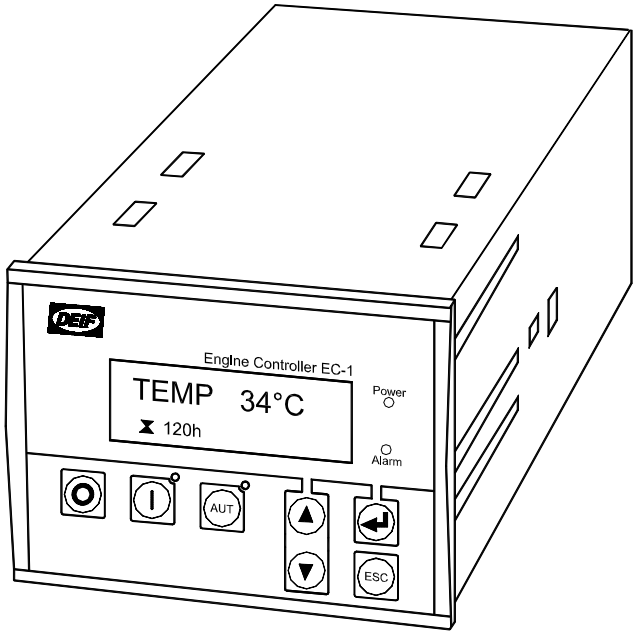
DEIF A/S

Description of options

Option B2,
Generator protection
Engine Controller EC-1/EC-1M

4189340398C
SW 1.2X.X



- *Description of option*
- *Functional descriptions*
- *Parameter list*

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Table of contents

1. Warnings and legal information

Legal information and responsibility

DEIF takes no responsibility for installation or operation of the engine set. If there is any doubt about how to install or operate the engine 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.

Warning

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

2. Description of option

ANSI numbers

Function	ANSI no.
Single-phase AC voltage measurement, 50-550V AC, 50/60Hz	-
Single-phase over- and undervoltage protection	27/59
Single-phase over- and underfrequency protection	81

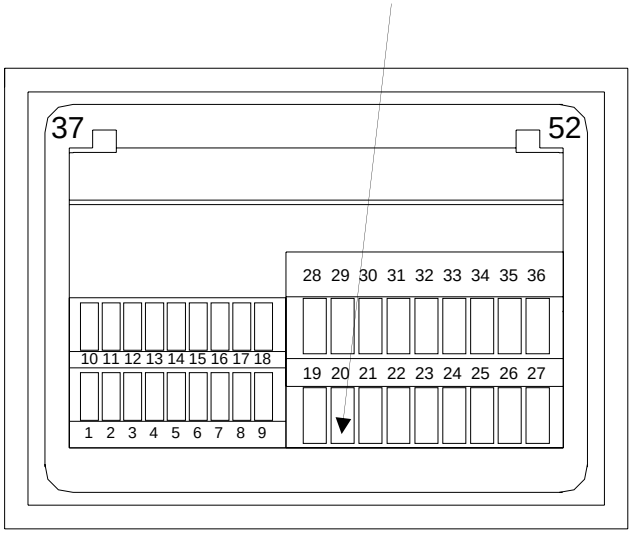
Option B2

Option B2 is a software option. It is a mix of voltage and frequency protection and offers over-/ undervoltage and over-/underfrequency protection. Option B2 also contains Hz/V OK and Hz/V failure used for general system status.

Hardware

Terminals

The AC voltage input is placed on terminals 19 (N or L) and 21 (L1/L2).



Unit rear view

Terminal	Technical data	Description
		Generator voltage and frequency measurement
19	Phase L2 or neutral	
20	Not used	
21	L1	
22	Not used	

3. Functional descriptions

Alarms

Alarm setting

The alarm settings relate to the nominal values for voltage and frequency.

Alarm timer

The alarms are all based on the definite time method, i.e. if the set point is exceeded, the timer starts, and when the timer runs out, the alarm activates. If the measured value returns to normal before the timer runs out, then the timer is stopped and reset.

Alarm enabling/disabling

There are 3 choices of alarm enabling and disabling:

OFF: The alarm is OFF (not used)
ON: The alarm is always active
RUN: The alarm is only active, when running status is present

Alarm fail class

There are 4 choices of alarm fail class:

Warning: Issues an alarm and activates a relay if chosen
Trip of GB: Issues an alarm and the generator breaker is opened
Trip and stop: Issues an alarm, opens the generator breaker and activates the cooling down
Shutdown: Issues an alarm and shuts the engine down immediately

Nominal settings

The use of 2 sets of nominal settings enables the use of the same generator set for different conditions without re-programming (e.g. going from 400V AC 50Hz to 440V AC 60Hz).

Then *nominal settings 1* are the normally used settings. If *nominal settings 2* are to be used, then a binary input needs to be designated to the function *mode shift*. This selection is made using the inputs settings in the PC utility software.

This icon activates the inputs settings: 

When activating the selected *mode shift* input, the *nominal settings 2* will be used.

Hz/V monitoring

Hz/V OK

The Hz/V OK monitoring is based on the generator frequency and voltage. When these are within the limits and the timer runs out, then the Hz/V OK status is reached.

Hz/V failure

The Hz/V failure monitoring is based on the engine running feedback and the Hz/V OK status. When the engine running status is reached, the timer will start. If the timer runs out before a Hz/V OK status is reached, then the Hz/V failure alarm will be set. The alarm fail class is warning.

4. Parameter list

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 is a 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.

Overview table

Protection	System
1120 Overvoltage	4010 Nominal settings 1
1130 Undervoltage	4020 Nominal settings 2
1140 Overfrequency	4050 Voltage transformer
1150 Underfrequency	4380 Hz/V OK
	4390 Hz/V failure

Default settings can be changed to the relevant settings.

Settings marked with an * can also be changed via the display.

Parameter tables

1120 Overvoltage

No.	Setting		Min. setting	Max. setting	Third setting	Factory setting
1121	Overvoltage	Set point	80.0%	150.0%	-	115.0%
1122	Overvoltage	Timer	0.1 s	100.0 s	-	10.0 s
1123	Overvoltage	Relay output A	R0 (none)	R5 (relay 5)	-	R0 (none)
1124	Overvoltage	Relay output B	R0 (none)	R5 (relay 5)	-	R0 (none)
1125	Overvoltage	Enable	OFF	ON	RUN	ON
1126	Overvoltage	Fail class	Warning	Shutdown	-	Warning

1130 Undervoltage

No.	Setting		Min. setting	Max. setting	Third setting	Factory setting
1131	Undervoltage	Set point	50.0%	110.0%	-	90.0%
1132	Undervoltage	Timer	0.1 s	100.0 s	-	5.0 s
1133	Undervoltage	Relay output A	R0 (none)	R5 (relay 5)	-	R0 (none)
1134	Undervoltage	Relay output B	R0 (none)	R5 (relay 5)	-	R0 (none)
1135	Undervoltage	Enable	OFF	ON	RUN	ON
1136	Undervoltage	Fail class	Warning	Shutdown	-	Warning

1140 Overfrequency

No.	Setting		Min. setting	Max. setting	Third setting	Factory setting
1141	Overfrequency	Set point	80.0%	150.0%	-	115.0%
1142	Overfrequency	Timer	0.1 s	100.0 s	-	10.0 s
1143	Overfrequency	Relay output A	R0 (none)	R5 (relay 5)	-	R0 (none)
1144	Overfrequency	Relay output B	R0 (none)	R5 (relay 5)	-	R0 (none)
1145	Overfrequency	Enable	OFF	ON	RUN	ON
1146	Overfrequency	Fail class	Warning	Shutdown	-	Warning

1150 Underfrequency

No.	Setting		Min. setting	Max. setting	Third setting	Factory setting
1151	Underfrequency	Set point	50.0%	110.0%	-	90.0%
1152	Underfrequency	Timer	0.1 s	100.0 s	-	5.0 s
1153	Underfrequency	Relay output A	R0 (none)	R5 (relay 5)	-	R0 (none)
1154	Underfrequency	Relay output B	R0 (none)	R5 (relay 5)	-	R0 (none)
1155	Underfrequency	Enable	OFF	ON	RUN	ON
1156	Underfrequency	Fail class	Warning	Shutdown	-	Warning

4010 Nominal settings 1

No.	Setting		Min. setting	Max. setting	Factory setting
4011	Nominal settings 1	Frequency	48.0Hz	62.0Hz	60.0Hz
4014	Nominal settings 1	Generator volt.	50V	25000V	440V

4020 Nominal settings 2

No.	Setting		Min. setting	Max. setting	Factory setting
4021	Nominal settings 2	Frequency	48.0Hz	62.0Hz	60.0Hz
4024	Nominal settings 2	Generator volt.	50V	25000V	440V

4050 Voltage transformer

No.	Setting		Min. setting	Max. setting	Factory setting
4051	Transformer gen.	Primary	50V	25000V	440V
4052	Transformer gen.	Secondary	50V	480V	440V

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

4380 Hz/V OK

No.	Setting		Min. setting	Max. setting	Factory setting
4381	Hz/V OK	Timer	1.0 s	99.0 s	5.0 s
4382	Hz/V OK	Voltage	1%	70%	10%
4383	Hz/V OK	Frequency	1Hz	20Hz	5Hz

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

4390 Hz/V failure

No.	Setting		Min. setting	Max. setting	Factory setting
4391	Hz/V failure	Timer	1.0 s	99.0 s	30.0 s
4392	Hz/V failure	Relay output A	R0 (none)	R5 (relay 5)	R0 (none)
4393	Hz/V failure	Relay output B	R0 (none)	R5 (relay 5)	R0 (none)
4395	Hz/V failure	Enable	OFF	ON	ON

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 will activate.