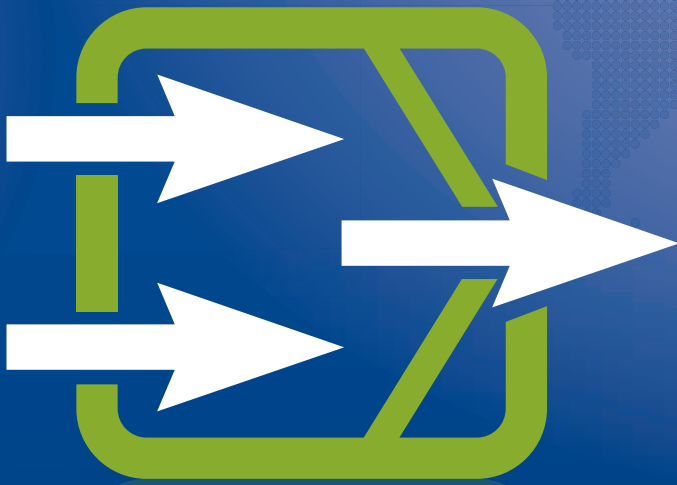




More than **sensors + automation**



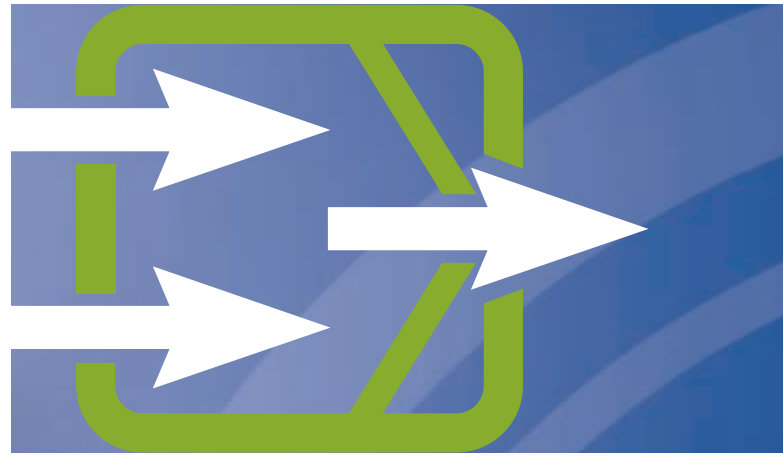
# Control

Innovative solutions for the toughest requirements



**Contact:**

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## Dear Reader,

Many processes, machines, and plants are extremely difficult to control without sophisticated automation technology. Temperature, pressure, level, and flow – to name but a few process variables – not only need to be monitored, but also precisely controlled. This is because accurate and reliable control technology is a key requirement for consistent product and process quality. Control technology is just as important for energy-efficient plant operation.

At the heart of every automated system is the controller itself. Its hardware and software functions enable easy and universal adaptability to all kinds of processes. This principle applies to JUMO control technology, which is both developed and produced at the company headquarters in Fulda. This is where knowledge and experience from over 50 years of development and production as well as the valuable feedback from our customers flow together. This way JUMO can offer innovative products that meet your needs and quality requirements.

This brochure provides an overview of JUMO's products in control technology. Along with the electronic solutions ranging from thermostats and compact controllers to multi-channel process and program controllers, JUMO also offers a wide range of electromechanical devices for controlling thermal processes. After all, many thermal processes can still be controlled reliably and with little installation effort using electromechanical thermostats.

Their advantages include that they do not require additional auxiliary energy and that they are absolutely impervious to electromagnetic interference. Deciding on the right controller for the job ultimately depends on the individual requirements of the process to be controlled. Our comprehensive product portfolio allows you to select the best possible solution for your process.

We would be happy to support you with our expertise in your control engineering challenge – because finding the perfect solution is what drives us. The satisfaction of our customers around the globe confirms our commitment that we show every day along with the aspiration to deliver high quality on a continuous basis.

Detailed information about our products can be found under the specified type/product group number at [www.jumo.net](http://www.jumo.net).

## Table of contents



<b>Control</b>	<b>4</b>
<b>Digital compact controllers</b>	<b>6</b>
Electronic thermostats	7
Compact controllers	9
Process and program controllers	13
Selection tools	16
General overview	18
<b>Measuring, control, and automation system JUMO mTRON T</b>	<b>20</b>
<b>Software</b>	<b>26</b>
<b>Electromechanical thermostats and contact dial thermometers</b>	<b>30</b>
Panel-mounted thermostats	31
Surface-mounted thermostats	32
Contact dial thermometers	34



# Control

However different the production processes in various industries may be, they all have in common that process variables such as temperature, pressure, humidity, flow, and level need to be controlled with the highest levels of accuracy. You will be sure to find the right controller for your application in the JUMO product range, which spans from inexpensive electromechanical and electronic thermostats to digital compact controllers and multichannel automation systems. JUMO has been an established name in measurement and control technology for a number of decades. Throughout this time the company has continuously adapted its product portfolio in line with the latest customer requirements while focusing strongly on the various issues of individual industries. Our devices, which are in use worldwide, are well known for their reliability. This is so despite – or quite possibly because of – the extreme conditions in which they operate.



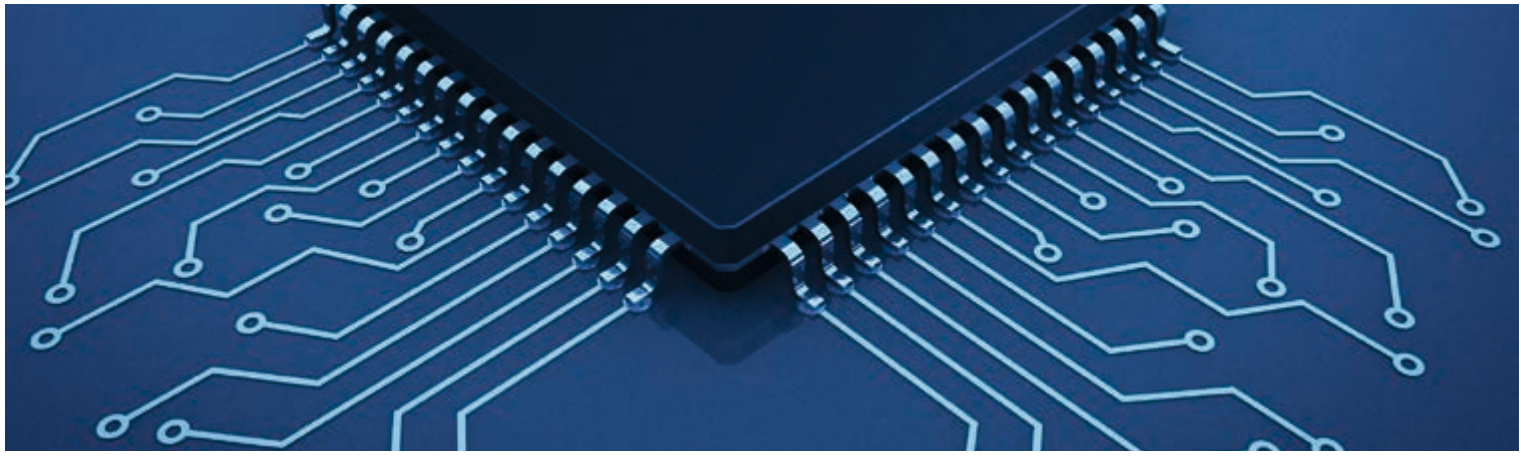


## The most important industries

Our wide range of different devices offers the ideal solution for classic mechanical and plant engineering as well as for the process industry and the OEM sector.

In addition to the standard devices, JUMO offers individual customer-specific versions for special applications.





# Digital compact controllers

JUMO offers various solutions for the control tasks in your plants and processes ranging from electronic thermostats to multichannel process and program controllers. Among the various digital compact controllers you are sure to find the device for your requirements. All compact and process controllers are equipped with proven JUMO control algorithms, as a result of which they can also handle higher-order control processes. Integrated math and logic functions enable calculations, links, evaluations, and thereby applications that were previously only possible with additional devices. The high-end devices with a modular structure from JUMO operate up to 8 independent and user configurable control channels. To help you keep track of the complexity of your plants and processes at all times, the latest controller generation offers a TFT-touchscreen and individual process screens. Display and input fields can also be integrated. The result is that you receive a clear overall impression as well as a quick status check or evaluation.



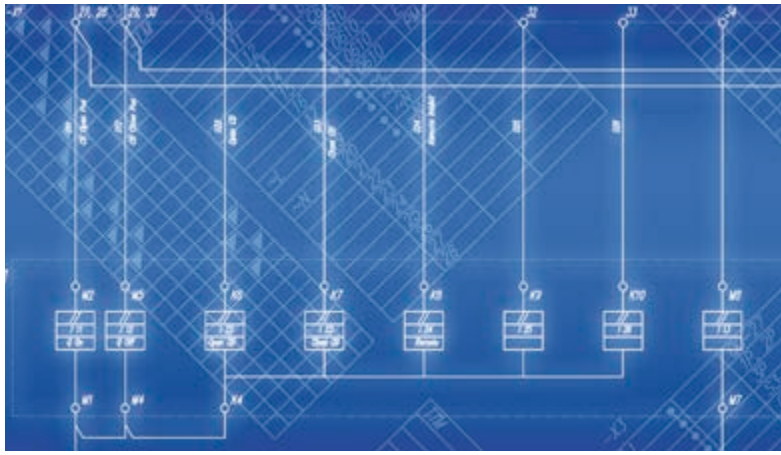
## Electronic thermostats – JUMO eTRON series



Designation	JUMO eTRON T100 electronic thermostat	JUMO exTHERM-DR two-state controller	JUMO eTRON M electronic microstat
Type	701052	701055	701060
Format	22.5 mm × 93.5 mm × 61.6 mm	87.5 mm × 45 mm × 104.8 mm	76 mm × 36 mm × 56 mm
Mounting	On DIN rail 35 mm × 7.5 mm		Panel mounting
Connections	Terminal blocks with PUSH IN technology	Screw terminals	
Protection type	IP20		At the front IP65; at the rear IP20
Measurement inputs	Pt100, Pt1000, KTY2X-6; thermocouple type J, type L, and type K; 0(4) to 20 mA; NTC 5 kΩ (at 25 °C); Ni 1000 DIN 43760, Ni 1000 Landis+Gyr TK5000	1 universal analog input for RTD temperature probe; thermocouple or current 4 to 20 mA; 1 digital input for potential-free contact	1 analog input for: Pt100, Pt1000, or KTY2x-6 in two-wire circuit (user configurable) or thermocouples Fe-CuNi (J, L) and NiCr-Ni (K) (user configurable) or current 0(4) to 20 mA (user configurable) or voltage 0 to 10 V
Display	Dot-matrix LCD display	Black and white LCD display with backlight	Three-digit, backlit LCD display with 13 mm digit height and with special characters for °C, °F, h, min, s; switching position indicators for defrost or heating phase
Outputs	1 relay (changeover contact 10 A); 1 PhotoMOS® solid state relay	1 analog output can be configured as actual value output, setpoint value output, or logic output 0/10 V; 1 relay output limit value changeover contact; 1 relay output controller; changeover contact with fuse cut-out	1 changeover contact 10 A/250 V or 2 N/O contacts 5 A/250 V
Alerts	–	Limit value output (relay) for alarm indication	Messages in the display or via the second relay output: lower/upper alarm limit temperature; service interval; timer message
Voltage supply	–	AC/DC 20 to 30 V, 48 to 63 Hz; AC 110 to 240 V +10/-15 %, 48 to 63 Hz	AC 230 V +10/-15 %, 48 to 63 Hz; AC 115 V +10/-15 %, 48 to 63 Hz; DC 12 to 24 V +15/-15 %, AC 24 V +15/-15 %, 48 to 63 Hz
Approvals	–	ATEX; IECEx	Metrological certificate; cULus
Application areas	Standard industry applications, heating and cooling technology, railway applications, building technology	Heating and cooling technology, pipe trace heating, process industry, chemical industry, fuel and heat technology, painting and drying plants	Standard industry applications, heating and cooling technology
Special features	Data logger as well as service and operating hours counter, timer function	–	Integrated defrosting function; operating hours counter; setup program

Technical data





## Electronic thermostats – JUMO eTRON series



Technical data	Designation	JUMO eTRON M100 electronic cooling controller	JUMO eTRON M100 two-channel microstat
	Type	701061	701066
	Format	76 mm × 36 mm × 71.7 mm	
	Mounting	Panel mounting	
	Connections	Screw terminals	
	Protection type	At the front IP65; at the rear IP20	
	Measurement inputs	2 analog inputs for: Pt100; Pt1000; KTY1x-6 or KTY2x-6 in two-wire circuit (configurable)	
	Display	Three-digit backlit LCD display with 13 mm digit height and special characters for °C, °F, h, min, s; switching position indicator for cooling, defrost, heating, fan, and alarm	Three-digit backlit LCD display with 13 mm digit height and special characters for °C, °F, h, min, s; switching position indicator of the relay
	Outputs	1 changeover contact 16 A/250 V and 2 N/O contacts 8 A/250 V; optional: 1 changeover contact 16 A/250 V for alarm output	
	Alerts	Alarm via relay or buzzer	
	Voltage supply	AC/DC 12 to 24 V +15/-15 %, 48 to 63 Hz	
	Approvals	cULus	
	Application areas	Cold-storage rooms, refrigerated cabinets, and refrigerated counters	Standard industry applications, heating and cooling technology
	Special features	Defrosting function with "electrical" or "hot gas" capability can be programmed; real-time clock; interface; operating hours counter; data logger; setup program including transmission and visualization of the measured values stored in the data logger; HACCP-compliant monitoring	Interface; operating hours counter; data logger; setup program including transmission and visualization of the measured values stored in the data logger



## Compact controllers – JUMO Quantrol series

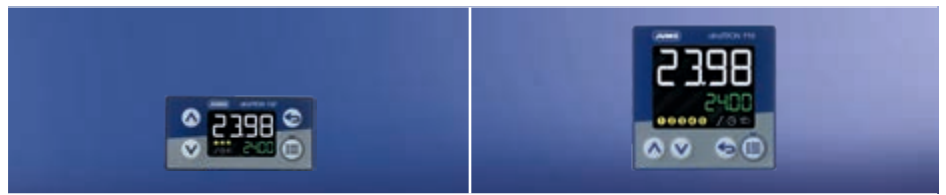


Designation	JUMO Quantrol LC100	JUMO Quantrol LC200	JUMO Quantrol LC300
Type	702031	702032	702034
Format	48 mm × 48 mm × 95 mm	48 mm × 96 mm × 80 mm	96 mm × 96 mm × 80 mm
Mounting	Plastic housing for panel mounting		
Connections	Screw terminals		
Protection type	At the front IP65; at the rear IP20		
Controller type	Two-state controller; three-state controller; continuous controller		
Controller structure	P; I; PD; PI; PID		
Measurement inputs	1 configurable analog input for: RTD temperature probe; thermocouples, current 0(4) to 20 mA; voltage 0(2) to 10 V (alternative to digital input)		
Display	2 four-digit, 7-segment displays (red, green) for process values, parameters, and timers; 6 LEDs (5 × yellow for indicating switch positions and 1 × green for ramp function)		
Outputs	1 relay output as a standard feature; can be expanded up to 3 outputs if required (relay, logic, or analog output)	1 relay output as a standard feature; can be expanded up to 5 outputs if required (relay, logic, or analog output)	
Alerts	2 limit value monitoring functions with 8 alarm functions each		
Digital inputs	1 digital input for potential-free contacts (as an alternative to voltage input)		
Voltage supply	AC 110 to 240 V +10/-15 %, 48 to 63 Hz; AC/DC 20 to 30 V, 48 to 63 Hz		
Interfaces/protocols	RS485 (Modbus); setup (USB powered)		
Approvals	cULus		
Application areas	Wine production		
Special features	Temperature control for wine production	Two-point and three-point control applications, control of control valves and thyristor power controllers	
	Easy-to-use setup program; USB-powered setup interface; autotuning procedure for determining controller parameters; firing curve		

Technical data



## Compact controllers – JUMO diraTRON series



	JUMO diraTRON 132	JUMO diraTRON 116
<b>Designation</b>	JUMO diraTRON 132	JUMO diraTRON 116
<b>Type</b>	702110	702111
<b>Format</b>	48 mm × 24 mm × 89 mm	48 mm × 48 mm × 78 mm
<b>Mounting</b>	Plastic housing for panel mounting	
<b>Connections</b>	Spring-cage terminals, PUSH IN terminal technology	
<b>Protection type</b>	At the front IP65; at the rear IP20	
<b>Controller type</b>	Two-state controller; three-state controller; modulating controller; continuous controller	
<b>Controller structure</b>	P; I; PD; PI; PID	
<b>Measurement inputs</b>	1 configurable analog input for RTD temperature probes; thermocouples; current 0(4) to 20 mA; voltage 0(2) to 10 V; resistance transmitters; resistance/potentiometers	
<b>Display</b>	18 segment LCD display; display elements for switch position of the outputs as well as manual mode; ramp function and timer	
<b>Outputs</b>	1 relay 3 A/230 V AC (N/O contact); 1 logic output 0/14 V (alternative to digital input 1)	2 relays 3 A/230 V AC (N/O contact); 1 logic output 0/14 V (alternative to digital input 1); optional: analog output, relay
<b>Alerts</b>	4 × limit value monitoring functions	
<b>Digital inputs</b>	2 digital inputs for potential-free contacts (digital input 1 alternative to logic output)	
<b>Voltage supply</b>	AC 110 to 240 V +10/-15 %, 48 to 63 Hz; AC/DC 20 to 30 V, 48 to 63 Hz	
<b>Interfaces</b>	Setup interface (USB powered); RS485 interface (optional)	
<b>Approvals</b>	cULus	cULus, Bureau Veritas, DNV GL
<b>Special features</b>	Fixed value and program controller; math and logic functions; ST code programming; service and operating hours counter	

Technical data

## Compact controllers – JUMO diraTRON series



Designation	JUMO diraTRON 108	JUMO diraTRON 108	JUMO diraTRON 104
Type	702112	702113	702114
Format	48 mm × 96 mm × 65 mm	96 mm × 48 mm × 65 mm	96 mm × 96 mm × 65 mm
Mounting	Plastic housing for panel mounting		
Connections	Spring-cage terminals, PUSH IN terminal technology		
Protection type	At the front IP65; at the rear IP20		
Controller type	Two-state controller; three-state controller; modulating controller; continuous controller		
Controller structure	P; I; PD; PI; PID		
Measurement inputs	1 configurable analog input for RTD temperature probes; thermocouples; current 0(4) to 20 mA; voltage 0(2) to 10 V; resistance transmitters; resistance/potentiometers		
Display	18 segment LCD display; display elements for switch position of the outputs as well as manual mode; ramp function and timer; pixel matrix LCD display		
Outputs	2 relays 3 A/230 V AC (N/O contact); 1 logic output 0/14 V (alternative to digital input 1); optional: analog output; relay; PhotoMOS® solid state relay		
Alerts	4 × limit value monitoring functions		
Digital inputs	2 digital inputs for potential-free contacts (digital input 1 alternative to logic output)		
Voltage supply	AC 110 to 240 V +10/-15 %, 48 to 63 Hz; AC/DC 20 to 30 V, 48 to 63 Hz		
Interfaces	Setup interface (USB powered); RS485 interface (optional)		
Approvals	cULus		cULus, Bureau Veritas, DNV GL
Special features	Fixed value and program controller; math and logic functions; ST code programming; service and operating hours counter		

Technical data



## Compact controllers and process controllers – JUMO dTRON series



	JUMO dTRON 316	JUMO dTRON 308 (horizontal/vertical)	JUMO dTRON 304
<b>Designation</b>	JUMO dTRON 316	JUMO dTRON 308 (horizontal/vertical)	JUMO dTRON 304
<b>Type</b>	703041	703042, 703043	703044
<b>Format</b>	48 mm × 48 mm × 90 mm	48 mm × 96 mm × 90 mm 96 mm × 48 mm × 90 mm	96 mm × 96 mm × 90 mm
<b>Mounting</b>	Plastic housing for panel mounting		
<b>Connections</b>	Screw terminals		
<b>Protection type</b>	At the front IP65; at the rear IP20		
<b>Controller type</b>	Two-state controller; three-state controller; modulating controller; continuous controller		
<b>Controller structure</b>	P; I; PD; PI; PID (2 control parameter sets)		
<b>Program controller</b>	1 program with up to 8 sections; 4 control tracks		
<b>Measurement inputs</b>	Up to 2 configurable analog inputs for: RTD temperature probes; resistance transmitters; thermocouples; current 0(4) to 20 mA; voltage 0(2) to 10 V; heater current 0 to 50 mA AC; customer-specific linearization possible		
<b>Display</b>	2 four-digit, 7-segment displays (red, green) for process values, parameters, timers; icons for indicating switch positions, ramp mode, manual mode, and active setpoint values; 1 two-digit 16 segment display (green) for display of various units		
<b>Outputs</b>	2 relays 3 A/230 V (N/O contact); 2 logic outputs 0/12 V (optionally 0/18 V)	2 relays 3 A/230 V (changeover contact); 2 logic outputs 0/12 V (optionally 0/18 V); voltage supply for two-wire transmitter	
	Additional outputs can be retrofitted via 3 optional expansion slots (type 703041: 2 slots): relay (changeover contact 8 A); double relay (2 × N/O contacts 3 A); analog output; solid state relay 1 A		
<b>Alerts</b>	4 limit value monitoring functions with 8 alarm functions each		
<b>Digital inputs</b>	Up to 4 digital inputs for potential-free contacts	Up to 6 digital inputs for potential-free contacts	
<b>Voltage supply</b>	AC 110 to 240 V +10/-15 %, 48 to 63 Hz; AC/DC 20 to 30 V, 48 to 63 Hz		
<b>Interfaces/protocols</b>	RS485 (Modbus); PROFIBUS DP; setup interface		
<b>Approvals</b>	Metrological certificate; cULus; DIN EN 14597		
<b>Special features</b>	Modular structure with individually retrofittable plug-in cards; easy-to-use setup program incl. startup software; min. sampling rate 50 ms; autotuning procedure for determining the controller parameters; programmable operating level; math and logic functions; also available in a special version for the plastics industry with hot channel startup ramp; heater current monitoring; Modbus master function; boost function		

Technical data



## Two-channel/four-channel process and program controller – JUMO DICON touch



Technical data	Designation	JUMO DICON touch
	Type	703571
	Format	96 mm × 96 mm × 131 mm
	Mounting	Metal/plastic housing for panel mounting
	Connections	Pluggable screw terminals
	Protection type	At the front IP66; at the rear IP20
	Number of control channels	2 or 4 independent and user configurable control channels
	Controller type	Two-state controller; three-state controller; modulating controller; continuous controller; continuous controller with integrated position controller
	Controller structure	P; I; PD; PI; PID (4 control parameter sets per channel)
	Program controller	32 programs with 50 sections each and 16 operating contacts
	Measurement inputs	4 universal analog inputs; 8 external analog inputs; 7 digital inputs; 8 external digital inputs
	Display	3.5 inch TFT color screen (320 × 420 pixels, 256 colors) with touchscreen operation; plain text display available in English, German, French, and other languages; process-specific texts and screens can be customized; bar graph display
	Outputs	Max. 12 internal outputs, depending on the hardware equipment: relay (changeover/N/O contact); digital output 0/12 V or 0/24 V; solid state relay AC 230 V, 1 A; PhotoMOS® relay DC 45 V, max. 200 mA, AC 30 V, max. 200 mA; analog output 0/2 to 10 V, 0/4 to 20 mA; extension with an external relay module (8 relays, 1 changeover contact 3 A/250 V) or extension with an external digital module (8 digital outputs 0/12 V, 20 mA)
	Alerts	16 limit value monitoring functions, each with 8 selectable alarm functions with timer and confirmation function
	Digital inputs	7 digital inputs for potential-free contacts
	Voltage supply	AC/DC 20 to 30 V, 48 to 63 Hz or AC 110 to 240 V +10/-15 %, 48 to 63 Hz
Interfaces/protocols	USB host, USB device, RS422/485 Modbus master/slave, PROFIBUS DP, Ethernet, PROFINET RT	
Approvals	cULus; DIN EN 14597; DNV GL	
Special features	Modular structure with individually retrofittable plug-in cards; intuitive operation via touchscreen; easy-to-use setup program incl. startup software; recording function with evaluation software; autotuning procedure for determining the controller parameters; programmable operating level; math and logic functions as well as additional binary signal processing; programmable function fields; teleservice and email notification; output level and control loop monitoring; integrated web server; Modbus master function; 5-digit analog value display; individual assignment of rights for different users (levels and control commands); Ethernet interface; weekly timer; visualization of process values through JUMO Device App; individual design of 4 process screens for plant visualization with interactive display and input fields; implementation of time-controlled processes via 32 user programs	



## Multichannel process and program controller with paperless recorder – JUMO IMAGO 500



Technical data	Designation	JUMO IMAGO 500
	Type	703590
	Format	144 mm × 130 mm × 170 mm, installation dimensions 92 × 92 mm
	Mounting	Panel mounting
	Connections	Pluggable screw terminals
	Protection type	At the front IP65; at the rear IP20
	Number of control channels	Up to 8 independent and user configurable control channels
	Controller type	Two-state controller; three-state controller; modulating controller; continuous controller; continuous controller with integrated position controller
	Controller structure	P; I; PD; PI; PID [2 control parameter sets per channel]
	Program controller	50 programs each with up to 100 sections; max. total of 1000 sections; 16 control tracks
	Measurement inputs	Up to 8 configurable analog inputs for: RTD temperature probe; resistance transmitter; thermocouples; current 0(4) to 20 mA; voltage 0(2) to 10 V; heater current; C-level control; customer-specific linearization possible
	Display	5-inch TFT color screen (320 × 420 pixels, 27 colors); plain text display available in English, German, French, and other languages; process-specific texts and screens can be customized; bar graph display
	Outputs	Max. 6 slots for the following plug-in cards: 2 relays (N/O contact), 1 relay (changeover contact), 2 logic outputs 0/5 V, 1 logic output 0/22 V, 1 solid state relay, 1 analog output, 1 voltage supply for two-wire transmitter via 22 V logic output
	Additional contacts	Up to 2 external relay modules with 8 changeover contacts or 8 logic outputs 0/12 V
	Alerts	16 limit value monitoring functions, each with 8 selectable alarm functions with timer and confirmation function
	Digital inputs	6 digital inputs for potential-free contacts
Voltage supply	AC 110 to 240 V +10/-15 %, 48 to 63 Hz; AC/DC 20 to 30 V, 48 to 63 Hz	
Interfaces/protocols	1 × RS422/485 (Modbus); 1 × PROFIBUS DP or RS422/485 (Modbus); setup interface	
Approvals	cULus	
Special features	Modular structure with individually retrofittable plug-in cards; easy-to-use setup program including startup software; recording function with evaluation software, min. sampling rate 50 ms; autotuning procedure for determining the controller parameters; programmable operating level; math and logic functions; programmable function keys and customizable process screen for plant visualization; teleservice and email notification (via external modem)	

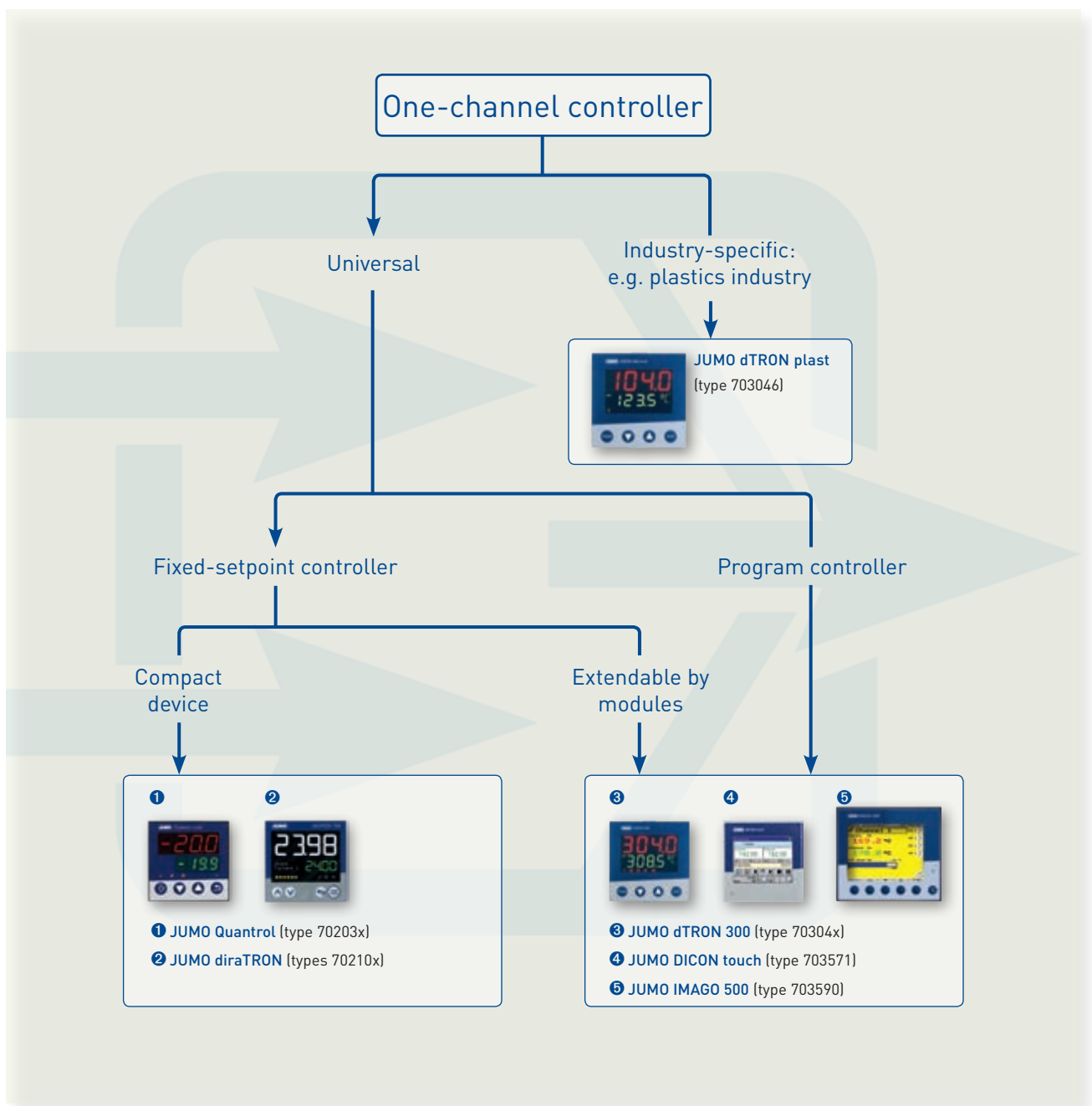
## Process control for the meat processing industry – JUMO IMAGO F3000



	<b>Designation</b>	JUMO IMAGO F3000
	<b>Type</b>	700101
<b>Technical data</b>	<b>Format</b>	307 × 165 mm (vertical or horizontal), mounting depth 107.6 mm
	<b>Mounting</b>	Plastic housing for panel mounting
	<b>Connections</b>	At the back via pluggable screw terminals
	<b>Protection type</b>	At the front IP67; at the rear IP20
	<b>Number of control channels</b>	4 independent and user configurable control channels
	<b>Controller type</b>	Two-state controller; three-state controller; modulating controller; continuous controller; continuous controller with integrated position controller
	<b>Controller structure</b>	P; I; PD; PI; PID (8 control parameter sets that can be freely assigned to the channels)
	<b>Program controller</b>	Program function (99 programs each with up to 99 sections); an additional 99 process steps can be programmed
	<b>Measurement inputs</b>	Up to 8 configurable analog inputs for: RTD temperature probes; thermocouples; current 0(4) to 20 mA; voltage 0(2) to 10 V
	<b>Display</b>	5-inch TFT color screen (320 × 420 pixels, 27 colors); plain text display available in English, German, French, and other languages; process-specific texts and screens can be customized; bar graph display; additional 4-digit, 7-segment displays (red) for displaying important process values
	<b>Outputs</b>	Max. 35 relays; max. 4 analog outputs
	<b>Alerts</b>	8 limit value monitoring functions, each with 8 selectable alarm functions with timer and confirmation function
	<b>Voltage supply</b>	AC 110 to 240 V +10/-15 %, 48 to 63 Hz; AC/DC 20 to 30 V, 48 to 63 Hz
	<b>Interfaces/protocols</b>	1 × RS 422/485 (Modbus); PROFIBUS DP; setup interface
	<b>Approvals</b>	cULus
<b>Special features</b>	Industry-specific features: core switching; smoke generator; fan control; input 0 to 1 V for humidity probe; F-value calculation  Modular structure with individually retrofittable plug-in cards; easy-to-use setup program; recording function with evaluation software; autotuning procedure for determining the controller parameters; programmable operating level; math and logic functions; programmable function keys and customizable process screen for plant visualization	

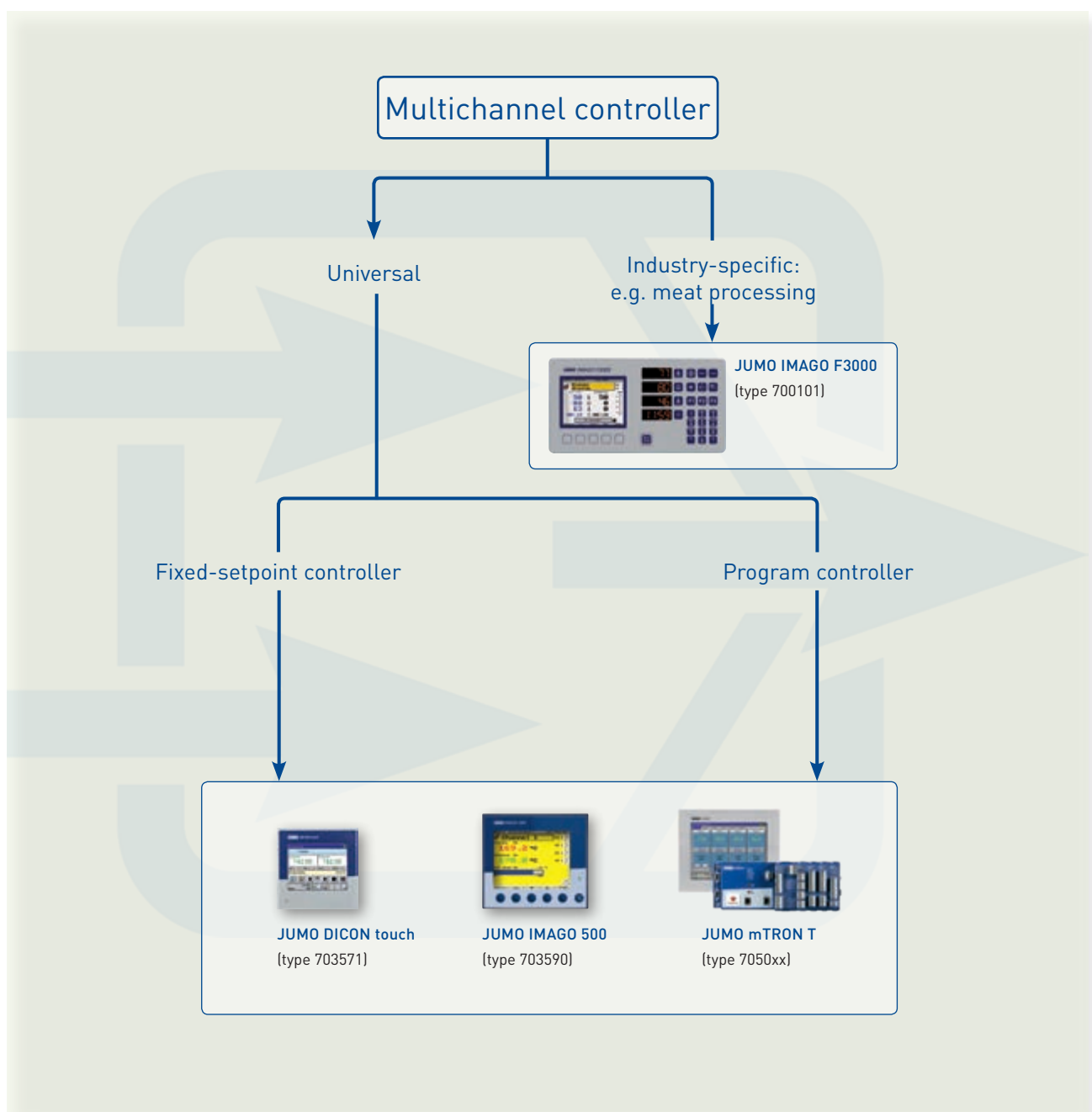


## Selection tool – one-channel controller





## Selection tool – multichannel controller





## General overview



Designation	JUMO Quantrol	JUMO diraTRON	JUMO dTRON
Type	70203x	70211x	70304x
Formats	48 mm × 48 mm × 95 mm 48 mm × 96 mm × 80 mm 96 mm × 96 mm × 80 mm	48 mm × 24 mm × 89 mm 48 mm × 48 mm × 78 mm 96 mm × 48 mm × 65 mm 48 mm × 96 mm × 65 mm 96 mm × 96 mm × 65 mm	48 mm × 48 mm × 95 mm 48 mm × 96 mm × 80 mm 96 mm × 48 mm × 65 mm 96 mm × 96 mm × 65 mm
Controller type	Two-state controller; three-state controller; continuous controller	Two-state controller; three-state controller; modulating controller	Two-state controller; three-state controller; modulating controller
Number of control channels	1	1	1
Program controller	-	✓	1 program with 4 control tracks
Ramp function	✓	✓	✓
Autotuning procedure for determining the controller parameters	Oscillation method	Oscillation method; step response method	Oscillation method; step response method
Number of control parameter sets	1	2	2
C-level control	-	-	-
Cascade control	-	-	-
Output level and control loop monitoring	-	✓	-
Operation	Foil with 4 keys	Foil with 4 keys	Foil with 4 keys
Display	LED	18-segment LCD display	LCD
Customizable process screen for plant visualization	-	-	-
Modular structure with plug-in cards that can be retrofitted individually	-	-	✓
Analog inputs	1	1	Max. 2
Customer-specific linearization	-	✓	10 value pairs
Heater current input	-	-	✓
Digital inputs	1	2	Max. 4
Switching outputs	Max. 5	Max. 6	Max. 9
Analog outputs	1	1	Max. 2
Voltage supply for transmitter	-	-	✓ (Except type 70304x)
Interfaces/protocols	RS485 (Modbus); setup (USB powered)	Setup interface (USB powered); RS485 interface (optional)	RS485 (Modbus)
Integrated web server	-	-	-
Timer	1	1	2
Weekly time switch	-	-	-
Operation hours counter	-	✓	-
Math and logic functions (incl. ratio, differential, and humidity control)	-	4 freely editable math or logic formulas	2 freely editable formulas
Recording function with evaluation software	-	-	-
Easy-to-use setup program	✓	✓	✓
Startup software	-	✓	✓
Protection type	IP65 (front)	IP65 (front)	IP65 (front)
Approvals	cULus	cULus in the preparation stage	Metrological DIN EN 1459

– Not available

✓ Available



	JUMO DICON touch	JUMO IMAGO 500	JUMO IMAGO F3000
	703571	703590	700101
mm × 90 mm mm × 90 mm mm × 90 mm mm × 90 mm	96 mm × 96 mm × 131 mm	144 mm × 130 mm × 170 mm, installation dimensions 92 × 92 mm	307 × 165 mm (vertical or horizontal), mounting depth 107.6 mm
oller; continuous controller	Two-state controller; three-state controller; modulating controller; continuous controller; continuous controller with integrated position controller		
	2 or 4	Max. 8	4
with up to 8 sections; cks	32 programs with 50 sections each and 16 operating contacts	50 programs each with max. 100 sections; max. total of 1000 sections; 16 control tracks	Program function (99 programs each with up to 99 sections); an additional 99 process steps can be programmed
	✓	✓	✓
	Oscillation method		
	4 per channel	2 per channel	8, freely assignable
	–	✓	–
	✓	✓	–
	✓	–	–
keys	Touchscreen	Foil with 6 keys	Foil with large keypad
	TFT 320 × 420 pixels; 256 colors	TFT 320 × 420 pixels; 27 colors	TFT-LED 320 × 420 pixels, 27 colors
	✓ (With interactive display and input fields)	✓	✓
	✓	✓	✓
	Max. 4	Max. 8	Max. 8
s	40 value pairs or polynomial	20 value pairs or polynomial	–
	–	✓	–
	7	6	Max. 21
	Max. 12 + 16 external	Max. 12 + 16 external	Max. 35
	Max. 5	Max. 6	Max. 4
ype 703041]	✓	✓	–
us); PROFIBUS DP; setup	USB host, USB device, RS422/485 Modbus master/slave, PROFIBUS DP, Ethernet, PROFINET RT	1 × RS422/485 (Modbus); 1 × PROFIBUS DP or RS422/485 (Modbus); setup interface	1 × RS 422/485 (Modbus); PROFIBUS DP; setup interface
	✓	–	–
	2	4	–
	✓	–	–
	✓	–	–
ble formulas	8 freely editable formulas and additional binary signal processing	16 freely editable formulas	4 freely editable math formulas and 16 freely editable logic formulas
	✓	✓	✓
	✓	✓	✓
	✓	✓	–
	IP66 (front)	IP65 (front)	IP67 (front)
ertificate; cULus; 7	cULus; DIN EN 14597; DNV GL	cULus	cULus

# Measuring, control, and automation system JUMO mTRON T

JUMO mTRON T combines a universal measured value recording system with a precise control system offering intuitive operation. It can also be expanded to a complete automation solution. The scalability of the JUMO mTRON T allows it to be individually adapted to a particular task. Tamper-proof data recording is just one of its outstanding features. Control and data recording meet the requirements of the AMS2750 and CQI-9 specifications.





## JUMO measuring, control, and automation system

JUMO mTRON T – a universally applicable device – uses an Ethernet-based system bus and an integrated PLC. Its modular structure also makes the measurement, control, and automation system a solution for decentralized automation tasks. JUMO mTRON T combines JUMO's extensive process expertise with a simple, application-oriented, and user-friendly configuration concept.



### Multifunction panel 840, type 705060

The panel with a 8.4" TFT touchscreen (640 × 480 pixels, 256 colors) displays data and process statuses. Among other features, the panel's predefined screen masks for service, controller, program generator, and recording functions make the overall system easy to use.

#### Features:

- Comprehensive user management – up to 50 different users and up to 16 user groups, each with individual rights allocation
- Individually-generated process screens in which measured value displays and input fields can be integrated
- Integrated paperless recorder for tamper-proof data recording for up to 54 analog and digital process values including batch logging
- Integrated web server
- Alarm and event lists
- Comprehensive interface connections: Ethernet/LAN, RS232, RS422/485, Modbus RTU as well as Modbus TCP (master/slave), USB host, USB device
- Robust metal case (die-cast aluminum), stainless steel option, protection type (front): IP67

### Central processing unit, type 705001

The central processing unit contains the process screen of your application with up to 30 modules (including input, output, and controller modules as well as power controllers but not including possible router modules) and at the same time manages the configuration and parameter data of your system. A setup program is used for quick and convenient hardware/software configuration as well as project planning of the measured value acquisition tasks and control tasks.

#### Features:

- CODESYS V3 PLC
- 9 program generators including process step function
- 64 limit value monitoring functions
- Math and logic modules
- Comprehensive interface connections: Ethernet/LAN, RS232, RS422/485, Modbus RTU as well as Modbus TCP (master/slave), PROFIBUS DP (slave), USB device
- Integrated web server
- Email functions (e.g. alarm for limit value violation)
- JUMO digiLine sensors for liquid analysis can be connected via PLC application



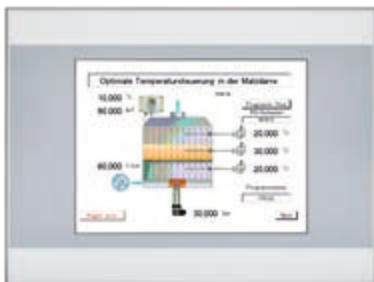
## Additional operating panels    Input and output modules

### Type 705065

The standard multifunction panel 840 acts as a human-machine interface for the JUMO mTRON T. When required, the automation system can be made even more flexible with additional operating panels.

### Features:

- Display sizes of 3.5" to 15"
- Direct access to PLC variables
- Up to 4 operating panels can be connected to each JUMO mTRON T central processing unit



Various modules are available for the inputs and outputs. These include an 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. JUMO mTRON T enables simultaneous operation of up to 120 control loops, as a result of which it can cope with demanding processes. Through expansion slots the inputs and outputs of each controller module can be individually expanded and adapted. The control loops operate fully independently here. This has the main advantage that no resources of the central processing unit are required. Power controllers can also be connected via the system bus. JUMO digiLine sensors for liquid analysis can be connected directly to the central processing unit as well.



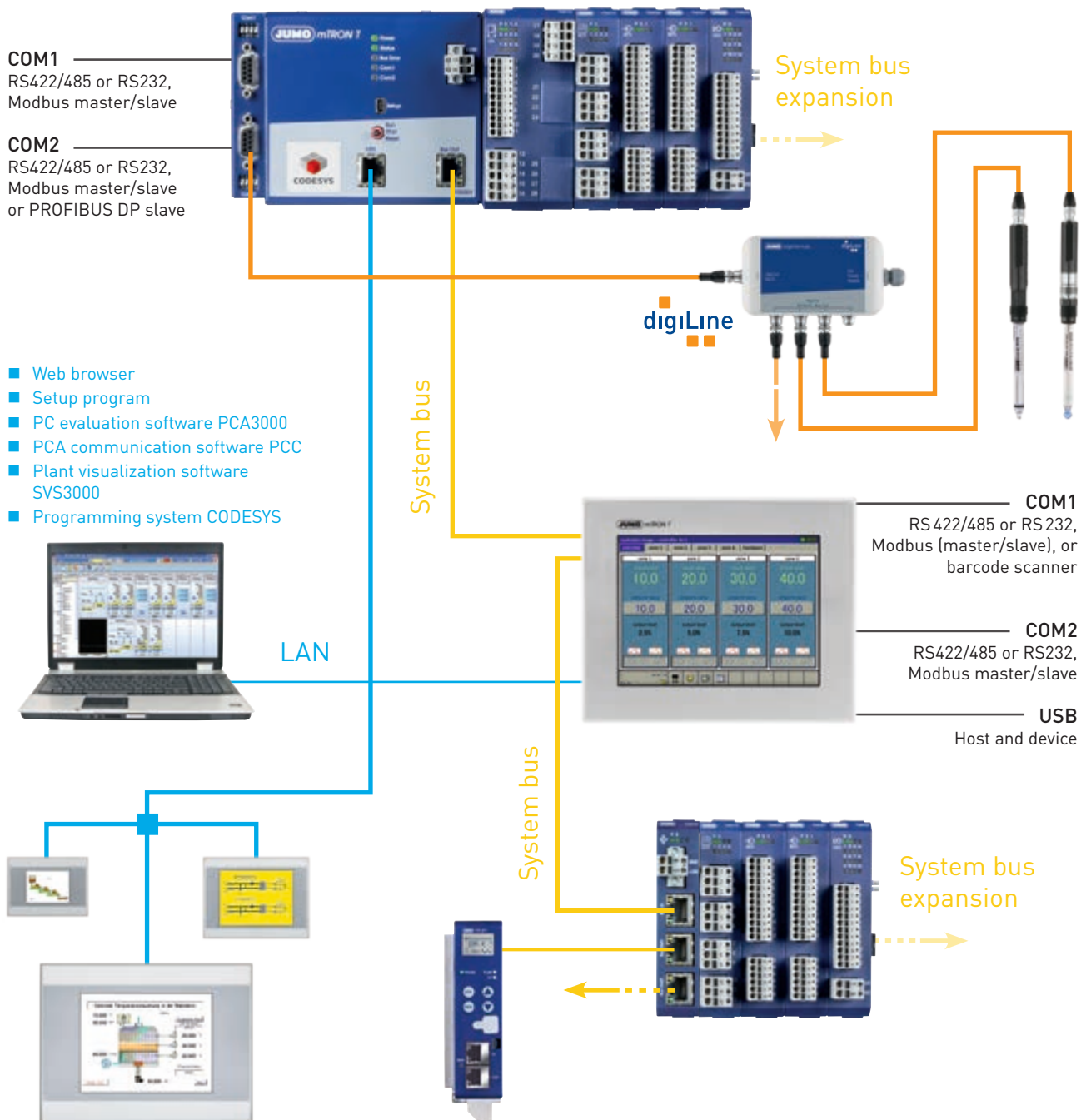


<b>Modules</b>	Multichannel controller module	Relay module 4-channel	Analog input module 4-channel	Analog input module 8-channel
<b>Type</b>	705010	705015	705020	705021
<b>Features</b>	Up to 4 independently configurable PID control loops with a fast cycle time and proven control algorithms; independent operation; math and logic functions; counter input up to 10 kHz	4 relay outputs controlled via the system bus by digital signals; respective changeover contact (230 V/3 A); switching statuses are displayed with LEDs	4 high-quality, user configurable analog inputs for RTD temperature probes, resistance transmitters, thermocouples, current 0(4) to 20 mA, voltage 0(2) to 10 V; all inputs are galvanically isolated from each other; customer-specific linearization possible; limit value monitoring function; additional digital input	8 high-quality analog inputs for RTD temperature probes Pt100, Pt500, Pt1000 in two-wire circuit; limit value monitoring function; additional digital input



<b>Modules</b>	Analog output module	Digital input and output module 12-channel	Router module	Power controller JUMO TYA 200 series
<b>Type</b>	705025	705030	705040	709061, 709062, 709063
<b>Features</b>	4 user configurable analog outputs 0(4) to 20 mA or 0(2) to 10 V; output behavior adjustable in case of malfunction	12 digital channels, each configurable as input DC 0/24 V or as output DC 24 V; capacity per output: 500 mA; switching statuses are visualized by LED	Distribution of input and output modules on several mounting rails or control cabinets; support of decentralized module arrangement	For one-phase and three-phase operation; continuous load current up to 250 A, load voltage up to 500 V; different circuit variants, load and operating modes possible

# System structure



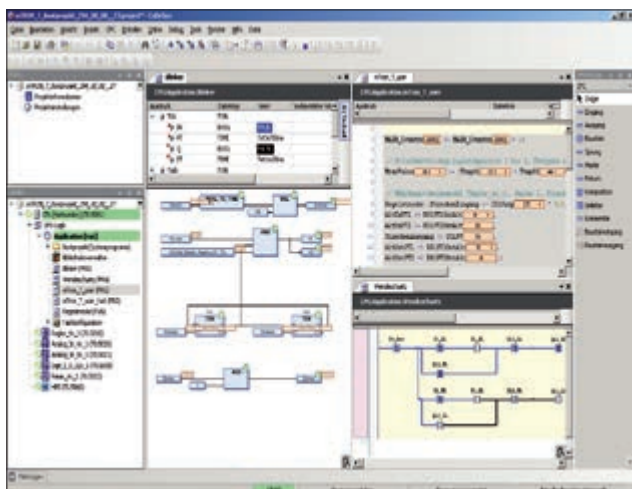


## Configuration

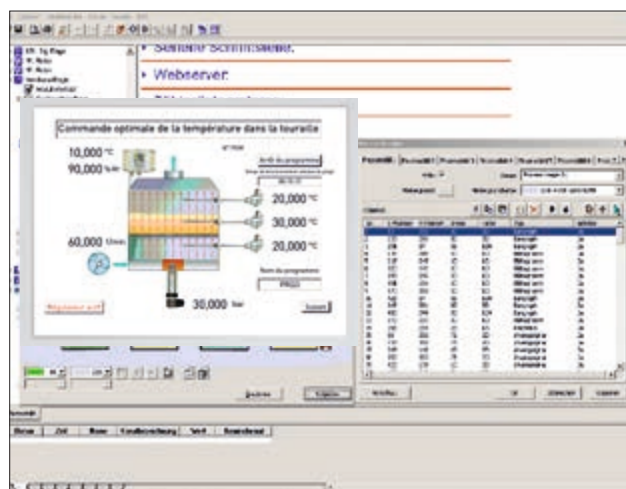
The option of individually presenting the plants, including their processes and individual sections, is very important to an automation system. For this purpose up to 18 process screens can be individually generated in the multifunction panel. In turn, up to 150 objects can be presented per process screen on up to 16 different levels.

Other than the necessary system functionality, project planning software that is as simple and intuitive to operate as possible was at the heart of JUMO's product development. For this reason, hardware and software configuration as well as project planning of the measured value acquisition and control tasks using the setup program are carried out for the JUMO mTRON T with the same look and feel as other JUMO devices. To ensure an automation solution according to IEC 61 131-3, access to the CODESYS V3 programming system has been integrated in the JUMO setup program.

This means that the hardware assignment as well as the designation of the physical inputs and outputs are adopted automatically. Project variables can then be defined and linked to a particular input or output address of the hardware assignment that appears in the device tree. All editors for programming the control application defined in the IEC 61 131-3 standard are available in CODESYS. After programming the automation solution with CODESYS, the project data is transferred from the setup program again. As a result the complete application can be acquired in a project file, which greatly simplifies project management and version maintenance.



PLC programming system CODESYS V3

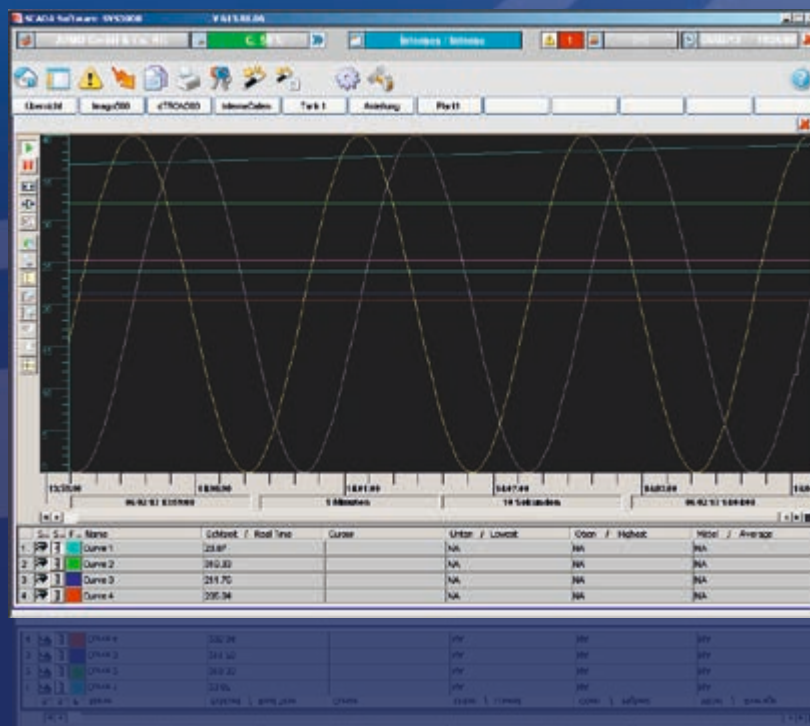


Setup program with process screen editor including process screen preview

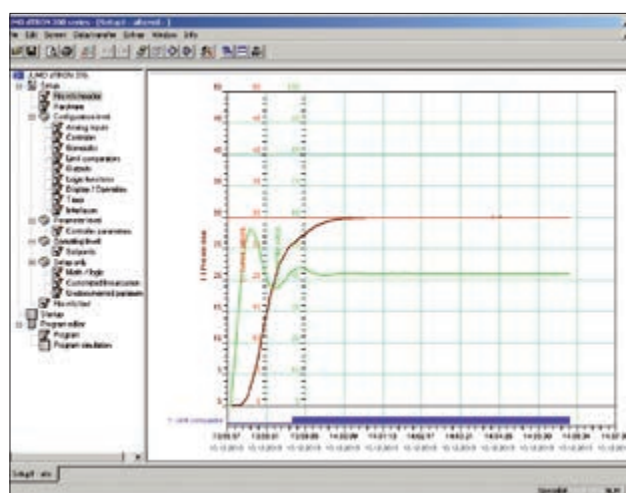
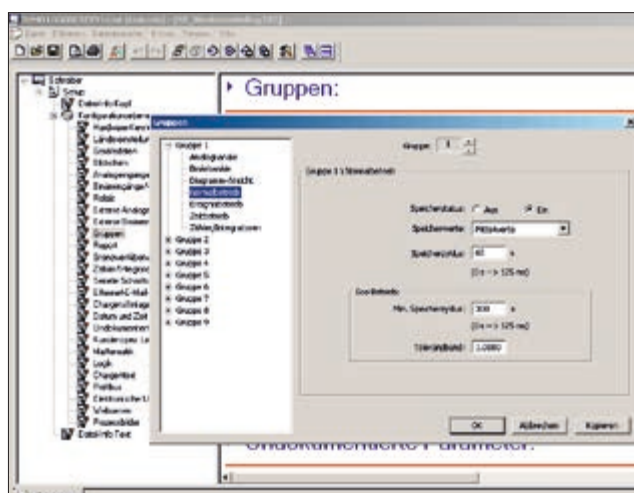


# Software

JUMO offers an intuitive PC-based setup program for all digital compact controllers which supports the user during device configuration and parameterization. It also facilitates the control-technological optimization of plants or processes and thereby contributes to such goals as achieving better energy efficiency. The startup tool contained in the setup program is particularly helpful during startup. The professional evaluation software PCA3000 can be used to manage, archive, visualize, and evaluate historical process data acquired by the integrated paperless recorder of a digital controller or the JUMO mTRON T automation system. The plant visualization software SVS3000 (also PC-based) enables on-line visualization and logging of important process values – features that can also be performed for batches if required. Preprogrammed graphic elements facilitate the creation of an individual process image. In addition, the JUMO mTRON T automation system is equipped with the CODESYS V3 PLC programming system, which is easy to program via the development environment embedded in the setup program.



## PC software components



### Setup program

The setup program is used for convenient project planning and configuration of your digital compact controller via the PC. Integrated auxiliary functions assist you in adjusting the controller to your process or your application.

- User-friendly configuration and parameterization
- Diagnosis function (display of the process data) \*
- Input of math and/or logic formulas \*
- Program editor \*
- Process screen editor \*
- Simple printout of the configuration for documentation purposes\*\*

### Startup software\*\*

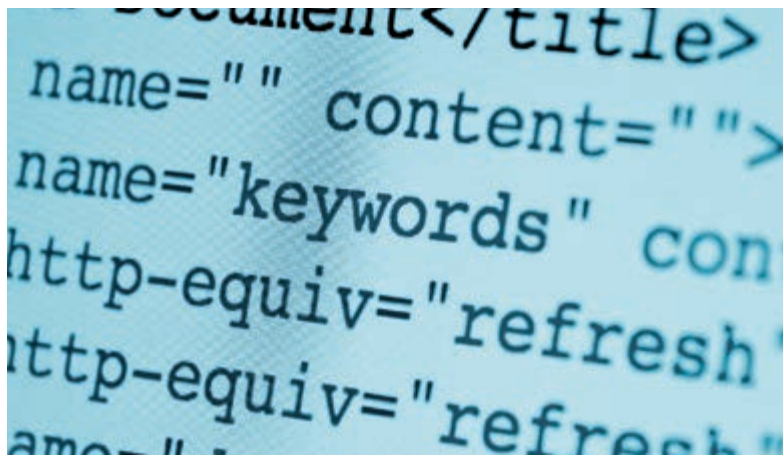
This software tool included in the setup program enables real-time visualization and storage of analog and binary signals during a startup or optimization phase (e.g. after a tool change). A visual display of the key process data in real-time is particularly useful when carrying out demanding processes.

- Visualization, monitoring, and recording of relevant analog and binary signals
- Triggering of a setpoint value change for determining control-related characteristic values based on the plant behavior
- Straightforward comparison of control results for various controller parameters
- Random monitoring of control quality
- No additional devices required to assist with startup

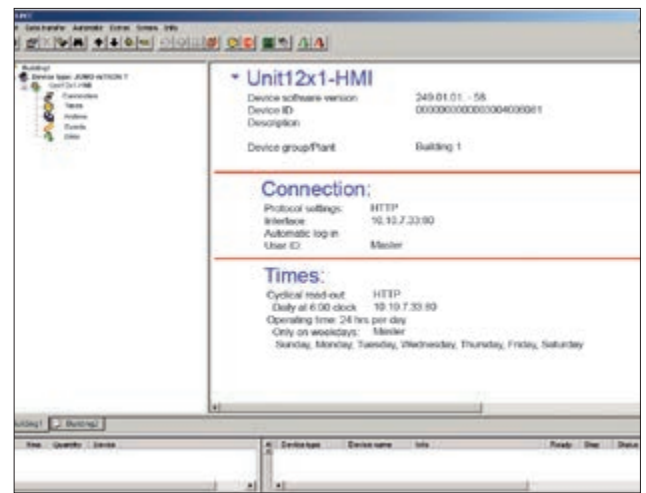
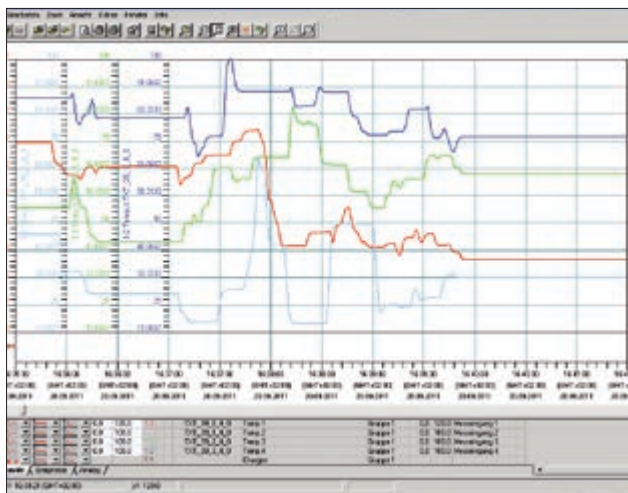
\* Included in certain JUMO compact controllers and the JUMO mTRON T automation system

\*\*Included in certain JUMO compact controllers





## PC software components



### Evaluation software PCA3000

The PC-based, professional evaluation software PCA3000 can be used to manage, archive, visualize, and evaluate historical process data (measurement data, batch data, notifications, etc.). The data can be imported via USB flash drive or memory card. It can also be made available for central data processing via the PCC communication software.

- Easy, straightforward backup and archiving of all process data in a data file
- Archived data can be read and visualized directly from the CD-ROM/DVD
- Graphical measured value processing: evaluation of measured data using a min/max search and zoom function (magnifying glass)
- Data export with PCA3000 form output in a variety of formats (CSV, HTML, PDF)

### PCA communication software PCC

The communication software PCC, which is optimally adapted to PCA3000, enables easy extraction of data via Ethernet, serial interface (USB, RS485), or modem.

- Time-controlled, automatic data extraction via interface or modem
- Easy, straightforward archiving of all process data in a data file on a hard disk drive or a network server
- Diagnosis function (display of current process data, e.g. via modem or Ethernet)
- Can be launched as a Windows® system service
- Email notification in the event of communication failure

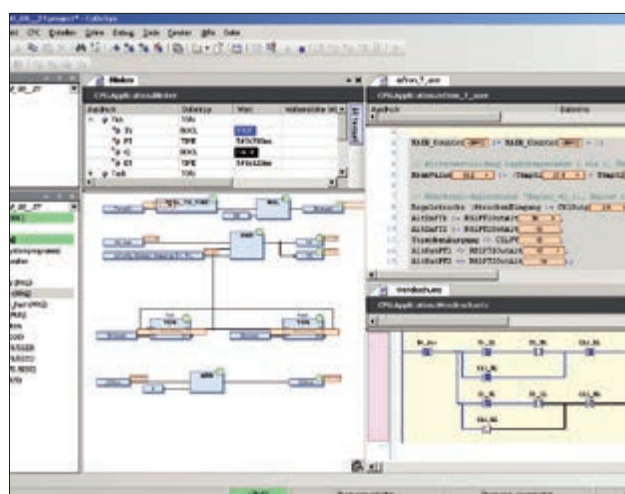




### Plant visualization software SVS3000

The visualization software SVS3000 enables the visualization of process data in real time or as a historical trend on the PC. The diverse reporting functions with batch-related protocol creation make the evaluation of archived production data easier. Thanks to preprogrammed graphic objects, the visualization of plant-specific components and processes in the form of group screens and process screens is easy. You have the option of processing 75, 250, 1,000, or 5,000 process variables.

- Comprehensive library with graphic elements for individual process screens
- Pre-programmed graphic objects for depicting all JUMO controllers
- Quick and simple creation of customized group screens and trend screens
- Plant operation via group screens and/or process screens
- Extensive documentation function with continuous and batch related evaluation
- Search function for date and time, plants, and freely definable batch criteria
- Automatic printout and data export



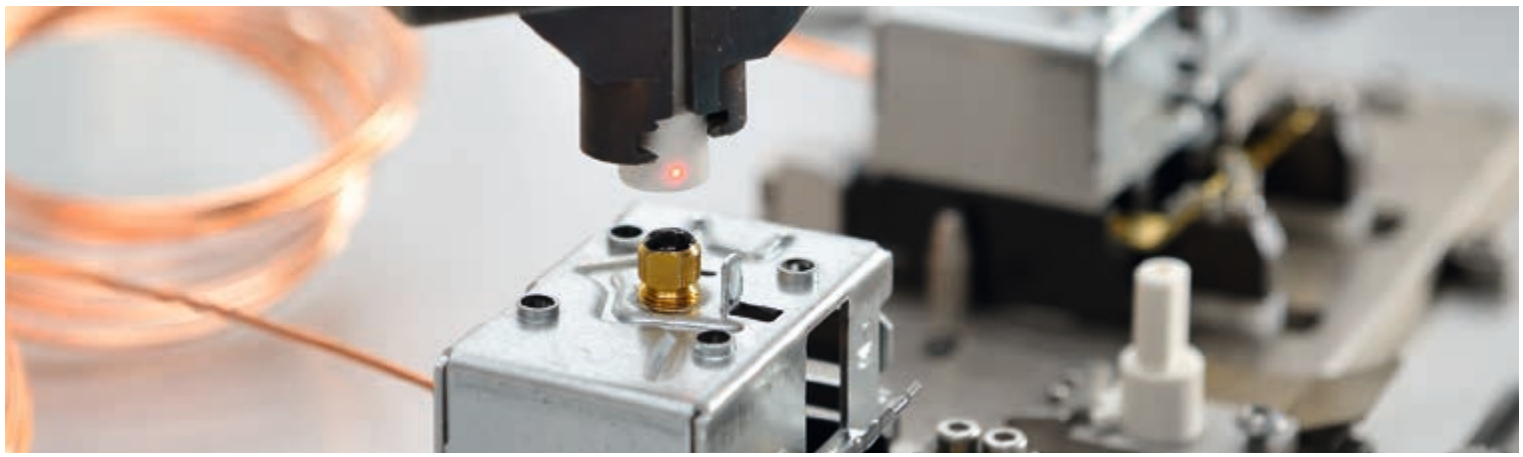
### PLC programming system CODESYS V3

The CODESYS development environment, which is included with the JUMO mTRON T, is a comprehensive software tool for industrial automation. This widely used PLC programming system according to IEC 61 131-3 enables the implementation of almost all automation tasks.

All editors defined in the standard are available for programming your control applications:

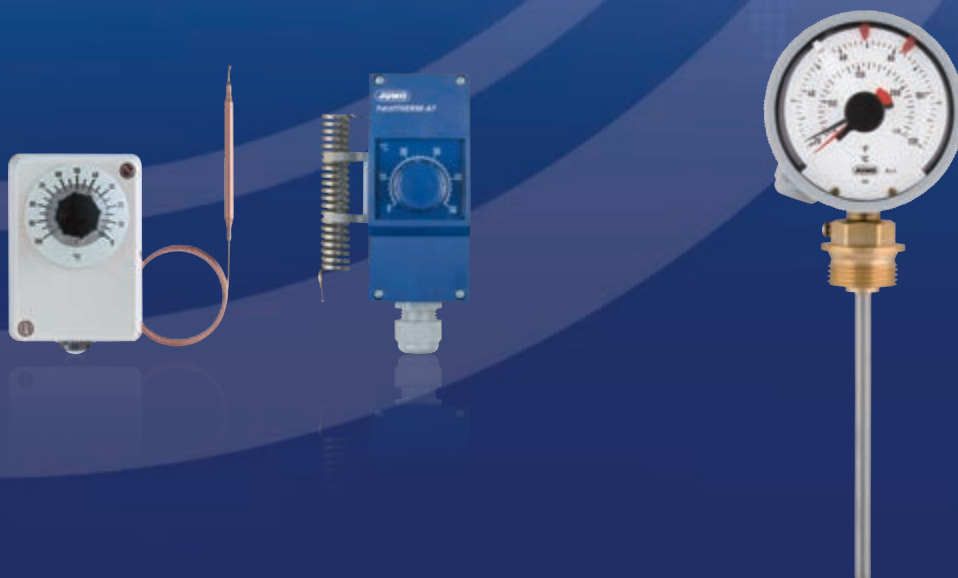
- For structured text (ST)
- Continuous function chart (CFC)
- Sequential function chart (SFC)
- Function block diagram (FBD)
- Ladder diagram (LD)
- Instruction list (IL)





# Electromechanical thermostats and contact dial thermometers

Electromechanical thermostats and contact dial thermometers have been an integral part of the JUMO product range for decades. Throughout this period these devices have proven themselves to be extremely reliable in controlling and regulating basic thermal processes. They are used in many sectors of industry because they do not require any additional auxiliary energy and because they are completely impervious to electromagnetic interference. Thanks to the broad product portfolio – which includes panel-mounted thermostats, surface-mounted thermostats, and contact dial thermometers – we are able to provide the ideal device for nearly all applications. In the event that standard versions do not optimally meet the requirements, customer-specific adaptations can be made. Furthermore, the comprehensive range of thermostats we stock enables us to quickly serve customers with urgent requirements.

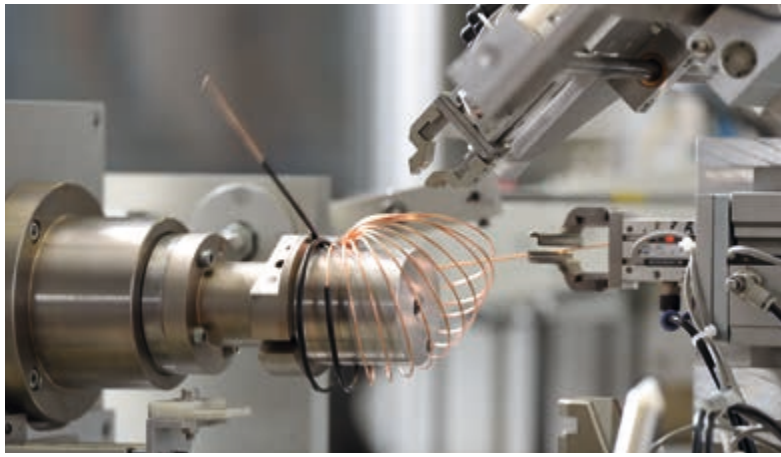


## Panel-mounted thermostats



<b>Designation</b>	Panel-mounted thermostat EM series	Panel-mounted thermostat EM series	JUMO heatTHERM panel-mounted thermostat	JUMO heatTHERM P100 panel-mounted thermostat	JUMO heatTHERM P300 3-phase panel-mounted thermostat
<b>Type</b>	602021, 602025	602026	602030, 602031	602051	602090
<b>Features</b>	Batch size according to customer specification; temperature ranges up to 650 °C possible	Batch size according to customer specification	Economic large-scale production; temperature compensation as a standard feature	Entry-level class thermostat	3-phase panel-mounted thermostat
<b>Versions</b>	Temperature controller (TR); temperature monitor (TW); temperature limiter (TB); safety temperature monitor (STW); safety temperature limiter (STB)	Safety temperature monitor (STW); safety temperature limiter (STB)	Temperature controller (TR); temperature monitor (TW); safety temperature monitor (STW); safety temperature limiter (STB)	Temperature controller (TR)	Safety temperature limiter (STB)
<b>Switching element</b>	1, 2, 3, or 4 single-pole snap-action switches	Single-pole snap-action switch	Single-pole snap-action switch	Snap-action switch	Switching mechanism which disconnects all contacts at the same time
<b>Switching capacity</b>	16 A, 230 V	10 A, 230 V	16 A, 230 V	N/C contacts 1-2: AC 230 V, 16 (2.5) A N/O contacts 1-4: AC 230 V, 4 (1) A	N/C contact: 40 to 480 V; 0.5 to 30 A (5.0 A) N/O contact: AC 40 to 480 V; 0.5 to 2 A (0.3 A)
<b>Maximum control range and limit value</b>	500 °C (type 602021); 650 °C (type 602025)	300 °C	350 °C	30 to 90 °C 30 to 120 °C	Limit value permanently set, upon request
<b>Approvals</b>	DIN; UL; DGRL; EAC; DVGW (up to 500 °C)	DIN; UL; DGRL; DVGW; EAC	DIN; UL; DGRL; EAC	–	VDE, UL
<b>Application areas</b>	Heating industry, air-conditioning, heating cabinets, plastics industry, oven engineering, general mechanical engineering			Electric heat generators, heating devices, heating elements, canteen kitchen technology	Screw-in heaters, electric heaters, food industry, canteen kitchen technology and catering sector, electric heat generators, heating devices, heating elements

Technical data



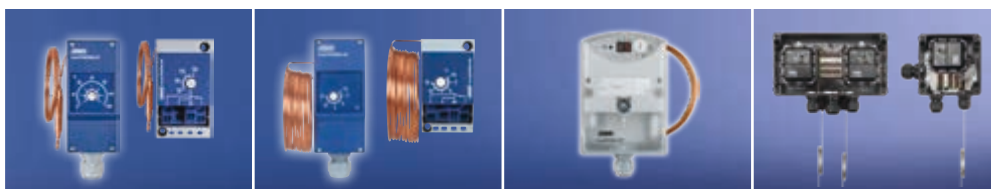
## Surface-mounted thermostats



	<b>Designation</b>	Surface-mounted thermostat ATH series	Surface-mounted thermostat ATH series	Surface-mounted thermostat ATH-SE series	Surface-mounted double thermostat JUMO heatTHERM S600
	<b>Type</b>	603021, 603035	603026, 603035	603031	603045
<b>Technical data</b>	<b>Features</b>	Single thermostat	Double thermostat	Single thermostat	Double thermostat
	<b>Versions</b>	Temperature controller (TR); temperature monitor (TW); safety temperature monitor (STW); safety temperature limiter (STB)			Temperature monitor (TW) with safety temperature limiter (STB) (adjustable)
	<b>Switching element</b>	Single-pole snap-action switch			
	<b>Switching capacity</b>	10 A, 230 V	10 A, 230 V	10 A, 230 V	AC 24 to 230 V, 0.1 to 10 A
	<b>Maximum control range and limit value</b>	500 °C	500 °C	300 °C	300 °C
	<b>Protection type</b>	IP54; IP65 (603035)		IP54	IP54 (DIN EN 60529)
	<b>Approvals</b>	DIN; DGRL (603021/603026)		DNV GL; Bureau Veritas; DIN; DGRL	–
	<b>Application areas</b>	Heating industry; air-conditioning industry; general mechanical engineering		Shipbuilding	Heating, ventilation, and air-conditioning industry, industrial applications



## Surface-mounted thermostats



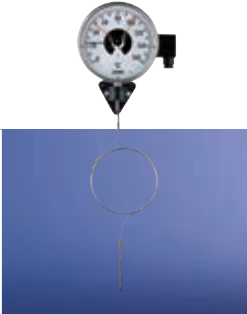



<b>Designation</b>	Surface-mounted thermostat JUMO heatTHERM-AT/DR	Frost protection thermostat JUMO frostTHERM-AT/DR	Electronic frost protection thermostat JUMO frostTHERM-ATE	Explosion-protected surface-mounted thermostat JUMO exTHERM-AT
<b>Type</b>	603070	604100	604170	605055
<b>Features</b>	Single and double thermostat; room thermostat; thermostat for DIN-rail mounting; exhaust gas temperature monitor	Probe line available in lengths of 3 m, 6 m, and 12 m	Single thermostat; voltage supply 24 V (SELV); probe line available in lengths of 2 m and 6 m	Single thermostat and double thermostat
<b>Versions</b>	Temperature controller (TR); temperature monitor (TW), safety temperature monitor (STW); safety temperature limiter (STB)	Safety temperature monitor (STW); safety temperature limiter (STB)	Temperature monitor (TW); temperature limiter (TB)	Temperature monitor (TW); temperature limiter (TB); safety temperature monitor (STW); safety temperature limiter (STB)
<b>Switching element</b>	Single-pole snap-action switch		Relay output; analog output	Pressure-resistant enclosed panel-mounted thermostat
<b>Switching capacity</b>	16 A, 230 V	16 A, 230 V	Relay output 6 A, 230 V; analog output 0 to 10 V	16 A, 230 V; optionally 25 A, 230 V
<b>Maximum control range and limit value</b>	350 °C	15 °C	10 °C	500 °C
<b>Protection type</b>	IP40; IP54 optionally		IP42	IP65; IP67 optionally
<b>Approvals</b>	DIN; UL; DGRL; EAC	EAC	–	ATEX; IECEx; RTN; EAC; DIN
<b>Application areas</b>	Building automation; heating industry; air-conditioning industry; control cabinets (DR); general mechanical engineering	Air-conditioning and cooling system engineering; refrigeration units; mechanical and plant engineering		Potentially explosive areas in zones 1 and 2 or 21 and 22; use in zone 0 with corresponding thermowell

Technical data



## Contact dial thermometers

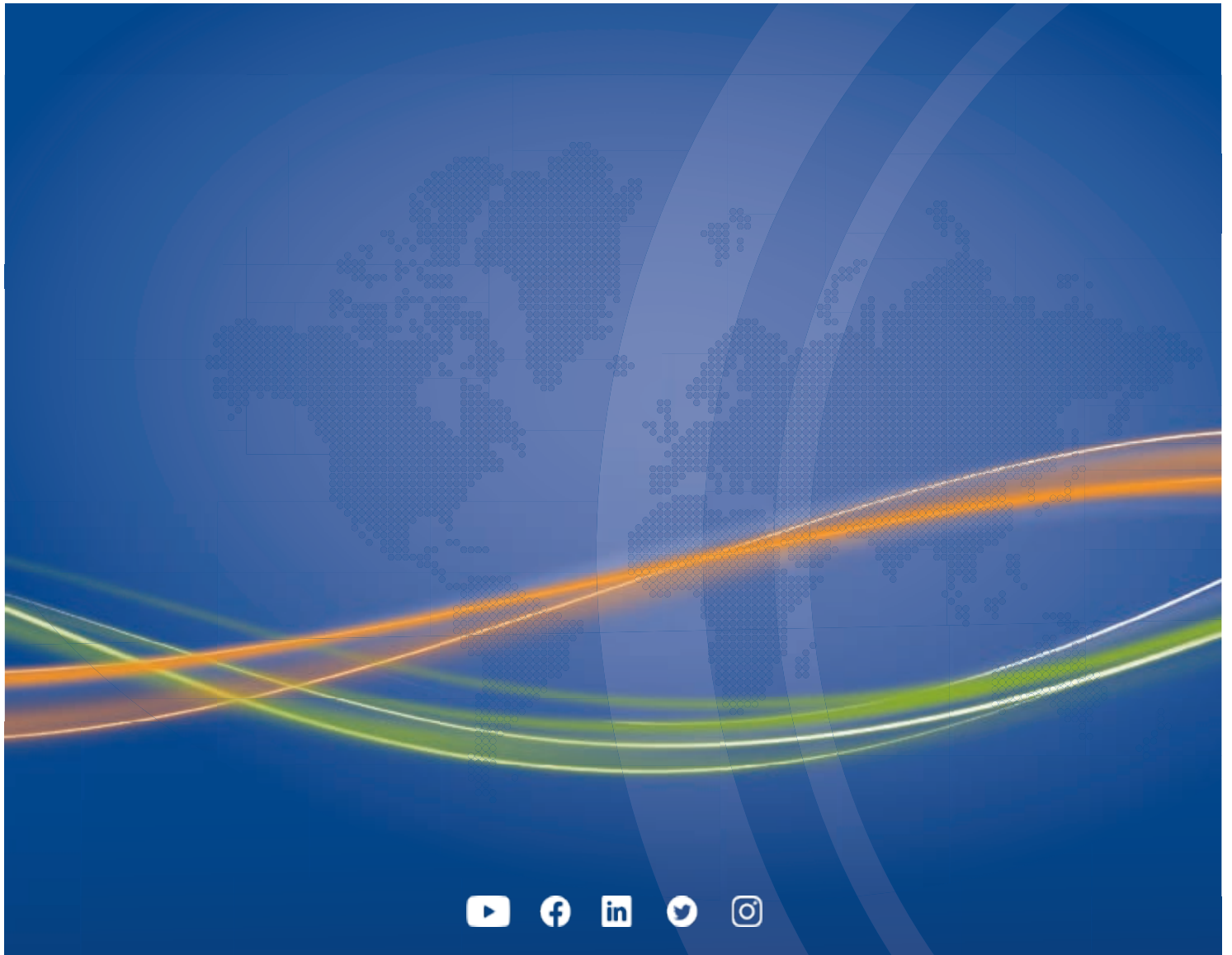
				
<b>Designation</b>	JUMO Microstat-M	JUMO contact dial thermometer	JUMO contact dial thermometer in bayonet housing	JUMO dicoTEMP 800 dial thermometer with microswitch
<b>Type</b>	608501	608520, 608523, 608540	608425	608530
<b>Features</b>	Temperature controller with a microswitch in a plastic flush-mounted housing; sheet steel housing as an optional extra	Temperature controller with up to 2 microswitches; IP65 possible (type 608523)	Temperature controller in panel-mounted or surface-mounted housing; ambient temperature compensation as a standard feature	Temperature controller with actual value display
<b>Application areas</b>	Compressor engineering; oven engineering	Oil temperature monitoring in industrial transformers; process technology	Process technology; oven engineering	Fish and chips industry; industrial applications
<b>Accuracy class according to DIN EN 13 190</b>	Class 2	Class 1.5	Class 1	Class 1.5
<b>Housing size</b>	60 mm; 80 mm; 100 mm	60 mm; 80 mm; 100 mm out of CrNi (608540 out of polyamide, only 80 mm)	100 mm; 160 mm	80 mm
<b>Capillary/rigid thermowell</b>	With capillary	Rigid thermowell or capillary (up to 10 m)		With capillary
<b>Probe outlet</b>	-	Vertical or horizontal		-

## Smart tube for diverse temperature measurement



Technical data	Designation	JUMO dicoTEMP 100 Smart tube for diverse temperature measurement
	Type	608740
	Material	Stainless steel
	Transmitter (optional)	4 to 20 mA or IO-Link (cable transmitter for temperature JUMO dTRANS T09 AS, analog output or JUMO dTRANS T09 DS, digital output)
	Protection type	IP66, IP67, IP69
	Sensor	Pt100 or Pt1000 in four-wire circuit with M12 connection
	Insertion length	65 to 300 mm
	Probe diameter	6, 8, or 10 mm
	Process connection	Thread for screwing in G1/2", G1", smooth pipe
	Process temperatures	-40 to +260 °C
	Ambient temperatures	-40 to +85 °C
	Application areas	Transformer and compressor construction, service area (retrofit), hydraulic units, general mechanical and plant engineering, particularly water treatment plants
	Special features	Easy startup, diverse temperature measurement based on 2 different measuring principles, only 1 measuring point required for diverse temperature measurement thanks to smart tube, compact system, various output signals – resistance signal, analog signal and digital signal, Plug and Play functionality

**JUMO dicoTEMP 100** combines the strengths of various measurement methods. Thermostats and dial thermometers that are already integrated into the process can continue to be used at the same measuring point and be expanded functionally with electrical temperature measurement. This way, a diverse measurement is simultaneously implemented and a signal is emitted for further processing. The appropriate JUMO dTRANS T09 cable transmitter can be used to provide either an analog signal (4 to 20 mA) or IO-Link. JUMO dicoTEMP 100 thereby permits simple retrofitting and digitization of the plant.



[www.jumo.net](http://www.jumo.net)