High Voltage Products

Combined instrument transformer
PVA 123

Power and productivity
for a better world™

General information

The PVA 123 combined instrument transformers are used for feeding measurement and protection systems in electric power grids with highest system voltage of 123 kV and frequency of 50 Hz.
They are designed to work in grids with an insulated or effectively earthed neutral point. The PVA123 combined instrument transformers are suitable to operate in outdoor conditions with ambient temperature from –40°C to 40°C and at relative humidity of up to 100% at 30°C and at the altitude not exceeding 1000 m above sea level.
The PVA 123 combined instrument transformer is top core construction; it comprises current and voltage modules encapsulated in common hermetically sealed housing filled with PCB free transformer oil. The current module is located in transformer's head and voltage module is in the bottom tank.
The transformer's stainless steel expansion bellows is fixed to the head and shielded with an aluminium cover. The expansion bellows compensates for thermal changes in oil volume.
The location of both CT and VT modules in one housing benefits the environment and offers reductions in the total cost of ownership of a substation due to:
– Reduced Station footprint:
  – lower number of transformers in a bay,
  – lower number of supporting structures,
  – lower number of connections.
– Lower cost for Civil Works.
– Lower transportation costs.
– Lower installation costs.

Top core construction

Top core construction makes it possible to achieve high values of thermal and dynamic short-circuit currents as well as a broad range of rated primary currents and outputs of secondary windings.

Primary and secondary windings and accuracy classes

The primary and secondary windings are made of highest quality electrical copper, enabling us to deliver to customers requiring high accuracy (classes 0.2S and 0.5S) with low values of rated primary current. We guarantee very high transformation accuracy in special classes, from 1% to 120%, 150% and even to 200% of the value of selected rated primary currents for both secondary currents of 1 A and 5 A.
The voltage module of PVA 123 has accuracy from 0.1 for measuring windings. High transformation accuracy for protection windings is guaranteed from 2% to 120% typically and even up to 190% of rated primary voltage in special cases.
Our in factory test laboratory is one of the most modern units of this type in the world.

Main insulation

The main insulation is made of insulation paper impregnated with transformer oil. We utilise a high quality oil conforming to IEC 60296 Standard requirements. This oil does not contain PCB's or any other toxic substances and has low environmental impact.

Hollow insulator

The standard insulator is made of brown porcelain with creepage distance of 25 mm/kV. A grey composite insulator with creepage distance of 31 mm/kV is available upon request. All materials used in the production of our insulators conform to relevant IEC Standards.

Housing

All external parts are robust and made from corrosion resistant materials.
The PVA 123 combined instrument transformer is leak proof due to o-ring sealing system in the housing that is made of high quality aluminium alloy. The expansion bellows is equipped with large oil level indicator that enables observations of thermal changes in oil volume even from a distance. Each completely assembled unit is subject to stringent leakage checks during routine testing.

Primary terminals

The standard primary terminals are flat, made of aluminium, 100 mm or 200 mm width. Upon request we can offer pin type primary terminals, made of copper or aluminium, with a diameter of 30 mm or 40 mm.

Secondary terminal box

The secondary terminal box is IP54, constructed of aluminium. The terminal box is fixed to the transformer's bottom tank. Secondary terminals are available for connection of 10 mm^2 conductors; the terminals may also be equipped with fuses for voltage circuits. Sealing of current and voltage measurement secondary terminals is also possible upon request. The secondary terminal box has two M32 cable glands (for cables from Ø 11 mm to Ø 21 mm) and two M40 cable glands (for cables from Ø 19 mm to Ø 28 mm). We offer secondary terminal boxes with other glanding arrangements upon request.

Technical data

General information

Parameter	Value
Type	PVA 123
Compliance with the standards	IEC 60044-3; PN-EN 60044-3
Rated primary voltage	110: √3 kV
Highest system voltage	123 kV
Rated power – frequency withstand voltage at 50 Hz	230 kV
Rated lighting – impulse withstand voltage 1.2/50 µs	550 kV
Minimum creepage distence	3625; 3800* mm
Rated frequency	50 Hz
Total weight	650; 580* kg
Insulation oil weight	150 kg

*composite insulator

Current module

Rated current [A]	Rated 1s thermal current [kA]	Rated dynamic current [kA]
50–3000	10–63	25–157

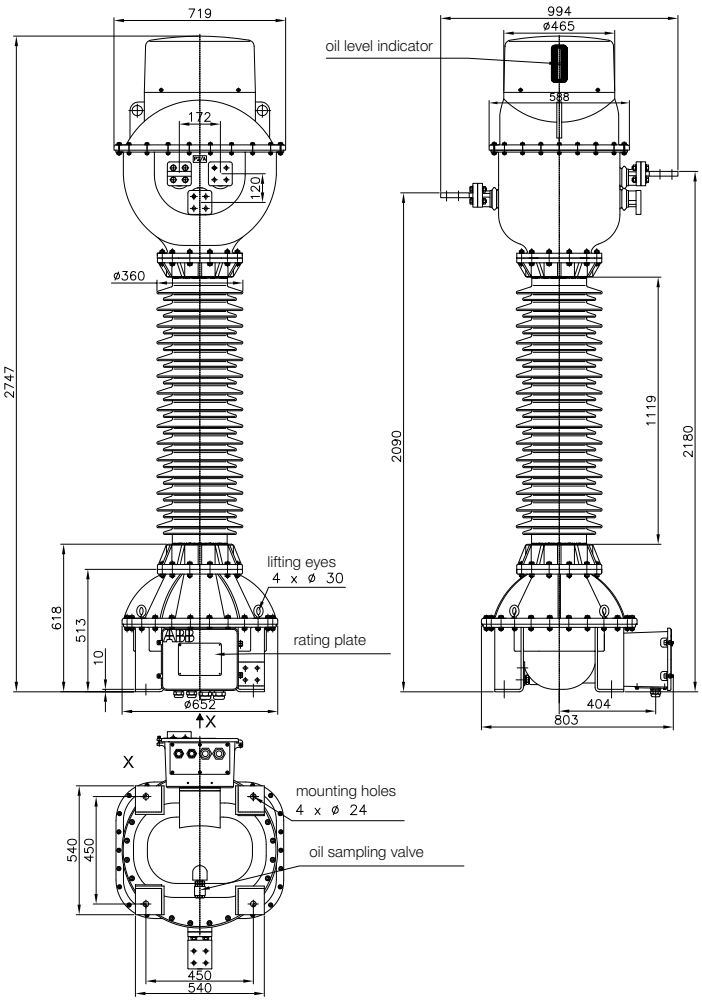
reconnectable 1:2 or 1:2:4

Parameter	Value
Rated secondary current	1 A; 5 A
Rated continuom thermal current	120%; 150%; 200%
Number of cores:	1–6
Measuring cores parameters:	
– total rated output	2.5–90 VA
– accuracy clases	from 0.2S
Protection cores parameters	
– total rated output	2.5–90 VA
– accuracy classes	5P; 10P

Voltage module

Voltage factor and time	1.5/30 s; 1.9/8 h		
Number of windings:	1–5		
Measuring/protection windings:			
– rated secondary voltage	100: √3 V; 110: √3 V		
– total rated output	up to 75 VA	up to 150 VA	up to 400 VA
– accuracy clases	0.1; 0.1/3P	0.2; 0.2/3P	0.5; 0.5/3P
Residual winding:			
– rated secondary voltage	100:3V; 110:3V		
– rated output	25 VA; 50 VA		
– accuracy classes	3P; 6P		

Dimensional drawing



Contact us

ABB Sp. z o.o.
Branch in Przasnysz
59 Leszno Str.
06-300 Przasnysz, Poland
Phone: 29 75 33 223
Fax: 29 75 33 329

www.abb.pl

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