Current Transformers

Type IOSK

TRENCH

Current Transformers

Introduction

Trench is a recognized world leader in the design and manufacture of high voltage equipment for application on electric utility and high energy industrial systems. As part of Trench's product scope, the company produces a diversified range of Instrument Transformers which are installed on 69-800 kV electrical systems. Instrument Transformers include: Voltage (Potential) Transformers (both inductive and capacitive type), Current Transformers and Combined Instrument Transformers (voltage and current transformer in one unit).

Fig. 1
Type IOSK
Current Transformer

Current Transformers must convert high transmission line currents (up to 5000 A) to standardized low and easily measurable values, which will be used for metering, protection and control of the high voltage system. As such, the need for accurate and reliable current transformation is essential.

This brochure will detail the features and characteristics of Trench Type IOSK Current Transformers. Please refer to Trench brochure E210 for additional general information concerning high voltage Instrument Transformers.

Features

- Meet all IEC and ANSI metering and protection classes, including special core classes TPS, TPX, TPY and TPZ (other standards on request)
- Rated primary currents up to 5000 A
- Primary reconnection available
- Rated secondary current 1 A, 2 A or 5 A
- Rated short circuit withstand up to 200 kA peak
- Quality Assurance in accordance with ISO 9001

- highly refined and processed oil/paper insulation system
- Head type design of low weight and minimum oil volume
- use of high quality mineral oil, PCB free, biological decomposition
- excellent seismic performance as a consequence of optimized design of flanges, porcelain and their interconnection
- short, symmetrically arranged low reactance bar-type primary conductor permits higher short circuit currents and avoids large voltage drop across the primary winding
- excellent control of internal and external insulation stresses through the use of a proprietary finely graded bushing system
- hermetically sealed by stainless steel metallic bellows
- welded housing sealed without screws
- uniformly distributed secondary windings guarantee accurate transformation at both rated and high currents

- essentially unaffected by stray external magnetic fields
- stable accuracy over a long period of time
- exclusive use of corrosion resistant materials
- explosion resistant by:
  - insulating system with high reliability
  - fine graded bushing
  - weakpoint in the aluminium headcasting and the metallic bellows serving as pressure release device
- 1:1 A current ratio possible
- Successful field experience since the manufacture of the first current instrument transformer in 1924
- maintenance free during a long lifetime of more than 30 years
- composite insulators available on request

Construction

Trench type IOSK Current Transformers are defined as "head type" Current Transformers. These CT's are designed and constructed with the well proven, highly reliable, oil/paper insulation system. Each porcelain housed, hermetically sealed Current Transformer is equipped with stainless steel expansion bellows, calibrated to the internal oil volume and extremes in ambient and operating temperatures.

Customer specifications, such as application (metering or protection), number of cores, ratings, etc. have a direct bearing on the size of the "head" or core housing for each Current Transformer. For this reason, the type IOSK is produced with different size heads, Trench will recommend the optimum design based on each individual customer specification.

Fig.2
IOSK 245 Current Transformers

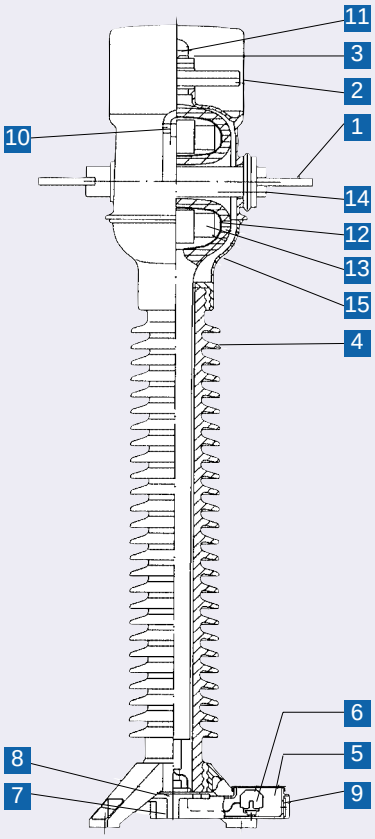
Standard Equipment

- Aluminum flat pad primary terminal and ground terminal
- Lifting lugs
- Bellows position indicator
- Oil filling port
- Oil drain valve
- Secondary terminal box with removable gland plate

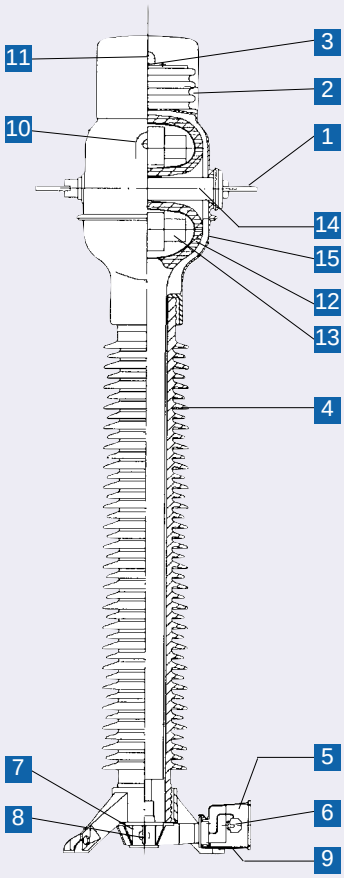
Optional Equipment

- Stud type primary terminal
- Primary or ground cable connector
- Anti-corona rings
- Capacitance tap for measurement of voltage or tan delta of bushing
- Gas Detection System (contact Trench for additional details)
- Terminal box heater
- Composite Insulators

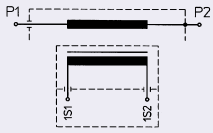
72.5 - 170 kV



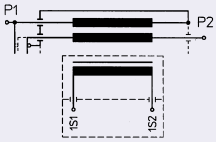
245 - 550 kV



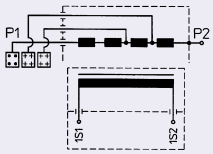
1 Primary terminal
2 Metallic expansion bellows
3 Oil filling screw
4 Porcelain insulator
5 Secondary terminal box
6 Secondary terminals
7 Oil drain valve
8 Grounding terminal
9 Gland plate
10 Lifting lugs
11 Bellows indicator
12 High voltage insulation
13 Secondary winding and cores
14 Primary winding
15 Transformer head (aluminum)



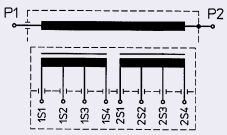
Without primary reconnection



Primary reconnection 1:2



Primary reconnection 1:2:4



Secondary reconnection

Fig.3
Electrical and mechanical design details

Oil/paper-insulated Current Transformers

Electrical and Mechanical Data (1)

Type	Max.continuous operating voltage phase to phase kV	Test voltage 50/60 Hz, 1 min. dry/wet kV	Impulse withstand test voltage full wave 1.2/50 µs kV	Switching impulse test voltage 250/2500 µs wet kV	Min. sparking distance mm	Standard creepage distance mm
IOSK 72.5	72.5	140	325	–	700	1815
IOSK 123	123	230	550	–	1200	3815
IOSK 145	145	275	650	–	1200	3815
IOSK 170	170	325	750	–	1400	4495
IOSK 245	245	395	950	–	2200	6300
IOSK 245	245	460	1050	–	2200	6300
IOSK 300	300	460	1050	850	2200	6300
IOSK 362	362	570	1300	950	2650	9955
IOSK 420	420	630	1425	1050	3200	11550
				1175	3800	
IOSK 420	420	680	1550	1050	3200	11550
				1175	3800	
				1300	4200	
IOSK 550	550	680	1550	1175	3800	15125
				1300	4200	

Notes:
(1) Other ratings available on request

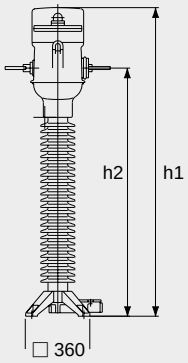


Fig. A

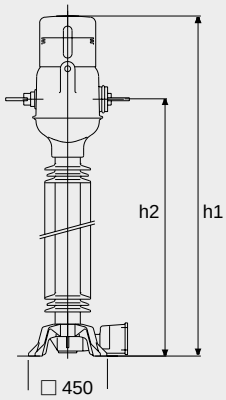


Fig.B

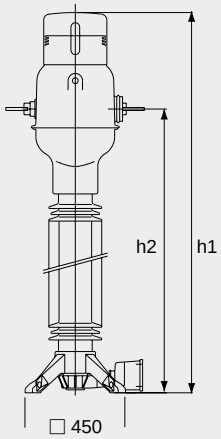


Fig. C

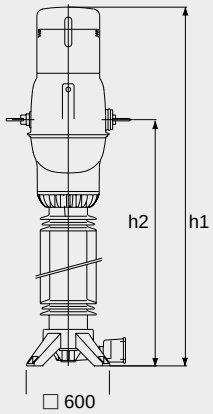


Fig. D

Net weight approx.		Dimension	Weight of oil
		h1	h2	
Fig	kg	m	mm	kg
A	160	1630	1215	31
A	200	2155	1715	35
B	380	2400	1825	70
A	200	2155	1715	35
B	380	2400	1825	70
A	220	2355	1915	44
B	390	2600	2025	79
B	470	3545	2970	79
C	700	3745	3080	158
B	470	3545	2970	79
C	700	3745	3080	158
B	470	3545	2970	79
C	700	3745	3080	158
C	900	4270	3600	184
D	1600	4570	3720	350
C	1000	4920	4150	245
C	1400	5515	4745	315
D	1700	5240	4270	411
C	1400	5515	4745	315
C	1600	5915	5145	380
D	2100	5840	4870	438
C	1400	5515	4745	315
D	2100	5990	5020	438
D	2300	6390	5420	505

TRENCH

The Trench Group is your partner of choice for electrical power transmission and distribution solutions today; and for the development of your new technology solutions of tomorrow.

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E 217.11
Subject to change without notice (05.2006)
Printed in Canada.