NWC6 series dry low-voltage shunt capacitor

1.Scope of application

NWC6 series dry low-voltage shunt capacitor is suitable for power frequency AC power system with nominal voltage of 1000V and below to raise power factor, reduce line loss and improve voltage quality. It is filled with dry flame-retardant materials internally.

Operative norm: IEC/EN 60831-1:2014 IEC/EN 60831-2:2014.

2. Model and its meaning

N WC 6-□-□-□

- Phase number: 3-Three-phase 1-Single-phase
- Rated capacity (kvar)
- Rated voltage (kV)
- Design No.
- Self-healing low -voltage shunt capacitor
- Enterprise code

Note: The default rated frequency is 50Hz. For products with the rated frequency of 60Hz, mark 60Hz.

3. Normal working conditions and installation conditions

3.1 Ambient air temperature: -25℃ ~ +50℃-25/C) ; (can customized -25/D)

3.2 Relative humidity: ≤50% at 40℃; ≤90% at 20℃ ;

3.3 Altitude: ≤2000m;

3.4 Environmental conditions: No harmful gases and vapor, conductive or explosive dust and severe mechanical vibration.

4. Main technical parameters and technical performance

4.1 Rated voltage: 0.23 kV, 0.25 kV, 0.4kV, 0.45kV, 0.48 kV, 0.525kV;
4.2 Rated frequency: 50Hz or 60Hz;
4.3 Rated capacity: (5～40)kvar;
4.4 Capacitance deviation: -5%～+10% ; the ratio of maximum and minimum measured of the capacitance between any two outlet terminals of the three-phase capacitor should not exceed 1.08;
4.5 Tangent of the loss angle tgδ: Lower than 0.0012 under rated power frequency voltage;
4.6 Withstand voltage: interelectrode, power frequency 2.15U_N, 10s; pole-to-case, power frequency 3.6kV, 60s;
4.7 Maximum permissible overvoltage: 1.1 U_N; no more than 8h every 24h;
4.8 Maximum permissible current: 1.3I_N; (1.6 In, 2h/24h; 2.0 In, 30min/24h)
4.9 Self-discharge characteristic: After the capacitor is applied with $\sqrt{2}$ U_N DC voltage and the power is disconnected for 3min, the remaining voltage drops 75V or below;
4.10 Inrush current: 200 In
4.11 Withstand voltage: interelectrode, power frequency 2.15UN, 10s
4.12 Withstand voltage: pole-to-case, power frequency 3.6kV, 60s
4.13 Losses : ≤0.20W/kvar
4.14 Use safety:Dry-type,over-pressure protection device,self-healing
4.15 Fixing: Bottom threaded bolt M12 and M16
4.16 Expected life:≥200,000 h

Main product models and data sheet

Serial number	Type and Specification	Rated voltage (kV)	Rated frequency (Hz)	Rated capacity (kVar)	Rated capacitor (μF)	Rated current (A)	Dimensions D×H(mm)	Mounting dimensions	Figure number
1	NWC6-0.23-1-3 (60Hz)	0.23	60	1	50	2.5	Φ60×190	M10×10	Figure 1
2	NWC6-0.23-3-3 (60Hz)	0.23	60	3	151	7.5	Φ60×240		
3	NWC6-0.23-5-3 (60Hz)	0.23	60	5	251	12.6	Φ76×240	M12×16	Figure 2
4	NWC6-0.23-7.5-3 (60Hz)	0.23	60	7.5	376	18.8	Φ76×290		
5	NWC6-0.23-10-3 (60Hz)	0.23	60	10	502	25.1	Φ86×290		
6	NWC6-0.23-15-3 (60Hz)	0.23	60	15	753	37.7	Φ96×290	M16×25	
7	NWC6-0.23-20-3 (60Hz)	0.23	60	20	1003	50.2	Φ116×290		Figure 3
8	NWC6-0.4-3-3	0.4	50	3	59.7	4.3	Φ60×175	M10×10	Figure 1
9	NWC6-0.4-5-3	0.4	50	5	99	7.2	Φ60×175		
10	NWC6-0.4-7.5-3	0.4	50	7.5	149	10.8	Φ60×240		
11	NWC6-0.4-10-3	0.4	50	10	199	14.4	ϕ76×240	M12×16	Figure 2
12	NWC6-0.4-15-3	0.4	50	15	298	21.7	Φ76×290		
13	NWC6-0.4-16-3	0.4	50	16	318	23.1	Φ76×290		
14	NWC6-0.4-20-3	0.4	50	20	398	28.9	Φ86×290		
15	NWC6-0.4-25-3	0.4	50	25	497	36.1	Φ96×290	M16×25	
16	NWC6-0.4-30-3	0.4	50	30	597	43.3	ϕ106×290		Figure 3
17	NWC6-0.4-40-3	0.4	50	40	796	57.7	ϕ116×290		
18	NWC6-0.45-3-3	0.45	50	3	47.2	3.8	Φ60×175	M10×10	Figure 1
19	NWC6-0.45-5-3	0.45	50	5	79	6.4	Φ60×175		
20	NWC6-0.45-7.5-3	0.45	50	7.5	118	9.6	Φ60×240		
21	NWC6-0.45-10-3	0.45	50	10	157	12.8	ϕ76×240	M12×16	Figure 2
22	NWC6-0.45-15-3	0.45	50	15	236	19.2	Φ76×290		
23	NWC6-0.45-16-3	0.45	50	16	252	20.5	Φ76×290		
24	NWC6-0.45-20-3	0.45	50	20	314	25.7	Φ86×290		
25	NWC6-0.45-25-3	0.45	50	25	393	32.1	Φ96×290	M16×25	
26	NWC6-0.45-30-3	0.45	50	30	472	38.5	ϕ106×290		Figure 3
27	NWC6-0.45-40-3	0.45	50	40	629	51.3	ϕ116×290		
28	NWC6-0.48-3-3	0.48	50	3	41.5	3.6	Φ60×175	M10×10	Figure 1
29	NWC6-0.48-5-3	0.48	50	5	69	6.0	Φ60×175		
30	NWC6-0.48-7.5-3	0.48	50	7.5	104	9.0	Φ60×240		
31	NWC6-0.48-10-3	0.48	50	10	138	12.0	ϕ76×240	M12×16	Figure 2
32	NWC6-0.48-15-3	0.48	50	15	207	18.0	Φ76×290		
33	NWC6-0.48-16-3	0.48	50	16	221	19.2	Φ76×290		
34	NWC6-0.48-20-3	0.48	50	20	277	24.0	Φ86×290		
35	NWC6-0.48-25-3	0.48	50	25	346	30.0	Φ96×290	M16×25	
36	NWC6-0.48-30-3	0.48	50	30	415	36.1	ϕ106×290		Figure 3
37	NWC6-0.48-40-3	0.48	50	40	553	48.1	ϕ116×290		

Serial number	Type and Specification	Rated voltage (kV)	Rated frequency (Hz)	Rated capacity (kVar)	Rated capacitor (μF)	Rated current (A)	Dimensions D×H(mm)	Mounting dimensions	figure number
38	NWC6-0.525-3-3	0.525	50	3	34.7	3.3	Φ60×240	M10×10	Figure 1
39	NWC6-0.525-5-3	0.525	50	5	58	5.5	Φ60×240		
40	NWC6-0.525-7.5-3	0.525	50	7.5	86.7	8.2	Φ60×240		
41	NWC6-0.525-10-3	0.525	50	10	115	11.0	ϕ76×240	M12×16	Figure 2
42	NWC6-0.525-15-3	0.525	50	15	173	16.5	Φ76×290		
43	NWC6-0.525-16-3	0.525	50	16	185	17.6	Φ76×290		
44	NWC6-0.525-20-3	0.525	50	20	231	22.0	Φ86×290		
45	NWC6-0.525-25-3	0.525	50	25	289	27.5	Φ96×290	M16×25	
46	NWC6-0.525-30-3	0.525	50	30	346	33.0	ϕ106×290		Figure 3
47	NWC6-0.525-40-3	0.525	50	40	346	33.0	ϕ116×290		
48	NWC6-0.45-5-3YN	0.45	50	5	79	6.4	ϕ76×240	M12×16	Figure 4
49	NWC6-0.45-7.5-3YN	0.45	50	7.5	118	9.6	ϕ76×240		
50	NWC6-0.45-10-3YN	0.45	50	10	157	12.8	ϕ76×290		
51	NWC6-0.45-15-3YN	0.45	50	15	236	19.2	ϕ86×290		
52	NWC6-0.45-16-3YN	0.45	50	16	252	20.5	ϕ96×290	M16×25	
53	NWC6-0.45-20-3YN	0.45	50	20	314	25.7	ϕ96×290		
54	NWC6-0.45-25-3YN	0.45	50	25	393	32.1	ϕ106×290		
55	NWC6-0.45-30-3YN	0.45	50	30	472	38.5	ϕ116×290		

Note: All sizes are customizable with rated frequency 50Hz or 60Hz, single-phase or three-phase capacitor; the products of the same capacity have the same overall dimensions.

5. Main technical parameters and technical performance

5.1 Main features

5.1.1 Use safety: This product is a dry product; it is filled with dry flame-retardant materials internally, such as: thermal conductivity silica gel. Cylindrical aluminum tensile shell is provided with the over-pressure protection device; it is characterized by oil-free, environmentally friendly, corrosion-resistant, anti-explosion etc. and it is safe and reliable.

5.1.2 Applicable environment: Suitable for places of higher fire rating.

5.1.3 Easy installation: The bottom is the M12/M16 stud fixedly installed; the product can be both mounted vertically and horizontally.

5.1.4 Using NWC6 dry capacitor can realize reactive power compensation cabinet modular design, reduce unit cost and make maintenance more convenient.

5.2 Notice for use

5.2.1 Capacitor selection:

Grid system voltage	Capacitor rated voltage	User grid frequency
127/220	0.23/0.25	Use 0.25kV-50 Hz or order 60Hz products
220/380	0.4/0.45/0.525	Use 0.45kV-50 Hz or order 60Hz products

5.2.2 Overvoltage and overheating will shorten the life of the capacitor. In tropical or high-altitude regions, recommend the users to choose products of higher rated voltage according to the voltage of power network system.

5.2.3 When the system is installed with the shunt capacitor, attention should be paid to the following circumstances:

a. Under the circumstance of severe harmonic content, do not directly install the shunt capacitor and connect the 7%/14% reactor in series for use. Under the circumstance of modest harmonic content, enhance the voltage level of the capacitor for derating, such as: 0.525kV. (Common harmonic sources are frequency converter, DC rectifier, inverter, electrolytic plating equipment, medium frequency furnace, electric arc furnace etc.).

b. When the motor is fixedly connected with the shunt capacitor, operating current of the

c. When the transformer is in empty load, the capacitor should be guaranteed to exit from the operation to prevent excessive compensation.

5.2.4 To ensure proper use of the capacitor, there should be short circuit, over-voltage, over-current protection and limiting inrush device in the capacitor circuit (such as series reactor or CJ19 special switch contacts).

5.2.5 The capacitor is disconnected from the power supply and must be short-circuited discharged, and then can be touched or tested.

5.2.6 The capacitor terminals and conductors should be well connected. Current-carrying capacity of the connecting wire is 1.43 times higher than the rated current of the capacitor.

Product rated voltage	Capacity range	Wire cross -sectional area
0.23、0.25	≤5	4.0
0.23、0.25	6~12	6.0
0.23、0.25	14~20	10.0
0.4、0.45	≤10	4.0
0.4、0.45	12~20	6.0
0.4、0.45	24~30	10.0

5.2.7 A distance of 20mm or more between the top of the capacitor and other components should be kept to ensure reliable operation of over-pressure protection device. The installation space between capacitors should be considered for the cooling condition of the equipment.

5.2.8 When the capacitor malfunctions or the service life is terminated, over-pressure protection device inside the product will be broken, the upper cover slightly bulges and the capacitor failure occurs. Users are asked to periodically detect the operating current and surface temperature of the capacitor and timely maintain it.

6. Physical and installation dimensions:

Figure 1

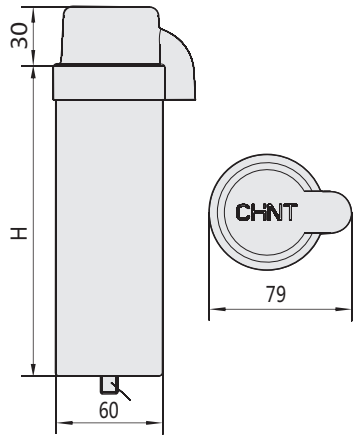


Figure 2

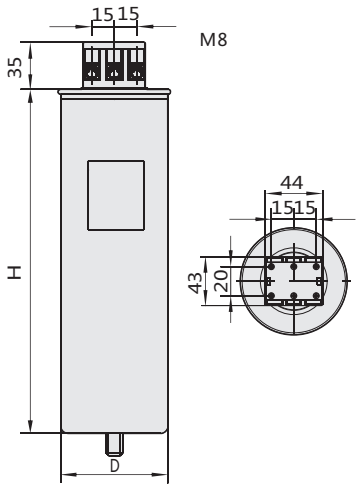


Figure 3

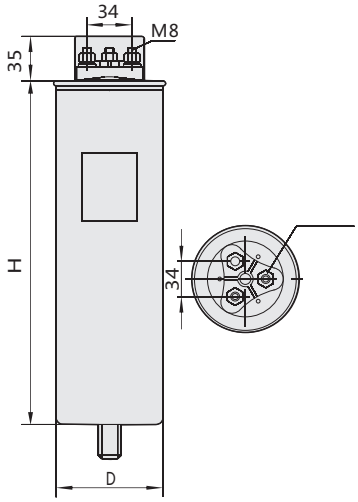
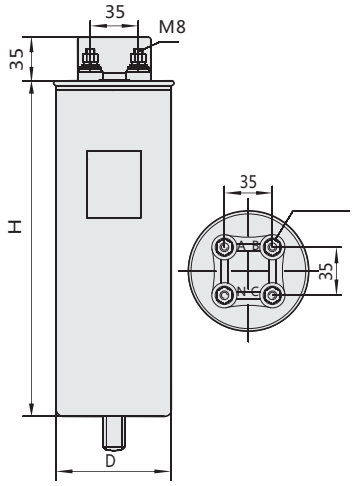


Figure 4



Note: The capacity of three-phase capacitor (1~8)kvar is seen in Fig.1; (10~25)kvar in Fig.2; (30~40)kvar in Fig.3;The split phase compensation capacitor has 4 connecting terminals with star connection and neutral line N lead-out, as shown in Fig.4.

7. Ordering information

7.1 Users must provide product rated voltage, rated capacity, frequency, phase number and other parameters.

7.2 Users must provide some of the features of the places of use as far as possible, such as environmental conditions, power network quality.

Such as: NWC6 0.4-30-3 10 sets

Ordering 10 NWC6 series three-phase capacitors with the rated voltage of 400V and rated capacity of 30kavr.