S. No	DESCRIPTION	Qty of RTU	MODBUS RS485	MODBUS TCP/IP	IEC 61850	DI	DO	AI	ВІ	во	Remark
1	132kV Switch Yard + MCR - SCADA (Type-A)	1	15	16	7	37	6	8	106	38	110kV Line CRP - 1No, PTR HV CRP - 1No, PTR LV CRP - 1No. 33kV Twin Feeder CRP - 1No. PSS Eqp - 1Set.
1 2	MCR Cum ICR (Type-B)	2	16	14	188	24	16	12	0	0	Land Parcel-1 & 2
1 3	ICR - SCADA (Type-C)	3	6	6	60	4	12	0	0	0	ICR - 3Nos.
	TOTAL	6	37	36	255	65	34	20	106	38	

UBJEC			H PARTNER ENERGY PRIVATE LIMITED IO List - PSS - Type-A											
DATE		: 19.02.20	225	D		N/CD=	DAGS	,=-						
S No	Device Description	Qty	Signal Description	Protocol Type	Sub Type	RS485	MODBUS TCP/IP	IEC 61850	DI	DO	AI	ВІ	во	Remarks
В			SUPERVISORY COI	ontrol Room (STITON (SCA	ADA)							
1	110kV CR / Engineering Work Station (EWS)		All Modbus Registers available on mapping sheet	Modbus RTU	TCP/IP		1							Redundant
3	110kV CR / Operator Work Station (OWS) 110kV CR / GPS		All Modbus Registers available on mapping sheet All Modbus Registers available on mapping sheet	Modbus RTU Modbus RTU	TCP/IP TCP/IP		1							Redundant
4	110kV CR / CCTV Rack		All Modbus Registers available on mapping sheet	Modbus RTU	TCP/IP		1							
5	110kV CR / Printer	1	All Modbus Registers available on mapping sheet	Modbus RTU	TCP/IP		1							
6 7	110kV CR / Firewall 110kV CR / SLDC		All Modbus Registers available on mapping sheet All Modbus Registers available on mapping sheet	Modbus RTU Modbus RTU	TCP/IP TCP/IP		1							Redundan
8	110kV CR / WMS		All Modbus Registers available on mapping sheet	Modbus RTU	TCP/IP		1							
9	110kV CR / PMU (Phasor Measurement Unit)	1	All Modbus Registers available on mapping sheet	Modbus RTU	TCP/IP		1							Future Purpo
10	PQM	3	All Modbus Registers available on mapping sheet	Modbus RTU	TCP/IP		3							110kV Line Fee 33kV Feede
11	SAS / LILO	1	All Modbus Registers available on mapping sheet	Modbus RTU	TCP/IP		0							
		ı		OKV LINE BAY /	' CRP		ı		I	ı	ı	ı	T	ı
12	110kV CRP Line / ANNUNCIATOR	1	LINE DIFFERNTIAL OPTD. SOTF. OPTD. PBS (POWER SWING BLOCKING) OPTD. COMMUNICATION FAIL AUTO RECLOSE OPTD. AUTO RECLOSE LOCAK OUT MANI PROTECTION RELAY FAIL OVER CURRENT / EARTH FAULT OPTD. LINE PT FUSE FAIL BUS PT FUSE FAIL BUS PT FUSE FAIL BACKUP PROTECTION OPTD. SF6 GAS PRESSURE LOW ALARM SF6 GAS PRESSURE LOW LOCKOUT CB T/C-1 FAULTY CB T/C-2 FAULTY GP A (86A) & GP B(86B) MASTER TRIP RELAY OPTD. LINE DIFFERNTIAL FAULTY BCPU RELAY FAULTY LBB PROTECTION OPTD. LBB TRIP RELAY OPTD. AC POWER SUPPLY FAIL DC SOURCE-1 & 2 FAIL UNDER / OVER VOLTAGE ALARM	- Modbus RTU	RS485	1								
13	110kV CRP Line / TVM / ABT	1	kW Energy / Peak kVA Energy / Peak kVA Energy / Peak kWh Energy / Peak kWh Energy kVAh Energy kVAh Energy kWh Energy / Daily kVAh Energy / Daily kVAh Energy / Daily kVAh Energy / Daily kVAh Energy / Daily R PHASE VOLTAGE B PHASE VOLTAGE B PHASE VOLTAGE R PHASE CURRENT Y PHASE CURRENT Y PHASE CURRENT RY PHASE VOLTAGE BR PHASE VOLTAGE BR PHASE VOLTAGE BR PHASE VOLTAGE RY PHASE VOLTAGE RY PHASE VOLTAGE RY PHASE VOLTAGE REACTIVE POWER IMPORT ACTIVE POWER IMPORT REACTIVE POWER EXPORT TOTAL APPARENT POWER CUMULATIVE ENERGY - FORWARD KWH CUMULATIVE ENERGY - REVERSE KWH RY-PHASE VOLTAGE RY-PHASE VOLTAGE CUMULATIVE ENERGY - REVERSE KWH RY-PHASE VOLTAGE RY-PHASE VOLTAGE RY-PHASE VOLTAGE REACTIVE POWER EXPORT	Modbus RTU	RS485	1								
			RY-PHASE VOLTAGE YB-PHASE VOLTAGE BR-PHASE VOLTAGE R,Y,B-PHASE CURRENT ACTIVE POWER REACTIVE POWER POWER FACTOR FREQUENCY R- PHASE FAULT Y- PHASE FAULT B- PHASE FAULT R-PHASE ANGLE Y-PHASE ANGLE B-PHASE ANGLE											SOFT SIGNA
			CB OPEN Trip Relay-1 OPTD (86A) Trip Relay-2 OPTD (86B) CB MANUAL CLOSE A/R INITIATION (Auto Recloser) Trip Relay-1 FAIL (86A) Trip Relay-2 FAIL (86B) CB MANUAL TRIP A/R BLOCK SYN. PREMISSION OK 21LM-2 RELAY FAIL BPCU FAIL ARSS IN MAINS-1 (AUTO RECLOSE SELECTOR SWITCH) ARSS OFF LBB TRIP RELAY OPTD. (86LBB)											FROM RELAY

14	110kV CRP Line / Relay i. Numerical Multifunction Relay - 1 No. ii. Differential protection -1 No. iii. Numerical Bay Control & Protection Unit (BCPU) - 1 No.	CB CLOSE CB OPEN ISO -ON Status (101-89L - Position) ISO -E/S ON Status (101-89L - Position) ISO -E/S ON Status (101-89L - Position) ISO -E/S OFF Status (101-89L - Position) ISO -E/S OFF Status (101-89L - Interlock) ISO -E/S Interlock (101-89L - Interlock) ISO Remote Open (101-89L - Position) ISO Remote Close (101-89L - Position) ISO -ON Status (101-89A - Position) ISO -OFF Status (101-89A - Position) ISO -E/S ON Status (101-89A - Position) ISO -E/S ON Status (101-89A - Position) ISO -E/S OFF Status (101-89A - Position) ISO -E/S OFF Status (101-89A - Position) ISO -E/S OFF Status (101-89A - Position) ISO -ON Status (101-89B - Position) ISO -ON Status (BUS CVT-89A - Position) ISO -ON Status (BUS CVT-89A - Position) ISO -E/S ON Fatus (BUS CVT-89A - Position) ISO -E/S OFF Status (BUS CVT-89A - Position)	IEC	IEC 61850		3				FROM BPCU
		CB DC SUPPLY-1 FAIL CB DC SUPPLY-2 FAIL CB SPRING STATUS 86BB TRIP RELAY OPTD DC SUPPLY-1 FAIL DC SUPPLY-2 FAIL AC SUPPLY FAIL SPARE (NOT TO LIMITED) kW Energy / Peak								
15	110kV CRP Line / PQM	kVA Energy / Peak kVAr Energy / Peak kWh Energy kVAh Energy kVAh Energy kVArh Energy kWh Energy / Daily kVAh Energy / Daily kVAh Energy / Daily kVArh Energy / Daily R PHASE VOLTAGE Y PHASE VOLTAGE B PHASE VOLTAGE R PHASE CURRENT Y PHASE CURRENT Y PHASE CURRENT RY PHASE VOLTAGE BR PHASE VOLTAGE FREQUENCY POWER FACTOR	Modbus RTU	тср/ір	1					
		ACTIVE POWER IMPORT ACTIVE POWER EXPORT REACTIVE POWER IMPORT REACTIVE POWER EXPORT TOTAL APPARENT POWER CUMULATIVE ENERGY - FORWARD KVAH CUMULATIVE ENERGY - FORWARD KWH CUMULATIVE ENERGY - REVERSE KVAH CUMULATIVE ENERGY - REVERSE KWH								
16	110kV CRP Line / ISOLATOR-89L (With 1-Earth Switch)	ISO -ON Status (101-89L - Position) ISO -OFF Status (101-89L - Position) ISO -E/S ON Status (101-89L-E - Position) ISO -E/S OFF Status (101-89L-E - Position) ISO - (101-89L - Interlock) ISO -E/S Interlock (101-89L-E - Interlock) ISO Remote Open (101-89L - Position) ISO Remote Close (101-89L - Position)	BI BI BI - - BO BO	Hard wire				1 1 1 1 -	1 1	Directly Communicated to BCPU
17	110kV CRP Line / ISOLATOR-89A (With 1-Earth Switch)	ISO -ON Status (101-89A - Position) ISO -OFF Status (101-89A - Position) ISO -E/S ON Status (101-89A-E - Position) ISO -E/S OFF Status (101-89A-E - Position) ISO -Interlock (101-89A - Interlock) ISO -E/S Interlock (101-89A-E - Interlock) ISO Remote Open (101-89A - Position)	BI BI BI BI -	Hard wire				1 1 1 1 -	1	Directly Communicated to BCPU
18	110kV CRP Line / ISOLATOR-89B (Without Earth Switch)	1 ISO Remote Close (101-89A - Position) 1 ISO -ON Status (101-89B - Position) 1 ISO -OFF Status (101-89B - Position) 1 ISO -Interlock (101-89B - Interlock) 1 ISO Remote Open (101-89B - Position) 1 ISO Remote Close (101-89B - Position)	BO BI BI - BO BO	Hard wire Hard wire Hard wire Hard wire Hard wire Hard wire				1 1 -	1 1 1	Directly Communicated to BCPU

	T			1		1				1	-	
			ISO -ON Status (BUS CVT-89A - Position) ISO -OFF Status (BUS CVT-89A - Position)	BI BI	Hard wire					1		
			ISO -E/S ON Status (BUS CVT-89A - Position)	BI	Hard wire					1		
19	110kV CRP Line / ISOLATOR-89A CVT	1	ISO -E/S OFF Status (BUS CVT-89A -E - Position)	BI	Hard wire					1		Directly Communicated to
13	(With 1-Earth Switch)		ISO -Interlock (BUS CVT-89A - Interlock)	-	Hard wire					-		ВСРИ
			ISO -E/S Interlock (BUS CVT-89A -E - Interlock) ISO Remote Open (BUS CVT-89A - Position)	BO	Hard wire					-	1	
		1	ISO Remote Close (BUS CVT-89A - Position)	ВО	Hard wire						1	
			CB ON Status (52 - Position - ON)	BI	Hard wire					1		
			CB OFF Status (52 - Position - OFF) CB in Service (52 - Position - Service)	BI BI	Hard wire					1		
			CB in Test (52 - Position - Test)	BI	Hard wire					1		
			CB Master Trip-A (86A - Operated)	BI	Hard wire					1		
			CB Master Trip-B (86B - Operated) CB Trip Circuit - A (TC1 - Operated)	BI BI	Hard wire Hard wire					1		
			CB Trip Circuit - B (TC2 - Operated)	BI	Hard wire					1		
			CB Trip Circuit Healthy-A (TC1 - Supervision)	BI	Hard wire					1		
		1	CB Trip Circuit Healthy-B (TC2 - Supervision)	BI BI	Hard wire					1		Directly
20	110kV CRP Line / CB		CB Spring Charged CB Spring Status	BI	Hard wire					1		Communicated to BCPU
			General Lockout / Emergency Stop	BI	Hard wire					1		ВСРО
			Loss of SF6	BI	Hard wire					1		
			SF6 Pressure Lockout CB in Local	BI BI	Hard wire					1		
			CB in Remote	BI	Hard wire					1		
			DC SUPPLY-1 FAIL	BI	Hard wire					1		
			DC SUPPLY-2 FAIL AC SUPPLY FAIL	BI BI	Hard wire					1		
		1	CB Remote Open (52 - Remote Trip)	BO	Hard wire						1	
		1	CB Remote Close (52 - Remote Close)	ВО	Hard wire						1	
				110kV PTR BA	ıΥ							
			DIFF. PROTECTION OPTD. (87T)									
			51G HV OPTD. RACKUP PROTECTION OPTD	1								
			BACKUP PROTECTION OPTD. BUCH. TRIP	1								
			OTI TRIP]								
			WTI TRIP (HV+LV)	4								
			PRV / OLTC PRV TRIP OSR TRIP	1								
			AIRCELL PUNCHER TRIP	1								
			BUCH. ALARM	1								
			OLTC ALARM OLTC/MAIN MOG ALARM	1								
12	110kV CRP PTR/ ANNUNCIATOR	1	WTI ALARM (HV+LV)	1								
			SF6 LOW/SF6 LOCKUOT]								
			LBB PROTECTION OPTD. V/F ALARM/TRIP	-								
			64R HV OPTD.	1								
			CB TC-1/2 FAIL]								
			SPARE (DC SOURCE-1 FAIL (80DC1))	4								
			SPARE (DC SOURCE-1 FAIL (80DC2)) PROTECTION RELAY FAIL	1								
			CB AC SUPPLY FAIL									
			51G LV OPTD.]								
			64R LV OPTD. Buch. Relay - Trip	-								
			Buch. Relay - Alarm	1								
			OTI - Trip Status]								
			OTI - High Alarm Status	4								
	33kV MV Panel / ANNUNCIATOR (12W)		HV WDG. TRIP HV WDG. ALARM	1								
13	AUX. TRANSFORMER	1	LV WDG. TRIP]								
			LV WDG. ALARM	A A a dla ca PTU	BC405							
			PRV - Trip Signal MOG ALARM	Modbus RTU	RS485	1						
			FUSE FAILURE TRIP	1								
			SPARE]								
			kW Energy / Peak	-								
			kVA Energy / Peak kVAr Energy / Peak	1								
			kWh Energy									
			kVAh Energy	1								
			kVArh Energy kWh Energy / Daily	1								
			kVAh Energy / Daily	1								
			kVArh Energy / Daily	4								
			R PHASE VOLTAGE Y PHASE VOLTAGE	1								
			B PHASE VOLTAGE	1								
			R PHASE CURRENT	4								
13	110kV CRP PTR/ TVM	1	Y PHASE CURRENT B PHASE CURRENT	1								
			RY PHASE VOLTAGE]								
			YB PHASE VOLTAGE	-								
			BR PHASE VOLTAGE FREQUENCY	1								
			POWER FACTOR	1								
			ACTIVE POWER IMPORT	1								
			ACTIVE POWER EXPORT REACTIVE POWER IMPORT	1								
			REACTIVE POWER IMPORT	1								
			TOTAL APPARENT POWER									
			CUMULATIVE ENERGY - FORWARD KVAH CUMULATIVE ENERGY - FORWARD KWH	1								
			CUMULATIVE ENERGY - FORWARD KWH CUMULATIVE ENERGY - REVERSE KVAH	1								
			CUMULATIVE ENERGY - REVERSE KWH									
			HV CB OPEN	-								
			BUCHHOLZ TRIP OTI TRIP	1								
			WTI TRIP	1								
ĺ			PRV-1/PRV-2 TRIP	4								
ĺ			OSR TRIP	1								
			AIRCELL PLINCHER TRID		I	1		1			•	
			AIRCELL PUNCHER TRIP HV CB CLOSE CMD	1								
	110kV CRP PTR		HV CB CLOSE CMD LBB RELLAY OPTD.									
14	Numerical Multifunction Relay	1	HV CB CLOSE CMD LBB RELLAY OPTD. BB/LBB OPTD	IEC	IEC 61850		1					
14	1	1	HV CB CLOSE CMD LBB RELLAY OPTD. BB/LBB OPTD 87T, 24, 64R LV PROTN. OPTD.	IEC	IEC 61850		1					
14	Numerical Multifunction Relay	1	HV CB CLOSE CMD LBB RELLAY OPTD. BB/LBB OPTD	IEC	IEC 61850		1					
14	Numerical Multifunction Relay	1	HV CB CLOSE CMD LBB RELLAY OPTD. BB/LBB OPTD 87T, 24, 64R LV PROTN. OPTD. 87T, 24, PROTN. OPTD. DIFF. PROTECTION OPTD. DIFF. PROTECTION OPTD.	IEC	IEC 61850		1					
14	Numerical Multifunction Relay	1	HV CB CLOSE CMD LBB RELLAY OPTD. BB/LBB OPTD 87T, 24, 64R LV PROTN. OPTD. 87T, 24, PROTN. OPTD. DIFF. PROTECTION OPTD. DIFF. PROTECTION OPTD. 87T, 24, 64R LV PROTN. OPTD.	IEC	IEC 61850		1					
14	Numerical Multifunction Relay	1	HV CB CLOSE CMD LBB RELLAY OPTD. BB/LBB OPTD 87T, 24, 64R LV PROTN. OPTD. 87T, 24, PROTN. OPTD. DIFF. PROTECTION OPTD. DIFF. PROTECTION OPTD.	IEC	IEC 61850		1					
14	Numerical Multifunction Relay	1	HV CB CLOSE CMD LBB RELLAY OPTD. BB/LBB OPTD 87T, 24, 64R LV PROTN. OPTD. 87T, 24, PROTN. OPTD. DIFF. PROTECTION OPTD. DIFF. PROTECTION OPTD. 87T, 24, 64R LV PROTN. OPTD. DIFF. PROTECTION OPTD. DIFF. PROTECTION OPTD.	IEC	IEC 61850		1					

			BCU DC FAIL									
			BCU FAULTY									
			51G HV OPTD. 86-1 OPTD.									
			86-2 OPTD.									
	110kV CRP PTR		BB/LBB OPTD. LBB INITIATION									
15	Numerical Multifunction Relay	1	51G LV OPTD.	IEC	IEC 61850		1					
15	(PTR DIRECTIONAL PROTECTION) (67/67N) - 1	1	CB CLOSE 64R HV OPTD.	IEC	15C 01030		1					
	No		DIFF. RELAY OPTD.									
			B/U PROTECTION OPTD.									
			B/U PROTECTION RELAY FAULTY LBB RETRIP									
			LBB RELAY OPTD.									
			LBB OPTD.									
	110kV CRP PTR		51G HV OPTD.									
16	Numerical Multifunction Relay (PTR GROUND TIME OVERCURRENT	1										
	PROTECTION) (51G HV) - 1 No		51G HV RELAY FAULTY									
	110kV CRP PTR		64R HV OPTD.									
17	Numerical Multifunction Relay	1	04K NV OPID.									
	(PTR RESTRICTED EARTH FAULT PROTECTION) (64R HV) - 1 No		64R HV RELAY FAULTY									
-												
	110kV CRP PTR Numerical Multifunction Relay		51G LV OPTD.									
18	(PTR GROUND TIME OVERCURRENT	1										
	PROTECTION) (51G LV) - 1 No		51G LV RELAY FAULTY									
			CB CLOSE									
1			CB OPEN SUB-CIRCUIT DC SUPPLY FAIL									
			LBB OPTD.									
			MAIN MOG ALARM									
			OLTC MOG ALARM OTI ALARM									
			LOSS OF SF6									
			SF6 LOW LOCKOUT									
			CB AC SUPPLY FAIL									
			CB SPRING CHARGE 86-1 OPTD.									
			86-2 OPTD.									
			48V DC SUPPLY FAIL									
			51G HV OPTD.									
			64R HV OPTD. DIFF. RELAY FAULTY									
			B/U RELAY FAULTY									
			51G HV RELAY FAULTY									
			51G LV OPTD. 51G LV RELAY FAULTY									
			WTI ALARM (HV+LV)									
			DC SUPPLY -1 FAIL									
			DC SUPPLY -2 FAIL									
			AC SUPPLY FAIL CB TC-1 FAULTY									
			CB TC-2 FAULTY									
			89A ISO. I/L OK									
			89AE ISO. I/L OK DC FAIL ACCEPT									
			86-1 RESET									
19	110kV CRP PTR Numerical Bay Control & Protection Unit	1	86-2 RESET	IEC	IEC 61850		1					
	(BCU) - 1 No		CB CLOSE I/L OK CB CLOSE CMD									
1			CB CLOSE CMD CB TC TRIP CMD									
1			ANN. ACCEPT									
1			ANN. RESET ANN. TEST									
1			ISO -ON Status (102-89A - Position)									
1			ISO -OFF Status (102-89A - Position)									
1			ISO -E/S ON Status (102-89A-E - Position)									
1			ISO -E/S OFF Status (102-89A-E - Position) ISO -Interlock (102-89A - Interlock)									
			ISO -E/S Interlock (102-89A-E - Interlock)									
1			ISO Remote Open (102-89A - Position)									
1			ISO Remote Close (102-89A - Position) ISO -ON Status (102-89B - Position)									
			ISO -ON Status (102-89B - Position)									
			ISO -E/S ON Status (102-89B-E - Position)									
1			ISO -E/S OFF Status (102-89B-E - Position) ISO -Interlock (102-89B - Interlock)									
1			ISO -Interlock (102-89B - Interlock) ISO -E/S Interlock (102-89B-E - Interlock)									
1			ISO Remote Open (102-89B - Position)									
1			ISO Remote Close (102-89B - Position)									
			ISO -ON Status (301-89A - Position) ISO -OFF Status (301-89A - Position)									
			ISO -Interlock (301-89A - Interlock)									
1			ISO Remote Open (301-89A - Position)									
1			ISO Remote Close (301-89A - Position)									
1			ISO -ON Status (301-89B - Position) ISO -OFF Status (301-89B - Position)									
1			ISO -Interlock (301-89B - Interlock)									
1			ISO Remote Open (301-898 - Position)									
	1		ISO Remote Close (301-89B - Position)		1			L	<u> </u>	l		

			4-20mA Signal of OTI 4-20mA Signal of WTI (HV)							1			
			4-20mA Signal of WTI (HV) 4-20mA Signal of WTI (LV)	1						1			
			4-20mA Signal of TRIP]						1			
			TC in Progress	_							1 1		
			OLTC Control Supply Fail OLTC Motor Trip	1							1		
			OLTC Fail]							1		Directly
20	110kV RTCC PTR/ RTCC TMR Relay	1	Cooler in Remote Auto Cooler in Remote Manual	IEC	IEC 61850			1			1 1		Communicated to
			Cooler in Kemote Manual Cooler in Local Auto	1							1		TMR Relay
			Cooler in Local Manual]							1		
			OLTC in Local Mode OLTC in Remote Mode	-							1		
			Tap Raise	-							1	1	
			Tap Lower]								1	
			Out of Step	_								1	
+			Fan Control Running Fan Fail (Group - 1)										
			Running Fan Fail (Group - 2)]									
			Standby Fan Fail (Group - 1)	-									
			Standby Fan Fail (Group - 2) Cooler Supply Fail (Main)	-									
21	110kV RTCC PTR/ RTCC Annuncitor	1	Cooler Supply Fail (Satndby)	Modbus RTU	RS485	1							
	110KV KI CC I TIJ KI CC / KIII GIICKC	-	Cooler Control Supply Fail	- Modebus NYO	1.0-103	-							
			Supply Change-Over Transfer to Fail	1									
			OLTC Moto Trip]									
			OLTC Not of Stop	-									
-+			OLTC Out of Step ISO -ON Status (102-89A - Position)								1		
			ISO -OFF Status (102-89A - Position)	1							1		
	110kV CRP PTR / ISOLATOR	1	ISO -E/S ON Status (102-89A-E - Position)	1							1		Directly
22	(102-89A + 1ES)		ISO -E/S OFF Status (102-89A-E - Position) ISO -Interlock (102-89A - Interlock)	IEC	IEC 61850						-		Communicated to
			ISO -E/S Interlock (102-89A-E - Interlock)	1							-		BCPU
		1	ISO Remote Open (102-89A - Position)	1								1	
\rightarrow			ISO Remote Close (102-89A - Position) ISO -ON Status (102-89B - Position)								1	1	
			ISO -OFF Status (102-89B - Position)	1							1		
	110kV CRP PTR / ISOLATOR	1	ISO -E/S ON Status (102-89B-E - Position)								1		Directly
23	(102-89B + 1ES)		ISO -E/S OFF Status (102-89B-E - Position) ISO -Interlock (102-89B - Interlock)	IEC	IEC 61850						-		Communicated to
			ISO -E/S Interlock (102-89B-E - Interlock)	1							-		BCPU
		1	ISO Remote Open (102-89B - Position)	1								1	1
-+			ISO Remote Close (102-89B - Position) ISO -ON Status (301-89A - Position)								1	1	
	110W/CRR RTR / ISOLATOR	1	ISO -OFF Status (301-89A - Position)	1							1		Directly
24	110kV CRP PTR / ISOLATOR (301-89A)		ISO -Interlock (301-89A - Interlock)	IEC	IEC 61850						-		Communicated to
		1	ISO Remote Open (301-89A - Position) ISO Remote Close (301-89A - Position)	_							\vdash	1	ВСРИ
+			ISO -ON Status (301-898 - Position)								1		
	110kV CRP PTR / ISOLATOR	1	ISO -OFF Status (301-89B - Position)								1		Directly
25	(301-89B)		ISO -Interlock (301-89B - Interlock) ISO Remote Open (301-89B - Position)	IEC	IEC 61850							1	Communicated to BCPU
		1	ISO Remote Close (301-89B - Position)	1								1	·
			CB CLOSE Status (52 - Position - ON)								2		
			CB OPEN Status (52 - Position - OFF) CB Master Trip-A (86A - Operated)	1							2		
			CB Master Trip-B (86B - Operated)	1							2		
			CB Master Trip-Transformer Differential (87T - Operated)	-							2		1
			CB Trip Circuit Healthy-A (TC1 - Supervision) CB Trip Circuit Healthy-B (TC2 - Supervision)	1							2		1
			CB Spring Charged	1							2		
26	110kV CRP PTR / CB	2	Loss of SF6	IEC	IEC 61950						2		Directly
26	(PTR - HV & PTR - LV)		SF6 Pressure Lockout CB AC Supply Fail	IEC	IEC 61850						2		Communicated to BCPU
			AC Supply Fail	1							2		
			DC SUPPLY-1 FAIL	1							2		1
			DC SUPPLY-2 FAIL SUB-CIRCUIT DC SUPPLY FAIL	†							2		1
			CB in Local	1							2		1
			CB Remote Open (52 - Remote Trip)	1							2		1
		2	CB Remote Open (52 - Remote Trip) CB Remote Close (52 - Remote Close)	1								2	1
\top			Oil Temperature	4-20mA	Al					1			
27	110kV CRP PTR / MB	1	Winding temperature - HV	4-20mA	Al					1	\vdash		1
			Winding temperature - LV Tap Position Indication	4-20mA 4-20mA	AI AI					1			1
\top			OIL TEMPERATURE ALARM	DI	Hard wire				1				1
			OIL TEMPERATURE TRIP	DI	Hard wire				1		\vdash		1
			WINDING TEMPERATURE ALARM-HV WINDING TEMPERATURE TRIP-HV	DI DI	Hard wire Hard wire				1				1
			MAIN TANK MOG ALARM	DI	Hard wire				1				
			MAIN TANK PRV TRIP (PRV-1)	DI	Hard wire				1		\Box		
28	110kV PTR / RTCC	1	OLTC PRV TRIP (PRV-2) BUCHHOLZ ALARM	DI DI	Hard wire Hard wire				1				1
	, ==	•	BUCHHOLZ TRIP	DI	Hard wire				1				
			WINDING TEMPERATURE ALARM-LV	DI	Hard wire				1				
			WINDING TEMPERATURE TRIP-LV OCSR TRIP	DI DI	Hard wire Hard wire				1				1
			OLTC OIL LEVEL LOW ALARM	DI	Hard wire				1				
			AIRCELL FAIL ALARM	DI	Hard wire				1				1
\rightarrow			OLTC MOG ALARM System Out of Service	DI	Hard wire				1				
			PNRV/TCIV Closed	1									1
	440131.070 / 20070		Fire detector Trip		TCD ('-								1
29	110kV PTR / NIFPS	1	Cylinder pressure Low Visual / Audio Alarm	Modbus RTU	TCP/IP		1						1
			Visual / Audio Alarm Visual / Audio alarm for DC supply Fail	1									1
$\perp \perp$			NIFPS system Fail	1							igsquare		
			AC FAIL AC OV/UV	-]						(I		
I			CHARGER FAIL	†							1		1
			DC VOLTAGE LOW	1							(I		
	FLOAT CUM BOOST CHARGER (FCBC)			1				i I					
30	(BATTERY CHARGER)	1	DC VOLTAGE HIGH	Modbus RTU	RS485	1							
30		1		Modbus RTU	RS485	1							
30	(BATTERY CHARGER)	1	DC VOLTAGE HIGH O/P MCB TRIP	Modbus RTU	RS485	1							

				22111211111									
				33kV BAY / PS	S					ı			
			OVER CURRENT (OC) OPTD. EARTH FAULT (EF) OPTD.	+									
			UNDER VOLTAGE ALARM	1									
			OVER VOLTAGE ALARM]									
	2214/ Twin Line CDD / ANNUALCIATOR		BUS PT FUSE FAIL GP A (86A) MASTER TRIP RELAY OPTD.	_									
31	33kV Twin Line CRP / ANNUNCIATOR (Line-1 & 2 - 2 Nos.)	2	GP B(86B) MASTER TRIP RELAY OPTD.	Modbus RTU	RS485	2							
			CB T/C-1 FAULTY										
			CB T/C-2 FAULTY	4									
			AC POWER SUPPLY FAIL DC SOURCE-1 & 2 FAIL	1									
			SPARE										
			kW Energy / Peak	_									
			kVA Energy / Peak kVAr Energy / Peak	1									
			kWh Energy										
			kVAh Energy										
			kVArh Energy kWh Energy / Daily	-									
			kVAh Energy / Daily	1									
			kVArh Energy / Daily										
			R PHASE VOLTAGE Y PHASE VOLTAGE	-									
			B PHASE VOLTAGE										
			R PHASE CURRENT										
32	33kV Twin Line CRP / TVM (Line-1 & 2 - 2 Nos.)	2	Y PHASE CURRENT	Modbus RTU	RS485	2							
32	(Line-1 & 2 - 2 Nos.)		B PHASE CURRENT RY PHASE VOLTAGE	I WIOGDUS KTO	K3463	2							
			YB PHASE VOLTAGE]									
			BR PHASE VOLTAGE	1									
			FREQUENCY POWER FACTOR	†									
			ACTIVE POWER IMPORT	1									
			ACTIVE POWER EXPORT	4									
			REACTIVE POWER IMPORT REACTIVE POWER EXPORT	+									
			TOTAL APPARENT POWER										
			CUMULATIVE ENERGY - FORWARD KVAH	4									
			CUMULATIVE ENERGY - FORWARD KWH CUMULATIVE ENERGY - REVERSE KVAH	†									
			CUMULATIVE ENERGY - REVERSE KWH										
			MASTER TRIP RELAY OPERATED										
			INSTANTANEOUS O/C & E/F PROTECTION (50/50N) INVERSE TIME O/C & E/F PROTECTION (51/51N)	-									
			UNDER VOLTAGE PROTECTION (27)	†									
	33kV Twin Line CRP		OVER VOLTAGE PROTECTION (59)										
33	Numerical Multifunction Relay (BPCU)	2	DIRECTIONAL OVERCURRENT (67)	IEC	IEC 61850	2							
33	(Line-1 & 2 - 2 Nos.)	2	NEUTRAL DIRECTIONAL OVERCURRENT (67N) CIRCUIT BREAKER IN ON STATUS	- ""	IEC 01030	2							
			CIRCUIT BREAKER IN OFF STATUS]									
			CIRCUIT BREAKER IN TRIP STATUS	_									
			TCS SUPERVISION-1 (95) TCS SUPERVISION-2 (95)	-									
			TCS HEALTHY										
			VCB in Local	DI	Hard wire			2					
			VCB in Remote VCB ON Status	DI	Hard wire Hard wire			2					
			VCB OFF Status	DI	Hard wire			2					
		2	VCB Spring Charged	DI	Hard wire			2					
34	33kV Twin Line CRP (Line-1 & 2 - 2 Nos.)		VCB Master Trip Operated Input DC Supply Fail	DI DI	Hard wire Hard wire			2					
	, , , , , , , , , , , , , , , , , , , ,		Input AC Supply Fail	DI	Hard wire			2					
			TCS Healthy-1	DI	Hard wire			2					
			TCS Healthy-2 Remote Open	DI	Hard wire Hard wire			2	2				
		2	Remote Close	DO	Hard wire				2				
			ISO -ON Status (302-89L - Position)	1							1		
			ISO -OFF Status (302-89L - Position) ISO -E/S ON Status (302-89L-E - Position)	+							1		
35	33kV Twin Feeder CRP / ISOLATOR	1	ISO -E/S OFF Status (302-89L-E - Position)	IEC	IEC 61850						1		Directly Communicated to
33	(302-89L + 1ES)		ISO -Interlock (302-89L - Interlock)	'[150 01030						-		BCPU
			ISO -E/S Interlock (302-89L-E - Interlock) ISO Remote Open (302-89L - Position)	†							-	1	
		1	ISO Remote Close (302-89L - Position)	<u></u>								1	
			ISO -ON Status (303-89L - Position)	1							1		
			ISO -OFF Status (303-89L - Position) ISO -E/S ON Status (303-89L-E - Position)	+							1		
36	33kV Twin Feeder CRP / ISOLATOR	1	ISO -E/S OFF Status (303-89L-E - Position)	150	IEC 61950						1		Directly Communicated to
36	(303-89L + 1ES)		ISO -Interlock (303-89L - Interlock)	IEC	IEC 61850						-		Communicated to BCPU
			ISO -E/S Interlock (303-89L-E - Interlock) ISO Remote Open (303-89L - Position)	+							-	1	
		1	ISO Remote Open (303-89L - Position)	1	<u>L</u>			<u></u>	<u></u>	<u>L</u>		1	
			ISO -ON Status (302-89A - Position)								1		
37	33kV Twin Feeder CRP / ISOLATOR (302-89A)	1	ISO -OFF Status (302-89A - Position) ISO -Interlock (302-89A - Interlock)	IEC	IEC 61850						1 -		Directly Communicated to
"	(302-034)		ISO -Interlock (302-89A - Interlock) ISO Remote Open (302-89A - Position)	"	1.50 01030							1	BCPU
		1	ISO Remote Close (302-89A - Position)	1								1	
	22M/Twin Fooder CDD / ICC: 4700	1	ISO -ON Status (302-89A - Position)	1							1		Ding office
38	33kV Twin Feeder CRP / ISOLATOR (303-89A)	1	ISO -OFF Status (302-89A - Position) ISO -Interlock (302-89A - Interlock)	IEC	IEC 61850						-		Directly Communicated to
	•	1	ISO Remote Open (303-89A - Position)	1								1	ВСРИ
			ISO Remote Close (303-89A - Position)								4	1	
	33kV Twin Feeder CRP / ISOLATOR	1	ISO -ON Status (BUS PT-89A - Position) ISO -OFF Status (BUS PT-89A - Position)	†							1		Directly
39	(BUS PT-89A)		ISO -Interlock (BUS PT-89A - Interlock)	IEC	IEC 61850						-		Communicated to
		1	ISO Remote Open (BUS PT-89A - Position)	4								1	ВСРИ
			ISO Remote Close (BUS PT-89A - Position) ISO -ON Status (AUX TF-89A - Position)		 					 	1	1	
	33kV Twin Feeder CRP / ISOLATOR	1	ISO -OFF Status AUX TF-89A - Position)	1							1		Directly
40	(AUX TF-89A)		ISO -Interlock (AUX TF-89A - Interlock)	IEC	IEC 61850						-		Communicated to
		1	ISO Remote Open (AUX TF-89A - Position) ISO Remote Close (AUX TF-89A - Position)	+								1	ВСРИ
			is a memore close (non 11-oun - Fusition)				L	 L	L				

				MCR/ PSS										
			kW Energy / Peak											
, [kVA Energy / Peak	_										
, [kVAr Energy / Peak											
			kWh Energy											
			kVAh Energy											
			kVArh Energy											
.			kWh Energy / Daily											
			kVAh Energy / Daily											
			kVArh Energy / Daily											
			R PHASE VOLTAGE											
			Y PHASE VOLTAGE											
			B PHASE VOLTAGE											
			R PHASE CURRENT											
			Y PHASE CURRENT											
41	ACDB-MFM	1	B PHASE CURRENT	Modbus RTU	RS485	1								
			RY PHASE VOLTAGE											
			YB PHASE VOLTAGE											
			BR PHASE VOLTAGE											
			FREQUENCY											
,]			POWER FACTOR											
,]			ACTIVE POWER IMPORT											
, 1			ACTIVE POWER EXPORT											
			REACTIVE POWER IMPORT											
, [REACTIVE POWER EXPORT											
			TOTAL APPARENT POWER											
			CUMULATIVE ENERGY - FORWARD KVAH											
			CUMULATIVE ENERGY - FORWARD KWH											
			CUMULATIVE ENERGY - REVERSE KVAH											
			CUMULATIVE ENERGY - REVERSE KWH											
			BATTERY VOLTAGE											
			BATTERY CURRENT											
			OUTPUT VOLTAGE											
			UPS LOAD											
			UPS TEMPERATURE											
42	10kVA UPS	1	UPS BACKUP TIME	Modbus RTU	RS485	1								
42	IONVA OF3	1	FREQUENCY	IVIOUDUS KTO	N3463	1								
			BATTERY LOW STATUS											
			MAINS FAIL STATUS											
			OVERLOAD STATUS											
			BYPASS MODE STATUS											
			BATTERY MODE STATUS											
			AC FAIL											
			AC OV/UV											
			CHARGER FAIL											
, 1	FLOAT CLIM BOOST CHARGER (ECRC)		DC VOLTAGE LOW											
43	FLOAT CUM BOOST CHARGER (FCBC) (BATTERY CHARGER) (110V/50A, 300Ah)	1	DC VOLTAGE HIGH	Modbus RTU	RS485	1								
, 1	(2.11 Ell Chandley (1104) 30A, 300All)		O/P MCB TRIP											
, [DC OVERLOAD											
, 1			BATTERY ON FLOAT MODE											
			BATTERY ON BOOST MODE											
44	EACD	1	All Modbus Pogistors available on manning short	Madhua DTU	DCASE	1								
44	FACP	1	All Modbus Registers available on mapping sheet	Modbus RTU	RS485	1								
\rightarrow			SOLAR INSOLATION HORIZONTAL (GHI)											
, 1			SOLAR INSOLATION TILTED (GII)	\dashv										
, 1			RAIN FALL	\dashv										
, 1			WIND SPEED (ANEMOMETER)	\dashv										
, 1			WIND DIRECTION	\dashv										
45	Weather Monitoring Station (WMS)	1	AMBIENT TEMPERATURE	Modbus RTU	TCP/IP		1							
, [MODULE TEMPERATURE	-										
, 1			AIR PRESSURE	-										
, [HUMIDITY	\dashv										
,]			SOILING STATUIN	\dashv										
\rightarrow			ON Status	DI	Hard wire				1					
, 1		1	OFF Status	DI	Hard wire				1					
46	ACDB / MCCB		Remote Open	DO	Hard wire					1				
,]		1	Remote Close	DO	Hard wire					1				
			memore close	_										
					Γotal IO List	15	16	7	37	6	8	106	38	

PROJ			Wac Solar Project, KUMBAKARANATHAM, TN.								
SUBJ		: SCAD	TH PARTNER ENERGY PRIVATE LIMITED A IO List - Type-B								
S No	Device Description	: R0 & Qty	03.04.2025 Signal Description	Protocol Type	Sub Type		MODBUS	DI	DO	AI	Remarks
3 140	Device Description	Qiy	Signal Description		ICR & ICR-1 x 1 RTU - Type-B	RS485	TCP/IP		1 50		Remarks
1	MCR + ICR-1 / Engineering Work	1	All Modbus Registers available on mapping sheet	Modbus RTU	TCP/IP		1	Ι	Τ	Τ	
-	Station (EWS)										
2	MCR + ICR-1 / CCTV Rack	1	All Modbus Registers available on mapping sheet	Modbus RTU	TCP/IP		1				
3	MCR + ICR-1 / Printer	1	All Modbus Registers available on mapping sheet	Modbus RTU	TCP/IP		1				String inverters will be connected to Sungrow EMU 200A
4	SACU for String inverter communication	2	All Modbus Registers available on mapping sheet	Modbus RTU	TCP/IP		2				via PLCC commiscation and string Inverter mapping details will be available in SCADA from Sungrow EMU
5	PV Module Temperature	1	All Modbus Registers available on mapping sheet	Modbus RTU	RS485	1					
6	33kV MV Panel / ANNUNCIATOR (14W) Out Going Feeders (0/6) - 1 Nos	1	O/C & E/F RELAY OPERATED MASTER TRIP RELAY OPERATED TCS UNHEALTHY-1 TCS UNHEALTHY-2 U/V & G/V TRIP SPARE SPARE SPARE SPARE SPARE SPARE SPARE SPARE								
7	33kV MV Panel / ANNUNCIATOR (24W) Solar Feeder (RR (1/C-1) (IDT-1)- 1Nos	1	SPARE O/C & LIF PROTECTION OPERATED MASTER TRIP OPERATED TCS UNHEALTHY-1 TCS UNHEALTHY-1 TCS UNHEALTHY-2 BUCH. TRIP BUCH. ALARM OTI TRIP OTI ALARM HW WIT ALARM LW-1 WTI TRIP LV-1 WTI TRIP LV-1 WTI TRIP LV-2 WTI TRIP LV-2 WTI TRIP LV-2 WTI TRIP LV-2 WTI TRIP LV-3 WTI ALARM LV-4 WTI ALARM MW ALARM MR ALARM MR ALARM MR ALARM MR ALARM MR ALARM MR CELL RUPTURE RELAY ALARM AUX. AC LUPS SUPPLY FAIL MUN ALARM AUX. ACCUMENTATION AUX. ACCUMENTS ALARM AUX. ACCUMENTS ALA	Modbus RTU	R5485	1					
8	33kV MV Panel / ANNUNCIATOR (12W) Solar Feeder ICR-2&3 2No.	2	AUX. AC RAW SUPPLY FAIL O/CR & EF RELAY OPERATED MASTER TRIP RELAY OPERATED TCS UNHEALTHY SPARE SPARE SPARE SPARE SPARE SPARE SPARE								
9	33kv MV Panel / ANNUNCIATOR (12W) AUX. TRANSFORMER	1	Buch, Relay - Trip Buch, Relay - Alarm OTI - Trip Status OTI - High Alarm Status HV WDG. TRIP HV WDG. ALARM LV WGG. ALARM LV WGG. ALARM PW Y- Trip Signal MOG ALARM FUSE FAILURE TRIP SSARE								
10	33kV MV Panel / TVM Out Going Feeders (O/G) - 1No, Solar Feeders - MCR Cum ICR-1- 1Nos. & Solar Feeders - ICR-2&3 2No.	3	IAW Energy / Peak IAWA Energy / Peak IAWA Energy / Peak IAWA Energy IAWA ENGRA IAWA ENERGY IAWA ENGRA IAWA ENGRA	Modbus RTU	R\$485	1					

MCX Can K2-10T OT A 20mA A 1												T
Description					-							
The second content of the content		33kV MV Panel			-							
10 10 10 10 10 10 10 10	11	Numerical Multifunction Relay	,	CIRCUIT BREAKER IN ON STATUS								
## 100 PATE OF THE		Solar Feeders - I/C - 1&2 2Nos	-		_							
Section Comment Comm					-							
200												
Month of the Control of the Contro												
1		33kV MV Panel			-							
20					-							
## APPLICATION OF THE PROPERTY	12		1									
10 10 10 10 10 10 10 10					Modbus RTU	RS485	1					
Management Man					-							
## COLORS					-							
Manual Property												
10												
20					-							
10		33kV MV Panel			-							
March Marc	13		1	CIRCUIT BREAKER IN ON STATUS								
1.		Out Going Feeders (O/G) - 1 Nos										
10 10 10 10 10 10 10 10					-							
No.												
Table Tabl												
1					-							
1					-							
Teach Teac	14	ICR-1 IDT / NIFPS	1		Modbus RTU	TCP/IP		1				
March Marc				Visual / Audio Alarm								
No. 10 10 10 10 10 10 10 1					4							
			-		DI	Hard wire			1			PF Contact in VCB Board
18												
No. Part P					DI							PF Contact in VCB Board
No. Part P		ļ										
Marie							-					
March Marc							 					
1.												
1				Input DC Supply Fail	DI				1			PF Contact in VCB Board
14 Sept.												
18												
Table of Profit P												
14 Salv Aff Parel 14 Salv Aff Parel 14 Salv Aff Parel 15 Salv Aff Parel												
1						Hard wire			1			
MOTO Com COS 97 17 17 17 17 17 17 17												
March Marc	14		1									
1.		(ICK-1 IDI)										
1				WTI - LV-1 Alarm Status		Hard wire			1			
March Care (C-1) March Care												
17 1.00 1.												
March Marc												
10 10 10 10 10 10 10 10				WTI - LV-4 Trip Status		Hard wire			1			
PROS. To Spend												
MGC - Altern												
MCR Care ICAS DIT Committee MCR Care ICAS DIT Committe												
Michigan				Air Cell Rupture Relay Alarm		Hard wire			1			PF Contact in VCB Board
Second Coop				Remote Open	DO	Hard wire				1		
MCR Cum (03-107 OTT VPT				D		11001000						230V AC shall be generated from VCB Board closing
MCR Cum (CR 1 DT From Comment or 1										1		circuit & DO shall be potential free within the SCADA
## MCK Cum KG 3.107 MCK Cum KG 3.107 Minding Temperature V-V-2												
## OCIT / WTI Part		MCR Cum ICR-1 IDT										
Note	15		1									
No. Feeder No. Status Discount No.							1					1
No. February Feb				Winding Temperature - LV-4	4-20mA	Al					1	-
16 Solar Feeders (VC) - 2 Nos (VC) 8 Service DI Hand wire 2 2 9 9 Contact in VC Board				Winding Temperature - LV-4 Winding Temperature - HV	4-20mA 4-20mA	AI AI			2		1	PE Contact in VCR Roard
16 Solar Feeders (VC) - 2 Nos VCB ON Shallow Di				Winding Temperature - LV-4 Winding Temperature - HV VCB in Local	4-20mA 4-20mA DI	Al Al Hard wire					1	
No. Solar Feeders (VC) - 2 Note				Winding Temperature - LV-4 Winding Temperature - HV VCB in Local VCB in Remote VCB in Test	4-20mA 4-20mA DI DI	Al Al Hard wire Hard wire			2		1	PF Contact in VCB Board PF Contact in VCB Board
16 Solar Federic (K) - 2 No. (KGR-2 & 3)				Winding Temperature - U-V-4 Winding Temperature - HV VCB in Local VCB in Remote VCB in Test VCB in Service	4-20mA 4-20mA DI DI DI	Al Al Hard wire Hard wire Hard wire Hard wire			2 2 2		1	PF Contact in VCB Board PF Contact in VCB Board PF Contact in VCB Board
Solar Feeders (LC) - 2 Nos (ICR 2 & 3) VEB Master Trip Operated Dil Hard wire Dil Hard			2	Winding Temperature - LV-4 Winding Temperature - HV WCB in Local VCB in Remote VCB in Test VCB in Service VCB ON Status	4-20mA 4-20mA DI DI DI DI	Al Al Hard wire Hard wire Hard wire Hard wire Hard wire			2 2 2 2		1 1	PF Contact in VCB Board
Part			2	Winding Temperature - I-V-4 Winding Temperature - HV VCB in Local VCB in Remote VCB in Service VCB in Service VCB OR Status	4-20mA 4-20mA DI DI DI DI DI DI DI DI DI	Al Al Hard wire			2 2 2 2 2		1	PF Contact in VCB Board
TCS Healthy	16	Solar Feeders (I/C) - 2 Nos	2	Winding Temperature - LIV-4 Winding Temperature - HV VCB in Local VCB in Remote VCB in Test VCB in Service VCB OF Status VCB OFF Status	4-20mA 4-20mA DI	AI AI Hard wire			2 2 2 2 2 2 2 2		1	PF Contact in VCB Board
Remote Open	16	Solar Feeders (I/C) - 2 Nos	2	Winding Temperature - I-V-4 Winding Temperature - HV VCB in Local VCB in Remote VCB in Service VCB ON Status VCB OF Status VCB OFF Status VCB Opring Charged VCB Master Trip Operated Input DC Supply Fall	4-20mA 4-20mA DI	Al Hard wire			2 2 2 2 2 2 2 2 2		1	PF Contact in VCB Board
Remote Upen	16	Solar Feeders (I/C) - 2 Nos	2	Winding Temperature - IV-4 Winding Temperature - HV VCB in Local VCB in Semote VCB in Semote VCB in Semote VCB in Service VCB in Service VCB ON Status VCB OPF Status VCB OPF Status VCB OPF Status VCB OPF Status INCB OPF Status VCB Spring Charged VCB Master Tip Operated Input DC Supply Fall Input AC Supply Fall	4-20mA 4-20mA DI	Al Al Hard wire			2 2 2 2 2 2 2 2 2 2		1	PF Contact in VCB Board
Remote Close	16	Solar Feeders (I/C) - 2 Nos	2	Winding Temperature - LV-4 Winding Temperature - HV VCB in Local VCB in Remote VCB in Test VCB in Service VCB OF Status VCB OFF Status VCB OFF Status VCB OFF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail Input AC Supply Fail ICS Healthy	4-20mA 4-20mA D1	Al Hard wire			2 2 2 2 2 2 2 2 2 2		1	PF Contact in VCB Board
VCB in Local	16	Solar Feeders (I/C) - 2 Nos		Winding Temperature - LV-4 Winding Temperature - HV VCB in Local VCB in Remote VCB in Test VCB in Service VCB OF Status VCB OFF Status VCB OFF Status VCB OFF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail Input AC Supply Fail ICS Healthy	4-20mA 4-20mA D1	Al Hard wire			2 2 2 2 2 2 2 2 2 2	2	1	PF Contact in VCB Board
VCB in Test	16	Solar Feeders (I/C) - 2 Nos		Winding Temperature - I-V-4 Winding Temperature - HV VCB in Local VCB in Remote VCB in Service VCB in Service VCB in Service VCB OF Status VCB OFF Status VCB OFF Status VCB OFF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail Input AC Supply Fail TCS Healthy Remote Open	4-20mA 4-20mA 4-20mA 01 01 01 01 01 01 01 01 01 01 01 01 01	Al Hard wire			2 2 2 2 2 2 2 2 2 2		1	PF Contact in VCB Board 230V AC shall be generated from VCB Board closing circuit & DO shall be notential free within the SCADA 230V AC shall be generated from VCB Board closing
VCB in Service	16	Solar Feeders (I/C) - 2 Nos		Winding Temperature - IV-4 Winding Temperature - HV Winding Temperature - HV WCB in Local VCB in Remote VCB in Service VCB OR Status VCB OF Status VCB OFF Status VCB Origing Charged VCB Master Trip Operated Input DC Supply Fail Input DC Supply Fail Input AC Supply Fail Remote Open Remote Close VCB in Local	4-20mA 4-20mA 01 D1	Al Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		1	PF Contact in VCB Board ZSDV AC shall be generated from VCB Board closing ctrcuit & DO shall be potential free within the SCADA ZSDV AC shall be generated from VCB Board dosing ctrcuit & DO shall be potential free within the SCADA PF Contact in VCB Board
VCB ON Status	16	Solar Feeders (I/C) - 2 Nos		Winding Temperature - LV-4 Winding Temperature - HV VCB in Local VCB in Remote VCB in Service VCB in Service VCB OF Status VCB OFF Status VCB OFF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail Input AC Supply Fail ICS Healthy Remote Open Remote Close VCB in Remote	4-20mA 4-20mA 01 01 01 01 01 01 01 01 01 01 01 01 01	Al Al Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 2 1		1	PF Contact in VCB Board DEAD STATE S
VCB OFF Status	16	Solar Feeders (I/C) - 2 Nos		Winding Temperature - I-V-4 Winding Temperature - HV VCB in Local VCB in Remote VCB in Remote VCB in Service VCB in Service VCB in Service VCB in Service VCB OF Status VCB Spring Charged VCB OFF Status VCB Spring Charged Input DC Supply Fail Input AC Supply Fail Input AC Supply Fail Input AC Supply Fail VCB Haster Tip Operated Input DC Supply Fail VCB in Remote Close VCB in Remote	4-20mA 4-20mA 4-20mA 01 D1	Al Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1		1	PF Contact in VCB Board SF Contact in VCB Board SF Contact in VCB Board ST Contact in VCB Board If Tom VCB Board dosing circuit & D.O. Shall be generated from VCB Board dosing circuit & S.O. Shall be potential free within the SCADA PF Contact in VCB Board PF Contact in VCB Board PF Contact in VCB Board
VCB Master Tip Operated	16	Solar Feeders (I/C) - 2 Nos		Winding Temperature - I-V-4 Winding Temperature - HV VCB in Local VCB in Semote VCB in Semote VCB in Service VCB in Service VCB in Service VCB ON Status VCB OF Status VCB OF Status VCB OF Status VCB OF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fall Input AC Supply Fall TCS Healthy Remote Open Remote Open Remote Close VCB in Remote VCB in Fest VCB in Remote VCB in Fest VCB in Festice	4-20mA 4-20mA 01 01 01 01 01 01 01 01 01 01 01 01 01	Al Al Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1		1	PF Contact in VCB Board 230V AC shall be generated from VCB Board closing circuit & DO shall be potential free within the SCADA 230V AC shall be penerated from VCB Board closing circuit & DO shall be potential free within the SCADA PF Contact in VCB Board PF Contact in VCB Board PF Contact in VCB Board
Input OC. Supply Fail	16	Solar Feeders (I/C) - 2 Nos		Winding Temperature - I.V-4 Winding Temperature - HV VCB in Local VCB in Exect VCB in Service VCB in Service VCB in Service VCB in Service VCB ON Status VCB OF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail Input AC Supply Fail TCS Healthy Remote Open Remote Open VCB in Local VCB in Service VCB in Service VCB in Service VCB OF Status	4-20mA 4-20mA DI 01 DI	Al Al Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 1 1		1	PF Contact in VCB Board 230V AC shall be generated from VCB Board closing circuit & DO shall be potential free within the SCADA 230V AC shall be generated from VCB Board closing circuit & DO shall be potential free within the SCADA PF Contact in VCB Board
17	16	Solar Feeders (I/C) - 2 Nos		Winding Temperature - LV-4 Winding Temperature - HV VCB in Local VCB in Remote VCB in Remote VCB in Service VCB ON Status VCB OFF Status VCB OFF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail Input AC Supply Fail TCS Healthy Remote Open Remote Close VCB in Remote VCB in Test VCB in Remote VCB in Service VCB in Service VCB in Service VCB ON Status VCB ON Status VCB ON Status VCB ON Status	4-20mA 4-20mA 01 01 01 01 01 01 01 01 01 01 01 01 01	Al Al Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 1 1 1		1	PF Contact in VCB Board
1 TCS Healthy	16	Solar Feeders (I/C) - 2 Nos		Winding Temperature - I-V-4 Winding Temperature - HV VCB in Local VCB in Remote VCB in Remote VCB in Service VCB in Service VCB In Service VCB OFF Status VCB Spring Charged VCB Spring Charged VCB Spring Charged VCB Master Tip Operated Input DC Supply Fail Input AC Supply Fail Input AC Supply Fail VCB Haster Tip Coperated VCB in Service VCB Spring Charged	4-20mA 4-20mA 4-20mA 01 D1	Al Al Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 1 1 1 1		1	PF Contact in VCB Board 230V AC shall be generated from VCB Board dosing cricuit & D.O. ball be otherhald free within the SCADA. 230V AC shall be generated from VCB Board dosing cricuit & D.O. ball be otherhald free within the SCADA. PF Contact in VCB Board
Salk M M Panel Aux. T/F Feeder	16	Solar Feeders (I/C) - 2 Nos		Winding Temperature - LV-4 Winding Temperature - HV VCB in Local VCB in Remote VCB in Remote VCB in Service VCB in Service VCB OF Status VCB OFF Status VCB OFF Status VCB OFF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fall Input AC Supply Fall ITCS Healthy Remote Open Remote Close VCB in Local VCB in Remote VCB in Service VCB OFF Status VCB Spring Charged VCB in Service VCB OFF Status VCB Spring Charged VCB Master Trip Operated VCB Spring Charged VCB Spring Charged VCB Master Trip Operated	4-20mA 4-20mA 001 01 01 01 01 01 01 01 01 01 01 01 01	Al Al Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 1 1 1 1		1	PF Contact in VCB Board
Aux. T/F Feeder	16	Solar Feeders (I/C) - 2 Nos	2	Winding Temperature - IV-4 Winding Temperature - HV VCB in Local VCB in Semote VCB in Semote VCB in Service VCB in Service VCB in Service VCB on Status VCB OFF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail Input AC Supply Fail TCS Healthy Remote Open Remote Open Remote Close VCB in Remote VCB in Service VCB in Service VCB OFF Status VCB in Feat VCB in Service VCB OFF Status VCB Master Trip Operated Input DC Supply Fail Input AC Supply Fail	4-20mA 4-20mA 01 01 01 01 01 01 01 01 01 01 01 01 01	Al Al Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 1 1 1 1		1	PF Contact in VCB Board 230V AC shall be generated from VCB Board dosing circuit & DO shall be potential free within the SCADA 230V AC shall be generated from VCB Board dosing circuit & DO shall be potential free within the SCADA PF Contact in VCB Board
OTI - high Alarm Status	16	Solar Feeders (I/C) - 2 Nos (ICR-2 & 3)	2	Winding Temperature - I-V-4 Winding Temperature - HV VCB in Local VCB in Remote VCB in Service VCB on Status VCB OFF Status VCB OFF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail TCS Healthy Remote Open Remote Close VCB in Local VCB in East VCB in Status VCB OFF Status VCB Spring Charged VCB in Status VCB Spring Charged VCB in Status VCB OFF Status	4-20mA 4-20mA 01 01 01 01 01 01 01 01 01 01 01 01 01	Al Al Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 1 1 1		1	PF Contact in VCB Board 230V Ac Shall be generated from VCB Board closing drout B QD Shall be otential free within the SCADA 230V Ac Shall be generated from VCB Board closing drout B QD Shall be otential free within the SCADA PF Contact in VCB Board
WTI - HV Trip Status		Solar Feeders (I/C) - 2 Nos (ICR-2 & 3)	2	Winding Temperature - IV-4 Winding Temperature - IV-4 Winding Temperature - IV VCB in Local VCB in Semote VCB in Service VCB in Service VCB ON Status VCB OPF Status VCB OPF Status VCB OPF Status VCB OPF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail TCS Healthy Remote Open Remote Open VCB in Local VCB in Service VCB OFF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail TCS Healthy VCB OFF Status VCB OFF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail TCS Healthy Buch, Relay - Trip Buch, Relay - Irip	4-20mA 4-20mA DI 01 DI	Al Al Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 1 1 1 1		1	PF Contact in VCB Board Salve South So
WTI - HV Alarm Status		Solar Feeders (I/C) - 2 Nos (ICR-2 & 3)	2	Winding Temperature - I-V-4 Winding Temperature - HV VCB in Local VCB in Remote VCB in Service VCB in Service VCB OF Status VCB OFF Status VCB OFF Status VCB OFF Status VCB OFF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail Input AC Supply Fail ICS Healthy Remote Open Remote Close VCB in Local VCB in Remote VCB in Service VCB OFF Status VCB Spring Charged VCB in Status VCB In Carl VCB in Carl VCB in Carl VCB in Service VCB OFF Status VCB Spring Charged Input DC Supply Fail Input AC Supply Fail Input AC Supply Fail Input CS Supply Fail Input AC Supply Fail	4-20mA 4-20mA 01 01 01 01 01 01 01 01 01 01 01 01 01	Al Al Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 1 1 1		1	PF Contact in VCB Board
WTI - LV Alarm Status		Solar Feeders (I/C) - 2 Nos (ICR-2 & 3)	2	Winding Temperature - I-V-4 Winding Temperature - HV VCB in Local VCB in Remote VCB in Remote VCB in Service VCB on Status VCB ON Status VCB OFF Status VCB OFF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail Input AC Supply Fail Input AC Supply Fail VCB Hoster Trip Operated Input DC Supply Fail Input AC Supply Fail VCB in Temperature VCB in Service VCB in Service VCB in Test VCB in Service VCB in Test VCB in Service VCB ON Status VCB OFF STATU	4-20mA 4-20mA 4-20mA 01 01 01 01 01 01 01 01 01 01 01 01 01	Al Al Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 1 1 1		1	PF Contact in VCB Board Salve In VCB Board PF Contact in VCB Board Salve In VCB Board FC Contact in VCB Board PF Contact in VCB Board
PRV - Trip Signal		Solar Feeders (I/C) - 2 Nos (ICR-2 & 3)	2	Winding Temperature - IV-4 Winding Temperature - HV VCB in Local VCB in Remote VCB in Service VCB on Status VCB OFF Status VCB OFF Status VCB OFF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail TCS Healthy Remote Open Remote Close VCB in Local VCB in Remote VCB in Status VCB OFF Status VCB In Remote VCB in Service VCB In Service VCB In Service VCB In Service VCB OFF Status OFF STATUS VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail Input AC Supply Fail Input AC Supply Fail VCB Hastus OFF STATUS OFF STATUS OFF STATUS OFF STATUS VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail Input AC Supply Fail VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail Input AC Supply Fail VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail VCB Spring Charged VCB Master Trip Operated VCB Master Trip Operated Input DC Supply Fail VCB Master Trip Operated VCB Master Trip Opera	4-20mA 4-20mA 01 01 01 01 01 01 01 01 01 01 01 01 01	Al Al Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 1		1	PF Contact in VCB Board 230V Ac Shall be generated from VCB Board closing drout & Do Shall be opential free within the SCADA 230V Ac Shall be generated from VCB Board closing drout & Board PF Contact in VCB Board
MOG - Alarm		Solar Feeders (I/C) - 2 Nos (ICR-2 & 3)	2	Winding Temperature - IV-4 Winding Temperature - IV-4 Winding Temperature - IV-9 Remote Open Remote Open Remote Open Remote Open Winding Temperature - IV-9	4-20mA 4-20mA DI	Al Al Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 1			PF Contact in VCB Board 230V AC shall be generated from VCB Board dosing crutil & Do Shall be otherial free within the SCADA. 230V AC shall be generated from VCB Board dosing crutil & Do Shall be otherial free within the SCADA. 230V AC shall be generated from VCB Board dosing crutil & Do Shall be otherial free within the SCADA. PF Contact in VCB Board
Remote Open		Solar Feeders (I/C) - 2 Nos (ICR-2 & 3)	2	Winding Temperature - IV-4 Winding Temperature - HV VCB in Local VCB in Remote VCB in Service VCB in Service VCB OF Status VCB OFF Status VCB OFF Status VCB OFF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail ICS Healthy Remote Open Remote Close VCB in Incal VCB in Remote VCB in Service VCB in Service VCB OFF Status VCB Spring Charged VCB in Service VCB In Service VCB In Service VCB In Service VCB OFF Status VCB in Remote VCB in Service VCB OFF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail Input AC Supply Fail Input AC Supply Fail Input DC S	4-20mA 4-20mA 01 01 01 01 01 01 01 01 01 01 01 01 01	Al Al Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 1			PF Contact in VCB Board 2300 Ac Shall be generated from VCB Board closing grouts & QD Shall be openital fire within the SCADA 2300 Ac Shall be generated from VCB Board closing grouts & QD Shall be openital fire within the SCADA PF Contact in VCB Board
1		Solar Feeders (I/C) - 2 Nos (ICR-2 & 3)	2	Winding Temperature - IV-4 Winding Temperature - IV-4 Winding Temperature - IV-1 Winding Temperature - IV-1 Winding Temperature - IV-1 VCB in Local VCB in Service VCB in Service VCB ON Status VCB OF Status VCB OF Status VCB OF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail Trips Hose Supply Fail Trips Hose Supply Fail VCB in Incal VCB in Service VCB in Local VCB in Service VCB in Service VCB in Service VCB OF Status VCB Spring Charged VCB OF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail Trips Hose Supply Fail Trips Hose Supply Fail Trips Hose Supply Fail Trips Hose Supply Fail Trips Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail Trips Hose Supply Fail Trip Status VCH Spring Status VCH - IV Trip Status VCH - IV Alarm Status VCH - IV Alarm Status	4-20mA 4-20mA DI 01 DI	Al Al Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 1			PF Contact in VCB Board Salve South So
Dil Temperature 4-20mA Al 1 1		Solar Feeders (I/C) - 2 Nos (ICR-2 & 3)	2	Winding Temperature - IV-4 Winding Temperature - IV-4 Winding Temperature - IV-9 Remote Open Remote Open Remote Open Remote Open Winding Temperature - IV-9	4-20mA 4-20mA 01 01 01 01 01 01 01 01 01 01 01 01 01	Al Al Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 1	2		PF Contact in VCB Board 230V AC shall be generated from VCB Board closing drout & DO Shall be otherital free within the SCADA 230V AC shall be generated from VCB Board closing drout & Board PF Contact in VCB Board
		Solar Feeders (I/C) - 2 Nos (ICR-2 & 3)	2	Winding Temperature - IV-4 Winding Temperature - IV-4 Winding Temperature - IV-9 Remote Open Remote Open Remote Open Remote Close Wild In Test Wild In Te	4-20mA 4-20mA 01 01 01 01 01 01 01 01 01 01 01 01 01	Al Al Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 1	1		PF Contact in VCB Board
I I I I I I I I I I I I I I I I I I I		Solar Feeders (I/C) - 2 Nos (ICR-2 & 3)	2	Winding Temperature - IV-4 Winding Temperature - HV VCB in Local VCB in Remote VCB in Service VCB in Service VCB in Service VCB in Service VCB ON Status VCB OF Status VCB OF Status VCB OF Status VCB OF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail Input AC Supply Fail Input AC Supply Fail VCB in Service VCB OF Status VCB in Service VCB OF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail Input DC Su	4-20mA 4-20mA 01 01 01 01 01 01 01 01 01 01 01 01 01	Al Al Hard wire Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1	1		PF Contact in VCB Board 230V AC shall be generated from VCB Board closing drout & DO Shall be otherital free within the SCADA 230V AC shall be generated from VCB Board closing drout & Board PF Contact in VCB Board
110000 compensare 11		Solar Feeders (I/C) - 2 Nos (ICR-2 & 3)	1	Winding Temperature - IV-4 Winding Temperature - HV VCB in Local VCB in Remote VCB in Service VCB on Status VCB OFF Status VCB OFF Status VCB Spring Charged VCB Master Trip Operated Input DC Supply Fail TCS Healthy Remote Open Remote Close VCB in Local VCB in Local VCB in Remote VCB in Status VCB OFF Status VCB In Local VCB in Local VCB in Remote VCB in Status VCB OFF STATUS VCB	4-20mA	Al Al Hard wire			2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1	1	1	PF Contact in VCB Board 230V AC Shall be generated from VCB Board dosing drout & DO Shall be Dotential free within the SCADA 230V AC Board PF Contact in VCB Board PF

_											
			VCB in Local	DI	Hard wire			1			PF Contact in VCB Board
			VCB in Remote VCB in Test	DI DI	Hard wire Hard wire			1			PF Contact in VCB Board PF Contact in VCB Board
			VCB in Test VCB in Service	DI	Hard wire			1			PF Contact in VCB Board
			VCB ON Status	DI	Hard wire			1			PF Contact in VCB Board
		1	VCB OFF Status	DI	Hard wire			1			PF Contact in VCB Board PF Contact in VCB Board
	33kV MV Panel	1	VCB Spring Charged VCB Master Trip Operated	DI DI	Hard wire Hard wire			1			PF Contact in VCB Board PF Contact in VCB Board
18	Out Going (O/G) - 1 Nos		Input DC Supply Fail	DI	Hard wire			1			PF Contact in VCB Board
			Input AC Supply Fail	DI	Hard wire			1			PF Contact in VCB Board
			TCS-1 Healthy TCS-2 Healthy	DI DI	Hard wire Hard wire			1			PF Contact in VCB Board PF Contact in VCB Board
		L	U/V & O/V Trip	DI	Hard wire			1			PF Contact in VCB Board
			Remote Open	DO	Hard wire				1		230V AC shall be generated from VCB Board closing
1		1		DO					1		circuit & DO shall be potential free within the SCADA 230V AC shall be generated from VCB Board closing
-		-	Remote Close		Hard wire				1		circuit & DO shall be potential free within the SCADA
1	33kV OH LINE I/C ISOLATOR		ISO -CLOSE Status ISO -OPEN Status	DI DI	Hard wire Hard wire			1			
19	(With 1-Earth Switch)	1	ISO -E/S CLOSE Status	DI	Hard wire			1			
_			ISO -E/S OPEN Status	DI	Hard wire			1			
			kW Energy / Peak kVA Energy / Peak								
			kVAr Energy / Peak								
			kWh Energy								
			kVAh Energy kVArh Energy								
			kWh Energy / Daily								
			kVAh Energy / Daily								
			kVArh Energy / Daily								
			R PHASE VOLTAGE Y PHASE VOLTAGE								
	33kV MV Panel		B PHASE VOLTAGE								
	Trivector Meter (TVM) - 8 Nos.		R PHASE CURRENT								
20	Incommer (I/C) (ICR-1 to 3) - 3 Nos.	4	Y PHASE CURRENT B PHASE CURRENT	Modbus RTU	RS485	1					
-	Outgoing (O/G) - 1 Nos.	"	RY PHASE VOLTAGE	mousus RTU	1.5463	1					
			YB PHASE VOLTAGE								
			BR PHASE VOLTAGE								
			POWER FACTOR								
			ACTIVE POWER IMPORT								
			ACTIVE POWER EXPORT								
			REACTIVE POWER IMPORT REACTIVE POWER EXPORT								
			TOTAL APPARENT POWER								
			CUMULATIVE ENERGY - FORWARD KVAH								
			CUMULATIVE ENERGY - FORWARD KWH								
			CUMULATIVE ENERGY - REVERSE KVAH CUMULATIVE ENERGY - REVERSE KWH								
			kW Energy / Peak								
			kVA Energy / Peak								
			kVAr Energy / Peak								
			kWh Energy kVAh Energy								
			kVArh Energy								
			kWh Energy / Daily								
			kVAh Energy / Daily kVArh Energy / Daily								
			R PHASE VOLTAGE								
			Y PHASE VOLTAGE								
			B PHASE VOLTAGE								
			R PHASE CURRENT Y PHASE CURRENT								
20	MFM - Aux. ACDB - 1Nos.	1	B PHASE CURRENT	Modbus RTU	RS485	1					
			RY PHASE VOLTAGE								
			YB PHASE VOLTAGE BR PHASE VOLTAGE								
			FREQUENCY								
			POWER FACTOR								
			ACTIVE POWER IMPORT ACTIVE POWER EXPORT								
			REACTIVE POWER EXPORT								
			REACTIVE POWER EXPORT								
			TOTAL APPARENT POWER								
			CUMULATIVE ENERGY - FORWARD KVAH CUMULATIVE ENERGY - FORWARD KWH								
			CUMULATIVE ENERGY - REVERSE KVAH								
<u> </u>		1	CUMULATIVE ENERGY - REVERSE KWH								DE C
		1	ON Status OFF Status	DI DI	Hard wire Hard wire			1			PF Contact in Aux. ACDB PF Contact in Aux. ACDB
21	Aux. ACDB / MCCB	1	Remote Open	DO	Hard wire				1		PF Contact in Aux. ACDB
<u> </u>		1	Remote Close	DO	Hard wire				1		PF Contact in Aux. ACDB
			BATTERY VOLTAGE BATTERY CURRENT								
			OUTPUT VOLTAGE								
			UPS LOAD								
			UPS TEMPERATURE								
22	10kVA UPS	1	UPS BACKUP TIME FREQUENCY	Modbus RTU	RS485	1					
			BATTERY LOW STATUS								
			MAINS FAIL STATUS								
			OVERLOAD STATUS BYPASS MODE STATUS								
			BATTERY MODE STATUS								
		1	All Modbus Registers available on mapping sheet	Modbus RTU	RS485	1					
23	FACP	1	ON Indication	DI	Hard wire			1			
		<u> </u>	OFF Indication	DI	Hard wire			1			
			SOLAR INSOLATION HORIZONTAL (GHI) SOLAR INSOLATION TILTED (GII)								
1			RAIN FALL								
1			WIND SPEED (ANEMOMETER)								
24	Weather Monitoring Station (WMS)	1	WIND DIRECTION	Modbus RTU	TCP/IP		1				
	(WMS)		AMBIENT TEMPERATURE MODULE TEMPERATURE								
			AIR PRESSURE								
			HUMIDITY								
			SOILING STATUIN		Sub-Total IO List	8	7	94	12	8	
					Sub-Total IO List SPARE	2	,	10	4	8	1
					TOTAL	10	7	104	16	16	

PROJI	CT	: 50 M	Wac Solar Project, KUMBAKARANATHAM, TN.								
DEVE	OPER / CLIEN	: FOUR	TH PARTNER ENERGY PRIVATE LIMITED								
SUBJE			A IO List - Type-C								
REVIS	ION & DATE	: R0 &	03.04.2025		1						
S No	Device Description	Qty	Signal Description	Protocol Type	Sub Type		MODBUS	DI	DO	AI	Remarks
						RS485	TCP/IP				
					ICR x 1 RTU - Type-C						
1	String Inverter PLCC Communication	2	All Modbus Registers available on mapping sheet	MODBUS RTU	TCP/IP		2				String inverters will be connected to Sungrow EMU 200A via PLCC commnication and string Inverter
	PECC COMMUnication										mapping details will be available in SCADA from Sungrow EMU 200A.
2	PV Module Temperature	1	All Modbus Registers available on mapping sheet	Modbus RTU	RS485	1					
			O/C & E/F PROTECTION OPERATED	-							
			MASTER TRIP OPERATED TCS UNHEALTHY-1	†							
			TCS UNHEALTHY-2	1							
			BUCH. TRIP	1							
			BUCH. ALARM OTI TRIP	-							
			OTI ALARM	1							
			HV WTI TRIP]							
			HV WTI ALARM	1							
			LV-1 WTI TRIP LV-1 WTI ALARM	+							
3	VCB (ICOG) / Annunciator	1	LV-2 WTI TRIP	†							
			LV-2 WTI ALARM]							
			LV-3 WTI TRIP								
			LV-3 WTI ALARM LV-4 WTI TRIP	-							
			LV-4 WTI ALARM	†							
			PRV-1 TRIP	Modbus RTU	RS485	1					
			PRV-2 TRIP	1		1					
			MOG ALARM AIR CELL RUPTURE RELAY ALARM	†							
			AUX. AC UPS SUPPLY FAIL	1							
			AUX. AC RAW SUPPLY FAIL]							
			MASTER TRIP RELAY OPERATED INSTANTANEOUS O/C & E/F PROTECTION (50/50N)	-							
4	VCB (ICOG) / Numerical	1	INVERSE TIME O/C & E/F PROTECTION (50/30N)	†							
"	Multifunction Relay	1	CIRCUIT BREAKER IN ON STATUS]							
			CIRCUIT BREAKER IN SERVICE POSITION CIRCUIT BREAKER IN TEST POSITION	-							
			BUCHHOLZ TRIP	1							
			OTI TRIP	1							
	VCB (ICOG)		WTI TRIP PRV-1/PRV-2 TRIP	+							
5	Numerical Multifunction Relay	1	OSR TRIP	1							
	(IDT DIFF. PROTECTION) (87T)		AIRCELL PUNCHER TRIP								
			DIFF. PROTECTION OPTD. V/F ALARM/TRIP	†							
			PROTN. RELAY FAIL								
			VCB in Local VCB in Remote	DI DI	Hard wire Hard wire			1			PF Contact in VCB (ICOG) PF Contact in VCB (ICOG)
			VCB in Test	DI	Hard wire			1			PF Contact in VCB (ICOG)
			VCB in Service	DI	Hard wire			1			PF Contact in VCB (ICOG)
			VCB ON Status	DI	Hard wire			1			PF Contact in VCB (ICOG)
			VCB OFF Status VCB Spring Charged	DI DI	Hard wire Hard wire			1			PF Contact in VCB (ICOG) PF Contact in VCB (ICOG)
			VCB Master Trip Operated	DI	Hard wire			1			PF Contact in VCB (ICOG)
			Input DC Supply Fail	DI	Hard wire			1			PF Contact in VCB (ICOG)
			Input AC Supply Fail TCS-1 Healthy	DI DI	Hard wire Hard wire	1		1			PF Contact in VCB (ICOG) PF Contact in VCB (ICOG)
			TCS-2 Healthy	DI	Hard wire			1			PF Contact in VCB (ICOG)
			Buch. Relay - Trip	DI	Hard wire			1			PF Contact in VCB (ICOG)
			Buch. Relay - Alarm	DI	Hard wire			1			PF Contact in VCB (ICOG)
			OTI - Trip Status OTI - High Alarm Status	DI DI	Hard wire Hard wire	 		1	 	-	PF Contact in VCB (ICOG) PF Contact in VCB (ICOG)
			WTI - HV Trip Status	DI	Hard wire			1			PF Contact in VCB (ICOG)
6	VCB (ICOG)	1	WTI - HV Alarm Status	DI	Hard wire			1			PF Contact in VCB (ICOG)
			WTI - LV-1 Trip Status WTI - LV-1 Alarm Status	DI DI	Hard wire Hard wire			1			PF Contact in VCB (ICOG) PF Contact in VCB (ICOG)
			WTI - LV-1 Alarm Status WTI - LV-2 Trip Status	DI	Hard wire	1		1			PF Contact in VCB (ICOG) PF Contact in VCB (ICOG)
			WTI - LV-2 Alarm Status	DI	Hard wire			1			PF Contact in VCB (ICOG)
			WTI - LV-3 Trip Status	DI	Hard wire			1			PF Contact in VCB (ICOG)
			WTI - LV-3 Alarm Status WTI - LV-4 Trip Status	DI DI	Hard wire Hard wire	-		1	-	-	PF Contact in VCB (ICOG) PF Contact in VCB (ICOG)
			WTI - LV-4 Alarm Status	DI	Hard wire			1			PF Contact in VCB (ICOG) PF Contact in VCB (ICOG)
			PRV-1 - Trip Signal	DI	Hard wire			1			PF Contact in VCB (ICOG)
			PRV-2 - Trip Signal	DI	Hard wire			1			PF Contact in VCB (ICOG)
			MOG - Alarm Air Cell Rupture Relay Alarm	DI DI	Hard wire Hard wire	1		1	-		PF Contact in VCB (ICOG) PF Contact in VCB (ICOG)
											230V AC shall be generated from VCB (ICOG) closing
			Remote Open	DO	Hard wire				1		circuit & DO shall be potential free within the SCADA
											230V AC shall be generated from VCB (ICOG) closing
L			Remote Close	DO	Hard wire				1		circuit & DO shall be potential free within the SCADA Panel
			Oil Temperature	4-20mA	Al					1	
			Winding Temperature - LV-1 Winding Temperature - LV-2	4-20mA 4-20mA	AI AI	1			 	1	+
7	IDT - OTI / WTI	1	Winding Temperature - LV-3	4-20mA	Al					1	1
			Winding Temperature - LV-4	4-20mA	Al					1	
<u> </u>			Winding Temperature - HV System Out of Service	4-20mA	Al	-				1	
			PNRV/TCIV Closed	†							
			Fire detector Trip	1							
8	ICR IDT / NIFPS	1	Cylinder pressure Low	Modbus RTU	TCP/IP		1				
			Visual / Audio Alarm Visual / Audio alarm for DC supply Fail	1							
			NIFPS system Fail	†							
_		-	,	1	1						+

_												
			kW Energy / Peak	_								
	Auxilairy Power - LT Panel MFM		kVA Energy / Peak					1				
1			kVAr Energy / Peak									
			kWh Energy									
9			kVAh Energy									
			kVArh Energy									
			kWh Energy / Daily									
			kVAh Energy / Daily									
			kVArh Energy / Daily									
			R PHASE VOLTAGE									
			Y PHASE VOLTAGE									
			B PHASE VOLTAGE									
			R PHASE CURRENT									
			Y PHASE CURRENT									
		1	B PHASE CURRENT									
1			RY PHASE VOLTAGE									
			YB PHASE VOLTAGE									
			BR PHASE VOLTAGE		RS							
			FREQUENCY									
			POWER FACTOR									
			ACTIVE POWER IMPORT	Modbus RTU		RS485	1					
			ACTIVE POWER EXPORT									
			REACTIVE POWER IMPORT									
			REACTIVE POWER EXPORT									
			TOTAL APPARENT POWER									
			CUMULATIVE ENERGY - FORWARD KVAH	-								
			CUMULATIVE ENERGY - FORWARD KWH									
			CUMULATIVE ENERGY - REVERSE KVAH									
\vdash			CUMULATIVE ENERGY - REVERSE KWH	-								
	3kva ups		BATTERY VOLTAGE	+								
			BATTERY CURRENT OUTPUT VOLTAGE	+								
1			UPS LOAD	+								
			UPS TEMPERATURE	+					1			
1			UPS BACKUP TIME	⊢					1			
10		1	FREQUENCY	+								
			BATTERY LOW STATUS	+								
			MAINS FAIL STATUS	┥					1			
			OVERLOAD STATUS	1								
			BYPASS MODE STATUS									
			BATTERY MODE STATUS	+								
			printeri mode sintos									
						Total IC		3	30	2	6	
							ARE 3		10	6	2	
TOTAL 6 3 40 8 8												

