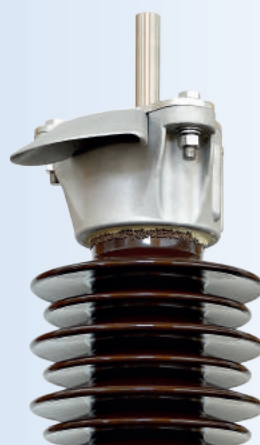


New Design according to latest IEC-Standard



Metal oxide (ZnO) surge arrester

Type series SB 6 to 396/SH-A-0
previously SB XXX/20.4-0

Field of application

Protection of Transformers, Switch-Gears and Plants against atmospheric and switching overvoltages

Selection of metal oxide (ZnO) surge arresters

The selection of the rated and the continuous operating voltage of the arresters is depending on the neutral performance of the networks.

Guidelines for selection:
see VDE 0675-5 or IEC 60099-5

Design

Type tested according to IEC 60099-4
porcelain housing: brown glazed (grey on request)
fittings: Al alloy
connections: clamps, screws, nuts stainless steel

Optional accessories

Monitoring spark gap, surge counter,
diagnostic appliance

Technical Parameters acc. IEC 60099-4

| | |
|--|------------------------|
| Rated voltage U_r : | 6 kV to 396 kV |
| Arrester class: | station, SH |
| Nominal discharge current: | 20 kA |
| Switching impulse discharge current: | 2 kA |
| Repetitive charge transfer rating Q_{rs} : | 2,4 C |
| Thermal energy rating W_{th} : | 10 kJ/kV _{Ur} |
| Line discharge class: | 4 |
| High current impulse (4/10): | 100 kA |
| Rated short-circuit current: | 65 kA |

Operating conditions

| | |
|----------------------|------------------------------|
| Ambient temperature: | -60°C to +60°C ¹⁾ |
| Rated frequency: | 48 Hz to 62 Hz |

Metalloxidableiter (ZnO)

Typenreihe SB 6 bis 396/SH-A-0
vormals SB XXX/20.4-0

Anwendungsbereich

Schutz von Transformatoren, Schaltgeräten und Anlagen gegen atmosphärische und Schaltüberspannungen

Metalloxidableiterauswahl (ZnO)

Die Auswahl der Bemessungs- und Dauerspannung der Ableiter ist von der Sternpunktbehandlung der Netze abhängig.

Auswahlkriterien siehe
VDE 0675-5 bzw. IEC 60099-5

Ausführung

Typgeprüft nach IEC 60099-4
Porzellanisolierkörper: braun glasiert (grau auf Anfrage)
Armaturen: Guss AL-Legierung
Verbindungen: Klemmen, Schrauben, Muttern CrNi-Stahl

Mögliches Zubehör

Kontrollfunkenstrecken, Ansprechzähler,
Diagnoseeinrichtung

Technische Parameter acc. IEC 60099-4

| | |
|--|------------------------|
| Bemessungsspannung U_r : | 6 kV bis 396 kV |
| Ableiterklasse: | Hochspannung, SH |
| Nennableitstoßstrom: | 20 kA |
| Schaltstoßstrom: | 2 kA |
| Wiederholtes Nenn-Ladungsableitvermögen Q_{rs} : | 2,4 C |
| thermische Energieaufnahme-fähigkeit W_{th} : | 10 kJ/kV _{Ur} |
| Leitungsentladungsklasse: | 4 |
| Hochstoßstrom (4/10): | 100 kA |
| Nenn-Kurzschlussstrom: | 65 kA |

Normale Betriebsbedingungen

| | |
|----------------------|-------------------------------|
| Umgebungstemperatur: | -60°C bis +60°C ¹⁾ |
| Nennfrequenz: | 48 Hz bis 62 Hz |

¹⁾ daily max/min values, The IEC values are defined in the range of $\pm 40^\circ\text{C}$

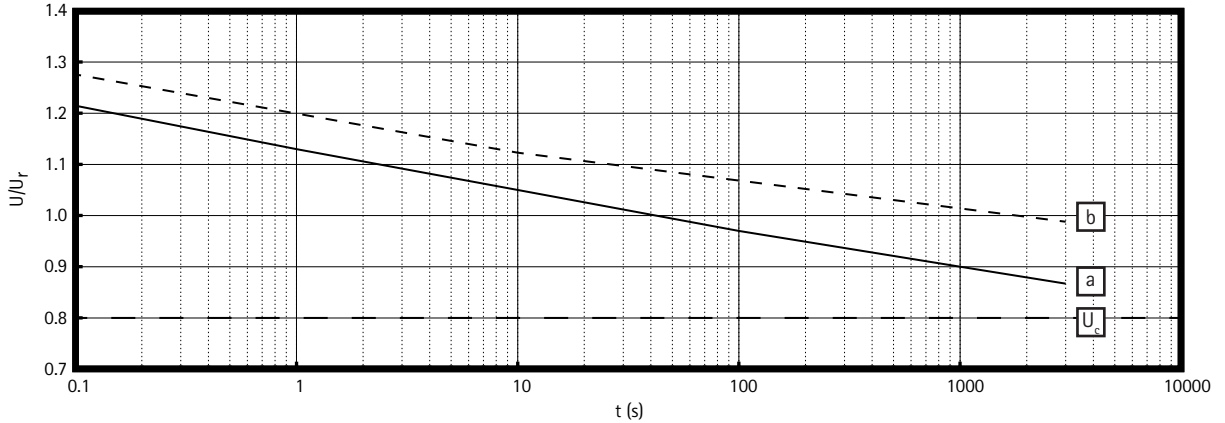
¹⁾ maximale/minimale Temperatur; IEC Werte auf Basis von $\pm 40^\circ\text{C}$

| Type / Typ | Rated Voltage / Bemes- sungs- spannung | Continuous operating voltage / Dauer- spannung | Temporary Over- voltage TOV ¹⁾ / Zeitweil. Spannungs- überhöhung TOV ¹⁾ | | Residual voltage at steep, lightning and switching impulse current / Restspannung bei Steil-, Blitz- und Schaltstoßstrom | | | | | | | | | | Min. housing size / Mindest- gehäuse- größe |
|---------------|--|--|---|------------------------|---|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----|--|
| | U _r kV | U _c kV | U _{1s} kV | U _{10s} kV | 20 kA | 5 kA | 10 kA | 20 kA | 40 kA | 500 A | 1000 A | 2000 A | 3000 A | | |
| | | | | | (1/20 µs) kV | (8/20 µs) kV | (8/20 µs) kV | (8/20 µs) kV | (8/20 µs) kV | (30/70µs) kV | (30/70µs) kV | (30/70µs) kV | (30/70µs) kV | | |
| SB 6/SH-A-0 | 6 | 4,8 | 4,8 | 6,3 | 18,6 | 15,0 | 16,0 | 17,3 | 19,0 | 13,0 | 13,4 | 13,9 | 14,3 | 01 | |
| SB 12/SH-A-0 | 12 | 9,6 | 13,6 | 12,6 | 33,4 | 27,1 | 28,8 | 31,1 | 34,3 | 23,3 | 24,2 | 25,1 | 25,7 | 01 | |
| SB 18/SH-A-0 | 18 | 14,4 | 20,3 | 18,9 | 50,1 | 40,6 | 43,2 | 46,7 | 51,4 | 35,0 | 36,3 | 37,6 | 38,6 | 01 | |
| SB 24/SH-A-0 | 24 | 19,2 | 27,1 | 25,2 | 66,8 | 54,1 | 57,6 | 62,2 | 68,5 | 46,7 | 48,4 | 50,1 | 51,5 | 01 | |
| SB 30/SH-A-0 | 30 | 24,0 | 33,9 | 31,5 | 83,5 | 67,7 | 72,0 | 77,8 | 85,7 | 58,3 | 60,5 | 62,6 | 64,4 | 01 | |
| SB 36/SH-A-0 | 36 | 28,8 | 40,7 | 37,8 | 100,2 | 81,2 | 86,4 | 93,3 | 102,8 | 70,0 | 72,6 | 75,2 | 77,2 | 01 | |
| SB 42/SH-A-0 | 42 | 33,6 | 47,5 | 44,1 | 116,9 | 94,8 | 100,8 | 108,9 | 120,0 | 81,6 | 84,7 | 87,7 | 90,1 | 02 | |
| SB 48/SH-A-0 | 48 | 38,4 | 54,2 | 50,4 | 133,6 | 108,3 | 115,2 | 124,4 | 137,1 | 93,3 | 96,8 | 100,2 | 103,0 | 02 | |
| SB 54/SH-A-0 | 54 | 43 | 61 | 57 | 150 | 122 | 130 | 140 | 154 | 105 | 109 | 113 | 116 | 02 | |
| SB 60/SH-A-0 | 60 | 48 | 68 | 63 | 167 | 135 | 144 | 156 | 171 | 117 | 121 | 125 | 129 | 03 | |
| SB 63/SH-A-0 | 63 | 50 | 71 | 66 | 175 | 142 | 151 | 163 | 180 | 122 | 127 | 132 | 135 | 03 | |
| SB 72/SH-A-0 | 72 | 58 | 81 | 76 | 200 | 162 | 173 | 187 | 206 | 140 | 145 | 150 | 154 | 03 | |
| SB 75/SH-A-0 | 75 | 60 | 85 | 79 | 209 | 169 | 180 | 194 | 214 | 146 | 151 | 157 | 161 | 03 | |
| SB 78/SH-A-0 | 78 | 62 | 88 | 82 | 217 | 176 | 187 | 202 | 223 | 152 | 157 | 163 | 167 | 03 | |
| SB 81/SH-A-0 | 81 | 65 | 92 | 85 | 226 | 183 | 194 | 210 | 231 | 157 | 163 | 169 | 174 | 03 | |
| SB 84/SH-A-0 | 84 | 67 | 95 | 88 | 234 | 190 | 202 | 218 | 240 | 163 | 169 | 175 | 180 | 03 | |
| SB 90/SH-A-0 | 90 | 72 | 102 | 94 | 251 | 203 | 216 | 233 | 257 | 175 | 181 | 188 | 193 | 03 | |
| SB 96/SH-A-0 | 96 | 77 | 108 | 101 | 267 | 217 | 230 | 249 | 274 | 187 | 194 | 200 | 206 | 04 | |
| SB 102/SH-A-0 | 102 | 82 | 115 | 107 | 284 | 230 | 245 | 264 | 291 | 198 | 206 | 213 | 219 | 04 | |
| SB 108/SH-A-0 | 108 | 86 | 122 | 113 | 301 | 244 | 259 | 280 | 308 | 210 | 218 | 226 | 232 | 04 | |
| SB 114/SH-A-0 | 114 | 91 | 129 | 120 | 317 | 257 | 274 | 295 | 326 | 222 | 230 | 238 | 245 | 04 | |
| SB 120/SH-A-0 | 120 | 96 | 136 | 126 | 334 | 271 | 288 | 311 | 343 | 233 | 242 | 251 | 257 | 05 | |
| SB 123/SH-A-0 | 123 | 98 | 139 | 129 | 342 | 277 | 295 | 319 | 351 | 239 | 248 | 257 | 264 | 05 | |
| SB 126/SH-A-0 | 126 | 101 | 142 | 132 | 351 | 284 | 302 | 327 | 360 | 245 | 254 | 263 | 270 | 05 | |
| SB 132/SH-A-0 | 132 | 106 | 149 | 139 | 367 | 298 | 317 | 342 | 377 | 257 | 266 | 276 | 283 | 05 | |
| SB 138/SH-A-0 | 138 | 110 | 156 | 145 | 384 | 311 | 331 | 358 | 394 | 268 | 278 | 288 | 296 | 05 | |
| SB 144/SH-A-0 | 144 | 115 | 163 | 151 | 401 | 325 | 346 | 373 | 411 | 280 | 290 | 301 | 309 | 05 | |
| SB 150/SH-A-0 | 150 | 120 | 170 | 158 | 418 | 338 | 360 | 389 | 428 | 292 | 302 | 313 | 322 | 06 | |
| SB 154/SH-A-0 | 154 | 123 | 174 | 162 | 429 | 347 | 370 | 399 | 440 | 299 | 310 | 322 | 330 | 06 | |
| SB 156/SH-A-0 | 156 | 125 | 176 | 164 | 434 | 352 | 374 | 404 | 446 | 303 | 314 | 326 | 335 | 06 | |
| SB 162/SH-A-0 | 162 | 130 | 183 | 170 | 451 | 365 | 389 | 420 | 463 | 315 | 327 | 338 | 348 | 06 | |
| SB 168/SH-A-0 | 168 | 134 | 190 | 176 | 468 | 379 | 403 | 435 | 480 | 327 | 339 | 351 | 360 | 06 | |
| SB 180/SH-A-0 | 180 | 144 | 203 | 189 | 501 | 406 | 432 | 467 | 514 | 350 | 363 | 376 | 386 | 07 | |
| SB 186/SH-A-0 | 186 | 149 | 210 | 195 | 518 | 420 | 446 | 482 | 531 | 362 | 375 | 388 | 399 | 07 | |
| SB 192/SH-A-0 | 192 | 154 | 217 | 202 | 535 | 433 | 461 | 498 | 548 | 373 | 387 | 401 | 412 | 07 | |
| SB 198/SH-A-0 | 198 | 158 | 224 | 208 | 551 | 447 | 475 | 513 | 565 | 385 | 399 | 413 | 425 | 08 | |
| SB 204/SH-A-0 | 204 | 163 | 231 | 214 | 568 | 460 | 490 | 529 | 583 | 397 | 411 | 426 | 438 | 08 | |
| SB 210/SH-A-0 | 210 | 168 | 237 | 220 | 585 | 474 | 504 | 544 | 600 | 408 | 423 | 438 | 451 | 08 | |
| SB 214/SH-A-0 | 214 | 171 | 242 | 225 | 596 | 483 | 514 | 555 | 611 | 416 | 431 | 447 | 459 | 08 | |
| SB 216/SH-A-0 | 216 | 173 | 244 | 227 | 601 | 487 | 518 | 560 | 617 | 420 | 435 | 451 | 463 | 08 | |
| SB 222/SH-A-0 | 222 | 178 | 251 | 233 | 618 | 501 | 533 | 575 | 634 | 432 | 448 | 464 | 476 | 08 | |
| SB 228/SH-A-0 | 228 | 182 | 258 | 239 | 635 | 514 | 547 | 591 | 651 | 443 | 460 | 476 | 489 | 08 | |
| SB 240/SH-A-0 | 240 | 192 | 271 | 252 | 668 | 541 | 576 | 622 | 685 | 467 | 484 | 501 | 515 | 08 | |
| SB 246/SH-A-0 | 246 | 197 | 278 | 258 | 685 | 555 | 590 | 638 | 703 | 478 | 496 | 514 | 528 | 08 | |
| SB 252/SH-A-0 | 252 | 202 | 285 | 265 | 702 | 569 | 605 | 653 | 720 | 490 | 508 | 526 | 541 | 09 | |
| SB 258/SH-A-0 | 258 | 206 | 292 | 271 | 718 | 582 | 619 | 669 | 737 | 502 | 520 | 539 | 554 | 09 | |
| SB 264/SH-A-0 | 264 | 211 | 298 | 277 | 735 | 596 | 634 | 684 | 754 | 513 | 532 | 551 | 566 | 09 | |
| SB 276/SH-A-0 | 276 | 221 | 312 | 290 | 768 | 623 | 662 | 715 | 788 | 537 | 556 | 576 | 592 | 09 | |
| SB 282/SH-A-0 | 282 | 226 | 319 | 296 | 785 | 636 | 677 | 731 | 805 | 548 | 569 | 589 | 605 | 10 | |
| SB 288/SH-A-0 | 288 | 230 | 325 | 302 | 802 | 650 | 691 | 746 | 823 | 560 | 581 | 601 | 618 | 10 | |
| SB 294/SH-A-0 | 294 | 235 | 332 | 309 | 818 | 663 | 706 | 762 | 840 | 572 | 593 | 614 | 631 | 10 | |
| SB 300/SH-A-0 | 300 | 240 | 339 | 315 | 835 | 677 | 720 | 778 | 857 | 583 | 605 | 626 | 644 | 12 | |
| SB 312/SH-A-0 | 312 | 250 | 353 | 328 | 869 | 704 | 749 | 809 | 891 | 607 | 629 | 651 | 669 | 12 | |
| SB 315/SH-A-0 | 315 | 252 | 356 | 331 | 877 | 711 | 756 | 816 | 900 | 612 | 635 | 658 | 676 | 12 | |
| SB 318/SH-A-0 | 318 | 254 | 359 | 334 | 885 | 717 | 763 | 824 | 908 | 618 | 641 | 664 | 682 | 12 | |
| SB 330/SH-A-0 | 330 | 264 | 373 | 346 | 919 | 744 | 792 | 855 | 942 | 642 | 665 | 689 | 708 | 13 | |
| SB 333/SH-A-0 | 333 | 266 | 376 | 350 | 927 | 751 | 799 | 863 | 951 | 647 | 671 | 695 | 714 | 13 | |
| SB 336/SH-A-0 | 336 | 269 | 380 | 353 | 935 | 758 | 806 | 871 | 960 | 653 | 677 | 702 | 721 | 13 | |
| SB 342/SH-A-0 | 342 | 274 | 386 | 359 | 952 | 772 | 821 | 886 | 977 | 665 | 689 | 714 | 734 | 13 | |
| SB 357/SH-A-0 | 357 | 286 | 403 | 375 | 994 | 805 | 857 | 925 | 1020 | 694 | 720 | 745 | 766 | 13 | |
| SB 360/SH-A-0 | 360 | 288 | 407 | 378 | 1002 | 812 | 864 | 933 | 1028 | 700 | 726 | 752 | 772 | 14 | |
| SB 366/SH-A-0 | 366 | 293 | 414 | 384 | 1019 | 826 | 878 | 949 | 1045 | 712 | 738 | 764 | 785 | 14 | |
| SB 372/SH-A-0 | 372 | 298 | 420 | 391 | 1036 | 839 | 893 | 964 | 1062 | 723 | 750 | 777 | 798 | 14 | |
| SB 378/SH-A-0 | 378 | 302 | 427 | 397 | 1052 | 853 | 907 | 980 | 1080 | 735 | 762 | 789 | 811 | 14 | |
| SB 384/SH-A-0 | 384 | 307 | 434 | 403 | 1069 | 866 | 922 | 995 | 1097 | 746 | 774 | 802 | 824 | 14 | |
| SB 390/SH-A-0 | 390 | 312 | 441 | 409 | 1086 | 880 | 936 | 1011 | 1114 | 758 | 786 | 814 | 837 | 14 | |
| SB 396/SH-A-0 | 396 | 317 | 447 | 416 | 1102 | 893 | 950 | 1026 | 1131 | 770 | 798 | 827 | 850 | 15 | |

¹⁾ with prior duty / mit vorheriger Belastung

Power-frequency voltage-versus-time characteristic (initial temperature +60°C)
 a) with prior duty (W_{th}); b) without prior duty

Wechselspannungs-Zeit-Kennlinie (TOV) (Ausgangstemperatur +60°C)
 a) mit vorheriger Belastung (W_{th}); b) ohne vorherige Belastung



Mechanical guaranteed data / Mechanische Garantiewerte

| | |
|--|----------|
| Specified short-term load / Festgelegte Kurzzeitlast (SSL): | 10000 Nm |
| Specified long-term load / Festgelegte Langzeitlast (SLL): | 4000 Nm |

| Housing size / Gehäusegröße | Height / Höhe h mm | min. creepage distance / min. Kriechweg mm | max. weight ¹⁾ / max. Gewicht ¹⁾ kg | Grading ring / Potential-ring d mm | min. rated voltage / min. Bemessungsspannung kV | Figure / Abbildung | Insulation of arrester housing at standard atmosphere / Äußere Isolation bei Standardatmosphäre | | |
|--------------------------------|---------------------------------|--|---|---|---|-----------------------|---|---|---|
| | | | | | | | p.f. withstand voltage (wetted) / Nennstehwechselspannung (berechnet) PFWL 50 Hz kV | Lightning impulse withstand voltage / Nennstehblitzspannung LIWL 1.2/50µs kV | Switching impulse withstand voltage (wetted) / Nennstehschaltspannung (berechnet) SIWL 250/2500µs kV |
| 01 | 451 | 642 | 28 | - | 6 | 1 | 85 | 134 | 141 |
| 02 | 587 | 1244 | 39 | - | 18 | 1 | 130 | 209 | 215 |
| 03 | 859 | 2387 | 59 | - | 27 | 1 | 210 | 361 | 352 |
| 04 | 1063 | 3267 | 76 | - | 54 | 1 | 265 | 475 | 446 |
| 05 | 1335 | 4495 | 96 | - | 54 | 1 | 332 | 626 | 563 |
| 06 | 1539 | 5305 | 112 | - | 84 | 1 | 378 | 740 | 644 |
| 07 | 2126 | 6534 | 154 | 700 | 96 | 2 | 441 | 803 | 755 |
| 08 | 2398 | 7762 | 177 | 700 | 114 | 2 | 493 | 948 | 848 |
| 09 | 2670 | 8990 | 197 | 700 | 132 | 2 | 542 | 1100 | 935 |
| 10 | 2874 | 9800 | 213 | 900 | 186 | 2 | 561 | 1170 | 970 |
| 12 | 3078 | 10610 | 229 | 900 | 186 | 2 | 594 | 1284 | 1030 |
| 13 | 3461 | 11029 | 256 | 1250 | 186 | 3 | 642 | 1392 | 1115 |
| 14 | 3733 | 12257 | 276 | 1250 | 186 | 3 | 681 | 1543 | 1186 |
| 15 | 4005 | 13485 | 295 | 1250 | 228 | 3 | 718 | 1694 | 1254 |
| 19 | 5340 | 17980 | 383 | 1500 | 261 | 4 | 845 | 2248 | 1488 |
| 21 | 1922 | 5654 | 139 | 700 | 114 | 2 | 399 | 690 | 676 |

¹⁾ without accessories.

Please refer to the technical drawing for the specific weight.

¹⁾ ohne Zubehör

Das spezifische Gewicht entnehmen Sie bitte der technischen Zeichnung.

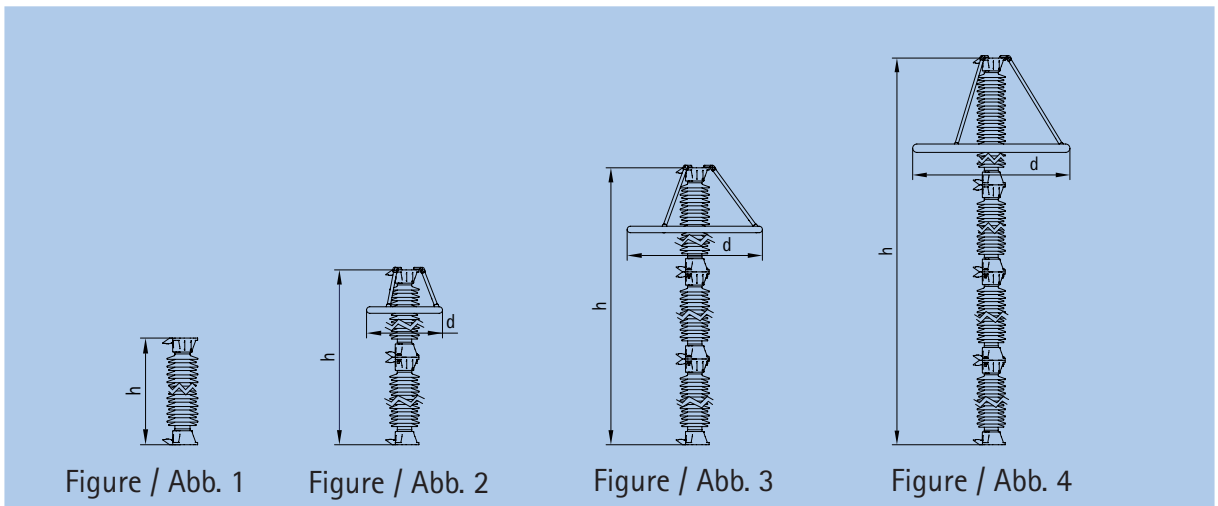


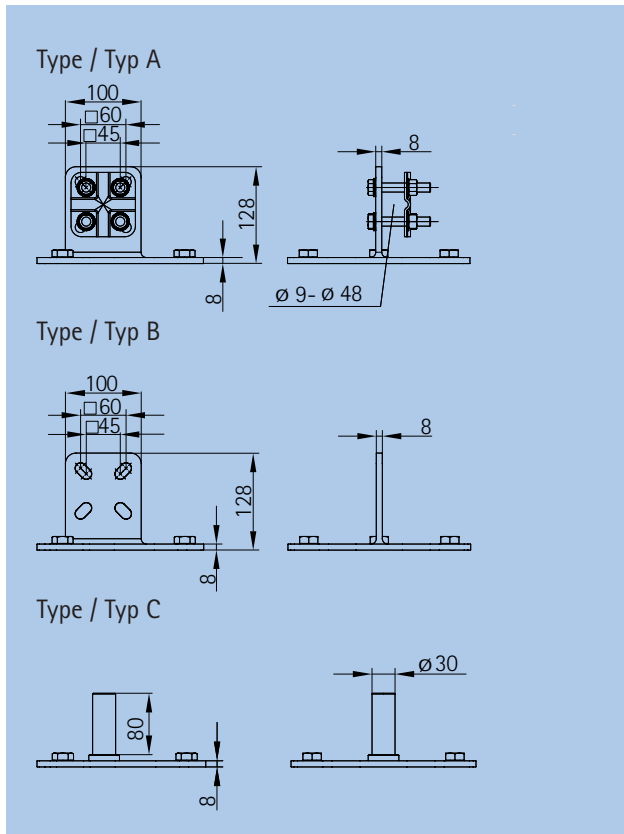
Figure / Abb. 1

Figure / Abb. 2

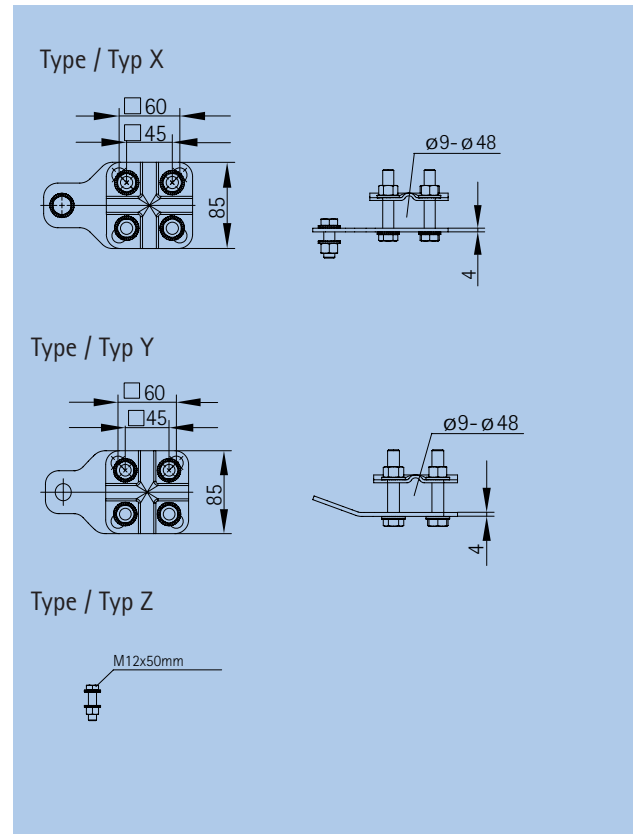
Figure / Abb. 3

Figure / Abb. 4

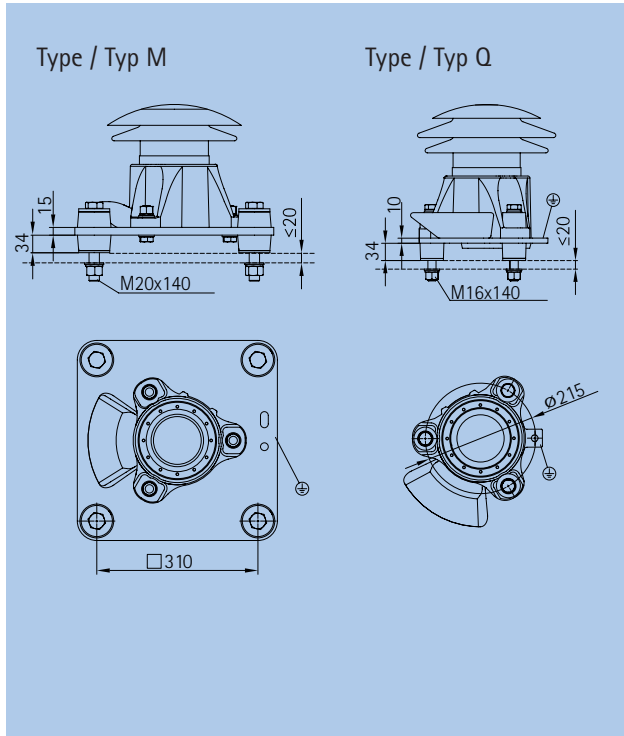
Line terminals / Phasenanschlüsse



Earth terminals / Erdanschlüsse



Variants of installation / Aufstellvarianten



How to order / Bestellbeispiel:

Metal oxide (ZnO) surge arrester /
Metalloxidableiter (ZnO) SB 60/SH-A-0

Housing / Gehäuse 03

Line terminal / Phasenanschluss A

Variant of installation /
Aufstellvariante M

Earth terminal / Erdanschluss X

Specifications in this leaflet are subject to change
without notice.
Wir behalten uns vor, technische Inhalte zu ändern.

All demensions in mm / Alle Abmessungen in mm

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Tridelta Meidensha GmbH is certified to DIN EN ISO 9001 and 14001.
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