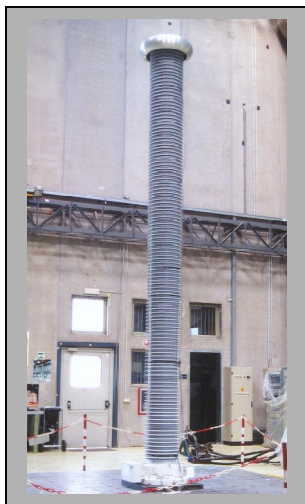


# HVDC Divider

Compensated voltage divider  
for HVDC transmission systems



# RC Divider design



**Type RC 500-V**

**Composite Insulator  
with: SF<sub>6</sub> Gas  
Mineral Oil**



**Type RC 200 N**

**Porcelain Insulator  
with: Mineral Oil**



**Type RC 60-V K**

**Composite Insulator  
with: SF<sub>6</sub> Gas  
Mineral Oil**

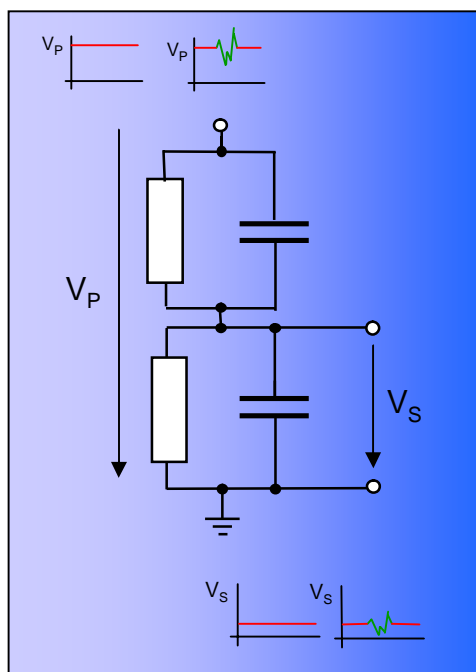


**Type RC 500 GIS**

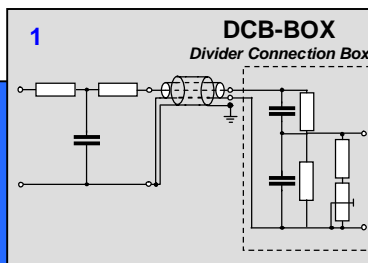
**Steel tank  
with: SF<sub>6</sub> Gas**

For measuring of high DC voltage at HVDC-transmission systems, compensated resistive voltage divider (RC-Divider) are in use. This design ensures a wide bandwidth from DC to several kHz with a fast response to voltage changes. The output voltage signal can then be processed individually. The resistive component is made of high-precision low inductance resistors, connected in series according to the primary rated voltage and the defined measuring current. To protect the RC-Divider against transients and to facilitate ripple measurements of the DC voltage or measuring frequencies up to some kHz, grading capacitors are connected parallel to the resistors. The characteristic of the precision RC Divider is high accuracy, high thermal- and voltage stability, exact linearity, very short response time and newest high technology.

Each RC-Divider will be designed especially to the electrical and mechanical requirements of the DC system.

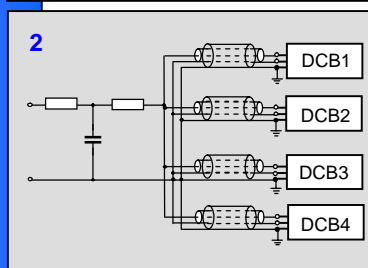


Version 03 2012



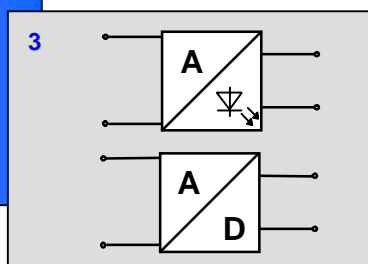
Divides the primary voltage to an intermediate voltage. A double shielded cable transmits the signal to the DCB-Box. The DCB-Box divides the intermediate voltage to the secondary voltage.

- transmitting over long distance
- very fine calibration of the exact ratio
- protected against EM-waves



Divides the primary voltage to an intermediate voltage. The 4 DCB-Boxes divide the intermediate voltage to different secondary voltage outputs.

- same advantages decrypted see above
- multiple independent measuring



Divides the primary voltage direct to the secondary voltage. Into the secondary box takes place a direct conversion to a digital or light signal.

- Individual transforming, transmitting and analysing of the secondary signal
- Insensitivity against guided EMC-waves
- Ratio is independent to external burden



## Technical Data

Rated primary voltage range	$V_N$	$\pm 1 \text{ kV to } \pm 800 \text{ kV}$
Rated current	$I_N$	1 mA or 0.5 mA
Typical accuracy	$n_{DC}$	$\pm 0.4\%$ to $\pm 1\%$ measured $\pm 0.1\%$ calculated by means of the separate measured elements
Temperature coefficient	TC	$\leq 15 \text{ ppm / } ^\circ\text{C}$
Voltage coefficient	VC	$\leq 1 \text{ ppm / } ^\circ\text{C}$
Accuracy depending on temp. range		$\leq 0.02\%$ (-40°C to +50°C)
Long time stability of the divider accuracy		$\leq 0.002\%$ / Year
Step response time	$\tau_S$	$< 33 \mu\text{s}$
Frequency response ( $\pm 3\text{dB}$ )	$\tau_F$	$> 10 \text{ kHz}$
Maximum length of the divider		9000 mm (Porcelain housing) 9900mm (Composite housing)
Shed form according (IEC with max 4.0)		Alternated sheds or regular sheds
Mounting		Indoor / Outdoor
Mechanical strength (depends on equipment height)		Normal application max. horizontal acceleration 0.5g Special application max. horizontal acceleration 1g

### Routine Tests

Measurement of the resistance and capacitance  
DC voltage withstand test, dry  
AC voltage withstand test  
PD measurement with AC voltage  
AC voltage withstand test on the low voltage tap  
Measurement of the DC- and AC-ratio  
Tightness test

### Type Tests

Lightning impulse voltage test  
Switching impulse voltage test  
Polarity reversal test  
DC voltage withstand test, wet  
RIV measurement  
Step- and Frequency response measurement  
Temperature rise test

Since there is no standard existing for RC divider, we define the Routine Tests and Type Tests based on our long experience together with our customers. There can be variations in the extend of the tests.



**Artificial Pollution Test**  
According IEC61245  
Solid layer method with  
SDD of 0.04 mg/cm<sup>2</sup>  
at – 525kV DC



**Seismic Qualification Test**  
According IEC 60068 and  
U-SD1, Rev. 5; 1.0g  
with horizontal acceleration  
of 1g at first own frequency



**Type Test According**  
IEC 60 at High Voltage  
Laboratory  
During withstand voltage test  
at +1200 kV DC

[www.trenchgroup.com](http://www.trenchgroup.com)

Trench France SAS  
16, rue du Général Cassagnou  
B.P. 80070  
F-68302 Saint Louis Cedex, France  
Phone + 33 3 89 70 23 23  
Fax + 33 3 89 67 26 63  
E-Mail [sales@trench-tsf.com](mailto:sales@trench-tsf.com)

Phone +44 191 483 4711  
Fax +44 191 430 0633  
E-Mail [sales@trench-uk.com](mailto:sales@trench-uk.com)

Product Manager RC Divider:  
Christian Weber  
Phone + 33 3 89 70 35 94  
E-Mail [weber@trench-group.com](mailto:weber@trench-group.com)



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