

Guaranteed Technical Particulars (GTP) of Protection, Control & Metering Cubicle

SN	Description	Unit	Requirement	Guaranteed Data
1	General			
1.1	Enclosure Standard of reference		IEC 61439-1-2	
1.2	Installation		Free Standing Floor Mounted	
2	Cubicle			
2.1	Frame and Door Manufacturer		Rittal/Equivalent	
2.2	Origin of Frame and Door		Germany/Italy/ EU/Equivalent	
2.3	Origin of Screws, Bolts and Hinges		Germany/Italy/ EU/Equivalent	
2.4	Steel Grade of Sheet, Frame and Door		Cold Rolled Sheet Steel, SAE 304	
2.5	Panel or Cubicle Type		Swing Frame Type and Welding Free	
2.6	Sheet Thickness	mm	≥ 3mm for weight bearing members, ≥ 2mm for others	
2.7	Ingress Protection		IP54 or Better	
2.8	Gasket		NEMA 12/13, UL 50 and IEC 60529	
2.9	Gasket Material			
2.10	Enclosure Door Type		Glass for Front Door	
2.11	Panel Interior & Exterior Color		RAL7032	
2.12	Swing Frame Swing Angle	deg	≥ 120	
2.13	Glass Door Swing Angle	deg	180	
3	Terminal Block			
3.1	Country of Origin		Germany/Italy/EU/Equivalent	
3.2	Manufacturer's Name		Phoenix Contact/WAGO/Equivalent	
3.3	Standard		IEC 60947-7-1, IEC 60998, and utility best practices	
3.4	Terminal Block for Grounding			
3.4.1	Type		Pick-off terminal	
3.4.2	Connection Method		Screw connection	
3.4.3	Nominal cross section	mm ²	35	
3.4.4	Model		AZK 35 or Equivalent	
3.4.5	Current Rating	A	100	
3.4.6	Spare Terminal	%	20	
3.5	Terminal Block for Main AC & DC			
3.5.1	Type		Feed-through	
3.5.2	Connection Method		Spring-cage	
3.5.3	Nominal cross section	mm ²	10	
3.5.4	Model		ST-10 or Equivalent	
3.5.5	Voltage Rating	kV	0.8/2	
3.5.6	Current Rating	A	50	
3.6	Terminal Block for Distribution AC & DC			
3.6.1	Type		Feed-through	
3.6.2	Connection Method		Spring-cage	
3.6.3	Nominal cross section	mm ²	2.5	
3.6.4	Model		ST-2.5 or Equivalent	
3.6.5	Voltage Rating	kV	0.8/2	
3.6.6	Current Rating	A	10	
3.6.7	Spare Terminal	%	20	
3.7	Terminal Block for CT & VT			

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3.7.1	Type		Disconnect with shorting facility	
3.7.2	Connection Method		Screw connection	
3.7.3	Nominal cross section	mm ²	6	
3.7.4	Model		URTK/S or Equivalent	
3.7.5	Voltage Rating	kV	0.8/2	
3.7.6	Current Rating for CT TB	A	10	
3.8	Terminal Block for Control			
3.8.1	Type		Knife-disconnect	
3.8.2	Connection Method		Screw connection	
3.8.3	Nominal cross section	mm ²	4	
3.8.4	Model		UDK 4-MTK-P/P or Equivalent	
3.8.5	Voltage Rating	kV	0.6/1	
3.8.6	Current Rating	A	10	
3.8.7	Spare Terminal	%	20	
4	Wiring Cable			
4.1	Local Manufacturer's Name		Poly Cables/Equivalent	
4.2	Global Manufacturer's Name		Nexans/Helukabel/Far East/Baosheng/Equivalent	
4.3	Country of Origin		Bangladesh/China/Germany/Equivalent	
4.4	Standard		IEC 60228 Class 5, IEC 60332	
4.5	Conductor Material & type		Flexible Copper	
4.6	Insulation Material		FRLSH(preferable)/FRLS/LSZH	
4.7	Temperature Rating	°C	90	
4.8	Flame Retardance		IEC 60332-1, IEC 60332-3, IEEE 1202, BS 4066	
4.9	Smoke & Halogen Emission		IEC 61034, IEC 60754	
4.10	Wiring Cable for Grounding			
4.10.1	Voltage Rating	V	300/500	
4.10.2	Conductor Size	mm ²	6.0	
4.10.3	Color Code		Green+Yellow	
4.11	Wiring Cable for Main AC & DC			
4.11.1	Voltage Rating	V	600/1000	
4.11.2	Conductor Size	mm ²	6.0	
4.11.3	Color Code		Brown-Blue	
4.12	Wiring Cable for Distribution AC & DC			
4.12.1	Voltage Rating	V	600/1000	
4.12.2	Conductor Size	mm ²	2.5	
4.12.3	Color Code		Brown-Blue	
4.13	Wiring Cable for CT & VT			
4.13.1	Voltage Rating	V	600/1000	
4.13.2	Conductor Size for CT Circuit	mm ²	2.5	
4.13.3	Conductor Size for VT Circuit	mm ²	2.5	
4.13.4	Color Code		Red-Yellow-Blue-Black	
4.14	Control Cable			
4.14.1	Voltage Rating	V	600/1000	

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SN	Description	Unit	Requirement	Guaranteed Data
4.14.2	Conductor Size	mm ²	1.5	
4.14.3	Color Code		Grey	
4.14.4	Color Code for TRIP		Orange	
5	Mimic Indicator			
5.1	Type		Whole Supply / Custom Made with Components	
5.2	Country of Origin		Germany/Italy/EU/Equivalent	
5.3	Indication Lamp			
5.3.1	Type		LED Type	
5.3.2	Manufacturer's Name		Schneider/ABB/ComElectric/Domo/Gave/ Equivalent	
5.3.3	Country of Origin		EU/Equivalent	
5.3.4	Voltage Rating		As per design requirement	
5.4	Push Button			
5.4.1	Manufacturer's Name		Schneider/Siemens/ABB/Eaton/Honeywell/Equivalent	
5.4.2	Country of Origin		EU/Equivalent	
5.4.3	Voltage Rating		As per design requirement	
5.4.4	Spare Contact	%	10	
5.5	Control Switch			
5.5.1	Type		Discrepancy Type	
5.5.2	Manufacturer's Name		Schneider/Siemens/ABB/Eaton/Honeywell/Equivalent	
5.5.3	Country of Origin		EU/Equivalent	
5.5.4	Voltage Rating		As per design requirement	
5.5.5	Spare Contact	%	10	
5.6	Selector Switch			
5.6.1	Selector Positions		As per design requirement	
5.5.2	Manufacturer's Name		Schneider/Siemens/ABB/Eaton/Honeywell/Equivalent	
5.5.3	Country of Origin		EU/Equivalent	
5.5.4	Voltage Rating		As per design requirement	
5.5.5	Spare Contact	%	10	
5.7	Muti Function Meter (MFM)			
5.7.1	Type		3P4W 3 Line Display	
5.7.2	Manufacturer's Name		As per design approval	
5.7.3	Country of Origin		Reputed Country	
5.7.4	Accuracy Class		0.5	
5.7.5	Current Rating		1A/5A	
5.7.6	Voltage Rating	V	100-200	
5.7.7	Communication		Modbus RTU/TCP-IP	
5.8	Volt Meter			
5.8.1	Type		1/3 Line Display	
5.8.2	Manufacturer's Name		As per design approval	
5.8.3	Country of Origin		Reputed Country	

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SN	Description	Unit	Requirement	Guaranteed Data
5.8.4	Accuracy Class		0.5	
5.8.5	Voltage Rating	V	100-200	
5.9	Ammeter			
5.9.1	Type		1/3 Line Display	
5.9.2	Manufacturer's Name		As per design approval	
5.9.3	Country of Origin		Reputed Country	
5.9.4	Accuracy Class		0.5	
5.9.5	Current Rating		1A/5A	
5.10	Annunciator			
5.10.1	Type		Test, Set, Reset, Acknowledgement with Buzzer	
5.10.2	Manufacturer's Name		Omniflex/ABB/Mikro/Equivalent	
5.10.3	Country of Origin		Reputed Country	
5.10.4	Voltage Rating		110V/220V DC	
5.10.5	Window Size		As per design requirement	
6	Panel Accessories			
6.1	AC and DC Breaker			
6.1.1	Manufacturer's Name		ABB/Siemens/Schneider/Equivalent	
6.1.2	Country of Origin		Germany/EU/Equivalent	
6.1.3	Rated Current		As per design requirement	
6.1.4	Auxiliary Contact		≥ 1	
6.2	Lockout Relay			
6.2.1	Type		Heavy Duty Electrical Reset with Indication	
6.2.2	Manufacturer's Name		ABB/Siemens/Schneider/Artech/Equivalent	
6.2.3	Country of Origin		Germany/France/Spain/EU/Equivalent	
6.2.4	Tripping Time	ms	≤ 10	
6.2.5	Making Current	A	≥ 20	
6.2.6	Breaking Current	A	≥ 5	
6.2.7	Spare Contact	%	≥ 10	
6.2.8	Voltage Rating		As per design requirement	
6.3	Trip Relay			
6.3.1	Type		Heavy Duty	
6.3.2	Manufacturer's Name		ABB/Siemens/Schneider/Artech/Equivalent	
6.3.3	Country of Origin		Germany/France/Spain/EU/Equivalent	
6.3.4	Tripping Time	ms	≤ 10	
6.3.5	Making Current	A	≥ 20	
6.3.6	Breaking Current	A	≥ 5	
6.3.7	Spare Contact	%	≥ 10	
6.3.8	Voltage Rating		As per design requirement	
6.4	DC Changeover Relay			
6.4.1	Type		Heavy Duty	
6.4.2	Manufacturer's Name		ABB/Siemens/Schneider/Artech/Equivalent	

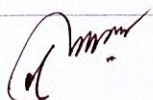
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SN	Description	Unit	Requirement	Guaranteed Data
6.4.3	Country of Origin		Germany/France/Spain/EU/Equivalent	
6.4.4	Operating Time	ms	≤ 10	
6.4.5	Spare Contact	%	≥ 10	
6.4.6	Voltage Rating	V	As per design requirement	
6.4.7	Voltage Operating Range	%Un	As per design requirement	
6.5	Trip Circuit Monitoring Relay			
6.5.1	Type		Pre Close and Post Close with internal resistor	
6.5.2	Indication		Phase wise LED	
6.5.3	Manufacturer's Name		ABB/Siemens/Schneider/Artech/Equivalent	
6.5.4	Country of Origin		Germany/France/Spain/EU/Equivalent	
6.5.5	Spare Contact	%	≥ 10	
6.5.6	Voltage Rating	V	As per design requirement	
6.6	Auxiliary Relay			
6.6.1	Type		High Burden	
6.6.2	Purpose		Changeover, Supervision, Signal Multiplication	
6.6.3	Indication		LED or Mechanical Flag	
6.6.4	Manufacturer's Name		Phoenix Contact/ABB/Siemens/Schneider//Equivalent	
6.6.5	Country of Origin		Germany/France/Spain/EU/Equivalent	
6.6.6	Operating Time	ms	≤ 15	
6.6.7	Spare Contact	%	≥ 10	
6.6.8	Voltage Rating	V	As per design requirement	
6.7	Multiplier Relay			
6.7.1	Type		Low Burden and Manually Operable	
6.7.2	Purpose		Signal Multiplication	
6.7.3	Base		With Locking Mechanism	
6.7.4	Indication		Yes	
6.7.5	Manufacturer's Name		Phoenix Contact/ABB/Siemens/Schneider/ /Equivalent	
6.7.6	Country of Origin		Germany/France/Spain/EU/Equivalent	
6.7.7	Operating Time	ms	≤ 15	
6.7.8	Spare Contact	%	≥ 10	
6.7.9	Voltage Rating	V	As per design requirement	
6.8	Test Block			
6.8.1	Purpose		Secondary Testing	
6.8.2	Manufacturer's Name		GE/Siemens/Schneider/Artech/Equivalent	
6.8.3	Country of Origin		France/Germany/Spain/EU/Equivalent	
6.8.4	Contact		14	
6.9	Heater			
6.9.1	Manufacturer's Name		Rittal/Civaux/Stego/ Equivalent	
6.9.2	Country of Origin		Germany/Spain/EU/Equivalent	
6.9.3	Voltage & Power Rating		250V AC, 50W	

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SN	Description	Unit	Requirement	Guaranteed Data
6.10	Thermostat & Hygrostat			
6.10.1	Manufacturer's Name		Rittal/Rose/Civau/ Equivalent	
6.10.2	Country of Origin		Germany/Spain/EU/Equivalent	
6.10.3	Voltage Rating		240V AC	
6.10.4	Activation Mechanism		Temperature and Humidity	
6.10.5	Temperature Setting Range	°C	15-45	
6.10.6	Humidity Setting Range	%	70-95	
6.11	Power Socket			
6.11.1	Type		3 pin UK	
6.11.2	Manufacturer's Name		Rittal/Civau/Stego/ Equivalent	
6.11.3	Country of Origin		Germany/Spain/EU/Equivalent	
6.11.4	Voltage & Current Rating		240V AC, 10A	
6.12	Panel Lamp			
6.12.1	Manufacturer's Name		ABB/Siemens/Schneider/Equivalent	
6.12.2	Country of Origin		EU/Equivalent	
6.12.3	Voltage & Power Rating		240V AC, 5W LED	
6.12.4	Activation Mechanism		with limit switch	
6.13	Panel Duct			
6.13.1	Manufacturer's Name		ABB/Siemens/Schneider/Legrand/ Equivalent	
6.13.2	Country of Origin		EU/Equivalent	
6.13.3	Material		PVC	
6.14	Ferrule			
6.14.1	Materials		Rubber or PVC type	
6.14.2	Marking		Cross Ferrule	
6.14.3	Print		Two line print with permanent ink	
6.15	Earthing Bus			
6.15.1	Earthing Bus Material		Copper	
6.15.2	Earthing Bus Size	mm	25 × 6	
6.16	Louver			
6.16.1	Type		With Filter	
6.16.2	Manufacturer's Name		Reputed Manufacturer	
6.16.3	Country of Origin		Germany/EU/Equivalent	
6.16.4	Voltage Rating	V	230V AC, 50/60Hz	
6.17	Louver Fan			
6.17.1	Manufacturer's Name		Reputed Manufacturer	
6.17.2	Country of Origin		Germany/EU/Equivalent	
6.17.3	Voltage Rating	V	230V AC, 50/60Hz	
6.17.4	Power	W	10~30	
6.17.5	Noise	dB	≤ 50	
6.18	Wire Termination			
6.18.1	Type		Solderless crimping type tinned copper lugs	
7	Main Protection Relay		Selected as per PSLD, GTP and Approved Vendor List	

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Annexure 2.1

The Contractor may propose cubicle from local manufacturer (assembler) other than OEM of Relay, SAS, DFDR & Energy (Tarrif) meter fulfilling with below mentioned criteria:

- a) Manufacturer (assembler) shall have valid ISO 9001 certification.
- b) Manufacturer (assembler) shall have at least 10 years of Panel manufacturing experience for Control, Protection & Metering.
- c) Manufacturer (assembler) shall have at least 30nos of complete Control/Protection Panels (132kV and above) incorporating protective relays from one or more of the following OEMs: Hitachi/ABB (Switzerland/Sweden), Schneider/Areva/Alstom/GE (France/UK/US), Siemens (Germany), NR Electric (China) and SEL (USA/UK/Canada) within the last 10 years.
- d) A valid Authorization Letter from the Main Relay manufacturers permitting the assembler to supply fully assembled Control, Protection, and SAS Panels using the relays mentioned in above clause (c) along with Employer-approved scheme drawings.
- e) Evidence from end users confirming satisfactory operation of at least 10 complete Control/Protection Panels (132kV and above) for a minimum of three (3) years, either outside or inside the Employer's country.
- f) The assembler must have test facilities to perform required tests of complete Control, Protection, and SAS Panels, DFDR & Metering Panels using calibrated test equipment meeting in the form of FAT/Routine/factory test in compliance with the Power Grid's standard practice. The assembler shall have sufficient test Engineer certified by relay manufacturer.

Note: Above criteria shall have to confirm during detail design and execution stage of the contract before manufacturing.

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