High Voltage Ceramic Capacitors

HR/HS Types - Type II

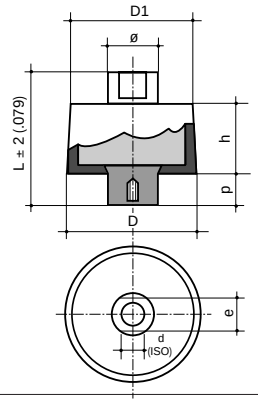
FEATURES

- Disc capacitor, type II
- Two available versions:
  - HR: Molded type with connections
  - HS: Uncoated type without connections (silvered ceramic)

APPLICATIONS

- DC high voltage applications

REFERENCES - VOLTAGE AND CAPACITANCE RANGE

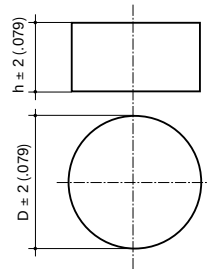
Style	Reference	C_R (pF)	V_R (kVc-)	V_E (kVc-)	Dimensions millimeters (inches) D	D_1	L	h	∅	d	p	e	Torque S (m.daN)	Weight (g)
	HR 30 0X 0471S--	470	16	24	27 (1.063)	25 (0.984)	37 (1.457)	23 (0.906)	8 (0.315)	5 (0.197)	9 (0.354)	7 (0.276)	0.3	32
	HR 30 0Y 0471S--	470	20	30	34 (1.339)	32 (1.260)	40 (1.575)	28 (1.100)	8 (0.315)	5 (0.197)	9 (0.354)	7 (0.276)	0.3	45
	HR 40 0X 0102S--	1000	16	24	39 (1.535)	37 (1.457)	37 (1.457)	23 (0.906)	8 (0.315)	5 (0.197)	9 (0.354)	7 (0.276)	0.3	65
	HR 40 0Y 0102S--	1000	20	30	44 (1.732)	42 (1.654)	40 (1.575)	28 (1.100)	8 (0.315)	5 (0.197)	9 (0.354)	7 (0.276)	0.3	90
	HR 60 0Y 0222S--	2200	20	30	54 (2.126)	52 (2.047)	47 (1.850)	28 (1.100)	12 (0.472)	8 (0.315)	13 (0.512)	10 (0.394)	1	180
	HR 60 0X 0502S--	5000	16	24	55 (2.165)	54 (2.126)	40 (1.575)	21 (0.827)	12 (0.472)	8 (0.315)	13 (0.512)	10 (0.394)	1	180

Important: HR type

In order to improve capacitor mounting, connections ends are designed with two flats. Thus, tightening torque is only applied on the screw (consult chart above for torque "S" value).

Hardware supplied for capacitor mounting

2 x screws TCB M5 L8 or TCB M8 L12 according to Ø
2 x washers

Style	Reference	C_R (pF)	V_R (kVc-)	V_E (kVc-)	Dimensions millimeters (inches) D	D_1	L	h
	HS 30 0X 0471S--	470	16	24	17 (0.669)	—	—	13 (0.512)
	HS 30 0Y 0471S--	470	20	30	19 (0.748)	—	—	17 (0.669)
	HS 40 0X 0102S--	1000	16	24	26 (1.024)	—	—	14 (0.551)
	HS 40 0Y 0102S--	1000	20	30	29 (1.142)	—	—	16 (0.630)
	HS 60 0Y 0222S--	2200	20	30	37 (1.457)	—	—	14 (0.551)
	HS 60 0X 0502S--	5000	16	24	42 (1.654)	—	—	8 (0.315)

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

SPECIAL TYPES

Upon request:

- Metallized uncoated ceramic disc with connections
- Stacks with coated or uncoated units from standard ceramic disc

MARKING

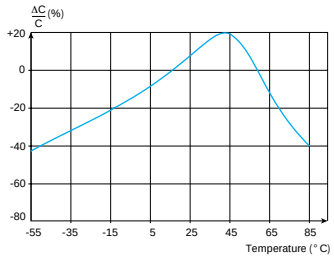
- Reference (HTX)
- Capacitance
- Rated voltage

ELECTRICAL CHARACTERISTICS

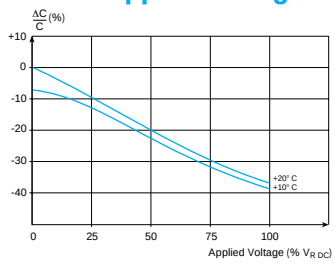
• Operating temperature range	-55 +85°C (+125°C: consult us)
• Rated voltage (V_{rms}/50 Hz)	16 kV or 20 kV
• Test voltage (V_{rms}/50 Hz)	24 kV or 30 kV
• Capacitance range (F = 1 kHz /T = 25°C / U_m = 1 V_{rms})	470 to 5000pF
• Capacitance tolerance on rated capacitance	-20 +50% (S)
• Dissipation factor	tg δ ≤ 200.10^{-4}
• Insulation resistance (Um = 1000 V / 1 mn)	Ri ≥ 10 G Ω
• Self-inductance	L ≤ 0.03 µH
• Main parameters change vs applied voltage, temperature	See typical curves

TYPICAL CURVES

Capacitance change vs temperature



Capacitance change vs applied voltage



TPC

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%

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).

Class not specified

HD
HE
HR
HS
HB
HF

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

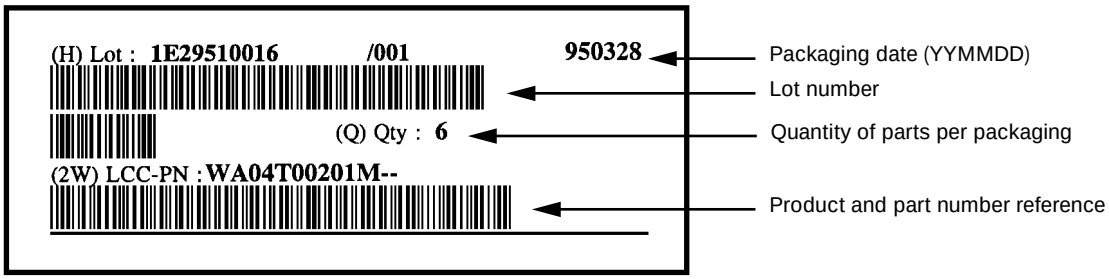
Each part is marked with the following indications:

- 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