Partners in Power

Lahmeyer – Transformer-Compactsubstations

What are we doing !

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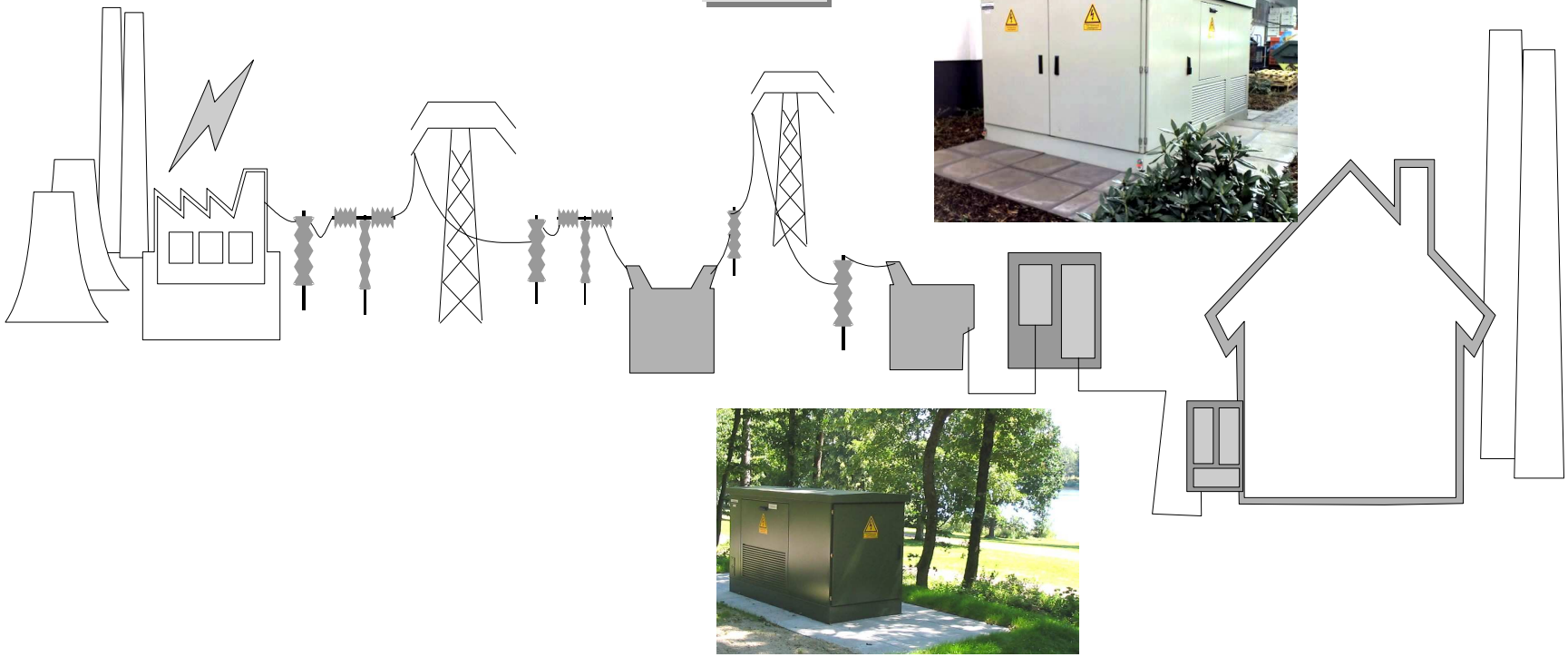
220-525 kV

220 kV

110 kV

30/20/10 kV

400/240 V



Comparison

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Conventional substation	⟷	Compact Secondary Substation
Procurement of individual substation equipments		Single point procurement, fully factory built solution
Interconnection at site		Interconnections at factory
More space required		Compact
Safety hazards		Fully safe
Expensive on total cost basis		Life cycle cost is less
More lead time		Faster delivery

Comparison

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Conventional substation ⟷ Compact Secondary Substation

- National standards
- International standards
- (New) IEC 62271 Part 202
- (Old) IEC 1330

Our solutions and design !

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- First Lahmeyer ®-Compactstation 1963
- About 60,000 stations world-wide in service !
- Made in folded steel sheet, stripe-galvanised and powder coated !
- Substation-design up to 2,500 kVA (690 V)
- Construction-design PEHLA-tested up to 16/20kA 1Sec.
- Housing-temperature-class : < 20 Kelvin

Types

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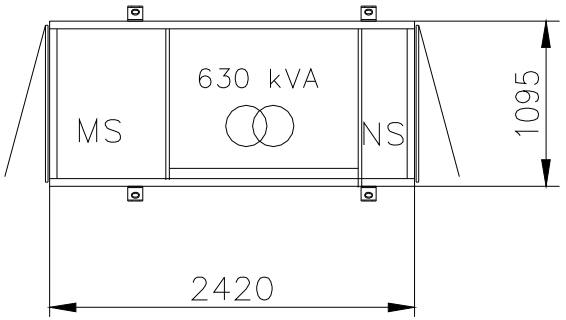
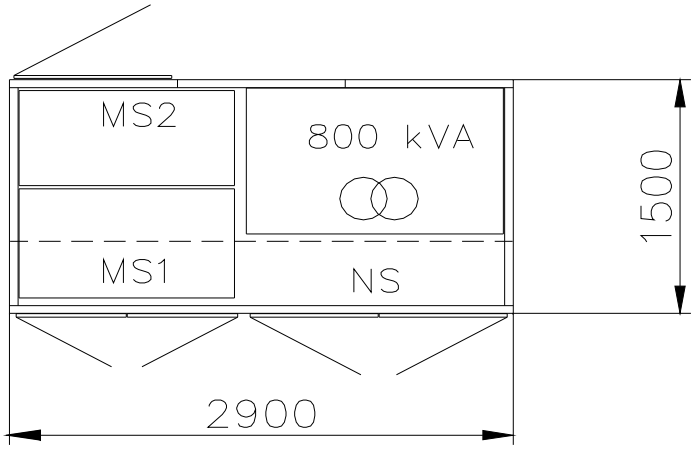
Compact-Station LCS-E.6 :

- smallest dimensions up to 630 kVA , SF6-Ring-Main-Unit
- LV : 910A-fuse-switch entry or circuit breaker 1000A
- up to 8 fuse-switch-outgoings 400/630A with 910A fuse-switch



Compact-Station NDV400.6 und NDV401.6 :

- smallest dimensions up to 800 kVA, SF6-Ring-Main-Unit
- MV1 = RMU 12/24kV (C,C,F or C,C,C,F or C,C,V)
- MV2 = HV-measuring 12/24kV (3 voltage/3 current)
- LV : 910A-fuse switch entry or circuit breaker 1000A
- up to 13 fuse-switch-outgoings 400/630A with 910A fuse-switch



Types

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- **Compact-Station NDV1600.6 und NDV2500.6 :**

- smallest dimension up to 1600 kVA / 2500kVA (690V)

- MV1 = SF6-Ring-Main-Unit 12/24kV (C,C,F or C,C,V)

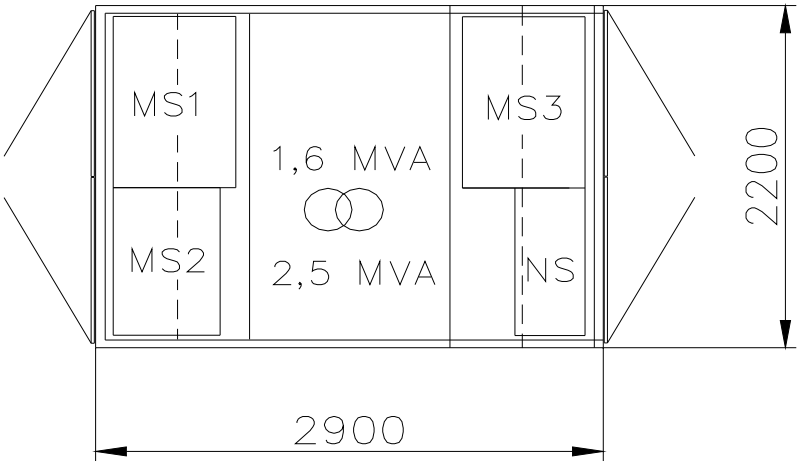
- MV2 = MS-measuring 12/24kV (3 voltage/3 current)

- MV3 = HV-fused-outgoings (if two transformers)

- LV : Circuit-breaker 2500A

- Fused outgoings or circuit breakers

- Compartments with door-entry also on the longside possible!



Advantages!

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- The oil-pan for the transformer is without contact to the surrounding ground panted „modular base unit“ steel foundation
- Low weight, small volume, much electrical equipment
- Lead in holes for the cables through baseplate above ground. No need for fluid-tight cable entry
- Materials environmentally safe and inflammable
- Sheet steel galvanisation plus powder coating = highest corrosion protection (> 30 years)

LCS-E

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LCS-E:

„The“ smallest substation up to 630 kVA !

NDV400.6

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NDV400.6 – Modular Basic-Unit

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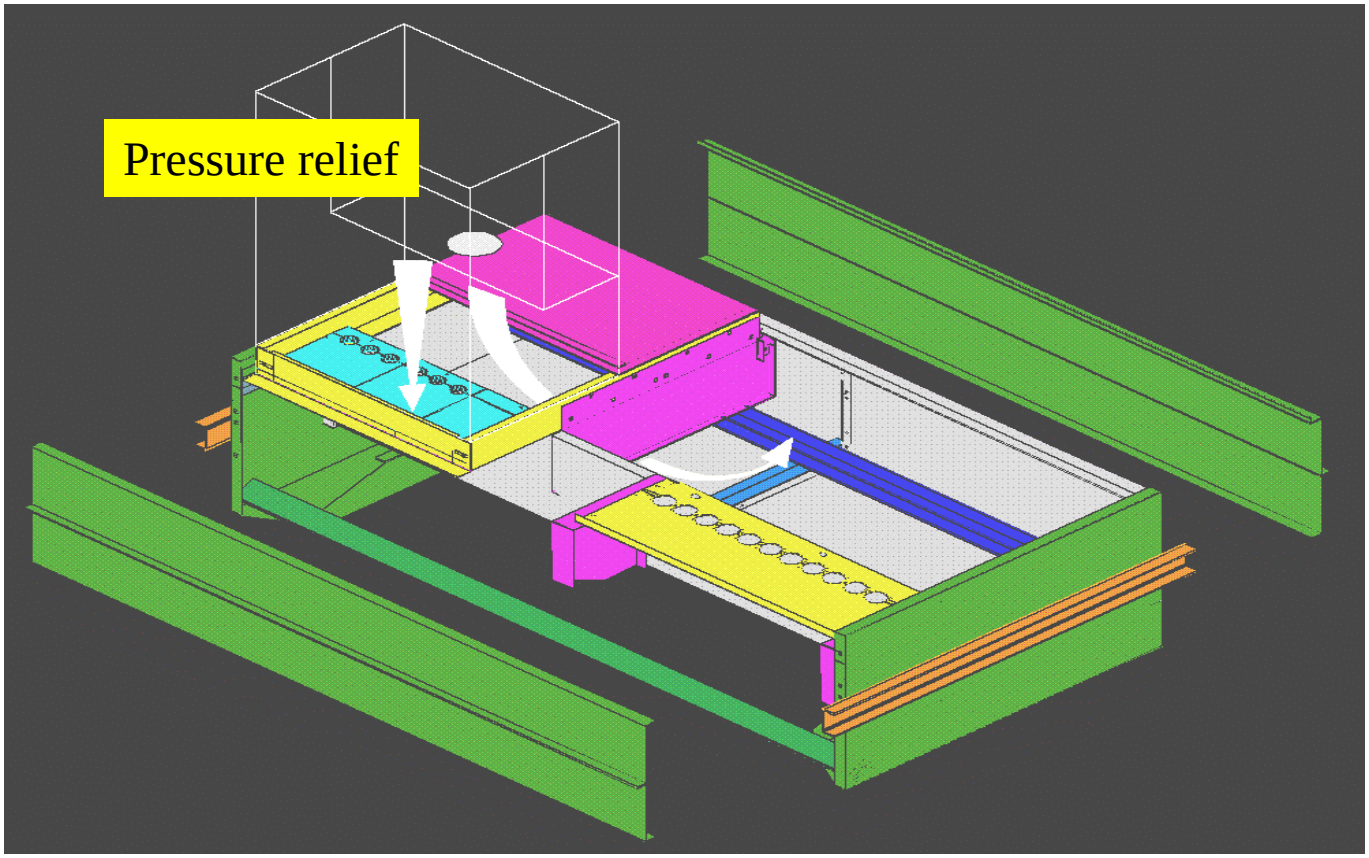

NDV1600

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NDV400.6 // NDV1600.6
Modular Basic-Unit

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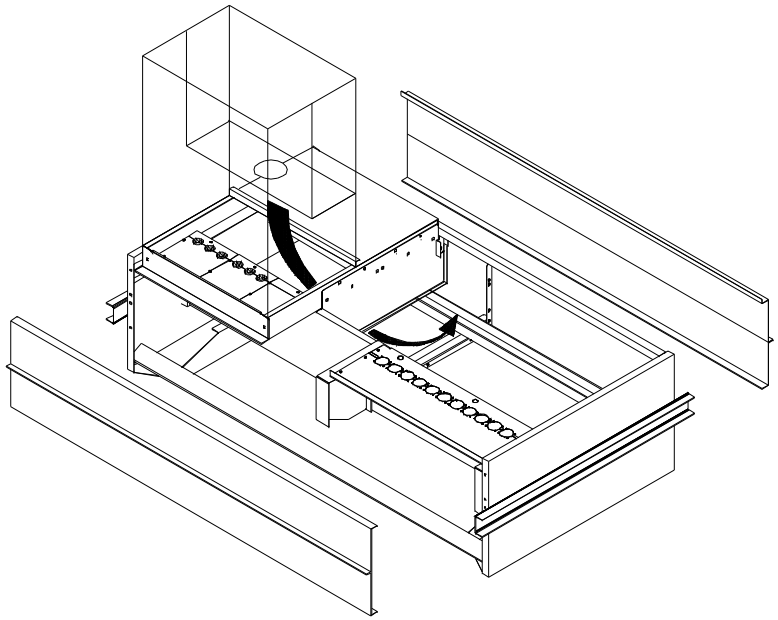
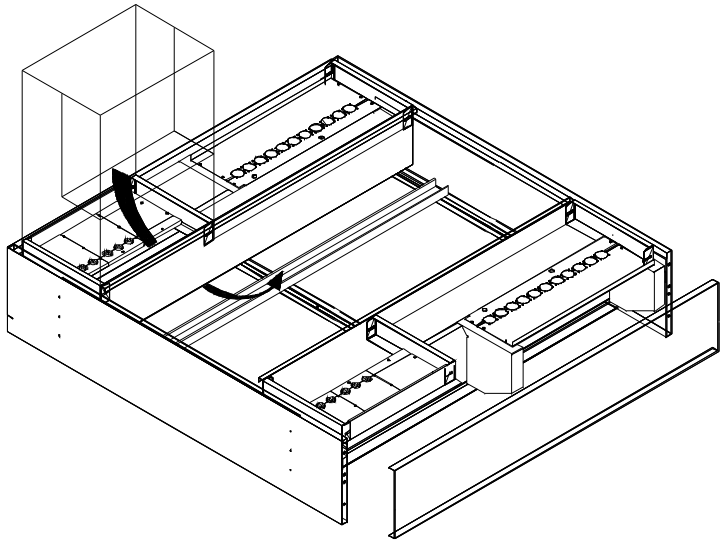
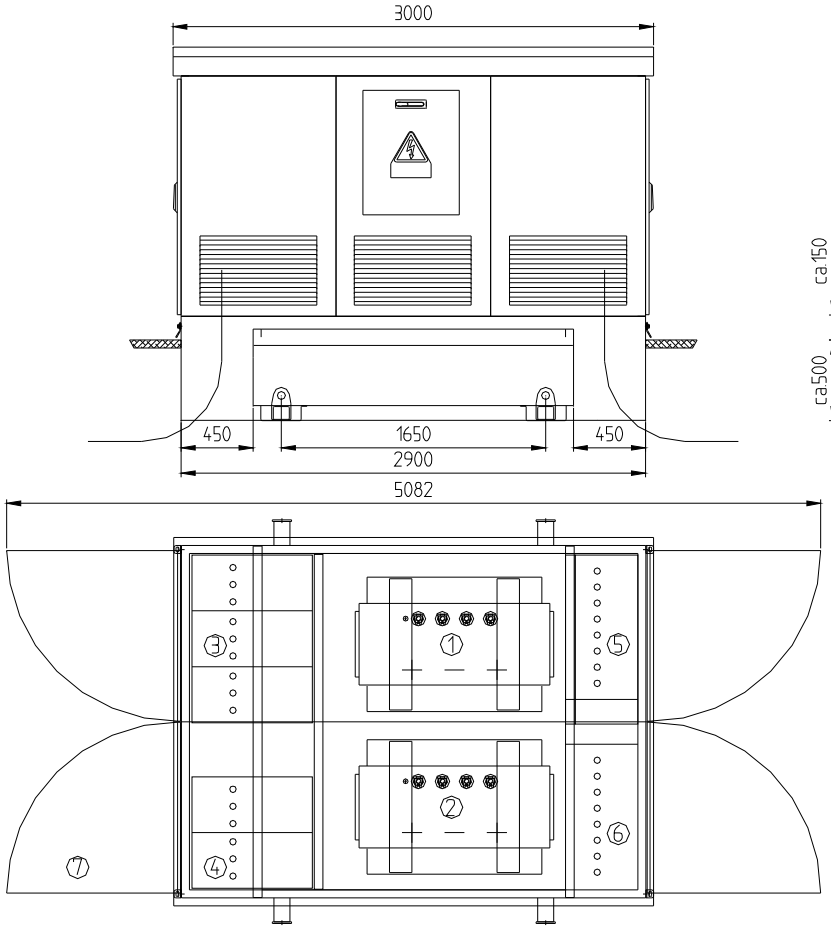
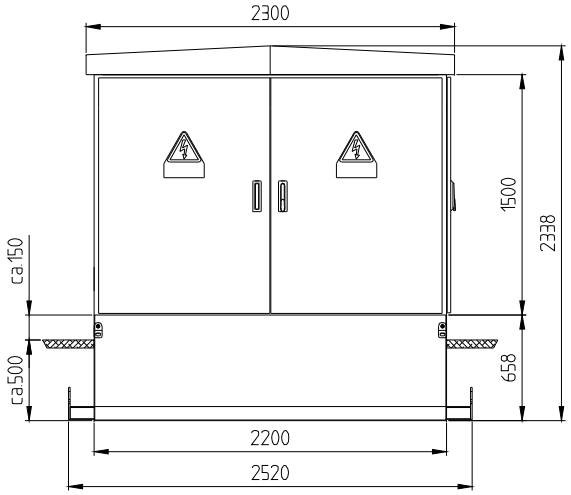




NDV1600 Layout





1) Transformer system 1
2) Transformer system 2
3) MV-switchgear system 1
4) MV-switchgear system 2
5) LV-distribution-board system 1
6) LV-distribution-board system 2

NDV1600 Lifting

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Experience with internal arcing tests

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Experience with internal arcing test

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Electromagnetic compatibility test (EMC)
< 100µTesla

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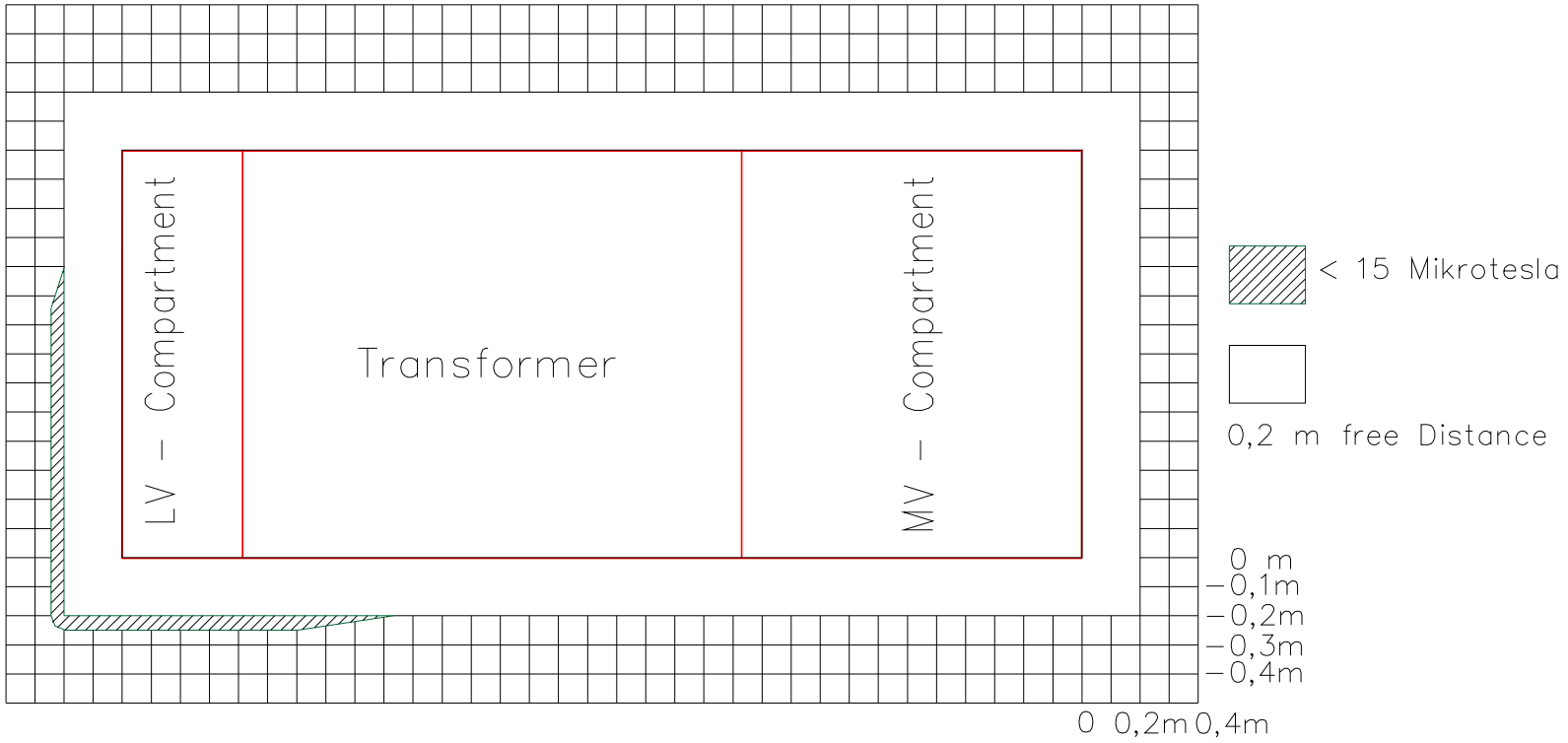

Dielectric tests of interconnections HV - LV

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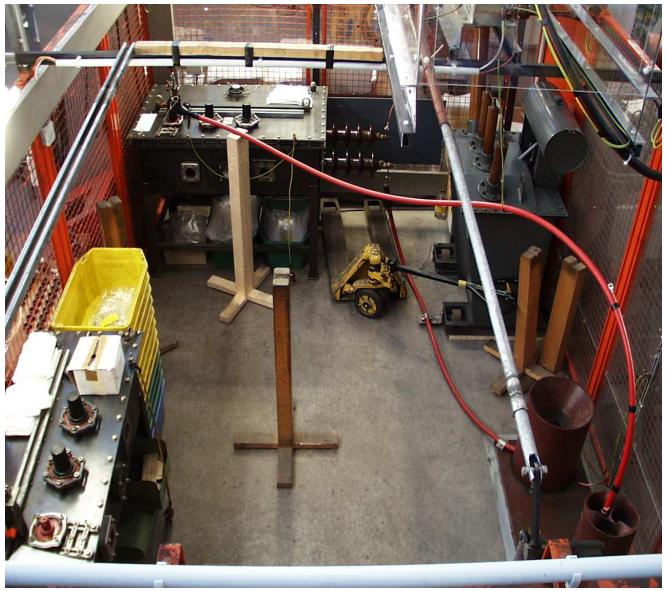
1. Testfield



2. Test voltage:

Lightning impulse-voltage test: 125 kV (peak) 1,2/50 according IE C 60694

Power-frequency voltage withstand test: 1 min 50 kV according IE C 60694

Mechanical impact tests

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1. Testfield

2. Impact energy 20 j according IE C 62262

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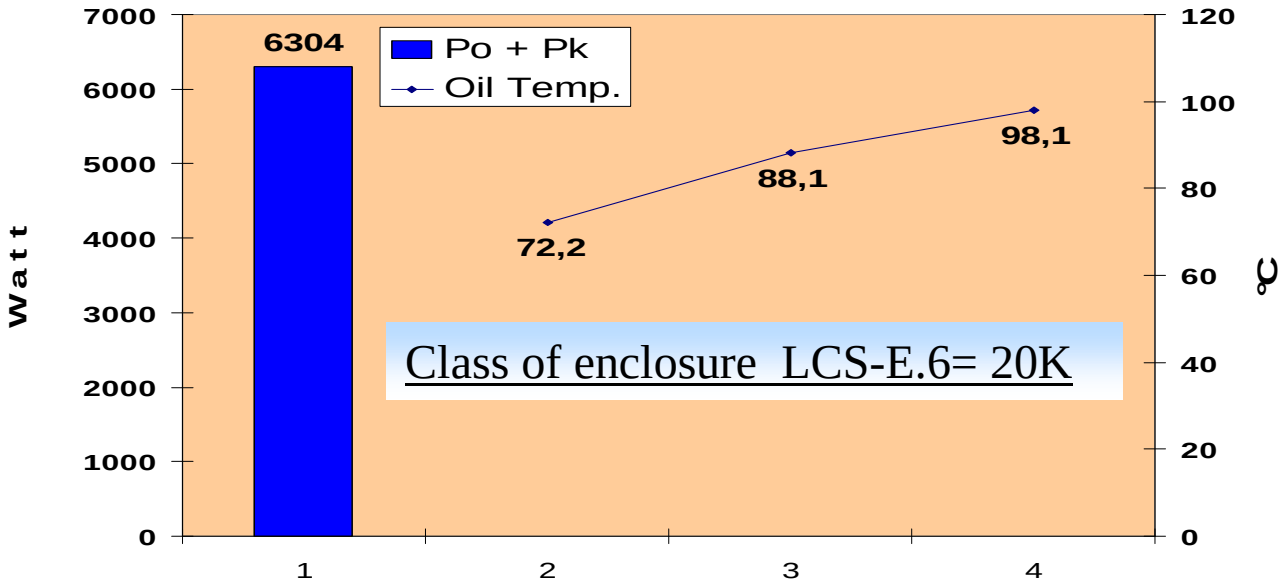
Temperature-rise tests



1= Po+Pk transformer-losses

2= Temperature without housing 20°C

3= Temperature with housing at ambient temperature 20°C

4= Temperature with housing at ambient temperature 30°C

LCS-E.6 with opened plug-in shutters

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LCS-E.6 Colors

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NCV300 Housing for switchgear only

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NDV1200/1600 MV-switchgear-compartment

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NDV400.6 with dry-type-transformer

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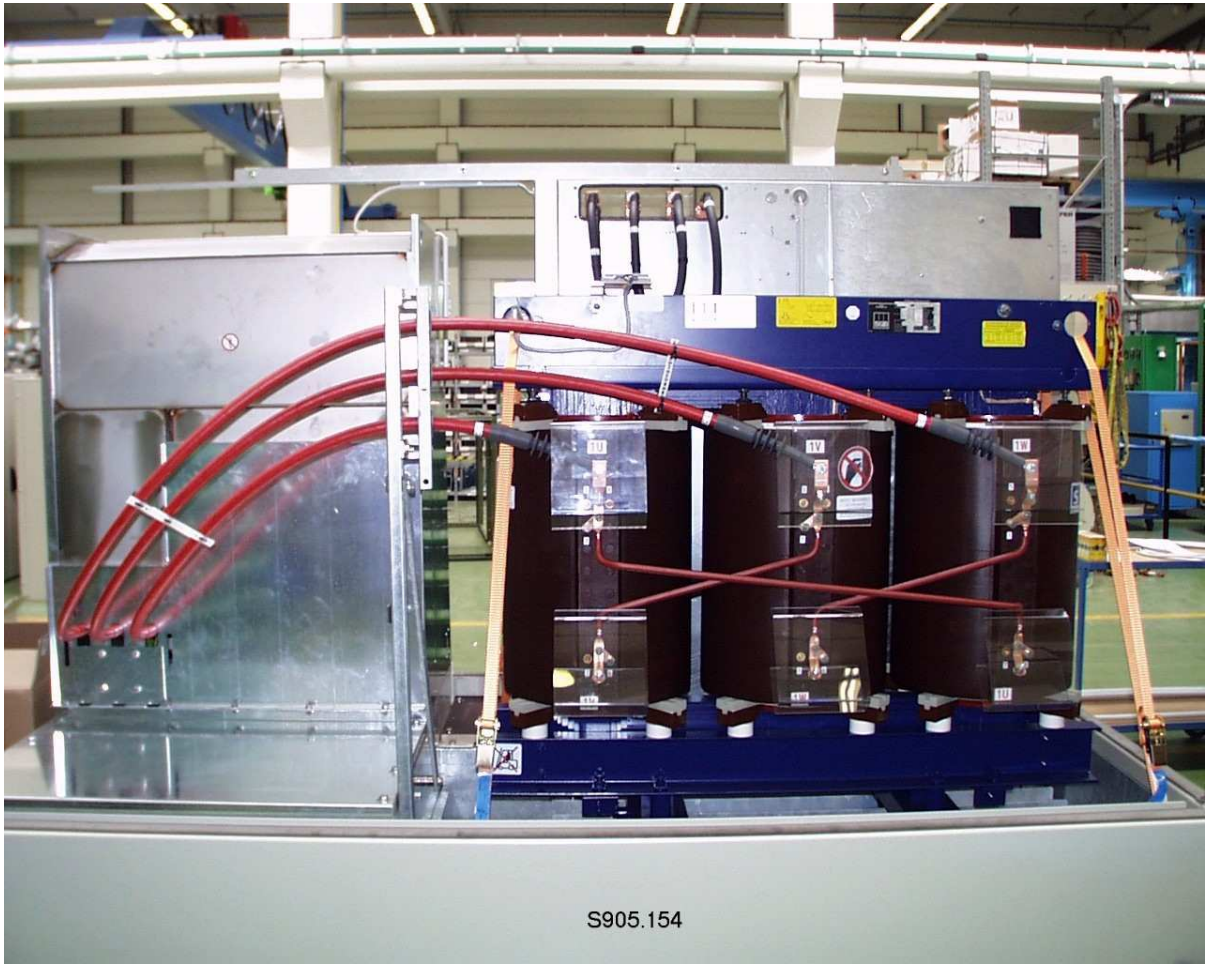

Export worldwide: i.e. China

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