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Outdoor solutions for the rail industry

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Outdoor solutions for the rail industry

For the “railway technology” sector, Rittal offers turnkey enclosure system solutions that are robust and versatile enough to meet the high demands of this industry, e.g. for control and safety systems, data transmission, rail power supply, signal box and signalling technology, and tunnel safety.

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Outdoor solutions – overview

Outdoor enclosures set up outside closed buildings are completely exposed to, and must withstand, the environmental conditions. In addition to natural environmental conditions such as wind, rain, hail or lightning, the specific artificial conditions that occur in the railway sector must also be taken into account, such as pressure and suction from passing trains or mechanical snow clearing. Furthermore, enclosures containing safety-relevant infrastructure often require a high level of protection against vandalism.

Outdoor applications also include use in tunnels, as temperature fluctuations, humidity and air movement can also be found there.

AX plastic enclosure

AX plastic enclosures meet protection category IP 66 according to DIN EN 60529 and are made of fibreglass-reinforced, unsaturated polyester. They are available in eight different sizes, from 250 x 350 x 155 mm to 800 x 1000 x 300 mm.
Most plastic enclosures are also available with a viewing panel in the door.
The three types 1432.000 (250 x 350 x 150 mm), 1434.000 (600 x 400 x 200 mm) and 1444.000 (400 x 400 x 200 mm) have successfully undergone a pressure wave simulation and a dynamic pressure test focusing on aerodynamic effects in accordance with Ril 853.2001 A01 to demonstrate their strength, and can therefore also be used in railway tunnels.

Further details are provided starting from page 6

GA cast aluminium terminal boxes

Cast aluminium terminal boxes are available in 16 different sizes, ranging from 58 x 64 x 36 mm to 330 x 230 x 183 mm. All terminal boxes meet protection category IP 66 according to DIN EN 60529.
These boxes should be used in protected areas only outdoors. They must be protected from direct sunlight and precipitation, and the seal should not be exposed to standing water.

Further details are provided starting from page 10

Outdoor solutions – overview

AX stainless steel enclosure

Single-door AX stainless steel enclosures meet protection category IP 66 according to DIN EN 60529, and the two-door model corresponds to protection category IP 55. These enclosures are available in 16 different sizes, ranging from 300 x 300 x 210 mm to 1000 x 1200 x 300 mm.
They are made of stainless steel 1.4301 (AISI 304), with four sizes also available as standard in 1.4404 (AISI 316L).
These boxes should be used in protected areas only outdoors. They must be protected from direct sunlight and precipitation, and the seal should not be exposed to standing water.

Further details are provided starting from page 8

Toptec outdoor enclosures

The Toptec bayable outdoor enclosure is available in two versions. The standard Toptec enclosure does not have railway approval and cannot be installed near tracks.
For applications away from the tracks, however, it meets the customary requirements. The enclosure has a protection category of IP 55 according to DIN EN 60529.

Further details are provided on page 11

Toptec outdoor enclosures for railway applications

A second version, however, meets railway requirements and can be installed at a minimum distance of 3.65 m from the centre of the track (based on train speeds of up to 300 km/h). These enclosures are specially designed for the relevant application. It is therefore important to determine in advance which requirements must be met and which can be waived, the aim being to forgo additional functions that could increase costs.
Toptec outdoor enclosures can be installed on concrete or steel bases/plinths. When set up directly by the track, the combination of outdoor enclosure and concrete base/plinth demonstrates the necessary stability in accordance with railway specifications.

Further details are provided starting from page 12

RailwayCube containers

RailwayCube containers for railway applications are available with a width of 3000 mm and a height of 3000 mm, in lengths of up to 12,000 mm. These containers have a resistance class up to RC4 according to DIN EN 1627 and a protection category of IP 55 according to DIN EN 60529. They can be set up at a minimum distance of 4 m from the centre of the track (based on train speeds of up to 300 km/h) and can be equipped with an active cooling unit, which also has a resistance class up to RC4 according to DIN EN 1627.
When combined with the relevant concrete foundations, RailwayCube containers form a turnkey system that is easy to install on site.

Further details are provided starting from page 16

AX plastic enclosures

Material:
- Enclosure and door: Fibre-glass-reinforced unsaturated polyester
- Fire protection corresponding to UL 94 V-0
- Door: All-round foamed-in PU seal
- Mounting plate: Sheet steel

Surface finish:
- Enclosure and door: Dyed plastic with no after-treatment
- Mounting plate: Zinc-plated

Colour:
- Enclosure: RAL 7035, light grey
- Rain protection strip (optional): RAL 9005, black

Protection category:
- IP 66 to IEC 60 529

Protection class:
- II at 1000 V AC

AX plastic enclosures without viewing window

Width mm	250	300	400	400
Height mm	350	400	400	600
Depth mm	150	200	200	200
Mounting plate width mm	155	205	305	305
Mounting plate height mm	275	325	325	525
Cam locks	1	2	2	2
Model No.	**1432.000***	**1434.000***	**1444.000***	**1446.000**

* Strength demonstrated using a pressure wave simulation and a dynamic pressure test focusing on aerodynamic effects in accordance with Ril 853.2001 A01. These enclosures can therefore also be used in railway tunnels.

Width mm	500	600	600	800
Height mm	500	600	800	1000
Depth mm	300	200	300	300
Mounting plate width mm	405	505	505	705
Mounting plate height mm	425	525	725	925
Cam locks	2	2	2	3
Model No.	**1453.000**	**1466.000**	**1468.000**	**1480.000**

AX plastic enclosures

Material:
– Enclosure and door: Fibre-glass-reinforced unsaturated
– polyester
– Fire protection corresponding to UL 94 V-0
– Door: All-round foamed-in PU seal
– Mounting plate: Sheet steel
– Viewing window: Polycarbonate

Surface finish:
– Enclosure and door: Dyed plastic with no after-treatment
– Mounting plate: Zinc-plated

Colour:
– Enclosure: RAL 7035, light grey
– Rain protection strip (optional): RAL 9005, black

Protection category:
– IP 56 to IEC 60 529

Protection class:
– II at 1000 V AC

AX plastic enclosures with viewing window

Width mm	Packs of	400	400	500	600	600	800
Height mm		400	600	500	600	800	1000
Depth mm		200	200	300	200	300	300
Mounting plate width mm		305	305	405	505	505	705
Mounting plate height mm		325	525	425	525	725	925
Cam locks		2	2	2	2	2	3
Model No.	1 pc(s).	**1448.000**	**1449.000**	**1454.000**	**1467.000**	**1469.000**	**1479.000**

AX stainless steel enclosures

Material:
- Stainless steel
- Door: All-round foamed-in PU seal
- Mounting plate: Sheet steel
- Lock: Die-cast zinc, nickel-plated

Surface finish:
- Enclosure and door: Brushed, grain size 400
- Mounting plate: Zinc-plated

Protection category:
- Single-door model: IP 66 to IEC 60 529
- Two-door model: IP 55 to IEC 60 529

Note:
- Outdoor use restricted to protected areas. Protect enclosures against direct sunlight and precipitation.

AX stainless steel enclosures with mounting plate

Width mm	Packs of	300	300	300	380
Height mm		300	380	380	300
Depth mm		210	210	210	210
Mounting plate width mm		250	250	250	330
Mounting plate height mm		275	355	355	275
Locking system		1 cam	1 cam	1 cam	1 cam
Door(s)		1	1	1	1
Material		1.4301	1.4301	1.4404	1.4301
Model No.	1 pc(s).	**1003.000**	**1005.000**	**1302.000**	**1011.000**

Width mm	Packs of	380	380	380	400
Height mm		380	380	600	500
Depth mm		210	210	210	210
Mounting plate width mm		330	330	330	350
Mounting plate height mm		355	355	575	475
Cam locks		1 cam	1 cam	2 cams	2 cams
Door(s)		1	1	1	1
Material		1.4301	1.4404	1.4301	1.4301
Model No.	1 pc(s).	**1006.000**	**1303.000**	**1008.000**	**1015.000**

AX stainless steel enclosures with mounting plate

Width mm	Packs of	500	500	600	600
Height mm		500	500	380	600
Depth mm		310	300	210	210
Mounting plate width mm		450	450	550	550
Mounting plate height mm		475	475	355	575
Locking system		2 cams	2 cams	1 cam	2 cams
Door(s)		1	1	1	1
Material		1.4301	1.4301	1.4301	1.4301
Model No.	1 pc(s).	**1007.000**	**1013.000**	**1009.000**	**1010.000**

Width mm	Packs of	600	600	760	800
Height mm		600	760	760	1000
Depth mm		210	210	300	300
Mounting plate width mm		550	550	705	745
Mounting plate height mm		575	735	735	975
Locking system		2 cams	2 cams	2 cams	2 cams
Door(s)		1	1	1	1
Material		1.4404	1.4301	1.4301	1.4301
Model No.	1 pc(s).	**1304.000**	**1012.000**	**1014.000**	**1016.000**

Width mm	Packs of	800	1000	1000	1000
Height mm		1200	1000	1200	1200
Depth mm		300	300	300	300
Mounting plate width mm		745	945	945	945
Mounting plate height mm		1175	975	1175	1175
Locking system		3-point	2 cams	3-point	3-point
Door(s)		1	2	2	2
Material		1.4301	1.4301	1.4301	1.4404
Model No.	1 pc(s).	**1017.000**	**1018.000**	**1019.000**	**1305.000**

GA cast aluminium enclosures

Material:
– Enclosure and cover: Cast aluminium
– Cover: All-round CR cellular rubber cord seal

Colour:
– RAL 7001, silver grey

Protection category:
– IP 66 to IEC 60 529

Note:
– Outdoor use restricted to protected areas. Protect enclosures against direct sunlight and precipitation.

GA cast aluminium enclosures

Width mm		58	98	75	125	175
Height mm		64	64	80	80	80
Depth mm		36	36	58	58	58
Model No.		**9101.210**	**9102.210**	**9104.210**	**9105.210**	**9106.210**
	Packs of	5 pc(s).	3 pc(s).	1 pc(s).	1 pc(s).	1 pc(s).

Width mm	Packs of	250	122	220	360	160
Height mm		80	120	120	120	160
Depth mm		58	82	93	84	93
Model No.	1 pc(s).	**9107.210**	**9108.210**	**9110.210**	**9111.210**	**9112.210**

Width mm	Packs of	260	360	202	280	330	330
Height mm		160	160	232	232	230	230
Depth mm		93	93	113	113	113	183
Model No.	1 pc(s).	**9113.210**	**9114.210**	**9116.210**	**9117.210**	**9118.210**	**9119.210**

Material:
– Frame: Stainless steel 1.4301
– Panels: Aluminium

Surface finish:
– Powder-coated with UV-resistant pure polyester

Colour:
– RAL 7035, light grey

Note:
– Double-walled bayable outdoor enclosure, fully pre-configured with 100 mm high base/plinth and rain canopy projecting on all sides
– The side panels, rear panel and door are double-walled on the outside over their entire area
– Enclosure frame with 25 mm system punchings in the roof frame, base frame and vertical sections and two mounting levels – fully available for interior fit-out
– The enclosure cannot be installed in the vicinity of tracks!

Toptec outdoor enclosures

Width mm	Packs of	600	600	800	800	800	800
Height mm		1600	1800	1200	1200	1600	1600
Depth mm		600	600	800	800	600	600
Cut-out for climate control unit		–	–	–	■	–	■
Model No.	1 pc(s).	**9781.666**	**9781.686**	**9781.818**	**9782.818**	**9781.866**	**9782.866**
Accessories							
Side panels		9781.660	9781.860	9781.180	9781.180	9781.660	9781.660
Baying kit		9781.000	9781.000	9781.000	9781.000	9781.000	9781.000

Width mm	Packs of	800	800	800	800	800	800
Height mm		1600	1600	1800	1800	2000	2000
Depth mm		800	800	800	800	800	800
Cut-out for climate control unit		–	■	–	■	–	■
Model No.	1 pc(s).	**9781.868**	**9782.868**	**9781.888**	**9782.888**	**9781.828**	**9782.828**
Accessories							
Side panels		9781.680	9781.680	9781.880	9781.880	9781.280	9781.280
Baying kit		9781.000	9781.000	9781.000	9781.000	9781.000	9781.000

Toptec outdoor enclosures for railway applications

Material:
– Frame, roof and base/plinth: Stainless steel 1.4301
– Panels: Stainless steel 1.4016

Surface finish:
– Powder-coated with UV-resistant pure polyester

Colour:
– RAL 7035, light grey

Note:
– Double-walled bayable outdoor enclosure, fully pre-configured with 100 mm high base/plinth and rain canopy projecting on all sides
– The side panels, rear panel and door are double-walled on the outside over their entire area
– Enclosure frame with 25 mm system punchings in the roof frame, base frame and vertical sections and two mounting levels – fully available for interior fit-out

Mechanical specifications:

Enclosure frame:
- Stable symmetrical extruded frame, consisting of welded hollow sections with a 25 mm DIN pitch pattern of holes
- All edges are rounded
- Horizontal sections with additional channel above the seal
- Vertical sections with two mounting levels for space-saving interior fit-out
- Option of being bayable on all sides

Panels:
- The side panels and rear panel are double-walled on the outside over their entire area
- The internal and external walls are separate from each other and can be fitted separately
- The side panels and rear panel can only be removed after first removing the roof (theft protection)
- Option of replacing the rear panel with a door

Roof:
- The roof plate is double-walled on the outside over its entire area
- The external rain canopy projects slightly on all sides
- The roof plate comes fitted with eyebolts that can be replaced with the roof fastening screws included in the scope of delivery once the enclosure has been set up
- The roof plate can only be removed when the door is open (theft protection)

Base:
- Base frame sealed by a one-piece bottom panel
- Bottom panel with cut-outs sealed using gland plates

Base/plinth:
- Base/plinth height 100 mm
- Base/plinth trim panels can be machined for cable entry from the front, rear or side
- Base/plinth trim panels are equipped with an M16 earth connection
- Base/plinth trim panels can only be removed when the door is open (theft protection)
- Option of an additional concrete base/plinth – the enclosure and base/plinth combined offer system approval for ground tension starting from 250 kN/m^2

Door:
- The door is double-walled on the outside over its entire area
- Hinged on the right, with the option of hinging on the left
- 4-point lock and RC2 swing lever handle, prepared ready for the customer to fit a profile half-cylinder
- Door stay fitted to the inside of the door at the top
- Hinges screwed on securely
- Option of a door with an aperture for an outdoor cooling unit or for using air filters and/or fans or degassing devices, including bulkheading to prevent air short-circuits in the double wall

Mechanical specifications:

Earthing:
- All panels with paint-free earthing points for ∅ 16 mm² cross section
- M16 earth connection in the base/plinth

Interior fit-out:
- Custom fit-out using the range of Rittal accessories – e.g. punched section with mounting flange, mounting rails, mounting plates and 19" mounting levels – or third-party wiring systems
- Example of punched section with mounting flange and mounting rails: Thanks to the 25 mm DIN pitch pattern and the two mounting levels of the enclosure frame, the punched section with mounting flange and the mounting rails can be fitted virtually anywhere in the enclosure
- Example of mounting plates: Mounting plates, partial mounting plates and divider panels can be fitted at the rear, at the sides or with the help of the punched section with mounting flange at any required depth in the enclosure
- Example of 19" mounting levels: 19" sections, 19" mounting frames or 19" swing frames can be fitted with a 25 mm depth pitch pattern – even with a second mounting level
- Example of wiring systems: All established third-party wiring systems can be integrated into the enclosures
- Rittal power distribution and climate control components are coordinated with the Toptec enclosure system

Climate control (optional):
- Wall-mounted Blue e+ outdoor cooling unit 3185.330 with a cooling output of 1.5 kW for any build height (see page 18)
- Wall-mounted outdoor cooling units with a cooling output of 2.0 kW, 2.5 kW, 3.8 kW or 5.0 kW, starting from a build height of 1800 mm (see page 18)
- Fan-and-filter units and air outlet openings

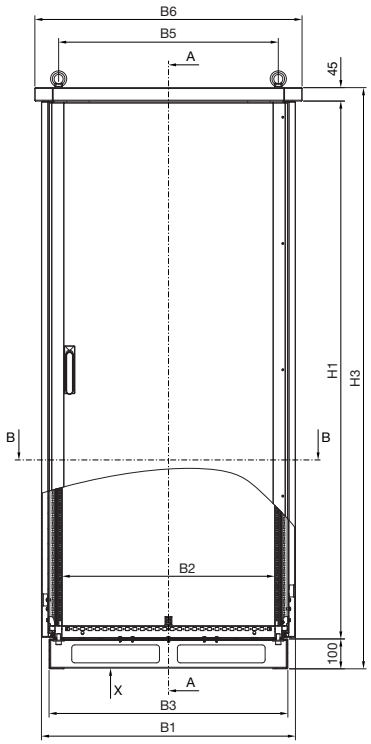
Dimensions:
- Preferred enclosure width: 600 mm or 800 mm
- Other enclosure widths can easily be created by baying
- Preferred enclosure height: 1200 mm, 1400 mm, 1600 mm or 1800 mm
- Enclosure heights of 2000 mm and 2200 mm are possible if the distance from the track is > 5 m
- Preferred enclosure depth: 600 mm or 800 mm
- Other sizes available on request

Standard-related requirements

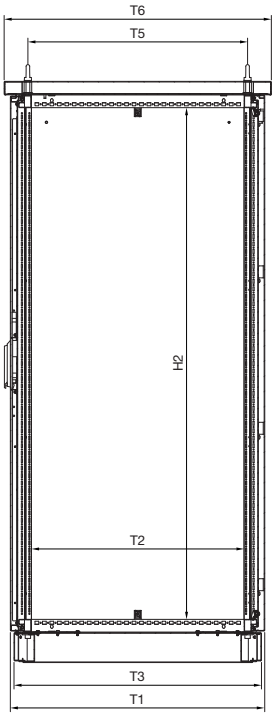
Requirement	Standard	Property
Protection category	IEC 60529	IP 55
Resistance class	DIN EN 1627	RC2, optionally RC3 and RC4
Protection class	DIN VDE 0140-1	Protection class 1
Degassing (battery gases)	DIN EN IEC 62485-2	Option of active and passive battery degassing
Current-carrying capacity	Ril 997.0205 A01	Optional if distance from centre of track < 4 m
Fire protection	DIN 4102	Frame, internal walls and external walls made from non-flammable material
Impact protection	IEC 62262	IK 10
Altitude	DIN EN 50125-3	A2 up to 1000 m above sea level
Temperature	DIN EN 50125-3	-30 °C…+60 °C
Humidity	DIN EN 50125-3	5% – 100%
Wind speed	DIN EN 50125-3	Up to 56 m/s
Rain	DIN EN 50125-3	> 6 mm/min
Snow and hail	DIN EN 50125-3	Outdoor-tested
Ice	DIN EN 50125-3	Outdoor-tested
Sunlight	DIN EN 50125-3	UV-resistant
Effects of pressure/suction	DIN EN 1991-2	Minimum distance of 3.65 m to centre of track based on a train speed of up to 300 km/h
Wind load	DIN EN 1991-1-4	Wind load zones 1 – 3
Snow load	DIN EN 1991-1-3	Snow load zones 1 – 3
Stability during snow clearing at up to 50 km/h	DIN EN 1794-1	Minimum distance of 3.65 m to centre of track
Protection against rodents and insects	–	Ensured by protection category IP 55
Corrosion resistance	–	> 20 years

Technical information

Dimensions



Section A – A



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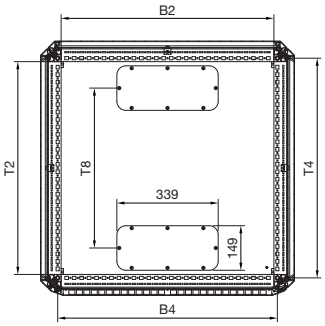
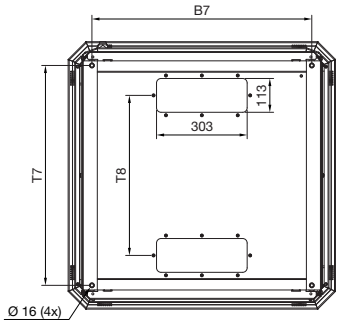


View X



	Width dimensions mm							Height dimensions mm			Depth dimensions mm							
	B1	B2	B3	B4	B5	B6	B7	H1	H2	H3	T1	T2	T3	T4	T5	T6	T7	T8
Nominal dimension	+ 50	– 88	– 1	– 65	– 65	+ 94	– 65	– 0.5	– 88	+ 44.5	+ 51	– 88	+ 28	– 65	– 65	+ 94	– 65	– 265

Sample calculation: Clearance width (B2) for an enclosure 600 mm wide = 600 mm – 88 mm = 512 mm

Concrete base/plinth for Toptec outdoor enclosures

Material:
– Light concrete, untreated

Note:
– Included in the system approval for use in railway environments without any further static calculation

– The enclosure and concrete base/plinth combined offer system approval for ground tension starting from 250 kN/m^2

– The base/plinth is made from pre-cast concrete sections for quick and easy installation of outdoor enclosures in situ. The front/rear base/plinth plate is screw-fastened from the inside and removable for servicing access.

Width mm	Packs of	600	800
Height mm		1000	1000
Depth mm		600	600
Approx. excavation depth mm		700	700
Weight kg		240	250
Model No.	1 pc(s).	On request	On request

Other sizes available on request.

RailwayCube container

Material:
– Sheet steel

Surface finish:
– Powder-coated, UV-resistant

Colour:
– RAL 7035, light grey

Note:
– Containers are steel structures insulated on all sides, tested to ISO 1496 Part 1, with weights and classification according to ISO 668, Series 1, and corner castings according to ISO 1161
– Manufactured with EXC2/ DIN EN 1090-2 welding certification

Mechanical specifications:

Design:
- Increased metal thickness for corner sections and roof plate based on the structural analysis
- Additional external plain sheet steel panelling
- Wall area reinforced on both sides to accommodate the power infeed and attach further components
- Roof pitch 2°
- With guttering and a downpipe
- External LED lights approved by Deutsche Bahn for use in the vicinity of tracks, including light sensor with welded-on weather protection cover
- Option of pre-fitted mountings on one wall to accommodate Rittal Blue e+ outdoor cooling units
- Option of cable or pipe entries in walls or base
- Option of integrated key safes

Foundations:
- The container stands on four concrete foundation blocks
- The foundation blocks have M16 earth connections
- Concrete block steps are located below the door(s)
- Container and foundation have Deutsche Bahn system approval

Insulation:
- Insulation with a U-value of 0.375 in the side panels, roof and base

Door(s):
- One or more RC4 access doors with additional earthing of door panels, mechanical locks, lock cylinder plus magnet and bolt contact

Earthing:
- Four M16 VA earth connections welded onto the outside (lightning-resistant outer enclosure)
- Internal earth rails in the ceiling area
- Option of potential equalisation rails underneath the power infeed

Interior fit-out:
- The base has a chequer plate design
- Both long sides have welded-in C-rails for attaching enclosures and other components
- LED lights, including light switches
- Battery-buffered emergency lights
- Temperature sensor with alarm monitoring and humidity monitoring in a separate distribution cabinet
- Option of having a raised floor

Rodent and insect protection:
- All openings closed with sealing bungs
- Optional battery ventilation with insect screen

Climate control:
- Option of cooling units or heat exchanger (RC4 maintained)
- Option of heater

Dimensions:
- Length up to 12,000 mm
- Width 3000 mm
- Height 3000 mm
- Suitable for transport by road

Technical information

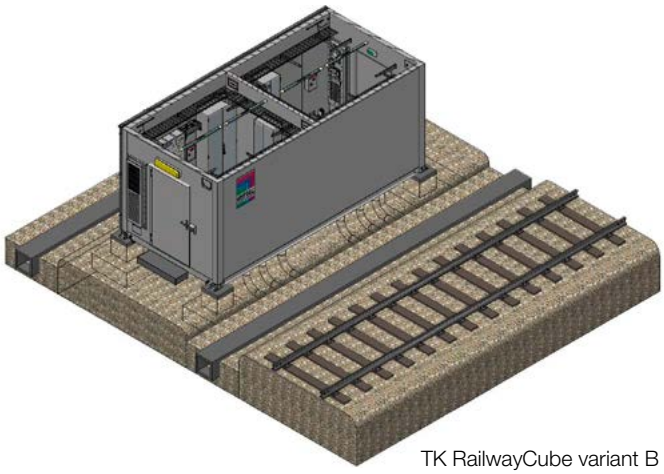
Standard-related requirements

Requirement	Standard	Property
Protection category	IEC 60529	IP 55
Resistance class	DIN EN 1627	RC4
Protection class	DIN VDE 0140-1	Protection class 1
Degassing (battery gases)	Ril 819.0904	Option of active and passive battery degassing
Fire protection	DIN 4102 / Ril 859.0601	Non-flammable outer enclosure and insulation
Impact protection	IEC 62262	IK 10
Altitude	DIN EN 50125-3	A2, up to 1000 m above sea level
Temperature	DIN EN 50125-3	T1, -25 °C…+40 °C
Humidity	DIN EN 50125-3	T1, 5%…100%
Wind speed	DIN EN 50125-3	Up to 56 m/s
Rain	DIN EN 50125-3	TX, > 15 mm/min
Snow and hail	DIN EN 50125-3	Outdoor-tested
Ice	DIN EN 50125-3	Outdoor-tested
Sunlight	DIN EN 50125-3	UV-resistant
Effects of pressure/suction	DIN EN 1991-2	Minimum distance of 4.0 m to centre of track based on a train speed of up to 300 km/h
Wind load	DIN EN 1991-1-4	Wind load zones 1 – 4
Snow load	DIN EN 1991-1-3	Snow load zones 1 – 3
Stability during snow clearing at up to 50 km/h	DIN EN 1794-1	Minimum distance of 4.0 m to centre of track
Corrosion resistance	DIN EN ISO 12944	> 20 years, atmospheric corrosivity C4H

Containers are constructed in accordance with specific requirements.
However, four standard containers have been specified for the telecommunications systems of Deutsche Bahn AG:

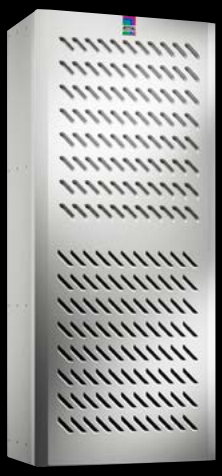
TK RailwayCube

Variant	**A**	**B**	**C**	**D**
Rooms (number)	1	2	1	1
Internal length m	3.15	6.25	6.25	4.5
External door (number)	1	2	1	1
Key safe	–	■	–	–
Cooling output kW	1 x 3.8	1 x 3.8 + 1 x 5.0	2 x 3.8	1 x 5.0
Type	DB-BSS-3.8kW-1	DB-FRMCS-8.8kW-1	DB-FRMCS-7.6kW-2	DB-BSS-5kW-2



TK RailwayCube variant B

Wall-mounted Blue e+ outdoor cooling units



Material:
– Aluminium AlMg

Surface finish:
– Powder-coated with UV-resistant pure polyester

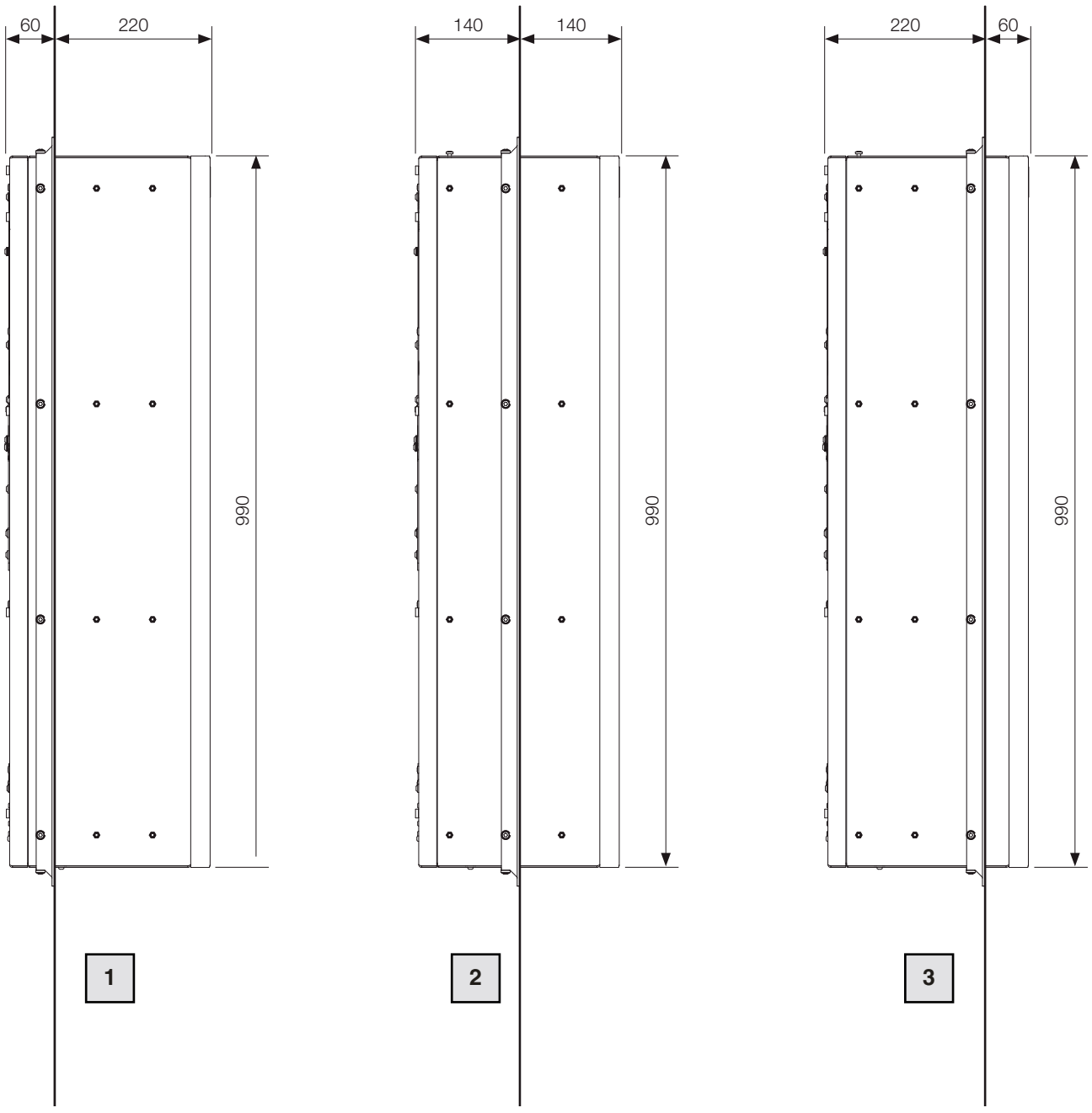
Colour:
– RAL 7035, light grey

Supply includes:
– Sealing frame for external mounting, partial internal mounting and full internal mounting
– Assembly parts

Note:
– Average 75% energy savings thanks to speed-regulated components and heat pipe technology
– Longer service life of the components inside the enclosure and the cooling unit due to component-friendly cooling
– Intuitive operation with touch display and intelligent interfaces
– Integral electric condensate evaporation
– Condenser with hydrophobic RiNano coating
– GWP < 750

Total cooling output 50 Hz L35 L35 to DIN EN 14511 kW	**1.5**	**2**	**2.5**	**3.8**	**5**
Rated operating voltage V, ~, Hz	110 – 240, 1~, 50/60			380 – 480, 3~, 50/60	
Width mm	415	465	465	465	465
Height mm	990	1640	1640	1640	1640
Depth mm	279	260	260	360	360
Operating temperature range	-30 °C…+60 °C				
Setting range	+20 °C…+50 °C				
Weight kg	37.1	56.8	56.8	72.8	72.8
Model No.	**3185.330**	**3186.330**	**3187.330**	**3188.340**	**3189.340**

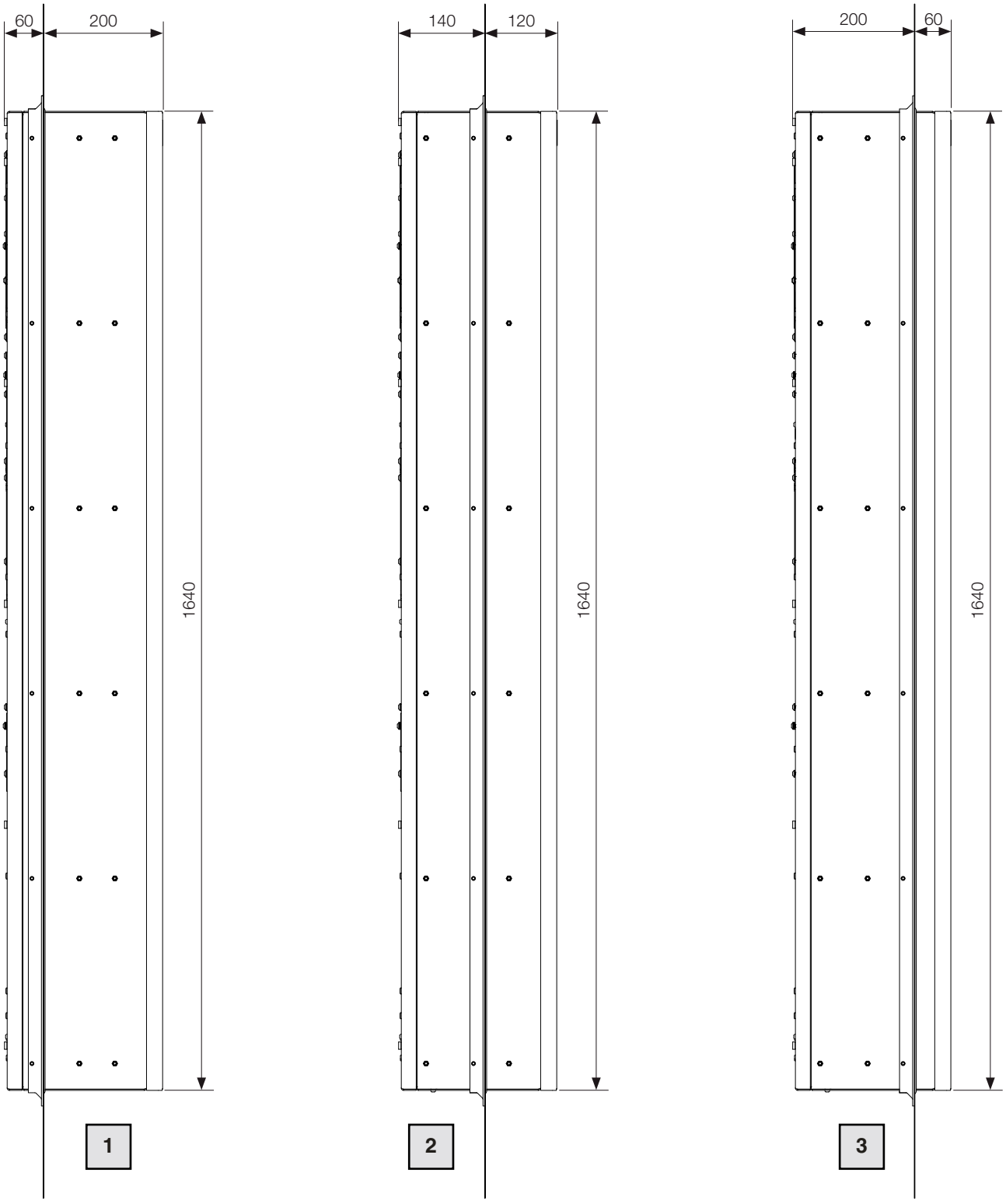
Dimensions and installation depths for external mounting, partial internal mounting and full internal mounting 3185.330



1 = External mounting
2 = Partial internal mounting
3 = Full internal mounting

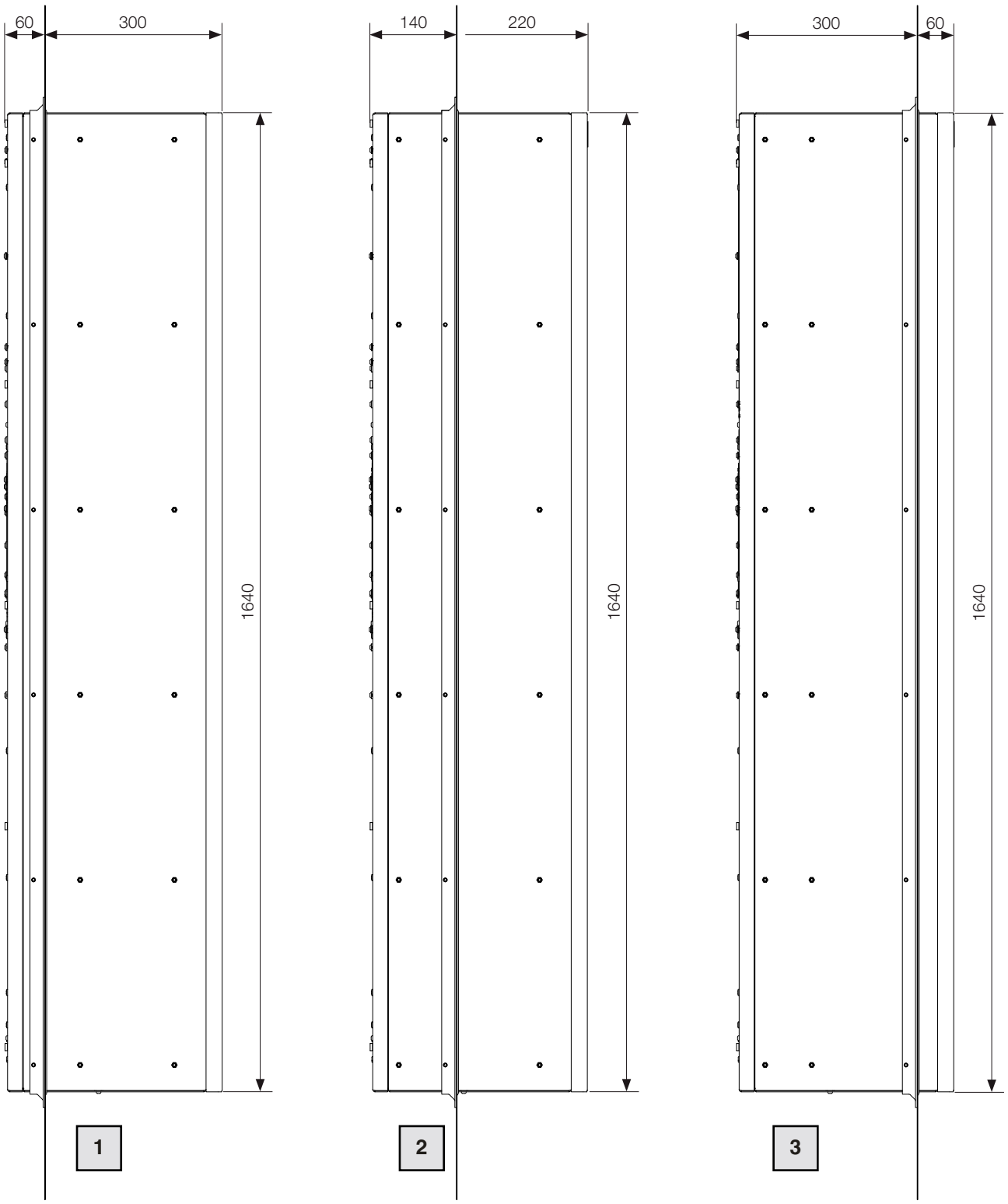
Technical information

Dimensions and installation depths for external mounting, partial internal mounting and full internal mounting 3186.330 and 3187.330



1 = External mounting
2 = Partial internal mounting
3 = Full internal mounting

Dimensions and installation depths for external mounting, partial internal mounting and full internal mounting 3188.340 and 3189.340



1 = External mounting
2 = Partial internal mounting
3 = Full internal mounting

Enclosure heaters

Material:
– Aluminium, anodised

Supply includes:
– PTC heater
– Quick-connection terminal
– Assembly parts

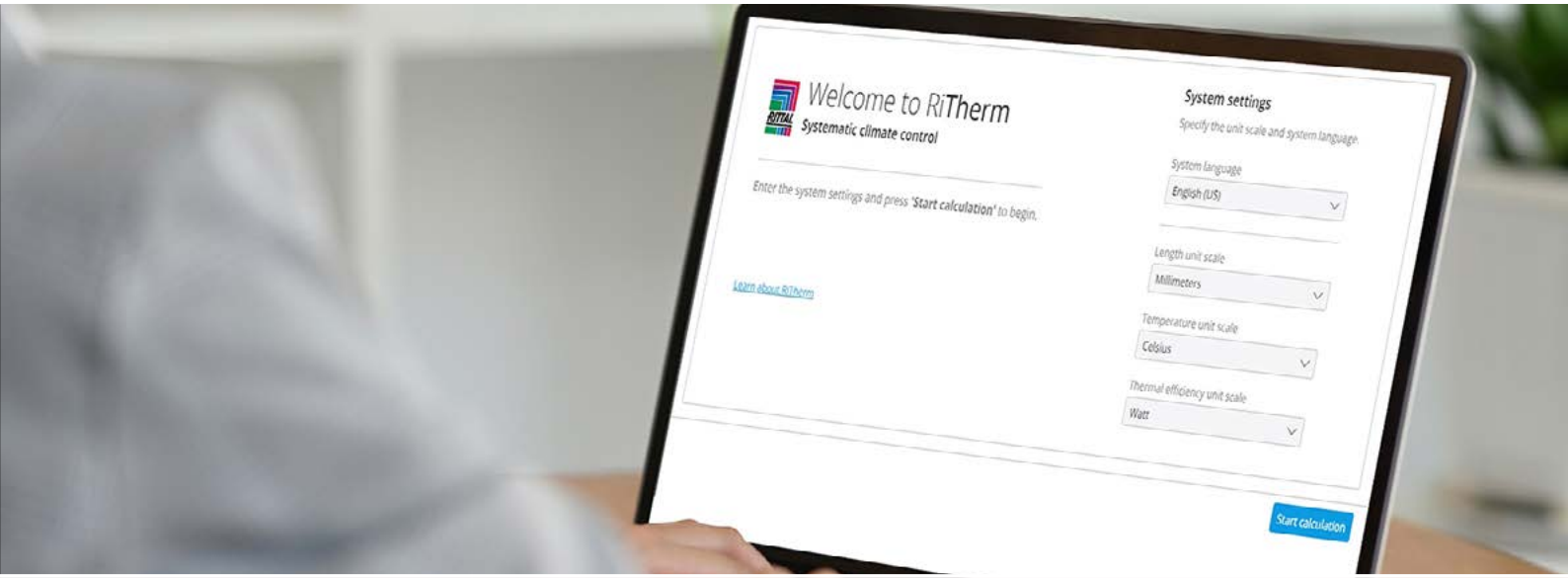
Protection class:
– II (all-insulated)

Note:
– Enclosure heaters to regulate relative humidity, prevent temperatures from dropping below the dew point and stop condensation forming inside the enclosure
– This prevents consequential damage associated with corrosion or electrical short-circuits
– In larger enclosures, the best way of achieving even heat distribution is by installing several low-output heaters

Continuous thermal output at T_u = 10 °C W	Packs of	**8 – 10**	**18 – 20**	**23 – 30**	**49 – 50**
Rated operating voltage V, ~, Hz		110 – 240, 1~, 50/60			
Width mm		45	45	64	64
Height mm		120	120	155	155
Depth mm		46	46	56	56
Model No.	1 pc(s).	**3105.310**	**3105.320**	**3105.330**	**3105.340**

Continuous thermal output at T_u = 10 °C W	Packs of	**63 – 75**	**86 – 100**	**130 – 150**
Rated operating voltage V, ~, Hz		110 – 240, 1~, 50/60		
Width mm		64	90	90
Height mm		230	165	180
Depth mm		56	75	75
Model No.	1 pc(s).	**3105.350**	**3105.360**	**3105.370**

Calculating climate control requirements with RiTherm



Climate control calculations for enclosures. Even better. Even easier.

RiTherm planning software helps you boost your performance and save time. After all, the correct design approach ensures you can plan exactly the enclosure climate control system you need, both quickly and with certainty. Naturally, standard-compliant documentation is also included.

Description:

Quickly and easily design the correct climate control for your switchgear:

- Calculation and selection for all environmental conditions that apply to the enclosures being planned
- Optionally define your altitude (which influences cooling output)
- Calculate bayed enclosure suites according to your requirements
- Recommendation of suitable accessories for your enclosure climate control system

Integral energy efficiency calculator:

- Energy efficiency calculator for individual climate zones
- Suggestions for more energy-efficient alternatives
- Calculate the carbon footprint of your climate control system, from delivery through to operation
- Information about F-gases / Global Warming Potential (GWP)

Comprehensive documentation:

- Standard-compliant heat dissipation certificate
- All required product information (such as approvals)
- Product lifecycle status with reference to successor products

Configure online at www.rittal.com/RiTherm

System accessories for Toptec interior fit-out

Accessories:
- Concrete base/plinth
- LED compact system light
- LED system light
- Installation bracket for 19" mounting angles
- Mounting angles, 482.6 mm (19") for TS, Toptec
- Enclosure internal thermostat
- TS punched section with mounting flange, 17 x 73 mm
- Modular plastic gland plate with metric knockouts, for AX
- Plastic gland plate with membranes, for AX
- Metal gland plate with metric knockouts, for AX
- Enclosure heater with fan
- Wall-mounted Blue e+ outdoor cooling unit 1.5 kW – 5.0 kW
- Mounting plate attachment for TS
- Mounting plate for VX, TS
- Profile half-cylinder for handle systems
- Enclosure internal thermostat
- Hygrostat

You will find components for interior fit-out, power distribution and climate control online at www.rittal.com/Accessory_finder

Indoor solutions – overview

The requirements for enclosures that are installed in closed rooms are generally much lower than for outdoor enclosures. However, careful attention must still be paid to which conditions need to be considered, e.g. whether the enclosures are in a closed space or in an environment open to the public.

Terminal boxes

Various materials can be used for terminal boxes. They can be made of plastic, sheet steel, cast aluminium or stainless steel. The extent to which they can also be used outdoors should be determined on a case-by-case basis.
PK plastic enclosures are made of fibre-reinforced polycarbonate. They are available in sizes ranging from 65 x 65 x 57 mm to 360 x 254 x 165 mm and meet protection category IP 66 according to DIN EN 60529.
GA terminal boxes are made of cast aluminium and also meet protection category IP 66 according to DIN EN 60529. They are available in sizes ranging from 58 x 64 x 36 mm to 330 x 230 x 183 mm.
KX terminal boxes come in both powder-coated sheet steel and stainless steel. The sheet steel enclosures are available in versions with gland plates and a completely closed body. Their sizes range from 150 x 150 x 80 mm to 800 x 400 x 120 mm, and they meet protection category IP 66 according to DIN EN 60529.
KX terminal boxes made of stainless steel have the same protection category. They are made of stainless steel 1.4301 (AISI 304) and are available in sizes ranging from 150 x 150 x 80 mm to 400 x 300 x 120 mm or 380 x 300 x 155 mm.

For further information, go to www.rittal.com/terminal_box_KX

AX compact enclosure

The AX compact enclosure is also available in powder-coated sheet steel and stainless steel.
Single-door compact enclosures meet protection category IP 66, while two-door compact enclosures meet protection category IP 55 according to DIN EN 60529.
The sheet steel version is available in 39 sizes, ranging from 300 x 300 x 210 mm to 1200 x 1200 x 400 mm.
The stainless steel version is available in sizes ranging from 300 x 300 x 210 mm to 1000 x 1200 x 300 mm and can be made of stainless steel 1.4301 (AISI 304) or stainless steel 1.4404 (AISI 316L).

Further information can be found at www.rittal.com/ax

Indoor solutions – overview

VX SE free-standing enclosure system

The roof and sides of the VX free-standing enclosure system are made from a single piece with a profiled frame. The system is available in six widths (600 mm, 800 mm, 1000 mm, 1200 mm, 1600 mm and 1800 mm), two heights (1800 mm and 2000 mm) and four depths (300 mm, 400 mm, 500 mm and 600 mm). Its protection category according to DIN EN 60529 is IP 55, and it is made of sheet steel.

Further information can be found at www.rittal.com/VX-SE

VX25 baying enclosure system

Enclosures from the VX25 series can be connected to form wide enclosure combinations. They are made of sheet steel or stainless steel and meet protection category IP 55 according to DIN EN 60529.

The sheet steel version is available in 44 sizes, including five widths (400 mm, 600 mm, 800 mm, 1000 mm and 1200 mm), six heights (1200 mm, 1400 mm, 1600 mm, 1800 mm, 2000 mm and 2200 mm) and four depths (400 mm, 500 mm, 600 mm and 800 mm).

The stainless steel version is available in eight sizes ranging from 800 x 1800 x 400 mm to 1200 x 2000 x 600 mm.

The VX25 baying enclosure system features an extensive range of accessories, including side panels, base/plinth systems, mounting rails, locking systems, baying connectors, and much more besides.

Further information can be found at www.rittal.com/VX25

VX IT network and server racks

The VX IT series is based on the VX25 baying enclosure system and boasts the same versatility. The racks are available with a choice of either glazed doors or perforated sheet steel doors. They are usually equipped with 19" mounting levels and are available in depths of up to 1200 mm, which is ideal for server applications. They can also be bayed as desired in data centres or server rooms. As these racks are usually installed in clean rooms, the protection category is not relevant here.

In addition to 19" components, they can also accommodate components compliant with the ETSI standard, the metric standard or 24" systems.

Further information can be found at www.rittal.com/VX-IT-Open

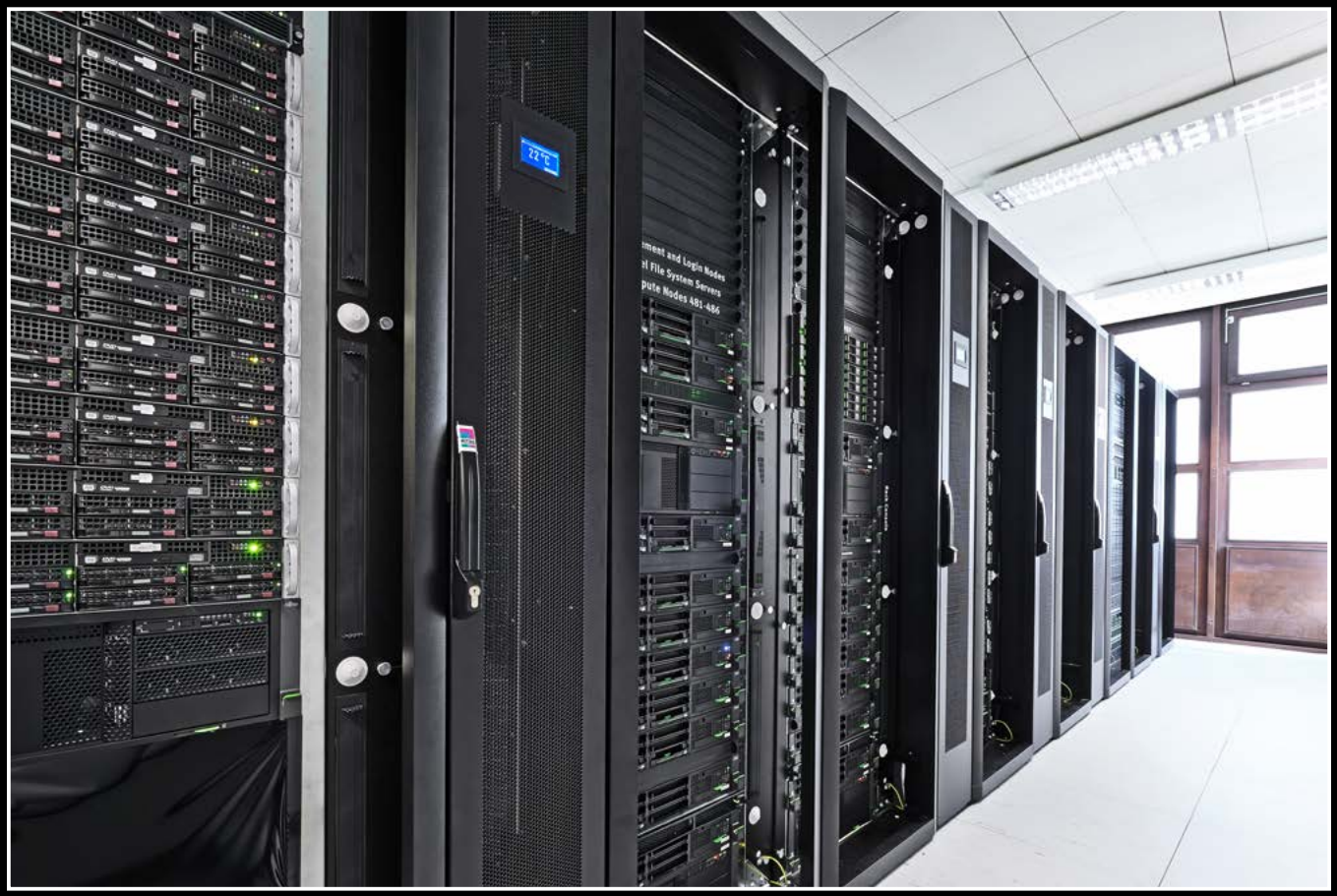
Indoor solutions – overview

Other options

Like the previous solutions, PC enclosures, console systems, command panels, wall-mounted enclosures, 19" enclosures, and other Rittal systems can also be used in the railway sector. However, it is important to ensure that the enclosure selected always meets the specified requirements.

Further information can be found at www.rittal.com/consoles

Detailed information is available online at www.rittal.com/railway-technology.



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- Climate Control
- IT Infrastructure
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