

# High Voltage Surge Arresters

## Buyer's Guide — Section HS PEXLIM T-T

# Zinc-Oxide Surge Arrester HS PEXLIM T-T

Protection of switchgear, transformers and other equipment in high voltage systems against atmospheric and switching overvoltages.

- in areas with very high lightning intensity
- where grounding or shielding conditions are poor or incomplete
- for important installations
- where energy requirements are very high (e.g. very long lines, capacitor protection).
- Specially suited to extreme seismic zones.

Superior where low weight, non-fragility and additional personnel safety is required.



Other data can be ordered on request. Please contact your local sales representative.



## Brief performance data

|                                                                                            |                             |
|--------------------------------------------------------------------------------------------|-----------------------------|
| System voltages ( $U_m$ )                                                                  | 245 - 800 kV                |
| Rated voltages ( $U_r$ )                                                                   | 180 - 624 kV                |
| Nominal discharge current (IEC)                                                            | 10/15/20 kA <sub>peak</sub> |
| Classifying current (ANSI/IEEE)                                                            | 10/15 kA <sub>peak</sub>    |
| Discharge current withstand strength:                                                      |                             |
| High current 4/10 $\mu$ s                                                                  | 100 kA <sub>peak</sub>      |
| Low current 2000 $\mu$ s                                                                   | 2200 A <sub>peak</sub>      |
| Energy capability:                                                                         |                             |
| Line discharge class (IEC)                                                                 | Class 5                     |
| [2 impulses, (IEC Cl. 8.5.5)]                                                              | 15.4 kJ/kV ( $U_r$ )        |
| Fulfills/exceeds requirements of ANSI transmission-line discharge test for 362 kV systems. |                             |
| Short-circuit/Pressure relief capability                                                   | 65 kA <sub>sym</sub>        |
| External insulation                                                                        | Fulfills/exceeds standards  |
| Mechanical strength:                                                                       |                             |
| Specified long-term load (SLL)                                                             | 19000 Nm                    |
| Specified short-term load (SSL)                                                            | 28000 Nm                    |
| Service conditions:                                                                        |                             |
| Ambient temperature                                                                        | -50 °C to +45 °C            |
| Design altitude                                                                            | max. 1000 m                 |
| Frequency                                                                                  | 15 - 62 Hz                  |

# HS PEXLIM T-T

## Guaranteed protective data

| Max.<br>system<br>voltage | Rated<br>voltage  | Max. continuous<br>operating voltage <sup>1)</sup> |                     | TOV capability <sup>2)</sup> |                   | Max. residual voltage with current wave |                    |                    |                    |                    |                    |                    |
|---------------------------|-------------------|----------------------------------------------------|---------------------|------------------------------|-------------------|-----------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
|                           |                   | as per<br>IEC                                      | as per<br>ANSI/IEEE | 1 s                          | 10 s              | 30/60 µs                                |                    |                    | 8/20 µs            |                    |                    |                    |
|                           |                   | U <sub>c</sub>                                     | MCOV                |                              |                   | 1 kA                                    | 2 kA               | 3 kA               | 5 kA               | 10 kA              | 20 kA              | 40 kA              |
| kV <sub>rms</sub>         | kV <sub>rms</sub> | kV <sub>rms</sub>                                  | kV <sub>rms</sub>   | kV <sub>rms</sub>            | kV <sub>rms</sub> | kV <sub>peak</sub>                      | kV <sub>peak</sub> | kV <sub>peak</sub> | kV <sub>peak</sub> | kV <sub>peak</sub> | kV <sub>peak</sub> | kV <sub>peak</sub> |
| <b>245</b>                | 180               | 144                                                | 144                 | 209                          | 198               | 354                                     | 364                | 371                | 389                | 405                | 438                | 476                |
|                           | 192               | 154                                                | 154                 | 218                          | 207               | 369                                     | 380                | 387                | 406                | 423                | 457                | 497                |
|                           | 216               | 156                                                | 174                 | 246                          | 233               | 415                                     | 427                | 435                | 457                | 476                | 514                | 559                |
|                           | 228               | 156                                                | 180                 | 259                          | 246               | 438                                     | 451                | 459                | 482                | 502                | 542                | 590                |
| <b>300</b>                | 228               | 182                                                | 182                 | 259                          | 246               | 438                                     | 451                | 459                | 482                | 502                | 542                | 590                |
|                           | 240               | 191                                                | 191                 | 273                          | 258               | 461                                     | 475                | 484                | 507                | 528                | 571                | 621                |
| <b>362</b>                | 258               | 206                                                | 209                 | 310                          | 293               | 523                                     | 538                | 548                | 575                | 599                | 647                | 704                |
|                           | 264               | 211                                                | 212                 | 310                          | 293               | 523                                     | 538                | 548                | 575                | 599                | 647                | 704                |
|                           | 276               | 221                                                | 221                 | 314                          | 297               | 531                                     | 546                | 556                | 583                | 608                | 656                | 714                |
| <b>380</b>                | 288               | 230                                                | 230                 | 328                          | 310               | 554                                     | 569                | 580                | 609                | 634                | 685                | 745                |
| <b>400</b>                | 300               | 240                                                | 240                 | 342                          | 323               | 577                                     | 593                | 604                | 634                | 660                | 713                | 776                |
| <b>420</b>                | 330               | 264                                                | 267                 | 378                          | 358               | 638                                     | 656                | 669                | 702                | 731                | 789                | 859                |
|                           | 360               | 267                                                | 291                 | 410                          | 388               | 692                                     | 712                | 725                | 761                | 792                | 856                | 931                |
|                           | 390               | 267                                                | 315                 | 444                          | 420               | 750                                     | 771                | 786                | 824                | 858                | 927                | 1013               |
| <b>550</b>                | 396               | 317                                                | 318                 | 474                          | 448               | 793                                     | 816                | 831                | 872                | 908                | 981                | 1072               |
|                           | 420               | 336                                                | 336                 | 478                          | 453               | 807                                     | 830                | 846                | 888                | 924                | 998                | 1091               |
|                           | 444               | 349                                                | 353                 | 506                          | 479               | 853                                     | 878                | 894                | 938                | 977                | 1060               | 1153               |
| <b>800</b>                | On request        |                                                    |                     |                              |                   |                                         |                    |                    |                    |                    |                    |                    |

More detailed information on the TOV capability and the protective characteristics are given in Publ. 1HSM 9543 13-01en.

1) The continuous operating voltages U<sub>c</sub> (as per IEC) and MCOV (as per ANSI) differ only due to deviations in type test procedures.  
U<sub>c</sub> has to be considered only when the actual system voltage is higher than the tabulated.  
Any arrester with U<sub>c</sub> higher than or equal to the actual system voltage divided by  $\sqrt{3}$  can be selected.

2) With prior duty equal to the maximum single-impulse energy stress (10.0 kJ/kV (U<sub>I</sub>)).

Arresters with lower or higher rated voltages may be available on request for special applications.

# HS PEXLIM T-T

## Technical data for housings

| Max.<br>system<br>voltage | Rated<br>voltage  | Housing | Creepage<br>distance | External insulation *) |                    |                    |                    | Dimensions |                  |      |      |      |      |
|---------------------------|-------------------|---------|----------------------|------------------------|--------------------|--------------------|--------------------|------------|------------------|------|------|------|------|
|                           |                   |         |                      | 1.2/50 µs<br>dry       | 50 Hz<br>wet (60s) | 60 Hz<br>wet (10s) | 250/2500 µs<br>wet | Mass       | A <sub>max</sub> | B    | C    | D    | Fig. |
| kV <sub>rms</sub>         | kV <sub>rms</sub> |         | mm                   | kV <sub>peak</sub>     | kV <sub>rms</sub>  | kV <sub>rms</sub>  | kV <sub>peak</sub> | kg         | mm               | mm   | mm   | mm   |      |
| 245                       | 180-216           | TH245   | 6950                 | 1081                   | 524                | 510                | 750                | 170        | 2310             | 600  | -    | 300  | 1    |
|                           | 228               | TV245   | 9900                 | 1500                   | 700                | 700                | 1050               | 245        | 3495             | 600  | -    | 300  | 2    |
| 300                       | 228-240           | TV300   | 9900                 | 1500                   | 700                | 700                | 1050               | 260        | 3495             | 1600 | 1000 | 1000 | 3    |
| 362                       | 258-276           | TH362   | 9900                 | 1500                   | 700                | 700                | 1050               | 265        | 3495             | 1600 | 1000 | 1000 | 3    |
| 380                       | 288               | TH380   | 9900                 | 1500                   | 700                | 700                | 1050               | 270        | 3495             | 1600 | 1000 | 1000 | 3    |
| 400                       | 300               | TM400   | 9900                 | 1500                   | 700                | 700                | 1050               | 270        | 3495             | 1600 | 1000 | 1000 | 3    |
| 420                       | 330               | TH420   | 11900                | 1831                   | 874                | 860                | 1275               | 300        | 4035             | 1600 | 1000 | 1000 | 3    |
|                           | 360               | TH420   | 11900                | 1831                   | 874                | 860                | 1275               | 300        | 4035             | 1200 | 1000 | 600  | 3    |
|                           | 390               | TV420   | 13900                | 2162                   | 1048               | 1020               | 1500               | 330        | 4575             | 1200 | 1000 | 600  | 3    |
| 550                       | 396               | TH550   | 14300                | 2162                   | 1048               | 1020               | 1500               | 350        | 4890             | 2000 | 1000 | 1200 | 4    |
|                           | 420               | TH550   | 14300                | 2162                   | 1048               | 1020               | 1500               | 350        | 4890             | 2000 | 1000 | 1200 | 4    |
|                           | 444               | TH550   | 14850                | 2250                   | 1050               | 1050               | 1575               | 405        | 5540             | 2000 | 1000 | 1200 | 5    |

\*) Sum of withstand voltages for empty units of arrester.

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Technical data for housings

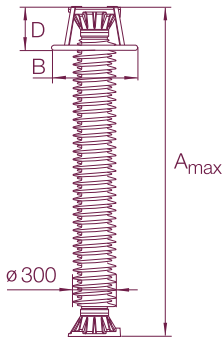


Figure 1

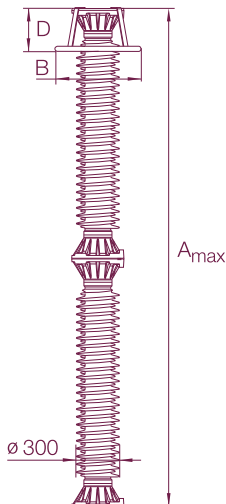


Figure 2

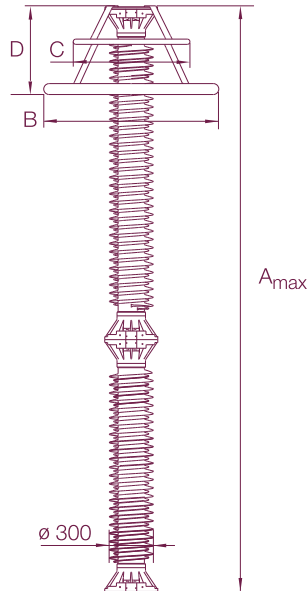


Figure 3

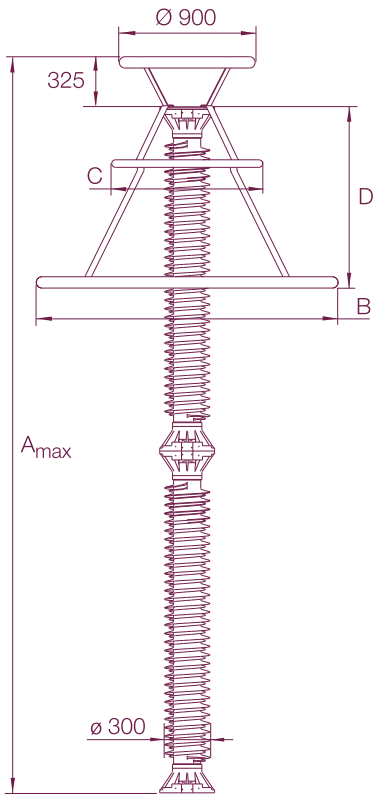


Figure 4

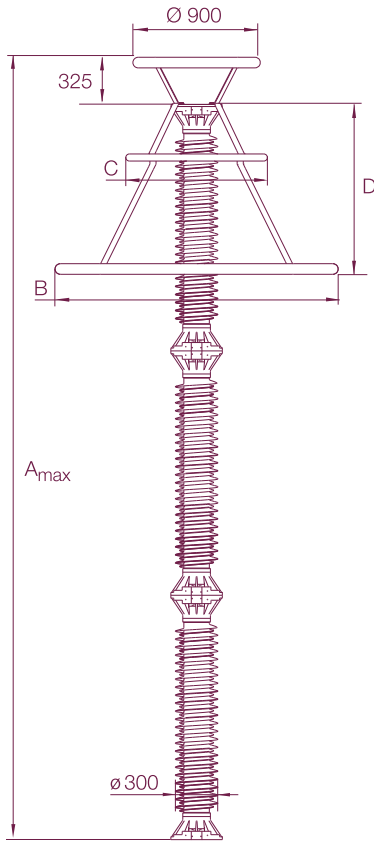
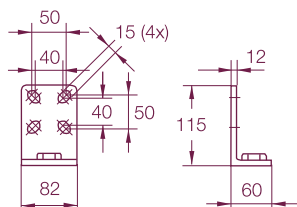


Figure 5

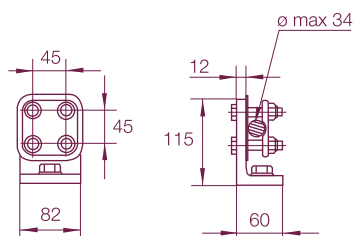
# HS PEXLIM T-T

## Accessories

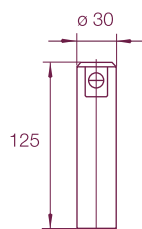
### Line terminals



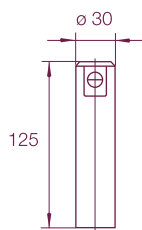
**1HSA410 000-A**  
Aluminium



**1HSA410 000-B**  
Aluminium flag with other  
items in stainless steel

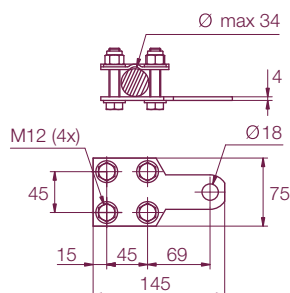


**1HSA410 000-C**  
Aluminium

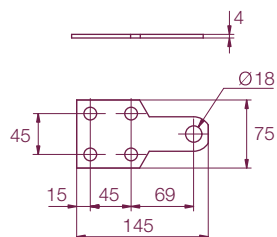


**1HSA410 000-D**  
Stainless steel

### Earth terminals

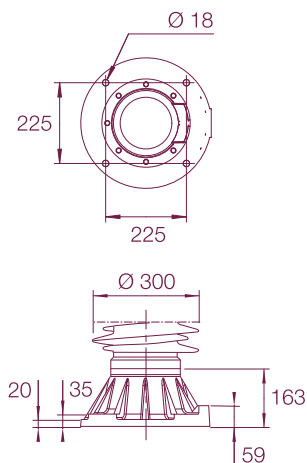


**1HSA420 000-U**  
Stainless steel

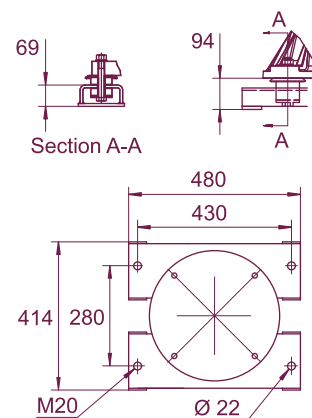


**1HSA420 000-V**  
Stainless steel

### Drilling plans



**Without insulating base**  
Aluminium



**Insulating base**  
**1HSA430 000-P**  
Galvanized steel

M20 bolts for connection to  
structure are not supplied by ABB.

# HS PEXLIM T-T

## Shipping data

| Rated voltage<br><br>$U_r$<br><br>$kV_{rms}$ | Housing | Number of arresters per crate |       |        |       |        |       |
|----------------------------------------------|---------|-------------------------------|-------|--------|-------|--------|-------|
|                                              |         | One                           |       | Three  |       | Six    |       |
|                                              |         | Volume                        | Gross | Volume | Gross | Volume | Gross |
|                                              |         | $m^3$                         | kg    | $m^3$  | kg    | $m^3$  | kg    |
| 180                                          | TH245   | 5.4                           | 315   | 5.4    | 676   | 6.0    | 1262  |
| 192                                          | TH245   | 5.4                           | 316   | 5.4    | 680   | 6.0    | 1270  |
| 216                                          | TH245   | 5.4                           | 321   | 5.4    | 692   | 6.0    | 1295  |
| 228                                          | TV245   | 2.6                           | 340   | 4.3    | 893   | -      | -     |
| 228                                          | TV300   | 2.8                           | 405   | 5.3    | 1006  | -      | -     |
| 240                                          | TV300   | 2.8                           | 407   | 5.3    | 1011  | -      | -     |
| 258                                          | TH362   | 2.8                           | 411   | 5.3    | 1026  | -      | -     |
| 264                                          | TH362   | 2.8                           | 411   | 5.3    | 1026  | -      | -     |
| 276                                          | TH362   | 2.8                           | 412   | 5.3    | 1028  | -      | -     |
| 288                                          | TH380   | 2.8                           | 414   | 5.3    | 1033  | -      | -     |
| 300                                          | TM400   | 2.8                           | 416   | 5.3    | 1038  | -      | -     |
| 330                                          | TH420   | 5.8                           | 507   | 6.6    | 1163  | -      | -     |
| 360                                          | TH420   | 5.2                           | 452   | 5.5    | 1086  | -      | -     |
| 390                                          | TV420   | 5.2                           | 483   | 5.5    | 1179  | -      | -     |
| 396                                          | TH550   | 6.7                           | 611   | 6.7    | 1355  | -      | -     |
| 420                                          | TH550   | 6.7                           | 612   | 6.7    | 1357  | -      | -     |

| Rated voltage<br><br>$U_r$<br><br>$kV_{rms}$ | Housing | Number of arresters per crate |       |        |       |  |  |
|----------------------------------------------|---------|-------------------------------|-------|--------|-------|--|--|
|                                              |         | One                           |       | Two    |       |  |  |
|                                              |         | Volume                        | Gross | Volume | Gross |  |  |
|                                              |         | $m^3$                         | kg    | $m^3$  | kg    |  |  |
| 444                                          | TH550   | 3.7                           | 602   | 5.5    | 1054  |  |  |

Each crate contains a certain number of arrester units and accessories for assembly and erection. A packing list is attached externally on each crate.

Each separate crate is numbered and the numbers of all crates and their contents are listed in the shipping specifica-

tion. ABB reserves the right to pack arresters in the most effective/economic combination. Alternate or non-standard crates may involve additional charges.



The table above is to be seen as an approximation and specific data for deliveries may differ from the values given.

For more information please contact:

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