

Data Sheet no. 1.12/3

Metal Tank Test Transformers and Transformer Cascades, Types PEO and FPEO

Brief Description:

Metal tank transformers have an earthed tank (very space saving in the HV laboratory) and a bushing to air (on request a bushing to a SF₆-insulated, completely metal-enclosed HV test system). They are provided for both, indoor (type PEO) or outdoor (type FPEO) operation and well suited for heavy climatic conditions.

Metal tank transformers are designed for higher power and continuous operation. For short-time operation higher currents than specified in this Data Sheet can be supplied. The exciter winding is divided into two parts which can be connected in series or parallel for an improved voltage adjustment and power adaptation. The internal partial discharge (PD) level is lower than 10 pC and recommends the application of metal tank transformers not only for test line operation, wet and pollution testing (which requires higher currents), but also for PD testing.

For the generation of voltages in the range of Mega volts, metal tank transformers can be cascaded (see principle drawing on the last page).

All mentioned data for power in the table are related to the following ambient conditions:

max. ambient temperature:	40 °C
max. average ambient temperature per month:	30 °C

The insulation of the bushings is related to standard climatic conditions:

air pressure :	0,1 MPa
temperature:	20 °C
humidity:	11g/m ³

The transformers are designed with low core induction to guaranty a sine wave shape of the output voltage with lower than 5 % of harmonic distortion. To prevent some increasing of harmonics due to resonant phenomena the systems may be provided with harmonic filters.

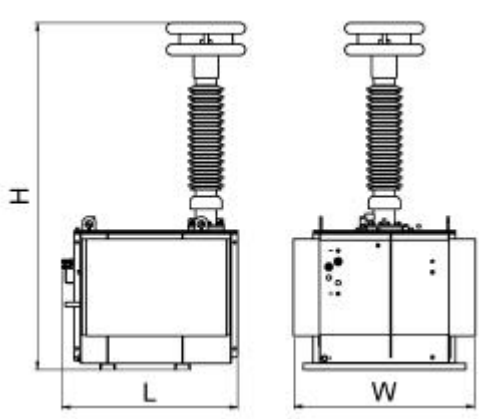
The high voltage windings are of layer type and they are completely shielded to achieve a high electric strength against transient over voltages. The windings are short-circuit-proof. For more details ask HIGHVOLT directly.

rated voltage	rated test current	rated test power	rated voltage ¹⁾ of exciter winding	duty cycle ²⁾ per day	impedance voltage ³⁾	short-circuit current ⁴⁾	type ⁵⁾ PEO / FPEO		type ⁵⁾ PEO / FPEO		design group ⁷⁾	dimension length x width x height including bushing	bushing position ⁸⁾	total weight	weight of oil
kV	A	kVA	kV	h	%	A						mm		kg	kg
60	1	60	0.4	24	5.2	10	PEO	60/60	PEO	60/60	H	920 x 720 x 1690	v	710	240
60	5	300	0.4	24	6.5	43	PEO	300/60	PEO	300/60	H	1300 x 1050 x 1550	v	2 000	600
100	1	100	0.4	24	5.5	10	PEO	100/100	PEO	100/100	H	1050 x 900 x 2200	v	1 100	400
100	5	500	0.5	24	7.0	42	PEO	500/100	PEO	500/100	H	1900 x 950 x 2550	v	3 200	1 200
200	1	200	0.4	24	5.0	10	PEO	200/200	PEO	200/200	H	2800 x 1200 x 1600	h	2 500	900
200	2	400	0.4	24	5.6	19	PEO	400/200	PEO	400/200	H	3300 x 1400 x 1800	h	4 300	1 000
200	5	1000	6	24	5.1	50	PEO	1000/200	PEO	1000/200	A	3500 x 1800 x 2700	h	6 300	1 700
300	1	300	0.4	24	5.5	10	PEO	300/300	PEO	300/300	T	3300 x 1500 x 2000	s	4 300	1 100
300	2	600	0.5	24	6.3	18	PEO	600/300	PEO	600/300	A	3500 x 1500 x 2000	s	7 800	1 900
300	6.7	2000	6	24	7	55	PEO	2000/300	PEO	2000/300	A	5400 x 2400 x 3200	s	15 000	3 700
400	1	400	0.4	24	5.6	9.5	PEO	400/400	PEO	400/400	T	4000 x 1700 x 2200	s	6 200	1 800
400	2	800	0.5	24	6.8	17	PEO	800/400	PEO	800/400	T	4400 x 1900 x 2800	s	12 000	3 400
400	5	2000	6	24	5.0	50	PEO	2000/400	PEO	2000/400	A	6300 x 2600 x 3600	s	20100	5 400
500	1	500	0.5	24	6.0	9	PEO	500/500	PEO	500/500	T	4600 x 1850 x 2300	s	8 300	2 400
500	2	1000	6	24	5,4	19	PEO	1000/500 t ⁶⁾	PEO	1000/500 t ⁶⁾	A	5200 x 2300 x 3400	s	18 000	5 400
500	4	2000	6	24	6.8	34	PEO	2000/500	PEO	2000/500	A	6300 x 2800 x 3900	s	22 200	6 200
600	1	600	0.5	24	5.8	9.5	PEO	600/600	PEO	600/600	A	5900 x 1950 x 2600	s	12 100	4 800
600	2	1200	6	24	5	20	PEO	1200/600	PEO	1200/600	A	6100 x 2600 x 3500	s	23 000	7 000
600	3.3	2000	6	24	6.8	28	PEO	2000/600 t ⁶⁾	PEO	2000/600 t ⁶⁾	A	6300 x 2800 x 3900	s	24 500	9 200
750	2	1500	6	24	6.2	18	PEO	1500/750 t ⁶⁾	PEO	1500/750 t ⁶⁾	A	7100 x 2900 x 4800	s	29 500	10 200
1000	1	1000	6	24	19	4	2 x PEO 1000/500 t ⁶⁾		2 x PEO 1000/500 t ⁶⁾		C	13000 x 6200 x 7800	s	42 000	10 800
1200	2	2400	6	24	23	7	2 x PEO 2000/600 t ⁶⁾		2 x PEO 2000/600 t ⁶⁾		C	13000 x 6200 x 7800	s	58 000	18 400
1500	1	1500	6	24	22	4	2 x PEO 1500/750 t ⁶⁾		2 x PEO 1500/750 t ⁶⁾		C	15000 x 6200 x 9500	s	64 000	20 400
1800	1.25	2700	6	24	30	3.5	3 x PEO 2000/600 t ⁶⁾		3 x PEO 2000/600 t ⁶⁾		C	24000 x 6200 x 11000	s	98 000	27 600

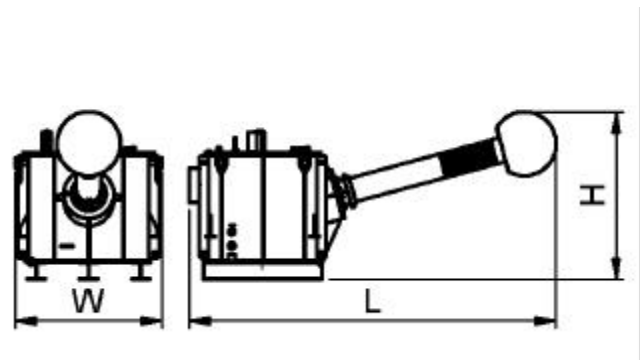
- Explanations:**
- 1) The adaptation to different voltages on request.
 - 2) The transformers are designed for 50 / 60 Hz and continuous duty (24h per day), higher currents for short time operation can be generated. Related details on request.
 - 3) The impedance voltage depends on the frequency, the first value is related to 50 Hz, that for 60 Hz is about 1.2 times higher.
 - 4) The short-circuit current is related to a system. The realized value depends on the regulator and current limiting components of the power circuit. The given value is related to a regulator of 5% impedance voltage.
 - 5) The type designation PEO characterizes the indoor type. All types can be supplied in outdoor design with the designation FPEO instead of PEO. The first figure is the rated test power, the second the rated voltage.

- Explanations:**
- 6) The letter "t" means the transformer can be equipped with a transfer winding for cascades.
 - 7) The design groups are
H - hermetically sealed tank, corrugated tank
A - steel tank with conservator
T - steel tank without conservator, indoor application only, in case of outdoor operation group A
C - cascade.
 - 8) The bushing is arranged in
h - horizontal position
s - slanting position
v - vertical position.

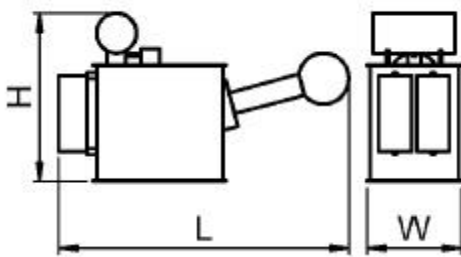
Dimensional Drawings of the Design Groups:



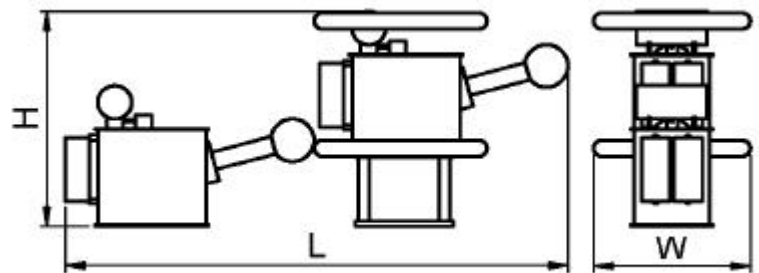
Design group H



Design group T



Design group A



Design group C

Special design and accessories on request:

- design for short-time operation with higher currents
- internal compensation of capacitive current by a gap in the magnetic core
- position of the bushing different from standard
- bushing oil-to-SF₆
- rollers for transportation on floor (smaller types) or rails (larger types)
- air cushions for the transportation of larger types
- base frame as a trough receptive for the oil if demanded for emergency cases (smaller types)

For further information please contact:

or our local representative:

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