ASCON TECNOLOGIC

EVERYTHING UNDER CONTROL


# KUBE SERIES

## 3 DYNAMIC COLOUR LED DISPLAY

THE COLOUR CHANGES DEPENDING ON PROCESS VALUE

## CONTROLLERS | PROGRAMMERS

- COMPACT SIZE

- *evo*Green for energy saving;
- *evo*Tune auto-tune PID parameters "push and forget";
- **Universal Input** (TC, mV, V, mA, Pt100-Pt1000 / PTC-NTC);
- **Universal Output** (relay, Vout for SSR, linear mA/V, servomotor);
- **User calibration** for sensor position compensation;
- 8 segments **Programmer** function with "guaranteed soak";
- Independent **Timer** Function with 5 different operating modes;
- Working hours/days **counter** with programmable alarms;
- **Wattmeter** measuring instantaneous/integrated power consumption;
- Parameters sequence **fully customizable**;
- Now with a new white main display for a better visibility (KM line);
- *evo*Tools - configuration with codes for quick start-up;
- *evo*Tools - programming key for instant parameterisation.

### FIELDS OF APPLICATION

- HOT GLUE AND BEADING MACHINES
- WRAPPING, BLISTERING MACHINES
- PAINTING ROOMS
- TEXTILE PRINTING MACHINES
- PACKAGING MACHINERY
- CLIMATIC CHAMBERS AND INCUBATORS
- HOT RUNNER EXTRUDERS
- GLASS BENDING FURNACES
- CONTINUOUS MULTI-ZONE FURNACES
- CERAMIC FURNACES
- SIMPLE CASCADE CONTROLS
- HEAT TREATMENT FURNACES
- FOOTWEAR MACHINERY
- HEAT EXCHANGERS
- INDUSTRIAL BOILERS
- MACHINES FOR LEATHER GOODS

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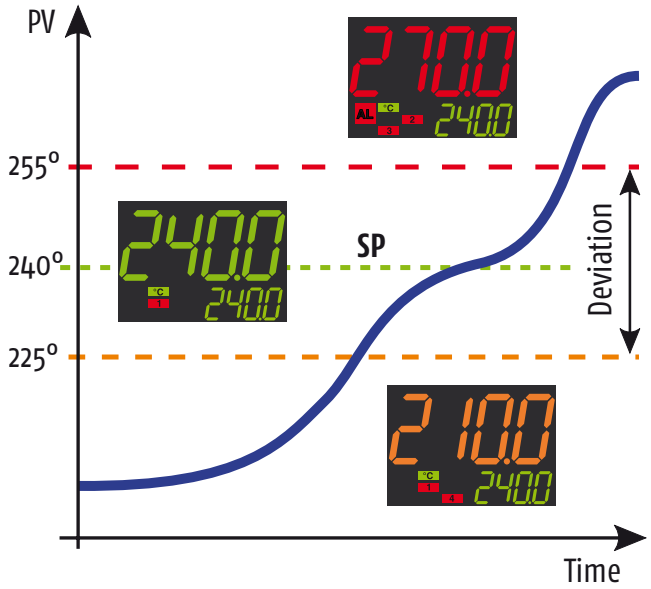
## 3 COLOUR DISPLAY

The colour of the main display changes depending on process value.

Color change thresholds are programmable.




Immediate and intuitive process status acknowledgement, even at great distance.

This function may be disabled by the user.

## evoGREEN ENERGY SAVING

This user selectable function allows to reduce energy consumption while indicating the presence of alarms and process deviations, even from a great distance.

Once the function is activated, the display acts as follows:

- If no button is pressed within the user defined time, the display turns off and 4 display segments remain lit and alternate to report that the system is in operation;
- If an alarm is detected or a button is pressed, the display turns on again immediately.

Normal operation

Alarm or operator command

## evoTUNE

evoTune is a technological evolution of the "classic" auto-tuning method. Performs auto-tuning in all operating conditions.

At evoTune start-up the instrument evaluates the current situation (set point, current process measurements etc.) and establishes the best tuning solution.

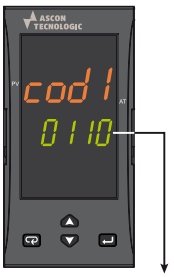
Set point change made during auto-tuning, restarts process according to the new conditions.

## evoTOOLS CONFIGURATION CODE

To make a quick and safe instrument configuration, just enter two 4 digit codes.

Input signal type, alarms, control mode and service functions activation will be selected and "ready to use" by pushing a few buttons.

This function does not exclude the full configuration menu, if the application requires it.




cod1 = 0110
01: Type K thermocouple input;
10: Heat PID control, output on OP1, OP2 = AL1, OP3 = AL2, OP4 = AL3


cod2 = 1284
1: AL1 Sensor break;
2: AL2 absolute high;
8: AL3 external band alarm;
4: Absolute working time counter (in hours)

## CUSTOMIZED PARAMETER SEQUENCE

Provide a user-defined operator interface has been, until now, a privilege of "custom" solutions.

The KUBE Line allows to customize operator parameters making safe and easy the instrument use.

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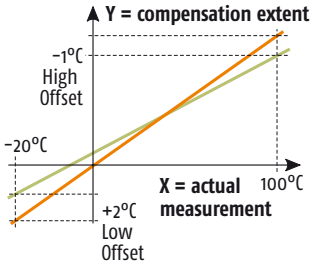
## USER CALIBRATION

This function allows the manufacturer of the equipment to **calibrate the entire measurement values** compensating for errors due to:

- Sensor position;
- Sensor accuracy class;
- Accuracy of the instrument.

The "*User calibration*" **DOES NOT** change factory calibration and can be removed at any time.




## INDEPENDENT TIMER

Timer function with 5 different operating modes.
Programmable time base in h/min, min/s s/thents of seconds.
Start/Hold/Reset command from digital inputs and/or from the button ↵.
Function Timer operates in parallel but independently from Control.

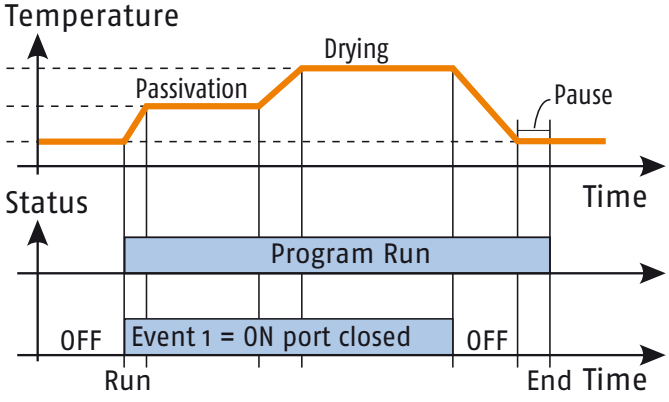
## PROGRAMMER FUNCTION

This function allows to set:

- Up to 8 segments (4 ramps and 4 soaks);
- 4 start-up modes: at power-up, at power-up with initial delay, on command (from the keyboard, digital input or serial line) and on command signal with initial delay;
- 3 output modes at the end of the program: the process continues with the last programmed set-point, using the last active set-point, switching to stand-by;
- 2 programmable events for each program segment;
- Indicator "program running";
- Timed indicator "program end";
- Two digital inputs and/or the button ↵ can be programmed to perform Start/Hold/Reset commands;

**Application example:**

Paint booth and drying chambers to spray paint (car spray booths).

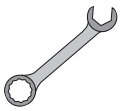



## WORKING HOURS/DAYS COUNTER

**With adjustable preset**

Generates preventive maintenance alerts after a predetermined period of actual operation.

The alert does not interfere with instrument functions and can be reset by maintenance to restart the count.



Normal operation | Inspection request | Normal operation

**Non resettable**

It counts the actual operation period, from its first power-up. Could be used to extend the warranty beyond the legal period. The continuous non-resettable counter provides manufacturer of the machine with a reliable parameter to calculate MTBF (Medium Time Between Failures).

## ACCESSORIES

**A01 - Programming key**

An electronic key, with memory, that can be connected directly to the instrument (even not powered), it provides a variety of functions, including:

- Copy and store the configuration of an instrument (even damaged) and transfer it into another one;
- Configure the instruments in a safe and quick way, without the need of a PC;
- Communicate with a PC, even if the instrument is not equipped with an RS-485 port.

**Configuration software**

Supplied free of charge, once loaded on PC, allows to:

- Easily configure an instrument;
- Upload and download previously saved configurations;
- Simplify the start-up , thanks to the real time update of variables and parameters.

**WinTec - Supervisor**

Based on simple and flexible SCADA, it provides:

- Data acquisition;
- Centralized control;
- Alarm and recipes management;
- Trend;
- Report.

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CONTROLLERS | PROGRAMERS

# KUBE SERIES

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KR

KM

KX

## SPECIFICATIONS

| DISPLAY | KM1/KR1/KX1 | KM3/KR3/KX3 |
|---|---|---|
| Dual LED | **Main display:** 4 digit h 10.9 mm (KR) or 15.5 (KM and KX) dynamic three colours red, green and amber or 1 fixed selectable colour or white (KM) | |
| | **Secondary display:** 4 digit h 6 mm (KR), 7.6 mm (KM) or 10 mm (KX) green colour | |
| | **Bargraph:** – | **22 segments bar graph: (KX models)** |
| **INPUTS** | | |
| Universal Input | **Thermocouples:** J (-50... +1000°C/-58... +1832°F), K (-50... +1370°C/-58... +2498°F), S/R (-50... +1760°C/-58... +3200°F), T (-70... +400°C/-94... +752°F)<br>**Infrared sensors:** J or K<br>**RTD:** Pt100 3 wires and Pt1000 2 wires (-200... +850°C/-328... +1562°F)<br>**Thermistors:** PTC KTY81-121 (-50... +150°C/-58... +302°F), NTC 103-AT2 (-50... +110°C/-58... +230°F)<br>**Linear signals:** 0/12... 60mV, 0/4... 20mA, 0/1... 5V, 0/2...10V | |
| Measurement accuracy | ±0.5% span ±1 digit, (±1% span ±1 digit for T/c type S) | |
| Digital inputs | 1 contact input + 1 (available when I/O 4 = DI2) programmable as voltage (24 VDC) or contact input | |
| **OUTPUTS** | | |
| Up to four | **OUT1:** Relay SPST-NO 4 A/240 Vac (SPDT for KR1) or voltage output for SSR driving 13 V max. @ 1 mA, 10.5 V min. @ 15 mA ±10% | **OUT1:** Relay SPST-NO 4 A/240 Vac (SPDT for KR3) or voltage output for SSR driving 13 V max. @ 1mA, 10.5 V min. @ 15 mA ±10% or analogue 0/4... 20 mA, 0/2... 10 V galvanically isolated |
| | **OUT2 and OUT3:** Relay SPST-NO 2A/240 Vac or voltage output for SSR driving 13 V max. @ 1mA, 10.5 V min. @ 15 mA ±10% | **OUT2 and OUT3 (*):** Relay SPST-NO 2A/240 Vac or voltage output for SSR driving 13 V max. @ 1mA, 10.5 V min. @ 15 mA ±10% Relay SPST-NO 2A/240 Vac (for servomotor drive) |
| | **OUT4 programmable:** Voltage output for SSR driving 13 V max. @ 1mA, 10.5 V min. @ 22 mA ±10% or transmitter power supply or 2nd Digital Input | |
| **FUNCTIONAL** | | |
| Control | PID single or double action, On/Off, On/Off with Neutral Zone. Autotune, Selftune and evoTune. Overshoot control | |
| Alarms | 3 alarms configurable as absolute, deviation, band | |
| Set Point | 4 Set Points selectable | |
| Serial communications | TTL (standard) + RS485 (optional), protocol: MODBUS RTU | |
| Communications speed | 1200... 38400 baud selectable (8 bit + 1 stop bit, no parity) | |
| Work hours/days counter | With 2 simultaneous functions: cumulative non-erasable and resettable with alarm | |
| Power calculation | Instant power, hourly consumption, total consumption during program running | |
| Evogreen | Time based Display switch-off, selectable | |
| Programmer (optional) | - - | Up to 8 segments with "guaranteed soak" |
| Timer (optional) | Independent with 5 operating modes | |
| **GENERAL** | | |
| Power supply | 24 Vac/dc ±10%, 100... 240 Vac/dc (-15... +10%), 50/60 Hz, power consumption 7 VA max. | |
| Temperature | **Operating:** 0... 50°C (32... 122°F); **Storage:** -20... +70°C (-4... +158°F); | |
| Relative humidity | 20... 95 RH% with no condensation | |
| Conformity | EN 61010-1, EN 61326, CE, UKCA, UL | |

***: For servomotor drive, both OUT2 and OUT3 are relay output (see "How to order": OUT2 and OUT3 = code M).**

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CONTROLLERS | PROGRAMMERS

# KUBE SERIES

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# KR1 / KR3

## How to order

**Model**
**KR1** - = Controller
**KR1T** = Controller+ timer
**KR3**- = Controller
**KR3T** = Controller+ timer
**KR3P** = Controller+ timer + programmer

**Power supply**
H = 100... 240 VAC
L = 24 VAC/DC

**Analogue input + digital input DI1 (standard)**
**C** = J, K, R, S, T, PT100, PT 1000 (2 wires), mA, mV, V
**E** = J, K, R, S, T, NTC, PTC, mA, mV, V

**Output 1**
**I** = 0/4... 20 mA, 0/2... 10V **(KR3 only)**
**R** = Relay SPST-NO A4 A (resistive load)
**O** = VDC for SSR

**Output 2**
**-** = Not available
**R** = Relay SPST 2 A (resistive load)
**O** = VDC for SSR
**M** = Relay SPST 2 A (**servomotor drive KR3 only**)*

**Output 3**
**-** = Not available
**R** = Relay SPST 2 A (resistive load)
**O** = VDC for SSR
**M** = Relay SPST 2 A (**servomotor drive KR3 only**)*

**Input/Output 4**
**D** = Output 4 (VDC for SSR)/Transmitter PWS/Dig. Input DI2

**Serial communication**
**-** = TTL Modbus
**S** = RS485 Modbus + TTL Modbus

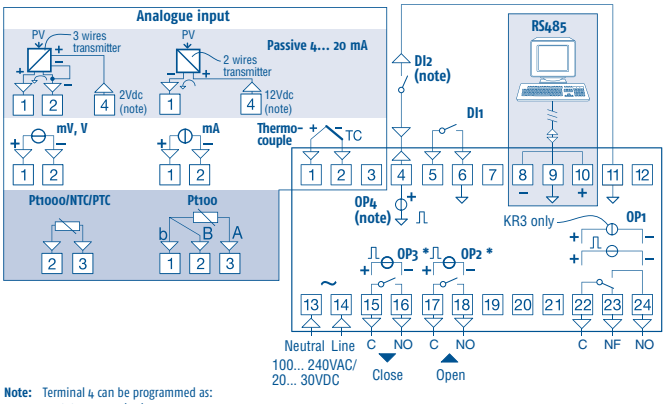
**Connection type**
**-** = Standard (non-removable screw terminal block)
**E** = With removable screw terminal block
**M** = With removable spring terminal block
**N** = With removable terminal block (fixed part only)

***:** For servomotor drive, **both OUT2 and OUT3** codes **must be selected as "M".**

## Mechanical characteristics

| PARAMETER | |
|---|---|
| Housing | Self-extinguishing plastic UL 94 v0 |
| Mounting | Front panel |
| Dimensions | 78 x 35 x 78 mm (W x H x D) |
| Panel cut-out | 71 x 29 (-0... +0.6 mm) |
| Weight | 140 g approx. |
| Terminals | 24 terminals for cables from 2.5 mm² (AWG22... AWG14):<br>- on fixed or removable terminal block with screw terminals;<br>- on removable terminal block with spring-load terminals |
| Protection degree | IP 65 panel mounted with gasket<br>(IP20 for screw terminals)<br>In conformity with En 60070-1 (internal use only) |

## Electrical connections

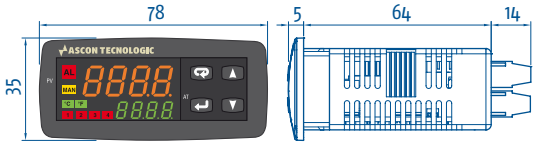



**Note:** Terminal 4 can be programmed as:
- **Digital Input** (DI2) connecting a free of voltage contact between terminals 4 and 11
- **0... 12 V SSR Drive Output** (OP4) connecting the load between terminals 4 and 11
- **12 Vdc (20 mA) transmitter power supply** connecting the transmitter between terminals 4 and 1

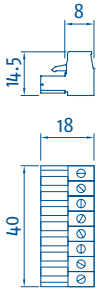
***:** For servomotor drive **OP2** and **OP3** must be ordered as **"M"**. **Out 2 (OP2) = open, OUt 3 (OP3) = close.**

## Dimensions (mm)

**Instrument with non-removable terminals**




**Removable terminals**





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CONTROLLERS | PROGRAMMERS

# KUBE SERIES

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# KM1 / KM3

## How to order

**Model**
**KM1 -** = Controller
**KM1W** = Controller with white display
**KM1T** = Controller + timer
**KM1TW** = Controller with white display + timer
**KM3 -** = Controller
**KM3W** = Controller with white display
**KM3T** = Controller + timer
**KM3TW** = Controller with white display + timer
**KM3P** = Controller + timer + Programmer
**KM3PW** = Controller with white display+ timer + Programmer

**Power supply**
H = 100... 240 VAC
L = 24 VAC/DC

**Analogue input + digital input DI1 (standard)**
**C** = J, K, R, S, T, PT100, PT 1000 (2 wires), mA, mV, V
**E** = J, K, R, S, T, NTC, PTC, mA, mV, V

**Output 1**
**I** = 0/4... 20 mA, 0/2... 10V **(KM3 only)**
**R** = Relay SPST-NO A4 A (resistive load)
**O** = VDC for SSR

**Output 2**
**-** = Not available
**R** = Relay SPST 2 A (resistive load)
**O** = VDC for SSR
**M** = Relay SPST 2 A **(servomotor drive KM3 only)***

**Output 3**
**-** = Not available
**R** = Relay SPST 2 A (resistive load)
**O** = VDC for SSR
**M** = Relay SPST 2 A **(servomotor drive KM3 only)***

**Input/Output 4**
**D** = Output 4 (VDC for SSR)/Transmitter PWS/Dig. Input DI2

**Serial communication**
**-** = TTL Modbus
**S** = RS485 Modbus + TTL Modbus

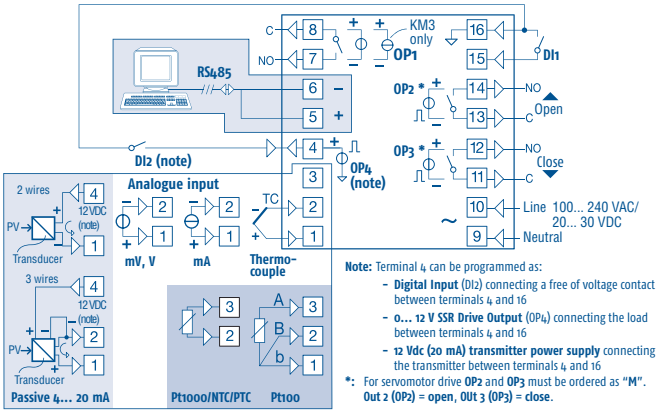
**Connection type**
**-** = Standard (non-removable screw terminal block)
**E** = With removable screw terminal block
**M** = With removable spring terminal block
**N** = With removable terminal block (fixed part only)

***:** For servomotor drive, **both OUT2 and OUT3** codes **must be selected as "M".**

## Mechanical characteristics

| PARAMETER | |
|---|---|
| Housing | Self-extinguishing plastic UL 94 v0 |
| Mounting | Front panel |
| Dimensions | 48 x 48 x 62 mm (W x H x D) |
| Panel cut-out | 45 x 45 (-0... +0.6 mm) |
| Weight | 120 g approx. |
| Terminals | 16 terminals for cables from 2.5 mm² (AWG22... AWG14):<br>- on fixed or removable terminal block with screw terminals;<br>- on removable terminal block with spring-load terminals |
| Protection degree | IP 65 panel mounted with gasket<br>(IP20 for screw terminals)<br>In conformity with En 60070-1 (internal use only) |

## Electrical connections

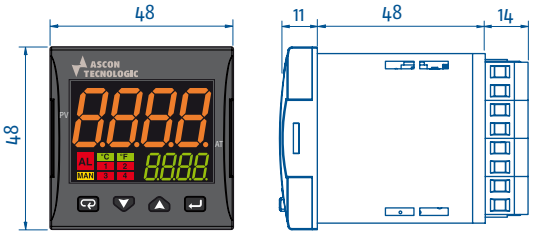



**Note:** Terminal 4 can be programmed as:
- **Digital Input** (DI2) connecting a free of voltage contact between terminals 4 and 16
- **0... 12 V SSR Drive Output** (OP4) connecting the load between terminals 4 and 16
- **12 Vdc (20 mA) transmitter power supply** connecting the transmitter between terminals 4 and 16

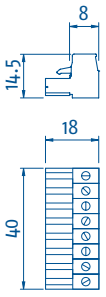
*: For servomotor drive **OP2** and **OP3** must be ordered as **"M"**. **Out 2 (OP2) = open, OUt 3 (OP3) = close.**

## Dimensions (mm)

**Instrument with non-removable terminals**




**Removable terminals**

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CONTROLLERS | PROGRAMMERS

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# KX1 / KX3


## Mechanical characteristics

| PARAMETER | |
|---|---|
| Housing | Self-extinguishing plastic UL 94 v0 |
| Mounting | Front panel |
| Dimensions | 48 x 96 x 75.9 mm (W x H x D) |
| Panel cut-out | 45 x 89 (-0... +0.6 mm) |
| Weight | 160 g approx. |
| Terminals | 16 terminals for cables from 2.5 mm² (AWG22... AWG14):<br>- on fixed or removable terminal block with screw terminals;<br>- on removable terminal block with spring-load terminals |
| Protection degree | IP 65 panel mounted with gasket<br>(IP20 for screw terminals)<br>In conformity with En 60070-1 (internal use only) |

## How to order

**Model**
**KX1 –** = Controller
**KX1T** = Controller+ timer
**KX3 –** = Controller
**KX3T** = Controller+ timer
**KX3P** = Controller+ timer + programmer

**Power supply**
H = 100... 240 VAC
L = 24 VAC/DC

**Analogue input + digital input DI1 (standard)**
**C** = J, K, R, S, T, PT100, PT 1000 (2 wires), mA, mV, V
**E** = J, K, R, S, T, NTC, PTC, mA, mV, V

**Output 1**
**I** = 0/4... 20 mA, 0/2... 10V **(KX3 only)**
**R** = Relay SPST-NO AA A (resistive load)
**O** = VDC for SSR

**Output 2**
**–** = Not available
**R** = Relay SPST 2 A (resistive load)
**O** = VDC for SSR
**M** = Relay SPST 2 A **(servomotor drive KX3 only)***

**Output 3**
**–** = Not available
**R** = Relay SPST 2 A (resistive load)
**O** = VDC for SSR
**M** = Relay SPST 2 A **(servomotor drive KX3 only)***

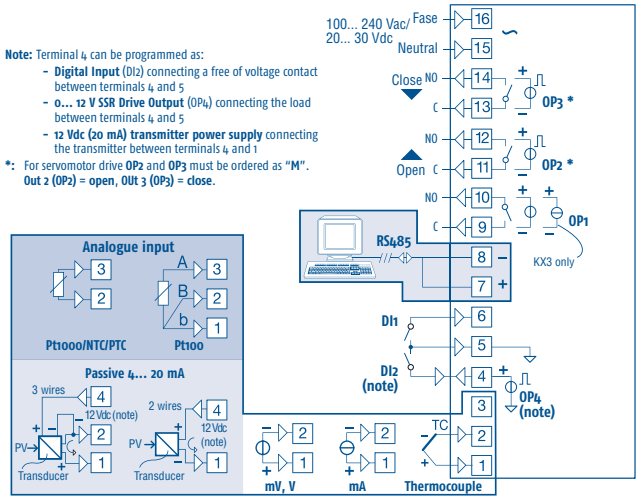
**Input/Output 4**
**D** = Output 4 (VDC for SSR)/Transmitter PWS/Dig. Input DI2

**Serial communication**
**–** = TTL Modbus
**S** = RS485 Modbus + TTL Modbus

**Connection type**
**–** = Standard (non-removable screw terminal block)
**E** = With removable screw terminal block
**M** = With removable spring terminal block
**N** = With removable terminal block (fixed part only)

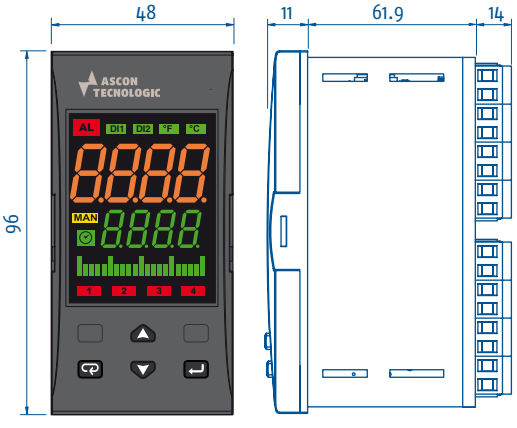
***:** For servomotor drive, **both OUT2 and OUT3** codes **must be selected as "M"**.

## Electrical connections

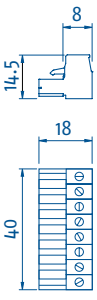



## Dimensions (mm)

**Instrument with non-removable terminals**




**Removable terminals**

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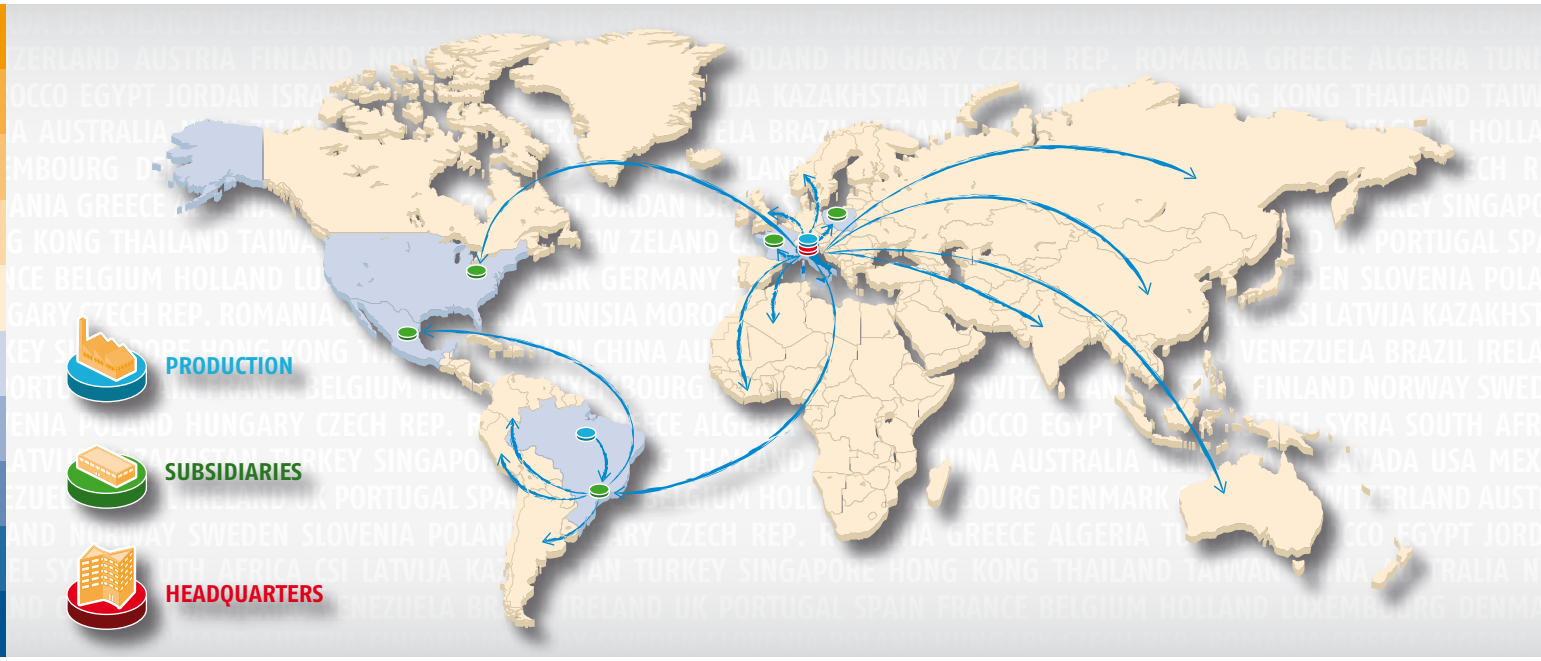


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