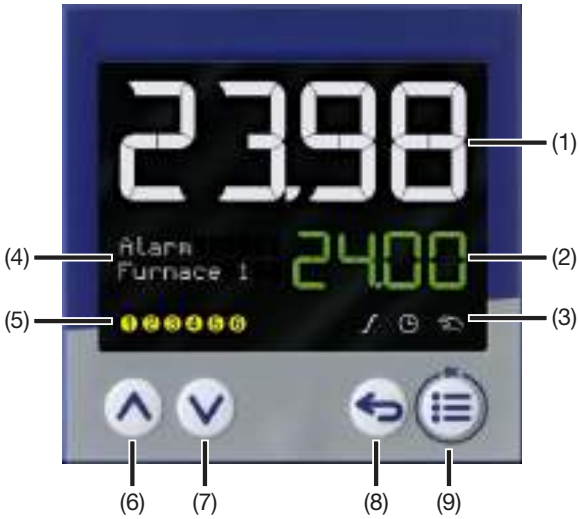
JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Display and control elements



(1) 18-segment LCD display (e.g. actual value), 4-digit, white;
for types 702110 (132) and 702111 (116) also for displaying menu items, parameters and text)

(2) 18-segment LCD display (e.g. setpoint value), 4-digit (702110 (132): 5-digit, 702111 (116): 8-digit), green;
for types 702110 (132) and 702111 (116) also for displaying menu items, parameters, values and text);
display "OK" when exiting editing mode (with change)

(3) Activity display for ramp function/program, timer, manual mode

(4) For types 702112 (108H), 702113 (108Q) and 702114 (104): pixel matrix LCD display for displaying menu items, parameters and values as well as customer-specific text

(5) Switching of the digital outputs (yellow = active)

(6) Up (in the menu: increase value, select previous menu item or parameter; in basic status: increase setpoint value)

(7) Down (in menu: reduce value, select next menu item or parameter; in basic status: reduce setpoint value)

(8) Back (in menu: back to previous menu level, exit editing mode without change; in basic status: configurable function)

(9) Menu/OK (call up main menu, switch to submenu/level, switch to editing mode, exit editing mode with change)

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

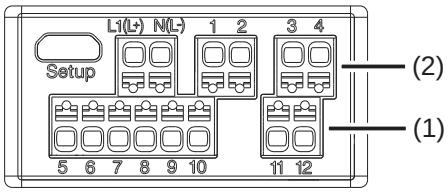
JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Connection elements

Type 702110 (format 132)

Type 702110 (48 mm × 24 mm)



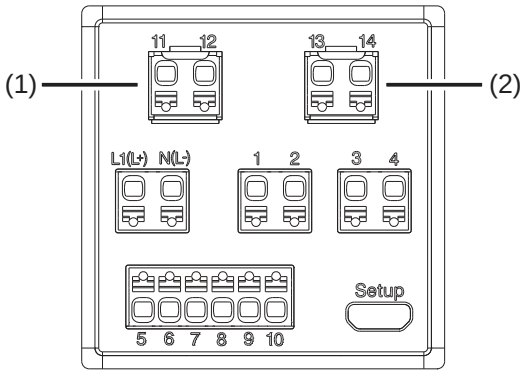
Terminals	Connection
1, 2	Output 1 (relay)
3, 4	(2) = option 2: output 2 (relay, logic or analog output)
5-8	Analog input

Terminals	Connection
8, 10	Input 2 (for potential-free contact)
9, 10	Input 1 (for potential-free contact) or output 3 (logic output)
11, 12	(1) = option 1: RS485 interface

Terminals	Connection
L1(L+), N(L-)	Voltage supply
Setup (USB)	PC (setup program)

Type 702111 (format 116)

Type 702111 (48 mm × 48 mm)



Terminals	Connection
1, 2	Output 1 (relay)
3, 4	Output 2 (relay)
5-8	Analog input

Terminals	Connection
8, 10	Input 2 (for potential-free contact)
9, 10	Input 1 (for potential-free contact) or output 3 (logic output)
11, 12	(1) = option 1: output 4 (relay, logic output) or RS485 interface

Terminals	Connection
13, 14	(2) = option 2: output 5 (relay, logic or analog output)
L1(L+), N(L-)	Voltage supply
Setup (USB)	PC (setup program)

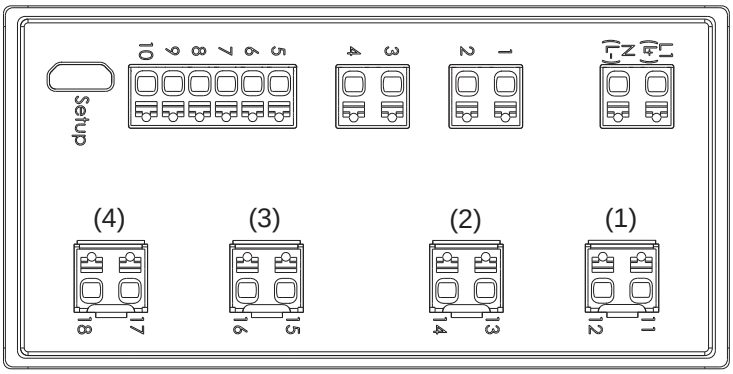
JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

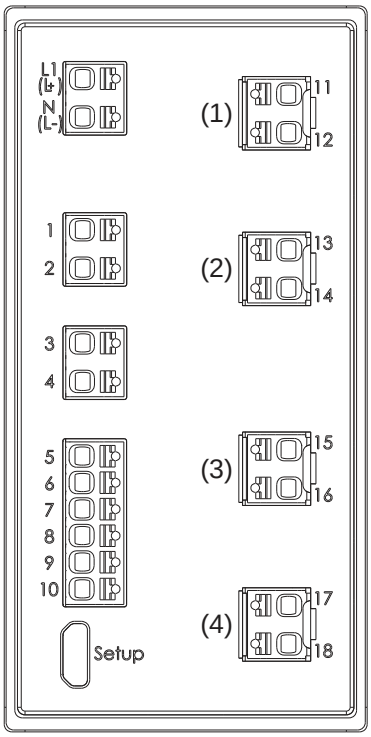
JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Types 702112 (format 108H), 702113 (format 108Q), 702114 (format 104)

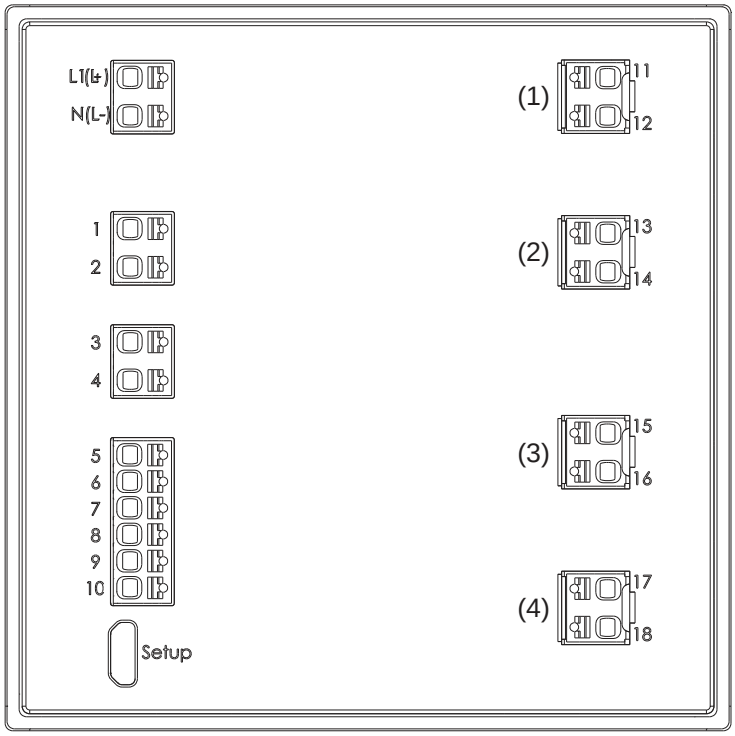
Type 702113 (96 mm × 48 mm)



Type 702112 (48 mm × 96 mm)



Type 702114 (96 mm × 96 mm)



Terminals	Connection
1, 2	Output 1 (relay)
3, 4	Output 2 (relay)
5-8	Analog input
8, 10	Input 2 (for potential-free contact)

Terminals	Connection
9, 10	Input 1 (for potential-free contact) or output 3 (logic output)
11, 12	(1) = option 1: output 4 (logic output) or RS485 interface
13, 14	(2) = option 2: output 5 (relay, logic or analog output)
15, 16	(3) = option 3: output 6 (relay, logic output or PhotoMOS® relay)

Terminals	Connection
17, 18	(4) = option 4: output 7 (relay, logic output or PhotoMOS® relay)
L1(L+), N(L-)	Voltage supply
Setup (USB)	PC (setup program)

If the device is equipped with the Ethernet interface (option 2: RJ45 socket), terminals 11 to 14 are not available.

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

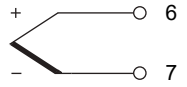
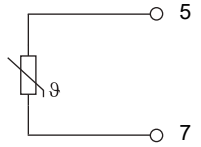
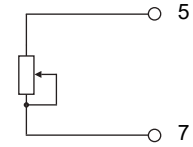
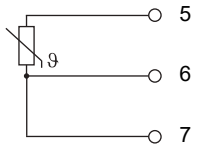
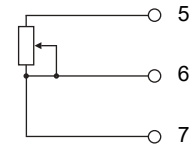
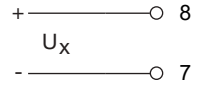
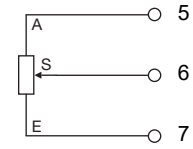
JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Connection diagram

The connection diagram in the data sheet provides preliminary information about the connection options. For the electrical connection, only use the installation instructions or the operating manual. The knowledge and the correct technical compliance with the safety information and warnings contained in these documents are mandatory for mounting, electrical connection, and startup as well as for safety during operation.

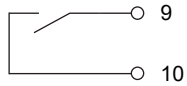
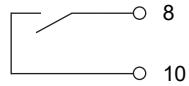
Analog input

The analog input version is identical for all types.

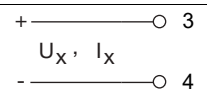
Measuring probe/ standard signal	Symbol and terminal designation	Measuring probe/ standard signal	Symbol and terminal designation
Thermocouple		Current DC 0(4) ... 20 mA	
RTD temperature probe two-wire circuit		Resistance/potentiometer two-wire circuit	
RTD temperature probe three-wire circuit		Resistance/potentiometer three-wire circuit	
Voltage DC 0(2) ... 10 V (useable as alternative to digital input 2)		Resistance transmitter A = Start E = End S = Slider	

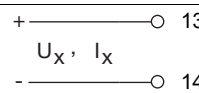
Digital inputs

The digital input version is identical for all types.

Input	Version	Symbol and terminal designation	Input	Version	Symbol and terminal designation
1	Digital input for potential-free contact (useable as alternative to digital output 3)		2	Digital input for potential-free contact (only usable if the analog input is not configured as DC 0(2) ... 10 V)	

Analog output

Version for type 702110 (format 132)		
Output		**Symbol and terminal designation**
2	**Option 2** (alternative to digital output 2): DC 0/2 ... 10 V or DC 0/4 ... 20 mA (configurable)	

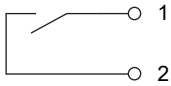
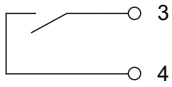
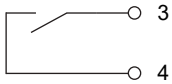
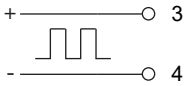
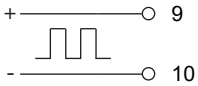
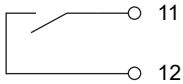
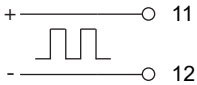
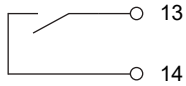
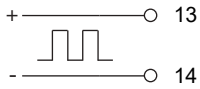
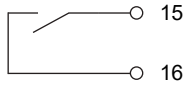
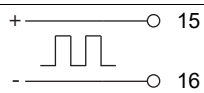
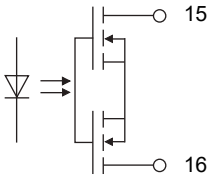
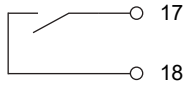
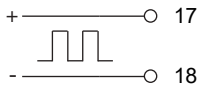
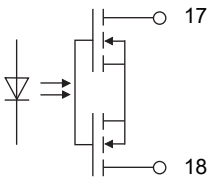
Version for types 702111 to 702114		
Output		**Symbol and terminal designation**
5	**Option 2** (alternative to digital output 5): DC 0/2 ... 10 V or DC 0/4 ... 20 mA (configurable)	

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Digital outputs

Output	Version	Symbol and terminal designation
1	Relay (N/O contact)	
2	Relay (N/O contact), (for type 702110 as option 2, see below)	
	Option 2 for type **702110 (132)** (alternative to analog output): Relay (N/O contact) or logic output 0/14 V	 
3	Logic output 0/14 V (usable as alternative to digital input 1)	
4	**Option 1** for types **702111 (116)**, **702112 (108H)**, **702113 (108Q)**, and **702114 (104)** (alternative to RS485 interface): Relay (N/O contact), only for type **702111 (116)** or logic output 0/14 V	 
5	**Option 2** for types **702111 (116)**, **702112 (108H)**, **702113 (108Q)** and **702114 (104)** (alternative to analog output): Relay (N/O contact) or logic output 0/14 V	 
6	**Option 3** for types **702112 (108H)**, **702113 (108Q)** and **702114 (104)**: Relay (N/O contact) or logic output 0/14 V or PhotoMOS® relay	  
7	**Option 4** for types **702112 (108H)**, **702113 (108Q)**, and **702114 (104)**: Relay (N/O contact; only with longer contact life) or logic output 0/14 V or PhotoMOS® relay	  

RS485 interface

Version for type 702110 (format 132)	Symbol and terminal designation
Option 1: RS485 interface	RxD/TxD+ — 11 RxD/TxD- — 12

Version for types 702111 to 702114	Symbol and terminal designation
Option 1 (alternative to digital output 4): RS485 interface	RxD/TxD+ — 11 RxD/TxD- — 12

Voltage supply

Version (see nameplate)	Symbol and terminal designation
AC 110 to 240 V	L1 — L1/L+ N — N/L-

Version (see nameplate)	Symbol and terminal designation
AC/DC 20 to 30 V	L+ — L1/L+ L- — N/L-

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Order details

	(1)	**Basic type**
702110		**Type 702110** (format 132: 48 x 24 mm) 1 analog input, 2 digital inputs (digital input 1, alternative to logic output), 1 relay (N/O contact), 1 logic output 0/14 V (alternative to digital input 1) incl. timer, ramp function, and program function
702111		**Type 702111** (format 116: 48 x 48 mm) 1 analog input, 2 digital inputs (digital input 1, alternative to logic output), 2 relays (N/O contact), 1 logic output 0/14 V (alternative to digital input 1) incl. timer, ramp function, and program function
702112		**Type 702112** (format 108H: 48 x 96 mm) 1 analog input, 2 digital inputs (digital input 1, alternative to logic output), 2 relays (N/O contact), 1 logic output 0/14 V (alternative to digital input 1) incl. timer, ramp function, and program function
702113		**Type 702113** (format 108Q: 96 x 48 mm) 1 analog input, 2 digital inputs (digital input 1, alternative to logic output), 2 relays (N/O contact), 1 logic output 0/14 V (alternative to digital input 1) incl. timer, ramp function, and program function
702114		**Type 702114** (format 104: 96 x 96 mm) 1 analog input, 2 digital inputs (digital input 1, alternative to logic output), 2 relays (N/O contact), 1 logic output 0/14 V (alternative to digital input 1) incl. timer, ramp function, and program function
	(2)	**Version**
8		Standard with default settings[a]
9		Customer-specific configuration (specifications in plain text)
	(3)	**Option 1**[b]
0		Not used
1		1 relay (N/O contact) (only for type 702111)
2		1 logic output 0/14 V (only for types 702111, 702112, 702113, 702114)
4		1 RS485 interface (Modbus-RTU)
	(4)	**Option 2**[b]
0		Not used
1		1 relay (N/O contact)
2		1 logic output 0/14 V
3		1 analog output
7		1 Ethernet interface (Modbus-TCP, Modbus-RTU/ASCII via TCP/IP; only for types 702112, 702113, 702114); **option 1 does not apply**
	(5)	**Option 3**[b] (only for types 702112, 702113, 702114)
0		Not used
1		1 relay (N/O contact)
2		1 logic output 0/14 V
5		1 PhotoMOS® relay[c]
	(6)	**Option 4**[b] (only for types 702112, 702113, 702114)
0		Not used
1		1 relay (N/O contact)
2		1 logic output 0/14 V
5		1 PhotoMOS® relay[c]
6		1 relay (N/O contact) with longer contact life

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

	(7)	**Voltage supply**
23		AC 110 to 240 V +10/-15 %, 48 to 63 Hz
25		AC/DC 20 to 30 V, 48 to 63 Hz
	(8)	**Extra codes**
000		Without extra code
062		With DNV GL approval[d]
049		With BV approval[d]
214		Math and logic module
221		Structured text

[a] The language of the device texts can be adjusted (German, English, French, Spanish).

[b] The options cannot be retrofitted! Please consider options when ordering.

[c] PhotoMOS is a registered trademark of Panasonic Corporation.

[d] Can only be ordered for type 702111 with power supply AC/DC 20 to 30 V (approval only applies for operation with DC 20 to 30 V) and type 702114 with power supply AC 110 to 240 V; not in combination with Ethernet interface. The approval only applies to panel mounting.

	(1)		(2)		(3)	(4)	(5)	(6)		(7)		(8)		
Order code	[ ]	/	[ ]	-	[ ]	[ ]	[ ]	[ ]	-	[ ]	/	[ ]	,	...[a]
Order example	702114	/	8	-	4	3	5	6	-	23	/	214	,	...

[a] List extra codes in sequence, separated by commas.

Scope of delivery

1 device in the ordered version
1 quick start guide
1 mounting frame (only for types 702110 and 702111)
2 mounting elements (only for types 702112, 702113, and 702114)

Accessories

Description	**Part no.**
Setup program	00678822
USB cable, A connector to Micro-B connector, length 3 m	00616250
Activation for math and logic module (setup program required)	00689708
Activation for structured text (setup program required)	00689709
Mounting for DIN rail, for type 702110	00688236
Mounting for DIN rail, for type 702111	00688237

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

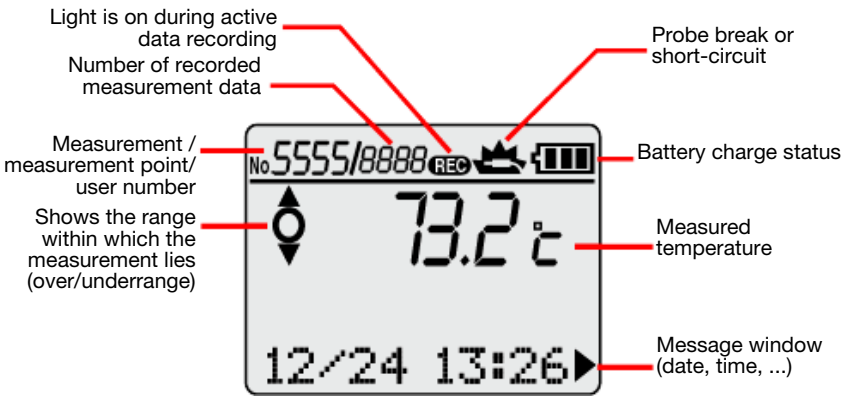
JUMO TDA-300 and JUMO TDA-3000 Handheld Thermometer with data logger

TDA-300 (Type 702540/...)
TDA-3000 (Type 702541/...)

Brief description

TDA-300 and TDA-3000 are handheld digital temperature indicators. They are used together with precision thermocouples or RTDs to measure temperatures on surfaces, in liquids, in melts, and in soft materials.
Interchangeable temperature probes allow rapid adaptation to different applications.
Both instruments feature a data logging function. On Type TDA-3000, the recorded measurement data can be read out via an USB interface. No special PC program is necessary for visualization, since the measurement data are available as ASCII files in CSV format (evaluation via spreadsheet programs).
The plastic housing is proof against shock and breakage and resistant to corrosive substances. Thermometers, temperature probes and accessories are all available for delivery from stock.

Displays



Comparison of models

	TDA-300	TDA-3000
Data logger	99 measurements	9999 measurements
TAG numbers (meas. point designation)	5 (11 characters each)	99 (11 characters each)
User	1	99 (11 characters each)
Interfaces	-	USB, type Mini-B
Enclosure protection	IP67	IP54

Key features

- Measurement input for Pt100, NiCr-Ni K, Fe-Con J and Cu-Con T
- DKD calibration certificate
- Data logger for 9999 measurements
- Simple readout via USB and evaluation of data from a PC (TDA-3000 only)
- Limit monitoring
- Peak/bottom value acquisition
- Battery AA, Mignon LR6, with a long service life

Technical data

Input

Measurement input	RTD Pt100 to EN 60751	Thermocouple NiCr-Ni K to EN 60584	Thermocouple Fe-Con J to EN 60584	Thermocouple Cu-Con T to EN 60584
Range limits - resolution 1 °C - resolution 0.1 °C	 -200 to +850 °C -199.9 to +850.0 °C	 -200 to +1372 °C -199.9 to +999.9 °C	 -200 to +1200 °C -199.9 to +999.9 °C	 -50 to +400 °C -50.0 to +400.0 °C
Measurement offset	-99.9 to +99.9 °C			
Sampling rate	0.5 seconds			
Input filter	1st order digital filter; filter constant adjustable from 0 — 100 seconds			
Unit	°C or °F			

Accuracy

Measurement accuracy of display at 23 °C ambient temperature	±(0.1 % + 1 digit) or ±0.3 °C; the larger value applies			
Accuracy of cold junction (thermocouple only)	-	±0.5 °C for 5 to 40 °C ±1 °C for -20 to +5 °C and for 40 to 50 °C	±0.5 °C for 5 to 40 °C ±1 °C for -20 to +5 °C and for 40 to 50 °C	±0.5 °C for 5 to 40 °C ±1 °C for -20 to +5 °C and for 40 to 50 °C
Accuracy class of temperature probes	Class A	Class 2	Class 2	Class 2

Measuring circuit monitoring

Probe short-circuit, probe/cable break, wrong connection	Symbol in display

Electrical data

Supply	1 alkaline battery, type LR6 AA
Battery service life	400 hrs continuous operation at 23 °C ambient temperature
Power consumption	10 mW (average value)

Environmental influences

Device type	TDA-300	TDA-3000
Operating temperature range	-20 to +50 °C	
Temperature error	± 0.01 % of measuring span for 5 to 40 °C ambient temperature ± 0.02 % of measuring span for -20 to +5 °C and 40 to 50 °C ambient temperature	
Climatic conditions	rel. humidity ≤ 95 % annual average, no condensation	
Electromagnetic compatibility (EMC) - interference emission - immunity to interference	EN 61326-1 Class B[a] to general requirements	
IP enclosure protection	IP67	IP54

[a] The product is suitable for industrial use as well as for housholds and small businesses.

Housing

Dimensions (W x H x D)	57 x 152 x 46 mm
Weight	approx. 150 g including battery

Display screen

Screen type	FSTN LCD
Display of measured temperature	through 4 digits
Display of memory number	through 4 digits
Display of total number of measured temperatures	through 4 digits
Messages (date, time, ...)	11 characters (68 x 8 pixels)
Data logging info	through symbol; light is on during data recording, flashes when ready for automatic data recording

Probe break/short-circuit	through symbol; light is on when the sensor is not connected or in the event of a break or short-circuit.
Battery charge status	3-stage display
Temperature unit	°C or °F (12 x 8 pixels)

Data logging function

Device type	TDA-300	TDA-3000
Recording type	manual or automatic	
Recording interval	any (manually), 1 — 3600 seconds (automatically)	
Contents of data record	temperature, TAG No. (meas. point designation), user, limits, and date/time	
Recording capacity	99 measurements	9999 measurements
Data storage	in SRAM (volatile memory)	in EEPROM (non-volatile memory)
	Loss of data when battery is discharged or has to be replaced	Data are retained for about 10 years, memory can be rewritten about 100,000 times.

Limit monitoring

Limit monitoring	upper and lower limit can be set for each measurement point
Temperature within the limits	
Temperature above or below the limit	 

Measurement points

Device type	TDA-300	TDA-3000
Number of measurement points	5	99
TAG number (meas. point designation)	consisting of up to 11 characters (digits, letters, and symbols)	

User

Device type	TDA-300	TDA-3000
Number of users	1	99
User names	-	consisting of up to 11 characters (digits, letters, and symbols)

USB interface (Universal Serial Bus) - only for TDA-3000

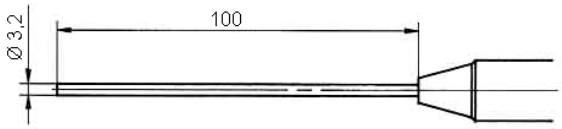
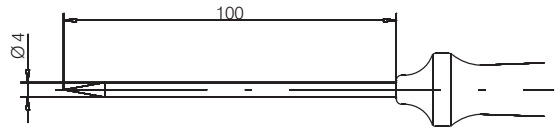
Speed	USB 2.0 (theoretically 12 Mbps max.)
Connection	Mini-B connector
Connecting cable	included in delivery
Supply	via PC
PC operating system	for Windows® 2000, XP, Vista, 7, 8.1, 10 (32-bit and 64-bit)

Additional functions

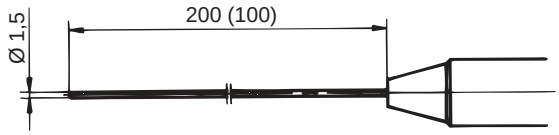
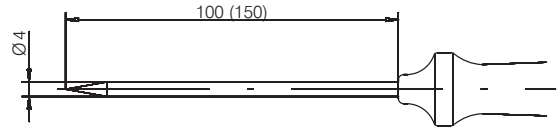
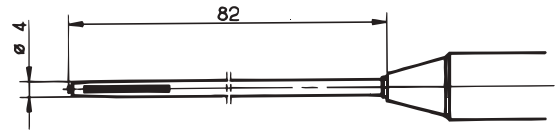
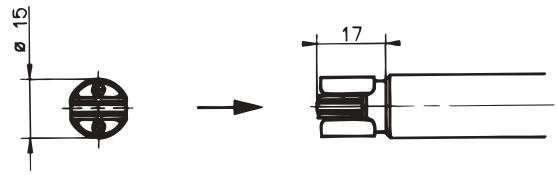
Functions	Peak/bottom value storage, real-time clock (date and time), function locking and self-diagnostics

Temperature probes and adapters

RTD Pt100 with handle and attached connecting cable

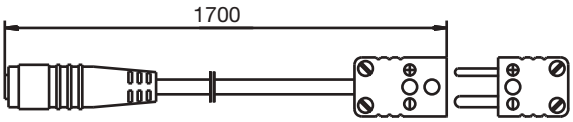
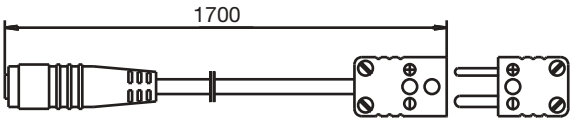
Type	Construction	Description
Immersion probe **702546/01-100**		The immersion probe with handle is particularly suitable for measuring temperatures in liquids. The temperature sensor is located in the probe tip, embedded in a heat transfer compound. The handle, which is provided with an anti-kink spring, is made from temperature-resistant plastic. Max. measurement temperature: 250 °C Max. temperature of handle: 100 °C Max. temperature of cable: 180 °C
Insertion probe **702546/02-100**		Thanks to its measurement tip, this probe is particularly suitable for measuring the core temperature in food and other soft materials. The silicone handle is covered by a protective sleeve and is resistant to corrosive media such as oil and fatty acids. Max. measurement temperature: 250 °C Max. temperature of handle: 180 °C Max. temperature of cable: 180 °C

Thermocouples NiCr-Ni K with handle and attached compensating cable

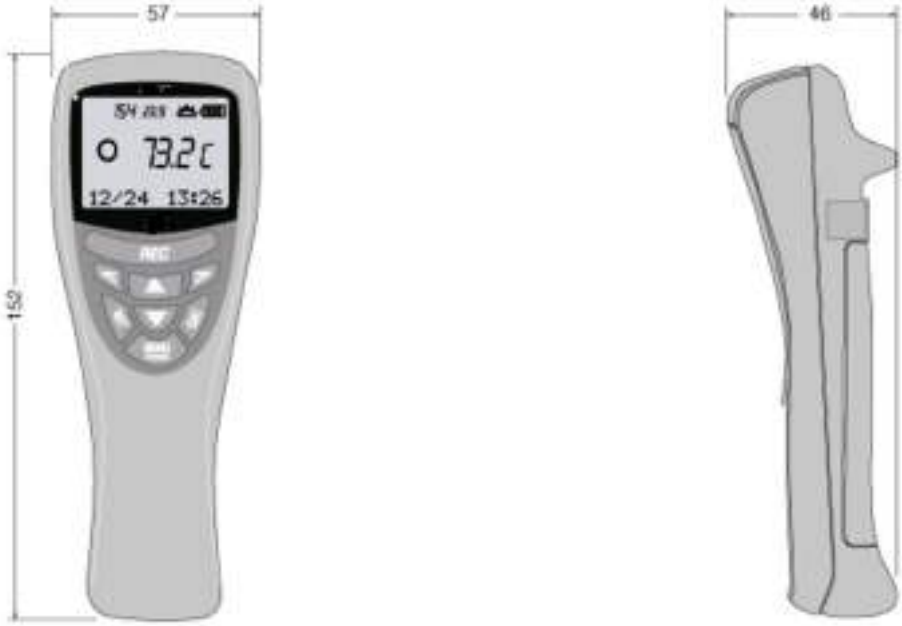
Type	Construction	Description
Flexible immersion probe (mineral-insulated thermocouple) **702545/01-...**		The immersion probe tip is suitable for measuring temperatures in liquids. Max. measurement temperature: 1150 °C Max. temperature of handle: 100 °C Max. temperature of cable: 180 °C
Insertion probe **702545/02-...**		Thanks to its measurement tip, this probe is particularly suitable for measuring the core temperature in food and other soft materials. The silicone handle is covered by a protective sleeve and is resistant to corrosive media such as oil and fatty acids. Max. measurement temperature: 250 °C Max. temperature of handle: 180 °C Max. temperature of cable: 180 °C
Surface probe **702545/03-004**		The surface probe is particularly suitable for measurement on very small and uneven objects with poor heat conduction, for instance electronic components, glass, ceramic. The thermocouple is mounted on a spring plate so that the probe can also be applied obliquely to the surface. Max. measurement temperature: 400 °C Max. temperature of handle: 100 °C Max. temperature of cable: 180 °C
Surface probe **702545/03-015**		This surface probe enables highly accurate and easily reproducible measurements on flat surfaces. Since the spring bands of the probe are transversely linked, the measurements are largely independent of the applied pressure and the contact angle. Max. measurement temperature: 500 °C Max. temperature of handle: 110 °C Max. temperature of cable: 180 °C

The cable length for all probes is about 1500 mm. The insertion probes are protected to IP67.
Probes with type J and T thermocouples on request.

Adapters for existing probes

Type	Diagram	Description
Adapter for RTD Pt100 **702546/04-000**		The adapter is 1700 mm long and can be used in ambient temperatures up to 100 °C. Existing RTDs can be connected up via a connector-coupling combination (type Mini-Flach) in copper.
Adapter for thermocouple type K **702545/04-000**		The adapter is 1700 mm long and can be used in ambient temperatures up to 100 °C. Existing thermocouples can be connected up via a thermal connector-coupling (type Mini-Flach).

Dimensions



Carrying case

Order details: Handheld thermometer with data logger

	(1) Basic version
702540/	TDA-300, Type 702540/88-000
702541/	TDA-3000, Type 702541/88-000

	(1)		(2)		(3)
Order code		/	88	-	000
Order example	702541	/	88	-	000

Order details: Temperature probe and adapter

			(1) Basic version
		702545/	Thermocouple K
		702546/	Pt100 RTD
			(2) Probe type
x	x	01	immersion probe
x	x	02	insertion probe
x		03	surface probe
x	x	04	adapter with 1500mm cable, for existing probes
			(3) probe diameter/length
x	x	000	with probe type 04 only
x		004	4 mm dia. (probe type 03 only)
x		015	15 mm dia. (probe type 03 only)
x	x	100	length: 100 mm (probe types 01 and 02 only)
x		150	length: 150 mm (probe type 02 only)
x		200	length: 200 mm (probe type 01 only)

	(1)		(2)		(3)
Order code		/		-	
Order example	702545	/	01	-	200

Standard accessories

- 1 Operating Manual
- 1 battery
- 1 carrying hook
- 1 USB connecting cable (TDA-3000 only)

Accessories

- Silicone heat transfer compound (20 ml tube, for temperature measurements up to 200 °C, part no. 94091460
- Carrying case for thermometer, two probes, heat transfer compound and accessories, part no. 00453912

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

JUMO dTRON 304/308/316 Compact Controller with program function

JUMO dTRON 316
Type 703041/ ...

JUMO dTRON 308H
Type 703042/ ...

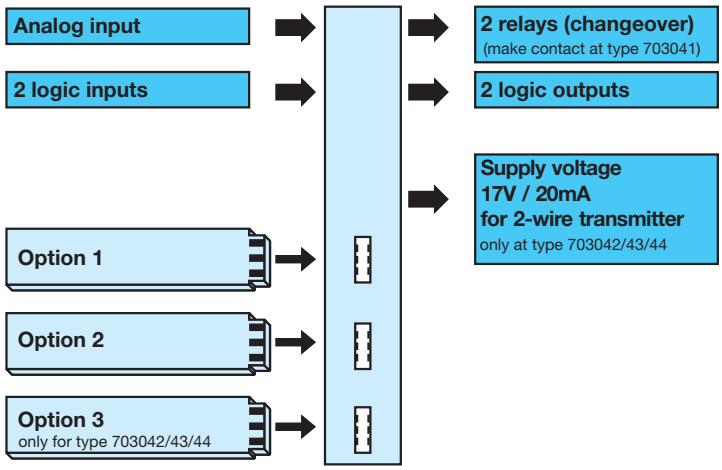
JUMO dTRON 308Q
Type 703043/ ...

JUMO dTRON 304
Type 703044/ ...

Brief description

The JUMO dTRON 300 series of controllers includes four freely programmable devices in different DIN formats for controlling temperature, pressure and other process variables. As a temperature controller (TR) according to EN 14597 the devices are used in heat-generating plants to control the temperature of liquids or gases (mode of action: 1B).
The high-contrast, multicolor LC display for process value, setpoint and operator prompting contains two four-digit 7-segment displays, two single-character 16-segment displays, display of the active setpoints, six switch position indicators, and displays for the dimensional unit, ramp function and manual operation.
Simple operation through 4 keys. The instruments can be used as 2-state, 3-state, modulating or continuous controllers. The controller software includes a program or ramp function, parameter set changeover, two autotuning (self-optimization) procedures, a math and logic module, as well as 4 limit comparators.
Linearizations for the usual transducers are stored, and a customer-specific linearization table can be programmed.
A setup program is available for user-friendly configuration from a PC.
A serial interface for RS422/485 or Profibus-DP can be used to integrate the instruments into a data network.
The electrical connection is made at the back, via screw terminals.
The possible input and output configurations are shown in the following block diagram. The option boards are universally applicable for all instruments in the series.

Block structure



Option boards:
- Analog input
- 2 logic inputs
- 1 relay 230V/8A (changeover)
- 2 relays 230V/3A (make contact) with common pole
- 1 solid-state relay
- Analog output (voltage/current)
- RS422/485 interface
- PROFIBUS-DP interface

Key features

+ Up to two programmable analog inputs
+ Four programmable setpoints, two parameter sets
+ Program function with 8 segments, or ramp function
+ Math and logic module
+ 4 limit comparators
+ Two timers
+ Two self-optimization procedures
+ Fast, user-friendly configuration through the setup program with program editor
+ RS422/485 interface or PROFIBUS-DP interface

Approvals/marks of conformity (see technical data)

Self-optimization

Standard features include the tried and tested self-optimization, which makes it possible for the controller to be matched to the control loop by a user who is not a control technology expert.
This functions by evaluating the response of the control loop to specific changes in the manipulating variable. Either an oscillatory method or a step-response test can be selected. The step-response test is used, for example, in the plastics industry or in processes where the oscillatory method cannot be employed. The controller parameters that are calculated are: proportional band, reset time, derivative time, cycle time and filter time constant.

Customer-specific linearization

In addition to the linearizations for the usual transducers, a customer-specific linearization can also be created. The programming is carried out in the setup program, in the form of a table of values or a formula.

User data

Parameters which are frequently changed by the user can be combined at the operating level under “User data” (only through the setup program).

Math and logic module

Order details: Extra code 214
The math module makes it possible to combine values such as the setpoints, output levels and measurements from the analog inputs into a mathematical formula.
The logic module can be used, for instance, to make a logical combination of logic inputs and limit comparator states.
Up to two math or logic formulae can be entered through the setup program, and the results of the calculations can be presented at the outputs or used for internal purposes.

Special types of controller

Order details: Extra codes 217, 218 and 219
The instrument can be operated as a differential, humidity or ratio controller.

Logic functions

- Start/cancel self-optimization
- Change to manual mode
- Hold/cancel ramp
- Controller off
- Setpoint changeover
- Parameter set switching
- Key/level inhibit
- Text display
- Display off
- Acknowledge limit comparators
- Program start/hold/cancel
- Timer start/stop

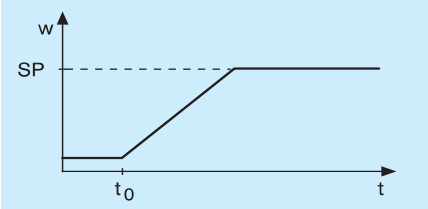
The logic functions can be combined with one another (only through the setup program).

Functions of the outputs

- Analog input variables
- Math
- Process value
- Setpoint
- Ramp end value
- Control deviation
- Output level
- Controller outputs
- Limit comparators
- Control contacts
- Logic inputs
- Logic formula
- Program end
- Timer signals
- Program/automatic signal

Ramp function

Either a rising or a falling ramp function can be used (increase or decrease in the setpoint). The change in setpoint value SP at t_0 is the final value for the ramp. The ramp starts with the setpoint at time t_0. The slope of the ramp can be programmed; the sign (direction) of the slope is given by the relationship between the setpoint at time t_0 and the SP value. When the supply voltage is switched on, the ramp function starts with the momentary process value.



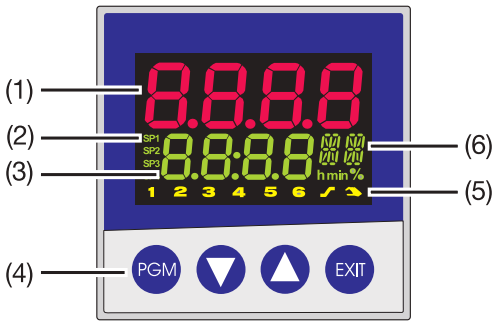
Timers

Two timers are available for time-dependent control. The status of the timers can be switched through to the logic outputs or internally processed for the activation or de-activation of time-dependent processes.

Setup program (accessory)

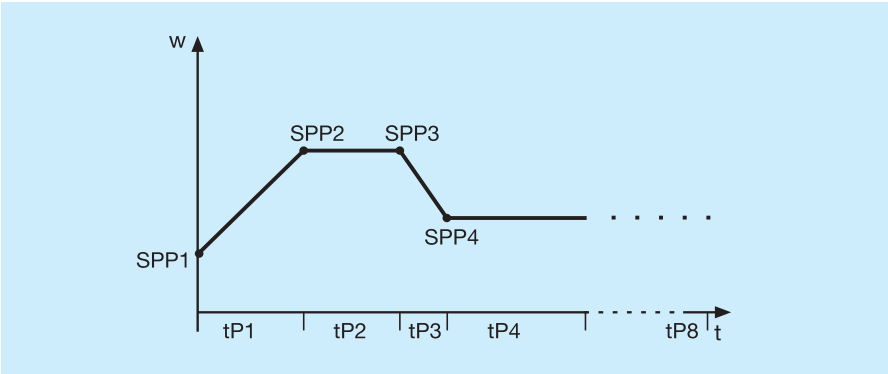
The setup program for configuring the instrument is available in English, French and German. Using a PC, you can create and edit sets of data, and transfer them to the controller or read them out from the instrument. The data sets are stored and managed.
Program editor
For the easy creation of programs.
Startup function
To check the control-loop behavior.

Displays and controls



(1)	**7-segment display** (factory setting: process value) four-digit, red; decimal place is configurable (automatic adjustment on display overflow)
(2)	**Active setpoint** (factory setting: SP1) SP1, SP2, SP3, SP4 (SP=setpoint); green;
(3)	**7-segment display** (factory setting: setpoint) four-digit, green; decimal place is configurable, also used for operator prompting (display of parameter and level symbols)
(4)	**Keys**
(5)	**Indication** yellow, for - switch status of logic outputs 1 — 6 (display lights up = ON) - ramp/program function is active - active manual operation
(6)	**16-segment display for the unit °C/°F and text** two-digit, green; with symbols for h, min, % additional display options through the setup program

Program function



A setpoint profile can be implemented with a maximum of 8 program segments. The settings for the segment setpoints (SPP1 — SPP8) and segment times (tP1 — tP8) are carried out at the user level. The time scale can be configured as mm:ss or hh:mm (s = seconds, h = hours).
A program-end signal can be generated, and the program can be halted or canceled.
Further functions can be defined through the setup program (start at process value, cyclical program handling, segment-by-segment assignment of parameter sets and four control contacts). The program profile can also be visualized.

Interfaces

RS422/RS485 interface

The serial interface is used for communication with higher-level (supervisory) systems.
The Modbus protocol is used for transmission.

PROFIBUS-DP

The Profibus-DP interface can be used to integrate the controller into a fieldbus system operating according to the Profibus-DP standard. This Profibus version is especially designed for communication between automation systems and decentralized peripheral devices at the field level, and optimized for speed.
Data transmission is made serially, using the RS485 standard.
GSD generator, the project-planning tool that is supplied with the package (GSD = Gerätestammdaten, i.e. device data), is used to make a selection of device characteristics for the controller to create a standardized GSD file that is used to integrate the controller into the fieldbus system.

Parameter level

All the parameters and their meanings are included in the table. Some parameters may be missing or meaningless for a particular type of controller. Two parameter sets can be stored, to handle special applications.

Parameter	Value range	Factory setting	Meaning
Proportional band	0 to 9999 digits	0 digits	Size of the proportional band 0 means that the controller structure is out of action!
Derivative time	0 to 9999 sec	80 sec	Influences the differential component of the controller output signal
Reset time	0 to 9999 sec	350 sec	Influences the integral component of the controller output signal
Cycle time	0 to 999.9 sec	20.0 sec	When using a switched output, the cycle time should be chosen so that the energy flow to the process is as continuous as is practicable without overloading the switching elements.
Contact spacing	0 to 999.9 digits	0.0 digits	The spacing between the two control contacts for 3-state or modulating controllers
Switching differential	0 to 999.9 digits	1.0 digits	Hysteresis for switching controllers with proportional band = 0
Actuator time	5 to 3000 sec	60 sec	Actuator time range used by the control valve for modulating controllers
Working point	-100 to +100%	0%	The output level for P and PD controllers (if x = w then y = Y0)
Output level limiting	0 to 100%	100%	The maximum limit for the output level
	-100 to +100 %	-100%	The minimum limit for the output level

Technical data

Thermocouple input

Designation		Measuring range	Measuring accuracy	Ambient temperature error
Fe-Con L		-200 to + 900°C	≤0.25%	100 ppm /°C
Fe-Con J	EN 60584	-200 to +1200°C	≤0.25%	100 ppm /°C
Fe-Con U		-200 to + 600°C	≤0.25%	100 ppm /°C
Cu-Con T	EN 60584	-200 to + 400°C	≤0.25%	100 ppm /°C
NiCr-Ni K	EN 60584	-200 to +1372°C	≤0.25%	100 ppm /°C
NiCr-Con E	EN 60584	-200 to +1000°C	≤0.25%	100 ppm /°C
NiCrSi-NiSi N	EN 60584	-100 to +1300°C	≤0.25%	100 ppm /°C
Pt10Rh-Pt S	EN 60584	0 to 1768°C	≤0.25%	100 ppm /°C
Pt13Rh-Pt R	EN 60584	0 to 1768°C	≤0.25%	100 ppm /°C
Pt30Rh-Pt6Rh B	EN 60584	0 to 1820°C	≤0.25% in the range 300 to 1820°C	100 ppm /°C
W5Re-W26Re C		0 to 2320 °C	≤0.25%	100 ppm /°C
W3Re-W25Re D		0 to 2495 °C	≤0.25%	100 ppm /°C
W3Re-W26Re		0 to 2400 °C	≤0.25%	100 ppm /°C
Cold junction		Pt100, internal		

Input for resistance thermometer

Designation		Connection	Measuring range	Measuring accuracy		Ambient temperature error
				3-/4-wire	2-wire	
Pt100	EN 60751 (factory setting)	2-wire / 3-wire / 4-wire	-200 to +850°C	≤0.05%	≤0.4%	50 ppm / °C
Pt500	EN 60751	2-wire / 3-wire / 4-wire	-200 to +850°C	≤0.2%	≤0.4%	100 ppm /°C
Pt1000	EN 60751	2-wire / 3-wire / 4-wire	-200 to +850°C	≤0.1%	≤0.2%	50 ppm /°C
KTY11-6		2-wire	-50 to +150°C		≤2.0%	50 ppm /°C
Sensor lead resistance		max. 30Ω per lead for 3-wire or 4-wire circuit				
Measuring current		approx. 250µA				
Lead compensation		Not required for 3-wire or 4-wire circuit. With a 2-wire circuit, the lead resistance can be compensated in software by a correction of the process value.				

Input for standard signals

Designation	Measuring range	Measuring accuracy	Ambient temperature error
Voltage	0(2) — 10V 0 — 1V Input resistance R_{IN} > 100kΩ	≤0.05% ≤0.05%	100 ppm / °C 100 ppm / °C
Current	0(4) — 20mA, voltage drop 2.0 — 2.5V	≤0.05%	100 ppm / °C
Heating current	0 — 50mA AC	≤1%	100 ppm / °C
Resistance transmitter	min. 100Ω, max. 4kΩ	±4Ω	100 ppm / °C

Logic inputs

Floating contacts	

Measuring circuit monitoring

In the event of a fault, the outputs move to a defined (configurable) status.

Sensor		Overrange / underrange	Probe or lead short-circuit	Probe or lead break
Thermocouple		•	-	•
Resistance thermometer		•	•	•
Voltage	2 — 10V	•	•	•
	0 — 10V	•	-	-
	0 — 1V	•	-	-
Current	4 — 20mA	•	•	•
	0 — 20mA	•	-	-
Resistance transmitter		-	-	•

• = recognized - = not recognized

Outputs

Relay (changeover) for type 703042/43/44 contact rating contact life	 5A at 230VAC resistive load [1] 350,000 operations at rated load / 750,000 operations at 1A
Relay (changeover) (option) contact rating contact life	 8A at 230V AC resistive load [1] 100,000 operations at rated load / 350,000 operations at 3A
Relay (make) for type 703041 contact rating contact life	 3A at 230VAC resistive load [2] 150,000 operations at rated load / 350,000 at 1A
Relay (changeover) (option) contact rating contact life	 3A at 230VAC resistive load 350,000 operations at rated load / 900,000 operations at 1A
Logic output	0/12V / 30mA max. (sum of all output currents) or 0/18V / 25mA max. (sum of all output currents)
Solid-state relay (option) contact rating protection circuitry	The holding current of the triac is at least 50mA. 1A at 230V varistor
Voltage (option) output signals load resistance accuracy	 0 — 10V / 2 — 10V $R_{load} \geq 500\Omega$ ≤ 0.5%
Current (option) output signals load resistance accuracy	 0 — 20mA / 4 — 20mA $R_{load} \leq 500\Omega$ ≤ 0.5%
Supply voltage for 2-wire transmitter for type 703042/43/44 voltage	electrically isolated, not stabilized 17V DC at 20mA load, 25V DC with no load

1. 3A with devices certified to DIN EN 14597
2. 1A with devices certified to DIN EN 14597

Controller

Controller type	2-state controller (factory setting), 3-state controller, modulating controller, continuous controller
Controller structures	P, PD, PI, PID
A/D converter	dynamic resolution up to 16-bit
Sampling time	50msec, 90msec, 150msec, 250msec (factory setting: 250msec)

Electrical data

Supply voltage (switchmode PSU)	110—240V AC -15/+10%, 48 — 63Hz 20—30V AC/DC, 48—63Hz
Electrical safety	to EN 60730 overvoltage category III, pollution degree 2
Power consumption	Type 703041: max. 8VA; type 703042/43/44: max. 13VA
Data backup	EEPROM
Electrical connection	at the back, via screw terminals, conductor cross-section up to 2.5mm^2 with core ferrules (length: 10mm)
Electromagnetic compatibility Interference emission Interference immunity	EN 61326-1 Class B to industrial requirements

Housing

Housing type	plastic housing for panel mounting to IEC 61554
Depth behind panel	90 mm
Ambient/storage temperature range	0 to 55°C / -30 to +70°C
Climatic conditions	rel. humidity ≤90% annual mean, no condensation
Operating position	horizontal
Protection	to EN 60529, front IP65 / back IP20
Weight (fully fitted)	Type 703041: approx. 220g Type 703042/43: approx. 380g Type 703044: approx. 490g

Interface

Modbus

Interface type	RS422/485
Protocol	Modbus, Modbus Integer
Baud rate	9600, 19200, 38400
Device address	0 — 255
Max. number of nodes	32

PROFIBUS

Device address	0 — 255

DIN approved sensors for operation in air

	Sensor type	Temperature range[1]	Nom. length mm	Process connection
Resistance thermometers acc. to data sheet 90.2006	2 x Pt 100	-170 ... +700°C	500, 700, 1000	Sliding stop flange
	2 x Pt 100	-170 ... +700°C	500, 700, 1000	Screwed pipe joint G1/2
Thermocouples acc. to data sheet 90.1006	2 x NiCr-Ni, type „K“	-35 ... +800°C	500, 700, 1000	Sliding stop flange
	2 x FeCuNi, type „L“	-35 ... +700°C	500, 700, 1000	
	2 x NiCr-Ni, type „K“	-35 ... +1000°C	250, 355, 500	
	1 x Pt10Rh-Pt, type „S“	0 ... 1300°C	250, 355, 500	
	2 x Pt10Rh-Pt, type „S“	0 ... 1300°C	250, 355, 500	
	1 x Pt30Rh-Pt6Rh, type „B“	600 ... 1500°C	250, 355, 500	
	2 x Pt30Rh-Pt6Rh, type „B“	600 ... 1500°C	250, 355, 500	

1. This is the sensor temperature range. The approval of the device does only apply to the temperature ranges listed on page 4/10.

DIN approved sensors for operation in water and oill

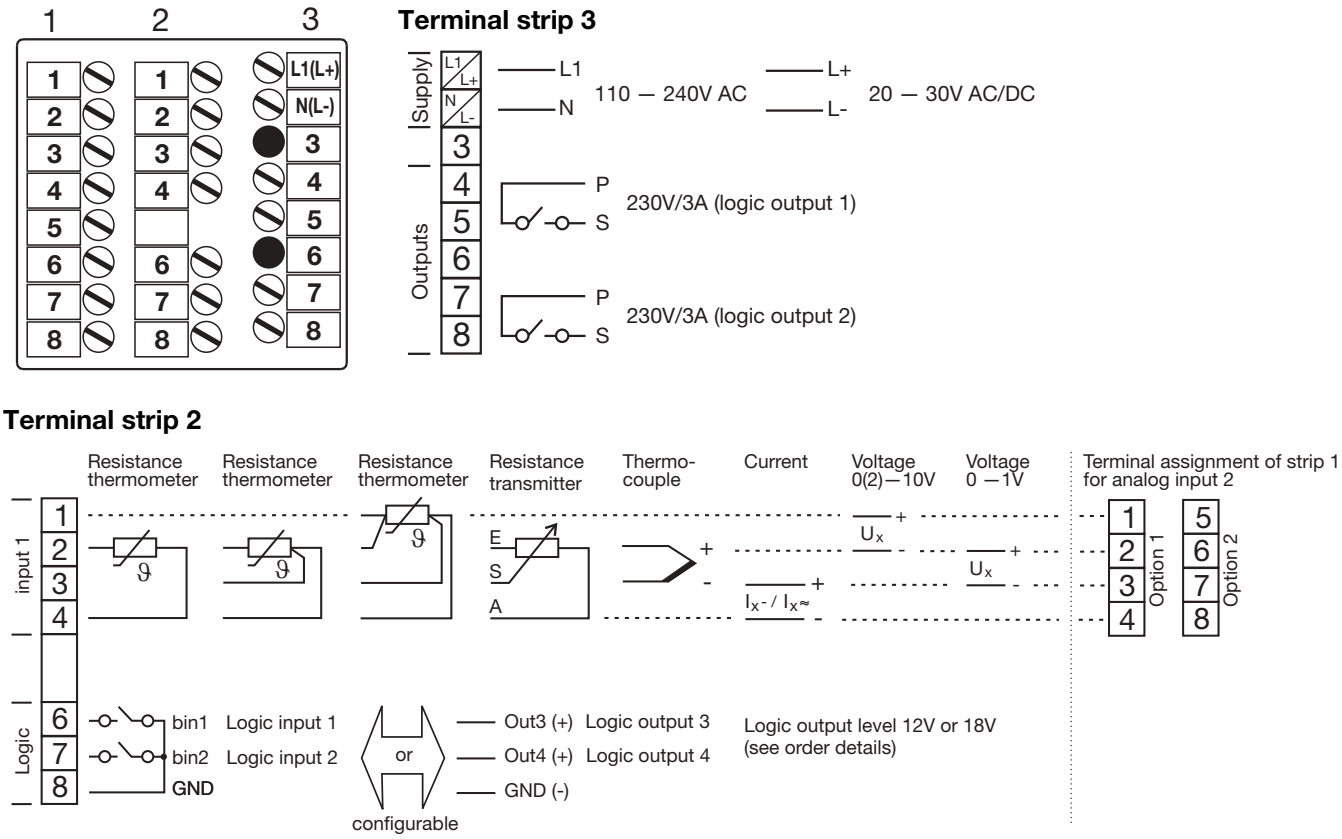
	Sensor type	Temperatur range[1]	Fitting length mm	Process connection
Resistance thermometers acc. to data sheet 90.2006	1 x Pt 100	-40 ... +400°C	100	Screw fitting G1/2
	2 x Pt 100		100	
	2 x Pt 100	-170 ... +550°C	65 ... 670	Screwed pipe joint G1/2
	1 x Pt 100		65 ... 670	
	1 x Pt 100	-170 ... +480°C	250	Screw fitting G1/2
	2 x Pt 100		250	
	1 x Pt 100	-40 ... +480°C	100, 160, 220	Weld-in pocket
	1 x Pt 100	-40 ... +400°C	190	
	2 x Pt 100	-40 ... +400°C	190	
	2 x Pt 100	-40 ... +480°C	100, 160, 220	
	3 x Pt 100	-40 ... +400°C	100, 160, 220	
	1 x Pt 100	-170 ... +480°C	100, 160, 220	
Thermocouples acc. to data sheet 90.1006	2 x NiCr-Ni, type „K“	-35 ... +550°C	65 ... 670	Screwed pipe joint G1/2
	1 x NiCr-Ni, type „K“		65 ... 670	
	2 x FeCuNi, type „L“		65 ... 670	
	1 x FeCuNi, type „L“		65 ... 670	
	1 x Fe-CuNi, type „L“	-35 ... +480°C	220	Weld-in pocket
	2 x Fe-CuNi, type „L“		220	

1. This is the sensor temperature range. The approval of the device does only apply to the temperature ranges listed on page 4/10.

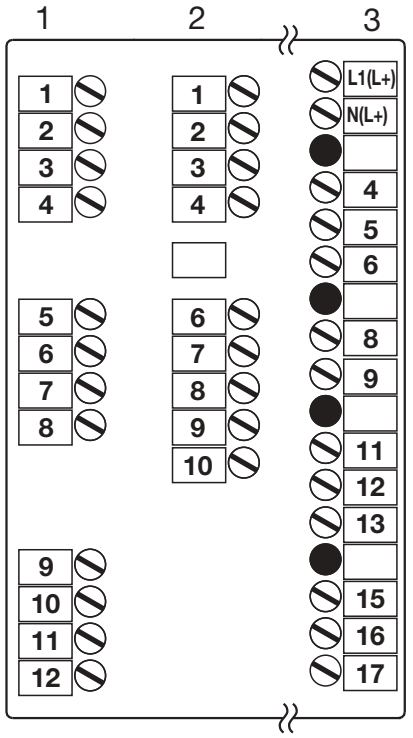
Approvals/marks of conformity

Mark of conformity	Testing laboratory	Certificates/certification numbers	Test basis	valid for
DIN	DIN CERTCO	Register No. TR1187	DIN EN 14597	all types
DNV GL	DNV GL	TAA00001B3	Class Guideline DNVGL-CG-0339	703044/191-320-23/214, 062
c UL us	Underwriters Laboratories	E 201387	UL 61010-1 CAN/CSA-C22.2 No. 61010-1	all types

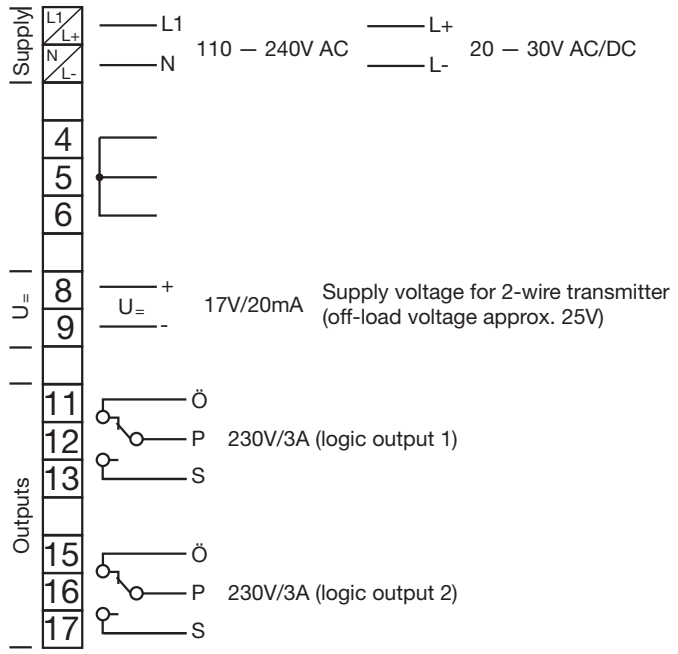
Connection diagram, type 703041



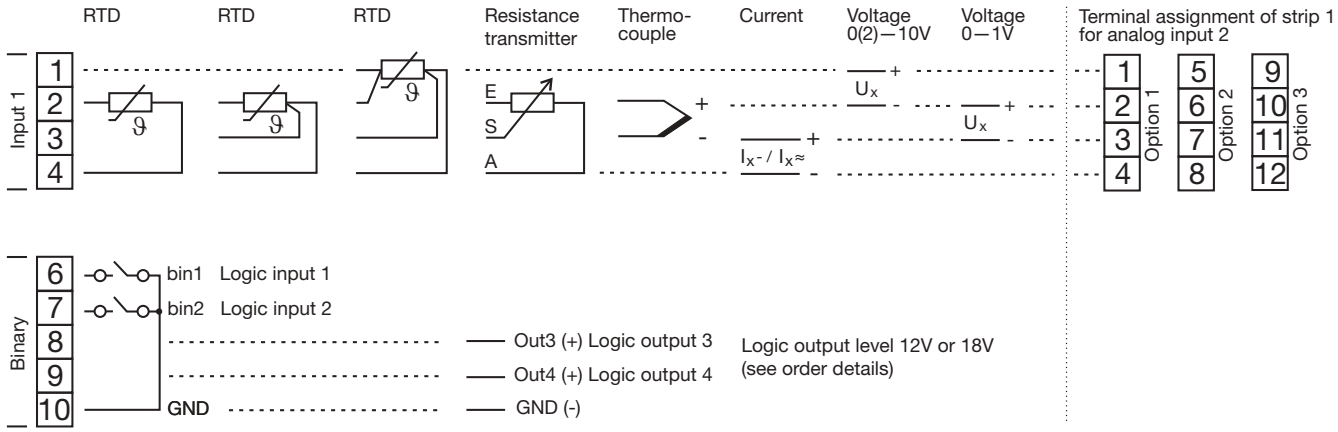
Connection diagram, type 703042/43/44



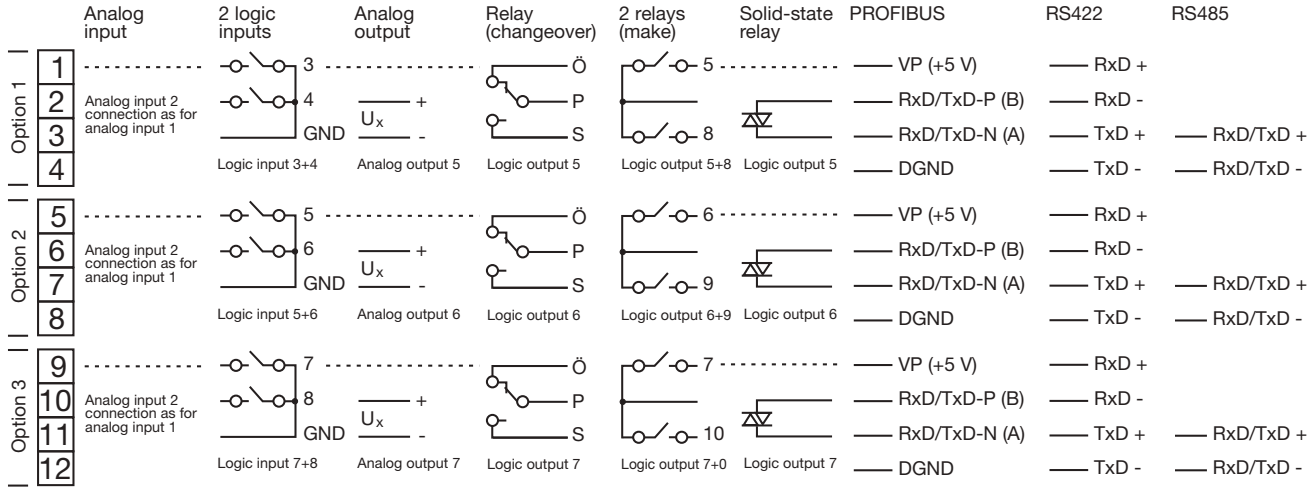
Terminal strip 3



Terminal strip 2

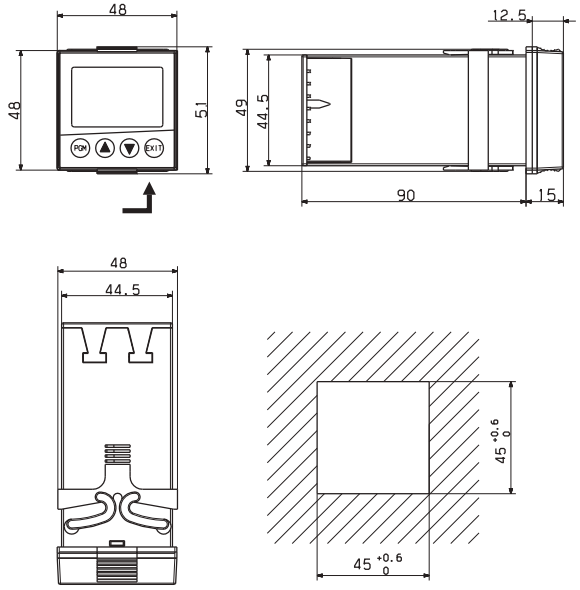


Terminal strip 1

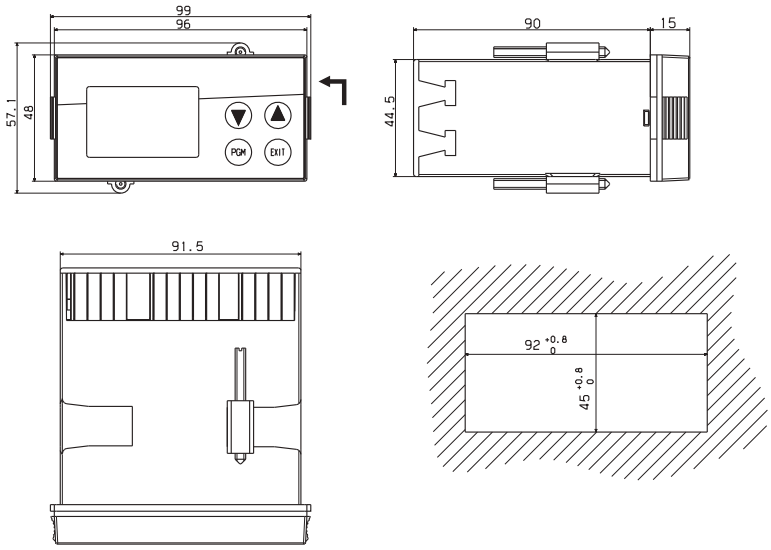


Dimensions

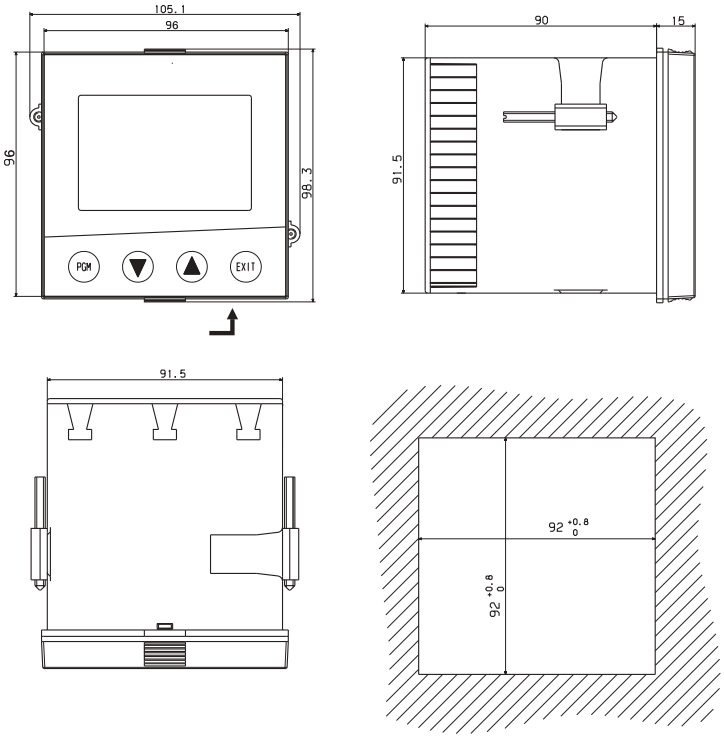
Type 703041



Type 703042/43



Type 703044



Close mounting Minimum spacing of panel cut-outs		
Type	horizontal	vertical
without setup connector:		
703041	11 mm	30 mm
703042 (portrait format)	11 mm	30 mm
703043 (landscape fmt.)	30 mm	11 mm
703044	11 mm	30 mm
with setup connector (see arrow):		
703041	11 mm	65 mm
703042 (portrait format)	11 mm	65 mm
703043 (landscape fmt.)	65 mm	11 mm
703044	11 mm	65 mm

Order details

	Basic type
703041	JUMO dTRON316, format 48mm x 48mm incl. 1 analog input, 2 relays and 2 logic inputs or 2 logic outputs
703042	JUMO dTRON308, format 48mm x 96mm (portrait format) incl. 1 analog and 2 logic inputs, 2 relays and 2 logic outputs
703043	JUMO dTRON308, format 96mm x 48mm (landscape format) incl. 1 analog and 2 logic inputs, 2 relays and 2 logic outputs
703044	JUMO dTRON304, format 96mm x 96mm incl. 1 analog and 2 logic inputs, 2 relays and 2 logic outputs

			Basic type extensions
1			**Basic type 1**
			Version
	8		Standard, with factory settings
	9		Programming to customer specification
			Logic outputs (2 available as standard)
		1	0 / 12V
		2	0 / 18V

				Type 703042/43/44		Type 703041 (no option 3)		
1	**2**	**3**	**Option slots**	**Max. number**		**Max. number**	**Option 1**	**Option 2**
0	0	0	not used				X	X
1	1	1	Analog input 2 (universal)	1		1	X	X
2	2	2	Relay (changeover)	2		1	X	-
3	3	3	2 relays (make contact)	2		1	X	-
4	4	4	Analog output	2		2	X	X
5	5	5	2 logic inputs	2		1	X	X
6	6	6	Solid-state relay 1A	2		2	X	X
7	7	7	RS422/485 interface	1		1	X	X
8	8	8	Profibus-DP interface	1		1	X	X

X = available in this option slot, - = not available in this option slot

	Supply voltage
2 3	110 — 240V AC -15/+10%, 48 — 63Hz
2 5	AC/DC 20…30V, 48…63Hz

	Extra codes
0 0 0	none
2 1 4	Math and logic module
2 1 7	Ratio controller (requirement: 2 analog inputs)
2 1 8	Differential controller (requirement: 2 analog inputs)
2 1 9	Humidity controller (requirement: 2 analog inputs)
8 7 9	AMS2750/CQI-9[a]

	Approvals	
0 0 0	none	
0 5 6	DIN EN 14597	
	dTRON 304 with DNV GL approval	on request

[ ] / 1 [ ] [ ] – [ ] [ ] [ ] – [ ] / [ ] , [ ]

703041 / 1 8 1 – 1 4 0 – 2 3 / 0 0 0 ,

[a] For the calibration certificate the thermocouple type and the desired measuring points (calibration points) are to be defined.

Scope of delivery:
- 1 controller
- 1 seal
- mounting brackets
- 1 operating manual (format DIN A6)

A CD with demo setup software and PDF documents (operating manual and other documentation) can be ordered separately.
Individual documents and programs can be downloaded at www.jumo.net (a charge is made for enabling the software).

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14, 36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
E-mail: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
E-mail: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
8 Technology Boulevard
Canastota, NY 13032, USA
Phone: 315-697-JUMO
1-800-554-JUMO
Fax: 315-697-5867
E-mail: info@jumo.us
Internet: www.jumo.us

JUMO dTRON 304/308/316 plast Compact Controller for the plastics industry

JUMO dTRON 316 plast
Type 703045/ ...

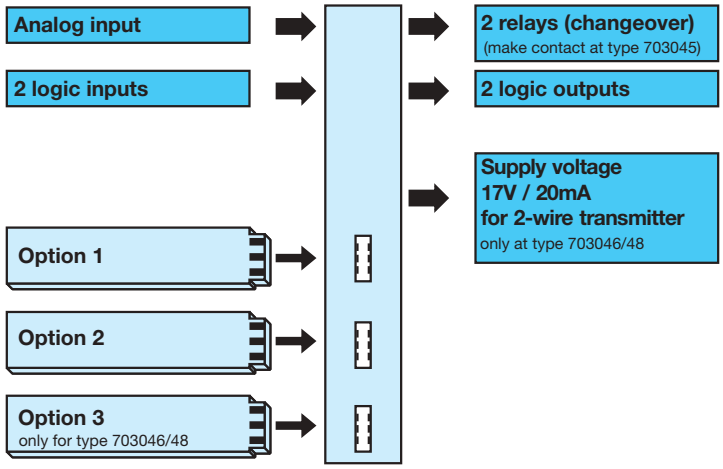
JUMO dTRON 308 plast
Type 703046/ ...

JUMO dTRON 304 plast
Type 703048/ ...

Brief description

The JUMO dTRON 300 plast series of controllers consists of three freely programmable instruments in different DIN formats for controlling temperature and other process variables, to suit the special applications of the plastics industry. Such applications include extruders, injection-molding machinery, tempering equipment and hot-channel systems.
The high-contrast, multicolor LC display for process value, setpoint and operator prompting contains two four-digit 7-segment displays, two single-character 16-segment displays, display of the active setpoints, six status indicators, and displays for the unit, ramp function and manual operation.
Simple operation through 4 keys. The instruments can be used as 2-state, 3-state, modulating or continuous controllers. The controller software includes a hot-channel warm-up ramp function, control loop and output level monitoring, two autotuning (self-optimization) procedures, a math and logic module, as well as 4 limit comparators.
Linearizations for the usual transducers are stored, and a customer-specific linearization table can be programmed.
A setup program is available for user-friendly configuration from a PC.
An RS422/485, a PROFIBUS-DP or current interface can be used to integrate the instruments into a data network.
The electrical connection is made at the back, via screw terminals.
The possible input and output configurations are shown in the following block diagram. The option boards are universally applicable for all instruments in the series.

Block structure



Option boards:
- analog input
- 2 binary inputs
- 1 relay 230V/8A, changeover (SPDT)
- 2 relays 230V/3A, make (SPST-NO), with common pole
- 1 solid-state relay
- analog ouput (voltage/current)
- RS422/485 interface
- PROFIBUS-DP interface
- current interface 0/20mA

Key features

- Control loop monitoring
- Output level monitoring
- Hot-channel warm-up ramp
- Heater current monitoring
- Modbus master function
- Boost function
- Four programmable setpoints, two parameter sets
- Math and logic module
- Two autotuning procedures
- Fast, user-friendly configuration through the setup program with program editor
- RS422/485 interface
- PROFIBUS-DP interface
- Current interface 0/20mA (as per Euromap)

Approvals/marks of conformity (see technical data)

2009-09-30/00465477

Autotuning

Standard features include the tried and tested autotuning facility, which makes it possible for the controller to be matched to the control loop by a user who is not a control-technology expert.
This functions by evaluating the response of the control loop to specific changes in the output level. Either an oscillatory method or a step-response test can be selected. The step-response test is used, for example, in the plastics industry or in processes where the oscillatory method cannot be employed. The controller parameters that are calculated are: proportional band, reset time, derivative time, cycle time and filter time constant.

Customer-specific linearization

In addition to the linearizations for the usual transmitter outputs, a customer-specific linearization can be created. The programming is carried out in the setup program, in the form of a table of values or a formula.

User data

Parameters which frequently have to be changed by the user can be combined at the user level, under “User data” (only through the setup program).

Math and logic module

Order details: Extra code 214
The math module makes it possible to combine values such as setpoints, output levels and measurements from the analog inputs into a mathematical formula.
The logic module can, for instance, be used to logically combine binary inputs and limit comparators with one another.
Up to two math or logic formulae can be entered through the setup program, and the results of the calculations can be presented at the outputs or used for internal purposes.

Special types of controller

Order details: Extra codes 217, 218, 219
The instrument can be operated as a difference, humidity or ratio controller.

Binary functions

- Start boost function
- Start/cancel autotuning
- Change to manual mode
- Hold/cancel ramp
- Controller off
- Setpoint switching
- Parameter set switching
- Key/level inhibit
- Text display
- Display off
- Acknowledge limit comparators
- Program start/hold/cancel
- Timer start/stop

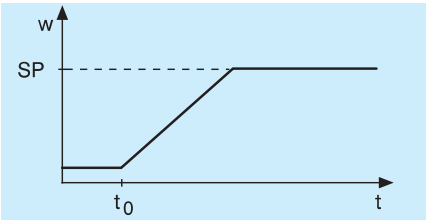
Several binary functions can be combined with one another (only through the setup program).

Functions of the outputs

- Analog input variables
- Math
- Process value
- Setpoint
- Ramp end value
- Control deviation
- Output level
- Controller outputs
- Limit comparators
- Control contacts
- Binary inputs
- Logic formula
- Program end
- Timer signals
- Program/automatic signal

Ramp function

Either a rising or a falling ramp function can be used (increase or decrease in the setpoint). The setpoint value SP changed at time t_0 is the final value for the ramp. The ramp starts with the setpoint at time t_0. The slope of the ramp can be programmed; the sign of the slope is given by the relationship between the setpoint at time t_0 and the SP value. When the supply voltage is switched on, the ramp function starts with the momentary process value.



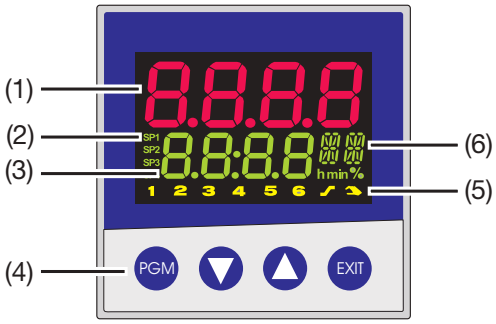
Timer

A timer is available for time-dependent control. The status of the timer can be switched through to the binary outputs or internally processed for the activation or de-activation of time-dependent processes.

Setup program (accessory)

The setup program for configuring the instrument is available in English, French, German, and other languages. Using a PC, you can create and edit sets of data, and transfer them to the controller or read them out from the instrument. The data sets are stored and managed.
The setup program can be expanded through additional program modules.
Program editor
For the easy creation of programs.
Start-up
To check the control behavior.

Displays and controls



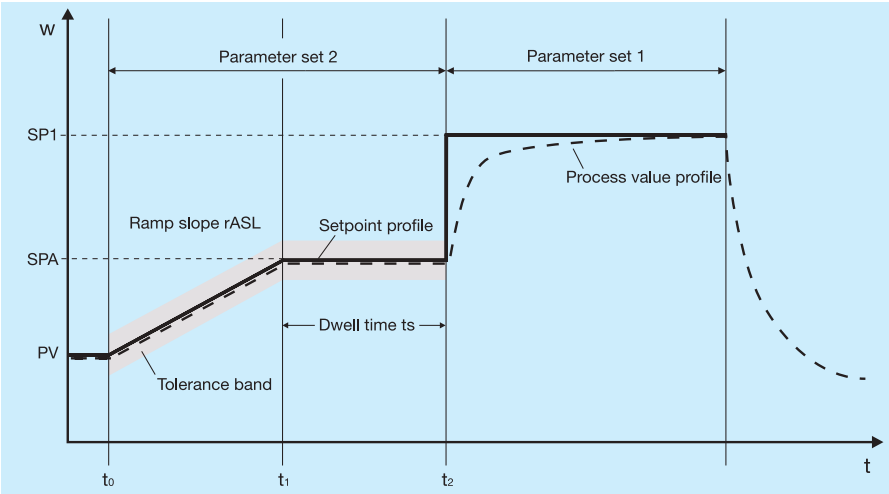
(1)	**7-segment display** (factory setting: process value) four-digit, red; decimal place is configurable (automatic adjustment on display overflow)
(2)	**Active setpoint** (factory setting: SP1) SP1, SP2, SP3, SP4 (SP=setpoint); green;
(3)	**7-segment display** (factory setting: setpoint) four-digit, green; decimal place is configurable; also used for operator prompting (display of parameter and level symbols)
(4)	**Keys**
(5)	**Indication** yellow, for - switch status of binary outputs 1 — 6 (display lights up = on) - ramp/program function is active - manual operation is active
(6)	**16-segment display for the unit °C/°F and text** two-digit, green; symbols for h, min and % additional display options through the setup program

Program function

A setpoint profile can be implemented with a maximum of 8 program segments. The settings for the segment setpoints and segment times are carried out at the user level. The time scale can be configured as mm:ss or hh:mm (s = seconds, h = hours).
A program-end signal can be generated, and the program can be halted or canceled.
Further functions can be defined through the setup program (start at process value, cyclical program handling, segment-by-segment assignment of parameter sets and four control contacts). The program profile can also be visualized.

Warm-up ramp for hot channel

The warm-up ramp for hot-channel equipment is used, for example, for the gentle operation of ceramic heater elements. Damage can be avoided by allowing moisture to evaporate slowly from the hygroscopic heater elements during the warm-up phase.



Boost function

Time- or event-controlled setpoint boost, for example for tool nozzle retraction during the production process. The temperature of the zones is raised by an adjustable value for an adjustable time period, via the binary function (factory setting: binary input 1 (pushbutton)).

Reduction function

The temperature of the zones can be lowered to a quiescent-state setpoint during the production process, for cleaning or changing tools. Ex-factory, this is carried out via binary input 2, but can also be activated through a different signal.

Control loop monitoring

Control loop monitoring is used to check whether the process reacts as expected during commissioning and the approach phase. What is checked is how the process value changes with respect to changes in the output level.
In addition, control loop monitoring also detects any polarity reversal of the operating sense (heating ON, process value falls).
If the (adjustable) conditions are not fulfilled, an alarm will be triggered.

Output level monitoring

This functions serves to monitor the control loop during operation. Output level monitoring is available for checking whether the output level (in a stabilized condition) moves within definable limits (monitoring band) about an average output level. The average output level is calculated by the instrument by means of an adjustable determination time ty. If the output level goes outside the monitoring band, an alarm signal is initialized. This serves to indicate a heating failure or changes to the sensor, for instance.

Interfaces

RS422/RS485 interface

The serial interface is used for communication with higher-level (supervisory) systems.
The Modbus protocol is used for transmission.

PROFIBUS-DP

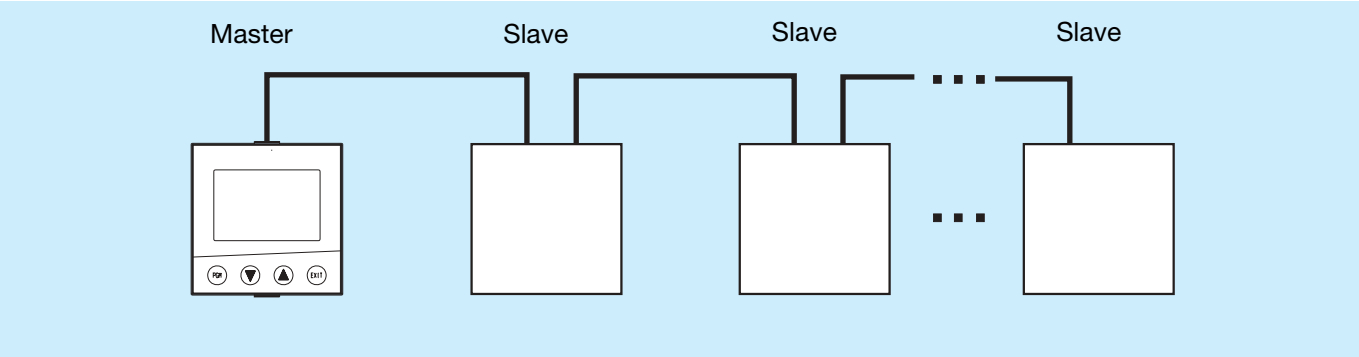
The PROFIBUS-DP interface can be used to integrate the controller into a fieldbus system operating according to the PROFIBUS-DP standard. This PROFIBUS variant is especially designed for communication between automation systems and decentralized peripheral devices at the field level, and optimized for speed.
Data transmission is made serially, using the RS485 standard.
GSD generator, the project-planning tool that is supplied with the package (GSD = Gerätestammdaten, i.e. device data), is used to make a selection of device characteristics for the controller, to create a standardized GSD file that is used to integrate the controller into the fieldbus system.

Current interface

Serial interface with 0/20 mA as per Euromap. Communication takes place through the Modbus or Arburg protocol.

Modbus master

The instrument can be used as an independent master within a Modbus network. This enables the transmission of data to all the devices (slaves (max. 32)) in the Modbus network, either by a key stroke or through the binary function. The slaves must all be devices of the same type.
The configuration is performed through the Setup program.



Parameter level

All parameters and their meanings are listed in the table below. Some parameters may be missing or meaningless for a particular type of controller. Two parameters sets can be stored, to handle special applications.

Parameter	Value range	Factory setting	Meaning
Proportional band	0 to 9999 digits	0 digits	Size of the proportional band 0 means that the controller structure is out of action!
Derivative time	0 to 9999 sec	80 sec	Influences the differential component of the controller output signal
Reset time	0 to 9999 sec	350 sec	Influences the integral component of the controller output signal
Cycle time	0 to 999.9 sec	20.0 sec	When using a switched output, the cycle time should be chosen so that the energy flow to the process is as continuous as is practicable without overloading the switching elements.
Contact spacing	0 to 999.9 digits	0.0 digits	The spacing between the two control contacts for 3-state or modulating controllers
Switching differential	0 to 999.9 digits	1.0 digits	Hysteresis for switching controllers with proportional band = 0
Actuator time	5 to 3000 sec	60 sec	Actuator time range used by the control valve for modulating controllers
Working point	-100 to +100%	0%	The output level for P and PD controllers (if x = w then y = Y0).
Output level limiting	0 to 100%	100%	Maximum output level
	-100 to +100 %	-100%	Minimum output level

Technical data

Input for thermocouple

Designation		Measuring range	Measuring accuracy	Ambient temperature error
Fe-Con L		-200 to + 900°C	≤0.25%	100 ppm /°C
Fe-Con J	EN 60584	-200 to +1200°C	≤0.25%	100 ppm /°C
Cu-Con U		-200 to + 600°C	≤0.25%	100 ppm /°C
Cu-Con T	EN 60584	-200 to + 400°C	≤0.25%	100 ppm /°C
NiCr-Ni K	EN 60584	-200 to +1372°C	≤0.25%	100 ppm /°C
NiCr-Con E	EN 60584	-200 to +1000°C	≤0.25%	100 ppm /°C
NiCrSi-NiSi N	EN 60584	-100 to +1300°C	≤0.25%	100 ppm /°C
Pt10Rh-Pt S	EN 60584	0 to 1768°C	≤0.25%	100 ppm /°C
Pt13Rh-Pt R	EN 60584	0 to 1768°C	≤0.25%	100 ppm /°C
Pt30Rh-Pt6Rh B	EN 60584	0 to 1820°C	≤0.25% within range 300 to 1820°C	100 ppm /°C
W5Re-W26Re C		0 to 2320 °C	≤0.25%	100 ppm /°C
W3Re-W25Re D		0 to 2495 °C	≤0.25%	100 ppm /°C
W3Re-W26Re		0 to 2400 °C	≤0.25%	100 ppm /°C
Cold junction		Pt100, internal		

Input for resistance thermometer

Designation		Connection circuit	Measuring range	Measuring accuracy		Ambient temperature error
				3-/4-wire	2-wire	
Pt100 (factory setting)	EN 60751	2-wire / 3-wire / 4-wire	-200 to +850°C	≤0.05%	≤0.4%	50 ppm / °C
Pt500	EN 60751	2-wire / 3-wire / 4-wire	-200 to +850°C	≤0.2%	≤0.4%	100 ppm /°C
Pt1000	EN 60751	2-wire / 3-wire / 4-wire	-200 to +850°C	≤0.1%	≤0.2%	50 ppm /°C
KTY11-6		2-wire	-50 to +150°C		≤2.0%	50 ppm /°C
Sensor lead resistance		30Ω max. per lead for 3-wire/4-wire circuit				
Measuring current		approx. 250µA				
Lead compensation		Not required for 3-wire or 4-wire circuit. With a 2-wire circuit, the lead resistance can be compensated in software by a correction of the process value.				

Input for standard signals

Designation	Measuring range	Measuring accuracy	Ambient temperature error
Voltage	0(2) — 10V 0 — 1V input resistance R_{IN} > 100kΩ	≤0.05% ≤0.05%	100 ppm / °C 100 ppm / °C
Current	0(4) — 20mA, voltage drop ≤ 1.5V	≤0.05%	100 ppm / °C
Heating current	0 — 50mA AC	≤1%	100 ppm / °C
Resistance transmitter	min. 100Ω, max. 4kΩ	≤0.5%	100 ppm / °C

Binary inputs

Floating contacts	

Measuring circuit monitoring

In the event of a fault, the outputs move to a defined (configurable) status.

Sensor	Overrange / underrange	Probe or lead short-circuit	Probe or lead break
Thermocouple	•	-	•
Resistance thermometer	•	•	•
Voltage 2 — 10V	•	•	•
0 — 10V	•	-	-
0 — 1V	•	-	-
Current 4 — 20mA	•	•	•
0 — 20mA	•	-	-
Resistance transmitter	-	-	•

• = recognized - = not recognized

Outputs

Relay, changeover (SPDT) at type 703046/48 contact rating contact life	 5A at 230V AC resistive load 350,000 operations at rated load / 750,000 operations at 1A
Relay, changeover (SPDT), option contact rating contact life	 8A at 230VAC resistive load 100,000 operations at rated load / 350,000 operations at 3A
Relay, make (SPST-NO) at type 703045 contact rating contact life	 3A at 230VAC resistive load 150,000 operations at rated load / 350,000 operations at 1A
Relay, make (SPST-NO), option contact rating contact life	 3A at 230VAC resistive load 350,000 operations at rated load / 900,000 operations at 1A
Logic output	0/12V / 30mA max. (sum of all output currents) or 0/18V / 25mA max. (sum of all output currents)
Solid-state relay, option contact rating protection circuitry	 1A at 230V varistor
Voltage (option) output signals load resistance accuracy	 0 — 10V / 2 — 10V $R_{load} \geq 500\Omega$ ≤ 0.5%
Current (option) output signals load resistance accuracy	 0 — 20mA / 4 — 20mA $R_{load} \leq 500\Omega$ ≤ 0.5%
Supply voltage for 2-wire transmitter for type 703046/48 voltage	electrically isolated, not stabilized 17V at 20mA, 25V with no load

Controller

Controller type	2-state controller (factory setting), 3-state controller, modulating controller, continuous controller
Controller action	P/PD/PI/PID
A/D converter	dynamic resolution up to 16-bit
Sampling cycle time	50msec, 90msec, 150msec, 250msec (factory setting: 250 msec)

Electrical data

Supply voltage (switch-mode PSU)	110 — 240V AC -15/+10%, 48 — 63Hz 20 — 30V AC/DC, 48 — 63Hz
Electrical safety	Type 703045: to EN 61010, Part 1 Type 703046/48: to EN 60730 overvoltage category III, pollution degree 2
Power consumption	Type 703045: 8VA max. Type 703046/48: 13VA max.
Data backup	EEPROM
Electrical connection	at the back, via screw terminals, conductor cross-section up to 2.5mm^2 with core ferrules (length: 10mm)
Electromagnetic compatibility interference emission interference immunity	EN 61326-1 Class B to industrial requirements

Housing

Housing type	plastic housing for panel mounting to IEC 61554
Depth behind panel	90 mm
Ambient/storage temperature range	0 to 55°C / -30 to +70°C
Climatic conditions	rel. humidity ≤ 90% annual mean, no condensation
Operating position	horizontal
Enclosure protection	to EN 60529, front IP65 / back IP20
Weight (fully fitted)	Type 703045: approx. 220g Type 703046: approx. 380g Type 703048: approx. 490g

Interface

Modbus

Interface type	RS422/485
Protocol	Modbus, Modbus Integer, Modbus Master
Baud rate	4800, 9600, 19200, 38400
Device address	0 — 255
Max. number of stations	32

PROFIBUS-DP

Device address	0 — 255

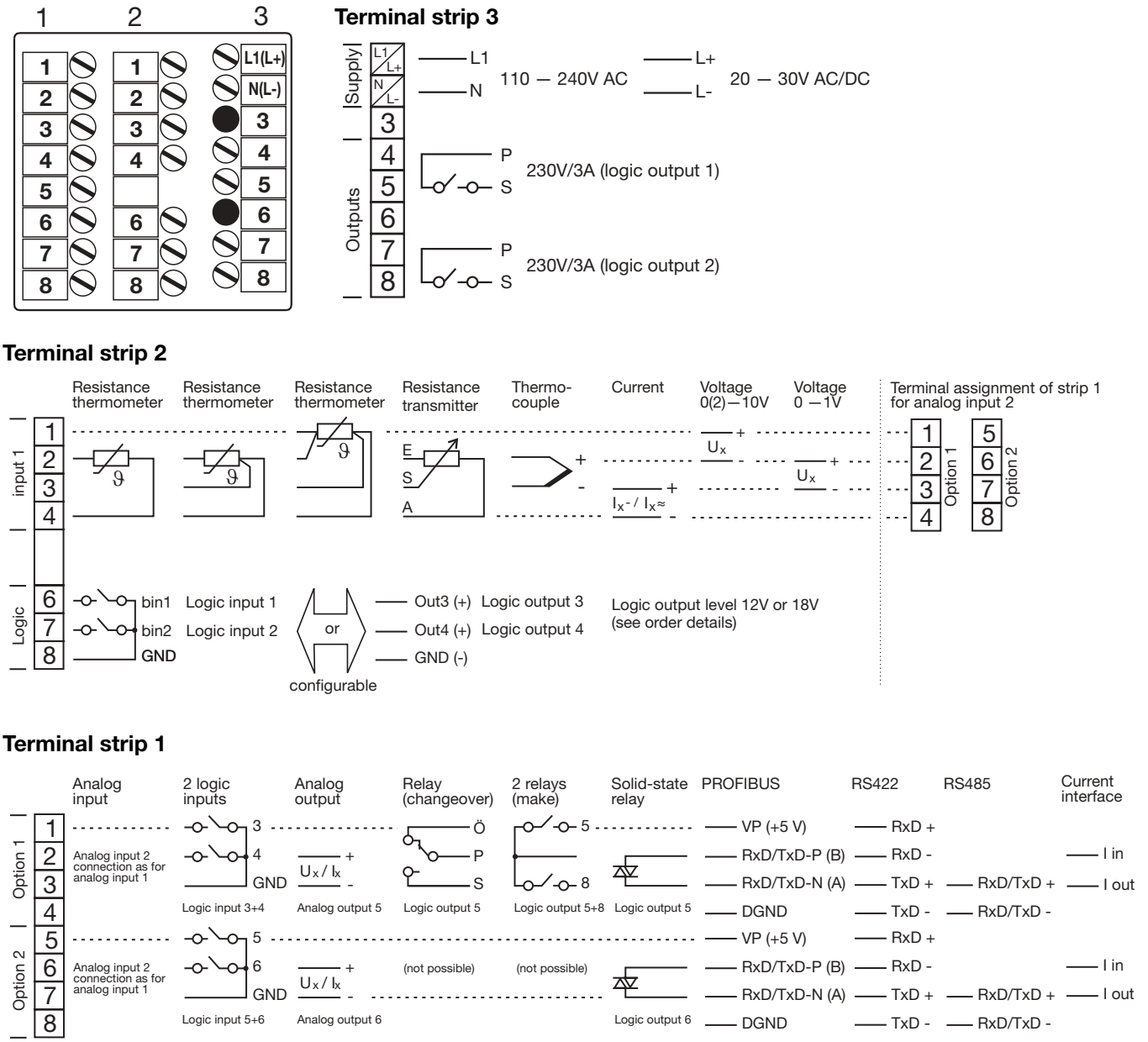
Current interface

Interface type	current 0/20mA
Protocol	Arburg
Baud rate	4800, 9600, 19200, 38400
Device address	0 — 255
Max. number of stations	depending on the current source or their voltage supply; voltage drop per device: approx. 2.5V at 20mA

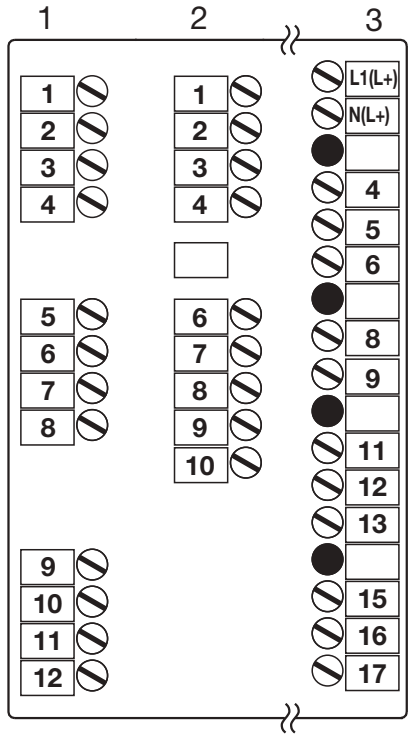
Approvals/marks of conformity

Mark of conformity	Testing laboratory	Certificates/certification numbers	Test basis	valid for
c UL us	Underwriters Laboratories	E 201387	UL 61010-1 CAN/CSA-C22.2 No. 61010-1	dTRON 304 plast dTRON 308 plast

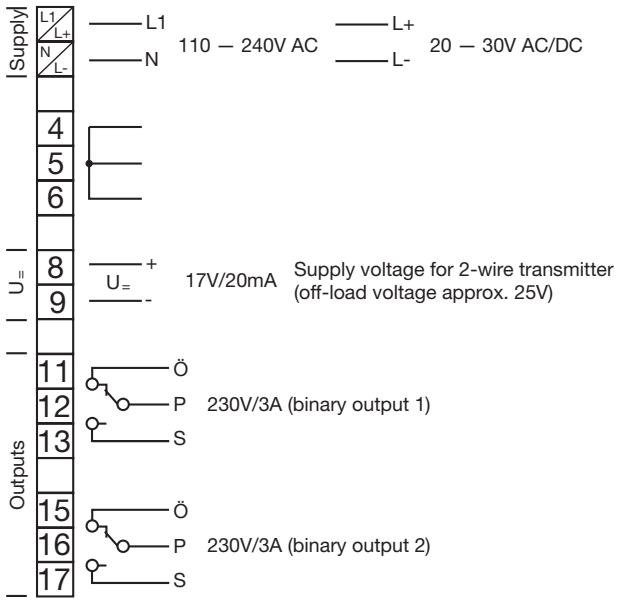
Connection diagram, type 703045



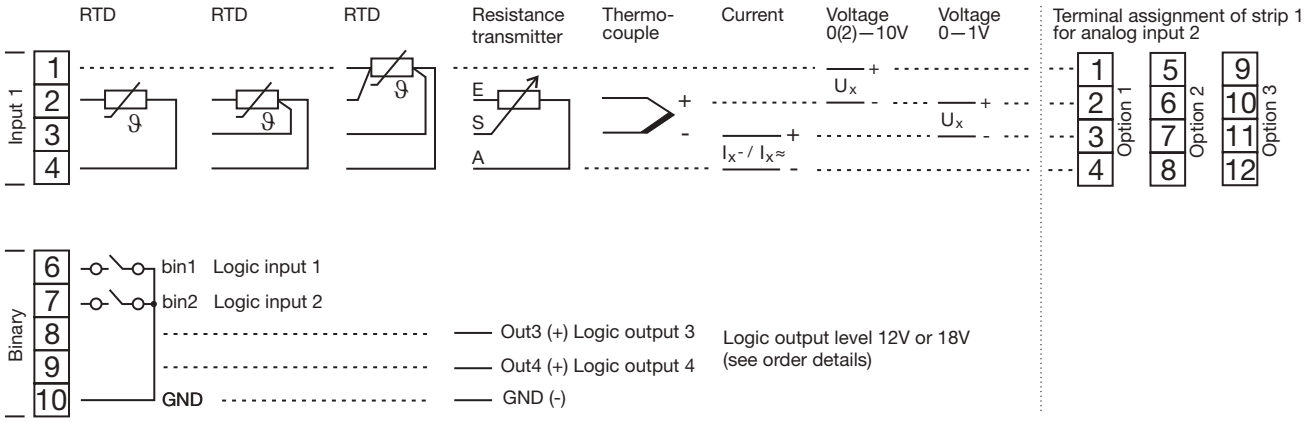
Connection diagram, type 703046/48



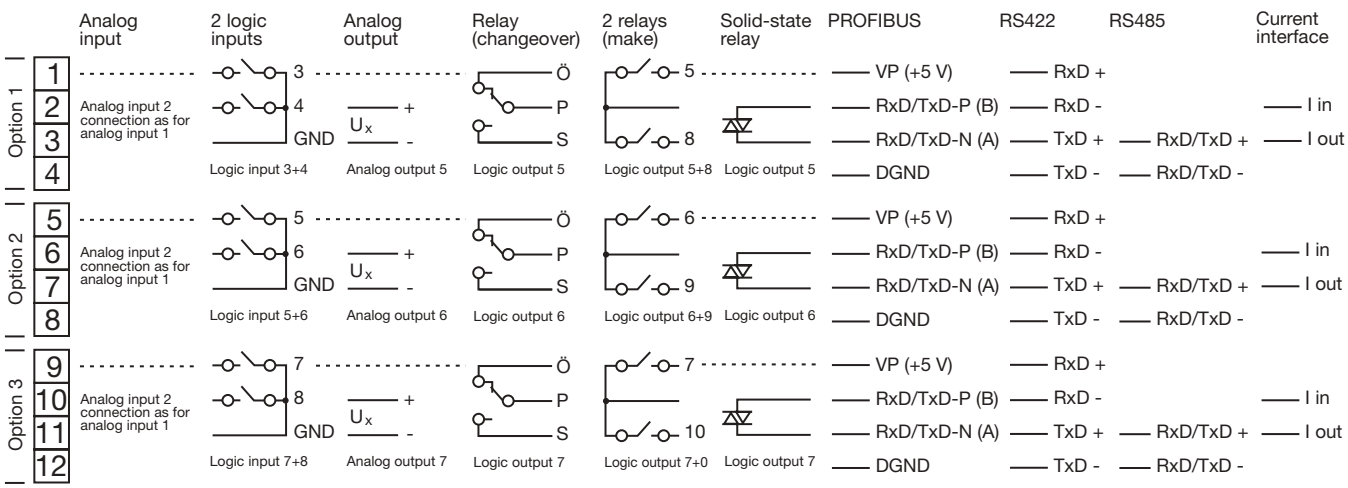
Terminal strip 3



Terminal strip 2

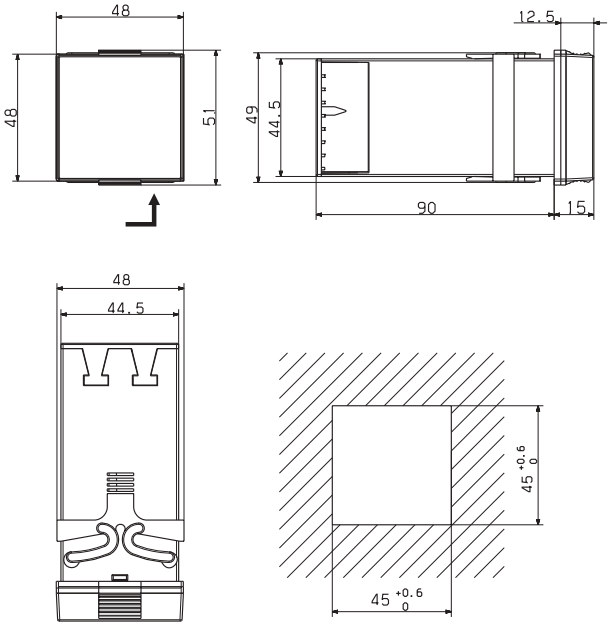


Terminal strip 1

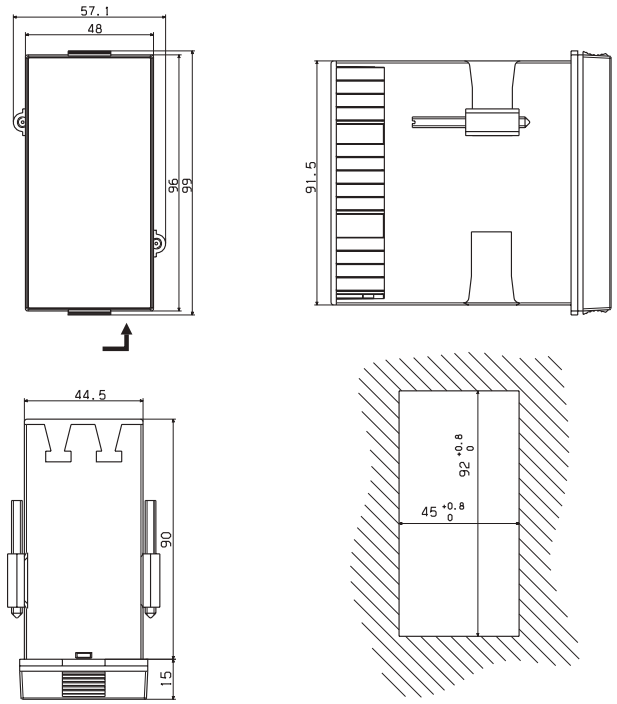


Dimensions

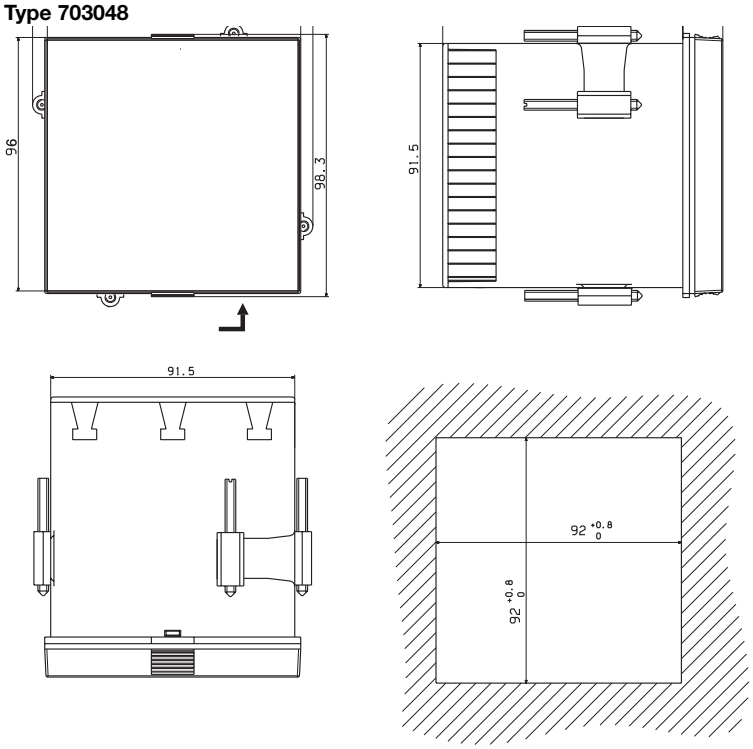
Type 703045



Type 703046



Type 703048



Side-by-side mounting Minimum spacing of panel cut-outs		
Type	horizontal	vertical
without setup plug:		
703045	11mm	30mm
703046	11mm	30mm
703048	11mm	30mm
with setup plug (see arrow):		
703045	11mm	65mm
703046	11mm	65mm
703048	11mm	65mm

Order details

	Basic type
703045	JUMO dTRON316 plast, 48mm x 48mm format incl. analog input, 2 relays and 2 binary inputs or 2 logic outputs
703046	JUMO dTRON308 plast, 48mm x 96mm format (portrait format) incl. analog input and 2 binary inputs, 2 relays and 2 logic outputs
703048	JUMO dTRON304 plast, 96mm x 96mm format incl. analog input and 2 binary inputs, 2 relays and 2 logic outputs

			Basic type extensions
2			**Basic type 2**
			Version
	8		Standard, with factory settings
	9		Programming to customer specification
			Logic outputs (2 are available as standard)
		1	0 / 12V
		2	0 / 18V

				Type 703046/48	Type 703045 (no option 3)		
1	**2**	**3**	**Option slots**	**Max. number**	**Max. number**	**Option 1**	**Option 2**
0	0	0	not used			X	X
1	1	1	Analog input 2 (universal)	1	1	X	X
2	2	2	Relay (changeover)	2	1	X	-
3	3	3	2 relays (make contact)	2	1	X	-
4	4	4	Analog output	2	2	X	X
5	5	5	2 logic inputs	2	1	X	X
6	6	6	Solid-state relay 1A	2	2	X	X
7	7	7	RS422/485 interface	1	1	X	X
8	8	8	Profibus-DP interface	1	1	X	X
9	9	9	Current interface 0/20mA	1	1	X	X

X = allowed in this option slot, - = not allowed in this option slot

	Supply
2 3	110 — 240V AC -15/+10%, 48 — 63Hz
2 5	20 — 30V AC/DC, 48 — 63Hz

	Extra codes
0 0 0	none
2 1 4	Math and logic module
2 1 7	Ratio controller
2 1 8	Difference controller
2 1 9	Humidity controller

[ ] / 2 [ ] [ ] – [ ] [ ] [ ] – [ ] / [ ]

703046 / 2 8 1 – 1 4 0 – 2 3 / 0 0 0

Scope of delivery: - controller
- seal
- mounting brackets
- Operating Manual B70.3046.0 in DIN A6 format

1 mini-CD with the demo setup software and pdf documents in DIN A4 format (operating manual and additional documentation) can be ordered separately. The individual documents and programs are downloadable from www.jumo.net (the software can be enabled for a charge).

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

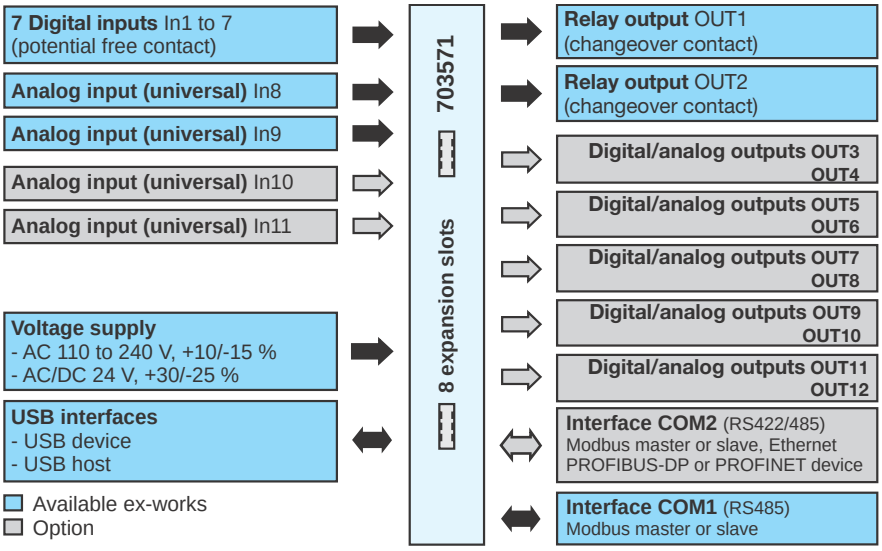
JUMO DICON touch
Two-Channel Process and Program Controller with Paperless Recorder and Touchscreen

Brief description

The DICON touch is a two-channel universal process and program controller that displays information on a vibrant screen. The device is easy to operate via a touchscreen.
Both control channels use the tried-and-tested JUMO control algorithm with two possible optimization options. These enable a simple and highly-accurate startup. It also enables multiple zone control, cascade control, or other complex control tasks.
The block diagram below illustrates the various different hardware options offered by the modular hardware concept. Four analog universal inputs and up to eight external inputs can record a variety of physical measured values with high precision. The actuators can be controlled directly in the device with either an analog or digital setup. These can be expanded further through external digital outputs. Interfaces such as Modbus (master/slave), PROFIBUS, PROFINET-RT or Ethernet with Web server can be used for the communication with higher-order systems.
To ensure secure process operation, the device has a password-protected user administration with individual assignment of rights for different levels or control commands. Screen masks for controllers, program generators, recording, and for overview screens are ready-made and available. An individual process screen can be created using the configuration software. Using the extra-code recording function, important analog and digital process values can be saved so that they are tamper-proof, so that they can be graphically visualized, and so that they can be exported via interface or USB stick in a tamper-proof fashion to the PC.
The configuration software ensures that the process controller can be easily programmed, that math or logical coherences can be described, and that customer-specific linearizations can be created. In addition, tools for simulating external signals or control paths are included. These tools can also record for the duration of the startup.
A comprehensive alarm and limit-value concept as well as a flexible digital signal administration complete the "all-in-one" device.

Type 703571/...

Block diagram



Approvals/approval marks (see "Technical data")

Special features

- Vibrant 3.5-inch color screen, with 320 × 240 pixels and 256 colors
- Easy-to-use program entry and program control
- Interfaces standard: USB host, USB device, RS485 (COM1)
- Available as interface COM2: RS422/485 Modbus master/slave, PROFIBUS-DP, Ethernet and PROFINET-RT
- Integrated paperless recorder with tamper-proof data storage (extra code)
- Individual process-screen display with configurable edit boxes
- Math and logic functions
- Flexible through modular hardware
- Password-protected user administration Five-digit analog value display
- Individual operator level
- Control loop and output value monitoring
- Integrated timer and time switch Service and operating hours counter
- Web server for online visualization via a web browser
- Alarm transmission by email
- Protection type on the front IP66
- AMS2750/CQI-9 calibration certificate
- cULus, GL, DIN EN14597 approval

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Description

Controller types

The controller can be configured as a two-state controller, three-state controller, modulating controller, continuous controller, or continuous controller with integrated position controller. The cycle time is 150 ms.

Parameter blocks

Four parameter blocks can be assigned to each controller. Each parameter block has 15 parameters. The controller structures P, I, PD, PI, and PID can be adjusted.

Self-optimization

Self-optimization also makes it possible for the controller to be matched to the control path by a user who is not a control technology expert. The way the control path reacts to changes in the actuating variable is evaluated in the process. Two different optimization processes are available. The oscillation method is preset as the standard method in the controller.

User level

Up to 25 parameters of any type from the configuration or parameter level can be included in this level. These parameters, for example, often need to be changed or made available to operating personnel (see "User administration").

User administration

Password-protected user administration guarantees safe process operation. This function allows the individual assignment of rights, enabling four users to access different levels and control commands.

Setpoint values

Up to four setpoint values can be entered for each controller channel. Toggling these setpoint values is controlled by two binary-coded digital signals. However, the setpoint values for both controllers can also be specified as an external setpoint specification via an additional analog input or an interface.

Program controller (extra code)

Ten programs with 50 sections can be programmed in the program controller. Each program can be assigned a program name and an icon.
Two setpoint values, section run times, operating contacts, tolerance bands, cycles, and parameter blocks can be assigned in each program section.

The tolerance band monitoring function monitors the actual value in an adjustable band around the setpoint value. The output signal of the tolerance band monitoring function can, for example, also be used to stop the program.

Ramp function

The ramp function allows a continuous change of the setpoint value to the ramp end value (setpoint specification) for each controller channel. After power ON, the ramp starts at the current actual value. The slope of the ramp is determined via different gradients for a rising and falling ramp. The ramp starts at the time the setpoint value is changed or at the same time as a digital signal. The ramp function can be controlled by digital signals or via the functional level.

Limit value monitoring

There are 16 limit value monitorings each with 8 selectable alarm functions AF1 to AF8 available. The limit value can be fixed or be dependant on another value (setpoint value).
Using additional parameters such as location and value of the switching differential, switch on/off delay, pulse function, type of acknowledgement and start-up alarm suppression extensive functions may be realized. Processes can be hindered through the start-up alarm suppression, for example the activation of the limit value monitoring during the start-up phase.

Math and logic function (extra code)

The math and logic module allows analog and/or digital signals to be operated. The following math formulas are available to the operators: +, -, *, /, SQRT(), MIN(), MAX(), SIN(), COS(), TAN(), **, EXP(), ABS(), INT(), FRC(), LOG(), LN(), humidity and floating average, as well as !, &, |, ^, and (and).

Difference, ratio, and humidity can also be configured on the device without extra code.

Analog inputs

The analog inputs (maximum of four) are universally configurable for RTD temperature probes, thermocouples, resistors (resistance transmitters, potentiometers), and standard signals (current, voltage). Linearizations for over 20 common measuring probes are saved. A measured value offset or a fine adjustment can be carried out to compensate for machine-specific deviations.
Due to the measuring circuit monitoring, out of range measurements (too high or too low), probe/cable break, and probe/cable short circuit are detected depending on the type of measuring probe. Due to the measuring circuit monitoring function, out of range (too high or too low), probe/cable break, and probe/cable short circuit are detected depending on the type of measuring probe so that the system is switched to a safe operating status (configurable) in the event of a fault.

Customer-specific linearization

A customer-specific linearization is additionally possible. Programming is carried out with the aid of the setup program, using a value table with 40 pairs of values or a fourth-order polynomial as a formula.

Analog outputs

Up to five analog outputs can be realized in the device. They can be used, for example, as controller outputs, setpoint value outputs, to output results of the math formulas, or as actual value outputs. The signals are freely scalable.

Digital inputs

The signals of the seven standard digital inputs (potential-free contacts) can be used to initiate different internal functions, for example switching the parameter block, starting self-optimization, or acknowledging limit value monitoring.

Digital outputs

Up to 12 digital outputs can be realized in the device (see block diagram). They can be used as, for example, controller outputs, limit value monitoring signals, results of logic operations, or for programmer signals, etc.

External inputs

Eight external analog inputs and eight external digital inputs can each by read via an interface. The unit, range limits, and alarms can be adjusted for the external analog inputs.

Timers

Two timer functions are provided as standard. They can be used as relative timers or as weekly time switches (linked to the real-time clock).

Digital controller signals

There are eight digital control signals with different functions (OR operation, BCD operation, delay, inversion). The results are also available to control internal functions or they can be output to digital outputs.

Web server (online visualization)

This function is available with the insertion of the Ethernet interface on expansion slot COM2. All appearances in the device operating loop are automatically attainable without configuration.

Alarm transmission by email

An email alarm can be sent to up to three addresses simultaneously via a mail server.
Up to five alarm messages can be configured; the sending process is controlled by digital signals. There are five different alarm messages for this. These are linked to specific digital signals from the device.

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

PROFINET-RT class B

Extra code 63 enables operation as a PROFINET-RT device according to IEEE 802.1 in a PROFINET network.

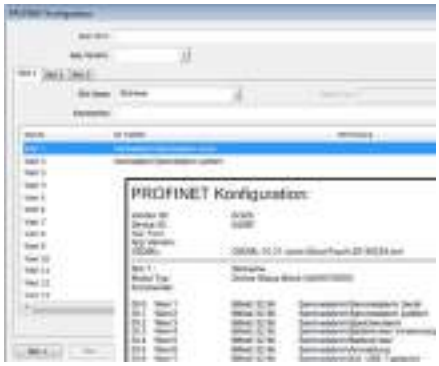
The GSDML that is part of the standard delivery is also available as a download on our website.

The connection is made via two RJ-45 ports on the rear of the device.

The slots can be configured in the setup program. This configuration can then be printed out as a PDF file.

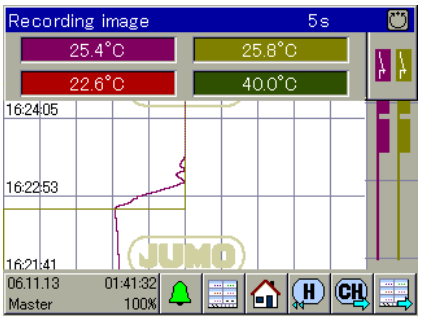
All the standard Ethernet applications such as setup, PCC/PCA, and web server are also available here.

The integration of acyclical services is also possible. It is explained in the enclosed interface description.



Recording function (extra code)

Four analog channels and three digital channels can be recorded. They appear as line recorders with a time stamp. The recorder image is always present. It is only possible to use the "history" function and to extract the registry data via PCC, PCA by means of the extra code 213 recording function.



Setup program

The setup program makes the controller easy to configure and parameterize using a PC. Data sets can thus be created, edited, and transferred to the controller, and can be extracted from there. The data can be saved and printed. The setup program supports multiple national languages, including German, English, and French.

External relay or logic modules ER8 (accessories)

By connecting two ER8 external logic modules, eight relay or digital outputs (12 V/20 mA) can be added to the device in each case. The control takes place via interface RS422/RS485. The setup program is essential for the configuration of the ER8 module that is mountable on the DIN-rail. Two ER8 modules can be connected.

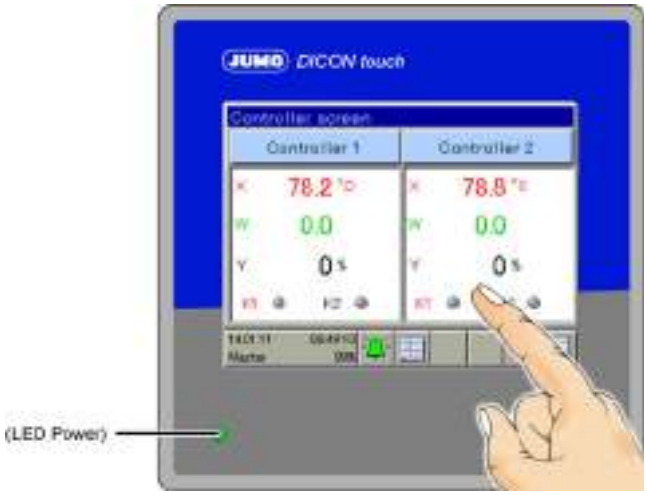
JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

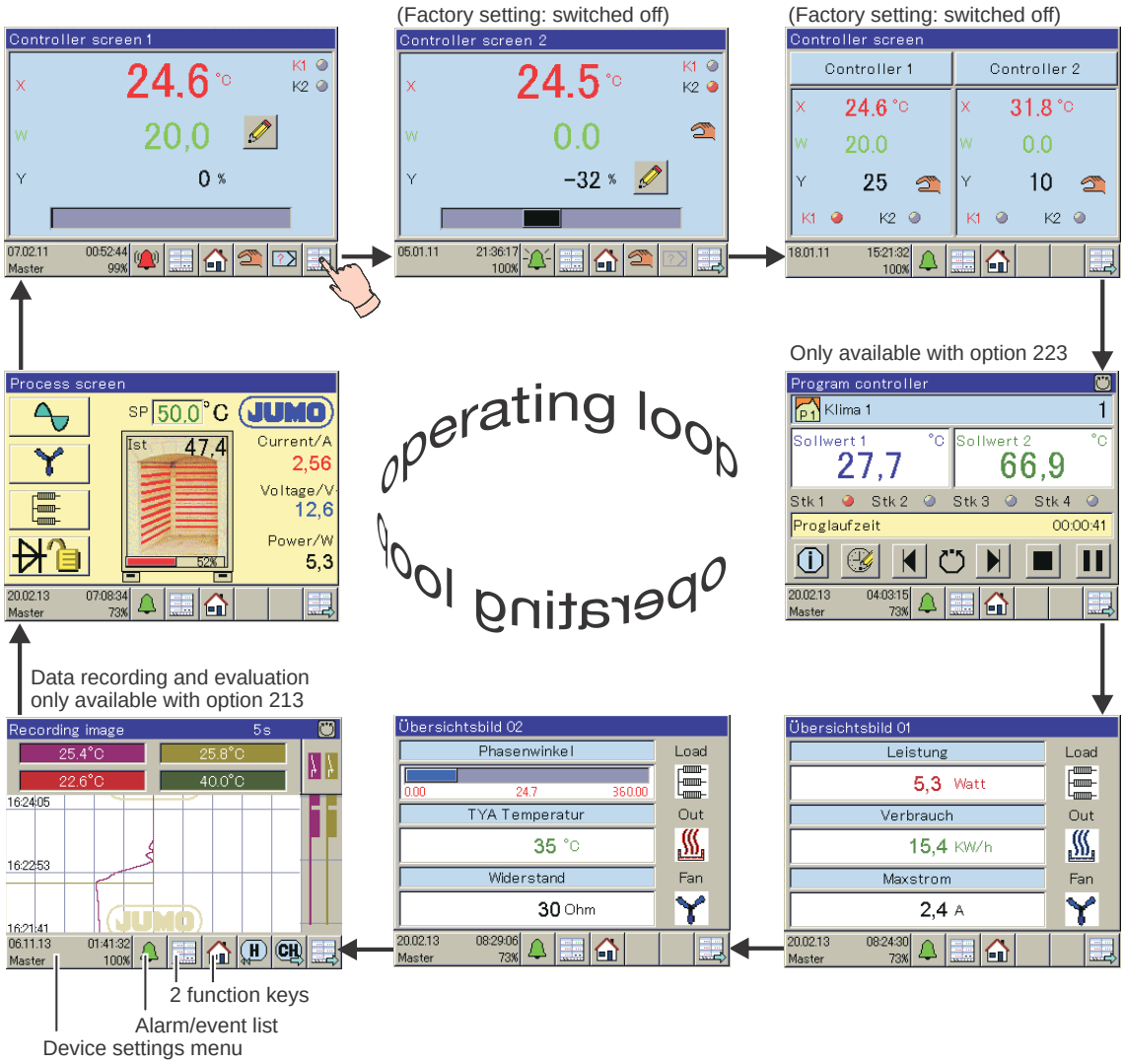
JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Display and operating concept

The DICON touch is operated via a resistive touchscreen and also reacts to finger pressure. Commercially available pens with plastic tips can also be used.





JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Controller parameters

The parameters and their meanings are listed in the table. Some parameters may be missing or meaningless for a particular type of controller. Three-state controllers have two controller structures that can be parameterized differently for "heating" and "cooling." Four parameter blocks can be managed for both of the controller channels.

Parameters	Value range	Default setting	Meaning
Proportional band Xp1	0 to 9999 digits	0 digits	Size of the proportional band The controller structure has no effect at 0! In the case of a continuous controller, Xp1 and Xp2 must be > 0.
Proportional band Xp2	0 to 9999 digits	0 digits	
Derivative time Tv1	0 to 9999 s	80 s	Influences the differential component of the controller output signal
Derivative time Tv2	0 to 9999 s	80 s	
Reset time Tn1	0 to 9999 s	350 s	Influences the integral component of the controller output signal
Reset time Tn2	0 to 9999 s	350 s	
Cycle time Cy1	0 to 999.9 s	20.0 s	When using a switched output, the cycle time should be chosen so that the energy supply to the process is as continuous as possible without overloading the switching elements.
Cycle time Cy2	0 to 999.9 s	20.0 s	
Contact spacing Xsh	0 to 999.9 digits	0.0 digits	Spacing between the two control contacts for three-state controllers, modulating controllers, and continuous controllers with integrated position controller
Switching differential Xd1	0 to 999.9 digits	1.0 digit	Hysteresis for switching controllers with proportional band = 0
Switching differential Xd2	0 to 999.9 digits	1.0 digit	
Actuator time TT	5 to 3000 s	60 s	Used run time range of the control valve for modulating controllers
Working point Y0	-100 to +100 %	0 %	The output level for P and PD controllers (if x = w then y = Y0)
Output level limits Y1	0 to 100 %	100 %	The maximum limit for the output level
Output value limits Y2	-100 to +100 %	-100 %	The minimum limit for the output level
Minimum relay ON time Tk1	0.000 to 60.00 s	0.000 s	Limits the frequency of switching for switched outputs
Minimum relay ON time Tk2	0.000 to 60.00 s	0.000 s	

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Technical data

Analog inputs

General information

Standard number	Two universal analog inputs
Optional number	Two additional universal analog inputs via optional boards
A/D converter	Dynamic resolution up to 16-bit (for all input types)
Galvanic isolation	See chapter "Galvanic isolation"

Thermocouples

Description	**Standard**	**Measuring range**	**Measuring accuracy[a]**	**Ambient temperature influence**
Fe-CuNi “L”	DIN 43 710	-200 to +900 °C	≤ 0.25 %	≤ 100 ppm/K
Fe-CuNi “J”	DIN EN 60584	-200 to +1200 °C	≤ 0.25 %	≤ 100 ppm/K
Cu-CuNi “U”	DIN 43 710	-200 to +600 °C	≤ 0.25 %	≤ 100 ppm/K
Cu-CuNi “T”	DIN EN 60584	-200 to +400 °C	≤ 0.25 %	≤ 100 ppm/K
NiCr-Ni “K”	DIN EN 60584	-200 to +1372 °C	≤ 0.25 %[b]	≤ 100 ppm/K
NiCr-CuNi “E”	DIN EN 60584	-200 to +1000 °C	≤ 0.25 %	≤ 100 ppm/K
NiCrSi-NiSi “N”	DIN EN 60584	-100 to +1300 °C	≤ 0.25 %	≤ 100 ppm/K
Pt10Rh-Pt “S”	DIN EN 60584	-50 to 1768 °C	≤ 0.25 %[c]	≤ 100 ppm/K
Pt13Rh-Pt “R”	DIN EN 60584			
Pt30Rh-Pt6Rh “B”	DIN EN 60584	0 to 1820 °C	≤ 0.25 %[d]	≤ 100 ppm/K
Pt40Rh-Pt20Rh	ASTM E1751M-09	0 to 1888 °C	≤ 0.25 %[e]	≤ 100 ppm/K
Ir40Rh-Ir	ASTM E1751M-09	0 to 2110 °C	≤ 0.25 %	≤ 100 ppm/K
W5Re-W26Re “C”	ASTM E230M-11	0 to 2315 °C	≤ 0.25 %	≤ 100 ppm/K
W3Re-W25Re “D”	ASTM E1751M-09	0 to 2315 °C	≤ 0.25 %	≤ 100 ppm/K
Chromel®-Copel®	GOST R 8.585-2001	-200 to +800 °C	≤ 0.25 %	≤ 100 ppm/K
Chromel®-Alumel® (like NiCr-Ni "K")	GOST R 8.585-2001	-200 to +1372 °C	≤ 0.25 %	≤ 100 ppm/K
Fe-CuNi "L"	GOST R 8.585-2001	-200 to +800 °C	≤ 0.25 %	≤ 100 ppm/K
Smallest measuring span		Type L, J, U, T, K, E, N, Chromel®-Alumel®; 100 K Type S, R, B, D, C, W3Re/W26Re, Chromel®-Cope®l: 500 K		
Measuring range start/end		Freely programmable within the limits in steps of 0.1 K		
Cold junction	GOST R	Pt100 internal, thermostat constant or external temperature probe		
Reference point accuracy (internal)		± 1 K		
Reference point temperature (external)		0 to +100 °C adjustable		
Sampling rate		Controller 1(2): 150 ms in total		
Input filter		Digital filter, 2nd order, filter constant can be set from 0 to 10.00 s		
Special features		Can also be programmed in °F		

[a] The accuracy values refer to the maximum measuring range. Smaller measuring ranges lead to reduced linearization accuracy.
[b] The accuracy values are first guaranteed from -150°.
[c] The accuracy values are first guaranteed from 0 °C
[d] The accuracy values are first guaranteed from 300 °C
[e] The accuracy values are first guaranteed from 600 °C.

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

RTD temperature probe

Description	Standard	Measuring range	Measuring accuracy[a]	Ambient temperature influence
Pt50 Two-wire circuit Three-wire circuit	DIN EN 60751	-200 to +850 °C	≤ 0.05 %	≤ 50 ppm/K
Cu50 Two-wire circuit Three-wire circuit	IEC 60 317	-50 to +200 °C	≤ 0.15 %	≤ 50 ppm/K
Pt100 Two-wire circuit Three-wire circuit	DIN EN 60751	-200 to +850 °C	≤ 0.05 %	≤ 50 ppm/K
Pt500 Two-wire circuit Three-wire circuit	DIN EN 60751	-200 to +850 °C	≤ 0.1 %	≤ 50 ppm/K
Pt1000 Two-wire circuit Three-wire circuit	DIN EN 60751	-200 to +850 °C	≤ 0.1 %	≤ 50 ppm/K
Ni100 Two-wire circuit Three-wire circuit	DIN 43760	-60 to +250 °C	≤ 0.15 %	≤ 50 ppm/K
Ni1000 Two-wire circuit Three-wire circuit	DIN 43760	-60 to +250 °C	≤ 0.1 %	≤ 50 ppm/K
KTY11-6 Two-wire circuit		-50 to +150 °C	≤ 1 %	≤ 50 ppm/K
Pt50 Two-wire circuit Three-wire circuit	GOST 6651-99	-200 to +850 °C	≤ 0.05 %	≤ 50 ppm/K
Pt100 Two-wire circuit Three-wire circuit	GOST 6651-94	-200 to +850 °C	≤ 0.05 %	≤ 50 ppm/K
Cu50 Two-wire circuit Three-wire circuit	GOST 6651-94	-50 to +200 °C	≤ 0.15 %	≤ 50 ppm/K
Cu100 Two-wire circuit Three-wire circuit	GOST 6651-94	-50 to +200 °C	≤ 0.15 %	≤ 50 ppm/K
Smallest measuring span		15 K		
Measuring current		Pt100 approx. 250 µA, Pt1000 approx. 100 µA		
Sensor lead resistance		Max. 10 Ω per cable for two-wire and three-wire circuits		
Lead compensation		Not required for a three-wire circuit. For a two-wire circuit, the lead compensation can be compensated for in the software by correcting the process value.		
Measuring range start/end		Freely programmable within the limits in steps of 0.1 K		
Sampling rate		Controller 1(2): 150 ms in total		
Input filter		Digital filter, 2nd order; filter time constant can be set from 0 to 100 s		
Special features		Can also be programmed in °F		

[a] The accuracy values refer to the maximum measuring range. Smaller measuring ranges lead to reduced linearization accuracy.

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Standard signals

Description	**Measuring range**	**Measuring accuracy**[a]	**Ambient temperature influence**
Freely scalable voltage Input resistance R_E > 500 kΩ Input resistance R_E > 100 kΩ	 DC 0(2) to 10 V DC 0 to 1 V 0 to 100 mV	≤ 0.1 %	≤ 100 ppm/K
Smallest measuring span	5 mV		
Measuring range start/end	Freely programmable within the limits in steps of 0.01 mV		
Current **(voltage drop ≤ 2 V)**, freely scalable	DC 0(4) to 20 mA	≤ 0.1 %	≤ 100 ppm/K
Smallest measuring span	0.5 mA		
Measuring range start/end	Freely programmable within the limits in steps of 0.01 mA		
Limits in accordance with NAMUR recommendation NE 43 in case of deviation above/below measured range		**Signal type 2 to 10 V**	**Signal type 4 to 20 mA**
Measurement information M		1.9 to 10.25 V	3.8 to 20.5 mA
Failure information A for deviation below measured value/short-circuit ("NAMUR Low")		≤ 1.8 V	≤ 3.6 mA
Failure information A for deviation above measured value/probe break ("NAMUR High")		≥ 10.5 V	≥ 21 mA
Sampling rate	Controller 1(2): 150 ms in total		
Input filter	Digital filter, 2nd order; filter constant can be set from 0 to 10.0 s		
Galvanic isolation	See Kapitel "Electrical data", Seite 10 and Kapitel "Galvanic isolation", Seite 12		
Resistance transmitter	Min. 100 Ω, max. 4 kΩ	≤ 0.5 %[b]	≤ 100 ppm/K
Connection type	Resistance transmitter: three-wire circuit		
Smallest measuring span	60 Ω		
Sensor lead resistance	Max. 10 Ω per cable for two-wire and three-wire circuits		
Resistance values	Freely programmable within the limits in steps of 0.1 Ω		
Sampling rate	Controller 1(2): 150 ms in total		
Input filter	Digital filter, 2nd order, filter constant can be set from 0 to 10.00 s		

[a] The accuracy values refer to the maximum measuring range. Smaller measuring ranges lead to reduced linearization accuracy.
[b] The accuracy values refer to the maximum measuring range (initial resistance Ra + loop resistance RS + end resistance Re).

Measuring circuit monitoring

In the event of a malfunction, the outputs move to a defined (configurable) status.

Measuring probe	**Out of range**	**Probe/cable short circuit**	**Probe/cable break**
Thermocouple	is detected	is not detected	is detected
RTD temperature probe	is detected	is detected	is detected
Voltage 2 to 10 V 0 to 10 V 0 to 1 V	 is detected is detected is detected	 is detected is not detected is not detected	 is detected is not detected is not detected
Current 4 to 20 mA 0 to 20 mA	 is detected is detected	 is detected is not detected	 is detected is not detected
Resistance transmitter	is not detected	is not detected	is detected

Digital inputs

Standard number	7
Control	Potential-free contact

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Analog outputs

Per optional board (OUT3, 5, 7, 9 and OUT11 are possible)

1 analog output (configurable) A/D converter 12 bit resolution	Load resistance R_{load}	Accuracy	Ambient temperature influence
Voltage DC 0(2) to 10 V	≥ 500 Ω	±0.25 %	±100 ppm/K
Current DC 0(4) to 20 mA	≤ 500 Ω	±0.25 %	±100 ppm/K

Digital outputs

Standard

Two relay outputs (changeover contact) Switching capacity AC Switching capacity DC Contact life	 AC 230V/24V; 3(0,5) A; cosφ=1(≥ 0,6); D300 DC 24V; 3(0,5; τ =7ms) A 250,000 operations at nominal load

Per optional board

One relay output (changeover contact) Switching capacity AC Switching capacity DC Contact life	 AC 230V/24V; 3(0,5) A; cosφ=1(≥ 0,6); D300 DC 24V; 3(0,5; τ =7ms) A 250,000 operations at nominal load
Two relay outputs (N/O contact)[a] Switching capacity AC Switching capacity DC Contact life	 AC 230V/24V; 3(0,5) A; cosφ=1(≥ 0,6); D300 DC 24V; 3(0,5; τ =7ms) A 250,000 operations at nominal load
One solid state relay Switching capacity Protection circuitry	 1 A at AC 230 V, resistive load Varistor
Two solid state relay for motor actuators Switching capacity Protection circuitry	 1 A at AC 230 V, RC combination
One logic output (voltage supply for transmitter)	DC 0/22 V, max. 30 mA (short-circuit proof)
Two logic outputs	DC 0/12 V max. 20 mA (short-circuit proof, not galvanically isolated)
Two PhotoMOS® relays[b]	DC 45 V, max. 200 mA, (galvanically isolated from each other, not short-circuit proof) AC 30 V, max. 200 mA, (galvanically isolated from each other, not short-circuit proof)

[a] Combining a mains voltage circuit with a protective low-voltage circuit on the "dual normally open contact" option is not admissible.
[b] PhotoMOS is a registered trademark of Panasonic Corporation.

Controllers

Controller types	Inverse/direct two-state controller, three-state controller, three-state modulating controller, inverse/direct continuous controller, continuous controller with integrated position controller
Controller structures	P, PD, PI, PID
Sampling rate	150 ms
Parameter blocks	Four parameter blocks per controller

Screen

Resolution, size	320 × 240 pixels, 3.5 "
Type, number of colors	TFT color screen, 256 colors
Brightness setting	Adjustable on the device
Device operation	Via resistive touchscreen
Screensaver	Via waiting period or control signal
Display operating life	50 000 h

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Electrical data

Voltage supply Connection Voltage	 At the back via screw terminals AC/DC 24 V +30/-25%, 48 to 63 Hz or AC 110 to 240 V +10/-15 %, 48 to 63 Hz	
Power consumption	At voltage supply 230 V: max. 15 VA / 7 W At voltage supply 24 V: max. 12 VA / 9 W	
Inputs and outputs Connection Conductor cross section	 At the back via screw terminals Max. 2.5 mm ^{2}, wire or strand with end sleeve	
Electrical safety	According to DIN EN 61010-1 Overvoltage category III, pollution degree 2	
Electromagnetic compatibility Interference emission Interference immunity	According to DIN EN 61326-1 Class A - For industrial applications only Industrial requirements	
Memory data recorder	Memory cycle	Recording interval
When recording: 4 analog signals 3 digital signals	1 s	approx. 44 days
	5 s	approx. 220 days
	10 s	approx. 441 days
	60 s	approx. 2646 days (7 years, 91 days)

Environmental influences

Ambient/storage temperature range	-5 to +55 °C/-30 to +70 °C
Resistance to climatic conditions	Humidity 3K3 (DIN EN 60721-3-3) with extended temperature range, rel. humidity ≤ 95 % mid-year without condensation

Case

Site Altitude	maximum 2000m above sea level
Case type	Plastic front frame with metal case barrel (for indoor use only)
Front frame dimensions	96 mm × 96 mm
Panel cut-out	$92^{+0.8}$ mm × $92^{+0.8}$ mm according to DIN IEC 61554
Close mounting	Spacing between the panel cut-outs, min. 35 mm horizontally and min. 80 mm vertically
Panel thickness	Max. 5 mm
Depth behind panel	Max. 130 mm
Mounting	Four mounting brackets
Operating position (including the viewing angle of the TFT color screen)	Any Horizontal ±65°, vertical +40 to -65°
Protection type	Front IP66, rear IP20, according to DIN EN 60529
Weight (fully fitted)	approx. 1000 g

Approvals/approval marks

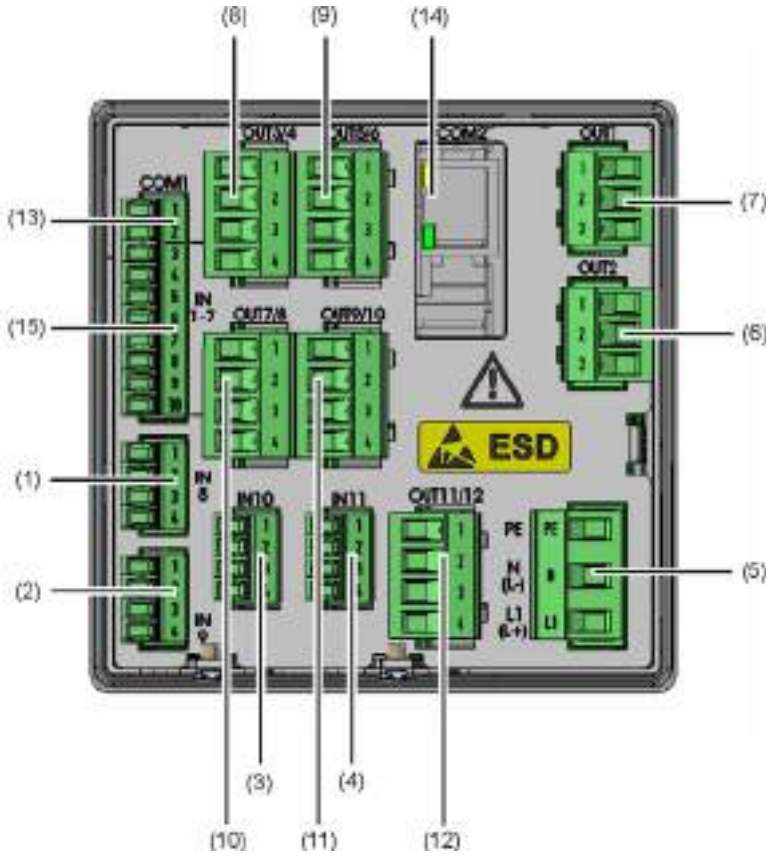
Approval mark	Testing agency	**Certificate/certification number**	**Inspection basis**	**Valid for**
GL - hardware GL - software	Germanischer Lloyd	11 172-14 HH	Environmental Category C EMC 1	All modules except PROFINET-RT
c UL us	Underwriters Laboratories	20150622-E201387	UL 61010-1	All modules
DIN	DIN CERTCO	TR1238	DIN EN 14597	All modules except PROFINET-RT

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Connection elements



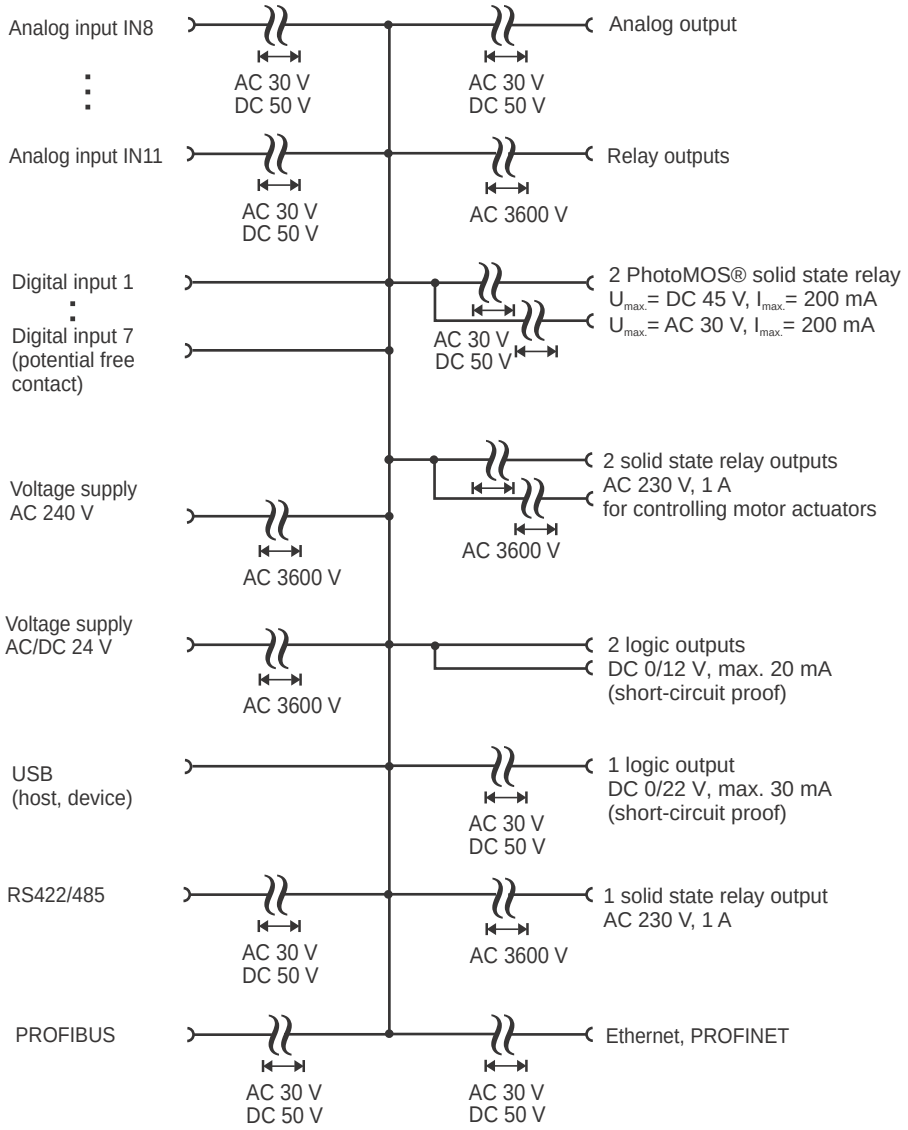
(1)	Analog input IN8	(2)	Analog input IN9
(3)	Expansion slot for analog input IN10	(4)	Expansion slot for analog input IN11
(5)	Voltage supply AC 240 V +10/-15 %, 48 to 63 Hz, max. 38.1 VA AC/DC 24 V +30/-25%, 48 to 63 Hz, max. 21.9 VA / 11.5 W	(6)	Relay output OUT2
(7)	Relay output OUT1	(8)	Expansion slot for outputs OUT3/4
(9)	Expansion slot for outputs OUT5/6	(10)	Expansion slot for outputs OUT7/8
(11)	Expansion slot for outputs OUT9/10	(12)	Expansion slot for outputs OUT11/12
(13)	COM1 interface RS485	(14)	Expansion slot for COM2 interface
(15)	Digital inputs IN1 to 7		

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Galvanic isolation



JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

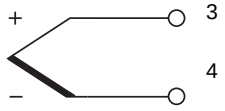
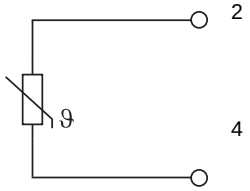
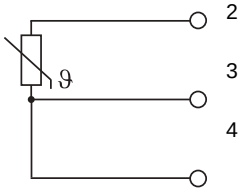
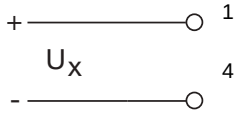
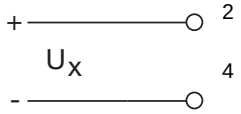
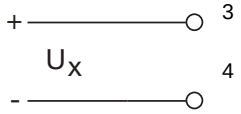
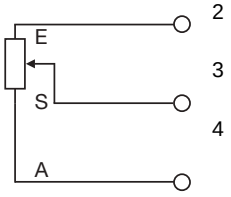
JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Connection diagram

The connection diagram included in the data sheet provides initial information about the connection options. Only use the installation instructions or the operating manual for the electrical connection. The know-how and the correct technical implementation of the safety warnings/instructions contained in these documents are the prerequisite for the installation, electrical connection, and initial start as well as for the safety during operation.

Analog inputs

Input IN8, IN9 as standard
Two analog inputs can be added to input (IN10), (IN11) optional boards

Connection	**(Connection element)** **Input**	**Symbol and terminal designation**
Thermocouple	(1) IN8 (2) IN9 (3) IN10 (4) IN11	
RTD temperature probe Two-wire circuit		
RTD temperature probe Three-wire circuit		
Voltage DC 0(2) to 10 V		
Voltage DC 0 to 1 V		
Voltage DC 0 to 100 mV		
Current DC 0(4) to 20 mA		
Resistance transmitter A = Start E = End S = Slider		

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

TIP!
The approval according to DIN EN 14597 is only valid when the correct probe with DIN approval is set in the configuration level and if the probe is connected. The measured value must be inside the following decribed temperature ranges for DIN-Probes and can be used as a setpoint for both controllers or for a limit value monitoring.

Probes for the operating medium air

Note: Because of the high response accuracy, the use of **thermowells** (pockets) is **not admissible**.

Actual type designation	Old type designation	Probe type	Temperature range	Nom. length mm	Process connection
RTD temperature probe Data Sheet 90.2006					
902006/65-228-1003-1-15-500-668/000	-	1 x Pt100	-170 ... +700°C	500	
902006/65-228-1003-1-15-710-668/000	-			710	
902006/65-228-1003-1-15-1000-668/000	-			1000	
902006/55-228-1003-1-15-500-254/000	-	1 x Pt100	-170 ... +700°C	500	
902006/55-228-1003-1-15-710-254/000	-			710	
902006/55-228-1003-1-15-1000-254/000	-			1000	
902006/65-228-2003-1-15-500-668/000	90.271-F01	2 x Pt100	-170 ... +700°C	500	Stop flange, movable
902006/65-228-2003-1-15-710-668/000	90.272-F01			710	
902006/65-228-2003-1-15-1000-668/000	90.273-F01			1000	
902006/55-228-2003-1-15-500-254/000	-	2 x Pt100	-170 ... +700°C	500	movable G1/2 compression clamp
902006/55-228-2003-1-15-710-254/000	-			710	
902006/55-228-2003-1-15-1000-254/000	-			1000	
Thermocouples Data Sheet 90.1006					
901006/65-547-2043-15-500-668/000	90.019-F01	2 x NiCr-Ni, Type „K“	-35 ... +800°C	500	Stop flange, movable
901006/65-547-2043-15-710-668/000	90.020-F01			710	
901006/65-547-2043-15-1000-668/000	90.021-F01			1000	
901006/65-546-2042-15-500-668/000	90.019-F11	2 x Fe-CuNi, Type „L“	-35 ... +700°C	500	
901006/65-546-2042-15-710-668/000	90.020-F11			710	
901006/65-546-2042-15-1000-668/000	90.021-F11			1000	
901006/66-550-2043-6-500-668/000	90.023-F01	2 x NiCr-Ni, Type „K“	-35 ... +1000°C	500	
901006/66-550-2043-6-355-668/000	90.023-F02			355	
901006/66-550-2043-6-250-668/000	90.023-F03			250	
901006/66-880-1044-6-250-668/000	90.021	1 x PT10Rh-PT, Type „S“	0 ... 1300°C	250	
901006/66-880-1044-6-355-668/000	90.022			355	
901006/66-880-1044-6-500-668/000	90.023			500	
901006/66-880-2044-6-250-668/000	90-D-021	2 x PT10Rh-PT, Type „S“	0 ... 1300°C	250	Stop flange, movable
901006/66-880-2044-6-355-668/000	90-D-022			355	
901006/66-880-2044-6-500-668/000	90-D-023			500	

901006/66-953-1046-6-250-668/000	90.027	1 x PT30Rh-PT6Rh, Type „B“	600 ... 1500°C	250	
901006/66-953-1046-6-355-668/000	90.028			355	
901006/66-953-1046-6-500-668/000	90.029			500	
901006/66-953-2046-6-250-668/000	90-D-027	2 x PT30Rh-PT6Rh, Type „B“	600 ... 1500°C	250	
901006/66-953-2046-6-355-668/000	90-D-028			355	
901006/66-953-2046-6-500-668/000	90-D-029			500	

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Probes for the operating medium water and oil

Note: Because of the high response accuracy, the use of **thermowells** (pockets) is **not admissible**.

Actual type designation	Old type designation	Probe type	Temperature range	Nom. length mm	Process connection
RTD temperature probe Data Sheet 90.2006					
90.2006/10-402-1003-1-9-100-104/000		1 x Pt100	-40 ... +400°C	100	G1/2 screw connection
90.2006/10-402-2003-1-9-100-104/000		2 x Pt100		100	
902006/54-227-2003-1-15-710-254/000	90.272-F02	2 x Pt100	-170 ... 550°C	65...670	movable G1/2 compression clamp
902006/54-227-1003-1-15-710-254/000	90.272-F03	1 x Pt100		65...670	
902006/10-226-1003-1-9-250-104/000	90.239	1 x Pt100	-170 ... 480°C	250	G1/2 screw connection
902006/10-226-2003-1-9-250-104/000	90-D-239	2 x Pt100		250	
Thermocouples Data Sheet 90.1006					
901006/54-544-2043-15-710-254/000	90.020-F02	2 x NiCr-Ni, Type „K“	-35 ... 550°C	65...670	movable G1/2 compression clamp
901006/54-544-1043-15-710-254/000	90.020-F03	1 x NiCr-Ni, Type „K“		65...670	
901006/54-544-2042-15-710-254/000	90.020-F12	2 x FeCuNi, Type „L“		65...670	
901006/54-544-1042-15-710-254/000	90.020-F13	1 x FeCuNi, Type „L“		65...670	

Note: Because of the high response accuracy, **only use thermowells** (pockets) that are **included in the scope of delivery**.

Actual type designation	Old type designation	Probe type	Temperature range	Nom. length mm	Process connection
RTD temperature probe Data Sheet 90.2006					
902006/53-505-2003-1-12-190-815/000	90D239-F03	2 x Pt100	-40 ... +400 °C	190	
902006/53-507-2003-1-12-100-815/000	90.239-F02	2 x Pt100 (arranged one below the other in protection tube)	-40 ... +480 °C	100	
902006/53-507-2003-1-12-160-815/000	90.239-F12			160	
902006/53-507-2003-1-12-190-815/000				190	
902006/53-507-2003-1-12-220-815/000	90.239-F22			220	
902006/53-507-1003-1-12-100-815/000	90.239-F01	1 x Pt100	-40 ... +480 °C	100	weld-in sleeve
902006/53-507-1003-1-12-160-815/000	90.239-F11			160	
902006/53-507-1003-1-12-220-815/000	90.239-F21			220	
902006/53-505-1003-1-12-190-815/000	90.239-F03	1 x Pt100	-40 ... +400 °C	190	
902006/53-505-3003-1-12-100-815/000	90.239-F07	3 x Pt100	-40 ... +400 °C	100	
902006/53-505-3003-1-12-160-815/000	90.239-F17			160	
902006/53-505-3003-1-12-220-815/000	90.239-F27			220	
902006/40-226-1003-1-12-220-815/000	90.280-F30	1 x Pt100	-170 ... +480°C	220	weld-in sleeve
902006/40-226-1003-1-12-160-815/000	90.280-F31			160	
902006/40-226-1003-1-12-100-815/000	90.280-F32			100	
Thermocouples Data Sheet 90.1006					
901006/53-543-1042-12-220-815/000	90.111-F01	1 x Fe-CuNi Type „L“	-35 ... 480°C	220	weld-in sleeve
901006/53-543-2042-12-220-815/000	90.111-F02	2 x Fe-CuNi Type „L“		220	

Probes for the operating medium water, oil and air

Note: Because of the high response accuracy, the use of **thermowells** (pockets) is **not admissible**.

Actual type designation	Old type designation	Probe type	Temperature range	Install. length mm	Process connection
RTD temperature probe Data Sheet 90.2006					
90.2006/10-390-1003-1-8-250-104/000	90.210-F95	1 x Pt100	max. 300°C	250	
Thermocouples Data Sheet 90.1006					
901006/45-551-2043-2-xxxx-11-xxxx		2 x NiCr-Ni, Type „K“	max. 1150°C	50...2000	

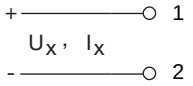
JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

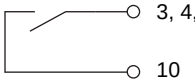
Analog outputs

One analog output can be added to output OUT 3/4 to 11/12 using optional boards

Connection	(Connection element) Input	Symbol and terminal designation
One analog output DC 0/2 to 10 V or DC 0/4 to 20 mA (configurable)	(8) OUT3/4 (9) OUT5/6 (10) OUT7/8 (11) OUT9/10 (12) OUT11/12	

Digital inputs

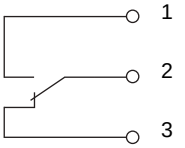
Input IN1 to 7 as standard (cannot be extended)

Connection	(Connection element) Input	Symbol and terminal designation
Digital input, potential-free contact as standard	(15) IN1 to 7	

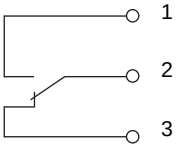
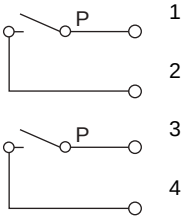
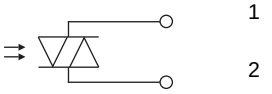
Digital outputs

OUT1 and OUT2 as standard

The controller is fitted with two relay outputs (changeover contacts) as standard.

Connection	(Connection element) Output	Symbol and terminal designation
Relay output (changeover contact)	(6) OUT2 (7) OUT1	

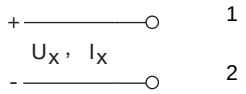
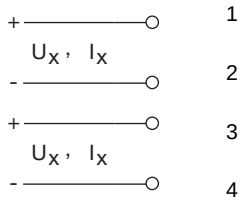
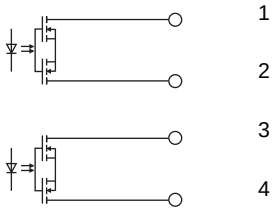
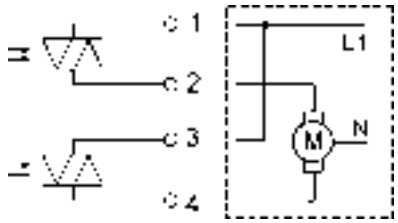
Outputs OUT 3/4 to 11/12 are expandable using the following optional boards

Connection	(Connection element) Output	Symbol and terminal designation
One relay output (changeover contact)	(8) OUT3/4 (9) OUT5/6 (10) OUT7/8 (11) OUT9/10 (12) OUT11/12	
Two relay outputs (N/O contact)[a]		
One solid state relay AC 230 V, 1 A		

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Connection	**(Connection element)** **Output**	**Symbol and terminal designation**
One logic output DC 0/22 V, max. 30 mA (short-circuit proof)		
Two logic outputs DC 0/12 V max. 20 mA (short-circuit proof, not galvanically isolated from each other)		
Two PhotoMOS® relays[b] max. DC 45 V, 200 mA max. AC 30 V, 200 mA (galvanically isolated)		
Two solid state relays AC 230 V, 1 A (for controlling the left and right-hand motor actuators, galvanically isolated)		

[a] Combining a mains voltage circuit with a protective low-voltage circuit on the "dual normally open contact" option is not admissible.
[b] PhotoMOS is a registered trademark of Panasonic Corporation.

Voltage supply (according to nameplate)

AC 230V (DC 24V)

Connection	**(Connection element)**	**Symbol and terminal designation**
Protection conductor Neutral conductor Line conductor	PE N (L-) L1(L+)	 PE N L1

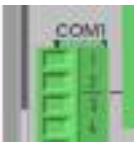
JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

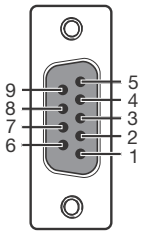
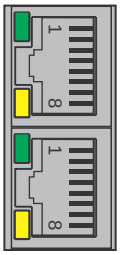
JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Interfaces

USB device, USB host and COM1 interfaces as standard

Connection	(Connection element)	Symbol and terminal designation		
USB device interface	(21)			
USB host	(20)			
COM1 serial interface RS485 (galvanically isolated)	(13)		1 TxD+/RxD+ 2 TxD-/RxD-	Transmission/received data + Transmission/received data -

COM2 interface can be expanded using optional boards

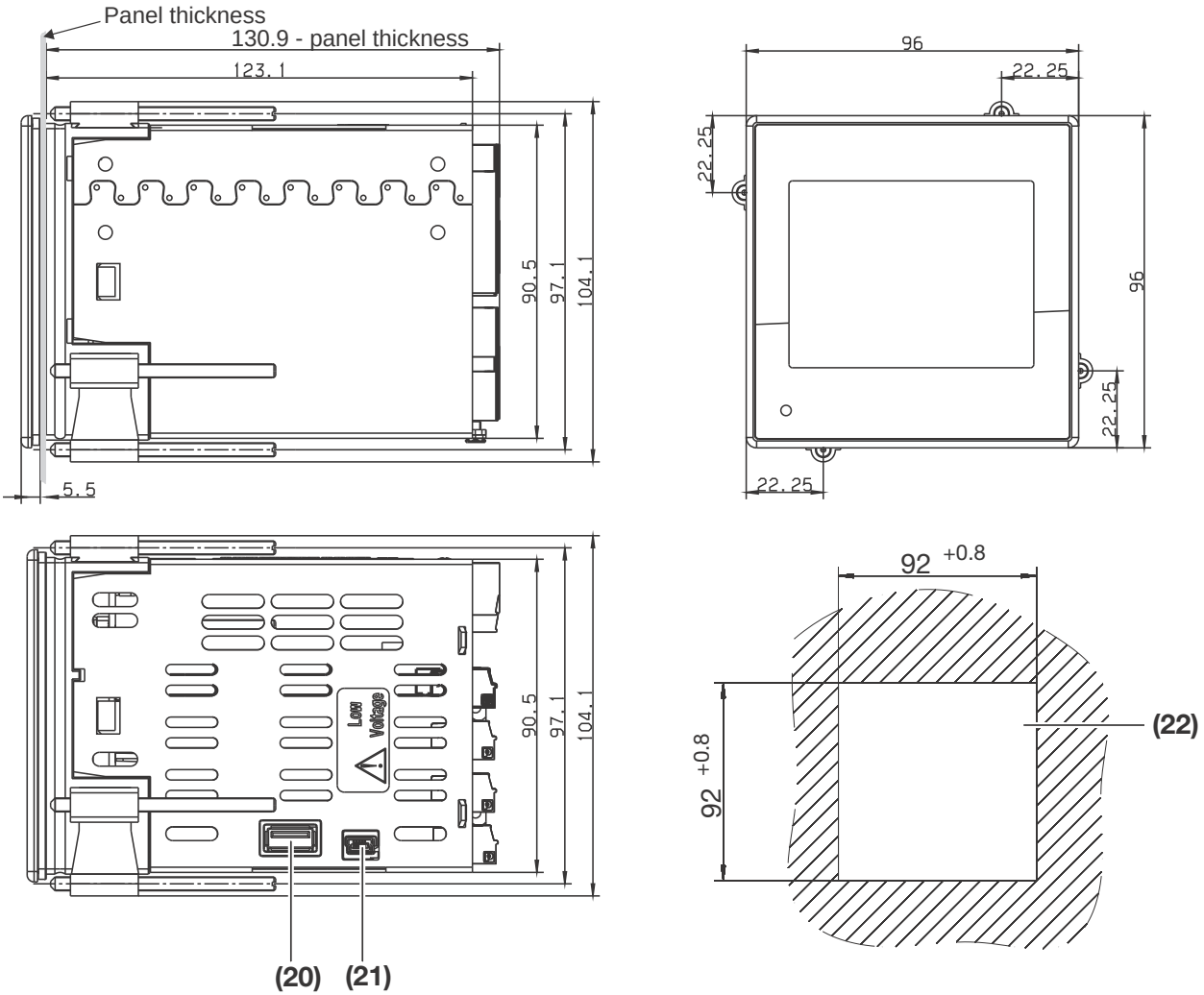
Connection	(Connection element)	Symbol and terminal designation		
Ethernet	(14)		1 TX+ 2 TX- 3 RX+ 6 RX-	Transmission data + Transmission data - Received data + Received data -
Serial interface RS422 (galvanically isolated)			1 RxD+ 2 RxD- 3 TxD+ 4 TxD-	Received data + Received data - Transmission data + Transmission data -
Serial interface RS485 (galvanically isolated)			3 TxD+/RxD+ 4 TxD-/RxD-	Transmission/received data + Transmission/received data -
PROFIBUS-DP			3 RxD/TxD-P (B) 5 DGND 6 VP (+5 V) 8 RxD/TxD-N (A)	Transmission/received data + Ground Voltage supply Transmission/received data -
PROFINET-RT			1TX+ 2 TX- 3 RX+ 6 RX-	Transmission data + Transmission data - Received data + Received data -

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Dimensions



(20) USB host interface

(21) USB device interface for setup

(22) Panel cut-out

Scope of delivery

- 1 controller in the ordered version
- 1 Operating Manual
- 1 panel seal 4 retaining elements for panel installation

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Order details

	(1)	**Basic type**
703571		JUMO DICON touch - two-channel process and program controller with RS485 interface
	(2)	**Version**
8		Standard with default settings
9		Customer-specific configuration (specifications in plain text)
	(3)	**National language of display texts**
01		German
02		English
03		French
	(4)	**Input IN10**
00		Not used
10		Analog input (universal)
	(5)	**Input IN11**
00		Not used
10		Analog input (universal)
	(6)	**Outputs OUT3/4**
00		None
11		One relay (changeover contact)
12		Two relays (N/O contact)
13		One solid-state relay 230 V, 1 A
14		One logic output DC 0/22 V max. 30 mA
15		Two logic outputs 0/12 V, 20 mA
16		One analog output
17		Two PhotoMOS® relays[a]
20		Two solid state relays 230 V, 1 A for motor actuator (double slot: OUT3/4 and OUT7/8)
	(7)	**Outputs OUT5/6**
00		None
11		One relay (changeover contact)
12		Two relays (N/O contact)
13		One solid-state relay 230 V, 1 A
14		One logic output 0/22 V, max. 30 mA
15		Two logic outputs 0/12 V, 20 mA
16		One analog output
17		Two PhotoMOS® relays[a]
20		Two solid state relays 230 V, 1 A for motor actuator (double slot: OUT5/6 and OUT9/10)
	(8)	**Outputs OUT7/8** (not available for assignment with module 20 on OUT3/4)
00		None
11		One relay (changeover contact)
12		Two relays (N/O contact)
13		One solid-state relay 230 V, 1 A
14		One logic output 0/22 V, max. 30 mA
15		Two logic outputs 0/12 V, 20 mA
16		One analog output
17		Two PhotoMOS® relays[a]
	(9)	**Outputs OUT9/10** (not available for assignment with module 20 on OUT5/6)
00		None
11		One relay (changeover contact)
12		Two relays (N/O contact)
13		One solid-state relay 230 V, 1 A
14		One logic output 0/22 V, max. 30 mA

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

15		Two logic outputs 0/12 V, 20 mA
16		One analog output
17		Two PhotoMOS® relays [a]
	(10)	**Outputs OUT11/12**
00		None
11		One relay (changeover contact)
12		Two relays (N/O contact)
13		One solid-state relay 230 V, 1 A
14		One logic output 0/22 V, max. 30 mA
15		Two logic outputs 0/12 V, 20 mA
16		One analog output
17		Two PhotoMOS® relays[a]
	(11)	**Voltage supply**
23		AC 110 to 240 V +10/-15 %, 48 to 63 Hz
39		AC/DC 24 V +30/-25 %, 48 to 63 Hz
	(12)	**COM2 interface**
00		Not used
08		Ethernet
54		RS422/485 Modbus RTU
63		PROFINET[b]
64		PROFIBUS-DP
	(13)	**DIN-tested**
000		Without approval
056		With DIN approval
	(14)	**GL-tested**
000		Without approval
062		With GL approval
	(15)	**Extra code**
000		Without extra code
213		Recording function
214		Math and logic module
223		Program controller
879		AMS2750/CQI-9[c]

[a] PhotoMOS is a registered trademark of Panasonic Corporation
[b] In conjunction with PROFINET no GL and DIN approval available
[c] For the calibration certificate the channels to be checked are to be defined with the thermocouple type and the desired measuring points.

	(1)	/	(2)	-	(3)	-	(4)	(5)	-	(6)	(7)	(8)	(9)	(10)	-	(11)	-	(12)	/	(13)	,	(14)	,	(15)	
Order code		/		-		-			-						-		-		/		,		,		, ...[a]
Order example	703571	/	X	-	X	-	X	X	-	X	X	X	X	X	-	X	-	X	/	X	,	X	,	X	

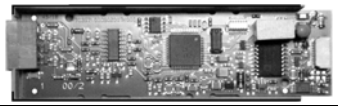
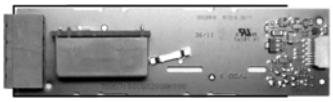
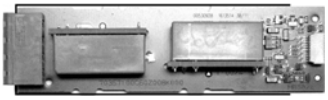
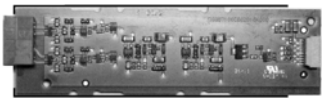
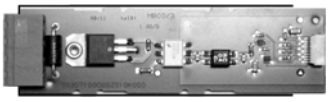
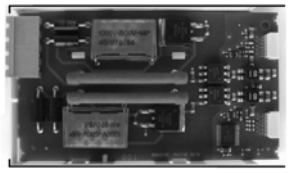
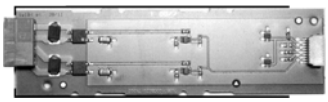
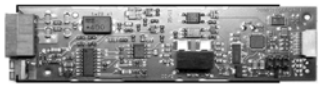
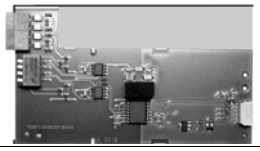
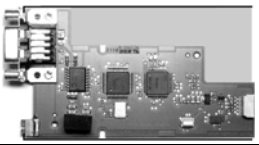
[a] List extra codes in sequence, separated by commas.

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Accessories

Item		Parts no.
Modules for expansion slots:		
One analog input (universal)		00581159
One relay output (changeover contact)		00581160
Two relay outputs (N/O contact)		00581162
One logic output DC 0/22 V, max. 30 mA		00581165
Two logic outputs DC 0/12 V max. 20 mA		00581168
One solid state relay AC 230 V, 1 A		00581164
Two solid state relays AC 230 V, 1 A for motor actuator		00621574
Two PhotoMOS® relays[a] DC 45 V, max. 200 mA, AC 30 V, max. 200 mA		00581171
One analog output (universal)		00581169
Ethernet interface		00581174
Serial interface RS422/RS485		00581172
PROFIBUS-DP interface		00581173

[a] PhotoMOS is a registered trademark of Panasonic Corporation

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
Email: info.us@jumo.net
Internet: www.jumousa.com

General accessories

Article	Part no.
Program editor/startup	00607139
Setup/program editor	00606496
PCA3000/PCC JUMO software package 709701/709702	00431884
USB cable A-connector mini B-connector 3 m	00506252

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
E-mail: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
E-mail: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: 315-437-5866
1-800-554-5866
Fax: 315-437-5860
E-mail: info.us@jumo.net
Internet: www.jumousa.com

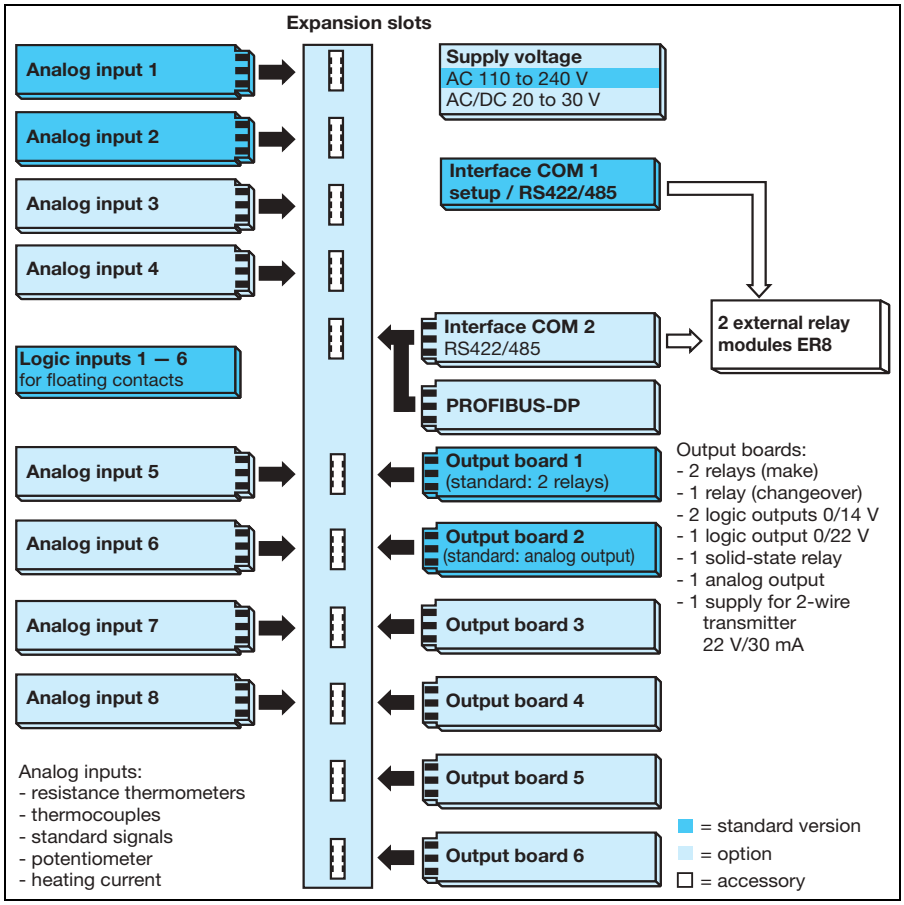
JUMO IMAGO 500 Multi-channel Process and Program Controller

JUMO IMAGO 500
Type 703590/ ...

Brief description

The JUMO IMAGO 500 is a process and program controller with up to 8 controller channels or 4 program channels. The instrument is built to the format 144 mm × 130 mm for a standard 92 mm × 92 mm panel cut-out and a mounting depth of 170 mm.
The display is a 5" TFT screen (27 colors). The layout of the screen templates can be individually adapted and adjusted. Two freely configurable screen templates make it possible to customize the placing of texts, process values, background pictures and icons.
The controller features up to 8 analog inputs and 6 logic inputs, as well as six expansion slots for switched or analog outputs. Four of these slots can be used alternatively for analog inputs or outputs.
A setup program is available for conveniently configuring the instrument from a PC.
Linearizations for the usual transducers are stored within the controller, four customer-specific linearization tables can be programmed.
A math and logic module can be used to adapt the instrument to a very wide range of control tasks.
Two serial interfaces, RS422/485 or PROFIBUS-DP, serve to integrate the controller into a data network.
Modules can be retrofitted quite simply by the user (see block structure).
The electrical connection is made at the rear of the instrument, via plug-in screw terminals.

Block structure



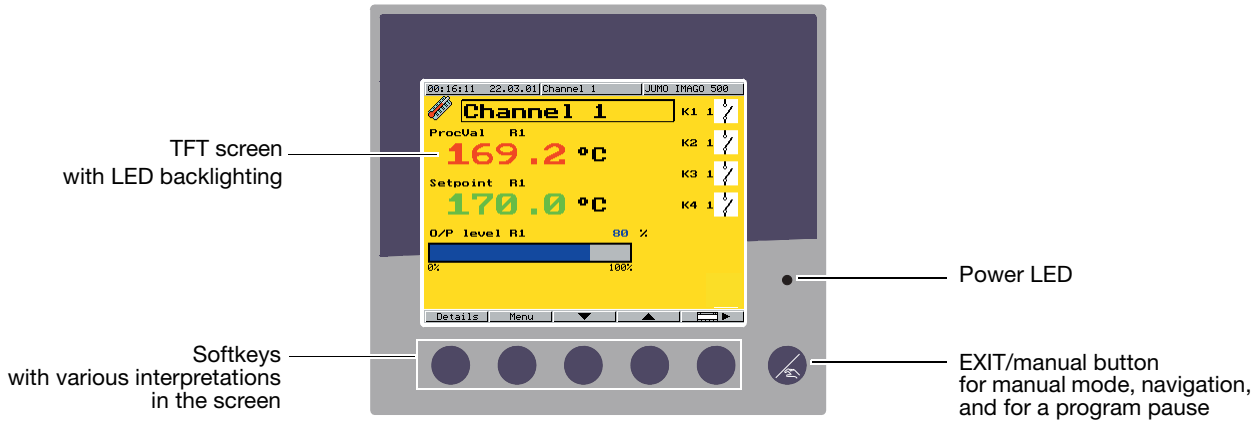
Key features

- Brilliant 5" TFT screen with 27 colors
- Freely configurable screen templates
- Up to 8 controller channels
- 50 programs, with 1000 segments under dynamic management
- 16 limit comparators
- Modular hardware design
- Recording function
- Up to 4 cascade controllers
- PROFIBUS-DP interface
- Math and logic functions
- Teleservice via external modem
- Setup program and program editor for Windows® 2000, XP, Vista, 7 (32-bit and 64-bit)

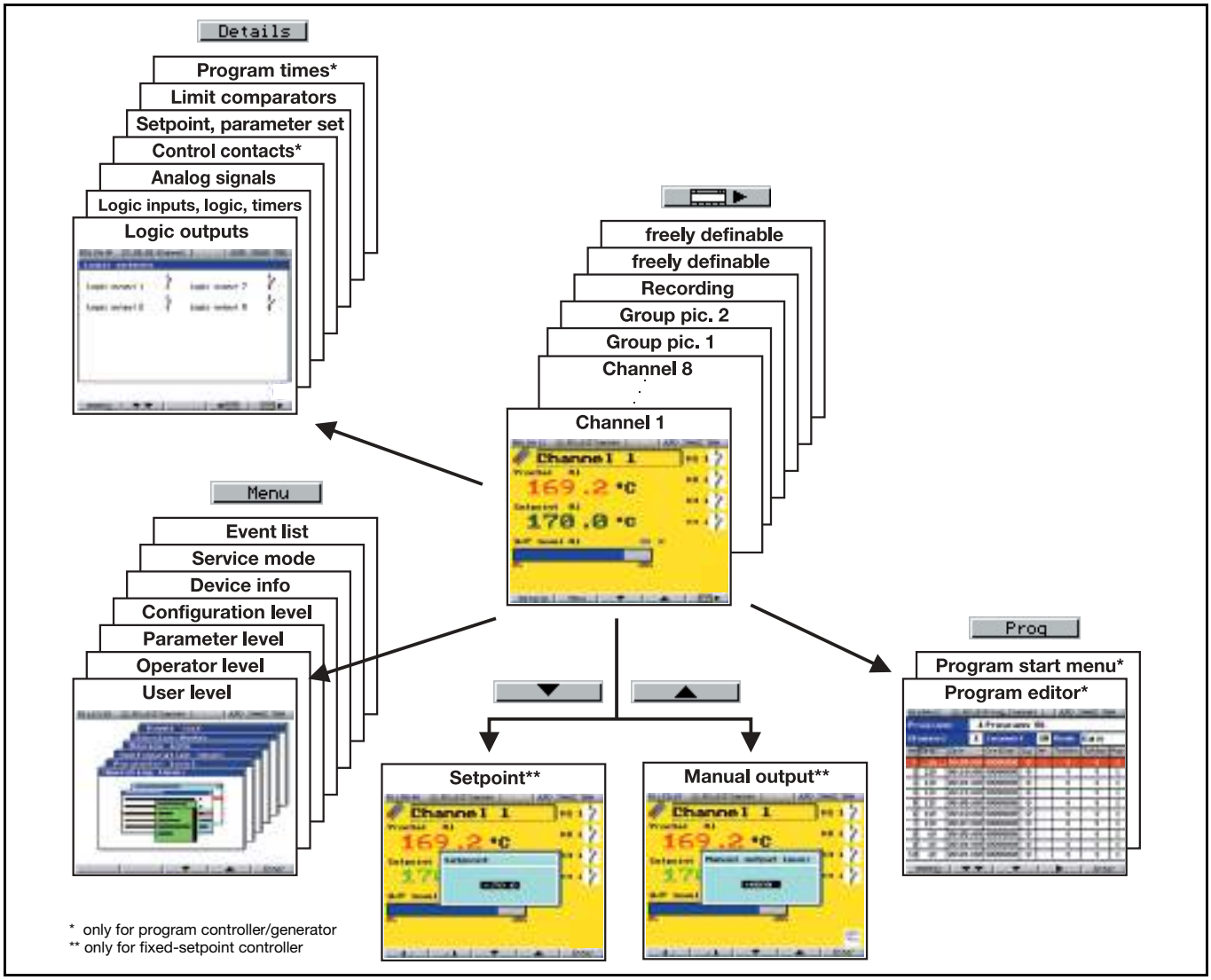
Approval/ approval marks

c UL us

Displays and controls

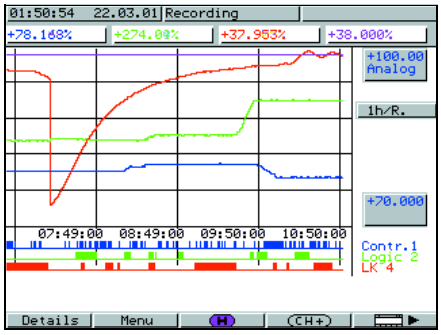


Operating concept



The operation, configuration and displays are organized into a structural arrangement in the screen templates. The insertion of the (variable) softkey functions in the lower section of the screen keeps the user continually informed about the operating options.
The instrument is configured through the well-established level structure (operating, parameter and configuration levels).
A customer-specific arrangement of those parameters that frequently have to be altered (user level) can also be implemented by using the setup program.
A wide variety of process values and status displays (e.g. switching states of the limit comparators) are visualized clearly and in detail.
Operating states and alarms are indicated by definable texts and icons in a reserved area of the screen.
Unused screen templates can be switched out of the display.

Recording



The recording function is used to create a graphical representation of the development of process values. This can be used to monitor and check control processes.
Features:

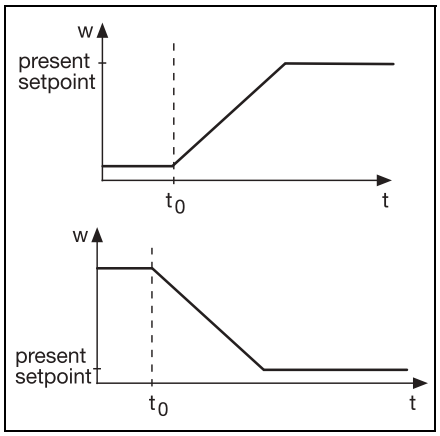
- free choice of signals for 4 analog channels and 3 logic channels
- memory storage cycle 60 to 3600 measurements per hour
- ring memory for 43,200 measurements
- readout of data via the interface

Self-optimization

Standard features include self-optimization, making it possible for the controller to be matched to the control loop by a user who is not a control-technology expert.
This functions by evaluating the response of the control loop to specific changes in the manipulating variable. Either an oscillatory method or a step response test can be selected. The controller parameters that are calculated are: proportional band, reset time, derivative time, filter time constant, and cycle time.

Ramp function

In a fixed-setpoint controller, the ramp function enables a defined run-up of the process value from t_0 until it reaches the given setpoint value.
The rate of change is defined as a gradient (°C/min, °C/hour or °C/day).
When the setpoint changes, this function is activated in the rising or falling direction.
The ramp function can be activated individually for each channel.



Customer-specific linearization

In addition to the linearizations for the usual transducers, up to four customer-specific linearizations can be created. The programming is carried out in the setup program, in the form of a table of values or a formula.

Configurable screen templates

Two freely configurable screen templates are available for arrangement into user-specific layouts.
Using the accessory setup program, representations of process values and graphics are selected from a library and assembled into the screen template within a graphics editor.
Some graphical elements can also be incorporated.

Configurable texts

The accessory setup program can be used to define up to 100 texts for use as messages and representations in the screen templates. Furthermore, all instrument texts can be changed or translated into other languages.

Event list

Important events, such as alarm messages, external texts or system messages, are collected together in an event list.

User level

Parameters which frequently have to be changed by the user can be collected together and displayed in the screen template "User level" (only through the setup program).

Math and logic module (option)

The math module makes it possible to combine values such as setpoints, output levels and measurements into a mathematical formula.
The logic module can be used to make a logical combination of such elements as logic inputs and limit comparator states.
Up to 16 math or logic formulae can be entered through the setup program, and the results of the calculations can be presented at the outputs or used for internal purposes.

Difference, ratio, and humidity control

Controllers for difference, ratio, and humidity can be achieved through standard formulae that have been included.

Cascade controller

Demanding control tasks can be handled by configuring the instrument as a cascade or trimmer cascade controller. Four cascade controllers can be implemented by using eight controller channels.

C-level controller (option)

The instrument can be used as a C-level controller, to regulate the level of carbon in the atmosphere of a gas coking furnace. The sensing device in this case is a zircon dioxide probe.

Logic functions

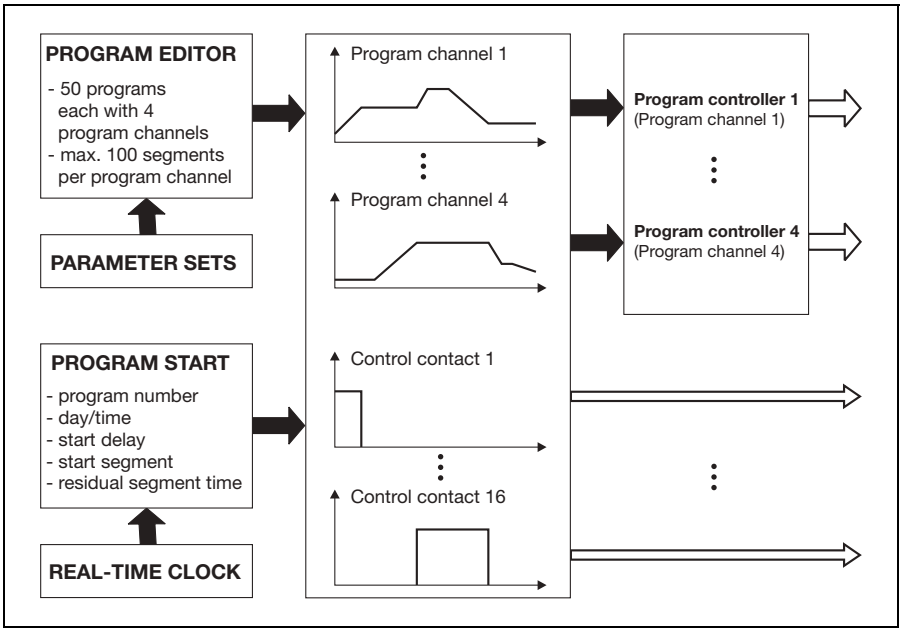
- Start/cancel of self-optimization
- Change to manual mode
- Inhibit manual mode
- Ramp stop/OFF
- Setpoint changeover
- Process value changeover
- Parameter set switching
- Key/level inhibit
- Text display
- Screen saving
- Screen switching
- Acknowledge limit comparators
- Program start/stop/cancel
- Inhibit program start
- Program selection
- Fast forwards
- Segment change
- Time synchronization
- Timer start/stop

The logic functions can be combined with one another.

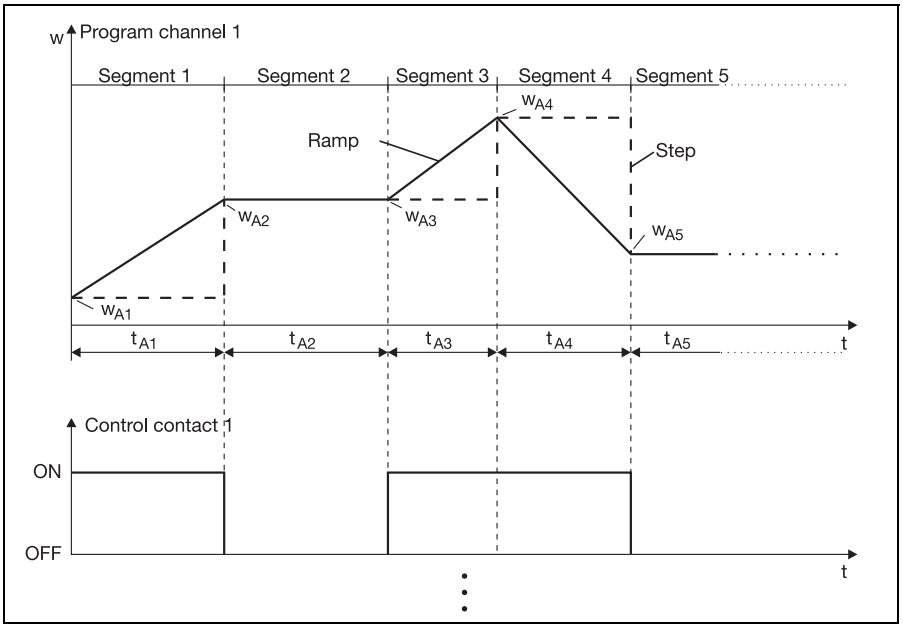
Functions of the Outputs

- Analog input variables
- Math
- Process value
- Setpoint
- Ramp end value
- Control deviation
- Output level
- Cascade output level
- Program end value
- Controller outputs
- Limit comparators
- Control contacts
- Logic inputs
- Logic
- Program end
- Ramp end
- Manual mode signal
- Timer signals
- Program/automatic signals

Program controller

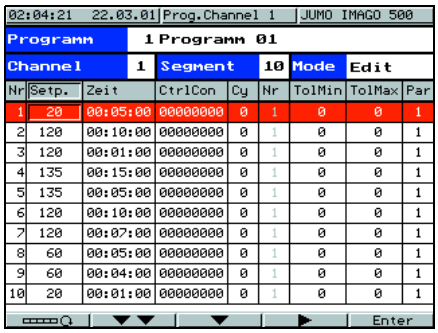


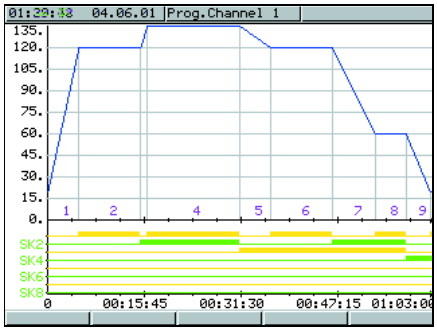
50 programs can be created, with a maximum of 4 program channels. The program channels run synchronously, and can each contain up to 100 segments. A total of 1000 segments can thus be programmed.
Furthermore, 16 control contacts can be programmed and assigned to the program channels. These are also run synchronously.
The start of a program can be initiated manually, by pressing a key on the instrument (or an external button), or through the programming of the start conditions. The start time can be determined either by defining a start delay or by programming a date and time. A weekly program can also be entered into the instrument, through the setup program.



Program channels are made up from a sequence of segments containing defined segment setpoints. The individual segment setpoints can optionally be linked to ramp or step functions.
The state of the 16 control contacts can be influenced in each segment. In addition, one of two programmable parameter sets and an upper and lower limit (tolerance band) for monitoring the process value can be assigned to each segment.
Endless loops can be implemented by programming repeated cycles.
Segments are defined by the segment setpoint and the segment time.
The control contacts 9 to 16 can only be set in the program editor of the setup program.

Program editor





The integrated program editor can be used for the comfortable creation and alteration of programs.
The program profiles and the states of the control contacts can be graphically displayed as a function of the time.
The setup program can be used to program a second setpoint sequence per program channel.

Timers

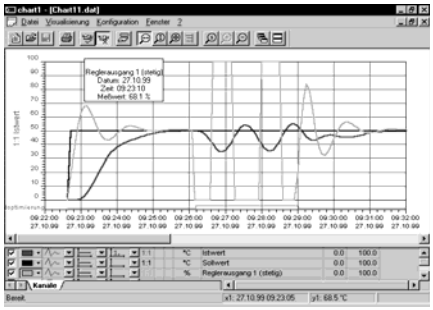
Four timers are provided, for time-dependent control. The states of the timers can be used for further internal processing or to set logic outputs.

Setup program (accessory)

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

Commissioning software JUMO Startup

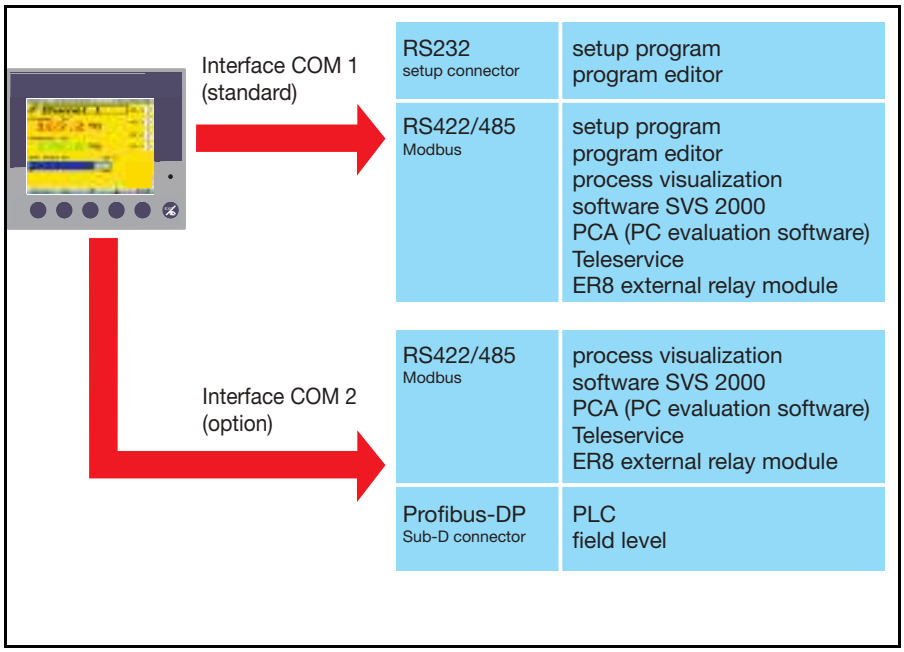
The commissioning software JUMO Startup is provided for optimum and comfortable adaptation of the controller to the control loop.
Various process variables (e.g setpoint, process value, control deviation, controller output signals) can be graphically visualized. The controller parameters can be altered and transferred to the controller via the setup or the RS422/485 interface on the controller.



External relay module ER8 (accessory)

Up to 2 ER8 external relay modules can be used. Each module expands the controller by 8 relay or logic outputs.
They can be operated via an RS422/RS485 interface.
The setup program is required to configure ER8 modules, which are mounted on DIN rails.

Interfaces



RS422/RS485 interface

The serial interface is used for communication with higher-level (supervisory) systems. The transmission protocol that is used is the Modbus protocol.

PROFIBUS-DP[1]

The PROFIBUS-DP interface can be used to integrate the controller into a fieldbus system operating according to the PROFIBUS-DP standard. This Profibus version is especially designed for communication between automation systems and decentralized peripheral devices at the field level, and optimized for speed. The data transmission is made serially, using the RS485 standard.
GSD generator, the project-planning tool that is supplied with the package (GSD = Gerätestammdaten, i.e. basic device data), is used to make a selection of device characteristics for the controller to create a standardized GSD file that is used to integrate the controller into the fieldbus system.

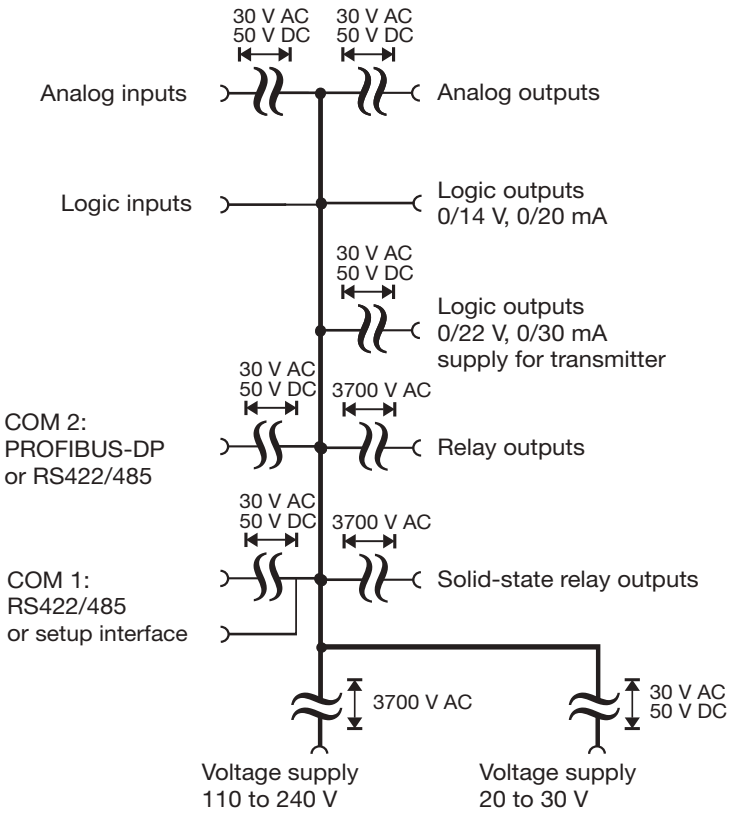
[1] Option

Parameter level

All the parameters and their meanings are included in the table. Some parameters may be omitted or meaningless for a particular type of controller. Two parameter sets can be stored, to handle special applications.

Parameter	Value range	Factory setting	Meaning
Controller structure	P, I, PD, PI, PID	PID	Control loop feedback
Proportional band	0 to 9999 digits	0 digits	Size of the proportional band 0 means that the controller structure is out of action!
Derivative time	0 to 9999 sec	80 sec	Determines the differential component of the controller output signal
Reset time	0 to 9999 sec	350 sec	Determines the integral component of the controller output signal.
Cycle time	0 to 9999 sec	20 sec	When using a switched output, the cycle time should be chosen so that the energy flow to the process is quasi-continuous, i.e. as continuous as is practicable without overloading the switching elements.
Contact spacing	0 to 999 sec	0 digits	The spacing between the two controller contacts for 3-state or modulating controllers, or continuous controllers with an integrated actuator driver.
Switching differential	0 to 999 digits	1 digit	Hysteresis for switching controllers with proportional band = 0
Actuator time	5 to 3000 sec	60 sec	The actually utilized stroke time of the regulator valve with modulating controllers or continuous controllers with an integrated actuator driver.
Working point	-100 to +100 %	0 %	The output level for P and PD controllers (if x = w then y = Y0).
Output level limiting	0 to 100%	100 %	The maximum limit for the output level.
	-100 to +100 %	-100 %	The minimum limit for the output level.
Minimum relay ON time	0 to 60 sec	0 sec	Limits the frequency of switching for switched outputs.

Electrical isolation



Technical data

Thermocouple input

Designation		Measurement range	Meas. accuracy[a]	Ambient temperature error
Fe-Con L		-200 to +900 °C	≤ 0.25 %	100 ppm/°C
Fe-Con J	EN 60584	-200 to +1200 °C	≤ 0.25 %	100 ppm/°C
Fe-Con U		-200 to +600 °C	≤ 0.25 %	100 ppm/°C
Cu-Con T	EN 60584	-200 to +400 °C	≤ 0.25 %	100 ppm/°C
NiCr-Ni K	EN 60584	-200 to +1372 °C	≤ 0.25 %	100 ppm/°C
NiCr-Con E	EN 60584	-200 to +915 °C	≤ 0.25 %	100 ppm/°C
NiCrSi-NiSi N	EN 60584	-100 to +1300 °C	≤ 0.25 %	100 ppm/°C
Pt10Rh-Pt S	EN 60584	0 to 1768 °C	≤ 0.25 %	100 ppm/°C
Pt13Rh-Pt R	EN 60584	0 to 1768 °C	≤ 0.25 %	100 ppm/°C
Pt30Rh-Pt6Rh B	EN 60584	0 to 1820 °C	≤ 0.25 %[b]	100 ppm/°C
W5Re-W26Re C		0 to 2320 °C	≤ 0.25 %	100 ppm/°C
W3Re-W25Re D		0 to 2495 °C	≤ 0.25 %	100 ppm/°C
W3Re-W26Re		0 to 2400 °C	≤ 0.25 %	100 ppm/°C
Cold junction		Pt100 internal, external, or constant		

[a] With 250 msec sampling time
[b] Within the range 300 to 1820 °C

Input for resistance thermometer

Designation		Connection circuit	Measurement range	Meas. accuracy[a]	Ambient temperature error
Pt100	EN 60751	two-wire/three-wire	-200 to +850 °C	≤ 0.05 %	50 ppm/°C
Pt50, Pt500, Pt1000	EN 60751	three-wire	-200 to +850 °C	≤ 0.1 %	50 ppm/°C
Cu50		three-wire	-50 to +200 °C	≤ 0.1 %	50 ppm/°C
Ni100	DIN 43760	two-wire/three-wire	-60 to +250 °C	≤ 0.05 %	50 ppm/°C
KTY11-6		three-wire	-50 to +150 °C	≤ 1.0 %	50 ppm/°C
PtK9		three-wire	Lithium-chloride sensor		
Sensor lead resistance		max. 30 Ω per lead for two-wire or three-wire circuit			
Meas. current		250 µA			
Lead compensation		Not required for 3-wire circuit. With a 2-wire circuit, the lead resistance can be compensated in software by a correction of the process value.			

[a] with 250 msec sampling time

Input for standard signals

Designation	Measurement range	Meas. accuracy[a]	Ambient temperature error
Voltage	0 to 10 V -10 to +10 V -1 to +1 V 0 to +1 V 0 to 100 mV -100 to +100 mV Input resistance R_{IN} >100 kΩ	≤ 0.2 % ≤ 0.2 % ≤ 0.1 % ≤ 0.1 % ≤ 0.1 % ≤ 0.1 %	100 ppm/°C 100 ppm/°C 100 ppm/°C 100 ppm/°C 100 ppm/°C 100 ppm/°C
C-level	0 to 2 V Input resistance R_{IN} >7.5 MΩ	≤ 0.1 %	100 ppm/°C
Current	4 to 20 mA, voltage drop ≤ 1 V 0 to 20 mA, voltage drop ≤ 1 V	≤ 0.1 % ≤ 0.1 %	100 ppm/°C 100 ppm/°C
Heating current	AC 0 to 50 mA	≤ 1 %	100 ppm/°C
Potentiometer	min. 100 Ω, max. 4 kΩ		

[a] with 250 msec sampling time

Logic inputs

Floating contacts	

Standard version

Measurement circuit monitoring

In the event of a fault, the outputs move to a defined (configurable) status.

Sensor	Overrange / underrange	Probe or lead short-circuit	Probe or lead break
Thermocouple	•	-	•
Resistance thermometer	•	•	•
Voltage 2 to 10 V	•	•	•
0 to 10 V	•	-	-
Current 4 to 20 mA	•	•	•
0 to 20 mA	•	-	-

• = recognized - = not recognized

Outputs

Relay contact rating contact life	changeover contact, or 2 x make 3 A at AC 250 V resistive load 150,000 operations at rated load (with 2 x make, the supply circuits ≥ AC 48 V cannot be combined on one board with SELV circuitry!)		
Logic current limiting	0/14 V 20 mA	or	0/22 V 30 mA
Solid-state relay contact rating protection circuitry	1 A at 230 V varistor		
Voltage output signals load resistance	0 to 10 V or 2 to 10 V $R_{load} \geq 500\,\Omega$		
Current output signals load resistance	0 to 20 mA or 4 to 20 mA $R_{load} \leq 450\,\Omega$		
Voltage supply for 2-wire transmitter voltage current	22V 30mA		

Controller

Controller type	Two-state controller,
	Two-state controller, modulating controller, continuous controller, continuous controller with integrated actuator driver
Controller structures	P/PD/PI/PID/I
A/D converter	dynamic resolution up to 16 bit
Sampling time	250 msec
	50 msec, 150 msec, 250 msec (configurable)

Color screen

Resolution	320 × 240 pixels
Size (screen diagonal)	5" (12.7cm)
Type	TFT screen with LED backlighting
No. of colors	27 colors

Electrical data

Voltage supply (switchmode PSU)	AC 110 to 240 V +10/-15 %, 48 to 63 Hz
	AC/DC 20 to 30V, 48 to 63 Hz (only for operation in SELV or PELV current circuits)
Electrical safety	to EN 61010-1 overvoltage category III, pollution degree 2
Power consumption	max. 30 VA
Data backup	Flash memory
Data buffer	battery (for restart data/initial conditions for the program controller/time)
Electrical connection	at rear, via plug-in screw terminals conductor cross-section max. 2.5mm^2 with core ferrules (length: 10mm)
Electromagnetic compatibility interference emission interference immunity	EN 61326-1 Class A - only for industrial use - to industrial requirements

Standard version

Housing

Housing type	housing and back panel: metal for mounting in control panels/switchgear cabinets (indoor use) acc. to IEC 61554
Front bezel	plastic to UL94 V0 144mm × 130mm
Mounting depth	170 mm
Panel cut-out	$92^{+0.8} \times 92^{+0.8}$ mm
Ambient/storage temperature range	-5 to 50 °C/-40 to +70 °C
Climatic conditions	rel. humidity ≤75 % annual mean, no condensation
Site altitude	up to 2000 m above sea level
Operating position	horizontal
Enclosure protection	to EN 60529 front IP65/rear IP20
Weight (fully fitted)	approx. 1400 g
Membrane keypad	polyester film, resistant to normal washing and cleaning agents

Interface (COM1)

Interface type	PC interface or RS422/485
Protocol	Modbus
Baud rate	9600, 19200, 38400
Device address	1 to 255
Minimum response time	0 to 500 msec

Interface (COM2)

Modbus

Interface type	RS 422/485
Protocol	Modbus
Baud rate	9600, 19200, 38400
Device address	1 to 254
Minimum response time	0 to 500 msec

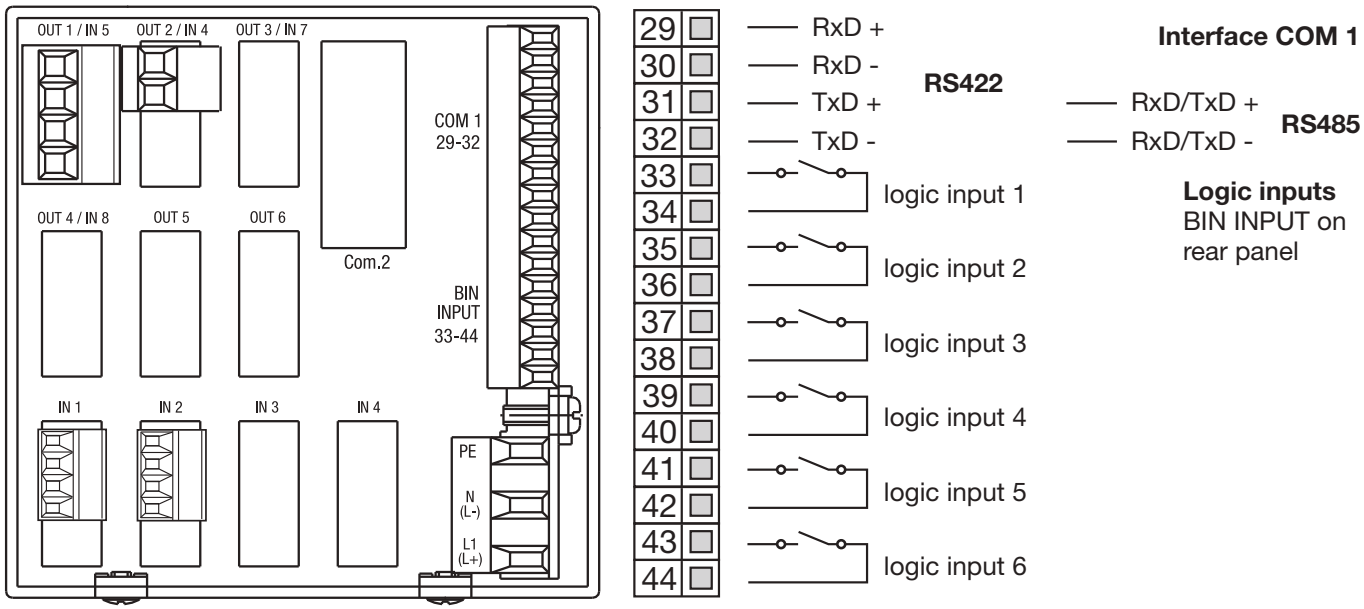
Profibus

Device address	1 to 128

Approvals/marks of conformity

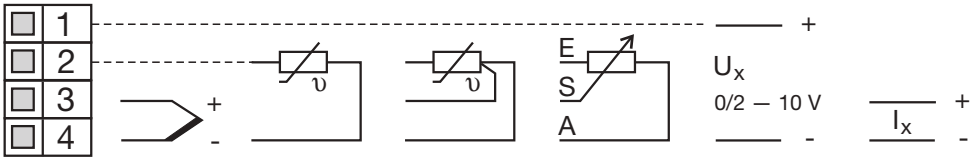
Mark of conformity	Testing laboratory	Certificates / certification numbers	Test basis	valid for
c UL us	Underwriters Laboratories	E201387	UL 61010-1 UL 50 - Type 1 CAN/CSA-C22.2 No. 61010-1	703590/...

Connection diagram



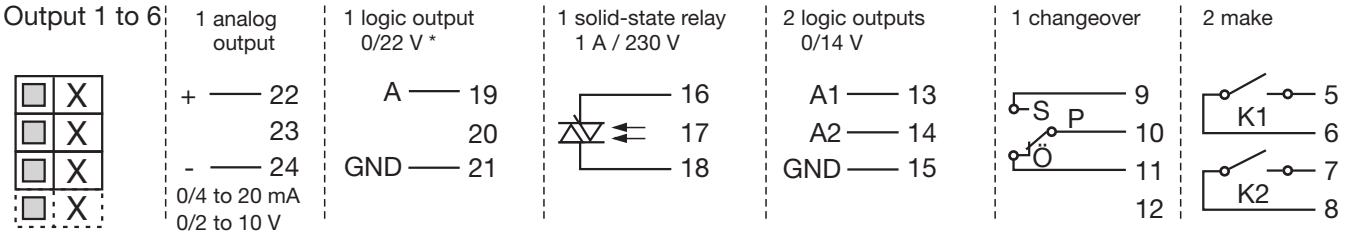
Analog inputs

Expansion slots: IN1 to 8



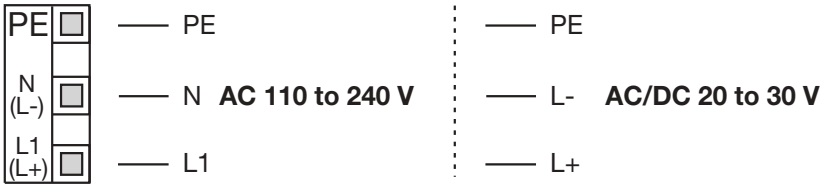
Outputs

Expansion slots: OUT1 to 6



* or supply for two-wire transmitter

Voltage supply



Slot	Expansion card with 1 output	Expansion card with 2 outputs
OUT1	Output 1	Output 1+7
OUT2	Output 2	Output 2+8
OUT3	Output 3	Output 3+9
OUT4	Output 4	Output 4+10
OUT5	Output 5	Output 5+11
OUT6	Output 6	Output 6+12

Interfaces

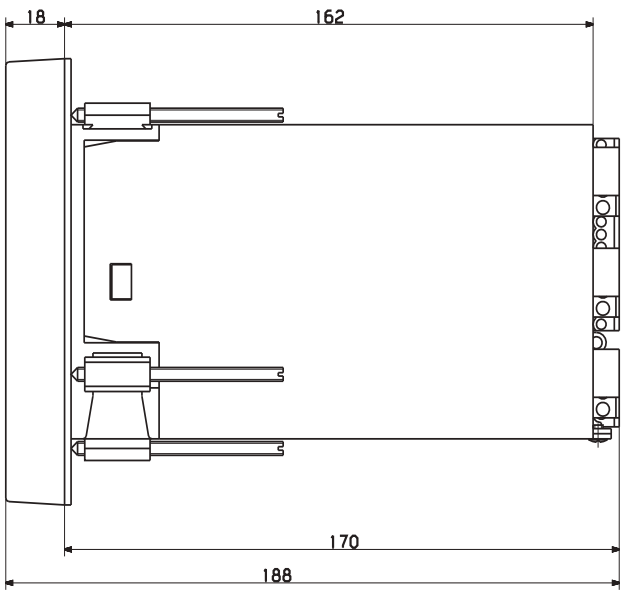
COM 2

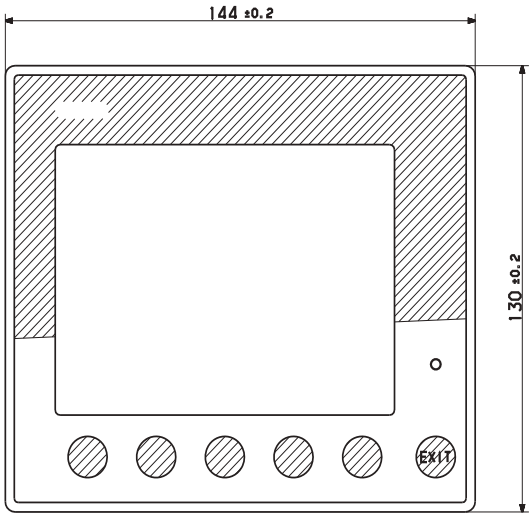
COM 2

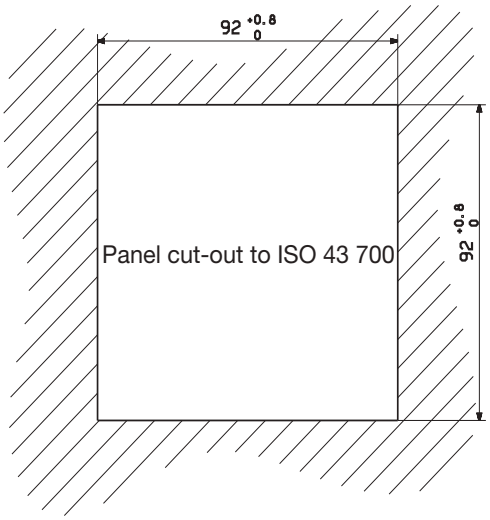
PROFIBUS-DP

Pin	Assignment
3	RxD/TxD-P
4	RTS
5	DGND
6	VP
8	RxD/TxD-N

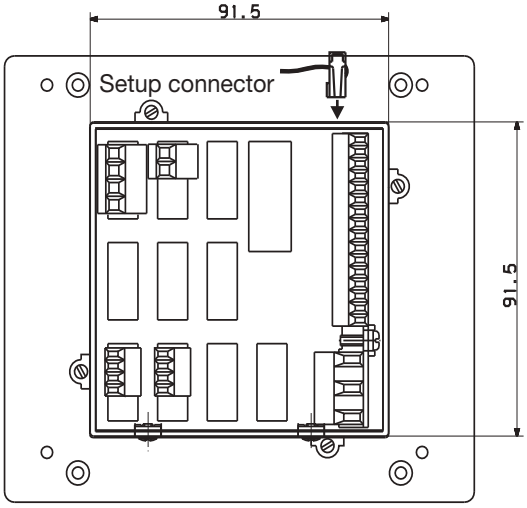
Dimensions





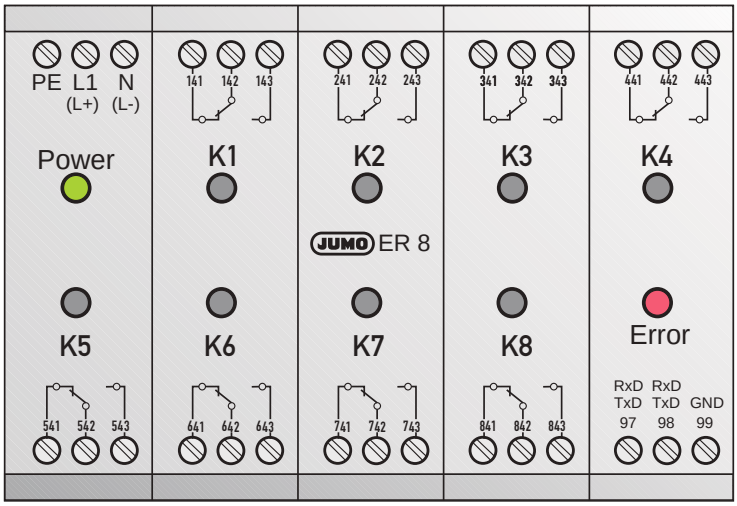


Rear view



Accessories

External relay module ER8[a], AC 110 to 240 V Part no. 00405292 (relay outputs) Part no. 00439131 (logic outputs)
External relay module ER8[a], AC/DC 20 to 53 V Part no. 00405297 (relay outputs) Part no. 00471459 (relay outputs)
PC interface for setup program Part no. 00301315 (TTL/RS232) Part no. 00456352 (USB/TTL)
Setup program and program editor[b] Part no. 00399795
Setup program with program editor and Startup[b] Part no. 00403094
Setup program with program editor, Startup and Teleservice[b] Part no. 00400012
Program editor (software)[b] Part no. 00400460



[a] If the two external relay modules are used, an RS422/485 interface is required!

[b] Requirements: Windows® 2000, XP, Vista, 7 (32-bit and 64-bit) PC with 512 MByte RAM, 60 MByte free on HD, CD-ROM, 1 free serial or USB interface

Order details

	Basic type
703590	JUMO IMAGO 500; multi-channel process and program controller

			Basic type extensions
			No. of controller channels
2			2 controller channels
4			4 controller channels
8			8 controller channels
			Version
	8		standard, with factory settings
	9		customized programming, as specified
			Language for instrument texts
		1	German
		2	English
		3	French
		9	Customer-specifc language (Czech, Dutch, Finnish, Hungarian, Italian, Polish, Russian, Spanish, Swedish)

1	2	3	4	Analog inputs
0	0	0	0	not used
8	8	8	8	universal input (configurable)
3	3	3	3	input for zirconium dioxide sensor 0 to 2 V

1	2	3	4	5	6	Outputs and analog inputs
0	0	0	0	0	0	none
1	1	1	1	1	1	1 relay (changeover)
2	2	2	2	2	2	1 solid-state relay 1 A/230 V
3	3	3	3	3	3	2 relays (make contacts)
4	4	4	4	4	4	1 logic output 0/22 V
5	5	5	5	5	5	1 analog output
6	6	6	6	6	6	1 supply for two-wire transmitter 22 V/30 mA
7	7	7	7	7	7	2 logic outputs 0/14 V
8	8	8	8	-	-	1 universal input

		Voltage supply
2	3	AC 110 to 240 V +10/-15 %, 48 to 63 Hz
2	5	AC/DC 20 to 30 V 48 to 63 Hz

		Interface COM2
0	0	not used
5	4	RS422/485 with Modbus/Jbus protocol
6	4	PROFIBUS-DP

			Extra codes
0	0	0	no extra codes
2	1	2	C-level control
2	1	3	recording function
2	1	4	math and logic module 1 to 8
2	1	5	math and logic module 9 to 16 (requires extra code 214)

703590/ ☐☐☐ – ☐☐☐☐ – ☐☐☐☐☐☐ – ☐☐ – ☐☐ / ☐☐☐ , ...[a]

[a] List extra codes in sequence, separated by commas.

Standard version

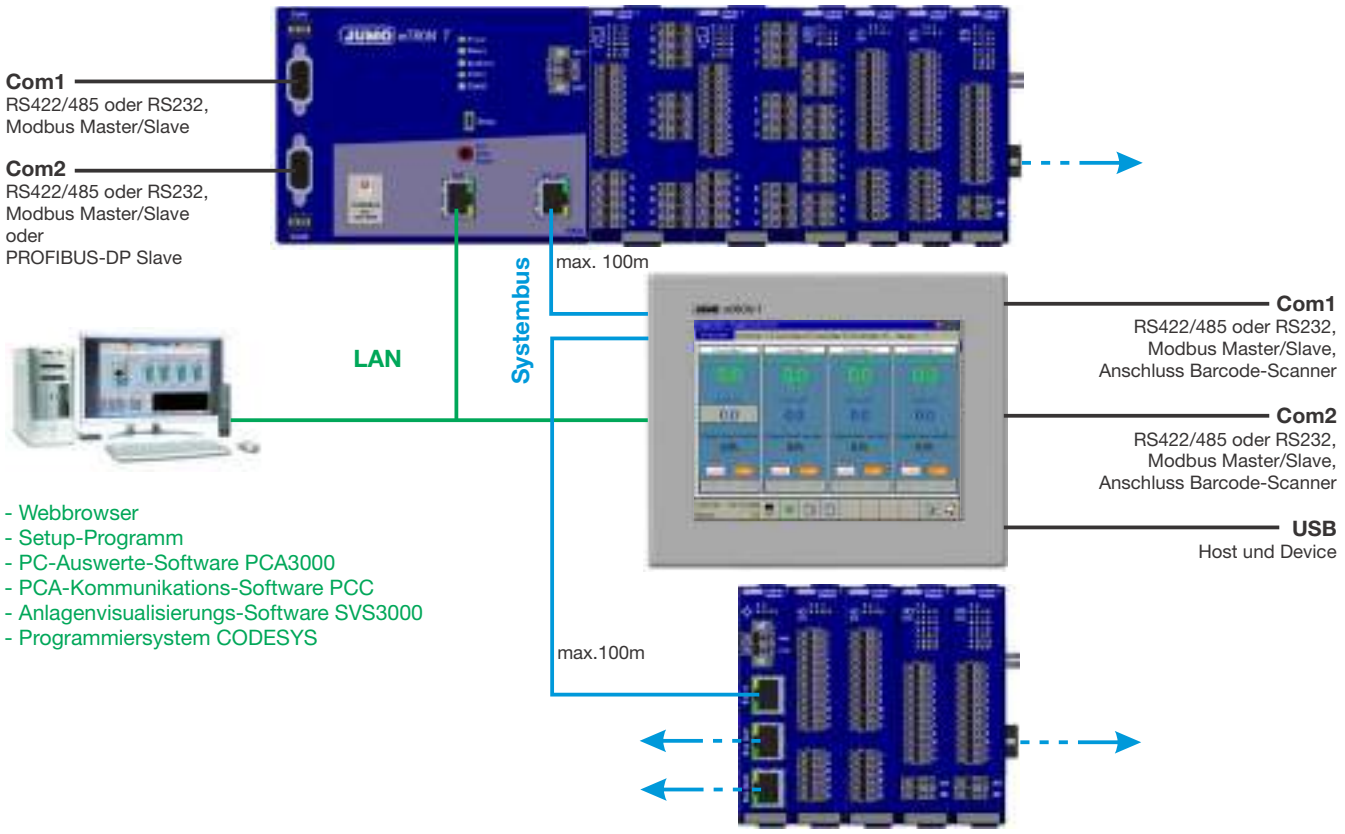
JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

JUMO mTRON T

Measuring, Control, and Automation System



Brief description

The modular measuring, control, and automation system is suitable for the precise detection, regulation, control, and recording. Special features of the system are the easy operation and the corresponding software components, the high measuring accuracy and regulation quality as well as the sturdy and service-friendly mechanical system.

An application consists of a base unit (central processing unit), a maximum of 30 input/output modules (multichannel controller module, analog input module 4-channel, analog input module 8-channel, analog output module 4-channel, digital input/output module 12-channel, thyristor power controller type 70906x), and if necessary the multifunction panel, up to four operating panels, and router modules for distributed module arrangement. For user-friendly all-in-one solutions, various PC programs are available.

Automation solutions for small and medium size machine lines are possible due to the integration of an optional PLC including programming system according to IEC 61131-3.

The base unit is equipped with a sturdy metal case; the router module and the input and output modules are equipped with a plastic case. All these devices can be fitted on a 35 mm DIN rail. The multifunction panel with TFT touch screen has a metal case with decor foil and is intended for mounting into a panel cut-out.

The system operates at a voltage of DC 24 V. The supply of operating voltage is only required at the base unit (central processing unit), at the router module, and at the multifunction panel.

Features

- Quick wiring of operating voltage and system bus due to easy module connection
- Flexible connection technology due to removable terminal strips with Push-In technology
- Modular device and function concept
- Touchscreen multifunction panel with predefined screen masks and customer-specific process screens
- Universal analog inputs
- Reliable, independent PID controller with self-optimization function
- Integrated PLC acc. to IEC 61131-3 (optional)
- 9 program generators (optional)
- Math and logic functions (optional)
- Fully-fledged recording function for up to 54 analog and 54 digital process values (optional)

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Description

Functionality

- Multichannel controller, program generator (optional)
- Measured data detection, visualization, and recording incl. batch reporting (optional) with multifunction panel
- Measured data archiving and evaluation by means of the PC Evaluation Software PCA3000 and PCA Communication Software PCC
- Operation, visualization und batch reporting with Plant Visualization Software SVS3000
- PLC programming system CODESYS; programming acc. to IEC 61131-3

Multilingual operation

Operation and configuration of the measuring, control, and automation system is possible in many European and Asian languages.

Setup program

The setup program is installed on a PC and connected to the base unit (central processing unit) or the multifunction panel via USB or LAN interface. That way the entire system can be comfortably configured, parameterized, and operated.

The setup data is transmitted to the up to 30 connected input/output modules (system bus).

General setup data and functions:

- Hardware configuration of the entire system
- Selection and editing of the operating languages
- Configuration and parameterization of the input and output modules
- Configuration of the central processing unit and the multifunction panel
- Configuration and programming of the PLC
- Program editor for 99 programs
- Configuration of the 9 program generators
- Configuration of the recording and the batch reporting
- Editor for customer-specific process images

Central processing unit

The central processing unit is the heart of the system. It contains the process image of the application and manages the configuration and parameter data of the complete system (except for the multifunction panel).

For individual control tasks 64 limit values can be monitored.

Nine program generators and a PLC according to IEC 61131-3 are available as an option.

The central processing unit continuously compares the saved system configuration with the data of the existing modules. For this reason Plug and Play replacement of the module insert of controller and input/output modules is possible during service work (Hot-Swapping).

Multichannel controller module

In the standard version, the multichannel controller module is a 2-channel PID controller with relay output or logic output to control a solid-state relay. It is additionally equipped with three optional slots which can be used to extend the number of inputs and outputs. As a result, all common controller types can be utilized including the cascade controller. Even a 4-channel two-state controller is possible.

The module operates independently, the control task is carried out even if the central processing unit fails or the higher-ranking system malfunctions. This behavior can be configured.

All controller channels can operate as a fixed-setpoint controller or a program controller. The programs are specified by the program generator function of the central processing unit or by the PLC.

Math and logic functions can be utilized by the user with the setup program.

Multifunction panel 840

The multifunction panel with TFT touch screen is used for clearly-arranged measured data visualization, operation, configuration, and parameterization of the system.

As an interface between man and machine, it allows a clear look into the process statuses and parameters of the system. It is perfectly suited for the display and operation of the controller screen, process screen, program editor or recording function. Controller setpoint values and texts for batch reporting can be directly entered on the screen.

Operating panels 350, 570, 1040

As of system version 02 the measuring, control, and automation system supports the use of up to four operating panels. The panels contain a CODESYS runtime system (V3.5 SP3 patch 9 or higher) and they are connected via Ethernet to the central processing unit's LAN interface.

The function of an operating panel is implemented as a PLC application (target/web visualization).

Input/output modules

The following input/output modules extend the system in addition to the multichannel controller module:

- Relay module 4-channel
- Analog input module 4-channel
- Analog input module 8-channel
- Analog output module 4-channel
- Digital input/output module 12-channel
- Thyristor power controller, type 70906x

Router module

The router module is used to achieve decentralization within the automation system (the input/output modules are distributed to several DIN rails/control cabinets). Up to 100 m distance between two router modules or between a router module and a base unit/ multifunction panel are possible. Up to 30 router modules and up to 30 input/output modules are possible in a system.

No configuration of the router module is required. It is integrated into the overall system by the setup program.

PLC function

The PLC function can be used to read and write to all inputs and outputs of the system modules. A library with predefined function modules and data types including their documentation is provided for the user.

For programming a control application, all editors defined in the IEC 61131-3 standard are provided:

- Structured text (ST)
- Sequential function chart (SFC)
- Continuous function chart (CFC)
- Function block diagram (FBD)
- Ladder diagram (LD)
- Instruction list (IL)

Furthermore, a large number of functions are implemented which can be used to quickly and efficiently debug, test, and start the application.

In addition, the user has the following functions and possibilities when using the PLC:

- Generation of events saved in the event list of the central processing unit
- Configuration of all system modules
- Process screen control of the multifunction panel

The PLC programming system is started from the setup program. Information about the system hardware (modules) is automatically imported into the PLC programming system. The user can assign machine-specific names to process data so that working with the PLC is even more comfortable.

A fully adequate OPC server (OPC DA) is available in connection with the PLC function. This simplifies the exchange of data with other systems such as SCADA systems or other control systems.

Event list

The event list within the central processing unit contains all events that occurred in the system including date and time. This includes system messages (configuration changes of a module, mains OFF/ON of the central processing unit), general events (sending an e-mail), malfunctions (module errors, communication malfunction), alarms and collective alarms.

An alert e-mail can be sent up to three addresses simultaneously. Up to five alarm texts can be configured, the sending is controlled via digital signals.

Recording function

The optional recording function in the multifunction panel detects, visualizes, and records all measuring and process data. The user can transfer the data to the PC Evaluation Software PCA3000 using a USB memory stick or

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

the PCA Communication Software PCC. The data can then be evaluated in the software.

Interfaces

The connection to PC programs (setup, evaluation, visualization and PLC programming) and higher-ranking systems is established via standardized interfaces.

The following interfaces are available:

- LAN (Ethernet)
  (HTTP or Modbus/TCP as master/slave)
- Serial RS232
  (Modbus RTU as master/slave)
- Serial RS422/485
  (Modbus RTU as master/slave)
- PROFIBUS-DP as slave (as of system version 02)
- USB device/host

The connection of additional devices (barcode scanner, paperless recorder, power controller, etc.) is possible.

Voltage supply

The measuring, control, and automation system operates at a voltage supply of DC 24 V. The supply is only required at the base unit (central processing unit), at the router module, and at the multifunction panel.

System expansions

The measuring, control, and automation system JUMO mTRON T is continuously expanded by the enhancement of the setup program and by the integration of new hardware. These system expansions are implemented in the context of new system versions (expansion stages).

System version 02

- Program generator with process steps
- Advanced user administration
- Extended process screen editor

System version 03

- Analog output module 4-channel
- Cyclic program repetition
- New and extended functions of the program generators for process engineering (ramp function with end value, manufacturer programs, configurable section changeover)
- Extended function of the process steps (configurable process contacts)
- Process screen input mask with individual text in the title bar
- Touchscreen operation recognized in the PLC
- Hierarchic user administration on the multifunction panel 840
- Horizontal recorder screen (analog and digital channels) in the multifunction panel 840

System version 04

- Connection of thyristor power controllers type 70906x (via system bus)
- Connection of up to 62 digiLine sensors for liquid analysis to the central processing unit (via Modbus RTU) and integration into the system by PLC application (as of CODESYS version 3.5 SP3 patch 9; extra code 224 required)
- 90 external batch texts (text variables) via Modbus
- Additional PLC library functions for configuration and operation of the multifunction panel
- Automatic user logoff after an adjustable period of time
- Setpoint standardization for realizing a cascade control
- Improved ease of use for the process screen editor
- Calculation of the maximum recording time of measurement data (recording data) during group configuration
- Remote maintenance of a customer's PLC application (CODESYS) via TCP connection (no gateway required)

System version 05

- Update to CODESYS version 3.5 SP10 patch 0
- Program preview in the multifunction panel 840 (only for central processing unit with extra code 225)
- Preparation of user logon via interface (e.g. with RFID chip card)
- Expansion of the process contacts in the process steps from 16 to a maximum of 64; introduction of editable designations for the process contacts
- Introduction of editable designations for the limit value monitoring, binary linking, and math/logic functions
- Extension of the TAG numbers (designation for PLC) of inputs and outputs from 7 to 42 characters
- Increase in the number of the analog, integer, and the digital variables within the central processing unit from 64 to 128; introduction of TAG numbers (42 characters) for these variables
- Additional configuration parameters and process values of the multichannel controller module are accessible via Modbus
- Changeable SMTP port number for sending emails
- Copying of PLC generated measurement data to a USB flash drive (in a generally readable format)
- Expanded import and copy functions in the setup program (import module configuration, import Modbus frames, copy frame entries to another frame)
- Expansion of the analog selector in the multichannel controller module for the independent operating mode (current setpoint value and actual value of the controller channel)

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

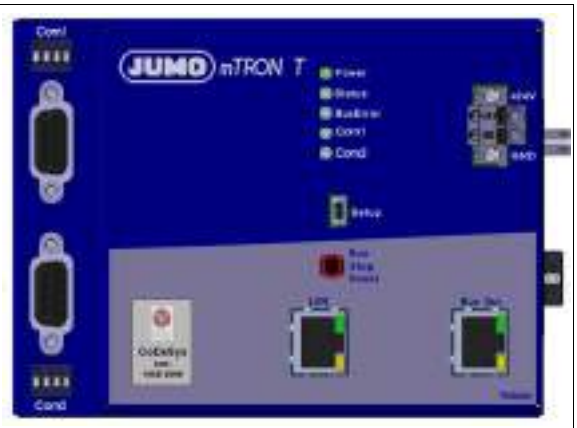
Base units

- The base unit, up to 30 input/output modules, and up to 30 router modules can be used to build a compact and economic central or decentral measuring, control, and automation system (visualization and operation either with the multifunction panel or the plant visualization software JUMO SVS3000).
- The base units contain the process image of the application. Furthermore, all configuration and parameter data of the system are stored in these modules (except for the multifunction panel). As a result, individual input/output modules can be replaced with Plug and Play.
- All base units operate at a voltage supply of DC 24 V.
- The setup program or the multifunction panel can be used to comfortably configure and parameterize the base units.
- LEDs are used to indicate the voltage supply as well as the operating status of a module and of the interfaces.

Central processing unit

CPU

- The central processing unit is the basis for the maximum extension of the system
- Nine program generators (option)
- 64 limit values are monitored
- An integrated PLC acc. to IEC 61 131-3 (option)
- Math and logic function (option) for all connected multichannel controller modules
- Two interfaces for field bus applications; optional:
  - RS232, Modbus RTU as master or slave
  - RS422/485 Modbus RTU as master or slave
  - PROFIBUS-DP as slave (as of system version 02)
- One USB device interface (setup)
- System bus connection at the front (Bus Out)
- A LAN interface (Ethernet) for HTTP and Modbus/TCP as master and slave
- Integrated web server
- E-mail transmission
- The central processing unit operates at a voltage supply of DC 24 V and supplies the connected input/output modules
- Dimensions (W x H x D): 135 mm x 101 mm x 67.1 mm (without connection elements)



For further information: Refer to data sheet 705001

Additional base units in preparation.

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

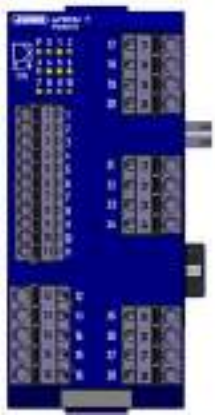
Input/output modules

- The modules are equipped with removable terminal strips with Push-In technology for the electrical connection.
- All input/output modules operate at a voltage supply of DC 24 V.
- The setup program, the multifunction panel or the optional PLC can be used to comfortably configure and parameterize the modules.
- LEDs are used to indicate the voltage supply as well as the operating status of a module and the input/output statuses.
- For service work (replacement) or adding optional boards, the module insert can be easily pulled out of the case at the front.

Multichannel controller module

2...4

- 2-channel PID controller with relay output or logic output to control solid-state relays
- Up to 4 PID controller channels can be activated (cascadable)
- Two universal analog inputs, two digital inputs (DC 0/24 V) and two digital outputs (relay or logic DC 0/15 V)
- Supported measuring probes: Thermocouples, RTD temperature probes, resistance transmitters, resistance/potentiometers, or standard signals (current or voltage)
- The analog inputs are electrically isolated from each other
- Three option slots for the extension of up to four universal analog inputs, eight digital inputs, three analog outputs, or eight digital outputs
- Supported controller types: Two-state controller, three-state controller, modulating controller, continuous controller, or continuous controller with integrated actuator controller
- Customer-specific linearization possible by using a formula
- Limit value monitoring
- Four formulae for math and logic functions (option)
- One counting input up to 10 kHz
- The module operates independently (configurable) which means the control task is carried out even if the base unit or the higher-ranking system malfunctions
- If the controller is replaced during service work the new controller (identical type) is automatically configured
- Dimensions (W x H x D): 45 mm x 103.6 mm x 101.5 mm (without connection elements)

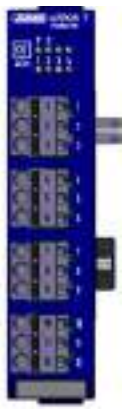


For further information: Refer to data sheet 705010

Relay module 4-channel

4

- Four relay outputs controlled via the system bus by digital signals
- Each relay is equipped with a changeover contact AC 230 V / 3 A
- Separate terminal strip per relay output
- Automatic configuration after the module insert has been exchanged during service work
- Dimensions (W x H x D): 22.5 mm x 103.6 mm x 101.5 mm (without connection elements)



For further information: Refer to data sheet 705015

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Analog input module 4-channel

- Four universal analog inputs
- Supported measuring probes: Thermocouples, RTD temperature probes, resistance transmitters, resistance/potentiometers or standard signals (current or voltage)
- The analog inputs are electrically isolated from each other
- Customer-specific linearization possible by using a formula or up to 45 pairs of values
- Limit value monitoring
- Automatic configuration after the module insert has been exchanged during service work
- A digital input (DC 0/24 V) is also provided
- Dimensions (W x H x D): 22.5 mm x 103.6 mm x 101.5 mm (without connection elements)

For further information: Refer to data sheet 705020

Analog input module 8-channel

- Eight analog inputs for RTD temperature probes Pt100, Pt500 or Pt1000 in 2-wire circuit
- The analog inputs are not electrically isolated from each other
- Limit value monitoring
- Automatic configuration after the module insert has been exchanged during service work
- A digital input (DC 0/24 V) is also provided
- Dimensions (W x H x D): 22.5 mm x 103.6 mm x 101.5 mm (without connection elements)

For further information: Refer to data sheet 705021

Analog output module 4-channel

- Four analog outputs 0(2) to 10 V or 0(4) to 20 mA (configurable per channel)
- The analog outputs are electrically isolated from each other
- Configurable behavior in case of an error, e.g. acc. to NAMUR recommendation NE 43
- Automatic configuration after the module insert has been exchanged during service work
- Dimensions (W x H x D): 22.5 mm x 103.6 mm x 101.5 mm (without connection elements)

For further information: Refer to data sheet 705025

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Digital input/output module 12-channel

- 12 channels which can be respectively configured as digital inputs (DC 0/24 V) or as digital outputs (DC 0/24 V, 500 mA)
- Supply of external voltage through terminal at the front
- Automatic configuration after the module insert has been exchanged during service work
- Dimensions (W x H x D): 22.5 mm x 103.6 mm x 101.5 mm (without connection elements)

For further information: Refer to data sheet 705030

Thyristor power controller type 70906x

- Various device versions for single-phase operation, for operation in three-phase economy circuit and full three-phase operation
- Integration in the measuring, control, and automation system via system bus, using a network cable
- Each power controller counts as one input/output module (a maximum of 30 modules per system)
- Access to various process values of the power controller

For further information: Refer to data sheets 709061, 709062, 709063

Special modules

Router module

- The router module distributes the input/output modules to several DIN rails/control cabinets (decentralized arrangement)
- It uses the system bus to link modules to the base unit or the multifunction panel
- Up to 100 m distance between two router modules or between a router module and the base unit or the multifunction panel
- Up to 30 router modules are possible
- The router module operates at a voltage supply of DC 24 V and supplies the connected input/output modules
- No configuration of the router module required
- For applications such as Hot Connect, for example, the address of the router module can be set by rotary coding switches
- Three RJ45 system bus connections at the front (1 × Bus In, 2 × Bus Out), electrically isolated
- Dimensions (W x H x D): 22.5 mm x 103.6 mm x 101.5 mm (without connection elements)

For further information: Refer to data sheet 705040

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Operating, visualization, recording

Multifunction panel 840

HMI

- Touchscreen with front made of aluminum incl. design foil (IP67)
- TFT color monitor 21.3 cm (8.4”),
  resolution 640 x 480 pixels, 256 colors, with LED backlight
- As an interface between man and machine it allows an optimal and clearly-arranged view of the process statuses and parameters of the system
- Display (in real time) and operation of controller screen, process screen, program editor, and recording function (option)
- Configuration of all connected modules
- Setpoint values and batch texts are directly entered on the screen
- Data archiving and evaluation with PC
- The multifunction panel operates at a voltage supply of DC 24 V
- A setup program can be used to comfortably configure the multifunction panel
- Two interfaces for field bus applications; optional:
  - RS232, Modbus RTU as master or slave
  - RS422/485, Modbus RTU as master or slave
- One USB device interface (setup)
- Two USB host interfaces (memory stick)
- Two system bus connections (Bus In and Bus Out)
- A LAN interface (Ethernet) for HTTP and Modbus/TCP as master and slave
- Integrated web server
- E-mail transmission
- Connection possibility for barcode scanner
- Dimensions (W x H x D): 235 mm x 195 mm x 58 mm

For further information: Refer to data sheet 705060

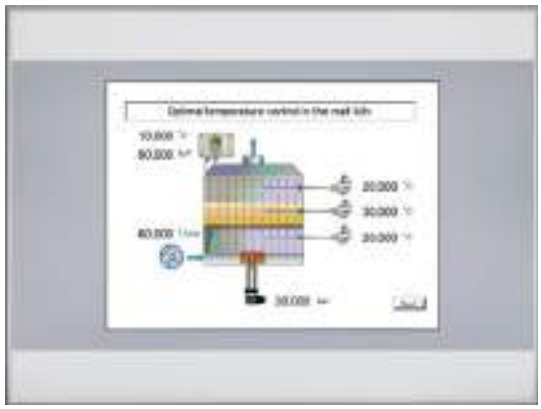
JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

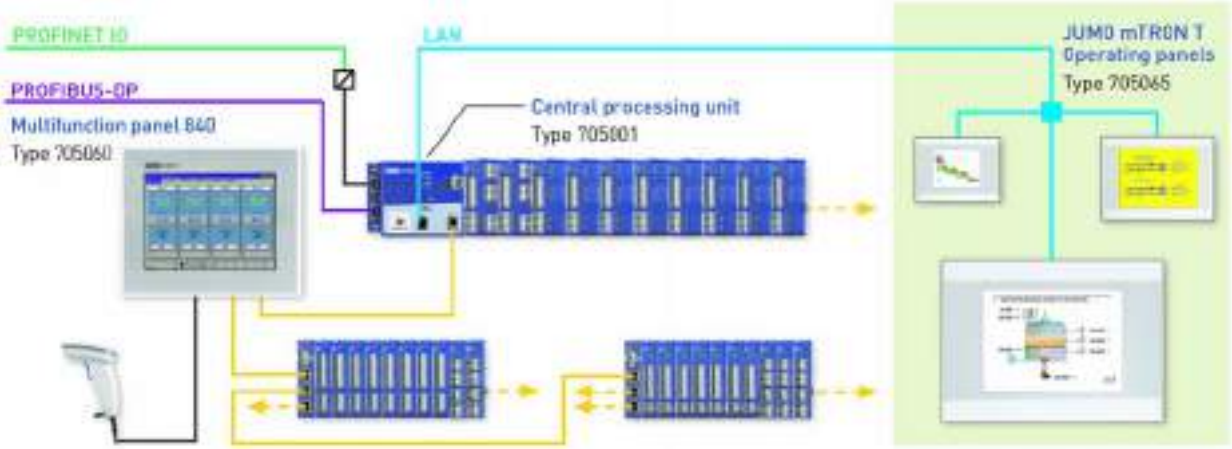
JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Operating panels 350, 570, 1040

- TFT color display (64k colors) with resistiv-touch technology
- Display sizes 8.9 cm (3.5"), 14.5 cm (5.7"), and 26.4 cm (10.4")
- Display resolutions 320 × 240 pixels and 640 × 480 pixels
- Different case materials (plastics, metal)
- Protection type IP65 (at the front)
- Voltage supply DC 24 V
- Ethernet interface (RJ45) for connection to the system
- Up to four operating panels per central processing unit (PLC option required)
- Specific process screens for operating the system
- Direct access to PLC variables



System structure:



For further information: Refer to data sheet 705065

Power supply units

These power supply units are suitable for demanding tasks requiring the latest state-of-the-art technology and special flexibility. The excellent efficiency, the high peak load capability, and many additional features distinguish this series.

Power supply units 705090/...

- Voltage supply AC 100 V ... 240 V
- 150 % peak load capability (for typical 4 s)
- Minimum current inrush
- Floating DC-OK relay contact
- Efficiency up to 93.5 %
- Active power factor correction (PFC)
- Active filter against mains transients
- Quick connection due to spring-cage terminals
- Dimensions (W x H x D):
  705090/05-33: 40 mm x 130.5 mm x 121.5 mm
  705090/10-33: 60 mm x 130.5 mm x 121.5 mm

For further information: Refer to data sheet 705090

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

PC programs

Setup program

SET

Setup program for project planning and configuration of the entire measuring, control, and automation system

A complete PLC can be activated as an option.

The setup program is distinguished by:

- User-friendly configuration, parameterization, and startup of the base units, the input/output modules, and the multifunction panel
- Automatic import of the hardware configuration into the PLC programming software CODESYS
- Program editor
- Process screen editor

The project file contains all data that is relevant for the configuration, parameterization, and visualization. The file also contains the controller programs and, if applicable, the customer-specific PLC code.

For further information: Refer to operating manual 705000.6

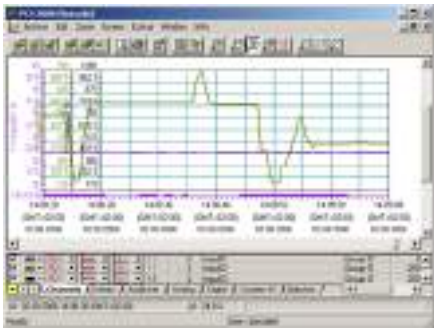
PC Evaluation Software PCA3000

PCA

Professional evaluation software to manage, archive, visualize and evaluate process data (measuring data, batch data, messages, ...)

The process data can be imported via USB memory stick or provided by the software PCC.

- Data memory: Clearly arranged and easy backup and archiving of all process data in a data file
- Data backup: Archive data can directly be imported from CD/DVD and then displayed
- Data export: Data export to HTML level or ASCII text file (for evaluation in Excel) or customer-specific forms
- Communication: The communication software PCC optimally adapted to PCA3000 can be used to comfortably import data via an interface or a modem



For further information: Refer to operating manual 709701.0

PCA Communication Software PCC

PCC

The communication software PCC optimally adapted to PCA3000 can be used to comfortably import data via an interface or modem.

- Data memory: Clearly-arranged, easy backup and archiving of all process data in a data file
- Teleservice function (display of the process data)

For further information: Refer to operating manual 709702.0

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

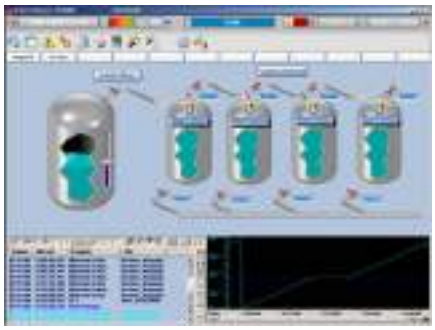
Plant Visualization Software JUMO SVS3000

SVS

Plant Visualization Software for online visualization, batch reporting and operation of the measuring, control and automation system with a networked PC

This software ensures quick familiarity and easy creation of applications. The user is able to quickly configure an individual application according to his/her requirements due to the prepared masks (process, group, trend screens).

- Easy and quick application creation
- Extensive library with predefined graphical elements
- System operation via group masks
- Extensive documentation function with continuous and batch related evaluation
- Search function for date/time, plant, and batch criteria to be defined
- Automatic print and data export
- Recipe function
- Quick and easy commissioning/startup due to installation menu
- Alarm and event list
- Password protected
- History and real time trend
- Network compatible
- Connection of bar code scanner
- Remote alerting (optional)



For further information: Refer to data sheet 700755

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Module overview

Base units

- Central processing unit
  Data sheet 705001

Input/output modules

- Multichannel controller module
  Data sheet 705010
- Relay module 4-channel
  Data sheet 705015
- Analog input module 4-channel
  Data sheet 705020
- Analog input module 8-channel
  Data sheet 705021
- Analog output module 4-channel
  Data sheet 705025
- Digital input/output module 12-channel
  Data sheet 705030
- Thyristor power controller type 70906x
  Data sheet 709061, 709062, 709063

Special modules

- Router module
  Data sheet 705040

Operating, visualization, recording

- Multifunction panel 840
  Data sheet 705060
- Operating panels
  Data sheet 705065

Power supply units

- 705090/05-33
  Data sheet 705090
- 705090/10-33
  Data sheet 705090

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

JUMO mTRON T
Measuring, Control, and Automation System

Central processing unit

Brief description

The central processing unit is the heart of the system. It contains the process image of the application and manages the configuration and parameter data of the complete system.

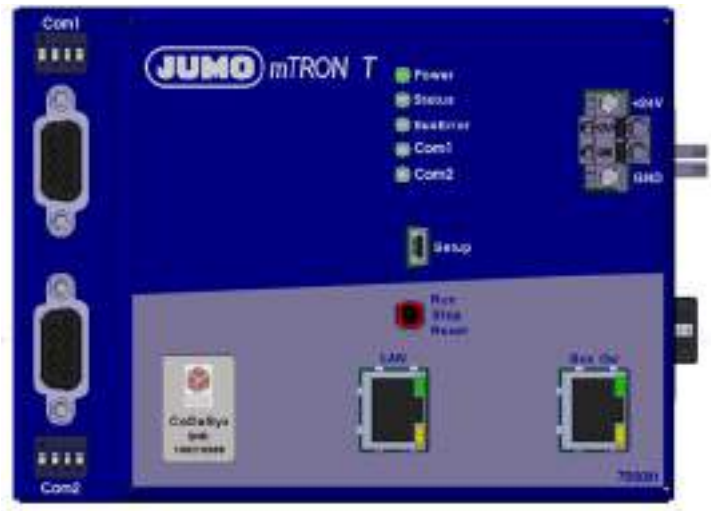
For individual control tasks nine program generators and extensive limit value monitoring functions are available.

LEDs are used to indicate applied voltage supply, the operating status of the PLC, system messages, as well as the communication through interfaces.

A USB device interface, a LAN connection (Ethernet), and two system bus connections are available as standard. Up to two interfaces can be optionally equipped for fieldbus applications.

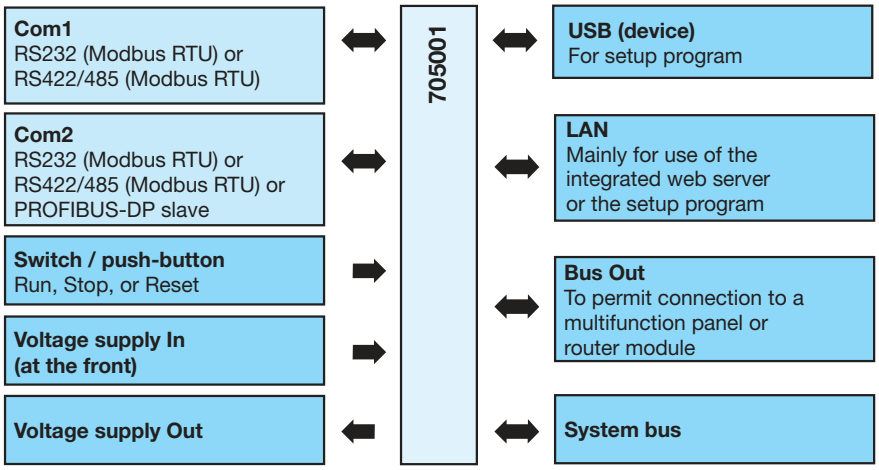
The central processing unit, the input/output modules connected laterally, and modules integrated by a router are comfortably configured and parameterized with the setup program or the multifunction panel 840.

The integrated CODESYS V3.5 PLC completes the parameterizable functions with a powerful control unit. This allows to realize even complex applications.



Type 705001/...

Block diagram



Features

- Process image for up to 30 input/output modules
- Ethernet interface with integrated web server
- One USB interface
- 64 limit values can be monitored
- PLC acc. to IEC 61131-3 (CODESYS V3.5)
- OPC server (OPC DA, in connection with PLC CODESYS V3.5)
- Nine program generators
- Two field bus interfaces
- Math and logic module
- System bus connection on the front (Bus Out)
- Plug and Play when replacing the input/output modules
- Battery buffered RAM
- Real time clock
- Sturdy metal case
- Supply of operating voltage
- Quick wiring of operating voltage and system bus due to easy module connection

Approval/approval marks (see “Technical data”)

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Description

Setup program

The setup program is installed on a PC and connected to the base unit (central processing unit) or the multifunction panel via USB or LAN interface. That way the entire system can be comfortably configured, parameterized, and operated.

The setup data is transmitted to the up to 30 connected input/output modules (system bus).

General setup data and functions:

- Hardware configuration of the entire system
- Selection and editing of the operating languages
- Configuration and parameterization of the input and output modules
- Configuration of the central processing unit and the multifunction panel
- Configuration and programming of the PLC
- Program editor for 99 programs
- Configuration of the 9 program generators
- Configuration of the recording and the batch reporting
- Editor for customer-specific process images

Limit value monitoring

With the limit value monitoring one input variable can be monitored compared to a fixed limit value or a different variable. 64 limit values can be monitored in this way and for each limit value monitoring eight different alarm functions are available. The configuration is carried out in the setup program or with the multifunction panel.

Even extensive functions can be realized due to additional parameters such as position and value of the switching differential, switch ON/OFF delay, pulse function, acknowledgement type, and startup alarm suppression. The startup alarm suppression can, for example, be used to prevent the limit value monitoring function to be tripped during the process startup phase.

Event list

The event list contains all events that occurred in the system including date and time. This includes system messages (configuration changes of a module, mains OFF/ON of the central processing unit), general events (sending an e-mail), malfunctions (module errors, communication malfunction), alarms, and collective alarms.

The list contains the last 150 events and can be invoked as text in the set language via web server and on the multifunction panel. In the event of a mains failure, the event list remains saved.

Event texts

The setup program can be used to define up to 250 event texts, each with a length of up to 31 characters. This way, customized event messages can be created.

Interfaces

The following interfaces are available:

- USB device to connect a PC (e.g. for the setup program)
- LAN (Ethernet)
  (HTTP or Modbus/TCP as master/slave)
- Serial RS232
  (Modbus RTU as master/slave)
- Serial RS422/485
  (Modbus RTU as master/slave)
- PROFIBUS-DP as slave (as of system version 02)
- Bus Out (at the front) to connect a router module or multifunction panel via network cable

External signals

External input signals (variables) can be transmitted to the system via the fieldbus interfaces and the LAN interface (Modbus/TCP) in addition to the internal input signals. As a result, up to 64 analog variables, up to 64 integer variables, and up to 64 digital variables as well as up to 90 text variables are available.

As of system version 05, 128 analog, integer, and digital variables are supported.

Web server

The central processing unit serves as web server and thereby offers the option to comfortably access the system via LAN using a PC (web browser). This access method provides the following information:

- Process values
- Event list

Access can be protected by a password.

Alarm transmission by e-mail

Alerts can be sent by e-mail to three addresses simultaneously via a mail server. Up to five alarm texts can be configured; sending is controlled via binary signals.

If special e-mail addresses that forward to mobile phones (text messaging) or fax machines are provided in the company network, alerts can also be transmitted using these communication channels.

Program generator

Nine independent program generators are available as an option so that nine programs can run asynchronously and independently from each other. A total of 100 programs can be managed in a program pool.

The program editor, which is part of the setup program and the multifunction panel, can be used to create a program.

Each program can consist of up to three program channels with four setpoint values and 16 control contacts. Up to 100 program sections are possible. A tolerance band monitoring can be set for the first set point value of each program channel.

A program can be started, stopped, and aborted by an action on the multifunction panel, a binary signal, or via the PLC. Toggling between the program sections is possible as well. A program can also be started by setting default dates and times. The individual program channels of a program are synchronously started.

The program is completed when all program channels of the program are completed. If a program channel is prematurely completed, its setpoint values and control contacts are set to a defined value (basic status).

For manual mode, separate setpoint values and control contacts can be defined per program channel (basic status). The setpoint values can be adjusted through the multifunction panel.

The behavior after a mains interruption can be configured (e.g. program abort, continued run, or continuation/abort via multifunction panel).

As of system version 02, programs can be marked in the program editor as favorite programs, so that they appear in the program selection at the beginning of the program list.

Cyclic program repetition is supported as of system version 03 . The number of cycles is already specified in the program editor. During program run, the current cycle is indicated in the generator screen.

Program generator with process steps (as of system version 02)

A total of 90 programs can be managed in a program pool. The nine program generators support the use of up to 100 process steps. In every process step the allowed setpoint values and control contacts are selected and the time limits of a program section are defined. This assignment is normally done by the plant manufacturer because special knowledge of the plant is required.

While entering a program using the program editor, a certain process step is assigned to each program section. As a result, the specifications defined with the process step are relevant for the dedicated program section. This means: only the allowed setpoint values and control contacts can be used and the section run time has to be within the time limits.

In a process step, up to 16 process contacts that are used to control PLC functions can be activated (system versions 02 to 04). As of system version 03, the function of the process contacts is configurable (time behavior).

As of system version 03, additional functions for ramp function and section changeover are available. Furthermore, up to 50 programs may be defined as manufacturer programs which are editable by the manufacturer only.

As of system version 05, up to 64 process contacts are available. The contact designations are editable (individually for each program generator).

PLC function

The PLC function (option) is a fully adequate PLC which can be used to read all inputs and to write to all outputs of the modules in the system. A library with predefined function modules and data types including their documentation is available to the user.

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

For programming a control application, all editors defined in the IEC 61131-3 standard are provided:

- Structured text (ST)
- Sequential function chart (SFC)
- Continuous function chart (CFC)
- Function block diagram (FBD)
- Ladder diagram (LD)
- Instruction list (IL)

Furthermore, a large number of functions are implemented which can be used to quickly and efficiently debug, test, and start up the application.

In addition, the user has the following functions and possibilities when using the PLC:

- Generation of events saved in the event list of the central processing unit
- Configuration of all system modules
- Process mask control of the multifunction panel

The PLC programming system is started from the setup program. Information about the system hardware (modules) is automatically loaded into the PLC programming system. The user can assign machine specific names to process data so that working with the PLC is more comfortable.

A fully adequate OPC server is available in connection with the PLC function. This simplifies the exchange of data with other systems such as SCADA systems or other control systems.

As of CODESYS version 3.5 SP3 patch 9, up to 62 digiLine sensors for liquid analysis can be integrated in the measuring, control, and automation system by a PLC application. The sensors are connected to the serial interface of the central processing unit (RS485, Modbus RTU) via a bus system.

System version 05 includes an update to CODESYS version 3.5 SP10 patch 0.

As of system version 05 a user can log on to the system through the PLC. As a result, applications such as the user logon via interface (e.g. with RFID chip card) can be implemented by a PLC application.

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Technical data

Interfaces

USB device	
Connector designation	Setup
Connector type	Mini-B
Number	1
Application	Connection to a PC (setup program)
Max. current	100 mA
System bus Out	
Connector designation	Bus Out
Connector type	RJ45
Number	1
Application	Connection of a router module or a multifunction panel
Connection cable	Network cable (patch or crossover cable), at least CAT5 (S/FTP)
Cable length	Up to 100 m
Ethernet	
Connector designation	LAN
Connector type	RJ45
Number	1
Application	Communication with PC (setup program, web server), e-mail server, and Modbus master/slave
Protocol	TCP/IP, HTTP, DHCP, SMTP+POP3, Modbus/TCP
Transfer rate	10 Mbit/s, 100 Mbit/s
RS232 or RS422/485 (serial interfaces)	Depending on the device type
Connector designation	Com1 and Com2
Connector type	D-Sub
Number	2
Application	Fieldbus applications, communication via modem with a PC (setup program) or with an e-mail server
Protocol	Modbus RTU (master or slave); PROFIBUS-DP (slave, Com2 only)
Transfer rate	Modbus: 9600 Bd, 19200 Bd, 38400 Bd; PROFIBUS: max. 12 Mbit/s

Electrical data

Voltage supply	
Connection	At the front (removable 2-pole terminal strip with Push-In technology)
Voltage	DC 24 V +25/-20 % SELV
Residual ripple	5 %
Current consumption	Max. 350 mA (at DC 19.2 V) Current consumption of lined-up modules also has to be considered (see „Hardware configuration“ in the setup program)!
Power consumption	Max. 7 W
Conductor cross section (voltage supply)	
Wire or strand without ferrule	Min. 1.5 mm^2, max. 2.5 mm^2
Strand with ferrule	Min. 1.5 mm^2, max. 2.5 mm^2
2 x strand with twin ferrule with plastic collar	1.5 mm^2
Stripping length	10 mm
Electrical safety	Acc. to EN 61010-1 Overvoltage category III, pollution degree 2

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Electromagnetic compatibility	Acc. to EN 61326-1
Interference emission	Class A – only for industrial use –
Interference immunity	To industrial requirements
Data backup	Buffered RAM
Buffer battery service life	Approx. 10 years (Lithium battery)

Case and ambient conditions

Case type	Metal case for DIN rail mounting in the control cabinet (indoor use); DIN rail acc. to DIN EN 60715, 35 mm x 7.5 mm x 1 mm
Dimensions (W × H × D)	135 mm × 101 mm × 67.1 mm (without connection elements)
Weight (fully equipped)	Approx. 670 g
Protection type	IP20, acc. to DIN EN 60529
Ambient temperature range	-20 to +55 °C
Storage temperature range	-40 to +70 °C
Resistance to climatic conditions	Relative humidity ≤ 90 % annual average without condensation (climatic class 3K3 acc. to DIN EN 60721-3-3 with extended temperature and humidity range)
Site altitude	Up to 2000 m above sea level
Mechanical ambient conditions[a]	Classification acc. to DIN EN 60721-3-3, table 6, class 3M2

[a] Test conditions are listed in the System Descripton B 705000.8.

Approval/approval marks

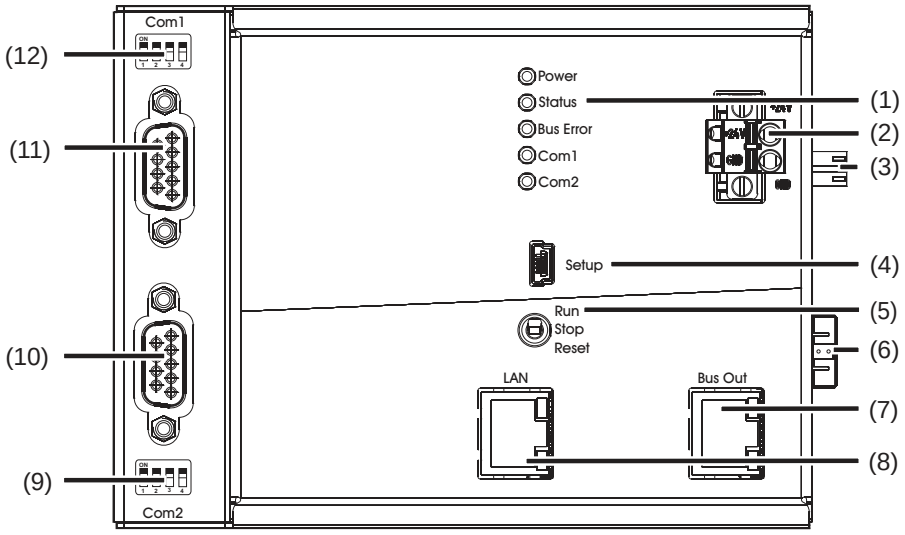
Approval mark	Testing agency	Certificate/certification number	Inspection basis	Valid for
c UL us	Underwriters Laboratories	E201387	UL 61010-1 (3. Ed.), CAN/CSA-22.2 No. 61010-1 (3. Ed.)	all types
DNV GL	DNV GL	TAA000016N	Class Guideline DNVGL-CG-0339	all types; a power supply unit with DNV GL or GL type approval is required (e.g. type 705090)

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

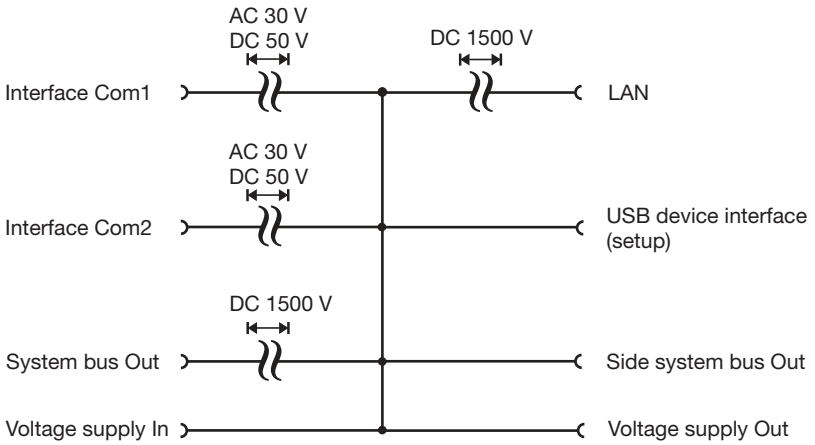
JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Display, operating, and connection elements



(1) Status displays (LED)
(2) Voltage supply In, DC 24 V
(3) Voltage supply Out, DC 24 V
(4) USB device interface (setup)
(5) Switch/push-button for Run, Stop, or Reset
(6) Side system bus Out
(7) System bus Out
(8) LAN interface (Ethernet)
(9) Termination resistors Com2
(10) Interface Com2
(11) Interface Com1
(12) Termination resistors Com1

Electrical isolation



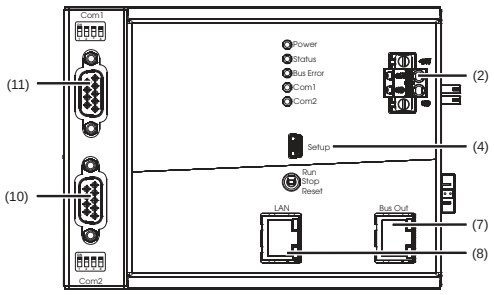
JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

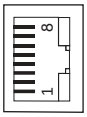
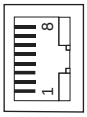
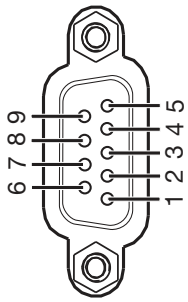
JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Connection diagram

The connection diagram included in the data sheet provides initial information about the connection options. Only use the installation instructions or the operating manual for the electrical connection. The know-how and the correct technical implementation of the safety warnings/instructions contained in these documents are the prerequisite for the installation, electrical connection, and initial start as well as for the safety during operation.



Interfaces

Connection	Designation	Number	Connection element		
USB device	Setup	(4)			
System bus Out	Bus Out	(7)		1 TX+ 2 TX- 3 RX+ 6 RX-	Transmit data + Transmit data - Receive data + Receive data -
Ethernet	LAN	(8)		1 TX+ 2 TX- 3 RX+ 6 RX-	Transmit data + Transmit data - Receive data + Receive data -
Serial interface (RS232), option	Com1, Com2	(11), (10)		2 RxD 3 TxD 5 GND	Receive data Transmit data Ground
Serial interface (RS422), option	Com1, Com2	(11), (10)		3 TxD+ 4 RxD+ 5 GND 8 TxD- 9 RxD-	Transmit data + Receive data + Ground Transmit data - Receive data -
Serial interface (RS485), option	Com1, Com2	(11), (10)		3 TxD+/RxD+ 5 GND 8 TxD-/RxD-	Transmit/Receive data + Ground Transmit/Receive data -
PROFIBUS-DP, option (as of system version 02)	Com2	(10)		8 RxD/TxD-N (A) 3 RxD/TxD-P (B) 6 VP (+5 V) 5 DGND	Transmit/Receive data - Transmit/Receive data + Voltage supply + Data ground

Voltage supply

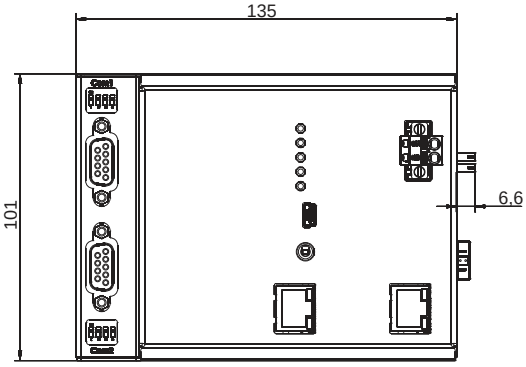
Connection	Designation	Number	Symbol and terminal designation
Voltage supply In	+24 V and GND	(2)	+ ——— ○ +24 V U_X - ——— ○ GND

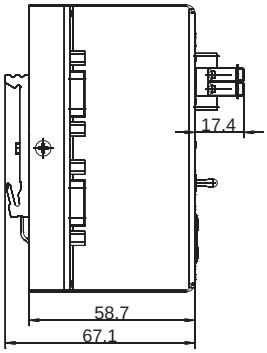
JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Dimensions





Module overview

Base units

- Central processing unit
  Data sheet 705001

Input/output modules

- Multichannel controller module
  Data sheet 705010
- Relay module 4-channel
  Data sheet 705015
- Analog input module 4-channel
  Data sheet 705020
- Analog input module 8-channel
  Data sheet 705021
- Analog output module 4-channel
  Data sheet 705025
- Digital input/output module 12-channel
  Data sheet 705030
- Thyristor power controller type 70906x
  Data sheet 709061, 709062, 709063

Special modules

- Router module
  Data sheet 705040

Operating, visualization, recording

- Multifunction panel 840
  Data sheet 705060
- Operating panels
  Data sheet 705065

Power supply units

- 705090/05-33
  Data sheet 705090
- 705090/10-33
  Data sheet 705090

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Order details

	(1)	**Basic type**
705001		Central processing unit (1x Ethernet (RJ45), 1x system bus (RJ45), 1x system bus (E-Bus), monitoring of 64 limit values)
	(2)	**Basic type extension**
0		Standard
	(3)	**Version**
8		With factory settings
	(4)	**Interface Com1**
00		Not used
51		RS232 Modbus RTU[a]
54		RS422/485 Modbus RTU[a]
	(5)	**Interface Com2**
00		Not used
51		RS232 Modbus RTU[a]
54		RS422/485 Modbus RTU[a]
64		PROFIBUS-DP (slave; as of system version 02)
	(6)	**Voltage supply**
36		DC 24 V +25/-20 %
	(7)	**DNV GL approval**
000		Without approval
062		With DNV GL approval[b]
	(8)	**Extra codes**
000		Without extra code
214		Math/logic function (activation for all connected controller modules)
224		PLC acc. to IEC 61131-3 (CODESYS V3.5)
225		Program generator 1 to 9
228		Program generator 1 to 9 with process steps (as of system version 02)

[a] Any interface protocols can be implemented with the PLC (extra code 224).
[b] The power supply unit used must also have a DNV GL or GL type approval (e.g. type 705090).

	(1)		(2)	(3)		(4)		(5)		(6)		(7)		(8)		
Order code	[ ]	/	[ ]	[ ]	-	[ ]	-	[ ]	-	[ ]	/	[ ]	,	[ ]	,	...[a]
Order example	705001	/	0	8	-	00	-	00	-	36	/	000		214		

[a] List extra codes in sequence, separated by a comma.

Delivery package

1 central processing unit in the ordered version
1 cover for system bus
2 screw-on end clamps for DIN rail
1 Installation Instructions
Setup program with program editor JUMO mTRON T (30-day trial version, on MiniDVD)

DVD content (2 Mini-DVDs):
- Setup program with program editor JUMO mTRON T (30-day trial version)
- CODESYS programming software (free version)
- CODESYS Repository Package - Operating panels (free version)
- Export files JUMO digiLine (free version)
- GSD file JUMO mTRON T - CPU (free version)
- PC Evaluation Software PCA3000 (30-day trial version)
- PCA Communication Software PCC (30-day trial version)
- Documentation in PDF format

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Accessories

Description	Part no.
Interface modules (expansion boards):	
RS232 Modbus RTU	00569505
RS422/485 Modbus RTU	00569506
PROFIBUS-DP (slave; as of system version 02 and as of the central processing unit‘s production date 27/2013 (calendar week))	00569507
Extra codes (activations):	
Math/logic module (activation for all connected controller modules)	00569509
PLC according to IEC 61131-3 (CODESYS V3.5)	00569510
Program generator 1 to 9	00569511
Program generator 1 to 9 with process steps (as of system version 02)	00606498

General accessories

Description	Part no.
JUMO mTRON T system manual, English	00575577
Setup program with program editor JUMO mTRON T (on MiniDVD), incl. USB cable (A-plug to mini-B-plug, 3 m)	00569494
Program editor JUMO mTRON T (on MiniDVD), incl. USB cable (A-plug to mini-B-plug, 3 m)	00622333
PCA3000/PCC JUMO software package	00431884
PC Evaluation Software PCA3000	00431882
Release automatic print for PC Evaluation Software PCA3000	00505548
PCA Communication Software PCC	00431879
Plant Visualization Software JUMO SVS3000: See data sheet 700755	-
USB cable A-plug mini-B-plug 3 m	00506252

DVD content (2 Mini-DVDs):
- Setup program with program editor JUMO mTRON T in case of part no. 00569494
- Program editor JUMO mTRON T in case of part no. 00622333
- CODESYS programming software (free version)
- CODESYS Repository Package - Operating panels (free version)
- Export files JUMO digiLine (free version)
- GSD file JUMO mTRON T - CPU (free version)
- PC Evaluation Software PCA3000 (30-day trial version)
- PCA Communication Software PCC (30-day trial version)
- Documentation in PDF format

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

JUMO variTRON 500 – Automation System

Central Processing Unit 705002

Brief description

The central processing unit JUMO variTRON 500 along with the proven input and output modules (incl. controller module) form a complete system.

The central processing unit manages all configuration and parameter data of the complete system and provides a PLC acc. to IEC 61131-3 (CODESYS V3.5; as extra code). The PLC can be activated in different versions:

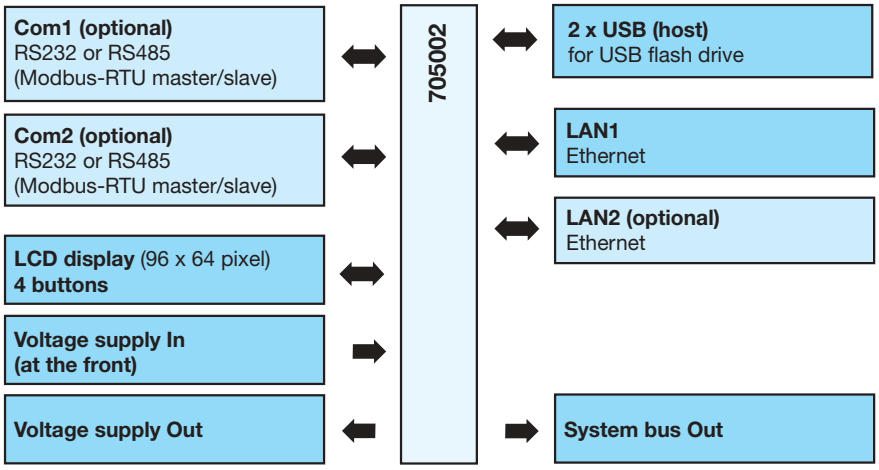
- CODESYS runtime system
- CODESYS runtime system incl. Remote TargetVisu
- CODESYS runtime system incl. WebVisu
- CODESYS runtime system incl. Remote TargetVisu and WebVisu

For visualization, commercially available panels are used which support CODESYS Remote TargetVisu or WebVisu functionality. The visualization is also possible via web browser. Visualizations have to be implemented with CODESYS resources.

A convenient setup program is used for configuration. JUMO standard functions for CODESYS are provided in libraries (as of system version x) and can be individually integrated into the customer application.

Type 705002

Block diagram



Features

- Process mapping for all connected input/output modules (incl. controller module)
- Display and keys to display the system status
- 2 USB host interfaces
- OPC UA server (in conjunction with PLC)
- 9 program generators (in conjunction with PLC, as of system version 4)
- 2 field bus interfaces (as of system version 3)
- PROFINET IO controller (in conjunction with PLC)
- Plug and Play for input/output module replacement
- Battery-buffered RAM
- Real-time clock

Approvals and approval marks (see "Technical data")

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Description

JUMO variTRON 500

The central processing unit JUMO variTRON 500 is based on a new hardware platform with an 800 MHz processor, which is used as a quad-core variant.

Due to the scalability of hardware and software a modular, flexible, and above all sustainable hardware platform is available that is combined with a modern software architecture. Based on this new platform, innovative operating concepts can now be implemented using state-of-the-art display technologies.

The advantages at a glance:

- High speed performance
- Flexible operating philosophy
- Modern communication interfaces (e.g. OPC UA, MQTT)
- Integration of different fieldbus protocols such as PROFINET IO, EtherCAT, and Modbus-TCP/-RTU
- Easy integration of new software functions via PLC (CODESYS V3.5)
- Availability of function and visualization libraries (as of system version x)
- Easy adaptation of hardware inputs and outputs
- Customized operation and visualization with several operator stations via CODESYS remote target visualization or via web visualization (mixed operation is possible)
- Panels in various formats (portrait or landscape, 4:3 or 16:9)
- JUMO Web Cockpit
- Data recording function (on the device side as of system version 5; evaluation with JUMO smartWARE Evaluation as of system version x)

Input/output modules

The proven input and output modules (incl. controller module) are available as module variants.

For example: the analog input module with universal inputs for thermocouples, RTD temperature probes, and voltage or current standard signals. As a result the same hardware can be used to precisely record and digitize a highly diverse range of process variables.

JUMO variTRON 500 enables simultaneous operation of more than 120 control loops so that it can also be used for sophisticated processes. Through expansion slots the inputs and outputs of each controller module can be individually expanded and adapted. The control loops here operate fully independently, which means they do not require resources from the central processing unit.

Thyristor power controllers can also be connected via EtherCAT or PROFINET. In addition, JUMO digiLine sensors for liquid analysis can be connected to the central processing unit.

JUMO Cloud

The IoT platform for process visualization as well as data acquisition, evaluation, and archiving enables worldwide access to measurement data using common web browsers. The JUMO Cloud is characterized by a high degree of security as well as valuable visualization, alarm, and planning functions.

Further information on the JUMO Cloud:

qr-en-cloud.jumo.info

JUMO smartWARE SCADA

The JUMO smartWARE SCADA software provides easy access to measurement data using conventional web browsers. It offers functions for process visualization as well as for evaluation of the acquired data. The software also supports manufacturing and work processes with valuable visualization, alarm, and planning functions.

Further information on the JUMO smartWARE SCADA software:

qr-en-scada.jumo.info

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Technical data

Interfaces

USB host	
Description	USB
Type	A (socket)
Number	2
Device category	Mass storage class
Application	For connecting a USB flash drive (interfaces cannot be used simultaneously)
Data rate	Low Speed, Full Speed, Hi-Speed
Max. current	500 mA per interface
Ethernet	
Description	LAN1, LAN2 (optional)
Type	RJ45
Number	1 (optional: 2)
Protocol	TCP, IPv4, HTTP(S) Via CODESYS as an option: Modbus-TCP, PROFINET IO controller, EtherCAT master, OPC UA server, BACnet/IP (as of system version 4)
Application	Communication with: - PC (setup program, web browser) - Email server - Modbus-TCP master/slave - PROFINET IO device - EtherCAT slave - OPC UA client - BACnet/IP server/client
Transfer rate	10 Mbit/s, 100 Mbit/s
Connection cable	Network cable, at least CAT5 (S/FTP)
Cable length	Up to 100 m
RS232 or RS485 (serial interface)	Depending on the device version
Description	Com1, Com2
Type	D-Sub 9-pole
Number	2
Application	Fieldbus applications, communication via modem with a PC or with an email server
Protocol	Via CODESYS: Modbus-RTU master/slave
Data format	8/1/n, 8/1/e, 8/1/o
Transfer rate	9600 Bd, 19200 Bd, 38400 Bd
System bus	
Description	None (side connector)
Type	System specific
Number	1
Application	Connection of a router module 705041 or an input/output module

Display

Type	LCD, monochrome
Resolution	96 × 64 pixels (8 rows)

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Electrical data

Voltage supply	
Symbol (see nameplate)	⎓
Connection	At the front (removable terminal strip, 2-pole with Push-In technology)
Voltage	DC 24 V +25/-20 % SELV
Residual ripple	5 %
Current consumption	Max. 1.16 A (at DC 19.2 V) Current consumption of lined-up modules also has to be considered (see "Hardware configuration" in the setup program)!
Power consumption	Max. 25 W
Conductor cross section (voltage supply)	
Wire or stranded wire without ferrule	Min. 1.5 mm^2, max. 2.5 mm^2
Stranded wire with ferrule	Min. 1.5 mm^2, max. 2.5 mm^2
2 × stranded wire with twin core-end ferrule with plastic collar	1.5 mm^2
Stripping length	10 mm
Electrical safety	According to DIN EN 61010-1 Overvoltage category III, pollution degree 2
Protection rating	III
Electromagnetic compatibility	Acc. to DIN EN 61326-1
Interference emission	Class A - only for industrial use -
Interference immunity	Industrial requirement
Data backup	Buffered RAM
Buffer battery service life	Typ. 6 years (lithium battery) Observe fault messages on battery status in the event list (battery almost empty, battery empty)!

Housing and environmental conditions

Case type	Plastic case for DIN rail mounting in the control cabinet (indoor use); DIN rail acc. to DIN EN 60715, 35 mm x 7.5 mm x 1 mm
Dimensions (W × H × D)	135 mm × 101 mm × 101.5 mm (without connection elements)
Weight (fully fitted)	Approx. 590 g
Protection type	IP 20, according to DIN EN 60529
Ambient temperature range	-20 to +55 °C
Storage temperature range	-40 to +70 °C
Resistance to climatic conditions	Relative humidity ≤ 90 % annual average without condensation (climate class 3K3 acc. to DIN EN 60721-3-3 with extended temperature and humidity range)
Site altitude	Up to 2000 m above sea level
Vibration	Acc. to DIN EN 60068-2-6, table C.2
Amplitude	0.15 mm from 10 to 58.1 Hz
Acceleration	20 m/s^2 from 58.1 to 150 Hz
Shock	Acc. to DIN EN 60068-2-27, table A.1
Peak acceleration	150 m/s^2
Shock duration	11 ms

Approvals and approval marks

Approval mark	Test facility	Certificate/certification number	Inspection basis	Valid for
c UL us	Underwriters Laboratories	E201387	UL 61010-1 (3. Ed.), CAN/CSA-22.2 No. 61010-1 (3. Ed.)	All types

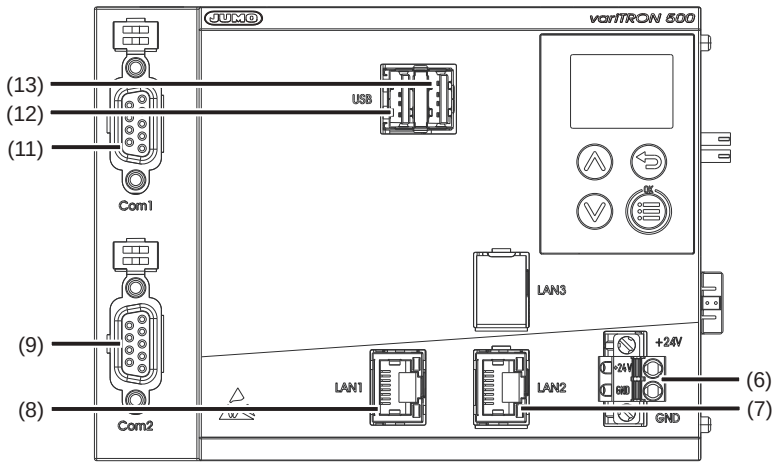
JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

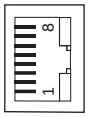
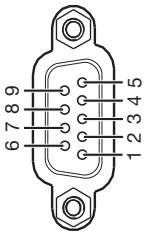
JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Connection diagram

The connection diagram in the data sheet provides preliminary information about the connection options. For the electrical connection, only use the installation instructions or the operating manual. The knowledge and the correct technical compliance with the safety information and warnings contained in these documents are mandatory for mounting, electrical connection, and startup as well as for safety during operation.



Interfaces

Connection	Designation	Number	Connection element	Assignment	
USB host (2 ×)	USB	(12), (13)			
Ethernet (LAN2 optional)	LAN1, LAN2	(8), (7)		1 TX+ 2 TX- 3 RX+ 6 RX-	Transmission data + Transmission data - Received data + Received data -
Serial interface RS232 (optional)	Com1, Com2	(11), (9)		2 RxD 3 TxD 5 GND	Received data Transmission data Ground
Serial interface RS485 (optional)	Com1, Com2	(11), (9)		3 TxD+/RxD+ 5 GND 8 TxD-/RxD-	Transmission/received data + Ground Transmission/received data -

Voltage supply

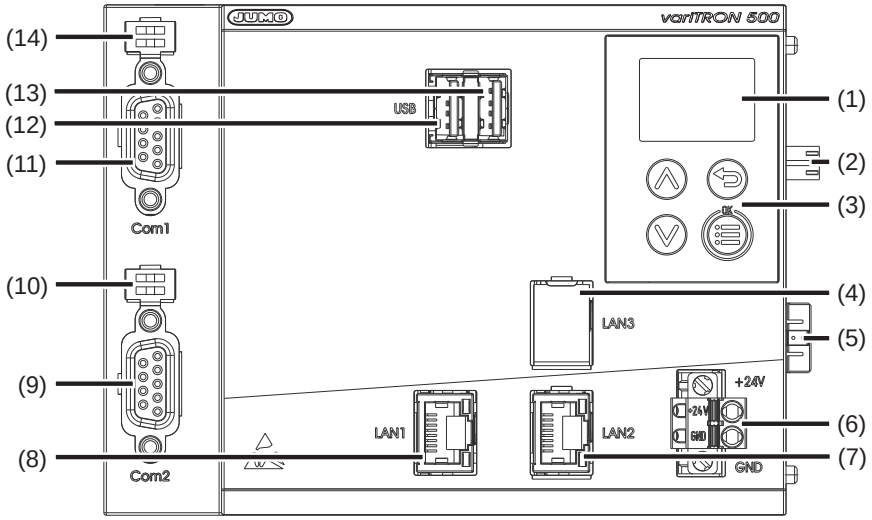
Connection	Designation	Number	Symbol and terminal designation
Voltage supply In	+24 V and GND	(6)	+ ——— +24 V U_X - ——— GND

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

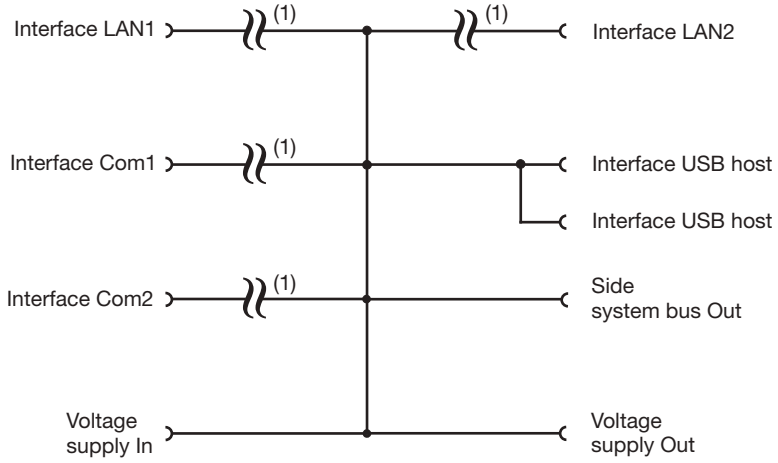
JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Display, operating, and connection elements



(1) Display
(2) Voltage supply Out, DC 24 V
(3) Control elements
(4) Interface LAN3 (for future use)
(5) Side system bus Out
(6) External voltage supply DC 24 V
(7) Interface LAN2
(8) Interface LAN1
(9) Interface Com2
(10) Com2 terminating resistors
(11) Com1 interface
(12) USB host interface 1
(13) USB host interface 2
(14) Com1 terminating resistors

Electrical isolation



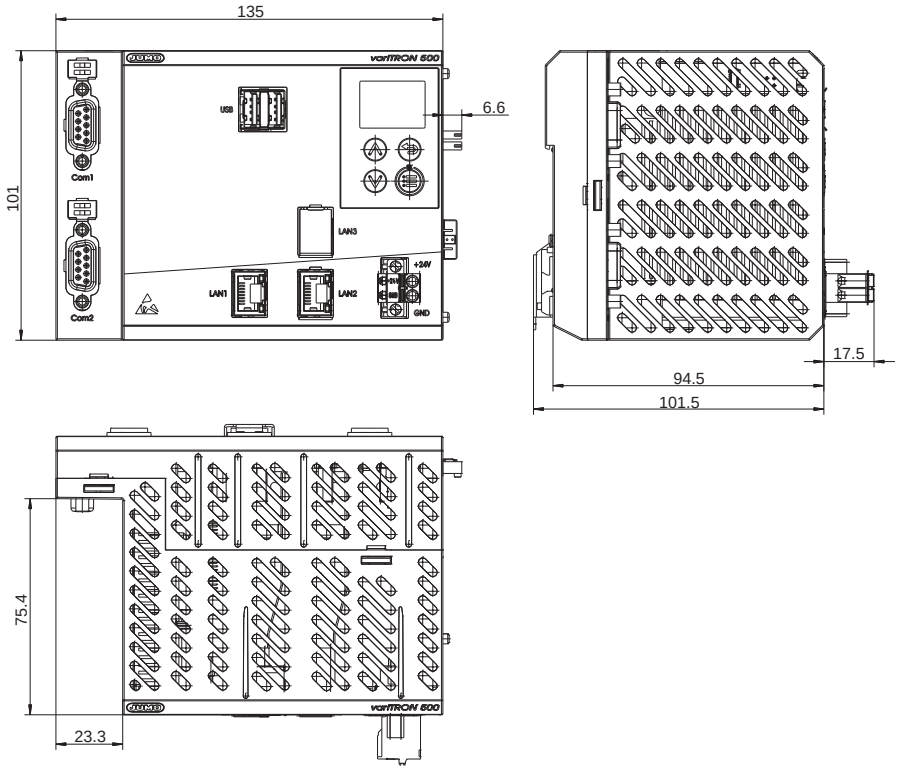
(1) Functional galvanic isolation for connection of SELV or PELV electrical circuits.

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Dimensions



Module overview

Central processing unit

- JUMO variTRON 500
  Data sheet 705002

Input/output modules

- Multichannel controller module
  Data sheet 705010
- Relay module 4-channel
  Data sheet 705015
- Analog input module 4-channel
  Data sheet 705020
- Analog input module 8-channel
  Data sheet 705021
- Analog output module 4-channel
  Data sheet 705025
- Digital input/output module 12-channel
  Data sheet 705030
- Digital input/output module 32-channel
  Data sheet 705031
  (as of system version 3)
- Thyristor power controller type 70906x
  Data sheet 709061, 709062, 709063
  (as of system version 3)

Special modules

- Router module 2-port
  Data sheet 705041
  (as of system version 3)
- Router module 3-port
  Data sheet 705042
  (as of system version 3)
- Router module 1-port
  Data sheet 705043
  (as of system version 4)

Panels

- JUMO variTRON Web panels
  Data sheet 705070

Power supply units

- 705090/05-33
  Data sheet 705090
- 705090/10-33
  Data sheet 705090

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Order details

	(1)	**Basic type**
705002		Central processing unit, type 705002 (1 × Ethernet (RJ45), 1 × system bus (side), 2 × USB host interface), Node-RED
	(2)	**Basic type extension 1**
2		Quad core CPU
	(3)	**Basic type extension 2**
2		RAM 1024 MB
	(4)	**Basic type extension 3**
1		eMMC 8 GB[a]
	(5)	**Basic type extension 4**
0		Without software control loops
	(6)	**Version**
8		Standard with default settings
	(7)	**Com1 interface**
00		Not used
51		RS232 Modbus-RTU[b] (as of system version 3)
55		RS485 Modbus-RTU[b] (as of system version 3)
	(8)	**Interface Com2**
00		Not used
51		RS232 Modbus-RTU[b] (as of system version 3)
55		RS485 Modbus-RTU[b] (as of system version 3)
	(9)	**Interface LAN2**
00		Not used
08		Ethernet (RJ45)
	(10)	**Voltage supply**
36		DC 24 V +25/-20 %, SELV
	(11)	**DNV GL approval**
000		Without approval
	(12)	**Extra codes**
224		PLC according to IEC 61131-3 (CODESYS V3.5; necessary to operate the device as a PLC)
225		Program generator 1 – 9 (as of system version 4)[c]
280		Remote TargetVisu[c]
281		WebVisu[c]
282		PROFINET IO controller[c]
283		OPC UA server[c]
284		Modbus-TCP master[c]
285		Modbus-TCP slave[c]
286		EtherCAT master[c]
289		BACnet/IP (as of system version 4)[c]

[a] Flexible allocation between system data and application data.
[b] The PLC (extra code 224) enables additional interface protocols to be implemented (extra cost).
[c] Only in conjunction with extra code 224.

	(1)		(2)	(3)	(4)	(5)	(6)		(7)		(8)		(9)		(10)		(11)		(12)		
Order code	705002	/	2	2	1	0	8	-		-		-		-	36	/	000	,	224	,	...[a]
Order example	705002	/	2	2	1	0	8	-	00	-	00	-	00	-	36	/	000	,	224		

[a] List further extra codes in sequence, separated by commas.

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Scope of delivery

1 central processing unit, type 705002, in the ordered version
1 cover for system bus
2 screw-on end clamps for DIN rail
1 installation instructions

Accessories

Description	**Part no.**
Interface modules (expansion boards):	
RS232 Modbus-RTU (as of system version 3)	00745041
RS485 Modbus-RTU (as of system version 3)	00745042
Ethernet (RJ45)	00745043

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Multichannel Controller Module

705010

Brief description

The multichannel controller module supports up to four PID controller channels (cascadable). In the standard version, two high-quality universal analog inputs for thermocouples, RTD temperature probes, resistance transmitters, resistance/potentiometers, and standard signals are available. Two digital inputs (DC 0/24 V) and two digital outputs as a relay with N/O contact (AC 230 V / 3 A) or as a logic output (DC 0/15 V) are also available as part of the standard version. Due to the three option slots (option 1, 2, and 3), the module can be extended up to four universal analog inputs, eight digital inputs, three analog outputs, or eight digital outputs.

The digitized input values/states are available in the system for further processing. The digital and the analog outputs can be actuated by the system or directly by the module.

The module operates independently, even if the central processing unit fails or the higher-ranking system malfunctions. This behavior can be configured.

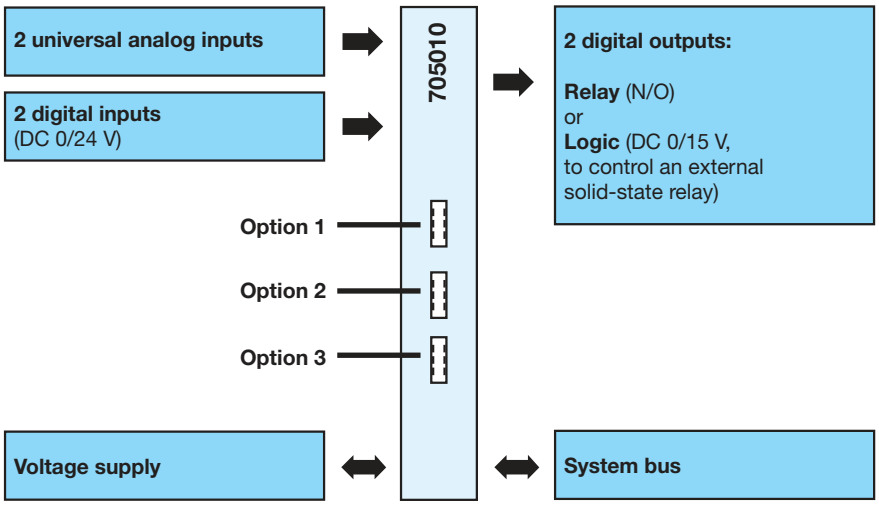
LEDs are used to indicate applied voltage supply, the module operating status, as well as the status of the digital inputs/outputs.

For expansion of the inputs/outputs or for service work, the module insert can be easily pulled out of the case at the front. The case including the bus PCB remains mounted on the DIN rail.

A setup program or the multifunction panel 840 allows the user to comfortably configure and parameterize the multichannel controller module.

Type 705010/...

Block diagram



Features

- Up to four PID controller channels each with two parameter sets and four setpoint values
- Self-optimization using the oscillation or step response method
- Independent operation
- Two universal analog inputs
- Customer-specific linearization (polynomial up to the 4th order)
- Two digital inputs DC 0/24 V
- Two digital outputs as a relay with N/O contact or a logic output
- The inputs and outputs can be extended (option)
- All analog inputs are electrically isolated from each other
- Limit value monitoring
- One counting input up to 10 kHz
- Automatic configuration after the module insert has been exchanged (hot swappable)
- Connection of the inputs and outputs at the front
- Removable terminal strips with Push-In technology
- Quick wiring of operating voltage and system bus due to easy module connection
- AMS2750/CQI-9 (extra code)

Approval/approval marks (see “Technical data”)

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Description

Controller types

The controller can be configured as two-state controller, three-state controller, modulating controller, continuous controller, or continuous controller with integrated actuator controller independent of the number of channels. If the number of standard and optional inputs and outputs provided on the controller module are insufficient for the desired configuration, external inputs and outputs are available through the system bus. The cycle time of the controller module can be configured between 50 ms and 250 ms.

Standardization of the setpoint input (as of system version 04) allows to realize a cascade control. The controller channel in question is then used as slave controller within the cascade control.

Parameter sets

Two parameter sets can be saved for each of the four controller channels. Each parameter set contains 17 parameters so that separate derivative and reset times can be set for the "Heating" and "Cooling" functions. The parameter set can be changed over separately for each controller channel.

Self-optimization

Self-optimization makes it possible for the controller to be adjusted to the control loop by a user who is not a control technology expert. During this process, the reaction of the control loop to the actuating variable is evaluated. The oscillation method is set as the standard method in the controller. The step response method can be activated in the setup program or the multifunction panel.

Setpoint values

Up to four setpoint values can be entered for each controller channel. The setpoint value changeover is controlled by two digital signals.

Ramp function

The ramp function is used for a continuous setpoint value change up to the ramp limit value (setpoint value input). Any analog value (e.g. actual value) available in the system can be selected as the start value. The ramp change is defined via two adjustable gradients (upward, downward). If the setpoint value changes, the new setpoint value is reached under consideration of the set gradient. Depending on the start value, the result is an upward or downward ramp. Alternatively a ramp start synchronous to a digital signal is possible. The ramp function can be stopped and canceled via digital signals.

It is possible to enter a tolerance band (symmetrically or above/below) around the setpoint value curve to monitor the actual value. If the actual value leaves the tolerance band, a digital signal is activated which can be used internally or externally.

Limit value monitoring

For each analog input, two separate alarms (min/max alarm) can be activated; each alarm has its own limit value. Alarm type, event text, collective alarm, alarm suppression, and alarm delay are configurable.

In addition, four limit values with configurable alarm functions are available. Any analog signal can be selected as the actual value and setpoint value. The actual value monitoring depends on the set limit value and the used alarm function (monitoring band around the setpoint value, limit value above or below the setpoint value as well as independent of the setpoint value).

Math and logic function

The optional math and logic function (extra code of base unit) can be used to link analog or binary values. Up to four freely configurable math or logic formulas can be entered with the setup program. The results are available in the controller module for various functions or can be made available at the outputs.

Analog inputs

The maximum four analog inputs are universal measuring inputs for RTD temperature probes, thermocouples, resistance transmitters, resistance/potentiometers, and standard signals (current, voltage). Linearizations for over 20 common measuring probes (RTD temperature probes, thermocouples) are stored. A measured value offset or a fine adjustment can be carried out to compensate for plant-specific deviations. Due to the measuring circuit monitoring, a measuring range that is too high or too low, probe/cable break, and probe/cable short circuit are detected – depending on the measuring element type – so that the system is switched to an operational safe status in the event of an error.

Customer-specific linearization

A customer-specific linearization is also possible. Programming is carried out through a formula (polynomial up to the 4th order) using the setup program.

Analog outputs

The maximum three analog outputs are freely scalable (current, voltage). They can be used to make available controller outputs, setpoint values, math results, signals of the analog inputs (e.g. actual value), and values from the system bus. The output behavior in case of an error is selectable from available options (e.g. behavior according to NAMUR recommendation NE 43).

Digital inputs

The signals of the up to eight digital inputs (DC 0/24 V) can be used to initiate various internal functions such as changeover of the parameter set, start of self-optimization, or acknowledgement of a limit value exceedance.

Linking of digital signals

External and internal digital signals (e.g. logic results) can be OR-linked. Four logic links of up to four digital signals are possible. The results are also available to control internal functions or they can be made available at the digital outputs.

Digital outputs

The up to eight digital outputs can be used to provide digital signals such as controller outputs, signals of the limit value monitoring, logic results, signals of the digital inputs, and values from the system bus. In addition to the two standard outputs (relay or logic), further outputs can be realized via the option slots (relay, solid-state relay, open-collector output).

Counter

The controller module is equipped with a counter which is solidly connected to the first digital input and counts all low-high edges of the input signal. The counter reading is available in the base unit. The counter runs endlessly in the "Counting" operating mode. The counter starts with zero again after reaching the maximum counting value (0xFFFF). In the "Filling" operating mode the counter is started via a digital signal and generates a switch-off signal when the adjustable switch-off limit is reached.

Operation

The controller module is operated with the multifunction panel. Furthermore, specific values can be changed and functions can be activated via the PLC or the Modbus interface (base unit).

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Controller parameters

All the parameters and their meanings are included in the table. Some parameters may be missing or do not apply for a particular type of controller. Two parameter sets can be stored for each of the four possible controller channels to handle special applications.

Parameters	Value range	Factory set	Meaning
Proportional band Xp1	0 to 9999 digit	0 digit	Size of the proportional band. The controller structure is not effective with 0 (behavior identical to limit value monitoring)! For a continuous controller, Xp1/2 must be > 0.
Proportional band Xp2	0 to 9999 digit	0 digit	
Derivative time Tv1	0 to 9999 s	80 s	Influences the differential component of the controller output signal.
Derivative time Tv2	0 to 9999 s	80 s	
Reset time Tn1	0 to 9999 s	350 s	Influences the integral component of the controller output signal.
Reset time Tn2	0 to 9999 s	350 s	
Switching period Cy1	0 to 999.9 s	20.0 s	When using a switched output, the switching period should be chosen so that, on the one hand the energy flow to the process is almost continuous, and on the other hand the switching elements are not overloaded.
Switching period Cy2	0 to 999.9 s	20.0 s	
Contact spacing Xsh	0 to 999.9 digit	0.0 digit	Spacing between the two control contacts for a three-state controller, modulating controller, and continuous controller with integrated actuator controller.
Switching differential Xd1	0 to 999.9 digit	1.0 digit	Switching differential for a switching controller with proportional range Xp = 0.
Switching differential Xd2	0 to 999.9 digit	1.0 digit	
Actuator time TT	5 to 3000 s	60 s	Applied run time range of the control valve (actuator) of the modulating controller and continuous controller with integrated actuator controller.
Working point Y0	-100 to +100 %	0 %	Output value for P and PD controllers (for x = w is y = Y0).
Output value limits Y1	0 to 100 %	100 %	Maximum output value limits (only effective when Xp > 0).
Output value limits Y2	-100 to +100 %	-100 %	Minimum output value limits (only effective when Xp > 0).
Minimum relay ON period Tk1	0.05 to 60.00 s	0.05 s	Limitation of the switching frequency for switching outputs (lower value depends on sampling rate: min. 0.05 s, max. 0.25 s).
Minimum relay ON period Tk2	0.05 to 60.00 s	0.05 s	

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Technical data

Analog inputs

General information

Number (standard version)	2 (input 1 and 2)
Optional number (option slot 1 to 3)	2 (input 3 and 4)
A/D converter	Dynamic resolution up to 16 bit

Thermocouples

Designation	Standard	Measuring range	Measuring accuracy[a]	Ambient temperature influence
Fe-CuNi “L”		-200 to +900 °C	≤ 0.1 % from -100 °C	300 ppm/K
Fe-CuNi “J”	DIN EN 60584	-200 to +1200 °C	≤ 0.1 % from -100 °C	300 ppm/K
Cu-CuNi “U”		-200 to +600 °C	≤ 0.1 % from -130 °C	300 ppm/K
Cu-CuNi “T”	DIN EN 60584	-200 to +400 °C	≤ 0.1 % from -150 °C	300 ppm/K
NiCr-Ni “K”	DIN EN 60584	-200 to +1372 °C	≤ 0.1 % from -80 °C	300 ppm/K
NiCr-CuNi “E”	DIN EN 60584	-200 to +1000 °C	≤ 0.1 % from -80 °C	300 ppm/K
NiCrSi-NiSi “N”	DIN EN 60584	-100 to +1300 °C	≤ 0.1 % from -80 °C	300 ppm/K
Pt10Rh-Pt “S”	DIN EN 60584	-50 to 1768 °C	≤ 0.15 % from 20 °C	300 ppm/K
Pt13Rh-Pt “R”	DIN EN 60584	-50 to 1768 °C	≤ 0.15 % from 20 °C	300 ppm/K
Pt30Rh-Pt6Rh “B”	DIN EN 60584	0 to 1820 °C	≤ 0.15 % from 400 °C	300 ppm/K
W5Re-W26Re “C”		0 to 2320 °C	≤ 0.15 % from 500 °C	300 ppm/K
W3Re-W25Re “D”		0 to 2495 °C	≤ 0.15 % from 500 °C	300 ppm/K
W3Re-W26Re		0 to 2400 °C	≤ 0.15 % from 500 °C	300 ppm/K
Chromel-Copel	GOST 8.585-2001	-200 to +800 °C	≤ 0.15 % from -80 °C	300 ppm/K
Chromel-Alumel	GOST 8.585-2001	-200 to +1372 °C	≤ 0.1 % from -80 °C	300 ppm/K
PLII (Platinel II)		0 to 1395 °C	≤ 0.1 % from -80 °C	300 ppm/K
Linear		0 to 75 mV	≤ 0.1 %	300 ppm/K
Cold junction		Pt100 internal		
Cold junction accuracy		± 1 K		

[a] The accuracy values refer to the maximum measuring range. Smaller measuring ranges lead to reduced linearization accuracy.

RTD temperature probe

Designation	Standard	Measuring range	Measuring accuracy[a]	Ambient temperature influence
Pt100	DIN EN 60751	-200 to +850 °C		50 ppm/K
2-wire circuit			≤ 0.15 %	
3-wire/4-wire circuit			≤ 0.05 %	
Pt500	DIN EN 60751	-200 to +850 °C		50 ppm/K
2-wire circuit			≤ 0.30 %	
3-wire/4-wire circuit			≤ 0.15 %	
Pt1000	DIN EN 60751	-200 to +850 °C		50 ppm/K
2-wire circuit			≤ 0.20 %	
3-wire/4-wire circuit			≤ 0.08 %	
Ni100	DIN 43760	-60 to +250 °C		50 ppm/K
2-wire circuit			≤ 0.36 %	
3-wire/4-wire circuit			≤ 0.24 %	
Pt100	JIS 1604	-200 to +650 °C		50 ppm/K
2-wire circuit			≤ 0.20 %	
3-wire/4-wire circuit			≤ 0.06 %	

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Designation	Standard	Measuring range	Measuring accuracy[a]	Ambient temperature influence
Pt50	GOST 6651-94	-200 to +1100 °C		50 ppm/K
2-wire circuit			≤ 0.30 %	
3-wire/4-wire circuit			≤ 0.06 %	
Pt100	GOST 6651-94	-200 to +850 °C		50 ppm/K
2-wire circuit			≤ 0.15 %	
3-wire/4-wire circuit			≤ 0.05 %	
Cu50	GOST 6651-94	-50 to +200 °C		200 ppm/K
2-wire circuit			≤ 0.80 %	
3-wire/4-wire circuit			≤ 0.60 %	
Cu100	GOST 6651-94	-50 to +200 °C		200 ppm/K
2-wire circuit			≤ 0.80 %	
3-wire/4-wire circuit			≤ 0.50 %	
KTY11-6		-50 to +150 °C		50 ppm/K
2-wire circuit			≤ 1 %	
3-wire/4-wire circuit			≤ 0.24 %	
Sensor lead resistance		Max. 30 Ω per lead for 3-wire and 4-wire circuit Max. 10 Ω per lead for 2-wire circuit		
Measuring current		Pt100 approx. 250 µA, Pt500, and Pt1000 approx. 100 µA; not constant		
Lead compensation		Not required for 3-wire and 4-wire circuit. For a 2-wire circuit, lead compensation can be set in the software by correcting the actual value.		

[a] The accuracy values refer to the maximum measuring range. Smaller measuring ranges lead to reduced linearization accuracy.

Standard signals

Designation	Measuring range	Measuring accuracy[a]	Ambient temperature influence
Voltage		≤ 0.05 %	100 ppm/K
Input resistance R_E > 500 kΩ	DC 0(2) to 10 V		
Input resistance R_E > 100 kΩ	DC 0 to 1 V		
Current (voltage drop ≤ 2 V)	DC 0(4) to 20 mA	≤ 0.05 %	100 ppm/K
Heater current	AC 0 to 50 mA	≤ 1 %	100 ppm/K
Resistance transmitter	100 Ω to 4 kΩ	± 4 Ω	100 ppm/K
Resistance/potentiometer	100 Ω to 4 kΩ	± 4 Ω	100 ppm/K

[a] The accuracy values refer to the maximum measuring range. Smaller measuring ranges lead to reduced linearization accuracy.

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Measuring circuit monitoring

In the event of an error the outputs move to a defined status.

Measuring element	Underrange	Overrange	Probe or lead short circuit	Probe or lead break
Thermocouple	Is detected	Is detected	Is not detected	Is detected
RTD temperature probe	Is detected	Is detected	Is detected	Is detected
Voltage				
2 to 10 V	Is detected	Is detected	Is detected	Is detected
0 to 10 V	Is detected	Is detected	Is not detected	Is not detected
0 to 1 V	Is detected	Is detected	Is not detected	Is not detected
Current				
4 to 20 mA	Is detected	Is detected	Is detected	Is detected
0 to 20 mA	Is not detected	Is detected	Is not detected	Is not detected
Heater current	Is detected	Is detected	Is not detected	Is not detected
Resistance transmitter	Is detected	Is detected	Is not detected	Is detected
Resistance/potentiometer	Is detected	Is detected	Is detected	Is detected

Digital inputs

Number (standard version)	2 (input 1 and 2)
Optional number (option slot 1 to 3)	6 (input 5 to 10)
Input signal	DC 0/24 V (Input 1: Counting input up to 10 kHz) (PLC level; logical "0" = -3 to +5 V; logical "1" = +15 to +30 V)

Analog outputs

Per optional board (option slot 1 to 3)

1 analog output (configurable) (Output 1 to 3)	Load resistance R_{Load}	Accuracy	Ambient temperature influence
Voltage DC 0(2) to 10 V	≥ 500 Ω	± 0.25 %	± 150 ppm/K
Current DC 0(4) to 20 mA	≤ 500 Ω	± 0.25 %	± 150 ppm/K

Selectable output behavior in case of an error according to NAMUR recommendation NE 43 (for signal type 2 to 10 V and 4 to 20 mA).

Digital outputs

Standard version

2 relay outputs (N/O)	
Switching capacity	3A at AC 230V resistive load 3A at DC 30V resistive load
Contact life	150,000 operations at rated load / 350,000 operations at 1 A
or	
2 logic outputs (to control external solid-state relays)	
Output signal	DC 0/15 V
Current	Max. 25 mA per output
(Output 3 and 4)	

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Per optional board (option slot 1 to 3)

1 relay output (changeover contact)	
Output 5, 7, and 9)	
Switching capacity	3A at AC 230V resistive load 3A at DC 30V resistive load
Contact life	350,000 operations at rated load / 750,000 operations at 1 A
2 relay outputs (N/O contacts with common pole)	
(Output 5 to 10)	
Switching capacity	3A at AC 230V resistive load 3A at DC 30V resistive load
Contact life	150,000 operations at rated load / 350,000 operations at 1 A
1 solid-state relay	
(Output 5, 7, and 9)	
Switching capacity	1 A at 230 V
Protection circuitry	Varistor
2 open-collector outputs	
(Output 5 to 10)	
Status logical "0" (transistor inhibited):	
Allowable voltage via switching transistor	Min. 5 V, max. 30 V
Maximum reverse current	0.1 mA
Status logical "1" (transistor switched):	
Maximum voltage via switching transistor	≤ 1.6 V
Maximum current	50 mA

Controller

Controller types	Two-state controller, three-state controller, modulating controller, continuous controller, continuous controller with integrated actuator controller
Controller structures	P, PD, PI, PID
Sampling rate	50 ms, 100 ms, 150 ms, 200 ms, or 250 ms

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Electrical data

Voltage supply	
Connection	Lateral (feed via base unit or router module)
Voltage input	DC 24 V +25/-20 %
Residual ripple	5 %
Current consumption	Max. 300 mA (at DC 19.2 V)
Power consumption	Max. 6 W
Inputs and outputs (terminals 1 to 28)	
Connection	At the front (removable terminal strips with Push-In technology)
Conductor cross section on terminals 1 to 11	
Wire or strand without ferrule	Min. 0.14 mm^2, max. 1.5 mm^2
Strand with ferrule	Without plastic collar: Min. 0.25 mm^2, max. 1.5 mm^2 With plastic collar: Min. 0.25 mm^2, max. 0.5 mm^2
Stripping length on terminals 1 to 11	9 mm
Conductor cross section on terminals 12 to 28	
Wire or strand without ferrule	Min. 0.5 mm^2, max. 2.5 mm^2
Strand with ferrule	Min. 0.5 mm^2, max. 2.5 mm^2
2 x strand with twin ferrule with plastic collar	Min. 0.5 mm^2, max. 1.5 mm^2 (both strands with the same cross section)
Stripping length on terminals 12 to 28	10 mm
Electrical safety	Acc. to EN 61010-1 Overvoltage category III, pollution degree 2
Electromagnetic compatibility	Acc. to EN 61326-1
Interference emission	Class A – only for industrial use –
Interference immunity	Industrial requirements

Case and ambient conditions

Case type	Plastic case for DIN rail mounting in the control cabinet (indoor use); DIN rail acc. to DIN EN 60715, 35 mm x 7.5 mm x 1 mm
Dimensions (W x H x D)	45 mm x 103.6 mm x 101.5 mm (without connection elements)
Weight (fully equipped)	Approx. 250 g
Protection type	IP20, acc. to DIN EN 60529
Ambient temperature range	-20 to +55 °C
Storage temperature range	-40 to +70 °C
Resistance to climatic conditions	Relative humidity ≤ 90 % annual average without condensation (climatic class 3K3 acc. to DIN EN 60721-3-3 with extended temperature and humidity range)
Site altitude	Up to 2000 m above sea level
Mechanical ambient conditions[a]	Classification acc. to DIN EN 60721-3-3, table 6, class 3M2

[a] Test conditions are listed in the System Descripton B 705000.8.

Approval/approval marks

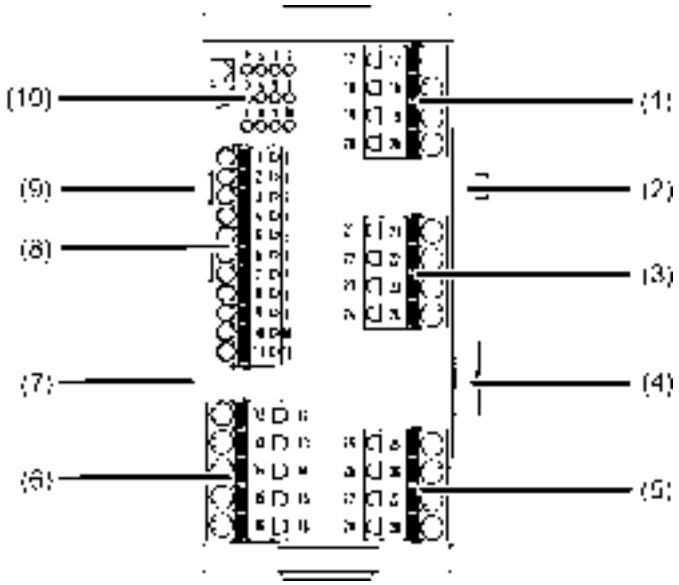
Approval mark	Testing agency	Certificate/certification number	Inspection basis	Valid for
c UL us	Underwriters Laboratories	E201387	UL 61010-1 (3. Ed.), CAN/CSA-22.2 No. 61010-1 (3. Ed.)	all types
DNV GL	DNV GL	TAA000016N	Class Guideline DNVGL-CG-0339	all types; a power supply unit with DNV GL or GL type approval is required (e.g. type 705090)

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Display and connection elements



(1) *Option slot 1:*
- Analog input 3
- Digital inputs/outputs 5, 6
- Analog output 1

(2) Voltage supply Out, DC 24 V

(3) *Option slot 2:*
- Analog input 4
- Digital inputs/outputs 7, 8
- Analog output 2

(4) Side system bus Out

(5) *Option slot 3:*
- Digital inputs/outputs 9, 10
- Analog output 3

(6) Digital outputs 3, 4

(7) Side system bus In

(8) Analog inputs 1, 2
and digital inputs 1, 2

(9) Voltage supply In, DC 24 V

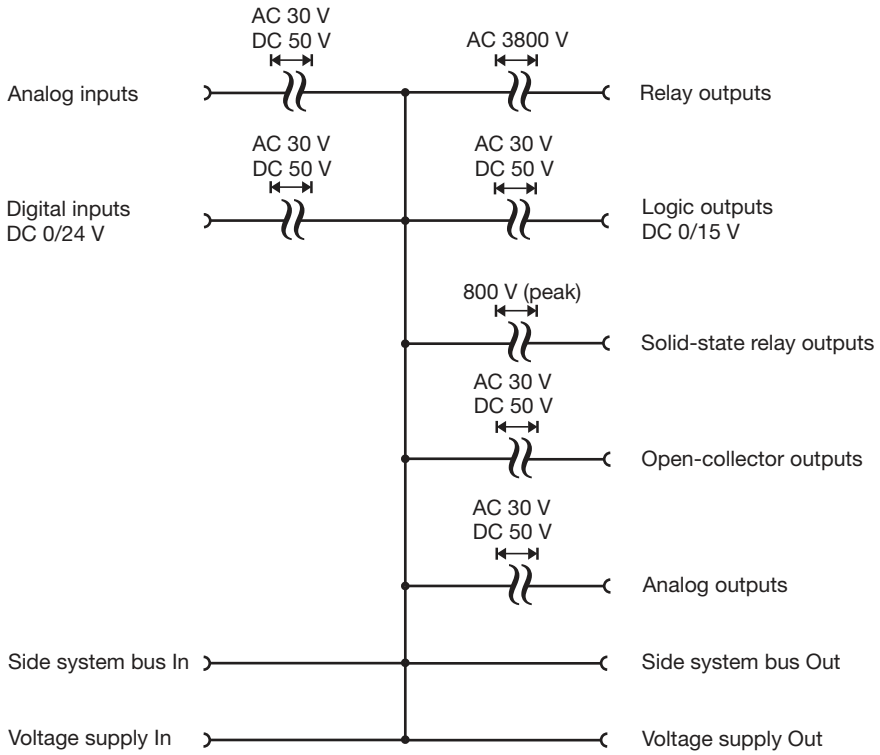
(10) Status displays (LED):

P = Voltage supply and operating mode

S = Status

1 to 10 = Digital inputs/outputs (LED is lit: Active)

Electrical isolation



Relay outputs:
Electrically isolated from each other

Logic outputs DC 0/15 V:
Electrically isolated from each other

Solid-state relay outputs:
Electrically isolated from each other

Open-collector outputs:
Outputs of various option slots electrically isolated from each other

Analog outputs:
Electrically isolated from each other

Digital inputs DC 0/24 V:
Inputs of different boards (main board, option slots) electrically isolated from each other

Analog inputs:
Electrically isolated from each other

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

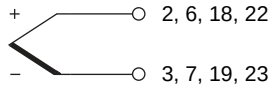
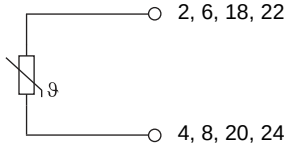
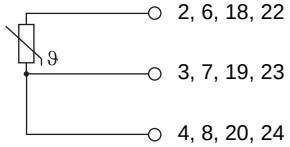
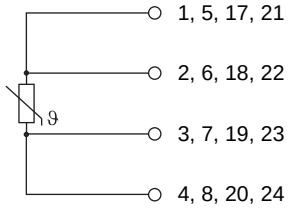
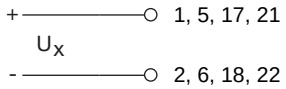
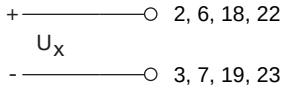
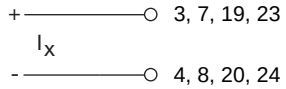
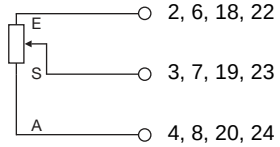
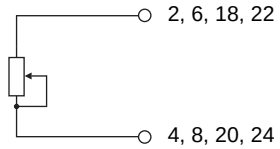
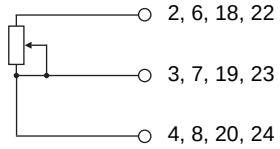
JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Connection diagram

The connection diagram included in the data sheet provides initial information about the connection options. Only use the installation instructions or the operating manual for the electrical connection. The know-how and the correct technical implementation of the safety warnings/instructions contained in these documents are the prerequisite for the installation, electrical connection, and initial start as well as for the safety during operation.

Analog inputs

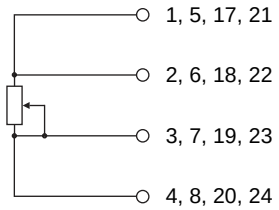
Input 1, 2: Standard version; input 3, 4: Option

Connection	Input	Terminals	Symbol and terminal designation
Thermocouple	1 2 3 4	2 and 3 6 and 7 18 and 19 22 and 23	
RTD temperature probe 2-wire circuit	1 2 3 4	2 and 4 6 and 8 18 and 20 22 and 24	
RTD temperature probe 3-wire circuit	1 2 3 4	2 to 4 6 to 8 18 to 20 22 to 24	
RTD temperature probe 4-wire circuit	1 2 3 4	1 to 4 5 to 8 17 to 20 21 to 24	
Voltage DC 0(2) to 10 V	1 2 3 4	1 and 2 5 and 6 17 and 18 21 and 22	
Voltage DC 0 to 1 V	1 2 3 4	2 and 3 6 and 7 18 and 19 22 and 23	
Current DC 0(4) to 20 mA, Heater current AC 0 to 50 mA	1 2 3 4	3 and 4 7 and 8 19 and 20 23 and 24	
Resistance transmitter A = Start E = End S = Slider	1 2 3 4	2 to 4 6 to 8 18 to 20 22 to 24	
Resistance/potentiometer 2-wire circuit	1 2 3 4	2 and 4 6 and 8 18 and 20 22 and 24	
Resistance/potentiometer 3-wire circuit	1 2 3 4	2 to 4 6 to 8 18 to 20 22 to 24	

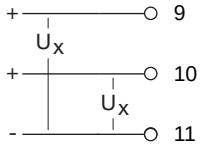
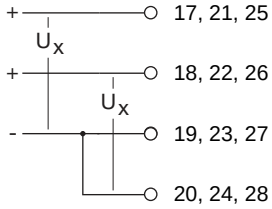
JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

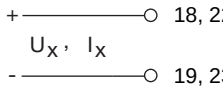
JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Connection	Input	Terminals	Symbol and terminal designation
Resistance/potentiometer 4-wire circuit	1 2 3 4	1 to 4 5 to 8 17 to 20 21 to 24	

Digital inputs

Connection	Input	Terminals	Symbol and terminal designation
Digital input DC 0/24 V, standard version (Input 1: Counting input)	1 2	9 and 11 10 and 11	
Digital input DC 0/24 V, optional Terminals 19 and 20, 23 and 24 as well as 27 and 28 are internally linked.	5 6 7 8 9 10	17 and 19 18 and 20 21 and 23 22 and 24 25 and 27 26 and 28	

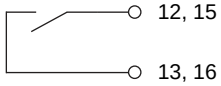
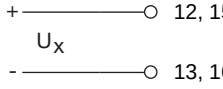
Analog outputs

Connection	Output	Terminals	Symbol and terminal designation
Analog output DC 0/2 to 10 V or DC 0/4 to 20 mA (configurable), optional	1 2 3	18 and 19 22 and 23 26 and 27	

Digital outputs

Standard version

In the standard version the controller module is equipped with relay or logic outputs (see “Order details”).

Connection	Output	Terminals	Symbol and terminal designation
Relay output (N/O)	3 4	12 and 13 15 and 16	
Logic output DC 0/15 V	3 4	12 and 13 15 and 16	

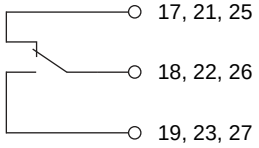
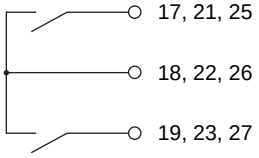
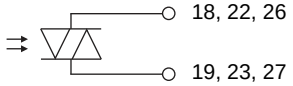
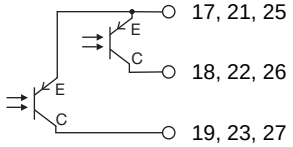
The digital output numbering starts with 3. This allows the direct assignment to the LEDs of the digital outputs (LED 3 to 10).

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Optional

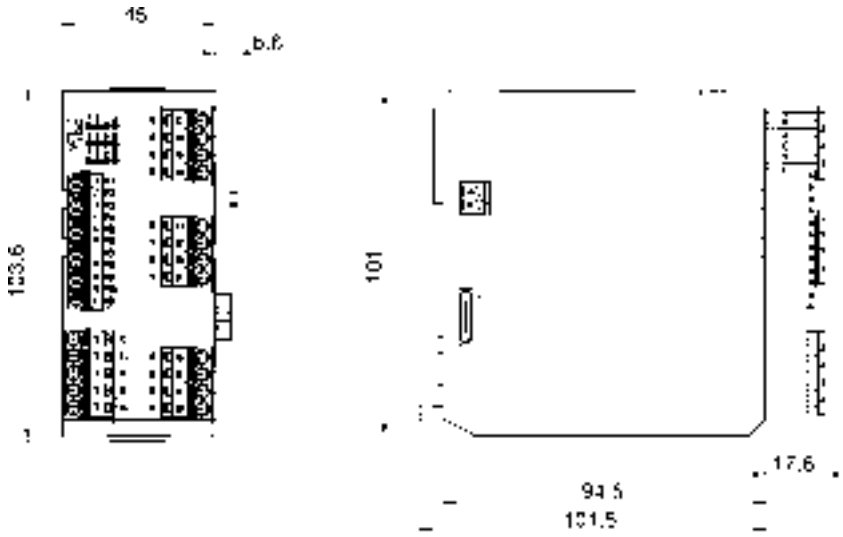
Connection	Output	Terminals	Symbol and terminal designation
Relay output (changeover contact)	5 7 9	17 to 19 21 to 23 25 to 27	
Relay output (N/O)	5 6 7 8 9 10	17 and 18 18 and 19 21 and 22 22 and 23 25 and 26 26 and 27	
Solid-state relay	5 7 9	18 and 19 22 and 23 26 and 27	
Open-collector output C = Collector E = Emitter	5 6 7 8 9 10	17 and 18 17 and 19 21 and 22 21 and 23 25 and 26 25 and 27	

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Dimensions



Compatibility

JUMO mTRON T

See data sheet of the central processing unit JUMO mTRON T:
Data sheet 705001

JUMO variTRON

See data sheet of the relevant central processing unit JUMO variTRON:
Data sheet 70500x

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Order details

	(1)	**Basic type**
705010		Multichannel controller module, 2x universal input, 2x digital input, 2x relay output
	(2)	**Basic type extension**
1		2 relays (N/O contact)
2		2 logic outputs 0/15 V
	(3)	**Version**
8		With factory settings
	(4)	**Option slot 1**
0		Not used
1		Analog input 2
2		Relay (changeover contact)
3		2 relays (N/O contacts with common pole)
4		Analog output
5		2 digital inputs
6		Solid-state relay 1 A
7		2 open-collector outputs
	(5)	**Option slot 2**
0		Not used
1		Analog input 2
2		Relay (changeover contact)
3		2 relays (N/O contacts with common pole)
4		Analog output
5		2 digital inputs
6		Solid-state relay 1 A
7		2 open-collector outputs
	(6)	**Option slot 3**
0		Not used
2		Relay (changeover contact)
3		2 relays (N/O contacts with common pole)
4		Analog output
5		2 digital inputs
6		Solid-state relay 1 A
7		2 open-collector outputs
	(7)	**Voltage supply**
36		DC 24 V +25/-20 %
	(8)	**DNV GL approval**
000		Without approval
062		With DNV GL approval[a]
	(9)	**Extra codes**
000		Without extra code
879		AMS2750/CQI-9[b]

[a] The power supply unit used must also have a DNV GL or GL type approval (e.g. type 705090).
[b] For the calibration certificate the channels to be checked are to be defined with the thermocouple type and the desired measuring points.

	(1)		(2)	(3)		(4)	(5)	(6)		(7)		(8)		(9)
Order code		/			-				-		/		,	
Order example	705010	/	1	8	-	0	0	0	-	36	/	000		000

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14
36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex, CM20 2DY, UK
Phone: +44 1279 63 55 33
Fax: +44 1279 62 50 29
Email: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
6733 Myers Road
East Syracuse, NY 13057, USA
Phone: +1 315 437 5866
Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

Scope of delivery

1 multichannel controller module in the ordered version
1 Installation instructions

Accessories

Description	**Part no.**
Modules for option slots (expansion boards):	
Analog input	00569497
Relay (changeover contact)	00569498
2 relays (N/O contacts with common pole)	00569499
Analog output	00569500
2 digital inputs	00569501
Solid-state relay 1 A	00569502
2 open-collector outputs	00569503

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14, 36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
e-mail: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
e-mail: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
8 Technology Boulevard
Canastota, NY 13031, USA
Phone: 315-697-JUMO
1-800-554-JUMO
Fax: 315-697-5867
e-mail: info@jumo.us
Internet: www.jumo.us

JUMO mTRON T
Measuring, Control, and Automation System

Relay module 4-channel

Brief description

The relay module provides four relay outputs controlled through the system bus by digital signals. Each relay output is equipped with an AC 230V/3A changeover contact.

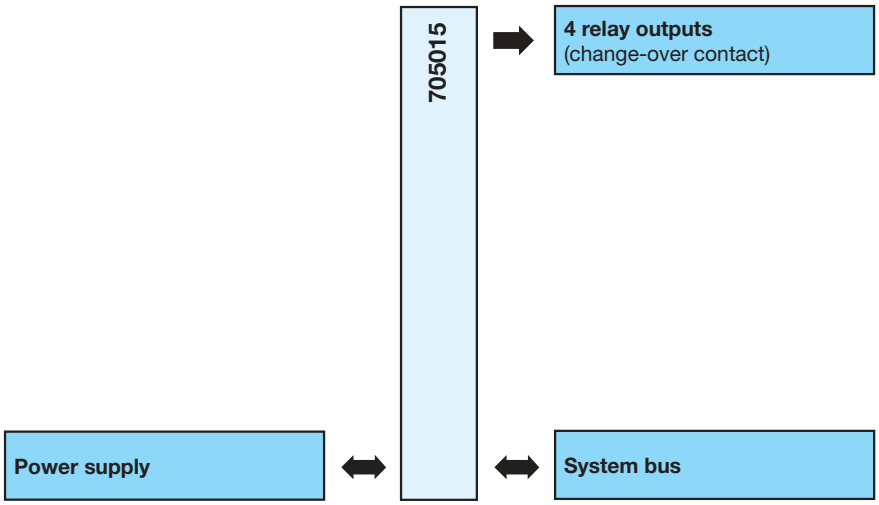
LEDs are used to indicate applied voltage supply, the module operating status, as well as the status of the relay outputs.

For service work, the module insert can be easily pulled out of the case at the front. The case including the bus PCB remains mounted on the DIN rail.

A setup program or the multifunction panel 840 allows the user to comfortably configure the relay module.

Type 705015/...

Block diagram



Features

- Four relay outputs with changeover contact AC 230 V / 3 A
- Automatic configuration after the module (hot swappable)
- Connection of the outputs at the front
- Removable terminal strips with Push-In technology
- Quick wiring of operating voltage and system bus due to easy module connection

Approval/approval marks (see “Technical data”)

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14, 36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
e-mail: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
e-mail: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
8 Technology Boulevard
Canastota, NY 13031, USA
Phone: 315-697-JUMO
1-800-554-JUMO
Fax: 315-697-5867
e-mail: info@jumo.us
Internet: www.jumo.us

Technical data

Outputs

4 relay outputs (changeover contact)	
Switching capacity	3 A at AC 230 V resistive load 3 A at DC 30 V resistive load
Contact life	350,000 operations at rated load / 750,000 operations at 1 A

Electrical data

Voltage supply	
Connection	Lateral (feed via base unit or router module)
Voltage	DC 24 V +25/-20 %
Residual ripple	5 %
Current consumption	120 mA (at DC 19.2 V)
Power consumption	3 W
Relay outputs	
Connection	At the front (removable terminal strips with Push-In technology)
Conductor cross section	
Wire or strand without ferrule	Min. 0.5 mm^2, max. 2.5 mm^2
Strand with ferrule	Min. 0.5 mm^2, max. 2.5 mm^2
2 x strand with twin ferrule with plastic collar	Min. 0.5 mm^2, max. 1.5 mm^2 (both strands with the same cross section)
Stripping length	10 mm
Electrical safety	Acc. to EN 61010-1 Overvoltage category III, pollution degree 2
Electromagnetic compatibility	Acc. to EN 61326-1
Interference emission	Class A – only for industrial use –
Interference immunity	To industrial requirements

Case and ambient conditions

Case type	Plastic case for DIN rail mounting in the control cabinet (indoor use); DIN rail acc. to DIN EN 60715, 35 mm x 7.5 mm x 1 mm
Dimensions (W x H x D)	22.5 mm x 103.6 mm x 101.5 mm (without connection elements)
Weight	Approx. 160 g
Protection type	IP20, acc. to DIN EN 60529
Ambient temperature range	-20 to +55 °C
Storage temperature range	-40 to +70 °C
Resistance to climatic conditions	Relative humidity ≤ 90 % annual average without condensation (climatic class 3K3 acc. to DIN EN 60721-3-3 with extended temperature and humidity range)
Site altitude	Up to 2000 m above sea level
Mechanical ambient conditions[a]	Classification acc. to DIN EN 60721-3-3, table 6, class 3M2

[a] Test conditions are listed in the System Descripton B 705000.8.

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14, 36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
e-mail: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
e-mail: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
8 Technology Boulevard
Canastota, NY 13031, USA
Phone: 315-697-JUMO
1-800-554-JUMO
Fax: 315-697-5867
e-mail: info@jumo.us
Internet: www.jumo.us

Approval/approval marks

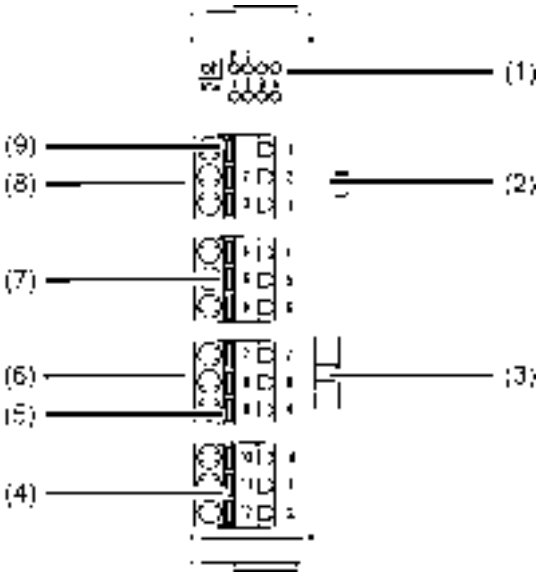
Approval mark	Testing agency	Certificate/certification number	Inspection basis	Valid for
c UL us	Underwriters Laboratories	E201387	UL 61010-1 (3. Ed.), CAN/CSA-22.2 No. 61010-1 (3. Ed.)	all types
DNV GL	DNV GL	TAA000016N	Class Guideline DNVGL-CG-0339	all types; a power supply unit with DNV GL or GL type approval is required (e.g. type 705090)

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14, 36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
e-mail: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
e-mail: sales@jumo.co.uk
Internet: www.jumo.co.uk

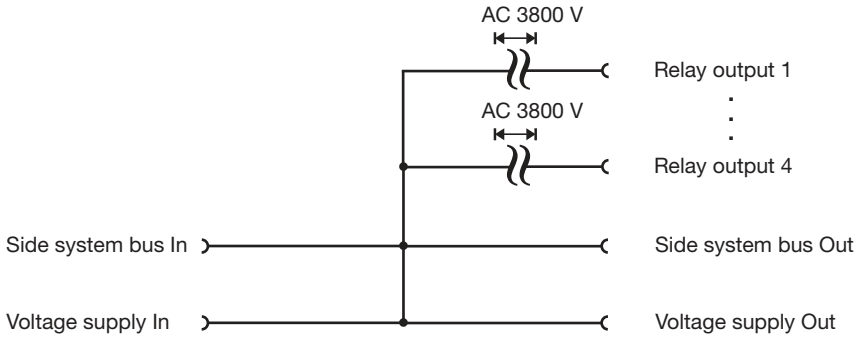
JUMO Process Control, Inc.
8 Technology Boulevard
Canastota, NY 13031, USA
Phone: 315-697-JUMO
1-800-554-JUMO
Fax: 315-697-5867
e-mail: info@jumo.us
Internet: www.jumo.us

Display and connection elements



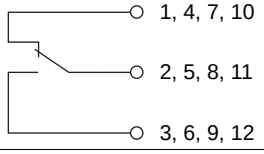
(1) Status displays (LED):
P = Voltage supply
S = Status
1 to 4 = Relay outputs
(LED is lit: Active)
(2) Voltage supply Out, DC 24 V
(3) Side system bus Out
(4) Relay output 4
(5) Relay output 3
(6) Side system bus In
(7) Relay output 2
(8) Voltage supply In, DC 24 V
(9) Relay output 1

Electrical isolation



Connection diagram

The connection diagram included in the data sheet provides initial information about the connection options. Only use the installation instructions or the operating manual for the electrical connection. The know-how and the correct technical implementation of the safety warnings/instructions contained in these documents are the prerequisite for the installation, electrical connection, and initial start as well as for the safety during operation.

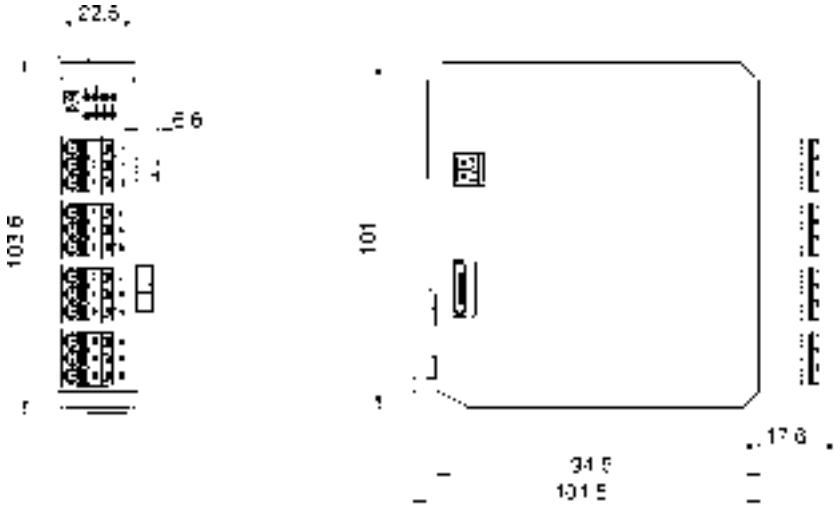
Connection	Output	Terminals	Symbol and terminal designation
Relay output (changeover contact)	1 2 3 4	1 to 3 4 to 6 7 to 9 10 to 12	

JUMO GmbH & Co. KG
Delivery address: Mackenrodtstraße 14, 36039 Fulda, Germany
Postal address: 36035 Fulda, Germany
Phone: +49 661 6003-0
Fax: +49 661 6003-607
e-mail: mail@jumo.net
Internet: www.jumo.net

JUMO Instrument Co. Ltd.
JUMO House
Temple Bank, Riverway
Harlow, Essex CM20 2DY, UK
Phone: +44 1279 635533
Fax: +44 1279 635262
e-mail: sales@jumo.co.uk
Internet: www.jumo.co.uk

JUMO Process Control, Inc.
8 Technology Boulevard
Canastota, NY 13031, USA
Phone: 315-697-JUMO
1-800-554-JUMO
Fax: 315-697-5867
e-mail: info@jumo.us
Internet: www.jumo.us

Dimensions



Module overview

Base units

- Central processing unit
  Data sheet 705001

Input/output modules

- Multichannel controller module
  Data sheet 705010
- Relay module 4-channel
  Data sheet 705015
- Analog input module 4-channel
  Data sheet 705020
- Analog input module 8-channel
  Data sheet 705021
- Analog output module 4-channel
  Data sheet 705025
- Digital input/output module 12-channel
  Data sheet 705030
- Thyristor power controller type 70906x
  Data sheet 709061, 709062, 709063

Special modules

- Router module
  Data sheet 705040

Operating, visualization, recording

- Multifunction panel 840
  Data sheet 705060
- Operating panels
  Data sheet 705065

Power supply units

- 705090/05-33
  Data sheet 705090
- 705090/10-33
  Data sheet 705090