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# JUMO variTRON 500 touch – Automation System

## Central Processing Unit 705004

### Brief description

The JUMO variTRON 500 touch is a central processing unit with integrated TFT color screen for operation and visualization using CODESYS TargetVisu. Along with the proven input and output modules (incl. controller module), a complete automation system can be realized.

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

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

For visualization, commercially available panels that support the CODESYS Remote TargetVisu or WebVisu functionality can be used in addition. 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 and can be individually integrated into the customer application.

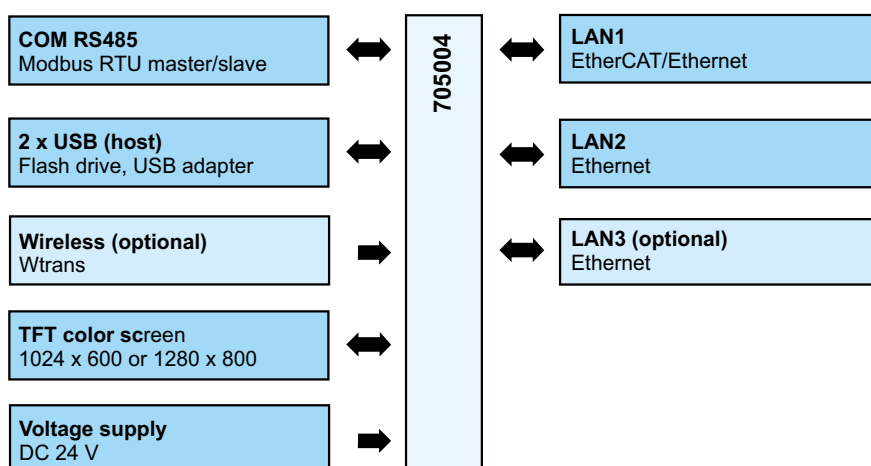


Type 705004/2



Type 705004/3

### Block diagram



### Features

- Process mapping for all connected input/output modules (including controller module)
- 2 USB host interfaces
- OPC UA Server (in conjunction with PLC)
- Wireless interface for Wtrans transmitters
- PROFINET IO controller (in conjunction with PLC)
- Battery-buffered SRAM (synchronization of retain data in CODESYS application)
- Battery-buffered real-time clock
- Data evaluation with JUMO smartWARE Evaluation
- Customer-specific boot logo

### Approvals and approval marks (see technical data)

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## Description

### JUMO variTRON 500 touch

The central processing unit JUMO variTRON 500 touch – just like variTRON 300 (705003) and variTRON 500 (705002) – is based on the new hardware platform. It is equipped with an 800 MHz processor, which is used as a quad-core variant.

The central processing unit JUMO variTRON 500 touch is integrated into the housing of a TFT color screen, which is used for operation and visualization (capacitive touch display). It is available in screen sizes of 7 inches and 10.1 inches. Both sizes are also available with stainless steel front.

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 6)
- Easy adaptation of hardware inputs and outputs
- Customized operation and visualization with several operator stations via CODESYS remote target visualization or web panels via web visualization (mixed operation is possible)
- Panels in various formats (portrait or landscape, 4:3 or 16:9)
- JUMO Web Cockpit

### 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 acquire and digitize a highly diverse range of process variables.

The mounting of the modules is possible in two variants. In variant 1, a DIN rail (accessory) is attached to the rear of the central pro-

cessing unit JUMO variTRON 500 touch, on which the modules are mounted. In variant 2, the modules are mounted on a separate DIN rail. In both variants, the connection to the central processing unit is established via a router module using a commercially available network cable (see Technical data or Accessories). The voltage for the modules is also supplied at the router module.

JUMO variTRON 500 touch 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.

### Wireless measured value transmission

The central processing unit JUMO variTRON 500 touch is also available with a wireless interface that enables wireless transmission of measured values. The transmitters of the JUMO Wtrans series are available as measuring probes (Wtrans T, Wtrans B, Wtrans p, Wtrans E01). A maximum of 32 transmitters can be operated on the central processing unit.

During startup, the display of the RSSI value (Received Signal Strength Indicator) in the Web Cockpit is helpful as an indicator of the signal strength of a received radio telegram.

### Acquisition of process data

The JUMO variTRON 500 touch central processing unit has a function for acquiring process data. This allows up to 240 analog or digital channels (signals) to be logged. The channels are combined into groups for this purpose.

By grouping the channels, the user can, for example, create a separate group for each plant or log signals with a different memory cycle. The grouping of channels is also the basis for acquiring batches.

The process data is only temporarily stored in the central processing unit to bridge network failures before this data is transferred to the Datastore for storage. The Datastore is part of the JUMO smartWARE Evaluation software, which is used to visualize and evaluate the data. A fee-based license is required for this pur-

pose (number of channels). A visualization using only the central processing unit is not possible.

### Acquisition of batches

The scope of the JUMO variTRON 500 touch central processing unit also includes the acquisition of batches. As a result, up to 20 batches can be logged simultaneously.

The batch data is acquired together with the channels (signals) of the assigned groups and the event messages.

The batches are also only temporarily stored in the central processing unit. Storage, visualization, and evaluation are then carried out with the JUMO smartWARE Evaluation software. A fee-based license is also required for this purpose (number of batches).

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## 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](http://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](http://qr-en-scada.jumo.info)

## JUMO smartWARE Evaluation

JUMO smartWARE Evaluation stores process data from distributed plants that is acquired by JUMO variTRON devices. The collected data can be viewed and evaluated with a web browser. Thanks to Docker technology, JUMO smartWARE Evaluation can be installed on a desktop computer, on a server in your own network, or on a cloud server. A manipulation detection system ensures data security.

Further information on the JUMO smartWARE Evaluation software:

[qr-en-evaluation.jumo.info](http://qr-en-evaluation.jumo.info)

## JUMO smartWARE Program

The browser-based software solution JUMO smartWARE Program enables intuitive creation and editing of process technology programs and recipes on the JUMO variTRON 500 via web access. As a result, plant manufacturers can define process steps and then link them into a program using the graphical editor. The plant user can control the program sequence via a connected web interface.

Further information about the JUMO smartWARE Program software:

[qr-en-program.jumo.info](http://qr-en-program.jumo.info)

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## Technical data

### Interfaces

USB host Product name Type Number Device category Application Data rate Max. current	USB A (socket) 2 Mass Storage Class, Communications Device Class – Ethernet Control Module Connecting a USB flash drive or a USB to Ethernet converter Low Speed, Full Speed, Hi-Speed 500 mA per interface
Ethernet Product name Type Number Protocol  Application  Transfer rate Connecting cable Cable length	LAN1, LAN2, LAN3 (optional) RJ45 1 TCP, IPv4, HTTP(S) Via CODESYS as an option: Modbus TCP, PROFINET IO controller, EtherCAT master, OPC UA server, BACnet/IP 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 - JUMO system bus via JUMO variTRON router modules (LAN1 only) 10 Mbit/s, 100 Mbit/s (EtherCAT: 100 Mbit/s) Network cable, at least CAT5e (S/FTP) Up to 100 m
RS485 (serial interface) Product name Type Number Application Protocol Data format Transfer rate	COM D-Sub 9-pole 1 Fieldbus applications, communication via modem with a PC or with an email server Via CODESYS: Modbus RTU master/slave 8/1/n, 8/1/e, 8/1/o 9600 Bd, 19200 Bd, 38400 Bd, 115200 Bd

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Wireless interface (optional)	
Antenna connector	SMA socket
Radio frequency	868.4 MHz (Europe) or 915 MHz (USA, Australia, Canada, New Zealand ...) In the 915 MHz frequency band (912.6 MHz to 917.4 MHz) one of 10 fixed frequencies can be set.
Open air range	300 m with 868.4 MHz or 200 m with 915 MHz Range when using the antenna holder for wall mounting with 3 m long antenna cable; when mounting the antenna directly to the receiver, a reduction in the range must be taken into account.
Required RSSI value for error-free transmission	> -90 (with stationary transmitter) The RSSI value is an indicator of the strength of the received signal (theoretical value range: -120 to 0).
Application	Receiver for JUMO Wtrans transmitters (wireless measured value transmission)
Compatible transmitters	Wtrans T (902930), Wtrans B (707060), Wtrans p (402060), Wtrans E01 (902928) Not supported thermocouple types with Wtrans B: MoRe5-MoRe41, W3Re-W26Re

## Screen

Type	TFT color screen
Touch technology	Capacitive
Screen size (diagonal)	
Types 705004/0, 705004/1	Approx. 17.8 cm (7")
Types 705004/2, 705004/3	Approx. 25.7 cm (10.1")
Resolution	
Types 705004/0, 705004/1	1024 × 600
Types 705004/2, 705004/3	1280 × 800
Number of colors	16.7M
Brightness (luminance)	Typically 400 cd/m <sup>2</sup>
Backlight	LED (dimnable in 7 steps)

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## Electrical data

Voltage supply	
Symbol (see nameplate)	
Connection	Removable terminal strip 3-pole with push-in technology (incl. connection for functional ground)
Voltage	DC 24 V +25/-20 % SELV
Residual ripple	5 %
Current consumption	(at DC 19.2 V)
Type 705004/0	Max. 0.84 A
Type 705004/1	Max. 0.84 A
Type 705004/2	Max. 0.91 A
Type 705004/3	Max. 0.91 A
Power consumption	
Type 705004/0	Max. 17.5 W
Type 705004/1	Max. 17.5 W
Type 705004/2	Max. 19.4 W
Type 705004/3	Max. 19.4 W
Conductor cross section (terminals +24V, GND, FE)	
Wire or stranded wire without ferrule	Min. 0.2 mm <sup>2</sup> , max. 2.5 mm <sup>2</sup>
Stranded wire with ferrule	Min. 0.25 mm <sup>2</sup> , max. 2.5 mm <sup>2</sup>
2 × stranded wire with twin ferrule with plastic collar	Min. 0.5 mm <sup>2</sup> , max. 1.5 mm <sup>2</sup>
Stripping length	10 mm
Conductor cross section COM (terminals 1, 2)	
Wire or stranded wire without ferrule	Min. 0.14 mm <sup>2</sup> , max. 1.5 mm <sup>2</sup>
Stranded wire with ferrule	Without plastic collar: min. 0.25 mm <sup>2</sup> , max. 1.5 mm <sup>2</sup> With plastic collar: min. 0.25 mm <sup>2</sup> , max. 0.5 mm <sup>2</sup>
Stripping length	9 mm
Electrical safety	According to DIN EN 61010-1:2020 Overvoltage category III, pollution degree 2
Protection rating	III
Electromagnetic compatibility	According to DIN EN 61326-1:2022
Interference emission	Class A – only for industrial use –
Interference immunity	Industrial requirement
Radio frequency spectrum	
868.4 MHz	According to ETSI EN 300 220-1 and ETSI EN 300 220-2
915 MHz (912.6 MHz to 917.4 MHz)	According to FCC - Title 47 CFR Part 15 and ANSI C63.4
Data backup	Buffered RAM
Buffer battery service life	Typically 6 years (lithium battery CR2032) Observe fault messages on battery status in the event list (battery almost empty, battery empty)!

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## Housing and environmental conditions

Case type Types 705004/0, 705004/2 Types 705004/1, 705004/3	Housing for installation in panel cut-out (indoor use), horizontal orientation only Plastic housing, display with glass front Plastic housing with stainless steel front, display with glass front
Front panel (width × height) Type 705004/0 Type 705004/1 Type 705004/2 Type 705004/3	199.7 mm × 134.7 mm 229 mm × 164 mm 265.1 mm × 180.5 mm 294.4 mm × 209.8 mm
Thickness of the front frame (without seal) Type 705004/0 Type 705004/1 Type 705004/2 Type 705004/3	8.1 mm 5.5 mm 8.1 mm 5.5 mm
Mounting depth (up to seal) Type 705004/0 Type 705004/1 Type 705004/2 Type 705004/3	(without DIN rail) 49.6 mm 53.6 mm 49.6 mm 53.6 mm
Panel cut-out (width×height) Type 705004/0 Type 705004/1 Type 705004/2 Type 705004/3	190.2 mm × 125.2 mm (+ 1 mm) 214 mm × 149 mm (+ 1 mm) 253 mm × 168.4 mm (+ 1 mm) 279.4 mm × 194.8 mm (+ 1 mm)
Panel thickness Types 705004/0, 705004/2 Types 705004/1, 705004/3	Max. 7 mm Max. 8 mm
Weight (fully fitted) Type 705004/0 Type 705004/1 Type 705004/2 Type 705004/3	Approx. 990 g Approx. 1780 g Approx. 1410 g Approx. 2400 g
Protection type Types 705004/0, 705004/2 Types 705004/1, 705004/3	According to DIN EN 60529 At the front IP65, at the rear IP20 At the front IP69K (high-pressure cleaning > 70 °C only when switched off), at the rear IP20
Ambient temperature range (operation) Types 705004/0, 705004/1 Types 705004/2, 705004/3	-20 to +55 °C -20 to +50 °C
Storage temperature range	-30 to +70 °C
Resistance to climatic conditions Operation Storage	Relative humidity ≤ 90 % annual average, no condensation Climate class 3K22 according to DIN EN 60721-3-3 with extended temperature and humidity range Climate class 1K21 according to DIN EN 60721-3-3 with extended temperature and humidity range
Site altitude	Up to 2000 m above sea level
Vibration Amplitude Acceleration	According to DIN EN 60068-2-6, table C.2 0.15 mm from 10 to 58.1 Hz 20 m/s <sup>2</sup> from 58.1 to 150 Hz

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Shock	According to DIN EN 60068-2-27, table A.1
Peak acceleration	150 m/s <sup>2</sup>
Shock duration	11 ms
Degree of protection against mechanical loads (shock resistance)	According to DIN EN 50102/A1
Types 705004/1, 705004/3	IK08 (shatterproof)

### Approvals and approval marks

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



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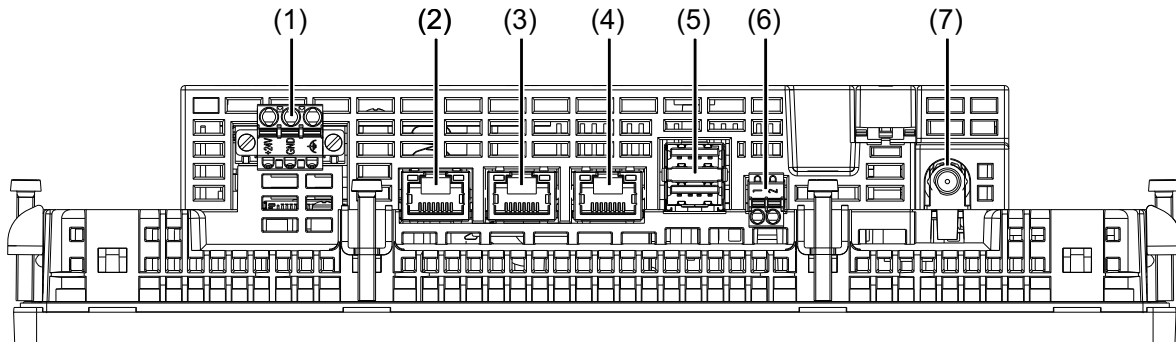
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## Connection diagram

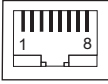
The connection diagram in the data sheet provides information on product selection.

**For the electrical connection, only use the installation instructions or the operating manual.**

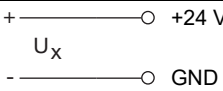

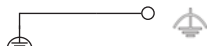


- (1) Voltage supply and functional ground
- (2) Interface LAN3 (Ethernet), optional
- (3) Interface LAN2 (Ethernet)
- (4) Interface LAN1 (Ethernet/JUMO system bus)
- (5) 2 USB host interfaces
- (6) Interface COM (RS485)
- (7) Antenna connector for wireless interface, optional

## Interfaces

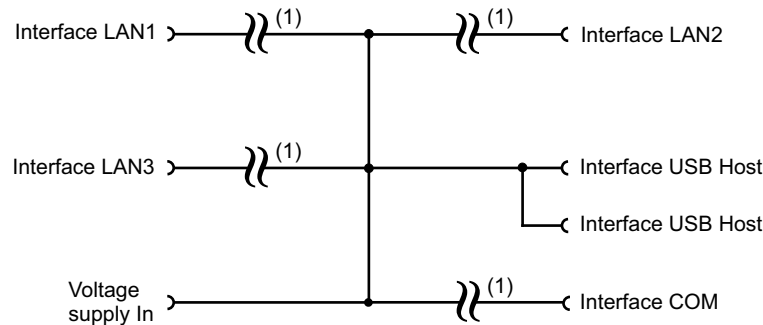
Connection	Product name	Number	Connection element	Assignment	
USB host (2 ×)	USB	(5)	USB socket type A (2 ×)		
Ethernet	LAN1	(4)		1 TX+	Transmission data +
	LAN2	(3)		2 TX-	Transmission data -
	LAN3 (optional)	(2)		3 RX+	Received data +
				6 RX-	Received data -
Serial interface RS485	COM	(6)	Terminal strip 2-pole	1 TxD+/RxD+	Transmission/received data +
				2 TxD-/RxD-	Transmission/received data -
Antenna		(7)	SMA socket		

## Voltage supply

Connection	Product name	Number	Symbol and terminal designation
Voltage supply In	+24 V and GND	(1)	
Functional ground			



## Electrical isolation



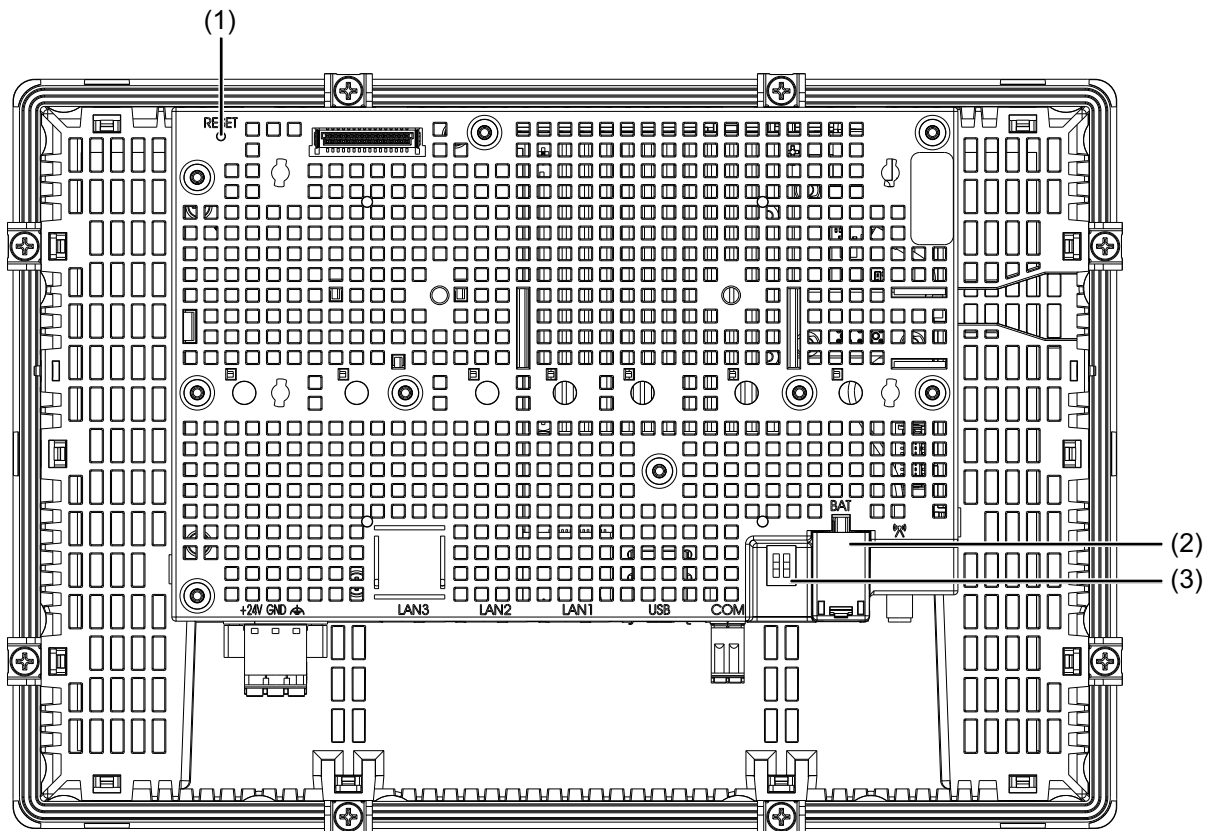
(1) Functional galvanic isolation for connection of SELV or PELV electrical circuits.

## Control elements

### Front

Touch operation (depending on application)

### Back cover



- (1) Reset push-button (resetting to default settings)
- (2) Battery compartment (buffer battery)
- (3) Switches for terminating resistors (RS485)

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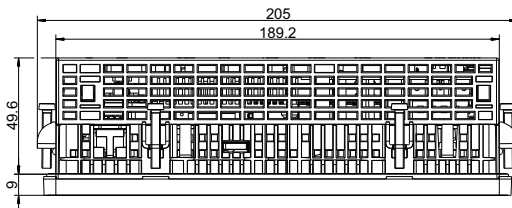
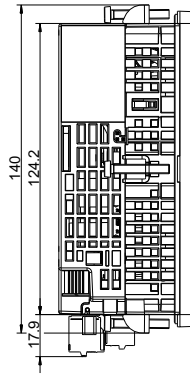
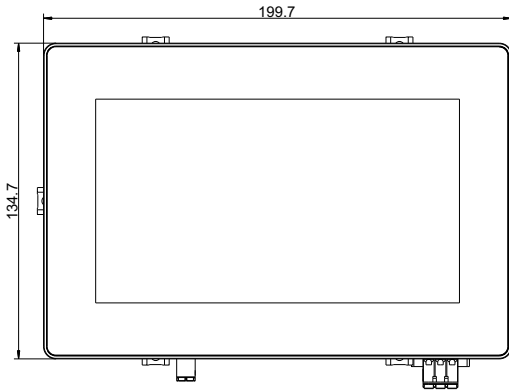
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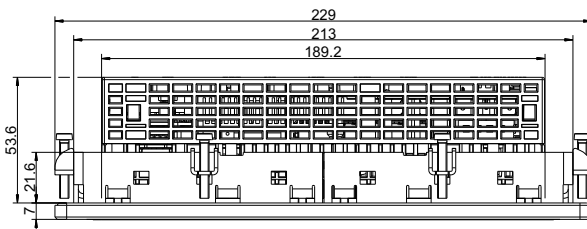
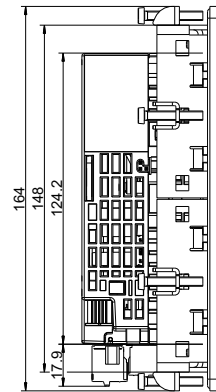
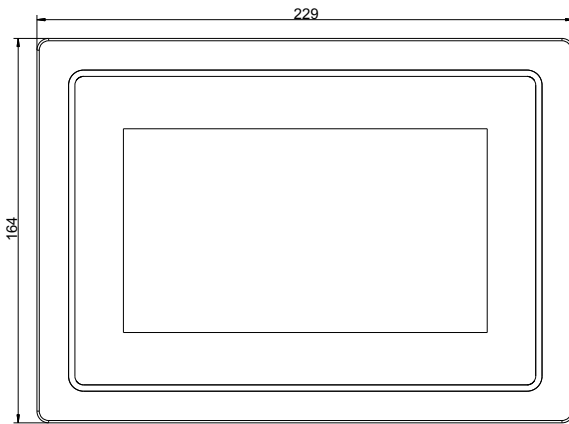


## Dimensions

### 705004/0



### 705004/1



## Module overview

### Central processing unit

- JUMO variTRON 500 touch  
Data sheet 705004

### 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
- Thyristor power controller type 70906x  
Data sheet 709061, 709062, 709063

### Special modules

- Router module 2-port  
Data sheet 705041
- Router module 3-port  
Data sheet 705042
- Router module 1-port  
Data sheet 705043

### Panels

- JUMO variTRON web panels  
Data sheet 705070

### Power supply units

- 705090/03-33  
Data sheet 705090
- 705090/05-33  
Data sheet 705090
- 705090/10-33  
Data sheet 705090

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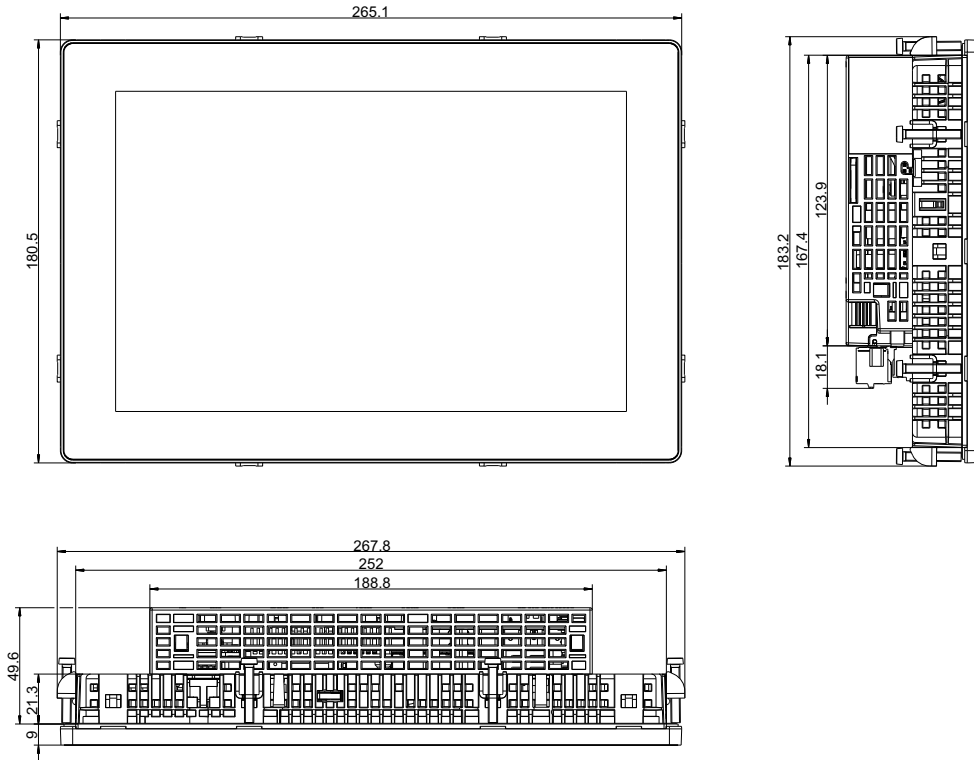
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# Dimensions

705004/2



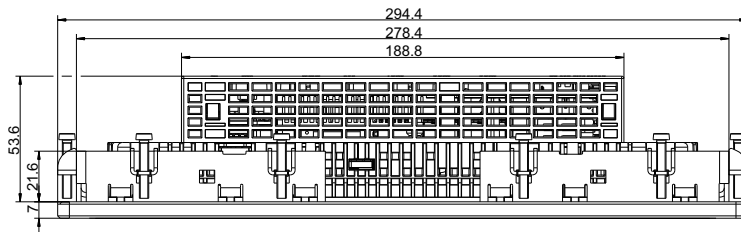
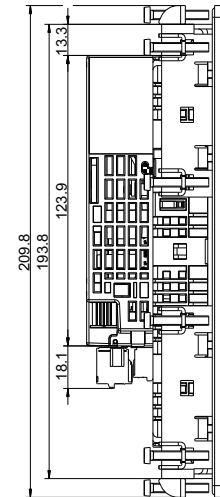
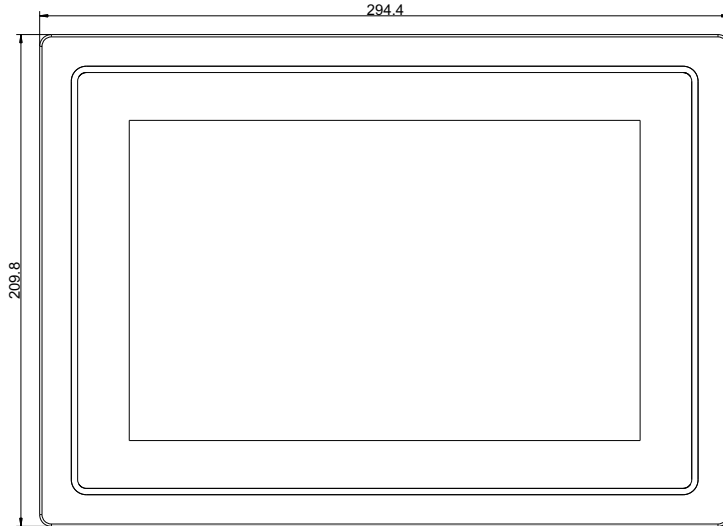
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705004/3



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## Order details

<b>(1)</b>	<b>Basic type</b>
705004	Central processing unit, type 705004, integrated in the operating panel (capacitive touchscreen, program generator, 2 × Ethernet, 2 × USB host, RS485 Modbus-RTU <sup>b</sup> ), Node-RED
<b>(2)</b>	<b>Basic type extension 1</b>
0	7" variant
1	7" variant with stainless steel front
2	10.1" variant
3	10.1" variant with stainless steel front
<b>(3)</b>	<b>Basic type extension 2</b>
2	Quad core CPU
<b>(4)</b>	<b>Basic type extension 3</b>
2	RAM 1024 MB
<b>(5)</b>	<b>Basic type extension 4</b>
1	eMMC 8 GB <sup>a</sup>
<b>(6)</b>	<b>Version</b>
0	Standard with default settings
<b>(7)</b>	<b>Interface LAN3</b>
00	Not used
08	Ethernet (RJ45)
<b>(8)</b>	<b>Wireless interface</b>
00	Not used
10	Wtrans 868.4 MHz (Europe)
20	Wtrans 915 MHz (USA, Australia, Canada, New Zealand ...)
<b>(9)</b>	<b>Voltage supply</b>
36	DC 24 V +25/-20 %, SELV
<b>(10)</b>	<b>Extra codes</b>
001	Program generator incl. JUMO smartWARE Program (701850; as of system version x) <sup>b, c</sup>
224	PLC according to IEC 61131-3 (CODESYS V3.5; necessary to operate the device as a PLC) <sup>d</sup>
280	Remote TargetVisu <sup>b, d</sup>
281	WebVisu <sup>b, d</sup>
282	PROFINET IO controller <sup>b, d</sup>
283	OPC UA server <sup>b, d</sup>
284	Modbus TCP master <sup>b, d</sup>
285	Modbus TCP slave <sup>b, d</sup>
286	EtherCAT master <sup>b, d</sup>
289	BACnet/IP <sup>b, d</sup>
290	TargetVisu (required for visualization with the integrated touch panel) <sup>b, d</sup>

<sup>a</sup> Flexible allocation between system data and application data.

<sup>b</sup> Only in conjunction with extra code 224.

<sup>c</sup> Only in conjunction with extra code 281 or 290.

<sup>d</sup> This function can be used free of charge for 30 minutes in demo mode.

**Order code:**

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (10)  
 705004 / [ ] 2 2 1 - 0 - [ ] - [ ] - 36 / 224 , 290 , <sup>a</sup>

<sup>a</sup> List further extra codes in sequence, separated by commas.

**Order example:**

705004 / 2 2 2 1 - 0 - 00 - 00 - 36 / 224 , 290

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## Scope of delivery

1 central processing unit, type 705004, in the ordered version
1 installation instructions
Mounting elements Type 705004/0: 8 pieces (only 6 are needed) Type 705004/1: 8 pieces Type 705004/2: 8 pieces Type 705004/3: 16 pieces

## Stock versions

Order code	Part no.
705004/2221-0-08-00-36/224,290	30049514

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## Accessories

Product name	Part no.
USB to Ethernet converter:	
TP-Link UE300 USB to Gigabit LAN Converter <sup>a</sup>	30047695
Accessories for the use of router module and input/output modules:	
RJ45 patch cable SF/UTP, length 0.3 m	00747472
RJ45 patch cable S/FTP, Cat. 6A, length 1.5 m	00666324
DIN rail incl. fastening material and terminal block for functional ground	30047694
Cover for system bus	30049495
Screw-on end clamp for DIN rail (2 pieces are required)	00528648
Accessories for wireless interface:	
Antenna cable, length 1 m, impedance 50 ohm with preconfigured screw-type connection, T <sub>max.</sub> 85 °C	00710813
Antenna cable, length 3 m, impedance 50 ohm with preconfigured screw-type connection, T <sub>max.</sub> 85 °C	00482646
Antenna cable, length 5 m, impedance 50 ohm with preconfigured screw-type connection, T <sub>max.</sub> 85 °C	00490066
Antenna cable, length 5 m, impedance 50 ohm with preconfigured screw-type connection, T <sub>max.</sub> 125 °C	00660378
Antenna cable, length 10 m, impedance 50 ohm with preconfigured screw-type connection, T <sub>max.</sub> 85 °C	00490068
Antenna cable, length 10 m, impedance 50 ohm with preconfigured screw-type connection, T <sub>max.</sub> 125 °C	00511870
Antenna holder for wall mounting with antipole for lambda/4 antenna	00482648
Lambda/4 antenna with waterproof, permanently connected cable, length 10 m, T <sub>max.</sub> 125 °C	00757047
Additional lambda/4-antenna, impedance 50 ohm, T <sub>max.</sub> 125 °C	00757039
Extra codes (activations):	
Program generator incl. JUMO smartWARE Program (701850; as of system version x)	00771090
PLC according to IEC 61131-3 (CODESYS V3.5; necessary to operate the device as a PLC)	00724988
Remote TargetVisu	00724990
WebVisu	00724991
PROFINET IO controller	00724992
OPC UA server	00724993
Modbus TCP master	00724994
Modbus TCP slave	00724996
EtherCAT master	00724997
BACnet/IP	30049494
TargetVisu (required for visualization with the integrated touch panel)	30049496

<sup>a</sup> This USB to Ethernet converter with RTL8153 chipset has been tested by the manufacturer. Other USB to Ethernet converters with the same chipset should also be usable, as well as converters with the following chipsets: Realtek RTL8150, RTL8152, RTL8153ASIX AX88xxx based, AX88179, AX88178ASMSC LAN95XX based.