The Digital Diesel Control is the remote control panel of your GENVERTER

**Load bar** (chapter 2.3)

The Load bar displays the approximate load that is connected to the Genverter in proportion to the maximum available power. Each LED represents 20% of the available power.

**Red LED** (chapter 2.4)

When the red LED blinks, the Genverter is in overload. If the connected load is not reduced, the Genverter stops automatically after a few seconds.

**Stop** (chapter 2.2).

Press Stop shortly to stop the Genverter at any time.

**Start** (chapter 2.1).

Press Start shortly to start the Genverter at any time.

**Select and Set** (chapter 2.5)

Genverter is running:
- Press the Select button shortly to scroll through the monitor menu (chapter 4).

Genverter is not running:
- Press the Select button shortly to scroll through the stand-by menu (chapter 3) and the historical data menu* (chapter 5).
- Hold the Select button pressed for approximately 3 seconds to enter the Select menu* (chapter 6). From here you can enter the advanced sub-menus. You can change several advanced set-points by means of the Set button. You can leave these sub-menus by pressing Stop shortly.

**LCD display** (chapter 2.4)

The actual status and user specific information of the Genverter is displayed at the LCD display. When two blinking stars (x) are shown, the autostart function (chapter 9) or the interval mode (chapter 10) is activated.

**Load bar** (chapter 2.3)

When the red LED blinks, the Genverter is in overload. If the connected load is not reduced, the Genverter stops automatically after a few seconds.

**Select and Set** (chapter 2.5)

Genverter is running:
- Press the Select button shortly to scroll through the monitor menu (chapter 4).

Genverter is not running:
- Press the Select button shortly to scroll through the stand-by menu (chapter 3) and the historical data menu* (chapter 5).
- Hold the Select button pressed for approximately 3 seconds to enter the Select menu* (chapter 6). From here you can enter the advanced sub-menus. You can change several advanced set-points by means of the Set button. You can leave these sub-menus by pressing Stop shortly.

* These menus are only accessible when the Genverter is not running and the access to these menus is allowed at the set-up menu (see chapter 2.6).
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1 GENERAL INFORMATION

1.1 Use of this manual

This operating manual serves as a guideline for the safe and effective operation of the Digital Diesel Control. Installation of the Digital Diesel Control is described in the installation manual of the Genverter.

Operation of the Digital Diesel Control can be separated into three major parts:

- **Basic operations.** The most important functions of the Digital Diesel Control are explained in chapter 2. Read at least this chapter before you start operating the Digital Diesel Control!
- **Readout functions.** Chapters 3, 4 and 5 explain the stand-by menu, the monitor menu and the historical data menu. These menus offer you a quick overview of all actual and historical data of the Genverter.
- **Advanced operations.** Several advanced operations which are accessible via the select menu are described from chapter 6 on.

1.2 Introduction and features

Whisper Generating sets and Genverters are standard supplied with a very advanced digital control system, named “Digital Diesel Control”. This system performs automatic starting and stopping, it offers many monitoring functions and shows a large number of actual and historical parameters. Further it supports faultfinding and maintenance.

The system includes a control unit (“black box”) containing a microprocessor and a local control panel that are both on the Genverter itself. A remote control panel communicates with the control unit over a “plug in” communication cable that is in the delivery. The remote control panel shows information on a LCD display.

After connecting the remote panel to the Genverter (plug in) the system is ready to be used and no settings are required:

- Just pushing the Start button shortly will initiate the start procedure. Each step in this procedure is displayed on the panel and shows for itself.
- Stopping is possible at any moment by pushing the Stop button shortly.
- While the Genverter is running the LCD display shows the most important information about the output and load. The Load bar allows a one-glance observation of the load as well.
- When scrolling through the menu many more actual parameters can be monitored.
- A red LED lighting up indicates that a failure occurred. Detailed information about the failure is shown on the LCD display.
- In case of a failure the microprocessor will stop the engine. After stopping, the failure is shown on the LCD display. Restarting is only possible after correcting the failure and resetting the panel.
So far everything is very simple and for normal use we recommend to keep it this way.

However the system has many more features. The most important features have to do with rpm settings and automatic starting.
- The system is capable of monitoring a set of (independent) batteries starting the Genverter when the battery voltage drops below a certain preset level.
- Also it is possible to have the engine started and run according to a pre-programmed time schedule.

It is a well-known misunderstanding to think that automatic start functions make the operation of the Genverter simpler. In the contrary the Genverter will live its own life and you have to be sure that this is what you want! The Genverter will start in your absence and also when the boat is in the dry dock for maintenance or when an other boat has moored aside just below your exhaust, if the automat is not manually override to do so!
Only use the automatic start functions when you really need this option. Installing and setting of automatic start options should only be executed by trained technical engineers.

1.3 Validity of this manual (version 1.1)
This operating manual (version 1.1) applies to Digital Diesel Control panels with Firmware version 2.24 and higher.

Under normal circumstances you will receive the correct operating manual with your panel. This means that the operating manual corresponds with the delivered Digital Diesel Control panel.
2 BASIC OPERATION

The Digital Diesel Control is the remote control panel of your Genverter. The panel is connected to the control electronics of the Genverter by means of a communication cable.

2.1 Start button
Press the Start button shortly to start the Genverter at any time. Refer to chapter 2.8 for additional information about the Genverter start-cycle.

2.2 Stop button
Press the Stop button shortly to stop the Genverter at any time. Refer to chapter 2.9 for additional information about the Genverter stop-cycle.

2.3 Load bar
The load bar displays the approximate load that is connected to the Genverter in proportion to the maximum available power: the more LED’s illuminate, the more load is connected to the Genverter. Each LED represents 20 % of the available power. When the red LED blinks, the Genverter is in overload. If the connected load is not reduced, the Genverter stops automatically after a few seconds. During a Genverter start- or stop-cycle, the load bar shows the countdown of the several steps.

2.4 LCD display
The actual status and user specific information of the Genverter is displayed at the LCD display. When one or two blinking stars (x) are shown, the autostart function (see chapter 9) or the interval mode (see chapter 10) is activated.

2.5 Select- and Set-button
The Digital Diesel Control offers several menus to adjust the settings to control the Genverter. See figure 2 for an overview of all menus.
The navigation through these menus and the adjustment of parameters is done by means of the Select- and Set- button. There is a distinction between pressing the Select- and Set- button for a short and a long time:

- **Select (short).** In general, when pressed shortly (less than 3 sec.), you can scroll trough the (sub-) menus.
- **Set (short).** Depending on the shown data, when you press the Set-button shortly (less than 3 sec.), you can:
  1. Enter a displayed submenu
  2. Leave a (sub-)menu at the Exit menu;
  3. Adjust a value
- **Select (long).** Pressing the Select button for at least three seconds has two functions:
  1. From the stand-by menu, you can enter the select menu (see chapter 6);
  2. You can change the direction of the arrow in the right part of the display when a value needs to be adjusted. If the arrow is pointing downwards (↓) the value can be decreased. If the arrow is pointing upwards (↑) the value can be increased.
- **Set (long).** At certain (sub-)menus specific counters or historical data can be reset by holding the Set button pressed for at least three seconds.

2.6 Restricted accessibility to the menus

Wrong settings of the Digital Diesel Control may lead to hazardous situations. Therefore availability of, and accessibility to settings of the select menu, the autostart menu and/or the interval menu might be restricted by the installer (or owner) at the set-up menu. See figure 2.
Refer to the appendix to change the accessibility to these menus.

2.7 Lock mode

To protect the Digital Diesel Control against unintended adjustment of critical variable set points, the lock mode is activated every time you leave a (sub)menu. When activated, critical settings cannot be changed when the lock-mode symbol (x) is shown at the right upper corner of the display.
See chapter 11.4 to disable the lock mode.
Only allow changes in the settings to be carried out by qualified persons.
Figure 2: menu structure of the Digital Diesel Control
2.8 Start Cycle

There are four ways to trigger the start cycle of the Genverter*:
- Manually, by pressing Start shortly (see chapter 2.1);
- Automatically, triggered by the autostart function (see chapter 9);
- Automatically, triggered by the interval mode (see chapter 10);
- Automatically, after a failed start attempt.

In all cases the start cycle is similar. When the Genverter is started, the display shows all stages of the start cycle. See left figure.

The LED-indicators of the load bar show a countdown of the remaining time of each stage.

See chapter 8 to adjust the settings of the start cycle.

When the Genverter is started successfully, the initial level of the monitor menu is displayed (chapter 4).

When the Genverter failed to start, all stages of the start cycle are repeated as often as adjusted (see chapter 8.5 to adjust the maximum number of start attempts).

When the Genverter is still not running OK after the maximum number of start attempts, it is stopped and a failure code is displayed. See chapter 13 for an overview of all possible failure code.

Press Set shortly to go to the stand by menu.

NOTE: A Genverter start is considered to be successful if:
- The output frequency of the Genverter is >25Hz or the Genverter produces a battery charging voltage and
- None of the sensor switches on the Genverter detects an error

* The Genverter can also be started manually by means of a service start. See chapter 12.14 for information.
2.9 Stop Cycle

There are five ways to stop the Genverter:

- Manually, by pressing Stop shortly (see chapter 2.2);
- Automatically, triggered by the autostart function (see chapter 9);
- Automatically, triggered by the interval mode (see chapter 10);
- Automatically, caused by a hardware failure of the Genverter (see chapter 13 for an overview of all failure codes.);
- Automatically, after a failed start attempt (see chapter 2.8)

In all cases the stop cycle is similar: the display shows STOP ENGINE. See left figure. At the same time all indicators of the load bar flash simultaneously.

After the Genverter was stopped, the Digital Diesel Control returns to the stand-by menu.

2.10 Genverter maintenance

The Digital Diesel Control is equipped with an hour counter to indicate the time before maintenance. It will help you to schedule maintenance.

IMPORTANT: The maintenance time interval is not only determined by the number of running hours, but also by factors like environmental conditions, average runtime, connected load, etcetera. The Digital Diesel Control does not take account of these factors. Refer to the user’s manual of the Genverter for additional information about service maintenance to the Genverter.

Refer to chapter 12.1 (clear maintenance time) to reset the counter of the maintenance time after the Genverter was serviced. This submenu is accessible by entering the select menu followed by the service menu (see chapter 6).

2.11 Maintenance of the Digital Diesel Control

No specific maintenance to the Digital Diesel Control is required. If necessary, use a soft clean cloth to clean the display. Never use any liquids, acids and/or scourers.
3 STAND-BY MENU

This chapter describes the functions of the stand-by menu. The stand-by menu offers the user a brief overview of the status of the Genverter. This menu is not available when the Genverter is running.

Touch the Select button shortly to scroll through the levels as described below.

3.1 Unlock the automatic mode

When the Genverter works in automatic mode and has been stopped manually the Genverter is locked. To press the SET button for 3 seconds, the system is in automatic mode again.

3.2 Initial level

When the system is in rest (the Genverter is not running), the initial level is displayed. The initial level shows:

- The identification of the Genverter model
- The mode that is active at the moment (stand by mode, automatic mode or silent period)

When automatic mode is active, two blinking stars (x) are shown, which means that the autostart function (see chapter 9) or the interval mode (see chapter 10) is activated.

3.3 Start battery voltage

Press Select once to show the actual battery voltage of the Genverter start battery (BAT1). When no button is touched during 40 seconds, the display returns to the initial level automatically.

3.4 Trigger level autostart function (start battery)

Only displayed when the autostart function is activated (see chapter 9). This value marks the voltage of the start battery (BAT1) below which the Genverter is triggered for an automatic start. See chapter 9.2 to adjust this value. When no button is touched during 40 seconds, the display returns to the initial level automatically.

3.5 Voltage of the second battery

Only displayed when a second battery is installed (refer to the appendix). It shows the actual battery voltage of the second battery (BAT2). When no button is touched during 40 seconds, the display returns to the initial level automatically.
3.6 Trigger level autostart function (second battery)
Only displayed when a second battery is installed (refer to the installation manual) and when the autostart function is activated (see chapter 9). This value marks the voltage of the second battery (BAT2) below which the Genverter is triggered for an automatic start. See chapter 9.5 to adjust this value. When no button is touched during 40 seconds, the display returns to the initial level automatically.

3.7 Time till start
Time till start shows a clock counting down. It represents the remaining time until the Genverter will be started automatically. It is only displayed when the interval mode is activated (see chapter 10). When no button is touched during 40 seconds, the display returns to the initial level automatically.

3.8 Clock
The next level shows the actual time. Refer to chapter 11.2 for clock settings.

3.9 Time before maintenance
Time before maintenance shows the number of hours until the Genverter needs to be serviced again. See also chapter 0. See chapter 8.7 to adjust the default time of this counter. When no button is touched during 40 seconds, the display returns to the initial level automatically.

3.10 Runtime
Runtime shows the cumulative runtime since the latest service maintenance inspection of the Genverter. See chapter 12.1 to clear this counter after service. When no button is touched during 40 seconds, the display returns to the initial level automatically.

3.11 Historical data menu
From here you can enter the historical data menu by pressing shortly. See chapter 4 for a description of the historical data menu. Press Select shortly to return to the initial level. Also when no button is touched during 40 seconds, the display returns to the initial level.
4 MONITOR MENU

This chapter describes the functions of the *monitor menu*. This menu offers an actual status overview of the Genverter and the batteries while the Genverter is running. It is therefore only available while the Genverter is running: it is immediately accessible by pressing Select shortly. None of the displayed information can be modified.

Touch the Select button shortly to scroll through the levels as described below. Press Set shortly to return to the initial level.

### 4.1 Actual Voltage, Amps, Frequency and Load
Shows the actual voltage, amps, load and frequency.

### 4.2 Power boost
This function helps to start up heavy loads. When the power boost is on, the minimum RPM is set to 3000RPM. At this RPM the generator can handle the loads to its maximum power. Switching of the power boost, the minimum RPM will be 2500RPM again.

### 4.3 Actual Load
The load (kVA) connected to the Genverter is displayed also the percentage of the load related to the nominal load of the Genverter is shown. This percentage is shown by the load bar as well. On the lower line is indicated if the Genverter is in the variable speed mode or fixed speed mode and the RPM.

### 4.4 Engine temperature
On the display you see the temperature of the engine, measured on the cylinder head. The temperature may not exceed the upper limit of 120°C. The temperature of the engine dependents of the load, the ambient temperature and the installation of the generator. When the engine approaches the maximum temperature, load has to be switched off what is not necessary for use or try to improve the ventilation of the engine.

### 4.5 Start battery voltage
Actual voltage of the Genverter start battery (BAT1). When no button is touched during 40 seconds, the display returns to the initial level automatically.

### 4.6 Trigger level autostart function (start battery)
Only displayed when the autostart function is activated (see chapter 9). This value marks the voltage of the start battery (BAT1) below which the Genverter is triggered for an automatic start. See chapter 9.2 to adjust this value.
When no button is touched during 40 seconds, the display returns to the initial level automatically.

4.7 Second battery voltage
Only displayed when a second battery is installed (refer to the appendix). It shows the actual battery voltage of the second battery (BAT2). When no button is touched during 40 seconds, the display returns to the initial level automatically.

4.8 Trigger level autostart function (second battery)
Only displayed when a second battery is installed (refer to the installation manual) and when the autostart function is activated (see chapter 9). This value marks the voltage of the second battery (BAT2) below which the Genverter is triggered for an automatic start. When no button is touched during 40 seconds, the display returns to the initial level automatically.

4.9 Actual runtime
Actual runtime shows the runtime since the latest successful start cycle. When no button is touched during 40 seconds, the display returns to the initial level automatically.

4.10 Time till stop
Time till stop shows a clock counting down. It represents the time until the Genverter will be stopped automatically. It is only displayed when the interval mode is activated (see chapter 10). When no button is touched during 40 seconds, the display returns to the initial level automatically.

4.11 Day and time
Here the actual day and time are displayed. To adjust the clock, see chapter 11.2. When no button is touched during 40 seconds, the display returns to the initial level.
To know the history of your Genverter can be very useful. It will help you to check if the Genverter needs major service maintenance. This can be done by reading the number of successful start attempts compared to the unsuccessful ones. It will also help you to decide whether the batteries need to be replaced. Therefore the deepest and the lowest average voltage can be shown as well as the number of low voltage hits triggered by the autostart function.

The historical data menu is only accessible when the Genverter is not running. See chapter 3.11 to enter this menu.

Touch Select shortly to scroll through the levels as described below. When no button is touched during 40 seconds, the display returns to the stand-by menu (chapter 3) automatically.

### 5.1 Total run time
This function displays the total time of successful Genverter runs. It is the hour counter of your Genverter, which cannot be reset by the end-user.

### 5.2 Average runtime
Average runtime shows the total run time divided by the number of successful start attempts. See chapter 12.2 to reset this value.

### 5.3 Number of successful start attempts
This screen shows the total number of successful start attempts. Refer to chapter 12.2 if you want to reset this counter.

### 5.4 Number of failed start attempts
This screen shows the total number of failed start attempts. Refer to chapter 12.2 if you want to reset this counter.

### 5.5 Number of autostarts (start battery)
Only displayed when the autostart function is activated (see chapter 9). It shows the number of starts of the autostart function triggered by a low voltage of the start battery (BAT1). See chapter 9.2 and 9.8 to adjust this low voltage level (trigger level of the start battery). Refer to chapter 12.3 if you want to reset this counter.
5.6 Number of autostarts (second battery)
Only displayed when the autostart function is activated (see chapter 9). It shows the number of starts of the autostart function triggered by a low voltage of the second battery (BAT2). See chapter 9.5 and 9.8 to adjust this low voltage level (trigger level of the second battery). Refer to chapter 12.4 if you want to reset this counter.

5.7 Deepest start battery voltage
This screen shows the lowest average voltage of the start battery (BAT1). Not shown when the number of deep voltage hits = 0. Refer to chapter 12.9 if you want to reset this value.

5.8 Number of deep voltage hits
Shows the number of times that the battery voltage dropped below the level of the start battery low voltage warning (BAT1). Every time the battery voltage drops below this level (see chapter 7.10) during 5 seconds, this counter is increased by 1. A large number of deep voltage hits might indicate a too low battery capacity, an old battery that needs to be replaced or a defective battery charger. Refer to chapter 12.9 if you want to reset this counter.

5.9 Latest warning
Latest warning shows the most recent warning that was detected by the control unit of the Genverter during the last Genverter run. See chapter 13 for an overview of all possible warning codes.

5.10 Latest failure
This menu shows the cause of failure resulting in the last Genverter stop. See chapter 13 for an overview of the failure codes.

Press Select shortly to return to the stand-by menu. Also when no button is touched during 40 seconds, the display returns to the stand-by menu.
6 SELECT MENU

When the Genverter is not running and access is allowed (see chapter 2.6), it is possible to enter the select menu. From the select menu several advanced submenus can be accessed.

From the stand-by menu (see chapter 3), hold Select pressed for approximately 3 seconds to get access to the select menu.

Press Select shortly to navigate through the select menu. Press Set shortly to enter the displayed submenu.

The submenus are:

- **Energy menu** (see chapter 7). This menu allows you to adjust the set points of the alarm functions.

- **Engine menu** (see chapter 8). It is used to adjust the Digital Diesel Control according to the Genverter’s specifications.

- **Autostart menu** (see chapter 9). Adjustment of trigger points to start and stop the Genverter automatically because of low battery voltage. (Restricted accessibility; see chapter 2.6)

- **Interval menu** (see chapter 10). Settings to run the Genverter periodically. (Restricted accessibility; see chapter 2.6)

- **The display menu** (see chapter 11) is used to set the internal clock and to adjust the display according the user’s specific requirements.

- **Service menu** (see chapter 12). Here you can reset and adjust several parameters after maintenance of your Genverter.

From the exit menu you can return to the stand-by menu by pressing Set shortly. Also if none of the buttons was touched for 40 seconds, the Digital Diesel Control returns to the stand-by menu.
7 ENERGY MENU

At the energy menu you can:

- Adjust the parameters of the alarm function. If one of these parameters is out of range, the alarm function is activated. When activated, it can control an external relay or an audible alarm (refer to the installation manual).
- To adjust these parameters, unlock the panel by the unlock function in the display menu. Every time you leave the menu, you have to unlock the panel again.
- Adjust the Digital Diesel Control according to the nominal voltage of the second battery (BAT2);

The energy menu is only accessible when the Genverter is not running. Refer to chapter 6 to gain access to this menu.

Touch Select shortly to scroll through the levels as described below. When no button is touched during 40 seconds, the display returns to the stand-by menu (chapter 3) automatically.

NOTE: If an arrow is displayed in the right part of the display, the direction of this arrow can be changed by holding Select pressed for three seconds. If the arrow is pointing downwards (↓) the displayed value can be decreased by pressing Set shortly. If the arrow is pointing upwards (↑) the value can be increased.

7.1 Reset to factory settings

The first screen allows you to reset all prior adjustments of the energy menu back to the factory defaults. Hold Set pressed for at least 3 seconds to reset all settings or press Select shortly to go to the next step.

7.2 Alarm triggered by a failure on/off

The alarm function can be triggered by a failure. When a failure is detected, the Genverter is stopped automatically. See chapter 13 for an overview of all failure codes. Press Set shortly to enable/disable. Factory setting: disabled.

7.3 Alarm triggered by a warning on/off

The alarm function can also be triggered when a warning is issued. See chapter 13 for an overview of all warning codes. Press Set shortly to enable/disable. Factory setting: disabled.
7.4 Test alarm output on/off
This function can be used to check the operation of the external relay. Press Set shortly to toggle the alarm function between “ON” and “OFF”. Beware: during normal operation of the Digital Diesel Control this function must be switched off!
Factory settings: OFF

7.5 Show warnings on/off
Press Set to enable or disable this function. If this function is disabled (OFF), the warning codes generated by the Digital Diesel Control will not be shown anymore at the LCD-display. See chapter 13 for an overview of all warning codes.
Factory settings: ON (warning codes are displayed)

7.6 Low AC voltage warning level
When the AC output voltage of the generator drops below this value, the display will show an overload warning. The engine cannot handle the connected load at the running speed. When you select fixed speed and set the speed to a reduced level, the maximum power is also reduced. The inverter inside the generator can overload the engine and the engine speed will drop. This causes a lower output voltage.

7.7 High current warning level
When the AC output current raises above this level, the display will show an overload warning. This level contains the current that the generator can handle continuously.

7.8 Low and high engine rpm warning
When the rpm of the engine drops below the set values, the alarm function will be triggered. Low rpm can be caused by lack of fuel or a choked air filter element. Also when the rpm is low and a too high load comes in, the engine could be “knocked down”. A too high rpm could be caused by a faulty actuator a mechanical failure of the governor: Factory setting 2000 rpm low 4000 rpm high.

7.9 Overload warning level
The alarm will be triggered when the load is above this power level.

7.10 Start battery low voltage warning
The alarm function will be triggered when the voltage of the start battery (BAT1) drops below this value.
Factory setting: 10.8 / 21.6 V (depending on the nominal voltage of the start battery).
### 7.11 Nominal voltage of the second battery

Here you can select the nominal voltage of the second battery (BAT2) by pressing the Set button shortly. This value must be set to 0V if no second battery is connected to the Digital Diesel Control.

### 7.12 Second battery low voltage warning

Only displayed when a second battery is installed (refer to chapter 7.11). It marks the DC-voltage of the second battery (BAT2) below which the alarm function is triggered. Factory setting: 11.0 / 22.0 V (depending on the nominal voltage of the second battery).

From the exit menu you can return to the select menu (chapter 6) by pressing Set shortly. If none of the buttons was touched for 40 seconds, the Digital Diesel Control returns to the stand-by menu.
8 ENGINE MENU

The engine menu is used to adjust the Digital Diesel Control according to the Genverter’s specifications. Under normal circumstances adjustment of the parameters is not recommended. Refer to chapter 6 to gain access to this menu.

For each step below you need to finish within 40 seconds; otherwise the Digital Diesel Control returns to the stand-by menu again.

To adjust these parameters, unlock the panel by the unlock function in the display menu. Every time you leave the menu, you have to unlock the panel again.

Press the Select button shortly to navigate through the engine menu. Press the Set button shortly to change a setting.

NOTE: If an arrow is displayed in the right part of the display, the direction of this arrow can be changed by holding Select pressed for three seconds.
If the arrow is pointing downwards (↓) the displayed value can be decreased by pressing Set shortly. If the arrow is pointing upwards (↑) the value can be increased.

8.1 Engine RPM settings
The engine can be set for variable rpm mode or fixed rpm mode.
When in the variable RPM mode there can be set a deviant higher low RPM setting. (Standard is 2500 rpm; a higher value can be necessary to relieve the engine and make it easier to ramp up when a high load is switched on) The low rpm setting must be related to the highest load that can be switched on.
When there is a constant high load; fixed speed will be preferable. In the fixed speed mode the speed has to be set between 2500 and 3400 rpm).

8.2 Reset to factory settings
The first screen allows you to reset all prior adjustments of the engine menu back to the factory defaults.
Hold Set pressed for at least 3 seconds to reset all settings or press Select shortly to go to the next step.

8.3 Lift time of the fuel supply pump
This screen is used to adjust the operation time of the fuel lift pump prior to the cranking of the engine. Factory setting: 3 sec.

8.4 Maximum cranking time
Adjustment of the maximum run time of the cranking motor.
Factory settings: 5 sec
8.5 Maximum number of start attempts
This function allows the user to set the maximum number of start attempts. Example: When set to 3 and the Genverter is triggered to start, the Digital Diesel Control will try to start the Genverter for another two times if the Genverter did not start after the first attempt. Factory setting: 3 attempts

8.6 Starting error by-pass time
If the Genverter fails to start after a start attempt, the Digital Diesel Control tries to start the Genverter again (see paragraph 8.5). To check whether the start attempt was successful, the control unit on the Genverter measures the AC-output voltage of the Genverter. This measurement is delayed to be sure the Genverter is stable in operation. Factory setting of the failure by-pass time: 15 sec.

8.7 Set maintenance time
At normal circumstances the Genverter needs to be serviced for the first time after 50 running hours (fixed value), and then after every 150hrs. However, in some cases a different maintenance interval should be applied. Refer to the user’s manual of the Genverter for detailed information. Factory settings: 150 hours.

From the exit menu you can return to the select menu (chapter 6) by pressing Set shortly. If none of the buttons was touched for 40 seconds, the Digital Diesel Control returns to the stand-by menu.
9 AUTOSTART MENU

The Digital Diesel Control offers an automatic Genverter start/stop function, triggered by the battery voltage. When the battery voltage is too low, the Genverter can be started automatically in order to recharge the batteries. The Genverter is stopped again after the batteries were charged.

In addition a silent period can be set to avoid an unintended Genverter run during night time. During this period, “silent period” is displayed at the initial level of the stand-by menu (see chapter 3). This means that the Genverter will not be started automatically. At the autostart menu you can adjust the settings of the autostart function.

To adjust these parameters, unlock the panel by the unlock function in the display menu. Every time you leave the menu, you have to unlock the panel again.

Before using the autostart function make sure:

- that access to the autostart menu is allowed at the set up menu (see appendix)
- the internal clock is set to the correct time (see chapter 11.2), if you intend to use the silent period.
- the lock mode (see chapter 11.4) is switched off before programming.
- the Genverter is ready to operate. Among other things, this means that enough cooling liquid, oil and gasoline are available and all valves are opened (refer to the operating manual of the Genverter).

NOTES:

- The autostart function will fail to start the Genverter when maintenance time has elapsed. However, when the maintenance time elapses during a Genverter run, the Genverter will not stop until the Minimum runtime (chapter 9.8) has elapsed.
- You can start or stop the Genverter manually at any time (also during the silent period!) by pressing Start / Stop shortly.
- When the Genverter failed to start or was stopped because of a failure, the autostart function will be disabled automatically. This means that the Genverter start can not be triggered by a low battery voltage again.
- When the autostart function is activated, one or two blinking stars (x) are shown on the display at the initial level of the stand-by menu.
- If during programming an arrow is displayed in the right part of the display, the direction of this arrow can be changed by holding Select pressed for three seconds. If the arrow is pointing downwards (↓) the displayed value can be decreased by pressing Set shortly. If the arrow is pointing upwards (↑) the value can be increased.

Refer to chapter 6 to gain access to the autostart menu.

Press the Select button shortly to navigate through the autostart menu. Press the Set button shortly to change a setting.

For each step below you need to finish within 40 seconds; otherwise the Digital Diesel Control returns to the stand-by menu again.
9.1 Reset to factory settings
The first screen allows you to reset all prior adjustments of the autostart menu back to the factory defaults.
Hold Set pressed for at least 3 seconds to reset all settings or press Select shortly to go to the next step.

9.2 Autostart - Start battery on/off
Press Set shortly to enable / disable (ON / OFF) the autostart function triggered by the start battery (BAT1).
- When switched to ON, press Select shortly to adjust the trigger points of the autostart function; continue with chapter 9.88.
- When switched to OFF, press Select shortly to continue to the next step

9.3 Autostart – External switch on/off
Press Set shortly to enable / disable (AUTOSTART ON / AUTOSTART OFF) the autostart function triggered by an external switch, using BAT2 input.
When there is a BAT2 measures a voltage higher than 6V, the generator is required and will start automatically when there aren’t restrictions by the silent timer.

9.4 Minimum runtime
When the generator is started by the external switch, a minimum runtime prevents the generator to start and stop too often when the switch doesn’t foresee this.

9.5 Autostart - Second battery on/off
Press Set shortly to enable / disable (ON / OFF) the autostart function triggered by the second battery (BAT2). This function is only displayed when a second battery was installed.
- When switched to ON, press Select shortly to adjust the trigger points of the autostart function; continue with chapter 9.88.
- When switched to OFF, press Select shortly to continue to the next step
9.6 Silent Period on/off
Press Set shortly to enable / disable (ON / OFF) the silent period. If the silent period is activated (ON), the Genverter will not be started automatically during the specified period.
- When switched to ON, press Select shortly to specify the time frame of the silent period; continue with chapter 9.77.
- When switched to OFF, press Select shortly to continue to the next step.

From the exit menu you can return to the select menu (chapter 6) by pressing Set shortly. If none of the buttons was touched for 40 seconds, the Digital Diesel Control returns to the stand-by menu.

9.7 Adjustment of the silent period
The silent period is the daily time period that the Genverter should not be started automatically by the autostart function. You can use this function to avoid an unintended Genverter run during night time.

Silent period begin
Hours blinking: press Set several times to adjust the hours of the begin time. Then press Select shortly. Minutes blinking: press Set several times to adjust the minutes of the begin time. Then press Select shortly.

Silent period end
Hours blinking: press Set several times to adjust the hours of the end time. Then press Select shortly. Minutes blinking: press Set several times to adjust the minutes of the end time.

Then press Select shortly. Return to chapter 9.66.
9.8 Adjustment of the autostart trigger points

**Trigger level autostart function**
The first parameter marks the battery voltage below which the autostart function is triggered. Factory setting: 11.50V / 23.00V

**Delay time**
The battery low delay prevents the autostart function being triggered during a small low voltage drop. Factory setting: 5 sec.

**Battery OK setting**
This parameter marks the voltage above which the battery is considered to be fully charged. It is the trigger to start the **Minimum runtime**. Factory setting: 14.00 / 28.00V

**Minimum runtime**
This is the minimum time that the Genverter will keep running after the battery voltage reached the **battery OK setting**. Factory setting: 60 minutes.

**Maximum runtime**
To avoid an incessant Genverter run caused by the fact that the battery voltage doesn’t reach the **battery OK setting**, a maximum runtime can be set. Factory setting: 240 minutes.
10 INTERVAL MENU

With the interval menu you can programme the interval mode: a timer to start and stop the Genverter at any desired moment, like you would programme a VCR.

To adjust these parameters, unlock the panel by the unlock function in the display menu. Every time you leave the menu, you have to unlock the panel again.

Before using the interval mode make sure:
- that access to interval menu is allowed at the set up menu (see appendix).
- the internal clock is set to the correct time (see chapter 11.2).
- the lock mode (see chapter 11.4) is switched off before programming the interval menu.
- the Genverter is ready to operate. Among other things, this means that enough cooling liquid, oil and gasoline are available and all valves are opened (refer to the operating manual of the Genverter).

NOTES:
- The Genverter will fail to start when the maintenance time has elapsed. However, when the maintenance time elapses during a Genverter run, the Genverter will not stop until the interval end time is reached.
- You can stop the Genverter at any time by pressing Stop shortly.
- When the Genverter failed to start or was stopped because of a failure, the interval mode will be cancelled automatically. This means that the Genverter will not be started automatically again.
- When the interval mode is activated, at the initial level of the stand-by menu two blinking stars (x) are shown on the display and the time till start function is available at the stand-by menu (chapter 3.7).
- If during programming an arrow is displayed in the right part of the display, the direction of this arrow can be changed by holding Select pressed for three seconds. If the arrow is pointing downwards (↓) the displayed value can be decreased by pressing Set shortly. If the arrow is pointing upwards (↑) the value can be increased.

Refer to chapter 6 to gain access to the interval menu.

Press Select shortly to navigate through the interval menu. Press Set shortly to change a setting.

For each step below you need to finish within 40 seconds; otherwise the Digital Diesel Control returns to the stand-by menu again.

CAUTION!
Whisper Power cannot be held responsible for any damage caused by the unattended running of the Genverter in the interval mode

WARNING!
When working on the electrical installation make sure that the Genverter cannot start automatically. First remove the 3 Amps fuse from the local control panel and then disconnect the plus poles of the batteries.
10.1 Reset to factory settings
The first screen allows you to reset all prior adjustments of the interval menu back to the factory defaults.
Hold Set pressed for at least 3 seconds to reset all settings or press Select shortly to go to the next step.

10.2 Interval Auto start ON/OFF
Press Set shortly to enable / disable (ON / OFF) the interval mode.
Then press Select shortly to go to the next step. When switched to OFF, you will go to the exit menu immediately
Factory settings: OFF (no programme)

10.3 Repeat cycle
Press Set shortly to change the desired repeat cycle mode:
- *Once*: the Genverter will be started and stopped only once.
- *Daily*: the Genverter will be started and stopped every day at the same time.
- *Weekly*: the Genverter will be started and stopped once a week.
- *4 weeks*: the Genverter will be started and stopped every four weeks.
Press Select to go to the next step

10.4 Interval begin
First choose the start day (day is blinking) by pressing Set shortly.
Then press Select shortly to store the displayed day.
Repeat this for the hours and minutes.

10.5 Interval end
In the same way the end time of the interval can be adjusted
(NOTE: the day cannot be specified here; an interval can never last more than 23 hours and 59 minutes)

From the exit menu you can return to the select menu (chapter 6) by pressing Set shortly. If none of the buttons was touched for 40 seconds, the Digital Diesel Control returns to the stand-by menu.
11 DISPLAY MENU

The display menu is used to adjust the internal clock and to set the display according to the user's specific requirements. Refer to chapter 6 to gain access to this menu.

For each step below you need to finish within 40 seconds; otherwise the Digital Diesel Control returns to the stand-by menu again.

Press the Select button shortly to navigate through the display menu. Press the Set button shortly to change a setting.

NOTE: If an arrow is displayed in the right part of the display, the direction of this arrow can be changed by holding Select pressed for three seconds. If the arrow is pointing downwards (↓) the displayed value can be decreased by pressing Set shortly. If the arrow is pointing upwards (↑) the value can be increased.

11.1 Reset to factory settings
The first screen allows you to reset all prior adjustments of the display menu back to the factory defaults. Hold Set pressed for at least 3 seconds to reset all settings or press Select shortly to go to the next step.

11.2 Set clock
To adjust the clock:
• Day is blinking: choose the day by pressing Set shortly. Then press Select shortly to continue.
• Hour is blinking: adjust the hour (24hr clock) by pressing Set shortly. Then press Select shortly to continue.
• Minute is blinking: adjust the minutes by pressing Set shortly. Then press Select shortly to continue.

11.3 Sleep mode
If the sleep mode is enabled (ON) the backlight of the display switches off automatically if the buttons are not touched for 4 minutes. As soon as one of the buttons is touched, the display's backlight will be lit again for an easy reading of the display. Press Set to toggle the sleep mode. Factory setting: ON
11.4 Lock mode
To protect the Digital Diesel Control against unintended adjustment of the variable set points, the lock mode is activated every time you leave a (sub)menu. When activated, critical settings cannot be changed when the lock-mode symbol (x) is shown on the right upper corner of the display. Press Set to toggle the lock mode.
Factory setting: ON

11.5 Language setting
Press Set to choose the desired language.
Factory setting: ENGLISH
Then press Select to continue.

11.6 Contrast
The contrast of the display may change due to ambient conditions. Press Set to adjust the display’s contrast. Then press Select to continue.

11.7 Firmware Panel
Firmware Panel shows the software version that is installed in the microprocessor of the panel. This value cannot be changed; for installer’s reference only.

11.8 Firmware Control
Firmware Control shows the software version that is installed in the microprocessor of the Genverter control unit. This value cannot be changed; for installer’s reference only.

From the exit menu you can return to the select menu (chapter 6) by pressing Set shortly. If none of the buttons was touched for 40 seconds, the Digital Diesel Control returns to the stand-by menu.
12 SERVICE MENU

At the service menu you can reset several counters or adjust several set-points after service maintenance of your Genverter.
Refer to chapter 6 to gain access to this menu.

Touch Select shortly to scroll through the levels as described below. When no button is touched during 40 seconds, the display returns to the stand-by menu (chapter 3) automatically.

NOTE: If an arrow is displayed in the right part of the display, the direction of this arrow can be changed by holding Select pressed for three seconds. If the arrow is pointing downwards (↓) the displayed value can be decreased by pressing Set shortly. If the arrow is pointing upwards (↑) the value can be increased.

12.1 Clear maintenance time
Hold Set pressed for three seconds to clear the maintenance time counter after service.

12.2 Clear number of start attempts
The first screen allows you to clear the average runtime (see chapter 5.2), the total number of failed start attempts (see chapter 5.3) and the total number of successful start attempts (see chapter 5.4). Hold Set pressed for at least 3 seconds to clear these counters or press Select shortly to go to the next step.

12.3 Clear number of autostarts (start battery)
Only displayed when the autostart function is activated. See chapter 5.5. Hold Set pressed for at least 3 seconds to clear the number of starts of the autostart function triggered by a low voltage of the start battery (BAT1) or press Select shortly to go to the next step.

12.4 Clear number of autostarts (second battery)
Only displayed when the autostart function is activated. See chapter 5.6. Hold Set pressed for at least 3 seconds to clear the number of starts of the autostart function triggered by a low voltage of the second battery (BAT2) or press Select shortly to go to the next step.

12.5 Latest battery warning
This screen shows the most recent battery warning that was issued by the alarm function. (see chapters 7.10 and 7.12). It will help you to decide whether the parameters of the alarm function should to be adjusted. It can also be used to decide whether the batteries need to be replaced.
See chapter 13 for an overview of all warning codes.
12.6 Alarm function delay time (start battery)
This level is used to set the delay time of the alarm function triggered by a low voltage of the start battery (BAT1). See chapter 7.10. This delay prevents the alarm function being activated during a small dip in the battery voltage.
Factory setting: 10 sec.

12.7 Number of deep voltage hits (start battery)
Shows the number of times that the battery voltage of the start battery dropped below the level of the start battery low voltage warning (BAT1) (read only). Every time the battery voltage drops below this level during 5 seconds, this counter is increased by 1. A large number of deep voltage hits might indicate a too low battery capacity, an old battery that needs to be replaced or a defective battery charger.
See chapter 7.10 to adjust the level of the start battery low voltage warning.

12.8 Deepest voltage of the start battery
This screen shows the lowest average voltage of the start battery (BAT1). A lowering value might indicate an old battery that needs to be replaced.

12.9 Clear deep voltage hits (start battery)
Hold Set pressed for at least 3 seconds to clear the counter for the number of deep voltage hits (start battery) (see chapter 12.7) and the deepest voltage of the start battery (see chapter 12.8).

12.10 Alarm function delay time (second battery)
This level is used to set the delay time of the alarm function triggered by a low voltage of the second battery (BAT2). See chapter 7.12. This delay prevents the alarm function being activated during a small dip in the battery voltage.
Factory setting: 10 sec.

12.11 Number of deep voltage hits (second battery)
Shows the number of times that the battery voltage of the start battery dropped below the level of the second battery low voltage warning (BAT2) (read only). Every time the battery voltage drops below this level during 5 seconds, this counter is increased by 1. A large number of deep voltage hits might indicate a too low battery capacity, an old battery that needs to be replaced or a defective battery charger.
See chapter 7.12 to adjust the level of the second battery low voltage warning.
12.12 Deepest voltage of the second battery

Only displayed if the number of deep voltage hits (second battery) >0. This screen shows the lowest average voltage of the second battery (BAT2). A lowering value might indicate an old battery that needs to be replaced.

12.13 Clear deep voltage hits (second battery)

Hold Set pressed for at least 3 seconds to clear the counter for the number of deep voltage hits (second battery) (see chapter 12.11) and the deepest voltage of the second battery (see chapter 12.12).

12.14 Service start

Under normal circumstances, when the Genverter AC output voltage or frequency is out of range, the Genverter is stopped automatically within a few seconds. This is to protect the connected load. However when the Genverter is serviced, this automatic stop may be undesirable. In those cases a service start can be applied. With this service start the Genverter will run for two minutes to make it possible to carry out measurements by service engineers.

**CAUTION:** Too high or too low voltages may appear on the Genverter output. This may cause serious damage to the connected AC-load. Therefore appropriate measures must be taken, e.g. disconnect all loads from the Genverter. For this reason use of the service start may only be executed by trained technical engineers.

From the exit menu you can return to the select menu (chapter 6) by pressing Set shortly. If none of the buttons was touched for 40 seconds, the Digital Diesel Control returns to the stand-by menu.
13 WARNING AND FAILURE CODES

The tables below explain the warning codes and failure codes. Refer to the trouble shooting chapter at the user’s manual of the Genverter. Consult an installer, if you cannot solve the problem by means of this user’s manual.

A warning code is displayed when one of the settings of the energy menu (chapter 7) is out of range.

<table>
<thead>
<tr>
<th>Warning code</th>
<th>Problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO WARNING</td>
<td>None (no warning was detected)</td>
</tr>
<tr>
<td>LOW/HIGH RPM</td>
<td>The engine runs faster or slower than it was set to do.</td>
</tr>
<tr>
<td>LOW STARTBAT</td>
<td>Voltage of the start battery (BAT1) is below setting</td>
</tr>
<tr>
<td>NO BAT2</td>
<td>No second battery detected or voltage is below 5V while nominal voltage is set at 12V or 24V check connections/fuses/polarity of the second battery</td>
</tr>
<tr>
<td>LOW BAT2</td>
<td>Voltage of the second battery (BAT2) is below setting</td>
</tr>
<tr>
<td>AC- VOLTAGE</td>
<td>Genverter AC output voltage is too low.</td>
</tr>
<tr>
<td>HIGH CURRENT</td>
<td>Output current of the Genverter is above</td>
</tr>
<tr>
<td>COMMUNICATION</td>
<td>Communication error between the panel and the Genverter. Check the cable connection between the panel and the control unit.</td>
</tr>
<tr>
<td>OIL PRESS HIGH</td>
<td>The pressure switch in the cooling system indicates a too high oil pressure</td>
</tr>
<tr>
<td>OIL PRESSURE</td>
<td>The oil pressure in the lubrication system is too low</td>
</tr>
<tr>
<td>ENGINE TEMP</td>
<td>Temperature engine oil temperature is too high</td>
</tr>
<tr>
<td>EXHAUST TEMP</td>
<td>Exhaust temperature is too high (Wet only)</td>
</tr>
<tr>
<td>OVERLOAD</td>
<td>Generator runs above continuous power and can switch off after a certain time.</td>
</tr>
</tbody>
</table>

A failure code is displayed when a hardware failure at the Genverter is detected.

<table>
<thead>
<tr>
<th>Failure code</th>
<th>Problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO FAILURE</td>
<td>None (no failure was detected)</td>
</tr>
<tr>
<td>COMMUNICATION</td>
<td>Communication error between the panel and the Genverter</td>
</tr>
<tr>
<td>LOW BAT1</td>
<td>Starter battery voltage (BAT1) too low</td>
</tr>
<tr>
<td>PM ALTERNATOR</td>
<td>Voltage PM alternator is not OK.</td>
</tr>
<tr>
<td>EXHAUST TEMP</td>
<td>Exhaust temperature is too high (marine Genverters only)</td>
</tr>
<tr>
<td>OIL TEMP</td>
<td>Oil temperature too high</td>
</tr>
<tr>
<td>OIL PRESSURE</td>
<td>Oil pressure failure (lubrication oil pressure too low)</td>
</tr>
<tr>
<td>OIL PRESSURE HIGH</td>
<td>Oil pressure failure (lubrication oil pressure too low)</td>
</tr>
<tr>
<td>AC VOLTAGE</td>
<td>Inverter AC output voltage is out of range</td>
</tr>
<tr>
<td>OVERLOAD</td>
<td>Inverter overloaded</td>
</tr>
<tr>
<td>SHORT CIRCUIT</td>
<td>Inverter output short circuit</td>
</tr>
<tr>
<td>INV. OVERHEATED</td>
<td>Inverter temperature too high</td>
</tr>
<tr>
<td>SOFTWARE INV</td>
<td>Software failure in inverter</td>
</tr>
<tr>
<td>COMM ERROR INV</td>
<td>Communication between inverter and interface lost</td>
</tr>
<tr>
<td>FAILURE TO START</td>
<td>No start signal</td>
</tr>
</tbody>
</table>

14 TECHNICAL DATA

Model: Digital Diesel Control – version 4
Article number: 40209102
Function of the product: Monitoring and remote control instrument for a Genverter.
Delivery: Included with the supply of a Genverter set
Manufacturer: Whisper Power Drachten, the Netherlands
Supply voltage: Internally powered by the Genverter control unit.
Connection 2nd battery: Optional, input voltage range: 0-60V
Operating temperature: 0 to 45 °C Emission: EN 50081-1
Storage temperature: -20 to 70 °C Immunity: EN 50082-2
CE conformity: Yes LV directive: 73/23/EEG
EMC directive: 89/336/EEG Safety: EN60950
APPENDIX

Wrong operation of the Digital Diesel Control may lead to hazardous situations. Therefore the availability of certain functions and accessibility to specific menus can be restricted or extended at the set-up menu.

Instructions that are stated in this appendix may only be carried out by trained technical engineers!

SET-UP MENU
Follow the procedure below to gain access to the set-up menu.

IMPORTANT: Perform these steps only if you want to:
- change the Genverter model type, or
- change the accessibility to the select menu, or
- change the accessibility to the autostart menu, or
- change the accessibility to the interval menu, or
- add an offset to the measured values that are displayed.

If none of the buttons was touched for 40 seconds, the Digital Diesel Control will go to the stand-by menu without saving any of the settings. If this occurs unintended, you have to repeat the whole procedure again.

Keep the Select and the Set buttons pressed simultaneously while you insert the modular connector of the communication cable into the modular socket of the panel. You will enter the set-up menu. See below. Touch Select shortly to scroll through the levels as described below.

- **Reset to factory settings**
  - This screen allows you to reset all prior adjustments of the set-up menu back to the factory defaults.
  - Hold Set pressed for at least 3 seconds to reset all previous settings or press Select shortly to go to the next step.

- **Change model type**
  - The Digital Diesel Control recognizes the Genverter model automatically. If it fails to do so, you can select the model type here.
  - To change the model type, hold Set pressed for at least 3 seconds.
  - Then press Select shortly to scroll to the corresponding model type, followed by Set to store. Now “SEND GENTYPE PRESS SET 3S” is displayed. Press Set for 3 seconds to confirm the new setting or press Select to cancel.

- **Override maintenance blocking**
  - By default the autostart function and interval mode are blocked to start the Genverter when maintenance time has elapsed. Press Set if you want to override this blocking (=ON)
Access to interval menu denied / allowed
With the interval menu you can programme the interval mode: a timer to start and stop the Genverter at any desired moment. See chapter 10 for programming functions.
Press Set to allow accessibility to the interval menu.
Factory setting: denied.

Access to autostart menu denied / allowed
The autostart menu allows you to start the Genverter, triggered by a low battery voltage. See chapter 9.
Press Set to allow accessibility to the autostart menu.
Factory setting: denied.

Access to the select menu
From the select menu several advanced submenus can be accessed. See chapter 6 for explanation. Press Set to disable the accessibility to the select menu.
Factory setting: access allowed.

Access to the calibration menu
To be used by the manufacturer only. NEVER change this setting.
Press Select shortly to continue.

At the exit menu press Set shortly to save all adjustments at the setup menu and to go to the stand-by menu (see chapter 3)
If none of the buttons was touched for 40 seconds, the Digital Diesel Control will go to the stand-by menu without saving any of the adjustments.
Press Select to return to reset to factory settings.

SECOND BATTERY
If a second battery is connected to the Digital Diesel Control, refer to chapter 7.11 of this manual to select the nominal voltage of this battery.
APPENDIX

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TROUBLE SHOOTING

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