

Instructions and Advices to use the electronic controller Logik 33-S

ORIGINAL INSTRUCTIONS



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CAUTIONS

THE LOGIK 33-S CONTROLLER IS AN ELECTRONIC DEVICE (NOT A SAFETY INSTRUMENT) FOR THE OPERATION OF A SCREW COMPRESSOR.

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.

TECHNICAL FEATURES

- Electronic controller for industrial use for the operation and management of screw compressors only; don't mount and use in explosive room.
- Composed by CPU (power board) connected to control panel via serial cable RS232 supplied with.
- Black-grey auto-extinguishing box in ABS
- Protection
 - IP64 for the control panel and IP20 for the other parts; CPU to mount inside the electrical cabinet: IP20.
- Inputs and outputs via terminal-block board to wires.
- Working temperature: 0°C (32°F) ÷ 55°C (132°F) 90% RH (non condensing)
- Storage temperature: -20°C (-4°F) ÷ 70°C (158°F)
- Max current absorbed: ~ 550mA
- In accordance to CE regulation:
 - Low tension: 2006/95/CE
 - Safety: EN 60730-1 (General regulations)
 - EMC 2004/108/CE

Control panel

Visualization through:

- Graph back light LCD (128 x 240)
- Messages selectable into 8 languages: Italian – English – French – German – Spanish – Portuguese – Turkish – Russian.
- nr. 2 signalling led
- nr. 8 functions buttons
- nr. 2 serial port RS 232:
 - 1) for connection to CPU
 - 2) provided for future connections

CPU

- Power supply: 12 Vac ± 10% 50÷60 Hz (power of the transformer's secondary ~ 15VA) coming from safety transformer
- nr. 2 serial port:
 - 1) RS232 for connection to the control panel
 - 2) RS485 for Multiunit operation (max. 4 units)
- nr. 1 time-keeper with buffer battery
- nr. 4 analogue inputs for:
 - a) oil temperature probe.
 - b) temperature probe settable into: temperature drop or absolute temperature
 - c) working pressure transducer
 - d) pressure transducer settable into: pressure drop or absolute pressure
- nr. 1 input from PTC or Klicson for motor protection
- nr. 3 digital inputs for connection to Logika Control phases unit
- nr. 6 opto isolated digital inputs from 12/24Vac for detection:
 - IN 1 = emergency stop button
 - IN 2 = thermal motor
 - IN 3 = thermal fan
 - IN 4 = remote start/stop
 - IN 5 = settable as: door open (of the electrical cabinet), air filter pressure switch or control phase relay
 - IN 6 = separator filter pressure switch

All the digital inputs gives alarm with contact open except IN5 while configured as air filter pressure switch.
- nr. 7 outputs via relay with contact 1.5A (general use)
 - RL1 = line contactor
 - RL2 = don't connect
 - RL3 = don't connect
 - RL4 = load solenoid valve
 - RL5 = fan contactor
 - RL6 = condensate drain solenoid valve or machine status
 - RL7 = alarm

MAX. RATED CURRENT WITH ALL RELAYS CLOSED: 4.5A

- Control of max. and min. power supply to CPU.
 - The controller switches off due to micro interruption of power supply ~ 300 m.sec.

Drive board (Inverter)

- Power supply: 24Vdc \pm 10% from inverter
- The connection to the Drive can come via:
 - a) "I/O" and support all type of Drive; data from the Drive are not visualized.
 - b) "serial port RS232 / 485" and the data from the Drive are visualized.

I / O CONNECTION

- nr. 1 digital input = inverter failure
- nr. 2 outputs via transistor:
 - OUT 1 = inverter run
 - OUT 2 = inverter run fixed frequency
- nr. 1 analogue input 0÷10 V and/or 4÷20 mA = detection inverter working frequency
- nr. 2 analogue outputs:
 - AN.1 = 4÷20mA and/or AN.1= 0÷10V = communication working pressure
 - AN.2= 0÷10V = communication working set

SERIAL CONNECTION

- nr. 1 RS 232 for Drive operation (see DRIVE manual for communication protocols supported)
- nr. 1 RS485 for Drive operation (see DRIVE manual for communication protocols supported)
- nr. 1 digital input from a 24 V dc = inverter failure

Logik 33-S is provided with:

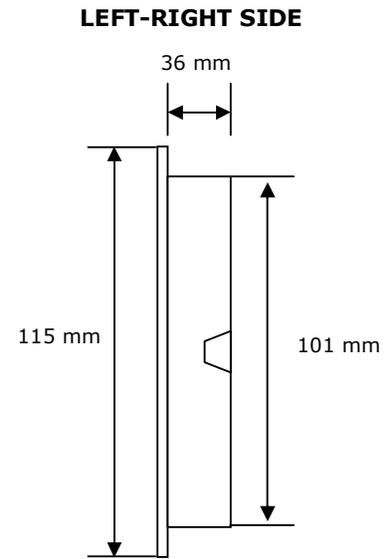
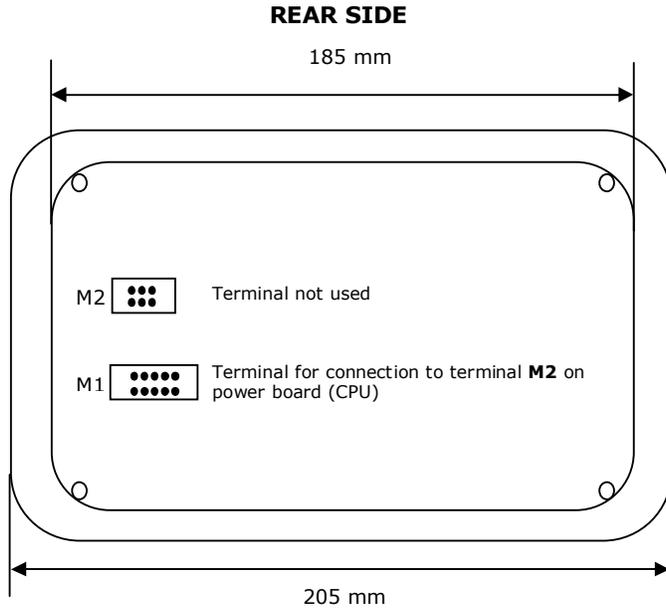
- nr. 1 connection cable control panel - CPU

Accessories:

- nr. 2 temperature probe KTY 13.5 for detection of the air end temperature: black cable TPE, length 2.5 m, working range $-10 \div 130^{\circ}\text{C}$, resolution 1°C , precision $\pm 1^{\circ}\text{C}$.
- nr. 2 pressure transducer 4-20mA for working pressure control: 2 wires, AISI 316L stainless steel membrane, working range $0 \div 15\text{bar}$, resolution 0,1bar, precision $\pm 0,1\text{bar}$
- nr. 1 Logika Control phases unit:
 - a) for power supply 380 \div 400V three phase
 - b) for power supply 230V three phase
 - c) for power supply 440 \div 460V three phase

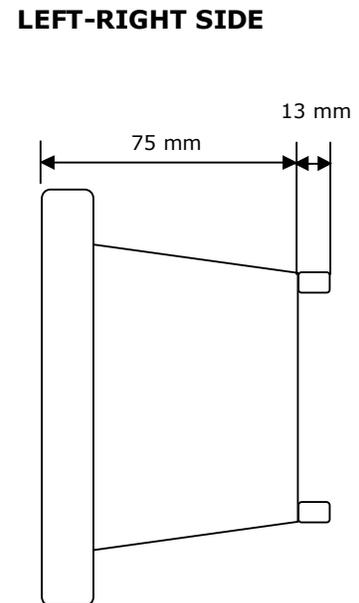
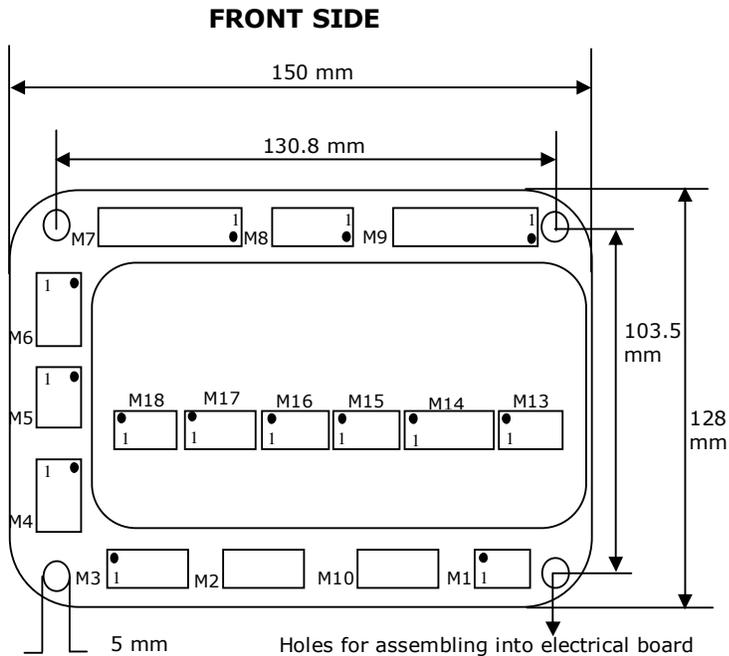
ASSEMBLING THE CONTROL PANEL

Use the drawings below as overall dimensions to assemble the control panel.



MOUNTING THE CPU

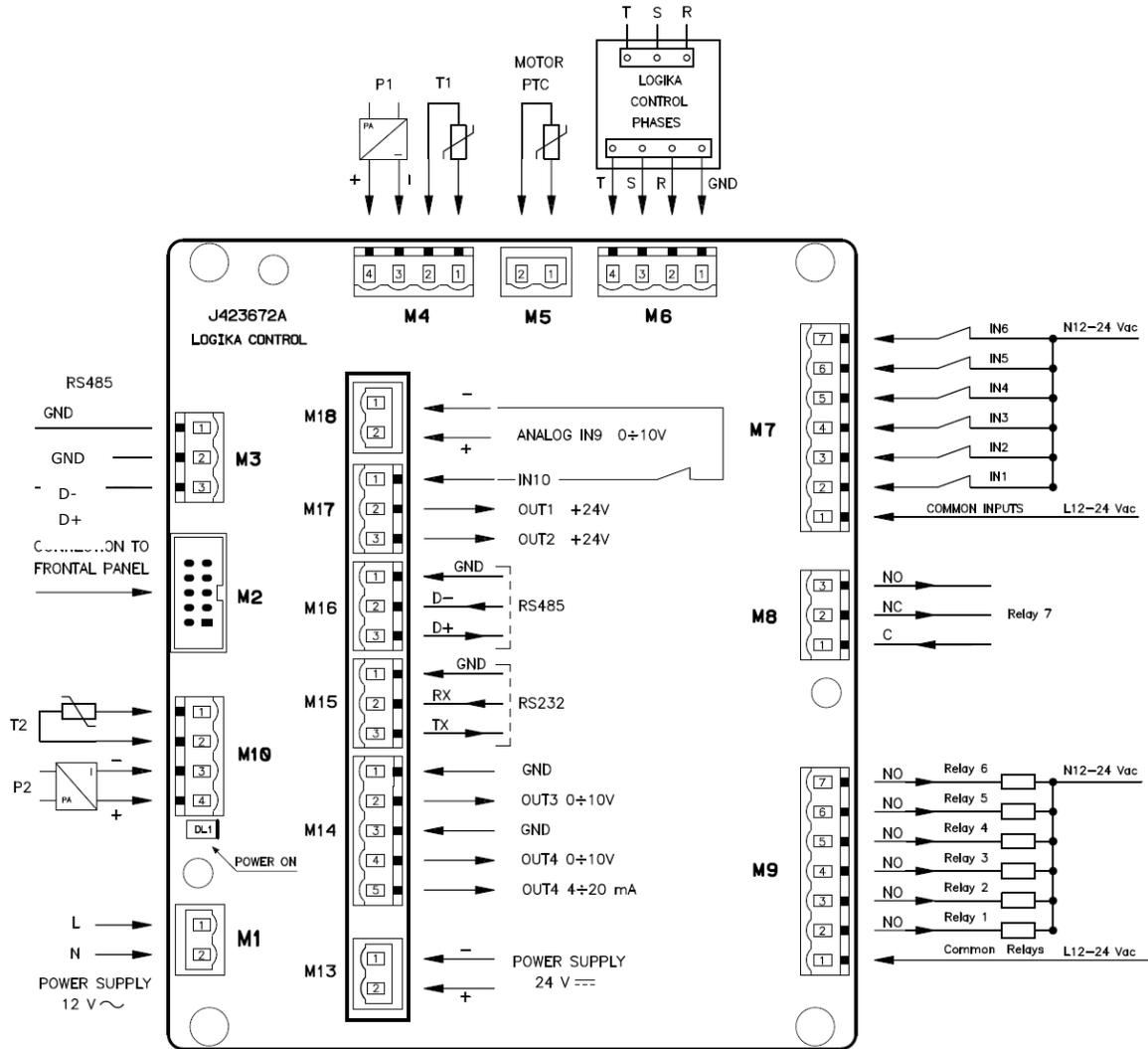
Use the drawings below as overall dimensions to mount the CPU mechanically and legend pertinent to the connectors.



ATTENTION: the box must be vertically fixed to allow proper ventilation to the boards placed inside; see the arrows on the rear side of the box.

ELECTRICAL DRAWINGS AND LEGEND OF THE CONNECTIONS

CPU



NOTES ON THE 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 mylar with a soft cloth using soap water.

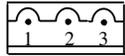


- TERMINAL M1: power supply 12Vac

ATTENTION: over voltage to the controller will damage the controller; under voltage to the controller can cause malfunctioning.

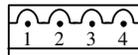


- TERMINAL M2: connection to the terminal M1 on the rear side of the control panel (see chapter ASSEMBLING THE CONTROL PANEL)



- TERMINAL M3: serial port RS485 for Multiunit operation

- Pole1: GND
Pole2: RX
Pole3: TX



- TERMINAL M4: temperature probe and pressure transducer

Pole1-2: temperature probe
Pole3: - (negative) pressure transducer
Pole4: + (positive) pressure transducer

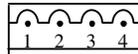


- TERMINAL M5: Motor PTC or Klicson

Operation data of PTC:

Total resistance of operation = 2,900 ohm

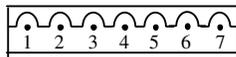
Total resistance of restoration = 1,600 ohm



- TERMINAL M6: Logika Control phases unit

Pole1: pole5 of the control phases (GND)
Pole2: pole3 of the control phases (R)
Pole3: pole2 of the control phases (S)
Pole4: pole1 of the control phases (T)

NOTE: THE GND FROM THE CONTROL PHASES UNIT MUST NOT BE CONNECTED TO EARTH. IT'S THE GROUND OF THE CONTROLLER AND MUST BE CONNECTED TO IT.



- TERMINAL M7: digital inputs

Pole1: N = 0Vac

Pole2: IN1 = emergency stop button

Pole3: IN2 = thermal motor

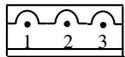
Pole4: IN3 = thermal fan

Pole5: IN4 = remote start/stop

Pole6: IN5 = door open (of the electrical cabinet), air filter pressure switch or control phase relay

Pole7: IN6 = filtro separatore

L = 12 / 24Vac

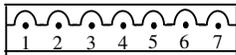


- TERMINAL M8: alarm relay = RL7

Pole1: C = 24 ÷ 230Vac

Pole2: N.O.

Pole3: N.C.



- TERMINAL M9: outputs via relay

Pole1: IN = 24 ÷ 230Vac

Pole2: OUT RL1 = line contactor

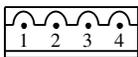
Pole3: OUT RL2 = delta contactor

Pole4: OUT RL3 = star contactor

Pole5: OUT RL4 = load solenoid valve

Pole6: OUT RL5 = fan contactor

Pole7: OUT RL6 = condensate drain solenoid valve or machine status



- TERMINAL M10: auxiliary temperature probe and auxiliary pressure transducer

Pole 1-2 temperature probe

Pole 3: - (negative) pressure transducer

Pole 4: + (positive) pressure transducer

DRIVE BOARD

-  CONNETCOR M13: power supply 24Vdc from inverter

Pole1: -
Pole2: +

-  CONNECTOR M14 (I/O connection)

OUT3 = value of the working set on the controller
Pole1(GND)-2(V): tension output 0 ÷ 10Vdc
OUT4 = value of the pressure detects by the controller
Pole3(GND)-5(A.): current output 4 ÷ 20mA
Pole3(GND)-4(V.): tension output 0 ÷ 10Vdc

NOTA: select the tension or current output into menu n°14 Drive

-  CONNECTOR M15:serial connection RS232

Pole1: GND
Pole2: RX
Pole3: TX

-  CONNECTOR M16: serial connection RS485

Pole1: GND
Pole2: B
Pole3: A

-  CONNECTOR M17 (I/O connection)

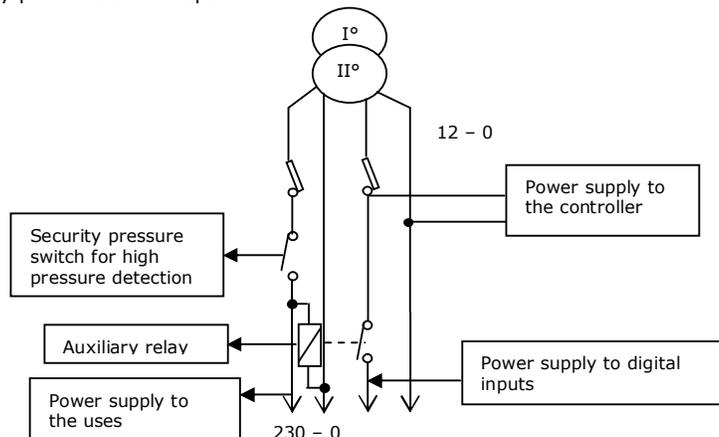
Pole1: IN10: input inverter failure
Pole2: +24V (20mA max.) = OUT1 = operation of run/stop sent to the inverter
Pole3: +24V (20mA max.) = OUT2 = operation of run at fixed frequency sent to the inverter

-  CONNECTOR M18: 0-10V analogue input IN9 (inverter working frequency)

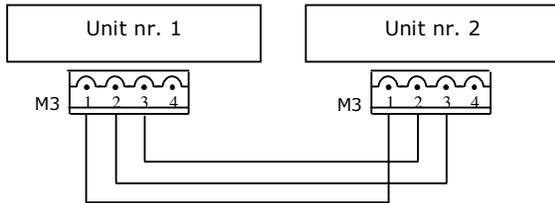
EXAMPLE OF CONNECTION TO THE SECURITY PRESSURE SWITCH

If the operation of the contactors and soenoid valves come through 24Vac, the digital inputs have to be connected to 24Vac (*see drawing page 7*); 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 "**SEC. PRESS. SWITCH**", it means security pressure switch opened.

If the operation of the contactors and solenoid valves comes through 230Vac, the digital inputs have to be connected to 12Vac; next to the contact of the pressure switch, place and energize an auxiliary relay and put the contact in serie to 12Vac (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 open and signal the alarm "**SEC. PRESS. SWITCH**".



MULTIUNIT CONNECTION



INSTRUCTION FOR SERIAL CONNECTION RS232 AND/OR RS485

NOTES ON THE WIRING: wrong wiring can damage both the controller and other devices connected to the serial port.

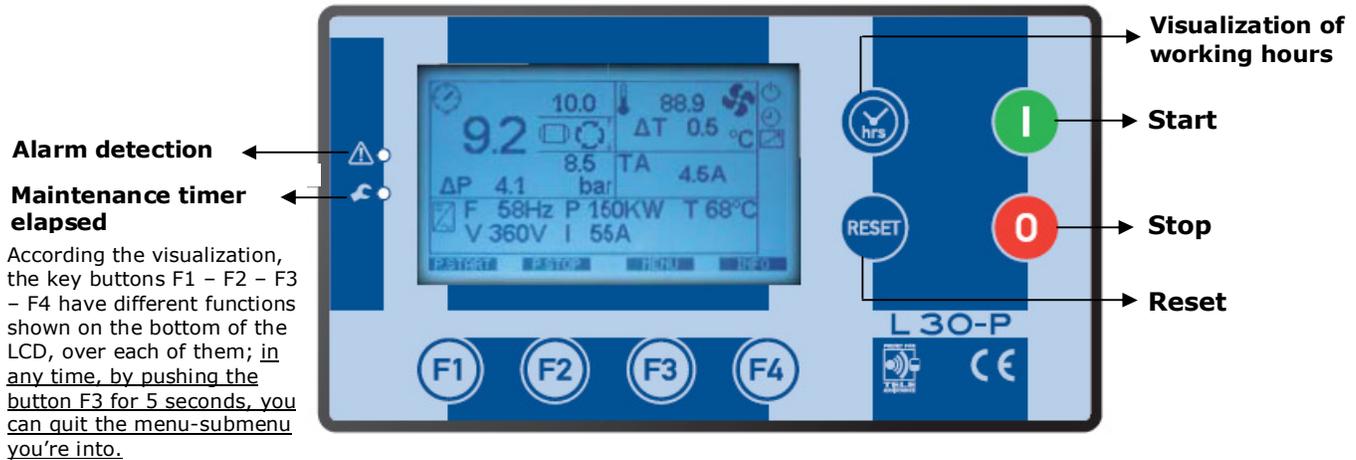
Be careful following the technical points below:

1. Use flexible, twisted pair, earth shielded cable, type 22 AWG.
2. The total length of the net has to be no more than:
 - 5 m for serial connection RS 232
 - 400 m for serial connection RS 485
3. In serial connection RS 485 the maximum devices connectable are 32 units.

NOTES ON INSTALLATION

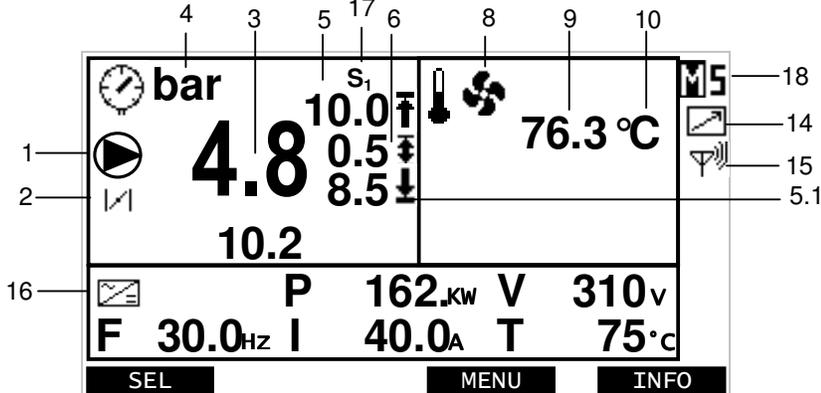
- The signal wire must be placed in a electrical trunk separated from power cables or that can be dangerous like the wires of lighting and so on...
- Don't place the signal wires near power bus-bar, lamps, transformers and high frequency antenna.
- The signal cable must be minimum 2 m of far from heavy inductive load (motors, inverters and control / patch board).
- 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.
- Don't twist, knot, crush and fray the wires.
- Use always a single cable without cut it to make the connection between two devices.
- Pay attention to wire stripper.
- To be sure that the connection is well done, sign the position of terminal block with the colour of the wire.

CONTROL PANEL



MAIN VISUALIZATION

Supplying power to the controller, the LCD shows the main visualization as below.



NOTE!

Change start pressure: push F1, change the value by F1 – F2 and confirm by F3.

Change stop pressure: push F2, change the value by F1 – F2 and confirm by F3.

ANTIPANIC FUNCTION

2 minutes later from the last pushing of any button, the LCD shift back to the main visualization.

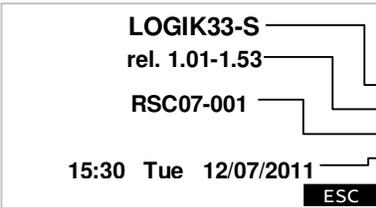
Meaning of the icons/data (paying attention to the reference numbers):

1. Compressor ON (blinking if the compressor is going to stop or run; it's not visualized if the compressor is OFF).
2. Load solenoid valve open.
3. Indication of the line pressure.
4. Scale of the pressures visualized (bar / PSI).
5. Stop pressure (see notes on inverter operation page 23).
- 5.1 Start pressure (see notes on inverter operation page 23).
6. Pressure set (see notes on inverter operation page 23).
7. Detection of the pressure by the auxiliary pressure transducer: in the example above configured as absolute pressure (see menu COMPRESSOR SETUP page 14).
8. Fan ON.
9. Air end temperature.
10. Scale of the temperatures visualized (°C / °F).
11. Detection of the temperature by the auxiliary temperature probe: in the example above configured as differential temperature (see menu COMPRESSOR SETUP page 14).
13. Start – stop by timer
14. Remote control or Multiunit operation (under construction).
15. Wireless interface connected (under construction)
16. Area of the data from the inverter (as indicated by the icon) for serial connection only: (F) working frequency, (P) power, (V) current, (I) motor tension and (T) temperature of the inverter's heat sink.
17. Level of pressures set the compressor is working.
18. Master/Slave operation enabled: letters relating to the current operation of the compressor is shown in reverse: letter in white on a black background.

In case of alarm, the area with inverter data is changed into the indication of the alarm (message and eventual symbol) and the red light on the left side of the LCD lightens.

NOTE: in case of inverter connected via I/O the area of the data from the inverter is dedicated to the machine status; the icon of inverter operation will be always visualized as per inverter via serial connection.

INFORMATION ON THE CONTROLLER (INFO)



From the main visualization, pushing F4 (INFO) enter into the label dedicated to the information on the controller.

The LCD visualizes:

model of the controller

software release both of the control panel and CPU

serial number of the compressor set by the manufacturer

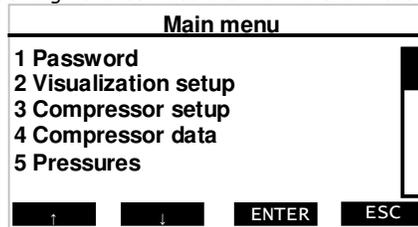
date and time

From label INFO shift back to the main visualization by the button F4 (ESC).

MAIN MENU

From the main visualization, pushing F3 enter into the main menu visualizing all the menu below.

- 1 Password
- 2 Visualization setup
- 3 Compressor setup
- 4 Compressor data
- 5 Pressures
- 6 Temperatures
- 7 Ampere transducer
- 8 Working timer
- 9 Maintenance
- 10 Working hours
- 11 Alarms
- 12 Reset
- 13 Weekly timer



Flow bar indicating the end of menu or parameters

Into each menu there is a submenu described later.

Through the buttons F1 e F2 flow up/down all the menu; by F3 enter into each submenu (programming); by F4 shift back to the previous visualization.

ATTENTION: the Logik 33-S controller is provided with 3 password levels with following default codes::

- Level 1 22 (service 1)
- Level 2 4444 (service 2)
- Level 3 666666 (factory)

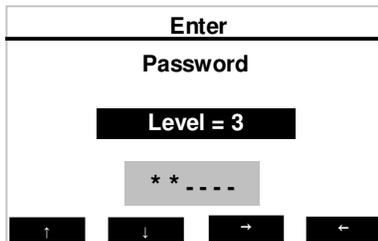
Make reference to the chapter of each menu - submenu to check the password level enabling the programming.

PASSWORD

Into the menu Password you have two options, selectable by F1 and F2; enter into the selection by F3 (ENTER):

- 1 Enter
- 2 Change (this option is visualized and selectable only once the password is enter)

In both options confirm enter and go the following visualization:



First select the password level you need to enter (in case you select **1. Enter**) or change the code (in case you select **2. Change**) by the buttons F1 and F2; enable the enter or modification (grey area) by the buttons F3 and F4, select each character by the buttons F1 and F2 and shift to the next by F3. Once the last character has been selected, push the button F3 and the password level selected will be enabled.

Every time one figure is entered the LCD visualizes it as asterisk "*" to protect the password number from prying eyes.

In case of wrong character, it's possible to shift back to change it by the button F4.

Once the password level is enabled, the LCD visualize the main menu on "Visualization setup".

In case you enter a wrong password code, the LCD visualizes the message "**PASSWORD WRONG**" and shift back to the previous visualization.

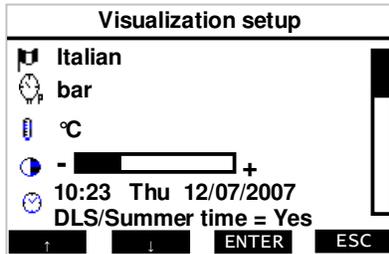
NOTE: menu and parameters under password are not visualized till the proper code is loaded.

PASSWORD MISSED?

In case you forget or miss the password, pay attention to the following procedure to recover the 3 default password values: take power off to the controller in case it's powered; supply power again and at the same time keep on pushing the button F3 till the message "Logik30 Logika Control" change into the blinking message "Resetting; now you can release the button and after 3 seconds the message disappear to inform you the 3 level password have been loaded to the default values.

VISUALIZATION SETUP

This menu (**available without password**) allows to set: language, scale of pressures and temperatures, LCD contrast, date and time, automatic DLS/Summer time.



Once the data to change has been selected by F1 and F2, push F3 to enable the modification. The information on the bottom of the LCD, over each button, indicate the possible functions.

COMPRESSOR SETUP

This menu allows to set the compressor operation and enable the alarms and warnings.

Enter into the menu by the function ENTER; below you can find all the settable parameters with ref. to the different password levels.

COMPRESSOR SETUP					
Parameter	Description	Meaning	Values	Default	Password
S01	*Restart	Aut = Automatic / Man = Manual	Auto/Man	Man	1-2-3
S02	**Starts/hour	Number of starts allow in 1 hour	6÷60	10	2-3
S03	Wt4 variable	0=unload time fixed 1=unload time variable	0÷1	0	2-3
S04	Control phases	YES = control phases enabled NO = control phases disabled	YES/NO	YES	1-2-3
S05	***Safety	YES = the compressor stops once timer CAF is elapsed NO = the option Safety is not operated	YES/NO	NO	2-3
S06	Low voltage	YES = low tension alarm and warning enabled NO = low tension alarm and warning disabled	YES/NO	YES	1-2-3
S07	Multiunit	0 Multiunit disable and compressor runs standing alone 1. Master/Slave (compatibilità with other Logik controllers) 2. Master/Slave Logik 31S-33S range 3. Multiunit Slave 4. Multiunit Master Smart mode 5. Multiunit Master Equil mode 6. Multiunit Master Prio mode	0÷6	0	2-3
S07-2	****Rotation time	0 = balance working hours not operated > 0 = balance working hours among Slave compressors	0÷200h	50h	2-3
S07-3	Start timer slave	After first power ON if the Master has not reached the pressure set, the first Slave starts to support	1÷99min	5min	2-3
S07-5	Connection	0 = Multiunit connection through serial line RS232 1 = Multiunit connection through wireless interface	0-1	0	2-3
S08	Aux. transd.	0 = Disabled 1 = Detection of the pressure as pressure drop between the auxiliary pressure and working pressure and operation of pertinent alarm (see operation of the auxiliary transducer page 21)	0÷1	0	3
S09	Aux. probe	0 = Disabled 1 = Detection of the temperature as absolute temperature and operation of the pertinent alarm 2 = Detection of the temperature as temperature drop between the air end temperature and auxiliary temperature and operation of the pertinent alarm 3 = Operation as dryer temperature (see operation of the auxiliary temperature page 22)	0÷3	0	3
S11	Input IN5	0 = Disabled 1 = Air filter pressure switch (warning - visual alarm) 2 = Micro door (shut off alarm) 3 = control phase relay	0÷3	0	3
S12	Input IN9	0 = Disabled 1 = Warning (visual alarm) 2 = Shut off alarm	0÷2	0	3
S13	Output RL6	0 = Operation as condensate drain 1 = Operation as machine status; RL6 is: - energized when the compressor is working - de-energized when the compressor is stopped for pressure set reached	0÷1	0	3
S14	Output RL10	0 = Disabled 1 = Operation as machine status	0÷1	0	3

S15	Output RL11	0 = Disabled 1 = Operation to implement	0÷1	0	3
S16	2nd press. set	NO = Disabled YES = Enabled	NO ÷ YES	NO	3
S17	C—h shutoff	NO = Disabled YES = Enabled	NO ÷ YES	NO	3

NOTE "S07": ONCE THIS PARAMETER HAS BEEN SET, ENTER SUB-MENU "MULTIUNIT" PAGE 24

NOTE:

In case of Master compressor failure (with ref. to the communication) the other compressors will work standing alone according own start/stop pressures set; it is advisable to set their local pressures to get a cascade operation and don't have any superimposition in operating set.

- **The parameter S16**, if enabled (YES), allow to set (into the menu Pressures) a second level of working pressures; it's useful in case of operation under clock timer where different working pressure set are needed during the day.

- The **parameter S17**, if enabled (YES), activates a safety alarm: 100 hours before the timer C—h elapses the compressor stops (make reference to the section "ALARM MESSAGES WITH COMPRESSOR SHUT OFF AFTER 30 SECONDS UNLOAD RUN").

* Manual: in case of black out, the compressor doesn't restart automatically and the LCD visualizes the message **POWER OFF**.

Automatic: in case of black out, once the power comes again, the controller restart automatically with a delay time set on Wt5; during Wt5 the LCD visualizes the message **WAIT**.

The modification of the default data is recorded into the alarms buffer and it's cancelled only by General Resetting.

** Reached the pressure set, the compressor will work load/unload without stop till the hour is elapsed.

*** YES = once the timer CAF is elapsed, the compressor stops and the LCD visualizes the message **Shut off for Safety**; this alarm is erased only into this menu and select Safety = YES.

Selecting NO the alarm change into **Change Air filter** (see chapter Maintenance).

NO = the operation shut off for SAFETY is disabled.

**** Set the balance hours only if the compressors have the same capacity

NOTE MASTER/SLAVE: In case of Master compressor failure (referred to the communication only) the compressors works as standing alone according their own start/stop setting: in this case it's advisable set such parameters locally to prevent working groups have overlapping but rather "cascade"

If parameter S07-2 is set as "0", the compressor number decides who will be Master always (failure unless). If a compressor is set as unit 1 and other different number (settable into menu COMPRESSOR DATA), the first one will be Master then.

COMPRESSOR DATA

Compressor data	
R01 Power	0KW
R02 Flow rate	0m3/min
R03 Compressor nr.	1
Serial number	
<div style="display: flex; justify-content: space-around;"> ↑ ↓ ENTER ESC </div>	

Into this menu is possible to set the data for Multiunit operation further to the serial number of the compressor.

Power, Flow rate and Compressor nr. are under **password level 2-3** while the parameter **Serial number** is on **level 3**.

Selecting **Serial number**, enter into another label allowing to enter/change the serial number of the compressor (max. 20 alphanumerical characters).

NOTE: the parameter **Compressor nr.** allows to set the number of the compressor for the serial communication.

PRESSURES

Menu pertinent to all pressure parameters.

Enter into the menu by F3 (ENTER) and select the parameters paying attention to the different password levels. It's possible to flow up/down all the parameter by F1 and F2 and enable the setting by F3 (ENTER); for each parameter it's possible to change the value by F1 and F2 and confirm by F3 (ENTER).

PRESSURES					
Parameter	Description	Meaning	Values	Default	Password
WP1	Top range	Working pressure transducer with top range from 15 (provided with the controller) to 60 bar	15 ÷ 60	15 bar	3
WP2	Max. alarm	High pressure alarm	$(WP3+0,5) \div (WP1-0,5)$	11 bar	2-3
WP3	P. Stop	Stop pressure	$(WP4+0,2) \div (WP2-0,2)$	10 bar	0-1-2-3
WP4	P. Start	Start pressure	$3 \div (WP3-0,2)$	8,5 bar	0-1-2-3
WP5	Start. P slave	Start pressure of slave compressor in Multiunit operation	$2,8 \div (WP4-0,2)$	8,3	2-3
WP6	Offset	Calibration of the pressure detected by the working pressure transducer	-2,0 ÷ +2,0	0 bar	2-3
SP1	Top range	Auxiliary pressure transducer with top range from 15 (provided with the controller) to 60 bar	15 ÷ 60	15 bar	3
SP2	Sep. filt. alarm	Separator filter clogged detected by the auxiliary pressure transducer (see notes on S08 into menu Compressor setup)	$(SP3+0,5) \div 2$	1,7 bar	3
SP3	Sep. filt. warn.	Separator filter clogged detected by the auxiliary pressure transducer (see notes on S08 into menu Compressor setup)	$0,4 \div (SP2-0,5)$	1,2 bar	3
SP4	Offset	Calibration of the pressure detected by the auxiliary pressure transducer	-2,0 ÷ +2,0	0 bar	3

NOTE TO THE SECOND LEVEL PRESSURES SET

Enabling (YES) the parameter "2nd press set" into the menu "Compressor set up", two more parameters are visualized and settable into the menu "Pressures": "Stop pressure" (\rightarrow P3) and "Start pressure" (\rightarrow P4) preceded by "WPS1 Working set" (pressures level S₁) and "WPS2 working set" (pressures level S₂).

The levels S₁ and S₂ can be operated during the normal operation into two different ways:

- manual: in the main visualization push F1 to enable the selection of the level, then F2 and the level on the LCD starts blinking to be changed; by F1 and F2 select the level needed and confirm by F3;
- under clock timer: see section "WEEKLY TIMER" for the setting instructions.

ATTENTION: in case the Master/Slave operation is enabled, the 2nd level of pressure is disabled automatically.

TEMPERATURES

Into this menu is possible to set all the temperature parameters.

Enter into the menu by F3 (ENTER) and select the parameters paying attention to the different password levels.

It's possible to flow up/down all the parameter by F1 and F2 and enable the setting by F3 (ENTER); for each parameter it's possible to change the value by F1 and F2 and confirm by F3 (ENTER).

TEMPERATURE					
Parameters	Description	Meaning	Values	Default	Password
WT1	High temp. alarm	Alarm high air end temperature	$(WT2+2^\circ) \div 125$	110 °C	3
WT2	Temp. warning	Warning high air end temperature	$(WT3+2^\circ) \div (WT1-2^\circ C)$	105 °C	3
WT3	Temp. start fan	Start fan set	$30 \div (WT2-2^\circ)$	70 °C	2-3
WT4	Δ Temp. stop fan	Stop fan set	$5 \div 15^\circ C$	10 °C	2-3
WT5	Low temperature	Alarm low air end temperature	-10 ÷ +15	0 °C	1-2-3
WT6	Offset	Calibration of the temperature detected by the air end temperature probe	-10 ÷ +10 °C	0 °C	3
STA1	High safety T.	High temperature alarm (absolute temperature) detected by the auxiliary probe (see notes on S09 into menu Compressor setup)	$(ST2+2^\circ) \div 125$	80 °C	3
STA2	Safety T. warn.	High temperature warning (absolute temperature) detected by the auxiliary probe (see notes on S09 into menu Compressor setup)	-10 ÷ (ST1-2°C)	70 °C	3
STT1	Cooler warning	Temperature drop informs cooler clogged (see notes on S09 into menu Compressor setup)	0 ÷ 60 °C	25 °C	3
STD1	High air temp.	High temperature alarm (absolute temperature) by the auxiliary probe (see notes on S09 into menu Compressor setup)	10 ÷ 20 °C	15 °C	3
ST3	Offset	Calibration of the temperature detected by the auxiliary temperature probe	-10 ÷ +10 °C	0 °C	3

WORKING TIMER

Into this menu it's possible to set the timer for the compressor operation.

TIMER				
Parameter	Description	Values	Default	Password
Wt1		2 ÷ 20 sec	5 sec	3
Wt2		10 ÷ 50 ms	20 ms	3
Wt3		1 ÷ 5 sec	2 sec	3
Wt4	Unload	1 ÷ 10 min	4 min	2-3
Wt5	Safety	10 ÷ 240 sec	60 sec	3
Wt6	On RL6	1 ÷ 10 sec	2 sec	1-2-3
Wt7	Off RL6	1 ÷ 10 min	3 min	1-2-3
Wt8	Sep. filt. alarm (delay in signalling alarm from separator filter)	10 ÷ 600 sec	30 sec	3
Wt9	On RL9	1 ÷ 5 sec	2 sec	1-2-3
Wt10	Off RL9	30 ÷ 300 sec	200 sec	1-2-3

MAINTENANCE

Into this menu there are three submenu selectable by F1 and F2; by the button F3 (ENTER) into the following submenu:

- 1 Maintenance timer (password level 1-2-3)
- 2 Maintenance list (password level 1-2-3)
- 3 Quick oil drain (password level 1-2-3)

Maintenance timer

Into this menu it's possible to set and reset all maintenance timer and pertinent residual time (COUNTER).

Maintenance timer		
	SET	COUNTER
CAF	2000h	1500h30m
COF	2000h	1500h30m
CSF	4000h	3500h30m
C—	1000h	500h30m
C-h	500h	0h30m
		ENTER
		ESC

Selecting the rows by F1 and F2 and confirming by F3 (ENTER) the maintenance SET and RESET is enabled as shown in the following example about the timer to change the air filter.

CAF = CHANGE AIR FILTER
 COF = CHANGE OIL FILTER
 CSF = CHANGE SEPARATOR FILTER
 C-- = CHANGE OIL
 C-h = CHECK COMPRESSOR
 BL = BEARING LUBRICATE

NOTE:

- "C--h" set to the max value (10.000) is disabled and the alarm will not be activated.
- "BL" set to the max value (29.999) is disabled and the alarm will not be activated.

The following example is valid for all the other maintenance timer into this menu.

Maintenance timer	
CAF	
Change air filter	
SET	2000h
COUNTER	1500h30m
SET	RESET
NEXT	ESC

The functions on the bottom of LCD are always joined to the buttons F1 – F2 – F3 – F4. Shift back to the previous visualization by function ESC.

NOTE: the modification of the set updates the counter value automatically.

Maintenance list

Into this submenu are recorded the last 20 reset of the maintenance timer, indicating both day and time of the reset .

Maintenance list	
00- 12:42 10/7/2007	RESET CAF 1500h30m
01- 12:40 10/7/2007	RESET CSF 1500h30m
02- 12:39 10/7/2007	RESET COF 1500h30m
↑ ↓ ESC	

By F1 and F2 flow up/down the records into this submenu.
Shift back to the previous visualization by the function ESC (F4).

Quick oil drain

Into this submenu it's possible to start the quick oil drain from the compressor; the machine has to be in OFF.

Quick oil drain	
P=3.5bar High pressure	
START ESC	

After the function "Quick oil drain has been selected" the LCD informs about the following:

- **High pressure:** the internal pressure is > 2.5 bar: discharge the pressure.
- **Ready:** the pressure is < 2.5 bar; by the button F3 (START) the load solenoid valve is excited and the oil drain starts.

During the drain the button F3 get function of STOP to stop the drain.

Once the drain is finished, shift back to the previous visualization by F4 (ESC).

WORKING HOURS

This menu (**Password level 1-2-3**) visualizes the counter of the working hours, load working hours, percentage of working hours and number of starts/hour.

Working hours	
Working hours	500h30m
Load hours	324h12m
Working %	65.1%
Starts/hour	3
Flow rate	xxx.xx m3/min
Average Flow rate	xxx.xx m3/min
ESC	

The working hours are the addition of ON hours of the line contactor (RL1).

The load hours are the addition of the ON hours of the load solenoid valve (RL4).

The working % is got by dividing the ON hours of RL4 to the ON hours of RL1 in the last 100 working hours of RL1: the percentage is updated every 5 minutes.

Starts/hours are the number of starts the motor has made in the previous hour.

The Flow rate (as instantaneous flow) and Average Flow rate (referred to the last 10 minutes) are related to the compressor in subject unless you're in Master/Slave operation range Logik 33-S: in this case represent the sum of both compressors (instantaneous and average flow).

ALARMS

This menu (**available without password**) visualizes the last 20 alarms detected.

The 21st alarm erases the first one and following.

Each alarm reports date and time of detection.

Alarms	
00- 12:42 10/7/2007	DATA LOST
01- 12:40 10/7/2007	AIR FILTER
02- 12:39 10/7/2007	PRESS. TRANSD. FAILURE
↑ ↓ ESC	

RESET

Into this menu there are the 4 following reset submenu:

- 1 **Working hours (password level 3)**
- 2 **Alarms (password level 2-3)**
- 3 **Maintenance list (password level 3)**
- 4 **General (password level 3)**

Select by F1 and F2 the submenu needed and confirm by F3 to execute the reset.

ATTENTION: reset is accepted only by pushing button F3 for 2 seconds.

During reset in progress, the LCD visualizes the message "Resetting" for the time necessary to finish it.

NOTE: the general reset is possible with compressor in OFF only.

Once the reset is finished, the LCD shift back to the previous visualization.

WEEKLY TIMER

This menu (**password level 1-2-3**) allows to activate and/or change automatic start/stop of the compressor through real time clock.

Weekly timer	
T01 Start/stop timer	YES
Timer on/off	
	

Enable the timer selecting "T01 Start/stop by timer" and confirm by F3 (ENTER); select "YES" by F1 and F2 and confirm by F3 again (CHANGE); confirming NO, Start/Stop by timer will be disabled. Select "Timer on/off" and confirm by F3 to enable the time programming.

For the time programming make reference to the following procedure.

Timer on/off				
	Mon	Tue	Wed	Thu
ON	00:00 S1	00:00 S1	00:00 S1	00:00 S1
OFF	00:00	00:00	00:00	00:00
ON	00:00 S1	00:00 S1	00:00 S1	00:00 S1
OFF	00:00	00:00	00:00	00:00
ON	00:00 S1	00:00 S1	00:00 S1	00:00 S1
OFF	00:00	00:00	00:00	00:00
				




By the arrow functions select the time and/or the pressure level to set; by the function "change" enable the setting and change the time by the arrow functions (left/right); confirm the new set value by "enter". Use "esc" to quit the setting of the weekly timer and shift back to the previous visualization.

NOTE: in case of OFF by timer, on the main visualization keep on pushing the start button more than 3 seconds it's possible to force the start of the compressor.

DRIVE

Into this menu (**password level 1-2-3**) it's possible to set the inverter.

Drive	
D1 Drive connect.	I/O
D2 OUT4 Drive	0-10V
D3 Model	0
D4 Stop. min. freq.	NO
D5 OUT3/4 Airend temp.	NO
Drive setup	
<div style="display: flex; justify-content: space-between;"> ← → ENTER ESC </div>	

The settable value of the parameters are reported below:

D1 Connection

- I/O (in case the connection to the inverter is made via I/O)
- Ser (in case the connection to the inverter is made via serial port)
- PID (in case the connection to the inverter is made via I/O and only one analogue output to determine the inverter frequency directly).

NOTE:

- **in case of connection and set I/O:** the parameters "D3", "D4" and "Drive setup" are not visualized.
- **in case of connection and set PID:** "D3" and "D5" are not in.

D2 Output OUT4 (value of the pressure detected by the controller)

- 0-10V
- 4-20mA

Make the selection according the type of input accepted by the drive.

D3 Model (selection of the model of inverter supported by the communication protocol)

0. Vatech MX Eco
1. Vacon NXL
2. KEB F5
3. Fuji Frenic 5000G11
4. Vaxon NXS
5. ABB ACS550
6. ABB ACS800
7. ABB ACS550 EXTENDED SETUP
8. ABB ACS800 EXTENDED SETUP
9. EMERSON SK
10. EMERSON SP

NOTE: make this selection absolutely before the Drive setup.

The last two items enable Drive Setup procedure where it's possible to set further data (see related Application)

D4 Stop min. freq.

If the connection comes through serial port, this parameter acts on the operation according the following procedure:

- NO: if the compressor is running load at minimum frequency, it keeps on running except for the cases reported at page 23 (How Logik 32-P controls the compressor);
- YES: if the compressor is running load at minimum frequency the timer set on Wt4 starts; if timer Wt4 is over and the compressor is still running at minimum frequency, the timer Wt4 starts again and the compressor shift to running unload; if the timer Wt4 elapses and the compressor is still unload running, the Logik 32-P will stop the compressor.

Confirming "Drive setup" enter into a submenu where it's possible to set the main parameters of the inverter.

The settable parameters are the followings:

DRIVE SETUP			
Parameter	Description	Values	Default
DS.1	Min. frequency	5 ÷ (D4.2 - 5Hz)	20 Hz
DS.2	Max. frequency	(D4.1 + 5Hz) ÷ 100Hz	50 Hz
DS.3	Accel. time	0.1 ÷ 300.0sec	5.0 sec
DS.4	Decel. time	0.1 ÷ 300.0sec	5.0 sec
DS.5	PID-prop. gain	0.00 ÷ 99.99	0.100
DS.6	PID-int. time	0.00 ÷ 99.99sec ⁻¹	1.00 sec ⁻¹

After the last parameter DS.6 comes "Start setup" that allows to start the setting of the inverter; it means to send the parameters set into "Drive setup" to the inverter.

Start setup	
Drive ready	
<div style="display: flex; justify-content: space-around;"> ON SETUP ESC </div>	

Confirming "Start setup" the LCD visualizes the following:

In the middle of the LCD is visualized the drive status.

When the download is in progress, below the drive status comes the progress status (in percentage) of the setup.

The possible status and pertinent functions of the buttons are described in the next charter.

D5 Air end temperature on OUT3 / OUT4

In case of serial connection, into menu Drive the following parameter is visualized:

"D5 - OUT3/4 air-end temp. **NO/YES**"

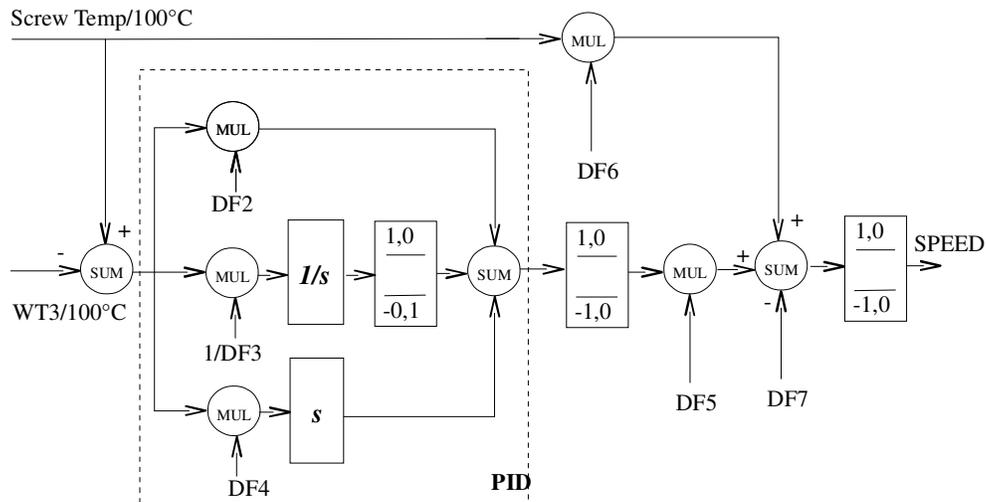
If this parameter is enabled (YES), on the analogue outputs out3 and out4 (normally proportionate to set-point pressure and work pressure) set are instead proportional values of the temperature to operate fan start and air end temperature.

This feature allow to connect a small size inverter to control the fan. Inverter integrates a PID the references and feedback are respectively OUT3 and OUT4. Start can come via RL5 and the failure relay on the inverter can be connected to input IN3 (thermal fan).

It is possible to make PID calculation for the regulation of the air end temperature by Logik 33S. Select YES on parameter D5 and you enter into a sub menu to edit parameter DF1: activation or deactivation of PID by Logik 33S.

Parameter	Description	Default	Values
DF1	Set Drive Speed	YES	YES/NO
DF2	PID prop. gain	5,00	0..99,99
DF3	PID int. time	15,00	0..99,99
DF4	PID der. time	1	0..99,99
DF5	PID out scaling	400	0..99,99
DF6	Adder multipl.	160	0..99,99
DF7	Adder offset	76	0..2,00

PID regulator make calculation reported in the drawing below (s is the Laplace operator, s means differentiation, 1/s means integration):



D6 Editing analog input

This parameter and next one are visible if the inverter communication is set via I/O or PID. It defines if the input 0-10V on the drive board is connected to a signal and type of signal: values allowed are 0 (not used) / Hz (frequency) / RPM (speed) / A (current) / P (power)

D7 Range

It is visible if D6 is not 0.

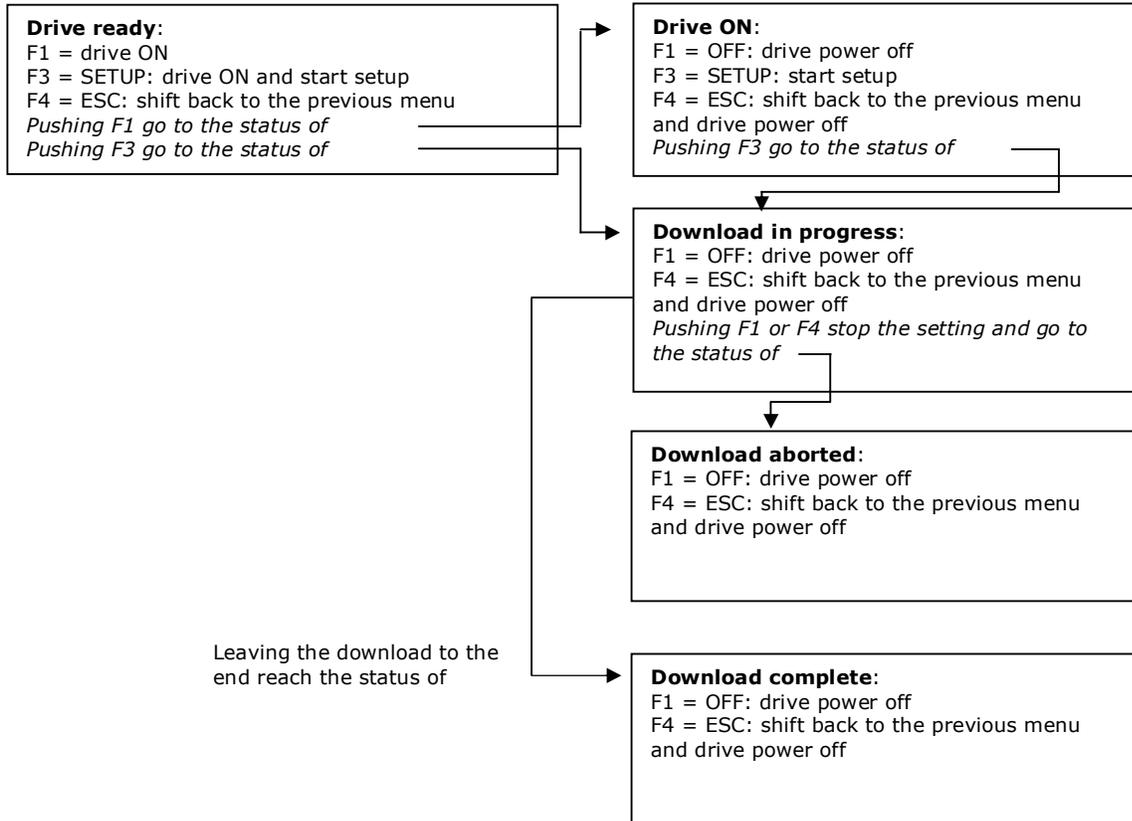
It defines the value of the measure reading by inverter in the input 0-10V related to the top range of 10V.

NOTE ON PID CONNECTION: into submenu DRIVE SETUP the parameters "DS.3" and "DS.4" are not visualized. "DS.1" and "DS.2" are just indication used on the main visualization and correspond to min. and max tension set on analogue outputs out3 and out4.

You can use either OUT3 or OUT4 and in this case it's possible to set tension or current output. In particular: 0V - (4mA) correspond to the min. frequency while 10V - (20mA) correspond to max. frequency.

DRIVE SETUP

From Drive ready go to the setting through two different procedures:



NOTE: ACCORDING THE INVERTER USED, ASK FOR THE DOCUMENTATION ON THE PROPER APPLICATION FOR THE COMMUNICATION.

ALARM MESSAGES WITH IMMEDIATE COMPRESSOR SHUT OFF

Code	MESSAGE	CAUSE
1	EMERGENCY STOP	Emergency stop button open (IN 1)
2	THERMAL MOTOR	Thermal motor open (IN 2)
3	THERMAL FAN	Thermal fan open (IN 3)
4	DOOR OPEN	IN 5 open if it is configured as Micro door (S11=2)
5	MISSING PHASE	One or more phase is missed over 400 m.s.
6	WRONG PHASE	Phase reversed (check every motor starting)
7	SEC. PRESS. SWITCH	All the inputs IN1 ÷ IN6 open
8	HIGH PRESSURE	Working pressure over set WP2
9	TEMP. PROBE FAILURE	Air end temperature probe failure
10	HIGH TEMPERATURE	Air end temperature over set WT1
11	LOW TEMPERATURE	Air end temperature lower than set WT5
12	POWER OFF	Signalled on power up in case of power off while compressor was on and selected as manual restart
13	RS 232 NR.1 FAILURE	Communication to the control panel interrupted
14	LOW VOLTAGE	Power supply to the controller lower than 9V(-40%); reset accepted only when power over 10,5V (-30%)
15	RS 232 no. 1 FAILURE	5 seconds from the activation of MODBUS control monitoring without any packet back
66	HIGH SAFETY TEMP	Temperature over set STA1 – compressor shut off if the auxiliary probe is set as absolute temperature (S09=1)

ALARM MESSAGES WITH COMPRESSOR SHUT OFF AFTER 30 SECONDS UNLOAD RUN

Code	MESSAGE	CAUSE
20*	SEPARATOR FILTER	Differential pressure switch separator filter open (IN6)
21	MOTOR TEMPERATURE	Input PTC open
22	PRESS. TRANSD. FAILURE	Working pressure transducer failure
24	SAFETY	Timer CAF elapsed, alarm detected only if the parameter Safety is set YES
26**	Shutoff for compressor check	Timer C—h elapsed
80	DRIVE SHUT OFF	Drive shut off (shut off from serial ommunication and/or IN10 open): follow the drive alarm string in case of serial connection
81	DRIVE ALARM	Non shut off alarm on drive (from serial connection), follow the drive alarm string if available
83	DRIVE COMMUNICATION	No communicatio to the drive, check out wiring and serial setting on the drive

* The alarm "**SEPARATOR FILTER**" is generated only if the compressor is loading, the air end temperature is higher than 45 °C. and the timer Wt8 is elapsed.

** The alarm "**SHUTOFF FOR COMPRESSOR CHECK**" is detected the first time 100 before the timer "C—h" elapses: after the first reset, the alarm will be visualized again every 50 minutes (just visual alarm) for the next 100 working hours to remind the maintenance; when the last 100 hours are over (the timer C—h is elapsed), the compressor shut off and it's possible to restart only by reset into the maintenance timer.

WARNINGS (VISUAL ALARMS)

Code	MESSAGE	CAUSE
30	DATA LOST	Default data are loaded on the controller (on power up check the data checksum in EEPROM)
31	AIR FILTER	IN5 closed if it is configured as air filter pressure switch (S11=1)
32	TEMPERATURE WARNING	Temperature over set WT2; automatic reset when temperature is below WT2 -5°C
33	LOW VOLTAGE WARNING	Power supply to the controller below 10,5V (-30%); automatic reset when the power rise over 12V (-20%)
34	HIGH VOLTAGE	Power supply to the controller over 20.3V(+35%); automatic reset when the power goes down below 19.3V(+30%)
35	RS 232 NR.2 FAILURE	In case of Multiunit operation enabled the communication is interrupted and the compressors works by own pressures set standing alone
36	MAX. STARTS/HOUR	Inform the compressor will never stop till the expiration of 1 hour time from the first start
37	MULTIUNIT FAILURE	No communication or Master failure: each slave works staing alone
65	CLOCK FAILURE	Start and stop of the compressor have to be operated manually; the Master/Slave operation timer are controlled by the micro controller
67	SAFETY T. WARNING	Temperature over set STA2 if the auxiliary probe is configured as absolute temperature (S09=1); automatic reset reset when the temperature goes down the set value
69	DELTA TEMP	Temperature over set STT1 – reset with temperature below set STT1- 5 °C if the auxiliary probe is set as differential temperature (S09=2)
70	HIGH DRYER TEMP.	Temperature over set STD1 – reset with temperature below set STD1- 5 °C if the auxiliary probe is configured as dryer (S09=3)
72	SEP. FILTER WARNING	Delta P. over set SP3; automatic reset with delta P < SP3- 0,2 bar and auxiliary transducer enabled (S08=1);
74	DLS/SUMMER TIME	In case of time setting on power up or time change (at 2:00 am in the morning on the last Sunday of March and October)
79	AUX. T. PROBE FAILURE	Auxiliary temperature probe failure if it is configured as differential temperature or dryer (S09=2) or (S09=3)

MESSAGES VISUALIZED INTO ALARM LIST ONLY

Code	MESSAGGE	CAUSE
40	MANUAL RESTART	Restart set from automatic into manual
41	AUTO RESTART	Restart set from manual into automatic

MAINTENANCE MESSAGES

Code	MESSAGE	CAUSE
50	CHANGE AIR FILTER	Timer of parameter CAF into menu MAINTENANCE elapsed
51	CHANGE OIL FILTER	Timer of parameter COF into menu MAINTENANCE elapsed
52	CHANGE SEP. FILTER	Timer of parameter CSF into menu MAINTENANCE elapsed
53	CHANGE OIL	Timer of parameter C-F into menu MAINTENANCE elapsed
54	CHECK COMPRESSOR	Timer of parameter C-h into menu MAINTENANCE elapsed
55	BEARING LUBRICATE	Timer of parameter BL into menu MAINTENANCE elapsed

NOTE: the maintenance alarms are visualized every 50 minutes from reset (reset button on the control panel) till the reset is operated into the related menu "MAINTENANCE".

HOW LOGIK 33-S CONTROLS THE COMPRESSOR

Safety time Wt5

Pushing the stop button **O**, the compressor stops according the following procedure:

- If the compressor is loading changes into unload for the time set on Wt5 and during this time restart is accepted by the start button **I**; when timer Wt5 is elapsed, the compressor stop visualizing the message "**OFF**" on the LCD.
- If the compressor is unloading and the counting on timer Wt4 is higher than Wt5, when Wt4 is elapsed the compressor stops visualizing the message "**OFF**" on LCD; if the counting on Wt4 is lower than Wt5, timer Wt5 goes on counting to the end and the compressor will stop visualizing the message "**OFF**" on LCD only when Wt5 will be elapsed.
- If the compressor is "**IN SET**" status, it stops visualizing the message "**OFF**" on LCD.
- When the compressor stops and the message "**OFF**" is visualized on LCD, timer Wt5 start; during this time if the start button **I** is pushed, LCD visualizes the message "**WAIT**" and the compressor will not start till timer Wt5 elapses.

When the compressor stops due to an alarm, timer Wt5 starts; during this time if the alarm messages is reset and the start button **I** is pushed, the message "**OFF**" starts blinking and the compressor will not start till timer Wt5 elapses.

ATTENTION: on the contact of the relay operating the load solenoid valve is mounted an RC Filter (22 nF + 100 Ω) sized for power of 4.7W; in case a less power load solenoid valve is used, if the valve keeps on powered even if the contact of the relay is opened, the RC Filter must be eliminated by cutting the terminal of the resistor R51.



Compressor stopped by remote start/stop input (IN4)

When the input IN4 opens, the compressor stops according the same stop procedure by the button **O** with the following messages:

- "**REMOTE STOP**" blinking to inform pump is blowing down; during this time if IN4 closes, RL4 switch ON again and the timer reset itself;
- "**REMOTE STOP**" : RL1 – RL4 switch OFF – inverter OFF. The pump has finished to blow down.

Thermoregulation of the fan by RL5

- With air end temperature equal or higher than parameter WT3 = RL5 ON.
- With air end temperature lower than parameter (WT3 - WT4) = RL5 OFF.

Operation of the condensate drain solenoid valve - RL6

When the load solenoid valve (RL4) is powered, the condensate drain solenoid valve (RL6) is activated and deactivated according the times set on the parameters Wt6 and Wt7; when the load solenoid valve is deactivated, the timer Wt6 and/or Wt7 stop and will start again on the next activation of RL4.

Operation with auxiliary pressure transducer enabled (differential pressure)

- Every time the compressor starts, the controller checks the absolute value of the internal pressure (**auxiliary pressure transducer placed before the separator element**) that must be lower than 1.5 bar; if the pressure is higher the LCD visualizes the message "**WAIT INT. PRESSURE x.x**" (where x.x is the value detected). When the pressure goes down 1.5 bar, the compressor starts.
- The delta P. (difference between internal pressure and working pressure) detected is compared to SP3 set into menu 5 "Pressures"; if the value detected is higher than the set on SP3, the warning message "**SEP. FILTER WARNING**" is visualized on the LCD, if it is higher than the set on SP2, the controller generates the shut off alarm "**SEP. FILTER ALARM**".
- The shut off alarm "**SEP. FILTER ALARM**" is generated only if the compressor is loading, the air end temperature is higher than 45 °C. and the timer Wt8 is elapsed.

Operation with auxiliary temperature probe enabled

Into menu "Compressor setup", on parameter S09 select the operation of the auxiliary temperature probe you need:

- 1) If 1 (absolute temperature) has been selected, the value detected by the probe is compared to the value set on STA2 (menu 6): if the value detected is higher than the set on STA2 the warning message "**SAFETY T. WARNING**" is visualized on the LCD; if the value detected is higher than the set on SAT1, the controller generates immediately the shut off alarm "**HIGH SAFETY TEMP.**".
- 2) If 2 (differential temperature) has been selected, the value detected by the probe is the difference between the air end temperature and the one detected by the auxiliary temperature probe placed at the outlet of the cooler; the differential temperature is compared to the value set on STT1 (menu 6): if the value detected is higher than the set on STT1 the warning message "**DELTA TEMP.**" is visualized on the LCD and it reset automatically when the temperature goes down STT1 - 5°C.
- 3) If 3 (dryer temperature) has been selected, the value detected by the probe is compared to the set on STD1 (menu 6): if the value detected is higher than the set on STD1, the warning message "**HIGH DRYER TEMP.**" is visualized on the LCD.

Compressor starts and stops by timer (LCD visualizes the clock icon)

The LCD visualizes the message "**OFF BY TIMER – NEXT ON: XX:XX**" when the compressor is stopped by timer; the message "**NEXT ON: XX:XX**" informs the time of the next start.

NOTE: if the compressor has been stopped by timer it is possible to force a start keeping on pushed the start button for 3 seconds; pushing the OFF button again, the compressor comes back to operation managed by timer.

ATTENTION: when the compressor start/stop is controlled by timer, the remote start/stop (input IN4) is not operated.

NOTES ON MASTER/SLAVE OPERATION

Start/stop button enabled or disable both compressors, not only the compressor which the button is pushed.

PAY ATTENTION remote start/stop inputs on both compressors are closed to enable the couple: just opening one of the two inputs to switch OFF both compressors.

If a compressor is in shut off status doesn't influence the other will keep on working as standing alone.

Some parameters (peculiar to the Master/Slave operation) are transferred to the other in case of change in only one of the two units. In particular, this applies to the parameters:

- WP2..WP5, WPS and to the once related to second pressure level, just if enabled;
- Configuration flag related to start/stop via weekly timer, automatic restart and second pressure set enabled;
- Switching between first and second pressure set;
- Date and time;
- start/stop bands via weekly timer;

When you edit any of the above parameters, all setting described above is automatically copied to the other compressor.

At the time of shutdown (Power off) of the compressors, the status of each of the two is stored; the restart this state is recovered and initial roles in the pair are the same that were present in shutdown.

In the main visualization the activation of Master/Slave operation is indicated by the icon "MS" in the upper right corner. In particular, the current operation of the compressor is shown in reverse: if the unit is Master, letter M will be visualized in white on a black background.

The weekly timer determining the operation are those of Master unit.

Slave unit operates and visualizes the pressure detected by Master compressor.

For the determination of Master and Slave roles, the setting of the nominal flow rate of the compressor is very important (parameter R02, menu 4 COMPRESSOR DATA). In particular, in case of inverter compressor, is assumed that minimum flow (flow at minimum working frequency of the motor) is around half of nominal one.

Max. frequency is set in menu (menu Drive, in particular Drive setup) while the instantaneous frequency is detected by inverter via serial connection or determined by the controller as PID connection.

A compressor is Master if:

1. The serial connection is isolated (the alarm serial failure is visualized after 10 seconds).
2. In ON status, the partner units is in shut off status or simply OFF.
3. The switch time Master/Slave (S07-2) is set "0" (fixed as default) and one of the two compressors is ON (not shut off status) with compressor number as "1" and the other unit has a compressor number different from "1".
4. The hours difference is 25% more than the switch time master/slave (S07-2) even if the Master unit is loading and other in stand-by status.
5. The flow rate are different and:
 - a) both compressors are loading and the total flow is bigger than the flow of the current Master unit and lower than Slave unit (condition valid for 60 seconds time); after further 60 seconds time the compressor becomes Slave runs unload if such condition is going on.
 - b) If the average flow in last 10 minutes is lower than half flow of the current Master unit, lower than Slave flow but bigger than half flow of the Slave unit: the new Master unit has a suitable flow rate for the current air demand and a exuberant compressor respect the air demand is working.
6. The compressors are in same status (loading, unloading or set) and the difference in working hours is bigger than timer switch M/S.

Condition 1 is priority respect to condition 2, condition 2 respect to condition 3 and so on.

If no one condition above is detected, the previous Master (or Slave) status is kept.

NOTE:

1. In case of carrying out maintenance on one of the two compressors, before to stop it both units have to be set as standing alone operation and restore them as Master/Slave once maintenance is over.
2. In case of serial connection failure, both compressors becomes Master.
3. These notes are valid between two controllers of Logik 33-S range.
It's not possible to connect one Logik31-S controller to one Logik25S, Logik18 or Logik16-S unless Master/Slave operation version "compatibility" (parameter S07=1) is set; in this case if Logik31-S represents an inverter compressor, it will always work as Master unit.

MENU MULTIUNIT

Once you have selected and set "Multiunit" into menu "COMPRESSOR SETUP", you enter into sub menu Multiunit to set the parameters below.

Pay attention to the three different ways of operation you can set:

- **SMART MODE** (Intelligent): operating principle to obtain the best performance by optimizing the power consumption (saving). By setting the controller with the rating system will be arrested or put into service the compressors according to the actual air consumption; consumption detected by the fall or increased.
- **EQUIL MODE** (Balance hours): for installations consisting of compressors of the same power where you want to use the machines alternately and obtain even wear.
You can set a time after which the machine will rotate among them according to the FIFO principle (First In First Out: the compressor, which was first placed in service will be the first to be excluded).
- **PRIOR MODE** (Priority): for installation where the installer / end user decides the priority of the compressor (ie the sequence of action) by assigning them a number (lower number = higher priority).
This is a principle useful for those systems **disproportionately** evolved over time where an intelligent operation would risk the exclusion of certain machines because never felt enough or too big.

CODE	MESSAGGE	SETTING RANGE	DEFAULT
M01	Slave number	1 ÷ 4	1
R02	Air flow	100 ÷ 99990 L/min	1000
R03	Compressor #.	1 ÷ 5	1
M02	Air tank capacity	100 ÷ 99990 L	1000
M03	Compressor 1st start	0 ÷ 5	0
M04	Power on	1 ÷ 99 min	5
M05	Emergency unit	0 ÷ 5	0
M05.1	Start pressure	2.8 ÷ (P. Start-0.2)	8.3
M06	Delay start	0 ÷ 30 sec.	0
M07	Delay stop	0 ÷ 30 sec.	0
M08	Allign hours	NO / YES	NO
M09	Balance hours	0 ÷ 200	100
M10	Priority		
M10.1	Compr1	0..5	0
M10.2	Compr2	0..5	0
M10.3	Compr3	0..5	0
M10.4	Compr4	0..5	0
M10.5	Compr5	0..5	0

1. The parameters M* are visible and settable on Master unit only.
2. The parameters M03 ÷ M05.3 and M10 settable under password level 1, all the others level 2.
3. The parameter M02 is visible and settable on Smart operation only.
4. The parameters M05.1 is visible and settable once emergency unit is enabled only.
5. The parameters M08 and M09 are visible and settable on balance hours operation only.
6. The parameters M10* are visible and settable on Priority operation only

Notes to the parameters

M01 = Number to assign to every Slave unit

R02 = Nominal air flow of the compressor

R03 = Set a different number to every compressor: from 1 to Slave #+1.

For example, in case of one Master and two Slaves, the compressors have to be set with addresses 1,2,3.

We suggest to use 1 to the master even if not strictly necessary.

M02 = Air tank capacity

M03 = Select the compressor has to start as 1st one every Power till the system reaches the working pressure; in case you set "0", the Master will decide every time.

M04 = This timer starts every power on of Multiunit system; once it is over, if the compressor set as 1st one has not reached the working set between Start and Stop, a second compressor will start to support it.

The choice of the second compressor to start will be done according the operating principle selected.

M05 = Setting "0" all the compressors will be managed according the operating principle selected.

In case you set one of the compressors, it will be managed as emergency unit: it is not included in the standard operation and will be started when strictly necessary only, it means when the other compressors will not be able to support the air demand. Usually old compressors are used as emergency unit.

M05.1 = Set the start pressure of the emergency unit.

M06 = By this timer you can delay the start of the compressor even if the pressure is decreasing below the start pressure. This is useful to limit starts/hour and avoid useless starting due to eventual short air peak you can match by a simple start delayed..

M07 = By this timer you can delay to stop the compressor even the pressure is rising.

M08 = by this parameter you can balance and align the working hours of the compressors according two different ways:

YES: the system take into consideration of eventual working hours already operated by the compressors; in this case the compressors with less hours will have higher priority during the operation till they will reach the same value: from the moment they will have the same, the system will be operated according the balance hours set on the next parameter;

NO: the compressors are managed as they are starting from 0 working hours: all with the same value as new units.

M09 = selected BALANCE HOURS, this is the timer the compressors switch among them to balance the working hours.

M10 = priority of each compressor according PRIORITY operating principle: on the next parameters you set each single priority to every unit connected.

ATTENTION!

Into the menu "Maintenance" you have a new parameter related to the activation of maintenance function for one of the compressor connected:

Code	Message	Description	Setting range	Default
MA1	Maintenance	Exclude the compressor from Multiunit management	NO/YES	NO

This parameter is visible and settable if the Multiunit operation is activated only.

In case you set "YES", Master doesn't take it into consideration in the regular Multiunit management and the compressor will work according its own pressure set.

NOTES ON MULTIUNIT OPERATION

Max. number of units to compose a Multiunit system is 5, it means max. 4 Slave units.

Slave units can start/stop all Multiunit group through on/off buttons.

Slave units receive from Master unit working pressure and start/stop pressure

These setting are not changeable in the main visualization.

Into menu "PRESSURES" of each Slave unit are visible the on board setting and they will come into operation if:

- Master multiunit is failure (Master's pressure transducer failure)
- Master multiunit is not communicating to the Slave concerned ("MULTIUNIT FAULT")
- On the Slave unit concerned the function "Maintenance (MA1)" is enabled.

The alarm "MULTIUNIT FAULT" is detected if: Multiunit is enabled, Maintenance function is not enabled and Master is not communicating since 12 seconds (namely, Slave unit is not receiving communication from Master since 12 seconds) or Master shut off due to pressure transducer failure.

This is a warning (visual alarm only) and must be reset by the user if the fault cause has been solved only.

Timer in Master unit manages the operation under timer of all Multiunit system.

In case of Multiunit starts by timer, to deactivate ON manually, push stop button on Master unit for a time fo 3 seconds; if the compressors are stopped by timer, to force start manually, push the start button on Master unit for a time fo 3 seconds.

Multiunit system can manage the second pressure set if it is enabled on Master unit.

The Master's remote start/stop operate all Multiunit system while the Slaves' remote start/stop operate locally only just in case of "Maintenance", "MULTIUNIT FAULT" or Multiunit not communicating.

Multiunit status is stored if Master is on and all Slave units are on (unless shut off or maintenance status).

Similarly when Master is off all slave units switches off.

The last ON/OFF status is stored by slave units, so in case of communication to the Master interrupted they keep on that status (ON or OFF) working by own on board setting.

Master stores the balance hours in case of alignment set NO.

NOTES ON MAIN VISUALIZATION MULTIUNIT

On the main visualization of Slave unit the symbol **MU** is shown to inform the Multiunit operation is enabled. While the communication to the Master is interrupted, the symbol **MU** starts blinking.

In case of Master failure (example: pressure transducer failure) the symbol is barred.

In case of Slave set as "emergency compressor", the symbol  is visualized below **MU**.

If the compressor is set as "Maintenance", the symbol  is visualized below **MU**.

On the Master unit, below the symbol **MU** (visualization in reverse to indicate it is the Master) the display visualizes rectangles how many units connected to the Multiunit system (Master + Slaves).

Each rectangle contain the related compressor #, for example .

The compressor # is visualized in reverse if it is loading, blinking in reverse if it is running upload and blinking if safety timer is in progress.

All rectangle and number blink if the compressor shut off, is set as "maintenance" or the communication is interrupted.

On Master's LCD is visualized the function "MU" (function key F2) to visualize overview of managed units.

As follow example of visualization through function "MU":

MULTIUNIT	
C1  	3500 L/min
C2  	0 L/min
C3	NO COMM
ESC	

For each unit connected to Multiunit the LCD visualizes an overview row composed as follow:

"Compressor # - icon status - other eventual significant icons - current air flow"

or

"Compressor # - NO COMM" in case of communication to the Slave interrupted.

As below all possible icons status related to the units connected:

	Shut off alarm
	Compressor loading
 blinking	Compressor running unload or starting-up
	Pressure set or compressor ready to start
 lampeggiante	Safety timer in progress
	Maintenance

As below other possible significant icons

	Identify compressor with drive technology
	Compressor selected ad emergency unit
	Compressor selected as first one to Power ON

WARRANTY TERMS

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

Temperature probes and pressure transducers are not included in the warranty terms.

The working 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 certification of the controller declines.

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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