



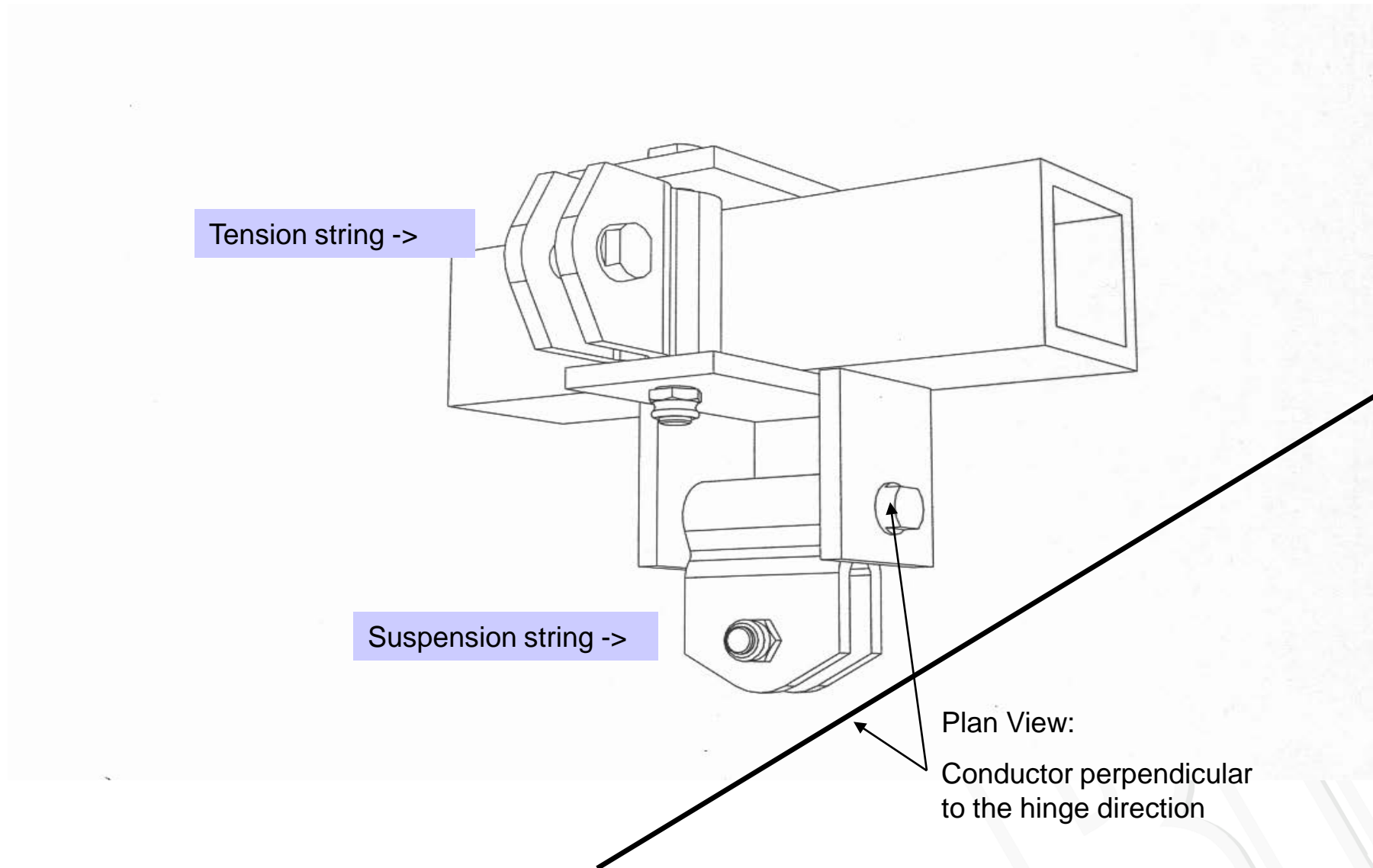
# **Insulator strings for substations 66-500kV**

# Differences between OHL and S/S strings

- **Breaking loads**  
(substations max. ca. 130kN, OHL higher)
- **Short circuit currents**  
(substations usually 40-80 kA1s, OHL lower)
- **Conductor arrangements**  
(OHL always jumper, substations dead ends)
- **Clearances acc. to EN61284**
- **Quantities**

# Standardisation basics (1)

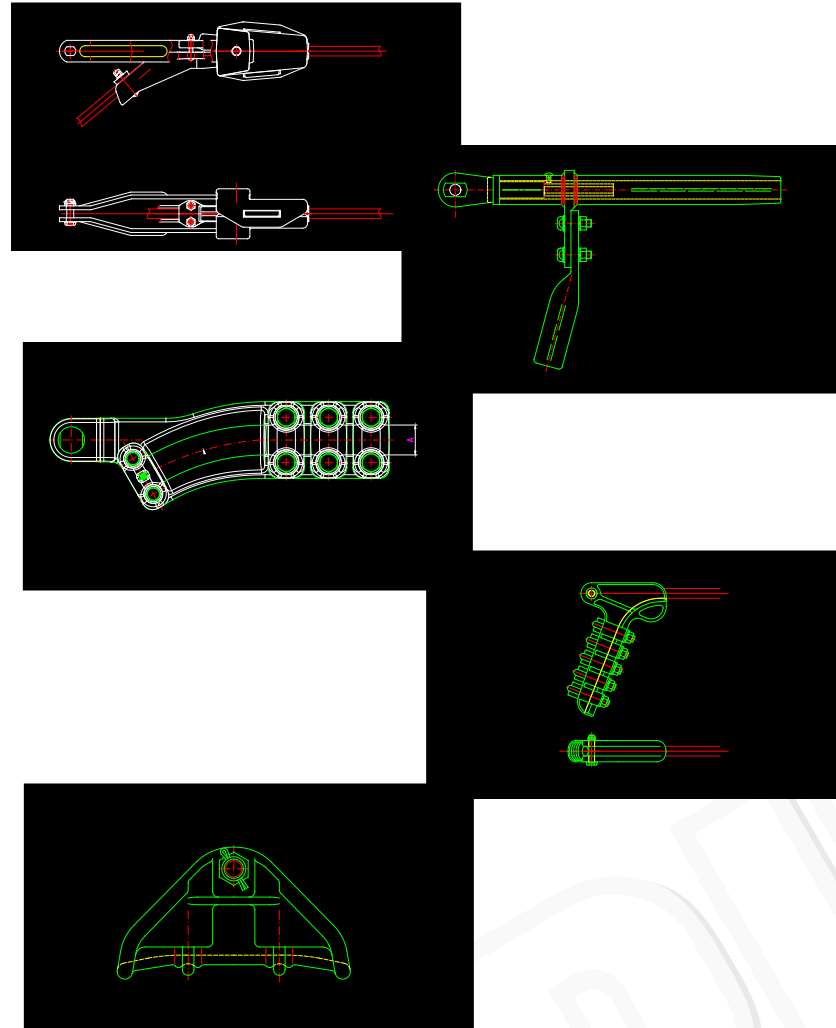
## Uniform tower attachment



# Standardisation basics (2)

## „End“ clamps separate

- **KAK** = Wedge type
- **PAK** = Compression type.
- **DAK** = Bolted cover type.
- **BAK** = U-bolted type.
- **HK** = Simple suspension type



# Standardisation basics (3)

## Performance values

- **Voltage levels**  
66 / 145 / 245 / 300 / 420 / 500 kV
- **Short- current withstand levels**  
40 / 50 / 63 / 80 kA1s
- **Insulator types**  
Cap & pin / long-rod / polymeric
- **Breaking load**  
minimal 130 kN, usually 160kN and more

DRBEE



# Standardisation basics (5)

## Conductor arrangements

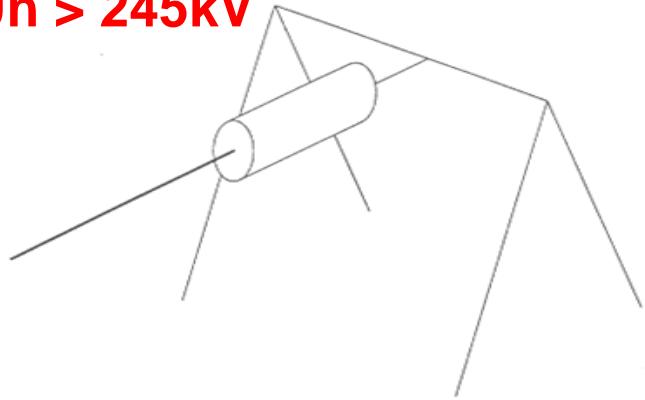
- F = triplex (flat)      0   0   0
- Q = Quadruple (#)      0   0  
   0   0
- T = Quadruple (flat)    0   0   0   0
- H = specials



# Sensitive topics – string arrangements

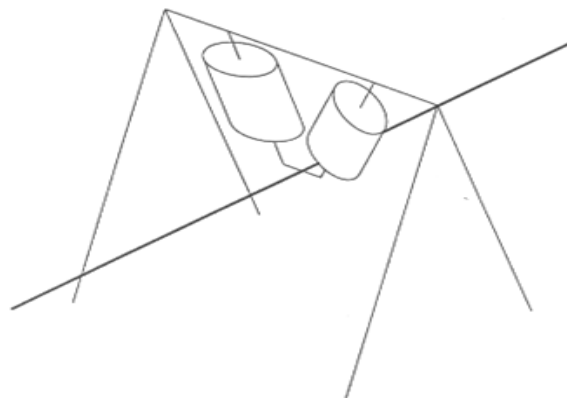
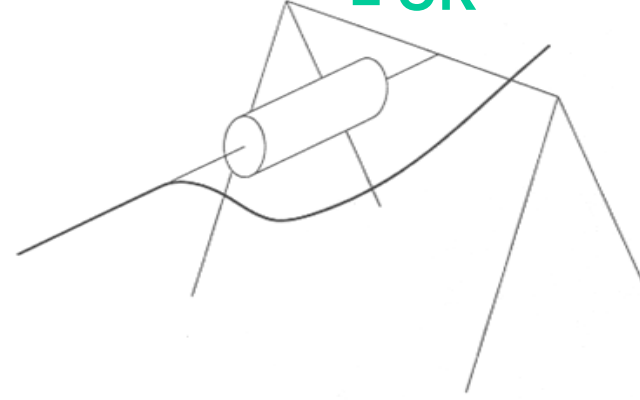
**Dead End -> Corona**

**if  $U_n > 245\text{kV}$**



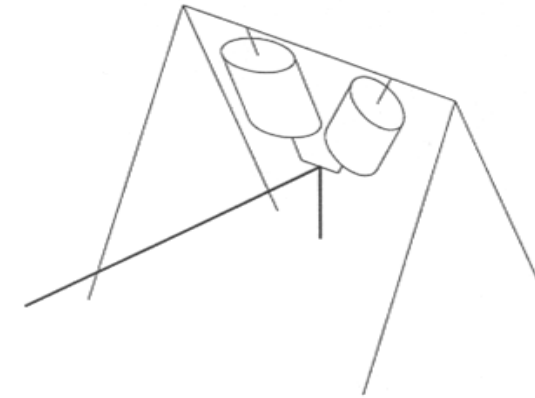
**Tension with jumper**

**= OK**



**Suspension (run)**

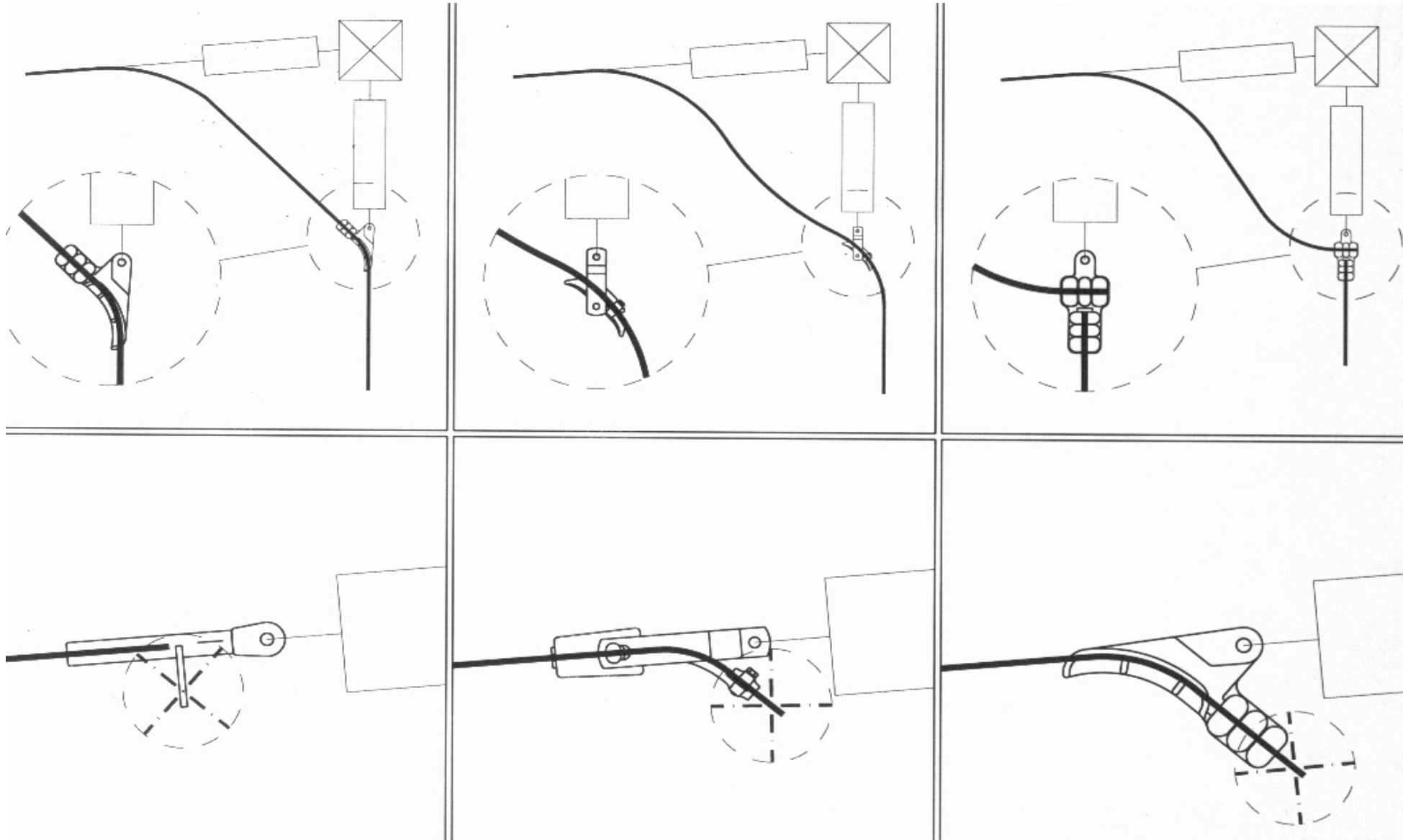
**= OK**



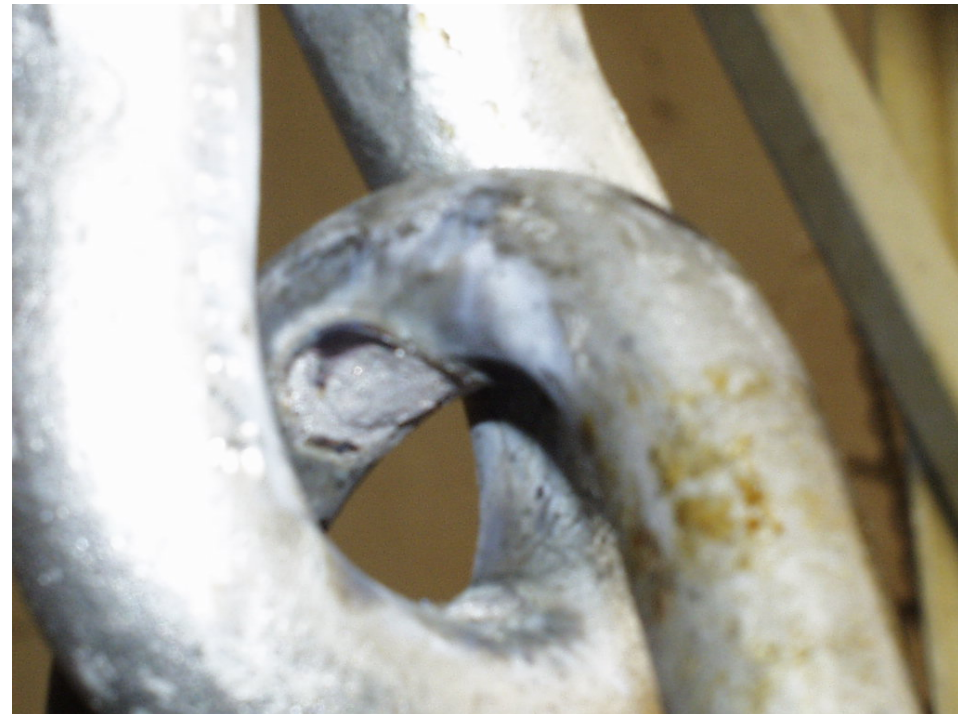
**T-derivation ->  
Corona if  $U_n > 245\text{kV}$**



# Sensitive topics – clamps arrangements

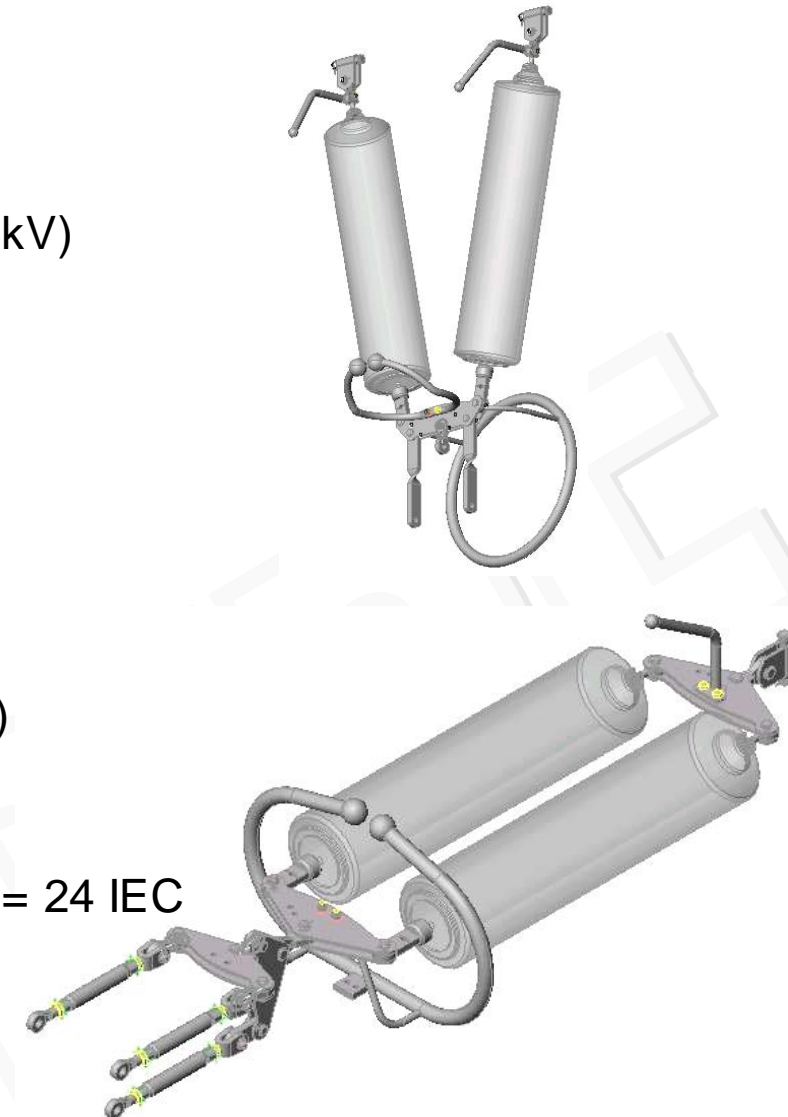


# Sensitive topics – short circuit currents



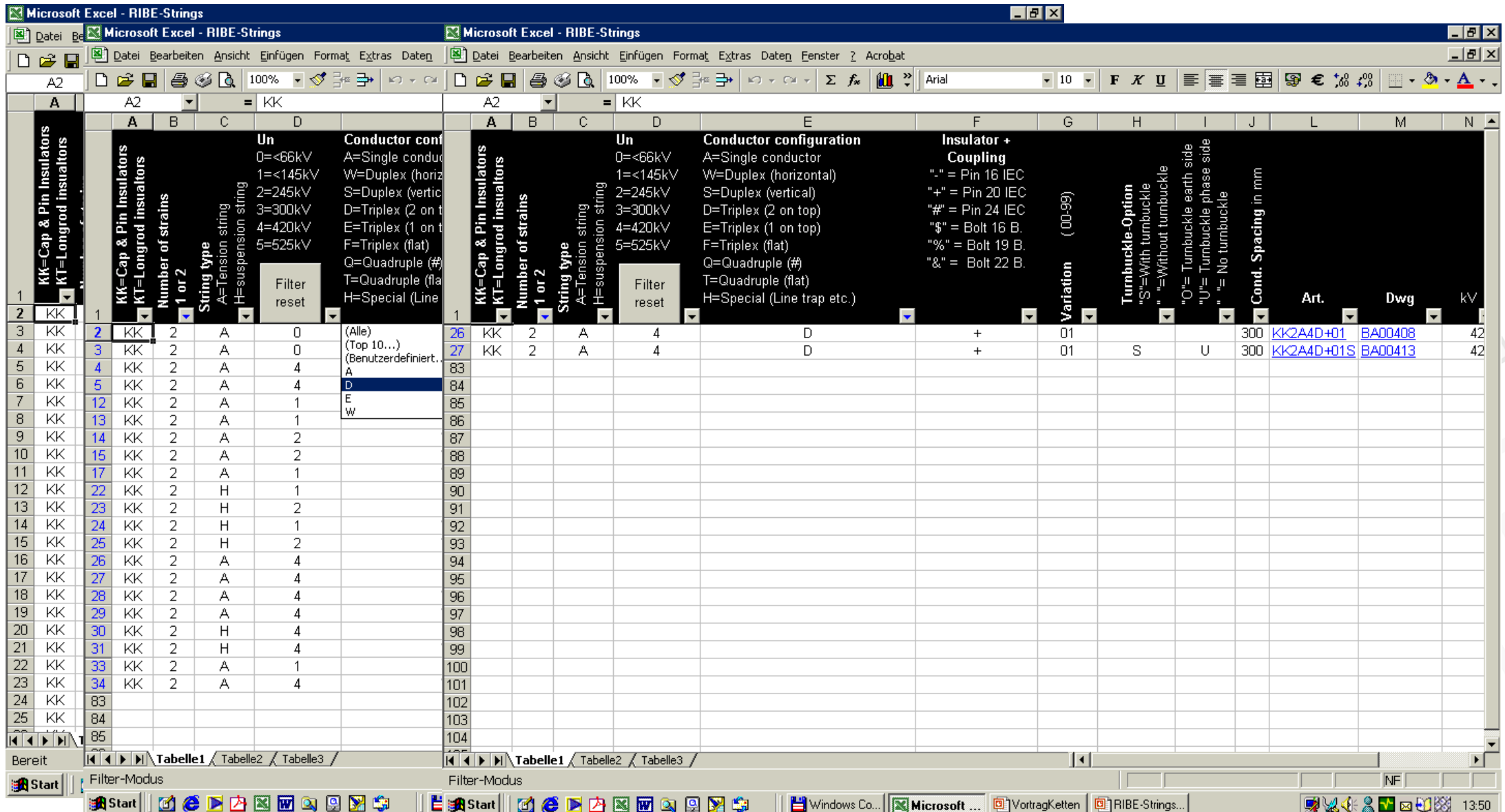
# Numbering system for insulator strings

Seq.	Value	Description
1+2	KK KL	String for cap and pin insulators String for longrod insulators
3	1, 2	<b>Number of insulator strains</b>
4	A , H	<b>String type:</b> A=tension , H=suspension
5	0, 1, 2, 4, 5	<b>Voltage levels</b> (0=<66kV, 1=<150kV, 2=245kV,4=420kV,5=525kV)
6	A W S D E F Q T H	<b>Conductors and their arrangement</b> "A" = single conductor "W" = Duplex cond.in horizontal plane "S" = Duplex cond.in vertical plane "D" = Triplex cond. (2 on top) "E" = Triplex cond. (1 on top) "F" = Triplex cond. (flat arrangement) "Q" = Quadruple cond. (rectangular arrangement) "T" = Quadruple cond. (flat arrangement) "H" = Special arrangement (line traps)
7	"-" "+" "#"	<b>Cap and pin size:</b> "-"= 16 IEC, "+"= 20 IEC, "# "= 24 IEC
8+9	00 - 99	<b>Varianion</b>
10	S	Optional for tension strings with turnbuckles



# Catalogue – RIBE-Strings.xls (1)

- Use the filter – option to find the string

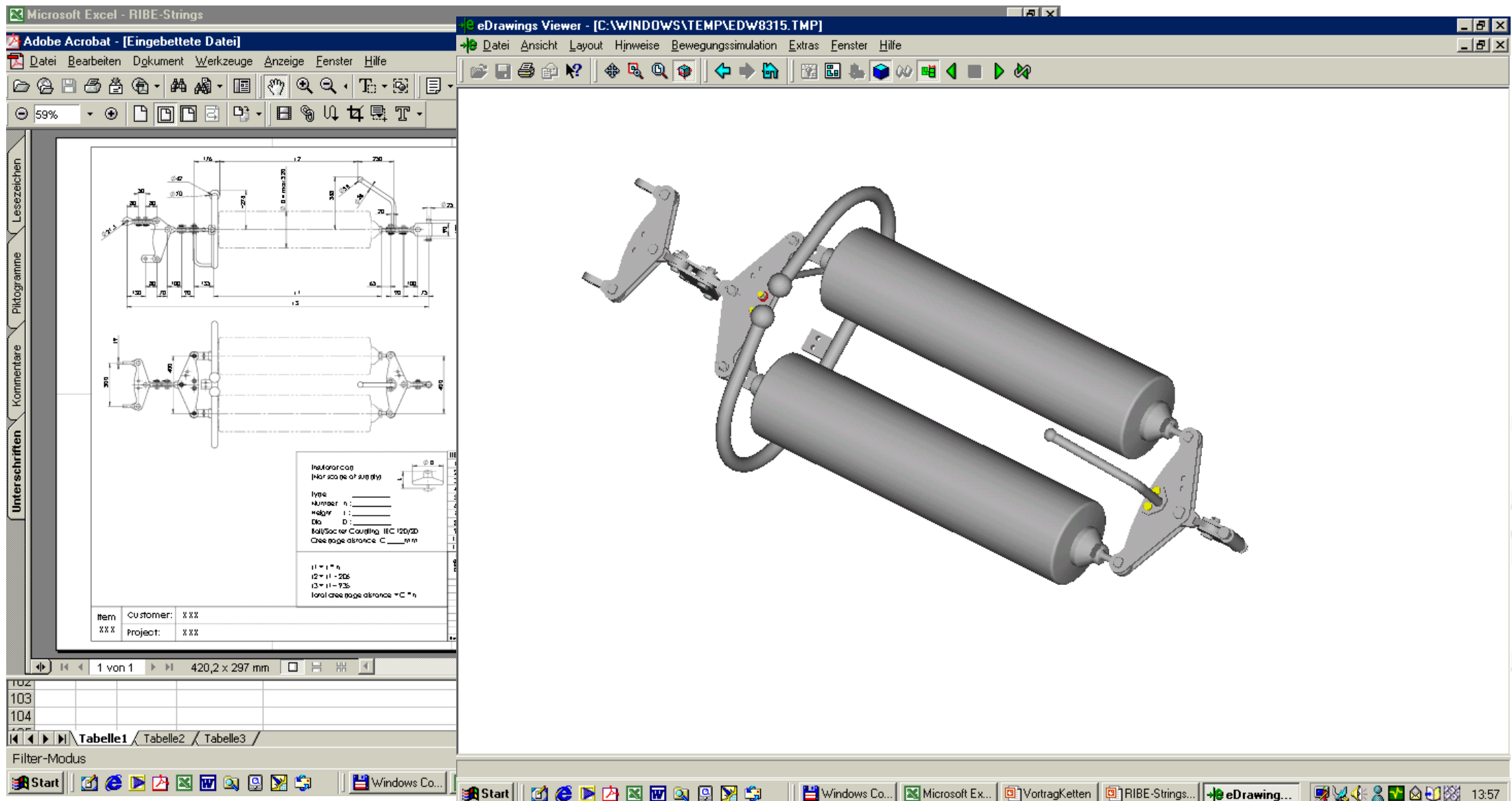


The screenshot shows a Microsoft Excel spreadsheet titled "RIBE-Strings". The spreadsheet is divided into two panes. The left pane shows a list of strings with columns A through D. The right pane shows a detailed view of the string configuration with columns A through N. A filter dropdown is visible in column C of the right pane, showing options like "A", "D", "E", and "W".

String ID	KK	KT	Number of strains	String type	Un	Conductor configuration	Insulator + Coupling	Variation	Turnbuckle-Option	Cond. Spacing in mm	Art.	Dwg	kV
26	KK	2	2	A	4	D	+	01		300	KK2A4D+01	BA00408	42
27	KK	2	2	A	4	D	+	01	S	300	KK2A4D+01S	BA00413	42

# Catalogue – RIBE-Strings.xls (2)

- Click for 2D / 3D - preview



The screenshot displays a Windows desktop environment with two primary application windows open:

- Adobe Acrobat - [Eingebettete Datei]:** This window shows a 2D technical drawing of a mechanical assembly. The drawing includes various dimensions and a table at the bottom with the following content:

Item	Customer:	XXX
XXX	Project:	XXX
- eDrawings Viewer - [C:\WINDOWS\TEMP\EDW8315.TMP]:** This window displays a 3D perspective view of the same mechanical assembly, showing two cylindrical components and a complex bracket structure.

The Windows taskbar at the bottom shows the Start button and several open applications, including Microsoft Excel, VortragKetten, RIBE-Strings..., and eDrawing... The system clock in the bottom right corner indicates the time 13:57.