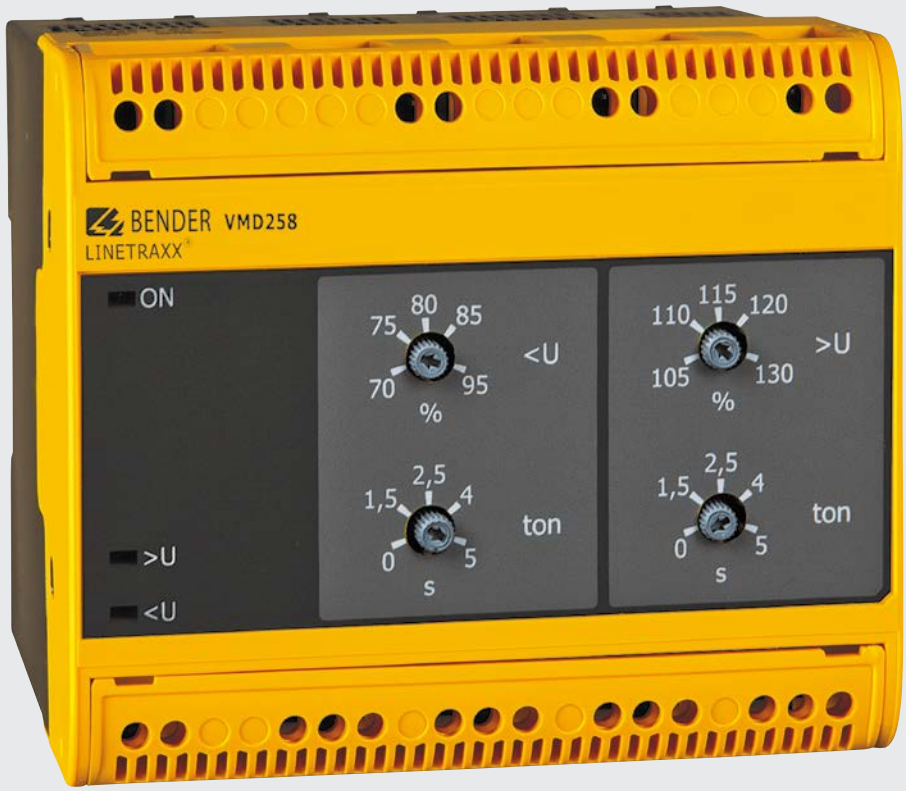
LINETRAXX® VMD258

Undervoltage/overvoltage relay for monitoring three-phase AC systems (window function) for power plant applications



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Device features

- High availability due to purely analogue technology
- Undervoltage and overvoltage monitoring for 3AC systems
- No separate supply voltage required
- Separate alarm relays for undervoltage and overvoltage with two potential-free changeover contacts
- Adjustable response value: 0.7…0.95 x U_n / 1.05…1.3 x U_n
- Nominal system voltages: 3AC 690/500/480/440/400/230/110/100 V
- Adjustable response delay: 0…5 s
- LEDs for operation, overvoltage, undervoltage

Product description

The voltage relay VMD258 monitors three-phase AC systems for undervoltage and overvoltage (window function). Neutral conductor connection is not required, therefore it is suitable for 3AC systems. The device consists of purely analogue technology and is suitable for power plant applications due to its high availability.

The voltage to supply the electronics is taken from the system to be monitored. The supply for the electronics, the relays and the connection for the external energy storage device are isolated from the system by means of double isolation. Special input transformers attenuate interferences from the system.

The response values for undervoltage and overvoltage as well as the response delays are continuously adjustable.

Replaces the SUR35x series.

Description of function

When the relay is connected to the mains, within the preset response values, the alarm relays **K1/K2** for undervoltage are in N/C operation (relay **energised**) and die alarm relays **K3/K4** for overvoltage are in N/O operation (relay **deenergised**).

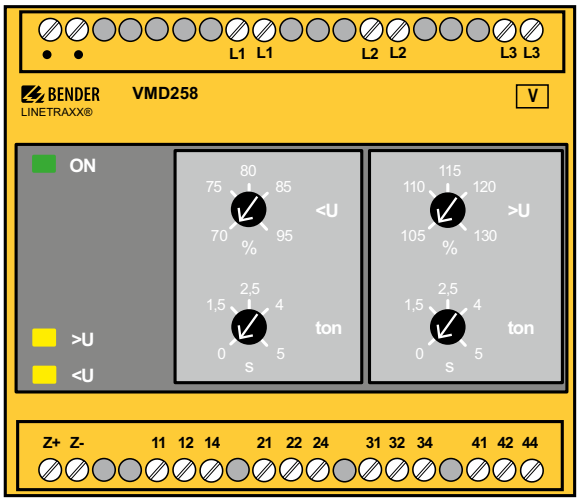
When the value of the nominal system voltage U_n falls below the set response value $<U_n$, the alarm LED "<*U*" lights up and the alarm relays K1/K2 switch once the set response delay has elapsed.

When the value of the nominal system voltage exceeds U_n the set response value $>U_n$, the alarm LED ">*U*" lights up and the alarm relays K3/K4 switch once the response delay has elapsed. Once the response values are within the set response range again, the VMD258 switches back to the initial state after approx. 100 ms.

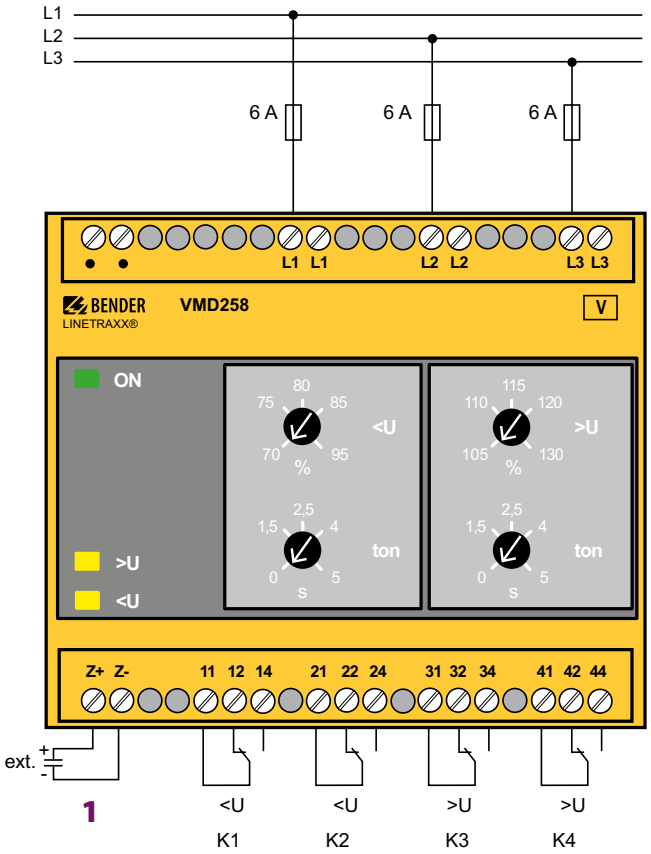
Standards

The LINETRAXX® VMD258 series complies with the requirements of the device standards: DIN EN 60255-1 VDE 0435-300 and E DIN IEC 60255-127 VDE 0435-3127.

Operating elements



Wiring diagram



1 - Z+ and Z-: Connection ES258 for a backup time of > 5 s

Ordering details

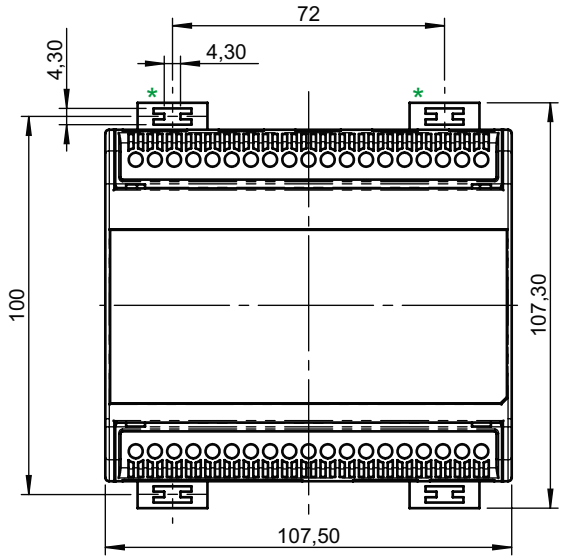
Connection	Type	Art. No.
3AC, 100 V	VMD258 3AC 100 V	B93010060
3AC, 110 V	VMD258 3AC 110 V	B93010061
3AC, 230 V	VMD258 3AC 230 V	B93010062
3AC, 400 V	VMD258 3AC 400 V	B93010063
3AC, 440 V	VMD258 3AC 440 V	B93010064
3AC, 480 V	VMD258 3AC 480 V	B93010065
3AC, 500 V	VMD258 3AC 500 V	B93010066
3AC, 690 V	VMD258 3AC 690 V	B93010067

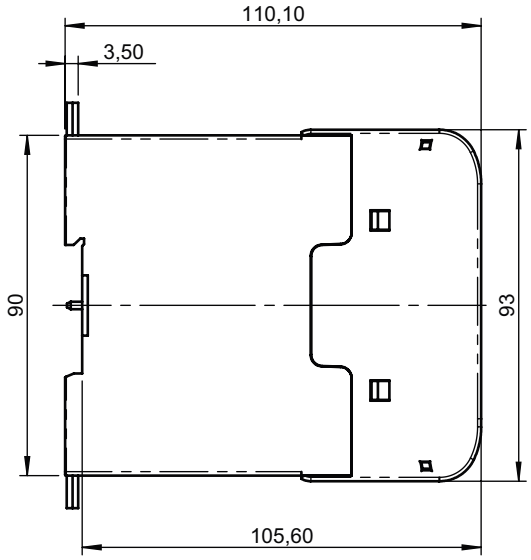
Accessories

Designation	Art. No.
Additional mounting clips (screw mounting)	B98060008
Energy backup ES258	B93010068

Dimension diagrams

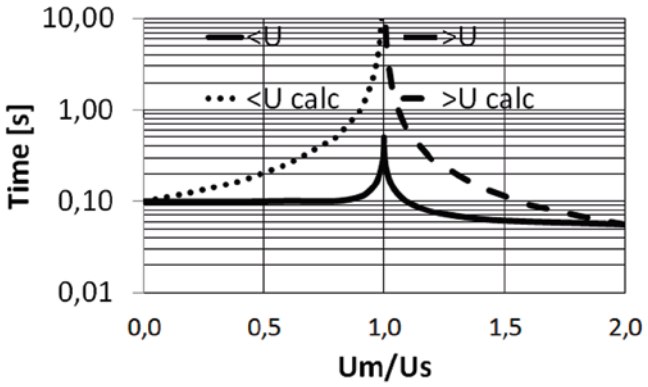
Dimensions in mm





* Upper mounting clips only for screw mounting required

Dependent time characteristic



U_m: measured value of voltage

U_S: switching threshold

U_{calc}: value calculated according to the following formula
Undervoltage $t\ U_m = T/(1-(U_m/U_S))$
Overvoltage $t\ U_m = T/((U_m/U_S)-1)$

Technical data

Insulation coordination acc. to DIN EN 60255-27

Supply voltage U_S AC (V)	690	480/500	400/440	230	100/110
Rated voltage AC (V)	1000	1000	600	300	150
Rated impulse voltage (kV)	12	12	8	6	4
Pollution degree					3
Overvoltage category					III

Voltage ranges

Frequency range of U_S								45…66 Hz
Operating range								0.5…1.5 x U_S
Power consumption								≤ 10 VA
Nominal supply voltage U_S 3AC (V)	690	500	480	440	400	230	110	100
Power consumption at 50 Hz, 1.3 x U_S (VA)	19	15	12	14	9	16	15	10
Power consumption at 60 Hz, 1.3 x U_S (VA)	11	9	8	8	6	9	9	7

Measuring circuit

Nominal system voltage U_n	3AC 690/500/480/440/400/230/110/100 V
Setting range	0.7…1.3 x U_n
Frequency range of U_n	45…66 Hz
Max. permissible measuring voltage	1.5 x U_n
Response value U_n adjustable	>U, <U

Response values

Undervoltage <*U* (alarm)	0.7…0.95 x U_n
Overvoltage >*U* (alarm)	1.05…1.3 x U_n
Relative uncertainty at the setting limits	45…66 Hz: ±3 %
	47.5…63 Hz: ±2 %
Hysteresis	< 3 %
Repetition accuracy	±1 %
LED ON	(green)
Alarm for <*U*	LED (yellow)
Alarm for >*U*	LED (yellow)

Time response

Start-up delay *t*	500 ms ±20 %
Response delay t_{on}	0…5 s ±10 %
Delay on release t_{off}	100 ms ±20 %
Operating time t_{ae} at overvoltage	60 ms* ±20 %
Operating time t_{ae} at undervoltage	100 ms** ±20 %
Response time t_{an}	$t_{an} = t_{ae} + t_{on}$
Long-term influence	-10 %
Overshooting time t_{ov}	< 60 ms

Connection for external energy storage device

U_{min}	DC 24 V
U_{max}	DC 68 V
U_{typ} at 1.0 x U_n	42…47 V ±15 %
Short-circuit proof (Z+, Z-)	short time yes

Switching elements

Number of switching elements	2 x 2 changeover contacts
Operating mode	N/C operation (undervoltage)
	N/O operation (overvoltage)
Electrical endurance, number of cycles	10000
Contact data acc. to IEC 60947-5-1	
Rated operational voltage AC	230 V/230 V
Utilisation category	AC-13/AC-14
Rated operational current AC	5 A/3 A
Rated operational voltage DC	220/110/24 V
Utilisation category	DC12
Rated operational current DC	0.1/0.2/1 A
Minimum current	1 mA at AC/DC > 10 V

Environment/EMC

EMC immunity	acc. to IEC 60255-26
EMC emission	acc. to IEC 60255-25
Operating temperature	-20…+70 °C
Climatic class acc. to DIN IEC 60721-3-3	
Stationary use, except condensation	3K5
Transport	2K3
Long-term storage	1K4
Classification of mechanical conditions acc. to IEC 60721	
Stationary use	3M4
Transport	2M2
Long-term storage	1M3
Requirements acc. to IEC 60255	Class 2

Connection

Connection	screw terminals
Connection properties	
rigid/flexible	0.2…2.5 mm²
flexible with ferrule	0.25…2.5 mm²
without/with plastic sleeve	0.25…2.5 mm²
Conductor sizes (AWG)	24…13
Tightening torque	0.5…0.6 Nm
Current through L1L1, L2L2 or L3L3	each max. 3 A

Other

Operating mode	continuous operation
Position	any position
Degree of protection, internal components (DIN EN 60529)	IP30
Degree of protection, terminals (DIN EN 60529)	IP20
Enclosure material	polycarbonate
Flammability class	UL94 V-0
DIN rail mounting acc. to	IEC 60715
Screw mounting	4 x M4
Weight	825 g

* Operating time t_{ae} **overvoltage**
Increase from 100 % to 130 %, switching threshold at 105 %

** Operating time t_{ae} **undervoltage**
Decrease from 100 % to 0 %, switching threshold at 95 %

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