INSTALLER MANUAL

CM60

Series

MODELS

CM61

CM62

CM63

INDEX

(This page has been intentionally left empty)

1 INTRODUCTION

CM60 is a fully programmable engine control panel controlled by a microcontroller.
It reads signals from analogue transducers, ON/OFF contacts, CANBUS and RS485 serial buses.

CM60 can perform the automatic engine start and stop, therefore can be used on gen-sets.

The monochromatic **display is readable** in every environmental condition, even in **full sunlight**.

The panel fits for on dashboard/switchboard mounting. The front of the electronic unit is protected against dust and water (IP65 protection grade). The back part is not water proof but it is designed to avoid water infiltration.

The electrical connections are mechanically locked.

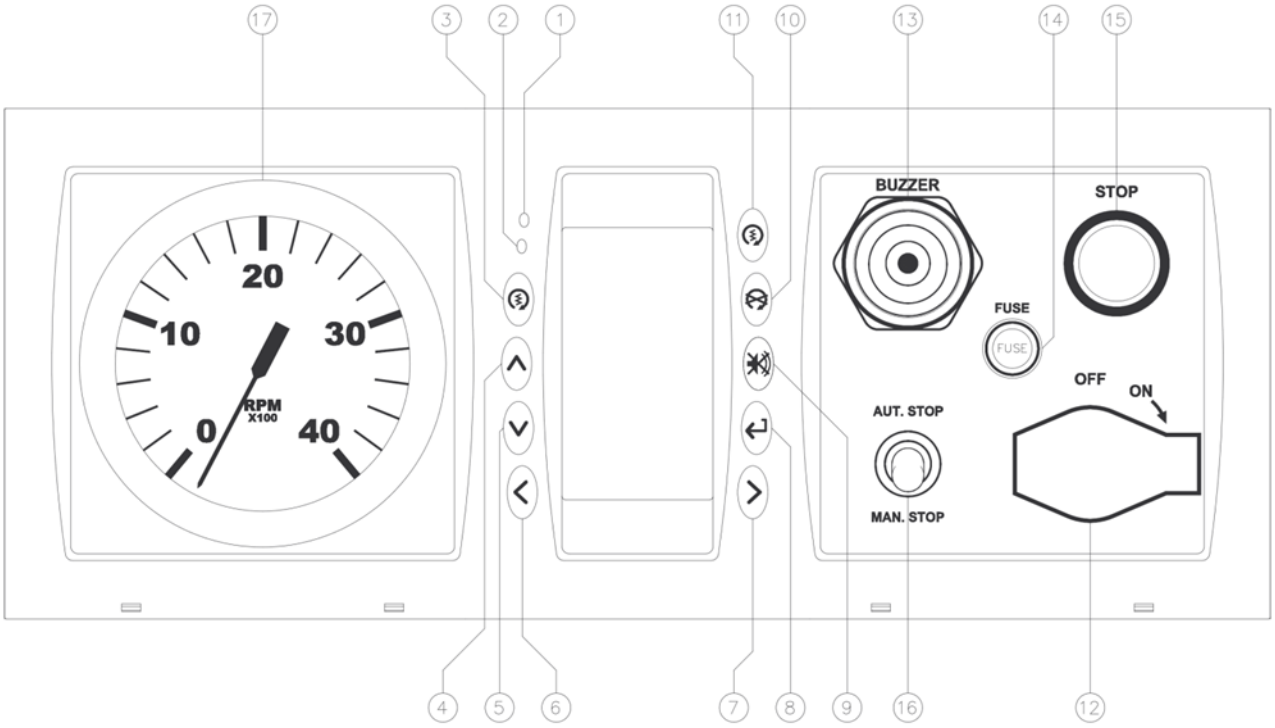
All functions performed by CM60 panel are intuitive.
The user interface can be customized, many languages are available.

CM60 records all the significant events, similar to a "black box". A software provided by Pine allows user to download recordings on computer via the RS485 serial bus (also the RS485 interface for the PC can be provided by Pine).

One or more repeaters (CM60 slaves) can be connected to a CM60 master via serial bus with few cables.

2 GENERAL FEATURES

- High contrast monochromatic LCD sun light readable
- 6+6 analogue readings displayed
- 8+8 icons/warning-lights for alarms/safeties/faults signallings
- 2 text rows dedicated to messages
- RPM are also visible on a tachometer (if provided)
- Canbus line for connection to the engine electronic control units
- 8 ON/OFF inputs for alarms/safeties with Continuity or Short Circuit check
- 1 input for RPM measurement (with continuity check on request)
- 5 inputs for analogue transducers
- 1 Input for remote engine stop
- 1 Input for remote engine ignition
- Internal temperature monitoring
- Output "System Ready"
- 5 output relays with selectable function (see chap. 9)
- Alarms acknowledgment / buzzer silencing button
- Alternator excitation (D+) (or AL7)
- Lamp test
- Manual adjustment of brightness and contrast
- Check of the stop solenoid line
- Maintenance / Oil change management, with countdown timer
- 2 user selectable countdown timers (engine maintenance / reminder)
- Events recording
- RS485 Serial connection for slave repeater/s, real time monitoring and to download the recordings
- Power supply: from 10 to 35 Vdc (in setup 12V or 24V has to be selected according with the battery in use)



LEGEND

1 Ambient light sensor (unused)
2 SYSTEM READY led
3 Start (Start) button – engine ignition (if enabled)
4 Up button (^) – increase
5 Down button (v) – decrease
6 Previous page button (<) – previous page.
7 Next page button (>) – next page
8 ENTER button (↵)
9 ACK button (ACK)
10 Stop button – timed engine stop
11 Engine Ignition Acknowledge button (Start) (at the same time of button 3)
12 Ignition key
13 Buzzer
14 Fuse
15 EXTERNAL STOP button
16 OVERRIDE switch
17 Tachometer

3 INSTALLATION

CM60 can be installed on a dashboard or on a switchboard.

For support drilling and panel size see **D1** pg.35
See **D2** pg.36 for panel and bezel mounting.

Connect the panel to the harness or to the extension cable.
It is recommended to test all the alarms, safeties and failures.

4 WARNING-LIGHTS / ICONS - READINGS - ALARMS - CONNECTION FAULTS

"SYSTEM READY" led indicates that panel is working properly. A fault to the panel, or during the SETUP, will turn off the "SYSTEM READY" led and it will deenergize the "SYSTEM READY RELAY" (open contact).

4.1 WARNING LIGHTS / ICONS

Up to 16 WARNING-LIGHTS / ICONS can be displayed.
A warning-light / icon can be associated to:

- input contacts (up to 8)
- serial bus messages
- CM60 internal functions

A WARNING-LIGHT / ICON activation can be delayed for avoiding false signallings due to unstable/noisy signals and it can be conditioned by "ENGINE RUNNING" (chap. 10) and/or by the activation of another WARNING-LIGHT / ICON.
The following behaviours of the WARNING-LIGHT / ICON can be set:

- the acknoledgement can be activated / deactivated
- the WARNING-LIGHT / ICON blinkng can be activated / deactivated
- the acoustic signalling (BUZZER) can be activated / deactivated

A WARNING-LIGHT / ICON parameters can be set according to **the ISA-1 alarm sequence**.

ISA-1 SEQUENCE	
MEMORY	ENABLED
BLINK	ENABLED
BUZZER	ENABLED

ON/OFF contacts and FAULT check:
The contact is active when connected to GND (negative of power supply) with exception of the ID6 that can be optionally configured to be active when connected to the positive of power supply.
The ID7 (CN3/3) input contact is used for the alternator excitation (D+) or can be an input contact.
A 4700 Ohm resistor has to be connected to check a fault to the sensor connection. See **D7** pg.41.
It is possible set each input as follows:

- **NO** NORMALLY OPEN
- **NO + FAULT CHECK** NORMALLY OPEN with fault check in case of line disconnection
- **NC** NORMALLY CLOSE
- **NC + FAULT CHECK** NORMALLY CLOSE with fault check in case of line short circuit

The connection fault is managed according to ISA-1 alarm sequence.

The fault to sensor connection is notified by alternating ICON and **FAIL** and by acoustic signalling.

On the signalling / alarm coming from serial bus messages the fault is available only if it is provided by engine electronic unit / sender.

Some warning-light/icon can be activated by internal functions of CM60:

- PREHEATING
- PRELUBRICATION
- MAINT. 1 (Maintenance 1 / Oil change)
- MAINT. 2 (Maintenance 2)
- MAINT. 3 (Maintenance 3)
- CANBUS MESSAGES
- CM60 FAULT
- ENGINE RUNNING
- cSG. (tripping the RPM threshold cSG)
- IGNITION CIRCUIT FAULT
- STOP STATE
- STOP FAILED

It is mandatory to set the warning-light/icon Rdy / FAIL for **cumulative CM60 FAULT** signalling.
For description see chap. 19, **MENU → SETUP → WARN. LIGHT**.

4.2 READINGS

It's possible to display up to 12 readings in 2 pages.
According to the panel settings, the readings depend on signals coming from the following sources:

- RPM Input (digital pulses)
- analogue inputs (up to 5)
- internal measures (CM60 supply Voltage, internal temperature)
- messages from the serial buses

4.3 ALARMS ON READINGS

CM60 handles up to **4 alarm thresholds** for each reading.
Alarm S1 UP is generated when the measure is higher than the S1 UP threshold value.
Alarm S2 UP is generated when the measure is higher than the S2 UP threshold value.
Alarm S1 DW is generated when the measure is lower than the S1 DOWN threshold value.
Alarm S2 DW is generated when the measure is lower than the S2 DOWN threshold value.
On S1 UP and S1 DOWN acoustic signalling can be activated.
The S2 UP and the S2 DOWN alarm threshold always activate the acoustic signaling and can be set to perform the automatic engine stop.
Alarm detection can be delayed from 0 to 240 seconds in order to avoid false signals due to unstable/noisy signals and can be conditioned by "ENGINE RUNNING" (chap. 10) and/or by the activation of an icon/warning-light.
The alarm on a reading is notified by the blinking of the reading and by an acoustic signalling (if enabled).
If the alarm has been acknowledged (by pressing ACK) the buzzer is silenced and:

- if the reading is still in alarm condition it will be shown in negative
- if the reading is no longer in alarm condition the reading will be shown as usual

This alarm sequence complies with ISA-1 if acoustic signalling is activated.

4.4 CONNECTIONS FAULT

A sensor connection fault can be notified by blinking:
- OC / FAULT in case of open circuit
- SC / FAULT in case of short circuit
- Reading value / FAULT in case of out of range reading in case of a 4-20 mA sensor

Faults are managed in according with ISA-1 sequence.
For the fault to RPM measure see chap.10.

Remember that an alarm / signaling is generated when delay time is elapsed.

5 SWITCHING ON THE PANEL

After powering, the panel:
- activates the “SYSTEM READY” led and the “SYSTEM READY OUTPUT RELAY”
- runs the display test sequence (about one second)
- emits a short acoustic signalling and visualize the logo (about two seconds)
- starts to monitor the engine

6 ENGINE IGNITION

6.1 IGNITION BY KEY

Depending on the panel electrical wiring, the contact “50” of the ignition key can:
- power (directly or indirectly) the starter motor
- power the starter motor by the “RL4” relay (that deenergize the starter motor automatically when the engine is running) to avoid damages to the starter motor. See D6 pg.40.

In case of preheating / prelubrication cycle see the chap.7.
Depending on the setting, the engine ignition signal can reset all the active alarms.

6.2 IGNITION BY BUTTON / REMOTE IGNITION

Depending on the electrical wiring and the setting, the CM60 can ignite the engine by pushing together buttons Start and Start (3 and 11 buttons at pg.2 drawing) or by activating the IN_AVV input (CN2/9). The engine ignition relay “RL4” power (directly or indirectly) the starter motor until the RPM exceed the value named SoA or at most for the IGNITION DURATION (see F00 ch 19.5). The release of one of the two buttons or the deactivation of the remote ignition signal before that RPM exceed the SoA, will interrupt the engine starting sequence.

7 PREHEATING / PRELUBRICATION CYCLES

If enabled (see **MENU → SETUP → OPTIONS → RELAYS**) the preheating and prelubrication cycles are managed.

7.1 PREHEATING

A relay has to be set as output for F03 PREHEATING function.
If a warning-light / icon is set as “PREHEATING” it will signal the preheating phase.

There are 3 way to perform the preheating:

- **PRR_STD_1**
- **PRR_STD_2:**
- **PRR_CYCLE:**

PRR_STD_1 and PRR_STD_2 preheating cycles depend on engine temperature and they start at switching on the panel (input IN_AVV has to be connected to ignition command CN2/9). The preheating relay is energized for the time of the preheating icon activation + 5 seconds. User can ignite the engine after the icon has turned off. The relay is energized also during engine ignition + 2 seconds (POST HEATING).

Select the most suitable timing to the engine features.

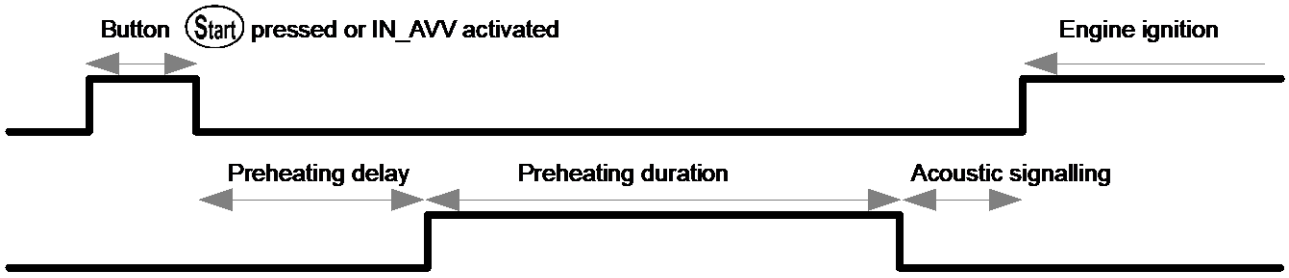
PRR_STD_1 - Preheating phase function executed when panel is switched on

WATER TEMP. SENSOR	**WATER TEMPERATURE** °C WAT	**PREHEATING ICON ACTIVATION**	**PREHEATING RELAY ACTIVATION**
INSTALLED	Negative Temperature	20 seconds	20 + 5 + ignition time + 2 seconds
	0 °C	15 seconds	15 + 5 + ignition time + 2 seconds
	20 °C	11 seconds	11 + 5 + ignition time + 2 seconds
	40 °C	7 seconds	7 + 5 + ignition time + 2 seconds
	> 60 °C	0 seconds	0 seconds
NOT INSTALLED		20 seconds	20 + 5 + ignition time + 2 seconds

PRR_STD_2 - Preheating function executed when panel is switched on

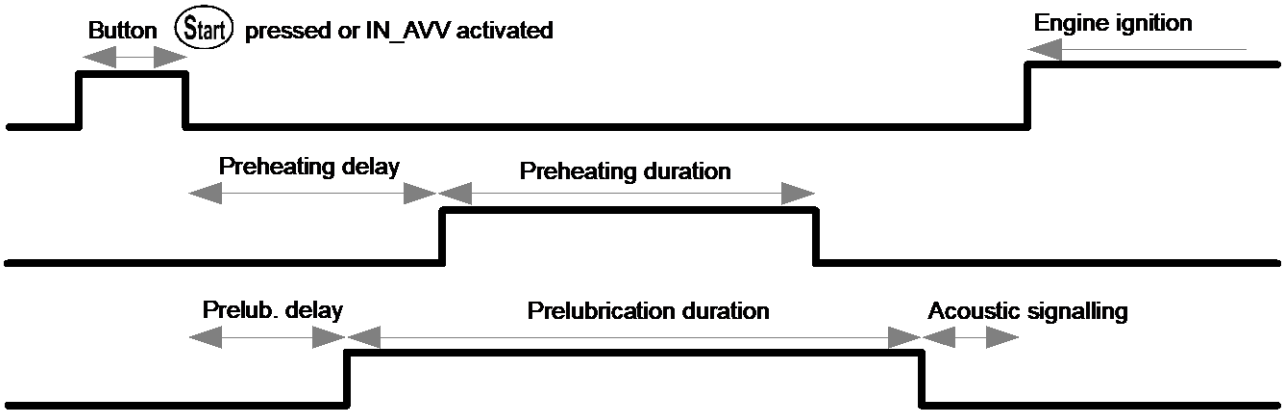
WATER TEMP. SENSOR	**WATER TEMPERATURE** °C WAT	**PREHEATING ICON ACTIVATION**	**PREHEATING RELAY ACTIVATION**
INSTALLED	Negative Temperature	40 seconds	40 + 5 + ignition time + 2 seconds
	0 °C	35 seconds	35 + 5 + ignition time + 2 seconds
	20 °C	27 seconds	27 + 5 + ignition time + 2 seconds
	40 °C	20 seconds	20 + 5 + ignition time + 2 seconds
	> 60 °C	0 seconds	0 seconds
NOT INSTALLED		40 seconds	40 + 5 + ignition time + 2 seconds

PRR_CYCLE preheating cycle is timed and it doesn't depend on engine temperature.
Preheating cycle starts when (Start) is pressed or if IN_AVV input is activated.
The icon is activated and the relay is energized after the "PREHEATING START DELAY" and for the "PREHEATING DURATION" time.
When this time is elapsed an acoustic signal (5 seconds) informs the user that engine can be ignited.



7.2 PRELUBRICATION (PRL_CYCLE)

Prelubrication cycle works in the same way of the TIMERED Preheating **PRR_CYCLE**. If the icon is set as PRELUBRICATION and a relay is set as output for F04 PRELUBRICATION (see chap.19.5), the icon is activated and the relay is energized during the prelubrication cycle.
The PRELUBRICATION cycle can be overlapped to the PREHEATING cycle by selecting the desired timing as in the following diagram:



If both preheating and prelubrication cycles are active, at the end of the longest cycle an acoustic signalling (5 seconds) informs the user that engine can be ignited.
Delays and cycles duration range are from 0 to 240 seconds.

Customized cycles can be added on request.

8 ENGINE STOP

Engine stop can be performed in two ways:

- acting directly on stop line by pushing STOP button or EXTERNAL STOP switch
- using the CM60 internal relay RL0, the CM60 manages the stop sequence and its duration (to avoid damages to the device that stops the engine)

Both ways can be used on the same panel.

8.1 STOP BY FUEL ELECTRO VALVE

Select MENU → SETUP → OPTIONS → STOP TYPE → CUT
Manual / Remote ENGINE STOP
Engine stop is performed by removing the power to the fuel electro valve. Depending on electrical wiring and settings, stop is performed:

- turning the ignition key in OFF position
- pushing the EXTERNAL STOP button (if installed) until the engine stops
- pushing the (only if enabled), STOP SEQUENCE starts
- activating the remote stop signal (if enabled, contact CN3/15) STOP SEQUENCE starts

STOP SEQUENCE
The panel performs the engine stop cycle (activating RL0, see chap. 19.5) that ends when the engine is stopped or after STOP DURATION time is elapsed.

8.2 STOP BY STOP SOLENOID

Select MENU → SETUP → OPTIONS → STOP TYPE → SUP

Manual / Remote ENGINE STOP
In this configuration engine **is not stopped** by turning the ignition key in OFF position.
Engine stop is performed by powering the stop solenoid. Depending on the electrical wiring and the setting, stop is performed:

- turning the ignition key in **stop position** (if available on the key)
- pushing EXTERNAL STOP button (if installed) until the engine stops
- pushing ⊛ (only if enabled), will start the STOP SEQUENCE (the panel will extend the stop cycle until the engine stops or for the programmed STOP DURATION)
- activating the remote stop signal (contact CN3/15) if enabled the STOP SEQUENCE starts (the panel will extend the stop cycle until the engine stops or for the programmed STOP DURATION)

STOP SEQUENCE
The panel performs the engine stop cycle (activating RL0, see chap. 19.5) that ends when the engine is stopped or after STOP DURATION time is elapsed.

8.3 AUTOMATIC ENGINE STOP (IF AVAILABLE)

Depending on the electrical wiring and the setting, the CM60 can perform the automatic engine stop cycle. See D6 pg.40.
The automatic stop cycle is a STOP SEQUENCE generated by one or more safeties to avoid damages to the engine. Stop cycle duration is limited by the programmed STOP DURATION.
If the STOP DURATION has elapsed and the engine is still running, the panel will record the STOP ATTEMPT FAILED.

If OVERRIDE switch is installed and it's in **MANUAL STOP** position**, the automatic stop is overridden**.
The Aut. Stop icon can be set to notify the OVERRIDE switch position. This icon has to be associated to the input ID5 (CN2/14).

By setting the icon "STOP ACTIVATED" Stop, associated to the input ID6 (CN2/6) the CM60 will notify:

- a stop sequence in progress
- a fault to stop connection / wiring / logic by alternating Stop OFF and FAIL

By selecting **MENU → STATISTICS** on the 4th row the cause of the last stop is displayed. The cause is one of the following:

- REM - STOP REQUIRED BY REMOTE INPUT (i.e. the EXTERNAL STOP button)
- SFT - STOP DUE TO A SAFETY (followed by the safety that caused the engine stop)
- PB - STOP BY PUSHING ⊛
- FLD - STOP ATTEMPT FAILED
- - - NOT RECOGNIZED (may be that engine stop by itself without external intervention)

When a stop cycle starts, if an ignition cycle is active it will be aborted (this mean that also the preheating / prelubrication cycles will be aborted).

9 OUTPUTS

CM60 has 5 general purpose output relays and the “SYSTEM READY OUTPUT RELAY”.
Each output relay can be selected as the output of one of the following functions:

- **F00** “Engine Ignition”
- **F01** “Engine Stop”
- **F02** “Siren”
- **F03** “Preheating”
- **F04** “Prelubrication”
- **F05** “Cumulative Alarms”
- **F06** “Cumulative Failures”
- **F07** “Cumulative Safeties”
- **F08** “Engine Running”
- **F09** “Cumulative CM60 faults”
- **F10** “RPM threshold cSG”
- **F11** “Pulse”

SYSTEM READY OUTPUT RELAY notifies to a remote-control system that CM60 is powered and works correctly. This output is not active if CM60 is not powered or damaged or during panel setup.

F00 “Engine ignition” function performs an automatic ignition (see chap. 6). **RL4 relay have to be set as output relay for this function**.

F01 “Engine Stop” function performs the STOP SEQUENCE (see chap. 8). **RL0 relay have to be set as output relay for this function**.

F02 “Siren” function replicates the buzzer signal on the selected output relay.

F03 “Preheating” function performs the preheating cycle (an external power relay for supplying the glow plugs is required, see ch 7).

F04 “Prelubrication” function performs the prelubrication cycle (an external power relay for supplying the prelubrication pump is required, see chap.7).

F05 “Cumulative Alarms” function notifies that one or more alarms occur.

F06 “Cumulative Failures” function notifies that one or more failures to sensors connections occur.

F07 “Cumulative Safeties” function notifies that one or more safeties occur.

F08 "Engine Running” function notifies that RPM is higher than a preset threshold (SoA) or RPM is lower than SoA for more than 20 seconds (see Engine Running Table chap. 10).

F09 “Cumulative CM60 faults” function notifies that one or more faults to the CM60 electronic unit occur.

F10 “RPM threshold cSG” function notifies that RPM value has exceeded the threshold “cSG”. This function can be used for external logic.

F11 “Pulse” function generate one pulse (400 ms) on an output relay every time engine goes from stopped to running.

To assign a function to an output relay see SETUP (ch 19.5).
The output relays contacts are protected by 1 Amp self-resetting fuses. For the connections see the D4 pg.38.

Some functions (F03, F04, F08, F09, F10) can be also used as internal source of the warning-lights / icons.

10 ENGINE RUNNING AND RPM FAULT CIRCUIT

Some alarms have to be active only when engine is running. The icon “ENGINE RUNNING” can be added so the user can see the state of the engine (running / not running).

The ENGINE IS RUNNING if:

- the RPM exceed the **SoA** value for a time longer than **T_mm.**
- the RPM are lower than SoA for more than 20 seconds.
- there are not RPM pulses detected and the engine oil pressure is high for more than 5 sec. as detected by the “LOW ENG. OIL P.” icon. In this case, it is mandatory set the “LOW ENG. OIL P.” icon for the low oil pressure in SETUP.

The following table show how the CM60 detects the ENGINE RUNNING state, also in case of

pressure sensor fault or not installed or not selected in SETUP.

ENGINE RUNNING TABLE

ENGINE REVOLUTION	ENGINE OIL PRESSURE (detected by low oil pressure switch / serial bus message)	RPM reading circuit FAULT	ENGINE RUNNING
RPM = 0	LOW	NO	NO
RPM = 0	HIGH (a fault will be notified after 5 Sec.)	YES (5 Sec. DELAY)	YES (5 Sec. DELAY)
RPM < SoA	LOW	YES (20 Sec. DELAY)	YES (20 Sec. DELAY)
RPM < SoA	HIGH	YES (20 Sec. DELAY)	YES (20 Sec. DELAY)
RPM > SoA	LOW (low engine oil pressure alarm)	NO	YES
RPM > SoA	HIGH	NO	YES
RPM = 0	FAULT / NOT INSTALLED	NO	NO
RPM < SoA	FAULT / NOT INSTALLED	YES (20 Sec. DELAY)	YES (20 Sec. DELAY)
RPM > SoA	FAULT / NOT INSTALLED	NO	YES (T_mm DELAY)

If **during engine ignition** CM60 does not receive the RPM pulses or the RPM value from CANBUS is zero, a fault to RPM reading system is notified.

11 MAINTENANCES / OIL CHANGE

CM60 has 3 countdown timers for maintenances.
An icon can be associated to each maintenance (see **WARNING LIGHTS/ICONS tab.** chap. 19.5).
Each counter starts from the selected “INTERVAL” (in hours) and countdown to 0. When the “H. TO MAINT.” is 0 the associated icon behaves as set in options. User can reload the counter for next maintenance.
While CM60 is switched ON the countdown can be always active or active only if engine is running.

MAINTENANCE 1 is totally programmable only in SETUP, user can only reload “H. TO MAINT.”
MAINTENANCE 2 and 3 are totally programmable by the user in **MENU** → **MAINT 2/3** (ch 18.3) and their “H. TO MAINT.” can be reloaded at any time.
It’s suggested to use MAINTEINANCE 1 for oil change.

12 REPEATER PANELS / MASTER-SLAVE

It is very easy to add repeater panels (SLAVES) to control / monitor the engine from other stations (engine room, bridge, flybridge).
The panel connected to the engine wiring / canbus has to be set as MASTER**,** the others as SLAVES.
The repeaters (SLAVES) need the power supply and the connection to the MASTER via the RS485 serial line (3 cables). See D5 pg.39.
Each repeater (SLAVE) will manage (similar to a MASTER) all the signals received from serial bus RS485.
For avoiding conflicts use only the outputs (out relays) of the MASTER panel.
Some function (i.e. ignition key, stop button…) can be added to a repeater panel.

13 RECORDING

CM60 records all the relevant events into a memory, similar to a black box. An authorized technician can download the recordings by RS485 using the PC software **CM60 BBD**.
The RS485 interface and the software **CM60 BBD** can be provided by Pine.
Once entered in recording download (**SETUP→REC.DL→ON**), start the program on PC. The software will guide the technician.
Selecting **OFF** in **SETUP → REC.DL downloading** process will be immediately interrupted.

14 MONITORING SYSTEM

A CM60 MASTER sends messages used by repeater(s)/SLAVE(s), monitoring system and REAL TIME events recorder through RS485. There are different types of messages:

- SLAVE dedicated messages, not usable for other purpose
- Messages containing readings and alarms values (for monitoring)
- Messages containing engine state info, similar to black box recording format.

An external or remote recorder of engine data (i.e. a Personal Computer) can be used to record engine state and relevant events in **real time**, while engine is running.
Engine parameters are sent, thought RS485, to the data recorder with 1 second cadence.

Messages with reading and alarms can be used to realize an engine monitoring application for PC.

15 TACHOMETER

A Tachometer can be connected to the CM60.
In **MENU → USER ADJ → TACH. ADJ** user has to adjust the FULL-SCALE value then the PULSE/RPM ratio until the tachometer reading matches the CM60 reading. It's suggested to operate at half of the FULL-SCALE value and to check the reading for different RPM values.
If panel includes the tachometer, adjustment is not necessary.

16 LAMP TEST

CM60 performs the LAMP TEST sequence, both in switching on the panel and pushing ⮜ in main page.

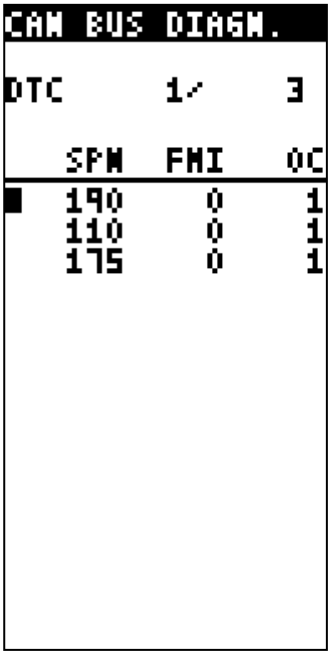
During LAMP TEST sequence CM60:

- runs the display test sequence (about one second)
- emits a short acoustic signalling and displays the logo (about two seconds)
- tachometer (if installed) reaches the full-scale

This sequence allows the user to verify that the display, the buzzer and the external tachometer work correctly.

At the end of the sequence, the CM60 goes back to main page.

17 CANBUS DIAGNOSIS (available on electronic engines)



If engine control unit sends ERROR MESSAGES (DM1), the CANBUS DIAGNOSIS page will be available after the main page 2/2. If there aren't any error messages, this page won't be visualized.

The first column contains the identificative part SPN, the second contains the error type FMI, the third OC the number of error occurrence.

Maximum error messages number visualized in a page is 15.
Using ⓐ and ⓥ buttons, it's possible to scroll error messages, in case there are more than 15, to a maximum number of 78.

18 MENU

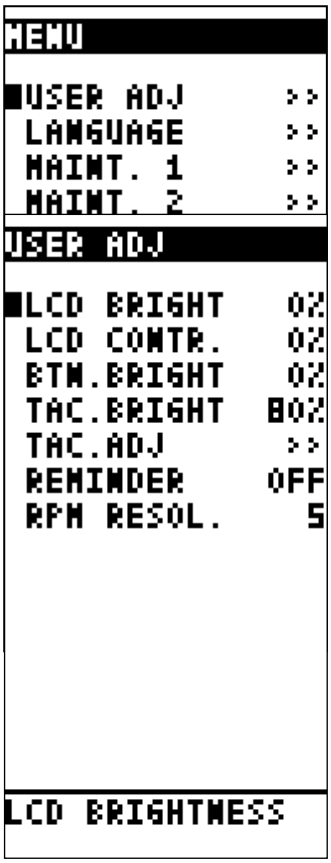
Press one or two times (it depends on the presence of CANBUS DIAGNOSIS page, see chap. 17) ⓡ button to access to MENU.

Navigation:

- Use ⓐ and ⓥ to move the cursor through page items or to modify parameter value
- Use ⓛ to go back to the previous MENU level (not valid in SETUP)
- Use ⓡ to access to a submenu page reported by ▸▸
- Press ↵ to select the parameter to modify, then press it again to confirm
- Press ACK to go to main page (reading page). Not valid when in SETUP

On the 2 rows on the bottom is descripted the item where cursor is set.
MENU page item description:

MENU ITEM	DESCRIPTION
USER ADJ	User settings and adjustments
LANGUAGE	Select language
MAINT. 1	Maintenance 1
MAINT. 2	Maintenance 2
MAINT. 3	Maintenance 3
STATISTICS	Statistics of important events
DIAGNOSTIC	Input signals and outputs
INFO	Product informations
SETUP CM60	Panel settings

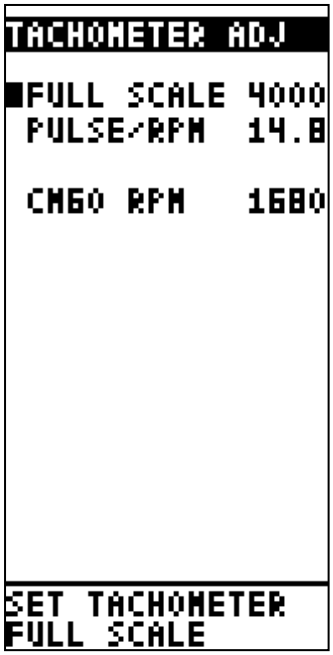


18.1 USER ADJUSTMENT

ITEM	DESCRIPTION
LCD BRIGHT	LCD brightness
LCD CONTR.	LCD contrast
BUTS BRIGHT	Buttons brightness
TACH. BRIGHT	Tachometer brightness
TACH. ADJ	Tachometer adjustment
REMINDER	Notice of panel forgotten ON
RPM RESOL.	RPM resolution or 5 or 10

The item “REMINDER” is used to avoid the user goes away from the panel when it’s switched on while the engine is not running.
Setting REMINDER → ON an intermittent acoustic signalling will be activated when the panel is switched on for more than 20 seconds while the engine is not running. This acoustic signalling can’t be acknowledge using (ACK) button, but it will stop only after an engine ignition or after the panel is switched off.

18.1.1 TACHOMETER ADJUSTMENT

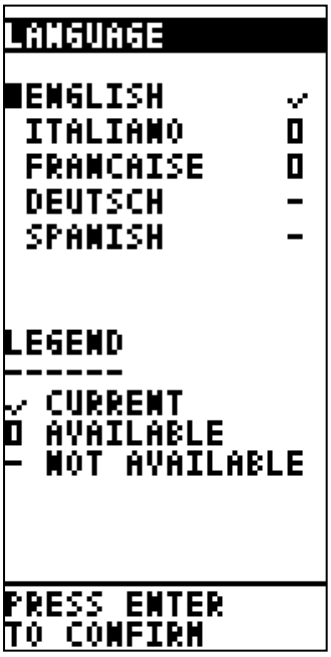


ITEM	DESRIPTION
FULL SCALE	Tachometer FULL SCALE
PULSE/RPM	Adjust tachometer reading
CM60 RPM	RPM read by CM60 to compare

CM60 supplies the digital pulses that can be used to drive a tachometer (included on CM63). The output is OUT_RPM.

User has to select the tachometer FULL SCALE and to change the PULSE/RPM value until the reading on the tachometer matches the one displayed on the CM60. It is suggested to operate at one half of the FULL SCALE.

18.2 LANGUAGE



LANGUAGE	DESCRIPTION
ENGLISH	English
ITALIANO	Italian
FRANCAISE	French
DEUTSCH	German
ESPANOL	Spanish

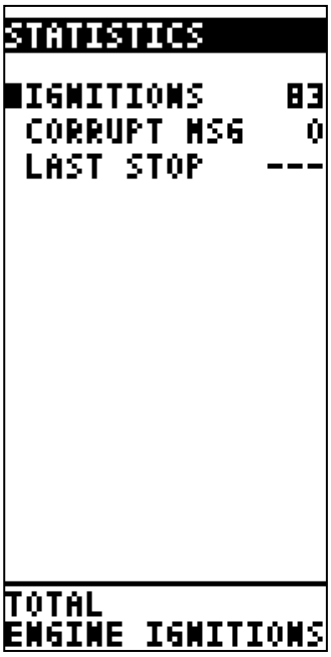
The character ✓ indicate the selected language among the available **D**. The not available languages **-** can be added only on request.

18.3 MAINTEINANCE 1/2/3

ITEM	DESRIPTION
ENABLED	Enabled YES/NO
ENG.RUNNING	Count only at engine running
H.TO MAINT	Remaining time to maintenance
INTERVAL	Total time between maintenance
RESTART	Restart counter for a new maintenance

MAINTENANCE 1 is totally programmable only in SETUP, user can only reload “H. TO MAINT.”
MAINTENANCE 2 and 3 are totally programmable by the user in MENU→ MAINT 2/3 and their TIME TO MAINT.” can be reload at any time.

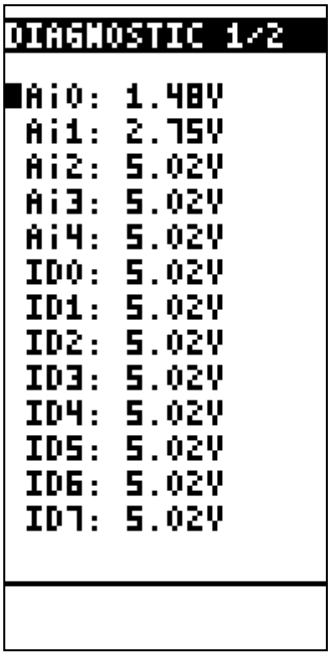
18.4 STATISTICS



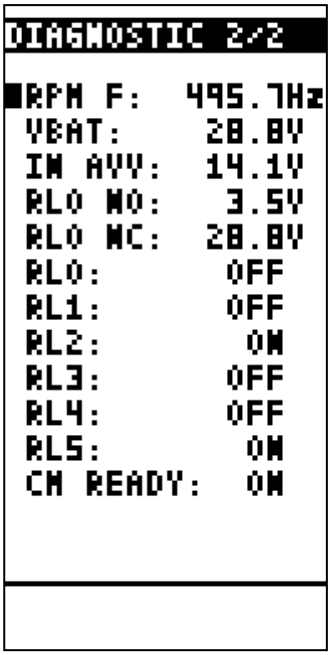
ITEM	DESCRIPTION
IGNITIONS	Engine ignition total number
CORRUPT MSG	Corrupt CANBUS messages total number
LAST STOP	Last engine stop cause

LAST STOP cause is identified by 3 char initials described explained in ch 8.3.
While cursor is set on LAST STOP, on the message rows will appear the last engine stop cause.

18.5 DIAGNOSTIC



ITEM	DIAGNOSTIC PAGE DESCRIPTION 1/2
Ai0	Ai0 voltage (reading)
Ai1	Ai1 voltage (reading)
Ai2	Ai2 voltage (reading)
Ai3	Ai3 voltage (reading)
Ai4	Ai4 voltage (reading)
ID0	ID0 voltage (warning light / icon)
ID1	ID1 voltage (warning light / icon)
ID2	ID2 voltage (warning light / icon)
ID3	ID3 voltage (warning light / icon)
ID4	ID4 voltage (warning light / icon)
ID5	ID5 voltage (warning light / icon)
ID6	ID6 voltage (warning light / icon)
ID7	ID7 voltage (warning light / icon)

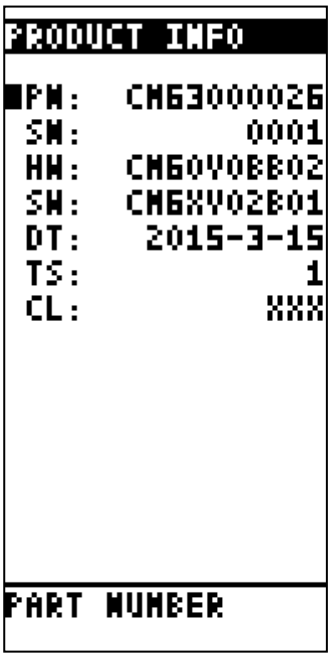


ITEM	DIAGNOSTIC PAGE DESCRIPTION 1/2
RPM F	RPM Input Frequency
VBAT	Supply voltage
RL4 NO	Voltage on RL4 NO contact
RL0 NO	Voltage on RL0 NO contact
RL0 NC	Voltage on RL0 NC contact
RL0	RL0 relay state (OFF or ON)
RL1	RL1 relay state (OFF or ON)
RL2	RL2 relay state (OFF or ON)
RL3	RL3 relay state (OFF or ON)
RL4	RL4 relay state (OFF or ON)
RL5	RL5 relay state (OFF or ON)
CM READY	CM READY relay state

There are 2 pages for diagnostic. They allow to read:

- the Voltage in mV on the analogues (AN0-7) and on the ON / OFF (ID0-7) inputs
- the frequency at the RPM input,
- the battery Voltage
- the Voltage at the ignition input (CN2/9), at the RL0 NO (CN3/16), RL0 NC (CN3/15)
- the state of the output relays (RL0-5).

18.6 INFO



ITEM	DESCRIPTION
PN	Part number
SN	Serial number
HW	Hardware version
SW	Software version
DT	Production date
TS	Tester code
CL	Customer

This page displays all the information's for panel identification.

18.7 SETUP

ITEM	DESCRIPTION
VIEW ONLY	Read-only SETUP
ENTER BY PW	Access by password
ONE TIME PW	Access using one-time password

User can visualize the SETUP (VIEW ONLY) while the engine is not running.
Only an authorized technician can modify SETUP parameters accessing with a valid password.
If available (this depend on the product) a secondary password can be used for calibrating the RAP (Pulse / Eng. Rev. Ratio) of the CM60 RPM counter. In this case select ENTER BY PW, enter the secondary password and change the RAP as described in chap. 19.3, **CALIBRATION**.
Under Engine Supplier Authorization, it is possible to ENTER in panel settings only ONE TIME by asking to Engine Supplier or to PINE Company a valid one time password, according with the instructions supplied by panel.

19 SETUP

SETUP allows to:
- Adapt the panel to the engine specifications
- Adjust the panel settings for a correct management of the inputs, of the outputs and for a proper detection of alarms, safeties and of signallings
- Set the panel to manage remote commands
- Calibrate the parameters for a correct transducers reading

To enter in SETUP: page MENU → SETUP → ENTER BY PW (or ONE TIME PW) enter the password by selecting each alphanumeric character with buttons ⓦ and ⓧ , then confirm with button ⓔ.

If the password is wrong the screen will display the wait time before insert the right password (3 sec. after first attemp, 6 sec. for the second, 10 sec. for the third).
After 3 attempts the panel will abort the attempt to enter in setup and will go back to the main page of engine monitoring/control.
If the password is right the main menu will appear.

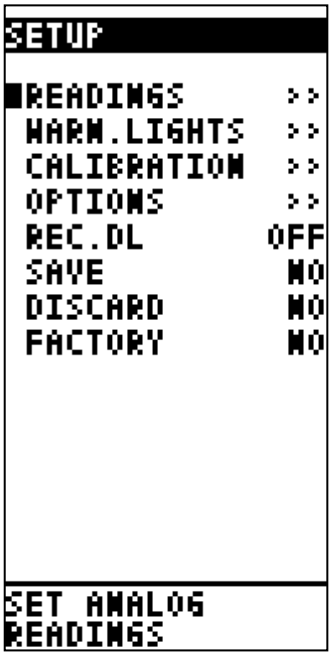
WARNING

*During view or change of the settings, the panel ignores readings and does not control the engine; for this reason, user **must view or change the settings only when engine is stopped (except for the RPM calibration).***

WARNING

*If during setup no button is pressed for more than 2 minutes the setup will be aborted automatically and **all changes will be lost.***

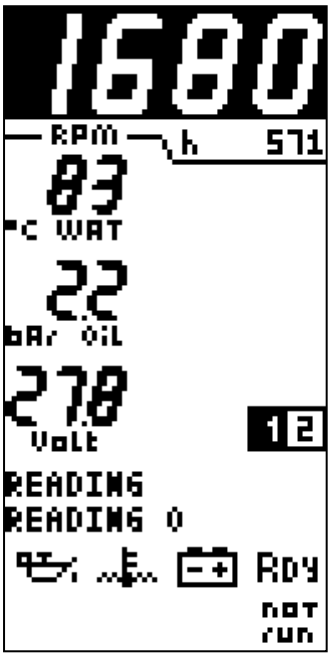
SETUP PAGE ITEM DESCRIPTION



ITEM	DESCRIPTION
READINGS	Set analog readings
WARN.LIGHTS	Set warning-lights/icons
CALIBRATION	Parameters calibration
OPTIONS	Set outputs and other options
REC.DL	Recordings download
SAVE	Save settings and exit
DISCARD	Discard settings and exit
FACTORY	Load factory settings

Last items are described first.
REC.DL → **ON** allows to download the recording sessions using the "CM60 BLACKBOX DOWNLOADER" program supplied by PINE. Remember to set **REC.DL** to **ON** before running the program on the PC.
SAVE→YES to quit SETUP **saving** modifications.
DISCARD→YES to quit SETUP **not saving** modifications.
FACTORY→YES to quit SETUP **loading factory settings (the current SETUP will be lost)**.

19.1 READING CONFIGURATION



The ⓐ / ⓥ buttons are used to select the parameters to modify, to scroll among parameters modification and, if necessary, to set numeric values.
↵ is used to confirm the choice and go to next step.

The page looks like the monitoring page and initially READING 0 is highlighted.
Select the reading to be modified and confirm. On the message rows the first parameter to be changed will appear. Select the parameter to modify and confirm, the next parameter will be automatically shown.

It's not possible to go back step by step to previously modified parameters, but it's possible to go back to last checkpoint by pressinghjf ACK. On next tables the checkpoints are pointed out by the symbol ♦.

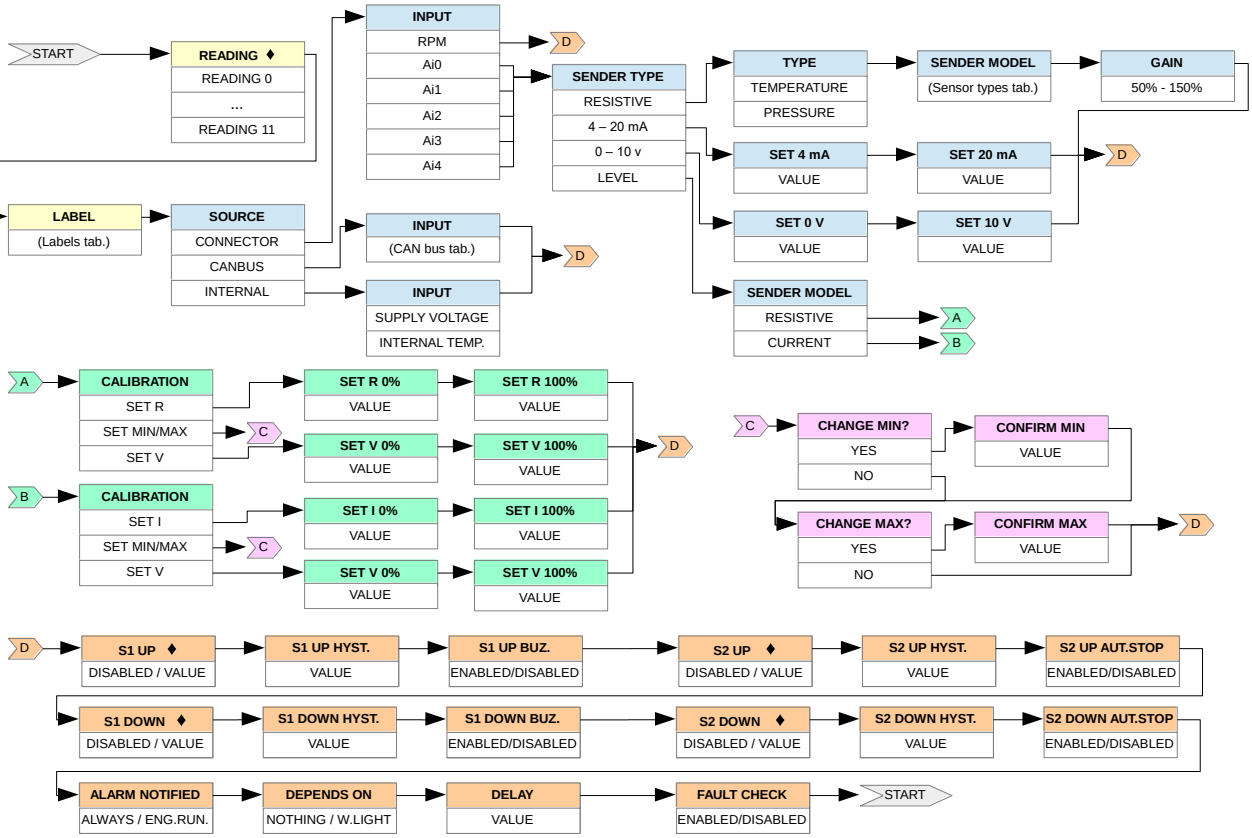
Parameters description

SETTING	DESCRIPTION
READING POSITIONG AND NAMING	
READING ♦	Select the reading to be configured
LABEL	Select the label associated to the reading
READING CONVERSION	
SOURCE	Select the source of the reading
INPUT	Select from which of the inputs to acquire the analog value
SENDER TYPE	Specify the type of the sender
TYPE	Specify the type of the sender
SENDER MODEL	Specify the model of the sender
GAIN	Set the per cent gain to be applied to the reading from the sender
SET 4 mA	Set the value of the reading when the senders outputs 4 mA
SET 20 mA	Set the value of the reading when the senders outputs 20 mA
SET 0 V	Set the value of the reading when the senders outputs 0 V
SET 10 V	Set the value of the reading when the senders outputs 10 V
FAULT CHECK	Enable / disable the fault check on the reading
LEVEL READING CALIBRATION	
CALIBRATION	Select the type of calibration to be performed
SET R 0%	Set the resistance value corresponding to 0%
SET R 100%	Set the resistance value corresponding to 100%
SET V 0%	Set the voltage value corresponding to 0%
SET V 100%	Set the voltage value corresponding to 100%
SET I 0%	Set the current value corresponding to 0%
SET I 100%	Set the current value corresponding to 100%
CHANGE MIN?	Select if the minimum level has to be changed
CONFIRM MIN	Select to confirm the new minimum level
CHANGE MAX?	Select if the maximum level has to be changed
CONFIRM MAX	Select to confirm the new maximum level
ALARM THRESHOLDS CONFIGURATION	
S1 UP ♦	Value of the 1st rising threshold

S1 UP HYST.	Hysteresis applied to S1 UP
S1 UP BUZ.	Enable / disable the buzzer when the reading trips S1 UP
S2 UP ♦	Value of the 2nd rising threshold
S2 UP HYST.	Hysteresis applied to S2 UP
S2 AUT.STOP	Enable / disable the automatic stop when the reading trips S2 UP
S1 DOWN ♦	Value of the 1st falling threshold
S1 DOWN HYST.	Hysteresis applied to S1 DOWN
S1 DOWN BUZ.	Enable / disable the buzzer when the reading trips S1 DOWN
S2 DOWN ♦	Value of the 2nd falling threshold
S2 DOWN HYST.	Hysteresis applied to S2 DOWN
S2 DOWN AUT.STOP	Enable / disable the automatic stop when the reading trips S2 DOWN
ALARM NOTIFIED	Set if the alarm is detected only when the engine is running or always
DEPENDS ON	Set if the alarm detection is conditioned by the activation of a warning-light
DELAY	Set the delay applied to tripping of the threshold
FAULT CHECK	Enable/disable the fault check on the reading

The following chart shows the path and the parameters for the readings setting. Colors refer to previous table.

READINGS CONFIGURATION PATH



Canbus tab.

LIST OF AVAILABLE CANBUS READINGS

Sensor types tab.

RPM
FUEL CONSUMPTION
OIL TEMP.
OIL PRESS.
WATER TEMP.
WATER PRESS.
WATER LEVEL
ENGINE LOAD
PEDAL POSITION
BOOST PRESS.
SUPPLY VOLT.
SUPPLY VOLT.(SW)
FUEL PRESS.

TEMPERATURE SENSORS
VDO 120
VDO 150
VEGLIA
JAEGER
CATERPILLAR
MURPHY
BAUDOUIN

PRESSURE SENSORS
VD0 2 bar
VD0 5 bar
VD0 10 bar
VD0 25 bar
CATERP. 10 bar
CATERP. 25 bar
VEGLIA 8 bar
MURPHY 2 bar
MURPHY 5 bar
MURPHY 7 bar
MURPHY 25 bar
JAEGER 10 bar
JAEGER 25 bar
BAUDOUIN 10 bar

Labels tab.

LABEL NAME	DESCRIPTION	LABEL
ENGINE SPEED	Engine speed	RPM
COOLANT TEMP. L.	Coolant temperature left	°C W L
COOLANT TEMP. R.	Coolant temperature right	°C W R
OIL TEMP. LEFT	Oil temperature left	°C OiL L
OIL TEMP. RIGHT	Oil temperature right	°C OiL R
EX.GAS TEMP.	Exhaust gas temperature	°C GAS
EX.GAS TEMP. L.	Exhaust gas temperature left	°C GAS L
EX.GAS TEMP. R.	Exhaust gas temperature right	°C GAS R
LUB. OIL TEMP.	Lubrication oil temperature	°C LubOil
COOLANT TEMP.	Coolant temperature	°C WAT
COOLANT TEMP.	Coolant temperature	°C En.W
COOLANT TEMP.	Coolant temperature	°C EW
OIL TEMP.	Oil temperature	°C oil
G.BOX OIL TEMP.	Gears box oil temperature	°C G.b.
G.BOX OIL TEMP.	Gears box oil temperature	°C bOx
OIL PRESSURE	Oil pressure	bAr oiL
OIL PRESSURE	Oil pressure	bAr L.oil
OIL PRESSURE	Oil pressure	bArLubO
OIL PRESSURE	Oil pressure	b.LubOil
G.BOX OIL PRESS.	Gear box oil pressure	bAr G.b.
BOOST PRESSURE	Boost pressure	bAr turb
BOOST PRESS. L.	Boost pressure left	bAr t.L.
BOOST PRESS. R.	Boost pressure right	bAr t.R.
AIR PRESSURE	Air pressure	bAr AiR
FUEL PRESSURE	Fuel pressure	bAr FuEL
COOLANT PRESS.	Coolant pressure	bAr F.W.
COOLANT PRESS.	Coolant pressure	bAr S W.
INTAKE PRESSURE	Intake pressure	bAr int.

LABEL NAME	DESCRIPTION	LABEL
MANIFOLD PRESS.	Manifold pressure	bAr in M
WATER LEVEL	Water level	%WAtER
FUEL LEVEL	Fuel level	% F. LEV.
FUEL LEVEL	Fuel level	% FuEL
FUEL LEVEL L.	Fuel level left	% FuEL L.
FUEL LEVEL R.	Fuel level right	% FuEL R
LEVEL	Level	% LEVEL
FUEL OIL LEVEL	Fuel oil level	%FuEL.oil
WATER LEVEL	Water level	%W.LEV.
TANK LEVEL	Tank level	%F.tAnK
ENGINE % TORQUE	Engine % torque	% torq.
TRIM LEVEL	Trim level	% TRIM
ACC. POSITION	Accelerator position	% PEDAL
RUDDER	Rudder position	RUDDER
ENGINE % LOAD	Engine % load	% LoAd
BATT.POTENTIAL	Battery potential	Volt
BATT.POTENTIAL	Battery potential	V. bAtt.
BATT.POTENTIAL	Battery potential	Volt
BATT.POTENTIAL	Battery potential	Volt b.
SPEED	Speed	SPEED
MPH	Speed	MPh
FUEL CONS. L/h	Fuel consumption L / h	L/hour
CHARGE CURRENT	Charge current	AMP
CURRENT	Current	AMPERE
PROP.SHAFT REV.	Propeller shaft revolutions	ShAFt
PROPELLER REV.	Propeller revolutions	PrOPELL
PROPELLER REV.	Propeller revolutions	∞RPM

Example:
On the engine, it's installed a 25 bar VDO sender for the gear box oil pressure.
User wants to set an alarm for the low gear box oil pressure at 8 bar, a safety to stop automatically the engine at very low gear box oil pressure at 4 bar and the sender connections fault. It is suitable to set a 1 bar hysteresis for both thresholds.

Enter in SETUP→READINGS, set the cursor position on the reading and press ENTER.
LABEL **G.BOX OIL PRESS.** → SOURCE **CONNECTOR** → INPUT **Ai2** → SENDER TYPE **RESISTIVE** → TYPE **PRESSURE** → SENDER MODEL **VDO 25 bar** → GAIN **100%** → S1 UP **DISABL.** → (press ENTER till…) → S2 UP **DISABLED** → (press ENTER till…) → S1 DOWN **8.0 / 25.0** → S1 DOWN HYST **1.0** → S1 DOWN BUZ. **ENABLED** → S2 DOWN **4.0 / 25.0** → S2 DOWN HYST. **1.0** → S2 DOWN AUT.STOP **ENABLED** → ALARM NOTIFIED **ONLY IF ENG. RUN.** → DEPENDS ON **- - -** → DELAY **5sec.** → FAULT CHECK **ENABLED**

Notes on level calibration
It's not easy to calibrate a level reading, so it's suggest to read the following instructions.

There are two ways to perform the calibration of a level reading.

1) first method is quicker and it's used when sender outputs values at 0% (min) and at 100% (MAX) are known.
In case of resistive sender (SET R), resistance values at 0% (min) and at 100% (MAX) must be set.
In case of current sender (SET I), current values at 0% (min) and at 100% (MAX) must be set.

Either with a resistive sender or with a current sender, it's possible to set min and MAX using the voltage values (SET V) read in diagnostic by engine control unit in correspondence to the resistance/current values at 0% (min) and at 100% (MAX).

2) the second method is used if sender characteristics are unknown, use this way both for resistive and current senders.
min: when the tank is empty (or at values expected as 0%)
Enter in SETUP…to SET MIN? → YES
Push two times ↵ confirming the 0% shown by the cursor
Quit SETUP saving changes.
MAX: fill up the tank to maximum level
Enter in SETUP…to SET MAX? → YES
Push two times ↵ confirming the 100% shown by the cursor
Quit SETUP saving changes.

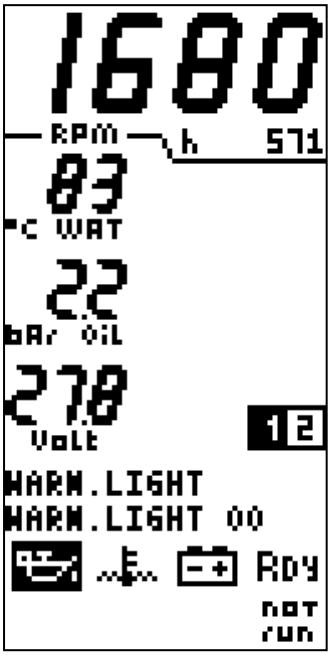
It's suggested to act directly on the level sender, moving it in minimum position first, then in maximum position, instead emptying ad filling the tank.

WARNING

RPM measure must always be on reading 0 (it may be repeated on reading 6 in the second page).
ENGINE LOW OIL PRESSURE WARNING-LIGHTS / ICON must be set as one of the 8 icon of

the first page (may be repeated in the second page).
This allows to properly detect the ENGINE RUNNING condition.

19.2 WARNING LIGTHS / ICONS CONFIGURATION



⊙ / ⊙ are used to select the parameters to modify, to scroll among parameters modification and, if necessary, to set numeric values.
⊙ is used to confirm the choice made and to go to the next step.

The page looks like the visualization page and the WARNING-LIGHT 00 will be highlighted.
Select the WARNING-LIGHT to modify and confirm.
On the two messages, rows will appear the first parameter to be changed. Scroll among the choices, and confirm. In some parameters, it is necessary to set a numeric value, confirm to go to next parameter.

It's not possible to go back step by step to previously modified parameters, but it's possible to go back to last checkpoint pressing ⊙.
On next tables checkpoints are pointed out by the symbol ♦.

WARNING LIGHT/ICON PARAMETERS tab.

PARAMETERS	DESCRIPTION

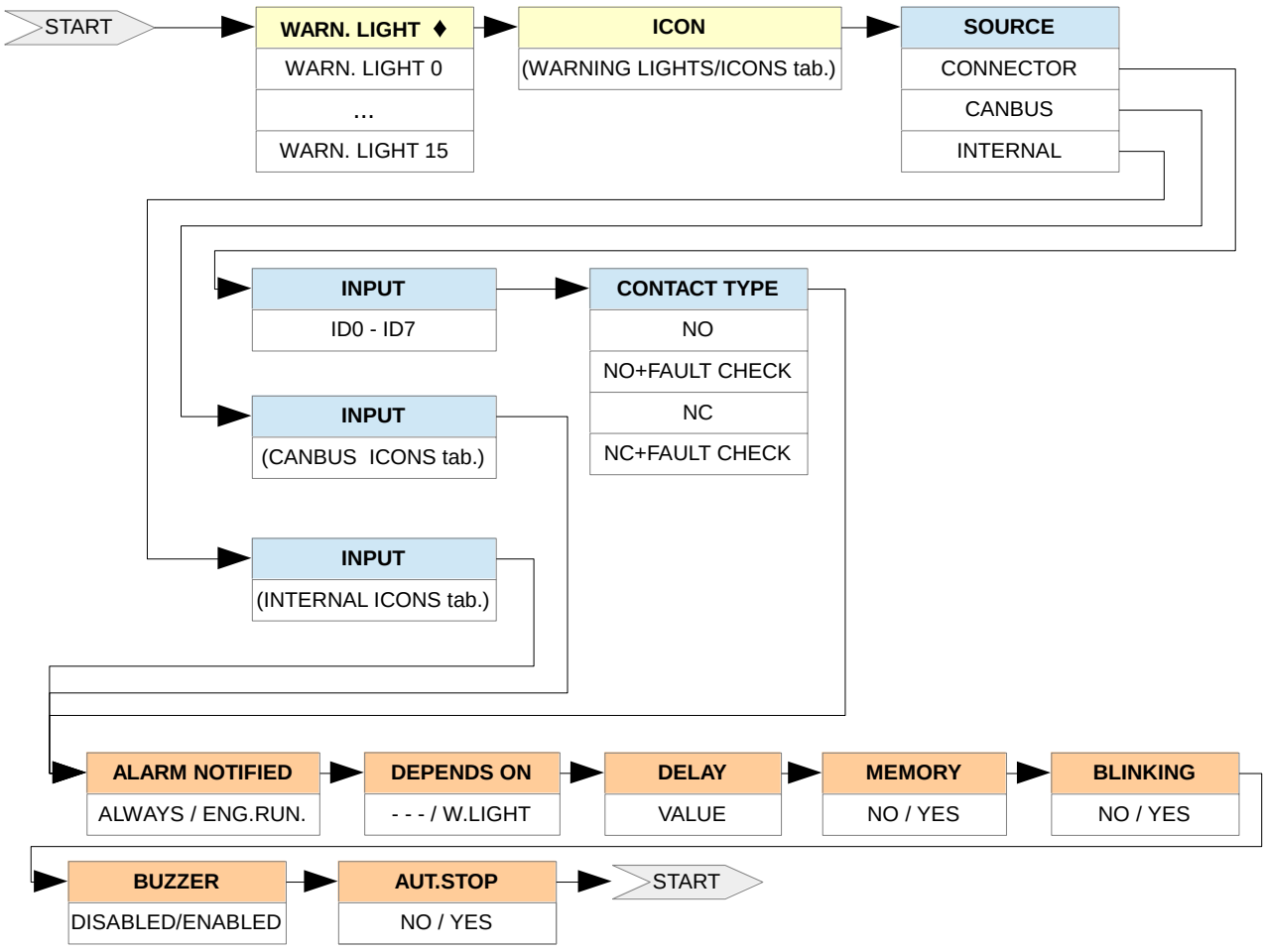
READING POSITIONG AND NAMING	
WARNING-LIGHT ♦	Select the alarm to be configured
ICON	Select the icon associated to the alarm

READING CONVERSION	
SOURCE	Select the source of the alarm
INPUT	Select from which of the inputs to acquire the value of the alarm
CONTACT TYPE	Specify the type of the contact of the alarm

ALARM CONFIGURATION	
ALARM NOTIFIED	Set if the alarm is detected only when the engine is running or always
DEPENDS ON	Set if the alarm detection is conditioned by the activation of another warning-light
DELAY	Set the delay applied to detection of the alarm condition
MEMORY	Enable / disable the memory of the alarm. If enabled the alarm must be acknowledged by the user.
BLINKING	Enable / disable the blinking of the alarm
BUZZER	Enable / disable the buzzer on alarm condition
AUT.STOP	Enable / disable automatic stop when the alarm is detected

The following chart shows the path and the parameters for the readings setting. Colors refer to previous table.

WARNING LIGTHS / ICONS CONFIGURATION PATH



CANBUS ICONS tab.

LIST OF CANBUS WARNIG LIGHTS / ICONS
OIL LOW PRESS.
WATER HIGH TEMP.
WATER LOW LEVEL
FUEL FILTER
INJECTORS FAULT
OVERSPEED
OIL HIGH TEMP.
WATER IN FUEL
EMERGENCY STOP
CHECK ENGINE
LOW VOLTAGE
HIGH VOLTAGE
BOOST HIGH PRES.

INTERNAL ICONS tab.

LIST OF INTERNAL WARNIG LIGHTS / ICONS
PREHEATING
PRELUBRICATION
MAINT. 1
MAINT. 2
MAINT. 3
CANBUS MESSAGGES
CM60 FAILURE
ENGINE RUNNING
EXCEEDING cSG
IGN.CIRC. FAULT
STOP STATE
STOP FAILED

In this table are listed all the available warning lights/icons.

WARNING LIGHTS/ICONS tab.

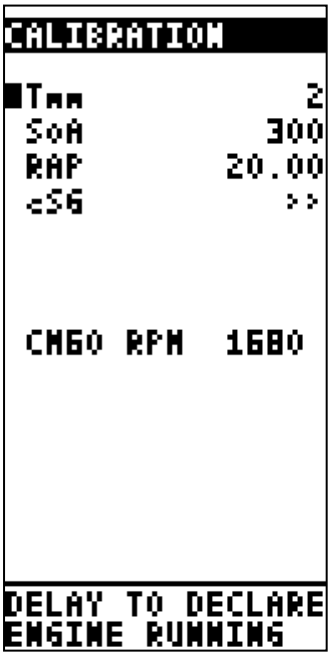
ICON NAME	DESCRIPTION	OFF	ON
HIGH TEMP.	High temperature		
HIGH COOLANT T.	High coolant temperature		
HIGH ENG. OIL T.	High engine oil temperature		
HIGH GEAR BOX T.	High gear box temperature		
HH TEMP.	Very (too) high temperature		
HH COOLANT T.	Very (too) high coolant temp.		
HH ENG. OIL T.	Very (too) high engine oil temp.		
HIGH GEAR OIL P.	High gear oil pressure		
HIGH ENG. OIL P.	High engine oil pressure		
LOW PRESSURE	Low pressure		
LOW ENG. OIL P.	Low engine oil pressure		
LOW G.BOX OIL P.	Low gear box oil pressure		
LL PRESSURE	Very (too) low pressure		
LL ENG. OIL P.	Very (too) low engine oil press.		
HIGH BOOST P.	High boost pressure		
LOW LEVEL	Low level		
LOW WATER LEVEL	Low water level		
LOW COOLANT LEV	Low coolant level		
LOW FUEL LEVEL	Low fuel level		
LOW STERN D. OIL	Low stern oil drive level		
FUEL FILTER	Fuel filter obstructed		
AIR FILTER	Air filter obstructed		
OIL FILTER	Oil filter obstructed		
BLOW-BY FILTER	Blow by filter obstructed		
WAT. IN FUEL FIL.	Water in fuel		
MAINTENANCE 1	Maintenance 1 – Oil change		

ICON NAME	DESCRIPTION	OFF	ON
CM60 FAILURE	Cumulative CM60 faults		
INJECTORS FAULT	Injectors fault		
EDC FAILURE	EDC failure		
STOP ACTIVATED	Stop activated		
IGN. CIRC. FAULT	Ignition circuit fault		
ALTERNATOR FAULT	Alternator circui fault		
LOW VOLTAGE	Low voltage		
HIGH VOLTAGE	High voltage		
EMERGENCY STOP	Emergency stop		
CHECK ENGINE	Check engine		
OVERSPEED	Overspeed		
RPM THRESHOLD	RPM threshold tripped		
NEUTRAL	Engine transmission in neutral		
FORWARD	Engine transmission in forward	(R)	(F)
ENGINE RUNNING	Engine running		
PREHEATING CYCLE	Preheating cycle in progress		
PRELUBR. CYCLE	Prelubrication cycle in progress		
INJECTORS LEAK	Injectors leak		
RIGHT INJ.LEAK	Right injectors leak		
LEFT INJ. LEAK	Left injectors leak		
WATER IN BILGE	Water in bilge		
BILGE PUMP	Bilge pump active		
STOP PRESSED	Stop button pressed		
STOP PRESSED	Stop button pressed		
STOP OVERRIDDEN	Stop overridden		
GENERIC ALARM	Generic alarm	ALL	ALL

MAINTENANCE 2	Maintenance 2		
MAINTENANCE 3	Maintenance 3		
CUM. CANBUS MSG	Cumulative CANBUS messages		

GENERIC ALARM 1	Generic alarm 1	AL1	
GENERIC ALARM 2	Generic alarm 2	AL2	
BELT BROKEN	Belt broken		

19.3 CALIBRATION



This sub menu allows to set some parameters for a proper engine management.

PARAMETER	DESCRIPTION	VALUE
Tmm	Time to declare engine running	0 - 240 S
SoA	Engine ignition RPM threshold	0 – 9999 RPM
RAP	Pulse / Eng. Rev. ratio	1 - 600
cSG	(see 17.3.1, next page)	
CM60 RPM	RPM value read by CM60	

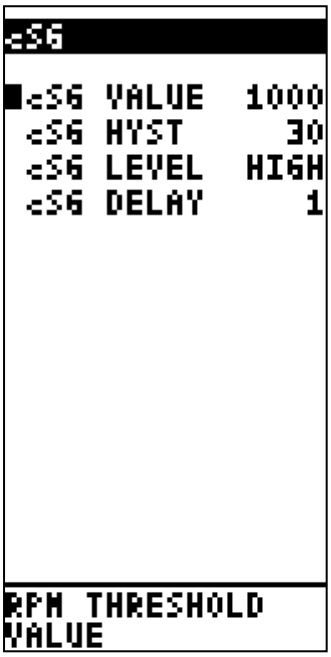
Tmm is the delay time for engine running detection, used on the ENGINE RUNNING Tab. (chap.10).

SoA is an RPM value higher than those forced by the starter motor are but lower than the RPM at idle; it is used for disconnecting starter motor during automatic engine ignition.

RAP is the pulse/revolution ratio. By changing RAP, the CM60 RPM change. If the RAP is known set the RAP value, otherwise the user can adjust the RAP indirectly by comparing the RPM displayed with the one measured by an accurate (digital) tachometer. Change the RAP to obtain the same value of the accurate tachometer.

19.3.1 CSG

cSG is a general-purpose threshold on RPM; it can activate a warning-light/icon and/or an output relay, therefore it can be used for a remote signaling and external logic.



PARAMETER	DESCRIPTION	VALUE
cSG VALUE	RPM threshold value	0-9999
cSG HYST	Hysteresis	0-9999
cSG LEVEL	Active logic level	HIGH / LOW
cSG DELAY	Delay	0 – 240 S

The cSG VALUE, HYST, LEVEL and DELAY are fully configurable.

cSG VALUE is the value of the threshold named cSG
cSG HYST is the VALUE hysteresis.
cSG LEVEL can be set HIGH or LOW.
cSG DELAY is the time that has to elapse before to take the VALUE.

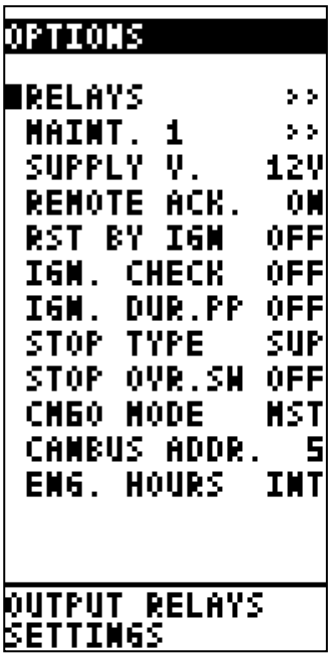
EXAMPLE: VALUE **800** RPM, LEVEL **HIGH**, HYSTERESIS **50**, and DELAY **15**.
If the engine exceeds 800 RPM for more than 15 seconds, according to the SETUP, the warning light/icon associated to cSG will be switched ON and F10 function will energize the associated relay.
If engine RPM go down to 750 (that is VALUE – HYSTERESIS) the icon will be deactivated and the associated relay de-energized.

EXAMPLE: VALUE **800** RPM, LEVEL **LOW**, HYSTERESIS **40**, DELAY **15**.
If the engine exceeds 800 RPM for more than 15 seconds, according to the SETUP, the warning light/icon associated to cSG will be switched OFF and F10 function will de-energize the associated relay.
If engine RPM go down to 760 (that is VALUE – HYSTERESIS) the icon will be activated and the associated relay energized.

19.4 OPTIONS

This page groups various options of the CM60.

PARAMETER	DESCRIPTION	VALUE
RELAYS	Output relays settings	
MAINT. 1	Maintenance 1 settings	
SUPPLY V.	System supply voltage	12V / 24V
REMOTE ACK.	Remote alarm acknowledgement	OFF/ON
RST BY IGN	Alarms reset by engine ignition	OFF/ON
IGN. CHECK	Ignition circuit continuity check	OFF/ON
IGN. DUR.PP	Ignition during preheat/prelubr.	OFF/ON
STOP TYPE	Stop by current supply / cut	SUP / CUT
STOP OVR.SW	Stop override by CM60 input	OFF/ON
CM60 MODE	Set CM60 mode: master / slave	MST/SLV
CANBUS ADDR.	CM60 CANBUS address	0 - 255
ENG. HOURS	Source of engine hours	INT / CAN



SUPPLY V. sets the operating voltage of the CM60.

REMOTE ACK enables a CM60 panel to send and receive a REMOTE ACKNOWLEDGE command. When enabled, the pression of (ACK) on a CM60 is propagated on all the connected CM60.

RST BY IGN enables the reset of all the alarms if a positive battery signal is detected on IN_AVV input (usually it is the contact 50 of the ignition key).

IGN. CHECK enables / disables the continuity check on the ignition line and it is available only with the wiring on scheme 1 in D6.

IGN DUR. PP allows panel to ignite the engine during preheating or prelubrication cycles (this is valid only for ignition conditioned or performed by CM60 panel relay).

STOP OVR.SW enables the use of the OVERRIDE INPUT of the CM60 to disable the automatic stop instead of using an external switch.

CM60 MODE set the panel mode as master (MST) or as slave (SLV). In a system with more than one panel **only a panel has to be set as master**.

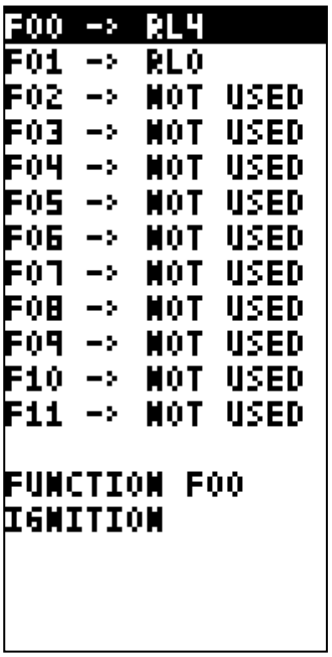
WARNING

CM60 IN SLAVE MODE DOES NOT MANAGE THE CANBUS MESSAGES AND THE ANALOG AND DIGITAL INPUTS; IT CAN ONLY RECEIVE THE DATA, SIGNALS AND MEASURES VIA SERIAL BUS (RS485).

19.5 RELAYS

This page allows user to configure the CM60 functions and to associate them to the relays.
First user has to select the function to be configured by pressing (^) and (v) then confirm using ENTER to start configuration path of the function.

The following table contains the list of relay functions and the output relay that can be associated.



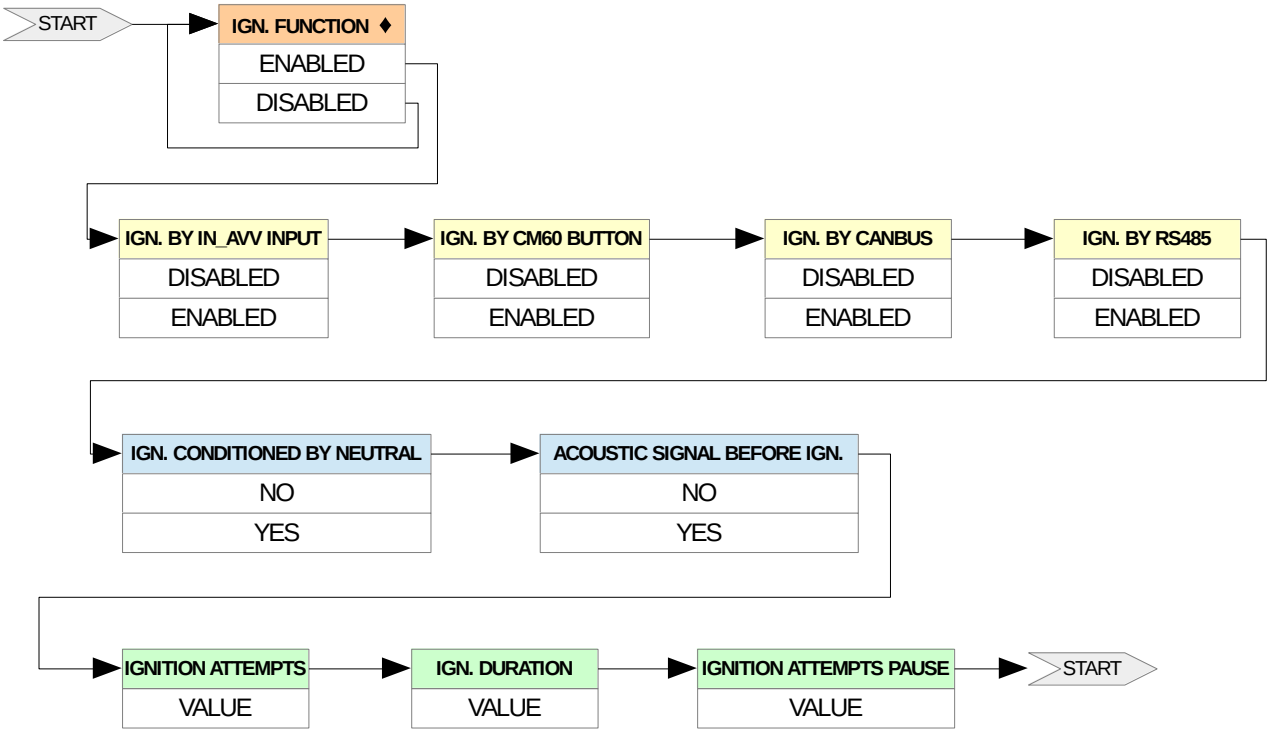
NOTE: some functions have the same configuration path but performs different functions.

F00 – IGNITION FUNCTION

This function performs the timed engine ignition.

Ignition function configuration path

FUNCTION CODE	FUNCTION NAME	OUTPUT RELAY
F00	Ignition	RL4
F01	Stop	RL0
F02	Siren	Any relay not in use
F03	Preheating	Any relay not in use
F04	Prelubrication	Any relay not in use
F05	Cum. alarms	Any relay not in use
F06	Cum. faults	Any relay not in use
F07	Cum. safeties	Any relay not in use
F08	Eng. running	Any relay not in use
F09	CM60 faults	Any relay not in use
F10	cSG thres. trip	Any relay not in use
F11	Pulse	Any relay not in use



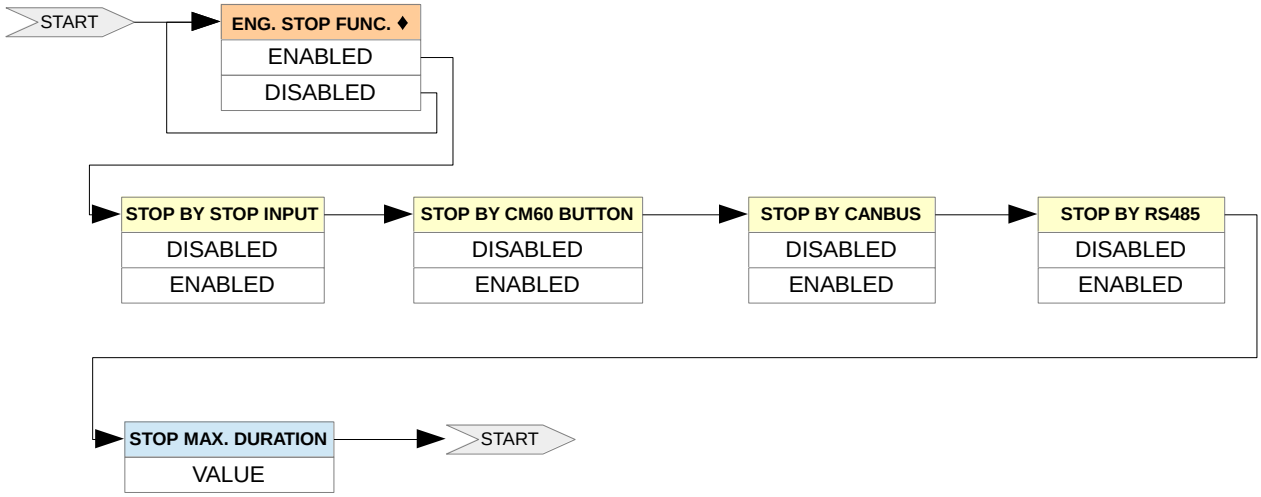
Ignition function parameters tab.

PARAMETERS	DESCRIPTION
IGN. FUNCTION ♦	Disable / enable the function
IGN. BY IN_AVV INPUT	Disable / enable the ignition by IN_AVV input
IGN. BY CM60 BUTTON	Disable / enable the ignition by button on CM60
IGN. BY CANBUS	Disable / enable the ignition by CANBUS (not available)
IGN. BY RS485	Disable / enable the ignition by RS485 (not available)
IGN. CONDITIONED BY NEUTRAL	If enabled inhibits the ignition if the engine is not in neutral
ACOUSTIC SIGNAL BEFORE IGN.	If enabled an acoustic signal is emitted before the ignition (not available)
IGNITION ATTEMPTS	Set the number of ignition attempts
IGN. DURATION	Set the duration of an ignition attempt (in seconds)
IGNITION ATTEMPTS PAUSE	Set the pause between successive ignition attempts

F01 – STOP FUNCTION

This function performs the automatic engine stop and the timed stop.

Stop function configuration path



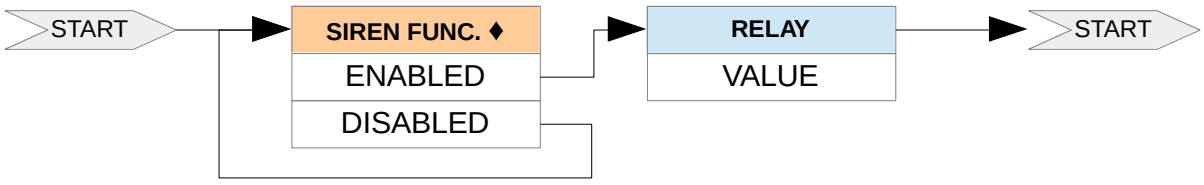
Stop function Parameters tab.

PARAMETERS	DESCRIPTION
ENG. STOP FUNC. ♦	Disable / enable the function
STOP BY INPUT	Disable / enable the ignition by STOP input
STOP BY CM60 BUTTON	Disable / enable the stop by button on CM60
STOP BY CANBUS	Disable / enable the stop by CANBUS (not available)
STOP BY RS485	Disable / enable the stop by RS485 (not available)
STOP MAX. DURATION	Set the duration of a stop attempt (in seconds)

F02 – SIREN FUNCTION

The Siren function activates a relay every time that the buzzer is activated.

Siren function configuration path



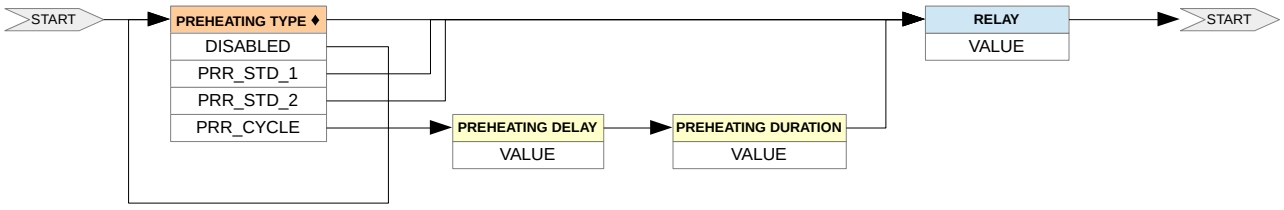
F02 Parameters tab.

PARAMETERS	DESCRIPTION
SIREN FUNC. ♦	Disable / enable the function
RELAY	Select the output relay

F03 – PREHEATING FUNCTION

The Preheating function performs the preheating of the engine.

Preheating function configuration path



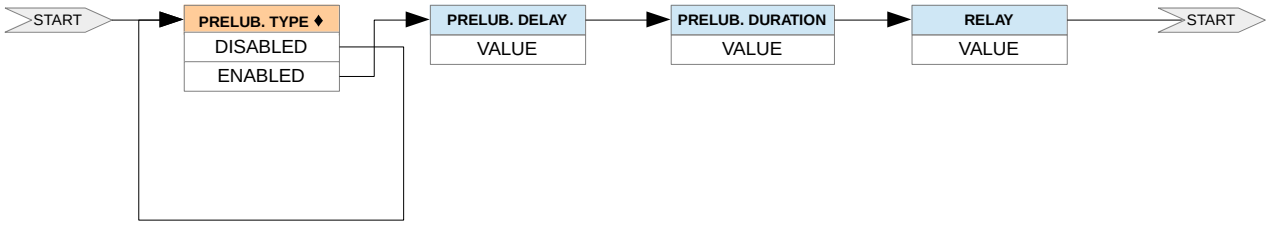
Preheating function parameters tab.

PARAMETERS	DESCRIPTION
PREHEATING TYPE ♦	Set the preheating type
PREHEATING DELAY	Set the preheating delay referred to the issuing of preheating comand
PREHEATING DURATION	Set the preheating phase duration
RELAY	Select the output relay

F04 – PRELUBRICATION FUNCTION

The Prelubrication function performs the prelubrication of the engine.

Prelubrication function configuration path



Prelubrication function parameters tab.

PARAMETERS	DESCRIPTION
PRELUB TYPE ♦	Disable / enable the prelubrication function
PRELUB. DELAY	Set the prelubrication delay referred to the issuing of prelubrication comand
PRELUB. DURATION	Set the prelubrication phase duration
RELAY	Select the output relay

F05 – CUMULATIVE ALARMS FUNCTION

This function is used to signal, cumulatively, the presence of one or more alarms and to send out this signalling energizing the associated relay.

F06 – CUMULATIVE FAULTS FUNCTION

This function is used to signal, cumulatively, the presence of one or more faults and to send out this signalling energizing the associated relay.

F07 – CUMULATIVE SAFETIES FUNCTION

This function is used to signal, cumulatively, the intervention of one or more safeties and to send out this signalling energizing the associated relay.

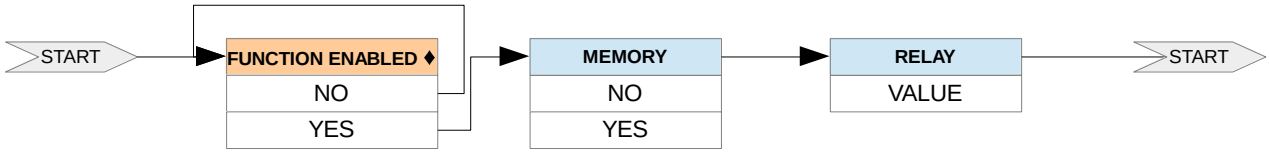
F09 – CUMULATIVE CM60 FAULT FUNCTION

This function is used to signal, cumulatively, the presence of one or more internal CM60 faults (i.e. internal memory damaged) and to send out this signalling energizing the associated relay.

When the “MEMORY” parameter is set to “ON” the associated relay remains activated till the user acknowledgement.

F05, F06, F07, F09 have the same configuration path.

Cumulative alarms function / Cumulative faults function / Cumulative safeties function / Cumulative CM60 fault function configuration path



F05 / F06 / F07 / F09 Parameters tab.

PARAMETERS	DESCRIPTION
FUNCTION ENALED ♦	Disable / enable the function
MEMORY	Disable / enable the memory on the signaling
RELAY	Select the output relay

F08 – ENG. RUNNING FUNCTION

This function is used to signal the engine state, running or not running (see Engine running tab. chap. 10) and to send out this signalling energizing the associated relay.

F10 – cSG THRES. TRIP FUNCTION

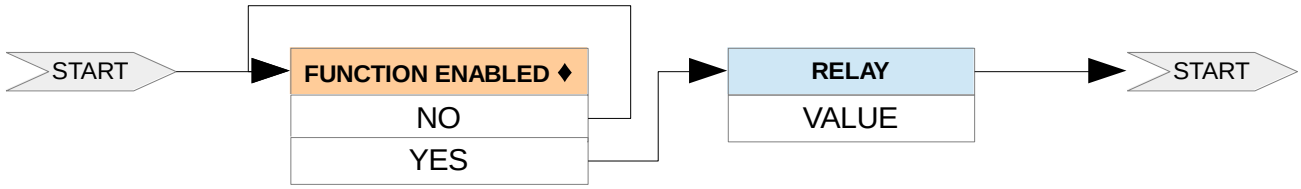
This function is used to notify the cSG threshold tripping and to send out this signalling **energizing** the associated relay.

F11 – PULSE FUNCTION

This function is used to generate a 400ms pulse on the associated relay when the “Engine running” state is detected.

F08, F10, F11 have the same configuration path.

Eng. runnung function / cSG thres. trip function / Pulse function configuration path



F08 / F10 / F11 Parameters tab.

PARAMETERS	DESCRIPTION
FUNCTION ENALED ♦	Disable / enable the function
RELAY	Select the output relay

20 FAULTS

The CM60 checks the internal circuits and the data stored in the internal memory. If there aren't any faults, the "SYSTEM READY" led and the "SYSTEM READY OUTPUT RELAY" will be activated. If "System ready" is not active the display will show an error message.

Remember that during SETUP, the panel does not check faults and alarms.

According to the panel setting, the failures to the sensors, to the alarm senders, to the stop circuit, to the start circuit, to the communication lines and to the internal resources of the panel, are notified to the user by visual and acoustic signallings and by fault messages.

In case of serious damages, the "SYSTEM READY" led and the "SYSTEM READY OUTPUT RELAY" are not active.
In such cases, contact the assistance service and report the error message.

21 CONFORMITY DECLARATION

CE

Manufactures declares that the series CM60 engine control panel is in conformity at European requirements of electromagnetic compatibility and of safety with directives 2006/95/EEC (ex 73/23/EEC), 89/336/EEC, 92/31/EEC, 93/68/EEC, 93/97/EEC, EN 60945, and RINA RULES ed. 2007.

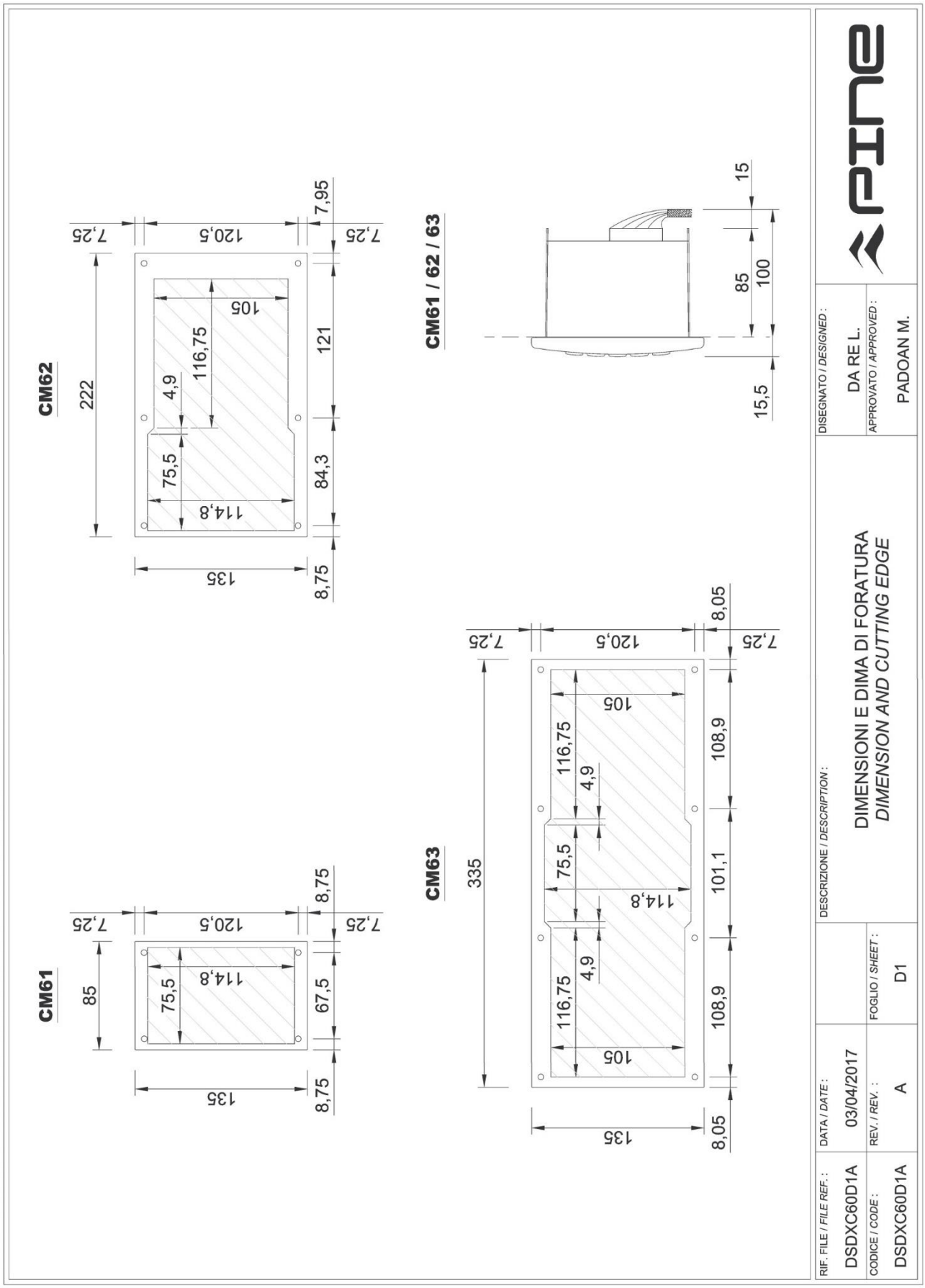
22 TECHNICAL SPECIFICATIONS

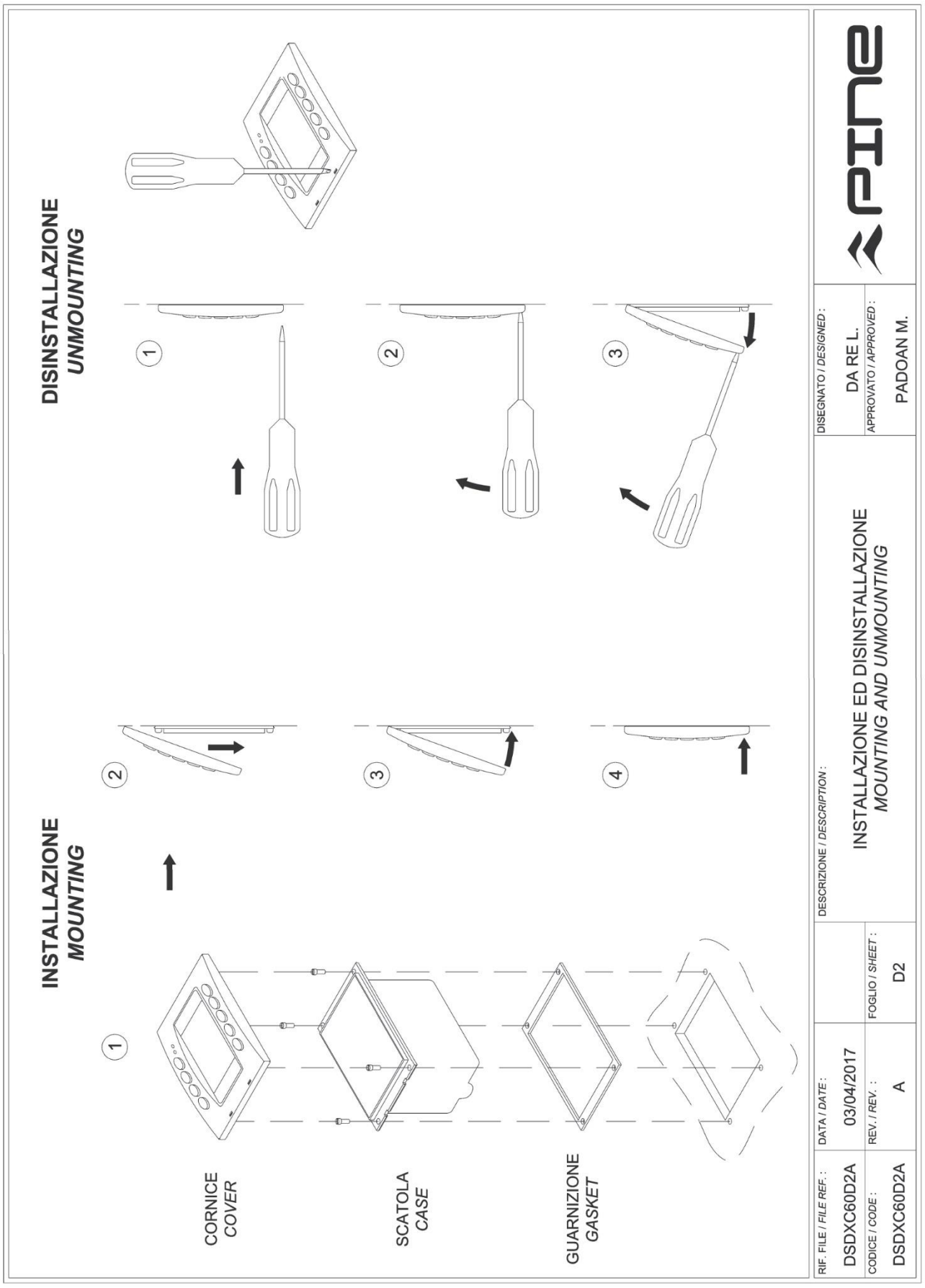
POWER SUPPLY			Nominal voltage: from 12 / 24 VDC	Range : min 9.5 VDC max 35 VDC
POWER CONSUMPTION (no loads, output relays not powered)			Less than 3 W (tachometer consumption not included)	
POWER CONSUMPTION (no loads, all output relays powered)			Less than 7W (tachometer consumption not included)	
PROTECTIONS			Polarity inversion, Battery disconnection extra-voltage (not repetitive).	
TEMPERATURE	**WORKING TEMPERATURE**		-25 +55 °C	
	STORAGE TEMPERATURE		-30 +80 °C	
RELATIVE HUMIDITY			Max 95 %	
VISUALIZATION			TRANSFLECTIVE LCD display 128 x 64 dots, back light, sun light readable	
SIGNALINGS	WARNING-LIGHT / ICONS		"System ready" warning lamp	Up to 16 warning lamps / icons
	ACOUSTIC SIGNALING		Internal buzzer	
			Output for external buzzer (see OUTPUTS)	
ENGINE REVOLUTIONS	RPM / Speed signal from transducer (line continuity check available)		Alternator "W" (10KΩ resistor in parallel for continuity check) Or - PNP PROXIMITY SENSOR (10KΩ resistor for continuity check) Or - Pick-up on crown wheel (3 - 50VRMS - impedance from 1 to 20KΩ	
	Reading from CANBUS (J1939) or customized messages		2 RPM measure can be visualized: 1 from can-bus and 1 form transducer (engine RPM, boat SPEED, measure of revs of the propeller shaft ...	
	Maximum measurable frequency		15KHz - $5V_{pp}$ - duty cycle 50%	
ANALOGUE INPUTS	5 ANALOGUE INPUTS from commercial resistive transducer / 4-20 mA / 0-5 (10) V or from CANBUS		Visualization up to 10 analogue measures (5 for page) 4 set points per input for alarm signaling	
DIGITAL INPUTS	8 DIGITAL INPUTS from N.C. or N.O. contacts (is available the continuity or the short circuit check)		Open circuit voltage: 5 V_{dc} Short circuit voltage: 0-2Vdc – 0.5 mA Continuity / short circuit voltage (with 4700 Ω resistor), about 2.5 Vdc	
CONTINUITY CHECK	Start and Stop Connection Lines		Fault if open circuit is detected (if enabled)	
OUTPUTS	**SYSTEM READY**		+ POWER SYPPLY when ready	max current 1 A
	5 RELAYS the "C" contacts are protected by self-resettable fuses (PTC) max current 1 A	RL0	ENGINE STOP or another function if Engine Stop is not required (see OPTION SUB MENU in setup)	max current 1 A
		RL1	One of the functions as in OPTION SUB MENU	max current 1 A
		RL2	One of the functions as in OPTION SUB MENU	max current 1 A
		RL3	One of the functions as in OPTION SUB MENU	max current 1 A
		RL4	ENGINE IGNITION or another function if Engine ignition is not required (see OPTION SUB MENU in setup)	max current 1 A
	BUZZER		max current 10 mA	
	ALTERNATOR EXCITATION	"D+"	Alternatively to the digital input ID 7 - CN3/2)	peak current 0.35 A
	Tachometer POWER SUPPLY		12 V +/- 1 V	max current 0.2 A
	Tachometer BACKLIGHTING		negative or positive PWM signal	max current 1 A

DIMENSION	CM61	CM62	CM63
	85 x 135 mm	222 x 135 mm	335 x 135 mm
ELECTRONIC UNIT IP PROTECTION GRADE - FRONT SIDE (valid only if the supplied gasket is correctly installed)	IP 66	IP 66	IP 66

MEASURE PRECISIONS OF CM60 ANALOGS AND DIGITALS IINPUTS (sensors / transmitters accuracy not included):

ENGINE RPM:	± 0,5% ± 1DGT, 1 or 10 RPM resolution, see user settings.
TEMPERATURES :	± 2% ± 1DGT
PRESSURES :	± 2% ± 1DGT
OTHERS:	± 2% ± 1DGT


CM62
222
7,25
120,5
7,25
7,95
105
116,75
4,9
121
75,5
114,8
84,3
135
8,75
CM61 / 62 / 63
15
85
100
15,5
CM61
85
7,25
120,5
7,25
8,75
114,8
75,5
67,5
135
8,75
CM63
335
7,25
120,5
7,25
8,05
105
116,75
4,9
108,9
75,5
114,8
101,1
4,9
116,75
108,9
105
135
8,05
RIF. FILE / FILE REF. :
DSDXC60D1A
DATA / DATE :
03/04/2017
DESCRIZIONE / DESCRIPTION :
DIMENSIONI E DIMA DI FORATURA
DIMENSION AND CUTTING EDGE
DISEGNATO / DESIGNED :
DA RE L.
APPROVATO / APPROVED :
PADOAN M.
CODICE / CODE :
DSDXC60D1A
REV. / REV. :
A
FOGLIO / SHEET :
D1


DISINSTALLAZIONE
UNMOUNTING
INSTALLAZIONE
MOUNTING
CORNICE
COVER
SCATOLA
CASE
GUARNIZIONE
GASKET
RIF. FILE / FILE REF. :
DSDXC60D2A
DATA / DATE :
03/04/2017
DESCRIZIONE / DESCRIPTION :
INSTALLAZIONE ED DISINSTALLAZIONE
MOUNTING AND UNMOUNTING
DISEGNATO / DESIGNED :
DA RE L.
APPROVATO / APPROVED :
PADOAN M.
CODICE / CODE :
DSDXC60D2A
REV. / REV. :
A
FOGLIO / SHEET :
D2

CONNETTORE / *CONNECTOR* CN2

NUM *PIN*	SEG. *SIG.*	DESCRIZIONE *DESCRIPTION*
1	BUZ_EST	BUZZER ESTERNO *EXTERNAL BUZZER*
2	NMEA0183_B	NMEA0183 SEGNALE 'B' *NMEA0183 'B' SIGNAL*
3	ID0	INGRESSO DIGITALE 0 *DIGITAL INPUT 0*
4	ID2	INGRESSO DIGITALE 2 *DIGITAL INPUT 2*
5	ID4	INGRESSO DIGITALE 4 *DIGITAL INPUT 4*
6	ID6	INGRESSO DIGITALE 6 *DIGITAL INPUT 6*
7	Ai1	INGRESSO LETTURA ANALOGICA 1 *ANALOG INPUT 1*
8	Ai4	INGRESSO LETTURA ANALOGICA 4 *ANALOG INPUT 4*
9	IN_AVV	INGRESSO AVVIAMENTO *IGNITION INPUT SIGNAL*
10	NMEA0183_A	NMEA0183 SEGNALE 'A' *NMEA0183 'A' SIGNAL*
11	RPM	INGRESSO SEGNALE GIRI - RPM *RPM INPUT SIGNAL*
12	ID1	INGRESSO DIGITALE 1 *DIGITAL INPUT 1*
13	ID3	INGRESSO DIGITALE 3 *DIGITAL INPUT 3*
14	ID5	INGRESSO DIGITALE 5 *DIGITAL INPUT 5*
15	Ai0	INGRESSO LETTURA ANALOGICA 0 *ANALOG INPUT 0*
16	Ai2	INGRESSO LETTURA ANALOGICA 2 *ANALOG INPUT 2*
17	Ai3	INGRESSO LETTURA ANALOGICA 3 *ANALOG INPUT 3*
18	GND	NEGATIVO BATTERIA *NEGATIVE POLE OF POWER SUPPLY*

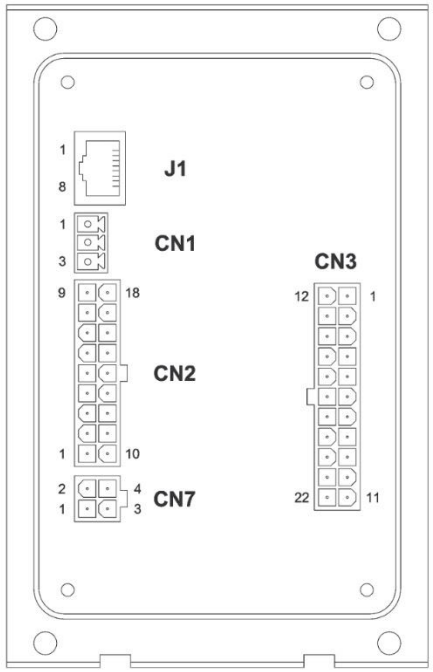
CONNETTORE / *CONNECTOR* CN7

NUM *PIN*	SEG. *SIG.*	DESCRIZIONE *DESCRIPTION*
1	RS485_B	RS485 SEGNALE 'B' *RS485 'B' SIGNAL*
2	+5 SER	ALIMENTAZIONE PER DISPOSITIVI SERIALI CAN BUS *POWER SUPPLY FOR CAN BUS SERIAL DEVICES*
3	RS485_A	RS485 SEGNALE 'A' *RS485 'A' SIGNAL*
4	GND	NEGATIVO BATTERIA *NEGATIVE POLE OF POWER SUPPLY*

CONNETTORE / *CONNECTOR* J1 - CN1

CN1 NUM *PIN*	CN2 NUM *PIN*	SEG. *SIG.*	DESCRIZIONE *DESCRIPTION*
7+8	1	CAN H	SEGNALE CAN BUS 'H' *CAN BUS 'H' SIGNAL*
3+6	2	GND	NEGATIVO BATTERIA *NEGATIVE POLE OF POWER SUPPLY*
1+2	3	CAN L	SEGNALE CAN BUS 'L' *CAN BUS 'L' SIGNAL*
4+5		+5 SER	ALIMENTAZIONE PER DISPOSITIVI SERIALI CAN BUS *POWER SUPPLY FOR CAN BUS SERIAL DEVICES*

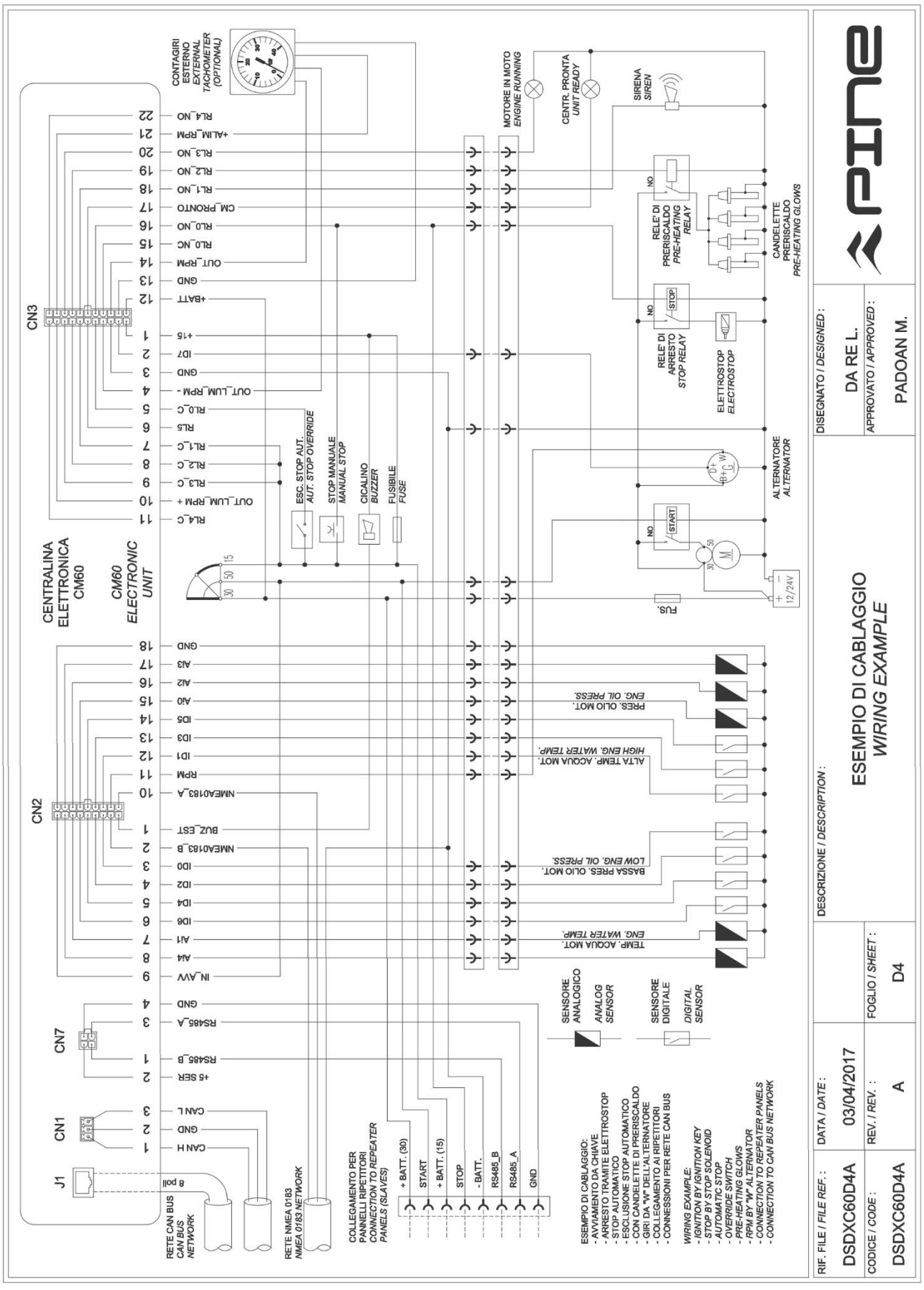
VISTA POSTERIORE *BACK VIEW*

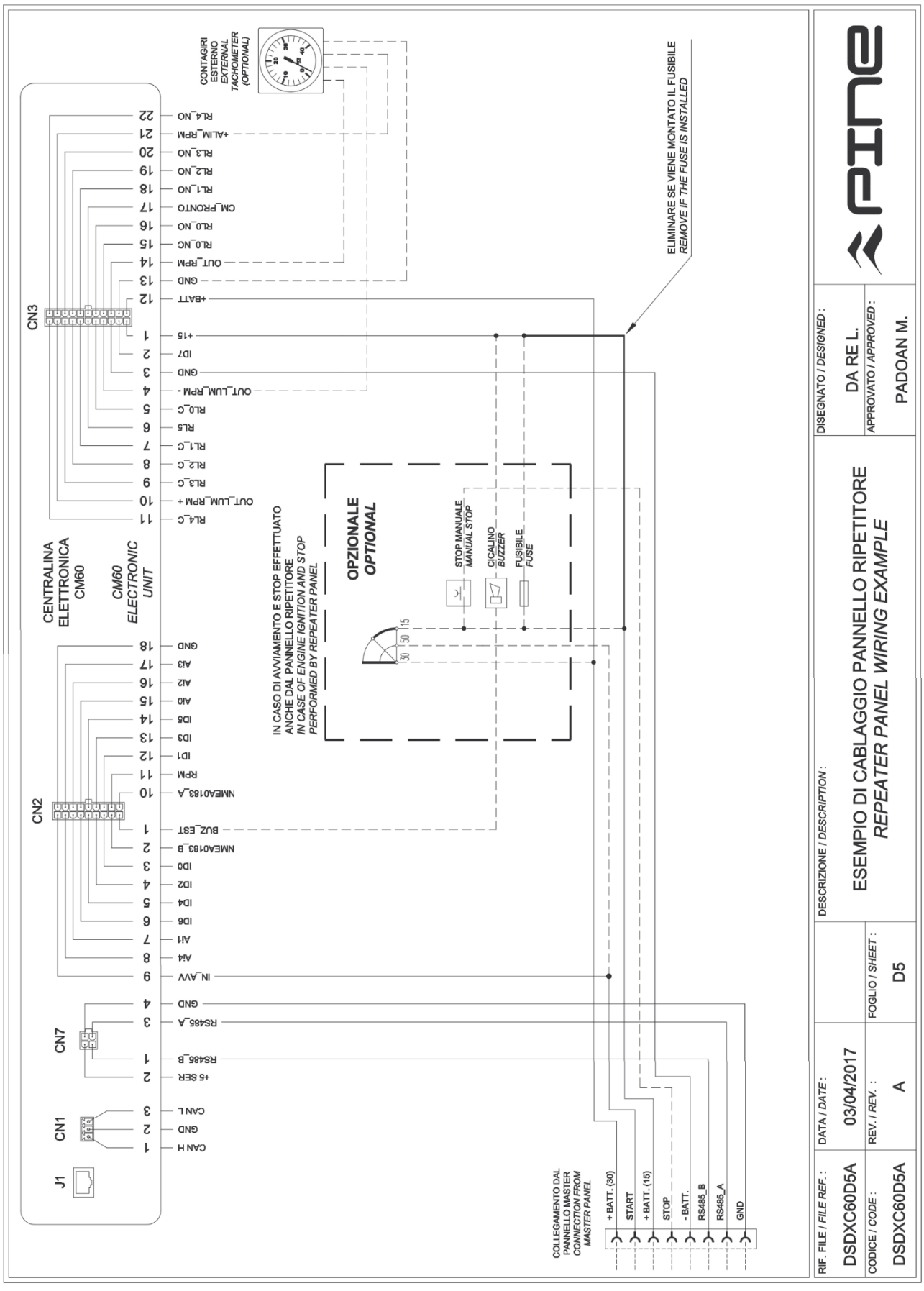


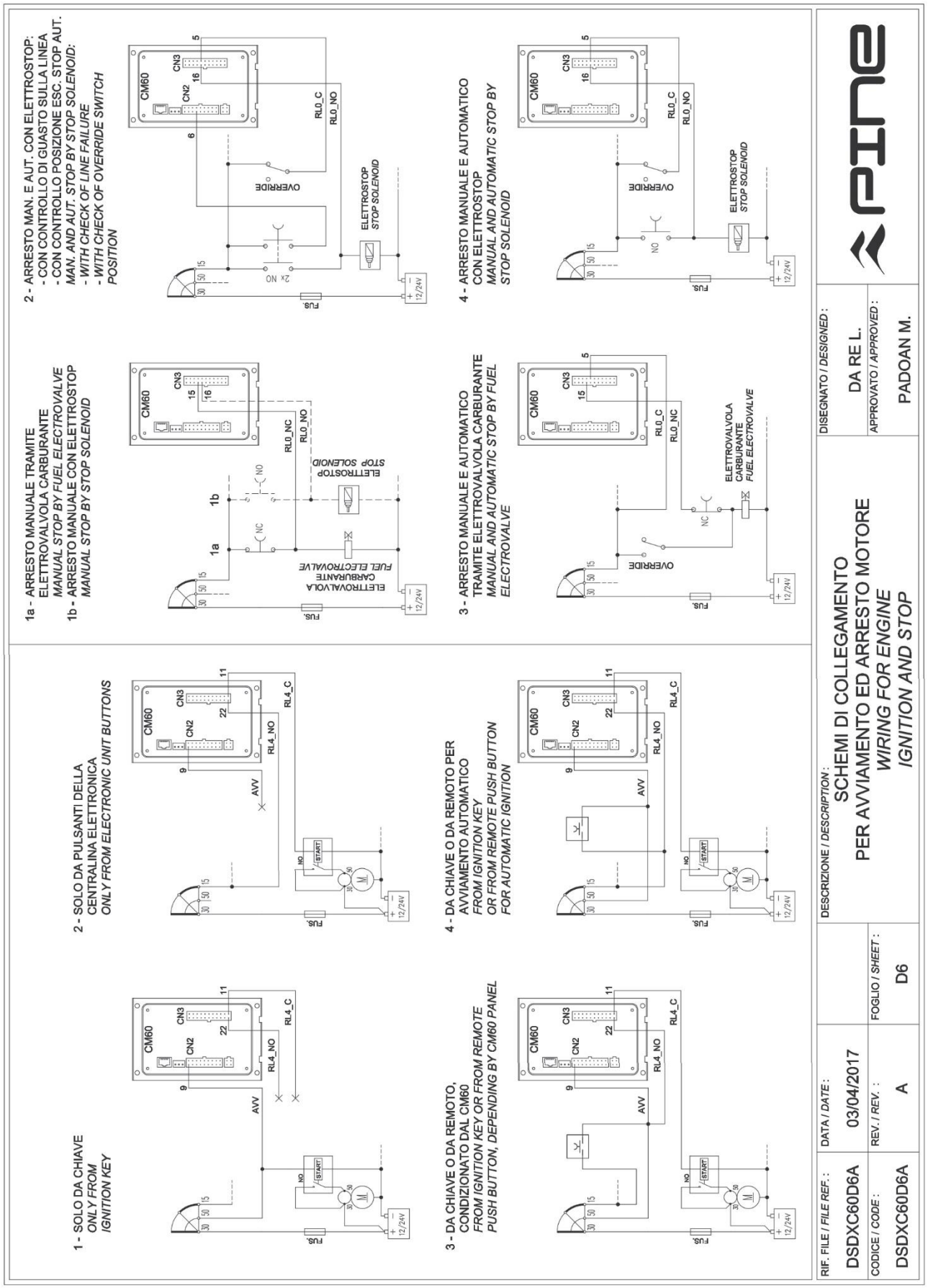
CONNETTORE / *CONNECTOR* CN3

NUM *PIN*	SEG. *SIG.*	DESCRIZIONE *DESCRIPTION*
1	+15	POSITIVO BATTERIA SOTTO CHIAVE '15' *POSITIVE POLE OF POWER SUPPLY UNDER KEY '15'*
2	ID7	INGRESSO GENERATORE D+ / ALLARME DIGITALE 7 *D+ GENERATOR / DIGITAL INPUT 7*
3	GND	NEGATIVO BATTERIA *NEGATIVE POLE OF POWER SUPPLY*
4	OUT_LUM_RPM-	RETROILLUMINAZIONE CONTAGIRI ESTERNO (NEGATIVO) *EXTERNAL RPM COUNTER BACK LIGHT (NEGATIVE)*
5	RL0_C	USCITA DIGITALE 0 (C - ARRESTO) *DIGITAL OUTPUT 0 (C - STOP)*
6	RL5	USCITA DIGITALE (+B) *DIGITAL OUTPUT (+B)*
7	RL1_C	USCITA DIGITALE 1 (C) *DIGITAL OUTPUT 1 (C)*
8	RL2_C	USCITA DIGITALE 2 (C) *DIGITAL OUTPUT 2 (C)*
9	RL3_C	USCITA DIGITALE 3 (C) *DIGITAL OUTPUT 3 (C)*
10	OUT_LUM_RPM+	RETROILLUMINAZIONE CONTAGIRI ESTERNO (POSITIVO) *EXTERNAL RPM COUNTER BACK LIGHT (POSITIVE)*
11	RL4_C	USCITA DIGITALE 4 (C - AVVIAMENTO) *DIGITAL OUTPUT 4 (C - START)*
12	+BATT	POSITIVO BATTERIA *POSITIVE POLE OF POWER SUPPLY*
13	GND	NEGATIVO BATTERIA *NEGATIVE POLE OF POWER SUPPLY*
14	OUT_RPM	SEGNALE PER CONTAGIRI ESTERNO *INPUT SIGNAL FOR EXTERNAL RPM COUNTER*
15	RL0_NC	USCITA DIGITALE 0 (NC - ARRESTO) *DIGITAL OUTPUT 0 (NC - STOP)*
16	RL0_NO	USCITA DIGITALE 0 (NO - ARRESTO) *DIGITAL OUTPUT 0 (NO - STOP)*
17	CM_PRONTO	USCITA DIGITALE - CENTRALINA PRONTA (+B) *DIGITAL OUTPUT - UNIT READY (+B)*
18	RL1_NO	USCITA DIGITALE 1 (NO) *DIGITAL OUTPUT 1 (NO)*
19	RL2_NO	USCITA DIGITALE 2 (NO) *DIGITAL OUTPUT 2 (NO)*
20	RL3_NO	USCITA DIGITALE 3 (NO) *DIGITAL OUTPUT 3 (NO)*
21	+ALIM_RPM	POSITIVO ALIMENTAZIONE PER CONTAGIRI ESTERNO *POSITIVE POWER SUPPLY FOR EXTERNAL RPM COUNTER*
22	RL4_NO	USCITA DIGITALE 4 (NO - AVVIAMENTO) *DIGITAL OUTPUT 4 (NO - START)*

RIF. FILE / *FILE REF.* :	DATA / *DATE* :		DESCRIZIONE / *DESCRIPTION* :	DISEGNATO / *DESIGNED* :	
DSDXC60D3A	03/04/2017		CM60 : CONNETTORI E SEGNALI *CM60 : CONNECTORS AND SIGNALS*	DA RE L.	PINE
CODICE / *CODE* :	REV. / *REV.* :	FOGLIO / *SHEET* :		APPROVATO / *APPROVED* :	
DSDXC60D3A	A	D3		PADOAN M.	


ESEMPIO DI CABLAGGIO
WIRING EXAMPLE
DESCRIZIONE / DESCRIPTION :
DISEGNATO / DESIGNED :
DA RE L.
APPROVATO / APPROVED :
PADOAN M.
RIF. FILE / FILE REF. :
DSDXC60D4A
DATA / DATE :
03/04/2017
FOGLIO / SHEET :
D4
CODICE / CODE :
DSDXC60D4A
REV. / REV. :
A
CENTRALINA ELETTRONICA CM60
CM60 ELECTRONIC UNIT
CN1
CN2
CN3
CN7
J1
CONTAGIRI ESTERNO
EXTERNAL TACHOMETER (OPTIONAL)
MOTORE IN MOTO
ENGINE RUNNING
CENTR. PRONTA
UNIT READY
SIRENA
SIREN
RELE' DI PRERISCALDO
PRE-HEATING RELAY
CANDELETTE PRERISCALDO
PRE-HEATING GLOWS
RELE' DI ARRESTO
STOP RELAY
ELETTROSTOP
ELECTROSTOP
ALTERNATORE
ALTERNATOR
ESC. STOP AUT.
AUT. STOP OVERRIDE
STOP MANUALE
MANUAL STOP
CICALINO
BUZZER
FUSIBILE
FUSE
FUS.
RETE CAN BUS
CAN BUS NETWORK
RETE NMEA 0183
NMEA 0183 NETWORK
COLLEGAMENTO PER PANNELLI RIPETITORI
CONNECTION TO REPEATER PANELS (SLAVES)
SENSORE ANALOGICO
ANALOG SENSOR
SENSORE DIGITALE
DIGITAL SENSOR
TEMP. ACQUA MOT.
ENG. WATER TEMP.
BASSA PRES. OLIO MOT.
LOW ENG. OIL PRESS.
ALTA TEMP. ACQUA MOT.
HIGH ENG. WATER TEMP.
PRES. OLIO MOT.
ENG. OIL PRESS.
ESEMPIO DI CABLAGGIO:
- AVVIAMENTO DA CHIAVE
- ARRESTO TRAMITE ELETTROSTOP
- STOP AUTOMATICO
- ESCLUSIONE STOP AUTOMATICO
- CON CANDELETTE DI PRERISCALDO
- GIRI DA "W" DELL'ALTERNATORE
- COLLEGAMENTO AI RIPETITORI
- CONNESSIONI PER RETE CAN BUS
WIRING EXAMPLE:
- IGNITION BY IGNITION KEY
- STOP BY STOP SOLENOID
- AUTOMATIC STOP
- OVERRIDE SWITCH
- PRE-HEATING GLOWS
- RPM BY "W" ALTERNATOR
- CONNECTION TO REPEATER PANELS
- CONNECTION TO CAN BUS NETWORK


CONTAGIRI ESTERNO
EXTERNAL TACHOMETER (OPTIONAL)
ELIMINARE SE VIENE MONTATO IL FUSIBILE
REMOVE IF THE FUSE IS INSTALLED
CN3
CENTRALINA ELETTRONICA CM60
CM60 ELECTRONIC UNIT
CN2
CN7
CN1
J1
IN CASO DI AVVIAMENTO E STOP EFFETTUATO ANCHE DAL PANNELLO RIPETITORE
IN CASE OF ENGINE IGNITION AND STOP PERFORMED BY REPEATER PANEL
OPZIONALE
OPTIONAL
STOP MANUALE
MANUAL STOP
CICALINO
BUZZER
FUSIBILE
FUSE
COLLEGAMENTO DAL PANNELLO MASTER
CONNECTION FROM MASTER PANEL
+ BATT. (30)
START
+ BATT. (15)
STOP
- BATT.
RS485_B
RS485_A
GND
RIF. FILE / FILE REF. :
DSDXC60D5A
DATA / DATE :
03/04/2017
FOGLIO / SHEET :
D5
DESCRIZIONE / DESCRIPTION :
ESEMPIO DI CABLAGGIO PANNELLO RIPETITORE
REPEATER PANEL WIRING EXAMPLE
DISEGNATO / DESIGNED :
DA RE L.
CODICE / CODE :
DSDXC60D5A
REV. / REV. :
A
APPROVATO / APPROVED :
PADOAN M.


1 - SOLO DA CHIAVE
ONLY FROM
IGNITION KEY
2 - SOLO DA PULSANTI DELLA
CENTRALINA ELETTRONICA
ONLY FROM ELECTRONIC UNIT BUTTONS
3 - DA CHIAVE O DA REMOTO,
CONDIZIONATO DAL CM60
FROM IGNITION KEY OR FROM REMOTE
PUSH BUTTON, DEPENDING BY CM60 PANEL
4 - DA CHIAVE O DA REMOTO PER
AVVIAMENTO AUTOMATICO
FROM IGNITION KEY
OR FROM REMOTE PUSH BUTTON
FOR AUTOMATIC IGNITION
1a - ARRESTO MANUALE TRAMITE
ELETTROVALVOLA CARBURANTE
MANUAL STOP BY FUEL ELECTROVALVE
1b - ARRESTO MANUALE CON ELETTROSTOP
MANUAL STOP BY STOP SOLENOID
2 - ARRESTO MAN. E AUT. CON ELETTROSTOP:
- CON CONTROLLO DI GUASTO SULLA LINEA
- CON CONTROLLO POSIZIONE ESC. STOP AUT.
MAN. AND AUT. STOP BY STOP SOLENOID:
- WITH CHECK OF LINE FAILURE
- WITH CHECK OF OVERRIDE SWITCH
POSITION
3 - ARRESTO MANUALE E AUTOMATICO
TRAMITE ELETTROVALVOLA CARBURANTE
MANUAL AND AUTOMATIC STOP BY FUEL
ELECTROVALVE
4 - ARRESTO MANUALE E AUTOMATICO
CON ELETTROSTOP
MANUAL AND AUTOMATIC STOP BY
STOP SOLENOID
CM60
CN2
CN3
AVV
START
OVERRIDE
ELETTROSTOP
STOP SOLENOID
ELETTROVALVOLA
CARBURANTE
FUEL ELECTROVALVE
RL4_C
RL4_NO
RL0_C
RL0_NO
RL0_NC
FUS.
12/24V
RIF. FILE / FILE REF. :
DSDXC60D6A
DATA / DATE :
03/04/2017
DESCRIZIONE / DESCRIPTION :
SCHEMI DI COLLEGAMENTO
PER AVVIAMENTO ED ARRESTO MOTORE
WIRING FOR ENGINE
IGNITION AND STOP
DISEGNATO / DESIGNED :
DA RE L.
APPROVATO / APPROVED :
PADOAN M.
CODICE / CODE :
DSDXC60D6A
REV. / REV. :
A
FOGLIO / SHEET :
D6

ALLARME NORMALMENTE APERTO
CON CONTROLLO DI CONTINUITA'
NORMALLY OPEN ALARM
WITH CONTINUITY CONTROL
AL CM60
TO CM60
4700 Ω
ALARM CONTACT
- ALIMENTAZIONE / GND
- SUPPLY / GND
ALLARME NORMALMENTE CHIUSO
CON CONTROLLO DI CORTOCIRCUITO
NORMALLY CLOSE ALARM
WITH SHORT CIRCUIT CONTROL
ALLARME NORMALMENTE APERTO
SENZA CONTROLLO DI CONTINUITA'
NORMALLY OPEN ALARM
WITHOUT CONTINUITY CONTROL
ALLARME NORMALMENTE CHIUSO
SENZA CONTROLLO DI CORTOCIRCUITO
NORMALLY CLOSE ALARM
WITHOUT SHORT CIRCUIT CONTROL
SCHEMA DI COLLEGAMENTO DEGLI ALLARMI
ALARMS CONNECTION SCHEME
RIF. FILE / FILE REF. : DSDXC60D7A
DATA / DATE : 03/04/2017
CODICE / CODE : DSDXC60D7A
REV. / REV. : A
FOGLIO / SHEET : D7
DESCRIZIONE / DESCRIPTION :
DISEGNATO / DESIGNED : DA RE L.
APPROVATO / APPROVED : PADOAN M.

Per una corretta installazione ed impiego del prodotto devono essere utilizzate le informazioni tecniche contenute
in questo manuale e tutte le normali precauzioni.
PINE S.r.l. non è responsabile per danni o guasti provocati dal non corretto utilizzo dei prodotti.
La garanzia copre al massimo il costo del prodotto stesso (cioè la sostituzione del prodotto stesso e non il rimborso)
e non copre I danni causati da un uso improprio dei prodotti.
Le informazioni contenute in questo manuale d'uso sono soggette a cambiamento senza preavviso.
PINE S.r.l. non è responsabile di errori tecnici, di stampa o di omissioni nel presente manuale.

All the normal precautions and the technical information contained in this manual must be used for a proper installation and use of the products.
PINE S.r.l. is not responsible of any damage caused by improper use of the products.
Warranty will not cover any damage caused by improper use of the products.
The information contained herein is subject to change without notice.
PINE shall not be liable for technical or editorial errors or omissions contained herein.

La serie di pannelli CM60 è prodotta in Italia da:
CM60 panels are made in Italy by:

PINE S.r.l.
Sede legale: Via P. E. Venturini, 56 Chioggia - VE
Sede operativa: Via San Pietro n. 49/51– 30014 Cavarzere – Venice - Italy
Tel. +39 +426 357041
www.pinesrl.com info@pinesrl.com

PINE S.r.l.
Registered office: Via P. E. Venturini, 56 Chioggia - VE
Head office: Via San Pietro n. 49/51– 30014 Cavarzere – Venice - Italy
Tel. +39 +426 357041
www.pinesrl.com info@pinesrl.com

.....

.....

.....

.....

.....

.....

.....

.....

SISTEMI ELETTRONICI - Via Centro, 51 – Fraz. S. Pietro - 30014 Cavarzere (VE) - Italy
Tel / Fax +39.0426.35.70.41 www.pinesrl.com info@pinesrl.com

(This page has been intentionally left empty)

PINE S.r.l.
SEDE LEGALE: Via P.E. Venturini, 56 - 30015 CHIOGGIA (VE)
SEDE OP. Via Centro, 49 fraz. San Pietro - 30014 CAVARZERE (VE)
Tel/Fax 0426/357041 - P. IVA e CF 02661980272
REG. IMPRESE N. 40378 - R.E.A. N.0232884
Capitale sociale € 15.300 int. versato