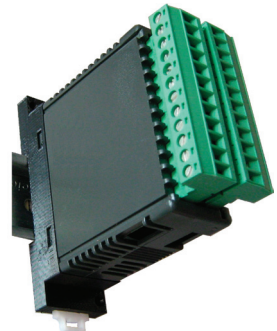*evolution*

KUBE 7^{SPEED} SERIES

CONSTANT SPEED
WHEN THE LOAD AND/OR THE SUPPLY CHANGE

CONTROLLERS | PROGRAMMERS

WITH FEEDBACK CONTROL OF THE BELT SPEED

- **Speed control output for 24 VDC motors;**
- Speed can be set in: time (eg 5 min of cooking time) or in engineering units (eg m/min) or as 100% of maximum speed;
- 4 speed + 4 independent adjustment set points or 4 recipes (SP1 & time 1, SP2 & time 2, etc.) selectable by front button, logical contacts or serial;
- **Servomotor control output for gas ovens;**
- **Up to 3 outputs for control or alarms;**
- **Universal input;**
- Independent **timer** function with 5 operating modes;
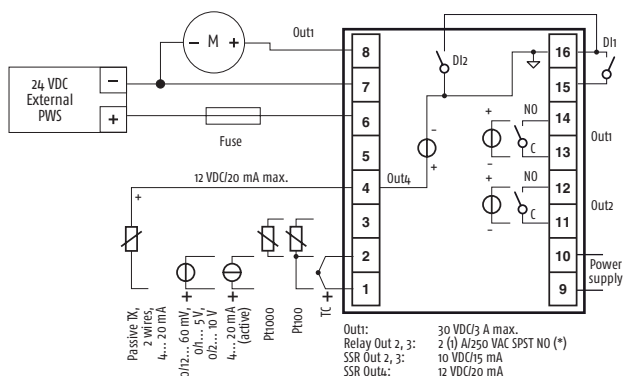- **Worked hours/days counter** with programmable alarm.

APPLICATION FIELDS

- TUNNEL OVENS FOR PIZZA;
- TUNNEL OVENS FOR PASTRY SHOPS;
- COOLING TUNNEL;
- SMALL SHRINK TUNNELS;
- SMALL THERMAL PACKAGING MACHINES.

ASCON TECNOLOGIC

EVERYTHING UNDER CONTROL

MOTOR SPEED CONTROL OUTPUT

It simplifies the use permitting to set the temperature and the "cooking time"; it will be the controller to automatically convert the time in the corresponding speed.

It lightens the machine: controller, power supply and motor are all you need.

Out1:	30 VDC/3 A max.
Relay Out 2, 3:	2 (1) A/250 VAC SPST NO (*)
SSR Out 2, 3:	10 VDC/15 mA
SSR Out4:	12 VDC/20 mA

It defines your "Standard"

Using the recipes (temperature + time) it is possible to switch from one "cooking" recipe to another one with the maximum speed, but maintaining the optimal standard for the specific processing.

It guarantees speed (time) regardless of load

The control module continuously detects the speed of the motor and compensates for any unwanted changes.

INDEPENDENT TIMER

Timer function with 5 different operating modes.
Time base programmable as h/min, min/s, s/s·10⁻¹.
Start/Hold/Reset commands programmable from digital input and/or from "↻"key.
The Timer function works in parallel, but independently of the adjustment.

3 COLOUR DISPLAY

The colour of the main display changes depending on process value.
Colour change thresholds are programmable.
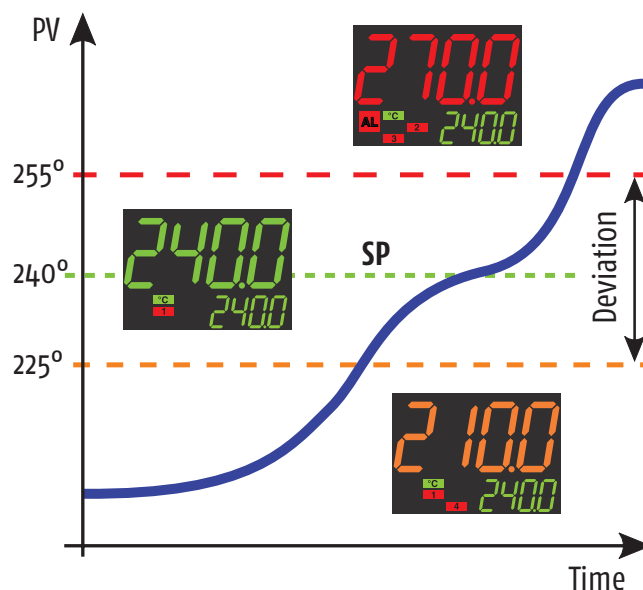
Immediate and intuitive process status acknowledgement, even at great distance.
This function may be disabled by the user.

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.

AUTO TUNE Parameters

CUSTOMIZED PARAMETER SEQUENCE

Providing 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.

ASCON TECNOLOGIC

EVERYTHING UNDER CONTROL

KR7   KM7   KX7   KRD7

SPECIFICATIONS

DISPLAY		KM7/ KR7/ KX7/ KRD7	
Dual LED	Main display:	4 digit h 10.9 mm (KR) or 15.5 (KM and KX) dynamic 3 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:	–	21 segments Bargraph (KX)
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);	
	Infrared sensors	J or K;	
	RTD:	Pt100 3 wires and Pt1000 2 wires (–200… +850°C/–328… +1562°F);	
	Thermistors:	PTC KTY81-121 (–50… +150°C/–58… +302°F), NTC 103-AT2 (–50… +110°C/–58… +230°F);	
	Linear signals:	0/12… 60 mV, 0/4… 20 mA, 0/1… 5 V, 0/2… 10 V.	
Measurement accuracy		±0.5% span ±1 digit, (±1% span ±1 digit for T/c type S)	
Digital inputs		1 free voltage contact + 1 (available when I/O 4 = DI2) programmable as voltage (24 VDC) or free voltage contact	
OUTPUTS			
Up to four	OUT1:	PWM with feedback control for motor speed. 24 VDC max 4 A.	
	OUT2 and Out3 (*):	Relay SPST-NO 2 A/240 VAC; voltage output for SSR driving SSR 13 V max. @ 1 mA, 10.5 V min. @ 15 mA ±10% or relay SPST-NO 2 A/ 240 VAC (for servomotor control)	
	OUT4 programmable:	Voltage output for SSR driving SSR 13 V max. @ 1 mA, 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 *evo*Tune. Overshoot control	
Alarms		3 alarms configurable as absolute, deviation, band	
Set Point		4 Set Points selectable + 4 speed selectable individually or as a recipe	
Serial Communication		TTL (standard) + RS485 (optional), protocol: MODBUS RTU	
Baud rate		1200… 38400 baud selectable (8 bit + 1 stop bit no parity)	
Worked hours/days counter		With 2 simultaneous functions: cumulative non-erasable and resettable with alarm	
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% without condensation	
Conformity		EN 61010-1, EN 61326	

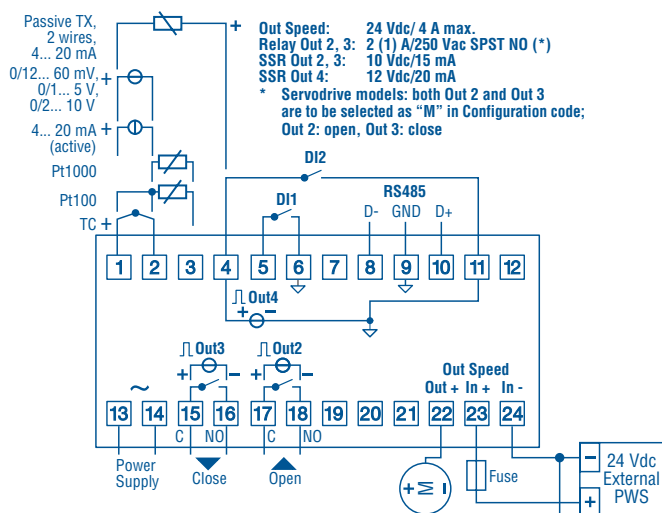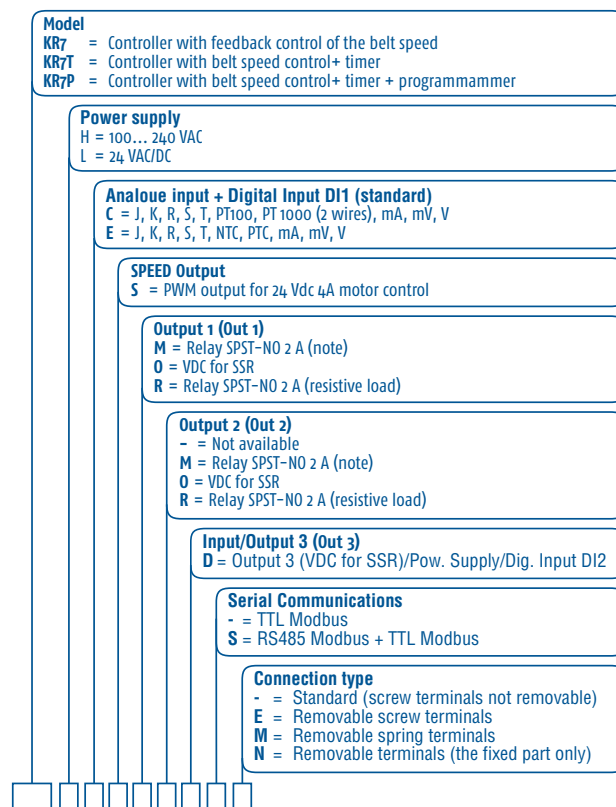***:** For servomotor drive, both **Out2** and **Out3** are relay putput (see " How to order": Out2 and Out = code "**M**").

ASCON
TECNOLOGIC

EVERYTHING UNDER CONTROL

KR7

How to order

Model
KR7 = Controller with feedback control of the belt speed
KR7T = Controller with belt speed control+ timer
KR7P = Controller with belt speed control+ timer + programmammer

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

Analoue 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

SPEED Output
S = PWM output for 24 Vdc 4A motor control

Output 1 (Out 1)
M = Relay SPST-NO 2 A (note)
O = VDC for SSR
R = Relay SPST-NO 2 A (resistive load)

Output 2 (Out 2)
– = Not available
M = Relay SPST-NO 2 A (note)
O = VDC for SSR
R = Relay SPST-NO 2 A (resistive load)

Input/Output 3 (Out 3)
D = Output 3 (VDC for SSR)/Pow. Supply/Dig. Input DI2

Serial Communications
– = TTL Modbus
S = RS485 Modbus + TTL Modbus

Connection type
– = Standard (screw terminals not removable)
E = Removable screw terminals
M = Removable spring terminals
N = Removable terminals (the fixed part only)

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

Mechanical characteristics

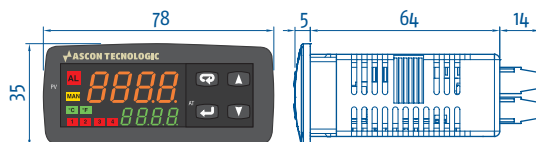| FEATURE	
Housing	Self-extinguishing plastic UL 94 v0
Mounting	Front panel
Dimensions	78 x 35 x 78 mm (W x H x D)
Panel cut-out	71 x 29 (-0... +0.6 mm)
Weight	140 g approx.
Terminals	24 terminals for cables from 2.5 mm² (AWG22... AWG14): - on fixed or removable terminal block with screw terminals; -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

Electrical connections

Passive TX, 2 wires, 4... 20 mA
0/12... 60 mV, 0/1... 5 V, 0/2... 10 V
4... 20 mA (active)
Pt1000
Pt100
TC

Out Speed: 24 Vdc/ 4 A max.
Relay Out 2, 3: 2 (1) A/250 Vac SPST NO (*)
SSR Out 2, 3: 10 Vdc/15 mA
SSR Out 4: 12 Vdc/20 mA
* Servodrive models: both Out 2 and Out 3 are to be selected as "M" in Configuration code; Out 2: open, Out 3: close

DI2
DI1
RS485
D- GND D+

1 2 3 4 5 6 7 8 9 10 11 12

Out4

Out3 Out2

Out Speed
Out + In + In -

13 14 15 16 17 18 19 20 21 22 23 24
C NO C NO

Power Supply
Close
Open
Fuse
24 Vdc External PWS

Dimensions (mm)

Instrument with non-removable terminals

78   5   64   14

35

ASCON TECNOLOGIC

Removable terminals

8

14.5

18

40

ASCON TECNOLOGIC
EVERYTHING UNDER CONTROL

KM7

How to order

Model
KM7 = Controller with feedback control of the belt speed
KM7T = Controller with belt speed control+ timer
KM7P = Controller with belt speed control+ timer + programmammer

Power supply
H = 100… 240 VAC
L = 24 VAC/DC

Analoue 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

SPEED Output
S = PWM output for 24 Vdc 4A motor control

Output 1 (Out 1)
M = Relay SPST–NO 2 A *
O = VDC for SSR
R = Relay SPST–NO 2 A (resistive load)

Output 2 (Out 2)
– = Not available
M = Relay SPST–NO 2 A *
O = VDC for SSR
R = Relay SPST–NO 2 A (resistive load)

Input/Output 3 (Out 3)
D = Output 3 (VDC for SSR)/Pow. Supply/Dig. Input DI2

Connection type
– = Standard (screw terminals not removable)
E = Removable screw terminals
M = Removable spring terminals
N = Removable terminals (the fixed part only)

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

Mechanical characteristics

FEATURE	
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): – on fixed or removable terminal block with screw terminals; – on removable terminal block with spring–load terminals
Protection degree	IP 65 panel mounted with gasket (IP20 for screw terminals) In conformity with En 60070-1 (internal use only)

Electrical connections

Out Speed: 24Vdc 4 A max.
Relay Out 2, 3: 2 (1) A/250 VAC (*)
SSR Out 2, 3: 12 Vdc/15 mA

Dimensions (mm)

Instrument with non-removable terminals

Removable terminals

KX7

How to order

Model	
KX7	= Controller with feedback control of the belt speed
KX7T	= Controller with belt speed control+ timer
KX7P	= Controller with belt speed control+ timer + programmammer

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

Analoue 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

SPEED Output
S = PWM output for 24 Vdc 4A motor control

Output 1 (Out 1)
M = Relay SPST-NO 2 A (note)
O = VDC for SSR
R = Relay SPST-NO 2 A (resistive load)

Output 2 (Out 2)
– = Not available
M = Relay SPST-NO 2 A (note)
O = VDC for SSR
R = Relay SPST-NO 2 A (resistive load)

Input/Output 3 (Out 3)
D = Output 3 (VDC for SSR)/Pow. Supply/Dig. Input DI2

Connection type
– = Standard (screw terminals not removable)
E = Removable screw terminals
M = Removable spring terminals
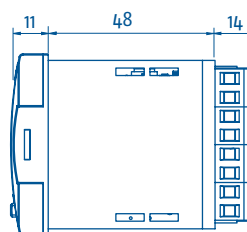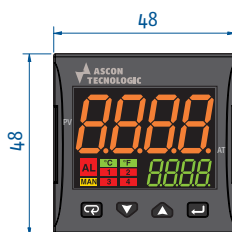N = Removable terminals (the fixed part only)

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

Mechanical characteristics

FEATURE	
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): – on fixed or removable terminal block with screw terminals; – on removable terminal block with spring-load terminals
Protection degree	IP 65 panel mounted with gasket (IP20 for screw terminals) In conformity with En 60070-1 (internal use only)

Electrical connections

Dimensions (mm)

Instrument with non-removable terminals

Removable terminals

ASCON
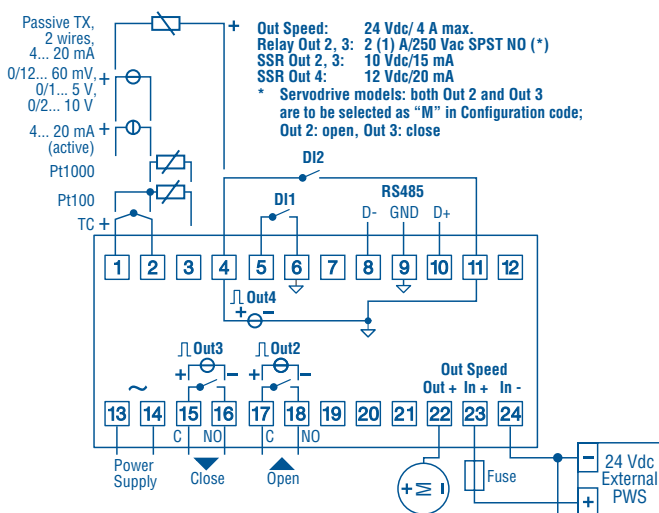TECNOLOGIC

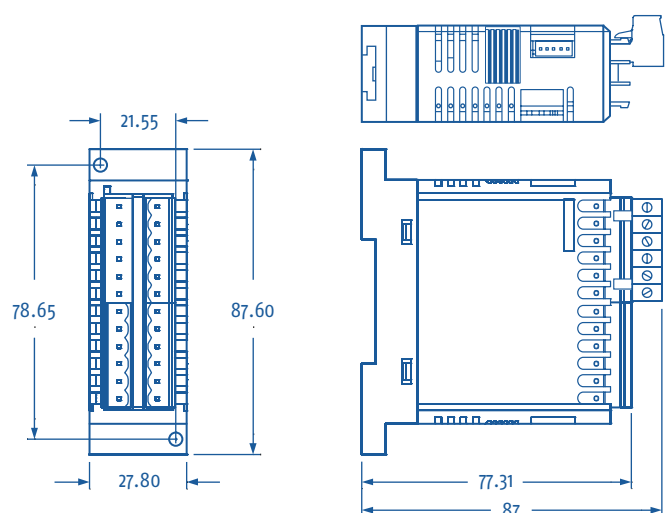EVERYTHING UNDER CONTROL

KRD7

How to order

Model
KRD7 = Controller with feedback control of the belt speed
KRD7T = Controller with belt speed control+ timer
KRD7P = Controller with belt speed control+ timer + programmammer

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

Analoue 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

SPEED Output
S = PWM output for 24 Vdc 4A motor control

Output 1 (Out 1)
M = Relay SPST-NO 2 A (note)
O = VDC for SSR
R = Relay SPST-NO 2 A (resistive load)

Output 2 (Out 2)
– = Not available
M = Relay SPST-NO 2 A (note)
O = VDC for SSR
R = Relay SPST-NO 2 A (resistive load)

Input/Output 3 (Out 3)
D = Output 3 (VDC for SSR)/Pow. Supply/Dig. Input DI2

Serial Communications
– = TTL Modbus
S = RS485 Modbus + TTL Modbus

Connection type
– = Screw terminals
E = Screw terminals pitch 5.00
M = Removable spring terminals
N = Removable terminals pitch 5.00
         (the fixed part only)

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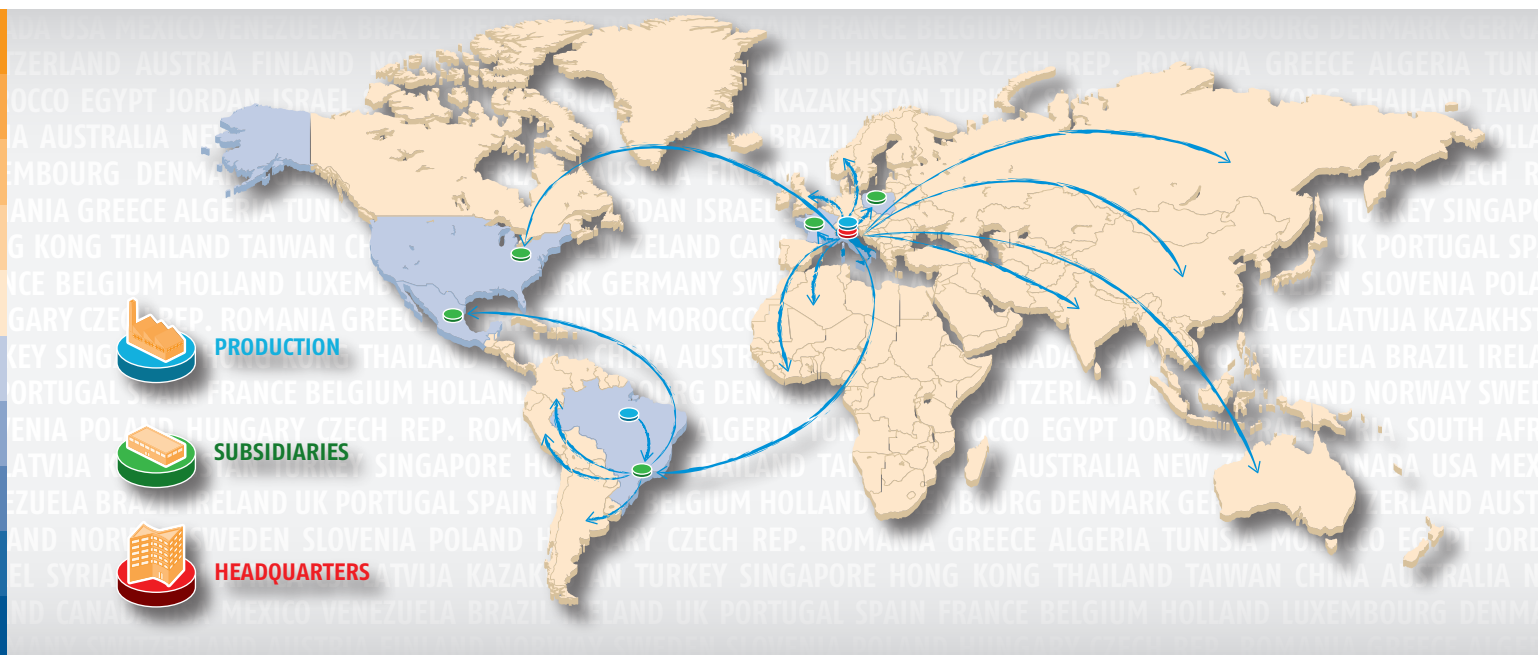
Mechanical characteristics

FEATURE	
Housing	Self–extinguishing plastic UL 94 v0
Mounting	On Omega DIN rail
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): – on fixed or removable terminal block with screw terminals; – on removable terminal block with spring–load terminals
Protection degree	IP20 In conformity with En 60070–1 (internal use only)

Electrical connections

Passive TX, 2 wires, 4... 20 mA

0/12... 60 mV, 0/1... 5 V, 0/2... 10 V

4... 20 mA (active)

Pt1000

Pt100

TC +

Out Speed: 24 Vdc/ 4 A max.
Relay Out 2, 3: 2 (1) A/250 Vac SPST NO (*)
SSR Out 2, 3:   10 Vdc/15 mA
SSR Out 4:   12 Vdc/20 mA
* Servodrive models: both Out 2 and Out 3 are to be selected as "M" in Configuration code; Out 2: open, Out 3: close

DI2

DI1

RS485
D-   GND   D+

1 2 3 4 5 6 7 8 9 10 11 12

Out4

Out3   Out2

Out Speed
Out + In + In -

13 14 15 16 17 18 19 20 21 22 23 24

Power Supply   C   NO   C   NO
           Close   Open

Fuse

– 24 Vdc External PWS +

Dimensions (mm)

21.55

78.65   87.60

27.80

77.31

87

ASCON TECNOLOGIC
EVERYTHING UNDER CONTROL

PRODUCTION

SUBSIDIARIES

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**COMPANY WITH
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≡ **ISO 9001** ≡
≡ **OHSAS 18001** ≡

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