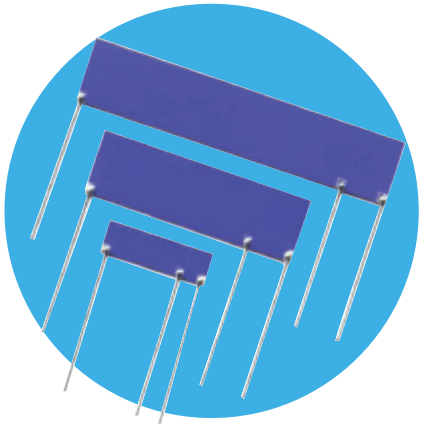
Resistors

Precision High Voltage Divider Resistors

PHVD Series

OBSOLETE

- Voltage ratings 10 to 40kV
- Non-inductive, non-magnetic design
- Ratio tolerance down to 0.1%
- TCR and tracking down to 25ppm/°C
- VCR down to -0.05ppm/V
- Custom design service available
- RoHS compliant



All parts are Pb-free and comply with EU Directive 2011/65/EU (RoHS2)

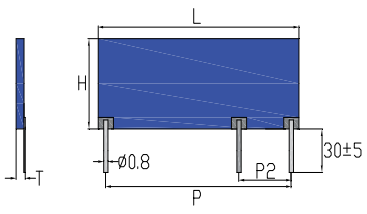
Electrical Data

		PHVD10	PHVD15	PHVD20	PHVD30	PHVD40
Power rating at 25°C	watts	0.75	1.5	2.5	3.5	4.5
Limiting element voltage in air	kV	10	15	20	30	40
Limiting element voltage in oil*	kV	20	30	40	60	80
Resistance value	ohms	1K – 7G	1K – 10G	1K – 20G	1K – 30G	1K – 40G
Resistance tolerance	%	2.5 x Ratio Tolerance				
Ratio tolerance	%	0.1%, 0.25%, 0.5%, 1%				
TCR (25°C to 75°C)	ppm/°C	2.5 x Tracking TCR				
Tracking TCR (25°C to 75°C)	ppm/°C	25, 50				
Standard values		E24 preferred				
Ambient temperature range	°C	-55 to +175				
Insulation resistance at 500V	ohms	>10G				
Dielectric strength of insulation	volts	>1000				

Physical Data

Dimensions in mm, weight in g

Type	L (±0.5)	H (±0.5)	T (Max)	P (±0.5)	P2 (±0.5)	Lead Length	Lead Dia.	Wt. nom
PHVD10	25.4	7.62	2.5	22.86	5.08	30 ±5	0.8 ±0.05	1.12
PHVD15	38.1	12.7	2.5	35.56	7.62			2.03
PHVD20	50.8	15.24	2.5	48.26	10.16			2.92
PHVD30	76.2	15.24	2.5	73.66	10.16			4.98
PHVD40	101.6	15.24	2.5	99.06	10.16			6.52



Construction

Termination conductors and ruthenium oxide resistive material are printed in a non-inductive pattern onto the surface of a 96% alumina substrate. A screen-printed protection is then applied and terminal wires are then attached.

Terminations

The termination wires are tin coated copper.

Marking

Type reference, resistance value and tolerance are legend marked. The resistance value code conforms to IEC 62.

Solvent Resistance

The body protection and marking are resistant to all normal industrial cleaning solvents suitable for printed circuits.

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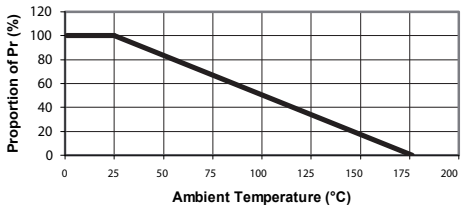
Performance Data

		Maximum	Typical
Load at rated power: 1000 hours at 25°C	ΔR%	0.25	0.1
Overload: 1.5 x rated power not exceeding LEV for 5 seconds	ΔR%	0.25	0.1
Moisture resistance: MIL Std. 202, method 106	ΔR%	0.25	0.1
Thermal shock: MIL Std. 202, method 107, condition C	ΔR%	0.2	0.1

Type	Typical VCR (ppm/V)	
PHVD10	<500M: -0.35	500 M to 7G0: -0.9
PHVD15	<1G0: -0.2	1G0 to 10G: -0.4
PHVD20	<1G0: -0.1	1G0 to 20G: -0.3
PHVD30	<1.5G: -0.07	1.5G to 30G: -0.2
PHVD40	<2G0: -0.05	2G0 to 40G: -0.15

Derating Curve



Application Notes

Due to the high voltage, which can appear between the terminations and any adjacent metal part, resistors should be mounted at an adequate distance from other conductors.
For some ultra-high voltage applications it is required to immerse the components in oil or SF_6 gas or pot them in void-free silicone compound to reduce corona or surface tracking. The printed protection is suitable for these applications.
The divider consists of high value R_1 and low value R_2. The voltage division ratio of the divider is given by Ratio = $R_2 / (R_1 + R_2)$.

Ordering Procedure

Example: PHVD15 for a voltage ratio of 1:1000, with R_1 = 99.9 megohms and R_2 = 100 kilohms (total $R_1 + R_2$ = 100 megohms) at 25ppm/°C tracking TCR and 0.5% ratio tolerance

PHVD 15 D – 100M/100K D

Type

Size

TCR Tracking

C	50ppm/°C
D	25ppm/°C

Total Value R1 + R2 (use IEC62 code)

Low Value R2 (use IEC62 code)

Tolerance Ratio

C	0.25%	F	1%
B	0.1%	D	0.5%

Packing — no code required

	Bulk Pack