Lots of options, just one choice.





A successful method















Suitable for use R290

Wireless connection

Bluetooth

Internet of Things

Applications



GLOBAL MARKET PRESENCE

Today millions of professional and commercial refrigerators, blast chillers and freezers, dough-retarder provers, ovens, air conditioners, compressed air dryers are controlled by high-performance regulators. You may often wonder who manufactures these customized electronic controls.

If you see a product operating with innovative technology & long lasting performance it is likely to be our LAE ELECTRONIC brand.

LEADER IN CUSTOMIZED CONTROLLERS

For many years we have proven to be leaders in the designing of customized controllers based on the technical specifications and design of the system to be controlled. For over thirty years, we have supported innovative changes requested by some of the most reputable world manufacturers.

Our Customers recognize the competency and the unique know-how with which we approach the project phases, creating synergies for the development of original and unique proposals. Solutions we help provide are the key to the complete success of their system.

PERFECT INTEGRATION

We aim to produce a perfect integration into your applications, without compromise, making LAE Electronic controllers among the best ever in the global marketplace. Our products have a solid reputation for reliability and incredible efficiency in the toughest working conditions. Being aesthetically sophisticated and easy to operate, they are just as user-friendly as a tablet or a smartphone.

ENVIRONMENT & ETHICAL CODE

LAE policy is to always respect all environmental protection concerns that are important to all consumers. We develop functions and adopt technologies that best meet the growing needs for energy saving and low environmental impact.

Another cornerstone of our company policy is focused on ethical treatment of all workers. We closely work with exclusively selected suppliers that have adopted ethical codes.

CONNECTIVITY

Our R&D division is continuously engaged in the assessment of the latest generation of new technologies, especially with respect to the collection and processing of data. These connectivity features are now easily obtainable providing great functionality for the enduser and the manager. Machines that communicate and coordinate among them, by means of our controllers, form a much more efficient and easily controllable system, with enormous benefits in terms of safety, process stability and product quality.



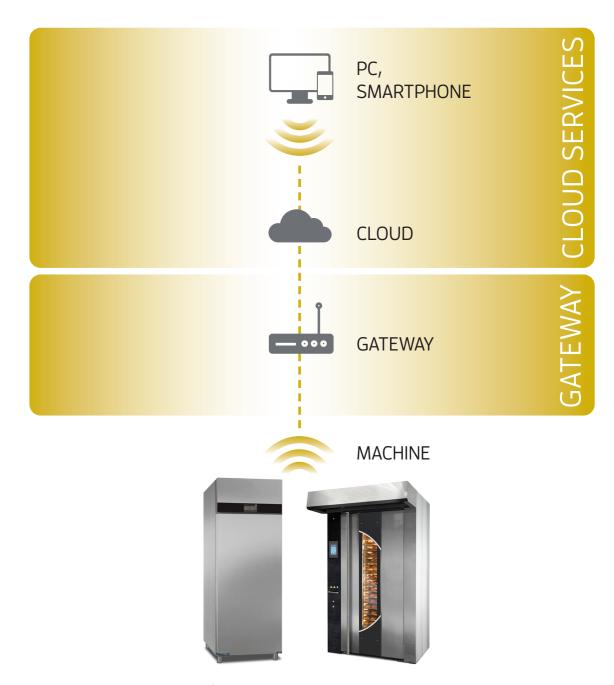
A cloud-based software suitable for use with the LAE controllers, **accessible** anywhere and anytime via a web browser or mobile App.

Its User Interface may be **customised** to suit the specific customer's requirements as to webpage layout, colours, logo and functions.

The adoption of the **most updated security and privacy standards** is guaranteed at all times.







The complete scenario of the plant connected is always and anywhere **under control via your Smartphone**, **tablet or PC**.

Maximum productivity is thus ensured and the risk of downtimes, unpredicted maintenance costs and high operation costs is actually eliminated.

A precise continual supervision allows the machine parameters to be programmed when needed and machine components to be serviced or replaced in a timely manner so as to always maintain the best product quality and texture without the risk of losses.

This cloud-based software is a very powerful service tool to **add** significant **value to the offer range of OEMs**, service engineers and system managers, ensuring peace of mind, long lasting operation and optimised performance of the machines.

Gateway









WFM-1x 67.5 x 35 x 15 mm

WiFi module for IoT Communication

The WFM-1 module allows an LAE controller equipped with TTL (WFM-1 version) or RS485 (WFM-1B version) serial port to connect to the cloud.

Model

WFM-1

- Bidirectional connectivity: send data to the cloud for storage and monitoring, and receive commands or configurations.
- Flexible user-friendly configuration: set up parameters via PC.
- Reliable technology: Wi-Fi 6 ensures stable and efficient connections.

	How to order WFM-1X								
Version	Customisations	Description							
		External Wi-Fi module with connectivity for LAE controllers to the Cloud							
Α		TTL version							

Customisation pro Customer, with a progressive N

	Technical Data
CPU	ESP32-C6
Core	32-bit RISC-V single-core microprocessor 160Mhz
Memory	8MB FLASH
0S	Free RTOS
WiFi	IEEE 8802.11ax 2.4 GHz Wi-Fi 6 (Fully compatible with IEEE 802.11b/g/n protocol)
Serial Port	TTL/RS485
Power supply	5 Vdc from an LAE controller
Size	67.5 x 35 x 15 mm

	Approvals
FCC	2AC7Z-ESPC6WR00M1
IC	21098-ESPC6WR00M1
KR	R-C-es5-ESP32C6WR00M1
CN	24J31H8DC601





CONTROLLERS

AC2-5	Pg. 10
AC2-27	Pg. 12
LTR-5	Pg. 14

REFRIGERATION CONTROLLERS

AT1-5	Pg. 16
AT2-5	Pg. 18
BR5	Pg. 20
CT1-5	Pg. 22
CD5	Pg. 24
CR5	Pg. 26
CD25	Pg. 28
BR1-27	Pg. 30
BD1-28	Pg. 32
BR1-28	Pg. 34
DISPLAYS	Pg. 36

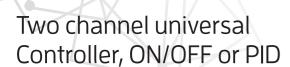
SUPERVISORY SYSTEMS

TAB 5.0	Pg. 38
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PROBES

HT2WAD	Pg. 40
PGT35	Pg. 41
NTC2K & NTC10K	Pg. 42
Pt100 & Thermocouples	Pg. 43

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Main Features

- Stylish Capacitive Touch display and keypad technology
- Runs on universal mains power supply
 PID with autotuning or ON/OFF control
- Main output on 12A relay or for SSRpiloting and auxiliary output on 7A relay
- Input for 0÷1V, 0/4÷20mA, PTC/NTC10K, TC J/K or Pt100
- Selectable Refrigerating/Heating (Dehumidifying/Humidifying) control
- Absolute or relative temperature alarms
- Connectivity to supervisory systems and gateway for cloud

Applications

Temperature: Control of heating systems, heated cupboards, bains-marie, ovens, laboratory equipment.

Humidity: Control of greenhouses, seasoning cells, cold rooms, air-conditioned rooms.

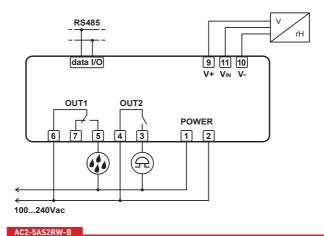
How to order AC2-5							
Model	Suffix	Suffix		Opt.	Description		
AC2-5					Model and dimensions main unit 5 series		
	A				Input 01V		
	1				Input 0 / 420mA		
Inputs	J				TC "J" (Iron-Constantan) / TC "K" (Chromel-Alumel		
	Р				Thermistor Pt100		
	Т				PTC1000 / NTC10K		
Connections S				Screw Connections (built in screw terminals)			
Outnute		1			Output 1		
Outputs		2			Output 1 + 2		
Type of autoute		R			Outputs on relay		
Type of outputs		М	l		Output 1 on SSR drive, output 2 on relay		
_			L*		7 ÷ 30Vdc / 12Vac		
Power supply		w		100 ÷ 240 Vac			
				-	None		
Aux. functions				-Δ	Serial communication TTI		

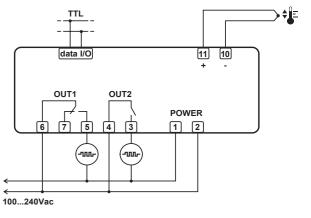
* In the AC2-5...L version, the power supply of the controller and of the loads must be of type SELV or PELV.

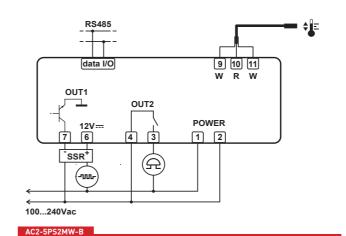
-B Serial communication RS485

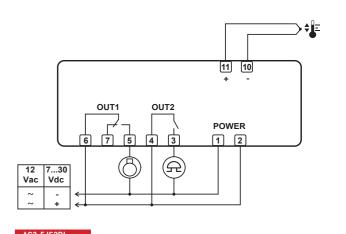
AC2-5 series								
TECHNICAL DATA	HNICAL DATA AC2-5T		AC2-5P	AC2-5J		AC2-5A	AC2-51	
Input Type	PTC	NTC10K	Pt100	TC "J"	TC "K"	0÷1V	0/4÷20mA	
Range	-60÷300°F -40÷260°F -150÷999°F		-50÷750°C -60÷999°F	-50÷999°C -60÷999°F	Configurable in setup			
Accuracy*			< ±3°C < ±5°F	< ±3mV	< ±0.2mA			
Resolution		0.1 / 19	C / 1°F	1 °C / °F 0.1 / 1				
Max. loads of outputs	OUT1 OUT2 SSR drive fo	or OUT1	3.6 FLA, 21.6 LRA @ 240Va 1 FLA, 6 RLA @ 240Vac; 7/ 15mA 12Vdc	ac; 12A resistive DC30 10A A resistive DC30 5A				
Power supply	100 ÷ 240 Vac ±10%, 50/60Hz, 3W; 7 ÷ 30Vdc / 12Vac ± 10%, 3W							
Panel-cutout	71 x 29 mm							
Ambient temperature & humidity	-10 +50°C; 15% 80% rH							

^{-50÷150°}C^(a); ^(b) remaining range.









^{*} Approximate (for exact indications, please refer to the instructions for use)

AC2-27

72 x 94 x 61 mm DIN rail

Two channel universal Controller, ON/OFF or PID





- Runs on mains power supply
- PID with autotuning or ON/OFF control
- Main output on relay or for SSR-piloting and auxiliary output on relay
- Input for 0÷1V, PTC/NTC10K, TC J/K or Pt100
- 0.1 / 1°C or 1°F resolution
- Selectable Refrigerating/Heating (Dehumidifying/Humidifying) control
- Absolute or relative temperature alarms
- ON/OFF button on front
- Connectivity for supervisory systems or IoT
- Selectable serial communication protocol ASCII or RTU

Applications

Temperature: on control panels for small cold stores, heating systems, heated cupboards, bains-marie, ovens, laboratory equipment. Humidity: on control panels for greenhouses, seasoning cells, cold rooms, air-conditioned rooms.

Trow to craci riol 22					
Model	Suffi	Suffix Op		Description	
AC2-27				Model and dimensions main unit 27 series	
	Α			Input 01V	
Inputs	J			TC "J" (Iron-Costantan) / TC "K" (Chromel-Alumel)	
	Р			Thermistor Pt100	
	Т			PTC1000 / NTC10K	
Connections	S			Screw Connections (buil-in screw terminals)	
Outnute		1		Output 1	
Outputs		2		Output 1 + 2	
		R		Outputs on relay	

How to order AC2-27

* In the AC2-27...L version, the power supply of the controller and of the loads must be of type SELV or PELV.

-A

-B

AC2-27 series									
TECHNICAL DATA	AC2-27T		AC2-27P	AC2-	27J	AC2-27A			
Input Type	PTC	NTC10K* Pt100		TC "J" TC "K"		0÷1V			
Range	-50÷150°C -60÷300°F	-40÷125°C -40÷260°F	-100÷850°C -150÷999°F	-50÷750°C -60÷999°F	-50÷999°C -60÷999°F	Configurable in setup			
Accuracy*	±0.3°C ±0.6°F	±0.3°C ±0.6°F	±0.3°C ^(a) ; ±1°C ^(b) < ±2°F	< ±3°C < ±5°F		< ±3mV			
Resolution		0.1 / 1°	C / 1°F	1 °C / °F 0.1 / 1					
Max. loads of outputs	OUT1 3.6 FLA; 21.6 LRA 240Vac; 12A resistive OUT2 3.6 FLA; 21.6 LRA 240Vac; 12A resistive SSR drive for OUT1 15mA 12Vdc								
Power supply	100 ÷ 240 Vac ±10%, 50/60Hz, 3W; 7 ÷ 30Vdc / 12Vac ± 10%, 3W								
Ambient temperature & humidity	-10 +50°C; 15% 80% r.H.								

Type of outputs

Power Supply

Aux. functions



Output 1 on SSR drive,

7...30Vdc / 12Vac ±10%

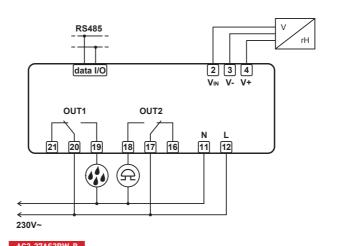
Serial Communication TTL

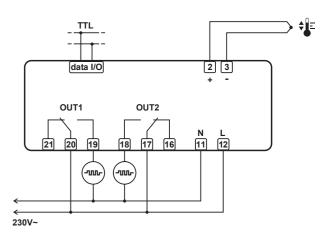
Serial Communication RS485

output 2 on relay

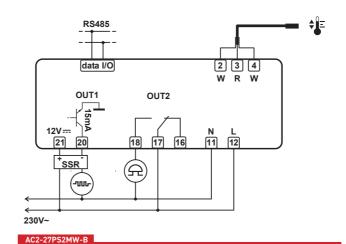
100...240 Vac

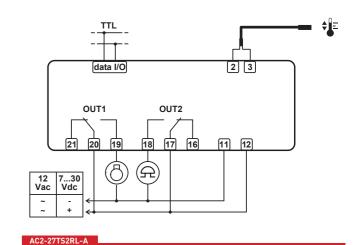
None





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^(a) -50÷150°C; ^(b) remaining range.

^{*}Approximate (for exact indications, please refer to the instructions for use)

LTR-5

77 x 35 x 77 mm

Single output ON/OFF or PID controller



Main features

- Runs on mains power supply
- PID with autotuning or ON/OFF control
- Output on relay (16A) or SSR piloting
- Input for PTC, NTC10K or 0÷1V
- 0.1 / 1°C or 1°F resolution
- Refrigerating (dehumidifying) or heating (humidifying) control mode selection
- ON/OFF button on front
- Connectivity LAE supervisory systems

Applications

Temperature: Control of small cold stores, refrigerated cabinets and tables, heating systems, heated cupboards, bains-marie, ovens, laboratory equipment.

Humidity: Control of greenhouses, seasoning cells, cold rooms, air-conditioned rooms.

How to order LTR-5

Model	Suffix			Options	Description
LTR-5					Model and dimensions main unit
	Α				Input 01V (rH%)
nputs	С				NTC 10K
	Т				PTC1000
Connections	S				Screw connections (fixed screw terminals)
Destance to		R			Relay 16(4)A
Outputs	F				SSR drive
			D		12 Vac/dc
Power Supply			E		230 Vac
			U		115 Vac
				-	None
Aux. functions				-A	TTL serial port
				-В	RS485 serial port

Standard Models

- > LTR-5CSRE, LTR-5CSRE-A, LTR-5CSRE-B, LTR-5ASRE
- $oldsymbol{\mathcal{Y}}$ On request, the LTR-5 is also available with gasket for a better protection between bezel and panel.

Technical Data

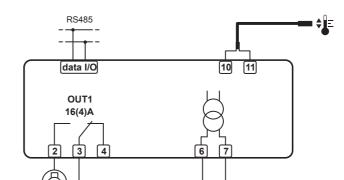
Power supply					
LTR-5D	12Vac/dc±10%, 2W				
LTR-5E	230Vac±10%, 50/60Hz, 2W				
LTR-5U	115Vac±10%, 50/60Hz, 2W				
Relay outputs (LTR-5	R)				
LTR-5. S R	OUT1 16(4)A				
LTR-5. Q R OUT1 12[4]A					
SSR drive (LTR-5F)					
OUT1	15mA 12Vdc				
Inputs					
LTR-5A:	099%r.H.				
LTR-5C:	-40125°C				

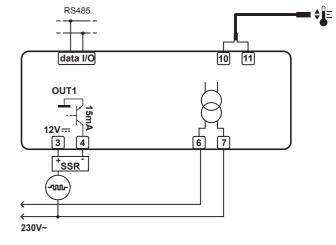
Measuring accuracy

LTR-5T...:

LTR-5A:	<±0.7%r.H. in the measuring range
LTR-5C:	<±0.3°C -40100°C; ±1°C out of that range
LTR-5T:	<±0.3°C -50140°C; ±1°C out of that range
Front protection	IP54
Ambient temperature & humidity	-10÷50°C; 15%÷80%

-50...150°C



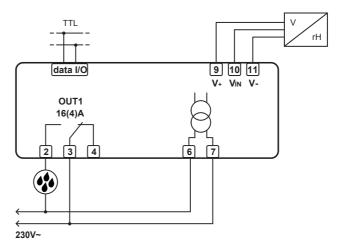


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LTR-5CSRE-B

230V~





LTR-5ASRE-A

AT1-5

77 x 35 x 77 mm

Refrigeration Controller for HT applications



- Selectable Refrigerating or Heating control
- Integrated defrost functions
- Runs on mains power supply
- Direct compressor control through high power 16(8)A relay
- Selectable NTC10K or PTC probe input
 Auxiliary output configurable in four.
- Auxiliary output configurable in four different operation modes
- Temperature, door open alarms
- Optional light control button
- TTL or RS485 serial port, connectivity option to LAE supervisory systems or IOT
- UL approved

Applications

Freestanding upright cabinets and counters, cold stores, plug-in display cases, control panels, heated cabinets.

	How to order AT1						
Model	S	Suffix		0	ptions	Description	
AT1-5							Model and dimensions main unit
	Α						Thermostat probe
Inputs	В	В					Thermostat probe + evaporator probe + door switch input
Connectors		Q					Quick Connections (detachable screw terminals)
Connectors		S				Screw Connections (fixed screw terminals)	
			5				Thermostat relay (16(8)A)
Outputs			6				Thermostat relay (16(8)A) + Aux relay 7(2)A
				D			12 Vac/dc
Power Supply				E			230 Vac
				U			110 Vac
							Standard relays
Relay type					Н		Sealed relays for flammable gas applications
					-		None
Aux functions			-A		TTL serial port		
			-В		RS485 serial port		
Overlay artwork				GK	Standard version		

- ➤ The standard display is RED
- All versions include buzzer

Overlay artwork

> Upon request, the AT1-5 is also available with a gasket for a better protection between bezel and metal panel

With lights button



RS485	Door Switch
data I/O	7 8 9 11 10 Door T2 Com T1
5 4	# AUX 16(8)A 7(2)A
230 Vac	

AT1-5BS6E-BG

	Technical Data
Control range	-50÷120°C
Resolution	0.1 / 1 °C; °F
Accuracy	NTC10K: <±0.3°C (-40.0÷70.0°C) PTC1000: <±0.5°C (-50÷120°C)
Sensor type	selectable NTC10K standard mod. SN4B20P1/P2 or PTC1000

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Relay outputs:

AT1-5. Q5 (6)	Compressor	12(8)A
AT1-5. S5 (6) (Compressor	16[8]A
Auxiliary loads		7(2)A 240Vac
AT1-5. Q		maximum total current 12A
AT1-5. S		maximum total current 16A
Power supply	230V~ ±10% 50	D÷60Hz 3W
Front protection	IP54	
Panel cut-out	71 x 29 mm (WxH)	
Ambient temperatu & humidity	-10÷50°C; 15%÷80°	% г.Н.

AT2-5

77 x 35 x 77 mm

Refrigeration Controller for HT/LT



Standard version

With lights button

Main Features

- Selectable Refrigerating or Heating control
- Runs on mains power supply
- Direct compressor control through high power 16(5)A
- Auxiliary output configurable in six different operating modes
- Selectable NTC10K or PTC input
- Electrical, off cycle or hot gas defrost
- Temperature, door open alarms
- Optional light control button
- TTL or RS485 serial port, connectivity option to LAE supervisory systems or IOT
- UL approved

Applications

High or Low Temperature upright cabinets and counters, cold stores, plug-in display cases, control panels, heated cabinets.

How to order AT2						
Suffix		Options	Description			
			Model and dimensions main unit			
В			Thermostat probe + evaporator probe + door switch input			
Q			Quick Connections (detachable screw terminals)			
s			Screw Connections (fixed screw terminals)			
4			Compressor relay 16A (High Power) + evap. fans + defrost			
	D		12 Vac/dc			
	Е		230 Vac			
			110 Vac			
Aux functions		-A	TTL serial port			
		-B	RS485 serial port			
	Suffix B Q S	Suffix B Q S D	Suffix Options B Q S D E U -A			

> The standard display is RED

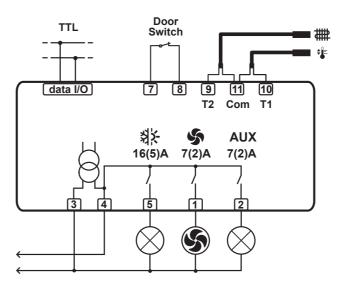
Overlay artwork

- > All models come with an alarm buzzer
- **>** Upon request, the AT2-5 is also available with gasket for a better protection between bezel and metal panel

GK







	Technical Data
Control Range	-50÷120°C
Resolution	0.1 / 1 °C; °F
Accuracy	NTC10K: <±0.3°C (-40.0÷70.0°C) PTC1000: <±0.5°C (-50÷120°C)
Sensor type	Selectable NTC10K standard mod. SN4B20P1/P2 or PTC1000

Flae

Relay outputs:

AT2-5. Q Compre	ssor	12(5)A 240vac		
AT2-5. S Compre	ssor	16(5)A 240vac		
Evaporator fans		7(2)A 240vac		
Auxiliary loads		7(2)A 240vac		
AT2-5. Q		maximum total current 12A		
AT2-5. S		maximum total current 16A		
Power supply	230V~ ±10% 50	÷60Hz 3W		
Front protection	IP54			
Panel cut-out	71 x 29 mm (WxH)			
Ambient temperature & humidity	-10÷50°C; 15%÷80%	6 r.H.		

BR5

77 x 35 x 90 mm

Compact Comprehensive Refrigeration Controller





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Main features

- Up to 5 configurable outputs for a perfect adaptation to the specific needs such as: control of variable speed compressors (example 2) or fans (example 1), drive of a large external compressor relay (example 3), control of lights, ON/OFF fans, heaters, switched loads, defrost, alarms, second evaporator
- With or without RTC for timed control functions
- Suitable for R290 compressors
- Universal mains power supply
- Connectivity to residential supervisory systems or Cloud

Applications

Upright refrigerators, plug-in and supermarket display cases, refrigerated vehicles, cold stores, control panels.

		Но	W	to c	order BR5
Model	Suff	ix		Opt.	Description
BR5					Model
OUTE output	-A				ECM Fan output
OUT5 output	-B	-B			VCC output
	0				RTC fitted
RTC	1	1			RTC absent
Inputs/Outputs		01			Standard Version: 6 inputs, 4 outputs
inputs/outputs					
Power Switch	W				100240 Vac
Relays					Standard relays
Relays			Н		Sealed relays
Communication	0				RS485
Communication port		Т		TTL	
Aesthetical options and F/W				-	None
				-xxx	

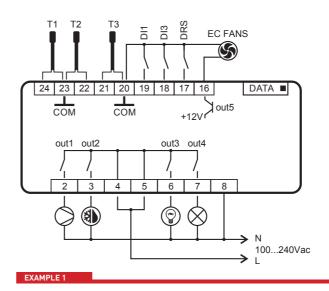
> All models are fitted with buzzer.

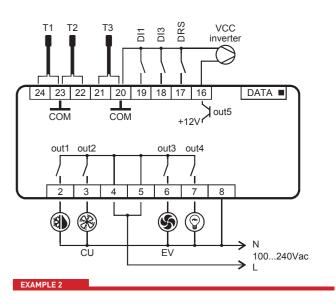
Standard Model

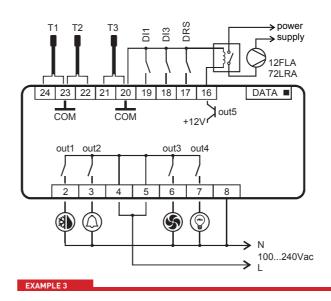
> BR5-A001WR

Range		-50÷110°C, -58÷180°F		
Resolution		0.1 / 1°C; °F		
Precision		<±0.5°C within the measurement range		
Ser	nsor type	NTC 10K Ω@ 25°C		
Relay output max loads (240Vac):				
	OUT1	12A resistive 3.5 FLA; 21 LRA		
	OUT2	7A resistive 1 FLA; 4 LRA		
	OUT3	7A resistive 1 FLA; 4 LRA		
	OUT4	7A resistive 1 FLA; 4 LRA		
	OUT5	SELV 90mA@12Vdc		
Power supply		100÷240Vac ±10% 50÷60Hz 3W		
Ambient temperature		-10÷50°C		
Real Time Clock battery		>10 years		

Technical Data







CT1-5

77 x 35 x 77 mm

Controller for HT/LT, configurable, suitable for flammable refrigerants



Main Features

- Stylish capacitive touch display and keypad technology.
- Up to two power outputs, configurable for a perfect adaptation to the specific requirements such as: direct control of a highly rated compressor, LED light control, ON/OFF control of ECM fans, regulation of heaters for heated cupboards, control of switched loads, defrost, alarms.
- Suitable for R290 natural refrigerant gas.
- Immediate configuration of the specific application (HT, LT, heating etc.).
- Excellent measurement accuracy ±0.1°.
- Universal power supply.
- TTL or RS485 serial port.
- Selectable ASCII/RTU communication protocol.
- IoT connectivity option via external WiFi module.

			П		order C11-3
Model	Suffix			Options	Description
CT1-5					Model and dimensions
Inputs	В				3 inputs (Air probe + DI1/T2 + DI2/T3)
Connections	S	;			Fixed screw terminals
Outrute		1			1 relay output
Outputs		2			2 relay outputs
Power supp	ly		W		100240 Vac
Relay type H			Н		Sealed relays according to IEC/EN 60079-15
				-	None
Auxiliary fu	nctio	ns		-A	TTL serial port
				-В	RS485 serial port

- > Standard models: CT1-5BS1WH, CT1-5BS2WH-B
- > All versions are fitted with white LEDs
- > All versions are fitted with alarm buzzer



OUT2 OUT1

Applications

Upright fridges and freezers, plug-in counters, refrigerated tables, cold storage rooms, glass door cabinets, heated cupboards, bain-maries.

	Technical data
Range	-50÷ +110°C, -58÷ +180°F
Resolution	0.1° / 1° (°C; °F)
Precision	±0.1°C within the measurement range
Sensor type	NTC10KΩ@25°C

4lae

Maximum loads of outputs:

OUT1	15 FLA; 90 LRA; 15A resistive @ 120Vac - 240Vac					
OUT2	10A resistive @ 120Vac; 7A resistive @ 240Vac					
Power supply	100÷240Vac ±10% 50÷60Hz 3W					
Ambient temperature & humidity	-10÷ +50°C: 15%÷80% r.H.					
Front protection	IP54 with gasket between panel and bezel					

> Reference norms:

- IEC/EN 60079-15
- EN61000-6-1
- EN61000-6-3
- EN/UL60730-1
- EN/UL60730-2-9
- RoHS 2015/863/EU • REACH 2021/979/EU

77 x 35 x 90 mm

Indestructible, Totally Adaptable, Incredibly User-Friendly Controller



Main Features

- Up to four powerful outputs, all configurable for a perfect adaptation to the specific requirements, such as: direct control of a highly rated compressor, LED light control, ECM ON/OFF fan control, regulation of heaters for heating/catering equipment, control of switched loads, defrost, alarms.
- Suitable for R290 natural refrigerant gas.
- Immediate configuration of the specific control mode (HT, LT, heating etc.).
- Excellent measurement accuracy ±0.1°C.
- Universal power supply.
- TTL or RS485 serial port; IoT connectivity option.
- Selectable ASCII/RTU communication protocol.
- Several display colour options: blue, white, red.

Applications

Fridges and freezers, cold stores, control panels, food warmers, bain-maries.

How to order CD5

I	Model	Suffix		0	pt.	Description	
	CD5					Model	
	Inputs/	01					Standard version: 4 inputs, 3 relay outputs, 1 SSR output
	Outputs	02					Standard version: 4 inputs, 3 relay outputs
	Power Switch	w				100240 Vac	
	N					Standard relays (not sealed)	
l	Relays		Н				Sealed relays
	R		R			RS485	
	Serial po	rt		T			TTL
ı				N			None
	Display		В		Blue		
ľ			R		Red		
				W		White	
	Aesthetical options				-	None	
6	and customised F/W			-xxx	LAE alpha-numeric code to specify extra specs		

Standard Model

- > CD5-01WHRW
- > All versions are fitted with alarm buzzer

	Technical Data
Range	-50÷110°C, -58÷180°F
Resolution	0.1 / 1 °C; °F
Precision	±0.1°C within the measurement range
Sensor Type	NTC10KΩ@25°C

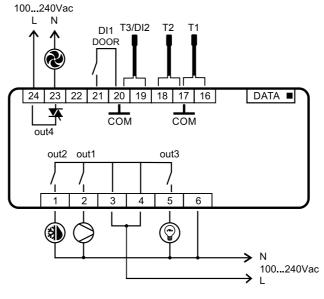
Maximum loads of outputs:

	OUT1	15 FLA; 90 LRA; 15A resistive 120Vac – 240Vac									
	OUT2	10A resistive @ 120Vac; 7A resistive @ 240Vac									
	OUT3	10A resistive @ 120Vac; 7A resistive @ 240Vac									
	OUT4	SSR 1A (30A inrush)									
Pow	ver Supply	100÷240Vac ±10% 50÷60Hz 3W									
	bient temperature umidity	-10÷50°C; 15%÷80% r.H.									





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CD5-01W

CR5

77 x 35 x 90 mm





Main Features

- Up to four powerful outputs, all configurable for a perfect adaptation to the specific requirements, such as: direct control of a highly rated compressor, LED light control, ECM ON/OFF fan control, regulation of heaters for heating/catering equipment, defrost, alarms.
- Real time defrosts with optimisation algorithm, for energy saving and a better food preservation.
- Suitable for R290 natural refrigerant gas.
- Immediate configuration of the specific control mode (HT, LT, heating etc.).
- Excellent measurement accuracy ±0.1°C.
- Universal power supply.
- TTL or RS485 serial port; IoT connectivity option.
- Selectable ASCII/RTU communication protocol.
- White LED display.

Applications

Cold stores, fridges and freezers, and all those applications where optimised real time defrosts are needed.

How to order CR5

Model	Suffix		0	ot.	Description		
CR5						Model	
Inputs/	01					Standard version: 4 inputs, 3 relay outputs, 1 SSR output	
Outputs	02					Standard version: 4 inputs, 3 relay outputs	
Power Switch	W				100240 Vac		
Delaye		Ν				Standard relays (not sealed)	
Relays		Н				Sealed relays	
			R			RS485	
Serial po	rt		T			TTL	
Aesthetical options				-	None		
and customised F/W		-xxx	LAE alpha-numeric code to specify extra specs				

Standard Model

> CR5-01WHR

> All versions are fitted with alarm buzzer and white display

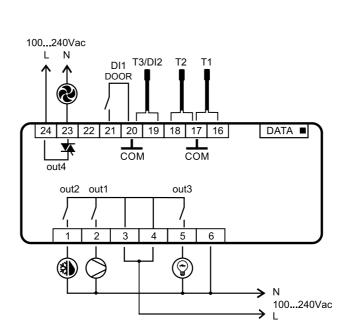
	Technical Data
Range	-50÷110°C, -58÷180°F
Resolution	0.1 / 1 °C; °F
Precision	±0.1°C within the measurement range
Sensor Type	NTC10KΩ@25°C

Maximum loads of outputs:

	OUT1	15 FLA; 90 LRA; 15A resistive 120Vac - 240Vac							
	OUT2	10A resistive @ 120Vac; 7A resistive @ 240Vac							
	OUT3	10A resistive @ 120Vac; 7A resistive @ 240Vac							
	OUT4	SSR 1A (30A inrush)							
Pow	er Supply	100÷240Vac ±10% 50÷60Hz 3W							
	pient temperature umidity	-10÷50°C; 15%÷80% r.H.							



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CR5-01WH

CD25

104 x 87 x 40 mm

Split HT/LT Refrigeration Controller





- Three highly rated relays, SSR drive on board
- Configurable control of the outputs
- Set of parameters for evergy saving
- Universal power supply 100-240Vac
- Suitable for R290 and ATEX environments
- Excellent measurement accuracy ±0.1°C
- RS485 serial port, IoT connectivity option
- Selectable ASCII or RTU communication
- Various options for the display unit: touch technology or with mechanical
- pushbuttons • UL approved

Applications

Upright refrigerators, refrigerated tables, beverage coolers, plug-in display cases for shops and supermarkets, cold rooms, control panels.

Technical Data Touch Display TD5

71 x 29 mm (WxH)

77 x 35 x 18.1 mm (WxHxD)

How to order the CD25

Model	Suffix	Options	Description
CD25			Model and dimensions Main Unit
Outputs	4		3 relays, 1 SSR drive
Power supply	W		100240 Vac 50/60 Hz
Relays	Н		Sealed relays
			None
Aesthetic Option	s and FW	-xxxx	LAE Alpha-numeric code to define the extras

- > All models are fitted with buzzer.
- > All models are fitted with 2 analogue inputs, 2 digital inputs and RS485 serial communication port.
- **>** Out of standard models not contemplated in the table above, will feature a part number deriving from the basic part number with the addition of a number at the end of the field "OPTIONS".

> CD25-4WH 3 relays, 1 SSR drive, 2 analogue inputs, 2 digital inputs, RS485 serial port.

Standard Model

	Technical Data
Range	-50110°C, -58180°F
Resolution	0.1/1°C;°F
Precision	<±0.1°C within the measurement range
Sensor type	NTC10K
Sensor type	TTOTOT

100...240Vac ±10%, 50/60Hz, 6W

Standard Models

Dimensions

Panel cut-out

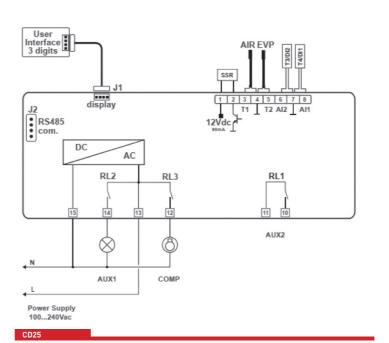
- > TD5S-W display with white LEDs, totally sealed IP55
- > TD5S-R display with red LEDs, totally sealed IP55
- > TD5U-W display with white LEDs, front protection IP54
- > TD5U-R display with red LEDs, front protection IP54

Maximum loads of outputs:

Power supply

MIGY	iiiiuiii toaus oi outp	Julis:
	Compressor	Motor load 16FLA / 96LRA max. @ 240Vac; resistive load 16A @ 240Vac
	AUX1	Motor load 3.6FLA / 21.6LRA max. @ 240Vac; resistive load 15A @ 240Vac
	AUX2	Resistive load 7A @ 240Vac
	Drive SSR	90mA @ 12Vdc Max. Ampacity on common terminals FT5 is altogether 23A
	ient temperature imidity	-10+50°C; 15%80% r.H.





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BR1-27

71 x 97 x 61 mm DIN rail

Clever Refrigeration Controller with RTC



Main features

- Up to six real time defrosts per day
- Enhanced ECO Energy Saving management
- Defrost synchronisation between two or more controllers
- Up to 2 auxiliary configurable outputs (Light, switched loads, second evaporator etc.)
- Universal mains power supply
- Connectivity to hard-wired supervisory systems, or wireless option

Applications

Cold stores, control panels.

	H	OJ WC	oraer	BK1-2/
Model	Suffix		Opt.	Description
BR1-27				Model and dimensions main unit
	В			Thermostat + evaporator probe
Inputs	С			Thermostat + evaporator + auxiliary probe
Aux digital input	1			Voltage free aux. digital input
Connections	S			Screw connections (built-in screw terminals)
		2		Compressor + evaporator fans
		3		Compressor + evaporator fans + defrost
Outputs		4		Compressor + evaporator fans + defrost + auxiliary 1
		5		Compressor + evaporator fans + defrost + auxiliary 1 + auxiliary 2
Power Supply		W		100240 Vac
			-	None
Aux functions		-A	TTL serial port	
		-B	RS485 serial port	

ightarrow All models come with an alarm buzzer and digital inputs DI1, DI2

Standard Model

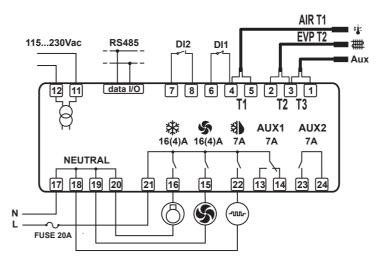
> BR1-27C1S5W-B

	Technical Data
Range	-50÷110°C, -58÷180°F
Resolution	0.1 / 1 °C; °F
Precision	<±0.5°C within the measurement range
Sensor type	NTC 10KΩ@25°C

Relay output max loads (240Vac):

		BR1-27S							
	Compressor	16A resistive 3.6 FLA 21.6 LRA							
	Evap. Fan	16A resistive 3.6 FLA 21.6 LRA							
	Defrost	7A resistive 1 FLA 4 LRA							
	Auxiliary loads 1	7A resistive 1 FLA 4 LRA							
	Auxiliary loads 2	7A resistive 1 FLA 4 LRA							
Pov	ver supply	100÷240Vac ±10% 50÷60Hz 3W							
Ambient temperature & humidity		-10÷50°C; 15%÷80% r.H.							





DD1_27C1CEW_

BD1-28

107 x 95 x 47 mm

Split Comprehensive Refrigeration Controller



Main features

- Refrigeration controller with cyclic defrosts
- Enhanced ECO Energy Saving management
- Optional compressor variable speed control
- Suitable for R290
- Up to 2 auxiliary configurable outputs (Light, switched loads, second evaporator etc.)
- Universal mains power supply
- Connectivity to hard-wired supervisory systems
- Many display options: coloured LED's with DU5S, capacitive touch TU5S or high contrast LCD, fully customised

Applications

Upright refrigerators, plug-in and supermarket display cases, cold stores, control panels.

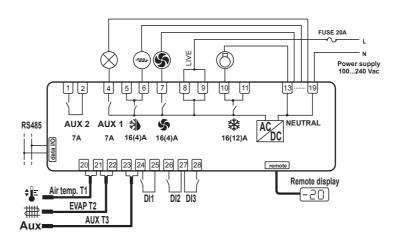
			-		
		Н	ow to c	rder	BD1-28
Model	Su	ıffix		Opt.	Description
BD1-28					Model and dimensions main uni
Innute	В				Thermostat probe + evaporator probe
Inputs	С				Thermostat probe + evaporator probe + auxiliary probe
Arry digital innul		0			None
Aux digital input	1				Voltage free aux digital input
Connectors		Q			Quick connections (male + female screw terminals
Connectors		S			Screw connections (fixed screw terminals)
			2		Compressor (16(12)A) + evaporator fans (16(4)A)
			3		Compressor + evaporator fans +

Aux digital input		0				None
		1	1			Voltage free aux digital input
			Q			Quick connections (male + female screw terminals)
Connectors		S				Screw connections (fixed screw terminals)
			2			Compressor (16(12)A) + evaporator fans (16(4)A)
	Outputs		3			Compressor + evaporator fans + defrost (16(4)A)
			4			Compressor + evaporator fans + defrost + Aux 1 (7A)
			5			Compressor + evaporator fans + defrost + Aux 1 + Aux 2 (7A)
	Power Supply W					100240 Vac
	Relay type					Standard relays
				Н		Sealed relays
	Aux functions				-	None
					-A	TTL serial port
					-B	RS485 serial port

> All versions come with an alarm buzzer and digital input DI1, DI2.







BD1-28C1S5W-B

	Technical Data
Range	-50÷110°C, -58÷180°F
Resolution	0.1 / 1 °C; °F
Precision	<±0.5°C within the measurement range
Sensor type	Mod. standard SN4B20P1/P2/P3

Relay output max loads (240Vac):

		BD1-28S	BD1-28Q
	Compressor	16A resistive 12 FLA 72 LRA	16A resistive 12 FLA 72 LRA
	Evap. Fan	16A resistive 3.6 FLA 21.6 LRA	16A resistive 3.6 FLA 21.6 LRA
	Defrost	16A resistive 3.6 FLA 21.6 LRA	16A resistive 3.6 FLA 21.6 LRA
	Auxiliary loads 1	16A resistive 1 FLA 4 LRA	16A resistive 1 FLA 4 LRA
	Auxiliary loads 2	16A resistive 1 FLA 4 LRA	16A resistive 1 FLA 4 LRA
ower supply		100÷240Vac ±10% 50÷60Hz 3V	V
mbient temperature humidity		-10÷50°C; 15%÷80% r.H.	

BR1-28

107 x 95 x 47 mm

Clever Split Refrigeration Controller with RTC



Main features

- Refrigeration controller with timed defrosts
- Enhanced ECO Energy Saving management
- Optional compressor variable speed control
- Suitable for R290
- Up to 2 auxiliary configurable outputs (Light, switched loads, second evaporator
- Universal mains power supply
- Connectivity to hard-wired supervisory systems, or wireless option
- Many display options: coloured LED's with DU5S, capacitive touch TU5S or high contrast LCD, fully customised
- UL approved

Applications

Upright refrigerators, plug-in and supermarket display cases, cold stores, control panels.

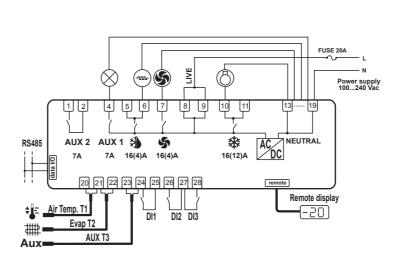
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How to order **BR1-28**

		10	v v		naci	DICE DO
Model	Suffi	ix			Opt.	Description
BR1-28						Model and dimensions main unit
	В					Thermostat + evaporator probe
Inputs	С					Thermostat + evaporator + auxiliary probe
Aux digital input	0					None
Aux digital iliput	1					Voltage free aux digital input
Connections		Q				Quick connections (male + female screw terminals)
Connections		S				Screw connections (built-in screw terminals)
			2			Compressor + evaporator fans
			3			Compressor + evaporator fans + defrost
Outputs			4			Compressor + evaporator fans + defrost + auxiliary 1
			5			Compressor + evaporator fans + defrost + auxiliary 1 + auxiliary 2
Power Supply		W	I		100240 Vac	
Relay type						Standard relays
			н		Sealed relays	
Aux functions				-	None	
				-A	TTL serial port	
				-В	RS485 serial port	

> All models come with an alarm buzzer and digital inputs DI1, DI2.





	Technical Data
Range	-50÷110°C, -58÷180°F
Resolution	0.1/1°C;°F
Precision	<±0.5°C within the measurement range
Sensor type	NTC 10KΩ@25°C

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Relay output max loads (240Vac):

		BR1-28S	BR1-28Q
	Condensed fan	16A resistive 12 FLA 72 LRA	12A resistive 12 FLA 72 LRA
	Evap. Fan	16A resistive 3.6 FLA 21.6 LRA	12A resistive 3.6 FLA 21.6 LRA
	Defrost	16A resistive 3.6 FLA 21.6 LRA	12A resistive 3.6 FLA 21.6 LRA
	Auxiliary loads 1	7A resistive	7A resistive
	Auxiliary loads 2	7A resistive	7A resistive
Pow	er supply	100÷240Vac ±10% 50÷60H	z 3W
	pient temperature umidity	-10÷50°C; 15%÷80% r.H.	

DISPLAYS

Displays for BD / BR1-28







DU5S Re	ed, Blue or Amber LED display unit
Dimensions	77 x 35 x 20 mm (W x H x D)
Panel cut-out	71 x 29 mm (W x H)
Front protection	IP55
Ambient temperature	-10÷50°C



TU5S Blue	e LED capacitive touch display unit
Dimensions	77 x 35 x 13 mm (W x H x D)
Panel cut-out	71 x 29 mm (W x H)
Panel thickness	0.9 to 1.2 mm
Front protection	IP55
Ambient temperature	-10÷50°C



DU	00 High contrast LCD display
Dimensions	78 x 64 x 15 mm (W x H x D)
Panel cut-out	57 x 60 mm (W x H)
Front protection with external overlay	IP67
Ambient temperature	-10÷50°C

Model	Features
DU5S	Red LEDs
DU5S-AMB	Amber LEDs
DU5S-BLU	Blue LEDs
DU00-02	With buzzer
DU00-03	Without buzzer
TU5S-BLU	Blue LEDs

) In order to know MOQ per model and options available, please consult LAE or our local dealer.

TAB 5.0

Monitoring, Logging and **Programming Software**

Main Features

- Overall plant monitoring
- Storage of temperature, humidity, pressure, alarms
- Display and printing in numerical and graphic form of stored data
- Export of stored data for Excel® or other spread sheets
- Diagnostics with dynamic graphs of all analog and digital inputs
- Virtual instrument for analysing the system and setting regulator parameters
- Direct sending of emails and SMS relating to the alarm state
- Configured for tele-servicing via remote control software Supremo®
- Languages available: English, German, Italian, Polish.

Available options

Available as full optional as described above but also in a "low cost version" for data logging only. This version is called TAB LV

Applications

Supervision of the refrigeration process in supermarkets, convenience stores, shops, petrol stations, large kitchens, food factories, cruise ships etc.



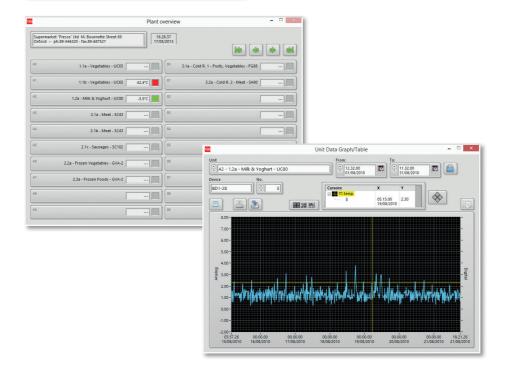




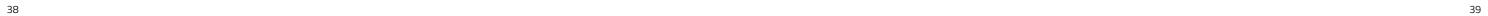
System Requirements

- Computer with Windows 7/8/10/11® operating system installed and properly running, minimum processor and memory as required from Windows version – USB port
- 1024x768 pixel screen resolution
- 50GB available on Hard Disk
- USB to RS-485 converter mod. USB485-STIXL. Up to 200 controllers connectable. Every 62 controllers, you must add a repeater ATC-109N
- RS232 serial port (COM) required if a GSM modem is fitted





Tab5





HT2WAD

Humidity transmitter



	Technical data
Sensor type	capacitive
Output signal	0÷1Vdc
Range	0%÷100% r.H.
Accuracy	±2%r.H. (10%÷90%r.H.)
Sheath	Ø14 x 40 mm
Protection	IP65 (electronics)
Operating temperature	0÷75°C (sensor) / 0÷50°C (electronics)
Dimensions of the enclosure	110 x 53 x 75 mm (electronics)
Power supply	12Vdc, 0.2W

PROBES TRANSMITTERS

PGT35

Pressure transmitter





	Technical data
Sensor type	Piezoresistive gauge
Output	4÷20mA
Range	-0.5÷35.0 bar
Accuracy	max±1%FS (0÷50°C)
Sheath	Ø 17 x 58 mm
Connections	mPm connector
Pressure port	7/16"-20UNF male, steel AISI 316L
Protection	IP65
Ambient temperature	-40÷100°C
Power supply	8÷32Vdc

NTC2K & NTC10K

Temperature probes



	SN2BxxPx
Sensor type	NTC2K, 2000Ω @ 25°C
Range	-40÷120°C
Accuracy	±0.3°C @ 25°C
Sheath	Ø 6 x 29 mm; TPE
Cable	2 wires x 0.35 mm²; -40÷120°C; TPE; loose leads
Ductostion	ID/7

Standard Versions	
SN2B15P1, P2	1.5 m
SN2B20P1, P2	2 m
SN2B25P1, P2	2.5 m
SN2B30P1, P2, P3	3 m
SN2B50P1	5 m

	SN4BxxPx
Sensor type	NTC10K, 10000Ω @ 25°C
Range	-40÷120°C
Accuracy	±0.3°C @ 25°C
Sheath	Ø 6 x 29 mm; TPE
Cable	2 wires x 0.35 mm²; -40÷120°C; TPE; loose leads
Protection	IP67

Standard Versions		
SN4B10P1	1 m	
SN4B15P1, P2	1.5 m	
SN4B20P1, P2	2 m	
SN4B25P1, P2	2.5 m	
SN4B30P1, P2	3 m	
SN435P1, P2	3.5 m	
SN4B40P1	4 m	
SN4B50P1, P2	5 m	
SN4B70P1	7 m	

SN2B / SN4BxxP1, P2



SN4BxxP2-B



SN4BxxP3-Y



PROBES TRANSMITTERS

Pt100 & thermocouples

IP65

Temperature probes

Protection

Protection



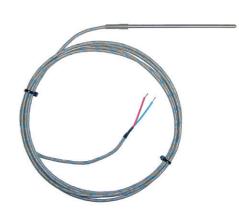
Standard versions	
QP1N20P-X	2 m
MOQ: 10 pieces	

#lae

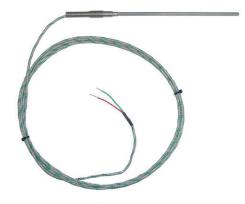
	SPT0
Sensor Type	Pt100 class "B" (DIN43760), 100Ω @ 0°C
Range	0÷400°C
Precision	± 0.3 °C or ± 0.5 °C (in the worst case scenario)
Response time	10 seconds in water
Sheath	Ø 6 x 160 mm; stainless steel AISI316
Cable	3 wires x 0.24 mm ² : L = 100 cm, fiber glass, loose leads



	TJ.ECO
Sensor Type	J thermocouple
Range	0÷450°C
Precision	$\pm 2.5^{\circ}\text{C}$ o $\pm 0.75\%$ (in the worst case scenario)
Response time	10 seconds in water
Sheath	Ø 6 x 160 mm; stainless steel AISI316
Cable	2 wires x 0.50 mm^2 ; L = 300 cm , fiber glass, loose leads
Protection	IP65



	TK.ECO
Sensor Type	K thermocouple
Range	0÷600°C
Precision	±2.5°C o ±0.75% (in the worst case scenario)
Response time	approx. 2 seconds in water
Sheath	Ø 4.5 x 160 mm; INCONEL600
Cable	2 wires x 0.24 mm²; L = 300 cm, fiber glass, loose leads
Protection	IP65



www.lae-electronic.com

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