M. K. JUCHHEIM GmbH & Co

Delivery address: Mackenrodtstraße 14,
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 60 03-0
Fax: +49 661 60 03-6 07
E-mail: mail@jumo.net
Internet: www.jumo.de

JUMO Instrument Co. Ltd.

JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2TT, UK

Phone: +44 12 79 63 55 33
Fax: +44 12 79 63 52 62
E-mail: sales@jumo.co.uk

JUMO PROCESS CONTROL INC.

885 Fox Chase, Suite 103
Coatesville PA 19320, USA
Phone: 610-380-8002
1-800-554-JUMO
Fax: 610-380-8009
E-mail: info@JumoUSA.com
Internet: www.JumoUSA.com

JUMO

JUMO DICON 1000
Universal process controller

for stock items see price list

Housing for flush-panel mounting to DIN 43 700

Brief description

Type 703560 is a universal and freely programmable compact controller with one or two channels for different physical control parameters and 96mm x 96mm bezel size.

The controller has two 4-digit and one single-digit 7-segment displays, switching and status indicators and one 16-character matrix display.

Operation, parameter setting and configuration can all be carried out via the six keys at the front.

The unit can be used as single and double setpoint controller, as modulating and proportional controller, as well as proportional controller with integral actuator driver.

The controller software includes, among others, a ramp function, parameter set switching, self-optimization, a fuzzy logic module and eight limit comparators.

Linearizations for the usual transducers are stored; a customized table can be programmed.
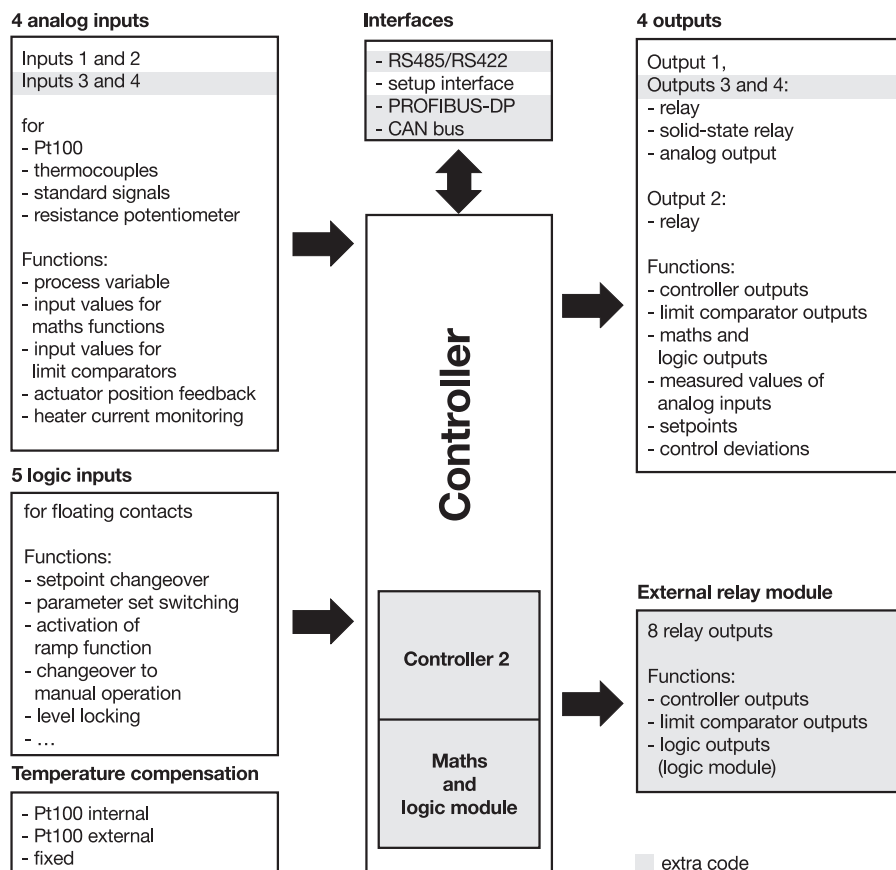
A maths and logic module can be supplied as an extra. A further extra code enables the Type 703560 to be used as C-level controller for gas carburizing furnaces. The plug-in controller chassis makes retrofitting of additional modules simple.

The controller can be integrated into a data network via the serial interface. A setup program is available for easy programming from a PC. The number of outputs can be increased through an external relay module with eight relay outputs.

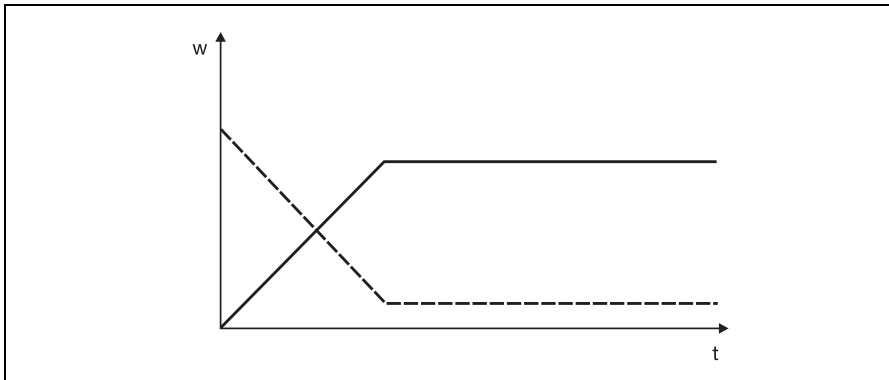**Type 703560/10-001-1-1-01/00**

Block structure

4 analog inputs

Inputs 1 and 2
Inputs 3 and 4

for
- Pt100
- thermocouples
- standard signals
- resistance potentiometer

Functions:
- process variable
- input values for maths functions
- input values for limit comparators
- actuator position feedback
- heater current monitoring

5 logic inputs

for floating contacts

Functions:
- setpoint changeover
- parameter set switching
- activation of ramp function
- changeover to manual operation
- level locking
- …

Temperature compensation

- Pt100 internal
- Pt100 external
- fixed

Interfaces

- RS485/RS422
- setup interface
- PROFIBUS-DP
- CAN bus

Controller

Controller 2

Maths and logic module

4 outputs

Output 1,
Outputs 3 and 4:
- relay
- solid-state relay
- analog output

Output 2:
- relay

Functions:
- controller outputs
- limit comparator outputs
- maths and logic outputs
- measured values of analog inputs
- setpoints
- control deviations

External relay module

8 relay outputs

Functions:
- controller outputs
- limit comparator outputs
- logic outputs (logic module)

☐ extra code

Features

- **8 limit comparators**
- **4 parameter sets**
- **ramp function**
- **self-optimization**
- **fuzzy logic**
- **cascade controller**
- **maths and logic module**
- **configurable text display**
- **interface (RS485/RS422)**
- **PROFIBUS-DP interface**
- **CAN bus interface**
- **setup program for PC**
- **C-level control**

Ramp function

This function is available to ensure a defined approach of the process to the setpoint, by using a rising or falling ramp at a preset gradient. A green LED signals that the ramp function is activated.

Proportional controller with integral motor actuator driver

$$\Delta t \approx \frac{\Delta y_s \, [\%]}{100 \, \%} \cdot TT$$
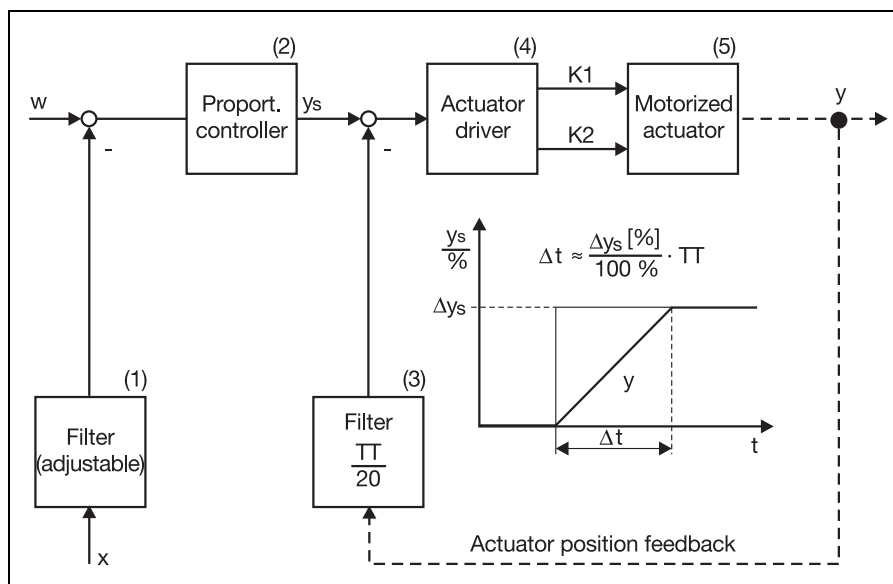
Function

The proportional controller (2) with integral actuator driver (4) for motorized actuators (5) forms a cascade control system. The subordinate control loop (actuator driver) is optimized after entering the actuating (stroke) time (TT) into the controller.

The closed loop of the actuator driver has a unity gain. The proportional controller determines the output Ys. The filter for actuator position feedback (3) is included in the optimization of the driver and cannot be altered by the user.

The proportional controller can be set to P, PI, I, PD or PID structures.

The time constant of the process value filter (1) is defined through the parameter dF by self-optimization and can be altered by the user.

In the event of a large run-on of the motorized actuator, the contact spacing X_{Sh} can be increased to avoid juddering of the actuator.

The actuator position feedback must be connected up!

Self-optimization

The standard version includes an self-optimization (auto-tuning) facility which permits adjusting the controller to the process without any control engineering know-how.

Self-optimization evaluates the reaction of the control loop to certain changes in the manipulated variable. The controller parameters Xp, Tn, Tv and Cy are calculated. The fuzzy parameters Fc1 and Fc2 are set to standard values after self-optimization, i.e. the fuzzy function is de-activated. All parameters can be called up at the parameter level and modified.

Fuzzy logic

As well as self-optimization, the controller software also contains a fuzzy logic software module. This can be used to improve both the control and the disturbance response.

Customized linearization

In addition to the linearizations for the usual transducers, altogether two custom linearizations can be set up.

Programming is carried out via the setup program, in the form of a table of values.

Maths and logic module

The maths module enables the integration of setpoints, outputs and the measurements of the analog inputs, as well as logic signals into a mathematical formula. With the aid of the logic module it is possible to logically link logic inputs, limit comparators and operating contacts.

Two formulae can be entered for each of the modules via the setup program and the results of the calculations produced via the outputs.

Furthermore, difference, ratio and humidity control can be implemented through established standard formulae.

Text display

Custom texts can be assigned to the functions of the logic inputs, the limit comparators, the logic outputs of the logic module and the operating contacts.

It is also possible to designate profile names.

Depending on the status of the function, or the configuration of the displays, the programmed text (16 characters max.) is shown in the matrix display.

The custom texts and profile names are set through the setup program.

Setup program

The setup program for configuring the controller is available in German, English and French.
A PC can be used to create and edit data sets, transfer them to the controller or read them out of the controller. The data sets are stored and managed.

RS422/RS485 interface

The serial interface is used for communication with higher-level systems.
MOD/Jbus are used as transmission protocols.

PROFIBUS-DP/ CAN bus

The controller can be integrated into a fieldbus system via the PROFIBUS-DP or CAN interfaces according to the PROFIBUS-DP/CANopen standards.
The PROFIBUS variant is designed especially for communication between automation systems and decentralized peripheral units at field level, and is speed-optimized. Data are transmitted serially according to the RS485 standard.
With the help of the project planning tool included in the delivery (GSD generator; GSD = instrument master data), controller data are selected to create a standardized GSD file which is used to integrate the controller into the fieldbus system.

Cascade controller

For demanding control tasks, the controller (in 2-channel version) can be configured for cascade control or trim cascade control.

C-level controller

The controller can be used as a C-level controller to regulate the carbon activity in the atmosphere of gas carburizing furnaces. A zirconium dioxide sensor serves as a transducer.

Operation, parameterization, configuration

Operation, setting the controller parameters and configuration are arranged on various levels.

Operating level
Here, different process variables (measured values of the analog inputs, program times ...) can be indicated and operating modes activated.

Parameter level
The controller parameters are set here.

Configuration level C1
Controller-specific settings (controller type, limit comparators ...) are made here.
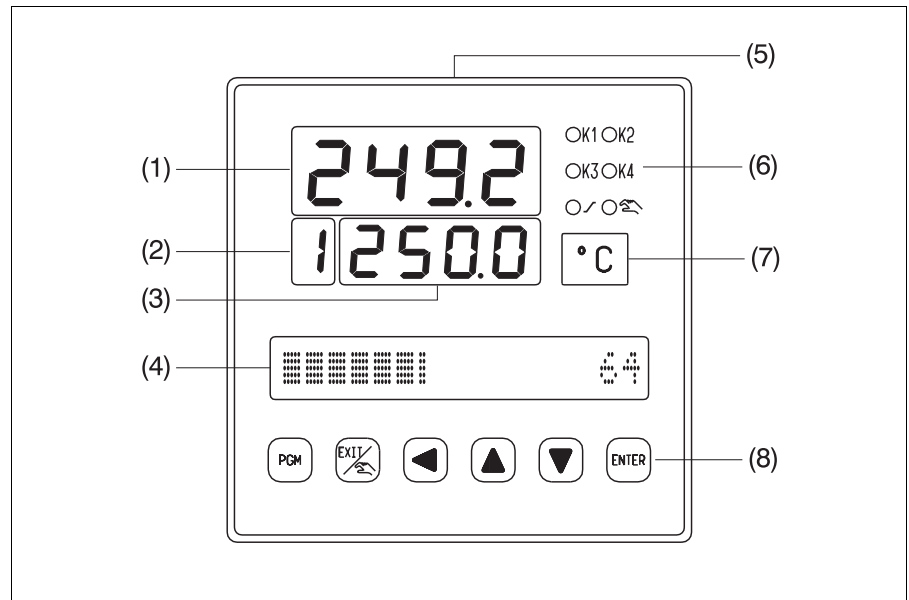
Configuration level C2
System-specific settings (interface, displays ...) are carried out here.

Configuration level C3
Hardware and software codes corresponding to the controller version are shown here.

```
┌─────────────────────────┐
│     Normal display      │
└─────────────────────────┘
            ↓
┌─────────────────────────┐
│     Operating level     │
└─────────────────────────┘
            ↓
┌─────────────────────────┐
│     Parameter level     │
└─────────────────────────┘
            ↓
┌─────────────────────────┐
│  Configuration level C1 │
└─────────────────────────┘
            ↓
┌─────────────────────────┐
│  Configuration level C2 │
└─────────────────────────┘
            ↓
┌─────────────────────────┐
│  Configuration level C3 │
└─────────────────────────┘
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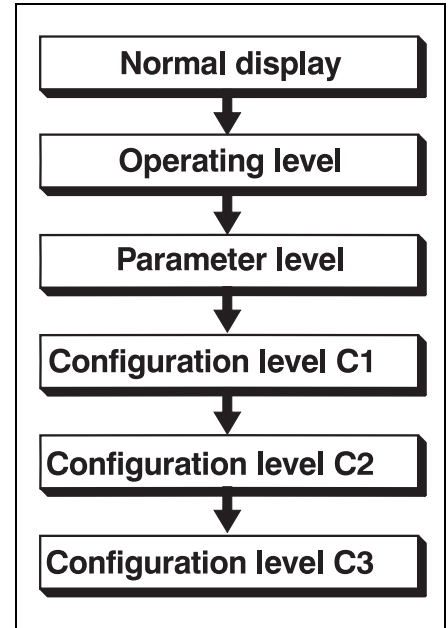
Displays and controls

(1)	**Configurable 7-segment display** 4-digit, 13mm high, red factory-set: process value	(5)	**Setup interface**
(2)	**Channel display** 1-digit, 7mm high, red	(6)	**Status indicators** 4 yellow LEDs for switch status indication of outputs 2 green LEDs to signal the "manual" and "ramp function" operating modes
(3)	**Configurable 7-segment display** 4-digit, 10mm high, green factory-set: setpoint	(7)	**Basic dimensional unit** can be altered using the unit labels supplied
(4)	**Configurable dot-matrix display** 16 characters, 5mm high, green	(8)	**Keys**

Parameter level

The table lists all parameters and their meaning. Depending on the controller type, certain parameters are omitted or are not applicable. For particular applications, four parameter sets can be stored for each controller.

| Parameter	Display	Value range	Factory setting	Meaning
Controller structure	Structure 1	P, I, PD, PI, PID	PID	The controller structure can be switched between P, I, PD, PI and PID structure (structure 2 refers to the second output of a double-setpoint controller).
	Structure 2	P, I, PD, PI, PID	PID	
Proportional band	Xp1	0 — 9999 digit	0 digit	Size of proportional band
	Xp2	0 — 9999 digit	0 digit	At Xp1.2 = 0, the controller structure is ineffective!
Derivative time	Tv1	0 — 9999 sec	80 sec	Influences the differential component of the controller output signal.
	Tv2	0 — 9999 sec	80 sec	
Reset time	Tn1	0 — 9999 sec	350 sec	Influences the integral component of the controller output signal.
	Tn2	0 — 9999 sec	350 sec	
Cycle time	Cy1	0 — 9999 sec	20 sec	For a switching output, the cycle time should be selected so that the energy supply to the process is virtually continuous while, at the same time, not overloading the switching elements.
	Cy2	0 — 9999 sec	20 sec	
Contact spacing	Xsh	0 — 999 digit	0 digit	Spacing between the two control contacts of a double-setpoint controller, modulating controller and proportional controller with integral actuator driver.
Switching differential	Xd1	0 — 999 digit	1 digit	Differential for switching controllers for Xp = 0.
	Xd2	0 — 999 digit	1 digit	
Actuating (stroke) time	TT	5 — 3000 sec	60 sec	Utilized actuating time range of the control valve on modulating controllers and proportional controllers with integral actuator driver.
Working point	Y0	-100 to +100 %	0 %	Output for P and PD controllers (y = Y0 at x = w).
Output limiting	Y1	0 — 100 %	100 %	Maximum output limit
	Y2	-100 to +100 %	-100 %	Minimum output limit
Minimum relay ON time	Tk1	0 — 60 sec	0 sec	Limiting the switching rate for switching outputs.
	Tk2	0 — 60 sec	0 sec	
Fuzzy intensity	Fc1	0 — 100 %	0 %	Intensity of the fuzzy signal added to the controller output, to improve the control quality.
Fuzzy parameter adjustment	Fc2	0 — 100 %	30 %	Influences the controller parameters with activated fuzzy module, to improve the control quality.

Configuration level C1

Controller	→ controller type controllers 1 + 2 time constant for control loop monitoring controllers 1 + 2		
Limit comparators	→ limit comparator 1 — 8	→ function action differential limit function on out-of-range	
Inputs [controllers and limit comparators (lk)]	→ input function	→ inputs controllers 1 + 2	→ process value external setpoint actuator position feedback additive disturbance multiplying disturbance
		inputs for limit comparators 1 — 8	→ lk actual value lk setpoint
	input type	→ analog input 1 — 4	→ transducer linearization process value correction constant cold junction temperature external cold junction temperature heater current monitoring display start display end range start range end filter time constant
Outputs	→ output 1 — 4	→ function output signal zero point full scale output signal on out-of-range	
External relay module	→ external output 1 — 8	→ function function on out-of-range	
Special functions	→ ramp	→ ramp controllers 1 + 2	→ function gradient unit
	manual output	→ manual output controllers 1 + 2	
	manual operation	→ manual operation controllers 1 + 2	
	self-optimization	→ self-optimization controllers 1 + 2	
	setpoint limits	→ setpoint limits controllers 1 + 2	→ setpoint start setpoint end
	maths and logic module	→ mathematics 1 + 2	→ function variable a variable b range start range end
		→ logic 1 + 2	

Configuration level C2

Display	→ display controllers 1 + 2	→ displays 1 — 4	→ display value decimal point
	display brightness displays 3 + 4		
Logic functions	→ logic input 1 — 5 limit comparator output 1 — 8 logic 1 + 2		
Cascade controller	→ function start value of output conversion end value of output conversion		
Customized recalibration	→ analog input 1 — 4	→ start value end value	
Time-out			
Unit			
Supply frequency			
Interface	→ protocol type data format	→ parity stop bit baud rate	
	unit address minimum response time		

Dimensions
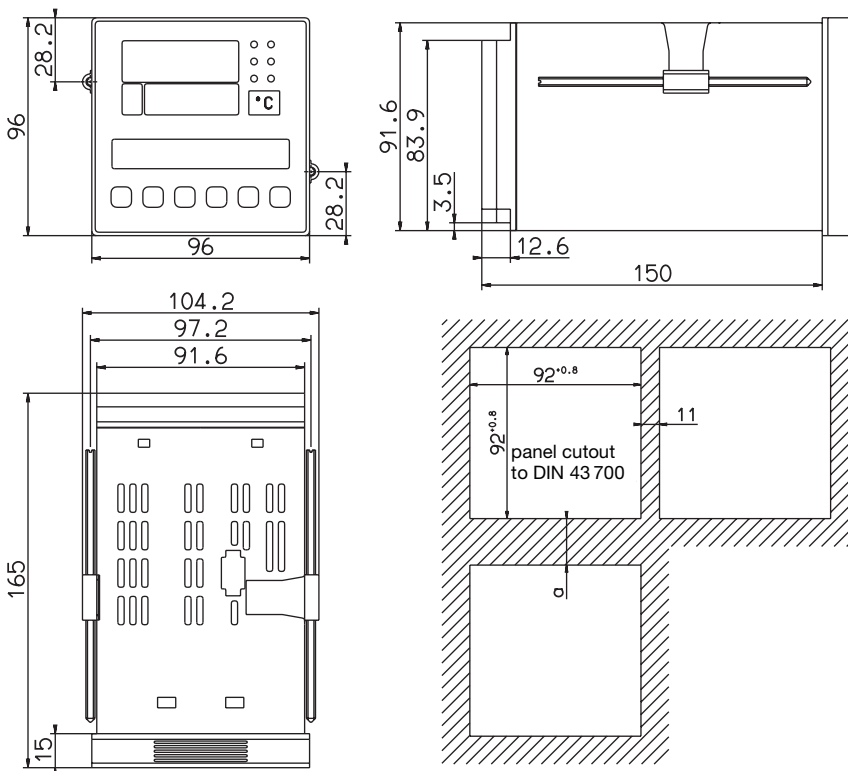
Side-by-side mounting

minimum spacing	a
with PC interface	65 mm
without PC interface	30 mm

Technical data

Input for thermocouple

Type	Range	Measuring accuracy[1]	Ambient temperature error
NiCrSi-NiSi N	-100 to +1300 °C	≤ 0.25 %	0.05 % / 10 °C
Cu-Con T	-200 to + 400 °C	≤ 0.25 %	0.05 % / 10 °C
Fe-Con J	-200 to +1200 °C	≤ 0.25 %	0.05 % / 10 °C
Cu-Con U	-200 to + 600 °C	≤ 0.25 %	0.05 % / 10 °C
Fe-Con L	-200 to + 900 °C	≤ 0.25 %	0.05 % / 10 °C
NiCr-Ni K	-200 to +1372 °C	≤ 0,25 %	0.05 % / 10 °C
Pt10Rh-Pt S	0 — 1768 °C	≤ 0.25 %	0.05 % / 10 °C
Pt13Rh-Pt R	0 — 1768 °C	≤ 0.25 %	0.05 % / 10 °C
Pt30Rh-Pt6Rh B	-55 to +1820 °C	≤ 0.25 %	0.05 % / 10 °C
NiCr-Con E	-200 to + 915 °C	≤ 0.25 %	0.05 % / 10 °C
Line resistance: ≤ 300 Ω			

Input for resistance thermometer

Type	Connection	Range	Measuring accuracy[1]	Ambient temperature error
Pt 100	3-wire circuit	-200 to +850 °C	≤ 0.05 %	≤ 0.025 % / 10 °C
Line resistance: ≤ 40 Ω				
Measuring current: 150 µA				

Input for standard signals

Type	Range	Measuring accuracy[1]	Ambient temperature error
Voltage	0 — 50 mV; R_i > 1 MΩ 0 — 1 V; R_i > 100 KΩ 0 — 10 V; R_i > 100 KΩ 0.2 — 1 V; R_i > 100 KΩ 2 — 10 V; R_i > 100 KΩ	≤ 0.05 % ≤ 0.05 % ≤ 0.05 % ≤ 0.05 % ≤ 0.05 %	≤ 0.1 % / 10 °C ≤ 0.1 % / 10 °C ≤ 0.1 % / 10 °C ≤ 0.1 % / 10 °C ≤ 0.1 % / 10 °C
Current	0 — 20 mA; ΔUe < 1 V 4 — 20 mA; ΔUe < 1 V	< 0.05 % < 0.05 %	≤ 0.1 % / 10 °C ≤ 0.1 % / 10 °C
Heater current (for connection to a current transformer)	AC 50/60 Hz ± 1 %, 0 — 20 mA	< 0.25 %	≤ 0.1 % / 10 °C
Resistance transmitters	min. 100 Ω, max. 10 kΩ	< 0.15 %[2]	≤ 0.025 % / 10 °C
Measuring current (resistance transmitters): ≤ 2 mA			
max. permitted input voltage: 12 V			

R_i = internal resistance; ΔUe = voltage drop

Measuring circuit monitoring[3]

Transducer	Out-of-range	Probe/lead short-circuit[1]	Probe/lead break
Thermocouple	•	–	•
Resistance thermometer/transmitter	•	•	•
Voltage 2 — 10 V 0 — 50 mV 10 — 50 mV 0.2 — 1 V	• • • •	• – • •	• • • •
Current 4 — 20 mA	•	•	•

• = recognized   – = not recognized

1. The data include the linearization tolerances.
2. After line resistance compensation.
3. In the event of a fault, the outputs move to a defined state.

Isolation

Logic inputs

Signal	– floating contact (standard) – 0/24V (on request)
Functions	– start/cancel self-optimization – changeover manual/automatic operation – locking of manual operation – setpoint changeover – process value changeover – parameter set switching – locking of parameter/configuration level – text display – all displays off – ramp stop – ramp on/off

Outputs

Four outputs are available. Output 2 is always a relay output, the others may be either switching or analog outputs.

Relay
  contact rating
  contact life
	changeover contact
	3A at 230V AC resistive load
	10^6 operations at rated load (with contact protection circuit)

Logic internal resistance	0/24V $R_i = 1.2k\Omega$
Solid-state relay (TRIAC) contact rating	1A at 230V

Voltage
  output signals
  load resistance
	-10 to +10V / 0 — 10V / 2 — 10V
	$R_{load} > 500\Omega$

Current
  output signals
  load resistance
	-20 to +20mA / 0 — 20mA / 4 — 20mA
	$R_{load} < 500\Omega$

Supply for 2-wire
transmitter
  voltage
  current
	isolated
	18V
	45mA

Controller

Controller type	Single-setpoint controller:	- O function[1] (heating); relay de-energized at x>w
		- S function[2] (cooling); relay de-energized at x<w
	Double-setpoint controller:	- switching (heating) / switching (cooling)
		- falling characteristic (heating) / switching (cooling)
		- switching (heating) / rising characteristic (cooling)
		- falling characteristic (heating) / rising characteristic (cooling)
	Modulating controller:	- cw / ccw rotation
	Proportional controller:	- falling characteristic (heating)
		- rising characteristic (cooling)
	Proportional controller with integral motor actuator driver :	- cw / ccw rotation
Controller structures	P/I/PD/PI/PID (with modulating controller: PI and PID)	
A/D converter	resolution 15 bit	
D/A converter	resolution 13 bit	
Sampling time	1-channel controller: 50 msec at 50 Hz, 75 msec at 60 Hz 2-channel controller: 110 msec at 50 Hz, 125 msec at 60 Hz When calculating a maths formula, the sampling time increases with the complexity of the formula.	

Electrical data

Supply	93 — 263V AC, 48 — 63 Hz, 20 — 53V AC/DC, 48 — 63 Hz with 93 — 263V AC, operation with Zener diode protection is not permissible!
Test voltages (type test)	to DIN EN 61 010, Part 1 overvoltage category II, pollution degree 2
Power consumption	< 20VA
Data backup	EEPROM
Electrical connection	on the rear, via screw terminals, conductor cross-section up to 2.5 mm^2 and core-end sleeve (length: 10mm)
Electromagnetic compatibility	EN 61 326
Electrical safety	to EN 61 010, overvoltage category II, protection Class I (rear), protection Class II (front through panel mounting)
Ambient/storage temperature range	0 to 50°C / -40 to +70°C
Climatic conditions	rel. humidity 75 % max. annual mean, no condensation

Housing

Housing type	housing for flush-panel mounting in conducting plastic to DIN 43 700, base material ABS, with plug-in controller chassis
Bezel in mm	96 x 96
Depth behind panel in mm	150
Panel cutout in mm	$92^{+0.8}$ x $92^{+0.8}$
Operating position	any
Protection	to EN 60 529, front IP65, rear IP20
Weight	850g approx.

Maths and logic module

Maths module	linking of analog and logic signals through a mathematical formula
Logic module	linking of the logic inputs, the operating contacts and the limit comparator outputs
Difference, ratio and humidity control	are set through implemented standard formulae

## Interfaces

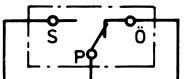| **RS 422 / RS 485**	
Transmission rate	187.5 kbaud max.
Transmission protocol	MOD/Jbus
Setup interface	
Connection	via PC interface with TTL/RS232 converter; connector at the top of housing
PROFIBUS-DP	
Transmission rate	12 Mbaud max.
CANopen master	
CANopen slave	
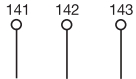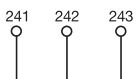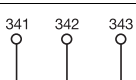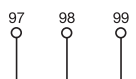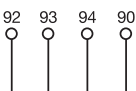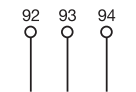
Limit comparators

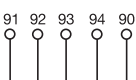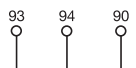| Number	The controller includes eight limit comparators which are linked internally, or which can be switched to physical outputs	
Function lk1 Window function: relay is energized when process value is within a window about the setpoint. Function lk2 as lk1, but inverted relay function.		
Function lk3 Low alarm Function: relay is de-energized when process value is below (setpoint – limit value). Function lk4 as lk3, but inverted relay function.		
Function lk5 High limit Function: relay is de-energized when process value is above (setpoint + limit value). Function lk6 as lk5, but inverted relay function.		
Function lk7 Switching point is independent of the controller setpoint; only AL determines the switching point. Function: relay is energized when process value is above limit value. Function lk8 as lk7, but inverted relay function.		
Switching differential X_{Sd}	0 — 9999 digit	
Limit value AL	-1999 to 9999 digit	

Connection diagram

Rear view with screw terminals
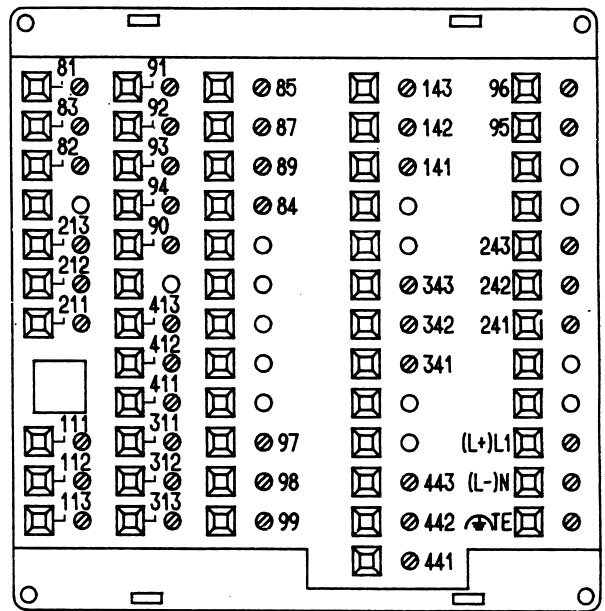
Output		Relays[1]	Solid-state relays	Logic outputs	Analog outputs	Terminals
Relays, solid-state relays, logic or analog outputs	1	141 (O) n.c. (break) 142 (P) common 143 (S) n.o. (make)	142 143	142 - 143 +	142 - 143 +	141 142 143
	2	241 (O) n.c. (break) 242 (P) common 243 (S) n.o. (make)	-	-	-	241 242 243
	3	341 (O) n.c. (break) 342 (P) common 343 (S) n.o. (make)	342 343	342 - 343 +	342 - 343 +	341 342 343
	4	441 (O) n.c. (break) 442 (P) common 443 (S) n.o. (make)	442 443	442 - 443 +	442 - 443 +	441 442 443
External relay module ER8		97 RxD/TxD (+) 98 RxD/TxD (-) 99 GND	communication with external relay module			97 98 99

Interfaces

				Terminals
RS422 interface	RxD	91 RxD (+) 92 RxD (-)	receive data	91 92 93 94 90
	TxD	93 TxD (+) 94 TxD (-)	transmit data	
	GND	90 GND		
RS485 interface	RxD/ TxD	93 RxD/TxD (+) 94 RxD/TxD (-)	receive/transmit data	93 94 90
	GND	90 GND		
PROFIBUS-DP		92 VP 93 RxD/TxD-P 94 RxD/TxD-N 90 DGND	positive supply voltage (P5V) receive/transmit data-P, B-cable receive/transmit data-N, A-cable data transfer potential	92 93 94 90
CAN bus		90 CAN-H 91 GND 92 VDD 93 CAN-GND 94 CAN-L		91 92 93 94 90

1. contact protection circuit 22nF/56Ω between common and make contact (n.o.)

Supply					
Supply source for external 2-wire transmitter	95 + 96 -	18V / 45mA			
Supply as on nameplate	TE technical earth L1 line N neutral AC		L+ L- DC		
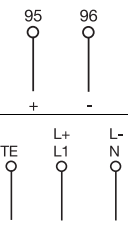
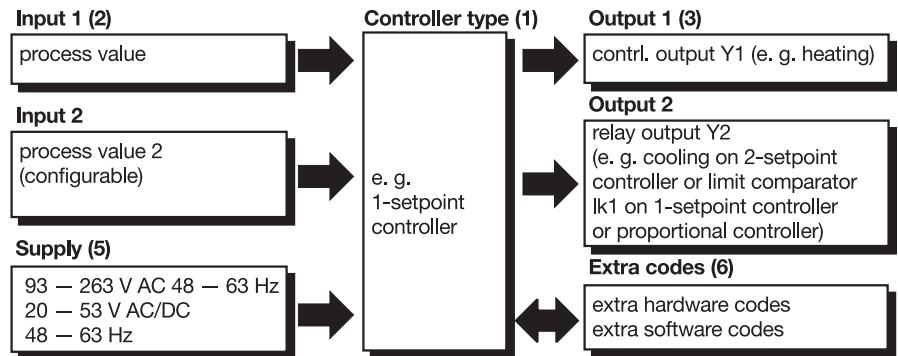| Analog inputs	Input 1	Input 2	Input 3	Input 4		Terminals
Thermocouple	111 + 112 -	211 + 212 -	311 + 312 -	411 + 412 -		
Resistance thermometer in 3-wire circuit	111 112 113	211 212 213	311 312 313	411 412 413		
Resistance thermometer in 2-wire circuit	111 112 113	211 212 213	311 312 313	411 412 413	$R_{comp} = R_{line}$	
Current input	111 + 113 -	211 + 213 -	311 + 313 -	411 + 413 -		
Voltage input	111 + 112 -	211 + 212 -	311 + 312 -	411 + 412 -		
Resistance transmitter	111 112 113	211 212 213	311 312 313	411 412 413	.11 start (A) .12 slider (S) .13 end (E)	
Logic inputs						
Logic input 1	81 82	through floating contacts or switching voltage 0/24V (on request)				
Logic input 2	83 82					
Logic input 3	85 84					
Logic input 4	87 84					
Logic input 5	89 84					

Ordering the JUMO DICON 1000

To make it easier for you to select and order your controller, a version which covers all the standard applications is available from stock. You can set the controller parameters, configuration data and time schedule programs yourself.

Make a cross against the **stock version** or enter the code numbers for the blocks (1) to (6) in **your version**.

You can also use this page to **fax** your order.

Fax: Head office: **+49 (0) 661 6003-607**
          UK office: **+44 (0) 1279 635262**
          US office: **610-380-8009**

Structure of the process controller

Input 1 (2)
process value

Input 2
process value 2 (configurable)

Supply (5)
93 — 263 V AC 48 — 63 Hz
20 — 53 V AC/DC
48 — 63 Hz

Controller type (1)
e. g. 1-setpoint controller

Output 1 (3)
contrl. output Y1 (e. g. heating)

Output 2
relay output Y2 (e. g. cooling on 2-setpoint controller or limit comparator lk1 on 1-setpoint controller or proportional controller)

Extra codes (6)
extra hardware codes
extra software codes

Ordering

		(1)	(2)	(3)	(4)	(5)	(6)
☐	**Basic unit:** 703560 /	10	- 001	- 1	- 1	- 01	/ 00

Sales No. 70/00309863

☐	**Your version:** 703560 /	..	- ...	- .	- .	- ..	/ .. *

☐	**Stock version:** ER8

Sales No. 70/00325805

* list in sequence, separated by commas

Type designation

(1) Controller type	Code
1-setpt. controller with O function (relay de-energized at x > w), configurable controller structure	10
1-setpt. controller with S function (relay de-energized at x < w), configurable controller structure	20
2-setpt. controller, configurable controller structure	30
Modulating controller, configurable controller structure	40
Proportional controller, configurable controller structure and output signal	50
Proportional controller, with integral motor actuator driver	80

(2) Input 1 Probe type	Code
Resistance thermometer Pt 100 in 3-wire circuit	001
NiCr-Con E	038
Cu-Con T	039
Fe-Con J	040
Cu-Con U	041
Fe-Con L	042
NiCr-Ni K	043
Pt10Rh-Pt S	044
Pt13Rh-Pt R	045
Pt30Rh-Pt6Rh B	046
NiCrSi-NiSi N	048
Standard linear signals	
0 — 20mA	052
4 — 20mA	053
0 — 1V	062
0 — 10V	063
0 — 50mV	064
0 — 2V (for C-level controller)	073
Resistance transmitter	021

(3) Output 1 Output signal	Code
Relay	1
Solid-state relay 1 A	2
Logic 0/24 V	3
Analog output	
0 — 20mA	4
4 — 20mA	5
-20 to +20mA	6
0 — 10V	7
2 — 10V	8
-10 to +10V	9

(4) User language	Code
German	1
English	2
French	3

(5) Supply	Code
93 — 263V AC, 48 — 63Hz	01
20 — 53V AC/DC, 48 — 63Hz	22

(6) Hardware extras	Code
no extra code	00
Analog inputs 3 + 4[1] (A/D converter II)	01
Output 3	3 .*
Output 4	4 .*
*digits as output 1	

(6) Hardware extras	Code
RS 422 interface	52
RS 485 interface	53
PROFIBUS-DP interface	64
CANopen master interface	40
CANopen slave interface	39
Controller meets requirements of Underwriters Laboratories Inc.	61
C-level controller (configurable in factory only)	04

1. Probe types, input or output signals to be specified in plain text.

(6) Software extras	Code
Second controller (channel)	02
Maths and logic module (incl. difference, ratio and psychrometric humidity)	03

Accessories
External relay module ER8 Supply 93 — 263V AC Sales No. 70/00325805
Supply 20 — 53V AC/DC Sales No. 70/00325806
PC interface with TTL/RS232 converter Sales No. 70/00301315
PC interface with RS232/CAN converter Sales No. 70/00377612
Setup program (3.5" diskette)
PC program editor