Grid Solutions
a GE and Alstom joint venture

INSTRUMENT TRANSFORMERS PRODUCT SOLUTIONS

CCV / CC

Capacitor voltage transformers - coupling capacitors 69 to 765 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 their reliability

The CCV-type capacitor voltage transformer 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.

- For revenue metering and protection in high voltage networks
- HF transmission
- Compliance with ANSI / IEEE, IEC or equivalent standards
- Reduce the slope of the Rate of Rise of Recovery Voltage (RRRV)
- Performance :
  - 69 to 765 kV
  - Cn from 20000 to 2500 pF
  - Thermal capacity up to 1000 VA

ACCURATE MEASUREMENT OF HIGH VOLTAGE

Grid Solutions' experience in the field of instrument transformers accounts for over 85 years of accumulated knowledge and we have thousands of units in place world-wide with proven success. Our factories - each with its own well-equipped high voltage test laboratory - design and build equipment which can be found in network substations around the world.

This experience has been applied to the design and manufacture of our CCV capacitor voltage transformers and result 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 optimized design
- Operation as coupling capacitors for power line carrier transmission
- Built-in safety features
- Hermetically sealed
- Mineral & synthetic oil-filled.
- Non-corrosive hardware

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 aluminum 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 synthetic dielectric oil.
The oil seal is ensured by synthetic rubber gaskets, which are unaffected by oil or ambient 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. As standard, the insulator is manufactured from the highest grade light grey glazed porcelain. Custom design options also include the utilization of light grey silicon rubber which can be quoted on request.

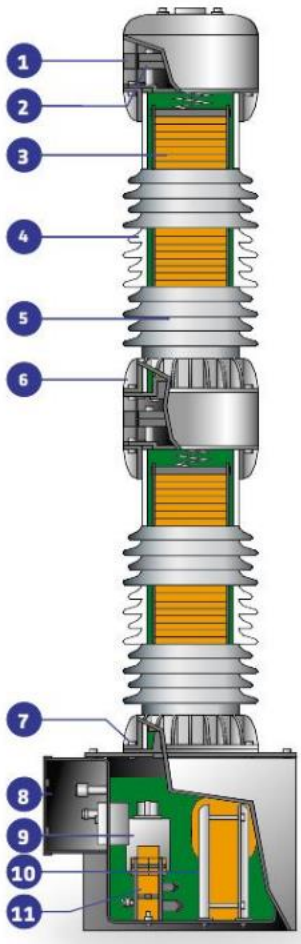
LIFE TIME

Excellent field experience confirms the soundness of our technical concepts, and our clients have expressed their total satisfaction with our products.

Our R&D team is continuously striving to improve the quality, performance and reliability of our product.CCV have been designed for a 30 year lifetime but many well out-live this service life.

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 galvanized.



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)	72.5	121	145	169	242	362	550	800
Nominal system voltage	(kV)	69	115	138	161	230	345	500	765
AC dry test 1 min.	(kV)	165	265	320	370	525	785	900	1200
BIL (1.2 / 50 s)	(kV)	350	550	650	750	1050	1150	1800	2425
Rated switching impulse withstand voltage	(kV)	-	-	-	-	-	975	1300	1675
Rated primary voltage	(kV)	40.25	69	80.5	90	138	207	287.5	431.25
Rated Ratio		350-600/1-1	700-1200/1-1	700-1200/1-1	1200-2000/1-1	1200-2000/1-1	2500-4500/1-1	2500-4500/1-1	3750-6250/1-1

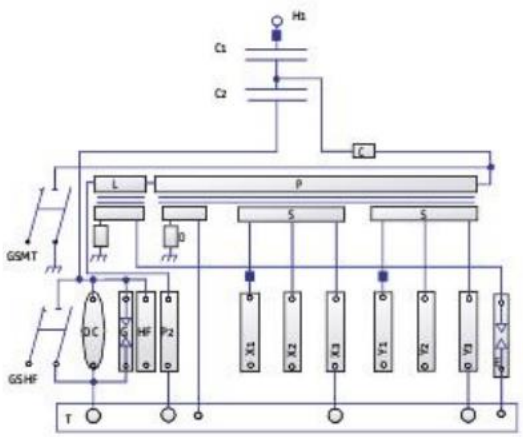
CAPACITANCE Cn : pF

Insulator								
15	14000	8800	7200	6200	4400	3600	2000	-
15	20000	12000	10500	8800	6000	4400	2500	-
20	-	-	-	-	10000	7200	5000	4000

ACCURACY CLASSES AND RATED BURDENS

Insulator - tank	
12Z	0.6 WXYZ OR 1.2 WXYZ, ZZ.
15A	0.3 WXYZ OR 0.6 WXYZ, ZZ.
15B	0.3 WXYZ, ZZ.
20B	0.3 WXYZ, ZZ.

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

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.

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	T. WEIGHT
CCV 69	12	Z	56.30	485
	15	A	58.70	641
	15	B	60.51	897
CCV 115	12	Z	72.05	553
	15	A	74.45	719
	15	B	76.26	974
CCV 138	12	Z	77.95	580
	15	A	80.35	747
	15	B	82.17	1003
CCV 161	12	Z	85.83	613
	15	A	88.23	787
	15	B	90.04	1043
CCV 230	12	Z	109.40	719
	15	A	113.4	906
	15	B	115.2	1162
	20	B	118.00	1398
CCV 362	15	A	157.60	1116
	15	B	159.40	1371
	20	B	173.60	1795
CCV 550	15	A	191.05	1272
	15	B	193.30	1528
	20	B	193.30	1973
CCV 800	20	B	-	-

*Note: Special design on request.
Indicatives values only - All indicated dimensions must be confirmed with order.

DIMENSIONS FOR CCV AND CC (in)

	B	C	D x D
CCV Tank Z	17.9	22.2	15.7 x 15.7
CCV Tank A	21.8	24.4	17.7 x 17.7
CCV Tank B	24	26.6	19.7 x 19.7
CC Base	21.3	21.3	19.7 x 19.7

DIMENSIONS ACCORDING TO INSULATOR TYPE (in)

Insulator	12	15	20
Φ ext max.	13.8	15.7	17.7

DIMENSIONS CC (in, lbs)

TYPE	INSULATOR	L1	T. WEIGHT
CC 69	15	52	304
CC 115	15	67	381
CC 138	15	73	410
CC 161	15	81	450
CC 230	15	106	569
CC 362	15	151	778
CC 550	15	184	935
CC 800	20	280	2200

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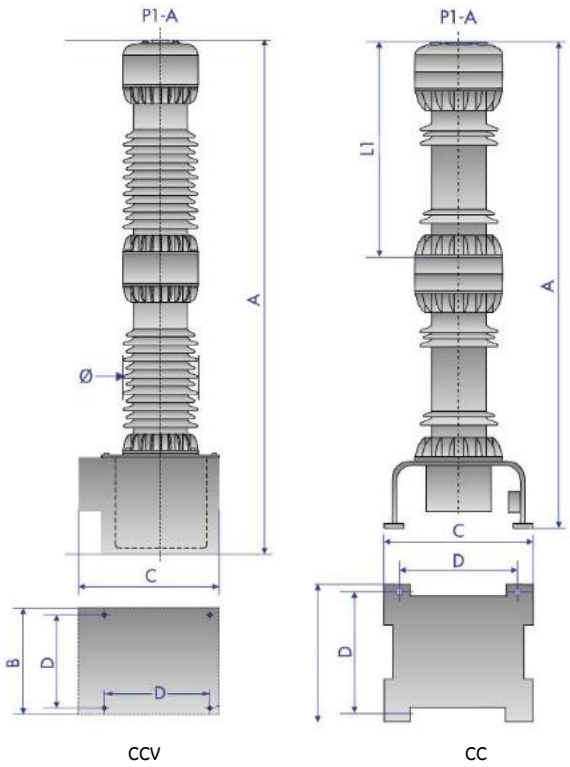

CCV CC

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