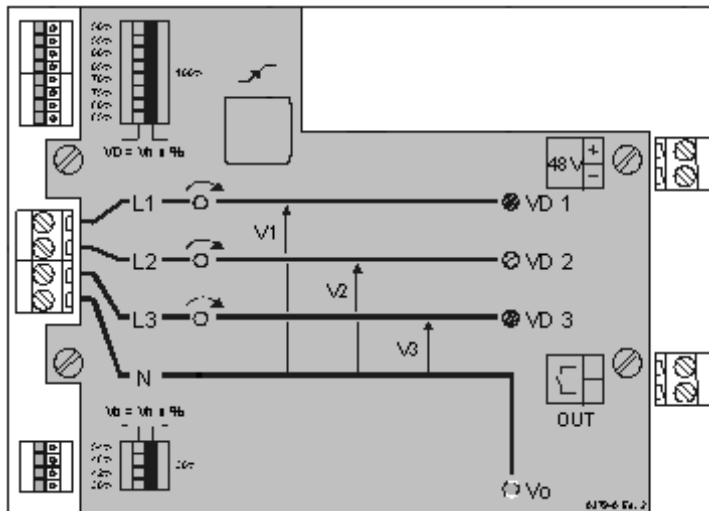


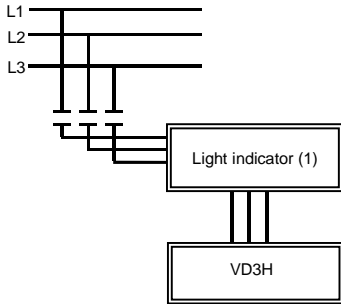
Electrical network management
MV substation control unit

Easergy range
T200

VD3H

Three phases voltage detection relay
User's manual

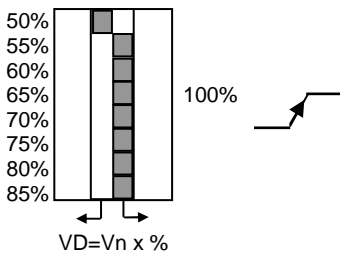




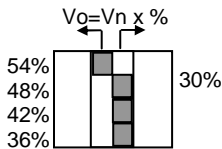
The light indicator has to be a specific reference for connection to VD3H.

i.e. : $Un=20kV$, $Vn=11,6kV$ ($Un/\sqrt{3}$), setting=50% :
 => Phase voltage detection : $VD=5,8kV$ ($UD/\sqrt{3}$)

Note : only one dip-switch must be set.



i.e. : $Un=20kV$, $Vn=11,6kV$ ($Un/\sqrt{3}$), setting=54% :
 => Unbalanced voltage detection : $Vo=6,2kV$



Note : only one dip-switch must be set.

- 1 – Voltage absence threshold
- 2 – MV Network voltage (Vn)
- 3 – Presence of voltage LED (green)
- 4 – 48V power supply terminal blocks
- 5 – Output contact
- 6 – Presence of unbalanced voltage
- 7 – MV network voltage adjustment
- 8 – Unbalanced voltage threshold
- 9 – Voltage signal input.

VD3H is a voltage presence relay dedicated to automatic reconfiguration systems such as auto-change over.

VD3H relay detects absence of phase voltage or presence of voltage unbalance on a MV network. It is adapted to all kind of MV network.

For each phase, VD3H is connected between the MV bushing capacitor and a capacitor connected to the ground for voltage measurement.

When mounted on SCHNEIDER ELECTRICS switchgears, the measurement is done through the voltage indicators.

VD3H must be powered by a backup power supply. The relay output is not maintained in case of power failure.

■ Phase voltage detection

The voltage value of each phase (L1,L2,L3) is compared to 2 thresholds.

High threshold : nominal single phase (Vn) *X% . Indicates a certain presence of voltage.

Low threshold : $Vn * X\% - 400V$. Indicates a certain absence of voltage

The absence of voltage is configurable from X=85% to X=50% by step of 5%.

The thresholds are plant set depending on the MV network voltage. This voltage is indicated on the board.

■ Unbalanced voltage detection

The unbalanced voltage (Vo) is calculated by 3 phases voltage summation.

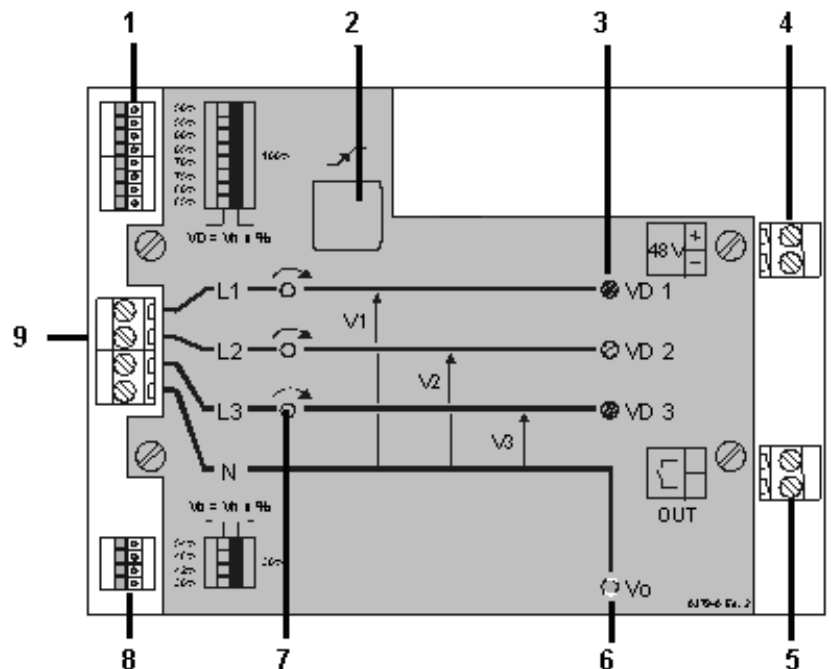
The residual voltage is detected if the unbalance is over $Y*Vn$, Y being configurable from 30% to 54% by step of 6%

■ Indications

Voltage presence (VD1, VD2, VD3) is indicated with green LEDs.

Unbalanced voltage Vo is indicated with a red LED.

A dry contact output is provided indicating the **3 phase voltage presence and no unbalanced voltage (Vo)**.



VD3H must be associated with a VPIS-VO

References	Light indicator / MV capacitor	MV (U)	Switchgear
VD3H-24V	VD3H supplied by 24V	5/20 kV	For SM6 or RM6 (delivered after 09/2000 : fitted for a VPIS with 30pF capacitor system in RM6) and 38pF capacitor system in SM6) (*): The range of voltage of each VPIS-VO depends on network frequency and switchgear capacitor. For more details, refer to the VPIS V2 technical leaflet (ENMED309037EN).
VD3H-48V	VD3H supplied by 48V	5/20 kV	
VPIS-VO : VPI62411	VPIS-VO 3,5 MUA	(*)	
VPIS-VO : VPI62412	VPIS-VO 5,1 MUA	(*)	
VPIS-VO : VPI62413	VPIS-VO 7,4 MUA	(*)	
VPIS-VO : VPI62414	VPIS-VO 10,7 MUA	(*)	
VPIS-VO : VPI62415	VPIS-VO 15,5 MUA	(*)	
VPIS-VO : VPI62416	VPIS-VO 22,4 MUA	(*)	
VPIS-VO : VPI62417	VPIS-VO 32,5 MUA	(*)	
VPIS-VO : VPI62418	VPIS-VO 47,2 MUA	(*)	
VPIS-VO : VPI62419	VPIS-VO 68,4 MUA	(*)	

MV Network characteristics (1)

MV Range (phase-ground)	Un = 5 kV to 20 kV
Voltage presence threshold	Vn (Un/√3) = 3 KV to 11 KV plant setting
Unbalanced voltage threshold	Setting from 50% to 85% of Vn by step of 5%
MV bushing capacitor	Setting from 36% to 54% by step of 6%
	30 pF ± 5%

Power supply

Power supply	+48V or 24V +/-15% (on turn screw terminal blocks)
Load current	< 50mA (48V) < 100mA (24V)
Protection	by Poly-switch 400 mA
Isolation	Inputs / mechanical ground : 2KV 50hz 1 mn
Dielectric	Inputs / mechanical ground: 5KV wave1.2/50 μs

OUTPUT

Maximum load	8A
Maximum switching power	AC : 196 VA / 250 V DC : 2000 W / 150 V
Characteristic	Dry gold contact with turn screw terminal blocks
Dielectric between open contacts	1 KV-50Hz-1 mn
Dielectric between contact and coil	3KV-50Hz-1mn

Voltage input

Connection	Connector with screw (wiring ≤ 2,5 mm ²) : L1, L2, L3 and earth
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CHARACTERISTICS

Climatic	Operational temperature	-15°C to +55°C
	Storage temperature	-25°C to +70°C
Dimension	H x L x P	35 mm x 140 mm x 100 mm



VD3H is associated with Easergy T200 for Automatic Transfer of Source function.

Installation

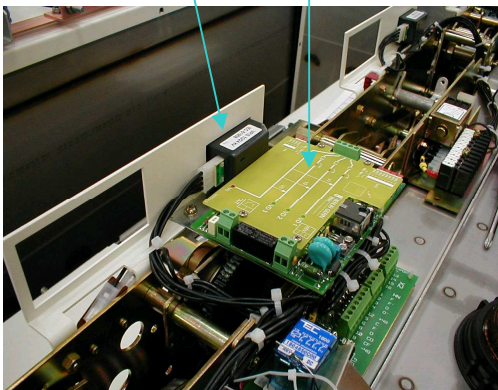
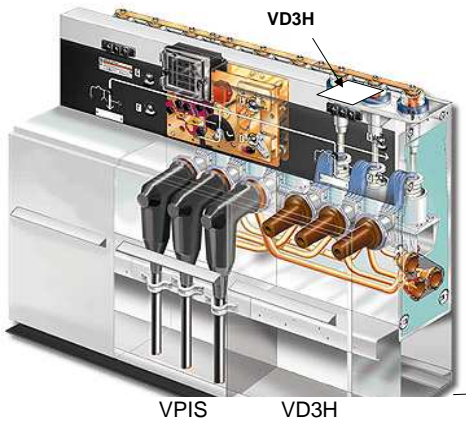
The voltage detector VD3H is a PCB ready to install in the MV switchgear enclosure.

VD3H power supply is available on the motorization terminal blocks.

The specific light voltage indicator VPIS-VO is installed instead of the standard one.

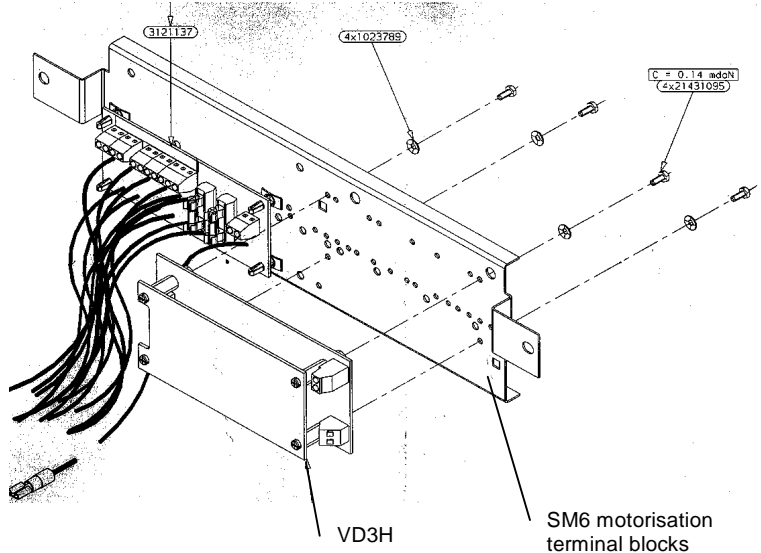
Installation of VD3H in RM6

VD3H is mounted on a plate (delivered with it) which is located in the RM6 strip behind the VPIS. The 48Vdc is taken from the motorization terminal blocks. VD3H is mounted on this plate with 4 screws.



Installation of VD3H in SM6

The VPIS-VO is located instead of the standard one. An optional output cable (included with VPIS-VO option) and an adaptor is delivered to connect directly the VPIS-VO to the VD3H.



Screws old the VD3H in the SM6 motorization terminal blocs as below.

Specific Settings

- VD3H is delivered with the tuning fitted to the voltage of the Network.
- The tuning is normally made at factory, so no needs to change it. It is however possible to redo it to adapt the VD3H to the voltage of the network : the voltage must be at the nominal value. Set the switches to V=Vn (micro-switches on right position) and turn the potentiometer for L1 until the Green VD1 LED is lightened. Proceed in the same way with L2 and L3. finally set the threshold micro-switch as you wish.

- setting recommended on the VD3H:

	setting recommended	i.e Voltage presence for Un=20 kV
Phase voltage detection	50%	$V_{1,2,3} > 5,8 \text{ kV}$
Unbalanced voltage detection	54%	$V_0 < 6,2 \text{ kV}$

Connection

VD3H must be used with VPIS-VO and plate for RM6.

Unplug the standard VPIS and replace it by the VPIS-VO version.

VPIS-VO is made to be directly connected to VD3H voltage inputs with using the optional output cable and a specific adaptor for VD3H relay.

The 4 wires are tagged with "L1", "L2", "L3", "N".

