

SCHEDULE- F
GUARANTEED PARTICULARS

F.1 Schedule of GTP for Outdoor RMU

01.	Manufacturer's Name and Country of origin	C-sec Technologies Private LTD., India	
02.	Manufacturer's Design/Type/Model	11kV SF6 RMU Type: CSGIK	
03.	Material used for making the body of the RMU	Main Tank-SS 304 Outer enclosure-GI Sheet	
04.	Standards of manufacturing	IEC 62271-1, IEC 62271-100, IEC 62271-102, IEC 62271-103, IEC 62271-200	
05.	Whether painting for RMU is done as per standards	Yes	
06.	Whether the enclosure is anti-corrosive	Yes, painted GI sheets are used for enclosure	
07.	Whether RMU metal clad has sufficient space for integration of: - Load Break Switches and SF6/Vacuum Circuit breaker - Sufficient space for inspection, testing, etc. - Earthing arrangements - Terminal output points for automation - Sufficient arrangement for future extension with Circuit Breakers	Yes	
08.	Maximum withstanding ambient temperature	50°C	
09.	Spacing between live parts to earth	Spacing between Live part to earth in LBS cable compartment - Phase to earth-71mm (Center line of phase to earth) Phase to phase-111 mm (Center line of phase to phase) VCB cable compartment - Phase to earth-98mm (Center line of phase to earth) Phase to phase-126 mm (Center line of phase to phase) Insulating boots are provided in Cable compartment.	
10.	Whether RMU are designed to withstand all weather conditions including chemical industry and polluted areas	Yes	
11.	Over all dimensions of the RMU (L x W x H) (Specify for each type and configuration)	Item	LXWXH in mm
		R-R-R-R-R	2685X845X1942
		R-R-R-R-L	2765X845X1942
		R-R-R-L-L	2845X845X1942

		R-R-L-L-L	2925X845X1942
		R-R-R	1875X845X1942
		R-R-L	1955X845X1942
12.	Material & Gauge of material used for fabrication of the RMU” Specify separately for Inner enclosure i.e Main tank housing switchgear and breakers, Outer enclosure and marshalling cabinet.	Tank- SS, 3mm Outer Enclosure and Marshalling cabinet- GI, 2mm	
13.	Whether RMU is manufactured as per IEC/IS standards to hold SF6 gas without leakage	Yes	
14.	Whether RMU has provision for sensors for temperature compensated pressure measurement in the relevant gas compartment to monitor the pressure of SF6 gas	Yes	
15.	Whether RMU is sealed pressure system	Yes	
16.	Maximum leakage rate of SF6 gas (% per year)	Less than 0.1% per year	
17.	Weight of RMU complete with operating mechanism (Specify for each type and configuration)	Item	Weight(Approx.)
		R-R-R-R-R	1000 kg
		R-R-R-R-L	1100 kg
		R-R-R-L-L	1150 kg
		R-R-L-L-L	1250 kg
		R-R-R	650 kg
		R-R-L	750 kg

F.2 Schedule of GTP for BREAKER

01.	Manufacturer's Name and Country of origin	C-sec Technologies Private Ltd., India
02.	Manufacturer's Design / Type ref/Model.	11kV SF6 RMU Type: CSGIK
03.	Material used for making the body of the breaker	SS (Tank act as body of the breaker)
04.	Standards of manufacturing	IEC-62271-1, IEC-62271-100
05.	Whether the breakers are manufactured as per IEC/IS standards Please give Standards no.	Yes, IEC-62271-1, IEC-62271-100
06.	Maximum withstanding ambient temperature	50°C
07.	1)Spacing between live part to Earth inside the breaker 2)Spacing between poles	1) Live part to earth-40 mm (inside SF6 gas tank) 2) Spacing between poles-115 mm (Center line of phase to phase)
08.	Rated frequency	50 Hz
09.	Rated voltage	11 kV
10.	Highest system voltage	12 kV
11.	Rated current	630A
12.	Short time current rating with duration	21kA for 3 sec.
13.	Certificate or report of short circuit type test	furnished
14.	Rated operating duty cycle	O-0.3 sec-CO-3min-CO
15.	Short circuit breaking current (a)Symmetrical (b)Symmetrical at rated voltage (c)Asymmetrical at rated voltage (i)Per Phase (ii)Average (d)DC Component	21kA 21kA 21kA 21kA ≤ 34 %
16.	Arcing time (At rated breaking current) in ms.	<15ms
17.	Opening time	25-60ms
18.	Total break time in milli sec. (a)At 10% rated interrupting capacity (b)At rated interrupting capacity	25-60ms 25-60ms
19.	Breaking Current (a)Rated out of phase current (b)Rated cable charging current (c)Rated fault level MVA	25% of 21kA (As per clause-4.106 of IEC 62271-100) 25A 400 MVA

	(d)Rated capacitor breaking current	400A
20.	Make time in ms.	25-60ms
21.	Maximum temperature rise over ambient (a)Main contacts Terminals	Temperature rise shall be within limit as per Table no. 14 of IEC 62271-1
22.	Rated re-striking voltage at 100% and 50% rated capacity. (a)Amplitude factor (b)Phase factor (c)Natural frequency (d)R.R.R.V.(Volts/micro sec.)	1.4 First pole to clear factor-1.5 50 Hz 0.34 kV/μs
23.	Dry 1 minute power frequency withstand test voltage (a)Between line terminal and earth kV RMS (b)Between terminals with breaker contacts open kV RMS.	28kV 32kV
24.	1.2/50 full wave impulse withstand test voltage (a)Between line terminal and earth kVp. (b)Between terminals with breaker contacts open kVp.	75 kVp 75 kVp
25.	VCB interrupter make	CG Power/Wuhan/BEL
26.	Contact separation distance	8-10mm
27.	Type of main contacts	Butt
28.	Contact pressure	210 - 230 KgF
29.	Contact resistance	25 μΩ
30.	Life of the interrupter (in number of operations) (i)Tripping at rated current (ii)Tripping at maximum fault current. (Allowable maximum erosion 3 mm) (iii)Mechanical operations.	10,000 30 10,000
31.	Details of main contacts making contact with the breaker truck with the panel	Making contacts are inside the Vacuum Interrupter and made of Cu-Cr alloy
32.	Control circuit voltage AC/DC.	24VDC
33.	Whether trip free or not	Yes (Trip free)
34.	Whether all the interlocks provided	Yes

F.3 Schedule of GTP for Load Break Switches

Sl.No.	Description	Load Break Switch	Isolator (Earthing Switch)
01.	Manufacturer's Name and Country of origin	C-sec Technologies Private Ltd., India	C-sec Technologies Private Ltd., India
02.	Manufacturer's Design / Type ref/Model.	11kV SF6 RMU Type: CSGIK	
03.	Material used for making the body of the isolators.	SS (Tank act as body of the Isolator)	
04.	Standards of manufacturing	IEC-62271-103	IEC-62271-102
05.	Whether the isolators & earth positions are manufactured as per IEC/IS standards	Yes	Yes
06.	Maximum temperature withstand ambient of the isolators & earth switches	50 Deg.C	50 Deg.C
07.	1) Spacing between live part to Earth 2) Spacing between fixed and moving contacts in the open position.	1)- In cable Compartment - 71mm (Center line of phase to earth) Insulating boots are provided 2)- 89mm (in SF6 environment)	
08.	Period of guarantee of the isolators	60 months from the date of commissioning or 66 months from date of supply whichever occurs first	
09.	Rated frequency	50 Hz	50 Hz
10.	Rated voltage	11 kV	11 kV
11.	Highest system voltage	12 kV	12 kV
12.	Rated current	630A	630A
13.	Short time current rating with duration	21kA for 3 sec	21kA for 3 sec
14.	Certificate or report of short circuit type test	Yes	Yes
15.	Rated operating duty cycle	Not Applicable for LBS	Not Applicable for Earth Switch
16.	Short circuit breaking current	NA	NA
17.	Arcing time (At rated breaking current) in ms.	< 15 ms	NA
18.	Opening time	< 1800 ms	NA
19.	Whether all the interlocks provided	Yes	Yes
20.	Whether Sufficient arrangements are made to operate the isolators through DAS	Yes	NA
21.	Fault passage indicator 1)Type/Model 2)Self powered Yes/No 3)Current readings 4)Fault currents 5)Phase currents	CSFPI Yes, Inbuilt Battery Yes, Current reading starts from 50A (internally) Earth Fault-40-60-80-100A ,Time setting-40-500ms in 20 ms steps Phase fault-200-300-500-625A,100A ,Time setting-40-500ms in 20 ms steps	

F.4 Schedule of GTP for CURRENT TRANSFORMERS

01.	Manufacturer's Name and country of origin	NPT /Vidyut
02.	Manufacturer's design ref / model	Ring type, Resin cast
03.	Applicable Standards	IS:2705
04.	1)Type of CT 2)Ratio	Epoxy resin cast CT LBS-400-200/1A VCB-50/1A
05.	Rated Primary current	For LBS -400-200 For VCB -50
06.	Rated secondary current	1A
07.	Rated frequency	50 Hz
08.	Transformation ratio	For LBS -400-200/1A, For VCB-50/1A
09.	Number of cores	LBS -Single core CT- Metering VCB-Single core CT- Metering VCB VCB-Single core CT- Protection VCB
10.	Rated output (a) For Core-I	For LBS & VCB -Metering core -2.5VA For VCB- Protection core -2.5VA
11.	Class of insulation	E
12.	Class of accuracy For Protection For Metering	5P20 for Protection 0.2s for Metering
13.	Short time current rating and its duration	21kA for 3sec.
14.	Secondary resistance at 70 Deg°C	50/1A-<0.6 Ω for 0.2s 50/1A-<0.5 Ω for 5P20 400-200/1A-<5-2.5 Ω for 0.2s
15.	Continuous over load (percentage)	20%
16.	One minute power frequency dry withstand voltage	3kV
17.	1.2/50 micro sec. impulse withstand test voltage	As per IS2705(PART1):1992 CL-6.7 Table 1A For CT designed up to 0.66kV impulse withstand test is not required However CT connected to bushing through primary conductor as cable
18.	One minute power frequency withstand test voltage on secondary	3kV
19.	Instrument safety factor	LBS CT-400-200-Metering For 400 $\leq$ 15,For200 $\leq$ 10 VCB-50/1A-Meterng core $\leq$ 10
20.	Type of primary winding	Cable acts as primary
21.	Literature/leaflets pamphlets about the current transformer offered	Yes

F.5 Schedule of GTP for Numerical protection relays

01.	Manufacturer's Name and country of origin		C&S Electric Ltd / Ashida, India
02.	Manufacturer's design / Ref. Type		CSDPR-V2-500/ADR 241S
03.	Applicable Standards		IEC-60255
04.	Current Setting range for		
	(a) Over current relay	IDMT	10-250%
		Definite Time	10-250%,0.1-150s
	(b) Earth fault Element	IDMT	5-250%
		Definite Time	5-250%,0.05-150s
05.	Whether the relay has the in-built facilities of IDMT, OL, EL		Yes
06.	Details of IDMT Characteristics		DEFT/VINV/EINV/NI/LI
07.	Accuracy for different settings and limits of errors		Overcurrent-1st Stage-0.1-2.5xIn,Step-0.01xIn Overcurrent-2nd Stage-0.5-30xIn,Step-0.05xIn EarthFault-1st Stage-0.05-2.5xIn,Step-0.01xIn EarthFault-2nd Stage-0.5-15xIn,Step-0.05xIn Phase unbalance pickup-5-80%,Step-1% DMT- $\pm 5\%$ of setting value or $\pm 40\text{ms}$ IDMT-Accuracy as per IEC-255-3 (2xIs to 20xIs) For VINV/NINV/RI: $\pm 5\%$ or $\pm 40\text{ms}$ For LINV/EINV/HV-Fuse: $\pm 7.5\%$ or $\pm 60\text{ms}$ Measuring accuracy-Range-1-30xIp- $\pm 2\%$ Pick up accuracy+5%
08.	Whether Alpha numeric / LED display		LCD DISPLAY, LED for faults
09.	Whether compatible for 1 A CT Secondary		Yes
10.	Whether draw out type		No
11.	Types of case		Metal Enclosure ,Plastic bezel with Flush mounting design

12.	Reset time	< 40 ms
13.	Burden of relay	2.5 VA
14.	Maximum and Minimum, operating ambient air temp.	-25 °C to +60 °C