



DISTRIBUTE POWER; NOT CO₂

MODULAR
ELSTEEL
ENCLOSURES

CO₂

26% CO₂ reduction?
It's possible today!



Elsteel is committed to the environment. Through research, development, testing and passion we're building greener panels and a greener future. Our goal is to manufacture 100% sustainable panels.

Fang Logstrup
Managing Director

We all want cost effective solutions. And to do that most people design panels using the smallest possible breakers, busbars, cables etc. That creates enormous watt loss and this is where we can make a change!

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

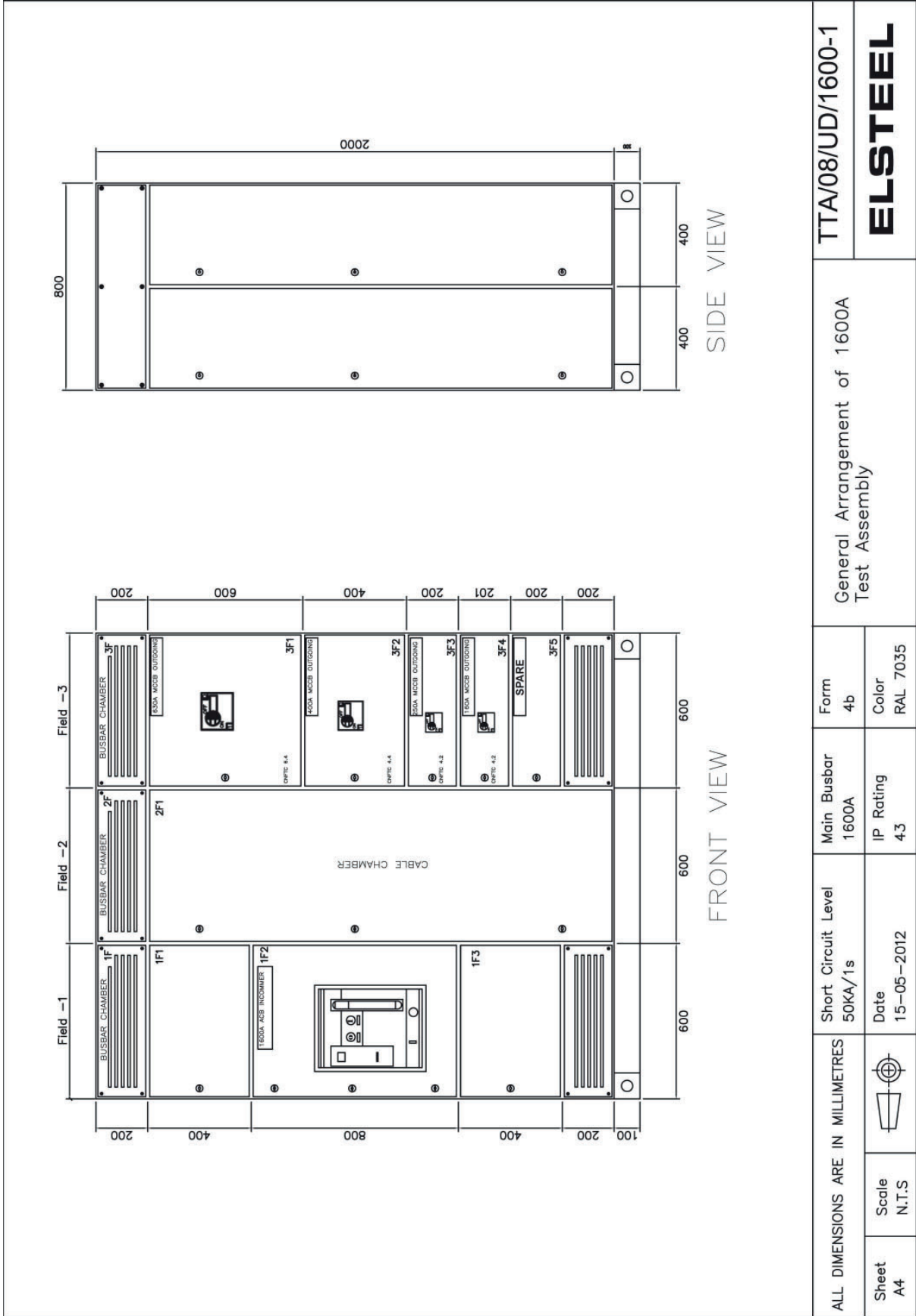
In order to reduce carbon emissions & global warming, we as engineers must offer “green panels”, rather than “cheap” panels!

The initial investment for a green panel will be higher but the extra cost can be recouped in just one year and you will actually save money as well as help the planet in the long run.

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



TEST PANEL

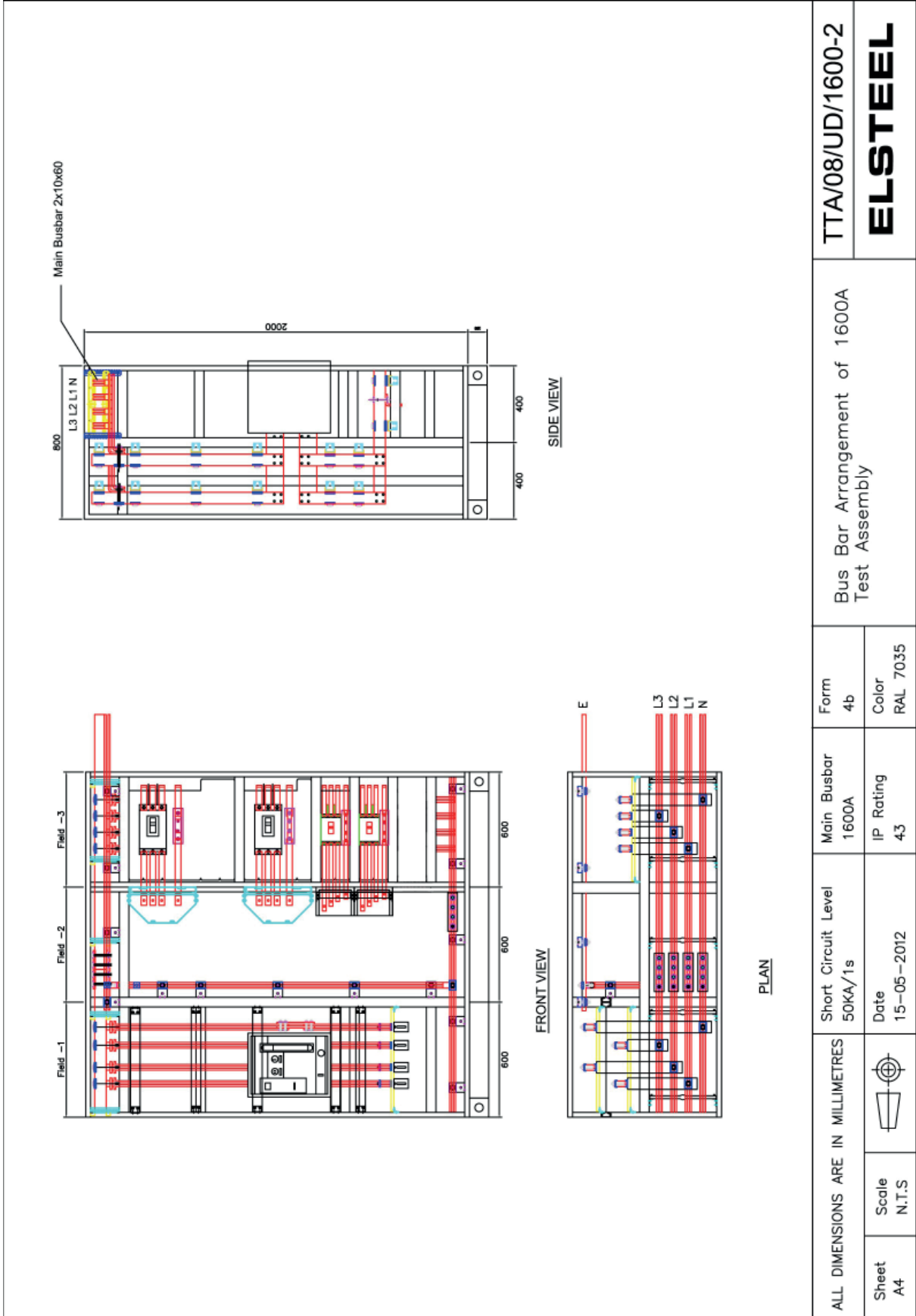


TTA/08/UD/1600-1

General Arrangement of 1600A Test Assembly

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| | | | |
|-----------------------------------|--------------------------------|----------------------|-------------------|
| ALL DIMENSIONS ARE IN MILLIMETRES | Short Circuit Level 50KA/1s | Main Busbar 1600A | Form 4b |
| Sheet A4 | Date 15-05-2012 | IP Rating 43 | Color RAL 7035 |
| Scale N.T.S | | | |



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

| Rated Current (A) | Standard 3P busbar system | | One step-up busbar system | | | Saving for 3P busbar system | | |
|-------------------|---------------------------|---------------------|---------------------------|---------------------|---------------------------------|-----------------------------|------------------------------------|--|
| | 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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