



ES3000 version n.4

Control electronic board for compressors



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1. GENERAL DESCRIPTION

ES3000 is a control box for medium and big capacity compressors.

The board manages all the operations of the compressor like about starting, stopping, full load, no load and so on.

The board itself carries out a test on the compressor and on the board to inform the status of the compressor and in case also to stop it.

In order to read and to modify the settings, the board is provided with displays to verify the status of the compressor and to check the operating condition. There are also push buttons to choose or modify the settings.

ES3000 is capable to replace ES99 as the terminal connectors are exactly the same. The size of the ES3000 is exactly double the previous ES99.

1.1 TECHNICAL FEATURES

		Specifications
Energy supply	12	Vac
Adsorption	6	VA
Max and min store temperature	-20+70	°C
Max and min working temperature	0+50	°C
IEC801-4	3	Class
Outgoing contact relays	5	Α
Outlet current triacs EV	5	Α
Inlet current on the optoinsulated contacts	8	mA

1.2 INPUT DEVICES.

The board has 8 digital inputs with single ground.

The chart below shows the use of the inputs and how the contacts should be in normal conditions.

Description	Contact	Terminal	Connector
Overload el. motor	Normally closed	4-3	CN1
Wrong rotation	Normally closed	5-3	CN1
Oil over temperature	Normally closed	6-3	CN1
Timing selection (only for	Open: t1_vuoto and t1_stand-by	7 – 3	CN1
ES99)	Closed: t2_vuoto and t2_stand-by		
Overload fan motor	Normally closed	9-3	CN1
Pressure switch (only for	Open: P> Pmax	10 - 3	CN1
ES99)	Closed: P< Pmin		
Remote control	Normally closed	11 - 3	CN1
Emergency push button	Normally closed	12 - 3	CN1



The board has 4 analogue inputs.

The chart below shows the use of the inputs and the kind of the sensor connected.

Description	Sensor	Terminal	Connector
Temperature sensor n.1	NTC100K -20/+120°C	33-34	CN5
Temperature sensor n.2	NTC100K -20/+120°C	34-35	CN5
Pressure sensor n.1	4/20mA 0-17bar	36-37	CN5
Pressure sensor n.2	4/20mA 0-17bar	37-38	CN5

1.3 OUTPUT DEVICES

The board controls 14 output digital signals as follows:

The chart below shows the use of the outputs and how the contacts should be in normal conditions.

Description	Contact	Terminal	Connector
Star power relay	Normally open	16 – 19	CN2
Power relay	Normally open	17 – 19	CN2
Delta power relay	Normally open	18 – 19	CN2
Discharge solenoid valve	Normally open	20-19	CN2
Condense discharge sol.valve	Normally open	21 - 22	CN3
Fan motor	Normally open	23 - 22	CN3
Dryer	Normally open	24 - 25	CN3
External compressor n. 2	Normally closed	26 - 27	CN3
External compressor n. 1	Normally closed	27 - 28	CN3
Compressor status (general alarm)	Normally closed	29 - 30	CN4
Compressor status (stop)	Normally closed	31 - 30	CN4
Compressor status (running)	Normally open	32 - 30	CN4
Inverter starting command	Normally open	45 - 46	CN7

The board controls 1 output analogue

The chart below shows the use of the outputs and how the contacts should be in normal conditions.

Description	Contact	Terminal	Connector
Variable speed compressor connection	0-10V	42-43	CN7



1.4 COMMUNICATION PORTS

The board is provided with 2 communication ports.

A serial port RS485 for the communication between other ES3000 boards. This can create a net up to 6 compressors using the same electronic board.

There is an interface port for communication with a personal computer via RS232 cable. This is to modify the settings parameters of the board and to monitor the compressor from a remote location, bringing the start, stop, alarms and status of the compressor signals.

1.5 DIP–SWITCH

Four dip–switches enable to activate the following features:

Dip	Position	Features
Switch		
1	ON	Remote control activated
	OFF	Remote control not activated
2	ON	Automatic re-starting when power energy had been interrupted
	OFF	Waiting for re-set when power energy had been interrupted
3	ON	ES99 software activated
	OFF	ES3000 software activated
4	ON	Not applicable
	OFF	Not applicable

1.6 PROGRAMMING AND WORKING PARAMETERS

In order to make the use of the control box easier, it has been decided to store the setting values into the static memory type Eeprom. The following cross reference chart shows the default parameters set from the compressor manufacturer.

Symbol	Parameter	Unit	Minimun	n Maximum	Increment	Settings	Notes
NO PAS	SSWORD						
P0	Maximum pressure	Bar/PSI	4 / 58	14 / 203	0,1/1	8/116	Only downwards
P1	Minimum pressure	Bar/PSI	3,9 / 56	13,9 / 201	0,1 / 1	6,5 / 94	min 0,1bar/1psi lower than P0
R2	Over temperature	°C/F	-10 / 14	105 / 221	1/1	100/212	Pre-alarm -5°C/-10F
Т3	Delay time discharge sol. valve	М	1	15	1	5	
T4	Working time discharge sol. valve	S	1	30	1	5	
C5	Starting per hour	-	0	25	1	10	
C6	Temperature setting	-	0	1	1	0	0=°C, 1=F
C7	Pressure setting	-	0	1	1	0	0=bar, 1= PSI
F8	Weekly/daily schedule activation	-	0	1	1	0	0=not activated 1=activated



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First le	vel PASSWORD = 1404						
T8	t wait on	S	10	60	1	15	
T9	Wrong rotation time	S	10	60	1	60	
T10	Star time	S	1	15	1	4	
T11	Inlet sol. valve delay	S	0	10	1	2	Starts from start time
	before load						
T12	Shortest no load time	S	5	240	1	20	
T13	Overpressure time	S	0	5	1	4	
P14	P delta over pressure	bar/PSI	0,5	5	0,1	1,5	
R15	Min.dryer temperature	°C/F	-10 / 14	40 / 104	1/1	0/32	
R16	Max.dryer temperature	°C/F	-10 / 14	40 / 104	1/1	10 / 50	
R17	Min.compressor temper	°C/F	-10 / 14	20/68	1/1	4/39	
R18	Fan temperature	°C/F	65 / 149	90 / 194	1/1	75 / 167	
R19	Wrong rotation temper.	°C/F	1/2	5/10	1/1	1/2	
O20	Oil filter life	h	1	3000	10	2000	
O21	Separator filter life	h	1	6000	10	4000	
O22	Air filter life	h	1	3000	10	2000	
O23	Oil maximum life	h	1	3000	10	2000	
O24	Planned maintenance	h	1	2000	10	500	
C25	Loading default settings	-	0	1	1	0	1 = load
A26	Net link	-	0	6	1	0	0 = no net $1 =$ master 2-3-4-5-6 = slave
Only or	n MASTER						
A27	SLAVE compr.on net	-	1	5	1	1	
A28	SLAVE electromec.	-	0	4	1	0	
	compr.						
A29	Priority or volumetric	-	0	1	1	0	0=prior, 1=volum.
	mode						
Priority	y mode	•			·		·
A30	Peak hour 1	h	1	250	1	24	
A31	Peak hour 2	h	1	250	1	24	
A32	Peak hour 3	h	1	250	1	24	
A33	Peak hour 4	h	1	250	1	24	
A34	Peak hour 5	h	1	250	1	24	
A35	Peak hour 6	h	1	250	1	24	
Volume	etric mode	1	1		1	1	1
A36	Tank capacity	Litres	100	40000	10	500	
A37	Compr.air delivery 1	Lt/m	100	30000	10	0	
A38	Compr.air delivery 2	Lt/m	100	30000	10	0	
A39	Compr.air delivery 3	Lt/m	100	30000	10	0	
A40	Compr.air delivery 4	Lt/m	100	30000	10	0	
A41	Compr.air delivery 5	Lt/m	100	30000	10	0	
A42	Compr.air delivery 6	Lt/m	100	30000	10	0	A42
** T 51	Delay on restart after	S	15	120	1	15	
	voltage fail	-		•			
**T52	Max voltage fail duration	S	0	60	1	30	
**C53	probe 1 type	•	0	1			0=ntc 1=pt1000
Second	level PASSWORD = xx	XX					

	CECCATO		ES3	000			
-	ARIA COMPRESSA	Control el	ectronic bo	pard for compre-	ssors		
P43	Maximum pressure set	bar/PS	4 / 58	14 / 203	0,1/1	8/116	
		Ι					
C44	Max. starting per hour	-	1	25	1	10	
C45	Working hour reset	-	0	1	1	0	1 / reset
C46	Temperature probe 2	-	0	1	1	0	0 = no, 1 = yes
C47	Pressure probe 2	-	0	1	1	0	0 = no, 1 = yes
T48	Volumetric mode timing	S	0	240	1	0	
T49	Delay on network	S	1	60	1	30	
C50	Time mode display 12 h or 24 h	-	0	1	1	0	0 = 24h, 1 = 12h
**C54	Offset on pressure reading	bar	-0,2	+0,2	0,1	0,0	**C54
**C56	High LAT protection	-	0	1			0=off, 1=on
**Nota	**Nota: ** parameters are not available on controller 7.00 / 7.03 (and before)						

In order to modify the values, press button 4 for a few seconds until P0 parameter is shown.

- 1 Select the parameter to be modifies by using buttons 1 and 2,
- 2 If the parameters is lower than C7, press button 1 until 4 zeros '0000' are shown (password required).
- 3 Enter the password by using buttons 1 and 2 and confirm the value by pressing button 4.
- 4 Select the parameter to be modified by using buttons 1 and 2.
- 5 Press button 4, the value of the parameter shown on the lower display will start blinking for modification.
- 6 Modify the selected parameter whose value is blinking by using buttons 1 and 2.
- 7 Confirm by pressing button 4; the new value will stop blinking.
- 8 By pressing button 3 you will exit the programming. After 30 seconds without any functions the card will exit automatically.

Please remember that by modifying "P43" parameter, the "P0" parameters (maximum pressure) will be automatically modified and it will be equal to "P43". Consequently even "P1" will change (minimum pressure) which is set 1,5 bar lower than "P43" (see below).

P43	P0	P1
8.0	8.0	6.5
10.0	10.0	8.5
13.0	13.0	11.5

N.B. By pressing key 3, you will exit the programme in any sequence point; obviously this is valid before sequence n.7 otherwise the parameter will not be modified.



1.7 Front and rear views

The ES 3000 board has the following lay out:





1.8 BUTTONS AND L.E.D.s

With the following 3 push buttons,

Button	Symbol	Description
7		 TEST/RESET By pushing this button the alarms already occurred are reset. By pushing the button for more than 3 seconds, a control test is carry out on all the board (all light have to be on) and shows the software version. Pushing this button together with : Button 3, the last 4 alarms are shown. Button 4, you enter into the maintenance menu. Button 5, enter into the daily/weekly schedule
6		RUNNING By pushing this button the compressor starts.
5	0	STOPPING By pushing this button the stop procedure starts.

Other 4 buttons to control the menus,

Button	Symbol	Description
4	ł	PROGRAMMING By pushing the button for more than 3 seconds you enter into the programming menu.
3	\diamondsuit	TAB By pushing the button you exit the programming and maintenance menus. By pushing the button on the display appears the values of the optional probes (if there are), the total working hours, the full load hours, the date and hours, the connection with network and (if MASTER) the net address with the number and status of the Slaves connected.
2	V	DOWN By pushing the button you move throughout the parameters of the menus.
1	~	UP By pushing the button the off load manually is activated or (in programming) you move throughout the parameters of the menus.



L.e.d.	Colour	Symbol	Lighted	Blinking
R	Green		Compressor in operation	Compressor awaiting to be started
Q	Green	~	Compressor in no load	Compressor in manual off load
Р	Green	+	Compressor in full load	
0	Green	/	Compressor stopped by a remote control	Compressor still awaiting to be started by a remote control or timer

4 green LEDs show the working operation of the compressor,

6 LEDs displaying alarms levels of the compressor,

L.e.d.	Colour	Symbol	Lighted	Blinking
N	Yellow	~	General maintenance alarm. 024 parameter elapsed.	Warning for coming general maintenance alarm. Starts 50 h before the 024 parameter
М	Yellow	*	Oil change alarm. 023 parameter elapsed	Warning for coming oil change alarm. Starts 50 h before the 023 parameter
L	Yellow	0000000	Air filter alarm. 022 parameter elapsed	Warning for coming air filter alarm. Starts 50 h before the 022 parameter
Ι	Yellow	NUNNA NUNNA	Air-oil separator alarm. 021 parameter elapsed	Warning for coming Air-oil separator alarm. Starts 50 h before the 021 parameter
Н	Yellow	Ť	Oil filter alarm. 020 parameter elapsed	Warning for coming Oil filter alarm. Starts 50 h before the 020 parameter
A	Red	-	Net alarm occurred	Net alarm occurring



6 LEDs displaying emergency conditions of the compressor.

L.e.d.	Colour	Symbol	Lighted	Blinking
G	Red	\land	General alarm occurring. Sensors and/or probes failure	Compressor internal temperature too low
F	Red		Main motor overload alarm occurred	Main motor overload alarm occurring
Е	Red	88	Fan motor overload alarm occurred	Fan motor overload alarm occurring
D	Red		Oil over temperature alarm occurred	Oil over temperature alarm occurring
С	Red	\bigotimes	Wrong rotation alarm occurred	Wrong rotation alarm occurring
В	Red	\bigcirc	Over pressure alarm occurred	Over pressure alarm occurring

2 displays to show compressor status.

IN NORMAL CONDITIONS:



The lower display shows the oil temperature (temperature probe NTC1) and a light is on to specify if the value of the temperature is

By pushing n.3 button once:



The upper display is empty.

expressed in C° or F.

lower part.

The lower display shows the dew point of a dryer if present (temperature probe NTC2). If not the display shows '-----' and the light is on to specify if the value of the temperature is expressed in C° or F.

The upper display shows the pressure (pressure probe TDC1) with

one decimal after the comma, where comma is made by a light in the



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By pushing n.3 button for the second time:



The upper display is empty. The light is on by the total working hours symbol.

The lower display shows the total working hours of the compressor.

By pushing n.3 button for the third time:



The upper display is empty. The light is on by the load working time symbol.

The lower display shows the total working hours in full load of the compressor.

By pushing the n.3 button for the fourth time,

- If the network is activated, there could be two different situation, depending if the compressor is MASTER or SLAVE.

If it is MASTER



The upper display shows n. 1 (one) as MASTER (n. 1 for MASTER only and 2,3,4,5 and 6 for Slaves)

The lower display shows the number of Slaves with ES3000 connected through the network and where the number blinks it means that there is a problem of connection with that specific compressor.

If it is a SLAVE



The upper display shows a number between 2 and 6 (n. 1 for MASTER only and 2,3,4,5 and 6 for Slaves)

The lower display shows three lines scrolling horizontally through the display if the connection is activated. If the connection is not activated the three lines stay still.



By pushing the n.3 button for the fourth time (fifth if the network is activated)



The upper display shows the day of the week (1=monday, 2=tuesday, 3=wednesday, 4=thursday, 5=friday, 6=saturday, 7=sunday).

The lower display shows the hours (hh:mm) if the hours parameter is set at 24.00 h.

The lower display shows the hours (hhX:mm) if the hours parameter is set at 12.00 h. where X = A (antemeridian) or X = P (postmeridian).

By pushing the n.3 button for the fifth time (sixth if the network is activated)



The upper display shows the year (yy).

The lower display shows day and month (dd.mm), if the hours parameter is set at 24.00 \mbox{h}

The lower display shows day and month (mm.dd), if the hours parameter is set at 12.00 h

By pushing the n.3 button for the sixth time (seventh if the network is activated), the displays go back to the initial position.

IN EMERGENCY CONDITIONS:

Internal temperature in the compressor too low:



the led G blinks

the upper display is empty

the lower display shows a value of temperature blinking. This means that the temperature inside the compressor is below the parameter R17.



IN PROGRAMMING:



the upper display shows the number of the parameter to modify

the lower display shows the value of the parameter

to modify the value, see 1.6.

DISPLAY OF THE LAST 4 ALARMS



By pushing buttons 7 and 3 in the same time, the board shows the last 4 alarms occurred and stopped the compressor. The upper display has three digits. The third digit shows the alarm number (always from 0 to 3) and, alternately, the first and second digits show the year when the alarms occurred (02-03-04 and so on) or the day of the week (1=monday, 2=tuesday, and so on). The lower display shows alternately the day and month or hours and minutes. On the left hand side, the L.E.D. correspondent to the alarm occurred is light on.

The display starts from the alarm 0; to move through the alarms, push buttons 1 or 2. To exit push button 3.

DISPLAY/RESET OF MAINTENANCE ALARMS

To see and eventually modify the hours of running for the components subject to maintenance, push in the same time buttons 7 and 4 till the L.E.D. H become on.



By using the buttons 1 and 2, move the L.E.D. on the component you want (pushing the button 1 and 2 to go forward and back). The lower display shows the running hours of the component chosen.

To reset the running hours, push once the button 4 and the value starts blinking; by pushing a second time button 4, the value become 0.

The above procedure is valid for all the other components. To exit, push button 3.





2.GENERAL FUNCTION

2.1 Start

When button 6 is pushed, the board starts the sequence of starting and carries out the following steps:

- 1. The L.E.D. 'R' switch on
- 2. In the case the power relay has just been released, the board wait for the time as per the parameter 'T8', or the board wait for the pressure to be lower to the minimum pressure parameter 'P1'.
- 3. The relays of line ('L') and star ('Y') are activated for the time set in the 'T10' parameter. From when the line relay is activated and for the time set into the parameter T9, the ES3000 controls that the temperature of the machines (temperature probe NTC1) increase at least of the value of 'R19' to confirm that the rotation is correct or by stopping immediately the machine (note that this control is deactivated if the temperature of the machine is over 30 C°).
- 4. When the time of T10 is elapsed, the star relay ('Y') is deactivated while the line relay remain activated for a not adjustable time of 50 milliseconds. After that the triangle relay ('T) is activated.
- 5. The solenoid valve of load/off load is delayed for the time value set in 'T11' (this is to delay the full load operation). L.E.D. 'P' when is lighted on shows when the compressor is in full load.
- 6. When the maximum pressure is reached, the L.E.D. 'Q' lights on and the machine switch in off load.

2.2 Stop

By pushing the button 5 during the three phases of starting, cancels the procedure and stops the compressor immediately. If the button 5 is pushed when the triangle relay ('T') is activated, the board starts the stopping procedure that lasts for the value of 'T12', where the compressor runs off-load with the solenoid valve deactivated. During all the stopping time, the L.E.D. 'R' blinks.

If the board is waiting for re-starting because the maximum pressure is reached, by pushing the button 5 cancel immediately all the functions running.

2.3 Stand By

In absence of compressed air from the system and with pressure over the Pmin (P1 parameter), the compressor runs in off-load.

To reduce the energy consumption, the compressor stops as soon as a time is elapsed. The values of this time is calculated as follows:

- 1) The machine cannot go over the number of starts value of C% parameter (where x=60/C5)
- 2) The time the machine remain still has to be over two times the T12 parameter (> 2*F12), the pressure must be over of the following formula [(P0-[1/3(P0-P1)]].
- 3) The calculated temperature of the electric motor must be lower the safety limits as per the graph below:





The solution adopted to define the idling time before to stop the compressor consists to calculate the thermal trend of the electric motor in relation with the times and the different way of working of the el.motor itself and to link this value to the parameter of number of starting ('C5').

C5 Value	Increase	Note
0	25000	Continuos working
1	24500	
2	23500	
3	22500	
4	21500	
5	20500	
6	19500	
7	18500	
8	17500	
9	16500	
10	15500	
11	14500	
12	13500	
13	12500	
14	11500	
15	10500	
16	9500	
17	8500	
18	7500	
19	6500	
20	5500	
21	4500	
22	3500	
23	2500	
24	1500	
25	500	Inverter control

Increases of starts depending from the value of C5 parameter.

Decreasing per seconds

During the full load phase, reduce the value of -10 (refer to the graph with '10')

During the off-load phase, reduce the value of -30 (refer to the graph with 'UN')

During the stand-by phase, reduce the value of -25 (refer to the graph with 'Off')

After the first start (first start is after the ES3000 has been energised), the compressor switch of as soon as the maximum pressure is reached after a no load time as T12 parameter. All the above calculation of no load starts from the following cycles.

In order to reduce the pressure drop into the compressed air distribution piping, the compressor in stand-by restart at 0,2 bar over the minimum pressure ('P1 + 0,2 bar').



2.4 Remote control

The remote control procedure enable stopping the compressor from a remote location by opening the contacts in terminal board marked 11 and 3. Opening of the contact will start the stopping procedure and the light 7 will be switched on. When the same contact will be closed, the compressor starts again following the procedure described in 2.1.

The actions given by pushing the buttons on the ES3000 board are at the same level related to the commands given from remote; it is possible to start the compressor both from remote location and also from the machine itself.

N.B.: The function 'Remote control' is activated by the dip switch 1 located on the side of the electronic board. If the position of this is OFF, the function is not activated and even opening the contact 11 and 3 does not have any effect.

2.5 Automatic re-starting when energy is cut

The function 'automatic restart' is activated when the dip switch located on the back side of the ES3000 is ON. This function bring the compressor in the same condition it was when the energy was cut.

Status of the machine	Missing of energy	Energy return
While Running	Machine stops	Machine re-start
While still	Machine still	Machine still

N.B.: If the 'Remote control' function is activated and the remote contact between 11 and 3 is open, when energy returns the machine will not re-start.

2.6 ES99 emulation.

The ES3000 can replace a ES99 if the dip switch n. 3 located on the back side of ES3000 is activated. When this function is activated, the ES3000 works like an ES99 and it is possible to replace a fault ES99. The connection sockets CN1 and CN2 are the same, the dimensions of ES3000 are not the same so the hole where the old ES99 was has to be bigger.

Of course, we do not have on the displays the pressure and the temperature values and those information will be replaced by ON and OFF.

2.7 Network

The ES3000 is capable to communicate with other ES3000 and also to manage other compressors managed Electro-mechanically.

The net could be up to maximum of 6 units as follows:

n.1 MASTER

n.5 Slaves with ES3000 board

or

n.4 Slaves with Electro-mechanic control board.

Of course every slave Electro-mechanic replace a slave with ES3000 board; the possible combinations are:

		ES3000 ontrol electronic board for compres	ssors
MASTER	SLAVE ES3000	SLAVE not ES3000	TOTAL
1	5	0	6
1	4	1	6
1	3	2	6
1	2	3*	6
1	1	4*	6

To activate the slaves not ES3000 n. 3 and 4 means to loose the digital outputs of the status of the compressor because they are converted to manage external compressors.

The machines could be managed by the ES3000 in two different modes; PRIORITY and VOLUMETRIC.

2.8 INVERTER CONNECTION The parameters C44 and C5, number of starts per hour, must be set at 25.

Digital output, contact K10 on terminals 45-46 on the connector CN8 for start or stop.

Analogic output, DAC (0-10 V) on terminals 43-44 on connector CN8 to modulate.

Start, when button n. 6 is pressed and then after the first start when P1 pressure +0,2 is reached.

Modulation of the rotation speed at pressure P0 - 0.5 bar

Idling when the pressure P0 is reached and for time set on parameter P12.

Load when pressure P1 is reached

Stop, when button 5 is pushed or when idling time parameter T12 is elapsed.

Emergency, K10 opens immediately on connector CN8.

Output DAC (0-10V), must give 10V (maximum tension), at the pressure of inverter (P0 – 0,5bar), must give 0V at the minimum pressure (0bar).

N.B. pushing the button n. 1 (manual off load) make the contact DAC up to 10 Volt.

2.9ADJUSTMENT OF WEEKLY/DAILY PLANNER

By pushing buttons 7 and 5 in the same time, you can adjust the parameters of the weekly/daily schedule.



When the parameter F8 is 0 (not activated), the upper display shows the number of the schedule (from 1 to 42). In the lower display, no information are shown.

When the parameter F8 is 1 (activated), the upper display shows in the first digit the day of the week (1=monday, 2=tuesday and so on) and in the third digit shows the action to be done (1= to start, 0=to stop).

The lower display shows the hours when to start the above action.



ADJUSTMENT

To modify, push button 4 for more than 3 seconds while the value is visible, than modify the value that blinks by pushing button 1 to increase and 2 to decrease and button 3 to move from hours and action to be taken. To pass to the following day, you need to go over the 24:00 of the current day.

To confirm, push again button 4. To cancel push '0' button for more than 3 seconds.

The minimum interval is 15 minutes with a maximum of 42 actions (start or stop). Automatically the software does not accept impossible scheduling (a stop before a start and so on).

Entering the above parameters it is not enough; to activated the weekly/daily schedule, the parameter F8 has to be activated.

Please note that the schedule has to follow the sequence from 1 to 42 steps. The schedule has to start from Monday to Sunday and to enter an action in the between, all the following actions have to be moved downwards.

2.10 WATCH ADJUSTMENT / DAY OF THE WEEK

To modify push button 4 for more than 3 seconds while is visible, than to modify the value that blinks by using buttons 1 to increase ands 2 to decrease and button 3 to move from hours, minutes and day of the week.

To confirm, push again button 4.

2.11 DATE ADJUSTMENT

To modify, push button 4 for more than 3 seconds while the value is visible, than modify the value that blinks by pushing button 1 to increase and 2 to decrease and button 3 to move from day to month to year. To confirm, push again button 4.

2.12 DRYER MANAGEMENT

Remark:

Function available only on controllers with sw V 7.00/7.03 or software A03.

To active dryer management it's necessary to active the second temperature sensor NTC2 setting C46=1.



To see the LAT (lowest air temperature), push **111** 3 times . On second display the LAT is shown like an incremental bar.

Dryer Start Stop:

The Dryer is managed by output K06. This output is closed and open together the output K03 (Delta contactor)

Compressor emergency/allarm: Ib this case also the Dryer is stopped.

Dryer Emergency: In case of second NTC damage led G is fixed On. Only dryer is stopped but compressor continue its working.



Dryer working condition:

Dryer working		Led G status on
conditions	LAT shown on Display	Dryer page
Dryer temperature too cool		Fixed ON
Optimal dryer temperature		OFF
		OFF
		OFF
		OFF
Dryer temperature too hot		Fixed ON



CONNECTIONS

F\$3000		ES3000 emulating ES90
<u>E65000</u>	CN1 terminal board	CN1 terminal board
1	Energy supply 12 Vac	Energy supply 12 Vac
2	Energy supply 12 Vac	Energy supply 12 Vac
2	Input common	Input common
<u>J</u>	Input overload main motor	Input overload main motor
+ 5	Input wrong rotation (*)	Input overload main motor
5	Input oil over temperature	Input oil over temperature
7	Input timing selection	Input timing selection
7 Q	Not applicable (connected to ground)	Not applicable (connected to ground)
0	Input overload fan motor	Not applicable
9 10	Input overload fail motor	Input prossure switch
10	Input is checked in the same time when the	a start button n 6 is nucled
()	Input is checked in the same time when the	e start button n. o is pushed
	CN2 terminal board	CN2 terminal board
11	Input remote control	Input remote control
11	Input remote control	Input remote control
12	Not applicable	Not applicable
13	Input common	Input common
14	Not applicable	Not applicable
15	Output contact star relay	Output contact star relay
10	Output contact line relay	Output contact star relay
17	Output contact triangle relay	Output contact triangle relay
10	Output contact triangle relay	Output contact thangle felay
20	Output common	Output common
20		Output solehold valve load/oll load
The follo	wing terminals are present only on ES3000	
	wing terminals are present only on ES5000	
	CN3 terminal board	
21	Output solenoid valve water condense	
21	Output solehold valve water condense	
22	Output common	
23	Output rail	
24	Output common for 25	
25	Output anyon	
20	Output second Electro-Internatic SEAVE	
21	Output common for 20 and 28	
20		
	CN4 terminal board	
20	General alarm signal	
30	Output common for 20, 21 and 22	
30	Output common for 29, 51 and 52	
31	Output stop signal	
52		
	CN5 terminal beard	
22	Und terminal Doard	
24	Input temperature probe 1	
54	mput common for 55 and 55	



35	Input temperature probe 2
36	Input pressure probe 1
37	Input common 36 and 38
38	Input pressure probe 2
39	Channel B communication port between ES3000
40	Channel A communication port between ES3000
41	Common contacts 39 and 40 (ground)
	CN6 terminal board
	Serial port
	CN8 terminal board
42	Variable speed command
43	Variable speed command
44	Not applicable
45	Variable speed control 10 Volt
46	Variable speed control 0 Volt



ES3000 Control electronic board for compressors

3.2 Circuit diagram





3.3 Connection diagram

NET1 + 1 version



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ES3000 Control electronic board for compressors

NET 1 + 3 version





ES3000 Control electronic board for compressors

NET 1 + 5 version

