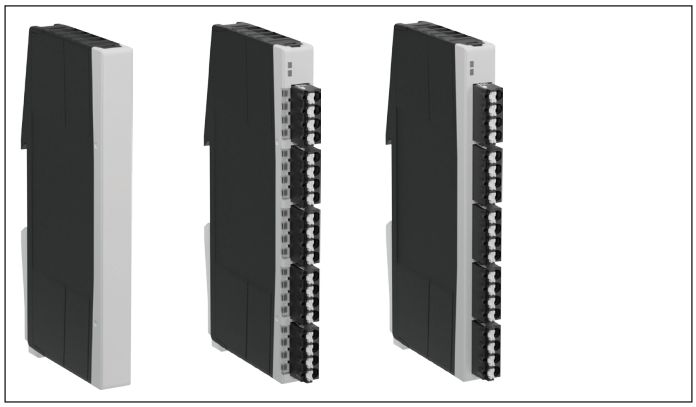
Control cabinet enclosure for top-hat rail installation with front connection technology – pluggable design KV 4612

Translation of the original instructions



Product Description

The multifunctional enclosure series KV 4600 is a modular empty enclosure system for top-hat rail installation. The I/O enclosure system with a minimum overall width of 12.5 mm is particularly suitable for modern control and industrial IoT applications and a number of further applications. The pluggable push-in connection technology is preferably integrated from the front side. The wiring, reading of signals or the connection of plugs is therefore practice-oriented and convenient in the application. Furthermore, the integrated test point allows for a quick diagnosis on site. The few enclosure components also allow for a quick and easy installation by means of snapping.
Nowadays, device systems are often contacted and managed decentrally by bus systems. For this purpose, the I/O enclosure system offers connecting elements that are separately available and make it possible to link the individual modules.

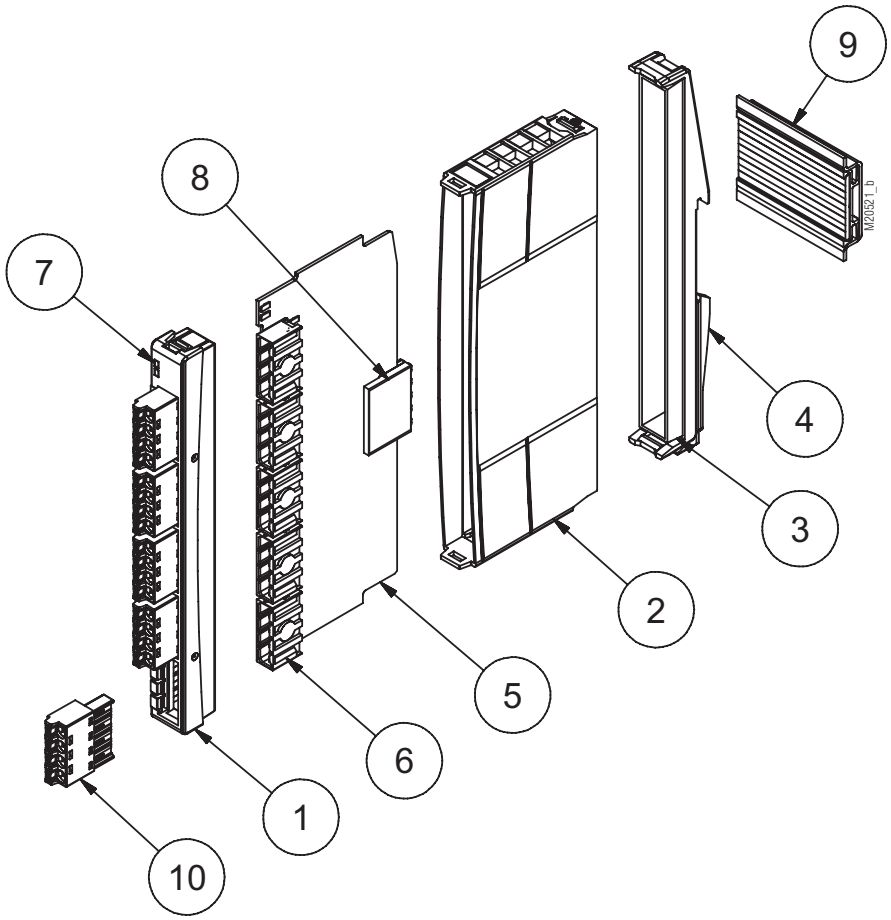
Your Advantages

- Full functionality at the enclosure front
- Quick installation by simplified enclosure design
- More connections within lower overall width – up to 20 poles per 12.5 mm module (5 slots per circuit board)
- PCB surface of 6429 mm² allows for manifold applications and a cost-effective design of the PCB use
- High mechanical stability and vibration resistance
- Quick, toolless, direct and vibration-resistant connection of the conductors
- The pluggable push-in terminal technology meets the high requirements to the reflow soldering process

Features

- Complete functionality at the front for display or control elements, connection technology, NFC and radio technology
- Space-saving module width of only 12.5 mm with an installation depth of 66 mm
- Pluggable push-in terminals 4-pin in the grid 5.0 mm
- The integrated plug removal aid allows for the convenient unlocking of individual terminal blocks. An ideal solution for decentral assemblies with high connection density and limited spatial conditions
- Easy and safe installation by snapping mechanism at rear side
- Easy and cost-effective realization of customer-specific adaptations
- Optionally, each terminal point can be assigned to a light conductor
- Common bus concepts can be integrated into the bottom assembly
- Optional mounting rail bus system (In-Rail-Bus)

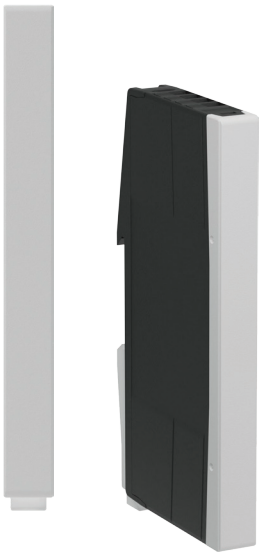
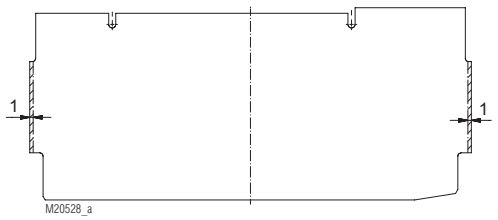
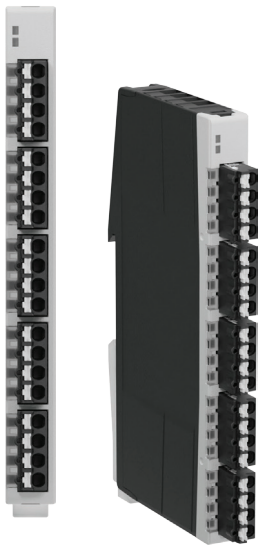
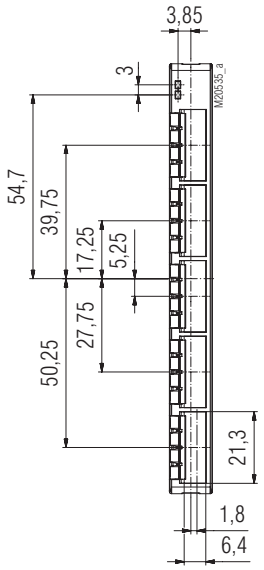
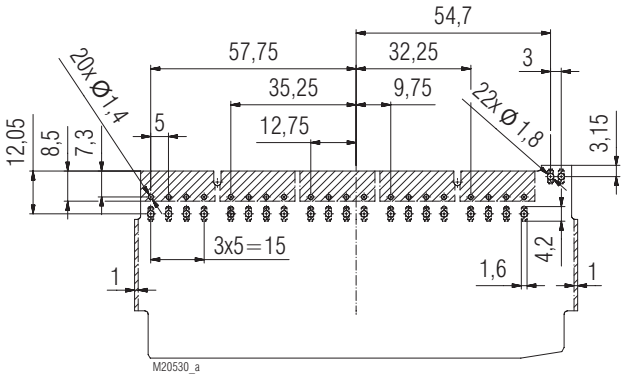
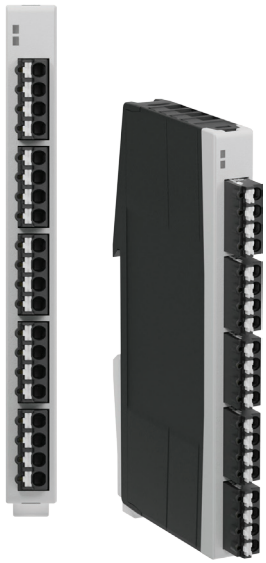
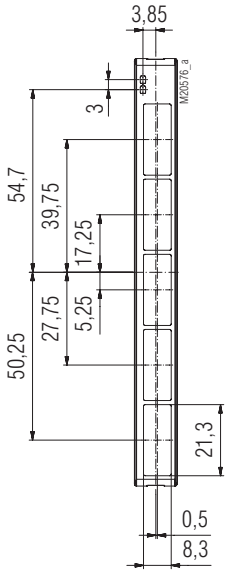
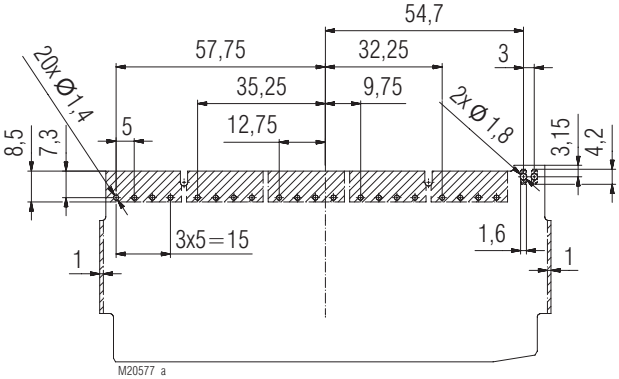
Explosion Drawing Three-Part Enclosure Design



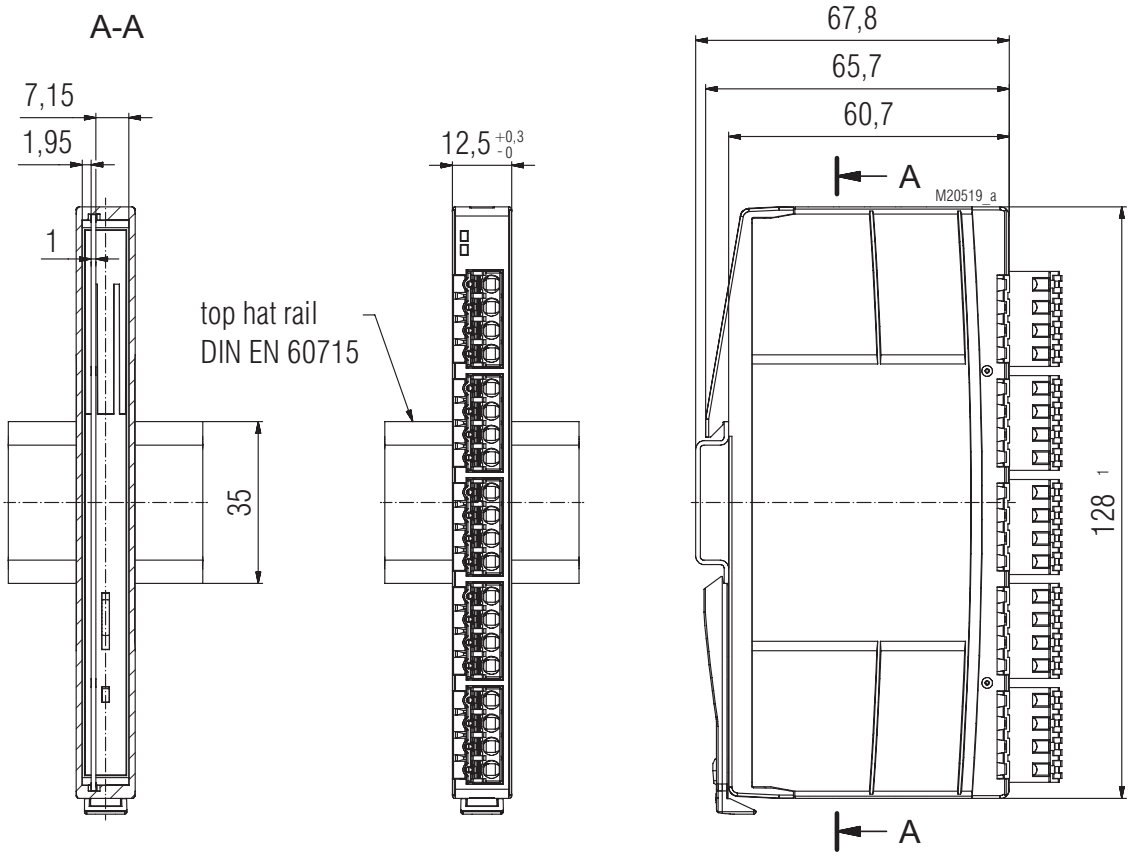
1 = Front plate
2 = Enclusure frame
3 = Enclosure bottom
4 = Mounting clip
5 = PCB (not included in delivery)
6 = Terminal block
7 = Light conductor *)
8 = In-Rail-Bus spring contact block *)
9 = In-Rail-Bus in DIN-rail *)
10 = Cage clamp terminals (Push-in)
*) optional

All specifications correspond to the technology used at time of publication.
We reserve the right to make improvements and changes of a technical nature at any time.

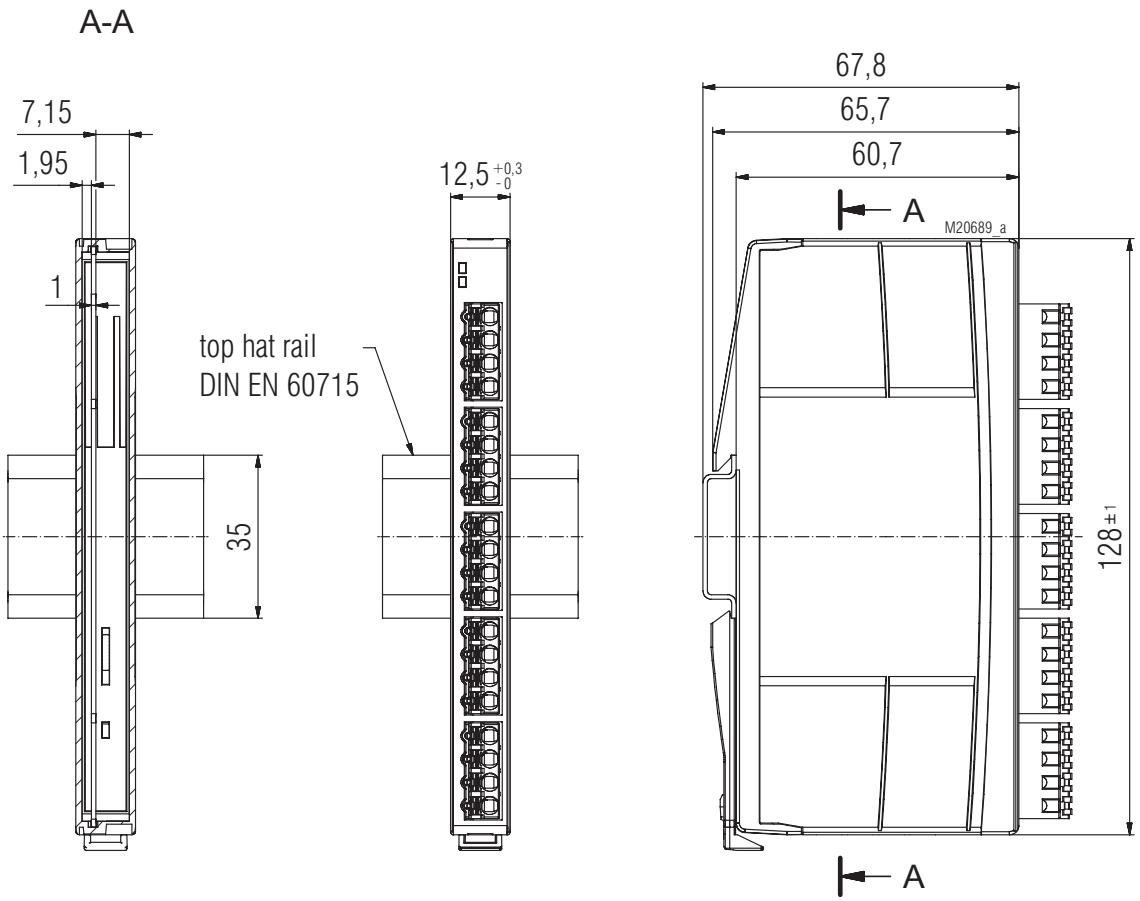
Design Examples

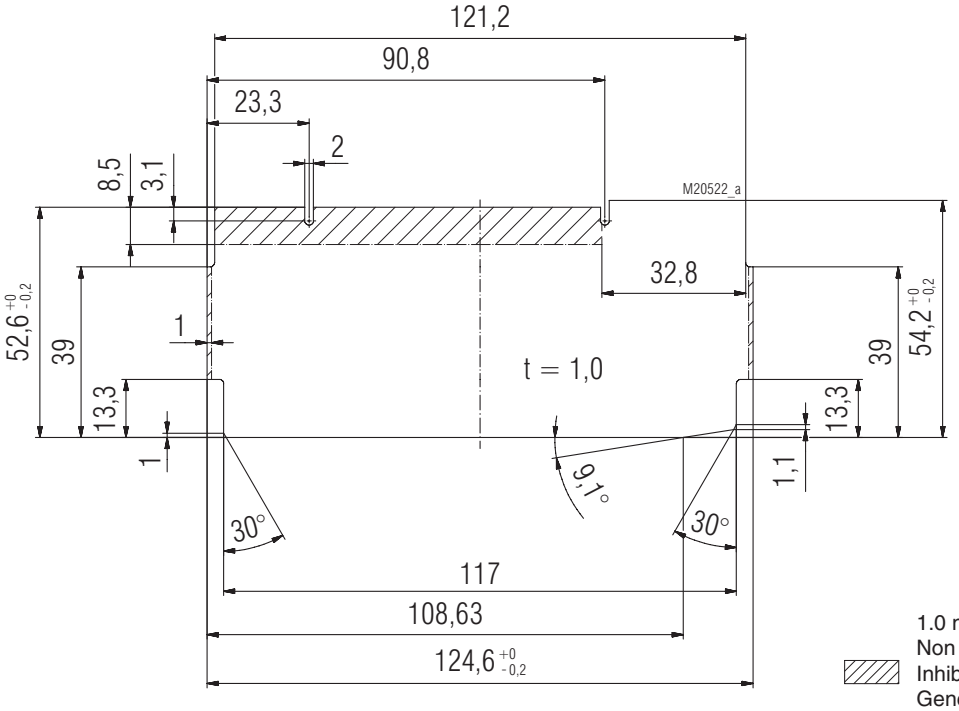
KV 4612 Width 12.5 mm	Front plate	PCB
Without terminals 		
Terminal 4-poles R = 5.0 mm (5 x arranged) with release lever 		
Terminal 4-poles R = 5.0 mm (5 x arranged) 		

Installation Spaces, PCB Position, Dimensions, Basic Structure, Sectional View

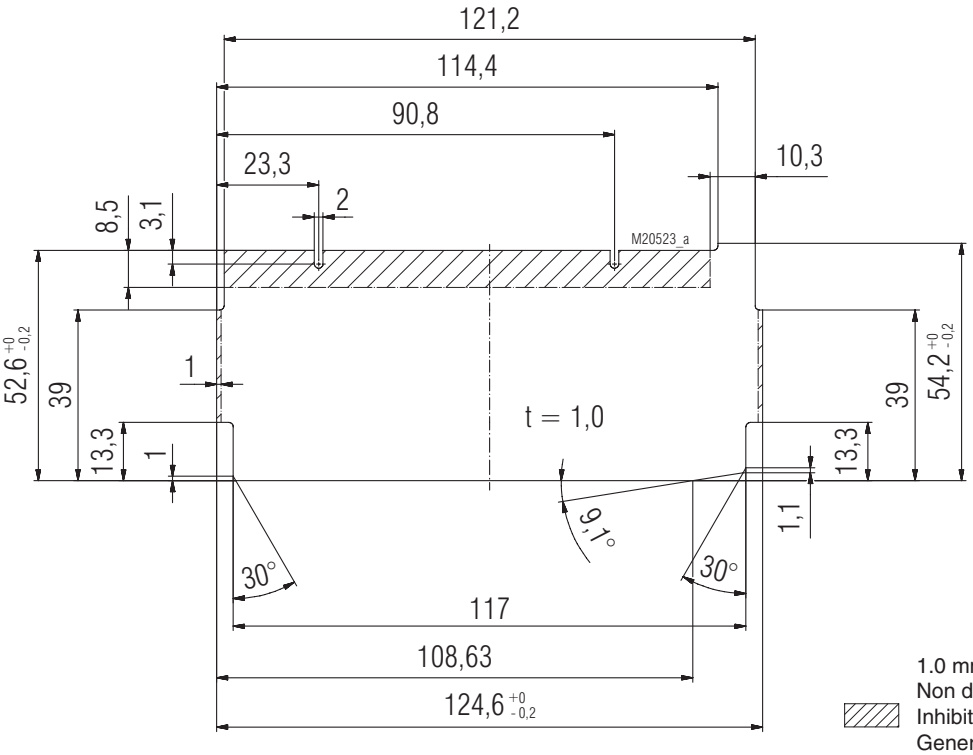


Installation Spaces, PCB Position, Dimensions, Basic Structure, Sectional View (Without Release Lever)





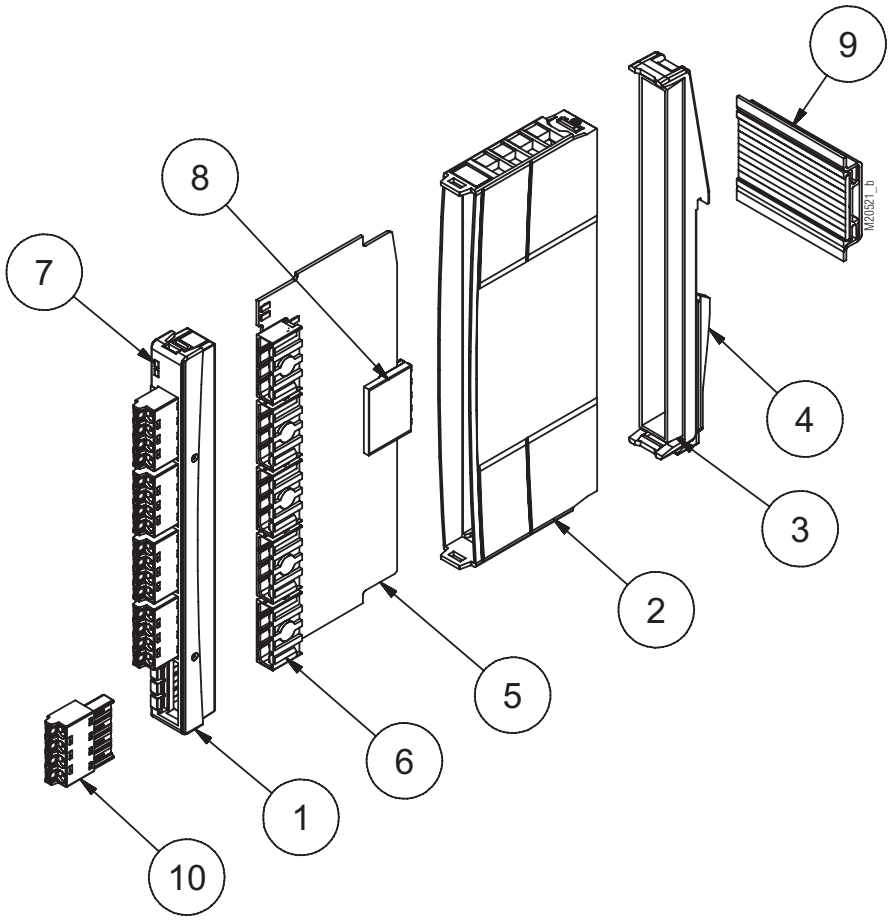
1.0 mm PCB
Non dimensioned radi R1
Inhibited surface
General tolerance: PERFAG 2E



1.0 mm PCB
Non dimensioned radi R1
Inhibited surface
General tolerance: PERFAG 2E

Explosion Drawing Three-Part Enclosure Design

The division of the enclosure bottom into two functional units allows the installation of an additional printed circuit board within the bottom assembly. This individually designable additional board allows the manufacturer-independent, flexible and easy integration of interfaces and communication modules for module networking. In case of a device failure the mechanical design allows to easily remove the primary electronics module from the device compound without dropping the voltage for the other modules. The status of sytems can thus be preserved, no information is lost.



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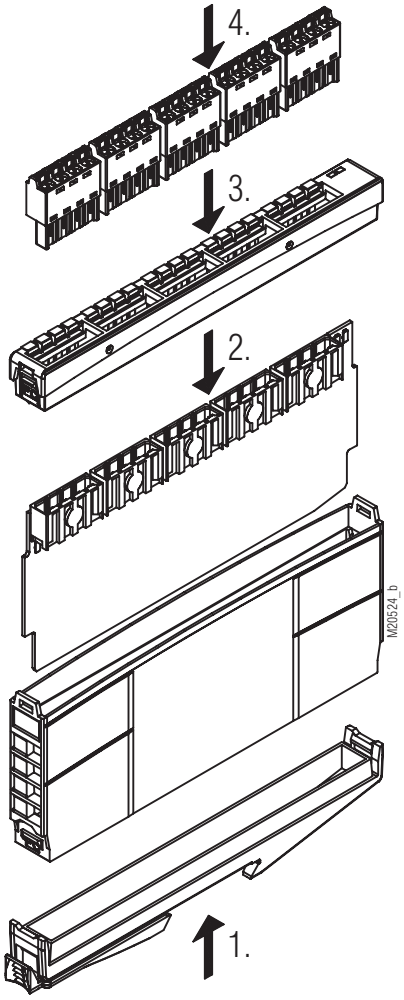
10 = Cage clamp terminals (Push-in)
*) optional

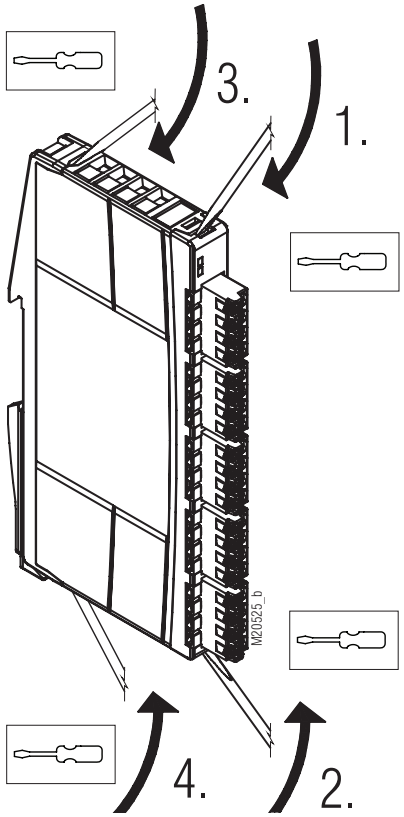
Assembly of Enclosure



Assembly of three-part enclosure

1. Mount enclosure bottom on enclosure frame
2. Insert PCB with terminal blocks into enclosure frame
3. Align and snap in front plate above the terminals
4. Plug in terminals

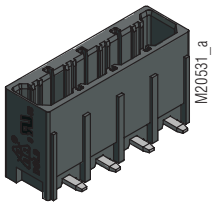
Disassembly of Enclosure

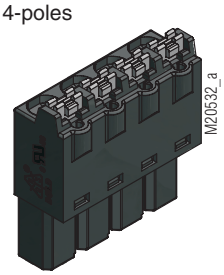


Disassembly of enclosure

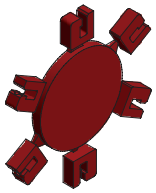
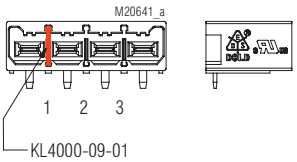
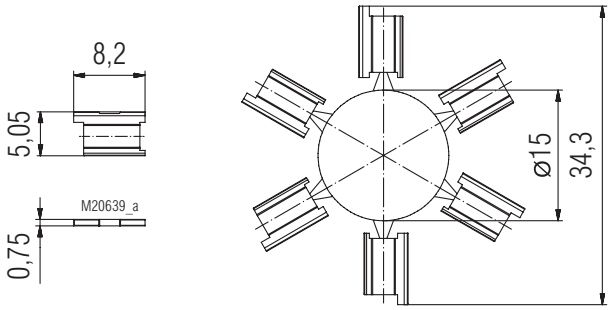
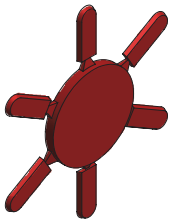
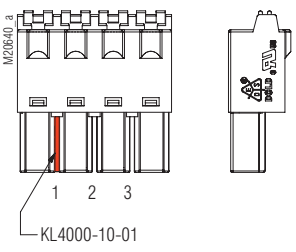
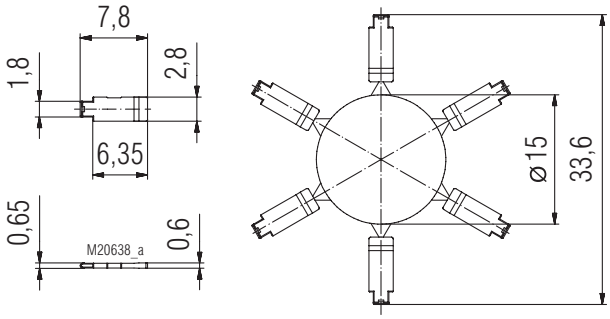
1. Remove terminals
2. Insert screwdriver at two spots, pry open one after the other, remove front plate
3. PCB accessible
4. Insert screwdriver into the provided recesses of the enclosure bottom and detach the enclosure frame by tilting movements

Order Data / Component Designs

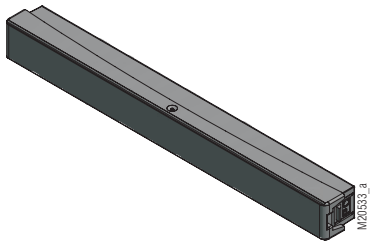
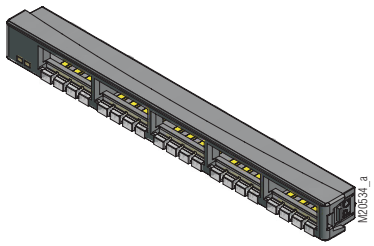
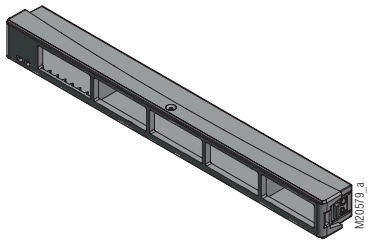
Product overview			
Terminal technology	Grid 5.0 mm	Article number	Position coding profile
Soldering procedure: Reflow soldering, 4-poles 	KL4000-230-0400	0068817	-
	KL4000-233-0400-xxxTR	0068982	-
	KL4000-233-0400-1xxTR	0069212	1
	KL4000-233-0400-x2xTR	0069213	2
	KL4000-233-0400-xx3TR	0069214	3
	KL4000-233-0400-12xTR	0069215	1 + 2
	KL4000-233-0400-x23TR	0069216	2 + 3
	KL4000-233-0400-1x3TR	0069217	1 + 3
	KL4000-233-0400-123TR	0069238	1 + 2 + 3

Terminal technology	Grid 5.0 mm	Article number	Position coding profile
Cage clamp terminal (Push-in) 4-poles 	KL4000-132-0400-XXX	0068816	-
	KL4000-132-0400-1XX	0069206	1
	KL4000-132-0400-X2X	0069207	2
	KL4000-132-0400-XX3	0069208	3
	KL4000-132-0400-12X	0069209	1 + 2
	KL4000-132-0400-X23	0069210	2 + 3
	KL4000-132-0400-1X3	0069211	1 + 3
	KL4000-132-0400-123	0069237	1 + 2 + 3

Order Data / Component Designs

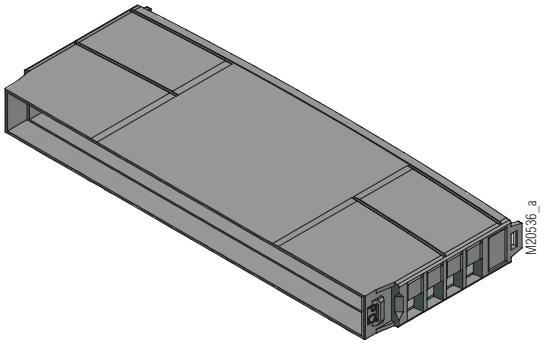
Product overview		
Coding star	Article number	Dimensions [mm]
KL4000-09-01	0069196	
		
KL4000-10-01	0069197	
		

Order Data / Component Designs

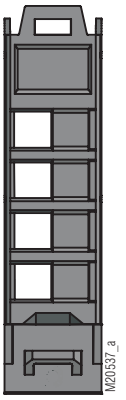
Product overview		
Standard front plate	Width 12.5 mm	Article number
Without terminals	KV4602-02-0210003	0069042
		
With plug extraction function and one light conductor per port	KV4602-02-0410103001	0069044
		
With openings to plug through the plugs	KV4602-02-0212803	0069043
		

Further configurable variants on request

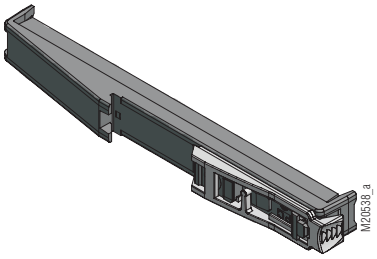
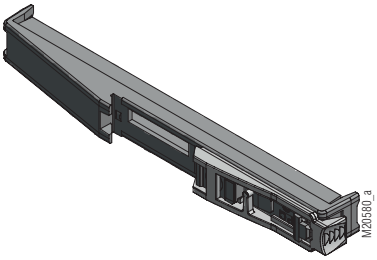
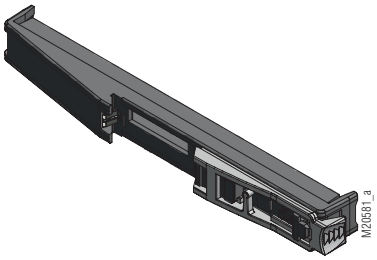
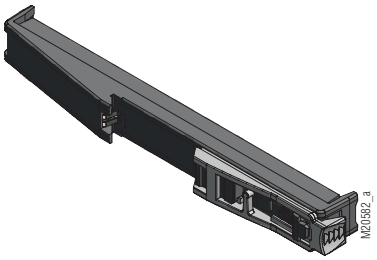
Order Data / Component Designs

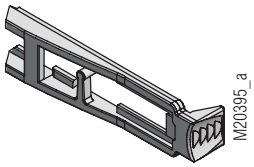
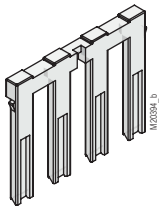
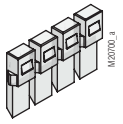
Product overview		
Enclosure frame	Width 12.5 mm	Article number
With ventilation slots	KV4612-01-0110101	0069045
		
Without ventilation slots	On request	

Enclosure frame with ventilation slots



Order Data / Component Designs

Product overview		
Enclosure bottom with mounting clip	Width 12.5 mm	Article number
Standard	KV4602-03-0110101001	0069038
		
With breakout opening for In-Rail-Bus	KV4602-03-0210101001	0069039
		
With breakout opening for In-Rail-Bus and grounding contact	KV4602-03-0310101001	0069040
		
With grounding contact	KV4602-03-0410101001	0069041
		

Product overview		
Accessories	Width 12,5 mm	Article number
Mounting clip	KV4602-09-0117	0068727
		
4-fold light conductor per port	KV4600-16-0216	0068986
		
Light conductor Display range	KS4400-05-0030416	0069403
		

Technical Data

Type	Width [mm]	Height [mm]	Depth [mm]
KV 4612	12.5	128	66

Outer dimensions: W x H x D

Enclosure material: PC, black RAL 9005, light grey RAL 7035 (other colours on request)

Front plate material: PC, black RAL 9005, light grey RAL 7035 (other colours on request)

Terminals: **See product overview terminal technology / PCB connection technology GE02 / www.dold.com**

Temperature stability		PC
Complying with UL 746 B:		130 °C
Complying with Vicat	Method A	-
ISO 306	Method B	146 °C
Compl. with ISO 75-2	Method A	123 °C
	Method B	142 °C

Specific thermal resistance: R_{th} = **K / W** for enclosure

Type	**With ventilation slots**		
	Individual module	20 mm distance	100 mm distance
	R_{th}	**R_{th}**	**R_{th}**
KV 4612	15,2	8,7	7,5

Flame retardancy
Complying with UL 94: PC V-0

Inner connection: Terminal block can be machine soldered, suitable for reflow soldering processes

Enclosure mounting: Snap-on clip on top hat rail IEC/EN 60715
IEC/EN 60715

Creepage resistance:

Insulation type	CTI	Insulation group	PLC classification
PC	225	IIIa	3

Air gap and creepage distance: ≥ 4 mm IEC 60664-1

Discharge of static electricity: Up to 8 kV air discharge with full usage of the available PCB surface EN 61000-4-2

Degree of protection
Enclosure (without ventilation slots): IP 40 IEC 60529
Enclosure (with ventilation slots): IP 30 IEC 60529
Terminals (front area): IP 20 IEC 60529

Print area:
(Depending on terminal allocation in front area)

Front plate	Dimensions [mm]
KV 4612	124 x 11,5

Possible PCB surface:

Enclosure	Number of integrable PCBs	Surface / PCB [mm²]	Usable total PCB surface [mm²]
KV 4612	1	6429	6429

PCB holder: PCB guidings with fixing geometries for PCB positioning

Net weight
(Enclosure frame with front plate, enclosure bottom and mounting clip):

Type	[g]
KV 4612	36