

## Appendix-C

### Technical Parameters of Current Transformers (Type & Rating)

Sl No	Technical Particulars	Type-1	Type-1a	Type-1b	Type-1c	Type-1d	Type-2	Type-2a	Type-2b	Type-2c	Type-2d	Type-3	Type-3a	Type-3b	Type-3c	Type-3d	Type-3e	Type-3f	Type-3g	Type-4
1	Normal System Voltage (KV)	220KV	220KV	220kV	220kV	220kV	110KV	110KV	110KV	110KV	110KV	66KV	66KV	66KV	66KV	66KV	66kV	66kV	66KV	33KV
2	Highest System Voltage (KV)	245KV	245KV	245kV	245kV	245kV	123KV	123KV	123KV	123KV	123KV	72.5KV	72.5KV	72.5KV	72.5KV	72.5KV	72.5kV	72.5kV	72.5KV	36KV
3	Frequency	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz
4	Earthing	Effective	Effective	Effective	Effective	Effective	Effective	Effective	Effective	Effective	Effective	Effective	Effective	Effective	Effective	Effective	Effective	Effective	Effective	Effective
5	Basic Insulation Level (KV Peak)	1050	1050	1050	1050	1050	650	650	650	650	650	325	325	325	325	325	325	325	325	170
6	Power Frequency withstand strength (KV RMS)	460	460	460	460	460	275	275	275	275	275	140	140	140	140	140	140	140	140	70
7	Short Time Current rating (KA for 1 sec)	50	50	50	50	50	40	40	40	40	40	40	40	40	40	40	40	40	40	31.5
8.	Secondary winding current rating (Amp)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	Number of cores	5	5	5	5	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3
10	Ratio	800-600-400-300/1-1-1A with two extra cores of ratio 800/1A	1200-800-400-300/1-1-1A with two extra cores of ratio 1200/1A	1600-1200/1-1-1A with two extra cores of ratio 1600/1A	2000-1600-1200/1-1-1A with two extra cores of ratio 1200/1A	1600-800/1-1-1-1-1A	600-400/1-1-1A	400-200/1-1-1A	200-100/1-1-1A	1000-600/1-1-1A	800-400/1-1-1A	1000-600/1-1-1A	400-200/1-1-1A	200-100/1-1-1A	1600-1000/1-1-1A	800-400/1-1-1A	1000-800/1-1-1A	1200-800/1-1-1A	400-200-100/1-1-1A	400-200/1-1-1A
11	Purpose for which used	220KV line & 220kV Transformer	220KV line with 1000Sq. mm cable & 220kV Transformer	220kV line with 1200/2000 Sq.mm XLPE UG cable	220kV Bus Coupler & Sectionalizer	220kV line with Twin Zebra conductor	220 kV 110kV 100MVA transformer & 110KV bus coupler	110KV lines with Lynx conductors	110KV Transformers	220 kV 110kV 160MV A transformer & 110KV bus coupler	220 kV 110kV 160MV A transformer & 110KV bus coupler	220 kV 100MV A Tr. & 66KV Bus Coupler	66KV line using lynx / coyote & 31.5MV A Tr. & 66KV capacitor bank	Up to 20MVA Tr.	220 kV - 150MV A Tr.	66KV lines using Drake & 630 Sq. mm cable	66kV line with 1000 Sq.mm XLPE, UG cable	66kV line with 1000 Sq.mm XLPE, UG cable	66KV line using lynx / coyote & 31.5MV A, 20MVA, 12.5MV A Tr. & 66KV capacitor bank	Transformer protection

12	Method of obtaining Secondary ratio	By secondary tapping without primary reconnection	By secondary tapping without primary reconnection	By secondary tapping without primary reconnection.	By secondary tapping without primary reconnection.	By secondary tapping without primary reconnection.	By secondary tapping without primary reconnection	By secondary tapping without primary reconnection	By secondary tapping without primary reconnection	By secondary tapping without primary reconnection	By secondary tapping without primary reconnection	By secondary tapping without primary reconnection	By secondary tapping without primary reconnection	By secondary tapping without primary reconnection	By secondary tapping without primary reconnection					
13	Suitability of Bimetallic terminal connector	Drake ACSR (28.14 mm Dia) or 63mm Aluminium Tube	Drake ACSR (28.14 mm Dia) or 63mm Aluminium Tube	Double Moose ACSR or 63mm Aluminium tube	Double Moose ACSR or 63/75/100mm Aluminium tube	Double Moose ACSR or 63/75/100mm Aluminium tube	Drake ACSR (28.14mm Dia or 63mm Aluminium Tube)	Drake ACSR (28.14 mm Dia or 50mm Aluminium Tube)	Drake ACSR (28.14 mm Dia or 50mm Aluminium Tube)	Drake ACSR (28.14 mm Dia or 50mm Aluminium Tube)	Drake ACSR (28.14 mm Dia or 50mm Aluminium Tube)	Twin Drake ACSR (28.14 mm Dia or 50mm Aluminium Tube)	Drake ACSR (28.14 mm Dia or 50mm Aluminium Tube)	Drake ACSR (28.14mm Dia or 50mm Aluminium Tube)	Twin Drake ACSR (28.14 mm Dia or 50mm Aluminium Tube)	Drake ACSR (28.14mm Dia or 50mm Aluminium Tube)	Twin drake ACSR or 50mm Aluminium tube	Twin drake ACSR or 50mm Aluminium tube	Drake ACSR (28.14 mm Dia or 50mm Aluminium Tube)	Drake ACSR (28.14 mm Dia or 50mm Aluminium Tube)

Sl. No	Type of CT's	Purpose	Rated burden	Accuracy Class	Accuracy limit factor	Instrument security factor	Knee point volts ( min) VK	Secondary winding resistance max. at 75°C RCT	Magnetizing current
A	<b>220KV CT Type-1</b> Core-1	<b>Distance/Transformer Differential</b>	--	<b>PS</b>	--	--	1600V at 800/1A	5 Ohms at 800/1A 1.875 Ohms at 300/1A	30mA at Vk/4
	Core-2	<b>Distance/Transformer Backup Protection</b>	--	<b>PS</b>	--	--	600V at 300/1A	5 Ohms at 800/1A 1.875 Ohms at 300/1A	30mA at Vk/4
	Core-3	<b>Metering</b>	10VA	<b>0.2S</b>	--	≤ 5 at all ratios	1600V at 800/1A 600V at 300/1A	--	--
	Core-4	<b>Bus Bar differential</b>	--	<b>PS</b>	--	--	--	5 Ohm at 800/1A	30mA at Vk/4
	Core-5	<b>Bus Bar differential</b>	--	<b>PS</b>	--	--	1600V at 800/1A 1600V at 800/1A	5 Ohm at 800/1A	30mA at Vk/4

B(i)	<b>220KV Type-1a</b>	<b>CT</b>	<b>Distance/Transformer Differential</b>	--	<b>PS</b>	--	--	1200V at 1200/1A 400V at 300/1A	12 Ohms at 1200/1A 3 Ohms at 300/1A	30mA at Vk/4
	Core-2		<b>Distance/Transformer Backup Protection</b>	--	<b>PS</b>	--	--	1200V at 1200/1A 400V at 300/A	12 Ohms at 1200/1A 3 Ohms at 300/1A	30mA at Vk/4
	Core-3		<b>Metering</b>	10VA	<b>0.2S</b>	--	≤ 5 at all ratios	--	--	--
	Core-4		<b>Bus Bar differential</b>	--	<b>PS</b>	--	--	1200V at 1200/1A	--	--
	Core-5		<b>Bus Bar differential</b>	--	<b>PS</b>	--	--	1200V at 1200/1A	12 Ohm at 1200/1A 12 Ohm at 1200/1A	30mA at Vk/4 30mA at Vk/4
<b>B(ii)</b>	<b>220kV Type -1b</b>	<b>CT</b>								
	Core-1	Distance/Differential	--	<b>PS</b>	--	--	1200V at 1200/1A	12 Ohms at 1200/1A	30mA at Vk/4	
	Core-2	Distance/Transformer Backup protection	--	<b>PS</b>	--	--	1200V at 1200/1A	12 Ohms at 1200/1A	30mA at Vk/4	

	Core-3	Metering	10VA	0.2S	-	≤5 at all ratios	-	-	-
	Core-4	Bus-Bar differential	-	PS	-	-	1600V at 1600/1A		30mA at Vk/4
	Core-5	Bus-Bar differential	-	PS	-	-	1600V at 1600/1A		30mA at Vk/4
<b>B(ii)</b>	<b>220kV CT Type -1c</b>								
	Core-1	Distance/Differential	-	PS	-	-	1200V at 1200/1A	12 Ohms at 1200/1A	30mA at Vk/4
	Core-2	Distance/Transformer Backup protection	-	PS	-	-	1200V at 1200/1A	12 Ohms at 1200/1A	30mA at Vk/4
	Core-3	Metering	10VA	0.2S	-	≤5 at all ratios	-	-	-
	Core-4	Bus-Bar differential	-	PS	-	-	1200V at 1200/1A		30mA at Vk/4
	Core-5	Bus-Bar differential	-	PS	-	-	1200V at 1200/1A		30mA at Vk/4
<b>B(ii)</b>	<b>220kV CT Type -1d</b>								
	Core-1	Distance/Differential	-	PS	-	-	1600V at 1600/1A 800V at 800/1A	8 Ohms at 1600/1A 4 Ohms at 800/1A	30mA at Vk/4

	Core-2	Distance/Transformer Backup protection	–	PS	–	–	1600V at 1600/1A 800V at 800/1A	8 Ohms at 1600/1A 4 Ohms at 800/1A	30mA at V <sub>k</sub> /4
	Core-3	Metering	10VA	0.2S	–	≤5 at all ratios	–	–	–
	Core-4	Bus-Bar differential	–	PS	–	–	1600V at 1600/1A 800V at 800/1A	8 Ohms at 1600/1A 4 Ohms at 800/1A	30mA at V <sub>k</sub> /4
	Core-5	Bus-Bar differential	–	PS	–	–	1600V at 1600/1A 800V at 800/1A	8 Ohms at 1600/1A 4 Ohms at 800/1A	30mA at V <sub>k</sub> /4
C	110KV CT Type-2 Core –1	Differential Scheme	--	PS	--	--	1100V at 600/1A	5 Ohm at 600/1A	30mA at V <sub>k</sub> /4
	Core –2	Metering	10VA	0.2S	--	≤ 5 at all ratios	--	--	--
	Core –3	Backup protection	30VA	5P	20	--	--	--	--
D	110KV CT Type –2a Core –1	Distance/ Differential Scheme	--	PS	--	--	800V at 400/1A	4 Ohm at 400/1A	30mA at V <sub>k</sub> /4
	Core –2	Metering	10VA	0.2S	--	≤ 5 at all ratios	--	--	--
	Core –3	Backup protection	30VA	5P	20	--	--	--	--

E	110KV Type -2b Core -1	CT	Distance/ Differential Scheme	--	PS	--	--	400V at 200/1A	2 Ohm at 200/1A	30mA at Vk/4
	Core -2		Metering	10VA	0.2S	--	≤ 5 at all ratios	--	--	--
	Core -3		Backup protection	30VA	5P	20	--	--	--	--
F	110KV Type-2c Core -1	CT	Differential Scheme	--	PS	--	- -	1200V at 1000/1A	6 Ohm at 1000/1A	30mA at Vk/4
	Core -2		Metering	10VA	0.2S	--	≤ 5 at all ratios	--	--	--
	Core -3		Back up protection	30VA	5P	20	--	--	--	--
G	110KV Type-2d Core -1	CT	Distance/ Differential Scheme	--	PS	--	--	1400V at 800/1A	5 Ohm at 800/1A	30mA at Vk/4
	Core -2		Metering	10VA	0.2S	--	≤ 5 at all ratios	--	--	--
	Core -3		Back up protection	30VA	5P	20	--	--	--	--
H	66KV Type-3 Core -1	CT	Differential Scheme	--	PS	--	- -	1200V at 1000/1A	6 Ohm at 1000/1A	30mA at Vk/4
	Core -2		Metering	10VA	0.2S	--	≤ 5 at all ratios	--	--	--
	Core -3		Back up protection	30VA	5P	20	--	--	--	--
I	66KV CT Type-3a Core -1		Differential Scheme	--	PS	--	- -	1600V at 400/1A	4 Ohm at 400/1A	30mA at Vk/4

	Core -2	Metering	10VA	0.2S	--	≤ 5 at all ratios	800V at 200/1A	2 Ohm at 200/1A	30mA at Vk/4
	Core -3	Back up protection	30VA	5P	20	--	--	--	--
J	66KV CT Type-3b Core -1	Differential Scheme	--	PS	--	-	800V at 200/1A	2 Ohm at 200/1A	30mA at Vk/4
	Core -2	Metering	10VA	0.2S	--	≤ 5 at all ratios	--	--	--
	Core -3	Back up protection	30VA	5P	20	--	--	--	--
K	66KV CT Type-3c Core -1	Differential Scheme	--	PS	--	--	1200V at 1000/1A	6 Ohm at 1000/1A	30mA at Vk/4
	Core -2	Metering	10VA	0.2S	--	≤ 5 at all ratios	--	--	--
	Core -3	Back up protection	30VA	5P	20	--	--	--	--
L	66KV CT Type-3d Core -1	Distance/ Differential Scheme	--	PS	--	--	1400V at 800/1A	5 Ohm at 800/1A	30mA at Vk/4
	Core -2	Metering	10VA	0.2S	--	≤ 5 at all ratios	--	--	--
	Core -3	Back up protection	30VA	5P	20	--	--	--	--
M	66KV CT								

	Type-3e Core -1	Differential	-	PS	--	-	1200V at 1000/1A	6 Ohms at 1000/1A	30mA at Vk /4
	Core -2	Metering	10 VA	0.2S	-	≤5 at all ratios	-	--	--
	Core-3	Back-up protection	30VA	5P	20	-	-	-	-
N	66KV CT Type-3f Core -1	Differential	-	PS	--	-	2100V at 1200/1A 1400V at 800/1A	7.5 Ohms at 1200/1A	30mA at Vk/4
	Core -2	Metering	10 VA	0.2S	-	≤5 at all ratios	-	--	--
	Core-3	Back-up protection	30VA	5P	20	-	-	-	-
O	66KV CT Type-3g Core -1	Differential Scheme	--	PS	--	-	1200V at 400/1A 600V at 200/1A 300V at 100/1A	4 Ohm at 400/1A 2 Ohm at 200/1A 2 Ohm at 200/1A	30mA at Vk/4
	Core -2	Metering	10VA	0.2S	20	≤ 5 at all ratios	--	--	--
	Core -3	Back up protection	30VA	5P	--	--	--	--	--
P	33KV CT Type-4 Core -1	Differential Scheme	--	PS	--	-	240V at 400/1A	5 Ohm at 400/1A	30mA at Vk/4

	Core -2	Metering	10VA	0.2S	--	≤ 5 at all ratios	--	--	--
	Core -3	Back up protection	30VA	5P	20	--	--	--	--
Q	33KV CT Type-4a								
	Core -1	Metering	10VA	0.2S	--	≤ 5 at all ratios	--	--	--
	Core -2	Protection	30 VA	5P	20	--	--	--	--