

VIPA System 100V

CM | Manual

HB100E_CM | Rev. 13/05

January 2013



Copyright © VIPA GmbH. All Rights Reserved.

This document contains proprietary information of VIPA and is not to be disclosed or used except in accordance with applicable agreements.

This material is protected by the copyright laws. It may not be reproduced, distributed, or altered in any fashion by any entity (either internal or external to VIPA), except in accordance with applicable agreements, contracts or licensing, without the express written consent of VIPA and the business management owner of the material.

For permission to reproduce or distribute, please contact:
VIPA, Gesellschaft für Visualisierung und Prozessautomatisierung mbH
Ohmstraße 4, D-91074 Herzogenaurach, Germany
Tel.: +49 (91 32) 744 -0
Fax.: +49 9132 744 1864
EMail: info@vipa.de
<http://www.vipa.com>

Note

Every effort has been made to ensure that the information contained in this document was complete and accurate at the time of publishing. Nevertheless, the authors retain the right to modify the information. This customer document describes all the hardware units and functions known at the present time. Descriptions may be included for units which are not present at the customer site. The exact scope of delivery is described in the respective purchase contract.

CE Conformity Declaration

Hereby, VIPA GmbH declares that the products and systems are in compliance with the essential requirements and other relevant provisions.

Conformity is indicated by the CE marking affixed to the product.

Conformity Information

For more information regarding CE marking and Declaration of Conformity (DoC), please contact your local VIPA customer service organization.

Trademarks

VIPA, SLIO, System 100V, System 200V, System 300V, System 300S, System 400V, System 500S and Commander Compact are registered trademarks of VIPA Gesellschaft für Visualisierung und Prozessautomatisierung mbH.

SPEED7 is a registered trademark of profichip GmbH.

SIMATIC, STEP, SINEC, TIA Portal, S7-300 and S7-400 are registered trademarks of Siemens AG.

Microsoft und Windows are registered trademarks of Microsoft Inc., USA.

Portable Document Format (PDF) and Postscript are registered trademarks of Adobe Systems, Inc.

All other trademarks, logos and service or product marks specified herein are owned by their respective companies.

Information product support

Contact your local VIPA Customer Service Organization representative if you wish to report errors or questions regarding the contents of this document. If you are unable to locate a customer service center, contact VIPA as follows:

VIPA GmbH, Ohmstraße 4, 91074 Herzogenaurach, Germany

Telefax: +49 9132 744 1204
EMail: documentation@vipa.de

Technical support

Contact your local VIPA Customer Service Organization representative if you encounter problems with the product or have questions regarding the product. If you are unable to locate a customer service center, contact VIPA as follows:

VIPA GmbH, Ohmstraße 4, 91074 Herzogenaurach, Germany

Telephone: +49 9132 744 1150 (Hotline)
EMail: support@vipa.de

Contents

About this manual	1
Safety information	2
Chapter 1 Basics	1-1
Safety information for Users.....	1-2
Overview System 100V	1-3
General Description of the System 100V.....	1-4
Assembly dimensions.....	1-5
Installation guidelines	1-7
Chapter 2 Hardware description and deployment	2-1
Overview	2-2
101-4FH50 - 8x11COM	2-3

About this Manual

This manual describes the terminal modules CM 101 of the System 100V from VIPA.

Outline

Chapter 1: Basics

These basics include recommendations on the handling of the modules of the VIPA System 100V as central resp. decentral automation system.

Besides a system overview you will find general information of the System 100V like assembly dimensions, installation and environmental conditions.

The chapter is finished by the installation guidelines to ensure the EMC during installation.

Chapter 2: Hardware description and deployment

This chapter contains every information for the deployment of the terminal modules of the System 100V.

The terminal modules are not connected to the backplane bus and they are deployed as passive stand-alone components. For example actively supplied sensors may be connected by means of these modules.

Objective and contents

This manual describes the installation and usage of the terminal modules CM 101 of the System 100V.

This manual is relevant for:

Product	Order number	as of state:	
		HW	FW
CM 101	VIPA 101-4FH50	01	-

Target audience

The manual is targeted at users who have a background in automation technology.

Structure of the manual

The manual consists of chapters. Every chapter provides a self-contained description of a specific topic.

Guide to the document

The following guides are available in the manual:

- an overall table of contents at the beginning of the manual
- an overview of the topics for every chapter

Availability

The manual is available in:

- printed form, on paper
- in electronic form as PDF-file (Adobe Acrobat Reader)

Icons Headings

Important passages in the text are highlighted by following icons and headings:

**Danger!**

Immediate or likely danger.
Personal injury is possible.

**Attention!**

Damages to property is likely if these warnings are not heeded.

**Note!**

Supplementary information and useful tips.

Safety information

Applications conforming with specifications

The System 100V is constructed and manufactured for

- communication and process control
- general control and automation applications
- industrial applications
- operation within the environmental conditions specified in the technical data
- installation into a cubicle



Danger!

This device is not certified for applications in

- in explosive environments (EX-zone)

Documentation

The manual must be available to all personnel in the

- project design department
- installation department
- commissioning
- operation



The following conditions must be met before using or commissioning the components described in this manual:

- Hardware modifications to the process control system should only be carried out when the system has been disconnected from power!
- Installation and hardware modification only by properly trained personnel.
- The national rules and regulations of the respective country must be satisfied (installation, safety, EMC ...)

Disposal

National rules and regulations apply to the disposal of the unit!

Chapter 1 Basics

Overview

These basics include recommendations on the handling of the modules of the VIPA System 100V as central resp. decentral automation system.

Besides a system overview you will find general information of the System 100V like assembly dimensions, installation and environmental conditions.

The chapter is finished by the installation guidelines to ensure the EMC during installation.

Content

Topic	Page
Chapter 1 Basics	1-1
Safety information for Users	1-2
Overview System 100V	1-3
General Description of the System 100V	1-4
Assembly dimensions	1-5
Installation guidelines	1-7

Safety information for Users

Handling of electrostatic sensitive modules

VIPA modules make use of highly integrated components in MOS-technology. These components are extremely sensitive to over-voltages that can occur during electrostatic discharges.

The following symbol is attached to modules that can be destroyed by electrostatic discharges:



The symbol is located on the module, the module rack or on packing material and it indicates the presence of electrostatic sensitive equipment.

It is possible that electrostatic sensitive equipment is destroyed by energies and voltages that are far less than the human threshold of perception. These voltages can occur where persons do not discharge themselves before handling electrostatic sensitive modules and they can damage components thereby, causing the module to become inoperable or unusable. Modules that have been damaged by electrostatic discharges may fail after a temperature change, mechanical shock or changes in the electrical load.

Only the consequent implementation of protection devices and meticulous attention to the applicable rules and regulations for handling the respective equipment can prevent failures of electrostatic sensitive modules.

Shipping of electrostatic sensitive modules

Modules have to be shipped in the original packing material.

Measurements and alterations on electrostatic sensitive modules

When you are conducting measurements on electrostatic sensitive modules you should take the following precautions:

- Floating instruments must be discharged before use.
- Instruments must be grounded.

Modifying electrostatic sensitive modules you should only use soldering irons with grounded tips.



Attention!

Personnel and instruments should be grounded when working on electrostatic sensitive modules.

Overview System 100V

General

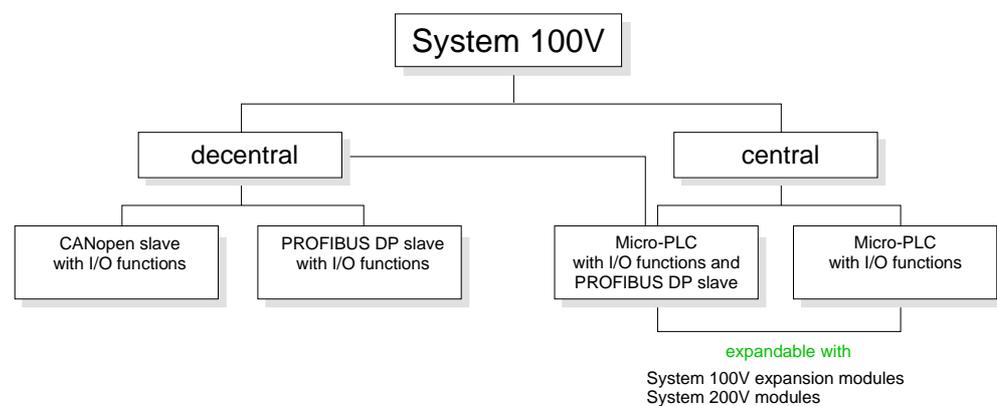
The System 100V from VIPA is a compact central and decentral usable automation system from VIPA. The system is recommended for lower and middle performance needs.

At a System 100V module, CPU res. bus coupler are integrated together with in-/output functions in one case.

System 100V modules are installed directly to a 35mm norm profile rail.

You may expand the number of I/Os of the Micro-PLC by means of expansion modules res. connect System 200V modules via bus couplers.

The following picture shows the performance range of the System 100V:



Central system

The central system is built of one CPU and integrated I/O-functions. The CPU is instruction compatible to the S7-300 from Siemens and may be programmed and projected by means of S7 programming tools from Siemens and VIPA via MPI.

By means of bus couplers you may connect modules of the System 200V family res. enlarge the number of I/Os by installing System 100V expansion modules.

The CPUs are available in different variants.

Central system with DP slave

At the central system besides the CPU and I/O functions, a PROFIBUS DP slave is included that acknowledges itself within the address range of the CPU.

Decentral system

This system contains a PROFIBUS DP res. CANopen slave with I/O functions instead of the CPU. The system is not expandable.

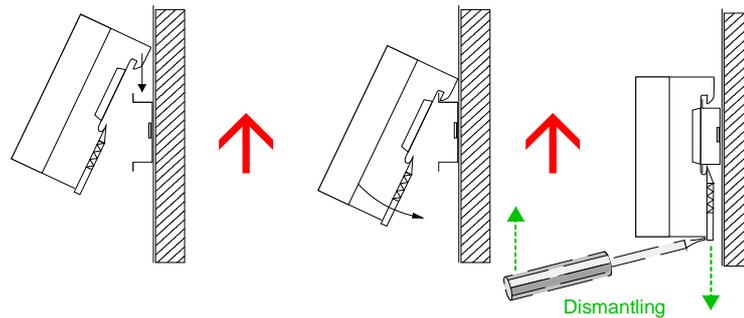
General Description of the System 100V

Structure and dimensions

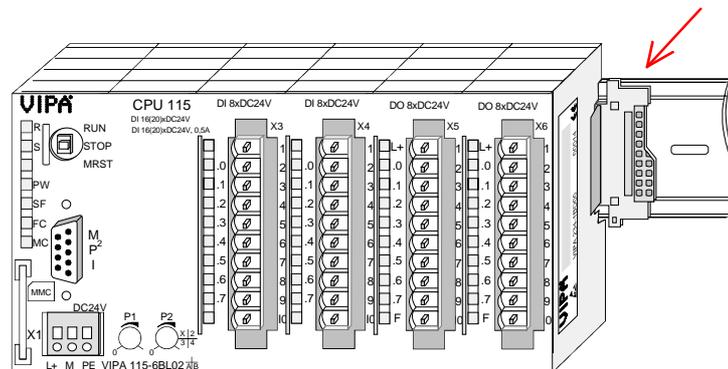
- Norm profile head rail 35mm
- Dimensions basic module:
 - 4tier width: (WxHxD) in mm: 101.6x76x48 / in inches: 4x3x1.9
 - 6tier width: (WxHxD) in mm: 152.4x76x48 / in Inches: 6x3x1.9

Installation

The installation of a System 100V module works via snapping on a norm profile head rail.



When using expansion modules, you have to clip the included 1tier bus connector at the right side to the module from behind before the installation.



Operation security

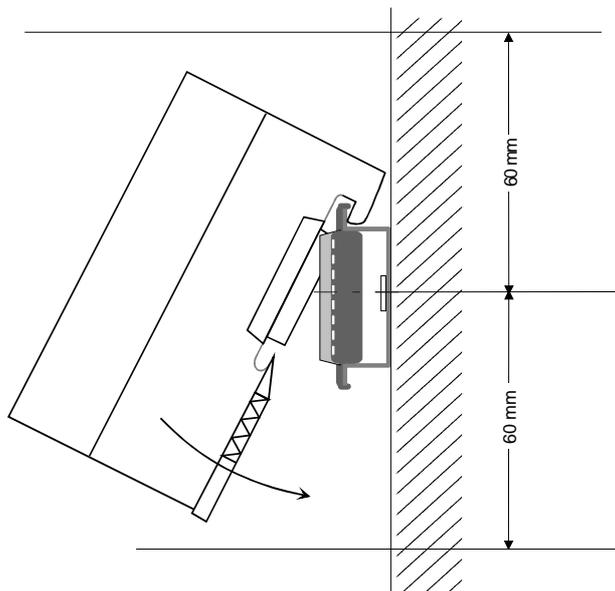
- Plug in via CageClamps, core cross-section 0.08...2.5mm²
- Total isolation of the cables during module changes
- EMV resistance ESD/Burst acc. IEC 61000-4-2 / IEC 61000-4-4 (to level 3)
- Shock resistance acc. IEC 60068-2-6 / IEC 60068-2-27 (1G/12G)

Environmental conditions

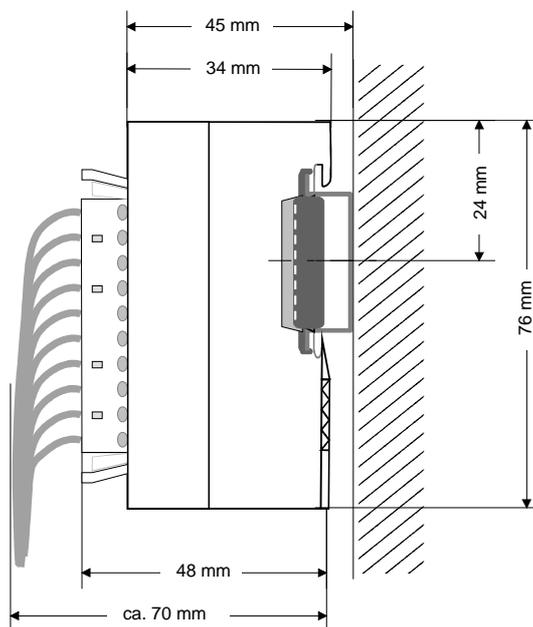
- Operating temperature: 0... + 60°C
- Storage temperature: -25... + 70°C
- Relative humidity: 5 ... 95% without condensation
- fan-less operation

Assembly dimensions

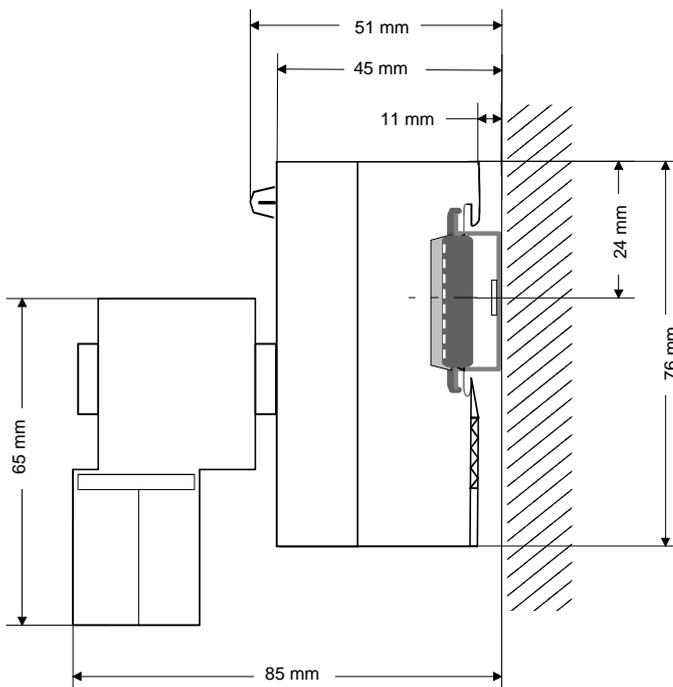
Installation dimensions



Installed and wired dimensions



**CPU 11x with
EasyConn from
VIPA**



Installation guidelines

General	<p>The installation guidelines contain information about the interference free deployment of System 100V. There is the description of the ways, interference may occur in your control, how you can make sure the electromagnetic digestibility (EMC), and how you manage the isolation.</p>
What means EMC?	<p>Electromagnetic digestibility (EMC) means the ability of an electrical device, to function error free in an electromagnetic environment without being interferenced res. without interfering the environment.</p> <p>All System 100V components are developed for the deployment in industrial environments and fulfill high demands on the EMC. Nevertheless you should project an EMC planning before installing the components and take conceivable interference causes into account.</p>
Possible interference causes	<p>Electromagnetic interferences may interfere your control via different ways:</p> <ul style="list-style-type: none">• Electromagnetic fields (RF coupling)• Magnetic fields with power frequency• I/O signal conductors• Bus system• Current supply• Protected earth conductor <p>Depending on the spreading medium (lead bound or lead free) and the distance to the interference cause, interferences to your control occur by means of different coupling mechanisms.</p> <p>One differs:</p> <ul style="list-style-type: none">• galvanic coupling• capacitive coupling• inductive coupling• radiant coupling

Basic rules for EMC

In the most times it is enough to take care of some elementary rules to guarantee the EMC. Please regard the following basic rules when installing your PLC.

- Take care of a correct area-wide grounding of the inactive metal parts when installing your components.
 - Install a central connection between the ground and the protected earth conductor system.
 - Connect all inactive metal extensive and impedance-low.
 - Please try not to use aluminum parts. Aluminum is easily oxidizing and is therefore less suitable for grounding.
- When cabling, take care of the correct line routing.
 - Organize your cabling in line groups (high voltage, current supply, signal and data lines).
 - Always lay your high voltage lines and signal res. data lines in separate channels or bundles.
 - Route the signal and data lines as near as possible beside ground areas (e.g. suspension bars, metal rails, tin cabinet).
- Proof the correct fixing of the lead isolation.
 - Data lines must be laid isolated (for details see below).
 - Analog lines must be laid isolated. When transmitting signals with small amplitudes the one sided laying of the isolation may be favorable.
 - Lay the line isolation extensively on an isolation/protected earth conductor rail directly after the cabinet entry and fix the isolation with cable clamps.
 - Make sure that the isolation/protected earth conductor rail is connected impedance-low with the cabinet.
 - Use metallic or metalized plug cases for isolated data lines.
- In special use cases you should appoint special EMC actions.
 - Wire all inductivities with erase links, which are not addressed by the System 100V modules.
 - For lightening cabinets you should avoid luminescent lamps.
- Create a homogeneous reference potential and ground all electrical operating supplies when possible.
 - Please take care for the targeted employment of the grounding actions. The grounding of the PLC is a protection and functionality activity.
 - Connect installation parts and cabinets with the System 100V in star topology with the isolation/protected earth conductor system. So you avoid ground loops.
 - If potential differences between installation parts and cabinets occur, lay sufficiently dimensioned potential compensation lines.

Isolation of conductors

Electrical, magnetically and electromagnetic interference fields are weakened by means of an isolation, one talks of absorption.

Via the isolation rail, that is connected conductive with the rack, interference currents are shunt via cable isolation to the ground. Hereby you have to make sure, that the connection to the protected earth conductor is impedance-low, because otherwise the interference currents may appear as interference cause.

When isolating cables you have to regard the following:

- If possible, use only cables with isolation tangle.
- The hiding power of the isolation should be higher than 80%.
- Normally you should always lay the isolation of cables on both sides. Only by means of the both-sided connection of the isolation you achieve high quality interference suppression in the higher frequency area.
Only as exception you may also lay the isolation one-sided. Then you only achieve the absorption of the lower frequencies. A one-sided isolation connection may be convenient, if:
 - the conduction of a potential compensating line is not possible
 - analog signals (some mV res. μA) are transferred
 - foil isolations (static isolations) are used.
- With data lines always use metallic or metalized plugs for serial couplings. Fix the isolation of the data line at the plug rack.
- At stationary operation it is convenient to strip the insulated cable interruption free and lay it on the isolation/protected earth conductor line.
- To fix the isolation tangles use cable clamps out of metal. The clamps must clasp the isolation extensively and have well contact.
- Lay the isolation on an isolation rail directly after the entry of the cable in the cabinet. Lead the isolation further on to the module and **don't** lay it on there again!

**Please regard at installation!**

At potential differences between the grounding points, there may be a compensation current via the isolation connected at both sides.

Remedy: Potential compensation line

Chapter 2 Hardware description and deployment

Overview

This chapter contains every information for the deployment of the terminal modules of the System 100V.

The terminal modules are not connected to the backplane bus and they are deployed as passive stand-alone components. For example actively supplied sensors may be connected by means of these modules.

Content

Topic	Page
Chapter 2 Hardware description and deployment	2-1
Overview	2-2
101-4FH50 - 8x11COM	2-3

Overview

Description

Terminal modules are passive modules where the contacts inside are vertically electrical connected. Using terminal modules, you may easily realize a distributor for your power supply and have the option to connect active supplied sensors like e.g. approximation switches.



Order number	Type	Description
VIPA 101-4FH50	CM101	Terminal module 8x11COM



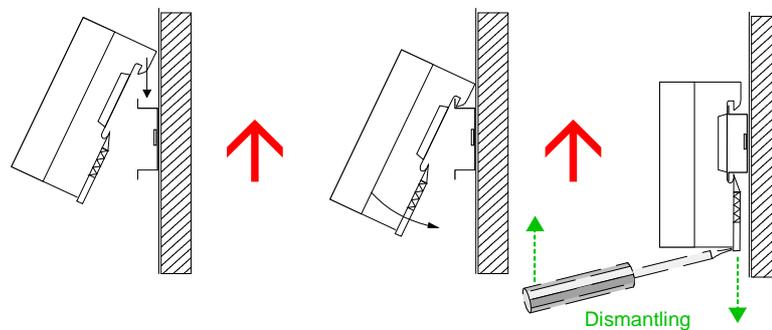
Note!

Please regard that all terminal modules have internal connected grounds.

Assembly and dismantling of terminal modules

Terminal modules are not connected to the backplane bus. They are deployed as stand-alone devices and mounted on a 35mm standard norm profile rail.

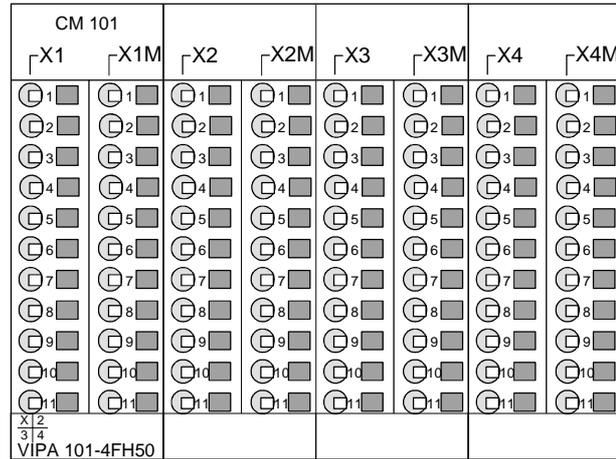
For dismantling, you have to pull the locker downwards with a screwdriver and lift the module up from the head rail.



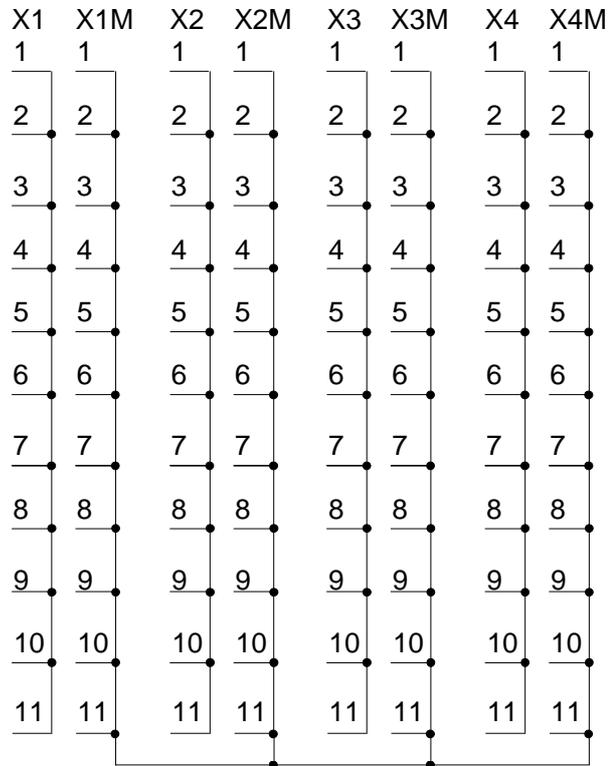
101-4FH50 - 8x11COM

Structure

Position X1	Position X2	Position X3	Position X4
2x11 COM	2x11 COM	2x11 COM	2x11 COM



Circuit diagram



Technical data

Order no.	101-4FH50
Type	CM 101
Clamp parameter	
Terminal voltage max.	DC 60 V
Terminal current max.	10 A
Total current per module, max.	
Isolated group	
Number of clamps	11
Colour of clamp	grey
Binding of potential	unbound
Potential group current, max.	10 A
Isolated group	
Number of clamps	11
Colour of clamp	grey
Binding of potential	unbound
Potential group current, max.	10 A
Isolated group	
Number of clamps	11
Colour of clamp	grey
Binding of potential	unbound
Potential group current, max.	10 A
Isolated group	
Number of clamps	11
Colour of clamp	grey
Binding of potential	unbound
Potential group current, max.	10 A
Isolated group	
Number of clamps	4*11
Colour of clamp	grey
Binding of potential	unbound
Potential group current, max.	10 A
Housing	
Material	PPE / PA 6.6
Mounting	Profile rail 35 mm
Mechanical data	
Dimensions (WxHxD)	101.6 x 76 x 48 mm
Weight	212 g
Environmental conditions	
Operating temperature	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C
Certifications	
UL508 certification	yes