

P45000

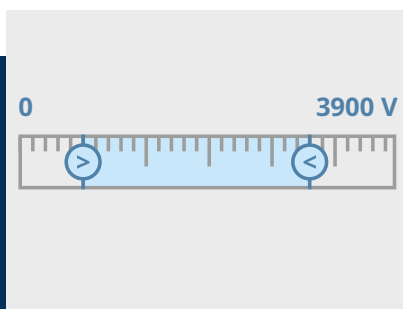
Signal Conditioner with a High Level of Isolation for Measuring Direct and Alternating Voltages of up to 3900 V DC and 4500 V AC_{peak}



Certified according to SIL 2/3, the P45000 is the world's first functionally safe high voltage transducer and it's ready to order with any input voltage range from 500 V DC.

One of the most space-saving high voltage transducers, it impresses thanks to its numerous installation options. This means not only can it be mounted on 35 mm DIN rails, but also screwed onto mounting surfaces—vertically, horizontally, or stacked as needed.

The P45000 can be flexibly customized to meet specific customer requirements, and many implemented versions are available for special uses.



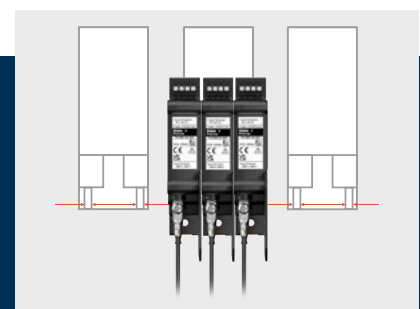
Can be Ordered with any Input Voltage Range

- Rapid availability for the input voltage ranges from 0 ... 500 V DC to 0 ... 3000 V DC.
- Additional input voltages are available on request.



Certified in Accordance with Standards

- World's first functionally safe high voltage transducer.
- Optimized for use on rolling stock.



Space Saving and Flexibly Mountable

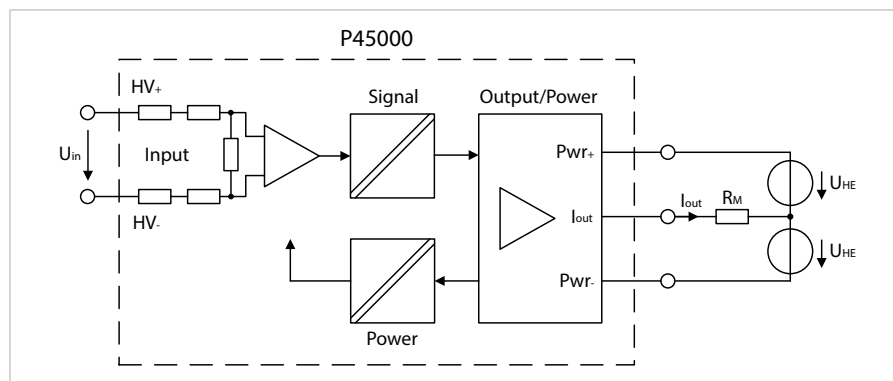
- Mounting on a 35 mm DIN rail or horizontally or vertically on a mounting surface.
- Multiple devices can be installed in series or stacked.

Product Code

High Voltage Transducer	P45	-	-	-	K	2	-	-	-	/	-	-	-	-	-	-	-	-
Type test voltage 10 kV AC, nominal voltage $U_{in,n}$ [V]: 500...1500	0									/								
Type test voltage 20 kV AC, nominal voltage $U_{in,n}$ [V]: 500...3000	1									/								
$I_{out} = \pm 50$ mA; bipolar	0	0								/								
$I_{out} = \pm 50$ mA; bipolar	0	2								/								
$I_{out} = 10...50$ mA; unipolar	1	1								/								
$I_{out} = 4...20$ mA; unipolar	2	1								/								
Out special type	9	0								/					-	S	x	x
Out special type	9	2								/					-	S	x	x
Without SIL capability, gain error 0.2 %	0									/								
With SIL capability, gain error 0.2 % ¹⁾	1									/								
Without SIL capability, gain error 0.1 %	2									/								
Type of enclosure					K	2				/								
Wall mounting only						0				/								
Wall mounting/35 mm DIN rail						1				/								
High-voltage connection: Screwed contact/ring cable lug									0	/								
High-voltage connection: Fixed cable									1	/								
Output/auxiliary power: Push-in terminals										1	/							
Output/auxiliary power: Screw terminals										2	/							
Input nominal voltage: $U_{in,n} = \text{xxxx V}$										/	x	x	x	x				
Special types															-	S	x	x

Specifications (Excerpt)

Excerpt from the user manual. Detailed information → knick-international.com

1 Block Diagram


¹⁾ Only for nominal voltage $U_{in,n}$ [V]: 500, 750, 1000, 1500, 2000, 2800, 3000

2 Input

Measuring ranges/output ranges				
Product variant	Nominal voltage	Nominal measuring range	Nominal output range	Type test voltage
Products without SIL capability				
P4500*	500 V	±500 V	±50 mA	10 kV
	...	...		
	1500 V	±1500 V	±50 mA	
P4510*	500 V	±500 V	±50 mA	20 kV
	...	...		
	3000 V	±3000 V	±50 mA	
Products with SIL capability/EN 61508				
P45011	500 V	0...500 V	10...50 mA	10 kV
	...	...		
	1500 V	0...1500 V	10...50 mA	
P45111	500 V	0...500 V	10...50 mA	20 kV
	...	...		
	3000 V	0...3000 V	10...50 mA	
P45021	500 V	0...500 V	4...20 mA	10 kV
	...	...		
	1500 V	0...1500 V	4...20 mA	
P45121	500 V	0...500 V	4...20 mA	20 kV
	...	...		
	3000 V	0...3000 V	4...20 mA	

3 Output

Output current in nominal measuring range	
P45*0*K2***:	$I_{out} = \pm 50 \text{ mA}$
P45*1*K2***:	$I_{out} = 10...50 \text{ mA}$
P45*2*K2***:	$I_{out} = 4...20 \text{ mA}$

4 Isolation

Galvanic isolation	Input to output/auxiliary power 2-port isolation
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5 Auxiliary Power

Power supply unit	
Nominal voltage range	±15 V DC, ± 10% ... ±24 V DC, ± 10%

6 Device Error Detection and Signaling

Output current (in the event of a fault)	
P45*0*K2***:	No error signal
P45*1*K2***:	$I_{out, failure} < 9 \text{ mA}$
P45*2*K2***:	$I_{out, failure} < 3.6 \text{ mA}$

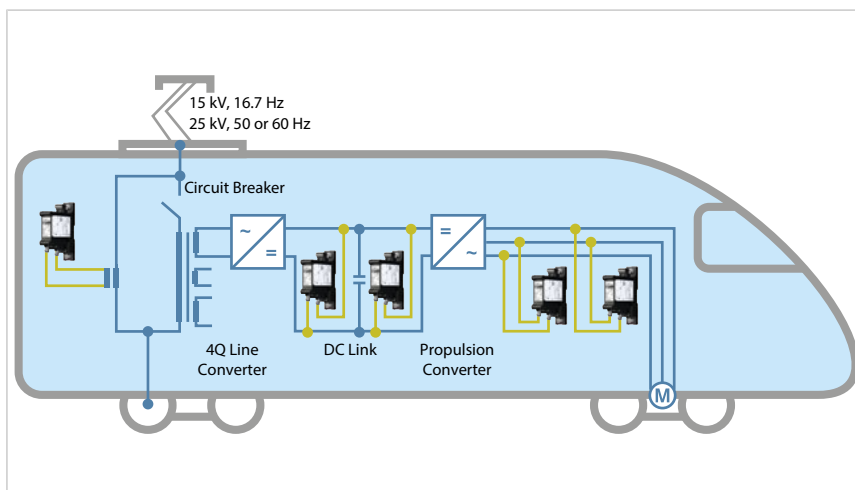
7 Transmission Behavior

Gain error	$\leq 0.2 \%$ of the measured value at 23 °C (73.4 °F)
Gain error (option)	$\leq 0.1 \%$ of the measured value at 23 °C (73.4 °F)
Offset error	$< 100 \mu\text{A}$ at 23 °C (73.4 °F)
Temperature coefficient	$< 100 \text{ ppm/K}$ of full scale value
Total error in the entire temperature range	$< 1 \%$ of full scale value
Cutoff frequency (-3 dB)	$\geq 10 \text{ kHz}$
Settling time $T_{90\text{resp}}$	$< 70 \mu\text{s}$

8 Further Data

EMC	
Railway applications	EN 50121-1, EN 50121-3-2, EN 50121-5
Industrial applications	EN 61326-1, EN 61326-3-1
Emitted interference	Class B (up to 110 V DC/up to 230 V AC)
Immunity to interference	Industrial applications
Mechanical stress	Category 1, class B
Vibration and shock	Tested by an independent accredited test laboratory
in accordance with EN 61373, IEC 61373	
Fire protection in accordance with EN 45545-1, EN 45545-2, EN 45545-5	For outdoor applications (combustible weight $< 400 \text{ g}$) up to HL3
	For interior applications: Mount only in closed control cabinets with sufficient fire protection
	Certified by independent test laboratory

Application Example



104492 TB-257.500-KNEN02 2025-04-16

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Subject to change.