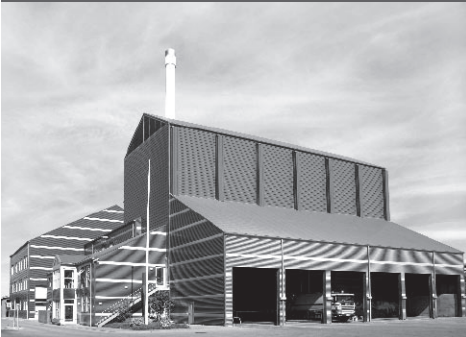




-power in control



DATA SHEET



Frequency relays, RMF-112D ANSI code 81

- Combined under-/over-frequency
- For single and 3-phase networks
- LED indication of fault condition
- Timer-controlled tripping
- LED indication for activated relay



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1. General information

1.1 Application and features

1.1.1 Application

The digital, combined under-frequency and over-frequency relay type RMF-112D forms part of a complete DEIF series of relays for protection and control of generators.

The relay is type-approved by major classification societies and is applicable to both marine and land-based installations.

The RMF-112D is applied for protection against under-frequency and over-frequency by supervising the frequency (of generators) in single phase and 3-phase networks.

1.1.2 Measuring principle

The relay measures the voltage between two phases or between one phase and the neutral.

To avoid unwanted under-frequency alarms, the RMF-112D relay is not activated until the measuring voltage exceeds 60 % of U_n .

If either the under-frequency or over-frequency exceeds its set point, its associated output is activated.

The set point values are set on the front of the relay 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, the associated timer starts and will run as long as the fault condition prevails. The delay does not depend on the exceeding of the set point.

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 RMF-112D is provided with two outputs:

- f< a minimum contact
(normally energised or normally de-energised)
- f> a maximum contact
(normally energised or normally de-energised)

The contacts 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 contact can be locked in its warning position, even if the input frequency returns 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 0.25 Hz between energising and de-energising of the relay.

Power-up/power-down circuits

The RMF-112D is provided with a 200 ms power-up circuit, ensuring the correct function of the relay on connection of the auxiliary voltage.



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

Likewise, the RMF-112D is 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

Meas. voltage (U_n)	57.7-63.5-100-110-127-200-220-230-240-380-400-415-440-450-480-660-690 V AC UL/cUL Listed: 57.7 to 450 V AC
Voltage range	60 to 120 % of U _n
Overload	1.2 × U _n , continuously 2 × U _n for 10 s
Load	2 kΩ/V
Frequency range	40 to 45 to 65 to 70 Hz
Nom. frequency (f_n)	50 Hz, 55 Hz or 60 Hz
Output	1 min. and 1 max. contact
Contact type	Relays B + C: Normally energised ("NE"), or normally de-energised ("ND") with or without latch circuit ("L")
Relay contacts	1 change-over switch per relay
Contact ratings	250 V AC/24 V DC, 8 A (200 × 10 ³ change-overs at resistive load) UL/cUL Listed: Resistive load only
Contact voltage	Max. 250 V AC/150 V DC
Optocoupler output	System status off = failure UL/cUL Listed: 30 V DC, 5 mA
Hysteresis	0.25 Hz
Response time	<90 ms
Temperature	-25 to 70 °C (-13 to 158 °F) (operating) UL/cUL Listed: Max. surrounding air temp. 60 °C/140 °F
Temperature drift	±0.1 Hz per 10 °C/50 °F
Galv. separation	Between inputs and outputs: 3250 V - 50 Hz - 1 min.
Supply voltage	57.7-63.5-100-110-127-220-230-240-380-400-415-440-450-480-660-690 V AC ±20 % (max. 4 VA) 24-48-110-220 V DC -25/+30 % (max. 3.5 W) UL/cUL Listed: Only 24 V DC and 110 V AC DC supply must be from a class 2 power source
Climate	HSE, to DIN 40040
EMC	To IEC/EN 61000-6-1/2/3/4
Connections	Max. 4.0 mm ² (single-stranded) Max. 2.5 mm ² (multi-stranded)
Materials	All plastic parts are self-extinguishing to UL94 (V1)
Protection	Case: IP40. Terminals: IP20, to IEC 529 and EN 60529

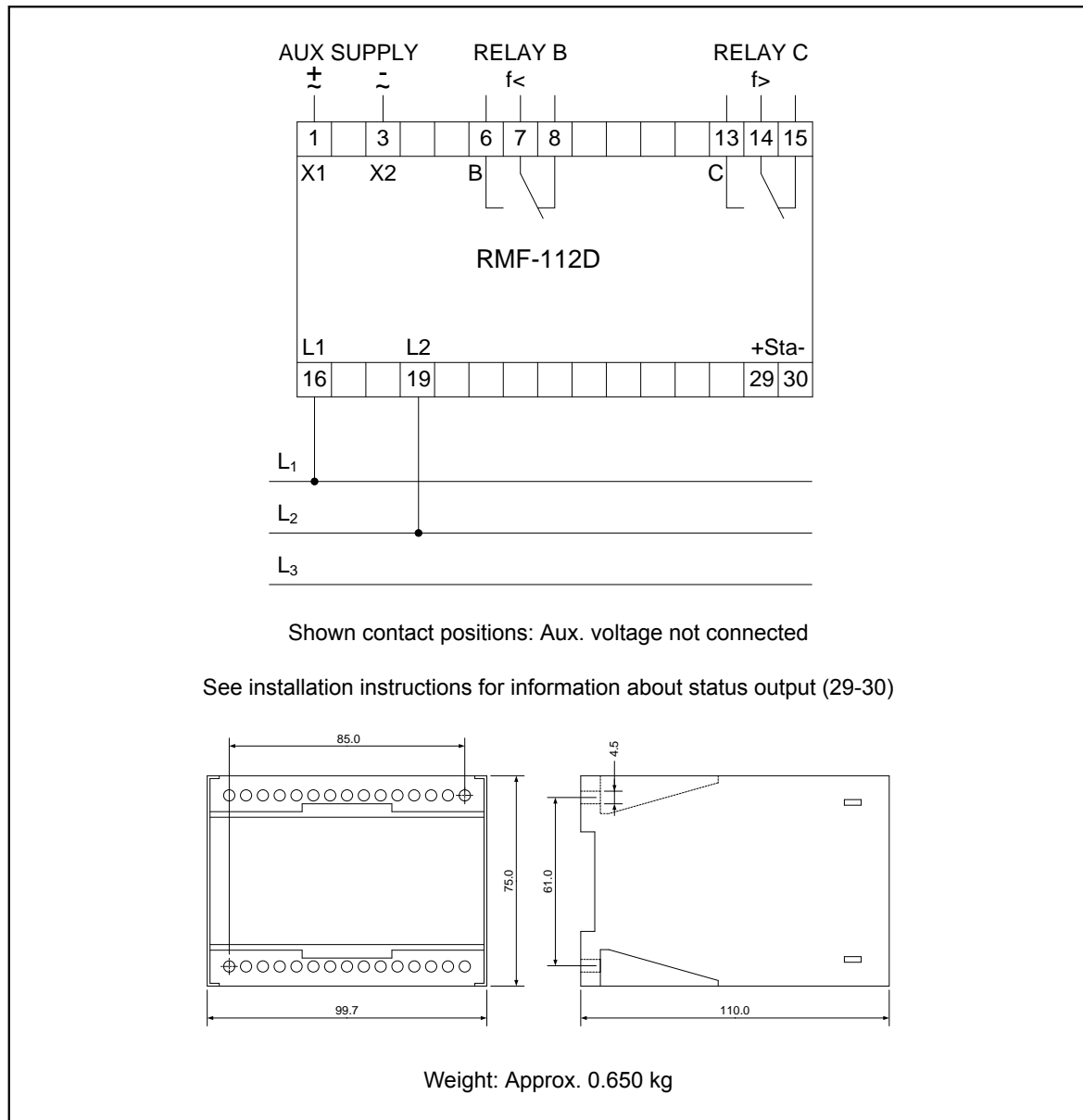
Type approval	The Uni-line components are approved by the major classification societies. For current approvals see www.deif.com or contact DEIF A/S.
UL markings	UL Listed only on request UL Listing will be lost if the product is re-customised outside DEIF DK's production plant Wiring: Use 60/75 °C (140/167 °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

Setting of	LED/relay
Under-frequency set point: (90 to 100 %) of f_n (80 to 100 %) of f_n at $f_n = 55$ Hz	"f<" yellow LED is lit when the frequency has dropped below the set point, but the relay not yet activated.
Over-frequency set point: (100 to 110 %) of f_n (100 to 120 %) of f_n at $f_n = 55$ Hz	"f>" yellow LED is lit when the set point is exceeded, but the relay not yet activated.
Time delay: (0 to 10 s) in seconds	Contact is activated and red LED lit after the timer has expired.

The relay is 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)



3. Ordering information

3.1 Order specifications and disclaimer

3.1.1 Available variants

Item no.	Variant no.	Variant description
2913360120	01	RMF-112D - DC supply
2913360120	02	RMF-112D - AC supply

3.1.2 Order specifications



There are no additional options to the standard variant.

Variants

Mandatory information							
Item no.	Type	Variant no.	Measuring voltage	Nom. frequency	Relay B	Relay C	Supply voltage

Example:

Mandatory information							
Item no.	Type	Variant no.	Measuring voltage	Nom. frequency	Relay B	Relay C	Supply voltage
2913360120-01	RMF-112D	01	380 V AC	50 Hz	NE	ND	24 V DC

3.1.3 Disclaimer

DEIF A/S reserves the right to change any of the contents of this document without prior notice.