eTRON M
Electronic Microstat

76 x 36 mm format

Brief description

The JUMO eTRON M is a compact, digital electronic thermostat for simple temperature control (heating or cooling). The measurement input permits the connection of resistance thermometers or thermocouples, or standard current or voltage signals. The measured value is shown on a 3-digit backlit display. The switching states of relays K1 and K2 are indicated by two LEDs.

The instrument incorporates a simple defrosting function as well as an operating hours counter, which can, for instance, be used to record the operating time of a cooling compressor.

The instrument can be operated from 4 keys on the front panel. The electrical connection is made via screw terminals on the back of the instrument.

A setup program and a PC interface are available as accessories, for simple configuration and parameterization from a PC.
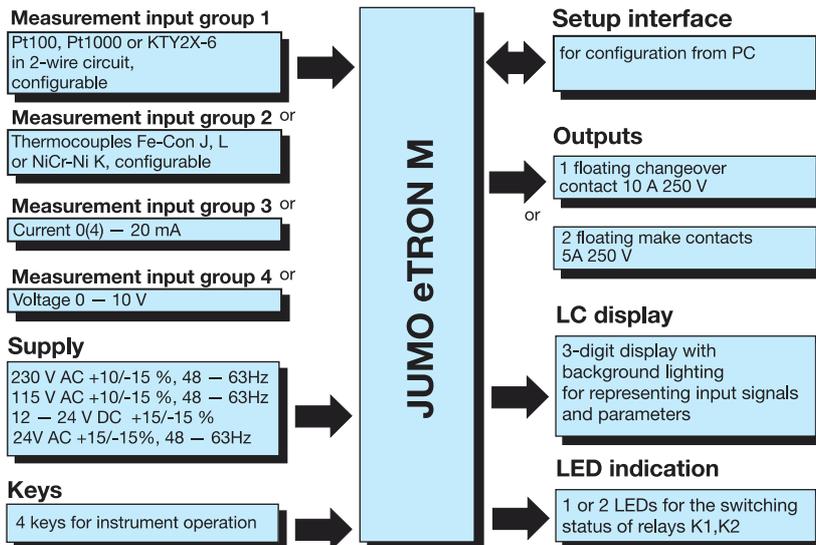
Type 701060/XX2...

Key features

k Integrated defrosting function

k Heating or cooling is configurable

k Limit monitoring

k Available for resistance thermometer, thermocouple, standard current or voltage signals, according to choice

k Choice of a 10A relay or two 5 A relays

k Adjustable switching hysteresis

k Time-delayed switch-on after power-on is selectable, e. g. for staggered starting of several equipment units

k Operating hours counter

k Symbols for operating modes, °C, °F, hours, minutes and seconds in display

k Parameter level protected by code

k Setup program for configuration and archiving via PC

k Customized linearization via tabular function in the setup program

k UL approval

Block structure

Measurement input group 1

Pt100, Pt1000 or KTY2X-6 in 2-wire circuit, configurable

Measurement input group 2 or

Thermocouples Fe-Con J, L or NiCr-Ni K, configurable

Measurement input group 3 or

Current 0(4) — 20 mA

Measurement input group 4 or

Voltage 0 — 10 V

Supply

230 V AC +10/-15 %, 48 — 63Hz
115 V AC +10/-15 %, 48 — 63Hz
12 — 24 V DC +15/-15 %
24V AC +15/-15%, 48 — 63Hz

Keys

4 keys for instrument operation

JUMO eTRON M

Setup interface

for configuration from PC

Outputs

1 floating changeover contact 10 A 250 V

or

2 floating make contacts 5A 250 V

LC display

3-digit display with background lighting for representing input signals and parameters

LED indication

1 or 2 LEDs for the switching status of relays K1,K2

Displays and controls

LC display	3-digit segment display, 13 mm high, and symbols for temperature unit, h, min, s, defrosting and heating, with red background lighting
Status indication	LED K1/K2 lights up when relay K1/K2 is energized. LED K1/K2 goes out when relay K1/K2 is de-energized.
Keys	⏯ for start-stop
	Ⓟ programming
	▲ increase parameter value
	▼ decrease parameter value
Setup interface	The instrument is linked to the PC via a PC interface with TTL/RS232 converter and adapter (3-pin).

Technical data

Measurement input	Designation	Measuring range	Meas. accuracy [1] ambient temperature error	Recognition of ...	
				Probe short-circuit	Probe break
Resistance thermometer	Pt100 EN 60 751	-200 to +600°C	0.1%/ ≤100ppm/°C	is recognized	is recognized
	Pt1000 EN 60 751	-200 to +600°C	0.1%/ ≤100ppm/°C	is recognized	is recognized
	KTY2X-6 (PTC)	-50 to +150 °C	1%/ ≤100ppm/°C	is recognized	is recognized
	Resistance 0 — 3000 Ω	customer table [3]	0.1%/ ≤100ppm/°C [3]	= 0Ω	is recognized
Measuring current for Pt100: 0.2 mA, for Pt1000, KTY2X-6 and resistance: 0.02 mA					
Lead compensation is adjustable via the parameter Lead compensation resistance $OF.r$					
The total resistance (sensor+lead) must not exceed 320 Ω for Pt100 and 3200 Ω for Pt1000, KTY2X-6 or resistance.					
Thermocouple	Fe-Con J EN 60 584	-200 to +999 °C	0.4%/ ≤100ppm/°C [2]	-	is recognized
	Fe-Con L DIN 43 710	-200 to +900 °C	0.4%/ ≤100ppm/°C [2]	-	is recognized
	NiCr-Ni K EN 60 584	-200 to +999 °C	0.4%/ ≤100ppm/°C [2]	-	is recognized
	-10 to 60 mV	customer table [3]	0.1%/ ≤100ppm/°C [3]	-	is recognized
For the voltage input (-10 to 60 mV), terminal temperature compensation can be used for thermocouples.					
Internal terminal temperature compensation can be switched off via the setup program (0°C).					
Current	0 — 20 mA	-2 to 22 mA scalable with ScL and ScH or customer table	0.1%/ ≤100ppm/°C [3]	-	-
	4 — 20 mA	2.4 to 21.6 mA scalable with ScL and ScH	0.1%/ ≤100ppm/°C [3]	is recognized	is recognized
Input resistance R$_{IN}$ ≤ 3Ω					
Voltage	0 — 10 V	-1 to 11 V scalable with ScL and ScH or customer table	0.1%/ ≤100ppm/°C	-	-
Input resistance R$_{IN}$ ≥ 100kΩ					

1.) The accuracies refer to the measuring range span.
2.) valid from -50°C
3.) A valid customer table must be entered via the setup program and changed over to tAb in the instrument. This may reduce the measuring accuracy.

Additional data

Sampling time	250 msec
Input filter	1st order digital filter; filter constant dF adjustable from 0.1 — 99.9sec
Measurement offset	adjustable from -99.9 to +99.9 via the parameter $OF.t$
Special features	display of temperature unit: °C, °F (Fahrenheit) or switched-off
Customer table	The setup program acquires a maximum of 20 value pairs and uses them for the linear interpolation of 20 new calibration points.

Ambient conditions

Ambient temperature range	0 to +50°C, with side-by-side mounting: 0 to +40°C
Storage temperature range	-40 to +70°C
Climatic conditions	≤ 75% rel. humidity, no condensation
Cleaning and care of front panel	The front panel can be cleaned with all the usual cleaning and rinsing agents. Do not use solvents such as methylated spirit, white spirit, P1 or xylene!

Output

1 relay (changeover contact) for Type 701060/XX1-XX	150,000 operations at 10A 250V AC 50Hz resistive load
2 relays (make contacts) for Type 701060/XX2-XX	100,000 operations at 5A 250V AC, 50Hz resistive load

Supply

Supply voltage	230V AC +10/-15%, 48 — 63Hz or 115V AC +10/-15%, 48 — 63Hz (isolated from measurement input)
	12 — 24V DC +15/-15%, 24V AC +15/-15%, 48 — 63Hz (not isolated from measurement input)
Power consumption	<3VA

Housing

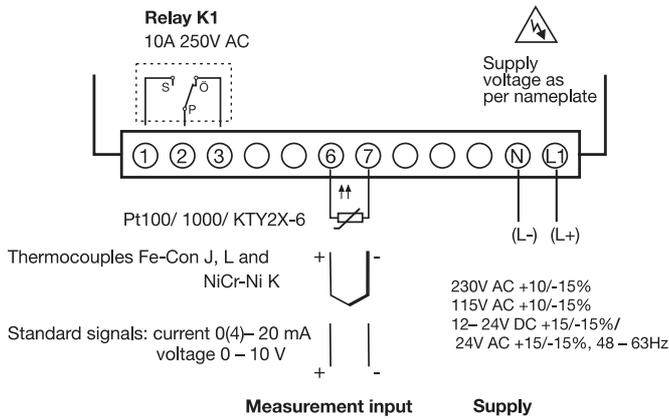| Material	polycarbonate
Mounting	in panel cut-out with bezel seal
Operating position	unrestricted
Weight	approx. 160g
Protection	front IP65, rear IP20
Flammability class	UL 94 V0

02.07/00440437

Electrical data

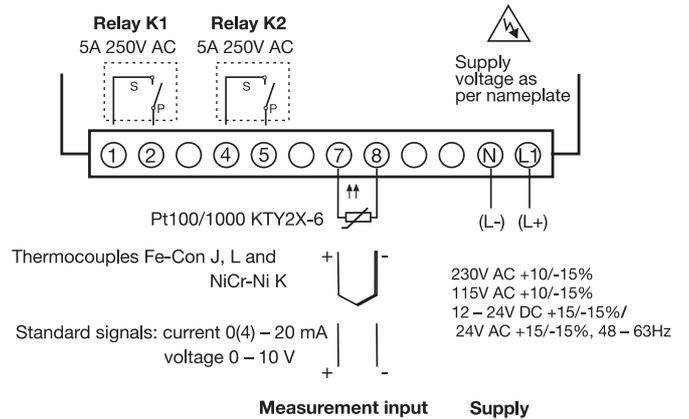|	
Data backup	EEPROM
Connection	via screw terminals for wire cross-section up to 4 mm^2 solid wire and 2.5 mm^2 stranded wire
Electromagnetic compatibility interference emission immunity to interference	product family standard: EN 61 326 Class B to industrial requirements
Operating conditions	The instrument is designed as a panel-mounting unit.
Electrical safety	to EN 61 010, Part 1 overvoltage category III, pollution degree 2

Connection diagram

Type 701060/XX1-31: Measurement input and supply voltage are not isolated from eacht other!
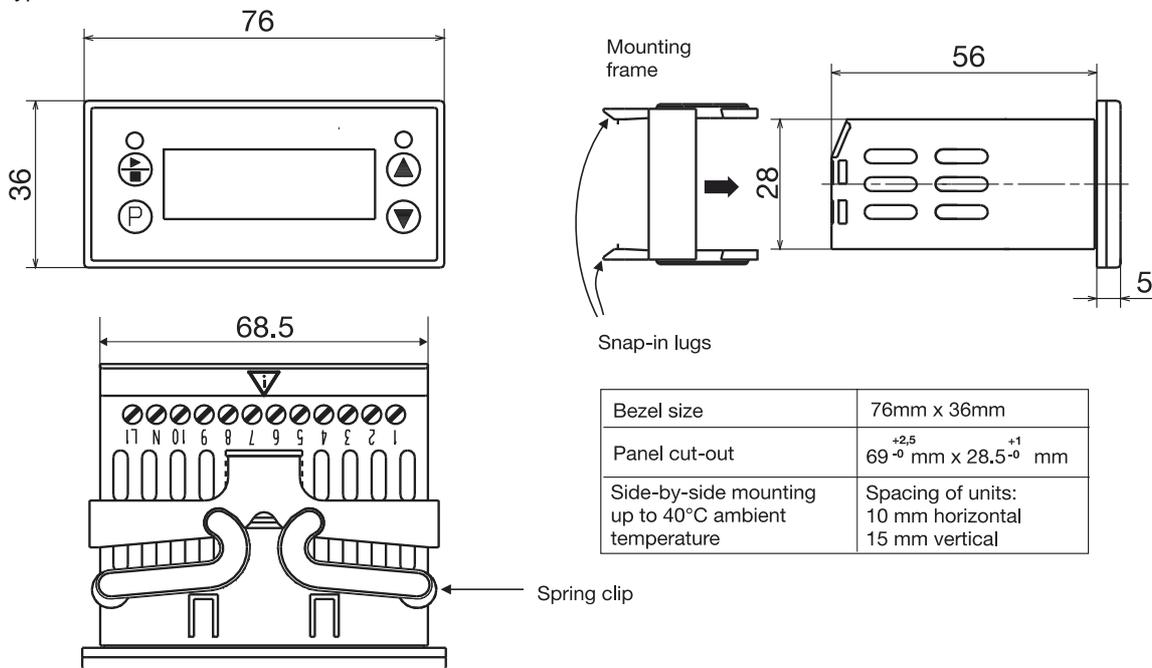
Type 701060/XX1-XX

Relay K1
10A 250V AC

Supply voltage as per nameplate

Pt100/ 1000/ KTY2X-6

Thermocouples Fe-Con J, L and NiCr-Ni K

Standard signals: current 0(4)– 20 mA voltage 0 – 10 V

230V AC +10/-15%
115V AC +10/-15%
12– 24V DC +15/-15%/
24V AC +15/-15%, 48 – 63Hz

Measurement input   Supply

Type 701060/XX2-31: Measurement input and supply voltage are not isolated from eacht other!

Type 701060/XX2-XX

Relay K1   Relay K2
5A 250V AC 5A 250V AC

Supply voltage as per nameplate

Pt100/1000 KTY2X-6

Thermocouples Fe-Con J, L and NiCr-Ni K

Standard signals: current 0(4) – 20 mA voltage 0 – 10 V

230V AC +10/-15%
115V AC +10/-15%
12 – 24V DC +15/-15%/
24V AC +15/-15%, 48 – 63Hz

Measurement input   Supply

Dimensions

Type 701060/XX2-XX

Mounting frame

Snap-in lugs

Spring clip

Bezel size	76mm x 36mm
Panel cut-out	69 $^{+2,5}_{-0}$ mm x 28.5 $^{+1}_{-0}$ mm
Side-by-side mounting up to 40°C ambient temperature	Spacing of units: 10 mm horizontal 15 mm vertical

Timing functions

Cooling controller

Defrosting repeat cycle
t.CY

If required:

Cyclic
cooling
with defrosting
ti.0 ≥1
tCY ≥1

ti.0   t.CY - ti.0

Cooling

Stop cooling,
start defrosting
with key >1 sec

Cooling

Stop defrosting,
start cooling
with key >1 sec

Cooling

t

One-off
defrosting:

Cooling

Start one-off defrosting
with key >1 sec

Cooling

t
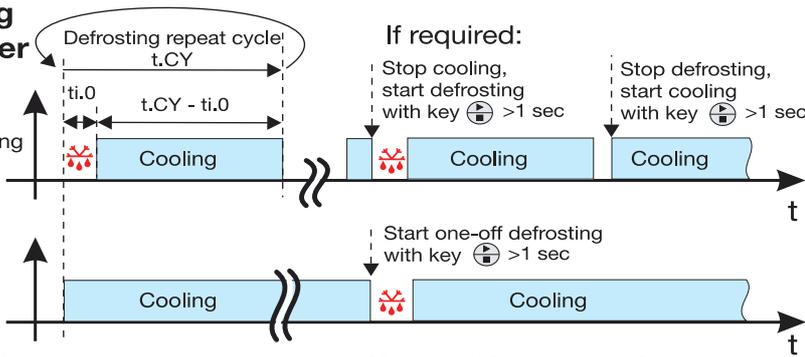
Special case:
tCY can only be set to if ti.0 has previously been set
to .
Afterwards, the defrosting duration
is again set to the desired value.

Keep to this sequence !
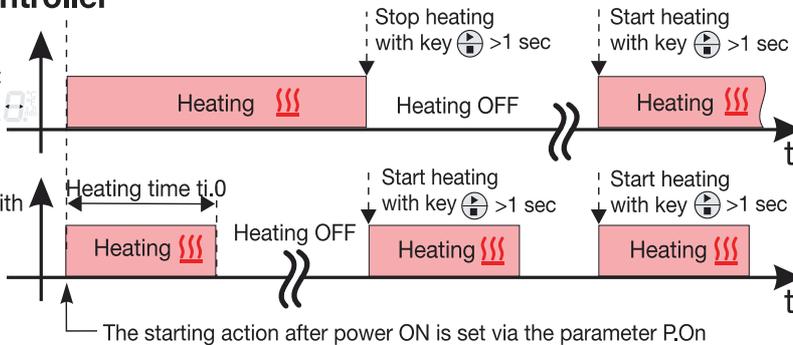
✳ First set ti.0 to
✳ Then set tCY to
✳ Now set defrosting duration ti.0 again

Heating controller

Heating,
no time limit
ti.0 =

Heating

Stop heating
with key >1 sec

Heating OFF

Start heating
with key >1 sec

Heating

t

Heating, with
time limit
ti.0 ≥1

Heating time ti.0

Heating

Heating OFF

Start heating
with key >1 sec

Heating

Start heating
with key >1 sec

Heating

t

The starting action after power ON is set via the parameter P.On

Order details

701060/	**(1) Basic version** JUMO eTRON M	
	(2) Basic type extension	
	Version	
8	factory-set, configurable within the measurement input group	
9	configured to customer specification	
	Measurement input group [1]	
1	Pt100 in 2-wire circuit	
	Pt1000 in 2-wire circuit	
	KTY2X-6	
2	Fe-Con J	
	Fe-Con L	
	NiCr-Ni K	
3	0 — 20 mA	
	4 — 20 mA	
4	0 — 10 V	
	Number of relays	
1	1 changeover contact 10A 250V	
2	2 make contacts 5A 250V	
	(3) Supply	
02	230V AC +10/-15% 48 — 63Hz	
05	115V AC +10/-15% 48 — 63Hz	
31	12 — 24V DC +15/-15% / 24V AC +15/-15%, 48 — 63Hz	
	(4) Approvals	
000	none	
061	Underwriters Laboratories Inc. (UL)	

	(1)	(2)	(3)	(4)
Order code	☐	/ ☐	- ☐	- ☐
Order example	701060	/ 811	- 02	- 061

◻ factory-set

1.) It is not possible to switch from one meas. input group to another

Accessories

Setup program, multilingual
PC interface with TTL / RS232C converter and adapter (pins)