Electrics for Rolling Stock

FRE-CRVIO, FRE-AVTRA, FRM-ASR, FRF-M7 series

Footrests for rail vehicles

S293, ZL290, S579 series

DSD push buttons and foot switches for rail vehicles

Catalogue F290.en
Footrests, DSD push buttons and DSD foot switches

Rail vehicles in good hands – with footrests, DSD foot switches and DSD push buttons

Footrests with DSD switches allow the driver to operate the driver safety device from an ergonomic seating position while keeping hands free. Additional functions, e.g. for track sanding or horn activation can be integrated. An optional heatable base plate provides additional comfort in winter. Footrests and DSD switches can be found in railway vehicles all around the world. They operate with the utmost safety, reliability, longevity and low maintenance. The quality system for development, manufacturing and assembly in our factory is DIN EN ISO 9001 and IRIS (International Railway Industry Standard) compliant. The long term pay-off is the long term in low follow-up costs for service and maintenance and, of course, a high degree of safety over the vehicle’s many years of operation. The design of our robust, shockproof and vibration-proof footrests enables a great variety of possible variants.

Customized solutions

In cooperation with you, our experienced design engineers select appropriate solutions from the existing basic models and customize them to meet your needs. Together, we find the optimum, state-of-the-art solution for every requirement. Our inhouse electronics development division enables us to respond quickly and flexibly to changing needs. Comprehensive type testing is performed in our laboratory according to customer specifications.

Generally, footrests are customized product developments because of the need for adaptations. Modern project management ensures adherence to the required deadlines and quality – even when requirements change. Talk to us and set us a challenge.

Globally leading

ALSTOM    BOMBARDIER    SIEMENS    STADLER

HITACHI    vossloh    HYUNDAI    Rotem    pesa

Design to order

Based on many years’ experience, we develop new footrests in close cooperation with the customer adependent on their requirements and exact specifications. The footrests are then manufactured by Schaltbau in their own works. Schaltbau assists the customer with the specifications and supplies complete documentation.

Our Portfolio

- Complete in-house customized design and manufacture
- Integrated DSD foot switch, additional foot switches on request
- Reliable, rugged, maintenance-free
- Standard-compliant design and components
Footrests

Customized, modular, robust, maintenance-free –
Ergonomic design for more safety

The modular construction of our robust, shock and vibration-proof footrests provides vibration options in the design and arrangement of additional switching elements.
The devices meet all requirements of the locomotive manufacturers and are notable for their solid construction and high reliability.

Series overview

Footrest FRE-AVTRA
- Electrically adjustable footrest
- Height adjustment simply by pressing a button
- Height 206.5 mm min., stroke 150 mm max.

Footrest FRE-CRVO
- Electrically adjustable footrest
- Height adjustment simply by pressing a button
- Height 170 mm min., stroke 120 mm max.

Footrest FRM-ASR
- Mechanically adjustable footrest
- Height adjustment simply by pressing a pedal
- Height 125 mm min., stroke 150 mm max.

Footrest FRF-M7
- Footrest without height adjustment
- Height 220 mm min.
- Heatable base plate, optional

DSD switches

S579 TG
DSD push button, panel mounting,
actuator colour yellow
1x snap-action switch

S579 T
DSD push button, panel mounting,
actuator colour black
1x snap-action switch

S579 W, S579 WR
DSD push button, wall mounting,
1x snap-action switch
S579 W actuator colour black
S579 WR actuator colour red

S293 S1 / S293 S1A
DSD foot switch with standard plate,
S293 S1 1x snap-action switch
S293 S2 2x snap-action switches

ZL290 B
DSD foot switch with standard plate
1x snap-action switch
with stronger reset spring

ZL290 B2
DSD foot switch with longer plate and
tactile egde, 1x snap-action switch with
stronger reset spring
Footrests for driver’s cabs in railway vehicles

The mechanically or electrically adjustable footrests can be easily positioned at the desired height just by pressing a pedal or a button. A rugged DSD foot switch is included. Additional functions, e.g. track sanding and/or horn are available on request. The base plate with heating option provides additional comfort in winter.

The devices meet all the requirements of the rail vehicle manufacturers and are notable for their solid construction and high reliability.

Features, applications, variants

Features:
- Modular, rugged, maintenance-free
- Customized design with or without height adjustment
- Integrated DSD foot switch
- Optional additional foot switches
- Optional heatable base plate
- High vibration and shock resistance

Applications:
- Driver’s cabs of locomotives and multiple units
- Driver’s cabs of trams

Variants (selection):

<table>
<thead>
<tr>
<th>Series</th>
<th>Height adjustment</th>
<th>Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>FR</td>
<td>E Electrical</td>
<td>AVTRA</td>
</tr>
<tr>
<td></td>
<td>M Mechanical</td>
<td>CRVIO</td>
</tr>
<tr>
<td></td>
<td>F None (fixed)</td>
<td>ASR</td>
</tr>
</tbody>
</table>

This catalogue shows only stock items. If you need a special variant, please do not hesitate to contact us! Maybe the type of footrest you are looking for is among our special designs. If not, we can also supply customized designs. In this case, however, minimum ordering quantities apply.

Specifications

<table>
<thead>
<tr>
<th>FRE-AVTRA</th>
<th>FRE-CRVIO</th>
<th>FRM-ASR</th>
<th>FRF-M7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height adjustment</td>
<td>Electric actuator* Scissors lift / spindle drive</td>
<td>Electric actuator* Scissors lift / spindle drive</td>
<td>Mechanical actuator gas spring</td>
</tr>
<tr>
<td>Power supply</td>
<td>24 / 72 / 110 V DC</td>
<td>24 / 72 / 110 V DC</td>
<td>---</td>
</tr>
<tr>
<td>DSD foot switch</td>
<td>Design</td>
<td>Mechanical endurance</td>
<td>S293, ZL290, s. a. page 8 ... 11 or other series on request</td>
</tr>
<tr>
<td>Additional foot switches (optional)</td>
<td>Design</td>
<td>Mechanical endurance</td>
<td>optional / on request</td>
</tr>
<tr>
<td>Mechanical endurance</td>
<td>EN 60529</td>
<td>20,000 operations</td>
<td>EN 50124-1</td>
</tr>
<tr>
<td>Insulation</td>
<td>EN 50124-1</td>
<td>IP66, all electric components</td>
<td>EN 50124-1</td>
</tr>
<tr>
<td>Housing, material</td>
<td>Base plate, with anti-sliding cover</td>
<td>Aluminium, steel, rubber</td>
<td>Aluminium, steel</td>
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<tr>
<td></td>
<td>Heatable base plate, optional lower part</td>
<td>Aluminium, steel</td>
<td>Aluminium, steel</td>
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<tr>
<td>Mounting position</td>
<td>horizontal</td>
<td>horizontal</td>
<td>horizontal</td>
</tr>
<tr>
<td>Weight</td>
<td>~40 kg</td>
<td>~35 kg</td>
<td>~20 kg</td>
</tr>
<tr>
<td>Temperature range</td>
<td>~50°C ... +70°C</td>
<td>~50°C ... +70°C</td>
<td>~50°C ... +70°C</td>
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<td>General</td>
<td>Fire/smoke</td>
<td>EN 60077, EN 12663, EN 15085, EN 50121</td>
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<tr>
<td></td>
<td>Shock/vibration</td>
<td></td>
<td>EN 50121</td>
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</tbody>
</table>

* Manual override in case of a system failure

Subject to change
FRE-AVTRA  Electrical adjustable footrest for railway vehicles

Dimension diagram:

FRE-CRVIO  Electrical adjustable footrest for railway vehicles

Dimension diagram:
FRM-ASR  Mechanical adjustable footrest for railway vehicles

Dimension diagram:

Footrest height 275 mm max.
Pedal for releasing the height adjustment
DSD foot switch, S293 series
Foot switch horn, 2x S847 series, IP67
Footrest height 125 mm min.
Stroke 150 mm max.

FRF-M7  Footrest for railway applications without height adjustment

Dimension diagram:

Removable hatch with square key lock
Footrest height in front 220 mm
Connectors
X1 port ITT Cannon
X2 port VBN3
Foot switch horn
DSD foot switch, 3x S826 series
Base plate heatable, controlled by adjustable thermostat

Dimensions in mm / Subject to change
**S579** DSD push buttons for railway vehicles

Driver safety device (DSD) push buttons S579 series are designed for use under rough operating conditions, e.g. on locomotives and multiple units. The devices meet all the requirements of the rail vehicle manufacturers, and are notable for their solid construction and high reliability.

**Features:**
- Reliable, rugged, maintenance-free
- Snap-action switches S804 or S814 with reinforced return spring, S814 featuring wiping, self-cleaning double-break contacts
- High electrical rating due to solid contact bridge
- Contact material: silver or gold-plated silver
- High resistance to shock and vibration

**Applications:**
- Driver’s cabs of locomotives and multiple units
- Driver’s cabs of trams

**Variants:**
- **S579 T** Panel mounting, actuator colour black, 1x snap-action switch S804 b40
- **S579 TG** Same as S579 T, but with yellow button
- **S579 W** Wall mounting, actuator colour black, 1x snap-action switch S814 b 40
- **S579 WR** Same as S579 W, but with red button

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**S579 T, S579 TG, S579 W, S579 WR** SDSD push buttons for panel or wall mounting

**Specifications**

<table>
<thead>
<tr>
<th></th>
<th>S579 T, S579 TG</th>
<th>S579 W, S579 WR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching element</td>
<td>S804 b40 with reinforced return spring *</td>
<td>S814 b40 with reinforced return spring *</td>
</tr>
<tr>
<td>Contact configuration</td>
<td>Form Za SPOT-D8 switch with silver contacts **, rigid contact bridge; self-cleaning contacts (S804 b40 only)</td>
<td></td>
</tr>
<tr>
<td>Terminals</td>
<td>Switching element Protection earth</td>
<td>M3 screws with saddle clamp @M3 screw</td>
</tr>
<tr>
<td>Conv. thermal current Ith</td>
<td>10 A</td>
<td>250 V</td>
</tr>
<tr>
<td>Rated insulation voltage U1</td>
<td>2.5 kV</td>
<td>PD3</td>
</tr>
<tr>
<td>Rated imp. withstand voltage Uimp</td>
<td>&gt; 5 million operating cycles</td>
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<tr>
<td>Pollution degree</td>
<td>Phenolic resin moulding compound PF31</td>
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<tr>
<td>Actuator travel</td>
<td>~ 3.6 mm</td>
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<td>Mechanical endurance</td>
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<td>~ 610 g</td>
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<td>IP rating</td>
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<td>EN 50124-1</td>
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<td>Insulation</td>
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<td>EN 50124-1</td>
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<tr>
<td>Material</td>
<td>Actuator Colour</td>
<td>phenolic resin moulding compound PF31</td>
</tr>
<tr>
<td>Housing / Colour</td>
<td>S579 T, ... W: black, S579 TG, yellow, S579 WR: red</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>For details see dimension diagramm</td>
<td></td>
</tr>
<tr>
<td>Temperature range</td>
<td>–40°C … +85°C</td>
<td></td>
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<td>Standards:</td>
<td>General</td>
<td>Fire/smoke</td>
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<tr>
<td>Shock/vibration</td>
<td>EN 60077, VDE0660</td>
<td>EN 45545</td>
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<tr>
<td>Ratings</td>
<td>EN 61373, UIC 651</td>
<td></td>
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<tr>
<td><strong>Material</strong></td>
<td>Aktuator Colour</td>
<td>phenolic resin moulding compound PF31</td>
</tr>
<tr>
<td>Housing / Colour</td>
<td>S579 T, ... W: black, S579 TG, yellow, S579 WR: red</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>For details see dimension diagramm</td>
<td></td>
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<td>Temperature range</td>
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<td>Shock/vibration</td>
<td>EN 60077, VDE0660</td>
<td>EN 45545</td>
</tr>
<tr>
<td>Ratings</td>
<td>EN 61373, UIC 651</td>
<td></td>
</tr>
</tbody>
</table>

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**Dimension diagram: S579 T, S579 TG:**

- Actuator S579 T: black, S579 TG: yellow
- Stroke 3.6 mm
- Housing aluminum die-cast / black
- Mounting borings 4x ø5 mm
- Cable outlet ø16 mm

**Dimension diagram: S579 W, S579 WR:**

- Actuator S579 W: black, S579 WR: red
- Stroke 3.6 mm
- Housing aluminum / gold
- Mounting borings 2x ø5 mm
- Cable outlet ø16 mm

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**Subject to change / Dimensions in mm**
S293, ZL290  DSD foot switches for railway vehicles

Schaltbau S293 and ZL290 series driver safety device (DSD) foot switches are compact, reliable and have a long service life. The DSD foot switches are designed for use under rough operating conditions, e.g. on locomotives and multiple units.

The device meets all the requirements of the rail vehicle manufacturers and are notable for their solid construction and high reliability.

Features, applications, variants

Features:
- Long mechanical life: reliable, rugged, maintenance-free
- Long electrical life at e.g. 24 V DC / 10 mA
- Snap-action switches S804, S814 or S814 with reinforced return spring and self-cleaning contacts
- Contact material: silver or gold-plated silver
- High resistance to shock and vibration
- Stainless steel case, ZL290 only: resistant to oil, maritime climate, ozone and UV radiation

Applications:
- Driver’s cabs of locomotives and multiple units
- Driver’s cabs of trams

Variants:
- S293 S1: DSD foot switch with standard plate (240 x 124 mm), 1x Snap-action switch
- S293 S1A: DSD foot switch with standard plate (240 x 124 mm), 2x Snap-action switches
- S293 S2: DSD foot switch with wider plate (240 x 154 mm), 1x Snap-action switch
- S293 S4: DSD foot switch with longer plate (400 x 124 mm), 1x Snap-action switch
- ZL290 B: DSD foot switch with standard plate (234 x 141 mm), 1x Snap-action switch with reinforced return spring
- ZL290 B1: DSD foot switch longer plate (299 x 144 mm), 1x Snap-action switch with reinforced return spring
- ZL290 B2: DSD foot switch longer plate and tactile edge (296 x 129 mm), 1x Snap-action switch with reinforced return spring

Specifications

<table>
<thead>
<tr>
<th></th>
<th>S293</th>
<th>ZL290</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching element</td>
<td>1x S814 b *</td>
<td>1x S814 b40 with reinforced return spring *</td>
</tr>
<tr>
<td></td>
<td>2x S814 b *</td>
<td>1x S814 b40 with reinforced return spring *</td>
</tr>
<tr>
<td></td>
<td>1x S804 b40 with reinforced return spring</td>
<td>1x S814 b40 with reinforced return spring *</td>
</tr>
<tr>
<td></td>
<td>1x S814 b *</td>
<td></td>
</tr>
<tr>
<td>Contact configuration</td>
<td>Schaltelement Schutzleiter</td>
<td>Anschlüsse</td>
</tr>
<tr>
<td></td>
<td>Schaltelement Schutzleiter</td>
<td>M3 screws with saddle clamp</td>
</tr>
<tr>
<td></td>
<td>Cable assembled with connectors</td>
<td>M5 screw</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Upon request</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conv. thermal current $I_a$</td>
<td>10 A</td>
<td>10 A</td>
</tr>
<tr>
<td>Rated Insulation voltage $U_i$</td>
<td>250 V</td>
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<tr>
<td>Rated Imp. withstand voltage $U_{imp}$</td>
<td>2.5 kV</td>
<td></td>
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<tr>
<td>Pollution degree</td>
<td>P03</td>
<td>ZL290 B, ...B1, ...B2: upon request</td>
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<tr>
<td>Actuator travel</td>
<td>~ 10 mm</td>
<td>~ 14 mm</td>
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<tr>
<td>Actuator force</td>
<td>S293 S1, ...S1A, ...S2: ~ 35 ±10 N / S293 S4: ~ 45 ±10 N</td>
<td>ZL290 B, ...B1, ...B2: ~ 33 N ±8 N</td>
</tr>
<tr>
<td>Mechanical endurance</td>
<td>&gt; 10 million operating cycles</td>
<td>&gt; 10 million operating cycles</td>
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<tr>
<td>IP rating</td>
<td>EN 60529</td>
<td>IP64</td>
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<td>Insulation</td>
<td>EN S0124-1</td>
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<td>Housing, material</td>
<td>Base plate / colour</td>
<td>Sheet steel, RAL7001 / silver grey (RAL7001)</td>
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<tr>
<td></td>
<td>Lower part / colour</td>
<td>Cast aluminium, RAL7001 / silver grey (RAL7001)</td>
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<tr>
<td>Mounting position</td>
<td>horizontal</td>
<td>Stainless steel sheet X5 CrNi 189 / silver grey</td>
</tr>
<tr>
<td>Weight</td>
<td>S293 S1, ...S1A: 2.3 kg / S293 S2: 2.4 kg / S293 S4: 2.5 kg</td>
<td>ZL290 B: 2.1 kg / ZL290 B1: 2.5 kg / ZL290 B2: 2.6 kg</td>
</tr>
<tr>
<td>Temperature range</td>
<td>~40° C ... +85° C</td>
<td>~25° C ... +60° C</td>
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<td>Standards:</td>
<td>General</td>
<td>EN 60077, VDE0660</td>
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<td>Fire/smoke</td>
<td>EN 45545</td>
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<tr>
<td></td>
<td>Shock/vibration</td>
<td>EN 61373, IEC 651</td>
</tr>
</tbody>
</table>

* For more information see [catalogue D20](#)  ** Gold upon request
**S293 S1 / S293 S1A** DSD foot switch with standard plate (240 x 124 mm)

**Dimension diagram:**

- Actuation travel approx. 10 mm
- Cable gland M20x1.5 for cable Ø 6...12mm
- Mounting borings 4x Ø9

**Circuit diagram:**

- S293 S1 series
  - 1x S814 b
- S293 S1A series
  - 2x S814 b

Subject to change / Dimensions in mm

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**S293 S2** DSD foot switch with wider plate (240 x 154 mm)

**Dimension diagram:**

- Actuation travel approx. 10 mm
- Cable gland M20x1.5 for cable Ø 6...12mm
- Mounting borings 4x Ø9

**Circuit diagram:**

- S293 S2 series
  - 1x S804 b40

Subject to change / Dimensions in mm
**S293 S4** DSD foot switch with longer plate (400 x 124 mm)

Dimension diagram:

- Actuation travel approx. 10 mm
- Cable gland M20x1.5 for cable Ø 6...12mm
- Mounting borings 4x Ø9

**Circuit diagram:**

S293 S4 series
1x S814 b40

ZL290 B series
1x S814 b40

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**ZL290 B** DSD foot switch with standard plate (234 x 141 mm)

Dimension diagram:

- Actuation travel approx. 14 mm
- Cable outlet Ø16
- Mounting borings 8x Ø9

**Circuit diagram:**

Dimensions in mm / Subject to change
ZL290 B1  DSD foot switch with longer plate (299 x 144 mm)

Dimension diagram:

Circuit diagram:

ZL290 B1 series
1x S814 b40

Subject to change / Dimensions in mm

ZL290 B2  DSD foot switch with longer plate and tactile egde (296 x 129 mm)

Dimension diagram:

Steckerbelegung
1 weiss NC
2 braun
3 blau NO
4 schwarz
5 grün-gelb

Actuation travel approx. 14 mm

Connector: 5 pol Wago No 231-105/037-000

Cable length approx. 1,000 mm

Mounting borings 8x Ø9

Circuit diagram:

ZL290 B2 series
1x S814 b40

Subject to change / Dimensions in mm
Connectors

- Connectors manufactured to industry standards
- Connectors to suit the special requirements of communications engineering (MIL connectors)
- Charging connectors for battery-powered machines and systems
- Connectors for railway engineering, including UIC connectors
- Special connectors to suit customer requirements

Snap-action switches

- Snap-action switches with positive opening operation
- Snap-action switches with self-cleaning contacts
- Enabling switches
- Special switches to suit customer requirements

Contactors

- Single and multi-pole DC contactors
- High-voltage AC/DC contactors
- Contactors for battery powered vehicles and power supplies
- Contactors for railway applications
- Terminal bolts and fuse holders
- DC emergency disconnect switches
- Special contactors to suit customer requirements

Electrics for rolling stock

- Equipment for driver's cab
- Equipment for passenger use
- High-voltage switchgear
- High-voltage heaters
- High-voltage roof equipment
- Equipment for electric brakes
- Design and engineering of train electrics to customer requirements