

1	2	3	4	5	6	7	8	9	10	11	12
Sl. No.	Item	Description	UOM	HSN/SAC Code	Qty/ RMU	Total Required Quantity (A)	Unit Rate (B)	GST (%)	GST (INR) (C)	Gross Unit Rate (D=B+C)	Gross Price (E=A*D)
	Nos. of RMU Sites		100								
A	Pre-Wired FRTU Panel										
1	Pre-Wired FRTU Panel with FRTU	Pre-Wired FRTU Panel FRTU Redundancy : Optional I/O Requirement: with 48 DI, 16 DO, 8 AI with Auxiliary relay for each Digital Input & Output Communication Ports per FRTU : 2 Nos. Ethernet ports/CPU (Both the ports should support IEC 104, IEC 61850 & other standard protocols for Communication with Control center and substation IEDs), 2 Nos. RS 485 electrical ports for communication with serial devices over MODBUS (Serial) protocol in the FRTU. Power supply: Redundant 24 V +/- 10% Supply with MCBs with add-on NO contact Protocols : IEC 60870-5-104, IEC 61850 (ED1, ED2), RSTP, MODBUS (Serial & TCP/IP), SNMP (V1.0, V2.0, V3.0), NTP & SNTP, MQTT Software Licenses: RTU OS, Application Software, Configuration tools, Diagnostic tools. Logic building Application-Interlock logic, Calculation Package, Application Software Licenses with 200 Physical I/O tags, 5 IEDs - IEC61850 (ED1, ED2), 5 IEDs - Serial Protocol, RTU shall Communicate to Eight Independent Remote SCADA Master on IEC 60870-5-104 Mounting: To be supplied with prewired panel (Reputed make panel, IP Class : IP55/65/67) Wall/floor mounted Other Accessories: Interface Modules, Pre-fabricated cables for I/O modules, Auxiliaries Relays for Power Supply monitoring, MCBs for all type of Power Supplies This FRTU should suffice 4 way RMU automation requirement and same can be used for 3 way as well, without any modification All connector shall be harting plug type (16 PIN 5 Plugs for 4 way RMU, 1 plug for each bay and 1 plug for comman signal) FRTU which are having PLC, protocol convertor are excuded and Processor in built protocol shall be inculed. FRTU shall have single database configuration	No. / Site	1	75		18%	-	-	-	
	Sub Total of FRTU System										-
B	Contact Multiplier Relay with Mounting Base										
1	CMR with Mounting Base for Digital Inputs	Contact Multiplier Relay with Mounting Base: 1. Contact Material : Silver Alloy 2. Contact Rating : 5 Amps. @ 24 V DC +/- 10% 3. Contact Resistance : 50 Mohms max. (Initial) 4. Dielectric Strength : i) Between open contacts : 500 V RMS ii) Between Contact and Coil : 2000 V RMS 5. Insulation Resistance : 500 Mohms @ 500 V DC, 250 C 6. Operate time at Nominal Voltage : 20 milli seconds 7. Release time at nominal Voltage : 10 milli seconds 8. Ambient temperature : -40°C to +70°C 9. Life expectancy : i) Mechanical : 20 million DC Relay ii) Electrical : More than 100,000 Operations 10. Coil Resistance at Nominal Voltage (DC) : 30,000 Ohms +10% at 250°C 11. Type of Contact Multiplier : 1 NO + 1 NC with LED Indicator + Free wheeling 12. Type of mounting : DIN RAIL MOUNTING WITH SOCKET 13. No. of Poles : 1 NO + 1 NC 14. Other Accessories: Necessary TB, Din rail channel and other accessories	Nos./ Site	48	480		18%	-	-	-	
	Sub Total of Contact Multiplier Relay with Mounting Base										-

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	Nos. of RMU Sites		100								
C	Interposing Relay with Mounting Base for Digital Output										
1	Interposing Relay for Digital Output	Interposing Relay with Mounting Base for Digital Output 1. Auxiliary Power. : 24 V DC +/- 10% 2. Input signal from field : 24 V DC +/- 10% 3. Input impedance : More than 50 Kohms 4. Output signal of the RTU : 24 V / 48 V DC 5. Contact mechanism : Self Reset 6. Contact Make & Carry : 30 A for 3 Sec. & 5A continuously at 660V 7. Number of Contacts : 2 NO with LED Indicator + Free wheeling 8. Operating time : Less than 15 msec. 9. Other Accessories: Necessary TB, Din rail channel and other accessories	Nos./ Site		16	1200		18%	-	-	-
	Sub Total of Interposing Relay with Mounting Base										-
D	Battery Charger & Battery										
1	Battery Charger	Battery Charger : 1. Charger Input Voltage : Single phase (2 wire) voltage 250V AC +30% to -20%, Frequency 50Hz ± 5%. 2. Constant Voltage and Current limiting charger. Charger with inbuilt battery health monitoring is highly preferable. 3. Battery & charger Alarms : Potential free contacts must be available to integrate with SCADA for abnormality if any. Most preferred alarms are like: AC supply fail , DC supply fail, Battery Low, Battery Fail, Battery Charger fail, Battery polarity reverse. Serial Communication is preferred. 4. Charger current : 10 Ampere 5. Efficiency : Not less than 85% at full rated load 6. Current limit : 110% of rated load 7. Regulation : ± 1% 8. Insulation : Not less than 5 mega Ohms. 9. Protection : AC input MCCB & ELBS with input ON/OFF switch and fuses/ contactor.DC output MCCB with output ON/OFF switch and fuses.Current limit protection, soft start feature, surge suppressor.	Nos./ Site		1	75		18%	-	-	-
2	Battery	Battery: 1. Voltage : 24 VDC specified at 27 deg.C. 2. Battery Type : SMF, VRLA with chargers of conventional type 3. Voltage/cell : 12 Volts 4. Capacity of Batteries : 42 AH,10 Amps 5. Connecting cables : Cable size selection should provide the lowest voltage Drop possible between battery system and operating Equipment. 6. Method of charging : Constant voltage method and current limit(variable Current) 7. Efficiency : Not less than 90% at full rated load	Nos./ Site		2	150		28%	-	-	-
	Sub Total of Battery Charger & Battery										-

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		Nos. of RMU Sites	100								
E	4G Modem cum Router										
1	4G Modem cum Router	4G Modem cum Router: 1. 5G Fall back to 4G/3G/2G 2. Modem should support multiband connectivity with FDD 5G & TDD 5G 3. Support Band 1,3,5,8,40 and Band 48. 4. Cellular interface : Cellular modem should have dual SIM provision for network redundancy /backup . Dual SIM operation ensures that the cellular connection is always available. It will automatically disconnect the 1st SIM card's low/weak cellular connection and will reconnect to establish a stronger connection using the 2nd SIM card. 5. Network Protocols : TCP/IP ,UDP/IP, HTTP, ARP,DHCP, ICMP, SNMP, V1/V2 & V1, NTP, SSL/TLS 6. Routing : Astatic Routing, RIP 1 & 2 ,OSPF V2 & V1 7. VPN : Open VPN , IP Sec, L2TP, PPTP, GRE 8. Alarm Message : Device shall have alarm notification on SNMP trap 9. Management /Monitoring : Cellular modem should shall support Local / Remote management through web HTMLS , SSHP & Telnet- 4. It shall support monitoring through system logs & SNMP version V1/V2 & V3. Notification & command shall be possible over SMS. Firmware upgradation through Web, backup & restore of configuration shall be possible. 10. SCADA Protocols : IEC 104 –104 Master – Multi Slave Mode: The modem should be capable to reading FRTUs in IEC60870-5-104 protocol and communicate with SCADA system on IEC 60870-5-104 protocol upto 8 masters. Adequate data interlock mechanisms should be implemented to avoid data loss. 11. No Of Antenna : The 5G Cellular modem Should have two antenna connection (MIMO).One is primary cellular antenna & second is diversity antenna(MIMO). Cable should have Low loss RF Cable with minimum 5M. Antenna Should be Omni directional with high gain (High gain ≥5). Power Supply : 24 V DC +/- 10% 12. Modem shall have inbuilt DI/DO to support hard rebooting of FRTU over SMS.	Nos. / Site		1	75		18%	-	-	-
	Sub Total of 4G Modem										-
F	Instrumentation Cable for Status, Control & Power Supply										
1	Instrumentation Cable 16 C X 0.5 mm2, Armored cable for Status and Indications	Instrumentation Cable for Status and Indications 16 C X 1.5 mm2, Armored, 1100 V Rated, Annealed Stranded Copper, PVC insulated, Overall shielded field cable Preferred Make: CCI / FINOLEX / HAVELLS / Universal Cables / Incab / Asian Cable / KEI / Polycab / Ruchika/Equivalent	Meters/ Site		50	3750		18%	-	-	-
2	Instrumentation Cable 7 C X 1.5 mm2, Armored for Control Output	Instrumentation Cable for Control Output 7 C X 1.5 mm2. Armored, 1100 V Rated, Annealed Stranded Copper, PVC insulated, Overall shielded field cable Preferred Make: CCI / FORT GLOSTER / FINOLEX / HAVELLS / Indian aluminum Cables / Universal Cables / Incab / Asian Cable / KEI / Polycab / Ruchika/Equivalent	Meters/ Site		0	0		18%	-	-	-

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	Nos. of RMU Sites		100								
3	Twisted Pair Shielded & Over all shielded Instrumentation Cable 5 P X 1.0 mm2, Armored for Analog Input	Twisted paired Shielded & Overall Shielded Cable for Analog Inputs 2 P X 0.5 mm2, Armored, Copper twisted paired and Overall shielded cable for Analog inputs from CRP/Field panel to the RTU panel Preferred Make: CCI / FORT GLOSTER / FINOLEX / HAVELLS / Indian aluminum Cables / Universal Cables / Incab / Asian Cable / KEI / Polycab / Ruchika//Equivalent	Meters/ Site		10	750		18%	-	-	-
4	4 C X 2.5 mm2 Copper cable for extension of CT & PT	Control Cable for CT & PT Extension & AC supply to FRTU 4 C X 2.5 mm2, multistrand copper cable for extending CT & CVT inputs to the MFM in the CRP panel. Preferred Make: CCI / FORT GLOSTER / FINOLEX / HAVELLS / Indian aluminum Cables / Universal Cables / Incab / Asian Cable / KEI / Polycab / Ruchika/Prime//Equivalent	Meters/ Site		20	1500		18%	-	-	-
	Sub Total of Instrumentation Cable for Status, Control & Power Supply										-
G	Communication Cable for MFM, IEDs Integration										
1	4P X 0.36 mm2, Armored Communication Cable for MFM	Communication Cable: 4 P X 0.36 mm2 Armored multistrand Pair and Overall shielded, for Multifunction Meter looping. Preferred Make : Belden/LAPP/SATYAM/KEC/Digisol/Polycab/Parashield	Meters/ Site		0	0		18%	-	-	-
2	Armored CAT6 SFTP Cable	Armored CAT6 SFTP Cable Preferred Make : Systemax/Finolex/Polycab/Digisol	Meters/ Site		0	0		18%	-	-	-
3	Un-Armored CAT6 SFTP Cable	Un-Armored CAT6 SFTP Cable Preferred Make : Systemax/Finolex/Polycab/Digisol	Meters/ Site		0	0		18%	-	-	-
	Sub Total of Communication Cable for MFM, IEDs Integration										-

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		Nos. of RMU Sites	100								
H		Multi Function Meter									
1	Multi Function Meter	Multi Function Meter: Requirement : For all 33 & 11 KV Feeders, Bus Voltages (33 & 11 kV), Station Trf, ACDB Multifunctional 3-phase Power meter, four quadrant active and reactive energy polyphase static meter Form Factor: 96 X 96 mm Accuracy Class: 0.2 S as per IEC62053:22 Voltage Inputs: Operating range : 690 V AC line-to-line, 460 V AC line-to-neutral Current Inputs: 1A / 5A (User selectable CT secondary 1A / 5A, PT Secondary) Wiring configurations: 3OP2, 4LN3, 3DIR2, 4LL3, 3OP3, 3LN3, 3LL3, 3BLN3, 3BLL3 (All wiring configurations selected via the front panel) Communication Port: RS 485 Serial Port with removable connector Protocols: MODBUS RTU, Device Address (User Configurable - (1-247)) Auxiliary Supply: 18-72 V DC (24 V DC) Other Accessories: Necessary TB, Din rail channel and other accessories for flash mounting in RMU Preferred Make: Reputed Make	Nos./ Site		1	0		18%	-	-	-
		Sub Total of Multi Function Meter									-
		Grand Total Supply (A+B+C+D+E+F+G+H)									-
I		Services for FRTU Panel, Communication and Other Supplied System									
1	Services of FRTU Panel, Communication and Other Supplied System	Integration and Commissioning FRTU System a) Site Survey, Design, Engineering, Finalization of BOM, FDS b) Transportation, Delivery, Unloading and Storage c) Installation and Commissioning of Pre-wired FRTU Panel, Networking equipment & other Accessories d) Civil Activities for Installation of FRTU panel e) Cable laying, termination and continuity check of all cables (Instrumentation, Communication & Power cables) f) Integration of all Protection, MFm, and other IEDs. g) Powering up of all supplied materials h) Configuration of FRTU and its accessories i) I/O testing, Pre- SAT testing of Hardware and Software functionality j) Integrated FAT & SAT for Hardware and Software k) Integrated testing with Purchaser's SCADA System l) Demonstration of System Capacity and Performance Guarantee Test m) Submission of As-Built Drawings, FRTU Backup	Lumpsum / Site		1	75		18%	-	-	-
		Total of Services (I)									-
		Grand Total (Supply + Services)									-
J		Training (10 Man-days of Trainer)									
1	Training	On-site Training on Supplied equipment and Application Software	Man-days			10		18%	-	-	-

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		Nos. of RMU Sites	100								
		Total of Training									-
		Grand Total (Supply + Services + Training)									-
K		Mandatory Spares									
1	Mandatory Spares (Unit Cost to be utilised for addition/ deletion of quantity as per site requirement)	FRTU Chassis	No.		-	0		18%	-	-	-
2		CPU Module of the FRTU	No.		-	10		18%	-	-	-
3		Power Supply Module of the FRTU	No.		-	10		18%	-	-	-
4		Memory Module of the FRTU	No.		-	0		18%	-	-	-
5		Communication Module (Ethernet)	No.		-	10		18%	-	-	-
6		Communication Module (Serial)	No.		-	10		18%	-	-	-
7		DI Cards with Interface Module & Cables for Digital Inputs	Sets		-	10		18%	-	-	-
8		DO Cards with Interface Module & Cables for Digital Output	Sets		-	10		18%	-	-	-
9		AI Cards with Interface Module & Cables for Analog Inputs	Sets		-	5		18%	-	-	-
11		Any Other Modules Specific to OEM Solution	Lot		-	1		18%	-	-	-
12		Managed Ethernet Switch - FRTU	No.		-	0		18%	-	-	-
13		CMR Relay with Base	No.		-	20		18%	-	-	-
14		HDR Relay with Base	No.		-	20		18%	-	-	-
15		Battery Charger	No.		-	10		18%	-	-	-
16		Multi Function Meter	No.		-	0		18%	-	-	-
		Total of Mandatory Spares									-
		Grand Total (Supply + Services+ Training + Mandatory Spares)									-