

Voltage Transducer CV 4-4000/SP1

For the electronic measurement of voltages: DC, AC, pulsed..., with galvanic isolation between the primary circuit and the secondary circuit.

$$U_{PN} = 2800 \text{ V}$$



Electrical data

U_{PN}	Primary nominal RMS voltage	2800	V
U_{PM}	Primary voltage, measuring range	0 ... ± 4000	V
U_S	Secondary voltage	10	V
S	Sensitivity	4000 V / 10 V	
R_L	Load resistance	≥ 2	k Ω
C_L	Load capacitance	≤ 5	nF
U_C	Supply voltage ($\pm 10\%$)	± 24	V
I_C	Current consumption @ $U_C = \pm 24 \text{ V}$	$35 + U_S / R_L$	mA

Accuracy - Dynamic performance data

		Max	
ε_{tot}	Total error @ $U_{PN}, T_A = 25 \text{ }^\circ\text{C}$	± 0.40	%
	-40 $^\circ\text{C}$... +70 $^\circ\text{C}$	± 1.00	%
I_O	Offset current @ $U_P = 0, T_A = 25 \text{ }^\circ\text{C}$	± 0.20	mA
	-40 $^\circ\text{C}$... +70 $^\circ\text{C}$	± 0.60	mA
t_{D90}	Delay time to 90 % of U_{PN} ¹⁾	≈ 50	μs
BW	Frequency bandwidth (-3 dB) @ 50 % U_{PN}	DC ... 6	kHz

General data

T_A	Ambient operating temperature	-40 ... +70	$^\circ\text{C}$
T_S	Ambient storage temperature	-50 ... +85	$^\circ\text{C}$
P_P	Total primary power loss @ U_{PN}	2.8	W
R_P	Resistance of primary (winding)	2.8	M Ω
m	Mass	750	g
	Standards	EN 50178: 1997 EN 50155: 2007 EN 50121-3-2: 2016 ²⁾	

Notes: ¹⁾ For a $dv/dt = 1000 \text{ V}/\mu\text{s}$.

²⁾ Deviation of the offset during the test IEC 61000-4-3 between 100 to 300 MHz.

Features

- Closed loop (compensated) voltage transducer
- Insulating plastic case recognized according to UL 94-V0.

Special features

- $U_C = \pm 24 (\pm 10\%) \text{ V}$
- $U_d = 9.5 \text{ kV}$
- $T_A = -40 \text{ }^\circ\text{C} \dots +70 \text{ }^\circ\text{C}$
- Shield
- Connection to secondary circuit on SUB-D 9 Poles (male).

Advantages

- Excellent accuracy
- Very good linearity
- Low temperature drift.

Applications

- AC variable speed drives and servo motor drives
- Static converters for DC motor drives
- Uninterruptible Power Supplies (UPS)
- Power supplies for welding applications
- Railway overhead line voltage measurement.

Application Domains

- Traction
- Industrial.

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Insulation coordination

U_d	RMS voltage for AC insulation test, 50 Hz, 1 min	9.5 ¹⁾	kV
U_e	Partial discharge extinction RMS voltage @ 10 pC	3.75 Min	kV
d_{Cp}	Creepage distance	185.1	mm
d_{Cl}	Clearance	118.5	mm
CTI	Comparative tracking index (group I)	600	

Note: ¹⁾ Between primary and secondary.

Applications examples

According to EN 50178 and IEC 61010-1 standards and following conditions:

- Over voltage category OV 3
- Pollution degree PD2
- Non-uniform field

	EN 50178	IEC 61010-1
d_{Cp}, d_{Cl}, U_{Ni}	Rated insulation voltage	Nominal voltage
Basic insulation	8000 V	1000 V
Reinforced insulation	5600 V	1000 V

Safety



This transducer must be used in electric/electronic equipment with respect to applicable standards and safety requirements in accordance with the manufacturer's operating instructions.



Caution, risk of electrical shock

When operating the transducer, certain parts of the module can carry hazardous voltage (e.g. primary connections, power supply).

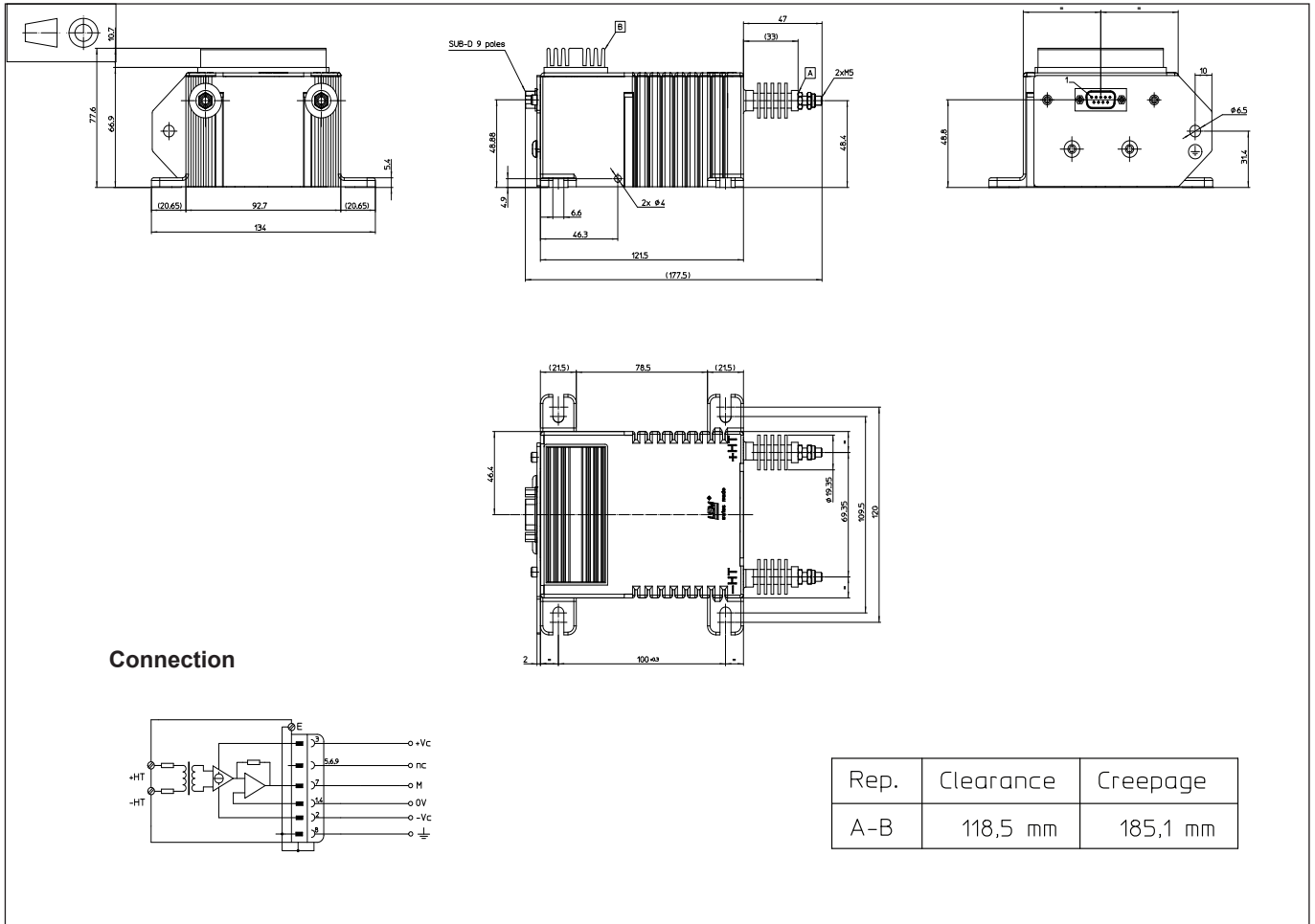
Ignoring this warning can lead to injury and/or cause serious damage.

This transducer is a build-in device, whose conducting parts must be inaccessible after installation.

A protective housing or additional shield could be used.

Main supply must be able to be disconnected.

Dimensions CV 4-4000/SP1 (in mm)



Mechanical characteristics

- General tolerance ± 0.5 mm
- Transducer fastening
 - 4 slots $\varnothing 6.6$ mm
 - 4 M6 steel screws
 - Recommended fastening torque 5 N·m
- Connection of primary
 - M5 threaded studs
 - Recommended fastening torque 2.2 N·m
- Connection of secondary SUB-D 9 Poles (male)
- Connection to the ground hole $\varnothing 6.5$ mm

Remarks

- I_s is positive when U_p is applied on terminal +HT.
- Installation of the transducer must be done unless otherwise specified on the datasheet, according to LEM Transducer Generic Mounting Rules. This application note is available on LEM website.