

## VMD258 Series

Overvoltage and Undervoltage Relay  
For Three-Phase AC Systems





**VMD258**

### Features

- Undervoltage and overvoltage relay for three-phase AC systems up to 690 VAC
- Analog-only device, non-microprocessor controlled; perfect for utilities and other mission critical areas
- Overvoltage and undervoltage alarms operate simultaneously (window function)
- Adjustable undervoltage alarm, 70 - 95% of system voltage
- Adjustable overvoltage alarm, 105 - 130% of system voltage
- 0 - 5 s adjustable time delay
- 2 DPDT contact outputs available, normally energized or normally de-energized depending on alarm type
- Line-powered, no separate supply voltage required

### Description

The VMD258 series voltage relay monitors for undervoltage and overvoltage in three-phase AC systems. Both overvoltage and undervoltage are monitored for simultaneously. Alarm values are set as a percentage of the system voltage (see ordering information for more). Power for the monitoring is derived from the monitored system; an external supply voltage is not required. Many different system voltage ratings are available, up to 690 VAC.

The device contains analog-only components and is not microprocessor controlled. The supply of the electronics and relays are isolated by means of double isolation. Special input transformers attenuate system interferences.

The alarm values and time delays are steplessly adjustable. 2 DPDT contact outputs are available for alarms:

- 1 DPDT contact for undervoltage, normally energized operation
- 1 DPDT contact for overvoltage, normally de-energized operation

Replaces the SUR353 / 357 / 358 series.

### Applications

- Three-phase AC systems
- Utilities
- Three-phase motors, pumps, and other industrial equipment
- General three-phase distribution networks / loads

### Optional energy backup

The ES258 energy backup device may be optionally connected to the VMD258. It provides power to the relay for min. 5 seconds if power is lost to the system.

### Ordering information

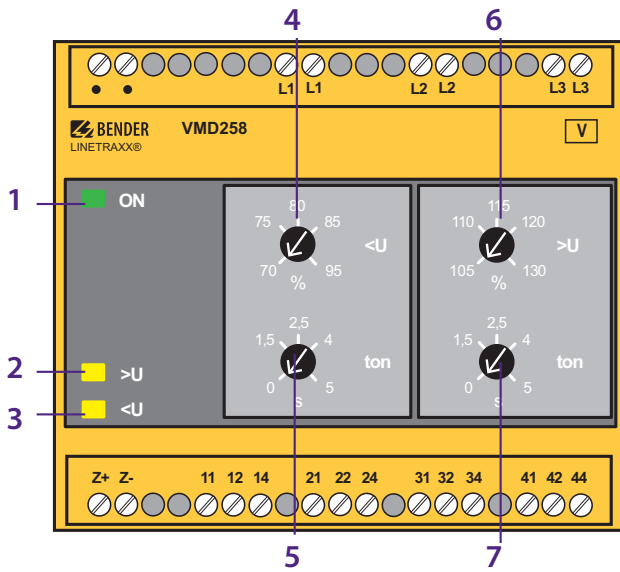
System voltage (3Φ, L-L)	Ordering number
100 VAC	B 9301 0060
110 VAC	B 9301 0061
230 VAC	B 9301 0062
400 VAC	B 9301 0063
440 VAC	B 9301 0064
480 VAC	B 9301 0065
500 VAC	B 9301 0066
690 VAC	B 9301 0067

### Accessories

Description	Ordering number
Additional mounting clips for screw mounting	B 9806 0008
External energy backup module (P/N ES258)	B 9301 0068

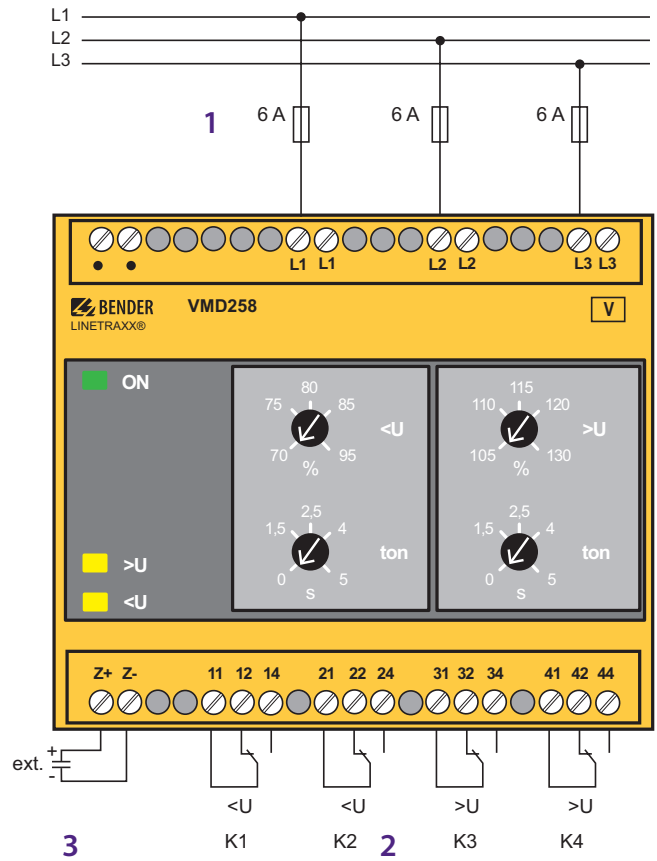


**Operating elements**



- 1 - Power On LED "ON" (green)
- 2 - Alarm LED ">U" (yellow): lights when the overvoltage alarm is activated.
- 3 - Alarm LED "<U" (yellow): lights when the undervoltage alarm is activated.
- 4 - Undervoltage alarm adjustment
- 5 - Time delay adjustment for undervoltage alarm
- 6 - Overvoltage alarm adjustment
- 7 - Time delay adjustment for overvoltage alarm

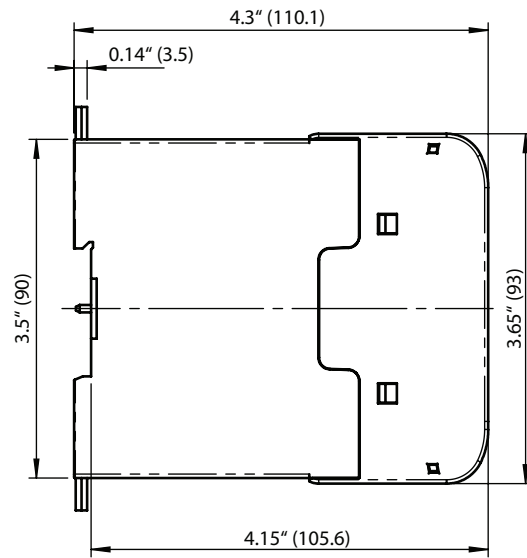
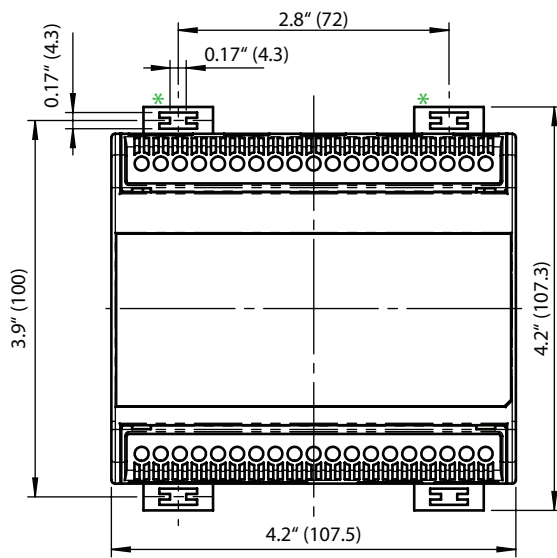
**Wiring diagram**



- 1 - Connection to system; fuses recommended
- 2 - Alarm contact outputs
- 3 - Connection for optional ES258 energy backup

## Dimensions

Dimensions in inches (mm)



## 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 $U_S$				
Nominal supply voltage $U_S$ 3AC (V)	690	500	480	440	400
Power consumption at 50 Hz, 1,3 x $U_S$ (VA)	19	15	12	14	9
Power consumption at bei 60 Hz, 1,3 x $U_S$ (VA)	11	9	8	8	6

### 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 $f_n$	45 - 66 Hz				
Max. permissible measuring voltage	1.5 x $U_n$				
Response value $U_n$ adjustable	> $U_n$ , < $U_n$				

### 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: $\pm 3\%$ 47,5 - 63 Hz: $\pm 2\%$				
Hysteresis	< 3 %				
Repetition accuracy	$\pm 1\%$				
LED ON	LED (green)				
Alarm for < $U$	LED (yellow)				
Alarm for > $U$	LED (yellow)				

### Time response

Start-up delay $t$	500 ms $\pm 20\%$				
Response delay $t_{on}$	0 - 5 s $\pm 10\%$				
Delay on release $t_{off}$	100 ms $\pm 20\%$				
Operating time $t_{ae}$ at overvoltage	60 ms* $\pm 20\%$				
Operating time $t_{ae}$ at undervoltage	100 ms** $\pm 20\%$				
Response time $t_{an}$	$t_{an} = t_{ae} + t_{on}$				
Long-term influence	-10 %				
Overshoot 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 $\pm 15\%$				
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	1/0.2/0.1 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	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 mm <sup>2</sup>				
flexible with connector sleeve	0.25 - 2.5 mm <sup>2</sup>				
without/with plastic sleeve	0.25 - 2.5 mm <sup>2</sup>				
Conductor sizes (AWG)	24 - 13				
Tightening torque	0.5 - 0.6 Nm				
Current through L1L1, L2L2, 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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