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SIPROTEC 5 Application Note

SIP5-APN-024-en:
Cubicle ENEAS – Flexible Generic Solutions HV SIP 5 (FGS HV SIP 5)

Answers for infrastructure and cities.

SIPROTEC 5 - Application: Cubicle ENEAS– Flexible Generic Solutions HV SIP 5 (FGS HV SIP 5)

Content

1 Cubicle ENEAS – Flexible Generic Solutions HV SIP 5 (FGS HV SIP 5)

1.1 Introduction

With ENEAS FGS HV SIP5 a technical concept was created as described below. It should be a base for EA SYS projects with SIPROTEC 5.

- Cubicle without swing-out frame
- Test plug instead of test switch
- Devices with detached display

Three 400kV Typicals (Feeder, coupler and transformer feeder) for double busbar have been worked out as sample examples. Single line diagrams in ELCAD as well the DIGSI 5 parameterization for SIPROTEC 5 is available for download.

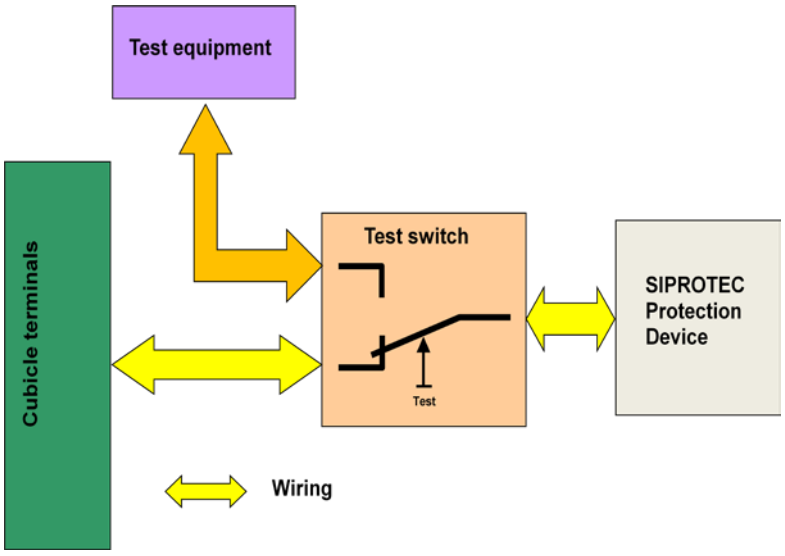
1.2 Concept of the cubicle

1.2.1 Cubicle without swing-out frame

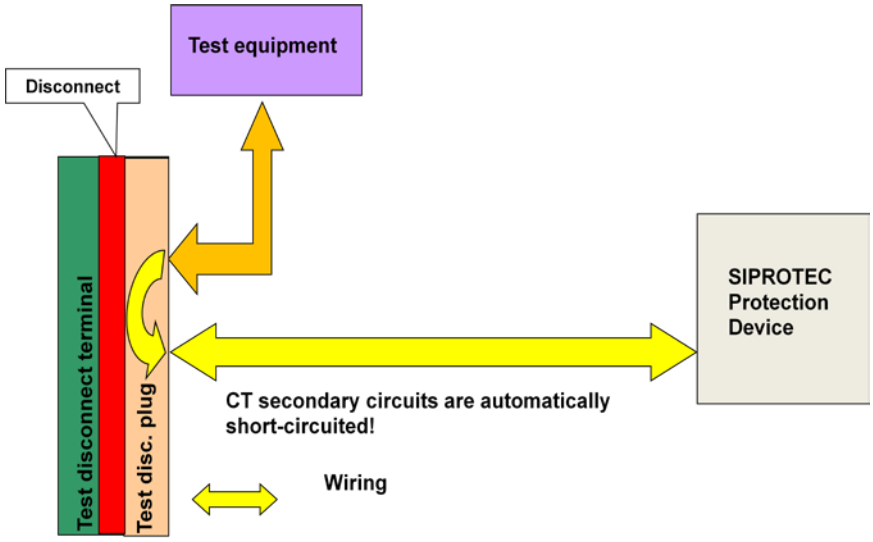
Due to the use of devices with detached display, swing frames are not necessary. More simple cubicles without swing frames do not apply the special quality requirements for swing frames.

1.2.2 Test plug instead of test switch

If test switches are used, additional wiring between the cubicle terminals and test switch as well from the test switch to the device is required.



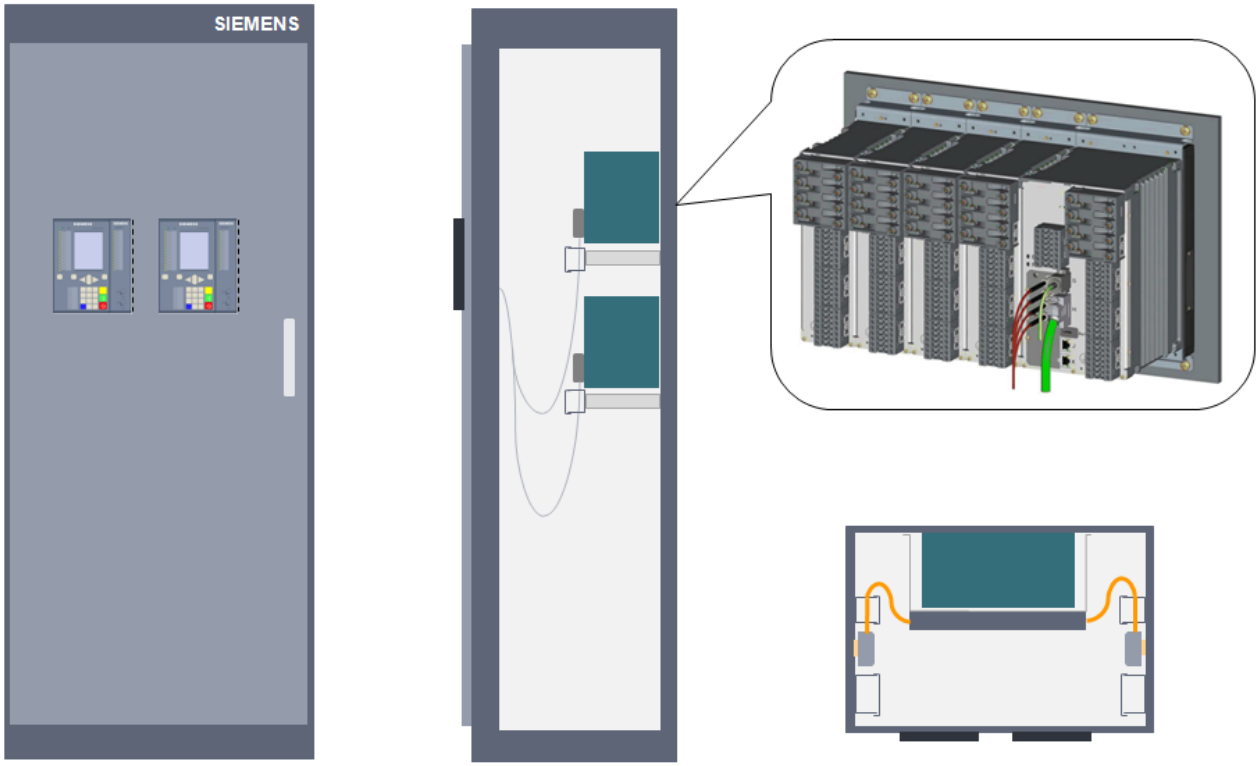
By using a test plug, only an end-to-end wiring between cubicle terminal and the device is required. Both, the wiring of the test switch as well as the necessary wiring test are not **required**.



1.2.3 Device with detached display

The use of this version enables an improved operation of the devices; the installation is within the cubicle door.

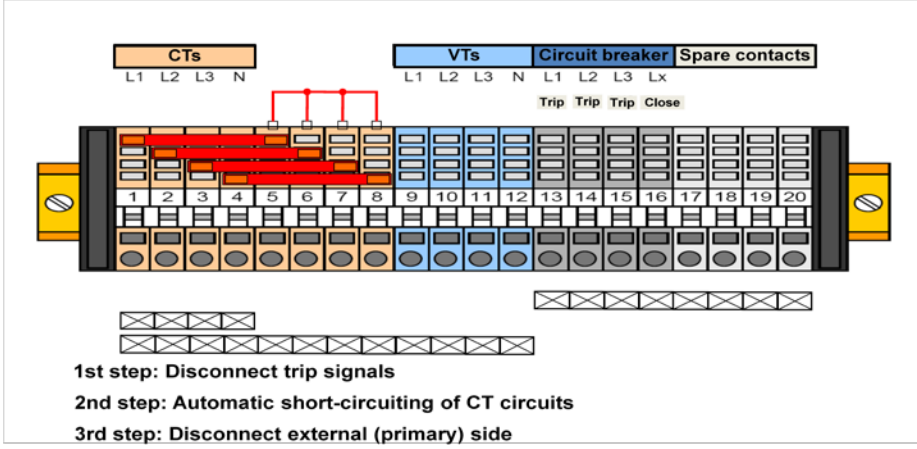
- It is possible to arrange the control units of several devices in one row.
- The width of the control units is independent of the width of the actual device.



1.3 Advantages of test terminals

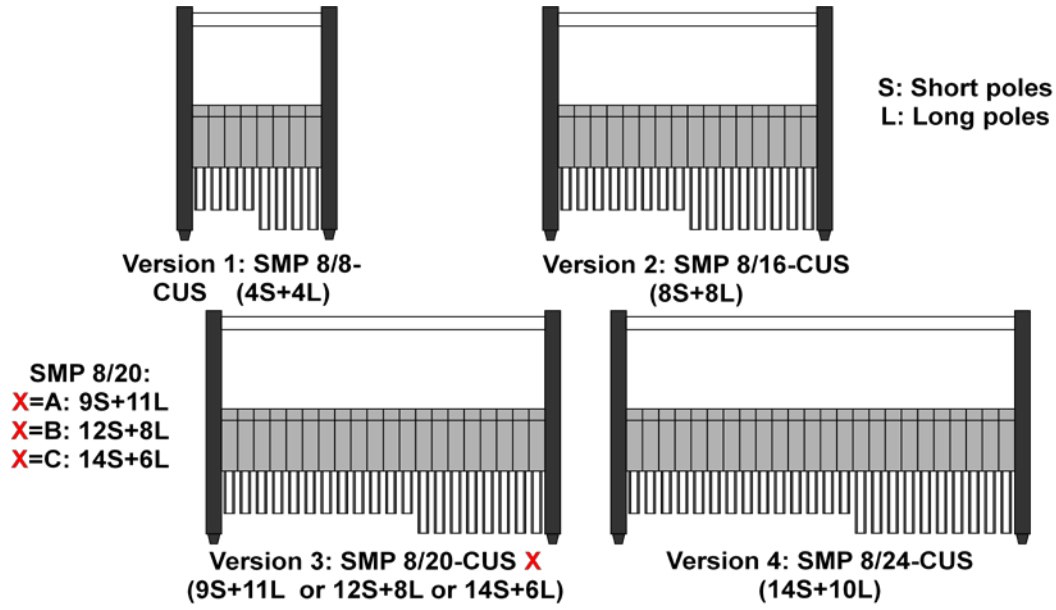
The test plug is a completion to the required connection terminals. In this way, the additional wiring between terminal strip and test switch is redundant. As the test plug is being inserted for testing only, each type within the site is needed only once. Another possible effect is, that only skilled personnel will get such plugs.

Main principle of test disconnect plug SMP - Example with an open star point



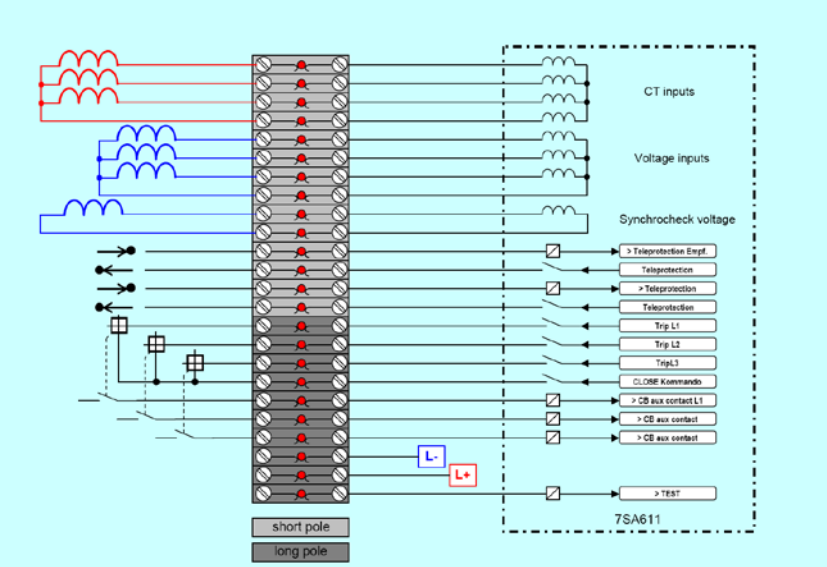
1.3.1 Flexibility

As four different versions have been defined, this enables flexible solutions for different requirements. Test plugs are being inserted for testing only.



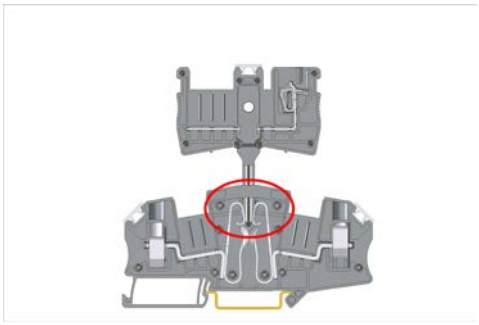
1.3.2 Additional interruptible Signals

As a result of the four different versions of test plugs, a variable number of signals is interruptible.
The number of contacts of a test switch have always precisely specified according to MLFB.
Example:



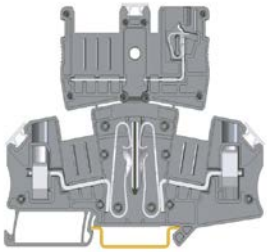
1.3.3 More secure contact connection by proprietary solution

Insertion operation phase 1



Short-circuiting – Enhanced security through double-contact

Insertion operation phase 2



Disconnecting

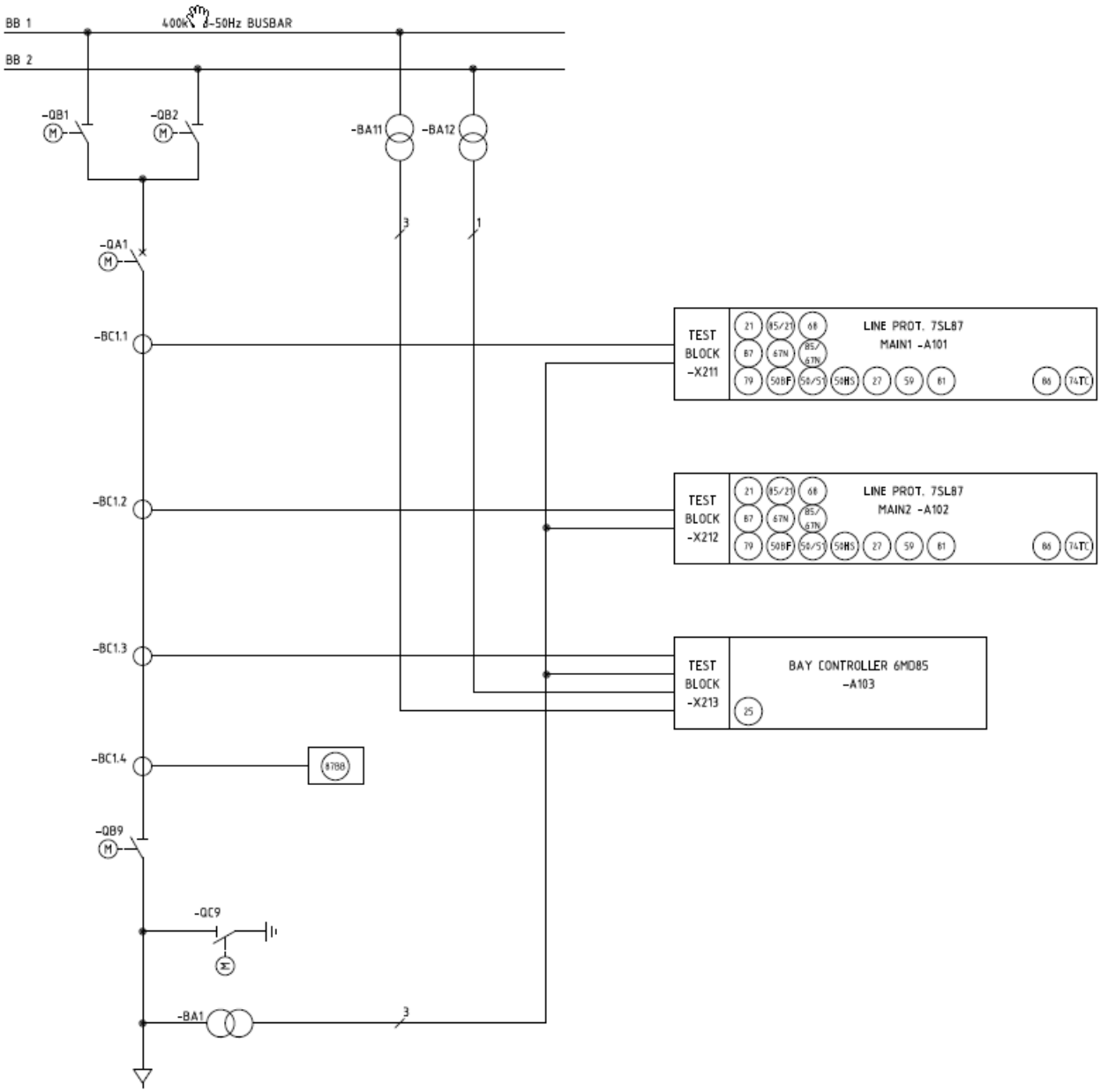
1.4 Sample Solutions

Three 400kV Typicals (Feeder, coupler and transformer feeder) for double busbar has worked out as sample examples. Single line diagrams in ELCAD as well the DIGSI 5 parameterization for SIPROTEC 5 is available for download.

1.4.1 Feeder

Line differential and distance protection relay 7SL87 as main 1 and main 2 are used, as well additionally a by controller 6MD85.

Base design



SIPROTEC 5 Application

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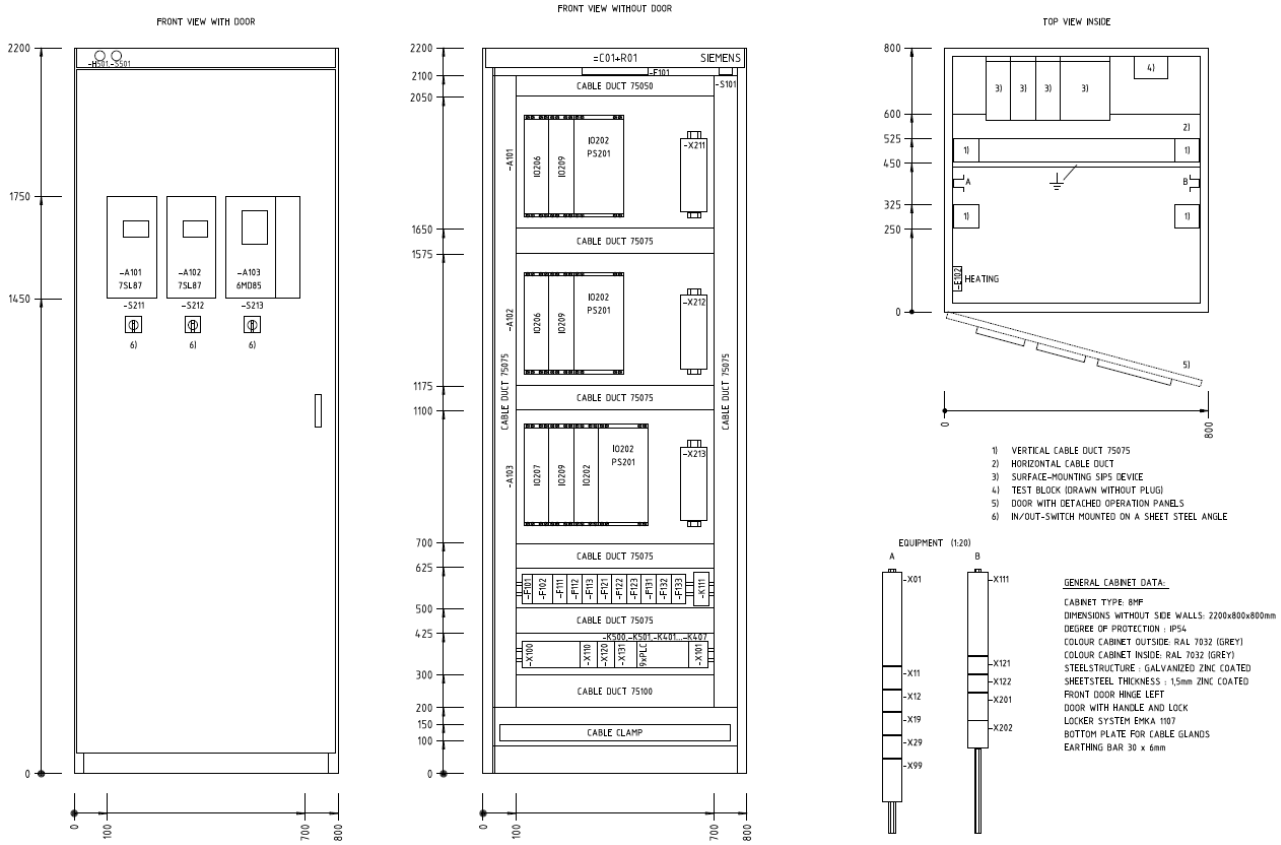
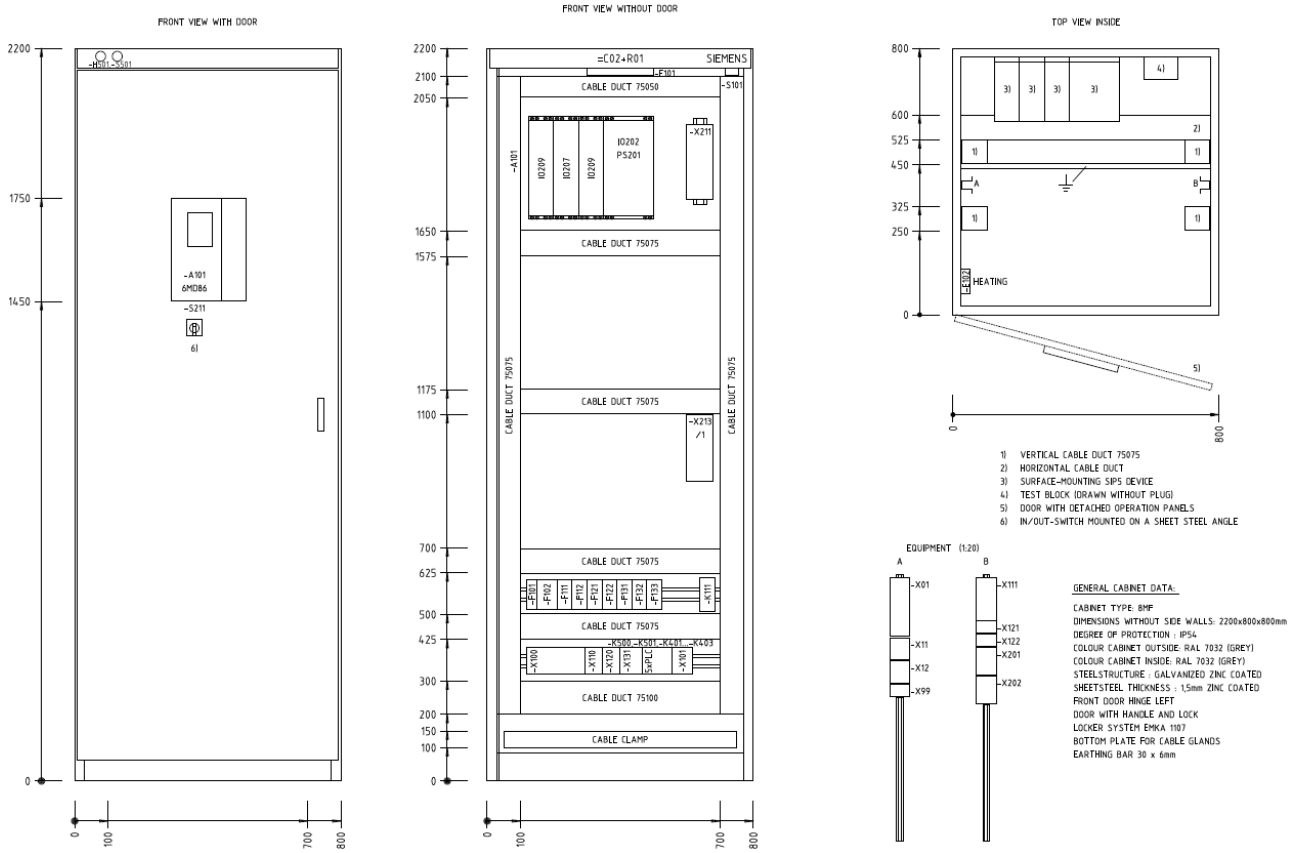
Cubicle layout



1.4.2 Coupler

One bay controller 6MD86 is used.

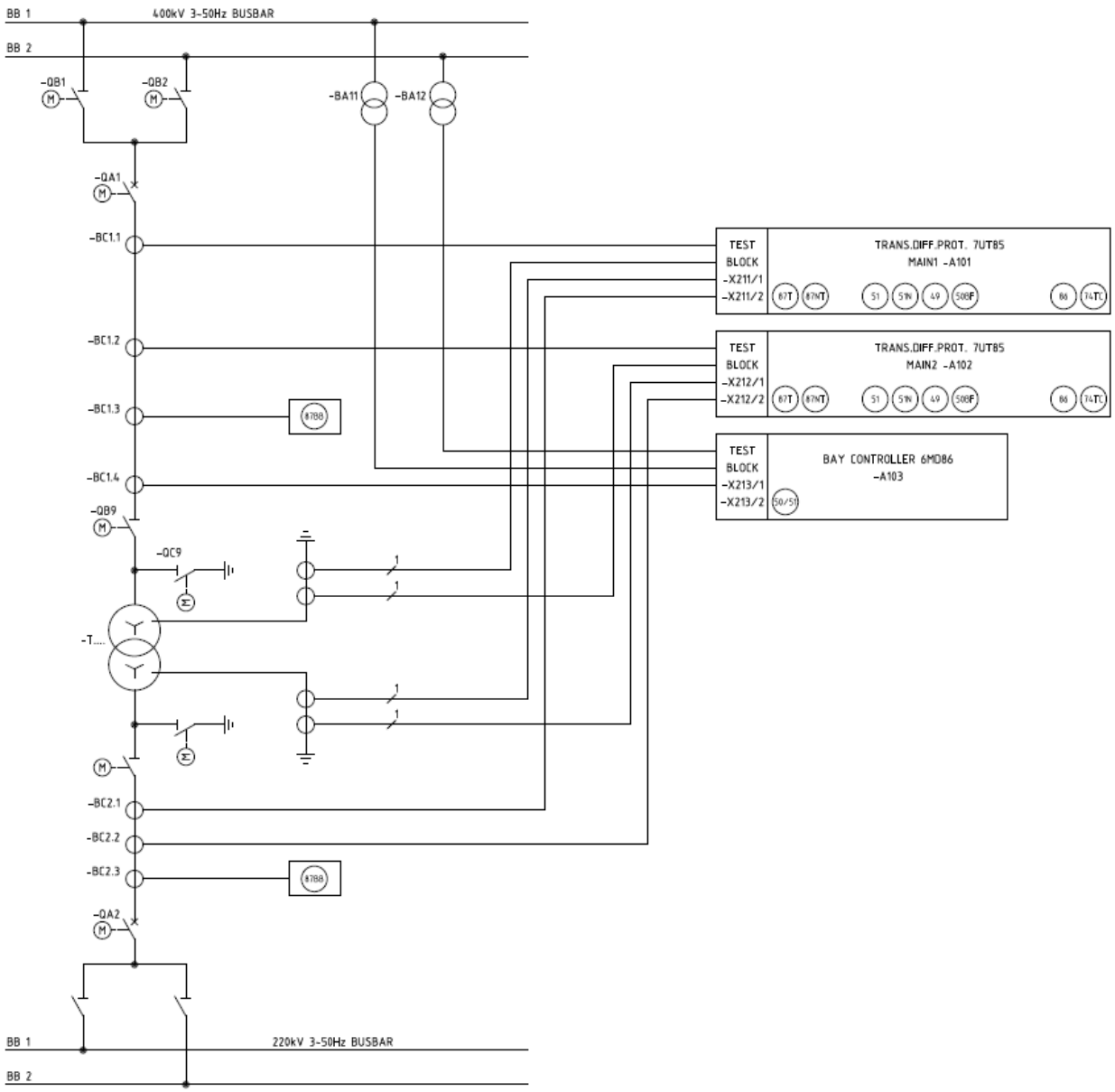
Cubicle layout



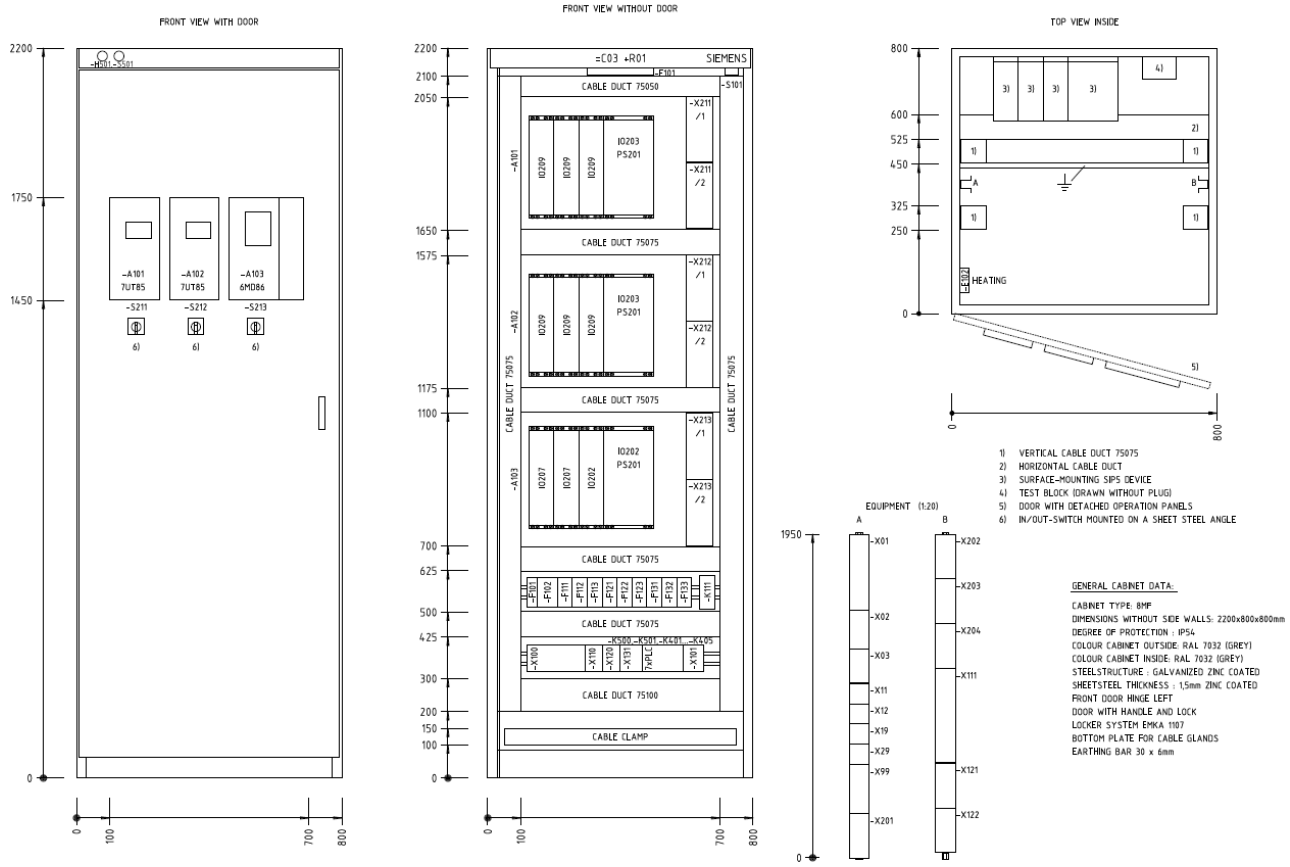
1.4.3 Transformer feeder

Two transformer protection relays 7UT85 are used together with a bay controller 6MD86.

Base design



Cubicle layout



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Siemens AG

Infrastructure & Cities Sector

Smart Grid Division

Humboldtstr. 59

90459 Nuremberg, Germany

Siemens AG

Infrastructure & Cities Sector

Smart Grid Division

Energy Automation

Humboldtstr. 59

90459 Nuremberg, Germany

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For more information, please contact
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Tel.: +49 180 524 8437
Fax: +49 180 524 24 71
(Charges depending on provider)
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