







DOCUMENT NO : <b>FOR624</b>		EQUIPMENT NO :				SHEET NO : 1 of 6		
		TITLE : <b>EQUIPMENT DATASHEET DC POWER SUPPLY &amp; BATTERIES</b>				CONTRACT NO :		
CLIENT : <b>QUEENSLAND URBAN UTILITIES</b>		REV :	PREPARED :		CHECKED :		APPROVED :	
			DATE	INITIAL	DATE	INITIAL	DATE	
		A	22/06/2015	KA	22/06/2015	SB	22/06/2015	
		B	30/11/2017	KA	30/11/2017	RN	30/11/2017	
PLANT LOCATION :								
DESCRIPTION		UNIT OF MEASURE	DATA TO BE CONFIRMED BY VENDOR				VENDORS RESPONSE	
GENERAL	1	Battery Charger	-	AS4044				
	2	DC-AC Inverters	-	AS/NZS 5603				
	3	DC-DC Converters	-	IEC/EN 60950-1				
	4	System Design Life (other than batteries)	Years	20 years minimum				
	5	Battery Design Life	Years	10 years minimum				
	6	Continuous Normal Operation without Maintenance	Years	5 years minimum				
	7	Altitude	m	0 - 300m				
	8	Ambient Temperature (inside s'room with HVAC)	°C	25°C to +35°C				
	9	Relative Humidity (inside s'room with HVAC)	°C	5 - 95%, non condensing				
	10	Environment Conditions	-	Temperate, Dusty, Corrosive (H2S)				
SYSTEM REQUIREMENTS	11	System Description	-	DC Power Supply				
	12	Single Line Diagram No.	-	TBA				
	13	Power Supply System	Vdc	230V 1ph 50Hz				
	14	AC Supply System Earthing	-	MEN to AS 3000				
	15	Nominal DC System Voltage	Vdc	VDC				
	16	DC System Earth	-	Negative				
	17	Rated Power Output	kVA/kW					
	18	Battery Back-Up Time	Hours	8 hours				
	19	90% Recharge Time	Hours	10 hours				
	20	System Configuration Chargers	-	2 x 100% chargers				
	21	System Configuration Batteries	-	2 x 50% batteries				
	22	Battery Charger Changeover Switch Configuration	-	A, A+B, B				
	23	System Configuration DC-DC Converters	-	Nil / 2 x 100%				
	24	DC Distribution Board 24 VDC	Y/N	Yes				
	25	DC Distribution Board 48 VDC	Y/N					
	26	DC Distribution Board 110 VDC	Y/N					
	27	System Configuration AC-DC Converters	-	Nil / 2 x 100%				
	28	AC Distribution Board 230VDC	Y/N					
BATTERY CHARGER	29	Manufacturer	-	VTA				
	30	Type	-	Phase Controlled Rectifier				
	31	Classification to AS 4044	-	Type 3				
	32	Conformal Coating	-	Yes				
	33	Input Current	A	VTA				
	34	Load Voltage Range	V					
	35	Soft Start Capability	-	Yes				
	36	Float Volt Compensation for Battery Temperature	-	Yes				
	37	Input AC Voltage Tolerance	Vac	230 V ± 10 % / 400 V ± 10 %				
	38	Input Supply Frequency	Hz	50 Hz ± 2.5 %				
	39	AC Supply Total Harmonic	-	Up to 20%				
	40	Harmonic Current Drawn by Charger on AC Supply	-	AS/NZS 61000.3				
	41	AC System Earthing	-	AS 3000				
	42	Line to Line Voltage Unbalance (3ph only)	-	Up to 5%				
	43	Power Factor	-	≥ 0.8				
	44	Rated Output Current	A	A				
	45	Max Continuous Current Before Current Limiting	A					
	46	Float Voltage Range	V	VTA				
	47	Equalizing Voltage Range	V	VTA				
	48	Boost Voltage Range	V	VTA				
	49	Voltage Regulation	-	≤ 1%				

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DESCRIPTION			UNIT OF MEASURE	DATA TO BE CONFIRMED BY VENDOR				VENDORS RESPONSE	
BATTERY CHARGER (continued)	50	Maximum Peak Output Voltage	V	Voltage Setting +10%					
	51	Ripple Voltage with Battery Connected	-	≤ 2%					
	52	Ripple Voltage without Battery Connected	-	≤ 5%					
	53	Efficiency	-	VTA					
	54	Battery Charger Isolating Switch	Y/N	Yes					
	55	Audible Noise to AS 4400	dB	≤60 dB(A) at 1.5 m					
BATTERY CHARGER PROTECTION	56	Electromagnetic Interference	-	AS CISPR 11					
	57	Circuit Breaker on AC Input	Y/N	Yes					
	58	Output High DC Voltage Shutdown to AS 4400	Y/N	Yes					
	59	Output Selective High DC Voltage Shutdown to AS 4400	Y/N	Yes					
	60	Input AC Current Power Failure to AS 4400	Y/N	Yes					
	61	Output Reverse Polarity	Y/N	Yes					
	62	Output DC Undervoltage Disconnection	Y/N	Yes					
	63	Output Overcurrent Protection	Y/N	Yes					
	64	Bypass to Output DC Undervoltage Disconnection	Y/N	Yes					
	65	Battery Charge Current Limiting	Y/N	Yes					
BATTERY BANKS AND CHARGER ROUTINE TESTS	66	Protection of Batteries from Excessive Discharge	Y/N	Yes					
	67	Overload Protection	Y/N	Yes					
	68	Power Factor	Y/N	Yes					
	69	Voltage Adjustment	Y/N	Yes					
	70	Voltage Regulation	Y/N	Yes					
	71	Short-Circuit	Y/N	Yes					
	72	AC Power Restoration	Y/N	Yes					
	73	Start-Up	Y/N	Yes					
	74	Dynamic Response	Y/N	Yes					
	75	Ripple Voltage	Y/N	Yes					
BATTERY CHARGER INDICATION & CONTROLS (LED STATUS INDICATION)	76	Heat Run Test	Y/N	Yes					
	77	High Voltage Flash Test	Y/N	Yes					
	78	Battery Bank Load, Discharge and Recharge	Y/N	Yes					
	79	System Normal (green)	Y/N	Yes					
	80	System Fault (red)	Y/N	Yes					
	81	AC Input Supply A/B Available (green)	Y/N	Yes					
	82	Rectifier/Charger A/B Available (green)	Y/N	Yes					
	83	Battery A/B Charging (green)	Y/N	Yes					
BATTERY CHARGER INDICATION & CONTROLS (LCD DISPLAY VALUE)	84	Battery Charger Output Failure	Y/N	Yes					
	85	Low DC Float Voltage	Y/N	Yes					
	86	High DC Float Voltage	Y/N	Yes					
	87	LED Test Facilities	Y/N	Yes					
BATTERY CHARGER INDICATION & CONTROLS (HARDWIRED ALARMS & AUDIBLE ALARMS)	88	AC Input Supply A/B Voltage (per phase)	Y/N	Yes					
	89	DC Output Supply A/B Voltage	Y/N	Yes					
	90	DC Output Supply A/B Current	Y/N	Yes					
	91	Battery Enclosure Temperature	Y/N	Yes					
BATTERY CHARGER INDICATION & CONTROLS (MODBUS TCP/IP STATUS SIGNAL)	92	Battery Charger Output Failure	Y/N	Yes					
	93	Low DC Float Voltage	Y/N	Yes					
	94	High DC float Voltage	Y/N	Yes					
	95	AC Power Failure Alarm	Y/N	Yes					
	96	Battery Charger Fault	Y/N	Yes					
	97	Common Alarm (grouped including Modbus)	Y/N	Yes					
	98	Charge Voltage	Y/N	Yes					
	99	Charge Current	Y/N	Yes					
	100	Load Voltage	Y/N	Yes					
	101	Load Current	Y/N	Yes					
	102	Float Voltage	Y/N	Yes					
	103	Battery Set 1 Charge/Discharge	Y/N	Yes					
	104	Battery Set 2 Charge/Discharge	Y/N	Yes					

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DESCRIPTION			UNIT OF MEASURE	DATA TO BE CONFIRMED BY VENDOR				VENDORS RESPONSE	
BATTERY CHARGER INDICATION & CONTROLS (MODBUS TCP/IP STATUS SIGNAL) (continued)	105	AC Input Supply A/B Failure	Y/N	Yes					
	106	Rectifier/Charger A/B Failure	Y/N	Yes					
	107	DC Low Voltage	Y/N	Yes					
	108	DC High Voltage	Y/N	Yes					
	109	DC Under/Over Voltage Trip	Y/N	Yes					
	110	Battery Charge Failure	Y/N	Yes					
	111	Battery Disconnected	Y/N	Yes					
	112	DC Earth Fault	Y/N	Yes					
	113	Rectifier/Charger A/B Current-Limit Mode	Y/N	Yes					
	114	Control Circuit Fault	Y/N	Yes					
BATTERY CHARGER INDICATION & CONTROLS (CONTROLS)	115	High Cabinet Temperature or Ventilation Fan Failure	Y/N	Yes					
	116	Rectifier/Charger A/B On/Off Switch	Y/N	Yes					
	117	Rectifier/Charger A/B Isolation Switch	Y/N	Yes					
	118	DC Float Voltage Adjustment	Y/N	Yes					
	119	DC Output Voltage Adjustment	Y/N	Yes					
	120	DC Current Limit Adjustment	Y/N	Yes					
	121	Load Transfer Initiating Control Switch	Y/N	Yes					
	122	Battery A/B Isolation Breakers	Y/N	Yes					
ENCLOSURE DETAILS	123	Alarm Acknowledge	Y/N	Yes					
	124	Alarm Reset	Y/N	Yes					
	125	Degree of Protection Doors Closed	-	IP42					
	126	Degree of Protection Doors Open	-	IP2X					
	127	Location	-	Indoor - Air Conditioned					
	128	Dimensions	-	VTA					
	129	Weight Batteries Total	kg						
	130	Weight Single Battery Cell	kg						
	131	Weight Charger Cubicle	kg						
	132	Paint Specification	-	man. Std. / Spec No.					
	133	External Paint Colour	-	RAL7035					
	134	Internal Paint Colour	-	White (man. std.)					
	135	Primary Nameplate to TMS1221	Y/N	Yes					
	136	Rating Plate to TMS1221	Y/N	Yes					
	137	Shock Hazard Label to AS4400	Y/N	Yes					
	138	Gland Plates	mm	3mm Aluminium					
	139	Power Cable (type/size)	mm <sup>2</sup>	PVC/PVC mm <sup>2</sup>					
	140	Cable Entry	-	Bottom					
	141	Cubicle Access	-	Front/Rear					
	142	Internal Earth Bar	Y/N	Yes					
143	Charger and Batteries Segregated	Y/N	Yes						
144	Battery Charger Cubicle Cooling	-	Natural/Fan Forced						
145	Battery Charger Fan Redundancy (if applicable)	-	N+1						
146	Battery Cubicle Cooling	-	Natural/Fan Forced						
147	Battery Cubicle Fan Redundancy (if applicable)	-	N+1						

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<b>DESCRIPTION</b>			<b>UNIT OF MEASURE</b>	<b>DATA TO BE CONFIRMED BY VENDOR</b>				<b>VENDORS RESPONSE</b>	
<b>BATTERY</b>	148	Type	-	Lithium Ion Phosphate or VRLA					
	149	Manufacturer	-	VTA					
	150	Model	-	VTA					
	151	Battery Location	-	Open stand / Cubicle / Drawers					
	152	Constant Load	A						
	153	Intermittent Load	A						
	154	Float Voltage	V/cell						
	155	Nominal Battery Voltage	V						
	156	Discharge Battery Voltage	V/cell						
	157	Battery Capacity Nominal Temperature	°C	25 °C					
	158	Guaranteed Battery Life at Nominal Temperature	Years	10 years					
	159	New Battery Capacity (minimum)	Ahr						
	160	Battery Capacity at End of Life (minimum 120% design load capacity)	Ahr						
	161	Number of Battery Banks	-	2					
	162	Number of Cells per Bank	-	VTA					
	163	Number of Cells per String	-	VTA					
	164	Number of Parallel Strings per Bank	-	VTA					
	<b>BATTERY (MODBUS TCP/IP BATTERY MONITORING SYSTEM)</b>	165	Battery Bank Isolation (per bank)	-	Double pole DC rated MCB				
166		Temperature Sensor Fixed to Batteries	Y/N	Yes					
167		Battery Monitoring System	Y/N	Yes					
168		Cell Voltage	Y/N	Yes					
169		Cell Temperature	Y/N	Yes					
170		Cell Impedance	Y/N	Yes					
171		Depth of Discharge	Y/N	Yes					
172		Battery Capacity Remaining	Y/N	Yes					
173		Discharge Current	Y/N	Yes					
174		Cycle Life of Battery Remaining	Y/N	Yes					
<b>DC-AC INVERTER</b>	175	DC-AC Inverters Fitted	Y/N						
	176	Standard	-	AC/NZS 5603					
	177	Derating % per °C	-	VTA					
	178	Conformal Coating	Y/N	Yes					
	179	Cooling	-	Temperature controlled fan					
	180	Degree of Protection	-	IP2X or better					
	181	System Configuration DC-AC inverters	-	2 x 100% inverters					
	182	Suitable for Parallel Operation (N+1 redundancy)	Y/N	Yes, synchronised outputs					
	183	On-off Switch by Double Pole DC MCB	Y/N	Yes					
	184	DC Connections	-	Screw terminal block					
	185	AC Connections	-	Screw terminal junction box / Screw terminal shrouded					
	186	19" Rack Mounted	-	VTA					
	187	Immunity	-	IEC/EN 61000-4					
	188	Nominal DC Input Voltage	Vdc	24V DC					
	189	DC operating range	Vdc						
	190	Nominal AC Output Voltage	Vac	230V AC 1 phase 50Hz					
	191	Nominal AC Output Frequency	Hz	50 ± 0.1 Hz					
	192	Power Factor Range	-						
	193	Continuous Output Power Rating at 25°C	W						
	194	Performance Class to AS 5603	-	Class A					
	195	AC Output Voltage Regulation	-	± 3% of nominal					
	196	Motor Load Handling	-	Not required					
	197	Isolation Input-Output	Vac	≥ 2500 VAC					
	198	Isolation Output-Chassis	Vac	≥ 1500 VAC					

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DC-AC INVERTER (PROTECTION)	199	Input Reverse Polarity Protection	Y/N	Yes					
	200	Input Inrush Current Limiting Protection	Y/N	Yes					
	201	Input Thermal Fuse Protection	Y/N	Yes					
	202	Input Undervoltage Protection	Y/N	Yes					
	203	Input Overvoltage Protection	Y/N	Yes					
	204	Output Overload Protection	Y/N	Yes					
	205	Output Thermal Protection (over temperature)	Y/N	Yes					
DC-AC INVERTER (HARDWIRED ALARM)	206	Output Short Circuit Protection	Y/N	Yes					
DC-AC INVERTER (MODBUS STATUS & ALARM)	207	Inverter Fault	Y/N	Yes					
	208	Inverter Fault	Y/N	Yes					
	209	Inverter Output Voltage	Y/N	Yes					
	210	Inverter Input Voltage	Y/N	Yes					
DC-DC CONVERTER	211	Inverter Input Failed	Y/N	Yes					
	212	DC-DC Converters Fitted	Y/N	Yes					
	213	Standard	-	IEC / EN 60950-1					
	214	Derating % per °C	-	VTA					
	215	Conformal Coating	Y/N	Yes					
	216	Cooling	-	Natural					
	217	Degree of Protection	-	IP2X or better					
	218	System Configuration DC-DC converters	-	2 x 100% Converters					
	219	Suitable for Parallel Operation (N+1 redundancy)	Y/N	Yes					
	220	Galvanic Isolation by Transformer	Y/N	Yes					
	221	Isolation Input-Output	-	≥1500 VDC					
	222	Isolation Output-Chassis	-	≥ 500 VDC					
	223	Immunity	-	IEC/EN 61000-4					
	224	Connections	-	Screw Terminals					
	225	Nominal DC Input Voltage	-	24V DC					
	226	DC Input Operating Range	-	VTA					
	227	Input DC Current at Nominal Input Voltage	A						
	228	In-rush Current	A/Vdc	VTA					
	229	Nominal DC Output Voltage	Vdc	48V DC					
	230	Output Rated Current	Ahr						
	231	Output Rated Power	W						
	232	Output Voltage Adjustment	-	VTA					
	233	Efficiency	-	≥ 74%					
234	Line Regulation	-	± 1% over input range						
235	Load Regulation	-	± 2% over load range						
236	Output Ripple and Noise	-	≤ 1% pk-pk max of output voltage						
237	Continuous Operation Over Load Range	-	0 to 100%						
DC-DC CONVERTER (PROTECTION)	238	Input Reverse Polarity Protection	Y/N	Yes					
	239	Input Inrush Current Limiting Protection	Y/N	Yes					
	240	Input Thermal Fuse Protection	Y/N	Yes					
	241	Output Overvoltage Protection	Y/N	Yes					
	242	Output Current Limiting Protection, w/ Hiccup Mode	Y/N	Yes					
	243	Output Thermal Protection	Y/N	Yes					
DC-DC CONVERTER (HARDWIRED ALARM)	244	Output Short Circuit Protection	Y/N	Yes					
245	Inverter Fault	Y/N	Yes						

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DC-DC CONVERTER  (MODBUS STATUS & ALARM)	246	Converter Fault	Y/N	Yes							
	247	Converter Output Voltage	Y/N	Yes							
	248	Converter Input Voltage	Y/N	Yes							
	249	Converter Input Failed	Y/N	Yes							
DC DISTRIBUTION BOARD	250	Nominal Voltage	Vdc	24 VDC							
	251	Busbar Current Rating	A								
	252	Number of Poles	-	VTA							
	253	Fault Rating	A/sec								
DC DISTRIBUTION BOARD  (INCOMING DC CIRCUIT BREAKER)	254	Manufacturer	-	VTA							
	255	Type	-	VTA							
	256	Number of Poles	-	2							
	257	Current Rating	A								
	258	Tripping Curve Type	-	B/C/D							
	259	Rated DC Voltage	-	VTA							
	260	Breaking Capacity	kA								
	261	Auxiliary Contact Wired to Terminals for SCADA	Y/N	No							
DC DISTRIBUTION BOARD  (OUTGOING DC CIRCUIT BREAKER)	262	Quantity	-								
	263	Manufacturer	-	VTA							
	264	Type	-	VTA							
	265	Number of Poles	-	2							
	266	Tripping Curve Type	-	B/C/D							
	267	Rated DC Voltage	-	VTA							
	268	Breaking Capacity	kA	kA							
	269	Auxiliary Contact Wired to Terminals for SCADA	Y/N	Yes							
AC DISTRIBUTION BOARD	270	20% Spare CBs Installed	Y/N	Yes							
	271	Standard	-	AS/NZS 61349							
	272	Nominal voltage	Vac	230 VAC							
	273	Busbar Current Rating	A								
	274	Fault Rating	A/sec								
AC DISTRIBUTION BOARD  (INCOMING DC CIRCUIT BREAKER)	275	Number of Poles	-	VTA							
	276	Manufacturer	-	VTA							
	277	Type	-	VTA							
	278	Number of Poles	-	2							
	279	Current Rating	A								
	280	Tripping Curve Type	-	B/C/D							
	281	Breaking Capacity	kA								
	282	Auxiliary Contact Wired to Terminals for SCADA	Y/N	Yes							
DC DISTRIBUTION BOARD  (OUTGOING DC CIRCUIT BREAKER)	283	Earth Leakage CB/RCB	Y/N	No							
	284	Quantity	-								
	285	Manufacturer	-	VTA							
	286	Type	-	VTA							
	287	Number of Poles	-	2							
	288	Tripping Curve Type	-	B/C/D							
	289	Breaking Capacity	kA								
	290	Auxiliary Contact Wired to Terminals for SCADA	Y/N	Yes							
	291	Earth Leakage CB/RCB	Y/N	Yes							
	292	20% Spare CBs Installed	Y/N	Yes							