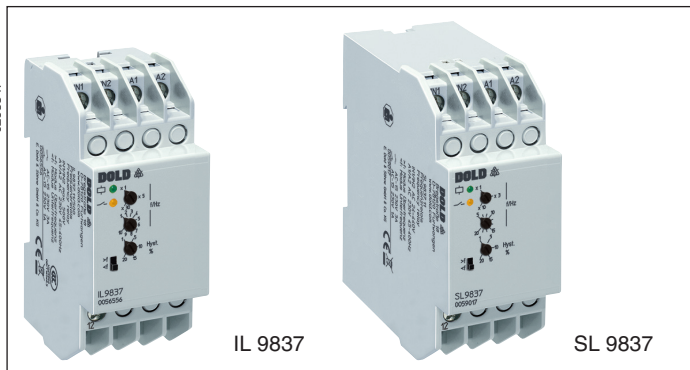


## VARIMETER Frequency Relay IL 9837, SL 9837

Translation  
of the original instructions

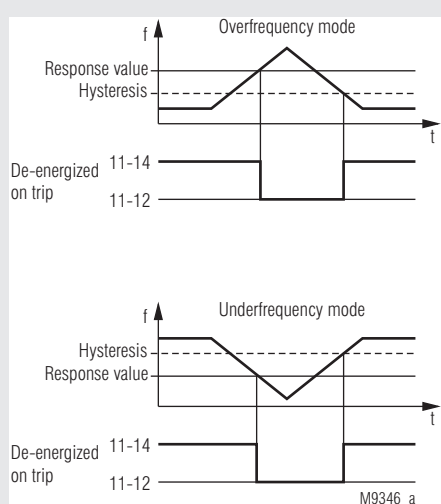


- According to IEC/EN 60255-1
- Overfrequency or underfrequency monitoring of AC voltages
- Adjustable response value  $f_{min}$  or  $f_{max}$  5 ... 200 Hz or 15 ... 600 Hz
- Adjustable hysteresis
- Large voltage range of the measuring input (nominal voltage AC 24 ... 440 V)
- De-energized on trip
- LED indication for auxiliary voltage, measuring voltage and contact position
- 1 changeover contact
- As option for frequency inverters with a range of 1 ... 300 Hz
- 2 changeover contacts available on request
- As option adjustable start-up delay available
- Energized on trip function available on request
- Devices available in 2 enclosure versions:
  - IL 9837: Depth 58 mm, with terminals at the bottom for installation systems and industrial distribution systems according to DIN 43880
  - SL 9837: Depth 98 mm, with terminals at the top for cabinets with mounting plate and cable duct
- 35 mm width

### Product Description

The frequency relay IL 9837, SL 9837 can be used to monitor the frequency of AC voltage systems, rotor frequency of slip ring motors, control/monitoring of motors on cranes, monitoring the output frequency of inverters (IL9837.11/500).

### Function Diagram



### Approvals and Markings



\* only for IL 9837

### Application

- Frequency monitoring of A.C. voltages
- Monitoring of the rotor frequency of slipring motors
- Control / monitoring of drives in crane systems
- Frequency monitoring in frequency inverters (IL 9837.11/500)

### Function

The frequency to be monitored is applied to measuring input IN1-IN2. The measuring circuit is electrically separated from the auxiliary voltage input A1-A2, to which the supply voltage of the frequency relay is connected.

The measured frequency is compared to a response value to be set at the unit.

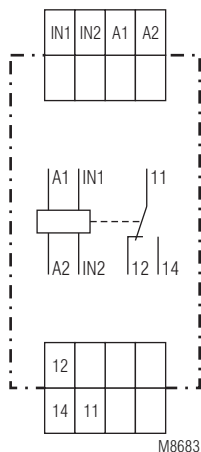
In overfrequency mode, the output relay switches into alarm position when the preset response value is exceeded. When the system frequency once more falls below the response value minus the preset hysteresis, the output relay will switch back into normal position.

In underfrequency mode, the output relay switches into alarm position when the actual value falls below the preset response value. When the system frequency once more exceeds the response value plus hysteresis, the output relay will switch back into normal position.

If de-energized on trip is selected, the output relay is energized (11-14 closed) in normal status.

If energized on trip is selected, the output relay is energized (11-14 closed) in alarm status.

## Circuit Diagram



IL 9837, SL 9837

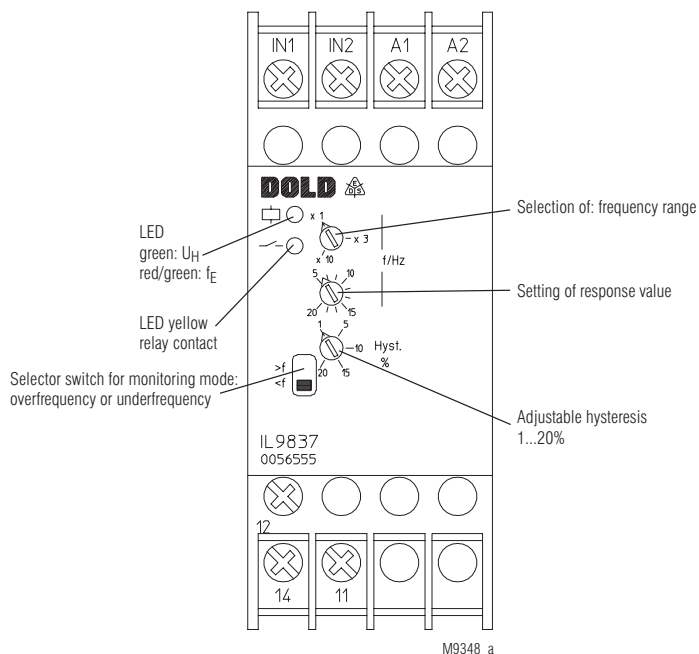
## Connection Terminals

Terminal designation	Signal description
A1, A2	Supply voltage
IN1, IN2	Measuring input
11, 12, 14	Changeover contact

## Indicators

Upper LED:	Green light is permanently on, when only the auxiliary voltage has been applied to A1-A2, green-red alternating light, when measuring frequency has also been applied to IN1-IN2
Yellow LED:	Is on, when the output relay is energized (contacts 11-14 closed)

## Setting



## Notes

**Monitoring mode underfrequency or overfrequency**  
The mode can be selected by means of the slide switch at the front of the unit. The operating mode de-energized or energized on trip as well as the response value do not change.

**Setting of the hysteresis**  
With input frequencies < 15 Hz (4 Hz with variant IL 9837.11/500), the hysteresis should not be set to minimum values to avoid cycling of the output relay.

In the “underfrequency” monitoring mode (“< f”), with input frequencies close to the end of the respective range, hysteresis can only be set to a maximum of 4 ... 10% for proper resetting; this is due to reasons of the switching operation. If applicable, select the next higher frequency range.

**Variant IL 9837.11/500 for frequency inverter**  
This variant can be used with frequency inverter to monitor the frequency of 1 ... 300 Hz generated by the frequency inverter. It has a specifically dimensioned measuring input with low pass character to suppress the cycle frequency of the inverter. Simultaneously, the input sensitivity is adjusted to the voltage/frequency characteristic of the inverter.

## Technical Data

### Measuring Circuit

<b>Measuring input:</b>	IN1-IN2
<b>Nominal voltage <math>U_N</math>:</b>	AC 24 ... 440 V
<b>Voltage range:</b>	0.8 ... 1.1 $U_N$
<b>Input resistance:</b>	Approx. 1 M $\Omega$
<b>Frequency range:</b>	5 ... 20 Hz, 15 ... 60 Hz, 50 ... 200 Hz or 15 ... 60 Hz, 45 ... 180 Hz, 150 ... 600 Hz selected with rotary switch

<b>Response value</b> Infinitely adjustable:	1 : 4 in each frequency range
<b>Hysteresis</b> Infinitely adjustable:	1 ... 20 % of the set response value

<b>Measuring input:</b>	IL 9837.11/500
<b>Max. input voltage:</b>	AC 500 V
<b>Min. measuring voltage:</b>	Approx. AC 10 V with 1 Hz ... AC 220 V with 300 Hz, see diagramm M8681
<b>Input resistance:</b>	Approx. 700 k $\Omega$
<b>Frequency range:</b>	1 ... 10 Hz, 5 ... 50 Hz, 30 ... 300 Hz selected with rotary switch

<b>Response value</b> Infinitely adjustable:	1 : 10 in each frequency range
<b>Hysteresis</b> Infinitely adjustable:	1 ... 20 % of the set response value

### Auxiliary Circuit

<b>Nominal voltage <math>U_H</math>:</b>	AC 24, 42, 115, 127, 230, 240, 400 V DC 12, 24, 48 V
--	---

<b>Voltage range</b>	
AC:	0.8 ... 1.1 $U_H$
DC:	0.9 ... 1.25 $U_H$

<b>Nominal consumption</b>	
AC:	Approx. 1.5 VA
DC:	Approx. 1 W

<b>Frequency range</b>	
AC:	45 ... 400 Hz

### Output

<b>Contacts:</b>	1 changeover contact
<b>Thermal current <math>I_{th}</math>:</b>	4 A
<b>Switching capacity</b>	
To AC 15	
NO contact:	3 A / AC 230 V IEC/EN 60947-5-1
NC contact:	1 A / AC 230 V IEC/EN 60947-5-1
To DC 13:	
NO contact:	1 A / DC 24 V IEC/EN 60947-5-1
NC contact:	1 A / DC 24 V IEC/EN 60947-5-1
<b>Contact life:</b>	
To AC 15 at 1 A, AC 230V:	1.5 x 10 <sup>6</sup> switch. cycles IEC/EN 60947-5-1
<b>Short circuit strenght</b>	
<b>max. fuse rating:</b>	4 A gG / gL IEC/EN 60947-5-1
<b>Mechanical life:</b>	$\geq 30 \times 10^6$ switching cycles

### General Data

<b>Nominal operation:</b>	Continous operation
---------------------------	---------------------

<b>Temperature range</b>	
Operation:	- 20 ... + 60 °C
Storage	- 25 ... + 60 °C
<b>Altitude:</b>	$\leq 2000$ m

### Clearance and creepage distances

Rated rated impulse voltage voltage / Pollution degree:	4 kV / 2
--	----------

### EMC

Electrostatic discharge (ESD):	8 kV (air)	IEC/EN 61000-4-2
HF irradiation		
80 MHz ... 1 GHz:	10 V / m	IEC/EN 61000-4-3
1 GHz ... 2 GHz:	3 V / m	IEC/EN 61000-4-3
2 GHz ... 2.7 GHz:	1 V / m	IEC/EN 61000-4-3
Fast transients:	2 kV	IEC/EN 61000-4-4
Surge		
Between		
supply lines:	1 kV	IEC/EN 61000-4-5
HF voltage driven:	10 V	IEC/EN 61000-4-5
Interference suppression:	Limit value class B	EN 55011

## Technical Data

### Degree of protection

Housing:	IP 40	IEC/EN 60529
Terminals:	IP 20	IEC/EN 60529

<b>Housing:</b>	Thermoplast with V0 behavior according to UL Subject 94
<b>Vibration resistance:</b>	Amplitude 0.35 mm Frequency 10 ... 55 Hz IEC/EN 60068-2-6

<b>Climate resistance:</b>	20 / 060 / 04 IEC/EN 60068-1
----------------------------	------------------------------

<b>Terminal designation:</b>	DIN EN 50005
<b>Wire connection:</b>	DIN 46228-1/-2/-3/-4
<b>Cross section:</b>	2 x 0.6 ... 2.5 mm <sup>2</sup> solid or 2 x 0.28 ... 1.5 mm <sup>2</sup> stranded wire with and without ferrules

<b>Stripping length:</b>	10 mm
<b>Wire fixing:</b>	Captive plus-minus terminal screws M3,5 self-lifting clamping piece

<b>Fixing torque:</b>	0.8 Nm
<b>Mounting:</b>	DIN rail IEC/EN 60715

<b>Net weight</b>	
IL 9837:	Approx. 137 g
SL 9837:	Approx. 164 g

### Dimensions

#### Width x height x depth

IL 9837:	35 x 90 x 59 mm
SL 9837:	35 x 90 x 98 mm

### CCC-Data for IL 9837

<b>Thermal current <math>I_{th}</math>:</b>	4 A
---	-----

### Switching capacity

To AC 15:	5 A / AC 230 V	IEC/EN 60947-5-1
To DC 13:	2 A / DC 24 V	IEC/EN 60947-5-1



Technical data that is not stated in the CCC-Data, can be found in the technical data section.

### Standard Type

IL 9837.11 5 ... 200 Hz  $U_N$  AC 230 V Hyst. 1 ... 20 %

Article number: 0056555

- De-energized on trip
- Selection of overvoltage or undervoltage
- Selectable frequency range: 5 ... 20 Hz, 15 ... 60 Hz, 50 ... 200 Hz
- Response value: Infinitely adjustable 1:4
- Auxiliary voltage  $U_H$ : AC 230 V
- Hysteresis: 1 ... 20 % adjustable
- Output contact: 1 changeover contact
- Width: 35 mm

## Varianten

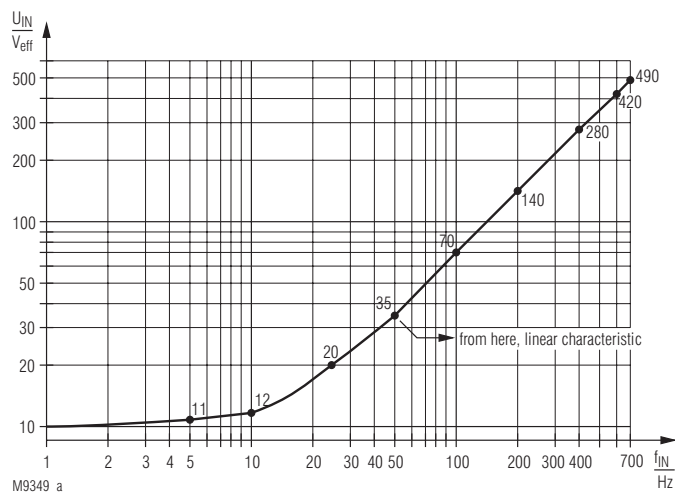
- IL 9837.11/500: Input designed for frequency inverters  
 Selection of overfrequency or underfrequency  
 Selectable frequency range  
 1 ... 10 Hz, 5 ... 50 Hz, 30 ... 300 Hz  
 Response value infinitely adjustable 1:10  
 Auxiliary voltage  $U_H$  AC 230 V  
 De-energized on trip  
 Output contact 1 changeover contact  
 With adjustable start-up delay  
 0.1 ... 20 s
- IL 9837.11/\_ \_4:

### Ordering example for variants

IL 9837 .11 / \_ \_ \_ 5 ... 200 Hz  $U_H$  AC 230 V 1 ... 20 %

Hysteresis  
 Auxiliary voltage  
 Frequency range  
 Variant, if required  
 Contacts  
 Type

## Characteristic



Typical input sensitivity of the measuring input with variant IL 9837.11/500

## Connection Example

