

Technical data sheet for low voltage MCC

General		
1.1	Project Name:	Beqtaqari concentrate plant
1.2	Country of destination:	Georgia
1.3	Main specification Doc. No.:	MCC design criteria
1.4	Related list of attachment	Attachement 1,2; SLD griding area
1.5	Switchgear Type	as per vendor standard
1.6	Communication protocol	Ethernet/IP for DCS, IEC 61850
1.7	Communication interface	RS485
1.8	Signal exchange described in	Attachement 1
INDIVIDUAL SITE CONDITIONS		
2.1	Individual site conditions	-
2.2	Location Type	indoor
2.3	Climatic condition - indoor	3K3 (Based on IEC 60721, no solar radiation)
2.4	Special climatic conditions	-
2.5	Classification of biological conditions	-
2.6	Classification of chemically active substances	-
2.7	Classification of mechanical conditions	-
2.8	Pollution (IEC 61439)	pollution degree 3 (industrial)
2.9	Altitude	< 1000m
2.10	EMC environment	Environment A
2.11	EMC compatibility level acc to. IEC 61000-2-4	class 3
2.12	Seismic zone	class 9
ELECTRICAL RATING OF SWITCHGEAR		
3.1	Type of neutral earthing	TN-S
3.2	System Nominal voltage (V)	380 V
3.3	Static voltage variation	±5%
3.4	Instantaneous voltage variation	±10%
3.5	Rated insulation voltage (Ui)	1000 V
3.6	Overvoltage Category	IV
3.7	Dielectric test voltage	3.5 kV
3.8	Impulse withstand voltage	12 kV
3.9	Rated frequency (fr)	50 Hz
3.10	Frequency variation	+/- 0.2 Hz (Normal) / +/- 0.4 Hz (Maximum)
3.11	Altitude correction to be considered	NO
3.12	Rated current (InA) (Incomer & Busbar)	2500 A
3.13	Rated diversity factor (assembly)	1.0
3.14	Power factor	compensated
3.15	Rated current (Inc) for (Feeders)	-
3.16	Rated diversity factor (vertical sections)	0.8
3.17	Prospective short-circuit current at supply terminals Icp (kA)	25 kA
3.18	Duration of Icp (tcp)	1 sec
3.19	Short circuit protective device (SCPD) to be included in the incoming unit & bus ties of the assembly	YES
3.20	Arc fault compliance to IEC 61641	YES
3.21	Arc fault current and duration	Icp and tcp to be considered
3.22	Data associated with loads likely to contribute to short circuit current	-

3.23	Rated voltage and frequency for (control and protection)	220V AC (24V DC for smart relays and HMIs)
3.24	Control voltage individually protected by MCB	per bus section
3.25	Auxiliary supply voltage:	
	- Space heater and panel illumination	220V AC
	- Contactors	220V AC
	- MCU / Soft Starter / VSD control supply	24 V DC, redundant (grounded minus) from AC UPS supply (at one point for each bus section)
	- ACB spring charging, closing and tripping indication, Numerical relays	220 V AC
3.26	Signal interface with DCS	as per attachment 1
3.27	Signal interface with Package Unit PLC	-

MECHANICAL DATA OF SWITCHGEAR AND GENERAL DESIGN

4.1	Number of cubicles	35
4.2	Manufacturer	ABB for the VFDs; Siemens for the smart
4.3	Type / Number	ACS880; Simocode
4.4	Dimension of Switchgear: Width Depth Height	as per vendor standard
4.5	Weight per cubicle / total	as per vendor standard
4.6	Waste heat per cubicle / total	as per vendor standard
4.7	Installation method	floor standing
4.8	Room floor design	concrete floor
4.9	Protection class (IP coding)	IP 41 (closed doors), IP 20 (open doors)
4.10	Painting	RAL 7037 (or other close to it)
4.11	Cabinet lights and convenience outlets	as per vendor standard
4.12	Cabinet space heaters	YES in cable connection compartments
4.13	Options:	Insulated busbars (to be considered)
	Operating arrangements	
4.14	Access to manually operated devices	authorized person
4.15	Location of manually operated devices	Easily accessible
4.16	Isolation of load installation equipment items	-

INCOMER

5.1	Number of feeders	2
5.2	Lettering	to be considered
5.3	Form of internal separation IEC 61439-2 Table 104	Form 3b
5.4	Dimension of Cubicle: Width Depth Height	as per vendor standard
5.5	Weight per cubicle	as per vendor standard
5.6	Power connection type / location	cable from top
5.7	Power connection conductor mat.	copper
5.8	Power connection quantity and size:	to be considered
5.9	Degree of Protection for bus ducts	IP55
5.10	Air break type circuit breaker Make: Type: Rating:	2500 A

5.11	Method of functional unit connection	W = withdrawable
5.12	CB No. of poles	4
5.13	Earthing facility inside of cable connection compartment	YES
5.14	Current transformers: measuring core 3 x 2500/1 A protection core 3 x 2500/1 A (Pfc only Phase L2) 1 x 25000/5 A	5 VA, 0.5 FS 5 5 VA, 5P 20 50 VA, 1 FS 5
5.15	Rated voltage and frequency for control and protection	220 V AC
5.16	Push buttons and selector switches	<input checked="" type="checkbox"/> ON; <input checked="" type="checkbox"/> OFF; <input checked="" type="checkbox"/> Lamp Test
5.17	Indication Lamps / LED's	<input checked="" type="checkbox"/> ON; <input checked="" type="checkbox"/> OFF; <input checked="" type="checkbox"/> Alarm; <input checked="" type="checkbox"/> Ready; <input checked="" type="checkbox"/> Trip;
5.18	Measuring & Protection for protection, monitoring, metering and control	YES
5.19	Instruments accuracy	class 0.2s
5.20	Separate mimic diagram on front of the switchgear required	No
5.21	Analogue instruments	Voltmeter with selector switch
5.22	Additional instruments	Power meter
BUS TIE		
6.1	Number of feeders	0
6.1	Lettering	to be considered
6.1	Form of internal separation IEC 61439-2 Table 104	Form 3b
6.1	Dimension of Cubicle: Width Depth Height	as per vendor standard
6.1	Power connection type / location	as per vendor standard
6.1	Air break type circuit breaker Make: Type: Rating:	2500 A
6.1	Method of functional unit connection	W = withdrawable
6.1	CB No. of poles	4 pole
6.1	Current transformers: measuring core 3 x 2500/1 A protection core 3 x 2500/1 A for overcurrent	5 VA, 0.5 FS 5 5 VA, 5P 20
6.1	Rated voltage and frequency for control and protection	220 V AC
6.1	Push buttons and selector switches	<input checked="" type="checkbox"/> ON; <input checked="" type="checkbox"/> OFF; <input checked="" type="checkbox"/> AUTO-MANUAL; <input checked="" type="checkbox"/> Lamp Test
6.1	Indication Lamps / LED's	<input checked="" type="checkbox"/> ON; <input checked="" type="checkbox"/> OFF; <input checked="" type="checkbox"/> Alarm; <input checked="" type="checkbox"/> Ready; <input checked="" type="checkbox"/> Trip
6.1	Analogue instruments	Voltmeter with selector switch
6.1	Measuring & Protection for protection, monitoring, metering and control	YES
6.1	Separate mimic diagram on front of the switchgear required	NO

6.1	Automatic Transfer System (ATS) Make: Type:	YES be protection relay
MOTOR – FEEDER		
7.1	Number of feeders	as per SLD griding area and consumer list
7.2	Applicable for	Motor Starters (FVNR / FVR,softstarter,VSD)
7.3	Applicable Typical Wiring diagrams	attachement 2
7.4	Method of functional unit connection	W = withdrawable
7.5	Form of internal separation IEC 61439-2 Table 104	Form 3b
7.6	Power connection type / location	cable compartment
7.7	Power connection conductor mat.	copper
7.8	Cable reduction factor for connection terminal co-ordination	0.4
7.9	Switching device	as per SLD
7.10	Periodic duty	Class 3 (up to three operating cycles per hour)
7.11	Control voltage	24 V DC for hmi and smart relay; 220V AC for the rest
7.12	Control Interface	MCU bus interface
7.13	Local control station interface	YES
7.14	Hardwired Interface to ESD or SIS	YES
7.15	Automatic reacceleration	-
7.16	Status indication	<input checked="" type="checkbox"/> RUN; <input checked="" type="checkbox"/> OFF; <input checked="" type="checkbox"/> Ready; <input checked="" type="checkbox"/> Fault
7.17	Measurement device	smart relay/VFD integrated
POWER FEEDER – SUB FEEDER		
8.1	Number of feeders	as per SLD griding area and consumer list
8.2	Applicable for	Power Feeders (FU, PUE, PUS)
8.3	Applicable Typical Wiring diagrams	attachement 2
8.4	Method of functional unit connection	W = withdrawable
8.5	Form of internal separation IEC 61439-2 Table 104	Form 3b
8.6	Power connection type / location	cable compartment
8.7	Power connection conductor mat.	copper
8.8	Cable reduction factor for connection terminal co-ordination	0.4
8.9	Switching device	as per SLD
8.10	Periodic duty	Not applicable
8.11	Control voltage	24 V DC for hmi and smart relay; 220V AC for the rest
8.12	Control Interface	conventional hardwired
8.13	Local control interface	NO
8.14	Hardwired Interface to ESD or SIS	YES
8.15	Automatic reacceleration	Not applicable
8.16	Status indication	<input checked="" type="checkbox"/> Ready; <input checked="" type="checkbox"/> Fault
8.17	Measurement device	as per vendor standard
POWER FACTOR CORRECTION CAPACITORS		
9.1	to be discussed later	