

# MKS/TKS

## General Purpose Controllers



### Features

- PID and Smart AT Autotuning
- Loop break alarm function
- NEMA 4X, IP65
- Relay or SSR output selectable
- Optional linear output (mA)
- Optional Servomotor output
- Open or closed loop servomotor control

### Specifications

#### Control Modes:

On/Off, PID with Smart AT Autotuning, Heat, Heat/Cool, Open or Closed loop servomotor control

#### Supply Voltage:

100-240 Vac (+10%, -15%), 50/60 Hz or 24 Vac/Vdc ( $\pm 10\%$ )

#### Operating Ambient:

0-50°C, 20-85% RH non-condensing

#### Inputs:

T/C Types J, K, L, N, R, S, T (°C, °F); Pt 100 3W RTD (°C, °F), mA, mV, Volts

#### Outputs:

see tables

#### Mounting:

panel mount

#### Mounting Dimensions:

96W x 96H x 119D mm (MKS)

48W x 96H x 119D mm (TKS)

#### Cutout:

MKS: 92W x 92H mm (-0, +0.8 mm), 125 mm min. center-to-center vert & horiz spacing.

TKS: 45W mm (-0, +0.6 mm) x 92H mm (-0, +0.8 mm), 125 mm min. center-to-center vertical spacing and 60 mm min. center-to-center horizontal spacing.

#### Weight:

490 gm max. (MKS)

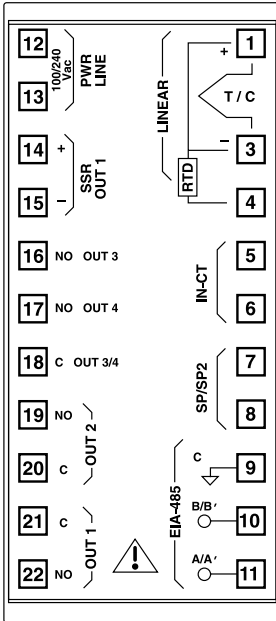
360 gm max. (TKS)

MKS/TKS controllers are designed for equipment manufacturers who demand tight process control and a full suite of advanced features. The MKS and TKS controllers offer outstanding performance in 1/8 DIN or 1/4 DIN sizes and are available with relay, current or servo outputs. They are configurable as heat or heat/cool PID controllers with Smart AT auto or adaptive tuning, universal inputs, up to 4 outputs and up to 3 independent configurable alarms. These controllers are ideal for demanding applications such as laboratory furnaces and ovens, autoclaves and chambers where a 4-digit display is required.

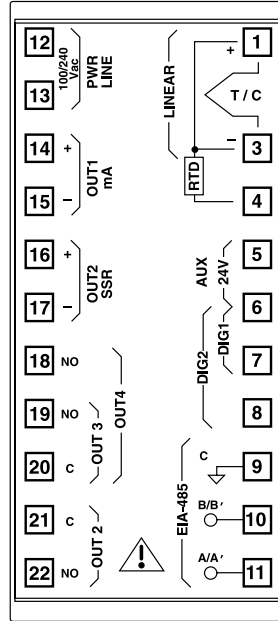
MKS and TKS controllers both have bright dual displays for process temperature and setpoint, as well as LED beacons for operating status. Three outputs can be programmed as heating + 2 alarms or heating/cooling + 1 alarm. Optional output 4 can be configured as alarm 3 or as the loop break alarm. Alarms can be process, deviation or band type, direct or reverse, with masking and programmable automatic or manual reset. Depending on the configuration, both units have multiple setpoints, selectable by logic input. Optional EIA-485 digital communications is available for connection to a supervisory computer. A NEMA 4X, IP65 front panel allows these instruments to work in severe environments.

# Rear terminal connections and ordering codes

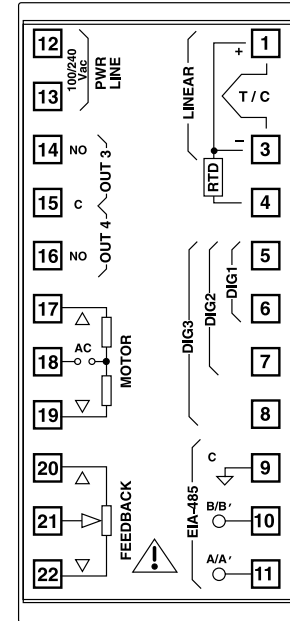
**MKS-TKS relay**



**MKS-TKS mA**



**MKS-TKS servo**



### Relay Output Modes

	Output 1	Output 2	Output 3
Mode 1	Heating	AL1	AL2+LBA
Mode 2	Heating	Cooling	AL2+LBA
Mode 3	Heating	AL1	AL2+OFD+LBA
Mode 4	Heating	Cooling	AL2+OFD+LBA

### Linear Output (mA) Modes

	Output 1	Output 2	Output 3
Mode 1	Heating	AL1	AL2
Mode 2	Heating	Cooling	AL2
Mode 3	Heating	AL1	Cooling
Mode 4	Cooling	Heating	AL2
Mode 5	Cooling	AL1	Heating
Mode 6	Retrans.	Heating	AL2
Mode 7	Retrans.	AL1	Heating
Mode 8	Retrans.	Heating	Cooling
Mode 9	Retrans.	Cooling	Heating
Mode 10	Retrans.	AL1	AL2

### Servo Output Modes

	Output 1	Output 2	Output 3
Mode 1	Output servomotor		AL1
Mode 2	Heating	//	AL1
Mode 3	Heating	//	Cooling
Mode 4	Cooling	//	Heating

Model Number	Outputs	Options	Power Supply	Reserved
				0BC

Model Number	
MKS	1/4 DIN General Purpose Controller
TKS	1/8 DIN General Purpose Controller

Outputs	
9311	Two relay outs + 1 alarm or control out + 2 logic ins
9371	One mA out + 2 relay outs + 2 logic ins + aux pwr supply
9321	One servomotor out + 1 relay out + 3 logic ins

Options	
1	None
2	OFD alarm + output 4 (xKS-Relay) Output 4 (alm2 & alm3)(xKS-mA) Output 4 (xKS-Servo)
3	EIA-485 + output 4
4	EIA-485 + output 4 + OFD alarm (xKS-Relay only)

Power Supply	
3	100/240 Vac
5	24 Vac/Vdc

### Example ordering code

**MKS9311230BC**

MKS 1/4 DIN general purpose temperature controller, 2 relay outputs + 1 alarm or control output + 2 logic inputs, optional OFD alarm + output 4, 100/240 Vac power supply.

Standard Input Ranges		
TC type	°C	°F
L	0 / 900	0 / 1650
L	0 / 400	0 / 1650
J	-100 / 1000	-150 / 1830
J -100	/400-150	/1830
K	-100 / 1370	-150 / 2500
K	-100 / 400	-150 / 2500
N	-100 / 1400	-150 / 2550
R	-50 / 1760	0 / 3200
S	-50 / 1760	0 / 3200
T-199	/400-330	/750
For MKS/TKS Servo only		
L	0 / 1820	0 / 3310
Input range		Impedance
0-20 mA	4-20 mA	<5 Ω
0-60 mV	12-60 mV	>1 Ω
0-5 V	1-5 V	>200 kΩ
0-10 V	2-10 V	>400 kΩ
RTD type		
	°C	°F
Pt 100	-200 / 800	-330 / 1470
Pt 100	-199 / 400	-199 / 400