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WSTECH

APS-Series Pre-Commissioning Checklist

WSTECH is a Wind&Sun Technologies and Siemens Joint Venture.

Before starting any work, please read "Original Operating Instructions" and "Function and Interface Description"!

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1 Plant information

1.1 Plant information

Plant name			
Address			
Coordinates (e.g. N: 48.5318, E 8.9240)	N	E	
Inverter type			
Number of units		Nominal power of plant	kW
Nominal MV	k V	Grid frequency	Hz

1.2 Additional information

Are the grid protection settings requested from the grid operator available?	
Is the commissioning spare part kit ordered?	
Is the commissioning spare part kit on site?	
Are tools on site that enable working in heights (fibre glass ladder, scaffolding,...)?	
Is personnel for special works on site (Craning, forklift, boom lift,...)?	

2 Free Comments

e.g. damages, missing parts, abnormalities

3 Contacts

3.1 Customer information

Customer	
Postal address	
Phone No.	
E-Mail	

3.2 Responsible contact on site

Name	
Company	
Phone No.	
E-Mail	

3.3 Person who fills-out this document

Name	
Company	
Phone No.	
E-Mail	

4 User Config Parameter

Please fill in the User Config Parameters. These parameters are specific to your project. The grid protection settings are part of these parameters. They can be extracted from your grid supplier's grid code. For further information on the User Config Parameters please check the "Function and Interface Description".

ID	SYMBOL	PARAMETER	Value
UC0010	R_IsoErr	Insulation Resistance Error Threshold	
UC0020	R_IsoWrn	Insulation Resistance Warning Threshold	
UC0030	IsoMod	Insulation Monitoring Mode	
UC0040	Isl_P_Lim	Island Mode Active Power Limit	
UC0050	Isl_Q_Lim	Island Mode Reactive Power Limit	
UC0060	Isl_f_Lim	Island Mode Frequency Limit	
UC0070	Isl_V_Lim	Island Mode Voltage Limit	
UC0080	IP	APMC Ethernet IP Address	
UC0090	Gateway	APMC Ethernet Gateway	
UC0100	Netmask	APMC Ethernet Subnet Mask	
UC0101	DNS	DNS Server IP Address	
UC0120	SntpMod	Time Synchronization Mode	
UC0130	Sntplp	SNTP Server IP Address	
UC0140	ModbTime	Modbus TCP Timeout	
UC0150	Tmvt_max	Medium Voltage Transformer Temperature Maximum	
UC0160	Smvt_max	Medium Voltage Transformer Apparent Power Maximum per Winding	
UC0170	CtrlMod	Control Mode	
UC0180	AutoRst	Auto Reset	
UC0181	T_AutoRst	Automatic Error Reset Delay	
UC0190	PvAutoStrt	PV Application Automatic Start	
UC0200	North	Northern GPS Coordinate	
UC0210	East	Eastern GPS Coordinate	
UC0220	TimZon	Timezone	
UC0230	V>	AC Overvoltage Level 1	
UC0240	t_V>	AC Overvoltage Level 1 Toleration Time	
UC0250	V>>	AC Overvoltage Level 2	
UC0260	t_V>>	AC Overvoltage Level 2 Toleration Time	
UC0270	V<	AC Undervoltage Level 1	
UC0280	t_V<	AC Undervoltage Level 1 Toleration Time	
UC0290	V<<	AC Undervoltage Level 2	
UC0300	t_V<<	AC Undervoltage Level 2 Toleration Time	
UC0310	f>	AC Overfrequency Level 1	
UC0320	t_f>	AC Overfrequency Level 1 Toleration Time	
UC0330	f>>	AC Overfrequency Level 2	
UC0340	t_f>>	AC Overfrequency Level 2 Toleration Time	
UC0350	f<	AC Underfrequency Level 1	
UC0360	t_f<	AC Underfrequency Level 1 Toleration Time	
UC0370	f<<	AC Underfrequency Level 2	
UC0380	t_f<<	AC Underfrequency Level 2 Toleration Time	
UC0390	Vac_StrtMx	Connection Conditions Minimum AC Voltage	
UC0400	Vac_StrtMn	Connection Conditions Maximum AC Voltage	
UC0410	f_StartMin	Connection Conditions Minimum AC Frequency	
UC0420	f_StartMax	Connection Conditions Maximum AC Frequency	
UC0430	k_LVRT	Fault Ride Through, LVRT k Factor	
UC0440	LVRT_dead	Fault Ride Through, LVRT Deadband	
UC0450	LVRT_Lim	Fault Ride Through, LVRT Limit	
UC0460	FrtMod	FRT Mode	
UC0470	k_HVRT	Fault Ride Through, HVRT k Factor	
UC0480	HVRT_dead	Fault Ride Through, HVRT Deadband	
UC0490	HVRT_Lim	Fault Ride Through, HVRT Limit	

ID	SYMBOL	PARAMETER	Value
UC0500	P_f_f1_high	Power Reduction as a Function of Grid Frequency, high	
UC0510	P_f_f2_high	Power Reduction as a Function of Grid Frequency, high	
UC0520	P_f_Mod_high	Power Reduction as a Function of Grid Frequency, high	
UC0530	P_PF_P1	Power Factor as a Function of Active Power, P1	
UC0540	P_PF_P2	Power Factor as a Function of Active Power, P2	
UC0550	P_PF_P3	Power Factor as a Function of Active Power, P3	
UC0560	P_PF_P4	Power Factor as a Function of Active Power, P4	
UC0570	P_PF_P5	Power Factor as a Function of Active Power, P5	
UC0580	P_PF_P6	Power Factor as a Function of Active Power, P6	
UC0590	P_PF_PF1	Power Factor as a Function of Active Power, PF1	
UC0600	P_PF_PF2	Power Factor as a Function of Active Power, PF2	
UC0610	P_PF_PF3	Power Factor as a Function of Active Power, PF3	
UC0620	P_PF_PF4	Power Factor as a Function of Active Power, PF4	
UC0630	P_PF_PF5	Power Factor as a Function of Active Power, PF5	
UC0640	P_PF_PF6	Power Factor as a Function of Active Power, PF6	
UC0650	dP_err	Power Gradient after Grid Fault	
UC0660	dP_start	Power Gradient at Start Up	
UC0670	t_Restart	Start Delay after Grid Faults	
UC0680	ApsDN	APS Device Name	
UC0690	ApsLic	APS License	
UC0700	T_start	Connection Delay	
UC0710	Reserved	-	
UC0720	Reserved	-	
UC0730	P_f_f1_low	Power Reduction as a Function of Grid Frequency, low	
UC0740	P_f_f2_low	Power Reduction as a Function of Grid Frequency, low	
UC0750	P_f_mode_low	Power Reduction as a Function of Grid Frequency, mode low	
UC0760	Q_of_U_U1_max	Reactive Power Characteristic as a Function of Grid Voltage, U1 max	
UC0770	Q_of_U_U2_max	Reactive Power Characteristic as a Function of Grid Voltage, U2 max	
UC0780	Q_of_U_mode_max	Reactive Power Characteristic as a Function of Grid Voltage, Mode max	
UC0790	Q_of_U_U1_min	Reactive Power Characteristic as a Function of Grid Voltage, U1 min	
UC0800	Q_of_U_U2_min	Reactive Power Characteristic as a Function of Grid Voltage, U2 min	
UC0810	Q_of_U_mode_min	Reactive Power Characteristic as a Function of Grid Voltage, mode min	
UC0820	Reserved	-	
UC0830	Reserved	-	
UC0840	Reserved	-	
UC0850	Unbal_Curr	Unbalance Current	
UC0860	Unbal_Curr_Time	Unbalance Current Time	
UC0870	Unbal_Volt	Unbalance Voltage	
UC0880	Unbal_Volt_Time	Unbalance Voltage Time	
UC0890	Angle_Dev	Unbalance Angle Deviation	
UC0900	Angle_Dev_Time	Unbalance Angle Deviation Time	
UC0910	VJ_Angle_max	Vector Jump Angle Max	
UC0920	Reserved	-	
UC0930	VJ_Volt_Limit	Vector Jump Voltage Limit	
UC0940	Date_Time	Manual Date/Time	
UC0950	Control_Source	Control Source	
UC0960	Q_prio	Prioritization of Commands	
UC0970	Q_ctrl	Q Control Mode	
UC0980	P_of_t_run	P during operation	
UC0990	Q_of_t_start	Q at startup	
UC1000	Q_of_t_run	Q during operation	

ID	SYMBOL	PARAMETER	Value
UC1010	Anti_Isl_Mode	Anti Islanding Mode	
UC1020	Δ P_Q_SetLim	Triggered APU Log DataTriggerlevel P/Q	
UC1030	Δ Vdc_MaxMin_SetLim	Triggered APU Log DataTriggerlevel Vdc max/min	
UC1040	Δ Idc_MaxMin_SetLim	Triggered APU Log DataTriggerlevel Idc max/min	
UC1050	Δ VislSet	Triggered APU Log DataTriggerlevel VislSet	
UC1060	Δ fislSet	Triggered APU Log DataTriggerlevel fislSet	
UC1070	Q_of_U_start	Activate Q of U Characteristic if actual active power is higher	
UC1080	Q_of_U_stop	Deactivate Q of U Characteristic if actual active power is lower	
UC1090	Q_of_U_Q1max	Reactive Power Characteristic as a Function of Grid Voltage, Q1 max	
UC1100	Q_of_U_Q2max	Reactive Power Characteristic as a Function of Grid Voltage, Q2 max	
UC1110	Q_of_U_Q1min	Reactive Power Characteristic as a Function of Grid Voltage, Q1 min	
UC1120	Q_of_U_Q2min	Reactive Power Characteristic as a Function of Grid Voltage, Q2 min	
UC1130	U_cos ϕ (P)_Start	Activate cos ϕ (P) Characteristic if actual active percentage voltage is higher	
UC1140	U_cos ϕ (P)_Stop	Deactivate cos ϕ (P) Characteristic if actual active percentage voltage is lower	
UC1150	t_restart	Reconnection Delay	
UC1160	FRT_react_curr_max	FRT reactive current max	
UC1170	P_of_U_function	Active Power Characteristic as a Function of Grid Voltage - Mode	
UC1180	P_of_U_italy_U_limit	P(U) Italy CEI 0-16 U limit	
UC1190	P_of_U_italy_P_limit	P(U) Italy CEI 0-16 P limit	
UC1200	P_of_U_AS4777.2_U_limit	P(U) AS4777.2 U limit	
UC1210	P_of_U_AS4777.2_t_mean	P(U) AS4777.2 time Grid voltage mean	
UC1220	P_f_Pmin_high	Power Reduction as a Function of Grid Frequency, P minimal mode high	
UC1230	P_f_gradient_high	Power Reduction as a Function of Grid Frequency, Gradient – Mode high	
UC1240	P_f_kWhz_high	Power Reduction as a Function of Grid Frequency, Gradient kW/Hz high	
UC1250	P_f_percentageHz_high	Power Reduction as a Function of Grid Frequency, Gradient %P_actual/Hz high	
UC1260	P_f_WaitState_high	Power Reduction as a Function of Grid Frequency, Wait State high	
UC1270	P_f_Pmax_low	Power Reduction as a Function of Grid Frequency, P maximal mode low	
UC1280	P_f_gradient_low	Power Reduction as a Function of Grid Frequency, Gradient – Mode low	
UC1290	P_f_kWhz_low	Power Reduction as a Function of Grid Frequency, Gradient kW/Hz low	
UC1300	P_f_percentageHz_low	Power Reduction as a Function of Grid Frequency, Gradient %P_actual/Hz low	
UC1310	P_f_WaitState_low	Power Reduction as a Function of Grid Frequency, Wait State low	
UC1320	P_of_U_SA15_Ustart	P(U) SA15 Grid voltage start	
UC1330	P_of_U_SA15_Uend	P(U) SA15 Grid voltage end	
UC1340	P_of_U_SA15_Ustop	P(U) SA15 Grid voltage stop	
UC1350	EnaDisAPU	Enable/Disable APU	
UC1360	extPlink_NodeSwID	Powerlink Node Switch ID	
UC1370	extPlink_NodeNuID	Powerlink Node Number ID	
UC1380	InsuMoni	Insulation Monitoring	
UC1390	P_f_f3_low	Power Reduction as a Function of Grid Frequency, f3 low	
UC1400	P_f_f3_high	Power Reduction as a Function of Grid Frequency, f3 high	

ID	SYMBOL	PARAMETER	Value
UC1410	P_f_perPnomHz_low	Power Reduction as a Function of Grid Frequency, Gradient %Pnom/Hz low	
UC1420	P_f_perPnom_perHz_low	Power Reduction as a Function of Grid Frequency, Gradient %Pnom/%Hz low	
UC1430	P_f_perPnomHz_high	Power Reduction as a Function of Grid Frequency, Gradient %Pnom/Hz high	
UC1440	P_f_perPnom_perHz_high	Power Reduction as a Function of Grid Frequency, Gradient %Pnom/%Hz high	
UC1450	V<<<	AC Undervoltage Level 3	
UC1460	t_V<<<	AC Undervoltage Level 3 Toleration Time	
UC1470	P_of_U_SA15_Mode	P(U) SA 15 gradient mode	
UC1480	P_of_U_SA15_gradient	P(U) SA 15 gradient	
UC1490	Isl_P_KP	Island Mode P Controller KP	
UC1500	Isl_P_KI	Island Mode P Controller KI	
UC1510	Isl_Q_KP	Island Mode Q Controller KP	
UC1520	Isl_Q_KI	Island Mode Q Controller KI	
UC1530	Isl_DQ_KP_init	Island Mode DQ-controller KP init	
UC1540	Isl_DQ_KP_max	Island Mode DQ-controller KP max	
UC1550	Isl_delta_F	Island Mode delta f start	
UC1560	Isl_delta_U	Island Mode delta U start	
UC1570	Q_P_No_Points	Number of Points for Q(P)-Control	
UC1580	Q_P_P_Pmax	P/Pmax Values (X-Values) for Q(P)	
UC1590	Q_P_Q_Pmax	Q/Pmax Values (Y-Values) for Q(P)	
UC1600	Ext_Log_Start_Year	Extended Log, start logging from year	
UC1610	Ext_Log_Start_Month	Extended Log, start logging from month	
UC1620	Ext_Log_Start_Day	Extended Log, start logging from day	
UC1630	Ext_Log_Start_Hour	Extended Log, start logging from hour	
UC1640	Ext_Log_Start_Minute	Extended Log, start logging from minute	
UC1650	Ext_Log_Start_Second	Extended Log, start logging from second	
UC1660	Ext_Log_Duration_Hour	Extended Log, logging duration hour	
UC1670	Ext_Log_Duration_Minute	Extended Log, logging duration minute	
UC1680	Ext_Log_Time_APS_Stat_60s	Extended Log, time between logging events for Log Type APS Status 60s	
UC1690	Ext_Log_Time_APU_Stat_60s	Extended Log, time between logging events for Log Type APU Status 60s	
UC1700	Ext_Log_Time_APU_Stat_10s	Extended Log, time between logging events for Log Type APU Status 10s	
UC1710	Ext_Log_Trig_Event	Extended Log, logging trigger events	
UC1720	Q_U_with_limit_U_UC	U/UC Values (X-Values) for Q(U) with limit	
UC1730	Q_U_with_limit_Q_Pmax	Q/P _{max} Values (Y-Values) for Q(U) with limit	
UC1740	Q_U_with_limit_Offset	Offset for Q(U) with limit	
UC1750	P_f_ctrl	P(f) Controll mode	
UC1760	P_f_freq	f Values (X-Values) for P(f) TERNA A68	
UC1770	P_f_P_Pmax	P/P _{max} Values (Y-Values) for P(f) TERNA A68	
UC1780	f_critical_err_detection	Critical frequency error detection	
UC1790	Err_thresh_dehumidifier	Error threshold for dehumidifier	
UC1800	Thresh_dehumidifier_on	Switch on threshold for dehumidifier	
UC1810	Thresh_dehumidifier_off	Switch off threshold for dehumidifier	
UC1820	IP_Config_Mode	Configuration mode of IP address	
UC1830	Modb_Time_APU	Modbus TCP Timeout APU	
UC1840	Modb_Timeout_Mode	Modbus TCP Timeout Mode	
UC1850	Modb_Time_APS	Modbus TCP Timeout APS	
UC1860	DC_Voltage_Limit	DC Voltage Limit	
UC1870	Upper_DC_Limit	Upper DC Limit per APU	
UC1880	Lower_DC_Limit	Lower DC Limit per APU	
UC1890	P_of_U_SA15_mode	P(U) SA15-Mode	
UC1900	P_of_U_SA15_lin_p_min	P(U) SA15 Linear p_min	

5 Pre-Commissioning checks and preparations per unit

These steps have to be done before commissioning starts.

Serial number: _____

Description	Additional Information	Done
Check if requirements of installation site are fulfilled	See operating instructions	
Check the scope of delivery		
Document the shock indicators by pictures	See operating instructions	
Document the humidity indicator by a picture	See operating instructions	
Mount the APS on the foundation	See operating instructions	
Ensure that around the APS and MV skid is a service area according to the following requirements: <ul style="list-style-type: none"> • width of two meters, • at the height of the cabinet, • with continuous surface, • without danger of falling. 	See operating instructions	
Mount the water-air heat exchanger	See operating instructions	
Mount the liquid fluid hose	See operating instructions	
Anchor the APS (Skid) to the foundation		
Ground the APS	See operating instructions	
Establish the power connection between the MV transformer and the APS		
Establish the control connection between the MV Skid and the APS		
Connect the DC Cables and fix them to the pull relief		
Connect the external supply voltage to the APS (optional)		
Connect the external enable switch to the APS (optional)		
Start of warm up and dehumidifying before hot commissioning	Additional document on request	
AC power available (full medium voltage)		
DC power available (at least 50%)		

Send this page and pictures per unit to service@wstech.com.

For further questions contact WSTECH Service:

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Service Request : <https://www.wstech.com/service/>

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