



## K SERIES

### CONTROLLERS / MINI-PROGRAMMERS WITH WATTMETER FUNCTION AND INDEPENDENT TIMER

#### USEFUL APPLICATIONS

- Shoemaking Machineries
- Glueing and binding machines (hot glue)
- Packaging and blister packing machines
- Paint booths
- T-shirt printing
- Climatic chambers and incubators
- Hot runner
- Glass bending ovens
- Extruders
- Industrial baking or large kitchens
- Continuous multi-zone ovens (for PCB, for leather goods, etc.)
- Ceramics ovens
- Heat-treatment ovens
- Ovens for goldsmiths and dentists
- Simple cascade controls
- Chillers

- INPUT FOR TC, RTD, PTC, NTC, MA OR V
- USER CALIBRATION
- H/C PID CONTROL WITH OVERSHOOT CONTROL, SELF-TUNE AND 2 AUTOTUNING ALGORITHMS
- 8 SEGMENT PROGRAMMER FUNCTION WITH SEGMENT RECOVERY, 2 EVENTS AND STASIS CONTROL (GUARANTEED SOAK)
- INDEPENDENT TIMER WITH 4 FUNCTIONING MODES
- H/C ON/OFF CONTROL WITH COMPRESSOR PROTECTION TIME
- WATTMETER FOR CALCULATING THE INSTANTANEOUS POWER AND ENERGY USED
- DIGITAL RETRANSMISSION OF THE SET POINT
- COUNTER FOR DAYS AND HOURS WORKED WITH PROGRAMMABLE THRESHOLD FOR PREVENTATIVE MAINTENANCE
- DELAY AT THE START UP FUNCTION
- PARAMETER SEQUENCE FREELY PROGRAMMABLE
- RAMP TO SET POINT CHANGE
- RS485 SERIAL COMMUNICATION WITH MODBUS RTU PROTOCOL
- SOFT START

## TWO AUTOTUNING ALGORITHMS

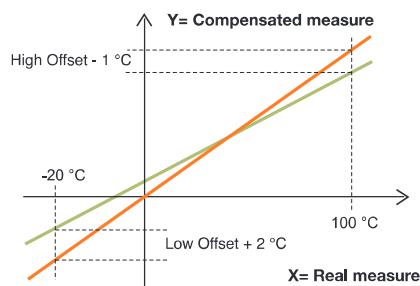
IN ORDER TO MEET THE CLIENTS' NEEDS AND THOSE OF THEIR PRODUCTION PROCESSES, ASCON TECNOLOGIC HAVE DEVELOPED TWO AUTOTUNING ALGORITHMS (AS WELL AS ADAPTIVE SELF-TUNING): OSCILLATORY AUTOTUNING AND THE "FAST" TYPE.

- **OSCILLATORY AUTOTUNING** IS THE CLASSIC TYPE THAT REQUIRES 3 OSCILLATIONS TO BE MADE AROUND A SET POINT. THIS TYPE OF TUNING IS PARTICULARLY ACCURATE AND CAN BE SET UP AT ANY MOMENT. HOWEVER, IT TAKES A LONG TIME AND GENERATES AN OVERSHOOT THAT, ALTHOUGH NOT EXAGGERATED, MAY NOT BE APPRECIATED.

- **FAST AUTOTUNING** ON THE OTHER HAND IS MUCH FASTER AND THEREFORE PARTICULARLY SUITABLE FOR VERY SLOW PROCESSES. ANOTHER OF ITS CHARACTERISTICS IS THAT IT DOES NOT GENERATE OVERSHOOT (THE ALGORITHM AIMS AT KEEPING THE PV UNDER THE SET POINT). FINALLY FAST AUTOTUNING, APPLIED IN MULTI-LOOP SYSTEMS, FEELS THE "DRAGGING" EFFECTS PRODUCED BY NEIGHBOURING LOOPS MUCH LESS AND IS THEREFORE PARTICULARLY SUITABLE FOR MACHINES SUCH AS EXTRUDERS, HOT-RUNNERS, CONTINUOUS OVENS, ETC.

## USER CALIBRATION

THIS FUNCTION ALLOWS THE MANUFACTURER OF THE MACHINE TO CALIBRATE THE ENTIRE MEASURING CHAIN THUS COMPENSATING FOR ALL ERRORS DUE TO:



- TO:
- SENSOR POSITION
- CLASS OF SENSOR
- ACCURACY OF THE INSTRUMENT.

THE USER CALIBRATION DOES NOT MODIFY THE PLANT CALIBRATION AND CAN ALWAYS BE CANCELLED.

## DIGITAL RETRANSMISSION

BY MAKING USE OF SERIAL COMMUNICATION AND WITHOUT USING A PC, IT IS POSSIBLE FOR AN INSTRUMENT (MASTER) TO SEND ITS OPERATIVE SET POINTS TO OTHER INSTRUMENTS (SLAVE). FURTHERMORE, EACH SLAVE INSTRUMENT CAN ADD ONE OF ITS OFFSETS TO THE VALUE RECEIVED. IT IS THEREFORE POSSIBLE TO MODIFY THE SET POINT OF ALL THE CONNECTED INSTRUMENTS BY MODIFYING THE SET POINT OF THE MASTER ONLY. TYPICAL APPLICATIONS INCLUDE CONTINUOUS OVENS, HOT-RUNNERS, POLYMERIZATION OVENS, ETC.

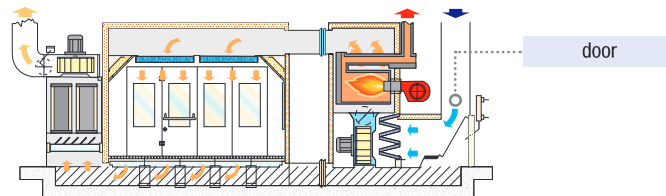


## PROGRAMMER FUNCTION

### APPLIED EXAMPLE:

PAINT BOOTH AND DRYING CHAMBER FOR SPRAY PAINTS (SPRAY BOOTHS FOR BODYWORK).

- DURING THE PAINTING PHASE, THE TEMPERATURE INSIDE THE BOOTH MUST REMAIN AT 20°C AND THE AIR USED FOR ITS VENTILATION MUST COME FROM OUTSIDE.
- ONCE THE PAINTING IS FINISHED, THE OPERATOR LEAVES THE BOOTH, CLOSES THE DOOR AND STARTS UP THE "DRYING" CYCLE. DURING THIS PHASE THE INSTRUMENT CLOSES THE AIR GATE AND RECYCLES THE AIR INSIDE THE BOOTH BY MEANS OF WHICH ENERGY CONSUMPTION IS REDUCED.



- WHEN THE DRYING PHASE IS OVER BUT BEFORE THE OPERATOR CAN ENTER THE BOOTH, IT IS NECESSARY TO RE-OPEN THE AIR GATE AND ENSURE THAT:
  - 1) THE AIR INSIDE THE BOOTH HAS BEEN REPLACED WITH AIR FROM OUTSIDE.
  - 2) THE TEMPERATURE IN THE CABIN IS LOWER THAN THE PRE-ESTABLISHED VALUE.
- THE THERMAL PROFILE NEEDED IS AS FOLLOWS.

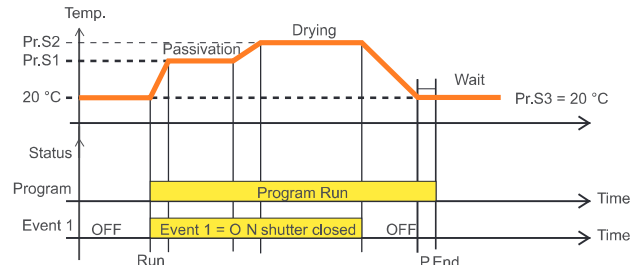
OUT 1 = HEATING OUTPUT

OUT 2 = EVENT 1

OUT 3 = PROGRAMME RUNNING

EVENT 1 = IN ON DURING RAMP 1, STASIS 1, RAMP 2, AND STASIS 2.

ONCE THE PROGRAMME IS RUNNING THE DOOR STAYS BLOCKED.



THE CONTROL FUNCTION OF THE STASIS ALLOWS US TO END THE PROGRAMME (THEREFORE ALLOWING ACCESS TO THE OPERATOR) ONLY WHEN THE TEMPERATURE IN THE BOOTH HAS REACHED THE PROGRAMMED VALUE (IN THE EXAMPLE Pr.S3). IN ADDITION, IF A POWER DOWN OCCURS DURING PROGRAM EXECUTION, AT THE NEXT POWER UP, THE INSTRUMENT IS ABLE TO CONTINUE THE PROGRAM EXECUTION STARTING FROM THE SEGMENT IN PROGRESS AND, IF THE SEGMENT WAS A SOAK, THE RESTART POINT WILL TAKE CARE OF THE SOAK TIME ALREADY MADE (WITH AN ACCURACY EQUAL TO 30 MIN.)

## ACCESSORIES

### A01 - PROGRAMMING KEY

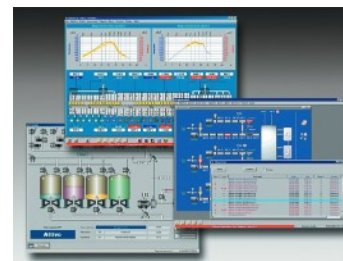
MAKES IT POSSIBLE TO:

- MEMORIZE THE CONFIGURATION OF AN INSTRUMENT TO TRANSFER IT TO OTHER INSTRUMENTS
- TRANSFER A CONFIGURATION TO A PC
- MEMORIZE A CONFIGURATION RECORDED IN A PC
- LET THE INSTRUMENT "CONVERSE" DIRECTLY WITH A PC.



### WINTEC - SUPERVISOR

- DATA ACQUISITION
- SUPERVISION
- ALARM MANAGEMENT
- RECIPE MANAGEMENT
- TREND
- REPORTS.



## TECHNICAL FEATURES

### ELECTRICAL DATA

POWER SUPPLY: SEE THE "HOW TO ORDER"  
 POWER CONSUMPTION: MAX 6 VA  
 DEVICE CLASS: CLASS II  
 NOMINAL PULSE VOLTAGE: 2,5 KV  
 CATEGORY OF OVERVOLTAGE: II  
 ISOLATION: REINFORCED BETWEEN LOW VOLTAGE (INPUT AND OUTPUT RELAY) AND FRONTAL PARTS. REINFORCED BETWEEN LOW VOLTAGE AND VERY LOW VOLTAGE PARTS (INPUT, STATIC OUTPUTS)

### THERMOCOUPLE INPUT

TYPE: J,K,S,R,T PROGRAMMABLE  
 LINE RESISTANCE: 100 W WITH ERROR  $\leq \pm 0.1\%$  OF THE INPUT RANGE WIDTH  
 UNIT OF MEASUREMENT: °C OR °F PROGRAMMABLE  
 COLD JUNCTION: AUTOMATIC COMPENSATION FROM 0 TO +50 °C  
 COLD JUNCTION ACCURACY: 0,1 °C/°C @ 25 °C AFTER A WARM-UP (INSTRUMENT SWITCH-ON) OF 20 MIN  
 CALIBRATION: ACCORDING TO EN 60584-1  
 BURN-OUT: AT THE END OF SCALE

TC Type	Range	Range
J	FROM 0 TO 1000 °C	FROM 32 TO 1832 °F
	FROM 0.0 TO 999.9°C	FROM 32.0 TO 999.0 °F
K	FROM 0 TO 1370 °C	FROM 32 TO 2498 °F
	FROM 0.0 TO 999.9°C	FROM 32.0 TO 999.0 °F
S	FROM 0 TO 1760 °C	FROM 32 TO 3200 °F
	FROM 0.0 TO 999.9°C	FROM 32.0 TO 999.0 °F
R	FROM 0 TO 1760 °C	FROM 32 TO 3200 °F
	FROM 0.0 TO 999.9°C	FROM 32.0 TO 999.0 °F
T	FROM 0 TO 400 °C	FROM 32 TO 752 °F
	FROM 0.0 TO 400.0°C	FROM 32.0 TO 752.0 °F

### THERMORESISTANCE INPUT (RTD)

TYPE: PT 100 3 WIRES  
 CURRENT: 135 µA  
 LINE RESISTANCE: AUTOMATIC COMPENSATION UP TO 20 W/WIRE WITH MAXIMUM ERROR  $\leq \pm 0.1\%$  OF THE INPUT SPAN  
 UNIT OF MEASUREMENT: °C OR °F PROGRAMMABLE  
 BURN-OUT: AT THE END OF SCALE  
 CALIBRATION: ACCORDING TO EN 60751/A2

RTD Type	Range	Range
Pt 100	FROM -200 TO 850 °C	FROM -328 TO 1562 °F
	FROM -200.0 TO 850.0 °C	FROM -328.0 TO 999.9 °F

### THERMISTOR INPUT

TYPE: KTY 81-121 (990 W @ 25 °C) AND NTC 103AT-2 (10 K W @ 25 °C)  
 UNIT OF MEASUREMENT: °C OR F, PROGRAMMABLE

Type	Range	Range
KTY 81-121	FROM -55 TO 150 °C	FROM -67 TO 302°F
	FROM -55.0 TO 150.0 °C	FROM -67.0 TO 302.0 °F
NTC103 AT-2	FROM -50 TO 110 °C	FROM -58 TO 230°F
	FROM -50.0 TO 110.0 °C	FROM -58.0 TO 230.0 °F

### LINEAR SIGNALS INPUT

TYPE: 0/10-50 mV, 0/12-60 mV, 0/4-20 mA, 0/1-5 V, 0/2-10 V  
 VISUALIZATION: PROGRAMMABLE FROM -1999 TO 9999  
 DECIMAL POINT: PROGRAMMABLE  
 BURN-OUT: (ONLY FOR ZERO SUPPRESSION SIGNALS) BURN-OUT SIGNALING WHEN THE INPUT SIGNAL IS LESS THAN 5% OF THE INPUT ·ELD  
 AUXILIARY SUPPLY FOR 0/4 - 20 mA TRANSMITTERS:  
 - TYPE: NOT ISOLATED AND NOT PROTECTED AGAINST SHORT-CIRCUIT  
 - LOAD: 10 V @ 20 mA  
 INPUT IMPEDANCE:  
 - 51 W FOR mA INPUT  
 - >1 M W FOR mV AND V INPUTS

### DIGITAL INPUTS

TYPE: FOR FREE-VOLTAGE CONTACTS  
 MAX CONTACT RESISTANCE: 10 W  
 CONTACT LOAD: 10 V, 6 mA

### OUTPUTS

FUNCTION: PROGRAMMABLE  
 OUTPUT ACTION: DIRECT/REVERSE, PROGRAMMABLE  
 TYPE:  
 A) RELAY OUTPUTS  
 CONTACT: SPDT OR SPST-NO  
 CONTACT LOAD: SEE THE "HOW TO ORDER"  
 RELAY ELECTRIC LIFE: 100000 OPERATIONS  
 B) LOGIC TENSION TO DRIVE A SOLID STATE RELAY  
 ISOLATION: OUTPUT **NOT** ISOLATED AS REGARDS THE VERY LOW VOLTAGE PARTS  
 LOGIC STATE 1: 12 V  $\pm 20\%$  @ 1 mA  
 10 V  $\pm 20\%$  @ 20 mA  
 LOGIC STATE 0: <0.5 V

### POWER OUTPUT SENSOR

ISOLATION: OUTPUT NOT ISOLATED AND NOT PROTECTED BY THE SHORT CIRCUIT  
 TENSION: 12 VDC  
 CURRENT: 20 mA MAX

### COMMUNICATION

TYPE: TTL MODBUS AND RS 485 (OPTIONAL)  
 ISOLATION: FUNCTIONAL ISOLATION (50 V) WITH RESPECT TO THE VERY LOW VOLTAGE PARTS  
 PROTOCOL: MODBUS RTU  
 ELECTRICAL LEVELS: ACCORDING TO EIA STANDARDS  
 BAUD RATE: FROM 1200 TO 38000 BAUD  
 PARITY: NONE  
 DATA FORMED: 8 BIT + 1 START BIT + 1 STOP BIT

### ENVIRONMENTAL DATA

POLLUTION CATEGORY: 2  
 INSTALLATION CATEGORY: II  
 OPERATING TEMPERATURE: FROM 0 TO 50 °C  
 OPERATING HUMIDITY: < 95 RH% WITHOUT CONDENSATION  
 STORAGE TEMPERATURE: -25 °C TO 60 °C

### FUNCTIONAL DATA

CONTROL: - SINGLE ACTION PID, DOUBLE ACTION PID  
 - ON/OFF, NEUTRAL ZONE ON/OFF  
 OVERALL ACCURACY:  $\pm (0,5 \% \text{ SPAN} \pm 1 \text{ DIGIT @} 25 \text{ } ^\circ\text{C})$ ;  
 TC S:  $\pm (1 \% \text{ SPAN} \pm 1 \text{ DIGIT @} 25 \text{ } ^\circ\text{C})$   
 SAMPLING RATE: 130 MS  
 DISPLAY UPDATING TIME: 500 MS  
 COMMON-MODE REJECTION: 120 DB TO 50/60 Hz  
 NORMAL-MODE REJECTION: 60 DB TO 50/60 Hz  
 CONFORMITY: EMC 2004/108/CE (EN 61326) DIRECTIVE, LV 2006/95/CE (EN 61010-1) DIRECTIVE.

# K 85

4 DIN MODULE - UP TO 3 OUTPUTS

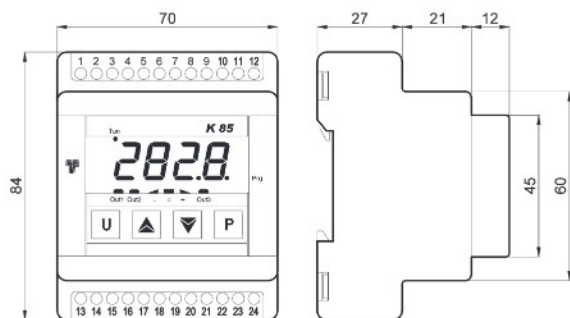


# K 85

### MECHANICAL DATA

HOUSING: UL 94 V0 SELF-EXTINGUISHING PLASTIC  
 MOUNTING: ON OMEGA DIN RAIL  
 DIMENSIONS: 4 DIN MODULE, 70 X 84 MM, DEPTH 60 MM  
 DISPLAY: 4 RED DIGIT H 12 MM  
 WEIGHT: 180 G APPROX.  
 TERMINAL BLOCK: 24 SCREW TERMINALS (SCREW M3 FOR CABLES FROM 0.25 TO 2.5 MM<sup>2</sup> OR FROM AWG 22 TO AWG 14 )  
 PROTECTION DEGREE: IP 40 (SCREW TERMINAL IP20) ACCORDING TO EN 60070-1 FOR INDOOR USE.

### DIMENSIONS (mm)



# K SERIES

### HOW TO ORDER

K85 - = REGULATOR  
 K85T = REGULATOR + TIMER  
 K85P = REGULATOR + TIMER + PROGRAMMER

#### Power supply

L = 24 V AC/DC  
 H = 100 - 240 V AC

#### Input

C = J, K, R, S, T, PT100, 0/12...60 mV  
 E = J, K, R, S, T, PTC, NTC, 0/12...60mV  
 I = 0/4...20 mA  
 V = 0...1V, 0/1...5V, 0/2...10V

#### Out 1

R = SPDT 8 A RELAY (RESISTIVE)  
 0 = VDC FOR SSR

#### Out 2

- = NOT AVAILABLE  
 R = SPDT 8 A RELAY (RESISTIVE)  
 0 = VDC FOR SSR

#### Out 3

- = NOT AVAILABLE  
 R = SPST-NO 5 A RELAY (RESISTIVE)  
 0 = VDC FOR SSR

#### Communication

- = TTL ModBUS  
 S = RS 485 ModBUS

#### Digital input

- = NOT AVAILABLE  
 D = 2 DIGITAL INPUTS

### CONNECTIONS

