

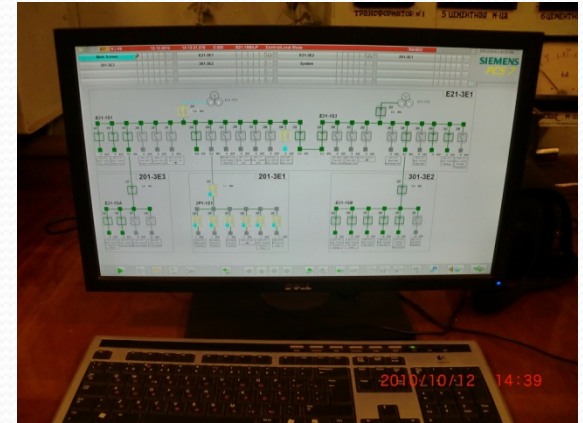
Presentation

SAT Ltd. – Sofia, Bulgaria

March 2012

Standard Equipment
part "Electrical" and "Automation"
Design, Production and
Commissioning by SAT Ltd.

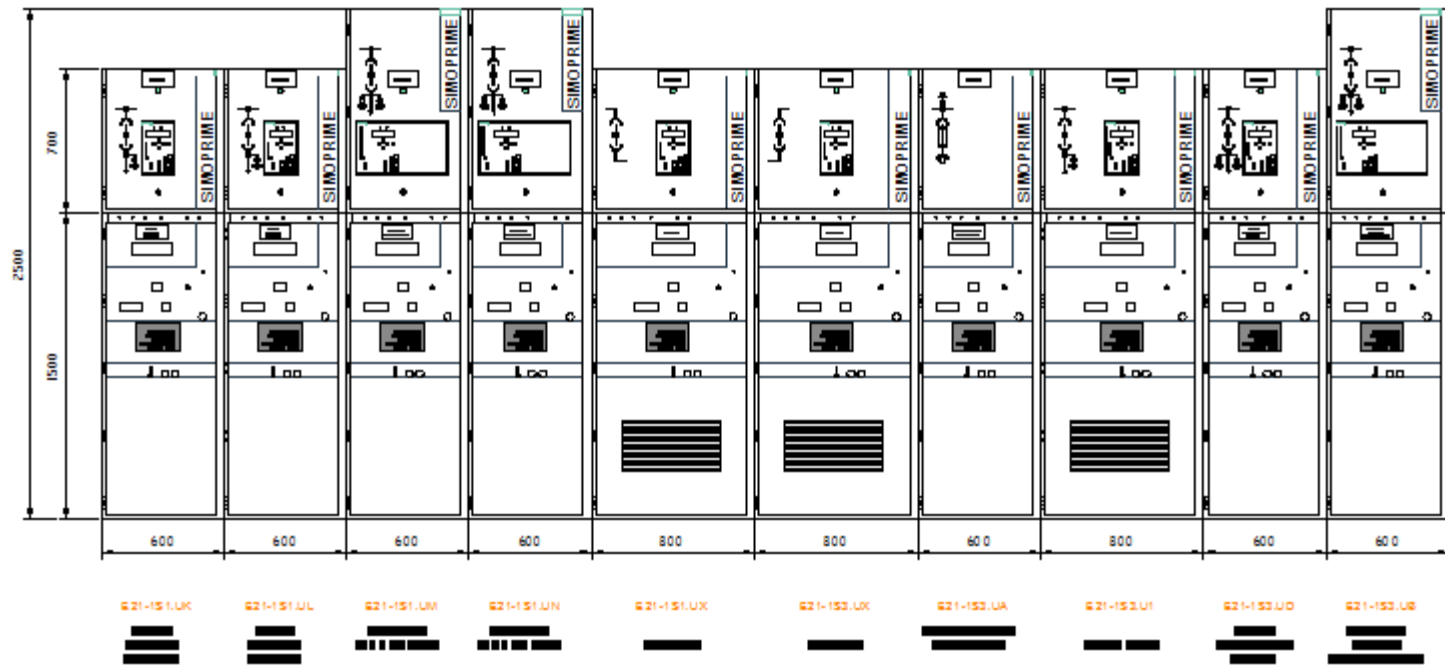
Medium Voltage Distribution switchgear



Medium Voltage Distribution switchgear



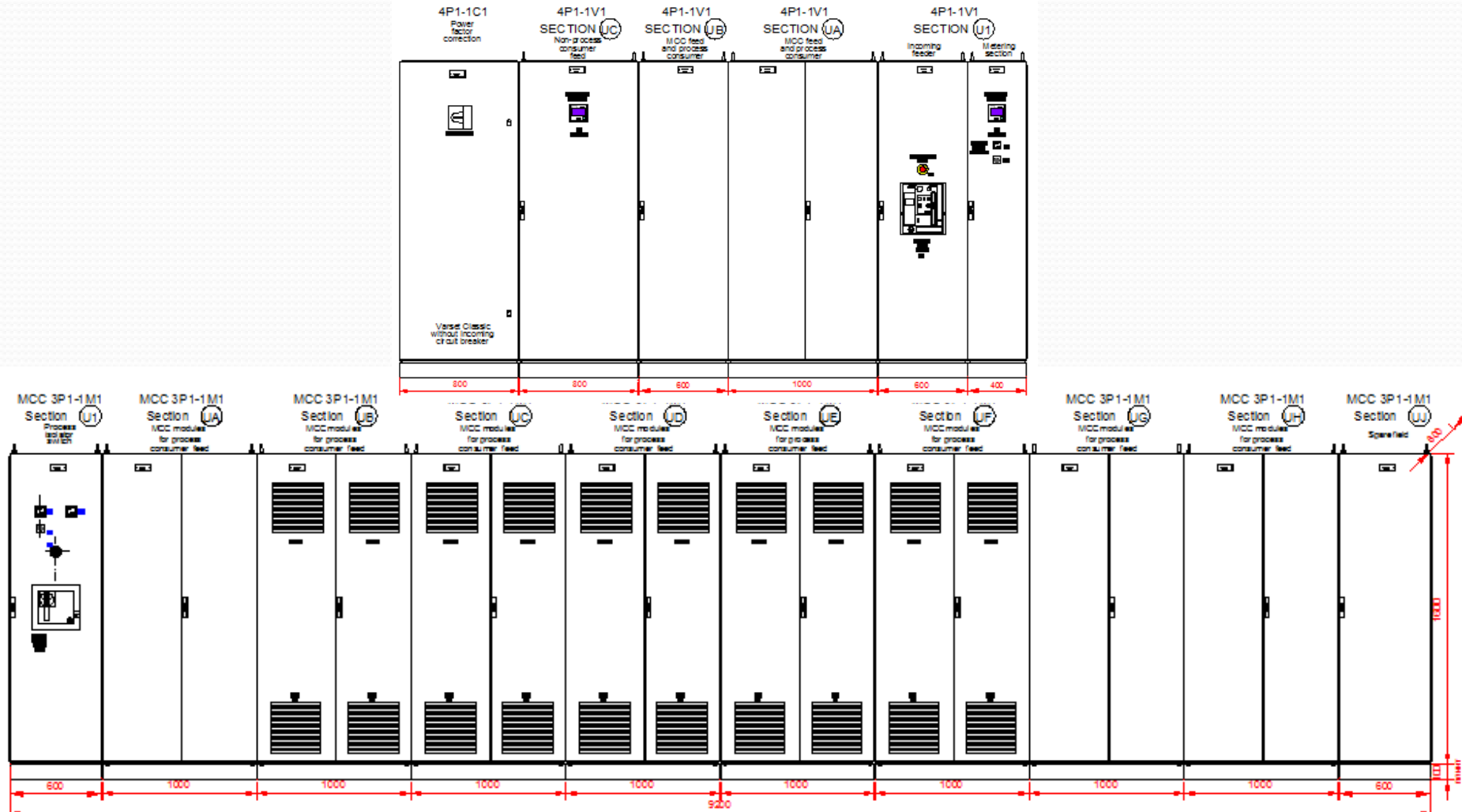
Medium Voltage Distribution switchgear



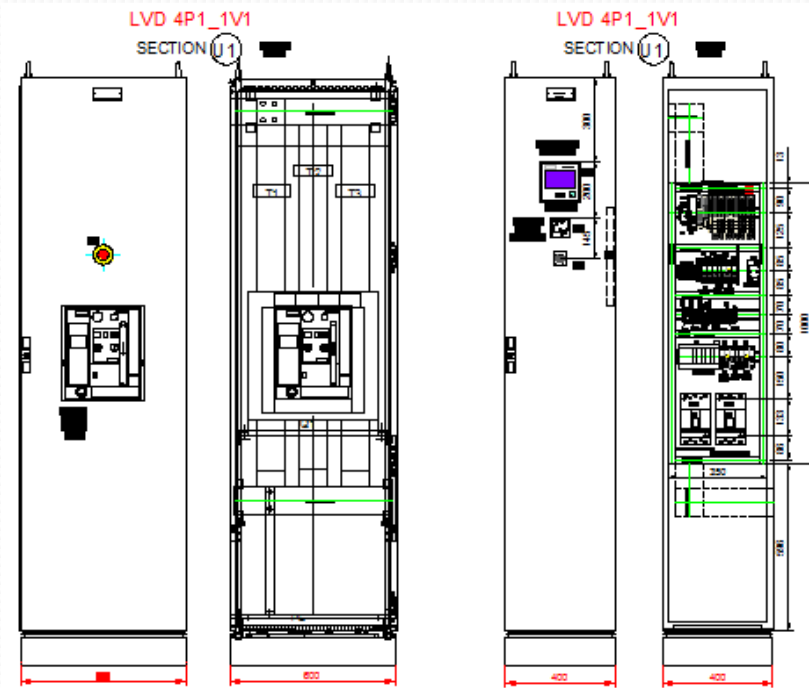
Low Voltage Distribution panels (LVD) and Distribution Motor Control Center (MCC)



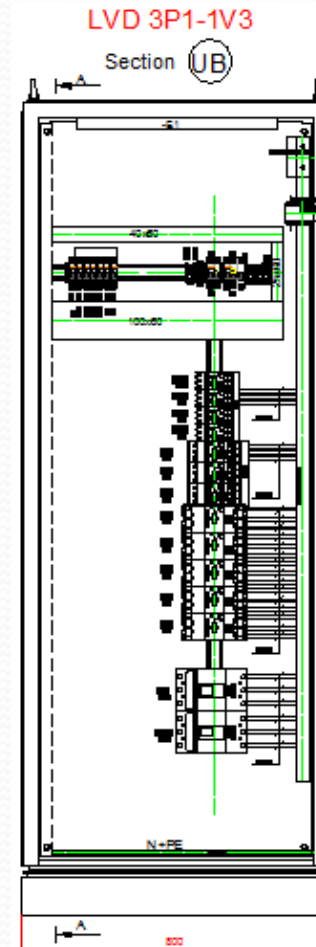
Low Voltage Distribution panels (LVD) and Distribution Motor Control Center (MCC)



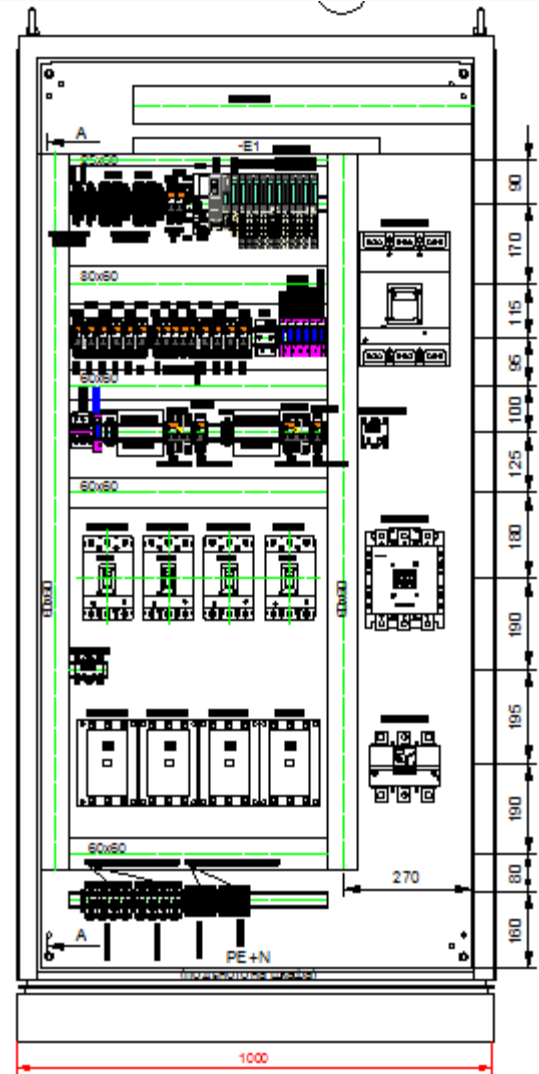
Low Voltage Distribution panels (LVD)



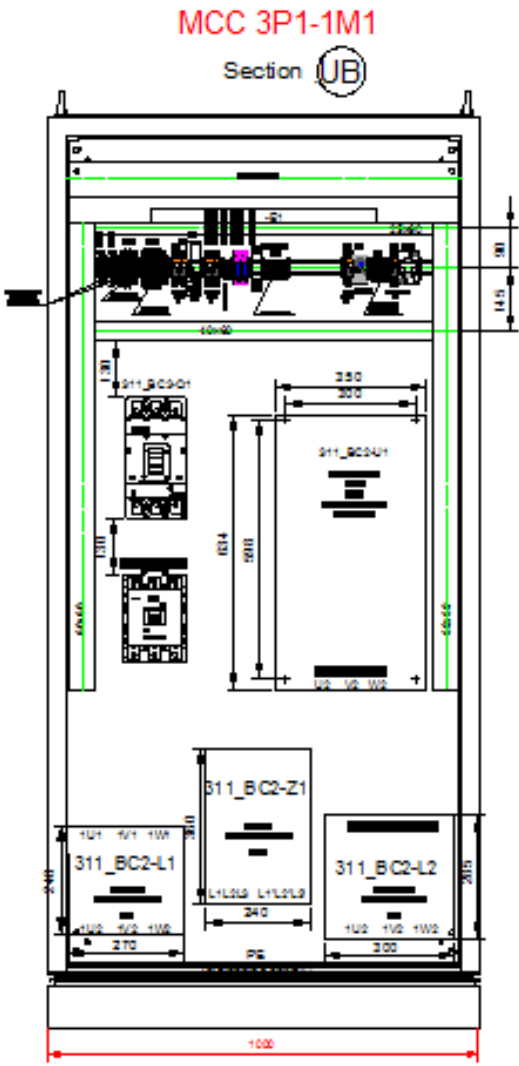
Low Voltage Distribution panels (LVD) for no process consumers



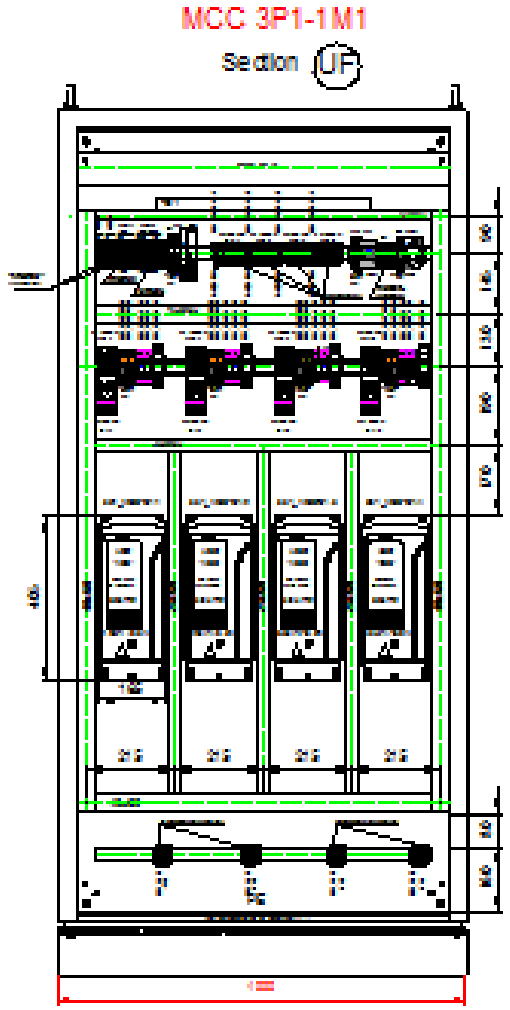
Distribution Motor Control Center (MCC)



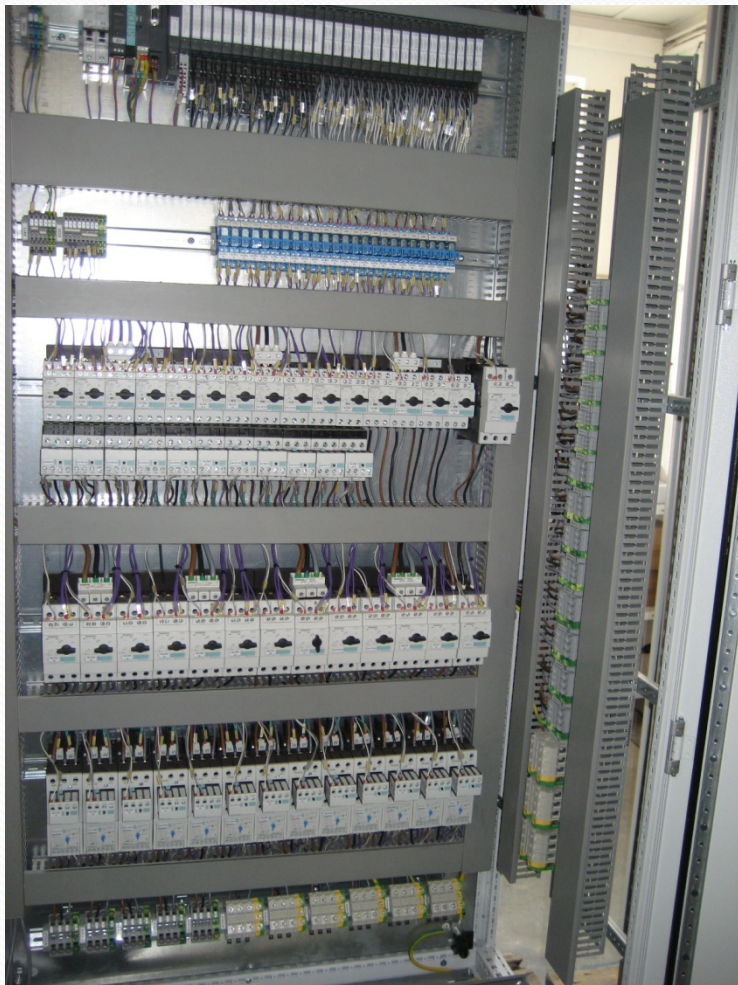
Distribution Motor Control Center (MCC)



Distribution Motor Control Center (MCC)

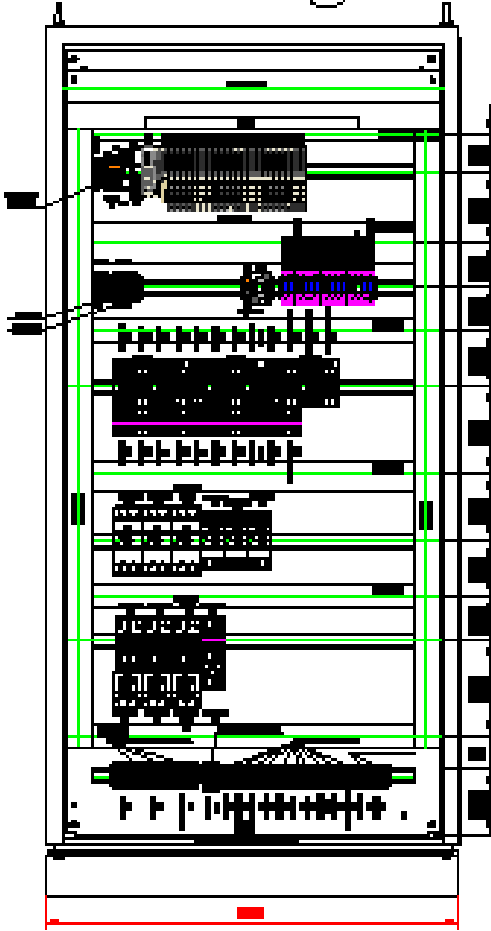


Distribution Motor Control Center (MCC)

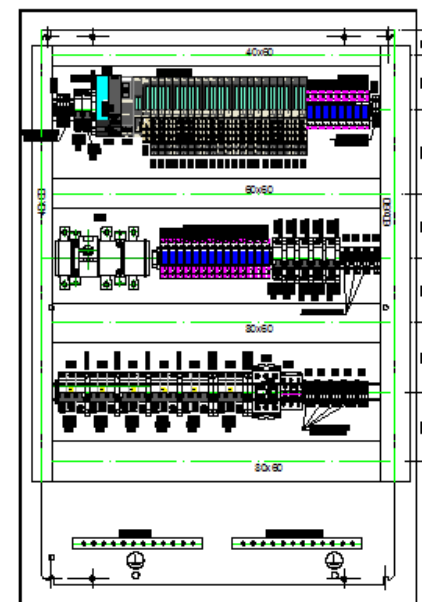
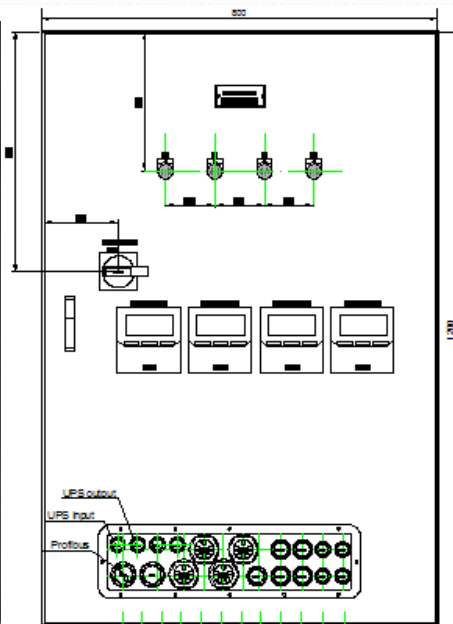


Distribution Motor Control Center (MCC)

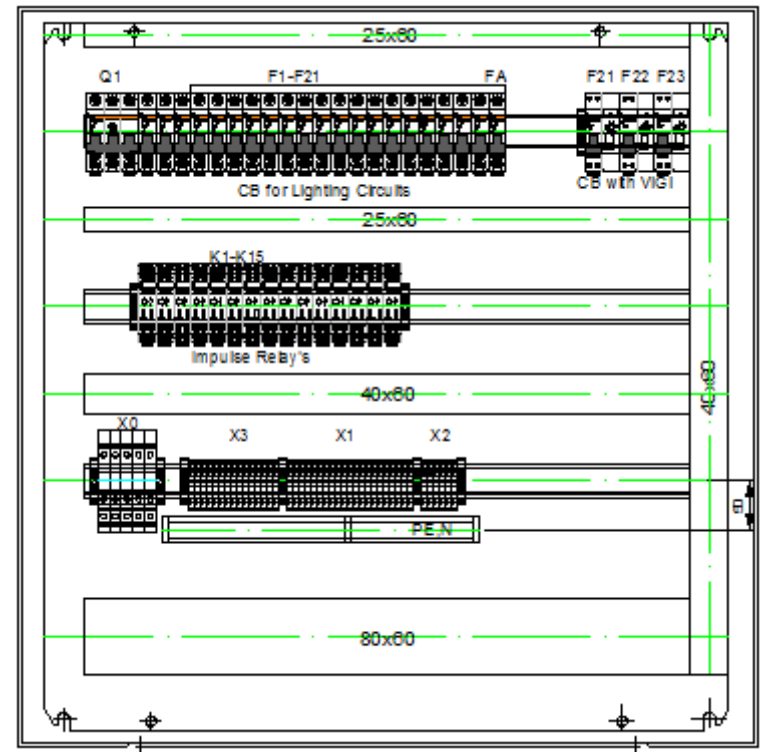
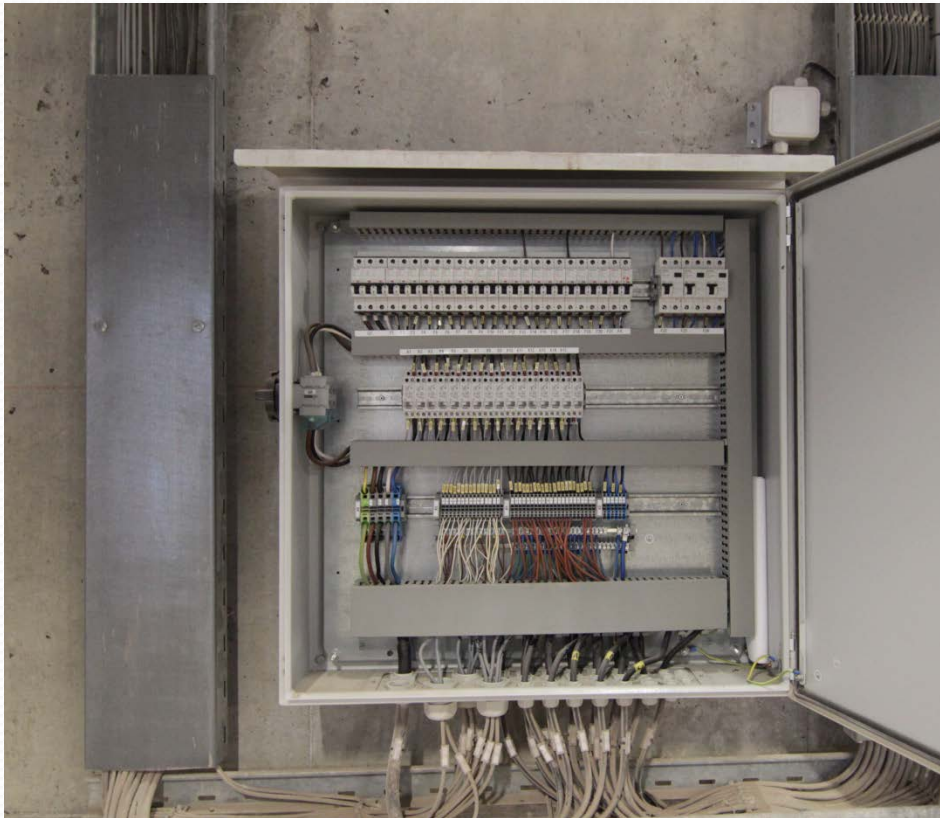
MCC 3P1-1M1
Section UG



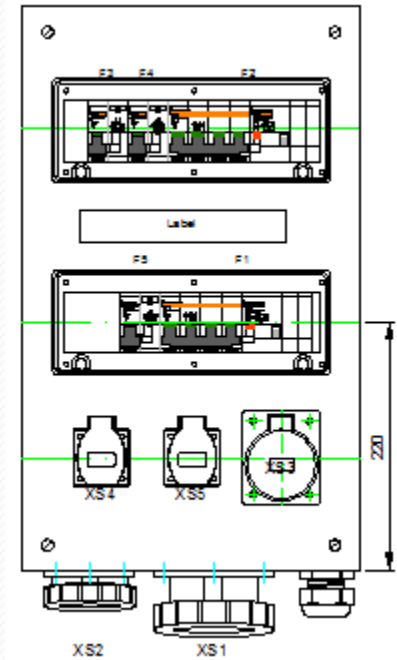
Panel for HVAC



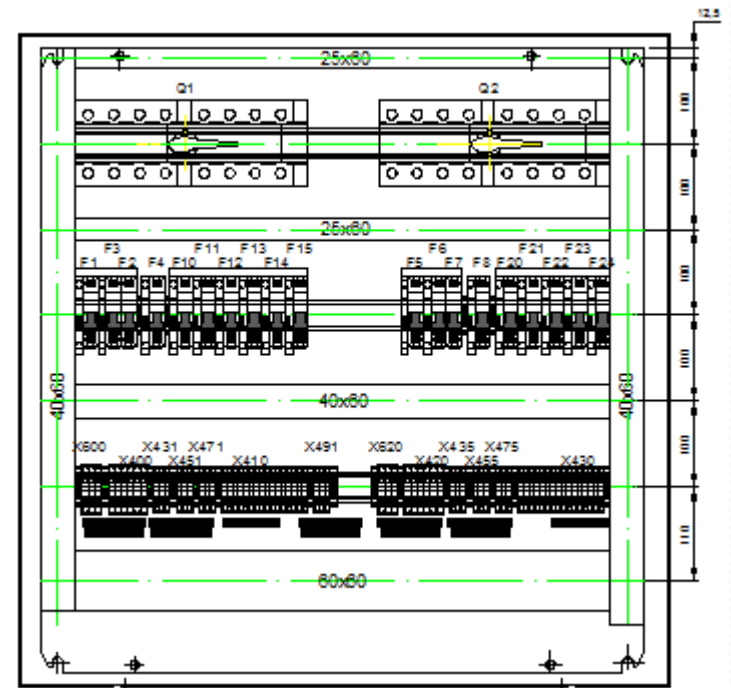
Lighting Panel



Socket Centers



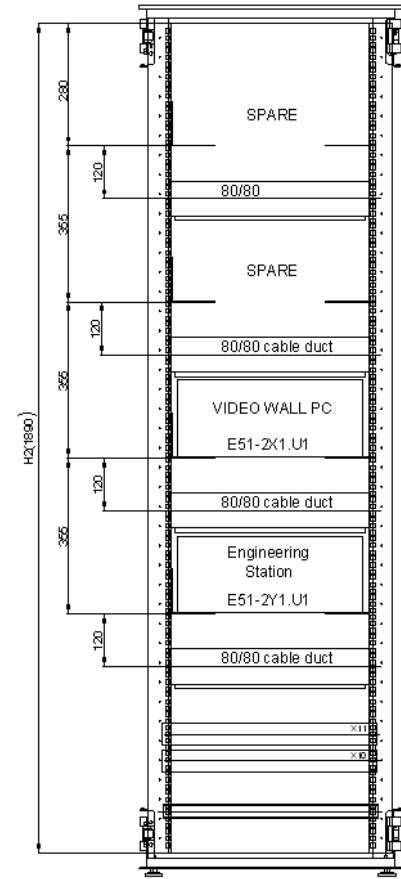
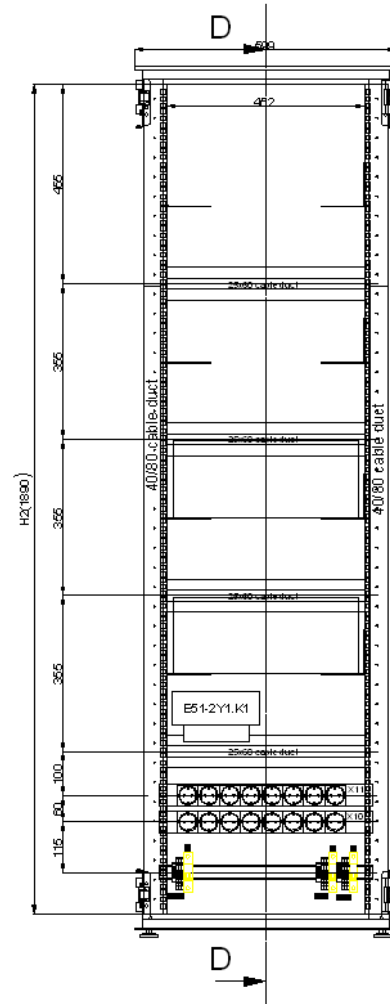
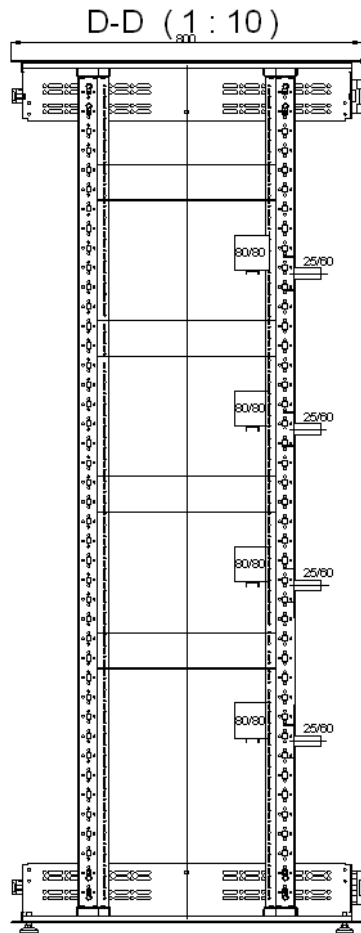
Distribution panel for UPS



Panel for PC's - RACK mounting



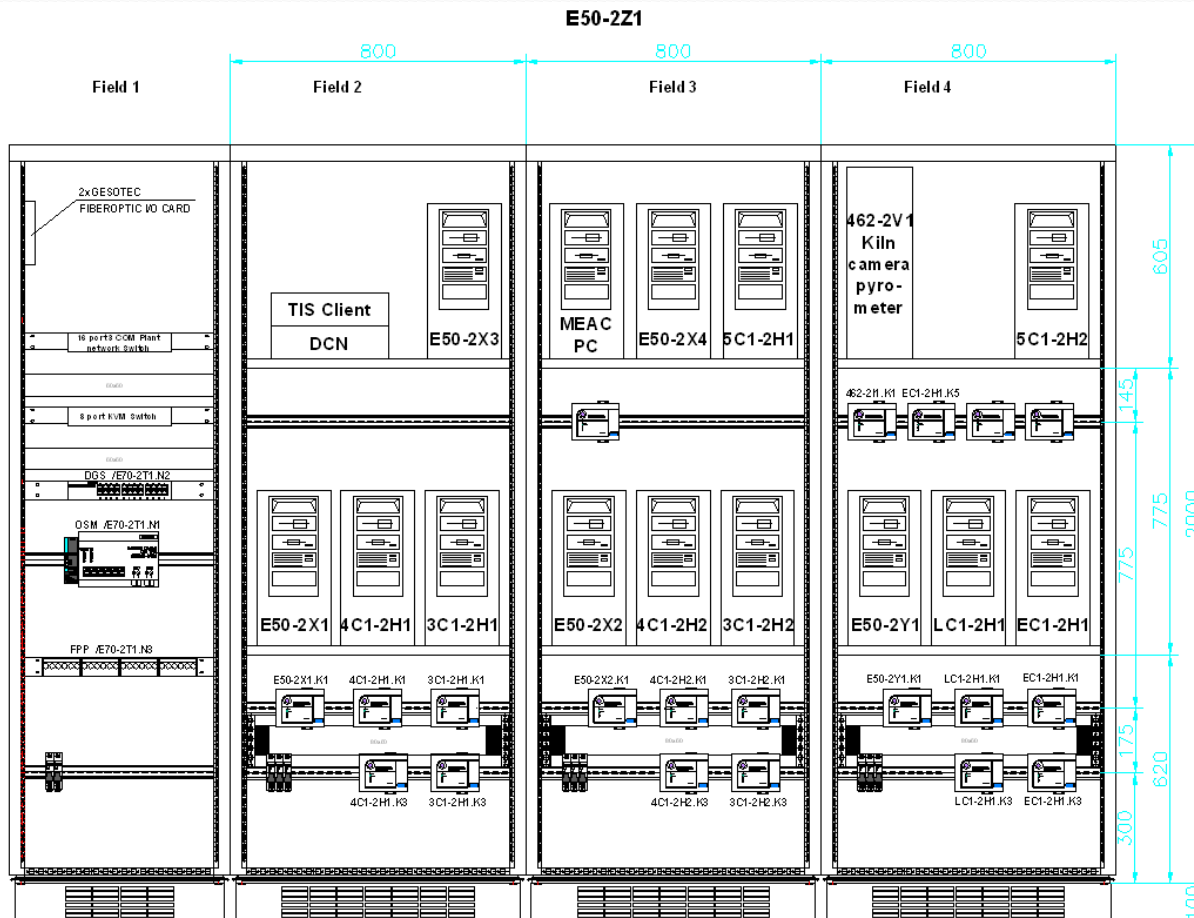
Panel for PC's - RACK mounting



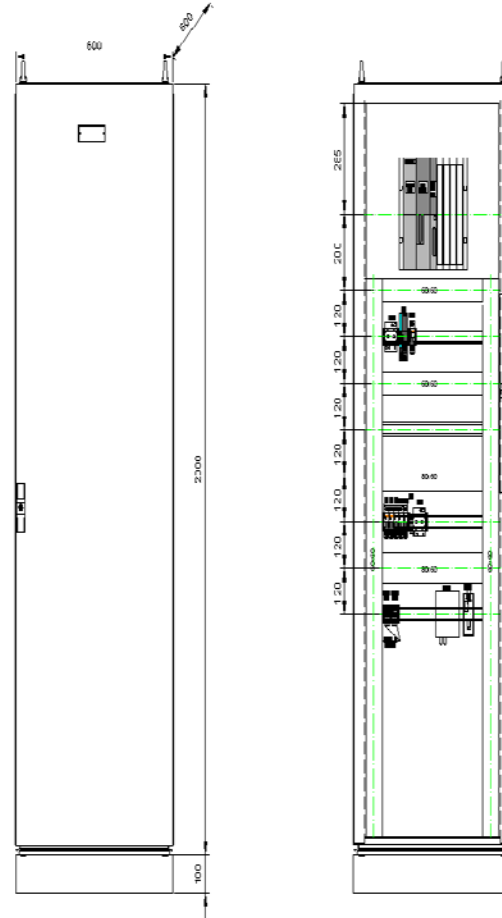
Panel for PC's – free standing



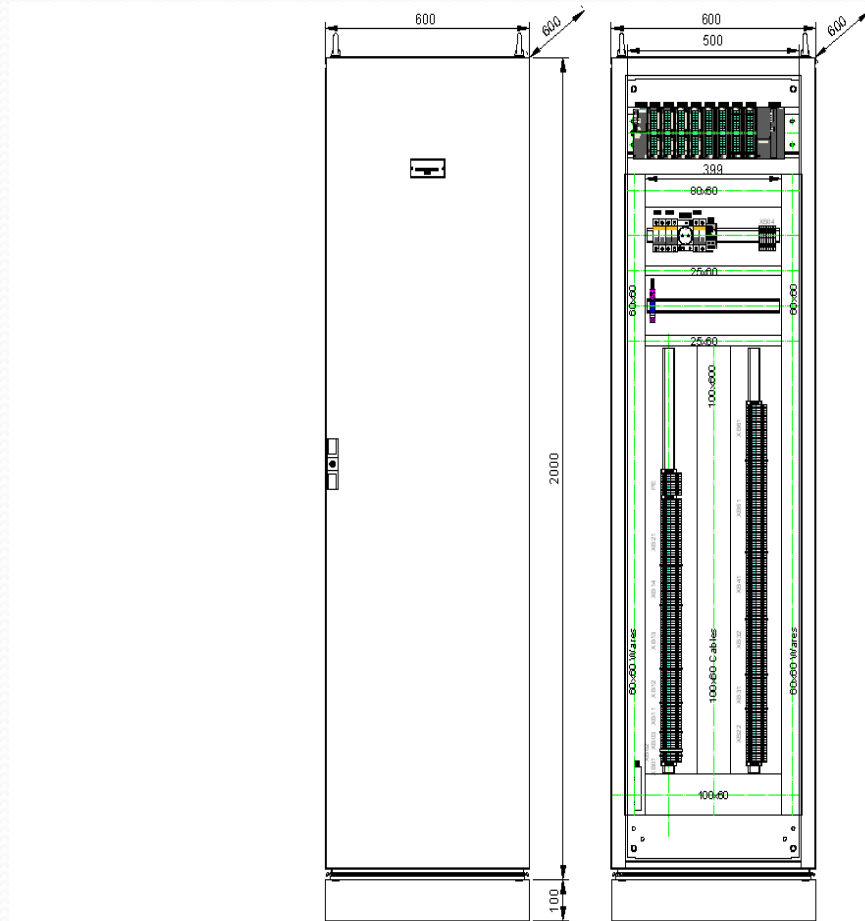
Panel for PC's – free standing



PLC Control Cabinet



Panel with distribution I/O modules



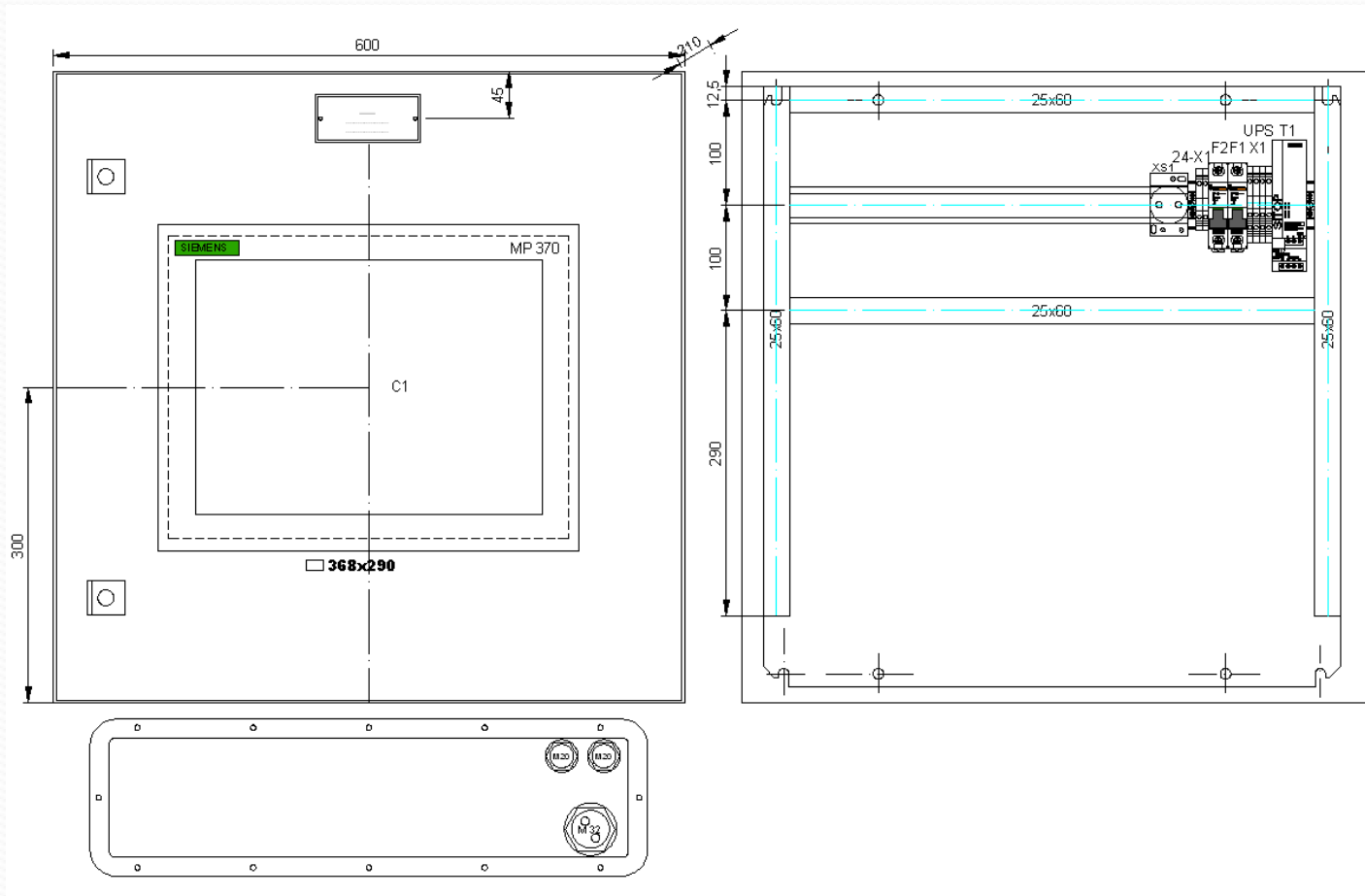
Panel with distribution I/O modules



Board with “Touch” panel



Board with “Touch” panel

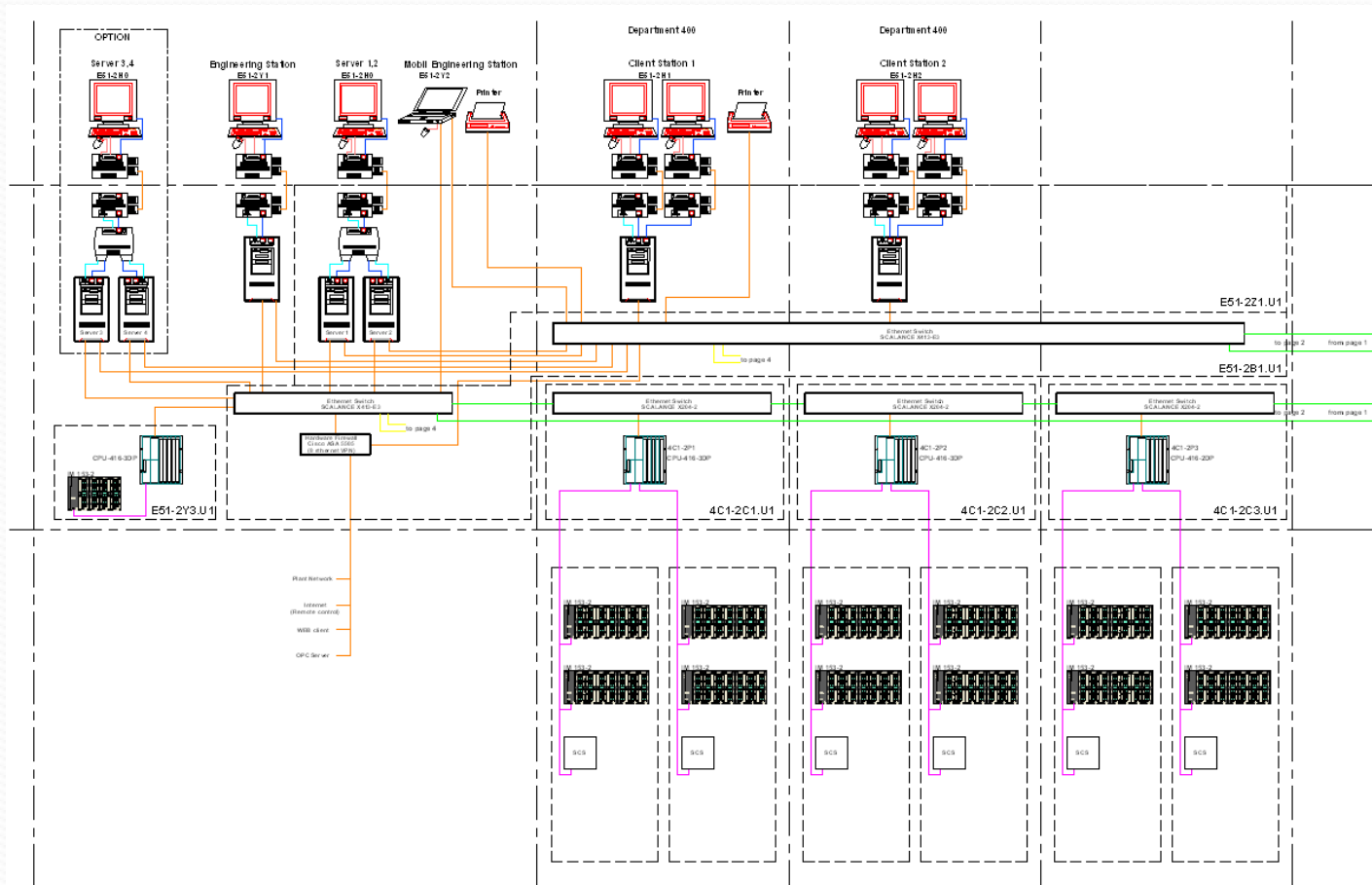


**Standard technical decisions
and documents
for part "Electrical"
and part "Automation"
design from
SAT Ltd. – Sofia, Bulgaria**

Block diagram for Structure of Plant automation

- Number of: Servers, operator (client) stations, engineering stations, PLC's, panels with distribution I/O, switches, printers, etc.
- Connection and type of connection between different elements
- Location at plant of different elements

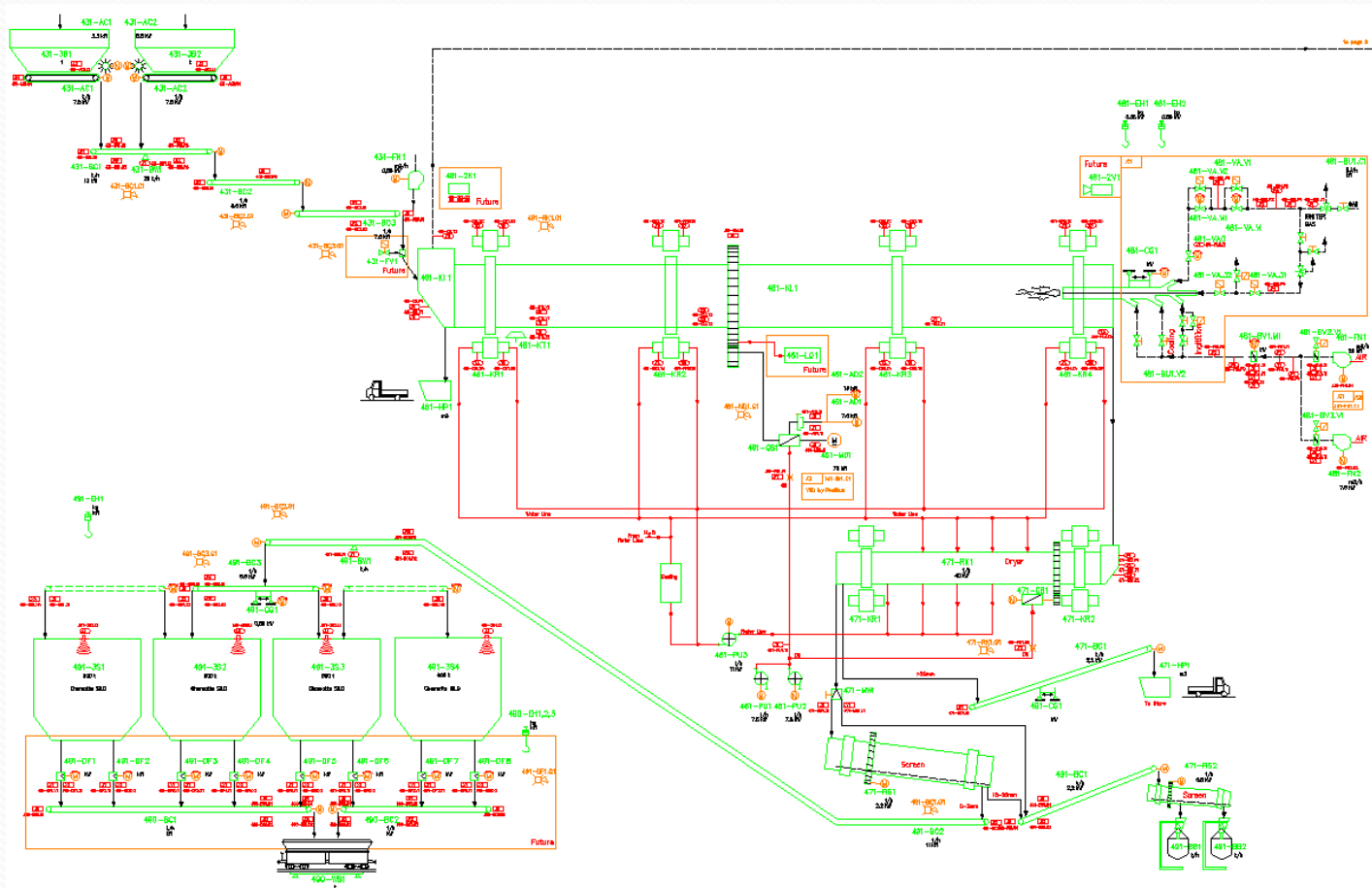
Block diagram for Structure of Plant automation



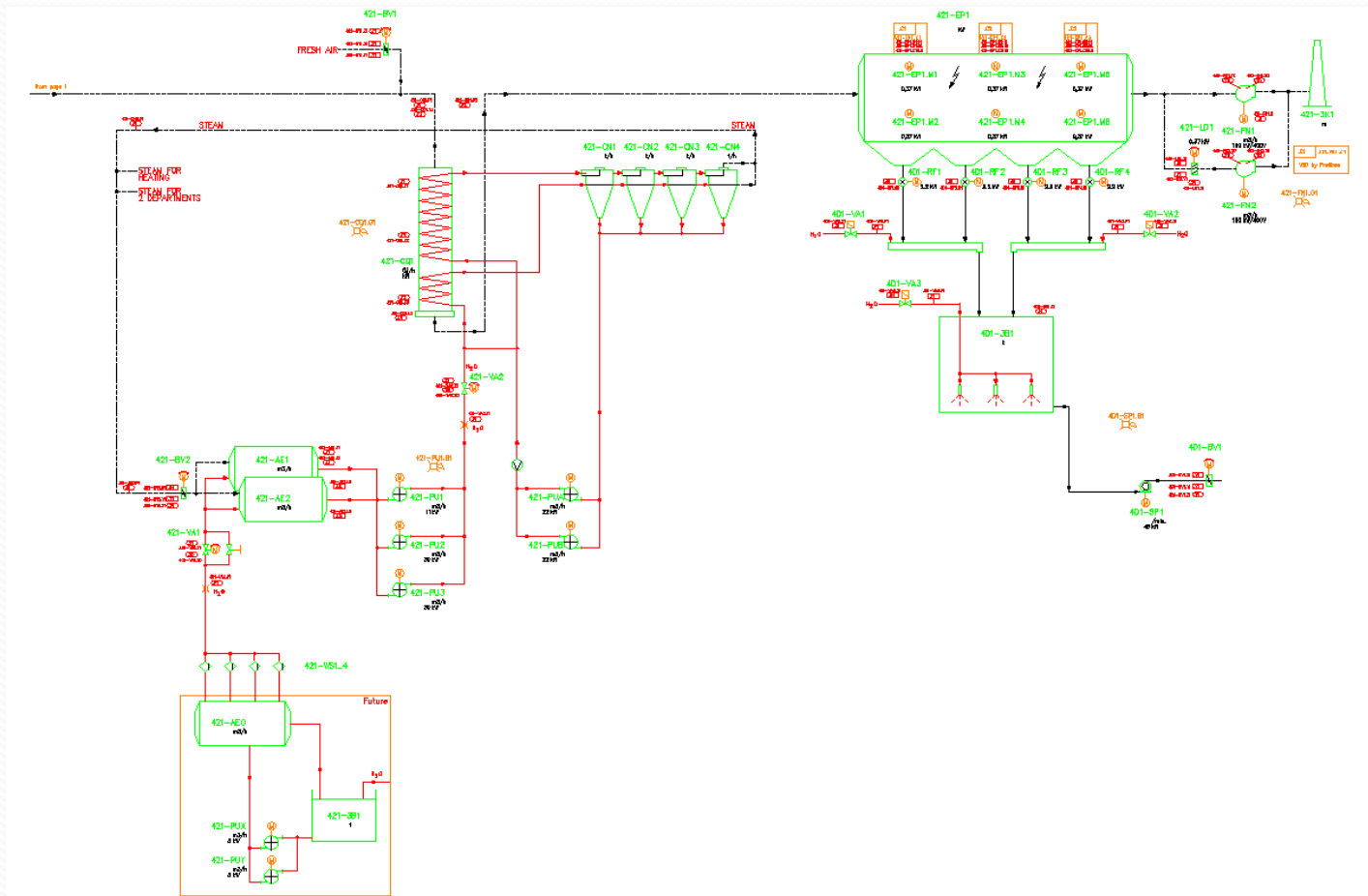
Technological flowsheets

- Technological equipment with code
- Equipment with technical data (power of motor, capacity, etc.)
- Indicated instrumentation, sensors and sub-control system
- Sequence of process flow

Technological flowsheets



Technological flowsheets



Standard Lists – List of instrumentation and sensors

- Technological equipment with code
- Description of equipment
- Measuring limits of instrument
- Alarm limits
- Supply
- Type of instrument/transmitter
- Producer

Standard Lists – List of instrumentation and sensors

Equipm:	Instrumentation, Sensors	Document code:	SH01-EE08-T01E00-001 A	Instrumentation - Sensor List										SAT SYSTEMS AUTOMATION TECHNOLOGIES						
Group:	Field Devices	Date:	27.5.2010																	
Deptm:	Raw Meal Preparation	Revision:	A																	
Plant:	Shurovskoyement OJSC																			
Legend:				**I = Supply Voltage: for 3 or 4-wire sensors only																
Device No. (HAC)	Used for Machinery / Equipment	Location	Device (What)	Measurement			Alarm				Supply Voltage ** (V / Ph)	Signal Source			Control of Device * or I/O-Addr.	Remarks				
				Unit (Phys)	Analog (Type)	Digital (Type)	Span min. max.	min. N	low L	High H		max. M	Sensor Type	Transmitter Type			Manufacturer	Year / Supplier		
T31-3B1.L1	Steel bin		Level high	Mr.	NC							3	230 / 1 Ph	Pointek CLS 300		Siemens	FLS	24 DC or 230 V AC Supply voltage		
T31-BCA.D1	Belt conveyor		Drift Switch-1		NC									HES711		Kiepe	FLS			
T31-BCA.D2	Belt conveyor		Drift Switch-2		NC									HES711		Kiepe	FLS			
T31-BCA.D3	Belt conveyor		Drift Switch-3		NC									HES711		Kiepe	FLS			
T31-BCA.D4	Belt conveyor		Drift Switch-4		NC									HES711		Kiepe	FLS			
T31-BCA.R1	Belt conveyor		Pull Rope Switch-1		NC									HEN 702		Kiepe	FLS			
T31-BCA.R2	Belt conveyor		Pull Rope Switch-2		NC									HEN 702		Kiepe	FLS			
T31-BCA.S1	Belt conveyor		Speed	1/s	NC									XSAV11373TF		Telemecanique	FLS			
T31-BFA.N1	Bag filter		Burst bag detector		NC								24 V DC	Snifer-55-0001		SWR engineering Messted	FLS			
T31-FVA.S1	Flap gate		Speed	1/s	NC									XSAV11373TF		Telemecanique	FLS			
T31-FVA.S2	Flap gate		Speed	1/s	NC									XSAV11373TF		Telemecanique	FLS			
T31-MW1.X1	Diverting gate		Open		NO									XS630B1PAL2TF		Telemecanique	FLS			
T31-MW1.Y1	Diverting gate		Closed		NO									XS630B1PAL2TF		Telemecanique	FLS			
T31-RF1.S1	Rotary Air lock		Speed	1/s	NC									XSAV11373TF		Telemecanique	FLS			
T51-1T1.TA	Converter Transformer		Sec. Winding 1 U Tempera	°C	PT100	E	-35	200						RTD		Pauwells	FLS			
T51-1T1.TB	Converter Transformer		Sec. Winding 1 W Tempera	°C	PT100	E	-35	200						RTD		Pauwells	FLS			
T51-1T1.TC	Converter Transformer		Sec. Winding 1 W Temper	°C	PT100	E	-35	200						RTD		Pauwells	FLS			
T51-1T1.TD	Converter Transformer		Sec. Winding 2 U Tempera	°C	PT100	E	-35	200						RTD		Pauwells	FLS			
T51-1T1.TE	Converter Transformer		Sec. Winding 2 V Tempera	°C	PT100	E	-35	200						RTD		Pauwells	FLS			
T51-1T1.TF	Converter Transformer		Sec. Winding 2 W Temper	°C	PT100	E	-35	200						RTD		Pauwells	FLS			
T51-2N1.C1	Stack Emmission		Dust concentration	mg/m3	4-20 ma		0	50							DR300	Durag	FLS			
T51-BF1.LA	Bag filter		Hopper Level Max		NC								230 / 1 Ph	Vega wave 63		Vega	FLS	24 DC or 230 V AC Supply voltage		
T51-BF1.LB	Bag filter		Hopper Level Max		NC								230 / 1 Ph	Vega wave 63		Vega	FLS	24 DC or 230 V AC Supply voltage		
T51-BF1.LC	Bag filter		Hopper Level Max		NC								230 / 1 Ph	Vega wave 63		Vega	FLS	24 DC or 230 V AC Supply voltage		
T51-BF1.LD	Bag filter		Hopper Level Max		NC								230 / 1 Ph	Vega wave 63		Vega	FLS	24 DC or 230 V AC Supply voltage		
T51-BF1.LE	Bag filter		Hopper Level Max		NC								230 / 1 Ph	Vega wave 63		Vega	FLS	24 DC or 230 V AC Supply voltage		
T51-BF1.LF	Bag filter		Hopper Level Max		NC								230 / 1 Ph	Vega wave 63		Vega	FLS	24 DC or 230 V AC Supply voltage		
T51-BF1.LG	Bag filter		Hopper Level Max		NC								230 / 1 Ph	Vega wave 63		Vega	FLS	24 DC or 230 V AC Supply voltage		
T51-BF1.LH	Bag filter		Hopper Level Max		NC								230 / 1 Ph	Vega wave 63		Vega	FLS	24 DC or 230 V AC Supply voltage		
T51-BF1.NA	Bag filter		Burst bag detector Section	mg/m3	4-20 ma		0.5	500					24 V DC			EM30T	Filter Sense	FLS		
T51-BF1.NB	Bag filter		Burst bag detector Section	mg/m3	4-20 ma		0.5	500					24 V DC			EM30T	Filter Sense	FLS		
T51-BF1.NC	Bag filter		Burst bag detector Section	mg/m3	4-20 ma		0.5	500					24 V DC			EM30T	Filter Sense	FLS		
T51-BF1.ND	Bag filter		Burst bag detector Section	mg/m3	4-20 ma		0.5	500					24 V DC			EM30T	Filter Sense	FLS		
T51-BF1.NE	Bag filter		Burst bag detector Section	mg/m3	4-20 ma		0.5	500					24 V DC			EM30T	Filter Sense	FLS		
T51-BF1.NF	Bag filter		Burst bag detector Section	mg/m3	4-20 ma		0.5	500					24 V DC			EM30T	Filter Sense	FLS		
T51-BF1.NG	Bag filter		Burst bag detector Section	mg/m3	4-20 ma		0.5	500					24 V DC			EM30T	Filter Sense	FLS		
T51-BF1.NH	Bag filter		Burst bag detector Section	mg/m3	4-20 ma		0.5	500					24 V DC			EM30T	Filter Sense	FLS		
T51-BF1.P1	Bag filter		Inlet Pressure	hpa	4-20 ma		0	-80								Sitrans P DSIII	Siemens	FLS		
T51-BF1.P2	Bag filter		Outlet Pressure	hpa	4-20 ma		0	-100								Sitrans P DSIII	Siemens	FLS		
T51-BF1.P3	Bag filter		Diff. Pressure	hpa	4-20 ma		0	50								EJA110	Yokogawa	FLS		
T51-BF1.P4	Bag filter		System Pressure	bar	4-20 ma		0	6								HE1149	Hesch	FLS		
T51-BF1.T1	Bag filter		Inlet Temperature	°C	TC		-40	200								B10C.1000.00		BJI	FLS	
T51-BF1.T2	Bag filter		Outlet Temperature	°C	TC		-40	200								B10C.1000.00		BJI	FLS	
T51-BF1.TA	Bag filter		Hopper Temperature	°C	PT100		-50	150								857.0450.00		BJI	FLS	
T51-BF1.TB	Bag filter		Hopper Temperature	°C	PT100		-50	150								857.0450.00		BJI	FLS	
T51-BF1.TC	Bag filter		Hopper Temperature	°C	PT100		-50	150								857.0450.00		BJI	FLS	
T51-BF1.TD	Bag filter		Hopper Temperature	°C	PT100		-50	150								857.0450.00		BJI	FLS	
T51-BF1.TE	Bag filter		Hopper Temperature	°C	PT100		-50	150								857.0450.00		BJI	FLS	
T51-BF1.TF	Bag filter		Hopper Temperature	°C	PT100		-50	150								857.0450.00		BJI	FLS	
T51-BF1.TG	Bag filter		Hopper Temperature	°C	PT100		-50	150								857.0450.00		BJI	FLS	
T51-BF1.TH	Bag filter		Hopper Temperature	°C	PT100		-50	150								857.0450.00		BJI	FLS	
T51-DN1.T1	Flash Dryer		Outlet temperature	°C	TC		-40	200								B10C.1000.00		BJI	FLS	
T51-DRI.P1	Flash Dryer		Inlet Pressure	hpa	4-20 ma		0	-10									Sitrans P DSIII	Siemens	FLS	
T51-DRI.T1	Flash Dryer		Inlet temperature	°C	TC		-40	800									B	Siemens	FLS	
T51-FN1.NA	Filter fan Motor		Motor Bearing Vibration	mm/s	4-20 ma		0	20								VS088	VC 1100-C11	tuel & Kjaer Vib	FLS	Dual Channel transmitter with

Standard Lists – List of consumers

- Technological equipment with code
- Description of equipment
- Power, Current and Rotation speed
- Starting type
- Supply
- Motor type
- Producer

Standard Lists – List of consumers

Equipment: Power Consumers		Document	SH01-EE02-T01E00-001 B		Motor - Consumer List										SAT SYSTEMS AUTOMATION TECHNOLOGIES			
Group: Motors and Drives		E80	code															
Deptm: Raw Meal Preparation		Date: 20.2.2011	Power = Motor template (load B, class F)															
Plant: OJSC "Shurovsky Cement"		Revision: C	Current = Current at nominal motor load															
Legend: *) Starting: DOL = Direct on line RDOL = Reversible LR = Liquid Starter SS = Starting Resistors VSD = Variable Speed Drive (VFD, SSC) F = Feeder (do not use SD= Star Delta)																		
**) Motor / Consumer: SC = Squirrel Cage SL = Slip Ring HR = Heating Resistor SO = Solenoid A = Actuator SCS = Sub Control System (special use only: SY = Synohro; DC = Direct Current; HY = Hydraulio; T8 = Two Speed)																		
Motor identification No. (IAC)	Designation		Motor / Consumer				Type of					Year / Supplier	MV / LVD / MCC identification	Remarks (e.g. standby power or rotor current/voltage for SL)	Rev. No.			
	Used for Machinery / Equipment	Location	Power kW (kVA)	Speed 1 rpm (st)	Speed 2 rpm (mech)	Volt V	Current A	Feeding Starting *)	Motor **)	Frame-Size	Mount.					Encls.	Insul. Class	Manufacturer
T31-BCA.M1	Belt conveyor Motor		5.5	1465		400	12	DOL	SC	132S		IP55	F/B	VEM	FLS	TP1-1M1		
T31-BFA.C1	Bag filter Controller		50 VA			230	1	F	SCS					FLS	FLS	TP1-1M1		
T31-BFA.H1	Bag filter Heat Tracing		0.4			230	1.9	F	HR					Themon	FLS	TP1-1M1		
T31-BFA.V0	Bag filter Solenoid valve					24			SO					FLS	FLS	T31-BFA.C1		
T31-FNA.M1	Fan Motor		22	1478		400	42	DOL	SC	180L		IP55	F/B	VEM	FLS	TP1-1M1		
T31-FVA.M1	Flap valve Motor		0.55	1400		400	1.6	DOL	SC			IP55	F/B	Bauer	FLS	TP1-1M1		
T31-MT1.C1	Metal Detector		0.011			230	0.5	F						ERIEZ	FLS	TP1-1M1		
T31-MW1.V1	Change over gate Pneumatic		0.01			230			SO					Parker	FLS	TP1-1M1		BISTABLE
T31-RF1.M1	Rotary feeder Motor		4	1440		400	8.2	DOL	SC	112M		IP55	F/B	FLENDER	FLS	TP1-1M1		
T31-SXA.M1	Belt conveyor Motor		0.75	1380	6	400	2.1	DOL	SC	80N		IP54	F/B	Sew Euro Drive	FLS	TP1-1M1		
T31-WF1.C1	Weigh feeder Local Control Panel		15 KVA			400	30	F	SCS					PFISTER	FLS	TP1-1M1		
T31-WF1.M1	Flap valve Motor		1.1	1400		400	2.8	DOL	SC			IP55	F/B	Bauer	FLS	TP1-1M1		
T31-ZM1.C1	Dust Monitor		2.3 KVA			230		F						DURAG	FLS	TP1-1M1		
T31-BF1.C1	Bag filter Controller		1.5 KVA			230	1	F	SCS					FLS	FLS	TP1-1M1		
T31-BF1.C1.P	Bag filter Controller Heating element		0.2 KVA			230	F	HR						FLS	FLS	TP1-1M1		
T31-BF1.CA	Node Box Section A		0.1 KVA			230	F	SCS						FLS	FLS	T31-BF1.C1		
T31-BF1.CA.P	Heating Node Box Section A		0.2 KVA			230	F	HR						FLS	FLS	TP1-1M1		
T31-BF1.CB	Node Box Section B		0.1 KVA			230	F	SCS						FLS	FLS	T31-BF1.C1		
T31-BF1.CB.P	Heating Node Box Section B		0.2 KVA			230	F	HR						FLS	FLS	TP1-1M1		
T31-BF1.CC	Node Box Section C		0.1 KVA			230	F	SCS						FLS	FLS	T31-BF1.C1		
T31-BF1.CC.P	Heating Node Box Section C		0.2 KVA			230	F	HR						FLS	FLS	TP1-1M1		
T31-BF1.CD	Node Box Section D		0.1 KVA			230	F	SCS						FLS	FLS	T31-BF1.C1		
T31-BF1.CD.P	Heating Node Box Section D		0.2 KVA			230	F	HR						FLS	FLS	TP1-1M1		
T31-BF1.HA	Bag filter Heating element		8			400		DOL	HR					FLS	FLS	TP1-1M1		Grp. of 4. 2 ph. consumers
T31-BF1.HB	Bag filter Heating element		8			400		DOL	HR					FLS	FLS	TP1-1M1		Grp. of 4. 2 ph. consumers
T31-BF1.HC	Bag filter Heating element		8			400		DOL	HR					FLS	FLS	TP1-1M1		Grp. of 4. 2 ph. consumers
T31-BF1.HD	Bag filter Heating element		8			400		DOL	HR					FLS	FLS	TP1-1M1		Grp. of 4. 2 ph. consumers
T31-BF1.HE	Bag filter Heating element		8			400		DOL	HR					FLS	FLS	TP1-1M1		Grp. of 4. 2 ph. consumers
T31-BF1.HF	Bag filter Heating element		8			400		DOL	HR					FLS	FLS	TP1-1M1		Grp. of 4. 2 ph. consumers
T31-BF1.HG	Bag filter Heating element		8			400		DOL	HR					FLS	FLS	TP1-1M1		Grp. of 4. 2 ph. consumers
T31-BF1.HH	Bag filter Heating element		8			400		DOL	HR					FLS	FLS	TP1-1M1		Grp. of 4. 2 ph. consumers
T31-BF1.V0	Bag filter Solenoid valve					24			SO					FLS	FLS	T31-BF1.C1		
T31-FA2.M1	Dust Monitor purge air fan		0.25 KVA			400		DOL	SC			IP55	F/B	DURAG	FLS	TP1-1M1		
T31-FN1.H1	Fan Motor Heating element		0.315			400	1	DOL	HR					SIEMENS	FLS	TP1-1M1		
T31-FN1.M1	Slag Heat Exchanger Fan Motor		655	1000-500		690	664	VFD	SC	450		IP55	F/B	SIEMENS	FLS	T31-FN1.U1		
T31-FN1.U1	Fan converter		655			690	0.5	F	SCS					SIEMENS	FLS	T31-IT1		
T31-FN1.U1.P	Auxiliary supply heating		0.2			230	2	F	HR					FLS	FLS	TP1-1M1		
T31-FN1.U1.P1	Auxiliary UPS supply					230	2	F	HR					FLS	FLS	TP1-1M1		UPS Supply
T31-FV1.M1	Flap valve Motor		1.1	1400		400	2.8	DOL	SC			IP55	F/B	Bauer	FLS	TP1-1M1		
T31-LD1.M1	Louvre damper Actuator		0.37	1500		400	1.7	F	A			IP67	F/B	AUMA	FLS	TP1-1M1		
T31-LD2.M1	Louvre damper Actuator		0.1	1500		400	0.6	F	A			IP67	F/B	BERNARD	FLS	TP1-1M1		
T31-LD3.M1	Louvre damper Actuator		0.1	1500		400	0.6	F	A			IP67	F/B	BERNARD	FLS	TP1-1M1		
T31-TV1.M1	Throttle valve Actuator		0.06	750		400	0.6	F	A			IP67	F/B	BERNARD	FLS	TP1-1M1		
T31-TV2.M1	Throttle valve Actuator		0.06	750		400	0.6	F	A			IP67	F/B	BERNARD	FLS	TP1-1M1		
T31-TV3.M1	Throttle valve Actuator		0.03	1500		400	0.3	F	A			IP67	F/B	BERNARD	FLS	TP1-1M1		
T31-BC1.M1	Belt conveyor Motor		5.5	1465		400	12	DOL	SC	132S		IP55	F/B	VEM	FLS	TP1-1M1		
T31-CVA.M1	Drag Chain conveyor Motor		3	1455		400	6.6	DOL	SC	100L		IP55	F/B	VEM	FLS	TP1-1M1		
T31-CVB.M1	Drag Chain conveyor Motor		3	1455		400	6.6	DOL	SC	100L		IP55	F/B	VEM	FLS	TP1-1M1		
T31-FVA.M1	Flap valve Motor		0.55	1400		400	1.6	DOL	SC			IP55	F/B	Bauer	FLS	TP1-1M1		
T31-FVB.M1	Flap valve Motor		0.55	1400		400	1.6	DOL	SC			IP55	F/B	Bauer	FLS	TP1-1M1		
T31-FVC.M1	Flap valve Motor		4	1420		400	8.5	DOL	SC			IP55	F/B	Bauer	FLS	TP1-1M1		
T31-SX1.M1	Chain Scraper Motor		0.75	1380	6	400	2.1	DOL	SC	80N		IP54	F/B	Sew Euro Drive	FLS	TP1-1M1		



Thank you for your Attention!