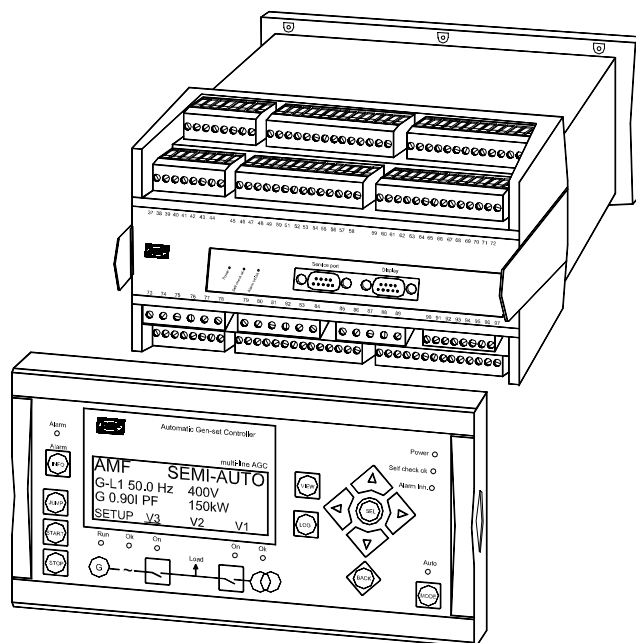


## Description of options

### Option M12, Configurable I/O extension cards 13 binary inputs/4 relay outputs Automatic Gen-set Controller

4189340390B

SW version 2.3X.X



- Description of options
- Functional description
- Parameter list



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## 1. Warnings and legal information

### Legal information and responsibility

DEIF 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.**

### 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

### M12 option

Option M12 is a hardware option, and therefore an extra PCB is placed in slot #3 in addition to the standard installed hardware. The option consists of the following:

| Function                                     | ANSI no. |
|----------------------------------------------|----------|
| 13 x binary inputs for control and/or alarms | 77       |
| 4 x digital outputs                          | 74       |



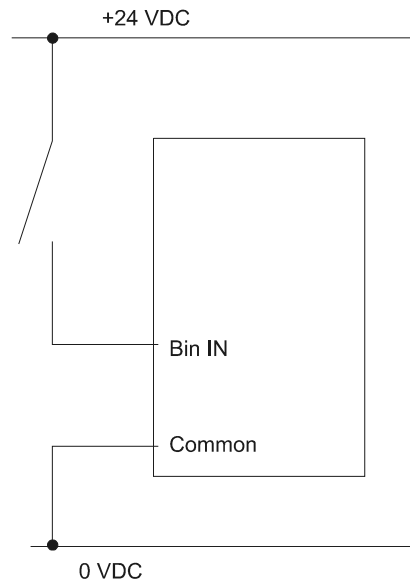
If option G3 is already installed, then option M12 is a software upgrade.

### Terminal description

| Term. | Function         | Technical data        | Description                   |
|-------|------------------|-----------------------|-------------------------------|
| 37    |                  |                       | <b>Used for the option G3</b> |
| 38    |                  |                       |                               |
| 39    |                  |                       |                               |
| 40    |                  |                       |                               |
| 41    |                  |                       |                               |
| 42    |                  |                       |                               |
| 43    | Digital input 43 | Optocoupler           | Configurable                  |
| 44    | Digital input 44 | Optocoupler           | Configurable                  |
| 45    | Digital input 45 | Optocoupler           | Configurable                  |
| 46    | Digital input 46 | Optocoupler           | Configurable                  |
| 47    | Digital input 47 | Optocoupler           | Configurable                  |
| 48    | Digital input 48 | Optocoupler           | Configurable                  |
| 49    | Digital input 49 | Optocoupler           | Configurable                  |
| 50    | Digital input 50 | Optocoupler           | Configurable                  |
| 51    | Digital input 51 | Optocoupler           | Configurable                  |
| 52    | Digital input 52 | Optocoupler           | Configurable                  |
| 53    | Digital input 53 | Optocoupler           | Configurable                  |
| 54    | Digital input 54 | Optocoupler           | Configurable                  |
| 55    | Digital input 55 | Optocoupler           | Configurable                  |
| 56    | Com.             | Common                | Common for terminals 43 to 55 |
| 57    | NO               | Relay 5<br>250V AC/8A | Configurable                  |
| 58    | Com.             |                       |                               |
| 59    | NO               | Relay 6<br>250V AC/8A | Configurable                  |
| 60    | Com.             |                       |                               |
| 61    | NO               | Relay 7<br>250V AC/8A | Configurable                  |
| 62    | Com.             |                       |                               |
| 63    | NO               | Relay 8<br>250V AC/8A | Configurable                  |
| 64    | Com.             |                       |                               |

### DC wiring

The wiring is done by connecting 24 volts across the common and the input terminal. All binary inputs are 24V DC bi-directional optocoupler. Typical input is:



**The binary inputs use fixed signals.**

### 3. Functional description

#### PC utility software

The PC utility software is a Windows® based software, which can be downloaded from our website [www.deif.com](http://www.deif.com). To adjust the inputs via the PC utility software, a computer must be connected to the controller unit. Furthermore, the unit parameters must be uploaded to the computer.

#### Binary input

The binary inputs available in this option can be used for two purposes:

1. Protection (alarm) inputs
2. Function inputs

Parameter "Dig. Input No43" (Channel 3060)

Setpoint : ... Dig. Input No43

Timer : 0,0 **10 sec** 100,0

Fail class : Warning

Output A : Output 0

Output B : Output 0

Password level : Customer

Enabled: OFF

☒ High Alarm

☐ Inverse proportional

Commissioning

Actual value : 0

Time elapsed : 0 sec (0 %)

0 sec 10 sec

Write OK Cancel

#### Protection inputs

The protection inputs can be set up via the PC utility software.

##### Set point

The text can be changed by clicking the button  which is placed on the left hand side of the existing text. The unit can be selected to relevant values, e.g. volt, amp, RPM etc.

##### Timer

The timer can be adjusted by moving the glider left or right or by clicking the present set point. (Above click '10 sec').

##### Fail class

Select the required fail class from the drop-down list.

**Output A/output B**

Select which relay to activate at an alarm, if this is necessary.

**Password level**

Select which password level is needed to modify this parameter.

**Enable**

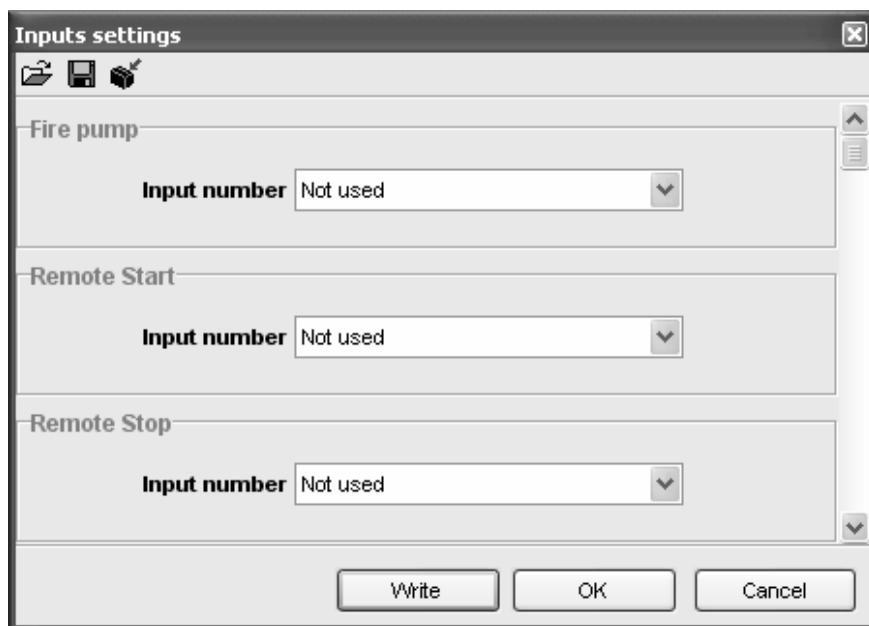
To activate the alarm function select ON or RUN in the list. (If RUN is selected, the alarm function will be activated when the gen-set is running).

**High alarm**

Mark this check box to get an alarm, when the input is activated. Unmark this check box to get an alarm, when the input is deactivated.

**Function input**

The function inputs can be set up via the PC utility software.



The screenshot shows a window titled "Inputs settings". Inside, there are three distinct sections, each with a title and a corresponding "Input number" drop-down menu. The sections are "Fire pump", "Remote Start", and "Remote Stop". All three drop-down menus are currently set to "Not used". At the bottom of the window, there are three buttons: "Write", "OK", and "Cancel".

Select the input number in the drop-down list based on the function it needs to activate.

**Relay setup**

The relays can be configured in two different ways as illustrated below.

**Alarm relay function**

*When an alarm activates the relay, it will remain activated for as long as the alarm is present and unacknowledged.*

**Limit function**

*When an alarm activates the relay, no alarm message is displayed. After the condition activating the relay has returned to normal, the relay will deactivate, when the 'off delay' has expired.*

**Horn relay function**

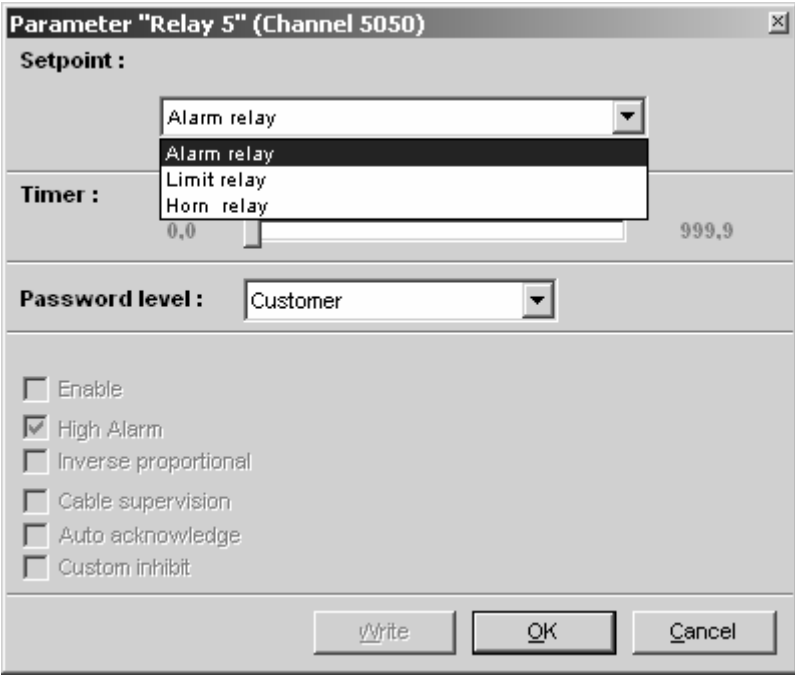
*When an alarm activates, the relays configured to 'Horn' will activate and an alarm message is displayed. After the condition activating the relay has returned to normal, the relay will deactivate, when the 'off delay' has expired.*

The setup of the relay is done in the I/O menu ('OUT' menu). All relays are set up in the same way. This example illustrates relay 6:

| No.  | Setting |           | First/min. setting | Second/max. setting | Third setting | Factory setting |
|------|---------|-----------|--------------------|---------------------|---------------|-----------------|
| 5061 | Relay 6 | Function  | Alarm              | Limit               | Horn          | Alarm           |
| 5062 | Relay 6 | Off delay | 0.0 s              | 999.9 s             | -             | 5.0 s           |

The 'off delay' is the time between the disappearance of the event that caused the relay to activate and the actual deactivation of the relay.

#### PC utility software



The screenshot shows a software window titled "Parameter "Relay 5" (Channel 5050)". Inside the window, there are several configuration options:

- Setpoint :** A dropdown menu currently showing "Alarm relay".
- Timer :** A dropdown menu currently showing "Alarm relay", with a list of options: "Alarm relay", "Limit relay", and "Horn relay". Below the dropdown is a numerical input field with "0,0" on the left and "999,9" on the right.
- Password level :** A dropdown menu currently showing "Customer".
- Options:** A list of checkboxes:
  - ☐ Enable
  - ☒ High Alarm
  - ☐ Inverse proportional
  - ☐ Cable supervision
  - ☐ Auto acknowledge
  - ☐ Custom inhibit
- Buttons:** At the bottom right, there are three buttons: "Write", "OK", and "Cancel".



## 4. Parameter list

### Digital inputs



Please refer to the Designer's Reference Handbook for a description of the fail class selections.



These parameters are used when the binary inputs are used as protection inputs.

#### 3060 Digital input no. 43

| No.  | Setting           |                | Min. setting | Max. setting     | Third setting | Factory setting |
|------|-------------------|----------------|--------------|------------------|---------------|-----------------|
| 3061 | Dig. input no. 43 | Timer          | 0.0 s        | 100.0 s          | -             | 10.0 s          |
| 3062 | Dig. input no. 43 | Relay output A | R0 (none)    | Option dependent | -             | R0 (none)       |
| 3063 | Dig. input no. 43 | Relay output B | R0 (none)    |                  | -             | R0 (none)       |
| 3064 | Dig. input no. 43 | Enable         | OFF          | ON               | RUN           | OFF             |
| 3065 | Dig. input no. 43 | Fail class     | Alarm (1)    | Trip MB (6)      | -             | Warning (2)     |
| 3066 | Dig. input no. 43 | N/O - N/C      | N/O          | N/C              | -             | N/O             |

#### 3070 Digital input no. 44

| No.  | Setting           |                | Min. setting | Max. setting     | Third setting | Factory setting |
|------|-------------------|----------------|--------------|------------------|---------------|-----------------|
| 3071 | Dig. input no. 44 | Timer          | 0.0 s        | 100.0 s          | -             | 10.0 s          |
| 3072 | Dig. input no. 44 | Relay output A | R0 (none)    | Option dependent | -             | R0 (none)       |
| 3073 | Dig. input no. 44 | Relay output B | R0 (none)    |                  | -             | R0 (none)       |
| 3074 | Dig. input no. 44 | Enable         | OFF          | ON               | RUN           | OFF             |
| 3075 | Dig. input no. 44 | Fail class     | Alarm (1)    | Trip MB (6)      | -             | Warning (2)     |
| 3076 | Dig. input no. 44 | N/O - N/C      | N/O          | N/C              | -             | N/O             |

#### 3080 Digital input no. 45

| No.  | Setting           |                | Min. setting | Max. setting     | Third setting | Factory setting |
|------|-------------------|----------------|--------------|------------------|---------------|-----------------|
| 3081 | Dig. input no. 45 | Timer          | 0.0 s        | 100.0 s          | -             | 10.0 s          |
| 3082 | Dig. input no. 45 | Relay output A | R0 (none)    | Option dependent | -             | R0 (none)       |
| 3083 | Dig. input no. 45 | Relay output B | R0 (none)    |                  | -             | R0 (none)       |
| 3084 | Dig. input no. 45 | Enable         | OFF          | ON               | RUN           | OFF             |
| 3085 | Dig. input no. 45 | Fail class     | Alarm (1)    | Trip MB (6)      | -             | Warning (2)     |
| 3086 | Dig. input no. 45 | N/O - N/C      | N/O          | N/C              | -             | N/O             |

**3090 Digital input no. 46**

| No.  | Setting           |                | Min. setting | Max. setting     | Third setting | Factory setting |
|------|-------------------|----------------|--------------|------------------|---------------|-----------------|
| 3091 | Dig. input no. 46 | Timer          | 0.0 s        | 100.0 s          | -             | 10.0 s          |
| 3092 | Dig. input no. 46 | Relay output A | R0 (none)    | Option dependent | -             | R0 (none)       |
| 3093 | Dig. input no. 46 | Relay output B | R0 (none)    |                  | -             | R0 (none)       |
| 3094 | Dig. input no. 46 | Enable         | OFF          | ON               | RUN           | OFF             |
| 3095 | Dig. input no. 46 | Fail class     | Alarm (1)    | Trip MB (6)      | -             | Warning (2)     |
| 3096 | Dig. input no. 46 | N/O - N/C      | N/O          | N/C              | -             | N/O             |

**3100 Digital input no. 47**

| No.  | Setting           |                | Min. setting | Max. setting     | Third setting | Factory setting |
|------|-------------------|----------------|--------------|------------------|---------------|-----------------|
| 3101 | Dig. input no. 47 | Timer          | 0.0 s        | 100.0 s          | -             | 10.0 s          |
| 3102 | Dig. input no. 47 | Relay output A | R0 (none)    | Option dependent | -             | R0 (none)       |
| 3103 | Dig. input no. 47 | Relay output B | R0 (none)    |                  | -             | R0 (none)       |
| 3104 | Dig. input no. 47 | Enable         | OFF          | ON               | RUN           | OFF             |
| 3105 | Dig. input no. 47 | Fail class     | Alarm (1)    | Trip MB (6)      | -             | Warning (2)     |
| 3106 | Dig. input no. 47 | N/O - N/C      | N/O          | N/C              | -             | N/O             |

**3110 Digital input no. 48**

| No.  | Setting           |                | Min. setting | Max. setting     | Third setting | Factory setting |
|------|-------------------|----------------|--------------|------------------|---------------|-----------------|
| 3111 | Dig. input no. 48 | Timer          | 0.0 s        | 100.0 s          | -             | 10.0 s          |
| 3112 | Dig. input no. 48 | Relay output A | R0 (none)    | Option dependent | -             | R0 (none)       |
| 3113 | Dig. input no. 48 | Relay output B | R0 (none)    |                  | -             | R0 (none)       |
| 3114 | Dig. input no. 48 | Enable         | OFF          | ON               | RUN           | OFF             |
| 3115 | Dig. input no. 48 | Fail class     | Alarm (1)    | Trip MB (6)      | -             | Warning (2)     |
| 3116 | Dig. input no. 48 | N/O - N/C      | N/O          | N/C              | -             | N/O             |

**3120 Digital input no. 49**

| No.  | Setting           |                | Min. setting | Max. setting     | Third setting | Factory setting |
|------|-------------------|----------------|--------------|------------------|---------------|-----------------|
| 3121 | Dig. input no. 49 | Timer          | 0.0 s        | 100.0 s          | -             | 10.0 s          |
| 3122 | Dig. input no. 49 | Relay output A | R0 (none)    | Option dependent | -             | R0 (none)       |
| 3123 | Dig. input no. 49 | Relay output B | R0 (none)    |                  | -             | R0 (none)       |
| 3124 | Dig. input no. 49 | Enable         | OFF          | ON               | RUN           | OFF             |
| 3125 | Dig. input no. 49 | Fail class     | Alarm (1)    | Trip MB (6)      | -             | Warning (2)     |
| 3126 | Dig. input no. 49 | N/O - N/C      | N/O          | N/C              | -             | N/O             |

**3130 Digital input no. 50**

| No.  | Setting           |                | Min. setting | Max. setting     | Third setting | Factory setting |
|------|-------------------|----------------|--------------|------------------|---------------|-----------------|
| 3131 | Dig. input no. 50 | Timer          | 0.0 s        | 100.0 s          | -             | 10.0 s          |
| 3132 | Dig. input no. 50 | Relay output A | R0 (none)    | Option dependent | -             | R0 (none)       |
| 3133 | Dig. input no. 50 | Relay output B | R0 (none)    |                  | -             | R0 (none)       |
| 3134 | Dig. input no. 50 | Enable         | OFF          | ON               | RUN           | OFF             |
| 3135 | Dig. input no. 50 | Fail class     | Alarm (1)    | Trip MB (6)      | -             | Warning (2)     |
| 3136 | Dig. input no. 50 | N/O - N/C      | N/O          | N/C              | -             | N/O             |

**3140 Digital input no. 51**

| No.  | Setting           |                | Min. setting | Max. setting     | Third setting | Factory setting |
|------|-------------------|----------------|--------------|------------------|---------------|-----------------|
| 3141 | Dig. input no. 51 | Timer          | 0.0 s        | 100.0 s          | -             | 10.0 s          |
| 3142 | Dig. input no. 51 | Relay output A | R0 (none)    | Option dependent | -             | R0 (none)       |
| 3143 | Dig. input no. 51 | Relay output B | R0 (none)    |                  | -             | R0 (none)       |
| 3144 | Dig. input no. 51 | Enable         | OFF          | ON               | RUN           | OFF             |
| 3145 | Dig. input no. 51 | Fail class     | Alarm (1)    | Trip MB (6)      | -             | Warning (2)     |
| 3146 | Dig. input no. 51 | N/O - N/C      | N/O          | N/C              | -             | N/O             |

**3150 Digital input no. 52**

| No.  | Setting           |                | Min. setting | Max. setting     | Third setting | Factory setting |
|------|-------------------|----------------|--------------|------------------|---------------|-----------------|
| 3151 | Dig. input no. 52 | Timer          | 0.0 s        | 100.0 s          | -             | 10.0 s          |
| 3152 | Dig. input no. 52 | Relay output A | R0 (none)    | Option dependent | -             | R0 (none)       |
| 3153 | Dig. input no. 52 | Relay output B | R0 (none)    |                  | -             | R0 (none)       |
| 3154 | Dig. input no. 52 | Enable         | OFF          | ON               | RUN           | OFF             |
| 3155 | Dig. input no. 52 | Fail class     | Alarm (1)    | Trip MB (6)      | -             | Warning (2)     |
| 3156 | Dig. input no. 52 | N/O - N/C      | N/O          | N/C              | -             | N/O             |

**3160 Digital input no. 53**

| No.  | Setting           |                | Min. setting | Max. setting     | Third setting | Factory setting |
|------|-------------------|----------------|--------------|------------------|---------------|-----------------|
| 3161 | Dig. input no. 53 | Timer          | 0.0 s        | 100.0 s          | -             | 10.0 s          |
| 3162 | Dig. input no. 53 | Relay output A | R0 (none)    | Option dependent | -             | R0 (none)       |
| 3163 | Dig. input no. 53 | Relay output B | R0 (none)    |                  | -             | R0 (none)       |
| 3164 | Dig. input no. 53 | Enable         | OFF          | ON               | RUN           | OFF             |
| 3165 | Dig. input no. 53 | Fail class     | Alarm (1)    | Trip MB (6)      | -             | Warning (2)     |
| 3166 | Dig. input no. 53 | N/O - N/C      | N/O          | N/C              | -             | N/O             |

**3170 Digital input no. 54**

| No.  | Setting           |                | Min. setting | Max. setting     | Third setting | Factory setting |
|------|-------------------|----------------|--------------|------------------|---------------|-----------------|
| 3171 | Dig. input no. 54 | Timer          | 0.0 s        | 100.0 s          | -             | 10.0 s          |
| 3172 | Dig. input no. 54 | Relay output A | R0 (none)    | Option dependent | -             | R0 (none)       |
| 3173 | Dig. input no. 54 | Relay output B | R0 (none)    |                  | -             | R0 (none)       |
| 3174 | Dig. input no. 54 | Enable         | OFF          | ON               | RUN           | OFF             |
| 3175 | Dig. input no. 54 | Fail class     | Alarm (1)    | Trip MB (6)      | -             | Warning (2)     |
| 3176 | Dig. input no. 54 | N/O - N/C      | N/O          | N/C              | -             | N/O             |

**3180 Digital input no. 55**

| No.  | Setting           |                | Min. setting | Max. setting     | Third setting | Factory setting |
|------|-------------------|----------------|--------------|------------------|---------------|-----------------|
| 3181 | Dig. input no. 55 | Timer          | 0.0 s        | 100.0 s          | -             | 10.0 s          |
| 3182 | Dig. input no. 55 | Relay output A | R0 (none)    | Option dependent | -             | R0 (none)       |
| 3183 | Dig. input no. 55 | Relay output B | R0 (none)    |                  | -             | R0 (none)       |
| 3184 | Dig. input no. 55 | Enable         | OFF          | ON               | RUN           | OFF             |
| 3185 | Dig. input no. 55 | Fail class     | Alarm (1)    | Trip MB (6)      | -             | Warning (2)     |
| 3186 | Dig. input no. 55 | N/O - N/C      | N/O          | N/C              | -             | N/O             |

**Relay outputs****5050 Relay 5**

| No.  | Setting |           | First/min. setting | Second/max. setting | Third setting | Factory setting |
|------|---------|-----------|--------------------|---------------------|---------------|-----------------|
| 5051 | Relay 5 | Function  | Alarm              | Limit               | Horn          | Alarm           |
| 5052 | Relay 5 | Off delay | 0.0 s              | 999.9 s             | -             | 5.0 s           |

**5060 Relay 6**

| No.  | Setting |           | First/min. setting | Second/max. setting | Third setting | Factory setting |
|------|---------|-----------|--------------------|---------------------|---------------|-----------------|
| 5061 | Relay 6 | Function  | Alarm              | Limit               | Horn          | Alarm           |
| 5062 | Relay 6 | Off delay | 0.0 s              | 999.9 s             | -             | 5.0 s           |

**5070 Relay 7**

| No.  | Setting |           | First/min. setting | Second/max. setting | Third setting | Factory setting |
|------|---------|-----------|--------------------|---------------------|---------------|-----------------|
| 5071 | Relay 7 | Function  | Alarm              | Limit               | Horn          | Alarm           |
| 5072 | Relay 7 | Off delay | 0.0 s              | 999.9 s             | -             | 5.0 s           |

**5080 Relay 8**

| No.  | Setting |           | First/min. setting | Second/max. setting | Third setting | Factory setting |
|------|---------|-----------|--------------------|---------------------|---------------|-----------------|
| 5081 | Relay 8 | Function  | Alarm              | Limit               | Horn          | Limit           |
| 5082 | Relay 8 | Off delay | 0.0 s              | 999.9 s             | -             | 5.0 s           |

DEIF A/S reserves the right to change any of the above