



## DATA SHEET



### **Current relays, RMC-111D, RMC-122D, RMC-132D ANSI codes 50/51**

- Short circuit/over-current
  - 3-phase measurement
- LED indication of fault condition
  - Timer-controlled tripping
- LED indication for activated relay



## 1. General information

<b>1.1 Application and features</b> .....	<b>3</b>
1.1.1 Application.....	3
1.1.2 Measuring principle.....	3
1.1.3 Timer functions.....	3
1.1.4 Relay outputs.....	3

## 2. Technical information

<b>2.1 Technical specifications and dimensions</b> .....	<b>5</b>
2.1.1 Technical specifications.....	5
2.1.2 Settings and indication.....	6
2.1.3 Connections/dimensions (in mm).....	6

## 3. Ordering information

<b>3.1 Order specifications and disclaimer</b> .....	<b>8</b>
3.1.1 Available variants.....	8
3.1.2 Order specifications.....	8
3.1.3 Disclaimer.....	8

# 1. General information

## 1.1 Application and features

### 1.1.1 Application

The protective current relays types RMC-111D, RMC-122D and RMC-132D form part of a complete DEIF series of relays for protection and control of generators. The relays are applicable to both marine and land-based installations. Also available are differential current relays (RMC-131D).

The relays are type-approved by major classification societies.

#### **RMC-111D (ANSI codes 50/51)**

This short circuit relay is applied in cases where only protection against short circuit currents is required ( $I>>$ ).

#### **RMC-122D (ANSI codes 50/51)**

This combined short circuit and over-current relay is applied for protection of generators against both over-currents and short circuit currents ( $I> + I>>$ ).

#### **RMC-132D (ANSI codes 50/51)**

This double over-current relay is applied in cases where protection against over-currents at two levels is required ( $I> + I>$ ).

### 1.1.2 Measuring principle

The relays measure the highest of the 3-phase currents, providing an RMS measurement at sinusoidal currents.

The measurement is based on average values for  $I>$ , peak values for  $I>>$ . If a current exceeds a set point, the output is activated.

The set point values are set on the front of the relays by means of potentiometers. If exceeded, a fault signal is generated, and the associated yellow LED is lit.

### 1.1.3 Timer functions

When the set point is exceeded, its timer starts and will run as long as the fault condition prevails.

If the fault disappears, the timer is reset. When the timer expires, the contact is activated and the associated red LED is lit.

### 1.1.4 Relay outputs

The relays are provided with outputs as follows:

RMC-111D:  $I>>$  1 max. contact

RMC-122D:  $I> + I>>$  2 max. contacts

RMC-132D:  $I> + I>$  2 max. contacts

which are either normally energised or normally de-energised contacts. The contact(s) may be set to open or to close on activation.

#### **Normally energised contact**

Recommended for land-based installations for warning and alarm purposes. In case of an auxiliary supply dropout, the contact is immediately activated.

### **Normally de-energised contact**

Recommended for marine installations for regulating and control purposes. An auxiliary supply failure will not result in an unwanted activation of the contact.

### **Latch circuit**

The contacts can be locked in their warning position, even if the input currents return to normal (add "L" to contact type in order specifications if this is required).

The latch circuit is reset by disconnecting the auxiliary supply.

### **Hysteresis**

In order to avoid "chatter" on the relay contacts, the contact functions are provided with a hysteresis, that is a difference of 2 % of full scale between energising and de-energising of the relay.

### **Power-up/power-down circuits**

The relays are provided with a 200 ms power-up circuit, ensuring the correct function of the relay on connection of the auxiliary voltage.



#### **INFO**

Normally energised contacts are not activated (contact does not open/close) until 200 ms after connection of the auxiliary voltage.

Likewise, the relays are provided with a 200 ms power-down circuit, ensuring supervision and maintenance of any set point exceedings for 200 ms after disconnection of the auxiliary voltage.

## 2. Technical information

### 2.1 Technical specifications and dimensions

#### 2.1.1 Technical specifications

<b>Meas. range (<math>I_n</math>)</b>	0.3-0.4-0.5-0.6-0.8-1.0-1.3-1.5-2.0-2.5-3.0-4.0-5.0 A AC UL/cUL Listed: 0.4 to 5.0 A AC
<b>Adjusted ranges</b>	75 to 100 % of $I_n$ (for example 0.4, 0.45, etc.) (Lowest meas. range: 0.3 A)
<b>Frequency range</b>	40 to <u>45</u> to <u>65</u> to 70 Hz
<b>Short circuit current</b>	1.0 to $4.0 \times I_n$
<b>Over-current</b>	0.5 to $1.5 \times I_n$
<b>Max. input current</b>	$4 \times I_n$ , continuously $20 \times I_n$ for 10 s (max. 75 A) $80 \times I_n$ for 1 s (max. 300 A)
<b>Load</b>	Max. 0.3 VA per phase
<b>Output(s)</b>	1(2) maximum contact(s)
<b>Contact type</b>	Relay B (+relay C): Normally energised ("NE"), or normally de-energised ("ND") with or without latch circuit ("L")
<b>Relay contacts</b>	1 change-over switch per relay
<b>Contact ratings</b>	250 V AC/24 V DC, 8 A ( $200 \times 10^3$ change-overs at resistive load) UL/cUL Listed: Resistive load only
<b>Contact voltage</b>	Max. 250 V AC/150 V DC
<b>Hysteresis</b>	Minimum set point: >2 % Medium set point: >6 % Maximum set point: >18 %
<b>Response time</b>	<50 ms short circuit current <500 ms over-current
<b>Temperature</b>	-25 to 70 °C (-13 to 158 °F) (operating) UL/cUL Listed: Max. surrounding air temp. 60 °C/140 °F
<b>Temperature drift</b>	Set points: Max. 0.2 % of full scale per 10 °C/50 °F
<b>Galv. separation</b>	Between inputs, outputs and aux. voltage: 3250 V - 50 Hz - 1 min.
<b>Supply voltage (<math>U_n</math>)</b>	57.7-63.5-100-110-127-220-230-240-380-400-415-440-450-480-660-690 V AC $\pm 20$ % (max. 3.5 VA) 24-48-110-220 V DC -25/+30 % (max. 2 W) UL/cUL Listed: Only 24 V DC and 110 V AC DC supply must be from a class 2 power source
<b>Climate</b>	HSE, to DIN 40040
<b>EMC</b>	To IEC/EN 61000-6-1/2/3/4
<b>Connections</b>	Max. 4.0 mm <sup>2</sup> (single-stranded) Max. 2.5 mm <sup>2</sup> (multi-stranded)
<b>Materials</b>	All plastic parts are self-extinguishing to UL94 (V1)
<b>Protection</b>	Case: IP40. Terminals: IP20, to IEC 529 and EN 60529
<b>Type approval</b>	The Uni-line components are approved by the major classification societies. For current approvals see <a href="http://www.deif.com">www.deif.com</a> or contact DEIF A/S.
<b>UL markings</b>	UL Listed only on request

UL Listing will be lost if the product is re-customised outside DEIF DK's production plant  
 Wiring: Use 60/75 °C (140/167 °F) copper conductors only  
 Wire size: AWG 12-16 or equivalent  
 Installation: To be installed in accordance with the NEC (US) or the CEC (Canada)

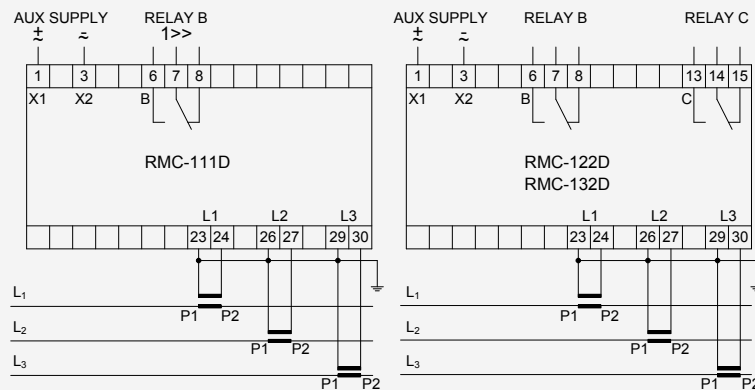
## 2.1.2 Settings and indication

	Relay B	Relay C
RMC-111D	Short circuit I>>	
RMC-122D	Short circuit I>>	Over-current I>
RMC-132D	Over-current I>	Over-current I>

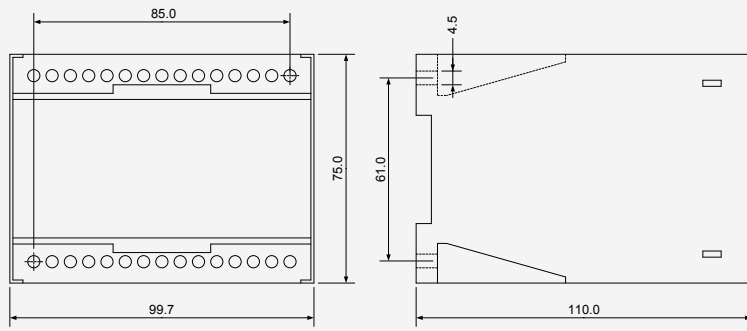
Setting of	LED/relay
<b>Short circuit current set point:</b> (100 to 400 %) of $I_n$	"I>>" yellow LED is lit when the set point has been exceeded, but the output contact not yet activated.
<b>Time delay:</b> (0 to T1) in seconds 0 to 1/0 to 5/0 to 10 s	Contact is activated and red LED lit after the timer has expired.
<b>Over-current set point(s):</b> (50 to 150 %) of $I_n$	"I>" yellow LED is lit when the set point has been exceeded, but the output contact not yet activated.
<b>Time delay:</b> (0 to T2) in seconds 0 to 20/0 to 60/0 to 120 s	Contact is activated and red LED lit after the timer has expired.

The relays are furthermore equipped with a green LED marked "POWER" for indication of power ON. Once the relay has been mounted and adjusted, the transparent front cover may be sealed to prevent unwanted change of the setting.

## 2.1.3 Connections/dimensions (in mm)



Shown contact positions: Aux. voltage not connected



Weight: Approx. 0.650 kg

## 3. Ordering information

### 3.1 Order specifications and disclaimer

#### 3.1.1 Available variants

Item no.	Variant no.	Variant description
2913160060	01	RMC-111D - DC supply
2913160060	02	RMC-111D - AC supply
2913160560	01	RMC-122D - DC supply
2913160560	02	RMC-122D - AC supply
2913160720	01	RMC-132D - DC supply
2913160720	02	RMC-132D - AC supply

#### 3.1.2 Order specifications



##### INFO

There are no additional options to the standard variant.

##### Variants

Mandatory information								
Item no.	Type	Variant no.	Measuring current ( $I_n$ )	Relay B	Relay C	Time delay T1	Time delay T2	Supply voltages

Example:

Mandatory information								
Item no.	Type	Variant no.	Measuring current ( $I_n$ )	Relay B	Relay C	Time delay T1	Time delay T2	Supply voltages
2913160060-02	RMC-111D	02	1 A AC	ND		5 s	20 s	380 V AC
2913160560-02	RMC-122D	02	5 A AC	ND	ND	1 s	20 s	400 V AC

#### 3.1.3 Disclaimer

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