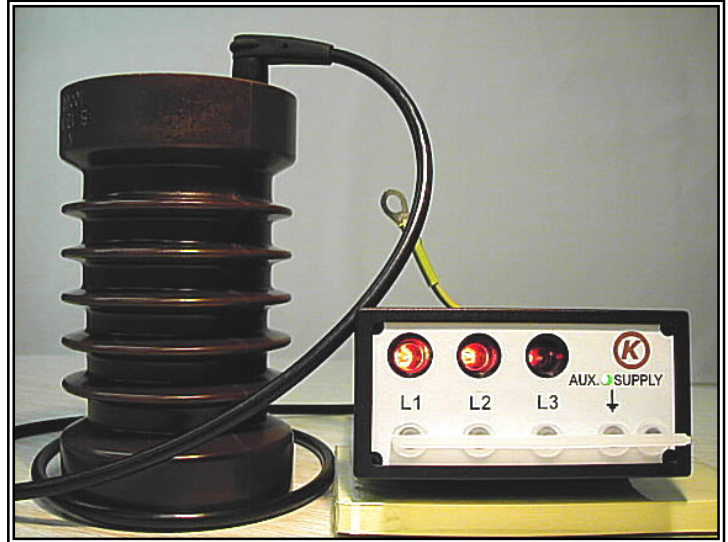


## **Voltage Indicator CPI VI-3P/R for voltage range 10-52 kV (3-7,2 kV)**

### **Capacitive Permanent Integrated Voltage Indicator – 3 Phase / with Relais**

#### ***General Characteristic***

This voltage indication system consists of indicator CPI VI-3P, output relay unit, set of connection cables and coupling electrodes. First two positions are built-in compact plastic box standard size according to DIN. Functional design is obvious from picture; as a coupling electrode is illustrated capacitive insulator company KUVAG.



#### ***Indicator***

- The capacitive integrated voltage indicator for permanent monitoring of all 3-phase line voltages serves to detection of service voltage presence in range of rated voltages from 10 kV up to 52 kV (or 3 to 7,2 kV) / 50 - 60 Hz, above all for el. distribution systems
- It complies with requirements given in the IEC 61243-5:1997 international standard, EN 61243-5:2001 or DIN VDE 0682 Part 415 respectively, if co-operates with customer's coupling electrodes or Kuvag capacitive insulators
- Fixed installation in front sheet cut-out (standardized dimension 96 x 48 mm acc. to DIN)
- Flashing LED diodes ensure a bright red signalling of individual phase service voltage in the 3-phase system network
- No external power is required, power demand is covered by direct consumption from individual MV system lines with help of capacitive coupling electrodes
- No maintenance is required
- Easy installation incl. cable connection with FAST-ON connectors
- Connection between capacitive sensors and indicator by screened coaxial cables
- It is intended for indoor use in standard environment, for intermediate panels of rated voltage from 10 kV up to 52 kV (or 3 to 7,2 kV) / 50 - 60Hz
- Built-in test points in order to determine phase sequence
- Built-in protection by means of surge arrester
- Safe voltage at the built-in test points
- Maximum operating current to 2.5  $\mu$ A (at start of signalling - treshold voltage)
- The voltage detecting system has no troubles with uncontrollable leakage currents
- Simple functional check of the indicator with help of an external tester under service conditions (it is not subject of the set delivery, to be ordered separately)
- A special testing power supply enables indicator functional test with disconnected MV system network (it is not subject of the set delivery, to be ordered separately)
- Delivery of complete three-phase set (see below)
- Type test executed according to IEC 61243-5:1997 and EN 61243-5:2001 standard

## Output Relay Unit

- An electronic unit powered by auxiliary switchgear voltage is built-in in the same enclosure as the a.m. indicator
- It provides information about operating voltage symmetry, or disconnection of all phase lines, with help of two relay contacts **ReA** and **ReB** (changeover, potential free), which are intended for transfer of voltage condition information, event. for further purposes (eg. interlocking or additional functions)
- Contact ratings: AC max. 250 V/5 A (resistive loading)  
DC Class 2 according to IEC 60694 (inductive loading)
- Output relay switches in accordance with below specified table - two switching systems:  
Voltage symmetry: all phase line voltages shall be present to close relay contacts  
Voltage condition: any phase line voltage opens relay contacts
- This electronic unit can be supplied by auxiliary both DC and AC voltage having following magnitudes: DC: 48, 60, 110 and 220 V, AC: 115 and 230 V/50-60 Hz - general-purpose use
- Presence of auxiliary voltage is indicated by green LED located at the front panel
- The CP VI - 3P/R integrated voltage indicator is built-in in a standardized instrument enclosure according to DIN having the same front dimensions as the CPI VI – 3P type (only mounting depth is larger - 141 mm)
- Evaluation circuits of electronic unit with supply sources and output relay are electrically isolated with help of optical coupling units
- Easy installation similar as with the CPI VI - 3P and to the same front sheet cut-out of switchgear
- A special external testing power supply enables indicator functional test with disconnected MV system network
- Functional check by means of the CPI TA test adapter (MV system in operation) similar as at indicator without relay outputs is possible
- Favourable price compared with another solutions and space saving in switchgears

## Switching Matrix of Output Relay:

### Voltage condition

Relay contacts (terminals 1-2 and 4-5)	Auxiliary voltage	L1	L2	L3
closed	1	0	0	0
open	1	1	0	0
open	1	0	1	0
open	1	1	1	0
open	1	0	0	1
open	1	1	0	1
open	1	0	1	1
open	1	1	1	1
open	0	arbitrary		

### Voltage symmetry

Relay contacts (terminals 1-2 and 4-5)	Auxiliary voltage	L1	L2	L3
closed	1	1	1	1
open	1	0	1	1
open	1	1	0	1
open	1	0	0	1
open	1	1	1	0
open	1	0	1	0
open	1	1	0	0
open	1	0	0	0
open	0	arbitrary		

Legend: 1 - voltage present 0 - no voltage

## Technical Data

Type	CPI VI - 3P/R/10-52 kV (or 3-7.2 kV)
Nom. frequency	50 - 60 Hz
Max. power input	DC (mW) auxiliary voltage (V) x 15 mA AC (W) approx. 1.2 VA
Contact ratings:	AC DC
Intended for capacitive sensors	250 V/5 A (resistive load) Class 2 according to IEC 60694 (inductive load)
Coupling capacitance of Kuvag sensors	10 to 52 kV (or 3 to 7.2 kV)
Capacitance of customer's coupling electrodes*	20 - 15 - 10 pF (12-24-36 kV) 26 - 7.25 pF (in range 10 to 52 kV) 41,5 - 31.5 pF (in range 3 to 7.2 kV)
$U_0 \leq 10 \% U_n$	no voltage signalling (IEC 61243-5), relay contacts according to the a.m. switching matrix
$U_0 \geq 45 \% U_n$	voltage signalling (IEC 61243-5), flashing frequency > 1 Hz, relay contacts according to the a.m. switching matrix
Max. voltage at the indicator	safe (below 50 VAC according to IEC 529)
Degree of protection	IP 42 (event. IP 54, if requested)
Operating temperature	-25 to +55 °C
Dimensions (W x H x D)	96 x 48 x 170 mm
Weight	approx. 450 g (excl. clamping screws)

\* **Calor/Emag coupling electrodes are also applicable**



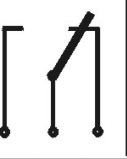
## The Three-Phase Set Contains

- 3 pieces supporting insulator with built-in capacitive Kuvag sensor according to selected rated voltage
- 3 pieces connection brass pin M6 (M5 is also available)
- 3 pieces coaxial cable with connecting FAST-ON 4.8 mm female connectors (line voltages) and earthing cable lug M6 (length 30 cm, earthing of coaxial cable screens via indicator's FAST-ON male connectors). Cable length in compliance with customer requirement (1 m to 10 m )
- 1 piece integrated voltage detection system for permanent indication with built-in voltage symmetry or voltage condition unit (it should be mentioned with ordering), type CPI VI - 3P/R/10-52 kV or 3-7.2 kV
- Installation instructions

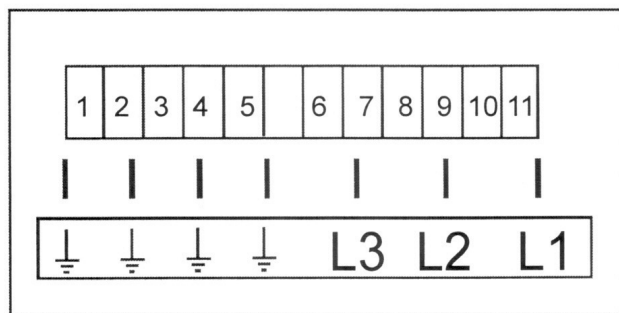
## Note

External tester under service conditions (CPI TA or CPI TA/7.2 kV), special testing source (TPS, 230 VAC powered) with connection leads having pins of  $\varnothing$  4 mm, and an equipment to determine phase sequence simultaneously are not subject of the set, they have to be ordered separately. If requested, the a.m. equipment can also be delivered in practical protective plastic boxes.

## Connection terminal and wiring diagram

<b>KUVAG</b>		CPI VI-3P/R/3-7,2kV								
www.kuvag.cz		IEC 61243-5								
Beznapětový stav		P <sub>MAX</sub> = 3,5 W								
Without-Volt. cond.		Type:8438 No: 38335								
										
ReA		ReB								
										
		RESERVE								
		+230VDC/AC								
		+115VDC/AC								
		+60V DC								
		+48V DC								
		- DC (PE), N								
1	2	3	4	5	6	7	8	9	10	11

## View to rear panel CPI VI-3P/R/



### Notes

- Contact pairs (terminals no. 2-3 and 5-6, N/C types) can be used for reversal application if required.
- Other auxiliary voltages available on request (eg. 12 or 24 VDC). Consult manufacturer.
- If agreed with manufacturer, another switching matrix of output relay can be delivered.