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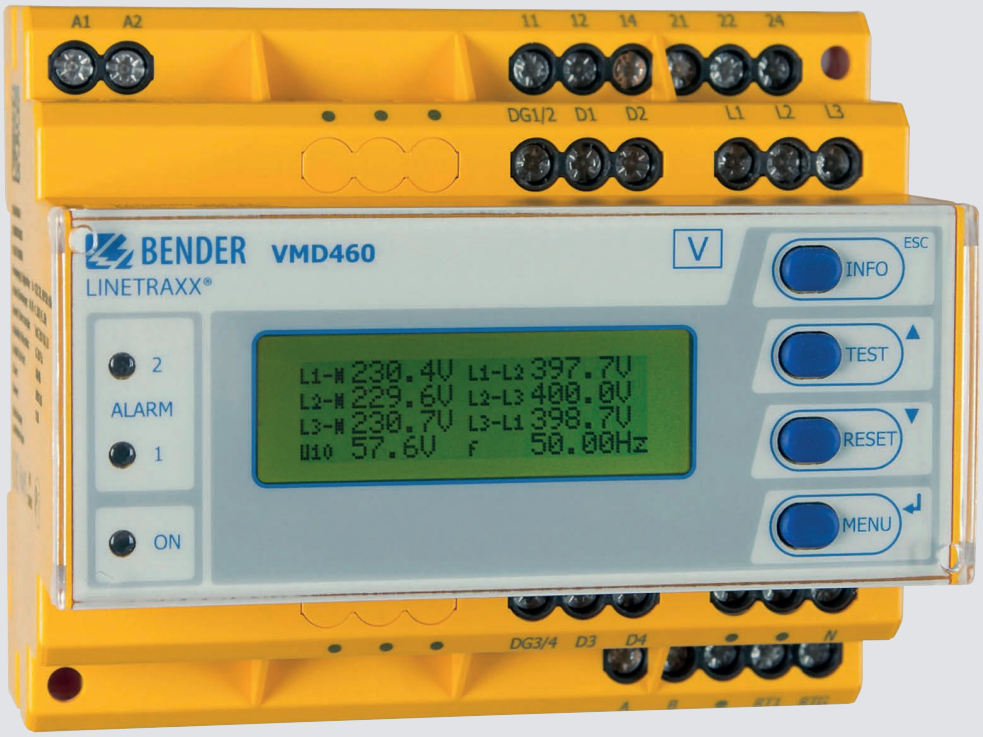
LINETRAXX® VMD460-NA

Network and system protection (NS protection)

for monitoring the power feed-in of power generation systems



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LINETRAXX® VMD460-NA

**Network and system protection (NS protection)
for monitoring the power feed-in of power generation systems**

LINETRAXX® VMD460

Device features

- Straightforward commissioning due to pre-set basic programs for national standards and regulations
- Single-fault tolerance
- Monitoring of the connected coupling switch (configurable: NC/NO/off)
- Islanding detection df/dt (ROCOF)
- Vector shift
- Interface RS-485 (data exchange, parameter setting, software update)
- Test function for the determination of the disconnection time
- Test button for the trigger circuit
- The last 300 distribution network faults can be recalled with time stamp/real-time clock
- Continuous monitoring of the phase and line-to-line voltage
- Separate switching conditions after a threshold infringement
- Language selection (German, English, Italian)
- Backlit graphics LC display
- Remote shutdown via ripple control signal receiver
- Password protection for device setting
- Sealable enclosure

Product description

The VMD460 is an external network and system protection (NS protection) the purpose of which is to disconnect the power generation system from the grid by coupling switches in the event of inadmissible threshold values. If voltage and frequency measurements on the power generation system are outside the thresholds required in the standards, the relays of the VMD460 will switch. The VMD460 is multifunctionally adjustable. The currently measured values are continuously shown on the LC display. The measured values leading to the tripping of the relays are stored.

Typical applications

- Central NS protection
- Automatic switching point between a power generation system operated in parallel with the network and the public grid
- Application in accordance with CEI 0-21, VDE-AR-N 4105, BDEW guideline, C10/11, G59/2, G59/3, G83/2, DIN V VDE V 0126-1-1/A1
- Universally applicable for safe mains decoupling of power generation systems

Description of function

Reconnection to the grid will only be carried out when the national conditions for connection to the grid are met. Here, both the mains voltage and the mains frequency must be within the tolerance range defined in each case.

The VMD460 features several separately adjustable measuring channels for

- Voltage drop protection *U* <
- Voltage drop protection *U*<<
- Rise-involtage protection *U* >>
- Rise-in-voltage protection *U10* > (10-minute average value)
- Frequency increase protection *f*>
- Frequency increase protection *f*>>
- Frequency decrease protection *f*<
- Frequency decrease protection *f*<<

This satisfies the requirements for static and dynamic network monitoring.

In case of limit infringements or a remote trip signal, the relays K1, and where appropriate K2, switch and the alarm LEDs light. Reconnection to the grid is carried out when the national conditions for connection to the grid are met. A test button "T" which when operated activates the relays and ensures that the required test (trigger test) for the purpose of checking the relays K1 and K2 is carried out.

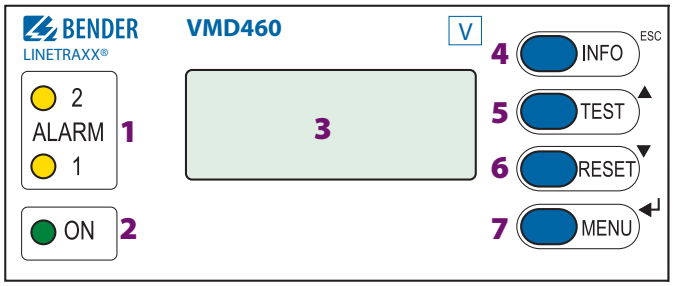
Certificate of non-objection/certificates of conformity

- CEI O-21
- VDE-AR-N 4105
- BDEW guideline
- C10/11
- G59/2
- G59/3
- G83/2
- DIN V VDE V 0126-1-1

Standards

- UL 508
- CSA (22.2 No. 14-13)

Operating elements



1 - Both alarm LEDs “AL1” and “AL2”: light when voltage and frequency values are outside the thresholds.

2 - LED “ON” (green): lights up when voltage is available and when the device is in operation or flashes in case of system fault alarm (external watchdog).

3 - Backlit LC display

4 - “INFO” button

5 - The test button “TEST” is used to start a manual self test that triggers both alarm relays (trigger test to check the coupling switches). In addition, a fault is simulated to determine the disconnection time.

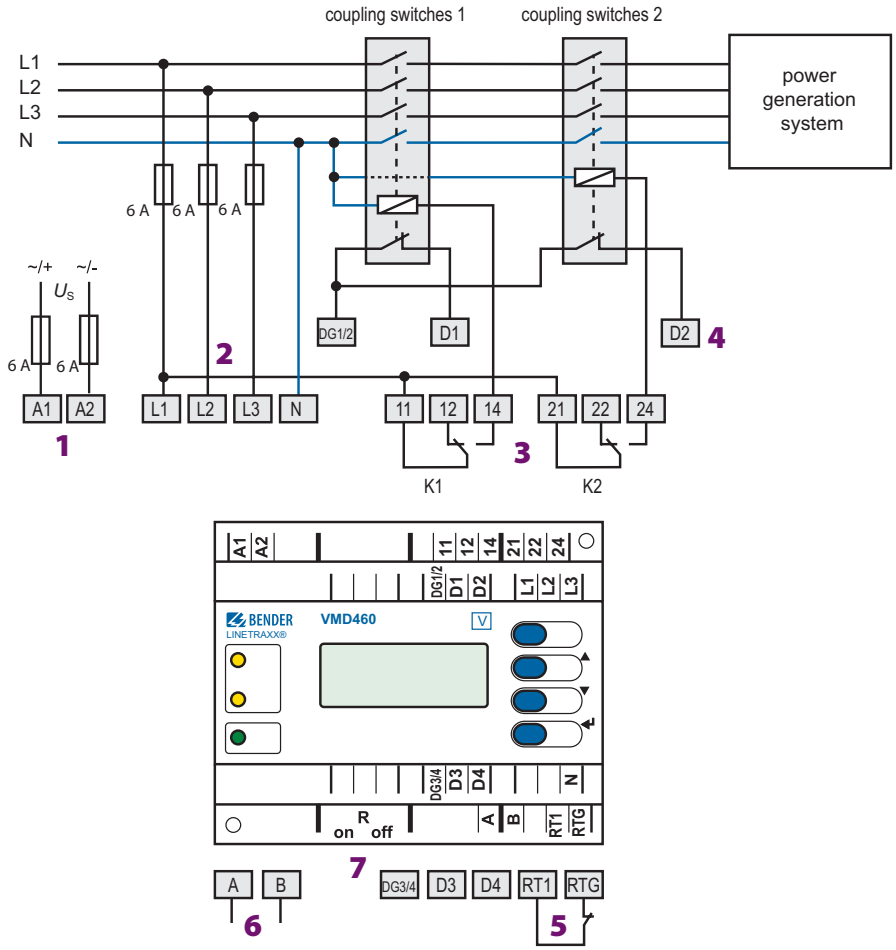
Arrow up button: parameter change, scroll

6 - “RESET” button: to acknowledge alarm and fault messages

Arrow down button: parameter change, scroll

7 - “MENU” button: to toggle between the standard display, menu and alarm display

Wiring diagram VMD460 (VDE-AR-N-4105)



1 - Supply voltage U_S (see ordering information)

2 - Coupling to the grid

3 - Relay connections

4 - Contact monitoring coupling switch (feedback signal contacts, optional NC/NO/off)

NO (in non-operating state open)

NC (in non-operating state closed)

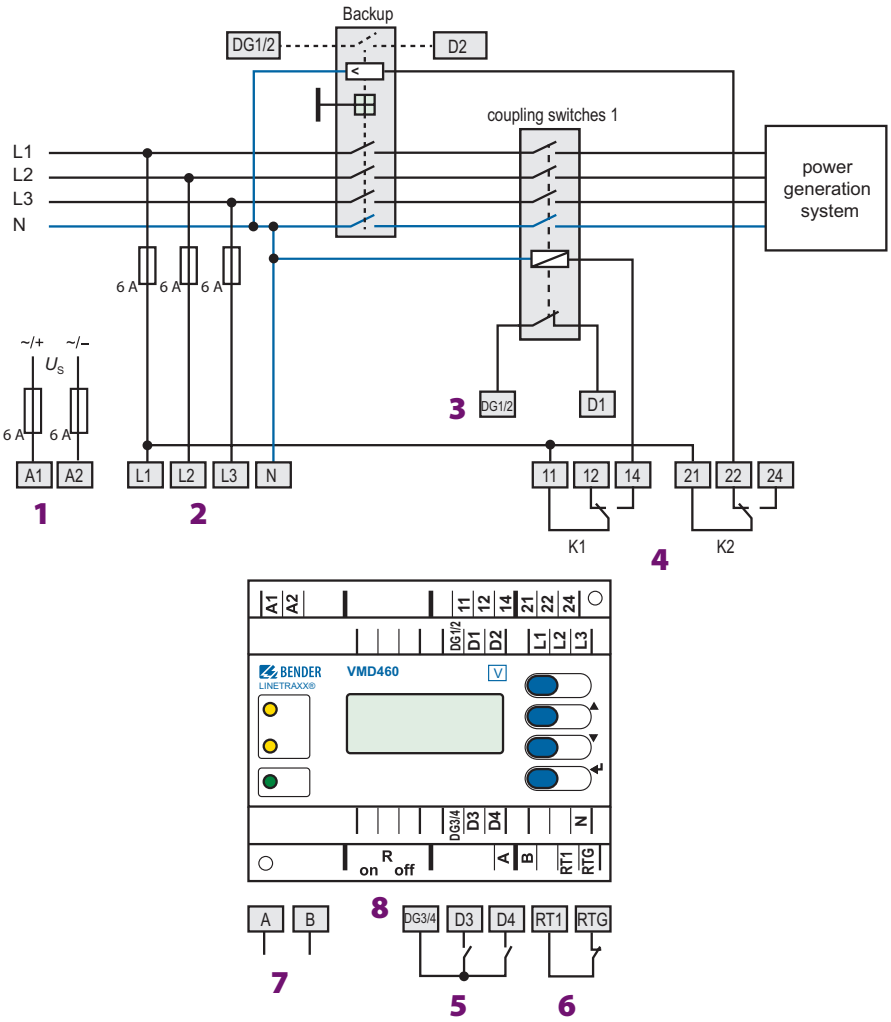
off (contact monitoring switched off)

5 - Remote trip input (NC/NO)

6 - RS-485 interface

7 - Activate or deactive the BMS bus terminating resistor (120 Ω)

Wiring diagram VMD460 (CEI 0-21)



1 - Supply voltage U_S (see ordering information)

2 - Coupling to the grid

3 - Contact monitoring coupling switch (feedback signal contacts, optional NC/NO/off)

NO (in non-operating state open)

NC (in non-operating state closed)

off (contact monitoring switched off)

4 - Relay connections

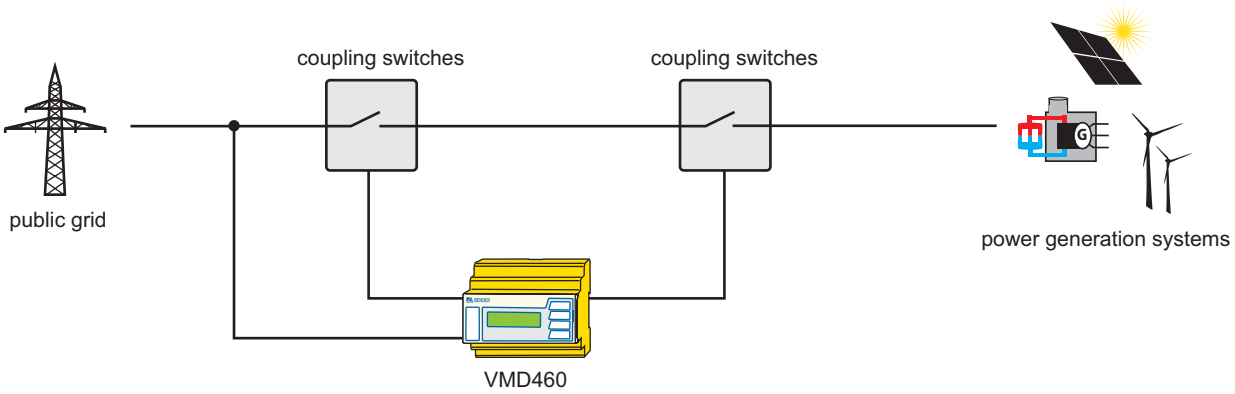
5 - GND, digital inputs (external monitoring)

6 - Remote trip input (NC/NO)

7 - RS-485 interface

8 - Activate or deactive the BMS bus terminating resistor (120 Ω)

Intended use



The principle of an installation according to CEI 0-21; VDE-AR-N 4105 (30 kW and higher), C10/11, BDEW guideline, DIN V VDE V 0126-1-1/A1, G59/2, G59/3, G83/2

Technical data

Insulation coordination acc. to IEC 60664-1/IEC 60664-3

Rated insulation voltage	400 V
Rated impulse voltage/pollution degree	6 kV/2
Overvoltage category	III
Safe separation (reinforced insulation) between	
	(A1, A2) - (L1, L2, L3, N) - (11, 12, 14, 21, 22, 24)
	(D1, D2, D3, D4, DG1/2, DG3/4, RTG, RT1)-(A1, A2, L1, L2, L3, N)
Voltage test acc. to IEC 61010-1:	
(N, L1, L2, L3) - (A1, A2), (11, 12, 14, 21, 22, 24)	3.32 kV

Supply voltage

Nominal supply voltage U_S	AC/DC 100…240 V
	DC/50/60 Hz
Operating range U_S	AC/DC 75…300 V
	DC/40…70 Hz
Power consumption at AC 230 V	< 7,5 VA/< 3,5 W
max.	9 VA/3,5 W

Measuring circuit

Nominal system voltage U_n (r.m.s. value) (L-N)	AC 0…300 V
Nominal system voltage U_n (r.m.s. value) (L-L)	AC 0…520 V
Rated frequency f_n (U_n > 20 V)	45…65 Hz

Response values

Type of distribution system	1AC: 230 V, 50 Hz
	3(N)AC: 400/230 V, 50 Hz
Relative uncertainty, voltage	$U \leq 280$ V: ≤ 1 %
	$U > 280$ V: ± 3 %
Resolution of setting, voltage	1 %
Rated frequency	50/60 Hz
Relative uncertainty, frequency	≤ ±0.1 %
Resolution of setting *f*	0.05 Hz

Recording of measurement values, condition for connection

L-N, L-L	0…1.3 U_n
<*f*, <<*f*	45…60 Hz
>*f*, >>*f*	50…65 Hz

Recording of measurement value, condition for disconnection

L-N, L-L	0…1.3 U_n
<*f*, <<*f*	45…60 Hz
>*f*, >>*f*	50…65 Hz
df/dt	0.05…9.9 Hz/s
Vectorshift	1…25°
Asymmetry	1…50 %
(Neutral-Voltage-Displacement 59 (N))	

Time response

Delay time for connection t_{on}	40 ms…30 s/1…3600 s	
Resolution of setting t_{on}	< 50 ms:	5 ms
	50 …200 ms:	10 ms
	200 ms …5 s:	50 ms
	5 …10 s	0,1 s
	10 s…60 s:	1 s
	60 …300 s:	10 s
	300 s…60 min:	1 min
Operating time voltage t_{ae}	half a supply period	
Operating time frequency t_{ae}	≤ 40 ms	
Recovery time t_b	300 ms	

Digital inputs

Monitoring of potential-free contacts or voltage inputs:	
	closed = low; 0…4 V; I_{in} < -5 mA
	open = high; > 6…≤ 30 V
D1	Feedback signal contact K1
D2	Feedback signal contact K2
D3	Local control (mode)
D4	External signal (mode)
RT1	Remote trip
DG1/2, DG3/4, RTG	GND

Displays, memory

Display	LC display, multi-functional, illuminated
Display range measured value	AC/DC 0…520 V
Operating uncertainty, voltage	$U \leq 280$ V: ≤ 1 %
	$U > 280$ V: ± 3 %
Operating uncertainty, frequency	≤ ±0.1 %
History memory for the last 300 messages	per data record measured values
Password	on/off/0…999 (off*)

Switching elements

Number	2 x 1 changeover contacts (K1, K2)				
Operating mode	N/C operation n.c /N/O operation n.o.				
Electrical endurance, number of cycles	10000				
Contact data acc. to IEC 60947-5-1:					
Utilisation category	AC 13	AC 14	DC-12	DC-12	DC-12
Rated operational voltage	230 V	230 V	24 V	110 V	220 V
Rated operational current	5 A	3 A	1 A	0.2 A	0.1 A
Minimum contact rating	1 mA at AC/DC ≥ 10 V				

Environment/EMC

EMC	DIN EN 60255-26/CEI 0-21
Operating temperature	-25…+55 °C
Classification of climatic conditions acc. to IEC 60721:	
Stationary use (IEC 60721-3-3)	3K5 (except condensation and formation of ice)
Transport (IEC 60721-3-2)	2K3 (except condensation and formation of ice)
Storage (IEC 60721-3-1)	1K4 (except condensation and formation of ice)
Classification of mechanical conditions acc. to IEC 60721:	
Stationary use (IEC 60721-3-3)	3M4
Transport (IEC 60721-3-2)	2M2
Storage (IEC 60721-3-1)	1M3

Connection

Connection type	screw terminals or push-wire terminals
Connection properties:	
rigid	0.2…4 mm² (AWG 24…12)
flexible	0.2…2.5 mm² (AWG 24…14)
Stripping length	8…9 mm
Tightening torque	0.5…0.6 Nm

Other

Operating mode	continuous operation
Mounting	any position
Degree of protection, internal components (IEC 60529)	IP30
Degree of protection, terminals (IEC 60529)	IP20
Enclosure material	polycarbonate
Flammability class	UL94 V-0
DIN rail mounting acc. to	IEC 60715
Screw mounting	2 x M4 with mounting clip
Documentation number	D00001
Weight	≤ 360 g

( )* = factory setting

Ordering information

Supply voltage U_S	Type	Art. No.
AC/DC		
100…240 V	VMD460-NA-D-2	B 9301 0045

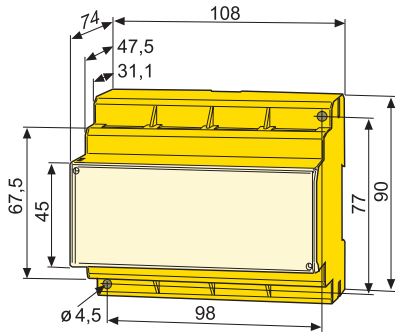
Device version with push-wire terminal on request.

Accessories

Type designation	Art. No.
Mounting clip for screw mounting (1 piece per device)	B 9806 0008

Dimension diagrams

Dimensions in mm



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