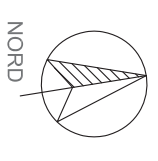
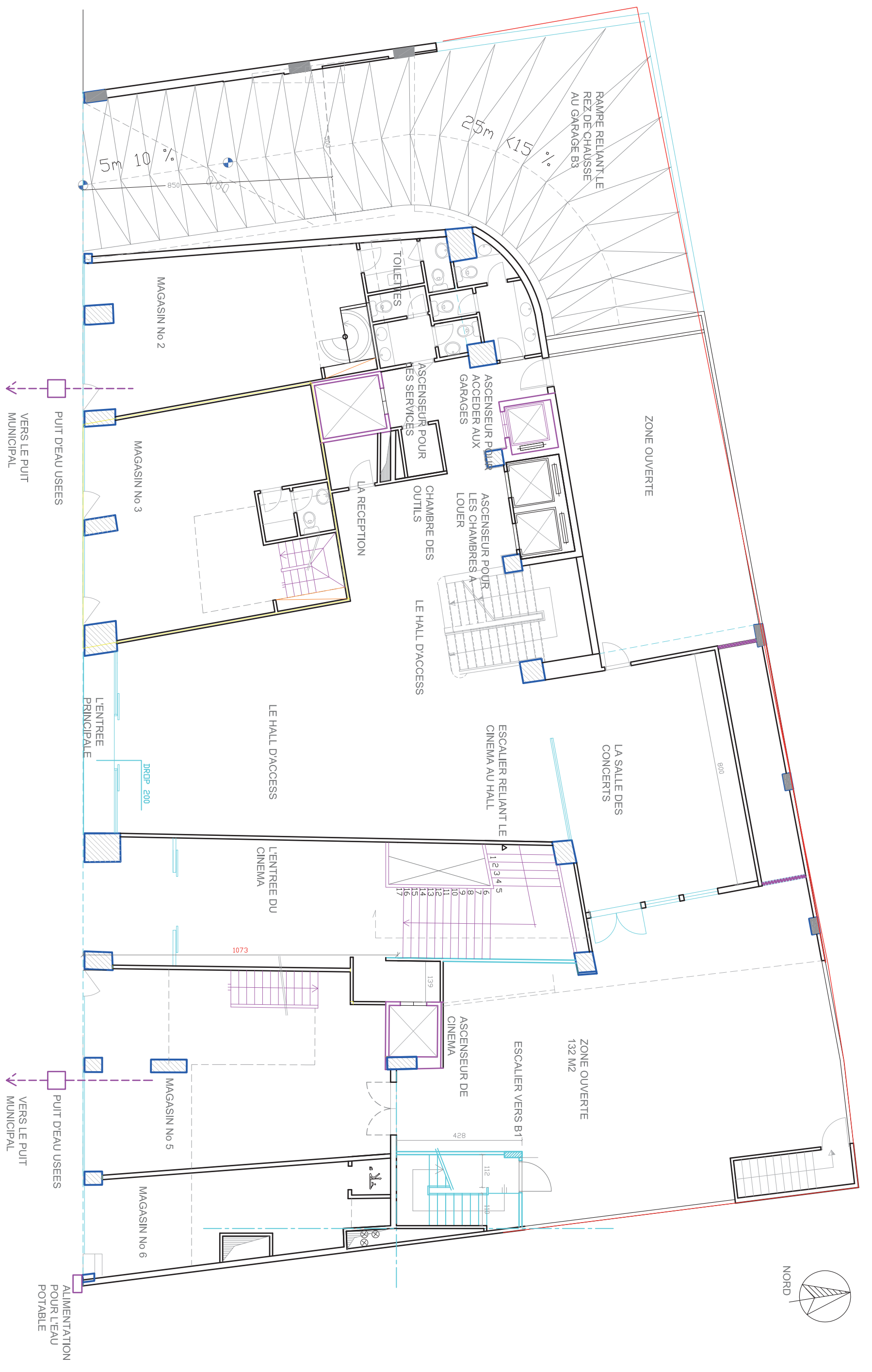
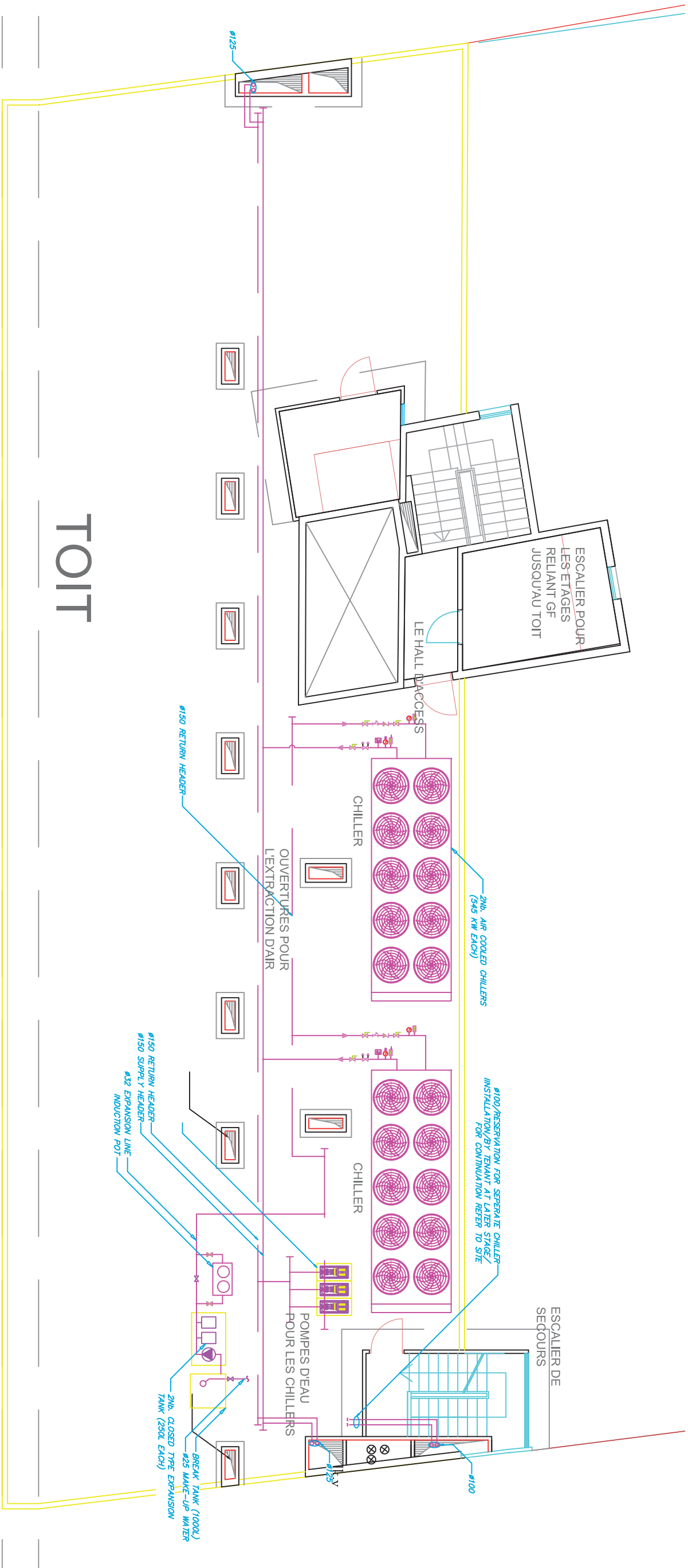


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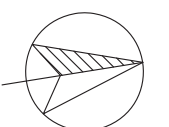
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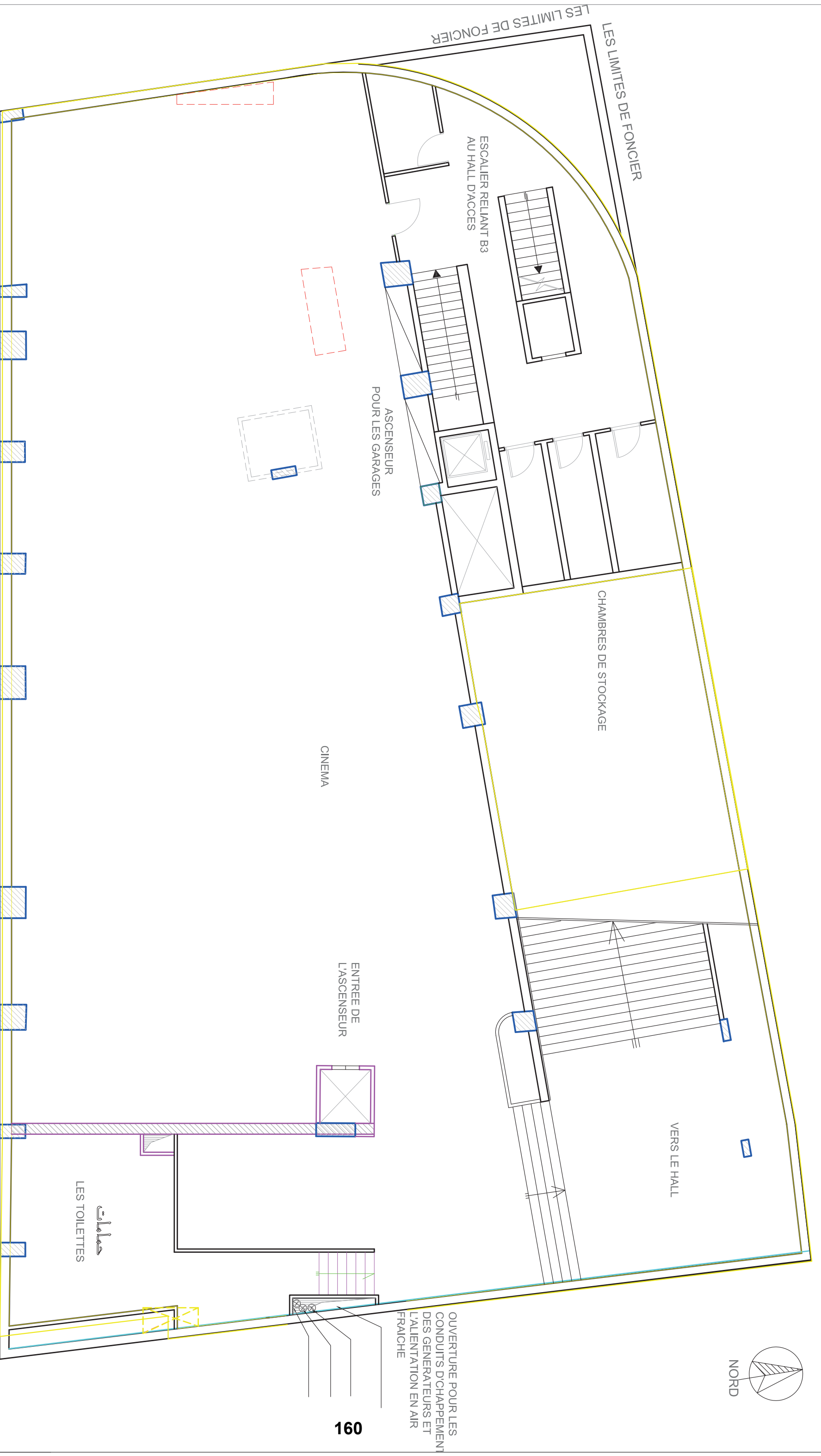


ETAGE SOL B1

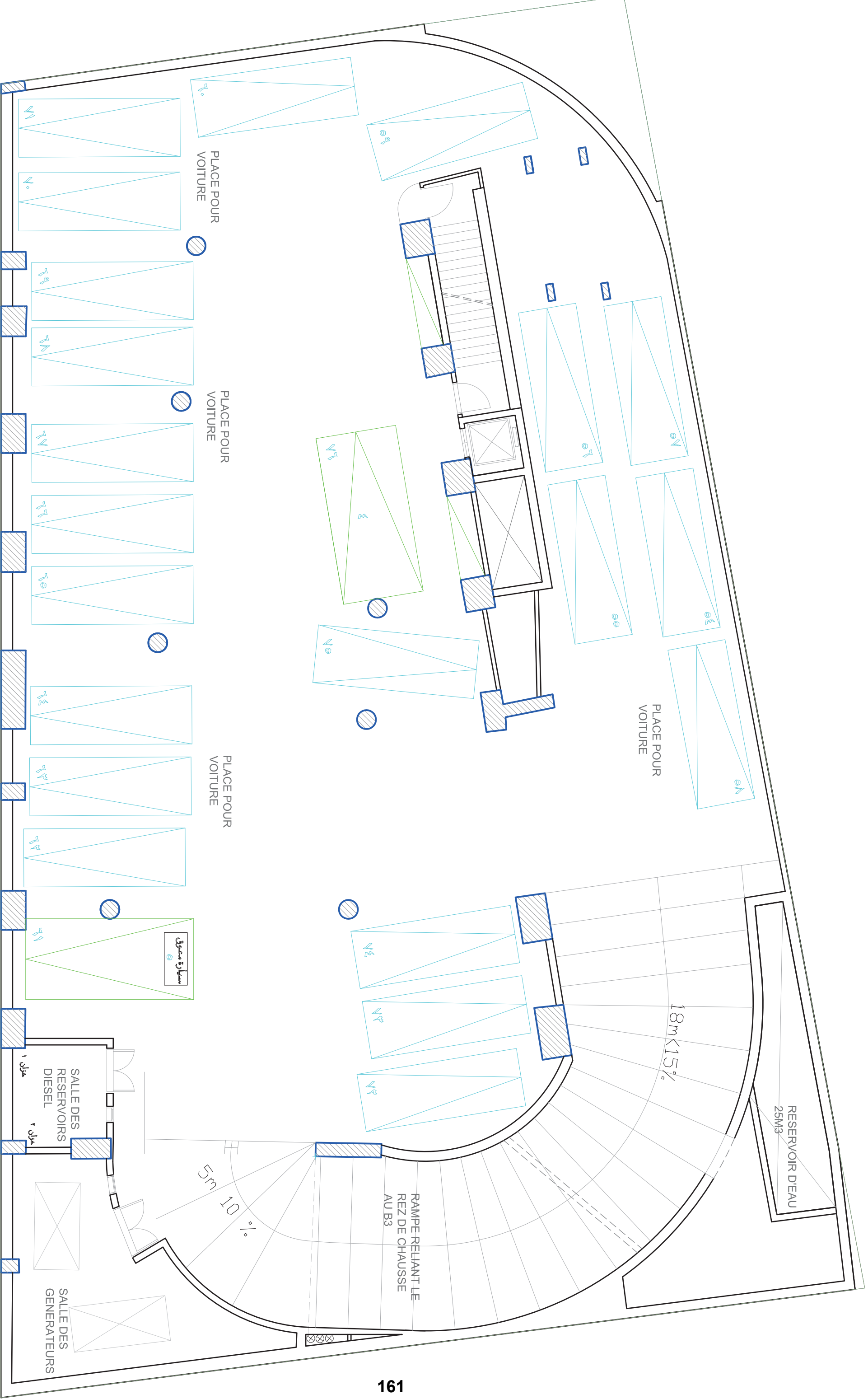




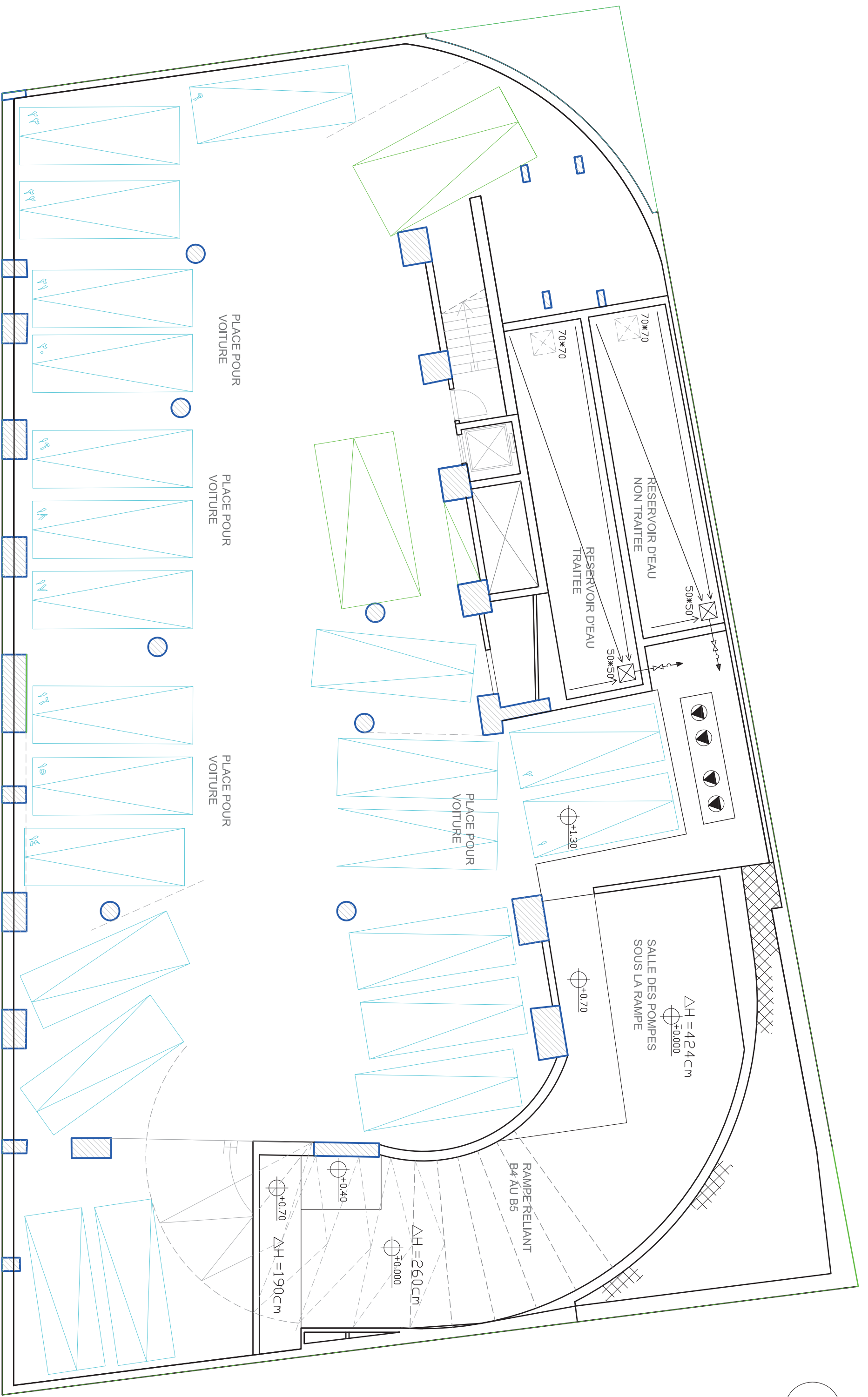
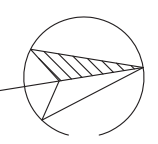
NORD



ETAGE B2



ETAGE SOL B3 ET B4



ETAGE SOUS SOL B5



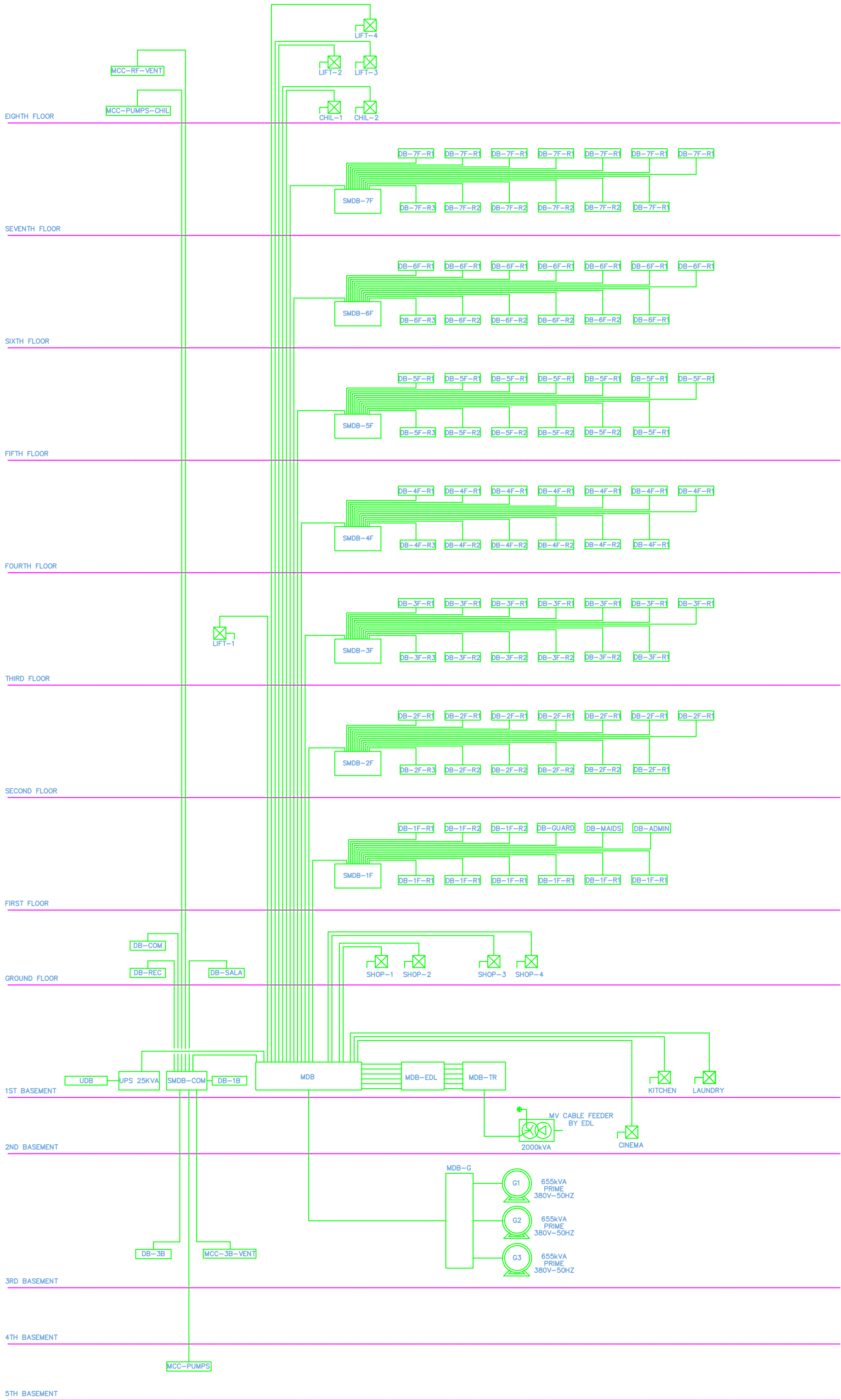


TABLEAU (DESTINATION)	NB DE PHASE	PHASE R Pt (kW)	PHASE S Pt (kW)	PHASE T Pt (kW)
HOTEL	3	190.38	182.23	180.62
CINEMA	3	100.00	100.00	100.00
SHOP-1	1	30.00		
SHOP-2	1		30.00	
SHOP-3	1			30.00
SHOP-4	1	30.00		
MDB-TR	TOTAL	350.38	312.23	310.62
	Ke	1.10		
	TOTAL	385.42	343.46	341.68
	cosphi global	1070.56		
		0.93		

TABLEAU (DESTINATION)	NB DE PHASE	PHASE R Pt (KW)	PHASE S Pt (KW)	PHASE T Pt (KW)	PHASE R Qt (KVAR)	PHASE S Qt (KVAR)	PHASE T Qt (KVAR)	Ks	
SMDB-1F	3	13.06	13.11	11.52	8.22	8.01	7.03	0.6	
SMDB-2F	3	17.03	15.18	14.68	10.56	9.05	8.84		
SMDB-3F	3	17.03	15.18	14.68	10.56	9.05	8.84		
SMDB-4F	3	17.03	15.18	14.68	10.56	9.05	8.84		
SMDB-5F	3	17.03	15.18	14.68	10.56	9.05	8.84		
SMDB-6F	3	17.03	15.18	14.68	10.56	9.05	8.84		
SMDB-7F	3	17.03	15.18	14.68	10.56	9.05	8.84		
SMDB-COM	3	31.88	29.13	31.19	18.56	18.42	20.84		
LAUNDRY	3	9	9	9	6.75	6.75	6.75		
KITCHEN	3	13	13	13	9.75	9.75	9.75		
LIFT-1	3	5.0	5.00	5.00	3.75	3.75	3.75		
LIFT-2	3	5.0	5.00	5.00	3.75	3.75	3.75		
LIFT-3	3	5.0	5.00	5.00	3.75	3.75	3.75		
LIFT-4	3	5.0	5.00	5.00	3.75	3.75	3.75		
CHILLER-1	3	60.00	60.00	60.00	45.00	37.50	37.50		
CHILLER-2	3	60.00	60.00	60.00	45.00	37.50	37.50		
UPS	3	3.19	3.41	3.25	2.39	2.56	2.43		
FIRE PUMP	3	5.00	5.00	5.00	3.75	3.75	3.75		
CINEMA	3	100	100	100	75.00	60.00	60.00	1	
SHOP-1	1	30.00			22.50				
SHOP-2	1		30.00			15.00			
SHOP-3	1			30.00			15.00		
SHOP-4	1	30.00			15.00				
MDB	TOTAL	350.38	312.23	310.62	243.17	191.11	191.14		
	Ke	1.1							
	TOTAL	385.42	343.46	341.68	267.49	210.22	210.26		
	cosphi global	1070.56			687.96				
		0.81							

TABLEAU DIVISIONNAIRE (DESTINATION)	NB DE PHASE	P (KW)	Q (KVAR)	KS	PHASE R Pt (KW)	PHASE S Pt (KW)	PHASE T Pt (KW)	PHASE R Qt (KVAR)	PHASE S Qt (KVAR)	PHASE T Qt (KVAR)		
DB-1F-1R	1	3.87	2.4		3.10			1.92				
DB-1F-1R	1	3.87	2.4			3.10			1.92			
DB-1F-1R	1	3.87	2.4				3.10			1.92		
DB-1F-1R	1	3.87	2.4		3.10			1.92				
DB-1F-1R	1	3.87	2.4			3.10			1.92			
DB-1F-1R	1	3.87	2.4	0.8			3.10			1.92		
DB-1F-1R	1	3.87	2.4		3.10			1.92				
DB-1F-2R	1	4.47	2.62			3.58			2.10			
DB-1F-2R	1	4.47	2.62				3.58			2.10		
DB-MAIDS	1	2.14	1.49		1.71			1.19				
DB-GUARD	1	1.57	1.06			1.26			0.85			
DB-ADMIN	3	2.47	1.47		0.87	0.89	0.71	0.52	0.50	0.45		
SMDB-1F				TOTAL	11.87	11.92	10.48	7.47	7.28	6.39		
				Ke	1.1							
				TOTAL	13.06	13.11	11.52	8.22	8.01	7.03		
				cosphi global	0.85							
				TOTAL	37.69		23.26					

TABLEAU DIVISIONNAIRE (DESTINATION)	NB DE PHASE	P (KW)	Q (KVAR)	KS	PHASE R Pt (KW)	PHASE S Pt (KW)	PHASE T Pt (KW)	PHASE R Qt (KVAR)	PHASE S Qt (KVAR)	PHASE T Qt (KVAR)
DB-(2...7)F-1R	1	3.87	2.40	0.8	3.10			1.92		
DB-(2...7)F-1R	1	3.87	2.40			3.10			1.92	
DB-(2...7)F-1R	1	3.87	2.40				3.10			1.92
DB-(2...7)F-1R	1	3.87	2.40		3.10			1.92		
DB-(2...7)F-1R	1	3.87	2.40					1.92		
DB-(2...7)F-1R	1	3.87	2.40				3.10			1.92
DB-(2...7)F-1R	1	3.87	2.40		3.10			1.92		
DB-(2...7)F-1R	1	3.87	2.40					1.92		
DB-(2...7)F-1R	1	3.87	2.40						1.92	
DB-(2...7)F-1R	1	3.87	2.40							1.92
DB-(2...7)F-2R	1	4.47	2.62							2.10
DB-(2...7)F-2R	1	4.47	2.62			3.58			2.10	
DB-(2...7)F-2R	1	4.47	2.62				3.58		2.10	
DB-(2...7)F-2R	1	4.47	2.62					3.58		2.10
DB-(2...7)F-3R	1	4.44	2.64						2.11	
TOTAL					15.48	13.80	13.34	9.60	8.22	8.03
Ke					1.1					
TOTAL					17.03	15.18	14.68	10.56	9.05	8.84
SMDB-(2...7)F					46.89					
cosphi					0.85					
global					28.44					

CHARGE	DESCRIPTION	P (W)	Q (W)	cos φ	Ku	Ks1	Ks2	Pu (W)	Qu (W)	
ECLAIRAGE CUISINE	LAMPE LED LINEAIRE	150	113	0.8	1	0.7		63	47	
	SPOT LIGHT 4x50	200	0	1	1			84	0	
ECLAIRAGE CHAMBRE	ECLAIRAGE INDIRECTE 8x36	288	114	0.93	1	0.6		121	48	
	LAMPE PRES DU LIT 2x60	120	0	1	1			50	0	
	BALCON ECLAIRAGE INDIRECTE 2X36	72	28	0.93	1			30	12	
	FCU (conditionnement d'air)	300	225	0.8	0.8			144	108	
PRISES DE COURANT DE LA CHAMBRE ET ECLAIRAGE SALLE DES BAINS	PRISE PRES DU LIT	200	204	0.7	1	0.6		30	31	
	TV	200	150	0.8	1			30	23	
	LAPTOP	200	150	0.8	1			30	23	
PRISES DE COURANT DE LA CUISINE	LAMPE DE BUREAU	100	0	1	1	0.6		15	0	
	LAMPE DE SALLE BAINS	200	0	1	1			30	0	
PRISES DE COURANT DE LA CUISINE	PRISE BALCON	200	204	0.7	1	0.7		30	31	
	VENTILATEUR D'EXTRACTION	50	38	0.8	0.8			17	13	
	MICROWAVE	1500	1125	0.8	1			630	473	
	PLAQUE DE CUISSON	1500	930	0.85	1			630	390	
	PLAQUE DE CHAUFFAGE D'EAU	1500	930	0.85	1			630	390	
CHAUFFE EAU ELECTRIQUE MINI-BAR		1500	930	0.85	1	1		900	558	
		100	75	0.8	1			60	45	
DB-1R								TOTAL	3524	2190
								Ke	1.1	
TOTAL								3877	2409	
cosphi global								0.85		

CHARGE	DESCRIPTION	P (W)	Q (W)	cos ^φ	Ku	Ks1	Ks2	Pu (W)	Qu (W)	
ECLAIRAGE CUISINE	LAMPE LED LINEAIRE	250	188	0,8	1	0,7		105	79	
	SPOT LIGHT 4x50	350	0	1	1			147	0	
ECLAIRAGE CHAMBRE	ECLAIRAGE INDIRECTE 8x36	400	158	0,93	1	0,19	0,6	168	66	
	LAMPE PRES DU LIT 2x60	120	0	1	1			50	0	
	BALCON ECLAIRAGE INDIRECTE 2X36	120	47	0,93	1			50	20	
	FCU (conditionnement d'air)	600	450	0,8	0,8	1		480	216	
PRISES DE COURANT DE 2 CHAMBRES ET ECLAIRAGE SALLE DES BAINS	PRISE PRES DU LIT	200	204	0,7	1	0,6		23	23	
	TV	400	300	0,8	1			46	34	
	LAPTOP	400	300	0,8	1			46	34	
	LAMPE DE BUREAU	200	0	1	1			23	0	
	LAMPE DE SALLE BAINS	200	0	1	1	23	0			
	PRISE BALCON	350	357	0,7	1			40	41	
PRISES DE COURANT DE LA CUISINE	VENTILATEUR D'EXTRACTION	50	38	0,8	0,8	0,7		17	13	
	MICROWAVE	1500	1125	0,8	1			630	473	
	PLAQUE DE CUISSON	1500	930	0,85	1			630	390	
	PLAQUE DE CHAUFFAGE D'EAU	1500	930	0,85	1			630	390	
	CHAUFFE EAU ELECTRIQUE	1500	930	0,85	1	1		900	558	
	MINI-BAR	100	75	0,8	1	1		60	45	
DB-2R								TOTAL	4067	2382
								Ke	1,1	
								TOTAL	4474	2620
								cosphi global	0,86	

CHARGE	DESCRIPTION	P (W)	Q (W)	cos ^φ	Ku	Ks1	Ks2	Pd (W)	Qu (W)	
ECLAIRAGE CUISINE	LAMPE LED LINEAIRE	350	263	0.8	1	0.7		147	110	
	SPOT LIGHT 4x50	500	0	1	1			210	0	
	ECLAIRAGE INDIRECTE 8x36	650	257	0.93	1			273	108	
ECLAIRAGE CHAMBRE	LAMPE PRES DU LIT 2x60	240	0	1	1	1		101	0	
	BALCON ECLAIRAGE INDIRECTE 2X36	200	79	0.93	1			84	33	
FCU (conditionnement d'air)		1000	750	0.8	0.8	1		480	360	
	PRISE PRES DU LIT	400	408	0.7	1			38	39	
	TV	600	450	0.8	1			58	43	
PRISES DE COURANT DE 2 CHAMBRES ET ECLAIRAGE SALLE DES BAINS	LAPTOP	600	450	0.8	1	0.16	0.6	58	43	
	LAMPE DE BUREAU	300	0	1	1			29	0	
	LAMPE DE SALLE BAINS	400	0	1	1			38	0	
	PRISE BALCON	500	510	0.7	1	1		48	49	
	VENTILATEUR D'EXTRACTION	50	38	0.8	0.8			17	13	
	MICROWAVE	1500	1125	0.8	0.85			536	402	
PRISES DE COURANT DE LA CUISINE	PLAQUE DE CUISSON	1500	930	0.85	0.85	0.7		536	332	
	PLAQUE DE CHAUFFAGE D'EAU	1500	930	0.85	0.85			536	332	
	CHAUFFE EAU ELECTRIQUE	1500	930	0.85	0.85	1		765	474	
	MINI-BAR	150	113	0.8	1			90	68	
DB-3R								TOTAL	4042	2405
								Ke	1.1	
								TOTAL	4446	2646
								cosphi global	0.86	

TABLEAU (DESTINATION)	NB DE PHASE	PHASE R Pt (kW)	PHASE S Pt (kW)	PHASE T Pt (kW)	PHASE R Qt (KVAR)	PHASE S Qt (KVAR)	PHASE T Qt (KVAR)	
DB-REC	3	0.73	0.80	0.79	0.34	0.46	0.52	
DB-SALA	3	4.13	3.95	3.78	3.88	3.86	3.61	
DB-COMI	3	2.68	2.64	2.44	1.29	1.26	1.13	
DB-3B	3	2.24	2.38	2.35	0.89	0.94	1.48	
DB-1B	3	0.86	0.86	0.86	0.47	0.47	0.34	
MCC-3B-VENT	1	5.01			5.11			
MCC-RF-VENT	1		1.21			1.23		
MCC-PUMPS	3	25.76	25.99	25.80	12.13	15.70	15.40	
MCC-PUMPS-CHILL	1			4.50			4.59	
SMDB-COMI	TOTAL	41.40	37.83	40.51	24.11	23.92	27.07	
	KS	0.70						
	TOTAL	28.98	26.48	28.36	16.88	16.75	18.95	
	Ke	1.1						
TOTAL		31.88	29.13	31.19	18.56	18.42	20.84	
		92.20						57.83
cosphi global		0.85						

CHARGE	TYPE CHARGE	REF	NB DE PHASE	P (kW)	Q (KVAR)	cosΦ	Ks1	Ks2	Pu (kW) PHASER	Pu (kW) PHASES	Pu (kW) PHASET	Qu (KVAR) PHASER	Qu (KVAR) PHASES	Qu (KVAR) PHASET		
KITCHEN	ECLAIRAGE	L1	1	0.6	0.24	0.93	1	0.6			0.36			0.14		
TECH ROOM		L2	1	0.6	0.24	0.93				0.36				0.14		0.14
LAB & WC		L3	1	0.6	0.24	0.93				0.36						0.14
TOOLS ROOM		L4	1	0.5	0.20	0.93				0.30				0.12		
LAUNDRY		L5	1	0.4	0.16	0.93				0.24				0.09		
CORRID. & STAIRS		L6	1	0.1	0.04	0.93				0.06						0.02
TRANSF. ROOM & CORRID.		L7	1	0.5	0.20	0.93				0.30				0.12		
LABORS	PRISES DECOURANT	P1	1	0.7	0.21	0.7	0.19			0.08		0.10				
KITCHENETTE		P2	1	0.9	0.92	0.7				0.10			0.10			
PARKING LEVEL 4		P3	1	0.7	0.21	0.7				0.08			0.08			
TOOLS ROOM		P4	1	0.9	0.92	0.7				0.10			0.10			
DB-1B																
TOTAL									0.78	0.78	0.78	0.42	0.42	0.31		
Ke									1.1							
TOTAL									0.86	0.86	0.86	0.47	0.47	0.34		
TOTAL									2.58							
cosphi global									0.89							

CHARGE	TYPE CHARGE	REF	NB DE PHASE	P (kW)	Q (kVAR)	cosφ	Ks1	Ks2	Pu (kW) PHASE R	Pu (kW) PHASE S	Pu (kW) PHASE T	Qu (kVAR) PHASE R	Qu (kVAR) PHASE S	Qu (kVAR) PHASE T									
PARKINGLEVEL 3	ECLAIRAGE	L1	1	0,6	0,24	0,93	1	0,6	0,36			0,14											
PARKINGLEVEL 3		L2	1	0,6	0,24	0,93				0,36					0,14	0,14							
PARKINGLEVEL 3		L3	1	0,6	0,24	0,93					0,36					0,14							
PARKINGLEVEL 3		L4	1	0,5	0,20	0,93						0,30		0,12									
PARKINGLEVEL 3		L5	1	0,4	0,16	0,93						0,24			0,09								
TRANSFORMER		L6	1	0,1	0,04	0,93							0,06				0,02						
RAMP LEVEL 1-3		L7	1	0,5	0,20	0,93									0,12								
RAMP LEVEL 1-3		L8	1	0,7	0,28	0,93						0,42				0,17							
PARKINGLEVEL 4		L9	1	0,9	0,36	0,93							0,54				0,21						
PARKINGLEVEL 4		L10	1	0,7	0,28	0,93					0,6	0,42			0,17								
PARKINGLEVEL 4		L11	1	0,9	0,36	0,93							0,54			0,21							
PARKINGLEVEL 4		L12	1	0,5	0,20	0,93								0,30			0,12						
PARKINGLEVEL 4		L13	1	1,1	0,43	0,93						0,66			0,26								
PARKINGLEVEL 5		L14	1	0,5	0,20	0,93							0,30			0,12							
PARKINGLEVEL 5		L15	1	0,5	0,20	0,93								0,30			0,12						
PARKINGLEVEL 4		L16	1	0,5	0,20	0,93								0,30			0,12						
PARKINGLEVEL 4		L17	1	0,5	0,20	0,93								0,14			0,37						
GAZOLINE ROOM	P1	1	0,6	0,61	0,7						0,14			0,37									
PARKINGLEVEL 3	PRISES DE COURANT	P1	1	0,6	0,61	0,7									0,4								
PARKINGLEVEL 5		P2	1	0,4	0,41	0,7									0,55								
DB-3B									TOTAL						2,04	2,16	2,14	0,81	0,85	1,35			
									Ke						1,1								
									TOTAL			2,24	2,38	2,35	0,89	0,94	1,48						
									cosphi			6,97			3,31								
									global						0,90								

CHARGE	TYPE CHARGE	REF	NB DE PHASE	P (kW)	Q (KVAR)	cosφ	Ks1	Ks2	Pu (kW) PHASE R	Pu (kW) PHASE S	Pu (kW) PHASE T	Qu (KVAR) PHASE R	Qu (KVAR) PHASE S	Qu (KVAR) PHASE T
CORRIDOR 1ST FLOOR		L1	1	0.9	0.36	0.93			0.54			0.21		
ROOM 1ST FLOOR		L2	1	0.8	0.32	0.93				0.48			0.19	
CORRIDOR 2ND FLOOR		L3	1	1.2	0.47	0.93					0.72			0.28
CORRIDOR 3RD FLOOR		L4	1	1.2	0.47	0.93			0.72			0.28		
CORRIDOR 4TH FLOOR	ECLAIRAGE	L5	1	1.2	0.47	0.93	1			0.72			0.28	
CORRIDOR 5TH FLOOR		L6	1	1.2	0.47	0.93					0.72			0.28
CORRIDOR 6TH FLOOR		L7	1	1.2	0.47	0.93			0.72			0.28		
CORRIDOR 7TH FLOOR		L8	1	1.2	0.47	0.93				0.72			0.28	
ELEVATOR ROOM ROOF		L9	1	0.7	0.28	0.93					0.42			0.17
SERVICE 1TH FLOOR		P1	1	1.2	1.22	0.7		0.6	0.10			0.10		
SERVICE 1TH FLOOR		P2	1	0.6	0.61	0.7				0.05			0.05	
SERVICE 1TH FLOOR		P3	1	0.6	0.61	0.7					0.05			0.05
SERVICE 1TH FLOOR	PRISES DE COURANT	P4	1	0.6	0.61	0.7	0.137		0.05			0.05		
SERVICE 1TH FLOOR		P5	1	0.6	0.61	0.7				0.05			0.05	
SERVICE 1TH FLOOR		P6	1	0.6	0.61	0.7					0.05			0.05
SERVICE 1TH FLOOR		P7	1	0.6	0.61	0.7			0.05			0.05		
EV1 F-4		AC1	1	0.3	0.23	0.8				0.13			0.10	
EV2 F-12		AC2	1	0.3	0.23	0.8					0.13			0.10
EV3 F-12		AC3	1	0.3	0.23	0.8			0.13					
EV4 F-12	CLIMATISATION	AC4	1	0.3	0.23	0.8	0.7			0.13				
EV5 F-12		AC5	1	0.3	0.23	0.8					0.13			0.10
EV6 F-12		AC6	1	0.3	0.23	0.8			0.13			0.10		
EV7 F-12		AC7	1	0.3	0.23	0.8				0.13		0.10		
DB-COM														
TOTAL									2.43	2.40	2.21	1.18	1.15	1.03
									1.1					
TOTAL									2.68	2.64	2.44	1.29	1.26	1.13
cosphi global									0.90					
									7.76					
									3.69					

CHARGE	TYPE CHARGE	REF	P (kW)	Q (KVAR)	cosΦ	Ks1	Ks2	Pu (kW)	Qu (KVAR)
BEDROOM, KITCHINETTE & WC	ECLAIRAGE	L1	0.4	0.16	0.93	1		0.24	0.09
KITCHINETTE	PRISES DE COURANT	P1	2.0	2.04	0.7	0.16		0.19	0.20
BEDROOM		P2	1.0	1.02	0.7			0.10	0.10
EVE 1F-13	CLIMATISATION	AC1	0.3	0.23	0.8	1		0.18	0.14
EMH	CHAUFFE EAU ELEC.	H1	1.2	0.74	0.85	1		0.72	0.45
DB-GUARDS									
TOTAL			1.43	0.97					
Ke			1.1						
TOTAL			1.57	1.07					
cosphi global			0.82						

CHARGE	TYPE CHARGE	REF	P (kW)	Q (kVAR)	cosΦ	Ks1	Ks2	Pu (kW)	Qu (kVAR)
MAID ROOM	ECLAIRAGE	L1	0.4	0.16	0.93	1		0.24	0.09
KITCHINETTE	PRISES DE COURANT	P1	0.6	0.61	0.7	0.16		0.06	0.06
KITCHINETTE		P2	0.6	0.61	0.7			0.06	0.06
BEDROOM		P3	1.6	1.63	0.7			0.15	0.16
EVE 1F-1	CLIMATISATION	AC1	1.2	0.90	0.8	1		0.72	0.54
EMH	CHAUFFEEAU ELEC.	H1	1.2	0.74	0.85	1		0.72	0.45
DB-MAIDS							TOTAL	1.95	1.36
							Ke	1.1	
							TOTAL	2.14	1.49
							cosphi global	0.82	

CHARGE	TYPE CHARGE	REF	NB DE PHASE	P (kW)	Q (KVAR)	cosΦ	Ks1	Ks2	Pu (kW) PHASE R	Pu (kW) PHASE S	Pu (kW) PHASE T	Qu (KVAR) PHASE R	Qu (KVAR) PHASE S	Qu (KVAR) PHASE T			
RECEPTION	ECLAIRAGE	L1	1	0.9	0.36	0.93	1		0.54	0.36		0.21	0.14				
RECEPTION RESTROOMS		L2	1	0.6	0.24	0.93											
RECEPTION		L3	1	0.6	0.24	0.93										0.14	
RECEPTION	PRISES DE COURANT	P1	1	1.6	1.63	0.7	0.137	0.6			0.13				0.13		
RECEPTION		P2	1	1.2	1.22	0.7					0.10						0.10
RECEPTION		AC1	1	0.3	0.23	0.8					0.13						0.09
RECEPTION	CLIMATISATION	AC2	1	0.3	0.23	0.8	0.7		0.13			0.09					
RECEPTION		AC3	1	0.9	0.65	0.8					0.37				0.27		
RECEPTION																	
DB-REC																	
TOTAL									0.67	0.73	0.72	0.31	0.42	0.47			
Ke									1.1								
TOTAL									0.73	0.80	0.79	0.34	0.46	0.52			
TOTAL									2.32		1.32						
cosphi									0.87								
global									0.87								

CHARGE	TYPE CHARGE	REF	NB DE PHASE	P (kW)	Q (KVAR)	cosφ	Ks1	Ks2	Pu (kW) PHASE R	Pu (kW) PHASE S	Pu (kW) PHASE T	Qu (KVAR) PHASE R	Qu (KVAR) PHASE S	Qu (KVAR) PHASE T			
SALA	ECLAIRAGE	L1	1	0.8	0.32	0.93	1	0.6	0.48			0.19					
TECH ROOM		L2	1	0.4	0.16	0.93				0.24						0.09	
SALA MEZZ.		L3	1	0.6	0.24	0.93				0.27	0.36					0.14	
SALA	PRISE DE COURANT	P1	1	1.4	1.43	0.7	0.325	0.27		0.08				0.08			
TECH ROOM		P2	1	0.4	0.41	0.7					0.08					0.08	
TECH ROOM MEZZ.		P3	1	0.4	0.41	0.7				0.27							
SALA MEZZ.		P4	1	1.4	1.43	0.7				0.27							
KITCHEN SALA DISCON. SW.		SW1	3	5	5.10	0.7	1	3.00	3.00	3	3.06	3.06	3.06	3.06			
DB-SALA									TOTAL			3.75	3.59	3.44	3.53	3.51	3.28
									Ke			1.1					
									TOTAL			4.13	3.95	3.78	3.88	3.86	3.61
									cosphi			11.86			11.36		
									global			0.72					

CHARGE	TYPE CHARGE	REF	NB DE PHASE	P (kW)	Q (kVAR)	cosφ	Ks1	Ks2	Pu (kW) PHASE R	Pu (kW) PHASE S	Pu (kW) PHASE T	Qu (kVAR) PHASE R	Qu (kVAR) PHASE S	Qu (kVAR) PHASE T			
RECEPTION	ECLAIRAGE	L1	1	0.8	0.32	0.93	1		0.48			0.19					
OFFICE 1&2		L2	1	1.0	0.40	0.93				0.60		0.30		0.24			
KITCHINETTE, WC & TECH ROOM		L3	1	0.5	0.20	0.93						0.08		0.08		0.12	
RECEPTION	PRISES DE COURANT	P1	1	0.8	0.82	0.7	0.16	0.6	0.08			0.08			0.02		
WLAN		P2	1	0.2	0.20	0.7										0.10	
OFFICE 1		P3	1	1.0	1.02	0.7							0.10				0.10
OFFICE 2		P4	1	1.0	1.02	0.7					0.10			0.10			
KITCHINETTE, WC & TECH ROOM		P5	1	2.0	2.04	0.7						0.19			0.20		
AC RESERVATION		P6	1	0.4	0.41	0.7							0.04				0.04
EX. RESERVATION	CLIMATISATION	AC1	3	0.3	0.25	0.8			0.14		0.04	0.10			0.04		
		AC2	1	0.5	0.38	0.8					0.21				0.16		
TOTAL									0.79	0.81	0.64	0.47	0.45	0.41			
Ke									1.1								
TOTAL									0.87	0.89	0.71	0.52	0.50	0.45			
cosphi global									0.86								
TOTAL									2.47								

DB-ADMIN

CHARGE	TYPE CHARGE	REF	NB DE PHASE	P (kW)	Q (kVAR)	cosφ	Ks1	Pu (kW) PHASE R	Pu (kW) PHASE S	Pu (kW) PHASE T	Qu (kVAR) PHASE R	Qu (kVAR) PHASE S	Qu (kVAR) PHASE T
RECEPTION GD FLOOR		LC1	1	0.2	0.15	0.8			0.20			0.15	
PARKING LEVEL 3		LC2	1	1.2	0.90	0.8		1.20				0.90	
PARKING LEVEL 4		LC3	1	0.3	0.19	0.8				0.25			0.19
PARKING LEVEL 5		LC4	1	2.5	1.88	0.8					1.88		
CORRIDOR 1ST FLOOR		LC5	1	0.2	0.11	0.8		0.15				0.11	
CORRIDOR 2ND FLOOR		LC6	1	0.3	0.23	0.8				0.30			0.23
CORRIDOR 3RD FLOOR		LC7	1	0.3	0.23	0.8			0.30				0.23
CORRIDOR 4TH FLOOR	CAMERA	LC8	1	0.3	0.23	0.8			0.30				0.23
CORRIDOR 5TH FLOOR		LC9	1	0.3	0.23	0.8				0.30			0.23
CORRIDOR 6TH FLOOR		LC10	1	0.3	0.23	0.8				0.30			0.23
CORRIDOR 7TH FLOOR		LC11	1	0.4	0.26	0.8			0.35				0.26
METER ROOM		LC12	1	0.6	0.45	0.8				0.60			0.45
INFORMATION GF	PRISE DE COURANT ASI	LC13	1	0.4	0.30	0.8					0.30		
MFAFCP	FIRE ALARM/PANEL	LC14	1	0.4	0.30	0.8			0.40				0.30
EPABX/MDP	TEL. CABINET	LC15	1	0.4	0.30	0.8				0.40			0.30
DVR/MON	DVR/MONITOR	LC16	1	0.4	0.30	0.8				0.40			0.30
ACU	ACCESS CONTROL	LC17	1	0.2	0.15	0.8			0.20				0.15
MUSIC RACK	MUSIC RACK	LC18	1	0.4	0.30	0.8				0.40			0.30
UDB													
TOTAL								2.90	3.10	2.95	2.18	2.33	2.21
Ke								1.10					
TOTAL								3.19	3.41	3.25	2.39	2.56	2.43
cosφh								0.80					
φGlobal								0.80					

CHARGE	REF	NB DE PHASE	P (KW)	Q (KVAR)	cosφ	η	KS	Pu (KW)	Qu (KVAR)
EXHAUST AIR FAN 2B-1 / 86 LPS	EAF 2B-1	1	0.1	0.10				0.07	0.07
EXHAUST AIR FAN 3B-1 / 2600 LPS	EAF 3B-1	1	0.4	0.41				0.28	0.29
EXHAUST AIR FAN 3B-2 / 40 LPS	EAF 3B-2	1	0.1	0.10				0.07	0.07
EXHAUST AIR FAN 3B-3 / 50 LPS	EAF 3B-3	1	0.1	0.10				0.07	0.07
EXHAUST AIR FAN 3B-1 / 2800 LPS	EAF 4B-1	1	1.3	1.33	0.7	0.7	0.7	0.91	0.93
FRESH AIR FAN 4B-1 / 2500 LPS	FAF 4B-1	1	1.3	1.33				0.91	0.93
EXHAUST AIR FAN 5B-1 / 2800 LPS	EAF 5B-1	1	1.3	1.33				0.91	0.93
FRESH AIR FAN 5B-1 / 2500 LPS	FAF 5B-1	1	1.3	1.33				0.91	0.93
EXHAUST AIR FAN 5B-2 / 60 LPS	EAF 5B-2	1	0.2	0.20				0.14	0.14
EXHAUST AIR FAN 5B-3 / 60 LPS	EAF 5B-3	1	0.2	0.20				0.14	0.14
EXHAUST AIR FAN 5B-4 / 140 LPS	EAF 5B-4	1	0.2	0.20				0.14	0.14
MCC-3B-VENT									
TOTAL								4.55	4.64
Ke								1.1	
TOTAL								5.01	5.11
cosphi global								0.7	

CHARGE	REF	NB DE PHASE	P (kW)	Q (kVAR)	cosΦ	η	KS	Pu (kW) PHASE R	Pu (kW) PHASE S	Pu (kW) PHASE T	Qu (kVAR) PHASE R	Qu (kVAR) PHASE S	Qu (kVAR) PHASE T	
PW BOOSTER PUMP DUTY	PW-BS-1	1	0.75	0.77	0.7	0.7		0.53			0.54			
PW BOOSTER PUMP STANDBY	PW-BS-2	1	0.75	0.77	0.7	0.7			0.53			0.54		
RW SUBMERSIBLE PUMPS	RW-SP-1	1	1.1	1.12	0.7	0.7				0.77			0.79	
RW SUBMERSIBLE PUMPS	RW-SP-2	1	1.1	1.12	0.7	0.7		0.77			0.79			
HOT WATER CIRC. PUMP	HW-CP-1	1	0.9	0.92	0.7	0.7			0.63			0.64		
HOT WATER CIRC. PUMP	HW-CP-2	1	0.9	0.92	0.7	0.7				0.63			0.64	
COLD WATER BOOSTER PUMP DUTY	CW-BS1	3	5.5	4.13	0.8	0.8		3.85	3.85	3.85	2.89	3.93	3.93	
COLD WATER BOOSTER PUMP DUTY	CW-BS2	3	5.5	4.13	0.8	0.8		3.85	3.85	3.85	2.89	3.93	3.93	
COLD WATER BOOSTER PUMP STANDBY	CW-BS3	3	5.5	4.13	0.8	0.8	0.7	3.85	3.85	3.85	2.89	3.93	3.93	
SEWAGE WATER PUMP SET1	SW-SP-1	1	1.1	1.12	0.7	0.7		0.77			0.79			
SEWAGE WATER PUMP SET2	SW-SP-2	1	1.1	1.12	0.7	0.7			0.77			0.79		
HOT WATER TANK 1500L	HWT-1	3	4.5	2.18	0.9	1		3.15	3.15	3.15	0.00	0.00	0.00	
HOT WATER TANK 1500L	HWT-2	3	4.5	2.18	0.9	1		3.15	3.15	3.15	0.00	0.00	0.00	
HOT WATER TANK 1500L	HWT-3	3	4.5	2.18	0.9	1		3.15	3.15	3.15	0.00	0.00	0.00	
FILTRATION SYSTEM	FILT.	1	0.5	0.38	0.8	0.8				0.35			0.26	
UV SYSTEM	UV SYS	1	0.5	0.38	0.8	0.8					0.26			
BOILER	BOIL-1	1	1	0.75	0.8	0.8			0.70			0.53		
BOILER	BOIL-2	1	1	0.75	0.8	0.8				0.70			0.53	
MCC-PUMPS														
TOTAL								23.42	23.63	23.45	11.03	14.27	14.00	
Ke								1.1						
TOTAL								25.76	25.99	25.80	12.13	15.70	15.40	
cosphi								77.54						
global								0.87						

CHARGE	REF	NB DE PHASE	P (KW)	Q (KVAR)	cosΦ	η	KS	Pu (KW)	Qu (KVAR)	
CHILLED WATER CIRC. PUMP	CW-C-1	1	1.5	1.53				1.50	1.53	
CHILLED WATER CIRC. PUMP	CW-C-2	1	1.5	1.53	0.7	0.7	1	1.50	1.53	
CHILLED WATER CIRC. PUMP	CW-C-3	1	1.5	1.53				1.50	1.53	
MCC-PUMPS CHILL										
								TOTAL	3.00	3.06
								Ke	1.1	
								TOTAL	4.50	4.59
								cosphi global	0.7	

CHARGE	REF	NB DE PHASE	P (KW)	Q (KVAR)	cosΦ	η	KS	Pu (KW)	Qu (KVAR)	
EXHAUST AIR FAN RF-1960 LPS	EA F RF-1	1	0.4	0.41				0.40	0.41	
EXHAUST AIR FAN RF-2090 LPS	EA F RF-2	1	0.4	0.41	0.7	0.7	1	0.40	0.41	
EXHAUST AIR FAN TF-570 LPS	EA F TR-1	1	0.15	0.15				0.15	0.15	
EXHAUST AIR FAN TF-475 LPS	EA F TR-2	1	0.15	0.15				0.15	0.15	
MCC-RF-VENT										
								TOTAL	1.10	1.12
								Ke	1.10	
								TOTAL	1.21	1.23
								cosphi global	0.7	

CAS EN ETE									
TABLEAU (DESTINATION)	NB DE PHASE	PHASE R Pt (KW)	PHASE S Pt (KW)	PHASE T Pt (KW)	PHASE R Qt (KVAR)	PHASE S Qt (KVAR)	PHASE T Qt (KVAR)	Ks	
SMDB-1F	3	13.06	13.11	11.52	8.22	8.01	7.03	0.6	
SMDB-2F	3	17.03	15.18	14.68	10.56	9.05	8.84		
SMDB-3F	3	17.03	15.18	14.68	10.56	9.05	8.84		
SMDB-4F	3	17.03	15.18	14.68	10.56	9.05	8.84		
SMDB-5F	3	17.03	15.18	14.68	10.56	9.05	8.84		
SMDB-6F	3	17.03	15.18	14.68	10.56	9.05	8.84		
SMDB-7F	3	17.03	15.18	14.68	10.56	9.05	8.84		
SMDB-COM	3	31.88	29.13	31.19	18.56	18.42	20.84		
LAUNDRY	3	9	9	9	6.75	6.75	6.75		
KITCHEN	3	13	13	13	9.75	9.75	9.75		
LIFT-1	3	5.0	5.00	5.00	3.75	3.75	3.75		
LIFT-2	3	5.0	5.00	5.00	3.75	3.75	3.75		
LIFT-3	3	5.0	5.00	5.00	3.75	3.75	3.75		
LIFT-4	3	5.0	5.00	5.00	3.75	3.75	3.75		
CHILLER-1	3	60.00	60.00	60.00	45.00	45.00	45.00		
CHILLER-2	3	60.00	60.00	60.00	45.00	45.00	45.00		
UPS	3	3.19	3.41	3.25	2.39	2.56	2.43		
FIRE PUMP	3	5.00	5.00	5.00	3.75	3.75	3.75		
CINEMA	3	100	100	100	75.00	75.00	75.00	1	
SHOP-1	1	30.00			22.50				
SHOP-2	1		30.00			22.50			
SHOP-3	1			30.00			22.50		
SHOP-4	1	30.00			22.50				
MDB	TOTAL	350.38	312.23	310.62	250.67	222.61	222.64		
	Ke	1.1							
	TOTAL	385.42	343.46	341.68	275.74	244.87	244.91		
		1070.56			765.51				
	cosphi global	0.81							

CAS EN HIVER									
TABLEAU (DESTINATION)	NB DE PHASE	PHASE R Pt (KW)	PHASE S Pt (KW)	PHASE T Pt (KW)	PHASE R Qt (KVAR)	PHASE S Qt (KVAR)	PHASE T Qt (KVAR)	Ks	
SMDB-1F	3	4.46	4.47	4.04	3.07	3.01	2.72	0.6	
SMDB-2F	3	7.66	4.74	4.59	3.30	2.83	2.76		
SMDB-3F	3	7.66	4.74	4.59	3.30	2.83	2.76		
SMDB-4F	3	7.66	4.74	4.59	3.30	2.83	2.76		
SMDB-5F	3	7.66	4.74	4.59	3.30	2.83	2.76		
SMDB-6F	3	7.66	4.74	4.59	3.30	2.83	2.76		
SMDB-7F	3	7.66	4.74	4.59	3.30	2.83	2.76		
SMDB-COM	3	22.77	20.80	22.28	13.26	13.16	14.89		
LAUNDRY	3	9	9	9	6.75	6.75	6.75		
KITCHEN	3	13	13	13	9.75	9.75	9.75		
LIFT-1	3	5.0	5.00	5.00	3.75	3.75	3.75		
LIFT-2	3	5.0	5.00	5.00	3.75	3.75	3.75		
LIFT-3	3								
LIFT-4	3								
CHILLER-1	3	60.00	60.00	60.00	45.00	45.00	45.00		
CHILLER-2	3								
UPS	3	3.19	3.41	3.25	2.39	2.56	2.43		
FIRE PUMP	3	5.00	5.00	5.00	3.75	3.75	3.75		
CINEMA	3	100	100	100	75.00	75.00	75.00	1	
SHOP-1	1	30.00			22.50				
SHOP-2	1		30.00			15.00			
SHOP-3	1			30.00			15.00		
SHOP-4	1	30.00			15.00				
MDB	TOTAL	264.04	222.49	222.45	179.26	155.06	155.62		
	Ke	1.1							
	TOTAL	290.44	244.74	244.70	197.19	170.57	171.18		
		779.88			538.94				
	cosphi global	0.82							

CAS APRES MINUIT									
TABLEAU (DESTINATION)	NB DE PHASE	PHASE R Pt (KW)	PHASE S Pt (KW)	PHASE T Pt (KW)	PHASE R Qt (KVAR)	PHASE S Qt (KVAR)	PHASE T Qt (KVAR)	Ks	
SMDB-1F	3	4.46	4.47	4.04	3.07	3.01	2.72	0.6	
SMDB-2F	3	7.66	4.74	4.59	3.30	2.83	2.76		
SMDB-3F	3	7.66	4.74	4.59	3.30	2.83	2.76		
SMDB-4F	3	7.66	4.74	4.59	3.30	2.83	2.76		
SMDB-5F	3	7.66	4.74	4.59	3.30	2.83	2.76		
SMDB-6F	3	7.66	4.74	4.59	3.30	2.83	2.76		
SMDB-7F	3	7.66	4.74	4.59	3.30	2.83	2.76		
SMDB-COM	3	22.77	20.80	22.28	13.26	13.16	14.89		
LAUNDRY	3								
KITCHEN	3								
LIFT-1	3	5.0	5.00	5.00	3.75	3.75	3.75		
LIFT-2	3	5.0	5.00	5.00	3.75	3.75	3.75		
LIFT-3	3								
LIFT-4	3								
CHILLER-1	3	60.00	60.00	60.00	45.00	45.00	45.00		
CHILLER-2	3								
UPS	3	3.19	3.41	3.25	2.39	2.56	2.43		
FIRE PUMP	3	5.00	5.00	5.00	3.75	3.75	3.75		
CINEMA	3								
SHOP-1	1							1	
SHOP-2	1								
SHOP-3	1								
SHOP-4	1								
MDB	TOTAL	90.84	79.29	79.25	56.86	55.16	55.72		
	Ke	1.1							
	TOTAL	99.92	87.22	87.18	62.55	60.68	61.29		
		274.32			184.52				
	cosphi global	0.82							

CAS AU MATIN									
TABLEAU (DESTINATION)	NB DE PHASE	PHASE R Pt (KW)	PHASE S Pt (KW)	PHASE T Pt (KW)	PHASE R Qt (KVAR)	PHASE S Qt (KVAR)	PHASE T Qt (KVAR)	Ks	
SMDB-1F	3	4.46	4.47	4.04	3.07	3.01	2.72	0.6	
SMDB-2F	3	7.66	4.74	4.59	3.30	2.83	2.76		
SMDB-3F	3	7.66	4.74	4.59	3.30	2.83	2.76		
SMDB-4F	3	7.66	4.74	4.59	3.30	2.83	2.76		
SMDB-5F	3	7.66	4.74	4.59	3.30	2.83	2.76		
SMDB-6F	3	7.66	4.74	4.59	3.30	2.83	2.76		
SMDB-7F	3	7.66	4.74	4.59	3.30	2.83	2.76		
SMDB-COM	3	22.77	20.80	22.28	13.26	13.16	14.89		
LAUNDRY	3	9	9	9	6.75	6.75	6.75		
KITCHEN	3	13	13	13	9.75	9.75	9.75		
LIFT-1	3	5.0	5.00	5.00	3.75	3.75	3.75		
LIFT-2	3	5.0	5.00	5.00	3.75	3.75	3.75		
LIFT-3	3	5.0	5.00	5.00	3.75	3.75	3.75		
LIFT-4	3	5.0	5.00	5.00	3.75	3.75	3.75		
CHILLER-1	3	60.00	60.00	60.00	45.00	45.00	45.00		
CHILLER-2	3	60.00	60.00	60.00	45.00	45.00	45.00		
UPS	3	3.19	3.41	3.25	2.39	2.56	2.43		
FIRE PUMP	3	5.00	5.00	5.00	3.75	3.75	3.75		
CINEMA	3							1	
SHOP-1	1	30.00			22.50				
SHOP-2	1		30.00			15.00			
SHOP-3	1			30.00			15.00		
SHOP-4	1	30.00			15.00				
MDB	TOTAL	206.04	164.49	164.45	135.76	111.56	112.12		
	Ke	1.1							
	TOTAL	226.64	180.94	180.90	149.34	122.72	123.33		
		588.48				395.39			
	cosphi global	0.82							

CAS DURANT LA JOURNEE									
TABLEAU (DESTINATION)	NB DE PHASE	PHASE R Pt (KW)	PHASE S Pt (KW)	PHASE T Pt (KW)	PHASE R Qt (KVAR)	PHASE S Qt (KVAR)	PHASE T Qt (KVAR)	Ks	
SMDB-1F	3	6.00	6.00	6.00	8.22	8.01	7.03	0.6	
SMDB-2F	3	10.00	10.00	10.00	6.00	6.00	6.00		
SMDB-3F	3	10.00	10.00	10.00	6.00	6.00	6.00		
SMDB-4F	3	10.00	10.00	10.00	6.00	6.00	6.00		
SMDB-5F	3	10.00	10.00	10.00	6.00	6.00	6.00		
SMDB-6F	3	10.00	10.00	10.00	6.00	6.00	6.00		
SMDB-7F	3	10.00	10.00	10.00	6.00	6.00	6.00		
SMDB-COM	3	15.00	15.00	15.00	10.00	10.00	10.00		
LAUNDRY	3	9	9	9	6.75	6.75	6.75		
KITCHEN	3	13	13	13	9.75	9.75	9.75		
LIFT-1	3	5.0	5.00	5.00	3.75	3.75	3.75		
LIFT-2	3	5.0	5.00	5.00	3.75	3.75	3.75		
LIFT-3	3	5.0	5.00	5.00	3.75	3.75	3.75		
LIFT-4	3								
CHILLER-1	3	60.00	60.00	60.00	45.00	45.00	45.00		
CHILLER-2	3								
UPS	3	3.19	3.41	3.25	2.39	2.56	2.43		
FIRE PUMP	3	5.00	5.00	5.00	3.75	3.75	3.75		
CINEMA	3	100	100	100	75.00	75.00	75.00		
SHOP-1	1	30.00			22.50				
SHOP-2	1		30.00			22.50			
SHOP-3	1			30.00			22.50		
SHOP-4	1	30.00			22.50				
MDB	TOTAL	271.71	241.85	241.75	199.87	177.34	176.68	1	
	Ke	1.1							
	TOTAL	298.89	266.03	265.92	219.85	195.07	194.35		
		830.84			609.27				
	cosphi global	0.80							



SACE Emax automatic circuit-breakers

Common data

Voltages	
Rated service voltage Ue	[V] 690 ~
Rated insulation voltage Ui	[V] 1000
Rated impulse withstand voltage Uimp	[kV] 12
Operating temperature	[°C] -25...+70
Storage temperature	[°C] -40...+70
Frequency f	[Hz] 50 - 60
Number of poles	3 - 4
Versions	Fixed - Withdrawable



2

		E1		E2			
		B	N	B	N	S	L
Performance levels							
Currents: max rated uninterrupted current (at 40 °C)	[A]	800	800	1600	1000	800	1250
	[A]	1000	1000	2000	1250	1000	1600
	[A]	1250	1250		1600	1250	
	[A]	1600	1600		2000	1600	
	[A]					2000	
	[A]						
Neutral pole current-carrying capacity for 4-pole CBs	[%Iu]	100	100	100	100	100	100
Rated ultimate breaking capacity under short-circuit Icu							
220/230/380/400/415 V ~	[kA]	42	50	42	66	85	130
440 V ~	[kA]	42	50	42	66	85	110
500/525 V ~	[kA]	42	50	42	55	65	85
660/690 V ~	[kA]	42	50	42	55	65	85
Rated service breaking capacity under short-circuit Ics							
220/230/380/400/415 V ~	[kA]	42	50	42	65	85	130
440 V ~	[kA]	42	50	42	65	85	110
500/525 V ~	[kA]	42	50	42	55	65	65
660/690 V ~	[kA]	42	50	42	55	65	65
Rated short-time withstand current Icw	(1s) [kA]	42	50	42	55	65	10
	(3s) [kA]	36	36	42	42	50	-
Rated making capacity under short-circuit (peak value) Icm							
220/230/380/400/415 V ~	[kA]	88.2	105	88.2	143	187	286
440 V ~	[kA]	88.2	105	88.2	143	187	242
500/525 V ~	[kA]	88.2	105	88.2	121	143	187
660/690 V ~	[kA]	88.2	105	88.2	121	143	187
Utilisation category (according to CEI EN 60947-2)		B	B	B	B	B	A
Isolation behaviour (according to CEI EN 60947-2)		■	■	■	■	■	■
Overcurrent protection							
Electronic trip units for AC applications		■	■	■	■	■	■
Operating times							
Closing time (max)	[ms]	80	80	80	80	80	80
Breaking time for I<Icw (max) ⁽¹⁾	[ms]	70	70	70	70	70	70
Breaking time for I>Icw (max)	[ms]	30	30	30	30	30	12
Overall dimensions							
Fixed: H = 418 mm - D = 302 mm W (3/4 poles)	[mm]	296/386		296/386			
Withdrawable: H = 461 mm - D = 396.5 mm W (3/4 poles)	[mm]	324/414		324/414			
Weights (circuit-breaker complete with trip units and CS, excluding accessories)							
Fixed 3/4 poles	[kg]	45/54	45/54	50/61	50/61	50/61	52/63
Withdrawable 3/4 poles (including fixed part)	[kg]	70/82	70/82	78/93	78/93	78/93	80/95

(1) Without intentional delays; (2) The performance at 600V is 100kA.

		E1 B-N			E2 B-N-S			E2 L	
Max rated uninterrupted current (at 40 °C)	[A]	800	1000-1250	1600	800	1000-1250	1600	1250	1600
Mechanical life with regular ordinary maintenance	[No. operations x 1000]	25	25	25	25	25	25	20	20
Operation frequency	[Operations/hour]	60	60	60	60	60	60	60	60
Electrical life	(440 V ~) [No. operations x 1000]	10	10	10	15	15	12	4	3
	(690 V ~) [No. operations x 1000]	10	8	8	15	15	10	3	2
Operation frequency	[Operations/hour]	30	30	30	30	30	30	20	20



E3					E4			E6	
N	S	H	V	L	S	H	V	H	V
2500	1000	800	800	2000	4000	3200	3200	4000	3200
3200	1250	1000	1250	2500		4000	4000	5000	4000
	1600	1250	1600					6300	5000
	2000	1600	2000						6300
	2500	2000	2500						
	3200	2500	3200						
		3200							
100	100	100	100	100	50	50	50	50	50
66	75	100	130	130	75	100	150	100	150
66	75	100	130	110	75	100	150	100	150
66	75	100	100	85	75	100	130	100	130
66	75	85 ⁽²⁾	100	85	75	85 ⁽²⁾	100	100	100
66	75	85	100	130	75	100	150	100	125
66	75	85	100	110	75	100	150	100	125
66	75	85	85	65	75	100	130	100	100
66	75	85	85	65	75	85	100	100	100
66	75	75	85	15	75	100	100	100	100
66	65	65	65	-	75	75	75	85	85
143	165	220	286	286	165	220	330	220	330
143	165	220	286	242	165	220	330	220	330
143	165	220	220	187	165	220	286	220	286
143	165	187	220	187	165	187	220	220	220
B	B	B	B	A	B	B	B	B	B
■	■	■	■	■	■	■	■	■	■
■	■	■	■	■	■	■	■	■	■
80	80	80	80	80	80	80	80	80	80
70	70	70	70	70	70	70	70	70	70
30	30	30	30	12	30	30	30	30	30
		404/530				566/656			782/908
		432/558				594/684			810/936
66/80	66/80	66/80	66/80	72/83	97/117	97/117	97/117	140/160	140/160
104/125	104/125	104/125	104/125	110/127	147/165	147/165	147/165	210/240	210/240

E3 N-S-H-V						E3 L		E4 S-H-V		E6 H-V			
800	1000-1250	1600	2000	2500	3200	2000	2500	3200	4000	3200	4000	5000	6300
20	20	20	20	20	20	15	15	15	15	12	12	12	12
60	60	60	60	60	60	60	60	60	60	60	60	60	60
12	12	10	9	8	6	2	1.8	7	5	5	4	3	2
12	12	10	9	7	5	1.5	1.3	7	4	5	4	2	1.5
20	20	20	20	20	20	20	20	10	10	10	10	10	10

2

Circuit-breakers for power distribution

Electrical characteristics

2

		Tmax T1 1P	Tmax T1				Tmax T2			
Rated uninterrupted current	[A]	160	160				160			
Poles	[No.]	1	3/4				3/4			
Rated service voltage, Ue	(AC) 50-60 Hz	240	690				690			
	(DC)	125	500				500			
Rated impulse withstand voltage, Uimp	[kV]	8	8				8			
Rated insulation voltage, Ui	[V]	500	800				800			
Test voltage at industrial frequency for 1 min.	[V]	3000	3000				3000			
Rated ultimate short-circuit breaking capacity, Icu		B	B	C	N	N	S	H	L	
(AC) 50-60 Hz 220/230 V	[kA]	25*	25	40	50	65	85	100	120	
(AC) 50-60 Hz 380/400/415 V	[kA]	-	16	25	36	36	50	70	85	
(AC) 50-60 Hz 440 V	[kA]	-	10	15	22	30	45	55	75	
(AC) 50-60 Hz 500 V	[kA]	-	8	10	15	25	30	36	50	
(AC) 50-60 Hz 690 V	[kA]	-	3	4	6	6	7	8	10	
(DC) 250 V - 2 poles in series	[kA]	25 (at 125 V)	16	25	36	36	50	70	85	
(DC) 250 V - 3 poles in series	[kA]	-	20	30	40	40	55	85	100	
(DC) 500 V - 2 poles in series	[kA]	-	-	-	-	-	-	-	-	
(DC) 500 V - 3 poles in series	[kA]	-	16	25	36	36	50	70	85	
(DC) 750 V - 3 poles in series	[kA]	-	-	-	-	-	-	-	-	
Rated service short-circuit breaking capacity, Ics										
(AC) 50-60 Hz 220/230 V	[%Icu]	75%	100%	75%	75%	100%	100%	100%	100%	
(AC) 50-60 Hz 380/400/415 V	[%Icu]	-	100%	100%	75%	100%	100%	100%	75% (70 kA)	
(AC) 50-60 Hz 440 V	[%Icu]	-	100%	75%	50%	100%	100%	100%	75%	
(AC) 50-60 Hz 500 V	[%Icu]	-	100%	75%	50%	100%	100%	100%	75%	
(AC) 50-60 Hz 690 V	[%Icu]	-	100%	75%	50%	100%	100%	100%	75%	
Rated short-circuit making capacity, Icm										
(AC) 50-60 Hz 220/230 V	[kA]	52.5	52.5	84	105	143	187	220	264	
(AC) 50-60 Hz 380/400/415 V	[kA]	-	32	52.5	75.6	75.6	105	154	187	
(AC) 50-60 Hz 440 V	[kA]	-	17	30	46.2	63	94.5	121	165	
(AC) 50-60 Hz 500 V	[kA]	-	13.6	17	30	52.5	63	75.6	105	
(AC) 50-60 Hz 690 V	[kA]	-	4.3	5.9	9.2	9.2	11.9	13.6	17	
Opening time (415 V)	[ms]	7	7	6	5	3	3	3	3	
Utilisation category (IEC 60947-2)		A	A				A			
Reference Standard		IEC 60947-2	IEC 60947-2				IEC 60947-2			
Isolation behaviour		■	■				■			
Trip units:										
thermomagnetic										
T fixed, M fixed	TMF	■	-				-			
T adjustable, M fixed	TMD	-	■				■			
T adjustable, M adjustable (5...10 x In)	TMA	-	-				-			
T adjustable, M fixed (3 x In)	TMG	-	-				■ (e)			
T adjustable, M adjustable (2.5...5 x In)	TMG	-	-				-			
magnetic only	MA	-	-				■ (MF up to In 12.5 A)			
electronic	PR221DS	-	-				■			
	PR221GP/PR221MP	-	-				■			
	PR222DS	-	-				-			
	PR223DS	-	-				-			
	PR231/P	-	-				-			
	PR232/P	-	-				-			
	PR331/P	-	-				-			
	PR332/P	-	-				-			
Interchangeability		-	-				-			
Versions		F	F				F-P			
Terminals	fixed	FC Cu	FC Cu-EF-FC CuAl-HR				F-FC Cu-FC CuAl-EF-ES-R			
	plug-in	-	-				F-FC Cu-FC CuAl-EF-ES-R			
	withdrawable	-	-				-			
Fixing on DIN rail		-	DIN EN 50022				DIN EN 50022			
Mechanical life	[No. operations]	25000	25000				25000			
	[No. Hourly operations]	240	240				240			
Electrical life @ 415 V AC	[No. operations]	8000	8000				8000			
	[No. Hourly operations]	120	120				120			
Basic dimensions - fixed version										
	3 poles	W [mm]	25.4 (1 pole)	76			90			
	4 poles	W [mm]	-	102			120			
		D [mm]	70	70			70			
		H [mm]	130	130			130			
Weight										
	fixed	3/4 poles	[kg]	0.4 (1 pole)			0.9/1.2			
	plug-in	3/4 poles	[kg]	-			1.1/1.5			
	withdrawable	3/4 poles	[kg]	-			1.5/1.9			

TERMINAL CAPTION
 F = Front
 EF = Front extended
 ES = Front extended spread

FC Cu = Front for copper cables
 FC CuAl = Front for copper-aluminium cables
 R = Rear orientated
 HR = Rear flat horizontal

VR = Rear flat vertical
 HR/VR = Rear flat orientated
 MC = Multicable
 F = fixed circuit-breakers

P = plug-in circuit-breakers
 W = withdrawable circuit-breakers
 (e) The breaking capacity for settings
 In = 16 A and In = 20 A is 16 kA

Tmax T3		Tmax T4					Tmax T5					Tmax T6 ⁽⁹⁾					Tmax T7 ⁽¹⁰⁾				
250		250/320					400/630					630/800/1000					800/1000/1250/1600				
3/4		3/4					3/4					3/4					3/4				
690		690					690					690					690				
500		750					750					750					-				
8		8					8					8					8				
800		1000					1000					1000					1000				
3000		3500					3500					3500					3500				
N	S	N	S	H	L	V	N	S	H	L	V	N	S	H	L	S	H	L	V ⁽⁶⁾		
50	85	70	85	100	200	200	70	85	100	200	200	70	85	100	200	85	100	200	200		
36	50	36	50	70	120	200	36	50	70	120	200	36	50	70	100	50	70	120	150		
25	40	30	40	65	100	180	30	40	65	100	180	30	45	50	80	50	65	100	130		
20	30	25	30	50	85	150	25	30	50	85	150	25	35	50	65	40	50	85	100		
5	8	20	25	40	70	80	20	25	40	70	80	20	22	25	30	30	42	50	60		
36	50	36	50	70	100	150	36	50	70	100	150	36	50	70	100	-	-	-	-		
40	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
-	-	25	36	50	70	100	25	36	50	70	100	20	35	50	65	-	-	-	-		
36	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
-	-	16	25	36	50	70	16	25	36	50	70	16	20	36	50	-	-	-	-		
75%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	75%	100%	100%	100%		
75%	50% (27 kA)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	75%	100%	100%	100%		
75%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	75%	100%	100%	100%		
75%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	75%	100%	100%	75%		
75%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	75%	75%	75%	75%	100%	75%	75%	75%		
105	187	154	187	220	440	660	154	187	220	440	660	154	187	220	440	187	220	440	440		
75.6	105	75.6	105	154	264	440	75.6	105	154	264	440	75.6	105	154	220	105	154	264	330		
52.5	84	63	84	143	220	396	63	84	143	220	396	63	94.5	105	176	105	143	220	286		
40	63	52.5	63	105	187	330	52.5	63	105	187	330	52.5	73.5	105	143	84	105	187	220		
7.7	13.6	40	52.5	84	154	176	40	52.5	84	154	176	40	46	52.5	63	63	88.2	105	132		
7	6	5	5	5	5	5	6	6	6	6	6	10	9	8	7	15	10	8	8		
A		A					B (400 A) ⁽⁹⁾ - A (630 A)					B (630A - 800A) ⁽⁹⁾ - A (1000A)					B ⁽⁷⁾				
IEC 60947-2		IEC 60947-2					IEC 60947-2					IEC 60947-2					IEC 60947-2				
■		■					■					■					■				
-		-					-					-					-				
■		■ (up to 50 A)					-					-					-				
-		■ (up to 250 A)					■ (up to 500 A)					■ (up to 800 A) ⁽⁴⁾					-				
■		-					-					-					-				
-		-					■ (up to 500 A)					-					-				
■		■					■					■					-				
-		-					-					-					-				
-		■					■					■					■				
-		-					-					-					■				
-		-					-					-					■				
-		-					-					-					■				
-		-					-					-					■				
-		■					■					■					■				
F-P		F-P-W					F-P-W					F-W ⁽⁴⁾					F-W				
F-FC Cu-FC Cu AI-EF-ES-R		F-FC Cu-FC Cu AI-EF-ES-R-MC					F-FC CuAI-EF-ES-R-RC					F-FC CuAI-EF-ES-R-RC					F-EF-ES-FC CuAI-HR-VR				
F-FC Cu-FC Cu AI-EF-ES-R		EF-ES-HR-VR-FC Cu-FC CuAI					EF-ES-HR-VR-FC Cu-FC CuAI					-					-				
-		EF-ES-HR-VR-FC Cu-FC CuAI					EF-ES-HR-VR-FC Cu-FC CuAI					EF-HR-VR					EF-HR-VR-RS-ES				
DIN EN 50022		-					-					-					-				
25000		20000					20000					20000					10000				
240		240					120					120					60				
8000		8000 (250 A) - 6000 (320 A)					7000 (400 A) - 5000 (630 A)					7000 (630A) - 5000 (800A) - 4000 (1000A)					2000 (S, H, L versions) / 3000 (V version)				
120		120					60					60					60				
105		105					140					210					210				
140		140					186					280					280				
70		103.5					103.5					103.5					154 (manual) / 178 (motorizable)				
150		205					205					268					268				
1.5/2		2.35/3.05					3.25/4.15					9.5/12					9.7/12.5 (manual) - 11/14 (motorizable)				
2.7/3.7		3.6/4.65					5.15/6.65					-					-				
-		3.85/4.9					5.4/6.9					12.1/15.1					29.7/39.6 (manual) - 32/42.6 (motorizable)				

⁽¹⁾ 75% for T5 630
⁽²⁾ 50% for T5 630
⁽³⁾ Icw = 5 kA
⁽⁴⁾ W version is not available on T6 1000 A
⁽⁵⁾ Icw = 7.6 kA (630 A) - 10 kA (800 A)
⁽⁶⁾ Only for T7 800/1000/1250 A
⁽⁷⁾ Icw = 20 kA (S,H,L versions) - 15 kA (V version)
⁽⁸⁾ For availability, please ask ABB SACE
⁽⁹⁾ For T6V version please ask ABB SACE
⁽¹⁰⁾ For T7V version please ask ABB SACE
Notes: In the plug-in version of T2, T3 and T5 630 and in the withdrawable version of T5 630 the maximum rated current available is derated by 10% at 40 °C



SN 201 L	SN 201	SN 201 M
	IEC/EN 60898	
	2 ≤ In ≤ 40 ①	
	1P+N	
	230	
	500	
	254	
	60	
	125	
	12VAC - 12VDC	
	50...60	
4500	6000	10000
4.5	6	6
6	10	10
4.5	6	7.5
	5	
	2.5	
	III	
■	■	■
■	■	■
	black sealable in ON-OFF position	
	10000	
	20000	
	IP4X	
	IP2X	
	28 cycles with 55/95...100	
	23/83 - 40/93 - 55/20	
	25/95 - 40/95	
	30	
	-25...+55	
	-40...+70	
	16/16	
	1,2	
	on DIN rail EN 60715 (35mm) by means of rapid fixing device	
	85 x 68.9 x 17.6	
	110	

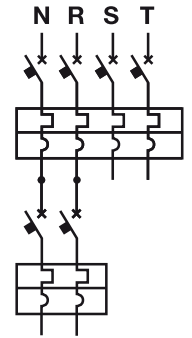
① SN201 and SN201M series in B and D characteristic are available for rated current In ≥ 6 A

Tables de coordination

Arrivée tétrapolaire ≤ 250 A

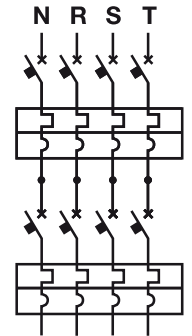
Disjoncteur tétrapolaire - Départ direct disjoncteurs phase/neutre @ 240 V

		Amont ▶	S200	S200M	S200P	S800C	XT1	XT2	XT3	XT4			
Courbe / Version			B, C	B, C	B, C	B, C, D, K	C	N					
		Icu [kA] @ 240 V	20	25	25	25	25	36					
		In [A]	0,5...63	0,5...63	0,5...63								
Aval ▼	SN201L DS201L	B, C	6	2...25	20	25	25	25	18	18	20	10	-
				32, 40	20	25	25	25	10	10	18	10	-
	SN201	B, C, D	10	2...25	20	25	25	25	18	18	25	18	-
	DS201			32, 40	20	25	25	25	18	18	18	18	-
	S200L	C	10	6...40	20	25	25	-	-	-	-	-	-
	S200	B, C, K, Z	20	0,5...63	-	25	25	-	-	-	-	-	-
	S200M	B, C, D	25	0,5...63	-	-	-	-	-	-	-	-	-
	S200P	B, C, D, K, Z	25	0,5...63	-	-	-	-	-	-	-	-	-



Disjoncteur tétrapolaire - Départ direct disjoncteurs tri/tétrapolaire @ 415 V

		Amont ▶	S200	S200M	S200P	S800C	XT1	XT2	XT3	XT4			
Courbe / Version			B, C	B, C	B, C	B, C, D, K	C	N					
		Icu [kA] @ 415 V	10	15	25	25	25	36					
		In [A]	0,5...63	0,5...63	0,5...25	25...125							
Aval ▼	S200L	C	6	6...40	10	15	25	-	25	30	36	16	36
				10	0,5...63	-	15	25	25	25	30	36	16
	S200M	B, C, D	15	0,5...63	-	-	25	25	25	30	36	25	36
	S200P	B, C, D, K, Z	15/25	0,5...63	-	-	-	25	25	30	36	25	36



Tripping characteristics S 200 / S 200 M / S 200 P

Acc. to	Tripping characteristic and rated current	Thermal release ②		Tripping time	Electromagnetic release ①		Tripping time
		Current: conventional non-tripping current	conventional tripping current		Currents: hold current surges	trip at least at	
IEC/EN 60898-1	B 6 to 63 A	$1.13 \cdot I_n$	$1.45 \cdot I_n$	> 1 h < 1 h	$3 \cdot I_n$	$5 \cdot I_n$	> 0.1 s < 0.1 s
	C 0.5 to 63 A	$1.13 \cdot I_n$	$1.45 \cdot I_n$	> 1 h < 1 h	$5 \cdot I_n$	$10 \cdot I_n$	> 0.1 s < 0.1 s
	D 0.5 to 63 A	$1.13 \cdot I_n$	$1.45 \cdot I_n$	> 1 h < 1 h	$10 \cdot I_n$	$20 \cdot I_n$	> 0.1 s < 0.1 s
IEC/EN 60947-2	K 0.5 to 63 A	$1.05 \cdot I_n$	$1.2 \cdot I_n$ $1.5 \cdot I_n$ $6.0 \cdot I_n$	> 1 h < 1 h ③ < 2 min. ③ > 2 s (T1)	$10 \cdot I_n$	$14 \cdot I_n$	> 0.2 s < 0.2 s
	Z 0.5 to 63 A	$1.05 \cdot I_n$	$1.2 \cdot I_n$ $1.5 \cdot I_n$ $6.0 \cdot I_n$	> 1 h < 1 h ③ < 2 min. ③ > 2 s (T1)	$2 \cdot I_n$	$3 \cdot I_n$	> 0.2 s < 0.2 s

① The indicated electromagnetic tripping values apply to a frequency range of 16 2/3 ... 60 Hz. For different network frequencies or direct current the values change according to the multiplier in the table below (see also page 11/75)

② The thermal releases are calibrated to a nominal reference ambient temperature; for Z and K, the value is 20 °C, for B and C = 30 °C. In the case of higher ambient temperatures, the current values fall by ca. 6 % for each 10 K temperature rise.
 ③ As from operating temperature (after $I_1 > 1$ h or, as applicable, 2 h).

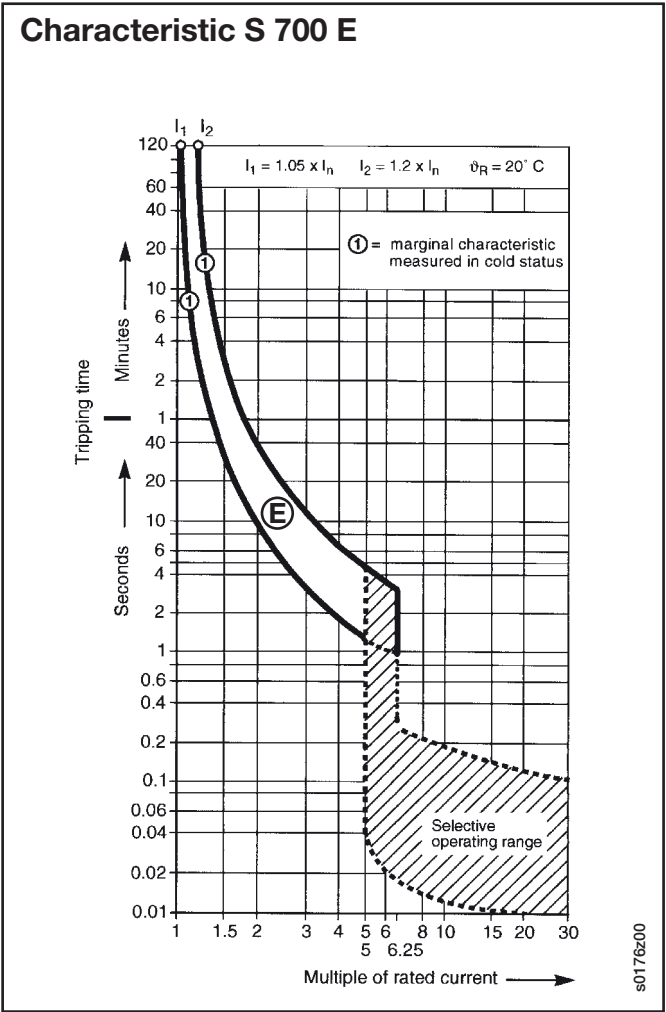
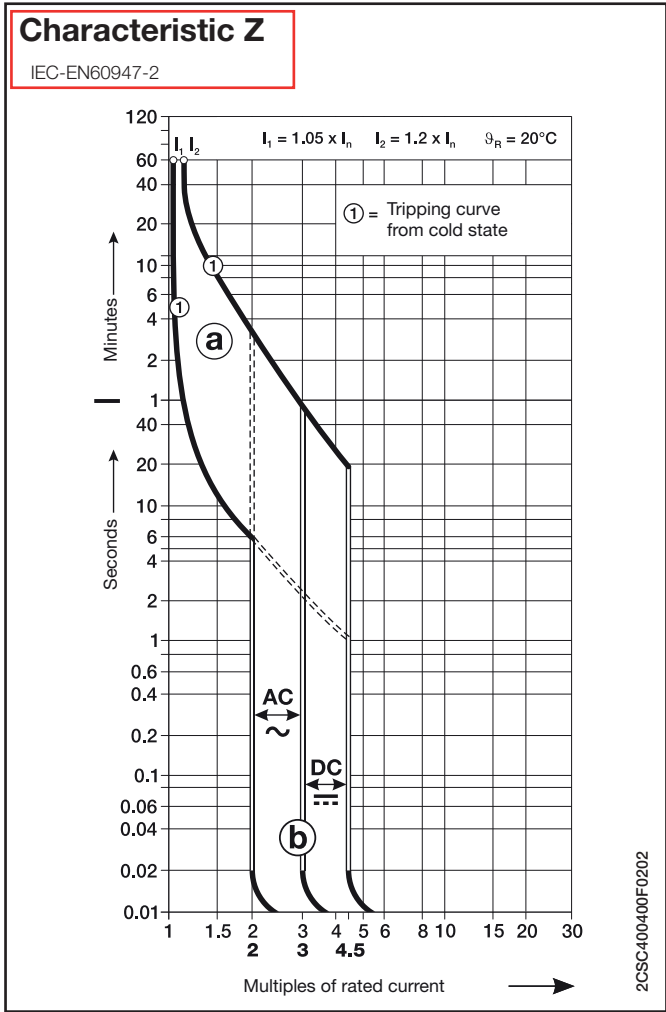
	AC			DC
	100 Hz	200 Hz	400 Hz	
Multiplier	1.1	1.2	1.5	1.5

The thermal tripping performance is independent from the network frequency

Tripping behavior S 700

Tripping characteristic	Rated current	Delayed thermal release			Short-time delayed selective tripping device		
		Conventional non-tripping current ①	Conventional tripping current ①	Tripping time	Delayed tripping	Short-time delayed tripping	Tripping time
		I_{nt}	I_{tt}	t	I_{tv}	I_{tk}	t
E	10 to 100 A	$1.05 \times I_n$		≥ 2 h	$5 \times I_n$		$0.05 \text{ s} < t < 5 \text{ s} (I_n \leq 32 \text{ A})$ $0.05 \text{ s} < t < 10 \text{ s} (I_n > 32 \text{ A})$
			$1.2 \times I_n$	< 2 h		$6.25 \times I_n$	$0.01 \text{ s} < t < 0.3 \text{ s}$
K	16 to 50 A	$1.05 \times I_n$		≥ 2 h	$10 \times I_n$		$0.05 \text{ s} < t < 5 \text{ s} (I_n \leq 32 \text{ A})$ $0.05 \text{ s} < t < 10 \text{ s} (I_n > 32 \text{ A})$
			$1.2 \times I_n$	< 2 h		$14 \times I_n$	$0.01 \text{ s} < t < 0.3 \text{ s}$
	63 to 100 A	$1.05 \times I_n$		≥ 2 h	$8 \times I_n$		$0.05 \text{ s} < t < 10 \text{ s}$
			$1.2 \times I_n$	< 2 h		$12 \times I_n$	$0.01 \text{ s} < t < 0.3 \text{ s}$

① The thermal trip values refer to a reference temperature of 20 °C. For higher ambient temperatures the current rating will be reduced by 3 % per 10 °C decrease.



- Ⓐ thermal trip
- Ⓑ electromagnetic trip

	T4				T5						T6					T7										
	N, S, H, L, V				N, S, H, L, V						N, S, H, L					S, H, L, V ³										
	EL				TM		EL				TM, M		EL			EL										
	250		320		400		630		400		630		630		800		1000		800		1000		1250		1600	
	100	160	250	320	320	400	500	320	400	630	630	800	630	800	1000	800 ²	1000 ²	1250	1600							
	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	
	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	70	70	70	70	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	55	55	55	55	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	40	40	40	40	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	40	40	40	40	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	30	30	30	30	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	30	30	30	30	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	30	30	30	30	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
		25	25	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
		25	25	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
			25	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
			25	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	25	25	25	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	25	25	25	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	25	25	25	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
		25	25	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
			25	25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T

2

Discrimination

Supply side circuit-breaker: MCCB

Load side circuit-breaker: MCCB

MCCB - T3 @ 415 V

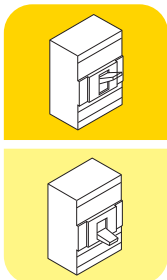
		Supply S.	T1	T2				T3			T4												
Version			B C N	N, S, H, L				N, S			N, S, H, L, V												
Release			TM	TM,M	EL			TM, M			TM, M												
I_u [A]			160	160				250			250												
Load S.		I_n [A]	160	160	25	63	100	160	160	200	250	20	25	32	50	80	100	125	160	200	250		
T3	N S	TM	250	63						3	4	5						7 ¹	7	7	7		
				80							3 ¹	4	5							7 ¹	7	7	
				100								4 ¹	5								7 ¹	7 ¹	7
				125																		7 ¹	
				160																			
				200																			
				250																			

- ¹ Value valid only for magnetic only supply side circuit-breaker
- ² Value valid only for PR232/P, PR331/P and PR332/P trip units
- ³ Available only with $I_u \leq 1250A$

MCCB - T4 @ 415 V

		Supply S.	T5				T6				T7						
Version			N, S, H, L, V				N, S, H, L				S, H, L, V ¹						
Release			TM		EL		TM, M		EL		EL						
I_u [A]			400	630	400	630	630	800	630	800	1000	800	1000	1250	1600		
Load S.		I_n [A]	320	400	500	320	400	630	630	800	630	800	1000	800 ²	1000 ²	1250	1600
T4	N S H L V	TM	250	20	T	T	T	T	T	T	T	T	T	T	T	T	
				25	T	T	T	T	T	T	T	T	T	T	T	T	
				32	T	T	T	T	T	T	T	T	T	T	T	T	
				50	T	T	T	T	T	T	T	T	T	T	T	T	
				80	T	T	T	T	T	T	T	T	T	T	T	T	
				100		50	50	50	50	50	T	T	T	T	T	T	
		125			50	50	50	50	T	T	T	T	T	T			
		160				50	50	50	T	T	T	T	T	T			
		200				50	50	50	T	T	T	T	T	T			
		250					50	50	T	T	T	T	T	T			
		EL	250	100	50	50	50	50	50	T	T	T	T	T	T		
				160	50	50	50	50	50	T	T	T	T	T			
				250			50	50	50	T	T	T	T	T			
320	320					50	T	T	T	T	T						

- ¹ Available only with $I_u \leq 1250A$
- ² Value valid only for PR232/P, PR331/P and PR332/P trip units



	T4				T5				T6				T7														
	N, S, H, L, V				N, S, H, L, V				N, S, H, L				S, H, L, V ³														
	EL				TM		EL		TM, M		EL		EL														
	250		320		400		630		400		630		630		800		1000		800		1000		1250		1600		
	100	160	250	320	320	400	500	320	400	630	630	800	630	800	1000	800 ²	1000 ²	1250	1600	800 ²	1000 ²	1250	1600	800 ²	1000 ²	1250	1600
	7	7	7	7	25	25	25	25	25	25	25	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
		7	7	7	25	25	25	25	25	25	25	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
		7	7	7	25	25	25	25	25	25	25	40	7	40	7	7	7	7	7	7	7	7	7	7	7	7	7
			7	7	20	20	20	20	20	20	20	36	7	36	7	7	7	7	7	7	7	7	7	7	7	7	7
			7	7			20	20	20	20	20	36	7	36	7	7	7	7	7	7	7	7	7	7	7	7	7
				7				20	20	20	20	30	7	30	7	7	7	7	7	7	7	7	7	7	7	7	7
								20	20	20	20	30	40	30	40	40	40	40	40	40	40	40	40	40	40	40	40

2

Discrimination

Supply side circuit-breaker: MCCB

Load side circuit-breaker: MCCB

MCCB - T5 @ 415 V

		Supply S.		T6					T7				
Version		Release		N, S, H, L					S, H, L, V ¹				
		I _u [A]		TM, M		EL			EL				
Load S.		I _u [A]	I _n [A]	630	800	630	800	1000	800	1000	1250	1600	
2 T5	N S H L V	TM	400	320	30	30	30	30	30	T	T	T	T
			400	400		30		30	30	T	T	T	T
		EL	630	500				30	30	T	T	T	T
			400	320	30	30	30	30	30	T	T	T	T
				400	30	30	30	30	T	T	T	T	
				630	630				30	T	T	T	T

¹ Available only with I_u ≤ 1250A

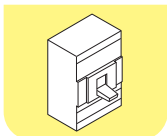
² Value valid only for PR232/P, PR331/P and PR332/P trip units

MCCB - T6 @ 415 V

		Supply S.		T7					
Version		Release		S, H, L, V ¹					
		I _u [A]		EL					
Load S.		I _u [A]	I _n [A]	800	1000	1250	1600		
T6	N S H L V	TM	630	630			40	40	
			800	800			40	40	
	EL	630	630	40	40	40	40		
		800	800	40	40	40	40		
				1000	1000			40	40

¹ Available only with I_u ≤ 1250A, maximum selectivity value: 15kA

² Value valid only for PR232/P, PR331/P and PR332/P trip units



Discrimination

Supply side circuit-breaker: ACB

Load side circuit-breaker: MCCB

ACB - MCCB @ 415 V

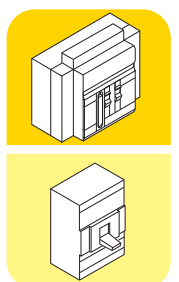
Load S.	Version	Release	Supply S.	X1			E1		E2				E3					E4			E6			
				B	N	L	B	N	B	N	S	L ¹	N	S	H	V	L ¹	S	H	V	H	V		
				EL			EL		EL				EL					EL						
				I _u [A]	800	800	800	800	800	1600	1000	800	1250	2500	1000	800	800	2000	4000	3200	3200	4000	3200	
T1	B	TM	160	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T			
	C			T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	N			T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	
T2	N	TM EL	160	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	S			T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	H			T	T	T	T	T	T	55	65	T	T	T	T	T	T	T	T	T	T	T	T	
	L			T	T	T	T	T	T	55	65	T	T	T	75	T	T	T	T	T	T	T	T	
T3	N	TM	250	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	S			T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	
T4	N	TM EL	250 320	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	S			T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	
	H			T	T	T	T	T	T	55	65	T	T	T	T	T	T	T	T	T	T	T	T	
	L			T	T	T	T	T	T	55	65	100	T	T	75	85	100	T	T	100	T	100	T	100
	V			T	T	T	T	T	T	55	65	100	T	T	75	85	100	T	T	100	T	100	T	100
T5	N	TM EL	400 630	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	S			T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	
	H			T	T	T	T	T	T	55	65	T	T	T	T	T	T	T	T	T	T	T	T	
	L			T	T	T	T	T	T	55	65	100	T	T	75	85	100	T	T	100	T	100	T	100
	V			T	T	T	T	T	T	55	65	100	T	T	75	85	100	T	T	100	T	100	T	100
T6	N	TM EL	630 800 1000	T	T	15	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	S			T	T	15	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	
	H			T	T	15	T	T	T	55	65	T	T	T	T	T	T	T	T	T	T	T	T	
	L			T	T	15	T	T	T	55	65	T	T	T	75	85	T	T	T	T	T	T	T	
T7	S	EL	800 1000 1250 1600	T	42	15	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T		
	H			T	42	15	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	
	L			T	42	15	T	T	T	55	T	T	T	T	T	T	T	T	T	T	T	T	T	
	V ²			T	42	15	T	T	T	55	65	T	T	T	75	85	T	T	T	T	T	T	T	

Table valid for Emax circuit-breakers only with PR121/P, PR122/P and PR123/P trip units

¹ Emax L circuit-breakers only with PR122/P and PR123/P trip units

² Available only with I_u ≤ 1250A

2



Switch-disconnectors

Supply side circuit-breaker: MCCB

Load side switch-disconnectors: OT/OETL

MCCB - OT/OETL @ 415 V

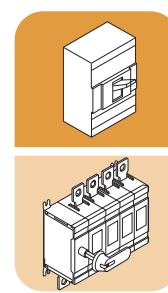
Supply S.	Release	Load S.	OT16	OT25	OT32	OT45	OT63	OT80	OT100	OT125	OT160	OT200-800	OETL1000-1600
		I _{cu} [kA]	0.5	0.5	0.5	1	1.5	1.5	2.5	2.5	4	8 - 15	17 - 50
		I _n [A]	25	32	40	63	80	100	115	125	200	200 - 400	630 - 1600
T1	TM	16	4	4	4	7	20	20	T	T	T	T	T
		20	4	4	4	7	20	20	T	T	T	T	T
		25	4	4	4	7	18	18	T	T	T	T	T
		32	4	4	4	7	18	18	T	T	T	T	T
		40	4 ²	4	4	7	18	18	T	T	T	T	T
		50		4 ²	4	6	18	18	T	T	T	T	T
		63			4 ²	6	18	18	T	T	T	T	T
		80				6 ²	16	16	T	T	T	T	T
		100					16 ²	16	T	T	T	T	T
		125						16	T	T	T	T	T
		160						16 ²	T ²	T	T	T	T
T2	TM	16	20	20	20	50	T	T	T	T	T	T	T
		20	14	14	14	36	T	T	T	T	T	T	T
		25	12	12	12	25	70	70	T	T	T	T	T
		32	12	12	12	25	70	70	T	T	T	T	T
		40	12 ²	10	10	20	36	36	T	T	T	T	T
		50		10 ²	10	20	36	36	T	T	T	T	T
		63			10 ²	20	36	36	T	T	T	T	T
		80				7 ²	16	16	50	50	T	T	T
		100					16 ²	16	50	50	T	T	T
		125						16	50	50	T	T	T
		160						16 ²	50 ²	50	T	T	T
T2	EL	25	10	10	10	16	50	50	T	T	T	T	T
		63	8 ¹	8 ¹	8 ¹	12	30	30	T	T	T	T	T
		100		8 ¹	8 ¹	6 ¹	16 ¹	16	50	50	T	T	T
		160				6 ¹	16 ¹	16 ¹	50 ¹	50	T	T	T
T3	TM	63			3.5 ²	5	8	8	25	25	T	T	T
		80				5 ²	8	8	24	24	T	T	T
		100					8 ²	8	21	21	T	T	T
		125						8 ²	20	20	40	T	T
		160							18 ²	18	36	T	T
		200								18 ²	36	T	T
250									36	T	T		
T4	TM	20	8	8	8	20	T	T	T	T	T	T	T
		32	6 ²	6	6	12	40	40	T	T	T	T	T
		50		6 ²	6	12	40	40	T	T	T	T	T
		80				8 ²	16	16	50	50	T	T	T
		100					10 ²	10	19	20	100	100	T
		160						10 ²	19	20	100	100	T
	250								20 ²	100	100	T	
T4	EL	100-320					10 ¹	10 ¹	19 ¹	20 ¹	100 ¹	100 ¹	T

4

Select the lowest value between the I_{cu} of the circuit-breaker and the value indicated

¹ Maximum setting of the overload threshold PR2xx = 1.28 * I_{th} OTxx/OETLxx

² I₁ = 0.7 x I



Switch-disconnectors

Supply side circuit-breaker: MCCB

Load side switch-disconnectors: OT/OETL

MCCB - OT/OETL @ 415 V

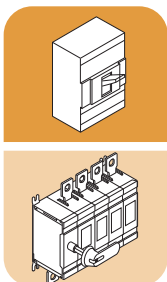
		Load S.	OT200	OT250	OT315	OT400	OT630	OT800	OETL1000	OETL1250	OETL1600	
		l _{cw}	8	8	15	15	20	20	50	50	50	
		l _{cm}	30	30	65	65	80	80	105	105	105	
Supply S.	Release	I _n [A]	I _{th} [A]	200	250	315	400	630	800	1000	1250	1600
T5	TM	320	50	50	100	100	T	T	T	T	T	
		400	50 ³	50	100	100	T	T	T	T	T	
	EL	320-630	50 ²	50 ²	100 ²	100	T	T	T	T	T	
T6	TM	630			25	30	70	70	T	T	T	
		800				28 ³	60 ³	60	T	T	T	
	EL	630-800-1000		22 ²	22 ²	28 ²	60	60	T	T	T	
T7	EL	800				30 ¹	40 ²	40	100	100	100	
		1000				30 ¹	40 ²	40	100	100	100	
		1250					40 ²	40 ²	100	100	100	
		1600					40 ²	40 ²	100 ²	100	100	

¹ Maximum setting of the protection against short-circuit: I₂ = 10xI_n t₂=0.1 or I₃= 10xI_n

² Maximum setting of the overload threshold PR2xx and PR3xx = 1.28*I_{th} OTxx/OETLxx

³ I₁ = 0.7 x I_n

4



Back-up

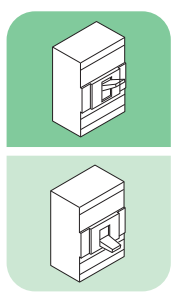
Supply side circuit-breaker: MCCB
 Load side circuit-breaker: MCCB

MCCB - MCCB @ 415 V

		Supply S.	T1	T1	T2	T3	T4	T5	T6	T2	T3	T4	T5	T6	T7	T2	T4	T5	T6	T7	T2	T4	T5	T6	T7	T4	T5	
		Version	C	N						S						H					L	L		L		V		
Load S.	Char.	I _{cu} [kA]	25	36						50						65					85	120		100 ¹		200		
T1	B	16	25	36	36	36	30	30	30	50	50	36	36	36		70	40	40	40		85	50	50	50		85	65	
T1	C	25		36	36	36	36	36	36	50	50	40	40	50	50	70	65	65	65	50	85	85	85	70	50	130	100	
T1	N	36								50	50	50	50	50	50	70	65	65	65	50	85	100	100	70	50	200	120	
T2											50	50	50	50	50	50	70	65	65	65	65	85	100	100	85	85	200	120
T3												50	50	50	50	50		65	65	65	50		100	100	100	50	200	120
T4													50	50	50	50		65	65	65	50		100	100	65	65	200	120
T5														50	50	50			65	65	50			100	85	65		120
T6															50	40				65	40				70	50		
T2	S	50														70	70	70	70	85	100	100	85	85	200	130		
T3																	70	70	70			100	100	100		200	150	
T4																	70	70	70	70		100	100	85	85	200	150	
T5																			70	70	70			100	85	85		150
T6																		70					85	85				
T2	H	70																			85	120	120	85	85	200	150	
T4																							120	120	100	100	200	180
T5																								120	100	100		180
T6																									100	85		
T2	L	85																				120	120			200	180	
T4		120																								200	200	
T5																											200	

¹ 120 kA for T7

1



Technical data

Switch-disconnectors OT160..800

Technical data according to IEC 60947-3

		Size	A
		Switch type	
Rated insulation voltage and rated operational voltage AC-20, DC-20	Pollution degree 3		V
Dielectric strength		50 Hz 1min.	kV
Rated impulse withstand voltage			kV
Rated thermal current and rated operational current AC-20, DC-20 in ambient 40 °C ⁴⁾	In open air In enclosure		A
...with minimum cable cross section		Cu	mm ²
Rated operational current, AC-21A		≤ 500 V	A
		690 V	A
		1000 V	A
Rated operational current, AC-22A		≤ 500 V	A
		690 V	A
		1000 V	A
Rated operational current, AC-23A		≤ 500 V	A
		690 V	A
		1000 V	A
Rated operational current / poles in series, DC-21A ¹⁾		24...110 V	A
		220 V	A
		440 V	A
		660 V	A
Rated operational current / poles in series, DC-21B		800 V	A
		1000 V	A
Rated operational power, AC-23 ³⁾		230 V	kW
		400 V	kW
		415 V	kW
		500 V	kW
		690 V	kW
Rated breaking capacity in category AC-23		≤ 500 V	A
Rated conditional short-circuit current I _p (r.m.s.) and corresponding max. allowed cut-off current \hat{i}_c	I _p (r.m.s.) Max. OFA_ fuse size	100 kA, 500 V gG/aM	kA A
The cut-off current \hat{i}_c refers to values listed by fuse manufacturers (single phase test acc. to IEC60269).	I _p (r.m.s.) Max. OFA_ fuse size	80 kA, 690 V gG/aM	kA A
Rated short-time withstand current	r.m.s. value I_{ew}	≤ 1000 V 0,15 s ≤ 1000 V 0,25 s ≤ 1000 V 1 s	kA kA kA
Rated short-time making capacity	Peak value I _m	≤ 1000 V	kA
Rated capacitor power	The capacitor ratings are limited by the fuse links	415 V 500 V 690 V	kVAr kVAr kVAr
When no initial charge on the capacitor			
Power loss / pole	With rated current		W
Mechanical endurance	Divide by two for oper. cycles		Oper.
Weight without accessories	3-pole switch		kg
Terminal bolt size	Metric thread diameter x length		mm
Terminal tightening torque	Counter torque required		Nm
Operating torque	3-pole switch disconnector		Nm

¹⁾ Further ratings on request.

²⁾ Category B.

³⁾ These values are given for guidance and may vary acc. to the motor manufacturer.

⁴⁾ Acc. to IEC 60947-1, § 6.1.1.

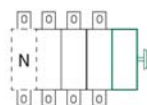
Placing options of the operating mechanism for OT160EV..800



At the end of the switch fuse
OT_03 or 04



Between the poles
OT_12 or 22



Side operated types
OT_30 or 40
OT_03 or 04

160	200	250	315	400	630	800
OT160EV	OT200	OT250	OT315	OT400	OT630	OT800
1 000	1 000	1 000	1 000	1 000	1 000	1 000
10	10	10	10	10	10	10
12	12	12	12	12	12	12
200	200	250	315	400	630	800
160	200	250	315	400	630	800
70	95	120	185	240	2x185	2x240
200	200	250	315	400	630	800
160	200	250	315	400	630	800
160	200	250	315	400	630	800
200	200	250	315	400	630	800
160	200	250	315	400	630	800
160	200	250	315	400	630	800
160	200	250	315	400	630	800
160	200	250	315	400	630	800
135	135	135	200	200	400	400
160/2	200/2	250/2	315/1 ²⁾	400/1 ²⁾	630/1	800/1
160/2	200/2	250/2	315/2 ²⁾	400/2 ²⁾	630/1	800/1
160/3	200/3	250/3	315/3	360/3	630/2	800/2
160/4	200/4	230/4 ²⁾	315/4	360/4	630/4 ²⁾	650/4 ²⁾
160/5	200/5	250/5	315/5	400/5	600/5	600/5
160/6	200/6	250/6	315/6	400/6	600/6	600/6
48	60	75	100	132	200	250
80	110	140	160	220	355	450
88	110	145	180	230	355	450
112	132	170	220	280	400	560
144	200	250	315	400	630	800
1 280	1 600	2 000	2 520	3 200	5 040	6 400
1 280	1 600	2 000	2 520	3 200	5 040	6 400
40.5	40.5	40.5	61.5	61.5	90	90
315/315	315/315	315/315	500/450	500/450	800/1 000	800/1 000
40.5	40.5	40.5	59	59	83.5	83.5
355/315	355/315	355/315	500/500	500/500	800/1 000	800/1 000
15	15	15	31	31	38	38
15	15	15	24	24	36	36
8	8	8	15	15	20	20
30	30	30	65	65	80	80
80	100	115	145	180	250	310
96	120	135	175	215	300	375
128	160	190	250	325	450	550
3.2	4	6.5	6.5	10	25	40
20 000	20 000	20 000	16 000	16 000	10 000	10 000
1.2	1.2	1.2	2.2	2.2	5.2	5.2
M8x25	M8x25	M8x25	M10x30	M10x30	M12x40	M12x40
15-22	15-22	15-22	30-44	30-44	50-75	50-75
7	7	7	16	16	27	27

Technical data

Switch-disconnectors OT1000...2500 and OETL3150

Technical data according to IEC 60947-3

		Size	A
		Switch type	
Rated insulation voltage and rated operational voltage AC20/DC20	Pollution degree 3		V
Dielectric strength		50 Hz 1min.	kV
Rated impulse withstand voltage			kV
Rated thermal current and rated operational current AC20/DC20	ambient 40°C ⁹⁾	In open air	A
	ambient 40°C ⁹⁾	In enclosure	A
	ambient 60°C	In enclosure	A
..with minimum conductor cross section	Cu		mm ²
Rated operational current, AC-21A		up to 690 V	A
		1000 V	A
Rated operational current, AC-22A		up to 500 V	A
		690 V	A
Rated operational current, AC-23A		up to 500 V	A
		690 V	A
Rated operational power, AC-23A		400...415 V	kW
(These values are given for guidance and may vary acc. to the motor manufacturer)		440 V	kW
		500 V	kW
		690 V	kW
Rated breaking capacity, AC-23A		up to 500 V	A
		690 V	A
Rated conditional short-circuit current I_p (r.m.s.) and corresponding max. allowed cut-off current \hat{i}_c	I_p (r.m.s.)	80 kA	kA
	Max. OFA_ fuse size gG/aM	≤ 415 V	A
	I_p (r.m.s.)	100 kA	kA
The cut-off current \hat{i}_c refers to values listed by fuse manufacturers	Max. OFA_ fuse size gG/aM	≤ 500 V	A
(single phase test acc. to IEC60269)	I_p (r.m.s.)	50 kA	kA
	Max. OFA_ fuse size gG/aM	≤ 690 V	A
Rated short-time withstand current	r.m.s. -value I_{cw}	690 V 0.25 s	kA
		690 V 1 s	kA
Rated short circuit making capacity	Peak value I_{cm}	415 V	kA
		500 V	kA
		690 V	kA
	Max. distance from switch frame to nearest busbar/cable support		mm
Rated capacitor power	The capacitor ratings are limited by the fuse links	415 V	kVAr
When no initial charge on the capacitor		500 V	kVAr
		690 V	kVAr
Power loss / pole	At rated operational current		W
Mechanical endurance	Divide by two for operation cycles		Oper.
Weight without accessories	3-pole		kg
	4-pole		kg
Terminal bolt size	Metric thread diameter x length		mm
Terminal tightening torque	Counter torque required		Nm
Operating torque	3-pole switch-disconnector		Nm

¹⁾ Extended phase distance (185 mm).

²⁾ IEC 947-3, utilization category B, infrequent operation.

³⁾ Phase barriers or terminal shrouds must be used on both sides of the switch at voltages ≥ 500 V.

⁴⁾ Pf. 0.65.

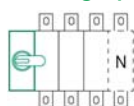
⁵⁾ Maximum distance between busbar support and switch terminal 70 mm.

⁶⁾ 690 V: 2500 A.

⁷⁾ The value is 92 kA for 4-pole switch-disconnectors.

⁸⁾ Acc. to IEC60947-1, § 6.1.1.

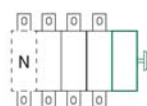
Placing options of the operating mechanism for OT1000...2500



At the end of the switch fuse
OT_03 or 04



Between the poles
OT_12 or 22



Side operated types
OT_30 or 40
OT_03 or 04

1000	1250	1600	2000	2500	3150
OT1000	OT1250	OT1600	OT2000	OT2500	OETL3150
1 000	1 000	1 000	1 000	1 000	1 000
10	10	10	10	10	8
12	12	12	12	12	8
1 000	1 250	1 600	2 000	2 500	3 150
1 000	1 250	1 600			2 600
					2 300
2x300	2x400	2x500	3x500	4x500	3x(100x10)
1 000	1 250	1 600	2 000 ²⁾	2 500 ²⁾	3 150 ^{2) 6)}
1 000	1 250	1 600			1 000 ²⁾
1 000	1 250	1 600	2 000 ^{2) 3)}	2 500 ^{2) 3)}	1 600 ²⁾
1 000	1 250	1 600	2 000 ^{2) 3)}	2 500 ^{2) 3)}	
1 000	1 250	1 250			
1 000	1 250	1 250			
560	710	710			
630	800	800			
710	900	900			
1 000	1 200	1 200			
10 000	10 000	10 000			6 400
10 000	10 000	10 000			4 800 ⁴⁾
100	100	100			140
1 250/1 250	1 250/1 250	1 250/1 250			
106	106	106			140
1 250/1 250	1 250/1 250	1 250/1 250			
					105
50	50	50	80	80	
50	50	50	55	55	80 ⁵⁾
					176 ¹⁾
110 ⁷⁾	110 ⁷⁾	110 ⁷⁾	176	176	140
150	150	150	150	150	105
460	575	575			
550	690	690			
750	950	950			
19	29	48	55	85	140
6 000	6 000	6 000	6 000	6 000	1 200
14.1	14.1	15.2	22	22	37
18	18	19.5	28	28	47
M12x50	M12x50	M12x60	M12x60	M12x60	M12x60
50...75	50...75	50...75	50...75	50...75	50...75
65	65	65	65	65	50

Technical data

Switch-disconnectors OT16...160

Technical data according to IEC 60947-3

		Size	A	16
		Switch type		OT16
Rated insulation voltage and rated operational voltage AC20/DC20	Pollution degree 3		V	750
Dielectric strength		50 Hz 1min.	kV	6
Rated impulse withstand voltage			kV	8
Rated thermal current and rated operational current AC20/DC20	ambient 40°C ²⁾	In open air	A	25
	ambient 40°C ²⁾	In enclosure	A	25
	ambient 60°C	In enclosure	A	20
..with minimum conductor cross section		Cu	mm ²	4
Rated operational current, AC-21A		up to 415 V	A	16
		440...690 V	A	16
Rated operational current, AC-22A		up to 415 V	A	16
		440...500 V	A	16
		690 V	A	16
Rated operational current, AC-23A		up to 415 V	A	16
		440 V	A	16
		500 V	A	16
		690 V	A	10
Rated operational current / poles in series, DC-21A		24...48 V ¹⁾	A	16/1
		110 V	A	16/2
		220 V	A	16/3
		440 V	A	16/4
		500 V	A	16/4
		750 V	A	16/8
Rated operational current / poles in series, DC-22A		24...48 V ¹⁾	A	16/1
		110 V	A	16/2
		220 V	A	16/3
		440 V	A	10/4
		750 V	A	16/8
Rated operational current / poles in series, DC-23A		24...48 V ¹⁾	A	16/1
		110 V	A	16/2
		220 V	A	16/4
		440 V	A	10/4
		750 V	A	16/8
Rated operational power, AC-23A (These values are given for guidance and may vary acc. to the motor manufacturer)		220...240 V	kW	3
		400...415 V	kW	7.5
		440 V	kW	7.5
		500 V	kW	7.5
		690 V	kW	7.5
Rated breaking capacity, AC-23A		up to 415 V	A	128
		440 V	A	128
		500 V	A	128
		690 V	A	80
Rated breaking capacity/poles in series, DC-23A		24...48 V	A	64/1
		110 V	A	64/2
		220 V	A	64/3
		440 V	A	40/4
		750 V	A	64/8
Rated conditional short-circuit current I_p (r.m.s.) and corresponding max. allowed cut-off current \hat{i}_c	I_p (r.m.s.)	50 kA	kA	6.5
	Max. OFA_ fuse size gG/aM	≤ 415 V	A	40/32
	I_p (r.m.s.)	100 kA	kA	
	Max. OFA_ fuse size gG/aM	≤ 500 V	A	
	I_p (r.m.s.)	10 kA	kA	
	Max. OFA_ fuse size gG/aM	≤ 690 V	A	
	I_p (r.m.s.)	50 kA	kA	4
	Max. OFA_ fuse size gG/aM	≤ 690 V	A	25/16
Rated short-time withstand current	r.m.s. -value I_{cw}	690 V, 0.25 s	kA	
	r.m.s. -value I_{cw}	690 V, 1 s	kA	0.5
Rated short circuit making capacity	Peak value I_{cm}	690 V/500 V	kA	0.705
Rated capacitor power (The capacitor ratings are limited by the fuse link.)		400...415 V	kVA _r	6.5
Power loss / pole	At rated operational current		W	0.3
Mechanical endurance	Divide by two for operation cycles		Oper.	20 000
Weight without accessories	3-pole		kg	0.11
	4-pole		kg	0.15
Cable size	Cu-wire size suitable for terminal clamps		mm ²	0.75...10
			AWG	18-8
Terminal tightening torque	Counter torque required		Nm	0.8
Operating torque	3-pole switch-disconnector		Nm	1

¹⁾ Below 48 V, two poles in parallel up to OT80 are recommended particularly in polluted atmosphere.

²⁾ Acc. to IEC 60947-1, § 6.1.1.

25	40	63	80	100	125
OT25	OT40	OT63	OT80	OT100	OT125
750	750	750	750	750	750
6	6	6	6	6	6
8	8	8	8	8	8
32	40	63	80	115	125
32	40	63	80	115	125
25	32	50	63	80	100
6	10	16	25	35	50
25	40	63	80	100	125
25	40	63	80	100	125
25	40	63	80	100	125
25	40	63	80	100	125
25	40	63	80	100	125
20	23	63	75	80	90
20	23	63	65	65	78
20	23	45	58	60	70
11	12	20	20	40	50
25/1	32/1	63/1	80/1	100/1	125/1
25/2	32/2	63/2	80/2	100/2	125/2
25/3	32/3	63/4	80/4	100/4	125/4
16/4	16/4	16/4	16/4		
16/4	16/4	16/4	16/4		
25/8	32/8				
25/1	32/1	63/1	80/1	100/1	125/1
25/2	32/2	63/2	80/2	100/2	125/2
25/3	32/4	45/4	45/4	63/4	80/4
10/4	10/4	10/4	10/4		
25/8	25/8				
25/1	32/1	63/1	80/1	100/1	125/1
25/2	32/2	63/2	80/2	100/2	125/2
25/4	32/4	45/4	45/4	63/4	80/4
10/4	10/4	10/4	10/4		
16/8	16/8				
4	5.5	11	22	22	22
9	11	22	37	37	45
9	11	22	37	37	45
9	11	22	37	37	45
9	11	15	18.5	37	45
160	184	360	640	640	720
160	184	360	448	520	624
160	184	360	464	480	560
88	96	160	160	320	40
100/1	128/1	180/1	252/1	400/1	500/1
100/2	128/2	180/2	252/2	400/2	500/2
100/4	128/4	180/4	180/4	252/4	252/4
40/4	40/4	40/4	40/4		
64/8	64/8				
6.5	6.5	13	13	16.5	16.5
40/32	40/32	100/80	100/80	125/125	125/125
		17	17		
		100/80	100/80		
				8.2	8.2
				125/100	125/100
4	4	11	11	10	10
25/16	25/16	80/63	80/63	63/63	63/63
0.5	0.5	1	1.5	2.5	2.5
0.705	0.705	1.4	2.1	3.6	3.6
10	15	25	30	40	50
0.6	1.6	2.8	4.5	4.0	6.3
20 000	20 000	20 000	20 000	20 000	20 000
0.11	0.11	0.27	0.27	0.36	0.36
0.15	0.15	0.35	0.35	0.50	0.50
0.75...10	0.75...10	1.5...35	1.5...35	10...70	10...70
18-8	18-8	14-4	14-4	8-00	8-00
0.8	0.8	2	2	6	6
1	1	1.2	1.2	2	2

Technical data

Switch-disconnectors OT160..800

Technical data according to IEC 60947-3

		Size	A
		Switch type	
Rated insulation voltage and rated operational voltage AC-20, DC-20	Pollution degree 3		V
Dielectric strength		50 Hz 1min.	kV
Rated impulse withstand voltage			kV
Rated thermal current and rated operational current AC-20, DC-20 in ambient 40 °C ⁴⁾	In open air		A
	In enclosure		A
...with minimum cable cross section		Cu	mm ²
Rated operational current, AC-21A		≤ 500 V	A
		690 V	A
		1000 V	A
Rated operational current, AC-22A		≤ 500 V	A
		690 V	A
		1000 V	A
Rated operational current, AC-23A		≤ 500 V	A
		690 V	A
		1000 V	A
Rated operational current / poles in series, DC-21A ¹⁾		24...110 V	A
		220 V	A
		440 V	A
		660 V	A
Rated operational current / poles in series, DC-21B		800 V	A
		1000 V	A
Rated operational power, AC-23 ³⁾		230 V	kW
		400 V	kW
		415 V	kW
		500 V	kW
		690 V	kW
Rated breaking capacity in category AC-23		≤ 500 V	A
Rated conditional short-circuit current I_p (r.m.s.) and corresponding max. allowed cut-off current \hat{i}_c	I_p (r.m.s.)	100 kA, 500 V	kA
	Max. OFA_ fuse size	gG/aM	A
The cut-off current \hat{i}_c refers to values listed by fuse manufacturers (single phase test acc. to IEC60269).	I_p (r.m.s.)	80 kA, 690 V	kA
	Max. OFA_ fuse size	gG/aM	A
Rated short-time withstand current	r.m.s. value I_{cw}	≤ 1000 V 0,15 s	kA
		≤ 1000 V 0,25 s	kA
		≤ 1000 V 1 s	kA
Rated short-time making capacity	Peak value I_m	≤ 1000 V	kA
Rated capacitor power	The capacitor ratings	415 V	kVAr
When no initial charge on the capacitor	are limited by the fuse links	500 V	kVAr
		690 V	kVAr
Power loss / pole	With rated current		W
Mechanical endurance	Divide by two for oper. cycles		Oper.
Weight without accessories	3-pole switch		kg
Terminal bolt size	Metric thread diameter x length		mm
Terminal tightening torque	Counter torque required		Nm
Operating torque	3-pole switch disconnector		Nm

¹⁾ Further ratings on request.

²⁾ Category B.

³⁾ These values are given for guidance and may vary acc. to the motor manufacturer.

⁴⁾ Acc. to IEC 60947-1, § 6.1.1.

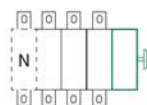
Placing options of the operating mechanism for OT160EV..800



At the end of the switch fuse
OT_03 or 04



Between the poles
OT_12 or 22



Side operated types
OT_30 or 40
OT_03 or 04

160	200	250	315	400	630	800
OT160EV	OT200	OT250	OT315	OT400	OT630	OT800
1 000	1 000	1 000	1 000	1 000	1 000	1 000
10	10	10	10	10	10	10
12	12	12	12	12	12	12
200	200	250	315	400	630	800
160	200	250	315	400	630	800
70	95	120	185	240	2x185	2x240
200	200	250	315	400	630	800
160	200	250	315	400	630	800
160	200	250	315	400	630	800
200	200	250	315	400	630	800
160	200	250	315	400	630	800
160	200	250	315	400	630	800
160	200	250	315	400	630	800
135	135	135	200	200	400	400
160/2	200/2	250/2	315/1 ²⁾	400/1 ²⁾	630/1	800/1
160/2	200/2	250/2	315/2 ²⁾	400/2 ²⁾	630/1	800/1
160/3	200/3	250/3	315/3	360/3	630/2	800/2
160/4	200/4	230/4 ²⁾	315/4	360/4	630/4 ²⁾	650/4 ²⁾
160/5	200/5	250/5	315/5	400/5	600/5	600/5
160/6	200/6	250/6	315/6	400/6	600/6	600/6
48	60	75	100	132	200	250
80	110	140	160	220	355	450
88	110	145	180	230	355	450
112	132	170	220	280	400	560
144	200	250	315	400	630	800
1 280	1 600	2 000	2 520	3 200	5 040	6 400
1 280	1 600	2 000	2 520	3 200	5 040	6 400
40.5	40.5	40.5	61.5	61.5	90	90
315/315	315/315	315/315	500/450	500/450	800/1 000	800/1 000
40.5	40.5	40.5	59	59	83.5	83.5
355/315	355/315	355/315	500/500	500/500	800/1 000	800/1 000
15	15	15	31	31	38	38
15	15	15	24	24	36	36
8	8	8	15	15	20	20
30	30	30	65	65	80	80
80	100	115	145	180	250	310
96	120	135	175	215	300	375
128	160	190	250	325	450	550
3.2	4	6.5	6.5	10	25	40
20 000	20 000	20 000	16 000	16 000	10 000	10 000
1.2	1.2	1.2	2.2	2.2	5.2	5.2
M8x25	M8x25	M8x25	M10x30	M10x30	M12x40	M12x40
15-22	15-22	15-22	30-44	30-44	50-75	50-75
7	7	7	16	16	27	27

Electrolyte temperature		Cell size correction factor
(° F)	(° C)	
25	-3.9	1.520
30	-1.1	1.430
35	1.7	1.350
40	4.4	1.300
45	7.2	1.250
50	10.0	1.190
55	12.8	1.150
60	15.6	1.110
65	18.3	1.080
66	18.9	1.072
67	19.4	1.064
68	20.0	1.056
69	20.6	1.048
70	21.1	1.040
71	21.7	1.034
72	22.2	1.029
73	22.8	1.023
74	23.4	1.017
75	23.9	1.011
76	24.5	1.006
77	25.0	1.000

Electrolyte temperature		Cell size correction factor
(° F)	(° C)	
78	25.6	0.994
79	26.1	0.987
80	26.7	0.980
81	27.2	0.976
82	27.8	0.972
83	28.3	0.968
84	28.9	0.964
85	29.4	0.960
86	30.0	0.956
87	30.6	0.952
88	31.1	0.948
89	31.6	0.944
90	32.2	0.940
95	35.0	0.930
100	37.8	0.910
105	40.6	0.890
110	43.3	0.880
115	46.1	0.870
120	48.9	0.860
125	51.7	0.850

NOTE—This table is based on vented lead-acid nominal 1.215 specific gravity. However, it may be used for vented cells with up to a 1.300 specific gravity. For cells of other designs, refer to the manufacturer.

AF09 ... AF38 4-pole contactors

Technical data

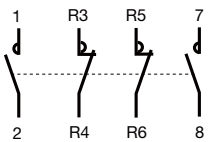
Main pole - Utilization characteristics according to IEC

Contactor types	AC / DC operated	AF09	AF16	AF26	AF38
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1			
Rated operational voltage U_e max.		690 V			
Rated frequency (without derating)		50 / 60 Hz			
Conventional free-air thermal current I_{th}					
acc. to IEC 60947-4-1, open contactors, $\theta \leq 40^\circ\text{C}$		35 A	35 A	55 A	55 A
With conductor cross-sectional area		6 mm ²	6 mm ²	16 mm ²	16 mm ²
AC-1 Utilization category					
For air temperature close to contactor					
I_e / Rated operational current AC-1	$\theta \leq 40^\circ\text{C}$	25 A	30 A	45 A	55 A
U_e max. $\leq 690\text{ V}$, 50/60 Hz	$\theta \leq 60^\circ\text{C}$	25 A	30 A	40 A	45 A
	$\theta \leq 70^\circ\text{C}$	22 A	26 A	32 A	37 A
With conductor cross-sectional area		4 mm ²	6 mm ²	10 mm ²	16 mm ²
Short-circuit protection device for contactors					
Without thermal overload relay - Motor protection excluded					
$U_e \leq 500\text{ V AC}$ - gG type fuse		25 A	32 A	50 A	63 A
Rated short-time withstand current I_{cw}					
At 40 °C ambient temperature, in free air from a cold state	1 s	300 A	300 A	450 A	450 A
	10 s	150 A	150 A	300 A	300 A
	30 s	80 A	80 A	225 A	225 A
	1 min	60 A	60 A	150 A	150 A
	15 min	35 A	35 A	55 A	55 A
Power dissipation per pole	I_e / AC-1	0.8 W	1.2 W	1.6 W	2.3 W
Max. electrical switching frequency	AC-1	600 cycles/h			

Main pole - Utilization characteristics according to UL / CSA

Contactor types	AF09	AF16	AF26	AF38
Standards	UL 508, CSA C22.2 N°14			
Max. operational voltage	600 V			
UL / CSA general use rating				
600 V AC	25 A	30 A	45 A	55 A
With conductor cross-sectional area	AWG 10	AWG 10	AWG 8	AWG 6
Max. electrical switching frequency				
For general use	600 cycles/h			

Remark for 4-pole contactors fitted with 2 N.O. + 2 N.C. main poles



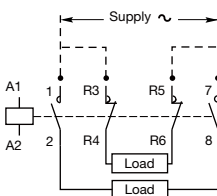
These contactors are suitable for controlling 2 separate circuits, i.e. 2 loads with 2 separate supplies, or 1 circuit comprising 2 separate loads with a single supply (see diagrams below). When the contactor operates there is no mechanical overlapping between the N.O. poles and the N.C. poles: BREAK before MAKE.



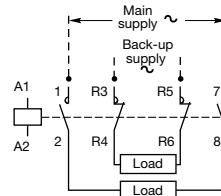
These contactors are not suitable for a reversing starter or for controlling a single load from 2 separate supplies.

Block diagrams

– Single supply and 2 separate loads



– 2 separate supplies and 2 separate loads



EK110 ... EK1000 4-pole contactors

Technical data

Main pole - Utilization characteristics according to IEC

Contactor types	AC or DC operated	EK110	EK150	EK175	EK210	EK370	EK550	EK1000
Standards		IEC 60947-1 / 60947-4-1 and EN 60947-1 / 60947-4-1						
Rated operational voltage U _e max.		1000 V						
Rated frequency (without derating)		50 / 60 Hz						
Conventional free-air thermal current I _{th}								
acc. to IEC 60947-4-1, open contactors, $\theta \leq 40\text{ }^\circ\text{C}$		200 A	250 A	300 A	350 A	550 A	800 A	1000 A
With conductor cross-sectional area		95 mm ²	150 mm ²	185 mm ²	240 mm ²	2x 185 mm ²	2x 240 mm ²	2x 300 mm ²
AC-1 Utilization category								
For air temperature close to contactor								
I _e / Rated operational current AC-1	$\theta \leq 40\text{ }^\circ\text{C}$	200 A	250 A	300 A	350 A	550 A	800 A	1000 A
U _e max. $\leq 1000\text{ V}$, 50/60 Hz	$\theta \leq 55\text{ }^\circ\text{C}$	180 A	230 A	270 A	310 A	470 A	650 A	800 A
	$\theta \leq 70\text{ }^\circ\text{C}$	155 A	200 A	215 A	250 A	400 A	575 A	720 A
With conductor cross-sectional area		95 mm ²	150 mm ²	185 mm ²	240 mm ²	2x 185 mm ²	2x 240 mm ²	2x 300 mm ²
AC-3 Utilization category								
For air temperature close to contactor $\theta \leq 55\text{ }^\circ\text{C}$								
I _e / Max. rated operational current AC-3 (1)								
	220-230-240 V	120 A	145 A	210 A	210 A	400 A	550 A	-
	380-400 V	120 A	145 A	210 A	210 A	400 A	550 A	-
	415 V	120 A	145 A	210 A	210 A	400 A	550 A	-
	440 V	120 A	145 A	210 A	210 A	370 A	550 A	-
	500 V	120 A	145 A	210 A	210 A	370 A	550 A	-
	690 V	120 A	120 A	210 A	210 A	370 A	550 A	-
	1000 V	64 A	80 A	113 A	113 A	155 A	175 A	-
Rated operational power AC-3 (1)								
	220-230-240 V	30 kW	45 kW	59 kW	59 kW	110 kW	160 kW	-
	380-400 V	55 kW	75 kW	110 kW	110 kW	200 kW	280 kW	-
	415 V	55 kW	75 kW	110 kW	110 kW	220 kW	315 kW	-
	440 V	59 kW	75 kW	110 kW	110 kW	220 kW	315 kW	-
	500 V	75 kW	90 kW	132 kW	132 kW	250 kW	400 kW	-
	690 V	110 kW	110 kW	160 kW	160 kW	355 kW	500 kW	-
	1000 V	90 kW	110 kW	160 kW	160 kW	220 kW	250 A	-
Rated making capacity AC-3		10 x I _e AC-3 acc. to IEC 60947-4-1						
Rated breaking capacity AC-3		8 x I _e AC-3 acc. to IEC 60947-4-1						
Short-circuit protection device for contactors								
without thermal overload relay - Motor protection excluded								
U _e $\leq 500\text{ V AC}$ - gG type fuse		250 A	250 A	355 A	355 A	630 A	800 A	1000 A
Rated short-time withstand current I _{cw}								
at 40 °C ambient temperature,	1 s	1700 A	1800 A	2300 A	2300 A	5500 A	5500 A	6800 A
in free air from a cold state	10 s	900 A	1200 A	1680 A	1680 A	5300 A	5300 A	6400 A
	30 s	600 A	700 A	1000 A	1000 A	3700 A	3700 A	4400 A
	1 min	450 A	550 A	800 A	800 A	3000 A	3000 A	3400 A
	15 min	210 A	250 A	320 A	320 A	1000 A	1000 A	1200 A
Maximum breaking capacity								
cos $\phi = 0.45$	at 440 V	1400 A	1500 A	2000 A	2000 A	5000 A	5400 A	-
(cos $\phi = 0.35$ for I _e > 100 A)	at 690 V	1100 A	1200 A	1700 A	1700 A	5000 A	5400 A	-
Power dissipation per pole								
	I _e / AC-1	10 W	13 W	18 W	18 W	40 W	60 W	80 W
	I _e / AC-3	3 W	5 W	9 W	9 W	15 W	25 W	-
Max. electrical switching frequency								
	AC-1	300 cycles/h						
	AC-3	300 cycles/h						
	AC-2, AC-4	150 cycles/h		120 cycles/h				-



3-phase motors



1500 r.p.m. 50 Hz
1800 r.p.m. 60 Hz
3-phase motors

Main pole - Utilization characteristics according to UL / CSA

Contactor types	AC or DC operated	EK110	EK150	EK175	EK210	EK370	EK550	EK1000
Standards		UL 508, CSA C22.2 N°14						
Max. operational voltage		600 V						
UL / CSA general use rating								
600 V AC		170 A	200 A	250 A	300 A	420 A	540 A	-
Short-circuit protection device for contactors								
without thermal overload relay - Motor protection excluded								
Fuse rating		400 A					1200 A	
Fuse type, 600 V		J					L	
Max. electrical switching frequency								
For general use		300 cycles/h						

(1) For the corresponding kW/A or hp/A values of 1500 r.p.m, 50 Hz or 1800 r.p.m, 60 Hz, 3-phase motors, see "Motor rated operational powers and currents".

Nature of current	Category	Typical applications	Relevant IEC product standard
a.c.	AC-20A, AC-20B AC-21A, AC-21-B AC-22A, AC-22B AC-23A, AC-23B 3)	Connecting and disconnecting under no-load conditions Switching of resistive loads, including moderate overloads Switching of mixed resistive and inductive loads, including moderate overloads Switching of motor loads or other highly inductive loads	60947-3
	AC-1 AC-2 AC-3 AC-4 AC-5a AC-5b AC-6a AC-6b AC-7a AC-7b AC-8a AC-8b	Non-inductive or slightly inductive loads, resistance furnaces Slip-ring motors: starting, switching off Squirrel-cage motors: starting, switching off motors during running Squirrel-cage motors: starting, plugging1), inching2) Switching of electric discharge lamp controls Switching of incandescent lamps Switching of transformers Switching of capacitor banks Slightly inductive loads in household appliances and similar applications Motor-loads for household applications Hermetic refrigerant compressor motor control with manual resetting of overload releases Hermetic refrigerant compressor motor control with automatic resetting of overload releases	60947-4-1
	AC-52a AC-52b AC-53a AC-53b AC-58a AC-58b	Control of slip ring motor stators: 8 h duty with on-load currents for start, acceleration, run Control of slip ring motor stators: intermittent duty Control of squirrel-cage motors: 8 h duty with on-load currents for start, acceleration, run Control of squirrel-cage motors: intermittent duty Control of hermetic refrigerant compressor motors with automatic resetting of overload releases: 8 h duty with on-load currents for start, acceleration, run Control of hermetic refrigerant compressor motors with automatic resetting of overload releases: intermittent duty	60947-4-2
	AC-51 AC-55a AC-55b AC-56a AC-56b	Non-inductive or slightly inductive loads, resistance furnaces Switching of electric discharge lamp controls Switching of incandescent lamps Switching of transformers Switching of capacitor banks	60947-4-3
	AC-12 AC-13 AC-14 AC-15	Control of resistive loads and solid-state loads with isolation by optocouplers Control of solid-state loads with transformer isolation Control of small electromagnetic loads Control of a.c. electromagnetic loads	60947-5-1
	AC-12 AC-140	Control of resistive loads and solid state loads with optical isolation Control of small electromagnetic loads with holding (closed) current $\leq 0,2$ A, e.g. contactor relays	60947-5-2
	AC-31A, AC-31B AC-33A, AC-33B AC-35A, AC-35B AC-36A, AC-36B 3)	Non inductive or slightly inductive loads Motor loads or mixed loads including motors, resistive loads and up to 30 % incandescent lamp loads Electric discharge lamp loads Incandescent lamp loads	60947-6-1

Nature of current	Category	Typical applications	Relevant IEC product standard	
a.c.	AC-40	Distribution circuits comprising mixed resistive and reactive loads having a resultant inductive reactance Non-inductive or slightly inductive loads, resistance furnaces Slip-ring motors; starting, switching off Squirrel-cage motors: starting, switching off motors during running Squirrel-cage motors: starting, plugging ¹⁾ , inching ²⁾ Switching of electric discharge lamp controls Switching of incandescent lamps	60947-6-2	
	AC-41			
	AC-42			
	AC-43			
	AC-44			
	AC-45a AC-45b			
	AC-7a	Slightly inductive loads for household appliances and similar applications	61095	
	AC-7b	Motor-loads for household applications		
a.c. and d.c.	A	Protection of circuits, with no rated short-time withstand current	60947-2	
	B	Protection of circuits, with a rated short-time withstand current		
d.c.	DC-20A, DC-20B DC-21A, DC21B	Connecting and disconnecting under no-load conditions Switching of resistive loads, including moderate overloads	60947-3	
	DC-22A, DC22B	Switching of mixed resistive and inductive loads, including moderate overloads (e.g. shunt motors)		
	DC-23A, DC23B 3)	Switching of highly inductive loads (e.g. series motors)		
	DC-1	DC-1	Non-inductive or slightly inductive loads, resistance furnaces Shunt-motors, starting, plugging ¹⁾ , inching ²⁾ . Dynamic breaking of motors Series-motors, starting, plugging ¹⁾ , inching ²⁾ . Dynamic breaking of motors Switching of incandescent lamps	60947-4-1
		DC-3		
		DC-5		
		DC-6		
	DC-12	DC-12	Control of resistive loads and solid-state loads with isolation by optocouplers Control of electromagnets Control of electromagnetic loads having economy resistors in circuit	60947-5-1
		DC-13		
		DC-14		
	DC-12	DC-12	Control of resistive loads and solid state loads with optical isolation Control of electromagnets	60947-5-2
		DC-13		
	DC-31	DC-31	Resistive loads Motor loads or mixed loads including motors Incandescent lamp loads	60947-6-1
DC-33				
DC-36				
DC-40	DC-40	Distribution circuits comprising mixed resistive and reactive loads having a resultant inductive reactance Non-inductive or slightly inductive loads, resistance furnaces Shunt-motors: starting, plugging ¹⁾ , inching ²⁾ . Dynamic breaking of d.c. motors Series-motors: starting, plugging ¹⁾ , inching ²⁾ . Dynamic breaking of d.c. motors Switching of incandescent lamps	60947-6-2	
	DC-41			
	DC43			
	DC-45			
	DC-46			
<p>1) By plugging is understood stopping or reversing the motor rapidly by reversing motor primary connections while the motor is running. 2) By inching (jogging) is understood energizing a motor once or repeatedly for short periods to obtain small movements of the driven mechanism. 3) The utilization categories with annex A apply for frequent operations, those with annex B for infrequent/occasional operations</p>				

Tab. 1.1-1

Examples of utilization categories for low-voltage switchgear as per IEC 60947-1 ed. 5.0 Appendix A. Copyright © 2007 IEC, Geneva, Switzerland. www.iec.ch

Customer	Plant
Project	Switchboard

Temperature-rise assessment

Computation algorithms described in Standard IEC 60890 and compatible with Standard EN 60439 in case of fans.

Switchboard			
Family			
Type			
Dimensions [mm]	Height 2000	Width 5300	Depth 625
IP			
Number of horizontal frames	0		
Installation type	Separate enclosure, detached on all sides		

Effective cooling area (Ae)

		Ao [m ²]	'b' factor	Ao x b [m ²]		
Top surface	Exposed	0.83	1.40	1.16		
Front surface	Exposed	2.65	0.90	2.39		
Back surface	Exposed	2.65	0.90	2.39		
Left side	Exposed	1.25	0.90	1.13		
Right side	Exposed	1.25	0.90	1.13		
Ae total				8.18		
IEC 60890 factors	f 3.078	k 0.118	d 1.000	x 0.804	g 1.509	c 1.330

Fan

Fan capacity	128.4 [m ³ /h]	Height a.s.l.	100 [m]
--------------	----------------------------------	---------------	----------------

Total power losses

Devices rated power losses	1020.0 [W]
Demand factor	0.85
Devices power losses	736.9 [W]
Conductors power losses	2370.0 [W]
Extra power losses	0.0 [W]
Power subtracted by fan	917.2 [W]
Total power losses	[W]
Max power losses admitted	3106.7 [W]
Losable power (residual)	[W]

Temperature-rise assessment

Ambient temperature	35.0 [°C]	
t (1.0 H)	60.0 [°C]	
Delta t (1.0 H)	25.0 [K]	
Designer	Date	ABB
	10. 12. 2014	

DOL starters protected by MS116 manual motor starters

With AS contactors - open type version in kit form

Coordination type 1 or **type 2, AC-3, 16 kA or 50 kA, 400 V, 50/60 Hz**

IEC AC-3, 400 V Rated operational power kW	Type	Order code	Current setting range A	Magnetic tripping current A	Rated control circuit Uc (1)		Type	Order code	Allowed setting current A	
					V 50 Hz	V 60 Hz				
					Manual motor starters					Contactors
0.06	0.2	MS116-0.25	1SAM250000R1002	0.16...0.25	2.44	24	24	AS09-30-10-20	ISBL101001R2010	0.25
						-	120	AS09-30-10-16	ISBL101001R1610	
0.09	0.3	MS116-0.4	1SAM250000R1003	0.25...0.40	3.9	230	230	AS09-30-10-26	ISBL101001R2610	0.4
						400	400	AS09-30-10-28	ISBL101001R2810	
						-	120	AS09-30-10-16	ISBL101001R1610	
0.12	0.44	MS116-0.63	1SAM250000R1004	0.40...0.63	6.14	230	230	AS09-30-10-26	ISBL101001R2610	0.63
						400	400	AS09-30-10-28	ISBL101001R2810	
						-	120	AS09-30-10-16	ISBL101001R1610	
0.18	0.6	MS116-1.0	1SAM250000R1005	0.63...1.00	11.5	230	230	AS09-30-10-26	ISBL101001R2610	1
						400	400	AS09-30-10-28	ISBL101001R2810	
						-	120	AS09-30-10-16	ISBL101001R1610	
0.25	0.85	MS116-1.0	1SAM250000R1005	0.63...1.00	11.5	24	24	AS09-30-10-20	ISBL101001R2010	1
						-	120	AS09-30-10-16	ISBL101001R1610	
						230	230	AS09-30-10-26	ISBL101001R2610	
0.37	1.1	MS116-1.6	1SAM250000R1006	1.00...1.60	18.4	400	400	AS09-30-10-28	ISBL101001R2810	1.6
						-	120	AS09-30-10-16	ISBL101001R1610	
						230	230	AS09-30-10-26	ISBL101001R2610	
0.55	1.5	MS116-1.6	1SAM250000R1006	1.00...1.60	18.4	24	24	AS09-30-10-20	ISBL101001R2010	1.6
						-	120	AS09-30-10-16	ISBL101001R1610	
						230	230	AS09-30-10-26	ISBL101001R2610	
0.75	1.9	MS116-2.5	1SAM250000R1007	1.60...2.50	28.75	400	400	AS09-30-10-28	ISBL101001R2810	2.5
						-	120	AS09-30-10-16	ISBL101001R1610	
						230	230	AS09-30-10-26	ISBL101001R2610	
1.1	2.7	MS116-4.0	1SAM250000R1008	2.50...4.00	50	400	400	AS09-30-10-28	ISBL101001R2810	4
						-	120	AS09-30-10-16	ISBL101001R1610	
						230	230	AS09-30-10-26	ISBL101001R2610	
1.5	3.6	MS116-4.0	1SAM250000R1008	2.50...4.00	50	24	24	AS09-30-10-20	ISBL101001R2010	4
						-	120	AS09-30-10-16	ISBL101001R1610	
						230	230	AS09-30-10-26	ISBL101001R2610	
2.2	4.9	MS116-6.3	1SAM250000R1009	4.00...6.30	78.75	400	400	AS09-30-10-28	ISBL101001R2810	6.3
						-	120	AS09-30-10-16	ISBL101001R1610	
						230	230	AS09-30-10-26	ISBL101001R2610	
3	6.5	MS116-10	1SAM250000R1010	6.30...10.0	150	24	24	AS12-30-10-20	ISBL111001R2010	10
						-	120	AS12-30-10-16	ISBL111001R1610	
						230	230	AS12-30-10-26	ISBL111001R2610	
4	8.5	MS116-10	1SAM250000R1010	6.30...10.0	150	400	400	AS12-30-10-28	ISBL111001R2810	10
						-	120	AS12-30-10-16	ISBL111001R1610	
						230	230	AS12-30-10-26	ISBL111001R2610	
5.5	11.5	MS116-12	1SAM250000R1012	8.00...12.0	180	24	24	AS12-30-10-20	ISBL111001R2010	12
						-	120	AS12-30-10-16	ISBL111001R1610	
						230	230	AS12-30-10-26	ISBL111001R2610	
7.5	15.5	MS116-16	1SAM250000R1011	10.0...16.0	240	400	400	AS12-30-10-28	ISBL111001R2810	15.5
						-	120	AS16-30-10-16	ISBL121001R1610	
						230	230	AS16-30-10-26	ISBL121001R2610	
						400	400	AS16-30-10-28	ISBL121001R2810	

Note: for multiple packaging, please contact your ABB local sales organization.

(1) Other control voltages see voltage code table.



Main accessories

Connecting link for manual motor starter

Type

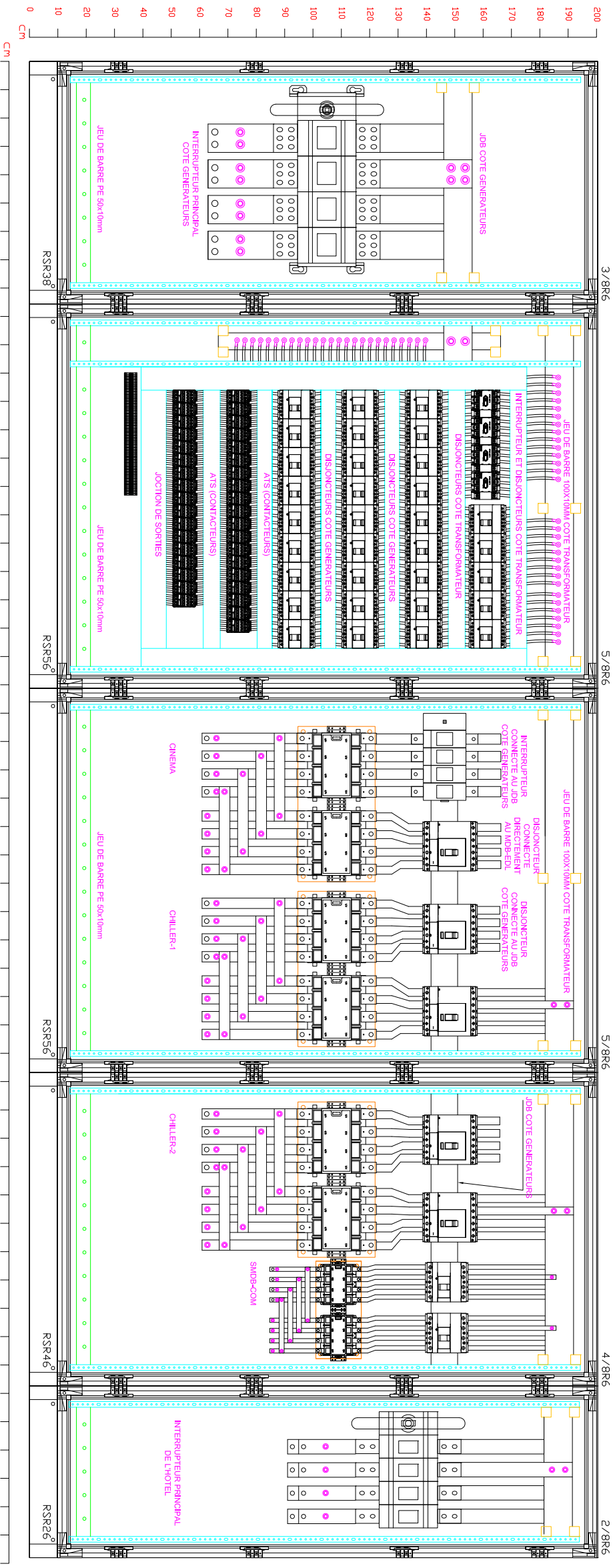
BEA16-3

Order code

1SBN081006T1000

NOTES

LEGEND



KEY PLAN

PROJECT

MAK PALACE

TITLE

MDB LAYOUT

REV	DATE	DESCRIPTION	DRAWING NO.	SCALE (SHEET A1)	SCALE (SHEET A3)	SIZE
0	7-11-13		001-E-P03-1/1	AS SHOWN	NTS	A3
	DATE: 10 February, 2014					REV: 1

ORIGINATOR	INIT.	SIGN	DATE	ORIGINATOR	INIT.	SIGN	DATE
ENGINEER	F. S.		8-11-13	APPROVED BY DECORATIVE	A. S.		
CHECKED	H. M.		8-11-13	APPROVED BY CONSULTANT	A. R.		

CLIENT:
MAK PALACE

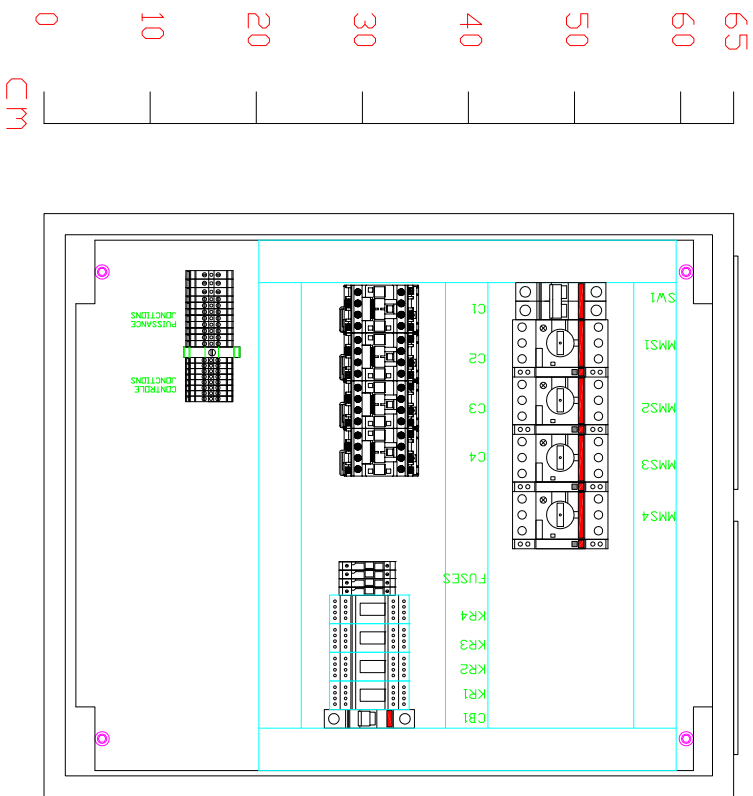

 Smart System Solution S.A.R.L.
 La Perla, C.P.
 Bahamon, Lebanon.
 Tel. +961 05 803965

NOTES

LEGEND

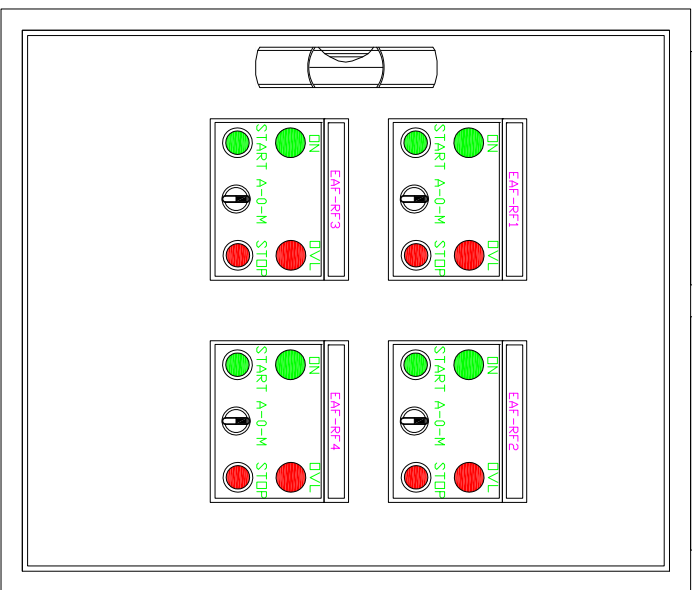
VUE INTERNE

2 / 0 B



VUE EXTERNE

2 / 0 B



CLIENT:

MAK PALACE

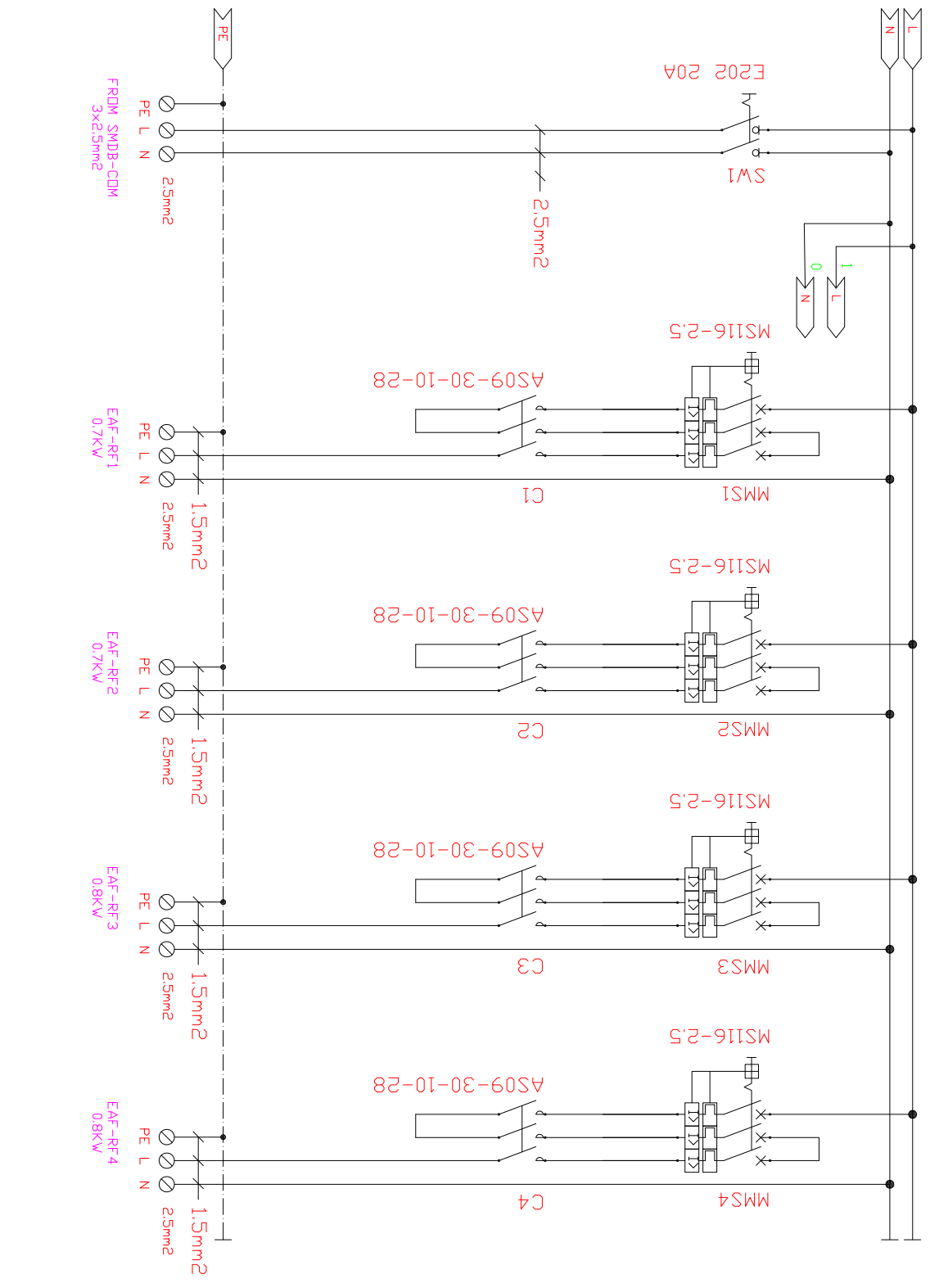


ORIGINATOR	INIT.	SIGN	DATE	ORIGINATOR	INIT.	SIGN	DATE
ENGINEER	F. S.		8-11-13	APPROVED BY DECORATIVE	A. S.		
CHECKED	H. M.		8-11-13	APPROVED BY CONSULTANT	A. R.		

REV / DATE	DESCRIPTION	DRAWING NO.	SCALE (SHEET A)	SCALE (SHEET A3)	SHEET
0 / 7-11-13		001-E-P4-1/3	AS SHOWN	NTS	A3
			DATE	15 April 2014	REV: 1

NOTES

LEGEND



KEY PLAN

PROJECT

MAK PALACE

TITLE

MCC-RF-VENT
POWER

REV / DATE	DESCRIPTION	DRAWING NO.	SCALE (SHEET A)	SCALE (SHEET A)	SHEET
0 / 7-11-13		001-E-P4-2/3	AS SHOWN	NTS	A3
			DATE	15 April 2014	REV 1

ORIGINATOR	INIT.	SIGN	DATE	ORIGINATOR	INIT.	SIGN	DATE
ENGINEER	F. S.		8-11-13	APPROVED BY DECORATIVE	A. S.		
CHECKED	H. M.		8-11-13	APPROVED BY CONSULTANT	A. R.		

CLIENT: **MAK PALACE**

La Perla, G. P. Milano
Smart System Solution s.r.l.
Via Paderno, G. P. Milano
Tel. +39 02 80896

NOTES

LEGEND

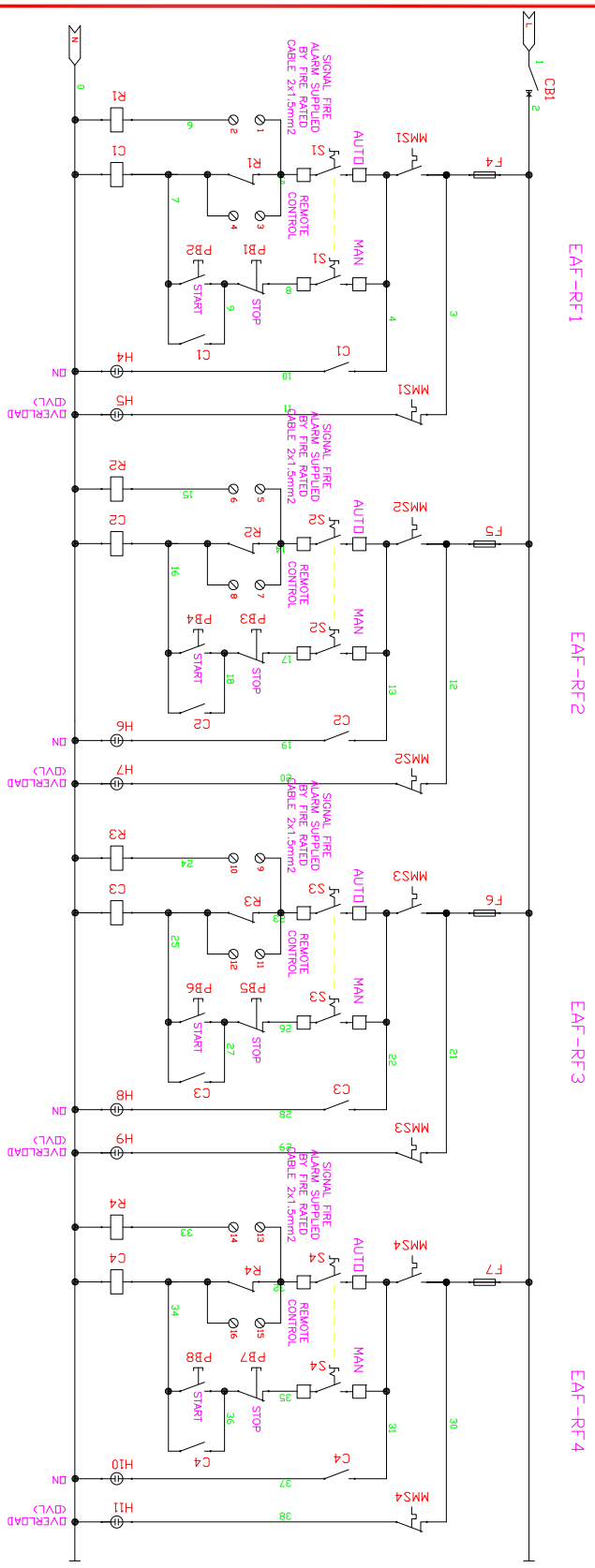
KEY PLAN

PROJECT

MAK PALACE

TITLE

MCC-RF-VENT CONTROL



CLIENT:		ORIGINATOR		INIT.		SIGN		DATE		ORIGINATOR		INIT.		SIGN		DATE	
MAK PALACE		ENGINEER		F. S.		CHECKED		H. M.		APPROVED BY DECORATIVE		A. S.		APPROVED BY CONSULTANT		A. R.	
8-11-13		8-11-13		8-11-13		8-11-13		8-11-13		8-11-13		8-11-13		8-11-13		8-11-13	

REV / DATE	DESCRIPTION	DRAWING NO.	SCALE (SHEET A1)	SCALE (SHEET A3)	SHEET
0 7-11-13		001-E-P4-3/3	AS SHOWN	NTS	A3
DATE	15 April 2014	REV	1		



La NF C 17-102 étant essentiellement une norme produit, il subsiste cependant, sur certains points relatifs à l'installation, une nécessité de mise en cohérence avec les règles de la NF EN 62305-3 quand les exigences en matière de niveaux de sécurité de la NF C 17-102 ne sont pas équivalentes ou plus sévères.

La mise en cohérence est obtenue en appliquant les mesures suivantes :

- *Systématiquement utiliser 2 descentes*
- *Respecter une des exigences suivantes en cas d'installation de conducteurs de descente sur des murs en matériaux combustibles et de risque d'élévation dangereuse de température de la descente :*
 - *1^{ère} exigence : Respecter un écartement minimal de 0,10 m*
 - *2^{ème} exigence : Porter la section du conducteur à 100 mm²*
- *Appliquer les prescriptions du paragraphe 6 de la NF EN 62305-3 en lieu et place de celles du paragraphe 3*
- *Porter la longueur minimale de conducteur enterré de 100 m évoquée au paragraphe 4.3 à 160 m pour le niveau de protection 1*
- *Remplacer le tableau du paragraphe 7.2.1 par l'annexe E.7 de la NF EN 62305-3*
- *Compléter l'annexe E qui présente des règles de bonne conduite avec les prescriptions normatives du paragraphe 8 de la NF EN 62305-3.*

1 PERFORMANCE DATA (Calculated values)

TYPE

Type designation: **AMG 0355CC04**

PERFORMANCE DATA

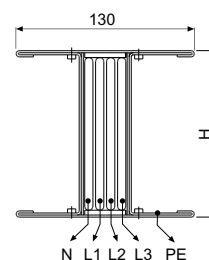
Main standard	IEC 60034							
Rated power factor	0.8							
Insulation class	H							
Temperature rise	H							
Ambient temperature	40 °C							
Altitude over sea level	≤ 1000 m							
Cooling/Protection	IC0A1/IP23							
	Single bearing				Double bearing			
Mounting arrangement	IM 2105				IM 1001			
Weight without/with PMG	1610/1635 kg				1650/1670 kg			
Inertia without/with PMG	11.80/11.81 kgm ²				11.44/11.45 kgm ²			
Direction of rotation	CW (Facing drive end)							
Maximum overspeed	2250 rpm							
Winding pitch	Two thirds (2/3)							
Stator winding resistance	0.00374 Ω per phase at 20°C series star connection							
Rotor winding resistance	2.190 Ω at 20°C							
Ex. stator winding resistance	15.16 Ω at 20°C							
Ex. rotor winding resistance	0.157 Ω at 20°C							
Total Harmonic Distortion	At no load <2.5%, at rated Linear balanced load <5%							
Voltage regulation	±1 %							
Frequency	THF <2%				TIF <50			
Telephone Interference	50 Hz				60 Hz			
Speed	1500 rpm				1800 rpm			
Cooling Air	0.70 m ³ /sec				0.84 m ³ /sec			
Voltage series star 3ph.	380/220	400/231	415/240	440/254	415/240	440/254	460/266	480/277
Voltage parallel star 3ph.	190/110	200/115	208/120	220/127	208/120	220/127	230/133	240/138
Voltage series delta 3ph.	220	230	240	254	240	254	266	277
Voltage parallel delta 3ph.	110	115	120	127	120	127	133	138
X _d (u)	3.802	3.614	3.358	2.684	4.263	4.026	3.850	3.689
X _d (s)	2.759	2.381	2.017	1.309	3.422	3.070	2.760	2.430
X _q (u)	1.766	1.679	1.560	1.247	1.981	1.871	1.789	1.714
X' _d (u)	0.252	0.240	0.223	0.178	0.283	0.267	0.255	0.245
X' _d (s)	0.229	0.218	0.203	0.162	0.257	0.243	0.232	0.223
X'' _d (u)	0.166	0.157	0.145	0.113	0.188	0.176	0.168	0.160
X'' _d (s)	0.151	0.143	0.132	0.103	0.171	0.160	0.153	0.145
X'' _q (u)	0.183	0.174	0.162	0.129	0.205	0.194	0.186	0.178
X'' _q (s)	0.167	0.158	0.147	0.118	0.187	0.176	0.169	0.162
X ₁ (u)	0.077	0.073	0.068	0.054	0.087	0.082	0.078	0.075
X ₂ (u)	0.175	0.166	0.153	0.121	0.197	0.185	0.177	0.169
X ₂ (s)	0.159	0.151	0.140	0.110	0.179	0.168	0.161	0.154
X ₀ (u)	0.025	0.023	0.022	0.017	0.028	0.026	0.025	0.024
X _p (s)	0.189	0.180	0.167	0.134	0.212	0.200	0.191	0.184
SCR (short circuit ratio), I _{r0} /X _d (u)	0.36	0.42	0.50	0.76	0.29	0.33	0.36	0.41
s=saturated value, u=unsaturated value, values are p.u. at rated voltage and power								
T _{d0} '	4.082 s							
T _d '	0.170 s							
T _d ''	0.0142 s							
T _a	0.0276 s							
CE-Marking	Generator fulfills the requirements of Low Voltage Directive (2006/95/EC) Generator supplied to EEA-area will be CE-marked							

ABB	ABB Generators Ltd.	Document identification	Lang.	Rev. ind.	Sheet
		8AMG 5862152	en	B	2

TEMPLATE: TECHNICALSPECIFICATION.DOT; FILENAME: 5862152-B-AMG 0355CC04 TECHNICAL SPECIFICATION.DOC; PRINTDATE: 5/31/2012 1:26:00 PM; SAVEDATE: 5/30/2012 12:08:00 PM

Technical data

Type	H class (125 K), ambient 40°C, continuous, p.f. 0.8													
	50 Hz						60Hz							
	380 V	400 V	415 V	440 V	1 phase	Efficiency	380 V	400 V	415 V	440 V	460 V	480 V	1 phase	Efficiency
	kVA	kVA	kVA	kVA	220-240V	(400V)	kVA	kVA	kVA	kVA	kVA	kVA	220-240V	(480V)
AMG 0180AA04 DBSI	15.0	15.0	15.0	14.0	9.00	80.70	16.0	16.0	16.0	17.0	18.0	19.0	10.0	82.80
AMG 0180BB04 DBSI	20.0	20.0	20.0	19.0	12.0	82.67	22.0	22.0	22.0	23.0	24.0	25.0	13.0	84.50
AMG 0180CC04 DBSI	25.0	25.0	25.0	24.0	15.0	84.42	27.0	27.0	27.0	28.0	29.0	30.0	16.0	86.35
AMG 0180DD04 DBSI	30.0	30.0	30.0	29.0	18.0	85.91	33.0	33.0	33.0	34.0	35.0	36.0	20.0	87.66
AMG 0200AA04 DBSI	36.0	38.0	38.0	36.0	23.0	84.92	39.0	40.0	40.0	42.0	44.0	46.0	24.0	86.41
AMG 0200BB04 DBSI	42.0	45.0	45.0	42.0	27.0	87.16	46.0	47.0	48.0	50.0	52.0	54.0	28.0	88.42
AMG 0200CC04 DBSI	48.0	50.0	50.0	48.0	30.0	88.57	52.0	53.0	54.0	56.0	58.0	60.0	32.0	89.57
AMG 0200DS04 DBSI	60.0	63.0	63.0	60.0	38.0	89.07	65.0	67.0	68.0	70.0	73.0	76.0	40.0	90.16
AMG 0200DD04 DBSI	66.0	70.0	70.0	66.0	42.0	88.67	71.0	73.0	74.0	77.0	81.0	84.0	44.0	89.90
AMG 0250AS04 DBSI	78.0	82.0	82.0	78.0	49.0	88.86	81.0	85.0	88.0	94.0	98.0	102	51.0	89.97
AMG 0250AA04 DBSI	95.0	100	100	90.0	60.0	89.88	99.0	104	108	115	120	125	63.0	90.87
AMG 0250BS04 DBSI	107	113	113	105	70.0	90.46	111	117	120	130	135	140	70.0	91.44
AMG 0250BB04 DBSI	120	125	125	115	75.0	90.85	125	130	135	145	150	155	78.0	91.81
AMG 0250CC04 DBSI	135	140	140	125	85.0	91.32	140	145	150	160	170	175	87.0	92.19
AMG 0250DS04 DBSI	145	150	150	135	90.0	91.91	150	155	160	170	180	185	93.0	92.74
AMG 0250DD04 DBSI	155	165	165	145	100	92.07	165	170	180	190	195	205	102	92.87
AMG 0280AS04 DBSI	165	175	175	155	105	92.01	170	180	185	195	205	215	110	92.78
AMG 0280AA04 DBSI	180	190	190	165	115	92.09	185	195	200	210	220	230	120	92.91
AMG 0280AL04 DBSI	190	200	200	185	120	92.63	195	205	210	225	235	245	125	93.35
AMG 0280BB04 DBSI	215	225	225	210	135	93.21	225	235	240	255	265	275	140	93.85
AMG 0280CC04 DBSI	235	250	250	220	150	93.30	245	255	260	275	290	300	155	94.01
AMG 0280DS04 DBSI	260	275	275	255	165	93.82	270	280	290	310	320	335	170	94.40
AMG 0280DD04 DBSI	285	300	300	280	180	93.89	295	310	320	335	350	365	185	94.50
AMG 0315AS04 DBSI	310	325	325	305	195	92.88	315	335	345	365	385	400	200	93.52
AMG 0315AA04 DBSI	335	350	350	330	210	92.92	335	355	365	390	405	425	215	93.56
AMG 0315BS04 DBSI	355	375	375	350	225	93.48	365	385	400	420	440	460	230	94.05
AMG 0315BB04 DBSI	380	400	400	375	240	93.53	390	405	425	450	470	490	245	94.12
AMG 0315CC04 DBSI	435	460	460	420	275	94.16	445	465	485	515	535	560	280	94.68
AMG 0355AA04 DBSI	475	500	500	450	300	94.05	485	510	525	560	585	610	305	94.57
AMG 0355BB04 DBSI	545	575	575	520	345	94.37	555	585	605	640	670	700	350	94.87
AMG 0355BL04 DBSI	595	625	625	595	375	94.46	605	640	660	700	735	765	385	94.96
AMG 0355CC04 DBSI	655	690	690	620	415	94.71	670	705	730	775	810	845	425	95.16
AMG 0400AA04 DBAI	715	750	750	675	N/A	94.10	715	750	780	825	860	900	N/A	94.58
AMG 0400BB04 DBAI	810	850	850	775	N/A	94.54	810	850	880	940	980	1020	N/A	94.97
AMG 0400CC04 DBAI	900	950	950	850	N/A	95.05	900	950	1000	1050	1100	1150	N/A	95.39
AMG 0400CL04 DBAI	950	1000	1000	950	N/A	95.01	950	1000	1040	1100	1150	1200	N/A	95.46
AMG 0400DD04 DBAI	1100	1150	1150	1050	N/A	95.19	1100	1150	1200	1265	1325	1400	N/A	95.52
AMG 0400ES04 DBAI	1190	1250	1250	1190	N/A	95.26	1190	1250	1300	1375	1440	1500	N/A	95.68
AMG 0400EE04 DBAI	1430	1500	1500	1330	N/A	95.48	1430	1530	1560	1650	1720	1800	N/A	95.89
AMG 0450AA04 DBAI	1565	1650	1650	1450	N/A	95.22	1565	1650	1710	1815	1900	1980	N/A	95.54
AMG 0450BB04 DBAI	1780	1875	1875	1650	N/A	95.44	1780	1875	1945	2060	2155	2250	N/A	95.79
AMG 0450CC04 DBAI	1990	2100	2100	1900	N/A	95.76	1990	2100	2180	2310	2415	2520	N/A	96.02
AMG 0450DD04 DBAI	2135	2250	2250	2050	N/A	95.76	2135	2250	2335	2475	2590	2700	N/A	96.04
AMG 0500AA04 DAAI	2200	2315	2315	2150	N/A	95.94	2200	2315	2400	2545	2660	2775	N/A	96.11
AMG 0500BB04 DAAI	2420	2550	2500	2250	N/A	95.93	2420	2550	2645	2805	2930	3060	N/A	96.13
AMG 0500CC04 DAAI	2610	2750	2750	2450	N/A	96.24	2610	2750	2850	3025	3160	3300	N/A	96.39
AMG 0500DD04 DAAI	2970	3125	3125	2900	N/A	96.27	2970	3125	3240	3440	3590	3750	N/A	96.48



Copper SCP trunking (3P + N + PE)

	In (A)	Single bars						Double bars			
		800	1000	1,250	1,600	2,000	2,500	3,200	4,000	5,000	
Rated current	In (A)	800	1000	1,250	1,600	2,000	2,500	3,200	4,000	5,000	
External dimensions	L x H (mm)	130 x 130	130 x 130	130 x 130	130 x 170	130 x 170	130 x 220	130 x 380	130 x 440	130 x 480	
Operating voltage	U _e (V)	1000	1000	1000	1000	1000	1000	1000	1000	1000	
Isolation voltage	U _i (V)	1000	1000	1000	1000	1000	1000	1000	1000	1000	
Operating frequency	f (Hz)	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	50/60	
Permissible short-duration current in a 3-phase fault (1s)	I _{CW} (kA)rms	45	50	60	85	88	88	170	176	176	
Peak current permissible in a 3-phase fault	I _{pk} (kA)	95	110	132	187	194	194	374	387	387	
Short-duration current permissible in a fault on 1 phase (1s)	I _{CW} (kA)rms	27	30	36	51	53	53	102	106	106	
Peak current permissible in a fault on 1 phase	I _{pk} (kA)	57	66	79	112	116	116	224	232	232	
Permissible thermal stress in a 3-phase fault	I ² t (MA ² s)	2,025	2,500	3,600	7,225	7,744	7,744	28,900	30,976	30,976	
Phase resistance	R ₂₀ (mΩ/m)	0.041	0.032	0.032	0.024	0.020	0.016	0.012	0.010	0.008	
Phase reactance (50Hz)	X (mΩ/m)	0.023	0.017	0.017	0.015	0.014	0.011	0.007	0.006	0.006	
Phase impedance	Z (mΩ/m)	0.047	0.037	0.037	0.028	0.024	0.019	0.014	0.012	0.010	
Phase resistance at thermal equilibrium	R _t (mΩ/m)	0.045	0.037	0.040	0.029	0.024	0.019	0.015	0.013	0.010	
Phase impedance at thermal equilibrium	R ₂₀ (mΩ/m)	0.023	0.017	0.017	0.015	0.014	0.011	0.007	0.006	0.006	
Neutral resistance	Z (mΩ/m)	0.050	0.041	0.043	0.033	0.028	0.022	0.016	0.014	0.012	
Protective conductor resistance (PE 1)	R _{PE} (mΩ/m)	0.125	0.125	0.125	0.113	0.113	0.101	0.075	0.069	0.065	
Protective conductor resistance (PE 2)	R _{PE} (mΩ/m)	0.036	0.036	0.036	0.028	0.028	0.023	0.014	0.012	0.011	
Protective conductor resistance (PE 3)	R _{PE} (mΩ/m)	0.050	0.050	0.050	0.041	0.041	0.033	0.021	0.018	0.017	
Protective conductor reactance (50 Hz)	X _{PE} (mΩ/m)	0.054	0.054	0.054	0.044	0.044	0.032	0.022	0.017	0.016	
Fault loop resistance (PE 1)	R _o (mΩ/m)	0.170	0.162	0.165	0.142	0.137	0.120	0.090	0.082	0.075	
Fault loop resistance (PE 2)	R _o (mΩ/m)	0.081	0.073	0.076	0.057	0.052	0.042	0.029	0.025	0.021	
Fault loop resistance (PE 3)	R _o (mΩ/m)	0.095	0.087	0.090	0.070	0.065	0.052	0.036	0.031	0.027	
Fault loop reactance (50 Hz)	X _o (mΩ/m)	0.077	0.071	0.071	0.059	0.058	0.043	0.029	0.023	0.022	
Fault loop impedance (PE 1)	Z _o (mΩ/m)	0.186	0.177	0.179	0.154	0.149	0.128	0.094	0.085	0.078	
Fault loop impedance (PE 2)	Z _o (mΩ/m)	0.111	0.102	0.104	0.082	0.078	0.060	0.041	0.034	0.030	
Fault loop impedance (PE 3)	Z _o (mΩ/m)	0.122	0.112	0.114	0.092	0.087	0.068	0.046	0.039	0.035	
Phase homopolar resistance - N	R _o (mΩ/m)	0.170	0.155	0.155	0.115	0.120	0.098	0.083	0.071	0.062	
Phase homopolar reactance - N	X _o (mΩ/m)	0.159	0.151	0.151	0.114	0.098	0.065	0.056	0.055	0.042	
Phase homopolar impedance - N	Z _o (mΩ/m)	0.233	0.216	0.216	0.162	0.155	0.118	0.100	0.090	0.075	
Phase homopolar resistance - PE	R _o (mΩ/m)	0.507	0.429	0.429	0.331	0.283	0.221	0.177	0.178	0.144	
Phase homopolar reactance - PE	X _o (mΩ/m)	0.201	0.177	0.177	0.143	0.150	0.124	0.111	0.094	0.086	
Phase homopolar impedance - PE	Z _o (mΩ/m)	0.545	0.464	0.464	0.361	0.320	0.253	0.209	0.201	0.168	
Voltage drop with uniformly distributed loads u = K · L · I _B · 10 ⁻⁴ (V)	K (V/m/A)10 ⁻⁶	cosφ = 0.70	41.3	33.0	34.6	27.1	23.5	18.5	13.2	11.5	9.8
		cosφ = 0.75	42.1	33.8	35.5	27.7	23.9	18.8	13.5	11.8	9.9
		cosφ = 0.80	42.8	34.5	36.3	28.1	24.2	19.1	13.8	12.1	10.0
		cosφ = 0.85	43.3	35.0	37.0	28.4	24.4	19.2	14.0	12.2	10.1
		cosφ = 0.90	43.4	35.3	37.3	28.5	24.4	19.2	14.1	12.3	10.1
		cosφ = 0.95	42.9	35.1	37.2	28.2	23.9	18.8	14.0	12.2	9.8
		cosφ = 1.00	38.6	32.1	34.4	25.4	21.2	16.7	12.7	11.2	8.7
Weight (PE 1)	p (kg/m)	31	31	31	42	46	69	84	101	126	
Weight (PE 2)	p (kg/m)	35	35	35	47	51	70	94	114	139	
Weight (PE 3)	p (kg/m)	33	32	32	44	48	66	87	105	130	
Calorific power with regard to fire	(kWh/m)	4.5	5.5	5.5	8	8.2	10.5	16	19	21	
Degree of protection (IEC EN 60529)	IP	55	55	55	55	55	55	55	55	55	
Thermal resistance class for insulating materials		B/F*	B/F*	B/F*	B/F*	B/F*	B/F*	B/F*	B/F*	B/F*	
Losses through Joule effect at rated current	P (W/m)	86	111	186	225	294	361	451	619	750	
Min/max ambient temperature	(°C)	-5/50	-5/50	-5/50	-5/50	-5/50	-5/50	-5/50	-5/50	-5/50	

* Class F (155°C) available on request



PE 1



PE 2



PE 3

Standard version Reinforced copper earth Reinforced aluminium earth

La norme NF EN 61439-6

Les formes des tableaux

Les séparations à l'intérieur d'un ensemble sont définies au chapitre 7.7 de la norme NF EN 60439-1. Elles font l'objet d'un accord entre le constructeur et l'utilisateur. Elles sont déterminées selon 4 formes distinctes pour assurer la protection contre les contacts directs. Une forme supérieure intègre les caractéristiques de la forme qui la précède.

formes		sécurité	disponibilité
<p>Forme 1 Aucune séparation</p>		<ul style="list-style-type: none"> ● pas d'accès aux parties sous tension, mais commande à travers porte (référence avant) donc ajout d'une porte si installation en ambiance 	<ul style="list-style-type: none"> ● nulle, toute intervention à l'intérieur de l'enveloppe impose une mise hors tension de la colonne considérée
<p>Forme 2a Séparation des jeux de barres des unités fonctionnelles. Les bornes pour conducteurs extérieurs n'ont pas besoin d'être séparées des jeux de barres.</p>	<p>Forme 2b Séparation des jeux de barres des unités fonctionnelles. Les bornes pour conducteurs extérieurs sont séparées des jeux de barres.</p>	<p>Forme 2a</p> <ul style="list-style-type: none"> ● pas d'accès aux parties sous tension dans le volume des unités fonctionnelles ● risques humains élevés lors d'interventions dans le caisson câble (présence du JdB vertical) ● risques humains lors de l'accès à une unité fonctionnelle (manifestations extérieures des unités fonctionnelles voisines) <p>Forme 2b</p> <ul style="list-style-type: none"> ● pas d'accès aux parties sous tension ● risques humains lors de l'accès à une unité fonctionnelle (manifestations extérieures des unités fonctionnelles voisines) 	<ul style="list-style-type: none"> ● bonne intervention sur une unité fonctionnelle sans coupure générale ● selon les constructeurs la forme 2 peut s'apparenter à une forme 3 (technologie tableau)
<p>Forme 3a Séparation des jeux de barres des unités fonctionnelles et séparation de toutes les unités fonctionnelles entre elles. Les bornes pour conducteurs extérieurs n'ont pas besoin d'être séparées des jeux de barres.</p>	<p>Forme 3b Séparation des jeux de barres des unités fonctionnelles et séparation de toutes les unités fonctionnelles entre elles. Séparation des bornes pour conducteurs extérieurs des unités fonctionnelles. Les bornes pour les conducteurs extérieurs sont séparées des jeux de barres.</p>	<p>Forme 3a</p> <ul style="list-style-type: none"> ● pas d'accès aux parties sous tension ● risques humains élevés lors d'interventions dans le caisson câble (présence du JdB vertical) ● pas de risques humains lors de l'accès à une unité fonctionnelle <p>Forme 3b</p> <ul style="list-style-type: none"> ● pas d'accès aux parties sous tension ● pas de risques humains lors de l'accès à une unité fonctionnelle 	<ul style="list-style-type: none"> ● bonne intervention sur une unité fonctionnelle sans coupure générale
<p>Forme 4a Séparation des jeux de barres des unités fonctionnelles et séparation de toutes les unités fonctionnelles entre elles y compris les bornes pour conducteurs extérieurs qui font partie intégrante de l'unité fonctionnelle.</p>	<p>Forme 4b Séparation des jeux de barres des unités fonctionnelles et séparation de toutes les unités fonctionnelles entre elles y compris les bornes pour conducteurs extérieurs. Séparation des unités fonctionnelles des bornes pour conducteurs extérieurs.</p>	<ul style="list-style-type: none"> ● pas d'accès aux parties sous tension ● pas de risques humains lors de l'accès à une unité fonctionnelle et son départ câble associé 	<ul style="list-style-type: none"> ● disponibilité maximum, intervention sur une unité fonctionnelle et son départ câble associé sans coupure générale