

OPERATING INSTRUCTIONS

February 2006
(Subject to technical modifications)

TEMP-STAR[★]

MULTI 6 – 36

HUMMEL AG

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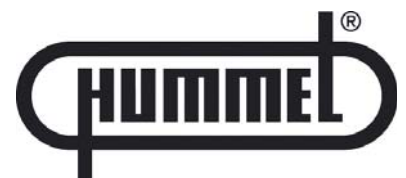


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Important operating instruction – do not ignore!



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 cards unless the unit has been disconnected from the power supply. Do only use the same type of fuses, 16 amps FF. (see Repair Fuses)
-  Prior to inserting the hot-runner mold cables, be sure to verify that all connectors have been properly connected. (see Connections)
-  Check power cable and mold connecting cables for potential defects on a regular basis! Be sure to use a new cable whenever the cable sheath is found to be defective!




Warranty

For all **TEMP-STAR*** controllers, the manufacturer issues a 2-year warranty, with the period of warranty beginning on the day when the product is dispatched to the buyer. This warranty shall not cover any damage that has been caused by improper handling, wrong connection or improper use of the product. Return shipments must be addressed to **HUMMEL AG**, Geschäftsbereich EL Waldkirch (Germany), using the original packaging.

Intended Use

- TEMP-STAR*** units are industrial temperature controllers for controlling the melting temperature of hot-runner molds. The temperature is measured with thermocouples and then adjusted accordingly.
-  To prevent overheating damage in case of malfunction, an external temperature fuse must be integrated into the heating circuits.
-  The manufacturer will accept no responsibility for damage caused by improper use of the unit.

General Instructions

- A separate "control zone" is required for every load to be connected.
- A "control zone" consists of a temperature sensor input, and a load output including a load circuit fuse.
-  When connecting the hot-runner mold cables, be sure to assign the cables to the correct connectors. (see Connections)
-  Unused controller zones must be switched off.
-  For connecting the load circuits, a heat resistant flexible cable must be used. For the temperature sensors, a special compensating cable is required! (see Accessories)

Installation

Place your **TEMP-STAR**★ controllers on a stable, flat working surface. The displays should be at eye-level with the user.

Cooling fans prevent overheating of the output stage. The vents are at the unit's rear and underside (MULTI 18 – 36). Be sure that the air can circulate freely through the appropriate vents.

Cleaning

The housing and the control panel may be cleaned with a soft cloth soaked with alcohol if necessary. However, do not use acid cleaners or scouring agents!

Service

We recommend cleaning the ventilation slots on the rear and underside of the MULTI 18 – 36 units at regular intervals. If necessary, please change the filter.

Note that this work may only be carried out by qualified service personnel! No further servicing or maintenance is required. Should you experience any malfunction, please call your **TEMP-STAR**★ Service or contact the manufacturer.



Alarm Indicators



Thermocouple alarm

Lights up in case of TC malfunction (open, reversal). The instantaneous value display shows "- - -" or the temperature of the controller by TC reversal. If Automode is active, the display shows alternating "- - -" and "- A -".



Temperature deviation alarm

Flashes during the heating-up phase of the soft-start ramp. Lights up continuously if the temperature exceeds or falls below set limits. In case of overtemperature, the power supply is interrupted.



Load alarm

Lights up if the set maximum current is exceeded (see Change Parameters) or flashes by open load. In case of overcurrent, the power supply is interrupted.

Parameters (Factory Preset)

Menu Item	Name	Function	Range	Standard Factory-preset
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The following parameters can only be set for all zones

O V T E M P	Overtemperature	Limit value, alarm output 1	0 - 50°C above setpoint	10°C
U N T E M P	Undertemperature	Limit value, alarm output 2	0 - 50°C below setpoint	10°C
R M P E N D	Ramp end	Final temperature ramp 1	80 - 120°C	120°C
R M P T 1	Rise, ramp 1	Heating speed, ramp 1	2 - 10 seconds for 1°C	4 seconds
R M P T 2	Rise, ramp 2	Heating speed, ramp 2	2 - 10 seconds for 1°C	2 seconds
R M P P S E	Ramp pause	Pause between ramps 1 + 2	1 - 10 minutes	1 minute
A U T O	Automode *	Automatic control if TC is open (average output power)	1 = On; 0 = Off	0 (Off)
T E M P D N	Standby	Temperature below setpoint	10 – 200°C	50°C
T C T Y P	Thermocouple	Type of Thermocouple	J or L	J
U N I T	Temperature unit	°C or °F	C or F	°C
P R E S E T	Preset	Set to factory preset values	-	-
F W V E R	Actual firmware version	Software version controller card	V...	-
C O D E	Access code	Lock function	0 - 250	0 (inactive)
S Y N C	Compound heating	Deactivates softstart synchronisation	1 = On; 0 = Off	1 (On)

The following parameters can be set individually for each zone

T E M P U P	Boostfunction	Temperature above setpoint	5 - 60°C	20°C
U P T I M E	Boosttime	Duration of boost process	0 - 180 sec.	20 seconds
C U R R	Overload	Limit value	1 - 16 A	16 A
T M P M A X	Setpoint limitation	Max. setpoint setting	50 - 500°C	450°C

* Automode function is available only after **failure-free** operation for approx. 15 min!

Start-Up

The controller must be connected to a three-phase power supply source using a CEE connector. (see Specifications)

After carefully checking the cables for potential defects, connect the hot-runner mold to the controller. If needed, you can also make a connection to the molding machine using the alarm connector. Connect the power cable, switch on the controller with the main switch at the backplane.



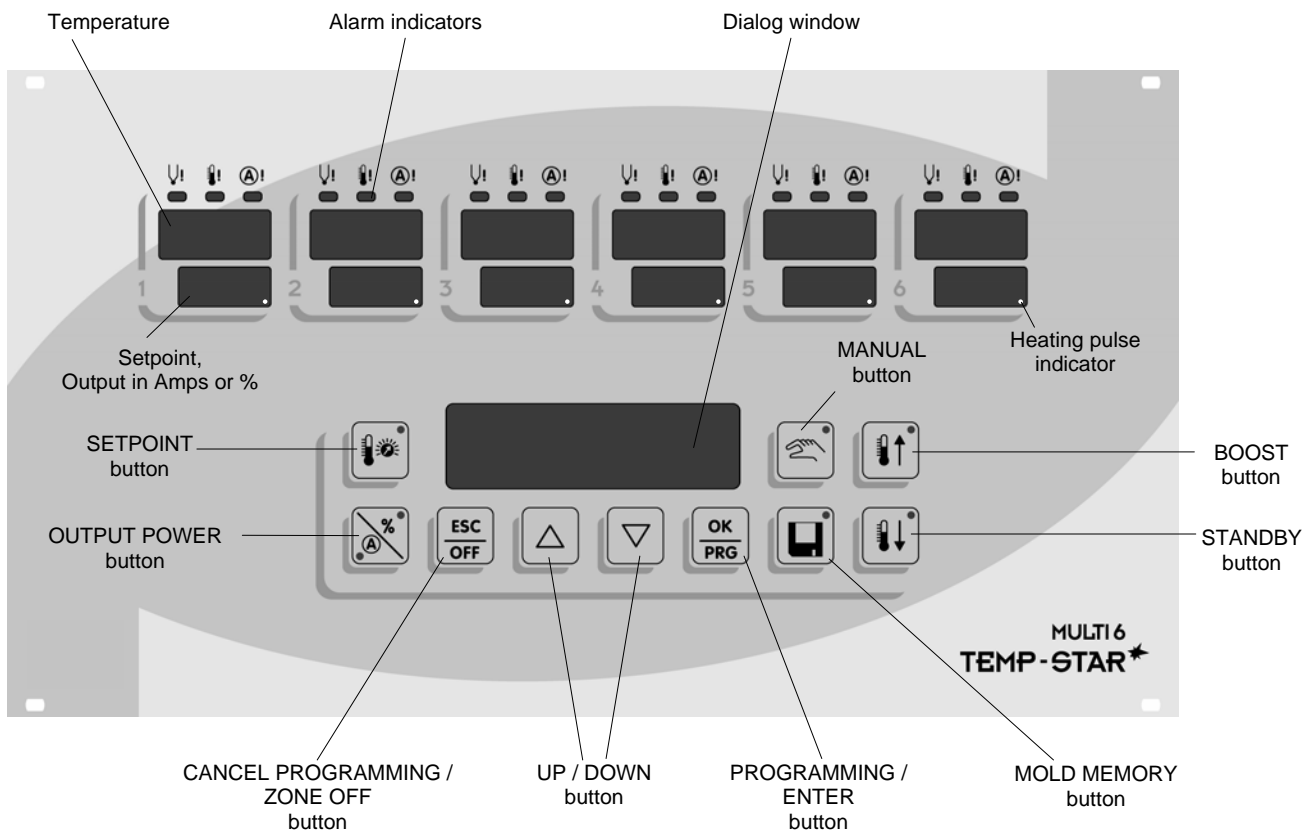
Select the desired setpoint. Note that all unused control zones must be switched off! (see Setpoints, Zones switch off)

The controller will now heat up the mold in a uniform manner, thereby drying up any moist heating elements. During this process, the temperature deviation alarm indicator will be flashing (Soft-start ramp). The inactive zones will show a standby indicator.


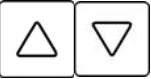





As soon as the setpoint has been reached, the production process can be started on the basis of the factory settings.

Should malfunction occur during the start-up process, the cause of the trouble will be indicated by the corresponding indicators. (see Alarm indicators)

Front View






Setting Setpoints / Zones Switch Off

Button	Command	Display / Result
	Display setpoint	Upon pressing this button, the setpoints are displayed, or oFF for the non-active zones. The button indicator lights up. The dialog window shows Z ALL.
	Select zone	The selected zone is indicated in the dialog window. Z ALL for all zones.
	Confirm zone	The selected zone no. is flashing, or all zones at Z ALL. The dialog window shows TEMP.
	Set setpoint, - Zone switch off - Zone switch on	Change the setpoint with the UP / DOWN buttons. Keeping the ESC / OFF button pressed for a few seconds and press again, switches off the selected zone. Press the OK / PRG button 2 times will switch on the selected zone. The last setpoint before deactivating this zone will be set again.
	Confirm setting	Stores the changed values.
	Setpoint display off	Button indicator off. Back to standard run mode. Increased setpoints will be reached with 100% power output!
* Exit Setting without storing:		
	Cancel	Pressing this button will lead back one programming step without storing the changed value.




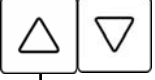





Function Keys

Button indicator lights up upon activation of respective button (On).

	Output power	Pressing this button once indicates the output power in % of the maximum in the setpoint display. Pressing it again shows you the load current (in amperes). The button indicator % or A lights up. Pressing once more returns to the setpoint value.
	Boost function active	Increases temperature temporarily. (also externally via alarm connector)
	Standby active	Decreases temperature permanently. (also externally via alarm connector)

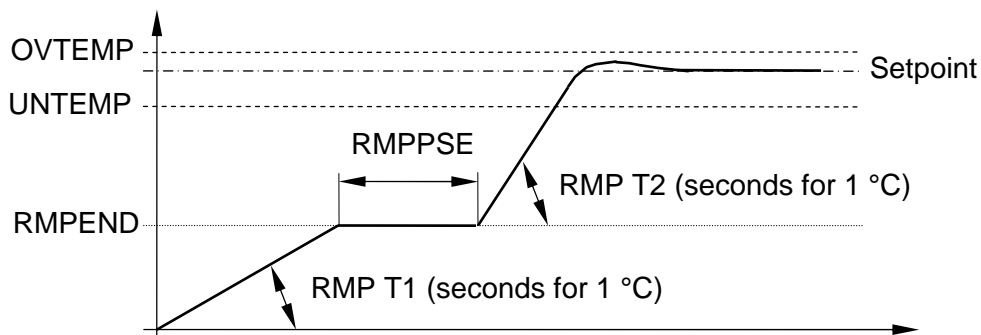
*** Mold Memory and Manual Mode see separate chapter.**

Change Parameters

Button	Command	Display / Result
 For more than 5 s	Change Parameters	The Dialog window shows Z ALL while the zone numbers are shown in the setpoint displays.
	Select zone	The selected zone is indicated in the dialog window. Z ALL for all zones.
	Confirm zone	The selected zone no. is flashing, or all zones at Z ALL. The Dialog window shows the first menu item.
	Select menu item	The Dialog window shows the respective menu item.
	Confirm menu item	Currently used parameters are shown in the setpoint display.
	Change value	Modified parameters are shown in the setpoint display. (see Parameters / Factory Preset)
	Store *	Modified parameters will be stored.
	Exit setting	Dialog display off. Back to standard run mode.
	* Exit programming without storing: Cancel	Pressing this button will lead back one programming step without storing the changed value.








Soft-Start Ramp

Active by: Start-Up, Heating after standby or alarm.



Manual Mode






ATTENTION: In this mode the hotrunner is not controlled and not switched off in case of overtemperature. So overtemperature and damaging is possible!

Button	Command	Display / Result
	Manual mode	Upon pressing this button the setpoint display of all inactive zones shows oFF. The button indicator lights up.
	Select zone	The selected Zone is displayed in the dialog window.
	Confirm zone	The selected zone no. is flashing. The dialog window shows TEMP.
	Set power value	With the UP / DOWN buttons in percent.
	- Manual mode Off	Keeping the ESC / OFF button pressed for a few seconds and press again, switches off the Manual mode of the selected zone.
	- Manual mode On	Press the OK / PRG button 2 times will switch on the manual mode of the selected zone. The last power value before deactivating will be set again.
	Confirm setting	Stores the selected power value.
	Exit setting	Button indicator off. Back to run mode. The setpoint display of the zones in manual mode will toggle between the selected power value in percent and PLS.
	Cancel	Pressing this button will lead back one programming step without storing the changed value.

* **Exit Setting without storing:**

* **The Manual-Mode will be cancelled by switching off the unit with the main switch!**

Mold Memory

Button	Command	Display / Result
	Mold memory	The button indicator lights up. Zone numbers are flashing in the setpoint displays, the dialog window shows the active mold memory.
	Select memory location	Inside the dialog window the selected memory location is displayed.
	Confirm memory location	The dialog window shows LOAD.
	Select function	With LOAD you can recall the settings of a stored hotrunner mold, with SAVE you store all settings in the selected memory location.
	Confirm setting	Dialog display off. Back to standard run mode.

Repair Fuses



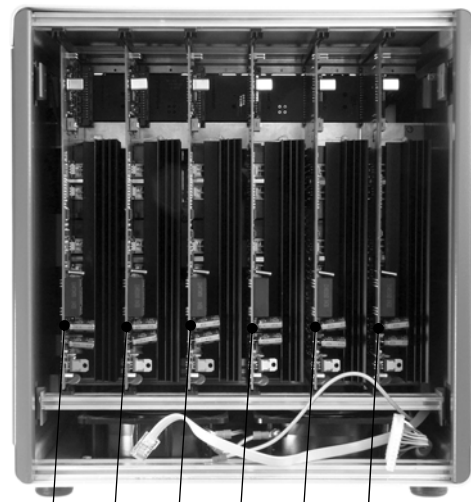
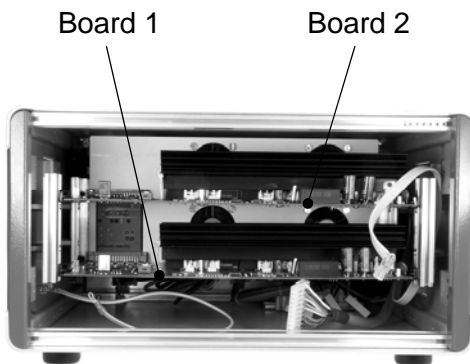
The fuses may be changed only by qualified personnel. Be sure to withdraw the mains plug before opening the housing!

For changing the fuses unlock the front panel, take away the front sheet and disconnect the unit. Now you can pull out the controller board with the corresponding fuses. Please replace only with similar fuses!

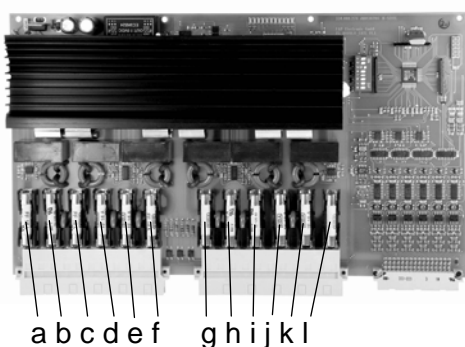
The controller boards are designed for 6 zones each.

Assembling in reverse order.

Zone No. / Controller boards



Controller board 6 5 4 3 2 1



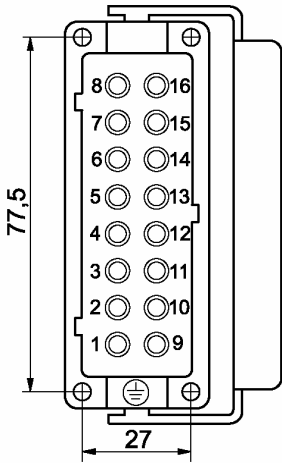
Fuses on controller board

Zone	Board	Fuses
1	1	a + b
2	1	c + d
3	1	e + f
4	1	g + h
5	1	i + j
6	1	k + l
7	2	a + b
8	2	c + d
9	2	e + f
10	2	g + h
11	2	i + j
12	2	k + l
13	3	a + b
14	3	c + d
15	3	e + f
16	3	g + h
17	3	i + j
18	3	k + l

Zone	Board	Fuses
19	4	a + b
20	4	c + d
21	4	e + f
22	4	g + h
23	4	i + j
24	4	k + l
25	5	a + b
26	5	c + d
27	5	e + f
28	5	g + h
29	5	i + j
30	5	k + l
31	6	a + b
32	6	c + d
33	6	e + f
34	6	g + h
35	6	i + j
36	6	k + l

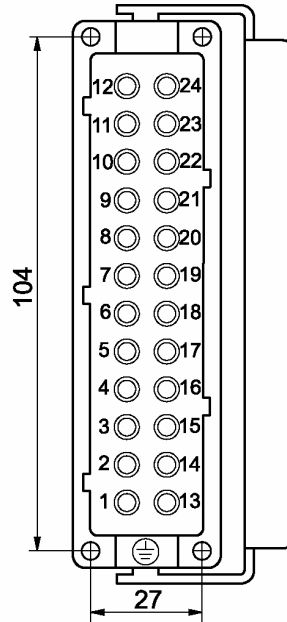
Connections (following DIN 16765-A)

Load 16-Pole



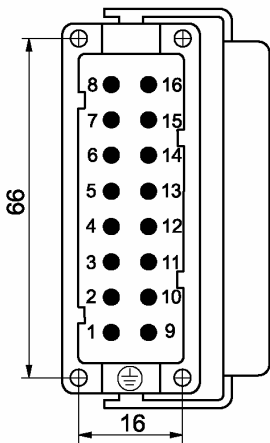
Zone	PIN
1	1 / 9
2	2 / 10
3	3 / 11
4	4 / 12
5	5 / 13
6	6 / 14
Ground connects to housing!	

Load 24-Pole



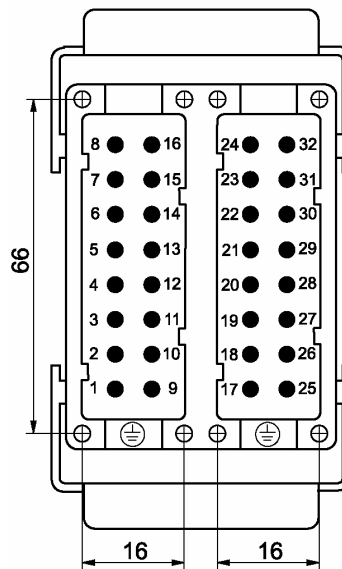
Zone	PIN
1, 13, 25	1 / 13
2, 14, 26	2 / 14
3, 15, 27	3 / 15
4, 16, 28	4 / 16
5, 17, 29	5 / 17
6, 18, 30	6 / 18
7, 19, 31	7 / 19
8, 20, 32	8 / 20
9, 21, 33	9 / 21
10, 22, 34	10 / 22
11, 23, 35	11 / 23
12, 24, 36	12 / 24
Ground connects to housing!	

Thermocouple 16-Pole



Zone	PIN
1	1 + / 9 -
2	2 + / 10 -
3	3 + / 11 -
4	4 + / 12 -
5	5 + / 13 -
6	6 + / 14 -
Ground connects to housing!	

Thermocouple 32-Pole

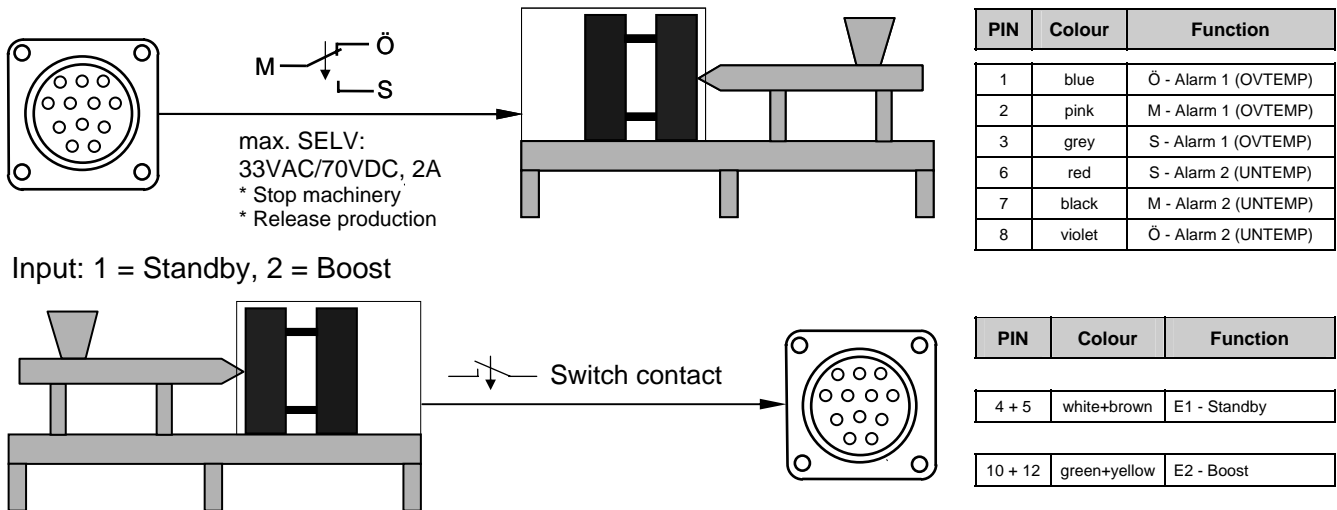


Zone	PIN
1, 13, 25	1 + / 9 -
2, 14, 26	2 + / 10 -
3, 15, 27	3 + / 11 -
4, 16, 28	4 + / 12 -
5, 17, 29	5 + / 13 -
6, 18, 30	6 + / 14 -
7, 19, 31	7 + / 15 -
8, 20, 32	8 + / 16 -
9, 21, 33	17 + / 25 -
10, 22, 34	18 + / 26 -
11, 23, 35	19 + / 27 -
12, 24, 36	20 + / 28 -
Ground connects to housing!	

Connections

Alarm connector 12-pole (Mating connector or alarm cable see accessories)

Alarm Output: 1 = overtemperature, 2 = undertemperature



Specifications

Working conditions:	To be operated only in closed rooms. Altitude max. 2000m. Relative humidity up to 80% at 30°C (86°F). Avoid moisture condensation! Pollution severity level 2.	
Temperature range:	Operating: 10...40°C (50...104°F)	Storage: 0...50°C (32...122°F)
Housing:	Metal-enclosure powder coated, protection IP20, class of protection I	
	Dimensions [mm] (WxHxD)	Weight [kg]
	MULTI 6 + 12 approx. 350 x 200 x 390	approx. 12
	MULTI 18 - 36 approx. 350 x 380 x 390	approx. 22
Power supply:	4-conductor three-phase system 230 / 400VAC +/- 10%, 50 Hz, Overvoltage class II, CEE 32A connector (other Supplies on request)	
Connected load:	max. 3 x 32 A	
Connection:	Load and Thermocouple separate, 16-, 24-, 32-pole (depending on number of control zones; pinning see "Connections")	
Thermocouple:	Fe-CuNi, type J or L	
Power output:	Contactless semiconductor output stage, max. 16 A, zero switching	
Control range:	50...500°C (122...932°F)	
Control precision:	Better 1°C, self-optimizing (if hotrunner permits)	