LAE ELECTRONIC AT2-5 CONTROL 115V, SPEED CONTROL & SOLENOID
FACTORY & FIELD WIRING

LEGEND

GRD = GROUND

LLS = LIQUID LINE SOLENOID

SC = SPEED CONTROL

FACTORY WIRING

FIELD WIRING

1. USE COPPER CONDUCTORS ONLY
2. UNIT MUST GROUNDED
3. FOR MOTOR AMPS SEE RATING STICKER ON OUTSIDE OF UNIT.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS DECIMALS ANGLES
+ .XX+ .XX + 1
.XXX+.XXX

MATERIAL XX

FINISH --

DO NOT SCALE DRAWING

CAD GENERATED DRAWING, DO NOT MANUALLY UPDATE

APPROVALS	DATE
DRAWN GA	1/27/2012
CHECKED	
RESP ENG	
MFG ENG	
QUAL ENG	

LRC COIL CO.

WM 15, 25 and 35
WIRING DIAGRAM FOR WM-LINE
WITH LAE CONTROL 115V,
SPEED CONTROL & SOLENOID

SIZE A | DWG. NO. 19647-04 | REV. B

SCALE | CAD FILE: | SHEET OF

UNIT WILL HAVE A TURN ON DELAY OF 2 MIN, TO CHANGE MODIFY "CRT"

AT2 LAE PARAMETERS

AT2 PARA	LRC VALUES	DESCRIPTION
SCL	F	READOUT SCALE
SPL	0	MIN SE TPOINT TEMPERATURE
SPH	100	MAX SE TPOINT TEMPERATURE
SP	53	SET POINT
C-H	REF	CONTROL MODE
HYS	2	THERMOSTAT DIFFERENTIAL
CRT	2	COMPRESSOR REST TIME
CT1	4	CYCLE TIME ON (WHEN T1 PROBE FAILS)
CT2	6	CYCLE TIME OFF (WHEN T1 PROBE FAILS)
CSD	0	COMPRESSOR STOP DELAY, WHEN USING DOOR SENS
DTY	OFF	DEFROST TYPE
FID	YES	FANS ACTIVE DURING DEFROST
FDD	0	EVAPORATOR FAN RESTART TIME
FTC	NO	OPTOMISED FAN CONTROL
FT1	0	FAN STOP DELAY
FT2	0	TIMED FAN STOP
FT3	0	TIMED FAN RUN
ATM	NON	ALARM THESHOLD MANAGEMENT
ADO	0	DELAY BEFORE DOOR OPEN ALARM
ACC	0	CONDENSER CLEANING REMINDER (WEEKS)
IISM	NON	ENABLE SECOND PARAMETER SET
SB	YES	STANBY ENABLED
DS	NO	DOOR SWITCH INPUT ENABLED
LSM	NON	LIGHT CONTROL MODE
OAU	NON	AUX OUTPUT OPERATION
INP	SN4	TEMPERATURE TYPE
OS1	0	PROBE T1 OFFSET
T2	NO	PROBE T2 ENABLE
OS2	0	PROBE T2 OFFSET
TLD	1	DELAY FOR MIN TEMP AND MAX TEMP LOGGING
SIM	0	DISPLAY SLOWDOWN

AT2-5 INSTRUCTIONS FOR USE

Thank you for having chosen a LAE electronic product. Before installing the instrument, please read these instructions carefully to ensure maximum performance and safety.

DESCRIPTION

Fig.1 — Front panel

i Info / Setpoint button.

Manual defrost / Decrease button.

M Increase / manual activation button.

Exit / Stand-by button.

INDICATIONS

Thermostat output

Fan output

RL3 Auxiliary output

II° Activation of 2nd parameter set

Alarm

INSTALLATION

- Insert the controller through a hole measuring 71x29 mm.
- Make sure that electrical connections comply with the paragraph "wiring diagrams". To reduce the effects of electromagnetic disturbance, keep the sensor and signal cables well separate from the power wires.
- Fix the controller to the panel by means of the suitable clips, by pressingly gently; if fitted, check that the rubber gasket adheres to the panel perfectly, in order to prevent debris and moisture infiltration to the back of the instrument.
- Place the probe T1 inside the room in a point that truly represents the temperature of the stored product.
- Place the probe T2 on the evaporator where there is the maximum formation of frost.

OPERATION

DISPLAY

During normal operation, the display shows either the temperature measured or one of the following indications:

DEF	Defrost in progress	**HI**	Room high temperature alarm
REC	Recovery after defrost	**LO**	Room low temperature alarm
OFF	Controller in stand-by	**E1**	Probe T1 failure
CL	Condenser clean warning	**E2**	Probe T2 failure
DO	Door open alarm		

INFO MENU

The information available in this menu is:

T1	Instant probe 1 temperature	**TLO**	Minimum probe 1 temperature recorded
T2	Instant probe 2 temperature	**CND**	Compressor working weeks
THI	Maximum probe 1 temperature recorded	**LOC**	Keypad state lock

Access to menu and information displayed.
- Press and immediately release button i.
- With button ▼ or ▲ select the data to be displayed.
- Press button i to display value.
- To exit from the menu, press button ✕ or wait for 10 seconds.

Reset of THI, TLO, CND recordings
- With button ▼ or ▲ select the data to be reset.
- Display the value with button i.
- While keeping button i pressed, use button ✕.

SETPOINT (display and modification of desired temperature value)
- Press button ↕ for at least half second, to display the setpoint value.
- By keeping button ↕ pressed, use button ▼ or ▲ to set the desired value (adjustment is within the minimum **SPL** and the maximum **SPH** limit).
- When button ↕ is released, the new value is stored.

STAND-BY

Button ⏻, when pressed for 3 seconds, allows the controller to be put on a standby or output control to be resumed (with **SB**=YES only).

KEYPAD LOCK

The keypad lock avoids undesired, potentially dangerous operations, which might be attempted when the controllers is operating in a public place. In the INFO menu, set parameter **LOC**=YES to inhibit all functions of the buttons. To resume normal operation of keypad, adjust setting so that **LOC**=NO.

SELECTION OF SECOND PARAMETER GROUP

It's possible to select control parameters between two different pre-programmed groups, in order for the fundamental control parameters to be adapted quickly to changing needs. With **IISM**=MAN, changeover from Group I to Group II takes place manually by pressing button ▼ for 2 seconds. The activation of Group II is signalled by the lighting up of the relevant LED on the controller display. If **IISM**=NON, switchover to group II is inhibited.

DEFROST

Timed defrost. Defrosting starts automatically when necessary time has elapsed to obtain the defrosting frequency set with **DFR** (**IIDF**). For example, with **DFR**=4 defrosting occurs once every 6 hours. The internal timer is set to zero when power is applied to the controller and at each subsequent defrost start. When the controller is put on a standby, the accumulated time count is "frozen" (is not incremented).

Manual defrost. Defrosting may also be induced manually by keeping the button ❄ pressed for 2 seconds.

Defrost type. Once defrost has started, Compressor and Defrost outputs are controlled according to the parameters **DTY** and **OAU**. The AUX output is associated to defrost function with **OAU**=DEF exclusively.
If **FID**=YES the evaporator fans are active all through defrost.

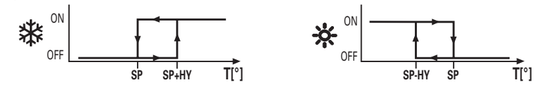
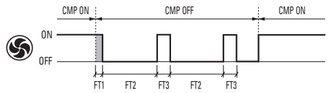
Defrost termination. Defrost lasts as long as time **DTO** but, if the evaporator probe has been enabled (**T2**=YES) and temperature **DLI** is achieved before this time elapses, defrost will be terminated in advance.

Resuming thermostatic cycle. When defrost is over, if **DRN** is greater than 0, all outputs will remain off for **DRN** minutes, in order for the ice to melt completely and the resulting water to drain. Moreover, if probe T2 is active (**T2**=YES), the fans will re-start when the evaporator gets to a temperature lower than **FDD**; Vice versa, if such condition does not occur after 4 minutes following defrost termination, the fans will be switched on anyway.

*Caution: if **C-H**=HEA all defrost functions are inhibited; if **DFR**=0 the timed defrost function is excluded; during defrost, the high temperature alarm is inhibited.*

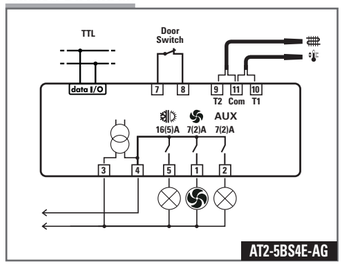
CONFIGURATION PARAMETERS

- The setup menu is accessed by pressing button ✕+i for 5 seconds.
- With button ▼ or ▲ select the parameter to be modified.
- Press button i to display the value.
- By keeping button i pressed, use button ▼ or ▲ to set the desired value.
- When button i is released, the newly programmed value is stored and the following parameter is displayed.
- To exit from the setup, press button ✕ or wait for 30 seconds.

PAR	RANGE	DESCRIPTION
SCL	1°C; 2°C; °F	Readout scale. 1°C (only with **INP**=SN4): measuring range -50/-9.9 … 19.9/80°C 2°C : measuring range -50 … 120°C °F : measuring range -55 … 240°F Caution: upon changing the **SCL** value, it is then absolutely necessary to reconfigure the parameters relevant to the absolute and relative temperatures (**SPL**, **SPH**, **SP**, **ALA**, **AHA**, etc..)
SPL	-50..SPH	Minimum limit for **SP** setting
SPH	SPL.120°	Maximum limit for **SP** setting
SP	SPL... SPH	Setpoint (value to be maintained in the room).
C-H	REF; HEA	Refrigerating (REF) or Heating (HEA) control mode
HYS	1...10°	OFF/ON thermostat differential  Refrigerating control (**C-H**=REF) Heating control (**C-H**=HEA)
CRT	0...30min	Compressor rest time. The output is switched on again after **CRT** minutes have elapsed since the previous switchover. We recommend to set **CRT**=03 with **HYS**<2.0°.
CT1	0...30min	Thermostat output run when probe T1 is faulty. With **CT1**=0 the output will always remain OFF.
CT2	0...30min	Thermostat output stop when probe T1 is faulty. With **CT2**=0 and **CT1**>0 the output will always be ON. Example: **CT1**=4, **CT2**= 6: In case of probe T1 failure, the compressor will cycle 4 minutes ON and 6 minutes OFF.
CSD	0..30min	Compressor stop delay after the door has been opened (active only if **DS**=YES).
DFR	0... 24(1/24h)	Defrost frequency expressed in cycles/24 hours.
DLI	-50...120°	Defrost end temperature.
DTO	1...120min	Maximum defrost duration.
DTY	OFF; ELE; GAS	Defrost type OFF: off cycle defrost (Compressor and Heater OFF). ELE: electric defrost* (Compressor OFF and Heater ON). GAS: hot gas defrost* (Compressor and Heater ON). * The defrost output is active if only **OAU**=DEF.
DRN	0...30min	Pause after defrost (evaporator drain down time).
DDY	0...60min	Display during defrost. If **DDY**=0 during defrost the temperature continues to be displayed. If **DDY** > 0, during defrost the display shows DEF, and at the end of defrost it shows REC for **DDY** minutes.
FID	NO/YES	Fans active during defrost.
FDD	-50...120°	Evaporator fan re-start temperature after defrost.
FTC	NO/YES	Optimised fan control enabling. With **FTC** = NO the fans remain on all the time  Fig. 2 Optimised fan control (**FTC**=YES)
FT1	0...180sec	Fan stop delay after compressor stop. See Fig. 2.
FT2	0...30min	Timed fan stop. With **FT2**=0 the fans remain on all the time.
FT3	0...30min	Timed fan run. With **FT3**=0, and **FT2** > 0, the fans remain off all the time.
ATM	NON; ABS; REL	Alarm threshold management. NON: all temperature alarms are inhibited (the following parameter will be **ADO**). ABS: the values programmed in **ALA** and **AHA** represent the real alarm thresholds. REL: the values programmed in **ALR** and **AHR** are alarm differentials referred to **SP** and **SP+HY**.  Temperature alarm with relative thresholds, refrigerating control (**ATM**=REL, **C-H**=REF). Temperature alarm with relative thresholds, heating control (**ATM**=REL, **C-H**=HEA).

ALA	-50... 120°	Low temperature alarm threshold.
AHA	-50... 120°	High temperature alarm threshold.
ALR	-12... 0°	Low temperature alarm differential. With **ALR**=0 the low temperature alarm is excluded.
AHR	0... 12°	High temperature alarm differential. With **AHR**=0 the high temperature alarm is excluded.
ATD	0... 120min	Delay before alarm temperature warning.
ADO	0... 30min	Delay before door open alarm warning.
ACC	0...52 weeks	Condenser periodic cleaning. When the compressor operation time, expressed in weeks, matches the **ACC** value programmed, "CL" flashes in the display. With **ACC**=0 the condenser cleaning warning is disabled.
IISM	NON; MAN;	Switchover mode to second parameter set NON: inhibition to use the second parameter group (the following parameter will be **SB**). MAN: button M switches the two parameter groups over.
IISL	-50...IISH	Minimum limit for **IISP** setting.
IISH	IISL...120°C	Maximum limit for **IISP** setting.
IISP	IISL... IISH	Setpoint in mode 2
IIHY	1...10°	OFF/ON differential in mode 2.
IIFT	NO/YES	Optimised fan control enabling in mode 2.
IIDF	0...99hours	Defrost timer set to start a defrost in mode 2.
SB	NO/YES	Stand-by button enabling ⏻.
DS	NO/YES	Door switch input enabling (closed when door is closed).
LSM	NON; MAN; DOR	Light control mode NON : light output not controlled. MAN : light ouput controlled through button M (if **OAU**=LGT). DOR : light ouput switched on when door is opened (if **OAU**=LGT).
OAU	NON; 0-1; DEF; LGT; AL0; AL1	AUX output operation. NON : output disabled (always off). 0-1 : the relay contacts follow the on/standby state of controller. DEF : output programmed for defrost control. LGT : output enabled for light control. AL0 : contacts open when an alarm condition occurs. AL1 : contacts make when an alarm condition occurs.
INP	SN4; ST1	Temperature sensor selection. With **INP** = SN4, the probes must be the LAE models SN4..; with **INP** = ST1, the probes must be the LAE models ST1...
OS1	-12.5..12.5°C	Probe T1 offset.
T2	NO/YES	Probe T2 enabling (evaporator).
OS2	-12.5..12.5°C	Probe T2 offset.
TLD	1...30 min	Delay for minimum temperature (TLO) and maximum temperature (THI) logging.
SIM	0...100	Display slowdown.
ADR	1...255	AT2-5 address for PC communication.

WIRING DIAGRAM



TECHNICAL DATA

Power supply

AT2-5…E	230Vac±10%, 50/60Hz, 3W
AT2-5…U	115Vac±10%, 50/60Hz, 3W
AT2-5…D	12Vac/dc±10%, 3W

Relay outputs

AT2-5.**Q**…	Compressor	12(5)A 240vac
AT2-5.**S**…	Compressor	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

Inputs

NTC 10KΩ@25°C, LAE part No. SN4...
PTC 1000Ω@25°C, LAE part No. ST1…

Measurement Range

-50…120°C, -55…240°F
-50 / -9.9 … 19.9 / 80°C (NTC10K only)

Measurement accuracy

<0.5°C within the measurement range

Operating conditions

-10 … +50°C; 15%...80% r.H.

CE – UL (Approvals and Reference Norms)

EN60730-1; EN60730-2-9;
EN55022 (Class B);
EN50082-1
UL 60730-1A

Front protection

IP55

lae ELECTRONIC

VIA PADOVA, 25
31046 ODERZO /TV /ITALY
TEL. +39 - 0422 815320
FAX +39 - 0422 814073
www.lae-electronic.com
E-mail: sales@lae-electronic.com