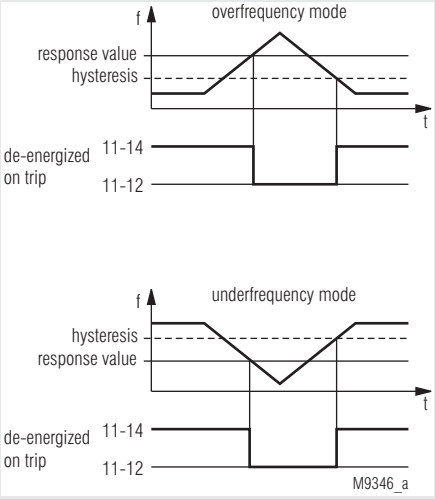
VARIMETER
Frequency Relay
IL 9837, SL 9837

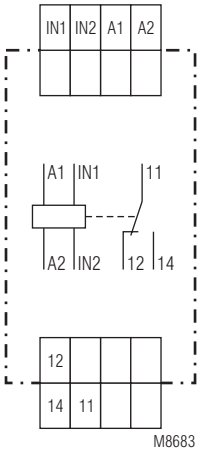
0265347



Function Diagram



Circuit Diagram



IL 9837, SL 9837

- According to IEC/EN 60 255-1
- 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 43 880
  SL 9837: depth 98 mm, with terminals at the top for cabinets with mounting plate and cable duct
- 35 mm width

Approvals and Markings

A025518

* 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.

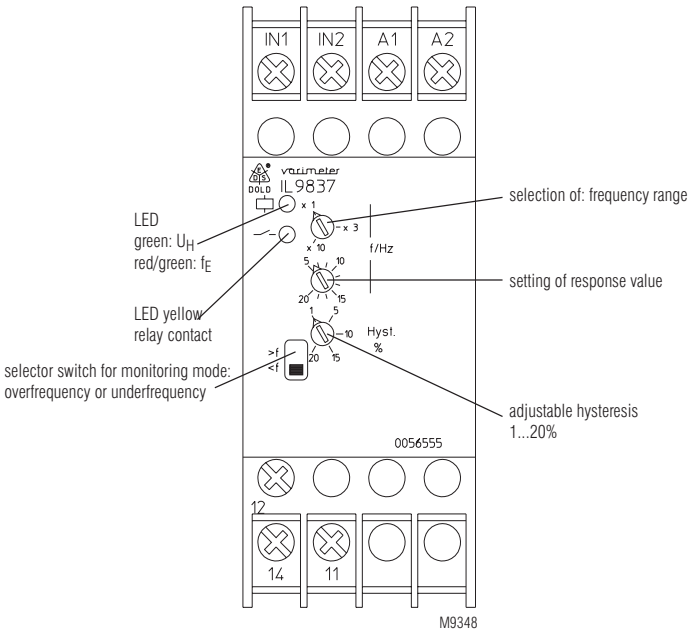
If de-energized on trip is selected, the output relay is energized (11-14 closed) in normal status.
If energized on trip is selected, the output relay is energized (11-14 closed) in alarm status.

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)

All data in this list are in correspondence with the technical equipment used at the time of this version. We reserve the right to implement technical improvements and changes at any time.

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

Measuring input:	IN1-IN2
Nominal voltage U_N:	AC 24 ... 440 V
Voltage range:	0.8 ... 1.1 U_N
Input resistance:	approx. 1 MΩ
Frequency range:	5 ... 20 Hz, 15 ... 60 Hz, 50 ... 200 Hz or 15 ... 60 Hz, 45 ... 180 Hz, 150 ... 600 Hz selected with rotary switch
Response value	
infinitely adjustable:	1 : 4 in each frequency range
Hysteresis	
infinitely adjustable:	1 ... 20 % of the set response value
Measuring input:	IL 9837.11/500
Max. input voltage:	AC 500 V
Min. measuring voltage:	approx. AC 10 V with 1 Hz … AC 220 V with 300 Hz, see diagramm M8681
Input resistance:	approx. 700 kΩ
Frequency range:	1 ... 10 Hz, 5 ... 50 Hz, 30 ... 300 Hz selected with rotary switch
Response value	
infinitely adjustable:	1 : 10 in each frequency range
Hysteresis	
infinitely adjustable:	1 ... 20 % of the set response value

Technical Data

Auxiliary Circuit

Nominal voltage U_H:	AC 24, 42, 115, 127, 230, 240, 400 V DC 12, 24, 48 V
Voltage range	
AC:	0.8 ... 1.1 U_H
DC:	0.9 ... 1.25 U_H
Nominal consumption	
AC:	approx. 1.5 VA
DC:	approx. 1 Watt
Frequency range	
AC:	45 ... 400 Hz

Output

Contacts:	1 changeover contact	
Thermal current I_{th}:	4 A	
Switching capacity		
to AC 15		
NO contact:	3 A / AC 230 V	IEC/EN 60 947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60 947-5-1
to DC 13:		
NO contact:	1 A / DC 24 V	IEC/EN 60 947-5-1
NC contact:	1 A / DC 24 V	IEC/EN 60 947-5-1
Contact life:		
to AC 15 at 1 A, AC 230V:	1.5 x 10^5 switch. cycles	IEC/EN 60 947-5-1
Short circuit strenght		
max. fuse rating:	4 A gL	IEC/EN 60 947-5-1
Mechanical life:	≥ 30 x 10^6 switching cycles	

General Data

Nominal operation:	Continous	
Temperature range:	- 20 ... + 60°C	
Clearance and creepage distances		
Rated rated impulse voltage voltage /		
Pollution degree:	4 kV / 2	
EMC		
Electrostatic discharge (ESD):	8 kV (air)	IEC/EN 61 000-4-2
Fast transients:	2 kV	IEC/EN 61 000-4-4
Surge		
between		
supply lines:	1 kV	IEC/EN 61 000-4-5
HF voltage driven:	10 V	IEC/EN 61 000-4-5
Interference suppression:	Limit value class B	EN 55 011
Degree of protection		
Housing:	IP 40	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Housing:	Thermoplast with V0 behavior according to UL Subject 94	
Vibration resistance:	Amplitude 0.35 mm Frequency 10 ... 55 Hz	IEC/EN 60 068-2-6
Climate resistance:	20 / 060 / 04	IEC/EN 60 068-1
Terminal designation:	DIN EN 50 005	
Wire connection:	2 x 2.5 mm² massive, or 2 x 1.5 mm² stranded wire ferruled DIN 46 228-1/-2/-3	
Wire fixing:	Screw terminals with self-lifting clamping piece	IEC/EN 60 999-1
Mounting:	DIN rail	IEC/EN 60 715
Net weight		
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

Thermal current I_{th}: 4 A

Switching capacity

to AC 15:	5 A / AC 230 V	IEC/EN 60 947-5-1
to DC 13:	2 A / DC 24 V	IEC/EN 60 947-5-1

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 %

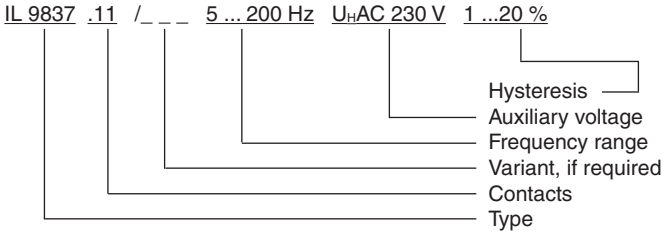
Article number: 0056555

- 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

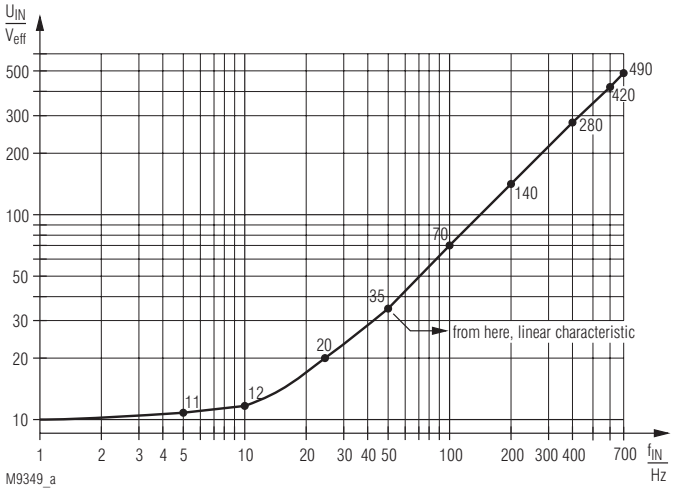
Varianten

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
IL 9837.11/_ _4:	with adjustable start-up delay 0.1 ... 20 s

Ordering example for variants



Characteristic



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

Connection Example

