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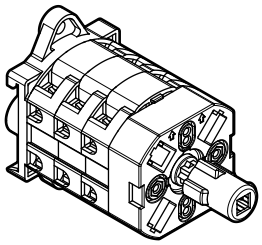
EN
instruction manual



P012...B
P016...B
P020...B

PHOENIX CAM SWITCHES WITH TYPE "B" BASE MOUNTING (12 A / 16 A / 20 A)

ATTENTION
Before any installation or maintenance operation, disconnect the power supply to the system. Before restoring the power supply, make sure that all connections to the device have been made correctly. Giovenzana International B.V. disclaims any responsibility for any damage to things and people caused by non-compliance with the rules described here.

Before use, read this booklet carefully to acquaint yourself with the features of the product. This booklet is an integral part of the product and therefore must be kept until the product is dismissed.

Giovenzana International B.V. reserves the right to change the features and data shown in this document at any time and without notice. This document cannot therefore be considered a contract with third parties.

P0 and PX series cam switches are designed and manufactured according to IEC international standard and EN European regulations.

Any improper installation or any tampering of the device may cause serious personnel injury or property damage, therefore, the installation and maintenance must be performed by specialized and authorized personnel.

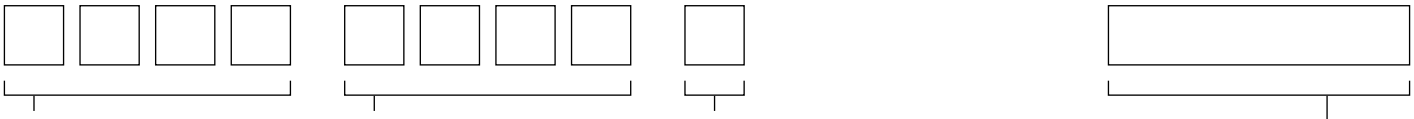
The use of this device is not allowed in environment with a potentially explosive atmosphere or in presence of corrosive substances and in salt spray.

Cam switches involved in this instruction manual:

Series	Mounting	Terminal protection class	AC-21A (690 V)	AC-23A (400 V)
P012...B	Base	IP20	12 A	10 A
P016...B			16 A	14 A
P020...B			20 A	16 A

Read the page with the code reading for further useful information on the product in your possession. This instruction manual illustrates features and procedures relating to the products in the Giovenzana catalog. The specifications on p.2 and the mounting instructions on p.8, and following, are also valid for custom products derived from one of the series illustrated in this manual.

CODE READING



Series
Specifications: p.2

P012 12 A, IP20 contacts
P016 16 A, IP20 contacts
P020 20 A, IP20 contacts

Electrical scheme
Reference table: p.6

ON-OFF switches 0-1
0002 2 poles
0003 3 poles
0004 4 poles
0006 6 poles
Changeover switches 1-0-2
0008 1 pole
0009 2 poles
0010 3 poles
0011 4 poles

Cam switch mounting type
Overall dimensions: p.5

B base mounting
DIN rail mounting
S custom product (these products have their own electrical scheme, not available in this document)

Actuator code
Each cam switch series can be fitted with one or more actuators with their own code.
This document provides the installation instructions for each cam switch series and its matching actuators.
Actuators reference table: p.7

SPECIFICATIONS

General characteristics

Protection class	control	EN 60529 UL50 / NEMA	IP65 Type 1 - 4 - 4X
	control with knob only		IP40
	terminals		IP20
Material group		EN 60947-1	II
Pollution grade		EN 60947-1	3
Flammability		UL94	V0 (live electrical parts)
Ambient temperature	operating storage		-40 ... +85°C -40 ... +70°C
Climate withstand		IEC 68 part 2-3 IEC 68 part 2-30	damp heat, steady state damp heat, cyclic
Terminal screw identification	conforming to		EN50013
Connections	terminal block caliber	EN60947-1	A3
	terminal screw		M3.5
	tightening torque	EN60947-1 UL508	0.8 N·m (7.2 lb·in) 7.5 lb·in (0.85 N·m)
Connectable section	flexible conductors		1 × 0.75 ... 4 mm² or 2 × 0.75 ... 2.5 mm² AWG 18 ... 10
	solid conductors		1 × 0.75 ... 4 mm² or 2 × 0.75 ... 2.5 mm² AWG 18 ... 10
Contacts			double breaking
Opening angles			30° - 45° - 60° - 90°
Mechanical lifetime	@ 120 operations / hour		1 million cycles
Electrical lifetime	@ 120 operations / hour		P012... 1 million cycles P016... 0.75 million cycles P020... 0.75 million cycles

EN 60947-3 characteristics

		P012...	P016...	P020...
Rated operating voltage	Ue	690 V	690 V	690 V
Rated insulation voltage	Ui	690 V	690 V	690 V
Rated impulse withstand voltage (sectionable)	Uimp	4 kV	4 kV	4 kV
Rated thermal current	Ith	16 A	20 A	25 A
Rated enclosed thermal current	Ithe	12 A	16 A	20 A
Frequency		50/60 Hz	50/60 Hz	50/60 Hz

Alternate current

Rated operating current		**Ie**		P012...		P016...		P020...	
AC-21A	Switching of resistive loads, including moderate overloads		690 V	12 A		16 A		20 A	
AC-22A	Switching of mixed resistive and inductive loads, including moderate overloads		690 V	12 A		16 A		20 A	
AC-23A	Switching of motor loads or other highly inductive loads	1 phase - 1 pole	110 V 230 V	12 A 12 A	1.1 kW 2.2 kW	14 A 14 A	1.5 kW 3 kW	18 A 18 A	2 kW 4 kW
		3 phases - 3 poles	230 V 400 V 500 V 690 V	10 A 10 A 10 A 10 A	3 kW 5.5 kW 7.5 kW 7.5 kW	14 A 14 A 14 A 14 A	3 kW 7.5 kW 10 kW 10 kW	16 A 16 A 16 A 16 A	5 kW 9 kW 11 kW 12.5 kW
AC-3	Squirrel-cage motors: starting, switches off motors during running time	1 phase - 1 pole	110 V 230 V	10 A 10 A	0.75 kW 2 kW	12 A 12 A	1.1 kW 2.2 kW	16 A 16 A	1.5 kW 3.5 kW
		3 phases - 3 poles	230 V 400 V 500 V 690 V	8 A 8 A 8 A 6 A	2.2 kW 4 kW 5.5 kW 5.5 kW	10 A 10 A 10 A 8 A	3 kW 5 kW 7.5 kW 7.5 kW	12 A 12 A 12 A 10 A	4 kW 6 kW 8 kW 9 kW

AC-23A	Nominal breaking capacity (cosφ 0.45)	230 V 400 V 500 V 690 V	80 A 80 A 80 A 80 A	104 A 104 A 112 A 112 A	128 A 128 A 128 A 128 A
	Power dissipation for each pole		0.3 W	0.35 W	0.4 W

Direct current

Rated operating current		**Ie**		P012...	P016...	P020...
DC-21A	Switching resistive loads with light overloads	1 phase	50 V	10 A	12 A	16 A
DC-22A	Switching resistive loads with light overloads	1 phase	30 V	8 A	10 A	12 A

Short circuit characteristics

		P012...	P016...	P020...
Rated short-time short circuit withstand current (1 s)	Icw	300 A	300 A	300 A
Rated short circuit making capacity	Icm	1200 A	1200 A	1200 A
Conditional rated short circuit withstand current		5 kA	5 kA	5 kA
Fuse rating (type gG)	690 V	20 A	20 A	20 A

UL 508 characteristics

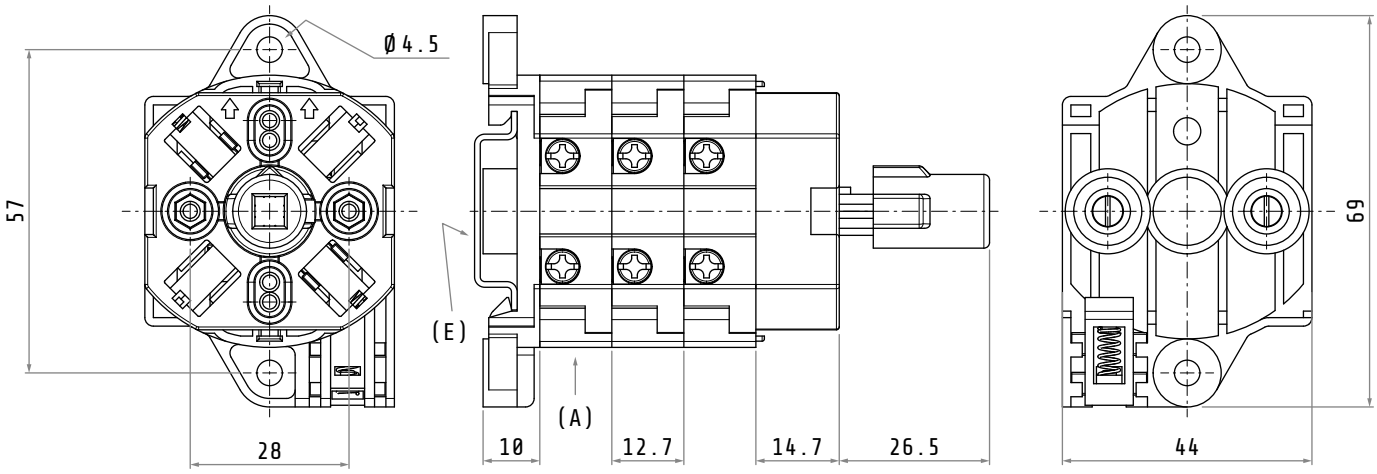
			P012...		P016...		P020...	
General use		600 V AC	12 A		16 A		20 A	
Standard motor load	1 phase - 2 poles	120 V AC	0.5 HP	9.8 FLA	1 HP	16 FLA	1.5 HP	20 FLA
		240 V AC	1 HP	8 FLA	1.5 HP	10 FLA	2 HP	12 FLA
	3 phases - 3 poles	200 V AC	1.5 HP	6.9 FLA	3 HP	11.04 FLA	5 HP	17.5 FLA
		240 V AC	3 HP	9.6 FLA	5 HP	15.2 FLA	5 HP	15.2 FLA
		480 V AC	5 HP	7.6 FLA	7.5 HP	11 FLA	10 HP	14 FLA
		600 V AC	5 HP	6.1 FLA	7.5 HP	9 FLA	10 HP	11 FLA

Marking

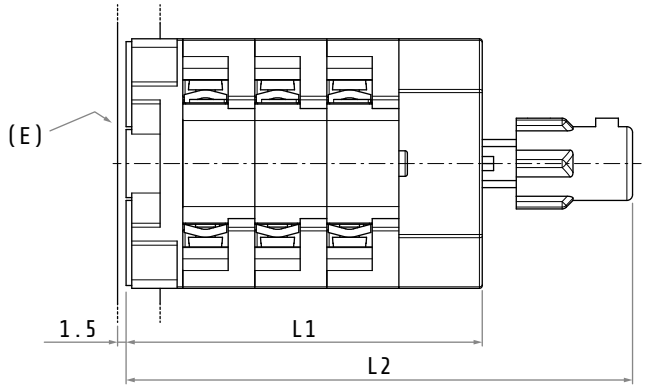
Compliance by passed test	CE
Approved	cULus, EAC, CCC

OVERALL DIMENSIONS

P012...B / P016...B / P020...B



Terminal protection class IP20



Dimensions in mm
Illustrations NOT in scale

(A)	wafer (thickness = 12.7 mm)
(E)	DIN rail 35 mm (EN 46277/3)

Some dimensions depend on the number of wafers of the cam switch and can be calculated with these formulas:

L1 [mm]	10 + (12.7 × n. of wafers) + 14.7
L2 [mm]	L1 + 26.5

Examples:

N. of wafers	1	2	3	4	5	6
L1 [mm]	37.4	50.1	62.8	75.5	88.2	100.9
L2 [mm]	63.9	76.6	89.3	102	114.7	127.4

Please note

This configuration allows both base mounting and DIN mounting.

ELECTRICAL SCHEMES

Code checking pattern

								B

Series
P012 / P016 / P020

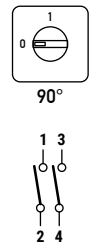
Function

Mounting

	Function	N. of wafers	Electrical scheme
	ON-OFF switches 0-1		
0002	ON-OFF switch 2 poles	1	p.6
0003	ON-OFF switch 3 poles	2	
0004	ON-OFF switch 4 poles	2	
0006	ON-OFF switch 6 poles	3	
	Changeover switches 1-0-2		
0008	Changeover switch 1 pole	1	p.6
0009	Changeover switch 2 poles	2	
0010	Changeover switch 3 poles	3	
0011	Changeover switch 4 poles	4	

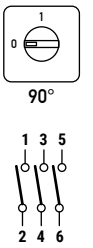
ON-OFF switches 0-1

0002 • 2 poles



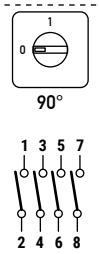
W	CNT	0		1
1	3-4			×
	1-2			×

0003 • 3 poles



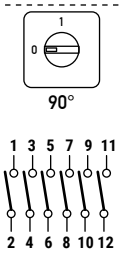
W	CNT	0		1
2				
	5-6			×
1	3-4			×
	1-2			×

0004 • 4 poles



W	CNT	0		1
2	7-8			×
	5-6			×
1	3-4			×
	1-2			×

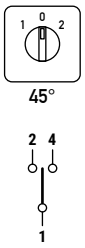
0006 • 6 poles



W	CNT	0		1
3	11-12			×
	9-10			×
2	7-8			×
	5-6			×
1	3-4			×
	1-2			×

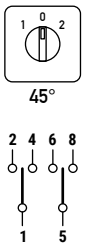
Changeover switches 1-0-2

0008 • 1 pole



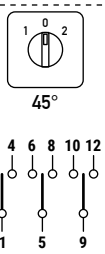
W	CNT	1	0	2
1	3-4			×
	1-2	×		

0009 • 2 poles



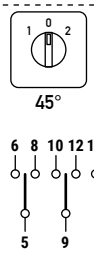
W	CNT	1	0	2
2	7-8			×
	5-6	×		
1	3-4			×
	1-2	×		

0010 • 3 poles



W	CNT	1	0	2
3	11-12			×
	9-10	×		
2	7-8			×
	5-6	×		
1	3-4			×
	1-2	×		

0011 • 4 poles



W	CNT	1	0	2
4	15-16			×
	13-14	×		
3	11-12			×
	9-10	×		
2	7-8			×
	5-6	×		
1	3-4			×
	1-2	×		

W	Wafers
CNT	Contacts

ACTUATORS

Cam switches / actuators matrix

Check the “Operation schemes matrix” (p.7) to identify the available operation scheme for each operator. Each actuator is referenced to the relevant page of the mounting instructions.

Series and size		P012 / P016 / P020	
Terminal protection class		IP20	
Mounting type		B	
		Grey/Black	Yellow/Red
48×48			
screw	IP65	020/... (p.8)	030/... (p.8)
Ø 22	IP65	095/... (p.10)	070/... (p.10)
48×48	padlock in 0		
screw	IP65 / 4-4X	005/... (p.9)	006/... (p.9)
Ø 22	IP65 / 4-4X	077/... (p.11)	069/... (p.11)
67×67	max 3 padlocks		
screw	IP65 / 4-4X	011/... (p.12)	012/... (p.12)
Ø 22	IP65 / 4-4X	063/... (p.13)	064/... (p.13)

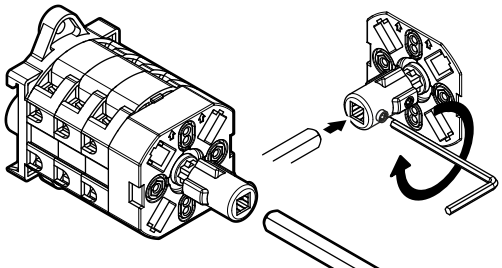
Operation schemes matrix

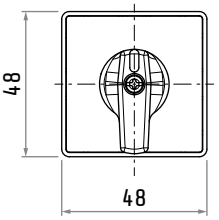
Actuator code example: 001/0001

	ON-OFF switches 0-1		Changeover switches 1-0-2 / Motor switches
	 90°	 90°	 45°
005/...	0001	0001-1	0008
006/...	0001	0001-1	0008
011/...	0001	0001-A	0008
012/...	0001	0001-2	0008
020/...	0001	-	0008
030/...	0001	-	0008
063/...	0001	0001-1	0008
064/...	0001	0001-1	0008
069/...	0001	-	0008
070/...	0001	-	0008
077/...	0001	-	0008
095/...	0001	-	0008

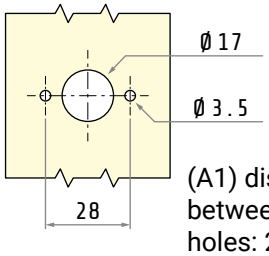
020/... - 030/... screw fixing

The exploded view shows an example with 28 mm distance between the fixing holes (A1). 32 mm distance between the fixing holes (B1) is also possible. Changing configuration from (A1) to (B1) requires the 90° rotation of the illustrated components (A2 - B2).
The reference pins orientation (A3 - B3) and the orientation of the shaft (A4 - B4), change accordingly.

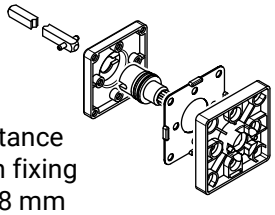




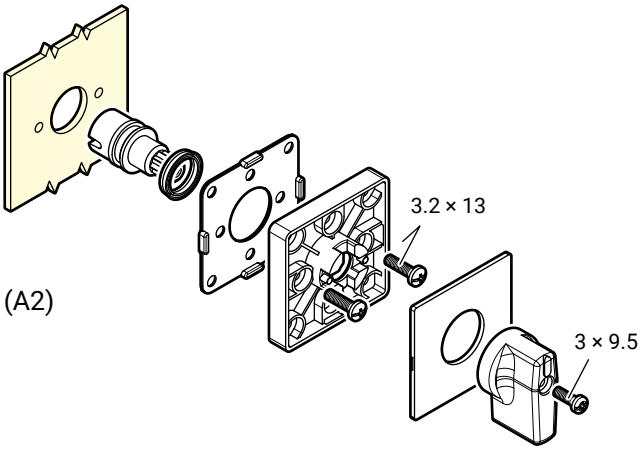
panel thickness: 1 ... 4 mm

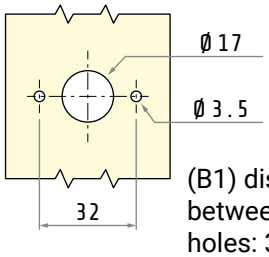


(A1) distance between fixing holes: 28 mm

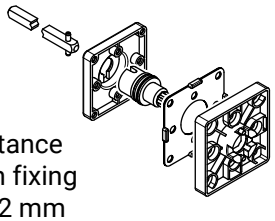


(A2)

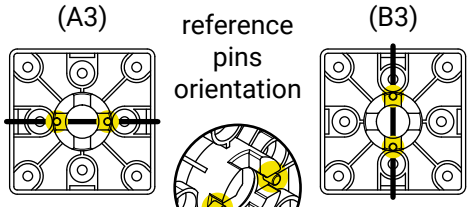


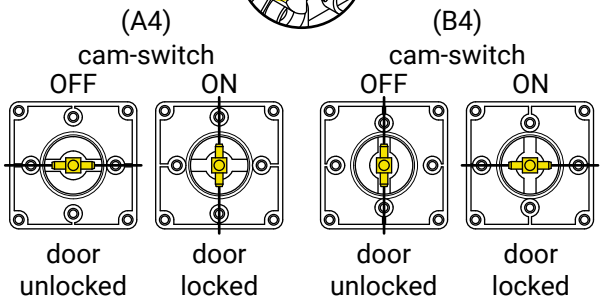


(B1) distance between fixing holes: 32 mm

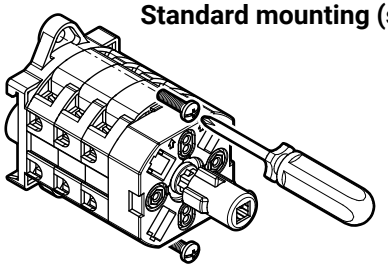


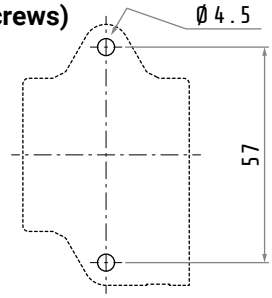
(B2)



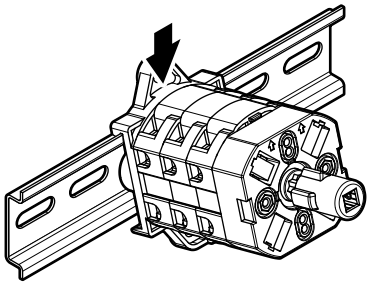


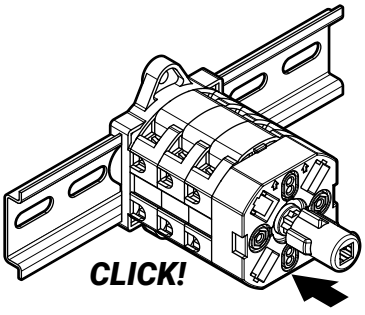
Standard mounting (screws)



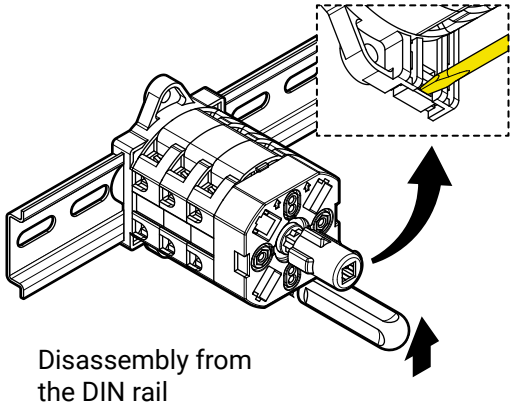


Alternative mounting (on DIN rail)



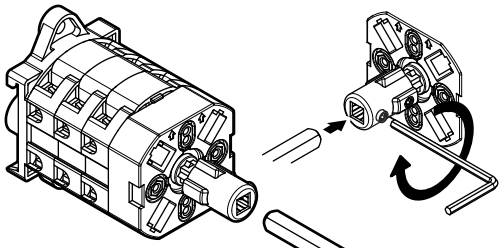


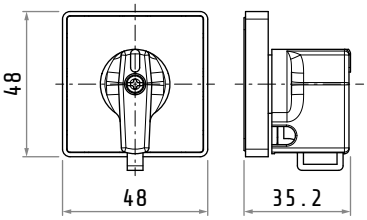
Fixing to the 35 mm DIN rail



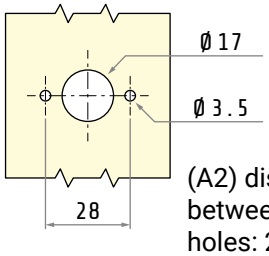
Disassembly from the DIN rail

005/... - 006/... screw fixing

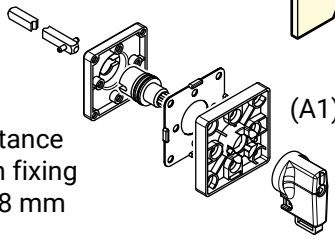


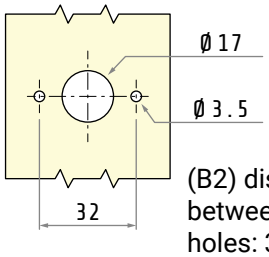


panel thickness: 1 ... 4 mm

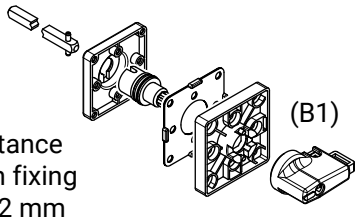


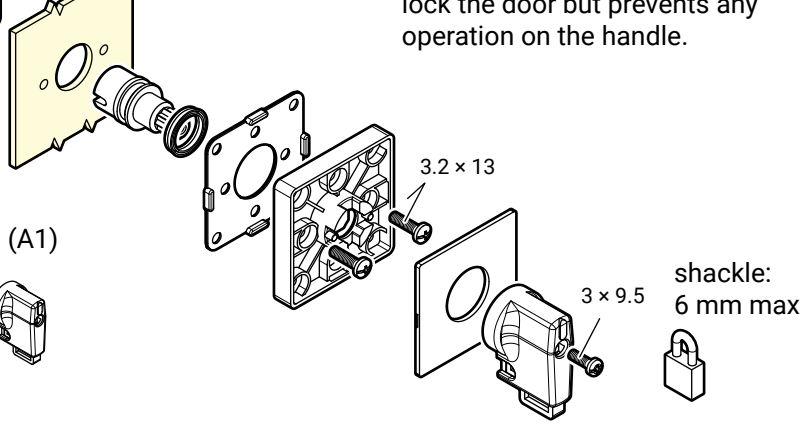
(A2) distance between fixing holes: 28 mm





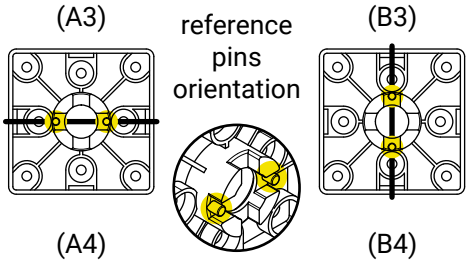
(B2) distance between fixing holes: 32 mm

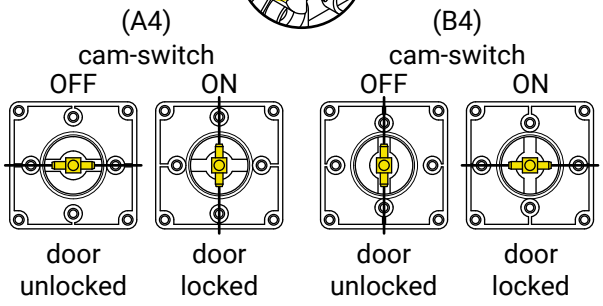




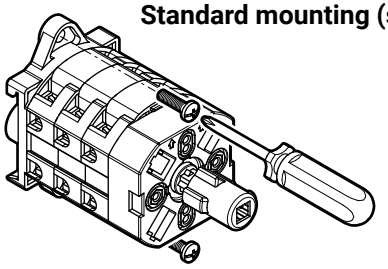
shackle: 6 mm max

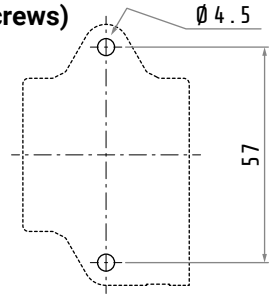
Padlocking is possible with the knob oriented at 12 o'clock (A1) or at 9 o'clock (B1). Changing configuration from (A1) to (B1) requires the 90° rotation of the illustrated components (A1 - B1). The distance between the holes (A2 - B2), the reference pins orientation (A3 - B3) and the orientation of the shaft (A4 - B4), change accordingly.
Padlocking is possible only with the cam-switch in OFF position (A4 - B4) with the door unlocked.
ATTENTION: padlocking does not lock the door but prevents any operation on the handle.



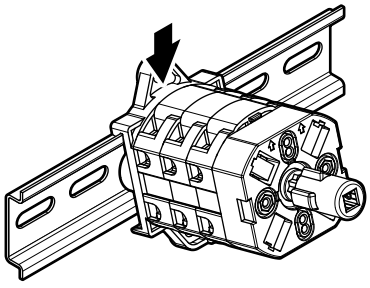


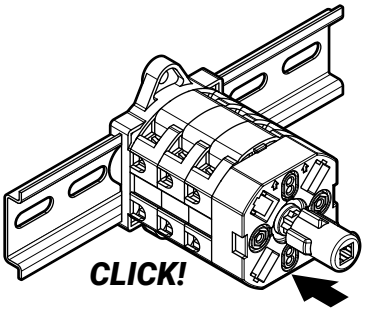
Standard mounting (screws)



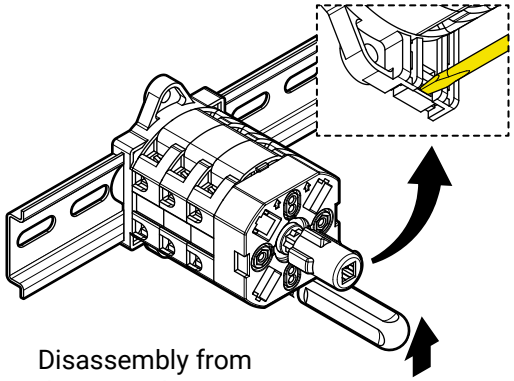


Alternative mounting (on DIN rail)



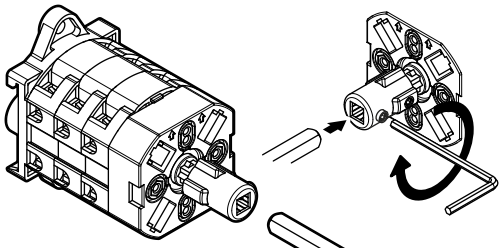


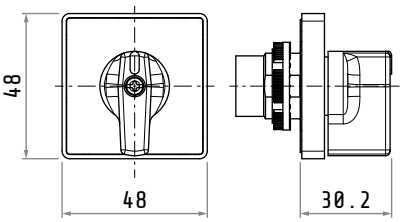
Fixing to the 35 mm DIN rail

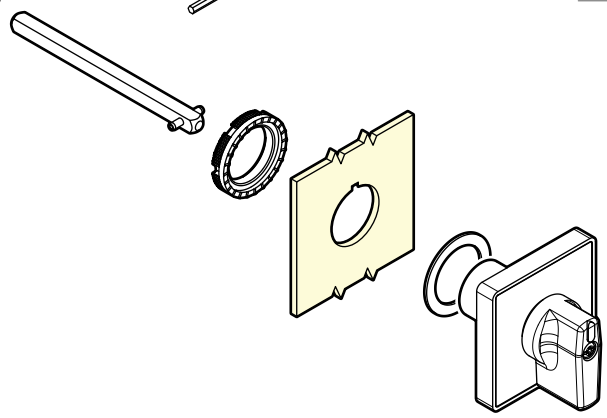


Disassembly from the DIN rail

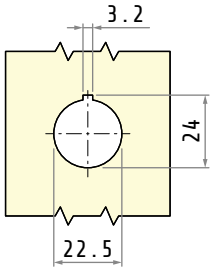
095/... - 070/... Ø 22 fixing

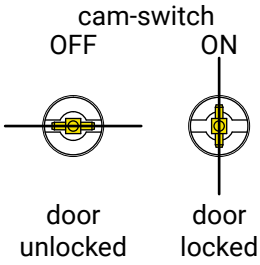




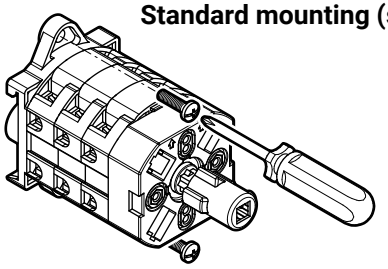


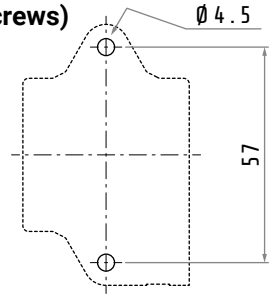
panel
thickness:
1 ... 4 mm



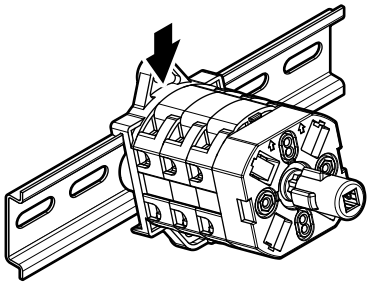


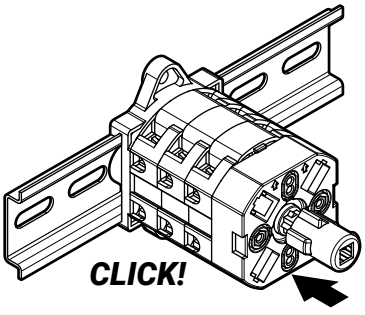
Standard mounting (screws)



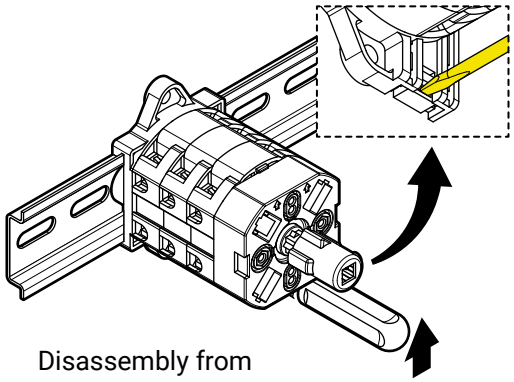


Alternative mounting (on DIN rail)



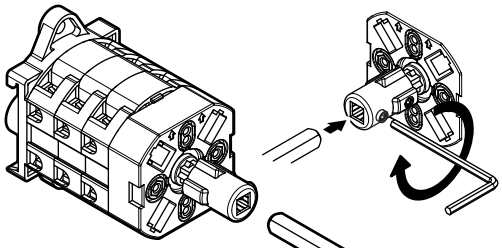


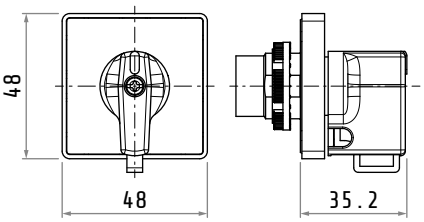
Fixing to the 35 mm DIN rail



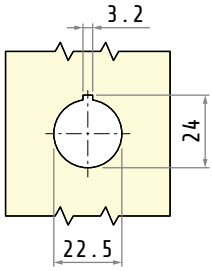
Disassembly from
the DIN rail

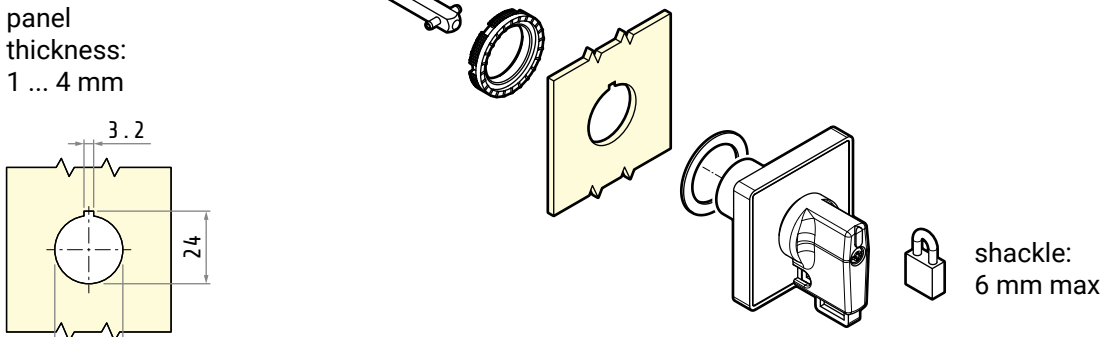
077/... - 069/... Ø 22 fixing



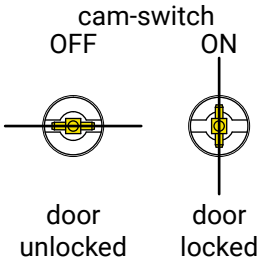


panel
thickness:
1 ... 4 mm



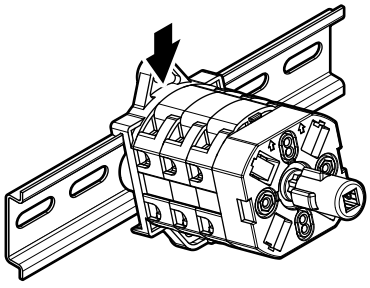


shackle:
6 mm max

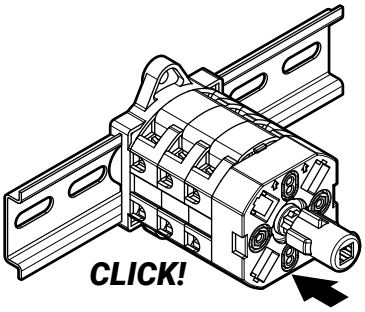


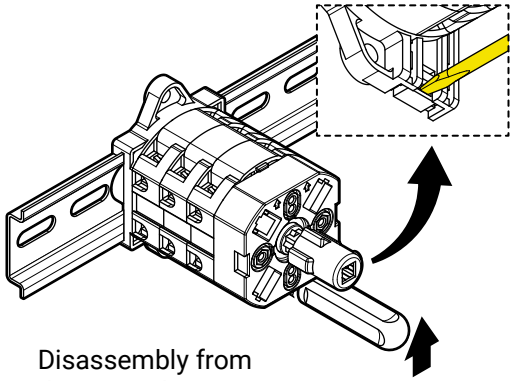
Padlocking is possible only with the cam-switch in OFF position with the door unlocked.
ATTENTION: padlocking does not lock the door but prevents any operation on the handle.

Mounting



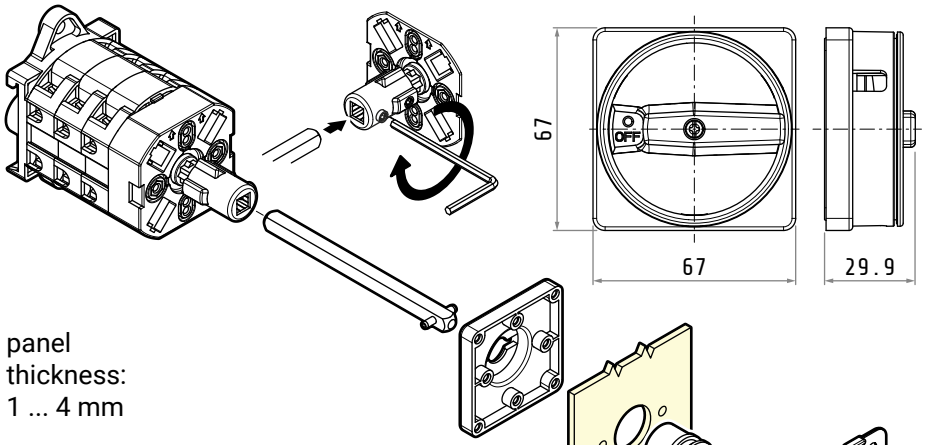
Fixing to the 35 mm DIN rail



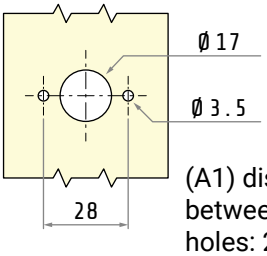


Disassembly from
the DIN rail

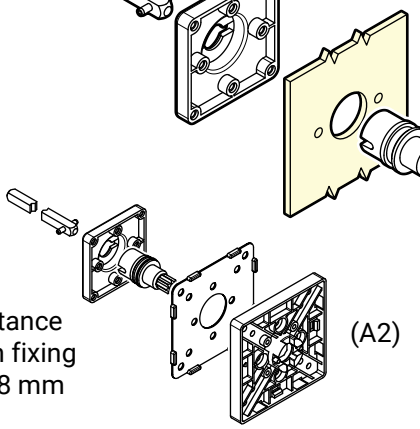
011/... - 012/... screw fixing



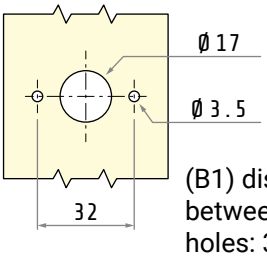
panel thickness: 1 ... 4 mm



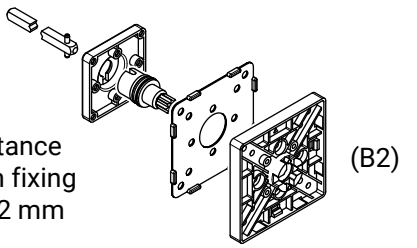
(A1) distance between fixing holes: 28 mm



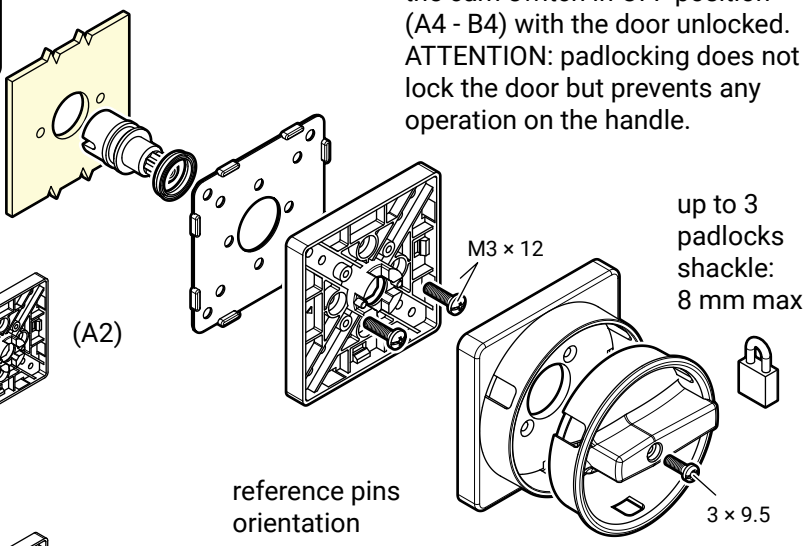
(A2)



(B1) distance between fixing holes: 32 mm

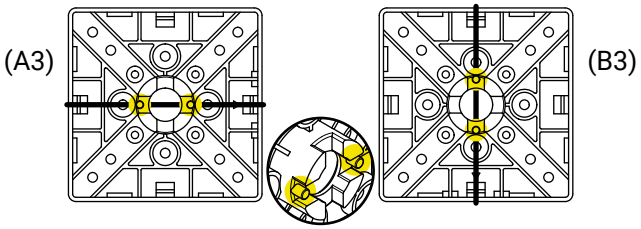


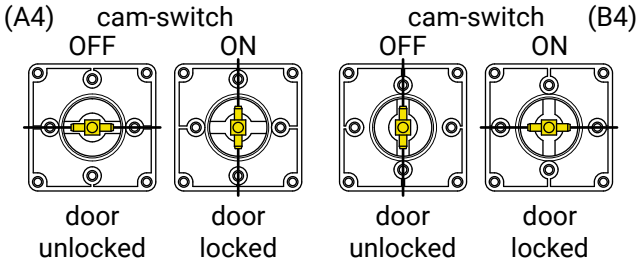
(B2)



up to 3 padlocks shackle: 8 mm max

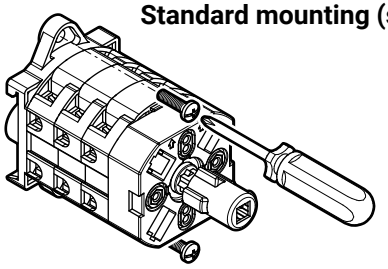
reference pins orientation

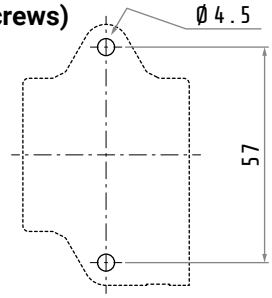




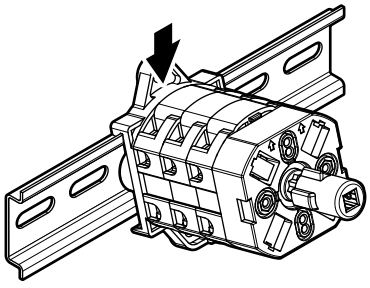
The exploded view shows an example with 28 mm distance between the fixing holes (A1). 32 mm distance between the fixing holes (B1) is also possible. Changing configuration from (A1) to (B1) requires the 90° rotation of the illustrated components (A2 - B2). The reference pins orientation (A3 - B3) and the orientation of the shaft (A4 - B4), change accordingly.
Padlocking is possible only with the cam-switch in OFF position (A4 - B4) with the door unlocked.
ATTENTION: padlocking does not lock the door but prevents any operation on the handle.

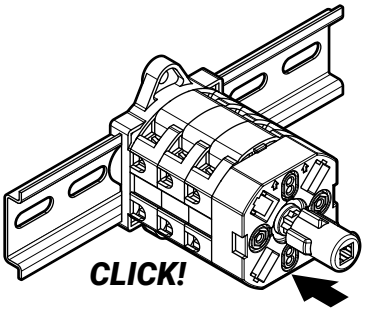
Standard mounting (screws)



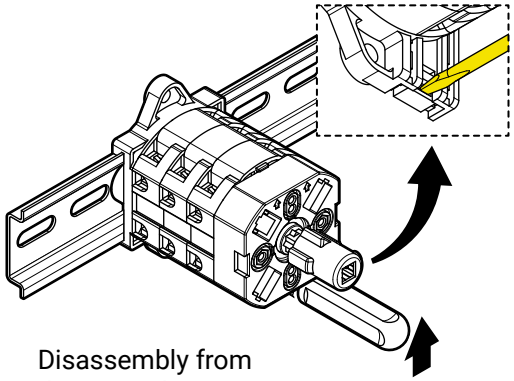


Alternative mounting (on DIN rail)



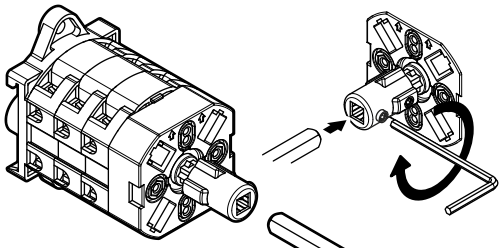


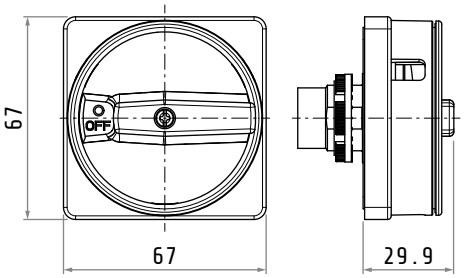
Fixing to the 35 mm DIN rail



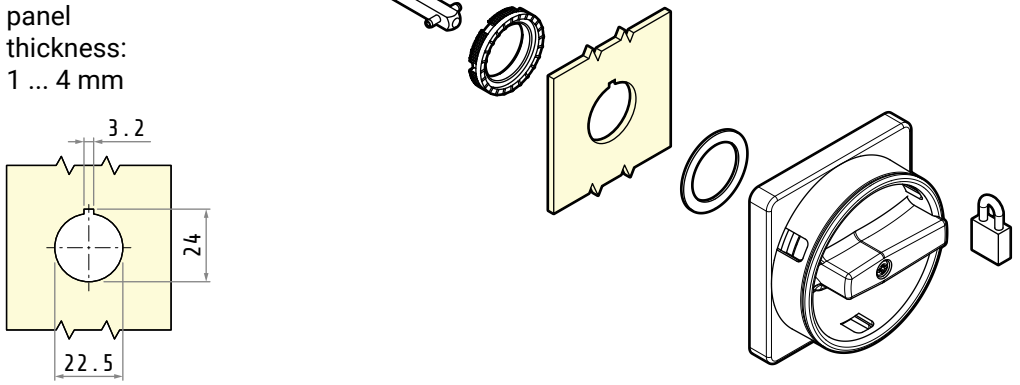
Disassembly from the DIN rail

063/... - 064/... Ø 22 fixing



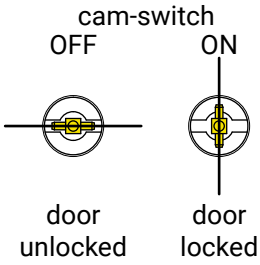


panel
thickness:
1 ... 4 mm



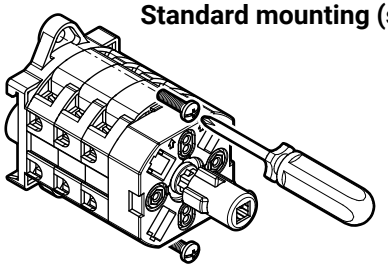
Padlocking is possible only in OFF position

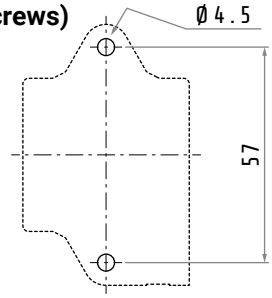
up to 3 padlocks
shackle: 8 mm max



Padlocking is possible only with the cam-switch in OFF position with the door unlocked.
ATTENTION: padlocking does not lock the door but prevents any operation on the handle.

Standard mounting (screws)





Alternative mounting (on DIN rail)