LogikaControl

Instructions and Advices
to use the electronic controller
Logik 9

ORIGINAL INSTRUCTIONS

CE

c**UL**us
LISTED

(INDUSTRIAL CONTROL EQUIPMENT)
39UG
FILE: E316817

LogikaControl

INDEX

Revision 1 – 09.06.15

LogikaControl

CAUTION

THE LOGIK 9 IS AN INDUSTRIAL CONTROL EQUIPMENT (NOT A SAFETY ISTRUMENT) FOR THE OPERATION OF A SCREW COMPRESSOR WITH SOFTWARE CLASS A (see EN 60730-1).

THE INSTALLATION MUST BE MADE IN ACCORDANCE TO THE LOCAL AND INTERNATIONAL STANDARDS AND REGULATIONS WHERE THE COMPRESSOR IS MANUFACTURED.

THE INSTALLATION AND START UP OF THE CONTROLLER MUST BE CARRIED OUT BY TRAINED PERSONNEL WELL KNOW IN THIS MANUAL.

THE CONTROLLER HAS TO BE USED IN STANDARD INDUSTRIAL ENVIRONMENT AND IT CAN NOT BE USED IN EXPLOSION RISK ENVIRONMENT, MARITIME AND MILITARY PURPOSE.

THIS MANUAL COULD BE SUBJET TO CHANGES; PLEASE CONTACT LOGIKA CONTROL TECHNICAL OFFICE IN CASE OF DOUBT ON THE LAST VERSION.

ATTENTION

LA LOGIK 9 EST UN CONTROLE EQUIPMENT INDUSTRIEL (PAS UN INSTRUMENT DE SECURITE) POUR LE FONCTIONNEMENT D'UN COMPRESSEUR A VIS AVEC SOFTWARE DE CLASS A (voir EN 60730-1).

L'INSTALLATION DOIT ETRE EFFECTUEE CONFORMEMENT AUX NORMES ET AUX REGLEMENTATIONS LOCALES ET INTERNATIONALES OU LE COMPRESSEUR EST FABRIQUE.

L'INSTALLATION ET MISE EN MARCHE DE LA COMMANDE DOIVENT ETRE EFFECTUEES PAR DU PERSONNEL QUALIFIÉ BIEN SAVOIR DANS CE MANUEL.

LE CONTROLEUR DOIT ETRE UTILISE DANS LA NORME ENVIRONNEMENT INDUSTRIEL ET IL NE PEUT PAS ETRE UTILISE DANS UN ENVIRONNEMENT DE RISQUE D'EXPLOSION ET MARITIME FINS MILITAIRES.

CE MANUEL POURRAIT ETRE SOUS RESERVE DE MODIFICATION; S'IL VOUS PLAIT CONTACTER LOGIKA CONTROL TECHNIQUE BUREAU EN CAS DE DOUTE SUR LA DERNIERE VERSION.

TECHNICAL FEATURES

- Industrial control equipment for the operation and management of screw compressors only, pollution degree 2.
- In accordance to **EC** Directives:
  Directive:
  LVD : 2014/35/UE
  EMC: 2014/30/UE
  RHOS: 2011/65/EU
  based on the following harmonized standards applied:
  SAF-EMC: EN 60730-1
  RHOS: EN 50581
- In accordance to **UL 508 (FILE #: E316817)**.
- Black auto-extinguishing box in ABS:
  a) **according CE**: IP64 for the front panel and IP20 for the other parts;
  b) **according UL**: type 1 and Type 12 for front panel mounting, installation in pollution degree 2 for the other parts.
- Inputs and outputs via terminal-block board to wires (250Vac – 10A – 12-24AWG) tightening torque: 8 Nm
- Working temperature: -10°C (14°F) ÷ 50°C (122°F), 90% RH (non-condensing)
- Storage temperature: -20°C (-4°F) ÷ 70°C (158°F).
- Power supply: 12 Vac ± 10% - 50÷60 Hz (power of the transformer's secondary: ~6 VA) from safety transformer
- Max. current absorbed: ~ 200mA
- Visualization through LCD custom (10 digit 7 segments + 6 icons)
- no. 1 input for pressure transducer settable via software into input for electromechanical pressure switch
- no. 1 input for temperature probe to detect air end temperature (KTY/NTC).
- no. 4 key buttons: no.1 Start/Stand-by + no.3 function keys (up/down/enter)
- no. 4 opto isolated digital inputs from 12-24Vac to detect:
   IN 1 = emergency stop button
   IN 2 = OR alarms and/or thermal motor – thermal fan
   IN 3 = phases sequence relay and/or thermal motor – thermal fan
   IN4 = remote start/stop and/or thermal motor – thermal fan
- no. 5 outputs via relay with contacts 1.5A AC1 250Vac – 6A AC1 250Vac total:
   RL1 = line contactor
   RL2 = star contactor
   RL3 = delta contactor
   RL4 = load solenoid valve
   RL5 = settable into alarm or fan contactor
- No.1 RS485: Multiunit/Master-Slave
- Non volatile memory to keep setting data, compressor status and working hours
- The electronic controller switched OFF due to micro-interruption over ~ 300ms

Weight: ~290g

Accessories:

- nr. 1 temperature probe KTY 13.5 with black cable TPE, length 2.5 m, working range –10°C÷130°C, resolution 1°C
  to detect air end temperature.
- nr. 1 pressure transducer 4-20mA for working pressure control: 2 wires, AISI 316L stainless steel membrane,
  working range 0 ÷ 15 bar, resolution 0,1bar, precision ± 0,1bar.

Revision 1 – 09.06.15

MOUNTING

Use the drawing below as overall dimensions to mount the controller.

61,6 mm

OVERALL DIMENSIONS

166,2 mm
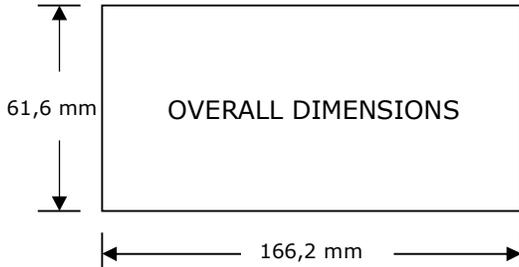
ELECTRICAL DRAWING AND LEGEND OF CONNECTIONS
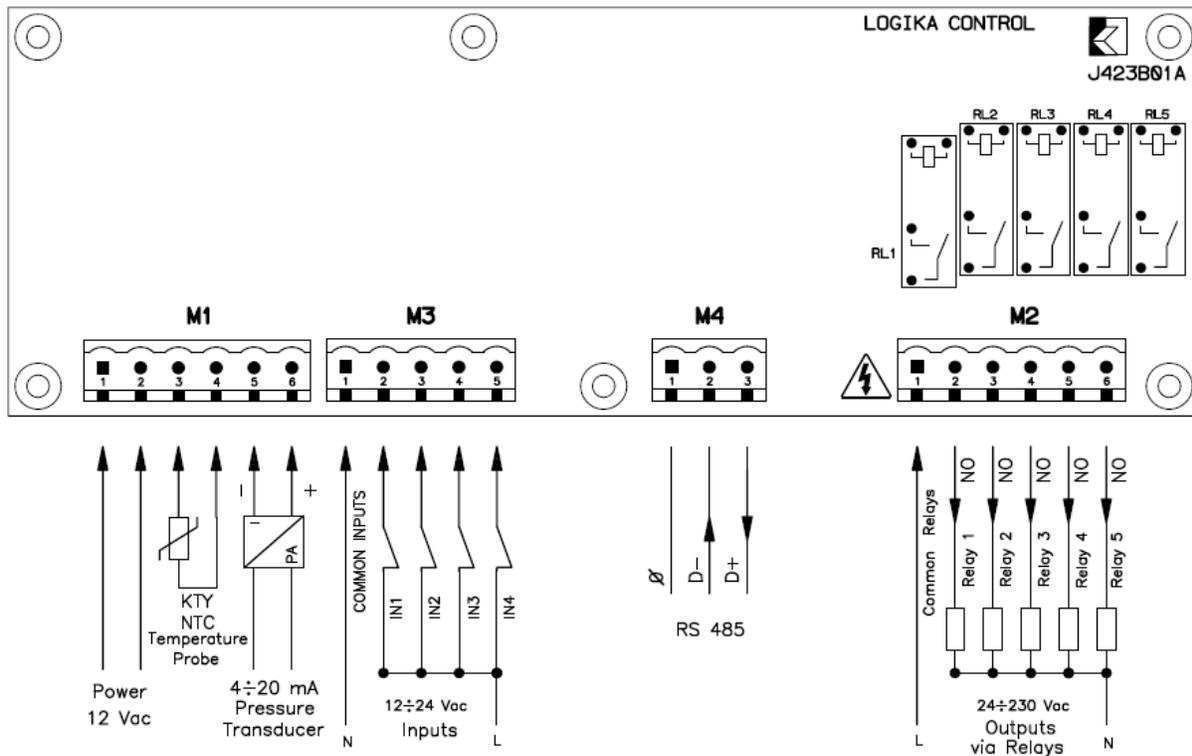
NOTES ON THE ELECTRICAL CONNECTIONS

Respect the working technical features and instructions on the electrical wiring; in special way both the cables of the temperatures probes and pressure transducers must be isolated from the power cables and proper RC filters must be placed on the contactors' coils.
Besides pay attention low voltage and high voltage cables run on separate trunks.
On the back side of the controller there must be enough space for wiring and connectors.
The rear side of the controller must be protected against condensation, oil and dust.
Don't wash the front panel by water injection; clean the front panel with a soft cloth using soap water.

Revision 1 – 09.06.15

LEGEND

Terminal M1: Power Supply and Analog Inputs

Poles 1-2 = power supply 12Vac ± 15% 50÷60 Hz
Poles 3-4 = temperature probe
Poles 5-6 = pressure transducer (pole no.5 = negative - pole no.6 = positive) or free contact
to the electromechanical pressure switch

Terminal M2: Outputs via Relay

Pole no.1 = common relay – 24-230Vac
Pole no.2 = output relay RL1 – line contactor
Pole no.3 = output relay RL2 – star contactor
Pole no.4 = output relay RL3 – delta contactor
Polo no.5 = output relay RL4 – load solenoid valve
Polo no.6 = output relayRL5 – alarm output or fan contactor

Terminal M3: Opto-isolated Digital Inputs

Pole no.1 = common = N
Pole no.2 = input IN 1 – emergency stop button = L
Pole no.3 = input IN 2 – OR alarms: thermal motor, thermal fan etc. = L
Pole no.4 = input IN 3 – phases sequence relay = L
Pole no.5 = input IN 4 – remote start/stop = L
NOTE: the digital inputs you do not use have to be connected directly to 12-24V otherwise they generate the related alarm

TERMINAL M4: Serial Bus RS485
Pole no.1: 0
Pole no.2: D-
Pole no.3: D+

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EXAMPLE OF CONNECTION TO SECURITY PRESSURE SWITCH

Alarm related to security pressure switch **A09**, is joined to the lacking phase to all the digital inputs.
This is a shut off alarm: below you can find the connection drawing both to contactors 24Vac and/or 230Vac.

Contactors 24 Vac

If the operation of the contactors and soenoid valves come through 24 Vac, the digital inputs have to be connected to 24 Vac (*see drawing on the right*); on this way when the pressure switch opens due to high pressure, 24 Vac lacks and deenergize all the contactors, solenoid valve and digital: the controller detects all the digital inputs opened and signal the alarm **A09**.
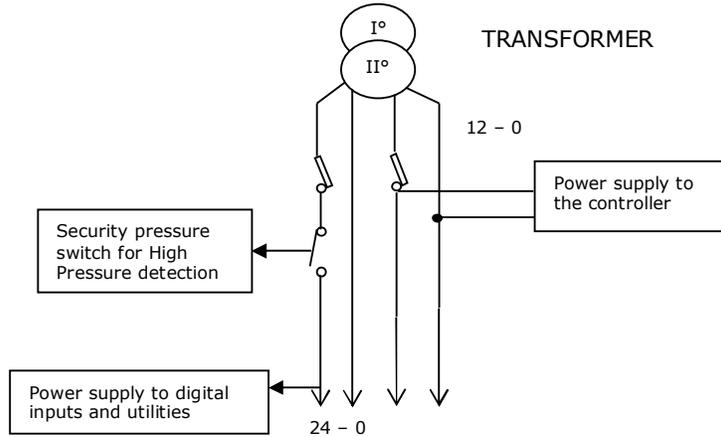
Contactors 230 Vac

If the operation of the contactors and solenoid valves comes through 230 Vac, the digital inputs have to be connected to 12 Vac; next to the contact of the pressure switch, place and energize an auxiliary relay and put the contact in serie to 12 Vac (L) (*see drawing on the right*).
When the pressure switch is closed, the auxiliary relay with contact closed supply power to the digital inputs; the power supply of the controller is connected before the contact of the relay.
When the pressure switch opens, the auxiliary relay opens power to the digital inputs; the controller detects all the digital inputs opened and signal the alarm **A09**.
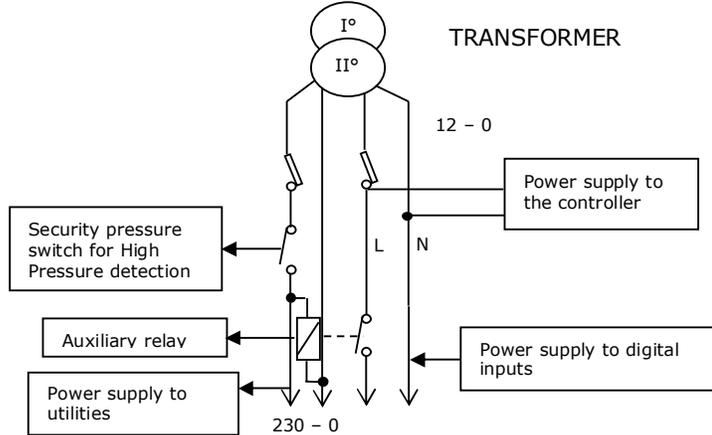
CONNECTION SERIAL NET RS485

To connect a serial net you have to pay carefully attention to some executive aspects:
1) Use flexible cable, shielded, twisted 22 AWG type.
2) Connect D- and D+ to two conductors of same couple and 0 to a third one (if available) or both conductors of a second couple; don't leave free couple of wires.
3) Connect the cable's shield to only one end of 0.
4) DO NOT CONNECT the cable's shield to the electrical ground of the plant.
5) The net MUST NOT BE LONGER than 400 meters.
6) Max connectable units through serial net RS 485 is 32.
7) In case of connection of more compressors via serial line RS485 you have to set the parameter nc into menu CnF (compressor setting).
8) The units on serial net RS485 must be connected without any reversal: pole D+ to D+, pole D- to D-, pole 0 to 0.
9) In case of connection with more than 2 units it is necessary to provide only one line without any deriving.
At the terminal both starting and ending the net it is possible to place (in parallel to D- and D+) a termination resistance 120 Ohm.
In the picture below you can see the connection of 4 units on serial net RS485 by using a shielded cable with two twisted couples.
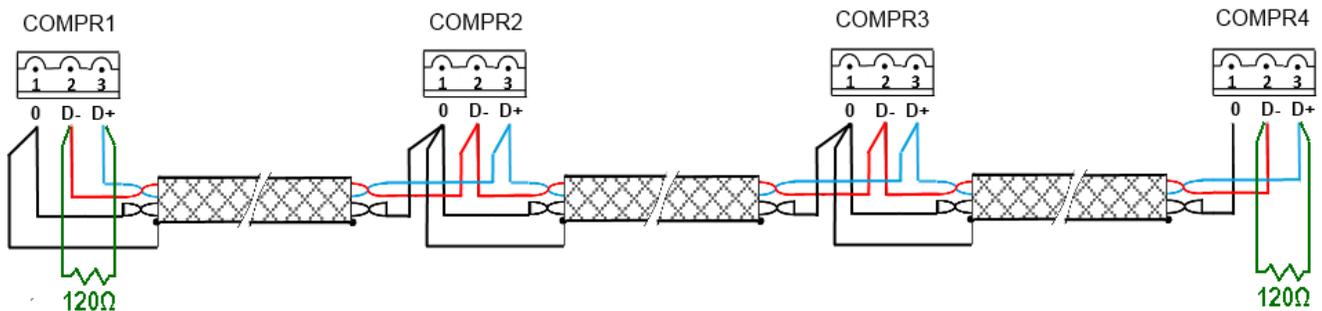
NOTE TO THE WIRING: wrong wiring can damage both the controller and other utilities connected on the serial net

WARNINGS TO THE WIRING RS485

1) The cable must be placed into a TRUNK SEPARATED by power cables and any potentially dangerous cables as lighting plant and so on.
2) DO NOT PLACE signal cables next to power bar, lighting lamps, antennas, transformers;
3) Keep signal cables FAR 2 METERS MINIMUM from units with heavy inductive (distribution cabinet, motors, inverter).
4) Don't pull the cables with a strength over 12 Kg; stronger strength can damage the wires and reduce the signal transmission on the line.
5) DO NOT: twist, knot, crush or fray the conductors.
6) Do not make any joints between lengths of cable: always use only one cable to connect any single unit to each others. Strip the end part carefully, do not crush the cable next to core-hitches or safety supports.
7) Always respect the position of the colors at the both sides of the connection.
8) Once the wiring is complete, visually and physically check the cables are undamaged and properly placed.

WARNINGS TO THE WIRING OF THE CONTROLLER

1) The connection cables temperature probe and pressure transducer must be placed in a trunk separate from the power cables.
2) The connections cables digital inputs must be placed in a trunk separate from the power cables.
3) The power cable controller must NOT be placed in the same trunk of the power cables.

CONTROL PANEL

Group 1

Group 2

Group 4   Group 3
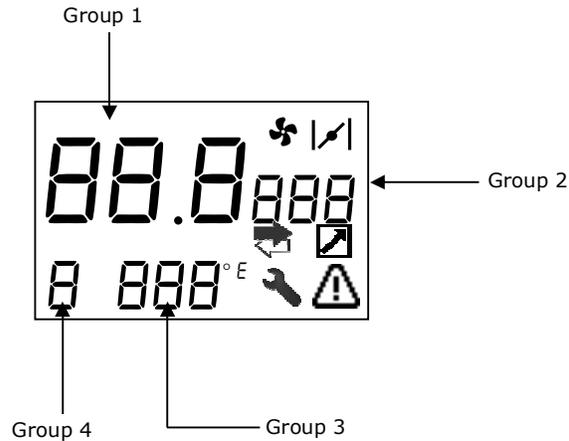
MEANINGS OF THE GROUPS

GROUP 1
Main Visualization and in case of alarm detected: working pressure detected.
Programming: setting value.

GROUP 2
Main Visualization: unit of measurement of the pressure (bar/psi).
Programming: code of the parameter the controller is visualizing
Till Programming: joined to *Group 1* in case the controller has have to visualizes values expressed in thousands.

GROUP 3
Main Visualization: working temperature detected or compressor status.
Programming: code of the menu the controller is visualizing.
In case of alarm detected: code of the alarm detected.

GROUP 4
Programming: progressive number of the menu into the main flow.

MEANING OF THE ICONS

1. Fan working

2. Compressor loading - Compressor unloading (blinking)

3. Remote start/stop enabled

4. Alarm detected

5. Maintenance timer over

6. Unit of measurement of the temperature (Main Visualization)

7. Compressor working under Master/Slave operation

9

LogikaControl
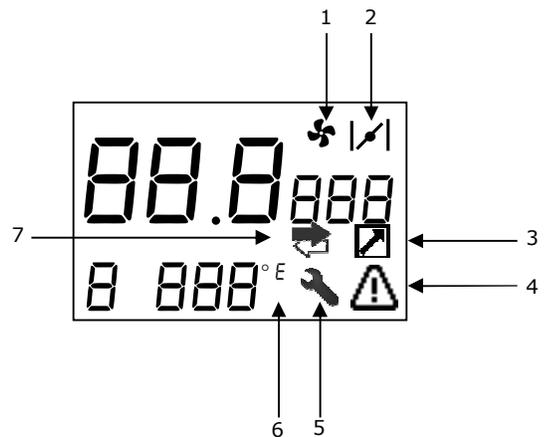
DESCRIPTION OF STATUS VISUALIZATIONS

1) Power on and the display visualizes LG9 for few seconds and then the following:

```
OFF
```
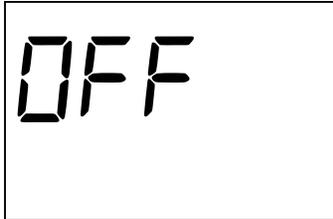
2) **OFF** status switch to **ON** by pushing ⏻ and the display visualizes the following:

```
3.2 bAr
26 °C
```

3) The possible status of the compressors are the followings:

Status	Visualization		Icons
	Pressure transducer P00=0	**Pressure switch** P00=1	
Wait for starting (timer t05)	Message On alternated into pressure detected	Message On blinking	
Compressor starting	Pressure detected blinking	Message run blinking	
Compressor loading	Pressure and temperature detected	Message run and temperature detected	⚡
Compressor unloading for reaching set	Pressure and temperature detected	Message run blinking and temperature detected	⚡ Blinking
Compressor in set	Pressure detected + Message SEt	Message SEt	
Compressor going to stop (unload running)	OFF alternated into pressure detected	OFF blinking	↗ in case remote start/stop input opened
Compressor stop	OFF	OFF	↗ in case remote start/stop input opened
Compressor shutting off due to alarm detection	StP + alarm code	StP + alarm code	⚠

10

Revision 1 – 09.06.15

LogikaControl

QUICK SETTING TO START AND STOP PRESSURE

On the main visualization by pushing ▲ ▼ simultaneously you enable the quick setting to start and stop pressure; the display visualizes the following:

```
10.0bAr
P Str
```

with start pressure value blinking; now you can change the set by ▲ and/or ▼ and confirm by ↵ , so LCD shift to the following:

```
10.0bAr
P StP
```

with stop pressure value blinking.

Follow the procedure to set the start pressure and confirm by ↵ .

Once the setting is confirmed the display shift back to the main visualization.

Revision 1 – 09.06.15

PROGRAMMING

When the compressor is OFF, on the main visualization you enter the main menu to the programming by pushing (↵); pay attention, on this way only the menu/parameters without password (level 0) are visible and settable.

You can flow up and down the flow by using (▼) and/or (▲) ; below you can check out the menu flow with related password level to access:

NOTE: in case of alarm visualized the button (↵) get reset function, so to enter the menu you have to reset the alarm before.

MENU	Password level	Display
1-Password	1-2	PAS
2-Pressures	0-1-2	PP
3-Temperatures	0-1-2	PH
4-Working timer	1-2	Pt
5-Maintenance	0-1-2	P-F
6-Compressor setting	1-2	CnF
7-Working hours	0	HrS
8-Alarms	0	AL
9-Reset	2	rES

NOTE
When the last menu is visualized by pushing (▼) you quit the flow and the display shift back to the main visualization; after 120 seconds the password level is lost.
For security reasons after 120 seconds you push any button, the controller quit the programming procedure automatically and load the setting values already modified.

ANTIPANIC FUNCTION: in any position of the flow you are by pushing (↵) for about 5 seconds the display shift back to the main visualization.

By pushing (↵) you confirm the menu you need to enter to set; below is an example of visualization:

```
15     P01        →  DEFAULT VALUE OF THE PARAMETER

                  →  PARAMETER CODE
                  →  PROGRESSIVE NUMBER OF THE MENU YOU ARE IN
1 PP
                  →  MENU CODE
```
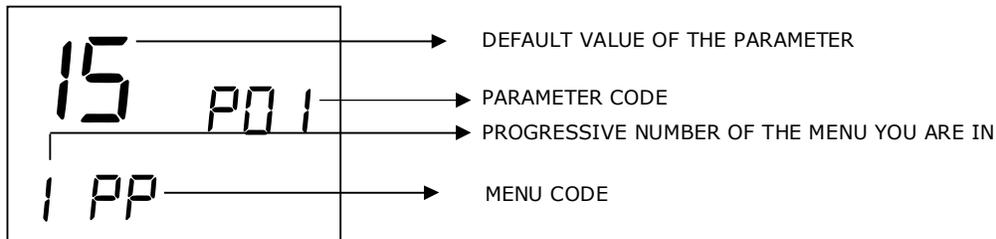
- By the buttons (▲)and/or (▼) you select the code of the parameter to set; once the last parameter is visualized if you keep on pushing (▼) the display shift back to the menu you are in.
- By the button (↵) you confirm the parameter and the setting value starts blinking to indicate the editing is enabled.
- By the buttons (▲)and/or (▼) you change the value and confirm the new one by (↵).

12

ENTER PASSWORD

When the compressor is **OFF** by pushing (⏎) for about 2 seconds you enter the label to select the password level and set the menu and parameters protected by related password code.

The display visualizes the following:

```
 --

PR1
```
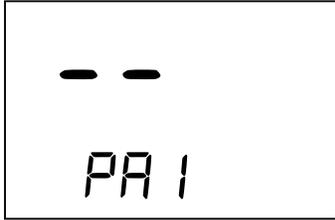
By the buttons (▲) and/or (▼) you can select the password level you need to enter **PR1** (Service) - **PR2** (Factory) and confirm by the button (⏎) : the display visualizes as many segments as the characters you have to enter and the first one blinks:

- select **PR1** = no. 2 segments (default password 22)

- select **PR2** = no. 3 segments (default password 333)

NOTE: without password means that the menu/parameter is visualized and editable to level 0 only.

Once the password level has been confirmed you can set the first digit by the button (▲) and/or (▼) and confirm by (⏎); now the next digit starts blinking.

To set the next digits, follow the same procedure as per the first one.

The password is accepted once you confirm the last digit so you can now set the parameter related to the password level selected; in case you enter a wrong password code, the display visualizes the following message:

```
Err
PR1
```

The message **-Err-** blinks for about 3 seconds to indicate the password code is wrong and shift back to the main visualization.

PASSWORD FORGOTTEN

In case you miss the password code, you can restore the default codes (on both 2 levels) according the following procedure:

take power off to the controller in case it is powered; then supply power again and keep on pushing (⏎) for about 5 seconds.

The display visualizes the blinking message **rES** to indicate the upload of the default password codes is in progress.

Revision 1 – 09.06.15

![LogikaControl logo]

MENU 1 – *PAS* = CHANGE PASSWORD

In this menu you can change the password code related to two password levels available.

Passwords are: *PA1* (Service) - *PA2* (Factory).

To enter the menu push (⤶) and the display visualizes the following:

```
- -    PA 1
 1 PAS
```
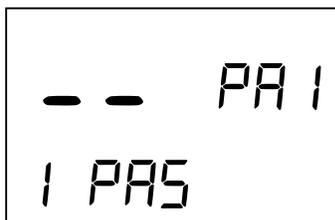
You can select the password level to change by using (▲) and/or (▼) then push (⤶) to enable the modification; in case you keep on pushing (▼) you shift back to previous menu.

Once you enalbe the modification the first digits blinks so you can change it by using (▲) and/or (▼) ; confirm the digit by (⤶) and the second one starts blinking to modification: follow the same procedure for all next digits.

Once the last digit has been confirmed, the new password code has been loaded.

MENU 2 – *PP* = PRESSURES

Below all the parameters related to the pressure.

Parameter	Description	Setting range	Default	Password
P00	Pressure control	0 (transducer) ÷ 1 (pressure switch)	0	1
P01	Top range transducer	15 ÷ 60	15 bar	2
P02	High pressure	(*P01*-0,5) ÷ (*P03*+0,5)	11 bar	1
P03	Stop pressure	(*P02*-0,5) ÷ (*P04*+0,2)	10 bar	0
P04	Start pressure	(*P03*-0,2) ÷ 3	8.5 bar	0
P05	Slave Start pressure	2,8 ÷ (*P04*-0,2)	8,3 bar	1
P06	Offset	-2,0 ÷ +2,0	0	2
P07	Unit of measurement	0 (*bAr*) ÷ 1 (*PSI*)	0	0

NOTE: in case you set *P00* = 1, parameters *P01* ÷ *P06* are not visualized and during the operation the display visualizes the working temperature and compressor status only.

P05 is visualized only if the parameter *con* (Master/Slave – Multiunit operation) = **1** or **2** into menu 6 *CnF* (Compressor setting).

MENU 3 – *PH* = TEMPERATURES

Below all the parameters related to the temperature.

Parameter	Description	Setting range	Default	Password
H00	Enable temperature probe	0 (disabled) - 1 (KTY) 2 (NTC)	1	1
H01	High temperature	(*H02*+2) ÷ 125°C	110°C	1
H02	Warning high temperature	(*H03*+2°) ÷ (*H01*-2)°C	105°C	1
H03	Fan ON (RL5)	30 ÷ (*H02*-2)°C	70°C	1
H04	ΔT Fan OFF (RL5)	2 ÷ 20°C	10°C	1
H05	Low temperature	-10 ÷ +15	0 °C	1
H06	Offset	-10 ÷ +10 °C	0 °C	2
H07	Unit of measurement	0 (°C) ÷ 1(°F)	0	0

NOTE: the parameters *H03* and *H04* are visualized only if the parameter *rL5* = **1** into menu 6 *CnF*.

Revision 1 – 09.06.15

MENU 4 – Pt = WORKING TIMER

Parameter	Description	Setting range	Default	Password
$t01$	Star delta	2 ÷ 20 sec	5 sec	2
$t02$	Star/Delta timer	10 ÷ 50 ms	20 ms	2
$t03$	Delta timer	1 ÷ 900 sec	2 sec	2
$t04$	Unload timer	0 ÷ 10 min	4 min	1
$t05$	Safety timer	10 ÷ 240 sec	60 sec	2
$t06$	Master/Slave rotation	0 ÷ 200h	100 h	1
$t07$	Slave timer	1 ÷ 99min	5 min	1
$t08$	$t04$ fixed or variable	0 (fixed) ÷ 1 (variable)	0	1

NOTE

$t06$: set 0 disables Master/Slave switch.

$t08$: it is possible to set a fixed or variable unload timer.

Fixed: when the pressure reaches set $P03$ (stop) timer $t04$ starts counting; when the timer is over if the pressure is still over set $P04$ (start) the compressor stops; on the other hand if during the counting the pressure goes down set $P04$, the compressors shift to loading again and timer $t04$ reset.

Variable: the starting the compressor runs the unload fixed cycle above; on the next unload cycle the controller keeps the time that the pressure takes going down from set $P03$ to set $P04$: if this time (called **tx**), is lower than $t04$, on the next unload cycle $t04$ will be shorter (1 minute less) and so on up to a minimum time of 2 minutes.

As soon as **tx** is shorter than $t04$ modified, the setting value $t04$ is uploaded again as stop timer.

$t05$: this is the minimum time has to pass between stop and next start of the compressor.

The parameters $t06$ and $t07$ are visualized only if the parameter $con = 1$ o 2 (Master/Slave – Multiunit operation) into the menu 6 CnF (Compressor setting).

MENU 5 – P-F = MAINTENANCE TIMER

Into this menu you can set the maintenance timer.

Parameter	Description	Setting range	Password	Default
CAF	Change air filter	100 ÷3000	1	2.000 h
COF	Change oil filter	100 ÷ 10000	1	2.000 h
CSF	Change separator filter	100 ÷ 10000	1	4.000 h
C--	Change oil	100 ÷ 10000	1	8.000 h
C-h	Check compressor	100 ÷ 10000	1	500 h
bL	Lubricate motor bearings	100 ÷ 29999	1	29999

NOTE

The timer counting is related to ON time of RL1 and it comes backwards; when the timer reaches 0, it goes on as negative counting.

The hours storage comes every 15 minutes: if during the counting the power goes off, the part of 15 minutes is lost.

If you set C-h = 10000 the related maintenance message is not detected.

By changing the set value the residual time is recalculated.

Example: CAF, set 2000h, the counter is 1600, it means 400h has passed from reset. If yu change the set, for example 3000, the counter will change into 2600.

LogikaControl

MENU 6 – CnF = COMPRESSOR CONFIGURATION

Parameter	Description	Setting values	Password	Password
r--	Restart Low voltage	0 (manual) ÷ 1 (automatic)	1	1
5-h	Starts/hour	0 ÷ 60	2	2
FAd	Air flow	1000 ÷ 10000 l/min.	0	0
5--	Security	0 (no) ÷ 1 (yes)	2	2
In2	Input IN2	0 ÷ 5	2	2
In3	Input IN3	0 ÷ 5	2	2
In4	Input IN4	0 ÷ 5	2	2
rL5	Output RL5	0 ÷ 1	2	2
con	Connection	0 (single) – 1 (Master/Slave) - 2 (Multiunit Slave)	1	1
nc	Compressor no.	0 ÷ 32	1	1
OFL	Working mode	0 ÷ 1	1	1
drY	Dryer delay	0 ÷999	0	2

MEANING OF THE PARAMETERS SETTING

r-- :

0: when the power supply to the controller goes down 9.0Vac, the compressor switches off; when the power comes back over 10.5Vac the display visualizes the alarm code $A07$ keeping OFF status; the compressor must be manually restarted by the start button.

1: when the power supply to the controller goes down 9.0Vac, the compressor switches off; when the power comes back over 10.5Vac, the compressor starts automatically once the time $t05$ without visualizing any alarm.

5-h: this parameter set the max. starts the compressor (electric motor) can run in one hour.

In case the compressor reaches the set before one hour, it keeps on unload working till the hour time is over.

NOTE: if you set 0, the counting related to the starts/hours is cancelled.

FAd: here you can set the nominal air flow of the compressor.

This parameter is used on Multiunit operation by Logik33S / Logik200 to select the more efficient compressor according the pressure drop in the net.

5-- : this parameter is related to the air filter change CAF.

0 = disabled

1 = enabled.

If you set 1 (enabled) when the timer CAF is over, the compressor shut off and the display visualizes the alarm code $A18$; you can reset the alarm only after you have reset the timer CAF into the related menu Reset.

In2 ÷ In4: you can set the 4 digital inputs according the followings:

In2: default 0 = OR alarms

0 = OR alarms
1 = thermal motor
2 = thermal fan
3 = phases sequence relay
4 = remote start/stop
5 = remote load/unload

In3: default 3 = phases sequence relay

0 = OR alarms
1 = thermal motor
2 = thermal fan
3 = phases sequence relay
4 = remote start/stop
5 = remote load/unload

Revision 1 – 09.06.15

In4: default 4 = remote start/stop
0 = OR alarms
1 = thermal motor
2 = thermal fan
3 = phases sequence relay
4 = remote start/stop
5 = remote load/unload

rL5:

0: RL5 is set as alarm relay and the parameters **H03** and **H04** in menu **PH** are not visualized.

1: RL5 is set as fan contactor and the parameters **H03** and **H04** are visualized in menu **PH**.

con:

this parameter allows to set the compressor operation according the followings:
0 (single) = compressor works standing alone.
1 (Multiunit Slave) = the compressor works as Slave unit (serial communication) into a compressors system all having Logik controllers on board.
2 (Master/Slave) = the compressor works according Master/Slave operation (serial communication) together with another compressor with Logik controller on board.

nc:

in case of serial communication with other compressors (compressors net), here you must combine the number of the unit to detect the controller into the net.

OFL:

this parameter is visualized only if Multiunit operation has been enabled.
It allows to take the compressor out of the compressors management without stopping the entire system: i.e. in case of serve maintenance on the compressor.
0 (Multiunit operation available) = the compressor is managed into Multiunit operation.
1 (Multiunit operation not available) = the compressor is not managed into Multiunit operation; it works standing alone by its own internal pressure sensor.

dry:

this parameter allows to manage a dryer easily by delaying the start of the compressor for the time dryer needs to start.
The dryer is powered by the line contactor.
This parameter manages the delay after line contactor switches on and before the start/delta sequence.
In case the parameter setting is 0 the starting procedure is the one described in the chapter "Operating principle".

Revision 1 – 09.06.15

![LogikaControl]

MENU 7 – Hr5 = WORKING HOURS

Here you can check out: total working hours, load working hours, starts/hour of the compressor, nominal air consumption and software release of the controller further to the maintenance timer in progress.

The display visualizes the name of the data (tH, LH, 5-h, FAd rEL) and related value.

tH = total working hours

LH = load working hours

CAF = time to change air filter

COF = time to change oil filter

CSF = time to change separator filter

C-- = time to change oil

C-h = time to check compressor

bL = time to lubricate bearings

5-h = starts/hour

FAd = nominal air consumption

rEL = software release

By the buttons ⊕e/o ⊗ou can flow the timer.

IMPORTANT NOTE

It is possible to modify boths "Working hours" and "Load working hours" <u>only if</u> you enable the password level 2.

By pushing ⊙ the first digit starts blinking to edit; select the new one by ⊕/or a⊗confirm it by ⊙ to shift to the next one and set it according the same procedure.

Once you confirm the last digit, the new value is loaded into the controller.

MENU 8 – AL = ALARMS

Here it is the visualization of the last 20 alarms detected; the 21st erase the first one and so on.

```
13  02
8 AL
```
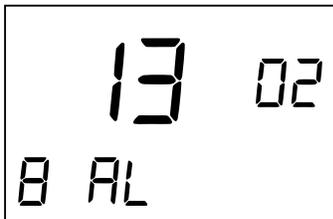
In the picture above: 13 is the alarm code detected (make reference to the alarms list in this manual) and 02 is the number of times the alarm has been detected.

8 is the number of the menu you are in, represented by the code AL.

By the buttons ⊕ and/or ⊗ you can flow the alarms list up and down.

On case there is not any alarm stored, the display visualizes the message "--".

![LogikaControl logo]

MENU 09 – rES = RESET

This menu is dedicated to the reset of the following menu:

P-F = Maintenance timer (password level = 1)
A-L = Alarms list (password level = 1)
HrS = Working hours (password level = 2)
G-G = General reset and upload of default values (password level = 2)

When you enter this menu by the button (⬕) the display is the following:

By the buttons (⬆) and/or (⬇) select the menu you need to reset and execute it by pushing (⬕) for about 3 seconds: the display visualizes the blinking message rES for a while to confirm reset in progress.

NOTE TO MAINTENANCE TIMER RESET: in case you confirm P-F (maintenance timer) the display visualizes the following:

By pushing (⬆) and/or (⬇) you can flow the maintenance timers to allow reset one by one: to understand the meaning of the nomenclature make reference menu "5 – P-F Maintenance timer" page 14.

Execute the reset as above, by pushing (⬕) for about 3 seconds.

IMPORTANT NOTE: General Reset is allowed when the compressor is OFF only.

Revision 1 – 09.06.15

ALARM CODES

SHUT OFF ALARMS

Reset to shut off alarms is allowed by pushing ⏎ when compressor is absolutely OFF.

CODE	DESCRIPTION	CAUSE
A0 1	REVERSED PHASE	Input used to sequence phase relay open (IN3)
A02	HIGH TEMPERATURE	Temperature detected by the probe is over set HD 1
A04	LOW TEMPERATURE	Temperature detected by the probe is below set HD5
A05	TEMPERATURE PROBE FAILURE	Temperature probe is faulty
A07	LOW VOLTAGE	Power supply to the controller lower than9Vac
A09	SECURITY PRESSURE SWITCH	All inputs IN1 ÷ IN4 open
AL 10	HIGH PRESSURE	Pressure detected by the transducer is over set P02
AL 11	PRESSURE TRANSDUCER FAILURE	Pressure transducer is faulty
AL 12	EMERGENCY STOP BUTTON	Input to emergency stop button open (IN1)
AL 13	THERMAL MOTOR	Input used to thermal motor open (IN2,IN3 or IN4)
AL 14	THERMAL FAN	Input used to thermal fan open (IN2,IN3 or IN4)
AL 15	OR ALARMS	Input used to OR alarms open (IN2)
A 18	SECURITY	Parameter 5-- set = 1: reset timer CAF to be able to reset this alarm
A 19	FIELDBUS ERROR	Watchdog via MODBUS is activated: 5 seconds timeout is over without any reply from the Master (see MODBUS document)
POF	POWER FAULT	Compressor set as per manual restart; in case of power off while the power comes back the compressor keeps off and visualizes this alarm code

NOTE: when the compressor shut off all the relays are switched off while RL5 switches on (in case into menu 6 - CnF parameter rL5 = 0).

WARNINGS (VISUAL ALARMS)

Reset to warning is possible by pushing ⏎ while compressor is working.

CODE	DESCRIPTION	CAUSE
A00	SET DATA LOST	EEPROM failure or firmware upgraded
A03	FOREWARNING HIGH TEMPERATURE	Temperature detected by the probe over set HD2 (automatic reset)
A06	WITHOUT TEMPERATURE PROBE	Parameter HDD set 0 and display visualizes "---"
A08	MAX. STARTS/HOUR	Compressor starts as many times as value set on 5-h. You can reset by increasing parameter starts/hour or waiting for expiring hour
A 16	MULTIUNIT FAILURE	Master unit failure or no communication to Master unit
A 17	MASTER/SLAVE FAILURE	NO serial communication between the compressors
A 18	WITHOUT TEMPERATURE PROBE	Parameter HDD set 0

NOTE: when warning is detected, RL5 switches on intermittently (in case into menu 6 - CnF parameter rL5 = 0).

MAINTENANCE CODES

Reset to maintenance codes is possible by pushing ⏎ while compressor is working.

CODE	DESCRIPTION	CAUSE
F-A	CHANGE AIR FILTER	Timer CAF over
F-O	CHANGE OIL FILTER	Timer COF over
F-5	CHANGE SEPARATOR FILTER	Timer C5F over
O1 L	CHANGE OIL	Timer C-- over
C-h	CHECK COMPRESSOR	Timer C-h over
bL	LUBRICATION BEARINGS	Timer bL over

NOTE

1) Shut off alarm codes have priority to warnings while warnings have priority to maintenance codes.
2) When you reset a maintenance code visualized on the display while related timer has not been reset yet into appropriate menu rE5, every power on the display keep on visualizing the same maintenance code.
3) Both alarm and maintenance code are visualized during all compressor status.
4) In case of maintenance messages, after carried out maintenance on the compressor you have to reset the counter in the menu P-F; if you don't do that, every 50 working hours or every time you switch on the compressor the message is visualized again.

Revision 1 – 09.06.15

OPERATING PRINCIPLE

1) Power on:

a) the display visualizes message OFF;

b) all relays are OFF.

2) Compressor ON by pushing start button and the display visualizes the pressure detected (according setting on parameter $P00$), working temperature and compressor status: the display visualizes ⚡ to indicate RL4 status (load solenoid valve).

Safety timer $t05$

By pushing the stop button the compressor stops according the following procedures:

a) If the compressor is running load shift to unload for the time set on $t04$; during this counting restart by start button is allowed.

When time $t05$ is over the compressor stops and the display visualizes the message OFF;

b) if the compressor is running unload and $t04$ counting is higher than $t05$, once $t04$ is over the compressor stops and the display visualizes the message OFF;

c) if the compressori s running unload and $t04$ counting is lower than $t05$, the compressor stops and the display visualizes the message OFF while $t05$ is over only;

d) if the compressor is OFF while it has reached the pressure set, it stops and the display visualizes the message OFF;

When the compressor stops and the display visualizes the message OFF, timer $t05$ starts; during this counting in progress if you push the start button the message On starts blinking alternating the pressure (according the set on parameter $P00$) and the compressor will start when timer $t05$ is over only.

In case the compressor stops due to shut off alarm, timer $t05$ starts; during timer in progress if you reset the alarm and push the start button, the message On starts blinking alternating the pressure (according the set on parameter $P00$) and temperature detected and the compressor will start when timer $t05$ is over only.

Remote start/stop

If you set one of the input (IN2 – IN3 – IN4) as remote start/stop when the compressor is ON by start button ⏻ if the input related to remote start/stop opens the display visualizes the message OFF with related icon ↗ and the compressor switch to unload working according the same principle and time related to the pushing of the stop button above.

When the compressor switch from load to unload working through remote start/stop the display visualizes the message OFF alternating the pressure (according the set on parameter $P00$) and the temperature detected.

21

Load solenoid valve operation (RL4)

1) $t08$ set as fixed time = 0

   When the pressure reaches stop set, RL4 switches **OFF** and the display visualizes the pressure (according the set on parameter $P00$) and the temperature and $t04$ starts; once the timer is over, if the pressure is not lower than the start set, the compressor stops; during timer in progress if the pressure goes down start set, the load solenoid valve RL4 switches **ON** and the display visualizes the pressure (according the set on parameter $P00$) and the temperature while timer $t04$ erases.

2) $t08$ set as variable time = 1

   The starting the compressor runs the unload fixed cycle above; on the next unload cycle the controller keeps the time that the pressure takes going down from set $P03$ to set $P04$: if this time (called **tx**), is lower than $t04$, on the next unload cycle $t04$ will be shorter (1 minute less) and so on up to a minimum time of 2 minutes.

   As soon as **tx** is shorter than $t04$ modified, the setting value $t04$ is uploaded again as stop timer

Fan operation ($rL5$ = 1)

When delta contactor is ON (RL3), the fan contactor (RL5) is operated according the following principle:

a) if the air end temperature is equal or higher than the set value on the parameter $H03$ = RL5 ON;

b) if the air end temperature is lower than the value ($H03 - H04$) = RL5 OFF.

Restart after black out

Menu CnF - parameter $r--$

Manual:

in case of black out when the power is restored, the compressor does not restart automatically and the display visualizes the message POF; after you reset the alarm message by the button 🔄 the compressor shift to RUN position. The alarm code is stored into the alarm list.

Automatic:

in case of black out when the power is restored the compressor restart from the status previous to black out: if the compressor was ON it restart according the principle above, after the timer $t05$ is over; during $t05$ in progress the display visualizes the blinking message On. Anyway the alarm code POF is stored into the alarm list.

Revision 1 – 09.06.15

LogikaControl

MASTER SLAVE OPERATION

Master/Slave operation allows to put two compressors in communication via serial line for the optimal management on air consumption.

NOTE: Master/Slave operation is allowed only between two compressors equipped with Logik controller.

Above all check out the compressors are in communication through the proper serial port terminal at disposal.

Check into menu Pt the parameters $t06$ (timer to shift Master into Slave and Slave into Master) and $t07$ (timer to start Slave compressor in case Master does not reaches the stop set after first start up) are set according your need.

If the working hours difference between the two compressors is higher than set $t06$, the machine having less working hours keeps on working till it reaches the same hours of the other + the working hours set on $t06$; after this time only the Master Slave shift is activated.

During Master/Slave operation the following parameters are common to both compressors:

$P02-P03-P04-P05$, Manual / Automatic restart ($r--$), timers $t06$ and $t07$.

Changing one of the above parameters on one compressor, modification is transferred automatically to the other.

Pushing the Start button of one of the two compressors both are activated

Pushing the stop button of one of the two compressors both are put in OFF

Slave compressor operates only if:

1) First start up Master does not reach the stop pressure until time set on $t07$.

2) Pressure goes down set on $P05$.

NOTE: the compressor stops when it reaches the pressure set $P03$.

Master Slave shift when:

1) timer set on $t06$ is over.

2) In case of shut off alarm on Master unit.

NOTE
- In case you have to serve one of the two compressors before to stop it you have to set both units for standing alone operation (menu CnF - parameter con = 0) and then set again Master/Slave operation after maintenance (menu CnF - parameter con = 1).

- In case of serial line failure both compressors are Master to work standing alone.

MULTIUNIT OPERATION

Multiunit function (configured on a net of Logik controllers up to 5 units max.), allows the cooperative operation of the compressors managed.

All the controllers must be connected on bus RS485 and you have to set a MODBUS address to each one: pay attention addresses must be different one to one. You can choose the addresses into a range from **1** to "**n**", where "**n**" is the number of controllers into the net.

It is strictly necessary one of the compressors is configured as "Master Multiunit" and this unit must have MODBUS address = 1.

Till on Master unit you set the number of "Slaves": in other words the other compressors into the Multiunit net.

NOTE: Master unit <u>CAN BE</u> <u>Logik31-S or Logik33-S</u> <u>ONLY</u>.

Till on Master unit you set the operating principle amongst: Smart, Balance Hours or Priority (for further details make reference to the manual of the Master controller).

The parameters of Logik9 interested to the Multiunit operation are the followings (menu 6 CnF):

- con: set 2 to operate Logik9 as Multiunit Slave.

- nc : set a value between 2 and **n**, where **n** is the number of compressors into the Multiunit net.

Pay attention to set different addresses into the different controllers.

- FAd: it is the air flow (Liters/minutes) of the compressor; Master unit needs this data to match the best compressor to operate in relation to the air consumption of the plant, in case of Smart operating principle.

- OFL : in case you need to carry out maintenance, if you set this parameter = 1, you can exclude the compressor from the Multiunit operation and stop it to serve.

During Multiunit operation the display shows the icon on the main visualization.

The pressure detected is the one Master detects and this detection is used to operate/manage the compressors according the air demand from the plant.
Icon blinks in case of communication error to the Master or pressure transducer failure till on the Master unit.

If the remote start/stop inputs on Master opens, all Multiunit net switch to stand-by status and the display shows on the main visualization.

In case the compressor is not under maintenance (OFL ≠ 1), if you push ON/OFF button on Logik9, all the compressors into Multiunit net start/stop through a command sent to Master.

Further information on the management and operation of the compressors, make reference to the instruction manual of the Master unit.

Revision 1 – 09.06.15

WARRANTY TERMS

24 (twenty-four) months from the production date printed on the label of the serial number.

Temperature probe is not included in the warranty terms.

Both working and technical features of the controller must be fully respected: the warranty declines if the controller has been opened or repaired by unauthorized personnel.

Operation or modification different from the original, wrong electrical wiring or bad assembling can be cause of failures or malfunctioning of the controller; in these cases both warranty and own technical features of the controller declines.

Technical features, drawings, and any other document in this manual are property of Logika Control that forbid any reproduction, even partial, of text and illustrations.

On its unquestionable judgement, Logika Control reserves the authority to modify the product to improve operation and performance, besides to the right to withdraw the product from the production, in any time and without notice.

REVISION INDEX
Revision 0 = Issue
Revision 1 = upgrade to parameter dry function

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CSQ   IQNet   CE

Dichiarazione di Conformità   CE
EC Declaration of Conformity   CE

Noi sottoscritti,
We the undersigned,

Logika Control s.r.l
Via Garibaldi, 83/A - 20834 Nova Milanese (MB) Italia

Certifichiamo e dichiariamo sotto la nostra responsabilità che i seguenti prodotti:
certify and declare under our sole responsibility that the following apparatus:

Descrizione   **Controllo elettronico per compressori**
Description   *Electronic controllers for compressors*

Marca   **Logika Control**
Brand name

Modello   **LOGIK 9 (0KLC5L4A)**
Type model

è conforme ai requisiti essenziali delle seguenti direttive:
conforms with the essential requirements of the following directives:

Compatibilità Elettromagnetica 2004/108/CE
EMC 2004/108/EC,

Bassa Tensione 2006/95/CE
LVD 2006/95/EC

ROHS 2011/65/EU
ROHS 2011/65/EU

e sono state applicate le seguenti norme armonizzate:
based on the following harmonized standards applied:

EN 60730-1
EN 50581

Data / *Date*

2015/03/01

Dott. Fabio Udine
Amministratore Delegato

Revision 1 – 09.06.15

Revision 1 – 09.06.15