

Surge arrester POLIM-H..N



Product description

Surge arrester with metal oxide resistors without spark gaps (MO surge arrester), direct molded silicone housing, grey color, designed and tested according to IEC 60099-4.

Overvoltage protection of

- Transformers
- Motors
- Generators
- Cables and cable terminations
- Cable sheaths
- Traction systems – fixed installations
- Rolling stock and high speed trains
- Capacitors and capacitor banks
- Medium voltage equipment

Application

- Systems with alternating current (AC)
- Outdoor and indoor installations

Additional certification

- Shock and vibration tested according to IEC 61373
- Fire and smoke behaviour tested and classified according to EN 45545-2

Technical data

| | |
|--|---|
| Arrester class | SH, Station High |
| Line discharge class (LD) | 4 |
| Nominal discharge current I_n (8/20 μ s) | 20 kA _{peak} |
| Repetitive charge transfer rating Q_{rs} | 2.4 As (C) |
| Rated thermal energy | |
| W_{th} at $T_{amb} = 40^\circ\text{C}$ | 12 kJ/kV (U_r) = 15 kJ/kV (U_c) |
| W_{th} at $T_{amb} = 55^\circ\text{C}$ | 10.5 kJ/kV (U_r) = 13.1 kJ/kV (U_c) |
| High current impulse I_{hc} (4/10 μ s) | 100 kA _{peak} |
| Long duration current impulse | 1350 A for 2000 μ s |
| Short-circuit rating I_s (50Hz) | 63 kA _{rms} for 0.2 s |

Power frequency voltage versus time characteristic (TOV) without prior duty energy input

| | |
|-----------------------|---------------------------|
| U_{TOV} at t = 1 s | 1.125 U_r = 1.406 U_c |
| U_{TOV} at t = 3 s | 1.090 U_r = 1.363 U_c |
| U_{TOV} at t = 10 s | 1.060 U_r = 1.325 U_c |

Power frequency voltage versus time characteristic (TOV) with prior duty energy input of 10.5 kJ/kV (U_r) = 13.1 kJ/kV (U_c)

| | |
|-----------------------|---------------------------|
| U_{TOV} at t = 1 s | 1.105 U_r = 1.381 U_c |
| U_{TOV} at t = 3 s | 1.074 U_r = 1.342 U_c |
| U_{TOV} at t = 10 s | 1.033 U_r = 1.291 U_c |

Mechanical loads

| | |
|---|---------|
| Torque | 100 Nm |
| Tensile strength axial | 4000 N |
| Short term load SSL perpendicular to axis | 4000 Nm |
| Long term load SLL perpendicular to axis | 2000 Nm |

Service conditions

| | |
|-----------------------------------|---|
| Ambient air temperature T_{amb} | -60 to +55 °C (for temperatures up to 80 °C consider instructions of application guidelines) |
| Altitude | up to 1800 m (for higher altitudes contact manufacturer) |
| Frequency of system voltage | 16.7/50/60 Hz |



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Electrical data

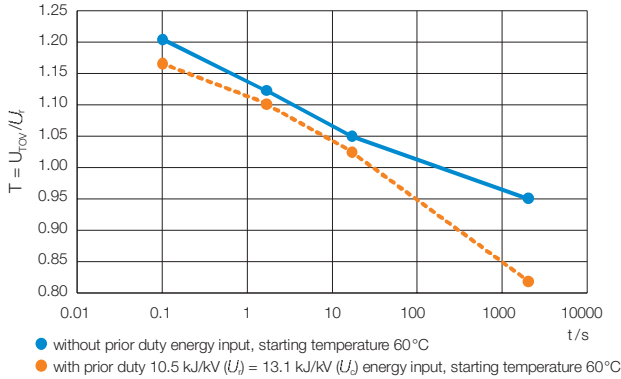
| U_c | | U_r | | Residual voltage U_{res} at specified impulse current | | | | | | | | |
|------------------------------|---------------|--|-------------|---|-------------|-------------|-------------|-------------|--|-------------|-------------|-------------|
| Continuous operating voltage | Rated voltage | Steep current impulse wave 1/... μ s | | Lightning current impulse wave 8/20 μ s | | | | | Switching current impulse wave 30/60 μ s | | | |
| | | 10 kA | 20 kA | 2 kA | 5 kA | 10 kA | $I_n=20$ kA | 40 kA | 500 A | 1000 A | 2000 A | |
| kV_{rms} | kV_{rms} | kV_{peak} | kV_{peak} | kV_{peak} | kV_{peak} | kV_{peak} | kV_{peak} | kV_{peak} | kV_{peak} | kV_{peak} | kV_{peak} | kV_{peak} |
| 4 | 5.0 | 12.7 | 13.6 | 10.6 | 11.2 | 11.6 | 12.7 | 14.2 | 9.8 | 10.1 | 10.4 | |
| 5 | 6.3 | 15.9 | 17.0 | 13.3 | 13.9 | 14.5 | 15.9 | 17.7 | 12.3 | 12.6 | 13.0 | |
| 6 | 7.5 | 19.0 | 20.4 | 15.9 | 16.7 | 17.4 | 19.0 | 21.3 | 14.7 | 15.2 | 15.6 | |
| 7 | 8.8 | 22.2 | 23.8 | 18.6 | 19.5 | 20.3 | 22.2 | 24.8 | 17.2 | 17.7 | 18.2 | |
| 8 | 10.0 | 25.3 | 27.2 | 21.2 | 22.3 | 23.2 | 25.3 | 28.4 | 19.6 | 20.2 | 20.8 | |
| 9 | 11.3 | 28.5 | 30.6 | 23.9 | 25.1 | 26.1 | 28.5 | 31.9 | 22.1 | 22.7 | 23.4 | |
| 10 | 12.5 | 31.7 | 34.0 | 26.5 | 27.8 | 29.0 | 31.7 | 35.4 | 24.5 | 25.2 | 26.0 | |
| 11 | 13.8 | 34.8 | 37.4 | 29.2 | 30.6 | 31.9 | 34.8 | 39.0 | 27.0 | 27.7 | 28.6 | |
| 12 | 15.0 | 38.0 | 40.8 | 31.8 | 33.4 | 34.8 | 38.0 | 42.5 | 29.4 | 30.3 | 31.2 | |
| 13 | 16.3 | 41.1 | 44.2 | 34.5 | 36.2 | 37.7 | 41.1 | 46.0 | 31.9 | 32.8 | 33.8 | |
| 14 | 17.5 | 44.3 | 47.6 | 37.1 | 38.9 | 40.6 | 44.3 | 49.6 | 34.3 | 35.3 | 36.4 | |
| 15 | 18.8 | 47.5 | 50.9 | 39.8 | 41.7 | 43.5 | 47.5 | 53.1 | 36.8 | 37.8 | 39.0 | |
| 16 | 20.0 | 50.6 | 54.3 | 42.4 | 44.5 | 46.4 | 50.6 | 56.7 | 39.2 | 40.3 | 41.6 | |
| 17 | 21.3 | 53.8 | 57.7 | 45.1 | 47.3 | 49.3 | 53.8 | 60.2 | 41.7 | 42.8 | 44.2 | |
| 18 | 22.5 | 56.9 | 61.1 | 47.7 | 50.1 | 52.2 | 56.9 | 63.7 | 44.1 | 45.4 | 46.8 | |
| 19 | 23.8 | 60.1 | 64.5 | 50.4 | 52.8 | 55.1 | 60.1 | 67.3 | 46.6 | 47.9 | 49.4 | |
| 20 | 25.0 | 63.3 | 67.9 | 53.0 | 55.6 | 58.0 | 63.3 | 70.8 | 49.0 | 50.4 | 52.0 | |
| 21 | 26.3 | 66.4 | 71.3 | 55.7 | 58.4 | 60.9 | 66.4 | 74.3 | 51.4 | 52.9 | 54.6 | |
| 22 | 27.5 | 69.6 | 74.7 | 58.3 | 61.2 | 63.8 | 69.6 | 77.9 | 53.9 | 55.4 | 57.2 | |
| 23 | 28.8 | 72.8 | 78.1 | 60.9 | 63.9 | 66.7 | 72.8 | 81.4 | 56.3 | 57.9 | 59.7 | |
| 24 | 30.0 | 75.9 | 81.5 | 63.6 | 66.7 | 69.6 | 75.9 | 85.0 | 58.8 | 60.5 | 62.3 | |
| 25 | 31.3 | 79.1 | 84.9 | 66.2 | 69.5 | 72.5 | 79.1 | 88.5 | 61.2 | 63.0 | 64.9 | |
| 26 | 32.5 | 82.2 | 88.3 | 68.9 | 72.3 | 75.4 | 82.2 | 92.0 | 63.7 | 65.5 | 67.5 | |
| 27 | 33.8 | 85.4 | 91.7 | 71.5 | 75.1 | 78.3 | 85.4 | 95.6 | 66.1 | 68.0 | 70.1 | |
| 28 | 35.0 | 88.6 | 95.1 | 74.2 | 77.8 | 81.2 | 88.6 | 99.1 | 68.6 | 70.5 | 72.7 | |
| 29 | 36.3 | 91.7 | 98.4 | 76.8 | 80.6 | 84.1 | 91.7 | 102.7 | 71.0 | 73.0 | 75.3 | |
| 30 | 37.5 | 94.9 | 101.8 | 79.5 | 83.4 | 87.0 | 94.9 | 106.2 | 73.5 | 75.6 | 77.9 | |
| 31 | 38.8 | 98.0 | 105.2 | 82.1 | 86.2 | 89.9 | 98.0 | 109.7 | 75.9 | 78.1 | 80.5 | |
| 32 | 40.0 | 101.2 | 108.6 | 84.8 | 89.0 | 92.8 | 101.2 | 113.3 | 78.4 | 80.6 | 83.1 | |
| 33 | 41.3 | 104.4 | 112.0 | 87.4 | 91.7 | 95.7 | 104.4 | 116.8 | 80.8 | 83.1 | 85.7 | |
| 34 | 42.5 | 107.5 | 115.4 | 90.1 | 94.5 | 98.6 | 107.5 | 120.3 | 83.3 | 85.6 | 88.3 | |
| 35 | 43.8 | 110.7 | 118.8 | 92.7 | 97.3 | 101.5 | 110.7 | 123.9 | 85.7 | 88.2 | 90.9 | |
| 36 | 45.0 | 113.8 | 122.2 | 95.4 | 100.1 | 104.4 | 113.8 | 127.4 | 88.2 | 90.7 | 93.5 | |
| 37 | 46.3 | 117.0 | 125.6 | 98.0 | 102.8 | 107.3 | 117.0 | 131.0 | 90.6 | 93.2 | 96.1 | |
| 38 | 47.5 | 120.2 | 129.0 | 100.7 | 105.6 | 110.2 | 120.2 | 134.5 | 93.1 | 95.7 | 98.7 | |
| 39 | 48.8 | 123.3 | 132.4 | 103.3 | 108.4 | 113.1 | 123.3 | 138.0 | 95.5 | 98.2 | 101.3 | |
| 40 | 50.0 | 126.5 | 135.8 | 106.0 | 111.2 | 116.0 | 126.5 | 141.6 | 98.0 | 100.7 | 103.9 | |
| 41 | 51.3 | 129.7 | 139.2 | 108.6 | 114.0 | 118.9 | 129.7 | 145.1 | 100.4 | 103.3 | 106.5 | |
| 42 | 52.5 | 132.8 | 142.6 | 111.3 | 116.7 | 121.8 | 132.8 | 148.6 | 102.8 | 105.8 | 109.1 | |
| 43 | 53.8 | 136.0 | 145.9 | 113.9 | 119.5 | 124.7 | 136.0 | 152.2 | 105.3 | 108.3 | 111.7 | |
| 44 | 55.0 | 139.1 | 149.3 | 116.5 | 122.3 | 127.6 | 139.1 | 155.7 | 107.7 | 110.8 | 114.3 | |

Housing

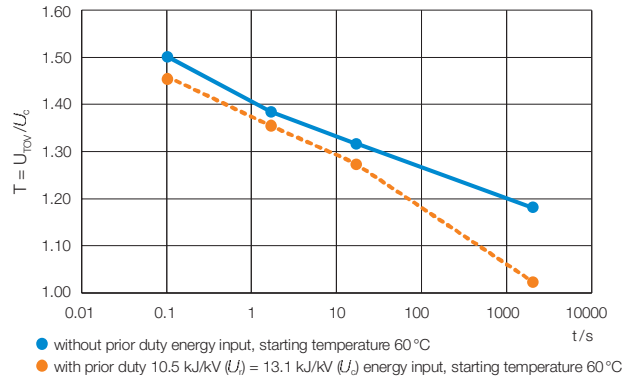
| U_c Continuous operating voltage | Creepage distance | Flashover distance | Recommended minimum clearances | | Height H | Weight | Insulation withstand voltage of empty housing | | | |
|---|----------------------|-----------------------|-----------------------------------|-----------|----------|--------|---|-------------|-----------------------------------|------------|
| | | | E_{min} | F_{min} | | | 1.2/50 μ s dry | | 50 Hz, 60 s wet condition | |
| | | | | | | | required values acc. to IEC | guaranteed | required values acc. to IEC | guaranteed |
| kV_{rms} | mm | mm | mm | mm | mm | kg | kV_{peak} | kV_{peak} | kV_{rms} | kV_{rms} |
| 4 | 358 | 196 | 100 | 190 | 210 | 5.7 | 17 | 118 | 8 | 34 |
| 5 | 358 | 196 | 101 | 190 | 210 | 5.8 | 21 | 118 | 10 | 34 |
| 6 | 493 | 227 | 111 | 190 | 240 | 6.6 | 25 | 137 | 12 | 39 |
| 7 | 493 | 227 | 121 | 190 | 240 | 6.7 | 29 | 137 | 14 | 39 |
| 8 | 493 | 227 | 131 | 190 | 240 | 6.8 | 33 | 137 | 16 | 39 |
| 9 | 648 | 277 | 141 | 191 | 290 | 8.0 | 38 | 167 | 18 | 48 |
| 10 | 648 | 277 | 151 | 201 | 290 | 8.1 | 42 | 167 | 20 | 48 |
| 11 | 648 | 277 | 161 | 211 | 290 | 8.2 | 46 | 167 | 22 | 48 |
| 12 | 648 | 277 | 171 | 221 | 290 | 8.3 | 50 | 167 | 24 | 48 |
| 13 | 823 | 346 | 181 | 231 | 360 | 10.0 | 54 | 208 | 26 | 59 |
| 14 | 823 | 346 | 191 | 241 | 360 | 10.1 | 58 | 208 | 28 | 59 |
| 15 | 823 | 346 | 201 | 251 | 360 | 10.2 | 62 | 208 | 30 | 59 |
| 16 | 823 | 346 | 212 | 261 | 360 | 10.3 | 66 | 208 | 32 | 59 |
| 17 | 823 | 346 | 221 | 271 | 360 | 10.4 | 70 | 208 | 34 | 59 |
| 18 | 823 | 346 | 231 | 281 | 360 | 10.6 | 74 | 208 | 36 | 59 |
| 19 | 823 | 346 | 242 | 292 | 360 | 10.7 | 79 | 208 | 38 | 59 |
| 20 | 823 | 346 | 252 | 301 | 360 | 10.8 | 83 | 208 | 39 | 59 |
| 21 | 978 | 396 | 262 | 311 | 410 | 12.0 | 87 | 238 | 41 | 68 |
| 22 | 978 | 396 | 272 | 322 | 410 | 12.1 | 91 | 238 | 43 | 68 |
| 23 | 978 | 396 | 282 | 332 | 410 | 12.2 | 95 | 238 | 45 | 68 |
| 24 | 978 | 396 | 292 | 342 | 410 | 12.3 | 99 | 238 | 47 | 68 |
| 25 | 978 | 396 | 302 | 352 | 410 | 12.4 | 103 | 238 | 49 | 68 |
| 26 | 1133 | 446 | 312 | 362 | 460 | 13.7 | 107 | 268 | 51 | 76 |
| 27 | 1133 | 446 | 322 | 372 | 460 | 13.8 | 112 | 268 | 53 | 76 |
| 28 | 1133 | 446 | 332 | 382 | 460 | 13.9 | 116 | 268 | 55 | 76 |
| 29 | 1133 | 446 | 342 | 392 | 460 | 14.0 | 120 | 268 | 57 | 76 |
| 30 | 1423 | 527 | 352 | 402 | 540 | 16.0 | 124 | 317 | 59 | 90 |
| 31 | 1423 | 527 | 362 | 412 | 540 | 16.1 | 128 | 317 | 61 | 90 |
| 32 | 1423 | 527 | 372 | 422 | 540 | 16.2 | 132 | 317 | 63 | 90 |
| 33 | 1423 | 527 | 382 | 432 | 540 | 16.3 | 136 | 317 | 65 | 90 |
| 34 | 1423 | 527 | 392 | 442 | 540 | 16.4 | 140 | 317 | 67 | 90 |
| 35 | 1423 | 527 | 402 | 452 | 540 | 16.6 | 144 | 317 | 69 | 90 |
| 36 | 1423 | 527 | 412 | 462 | 540 | 16.7 | 148 | 317 | 71 | 90 |
| 37 | 1597 | 596 | 423 | 472 | 610 | 18.0 | 153 | 358 | 73 | 102 |
| 38 | 1597 | 596 | 432 | 482 | 610 | 18.1 | 157 | 358 | 74 | 102 |
| 39 | 1597 | 596 | 442 | 492 | 610 | 18.2 | 161 | 358 | 76 | 102 |
| 40 | 1597 | 596 | 453 | 502 | 610 | 18.3 | 165 | 358 | 78 | 102 |
| 41 | 1733 | 627 | 463 | 512 | 640 | 19.3 | 169 | 377 | 80 | 107 |
| 42 | 1733 | 627 | 473 | 522 | 640 | 19.4 | 173 | 377 | 82 | 107 |
| 43 | 1733 | 627 | 483 | 533 | 640 | 19.5 | 177 | 377 | 84 | 107 |
| 44 | 1733 | 627 | 493 | 543 | 640 | 19.6 | 181 | 377 | 86 | 107 |

TOV and Dimensions

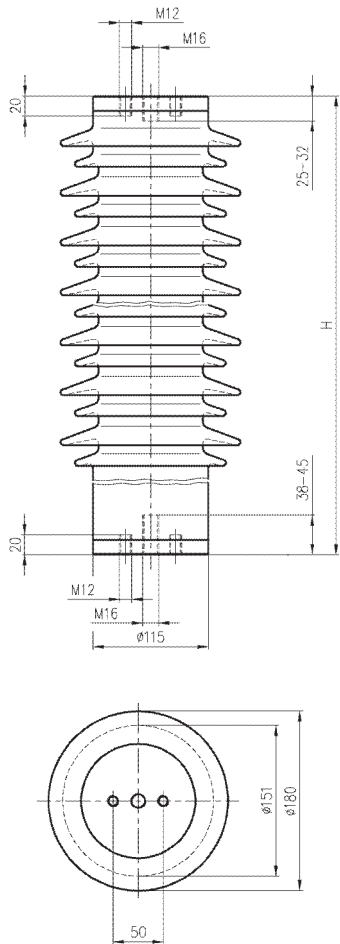
Power-frequency voltage-versus-time characteristic (TOV) based on U_r



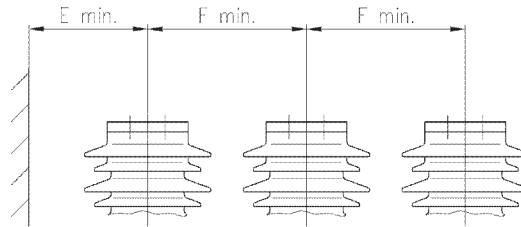
Power-frequency voltage-versus-time characteristic (TOV) based on U_c



Dimensions (mm)



Dimensions according to outline drawing HAAR481686
Outline drawings with accessories on request



Structure of type designation (Example)

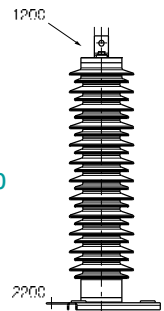
POLIM-H 36 N

Type of arrester ————
 U_c = Continuous operating voltage ————
 Housing ————

Structure of type designation with optional accessories (Example)

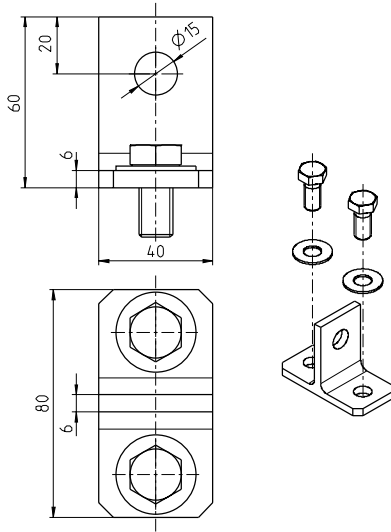
POLIM-H 36 N / 1200 / 2200

Type of surge arrester ————
 Type of top accessory (optional) ————
 Type of bottom accessory (optional) ————



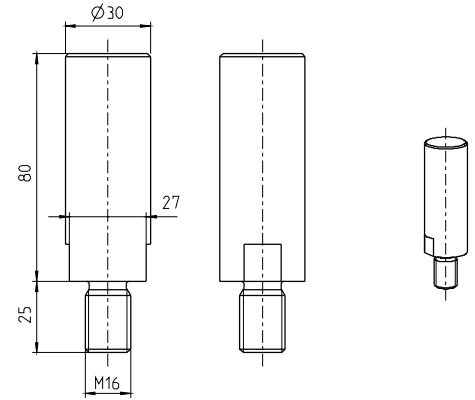
Common Top Accessories (optional)

Dimensions (mm)

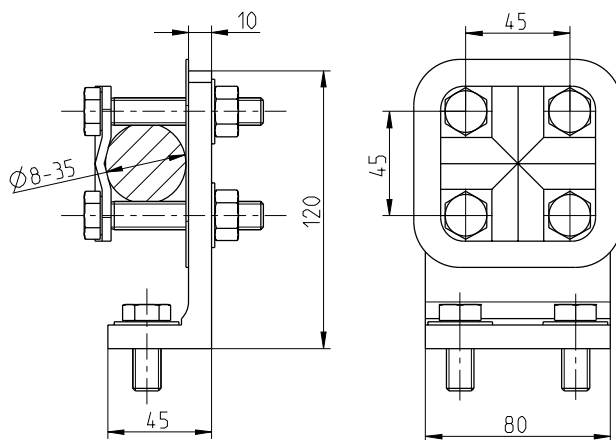


Type 1200 Flat terminal (aluminium alloy)

Type 1201 Flat terminal (stainless steel)



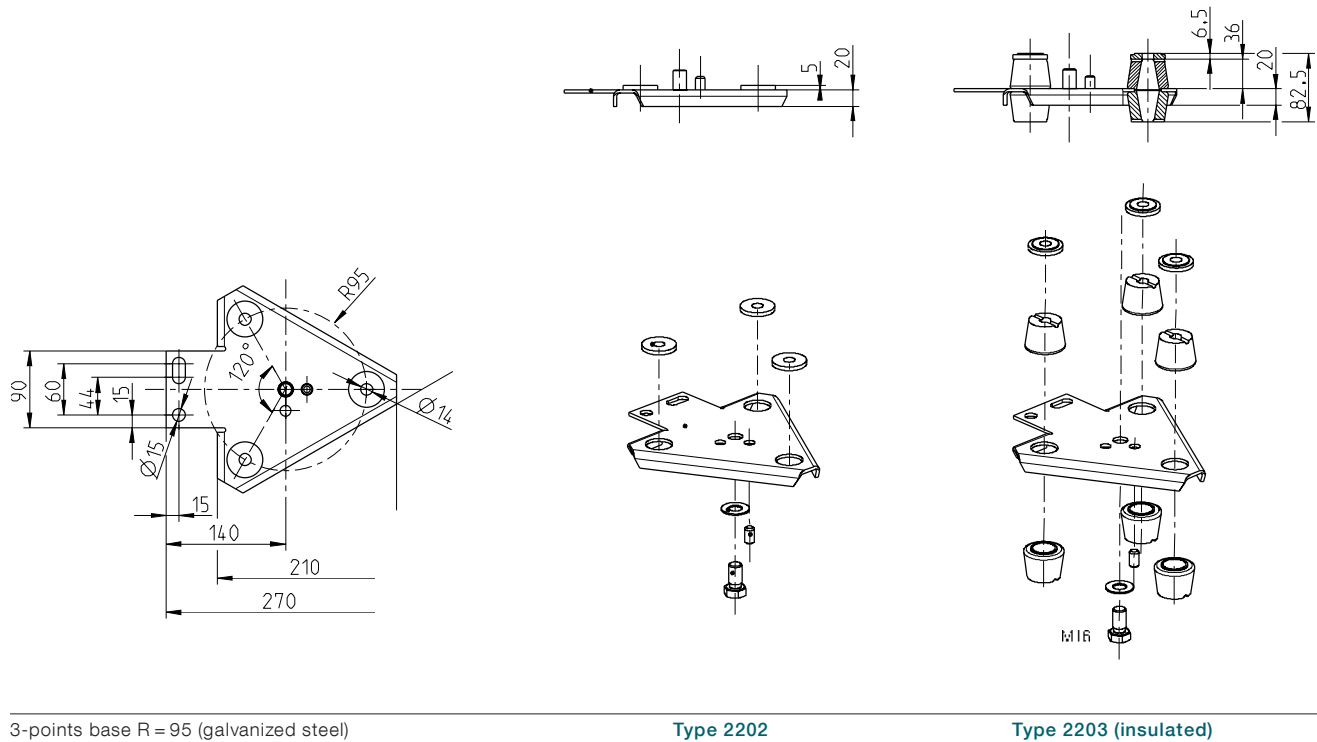
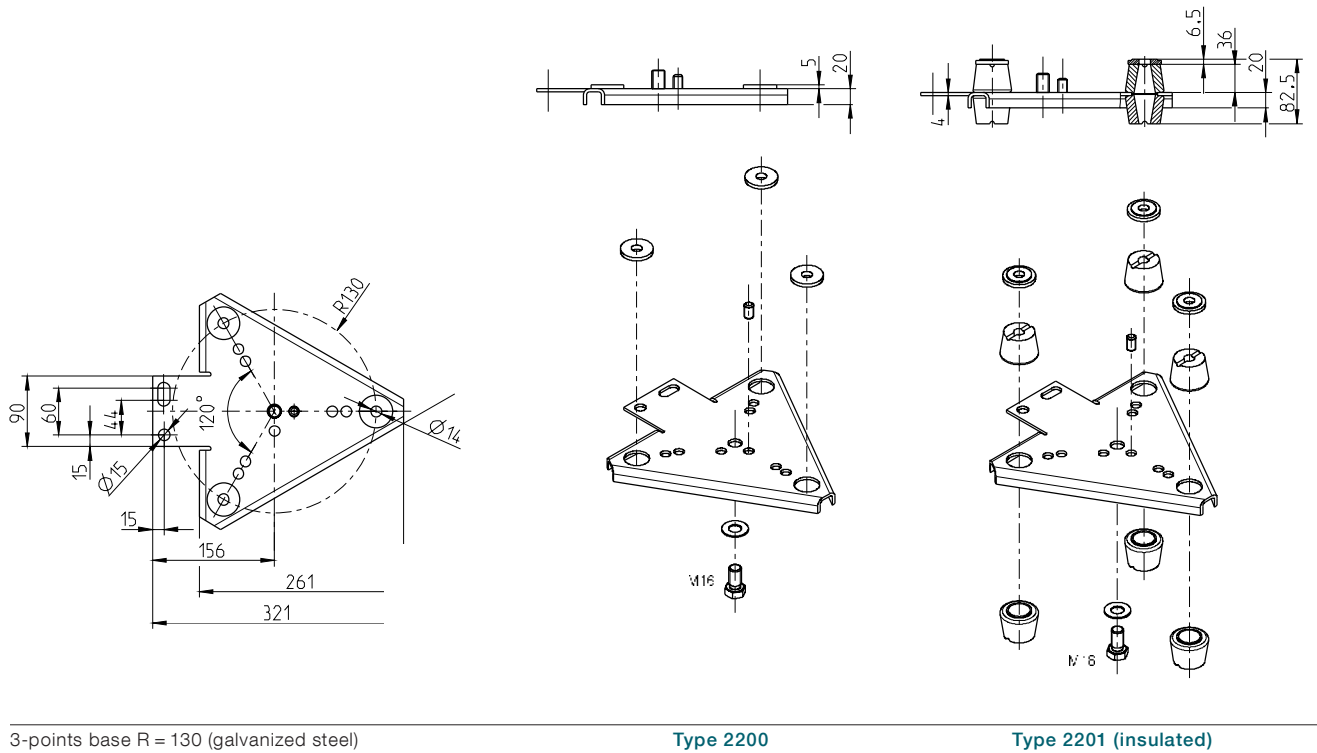
Type 1220 Stud \varnothing 30 x 80 (stainless steel)



Type 1209 Line terminal (bracket: aluminium alloy, other parts: stainless steel)

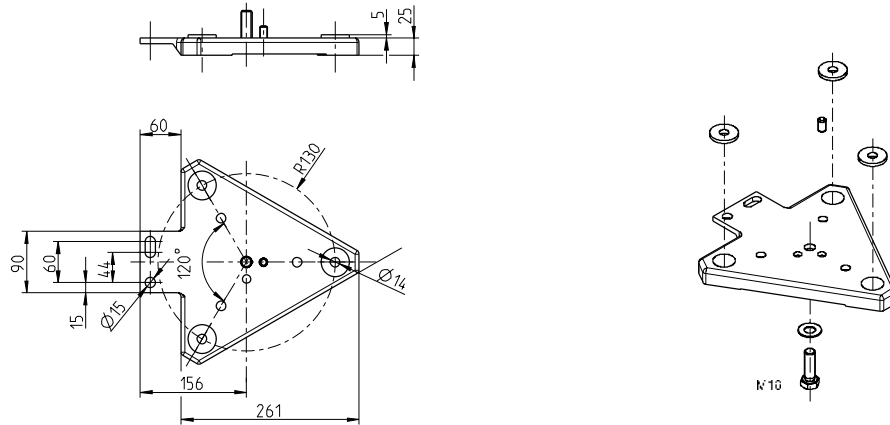
Common Bottom Accessories (optional)

Dimensions (mm)

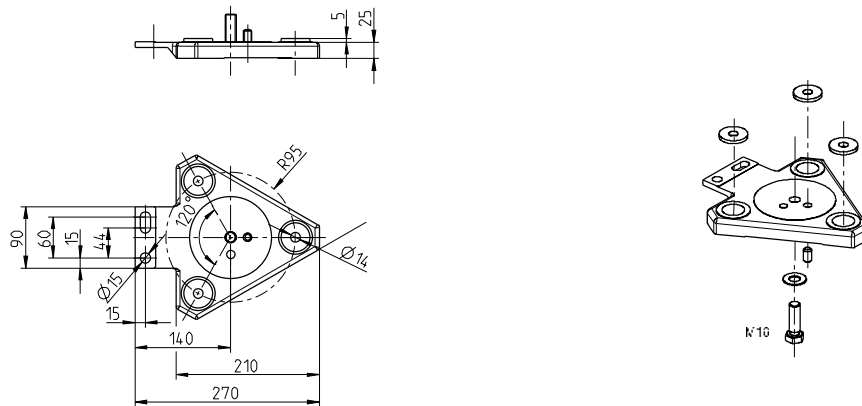


Common Bottom Accessories (optional)

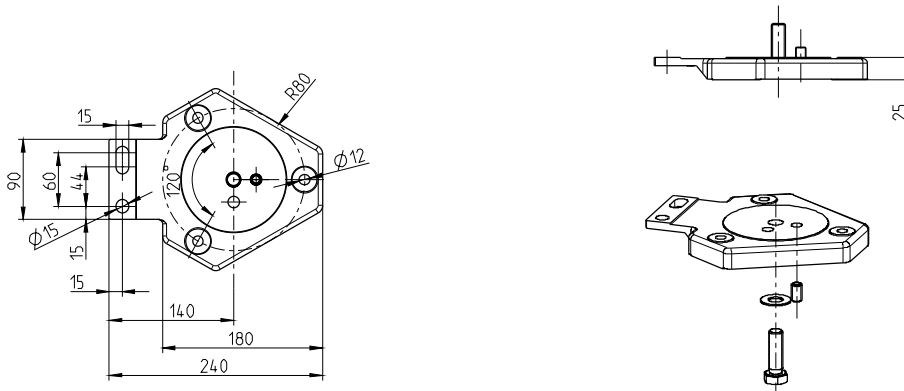
Dimensions (mm)



Type 2204 3-points reinforced base R = 130 – for railway application (aluminium alloy)



Type 2206 3-points reinforced base R = 95 – for railway application (aluminium alloy)



Type 2225 3-points reinforced base R = 80 – for all application (aluminium alloy)

For further information please contact:

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For detailed information regarding the dimensioning of our products see the following ABB documents:

- Application guidelines
Overvoltage protection
Metal oxide surge arresters in medium voltage systems
- Application guidelines
Overvoltage protection
Metal oxide surge arresters in railway facilities

For pdf or print version please send E-mail to:
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