

220kV COMBINED POWER TRANSFORMER

Structure characteristics

- The separate parts of a combined transformer share a common set of cooling system, conservator and piping system. For on-load regulating transformer, there is only one set of on-load regulating mechanism, the occupied area of the transformer on site is only slightly larger than that of the traditional transformer.
- In delta connection, LV leads of the combined transformer, firstly connected to be a delta type in corrugated lead pipe on the top of the tank, are brought out from LV. bushing then. Thus compared with the method before, this way to connect the leads can save 50% of workload and assembly period on site.
- The tertiary leads of the step-down transformer can be directly brought out to connect with the overhead line of the substation and be connected to form delta type

Specification of 220kV Combined Power Transformer(Two-Winding)

Type	SSP9-X-75 MVA/220 kV Three-phase two-winding combined transformer	SSP10-X-130 MVA/220 kV Three-phase two-winding combined transformer	SSP9-X-110 MVA/220 kV Three-phase two-winding combined transformer
Ratio of voltage(kV)	242 ± 2 × 2.5%/10.5	242 ± 2 × 2.5%/13.8	242 ± 2 × 2.5%/13.8
Connection group	YNd11	YNd11	YNd11
Winding combination	H--L	H--L	H--L
No-load current(%)	0.5	0.4	0.5
No-load loss(kW)	53	90	82
On-load loss(kW)	226	362.5	327.3
Impedance(%)	13.32	13.245	13.4
Weight of active part(kg)	3 × 28290	3 × 37500	3 × 31000
Transport weight (kg)	3 × 35000 (filling with nitrogen)	3 × 44500 (filling with nitrogen)	3 × 38000 (filling with nitrogen)
Transport dimension (L × W × H mm)	3300 × 2480 × 2950	3530 × 2840 × 3380	3253 × 2680 × 3200

1. OSFPSZ8-X-120 MVA/220kV combined transformer operating in Gejiu, Yunnan
2. SFPS8-X-120 MVA/220kV three-winding combined transformer, Hubei
3. SFPSZ8-X-120 MVA/220kV three-phase three-winding on-load combined auto-transformer, Yunnan
4. SSP9-X-75 MVA/220kV three-phase two-winding combined transformer



outside. Such simple structure, resulting in a convenient assembly, makes it easy to carry out a split-phase test and to supervise the condition of the transformer.

- Corrugated pipe is used to connect oil piping of three single-phase transformer, which is installed on the special steel pedestal supplied by XD. Convenient installation can also avoid the relative displacement caused by the difference of the property of the construction on site.
- The structure of single-phase three-limb core makes flux distribution uniform, thus substantially decreases the flux leakage, help avoid partial over-heat, and strengthen the ability of withstanding short circuit of the transformer.
- Together with other special technical measures, the technology to stack core without upper yoke effectively lower the noise, which of the transformer with blowers normally is lower than 70db and which of the main body is lower than 65db. It is very important for the substation in the mountain area or the boost substation inside the cavity of the hydroelectric power station to have a low noise.

Specification of 220kV Combined Power Transformer (Three-Winding)

Type	SFPS8-X-120 MVA/220 kV Three-phase three-winding combined transformer			OSFPSZ8-X-120 MVA/220 kV Three-phase three-winding combined auto-transformer			SFPSZ8-X-120 MVA/220 kV Three-phase three-winding combined transformer			SFPS9-H-150 MVA/220 kV Three-phase three-winding combined transformer		
	H--M	H--L	M--L	H--M	H--L	M--L	H--M	H--L	M--L	H--M	H--L	M--L
Ratio of voltage(kV)	242 ± 2 × 2.5%/121/38.5			220 ± 8 × 1.25%/115/37			220 ± 8 × 1.25%/115/35			220 ± 8 × 1.5%/121/10.5		
Connection group	YNyn0d11			YNyn0d11			YNyn0d11			YNyn0d11		
Winding combination	H--M	H--L	M--L	H--M	H--L	M--L	H--M	H--L	M--L	H--M	H--L	M--L
No-load current(%)	0.3	0.3	0.3	0.5	0.5	0.5	0.23	0.23	0.23	0.3	0.3	0.3
No-load loss(kW)	100	100	100	60	60	60	105	105	105	110	110	110
On-load loss(kW)	480	150	100	320	240	250	470.7	140.2	98.24	498	167	116
Impedance(%)	13.5	23	8	9	32	20	13.91	23.43	7.9	14.47	24.65	7.9
Weight of active part(kg)	3 × 33630			3 × 21680			3 × 36600			3 × 43800		
Transport weight (kg)	3 × 38430 (filling with nitrogen)			3 × 28380 (filling with nitrogen)			3 × 44570 (filling with nitrogen)			3 × 51860+52550 (filling with nitrogen)		
Transport dimension (L× W ×H mm)	3670 × 2980 × 3490			4895 × 2960 × 3330			3800 × 3210 × 3480			4300 × 3350 × 3575		

