

## Hotrunner Multizone Temperature Controller NR5000-v3



Fig.: NR5016 for 16 zones

- Compact controller for 10, 12 or 16 zones
- Specially designed for hotrunner applications
- Easy to understand, user friendly operation
- Automatic adaptation to the controlled system
- Integrated load-current monitor
- Many programmable specific hotrunner functions
- Comes standard with mould diagnosis function !

### **Application :**

The NR5000 concept was specially designed for hotrunner applications and therefore comes up with high temperature-stability, easy operation and numerous self-monitoring-features.

All units are usable regardless of the mould manufacturer.

### **Design :**

Control-electronics and solid-state relays are combined in one compact, rugged metal casing. Load-fuses are mounted on the side and thus provide an easy access in case of failure. Bright LCD-display for comfortable and simple control and operation of all zones plus dedicated keys for the most common functions.

### **Function :**

#### **Closed-loop control**

Microprocessor controller with self-tuning function : automatically determines the control-characteristics of each heating zone and adapts the control parameters accordingly. This assures optimal temperature control for quick hot-tips as well as for slow manifold heaters. Many control parameters can be set-up specific, this makes the controller an ideal unit for complex and difficult moulds. Unique feature : Auto-tuning can be started in hot operation as well.

### **LCD-display with tracing function**

The bright LCD-display permits an easy, quick overview on all important functions and control parameters. On request, it shows all zones together (actual temperature) or every zone in detail.

Furthermore, a trend display and a tracing function are available, which shows the variation in actual temperature for a given zone.

#### Detail view single zone :



#### Tracing function single zone :



See page 3 for more screen views

### **Specific hotrunner functions**

Beside the very precise temperature control of every zone, numerous hotrunner program

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functions can be chosen, for all zones together or for every single zone as appropriate. The most important ones are :

**Soft-start :** During soft-start, the controller unit works with reduced temperature and power setting (factory-defaults: 50% / 80°C / 5min). Cold heaters are gently pre-heated, moisture is expelled.

**Guided heat-up :**

All zones can be heated-up together - avoids hot-tips being at set-point temperature before the slower manifold zones and prevents stress inside the mould during start-up.

**Stand-by operation :**

Each heating-zone is equipped with a second temperature set-point. By pressing the "stand-by"- button or closing an external contact, all zones simultaneously are switched over to the second set-point, which may be used for stand-by operation.

**Boost:** Single-time override of the desired temperature-value melts „frozen“ nozzles

**„Zone coupling“ :** Coupling of a zone to any other zone with working thermocouple is also possible, e.g in case of a broken thermocouple or instable control due to a bad position of the sensor.

**„Safety-shutdown heating“ :**

The 1<sup>st</sup> alarm, typically program-med as high-temperature alarm, is wired to the central

safety masterswitch of the unit. This prevents damage of the mould with too high actual temperature and avoids costly repair. If desired, this safety function can be temporarily switched off in the set-up phase of a new mould.

**Direct access keys**

The most common hotrunner functions „Boost“ and „Stand-by“ can be started independantly from the display with a dedicated key on the front panel.

**Process survey functions**

Load current monitoring for every zone independently, 2 programmable alarms per zone, sensor and heater breakage are detected automatically and will be displayed on the screen. If sensor breakage happens, the controller automatically switches over to constant power-setting with the last assigned value for this zone. Manual overriding of this value is possible at any time. Beside those alarms, many other process parameters can be set-up and surveyed as well.

**External alarm output**

The 2 alarms on every zone are combined by a floating contact as common alarm output for the whole unit and wired to an external alarm connector on the back side. This permits a connection with external units such as an injection moulding machine or central production alarm system. The external stand-by input is wired on this connector as well.

Actual value / setpoint comparision :

ZONE	1	2	3	4	5	6	7	8
ISTWERT	125	125	125	125	125	125	125	124
SOLLWERT	125	125	125	125	125	125	125	125
ZONE	9	10	11	12	13	14	15	16
ISTWERT	125	125	125	124	124	125	125	125
SOLLWERT	125	125	125	125	125	125	125	125
Editieren mit Enter starten								

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Overview all zones :

ZONEN-STATUS	1	110	2	110	3	110	4	110
	5	110	6	110	7	110	8	110
	9	110	10	110	11	110	12	110
	13	110	14	110	15	110	16	110

Example 1 mould-diagnosis :

Diagnosis running, actually tested zone (here zone 1) and remaining testing time are shown.

ZONE	1	2	3	4	5	6	7	8
ISTWERT	11	0	0	0	0	0	0	0
ZEIT	8.0	2.0		2.0	10	10	10	10
ZONE	9	10	11	12	13	14	15	16
ISTWERT	0	0	0	0	0	0	0	0
ZEIT	10	10	10	10	10	10	10	10
Diagnose Phase2: ▲ Zone skip								

Example 2 mould-diagnosis:

Diagnosis terminated without failure (zone 3 was switched off).

ZONE	1	2	3	4	5	6	7	8
FÜHLER	1	2	3	4	5	6	7	8
HEIZUNG	1	2	-	4	5	6	7	8
ZONE	9	10	11	12	13	14	15	16
FÜHLER	9	10	11	12	13	14	15	16
HEIZUNG	9	10	11	12	13	14	15	16
Diagnose erfolgreich beendet								

Example 3 mould-diagnosis:

Diagnosis showed failures :

Heater zone 4 not found, sensor / heater zones 5 and 6 interchanged. (diagnosis zones 7 and 8 manually skipped by the operator, 9-16 switched off).

ZONE	1	2	3	4	5	6	7	8
FÜHLER	1	2	3	4	5	6	7	8
HEIZUNG	1	2	-	4	5	6	-	-
ZONE	9	10	11	12	13	14	15	16
FÜHLER	9	10	11	12	13	14	15	16
HEIZUNG	-	-	-	-	-	-	-	-
Fehler: Siehe Anleitung								

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## Specification :

### **Mains voltage**

230/400V +/-10%, 3~, 48...63Hz

### **Nominal rating / nominal current**

17,25kW total / 3x25A

### **Heating load per zone**

Max. 3,6kW / 16A

### **Fuses**

16AFF, 6,3x32mm, heating

### **Power control**

0 - 100% proportional, zero-voltage switching

### **Automatic soft-start** (factory default settings)

Power-setting 50% / temp. 80°C / time 5 min

### **LCD-Display**

Shows actual temperature, setpoint, alarms, configuration parameter, tracing function

Language choice English / German, plain language information for control- and configuration-parameters.

### **External stand-by / alarm exit:**

7 pin connector:

2 floating relay contacts for alarms, max. 230V, 3A, floating input for external stand-by, works on all zones together, wired in parallel with internal „Stand-by“-key on the front panel.

### **Process-high-alarm**

0...800°C programmable, default value +50°C

### **Low current-alarm**

0,0 ... 19,9A programmable, default value 1A minimum current

### **Sensor input**

Fe-CuNi type (J) 0...600°C  
Other types on request



Fig.: Back side NR5016 for 16 zones

### **Sensor and heater connection**

16- or 24-pin industrial heavy duty standard-connector 16A/400V, pin assignment following NR-norm, other pin assignments available

### **Precision**

0,25% FS

### **Insulation voltage**

2,5kV mains / controller

### **Dimensions**

429 x 380 x 167mm (WxDxH, 10 to 16 zones)

### **Colour**

Structured RAL3000 Casing

### **Weight**

NR5016 : ca. 20 kg

Designation	Art.-Nr.
NR 5010	81510v3.200
NR 5012	81512v3.200
NR 5016	81516v3.200