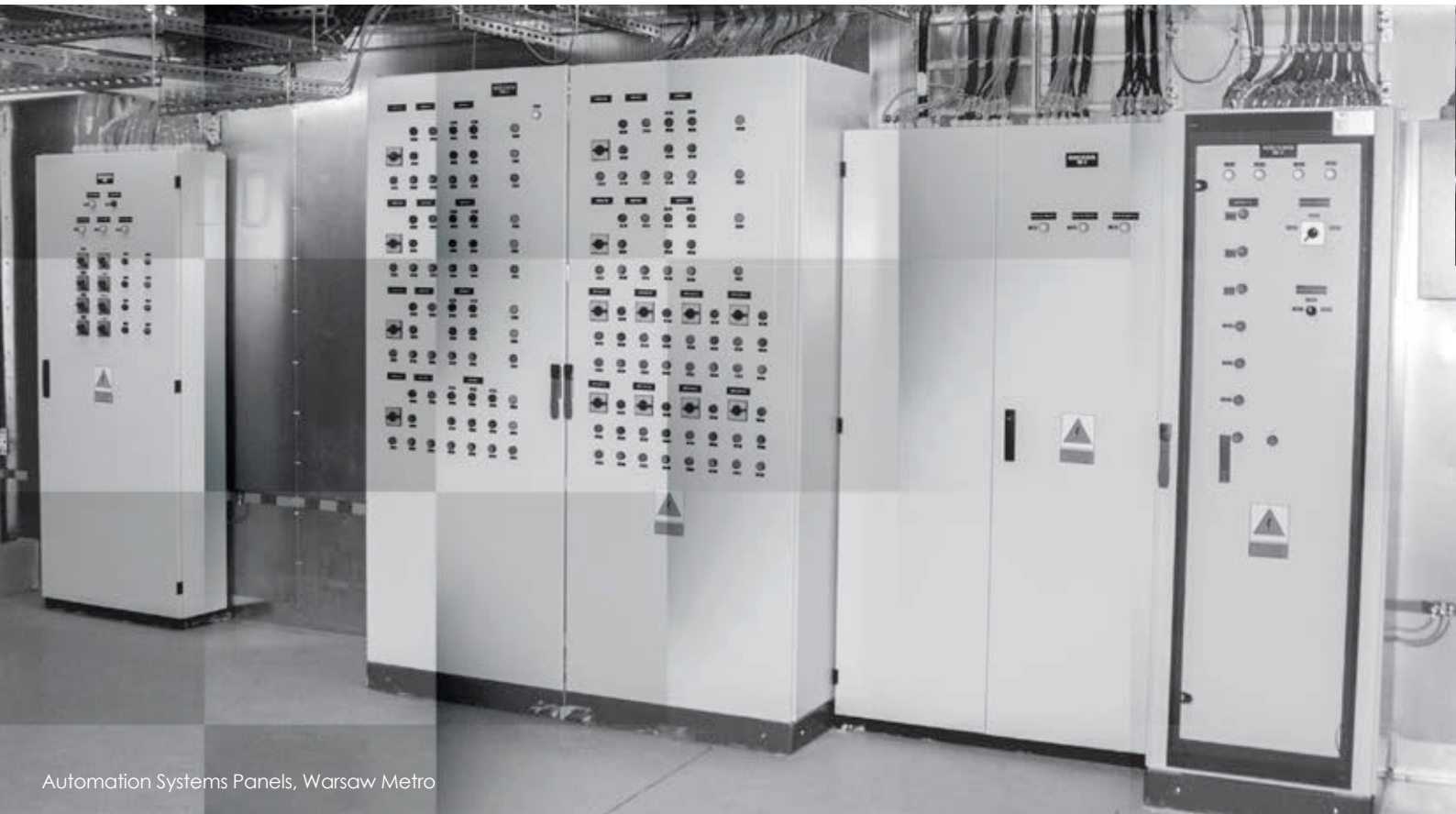


edition
2016

POWER SUPPLY DISTRIBUTION AND AUTOMATION SYSTEMS

LV DISTRIBUTION BOARDS
UP TO 3200 A



Automation Systems Panels, Warsaw Metro

CONTENTS

1	MAIN CHARACTERISTICS	3
2	STANDARD SOLUTIONS	6
3	APPLICATIONS	12

1 COMMON APPLICATIONS

Low Voltage Distribution Boards (LVDB) are intended to distribute electrical energy in a voltage rate up to 1000V AC, current rate up to 3200A and LV supply & distribution network protection for a wide range of industrial facilities. Such LV Distribution boards could be used as Main Distribution Boards for big shopping malls, warehouses and public facilities.

LV Distribution Boards are assembled and equipped with materials and equipment produced by ABB, Schneider Electric, EATON, LEGRAND, APATOR and other manufacturers.

BASIC TECHNICAL CHARACTERISTICS

- Separation forms: Form1-2-3-4 according to PN-EN 60439-1:2003/A1:2006;
- LVDBs are intended to be used within TN-C-S, TN-C, TN-S and TT/IT Earthing Systems;
- Main MCCB/ACB can be fixed, plug-in or withdrawable version;
- On clients demand Distribution Boards can be equipped with automatic monitoring systems unit SAN-3 which monitors voltages, currents, temperatures and circuit breakers statuses;
- Each Distribution Board may consist of following functional units:
 - RNN-IN main supply unit for current rates 800...3200A, consists of Main MCCB/ACB (equipped with auxiliary contacts to be connected to monitoring system) plug-in or withdrawable version also current transformers, measuring equipment and surge protection devices;
 - RNN-T tie-breaker unit for current rates 800...3200A, consists of Tie-breaker MCCB/ACB plug-in or withdrawable version equipped with ATS-unit and auxiliary contacts;
 - RNN-TIN main supply & tie-breaker unit as a rule for current rates up to 630A, consists of Main and Tie-Breaker (equipped with ATS-unit and auxiliary contacts) MCCBs fixed, plug-in or withdrawable version also current transformers, measuring equipment and surge protection devices;
 - RNN-OUT tap-off unit consists of tap-off MCCBs or MCBs (equipped with auxiliary contacts to be connected to monitoring system) that in turn connected to main buses. Depending of quantity and current rates circuit breakers can be connected to main buses via disconnectors in order to make service activities safety and easier;
- ATS-unit as a rule is designed based on programming controller Zelio Logic (Schneider Electric) or programmed automatic-transfer-switch controller ATS (ABB). However, on demand other solutions can be applied;
- Usually, as measuring equipment there are applied web-accessed multifunction power monitoring and control devices SHARK-100 which can be connected to remote control system via RS-485.

ADVANTAGES

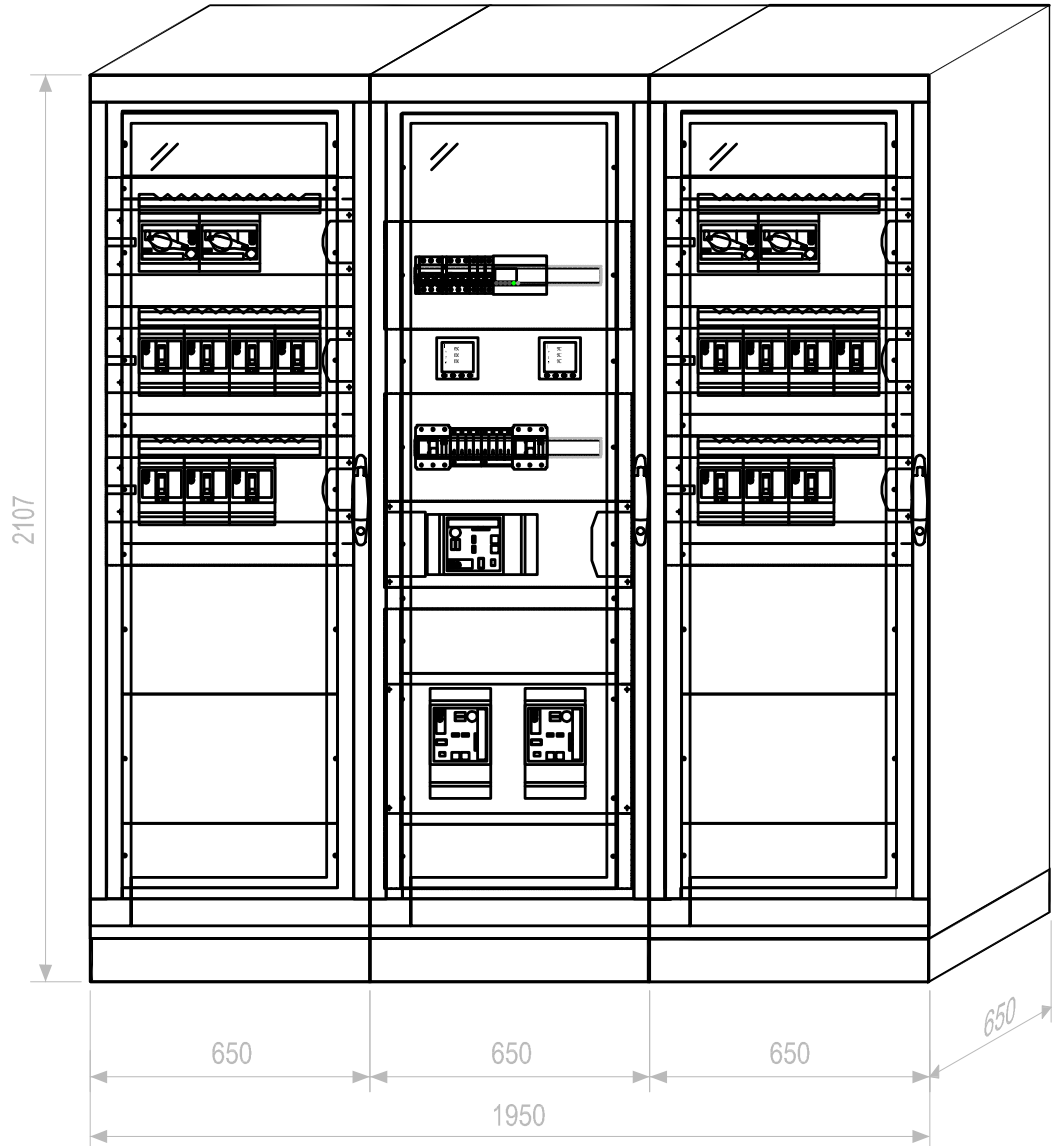
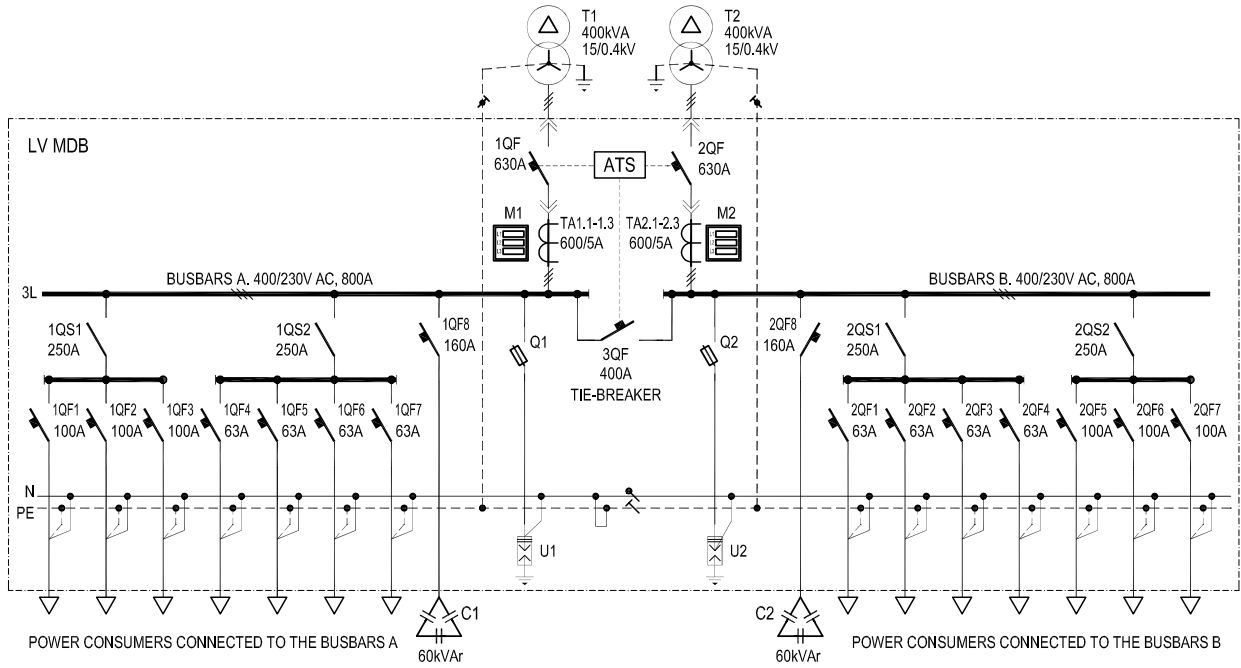
Polish assembling complies with international requirements of quality;

Distribution Boards are mounted with equipment and materials manufactured by worldwide leaders of protection, control & automation equipment production such as ABB, Schneider Electric, Eaton, Legrand etc.;

Depending on client requirements various configuration of Distribution Boards can be designed.

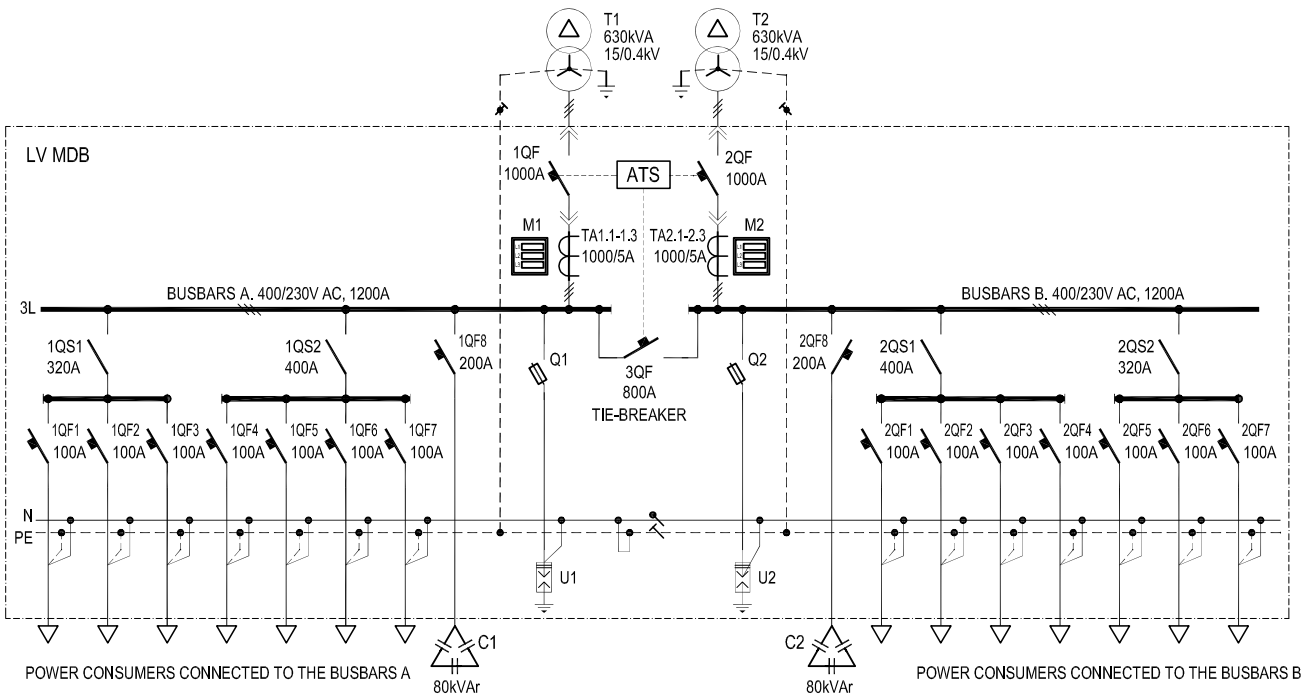


AN EXAMPLE OF LV MDB- CAPACITY OF UP TO 630 A



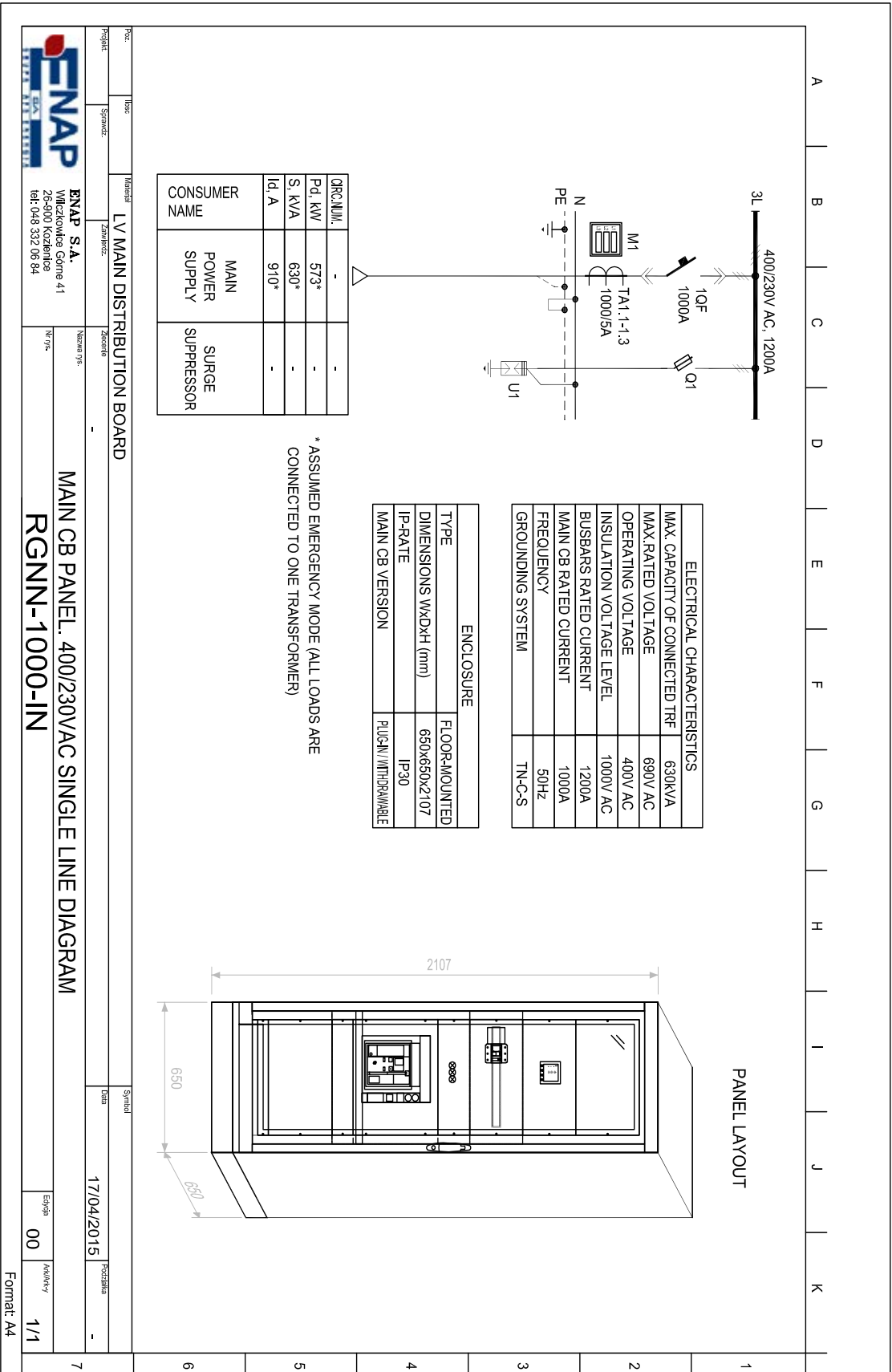
Note: Distribution Board arrangement, Tap-off CB quantity and current rates are shown for information only, particular system shall be specified according to client requirements.

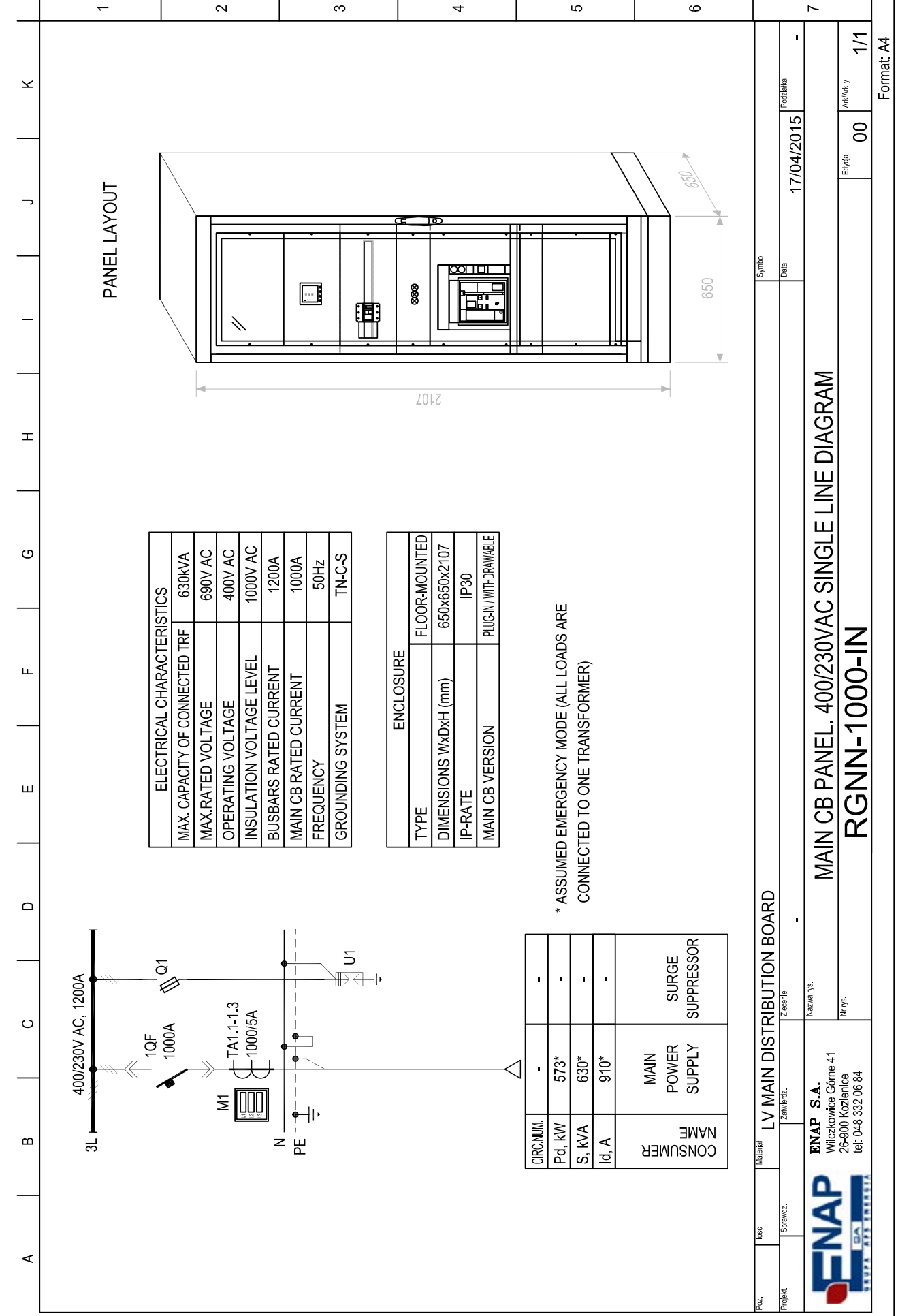
AN EXAMPLE OF LV MDB - CAPACITY OF 800... 3200 A



Note: Distribution Board arrangement, Tap-off CB quantity and current rates are shown for information only, particular system shall be specified according to client requirements.

2 STANDARD SOLUTIONS





ELECTRICAL CHARACTERISTICS	
MAX. CAPACITY OF CONNECTED TRF	630KVA
MAX. RATED VOLTAGE	690V AC
OPERATING VOLTAGE	400V AC
INSULATION VOLTAGE LEVEL	1000V AC
BUSBARS RATED CURRENT	1200A
MAIN CB RATED CURRENT	1000A
FREQUENCY	50Hz
GROUNDING SYSTEM	TN-C-S

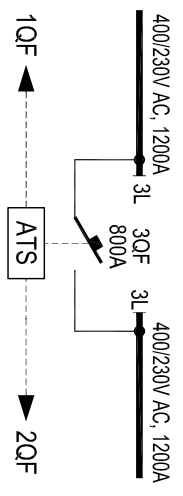
ENCLOSURE	
TYPE	FLOOR-MOUNTED
DIMENSIONS WxDxH (mm)	650x650x2107
IP-RATE	IP30
MAIN CB VERSION	PLUG-IN / WITHDRAWABLE

CIRC. NUM.	CONSUMER NAME	POWER SUPPLY	SURGE SUPPRESSOR
-	-	MAIN POWER SUPPLY	SURGE SUPPRESSOR
Pd, KW	573*	-	-
S, KVA	630*	-	-
Id, A	910*	-	-

* ASSUMED EMERGENCY MODE (ALL LOADS ARE CONNECTED TO ONE TRANSFORMER)

1	K																																																																																																																																																								
2	J																																																																																																																																																								
3	I																																																																																																																																																								
4	H																																																																																																																																																								
5	G																																																																																																																																																								
6	F																																																																																																																																																								
7	E																																																																																																																																																								
<table border="1"> <tr> <td>Symbol</td> <td colspan="10"></td> </tr> <tr> <td>Date</td> <td>17/04/2015</td> <td colspan="9"></td> </tr> <tr> <td>Project</td> <td></td> <td colspan="9"></td> </tr> <tr> <td>Material</td> <td></td> <td colspan="9"></td> </tr> <tr> <td>Ilosc</td> <td></td> <td colspan="9"></td> </tr> <tr> <td colspan="11">LV MAIN DISTRIBUTION BOARD</td> </tr> <tr> <td>Projekt</td> <td>Zawieracz.</td> <td>Zbiornik</td> <td colspan="8"></td> </tr> <tr> <td colspan="3">ENAP S.A.</td> <td colspan="8">Nazwa rys.</td> </tr> <tr> <td colspan="3">Włoczkowice Górne 41</td> <td colspan="8">Nr rys.</td> </tr> <tr> <td colspan="3">26-900 Kozienice</td> <td colspan="8"></td> </tr> <tr> <td colspan="3">tel: 048 332 06 84</td> <td colspan="8"></td> </tr> <tr> <td colspan="11"> MAIN CB PANEL. 400/230V AC SINGLE LINE DIAGRAM RGNN-1000-IN </td> </tr> <tr> <td colspan="11">Format: A4</td> </tr> </table>											Symbol											Date	17/04/2015										Project											Material											Ilosc											LV MAIN DISTRIBUTION BOARD											Projekt	Zawieracz.	Zbiornik									ENAP S.A.			Nazwa rys.								Włoczkowice Górne 41			Nr rys.								26-900 Kozienice											tel: 048 332 06 84											MAIN CB PANEL. 400/230V AC SINGLE LINE DIAGRAM RGNN-1000-IN											Format: A4										
Symbol																																																																																																																																																									
Date	17/04/2015																																																																																																																																																								
Project																																																																																																																																																									
Material																																																																																																																																																									
Ilosc																																																																																																																																																									
LV MAIN DISTRIBUTION BOARD																																																																																																																																																									
Projekt	Zawieracz.	Zbiornik																																																																																																																																																							
ENAP S.A.			Nazwa rys.																																																																																																																																																						
Włoczkowice Górne 41			Nr rys.																																																																																																																																																						
26-900 Kozienice																																																																																																																																																									
tel: 048 332 06 84																																																																																																																																																									
MAIN CB PANEL. 400/230V AC SINGLE LINE DIAGRAM RGNN-1000-IN																																																																																																																																																									
Format: A4																																																																																																																																																									

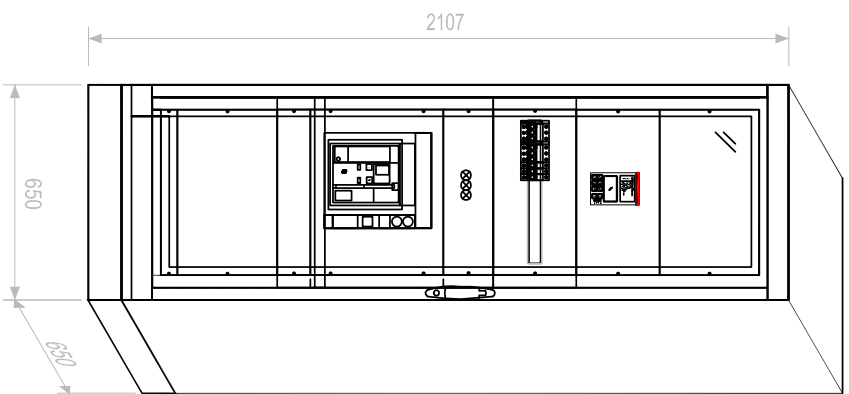
A | B | C | D | E | F | G | H | I | J | K



ELECTRICAL CHARACTERISTICS	
MAX. RATED VOLTAGE	690V AC
OPERATING VOLTAGE	400V AC
INSULATION VOLTAGE LEVEL	1000V AC
BUSBARS RATED CURRENT	1200A
TIE-BREAKER RATED CURRENT	800A
FREQUENCY	50Hz
GROUNDING SYSTEM	TN-C-S

ENCLOSURE	
TYPE	FLOOR-MOUNTED
DIMENSIONS WxDxH (mm)	650x650x2107
IP-RATE	IP30
TIE-BREAKER VERSION	WTYKOWIE / WYSUMNE

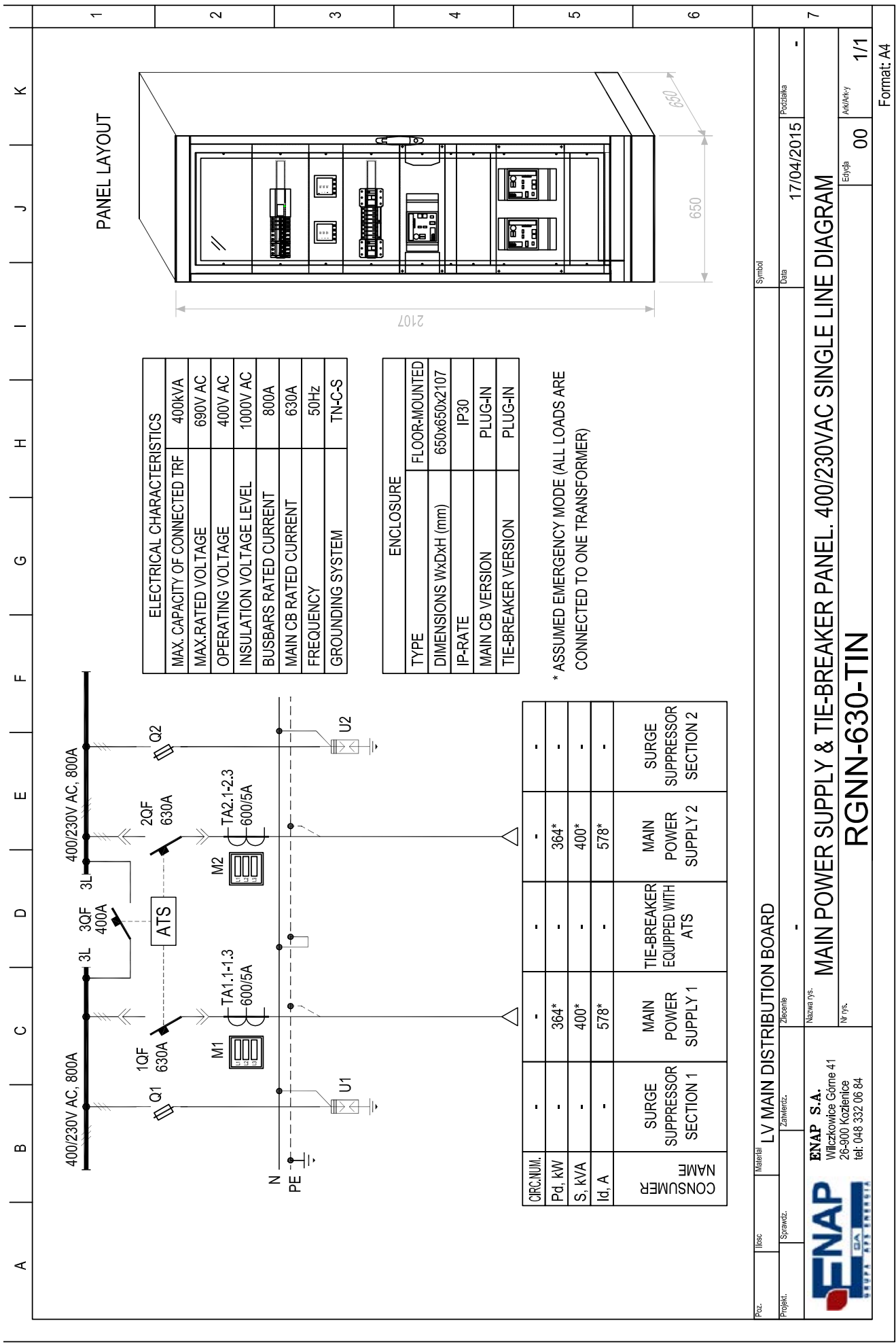
CIRC. NUM.	-	TIE-BREAKER EQUIPPED WITH ATS
Pd, kW	-	
S, kVA	-	
Id, A	-	
CONSUMER NAME		



PANEL LAYOUT

LV MAIN DISTRIBUTION BOARD

Przebieg	Uzasadnienie	Material	Zmiana rys.	Symbol	Data	Podpis
Projekt	Sprawdz.	Zamierz.	Zmiana rys.		17/04/2015	-
			ENAP S.A. Wilczkowie Górne 41 26-900 Kozłowiec tel. 048 332 06 84			
TIE-BREAKER PANEL. 400/230VAC SINGLE LINE DIAGRAM RGNN-1000-T			Nr rys.		Edycja 00	
Format: A4			1/1		7	



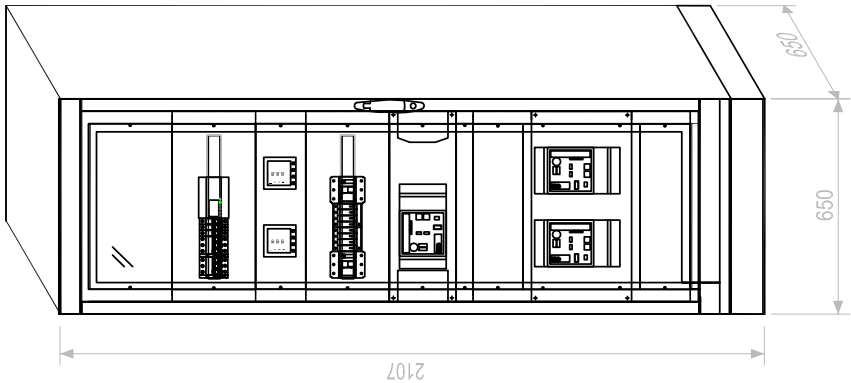
ELECTRICAL CHARACTERISTICS	
MAX. CAPACITY OF CONNECTED TRF	400kVA
MAX. RATED VOLTAGE	690V AC
OPERATING VOLTAGE	400V AC
INSULATION VOLTAGE LEVEL	1000V AC
BUSBARS RATED CURRENT	800A
MAIN CB RATED CURRENT	630A
FREQUENCY	50Hz
GROUNDING SYSTEM	TN-C-S

ENCLOSURE	
TYPE	FLOOR-MOUNTED
DIMENSIONS WxDxH (mm)	650x650x2107
IP-RATE	IP30
MAIN CB VERSION	PLUG-IN
TIE-BREAKER VERSION	PLUG-IN

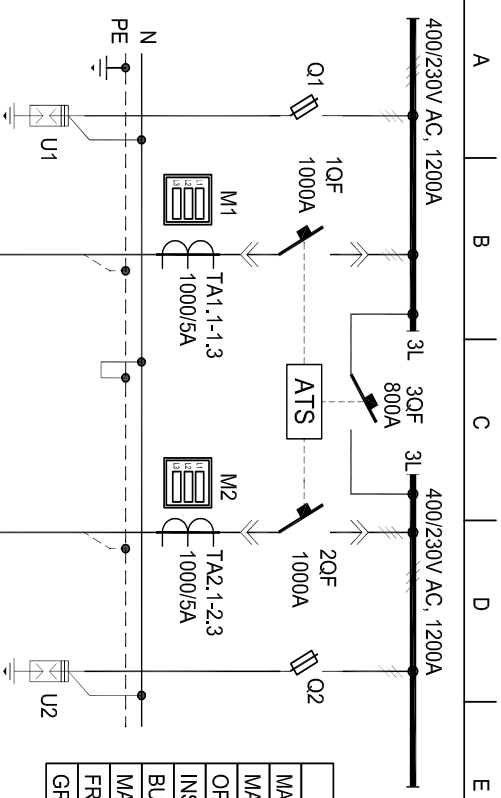
* ASSUMED EMERGENCY MODE (ALL LOADS ARE CONNECTED TO ONE TRANSFORMER)

CIRC. NUM.	-	-	-	-
Pd, kW	364*	-	364*	-
S, kVA	400*	-	400*	-
Id, A	578*	-	578*	-
CONSUMER NAME	SURGE SUPPRESSOR SECTION 1	MAIN POWER SUPPLY 1	TIE-BREAKER EQUIPPED WITH ATS	MAIN POWER SUPPLY 2
CONSUMER NAME	SURGE SUPPRESSOR SECTION 2	MAIN POWER SUPPLY 2	SURGE SUPPRESSOR SECTION 2	

PANEL LAYOUT



Pop.	Material	LV MAIN DISTRIBUTION BOARD	Symbol	
Projekt.	Sprawoz.	Zmierzanie	Data	17/04/2015
			Przebiłarka	-
			Nazwa rys.	MAIN POWER SUPPLY & TIE-BREAKER PANEL. 400/230VAC SINGLE LINE DIAGRAM
			Typ rys.	RGNN-630-TIN
			Edycja	00
			Autorka	1/1
				Format: A4

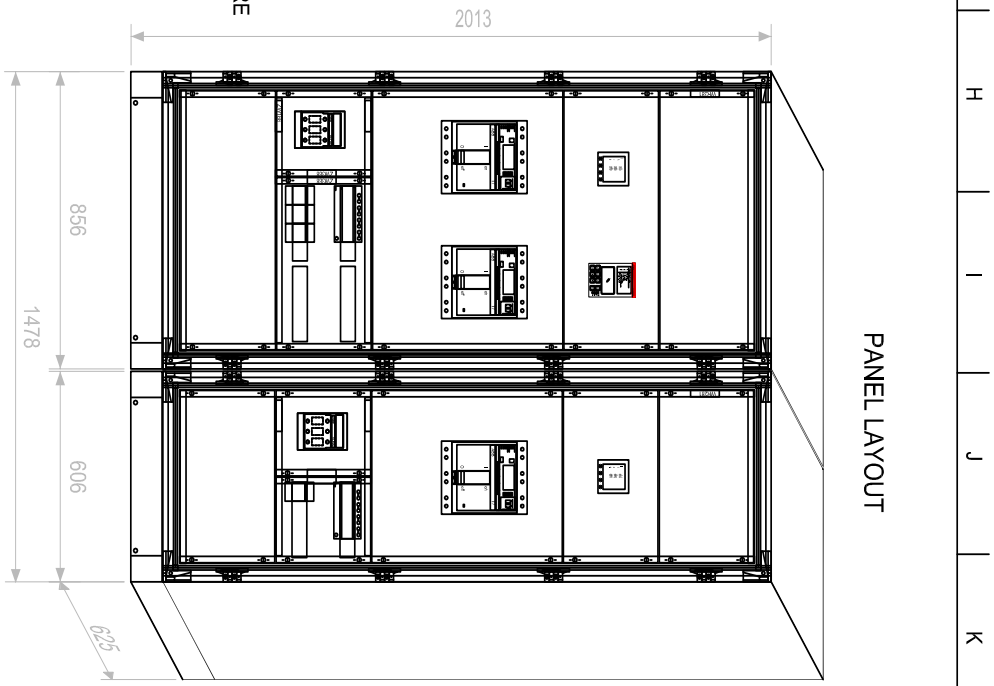


-	-	-	-	-
-	573*	-	573*	-
-	630*	-	630*	-
-	910*	-	910*	-
SURGE SUPPRESSOR SECTION 1	MAIN POWER SUPPLY 1	TIE-BREAKER EQUIPPED WITH ATS	MAIN POWER SUPPLY 2	SURGE SUPPRESSOR SECTION 2

ELECTRICAL CHARACTERISTICS	
MAX. CAPACITY OF CONNECTED TRF	630kVA
MAX. RATED VOLTAGE	690V AC
OPERATING VOLTAGE	400V AC
INSULATION VOLTAGE LEVEL	1000V AC
BUSBARS RATED CURRENT	1200A
MAIN CB RATED CURRENT	1000A
FREQUENCY	50Hz
GROUNDING SYSTEM	TN-C-S

ENCLOSURE	
TYPE	FLOOR-MOUNTED
DIMENSIONS WxDxH (mm)	1478x625x2013
IP-RATE	IP30
MAIN CB VERSION	WITHDRAWABLE
TIE-BREAKER VERSION	WITHDRAWABLE

* ASSUMED EMERGENCY MODE (ALL LOADS ARE CONNECTED TO ONE TRANSFORMER)



Poz.	1055	Material	LV MAIN DISTRIBUTION BOARD		Symbol		
Projekt.	Sprawdz.	Zamawiający	Zlecenie		Data		
Nazwa rys.		MAIN POWER SUPPLY & TIE-BREAKER PANEL. 400/230VAC SINGLE LINE DIAGRAM				Podziałka	-
Nz		RGNN-1000-TIN				Edycja	00
ENAP S.A.		Wieliczkowe Górne 41				Arkusz	1/1
26-900 Kozłowiec		tel. 048 332 06 84				Format: A4	
17/04/2015							

3 APPLICATIONS



LV auxiliary systems panel of 110 kV distribution station, Russia



Electrical lighting control panel, line II of Warsaw Metro

Pumps control panel, line II of Warsaw Metro





Ventilation systems control panel,
line II of Warsaw Metro

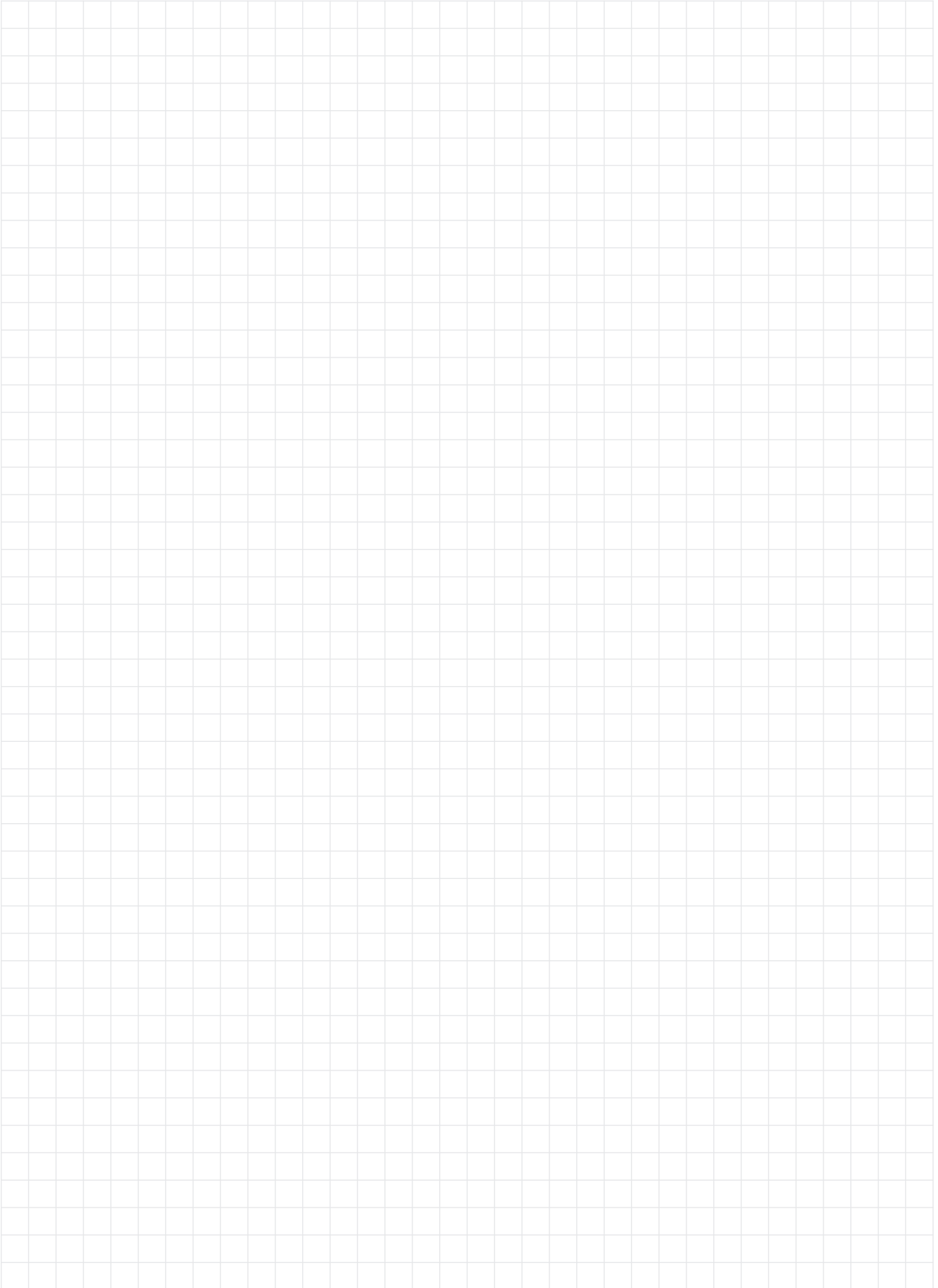


LV auxiliary systems panel, Kazakhstan



Ventilation systems control panel,
line II of Warsaw Metro

NOTES



CONTACT

phone +48 (48) 332 06 84, enap@enap.pl



Wilczkowice Górne 41
26 - 900 Kozienice
tel. (+48) 48 332 06 84
fax (+48) 48 332 05 34
e-mail: enap@enap.pl
www.enap.pl

NIP: 812-17-75-885
Regon: 672 754945

