THOMSON TECHNOLOGY
POWER & CONTROL
A REGAL-BELOIT COMPANY

MEC 310

GENSET CONTROLLER

INSTALLATION AND OPERATION MANUAL

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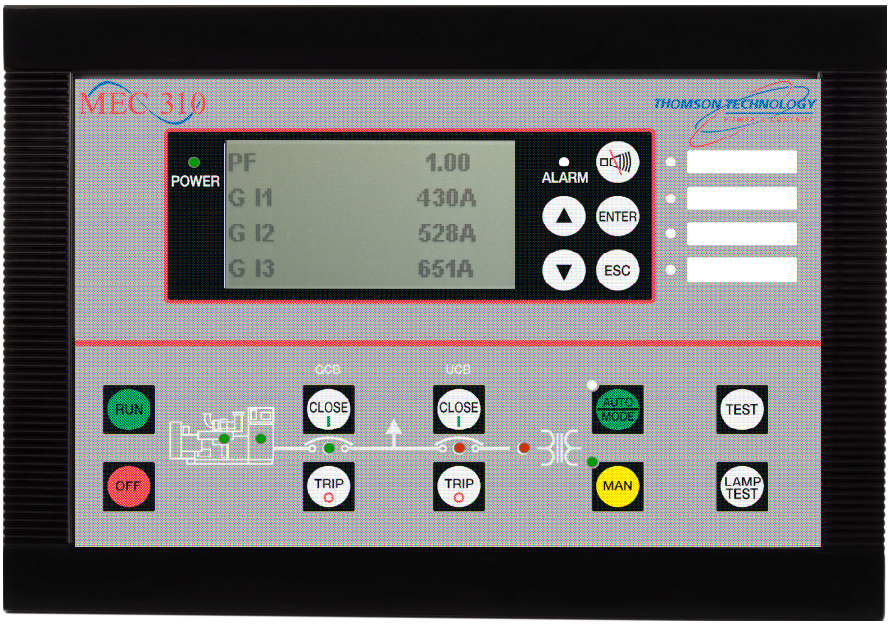

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Table of Contents

1. About this document

This chapter includes general user information about this handbook concerning the general purpose, the intended users, the overall purpose and the overall contents and structure.

General purpose

This document is the Installation Instructions and Reference Handbook for Thomson Technology's MEC 310 Generator Controller. The document mainly includes installation instructions, presentation of push-buttons, LEDs and display, functional descriptions and complete standard parameter lists.

The general purpose of the Installation Instructions and Reference Handbook is to provide the information needed to install the unit correctly and to provide information about the functionality of the unit and its applications. The handbook also offers the user the information he needs in order to successfully set up the parameters needed in his specific application.

Please make sure to read this handbook before working with the multi-line 2 controller and the gen-set to be controlled. Failure to do this could result in human injury or damage to the equipment.

Intended users

The handbook is mainly intended for the person responsible for installing the unit and for the person responsible for the unit setup. Naturally, others might also find useful information in the handbook.

Contents/overall structure

The Installation Instructions and Reference Handbook is divided into chapters and in order to make the structure of the document simple and easy to use, each chapter will begin from the top of a new page. The following will outline the contents of each of the chapters.

About this document

This first chapter includes general information about this handbook as a document. It deals with the general purpose and the intended users of the Installation Instructions and Reference Handbook. Furthermore, it outlines the overall contents and structure of the document.

Warnings and legal information

The second chapter includes information about general legal issues and safety precautions relevant in the handling of Thomson Technology products. Furthermore, this chapter will introduce note and warning symbols, which will be used throughout the handbook.

General product information

The third chapter will deal with the unit in general and its place in the Thomson Technology product range.

Installation instructions

This chapter includes the information needed to perform correct installation of the unit, e.g. mounting instructions, terminals, wiring, inputs etc.

Push-buttons, LEDs and display

This chapter deals with push-button and LED functions. Furthermore, information about the display including icon list is presented.

Functional descriptions

This chapter includes functional descriptions for the unit's standard functions. Screen dumps and flow charts are used in order to simplify the information.

Parameter list

This chapter includes a complete standard parameter list for setup. Therefore, this chapter is to be used for reference, when information about specific parameters is needed.

2. Warnings and legal information

This chapter includes important information about general legal issues relevant in the handling of Thomson Technology products. Furthermore, some overall safety precautions will be introduced and recommended. Finally, the highlighted notes and warnings, which will be used throughout the document, are presented.

Legal information and responsibility

Thomson Technology takes no responsibility for installation or operation of the generator set. If there is any doubt about how to install or operate the generator set controlled by the unit, the company responsible for the installation or the operation of the set must be contacted.

The units are not to be opened by unauthorised personnel. If opened anyway, the warranty will be lost.

Electrostatic discharge awareness

Sufficient care must be taken to protect the terminals against static discharges during the installation. Once the unit is installed and connected, these precautions are no longer necessary.

Safety issues

Installing the unit implies work with dangerous currents and voltages. Therefore, the installation should only be carried out by authorised personnel who understand the risks involved in working with live electrical equipment.

Be aware of the hazardous live currents and voltages. Do not touch any AC measurement inputs as this could lead to injury or death.

Factory settings

The unit is delivered with certain factory settings. Given the fact that these settings are based on average values, they are not necessarily the correct settings for matching the individual engine. Thus precautions must be taken to check the settings before running the engine.

Definitions

Throughout this document a number of notes and warnings will be presented. To ensure that these are noticed, they will be highlighted in order to separate them from the general text.

Notes

The notes provide general information which will be helpful for the reader to bear in mind.

Warnings

The warnings indicate a potentially dangerous situation which could result in death, personal injury or damaged equipment, if certain guidelines are not followed.

3. General product information

This chapter includes overall product information about the unit in general and its place in the Thomson Technology product range.

Introduction

The concept of the MEC 310 is to offer a simple and effective solution to gen-set builders, who need a flexible yet cost-competitive protection and control unit for small and medium-sized generators.

Type of product

The Generator Controller MEC 310 is a microprocessor-based control unit containing all necessary functions for protection and control of a power generator. Besides the control and protection of the diesel engine it contains a full 3-phase AC voltage and current measuring circuit. The unit is equipped with an LCD display presenting all values and alarms.

Standard functions

Engine control

- Start preparation (preheating or prelubrication)
- Start/stop sequences with selectable number of start attempts
- Fuel solenoid selection (coil type)
- Idle speed control
- Local or remote start/stop
- Stop sequence with cooling down
- Running speed detection selectable
  - Generator Hz/V
  - Charger alternator input (W terminal)
  - Binary input (D+)
  - Oil pressure

Engine monitoring

- 3 configurable inputs, all selectable between
  - VDO or
  - 4-20mA from active transducer or
  - Binary with cable supervision
- 6 binary inputs, configurable
- RPM input, selectable
  - Magnetic pick-up
  - NPN or PNP pick-up
  - Tacho generator
  - Charger alternator W terminal

Generator monitoring

- 3-phase or single phase generator monitoring
  - Voltage/current/frequency/power/reactive power

Generator protection (ANSI)

- Over-/undervoltage (27/59)
- Over-/underfrequency (81)
- Overcurrent (51)
- Reverse power (32)

Clear text display

- 128 x 64 pixel backlight STN
- Graphic symbol messaging
- Clear text alarm messages
- Clear text diagnostics for both hardwired inputs and CANbus messages (J1939)
- Log book holding 30 log entries
- Real time clock for time and date

Options

The basic MEC 310 generator controller unit can be equipped with an AMF option needed to provide a real emergency power system controller. Furthermore, CANbus communication for different engine types is available.

A full options list is included in the data sheet.

4. Installation instructions

This chapter includes the information needed to perform correct installation of the unit, e.g. mounting instructions, terminals, wiring, inputs etc.

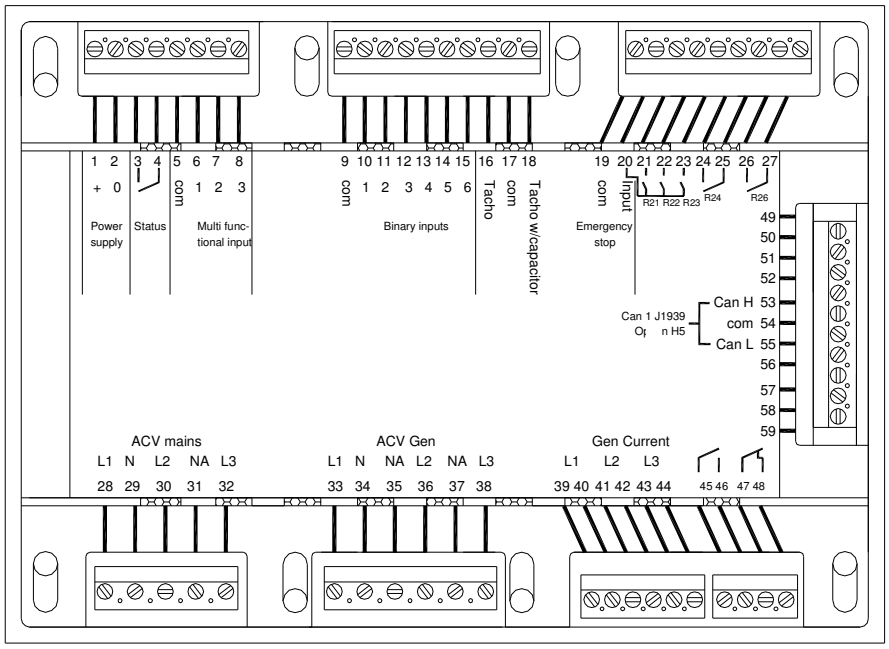
Mounting

The unit is designed for flush mounting by means of 4 fixing clamps (IP52), which are included at delivery. To have the IP65 (12 fixing clamps) the unit must be ordered with option L. The two fixing clamps on each side are mounted on the top and bottom of the MEC 310 box.

For Use on a Flat Surface of a Type 1 Enclosure.

Terminals

Unit rear view



The RJ11 connector for the PC connection interface (SSP) is placed on the side of the unit.

Terminal Description

- **Must be installed in accordance with the NEC (United States) or the CEC(Canada)**
- **Wire size: AWG 30 – 12 (or equivalent)**
- **Use 60/75°C copper conductors only**
- **Tightening torque: 5-7 lb-in (or equivalent)**
- **Main disconnect shall be provided by installer**

Term.	Technical data	Description
1	Power supply +	6…36V DC (UL/C-UL: 7.5…32.7V DC)
2	Power supply –	GND
3-4	Status out. Contact ratings 1A 24V DC/V AC Resistive	General status output for marine approvals
9	Common	Common for term. 10…15
10	Digital input	Start enable/configurable
11	Digital input	Remote start/stop/configurable
12	Digital input	Charge alternator D+ (running)/configurable
13	Digital input	Configurable
14	Digital input	Coolant temperature/configurable
15	Digital input	Oil pressure/configurable
19	Common	Common for emergency stop term. 20
20	Emergency stop and common for 21…23	Common for relay 1, 2 and 3 and input for emergency stop*
21	Relay output 21. Contact ratings 2A 30V DC/V AC (UL/C-UL: 1A Resistive)	Horn/configurable. Function NO
22	Relay output 22. Contact ratings 2A 30V DC/V AC (UL/C-UL: 1A Resistive)	Alarm/configurable. Function NO
23	Relay output 23. Contact ratings 2A 30V DC/V AC (UL/C-UL: 1A Resistive)	Start prepare/configurable. Function NO
24-25	Relay output 24. Contact ratings 8A 30V DC/V AC (UL/C-UL: 6A Resistive)	Run coil/stop coil/configurable. Function NO
26-27	Relay output 26. Contact ratings 8A 30V DC/V AC (UL/C-UL: 6A Resistive)	Starter (crank)/configurable. Function NO
Multi-functional inputs		
5	Common	Common for term. 6…8
6	VDO1/4...20mA/binary input	Fuel level/configurable
7	VDO2/4...20mA/binary input	Oil pressure/configurable
8	VDO3/4...20mA/binary input	Water temp./configurable
Optional CANbus engine interface		
53	CAN-H	CAN J1939 engine communication
54	CAN-GND	
55	CAN-L	
Tacho RPM input		
16	RPM input	Magnetic pick-up/tacho generator
17	RPM-GND	Common for RPM input
18	RPM input W	Magnetic pick-up. PNP, NPN or charge alternator W terminal
3-phase generator voltage input		
33	Gen. voltage L1	Generator voltage and frequency
34	Gen. neutral	
35	Not used, must not be connected	
36	Gen. voltage L2	

37	Not used, must not be connected	
38	Gen. voltage L3	

3-phase generator current input		
39	Gen. current L1, s1	Generator current. Use listed or R/C (XODW2,8) current transformer.
40	Gen. current L1, s2	
41	Gen. current L2, s1	
42	Gen. current L2, s2	
43	Gen. current L3, s1	
44	Gen. current L3, s2	
Optional 3-phase mains voltage inputs		
28	Mains voltage L1	
29	Mains voltage neutral	
30	Mains voltage L2	
31	Not used, must not be connected	
32	Mains voltage L3	
Breaker relays		
45	Relay R45	Generator circuit breaker, function NO (normally open). Not configurable
46	Relay R45	
Optional relay for closing mains breaker (option A)		
47	Relay R47	Mains circuit breaker, function NC (normally closed). Option A. Not configurable
48	Relay R47	

* If terminal 20 is used for emergency stop, please see wiring diagram on page 13.

** The status relay is the uP watchdog output. This relay is normally energised, and the switch is closed after power-up. If the uP fails or the power is lost, the relay will deenergise and the switch will open. If the unit fails to start up at power-up, then the relay switch will remain open.

The binary output functions are configurable via the TPS 300 software and can be configured to cover the following functions:

- Alarm/limit
- Engine running
- Horn
- Idle speed
- Not used
- Start prepare
- Run coil
- Starter
- Stop coil
- External heater
- Stop coil (not acc. in start seq.)

It is possible to choose run coil on one relay and stop coil on another, thus supporting engines with double systems.

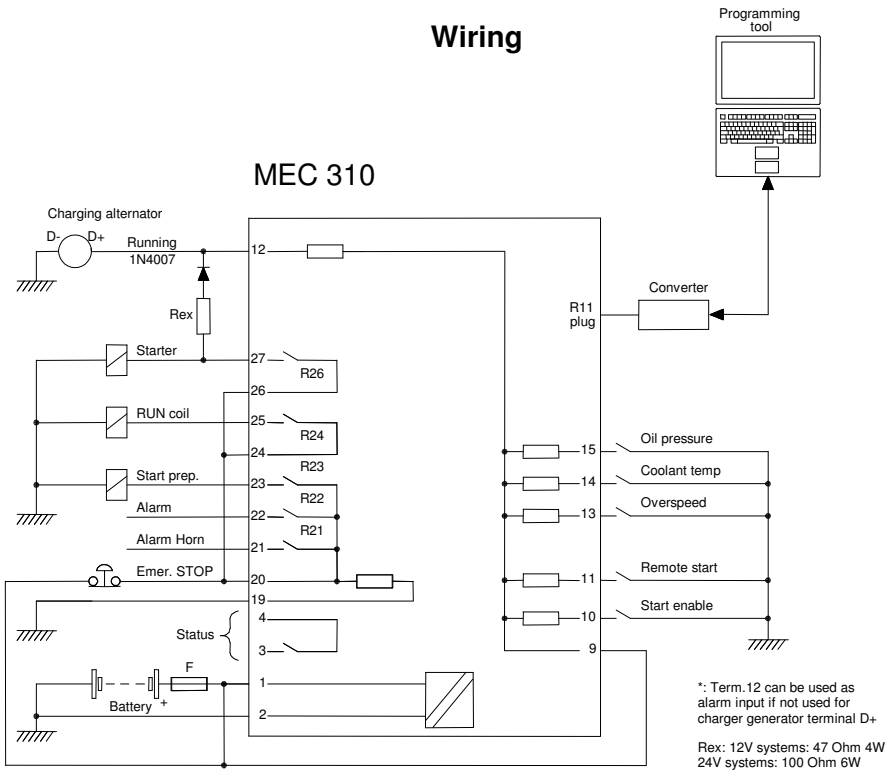
The multi-functional inputs can be configured to cover the following functions:
- VDO sensor input
- 4…20mA input
- Binary input with the possibility of cable supervision

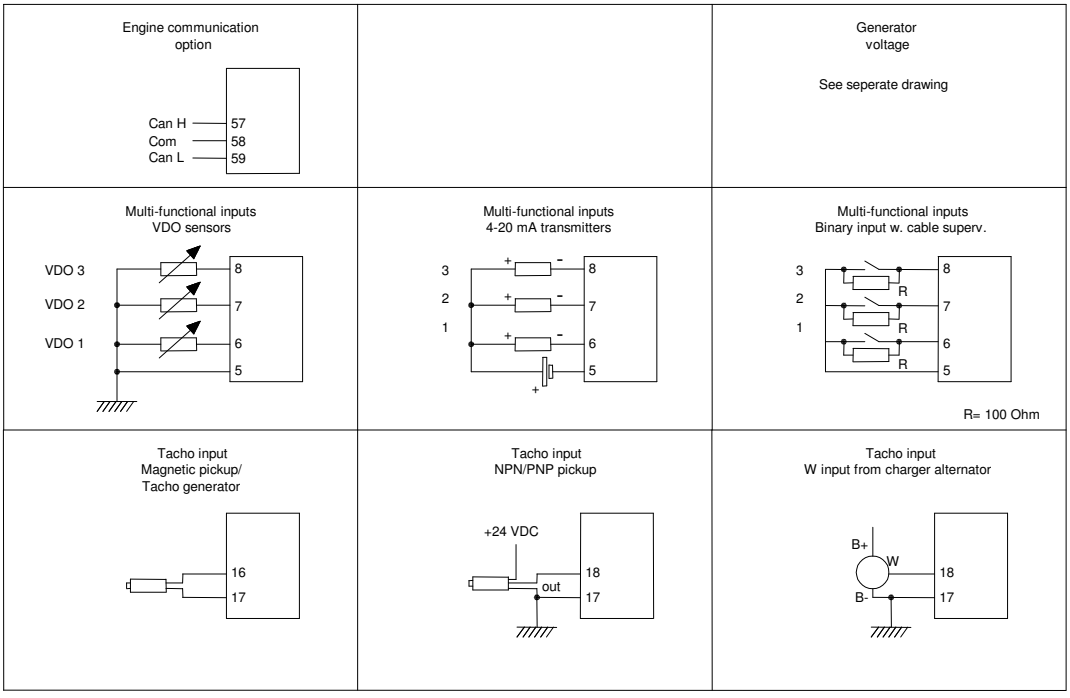
Tacho RPM input can be configured to cover the following functions:
- Magnetic pick-up (2-wire)
- W terminal on charger alternator
- NPN or PNP pick-up*

* These RPM inputs require external equipment.

The generator voltage and current input can be configured to the following:
- Voltage 100…25000V primary
- Current 5….9000A primary

Wiring



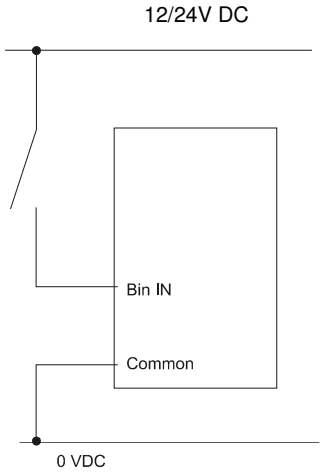


The illustrated configuration is the default factory setting. The use of the relays can be chosen freely.

It is important to protect the unit against damage caused by high voltages. Therefore, the fuse must not be more than 2A.

Binary inputs

All binary inputs are 12/24V DC bi-directional optocoupler type. The typical wiring is illustrated below:



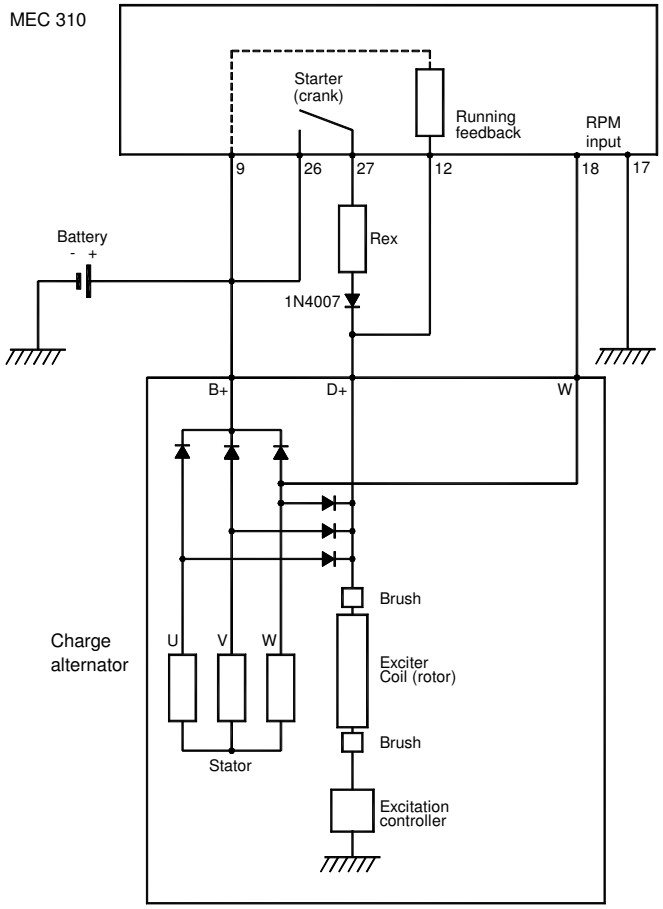
The binary inputs use fixed signals. Only the mode shift input and the test input (if the timer is used) use pulse signal.

Charger alternator connections

The charger alternator can be connected in 2 different ways:

1) Using the D+ terminal connected to terminal 12
2) Using the W terminal connected to the RPM input

Usually only one of these possibilities is used.

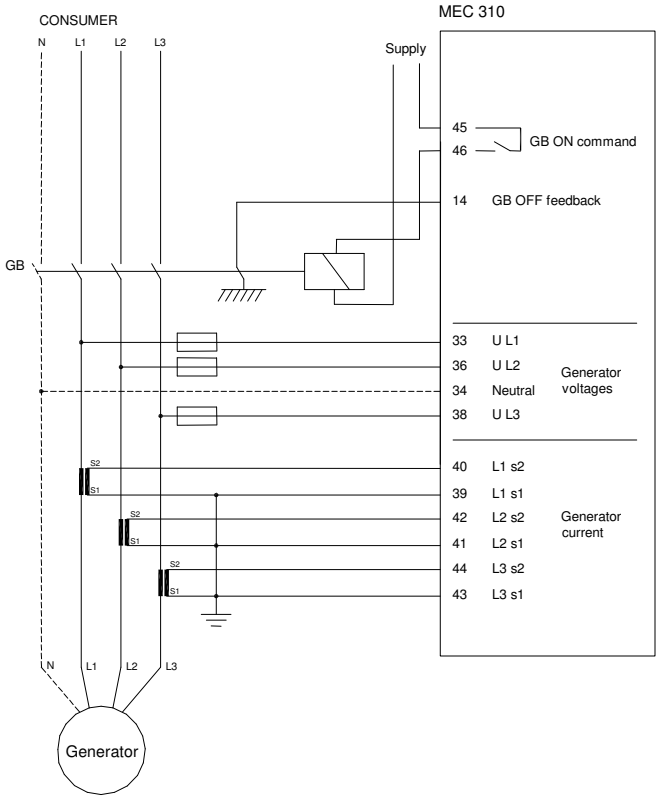


Rex: Excitation resistor	12V systems: 47Ω 4 W
	24V systems: 100Ω 6 W

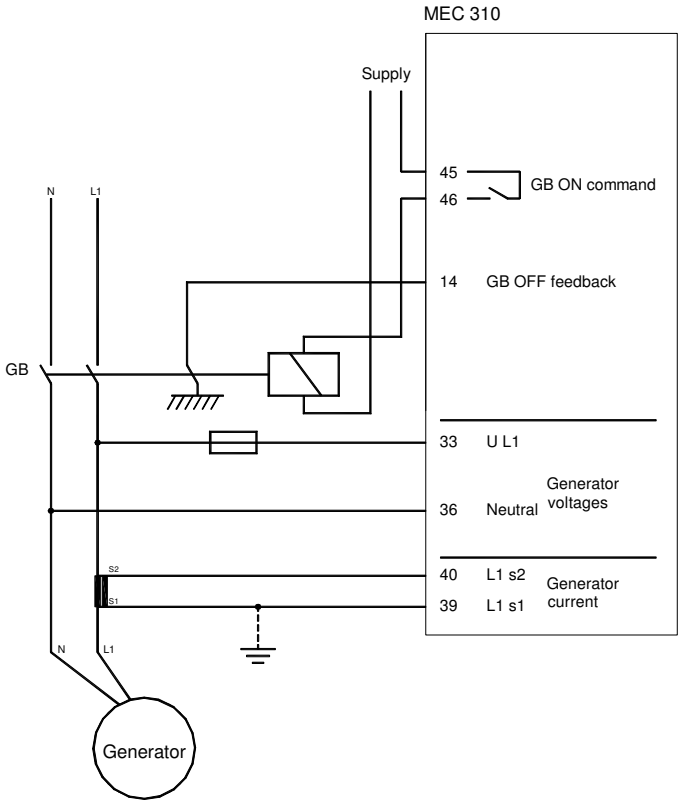
At standstill the battery + is connected to terminal 9 (common), and a current flows to terminal 12 and via the D+ input on the alternator to ground (battery -). When the starter is engaged (cranking), the battery will supply the D+ through the REX resistor, helping the alternator to excite. When the alternator starts to produce voltage (excitation OK), the speed of the alternator will be above running speed, and the voltage on term. 12 will rise to a value higher than the battery voltage and then interrupt the current flow through REX and activate the running feedback input. Engine is running.

Connection of the 3-phase voltage and current

Wiring, AC interface



Connection of the 1-phase voltage and current



Technical information

Technical specifications

Accuracy:	Class 2.0 to EN 60688/IEC 688
Galvanic separation:	Between inputs and aux. power supply: 500V DC – 1 min.
Connections:	1.5 mm^2 multi stranded
Operating temperature:	-25…70°C (UL/C-UL: Maximum ambient temp. 50°C)
Storage temperature:	-40…70°C
Aux. supply:	6-36V DC (UL/C-UL: 7.5…32.7V DC) continuously Max. 8W consumption
Measuring input voltage:	50…480V AC phase to phase (+20%)
Load:	1.5MΩ
Measuring input current (In):	/1 or /5A meas. range 0…200% Use listed or R/C (XODW2,8) current transformer
Load:	Max. 0.5VA per phase
Frequency:	30…70Hz
Analogue input:	From active transducer
Current:	4…20mA
Impedance:	50Ω Cable supervision: I <3mA = Fault Response times: 500ms

(From the set point is reached till the output is activated or the delay timer is started).

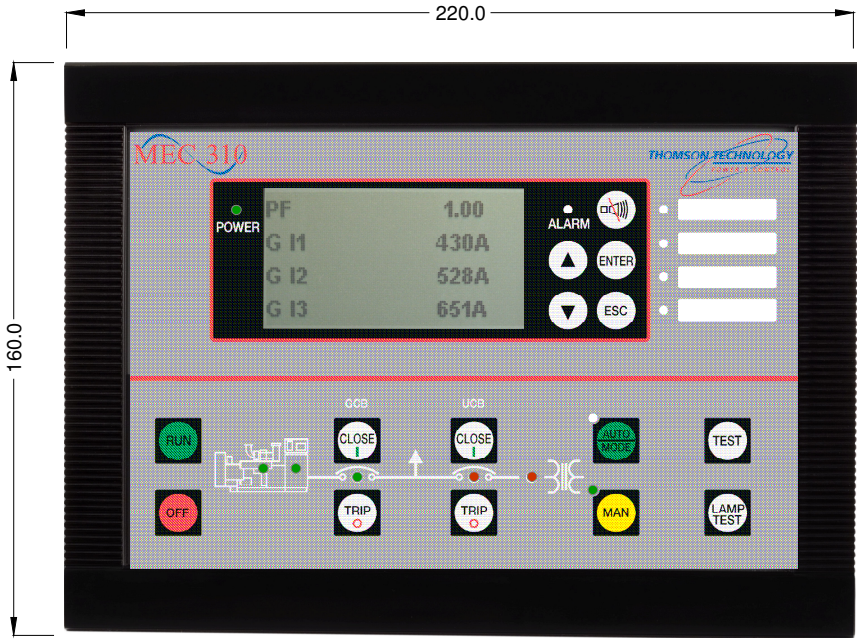
Multi inputs:	Resistor inputs, internal 3V supply Cable supervision: R >150Ω = Wire break Response times: 500ms

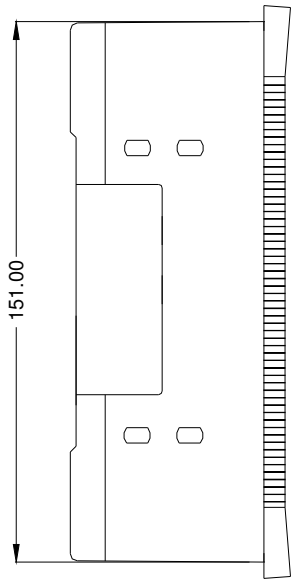
(From the set point is reached till the output is activated and the delay timer is started).

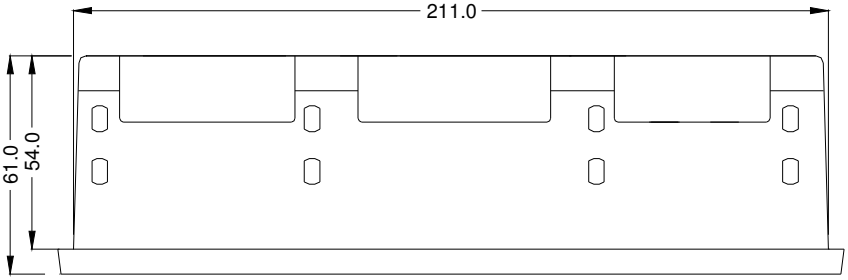
Active binary inputs:	Dry contact inputs with cable supervision
Internal voltage:	3V DC
Impedance:	240Ω ~ 16mA
RPM input:	2.0...70V 10...10,000Hz
Passive binary in voltage:	Bi-directional optocoupler 6…36V DC
Relay outputs:	5 relays: 30V DC/AC 2A (UL/C-UL: 1A Resistive) 2 relays: 30V DC/AC 8A (UL/C-UL: 6A Resistive) 1 status relay: 24V DC 1A Resistive

Mounting:	Panel mounted
Size:	160 x 220mm
EMC/CE:	To EN 61000-6-1/2/3/4 SS4631503 (PL4) and IEC 255-3
Material:	All plastic materials are self-extinguishing according to UL94
Plug connections:	Wire size AWG 30 – 12 (or equivalent) Use 60/75°C copper conductors only
Tightening torque, min.:	5-7 lb-in (or equivalent)
PC connection:	RS232 converter box (SSP)
Approval:	CE & C-UL (listing pending)
Weight:	Approx. 0.9 kg (2.0 lbs)

Unit dimensions and panel cutout







Panel cutout

H x W = 151 x 211 +1 mm

H x W = 5.94” x 8.31” +0.04”

5. Push-buttons, LEDs and display

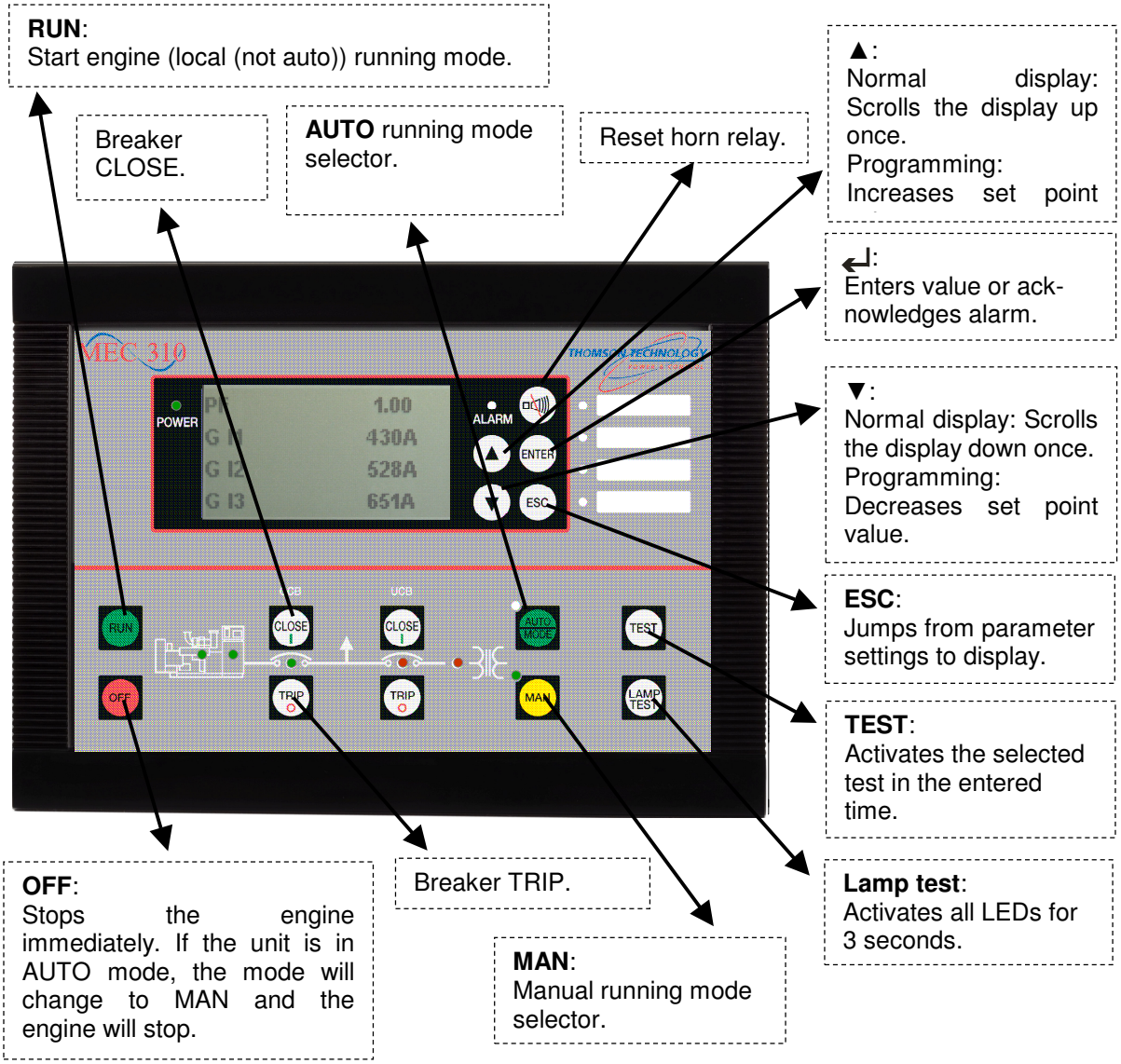
This chapter deals with the display including the push-button and LED functions.

Unit

Front dimensions H x W	160 x 220 mm (6.30” x 8.66”)
Unit depth	54 mm (2.13 “)

Push-button functions

The push-buttons on the unit have the following functions:



RUN: Start engine (local (not auto)) running mode.

OFF: Stops the engine instantaneously. If the unit is in AUTO mode, the mode will change to MANUAL and the engine will stop.

TRIP: Trip the breaker.

CLOSE: Close the breaker.

AUTO: AUTO running mode selector.

MAN: Manual running mode selector.

TEST: Initiates the test sequence selected for the push-button.

LAMP TEST: Lamp test. One push will illuminate all LEDs for 3 seconds.

ESC: Jumps from parameter settings to display. Removes pop-up messages.

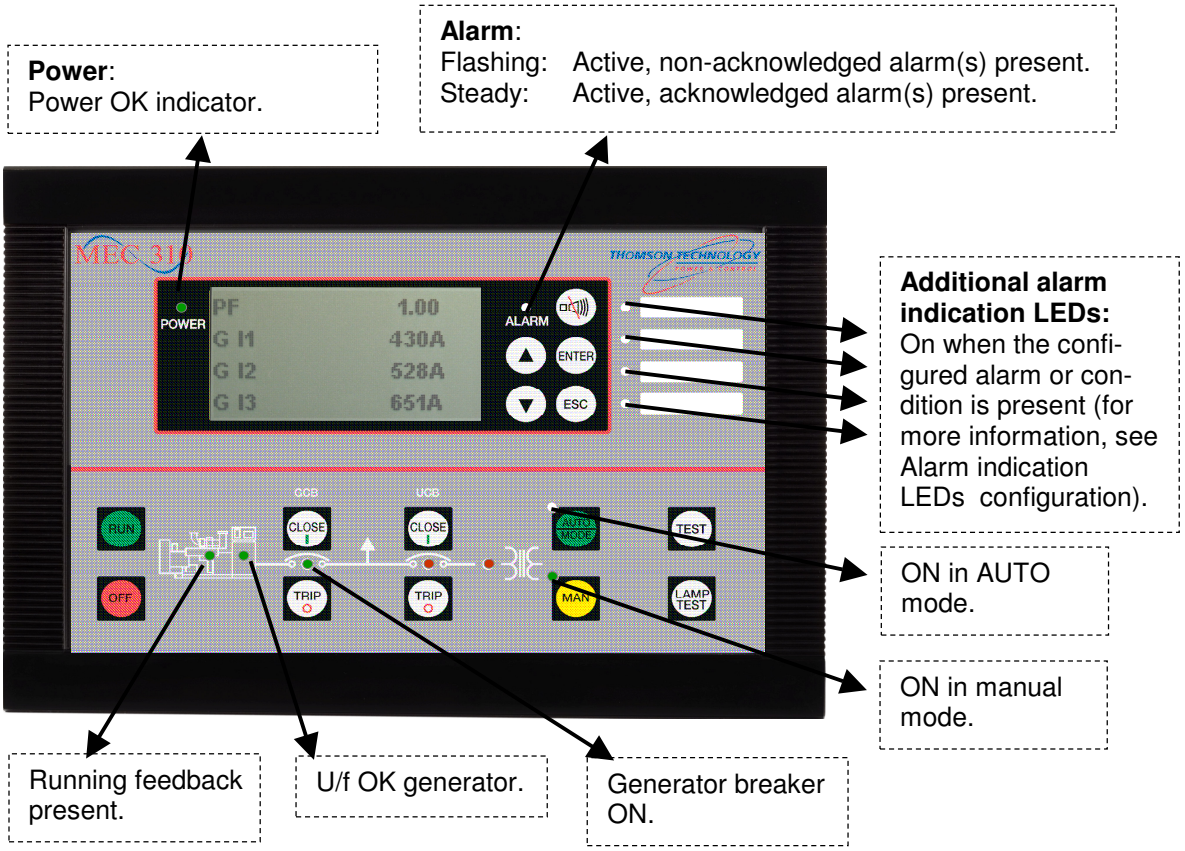
 : Resets horn relay. Press 2 seconds to jump to the alarm list.

▲: Normal display: Scrolls the display up once. Programming: Increases set point value.

▼: Normal display: Scrolls the display down once. Programming: Decreases set point value.

ENTER: Enters value/acknowledges alarm.

LED functions



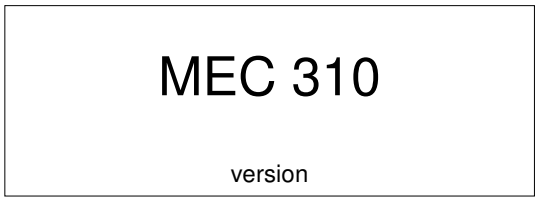
Power: Power OK indicator.

Alarm: Flashing: Active, non-acknowledged alarm(s) present.
Steady: Active, acknowledged alarm(s) present.

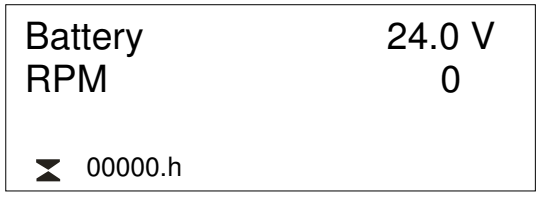
Additional alarm indication LEDs: Flashing (red): Active, non-acknowledged alarm(s) where output A or B is configured to LED 1, 2, 3 or 4.
Steady (red): Active, acknowledged alarm(s) where output A or B is configured to LED 1, 2, 3 or 4.

Display functions

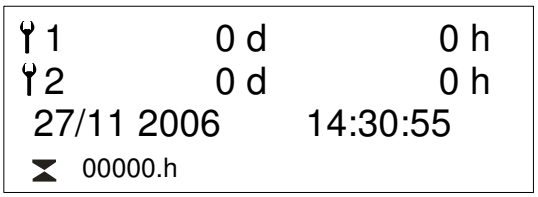
The display indicates both readings and alarms. Illustrated below are examples with icons and English language.



Type and software version.



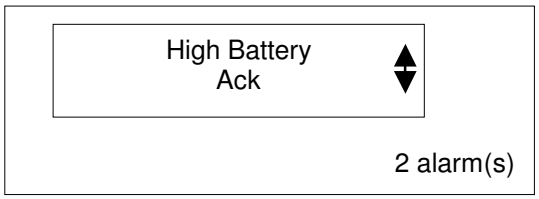
Battery voltage, RPM and running hours counter.



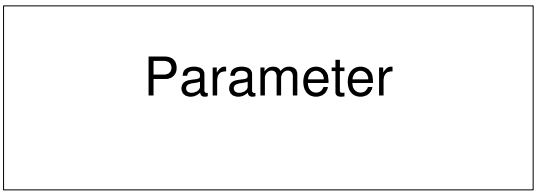
Service timer 1 and 2.

Date and time.

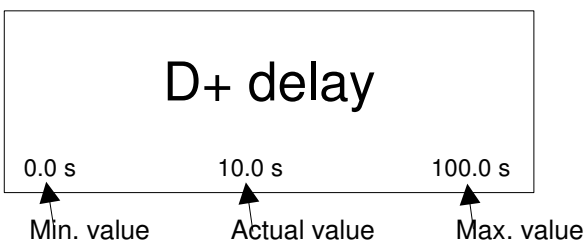
Press ↵ to enter the list of active alarms.



Active alarm list. The alarm list pops up automatically, when an alarm appears. When the arrow is present, more alarms are active. Press ▼ to scroll through the list. Exit the list by pressing ESC.



Press ↵ to enter the parameter setting.

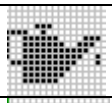
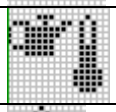
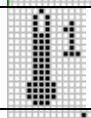
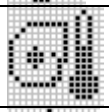
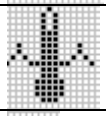
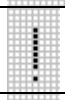
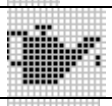
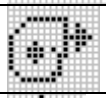
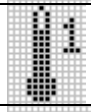
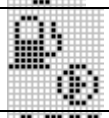
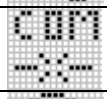
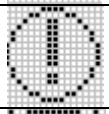
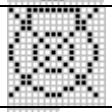
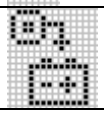


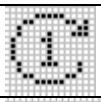
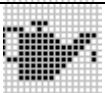
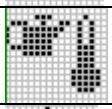
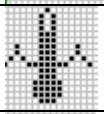
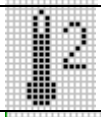
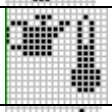
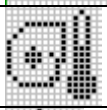
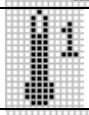
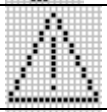
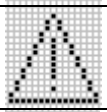
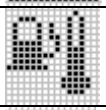
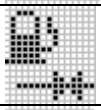
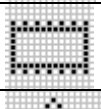
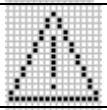
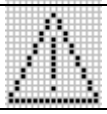
Parameter example: D+ delay setting. Use ▲ or ▼ to scroll through the settings list. If change of settings is necessary, press ↵ and enter the password. Then use ▲ or ▼ to change values. Use ESC to leave settings.

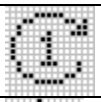
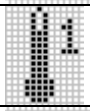
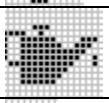
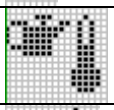
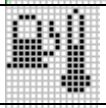
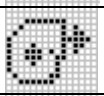
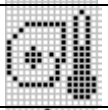
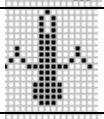
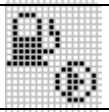
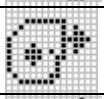
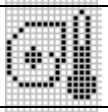
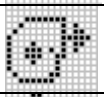
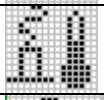
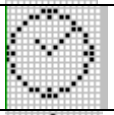
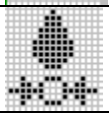
The available parameters depend on the set options. Some parameters can only be changed using the TPS 300 software. The parameter list will automatically be abandoned, if no button is pressed during a 30 sec. period.

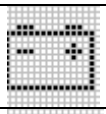
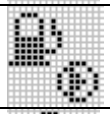
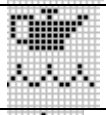
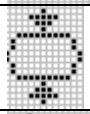
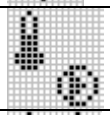
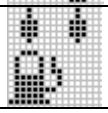
Icon list

The list covers all available icons including those related to the engine communication.

	Warning list	Icon
1	Low oil pressure warning	
2	EIC temp. lube oil	
3	High coolant temp. warning	
4	High intercooler temp.	
5	Defect coolant level switch	
6	EMR warning	
7	JDEC warning	
8	Oil pressure	
9	Intake manifold	
10	Coolant temperature	
11	Fuel injection pump	
12	EI comm. error	
13	EIC warning	
14	Stop limit exceeded	
15	EMS warning	
16	Charge gen.	

	Shutdown list	Icon
17	Overspeed shutdown	
18	Low oil pressure shutdown	
19	EIC temp. lube oil	
20	Low coolant level shutdown	
21	High coolant temp. shutdown	
22	High oil temp. shutdown	
23	High charge air temp. shutdown	
24	High coolant temp. shutdown	
25	EMR shutdown	
26	JDEC shutdown	
27	Fuel temperature	
28	Fuel control valve	
29	ECU failure	
30	EIC shutdown	
31	EMS shutdown	

	Analogue readings	**Icon**
32	EIC speed	
33	EIC coolant temp.	
34	EIC oil pressure	
35	EIC faults	
36	EIC oil temp.	
37	EIC fuel temp.	
38	EIC boost pressure	
39	EIC air inlet temp.	
40	EIC coolant level	
41	EIC fuel rate	
42	EIC charge air pressure	
43	EIC charge air temp.	
44	EIC air inlet pressure	
45	EIC exhaust gas temp.	
46	EIC engine hours	
47	EIC oil f. diff. press.	

48	EIC battery voltage	
49	EIC fuel del. press.	
50	EIC oil level	
51	EIC crankcase press.	
52	EIC coolant pressure	
53	EIC water in. fuel	

6. Functional descriptions

This chapter includes functional descriptions for the unit's standard functions. Screen dumps and flow charts are used in order to simplify the information.

Alarm function

The unit will detect and display individual alarms which are enabled. Furthermore, it is possible to activate relays for alarm purposes. The alarms can be configured to any of the available relay outputs. Each alarm function has two output settings, namely output A and output B.

Alarms can be acknowledged in one of two ways: Either the binary input "alarm ack." (selectable to be one of the binary inputs 10, 11, 12, 13, 14 and 15) is used, if this is configured for alarm acknowledge, or the select button on the display is used:

- The alarm acknowledge input acknowledges all present alarms, and the alarm LED will change from flashing to steady light.

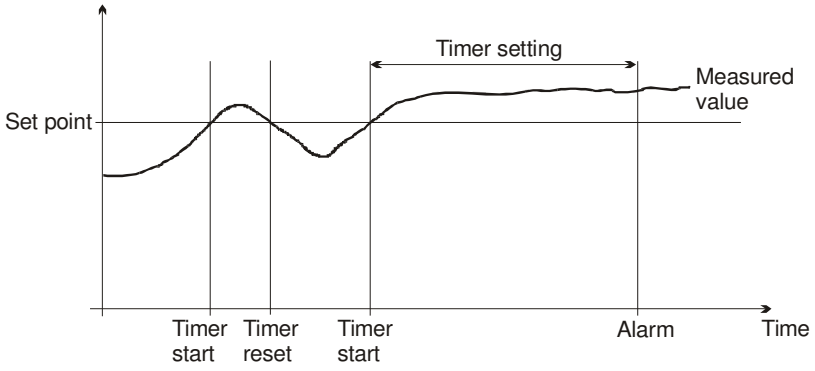
- The display can be used in the alarm information window. The alarm information window displays one alarm at a time and the alarm state whether the alarm is acknowledged or not. If it is unacknowledged, then press ◄ to acknowledge it. Use the ▲ and ▼push-buttons to scroll in the alarm list.

The alarm LED will be flashing, if unacknowledged alarms are present. The alarm relay will deactivate, when the alarm situation is reset and the alarm is acknowledged.

Timer function

The delay settings are all of the definite time type, i.e. a set point and time is selected.

If the function is e.g. overspeed, the timer will be activated, if the set point is exceeded. If the RPM value goes below the set point value before the timer runs out, then the timer will be stopped and reset.



When the timer runs out and the alarm is present, the output is activated.

TPS 300 software input configuration

It is possible to configure the inputs indicated in the table. The unit has a number of passive binary inputs (input terminals 10-15).

Input function	Comment
Test run	Configurable
Nom. setting 3 1 ph	Configurable
Alarm acknowledge	Configurable
Parameter shift (secondary parameters)	Configurable
Start enable (OFF = start blocked)	Configurable
GB Pos on	Configurable
GB Pos off	Configurable
MB Pos on	Configurable (option A)
MB Pos off	Configurable (option A)
Access lock	Configurable
Mode shift (auto/manual)	Configurable
Fire pump	Configurable
Remote start/stop	Configurable
D+	Configurable
Digital inputs no. 1….6 used as alarms	Configurable
Idle speed	Configurable
Inhibit EI alarms	Configurable (option J)

Input function description

1. Test run

When the test input is activated, the selected test sequence will start. Please see the test function description for further information.

2. Nom. setting 3 1 ph

Activates the third set of nominal settings, if the parameter 6026 is set to binary input. When deactivated, the MEC 310 returns to Nom. setting 1.

3. Alarm acknowledge

Acknowledges all present alarms.

4. Parameter shift

Selection of this input will make the unit use the secondary set of parameters (SP2).

5. Start enable

This input must be activated to start the engine.

Start enable is start control only, i.e. if removed when the engine is running, the engine keeps on running.

6. GB Pos on

When this input is activated, the MEC 310 sees the generator breaker as closed. If the GB on and the off feedback are on or off simultaneously, a GB position failure is displayed.

7. GB Pos off

When this input is activated, the MEC 310 sees the generator breaker as open. If the GB on and the off feedback are on or off simultaneously, a GB position failure is displayed.

8. MB Pos on

When this input is activated, the MEC 310 sees the mains breaker as open. If the MB on and the off feedback are on or off simultaneously, an MB position failure is displayed.

9. MB Pos off

When this input is activated, the MEC 310 sees the mains breaker as open. If the MB on and the off feedback are on or off simultaneously, an MB position failure is displayed.

10. Access lock

Activating the access lock input deactivates the control push-buttons on the display. It will only be possible to view measurements, alarms and the log.

11. Mode shift

Selection between manual and auto running. The mode is changed every time the input is activated (pulse input).

12. Fire pump (shutdown override)

Deactivates all protection functions except overspeed and emergency stop protection.

13. Remote start/stop input

Activating this input will start the gen-set. Deactivating it will stop the gen-set after cool down (auto mode only).

14. D+ (digital running feedback)

This input is used as a running indication of the engine. When the input is activated, the start relay is deactivated. Input for running feedback from charge generator +D terminal. (Runs when charger U > battery voltage).

15. Digital inputs 1…6

These inputs are configurable as alarm inputs.

16. Idle speed

Activating the idle speed input holds the engine at idle speed for as long as it is set.

17. Inhibit EI alarms

When this input is active, it will inhibit all engine interface (option J) alarms.

Output functions

It is possible to configure the output fonctions indicated in the table. The unit has 5 configurable relay outputs (output terminals 20-27).

Input function	Comment
Alarm/limit	Factory setting Relay 22
Engine running	
Horn	Factory setting Relay 21
Idle speed	
Prepare	Factory setting Relay 23
Run coil	Factory setting Relay 24
Starter	Factory setting Relay 26
Stop coil	
External heater	
Stop coil (not acc in start seq.)	

Output function description

1. Alarm/limit

When this setting for the relay is selected, the relay can be used in the alarm parameters in the setting Output A and Output B. This means that with factory settings the relay 2 can be used in the parameters as an alarm relay. If the relay is preferred to be a Limit relay, this selection must be done in the parameter list parameter 5000 to 5040.

2. Engine running

If a relay is configured to this function, this relay will close when a running feedback is detected. The relay will open again when the engine stops.

3. Horn

The horn relay is a common alarm output. This means that every time an alarm state appears the horn relay will close for the time configured in the parameter 6130 Alarm horn regardless of fail class. If 6130 is set to 0 seconds, it will be on until the reset horn push-button is activated or the alarm(s) has (have) been acknowledged.

4. Idle speed

This relay will close to give the engine governor the idle command (Low speed).

5. Prepare

This function will close the relay as the first thing in the start sequence. The relay will be closed for the time programmed in parameter 6181. This function is used for preheating the engine or for prelubrication.

6. Run coil

The relay configured to Run coil will be closed the entire time the engine is supposed to run.

7. Starter

The relay configured to Starter will be closed for the time selected in parameter 6184 in the start sequence of the MEC 310.

8. Stop coil

This relay will close to stop the engine, and when no running feedback is present it will stay closed in the ext. stop time (parameter 6212).

9. External heater

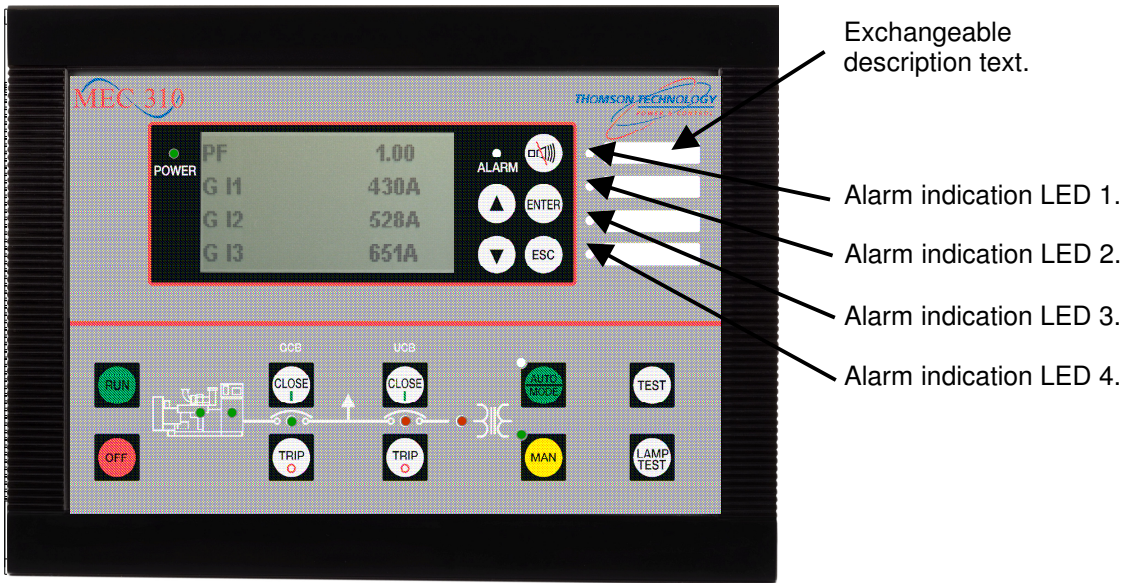
The relay configured to External heater will close when the temperature is below the set point in parameter 6320 and open again when the temperature is above the set point in parameter 6330. For more information, see the description of the function.

10. Stop coil (not acc. in start seq.)

The relay configured to this function will do the same as the normal stop coil with one exception: It will not close between the start attempts.

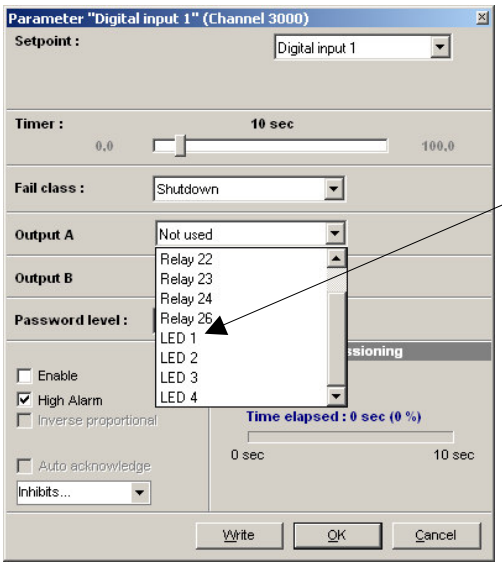
Alarm indication LEDs

Alarm indication LEDs are the 4 LEDs placed in the right side of the front label on the MEC 310. In the clear window next to the LEDs a label can be placed to explain the function of the LEDs. No label is provided from the factory. The label can be written on an overhead projector sheet and can be used with the print template on the cd-rom.



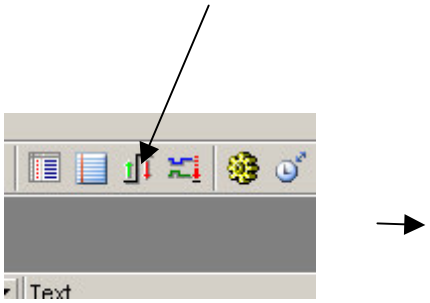
Configuration of the alarm indication LEDs

The alarm indication is able to indicate alarm status on one single alarm or a group of alarms. The factory setting for the LEDs is not used. When an alarm appears where one of the LEDs is set in output A or B, the LED will start flashing red. When the alarm is acknowledged, the LED will turn to steady red light. When the alarm status is no longer present, the LED will be turned off.

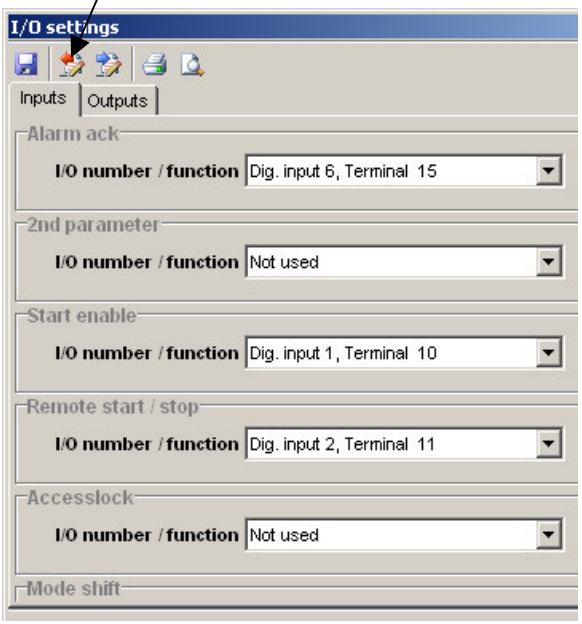


Configuration
The digital inputs are configured via the TPS 300 software.

Use this button to upload the menu.

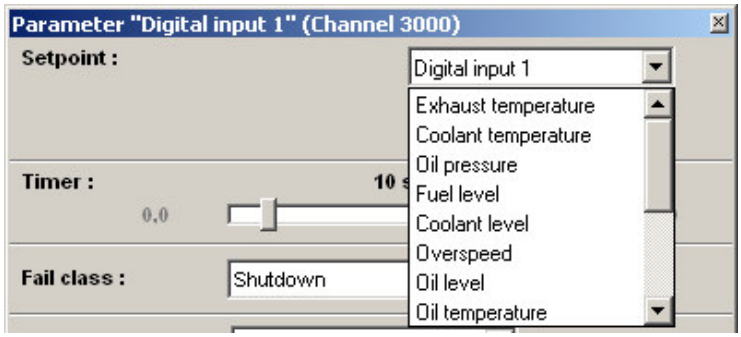


Remember to write the settings to the unit.

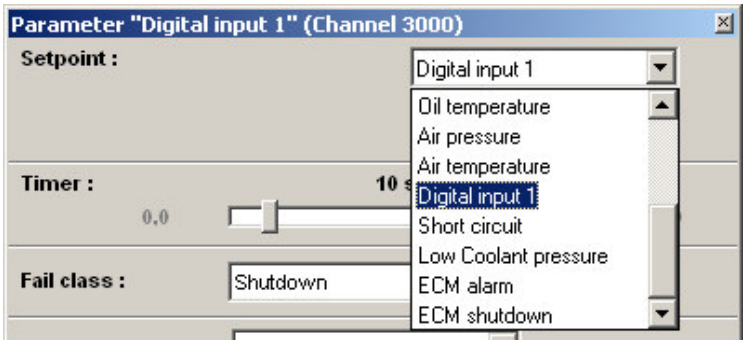


The individual I/O number and the function are now selected. In the example below '*Digital input 3*' is chosen, and a terminal number must be assigned to the input. If the input is used as alarm input, then the name can be changed to the relevant name selected from the predefined list below.

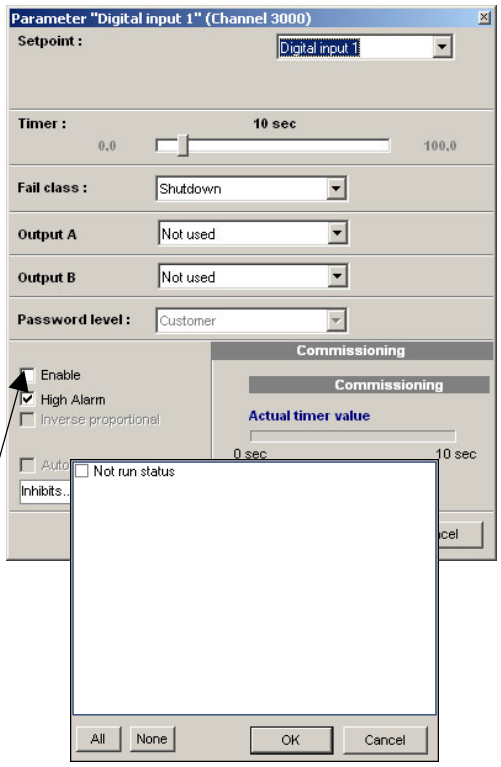
First, '*Digital input 3*' is selected from parameter no. 3000-3050 Digital input term. 10-15, no cable supervision



Then name the input from the roll down list.



Complete the input settings and select the appropriate fail class and outputs. The outputs A and B can be used to activate one or two of the configurable relay outputs or LEDs. If the relay function is set as a limit relay, no warning pop-up will be shown in the display. The relay 0 is a virtual relay, so both output A and B must be set to limit relays if no warning in the display is wanted.



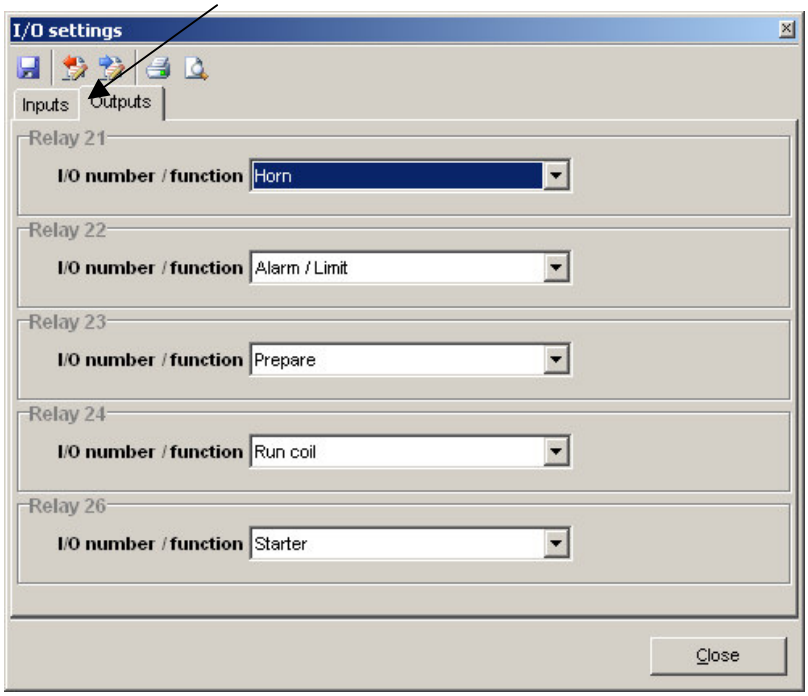
Remember to activate the function by marking the Enable tick box.

If the alarm is only to be active when the gen-set is running, the inhibit settings must be used. If the Not run status is ticked in the inhibit settings, it means that the alarm is inhibited when the Run status timer has not yet expired.

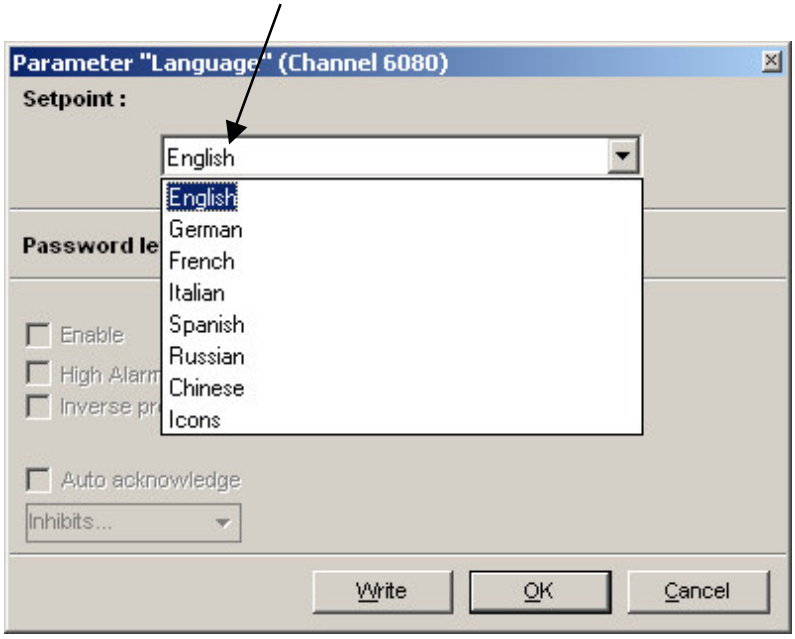
If the High Alarm is set, then the alarm will be registered upon a closing contact. If the High Alarm is not set, then the alarm will be registered upon an opening contact.

After configuration of the input parameter it is possible to assign a relay. Use the dialog box below for configuration of the output relay.

Remember to write the settings to the MEC 310 before closing the dialog box.



Select the language in the language dialog box.



Fail class

All the activated alarms of the MEC 310 must be configured with a fail class. The fail classes define the category of the alarms and the subsequent action of the alarm.

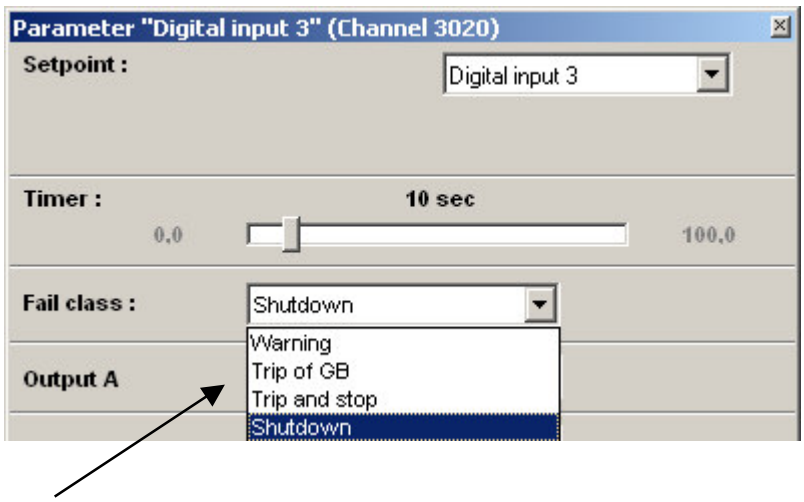
Four different fail classes are available:

Fail class	Action						
	Alarm horn relay*	Alarm display	Block engine start	Open gen. breaker	Stop generator	Cooldown	Shutdown
0 Warning	X	X					
1 Trip of GB	X	X		X			
2 Trip and stop	X	X	x	X	X	X	
3 Shutdown	X	X	x	X	X		X

* When alarm horn relay output is selected active.

Fail class configuration

The fail class can be selected for each alarm function via the TPS 300 software. To change the fail class via the TPS 300 software, the alarm function to be configured must be selected. Select the desired fail class in the fail class roll down panel.



The fail class roll down panel is activated, and the individual functions are ready for selection.

Service timers

The controller can monitor two different maintenance intervals:

- Service timer 1
- Service timer 2

The service timers both have the possibility of a setting for days (total elapsed time) and hours (running hours). The day setting counts whenever there is aux. supply on the MEC 310, and the hours count when a running feedback is present. It is possible to set the service timers to count up or count down.

The service timer alarm activates whenever the amount of days or the amount of running hours has expired. If the service timer is set to count down the display will shown 0 days or 0 hours; if the service timer is set to count up the display will show the amount of days or hours programmed in the parameter.

When the service timer alarm appears it can be acknowledged but the alarm will not become inactive before the service timer has been reset. This can be done from the display or via the TPS 300 software. Whenever the service timer is reset, the timer will start counting from the initial value.

The service timer alarm must be reset in the parameter list of the MEC 310 or via the TPS 300 software in parameter 6116 or 6126 to remove the actual alarm.

VDO sensors

In the following description of the VDO inputs the order will be input 2, 3, 1. In this way we are using the same order as in the TPS 300 software.

There are three VDO inputs in the unit. The inputs have different functions due to the fact that the hardware design is able to cover several VDO types.

All VDO inputs have a general accuracy of 2%.

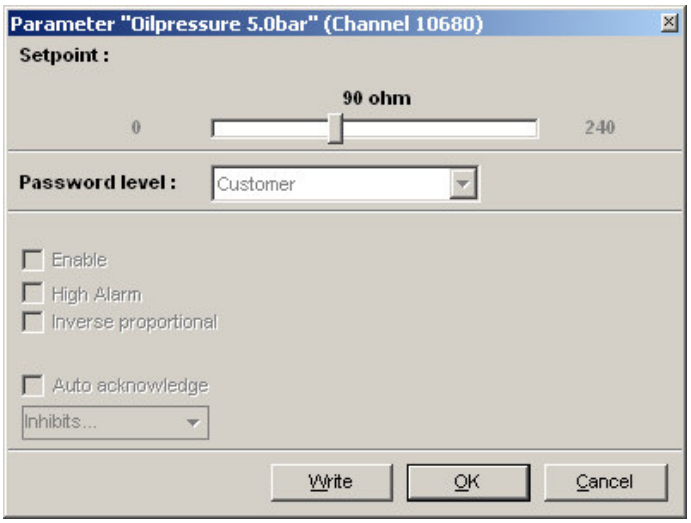
VDO input 2: Oil pressure - max. 240 Ohm
VDO input 3: Cooling water temperature - max. 2500 Ohm
VDO input 1: Fuel level sensor - max. 180 Ohm

VDO input 2, oil pressure

		VDO sensor type		
Pressure		**Type 1**	**Type 2**	**Type 3**
Bar	**Psi**	**Ω**	**Ω**	**Ω**
0	0	10.0	10.0	Configurable
0.5	7	27.2		
1.0	15	44.9		
1.5	22	62.9		
2.0	29	81.0	51.5	
2.5	36	99.2		
3.0	44	117.1	71.0	
3.5	51	134.7		
4.0	58	151.9	89.6	
4.5	65	168.3		
5.0	73	184.0	107.3	
6.0	87		124.3	
7.0	102			
8.0	116		155.7	
9.0	131			
10.0	145		184.0	

Type 3 is fully configurable with 8 points in the range 0-240Ω. The parameter settings can be found from menu 10810.

The TPS 300 software setting looks like this:



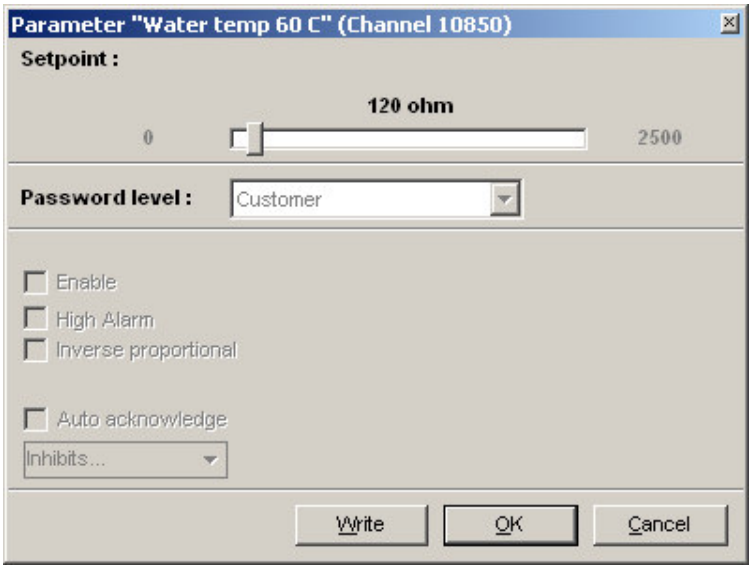
8 settings are available from 0-2,5-5-6-7-8-9-10 bar.

VDO input 3, cooling water temperature

		VDO sensor type			
Temperature		**Type 1**	**Type 2**	**Type 3**	**Type 4**
°C	**°F**	**Ω**	**Ω**	**Ω**	**Ω**
40	104	291.5	480.7	69.3	Configurable
50	122				
60	140	134.0	222.5	36.0	
70	158	97.1		27.9	
80	176	70.1	113.2	19.8	
90	184	51.2	83.2	15.8	
100	212	38.5	62.4	11.7	
110	230	29.1	47.6	9.5	
120	248	22.4		7.4	
130	266		28.9		
140	284				
150	302		18.2		

Type 4 is fully configurable with 8 points in the range 0-2500Ω.

The TPS 300 software setting looks like this:



8 settings are available from 0-40-60-80-90-100-120-150°.

VDO input 1, fuel level

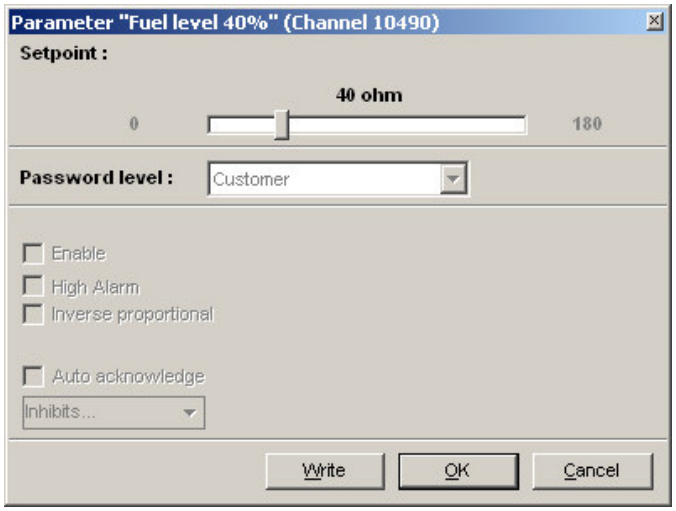
	VDO sensor type
	Type 1
Value	**Resistance**
0%	78.8Ω
100%	1.6Ω

	VDO sensor type
	Type 2
Value	**Resistance**
0%	3Ω
100%	180Ω

	VDO sensor type
Value	**Type 3**
%	**Resistance**
0	Configurable
10	
20	
30	
40	
50	
60	
70	
80	
90	
100	

Type 3 is fully configurable with 8 points in the range 0-180Ω.

The TPS 300 software setting looks like this:



8 settings are available from 0-40-50-60-70-80-90-100%.

VDO usage

The VDO inputs are used as alarm inputs and can be configured in the following menus.

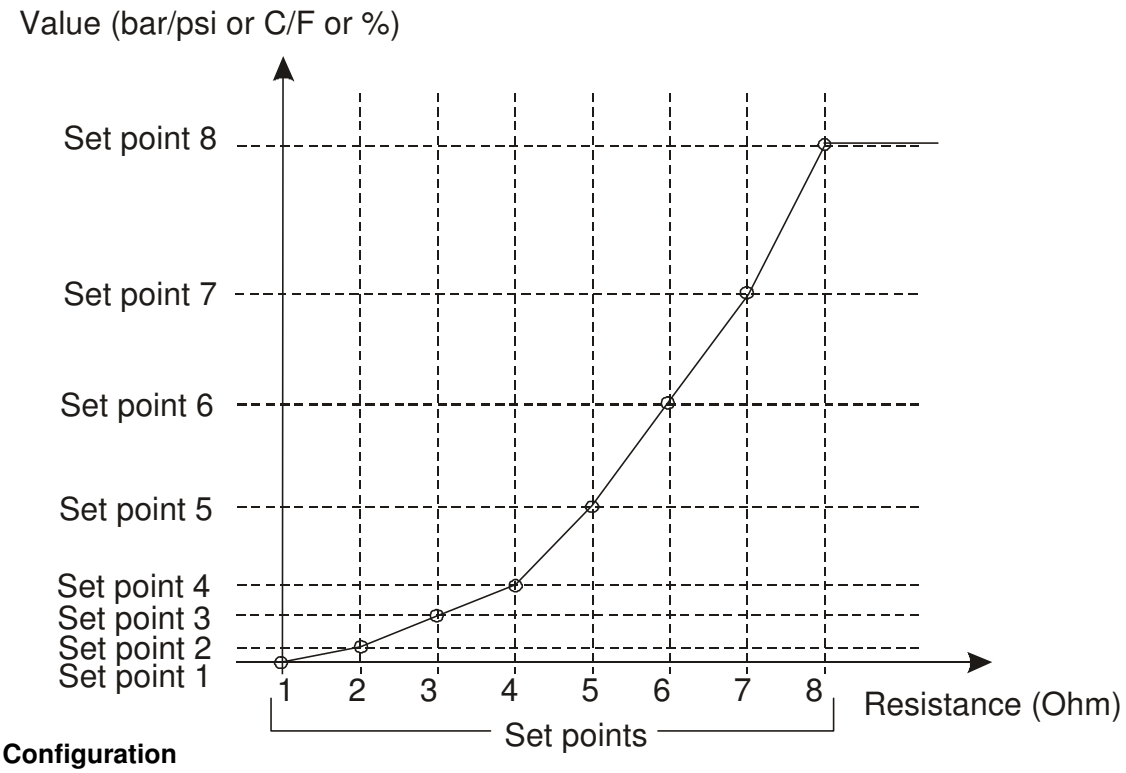
VDO input 2: Lubricating oil pressure - alarm settings in menus:
- 4310 VDO oil pressure input 2.1
- 4320 VDO oil pressure input 2.2

VDO input 3: Cooling water temperature - alarm settings in menus:
- 4460 VDO water temp input 3.1
- 4470 VDO water temp input 3.2

VDO input 1: Fuel level - alarm settings in menus:
- 4230 VDO fuel level input 2.1
- 4240 VDO fuel level input 2.2

In addition, VDO input 1 is also used for the fuel logic function.

Illustration of configurable inputs



Configuration

The 8 curve settings for the configurable VDO inputs cannot be changed in the display, but **only** in the TPS 300 software.

Binary inputs with cable supervision

The binary inputs are based on the VDO inputs, i.e. if a VDO input is selected, the binary input cannot be chosen, and vice versa. When selected as multi-functional inputs, the 3 VDO inputs can be changed to binary inputs with cable supervision. The cable supervision is selectable (ON/OFF) and based on the VDO inputs using a 100 Ohm resistor across the monitored switch. The resulting function is:

R < 20 Ohm =	Switch closed
30 < R < 140 Ohm =	Switch open, cable OK
150 Ohm < R =	Wire break

The setting of the alarm input is carried out in the same way as the setting of the standard binary input. So the texts are not 100% configurable but have to be chosen from a preconfigured text list.

Fuel pump logic

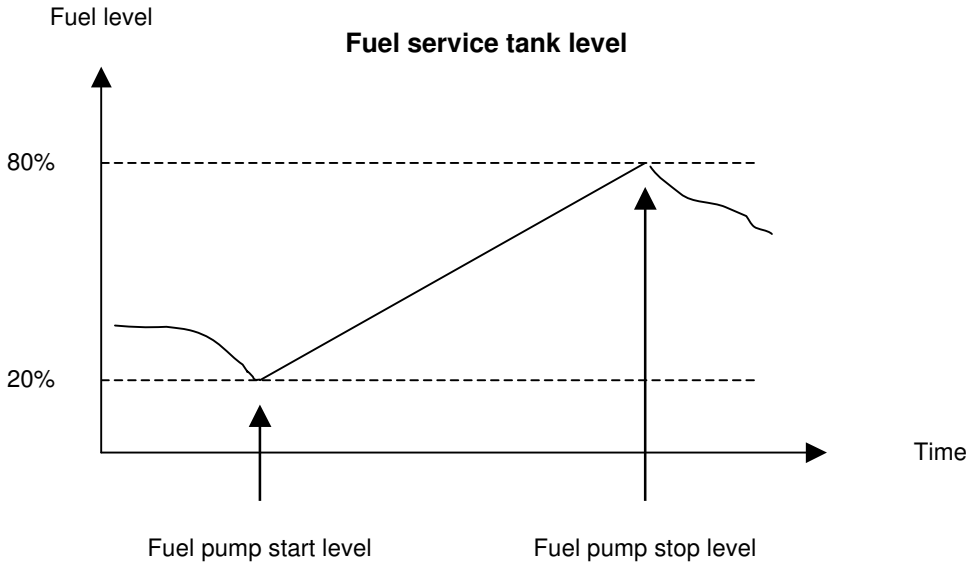
The fuel pump logic is used in order to start and stop the fuel supply pump to maintain the fuel level in the service tank at predefined levels. The start and stop limits are detected from the VDO 1 input.

Start level, factory setting at 20% (S2 - 2750 Fuel pump logic

Stop level, factory setting at 80% (S3 - 2750 Fuel pump logic

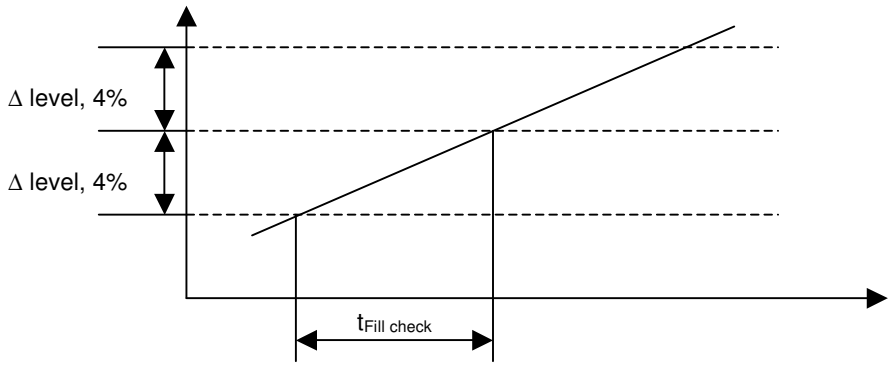
The fuel pump relay is an NO relay and is configured to relay 2 by default. This configuration cannot be changed. If other alarm functions have been configured to relay 2, and the fuel logic is activated, then a *relay channel error* alarm will occur. Please make sure that relay 2 is configured to Fuel Pump.

- Start level, relay 2 activates
- Stop level, relay 2 deactivates



Fuel fill check
The fuel pump logic includes a *fuel fill check* function.

When the fuel pump is running, the fuel level must increase with 4% within the *fuel fill check* timer. This timer is adjusted in 2750 Fuel pump logic, but the level of increase cannot be changed. If the fuel level does not increase at least 4% within the adjusted delay time, then the fuel pump relay will deactivate, and a *fuel fill alarm* occurs.

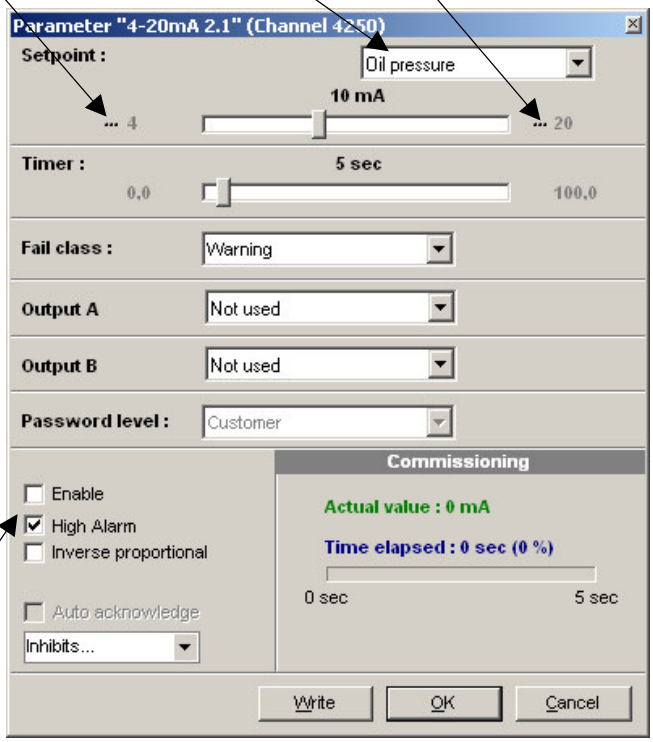


4-20mA inputs

The 4-20mA setting can *only* be set in the TPS 300 software.

Settings:

Scale top point value (click on the '...').
Name: Freely configurable (click on the '...').
Scale low point value.



Tick boxes: Select the needed function.

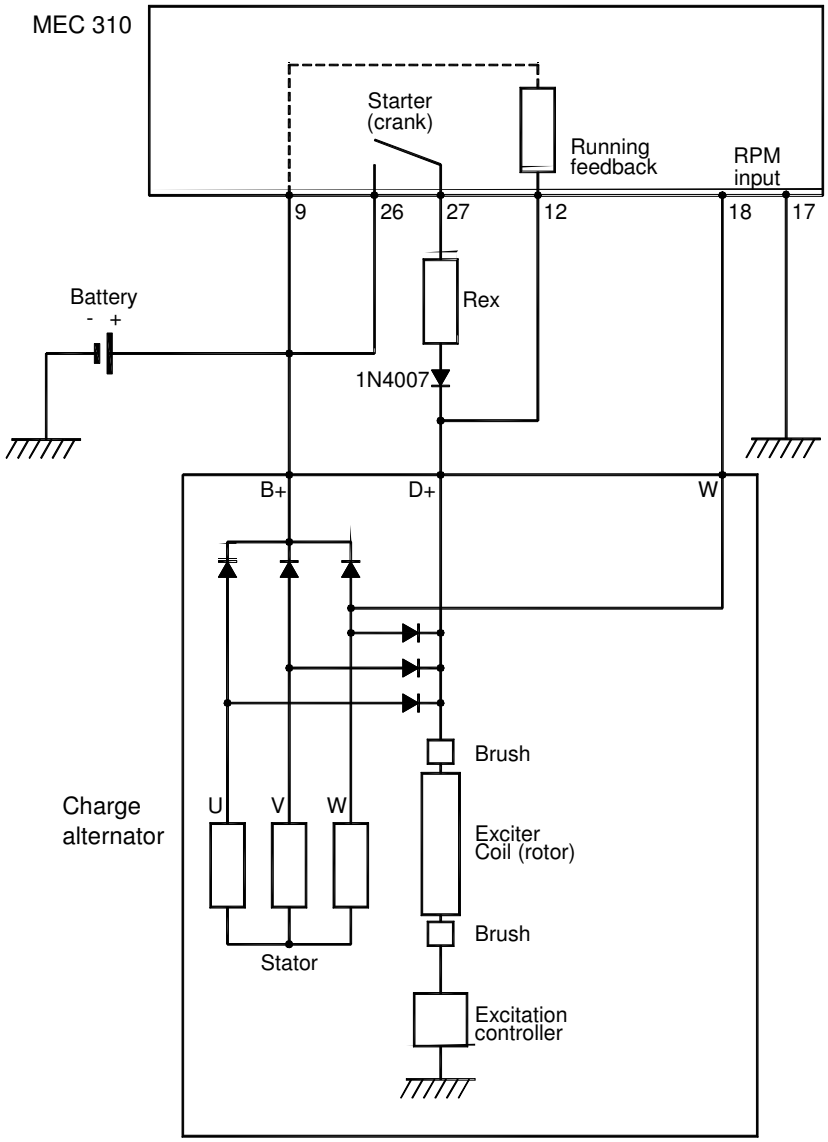
Unit: E.g. bar, mbar, C, F, %.

RPM inputs

Charger alternator connections

This schematic diagram shows the basic way the charger alternator and the MEC 310 can cooperate.

Only one running feedback is needed, but for optimal safety and function both the RPM (Tacho) input and the digital running feedback (D+) can be used as in the example below.



Rex: Excitation resistor: 12V systems: 47Ω 3 W
24V systems: 100Ω 6 W

Charger alternator terminal W

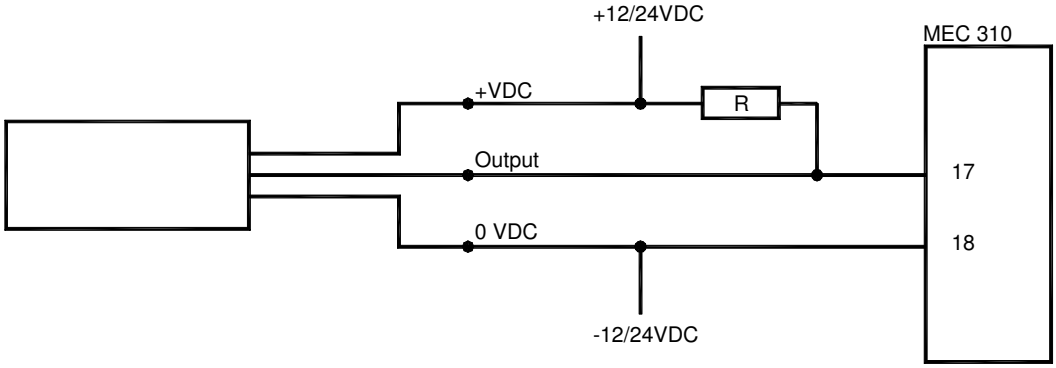
The terminal W output is an AC voltage.

Magnetic pick-up

The 2-wire magnetic pick-up can be connected directly to terminals 17-18.

NPN transistor output pick-up

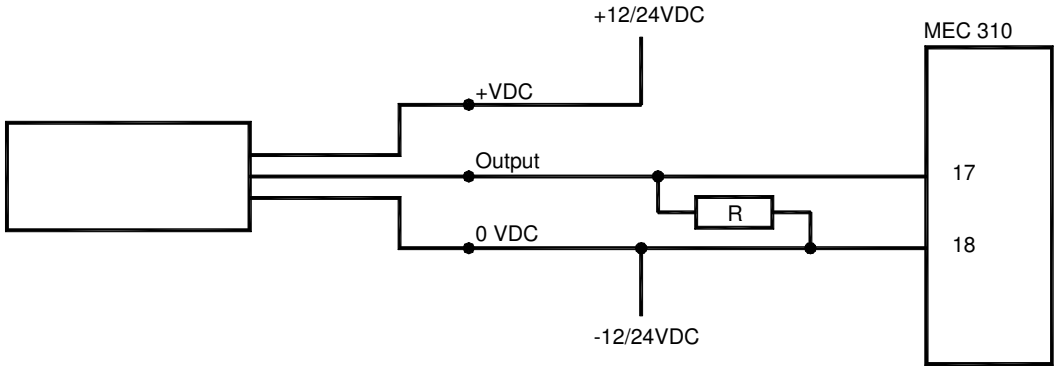
Since the NPN output is a frequency modulated DC pulse signal, a few external components are needed in order to eliminate the DC component.



R = 1200Ω (24V DC), 600Ω (12V DC)

PNP transistor output pick-up

Since the PNP output is a frequency modulated DC pulse signal, a few external components are needed in order to eliminate the DC component.



R = 1200Ω (24V DC), 600Ω (12V DC)

Generator breaker control

Breaker closing

Since the generator is assumed to run alone (single generator island), the breaker will close immediately when the Hz/V OK status is reached (AUTO), or if the breaker close button is activated (LOCAL). In LOCAL mode the breaker can be closed by pressing the GB close button on the front of the MEC 310, when Hz/V is OK.

Relay output control

The generator breaker is assumed to be a contactor, i.e. the relay output is steady ON when the breaker is closed, and steady OFF when the breaker is open. It is not possible to have 2 pulse outputs for a motorised breaker (ON and OFF).

Breaker trip control

Any alarm selected to have the fail class *Trip* or *Shutdown* will automatically open the breaker control relay. If the breaker is closed when the idle speed is activated, a breaker out signal will be transmitted.

Breaker ON/OFF feedback

As default there is no feedback for breaker ON or OFF. The breaker position LED is paralleled to the breaker control relay output. It is possible, however, to select a binary input to be breaker ON feedback and/or an OFF feedback. This is done via an extra selection in the input settings of the TPS 300 software. This extra input is called *GB Pos on* or *GB Pos off*.

This icon activates the inputs settings: 

If the input *Breaker ON feedback* is selected, then the input must be connected and activated, if the breaker is ON. The reason is that a *Breaker close failure* alarm will appear, if the breaker control relay is activated without the binary input. Also, if the breaker control relay is OFF and the binary input is ON, then a *Breaker open failure* alarm will appear.

These alarms are fixed with the fail class *Warning*.

Engine temperature controlled GB closing

This function can be used, if it is recommendable that the engine cooling water temperature must be above a certain temperature before the engine is loaded. In the parameter 6360 it is possible to set the cooling water temperature that must be exceeded, before the generator breaker is closed.

The function is also enabled/disabled in parameter 6360. An engine heating message is displayed, until the engine cooling water temperature has reached the set point in parameter 6360.

The engine cooling water temperature sensor must be selected to be a VDO sensor to make the function work. If the option A (AMF logic) is enabled, this function will also work upon a mains failure.

Test function

The MEC 310 has two test sequences if the option A is enabled. The test sequences can be initiated in two ways: Either with the test push-button on the front of the MEC 310 or by a digital input configured to this function.

Simple test function

When the simple test is initiated, the MEC 310 will go through the start sequence and run the engine for the time set in parameter 7090. In this parameter it is also selected if this sequence should be started by a digital input and/or the test push-button on the front of the MEC 310. If the

timer is set to 0, the test sequence will be interrupted when the digital input or test push-button is deactivated. This means that digital input can be used to activate and deactivate the test sequence. When the timer runs out or the input is deactivated (timer set to 0), the stop sequence including cooling down will be carried out.

The MEC 310 must be in Auto mode in order to initiate the test sequence.

AMF test function (A dependent)

When the AMF test is initiated, the MEC 310 will go through the AMF sequence and run the engine for the time set in parameter 7040. In this parameter it is also selected if this sequence should be started by a digital input and/or the test push-button on the front of the MEC 310. If the timer is set to 0, the test sequence will be interrupted when the digital input or test push-button is deactivated. This means that digital input can be used to activate and deactivate the test sequence. When the timer runs out or the input is deactivated (timer set to 0), the mains restore sequence and the stop sequence including cooling down will be carried out.

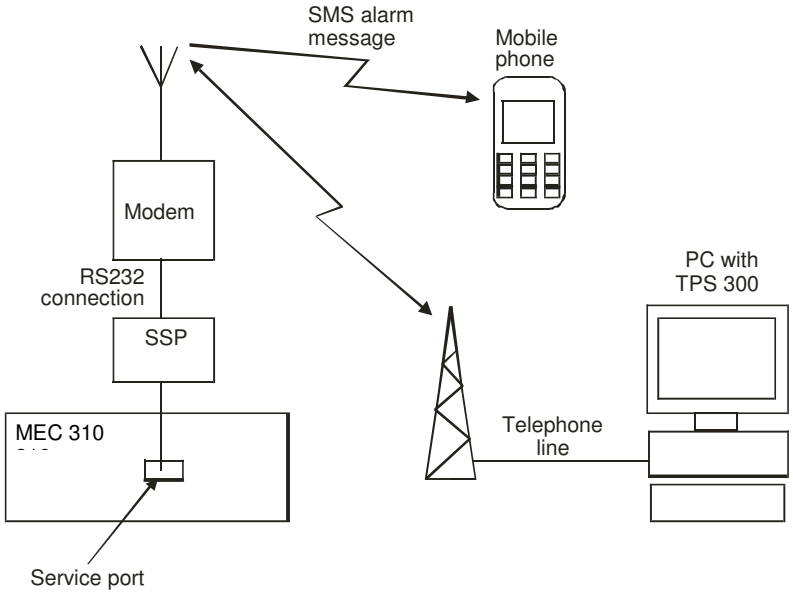
GSM communication

GSM communication can be used for 2 purposes:

1. Sending SMS alarm messages to up to 5 different mobile phones. The messages will be sent in clear text, representing the alarm in question (e.g. “Overspeed”).

2. Communicate with the MEC 310 TSP 300 software.

Connection:



The connection is based on an RS232 connection to a GSM modem via the service port on the MEC 310. Since the connection on the MEC 310 is a TTL communication, the SSP interface box is needed to convert the signals to RS232. The SSP connects via a cable with SUB-D 9-pin female connector on the modem side.

We recommend using Siemens MC35 modem. The easiest way to get the modem is to purchase it through a local dealer. The SIM card needed comes from your local mobile net provider. The easiest way to set the PIN code in the modem itself is to mount the SIM card in a mobile phone and change the PIN code there. The SIM card will remember the PIN code when it is installed in the modem.

Siemens recommends a short power interruption (30 sec.) once a day to prevent lock-up of the modem. The easiest way to do this is to use a 24 hour

Should an alarm occur during the interruption, the multi-line unit will re-transmit it when the modem starts again, so no messages are lost.

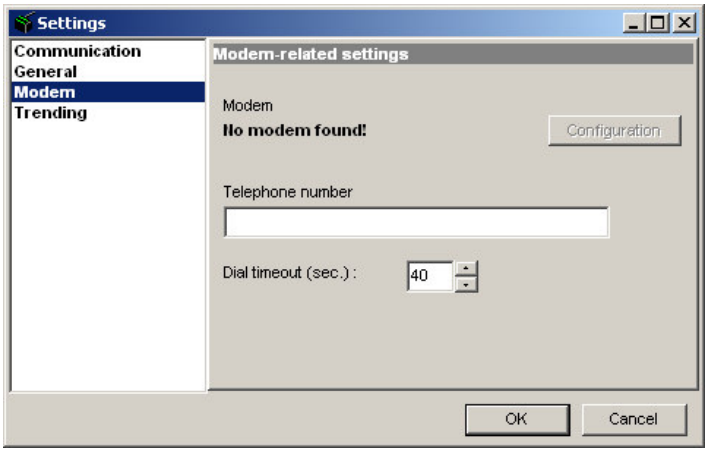
TPS 300 software connection via modem

If a TPS 300 software connection is required, then the SIM card must support data transfer. Contact your GSM provider for details.

TPS 300 software

Press the application settings push-button.

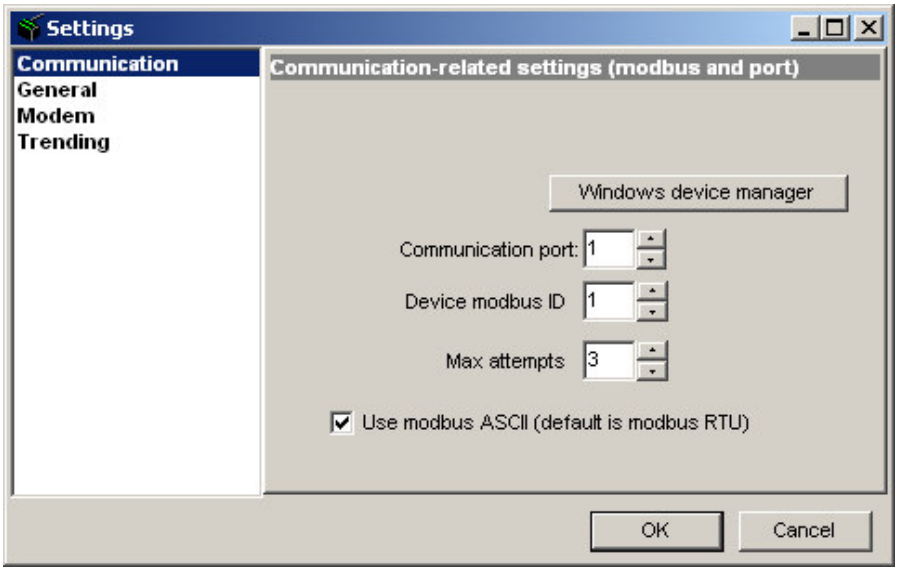
The settings dialog box appears:



Select modem and key in the telephone number of your GSM modem connected to the unit.

In the above example the modem is selected automatically by the TPS 300 software (internal modem in the PC).

When you want to use modem dial-up, the TPS 300 software must also be set to run ASCII communication:



After this, dial-up can be used: Click on the telephone button.

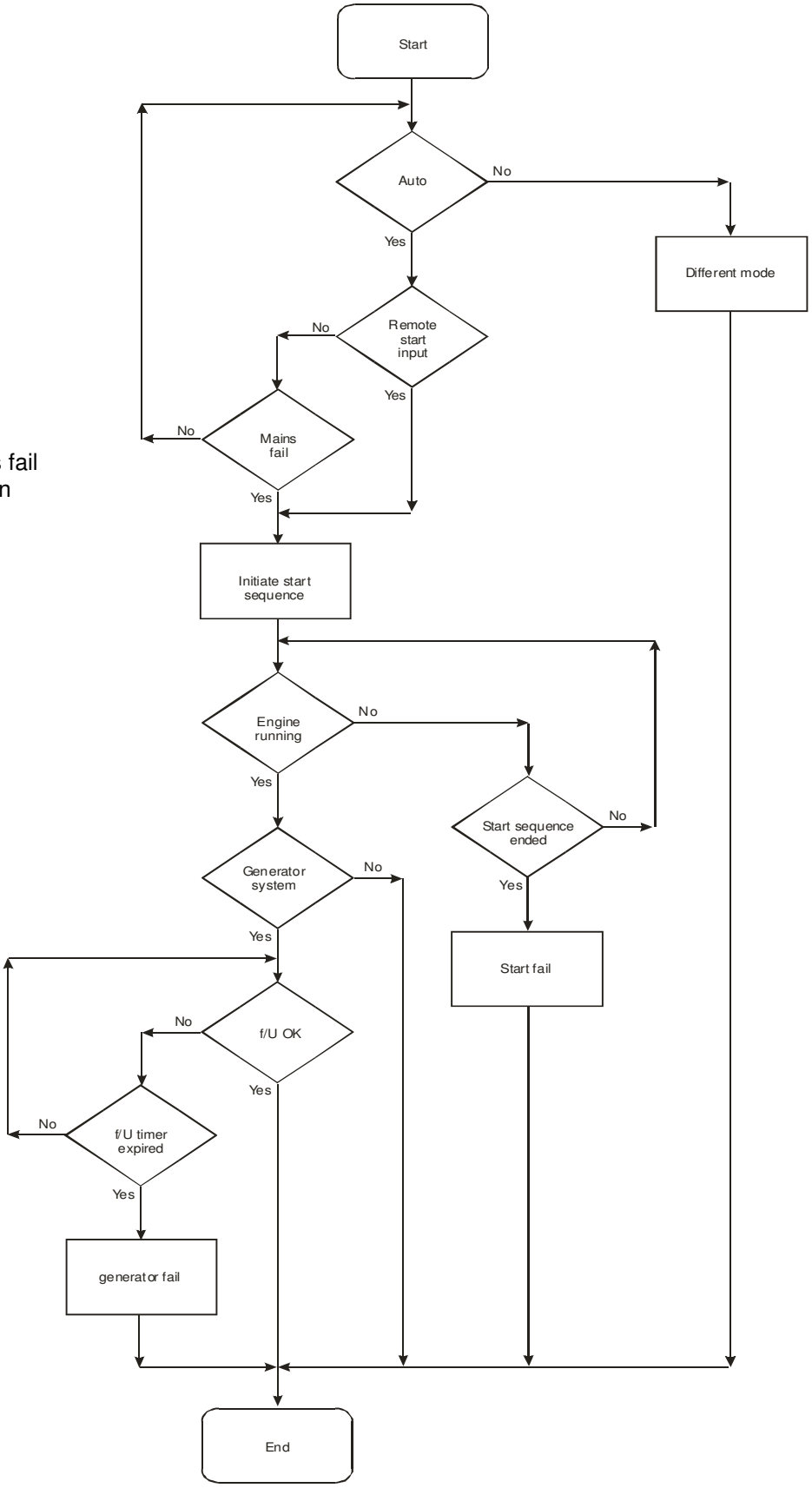
The modem communication is very much slower than the normal direct connection, so please be patient. It is not recommended to download the entire setting list. Use single setting downloads.

TPS 300 software communication safety

If the communication fails, the MEC 310 unit will operate according to the received data. If e.g. only half of the parameter file has been downloaded when the communication is interrupted, the settings are going to be a mix.

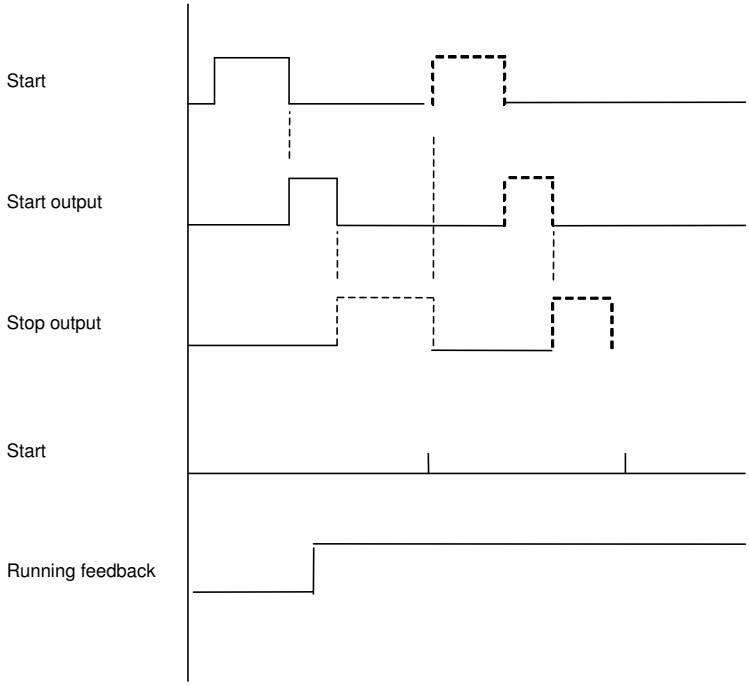
Auto engine start

The mains fail is an option

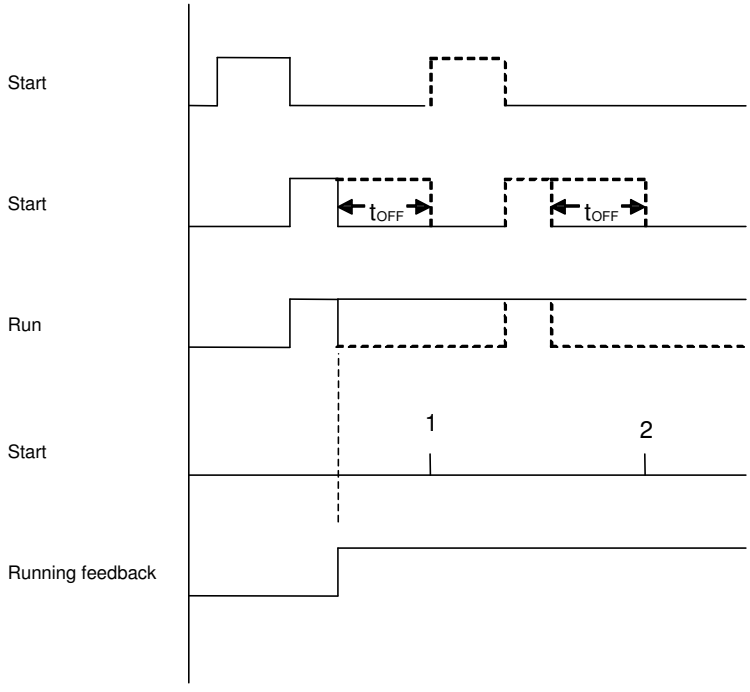


Start sequences

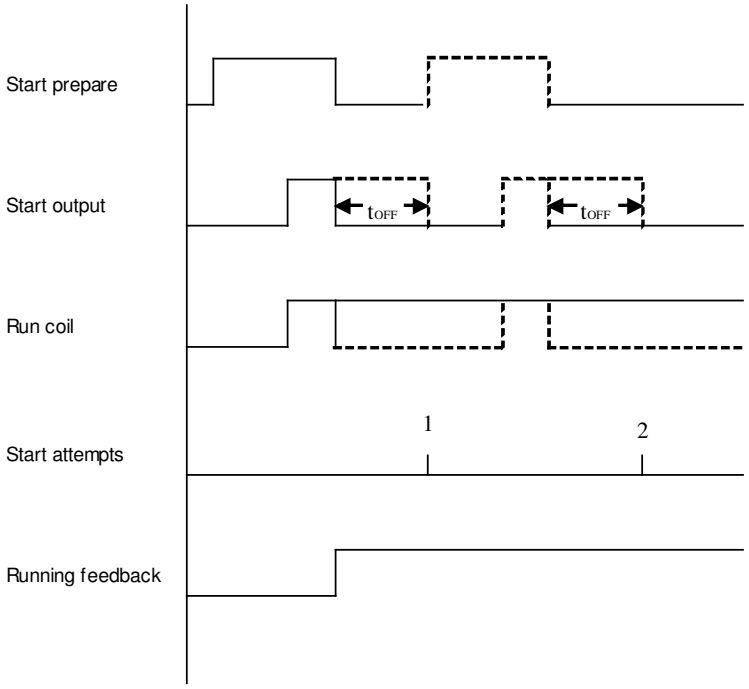
Start
Stop coil / normal



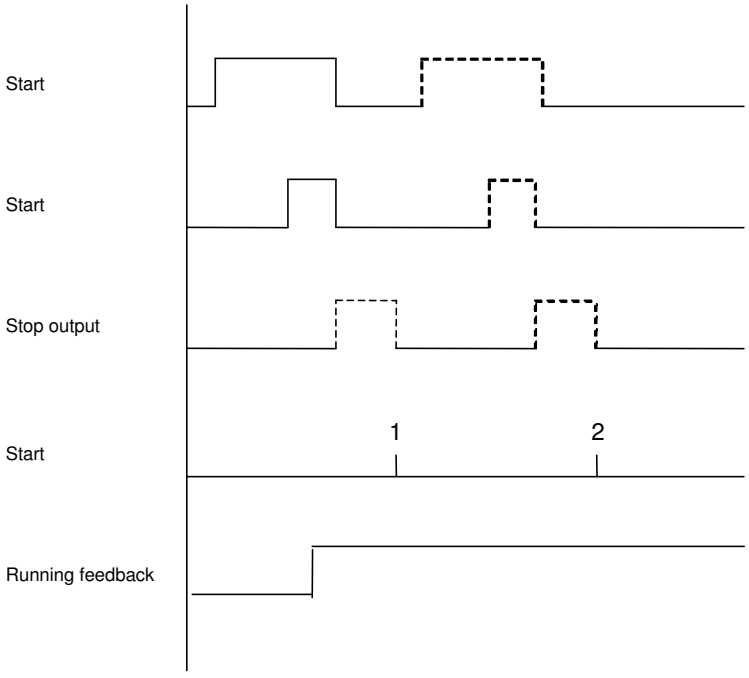
Start
Run coil / normal

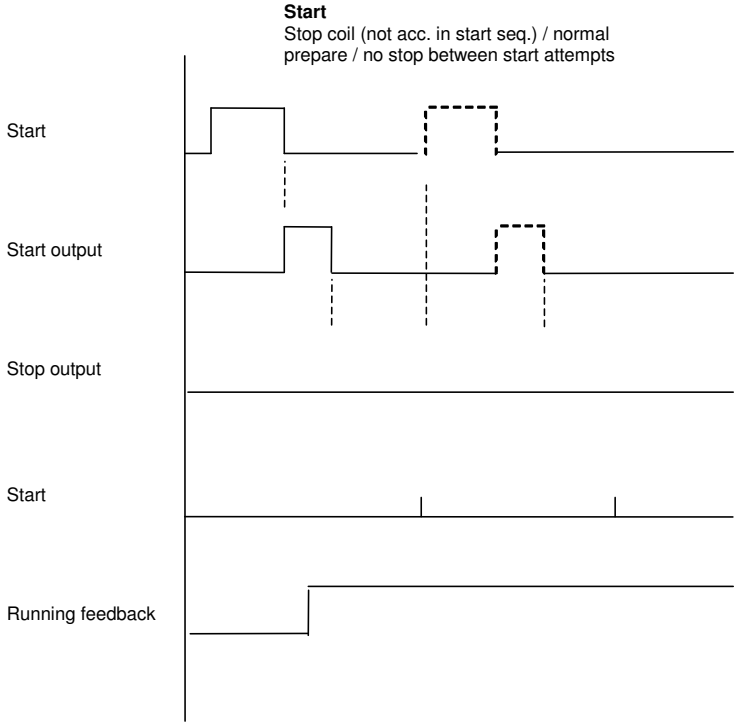


Start sequence:
Run coil / extended prepare



Start
Stop coil / extended




Start
Stop coil (not acc. in start seq.) / normal
prepare / no stop between start attempts
Start
Start output
Stop output
Start
Running feedback

Interruption of start sequence

The start sequence is interrupted in the following situations:

Event	Comment
Auto mode stop	Removal of start cause (binary input) or shutdown.
Start failure	
Running feedback	Tacho set point, menu 6173.
Running feedback	Binary input, D+.
Running feedback	Frequency measurement above 30Hz. The frequency measurement requires a voltage measurement of 30% U_{NOM}. So the running feedback based on the frequency measurement can only be used where the voltage builds up rapidly.
Running feedback	Oil pressure RUN detect menu 6550.
Emergency stop	
Stop push-button on the display	In manual as well as in auto operation.

Start failure alarm

The start failure alarm will occur, if the engine has not started after the last start attempt. A start failure will activate the HORN output and relay outputs if selected.

Start prepare

There are two possibilities for use of the start prepare timer:

Normal start prepare	The start prepare relay is activated when the start sequence is initiated for the adjusted time and before each start attempt. It deactivates before cranking.
Extended start prepare	The start prepare relay is activated when the start sequence is initiated, and it stays activated when cranking.

6290 Idle mode

Idle mode can be selected in 2 ways:

1. Configurable binary input
2. Timer setting

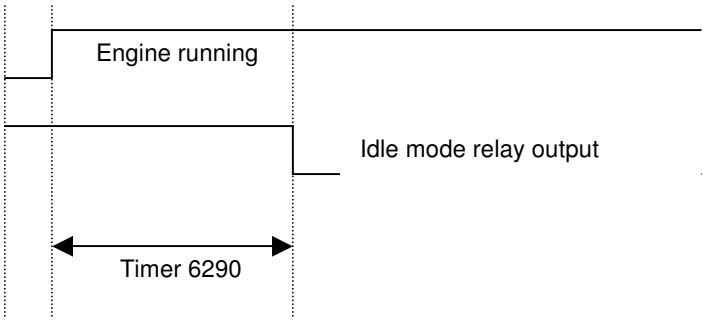
If a binary input for idle mode is used, activating this will hold the engine in idle mode for as long as the input is activated. This works for both manual and auto mode. Any time the idle mode is activated, the generator breaker will be opened.

If a binary input is not used, a timer function can be set to hold the engine in idle upon start until the timer runs out. This function can be selected to be:

- Off (no idling of engine upon start)

- Active for:
  - both manual and auto: Select Man./Auto.
  - manual only: Select Man.
  - auto only: Select Aut.

In both cases a relay must be selected to Idle in the output list. When idle mode is selected, a delay where the engine is running at low RPM is given. The delay is controlled by the MEC 310, and a relay output will activate the idle control on the engine.



Engine heater

The external heater function can be used to turn on an external heat source, when the engine cooling water temperature gets below the limit in parameter 6320. When the engine cooling water temperature reaches the temperature set point in parameter 6330, the heater is turned off again.

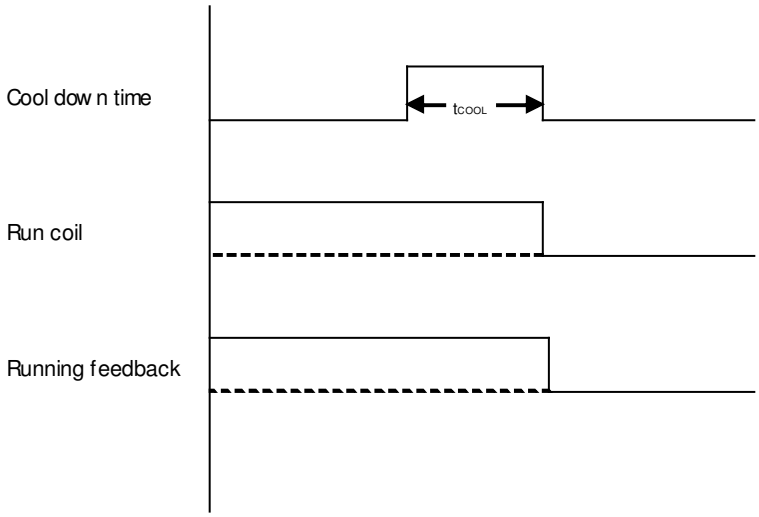
A relay must be selected in the output list to turn this external heat source on/off. The relay will close to turn the heater on or open to turn it off.

This function will only work, if the engine cooling water temperature sensor is selected to be a VDO sensor.

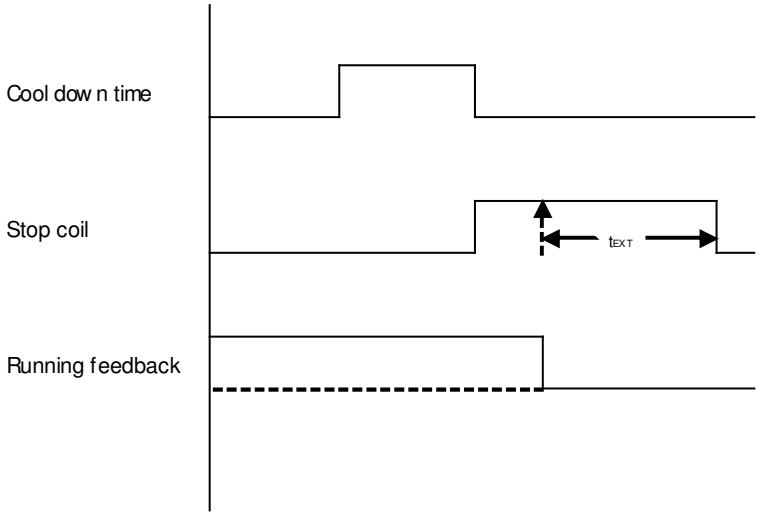
Stop sequences

The illustrations indicate the stop sequence schematically.

Stop sequence / RUN coil



Stop sequence / Stop coil and
Stop coil (not acc. in start seq.)



Stop sequence

The stop sequence will be activated, if a stop command is given. The stop sequence can include the cooling down time, if the stop is a normal or controlled stop.

Description	Cooling down	Stop	Comment
Auto mode stop	X	X	
Trip and stop	X	X	
Stop button on display		X	
Binary shutdown input		X	
Emergency stop		X	Engine shutdown and GB opens.

The stop sequence can only be interrupted during the cool down period. Interruptions can occur in these situations:

Event	Comment
Start button is pressed	Manual mode only. Engine will run in idle speed if idle is ON.
Binary start input	Auto mode.
GB close button is pressed	Manual mode only.

Stop failure alarm

A stop failure alarm will occur, if the running feedback (or the generator voltage and frequency) is still present. The stop failure timer is adjusted in menu 4580. Stop failure will activate the HORN output, and relay outputs if selected. Factory setting is no relay outputs besides horn.

7. Parameter list

This chapter includes a complete standard parameter list for setup. Therefore, this chapter is to be used for reference, when information about specific parameters is needed.

Parameter groups

In the parameter overview, the parameters are divided into three parameter groups. The parameter groups can be enabled and disabled in the parameters 4250-4270. If a parameter group is enabled, the parameters will be accessible from the display of the MEC 310. To see the specific parameter, see in the parameter list. If a parameter is marked (P2), it is available from the display, if parameter group 2 is enabled. The default display parameter setting is the parameter setting that will always be present in the display parameter list. These parameters are marked with a *.

Setup

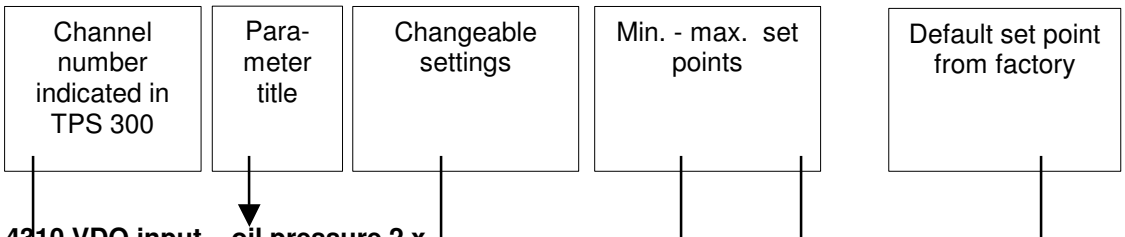
The setup of parameters is performed via the display or the TPS 300 software. Therefore, the default settings can be changed to the relevant settings through the TPS 300 software or by means of the push-buttons on the display.

The settings can be entered through the setup menu. If no entry has taken place before, then the first display to appear is the password display. Enter the factory setting password to gain access to the menus.

The factory Customer password is 2000. The factory Service password is 2001.

If no action has been taken after 30 seconds, then the password entry will be deactivated, and a new password entry is needed. (If entry via TPS 300 is used, the password is only needed once per connection).

Each parameter description is structured according to the same principles. Under the parameter title heading, the detailed parameter descriptions are illustrated and presented. First, a table indicating the parameter facts related to the individual parameter title is presented:



4310 VDO input – oil pressure 2.x

No.	Setting		Min. setting	Max. setting	Factory setting
4311	Oil pressure 2.1	Set point	0.0 bar	10.0 bar	4.0 bar
4312	Oil pressure 2.1	Delay	0.0 s	100.0 s	5.0 s
4313	Oil pressure 2.1	Output A	R0 (none)	R3 (relay 3)	R0 (none)
4314	Oil pressure 2.1	Output B	R0 (none)	R3 (relay 3)	R0 (none)
4315	Oil pressure 2.1	Enable	OFF	ON	OFF
4316	Oil pressure 2.1	Fail class	Warning	Shutdown	Trip of GB

The first column indicates the channel number in TPS 300.

The second column indicates the changeable setting in the TPS 300 software.

The third and fourth columns indicate the minimum/maximum set point available for this setting.

The fifth column indicates the default set point of the unit from the factory.

When it is necessary, additional information will be supplied after the table in order to make the individual parameter descriptions as informative as possible.

Parameter overview

Parameter group 1

6180 Starter
6210 Run/stop (cooling down)

Parameter group 2

1030 Overcurrent 1
1040 Overcurrent 2
1150 Overvoltage
1170 Undervoltage
1210 Overfrequency
1240 Underfrequency

Parameter group 3

2750 Fuel pump logic
4230 VDO fuel level input 1.1
4240 VDO fuel level input 1.2
4600 V-belt/RPM input failure
4610 Charger gen.
4620 VDO fuel level input 1.3
6350 D+ input

Default display parameter settings

4560 Hz/V failure
4580 Stop failure
4960 Battery low voltage
4970 Battery high voltage
6100 Counter
6110 Service timer 1
6120 Service timer 2
6130 Alarm horn
6220 Hz/V OK

Param. only configurable from TPS 300

1000 Reverse power
1630 Ph-0 readings
2160-2170 GB control
3000-3050 Digital input term. 10-15
3400 Binary input 1 (fuel) terminal 6
3410 Binary input 2 (oil) terminal 7
3420 Binary input 3 (temp.) terminal 8
3490 Emergency stop (terminal 19-20)
4120 4-20mA 1.1
4130 4-20mA 1.2
4250 4-20mA 2.1
4260 4-20mA 2.2
4310 VDO oil press. input 2.1
4320 VDO oil press. input 2.2
4380 4-20mA 3.1
4390 4-20mA 3.2
4460 VDO water temp. input 3.1
4470 VDO water temp. input 3.2
4510 Overspeed 1 (RPM input)
4520 Overspeed 2 (RPM input)
4590 Overspeed 3 (RPM input)
5000...5040 Relay functions
6000 Nominal settings 1
6010 Nominal settings 2
6020 Nominal settings 3 (1 ph)
6040 Transformer generator
6080 Language
6160 Run status
6170 Tacho config.
6190 Start attempts
6290 Idle mode
6320 Engine heater on
6330 Engine heater off
6360 GB on water temp.
6550 Oil press. run detection
6950 Parameter group 1
6960 Parameter group 2
6970 Parameter group 3
6980 Sleep mode
7090 Simple test function
9110 Password
10320-10370 GSM pin code and dial-up numbers
10470-10610 Fuel level config. sensor
10640-10780 Oil pressure config. sensor
10810-10950 Water temp. config sensor
10980 Configurable input selection

Parameter table description

The table consists of the following possible adjustments:

Set point: The alarm set point is adjusted in the set point menu. The setting can be in percentage of the nominal values.

Timer: The timer setting is the time that must expire from the alarm level is reached until the alarm occurs.

Relay output A: A relay can be activated by output A.

Relay output B: A relay can be activated by output B.

Enable: The alarm can be activated or deactivated. ON means always activated, RUN means that the alarm has run status. This means it is activated when the running signal is present.

Fail class: When the alarm occurs, the unit will react depending on the selected fail class.

Small differences due to the character of the parameters may exist between the individual tables.

Fail class

The fail class settings for the protections have the following possibilities:

Value	Comment
0: Warning	Shown in alarm pop-up window and activates the chosen relays.
1: Trip	Shown in alarm pop-up window and activates the chosen relays. Trips the breaker.
2: Trip and stop	Shown in alarm pop-up window and activates the chosen relays. Trips the breaker, cools down the engine and stops it.
3: Shutdown	Shown in alarm pop-up window and activates the chosen relays. Trips the breaker and shuts the engine down immediately.

Engine alarm settings (protection)

1000 Reverse power

No.	Setting		Min. setting	Max. setting	Third setting	Factory setting
1001	Reverse power	Set point	-50.0%	0.0%	-	-5.0%
1002	Reverse power	Timer	0.1 s	100.0 s	-	10.0 s
1003	Reverse power	Relay output A	R0 (none)	R3 (relay 3)	-	R0 (none)
1004	Reverse power	Relay output B	R0 (none)	R3 (relay 3)	-	R0 (none)
1005	Reverse power	Enable	OFF	ON	RUN	ON
1006	Reverse power	Fail class	Warning	Shutdown	-	Trip

1030 Overcurrent 1

No.	Setting		Min. setting	Max. setting	Third setting	Factory setting
1031	Overcurrent 1 (P2)	Set point	50.0%	200.0%	-	115.0%
1032	Overcurrent 1 (P2)	Timer	0.1 s	100.0 s	-	10.0 s
1033	Overcurrent 1	Relay output A	R0 (none)	R3 (relay 3)	-	R0 (none)

1034	Overcurrent 1	Relay output B	R0 (none)	R3 (relay 3)	-	R0 (none)
1035	Overcurrent 1	Enable	OFF	ON	RUN	ON
1036	Overcurrent 1	Fail class	Warning	Shutdown	-	Trip

1040 Overcurrent 2

No.	Setting		Min. setting	Max. setting	Third setting	Factory setting
1041	Overcurrent 2 (P2)	Set point	50.0%	200.0%	-	120.0%
1042	Overcurrent 2 (P2)	Timer	0.1 s	100.0 s	-	5.0 s
1043	Overcurrent 2	Relay output A	R0 (none)	R3 (relay 3)	-	R0 (none)
1044	Overcurrent 2	Relay output B	R0 (none)	R3 (relay 3)	-	R0 (none)
1045	Overcurrent 2	Enable	OFF	ON	RUN	ON
1046	Overcurrent 2	Fail class	Warning	Shutdown	-	Trip

1150 Overvoltage

No.	Setting		Min. setting	Max. setting	Third setting	Factory setting
1151	Overvoltage (P2)	Set point	80.0%	150.0%	-	115.0%
1152	Overvoltage (P2)	Timer	0.1 s	100.0 s	-	10.0 s
1153	Overvoltage	Relay output A	R0 (none)	R3 (relay 3)	-	R0 (none)
1154	Overvoltage	Relay output B	R0 (none)	R3 (relay 3)	-	R0 (none)
1155	Overvoltage	Enable	OFF	ON	RUN	ON
1156	Overvoltage	Fail class	Warning	Shutdown	-	Warning

1170 Undervoltage

No.	Setting		Min. setting	Max. setting	Third setting	Factory setting
1171	Undervoltage (P2)	Set point	50.0%	110.0%	-	90.0%
1172	Undervoltage (P2)	Timer	0.1 s	100.0 s	-	5.0 s
1173	Undervoltage	Relay output A	R0 (none)	R3 (relay 3)	-	R0 (none)
1174	Undervoltage	Relay output B	R0 (none)	R3 (relay 3)	-	R0 (none)
1175	Undervoltage	Enable	OFF	ON	RUN	ON
1176	Undervoltage	Fail class	Warning	Shutdown	-	Warning

1210 Overfrequency

No.	Setting		Min. setting	Max. setting	Third setting	Factory setting
1211	Overfrequency (P2)	Set point	80.0%	150.0%	-	115.0%
1212	Overfrequency (P2)	Timer	0.1 s	100.0 s	-	10.0 s
1213	Overfrequency	Relay output A	R0 (none)	R3 (relay 3)	-	R0 (none)
1214	Overfrequency	Relay output B	R0 (none)	R3 (relay 3)	-	R0 (none)
1215	Overfrequency	Enable	OFF	ON	RUN	ON
1216	Overfrequency	Fail class	Warning	Shutdown	-	Warning

1240 Underfrequency

No.	Setting		Min. setting	Max. setting	Third setting	Factory setting
1241	Underfrequency (P2)	Set point	50.0%	110.0%	-	90.0%
1242	Underfrequency (P2)	Timer	0.1 s	100.0 s	-	5.0 s
1243	Underfrequency	Relay output A	R0 (none)	R3 (relay 3)	-	R0 (none)
1244	Underfrequency	Relay output B	R0 (none)	R3 (relay 3)	-	R0 (none)
1245	Underfrequency	Enable	OFF	ON	RUN	ON
1246	Underfrequency	Fail class	Warning	Shutdown	-	Warning

1630 Ph-0 readings

No.	Setting		Min. setting	Max. setting	Factory setting
1631	Ph-0 readings on/off	Enable	OFF	ON	ON

The setting Ph–0 readings on/off enables/disables the display reading of the phase to neutral readings. This can be used in applications with a three-phased generator without a neutral connection.

2160 GB close failure

No.	Setting		Min. setting	Max. setting	Factory setting
2161	GB close failure	Timer	0.0 s	10.0 s	1.0 s

2170 GB open failure

No.	Setting		Min. setting	Max. setting	Factory setting
2171	GB open failure	Timer	0.0 s	10.0 s	1.0 s

2750 Fuel pump logic

No.	Setting		Min. setting	Max. setting	Factory setting
2751	Fuel pump logic (P3)	Set point 1	0%	100%	20%
2752	Fuel pump logic (P3)	Set point 2	0%	100%	90%
2753	Fuel pump logic (P3)	Timer	0.1 s	300.0 s	60.0 s
2754	Fuel pump logic	Enable	OFF	ON	OFF

Relay 2 is dedicated to this function and must be set as Fuel Pump in the I/O setting menu.

10980 Conf. inp. 1 must be set to VDO to activate the fuel pump logic.

3000-3050 Digital input term. 10-15, no cable supervision

No.	Setting		Min. setting	Max. setting	Third setting	Factory setting
30X1	Dig. input no. XX	Timer	0.0 s	100.0 s	-	10.0 s
30X2	Dig. input no. XX	Relay output A	R0 (none)	R5 (relay 5)	-	R0 (none)
30X3	Dig. input no. XX	Relay output B	R0 (none)	R5 (relay 5)	-	R0 (none)
30X4	Dig. input no. XX	Enable	OFF	ON	RUN	OFF
30X5	Dig. input no. XX	Fail class	See description of fail classes			
30X6	Dig. input no. XX	NO/NC	NO	NC	-	NO

3490 Emergency stop (terminal 19-20)

No.	Setting		Min. setting	Max. setting	Factory setting
3491	Emergency STOP	Timer	0.0 s	60.0 s	0.2 s
3492	Emergency STOP	Relay output A	R0 (none)	R5 (relay 5)	R0 (none)
3493	Emergency STOP	Relay output B	R0 (none)	R5 (relay 5)	R0 (none)
3494	Emergency STOP	Enable	OFF	ON	ON
3495	Emergency STOP	Fail class	See description of fail classes		

Binary inputs with cable supervision

The text for the inputs for correct display reading can only be done via the TPS 300 software.

3400 Binary input 1 (fuel) terminal 6

No.	Setting		Min. setting	Max. setting	Factory setting
3401	Term. 6	Delay	0.0 s	100.0 s	5.0 s
3402	Term. 6	Output A	R0 (none)	R3 (relay 3)	R0 (none)
3403	Term. 6	Output B	R0 (none)	R3 (relay 3)	R0 (none)
3404	Term. 6	Cable supervision	OFF	ON	OFF
3405	Term. 6	Enable	OFF	ON	OFF
3406	Term. 6	Fail class	See description of fail classes		

3410 Binary input 2 (oil) terminal 7

No.	Setting		Min. setting	Max. setting	Factory setting
3411	Term. 7	Delay	0.0 s	100.0 s	5.0 s
3412	Term. 7	Output A	R0 (none)	R3 (relay 3)	R0 (none)
3413	Term. 7	Output B	R0 (none)	R3 (relay 3)	R0 (none)
3414	Term. 7	Cable supervision	OFF	ON	OFF
3415	Term. 7	Enable	OFF	ON	OFF
3416	Term. 7	Fail class	See description of fail classes		

3420 Binary input 3 (temp.) terminal 8

No.	Setting		Min. setting	Max. setting	Factory setting
3421	Term. 8	Delay	0.0 s	100.0 s	5.0 s
3422	Term. 8	Output A	R0 (none)	R3 (relay 3)	R0 (none)
3423	Term. 8	Output B	R0 (none)	R3 (relay 3)	R0 (none)
3424	Term. 8	Cable supervision	OFF	ON	OFF
3425	Term. 8	Enable	OFF	ON	OFF
3426	Term. 8	Fail class	See description of fail classes		

4-20mA inputs

The scaling of the 4-20mA inputs for correct display reading can only be done via the TPS 300 software. Also the selection of HIGH/LOW alarm as well as cable supervision can be carried out in the TPS 300 software.

4120 4-20mA 1.1

No.	Setting		Min. setting	Max. setting	Factory setting
4121	4-20mA 1.1	Set point	4mA	20mA	10mA
4122	4-20mA 1.1	Delay	0.0 s	100.0 s	5.0 s
4123	4-20mA 1.1	Output A	R0 (none)	R5 (relay 5)	R0 (none)
4124	4-20mA 1.1	Output B	R0 (none)	R5 (relay 5)	R0 (none)
4125	4-20mA 1.1	Enable	OFF	ON	OFF
4126	4-20mA 1.1	Fail class	See description of fail classes		

4130 4-20mA 1.2

No.	Setting		Min. setting	Max. setting	Factory setting
4131	4-20mA 1.2	Set point	4mA	20mA	10mA
4132	4-20mA 1.2	Delay	0.0 s	100.0 s	5.0 s
4133	4-20mA 1.2	Output A	R0 (none)	R5 (relay 5)	R0 (none)
4134	4-20mA 1.2	Output B	R0 (none)	R5 (relay 5)	R0 (none)
4135	4-20mA 1.2	Enable	OFF	ON	OFF
4136	4-20mA 1.2	Fail class	See description of fail classes		

4250 4-20mA 2.1

No.	Setting		Min. setting	Max. setting	Factory setting
4251	4-20mA 2.1	Set point	4mA	20mA	10mA
4252	4-20mA 2.1	Delay	0.0 s	100.0 s	5.0 s
4253	4-20mA 2.1	Output A	R0 (none)	R5 (relay 5)	R0 (none)
4254	4-20mA 2.1	Output B	R0 (none)	R5 (relay 5)	R0 (none)
4255	4-20mA 2.1	Enable	OFF	ON	OFF
4256	4-20mA 2.1	Fail class	See description of fail classes		

4260 4-20mA 2.2

No.	Setting		Min. setting	Max. setting	Factory setting
4261	4-20mA 2.2	Set point	4mA	20mA	10mA
4262	4-20mA 2.2	Delay	0.0 s	100.0 s	5.0 s
4263	4-20mA 2.2	Output A	R0 (none)	R5 (relay 5)	R0 (none)
4264	4-20mA 2.2	Output B	R0 (none)	R5 (relay 5)	R0 (none)
4265	4-20mA 2.2	Enable	OFF	ON	OFF
4266	4-20mA 2.2	Fail class	See description of fail classes		

4380 4-20mA 3.1

No.	Setting		Min. setting	Max. setting	Factory setting
4381	4-20mA 3.1	Set point	4mA	20mA	10mA
4382	4-20mA 3.1	Delay	0.0 s	100.0 s	5.0 s
4383	4-20mA 3.1	Output A	R0 (none)	R5 (relay 5)	R0 (none)
4384	4-20mA 3.1	Output B	R0 (none)	R5 (relay 5)	R0 (none)
4385	4-20mA 3.1	Enable	OFF	ON	OFF
4386	4-20mA 3.1	Fail class	See description of fail classes		

4390 4-20mA 3.2

No.	Setting		Min. setting	Max. setting	Factory setting
4391	4-20mA 3.2	Set point	4mA	20mA	10mA
4392	4-20mA 3.2	Delay	0.0 s	100.0 s	5.0 s
4393	4-20mA 3.2	Output A	R0 (none)	R5 (relay 5)	R0 (none)
4394	4-20mA 3.2	Output B	R0 (none)	R5 (relay 5)	R0 (none)
4395	4-20mA 3.2	Enable	OFF	ON	OFF
4396	4-20mA 3.2	Fail class	See description of fail classes		

VDO inputs

4230 VDO fuel level input 1.1

No.	Setting		Min. setting	Max. setting	Factory setting
4231	Fuel level 1.1 (P3)	Set point	0%	100%	10%
4232	Fuel level 1.1 (P3)	Delay	0.0 s	100.0 s	5.0 s

4233	Fuel level 1.1	Output A	R0 (none)	R5 (relay 5)	R0 (none)
4234	Fuel level 1.1	Output B	R0 (none)	R5 (relay 5)	R0 (none)
4235	Fuel level 1.1	Enable	OFF	ON	OFF
4236	Fuel level 1.1	Fail class	See description of fail classes		

4240 VDO fuel level input 1.2

No.	Setting		Min. setting	Max. setting	Factory setting
4241	Fuel level 1.2 (P3)	Set point	0%	100%	99%
4242	Fuel level 1.2 (P3)	Delay	0.0 s	100.0 s	5.0 s
4243	Fuel level 1.2	Output A	R0 (none)	R5 (relay 5)	R0 (none)
4244	Fuel level 1.2	Output B	R0 (none)	R5 (relay 5)	R0 (none)
4245	Fuel level 1.2	Enable	OFF	ON	OFF
4246	Fuel level 1.2	Fail class	See description of fail classes		

4310 VDO oil press. input 2.1

No.	Setting (D)		Min. setting	Max. setting	Factory setting
4311	VDO 2.1	Set point	0.0 bar	10.0 bar	4.0 bar
4312	VDO 2.1	Delay	0.0 s	100.0 s	5.0 s
4313	VDO 2.1	Output A	R0 (none)	R5 (relay 5)	R0 (none)
4314	VDO 2.1	Output B	R0 (none)	R5 (relay 5)	R0 (none)
4315	VDO 2.1	Enable	OFF	ON	OFF
4316	VDO 2.1	Fail class	See description of fail classes		

4320 VDO oil press. input 2.2

No.	Setting (D)		Min. setting	Max. setting	Factory setting
4321	VDO 2.2	Set point	0.0 bar	10.0 bar	4.0 bar
4322	VDO 2.2	Delay	0.0 s	100.0 s	5.0 s
4323	VDO 2.2	Output A	R0 (none)	R5 (relay 5)	R0 (none)
4324	VDO 2.2	Output B	R0 (none)	R5 (relay 5)	R0 (none)
4325	VDO 2.2	Enable	OFF	ON	OFF
4326	VDO 2.2	Fail class	See description of fail classes		

4460 VDO water temp. input 3.1

No.	Setting		Min. setting	Max. setting	Factory setting
4461	VDO 3.1	Set point	0°C	150°C	95°C
4462	VDO 3.1	Delay	0.0 s	100.0 s	5.0 s
4463	VDO 3.1	Output A	R0 (none)	R5 (relay 5)	R0 (none)
4464	VDO 3.1	Output B	R0 (none)	R5 (relay 5)	R0 (none)
4465	VDO 3.1	Enable	OFF	ON	OFF
4466	VDO 3.1	Fail class	See description of fail classes		

4470 VDO water temp. input 3.2

No.	Setting		Min. setting	Max. setting	Factory setting
4471	VDO 3.2	Set point	0°C	150°C	95°C
4472	VDO 3.2	Delay	0.0 s	100.0 s	5.0 s
4473	VDO 3.2	Output A	R0 (none)	R5 (relay 5)	R0 (none)
4474	VDO 3.2	Output B	R0 (none)	R5 (relay 5)	R0 (none)
4475	VDO 3.2	Enable	OFF	ON	OFF
4476	VDO 3.2	Fail class	See description of fail classes		

VDO type: See functional description.

RPM input

4510 Overspeed 1 (RPM input)

No.	Setting		Min. setting	Max. setting	Third setting	Factory setting
4511	Overspeed 1	Set point	1 RPM	4000 RPM	-	1900 RPM
4512	Overspeed 1	Timer	0.2 s	100.0 s	-	15.0 s
4513	Overspeed 1	Relay output A	R0 (none)	R5 (relay 5)	-	R0 (none)
4514	Overspeed 1	Relay output B	R0 (none)	R5 (relay 5)	-	R0 (none)
4515	Overspeed 1	Enable	OFF	ON	RUN	OFF
4516	Overspeed 1	Fail class	See description of fail classes			

The overspeed setting 1 is disabled, if the secondary set point input is activated.

4520 Overspeed 2 (RPM input)

No.	Setting		Min. setting	Max. setting	Third setting	Factory setting
4521	Overspeed 2	Set point	1 RPM	4000 RPM	-	1900 RPM
4522	Overspeed 2	Timer	0.2 s	100.0 s	-	15.0 s
4523	Overspeed 2	Relay output A	R0 (none)	R5 (relay 5)	-	R0 (none)
4524	Overspeed 2	Relay output B	R0 (none)	R5 (relay 5)	-	R0 (none)
4525	Overspeed 2	Enable	OFF	ON	RUN	OFF
4526	Overspeed 2	Fail class	See description of fail classes			

The overspeed setting 2 is enabled, if the secondary set point input is activated.

4560 Hz/V failure

No.	Setting		Min. setting	Max. setting	Factory setting
4561	Hz/V failure*	Timer	1.0 s	99.0 s	30.0 s
4562	Hz/V failure	Relay output A	R0 (none)	R5 (relay 5)	R0 (none)
4563	Hz/V failure	Relay output B	R0 (none)	R5 (relay 5)	R0 (none)
4565	Hz/V failure	Enable	OFF	ON	ON
4566	Hz/V failure	Fail class	See description of fail classes		

When the frequency and voltage have not been OK for the adjusted delay time, a *Hz/V failure* alarm occurs, and output A and B activate.

4580 Stop failure

No.	Setting		Min. setting	Max. setting	Factory setting
4581	Stop failure*	Timer	10.0 s	120.0 s	30.0 s
4582	Stop failure	Relay output A	R0 (none)	R5 (relay 5)	R0 (none)
4583	Stop failure	Relay output B	R0 (none)	R5 (relay 5)	R0 (none)

If the engine has not stopped within the delay time, outputs A and B will activate and a *stop failure* alarm occurs.

4590 Overspeed 3 (RPM input)

No.	Setting		Min. setting	Max. setting	Third setting	Factory setting
4591	Overspeed 3	Set point	1 RPM	4000 RPM	-	1900 RPM
4592	Overspeed 3	Timer	0.2 s	100.0 s	-	15.0 s
4593	Overspeed 3	Relay output A	R0 (none)	R5 (relay 5)	-	R0 (none)

4594	Overspeed 3	Relay output B	R0 (none)	R5 (relay 5)	-	R0 (none)
4595	Overspeed 3	Enable	OFF	ON	RUN	OFF
4596	Overspeed 3	Fail class	See description of fail classes			

The overspeed setting 3 is enabled, if the third set of nominal values is activated.

4600 V-belt/RPM input failure

No.	Setting		Min. setting	Max. setting	Factory setting
4601	V-belt (P3)	Timer	0.0 s	10.0 s	1.0 s
4602	V-belt	Relay output A	R0 (none)	R5 (relay 5)	R0 (none)
4603	V-belt	Relay output B	R0 (none)	R5 (relay 5)	R0 (none)
4604	V-belt	Enable	OFF	ON	OFF
4605	V-belt	Fail class	See description of fail classes		

The V-belt failure is used on air-cooled engines to monitor that the V-belt driven cooling fan is operating properly. This alarm requires W input to be used in parallel with another running feedback at the same time. The status of both will be compared. If they do not match, a V-belt alarm will be activated.

4610 Charger gen.

No.	Setting		Min. setting	Max. setting	Factory setting
4611	Charger gen. (P3)	Timer	0.0 s	60.0 s	0.2 s
4612	Charger gen.	Relay output A	R0 (none)	R5 (relay 5)	R0 (none)
4613	Charger gen.	Relay output B	R0 (none)	R5 (relay 5)	R0 (none)
4614	Charger gen.	Enable	OFF	ON	OFF
4615	Charger gen.	Fail class	See description of fail classes		

This alarm requires D+ input to be used in parallel with another running feedback at the same time (binary input, tacho, generator voltage). The status of both will be compared. If they do not match, a charger gen. alarm will be activated.

4620 VDO fuel level input 1.3

No.	Setting		Min. setting	Max. setting	Factory setting
4621	Fuel level 1.3 (P3)	Set point	0%	100%	80%
4622	Fuel level 1.3 (P3)	Delay	0.0 s	100.0 s	5.0 s
4623	Fuel level 1.3	Output A	R0 (none)	R5 (relay 5)	R0 (none)
4624	Fuel level 1.3	Output B	R0 (none)	R5 (relay 5)	R0 (none)
4625	Fuel level 1.3	Enable	OFF	ON	OFF
4626	Fuel level 1.3	Fail class	See description of fail classes		

4960 Battery low voltage

No.	Setting		Min. setting	Max. setting	Factory setting
4961	Battery low V*	Set point	6.0V	24.0V	16.0V
4962	Battery low V*	Timer	0.0 s	10.0 s	1.0 s
4963	Battery low V	Relay output A	R0 (none)	R5 (relay 5)	R0 (none)
4964	Battery low V	Relay output B	R0 (none)	R5 (relay 5)	R0 (none)
4965	Battery low V	Enable	OFF	ON	ON

4970 Battery high voltage

No.	Setting		Min. setting	Max. setting	Factory setting
4971	Battery high V*	Set point	15.0V	40.0V	28.0V
4972	Battery high V*	Timer	0.0 s	10.0 s	1.0 s
4973	Battery high V	Relay output A	R0 (none)	R5 (relay 5)	R0 (none)
4974	Battery high V	Relay output B	R0 (none)	R5 (relay 5)	R0 (none)
4975	Battery high V	Enable	OFF	ON	OFF

5000...5040 Relay functions

No.	Setting		First/min. setting	Second/max. setting	Factory setting
50X1	Relay X	Function	Alarm	Limit	Alarm
50X2	Relay X	Off delay	0.0 s	999.9 s	5.0 s

The relays can be configured in the two different ways described below.

Alarm relay function: When an alarm activates the relay, it is activated as long as the alarm is present and unacknowledged. If the Off delay is set different from 0.0 s, a short reset of the relay will take place when a new alarm appears.

Limit function: When an input activates the relay, no alarm message is displayed. After the condition activating this relay has returned to normal, the relay will deactivate when the Off delay has expired.

6000 Nominal settings 1

No.	Setting		Min. setting	Max. setting	Factory setting
6001	Nominal settings 1	Frequency	48.0Hz	62.0Hz	60.0Hz
6002	Nominal settings 1	Generator power	4kW	20000kW	480kW
6003	Nominal settings 1	Generator current	0A	9000A	787A
6004	Nominal settings 1	Generator volt.	50V	25000V	440V

6010 Nominal settings 2

No.	Setting		Min. setting	Max. setting	Factory setting
6011	Nominal settings 2	Frequency	48.0Hz	62.0Hz	60.0Hz
6012	Nominal settings 2	Generator power	4kW	20000kW	480kW
6013	Nominal settings 2	Generator current	0A	9000A	787A
6014	Nominal settings 2	Generator volt.	50V	25000V	440V

6020 Nominal settings 3 (1 ph)

No.	Setting		Min. setting	Max. setting	Factory setting
6021	Nominal settings 3	Frequency	48.0Hz	62.0Hz	60.0Hz
6022	Nominal settings 3	Generator power	4kW	20000kW	480kW
6023	Nominal settings 3	Generator current	0A	9000A	787A
6024	Nominal settings 3	Generator volt.	50V	25000V	440V
6025	Nominal settings 3	Selection	Binary input	ON	Binary input

The voltage set in nominal settings 1 and 2 is phase to phase values.

If the third set of nominal settings is activated by a binary input, this input must be selected in the input list.

6040 Transformer generator

No.	Setting		Min. setting	Max. setting	Factory setting
6041	Transformer gen.	Primary	50V	25000V	440V
6042	Transformer gen.	Secondary	50V	480V	440V
6043	Transformer gen.	Current prim.	5A	9000A	1000A
6045	Transformer gen.	Current sec.	1A	5A	5A

If no voltage transformer is used, the setting 440/440V can be maintained.

6080 Language

No.	Setting		Setting	Factory setting
6081	Language	English	English	English
		German		
		French		
		Spanish		
		Icon		
		Italian		
		Chinese		
		Cyrillic		

6100 Counter

No.	Setting		Min. setting	Max. setting	Factory setting
6104	Counter*	Running time	0	20000	0
6102	Counter*	No. of GB operations	OFF	ON	OFF
6101	Counter*	Reset counter kWh	OFF	ON	OFF

6110 Service timer 1

No.	Setting		Min. setting	Second setting	Max. setting	Factory setting
6111	Service timer 1	Type	OFF	Counting down	Counting up	Counting up
6112	Service timer 1*	Set point hours	10		10000	150
6113	Service timer 1*	Set point days	1		1000	365
6114	Service timer 1	Fail class	See description of fail classes			
6115	Service timer 1	Output A	Relay 0		Relay 5	Relay 0
6116	Service timer 1*	Reset	OFF		ON	OFF

6120 Service timer 2

No.	Setting		Min. setting	Second setting	Max. setting	Factory setting
6121	Service timer 2	Type	OFF	Counting down	Counting up	Counting down
6122	Service timer 2*	Set point hours	10		10000	150
6123	Service timer 2*	Set point days	1		1000	365
6124	Service timer 2	Fail class	See description of fail classes			
6125	Service timer 2	Output A	Relay 0		Relay 5	Relay 0
6126	Service timer 2*	Reset	OFF		ON	OFF

6130 Alarm horn

No.	Setting		Min. setting	Max. setting	Factory setting
6131	Alarm horn*	Timer	0.0 s	990.0 s	20.0 s

According to factory setting the horn output will activate for 20 seconds when an alarm appears. If the timer setting is adjusted to 0, the horn relay will be activated continuously, until the reset alarm horn push-button is activated or the alarm is acknowledged.

6160 Run status

No.	Setting		Min. setting	Max. setting	Factory setting
6161	Run status	Timer	0.0 s	60.0 s	5.0 s
6162	Run status	Relay output A	R0 (none)	R5 (relay 5)	R0 (none)
6163	Run status	Relay output B	R0 (none)	R5 (relay 5)	R0 (none)
6164	Run status	Enable	OFF	ON	OFF

The running status detection has two purposes:

1. When the time delay period expires, all the alarms which have Enable selected to 'RUN' will be activated.

2. An output relay can be selected, if one is available. In that case, the settings output A and output B must be set according to the desired relay. To avoid an unwanted display alarm, 'RUN STATUS ALARM', the function of this relay must be selected to 'Limit' function to avoid the alarm when the engine starts. Notice that both output A and output B must have the same settings, when the function of the relay is set only as limit switch.

6170 Tacho config.

No.	Setting		Min. setting	Max. setting	Factory setting
6173	Tacho config.	Set point	0 RPM	4000 RPM	400 RPM
6171	Tacho config.	Number of teeth	0 teeth	500 teeth	0 teeth

The tacho config. set point is used to deactivate the start relay. The number of teeth is used to configure the tacho input. The tacho input must be configured to 0 teeth when not in use. The tacho input accepts magnetic pick-up (direct connection) or NPN/PNP/charger generator W input. Refer to functional description for information. Note that the frequency range for the tacho input is 10Hz to 10000Hz.

The * indicates parameters that can be changed via the push-buttons/display.

6180 Starter

No.	Setting		Min. setting	Max. setting	Factory setting
6181	Starter (P1)	Start prepare	0.0 s	600.0 s	5.0 s
6182	Starter (P1)	Start ON time	1.0 s	30.0 s	5.0 s
6183	Starter (P1)	Start OFF time	1.0 s	99.0 s	5.0 s

The settings "start prepare", "start ON time" and "start OFF time" are the periods in which the start relay is activated.

The start prepare output can e.g. be used for prelubricating or preheating. The start relay output is for activating the engine starter. The start sequence can be activated manually by pressing the "START" push-button in Local (hand) mode.

If no output relay has been chosen as starter relay, the start and stop sequences (cooling down) will be ignored, and the MEC 310 will only operate as a safety stop device.

6190 Start attempts

No.	Setting		Min. setting	Max. setting	Factory setting
6191	Start attempts	Attempts	1	10	3
6192	Start attempts	Relay output A	R0 (none)	R5 (relay 5)	R0 (none)
6193	Start attempts	Relay output B	R0 (none)	R5 (relay 5)	R0 (none)

The outputs A and B are activated at a start failure.

6210 Run/stop (cooling down)

No.	Setting		Min. setting	Max. setting	Factory setting
6211	Run/stop (P1)	Cooling down time	0.0 s	999.0 s	240.0 s
6212	Run/stop (P1)	Extended STOP	1.0 s	99.0 s	5.0 s

Hz/V monitoring settings

6220 Hz/V OK

No.	Setting		Min. setting	Max. setting	Factory setting
6221	Hz/V OK*	Timer	1.0 s	99.0 s	5.0 s
6222	Hz/V OK*	Voltage	1%	70%	10%
6223	Hz/V OK*	Frequency	1Hz	20Hz	5Hz

The setting ranges refer to nominal setting (nominal voltage +/- setting %, nominal frequency +/- setting Hz).

6290 Idle mode

No.	Setting		Min. setting	Max. setting	Factory setting
6291	Idle mode	Enable	OFF	ON	OFF
6292	Idle mode	Timer	1.0 s	300.0 s	5.0 s
6293	Idle mode	Active	Man.	Man./aut.	Aut.

Idle mode can be controlled via a binary input. If this is selected, the idle mode remains for as long as the input is ON. If a binary input is not used, the idle mode can be selected to be active for manual or auto or both running modes.

- Both manual and auto: Select Man./Aut.
- Manual only: Select Man.
- Auto only: Select Aut.

6320 Engine heater on

No.	Setting	Min. setting	Max. setting	Factory setting

6321	External heater on	Set point	0 C/F	100 C/F	10 C/F

6330 Engine heater off

No.	Setting		Min. setting	Max. setting	Factory setting
6331	External heater off	Set point	0 C/F	100 C/F	20 C/F

In order to make the external heater function work, a relay must be designated to this function in the output settings.

6350 D+ input

No.	Setting		Min. setting	Max. setting	Factory setting
6351	D+ input (P3)	Timer	0.0 s	100.0 s	10.0 s
6352	D+ input	Relay output A	R0 (none)	R5 (relay 5)	R0 (none)
6353	D+ input	Enable	OFF	ON	OFF
6354	D+ input	NO/NC	NO	NC	NO

If the D+ input is selected to be ON, this will be used as a running feedback. The D+ output from the charge generator must be connected to the input terminal configured to this function. The terminal 9 (common for terminals 10-15) must be connected to +, otherwise the D+ input does not work.

6360 GB on water temp.

No.	Setting		Min. setting	Max. setting	Factory setting
6361	GB on water temp.	Set point	0 C/F	100 C/F	40 C/F
6362	GB on water temp.	Enable	OFF	ON	OFF

6550 Oil press. run detection

No.	Setting		Min. setting	Max. setting	Factory setting
6551	Oil press. run detection	Set point	0 bar/PSI	150 bar/PSI	1 bar/PSI
6552	Oil press. run detection	Enable	OFF	ON	OFF

Parameter 6550 Oil pres. run detection makes it possible to use the oil pressure as a running feedback.

6950 Parameter group 1

No.	Setting		Min. setting	Max. setting	Factory setting
6950	Parameter group 1	Enable	OFF	ON	OFF

6960 Parameter group 2

No.	Setting		Min. setting	Max. setting	Factory setting
6960	Parameter group 2	Enable	OFF	ON	OFF

6970 Parameter group 3

No.	Setting		Min. setting	Max. setting	Factory setting
6970	Parameter group 3	Enable	OFF	ON	OFF

If a parameter list is enabled, the parameters marked (PX) are available in the display parameter list.

6980 Sleep mode

No.	Setting		Min. setting	Max. setting	Factory setting
6981	Sleep	Timer	0 sec.	1800 sec.	600 sec.
6982	Sleep	ON/OFF	OFF	ON	OFF

The sleep mode is a standstill power save mode. If the engine is stopped and nothing has happened within the time setting, the unit will enter sleep mode, i.e. the most power consuming functions (e.g. display) are turned off. As soon as an event occurs (a button is activated, the input state changes), the sleep mode is ended.

7090 Simple test function

No.	Setting		Min. setting	Second setting	Max. setting	Factory setting
7091	Activation	Set point	Digital input	Button	Digital input or button	Button
7092	Timer	Timer	0.0 s	-	990.0 s	5.0 s
7093	Enable	Enable	OFF	-	ON	ON

9110 Password

No.	Setting		Min. setting	Max. setting	Factory setting
9116	Password	Customer	0	9999	2000
9117	Password	Service	0	9999	2001

User password

If you forget the password, contact Thomson Technology Support for details.

10320-10370 GSM pin code and dial-up numbers

No.	Setting		Min. setting	Max. setting	Factory setting
10320	GSM	GSM pin code	0	9999	0
10331	GSM	SMS telephone no.	0	+9999999999999	+4511223344
10332	GSM	Enable	OFF	ON	OFF
10341	GSM	SMS telephone no.	0	+9999999999999	+4511223344
10342	GSM	Enable	OFF	ON	OFF
10351	GSM	SMS telephone no.	0	+9999999999999	+4511223344
10352	GSM	Enable	OFF	ON	OFF
10361	GSM	SMS telephone no.	0	+9999999999999	+4511223344
10362	GSM	Enable	OFF	ON	OFF
10371	GSM	SMS telephone no.	0	+9999999999999	+4511223344
10372	GSM	Enable	OFF	ON	OFF

A telephone number set to 0 means not used. The prefix + and country code must always be entered. E.g. +45 for Denmark.

If a GSM modem is connected to the programming interface, the communication automatically changes from modbus RTU to ASCII.

10460-10610 Fuel level config sensor

No.	Setting	Min. setting	Max. setting	Factory setting

10460	Fuel level 1	Type	1	3	1
10470	VDO 1	Fuel level at 0%	0 ohm	180 ohm	0 ohm
10490	VDO 1	Fuel level at 40%	0 ohm	180 ohm	40 ohm
10510	VDO 1	Fuel level at 50%	0 ohm	180 ohm	50 ohm
10530	VDO 1	Fuel level at 60%	0 ohm	180 ohm	60 ohm
10550	VDO 1	Fuel level at 70%	0 ohm	180 ohm	70 ohm
10570	VDO 1	Fuel level at 80%	0 ohm	180 ohm	80 ohm
10590	VDO 1	Fuel level at 90%	0 ohm	180 ohm	90 ohm
10610	VDO 1	Fuel level at 100%	0 ohm	180 ohm	100 ohm

10630-10780 Oil pressure config sensor

No.	Setting		Min. setting	Max. setting	Factory setting
10630	VDO	Type	1	3	1
10640	VDO 2	Oil pressure at 0.0Bar	0 ohm	240 ohm	30 ohm
10660	VDO 2	Oil pressure at 2.5Bar	0 ohm	240 ohm	60 ohm
10680	VDO 2	Oil pressure at 5.0Bar	0 ohm	240 ohm	90 ohm
10700	VDO 2	Oil pressure at 6.0Bar	0 ohm	240 ohm	120 ohm
10720	VDO 2	Oil pressure at 7.0Bar	0 ohm	240 ohm	150 ohm
10740	VDO 2	Oil pressure at 8.0Bar	0 ohm	240 ohm	180 ohm
10760	VDO 2	Oil pressure at 9.0Bar	0 ohm	240 ohm	210 ohm
10780	VDO 2	Oil pressure at 10.0Bar	0 ohm	240 ohm	240 ohm

10800-10950 Water temp config sensor

No.	Setting		Min. setting	Max. setting	Factory setting
10800	VDO	Type	1	4	1
10810	VDO 3	Water temp. at 0°C	0 ohm	2500 ohm	40 ohm
10830	VDO 3	Water temp. at 40°C	0 ohm	2500 ohm	80 ohm
10850	VDO 3	Water temp. at 60°C	0 ohm	2500 ohm	120 ohm
10870	VDO 3	Water temp. at 80°C	0 ohm	2500 ohm	180 ohm
10890	VDO 3	Water temp. at 90°C	0 ohm	2500 ohm	200 ohm
10910	VDO 3	Water temp. at 100°C	0 ohm	2500 ohm	240 ohm
10930	VDO 3	Water temp. at 120°C	0 ohm	2500 ohm	280 ohm
10950	VDO 3	Water temp. at 150°C	0 ohm	2500 ohm	320 ohm

10970-11000 Engineering units

No.	Setting		Min. setting	Max. setting	Factory setting
10971	Unit	Set point	C / bar	F / psi	C / bar

10980 Configurable input selection

No.	Setting		Min. setting	Max. setting	Factory setting
10980	Conf inp 1	Set point	VDO	Binary	VDO
10990	Conf inp 2	Set point	VDO	Binary	VDO
11000	Conf inp 3	Set point	VDO	Binary	VDO

Possible selections:

- VDO
- 4...20mA
- Binary

It is possible to combine VDO inputs with binary inputs and 4…20mA inputs in a mix.

Thomson Technology reserves the right to change any of the above