



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

Plant name _____

Address _____

Coordinates in decimal degrees Lat/N: ____ . ____ ° Lon/E: ____ . ____ °

Number of units in plant Nominal power of plant kW

Nominal MV k V Grid frequency Hz

2 Unit information

Unit type _____

Unit serial number _____

3 Additional information

Are the grid protection settings requested from the grid operator available? _____

Are tools on site that enable working in heights (ladder, scaffolding,...)? _____

Is personnel for special works on site (Craning, forklift, boom lift,...)? _____

4 Free Comments

e.g. damages, missing parts, abnormalities

5 Contacts

5.1 Customer information

Customer

Postal address

Phone No.

E-Mail

5.2 Responsible contact on site

Name

Company

Phone No.

E-Mail

5.3 Person who fills-out this document

Name

Company

Phone No.

E-Mail

6 Checklists

This document describes the works the customer has to finish before ordering WSTECH to site for cold and hot commissioning. It is intended to help the project manager and the commissioning personnel. The following lists need to be filled in for each unit in the project.

6.1 User Config Parameter

Please fill in the User Config Parameters. These parameters are specific to your project, some are even unit specific, e.g. IP address. 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 chapter "User Configuration Parameter Table" in the "Function and Interface Description".

ID	Symbol	Parameter	Default	Value
UC0010	R_IsoErr	Insulation Resistance Error Threshold	100000	
UC0020	R_IsoWrn	Insulation Resistance Warning Threshold	150000	
UC0030	IsoMod	Insulation Monitoring Mode	0	
UC0040	Isl_P_Lim	Island Mode Active Power Limit	650	
UC0050	Isl_Q_Lim	Island Mode Reactive Power Limit	650	
UC0060	Isl_f_Lim	Island Mode Frequency Limit	1	
UC0070	Isl_V_Lim	Island Mode Voltage Limit	10	
UC0080	IP	APMC Ethernet IP Address	192.168.1.222	
UC0090	Gateway	APMC Ethernet Gateway	192.168.1.1	
UC0100	Netmask	APMC Ethernet Subnet Mask	255.255.255.0	
UC0101	DNS	DNS Server IP Address	192.168.1.1	
UC0120	SntpMod	Time Synchronization Mode	0	
UC0130	SntpIp	SNTP Server IP Address	-	
UC0140	ModbTime	Modbus TCP Timeout	0	
UC0150	Tmvt_max	Medium Voltage Transformer Temperature Maximum	90	
UC0160	Smvt_max	Medium Voltage Transformer Apparent Power Maximum per Winding	1300	
UC0161	ExtTrafoCool_Lim_On	Ext. Medium Voltage Transformer Cooling switch on threshold	180	
UC0162	ExtTrafoCool_Lim_Off	Ext. Medium Voltage Transformer Cooling switch off threshold	0	
UC0170	CtrlMod	Control Mode	0	
UC0180	AutoRst	Auto Reset	0	
UC0181	T_AutoRst	Automatic Error Reset Delay	10000	
UC0190	PvAutoStrt	PV Application Automatic Start	0	
UC0200	North	Northern GPS Coordinate	54,766188	
UC0210	East	Eastern GPS Coordinate	9,44209	
UC0220	TimZon	Timezone	140	
UC0230	V>	AC Overvoltage Level 1	110	

ID	Symbol	Parameter	Default	Value
UC0240	t_V>	AC Overvoltage Level 1 Toleration Time	500	
UC0250	V>>	AC Overvoltage Level 2	120	
UC0251	V>>>	AC Overvoltage Level 5	140	
UC0260	t_V>>	AC Overvoltage Level 2 Toleration Time	100	
UC0261	t_V>>>	AC Overvoltage Level 5 Toleration Time	1000	
UC0270	V<	AC Undervoltage Level 1	90	
UC0280	t_V<	AC Undervoltage Level 1 Toleration Time	500	
UC0290	V<<	AC Undervoltage Level 2	80	
UC0300	t_V<<	AC Undervoltage Level 2 Toleration Time	100	
UC0310	f>	AC Overfrequency Level 1	51,5	
UC0320	t_f>	AC Overfrequency Level 1 Toleration Time	500	
UC0330	f>>	AC Overfrequency Level 2	55	
UC0340	t_f>>	AC Overfrequency Level 2 Toleration Time	100	
UC0350	f<	AC Underfrequency Level 1	47,5	
UC0360	t_f<	AC Underfrequency Level 1 Toleration Time	500	
UC0370	f<<	AC Underfrequency Level 2	45	
UC0380	t_f<<	AC Underfrequency Level 2 Toleration Time	100	
UC0390	Vac_StrtMn	Connection Conditions Minimum AC Voltage	95	
UC0400	Vac_StrtMx	Connection Conditions Maximum AC Voltage	110	
UC0410	f_StartMin	Connection Conditions Minimum AC Frequency	49,5	
UC0420	f_StartMax	Connection Conditions Maximum AC Frequency	50,5	
UC0430	k_LVRT	Fault Ride Through, LVRT k Factor	2	
UC0440	LVRT_dead	Fault Ride Through, LVRT Deadband	0	
UC0450	LVRT_Lim	Fault Ride Through, LVRT Limit	85	
UC0451	LVRT_Lim_2	Fault Ride Through, LVRT Limit 2	0	
UC0460	FrtMod	FRT Mode	0	
UC0461	FrtDetec	FRT Detection	0	
UC0470	k_HVRT	Fault Ride Through, HVRT k Factor	2	
UC0480	HVRT_dead	Fault Ride Through, HVRT Deadband	0	
UC0490	HVRT_Lim	Fault Ride Through, HVRT Limit	115	
UC0500	P_f_f1_high	Power Reduction as a Function of Grid Frequency, f1 high	51	
UC0510	P_f_f2_high	Power Reduction as a Function of Grid Frequency, f2 high	52	
UC0520	P_f_Mod_high	Power Reduction as a Function of Grid Frequency, Mode high	0	

ID	Symbol	Parameter	Default Value
UC0530	P_PF_P1	Power Factor as a Function of Active Power, P1	-100 0
UC0540	P_PF_P2	Power Factor as a Function of Active Power, P2	-60 20
UC0550	P_PF_P3	Power Factor as a Function of Active Power, P3	-20 40
UC0560	P_PF_P4	Power Factor as a Function of Active Power, P4	20 60
UC0570	P_PF_P5	Power Factor as a Function of Active Power, P5	60 80
UC0580	P_PF_P6	Power Factor as a Function of Active Power, P6	100
UC0590	P_PF_PF1	Power Factor as a Function of Active Power, PF1	1
UC0600	P_PF_PF2	Power Factor as a Function of Active Power, PF2	1
UC0610	P_PF_PF3	Power Factor as a Function of Active Power, PF3	1
UC0620	P_PF_PF4	Power Factor as a Function of Active Power, PF4	1
UC0630	P_PF_PF5	Power Factor as a Function of Active Power, PF5	1
UC0640	P_PF_PF6	Power Factor as a Function of Active Power, PF6	1
UC0650	dP_err	Power Gradient after Grid Fault	1000
UC0660	dP_start	Power Gradient at Start Up	1000
UC0670	t_restart	Start Delay after Grid Faults	10
UC0680	ApsDN	APS Device Name	-
UC0690	ApsLic	APS License	-
UC0700	t_start	Connection Delay	0
UC0710	Reserved	-	-
UC0720	Reserved	-	-
UC0730	P_f_f1_low	Power Reduction as a Function of Grid Frequency, f1 low	49,5
UC0740	P_f_f2_low	Power Reduction as a Function of Grid Frequency, f2 low	47
UC0750	P_f_mode_low	Power Reduction as a Function of Grid Frequency, low	0
UC0760	Q_of_U_U1_max	Reactive Power Characteristic as a Function of Grid Voltage, U1 max	105
UC0770	Q_of_U_U2_max	Reactive Power Characteristic as a Function of Grid Voltage, U2 max	115
UC0780	Q_of_U_mode_max	Reactive Power Characteristic as a Function of Grid Voltage, Mode max	0
UC0790	Q_of_U_U1_min	Reactive Power Characteristic as a Function of Grid Voltage, U1 min	95
UC0800	Q_of_U_U2_min	Reactive Power Characteristic as a Function of Grid Voltage, U2 min	85
UC0810	Q_of_U_mode_min	Reactive Power Characteristic as a Function of Grid Voltage, mode min	0

ID	Symbol	Parameter	Default	Value
UC0811	Q_of_U_PT1filter	Reactive Power Characteristic as a Function of Grid Voltage, PT1 Filter	0	
UC0812	Q_ofU_PT1time	Reactive Power Characteristic as a Function of Grid Voltage, PT1 Filter Time Constant	3	
UC0820	Reserved	–	–	
UC0830	Reserved	–	–	
UC0840	Reserved	–	–	
UC0850	Unbal_Curr	Unbalance Current	100	
UC0860	Unbal_Curr_Time	Unbalance Current Time	200	
UC0870	Unbal_Volt	Unbalance Voltage	50	
UC0880	Unbal_Volt_Time	Unbalance Voltage Time	500	
UC0890	Angle_Dev	Unbalance Angle Deviation	20	
UC0900	Angle_Dev_Time	Unbalance Angle Deviation Time	500	
UC0910	Reserved	–	–	
UC0920	Reserved	–	–	
UC0930	Reserved	–	–	
UC0940	Date_Time	Manual Date/Time	–	
UC0950	Control_Source	Control Source	0	
UC0960	Q_prio	Prioritization of Commands	0	
UC0970	Q_ctrl	Q Control Mode	0	
UC0980	P_of_t_run	P during operation	0	
UC0990	Q_of_t_start	Q at startup	100	
UC1000	Q_of_t_run	Q during operation	0	
UC1010	Anti_Isl_Mode	Anti Islanding Mode	0	
UC1020	Δ P_Q_SetLim	Triggered APU Log DataTriggerlevel P/Q	3	
UC1030	Δ Vdc_MaxMin_SetLim	Triggered APU Log DataTriggerlevel Vdc max/min	3	
UC1040	Δ Idc_MaxMin_SetLim	Triggered APU Log DataTriggerlevel Idc max/min	3	
UC1050	Δ VislSet	Triggered APU Log DataTriggerlevel VislSet	3	
UC1060	Δ fislSet	Triggered APU Log DataTriggerlevel fislSet	0,1	
UC1070	Q_of_U_start	Activate Q of U Characteristic if actual active power is higher	600	
UC1080	Q_of_U_stop	Deactivate Q of U Characteristic if actual active power is lower	50	
UC1090	Q_of_U_Q1max	Reactive Power Characteristic as a Function of Grid Voltage, Q1 max	0	
UC1100	Q_of_U_Q2max	Reactive Power Characteristic as a Function of Grid Voltage, Q2 max	–325	
UC1110	Q_of_U_Q1min	Reactive Power Characteristic as a Function of Grid Voltage, Q1 min	0	
UC1120	Q_of_U_Q2min	Reactive Power Characteristic as a Function of Grid Voltage, Q2 min	325	

ID	Symbol	Parameter	Default	Value
UC1130	U_cosφ(P)_Start	Activate cosφ(P) Characteristic if actual active percentage voltage is higher	105	
UC1140	U_cosφ(P)_Stop	Deactivate cosφ(P) Characteristic if actual active percentage voltage is lower	95	
UC1150	t_restart	Connection2 Delay	0	
UC1160	FRT_react_curr_max	FRT reactive current max	1137	
UC1170	P_of_U_function	Active Power Characteristic as a Function of Grid Voltage – Mode	0	
UC1180	P_of_U_italy_U_limit	P(U) Italy CEI 0–16 U limit	107	
UC1190	P_of_U_italy_P_limit	P(U) Italy CEI 0–16 P limit	0	
UC1200	P_of_U_AS4777.2_U_limit	P(U) AS4777.2 U limit	105	
UC1210	P_of_U_AS4777.2_t_mean	P(U) AS4777.2 time Grid voltage mean	60	
UC1220	P_f_Pmin_high	Power Reduction as a Function of Grid Frequency, P minimal mode high	0	
UC1230	P_f_gradient_high	Power Reduction as a Function of Grid Frequency, Gradient – Mode high	0	
UC1240	P_f_kWHHz_high	Power Reduction as a Function of Grid Frequency, Gradient kW/Hz high	0	
UC1250	P_f_percentageHz_high	Power Reduction as a Function of Grid Frequency, Gradient %P_actual/Hz high	0	
UC1260	P_f_WaitState_high	Power Reduction as a Function of Grid Frequency, Wait State high	0	
UC1270	P_f_Pmax_low	Power Reduction as a Function of Grid Frequency, P maximal mode low	0	
UC1280	P_f_gradient_low	Power Reduction as a Function of Grid Frequency, Gradient – Mode low	0	
UC1290	P_f_kWHHz_low	Power Reduction as a Function of Grid Frequency, Gradient kW/Hz low	0	
UC1300	P_f_percentageHz_low	Power Reduction as a Function of Grid Frequency, Gradient %P_actual/Hz low	0	
UC1310	P_f_WaitState_low	Power Reduction as a Function of Grid Frequency, Wait State low	0	
UC1320	P_of_U_SA15_Ustart	P(U) SA15 Grid voltage start	107	
UC1330	P_of_U_SA15_Uend	P(U) SA15 Grid voltage end	110	
UC1340	P_of_U_SA15_Ustop	P(U) SA15 Grid voltage stop	102	
UC1350	EnaDisAPU	Enable/Disable APU	1	
UC1360	extPlink_NodeSwID	Powerlink Node Switch ID	1	
UC1370	extPlink_NodeNuID	Powerlink Node Number ID	1	
UC1380	InsuMoni	Insolation Monitoring	0	
UC1390	P_f_f3_low	Power Reduction as a Function of Grid Frequency, f3 low	DS0130	

ID	Symbol	Parameter	Default Value
UC1400	P_f_f3_high	Power Reduction as a Function of Grid Frequency, f3 high	DS0130DS0120
UC1410	P_f_perPnomHz_low	Power Reduction as a Function of Grid Frequency, Gradient %Pnom/Hz low	0
UC1420	P_f_perPnom_perHz_low	Power Reduction as a Function of Grid Frequency, Gradient %Pnom/%Hz low	0
UC1430	P_f_perPnomHz_high	Power Reduction as a Function of Grid Frequency, Gradient %Pnom/Hz high	0
UC1440	P_f_perPnom_perHz_high	Power Reduction as a Function of Grid Frequency, Gradient %Pnom/%Hz high	0
UC1450	V<<<	AC Undervoltage Level 3	40
UC1460	t_V<<<	AC Undervoltage Level 3 Toleration Time	100
UC1470	P_of_U_SA15_Mode	P(U) SA 15 gradient mode	0
UC1480	P_of_U_SA15_gradient	P(U) SA 15 gradient	0
UC1481	P_of_U_PT1Filter	P(U) SA 15 Filter	0
UC1490	Isl_P_KP	Island Mode P Controller KP	0,04
UC1500	Isl_P_KI	Island Mode P Controller KI	0,00003
UC1510	Isl_Q_KP	Island Mode Q Controller KP	0
UC1520	Isl_Q_KI	Island Mode Q Controller KI	0,001
UC1530	Isl_DQ_KP_init	Island Mode DQ-controller KP init	0,005
UC1540	Isl_DQ_KP_max	Island Mode DQ-controller KP max	0,2
UC1550	Isl_delta_F	Island Mode delta f start	1
UC1560	Isl_delta_U	Island Mode delta U start	1,2
UC1570	Q_P_No_Points	Number of Points for Q(P)-Control	2
UC1580	Q_P_P_Pmax	P/Pmax Values (X-Values) for Q(P)	0.01..0.10
UC1590	Q_P_Q_Pmax	Q/P _{max} Values (Y-Values) for Q(P)	0
UC1600	Ext_Log_Start_Year	Extended Log, start logging from year	0
UC1610	Ext_Log_Start_Month	Extended Log, start logging from month	0
UC1620	Ext_Log_Start_Day	Extended Log, start logging from day	0
UC1630	Ext_Log_Start_Hour	Extended Log, start logging from hour	0
UC1640	Ext_Log_Start_Minute	Extended Log, start logging from minute	0
UC1650	Ext_Log_Start_Second	Extended Log, start logging from second	0
UC1660	Ext_Log_Duration_Hour	Extended Log, logging duration hour	0
UC1670	Ext_Log_Duration_Minute	Extended Log, logging duration minute	1
UC1680	Ext_Log_Time_APS_Stat_60s	Extended Log, time between logging events for Log Type APS Status 60s	0

ID	Symbol	Parameter	Default	Value
UC1690	Ext_Log_Time_APU_Stat_60s	Extended Log, time between logging events for Log Type APU Status 60s	0	
UC1700	Ext_Log_Time_APU_Stat_10s	Extended Log, time between logging events for Log Type APU Status 10s	0	
UC1710	Ext_Log_Trig_Event	Extended Log, logging trigger events	0	
UC1720	Q_U_with_limit_U_UC	U/U _C Values (X-Values) for Q(U) with limit	[0.94..1.06]	
UC1730	Q_U_with_limit_Q_Pmax	Q/P _{max} Values (Y-Values) for Q(U) with limit	[0.33..-0.33]	
UC1740	Q_U_with_limit_Offset	Offset for Q(U) with limit	0	
UC1750	P_f_ctrl	P(f) Controll mode	0	
UC1760	P_f_freq	f Values (X-Values) for P(f) TERNA A68	[49.5..51.5]	
UC1770	P_f_P_Pmax	P/P _{max} Values (Y-Values) for P(f) TERNA A68	[1..0]	
UC1780	f_critical_err_detection	Critical frequency error detection	0	
UC1790	Err_thresh_dehumidifier	Error threshold for dehumidifier	75	
UC1800	Thresh_dehumidifier_on	Switch on threshold for dehumidifier	67	
UC1810	Thresh_dehumidifier_off	Switch off threshold for dehumidifier	57	
UC1820	IP_Config_Mode	Configuration mode of IP address	0	
UC1830	Modb_Time_APU	Modbus TCP Timeout APU	0	
UC1840	Modb_Timeout_Mode	Modbus TCP Timeout Mode	0	
UC1850	Modb_Time_APS	Modbus TCP Timeout APS	0	
UC1860	DC_Voltage_Limit	DC Voltage Limit	0	
UC1870	Upper_DC_Limit	Upper DC Limit per APU	DS0190	
UC1880	Lower_DC_Limit	Lower DC Limit per APU	DS0180	
UC1890	P_of_U_SA15_mode	P(U) SA15-Mode	0	
UC1900	P_of_U_SA15_lin_P_min	P(U) SA15 Linear P _{min}	0	
UC1910	Angl_Dev_Vol_lim	Angle Deviation Voltage limit	80	
UC1920	Vac_StrtMx_agf	Reconnection Conditions Maximum AC Voltage after grid faults	110	
UC1930	Vac_StrtMn_agf	Reconnection Conditions Minimum AC Voltage after grid faults	95	
UC1940	f_StartMax_agf	Reconnection Conditions Maximum AC Frequency after grid faults	50,5	
UC1950	f_StartMin_agf	Reconnection Conditions Minimum AC Frequency after grid faults	49,5	
UC1960	t_start_agf	Reconnection Delay after grid faults	0	
UC1970	t_restart_agf	Reconnection2 Delay after grid faults	0	
UC1980	P_f_NTSV2_gradient_low	Power Adjustment as a Function of Grid Frequency (NTSV2), Gradient – Mode low	0	
UC1990	P_f_NTSV2_kWHz_low	Power Adjustment as a Function of Grid Frequency (NTSV2), Gradient kW/Hz low	0	

ID	Symbol	Parameter	Default	Value
UC2000	P_f_NTSV2_perPactHz_low	Power Adjustment as a Function of Grid Frequency (NTSV2), Gradient %P_actual/Hz low	0	
UC2010	P_f_NTSV2_perPnomHz_low	Power Adjustment as a Function of Grid Frequency (NTSV2), Gradient %Pnom/Hz low	0	
UC2020	P_f_NTSV2_perPnom_perHz_low	Power Adjustment as a Function of Grid Frequency (NTSV2), Gradient %Pnom/%Hz low	0	
UC2030	P_f_NTSV2_gradient_high	Power Adjustment as a Function of Grid Frequency (NTSV2), Gradient – Mode high	0	
UC2040	P_f_NTSV2_kWHz_high	Power Adjustment as a Function of Grid Frequency (NTSV2), Gradient kW/Hz high	0	
UC2050	P_f_NTSV2_perPactHz_high	Power Adjustment as a Function of Grid Frequency (NTSV2), Gradient %P_actual/Hz high	0	
UC2060	P_f_NTSV2_perPnomHz_high	Power Adjustment as a Function of Grid Frequency (NTSV2), Gradient %Pnom/Hz high	0	
UC2070	P_f_NTSV2_perPnom_perHz_high	Power Adjustment as a Function of Grid Frequency (NTSV2), Gradient %Pnom/%Hz high	0	
UC2080	P_f_NTSV2_mode_low	Power Adjustment as a Function of Grid Frequency (NTSV2), low active	0	
UC2090	P_f_NTSV2_mode_high	Power Adjustment as a Function of Grid Frequency (NTSV2), high active	0	
UC2100	P_f_NTSV2_limit_delta_P_low	Power Adjustment as a Function of Grid Frequency (NTSV2), limit delta P low	0	
UC2110	P_f_NTSV2_limit_delta_P_high	Power Adjustment as a Function of Grid Frequency (NTSV2), limit delta P high	0	
UC2120	SynIner_ON	Synthetic inertia function	0	
UC2130	H_P1	H–Curve point 1	0	
UC2140	H_P2	H–Curve point 2	0	
UC2150	H_P3	H–Curve point 3	0	
UC2160	H_P4	H–Curve point 4	0	
UC2170	H_P5	H–Curve point 5	0	
UC2180	H_P6	H–Curve point 6	0	
UC2190	H_dfdt1	H–Curve point 1	0	
UC2200	H_dfdt2	H–Curve point 2	0	
UC2210	H_dfdt3	H–Curve point 3	0	
UC2220	H_dfdt4	H–Curve point 4	0	
UC2230	H_dfdt5	H–Curve point 5	0	
UC2240	H_dfdt6	H–Curve point 6	0	
UC2250	F_P	Lowpass filter for the H–response	1	
UC2260	P_Max_syn	Max Power response	0,0	

ID	Symbol	Parameter	Default	Value
UC2270	F_f	Lowpass filter for the f- measurement signal	0	
UC2280	Gain_Vac_L1	Gain Vac L1	0	
UC2281	Offset_Vac_L1	Offset Vac L1	0	
UC2282	Gain_Vac_L2	Gain Vac L2	0	
UC2283	Offset_Vac_L2	Offset Vac L2	0	
UC2284	Gain_Vac_L3	Gain Vac L3	0	
UC2285	Offset_Vac_L3	Offset Vac L3	0	
UC2286	Gain_lac_L1	Gain lac L1	0	
UC2287	Offset_lac_L1	Offset lac L1	0	
UC2288	Gain_lac_L2	Gain lac L2	0	
UC2289	Offset_lac_L2	Offset lac L2	0	
UC2290	Gain_lac_L3	Gain lac L3	0	
UC2291	Offset_lac_L3	Offset lac L3	0	
UC2292	Gain_Vdc_pos	Gain Vdc pos	0	
UC2293	Offset_Vdc_pos	Offset Vdc pos	0	
UC2294	Gain_Vdc_neg	Gain Vdc neg	0	
UC2295	Offset_Vdc_neg	Offset Vdc neg	0	
UC2296	Gain_Idc	Gain Idc	0	
UC2297	Offset_Idc	Offset Idc	0	

6.2 Pre-Commissioning checks and preparations per unit

These steps have to be done before WSTECH Commissioning starts. Please fill in the following checklist for each unit.

Description	Additional Information	Done
Check if requirements of installation site are fulfilled	See operating instructions	
Check the scope of delivery		
Control that components are installed correctly and confirm to WSTECH Service	See WSTECH delivery notes	
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	
Connect the external supply voltage to the APS		
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 enable switch to the APS (optional)		
Configure IP address and check communication with external control	See Function and Interface Description	
Start of warm up and dehumidifying before hot commissioning	This document, 6.2.1	
AC power available (full medium voltage)		
DC power available (at least 50%)		

6.2.1 Dehumidification

Description	Additional Information	Done
Requirements:		
<ul style="list-style-type: none">Disconnect all DC sources from APS via external fuses or similar.	See operating instructions	
<ul style="list-style-type: none">AC connection must be connected.		
Start-up APMC (PLC of APS-Series):		
<ul style="list-style-type: none">Set dehumidifier in manual mode = ON.Set control card in manual mode, operating mode = 50.		
Wait minimum 48 hours before commissioning the product.		

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