

SCHEDULE-F

GUARANTEED PARTICULARS

F.1 Schedule of GTP for Outdoor RMU

01.	Manufacturer's Name and Country of origin	Manufacturer's Name :Lucy Electric India Private Limited Country of origin : India
02.	Manufacturer's Design/ Type / Model.	11kV SF6 Ring Main Unit, Type: AEGIS 12kV
03.	Material used for making the body of the RMU	Main Tank : Stainless steel Outer enclosure: GI sheets
04.	Standards of Manufacturing	IEC 60265-1, IEC 62271-100,IEC 62271-200, IEC 62271-102, IEC 62271-103
05.	Whether painting for RMU metal RMU is done as per standards	Yes
06.	Whether the enclosure is anti-corrosive	Yes, Galvatite sheets are used for Outer enclosure
07.	Whether the RMU metal clad has sufficient space for integration of b) Load Break Switches and SF6/Vacuum Circuit breaker. e) Sufficient space for inspection, testing, etc. f) Earthing arrangements g) Terminal output points for automation h) Sufficient arrangement for future extension with circuit Breakers	Yes Yes Yes Yes Yes
08.	Maximum withstanding ambient temperatures	50 Deg C
09.	Spacing between live parts to Earth	Clearance in cable compartment A) With insulating boots. Phase To Phase: 95mm (Center to Center) Phase To Earth: 36mm minimum B) Without insulating boots Phase to Earth – 80mm (Center to Center)
10.	Whether the RMU are designed to withstand the in all weather conditions including Chemical industry and polluted area	Yes

11.	Over all dimensions of the RMU (L x W x H)(Specify for each type and configuration)	Item	Lx W x H(approx)in mm
		R-R-R-R-R	2239 x 721 x 2156
		R-R-R-R-L	2239 x 721 x 2156
		R-R-R-L-L	2239 x 721 x 2156
		R-R-L-L-L	2239 x 721 x 2156
		R-R-R	1650x 721 x 2156
		R-R-L	1650x 721 x 2156
		Tolerance: $\pm 2\%$ Height is 2156 mm due to additional frame of 300 mm which is provided for accomodating CTs (both metering and protection) since due to lower ratios the axial length of the CT's are higher.	
12.	Material & Gauge of the Material used for the fabrication of the RMU" Specify separately for inner enclosure such that main tank housing switchgear & breakers, outer enclosure & Marshaling cabinet	3 mm Stainless Steel for Main Tank, 2mm GI Sheet for RMU including marshaling cabinet	
13.	Whether the RMU is manufactured as per IEC/IS standards to hold SF6 gas without leakage	Yes	
14.	Whether the 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 the 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 in kg with metering (approx)
		R-R-R-R-R	980kg
		R-R-R-R-L	1000kg
		R-R-R-L-L	1050kg
		R-R-L-L-L	1100kg
		R-R-R	740kg
		R-R-L	775kg

F.2 Schedule of GTP for Breaker

01.	Manufacturer's Name and Country of origin	Manufacturer's Name :Lucy Electric India Private Limited Country of origin : India
02.	Manufacturer's Design/ Type ref/ Model.	11kV SF6 Ring Main Unit , Type: AEGIS 12kV
03.	Material used for making the body of the Breaker	Main Tank : Stainless steel
04.	Standards of Manufacturing	IEC 62271-100, IEC 62271-102
05.	Whether the breakers are manufactured as per IEC/ IS standards Please give standard No.	Yes IEC 62271-100,IEC 62271-102
06.	Maximum temperature withstand of the breakers	50 Deg C
07.	1. Spacing between live part to Earth inside the breaker 2. Spacing between poles	1. Phase To Phase: 95mm minimum Phase To Earth: 60mm minimum 2. Inside gas compartment, distance between contacts for on and off position – 91.2 mm
08.	Rated frequency	50 Hz
09.	Rated Voltage	12 kV
10.	Highest system voltage	12 kV
11.	Rated current	630 Amps
12.	Short time current rating with duration	21KA rms for 3 seconds
13.	Certificate or report of short circuit type test	Enclosed
14.	Rated operating duty cycle	O- 3min - CO – 3min – CO
15.	Short circuit breaking current (a)Symmetrical (b)Symmetrical at rated voltage ©Asymmetrical at rated voltage (i)Per Phase (ii)Average (d)DC Component	21 kA rms for 3 sec 21 kA rms 21.3 kA rms 21.1 kA rms <35%
16.	Arcing time (At rated breaking current) in ms.	8 to 12 ms
17.	Opening time	< 2.5 Cycles
18.	Total break time in milli sec.	
	a. At 10% rated interrupting capacity	< 2.5 Cycles
	b. At rated interrupting capacity	< 2.5 Cycles
19.	Breaking Current	
	a. Rated out of phase current	21kA
	b. Rated cable charging current	25A
	c. Rated fault level MVA	400MVA approx
	d. Rated capacitor breaking current	400A

20.	Make time in ms.	<= 80 ms (Without considering actuator & spring charging time)
21.	Maximum temperature rise over ambient	
	a. Main contacts Terminals	59°C (As per temperature rise report)
22.	Rated restriking voltage at 100% and 50% rated capacity	
	a. Amplitude factor	1.4
	b. Phase factor	First pole to clear factor 1.5
	c. Natural frequency	50 Hz
	d. R.R.R. V. (Vcolts/ micro sec.)	0.34 kV/ms
23.	Dry 1 minute power frequency withstand test voltage	
	a. Between line terminal and earth KV RMS	28 kV rms
	b. Between terminals with breaker contacts open KV RMS	32 kV rms
24.	1.2/50 full wave impulse withstand test voltage	
	a. Between line terminals and earth kVp.	75 kVp
	b. Between terminals with breaker contacts open kVp	85 kVp
25.	VCB interrupter make	CGISPL (Model: VL-35352-17)
26.	Contact separation distance	CGL 6-8mm
27.	Type of main contacts	Butt Type
28.	Contact pressure	CGL 120-160kg
29.	Contact resistance	CGL <30 Micro-ohms
30.	Life of the interrupter (in number of operations)	
	i. Tripping at rated current	20,000 Nos.
	ii. Tripping at maximum fault current. (Allowable maximum erosion 3 mm)	30 nos.
	iii. Mechanical operations	30,000 Nos.
31.	Details of main contacts making contact with the breaker truck with the panel	Breaker is fixed type.Hence not applicable
32.	Control circuit voltage AC/DC	24V DC for Motors for motorized RMU
33.	Whether trip free or not	Trip Free for Closing
34.	Whether all the interlocks provided	Yes

F.3 Schedule of GTP for LOAD BREAK SWITCHES

Sr.No.	Description	Load Break Switch	Isolator (Earthing Switch)
01.	Manufacturer's Name and Country of origin	Manufacturer's Name :Lucy Electric India Private Limited Country of origin : India	
02.	Manufacturer's Design/ Type ref/ Model	11kV SF6 Ring Main Unit, Type: AEGIS 12kV	
03.	Material used for making body of the isolators	Main Tank : Stainless steel. Outer Enclosure: GI sheets.	
04.	Standards of manufacturing	IEC 62271-1, IEC 62271-103 IEC 60205-1 is not related to Load Break Switches, IEC 606094 is withdrawn and replace by IEC 62271-1.	IEC 62271-102 IEC 60129, IEC 606094 . These both standards are withdrawn and replace by IEC 62271-102 & IEC 62271-1 respectively.
05.	Whether the isolators & earth positions are manufactured as per IEC/ IS standards	Yes	Yes
06.	Maximum temperature with stand of the isolators & earth switches	50 Deg C	
07.	1. Spacing between live part to Earth 2. Spacing between fixed and moving contacts in the open position	1. Spacing between Live parts to Earth 60 mm (Center to Center) 2. Spacing between fixed & moving contacts in Open position :91.2 mm (Center to Center) Above dimensions are inside SF insulated gas tank	
08.	Period of guarantee of the isolators	5 Years from date of commissioning	
09.	Rated frequency	50 Hz	
10.	Rated voltage	12 KV	
11.	Highest system voltage	12 KV	
12.	Rated current	630Amps	
13.	Short time current rating with duration	21 KA for 3 Secs	
14.	Certificate or report of short circuit type test	Enclosed	
15.	Rated operating duty cycle	No operating duty cycle for LBS as per IEC 62271-103	
16.	Short circuit breaking current	630Amps	NA

17.	Arcing time (At rated breaking current) in ms.	Arcing time not applicable to LBS as per IEC 62271-103	
18.	Opening time	<=80 ms	
19.	Whether all the interlocks provided	Interlocks are provided for operator safety	
20.	Whether sufficient arrangements are made to operate the isolators through DAS	Yes	NA
21.	Fault passage indicator		
	1)Type/Model	1) CSFPI (C&S)/CGL31 (MUP)/ SICAM(Siemens)	NA
	2)Self powered Yes/No	2) Yes	NA
	3)Current readings	3) Yes	NA
	4)Fault currents	4) 40 to 100 A in 4 multiple steps	NA
	5)Phase currents	5) 200 to 625 A in 4 multiple steps	NA
		6) 40ms to 500ms In Steps of 20ms	NA
		7) 1/2/4/8 Hours	NA

F.4 Schedule of GTP for CURRENT TRANSFORMERS

01.	Manufacturer's Name and Country of origin	Manufacturer's Name : RATIO: 400-200/1A MAKE: G&M /NARAYAN POWERTECH/SHUBHADA POLYMER RATIO: 50/1A, CLASS: 0.2S MAKE: NARAYAN POWERTECH RATIO: 50/1A, CLASS: 5P20 MAKE: NARAYAN POWERTECH Country of Origin : India
02.	Manufacturer's design ref/ model	RCT
03.	Applicable Standards	IS 2705/IEC 61869
04.	1. Type of CT 2. Ratio	Epoxy Resin Cast, Ring type Metering: 400-200/1A for LBS & 50/1A for CB resp. Protection: 50/1A for CB
05.	Rated primary Current	400-200 & 50
06.	Rated Secondary Current	1Amps
07.	Rated frequency	50Hz
08.	Transformation ratio	400-200/1A & 50/1A
09.	Number of cores	1
10.	Rated output a. For Core – I	2.5VA
11.	Class of insulation	E or better
12.	Class of accuracy for Protection	5P20 for Protection & 0.2S for Metering
13.	Short time current rating and its duration	I _{th} = 21 kA for 3 Sec.
14.	Secondary resistance at 70 Deg °C	Secondary resistance at 70 Deg °C 50 /1 A, 2.5 VA, Cl. 5P20 - 0.3 Ohms 50 /1 A, 2.5 VA, Cl. 0.2S - 0.18 Ohms 200/1A - 2.0 Ohms & 400/1A - 3.9 Ohms
15.	Continuous over load (percentage)	20% Min
16.	One minute power frequency dry withstand voltage	3KV
17.	1.2/50 micro sec. impulse withstand test voltage	75KVp when mounted on cable with primary conductor as cable
18.	One minute power frequency withstand test voltage on secondary	3KV
19.	Instrument safety factor	ISF<=10 (for 400/1A/200/1A) & ISF<=20 (50/1A)
20.	Type of primary winding	Copper Bus bar bushing.
21.	Literature/ leaflets pamphlets about the current transformer offered	Yes

F.5 Schedule of GTP for Numerical Protection relays (Self Powered Relay)

01.	Manufacturer's Name and Country of origin	Manufacturer's Name: Ashida/C&S/Siemens Country of Origin : India
p02.	Manufacturer's Design/ Ref Type.	ADR241S/CSDPR-V2/7SR45
03.	Applicable standards	IEC60255
04.	Current Setting range for a. Over current relay IDMT b. Earth faults relay Definite Time	IDMTL Setting : Overcurrent :10% to 200% (insteps of 1%) t>:0.1-150s In Steps of 0.01 & ti>: 0.01-1.500 In Steps of 0.005 DMT Setting : Earth fault : 10% to 80% (insteps of 1%) te>:0.05-150s In Steps of 0.01s & tie>: 0.01-1.500 In Steps of 0.005 Highset setting : Overcurrent : 100% to 2000% (insteps of 100%) t>>: 0.03-20s In Steps of 0.01s; Earth fault: 100% to 1200% (insteps of 100%) te>>:0.04-20s In Steps of 0.01s
05.	Whether the relay has the in-built facilities of IDMT, OL, EL	Yes
06.	Details of IDMT Characteristics	NINV,VINV,EINV,LINV,DT
07.	Accuracy for different settings and limits of errors	Within class 5 in line with IEC60255
08.	Whether Alpha numeric/ Led display	Yes, Alpha numeric LCD display & LED indications
09.	Whether compatible for 1 A CT Secondary	Yes
10.	Whether draw out type	Fixed type
11.	Types of case	Flush type
12.	Reset time	As per mfg. std. C&S – < 40 msec Ashidha – <50 msec Siemens -< 50msec
13.	Burden of relay	Less than 2.5VA
14.	Maximum and Minimum operating ambient air temp.	-25 deg C to 60 deg C