High Voltage Ceramic Capacitors

HB/HF Types - Type II

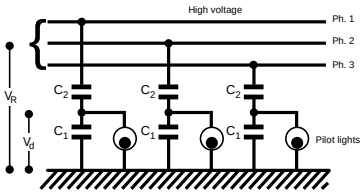
FEATURES

- These rod capacitors are designed for capacitive AC voltage dividers at 50/60 Hz frequency.
- Two versions are available:
  - HF type: unprotected rod with connections
  - HB type: unprotected metallized rod
- HB/HF types are for the high voltage section of the divider (C_2).

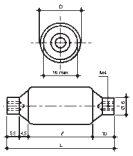
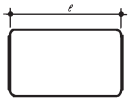
APPLICATIONS

- In HV mains supply (V_R), phase presence is checked by pilot lights. These lamps are supplied with a low voltage (Vd) which is obtained by means of capacitive divider according to the formula:

$$Vd = \left(\frac{C_2}{C_1 + C_2}\right) V_R$$



REFERENCES - VOLTAGE AND CAPACITANCE RANGE

Style	Reference	C_R (pF)	V_R kV_{RMS}	V_E kV_{RMS}	Corona level <5 pico C kV_{RMS}	Dimensions millimeters (inches) D	L	l	Weight g
HF 	HF60001250M.-.-	125	15	60	>14	17 (0.669)	81 (3.189)	61 (2.402)	115
	HF60000101M.-.-	100	15	60	>14	17 (0.669)	81 (3.189)	61 (2.402)	115
	HF60000500M.-.-	50	15	60	>14	17 (0.669)	81 (3.189)	61 (2.402)	115
	HF60000250M.-.-	25	15	60	>14	17 (0.669)	81 (3.189)	61 (2.402)	115
	HF60000160M.-.-	16	15	60	>14	17 (0.669)	81 (3.189)	61 (2.402)	115
	HF40000181M.-.-	180	11	42	>11	17 (0.669)	60 (2.362)	40 (1.575)	80
	HF40000750M.-.-	75	11	42	>11	17 (0.669)	60 (2.362)	40 (1.575)	80
	HF40000360M.-.-	36	11	42	>11	17 (0.669)	60 (2.362)	40 (1.575)	80
	HF40000240M.-.-	24	11	42	>11	17 (0.669)	60 (2.362)	40 (1.575)	80
	HF30000251M.-.-	250	8	30	>8	17 (0.669)	50.5 (1.988)	30.5 (1.201)	65
	HF30000101M.-.-	100	8	30	>8	17 (0.669)	50.5 (1.988)	30.5 (1.201)	65
	HF30000480M.-.-	48	8	30	>8	17 (0.669)	50.5 (1.988)	30.5 (1.201)	65
	HF30000320M.-.-	32	8	30	>8	17 (0.669)	50.5 (1.988)	30.5 (1.201)	65
HB 	HB60001250M.-.-	125	15	60	>14	17 (0.669)	/	61 (2.402)	110
	HB60000101M.-.-	100	15	60	>14	17 (0.669)	/	61 (2.402)	110
	HB60000500M.-.-	50	15	60	>14	17 (0.669)	/	61 (2.402)	110
	HB60000250M.-.-	25	15	60	>14	17 (0.669)	/	61 (2.402)	110
	HB60000160M.-.-	16	15	60	>14	17 (0.669)	/	61 (2.402)	110
	HB40000181M.-.-	180	11	42	>11	17 (0.669)	/	40 (1.575)	70
	HB40000750M.-.-	75	11	42	>11	17 (0.669)	/	40 (1.575)	70
	HB40000360M.-.-	36	11	42	>11	17 (0.669)	/	40 (1.575)	70
	HB40000240M.-.-	24	11	42	>11	17 (0.669)	/	40 (1.575)	70
	HB30000251M.-.-	250	8	30	>8	17 (0.669)	/	30.5 (1.201)	55
	HB30000101M.-.-	100	8	30	>8	17 (0.669)	/	30.5 (1.201)	55
	HB30000480M.-.-	48	8	30	>8	17 (0.669)	/	30.5 (1.201)	55
	HB30000320M.-.-	32	8	30	>8	17 (0.669)	/	30.5 (1.201)	55

Important:

Handling of uncoated types must be done under strict cleanliness conditions.

Special types

Other models with different dimensions and capacitance can also be supplied upon request.

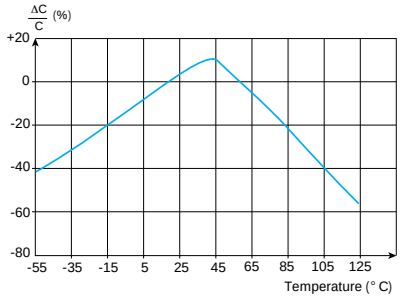
ELECTRICAL CHARACTERISTICS

• Capacitance range (at V_{Rrms})	16 to 250pF
• Capacitance tolerance	±20% (±10%: consult us)
• Rated voltage (V_R)	8 kV_{rms} to 15 kV_{rms}
• Test voltage (V_E) -measurement made in a dielectric fluid (ref. F113) during 1 min	30 kV_{rms} to 60 kV_{rms}
• Dissipation factor (at V_{rms})	tg δ 150.10^{-4}
• Ionization or corona voltage	Ui 8 kV_{rms} to 14 kV_{rms}
• Shock wave behavior (HB/HF types)	140 kVc (1.2/50 µs wave)
• Main parameters change vs temperature, voltage	See typical curves

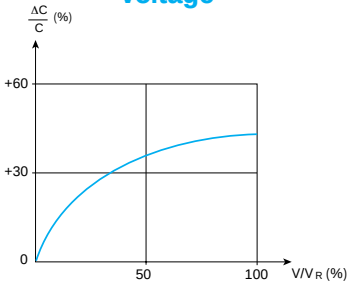
Note: For other electrical characteristics, please consult us.

TYPICAL CURVES

Capacitance change vs temperature



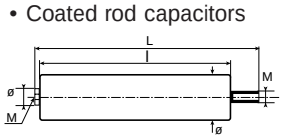
Capacitance change vs voltage



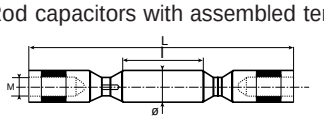
SPECIAL TYPES

According to specific customer requirements, TPC has developed special types to mold like:

- Coated rod capacitors



- Rod capacitors with assembled terminals



Dimensions, electrical characteristics can be adapted upon request.

High Voltage Ceramic Capacitors

How To Order

ORDERING CODE

HP40	E	3	0102	M	— —
Type/Size	Class	Voltage	Capacitance (EIA code)	Tolerance	Suffix

Type/Size

High Voltage Radial-leaded Discs

09
12
HZ 16
20
22

Coated Discs

HT 30
HD 40
HR 60

30
HP 40
50
60

Uncoated Discs

HU 30
HE 40
HS 60

Rods

HB 30
HF 40
60

Class

Type I

A = P 100
C = NP0
H = N33
T = N470
U = N750
V = N1500

Type II

E = N4700
N = N10000
W = +22 -56%
X = +22 -82%

Class not specified

HD
HE
HR
HS
HB
HF

Voltage

1000 V: L
1600 V: M
2000 V: N
2500 V: P
3000 V: Q
4000 V: R
5000 V: S
6000/6300 V: T
8000/9000 V: U
10,000 V: V
12,500 V: W
15/16 kV: X
20/25 kV: Y
30 kV: 3
40 kV: 4
50 kV: 5

For the following types whose class or voltage is not specified but inferred by the type, the size and the value: write 0 (zero) in the 5th (class) or 6th digit case (voltage).

Voltage not specified

HT
HU
HB
HF

Capacitance (EIA code)

Capacitance expressed by 2 significant figures

1st digit: 0 (zero)

2nd and 3rd digits: the 2 significant figures of the capacitance value.

4th digit:

- for values ≥ 10pF and ≤ 990µF: the number of ZEROS to be added to the capacitance values
- for values ≥ 1pF and ≤ 9.9pF: the figure 9 signifying that the capacitance value is to be multiplied by 0.1

Examples: 1000pF: 0102
8.2pF: 0829

Capacitance expressed by 3 significant figures

1st, 2nd and 3rd digits: the 3 significant figures of the capacitance value.

4th digit:

- for values > 100pF and ≤ 999 µF: the number of ZEROS to be added to the capacitance value
- for values > 10pF and < 100pF: the figure 9 signifying that the capacitance value is to be multiplied by 0.01.
- for values > 1pF and ≤ 10pF: the figure 8 signifying that the capacitance value is to be multiplied by 0.01.

Examples: 196pF: 1960
47.2pF: 4729
8.28pF: 8288

Tolerance

C < 10pF	Code
± 1pF	F
± 2pF	G

C ≥10pF	Code
±5%	J
±10%	K
±20%	M
-20 +50%	S
-20 +80%	Z

Suffix

--
PY
WH

NOTE: Special drawing number

If customer requirements differ from the standard type, the codification of the product is modified as follows:

5th, 6th digit: –
7th digit: H for high voltage types
8th, 9th, 10th digit: drawing number
11th digit: –
12th, 13th digit: two digits number for revised edition number

High Voltage Ceramic Capacitors

Marking - Packaging - Identification

MARKING

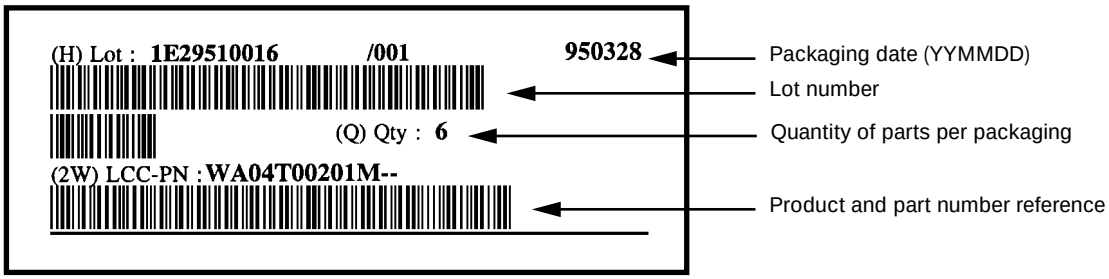
Each part is marked with the following indications:

- Logo
- Reference
- Rated capacitance (EIA code)
- Tolerance on capacitance (EIA code)
- Rated voltage

IDENTIFICATION - TRACEABILITY

On the packaging of all shipped capacitors, you will find a bar code label (code 39). This label gives systematic information on the type of product, part number, lot number, packing date and quantity.

An example is given below:



This information allows traceability of the entire manufacturing process, from critical raw materials to shipment. This is extremely useful for any information request, customer complaint or product return.

CROSS REFERENCES PREVIOUS REFERENCES / NEW REFERENCES

High Voltage	
Previous Reference	**New Reference**
HT030 ... 060	HT30 ... 60
HT030D ... 060D	HU30 ... 60
HTD230 ... 360	HD30 ... 60
HTD230D ... 360D	HE30 ... 60
HTX230 ... 360	HR30 ... 60
HTX230D ... 360D	HS30 ... 60
HTZ130 ... 160	HB30 ... 60
HTZ131 ... 161	HF30 ... 60