



A Phoenix Mecano Company



RAILWAY TECHNOLOGY

www.rose-systemtechnik.com



In 1969 ROSE Systemtechnik GmbH was founded in Porta Westfalica, Germany. Today ROSE is one of the world's leading and innovative providers of industrial enclosure system engineering, employing over 350 people at the German headquarter.

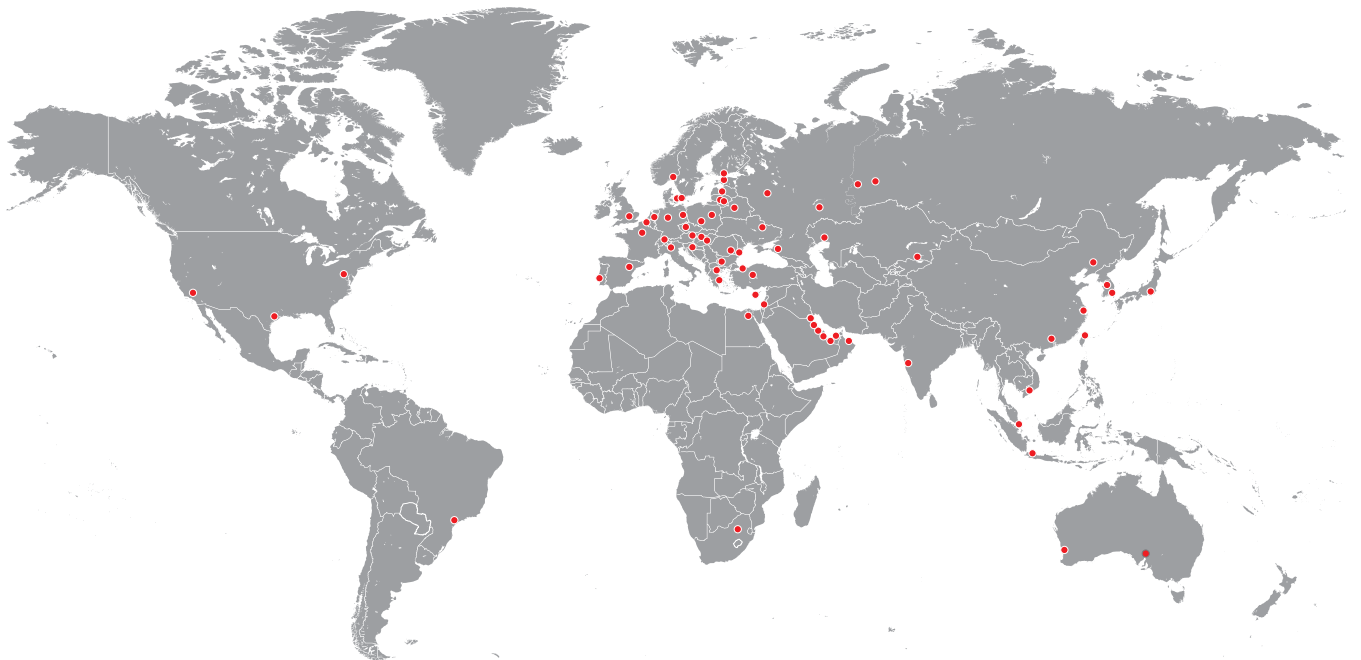
In association with Phoenix Mecano AG, Switzerland, we develop and manufacture high-quality industrial enclosures and system solutions for areas such as mechanical and plant engineering, automation engineering, potentially explosive atmospheres, instrumentation, control and automation technology, as well as the foodstuff and beverage industry.

Our product range comprises the following:

- Standard industrial enclosures made of aluminum, stainless steel and plastics for individual installations of electrical connection technology and electronic components.
- Operating and display enclosures based on aluminum profile systems and stainless steel materials for HMI applications with industrial PCs, PLC control systems and visualization units, including suspension systems.
- Components for explosion protection with junction boxes and control stations for worldwide use in potentially explosive atmospheres, as well as the petrochemical and chemical industry in both onshore and offshore environments.

Our business success is based on a wide range of products, a high quality standard, constant innovation and an exceptional level of service. You decide the condition of delivery – the un-machined enclosure, a partial assembly or a completely assembled and tested customized system solution.

Take advantage of our worldwide sales and marketing network for your international projects.



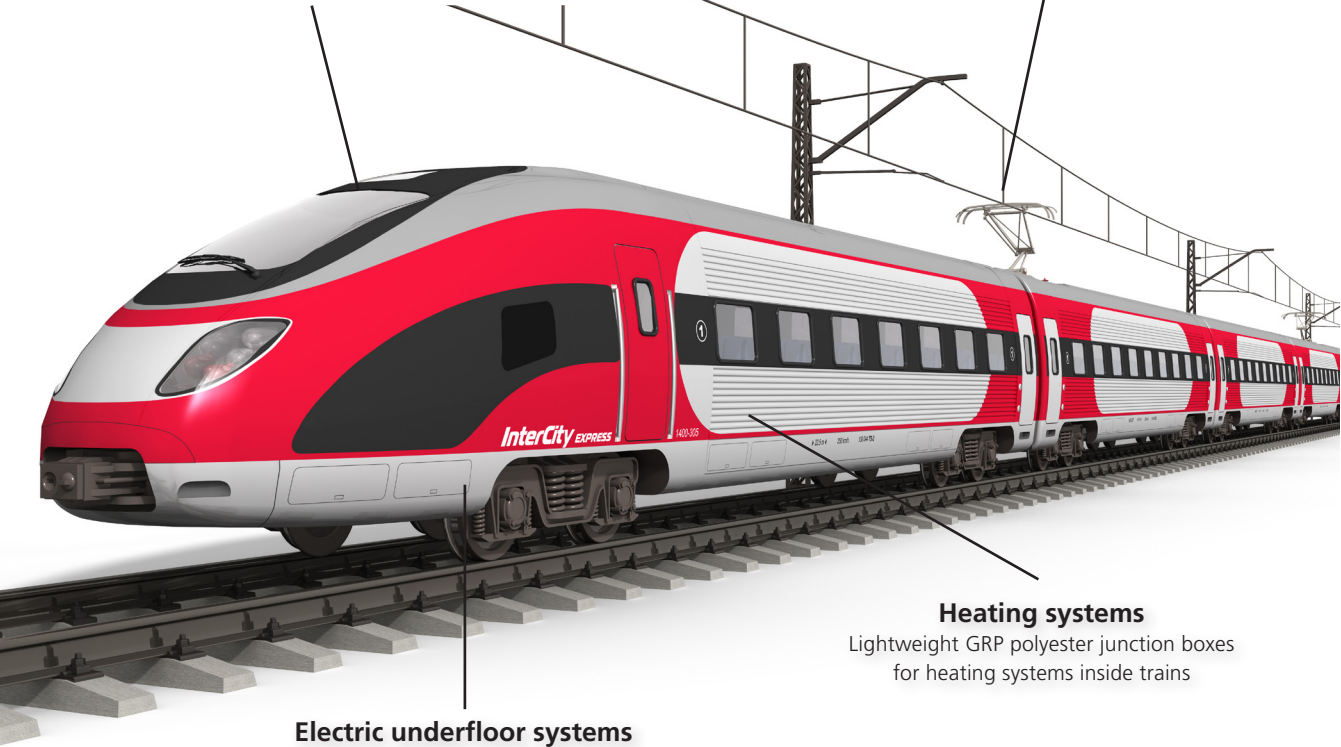
ROSE enclosure systems made of polyester, stainless steel and aluminium offer a wide range of application. They protect safety and function-relevant technology and are an important part of railway technology.

Processing of vehicle signals

NoVoTronic enclosures for sensitive electronics for processing of video data and vehicle signals

Pantograph system

Weatherproof GRP polyester enclosures for electric power supply in public metropolitan and suburban commuter railway systems

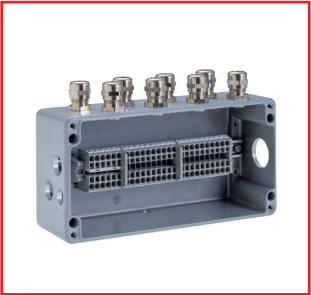


Electric underfloor systems

Robust stainless steel enclosures for different electronics, e.g. fuse box for 3rd current collector systems and other

Heating systems

Lightweight GRP polyester junction boxes for heating systems inside trains



EN 45545 – Fire protection for rail vehicles

EN 45545 – Fire protection for rail vehicles

| | |
|------------|---|
| EN 45545-1 | General definitions and regulations governing the classification of rail vehicles |
| EN 45545-2 | Requirements for the fire behaviour of materials and components |
| EN 45545-3 | Fire resistance requirements for fire doors |
| EN 45545-4 | Fire safety requirements for constructive design of rail vehicles |
| EN 45545-5 | Fire safety requirements for electrical equipment, including that of trolley buses, track guided buses and magnetic levitation vehicles |
| EN 45545-6 | Fire control and management systems |
| EN 45545-7 | Fire safety requirements for flammable liquid and gas installations |

EN 45545-1 contains the principal terms and definitions and general regulations governing the classification of rail vehicles in operational and design categories, as well as fire safety objectives.

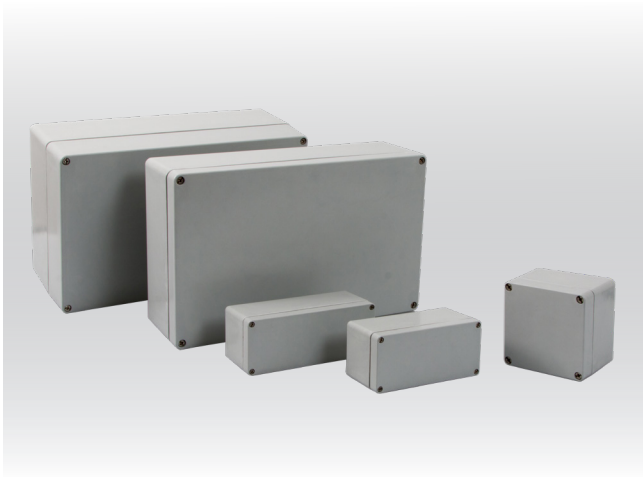
| Operation category | Design category | | | |
|-------------------------|-------------------------|--|------------------------------|--|
| | N: Standard vehicles | A: Vehicles forming part of an automatic train and having no emergency trained staff on board | D: Double decked vehicles | S: Sleeping cars and couchette vehicles |
| 1 Surface vehicles | HL1 | HL1 | HL1 | HL2 |
| 2 Tunnel max. 5 km | HL2 | HL2 | HL2 | HL2 |
| 3 Tunnel > 5 km | HL2 | HL2 | HL2 | HL3 |
| 4 No side evacuation | HL3 | HL3 | HL3 | HL3 |

EN 45545-2 describes requirements for fire behavior of materials and components. Those and any kind of surface treatment have to pass 4 different tests:

- lateral "spread of flame",
- concentration of smoke toxicity,
- heat release and mass loss rate and
- the smoke density.



Polyester enclosures EN 45545 conform



ROSE GRP polyester enclosures for the railway industry are in accordance to EN 45545. They consist of a special thermosetting plastic material which neither smelters nor drops in case of fire and is characterized by a moderate smoke emission. Within a test in an accredited laboratory ROSE GRP polyester enclosures for the railway industry show excellent results in 3 of 4 test criteria and can be used in almost all rail vehicle projects.

Technical data

| | |
|--------------------------|--|
| Material: | glass fibre reinforced thermosetting plastic polyester |
| Colour: | similar to RAL 7047 |
| Ingress protection: | IP 66 |
| IK code: | 07 acc. to IEC 62262 |
| Lateral flame spread: | HL 3 acc. to DIN EN 45545 |
| Rate of heat dispersion: | HL 3 acc. to DIN EN 45545 |
| Smoke gas concentration: | HL 3 acc. to DIN EN 45545 |
| Smoke gas density: | HL 2 acc. to DIN EN 45545 |
| Temperature range: | -40°C to +130°C with silicone seal |

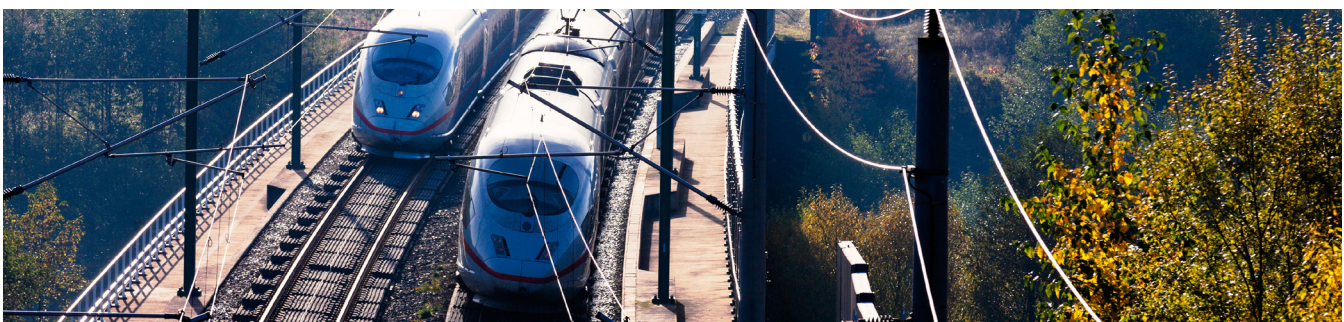
Accessories

| |
|----------------------------|
| External hinge |
| External mounting brackets |
| Mounting plate |
| Terminals |
| Cable glands |
| DIN rail |
| Sealable lid screws |

Product range

| Type | Order no. | Dimensions (mm) W x L x H | Type | Order no. | Dimensions (mm) W x L x H |
|-----------|--------------------|------------------------------|-----------|--------------------|------------------------------|
| POB 62020 | 62.08 08 06 | 75 x 80 x 56 | POB 62075 | 62.12 12 09 | 120 x 122 x 91 |
| POB 62025 | 62.08 08 08 | 75 x 80 x 75 | POB 62080 | 62.12 22 09 | 120 x 220 x 91 |
| POB 62030 | 62.08 11 06 | 75 x 110 x 56 | POB 62085 | 62.16 16 09 | 160 x 160 x 91 |
| POB 62035 | 62.08 11 08 | 75 x 110 x 75 | POB 62090 | 62.16 26 09 | 160 x 260 x 91 |
| POB 62045 | 62.08 16 08 | 75 x 160 x 75 | POB 62105 | 62.25 26 12 | 250 x 255 x 121 |
| POB 62055 | 62.08 19 08 | 75 x 190 x 75 | POB 62115 | 62.25 40 12 | 250 x 400 x 121 |
| POB 62065 | 62.08 23 08 | 75 x 230 x 75 | POB 62120 | 62.25 40 16 | 250 x 400 x 161 |

Additional sizes on request



Aluminium enclosures



ROSE aluminium enclosures are developed for application in harsh environments. Therefore they are predestined for use in outdoor application and underfloor area on railway vehicles. Within a test in an accredited laboratory ROSE aluminium enclosures, especially the coating, fulfill all demands acc. to EN 45545 with hazardous level HL 3.

Technical data

| | |
|---------------------------------|---|
| Material: | DIN EN 1706 EN AC-AISI 12(Fe) |
| Colour: | RAL 7001, silver grey, special colours on request |
| Ingress protection: | IP 66 |
| IK code: | 09 acc. to IEC 62262 |
| Lateral flame spread: | HL 3 acc. to DIN EN 45545 |
| Rate of heat dispersion: | HL 3 acc. to DIN EN 45545 |
| Smoke gas concentration: | HL 3 acc. to DIN EN 45545 |
| Smoke gas density: | HL 3 acc. to DIN EN 45545 |
| Temperature range: | -40°C to +90°C with PU seal -40°C to +100°C with CR seal -40°C to +130°C with silicone seal |

Product range

| Type | Order no. | Dimensions (mm) W x L x H |
|-----------|--------------------|------------------------------|
| ALS 01010 | 01.05 05 03 | 45 x 50 x 30 |
| ALS 01015 | 01.06 06 03 | 64 x 58 x 34 |
| ALS 01020 | 01.06 10 03 | 64 x 98 x 34 |
| ALS 01025 | 01.06 12 00 | 64 x 115 x 34 |
| ALS 01030 | 01.06 15 03 | 64 x 150 x 34 |
| ALS 01035 | 01.06 19 00 | 64 x 185 x 34 |
| ALS 01040 | 01.06 19 03 | 64 x 185 x 34 |
| ALS 01045 | 01.08 08 06 | 80 x 75 x 57 |
| ALS 01050 | 01.08 13 06 | 80 x 125 x 57 |
| ALS 01055 | 01.08 18 06 | 80 x 175 x 57 |
| ALS 01060 | 01.08 25 05 | 80 x 250 x 52 |
| ALS 01065 | 01.10 10 08 | 100 x 100 x 81 |
| ALS 01070 | 01.10 16 08 | 100 x 160 x 81 |
| ALS 01075 | 01.10 20 08 | 100 x 200 x 81 |
| ALS 01080 | 01.12 12 08 | 120 x 122 x 81 |
| ALS 01085 | 01.12 12 09 | 120 x 122 x 91 |
| ALS 01090 | 01.12 22 08 | 120 x 220 x 81 |
| ALS 01095 | 01.12 22 09 | 120 x 220 x 91 |
| ALS 01100 | 01.12 22 12 | 120 x 220 x 118 |
| ALS 01105 | 01.12 36 08 | 120 x 360 x 81 |
| ALS 01110 | 01.14 14 09 | 140 x 140 x 91 |
| ALS 01115 | 01.14 20 09 | 140 x 200 x 91 |
| ALS 01120 | 01.16 16 09 | 160 x 160 x 91 |

Accessories

| |
|----------------------------|
| External hinge |
| External mounting brackets |
| Internal hinge |
| Mounting plate |
| Terminals |
| Cable glands |
| DIN rail |
| Sealable lid screws |

| Type | Order no. | Dimensions (mm) W x L x H |
|-----------|--------------------|------------------------------|
| ALS 01125 | 01.16 26 09 | 160 x 260 x 91 |
| ALS 01130 | 01.16 26 16 | 160 x 260 x 160 |
| ALS 01135 | 01.16 36 09 | 160 x 360 x 91 |
| ALS 01140 | 01.16 56 09 | 160 x 560 x 91 |
| ALS 01145 | 01.18 18 10 | 180 x 180 x 101 |
| ALS 01150 | 01.18 28 10 | 180 x 280 x 101 |
| ALS 01155 | 01.23 10 11 | 100 x 230 x 111 |
| ALS 01160 | 01.23 20 11 | 232 x 202 x 111 |
| ALS 01165 | 01.23 20 18 | 232 x 202 x 181 |
| ALS 01170 | 01.23 28 11 | 230 x 280 x 111 |
| ALS 01175 | 01.23 33 11 | 230 x 330 x 111 |
| ALS 01180 | 01.23 33 18 | 230 x 330 x 181 |
| ALS 01185 | 01.23 40 11 | 230 x 400 x 111 |
| ALS 01190 | 01.23 40 23 | 230 x 400 x 225 |
| ALS 01195 | 01.23 60 11 | 230 x 600 x 111 |
| ALS 01200 | 01.31 40 11 | 313 x 404 x 111 |
| ALS 01205 | 01.31 40 14 | 312 x 403 x 141 |
| ALS 01210 | 01.31 40 18 | 313 x 404 x 181 |
| ALS 01215 | 01.31 40 23 | 313 x 404 x 227 |
| ALS 01220 | 01.31 60 11 | 310 x 600 x 111 |
| ALS 01225 | 01.31 60 18 | 310 x 600 x 181 |
| ALS 01230 | 01.60 60 20 | 600 x 600 x 202 |





The ROSE Aluform enclosure series has been designed for use of electronics and membrane keypads. They are being used within drivers stations for operating and visualizing demands.

Within a test in an accredited laboratory ROSE Aluform enclosures, especially the coating, fulfill all demands acc. to EN 45545 with hazardous level HL 3.

Technical data

| | |
|---------------------------------|---|
| Material: | DIN EN 1706 EN AC-AISI 12(Fe) |
| Colour: | RAL 7038, agate grey, special colours on request |
| Ingress protection: | IP 66 |
| IK code: | 09 acc. to IEC 62262 |
| Lateral flame spread: | HL 3 acc. to DIN EN 45545 |
| Rate of heat dispersion: | HL 3 acc. to DIN EN 45545 |
| Smoke gas concentration: | HL 3 acc. to DIN EN 45545 |
| Smoke gas density: | HL 3 acc. to DIN EN 45545 |
| Temperature range: | -40°C to +90°C with PU seal -40°C to +100°C with CR seal -40°C to +130°C with silicone seal |

Product range

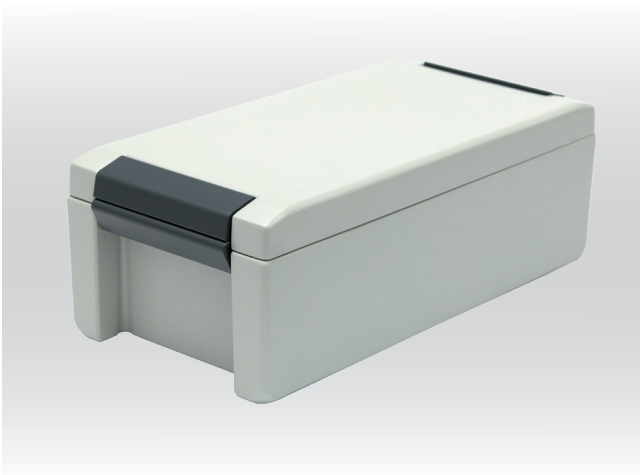
| Type | Order no. | Dimensions (mm) W x L x H |
|-----------|--------------------|------------------------------|
| ALF 04010 | 04.08 08 08 | 80 x 80 x 81 |
| ALF 04015 | 04.08 12 05 | 80 x 120 x 51 |
| ALF 04020 | 04.08 12 08 | 80 x 120 x 81 |
| ALF 04025 | 04.10 10 06 | 100 x 100 x 61 |
| ALF 04030 | 04.10 16 06 | 100 x 160 x 61 |
| ALF 04035 | 04.10 20 06 | 100 x 200 x 61 |
| ALF 04040 | 04.12 12 08 | 120 x 120 x 81 |
| ALF 04045 | 04.12 16 08 | 120 x 160 x 81 |
| ALF 04050 | 04.14 14 07 | 140 x 140 x 71 |

Accessories

| |
|---|
| External mounting brackets |
| Console holder for wall or table mounting |
| External hinges |
| Lid safety strip |
| Mounting plate |
| Terminals |
| Cable glands |
| DIN rail |
| Sealable lid screws |

| Type | Order no. | Dimensions (mm) W x L x H |
|-----------|--------------------|------------------------------|
| ALF 04055 | 04.14 18 07 | 140 x 180 x 71 |
| ALF 04060 | 04.14 22 07 | 140 x 220 x 72 |
| ALF 04065 | 04.15 18 08 | 150 x 180 x 81 |
| ALF 04070 | 04.16 16 08 | 160 x 160 x 81 |
| ALF 04075 | 04.16 24 08 | 160 x 240 x 81 |
| ALF 04080 | 04.20 20 07 | 200 x 200 x 72 |
| ALF 04085 | 04.20 28 07 | 200 x 280 x 72 |
| ALF 04090 | 04.28 28 11 | 280 x 280 x 111 |





AluFormPlus is an advanced version of the Aluform series and combines attractive design with sturdy protection for sensitive electronics.

AluFormPlus Highlights:

- Covered lid screws
- Integrated hinge solution
- Rectangular fixing points for pcb's in lid and base

Within a test in an accredited laboratory ROSE AluFormPlus enclosures, especially the coating, fulfill all tests acc. to EN 45545 with hazardous level HL 3.

Technical data

| | |
|---------------------------------|---|
| Material: | DIN EN 1706 EN AC-AISI 12(Fe) |
| Colour: | RAL 7035, light grey, profiles RAL 7015, slate grey, special colours on request |
| Ingress protection: | IP 66 |
| IK code: | 09 acc. to IEC 62262 |
| Lateral flame spread: | HL 3 acc. to DIN EN 45545 |
| Rate of heat dispersion: | HL 3 acc. to DIN EN 45545 |
| Smoke gas concentration: | HL 3 acc. to DIN EN 45545 |
| Smoke gas density: | HL 3 acc. to DIN EN 45545 |
| Temperature range: | -40°C to +90°C with PU seal -40°C to +100°C with CR seal -40°C to +130°C with silicone seal |

Product range

| Type | Order no. | Dimensions (mm) W x L x H |
|----------|--------------------|------------------------------|
| AFP 6405 | 64.09 12 06 | 86 x 121 x 60 |
| AFP 6410 | 64.09 16 06 | 86 x 159 x 60 |
| AFP 6415 | 64.09 20 06 | 86 x 199 x 60 |
| AFP 6420 | 64.13 16 09 | 128 x 159 x 60 |

Accessories

| |
|-------------------------------|
| Sealable lid screws |
| Pressure equalisation element |
| Mounting plate |
| Terminals |
| Cable glands |
| DIN rail |

| Type | Order no. | Dimensions (mm) W x L x H |
|----------|--------------------|------------------------------|
| AFP 6425 | 64.13 26 06 | 128 x 259 x 60 |
| AFP 6430 | 64.13 26 09 | 128 x 259 x 90 |
| AFP 6435 | 64.17 30 06 | 172 x 299 x 60 |
| AFP 6440 | 64.17 30 09 | 172 x 299 x 90 |





Due to the material advantages - corrosion resistance, long life cycle and robustness - stainless steel enclosures are to be used in out- and indoor railway application areas.

The basic collection consists of 27 standard dimensions – however custom made dimensions and individual designs allow various applications inside trains, on wagon roofs or in the underfloor area.

Within a test in an accredited laboratory ROSE stainless steel enclosures fulfill all demands acc. to EN45545 with hazardous level HL 3 – even if they are painted.

Technical data

| | |
|---------------------------------|--|
| Material: | Stainless steel 304, other materials on request |
| Colour: | grinded, grain 240, other surfaces on request |
| Ingress protection: | IP 66, IP 69K on request |
| IK code: | 09 acc. to IEC 62262 |
| Lateral flame spread: | HL 3 acc. to DIN EN 45545 |
| Rate of heat dispersion: | HL 3 acc. to DIN EN 45545 |
| Smoke gas concentration: | HL 3 acc. to DIN EN 45545 |
| Smoke gas density: | HL 3 acc. to DIN EN 45545 |
| Temperature range: | -40°C to +80°C with silicone seal |

Product range

| Type | Order no. | Dimensions (mm) W x L x H |
|---------|--------------------|------------------------------|
| IG 3710 | 37.10 10 06 | 100 x 100 x 61 |
| IG 3715 | 37.15 10 06 | 150 x 100 x 61 |
| IG 3720 | 37.15 15 08 | 150 x 150 x 81 |
| IG 3722 | 37.20 10 06 | 200 x 100 x 61 |
| IG 3725 | 37.20 20 08 | 200 x 200 x 81 |
| IG 3730 | 37.20 20 12 | 200 x 200 x 121 |
| IG 3735 | 37.30 15 08 | 300 x 150 x 81 |
| IG 3740 | 37.30 20 08 | 300 x 200 x 81 |
| IG 3745 | 37.30 20 12 | 300 x 200 x 121 |

Accessories

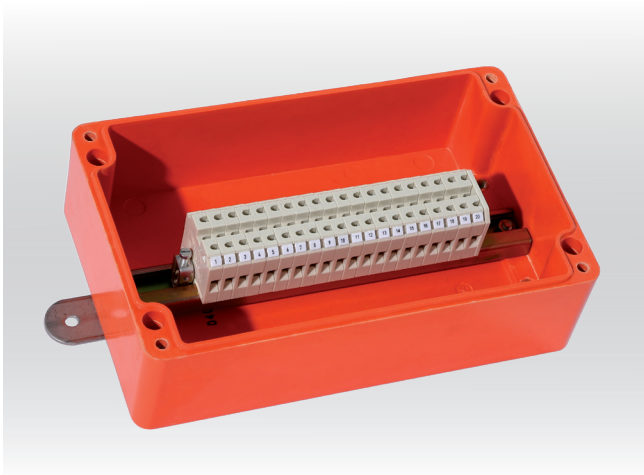
| |
|---------------------------------------|
| Mounting set (seals, nuts and screws) |
| External hinge set |
| External mounting brackets |
| Mounting plate |
| Terminals |
| Cable glands |
| DIN rail |
| Sealable lid screws |

| Type | Order no. | Dimensions (mm) W x L x H |
|---------|--------------------|------------------------------|
| IG 3750 | 37.30 30 12 | 300 x 300 x 121 |
| IG 3755 | 37.30 30 16 | 300 x 300 x 161 |
| IG 3760 | 37.38 38 16 | 380 x 380 x 161 |
| IG 3765 | 37.40 15 08 | 400 x 150 x 81 |
| IG 3770 | 37.40 20 12 | 400 x 200 x 121 |
| IG 3775 | 37.40 30 16 | 400 x 300 x 161 |
| IG 3780 | 37.50 30 16 | 500 x 300 x 161 |
| IG 3785 | 37.50 40 16 | 500 x 400 x 161 |
| IG 3790 | 37.60 20 12 | 600 x 200 x 121 |

In addition ROSE Systemtechnik offers a comprehensive range of explosion-proof products for hazardous applications such as tank wagons.



E30 enclosures



In case of fire protection not only rolling stock, but also railway application equipment has to fulfill special demands. For tunnel systems ROSE offers a range of E 30 enclosures acc. to DIN 4102 part 2. These enclosures are one part of the entire system for safety in tunnel systems in case of fire. E30 means that the complete electric system withstands the fire for 30 minutes for passenger evacuation. The approved design shows a special thermosetting plastic GRP material with special rail fixing system, ceramic terminals and especially listed cable glands. For further information please don't hesitate to contact us.

Technical data

| | |
|---------------------|--|
| Material: | glass fibre reinforced thermo-setting plastic material |
| Colour: | RAL 2004, orange |
| Ingress protection: | IP 66 |
| Impact strength: | 7 Joule acc. to EN 60079-0 |
| Toxic behaviour: | halogen-free |
| Temperature range: | -40°C to +90°C with CR seal |

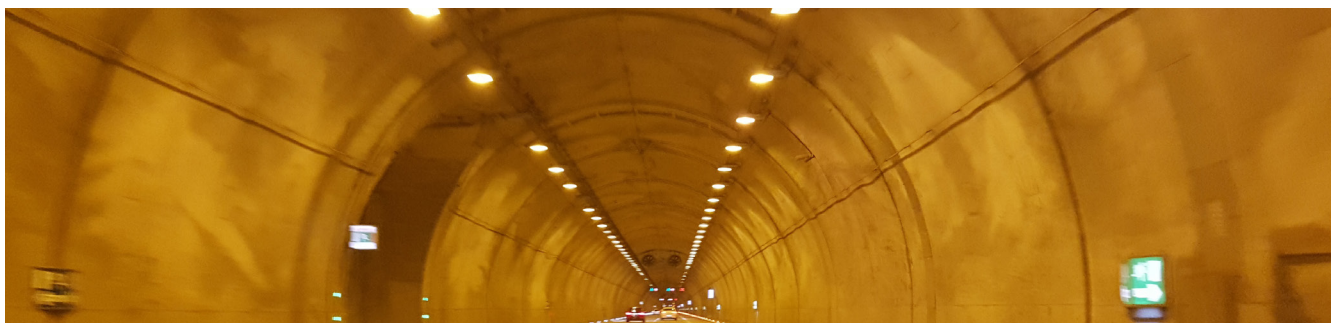
Accessories

- Terminals
- Cable glands
- Mounting plate
- Terminals

Product range

| Type | Order no. | Dimensions (mm) W x L x H |
|-------|---------------------|------------------------------|
| E3001 | E30.12 12 09 | 120 x 120 x 90 |
| E3002 | E30.12 22 09 | 120 x 220 x 90 |
| E3003 | E30.16 16 09 | 160 x 160 x 90 |

| Type | Order no. | Dimensions (mm) W x L x H |
|-------|---------------------|------------------------------|
| E3004 | E30.16 26 09 | 160 x 260 x 90 |
| E3005 | E30.25 26 12 | 250 x 260 x 120 |



We offer complete system solutions

Our service includes not only the delivery of an empty enclosure but a complete fitted and tested solution:

- Mechanical machining
- coating – either powder coating or wet paint
- engraving, pad painting or screen printing
- assembly, fitting and packaging



Mechanical processing – drilling, milling, punching

All machining tasks on enclosures, such as holes, threads, milled grooves for connectors, surface milling etc., are programmed in the shortest possible time using specialised CAD/CAM software. The data generated by CAD/CAM software are transferred to CNC machines for the immediate machining of the enclosures.



Painting, Printing of enclosures and components

Depending on the harsh environmental conditions that enclosures are exposed to within their respective application, surfaces are protected by chromating, passivation, liquid painting and/or powder coating. Customised surface printing is carried out in-house using screen printing or pad printing procedures.



Assembly, fitting and packaging

Our declared goal is to provide our customers not with a particular assembled component, but with a complete product. As a result, enclosures are usually fully machined and equipped before delivery with, mounting rails, terminal blocks, communication systems and cable glands.

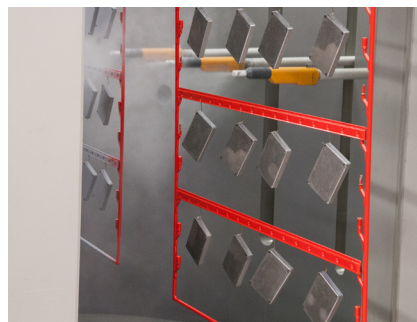


Engraving – permanent marking

When using the enclosures in harsh environmental conditions and if permanently legible markings are required, enclosures and control units can be engraved and covered with special paint.

In the case of application which are not covered by our standard range, or for special design requirements, we can provide your customspecific enclosure design.

We will be happy to assist you with any special needs!



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