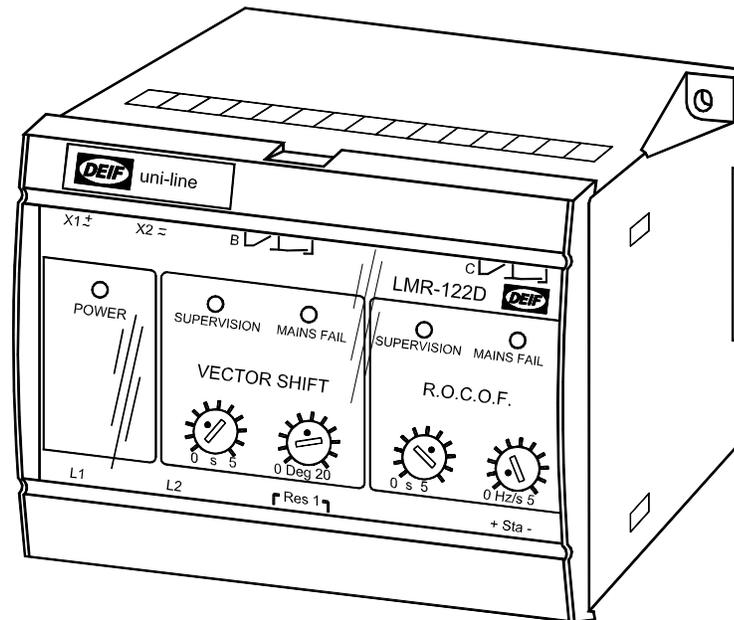


Loss of mains relay type LMR-122D

uni-line

4189340237C (UK)



- Detection of df/dt (rate of change of frequency R.O.C.O.F.)
- Detection of vector shift
- Generator disconnection on mains failure
- Ensures no asynchronous reconnection
- LED indication of fault condition
- LED indication for activated relay
- 35 mm DIN rail or base mounting



DEIF A/S
Frisenborgvej 33, DK-7800 Skive
Denmark

Tel: (+45) 9614 9614
Fax: (+45) 9614 9615
E-mail: deif@deif.com



1. Description

This loss of mains relay type LMR-122D forms part of a complete DEIF series (the *uni-line*) of relays for protection and control of generators.

The LMR-122D is applied to protect synchronous generators running in parallel with a high-voltage network (the mains) against damages caused by automatic reconnection to the network.

The LMR-122D will detect a mains failure, provided that a disconnection at an arbitrary point of the network results in a swift change of the generator frequency (vector shift) and/or a changing frequency overtime, df/dt (R.O.C.O.F).

The LMR-122D vector shift detects the sudden change of the load angle of the generator, arising the moment the external mains circuit breaker is opened momentarily on mains failure, thus disconnecting the generator. Basically a momentary 5% change of the load results in a 4.5 electr. degr. change of the load angle of the generator. If the vector shift potentiometer of the LMR-122D is set to 4 electr. degr., the relay will thus open its mains circuit breaker, ensuring that the generator remains disconnected, until the mains has been restored, and the generator has been resynchronised.

The LMR-122D df/dt detects a change of frequency overtime. If the frequency keeps changing for four periods in a row, exceeding the set-point, the output is activated.

2. Label

The relay is provided with a label with the following data:

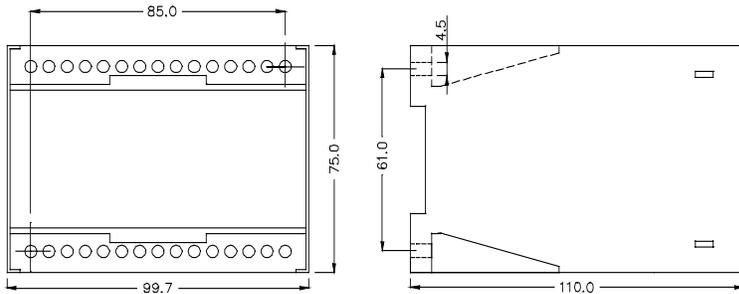
Type designation	TYPE	LMR-122D	121120	DEIF's order ack. No. To be stated when contacting DEIF
Input voltage	MEAS VOLTAGE	400V	MODULE	400V
	MEAS CURRENT		MODULE	
	MEAS POWER		SCALE	
Supply voltage	SUPPLY	24VDC	"Further information"	
	COUPLING		Special calibration (if non-standard calibration is applied)	
	RELAY B	<input checked="" type="checkbox"/> NORM. DEENERGIZED <input type="checkbox"/> NORM. ENERGIZED <input type="checkbox"/> LATCH	RELAY C	<input type="checkbox"/> NORM. DEENERGIZED <input checked="" type="checkbox"/> NORM. ENERGIZED <input type="checkbox"/> LATCH
Relay coupling Shown is relay B as a normally de-energised relay, relay C as a normally energised relay.	  		"Distributor No."	
	Highest voltage in relation to earth	Installation category	Distributor's ID No. Filled in by distributor when customizing the unit.	

Note: Latch function is not possible.

Note: The relay is provided with a 200 ms power-up relay, ensuring correct function of the relay on connection of the auxiliary voltage.

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

3. Mounting instructions



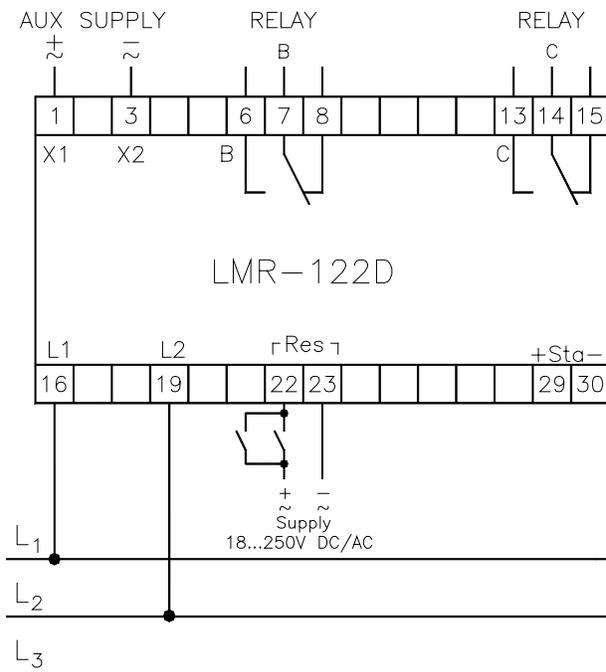
The LMR-122D is designed for panel mounting, being mounted on a 35 mm DIN rail, or by means of two 4-mm screws.

Weight: ca. 0.650 kg.

The design of the relay makes mounting of it close to other *uni-line* units possible, however make sure there are min. 50 mm between the top and bottom of this relay and other relays/units.

The DIN rail must always be placed horizontally when several relays are mounted on the same rail.

4. Connection diagram



A 2A fuse may protect all voltage inputs.

The relay is protected against ESD (electrostatic electricity), and further special protection against this during the mounting of the relay is not necessary.

The LMR-122D may be connected between 2 phases or between 1 phase and neutral.

The LMR-122D is to be configured so that the input of the relay corresponds to the connected voltage.

The RESET input marked "RES" is blocking the vector shift and the df/dt when the contact is closed.

The 2 relay outputs are related to vector shift "B" and df/dt "C".

The terminal "sta" (status) is an optocoupler output from the internal function check, which can be used for alarm purposes.



5. Start up instructions

5.1 Setting and indication

Setting of	LED/relay
Delay (initialising): (0.5...5 s)	Yellow LED "SUPERVISION" is lit after the timer has expired.
Vector shift: (2...20 electr. degr.)	Red LED "MAINS FAIL" is lit during fault condition.
R.O.C.O.F.: 0...5 Hz/s	Red LED "MAINS FAIL" is lit during fault condition.

The delay timer is started, when the contacts connected to the "RES" input open. It is typically set to 1 s; however, a longer delay is selected if unwanted disconnections occur immediately upon synchronisation of the generator to the mains.

During start up, the following setting procedure is recommended:

- a. Generators operating as emergency generators (much of their power is used locally, and simulating change of generator load is possible):
 1. Remove connections to "RES"
 2. Adjust potentiometer marked vector shift / df/dt, so that an opening signal is transmitted to the mains circuit breaker at a load variation of 5...10%.
- b. Generators of a co-generation plant, supplying all their power to the mains (change of generator load is only with difficulty simulated)
 1. Set potentiometer marked vector shift / df/dt to 5/1.5
 2. If necessary, adjust this on the basis of practical experience.

6. Technical specifications

Overload, voltages:	1.2 x U_n , continuously 2 x U_n for 10 s
Load:	2k Ω /V
Frequency range:	40... 45 ... 65 ...70Hz
"RESET" inputs:	Input voltage: 18...250V AC/DC for "activated" condition Input impedance: 100k Ω
Relay contacts:	2 change-over switches
Contact ratings:	250V-8A-2000A (AC), 24V-8A-200W (DC)
Contact voltage:	Max. 250V (AC). Max 150V (DC)
Response time:	<30 ms, vector shift <100 ms, R.O.C.O.F.
Galv. separation:	Between inputs and outputs: 3250V-50Hz-1 min.
Consumption:	(Aux. supply) 4VA/3.5W
Status output:	Open (fault): 10...30V DC Closed (OK): max. 5mA