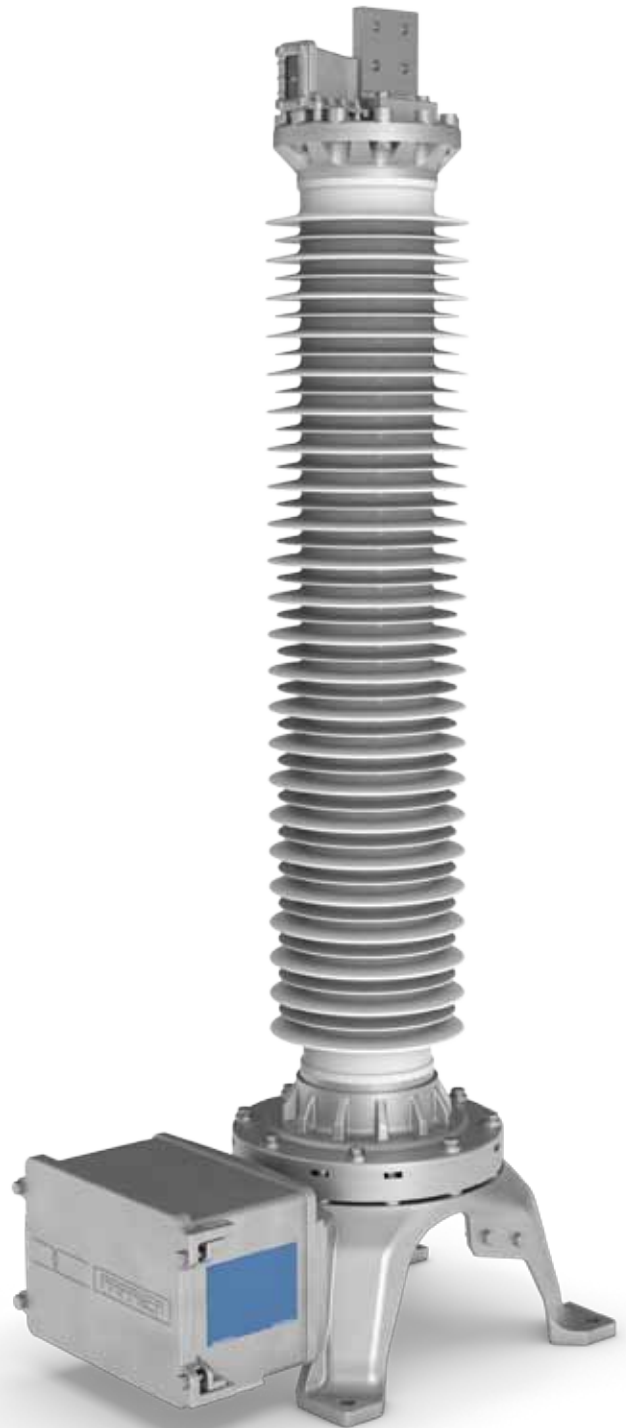




Resistive capacitive voltage divider

Outdoor operation
Oil-paper insulated

ROF (72-550) kV



PFIFFNER

Current and voltage – our passion



General description

Resistive capacitive voltage dividers type ROF (RC divider) are used in high voltage networks within the 72.5–550 kV range. They divide the primary voltage into a standardised, equivalent secondary voltage for meters, measuring and protection devices.

The active part of the RC divider consists of a capacitor divider and a parallel connected resistor divider. The length of the active part extends along the entire insulator length, which results in an excellent linear voltage distribution. Both dividers are matched with each other and reflect the transient voltage signals from the high voltage side precisely on the low voltage side. Due to the internal structure, an RC divider can be used for various frequencies and to measure alternating and direct voltages.

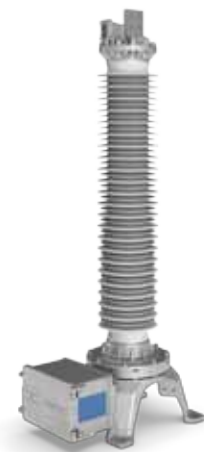
As the active part of the RC divider is hermetically sealed to the outside, an expansion bellows in the head section compensates volume changes in the impregnation oil due to temperature variations. The operating pressure can be visualised by a bellows position indicator.

To avoid field distortions, a shielding electrode is used in the divider head for voltage levels of 420 kV and above.

The secondary elements are located in the generously designed terminal box. In addition to fine adjustment and fast overvoltage protection, the terminal box also includes equivalent burden parameters. The terminal box cover is opened laterally and is fixed to the terminal box.

The transmission of the secondary voltage can be implemented either as analogue signal via a shielded measurement cable or as a digital signal via a fibre-optic cable.

The RC dividers are normally factory calibrated and can be put directly into operation.

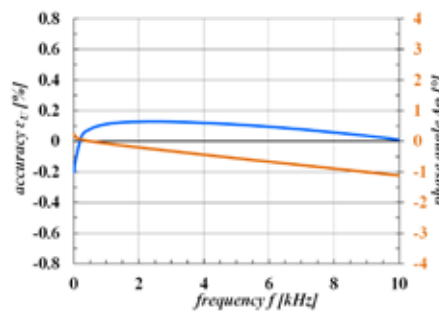
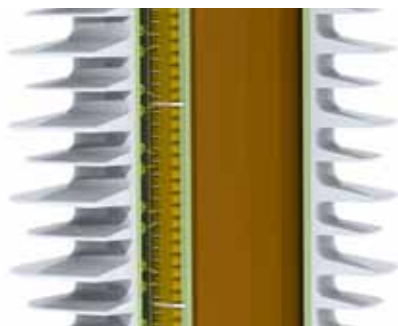


Advantages of capacitive resistive voltage dividers

- Ferroresonance-free and no saturation effects
- Secondary output operates without problems under short-circuit or no-load conditions
- AC accuracy class $\pm 0.1\% @_{f_N}$
- Measurement of harmonics possible up to 1 MHz
- Accuracy with harmonics up to 10 kHz of $\pm 0.2\%$



Highlights



Linear voltage distribution

- The optimised arrangement of the R and C dividers across the entire insulator length results in excellent voltage distribution.
- The RC divider shows a perfect performance under transient voltage loads and high pollution risk.
- The homogeneous field distribution prevents the occurrence of external partial discharges.

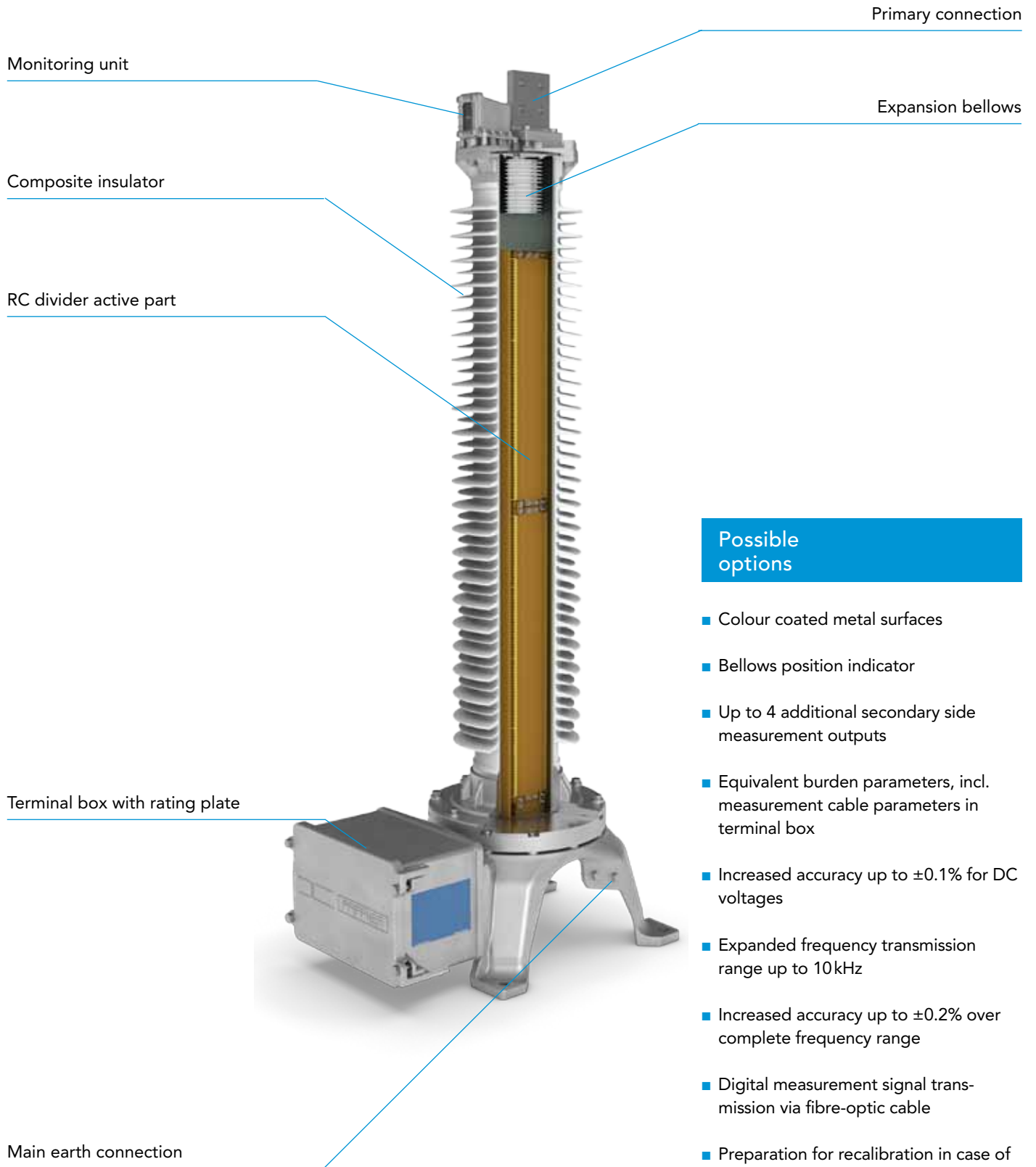
High accuracy at frequencies up to 10 kHz

- The specially developed design of the active part with the resistor and capacitor components enables a very high measurement accuracy and stability up to the 200th harmonic of the rated system frequency.
- At the same time, high accuracy and stability in voltage variation (linearity) is achieved, starting with just a few percent of U_R up to the overvoltage factor.

Simple measurement cable connection

- The terminal box has a base with connection sockets. The specially prepared measurement cable can be connected here easily without opening the terminal box.
- If the number of measurement cables is increased, an additional cable can be plugged into the next terminal. To do this, the prepared burden adaption must be switched off with a switch in the terminal box. The divider is then equalised and ready for operation again.

Design

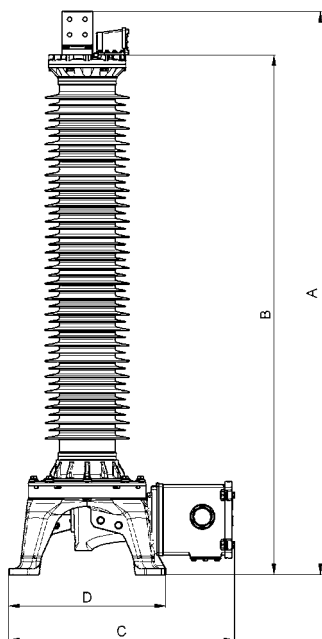
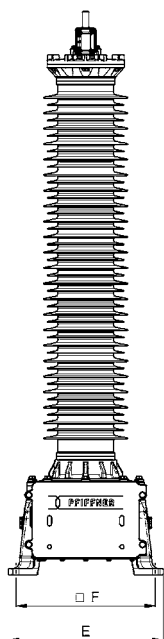


Possible options

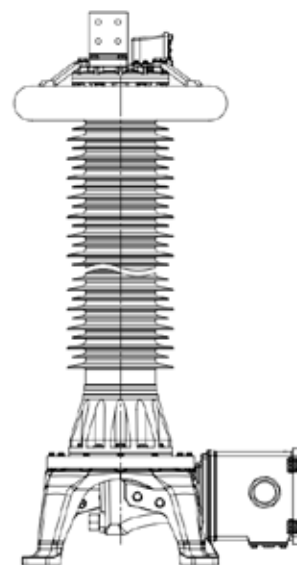
- Colour coated metal surfaces
- Bellows position indicator
- Up to 4 additional secondary side measurement outputs
- Equivalent burden parameters, incl. measurement cable parameters in terminal box
- Increased accuracy up to $\pm 0.1\%$ for DC voltages
- Expanded frequency transmission range up to 10 kHz
- Increased accuracy up to $\pm 0.2\%$ over complete frequency range
- Digital measurement signal transmission via fibre-optic cable
- Preparation for recalibration in case of secondary measurement system changes

Technical data

72–362 kV



420–550 kV



Type ROF		72	123	145	170	245	300	362	420	550
Standard		DIN/IEC/IEEE								
Highest voltage for equipment	kV	72.5	123	145	170	245	300	362	420	550
Rated power-frequency withstand voltage	kV	140	230	275	325	460	460	510	630	680
Rated lightning impulse withstand voltage	kV	325	550	650	750	1050	1050	1175	1425	1550
Frequency	Hz	DC/16.7/50/60								
Accuracy class		0.1; 0.2; 0.5; 1.0; 3.0								
Expanded frequency band	Hz	DC / 15–10000								
Burden		R or R//C								
Burden range		≥ 100 kΩ								
Rated voltage factors	VF	1.5–30 sec / 1.9–30 sec / 1.9–8 h								

Type ROF		72	123	145	170	245	300	362	420	550
Height of unit*	A mm	1326	1626	1826	2026	2626	2869	3511	3911	4669
Height to primary terminal*	B mm	1186	1486	1686	1886	2486	2729	3371	3771	4529
Depth of unit including terminal box	C mm	724	724	724	724	724	724	724	724	724
Depth of unit base	D mm	500	500	500	500	500	500	500	500	500
Width of unit base	E mm	500	500	500	500	500	500	500	500	500
Distance between screw holes at base	F mm	450	450	450	450	450	450	450	450	450
Min. creepage distance*	mm	2420	3540	4280	5030	7260	7900	9390	12280	14590
Approximate weight*	kg	90	100	110	130	150	170	190	210	230

* with standard composite insulator, creepage distance 25 mm/kV

Global presence

PIFFNER Instr. Transformers Ltd
5042 Hirschthal
Switzerland

☎ +41 (0)62 7392828
✉ sales@pmw.ch
💻 www.pfiffner-group.com/pch

PIFFNER Technologie Ltd
5042 Hirschthal
Switzerland

☎ +41 (0)62 7392828
✉ technologie@pmw.ch
💻 www.pfiffner-group.com/pte

PIFFNER Systems Ltd
4303 Kaiseraugst
Switzerland

☎ +41 (0)61 4676111
✉ info@pfiffner-systems.com
💻 www.pfiffner-systems.com

PIFFNER Deutschland GmbH
25524 Itzehoe
Germany

☎ +49 (0)48 21408270
✉ sales@pfiffner-messwandler.de
💻 www.pfiffner-group.com/pde

PIFFNER Transformatör A.S.
06750 Akyurt/Ankara
Turkey

☎ +90 (0)31 28475521
✉ info@pfiffner.com.tr
💻 www.pfiffner-group.com/ptr

PIFFNER do Brasil Ltda
88307-740 Itajaí
Brazil

☎ +55 (0)47 33481700
✉ pfiffner@pfiffner.com.br
💻 www.pfiffner-group.com/pbr

MGC Moser-Glaser Ltd
4303 Kaiseraugst
Switzerland

☎ +41 (0)61 4676111
✉ info@mgc.ch
💻 www.mgc.ch

ALPHA Elektrotechnik Ltd
2560 Nidau
Switzerland

☎ +41 (0)32 3328700
✉ mail@alpha-et.ch
💻 www.alpha-et.ch

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Current and voltage – our passion

HV HIGH VOLTAGE

MV MEDIUM VOLTAGE

LV LOW VOLTAGE