



HIRSCHMANN

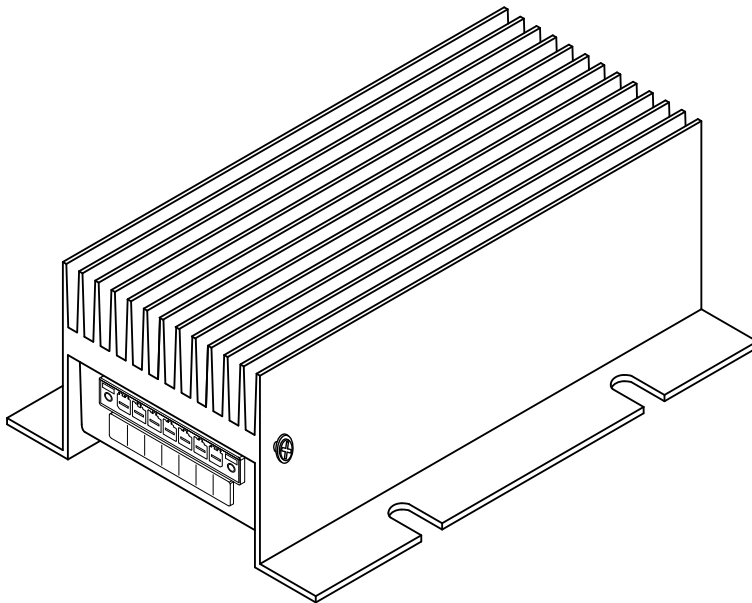
A **BELDEN** BRAND

User Manual

Installation

Power supply unit

PC150/110V/54V



The naming of copyrighted trademarks in this manual, even when not specially indicated, should not be taken to mean that these names may be considered as free in the sense of the trademark and tradename protection law and hence that they may be freely used by anyone.

© 2018 Hirschmann Automation and Control GmbH

Manuals and software are protected by copyright. All rights reserved. The copying, reproduction, translation, conversion into any electronic medium or machine scannable form is not permitted, either in whole or in part. An exception is the preparation of a backup copy of the software for your own use.

The performance features described here are binding only if they have been expressly agreed when the contract was made. This document was produced by Hirschmann Automation and Control GmbH according to the best of the company's knowledge. Hirschmann reserves the right to change the contents of this document without prior notice. Hirschmann can give no guarantee in respect of the correctness or accuracy of the information in this document.

Hirschmann can accept no responsibility for damages, resulting from the use of the network components or the associated operating software. In addition, we refer to the conditions of use specified in the license contract.

You can get the latest version of this manual on the Internet at the Hirschmann product site (www.hirschmann.com).

Hirschmann Automation and Control GmbH
Stuttgarter Str. 45-51
72654 Neckartenzlingen
Germany

Contents

	Safety instructions	4
	About this Manual	8
	Legend	9
1	Description	10
1.1	General device description	10
1.2	Device view	10
1.3	Pin assignments	11
2	Installation	12
2.1	Checking the package contents	12
2.2	Installing and grounding the device	12
2.3	Connecting the terminal blocks	15
2.4	Operating the device	16
3	Monitoring the ambient air temperature	17
4	Maintenance and service	18
5	Disassembly	19
5.1	Removing the device	19
6	Technical data	20
6.1	General technical data	20
6.2	Dimension drawings	21
6.3	EMC and immunity	22
6.4	Power consumption/power output	23
7	Scope of delivery	24
8	Underlying technical standards	25
A	Further support	26

Safety instructions

■ General safety instructions

You operate this device with electricity. Improper usage of the device entails the risk of physical injury or significant property damage. The proper and safe operation of this device depends on proper handling during transportation, proper storage and installation, and careful operation and maintenance procedures.

- Before connecting any cable, read this document, and the safety instructions and warnings.
- Operate the device with undamaged components exclusively.
- The device is free of any service components. In case of a damaged or malfunctioning device, turn off the supply voltage and return the device to Hirschmann for inspection.

■ Qualification requirements for personnel

- Only allow qualified personnel to work on the device.

Qualified personnel have the following characteristics:

- ▶ Qualified personnel are properly trained. Training as well as practical knowledge and experience make up their qualifications. This is the prerequisite for grounding and labeling circuits, devices, and systems in accordance with current standards in safety technology.
- ▶ Qualified personnel are aware of the dangers that exist in their work.
- ▶ Qualified personnel are familiar with appropriate measures against these hazards in order to reduce the risk for themselves and others.
- ▶ Qualified personnel receive training on a regular basis.

■ Correct usage

Only use the device for those purposes specified in the catalog and in the technical description. Only operate the device with external devices and components that are recommended and permitted by the manufacturer. The proper and safe operation of this product depends on proper handling during transport, proper storage, assembly and installation, and conscientious operation and maintenance procedures.

■ National and international safety regulations

Verify that the electrical installation meets local or nationally applicable safety regulations.

■ Requirements for connecting electrical wires

Before connecting the electrical wires, **always** verify that the requirements listed are complied with.

The following requirements apply without restrictions:

- ▶ The electrical wires are voltage-free.
- ▶ The cables used are permitted for the temperature range of the application case.
- ▶ Connect the grounding conductor to the grounding screw at the device housing.
- ▶ Exclusively switch on the device when it is installed.
- ▶ Relevant for North America:
Exclusively use 60/75 °C (140/167 °F) or 75 °C (167 °F) copper (Cu) wire.

Table 1: Requirements for connecting electrical wires

■ Requirements for connecting the supply voltage

Device variant Prerequisites:

- | | |
|---------------------|--|
| All variants | <p>All of the following requirements are complied with:</p> <ul style="list-style-type: none">▶ The supply voltage corresponds to the voltage specified on the type plate of the device.▶ The power supply conforms to overvoltage category I or II.▶ The power supply has an easily accessible disconnecting device (for example a switch or a plug). This disconnecting device is clearly identified. So in the case of an emergency, it is clear which disconnecting device belongs to which power supply cable.▶ The wire diameter of the power supply cable is at least 0.75 mm² (North America: AWG18) on the supply voltage input.▶ Use a power supply cable which is suitable for the voltage, the current and the physical load.▶ The cross-section of the ground conductor is the same size as or bigger than the cross-section of the power supply cables.▶ Install an external fuse suitable for DC voltage in the supply voltage input line of the plus terminal. |
|---------------------|--|

Table 2: Requirements for connecting the supply voltage

■ Device casing

Only technicians authorized by the manufacturer are permitted to open the casing.

- Keep the cooling fins free to ensure good air circulation.
- Verify that there is at least 4 in (10 cm) of space around the cooling fins of the casing.
- Do not touch the housing during operation or shortly after switching off the device. Hot surfaces can cause injury.
- Mount the device on a level surface with 4 M5 screws.

■ Installation site requirements

Operate the device at the specified ambient temperature (temperature of the ambient air at a distance of 2 in (5 cm) from the device) and at the specified relative humidity exclusively.

- ▶ When you are selecting the installation location, make sure you observe the climatic threshold values specified in the technical data.
- ▶ Use the device in an environment with a maximum pollution degree that complies with the specifications in the technical data.
- ▶ When mounting the device in an industrial environment: Install the device in a fire enclosure according to EN 60950-1.
- ▶ Hirschmann recommends a vertical installation of the power supply unit so that a natural convection can develop. The output power must be reduced if you install the device with differing orientation. The maximum temperature at the measurement point below the cooling fins must not exceed +194 °F (+90 °C).

[See "Monitoring the ambient air temperature" on page 17.](#)

■ **CE marking**

The labeled devices comply with the regulations contained in the following European directive(s):

- ▶ 2011/65/EU (RoHS)
Directive of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
- ▶ 2014/30/EU (EMC)
Directive of the European Parliament and the council for standardizing the regulations of member states with regard to electromagnetic compatibility.
- ▶ 2014/35/EU
Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.

In accordance with the above-named EU directive(s), the EU conformity declaration will be at the disposal of the relevant authorities at the following address:

Hirschmann Automation and Control GmbH
Stuttgarter Str. 45-51
72654 Neckartenzlingen
Germany
www.hirschmann.com

The product is suitable for use in the industrial sector and in rail vehicles.

- ▶ Interference immunity: EN 61000-6-2
- ▶ Emitted interference: EN 61000-6-4; EN 55032
- ▶ Reliability: EN 60950-1

Warning! This is a class A device. This device can cause interference in living areas, and in this case the operator may be required to take appropriate measures.

Note: The assembly guidelines provided in these instructions must be strictly adhered to in order to observe the EMC threshold values.

■ **Recycling note**

After usage, this device must be disposed of properly as electronic waste, in accordance with the current disposal regulations of your county, state, and country.




About this Manual

The document "User Manual Installation" contains a device description, safety instructions, and further information that you require to install and start up the device.

Documentation mentioned in the "Installation" user manual that is not supplied with your device in print can be found as PDF download on the Internet at the Hirschmann product pages (www.hirschmann.com).

Legend

The symbols used in this manual have the following meanings:

	Listing
	Work step
	Subheading

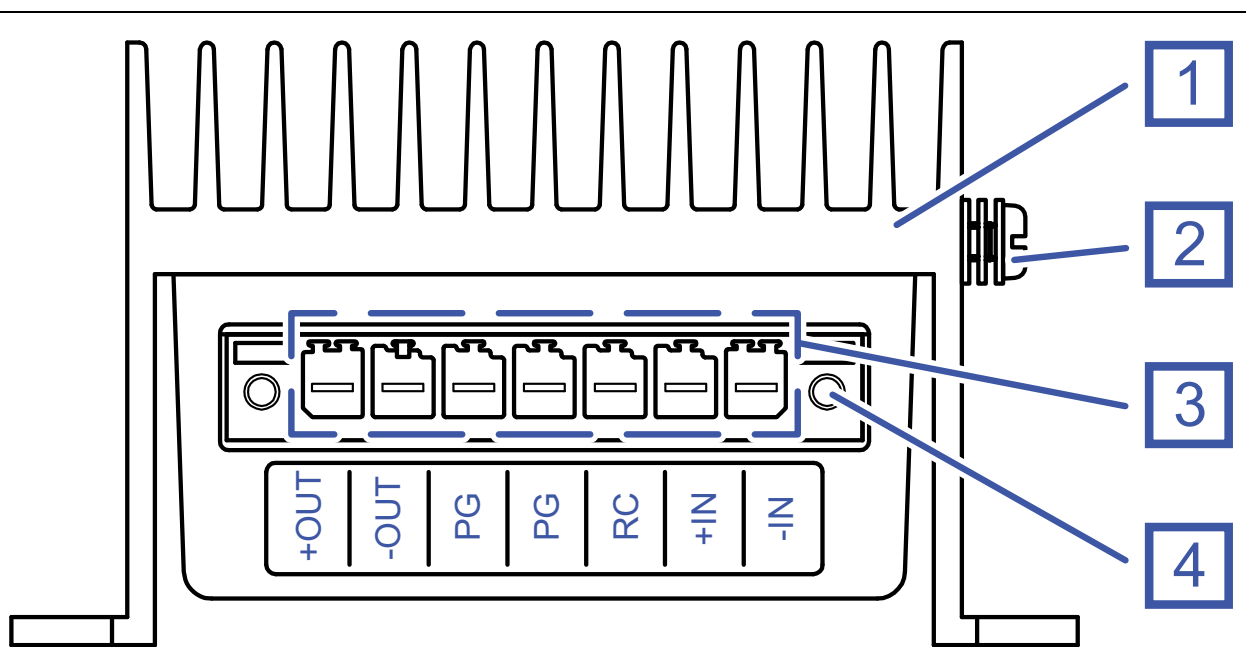
1 Description

1.1 General device description

The PC150/110V/54V devices are designed for the special requirements of industrial automation. They meet the relevant industry standards, provide very high operational reliability, even under extreme conditions, and also long-term reliability and flexibility.

The devices allow you to supply switches in harsh industrial environments and railway vehicles with power.

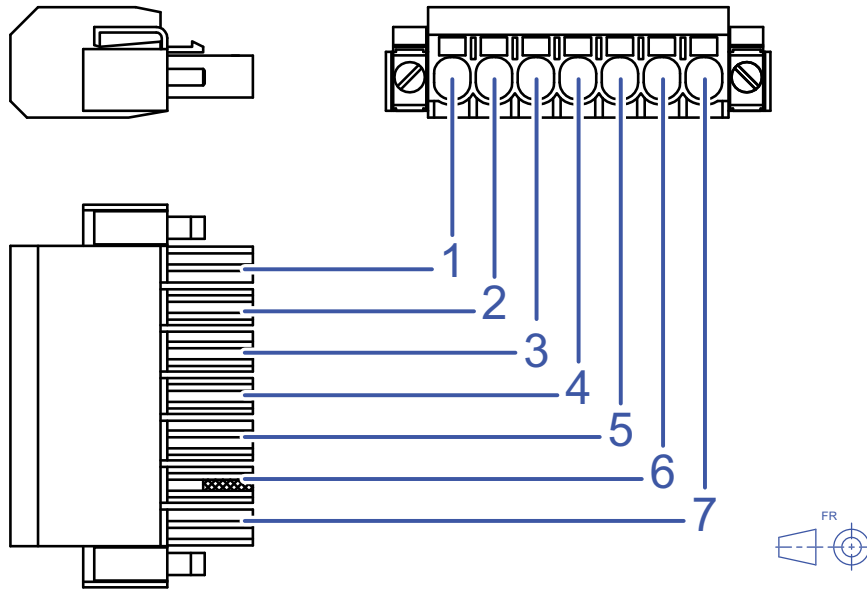
1.2 Device view



PC150/110V/54V

- | | |
|---|--|
| 1 | Housing |
| 2 | Functional earth screw |
| 3 | Supply voltage connection for 7-pin terminal block |
| 4 | Thread to screw on the terminal block for the supply voltage |

1.3 Pin assignments



Terminal block with pull spring, 7-pin

1	+OUT	Plus terminal of the output voltage
2	-OUT	Minus terminal of the output voltage
3	PG	Reserved
4	PG	Reserved
5	RC	Reserved
6	+IN	Plus terminal of the input voltage
7	-IN	Minus terminal of the input voltage

2 Installation

The devices have been developed for practical application in a harsh industrial environment and in railway vehicles.
On delivery, the device is ready for operation.

Perform the following steps to install the device:

- ▶ [Checking the package contents](#)
- ▶ [Installing and grounding the device](#)
- ▶ [Connecting the terminal blocks](#)
- ▶ [Operating the device](#)

2.1 Checking the package contents

- Check whether the package includes all items named in the section [“Scope of delivery” on page 24](#).
- Check the individual parts for transport damage.

2.2 Installing and grounding the device



WARNING

ELECTRIC SHOCK

Install this device solely in a switch cabinet or in an operating site with restricted access, to which maintenance staff have exclusive access.

Failure to follow this instruction can result in death, serious injury, or equipment damage.



CAUTION

OVERHEATING OF THE DEVICE

Verify that all cooling fins are clear when installing the device. Avoid touching the device while it is operating.

Failure to follow these instructions can result in minor injury or equipment damage.

Additionally for installations in industrial environments (scope of EN 60950-1):

WARNING

FIRE HAZARD

Install the device in a fire enclosure according to EN 60950-1.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

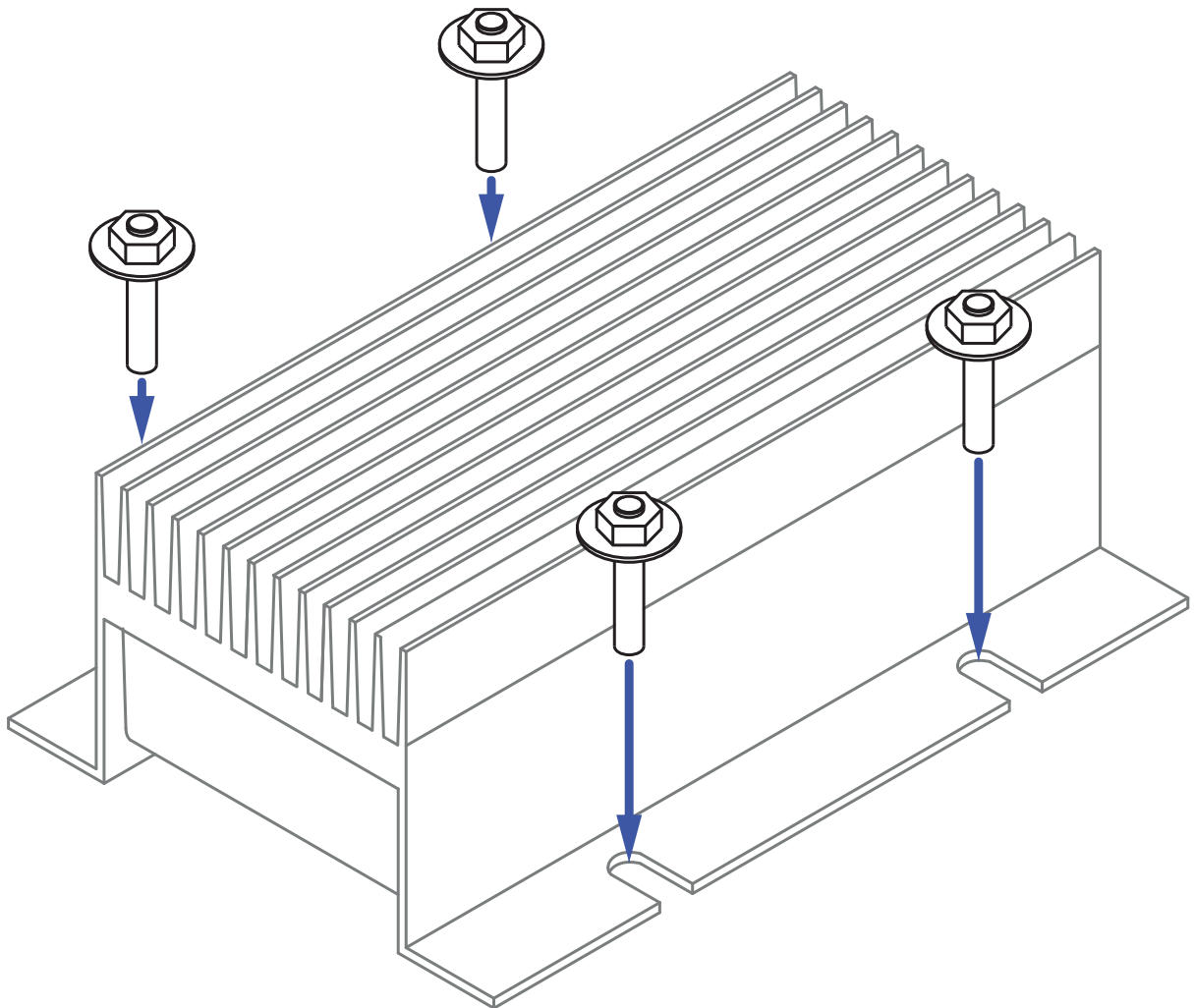


Figure 1: Installing and grounding the device: Mounting on a flat surface

Proceed as follows:

- Mount the device to a flat surface.
Screw on the power supply unit with 4 M5 screws.

Note: Hirschmann recommends a vertical installation of the power supply unit so that a natural convection can develop. The output power must be reduced if you install the device with differing orientation. The maximum temperature at the measurement point below the cooling fins must not exceed +194 °F (+90 °C).

See “Monitoring the ambient air temperature” on page 17.

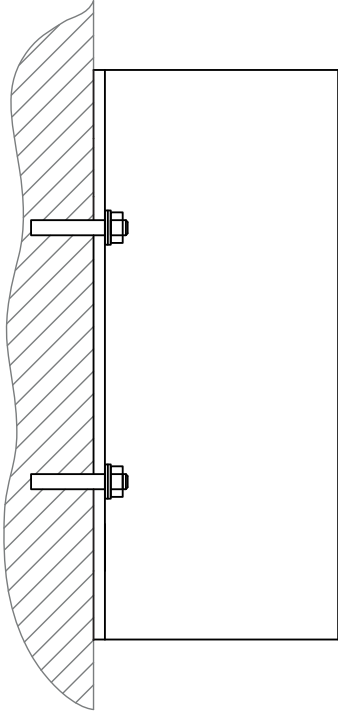


Figure 2: *Installing and grounding the device: Vertical mounting on a flat surface (side view)*

■ Grounding the device

The device has a functional ground connection.

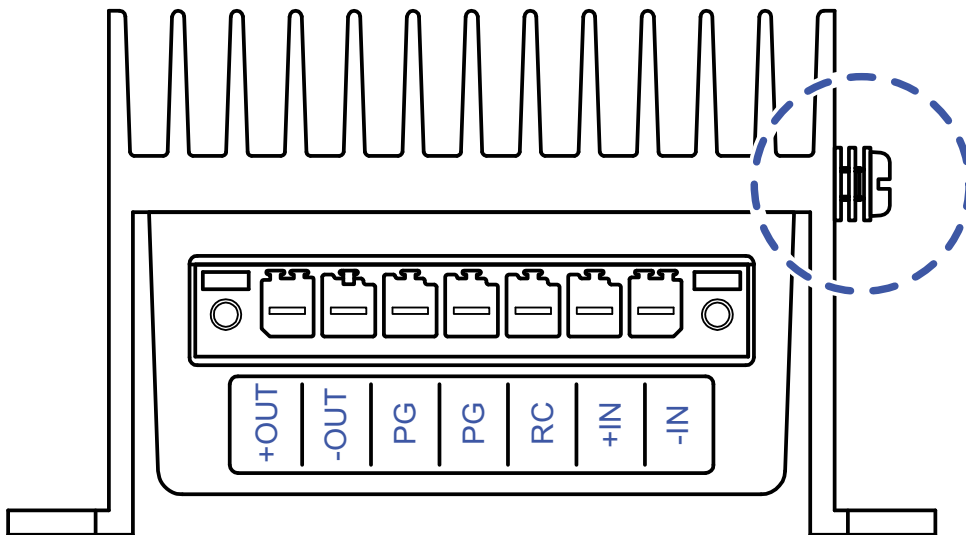


Figure 3: *Grounding: Location of ground connection screw on the device (front side of the device)*

Proceed as follows:

- Ground the device via the ground screw.
You find the prescribed tightening torque in chapter:
[“General technical data” on page 20](#)

2.3 Connecting the terminal blocks



WARNING

ELECTRIC SHOCK

Start connecting the electrical wires only if all safety requirements listed in chapter “[General safety instructions](#)” are fulfilled.

Failure to follow these instructions can result in death, serious injury, or equipment damage.



WARNING

ELECTRIC SHOCK

Connect only a supply voltage that corresponds to the type plate of your device.

Failure to follow these instructions can result in death, serious injury, or equipment damage.



WARNING

ELECTRIC SHOCK

Never insert sharp objects (small screwdrivers, wires, etc.) into the connection terminals for electric conductors, and do not touch the terminals.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Proceed as follows:

- Remove the terminal block from the transport packaging or disconnect the terminal block from the device.
- Connect the wires according to the pin assignment on the device with the clamps.
[See “Pin assignments” on page 11.](#)

2.4 Operating the device



WARNING

ELECTRIC SHOCK

Ground the device before connecting any other cables.

Failure to follow these instructions can result in death, serious injury, or equipment damage.



WARNING

ELECTRIC SHOCK

Exclusively connect voltage-free wires with the connections on the device.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Proceed as follows:

- Plug the terminal block into the connection for the supply voltage on the device.
- Mount the terminal block on the device using screws.
You find the prescribed tightening torque in chapter:
[“General technical data” on page 20](#)
- Enable the supply voltage.

Note: Verify that the prescribed performance parameters and ambient air temperatures are adhered to.

See [“General technical data” on page 20](#).

3 Monitoring the ambient air temperature

Exclusively operate the device up to the specified maximum ambient air temperature. Make sure that the device temperature does not exceed +194 °F (+90 °C) at the temperature measurement point. For the position of the temperature measurement point on the bottom of the device below the cooling fins, see [figure 4](#).

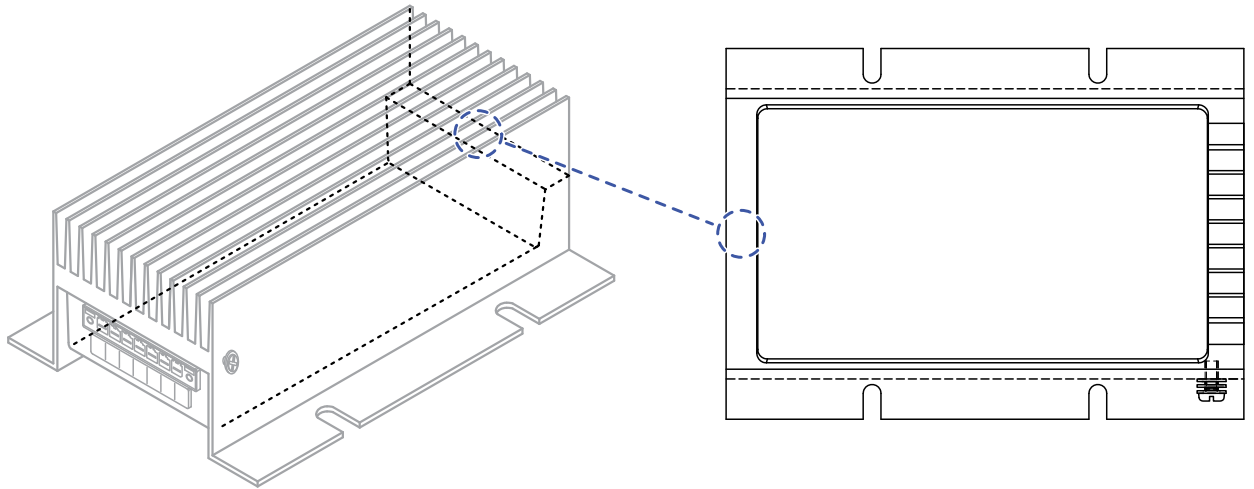


Figure 4: Monitoring the ambient air temperature: Temperature measurement point on the bottom of the device

Keep the cooling fins free to ensure good air circulation. Hirschmann recommends a vertical installation of the power supply unit so that a natural convection can develop. The output power must be reduced if you install the device with differing orientation.

[See figure 2 on page 14.](#)

4 Maintenance and service

- When designing this device, Hirschmann largely avoided using high-wear parts. The parts subject to wear and tear are dimensioned to last longer than the lifetime of the product when it is operated normally. Operate this device according to the specifications.
- In case of damage or malfunction of the device, turn off the supply voltage and return the device to the plant for inspection.
- Depending on the pollution degree in the operating environment, check at regular intervals that the cooling fins of the device are not obstructed.

The device does not require service or maintenance.

You find information on settling complaints on the Internet at <http://www.beldensolutions.com/en/Service/Repairs/index.phtml>.

5 Disassembly

5.1 Removing the device



WARNING

ELECTRIC SHOCK

Disconnect the grounding only after disconnecting all other cables.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Proceed as follows:

- Disable the supply voltage.

Note: The device heats up during operation. Before you touch the device: After you switch off the supply voltage, wait until the device has cooled down.

- Remove the terminal connector from the device.
- Disconnect the grounding.
- Remove the screws.

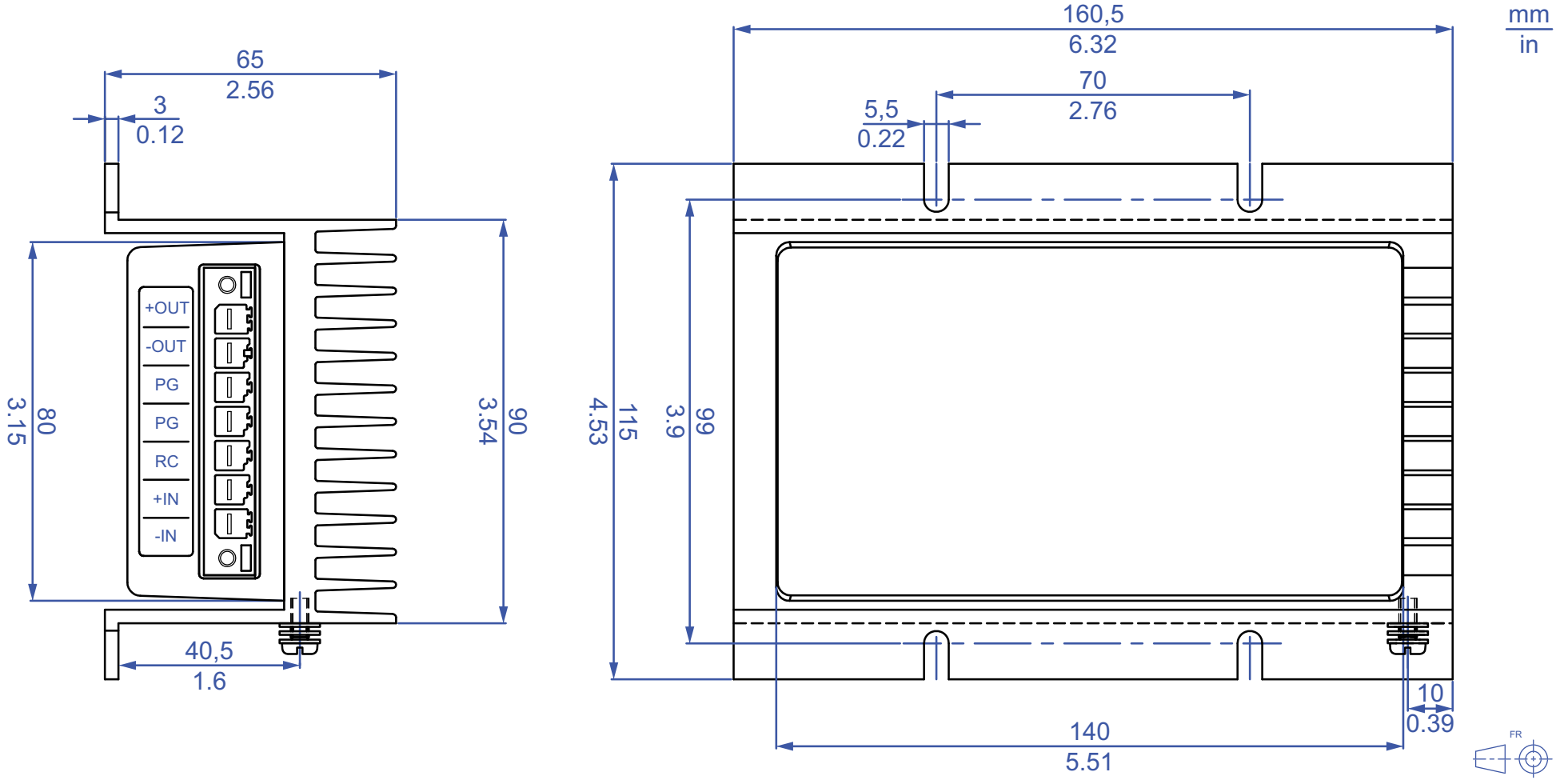
6 Technical data

6.1 General technical data

Dimensions	See "Dimension drawings" on page 21.			
Weight	3.09 lb (1.4 kg)			
Power supply	Rated voltage range	72 V DC ... 110 V DC		
	Voltage range including maximum tolerances	50.4 V DC ... 154 V DC		
	Input current	2.3 A ... 1.6 A		
	Efficiency	≥88 %		
	Idle behavior	Idling-proof		
	Resistance to short-circuiting	Permanent		
	Back-up fuse for each voltage input	Nominal rating:	6.3 A	
		Characteristic:	slow blow	
	Power loss buffer	>10 ms at 110 V DC		
	Insulation resistance	prim. - sec.	2.0 kV _{AC} / 2.8 kV _{DC}	
		prim. - cooling element	2.0 kV _{AC} / 2.8 kV _{DC}	
		sec. - cooling element	1.6 kV _{AC} / 2.25 kV _{DC}	
	Peak inrush current	2.4 A		
	Current integral I ² t	0.05 A ² s		
	Output voltage	54 V DC SELV	+1.5 % Tolerance	
Output current	2.8 A			
Current limitation	105 % ... 115 % I _{out nominal}			
Connection type	7-pin terminal block			
	min. conductor diameter	AWG18 (0.75 mm ²)		
	max. conductor diameter	AWG8 (10 mm ²)		
	Tightening torque	5.3 lb-in (0.6 Nm)		
Grounding the device	Ground screw M4	Tightening torque 8.85 lb-in (1 Nm)		
	Climatic conditions during operation	Ambient air temperature ^a	-40 °F ... +158 °F (-40 °C ... +70 °C)	
Humidity		5 % ... 95 % (non-condensing)		
Air pressure		min. 700 hPa (+9842 ft; +3000 m) max. 1060 hPa (-1312 ft; -400 m)		
Climatic conditions during storage	Ambient temperature	-40 °F ... +185 °F (-40 °C ... +85 °C)		
	Humidity	5 % ... 95 % (non-condensing)		
	Air pressure	min. 700 hPa (+9842 ft; +3000 m) max. 1060 hPa (-1312 ft; -400 m)		
Pollution degree	2			
Protection class	according to EN 60950-1	2		
Degree of protection	IP20			

a. Temperature of the ambient air at a distance of 2 in (5 cm) from the device

6.2 Dimension drawings



6.3 EMC and immunity

EMC interference emission		Standard applications	Railway applications (trackside)	Railway applications (in vehicles)
Radiated emission				
EN 55032		Class A	Class A	Class A
Conducted emission				
EN 55032	DC supply connection	Class A	Class A	Class A
EN 55032	Telecommunication connections	Class A	Class A	Class A

EMC interference immunity		Standard applications	Railway applications (trackside)	Railway applications (in vehicles)
Electrostatic discharge				
EN 61000-4-2	Contact discharge	±4 kV	±6 kV	±6 kV
EN 61000-4-2	Air discharge	±8 kV	±8 kV	±8 kV
Electromagnetic field				
EN 61000-4-3	80 MHz ... 6000 MHz	max. 10 V/m	max. 20 V/m	max. 20 V/m
Fast transients (burst)				
EN 61000-4-4	DC supply connection	±2 kV	±2 kV	±2 kV
EN 61000-4-4	Data line	±4 kV	±2 kV	±2 kV
Voltage surges - DC supply connection				
EN 61000-4-5	line/ground	±2 kV	±2 kV	±2 kV
EN 61000-4-5	line/line	±1 kV	±1 kV	±1 kV
Voltage surges - data line				
EN 61000-4-5	line/ground	±1 kV	±2 kV	±2 kV
Conducted disturbances				
EN 61000-4-6	150 kHz ... 80 MHz	10 V	10 V	10 V

Stability		Standard applications	Railway applications (trackside)	Railway applications (in vehicles)
IEC 60068-2-64	Vibration	—	—	Operating 5 Hz ... 150 Hz, Broadband noise vertical: 1.0 m/s ² (rms) horizontal: 0.7 m/s ² (rms)
		—	—	Not operating: 5 Hz ... 150 Hz, Broadband noise vertical: 7.9 m/s ² (rms) horizontal: 5.5 m/s ² (rms)
IEC 60068-2-27, test Ea	Shock	15 g at 11 ms	—	vertical: 30 m/s ² , 30 ms horizontal: 50 m/s ² , 30 ms

6.4 Power consumption/power output

Name	Maximum power consumption	Maximum power output
Power supply unit (PSU)		
PC150/110V/54V	176 W	89 Btu (IT)/h

7 Scope of delivery

■ Scope of delivery

Number	Article
1 ×	Device
1 ×	General safety instructions
1 ×	7-pin terminal block

■ Order numbers

Power supply unit PC150/110V/54V	942 242-001
----------------------------------	-------------

8 Underlying technical standards

Name	
EN 45545-2	Railway applications - Fire protection on railway vehicles - Part 2: Requirements for fire behavior of materials and components.
EN 50121-3-2	Railway applications – Electromagnetic compatibility – Part 3-2: railway vehicles – Devices.
EN 50124-1	Railway applications – Insulation coordination – Part 1: Basic requirements – Air and creepage distances for all electrical and electronic devices.
EN 50155	Railway applications – Electronic equipment used on rolling stock
EN 60950-1	Information technology equipment – Safety – Part 1: General requirements
EN 61000-6-2	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments
EN 61000-6-4	Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emitted interference in industrial environments

Table 3: List of the technical standards

The device generally fulfills the technical standards named in their current versions.

The device has an approval based on a specific standard only if the approval indicator appears on the device casing.

A Further support

Technical questions

For technical questions, please contact any Hirschmann dealer in your area or Hirschmann directly.

You find the addresses of our partners on the Internet at <http://www.hirschmann.com>.

A list of local telephone numbers and email addresses for technical support directly from Hirschmann is available at <https://hirschmann-support.belden.com>.

This site also includes a free of charge knowledge base and a software download section.

Hirschmann Competence Center

The Hirschmann Competence Center is ahead of its competitors on three counts with its complete range of innovative services:

- ▶ Consulting incorporates comprehensive technical advice, from system evaluation through network planning to project planning.
- ▶ Training offers you an introduction to the basics, product briefing and user training with certification.
You find the training courses on technology and products currently available at <http://www.hicomcenter.com>.
- ▶ Support ranges from the first installation through the standby service to maintenance concepts.

With the Hirschmann Competence Center, you decided against making any compromises. Our client-customized package leaves you free to choose the service components you want to use.

Internet:

<http://www.hicomcenter.com>



HIRSCHMANN

A **BELDEN** BRAND