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AC/DC Arc Furnace and Ladle Furnace Transformers

Specification parameter

Specify the requirements for your desired transformer	Unit	Your values	Sample values
1. Environmental condition and standards			
Applicable standard			
Electrical standard			IEC / IEEE / GOST
Mechanical standard			DIN, EN ISO / ANSI (with metric screw system)
Location			Indoor / Outdoor / Offshore / Explosion-proof
Environment			High pollution / Salty and or mist / Tropical / Artic
Altitude	m		≤ 1,000 m
Ambient temperatures			
Yearly average ambient temperature	°C		20 °C
Monthly average ambient temperature	°C		30 °C
Yearly maximum ambient temperature	°C		40 °C
Yearly minimum ambient temperature	°C		-25 °C
Max. water inlet temperature	°C		35 °C

Specify the requirements for your desired transformer	Unit	Your values	Sample values
2. Electrical design			
Design criteria			
Type			Oil-immersed 3-phase EAF transformer
Cooling type			ODWF
Rated power	MVA		124 MVA
Operating mode			Continuous
Rated frequency	Hz		60 Hz
Vector group			Dd0 (internally-closed delta)
Rated voltage	kV		34.5 kV / 0.728 kV
Tapping range	V		727.8 - 616.1 - 348.5 V
No. of steps/pos.			17/18
Overexcitation	%		10%
Rated current HV	A		1,339 A
Rated current LV	kA		63.458 kA (max. 74.97 kA)
Short-circuit duration	s		2 s
Short-circuit power	MVA		max. 500 MVA
Isolation level			
Highest voltage for equipment			
HV winding	kV		36 kV
LV winding	kV		1.5 kV
Rated power frequency withstand voltage			
HV winding	kV		70 kV
LV winding	kV		10 kV
Rated lightning impulse withstand voltage			
HV winding	kV		200 kV
LV winding	kV		30 kV
Rated switching impulse withstand voltage			
HV winding	kV		-
LV winding	kV		-

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Voltage table

Typical voltage values of AC/DC arc furnace and ladle furnace transformers

Position	S [MVA]	LV phase current [kA]	LV voltage [V]	HV voltage [V]	HV voltage [A]
18	80.00	63.458	728	34,500	1,339
17	80.00	65.600	704	34,500	1,339
16	80.00	67.742	682	34,500	1,339
15	80.00	70.152	658	34,500	1,339
14	80.00	72.562	637	34,500	1,339
13	80.00	74.972	616	34,500	1,339
12	76.19	74.972	587	34,500	1,275
11	72.73	74.972	560	34,500	1,217
10	69.57	74.972	536	34,500	1,164
9	66.67	74.972	513	34,500	1,116
8	63.28	74.972	487	34,500	1,059
7	60.22	74.972	464	34,500	1,008
6	57.44	74.972	442	34,500	961
5	54.50	74.972	420	34,500	912
4	51.85	74.972	399	34,500	868
3	49.45	74.972	381	34,500	828
2	47.26	74.972	364	34,500	791
1	45.25	74.972	348	34,500	757

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Heavy Duty Rectifier Transformer

Specification parameter

Specify the requirements for your desired transformer	Unit	Your values	Sample values
1. Environmental condition and standards			
Applicable standard			
Electrical standard			IEC / IEEE
Mechanical standard			DIN, EN ISO / ANSI (with metric screw system)
Location			Indoor / Outdoor / Offshore / Explosion-proof
Environment			High pollution / Salty and or mist / Tropical / Artic
Altitude	m		≤ 1,000 m
Ambient temperatures			
Yearly average ambient temperature	°C		12 °C
Monthly average ambient temperature	°C		-
Yearly maximum ambient temperature	°C		35 °C
Yearly minimum ambient temperature	°C		-20 °C
Max. water inlet temperature	°C		-

Specify the requirements for your desired transformer	Unit	Your values	Sample values
2. Electrical design			
Design criteria			
Type			Oil-filled 3-phase rectifier transformer with regulation (auto) transformer with built-in transducers
Cooling type			OFAF
Rated power	MVA		76,368 / 4x 19,092 MVA
Operating mode			Continuous
Rated frequency	Hz		50 Hz
Vector group			Da0 Dy0d1 + 7.5°el / Dy0d1 - 7.5°el
Rated voltage	kV		30.0 kV / 4x0.75 kV
Tapping range	V		750 to 272 V
No. of steps/pos.			approx. 71/72 (67/68 effective + necessary number of taps/positions for voltage fluctuation)
Rated current LV	kA		4x 14.697 kA
Harmonics			specified by Siemens Erlangen
Short-circuit duration	s		2 s
Short-circuit power	MVA		max. 3,000 MVA
Type of rectifier circuit			3-phase bridge or double star
Only for double-star transformers:			
Transducers control range	V		20 V
Only for double-star transformers:			
Interphase reactor			
Rated voltage	V		2x 160 V
Rated current	kA		15,0 kA per LV System
Rated frequency	Hz		150Hz
Isolation level			
Highest voltage for equipment			
HV winding	kV		36 kV
LV windings	kV		3 kV
Rated power frequency withstand voltage			
HV winding	kV		70 kV
LV windings	kV		10 kV

Specify the requirements for your desired transformer	Unit	Your values	Sample values
Rated lightning impulse withstand voltage			
HV winding	kV		170 kV
LV windings	kV		-
Rated switching impulse withstand voltage			
HV system			-
LV system			-

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Converter Trasnformer for Variable speed drives

Specification parameter

Specify the requirements for your desired transformer	Unit	Your values	Sample values
1. Environmental condition and standards			
Applicable standard			
Electrical standard			IEC / IEEE / CSA / GOST
Mechanical standard			DIN, EN ISO / ANSI (with metric screw system)
Location			Indoor / Outdoor / Offshore / Explosion-proof
Environment			High pollution / Salty and or mist / Tropical / Artic
Altitude	m		≤ 1,000 m
Ambient temperatures			
Yearly average ambient temperature	°C		20 °C
Monthly average ambient temperature	°C		30 °C
Yearly maximum ambient temperature	°C		40 °C
Yearly minimum ambient temperature	°C		-25 °C
Max. water inlet temperature	°C		-

Specify the requirements for your desired transformer	Unit	Your values	Sample values
2. Electrical design			
Design criteria			
Type			Oil-immersed, 3-phase double-tier converter transformer with filter winding
Cooling type			KFAF
Rated power	MVA		136.0 / 2x 68 MVA / 50 Mvar
Operating mode			Continuous
Rated frequency	Hz		60 Hz ± 5%
Vector group			D d0 y11 y11
Rated voltage	kV		132 kV / 2x 14.1 kV / 17.5 kV
Tapping range	%		2x (+/- 2.5) %
No. of steps			+/- 2
Harmonics			specified by Siemens PD OM OGD
Short-circuit duration	s		2 s
Short-circuit power	MVA		max. 500 MVA
Isolation level			
Highest voltage for equipment			
HV winding	kV		138 kV
LV1/2 winding	kV		≤ 15 kV
LV winding	kV		≤ 15 kV
Rated power frequency withstand voltage			
HV winding	kV		207 kV
LV1/2 winding	kV		34 kV
LV winding	kV		34 kV
Rated lightning impulse withstand voltage			
HV winding	kV		550 kV
LV1/2 winding	kV		110 kV
LV winding	kV		110 kV
Rated switching impulse withstand voltage			
HV system			-
LV system			-
F system			-