



C 448

Compact Control Device



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Start-up

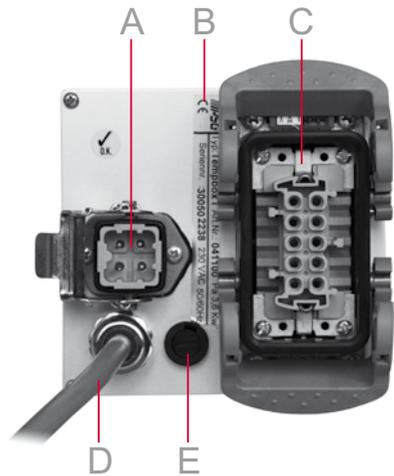
Factory setting enables the controller to be directly ready-for-use at delivery.

Before switching on the controller check whether the pin assignment of the control device corresponds with the one on the tool and the connection cable is applicable.

Switching on the controller it heats according to the preset set point. To prevent this, remove the connection cable between controller and tool and set the set point to 0°C. Switch off the control device, install the connection cable again and restart the control device.

Connections/Pin assignment

A	Alarm output
B	Type plate
C	Connector Heater/Sensor
D	Power cord
E	Control fuse (2A T)



Pin assignment Heater/Sensor (standard)

Zone 2, Sensor -	5	10	
Zone 1, Heater N	4	9	
Zone 1, Heater L	3	8	Zone 2, Heater N
Zone 1, Sensor +	2	7	Zone 2, Heater L
Zone 1, Sensor -	1	6	Zone 2, Sensor +

From standard deviating customer specific pin assignment is feasible. For more information please refer to pin assignment plan.

For compact control device type I zone 2 is not applicable.

Alarm output



Dry contact (break contact, 250V/2A, ohmic load).

Alarms for temperature limit value, sensor and heat current.

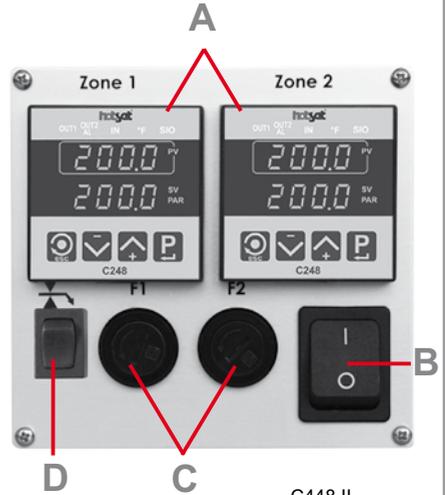
Display & operating device

Control cabinet

A	Temperature controller
B	On/Off switch
C	Fuses for heaters (16A T)
D	Switch for Standby mode



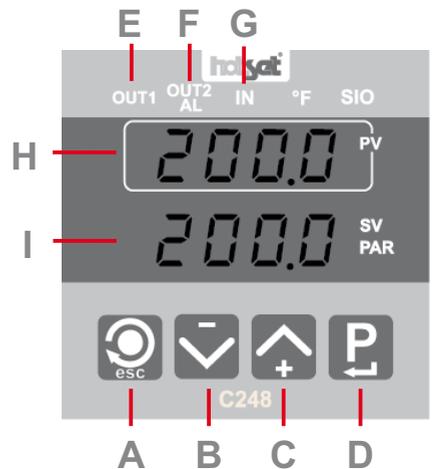
Type C448 I



C448 II

Temperature controller

A	Info button
B	Arrow down button
C	Arrow up button
D	Parameter button
E	LED Heating
F	LED Alarm
G	LED Standby
H	Actual value, parameter value and status
I	Set point and parameter name



Adjust setpoint value

Starting from the set point/ actual value display ...	
  Choose function adjust set point directly and enter the wanted set point with the up/down buttons (Example: new set point 250°C).	
The change of the set point is automatically accepted 3 seconds after the latest data entry. The controller works with the new set point.	

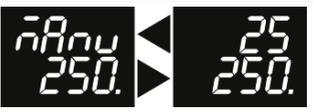
Pressing the info button before the expiration of 3 seconds, the change of the set point is aborted.

Adjust degree of operation in manual mode

What is manual mode for? In manual mode a constant degree of operation is provided at control output. 0% means that the control output is permanently OFF, 100% means that the control output is permanently ON. The manual mode can for example be used to maintain the operation of the controller in case of a damaged sensor in one zone until the exchange of the sensor.

The manual mode is activated on info level. Additional to the direct data entry the degree of operation can be changed.

Adjust degree of operation in manual mode

 2x	Press info button <u>twice</u> to change from set point/actual value display to degree of operation display.	
	Press the parameter button, to release the input interlock. The manual mode is deactivated. The upper LED display flashes.	
	Activate manual mode by arrow up/down buttons.	
	Confirm the activation of the manual mode. Now enter the degree of operation. The controller displays the last output of degree of operation during control. The degree of operation flashes.	
	Enter the degree of operation with arrow up/down buttons (Example: new degree of operation 25%). The degree of operation still flashes.	
	Confirm the change of degree of operation with parameter button. Now the controller starts to work with the constant degree of operation at controller output.	
	Press info button to return to the set point and actual value display. In the upper LED display alternately degree of operation value and information message <i>MANU</i> are displayed.	

The manual mode can be activated in the same way. For this in step 2 and 3 set *MANU* from *ON* to *OFF*.

Functions/Setup

The controller provides additional functions for e.g. hot runner control.

Functions

Manual mode Please refer to „Activate manual mode and adjust degree of operation“

Start-up function Function to heat up the zones preferable gentle. After activation the zone is adjusted to 100°C during the preset time t1 to remove the humidity of the heating unit.

Boost function The Boost function is started directly after the start-up function. The function clears nozzles of rests of material before start. The set point is increased by the preset value of SP3 during the preset time t2.

Stand-by function Temporary lowering of the set point by the preset value of SP2 activated by switch for stand-by mode. The function can be used for e.g. production stop to reduce the degree of operation and to save the plastic melting.

Alarm supervision The control performance is supervised by an adjustable limit band around the set point and the maximum temperature. The sensor and the connecting cable is controlled of line break, incorrect polarity and short circuit. With option heat current supervision the control device controls the difference between heat current and reference value (set point of current) and the status of the solid state relay.

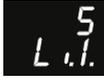
Change parameter at operator level

The additional functions are configurable at operator level by the parameter button.

Example Increase the upper limit from 5K to 10K.

	Press the parameter button to change to the operator level. Press the parameter button repeatedly until Li.1 appears. The parameter value flashes.	
	Enter the new wanted upper limit value with arrow up/down buttons (Example: 10 K). The parameter value still flashes.	
	Confirm the change of limit value with parameter button. The zone is controlled by the new limit value. The next parameter is shown in the LED display.	
	Press info button to return to set point and actual value display.	

Change parameter at operator level

Parameters	LED-Displays with standard settings	Range of value / unit	Description
Setpoint value		0 to 500°C	Set point = 0°C: No corrective signal at control output and no alarm supervision.
Manual mode		on/off	Please refer to „Activate manual mode and adjust degree of operation“
Degree of Operation		0 to 100 %	The degree of operation can only be changed during manual mode. In control mode the degree of operation is calculated by the controller and can only be read.
Status of zone		on/off	Activation/Passivation of zones. For a passive zone there is no corrective signal at control output and no alarm supervision.
Upper Temperature Limit Value		0 to 1500 K	Exceeds the actual temperature value the upper tolerance value above the set point an alarm is generated. Set value always greater than 0.
Lower Temperature Limit Value		-999 to 0 K	Falls the actual temperature value below the lower tolerance value beneath the set point an alarm is generated. Set value always less than 0.
Lowering/reduction value for Standby function		-999 to 0 K	Set value always less than 0.
Increasing of temperature for Boost function		0 to 1500 K	Set value always greater than 0.
Start-up time of start-up Mode		0 to 9999 seconds	Start-up function starts automatically after start of controller. Start-up time starts as soon as actual value reaches 95°C. Setting = 0: Start-up function deactivated.
Boost time for Boost function		0 to 9999 seconds	Boost function starts automatically after end of start-up function. Setting = 0: Boost function deactivated.

Status and error messages

Status messages provide an indication of the operating status of the zones. In case of alarm messages the reason for the error has to be searched for and corrected. Status and alarm messages will be alternately displayed in the upper LED display. **Example** Controller in phase of identification.



Status Messages

Display	Meaning
Id	The controller is in the 'phase of identification'. During heating up the control parameters adapt automatically to the connected zone.
mAnU	The controller is in manual mode.
SP2	The controller is in stand-by mode.
SP3	The controller is in Boost mode.
SP4	The controller is in start-up mode.

Error messages

To correct the errors disconnect the power supply necessarily of the controller!

Display	Cause of error	Methods of error correction
tCbr	Sensor break The wiring of the thermocouple is interrupted.	Check resistance at the tool. Display of thermocouple approx. 4 Ohm. If there is no pass, the sensor is damaged. Connect cable with the tool and check cable from pole to pole. If there is no pass, the cable is interrupted. If there is no problem recognized, change the controller or send the controller back to the supplier for repair.
tCrC	Sensor incorrect polarity Thermocouple with incorrect polarity. The thermocouple is connected in the wrong way.	Error can only be checked by visual control (not measurable). Only wires of the same polarity should be connected. For thermocouple type J this is black/black and black-and-white/black-and-white. For thermocouples of other standards other colors are feasible. Correct wrong wiring.
tCSC	Sensor short-circuit The thermocouple is squeezed.	Indirect error detection: An alarm is generated after 5 minutes when there is a heating output of 100% and no increase of the actual temperature value about 5°C. (The time is adjustable on request by the supplier). Check whether the cables of the thermocouple at the sensor in the tool or in the cable are squeezed and have contact. Then the controller identifies less temperature and the zone is overheated. Furthermore check: Heating output for heater sufficient? If not, exchange heating unit.
drl	Temperature drift The automatic parameter determination („Identification“) can not be started.	Actual temperature value is strongly influenced by another zone. Wait until interference is eliminated or zones are heated simultaneously.
AL	Maximum temperature exceeded The actual temperature value has exceeded the upper temperature limit of 500°C.	Check corresponding assignment of sensor and heater. Solid state relay damaged? Control output permanently ON although the controller provides no degree of operation. Send the controller back to the supplier for repair and get the SSR exchanged by specialized staff.