described in the manual)
- » Malfunctions caused by other devices
- » Changes or damage to the device which do not originate from the manufacturer/supplier

If you wish to use services within the framework of this guarantee, please contact the manufacturer/supplier.

### SERVICE

We can help you quickly and cost-effectively at any time. Please send us the device well packaged with a repair order and as detailed a description of the fault as possible. We prepare a cost estimate and carry out the repair after your approval.

### DISPOSAL

Electrical waste and electronic devices and components are subject to hazardous waste treatment and may only be disposed of by authorised specialist companies. Meusburger as manufacturer in the sense of the Electrical and Electronic Equipment Act (ElektroG), which transposes the European WEEE Directive 2002/96/EC into German law, is registered under the WEEE registration number DE 66448978. All components of this device are taken into account.

### SYMBOLS AND TYPOGRAPHICAL CONVENTIONS

In this manual the following safety-related and informative symbols and conventions are used:



Danger

This safety-relevant symbol indicates an imminent danger. Failure to comply may result in damage to the device or personal injury including death.



Warning / caution

This safety-relevant symbol warns of a possible malfunction or danger. Failure to comply may result in personal injury or serious damage to property.



Information / notes

This symbol indicates additional information for better understanding.



Instruction / example

This symbol indicates detailed explanation of operating steps for a function.



References

This symbol indicates information in another document is being referred to.



Installation / assembly

With this informative symbol, instructions are given for assembly, electrical installation or settings.

## 2 SAFETY INSTRUCTIONS



All instructions must be read and followed in full.

All persons responsible for the positioning, commissioning, operation, maintenance and servicing of the device must be suitably qualified and must:

- » pay close attention to this manual,
- » view the manual as part of the product,
- » store the manual during the life of the product,
- » pass this manual on to any subsequent owner or user of the product; and
- » ensure that any addition received is inserted into the manual



Please observe the following safety instructions for protection against electric shock and risks of injuries and fire.

During commissioning, adhere strictly to the local safety regulations as well as the safety instructions.

In industrial facilities, the regulations for the prevention of industrial accidents for electrical installations and equipment given by government safety organisations should be complied with.

Protect device against moisture. The permissible range of ambient climate influences must not be exceeded or fallen short of during operation. The ingress protection of the device must be taken into account when selecting the operating conditions and environmental influences.

This device must not be used in potentially explosive atmospheres.

Check for sufficient mechanical stability. Provide protection against slipping from the installation surface.

Check the specified voltage on the label is identical with the mains voltage on-site.

Make sure that the mains cable and the connecting cables are not damaged by being run over, crushed, pulled or the like. Protect cables from oil, sharp edges and temperatures above 70 °C.

Do not touch the mains plug with wet hands.

Secure the contacted mating connectors on the back of the device against unintentional removal with the locking clips.

The connecting cables are

- » only to be connected when they are voltage-free and the power supply is disconnected.
- » to be laid in such a way as to avoid tripping hazards.

Make sure that e.g. the connected injection mould is connected to the protective conductor.

Do not place any containers filled with liquids on the device. Otherwise, a dangerous situation may arise. Avoid any ingress of foreign bodies, liquids, dust or vapours. Risk of short circuit, fire or electric shock!

Before any cleaning, disconnect the device from the mains by pulling out the mains plug. Regularly check that the ventilation openings at the bottom of the device are free of dust. No further maintenance is necessary. Ensure that surfaces are clean. Use a slightly damp cloth for cleaning. Avoid the use of solvents, cleaning agents and scouring agents.

The device must be positioned in such a way that the main switch is easily accessible, so that the device can be switched off quickly in the event of danger. In addition, a disconnecting device according to chapter [7 3.3 Mains connection](#) must be available.

The feet of the device must not be removed. Also ensure that there is sufficient clearance (at least 5 cm) at the rear wall of the enclosure to allow the waste heat to escape. Air is drawn in around the base and below the bottom of the device to cool the heat sinks.

Work, e.g. maintenance and repair, may only be carried out by authorised and qualified professionals. Only qualified personnel, who have been familiarised with the device and made aware of all hazards, may use the device. The accident prevention regulations as well as other general occupational health and safety regulations must be observed. Unauthorised modifications of the device exclude liability of the manufacturer/supplier for resulting damages.





Before working on the device, disconnect it from the supply voltage or ensure that the device is voltage-free. Secure the supply voltage against being switched on again.

Personal injury and property damage caused by non-observance of this commissioning, service and operating manual or non-observance of these safety instructions render the warranty claim void. For these damages the manufacturer assumes no liability.

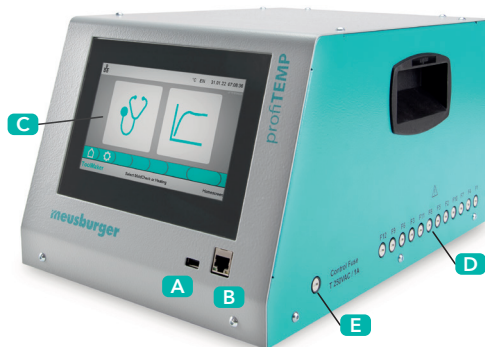
In all cases where the adjacent symbol is visible on the device, it is essential to observe the safety instructions marked with this symbol/sign/sticker for the profiTEMP IM. In all cases, this manual must be consulted.



Do not leave the packaging material lying around carelessly, plastic film/styrofoam parts may pose a danger to others.

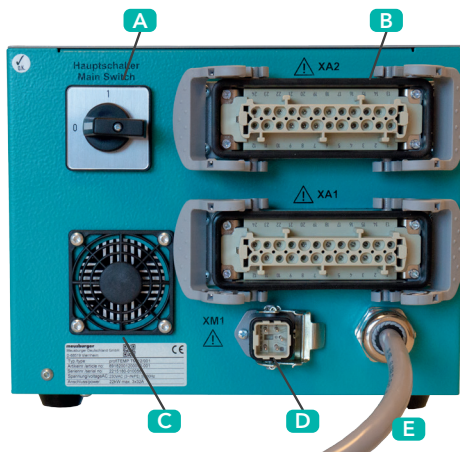
## 3 DESIGN AND CONNECTIONS

### 3.1 FRONT/SIDE VIEW



- A USB port
- B Network connection
- C Operating screen (7" touch screen)
- D Heating fuses
- E Control fuse

### 3.2 REAR VIEW



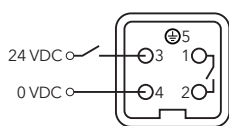
- A Main switch
- B Mould connection XA1 and XA2
- C Fan / air outlet
- D Digital input / alarm output XM1
- E Mains connection

### 3.3 MAINS CONNECTION

The device may only be operated with the mains voltage indicated on the label. The 32 A CEE mains socket intended for connection must be checked for sufficient and permissible fuse protection. The installation of the mains socket must include a disconnecting device in the form of a switch or circuit breaker which disconnects all live wires. This must be suitably located and easily accessible by the user. It must be marked in such a way that it can be clearly assigned to the connection.

When using a mains connection adapter for operation on a 16 A CEE socket, the system parameter ↗ [SP21] *Current limit L1/L2/L3* must be adjusted.

### 3.4 DIGITAL INPUT / ALARM OUTPUT XM1



The potential-free alarm output activates a collective alarm of all zones in case of error messages (function configurable ↗ [SP40] *Function digital output*).

The digital input is used to activate a function (configurable ↗ [SP41] *Function digital input*, e.g. standby, boost).

1/2 Alarm output (max. 230 VAC / 1 A)

3/4 Digital input 24 VDC / 0 VDC (external voltage)

5 Protective conductor



### 3.5 MOULD CONNECTION

The profITEMP IM has two mould connections (XA1 and XA2). The pin assignments for heaters and thermocouples depend on the three device variants.

#### Variant 1 – MEU/001 | RH 1200/12/001/WI24B/32A

	Mains plug (socket)	Thermo-couples		Heaters	
		-	+	L	N
Zone 1	XA1	1	2	3	4
Zone 2	XA1	5	6	7	8
Zone 3	XA1	9	10	11	12
Zone 4	XA1	13	14	15	16
Zone 5	XA1	17	18	19	20
Zone 6	XA1	21	22	23	24
Zone 7	XA2	1	2	3	4
Zone 8	XA2	5	6	7	8
Zone 9	XA2	9	10	11	12
Zone 10	XA2	13	14	15	16
Zone 11	XA2	17	18	19	20
Zone 12	XA2	21	22	23	24

#### Variant 2 – 121 | RH 1200/12/121/WI24B/32A

	Mains plug (socket)	Thermo-couples		Heaters	
		-	+	L	N
Zone 1	XA1	14	13	1	2
Zone 2	XA1	16	15	3	4
Zone 3	XA1	18	17	5	6
Zone 4	XA1	20	19	7	8
Zone 5	XA1	22	21	9	10
Zone 6	XA1	24	23	11	12
Zone 7	XA2	14	13	1	2
Zone 8	XA2	16	15	3	4
Zone 9	XA2	18	17	5	6
Zone 10	XA2	20	19	7	8
Zone 11	XA2	22	21	9	10
Zone 12	XA2	24	23	11	12

#### Variant 3 – 522 | RH 1200/12/522/WI24B/32A

	Mains plug (pin)	Thermo-couples		Heaters	
		-	+	L	N
Zone 1	XA1	13	1	1	13
Zone 2	XA1	14	2	2	14
Zone 3	XA1	15	3	3	15
Zone 4	XA1	16	4	4	16
Zone 5	XA1	17	5	5	17
Zone 6	XA1	18	6	6	18
Zone 7	XA1	19	7	7	19
Zone 8	XA1	20	8	8	20
Zone 9	XA1	21	9	9	21
Zone 10	XA1	22	10	10	22
Zone 11	XA1	23	11	11	23
Zone 12	XA1	24	12	12	24

Adapter connection cables are required for other variants.

The connection diagram on the device and the connection diagram of the plug on the mould must be checked. Improper connection can destroy the controller, heaters and thermocouples.



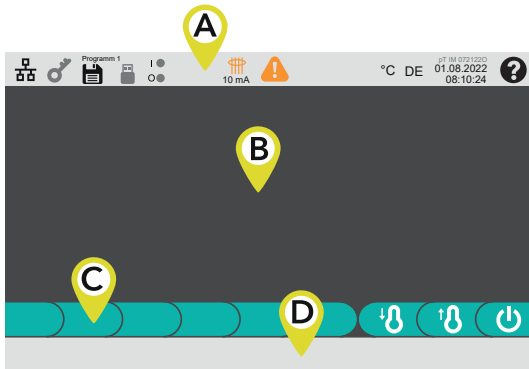
## 4 OPERATION

### 4.1 SWITCH ON / SWITCH OFF

After making all the necessary connections to the device, set the main switch on the back of the device to position 1 / ON to put the device into operation. The device can be de-energised in the same way (position 0 / OFF).

### 4.2 SCREEN LAYOUT

The device is operated via the 7" touch screen. For better readability of the screen, the front panel of the housing is inclined.



The screen is divided into four sections.

**A** ↗ 4.4.6 Header

**B** Content area

**C** a.o. ↗ 4.4.1.2 Menu bar

**D** ↗ 4.4.7 Footer

The content in all four areas may differ depending on the screen mask selected.

### 4.3 OPERATING INSTRUCTIONS

#### 4.3.1 BUTTONS AND INPUT FIELDS

The status or the function of buttons and control panels can be recognised by the grey tone of the key or control panel background.

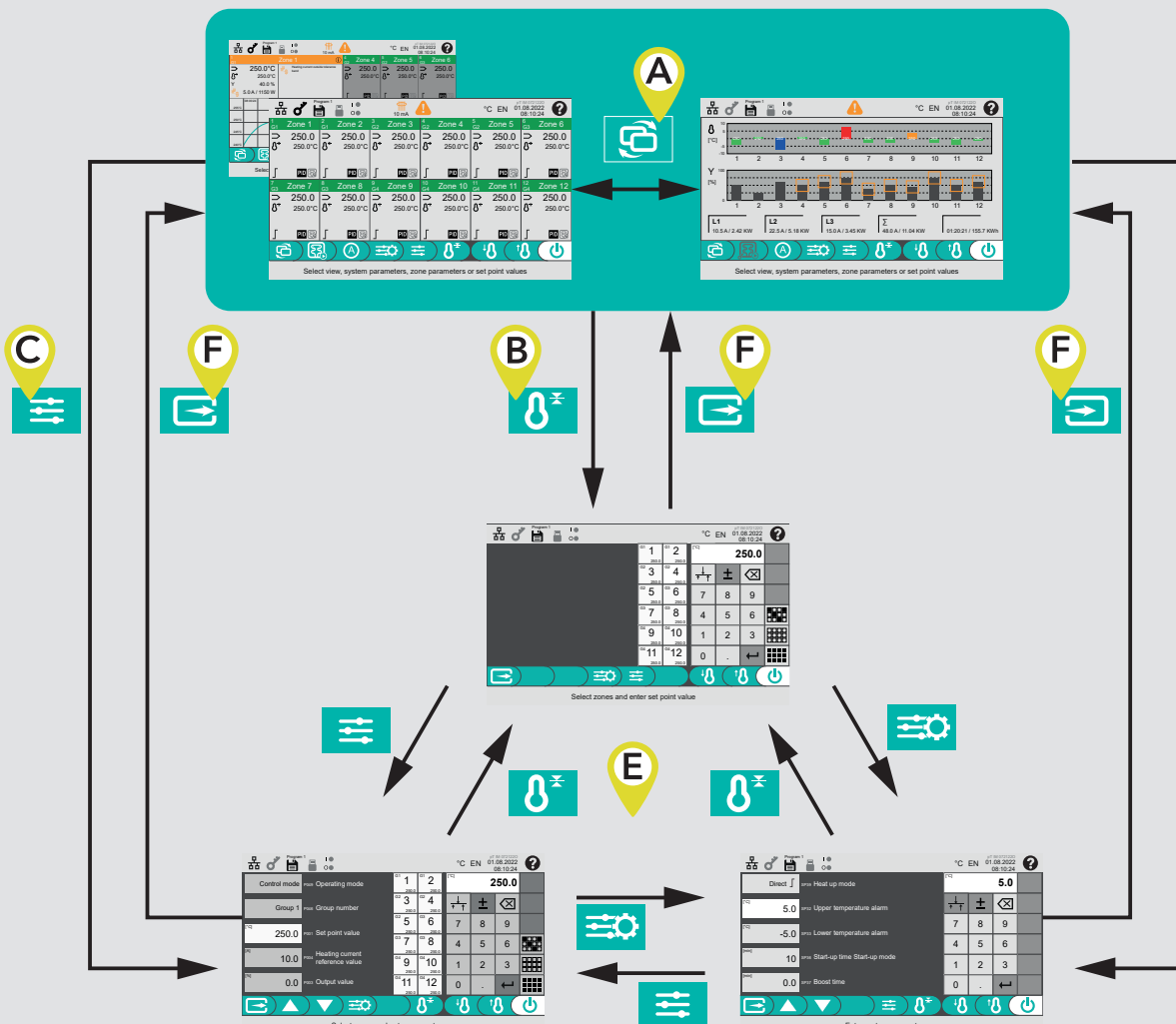
	<b>Button</b> The button cannot be pressed. <b>Input field</b> The input field cannot be selected.
	<b>Button</b> The button can be pressed. <b>Input field</b> The input field can be selected.
	<b>Button</b> The button is pressed or the button is selected. <b>Input field</b> The input field is selected.

Whether the value in an input field can be changed is indicated by the key symbol in the lower left corner of the input field.

	The value in the input field can be changed.
	The value in the input field cannot be changed. The user has no authorisation to change the setting value. This requires a ↗ Login.



## OPERATION AT A GLANCE



After switching on the profITEMP IM you start on the [4.4.1 Home page](#) with process data and status information. You can switch between [4.4.1 Home page](#) and [4.4.2 Status page](#) (A).

From here, the screen pages for entering the temperature set point values (B), the zone parameters (C) and the system parameters (D) can be called up. You can switch directly between these screen pages (E).

The return key (F) is used to exit the input screen pages. However, the return to the home page also takes place automatically if no entry has been made for 10 minutes.

In addition, the functions in the header can be called up from any screen page.

### 4.3.2 EDIT VALUES

#### NUMERICAL VALUES

250.0			
↑	±	⊗	
7	8	9	
4	5	6	
1	2	3	
0	.	←	

Numerical values are entered using a numeric keypad.

If a setting value for several zones is to be changed simultaneously, this can be done in two ways.

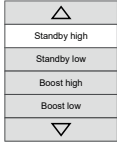


The selected zones are all changed to the same value.



The selected zones are reduced or increased by the same value. In this case the sign key is enabled. Positive numbers increase the values of all selected zones, negative numbers decrease them.

### SELECTION FROM A LIST OF VALUES



For parameters with a defined value list (here: digital input function), the selection is made directly in the list. The list is scrollable if it contains more than 6 entries.

### 4.3.3 SELECT AND DESELECT ZONES

Selecting several zones can be done conveniently via three buttons.



All zones are selected.



All zones are deselected.



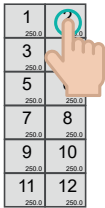
This button is only effective if zones are assigned to a ↗ [P046] Group. Starting from the selected zone, all other zones belonging to the group are selected.

**Example:** Zones 1 to 4 are assigned to group 1, only zone 1 is selected. After tapping the button, the remaining zones 2 to 4 of group 1 are also selected.

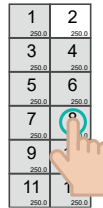


### SELECT AND DESELECT ZONES INDIVIDUALLY

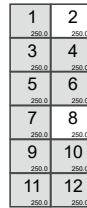
By tapping on the zones, they are selected or deselected.



Zone 2 – tap



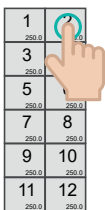
Zone 8 – tap



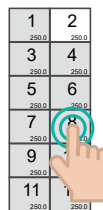
⇒ Zone 2 and Zone 8 are selected.

### BLOCK SELECTION

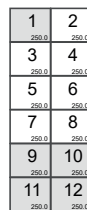
Tapping on a zone and then tapping twice quickly on another zone selects or deselects all zones in between.



Zone 2 – tap



Zone 8 – double-tap

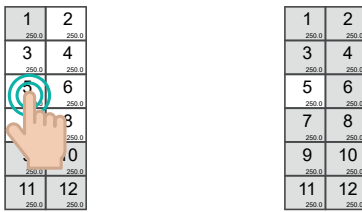


⇒ Zone 2 to Zone 8 are selected.



## CANCEL SELECTION AND SELECT INDIVIDUAL ZONE

Tapping a zone twice quickly selects it, and the previously selected zones are deselected.



Zone 5 – double-tap ⇒ Zone 5 is selected.

## 4.4 SCREEN PAGES

The following buttons of the menu bar are visible on **every** screen page.



The heating is switched off and can be switched on.



The heating is switched on and can be switched off.



The heating is switched off and can be switched on. Due to the function and status of the digital input, there is no heating, the heating outputs are passive (↗ [SP41] Function digital input).



The heating is switched on and can be switched off. Due to the function and status of the digital input, there is no heating, the heating outputs are passive (↗ [SP41] Function digital input).



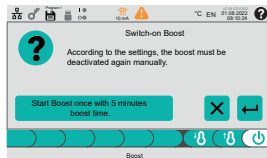
This button is only visible when the heating is switched on. ↗ [P007] Standby is not active and can be switched on. After switching on, the set point is reduced by the specified ↗ [P007] Standby value. The function is only effective for zones in the ↗ [P049] Operating mode control.



↗ [P007] Standby is active and should be switched off.



This button is only visible when the heating is switched on. ↗ [P008] Boost is not active and can be switched on. After switching on, the setpoint is increased by the specified ↗ [P008] Boostvalue.

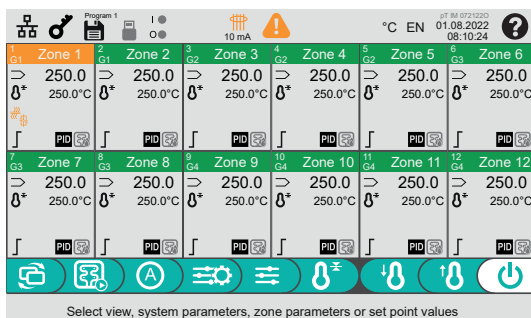


If the temperature increase is to be reset manually (↗ [SP37] Boost time = 0), the profitEMP IM offers to start the ↗ [P008] Boost for a period of 5 minutes. After 5 minutes, the temperature increase is reversed without user intervention and regulated back to the set point. The parameter ↗ [SP37] Boost time remains unchanged.



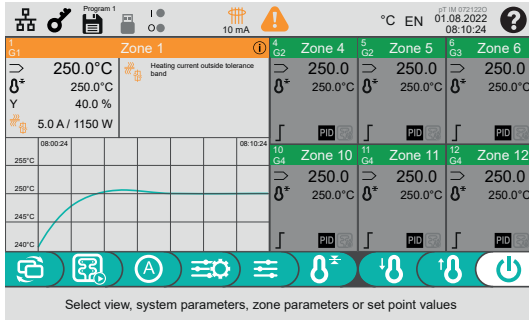
↗ [P008] Boost is active and should be switched off.

### 4.4.1 HOME PAGE



On the home page, process values, faults and the operating status of the 12 zones are displayed in 12 zone fields.

#### 4.4.1.1 HOME PAGE WITH DETAIL ZONE FIELD



Tapping on a zone field opens the detail zone field of the zone. No entries can be made in the detail zone field itself.

It contains additional information about the zone.

» For a zone in the ↗ [P049] Operating mode control, for example, a zone field with set point value, actual value, output value, heating current and the corresponding heating power.

» Plain text information on alarm messages.

» A curve of set and actual temperature for the last 10 minutes. The scaling of the temperature axis is automatic and cannot be changed.

Repeated tapping in the detail zone field closes the detail zone field.

#### 4.4.1.2 MENU BAR

The following functions can be used and screen pages called up on the ↗ 4.4.1 Home page via the buttons in the menu bar.

	The screen page for entering the set point values is called up [↗ 4.4.3 Set point value input].
	The screen page for entering zone parameters is called up [↗ 4.4.4 Zone parameters].
	The screen for entering system parameters is called up [↗ 4.4.5 System parameters].
	This button is only visible when there is a heating current error in at least one zone or if the ↗ [P004] Heating current reference value is equal to 0 A in at least one active zone. After tapping the button, the heating currents of all active zones are measured and saved as ↗ [P004] Heating current reference value.
	This button is only visible when the conditions for restarting the learning phase of the process monitoring are present for at least one zone [↗ 4.6 Process monitoring]. To start the learning phase of the process monitoring for the detection of leakages at the next possible moment, a ↗ Login is required.
	After ↗ Login, the button can be pressed and the learning phase of the process monitoring for the detection of leakages can be started.

#### 4.4.1.3 ZONE FIELD IN OPERATING MODE CONTROL

The zone field for a zone in the ↗ [P049] Operating mode control includes

	<b>A</b> the zone number
	<b>B</b> the zone name (cannot be changed)
	<b>C</b> the ↗ [P046] Group to which the zone is assigned (optional)
	<b>D</b> the header with colour code indicating the alarm status or operating mode (↗ 4.4.1.5 Colour code in the header of the zone field)
	<b>E</b> the status of the thermocouple
	<b>F</b> the actual temperature value
	<b>G</b> the set point symbol to indicate that the zone is in ↗ [P049] Operating mode control, and the set point
	<b>H</b> space for further alarm and status messages of the control zone

**I** the method of heating. It can be specified uniformly for all zones in the system parameter ↗ [SP39] Heating mode.

	<b>Direct</b> It is regulated directly to the new set point.
	<b>Start-up mode</b> To bake out the moisture in the heating elements, a timed intermediate stop at 100 °C is used when heating to the new set point.
	<b>Automatic ramp</b> All zones are controlled together and at the same speed to the new set point. All zones are oriented to the zone with the lowest rate of temperature increase.
	<b>Staggered heating</b> The zones assigned to groups are successively controlled to the set point in ascending order of the group number.





**J** the status of the PID control parameters. The symbol is hidden if the automatic calculation of the control parameters  $\blacktriangleright$  [P030] *Identification* is switched off. In this case, the stored control parameters are used for control.

	The symbol is visible when an automatic calculation of the control parameters [ $\blacktriangleright$ [P030] <i>Identification</i> = ON] is to be carried out during heating. However, this has not yet started.
	When the symbol is changing, the zone is in the heating phase and the control parameters are determined on the basis of the temperature curve.
	The calculation of the control parameters is completed, the appropriate control parameters have been determined and saved.

**K** the status of the process monitoring for leakage detection.

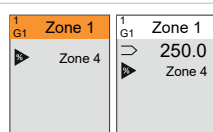
The symbol is visible when the zone is to be monitored for leakage. For this, the tolerance band of the process monitoring ( $\blacktriangleright$  [P025] *Process monitoring tolerance band*) must be greater than 0% for the zone.

	The start of the learning phase has not yet been activated (process monitoring button visible in menu bar). Or the start of the learning phase is activated, the learning phase has not yet been started (process monitoring button not visible in menu bar).
	The zone has reached the set point and is in a stable, steady state. The learning phase was started.
	The learning phase has been completed, the operating point has been calculated, the zone is monitored for leakage.
	There is a process alarm at the zone. Please check the zone for leakage.

Detailed information can be found in the functional description of  $\blacktriangleright$  4.6 *Process monitoring*.

#### 4.4.1.4 ZONE FIELD IN OTHER OPERATING MODES

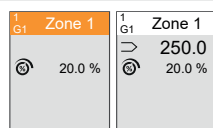
In addition to the operation mode control, a zone can alternatively operate in four other  $\blacktriangleright$  [P049] *Operating modes*.



##### Leading zone

In this  $\blacktriangleright$  [P049] *Operating mode*, the heating output is combined with that of the leading zone. The leading zone takes over the control, the outputs connected in parallel are also controlled by the leading zone. For detailed information, see the functional description at  $\blacktriangleright$  [P049] *Operating mode*.

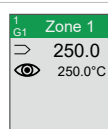
- » In the event of a sensor error, the actual value is hidden and the colour field is orange.
- » Without a sensor error, the actual temperature value is displayed and the colour field is white.
- » Other errors (e.g. in the heating circuit) are displayed with an error symbol, the colour field is orange.



##### Manual

In this  $\blacktriangleright$  [P049] *Operating mode*, a constant  $\blacktriangleright$  [P003] *Output value* is transmitted at the heating output. The control operating mode is primarily used for zones that do not have a sensor or where the sensor is defective.

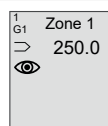
- » In the event of a sensor error, the actual temperature value is hidden and the colour field is orange.
- » Without a sensor error, the actual temperature value is displayed and the colour field is white.
- » Other errors (e.g. in the heating circuit) are indicated with an error symbol, the colour field is orange.



##### Monitoring

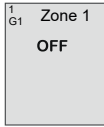
This  $\blacktriangleright$  [P049] *Operating mode* is intended for zones without heating whose actual temperature value is monitored for the temperature limits.

- » If there is a sensor error, the colour field turns orange.



##### Display

Only the actual temperature value is displayed. The zone is not monitored.


**Off**

The heating is switched off, no temperature is displayed.  
The zone is not monitored.

#### 4.4.1.5 COLOUR CODE IN THE HEADER OF THE ZONE FIELD

The colour field **(D)** in the zone field provides information about the status of the zone.



Applies only if the zone is in ↗ [P049] Operating mode control or monitoring.  
The actual temperature value is within the tolerance range around the set point value. There is no further alarm.



↗ [P049] Operating mode control and monitoring  
» The temperature is within the tolerance range around the set point value.  
» Another alarm is active (symbol see ↗ 6 Alarms and error handling).

↗ [P049] Operating mode manual and leading zone  
» An alarm is active (symbol see ↗ 6 Alarms and error handling).



↗ [P049] Operating mode control and monitoring  
Applies only if the zone is in ↗ [P049] Operating mode control or monitoring.  
The actual temperature value is within the tolerance range around the set point value. There is no further alarm.  
The actual temperature value is above the tolerance range. Other alarms may be present. The symbols **(H)** indicate which alarms they are (↗ 6 Alarms and error handling).



Only applies if the zone is in ↗ [P049] Operating mode control or monitoring.  
The actual temperature value is below the tolerance range. Other alarms may be present. The symbols **(H)** indicate which alarms they are (↗ 6 Alarms and error handling).



↗ [P049] Operating mode manual and leading zone  
The zone has no errors.



The zone is switched off (↗ [P049] Operating mode = OFF).

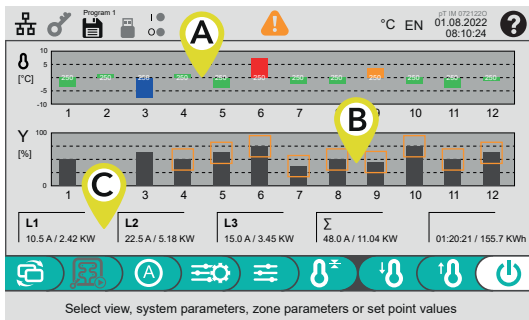
A detailed description of all error messages can be found in chapter ↗ 5.3 Monitoring.

#### 4.4.2 STATUS PAGE



Use the shift key to switch between the ↗ 4.4.1 Home page and the ↗ 4.4.2 Status page.

On the ↗ 4.4.2 Status page, the control deviation, the output level in bar graphs and the status of the process monitoring can be seen directly.



**A** Control deviation from the set point (control difference), colour-coded according to the ↗ 4.4.1.5 Colour code in the header of the zone field with display of the set point value.

**B** Output level with process monitoring tolerance window.

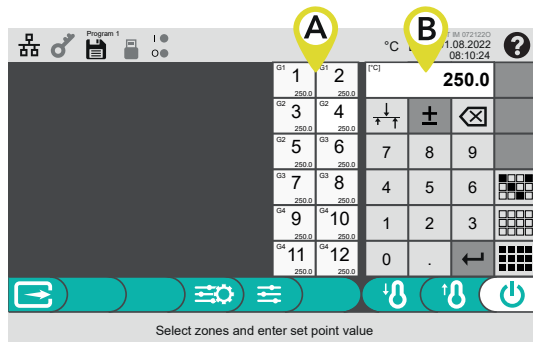
**C** The current power output delivered to the hot runner per phase, the current total power and an electricity meter. The value of the electricity meter is not stored when the hot runner controller is switched off and cannot be reset during operation.



### 4.4.3 SET POINT VALUE INPUT



The screen page for entering the set point value is called up.



The zone field **A** in a zone contains the following information:

- » the zone number
- » the current set point value
- » the group (optional – visible only if zone is assigned to a group.)

**A** Select zone(s). For easy selection of zones, consider the [↗ 4.3 Operating instructions](#).

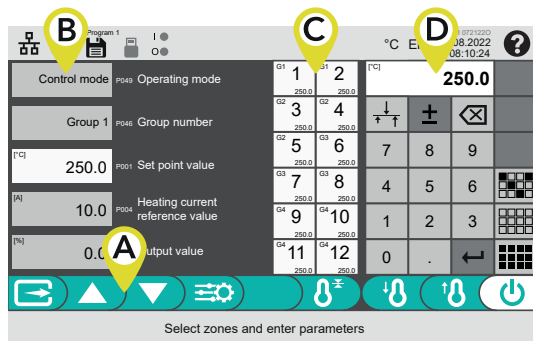
**B** Enter new set point values and confirm entry, the new set points are implemented immediately. Close the set point value input and return to the main or status page or switch to the screen page for zone parameters or system parameters.

### 4.4.4 ZONE PARAMETERS



The screen page for entering zone parameters is called up.

A zone parameter is set separately for each zone. Detailed information on the zone parameters and their functions can be found in chapter [↗ 5 Setting parameters and mode of operation](#).



The zone field **C** contains the following information for each zone:

- » the zone number
- » the current value of the selected zone parameter
- » the group (optional – visible only if zone is assigned to a group.)

**A** Select the display page with the zone parameter to be changed using the arrow buttons. Parameters that can only be changed after [↗ Login](#) are marked in the input field with a key symbol in the lower left corner.

**B** Select parameters. Log in beforehand if this is necessary to change the parameter.

**C** Select zone(s). For easy selection of zones, consider the [↗ 4.3 Operating instructions](#).

**D** Enter new values and confirm entry. The new values are taken over directly.

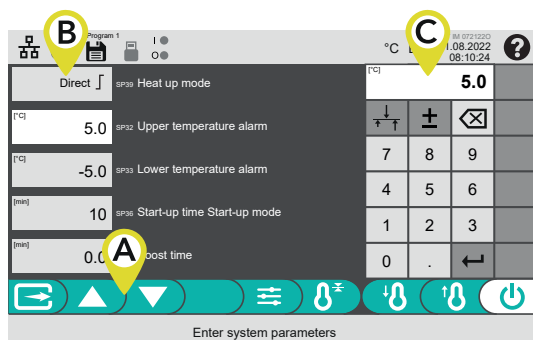
Close the input and return to the main or status page or go to the screen page for [↗ 4.4.3 Set point value input](#) or [↗ 4.4.5 System parameters](#).

### 4.4.5 SYSTEM PARAMETERS



The screen page for entering system parameters is called up.

A system parameter applies equally to all zones or to the device itself. Detailed information on the system parameters and their functions can be found in chapter [↗ 5 Setting parameters and mode of operation](#).



**A** Select the display page with the system parameter to be changed using the arrow buttons. Parameters that can only be changed after [↗ Login](#) are marked with a key symbol in the lower left corner.

**B** Select system parameters. Log in beforehand if this is necessary to change the parameter.

**C** Enter new value and confirm entry. The new value is implemented immediately.

Close the input and return to the main or status page or go to the screen page for [↗ 4.4.3 Set point value input](#) or [↗ 4.4.4 Zone parameters](#).

### 4.4.6 HEADER

The header contains operating elements and status information.



**A** ↗ Status Network / Network settings

**B** ↗ Login

**C** Currently loaded mould program (display only)

**D** ↗ Manage mould programs

**E** ↗ Status USB stick (display only)

**F** ↗ Status digital input / alarm output (display only)

**G** ↗ Status residual current (display only)

**H** ↗ Alarm status

**I** ↗ Select temperature unit

**J** ↗ Change language

**K** ↗ Date / Time

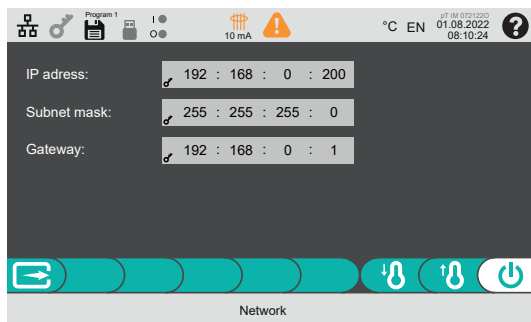
**L** Firmware version (display only)

**M** Call up on-screen ↗ Help

### STATUS NETWORK / NETWORK SETTINGS

The status of the network interface can be recognised by the colour of the network symbol.

	The device is not connected to any network.
	The device is connected to a network, no data is communicated.
	The device is connected to a network and data is being communicated.



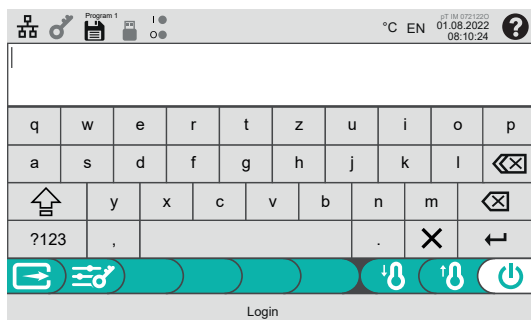
To change the network settings, a ↗ Login is required.

After tapping on the network symbol, the network interface can be configured (IP address, subnet mask, gateway). Click on the input field to be changed, make the entry and confirm.

### LOGIN

The key symbol indicates the authorisation level for changing the setting parameters.

	The user has access to the parameters that don't require a login. This authorisation level applies, for example, after switching on the profiTEMP IM.
	The user has logged in with the valid password and has access to all parameters.



Tap the key symbol to log in. Enter the password in the screen page.

The factory default password is **user**. It can be changed at any time.

Tap the button to change the password. Follow the prompts and enter the old password to be changed. Then enter the new password and confirm it again.



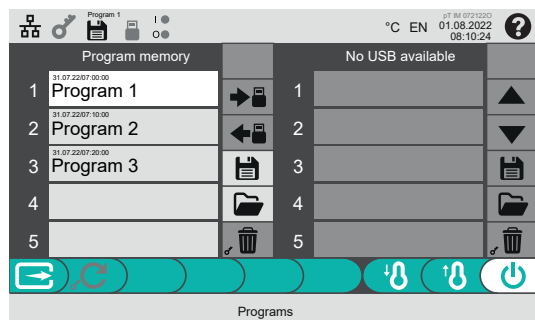
## RESET PASSWORD

If you lose your own password, it can be reset to the factory password **user**.



To do this, tap the button. When prompted to enter the old password, enter **defaultpw**. Confirm the prompt to reset the password.

## MANAGE MOULD PROGRAMS



Five mould settings (mould programs) can be stored in the program memory of the device. A mould program includes all zone and system parameters.

Furthermore, it is possible to save mould programs on a USB stick and load them via that stick.

In addition, mould programs can be copied between the device memory and the USB stick.

Detailed information on the handling of mould programs can be found in chapter [4.5 Mould programs](#).

## STATUS USB STICK



There is no USB stick connected.



A USB stick is connected. Mould programs can be saved on it or loaded from it.

## STATUS DIGITAL INPUT / ALARM OUTPUT

The LED symbol next to the I in the icon indicates the status of the digital input, the LED symbol next to the O in the icon indicates the status of the alarm output.

## STATUS RESIDUAL CURRENT

If a residual current above 5 mA is measured, the residual current symbol and the value of the residual current are displayed. The display is independent of the residual current alarm, which refers to the system parameter [\[SP05\] Maximum residual current](#).

## ALARM STATUS



The symbol is displayed if there is an error in at least one zone. Temperature limit value errors are not taken into account, these are shown in colour on the [4.4.1 Home page](#) and [4.4.2 Status page](#) directly in the zones.

Detailed information on alarm handling can be found in chapter [6 Alarms and error handling](#).

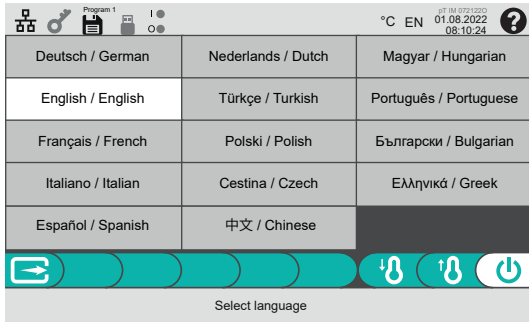
## SELECT TEMPERATURE UNIT

The temperature unit displayed applies to all temperature values. To change the temperature unit, a [Login](#) is required.

After tapping on the temperature unit in the header on the screen page, select the desired temperature unit and close the screen page. The selected temperature unit is used directly. The temperature values are converted in all setting parameters.

## CHANGE LANGUAGE

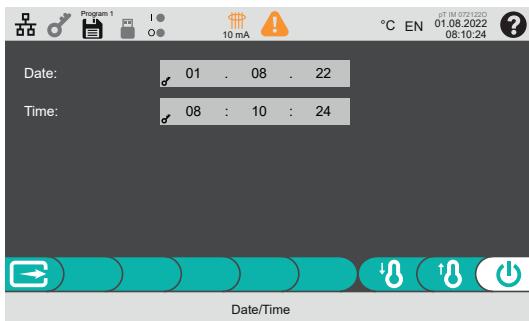
The two-digit country code indicates the selected language of the user interface (DE = German, EN = English, PL = Polish, etc.).



Tapping the country code in the header displays the language selection screen.

Select the desired language and exit the screen. The language is changed to the selected language immediately.

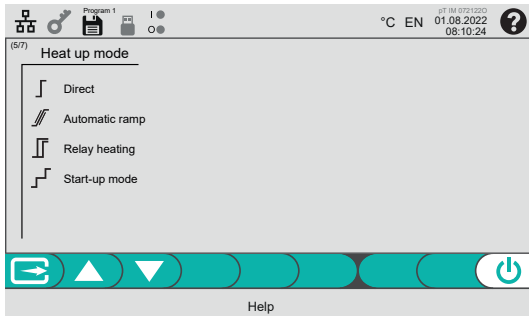
## DATE / TIME



To change the time and date, a Login is required.

The current date and time are displayed. In the screen mask, tap on the desired input field, make the entry and confirm.

## HELP



In the on-screen help, the symbols used in the user interface on buttons and for status and functions are named with plain text over seven screen pages.

Switching between the seven screen pages is done using the arrow keys. The help screen is closed via the return key in the menu bar or by tapping on the -symbol in the header.

### 4.4.7 FOOTER

In the footer, notes on the screen page currently displayed or notes on the next operating step are displayed. The right-hand side shows the name of the screen page displayed.

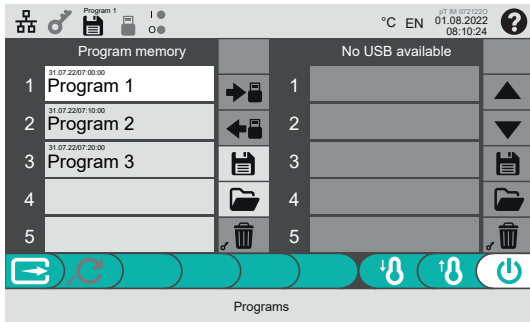
## 4.5 MOULD PROGRAMS

Mould programs are used to save the settings of all zone and system parameters. Mould programs save the user from entering settings manually, ensure the correct setting values and shorten the commissioning phase.

Mould programs can be saved (number of program memories in the controller: 5, number on USB stick according to the memory capacity available there), activated, deleted, exported from the program memory of the unit to the USB stick and imported from the USB stick into the program memory.



Tapping on the symbol in the header opens the overview page. It is divided into two parts:

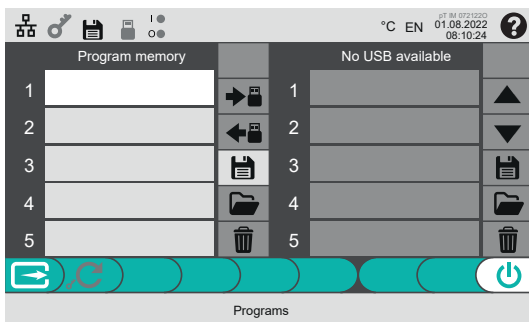


- » The **left-hand** window contains the programs saved in the controller's program memory and associated buttons.
- » In the **right-hand** window are the programs saved on the USB stick. This area can only be operated if a USB stick is inserted in the device.



The button can be used to reset the profiTEMP IM to the factory settings. This requires a [Login](#) ([↗ 4.7 Resetting the device to factory settings](#)).

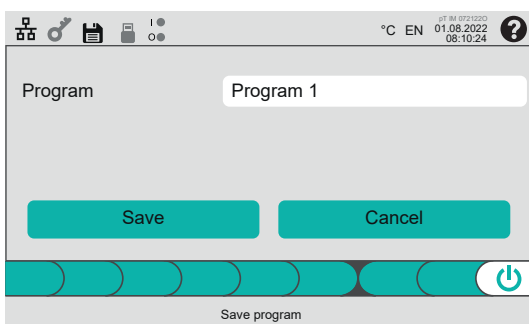
#### 4.5.1 SAVE MOULD PROGRAMS IN THE PROGRAM MEMORY OF THE CONTROLLER



Select the memory location in the left-hand window.

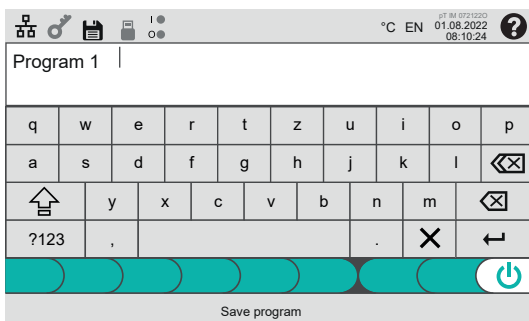


Tap the button.



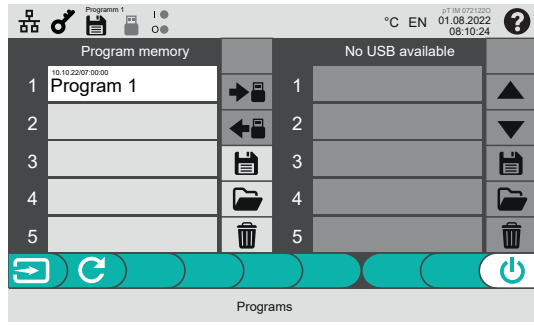
If the memory location is unoccupied so far, the controller makes a name suggestion (program X, X corresponding to the memory location number). Otherwise, the previous program name already in the name field of the program is used.

Tap in the field to change the program name.



Assign a new name and confirm.

The progress of the storage process is shown as a bar.

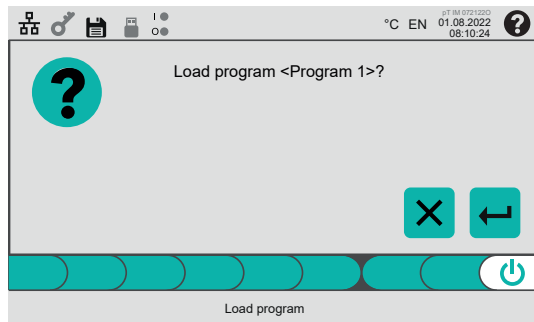


The name of the mould program appears in the left window on the selected memory location.


The name of the mould program just saved is displayed in the header.

#### 4.5.2 LOAD MOULD PROGRAM FROM THE PROGRAM MEMORY OF THE CONTROLLER

A mould program stored in the controller's program memory can be loaded and overwrites the current settings.

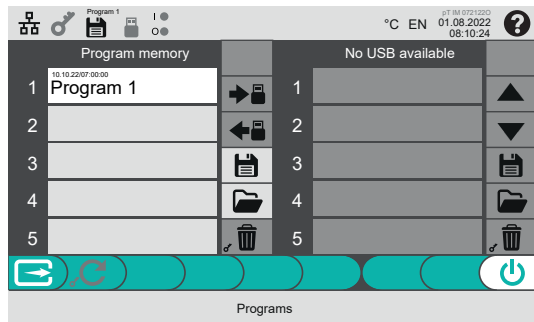


In the left-hand window, select the memory location with the mould program to be loaded.

 Tap the button.

Confirm the query.

The progress of the loading process is shown as a bar. The parameter settings are overwritten.

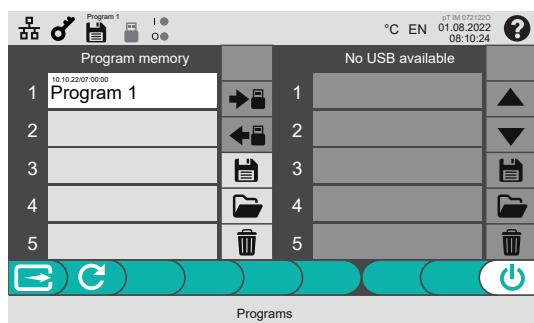


The program name in the header identifies the tool program currently loaded. The next time a setting value is changed, the program name in the header is hidden again. Because then the setting values in the device no longer match the settings in the mould program.


#### 4.5.3 DELETE MOULD PROGRAM IN THE PROGRAM MEMORY OF THE CONTROLLER

To delete a mould program, a  Login is required.

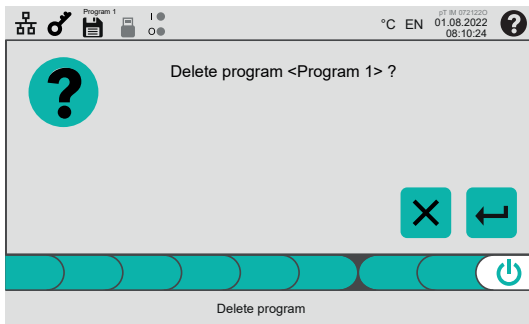
If a mould program is deleted, the settings can no longer be accessed. Therefore, please ensure that the correct mould program is deleted.



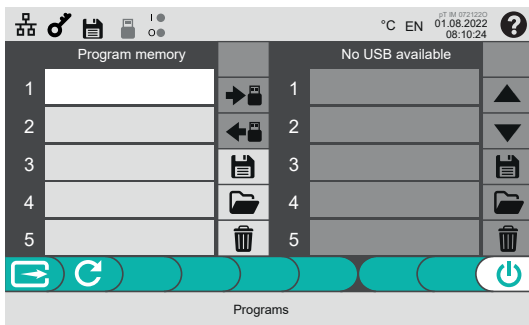
In the left-hand window, select the memory location (here memory location 1).

 Tap the button.





Confirm the query.



The mould program has been removed from the storage space.

## 4.5.4 HANDLING OF MOULD PROGRAMS WITH USB STICK

Mould programs can be saved on a USB stick. Mould programs stored there can be used for a safe restore or transferred to another profiTEMP IM.

The handling of mould programs with a USB stick is only enabled when a USB stick is inserted into the device.

### 4.5.4.1 SAVE, LOAD AND DELETE

The handling of mould programs with a USB stick is identical to the handling in the program memory of the device.



Saves the current settings to the USB stick.



Loads a mould program available on the USB stick and overwrites the current settings.



Deletes a mould program on the USB stick.

### 4.5.4.2 IMPORT AND EXPORT



**Export** A mould program stored in the program memory of the controller is to be copied to the USB stick.

To do this, select the mould program in the left-hand window. Select the storage location on the USB stick in the right-hand window and press the export button.



**Import** A mould program saved on the USB stick is to be imported into the program memory of the controller.

To do this, select the mould program in the right-hand window. Select the memory location to which the mould program is to be imported in the left-hand window. Then tap the import button. Any data previously stored there will be overwritten.

## 4.6 PROCESS MONITORING

The process monitoring function is primarily intended to detect plastic leaks in the hot runner mould. Leakage monitoring only makes sense if a temperature sensor is present in the vicinity of an expected leakage in order to quickly detect a change in the process. This is possible with nozzle zones, as there is generally a sensor near the tip. Distribution zones are less suitable for leakage detection.

For the zones intended for process monitoring, the average power requirement under process conditions (operating point) is determined in a learning phase.

After the operating point has been successfully determined, the controller starts monitoring the output level in the tolerance band (↗ [P025] *Process monitoring tolerance band*) around the operating point. If the output level exceeds the upper limit of the tolerance band, there may be leakage. An alarm message is issued.

In order to be able to stop production quickly in the event of a leakage, it makes sense to output the alarm at the alarm output and feed it to the injection moulding machine (↗ 5.1.6 *Digital input and alarm output*).

### PREREQUISITES

A prerequisite for leakage monitoring of a zone is that the setting value of the zone parameter ↗ [P025] *Process monitoring tolerance band* is greater than 0%. With a setting value equal to 0%, no leakage monitoring takes place.

### PROCEDURE

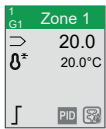
The default setting of the zone parameter ↗ [P025] *Process monitoring tolerance band* is 20%. This is to provide leakage monitoring for all zones. To remove or add zones from the leakage monitoring, a ↗ *Login* is required.


Go to the input of ↗ 4.4.4 *Zone parameters*, select the parameter ↗ [P025] *Process monitoring tolerance band* and make the change.

Now the actual process monitoring can be started:

For zones where leakage monitoring is provided, the grey process monitoring symbol is visible in the lower right corner of the zone field.

Run a ↗ *Login*.

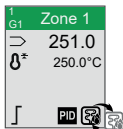


 Tap the button in the menu bar to start the learning phase of the process monitoring at the next possible time.

This button is only visible when at least one zone requires a restart of the learning phase.

Start the activation of the learning phase at the next possible moment under production conditions in the injection moulding cycle. It is precisely then that the controller for the zones determines the operating point under realistic conditions in the injection moulding process.

An alternating grey/black process monitoring symbol in the zone field indicates that the zone is in the learning phase.

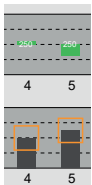
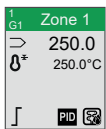


A black process monitoring symbol in the zone field indicates that the learning phase has been successfully completed for the zone and the operating point has been determined.

It is immediately checked for leakage based on this operating point and the tolerance band (↗ [P025] *Process monitoring tolerance band*).

On the ↗ 4.4.2 *Status* page, the status of the process monitoring is clearly visualised for each zone. An orange frame in the output level window indicates the tolerance band (↗ [P025] *Process monitoring tolerance band*) around the operating point located in the centre when the learning phase has been successfully completed.

If the output level exceeds the upper tolerance band limit, a leakage alarm message is issued. This can be output at the alarm output and used to stop the injection moulding cycle.





## 4.7 RESETTING THE DEVICE TO FACTORY SETTINGS

The controller can be reset to two different states.

**Only zone parameters** Only the zone-specific setting values are reset. For example, if all zone-specific settings for a new mould are to be made starting from the factory settings, but the remaining settings are to remain unaffected.

**All data** All settings are reset to the factory settings. This includes all system parameters in addition to the zone parameters.

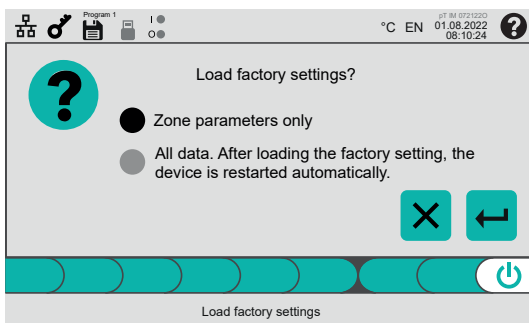
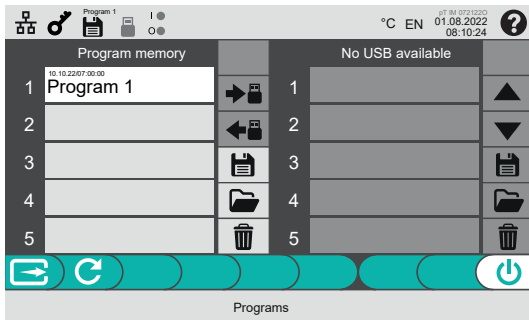
To reset the controller, log in first ([↗ Login](#)).



Tap the symbol in the header. The screen for managing the mould programs opens.



Tap the button in the menu bar.



Select how the controller is to be reset.

Confirm selection or cancel entry.

## 5 SETTING PARAMETERS AND MODE OF OPERATION

Changing some parameters is only possible after a ↗ *Login*. These parameters are marked with a ⚙️.

In this chapter the default value of a parameter at the setting range is marked with square brackets [].

A summary of all system and zone parameters can be found in the tables in the chapters ↗ 8.2 *Overview of zone parameters* and ↗ 8.3 *Overview of system parameters*.

### 5.1 SET UP SYSTEM

Device-specific settings, but also cross-zone settings of functions, apply to all moulds and must only be made once. Therefore, they are made in the system parameters. In addition, there are language, temperature unit, date, time and communication with external devices, the setting of which is done via the header.

#### 5.1.1 BEHAVIOUR OF THE HEATERS WHEN SWITCHED ON

##### [SP13] SWITCH-ON DELAY

The parameter defines the start-up behaviour when the hot runner controller is switched on or after a power failure.

⚙️ <b>Setting range</b>	[0 disabled]	The heaters must be switched on manually.
	1–999 s	The heaters are switched on automatically after the time has elapsed.

#### 5.1.2 THERMOCOUPLE

The type of sensor used for temperature measurement can be defined uniformly for all zones.

The setting value is directly linked to the design of the device. To prevent measurement errors in the actual temperature value, it must not be changed.

##### [SP28] SENSOR TYPE

⚙️ **Setting range** L (FeCu-Ni), J (FeCu-Ni), K (NiCr-Ni), N (NiCrSi-NiSi), T (Cu-CuNi), S (Pt10Rh-Pt)

#### 5.1.3 POWER LIMITATION

If the mains connection is overloaded, the controller reduces the power output to the heaters. In each operating phase, the power limitation ensures that the power delivered to the mould is less than the mains connection allows.

When heating up, during which all heaters can usually be switched on, heating pulses are omitted in a targeted manner if the limit is exceeded. This may increase the heating time. In the regulated state, heating pulses are shifted in a targeted manner without influencing the control performance.

##### [SP21] CURRENT LIMIT L1/L2/L3

⚙️ **Setting range** 16 A, [32 A]

The value is preset according to the standard CEE 32 A mains plug. If a mains cable adapter to a 16 A CEE plug is used, the value must be adjusted.

#### 5.1.4 TEMPERATURE LIMITS

The setting values are related to the selected temperature unit. When the temperature unit is changed, the temperature values are automatically converted.

##### [SP34] MAXIMUM TEMPERATURE SET POINT VALUE

⚙️ **Setting range** 0 – [500] – 999 °C | 32 – 1830.2 °F

Largest possible definable set point value

##### [SP35] MINIMUM TEMPERATURE SET POINT VALUE

⚙️ **Setting range** [0] – 999 °C | 32 – 1830.2 °F



Smallest possible definable set point value

## 5.1.5 RESIDUAL CURRENT LIMIT

### [SP05] MAXIMUM RESIDUAL CURRENT













♣ **Setting range** 0 (deactivated) – [60] mA

The residual current monitoring detects leakage currents that occur due to moisture in the mould or insulation damage. If the measured residual current is higher than the residual current limit, the heaters of the zones where the output level was greater than 0% when the error occurred are de-energised.

## 5.1.6 DIGITAL INPUT AND ALARM OUTPUT

The digital input and alarm output allow easy exchange of information, for example with an injection moulding machine. In this way, functions can be triggered in the controller and status information can be output for signalling, for example.

### [SP41] FUNCTION DIGITAL INPUT

♣ <b>Setting range</b>	[Standby ON/OFF  ]	Rising signal edge activates standby, falling signal edge deactivates standby.
	Standby ON/OFF 	Rising signal edge activates/deactivates standby.
	Standby OFF/ON 	Rising signal edge deactivates standby, falling signal edge activates standby.
	Boost ON/OFF 	Rising signal edge activates boost, falling signal edge deactivates boost.
	Boost ON/OFF 	Rising signal edge activates/deactivates standby.
	Boost OFF/ON 	Rising signal edge deactivates boost, falling signal edge activates boost.
	Heating passive 	High level at the digital input switches and keeps all heaters voltage-free.
	Heating passive 	Low level at the digital input switches and keeps all heaters voltage-free.
	Heating ON/OFF 	Rising signal edge switches heaters on, falling signal edge switches heaters off.
	Heating OFF/ON 	Rising signal edge switches heaters off, falling signal edge switches heaters on.
	Process monitoring start learning phase 	Rising signal edge enables the start of the learning phase of the process monitoring at the next opportunity.
	Process monitoring start learning phase 	Falling signal edge enables the start of the learning phase of the process monitoring at the next opportunity.

### [SP40] FUNCTION DIGITAL OUTPUT

The alarm contact is led out on the back of the controller. Warnings and alarms can be communicated as a collective message to an injection moulding machine, for example. The function of the alarm output can be combined as desired from the following error reasons.

♣ <b>Setting range</b>	Low	The signal is output inverted.
	Heating current outside tolerance band	
	Thyristor defective	Heating is permanently switched on
	Sensor polarity reversal	
	Sensor break	
	Temperature alarm	Temperature value is above the measuring range
	Upper temperature alarm	Temperature deviation too high
	Lower temperature alarm	Temperature deviation too low
	Reference junction	
	Residual current alarm	Residual current above the residual current limit
	Potential error	The voltage at a sensor input is too high


Mains phase missing	
Current too high	Heater output too high or short circuit detected
Channel data error	Checksum error in channel data
System data error	Checksum error in system data
Identification error	Error in determining the control parameters
Sensor short circuit TCs	A short circuit was detected in a thermocouple.
Process alarm	Plastic leakage detected
Heating switched off	
[Set point ok]	Actual values are within the temperature tolerance band around the set point value.
Process monitoring learning phase	Controller determines the operating point of a zone for process monitoring.
Process monitoring not active	
Boost active	
Relay heating completed	

### 5.1.7 ACTION IN THE EVENT OF SENSOR BREAK

#### [SP38] AUTOMATIC SENSOR BREAK

The parameter defines the action of a zone in the event of a sensor break. The defined action applies to all zones.

#### ♣ Setting range

[Off]	The heating output is switched off.
On	<p>If a ↗ [P023] <i>Leading zone</i> is set for the zone, the zone changes to the ↗ [P049] <i>Operating mode leading zone</i> when a sensor break occurs.</p> <p>If no leading zone is defined, the zone changes to the ↗ [P049] <i>Operating mode manual</i> in the event of a sensor break. The average output of this zone before the sensor break is entered in the parameter ↗ [P003] <i>Output value</i> and output. An output level of 0%, if it was not yet possible to determine the average output level, e.g. during heating. The value of the parameter ↗ [P003] <i>Output value</i> can be changed at any time.</p> <p> In both cases, the error is indicated by a symbol in the zone field of the affected zone.</p>

### 5.1.8 OTHER

#### [SP20] MAINS VOLTAGE

♣ Setting range 110 – [230] – 250 VAC

The parameter is used exclusively for converting the measured heating currents into the corresponding power value for display on various screen pages and for calculating the power consumption.

#### LANGUAGE, DATE/TIME, TEMPERATURE UNIT AND DATA COMMUNICATION

The four system values are set via the symbols in the header. Detailed information on these settings can be found in chapter ↗ 4.4.6 *Header*.



## 5.2 SET UP ZONES

To set up, all mould-specific settings must be made.

### 5.2.1 HEATING UP

#### [SP39] HEATING MODE

All zones of the controller are heated in the same way. The setting is therefore made in the system parameters.

**Setting range** [Direct], automatic ramp, relay heating, start-up mode

#### DIRECT

All zones are heated directly to the set point values without any further function.

#### AUTOMATIC RAMP

All zones are controlled together and at the same speed to the new set point value. They are all oriented to the zone with the lowest rate of temperature increase. This is to prevent the entire mould, including manifold and nozzles, from being heated up with thermal imbalances.

During heating, the slowest zone operates at maximum output. The other zones are limited in the output level so that they may only advance by the set temperature difference ( $\nearrow$  [SP02] *Automatic ramp tolerance band*). Since imbalances are insignificant with small set point changes, e.g. set point value corrections in the heated state, the function is only effective with set point changes from a stored value ( $\nearrow$  [SP03] *Automatic ramp set point value change*).

#### RELAY HEATING

In order to avoid tensions between nozzles and manifold when heating up a hot runner or to avoid long standing times of the plastic melt in the cavities at a high temperature level, some hot runner manufacturers require that the zones of different functional parts in the mould are heated up separately one after the other.

For this purpose, each zone can be assigned to a  $\nearrow$  [P046] *Group*. The heating process starts with the zones in group 1. When the zones in group 1 have reached their set point, group 2 follows. Then group 3 and finally group 4.

Zones that are not assigned to a group have no influence on relay heating and start heating immediately.

#### START-UP MODE

Heating up in start-up mode serves to dry out damp heaters. All zones, provided their actual values are less than 90 °C at the start of heating, are first controlled to the internal start-up set point value of 100 °C independently of a higher set point. After reaching the start-up set point, this temperature is maintained for the set  $\nearrow$  [SP36] *Start-up time in start-up mode*. All zones wait until the slowest zone finishes the start-up time. After the start-up time has elapsed, the zones are regulated to the set point.

#### [P046] GROUP

**Setting range** [0 (not assigned to any group)], Group 1, Group 2, Group 3, Group 4

The assignment of the zone to a group is used during operation to facilitate zone selection ( $\nearrow$  4.3.3 *Select and deselect zones*) as well as in  $\nearrow$  [SP39] *Heating mode* relay heating.

#### [P049] OPERATING MODE

**Setting range** [control], manual, leading zone, monitoring, display, off

#### CONTROL

In this operating mode, the controller will control the heating output so that the measured temperature reaches a preset set point value. The output value transmitted at the output is calculated automatically. In the steady state, the actual temperature value and the temperature set point value have the same value.

#### MANUAL

In this operating mode a consistent output value is transmitted at the heating output. The value is specified in the zone parameter  $\nearrow$  [P003] *Output value*.

The manual operating mode is used to operate zones that do not have a sensor or where the sensor is defective. The reference variable is no longer the set point value, but the  $\nearrow$  [P003] *Output value*. This indicates the output heating power in %. At 0% the heating is off, at 100% it is permanently on. At the intermediate output values, the heating output is switched on proportionally.

If desired, a zone can automatically switch to manual mode when a sensor error is detected. This is defined in system parameter  $\nabla$  [SP38] *Automatic sensor break*.

Of course, a zone can also be operated in manual mode without a sensor error.

### LEADING ZONE

The zone adopts the output value of another zone with the same properties and is switched in parallel with this zone. The  $\nabla$  [P023] *Leading zone* takes over the control, the outputs connected in parallel are also controlled by the leading zone.

This operating mode is used for zones with a sensor error. The heating of the zone with a defective sensor is switched in parallel with an identical, thermally symmetrical zone. In this case, the function is to be understood as emergency operation. Repair of the defective sensor should be carried out at the earliest opportunity.

The function can also be used for zones with very high power requirements. The heaters are distributed to several heater outputs so that no output is loaded with more than 16 A.

### MONITORING

In this operating mode, a zone without connected heating is only used for display and temperature monitoring of the set temperature limit values.

### DISPLAY

In this operating mode, a zone without connected heating can only be used for display. Alarms are not evaluated.

### OFF

The zone is passive. No temperatures are recorded, no heating is connected and no alarms are evaluated.

#### 5.2.1.1 HANDLING FOR HEATING UP

##### [SP03] AUTOMATIC RAMP SET POINT VALUE CHANGE

$\nabla$  **Setting range** 0 – [30] – 999.9 °C | 0 – 1831.8 °F

The parameter is only effective if zones are heated in the  $\nabla$  [SP39] *Heating mode* automatic ramp. The parameter determines from which set point change the heating in automatic ramp mode takes place. In the case of minor set point changes, heating to the new set point takes place without an automatic ramp.

##### [SP02] AUTOMATIC RAMP TOLERANCE BAND

$\nabla$  **Setting range** 0 – [30] – 999.9 °C | 0 – 1831.8 °F

The parameter is only effective if zones are heated in the  $\nabla$  [SP39] *Heating mode* automatic ramp. The parameter defines the difference of the actual temperature values that are heated up in heating mode. Therefore, the slowest zone is heated up with maximum output and the faster zones at a slower pace.

##### [SP36] START-UP TIME IN START-UP MODE

**Setting range** 0 – [30] – 999.9 °C | 0 – 1831.8 °F

The parameter is only for zones in  $\nabla$  [SP39] *Heating mode* start-up mode. The parameter defines the time period in which the zones are controlled to the internal start-up set point of 100 °C. After the start-up time has elapsed, all zones heat to the set point values.

## 5.2.2 HANDLING FOR OPERATION MODES

##### [P003] OUTPUT VALUE

**Setting range** 0.0 – 100.0%

The parameter is only effective for zones in the  $\nabla$  [P049] *Operating mode* manual. It sets the output heating power in %.

##### [P023] LEADING ZONE

**Setting range** [No zone selected], Zone 1, Zone 2, Zone 3, Zone 4, Zone 5, Zone 6, Zone 7, Zone 8, Zone 9, Zone 10, Zone 11, Zone 12

The parameter is only effective for zones in the  $\nabla$  [P049] *Operating mode* leading zone. The heating of the zone is switched in parallel with the heating of the leading zone. With the setting [No zone selected], the heating remains





switched off.

### 5.2.3 STANDBY & BOOST

#### [P007] STANDBY

**Setting range** 0 – [100] – 999.0 °C | 0 – 1830.2 °F

The use of the standby function is recommended to protect the moulds and to reduce energy costs during downtimes. The set point value is reduced by the set value at the push of a button. Control is via the standby button or the digital input.

#### [P008] BOOST

**Setting range** [0] – 999.0 °C | 0 – 1830.2 °F

The boost function is used to melt cold plugs. In the boost function, the temperature of the zones is raised by the set value for a period of time defined at ↗ [SP37] Boost time . Control is via the boost button or the digital input.

#### [SP37] BOOST TIME

**Setting range** [0] – 99.9 min

The system parameter, which is uniform for all zones, defines the time period after which the boost function is terminated and regulated to the set point again. With a setting value equal to 0, the function is deactivated. The boost function must be switched off manually via the boost button.

#### [P029] OUTPUT LIMIT

🔧 **Setting range** 0.0 – [100.0]%

The limitation of the maximum output level can be used to reduce the output of the heaters.

## 5.3 MONITORING

To monitor the hot runner control, the corresponding limit values must be set for temperatures and heating currents, among other things.

### 5.3.1 MONITOR TEMPERATURES

#### [SP32] UPPER TEMPERATURE ALARM

**Setting range** 0 – [5] – 99 °C | 0 – 178.2 °F

For temperature monitoring, a tolerance range can be set above the set point value. If the actual value is above the tolerance range, this is signalled as an alarm.

#### [SP33] LOWER TEMPERATURE ALARM

**Setting range** -99 – [-5] – 0 °C | -178.2 – 0 °F

For temperature monitoring, a tolerance range can be set below the set point value. If the actual value is below the tolerance range, this is signalled as an alarm.

### 5.3.2 MONITOR HEATING CURRENTS


The heating current monitoring is used to detect defective heaters or supply lines, and as system protection. An alarm is signalled if the measured current deviates from the specified heating current reference value.

#### [P004] HEATING CURRENT REFERENCE VALUE

**Setting range** 0.0 – 99.9 A

The heating current to be monitored can be preset. A deviation is calculated using the reference value. The setting of 0.0 A switches off the monitoring. However, the current will still be displayed.

The heating current reference value can be entered manually according to the power specifications of the connected heater. Alternatively, this can also be done automatically via the so-called power takeover.

 To do this, tap the button and start the automatic current measurement of all active zones. The measured heating currents are saved.

This button is only visible if at least one zone requires a restart of the learning phase or the  $\nabla$  [P004] Heating current reference value is 0 A.

If no heating current is measured, the heating current is not stored, because a heating current reference value of 0 A would switch off the heating current monitoring for this zone.

#### [P004] HEATING CURRENT TOLERANCE BAND

**Setting range** 0 – [20] – 100%

The tolerance that can be set here represents the maximum permissible deviation of the currently measured heating current from the reference value. If the tolerance is exceeded or not reached, an alarm is generated.

### 5.3.3 DETECTING LEAKS

#### [P025] PROCESS MONITORING TOLERANCE BAND

**Setting range** 0 – [20] – 100%

The tolerance value set here determines whether the zone is monitored for leakage with the process monitoring. For this purpose, a value greater than 0% must be set.

The parameter defines the tolerance band around the operating point in which the output level is located during normal operation.

A detailed description of the operation and function of the process monitoring can be found in chapter  $\nabla$  4.6 Process monitoring.



## 5.4 CONTROL BEHAVIOUR

The PID control parameters ↗ [P034] *Proportional band*, ↗ [P035] *Hold-off time* and ↗ [P036] *Reset time* determine the behaviour of the controller and can be determined automatically by the ↗ [P030] *Identification* when heating up the zones.

Comparable zones should have similar control parameters. Small deviations are normal, larger deviations indicate a fault in the control loop. For example, that the sensor does not have sufficient thermal contact or there are loose-fitting heaters.

Only in exceptional cases should the ↗ [P030] *Identification* be switched off and the control parameters set manually.

### [P030] IDENTIFICATION

↗ <b>Setting range</b>	Off	The controller operates with the fixed control parameters. Automatic calculation of the control parameters does not take place.
	[On]	For zones in the ↗ [P049] <i>Operating mode</i> control, the control parameters are calculated during heating after the first set point increase greater than 50 °C / 90 °F.

### [P034] PROPORTIONAL BAND

↗ **Setting range** 0.0 – [9.9] – 25.5%

P component of the controller. The output is reduced linearly before the set point is reached. Increasing the P band results in a slower transient response.

### [P035] HOLD-OFF TIME

↗ **Setting range** 0 – [2] – 999 s

D component of the controller. The hold-off time is only effective for fast changes of the actual value. Increasing the hold-off time results in a more dynamic transient response.

### [P036] RESET TIME

↗ **Setting range** 0 – [10] – 999 s

I component of the controller. Increasing the reset time results in a slower transient response.

### [P037] SAMPLING TIME

↗ **Setting range** 0.0 – [0.2] – 90.0 s

The sampling time defines after how long a new output level calculated by the controller is output at the control output. The sampling time is directly dependent on the dynamics of the controlled system.

## 6 ALARMS AND ERROR HANDLING

All errors and alarms pending in the zones can be seen on the [↗ 4.4.1 Home page](#) and [↗ 4.4.2 Status page](#).

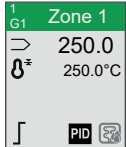
### ALARM SYMBOL IN THE HEADER



The alarm symbol in the header indicates that there is an alarm in at least one zone. Exceptions to this are temperature limit alarms; these are marked directly in colour in the zones.

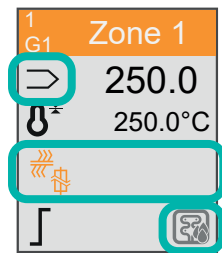
In the event of a sensor short-circuit, current alarm with the heating switched off, leakage current and active automatic sensor break, the symbol becomes a button for acknowledging the alarms.

### TEMPERATURE ALARMS



Temperature alarms can be recognised by the background colour of the header in the zone fields on the [↗ 4.4.1 Home page](#) or by the colour of the deviation bars in the control difference field on the [↗ 4.4.2 Status page](#).

Colour	Meaning	Cause
	There are no errors at the zone.	
	The actual temperature value is within the tolerance range around the set point value. However, there is at least one other alarm. This can be identified by the symbols in the zone fields on the home page.	
	The actual temperature value is above the tolerance range. Other alarms may be present. These can be identified by the symbols in the zone fields on the home page.	<ul style="list-style-type: none"> <li>» Incorrectly determined control parameters</li> <li>» <a href="#">↗ [SP32] Upper temperature alarm too low</a></li> </ul>
	The actual temperature value is below the tolerance range. Other alarms may be present. These can be identified by the symbols in the zone fields on the home page.	<ul style="list-style-type: none"> <li>» Incorrectly determined control parameters</li> <li>» <a href="#">↗ [SP33] Lower temperature alarm too low</a></li> </ul>




On screen pages, including on the [↗ 4.4.1 Home page](#) in the outlined areas of the zone fields, symbols indicate the status of the zone or system. Their significance, as well as possible causes, is explained below.




Symbol	Meaning	Response	Cause
	Sensor break Interruption in thermocouple line	<p><a href="#">↗ [SP38] Automatic sensor break off</a>: Heating is switched off (output level = 0%)</p> <p><a href="#">↗ [SP38] Automatic sensor break on</a>: If a <a href="#">↗ [P023] Leading zone</a> is stored for the zone, then the zone is operated in leading zone mode with the output level of the leading zone. Otherwise, the zone changes to the manual operating mode and the average output level is output.</p>	Sensor connection <ul style="list-style-type: none"> <li>» in the connecting cable</li> <li>» in the mould</li> <li>» in the controller</li> </ul>



Symbol	Meaning	Response	Cause
	Sensor polarity reversal Thermocouple connected with wrong polarity	Heating is switched off (output = 0%)	» Wiring
	Sensor short circuit The temperature displayed does not correspond to the temperature at the measuring point. It is generally lower.  In the thermal line there is contact of the two thermal lines at another point. This is caused, for example, by a cable being crushed during assembly work on the mould.	Heating is switched off (heating relay opens heating circuit). Error must be acknowledged ( <b>!</b> Alarm symbol in the header).	» Sensor connection
	The temperature is higher than the maximum permissible set point value ( <b>!</b> [SP34] Maximum temperature set point value)	Heating is switched off (output level = 0%) Heating is switched on again when the temperature falls below the limit value.	» Setting limit
	A residual current above the set limit ( <b>!</b> [SP05] Maximum residual current) is measured.	All heaters that had an output greater than 0% at the time of the error are switched off (heating relays open heating circuits). Error must be acknowledged ( <b>!</b> Alarm symbol in the header).	» Moisture » Insulation damage
	Phase error At least one of the mains phases used to control the heating outputs is not connected.	The heaters belonging to the phase are switched off. The heating relays open the heating circuits.	» Power cord » If no error can be detected when connecting the power supply, send the device in for repair.
	Power alarm when heating is switched off Current flows without control of the heating output.	Heating is switched off (output level = 0%). The heating relay opens the heating circuit.	» Send in the device for repair
	Short-circuit The measured heating current exceeds the measuring range (16 A). For example, in the event of a short circuit in the heating circuit or if a thermocouple is connected to the heating output.	Heating is not switched on and remains switched off. The heating relay opens the heating circuit.	» Wiring mistakes » Insulation damage » Heaters
	Power alarm when heating is switched on The measured heating current is greater than 0 A. Then the heating current is outside the <b>!</b> [P004] Heating current tolerance band.		» Faulty heating current reference value » Check power specifications
	Heater break The measured heating current is equal to 0 A. This means there is an interruption in the heating circuit.		» Heaters » Connections
	Potential thermocouple error A too high voltage is measured at the measuring input.	Heating is switched off (output level = 0%). The heating relay opens the heating circuit.	» Wiring » Connection to the neighbouring zone » Insulation damage
	Heat sink temperature has been exceeded (safety shutdown if heat sink temperature exceeds 100 °C).  The heating outputs of all zones are switched voltage-free. They are switched on again after falling below the limit value.	Heaters of all zones are switched off (output level 0%). Heaters are switched on again when the heat sink temperature falls below the limit value.	» Ventilation

Symbol	Meaning	Response	Cause
	Process monitoring The output value exceeds the tolerance window of the process monitoring.		» Spillage » Ageing of the heating system » Setting limit too low

In addition, the following information on temperature alarms is listed in the detail zone field.

Symbol	Meaning	Response	Cause
	The temperature is higher than the maximum permissible set point value ( $\uparrow$ [SP34] <i>Maximum temperature set point value</i> ).	Heating is switched off (output level = 0%). Heating is switched on again when the temperature falls below the limit value.	» Setting limit
	The actual temperature value is above the limit value $\uparrow$ [SP32] <i>Upper temperature alarm</i> around the set point value.		» Setting limit » Control parameters
	The actual temperature value is below the limit value $\downarrow$ [SP33] <i>Lower temperature alarm</i> around the set point value.		» Setting limit » Control parameters



## 7 SERVICE

It is essential to observe the [7.2 Safety Instructions](#).



### 7.1 FUSE REPLACEMENT

All fuses are accessible from the outside and are located on the right-hand side wall as seen from the front.



**A** Heating fuses

**B** Control fuse

Each zone fuse is marked with the zone number.

#### HEATING FUSES

Each heating fuse is marked with the zone number.

Only use fuses of the type SIBA FF 16 A / 500 V (RHZ 5000 / 500/ 16/FF)!



**Step 1** Disconnect the device from the power supply.

**Step 2** Remove the fuse cap.

The fuse cap is locked in the fuse holder with a bayonet fitting. To remove, press the fuse cap in slightly with a screwdriver and turn it 90 degrees anti-clockwise.

**Step 3** Remove the fuse from the fuse cap and replace it with a new fuse (SIBA FF 16 A).

**Step 4** Insert the fuse cap into the fuse holder.

Press the fuse cap in slightly with a screwdriver and turn it 90 degrees clockwise.

#### CONTROL FUSE

The procedure for replacing the control fuse is identical to that for the [7 Heating fuses](#).

When selecting the fuse, observe the specification printed on the housing.



### 7.2 FIRMWARE UPDATE

The range of functions of the profiTEMP IM is continuously being further developed. Updates are installed via USB stick. The procedure is as follows.

**Step 1** Download the latest firmware from the Meusburger website [www.meusburger.com](http://www.meusburger.com).

**Step 2** Unzip the downloaded file and copy the firmware file to the root directory of a USB stick.

**Step 3** Perform update

» Switch off profiTEMP IM, insert the prepared USB stick into the USB port of the device and switch on the device.

» A dialogue box appears on the start screen where you select the **Firmware Update** button.

» The firmware files on the USB stick are displayed. Select the desired file and press the **Update** button.

» Confirm the security prompt. The progress of the update process is displayed via a progress bar.

» When finished, end the process by pressing the **Ok** button.

» Remove the USB stick and restart the device.

## 8 APPENDIX

### 8.1 TECHNICAL SPECIFICATIONS

#### POWER SUPPLY

400 VAC  $\pm 10\%$  (~ / N = 230 VAC) 3~ / N / PE, 50/60 Hz

#### MAINS CONNECTION

CEE 32 A, 3 m

#### OPERATION AND DISPLAY

7" IPS panel with capacitive touch, integrated in the front of the device

#### SENSOR INPUTS

Thermocouple Fe/CuNi type J (-35 – 500 °C) with internal reference junction

Measuring accuracy < 1 K

Cable length to thermocouple < 30 m

#### HEATING OUTPUTS

Quantity: 12

230 VAC / 15 A (3.450 W) at 20 °C ambient temp.

230 VAC / 14.5 A (3.335 W) at 45 °C ambient temp. (derating fuse)

Fuse protection with extra fast fuses FF 16 A, 6.3 x 32 mm (SIBA type 7012540.16 FF)

Cable length to heater < 30 m

The heating outputs of zones 1, 4, 7, 10 and 2, 5, 8, 11 and 3, 6, 9, 12 are each assigned to a phase L1/L2/L3.

#### MOULD CONNECTION

Mains plug: Wieland WI 70.300.2440.0

Pin assignment: Meusburger Standard (001)

#### HEATING CURRENT MEASUREMENT

Measuring range 0 to 16 A per power output

Resolution 0.1 A (accuracy +/- 0.1 A)

#### LEAKAGE CURRENT MEASUREMENT

Measuring range 0 – 100 mA

Resolution 1 mA

#### INTERFACES

1 x USB type A (for data export, firmware update)

1 x Ethernet RJ45, IP address adjustable (for service)

#### ELECTR. SAFETY / EMC

Electrical safety: EN 61010-1:2010 + A1:2019 + AC:2019

EMC: emitted interference according to EN 61000-6-4, interference immunity according to EN 61000-6-2

Overvoltage category II

Pollution degree 2

Ingress protection I

Ingress protection class IP20





Installation altitude above sea level max. 2000 m

### AMBIENT TEMPERATURE

Operation 0 – 45 °C, transport and storage -20 – 70 °C

### CLIMATE APPLICATION CLASS

Relative humidity < 75% annual average, no condensation









### MECHANICS

Dimensions: 215 x 260 x 400 (H x W x D in mm)

Weight: 9.8 kg







## 8.2 OVERVIEW OF ZONE PARAMETERS

The parameters marked with  can only be changed after  Login.

P	Parameter designation	Default setting	Unit	
P049	Operation mode	Control		
P046	Group	0 (not assigned to any group)		
P001	Set point value	0   32	[°C]   °F	
P004	Heating current reference value	0.0	A	
P003	Output value	0.0	%	
P007	Standby	100   212	[°C]   °F	
P008	Boost	0   0	[°C]   °F	
P023	Leading zone	No zone selected		
P005	Heating current tolerance band	20	%	
P025	Process monitoring tolerance band	20	%	
P030	Identification	On		
P034	Proportional band	9.9	%	
P035	Hold-off time	2	s	
P036	Reset time	10	s	
P037	Sampling time	0.2	s	
P029	Output limit	100.0	%	

## 8.3 OVERVIEW OF SYSTEM PARAMETERS

The parameters marked with  can only be changed after  Login.

SP	Parameter designation	Default setting	Unit	
SP39	Heating mode	Direct		
SP32	Upper temperature alarm	5   41	[°C]   °F	
SP33	Lower temperature alarm	-5   -41	[°C]   °F	
SP36	Start-up time in start-up mode	15	min	
SP37	Boost time	0	min	
SP38	Automatic sensor break	Off		
SP03	Automatic ramp set point value change	30   86	[°C]   °F	
SP02	Automatic ramp tolerance band	20   68	[°C]   °F	
SP35	Minimum temperature set point value	0   32	[°C]   °F	
SP34	Maximum temperature set point value	500   932	[°C]   °F	
SP05	Maximum residual current	60	mA	

SP	Parameter designation	Default setting	Unit	
SP20	Mains voltage	230	V	🔑
SP21	Current limit SPL L1/L2/L3	32	A	🔑
SP40	Function digital output	Set point value ok		🔑
SP41	Function digital input	Standby ON/OFF ↕		🔑
SP28	Sensor type	J (FeCu-Ni)		🔑
SP13	Switch-on delay	0 (disabled)	s	🔑

## 8.4 DECLARATION OF CONFORMITY

All products have been developed and manufactured in compliance with applicable European standards and directives. The declaration of conformity can be requested from Meusburger.

## 8.5 VERSION HISTORY DOCUMENTATION

Date	Version	Modification
22.03.2023	1.00.02	Corrections
10.02.2023	1.00.01	Update operation Error corrections
14.12.2022	1.00.00	First publication



Rev. 1.00.02  
Subject to technical changes

**meusbürger**

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