Grid Solutions
a GE and Alstom joint venture

INSTRUMENT TRANSFORMERS PRODUCT SOLUTIONS

CCV / CC

Capacitor voltage transformers - coupling capacitors 72.5 to 1,200 kV

The CCV-type capacitor voltage transformer enables the accurate measurement of high voltages and the transmission of carrier currents ranging from 30 to 500 kHz.

Thousands of installed units attest to their reliability

CCV acts simultaneously as a potential transformer and as a coupling capacitor. The CCV-type capacitor voltage transformer is designed to support line traps.

CC-type coupling capacitors are used together with inductive potential transformers.

- Line protection
- HF transmission
- Compliance with ANSI / IEEE, IEC or equivalent standards
- Reduce the slope of the Rate of Rise of Recovery Voltage (RRRV)
- Performance :
  - 72.5 to 1,200 kV
  - Cn from 20,000 to 2,500 pF
  - Thermal capacity up to 1000 VA

ACCURATE MEASUREMENT OF HIGH VOLTAGE

Grid Solutions has been manufacturing thousands of high voltage instrument transformers since 1919. This experience has been applied to the design and manufacture of our CCV capacitor voltage transformers.

Our factories - each with its own wellequipped high voltage test laboratory- design and build equipment for numerous worldwide transmission and distribution networks.

Decades of experience have resulted in a lightweight, strong and reliable unit, able to meet the highest standards. These units are manufactured using the most modern insulation impregnation technology and equipment.

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CUSTOMER BENEFITS

- Superior transient response
- High reliability and longevity due to optimised design
- Operation as coupling capacitors for power line carrier transmission
- Built-in safety features
- Hermetically sealed
- Mineral & synthetic oil-filled. PCB free
- Non-corrosive hare

Reliable design for high life expectancy

The high voltage capacitor and intermediate capacitor consist of series-connected capacitor elements. Each element is made of high purity cellulose paper, polypropylene and aluminium sheets forming electrodes. These elements are assembled to form a unit within the porcelain insulator.

Each unit is temperature and vacuum dried, then impregnated with high-grade dried and degassed dielectric oil.
The oil seal is ensured by synthetic rubber gaskets, which are unaffected by oil or ambi-ent pollution. A stainless steel device allows expansion of the oil inside the insulator, maintaining constant pressure over the range of specified temperatures.

The electromagnetic unit, which includes the MV transformer and series inductance, is located in a hermetically sealed, oil-filled tank and is equipped with a protective device thus avoiding overvoltages and ferroresonance.
The low voltage terminal box is mounted on the tank.
Optional accessories such as HF equipment for carrier currents (voltage limiter, grounding switch and drain coil) are also located in the terminal box.

INSULATOR

The capacitive voltage transformer is composed of one or several capacitive units depending on the voltage level.
The bottom insulator is fastened to the tank by means of a metal flange, which is bonded to the porcelain. This type of mounting gives very high mechanical resistance to withstand severe seismic stresses.

The standard design creepage is 25 mm/kV but can be more upon request.The coupling capacitor is composed of one or several capacitive columns on a base without a tank. Ceramic insulator and non-corrosive hardware ensure a weather-proof and environmentally resistant product, ideal for location in polluted or coastal areas.

QUALITY AS COMMITMENT

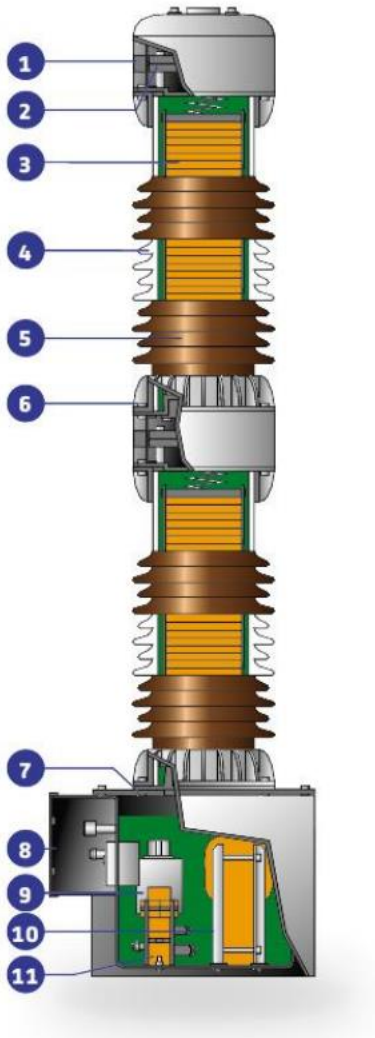
Strength reliability and small size are main advantages of the CCV and CC series.

Capacitor voltage transformers and the coupling capacitors are in accordance with the latest specifications for lightning, switching impulse tests, and internal partial discharges level. Sturdy construction offers good resistance.

EXTERNAL METALLIC PARTS

External metallic parts (tank, base, head, and flanges) do not require maintenance. The CCV tank and the CC base are zinc-coated steel (sprayed), then painted.

This metal protection technique complies with the most exacting standards (surface damages lower than the RE2 degree of rust after 10 years in service). On request, the metal parts can be hot-dip galvanised.



1. Oil level indicator (optional)
2. Expansion device
3. Capacitor units
4. Insulating oil
5. Porcelain insulator
6. Seal
7. Electromagnetic unit
8. Low voltage terminals box / HF terminal
9. Series inductance
10. Medium voltage transformer
11. Damping circuit against ferroresonance effects

The coupling capacitor only includes items 1 to 6. It is mounted on a steel base.
HF terminal is located under the base.

ELECTRICAL CHARACTERISTICS

Highest system voltage	(kV)	IEC	72.5	100	123	145	170	245	300	362	420	525	765
Rated 1 min. 50 Hz. wisthstand voltage	(kV)	IEC	140	185	230	275	325	460	460	510	630	680	880
Rated lightning impulse withstand voltage (1,2/50 ms)	(kV)	IEC	325	450	550	650	750	1,050	1,050	1,175	1,425	1,550	2,100
Rated switching impulse withstand voltage	(kV)	IEC	-	-	-	-	-	-	850	950	1,050	1,175	1,550
Rated switching impulse withstand voltage	(kV)	IEC	60/ √3	90/ √3	110/ √3	132/ √3	150/ √3	220/ √3	275/ √3	330/ √3	400/ √3	500/ √3	735/ √3

CAPACITANCE pF Cn

Insulator model 12	14,000	11,000	8,800	7,200 / 4,400	6,200	4,400	3,600	3,200	2,400	2,000	-
Insulator model 15	20,000	15,000	12,000	10,500 / 8,800	8,800	6,000	5,300	4,400	3,500 / 4,400	3,000	-
Insulator model 20	-	-	20,000	17,000	15,000	10,000 / 8,800	8,500	7,200	6,800	5,000	4,000

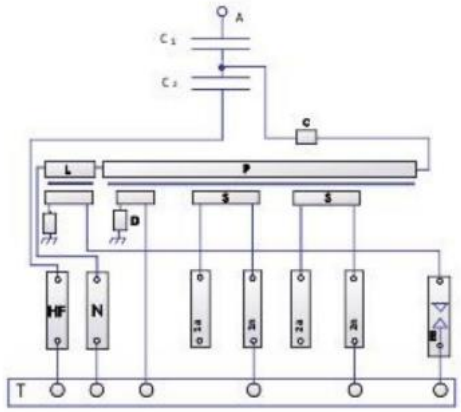
Capacitance are preferred values or current practice. Other rating available on request.

ACCURACY CLASSES AND RATED BURDENS

	on 50 Hz 1.5 U_n basis		60 Hz only	
Tank	IEC 0.2	IEC 0.5	ANSI 0.3	ANSI 0.6
A	125	300	Z	ZZ
B	250	800	ZZ	2 x ZZ
Z	50	150	Y	Z

Only for information.

ELECTRICAL CIRCUIT



C. Carrier blocking device
L. Inductance coil
E. Voltage limiter device
P. Transformer primary winding
S. Transformer secondary winding
D. Damping device
HF. Low voltage terminal of the capacity divider
T. Ground terminal

On request:
GS HF. HF grounding switch
GS MT. MV grounding switch
DC. Draining coil
G. Spare gap
F. Fuse
MCB. Micro circuit breaker

INQUIRY CHECK LIST

1. Applicable standards
2. Rated frequency
3. Highest system voltage
4. Power-frequency withstand test voltage
5. Lightning impulse test voltage
6. Switching impulse test voltage, if applicable
7. Rated capacitance Cn in pF
8. Overvoltage factor (ex. 1.5 Un 30 s)
9. Voltage ratio
10. Number of secondaries
11. Accuracy class and rated burden for each secondary winding
12. Thermal burden rating in VA
13. Environmental conditions (altitude, temperature, site pollution, seismic conditions...)
14. Required leakage path in mm or in mm/kV
15. Options as required:
    - HV terminal (material and dimensions)
    - Carrier accessories (1 voltage limiter, 1 HF disconnecting switch, 1 draining coil)
    - 1 anti-condensation heater. Please specify auxiliary supply voltage: 110, 115 or 220 V
    - Silicon rubber insulator (light gray)

For the CC type, specify items 1 to 8, 13 and 14. If a line trap is to be mounted on the CCV or CC, please specify the weight and overall dimensions.

AVAILABLE VERSIONS

DIMENSIONS CCV (in, lbs)

TYPE	INSULATOR	TANK	A	L1	T. WEIGHT
CCV 72.5	12	Z	1,440	-	225
	15	A	1,480	-	290
	15	B	1,540	-	370
	20	B	-	-	-
CCV 100/123	12	Z	1,840	-	250
	15	A	1,880	-	330
	15	B	1,940	-	400
	20	B	-	-	-
CCV 145	12	Z	1,990	-	265
	15	A	2,030	-	340
	15	B	2,090	-	410
	20	B	2,520	-	580
CCV 170	12	Z	2,190	-	280
	15	A	2,230	-	360
	15	B	2,290	-	430
	20	B	2,520	-	580
CCV 245	12	Z	2,770	-	320
	15	A	2,870	-	410
	15	B	2,930	-	480
	20	B	3,100	-	660
CCV 245	12	Z	3,225	1,440	360
	15	A	3,265	1,440	450
	15	B	3,325	1,440	520
	20	B	-	-	-
CCV 300	12	Z	3,540	1,590	385
	15	A	3,565	1,600	480
	15	B	3,625	1,600	550
	20	B	4,465	2,010	890
CCV 362	12	Z	3,940	1,790	420
	15	A	3,965	1,800	510
	15	B	4,025	1,800	580
	20	B	4,465	2,010	890
CCV 420	12	Z	4,520	2,370	460
	15	A	4,405	2,430	540
	15	B	4,465	2,430	620
	20	B	4,465	2,010	890
CCV 525	12	Z	4,520	2,370	460
	15	A	4,605	2,430	560
	15	B	4,665	2,430	640
	20	B	5,030	2,570	970
CCV 550	12	Z	5,130	2,370	510
	15	A	5,245	2,430	620
	15	B	8,310	2,430	700
	20	B	5,590	2,570	1,060
CCV 800	20	B	6,900	4,435*	1,280
	20	B	7,400	4,935*	1,450

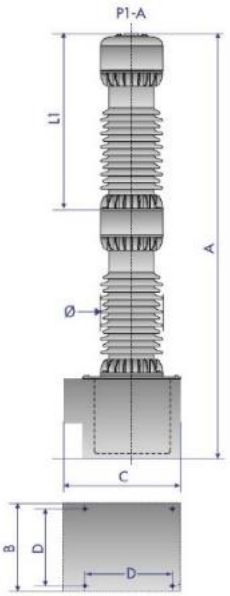
DIMENSIONS CC (mm, kg)

TYPE	A	L1	T. WEIGHT
CC 72.5	1,325	-	120
CC 100/123	1,725	-	150
CC 145	1,875	-	160
CC 170	2,075	-	180
CC 245	2,715	-	230
CC 245	3,110	1,440	260
CC 300	3,410	1,600	280
CC 362	3,810	1,800	320
CC 420	4,250	2,430	380
CC 525	4,450	2,430	400
CC 550	5,095	2,430	440

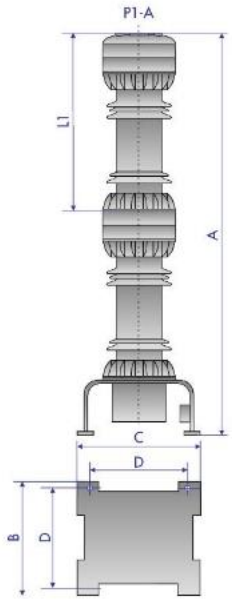
FIXING DIMENSIONS

B	C	D
540	550	500

Indicatives values only - All indicated dimensions must be confirmed with order.



CCV



CC

DIMENSIONS ACCORDING TO MODEL (FOR ALL TYPES)

TANK	B	C	D
A	555	620	450
B	610	675	500
Z	455	565	400
INSULATOR	12	15	20
Ø ext. (max)	350	400	450

* Note : column in 3 units : L1 corresponds to the height of the 2 top units.

For more information please contact
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