



SKF

Gas-insulated Current Transformer 100 kV to 550 kV



A Company of AREVA T&D

Sulfur hexafluoride (SF₆) has been successfully used for years as a high voltage insulating material in circuit breakers and in gas insulated substations (GIS). Therefore, it was only logical that AREVA T&D use SF₆ in HV instrument transformers. Over 20 years of SF₆ experience, in addition to optimized, dust-free production techniques, make the SKF an excellent current transformer choice for needs up to 550 kV.

AREVA T&D's SKF is a top core current transformer with composite insulator. Cores, secondary winding, main insulation and primary winding with solid primary conductor are assembled in the head housing. SKF is compliant with IEC, ANSI/IEEE or equivalent standards.

SAFE SOLUTION: PROTECTION AGAINST BURSTING

A metal rupture disk is located on top of the head housing. In case of a powerful internal flashover, the sudden increase in pressure will release the rupture disk. Its release pressure of 10 bars takes into consideration a well-calculated safety margin between an operation pressure of 5.5 bars and the routine test pressure of 12 bars. (Pressure atmospheric-absolute values)

GAS-TIGHTNESS, GAS DENSITY CONTROL

All components are subjected to a routine tightness test performed with a helium leak detection device, followed by a routine pressure test. A special dual-type gasket system - including single-piece molded O-rings - provides excellent gas-tightness. The density of the gas is checked by a temperature compensated density meter giving a visual control on the status of the transformer. The density meter can be equipped with alarm contacts for centralized control.

HOUSING

The SKF current transformer head housing consists of a corrosion-proof aluminum alloy. It is manufactured and tested in compliance with the required national pressure vessel standards. The routine test pressure amounts to approximately 12 bars; type tests are performed with 28 bars.



Customer Benefits

- Production in dust-free room
- Safe solution
- Long life insulation
- Decades of on-site experience



Optimized design

COMPOSITE INSULATOR

The composite insulator is made of fiberglass reinforced resin with sheds of silicone rubber. The color is light grey C70 according to ANSI Z 55.1. Aluminum connection flanges are bonded to the insulator with a special thin-film glue.



PRIMARY WINDING

Depending on the level of the primary nominal current and the core requirements, the primary winding is made up of 1, 2, or 4 turns. Solid primary conductors inside the transformer head pass concentrically through the cores in a direct and contact-free manner. They are made of solid aluminum or copper round stock, depending on the current rating. The primary winding (or primary windings, in case of multiple primary turns) are guided through the head housing and cores by means of a common tube. This tube ensures the gas tightness to the head housing. In case of short circuit currents, the gasket system is not influenced by mechanical or thermal stresses.

RATED CURRENTS

The maximum primary rated current is 5000 A. Secondary rated currents are 1 A or 5 A.

ALTERATION TO THE ACTUAL TRANSFORMATION RATIO

- > Primary reconnection at the ratio of 1:2 (max. 4800 A)
Series connection up to 2400 A
Parallel connection up to 4800 A
- > Primary reconnection at the ratio of 1:2:4 (max. 3600 A)
Series connection up to 900 A
Series and parallel up to 1800 A
Parallel connection up to 3600 A
- > Secondary taps for smaller nominal currents

Combinations of the primary reconnection and the secondary tap are possible.

CORES AND SECONDARY WINDINGS

Current transformers can have several toroidal laminated cores which are independent of each other (2 to 4 is normal, though up to 8 is possible). The cores, with the secondary winding, are accommodated in a thick-walled, round-core protected aluminum housing. This is connected to a strong metal pipe inside the insulator which leads to the base plate. Cross sections and connections have been dimensioned in such a way that the current can be led to ground in the event of a short circuit without a secondary arc occurring in the insulator area.





OUTPUT AND ACCURACY

Each core is custom designed and manufactured to meet specific customer requirements for metering protection purposes.

Accuracies in keeping with classes 0.1 to 3 are possible with a security factor of FS 5 or FS 10 (as per IEC) for metering and measurement.

The IEC classes 5P, 10P, TPX and TPY or TPZ with air gaps are possible for protection, with over-current factors as desired.

THERMAL AND DYNAMIC RATINGS

One advantage of the head type CT is the high thermal and dynamic short-circuit withstand capabilities, i.e. in some cases a thermal short-time current of 80 kA for 1 second and a dynamic current of 200 kAp. This is a result of low inductance from short straight primary conductors.

TESTS

All tests conform with national and international standards. Along with the power-frequency test, the capacitance and the inner partial discharges are also measured as routine tests. Test certificates are issued and supplied.

SPARE PARTS

Spare density meters and rupture discs are available.

COMMISSIONING, OPERATION AND MAINTENANCE

Units are delivered with a transport pressure of 1,5 bars. Prior to energizing, the gas pressure must be increased to operation pressure. Filling can be done by an AREVA T&D service inspector or the client. Further commissioning tests are not required.

Gas pressure monitoring is of significant importance for trouble-free operation. For this purpose, a temperature compensated density monitor at the base of the unit is provided which must be checked at regular intervals. The density monitor can be used for remote control and is equipped with contacts for different pressures. The density meter can also be equipped with alarm contacts for centralized control. It should be inspected for proper calibration at least every 5 years.

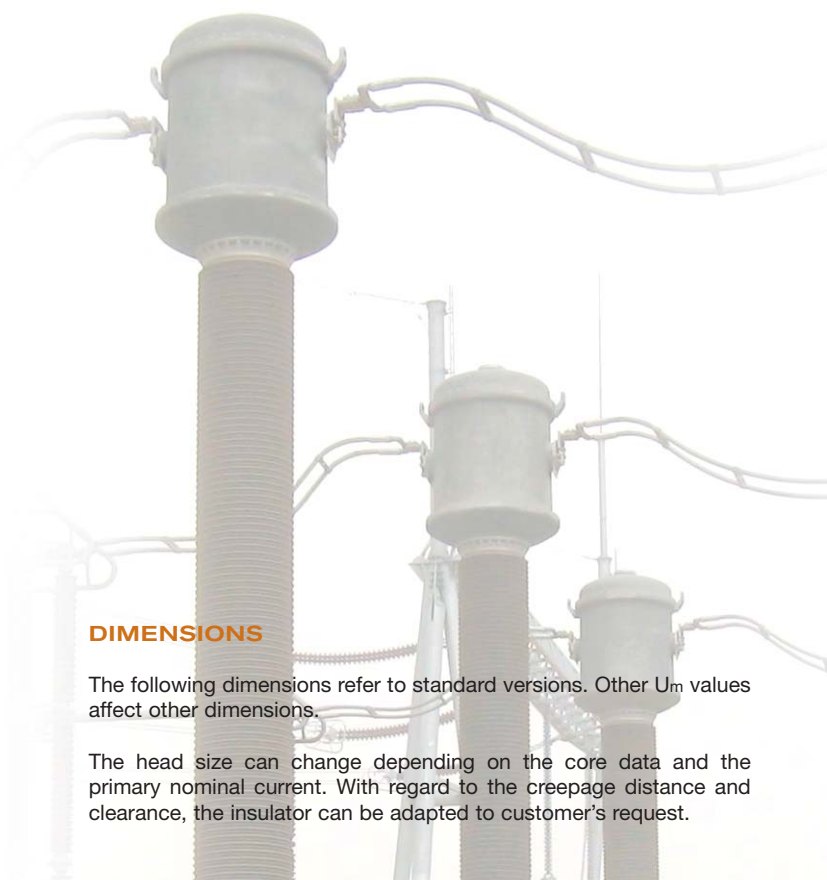
The SKF current transformers are virtually maintenance free without paint.

All hardware is made of stainless steel. All metallic parts (housings, flanges, and base plate) are corrosion-proof, seawater-resistant aluminum alloy. Angle brackets are hot-dipped galvanized steel.

ADDITIONAL INFORMATION:

- > **Radio Influence Voltage (RIV):**
Less than 2500 μV at 1.1 U_m
- > **Inner partial discharge:**
Less than 10 pC at 1.2 U_m
Less than 5 pC at 1.2 $U_m / \sqrt{3}$
- > **Frequency:**
50 Hz or 60 Hz or 16 2/3 Hz.
Other values on request.
- > **Ambient temperature:**
-35°C....+40°C on a 24h average.
- > **Mechanical strength:**
According to the standard.
- > **Seismic withstand capability**
Seismic design possible on request.

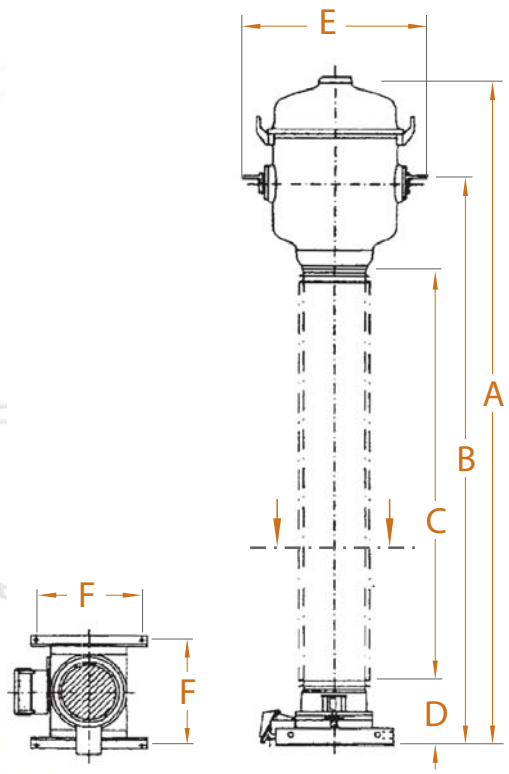




DIMENSIONS


The following dimensions refer to standard versions. Other U_m values affect other dimensions.

The head size can change depending on the core data and the primary nominal current. With regard to the creepage distance and clearance, the insulator can be adapted to customer's request.



DIMENSIONS											
Type		SKF 123	SKF145	SKF170	SKF 245		SKF 362		SKF 420		SKF 550
Head Size		1	1	1	2	3	2	3	2	3	3
Maximum system voltage (U_m)	kV	123	145	170	245	245	362	362	420	420	550
Impulse test voltage (BIL)	kV	550	650	750	1050	1050	1175	1175	1425	1425	1800
Minimum creepage distance	mm	2460	2900	3400	4900	4900	7204	7204	8400	8400	10500
Dimensions mm	A	2580	2680	3280	4160	4276	4560	4680	5560	5680	5880
	B	2045	2145	2545	3390	3670	3790	3970	4790	4970	5170
	C	1100	1200	1700	2200	2200	2600	2600	3600	3600	3800
	D	360	360	360	460	460	460	460	460	460	460
	E	1015	1015	1015	1375	1560	1375	1560	1375	1560	1560
	F	450	450	450	600	600	600	600	900	900	900
Total weight (approx.)	kg	420	435	485	1050	1400	1150	1500	1250	1600	1620
Weight of gas (approx.)	kg	10	11	16	28	37	33	42	37	46	47

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



A Company of AREVA T&D

On August 1, 2006, RITZ High Voltage became part of AREVA T&D.
 AREVA T&D Instrument Transformers equipment portfolio now includes RITZ High Voltage's extensive range.
 If you require any further information, please address your queries to:
instrument.transformers@areva-td.com

AREVA T&D Worldwide Contact Centre :
www.areva-td.com/contactcentre/
 Tél. : +44 (0) 1785 250 070

www.areva-td.com

Products-L3-SKF-71537-V1-EN - © - AREVA - 2007. AREVA, the AREVA logo and any alternative version thereof are trademarks and service marks of AREVA. All trade names or trademarks mentioned herein whether registered or not, are the property of their owners. - 389191982 RCS PARIS
 Our policy is one of continuous development. Accordingly, the design of our products may change at any time. Whilst every effort is made to produce up to date literature, this brochure should only be regarded as a guide and is intended for information purposes only. Its contents do not constitute an offer for sale or advice on the application of any product referred to in it. We cannot be held responsible for any decisions taken on its contents without specific advice.