

EWIKON

Valid for
item numbers:

HPS-C-MULTI 6:

69010.306 (6-zone)
69010.312 (12-zone)
69010.324 (24-zone)
69010.336 (36-zone)

HPS-C-MULTI 6

with WIRE TEST (WT):

69010.412 (12-zone)
69010.424 (24-zone)
69010.436 (36-zone)

software version **1.7x and later**



HPS-C-MULTI 6 Hotrunner Controllers

Operating manual

EWIKON

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Safety Instructions

Please read these operating instructions carefully prior to using the product.

The unit may be serviced only by qualified personnel. Be sure to withdraw the mains plug before opening the housing!

Never replace the controller boards unless the unit has been disconnected from the power supply. Do only use the same type of fuses (See "Fuse Replacement").

Prior to inserting the mould cables, be sure to verify that all connectors have been properly connected (see "Connections").

Check power supply cable and mould cables for potential defects on a regular basis! If the cable sheath is found to be defective, be sure to use a new connecting cable!



Intended Use

HPS-C-Multi 6 units are industrial temperature controllers for controlling the melting temperature of hotrunner moulds. To this end, the controllers determine the temperature of the respective control zone via a thermocouple. This input is then used to regulate the power output for the heating element.

To prevent overheating damage in case of malfunction, an external temperature fuse must be integrated into the heating circuits.

EWIKON shall not be liable for damage caused by improper use of the device.

General Information

A separate control zone is required for each load (zone) to be connected.

A "control zone" consists of a temperature sensor input and a load output including a fuse. When connecting the mould cables, be sure to assign the cables to the correct connectors (see "Connections").

Unused controller modules must be switched off.

A heat-resistant flexible cable must be used as a connecting lead for the load circuits. For the thermocouple a special compensating lead is required! Cables are available as original accessories.

Set-up

Place your controller on a stable, flat working surface. The displays should be at eye level with the user.

Cooling fans prevent overheating of the output stage. Be sure that the air can circulate freely through the appropriate vents. For 24- and 36-zone controllers these are provided on the underside and rear side of the unit.

Cleaning

The external surfaces of the device and the operating panel may be cleaned with a soft cloth saturated with alcohol. Please do not use acid cleaners or scouring agents.



Maintenance

The device must be regularly subjected to a safety check complying with BGV A3 requirements (protection against accidents).

It is recommended to clean the dust filters of the 24- and 36-zone controllers at regular intervals. Depending on the operating period and working condition, the filters should be replaced in the cassette.

In addition, the ventilation slots should be checked for obstruction and cleaned if necessary. However, this task must be carried out by qualified service personnel and not by the user.

No other maintenance work is required for the device beyond the tasks specified above. Should malfunction occur, please contact EWIKON.

Disposal

Once the device has reached the end of its service life, please feel free to return it to the manufacturer for proper disposal.



This device satisfies the essential protection requirements specified in pertinent EU Directives (as of 2010)

Start-up

The HPS-C-Multi 6 hot-runner controllers are designed for connection to a three-phase power supply source (see *Technical Data*). The unit features a CEE plug for this purpose. The main switch, which completely disconnects the device from the power supply (mains), is located on the rear panel.

After performing a careful cable check, connect the mould to the controller. The alarm connector with signal cable 60070.021 (accessory) allows you to establish a connection to the injection moulding machine as well. Connect the power cable, switch on the controller with the main switch.

A message will be displayed asking if you want to optimise the control parameters for the connected hotrunner. Only if a mould is connected for the first time, it will be necessary to carry out an optimisation process. If optimisation OFF (OPTI-N), it will be possible to heat up faster. An upload of the setpoint values from the mould storage makes it necessary to always carry out an optimisation process. A start time of 0-4 minutes can be set in the parameter menu. The controller will start automatically after the set time has exceeded, if no entry is made. If a start time of 0 minutes is set, a manual entry will always be necessary.

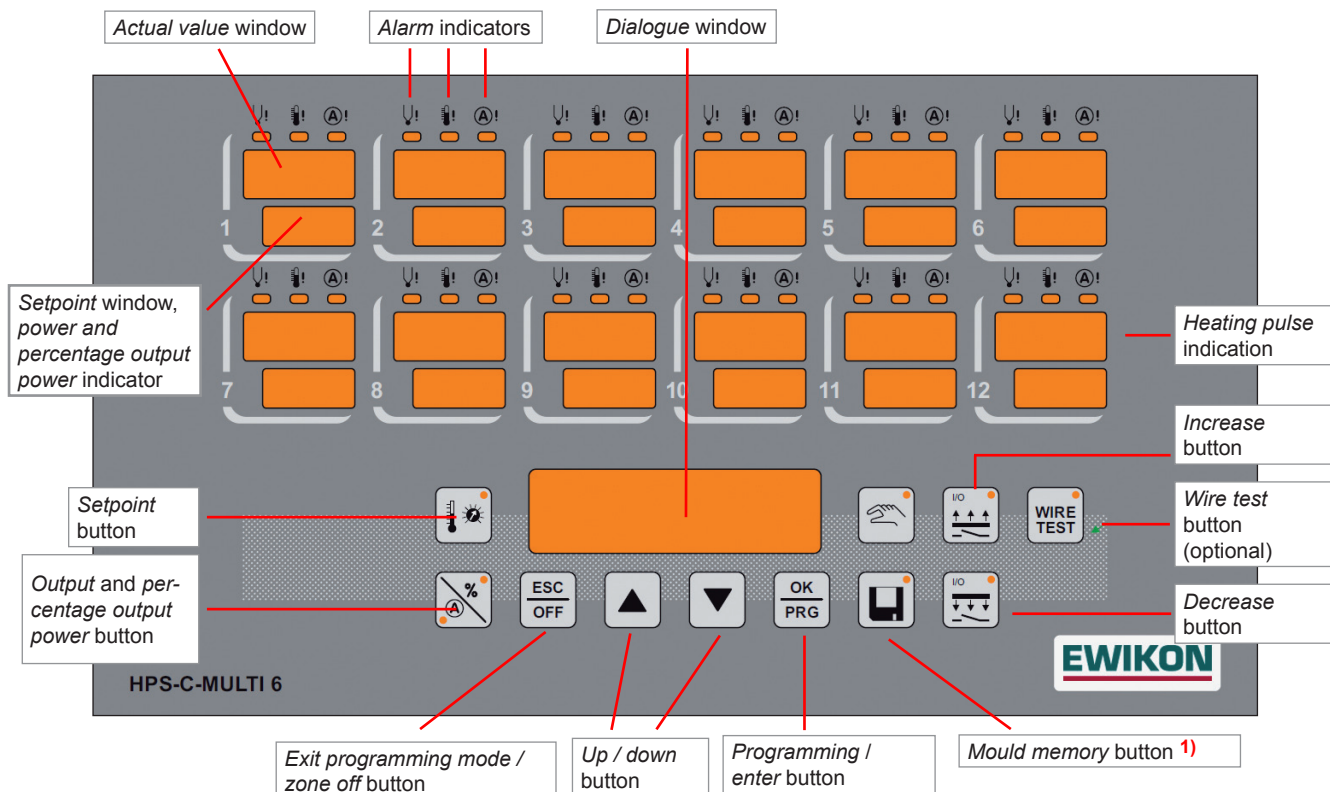
Set the setpoint values. Be sure to switch off all control zones that are not used currently (see *Setting Setpoint Value / Switching off Control Zones*).

The controllers will now heat up the mould in a uniform manner, thereby drying up any moist heating elements. During this process, the temperature deviation alarm indicator will be flashing for all active zones (soft-start ramp). The actual value window displays the temperature in °C. The standby indicator of deactivated zones is lit.

As soon as the setpoint has been reached the production process can be started on the basis of the factory settings.







Should malfunction occur during the start-up process, the cause of trouble will be indicated by the corresponding control panel indicator (see *Alarm Display*).

Front view




1) If set values are changed, the LED of the *mould memory* button flashes until all values have been stored permanently. The controller must not be switched off during this process to avoid any loss of data. Otherwise the message "E04" is displayed for a minute when switching the controller on next time and the standard parameter are transferred.

Setting Setpoint Value / Switching off Control Zones





Button	Command	Display
	Display setpoint value	The setpoint values are displayed, or OFF in the non-active zones. The key display lights up. The dialogue window shows <i>Z ALL</i>
	Select zone	The dialogue window displays the selected zone, <i>Z ALL</i> for all zones. Set setpoint value for all active zones with <i>Z COPY</i> .
	Confirm zone	The selected zone number flashes or all in case of <i>Z ALL</i> . The dialogue window displays <i>TEMP</i> . When selecting <i>Z COPY</i> setpoint value appears in the centre setpoint value window.
	Set setpoint value Switch off zone	Enter setpoint value using <i>UP / DOWN</i> buttons. Pressing and holding the <i>ESC / OFF</i> button and pressing it again switches the selected zone off.
	Switch on zone	Switches the selected zone on by pressing the <i>OK / PRG</i> button twice. The last entered setpoint value is reset.
	Confirm entry	Saves the set changes.
	Setpoint value display off	Button display off. Back to normal operation. Setpoint value increases will be applied with 100 % output performance!

*** Cancel without saving:**

	Cancel / Escape	Goes back one step in the programme without saving the current changes.
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Function Buttons

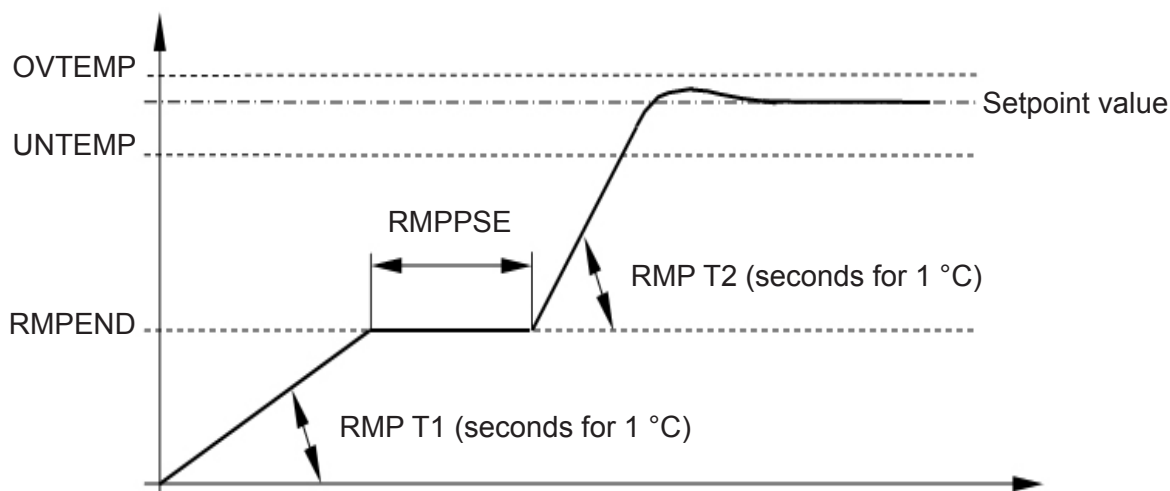
Button display lights up when pressed (function On)

	Power output	The setpoint value windows of the active zones show the current output power in percent or amperes. The button indicators % or $\text{\textcircled{A}}$ light up.
	Increase active	Temperature will be increased for the set uptime (also externally via alarm plug).
	Decrease active	Temperature will be decreased permanently (also externally via alarm plug).
	Interrupt operation	Pressing and holding the button switches the outputs off. Button display flashes. Re-start by pressing the button again.

*** For mould memory and manual operating mode see separate chapters.**

Soft-Start Ramp

Active on: Restart, re-heating after decrease mode or after alarm message



Alarm Display



Thermocouple

Lights up if thermocouple is broken, and the actual value display shows "- - -". If the automatic setter function (automatic mode) is active, the display alternates between "- - -" and "- A -". In case of incorrect connection, the display lights up and the actual value display shows the room temperature.



Temperature deviation

Flashes during the heating-up phase of the soft-start ramp. Remains on continually, if the set limit temperatures are exceeded in either direction (see Changing Setting Values). The power supply is also switched off in the event of over-temperature.








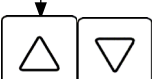


Over-current

Lights up if the set maximum current is exceeded (see Changing Setting Values) or flashes if the load circuit is broken. The power supply is also switched off in the event of over-current.


Mould Memory

Button	Command	Display
	Call up memory functions	The button indicator lights up. The zone numbers appear flashing in the actual value windows, and the current memory position is displayed in the dialogue memory.
	Select memory position	The selected memory position appears in the dialogue window.
	Confirm memory position	The display in the dialogue window changes to LOAD.
	Select function	With LOAD the saved data are called up, with SAVE the set values are saved at the selected memory position.
	Confirm entry	Dialogue display off. Back to normal operation. When data is saved the LED of the button "mould storage" flashes.

Changing Setting Values (Parameter Setting)

Button	Command	Display
 longer than 5 sec.	Change setting values	The dialogue window shows Z ALL, the actual value setting values windows show the zone numbers.
	Select zone	The selected zone is displayed in the dialogue window, Z ALL for all.
	Confirm zone	The dialogue window shows the first menu item, the selected zone number in the actual value window flashes.
	Select menu item	The current setting values appear in the setpoint value window.
	Confirm menu item	The current setting values appear in the setpoint value window.
	Change values	Changed setting values are displayed. (For setting range see <i>Setting Values / Factory Setting</i>)
	Save *	The changed setting values will be saved.
	Quit setting mode	Dialogue display off. Back to normal operation.

*** Cancel without saving:**

	Cancel/Escape	Goes back one step in the programme without changing the set values.
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Setting Values (Factory Settings)

Menu	Name	Function	Range	Factory setting
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The following functions can only be set globally for all zones

OVTEMP	Overtemperature alarm	Limit value, alarm output 1	0 - 50 °C above setpoint value	10 °C
UNTEMP	Undertemperature alarm	Limit value, alarm output 2	0 - 50 °C below setpoint value	10 °C
RMPEND	Ramp end	End temperature, ramp 1	80 - 120 °C	120 °C
RMP T1	Gradient, ramp 1	Heating speed, ramp 1 ²⁾	0-10 seconds for 1 °C	4 seconds
RMP T2	Gradient, ramp 2	Heating speed, ramp 2 ²⁾	0-10 seconds for 1 °C	2 seconds
RMPPE	Ramp pause	Pause between ramps 1 + 2	1 - 4 minutes	2 minutes
AUTO	Auto mode ¹⁾	Automatic setting in case of thermocouple break	1 = On; 0 = Off	0 (Off)
TEMPDN	Temperature decrease	Decrease in °C below setpoint value	10 - 200° C	50° C
TC TYP	Thermocouple	Fe-CuNi type J or L, NiCr-Ni type K	Display: H $\hat{=}$ type K J $\hat{=}$ type J L $\hat{=}$ type L	J
UNIT	Temperature unit	°C or °F	°C or °F	°C
SYNC	Compound heating	Deactivate ramp synchronization	1 = On; 0 = Off	1 (On)
CODE	Access code	Input locking	0 - 250	0 (deactivated)
TC TIM	Response time of thermocouple	Measuring time of temperature increase of thermocouple	0 - 10 minutes	0 (Off)
WAIT	Start time	Controller starts without optimisation when switched on	0 - 4 minutes	0 (manual start)
FW VER	Current firmware	Software version of controller board	V...	--
PRESET	Preset	Resets all values to factory settings	--	--

¹⁾ Auto mode operation is only possible after approx. 15 minutes of trouble-free operation!

²⁾ 0 = ramp off, setpoint value is approached as quickly as possible, no compound heating.


The following functions can be set individually for each zone




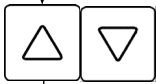


TEMPUP	Temp. increase function	Temperature above setpoint value	0 - 60 °C	20 °C
UPTIME	Increase time	Duration of increase time	0 - 60 min.	5 min.
CURR	Over-current	Limit value	5 - 16 A	16 A
TMPMAX	Max temperature	Max setpoint value	50 - 500 °C	450 °C

The following features are optional for the WireTest diagnosis function


WTPULS	WireTest Pulse	Testing percentage output	10 - 50 %	20 %
WTTEMP	WireTest Temperature	Testing excessive temperature ΔT	10 - 50 K	10 Kelvin
WTTIME	WireTest Time	Max test time / Testing zone	30 - 180 sec.	60 sec.

Manual Operating Mode

 In this operating mode the hotrunner is not regulated and will not be switched off in case of overtemperature. The hotrunner may therefore be overheated and severely damaged!




Button	Command	Display
	Manual operating mode	The setpoint value window displays <i>OFF</i> for all zones which are not in manual operating mode. The button indicator lights up.
	Select zone	The selected zone is displayed in the dialogue window.
	Confirm zone	The selected zone number flashes, the dialogue window shows <i>PULS</i> .
	Set output performance in %	Set output performance in % using the <i>UP / DOWN</i> buttons.
	Manual mode OFF	Pressing and holding the <i>ESC / OFF</i> button and again pressing the <i>ESC / OFF</i> button switches manual mode of the current zone off.
	Manual mode ON	Switches the selected zones on by pressing the <i>OK / PRG</i> button. The last set value is reset.
	Confirm entry	Saves the set changes.
	End entry	Button display off. Back to normal operation. The setpoint value window of zones in manual mode alternates between the current display and <i>PLS</i> .

*** Cancel without saving:**

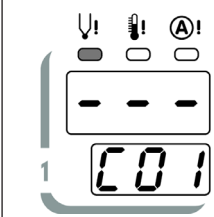
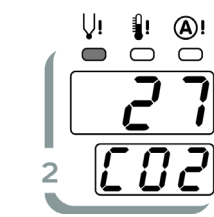
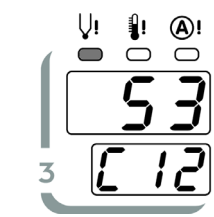
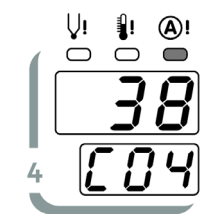
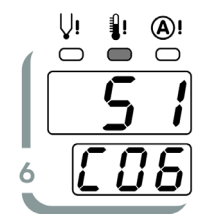
	Cancel / Escape	Goes back one step in the programme without saving the current changes.
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► **The activated manual operating mode is reset by switching the controller off at the main switch!**

WireTest (optional)

Button	Command	Display
	Diagnosis function	Button indicator lights up. The dialogue window displays <i>Start?</i> .
	Select function	By pressing the <i>OK</i> button you start the wiring diagnosis. The controller window displays <i>WAIT</i> . If this function has been activated when the system is heated up, the controller waits until the system has been cooled down to the optimal temperature to start the diagnostic process. Now each zone is checked for possible wiring errors. After completing the diagnostic process of all zones the dialogue window displays <i>STOP</i> and the zone windows display the result.
	Finish diagnosis function	Dialogue display off. Back to normal operation.

Diagnosis results

				
Thermocouple broken	Thermocouple reverse-poled	TC mixed up (here: zone 12 with 3)	Load error (short circuit/break)	TimeOut (ΔT not reached)
<ul style="list-style-type: none"> • Thermocouple alarm LED is lit • The <i>actual value</i> window displays three lines • The <i>setpoint value</i> window displays own zone number 	<ul style="list-style-type: none"> • Thermocouple alarm LED is lit • The <i>actual value</i> window displays room temperature • The <i>setpoint value</i> window displays own zone number 	<ul style="list-style-type: none"> • Thermocouple alarm LED is lit • The <i>actual value</i> window displays the zone temperature • The <i>setpoint value</i> window displays mixed up zone number 	<ul style="list-style-type: none"> • Current alarm LED is lit • The <i>actual value</i> window displays the zone temperature • The <i>setpoint value</i> window displays own zone number 	<ul style="list-style-type: none"> • Temperature alarm LED is lit • The <i>actual value</i> window displays the zone temperature • The <i>setpoint value</i> window displays own zone number

The zone windows of the faulty zones remain active after the diagnostic function has been carried out. The windows of faultless zones are dark until you exit the diagnostic function.

Replacing Controller Boards (item no. 60040.070)



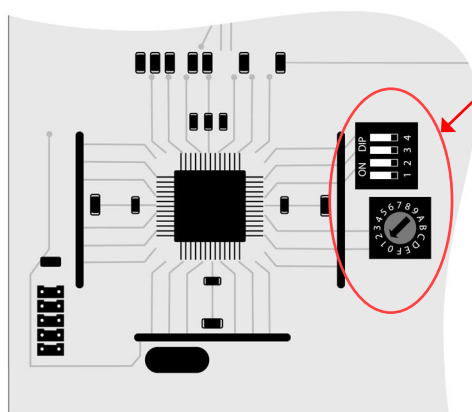
WARNING

Danger of death from electric shock!

Before starting any work on the device, be sure to pull mains plug!

Set address

When replacing the board directly the settings of the board to be exchanged can be applied. The board number is also the board address to be set – By using the turn switch *H1* (pict. 1) the board address can be set. Board 1 (zone 1-6) has to be set to address 1, board 2 (zone 7-12) to address 2 etc.



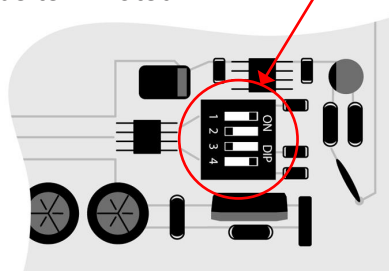
pic. 1

from PCB versions V1.3

	1	2	3	4	H1
board 1	OFF	OFF	OFF	OFF	1
board 2	OFF	OFF	OFF	OFF	2
board 3	OFF	OFF	OFF	OFF	3
board 4	OFF	OFF	OFF	OFF	4
board 5	OFF	OFF	OFF	OFF	5
board 6	OFF	OFF	OFF	OFF	6
board 7	OFF	OFF	OFF	OFF	7
board 8	OFF	OFF	OFF	OFF	8
board 9	OFF	OFF	OFF	OFF	9
board 10	OFF	OFF	OFF	OFF	A
board 11	OFF	OFF	OFF	OFF	B
board 12	OFF	OFF	OFF	OFF	C
board 13	OFF	OFF	OFF	OFF	D
board 14	OFF	OFF	OFF	OFF	E
board 15	OFF	OFF	OFF	OFF	F
board 16	OFF	ON	OFF	OFF	0

CAN termination

By sliding the DIL switches 1 and 4 below the cooling element to *ON* position (pict. 2) the CAN-BUS can be terminated. This is only necessary for devices with 18 zones and more. Only the last board in the system needs to be terminated.



pic. 2

Replacing fuses



WARNING

Danger of death from electric shock!

Before working on the controller make sure to pull mains plug!

The device may only be serviced by qualified personnel with sufficient electrotechnical knowledge.

Each controller board is designed for controlling 6 zones. For assignments, see page 16.

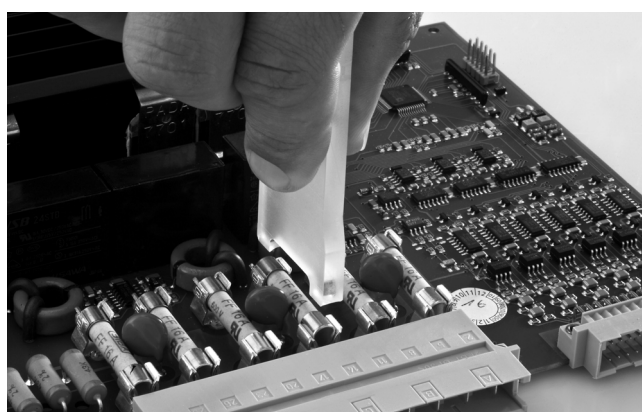
To replace fuses (item no. 18061) remove the front panel attachments, take off the front panel and disconnect the plug connections. Pull out the relevant controller board. Always replace fuses with others of the same type!

Reassemble in reverse order.

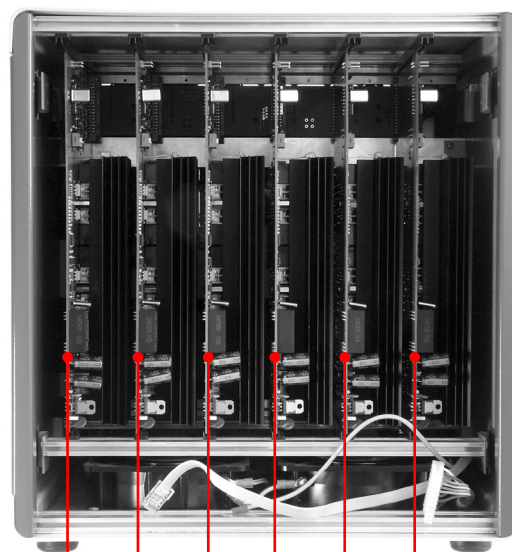
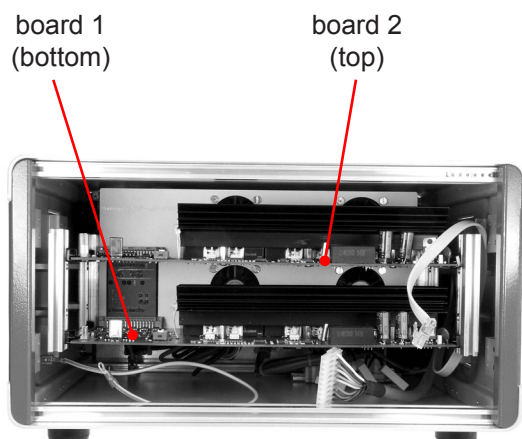
Removing fuses



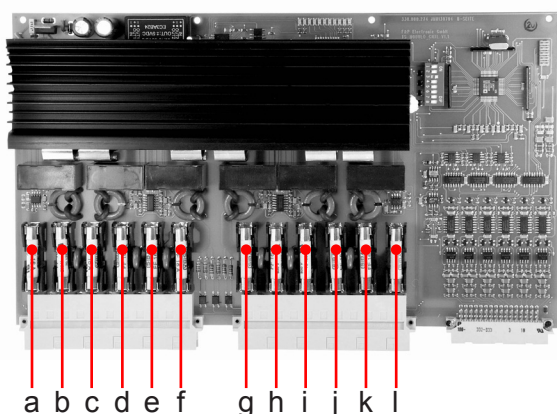
Installing fuses



Zone / Controller Board Assignment (item no. 60040.070)



board 6 (left) 5 4 3 2 1 (right)



Fuses
Controller board

Zone	Board	Fuse	Zone	Board	Fuse
1	1	a+b	19	4	a+b
2	1	c+d	20	4	c+d
3	1	e+f	21	4	e+f
4	1	g+h	22	4	g+h
5	1	i+j	23	4	i+j
6	1	k+l	24	4	k+l
7	2	a+b	25	5	a+b
8	2	c+d	26	5	c+d
9	2	e+f	27	5	e+f
10	2	g+h	28	5	g+h
11	2	i+j	29	5	i+j
12	2	k+l	30	5	k+l
13	3	a+b	31	6	a+b
14	3	c+d	32	6	c+d
15	3	e+f	33	6	e+f
16	3	g+h	34	6	g+h
17	3	i+j	35	6	i+j
18	3	k+l	36	6	k+l

Extended Error Codes of HPS-C-Multi6

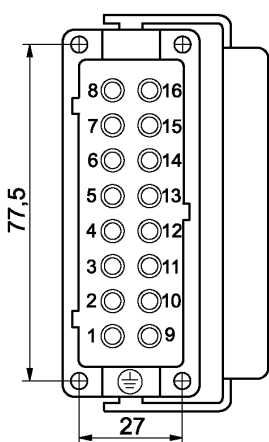
The following errors are displayed in the setpoint window of the relevant group of zones:

Display	Error	Possible cause
E01	STACK memory error	Internal memory overflow, programme error
E02	XRAM memory error	Internal memory error, one or several memory cells are defective
E04	EEPROM memory error	Invalid data memory, data concerned are reinitialised (e.g. controller was switched off just after having changed values)
E08	IRAM memory error	Internal memory error, one or several memory cells are defective
E16	Watchdog error	Undefined programme state, restart
E32	Phase error	One or more phases of supply are missing, e.g. fuses blown in the cable (check connector socket)
---	CAN error	No communication with the controller module, check internal sockets, modules might be damaged
hot	Temp. of cooling element	Excessive temperature of cooling element, overload of output stages, check fan

If several errors occur at the same time, a combination of error codes is displayed, e.g. E36 = E04 and E32.

Connectors (acc. to DIN 16765-A)

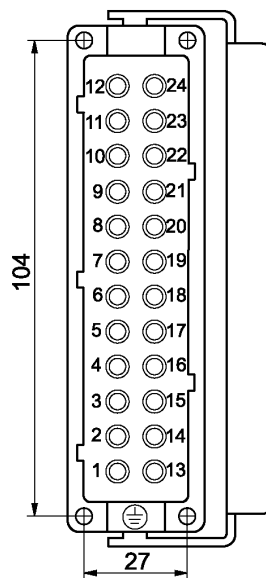
Load 16-pin



Zone	PIN
1	1 / 9
2	2 / 10
3	3 / 11
4	4 / 12
5	5 / 13
6	6 / 14

Earth conductor wired to housing!

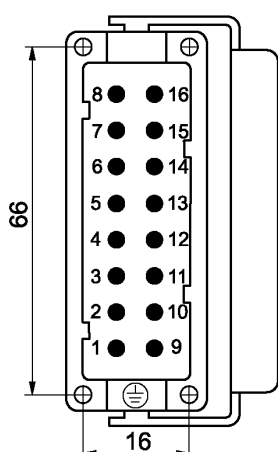
Load 24-pin



Zone	PIN
1, 13, 25	1 / 13
2, 14, 26	2 / 14
3, 15, 27	3 / 15
4, 16, 28	4 / 16
5, 17, 29	5 / 17
6, 18, 30	6 / 18
7, 19, 31	7 / 19
8, 20, 32	8 / 20
9, 21, 33	9 / 21
10, 22, 34	10 / 22
11, 23, 35	11 / 23
12, 24, 36	12 / 24

Earth conductor wired to housing!

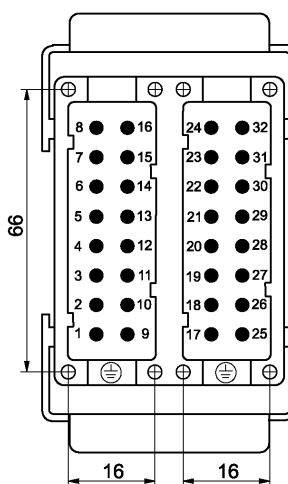
Thermocouple 16-pin



Zone	PIN
1	1 + / 9 -
2	2 + / 10 -
3	3 + / 11 -
4	4 + / 12 -
5	5 + / 13 -
6	6 + / 14 -

Earth conductor wired to housing!

Thermocouple 32-pin



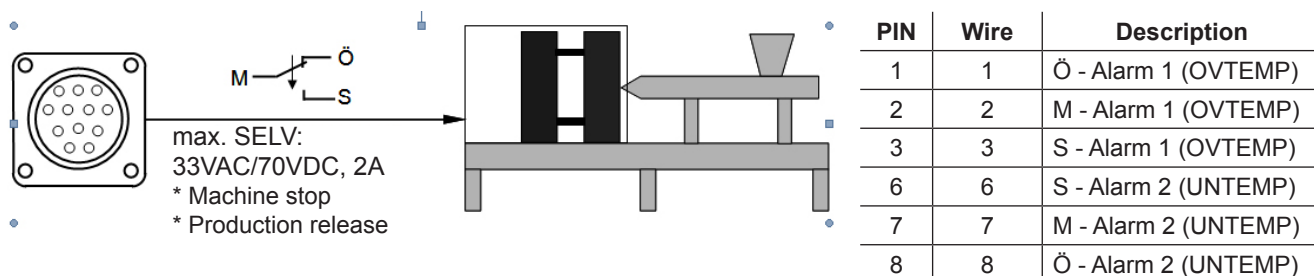
Zone	PIN
1, 13, 25	1 + / 9 -
2, 14, 26	2 + / 10 -
3, 15, 27	3 + / 11 -
4, 16, 28	4 + / 12 -
5, 17, 29	5 + / 13 -
6, 18, 30	6 + / 14 -
7, 19, 31	7 + / 15 -
8, 20, 32	8 + / 16 -
9, 21, 33	17 + / 25 -
10, 22, 34	18 + / 26 -
11, 23, 35	19 + / 27 -
12, 24, 36	20 + / 28 -

Earth conductor wired to housing!

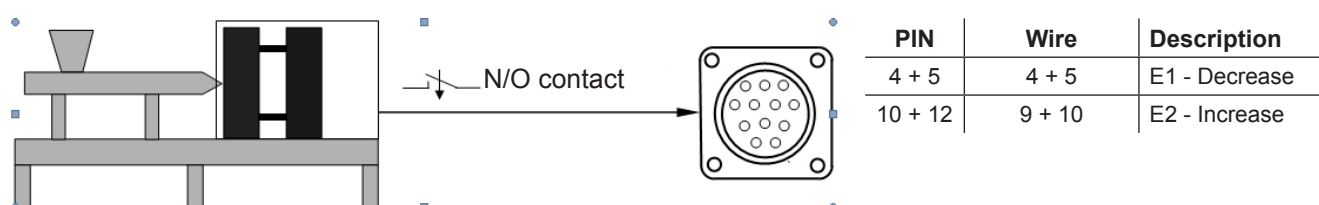
Connectors

Alarm connector 12-pin (alarm cable 60070.021)

Alarm outputs: 1 = overtemperature, 2 = undertemperature



Alarm inputs: 1 = temperature decrease, 2 = increase



Technical data

Working conditions: Operation only in closed rooms, max. altitude 2000 m M.S.L. Relative humidity up to 80 % at 30 °C (86 °F), moisture condensation not permitted, pollution severity level 2, operating temperature 10 - 40 °C (0 - 104 °F), storage temperature 0 - 50 °C (32 - 122 °F)

Housing: Metal half-shell housing, IP20, protection class I

	Dim. [mm] (WxHxD)	Weight [kg]
6-zone / 12-zone	approx. 350 x 200 x 390	approx. 12
24-zone / 36-zone	approx. 350 x 380 x 390	approx. 22

Power supply voltage: 4-conductor three-phase network, 230/400 VAC +/-10 %, 50 - 60 Hz, overvoltage class II, CEE 32 connector

Connected load: max 3 x 32 A

Plug connection: Load and thermocouple separated; 16-, 24- or 32-pin (depending on number of zones)

Thermocouple: Fe-CuNi type J or L, NiCr-Ni type K

Power output: Contactless semiconductor output stage, max 16 A, zero switching

Control range: 50 - 500 °C (122 - 932 °F), precision better 1 °C (if hot runner permits)

Spare Parts

Item No.	Description
18061	Fuse
60040.075	Fan for 6-zone and 12-zone controller
60040.076	Fan for 24-zone and 36-zone controller
60040.072	Display card
60040.071	Master card Multi 6
60040.073	Master card Multi 6 WT
60040.074	Power supply 24 V
60040.070	Controller board

We hereby confirm that the products described below conform to the essential protection requirements of the following European Directives

2006/95/EC “Low Voltage Directive”

and

2004/108/EC “EMC Directive”

with respect to their design type. This requires that the products are used for their intended purpose and that the assembly and operating instructions are observed.

Alterations made to the product will void the declaration of conformity.

Producer: EWIKON Heißkanalsysteme GmbH
Siegener Straße 35
35066 Frankenberg / Germany
phone: +49 (0) 6451 / 501-0

Product: **HPS-C-MULTI 6 hotrunner controllers
for the operation of 230 V hotrunner systems**

Type: **69010.306 ; 6-zone controller
69010.312 ; 12-zone controller
69010.324 ; 24-zone controller
69010.336 ; 36-zone controller
69010.412 ; 12-zone controller
69010.424 ; 24-zone controller
69010.436 ; 36-zone controller**

Applied standards: DIN EN 61010-1: 2011-07 “Safety requirements for electrical equipment for measurement, control, and laboratory use - part 1”
DIN EN 61000-6-2: 2006-03 “Immunity for industrial environments”
DIN EN 61000-6-4: 2007-09 “Emission for industrial environments”

Note: It is necessary to use genuine connecting cables outside the device to meet the requirements according to DIN EN 61000-6-2 and DIN EN 61000-6-4.

Frankenberg, 02 April 2012



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