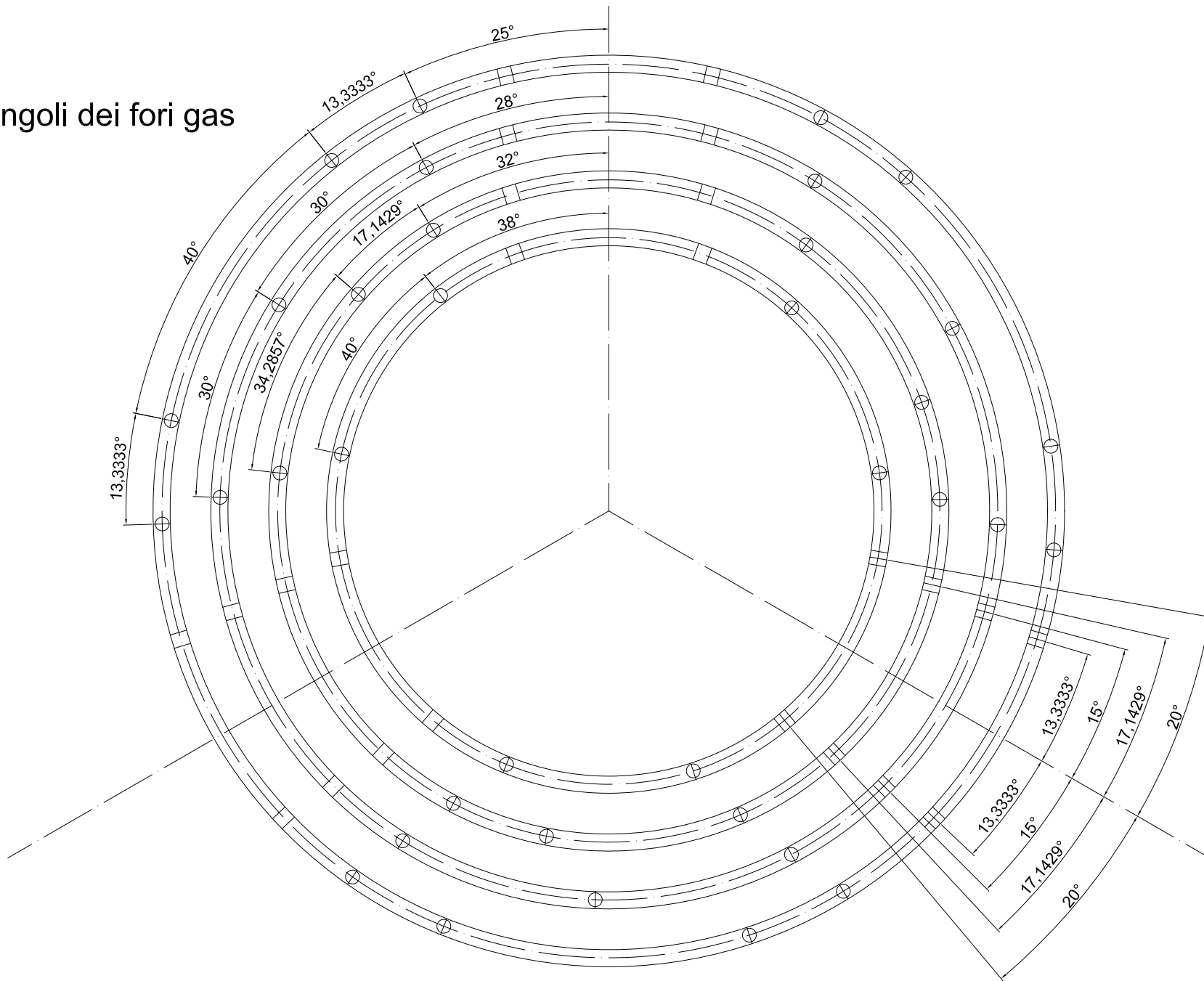


Raggi interni dei singoli piani

Angoli dei fori gas



Angoli dei fori di spina

Dimensioni ridotte degli stampi dell'anodo:

|          | Raggio  |
|----------|---------|
| -Layer_1 | 138,78  |
| -Layer_2 | 163,735 |
| -Layer_3 | 188,70  |
| -Layer_4 | 213.655 |

Gli stampi degli anodi assumono dimensione ridotta per effetto della dilatazione termica degli stessi in fase di realizzazione degli anodi embeded.

## LAYER1

| GEM Elongation due to tensioning |                       |
|----------------------------------|-----------------------|
| Young's Moudulus                 | 4,80 Gpa              |
| Thickness GEM                    | 0,06 mm               |
| Inner Radius G1                  | 133,00 mm             |
| Inner Radius G2                  | 135,00 mm             |
| Inner Radius G3                  | 137,00 mm             |
| Area G1                          | 50,14 mm <sup>2</sup> |
| Area G2                          | 50,89 mm <sup>2</sup> |
| Area G3                          | 51,65 mm <sup>2</sup> |
| Tension                          | 1000,00 N             |
| L_active_area                    | 700,00 mm             |
| Elongation                       | 0,955 mm              |

| Anode Elongation due to temperature |           |
|-------------------------------------|-----------|
| alfaT                               | 23 ppm*°C |
| DeltaT                              | 70 °C     |
| L                                   | 745 mm    |
| DeltaL                              | 1,199 mm  |

| Anode reduction due to tensioning       |           |
|---|-----------|
| Static stifness<br>(Carbon Fiber 0,1mm) | 16,728 mm |
| DeltaL                                  | 0,060 mm  |

Difference of the two interaxis  
Gems 0,18

Catode  
1,14

| Final mould pinholes interaxis |           |  |
|--------------------------------|-----------|--|
| Anode                          | 745,00 mm |  |
| G3                             | 745,18 mm |  |
| G2                             | 745,18 mm |  |
| G1                             | 745,18 mm |  |
| Cathode                        | 746,14 mm |  |

Interaxis after tensioning, temperature and compression  
746,14 (temperature - anode reduction)  
746,14 (GEM elongation)  
746,14 (GEM elongation)  
746,14 (GEM elongation)  
746,14

## LAYER2

| GEM Elongation due to tensioning |                       |
|----------------------------------|-----------------------|
| Young's Moudulus                 | 4,80 Gpa              |
| Thickness GEM                    | 0,06 mm               |
| Inner Radius G1                  | 158,00 mm             |
| Inner Radius G2                  | 160,00 mm             |
| Inner Radius G3                  | 162,00 mm             |
| Area G1                          | 59,56 mm <sup>2</sup> |
| Area G2                          | 60,32 mm <sup>2</sup> |
| Area G3                          | 61,07 mm <sup>2</sup> |
| Tension                          | 1000,00 N             |
| L_active_area                    | 700,00 mm             |
| Elongation                       | 0,806 mm              |

| Anode Elongation due to temperature |           |
|-------------------------------------|-----------|
| alfaT                               | 23 ppm*°C |
| DeltaT                              | 70 °C     |
| L                                   | 745 mm    |
| DeltaL                              | 1,199 mm  |

| Anode reduction due to tensioning       |           |
|---|-----------|
| Static stifness<br>(Carbon Fiber 0,1mm) | 19,778 mm |
| DeltaL                                  | 0,051 mm  |

Gems  
Difference of the two interaxis 0,34

Catode  
1,15

| Final mould pinholes interaxis |           |  |
|--------------------------------|-----------|--|
| Anode                          | 745,00 mm |  |
| G3                             | 745,34 mm |  |
| G2                             | 745,34 mm |  |
| G1                             | 745,34 mm |  |
| Cathode                        | 746,15 mm |  |

Interaxis after tensioning, temperature and compression  
 746,15 (temperature - anode reduction)  
 746,15 (GEM elongation)  
 746,15 (GEM elongation)  
 746,15 (GEM elongation)  
 746,15

### LAYER3

| GEM Elongation due to tensioning |                       |
|----------------------------------|-----------------------|
| Young's Modulus                  | 4,80 Gpa              |
| Thickness GEM                    | 0,06 mm               |
| Inner Radius G1                  | 183,00 mm             |
| Inner Radius G2                  | 185,00 mm             |
| Inner Radius G3                  | 187,00 mm             |
| Area G1                          | 68,99 mm <sup>2</sup> |
| Area G2                          | 69,74 mm <sup>2</sup> |
| Area G3                          | 70,50 mm <sup>2</sup> |
| Tension                          | 1000,00 N             |
| L_active_area                    | 700,00 mm             |
| Elongation                       | 0,697 mm              |

| Anode Elongation due to temperature |           |
|-------------------------------------|-----------|
| alfaT                               | 23 ppm*°C |
| DeltaT                              | 70 °C     |
| L                                   | 745 mm    |
| DeltaL                              | 1,199 mm  |

| Anode reduction due to tensioning        |          |
|--|----------|
| Static stiffness<br>(Carbon Fiber 0,1mm) | 22,79 mm |
| DeltaL                                   | 0,044 mm |

Difference of the two interaxis  
Gems 0,46

Catode  
1,16

Interaxis after tensioning, temperature and compression

| Final mould pinholes interaxis |           |  |
|--------------------------------|-----------|--|
| Anode                          | 745,00 mm |  |
| G3                             | 745,46 mm |  |
| G2                             | 745,46 mm |  |
| G1                             | 745,46 mm |  |
| Cathode                        | 746,16 mm |  |

746,16 (temperature - anode reduction)  
746,16 (GEM elongation)  
746,16 (GEM elongation)  
746,16 (GEM elongation)  
746,16

#### LAYER4

| GEM Elongation due to tensioning |                       |
|----------------------------------|-----------------------|
| Young's Moudulus                 | 4,80 Gpa              |
| Thickness GEM                    | 0,06 mm               |
| Inner Radius G1                  | 208,00 mm             |
| Inner Radius G2                  | 210,00 mm             |
| Inner Radius G3                  | 212,00 mm             |
| Area G1                          | 78,41 mm <sup>2</sup> |
| Area G2                          | 79,17 mm <sup>2</sup> |
| Area G3                          | 79,92 mm <sup>2</sup> |
| Tension                          | 1000,00 N             |
| L_active_area                    | 700,00 mm             |
| Elongation                       | 0,614 mm              |

| Anode Elongation due to temperature |           |
|-------------------------------------|-----------|
| alfaT                               | 23 ppm*°C |
| DeltaT                              | 70 °C     |
| L                                   | 745 mm    |
| DeltaL                              | 1,199 mm  |

| Anode reduction due to tensioning        |          |
|--|----------|
| Static stiffness<br>(Carbon Fiber 0,1mm) | 25,81 mm |
| DeltaL                                   | 0,039 mm |

Difference of the two interaxis  
Gems 0,55

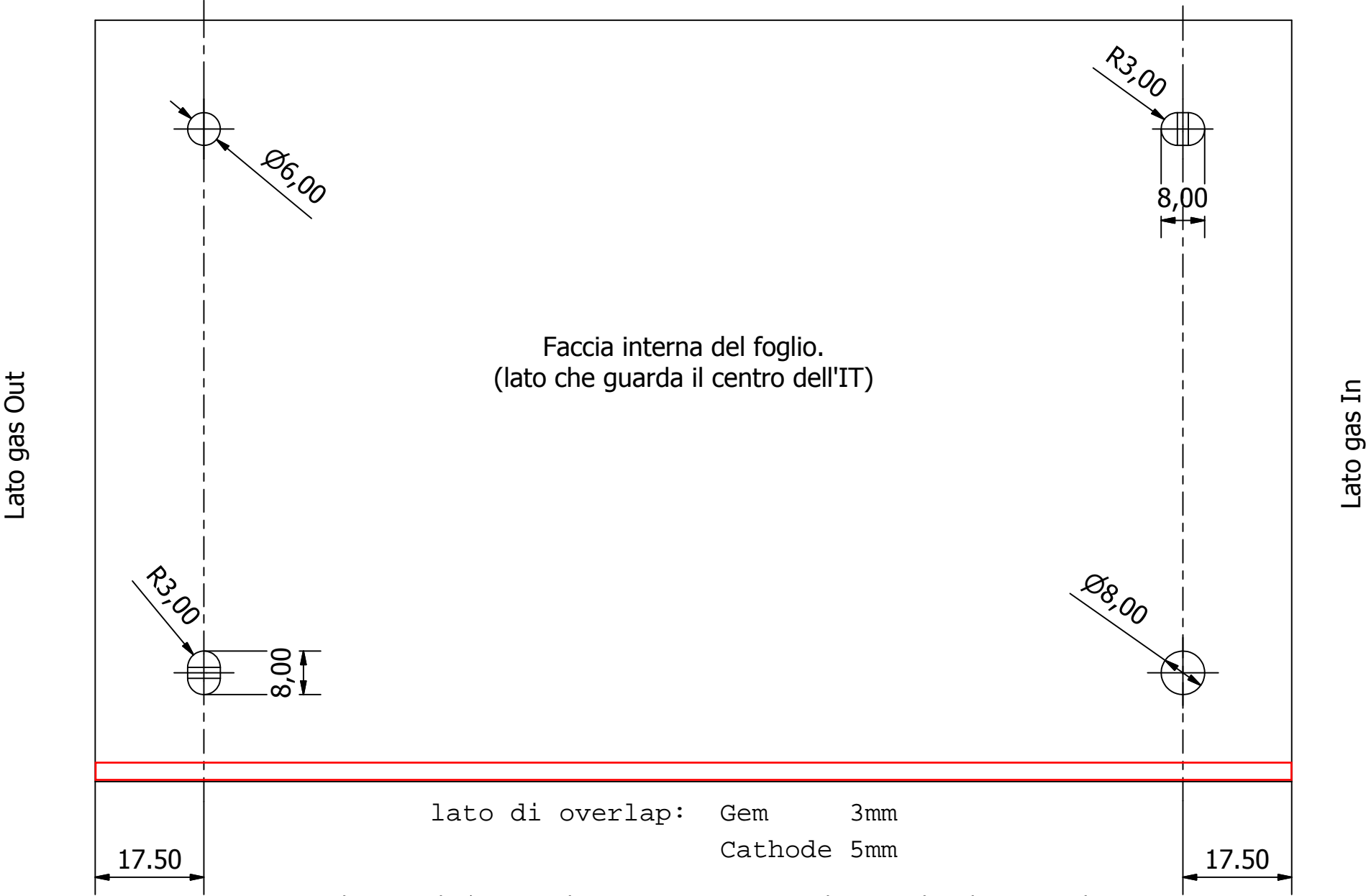
Catode  
1,16

Final mould pinholes interaxis

|         |           |
|---------|-----------|
| Anode   | 745,00 mm |
| G3      | 745,55 mm |
| G2      | 745,55 mm |
| G1      | 745,55 mm |
| Cathode | 746,16 mm |

Interaxis after tensioning, temperature and compression  
746,16 (temperature - anode reduction)  
746,16 (GEM elongation)  
746,16 (GEM elongation)  
746,16 (GEM elongation)  
746,16

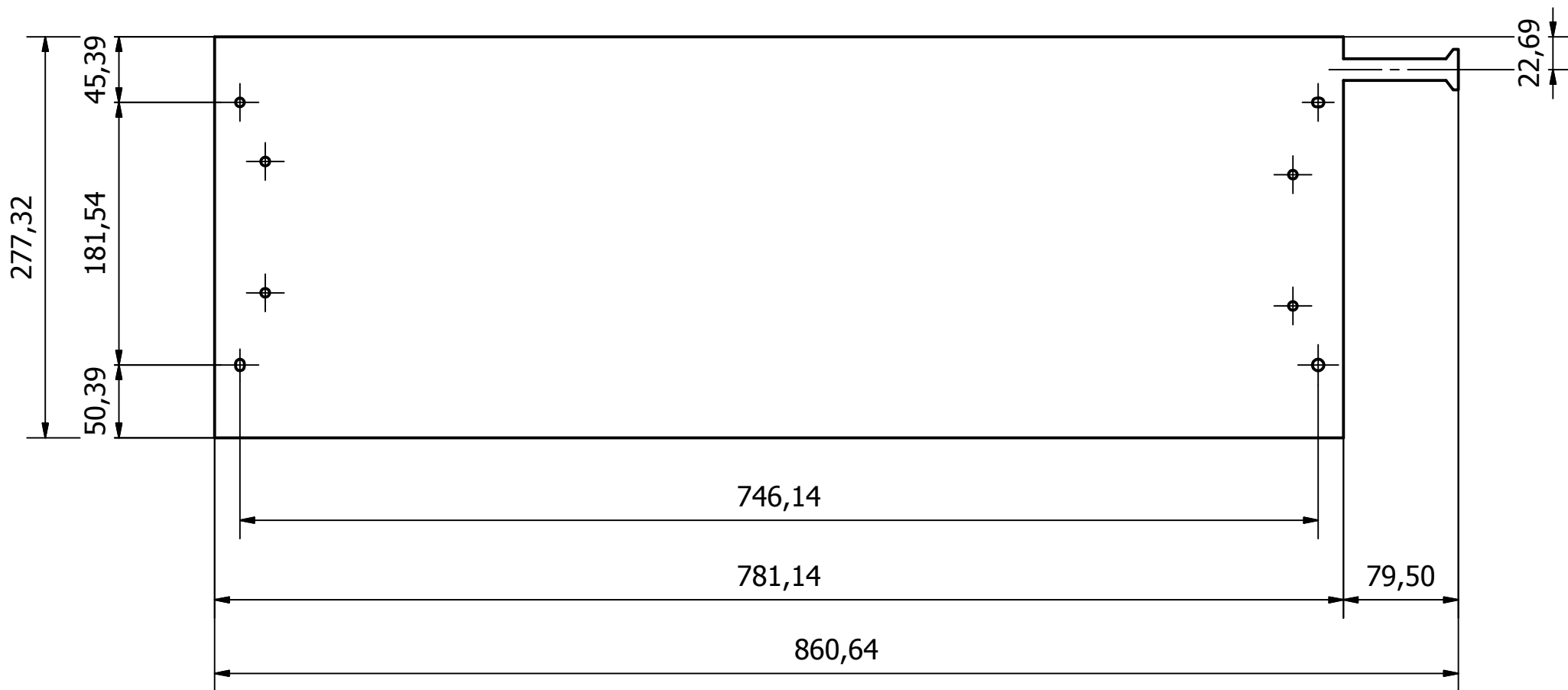
Valori comuni per tutti i fogli.



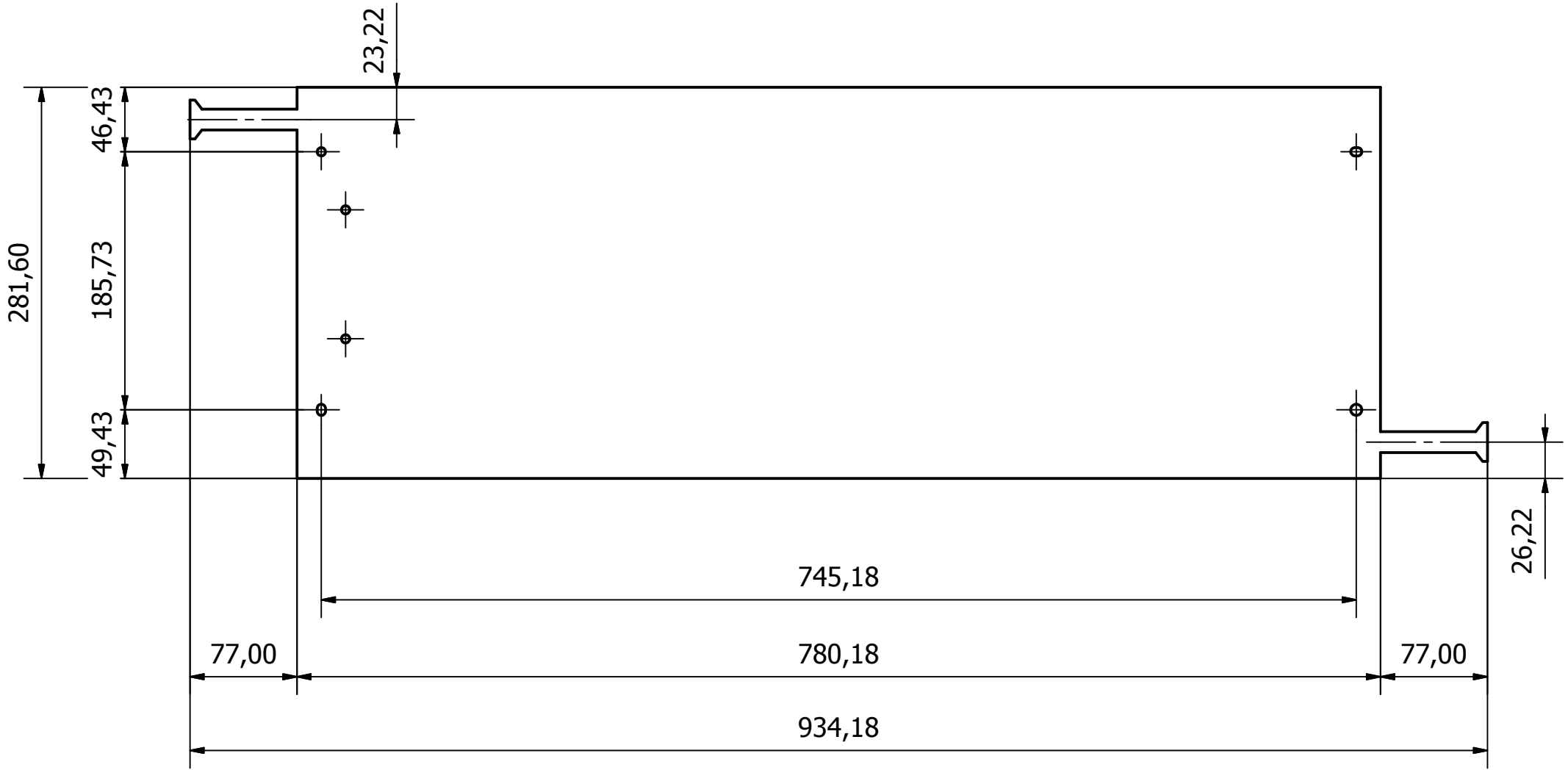
Per gli anodi è previsto un gap tra i fogli di 200 micron



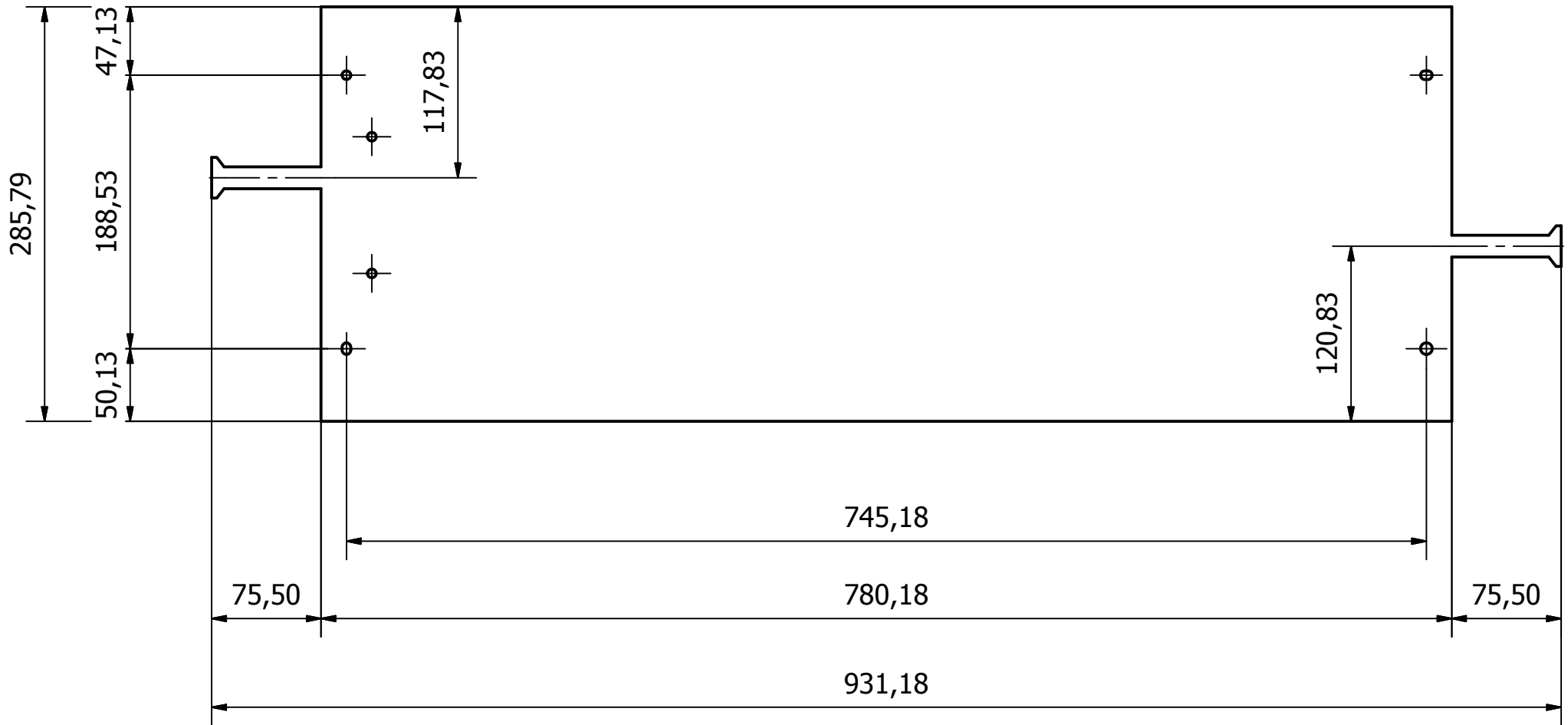
|         | Raggio                         | Larghezza foglio | interasse spine trasv. | Lunghezza foglio | interasse spine long. | lunghezza codina | Lunghezza totale |
|---------|--------------------------------|------------------|------------------------|------------------|-----------------------|------------------|------------------|
| Layer 1 |                                |                  |                        |                  |                       |                  |                  |
| Cathode | 130                            | 277,32           | 181,54                 | 781,14           | 746,14                | 79,5             | 860,64           |
| Gem 1   | 133                            | 281,6            | 185,73                 | 780,18           | 745,18                | 77               | 934,18           |
| Gem 2   | 135                            | 285,79           | 188,53                 | 780,18           | 745,18                | 75,5             | 931,18           |
| Gem 3   | 137                            | 289,98           | 191,32                 | 780,18           | 745,18                | 74               | 928,18           |
| Anode   | * ( 138,78) 139                | 290,74           | 193,96                 | 780              | 745                   | 65               | 910              |
| Layer 2 |                                |                  |                        |                  |                       |                  |                  |
| Cathode | 155                            | 329,68           | 231,91                 | 781,15           | 746,15                | 79,5             | 860,65           |
| Gem 1   | 158                            | 333,96           | 236,4                  | 780,34           | 745,34                | 77               | 934,34           |
| Gem 2   | 160                            | 338,15           | 239,39                 | 780,34           | 745,34                | 75,5             | 931,34           |
| Gem 3   | 162                            | 342,34           | 242,38                 | 780,34           | 745,34                | 74               | 928,34           |
| Anode   | * (163,735) 164                | 343,01           | 245,15                 | 780              | 745                   | 65               | 910              |
| Layer 3 |                                |                  |                        |                  |                       |                  |                  |
| Cathode | 180                            | 382,04           | 282,78                 | 781,16           | 746,16                | 79,5             | 860,66           |
| Gem 1   | 183                            | 386,32           | 287,49                 | 780,46           | 745,46                | 77               | 934,46           |
| Gem 2   | 185                            | 390,51           | 290,63                 | 780,46           | 745,46                | 75,5             | 931,46           |
| Gem 3   | 187                            | 394,7            | 293,77                 | 780,46           | 745,46                | 74               | 928,46           |
| Anode   | * (188,7) 189                  | 395,29           | 296,62                 | 780              | 745                   | 65               | 910              |
| Layer 4 |                                |                  |                        |                  |                       |                  |                  |
| Cathode | 205                            | 434,4            | 333,97                 | 781,16           | 746,16                | 79,5             | 860,66           |
| Gem 1   | 208                            | 438,68           | 338,86                 | 780,55           | 745,55                | 77               | 934,55           |
| Gem 2   | 210                            | 442,87           | 342,12                 | 780,55           | 745,55                | 75,5             | 931,55           |
| Gem 3   | 212                            | 447,06           | 345,38                 | 780,55           | 745,55                | 74               | 928,55           |
| Anode   | * (213,655) 214                | 447,57           | 348,27                 | 780              | 745                   | 65               | 910              |
|         | *( ) raggio reale degli stampi |                  |                        |                  |                       |                  |                  |



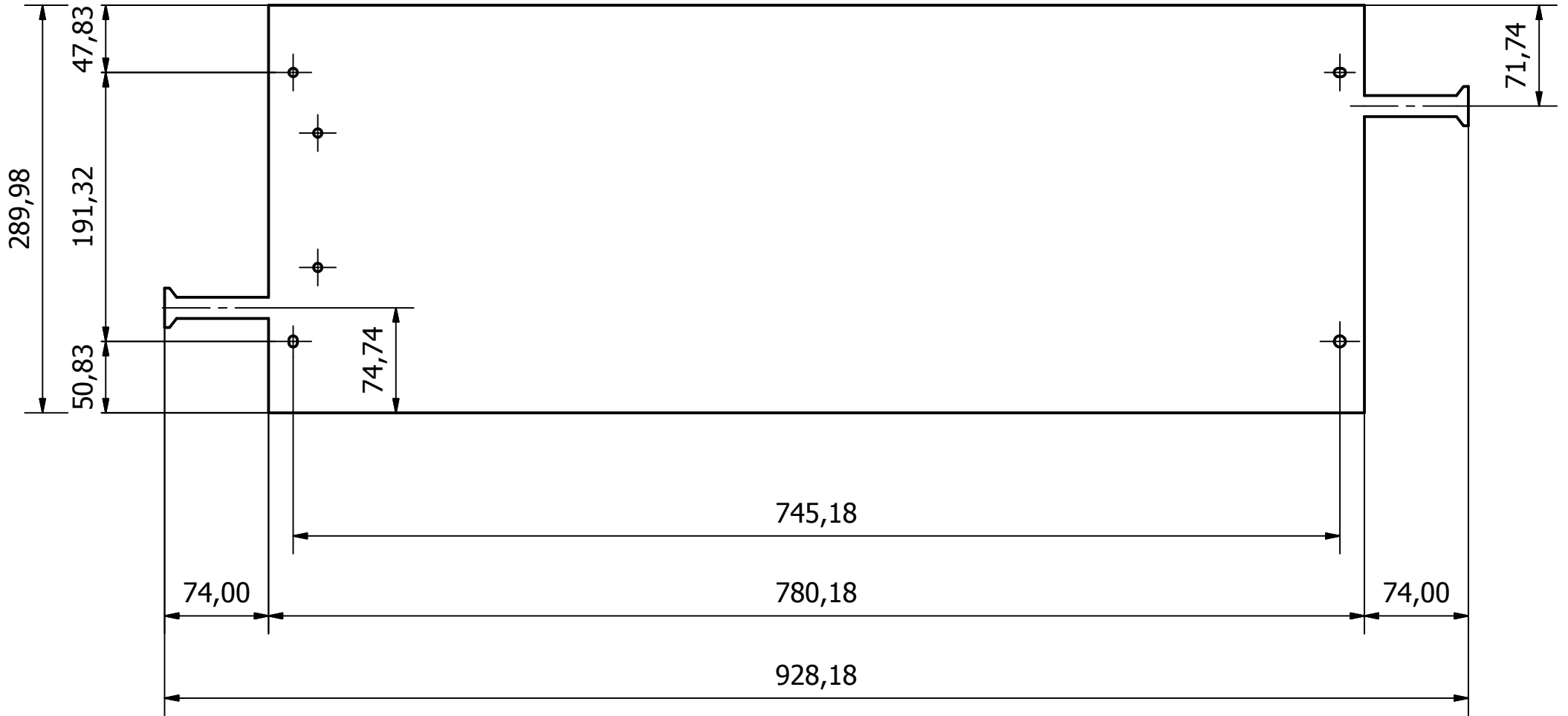
planar\_cathode\_L1

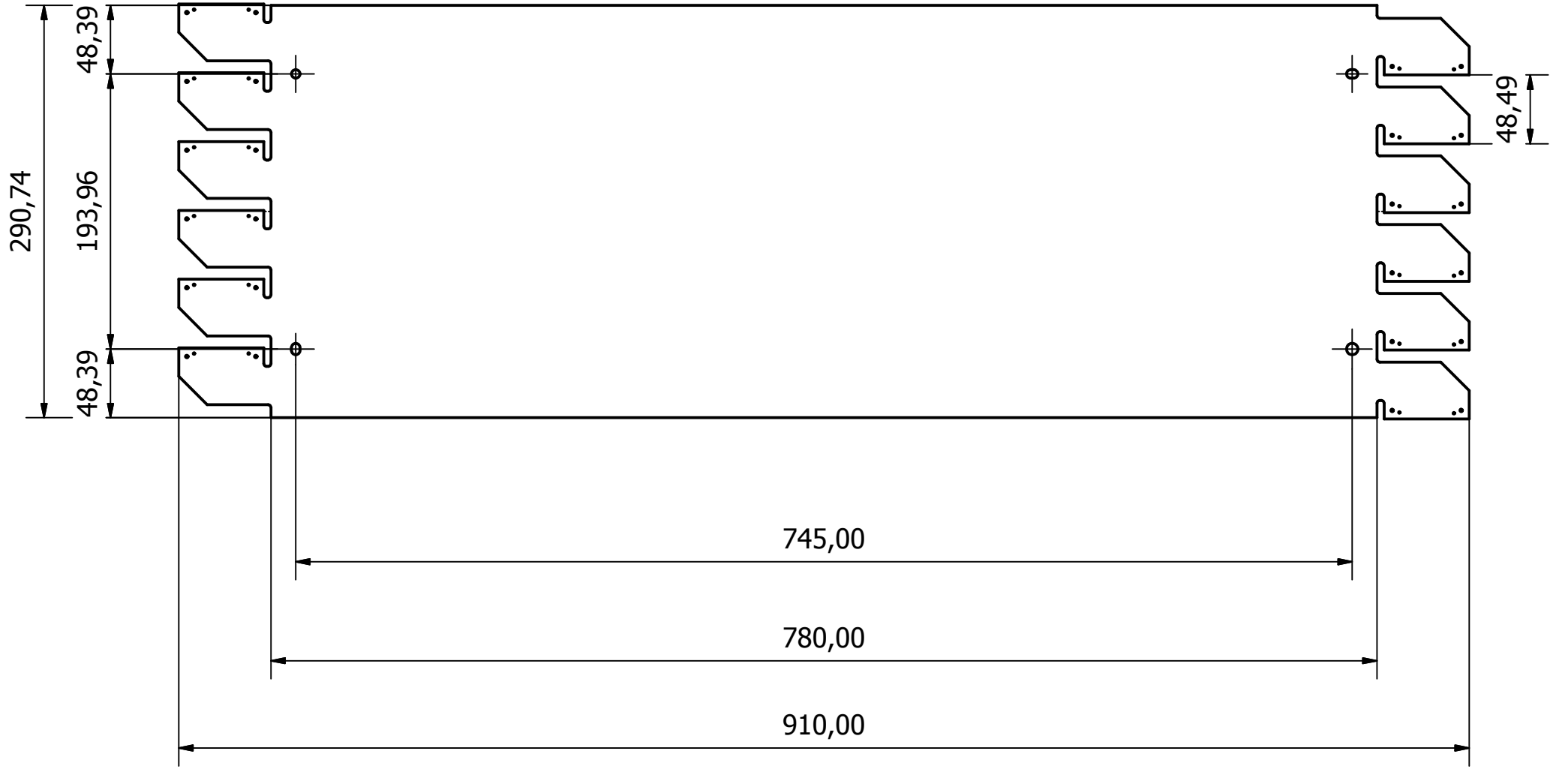


planar\_gem1\_L1

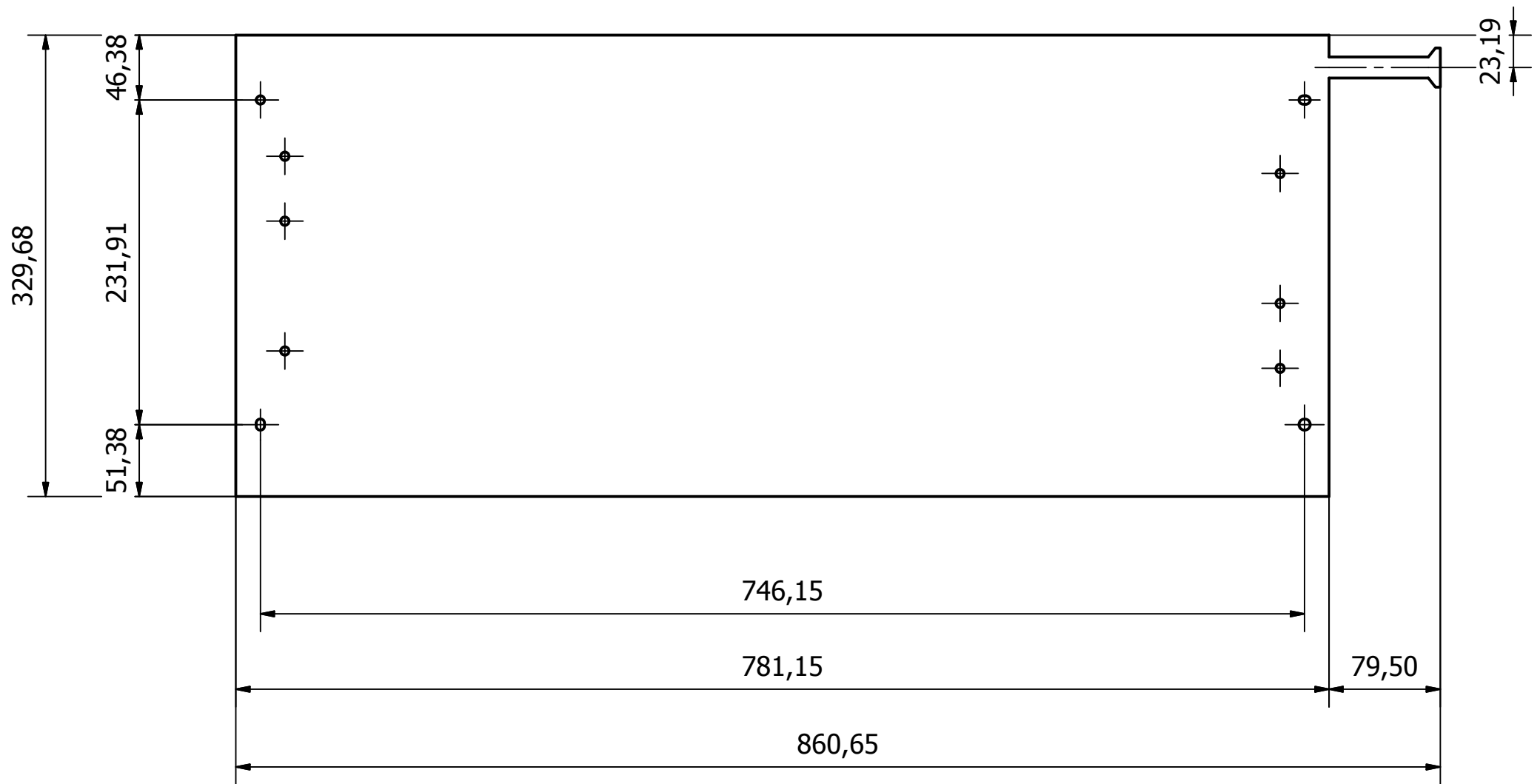


planar\_gem2\_L1

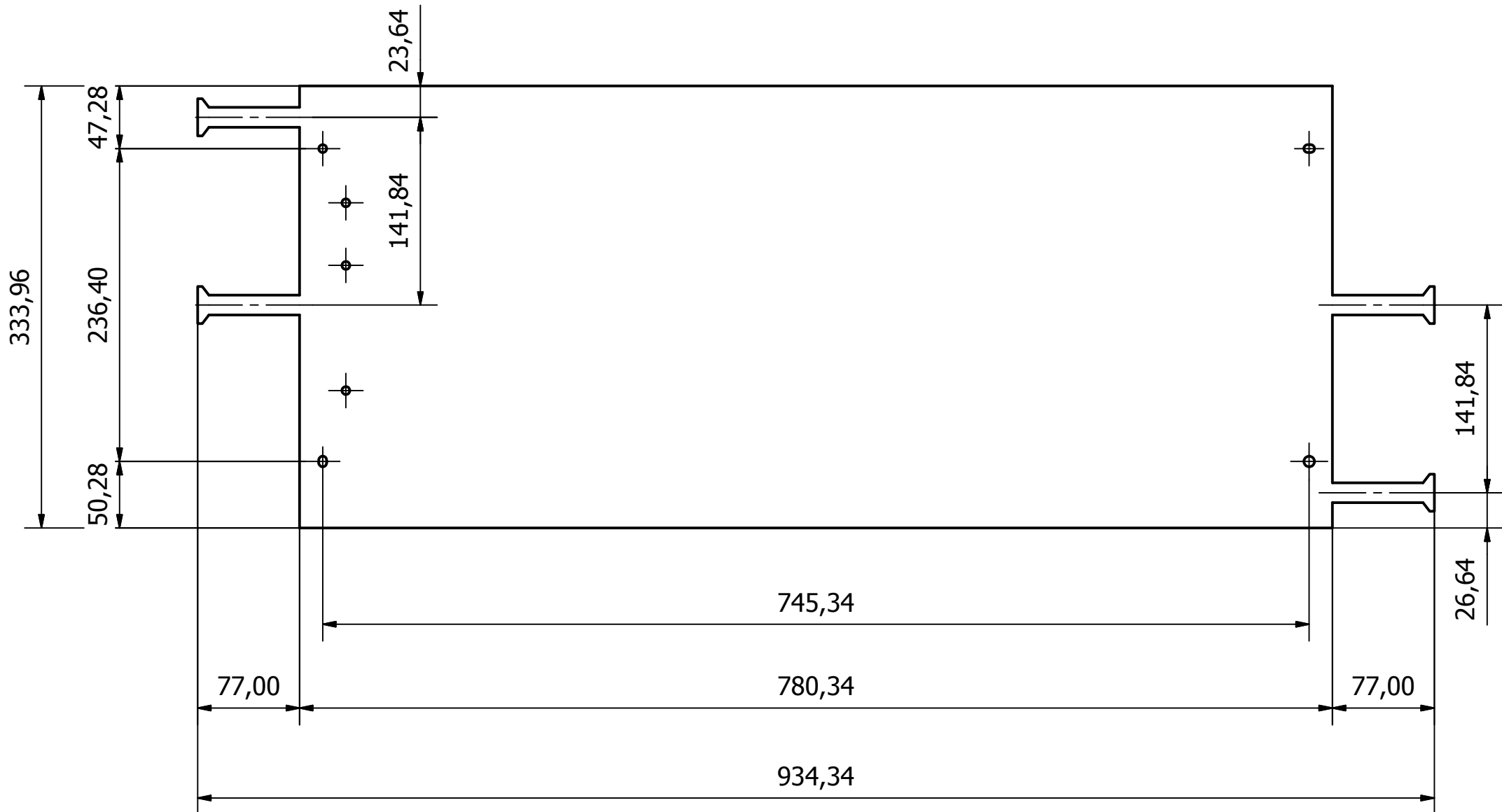




cold\_Anode\_L1

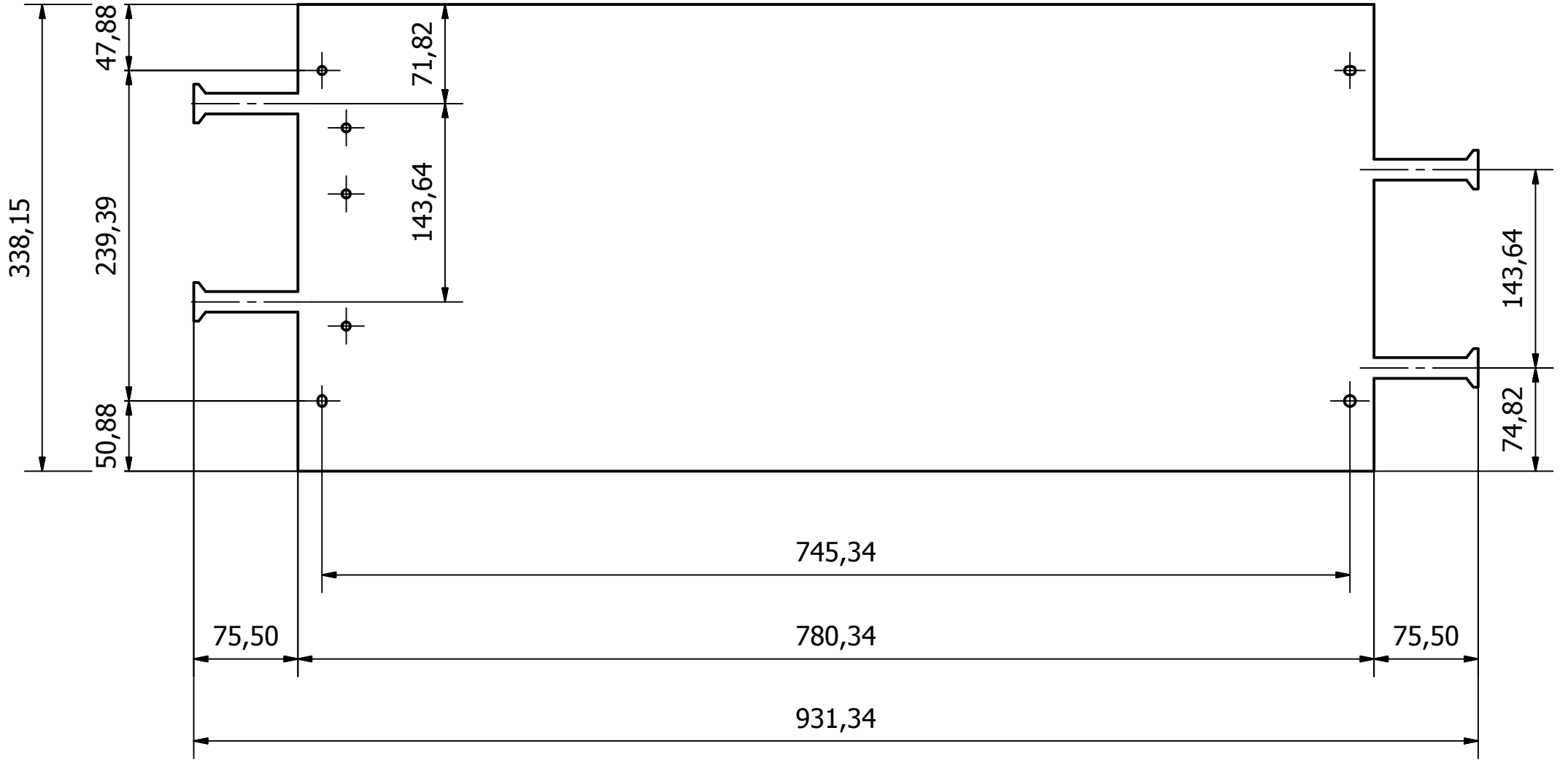


planar\_cathode\_L2

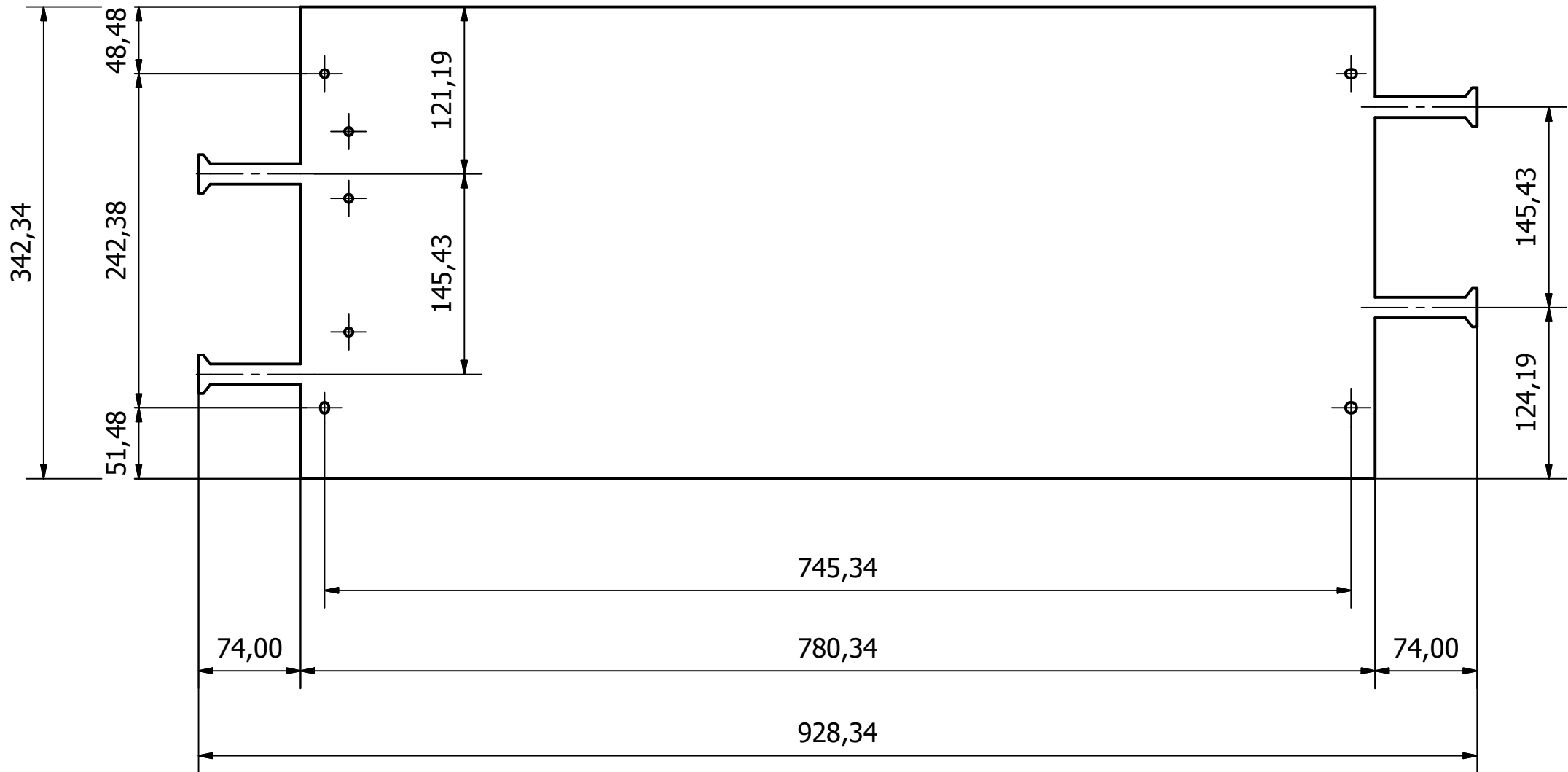


planar\_gem1\_L2

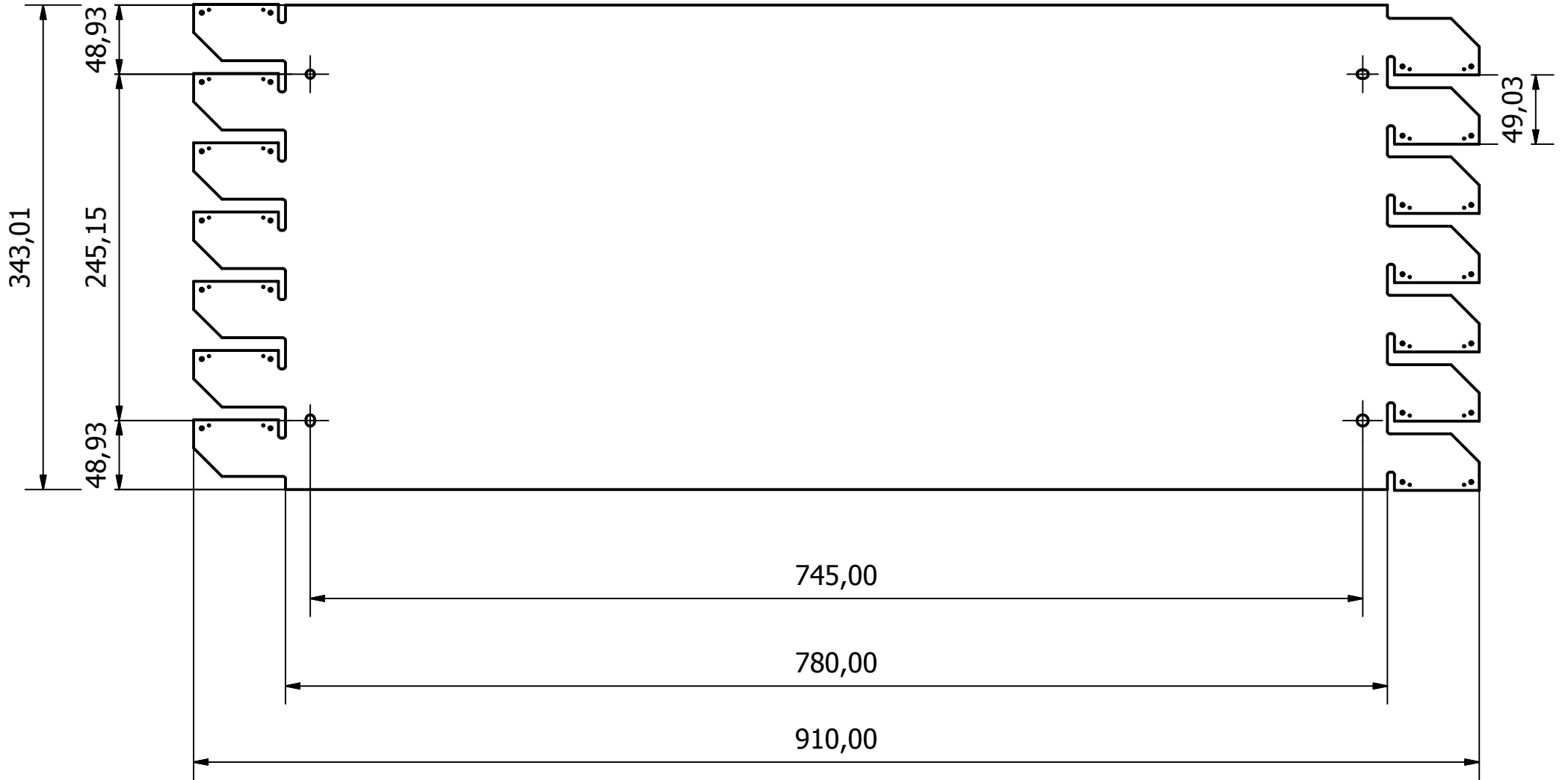




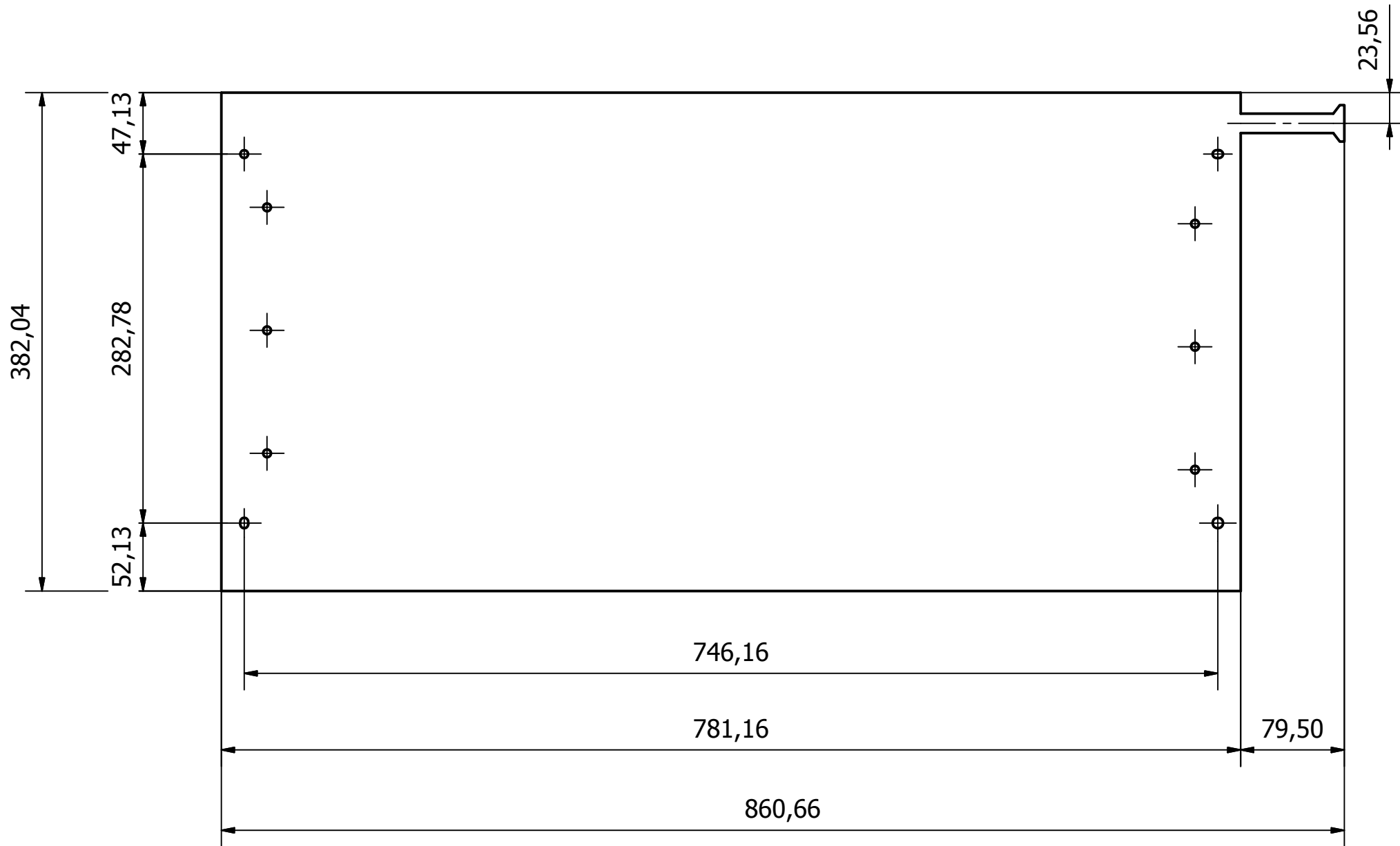
planar\_gem2\_L2



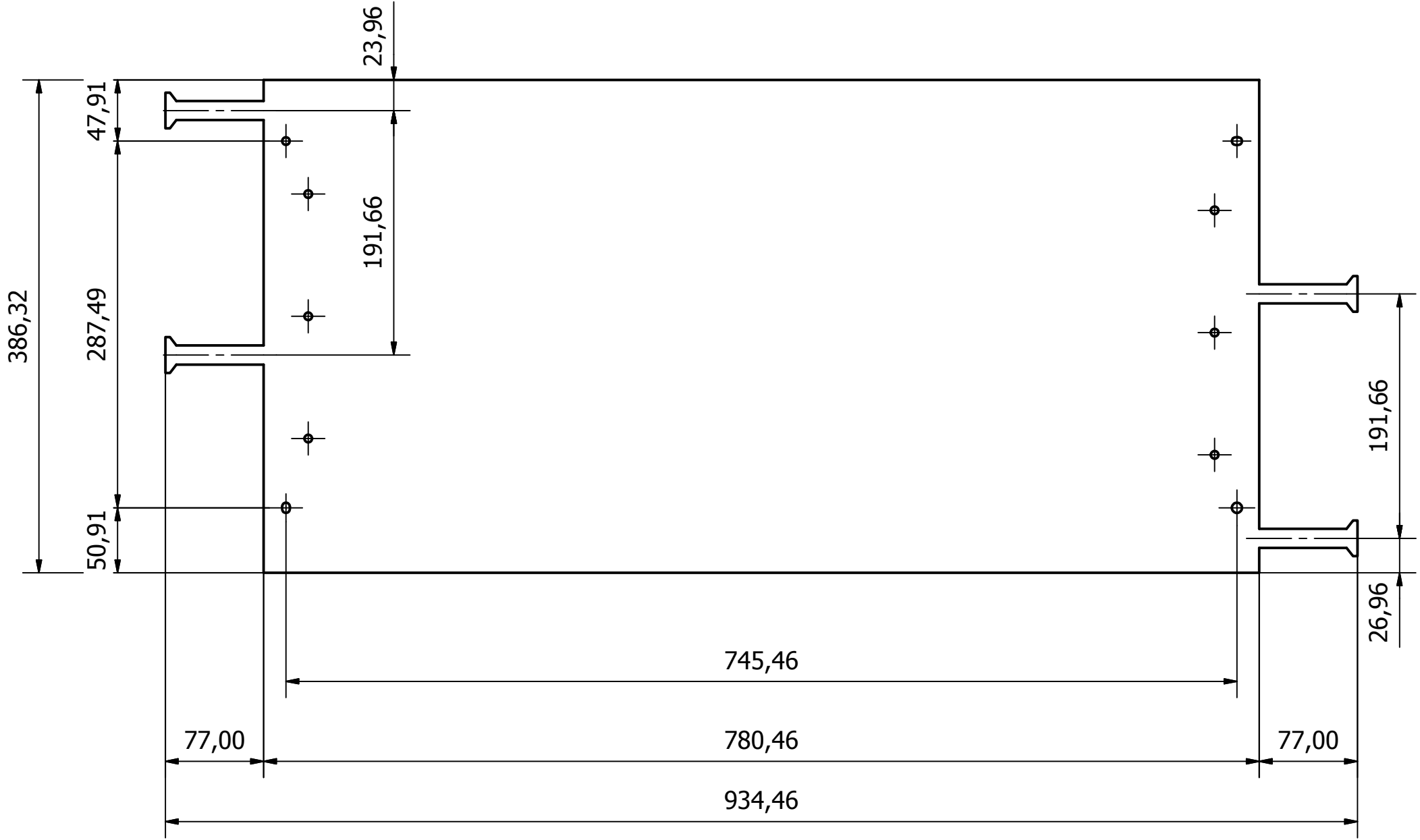
planar\_gem3\_L2



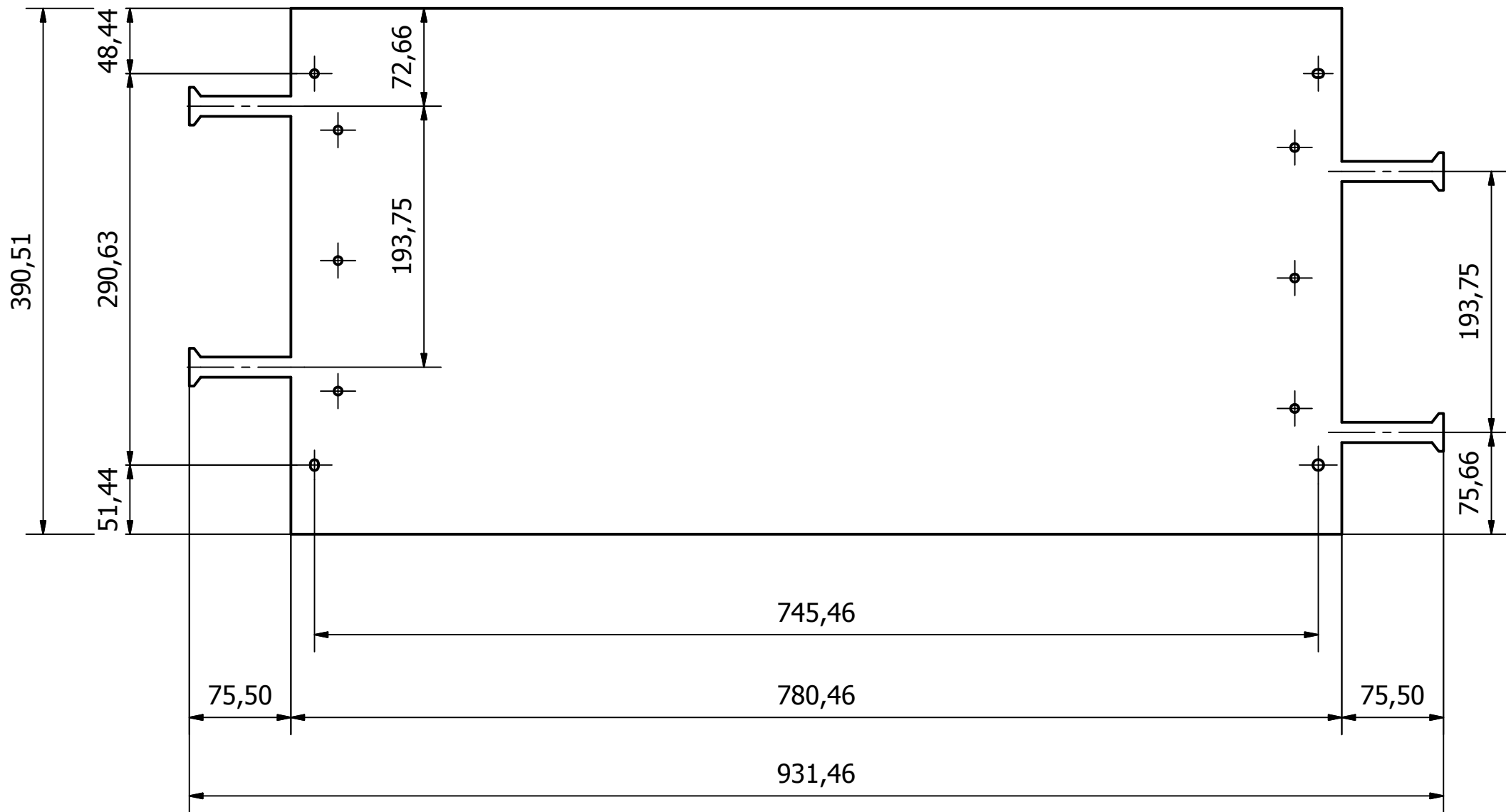
cold\_Anode\_L2



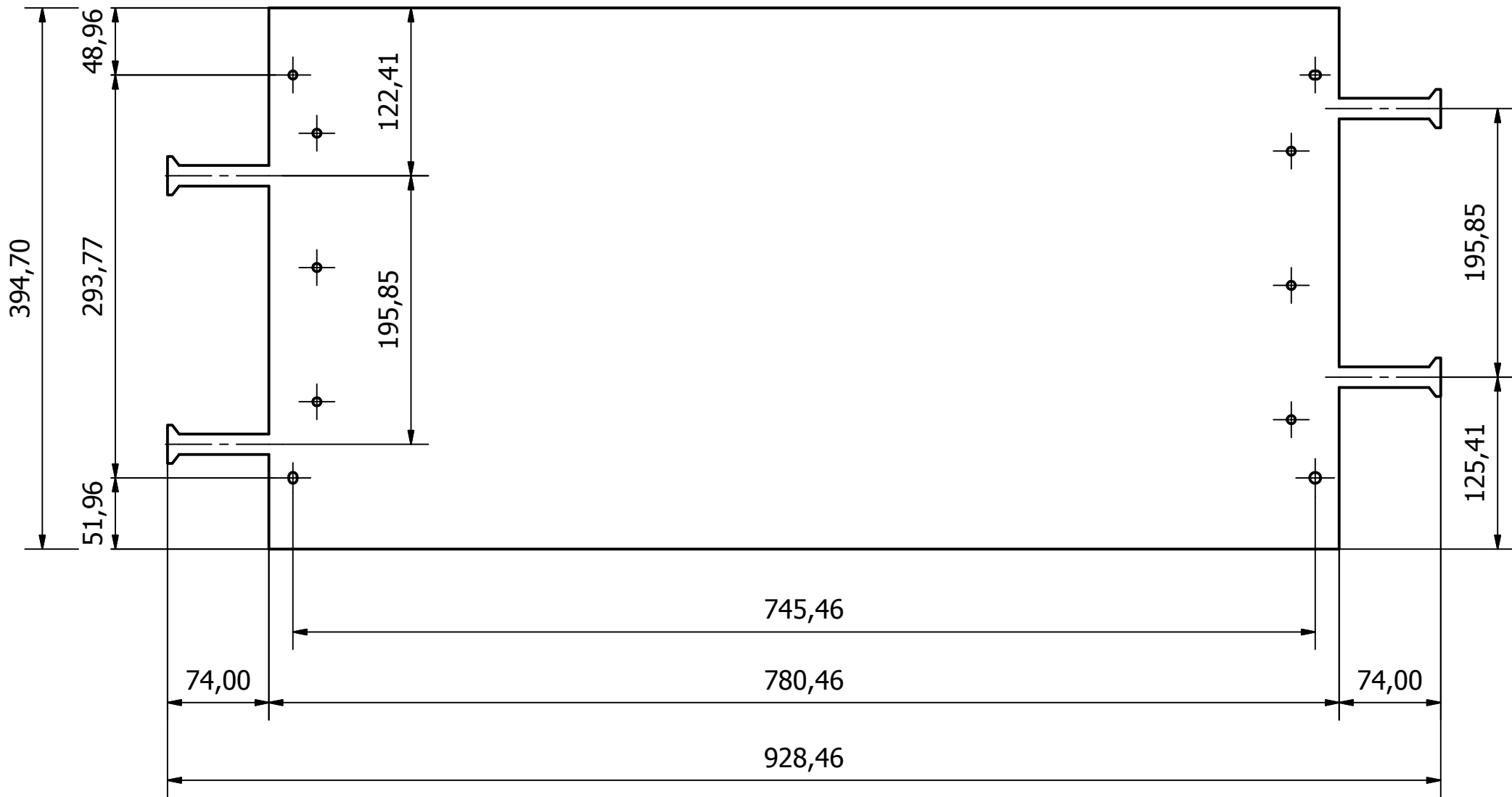
planar\_cathode\_L3



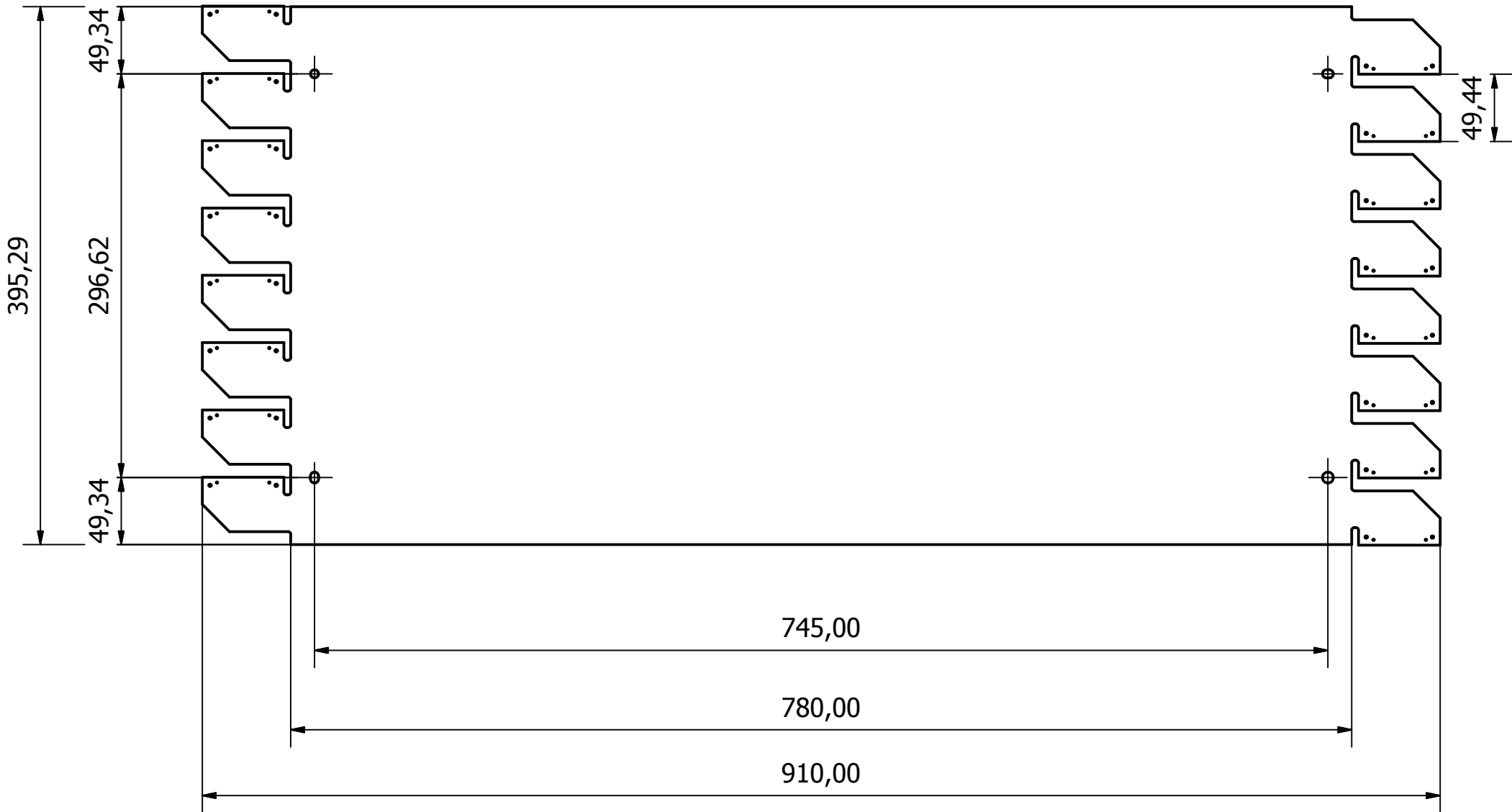
planar\_gem1\_L3



planar\_gem2\_L3

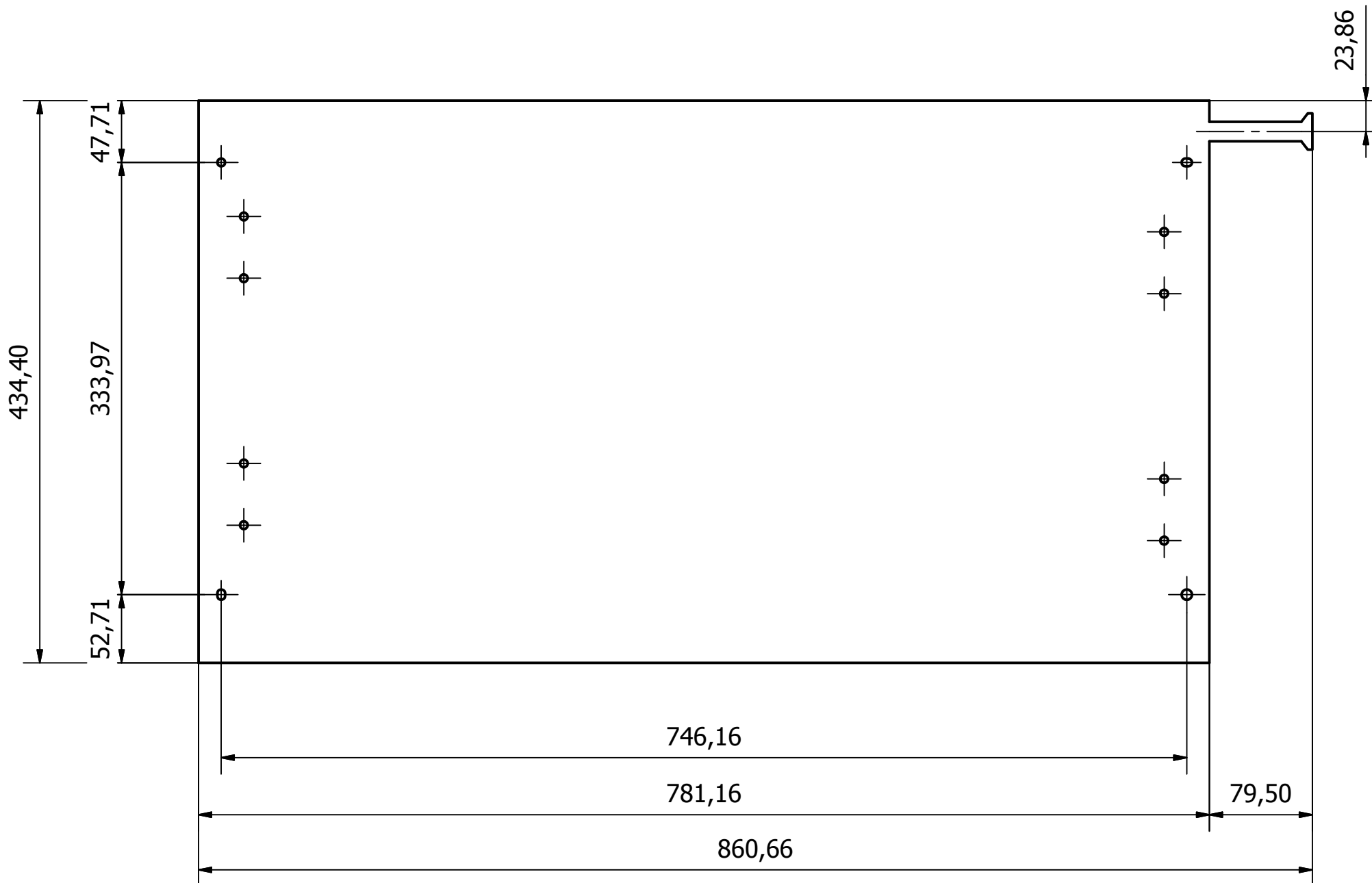


planar\_gem3\_L3

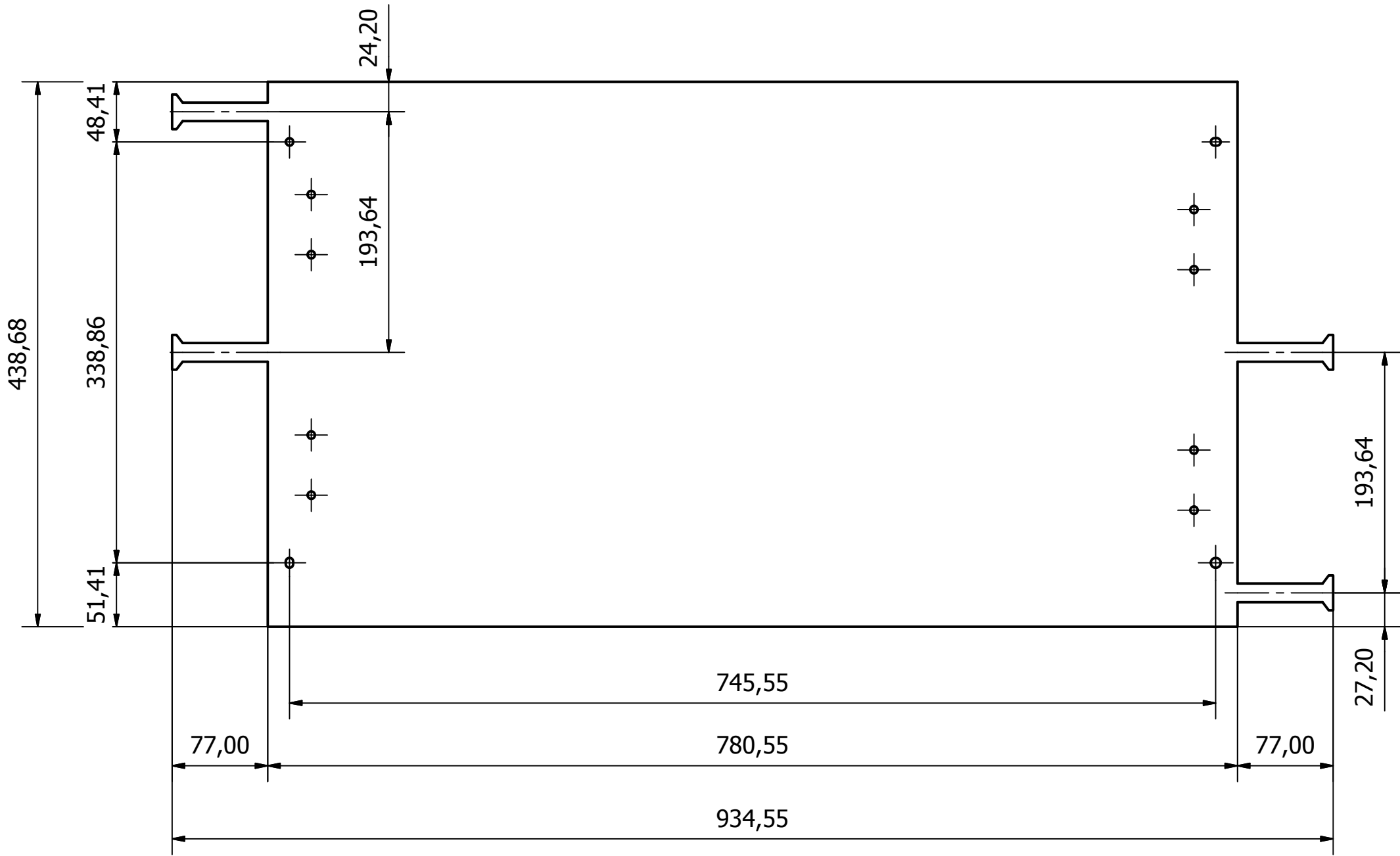


cold\_Anode\_L3

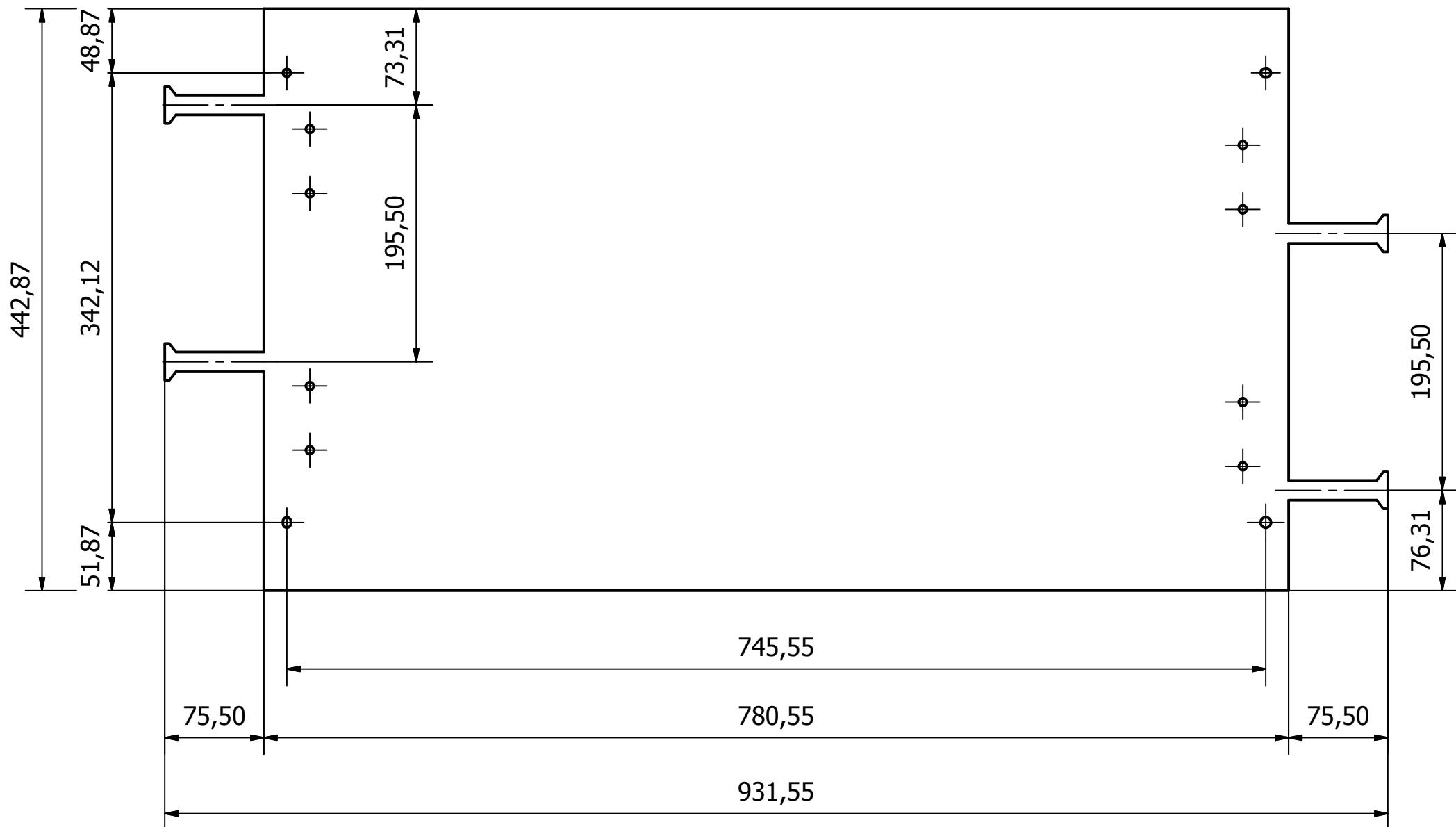




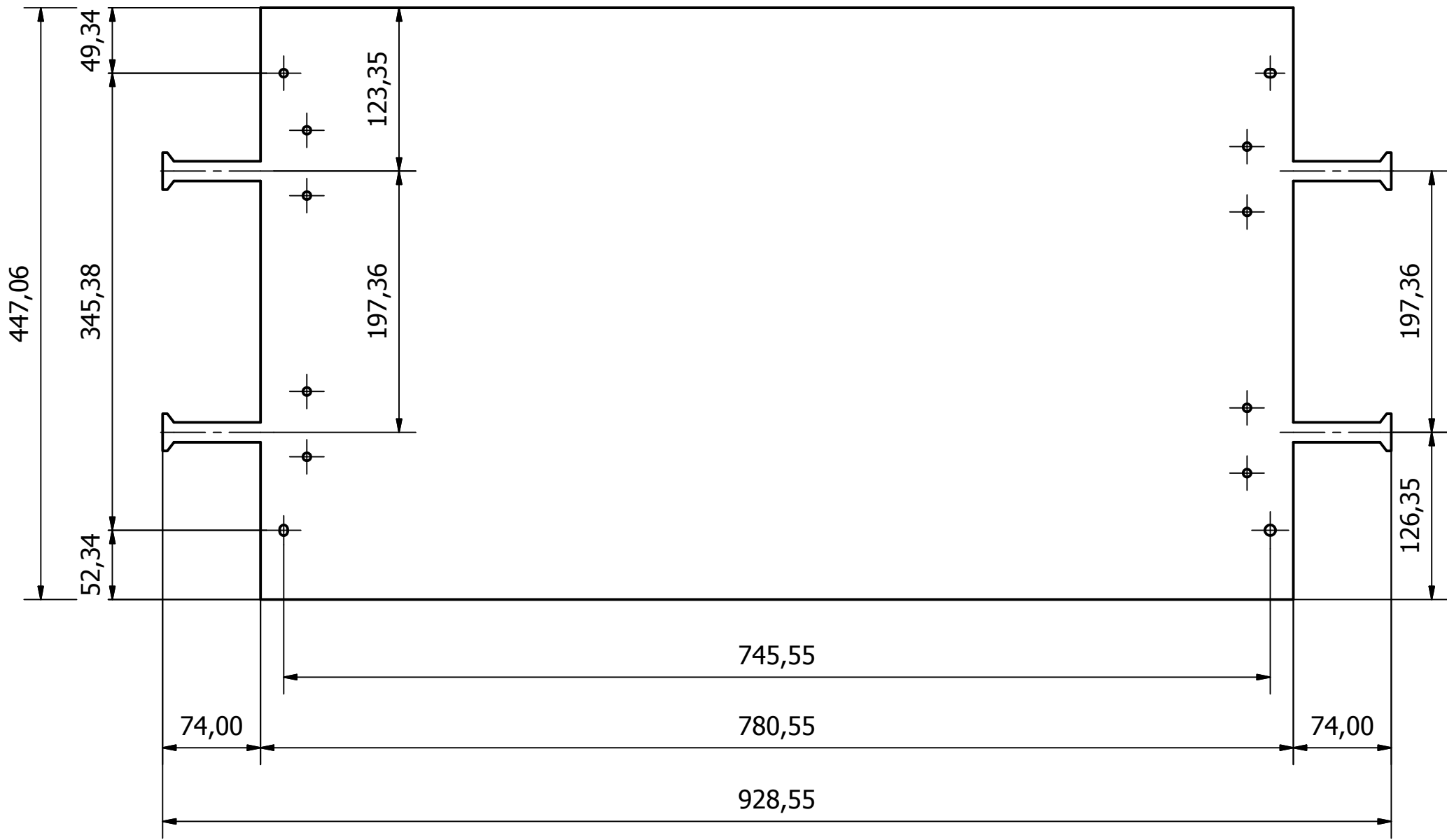
planar\_cathode\_L4



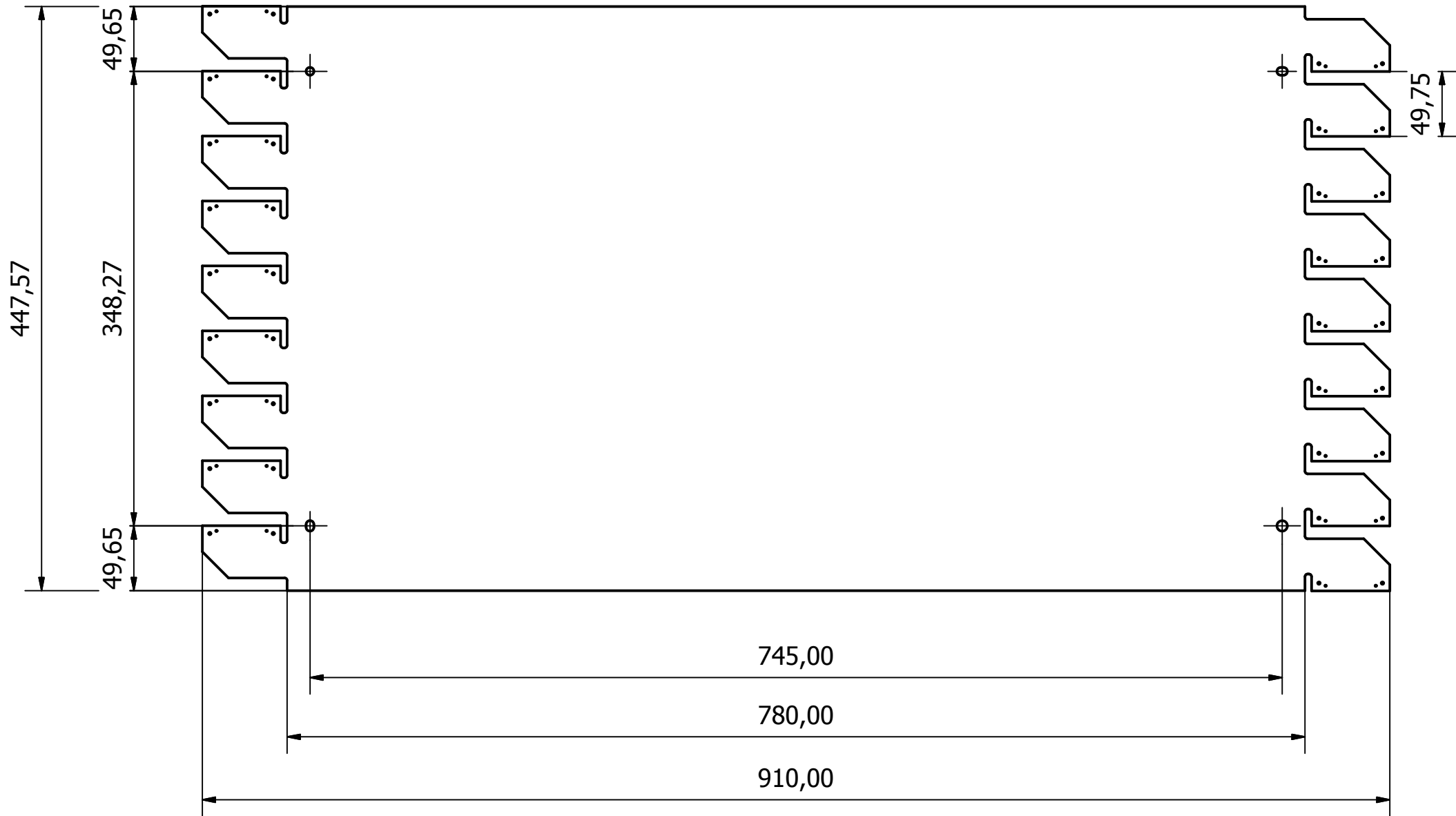
planar\_gem1\_L4



planar\_gem2\_L4



planar\_gem3\_L4



cold\_Anode\_L4