DISTRIBUTE POWER NOT CO_2

MODULAR
ELSTEEL
ENCLOSURES

www.elsteel.com

The best technical solution at the best possible price

ENVIRONMENT FRIENDLY
PANEL TECHNOLOGY

26% CO2 reduction when distributing power is achievable today !

You´re holding a top of the line quality product in your hands. Made with love and excellence! I hope you will enjoy assembling and using Elsteel products as much as I enjoy manufacturing it for you.

Fang Logstrup
Managing Director

In our eagerness to be competitive we have been designing electrical panels using the **smallest** possible breakers, busbars, cables etc. thereby generating enormous watt losses.

Designing a panel in accordance with IEC 61439 is not enough as this standard allows temperature rises up to 105 - 120 centigrade.

In order to reduce carbon emissions, and the consequent global warming, we as engineers must offer “green panels” rather than cheap panels!

The green panel will save the end-user money in the long run. Investment in the initially more expensive green panel could easily be paid back in just one year!

You just need to follow these 4 simple steps to go eco on your panel.

1. Increase breaker sizes “one step up”

2. Increase busbar sizes “one step up”

3. Avoid fuses, use MCCB and MCB.

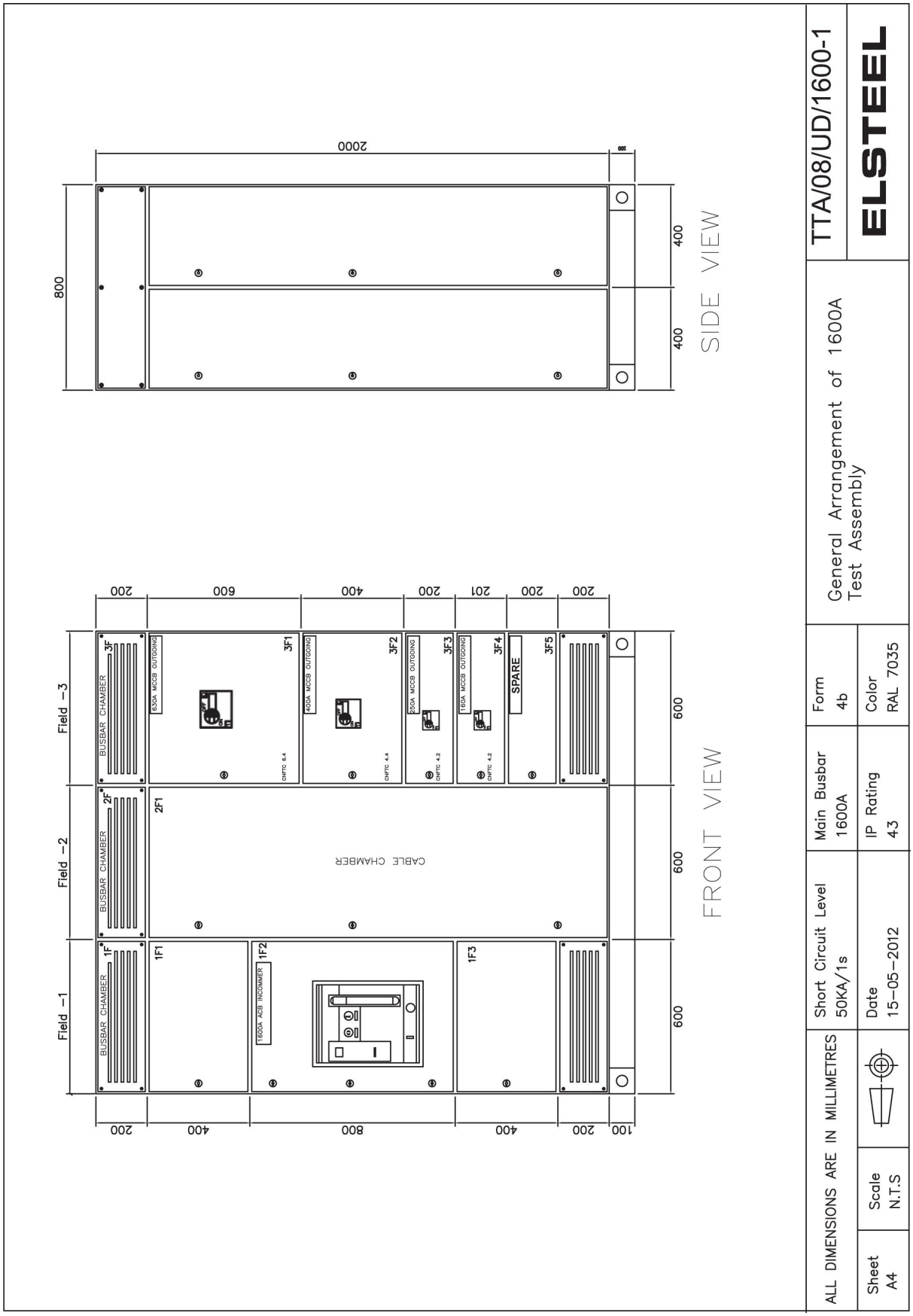
4. Use breakers with minimum watt loss.

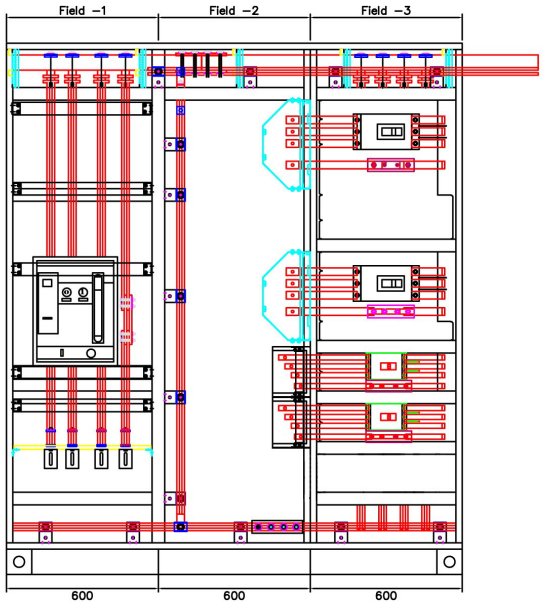
The EU has agreed to reduce
carbon emission with 20% by 2020.
You can achieve 26% today!

(See the sample calculation given in pg. 05)

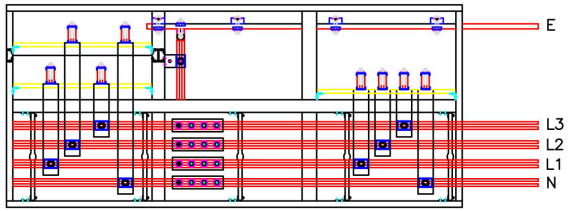
In these following pages you will find the in-house test results.

TEST PANEL

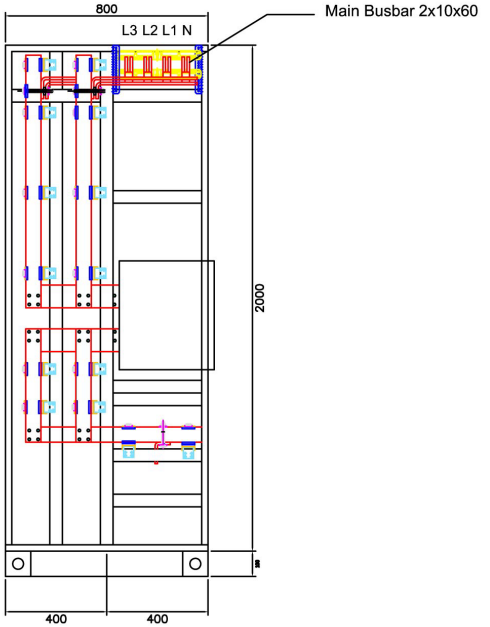

SIDE VIEW
FRONT VIEW
Field –1
Field –2
Field –3
BUSBAR CHAMBER
CABLE CHAMBER
1600A ACB INCOMMER
630A MCCB OUTGOING
400A MCCB OUTGOING
250A MCCB OUTGOING
160A MCCB OUTGOING
SPARE
2000
800
600
400
200
100
ALL DIMENSIONS ARE IN MILLIMETRES
Sheet A4
Scale N.T.S
Short Circuit Level 50KA/1s
Date 15–05–2012
Main Busbar 1600A
IP Rating 43
Form 4b
Color RAL 7035
General Arrangement of 1600A Test Assembly
TTA/08/UD/1600-1
ELSTEEL



FRONT VIEW



PLAN



SIDE VIEW

ALL DIMENSIONS ARE IN MILLIMETRES			Short Circuit Level 50KA/1s	Main Busbar 1600A	Form 4b	Bus Bar Arrangement of 1600A Test Assembly	TTA/08/UD/1600-2
Sheet A4	Scale N.T.S		Date 15–05–2012	IP Rating 43	Color RAL 7035		ELSTEEL

GREEN PANEL CALCULATION SHEET

Standard panel configuration		
Current rating	1600.00	A
Main busbar and dropper busbar size	2x10x60	mm
Main busbar and dropper busbar length	7.30	m
Watt loss of the busbar system (according to table-1)	909.22	W
Watt loss of standard breakers fitted in the panel (according to table-2)	673.75	W
Total watt loss due to heating (busbars and breakers)	1582.97	W
Energy loss per year (at full load 24 hours per day)	13866.77	kWh
CO2 emission when generating above energy per year	13034.77	kg
One step up Cu busbar size and breaker rating		
Current rating	1600	A
The next available higher size of main and dropper busbar	2x10x80	mm
Watt loss of the busbar system (according to table-1)	691.31	W
Watt loss of breakers of next available higher size frames (according to table-2)	475.36	W
Total watt loss due to heating (busbars and breakers)	1166.67	W
Energy loss per year (at full load 24 hours per day)	10220.03	kWh
CO2 emission when generating above energy per year	9606.83	kg
Savings due to one step up busbar system and breakers rating		
Power saving	416.30	W
Energy saving per year	3646.74	kWh
Cost of 1kWh energy	0.33	EUR
Saving in Euro per year	1203.43	EUR
CO2 saving per year	3427.94	kg
CO2 saving percentage	26.3	%
Additional investment cost due to one step up busbar system and breakers		
Additional Cu weight needed to step up the busbar system (according to table-1)	78.11	kg
Cu cost per 1 Tonne	6.31	EUR
Additional investment cost for Cu	492.87	EUR
Additional investment cost for one step higher breakers	1003.78	EUR
Total investment cost to one step up	1496.65	EUR
Payback period of investment	15	Months

Above shall be treated as guidance only as this is an example.

CALCULATION TABLE FOR Cu BUSBARS

	Standard 3P busbar system		One step-up busbar system			Saving for 3P busbar system		
Rated Current (A)	Busbar size (mm)	Watt loss (W/200mm)	Busbar size (mm)	Watt loss (W/200mm)	Additional Cu weight (kg/200mm)	Power saving (W/200mm)	Energy saving per year (kWh/200mm)	CO 2 saving per year (kg/200mm)
250	2-10×5	6.53	2-10×10	3.16	0.53	3.37	29.52	27.75
400	2-10×10	8.30	2-10×15	5.43	0.53	2.87	25.14	23.63
630	2-10×15	13.86	2-10×20	10.41	0.53	3.45	30.22	28.41
800	2-10×20	17.2	2-10×30	11.34	1.07	5.86	51.33	48.25
1000	2-10×30	18.16	2-10×40	13.44	1.07	4.72	41.35	38.87
1250	2-10×40	21.45	2-10×50	17.62	1.07	3.83	33.55	31.54
1600	2-10×60	24.91	2-10×80	18.94	2.14	5.97	52.30	49.16
2000	2-10×80	30.42	2-10×100	24.6	2.14	5.82	50.98	47.92
2500	2-10×100	39.64	3-10×80	28.84	2.14	10.80	94.61	88.93
3200	3-10×100	39.55	4-10×80	34.14	1.07	5.41	47.39	44.55
4000	4-10×100	44.34	6-10×80	36.53	4.28	7.81	68.42	64.31
5000	6-10×80	58.88	6-10×100	47.46	6.42	11.22	98.29	92.39
6300	6-10×100	77.69	8-10×80	71.02	2.14	6.67	58.43	54.92

Note : Emission Factor = 0.94kg of CO2 / kWh (source - International Energy Agency)

Table - 1

BREAKERS USED IN THE PANEL

	Standard breaker size		One step up frame size of breakers		Additional cost to one step up breaker (EUR)
	Breaker type	Watt loss (W)	Breaker type	Watt loss (W)	
160	FE160 (Fixed version)	48.00	FE250 (Fixed version)	40.70	28.83
250	FE250 (Fixed version)	61.88	FG400 (Fixed version)	20.63	124.69
400	FG400 (Fixed version)	52.80	FG630 (Fixed version)	52.80	50.66
630	FG630 (Fixed version)	119.07	FK800 (Fixed version)	47.63	489.42
1600	MPACT PLUS ACB-1600A	392.00	PACT PLUS ACB-2000A	313.60	310.18
	Total	673.75		475.36	1003.78

Table - 2

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