



Handheld new defined. USB Log and Intuitive User Interface



Smart Controller

Introducing the new TC70x series from bentrup combining a new concept of fully intuitive user interface with the latest technology available.

The high resolution display gives the operator access to important process data in one view - the changing colour of the main temperature is one innovative feature). Other features include a status line displaying output states, USB-Operation, www connection, etc. Up to 99 programmes are available with options to assign user defined names.

TC70x controllers log all process data continuously with a Real-Time-Clock-Stamp in CSV-Format. Enjoy adjusting values: see them change by circling your finger over the virtual dial!



TC70x are also available for multizone operations (up to 3 zones for temperature equalization). Up to 4 relay and 1 analogue output is factory fitted. With the bentrup IO-Box, TC70x inputs/outputs can be extended almost without limit. In addition, a WebServer is available connecting the TC70x directly to the www. This allows access to the controller from everywhere without the need of any software (ie. by any internet browser). One IO-Box can hold up to 3 extension boards plus WebBrowser.

A new PM3 module for measuring actual current and voltage for 3 phases each, allows feedback of this data to the TC70x. Any deviation causes an operator alert and event log entry.

While TC705 provides a 4 segment firing curve entirely shown on the display (making operation as easy as possible), TC707 offers up to 99 segments per programme (number of programs depends on segment length).

TC707 includes Bluetooth (to access TC707 via smartphone using the free bentrup App) or WinControl. Additionally, Real-Timed-Programme start is available (e.g. to have the kiln on temperature every Monday at 7:00).



TC705

TC707

General Information	Handheld wall mounting controller with 4.5" high resolution LC Display. Simultaneous reading of important process values, changing main process color on temperature deviations. Intuitive operation keypad with capacitive dial (acoustic feedback). Up to 99 programmes with user assignable name.	✓	✓
Data Logging USB	Logging of 48 hours of all relevant process data dumped on USB-Thumbdrive on insertion. Event Log dumped as well for ease in finding application, operator or technical issues. USB file for simple assignment of individual programme names.	✓	✓ signed stick protection
Technical Data	Powerful 32-bit ARM microprocessor based controller. Non volatile event log (sensor failure, short circuit, power breakdown, user access etc.) and continuous process supervisory. Real time clock providing detailed log information for error tracking and recording. Self validation of all relevant components. Adaptive P/PI/PID controller with continuous auto tune. Optional CAN-Interface to connect to bentrup IO-Box for IO-Extensions.	✓	✓
Temperature Profile	Number of Segments (one Segment consisting on Ramp followed by dwell)	4	up to 99
Automatic Programme Start or Completion	Real-Time-Clock pre-programmed programme start or completion (e.g. automatically start kiln to be on temperature on shift start and turn off for the weekend)	✗	✓
Data Connection	Bluetooth data link	✗	✓
Smartphone Access	watch one or more controllers via WebBox or WebServer; bentrup App for iOS & Android	✗	✓
Electrical Data, Ambient Requirements, Approvals,	Energy efficient power supply 85-264 V AC/DC (option 24V), max power dissipation 8W, power breakdown recovery feature, ambient temperature -10°C to 60°C, air humidity 10% to 90% non condensing, high level of active and passive EMC according to IEC8014-IV, CE conformity. Connects to all common standards via HAN7D, HAN15D, CPC14 etc. kiln sockets.	✓	✓
Mechanical Data	Wall mounting case 107 x 200mm of industrial classified ABS plastic with transparent grey LC Display protection, thickness 24mm only, weight 470g (depending on options), optional stainless steel wall mounting bracket (see picture)	✓	✓
Analogue Input (Sensor Input)	programmable for thermocouples (S, R, K, J, N, E, B), standardized signals voltage (20mV/50mV/10V) or current (0-20mA, 4-20mA), resistance (0-500R, PT100), Circonoxyde sensor signal processing (oxygen) including calculation of lambda and CO auto zero, internal or external CJC, accuracy 0.05%, resolution 17 bit, acquisition rate 16Hz, adjustable averaging and error compensation	✓	✓
Switching Outputs	relay outputs max. 8A/250V to directly drive contactors (dry open contacts O/R)	✓	✓
Digital Inputs/ Outputs	logic inputs 5-24V AC/DC, outputs 5-24V DC/0.5A both electrically isolated. Outputs overload protected/indicated. To be used for any kind of IO control.	DIO8 in IO-Box	DIO8 in IO-Box
PWM outputs	Pulse width modulation (PWM) outputs for solid state relays (SSR), 14V/60mA each, adjustable rate (1Hz to 10Hz) & pattern, overload/restart feature, error detection/indication	PWM4 in IO-Box	PWM4 in IO-Box
Analogue Outputs (Signal Outputs)	Analogue signal output (electrically isolated) for power control or process values. 0-10V (load >200 ohms), 0/4-20mA (load <600 ohms), accuracy 0.1% full scale, resolution 14 bit, intelligent overload and restart feature, error detection and indication	AO4 in IO-Box	AO4 in IO-Box
Multizone Kiln Operation	Multiple control loops (electrically isolated inputs) to ensure temperature equalization throughout the entire firing chamber. Complex algorithm to ensure zones are on same temperature considering heat movements between the zones and avoiding locks	AI4 in IO-Box	AI4 in IO-Box
Alert on end-of-life heating elements	SmartCheck determines ageing of heating elements and provides in-advance notice. Actual power is estimated on full power heating or direct measuring voltage and current by PM3 module in IO-Box (voltage & current included in CSV log for mains supervisory	✓	✓
Internet Connectivity	integrated WebBrowser to access TC70x from everywhere for retrieving log data, reading out event log, configuration, programming and control	WebBrowser in IO-Box	WebBrowser in IO-Box

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