MV CAPACITIVE VOLTAGE INDICATORS

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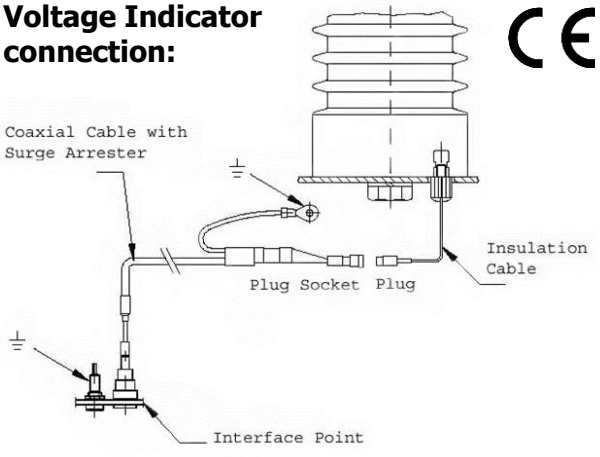
Voltage Indicator connection:



HR Voltage Indicator: CVI-E

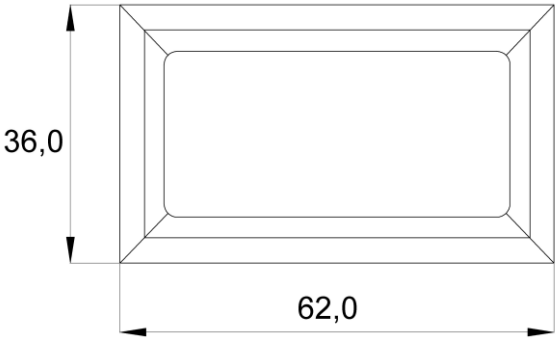
The Voltage Indicator is designed for to use with MV capacitive voltage divider devices to indicate system power status.

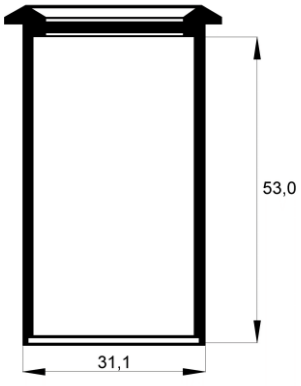
Features:

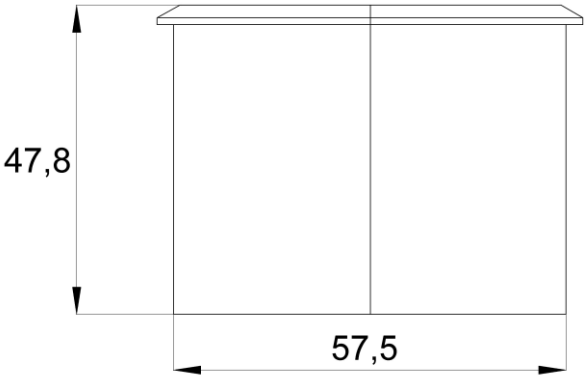
- System monitoring with safety (HR System)
- No auxiliary power is needed for voltage detection
- Bright and long-life LED to indicate
- Easy for installation and maintenance
- 4 connection leads for measuring at front panel
- Economical alternative

Technical Parameters:

1.Operating voltage : 2kV-40kV with capacitive voltage divider
2.Rated frequency : 50Hz or 60Hz
3.Ambient temperature range : -25℃ to +55℃
4.Protection class : IP20
5.Dimension : 36 x 62 x 45mm
6.Weight : 0,05kg







Voltage Indicator: CVI

The Capacitive Voltage Indicator is designed for to use with MV capacitive voltage divider devices.

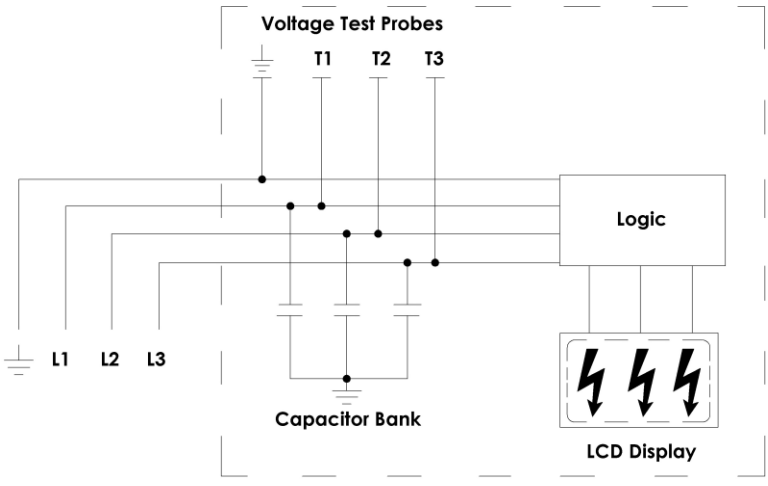
Features:

- LRM system
- According to IEC 62271-213
- No auxiliary power is needed for voltage detection
- 3-Phase LCD display
- Easy for installation and maintenance
- Economical alternative

INDICATION OF LCD	Indication with normal operation	Status of phase Voltage U
No indication	No Voltage	U < 10% * Un
	Voltage Present (light black arrow)	10% * Un < U < %45 * Un
	Nominal Voltage Present (full arrow)	U > 45% * Un

Technical Parameters:

1.Rated frequency : 50Hz or 60Hz
2.Threshold voltage : 10% to 45%Un
3.Operating temperature : -25℃ to +55℃
4.Storage temperature : -30℃ to +80℃
5.Protection class : IP54
6.Power freq. withstanding voltage: 2kV/1min
7.Connection leads : 4.8*0.8mm fast-on terminals
8.Dimension : 96*50*50mm
9.Cutting size : 92*45mm



Required data for order:

- Capacitance of coupling electrode C1
- C2 options; 3.3, 6.8, 10, 22, 68 nF
- Cable type and length
- Rated Voltage Un

Voltage Indicator: CVI+

The Capacitive Voltage Indicator is designed for to use with MV capacitive voltage divider devices.

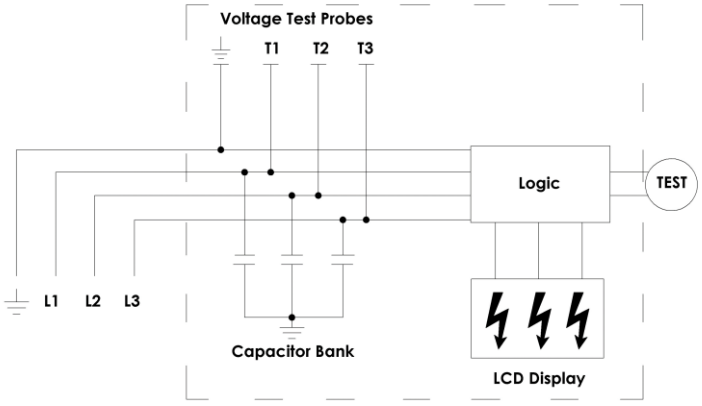
Features:

- LRM system
- According to IEC 62271-213
- No auxiliary power is needed for voltage detection
- 3-Phase LCD display
- Easy for installation and maintenance
- Self-test function without any auxiliary power
- Bigger screen

INDICATION OF LCD	Indication with normal operation	Status of phase Voltage U
	Display TEST	-
No indication	No Voltage	U < 10% * Un
	Voltage Present (light black arrow)	10% * Un < U < %45 * Un
	Nominal Voltage Present (full arrow)	U > 45% * Un

Technical Parameters:

1.Rated frequency : 50Hz or 60Hz
2.Threshold voltage : 10% to 45%Un
3.Operating temperature : -25℃ to +55℃
4.Storage temperature : -30℃ to +80℃
5.Protection class : IP54
6.Power freq. withstanding voltage: 2kV/1min
7.Connection leads : 4.8*0.8mm fast-on terminals
8.Dimension : 96*50*50mm
9.Cutting size : 92*45mm



Required data for order:

- Capacitance of coupling electrode C1
- C2 options; 3.3, 6.8, 10, 22, 68 nF
- Cable type and length
- Rated Voltage Un

Voltage Indicator: CVI S1

With 1 Relay Output

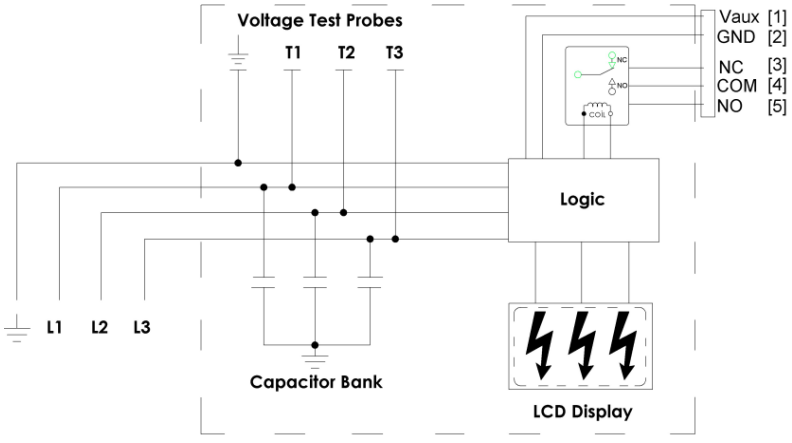
The Capacitive Voltage Indicator is designed for to use with MV capacitive voltage divider devices.

Features:

- LRM system
- According to IEC 62271-213
- No auxiliary power is needed for voltage detection
- Wide auxiliary input range for relay power supply
- 3-Phase LCD display
- Change-over contact for status monitoring
- Easy for installation and maintenance

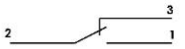
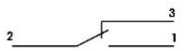
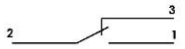
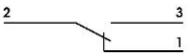
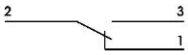
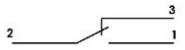
Technical Parameters:

1.Rated frequency	:	50Hz or 60Hz
2.Threshold voltage	:	10% to 45%Un
3.Operating temperature	:	-25°C to +55°C
4.Storage temperature	:	-30°C to +80°C
5.Protection class	:	IP54
6.Connection leads	:	4.8*0.8mm fast-on term.
7.Dimension	:	96*50*50mm
8.Cutting size	:	92*45mm
9.Contact output	:	8A, 250VAC or 30VDC
10. Auxiliary power	:	24 to 230V AC/DC
11. Power consumption	:	Less than 2W



Capacitive voltage Indicator with relay output

Voltage Indicator: CVI S1

Vaux status	Phase voltage	Type-1 Codes 5002280 5002282 5002283 Contact status	Type-2 Codes 5002285 5002287 5002288 Contact status
Off	For any status		
		2-3	2-3
On	All phases <%10 Un		
		2-3	1-2
On	At least one phase >%45 Un		
		1-2	2-3

Function table (Type-1):

Phase Voltage	Auxiliary Supply	Voltage Indication	Relay 1 NO-COM 1-2	Relay 1 NC-COM 2-3
<10%	Off	Off	Off	On
>45%	Off	On	Off	On
<10%	On	Off	Off	On
>45%	On	On	On	Off

Function table (Type-2):

Phase Voltage	Auxiliary Supply	Voltage Indication	Relay 1 NO-COM 1-2	Relay 1 NC-COM 2-3
<10%	Off	Off	Off	On
>45%	Off	On	Off	On
<10%	On	Off	On	Off
>45%	On	On	Off	On

Type-1 Terminal connection	Relay
1	NO
2	COM
3	NC
	Energy supply
4	Vaux (24-230 V AC/DC)
5	Gnd (-)

Type-2 Terminal connection	Relay
1	NO
2	COM
3	NC
	Energy supply
4	Vaux (24-230 V AC/DC)
5	Gnd (-)

Auxiliary Supply	Power (Red Led)
On	On
Off	Off

INDICATION OF LCD	Indication with normal operation	Status of phase Voltage U
No indication	No Voltage	U < 10% * Un
	Voltage Present (light black arrow)	10% * Un < U < %45 * Un
	Nominal Voltage Present (full arrow)	U > 45% * Un

Required data for order:

- Capacitance of coupling electrode C1
- C2 options; 3.3, 6.8, 10, 22, 68 nF
- Cable type and length
- Auxiliary power (24-230V AC/DC required)
- Options; type-1, type-2

Voltage Indicator: CVI+ S1

With 1 Relay Output

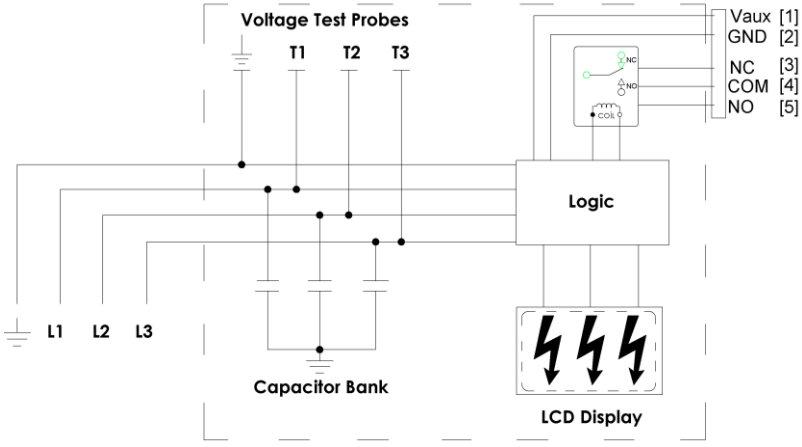
The Capacitive Voltage Indicator is designed for to use with MV capacitive voltage divider devices.

Features:

- LRM system
- According to IEC 62271-213
- No auxiliary power is needed for voltage detection
- Wide auxiliary input range for relay power supply
- 3-Phase LCD display
- Change-over contact for status monitoring
- Easy for installation and maintenance
- Bigger screen

Technical Parameters:

1.Rated frequency : 50Hz or 60Hz
2.Threshold voltage : 10% to 45%Un
3.Operating temperature: -25℃ to +55℃
4.Storage temperature : -30℃ to +80℃
5.Protection class : IP54
6.Connection leads : 4.8*0.8mm fast-on term.
7.Dimension : 96*50*50mm
8.Cutting size : 92*45mm
9.Contact output : 5A, 250VAC or 30VDC
10. Auxiliary power : 24 to 230V AC/DC
11. Power consumption : Less than 2W



Capacitive voltage Indicator with relay output

Voltage Indicator: CVI+ S1

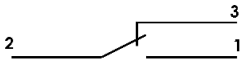
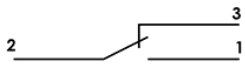
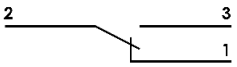
Indication Status:

INDICATION OF LCD	Indication with normal operation	Status of phase Voltage U
No indication	No Voltage	U < 10% * Un
	Display TEST	-
	Voltage Present (light black arrow)	10% * Un < U < %45 * Un
	Nominal Voltage Present (full arrow)	U > 45% * Un

Auxiliary Supply	Power (Red Led)
On	On
Off	Off

Function table (Type-1):

			Relay 1	
Phase Voltage	Auxiliary Supply	Voltage Indication	NO-COM 1-2	NC-COM 2-3
<10%	Off	Off	Off	On
>45%	Off	On	Off	On
<10%	On	Off	Off	On
>45%	On	On	On	Off

Vaux status	Phase voltage	Relay-1 Contact status
Off	For any status	 **2-3**
On	All phases <**%10** Un	 **2-3**
On	At least one phase >**%45** Un	 **1-2**

Type-1 Terminal connection	Relay
1	NO
2	COM
3	NC
	Energy supply
4	Vaux (24-230 V AC/DC)
5	Gnd (-)

Required data for order:

- Capacitance of coupling electrode C1
- C2 options; 3.3, 6.8, 10, 22,68 nF
- Cable type and length
- Auxiliary power (24-230V AC/DC required)

Voltage indicator: CVI+S2

With 2 Relay Output

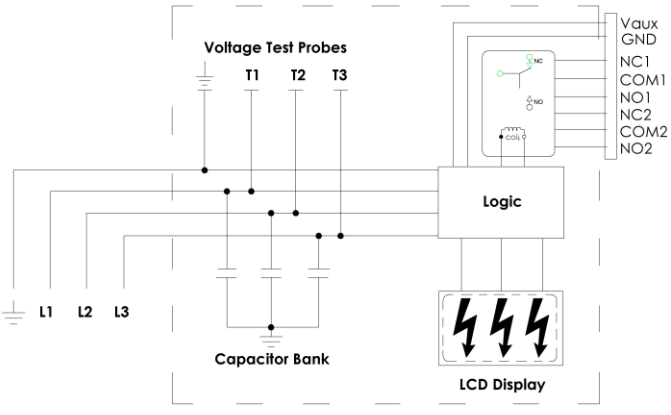
The Capacitive Voltage Indicator is designed for to use with MV capacitive voltage divider devices.

Features:

- LRM system
- According to IEC 62271-213
- Self test function without any auxiliary power
- No auxiliary power is needed for voltage detection
- Wide auxiliary input range for relay power supply
- 3-Phase LCD display and bigger screen
- 2 LED indicators for contact status
- 2 Change-over contact for status monitoring
- Easy for installation and maintenance

Technical Parameters:

1.Rated frequency	:	50Hz or 60Hz
2.Threshold voltage	:	10% to 45%Un
3.Operating temperature	:	-25℃ to +55℃
4.Storage temperature	:	-30℃ to +80℃
5.Protection class	:	IP54
6.Connection leads	:	4.8*0.8mm faston term.
7.Dimension	:	96*50*50mm
8.Cutting size	:	92*45mm
9.Contact output	:	5A, 250VAC or 30VDC
10. Auxiliary power	:	24 -230 AC/DC
11. Aux.Power isolation	:	1.5 kV
12.Power consumption	:	Less than 2W



Voltage indicator with 2 relay output

Function table:

Phase Voltage	Auxiliary Supply	Voltage Indication	Relay 1 NO-COM 1-2	Relay 1 NC-COM 2-3	Relay 2 NO-COM 4-5	Relay 2 NC-COM 5-6
<10%	Off	Off	Off	On	Off	On
>45%	Off	On	Off	On	Off	On
<10%	On	Off	Off	On	On	Off
>45%	On	On	On	Off	Off	On

Voltage indicator: CVI+S2

Indication Status:

INDICATION OF LCD	Indication with normal operation	Status of phase Voltage U
No indication	No Voltage	U < 10% * Un
	Display TEST	-
	Voltage Present (light black arrow)	10% * Un < U < %45 * Un
	Nominal Voltage Present (full arrow)	U > 45% * Un

HV on (Red Led)
On
Off

HV off (Green Led)
Off
On

Auxiliary Supply	Power (Red Led)
On	On
Off	Off

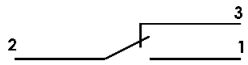
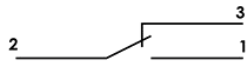
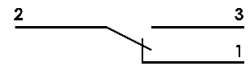
Relay function table:

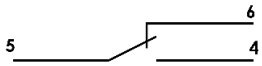
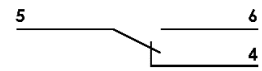
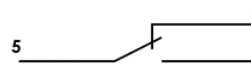
		Relay 1	
Phase Voltage	**Auxiliary Supply**	**NO-COM 1-2**	**NC-COM 2-3**
Any Situation	Off	Off	On
All phases **U <10% Un**	On	Off	On
At least 1 phase with **U >45% Un**	On	On	Off

		Relay 2	
Phase Voltage	**Auxiliary Supply**	**NO-COM 4-5**	**NC-COM 5-6**
Any Situation	Off	Off	On
At least 1 phase **U <10% Un**	On	On	Off
All phases with **U >45% Un**	On	Off	On

Voltage indicator: CVI+S2

Relay function table:

Vaux status	Phase voltage	Relay-1 Contact status
Off	For any status	 **2-3**
On	All phases <**%10** Un	 **2-3**
On	At least one phase >**%45** Un	 **1-2**

Vaux status	Phase voltage	Relay-2 Contact status
Off	For any status	 **5-6**
On	All phases <**%10** Un	 **4-5**
On	All phases with **U >45% Un**	 **5-6**

Terminal connection	Relay 1
1	NO1
2	COM1
3	NC1
	Relay 2
4	NO2
5	COM2
6	NC2
	Energy supply
7	Vaux (24-230 V AC/DC)
8	Gnd (-)

Required data for order:

- Capacitance of coupling electrode C1
- C2 options; 3.3, 6.8, 10, 22,68 nF
- Cable type and length
- Rated voltage Un
- Auxiliary power (24-230V AC/DC required)

Resonance Damper

Features:

-LED signal for status tracking.

-Due to its low resistance when ferroresonance arises, it provides better damping than other damping resistors.

-Better power safety for earth-fault due to its high resistance during earth-fault.

-There is a one ferroresonance damper for secondary voltages between 100 and 120 VAC (open-delta).

-Activation time delay to keep other external protection devices unaffected.

-Small size compared to damping resistors.

-Saves space in customer application.

-Can be mounted low-voltage part on DIN-rail.

-One Damper for the protection of 3 voltage transformer with open-delta connection.

Description:

The resonance damper is a low voltage indoor switchgear device for elimination of ferroresonance phenomenon. It protects voltage transformers against potential ferroresonance overcurrent by prompt damping actions. Ferroresonance can arise in ungrounded power networks or in the network where is not directly grounded neutral point. It can occur between voltage transformer inductance and capacitances of system components. Transients in a system like switching can also trigger a ferroresonance stage which may cause a significant damage due to overvoltage and overcurrent surges caused by magnetic saturation of VT core. The device is determined to be used in cooperation with voltage transformers connected in open delta. The Damper is a smart (active) load instrument which eliminates these unwanted surges and protects voltage transformer when ferroresonance occurs. When input voltage is greater than the threshold voltage, the device activates and damping action is realized. It stays inactive up to threshold which is pre-defined as 20VAC. Thus the device shows no action against natural system asymmetry caused by phase imbalance. Threshold voltage can be set 20- 25-30VAC upon request by the manufacturer. There is a default 0.5s default time delay for activation after threshold is recognized and it can be set as 0.5s-1.5s- 2.5s-3.5s (by the manufacturer upon on request), in order to keep the external protection device unaffected from damping process. If the voltage between terminals gets too high (or in the case of one phase is grounded), after pre-defined time, it automatically switches off to provide power safety for both itself and connected voltage transformers and after a certain time (according to thermal limits) tries to damp again. After the device being activated, it tries to damp the ferroresonance status until reaching a thermal limit (damping then cooling and afterwards damping). This function will protect the voltage transformers secondary windings from continuous high currents and over-heatings.

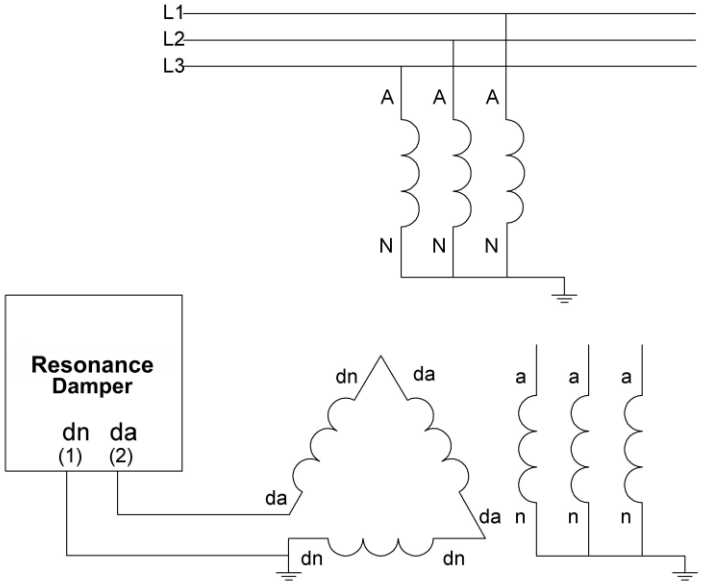
Resonance Damper

Technical Parameters:

1.Nominal voltage	:100-120VAC (open-delta)
2.Nominal Frequency	:50/60Hz
3.Activation Voltage	:20VAC, 25VAC, 30VAC (20VAC default)
4.Activation Delay	:0.5-1.5-2.5-3.5 sec (0.5 sec default)
5.Damping time @ 120V	:1 sec
6.Max. operational current	:14 A/1 sec
7.Protection Class	:IP20
8.Operating temperature	:-25°C to +55°C
9.Storage temperature	:-40°C to +85°C
10. Humidity	:up to %90
11. Dimensions	:69 × 86 × 56 mm
12. Weight	:0.15 kg
13. Installation	:35mm DIN rail (DIN EN 50 022)
14. Connection	:Screw, 0.5 - 2.5 mm2 wire

Connection Diagram:

LED Status	Description
Continuously ON	Damping action is in process
Blinking with~ 1Hz	Cooling
Blinking with >>1Hz	Continuous over-voltage (earth-fault) or at thermal limits



CVI T Phase Indicator

Phase comparator is designed for to indicate the state of high-voltage circuitry and check the phase sequence on the electrical equipment.
– LED Display
– No auxiliary power
– Self-test function without any auxiliary power
– Can be used with both LRM and HR Systems
– Easy to use

FUNCTIONS

– Indication: Insert the phase comparator into the earth and other terminals of the high-voltage electrical equipment, the LED display will indicate if the line is energized.
– Phase Comparator: Insert the phase comparator into power terminals on the same phase sequence of two high-voltage electrical equipment, if the LED display has no indication the tested phase sequences are same.

Technical Parameters:

1.Rated frequency	: 50Hz or 60Hz
2.Threshold voltage	: 10% to 45%Un
3.Operating temperature	: -25℃ to +55℃
4.Storage temperature	: -30℃ to +80℃
5.Protection class	: IP54
6.Connection leads	: 4 mm

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