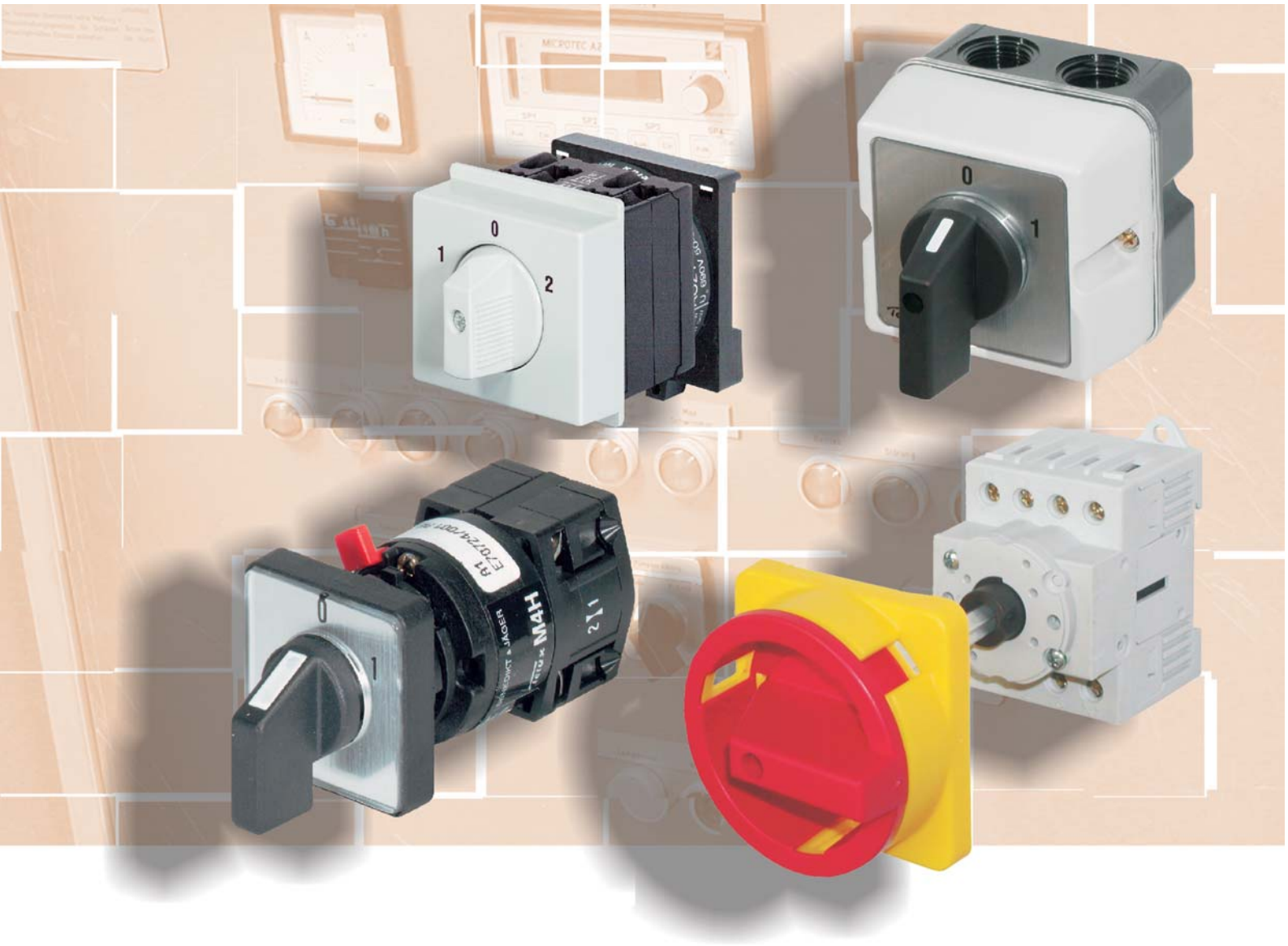
Switches



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General

Test Authorities, Registration Mark, Approvals

Low voltage switchgear from Benedict GmbH is built and tested to national and international specifications. All devices suit all important specifications without any test obligation, like VDE, BS and also relative to IEC Recommendations and to European Standards like IEC 947 and EN 60947.
It is for this reason of our Low voltage switchgear is used all over the world. In order to provide special versions, limitations to the max. voltages, currents and power ratings or special markings are sometimes necessary.

Quality Control System

Since November 1991 Benedict GmbH has been certified according to the quality control system **ÖNORM EN ISO 29001**. The target of the ISO-certification is, to grant the customer the quality of the performance of his supplier, who is audited in accordance with this standard.

CE-Marking CE

The manufacturer has to sign his products with the CE-Marking. With the CE-Marking the manufacturer confirms the accordance with the different EEC Directives. The CE-Marking is absolutely necessary to sell the products in the EEC.
Below you find the EEC Directives concerning our products.
Low Voltage Directive 2006/95/EC
EMC Directive 2004/108/EC
RoHS + WEEE 2002/95/EC + "002/96/EC

Country	North America	Russia
State deputy or private examination (state admitted)	UL Canada, USA	EAC
Label marking of examination boards	c UL us Listed c UL us Component	EAC
Duty of approvals	all switchgear	all switchgear

Explanations for choice and supply of low voltage switchgear in Canada and USA

Marking of auxiliary contacts
At several devices in UL-data are two voltages for auxiliary contacts mentioned (e. g.: 600 volts at same potential, 150 volts at different potentials). That means, if the voltage is higher than 150 volts, the control voltage applied to input terminals must be at the same potential.

Low voltage switchgear for auxiliary circuits (e. g. contactor relays, control units, auxiliary contacts in general) usually approved for "Heavy Duty" or "Standard Duty" UL and besides these marked with the admissible max. voltage or with short codes (see table).

Marking of auxiliary contacts according to CSA and UL	Max. rated values per pole Voltage V	Current Make A	 Break A	Cont. Current A	Contact Rating Code Designation
Heavy Duty (HD or HVY DTY)	AC 120 AC 240 AC 480 AC 600	60 30 15 12	6 3 1,5 1,2	10 10 10 10	A150 A300 A600 A600
	DC 125 DC 250 DC 600	2,2 1,1 0,4	2,2 1,1 0,4	10 10 10	N150 N300 N600
Standard Duty (SD or STD DTY)	AC 120 AC 240 AC 480 AC 600	30 15 7,5 6	3 1,5 0,75 0,6	5 5 5 5	B150 B300 B600 B600
	DC 125 DC 250 DC 600	1,1 0,55 0,2	1,1 0,55 0,2	5 5 5	P150 P300 P600
-	AC 120 AC 240 AC 480 AC 600	15 7,5 3,75 3	1,5 0,75 0,375 0,3	2,5 2,5 2,5 2,5	C150 C300 C600 C600
	DC 125 DC 250 DC 600	0,55 0,27 0,1	0,55 0,27 0,1	2,5 2,5 2,5	Q150 Q300 Q600
-	AC 120 AC 240	3,6 1,8	0,6 0,3	1 1	D150 D300
	DC 125 DC 250	0,22 0,11	0,22 0,11	1 1	R150 R300
-	AC 120	1,8	0,3	0,5	E150

Discernment at UL-Standards

Recognized Component Industrial Control Equipment	Listed Industrial Control Equipment
UL issues yellow "Guide cards" with Guide- and File-No.	UL issues white "Guide cards" with Guide- and File-No.
Devices have permission to be marked with on the label c UL us	Devices have to be marked with the "UL-Listing Mark" c UL us
Devices as components approved for "factory wiring": devices for employment in control panels, when they are selected, mounted and wired according to the charging conditions by skilled worker.	Devices approved for "field wiring", a) devices for employment in control panels, when they are mounted and wired by skilled worker. b) devices for retail in USA
Valid UL-Standards: UL 508 "Standard for Industrial Control Equipment" (partly limited)	Valid UL-Standards: UL 508 "Standard for Industrial Control Equipment" (unlimited)

Are devices approved as "Listed Equipment" c UL us the approval is also valid for using as "Recognized Component" c UL us.

Approvals

Country	USA, Canada UL	Europe	Russia EAC	CB/CCA- Certificates
Type	c UL us	CE	EAC	
Cam Switches (UL-Listed as MANUAL MOTOR CONTROLLER and suitable as MOTOR DISCONNECT)				
M10	o	o	o	o
M10H	o	o	o	o
M20	o	o	o	o
N20	o	o	o	o
N33F	o	o	o	o
N40	-	o	o	o
N60	-	o	o	o
N80	o	o	o	o
N100	o	o	o	o
N200	o	o	o	o
L400	o	o	-	-

o In standard version approved
- Not provided for test till now

/ No testing required CE

x In test

Technical Information

Degree of protection acc. to IEC 60947-1

Protection ratings are prefixed by the internationally agreed letters IP followed by two digits.

1 st digit: Pertains to solid objects
2 nd digit: Pertains to water.

1 st digit	Short description	Definition
1	Protected against solid objects greater than 50 mm	Excludes solid objects exceeding 50 mm in diameter and protects against contact with live and moving parts by a large body surface such as a hand (but not against deliberate access).
2L	Protected against solid objects greater than 12,5 mm and against contact by standard test finger	Excludes solid objects exceeding 12,5 mm in diameter and protects against contact with live and moving parts by a standard test finger or similar objects not exceeding 80 mm in length.
3	Protected against solid objects greater than 2,5mm	Excludes solid objects exceeding 2,5 mm in diameter or thickness.
4	Protected against solid objects greater than 1 mm	Excludes solid objects exceeding 1 mm in diameter or thickness.
5	Dust protected	Prevents ingress of dust in quantities and locations that would interfere with the intended operation of the equipment.
6	Dust tight	Prevents ingress of dust.

2 nd digit	Short description	Definition
1	Protected against dripping water	Dripping water (vertically falling drops) shall have no harmful effect.
2	Protected against dripping water when tilted up to 15°	Vertically dripping water shall have no harmful effect when the enclosure is tilted at any angle up to 15° from its normal position.
3	Protected against spraying water	Water falling as a spray at an angle up to 60° from the vertical shall have no harmful effect.
4	Protected against splashing water	Water splashed against the enclosure from any direction shall have no harmful effect.
5	Protected against water jets	Water protected by a nozzle against the enclosure from any direction shall have no harmful effect.
6	Protected against heavy seas	Water from heavy seas or water projected in powerful jets shall not enter the enclosure in harmful quanties.
7	Protected against the effects of immersion	Ingress of water in a harmful quantity shall not be possible when the enclosure is immersed in water under standard conditions of pressure and time.
8	Protected against submersion	No ingress of water.

Resistance to climatic conditions acc. to IEC60068

Open-type devices are climate-resistant in the constant climate according to IEC60068-2-3 (this is a climate with an ambient temperature of 40°C and an atmospheric humidity of 90 to 95%).
Enclosed devices are climate-resistant in an alternating climate according to IEC 68-2-30 (this is a moist alternating climate with a 24-hour cycle between climates with an ambient temperature of 25°C, and an atmospheric humidity of 95 to 100% and an ambient temperature of 40°C, and an atmospheric humidity of 90 to 96% in the presence of condensation during rises in temperature).
Data are valid up to an altitude of 2000m above sea level.

Short circuit protection

Back up fuses should be used to protect contactors and starters against short circuits. For starters the device with the smaller admissible fuse at the main and at the control circuit (contactor or thermal overload) determines the fuse size.
After a short circuit devices have to be checked for correct operation.
Disconnect power before proceeding with any work on the equipment!

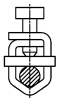
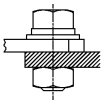
Mounting positions

Zulässige Umgebungstemperatur

Operation	open °C	-40 up to +60
	enclosed °C	-40 up to +40
Storage	°C	-50 up to +90

Technical Information

Terminal screws

Devices Type	Kind of connection Screw with washer	Screw with clamp box	2 Screw s	Screw with w. nut	Screw driver	Tightening torque Nm	lb. inch
							
Cam Switches							
M4H..	M2,5	-	-	-	Pz1	0,6	5
M10	M3	-	-	-	Pz2	0,6 - 1,2	5 - 11
M10H	M3,5	-	-	-	Pz2	0,8 - 1,4	7 - 12
M20, N20, N33F	M4	-	-	-	Pz2	1,2 - 1,8	11 - 16
N40	M5	-	-	-	Pz2	2,5 - 3	22 - 26
N60, N80	-	-	2 x M5	-	Pz2	2,5 - 3	22 - 26
N100	-	-	2 x M6	-	Pz3	3,5 - 4,5	31 - 40
N200	-	-	-	M10		10	88
L100	-	-	2 x M5	-	Pz2	2,5 - 3	22 - 26
L160	-	-	-	M8		4 - 6,5	35 - 57
L400	-	-	-	M12		16	140
L600	-	-	-	M16		24	210
L800	-	-	-	M16		24	210
L1200	-	-	-	M16		24	210

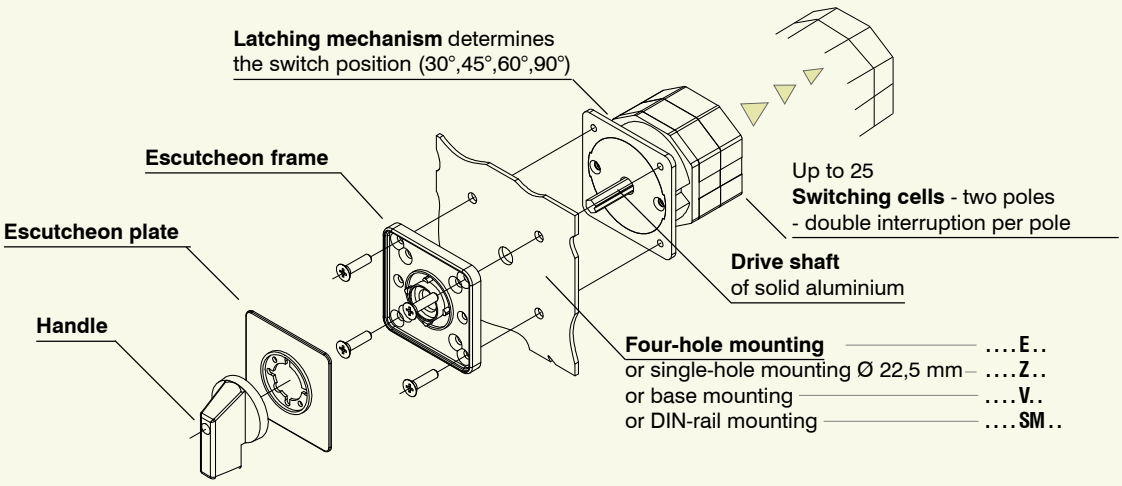
Typ	Ratings: Rated current Therm. I_{th} open A	AC21 A	atU_e V	Motor AC3 3~400V kW	AC23 3~400V A	kW	Plate mm	Designs: Panel moun. M10H, M20 IP65 IP40	Single hole mount. Ø22,5mm with Plate IP65	without Plate IP65	Flush mount. IP40
M4H	10	**10**	440	2,2	6	3	30❐	M4H E ●♦	M4H Z ●♦	M4H ZO ●♦	-
M10H	20	**20**	690	5,5	16	7,5	48❐	M10H E ●♦	M10H Z ●♦	M10H ZO ●♦	-
M10	20	**20**	440	5,5	16	7,5	48❐	-	-	-	M10 UP ●♦
M20	32	**32**	690	11	30	15	48❐	M20 E ●♦	M20 Z ●♦	M20 ZO ●♦	-
N20	32	**32**	690	11	30	15	64❐	N20 E ●♦	-	-	-
N33F	50	**50**	690	15	45	22	64❐	N33F E ●♦	N33F Z ●♦	-	-
N40	63	**63**	690	15	45	22	88❐	N40 E ●♦	-	-	-
N60	85	**85**	690	25	60	30	88❐	N60 E ●♦	-	-	-
N80	115	**115**	690	30	85	45	88❐	N80 E ●♦	-	-	-
L100	**125**	**125**	690	15	45	22	88❐	L100 E ●♦	-	-	-
L160	**180**	**180**	690	25	60	30	88❐	L160 E ●♦	-	-	-
N100	150	**150**	690	40	110	55	132❐	N100 E ●♦	-	-	-
N200	250	**250**	690	70	140	70	132❐	N200 E ●♦	-	-	-
L400	**400**	**400**	690	70	140	70	132❐	L400 E ●♦	-	-	-
L600	**600**	**400**	690	70	140	70	132❐	L600 E ●♦	-	-	-
L800	**800**	**400**	690	70	140	70	132❐	L800 E ●♦	-	-	-
L1200	**1200**	**400**	690	70	140	70	132❐	L1200 E ●♦	-	-	-

Cam Switches 10 - 250A

Cam switches can be used for virtually all purposes, e.g. as motor, main, control or instrument switches. Over and above the switching programs mentioned in the list, an effectively limitless number of special programs can be implemented.

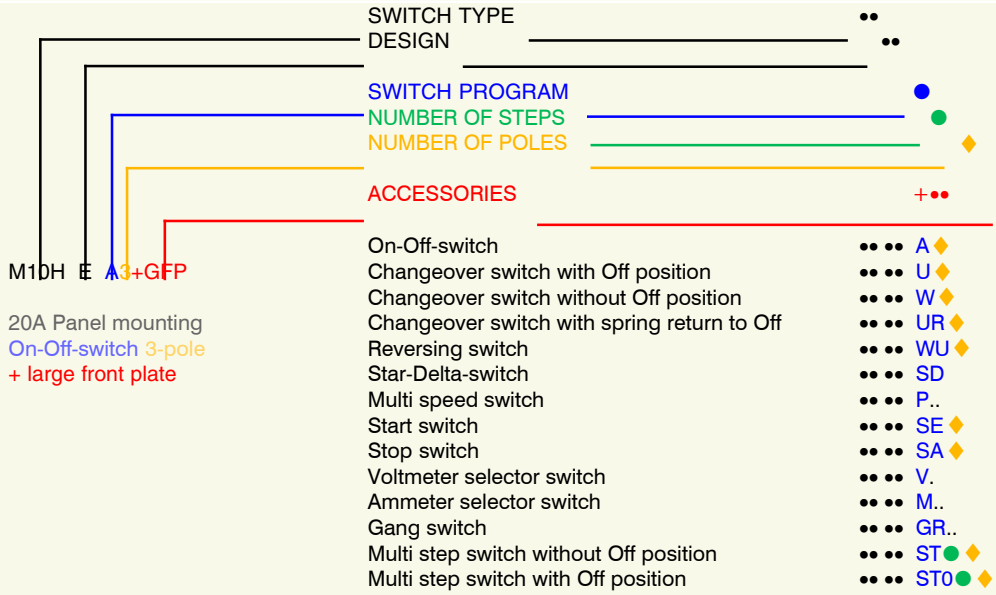
Load switch L.. 125 - 1200A

Load switches are primarily employed where resistive or slightly inductive current loads are to be switched on and off, or switching takes place without loading.
Load switches are assembled by parallel switching of two or more of cam switch contacts.
With customer built main terminal protection, load switch L.. can also be used as main switch.



Designs							
Base mounting IP40	DIN-rail mounting IP40	Modular IP40	Plastic enclosed ..P.. IP40 ..PF.. IP65	horizontal, IP65	Motor switch enclosed IP65	Terminal box mounting IP65	Cast enclosed ..G.. IP40 ..GF.. IP65
							
-	-	-	-	-	-	-	-
M10H V ●♦	M10H SM ●♦	M10H SMA ●♦	-	-	M10H PM ●♦	-	-
-	-	-	M10 P(F) ●♦	-	-	M10 KE ●♦	-
M20 V ●♦	M20 SM ●♦	M20 SMA ●♦	-	-	-	-	-
N20 V ●♦	N20 SM ●♦	-	N20 P(F) ●♦	-	N20 PM ●♦	N20 KE ●♦	N20 G(F) ●♦
N33F V ●♦	N33F SM ●♦	-	N33F P(F) ●♦	-	N33F PM ●♦	N33F KE ●♦	-
N40 V ●♦	-	-	N40 P(F) ●♦	N40 PLF ●♦	-	-	-
N60 V ●♦	-	-	N60 P(F) ●♦	N60 PLF ●♦	-	-	-
N80 V ●♦	-	-	N80 P(F) ●♦	N80 PLF ●♦	-	-	-
L100 V ●♦	-	-	-	-	-	-	-
L160 V ●♦	-	-	-	-	-	-	-
N100 V ●♦	-	-	N100 PF ●♦	-	-	-	-
N200 V ●♦	-	-	N200 PF ●♦	-	-	-	-
L400 V ●♦	-	-	-	-	-	-	-
L600 V ●♦	-	-	-	-	-	-	-
L800 V ●♦	-	-	-	-	-	-	-
L1200 V ●♦	-	-	-	-	-	-	-

Ordering



Panel mounting designs

Switches of the panel mounting designs listed below have protection from front IP40. Where a shaft seal (appendix +WD) is used, the protection is increased to IP54. Use of a moisture proofing cap (appendix +FR) results in an increase in rear protection to IP54. In the standard version, the switches are delivered with a square escutcheon plate and black twist knob. Forward mounting is possible for some of the design E switches. The position of the terminals of the standard switches is left and right, at switch M10H the terminals are above and below. Where a knob insert is turned by 90° (can easily be performed after delivery), the position of the terminals can be changed.
Dimensions see page 256.

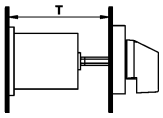
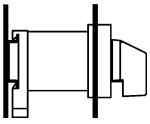
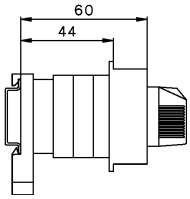
Design		Possible switch sizes					
Description	**Type appendix**	M10H	M20	N20 N33F	N40 N60 N80	N100 N200	L...
Panel mounting For installation in control panels, machines and equipment. For panel thickness of over 5mm, an extended switch shaft is required (appendix +VW). Protection from front: M10H, M20 IP65 all others IP40	**E**	**X**	**X**	**X**	**X**	**X**	**X**
Central fixing 22,5mm Switch for mounting with standard 22,5mm mounting holes and 1-4mm panel thickness. Protection from front: IP65 Wrench J7049 necessary	**Z**	**X**	**X**	**X** [2]	-	-	-
Central fixing 22,5mm Switch **without escutcheon plate**, for installation with standard 22,5mm mounting holes and 1-4mm panel thickness. Protection from front: IP65 Wrench J7049 necessary	**ZO**	**X**	**X**	-	-	-	-
Flush mounting version Switch with white instrument knob, cream escutcheon plate with black markings, for installation in 65mm flush mounting boxes and use of Unitas plate. Supplied with flush mounting box: appendix +UP. Maximum number of cells with: M10 FM box 45mm deep 2 FM box 65mm deep 4	**UP**	**X** [1]	-	-	-	-	-

1) Switches are delivered with switch type M10
2) For switch types N33F only, max. 3 poles and 3 cells

Base mounting designs

Switches of the designs listed below have protection from front IP40. When a shaft seal (appendix +WD) is used, the front protection type is increased to IP54. In the standard version, the switches are delivered with a square escutcheon plate and black twist knob (design SMA with grey cover and grey toggle knob). Door couplings are advisable for switchgear cabinets with hinged doors.

The position of the terminals of the standard switches is left and right, at switch M10H the terminals are above and below. Where a knob insert is turned by 90° (can easily be performed after delivery), the position of the terminals can be changed.
Dimensions see page 257.

Design Description	Type appendix	Possible switch sizes M10H	M20	N20 N33F	N40 N60 N80	N100 N200	L...
 **Base mounting** For screw mounting to the back wall or floor of distributor boxes, or of appliances with removable lids. Additional it is necessary to state the installation depth - that is the distance between mounting level of the switch and the inside edge of the door (dimension T).  Door couplings see page 244	**V ... +T/...**	**X**	**X**	**X**	**X**	**X**	**X**
 **Snap-on mounting on DIN-rail** Switch with square escutcheon plate, for snap-on mounting on standard DIN EN 50022 rail. Additional it is necessary to state the installation depth - that is the distance between mounting level of the switch and the inside edge of the door (dimension T).  Door couplings see page 244	**SM ... +T/...**	**X**	**X**	**X**	-	-	-
 **Snap-on mounting on DIN-rail** with installation cover for standard opening and toggle knob. The lay-out of the terminals of the standard switches is above and below. Dimensions for Switch types M10H SMA .. with1-3 cells M20 SMA .. with1 or 2 cells  further dimensions see page 257	**SMA**	**X**	**X**	-	-	-	-

Plastic enclosed switches

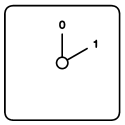
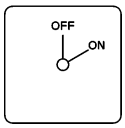
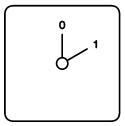
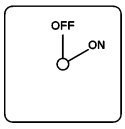
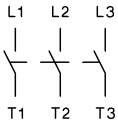
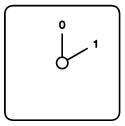
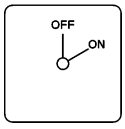
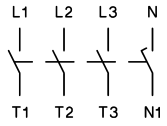
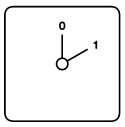
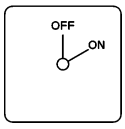
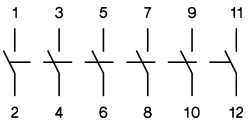
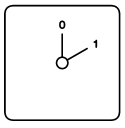
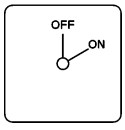
The switches, which have durable plastic enclosures, are intended for wall mounting or attachment to machines. In the standard version, they are supplied with a light-grey enclosure, square escutcheon plate, black markings on a silver background, and a black twist knob. Other colours and colour combinations are available for most enclosure types. It is not possible to mount an additional rectangular plate. The enclosure base is equipped with 4 entry glands with heavy-gauge conduit threads (see drawings). In all types of plastic enclosures, two terminals that are connected and insulated from switch column can be provided for a PE conductor (appendix +PE). In addition, 1 or 2 pilot lamps (appendix +SL..) with neon lights can be installed.
Dimensions see page 258.

Cast aluminium enclosed switches

The switches with cast aluminium enclosures are intended for wall mounting or attachment to machines, under heavy-duty operating conditions. The switches are delivered with a square escutcheon plate, black markings on a silver background, and a black instrument knob. It is not possible to mount an additional rectangular plate. The enclosure base makes provision for 2 (4) entry glands with heavy-gauge conduit threads. If a switch with an aluminium enclosure is to be mounted directly on the terminal box of a motor, a 35mm or 50mm hole can be made in the floor of the switch enclosure. Design PLF is the replacement for designs G and GF at types N40 to N80.
Dimensions see page 259.

Design		Possible switch sizes							
Description	**Type appendix**	M10H	N20	N33F	N40	N60	N80	N100	N200
Plastic enclosure light grey Protection class IP40 Maximum number of cells	**P**	**X** 6	**X** 6	**X** 6	**X** 6	**X** 2	-	-	-
Plastic enclosure light grey Moisture protection Protection class IP65 Maximum number of cells	**PF**	**X** 6	**X** 6	**X** 6	**X** 6	**X** 5	**X** 5	**X** 4	**X** 3
Plastic enclosure horizontal light grey Moisture protection Protection class IP65 Maximum number of cells	**PLF**	- -	- -	- -	**X** 10	**X** 6	**X** 6	-	-
Cast enclosure Protection class IP40 Maximum number of cells	**G**	- -	**X** 6	**-**	-	**-**	**-**	**-**	**-**
Cast enclosure Moisture protection Protection class IP65 Maximum number of cells	**GF**	**-** -	**X** 6	**-**	-	**-**	**-**	**-**	**-**
Terminal box mounting Protection class IP65 These switches are front mounted on a terminal box. The switch cells protrude through a hole into the terminal compartment. Maximum number of cells	**KE**	**X** 12	**X** 12	**X** 12	-	-	-	-	-
Plastic motor switch enclosure Moisture protection Protection class IP65 Maximum number of cells	**PM**	**-**	**X** 6	**-**	-	-	-	-	_

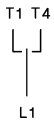
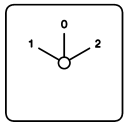
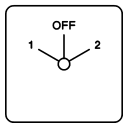
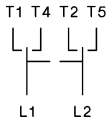
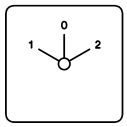
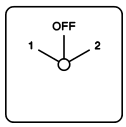
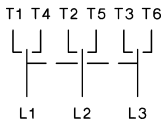
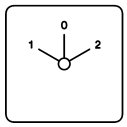
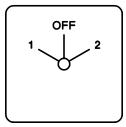
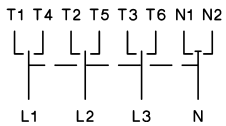
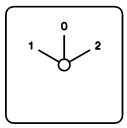
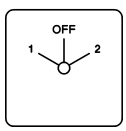
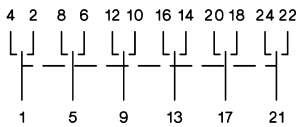
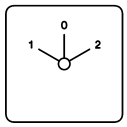
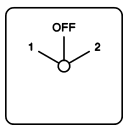
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
On-Off-switches A							
1-pole		*60°*	1 48 ❐ 20A	**M10H .**	**x x x x x¹⁾ - -**	**. A1**	
			32A	**M20 .**	**x x x x - -**	**. A1**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. A1**	
			50A	**N33F .**	**x x x - x -**	**. A1**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. A1**	**+003**
			80A	**N60 .**	**x - x - x -**	**. A1**	
			115A	**N80 .**	**x - x - - -**	**. A1**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. A1**	
			250A	**N200 .**	**x - x - - -**	**. A1**	
2-pole		*60°*	1 48 ❐ 20A	**M10H .**	**x x x x x¹⁾ - -**	**. A2**	
			32A	**M20 .**	**x x x x - -**	**. A2**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. A2**	
			50A	**N33F .**	**x x x - x -**	**. A2**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. A2**	**+003**
			80A	**N60 .**	**x - x - x -**	**. A2**	
			115A	**N80 .**	**x - x - - -**	**. A2**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. A2**	
			250A	**N200 .**	**x - x - - -**	**. A2**	
3-pole		*60°*	2 48 ❐ 20A	**M10H .**	**x x x x x¹⁾ - -**	**. A3**	
			32A	**M20 .**	**x x x x - -**	**. A3**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. A3**	
			50A	**N33F .**	**x x x - x -**	**. A3**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. A3**	**+003**
			80A	**N60 .**	**x - x - x -**	**. A3**	
			115A	**N80 .**	**x - x - - -**	**. A3**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. A3**	
			250A	**N200 .**	**x - x - - -**	**. A3**	
4-pole 4. pole early make		*60°*	2 48 ❐ 20A	**M10H .**	**x x x x x¹⁾ - -**	**. A4**	
			32A	**M20 .**	**x x x x - -**	**. A4**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. A4**	
			50A	**N33F .**	**x - x - x -**	**. A4**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. A4**	**+003**
			80A	**N60 .**	**x - x - x -**	**. A4**	
			115A	**N80 .**	**x - x - - -**	**. A4**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. A4**	
			250A	**N200 .**	**x - x - - -**	**. A4**	
6-pole		*60°*	3 48 ❐ 20A	**M10H .**	**x x x x x¹⁾ - -**	**. A6**	
			32A	**M20 .**	**x x x x - -**	**. A6**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. A6**	
			50A	**N33F .**	**x - x - x -**	**. A6**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. A6**	**+003**
			80A	**N60 .**	**x - x - x -**	**. A6**	
			115A	**N80 .**	**x - x - - -**	**. A6**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. A6**	
			250A	**N200 .**	**x - x - - -**	**. A6**	

Ordering example: AC21 250A panel mounting, On-Off-switch 6-pole, Escutcheon plate OFF - ON **N200 E A6+003**

1) Plastic enclosed switches are delivered with switch type M10.

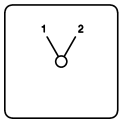
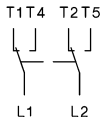
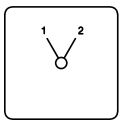
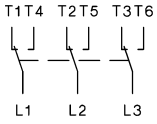
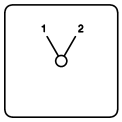
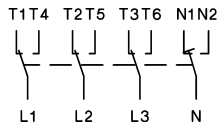
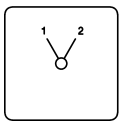
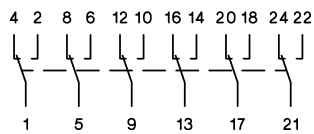
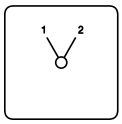
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ **AC21**	**Type**	**Design** see page 6-8 **E. Z. V. SMA. P. G.**	**Switch pro-gram**	Escutcheon plate
Changeover switches U							
1-pole		*60°*	1 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x** [1] **x x x x - -**	**. U1** **. U1**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x x x - x -**	**. U1** **. U1**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. U1** **. U1** **. U1**	**+007** 
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. U1** **. U1**	
2-pole		*60°*	2 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1]**-** **x x x x - -**	**. U2** **. U2**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x x x - x -**	**. U2** **. U2**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x -**	**. U2** **. U2** **. U2**	**+007** 
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. U2** **. U2**	
3-pole		*60°*	3 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1]**-** **x x x x - -**	**. U3** **. U3**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x x x - x -**	**. U3** **. U3**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. U3** **. U3** **. U3**	**+007** 
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. U3** **. U3**	
4-pole 4. pole early make		*60°*	4 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1]**-** **x x x x - -**	**. U4** **. U4**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. U4** **. U4**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. U4** **. U4** **. U4**	**+007** 
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. U4** **. U4**	
6-pole		*60°*	6 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x - x**[1]**-** **x x x - - -**	**. U6** **. U6**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. U6** **. U6**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. U6** **. U6** **. U6**	**+007** 
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. U6** **. U6**	

Ordering example: AC21 250A panel mounting, changeover switch 6-pole, Escutcheon plate 1 - OFF - 2 **N200 E U6+007**

1) Plastic enclosed switches are delivered with switch type M10.

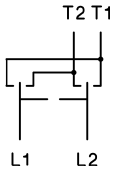
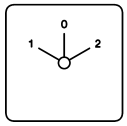
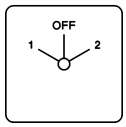
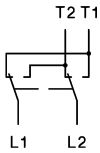
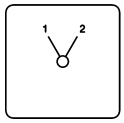
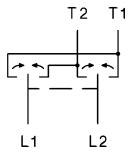
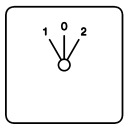
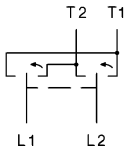
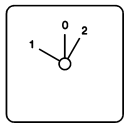
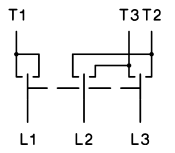
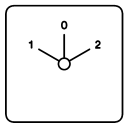
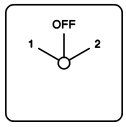
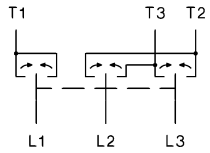
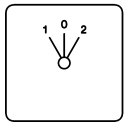
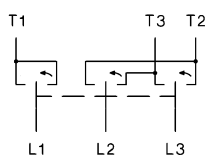
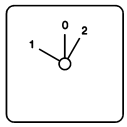
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Changeover switches without off W							
1-pole		*60°*	1 48 ❐ 20A	**M10H .**	**x x x x x**[1] **- -**	**. W1**	
			32A	**M20 .**	**x x x x - -**	**. W1**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. W1**	
			50A	**N33F .**	**x x x - x -**	**. W1**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. W1**	
			80A	**N60 .**	**x - x - x -**	**. W1**	
			115A	**N80 .**	**x - x - - -**	**. W1**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. W1**	
			250A	**N200 .**	**x - x - - -**	**. W1**	
2-pole		*60°*	2 48 ❐ 20A	**M10H .**	**x x x x x**[1] **- -**	**. W2**	
			32A	**M20 .**	**x x x x - -**	**. W2**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. W2**	
			50A	**N33F .**	**x x x - x -**	**. W2**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. W2**	
			80A	**N60 .**	**x - x - x -**	**. W2**	
			115A	**N80 .**	**x - x - - -**	**. W2**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. W2**	
			250A	**N200 .**	**x - x - - -**	**. W2**	
3-pole		*60°*	3 48❐ 20A	**M10H .**	**x x x x x**[1] **- -**	**. W3**	
			32A	**M20 .**	**x x x x - -**	**. W3**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. W3**	
			50A	**N33F .**	**x x x - x -**	**. W3**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. W3**	
			80A	**N60 .**	**x - x - x -**	**. W3**	
			115A	**N80 .**	**x - x - - -**	**. W3**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. W3**	
			250A	**N200 .**	**x - x - - -**	**. W3**	
4-pole 4. pole early make		*60°*	4 48 ❐ 20A	**M10H .**	**x x x x x**[1] **- -**	**. W4**	
			32A	**M20 .**	**x x x x - -**	**. W4**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. W4**	
			50A	**N33F .**	**x - x - x -**	**. W4**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. W4**	
			80A	**N60 .**	**x - x - x -**	**. W4**	
			115A	**N80 .**	**x - x - - -**	**. W4**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. W4**	
			250A	**N200 .**	**x - x - - -**	**. W4**	
6-pole		*60°*	6 48 ❐ 20A	**M10H .**	**x x x - x**[1] **- -**	**. W6**	
			32A	**M20 .**	**x x x - - -**	**. W6**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. W6**	
			50A	**N33F .**	**x - x - x -**	**. W6**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. W6**	
			80A	**N60 .**	**x - x - x -**	**. W6**	
			115A	**N80 .**	**x - x - - -**	**. W6**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. W6**	
			250A	**N200 .**	**x - x - - -**	**. W6**	

Ordering example: AC21 250A panel mounting, changeover switch without off 6-pole, **N200 E W6**

1) Plastic enclosed switches are delivered with switch type M10.

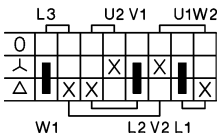
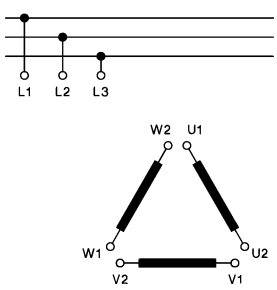
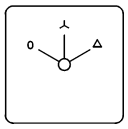
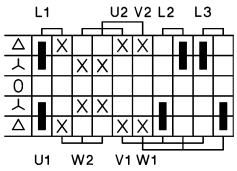
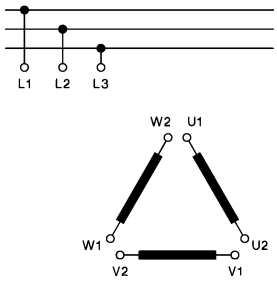
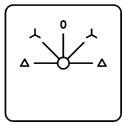
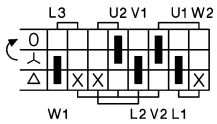
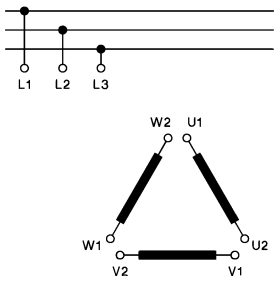
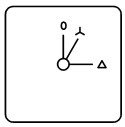
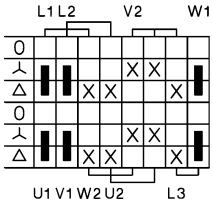
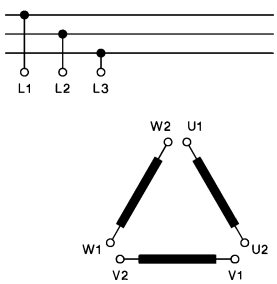
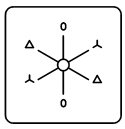
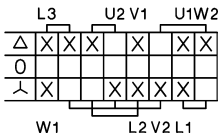
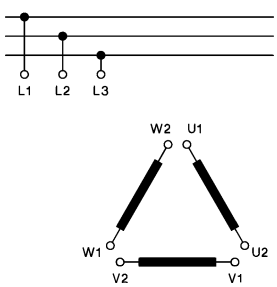
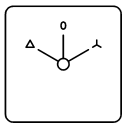
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Reversing switches WU							
2-pole		*60°*	2 48 ❒ 20A	**M10H .**	**x x x x x[1] - -**	**. WU2**	
			32A	**M20 .**	**x x x x - -**	**. WU2**	
			64 ❒ 32A	**N20 .**	**x - x - x x**	**. WU2**	
			50A	**N33F .**	**x x x - x -**	**. WU2**	
			88 ❒ 63A	**N40 .**	**x - x - x -**	**. WU2**	**+007**
			80A	**N60 .**	**x - x - x -**	**. WU2**	
			115A	**N80 .**	**x - x - - -**	**. WU2**	
			132❒ 150A	**N100 .**	**x - x - - -**	**. WU2**	
			250A	**N200 .**	**x - x - - -**	**. WU2**	
2-pole without off cross switch		*60°*	2 48 ❒ 20A	**M10H .**	**x x x x x[1] - -**	**. WK2**	
			32A	**M20 .**	**x x x x - -**	**. WK2**	
			64 ❒ 32A	**N20 .**	**x - x - x x**	**. WK2**	
			50A	**N33F .**	**x x x - x -**	**. WK2**	
			88 ❒ 63A	**N40 .**	**x x - x -**	**. WK2**	
			80A	**N60 .**	**x - x - x -**	**. WK2**	
			115A	**N80 .**	**x - x - - -**	**. WK2**	
			132❒ 150A	**N100 .**	**x - x - - -**	**. WK2**	
			250A	**N200 .**	**x - x - - -**	**. WK2**	
2-pole with spring return from both sides to off		*30°*	2 48 ❒ 20A	**M10H .**	**x x x x x[1] - -**	**. WU2R2**	
			32A	**M20 .**	**x x x x - -**	**. WU2R2**	
			64 ❒ 32A	**N20 .**	**x - x - x x**	**. WU2R2**	
			50A	**N33F .**	**x x x - x -**	**. WU2R2**	
			88 ❒ 63A	**N40 .**	**x - x - x -**	**. WU2R2**	
2-pole position 1 latched position 2 with spring return to off		*60°+30°*	2 48 ❒ 20A	**M10H .**	**x x x x x[1] - -**	**. WU2R1**	
			32A	**M20 .**	**x x x x - -**	**. WU2R1**	
			64 ❒ 32A	**N20 .**	**x - x - x x**	**. WU2R1**	
			50A	**N33F .**	**x x x - x -**	**. WU2R1**	
			88 ❒ 63A	**N40 .**	**x - x - x -**	**. WU2R1**	
3-pole		*60°*	3 48 ❒ 20A	**M10H .**	**x x x x x[1] - -**	**. WU3**	
			32A	**M20 .**	**x x x x - -**	**. WU3**	
			64 ❒ 32A	**N20 .**	**x - x - x x**	**. WU3**	
			50A	**N33F .**	**x x x - x -**	**. WU3**	
			88 ❒ 63A	**N40 .**	**x - x - x -**	**. WU3**	**+007**
			80A	**N60 .**	**x - x - x -**	**. WU3**	
			115A	**N80 .**	**x - x - - -**	**. WU3**	
			132❒ 150A	**N100 .**	**x - x - - -**	**. WU3**	
			250A	**N200 .**	**x - x - - -**	**. WU3**	
3-pole with spring return from both sides to off		*30°*	3 48 ❒ 20A	**M10H .**	**x x x x x[1] - -**	**. WU3R2**	
			32A	**M20 .**	**x x x x - -**	**. WU3R2**	
			64 ❒ 32A	**N20 .**	**x - x - x x**	**. WU3R2**	
			50A	**N33F .**	**x x x - x -**	**. WU3R2**	
			88 ❒ 63A	**N40 .**	**x - x x -**	**. WU3R2**	
3-pole position 1 latched position 2 with spring return to off		*60°+30°*	3 48 ❒ 20A	**M10H .**	**x x x x x[1] - -**	**. WU3R1**	
			32A	**M20 .**	**x x x x - -**	**. WU3R1**	
			64 ❒ 32A	**N20 .**	**x - x - x x**	**. WU3R1**	
			50A	**N33F .**	**x - x - x -**	**. WU3R1**	
			88 ❒ 63A	**N40 .**	**x - x - x -**	**. WU3R1**	

Ordering example: AC21 63A base mounting, reversing switch 3-pole, position 2 with spring to off **N40 V WU3R1**

1) Plastic enclosed switches are delivered with switch type M10.

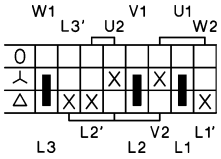
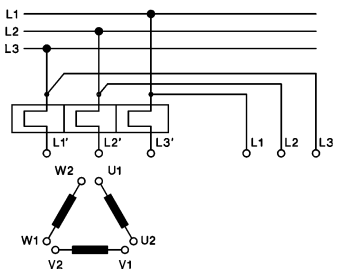
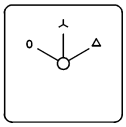
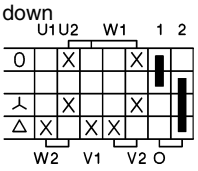
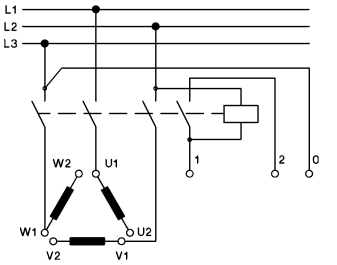
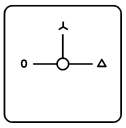
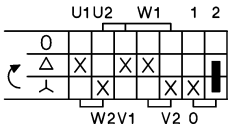
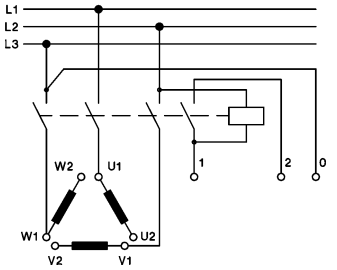
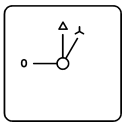
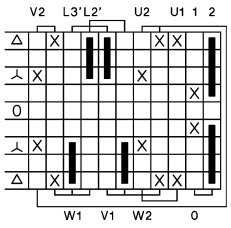
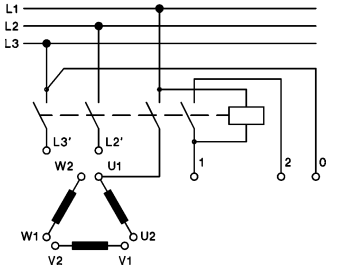
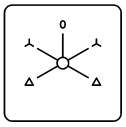
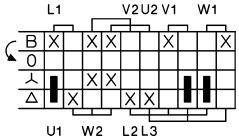
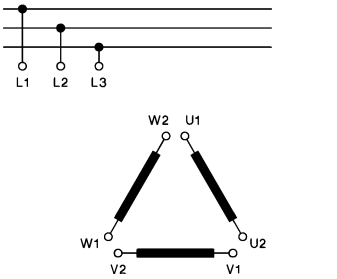
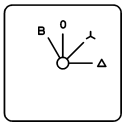
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Star-Delta switches SD							
1 rotary direction 		*60°*	4 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ - -** **x x x x - -**	**. SD** **. SD**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. SD** **. SD**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. SD** **. SD** **. SD**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. SD** **. SD**	
both rotary directions 		*45°*	5 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ - -** **x x x x - -**	**. SDR** **. SDR**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. SDR** **. SDR**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. SDR** **. SDR** **. SDR**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. SDR** **. SDR**	
1 rotary direction spring return from ⅄ to off 		°	4 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ - -** **x x x x - -**	**. SRD** **. SRD**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. SRD** **. SRD**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. SRD** **. SRD** **. SRD**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. SRD** **. SRD**	
1 rotary direction with clockwise operation and backswitch interlock 		*60°*	5 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ - -** **x x x x - -**	**. SDRU** **. SDRU**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. SDRU** **. SDRU**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. SDRU** **. SDRU** **. SDRU**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. SDRU** **. SDRU**	
Star-Delta selector switch 		*60°*	4 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ - -** **x x x x - -**	**. SDU** **. SDU**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. SDU** **. SDU**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. SDU** **. SDU** **. SDU**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. SDU** **. SDU**	

Ordering example: AC21 32A cast enclosed, star-delta selector switch **N20 G SDU**

1) Plastic enclosed switches are delivered with switch type M10.

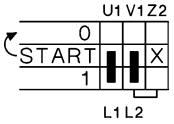
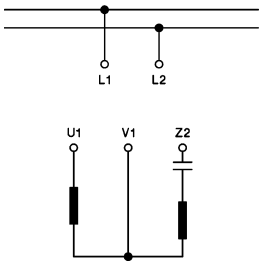
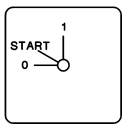
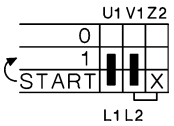
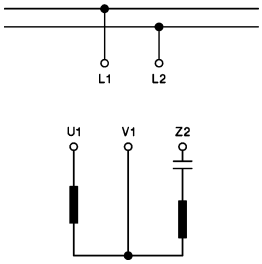
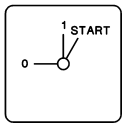
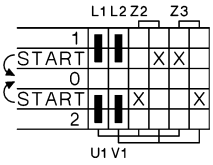
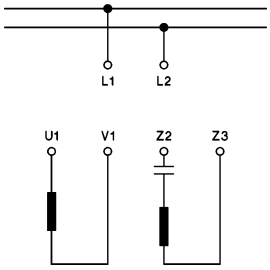
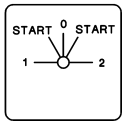
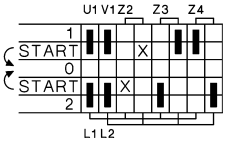
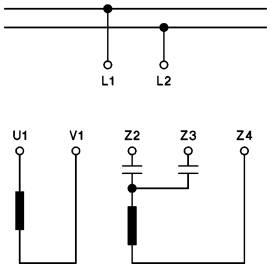
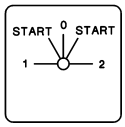
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ **AC21**	**Type**	**Design** see page 6-8 **E. Z. V. SMA. P. G.**	**Switch pro-gram**	Escutcheon plate
Star-Delta switches SD							
with double outfeed phases for use with manual motor starter 		*60°*	4 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **-** **x x x x - -**	**. SDMO** **. SDMO**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. SDMO** **. SDMO**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x x -** **x - x - x -** **x - x - - -**	**. SDMO** **. SDMO** **. SDMO**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. SDMO** **. SDMO**	
with auxiliary contacts for contactor control, without main contacts, automatic zero setting in event of mains break-down 		*90°*	4 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **-** **x x x x - -**	**. SDJ1** **. SDJ1**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. SDJ1** **. SDJ1**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. SDJ1** **. SDJ1** **. SDJ1**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. SDJ1** **. SDJ1**	
with auxiliary contacts for contactor control, without main contacts, automatic zero setting in event of mains break-down, spring return to 		*90°+30°*	4 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **-** **x x x x - -**	**. SDJ2** **. SDJ2**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. SDJ2** **. SDJ2**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. SDJ2** **. SDJ2** **. SDJ2**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. SDJ2** **. SDJ2**	
as type SDJ1 but for both rotary directions 		*60°*	7 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x - - -** **x x x - - -**	**. SDRJ1** **. SDRJ1**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - - -**	**. SDRJ1** **. SDRJ1**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - - -** **x - x - - -**	**. SDRJ1** **. SDRJ1** **. SDRJ1**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. SDRJ1** **. SDRJ1**	
with brake position (counter current braking) brake position is a momentary operation 		*45°+30°*	5 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **-** **x x x x - -**	**. SDB** **. SDB**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. SDB** **. SDB**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. SDB** **. SDB** **. SDB**	
			132 ❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. SDB** **. SDB**	

Ordering example: AC21 250A panel mounting star-delta switch with brake position **N200 E SDB**

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21			Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Split phase switches HP									
for starting up single-phase motors with split-phase, spring return from START to Off 		*30°+60°*	2	48 ❐	20A 32A	**M10H .** **M20 .**	**x x x x x[1] - -** **x x x x - -**	**. HP1** **. HP1**	
				64 ❐	32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. HP1** **. HP1**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**. HP1**	
for starting up single-phase motors with split-phase, spring return from START to 1 		*90°+30°*	2	48 ❐	20A 32A	**M10H .** **M20 .**	**x x x x x[1] - -** **x x x x - -**	**. HP2** **. HP2**	
				64 ❐	32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. HP2** **. HP2**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**. HP2**	
for starting up single-phase motors with split-phase, both rotary directions 		*60°+30°*	3	48 ❐	20A 32A	**M10H .** **M20 .**	**x x x x x[1] - -** **x x x x - -**	**. HPR1** **. HPR1**	
				64 ❐	32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. HPR1** **. HPR1**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**. HPR1**	
as type HPR1 with starting and phase-shifting capacitor 		*60°+30°*	4	48 ❐	20A 32A	**M10H .** **M20 .**	**x x x x x[1] - -** **x x x x - -**	**. HPR2** **. HPR2**	
				64 ❐	32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. HPR2** **. HPR2**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**. HPR2**	

Ordering example: AC21 63A panel mounting, split phase switch, both rotary directions **N40 E HPR1**

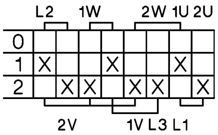
1) Plastic enclosed switches are delivered with switch type M10.

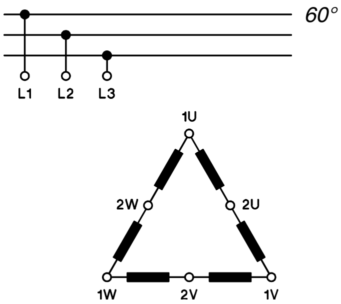
Switching programs

Description	Wiring diagram	Switching angle	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch program	Escutcheon plate

Multi speed switches P

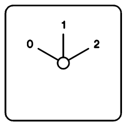
1 Dahlander winding
1 rotary direction



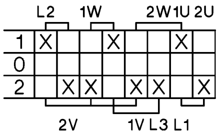


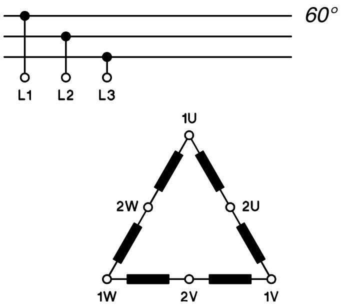
Switching angle: *60°*

Cells	Size	AC21	Type	E.	Z.	V.	SMA.	P.	G.	Switch program
4	48 □	20A	M10H .	x	x	x	x	x[1]	-	. P61
		32A	M20 .	x	x	x	x	-	-	. P61
	64 □	32A	N20 .	x	-	x	-	x	x	. P61
		50A	N33F .	x	-	x	-	x	-	. P61
	88 □	63A	N40 .	x	-	x	-	x	-	. P61
		80A	N60 .	x	-	x	-	x	-	. P61
		115A	N80 .	x	-	x	-	-	-	. P61
	132 □	150A	N100 .	x	-	x	-	-	-	. P61
		250A	N200 .	x	-	x	-	-	-	. P61



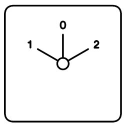
1 Dahlander winding
1 rotary direction



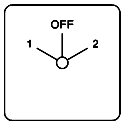


Switching angle: *60°*

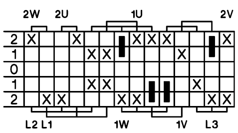
Cells	Size	AC21	Type	E.	Z.	V.	SMA.	P.	G.	Switch program
4	48 □	20A	M10H .	x	x	x	x	x[1]	-	. P62
		32A	M20 .	x	x	x	x	-	-	. P62
	64 □	32A	N20 .	x	-	x	-	x	x	. P62
		50A	N33F .	x	-	x	-	x	-	. P62
	88 □	63A	N40 .	x	-	x	-	x	-	. P62
		80A	N60 .	x	-	x	-	x	-	. P62
		115A	N80 .	x	-	x	-	-	-	. P62
	132 □	150A	N100 .	x	-	x	-	-	-	. P62
		250A	N200 .	x	-	x	-	-	-	. P62

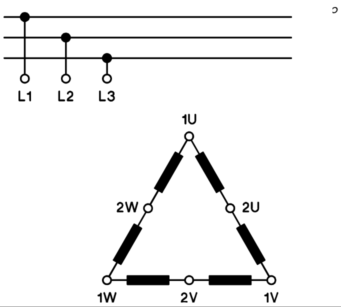


+007

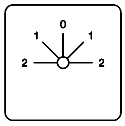


1 Dahlander winding
both rotary directions

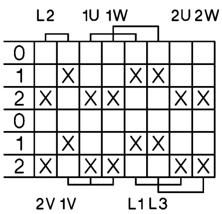


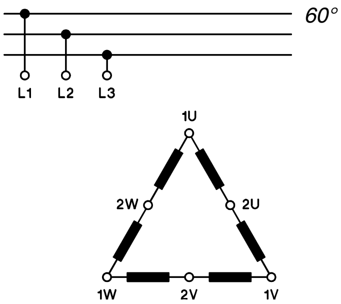


Cells	Size	AC21	Type	E.	Z.	V.	SMA.	P.	G.	Switch program
7	48 □	20A	M10H .	x	x	x	-	-	-	. P61R
		32A	M20 .	x	x	x	-	-	-	. P61R
	64 □	32A	N20 .	x	-	x	-	x	-	. P61R
		50A	N33F .	x	-	x	-	-	-	. P61R
	88 □	63A	N40 .	x	-	x	-	x	-	. P61R
		80A	N60 .	x	-	x	-	-	-	. P61R
		115A	N80 .	x	-	x	-	-	-	. P61R
	132 □	150A	N100 .	x	-	x	-	-	-	. P61R
		250A	N200 .	x	-	x	-	-	-	. P61R



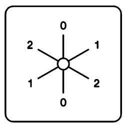
1 Dahlander winding
1 rotary direction,
clockwise operation



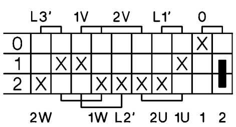


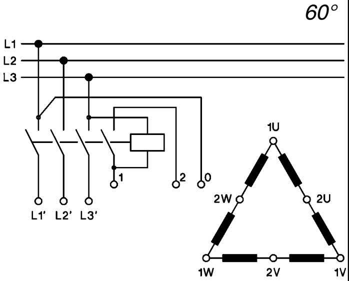
Switching angle: *60°*

Cells	Size	AC21	Type	E.	Z.	V.	SMA.	P.	G.	Switch program
5	48 □	20A	M10H .	x	x	x	x	x[1]	-	. P61RU
		32A	M20 .	x	x	x	x	-	-	. P61RU
	64 □	32A	N20 .	x	-	x	-	x	x	. P61RU
		50A	N33F .	x	-	x	-	x	-	. P61RU
	88 □	63A	N40 .	x	-	x	-	x	-	. P61RU
		80A	N60 .	x	-	x	-	x	-	. P61RU
		115A	N80 .	x	-	x	-	-	-	. P61RU
	132 □	150A	N100 .	x	-	x	-	-	-	. P61RU
		250A	N200 .	x	-	x	-	-	-	. P61RU



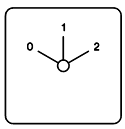
1 Dahlander winding
1 rotary direction,
with auxiliary contacts
for contactor control





Switching angle: *60°*

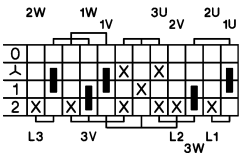
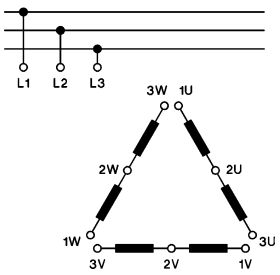
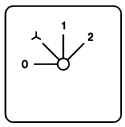
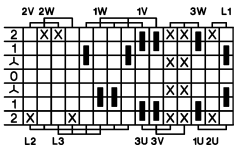
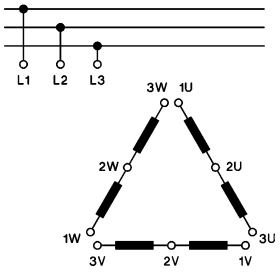
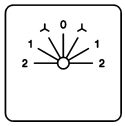
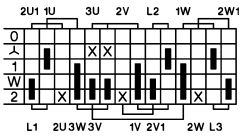
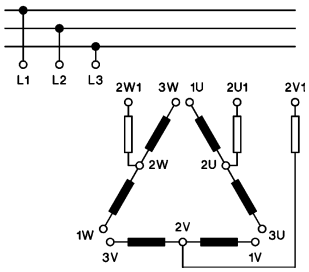
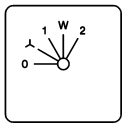
Cells	Size	AC21	Type	E.	Z.	V.	SMA.	P.	G.	Switch program
5	48 □	20A	M10H .	x	x	x	x	x[1]	-	. P61J
		32A	M20 .	x	x	x	x	-	-	. P61J
	64 □	32A	N20 .	x	-	x	-	x	x	. P61J
		50A	N33F .	x	-	x	-	x	-	. P61J
	88 □	63A	N40 .	x	-	x	-	x	-	. P61J
		80A	N60 .	x	-	x	-	x	-	. P61J
		115A	N80 .	x	-	x	-	-	-	. P61J
	132 □	150A	N100 .	x	-	x	-	-	-	. P61J
		250A	N200 .	x	-	x	-	-	-	. P61J



Ordering example: AC21 32A cast enclosed, multi speed switch, 1 Dahlander winding, 1 rotary direction **N20 G P61**

1) Plastic enclosed switches are delivered with switch type M10.

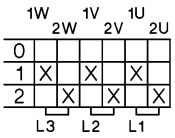
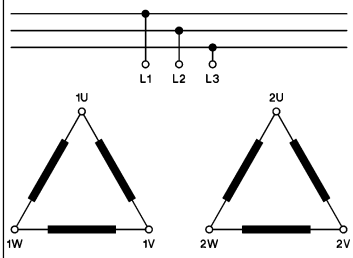
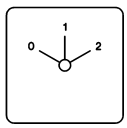
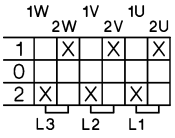
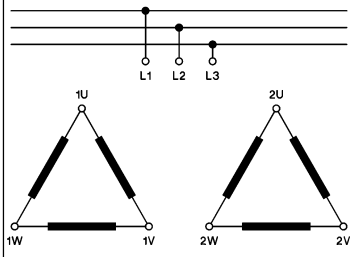
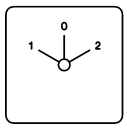
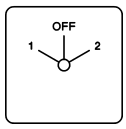
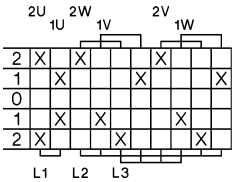
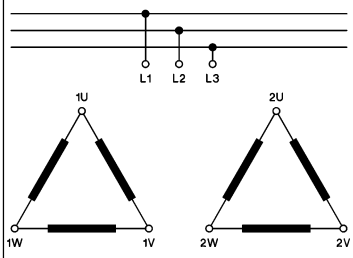
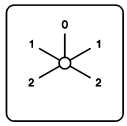
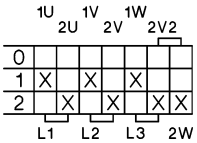
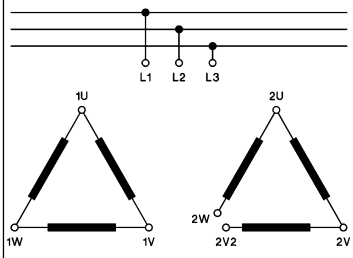
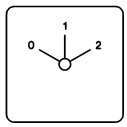
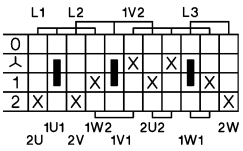
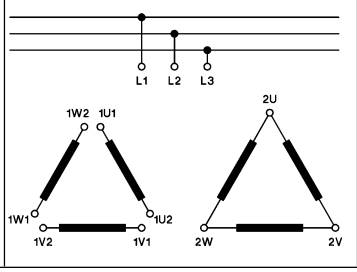
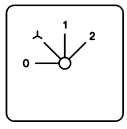
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21		Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi speed switches P								
open Dahlander winding 1 rotary direction low speed with star-delta-start 		*45°*	6	48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x - x[1] -** **x x x - - -**	**. P91** **. P91**	
				64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. P91** **. P91**	
				88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. P91** **. P91** **. P91**	
				132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. P91** **. P91**	
open Dahlander winding both rotary directions low speed with star-delta-start 		*30°*	8	48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x - - -** **x x x - - -**	**. P91R** **. P91R**	
				64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x -** **x - x - - -**	**. P91R** **. P91R**	
				88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - - -** **x - x - - -**	**. P91R** **. P91R** **. P91R**	
				132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. P91R** **. P91R**	
open Dahlander winding 1 rotary direction, low speed with star-delta-start, with additional start position (starting resistor) 		*30°*	7	48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x - - -** **x x x - - -**	**. P91W** **. P91W**	
				64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x -** **x - x - - -**	**. P91W** **. P91W**	
				88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - - -** **x - x - - -**	**. P91W** **. P91W** **. P91W**	
				132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. P91W** **. P91W**	

Ordering example: AC21 250A panel mounting, multi speed switch, 1 rotary direction, low speed with star-delta-start **N200 E P91**

1) Plastic enclosed switches are delivered with switch type M10.

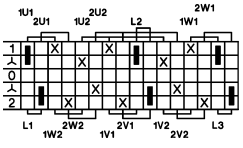
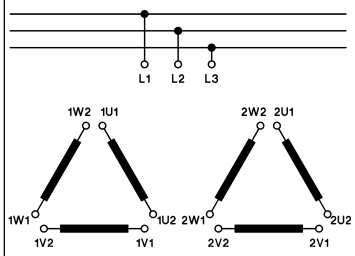
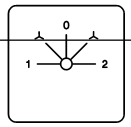
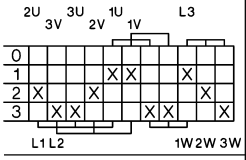
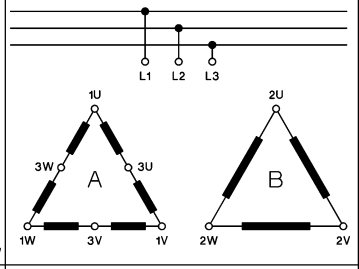
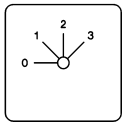
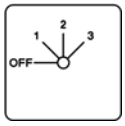
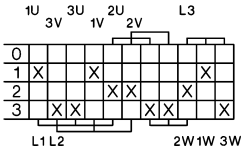
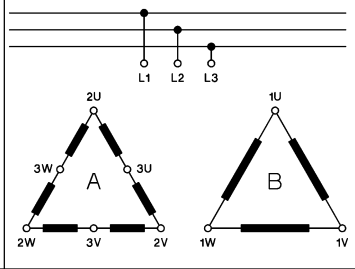
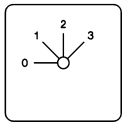
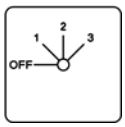
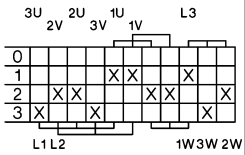
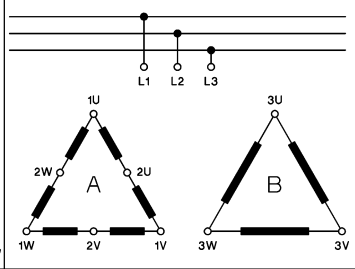
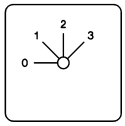
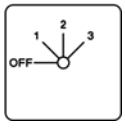
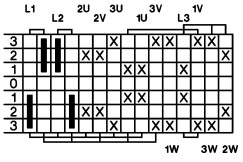
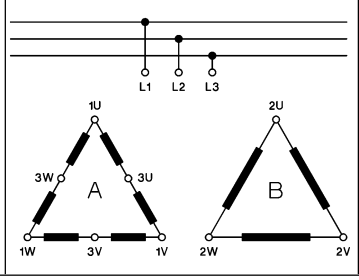
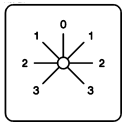
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi speed switches P							
2 separate windings 1 rotary direction	 	*60°*	3 48 ❒ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **- .** **x x x x - - .**	**P63** **P63**	
			64 ❒ 32A 50A	**N20 .** **N33F .**	**x - x - x x .** **x - x - x - .**	**P63** **P63**	
			88 ❒ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x - .** **x - x - x - .** **x - x - - - .**	**P63** **P63** **P63**	
			132❒ 150A 250A	**N100 .** **N200 .**	**x - x - - - .** **x - x - - - .**	**P63** **P63**	
2 separate windings 1 rotary direction	 	*60°*	3 48 ❒ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **- .** **x x x x - - .**	**P64** **P64**	
			64 ❒ 32A 50A	**N20 .** **N33F .**	**x - x - x x .** **x - x - x - .**	**P64** **P64**	
			88 ❒ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x - .** **x - x - x - .** **x - x - - - .**	**P64** **P64** **P64**	**+007** 
			132❒ 150A 250A	**N100 .** **N200 .**	**x - x - - - .** **x - x - - - .**	**P64** **P64**	
2 separate windings both rotary directions	 	*60°*	5 48 ❒ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **- .** **x x x x - - .**	**P66** **P66**	
			64 ❒ 32A 50A	**N20 .** **N33F .**	**x - x - x x .** **x - x - x - .**	**P66** **P66**	
			88 ❒ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x - .** **x - x - x - .** **x - x - - - .**	**P66** **P66** **P66**	
			132❒ 150A 250A	**N100 .** **N200 .**	**x - x - - - .** **x - x - - - .**	**P66** **P66**	
2 separate windings 1 opened 1 rotary direction	 	*60°*	4 48 ❒ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **- .** **x x x x - - .**	**P71** **P71**	
			64 ❒ 32A 50A	**N20 .** **N33F .**	**x - x - x x .** **x - x - x - .**	**P71** **P71**	
			88 ❒ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x - .** **x - x - x - .** **x - x - - - .**	**P71** **P71** **P71**	
			132❒ 150A 250A	**N100 .** **N200 .**	**x - x - - - .** **x - x - - - .**	**P71** **P71**	
2 separate windings 1 rotary direction low speed with star-delta-start	 	*45°*	6 48 ❒ 20A 32A	**M10H .** **M20 .**	**x x x - x**[1] **- .** **x x x - - - .**	**P96** **P96**	
			64 ❒ 32A 50A	**N20 .** **N33F .**	**x - x - x x .** **x - x - x - .**	**P96** **P96**	
			88 ❒ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x - .** **x - x - x - .** **x - x - - - .**	**P96** **P96** **P96**	
			132❒ 150A 250A	**N100 .** **N200 .**	**x - x - - - .** **x - x - - - .**	**P96** **P96**	

Ordering example: AC21 250A panel mounting, multi speed switch, 2 separate windings, low speed with star-delta-start **N200 E P96**

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21			Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi speed switches P									
2 separate windings 1 rotary direction both speeds with star-delta-start	 	*45°*	8	48 ❐	20A 32A	**M10H .** **M20 .**	**x x x - - -** **x x x - - -**	**. P122** **. P122**	
				64 ❐	32A 50A	**N20 .** **N33F .**	**x - x - x -** **x - x - - -**	**. P122** **. P122**	
				88 ❐	63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - - -** **x - x - - -**	**. P122** **. P122** **. P122**	
				132❐	150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. P122** **. P122**	
1 Dahlander winding A 1 normal winding B 3 speeds 1 rotary direction 0-A△-B△or⅄-A⅄	 	*45°*	6	48 ❐	20A 32A	**M10H .** **M20 .**	**x x x - x¹) -** **x x x - - -**	**. P93** **. P93**	
				64 ❐	32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. P93** **. P93**	
				88 ❐	63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. P93** **. P93** **. P93**	**+127** 
				132❐	150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. P93** **. P93**	
1 Dahlander winding A 1 normal winding B 3 speeds 1 rotary direction 0-B△or⅄-A△-A⅄	 	*45°*	6	48 ❐	20A 32A	**M10H .** **M20 .**	**x x x - x¹) -** **x x x - - -**	**. P94** **. P94**	
				64 ❐	32A 50A	**N20 .** **N33F .**	**x - x - x -** **x - x - x -**	**. P94** **. P94**	
				88 ❐	63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. P94** **. P94** **. P94**	**+127** 
				132❐	150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. P94** **. P94**	
1 Dahlander winding A 1 normal winding B 3 speeds 1 rotary direction 0-A△-A⅄-B△or⅄	 	*45°*	6	48 ❐	20A 32A	**M10H .** **M20 .**	**x x x - x¹) -** **x x x - - -**	**. P95** **. P95**	
				64 ❐	32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. P95** **. P95**	
				88 ❐	63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. P95** **. P95** **. P95**	**+127** 
				132❐	150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. P95** **. P95**	
1 Dahlander winding A 1 normal winding B 3 speeds both rotary directions	 	*45°*	9	48 ❐	20A 32A	**M10H .** **M20 .**	**x x x - - -** **x x x - - -**	**. P93R** **. P93R**	
				64 ❐	32A 50A	**N20 .** **N33F .**	**x - x - - -** **x - x - - -**	**. P93R** **. P93R**	
				88 ❐	63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - - -** **x - x - - -** **x - x - - -**	**. P93R** **. P93R** **. P93R**	
				132❐	150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. P93R** **. P93R**	

Ordering example: AC21 250A panel mounting, multi speed switch, 1 Dahlander winding A,
1 normal winding B, 3 speeds, both rotary directions **N200 E P93R**

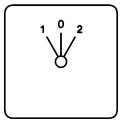
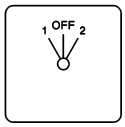
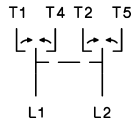
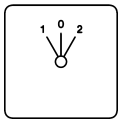
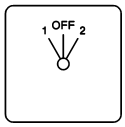
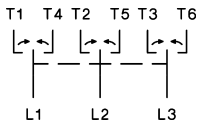
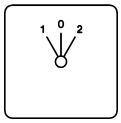
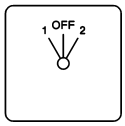
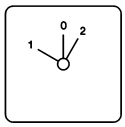
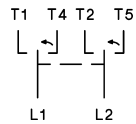
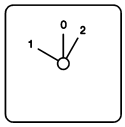
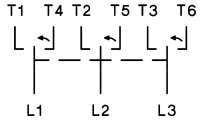
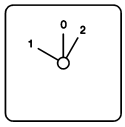
1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram *Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi speed switches P						
1 Dahlander winding A 1 normal winding B 3 speeds both rotary directions	*45°*	9 48 ❒ 20A	**M10H .**	**x x x - - -**	**. P94R**	
		32A	**M20 .**	**x x x - - -**	**. P94R**	
		64 ❒ 32A	**N20 .**	**x - x - - -**	**. P94R**	
		50A	**N33F .**	**x - x - - -**	**. P94R**	
		88 ❒ 63A	**N40 .**	**x - x - - -**	**. P94R**	
		80A	**N60 .**	**x - x - - -**	**. P94R**	
		115A	**N80 .**	**x - x - - -**	**. P94R**	
		132❒ 150A	**N100 .**	**x - x - - -**	**. P94R**	
		250A	**N200 .**	**x - x - - -**	**. P94R**	
1 Dahlander winding A 1 normal winding B 3 speeds both rotary directions	*45°*	8 48 ❒ 20A	**M10H .**	**x x x - - -**	**. P95R**	
		32A	**M20 .**	**x x x - - -**	**. P95R**	
		64 ❒ 32A	**N20 .**	**x - x - x -**	**. P95R**	
		50A	**N33F .**	**x - x - - -**	**. P95R**	
		88 ❒ 63A	**N40 .**	**x - x - x -**	**. P95R**	
		80A	**N60 .**	**x - x - - -**	**. P95R**	
		115A	**N80 .**	**x - x - - -**	**. P95R**	
		132❒ 150A	**N100 .**	**x - x - - -**	**. P95R**	
		250A	**N200 .**	**x - x - - -**	**. P95R**	
2 Dahlander windings 4 speeds 1 rotary direction 0 - A △ - B △ - A ⅄⅄ - B ⅄⅄	*30°*	8 48 ❒ 20A	**M10H .**	**x x x - - -**	**. P124**	
		32A	**M20 .**	**x x x - - -**	**. P124**	
		64 ❒ 32A	**N20 .**	**x - x - x -**	**. P124**	
		50A	**N33F .**	**x - x - - -**	**. P124**	
		88 ❒ 63A	**N40 .**	**x - x - x -**	**. P124**	+112
		80A	**N60 .**	**x - x - - -**	**. P124**	
		115A	**N80 .**	**x - x - - -**	**. P124**	
		132❒ 150A	**N100 .**	**x - x - - -**	**. P124**	
		250A	**N200 .**	**x - x - - -**	**. P124**	
2 Dahlander windings 4 speeds both rotary directions	*30°*	12 48 ❒ 20A	**M10H .**	**x x x - - -**	**. P124R**	
		32A	**M20 .**	**x x x - - -**	**. P124R**	
		64 ❒ 32A	**N20 .**	**x - x - - -**	**. P124R**	
		50A	**N33F .**	**x - x - - -**	**. P124R**	
		88 ❒ 63A	**N40 .**	**x - x - - -**	**. P124R**	
		80A	**N60 .**	**x - x - - -**	**. P124R**	
		115A	**N80 .**	**x - x - - -**	**. P124R**	
		132❒ 150A	**N100 .**	**x - x - - -**	**. P124R**	
		250A	**N200 .**	**x - x - - -**	**. P124R**	

Ordering example: AC21 250A Base mounting, multi speed switch, 2 Dahlander windings, 4 speeds, 1 rotary direction **N200 V P124**

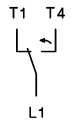
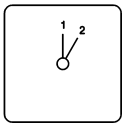
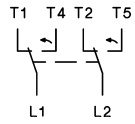
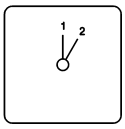
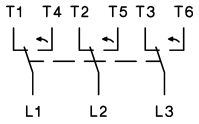
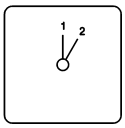
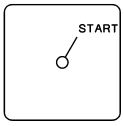
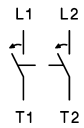
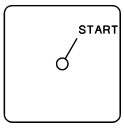
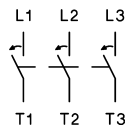
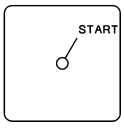
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21			Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Changeover switches with spring return to off UR									
1-pole		*30°*	1	48 ❐	20A	**M10H .**	**x x x x x[1] - -**	**. UR1**	
					32A	**M20 .**	**x x x x - -**	**. UR1**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**. UR1**	
					50A	**N33F .**	**x - x - x -**	**. UR1**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**. UR1**	**+264** 
2-pole		*30°*	2	48 ❐	20A	**M10H .**	**x x x x x[1] - -**	**. UR2**	
					32A	**M20 .**	**x x x x - -**	**. UR2**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**. UR2**	
					50A	**N33F .**	**x - x - x -**	**. UR2**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**. UR2**	**+264** 
3-pole		*30°*	3	48 ❐	20A	**M10H .**	**x x x x x[1] - -**	**. UR3**	
					32A	**M20 .**	**x x x x - -**	**. UR3**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**. UR3**	
					50A	**N33F .**	**x - x - x -**	**. UR3**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**. UR3**	**+264** 
Changeover switches with 1 latched and 1 momentary position UK									
1-pole position 1 latched position 2 with spring return		*60°+30°*	1	48 ❐	20A	**M10H .**	**x x x x x[1] - -**	**. UK1**	
					32A	**M20 .**	**x x x x - -**	**. UK1**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**. UK1**	
					50A	**N33F .**	**x - x - x -**	**. UK1**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**. UK1**	
2-pole position 1 latched position 2 with spring return		*60°+30°*	2	48 ❐	20A	**M10H .**	**x x x x x[1] - -**	**. UK2**	
					32A	**M20 .**	**x x x x - -**	**. UK2**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**. UK2**	
					50A	**N33F .**	**x - x - x -**	**. UK2**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**. UK2**	
3-pole position 1 latched position 2 with spring return		*60°+30°*	3	48 ❐	20A	**M10H .**	**x x x x x[1] - -**	**. UK3**	
					32A	**M20 .**	**x x x x - -**	**. UK3**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**. UK3**	
					50A	**N33F .**	**x - x - x -**	**. UK3**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**. UK3**	

Ordering example: AC21 63A panel mounting, changeover switch, position 1 latched, position 2 with spring return, 3-pole: **N40 E UK3**

1) Plastic enclosed switches are delivered with switch type M10.

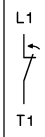
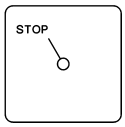
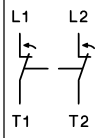
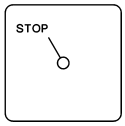
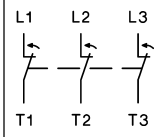
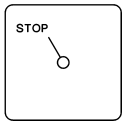
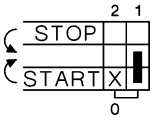
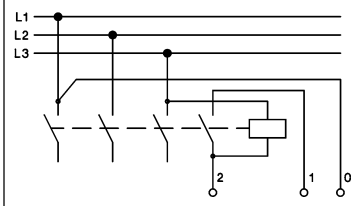
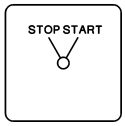
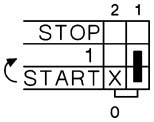
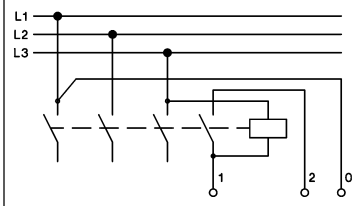
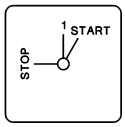
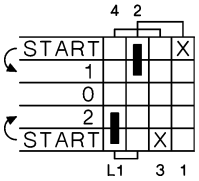
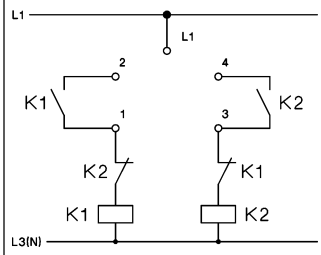
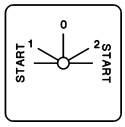
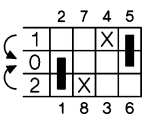
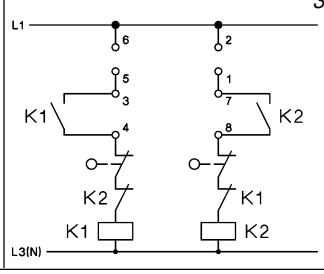
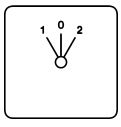
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ **AC21**			**Type**	**Design** see page 6-8 **E. Z. V. SMA. P. G.**	**Switch pro-gram**	Escutcheon plate
Double throw switches with spring return to off WR									
1-pole		*30°*	1	48 ❐	20A	**M10H .**	**x x x x x¹) -**	**. W1R**	
					32A	**M20 .**	**x x x x - -**	**. W1R**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**. W1R**	
					50A	**N33F .**	**x - x - x -**	**. W1R**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**. W1R**	
2-pole		*30°*	2	48 ❐	20A	**M10H .**	**x x x x x¹) -**	**. W2R**	
					32A	**M20 .**	**x x x x - -**	**. W2R**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**. W2R**	
					50A	**N33F .**	**x - x - x -**	**. W2R**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**. W2R**	
3-pole		*30°*	3	48 ❐	20A	**M10H .**	**x x x x x¹) -**	**. W3R**	
					32A	**M20 .**	**x x x x - -**	**. W3R**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**. W3R**	
					50A	**N33F .**	**x - x - x -**	**. W3R**	
				88 ❐	63A	**N40 .**	**x - x - x -**	**. W3R**	
Start-Stop switches S									
Start-switch,1-pole		*30°*	1	48 ❐	20A	**M10H .**	**x x x x x¹) -**	**. SE**	
					32A	**M20 .**	**x x x x - -**	**. SE**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**. SE**	
					50A	**N33F .**	**x - x - x -**	**. SE**	
Start-switch, 2-pole		*30°*	1	48 ❐	20A	**M10H .**	**x x x x x¹) -**	**. S2E**	
					32A	**M20 .**	**x x x x - -**	**. S2E**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**. S2E**	
					50A	**N33F .**	**x - x - x -**	**. S2E**	
Start-switch, 3-pole		*30°*	2	48 ❐	20A	**M10H .**	**x x x x x¹) -**	**. S3E**	
					32A	**M20 .**	**x x x x - -**	**. S3E**	
				64 ❐	32A	**N20 .**	**x - x - x x**	**. S3E**	
					50A	**N33F .**	**x - x - x -**	**. S3E**	

Bestellbeispiel: AC21 50A base mounting, Start-switch, 3-pole **N33F V S3E**

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Start-Stop switches S							
Stop-switch,1-pole		*30°*	1 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **- -** **x x x x - -**	**. SA** **. SA**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. SA** **. SA**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. SA**	
Stop-switch, 2-pole		*30°*	1 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **- -** **x x x x - -**	**. S2A** **. S2A**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. S2A** **. S2A**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. S2A**	
Stop-switch, 3-pole		*30°*	2 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **- -** **x x x x - -**	**. S3A** **. S3A**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. S3A** **. S3A**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. S3A**	
Start-Stop-switch, 1-pole 		*30°*	1 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **- -** **x x x x - -**	**. SEA** **. SEA**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. SEA** **. SEA**	
Start-Stop-switch, 1-pole position START with spring return to 1 		*90°+30°*	1 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **- -** **x x x x - -**	**. S392** **. S392**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. S392** **. S392**	
Start-Stop-switch, 1-pole for reversing contactors 		*60°+30°*	2 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **- -** **x x x x - -**	**. S2EA** **. S2EA**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. S2EA** **. S2EA**	
Start-Stop-switch, 1-pole for reversing contactors with limit switches 		*30°*	2 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **- -** **x x x x - -**	**. S22** **. S22**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. S22** **. S22**	

Ordering example: AC21 50A panel mounting, Start-Stop-switch,1-pole for reversing contactors **N33F E S2EA**

1) Plastic enclosed switches are delivered with switch type M10.

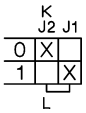
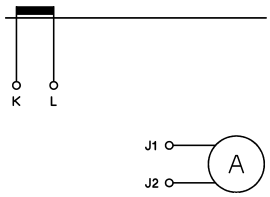
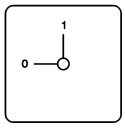
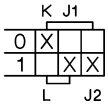
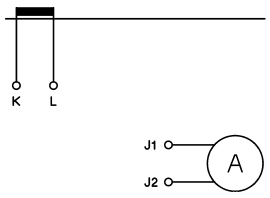
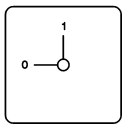
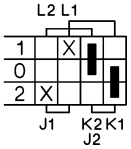
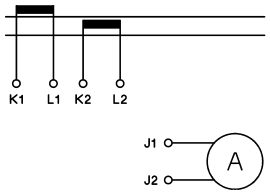
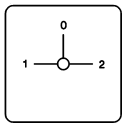
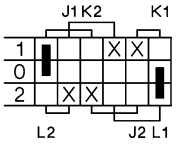
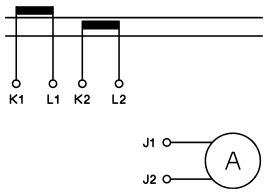
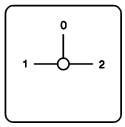
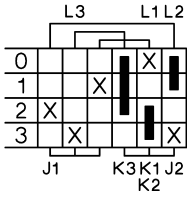
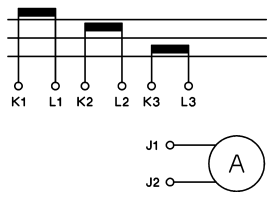
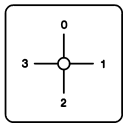
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21			Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Voltmeter selector switches V									
3 line voltages		*45°*	2	48 ❐	20A	**M10H .**	x x x x x[1] -	**. V3**	
					32A	**M20 .**	x x x x - -	**. V3**	
				64 ❐	32A	**N20 .**	x - x - x x	**. V3**	
					50A	**N33F .**	x x x - x -	**. V3**	
3 phase voltages		*45°*	2	48 ❐	20A	**M10H .**	x x x x x[1] -	**. V0**	
					32A	**M20 .**	x x x x - -	**. V0**	
				64 ❐	32A	**N20 .**	x - x - x x	**. V0**	
					50A	**N33F .**	x x x - x -	**. V0**	
3 line voltages and 3 phase voltages		*30°*	3	48 ❐	20A	**M10H .**	x x x x x[1] -	**. V1**	
					32A	**M20 .**	x x x x - -	**. V1**	
				64 ❐	32A	**N20 .**	x - x - x x	**. V1**	
					50A	**N33F .**	x x x - x -	**. V1**	
2 3-phase systems 2 x 3 line voltages		*45°*	4	48 ❐	20A	**M10H .**	x x x x x[1] -	**. V32**	
					32A	**M20 .**	x x x x - -	**. V32**	
				64 ❐	32A	**N20 .**	x - x - x x	**. V32**	
					50A	**N33F .**	x - x - x -	**. V32**	
3 line voltages and 1 phase voltage		*45°*	3	48 ❐	20A	**M10H .**	x x x x x[1] -	**. V13**	
					32A	**M20 .**	x x x x - -	**. V13**	
				64 ❐	32A	**N20 .**	x - x - x x	**. V13**	
					50A	**N33F .**	x x x - x -	**. V13**	

Ordering example: AC21 50A panel mounting, Voltmeter selector switch, 3 line voltages and 1 phase voltage **N33F E V13**

1) Plastic enclosed switches are delivered with switch type M10.

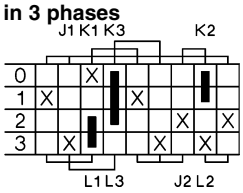
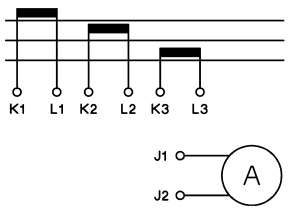
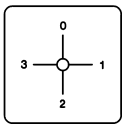
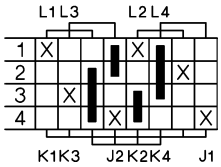
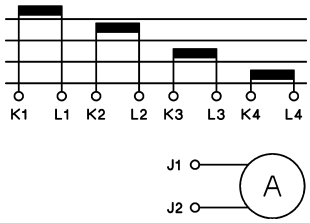
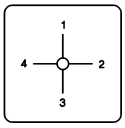
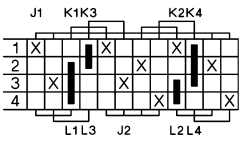
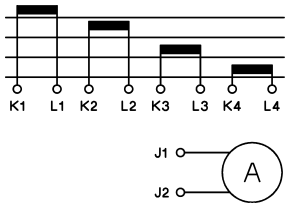
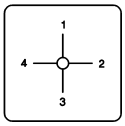
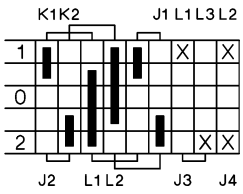
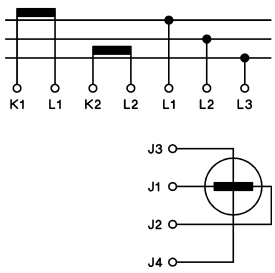
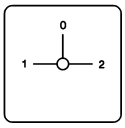
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21		Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Ammeter selector switches M								
1-pole, for current transformer 		*90°*	1	48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ - - . M11** **x x x x - - . M11**		
				64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x . M11** **x x x - x - . M11**		
				88 ❐ 63A	**N40 .**	**x - x - x - . M11**		
2-pole, for 1 current transformer or direct current measurement 		*90°*	2	48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ - - . M12** **x x x x - - . M12**		
				64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x . M12** **x x x - x - . M12**		
				88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x - . M12** **x - x - x - . M12** **x - x - - - . M12**		
				132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - - . M12** **x - x - - - . M12**		
1-pole, for 2 current transformers 		*90°*	2	48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ - - . M21** **x x x x - - . M21**		
				64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x . M21** **x x x - x - . M21**		
				88 ❐ 63A	**N40 .**	**x - x - x - . M21**		
2-pole, for 2 current transformers or direct current measurement in 2 phases 		*90°*	3	48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ - - . M22** **x x x x - - . M22**		
				64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x . M22** **x x x - x - . M22**		
				88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x - . M22** **x - x - x - . M22** **x - x - - - . M22**		
				132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - - . M22** **x - x - - - . M22**		
1-pole, for 3 current transformers 		*90°*	3	48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x¹⁾ - - . M31** **x x x x - - . M31**		
			4	64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x . M31** **x - x - x - . M31**		
				88 ❐ 63A	**N40 .**	**x - x - x - . M31**		

Ordering example: AC21 63A panel mounting, ammeter selector switch, for 3 current transformers 1-pole **N40 V M31**

1) Plastic enclosed switches are delivered with switch type M10.

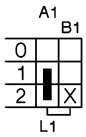
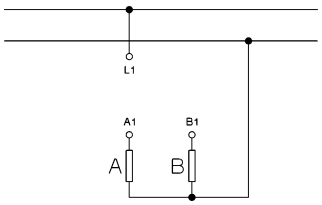
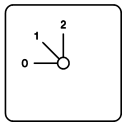
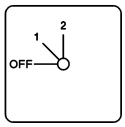
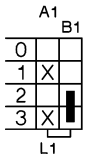
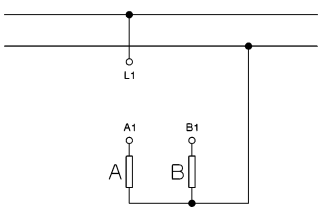
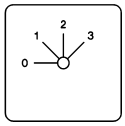
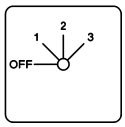
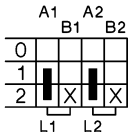
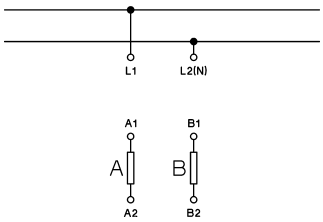
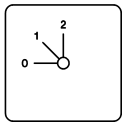
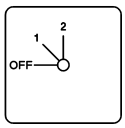
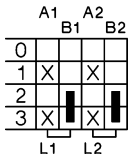
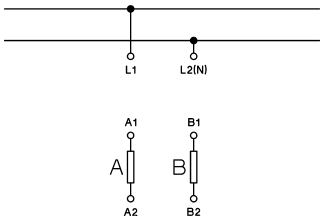
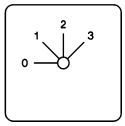
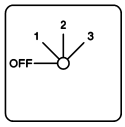
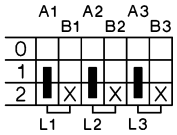
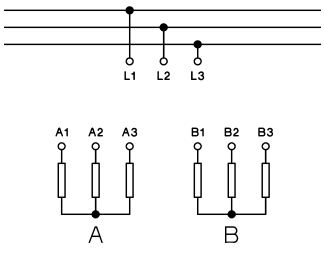
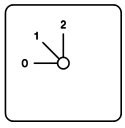
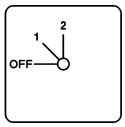
Switching programs

Description	Wiring diagram *Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Ammeter selector switches M						
2-pole, for 3 current transformers or direct current measurement in 3 phases 	*90°* 	6 ❒ 48 20A 32A 64 ❒ 32A 50A 88 ❒ 63A 80A 115A 132 ❒ 150A 250A	**M10H .** **M20 .** **N20 .** **N33F .** **N40 .** **N60 .** **N80 .** **N100 .** **N200 .**	**x x x x x[1] - . M32** **x x x - - - . M32** **x - x - x x . M32** **x - x - x - . M32** **x - x - x - . M32** **x - x - x - . M32** **x - x - - - . M32** **x - x - - - . M32** **x - x - - - . M32**		
1-pole, for 4 current transformers 	*90°* 	4 ❒ 48 20A 32A 64 ❒ 32A 50A 88 ❒ 63A	**M10H .** **M20 .** **N20 .** **N33F .** **N40 .**	**x x x x x[1] - . M41** **x x x x - - . M41** **x - x - x x . M41** **x - x - x - . M41** **x - x - x - . M41**		
2-pole, for 4 current transformers or direct current measurement in 4 phases 	*90°* 	6 ❒ 48 20A 32A 64 ❒ 32A 50A 88 ❒ 63A 80A 115A 132 ❒ 150A 250A	**M10H .** **M20 .** **N20 .** **N33F .** **N40 .** **N60 .** **N80 .** **N100 .** **N200 .**	**x x x x x[1] - . M42** **x x x - - - . M42** **x - x - x x . M42** **x - x - x - . M42** **x - x - x - . M42** **x - x - x - . M42** **x - x - - - . M42** **x - x - - - . M42** **x - x - - - . M42**		
f. output measurement in 3-phase ystems by 2-wattmeter method 	*90°* 	5 ❒ 48 20A 32A 64 ❒ 32A 50A 88 ❒ 63A 80A 115A 132 ❒ 150A 250A	**M10H .** **M20 .** **N20 .** **N33F .** **N40 .** **N60 .** **N80 .** **N100 .** **N200 .**	**x x x x x[1] - . M2W** **x x x x - - . M2W** **x - x - x x . M2W** **x - x - x - . M2W** **x - x - x - . M2W** **x - x - x - . M2W** **x - x - - - . M2W** **x - x - - - . M2W** **x - x - - - . M2W**		

Ordering example: AC21 63A panel mounting, ammeter selector switch, for 4 current transformers 1-pole **N40 V M41**

1) Plastic enclosed switches are delivered with switch type M10.

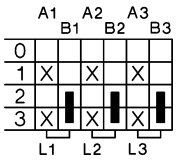
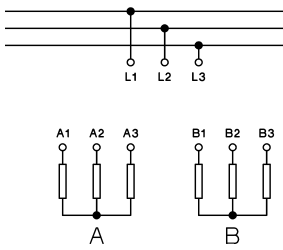
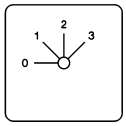
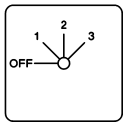
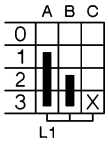
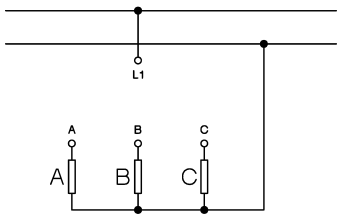
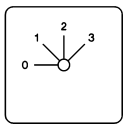
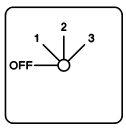
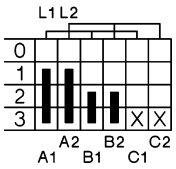
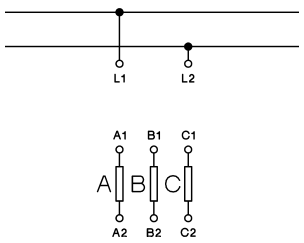
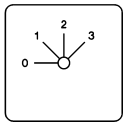
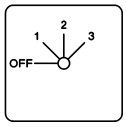
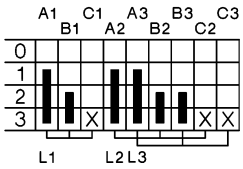
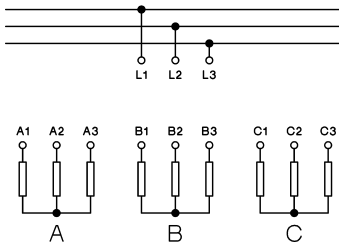
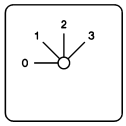
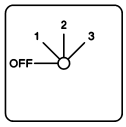
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Gang switches GR							
2 circuits A and B 1-pole 0 - A - A+B 		*45°*	1 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x[1] -** **x x x x - -**	**. GR11** **. GR11**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x x x - x -**	**. GR11** **. GR11**	**+126** 
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. GR11** **. GR11** **. GR11**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. GR11** **. GR11**	
2 circuits A and B 1-pole 0 - A - B - A+B 		*45°*	1 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x[1] -** **x x x x - -**	**. GR12** **. GR12**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x x x - x -**	**. GR12** **. GR12**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. GR12** **. GR12** **. GR12**	**+127** 
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. GR12** **. GR12**	
2 circuits A and B 2-pole 0 - A - A+B 		*45°*	2 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x[1] -** **x x x x - -**	**. GR21** **. GR21**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x x x - x -**	**. GR21** **. GR21**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. GR21** **. GR21** **. GR21**	**+126** 
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. GR21** **. GR21**	
2 circuits A and B 2-pole 0 - A - B - A+B 		*45°*	2 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x[1] -** **x x x x - -**	**. GR22** **. GR22**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x x x - x -**	**. GR22** **. GR22**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x -** **x - x - x -** **x - x - - -**	**. GR22** **. GR22** **. GR22**	**+127** 
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. GR22** **. GR22**	
2 circuits A and B 3-pole 0 - A - A+B 		*45°*	3 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x[1] -** **x x x x - -**	**. GR31** **. GR31**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x** **x - x - x -**	**. GR31** **. GR31**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x x** **x - x - x -** **x - x - - -**	**. GR31** **. GR31** **. GR31**	**+126** 
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. GR31** **. GR31**	

Ordering example: AC21 250A panel mounting, gang switch, 2 circuits A and B, 3-pole **N200 E GR31**

1) Plastic enclosed switches are delivered with switch type M10.

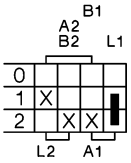
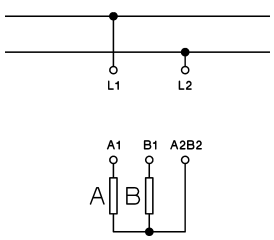
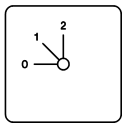
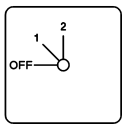
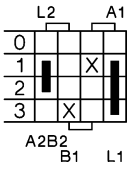
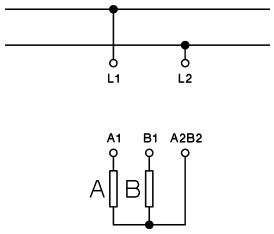
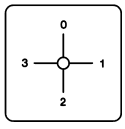
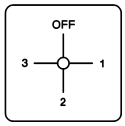
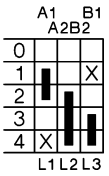
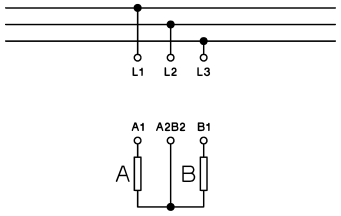
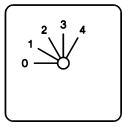
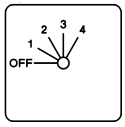
Switching programs

Description	Wiring diagram *Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Gang switches GR						
2 circuits A and B 3-pole 0 - A - B - A+B 	*45°* 	3 48 ❒ 20A 32A 64 ❒ 32A 50A 88 ❒ 63A 80A 115A 132❒ 150A 250A	**M10H .** **M20 .** **N20 .** **N33F .** **N40 .** **N60 .** **N80 .** **N100 .** **N200 .**	**x x x x x[1] - . GR32** **x x x x - - . GR32** **x - x - x x . GR32** **x - x - x - . GR32** **x - x - x - . GR32** **x - x - x - . GR32** **x - x - - - . GR32** **x - x - - - . GR32** **x - x - - - . GR32**		 **+127** 
3 circuits A, B and C 1-pole 0 - A - A+B - A+B+C 	*45°* 	2 48 ❒ 20A 32A 64 ❒ 32A 50A 88 ❒ 63A 80A 115A 132❒ 150A 250A	**M10H .** **M20 .** **N20 .** **N33F .** **N40 .** **N60 .** **N80 .** **N100 .** **N200 .**	**x x x x x[1] - . GR14** **x x x x - - . GR14** **x - x - x x . GR14** **x - x - x - . GR14** **x - x - x - . GR14** **x - x - x - . GR14** **x - x - - - . GR14** **x - x - - - . GR14** **x - x - - - . GR14**		 **+127** 
3 circuits A, B and C 2-pole 0 - A - A+B - A+B+C 	*45°* 	3 48 ❒ 20A 32A 64 ❒ 32A 50A 88 ❒ 63A 80A 115A 132❒ 150A 250A	**M10H .** **M20 .** **N20 .** **N33F .** **N40 .** **N60 .** **N80 .** **N100 .** **N200 .**	**x x x x x[1] - . GR23** **x x x x - - . GR23** **x - x - x x . GR23** **x - x - x - . GR23** **x - x - x - . GR23** **x - x - x - . GR23** **x - x - - - . GR23** **x - x - - - . GR23** **x - x - - - . GR23**		 **+127** 
3 circuits A, B and C 3-pole 0 - A - A+B - A+B+C 	*45°* 	5 48 ❒ 20A 32A 64 ❒ 32A 50A 88 ❒ 63A 80A 115A 132❒ 150A 250A	**M10H .** **M20 .** **N20 .** **N33F .** **N40 .** **N60 .** **N80 .** **N100 .** **N200 .**	**x x x x x[1] - . GR33** **x x x x - - . GR33** **x - x - x x . GR33** **x - x - x - . GR33** **x - x - x - . GR33** **x - x - x - . GR33** **x - x - - - . GR33** **x - x - - - . GR33** **x - x - - - . GR33**		 **+127** 

Ordering example: AC21 250A panel mounting, gang switch, 3 circuits A, B and C, 3-pole **N200 E GR33**

1) Plastic enclosed switches are delivered with switch type M10.

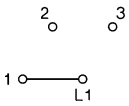
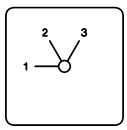
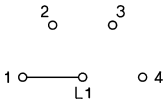
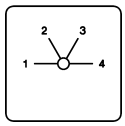
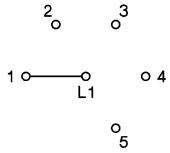
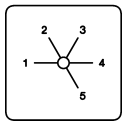
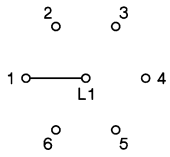
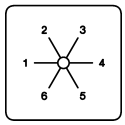
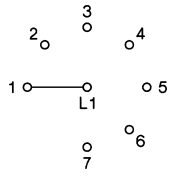
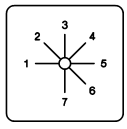
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Series-Parallel switches SP							
2 circuits A and B 2-pole 0 - A + B - A,B (parallel) 		*45°*	2 48 ❐ 20A 32A 64 ❐ 32A 50A 88 ❐ 63A 80A 115A 132❐ 150A 250A	**M10H .** **M20 .** **N20 .** **N33F .** **N40 .** **N60 .** **N80 .** **N100 .** **N200 .**	**x x x x x[1] - -** **x x x x - -** **x - x - x x** **x x x - x -** **x - x - x -** **x - x - x -** **x - x - - -** **x - x - - -** **x - x - - -**	**. SP1** **. SP1** **. SP1** **. SP1** **. SP1** **. SP1** **. SP1** **. SP1** **. SP1**	 **+126** 
2 circuits A and B 2-pole 0 - A,B (parall.) - A - A+B 		*90°*	3 48 ❐ 20A 32A 64 ❐ 32A 50A 88 ❐ 63A 80A 115A 132❐ 150A 250A	**M10H .** **M20 .** **N20 .** **N33F .** **N40 .** **N60 .** **N80 .** **N100 .** **N200 .**	**x x x x x[1] - -** **x x x x - -** **x - x - x x** **x x x - x -** **x - x - x -** **x - x - x -** **x - x - - -** **x - x - - -** **x - x - - -**	**. SP4** **. SP4** **. SP4** **. SP4** **. SP4** **. SP4** **. SP4** **. SP4** **. SP4**	 **+270** 
2 circuits A and B for 3-phase systems 0 - A+B - A - B - A,B 		*30°*	2 48 ❐ 20A 32A 64 ❐ 32A 50A 88 ❐ 63A 80A 115A 132❐ 150A 250A	**M10H .** **M20 .** **N20 .** **N33F .** **N40 .** **N60 .** **N80 .** **N100 .** **N200 .**	**x x x x x[1] - -** **x x x x - -** **x - x - x x** **x x x - x -** **x - x - x -** **x - x - x -** **x - x - - -** **x - x - - -** **x - x - - -**	**. SP3** **. SP3** **. SP3** **. SP3** **. SP3** **. SP3** **. SP3** **. SP3** **. SP3**	 **+112** 

Ordering example: AC21 250A panel mounting, series-parallel switch, 2 circuits for 3-phase systems **N200 E SP3**

1) Plastic enclosed switches are delivered with switch type M10.

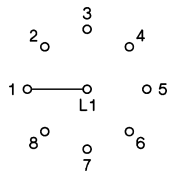
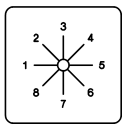
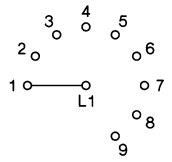
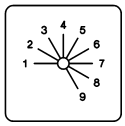
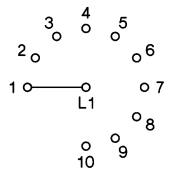
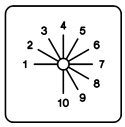
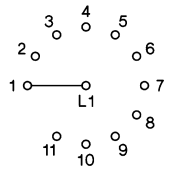
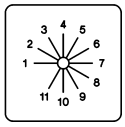
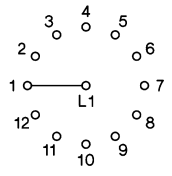
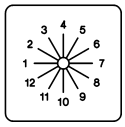
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi step switches 1-pole without Off ST.1							
3 steps		*60°*	2 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST31**	
			32A	**M20 .**	**x x x x - -**	**. ST31**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST31**	
			50A	**N33F .**	**x x x - x -**	**. ST31**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST31**	
			80A	**N60 .**	**x - x - x -**	**. ST31**	
			115A	**N80 .**	**x - x - - -**	**. ST31**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST31**	
			250A	**N200 .**	**x - x - - -**	**. ST31**	
4 steps		*60°*	2 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST41**	
			32A	**M20 .**	**x x x x - -**	**. ST41**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST41**	
			50A	**N33F .**	**x x x - x -**	**. ST41**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST41**	
			80A	**N60 .**	**x - x - x -**	**. ST41**	
			115A	**N80 .**	**x - x - - -**	**. ST41**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST41**	
			250A	**N200 .**	**x - x - - -**	**. ST41**	
5 steps		*60°*	3 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST51**	
			32A	**M20 .**	**x x x x - -**	**. ST51**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST51**	
			50A	**N33F .**	**x x x - x -**	**. ST51**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST51**	
			80A	**N60 .**	**x - x - x -**	**. ST51**	
			115A	**N80 .**	**x - x - - -**	**. ST51**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST51**	
			250A	**N200 .**	**x - x - - -**	**. ST51**	
6 steps		*60°*	3 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST61**	
			32A	**M20 .**	**x x x x - -**	**. ST61**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST61**	
			50A	**N33F .**	**x x x - x -**	**. ST61**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST61**	
			80A	**N60 .**	**x - x - x -**	**. ST61**	
			115A	**N80 .**	**x - x - - -**	**. ST61**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST61**	
			250A	**N200 .**	**x - x - - -**	**. ST61**	
7 steps		*45°*	4 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST71**	
			32A	**M20 .**	**x x x x - -**	**. ST71**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST71**	
			50A	**N33F .**	**x - x - x -**	**. ST71**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST71**	
			80A	**N60 .**	**x - x - x -**	**. ST71**	
			115A	**N80 .**	**x - x - - -**	**. ST71**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST71**	
			250A	**N200 .**	**x - x - - -**	**. ST71**	

Ordering example: AC21 250A panel mounting, multi step switch 1-pole without off, 7 steps **N200 E ST71**

1) Plastic enclosed switches are delivered with switch type M10.

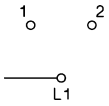
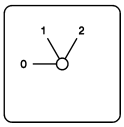
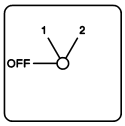
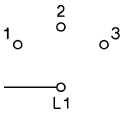
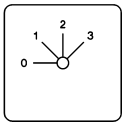
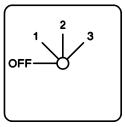
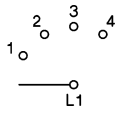
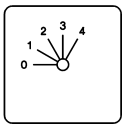
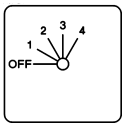
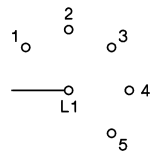
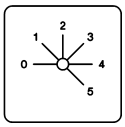
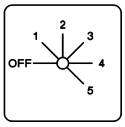
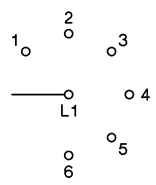
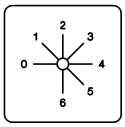
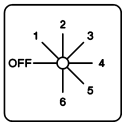
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi step switches 1-pole without Off ST.1							
8 steps		*45°*	4 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST81**	
			32A	**M20 .**	**x x x x - -**	**. ST81**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST81**	
			50A	**N33F .**	**x - x - x -**	**. ST81**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST81**	
			80A	**N60 .**	**x - x - x -**	**. ST81**	
			115A	**N80 .**	**x - x - - -**	**. ST81**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST81**	
			250A	**N200 .**	**x - x - - -**	**. ST81**	
9 steps		*30°*	5 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST91**	
			32A	**M20 .**	**x x x x - -**	**. ST91**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST91**	
			50A	**N33F .**	**x - x - x -**	**. ST91**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST91**	
			80A	**N60 .**	**x - x - x -**	**. ST91**	
			115A	**N80 .**	**x - x - - -**	**. ST91**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST91**	
			250A	**N200 .**	**x - x - - -**	**. ST91**	
10 steps		*30°*	5 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST101**	
			32A	**M20 .**	**x x x x - -**	**. ST101**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST101**	
			50A	**N33F .**	**x - x - x -**	**. ST101**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST101**	
			80A	**N60 .**	**x - x - x -**	**. ST101**	
			115A	**N80 .**	**x - x - - -**	**. ST101**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST101**	
			250A	**N200 .**	**x - x - - -**	**. ST101**	
11 steps		*30°*	6 48 ❐ 20A	**M10H .**	**x x x - x**[1] **-**	**. ST111**	
			32A	**M20 .**	**x x x - - -**	**. ST111**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST111**	
			50A	**N33F .**	**x - x - x -**	**. ST111**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST111**	
			80A	**N60 .**	**x - x - x -**	**. ST111**	
			115A	**N80 .**	**x - x - - -**	**. ST111**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST111**	
			250A	**N200 .**	**x - x - - -**	**. ST111**	
12 steps		*30°*	6 48 ❐ 20A	**M10H .**	**x x x - x**[1] **-**	**. ST121**	
			32A	**M20 .**	**x x x - - -**	**. ST121**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST121**	
			50A	**N33F .**	**x - x - x -**	**. ST121**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST121**	
			80A	**N60 .**	**x - x - x -**	**. ST121**	
			115A	**N80 .**	**x - x - - -**	**. ST121**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST121**	
			250A	**N200 .**	**x - x - - -**	**. ST121**	

Ordering example: AC21 250A panel mounting, multi step switch 1-pole without off, 12 steps **N200 E ST121**

1) Plastic enclosed switches are delivered with switch type M10.

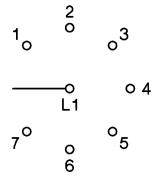
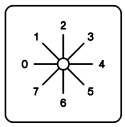
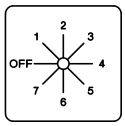
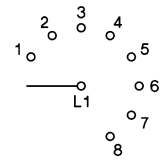
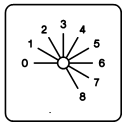
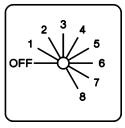
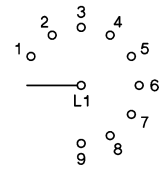
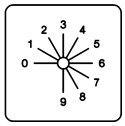
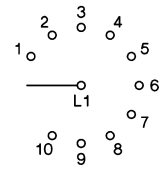
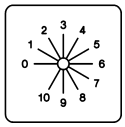
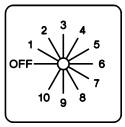
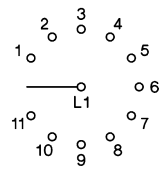
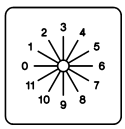
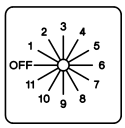
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ **AC21**	**Type**	**Design** see page 6-8 **E. Z. V. SMA. P. G.**	**Switch pro-gram**	Escutcheon plate
Multi step switches 1-pole with Off ST0.1							
2 steps		*60°*	1 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST021**	
			32A	**M20 .**	**x x x x - -**	**. ST021**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST021**	
			50A	**N33F .**	**x x x - x -**	**. ST021**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST021**	**+422**
			80A	**N60 .**	**x - x - x -**	**. ST021**	
			115A	**N80 .**	**x - x - - -**	**. ST021**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST021**	
			250A	**N200 .**	**x - x - - -**	**. ST021**	
3 steps		*45°*	2 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST031**	
			32A	**M20 .**	**x x x x - -**	**. ST031**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST031**	
			50A	**N33F .**	**x x x - x -**	**. ST031**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST031**	**+127**
			80A	**N60 .**	**x - x - x -**	**. ST031**	
			115A	**N80 .**	**x - x - - -**	**. ST031**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST031**	
			250A	**N200 .**	**x - x - - -**	**. ST031**	
4 steps		*30°*	2 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST041**	
			32A	**M20 .**	**x x x x - -**	**. ST041**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST041**	
			50A	**N33F .**	**x x x - x -**	**. ST041**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST041**	**+112**
			80A	**N60 .**	**x - x - x -**	**. ST041**	
			115A	**N80 .**	**x - x - - -**	**. ST041**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST041**	
			250A	**N200 .**	**x - x - - -**	**. ST041**	
5 steps		*45°*	3 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST051**	
			32A	**M20 .**	**x x x x - -**	**. ST051**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST051**	
			50A	**N33F .**	**x x x - x -**	**. ST051**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST051**	**+423**
			80A	**N60 .**	**x - x - x -**	**. ST051**	
			115A	**N80 .**	**x - x - - -**	**. ST051**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST051**	
			250A	**N200 .**	**x - x - - -**	**. ST051**	
6 steps		*45°*	4 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST061**	
			32A	**M20 .**	**x x x x - -**	**. ST061**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST061**	
			50A	**N33F .**	**x - x - x -**	**. ST061**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST061**	**+128**
			80A	**N60 .**	**x - x - x -**	**. ST061**	
			115A	**N80 .**	**x - x - - -**	**. ST061**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST061**	
			250A	**N200 .**	**x - x - - -**	**. ST061**	

Ordering example: AC21 250A panel mounting, multi step switch 1-pole with off, 6 steps **N200 E ST061**

1) Plastic enclosed switches are delivered with switch type M10.

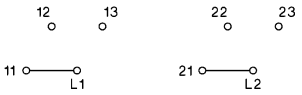
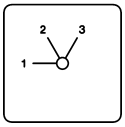
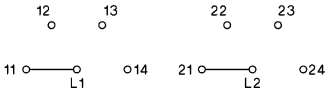
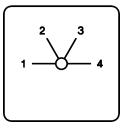
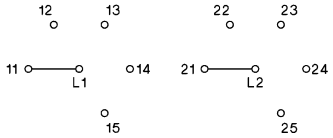
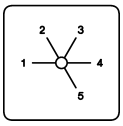
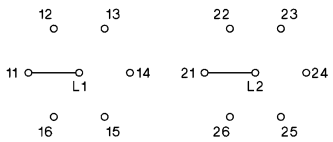
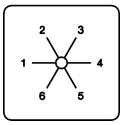
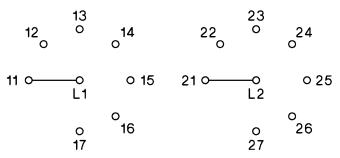
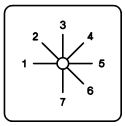
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi step switches 1-pole with Off ST0.1							
7 steps		*45°*	4 48 ❐ 20A	**M10H .**	**x x x x x[1] -**	**. ST071**	
			32A	**M20 .**	**x x x x - -**	**. ST071**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST071**	
			50A	**N33F .**	**x - x - x -**	**. ST071**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST071**	**+129**
			80A	**N60 .**	**x - x - x -**	**. ST071**	
			115A	**N80 .**	**x - x - - -**	**. ST071**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST071**	
			250A	**N200 .**	**x - x - - -**	**. ST071**	
8 steps		*30°*	5 48 ❐ 20A	**M10H .**	**x x x x x[1] -**	**. ST081**	
			32A	**M20 .**	**x x x x - -**	**. ST081**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST081**	
			50A	**N33F .**	**x - x - x -**	**. ST081**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST081**	**+114**
			80A	**N60 .**	**x - x - x -**	**. ST081**	
			115A	**N80 .**	**x - x - - -**	**. ST081**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST081**	
			250A	**N200 .**	**x - x - - -**	**. ST081**	
9 steps		*30°*	5 48 ❐ 20A	**M10H .**	**x x x x x[1] -**	**. ST091**	
			32A	**M20 .**	**x x x x - -**	**. ST091**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST091**	
			50A	**N33F .**	**x - x - x -**	**. ST091**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST091**	**+115**
			80A	**N60 .**	**x - x - x -**	**. ST091**	
			115A	**N80 .**	**x - x - - -**	**. ST091**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST091**	
			250A	**N200 .**	**x - x - - -**	**. ST091**	
10 steps		*30°*	6 48 ❐ 20A	**M10H .**	**x x x - x[1] -**	**. ST0101**	
			32A	**M20 .**	**x x x - - -**	**. ST0101**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST0101**	
			50A	**N33F .**	**x - x - x -**	**. ST0101**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST0101**	**+116**
			80A	**N60 .**	**x - x - x -**	**. ST0101**	
			115A	**N80 .**	**x - x - - -**	**. ST0101**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST0101**	
			250A	**N200 .**	**x - x - - -**	**. ST0101**	
11 steps		*30°*	6 48 ❐ 20A	**M10H .**	**x x x - x[1] -**	**. ST0111**	
			32A	**M20 .**	**x x x - - -**	**. ST0111**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST0111**	
			50A	**N33F .**	**x - x - x -**	**. ST0111**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST0111**	**+117**
			80A	**N60 .**	**x - x - x -**	**. ST0111**	
			115A	**N80 .**	**x - x - - -**	**. ST0111**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST0111**	
			250A	**N200 .**	**x - x - - -**	**. ST0111**	

Ordering example: AC21 250A panel mounting, multi step switch 1-pole with off, 11 steps **N200 E ST0111**

1) Plastic enclosed switches are delivered with switch type M10.

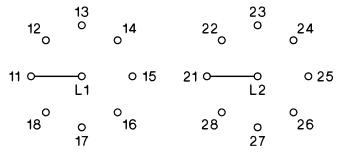
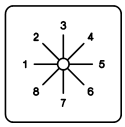
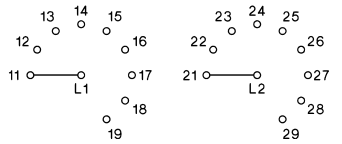
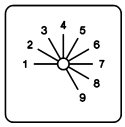
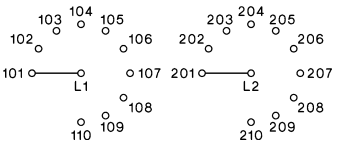
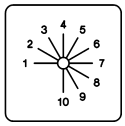
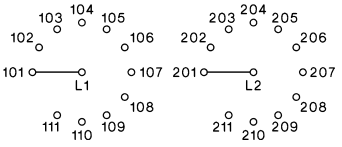
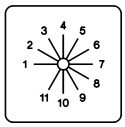
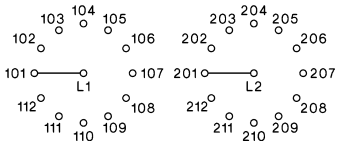
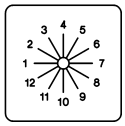
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ **AC21**	**Type**	**Design** see page 6-8 **E. Z. V. SMA. P. G.**	**Switch pro-gram**	Escutcheon plate
Multi step switches 2-pole without Off ST.2							
3 steps		*60°*	3 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST32**	
			32A	**M20 .**	**x x x x - -**	**. ST32**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST32**	
			50A	**N33F .**	**x x x - x -**	**. ST32**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST32**	
			80A	**N60 .**	**x - x - x -**	**. ST32**	
			115A	**N80 .**	**x - x - - -**	**. ST32**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST32**	
			250A	**N200 .**	**x - x - - -**	**. ST32**	
4 steps		*60°*	4 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST42**	
			32A	**M20 .**	**x x x x - -**	**. ST42**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST42**	
			50A	**N33F .**	**x - x - x -**	**. ST42**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST42**	
			80A	**N60 .**	**x - x - x -**	**. ST42**	
			115A	**N80 .**	**x - x - - -**	**. ST42**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST42**	
			250A	**N200 .**	**x - x - - -**	**. ST42**	
5 steps		*60°*	5 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST52**	
			32A	**M20 .**	**x x x x - -**	**. ST52**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST52**	
			50A	**N33F .**	**x - x - x -**	**. ST52**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST52**	
			80A	**N60 .**	**x - x - x -**	**. ST52**	
			115A	**N80 .**	**x - x - - -**	**. ST52**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST52**	
			250A	**N200 .**	**x - x - - -**	**. ST52**	
6 steps		*60°*	6 48 ❐ 20A	**M10H .**	**x x x - x**[1] **-**	**. ST62**	
			32A	**M20 .**	**x x x - - -**	**. ST62**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST62**	
			50A	**N33F .**	**x - x - x -**	**. ST62**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST62**	
			80A	**N60 .**	**x - x - x -**	**. ST62**	
			115A	**N80 .**	**x - x - - -**	**. ST62**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST62**	
			250A	**N200 .**	**x - x - - -**	**. ST62**	
7 steps		*45°*	7 48 ❐ 20A	**M10H .**	**x x x - - -**	**. ST72**	
			32A	**M20 .**	**x x x - - -**	**. ST72**	
			64 ❐ 32A	**N20 .**	**x - x - x -**	**. ST72**	
			50A	**N33F .**	**x - x - - -**	**. ST72**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST72**	
			80A	**N60 .**	**x - x - - -**	**. ST72**	
			115A	**N80 .**	**x - x - - -**	**. ST72**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST72**	
			250A	**N200 .**	**x - x - - -**	**. ST72**	

Ordering example: AC21 250A panel mounting, multi step switch 2-pole without off, 7 steps **N200 E ST72**

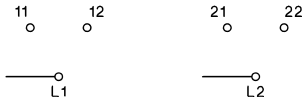
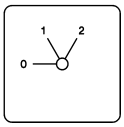
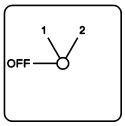
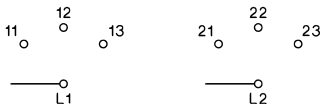
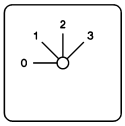
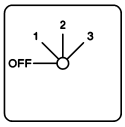
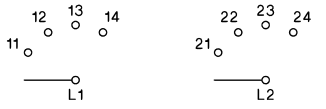
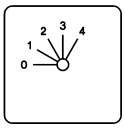
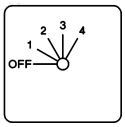
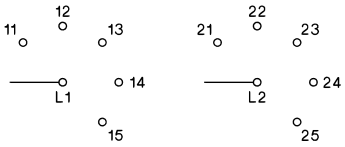
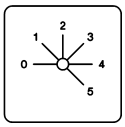
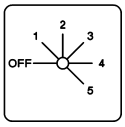
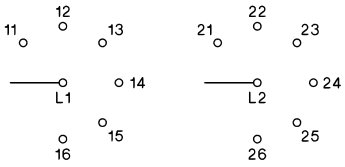
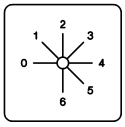
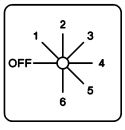
1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi step switches 2-pole without Off ST.2							
8 steps		*45°*	8 48 ❐ 20A	**M10H .**	**x x x - - -**	**. ST82**	
			32A	**M20 .**	**x x x - - -**	**. ST82**	
			64 ❐ 32A	**N20 .**	**x - x - x -**	**. ST82**	
			50A	**N33F .**	**x - x - - -**	**. ST82**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST82**	
			80A	**N60 .**	**x - x - - -**	**. ST82**	
			115A	**N80 .**	**x - x - - -**	**. ST82**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST82**	
			250A	**N200 .**	**x - x - - -**	**. ST82**	
9 steps		*30°*	9 48 ❐ 20A	**M10H .**	**x x x - - -**	**. ST92**	
			32A	**M20 .**	**x x x - - -**	**. ST92**	
			64 ❐ 32A	**N20 .**	**x - x - - -**	**. ST92**	
			50A	**N33F .**	**x - x - - -**	**. ST92**	
			88 ❐ 63A	**N40 .**	**x - x - - -**	**. ST92**	
			80A	**N60 .**	**x - x - - -**	**. ST92**	
			115A	**N80 .**	**x - x - - -**	**. ST92**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST92**	
			250A	**N200 .**	**x - x - - -**	**. ST92**	
10 steps		*30°*	10 48 ❐ 20A	**M10H .**	**x x x - - -**	**. ST102**	
			32A	**M20 .**	**x x x - - -**	**. ST102**	
			64 ❐ 32A	**N20 .**	**x - x - - -**	**. ST102**	
			50A	**N33F .**	**x - x - - -**	**. ST102**	
			88 ❐ 63A	**N40 .**	**x - x - - -**	**. ST102**	
			80A	**N60 .**	**x - x - - -**	**. ST102**	
			115A	**N80 .**	**x - x - - -**	**. ST102**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST102**	
			250A	**N200 .**	**x - x - - -**	**. ST102**	
11 steps		*30°*	11 48 ❐ 20A	**M10H .**	**x x x - - -**	**. ST112**	
			32A	**M20 .**	**x x x - - -**	**. ST112**	
			64 ❐ 32A	**N20 .**	**x - x - - -**	**. ST112**	
			50A	**N33F .**	**x - x - - -**	**. ST112**	
			88 ❐ 63A	**N40 .**	**x - x - - -**	**. ST112**	
			80A	**N60 .**	**x - x - - -**	**. ST112**	
			115A	**N80 .**	**x - x - - -**	**. ST112**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST112**	
			250A	**N200 .**	**x - x - - -**	**. ST112**	
12 steps		*30°*	12 48 ❐ 20A	**M10H .**	**x x x - - -**	**. ST122**	
			32A	**M20 .**	**x x x - - -**	**. ST122**	
			64 ❐ 32A	**N20 .**	**x - x - - -**	**. ST122**	
			50A	**N33F .**	**x - x - - -**	**. ST122**	
			88 ❐ 63A	**N40 .**	**x - x - - -**	**. ST122**	
			80A	**N60 .**	**x - x - - -**	**. ST122**	
			115A	**N80 .**	**x - x - - -**	**. ST122**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST122**	
			250A	**N200 .**	**x - x - - -**	**. ST122**	

Ordering example: AC21 250A panel mounting, multi step switch 2-pole without off, 12 steps **N200 E ST122**

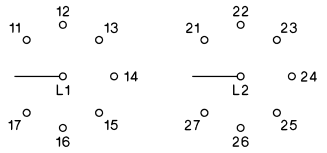
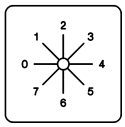
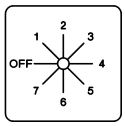
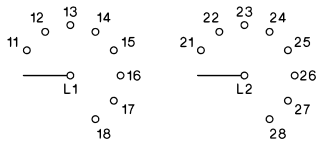
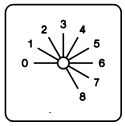
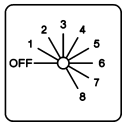
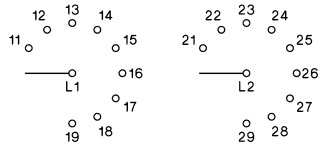
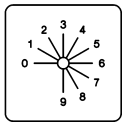
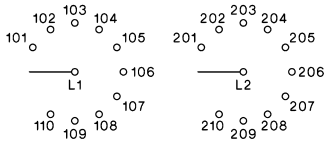
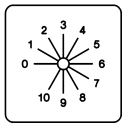
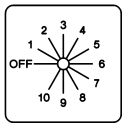
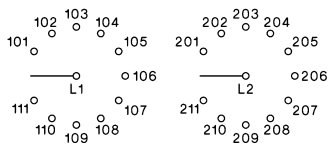
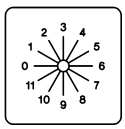
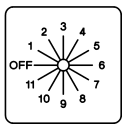
Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ **AC21**	**Type**	**Design** see page 6-8 **E. Z. V. SMA. P. G.**	**Switch pro-gram**	Escutcheon plate
Multi step switches 2-pole with Off ST0.2							
2 steps		*60°*	2 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST022**	
			32A	**M20 .**	**x x x x - -**	**. ST022**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST022**	
			50A	**N33F .**	**x x x - x -**	**. ST022**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST022**	**+422**
			80A	**N60 .**	**x - x - x -**	**. ST022**	
			115A	**N80 .**	**x - x - - -**	**. ST022**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST022**	
			250A	**N200 .**	**x - x - - -**	**. ST022**	
3 steps		*45°*	3 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST032**	
			32A	**M20 .**	**x x x x - -**	**. ST032**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST032**	
			50A	**N33F .**	**x x x - x -**	**. ST032**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST032**	**+127**
			80A	**N60 .**	**x - x - x -**	**. ST032**	
			115A	**N80 .**	**x - x - - -**	**. ST032**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST032**	
			250A	**N200 .**	**x - x - - -**	**. ST032**	
4 steps		*30°*	4 48 ❐ 20A	**M10H .**	**x x x x x**[1] **-**	**. ST042**	
			32A	**M20 .**	**x x x x - -**	**. ST042**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST042**	
			50A	**N33F .**	**x - x - x -**	**. ST042**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST042**	**+112**
			80A	**N60 .**	**x - x - x -**	**. ST042**	
			115A	**N80 .**	**x - x - - -**	**. ST042**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST042**	
			250A	**N200 .**	**x - x - - -**	**. ST042**	
5 steps		*45°*	6 48 ❐ 20A	**M10H .**	**x x x - x**[1] **-**	**. ST052**	
			32A	**M20 .**	**x x x - - -**	**. ST052**	
			64 ❐ 32A	**N20 .**	**x - x - x x**	**. ST052**	
			50A	**N33F .**	**x - x - x -**	**. ST052**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST052**	**+423**
			80A	**N60 .**	**x - x - x -**	**. ST052**	
			115A	**N80 .**	**x - x - - -**	**. ST052**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST052**	
			250A	**N200 .**	**x - x - - -**	**. ST052**	
6 steps		*45°*	7 48 ❐ 20A	**M10H .**	**x x x - x**[1] **-**	**. ST062**	
			32A	**M20 .**	**x x x - - -**	**. ST062**	
			64 ❐ 32A	**N20 .**	**x - x - x -**	**. ST062**	
			50A	**N33F .**	**x - x - - -**	**. ST062**	
			88 ❐ 63A	**N40 .**	**x - x - x -**	**. ST062**	**+128**
			80A	**N60 .**	**x - x - - -**	**. ST062**	
			115A	**N80 .**	**x - x - - -**	**. ST062**	
			132❐ 150A	**N100 .**	**x - x - - -**	**. ST062**	
			250A	**N200 .**	**x - x - - -**	**. ST062**	

Ordering example: AC21 250A panel mounting, multi step switch 2-pole with off, 6 steps **N200 E ST062**

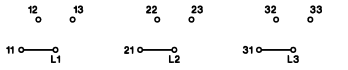
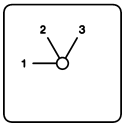
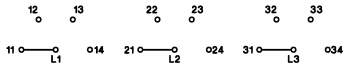
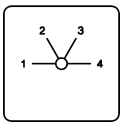
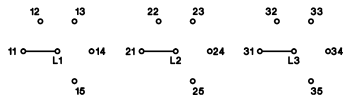
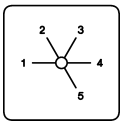
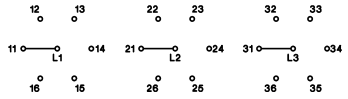
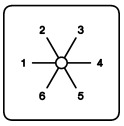
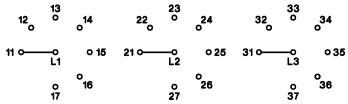
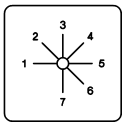
1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi step switches 2-pole with Off ST0.2							
7 steps		*45°*	8 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x - - - x x x - - -	**. ST072** **. ST072**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - x - x - x - - -	**. ST072** **. ST072**	**+129** 
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	x - x - x - x - x - - - x - x - - -	**. ST072** **. ST072** **. ST072**	
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. ST072** **. ST072**	
8 steps		*30°*	9 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x - - - x x x - - -	**. ST082** **. ST082**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - - - x - x - - -	**. ST082** **. ST082**	**+114** 
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	x - x - - - x - x - - - x - x - - -	**. ST082** **. ST082** **. ST082**	
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. ST082** **. ST082**	
9 steps		*30°*	10 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x - - - x x x - - -	**. ST092** **. ST092**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - - - x - x - - -	**. ST092** **. ST092**	**+115** 
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	x - x - - - x - x - - - x - x - - -	**. ST092** **. ST092** **. ST092**	
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. ST092** **. ST092**	
10 steps		*30°*	11 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x - - - x x x - - -	**. ST0102** **. ST0102**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - - - x - x - - -	**. ST0102** **. ST0102**	**+116** 
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	x - x - - - x - x - - - x - x - - -	**. ST0102** **. ST0102** **. ST0102**	
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. ST0102** **. ST0102**	
11 steps		*30°*	12 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x - - - x x x - - -	**. ST0112** **. ST0112**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - - - x - x - - -	**. ST0112** **. ST0112**	**+117** 
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	x - x - - - x - x - - - x - x - - -	**. ST0112** **. ST0112** **. ST0112**	
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. ST0112** **. ST0112**	

Ordering example: AC21 250A panel mounting, multi step switch 2-pole with off, 11 steps **N200 E ST0112**

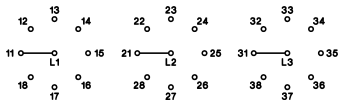
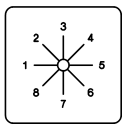
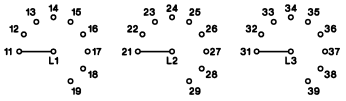
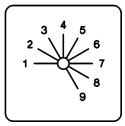
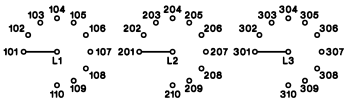
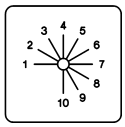
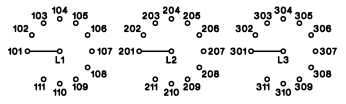
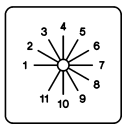
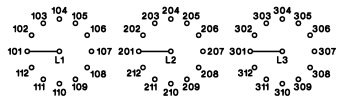
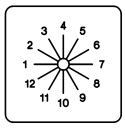
Switching programs

Description	Wiring diagram *Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi step switches 3-pole without Off ST.3						
3 steps	*60°* 	5 48 ❐ 20A	**M10H .**	**x x x x x**[1] **- . ST33**		
		32A	**M20 .**	**x x x x - - . ST33**		
		64 ❐ 32A	**N20 .**	**x - x - x x . ST33**		
		50A	**N33F .**	**x - x - x - . ST33**		
		88 ❐ 63A	**N40 .**	**x - x - x - . ST33**		
		80A	**N60 .**	**x - x - x - . ST33**		
		115A	**N80 .**	**x - x - - - . ST33**		
		132❐ 150A	**N100 .**	**x - x - - - . ST33**		
		250A	**N200 .**	**x - x - - - . ST33**		
4 steps	*60°* 	6 48 ❐ 20A	**M10H .**	**x x x - x**[1] **- . ST43**		
		32A	**M20 .**	**x x x - - - . ST43**		
		64 ❐ 32A	**N20 .**	**x - x - x x . ST43**		
		50A	**N33F .**	**x - x - x - . ST43**		
		88 ❐ 63A	**N40 .**	**x - x - x - . ST43**		
		80A	**N60 .**	**x - x - x - . ST43**		
		115A	**N80 .**	**x - x - - - . ST43**		
		132❐ 150A	**N100 .**	**x - x - - - . ST43**		
		250A	**N200 .**	**x - x - - - . ST43**		
5 steps	*60°* 	8 48 ❐ 20A	**M10H .**	**x x x - - - . ST53**		
		32A	**M20 .**	**x x x - - - . ST53**		
		64 ❐ 32A	**N20 .**	**x - x - x - . ST53**		
		50A	**N33F .**	**x - x - - - . ST53**		
		88 ❐ 63A	**N40 .**	**x - x - x - . ST53**		
		80A	**N60 .**	**x - x - - - . ST53**		
		115A	**N80 .**	**x - x - - - . ST53**		
		132❐ 150A	**N100 .**	**x - x - - - . ST53**		
		250A	**N200 .**	**x - x - - - . ST53**		
6 steps	*60°* 	9 48 ❐ 20A	**M10H .**	**x x x - - - . ST63**		
		32A	**M20 .**	**x x x - - - . ST63**		
		64 ❐ 32A	**N20 .**	**x - x - - - . ST63**		
		50A	**N33F .**	**x - x - - - . ST63**		
		88 ❐ 63A	**N40 .**	**x - x - - - . ST63**		
		80A	**N60 .**	**x - x - - - . ST63**		
		115A	**N80 .**	**x - x - - - . ST63**		
		132❐ 150A	**N100 .**	**x - x - - - . ST63**		
		250A	**N200 .**	**x - x - - - . ST63**		
7 steps	*45°* 	11 48 ❐ 20A	**M10H .**	**x x x - - - . ST73**		
		32A	**M20 .**	**x x x - - - . ST73**		
		64 ❐ 32A	**N20 .**	**x - x - - - . ST73**		
		50A	**N33F .**	**x - x - - - . ST73**		
		88 ❐ 63A	**N40 .**	**x - x - - - . ST73**		
		80A	**N60 .**	**x - x - - - . ST73**		
		115A	**N80 .**	**x - x - - - . ST73**		
		132❐ 150A	**N100 .**	**x - x - - - . ST73**		
		250A	**N200 .**	**x - x - - - . ST73**		

Ordering example: AC21 250A panel mounting, multi step switch 3-pole without off, 7 steps **N200 E ST73**

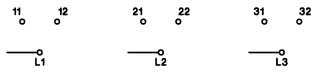
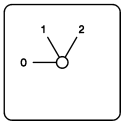
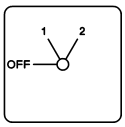
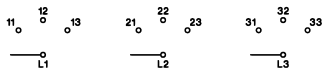
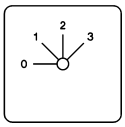
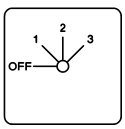
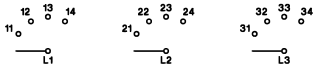
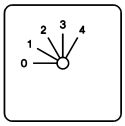
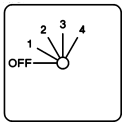
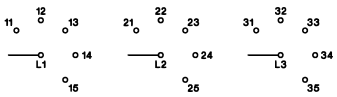
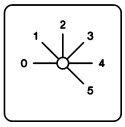
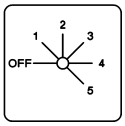
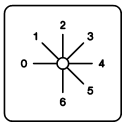
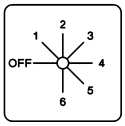
1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi step switches 3-pole without Off ST.3							
8 steps		*45°*	12 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x - - -** **x x x - - -**	**. ST83** **. ST83**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - - -** **x - x - - -**	**. ST83** **. ST83**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - - -** **x - x - - -** **x - x - - -**	**. ST83** **. ST83** **. ST83**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. ST83** **. ST83**	
9 steps		*30°*	14 48 ❐ 20A 32A	**M10H .** **M20 .**	**x - x - - -** **x - x - - -**	**. ST93** **. ST93**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - - -** **x - x - - -**	**. ST93** **. ST93**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - - -** **x - x - - -** **x - x - - -**	**. ST93** **. ST93** **. ST93**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. ST93** **. ST93**	
10 steps		*30°*	15 48 ❐ 20A 32A	**M10H .** **M20 .**	**x - x - - -** **x - x - - -**	**. ST103** **. ST103**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - - -** **x - x - - -**	**. ST103** **. ST103**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - - -** **x - x - - -** **x - x - - -**	**. ST103** **. ST103** **. ST103**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. ST103** **. ST103**	
11 steps		*30°*	17 48 ❐ 20A 32A	**M10H .** **M20 .**	**x - x - - -** **x - x - - -**	**. ST113** **. ST113**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - - -** **x - x - - -**	**. ST113** **. ST113**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - - -** **x - x - - -** **x - x - - -**	**. ST113** **. ST113** **. ST113**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. ST113** **. ST113**	
12 steps		*30°*	18 48 ❐ 20A 32A	**M10H .** **M20 .**	**x - x - - -** **x - x - - -**	**. ST123** **. ST123**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - - -** **x - x - - -**	**. ST123** **. ST123**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - - -** **x - x - - -** **x - x - - -**	**. ST123** **. ST123** **. ST123**	
			132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - -** **x - x - - -**	**. ST123** **. ST123**	

Ordering example: AC21 250A panel mounting, multi step switch 3-pole without off, 12 steps **N200 E ST123**

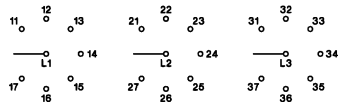
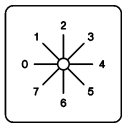
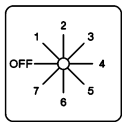
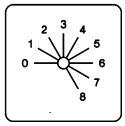
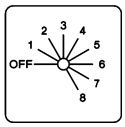
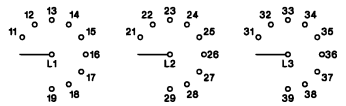
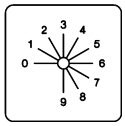
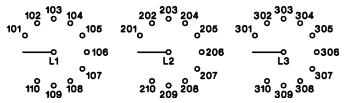
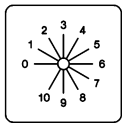
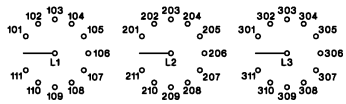
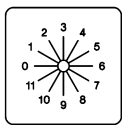
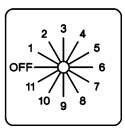
Switching programs

Description	Wiring diagram *Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi step switches 3-pole with Off ST0.3						
2 steps	*60°* 	3 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **- .** **x x x x - - .**	**ST023** **ST023**	
		64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x .** **x x x - x - .**	**ST023** **ST023**	
		88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x - .** **x - x - x - .** **x - x - - - .**	**ST023** **ST023** **ST023**	**+422** 
		132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - - .** **x - x - - - .**	**ST023** **ST023**	
3 steps	*45°* 	5 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x x x**[1] **- .** **x x x x - - .**	**ST033** **ST033**	
		64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x .** **x - x - x - .**	**ST033** **ST033**	
		88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x - .** **x - x - x - .** **x - x - - - .**	**ST033** **ST033** **ST033**	**+127** 
		132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - - .** **x - x - - - .**	**ST033** **ST033**	
4 steps	*30°* 	6 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x - x**[1] **- .** **x x x - - - .**	**ST043** **ST043**	
		64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - x x .** **x - x - x - .**	**ST043** **ST043**	
		88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - x - .** **x - x - x - .** **x - x - - - .**	**ST043** **ST043** **ST043**	**+112** 
		132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - - .** **x - x - - - .**	**ST043** **ST043**	
5 steps	*45°* 	9 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x - - - .** **x x x - - - .**	**ST053** **ST053**	
		64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - - - .** **x - x - - - .**	**ST053** **ST053**	
		88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - - - .** **x - x - - - .** **x - x - - - .**	**ST053** **ST053** **ST053**	**+423** 
		132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - - .** **x - x - - - .**	**ST053** **ST053**	
6 steps	*45°* 	11 48 ❐ 20A 32A	**M10H .** **M20 .**	**x x x - - - .** **x x x - - - .**	**ST063** **ST063**	
		64 ❐ 32A 50A	**N20 .** **N33F .**	**x - x - - - .** **x - x - - - .**	**ST063** **ST063**	
		88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	**x - x - - - .** **x - x - - - .** **x - x - - - .**	**ST063** **ST063** **ST063**	**+128** 
		132❐ 150A 250A	**N100 .** **N200 .**	**x - x - - - .** **x - x - - - .**	**ST063** **ST063**	

Ordering example: AC21 250A panel mounting, multi step switch 3-pole with off, 6 steps **N200 E ST063**

1) Plastic enclosed switches are delivered with switch type M10.

Switching programs

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design see page 6-8 E. Z. V. SMA. P. G.	Switch pro-gram	Escutcheon plate
Multi step switches 3-pole with Off ST0.3							
7 steps		*45°*	12 48 ❐ 20A 32A	**M10H .** **M20 .**	x x x - - - x x x - - -	**. ST073** **. ST073**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - - - x - x - - -	**. ST073** **. ST073**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	x - x - - - x - x - - - x - x - - -	**. ST073** **. ST073** **. ST073**	**+129** 
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. ST073** **. ST073**	
8 steps		*30°*	14 48 ❐ 20A 32A	**M10H .** **M20 .**	x - x - - - x - x - - -	**. ST083** **. ST083**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - - - x - x - - -	**. ST083** **. ST083**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	x - x - - - x - x - - - x - x - - -	**. ST083** **. ST083** **. ST083**	**+114** 
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. ST083** **. ST083**	
9 steps		*30°*	15 48 ❐ 20A 32A	**M10H .** **M20 .**	x - x - - - x - x - - -	**. ST093** **. ST093**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - - - x - x - - -	**. ST093** **. ST093**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	x - x - - - x - x - - - x - x - - -	**. ST093** **. ST093** **. ST093**	**+115** 
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. ST093** **. ST093**	
10 steps		*30°*	17 48 ❐ 20A 32A	**M10H .** **M20 .**	x - x - - - x - x - - -	**. ST0103** **. ST0103**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - - - x - x - - -	**. ST0103** **. ST0103**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	x - x - - - x - x - - - x - x - - -	**. ST0103** **. ST0103** **. ST0103**	**+116** 
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. ST0103** **. ST0103**	
11 steps		*30°*	18 48 ❐ 20A 32A	**M10H .** **M20 .**	x - x - - - x - x - - -	**. ST0113** **. ST0113**	
			64 ❐ 32A 50A	**N20 .** **N33F .**	x - x - - - x - x - - -	**. ST0113** **. ST0113**	
			88 ❐ 63A 80A 115A	**N40 .** **N60 .** **N80 .**	x - x - - - x - x - - - x - x - - -	**. ST0113** **. ST0113** **. ST0113**	**+117** 
			132❐ 150A 250A	**N100 .** **N200 .**	x - x - - - x - x - - -	**. ST0113** **. ST0113**	

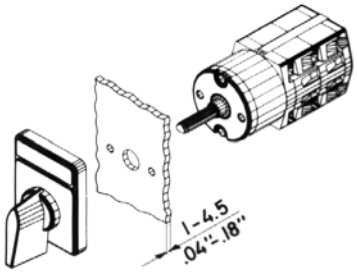
Ordering example: AC21 250A panel mounting, multi step switch 3-pole with off, 11 steps **N200 E ST0113**

Mini-Cam Switches M4H

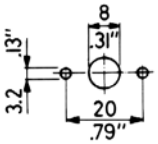
Panel mounting E, IP40

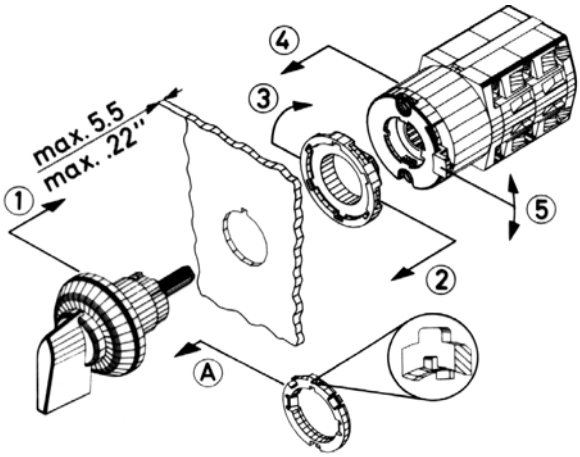
Central fixing Z

Central fixing without escutcheon plate ZO

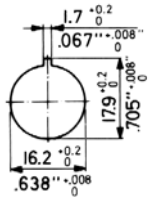


Mounting holes

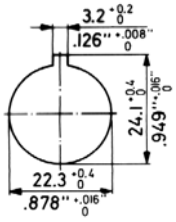




Central fixing 16mm



ock Central fixing 22mm

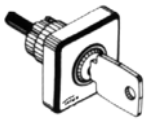


Single hole mountings are generally delivered for a 16mm (.64") mounting.
Using the forwarded adapter ring, it is possible to alter the single hole mountings from 22mm (.88"). For that purpose the adapter ring has to be attatched onto the threded part of the body in such a manner, that
1. the flat side of the adapter ring shows towards the front seal and
2. the inner nose fits into the notch of the body.
The adapter ring has to be pushed towards the front seal.

Optional extras	ordering code	for design
Additional escutcheon plate	**+SRE**	E, Z, ZO
Additional escutcheon plate	**+SRE2**	E, Z, ZO
Key operated switch with lock KABA with lock Ronis	 **+SA1** **+SA2**	 Z, ZO Z, ZO

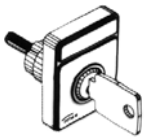
M4H Z ... +SRE

M4H Z ... +SA.



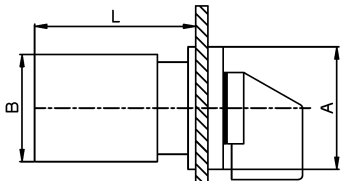
M4H ZO ... +SA.

M4H Z ... +SRE+SA.

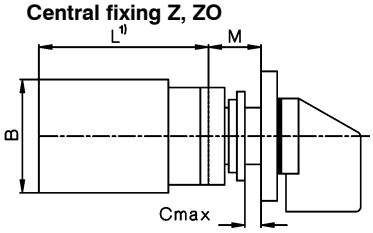


Wrench J7400
for switches M4H with central fixing is necessary

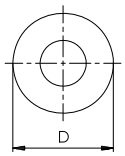
Panel mounting E



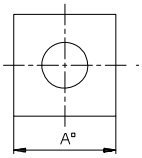
Central fixing Z, ZO



ZO



Z



Type		A	B	D	M	Dimension L for ... cells 1	2	3	4	5	6	7	8
M4H	mm	30	28	29,5	12,5	38,5	50,5	62,5	74,5	86,5	98,5	110,5	122,5

Technical data

Type	according to specifications	AC21A	AC15			Motor rating AC3							
			110V 380V			3 phase 3-pole			1 phase 2-pole			
			240V 440V		Volt	110 220 380			110 220 380			
		General use	Pilot Duty			120 240 440			120 240 277 440			
M4H	IEC, VDE, BS, SEV	10A/500V	2,5A 1,5A		kW	0,65 1,5 2,2			0,3 0,55 - 0,75			
	UL, CSA	10A/300V	A300		HP	0,75 1 -			0,33 0,75 0,75 -			

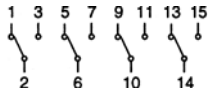
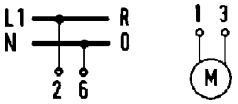
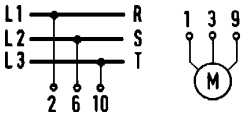
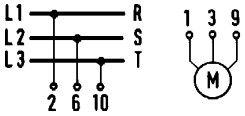
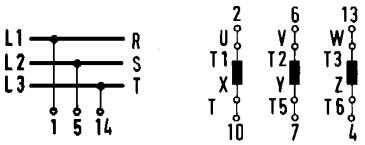
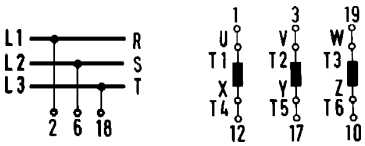
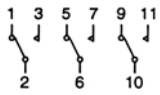
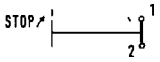
Type	according to specifications	Motor rating AC23					
			3-pole			2-pole	
		Volt	110 220 380			110 220 380	
			120 240 440			120 240 440	
M4H	IEC, VDE, BS, SEV	kW	0,75	1,8	3	0,37	0,75	1,1
	UL, CSA	HP	-	-	-	-	-	-

additional data for wiring according to UL and CSA

Type	type of wire	temp. rating of wire	torque value for field wiring terminals
M4H	copper wire only	60/75°C	0,6Nm / 5lb - inch

Mini-Cam Switches M4H

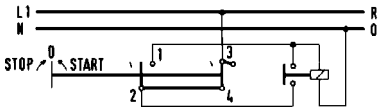
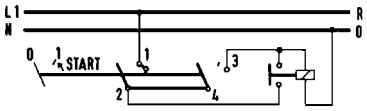
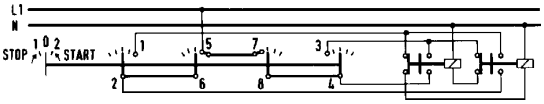
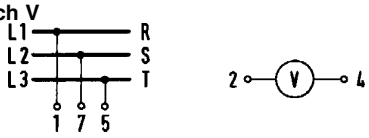
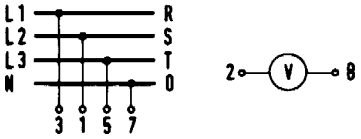
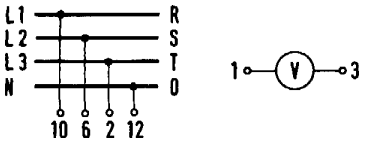
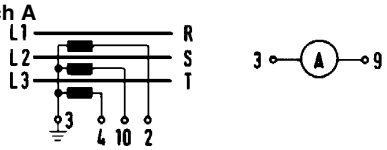
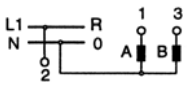
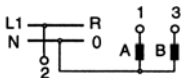
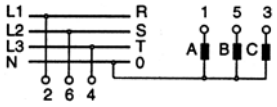
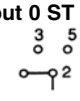
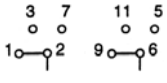
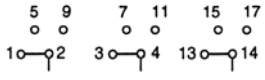
Switch programs

Description	Wiring diagram	AC21 500V 10A AC15 230V 2,5A AC3 4x400V 2,2kW	escutch. 30 x 30	numb. of cells	Type	Design .E. ↓	.Z. ↓	.ZO. ↓	Switch pro-gram
On-Off-switch A									
1-pole				1	**M4H .**	**x**	**x**	**x**	**. A1**
2-pole				1	**M4H .**	**x**	**x**	**x**	**. A2**
3-pole				2	**M4H .**	**x**	**x**	**x**	**. A3**
4-pole				2	**M4H .**	**x**	**x**	**x**	**. A4**
6-pole				3	**M4H .**	**x**	**x**	**x**	**. A6**
Changeover switch U									
1-pole				1	**M4H .**	**x**	**x**	**x**	**. U1**
2-pole				2	**M4H .**	**x**	**x**	**x**	**. U2**
3-pole				3	**M4H .**	**x**	**x**	**x**	**. U3**
4-pole				4	**M4H .**	**x**	**x**	**x**	**. U4**
Changeover switch without off W									
1-pole				1	**M4H .**	**x**	**x**	**x**	**. W1**
2-pole				2	**M4H .**	**x**	**x**	**x**	**. W2**
3-pole				3	**M4H .**	**x**	**x**	**x**	**. W3**
4-pole				4	**M4H .**	**x**	**x**	**x**	**. W4**
6-pole				6	**M4H .**	**x**	**x**	**x**	**. W6**
Reversing switch WU									
2-pole				2	**M4H .**	**x**	**x**	**x**	**. WU2**
3-pole				3	**M4H .**	**x**	**x**	**x**	**. WU3**
3-pole with spring return to 0				3	**M4H .**	**x**	**x**	**x**	**. WU3R2**
Star-delta switch SD									
1 rotary direction				4	**M4H .**	**x**	**x**	**x**	**. SD**
both rotary directions				5	**M4H .**	**x**	**x**	**x**	**. SDR**
Changeover with spring return UR									
1-pole				1	**M4H .**	**x**	**x**	**x**	**. UR1**
2-pole				2	**M4H .**	**x**	**x**	**x**	**. UR2**
3-pole				3	**M4H .**	**x**	**x**	**x**	**. UR3**
Start switch									
1-pole				1	**M4H .**	**x**	**x**	**x**	**. SE**
Stop switch									
1-pole				1	**M4H .**	**x**	**x**	**x**	**. SA**

Ordering example: Stop switch, 1-pole, Central fixing: **M4H Z SA**

Mini-Cam Switches M4H

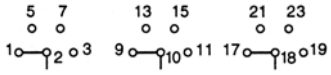
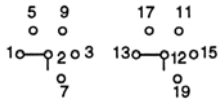
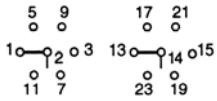
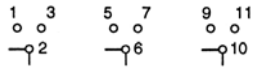
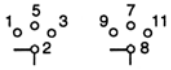
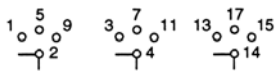
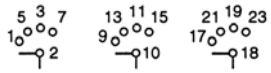
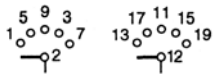
Switch programs

Description	Wiring diagram	AC21 500V 10A AC15 230V 2,5A AC3 4x400V 2,2kW	escutch. 30 x 30	numb. of cells	Type	Design .E. ↓	.Z. ↓	.ZO. ↓	Switch pro-gram
Start-Stop switch				1	**M4H .**	x	x	x	**. SEA**
Start-Stop switch position START with spring return to 1				1	**M4H .**	x	x	x	**. S392**
Start-Stop switch for reversing contactors				2	**M4H .**	x	x	x	**. S2EA**
Voltmeter selector switch V **3 line voltages**				2	**M4H .**	x	x	x	**. V3**
3 phase voltages				2	**M4H .**	x	x	x	**. V0**
3 line voltages **3 phase voltages**				3	**M4H .**	x	x	x	**. V1**
Ammeter selector switch A **1-pole, 3 current transformer**				4	**M4H .**	x	x	x	**. M31**
Gang switch GR **2 circuits A and B** **1-pole** **0 - A - A+B**				1	**M4H .**	x	x	x	**. GR11**
2 circuits A and B **1-pole** **0 - A - B - A+B**				1	**M4H .**	x	x	x	**. GR12**
3 circuits A, B and C **1-pole**				2	**M4H .**	x	x	x	**. GR14**
Multi step switch without 0 ST **3 steps, 1-pole**				2	**M4H .**	x	x	x	**. ST31**
3 steps, 2-pole				3	**M4H .**	x	x	x	**. ST32**
3 steps, 3-pole				5	**M4H .**	x	x	x	**. ST33**

Ordering example: Multi step switch without 0, 3 steps, 3-pole, panel mounting: **M4H E ST33**

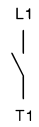
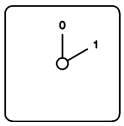
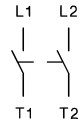
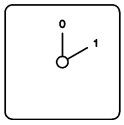
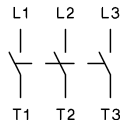
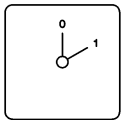
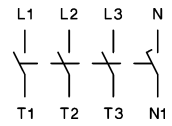
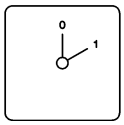
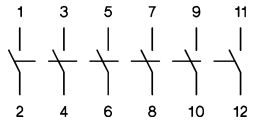
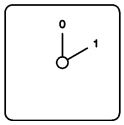
Mini-Cam Switches M4H

Switch programs

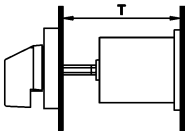
Description	Wiring diagram	AC21 500V 10A AC15 230V 2,5A AC3 4x400V 2,2kW	escutch. 30 x 30	numb. of cells	Type	Design .E. ↓	.Z. ↓	.ZO. ↓	Switch pro-gram
Multi step switch without 0 ST									
4 steps, 1-pole				2	**M4H .**	**x**	**x**	**x**	**. ST41**
4 steps, 2-pole				4	**M4H .**	**x**	**x**	**x**	**. ST42**
4 steps, 3-pole				6	**M4H .**	**x**	**x**	**x**	**. ST43**
5 steps, 1-pole				3	**M4H .**	**x**	**x**	**x**	**. ST51**
5 steps, 2-pole				5	**M4H .**	**x**	**x**	**x**	**. ST52**
6 steps, 1-pole				3	**M4H .**	**x**	**x**	**x**	**. ST61**
6 steps, 2-pole				6	**M4H .**	**x**	**x**	**x**	**. ST62**
Multi step switch with 0 ST0.									
2 steps, 1-pole				1	**M4H .**	**x**	**x**	**x**	**. ST021**
2 steps, 2-pole				2	**M4H .**	**x**	**x**	**x**	**. ST022**
2 steps, 3-pole				3	**M4H .**	**x**	**x**	**x**	**. ST023**
3 steps, 1-pole				2	**M4H .**	**x**	**x**	**x**	**. ST031**
3 steps, 2-pole				3	**M4H .**	**x**	**x**	**x**	**. ST032**
3 steps, 3-pole				5	**M4H .**	**x**	**x**	**x**	**. ST033**
4 steps, 1-pole				2	**M4H .**	**x**	**x**	**x**	**. ST041**
4 steps, 2-pole				4	**M4H .**	**x**	**x**	**x**	**. ST042**
4 steps, 3-pole				6	**M4H .**	**x**	**x**	**x**	**. ST043**
5 steps, 1-pole				3	**M4H .**	**x**	**x**	**x**	**. ST051**
5 steps, 2-pole				5	**M4H .**	**x**	**x**	**x**	**. ST052**
6 steps, 1-pole				4	**M4H .**	**x**	**x**	**x**	**. ST061**
7 steps, 1-pole				4	**M4H .**	**x**	**x**	**x**	**. ST071**
8 steps, 1-pole				5	**M4H .**	**x**	**x**	**x**	**. ST081**
9 steps, 1-pole				5	**M4H .**	**x**	**x**	**x**	**. ST091**
10 steps, 1-pole				6	**M4H .**	**x**	**x**	**x**	**. ST0101**

Ordering example: Multi step switch with 0, 10 steps, 1-pole, Central fixing without escutcheon plate: **M4H ZO ST0101**

Load Switches for resistive or slightly inductive loads or switching without load

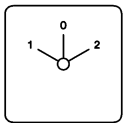
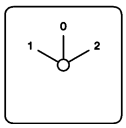
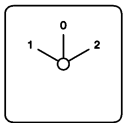
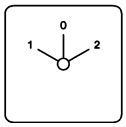
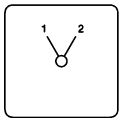
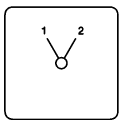
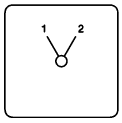
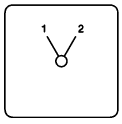
Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ **AC21**	**Type**	**Design** .E. ↓	.V. ↓	**Switch pro-gram**	Escutcheon plate
On-Off-switches A								
1-pole		*60°*	2 88 ❐ 125A	**L100 .**	**x**	**x**	**. A1**	
			1 180A	**L160 .**	**x**	**x**	**. A1**	
			1 132❐ 400A	**L400 .**	**x**	**x**	**. A1**	
			3 600A	**L600 .**	**x**	**x**	**. A1**	
			2 800A	**L800 .**	**x**	**x**	**. A1**	
			3 1200A	**L1200 .**	**x**	**x**	**. A1**	
2-pole		*60°*	2 88 ❐ 125A	**L100 .**	**x**	**x**	**. A2**	
			2 180A	**L160 .**	**x**	**x**	**. A2**	
			2 132❐ 400A	**L400 .**	**x**	**x**	**. A2**	
			3 600A	**L600 .**	**x**	**x**	**. A2**	
			4 800A	**L800 .**	**x**	**x**	**. A2**	
			6 1200A	**L1200 .**	**x**	**x**	**. A2**	
3-pole		*60°*	4 88 ❐ 125A	**L100 .**	**x**	**x**	**. A3**	
			3 180A	**L160 .**	**x**	**x**	**. A3**	
			3 132❐ 400A	**L400 .**	**x**	**x**	**. A3**	
			6 600A	**L600 .**	**x**	**x**	**. A3**	
			6 800A	**L800 .**	**x**	**x**	**. A3**	
			9 1200A	**L1200 .**	**x**	**x**	**. A3**	
4-pole **4. pole early make**		*60°*	4 88 ❐ 125A	**L100 .**	**x**	**x**	**. A4**	
			4 180A	**L160 .**	**x**	**x**	**. A4**	
			4 132❐ 400A	**L400 .**	**x**	**x**	**. A4**	
			6 600A	**L600 .**	**x**	**x**	**. A4**	
			8 800A	**L800 .**	**x**	**x**	**. A4**	
			12 1200A	**L1200 .**	**x**	**x**	**. A4**	
6-pole		*60°*	6 88 ❐ 125A	**L100 .**	**x**	**x**	**. A6**	
			6 180A	**L160 .**	**x**	**x**	**. A6**	
			6 132❐ 400A	**L400 .**	**x**	**x**	**. A6**	
			9 600A	**L600 .**	**x**	**x**	**. A6**	
			12 800A	**L800 .**	**x**	**x**	**. A6**	
			18 1200A	**L1200 .**	**x**	**x**	**. A6**	

For switches with the design **V..** it is necessary to state the installation depth - that is, the distance between mounting level of the switch and the inside edge of the door (dimension T).



Further informations	page
Technical Data	255
Dimensions	260

Load Switches for resistive or slightly inductive loads or switching without load

Description	Wiring diagram	*Switching angle*	Number of cells ↓ Size ↓ AC21	Type	Design .E. ↓	.V. ↓	Switch pro-gram	Escutcheon plate
Changeover switches U								
1-pole	T1 T4 L1	*60°*	2 88 ❐ 125A	**L100 .**	**x**	**x**	**. U1**	
			2 180A	**L160 .**	**x**	**x**	**. U1**	
			2 132 ❐ 400A	**L400 .**	**x**	**x**	**. U1**	
			3 600A	**L600 .**	**x**	**x**	**. U1**	
			4 800A	**L800 .**	**x**	**x**	**. U1**	
			6 1200A	**L1200 .**	**x**	**x**	**. U1**	
2-pole	T1 T4 T2 T5 L1 L2	*60°*	4 88 ❐ 125A	**L100 .**	**x**	**x**	**. U2**	
			4 180A	**L160 .**	**x**	**x**	**. U2**	
			4 132 ❐ 400A	**L400 .**	**x**	**x**	**. U2**	
			6 600A	**L600 .**	**x**	**x**	**. U2**	
			8 800A	**L800 .**	**x**	**x**	**. U2**	
			12 1200A	**L1200 .**	**x**	**x**	**. U2**	
3-pole	T1 T4 T2 T5 T3 T6 L1 L2 L3	*60°*	6 88 ❐ 125A	**L100 .**	**x**	**x**	**. U3**	
			6 180A	**L160 .**	**x**	**x**	**. U3**	
			6 132 ❐ 400A	**L400 .**	**x**	**x**	**. U3**	
			9 600A	**L600 .**	**x**	**x**	**. U3**	
			12 800A	**L800 .**	**x**	**x**	**. U3**	
			18 1200A	**L1200 .**	**x**	**x**	**. U3**	
4-pole **4. pole early make**	T1 T4 T2 T5 T3 T6 N1 N2 L1 L2 L3 N	*60°*	8 88 ❐ 125A	**L100 .**	**x**	**x**	**. U4**	
			8 180A	**L160 .**	**x**	**x**	**. U4**	
			8 132 ❐ 400A	**L400 .**	**x**	**x**	**. U4**	
			12 600A	**L600 .**	**x**	**x**	**. U4**	
			16 800A	**L800 .**	**x**	**x**	**. U4**	
			24 1200A	**L1200 .**	**x**	**x**	**. U4**	
Changeover switches without off W								
1-pole	T1T4 L1	*60°*	2 88 ❐ 125A	**L100 .**	**x**	**x**	**. W1**	
			2 180A	**L160 .**	**x**	**x**	**. W1**	
			2 132 ❐ 400A	**L400 .**	**x**	**x**	**. W1**	
			3 600A	**L600 .**	**x**	**x**	**. W1**	
			4 800A	**L800 .**	**x**	**x**	**. W1**	
			6 1200A	**L1200 .**	**x**	**x**	**. W1**	
2-pole	T1T4 T2T5 L1 L2	*60°*	4 88 ❐ 125A	**L100 .**	**x**	**x**	**. W2**	
			4 180A	**L160 .**	**x**	**x**	**. W2**	
			4 132 ❐ 400A	**L400 .**	**x**	**x**	**. W2**	
			6 600A	**L600 .**	**x**	**x**	**. W2**	
			8 800A	**L800 .**	**x**	**x**	**. W2**	
			12 1200A	**L1200 .**	**x**	**x**	**. W2**	
3-pole	T1T4 T2T5 T3T6 L1 L2 L3	*60°*	6 88 ❐ 125A	**L100 .**	**x**	**x**	**. W3**	
			6 180A	**L160 .**	**x**	**x**	**. W3**	
			6 132 ❐ 400A	**L400 .**	**x**	**x**	**. W3**	
			9 600A	**L600 .**	**x**	**x**	**. W3**	
			12 800A	**L800 .**	**x**	**x**	**. W3**	
			18 1200A	**L1200 .**	**x**	**x**	**. W3**	
4-pole **4. pole early make**	T1T4 T2T5 T3T6 N1N2 L1 L2 L3 N	*60°*	8 88 ❐ 125A	**L100 .**	**x**	**x**	**. W4**	
			8 180A	**L160 .**	**x**	**x**	**. W4**	
			8 132 ❐ 400A	**L400 .**	**x**	**x**	**. W4**	
			12 600A	**L600 .**	**x**	**x**	**. W4**	
			16 800A	**L800 .**	**x**	**x**	**. W4**	
			24 1200A	**L1200 .**	**x**	**x**	**. W4**	

Ordering example: AC1 1200A panel mounting, changeover switch without off 4-pole **L1200 E W4**

Operating Knobs and Handles

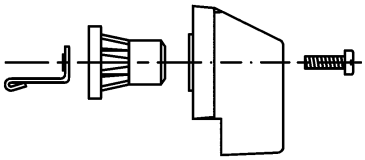
Types of handles

In the standard version, the switches are supplied with a black twist knob or instrument knob (M10H - N33F), except for design SMA, which has a grey toggle knob. Switches of size L, which consist of 2 or 3 switch columns, come with a black hand wheel. If required, the switch can be supplied with other knobs, which can later easily be exchanged.
All operating knobs have an insert, which sets the position of the knob in relation to the switch shaft. This insert can be mounted in 8 different positions (at intervals of 45°), causing the angle of each individual switch setting to be rotated by 45°.

All operating knobs can be moved on the hexagonal shaft, to permit adaptation to different sheet thicknesses, etc.

Type		M10 M10H M20	N20 N33F	N40 N60 N80 L100 L160	N100 N200 L400 L600 L800 L1200
Knob movement	mm	5	5	7	9
Hexagonal shaft dimension	mm	5	7	9	12

In the standard version, the switch terminals are positioned left and right (except M10H). When the knob insert is turned by 90°, the lay-out of the terminals changes to top and bottom.



Ordering example: Cam switch N60 V U3 with Instrument knob red
Order type: **N60 V U3 +G3**
Dimensions see page 261

Knobs and handles Description	Colour	**Ordering Code**	M10 M10H M20	N20 N33F	N40 N60 N80 L100 L160	N100 N200 L400 L600 L800 L1200
 **Instrument knob** Standard for M10 to N200	grey black red white	**+G1** **+G2** **+G3** **+G5**	**X** **X** **X** **X**	**X** **X** **X** **X**	 **X**	 **X**
 **Toggle knob**	grey black red white blue	**+K1** **+K2** **+K3** **+K5** **+K6**	**X** **X** **X** **X** **X**	**X** **X** **X** **X**		
 **Hand wheel**	black	**+HR**				**X**

Escutcheon Plates

TELUX-Cam Switches in designs E, V, P, PF, SM, UP, Z and KE are supplied with a square escutcheon plate consisting of a black frame and plexi insert plate. The markings are printed in black are on the back of the insert plate. To protect the markings so that they remain easy to read, the back of the insert plate is lined with silver foil. In addition, rectangular plates can be provided for all switch sizes, which can fitted on all switches after mounting.

Square plate

Rectangular plate
(with square plate)

TELUX-Cam Switches in design SMA, for distribution boards with 45mm inside edge of installation cover, is supplied with a grey cover and black markings.

Special engraved markings on escutcheon plates are limited by the available space. In the case of relatively large production runs or frequent use of the text, we recommend ordering of a printing block. This will be invoiced at cost price, and the engraving will not be charged for. This investment generally pays with batches from 50 pieces upwards.
The "escutcheon plate" column of the selection and ordering tables for switch programs indicates the standard plate and, in some cases, an additional plate that is often used for the programs in question. If such a plate, listed in the selection table, is desired, the appropriate code number should be stated when ordering a switch and switch program.

Should only **plates** or **parts** of the latter be ordered, the order type is assembled as shown by the following example.

Code letter of switch sizes

M10, M10H, M20	**A**
N20, N33F	**E**
N40, N60, N80, L100, L160	**H**
N100, N200, L400, L600, L800, L1200	**L**

Ordering example: Escutcheon plate silver, complete, for cam switch M10, marked with MAN OFF AUTO, angle of rotation 60°

Order type:

A85009

Switch size	**Plate**	**Marking**
Code letter for M10, M10H and M20	Art.No. for standard plate with markings, complete	Code number with label MAN OFF AUTO angle of rot. 60°

However, if a **switch** with non-standard lettering is required, only three-digit code number for the marking need be added to the order type (see next page).

Dimensions see page 261

Description	**Order type** Switch size Code letter	Plate Art.No.	Marking Code number
Escutcheon plate for designs E, V, P., Z, SM, KE and UP Escutcheon frame black, plexi insert plate silver, markings black			
Plexi insert plate silver	A E H L	.85...	... (see pp. 238-240)
Plexi insert plate yellow	A E H L	.80...	... (see pp. 238-240)
Escutcheon frame black	A E H L	.8203	-
Rectangular escutcheon plate for designs E, V, Z and SM Escutcheon frame black, plexi insert plate silver, markings black			
Plexi insert plate silver	A E H L	.885..	... (see pp. 238-240)
Plexi insert plate yellow	A E H L	.895..	... (see pp. 238-240)
Escutcheon frame black	A E H L	.8503	-
Installation cover for design SMA			
grey cover, markings black	A - - -	.68...	... (see page 240)

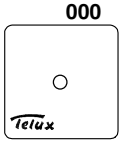
Escutcheon Plates

Selected standard markings
The markings that are most commonly required are shown below, together with code letters for the switch size and the code number.
Ordering example: Switch type M10H E A3 with escutcheon plate "OFF ON" and additional rectangular escutcheon plate "PUMP"
Order type: **M10H E A3 +003 +516**

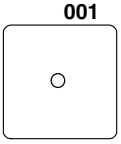
Code letter of switch sizes

M10, M10H, M20	**A**
N20, N33F	**E**
N40, N60, N80, L100, L160	**H**
N100, N200, L400, L600, L800, L1200	**L**

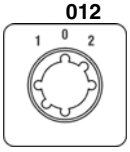
Blank escutcheon plates

000


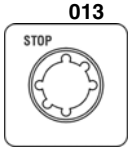
A E H L

001

A E H L

Switching angle 30°

012


A E H

013


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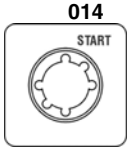

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016


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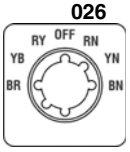

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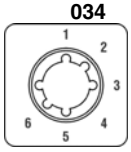

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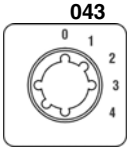

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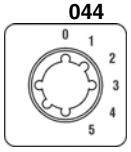

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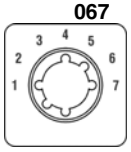

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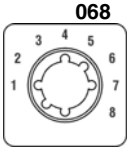

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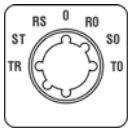

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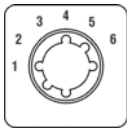

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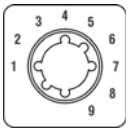

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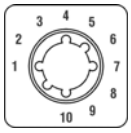

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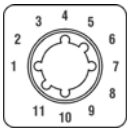

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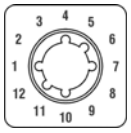

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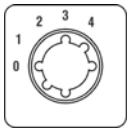

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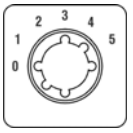

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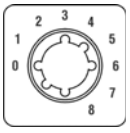

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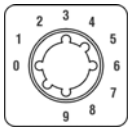

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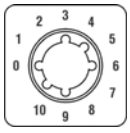

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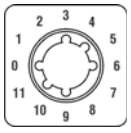

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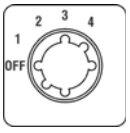

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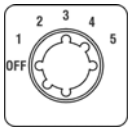

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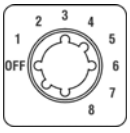

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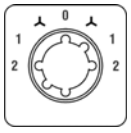

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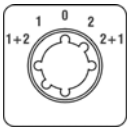
157


A

191


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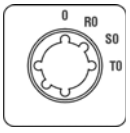

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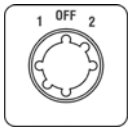

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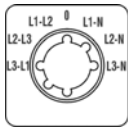

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371


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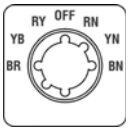

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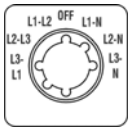
438


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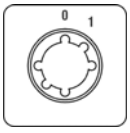

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648


A E

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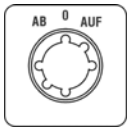

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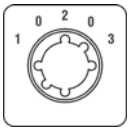

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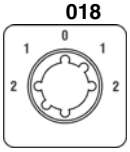
Switching angle 45°

018


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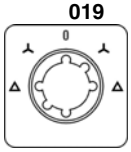

A E H L

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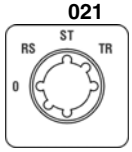

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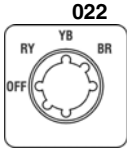

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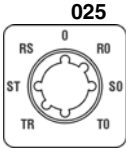

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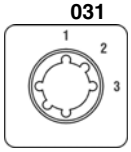

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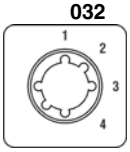

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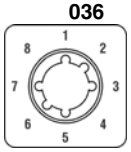

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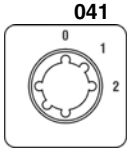

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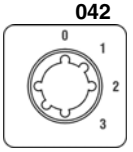

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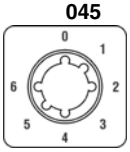

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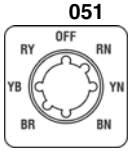

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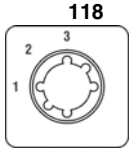

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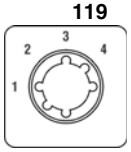

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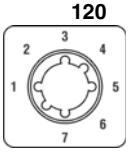

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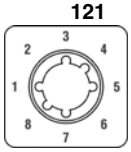

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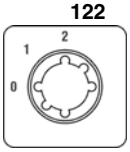

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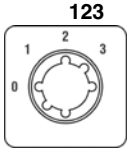

A E H L

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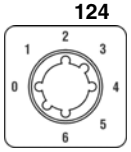

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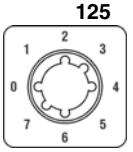

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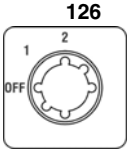

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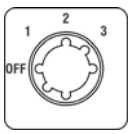

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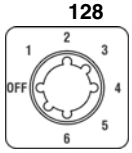
128


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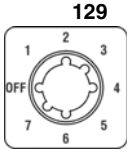

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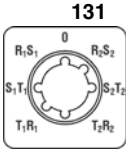

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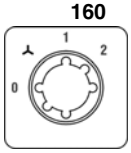

E H

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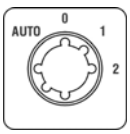

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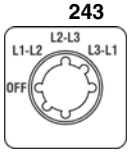
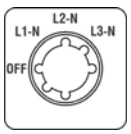
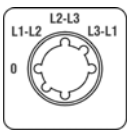


A E

244


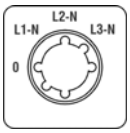
A E

247


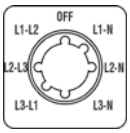
A E

Escutcheon Plates

Switching angle 45°

248


A

249


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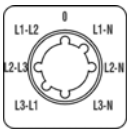
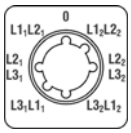
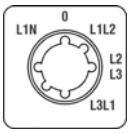
250


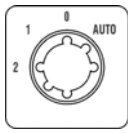
E

303


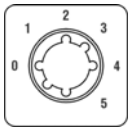
A E

304


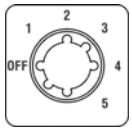
A E

336


A

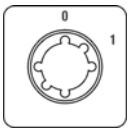
421


A E

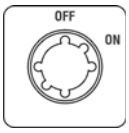
423


A E

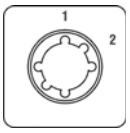
Switching angle 60°

002


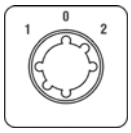
A E H L

003


A E H L

004


A E H L

006


A E H L

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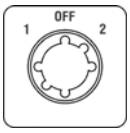

A E H L

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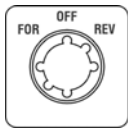

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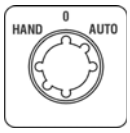

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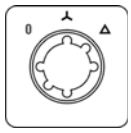
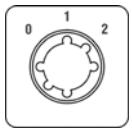
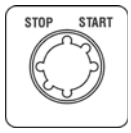
010


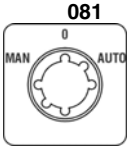
A E H L

011


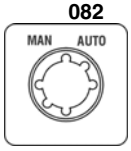
A E H L

015


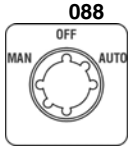
A E

081


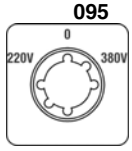
A E

082


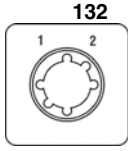
A E

088


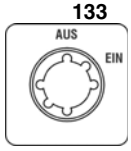
A E H

095


A E

132


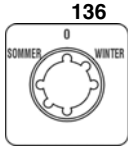
A E H

133


A E

134


A E

136


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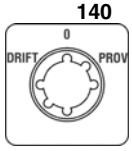
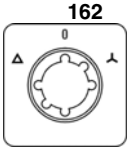
140


A

143


A

162


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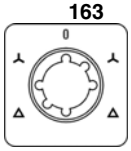
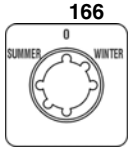
163


E

166


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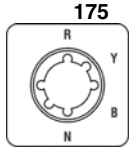
175


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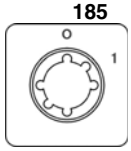
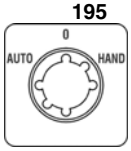
185


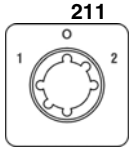
A E H L

186

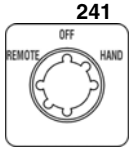

A

195


A E

211


E H L

241


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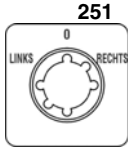
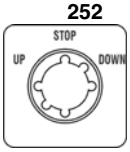
251


A E

252


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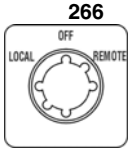
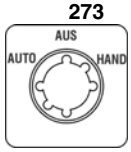
266


A E

273


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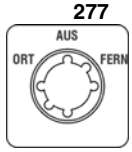
277


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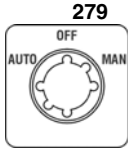
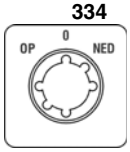
279


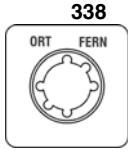
A E H

292

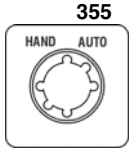

A

334


A

338


A E

355


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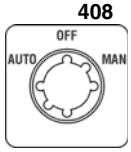
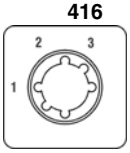
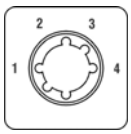
408


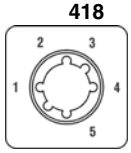
A

416


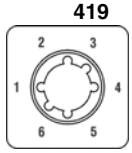
A E

417


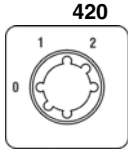
A E

418


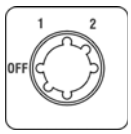
A E

419


A E

420


A E

422


A E

439

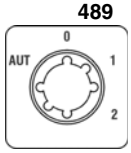

A

446


A E

448


A

489


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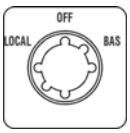
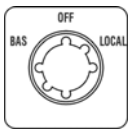
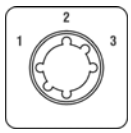
634


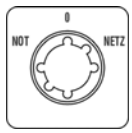
A

635


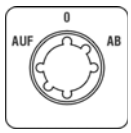
A

636


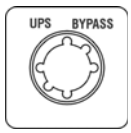
A

675


E H

699


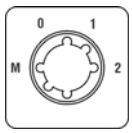
A

702


A H

706


A

739


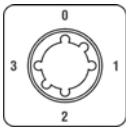
A

798

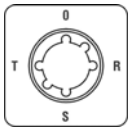

A

Escutcheon Plates

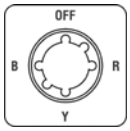
Switching angle 90°

028


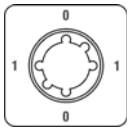
A E

029


A E

030


A E

056


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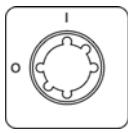
083


A E H L

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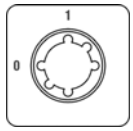
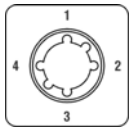
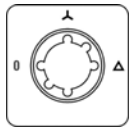


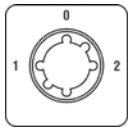
A E

089


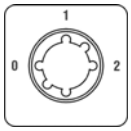
A E

144


A E H

145


E

217


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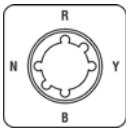
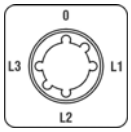
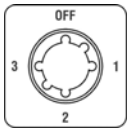
230


A E

246


A E

270


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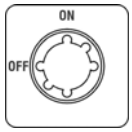
330


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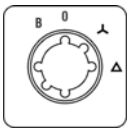
Miscellaneous

020


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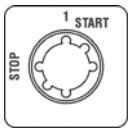

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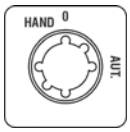

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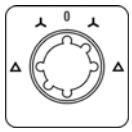
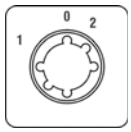
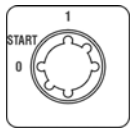
092


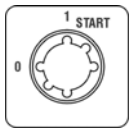
E

147


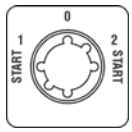
A E H

148


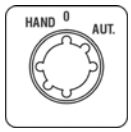
A E

149


E

172


A E

225


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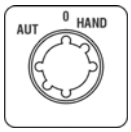
289


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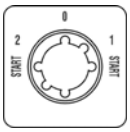
760


A

Rectangular additional escutcheon plates

500
A E H L

501
HAUPTSCHALTER
A E

503
AMMETER
A E

504
VOLTMETER
A E

505
PUMPE 1
A

506
PUMPE 2
A

509
FRAMMDÖRR
E

519
STEUERUNG
A E

520
LEISTUNGSSCHALTER
E

524
MAIN SWITCH
A E

534
NACHTLICHT
A

535
RAUMBELEUCHTUNG
A

542
Drehzahlverstellung
A E

543
Glimmlampentest
A

546
ALARMUNTERDRÜCKUNG
A

549
VEILLEUSE
A

550
PRISES
A

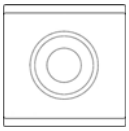
551
ECLAIRAGE
A

552
HOOFDSCHAKELAAR
A E

556
PUMPE 3
E

557
PUMPE 4
A

Covers for design SMA

001


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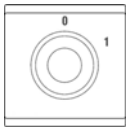

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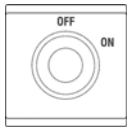

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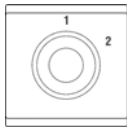

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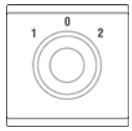

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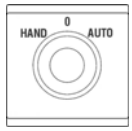

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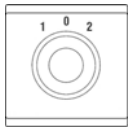

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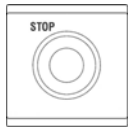

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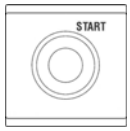

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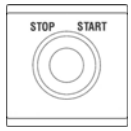

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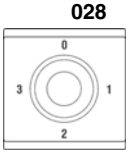
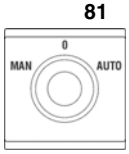
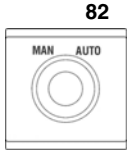
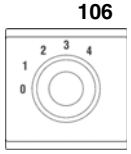
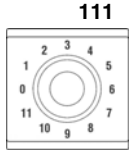
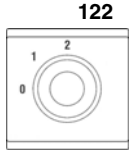


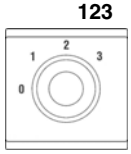
81


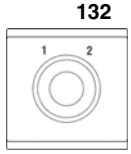
82


106


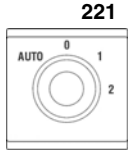
111


122


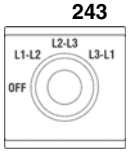
123


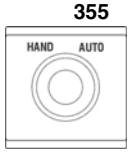
132


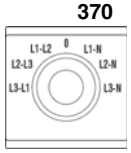
143


221


234


243


355


370


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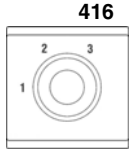

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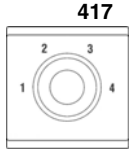

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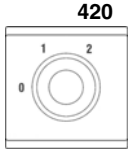
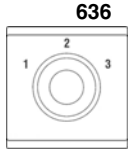
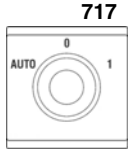


636


637

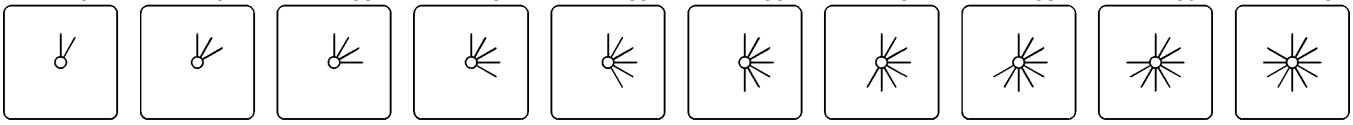

717


Arrangement of switch settings

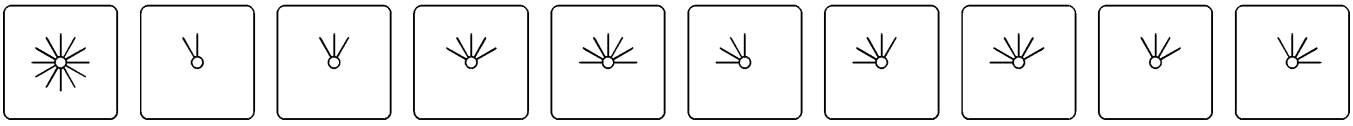
All feasible arrangements of switch settings are shown, and defined by position numbers, in the following tables. Not only the switching angles, but also switches with latched or momentary settings, or combinations of the two, are distinguished from one another.
Knowledge of the following variations is particularly important when planning special switches. It is necessary to state the position number when ordering special switches, as the cheapest version will otherwise be selected.
All the switches types listed can be supplied with switching angles other than those indicated, provided that they are permitted by the switch program (additional charge).

Switching angle 30°

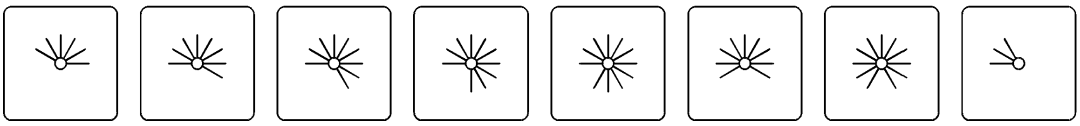
PN01 PN02 PN03 PN04 PN05 PN06 PN07 PN08 PN09 PN10



PN11 PN12 PN13 PN14 PN15 PN16 PN17 PN18 PN19 PN20

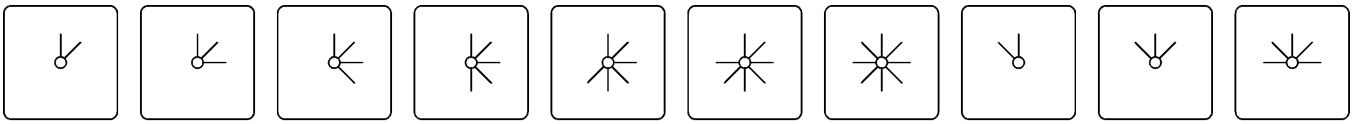


PN21 PN22 PN23 PN24 PN25 PN26 PN27 PN28

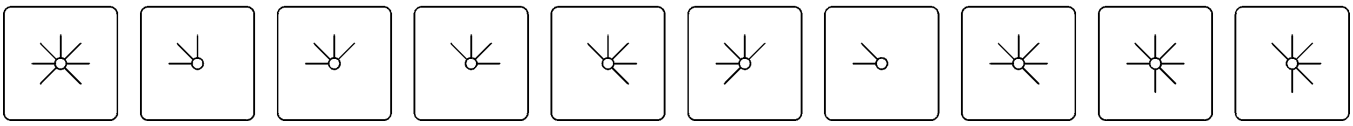


Switching angle 45°

PN30 PN31 PN32 PN33 PN34 PN35 PN36 PN37 PN38 PN39

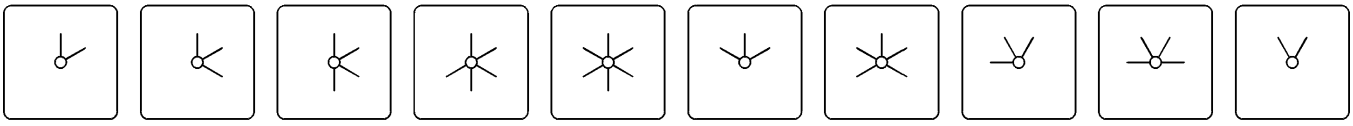


PN40 PN41 PN42 PN43 PN44 PN45 PN46 PN47 PN48 PN49

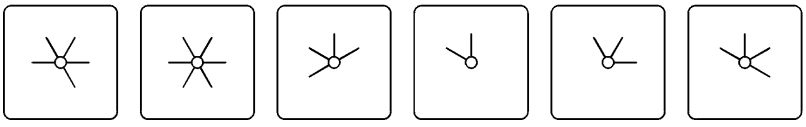


Switching angle 60°

PN50 PN51 PN52 PN53 PN54 PN55 PN56 PN57 PN58 PN59

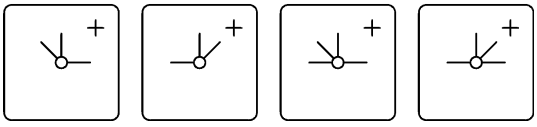


PN76 PN77 PN78 PN79 PN150 PN151



Switching angle 45/90°

PN70 PN71 PN72 PN73

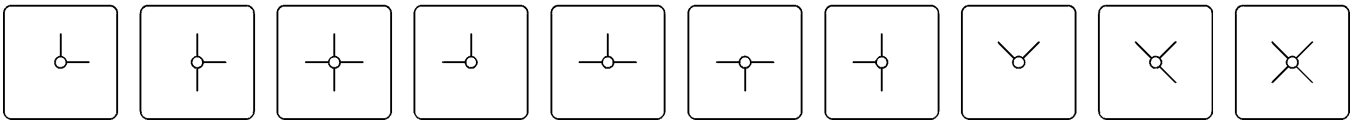


+) Not available for switch types M10, M10H and M20

Switching angles

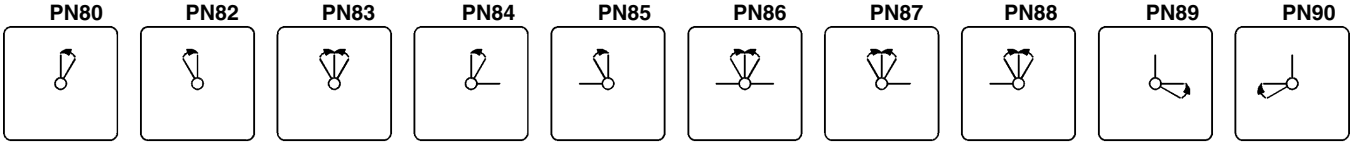
Switching angle 90°

PN60 PN61 PN62 PN63 PN64 PN65 PN66 PN67 PN68 PN69

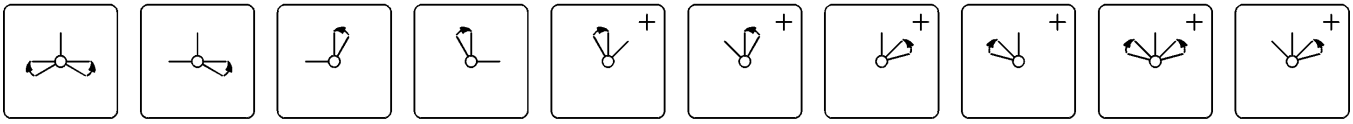


Momentary settings and special combinations

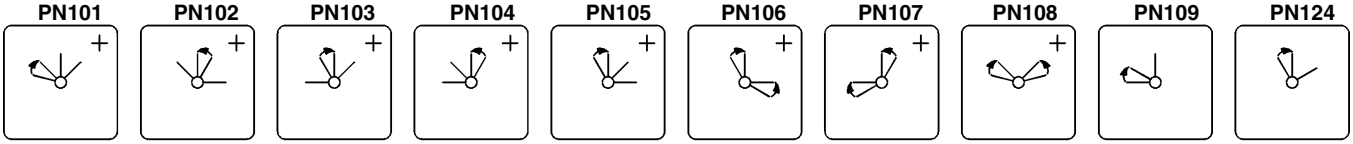
PN80 PN82 PN83 PN84 PN85 PN86 PN87 PN88 PN89 PN90



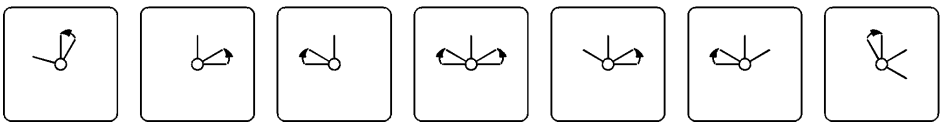
PN91 PN92 PN93 PN94 PN95 PN96 PN97 PN98 PN99 PN100



PN101 PN102 PN103 PN104 PN105 PN106 PN107 PN108 PN109 PN124

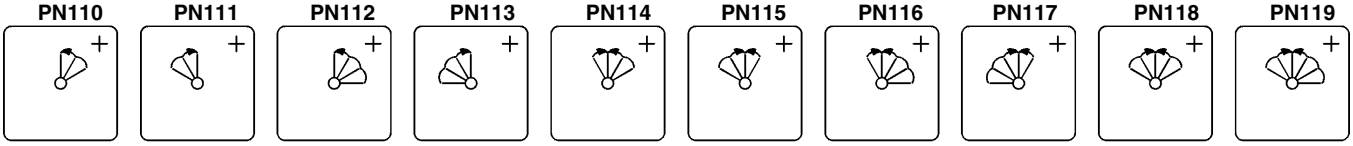


PN125 PN126 PN127 PN128 PN129 PN130 PN131

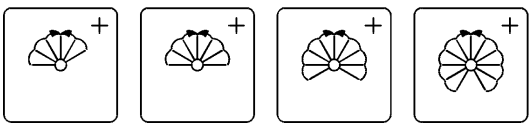


Spring return over several settings

PN110 PN111 PN112 PN113 PN114 PN115 PN116 PN117 PN118 PN119



PN120 PN121 PN122 PN123



+) Not available for switch types M10, M10H and M20

Handles and drive units

Special actuating mechanisms and ancillary attachments can be provided for many switch sizes and designs. Here, the switch type is followed by order code for the ancillary attachment.

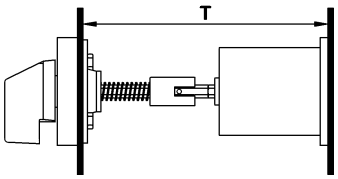
Ordering example: Cam switch N20 GF W3R with removable knob
Order type: **N20 E W3R +STGR**

Dimensions see page 262

	Ordering Code	Suitable for designs	Suitable for switch type
Removable knob drive The operating knob is designed to be removable, and can be withdrawn in any setting. The switch shaft is covered when the knob is withdrawn.	**+STGR**	E P	M10H, M20, N20, N33F M10, N20, N33F
Removable knob drive 2 The operating knob is designed to be removable. It can be withdrawn in one setting, to be stated when ordering.	**+STGR2**	E P	M10H, M20, N20, N33F M10, N20, N33F

Door couplings

For switches with door couplings it is necessary to state the installation depth - that is, the distance between mounting level of the switch and the inside edge of the door (dimension T).



Door couplings are available for switches to be installed in switchgear cabinets or distribution boards with hinged doors. These permit the doors to be openened without removal of the operating knobs.

Ordering example: Cam switch N100 V A3 with lockable door coupling, moisture protected IP65, dimension T=580mm
Order type: **N100 V A3 +TK2FR/580**

Dimensions see page 263

	Ordering Code	Suitable for designs	Suitable for switch type
Door coupling Protection class from front: IP65 5-hole mounting	**+TKE/...**	V, SM	M10H, M20, N20, N33F
Door coupling locked Protection class from front: IP65 5-hole mounting Doors only open at a given switch setting: unless otherwise stated, the "OFF" setting.	**+TK2E/...**	V, SM	M10H, M20, N20, N33F
Door coupling locked Protection class from front: IP65 Central fixing Ø22mm Doors only open at a given switch setting: unless otherwise stated, the "OFF" setting.	**+TK2Z/...**	V, SM	M10H, M20, N20, N33F

Door coupling Protection class from front: IP40 5-hole mounting	**+TK/...**	V	N40, N60, N80, N100, N200 L100, L160, L400, L600 L800
Door coupling Protection class from front: IP54 5-hole mounting	**+TKFR/...**	V	N40, N60, N80, N100, N200 L100, L160, L400, L600 L800

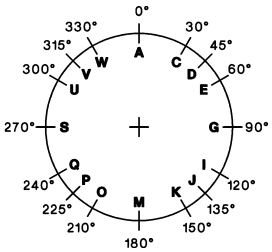
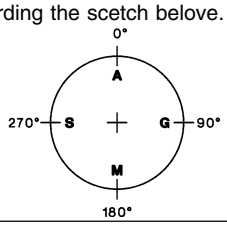
Door coupling locked Protection class from front: IP40 5-hole mounting Doors only open at a given switch setting: unless otherwise stated, the "OFF" setting.	**+TK2/...**	V	N40, N60, N80, N100, N200 L100, L160, L400, L600 L800
Door coupling locked Protection class from front: IP54 5-hole mounting Doors only open at a given switch setting: unless otherwise stated, the "OFF" setting.	**+TK2FR/...**	V	N40, N60, N80, N100, N200 L100, L160, L400, L600 L800

Lockable switches

Key-operated and lockable switches are supplied with two keys. Additional keys or other types of lock on request.

Ordering example: Cam switch N20 E A3 key operated
Order type: **N20 E A3 +SA**

Dimensions see page 264 and 265

	Ordering Code	Suitable for designs	Suitable for switch type
 **Key operated switch** Lock Willenhal FT101, key removable in all lockable settings. Other types of lock on request. Maximum number of cells M10 - N33F: 6 N40, N60: 2	**+SA**	E, V, SM E, V P SMA UP	M10H, M20, N20, N33F N40, N60 M10, N20, N33F, N40, N60 M10H, M20 M10
 **Key operated switch,** key removable only in some settings. Add letter of setting where key is removable to ordering code according to the scetch below. 	**+SA/.**		
 **Key operated switch IP65** Lock Ronis R455, key removable in all lockable settings. **Key operated switch,** key removable only in some settings. Add letter of setting where key is removable to ordering code according to the scetch above.	**+SA** **+SA/.**	Z, ZO	M10H, M20
 **Key operated switch** Lock KABA8, key removable in all lockable settings. **Key operated switch,** key removable only in some settings. Add letter of setting where key is removable to ordering code according the scetch below. 	**+SAK** **+SAK/.**	E	M10H, M20
 **Key operated switch with barrel for special security functions** Lock EVVA EHZ50/5 Nickel matt Special version which prevents not only switching but also access to the cable ends and removal of the switch when locked. Maximum number of cells Design E, P: 4 Design UP : 3	**+SASI**	E P UP	M10H, M20 M10, M20 M10, M20
Key operated switch for special security functions without lock for use of lock EVVA EHZ50/5 or with same dimensions Maximum number of cells Design E, P: 4 Design UP : 3	**+SASO**	E P UP	M10H, M20 M10, M20 M10, M20

Padlock devices

A range of padlock devices designed to prevent from being turned on by unauthorized personnel, or during maintenance and repair work, can be supplied.
Dimensions see page 266

Ordering example: Cam switch N33F E A3 with interlocking device SV3 suitable for 3 padlocks
Order type: **N33F E A3 +SV3**

	Padlock device Description	**Ordering Code**	Suitable for designs	Suitable for switch type
	**Padlock device** Standard version **black**, otherwise **red**, for 1 or 2 padlocks. Shackles up to Ø6mm Standard version **black** 64 x 64mm, otherwise **red** 64 x 64mm	**+SV1** **+SV1R** **+SV164** **+SV164R**	E, V, SM P, PF E, V P, PF	M10H, M20 M10 M10H, N20, N33F N20, N33F
	**Padlock device** Standard version **black**, otherwise **yellow** insert plate and **red** twist knob for 1-3 padlocks. Shackles up to Ø8,5mm Prior to insertion of the first padlock, a red locking ledge must be depressed. This indicates that the switch is locked.	**+SV3** **+SV3R**	E, V E, V E, V PF	N40, N60, N80, L100, L160 N100, N200, L400, L600, L800, L1200 N40, N60, N80, N100, N200
	**Padlock device** Standard base **grey**, locking ring **black**, or with **yellow** base and **red** locking ring. Locking ring for 1-3 padlocks. Shackles up to Ø6mm Standard base **grey**, locking ring **black** 88 x 88mm, or with **yellow** base and **red** locking ring 88 x 88mm	**+SV4** **+SV4R** **+SV488** **+SV488R**	E, V SM P, PF E, V E, V P, PF	M10H, N20, N33F M10H, N20, N33F N20, N33F N20, N33F N40, N60, N80 N40, N60, N80
	**Key lock device** With a cylinder lock in the lock attachment, one or more switch settings are lockable (state when ordering). The operating knob can only be turned when unlocked. The key can be withdrawn wheter locked or unlocked. Special versions, in which the key cannot be withdrawn when in some (unlokkable) settings can be supplied.	**+SZ**	E, V SM	alle M10H, M20, N20, N33F
	Key lock device Special version for on-off switches, in which it is possible to switch off without a key.	**+SZ2**	E, V SM	alle M10H, M20, N20, N33F

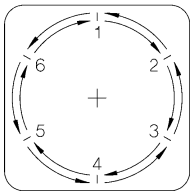
Switch interlocks

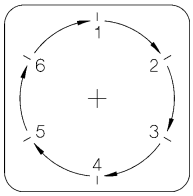
A wide range of locks and interlocking devices, designed to prevent accidental or hazardous switching, can be supplied.

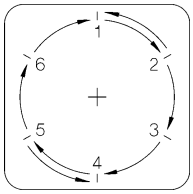
Ordering example: Cam switch N20 E A3 with push button switch lock
Order type: **N20 E A3 +DV**

Dimensions see page 267

Description	Ordering Code	Suitable for designs	Suitable for switch type
Push button interlock The switch can only be actuated when the pushbutton is simultaneously depressed (two-handed operation).	**+DV**	E, V	all
Interlock with electrical contact The switch can only be actuated when the pushbutton, which also operates a make and break contact, is actuated (for external interlocking devices or safety measures).	**+ET**	E, V	all
Magnetic interlock The switch can only be actuated when an electromagnet is simultaneously excited. When ordering, voltage and percentage duty cycle of the magnet coll should be stated.	**+MV**	E	N20, N33F, N40, N60, N80 N100, N200
Circular switch Switches that have the maximum number of settings for a given switching angle can be made without a stop position, permitting direct switching from the last to the first setting.	**+RU**	all	all
Backswitch 1 Special version of the circular switch, in which the switch can only be turned in one direction.	**+RS1**	all	all
Backswitch 2 Special version of the circular switch, in which, in given positions, the switch can only be operated in one direction.	**+RS2**	all	all



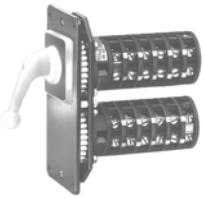




Couplings and stop mechanism

A range of couplings and stop mechanisms for trouble-free operation of switches with a very large number of contacts can be supplied.
Dimension see page 268

Ordering example: Cam switch N200 V ST0113 spread over three columns interconnected by gears
Order type: **N200 V ST0113 +ZK3**

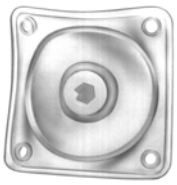


Description	Ordering Code	Suitable for designs	Suitable for switch type
Coupling of two columns For simultaneous drive of two switch columns (with very large number of switch cells or limited installation depth).	**+ZK2**	E, V	all
Coupling of three columns For simultaneous drive of three switch columns.	**+ZK3**	E, V	all
Coupling of different switch sizes For attachment of control switches (auxiliary contacts) to larger switches. M10H, M20 in sizes E and H. N20 to N80 in size L.	**+ZWK**	E	N40, N60, N80, L100, L160 N100, N200, L400, L600, L800, L1200
Delayed action switch Using a delayed action coupling, two switch shafts - a main shaft and delayed shaft - can be coupled, such that the delayed shaft is rotated together with the main shaft once a given angle of rotation is reached (e.g. for off-load return of switches used with pole-changing motors).	**+SK**	E, V G, GF	N20, N33F, N40, N60, N80 N20
Second stop mechanism With switches in which a large number of contacts is simultaneously operated, use of a second stop mechanism is sometimes necessary, in order to ensure precise switching to the next setting.	**+RW2**	all	all
Metal stop mechanism for extreme mecanical stress on the stop mechanism, e.g. where many contacts are switched at the same time. Not for PN110 to PN123	**+MRW**	E, V E, V E, V G, GF	N40, N60, N80, L100, L160 N100, N200, L400, L600, L800, L1200 N20

Special versions

A number of special versions can be supplied for adaptation of switches to various conditions of use.

Ordering example: Cam switch M10H E U3 with large front plate
Order type: **M10H E U3 +GFP**



Description	**Ordering Code**	Suitable for designs	Suitable for switch type
Switch shaft sealing For increased front protection class on IP54.	**+WD**	E, V SM	N20 to L1200 N20, N33F
Front plate/switch shaft sealing For increased front protection class on IP65. In this version, a wider hole is required for the shaft. Dimensions see page 268	**+FPWD**	E, V, SM	N20, N33F
Extended switch shaft For adaptation of switch designs V and SM to the enclosure depth. State additional shaft length when ordering.	**+VW/...**	E, V SM	all M10H, M20, N20, N33F
Large front plate Switch with front plate and operating knob of the next size (for replacement of older, larger switches or aesthetic reasons).	**+GFP**	E, V, SM	M10H, N20, N33F
Switch with pilot lamp lamp red, 230V lamp red, 400V lamp green, 230V lamp green, 400V	 **+SLR/230** **+SLR/400** **+SLG/230** **+SLG/400**	E P UP	all M10, N20, N33F, N40, N60 M10, N20
Gold plated contacts For electronic circuits with low voltages and currents.	**+GK**	all	M10H, M20, N20, N33F
Tropical proof type	**+TR**	all	all
Neon safety switch For all-pole switching off of neon advertisement circuits by the Fire Brigade. Dimensions see page 268	**+FEU**	E	N20, N33F

Accessories

A number of special versions can be supplied for adaptation of switches to various conditions of use.
Dimensions see page 267

Ordering example: Cam switch N20 E A3 with terminal cover plate
Order type: **N20 E A3 +KLAD**

Description	**Ordering Code**	Suitable for designs	Suitable for switch type
Terminal cover plate Prevents accidental touching of live terminals (requirement for main switches according to VDE 0113) only for 2 cells for all cells	**+KLAD** **+KLAD**	E, V E, V	N20, N40, N60, N80 N100, N200 N33F
Moisture proofing caps Protection class from rear: IP54. For protection of the switch from dust and moisture (e.g. when installed in machine pedestals). For switch mounting from the front and rear. Conical cable entry glands. Maximum number of cells: M10H 7 N20 5 N40 4 N60 2	**+FR**	E	M10H, N20, N40, N60
 **Angled terminals** For easy connection of inaccessible switches. Unless otherwise stated, all terminals specified with markings are equipped in this manner. A distinction is drawn between left and right angled terminals. Seen from the switch end, the left terminals are located above left and below right; conversely, right terminals are above right and below left.	**+WK**	E,V	M20, N20, N40, N60, N80, N100
 **Fast-on connectors** For 6,3 x 0,8mm plugs.	**+AMPZ**	E, V	M20, N20
Earth terminals 2 terminals, connected with one another, insulated from switch column: for earth conductors.	**+PE**	E, V, P, PF PF G, GF	all M10, N20, N33F, N40, N60 N80, N100, N200 N20
Additional rectangular escutcheon plate 1 line Dimensions see page 261	**SRE**	E, Z, V, SM	all
Big additional rectangular escutcheon plate for 2 lines Dimensions see page 261	**SRE2**	E, V	M10H, M20, N20, N33F
Spare key for key operated switches with Lock Willenhal FT101	**J7101**	E, V, P SMA	M10H, M20, N20, N33F,N40 M10H, M20
Spare key for key operated switches with Lock Ronis R455	**B4-R455**	Z, ZO	M10H, M20
Wrench for switches with central fixing	**J7049**	Z, ZO	M10H, M20

Switching Programs according to Customer Requirements

As a result of their modular construction, TELUX cam switches are particularly suitable for manufacturing of special variants. According to its function, each pair of contacts in the switch is adapted to the desired program by appropriate design of the cam plate. In the case of switches with an overall switching angle of more than 180°, provision must made for a cam plate in each switching cell, controlling two opposite, independent contact pairs with matching programs (does not apply to M10, M10H, M20 and N20).
Depending on the desired contact program for the special switch, it may often be impossible to make full use of all switching cells, that is, to include the maximum possible number of contacts. In determining the number of cells or switch length, one-contact cells will sometimes be resorted to.
Switch sizes M10, M10H, M20 and N20 are exceptions to this rule. Here, two cam plates can be built into each cell, so that both contacts are independently controlled (full use of the cells with special programs).

In all special switches with overall switching angles of less than 180°, the number of cells required is calculated by having the total number of contacts in the switching program.
When planning for switches with special programs, choice of the optimum switching angle thus plays an important part. The listing of all the options for lay-out of switch settings, on pages 241 and 242, should be an aid to planning (position numbers PN).
If special markings are to be engraved on the escutcheon plates, it is vital to take account of the available space. It is advisable to use abbreviations.
We provide forms (see page 269) on request, free of charge, to give a clear overview when special programs are being defined. Switch size, design, type of operating knob and desired switching angle, as well as the function of the contacts, are entered on these forms. Provision has also been made in them for entry of details as to escutcheon plate engravings or other special requirements.

Ordering Example

Order sheet D399E

Cam switches with special switching program
Benedict GmbH
A-1220 Vienna, Lieblgasse 7
Phone: 251 51-0 Fax: 251 51-88

Customer:

Switch Type			
M4H			
M10			
M10H	X		
M20			
N20			
N33F		L100	
N40		L160	
N60		L400	
N80		L600	
N100		L800	
N200		L1200	

Design		
Panel mounting	E	
Central fixing	Z	X
	ZO	
Base mounting	V	
Snap-on mount.	SM	
	SMA	
Plastic enclosure	P	
IP65	PF	
Cast enclosure	G	
IP65	GF	

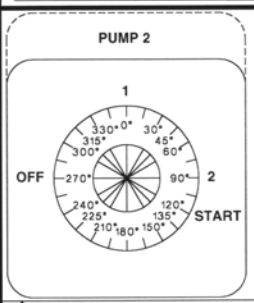
Optional extras

Circular switch

Key removeable

Explanations:
Contact closed over several positions — X
Spring return from pos. ↺

Handles			Handle colour	
Twist knob	R (standard)		black (standard)	X
Instrument knob	G (standard M4H)	X	red	
Toggle knob	K (standard SMA)		grey (standard SMA)	
Pointer knob	Z		white	
Ball type handle	B		cream-coloured	
Lever handle	H		yellow	
Hand wheel	HR		blue	



Connect. / Terminals: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47

Terminals / Connect.: 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Marking for switch position	Degree
OFF	270
1	0
	45
2	90
START	120

Order sheet A4 see page 269

Utilization Categories

For easier choice of devices and in order to make the comparison of different products simplier are utilization categories for cam switches according to IEC 947-3, VDE 0660 Part 107 and auiliary contacts according to IEC 947-5-1 and VDE 0660 Part 200 determind. The Table below offers divers utilization catagories and assorted test conditions.

Kind of current	Category fre-quent oper-ation	Category infre-quent oper-ation	Typical applications	Rated operational current	Test conditions for the number of on-load operating cycles (normal service) Make I/I_e	Make U/U_e	Make cosφ	Break I_c/I_e	Break U_r/U_e	Break cosφ	Test conditions for making and breaking capacities (operation in fault case) Make I/I_e	Make U/U_e	Make cosφ	Break I_c/I_e	Break U_r/U_e	Break cosφ
Alter-nating Current	**AC20A**	**AC20B**	No-load conditions	all values	-	-	-	-	-	-	-	-	-	-	-	-
	AC21A	**AC21B**	Switching of resistive loads including moderate overloads	all values	1	1	0,95	1	1	0,95	1,5	1,05	0,95	1,5	1,05	0,95
	AC22A	**AC22B**	Switching of mixed resistive and inductive loads including moderate overloads	all values	1	1	0,8	1	1	0,8	3	1,05	0,65	3	1,05	0,65
	AC23A	**AC23B**	Switching of motor loads or other highly inductive loads	$0<I_e\leq100A$ all values $100A<I_e$	1	1	0,65	1	1	0,65	10 10	1,05	0,45 0,35	8 8	1,05	0,45 0,35
	AC2		Slip-ring motors: Starting, plugging	all values	2,5	1	0,65	2,5	1	0,65	4	1,05	0,65	4	1,05	0,65
	AC3		Squirrel-cage motors: Starting, switching off motors during runing	$0<I_e\leq100A$ all values $100A<I_e$	$I_e\leq17A$ 6 $I_e>17A$	1	0,65 0,35	$I_e\leq17A$ 1 $I_e>17A$	0,17	0,65 0,35	10	1,05	0,45 0,35	8	1,05	0,45 0,35
	AC4		Squirrel-cage motors: Starting, plugging, inching	$0<I_e\leq100A$ all values $100A<I_e$	$I_e\leq17A$ 6 $I_e>17A$	1	0,65 0,35	$I_e\leq17A$ 6 $I_e>17A$	1	0,65 0,35	12	1,05	0,45 0,35	10	1,05	0,45 0,35
	AC15		Control of electromagnetic loads (> 72VA)	-	10	1	0,7	1	1	0,4	10	1,1	0,3	10	1,1	0,3
					I/I_e	U/U_e	$L/R^{1)}$	I_c/I_e	U_r/U_e	$L/R^{1)}$	I/I_e	U/U_e	$L/R^{1)}$	I_c/I_e	U_r/U_e	$L/R^{1)}$
Direct current	**DC20A**	**DC20B**	No-load conditions	all values	-	-	-	-	-	-	-	-	-	-	-	-
	DC21A	**DC21B**	Switching of resistive loads including moderate overloads	all values	1	1	1	1	1	1	1,5	1,05	1	1,5	1,05	1
	DC22A	**DC22B**	Switching of mixed resistive a. induct. loads incl. moderate overloads (shunt motors)	all values	1	1	2	1	1	2	4	1,05	2,5	4	1,05	2,5
	DC23A	**DC23B**	Switching of highly inductive loads (e.g. series motors)	all values	1	1	7,5	1	1	7,5	4	1,05	15	4	1,05	15
	DC3		Shunt-motors: Starting, plugging, inching	all values	2,5	1	2	2,5	1	2	4	1,05	2,5	4	1,05	2,5
	DC5		Series-motors: Starting, plugging, inching	all values	2,5	1	7,5	2,5	1	7,5	4	1,05	15	4	1,05	15

U_e Rated operational voltage, U Voltage before make, U_r Recovery voltage, I_e Rated operational current, I Current made, I_c Current broken
1) Time in milliseconds (ms)

Note:
By plugging, is understood stopping or reversing the motor rapidly by reversing motor primary connections while the motor is running.

By inching (jogging), is understood energizing a motor once or repeatly for short periods to obtain small movements of the driven mechanism.

Technical Data

Data according to IEC 947-3, IEC 947-5-1, VDE 0660, EN 60947-3, EN 60947-5-1

Type			M10 P	M10H	M20	N20	N33F	N40	N60	N80	N100	N200
Rated therm. current I_{th}	open	A	20	20	32	32	50	63	85	115	150	250
Rated therm. current I_{the}	encl.	A	20	20	32	32	50	63	85	115	150	250
Rated operational voltage U_e		V	440	690 [1]	690 [1]	690 [1]	690 [1]	690 [1]	690 [1]	690 [1]	690 [1]	690 [1]
Disconnection property [2] acc. to VDE, IEC up to		V	440	440	440	440	440	690	440	440	690	690
Breaking capacity I_{eff}												
3 x 220-440V		A	160	160	220	220	260	380	520	740	900	1100
3 x 500V		A	-	100	160	160	200	290	380	560	680	850
3 x 660-690V		A	-	80	120	120	150	200	290	520	450	-
Utilization categ. AC21A, AC21B Switching of resistive loads including moderate overloads Rated operational current I_e		A	20	20	32	32	50	63	85	115	150	250
Utilization categ. AC23A, AC23B Switching of motor loads or other highly inductive loads Rated current I_e	400V	A	16	16	30	30	45	45	60	85	105	135
Power rating	220-240V	kW	4	4	7,5	7,5	11	15	22	30	40	40
3-phase 3-pole	380-440V	kW	7,5	7,5	15	15	22	22	30	45	55	70
	500V	kW	-	7,5	15	15	22	22	30	45	55	70
	660-690V	kW	-	7,5	15	15	22	18,5	30	45	45	-
Star-Delta-Switches for squirrel cage motors Power rating												
3-phase 3-pole	220-240V	kW	3,7	3,7	7,5	7,5	8	11	15	18,5	37	40
	380-415V	kW	7,5	7,5	15	15	18,5	18,5	25	30	40	70
Utilization category AC3 Switching of three-phase motors Rated current I_e	400V	A	12	12	22	22	30	30	50	60	80	135
Power rating	220-240V	kW	3	3	5,5	5,5	7,5	7,5	15	18,5	37	40
3-phase 3-pole	380-440V	kW	5,5	5,5	11	11	15	15	25	30	40	70
	500V	kW	-	5,5	11	11	15	15	25	30	40	70
	660-690V	kW	-	5,5	11	11	15	15	25	30	40	-
Utilization category AC4 squirrel cage motors, inching												
Power rating	220-240V	kW	0,55	0,55	2,2	2,2	3,7	4	5,5	6	11	18,5
3-phase 3-pole	380-440V	kW	1,5	1,5	4	4	5,5	7,5	11	15	18,5	35
	500V	kW	-	1,5	4	4	5,5	7,5	11	15	22	35
	660-690V	kW	-	1,5	4	4	5,5	7,5	11	15	22	-
Utilization category AC15 Control of electromagnetic loads, contactors, Rated current I_e												
	up to 240V	A	6	6	12	12	16	-	-	-	-	-
	380 -440V	A	4	4	6	6	7	-	-	-	-	-
2-pole in series	500V	A	-	5	8	8	10	-	-	-	-	-
Utilization categ. DC21A, DC21B Switching of resistive loads Time constant L/R≤1ms Rated current I_e												
1-pole	30V	A	20	20	32	32	40	63	80	100	150	250
	60V	A	4	4	6	6	20	30	30	30	-	-
	110V	A	0,6	0,6	3	3	4	6	6	6	-	-
	220V	A	0,5	0,5	0,8	0,8	0,8	1,3	1,3	1,3	2,5	2,5
	440V	A	-	-	0,4	0,4	0,4	0,6	0,6	0,6	0,7	0,7
Utilization category DC3 - DC5 Switching of shunt motors and series motors Time constant L/R≤15ms Rated current I_e												
1-pole	30V	A	8	8	13	13	16	25	32	40	60	100
	60V	A	1	1	2,4	2,4	4	12	12	12	-	-
	110V	A	0,3	0,3	0,5	0,5	1,6	2,4	2,4	2,4	-	-
Protection class ot terminals [1]			IP00	IP20	IP00	IP00	IP20	IP00	IP00	IP00	IP00	IP00

1) suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): Uimp = 6kV. Data for other conditions on request
2) valid for lines with grounded common neutral termination, overvoltage category III , pollution degree 3.
3) Protection degree of the terminals with connected insulated conductor. Additional protection with terminal cover (KLAD).

Technical Data

Data according to IEC 947-3, IEC 947-5-1, VDE 0660, EN 60947-3, EN 60947-5-1

Type		M10 P	M10H	M20	N20	N33F	N40	N60	N80	N100	N200
Cable cross-sections											
solid	mm^2	1-2,5	1-2,5 [1]	1,5-6	1,5-6	2,5-10	2,5-16 [1]	6-25 [1]	6-35	10-50 [1]	50-150
flexible	mm^2	0,75-2,5	0,75-2,5 [1]	1-4	1-4	1,5- 6	2,5-10 [1]	6-25 [1]	6-35	10-35 [1]	35-120
flexible w. multicore cable end	mm^2	0,75-2,5	0,75-1,5	1-4	1-4	1,5- 6	2,5-6	6-16	6-35	10-25	-
Conductors to clamp per pole		2	2	2	2	2	2	1	1	1	1
Size of terminal screw		M3	M3,5	M4	M4	M4	M5	2xM5	2xM5	2xM6	M10
Tightening torque	Nm	0,6-1,2	0,8-1,4	1,2-1,8	1,2-1,8	1,2-1,8	2,5-3	2,5-3	2,5-3	3,5-4,5	10
	lb.inch	5-11	7-12	11-16	11-16	11-16	22-26	22-26	22-26	31-40	88
Short circuit protection											
Max. fuse size	gL (gG) A	20	20	35	35	50	63	100	125	160	250
Rated short-time withstand current (1sec. current)	A	250	250	400	400	500	800	1000	1400	1800	3000
Rated conditional short-circuit current	kA_{eff}	10	10	10	10	10	10	10	10	10	10
Short-time capacity											
Load duration	3s A	100	100	200	200	350	400	600	720	1000	2000
	10s A	60	60	130	130	230	250	400	480	600	1200
Note: Ratings applies to	30s A	35	35	85	85	110	160	250	300	500	600
contacts already closed	60s A	25	25	65	65	80	110	200	250	370	480
Power loss at AC21A	A	20	20	32	32	50	63	85	115	150	250
per pole	W	0,6	0,5	0,9	1,1	1,9	2	2,8	4,4	5,7	21
Switching of capacitive loads maximum making capacity up to 500V	A	140	140	300	300	350	400	600	700	900	1800

Data according to UL and cUL

Type			M10 P	M10H	M20	N20	N33F	N80	N100	N200	L400
Rated voltage		V~	300	600	600	600	600	600	600	600	600
Rated operational current	"General Use"	A	20	20	35	35	60	115	130	250	350
	with jumper	A	15	-	25	25	40	80	-	-	-
DOL-Rating 3-phase	110-120V	hp	1½	1½	5	5	7½	10	15	15	15
	200-208V	hp	2	2	5	5	10	15	25	25	25
	220-240V	hp	3	3	5	5	15	20	30	30	30
	440-480V	hp	-	5	10	10	25	40	40	60	60
	550-600V	hp	-	7½	15	15	30	50	50	75	75
DOL-Rating 1-phase	110-120V	hp	½	½	1½	1½	3	5	7½	7½	7½
	200-208V	hp	1	1	3	3	5	7½	15	15	15
	220-240V	hp	1½	1½	5	5	7½	10	15	20	20
Fuse size (RK5) 5kA / 600V	Manual Motor Controller and Motor Disconnect	A	40 [2]	40	80	80	150	200	300	350	350
Heavy pilot duty		AC	A300	A600	A600	A600	A600	-	-	-	-
Cable cross sections											
solid		AWG	12 - 20	12 - 20	10 - 18	10 - 18	10 - 12	10 - 12	10 - 14	-	-
flexible		AWG	14 - 20	14 - 20	8 - 18	8 - 18	6 - 12	2 - 12	1 - 14	250kcmil	500kcmil
Tightening torque		Nm	1.7	1-1.7	1.7-2.8	1.7-2.8	2.3-2.8	2.8	4.5	-	-
		lb.inch	15	9-15	15-25	15-25	20-25	25	40	-	-

1) Maximum cable cross-section with prepared conductor
2) 5kA / 300V

Technical Data

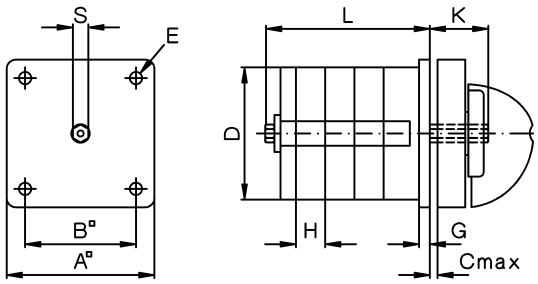
Data according to IEC 947-3, IEC 947-5-1, VDE 0660, EN 60947-3, EN 60947-5-1

Type			L100	L160	L400	L600	L800	L1200
Rated insulation voltage U_i		V	690 [2]	690 [2]	690 [2]	690 [2]	690 [2]	690 [2]
Rated thermal current I_{th}	open	A	125	180	400	600	800	1200
Rated thermal current I_{the}	encl.A	125	180	400	600	800	1200	
with conductor		mm²	50	70	40x5	40x10	busbar 2x40x10	busbar 2x50x10
Utilization category AC21A, AC21B								
Switching of resistive loads, including moderate overloads								
Rated operational current I_e		A	125	180	400	400	400	400
Shot-time current-carrying capacity								
Load duration		1s	-	-	4800	6500	8500	10000
		3s	800	1200	3600	5000	6500	8000
		10s	500	800	2000	3200	4000	5800
Note: Ratings applies to		30s	320	480	1200	1700	2200	3200
contacts already closed		60s	180	380	960	1300	1700	2300
Cable cross-sections								
solid or stranded		mm²	25-50 [1]	cable lug	busbar	busbar	busbar	busbar
flexible		mm²	25-50 [1]	70	40x5	40x10	2x40x10	2x50x10
flexible with multicore cable end		mm²	25-35	-	-	-	-	-
Size of terminal screw			2xM5	M8	M12	M16	M16	M16
Number of conductors to clamp per pole			1	1	1	2	1	1
Short circuit protection								
Max. fuse size	slow, gL (gG)	A	125	200	400	630	800	1250

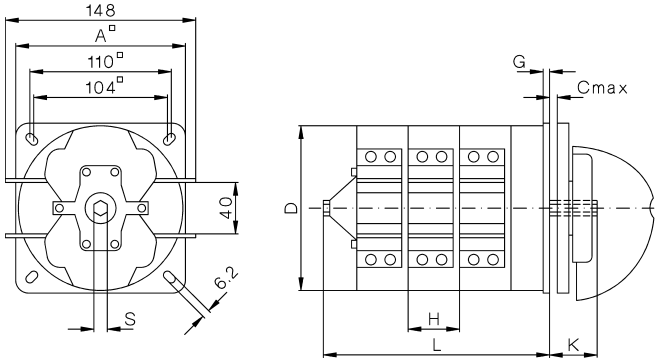
1) Maximum cable cross-section with prepared conductor
2) suitable for: earthed-neutral systems, overvoltage category I to III, pollution degree 3 (standard-industry): U_{imp} = 6kV. Data for other conditions on request

Dimensions (mm)

Panel mounting E
M10 - N100



N200

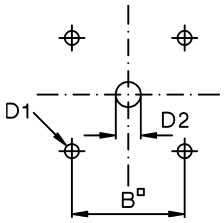


Type	A	B	C	D	D1	D2	D3	E	G	H	K	S
M10H	48	36	5	44 [1)]	5	8	-	4	3,5	9,5	19	SW5
M20	48	36	5	56	5	8	57	4	3,5	12,5	19	SW5
N20	64	48	5	56	5	12	57	4,2	3	12,5	20	SW7
N33F	64	48	5	58 [2)]	5	12	-	4,2	3	15,5	20	SW7
N40	86	68	7	80	6	12	82	5,2	3,5	18	24,5	SW9
N60	86	68	7	80	6	12	82	5,2	3,5	29,5	24,5	SW9
N80	86	68	7	80	6	12	82	5,2	3,5	29,5	24,5	SW9
N100	132	110	9	128	7	16	129	6,2	5	30	37	SW12
N200	132	110	9	128	7	16	-	6,2	5	40	37	SW12

1) 44,5 x 42

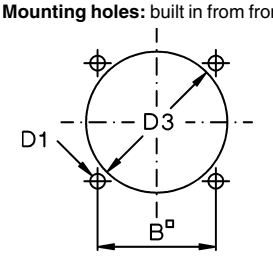
2) 58 x 58

Mounting holes: built in from ear

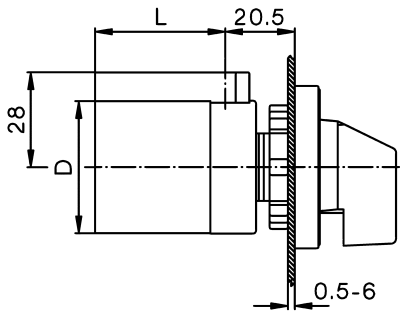


Type	Dimension L with .. cells 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
M10H	36,5	46	55,5	65	74,5	84	93,5	103	112,5	122	131,5	141	-	-	-
M20	38,5	51	63,5	76	88,5	101	113,5	126	138,5	151	163,5	176	-	-	-
N20	40,5	53	65,5	78	90,5	103	115,5	128	140,5	153	165,5	178	190,5	203	215,5
N33F	44	59,5	75	90,5	106	121,5	137	152,5	168	183,5	199	214,5	230	245,5	261
N40	52,5	70,5	88,5	106,5	124,5	142,5	160,5	178,5	196,5	214,5	232,5	250,5	268,5	286,5	304,5
N60	64	93,5	123	152,5	182	211,5	241	270,5	300	329,5	359	388,5	-	-	-
N80	64	93,5	123	152,5	182	211,5	241	270,5	300	329,5	359	388,5	-	-	-
N100	88	118	148	178	208	238	268	298	328	358	388	418	-	-	-
N200	96	136	176	216	256	296	336	376	416	456	496	536	-	-	-

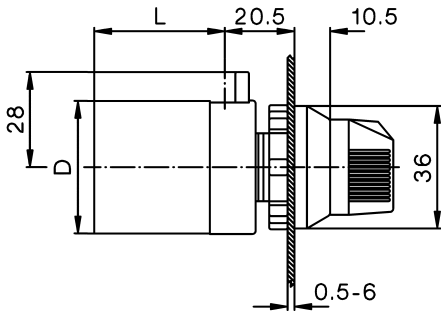
Mounting holes: built in from front



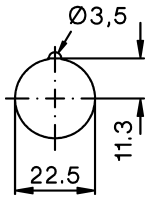
Central fixing Z
M10H, M20, N33F



Central fixing without escutcheon plate ZO
M10H, M20



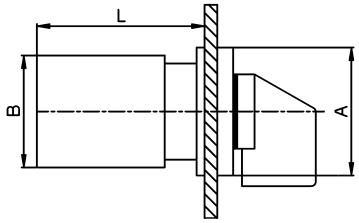
Mounting hole:



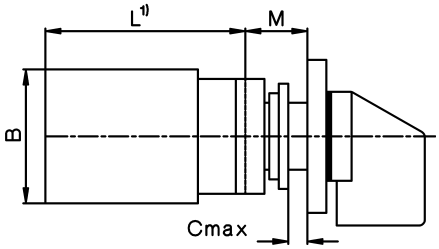
Further dimensions see tables above

Mini-Cam Switches M4H

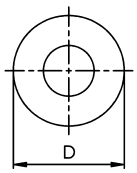
Panel mounting E



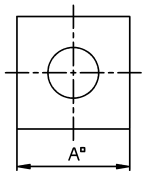
Central fixing Z, ZO



ZO



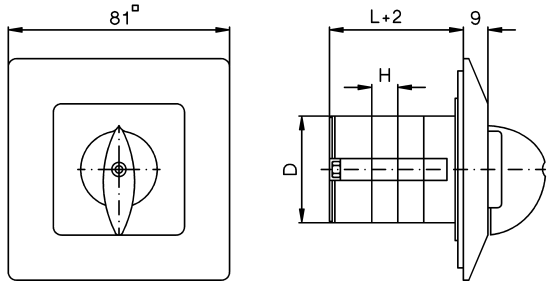
Z



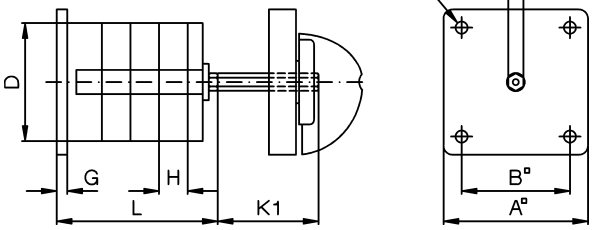
Type		A	B	D	M	Dimension L with .. cells 1	2	3	4	5	6	7	8
M4H	mm	30	28	29,5	12,5	38,5	50,5	62,5	74,5	86,5	98,5	110,5	122,5

Mounting holes see page 230

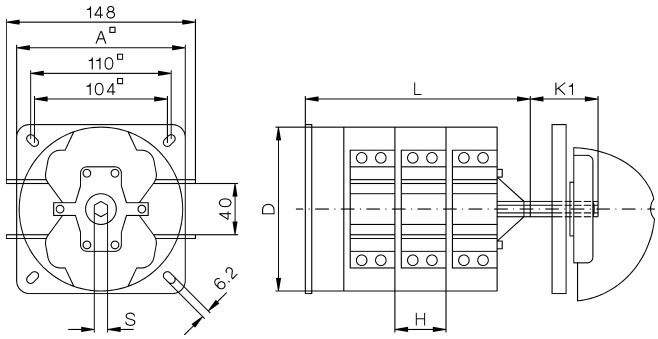
Flush mounting UP
M10



Base mounting V
M10H - N100



N200

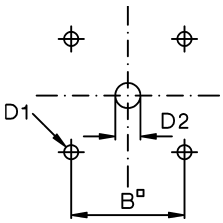


Type	A	B	D	D1	D2	E	G	H	I	K	K1	S
M10	48	36	39	5	8	4	3,5	9,5	6	19	41	SW5
M10H	48	36	44 [1)]	5	8	4,2	3	9,5	6	19	41	SW5
M20	48	36	56	5	8	4,2	3	12,5	6	19	47	SW5
N20	64	48	56	5	12	4,2	3	12,5	0	20	29	SW7
N33F	64	48	58 [2)]	5	12	4,2	3	15,5	0	20	31,5	SW7
N40	86	68	80	6	12	5,2	3,5	18	-	-	38,5	SW9
N60	86	68	80	6	12	5,2	3,5	29,5	-	-	49,5	SW9
N80	86	68	80	6	12	5,2	3,5	29,5	-	-	49,5	SW9
N100	132	110	128	7	16	6,2	5	30	-	-	79,5	SW12
N200	132	110	128	7	16	6,2	5	40	-	-	104	SW12

1) 42 x 44,5

2) 58 x 58

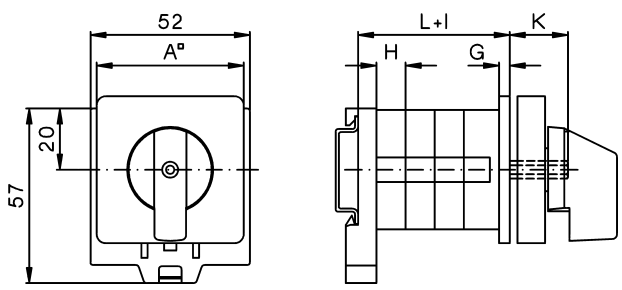
Mounting holes: for escutcheon plate



Type	Dimensions L with .. cells 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
M10	34,5	44	53,5	63	72,5	82	91,5	101	110,5	120	129,5	139	-	-	-
M10H	36,5	46	55,5	65	74,5	84	93,5	103	112,5	122	131,5	141	-	-	-
M20	38,5	51	63,5	76	88,5	101	113,5	126	138,5	151	163,5	176	-	-	-
N20	40,5	53	65,5	78	90,5	103	115,5	128	140,5	153	165,5	178	190,5	203	215,5
N33F	44	59,5	75	90,5	106	121,5	137	152,5	168	183,5	199	214,5	230	245,5	261
N40	52,5	70,5	88,5	106,5	124,5	142,5	160,5	178,5	196,5	214,5	232,5	250,5	268,5	286,5	304,5
N60	64	93,5	123	152,5	182	211,5	241	270,5	300	329,5	359	388,5	-	-	-
N80	64	93,5	123	152,5	182	211,5	241	270,5	300	329,5	359	388,5	-	-	-
N100	88	118	148	178	208	238	268	298	328	358	388	418	-	-	-
N200	96	136	176	216	256	296	336	376	416	456	496	536	-	-	-

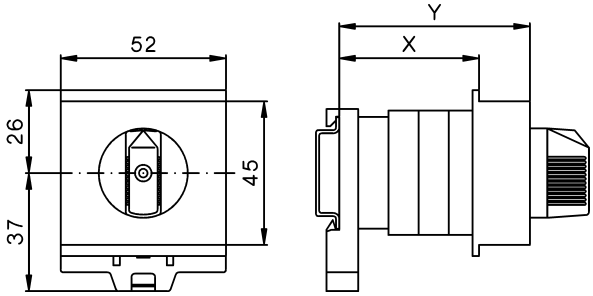
Snap-on mounting SM
M10H - N33F for 35mm DIN-rail mounting according to DIN EN 50022

Dimensions see tables above

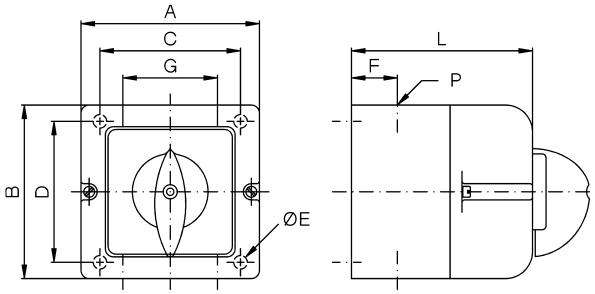


Swich with installation cover SMA
M10H, M20 for 35mm DIN-rail mounting according to DIN EN 50022

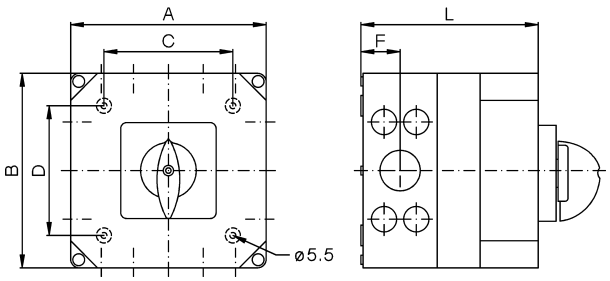
Type	Dimension X with .. cells 1, 2	3	4	5	Dimension Y with .. cells 1, 2	3	4	5
M10H	44	44	61	76	60	60	75	90
M20	44	61	76	76	60	75	90	90



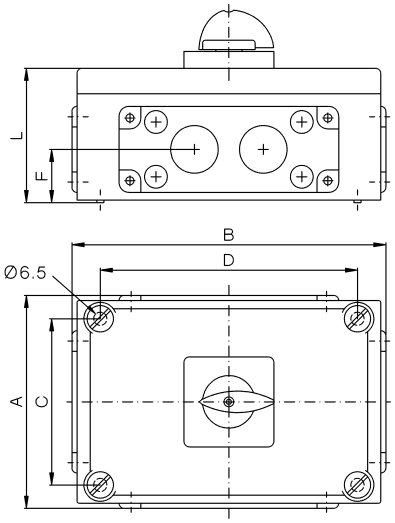
Plastic enclosed switches P, PF
M10 - N60



N60, N80



N100, N200



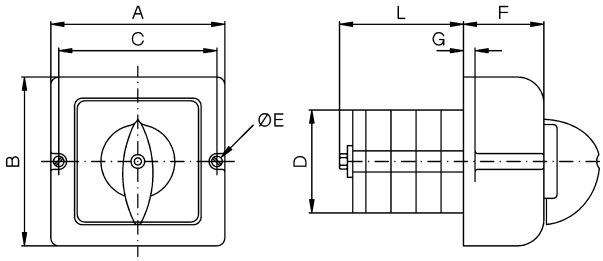
1) knock outs for M40/M32 + 4x M20 at top and bottom
M32/M25 + 4x M20 at the right and left hand side,

2) 2 flange plates with hole 50,5 at top and bottom

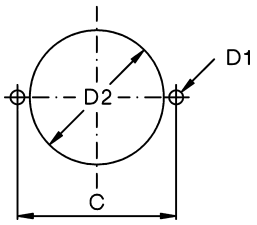
3) 2 flange plates with hole 50,5 at top and bottom, can also be mounted at the right and left hand side

Type	A	B	C	D	E	F	G	P	Dimension L with .. cells 1	2	3	4	5	6
M10	66	64	50	36	5	15,5	26	M20	43	52	62	71	81	90
N20	82	78	57	53	4,5	17	29	M20	66	66	80	94	108	122
N33F	112	108	85	50	5	20	50	M25	92	92	92	110	128	146
N40	112	108	85	50	5	20	50	M25	92	92	110	128	146	164
N60	112	108	85	50	5	20	50	M25	92	110	-	-	-	-
N60	182	180	120	120	5,5	36,5	-	1)	-	-	165	215	215	-
N80	182	180	120	120	5,5	36,5	-	1)	110	110	165	215	215	-
N100	210	310	165	255	6,5	52,5	-	2)	130	130	180	-	-	-
N200	310	310	255	255	6,5	52,5	-	3)	130	180	230	-	-	-

Motor terminal box mounting KE
M10 - N33F

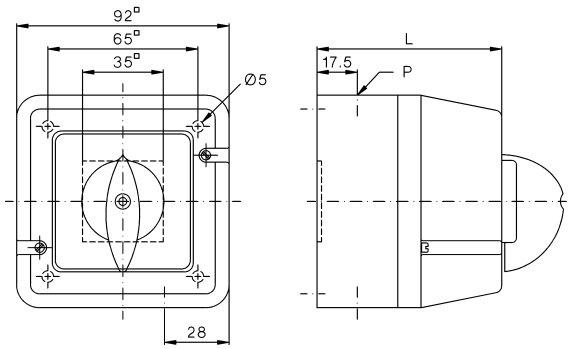


Mounting holes



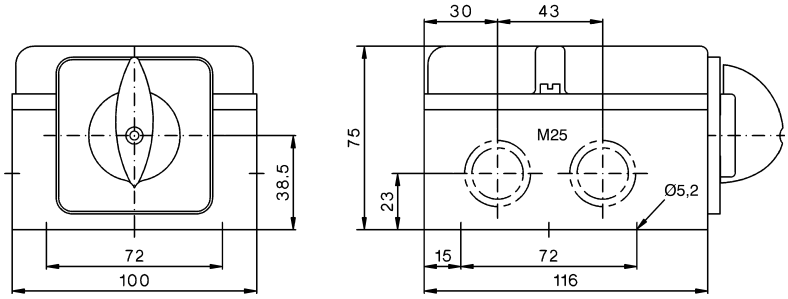
Type	A	B	C	D	D1	D2	E	F	G	Dimension L with .. cells 2	3	4	5	6
M10	66	64	58	39	4	48	3,2	24	6	22	31,5	41	50,5	60
N20	82	78	71	48	5	57	4,2	34	5	24,5	37	49,5	62	74,5
N33F	112	108	100	56	5	70	4,2	49	11	32,5	48	63,5	79	94,5

Plastic enclosed motor starter PM
N20

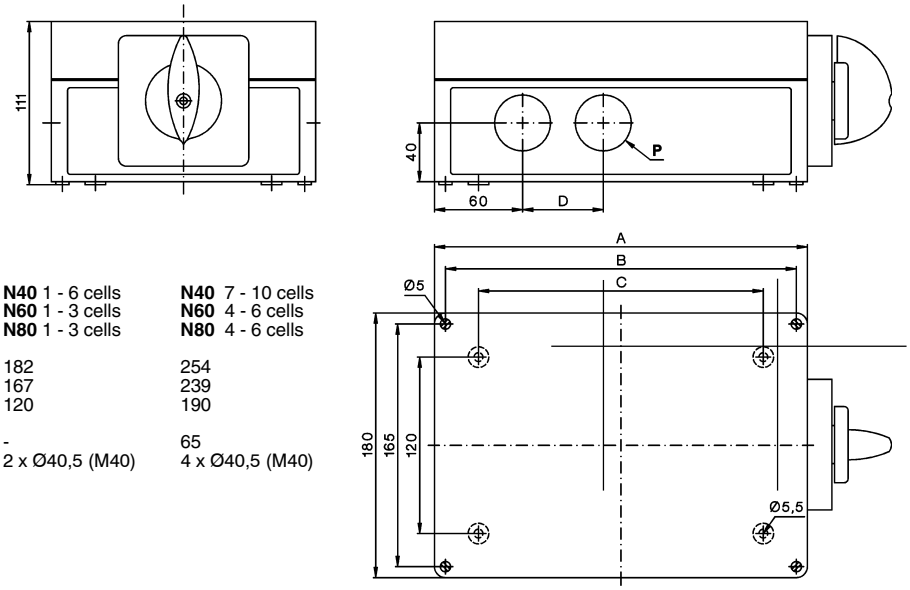


Typ	P	Dimension L with .. cells 1	2	3	4	5	6
N20	M25	80	80	80	92,5	105	117,5

Cast aluminium enclosed switches G, GF
N20



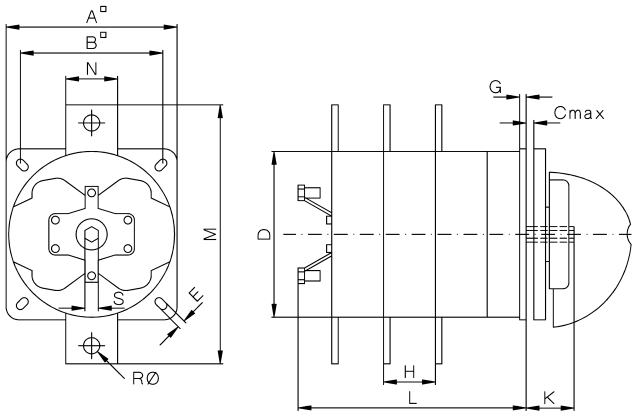
Plastic enclosure horizontal PLF (Replacement for cast aluminium enclosure G, GF)
N40, N60, N80



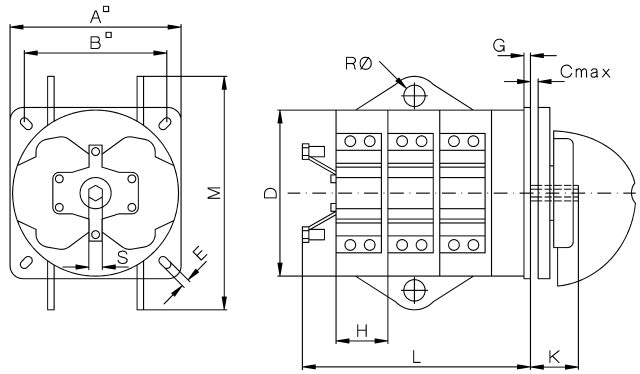
Type	**N40** 1 - 6 cells **N60** 1 - 3 cells **N80** 1 - 3 cells	**N40** 7 - 10 cells **N60** 4 - 6 cells **N80** 4 - 6 cells
A	182	254
B	167	239
C	120	190
D	-	65
P	2 x Ø40,5 (M40)	4 x Ø40,5 (M40)

Load Switches

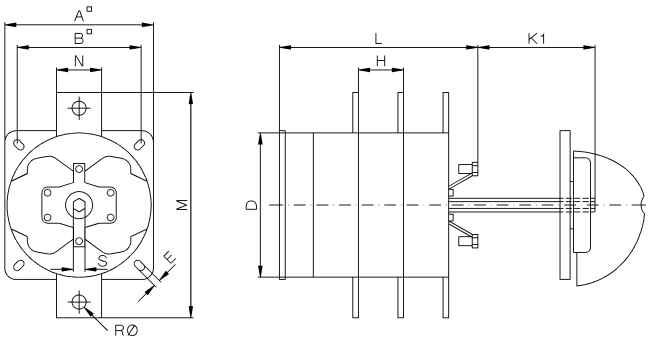
Panel mounting E
L100 - 400, L800, L1200



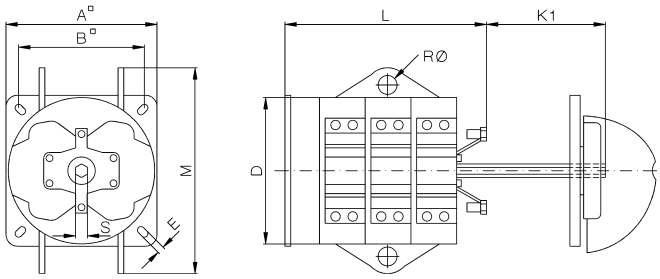
L600



Base mounting V
L100 - 400, L800, L1200

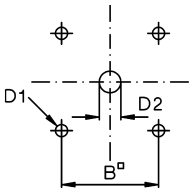


L600



Type	A	B	C	D	D1	D2	E	G	H	K	K1	M	N	R	S
L100	86	68	7	80	6	12	5,2	3,5	18	24,5	38,5	103	27	-	SW9
L160	86	68	7	80	6	12	5,2	3,5	29,5	24,5	38,5	115	-	8,5	SW9
L400	132	110	9	128	7	16	6,2	5	40	37	104	200	40	12,5	SW12
L600	132	110	9	128	7	16	6,2	5	40	37	104	180	-	16,5	SW12
L800	132	110	9	128	7	16	6,2	5	40	37	104	240	40	16,5	SW12
L1200	132	110	9	128	7	16	6,2	5	40	37	104	240	40	16,5	SW12

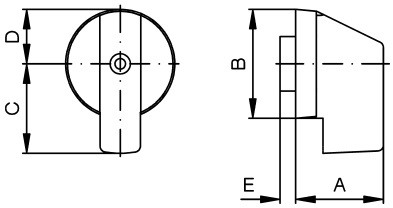
Mounting holes :



	Dimension L with .. cells											
Type	1	2	3	4	5	6	7	8	9	10	11	12
L100	52,5	70,5	88,5	106,5	124,5	142,5	160,5	178,5	196,5	214,5	232,5	250,5
L160	64	93,5	123	152,5	182	211,5	241	270,5	300	329,5	359	388,5
L400	96	136	176	216	256	296	336	376	416	456	496	536
L600	96	136	176	216	256	296	336	376	416	456	496	536
L800	96	136	176	216	256	296	336	376	416	456	496	536
L1200	96	136	176	216	256	296	336	376	416	456	496	536

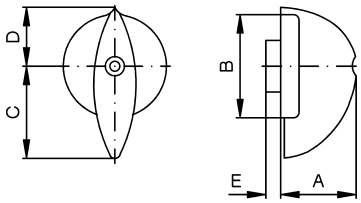
Operating Knobs and Handles

Instrument knob G.



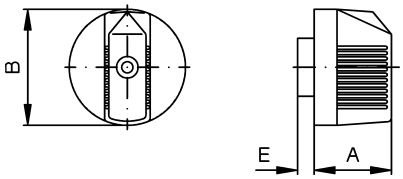
Type	A	B	C	D	E
M10, M10H, M20	23	28	24	14	4
N20, N33F	27	36	32	18	3
N40, N60, N80, L100, L160	36	47	42	24	3,5
N100, N200	48,10	75	63	37,5	-

Twist knob R.



Type	A	B	C	D	E
M10, M10H, M20	20,5	28	25	15	4
N20, N33F	24	36	29,5	19	3
N40, N60, N80, L100, L160	31	49	41	28	3,5
N100, N200, L400, L600, L800, L1200	50	75	62	41	2,5

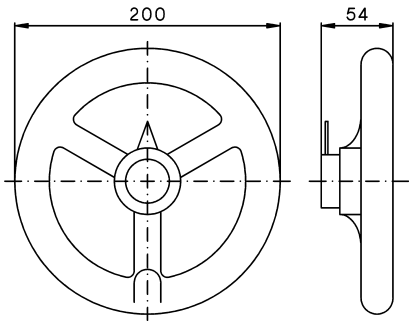
Toggle knob K.



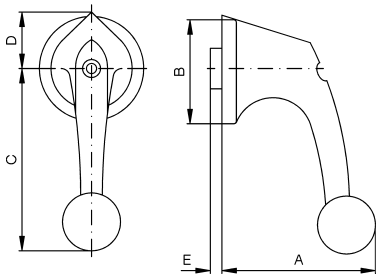
Type	A	B	E
M10, M10H, M20	18,5	28	4
N20, N33F	24	36	3

Hand wheel HR

N100, N200,
L400, L600, L800, L1200



Ball type handle B.



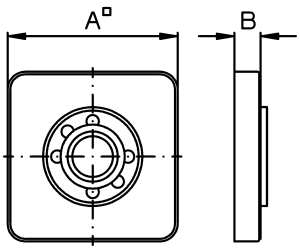
Type	A	B	C	D	E
N20, N33F	53	36,5	64	21	3
N40, N60, N80, L100, L160	62	49	82	31	3,5
N100, N200, L400, L600, L800, L1200	63	75	110	45	2,5

Code number for colour

grey	.1	white	.5
black	.2	blue	.6
red	.3	yellow	.7
cream-coloured	.4	euro-white	.8

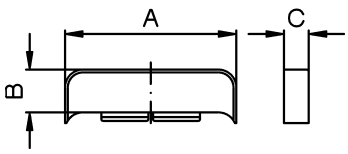
Escutcheon plates

Escutcheon plate



Type	A	B
M10, M10H, M20	48	7,5
N20, N33F	64	7,5
N40, N60, N80, L100, L160	88	8
N100, N200, L400, L600, L800, L1200	132	9

Rectangular additional plate SRE



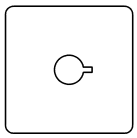
Type	A	B	C
M10, M10H, M20	48	12	7,5
N20, N33F	64	14	7,5
N40, N60, N80, L100, L160	88	22	8
N100, N200, L400, L600, L800, L1200	132	31	9

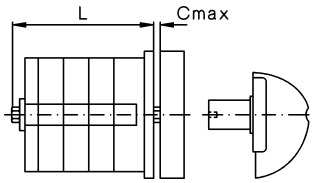
Special drives

Removable knob drive STGR, STGR2
M10H - N33F

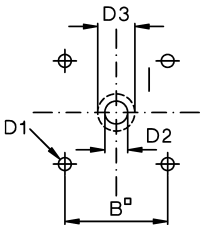
Type	B	C	D1	D2	D3
M10H, M20	36	5	5	12	18
N20, N33F	48	5	5	12	18

Replace dimension D2 with dimension D3 for STGR2
Dimension L see page 256





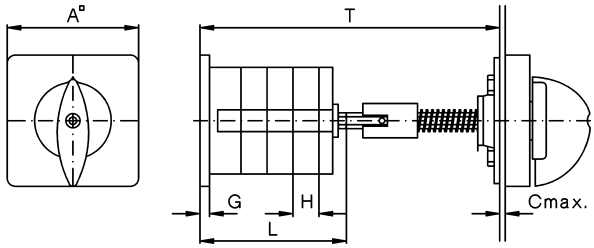
Mounting holes



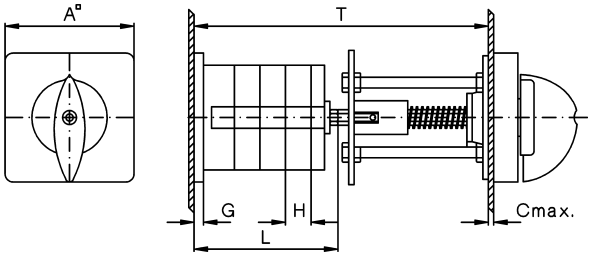
Door couplings

Dimension T is a minimum value. In case of order the dimension T is necessary.

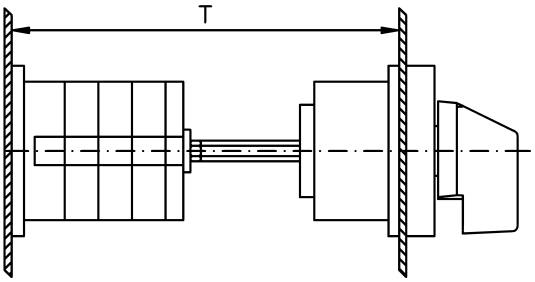
Door coupling TK, TKFR
N40 - L1200



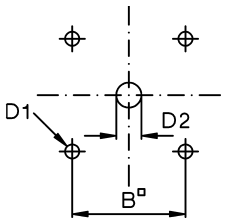
Door coupling, lockable TK2, TK2FR
N40 - L1200



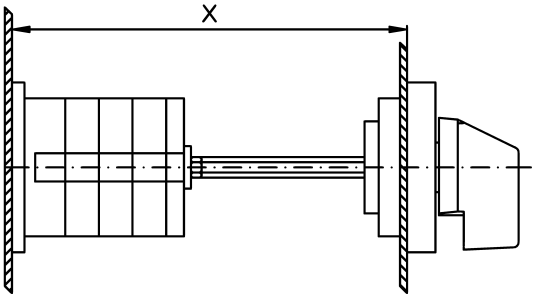
Door coupling TKE, TK2E
M10H, M20, N20, N33F



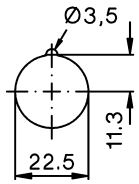
Mounting holes:
TK, TKFR, TK2, TK2FR
TKE, TK2E



Door coupling, lockable TK2Z
M10H, M20, N20, N33F



Mounting holes:
TKZ

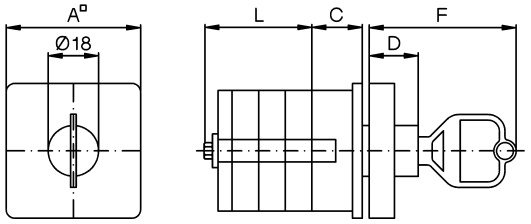


Further dimensions see pages 256 and 257.
Dimension T is a minimum value dependent on switch Type and number of cells. For ordering dimension T is necessary

						Minimum dimension T with .. cells							
Type	A	B	C	D1	D2	1	2	3	4	5	6	7	8
M10H	48	36	5	5	8	108	117,5	127	136,5	146	155,5	165	174,5
M20	48	36	5	5	8	100	112,5	125	137,5	150	162,5	175	187,5
N20	64	48	5	5	10	100	112,5	125	137,5	150	162,5	175	187,5
N33F	64	48	5	5	10	103	118,5	134	149,5	165	180,5	196	211,5
N40	88	48	7	6	12	134	152	170	188	206	224	242	260
N60	88	48	7	6	12	145,5	175	245,5	234	263,5	293	322,5	352
N80	88	48	7	6	12	145,5	175	245,5	234	263,5	293	322,5	352
N100	132	110	9	7	15	202	232	262	292	322	352	382	412
N200	132	110	9	7	15	212	252	292	332	372	412	452	492
L100	88	48	7	6	12	-	152	-	188	-	224	-	260
L160	88	48	7	6	12	145,5	175	245,5	234	263,5	293	322,5	352
L400	132	110	9	7	15	212	252	292	332	372	412	452	492
L600	132	110	9	7	15	-	-	292	-	-	412	-	-
L800	132	110	9	7	15	-	252	-	332	-	412	452	492
L1200	132	110	9	7	15	-	-	292	-	-	412	-	-

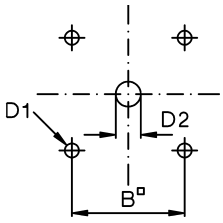
Key operated switches SA

Panel mounting E
M10 - N60



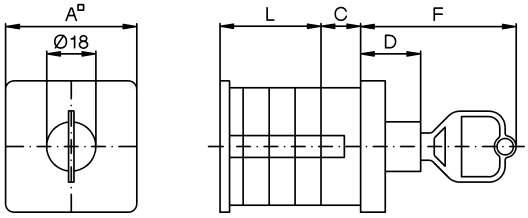
Type	A	B	C	D	D1	D2	F
M10H, M20	48	36	18	17,5	5	18,5	52,5
N20, N33F	64	48	10	17,5	5	18,5	52,5
N40,N60	88	68	23,5	15	6	18,5	50

Mounting holes



Dimension L see page 256

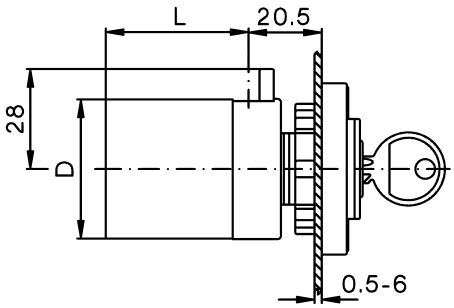
Base mounting V
M10 - N60



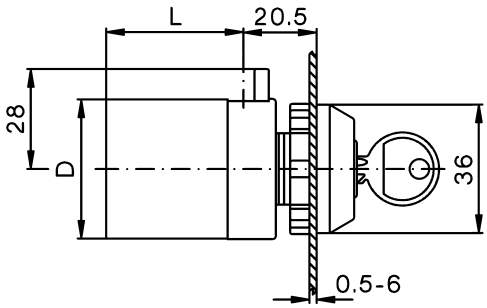
Type	A	C	D	F
M10H, M20	48	18	22	57
N20, N33F	64	8	22	57
N40,N60	88	15	15	50

Dimension L see page 257

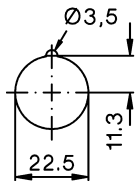
Central fixing Z
M10H Z ... + SA
M20 Z ... + SA



Central fixing without escutcheon plate ZO
M10H ZO ... + SA
M20 ZO ... + SA

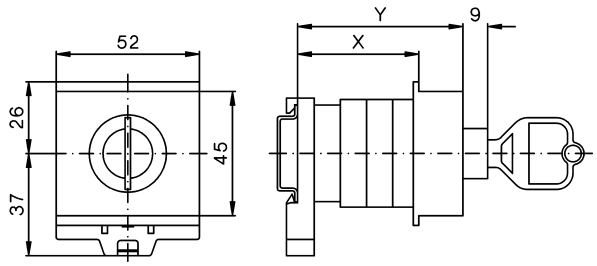


Mounting holes:



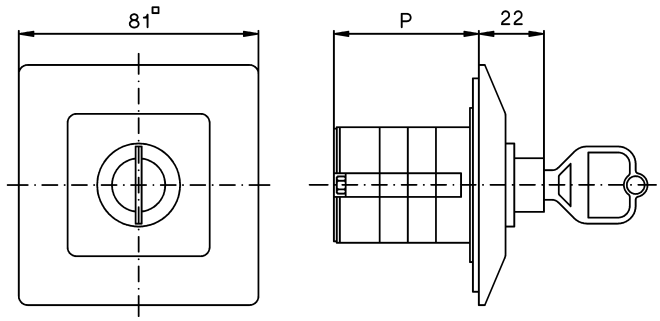
Further dimensions see page 256

DIN rail mounting SMA
M10H, M20



Type	Dimension X with .. cells 1	2	3	4	Dimension Y with .. cells 1	2	3	4
M10H	44	75	75	91	60	90	90	107
M20	59	75	75	91	75	90	90	107

Flush mounting UP
M10

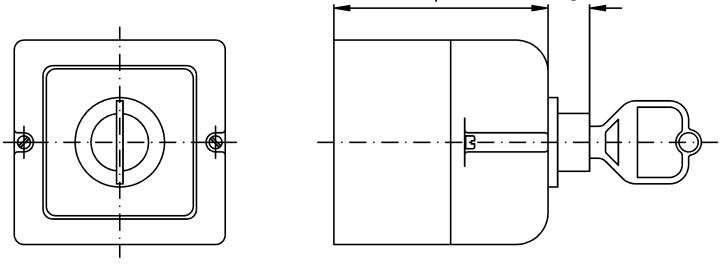


Type	Dimension P with .. cells 1	2
M10	47,5	57

Plastic enclosured switches P, PF
M10, N20, N33F, N40, N60

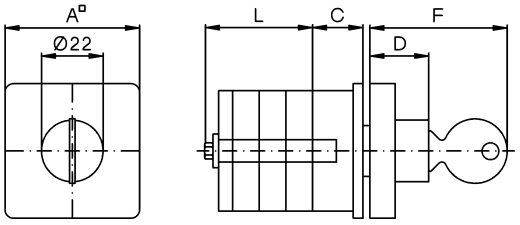
Type	Dimension P with .. cells 1	2	3	4
M10	62	71	81	90
N20	66	80	94	108
N33F	92	110	110	128
N40	92	110	-	-
N60	110	-	-	-

Further dimensions see page 258



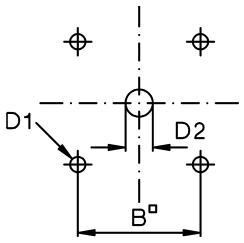
Key operated switches

Key operated switch SAK
Panel mounting E M10H, M20

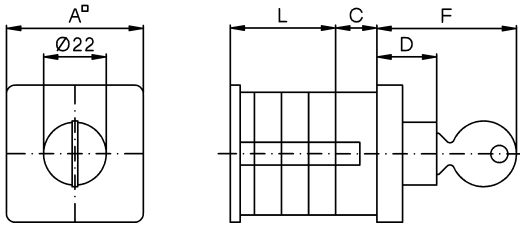


Type	A	B	C	D	D1	D2	F
M10H, M20	48	36	25	21	5	22,5	49

Mounting holes

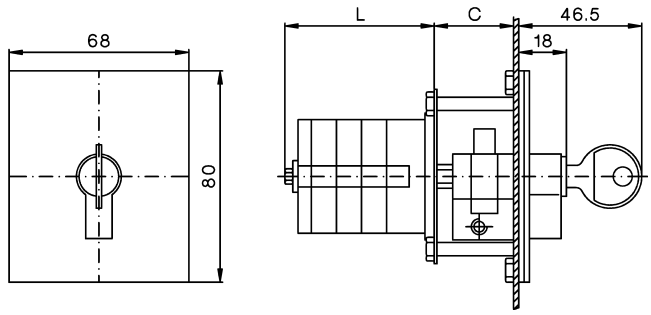


Key operated switch SAK
Base mounting V M10H, M20



Type	A	C	D	F
M10H, M20	48	25	21	49

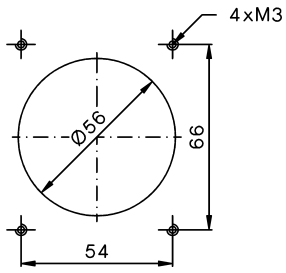
Key operated switch SASI
Panel mounting E M10, M20



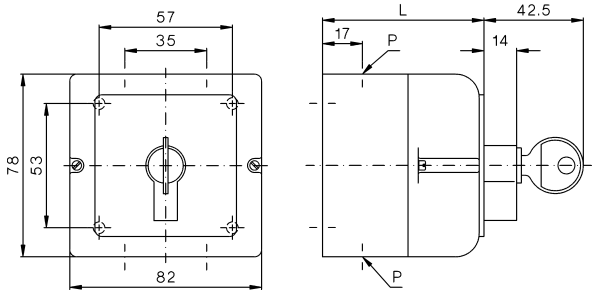
Type	M10	M20
C	20	20

Dimension L see page 256

Mounting holes M10, M20

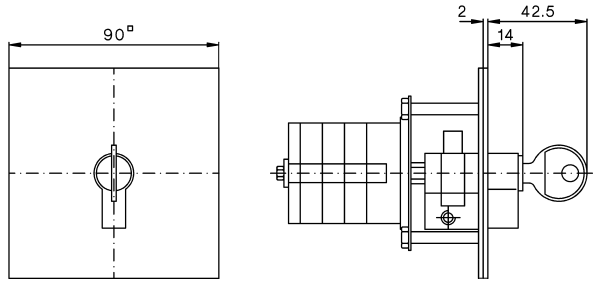


Key operated switch SASI
Plastic enclosured P M10, M20



Typ	Dimension P with .. cells 1	2	3	4	P
M10	67	79,5	92	104,5	2xM20
M20	79,5	92	104,5	117	2xM20

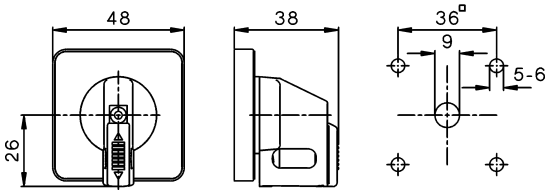
Key operated switch SASI
Flush mounting UP M10, M20



Padlock devices

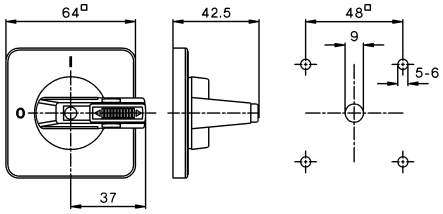
Padlock device SV1 (max. 2 padlocks with stirrup Ø6mm)
M10H, M20

Mounting holes design E, V

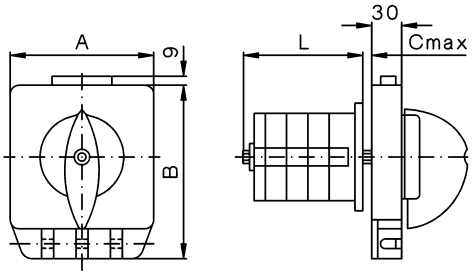


Padlock device SV164
M10H - N33F

Mounting holes design E, V



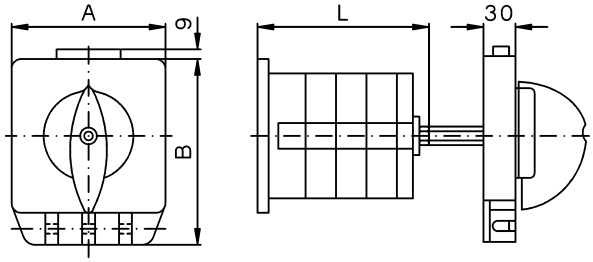
Padlock device SV3 (max. 3 padlocks with stirrup Ø8,5mm)
Panel mounting E
N20 - N200, L100 - L1200



Further dimensions see page 77

Type	A	B	C
N20, N33F	102	128	5
N40, N60, N80, L100, L160	102	128	7
N100, N200, L400, L600, L800, L1200	132	159	9

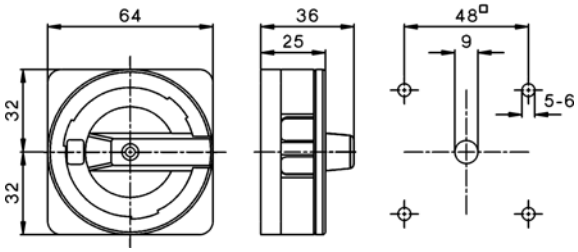
Base mounting V
N20 - N200, L100 - L1200



Further dimensions see page 257

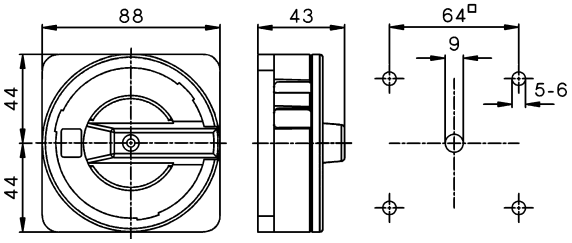
Padlock device SV4 (max. 3 padlocks with stirrup Ø6mm)
M10H - N33F

Mounting holes design E, V

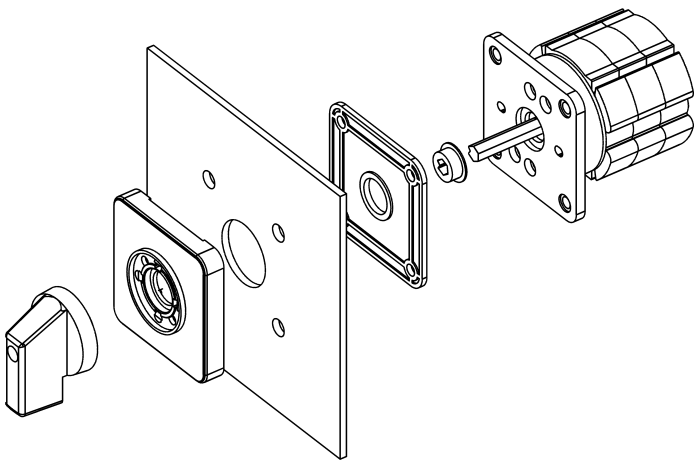


Padlock device SV4 (max. 3 padlocks with stirrup Ø6mm)
N40 - N80, L100 - L160
Padlock device SV488
N20, N33F

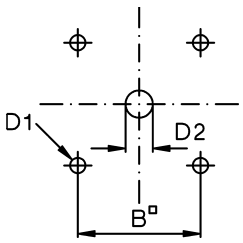
Mounting holes design E, V



Front plate/switch shaft sealing FPWD
N20, N33F



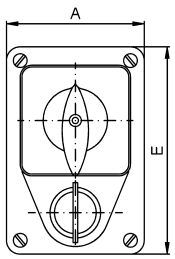
Mounting holes

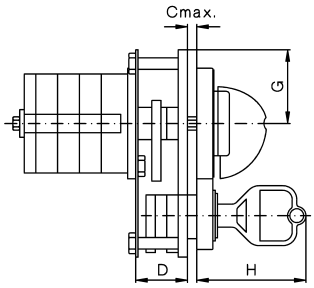


Typ	B	D1	D2
N20, N33F	48	5	17

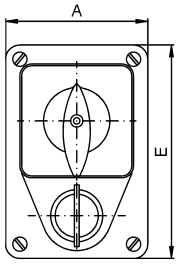
Interlocks

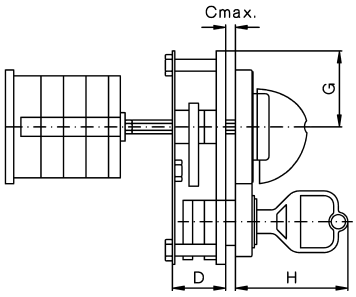
Lock switch SZ, SZ2
Panel mounting E



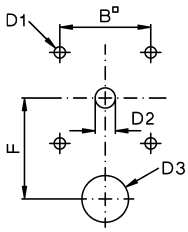


Base mounting V



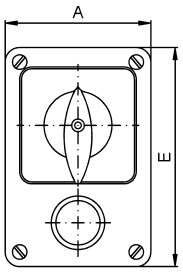


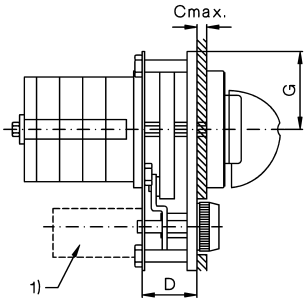
Mounting holes



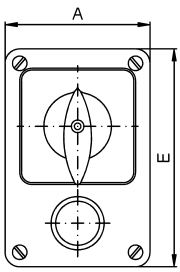
Type	A	B	C	D	D1	D2	D3	E	F	G	H
M10H, M20	60	36	3	22,5	5	8	18,5	90	40	32	47,5
N20, N33F	60	36	3	22,5	5	12	18,5	90	45	32	47,5
N40, N60, N80, L100, L160	90	68	4	24	6	12	18,5	142	61	61,5	48
N100, N200, L400, L600, L800, L1200	140	110	4	27	7	15	18,5	180	83	90,5	49

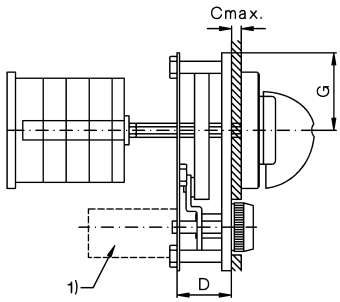
Push-button switch lock DV
Switch interlock with electrical contact ET
Panel mounting E



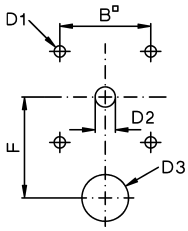


Base mounting V





Mounting holes

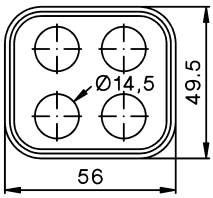


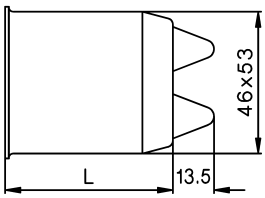
Type	A	B	C	D	D1	D2	D3	E	F	G
M10H, M20	60	36	3	22,5	5	8	26	90	40	32
N20, N33F	60	36	3	22,5	5	10	26	90	45	32
N40, N60, N80, L100, L160	90	68	4	25	6	12	29	142	61	61,5
N100, N200, L400, L600, L800, L1200	140	110	4	41	7	15	29	180	83	90,5

1) only at +ET

Moisture proofing caps for panel switches FR
M10H

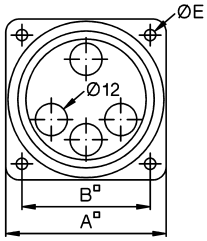
Type	Dimension L with .. cells 1	2	3	4	5	6	7
M10H	55	55	75	75	88	106	106

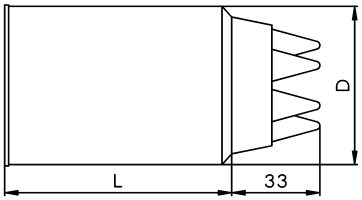




Moisture proofing caps for panel switches FR
N20, N40, N60

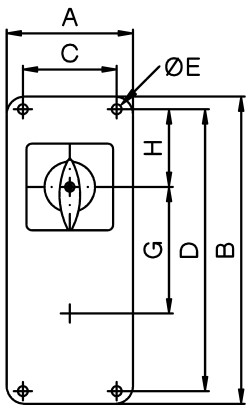
Type	A	B	D	E	Dimension L with .. cells 1	2	3	4	5
N20	60	48	59	5,5	68	68	68	91	91
N40	87	68	83	5,5	82	82	117	117	-

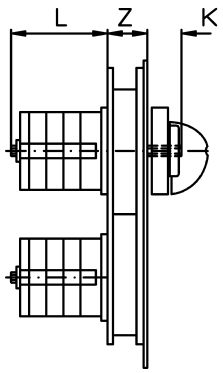




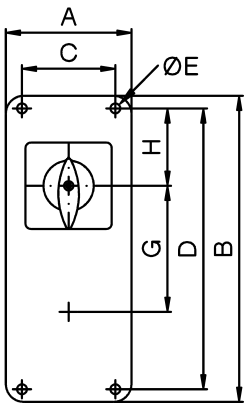
Interlocks

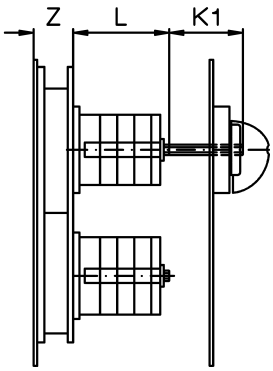
Geared switch with two columns ZK2
Panel mounting E





Base mounting V

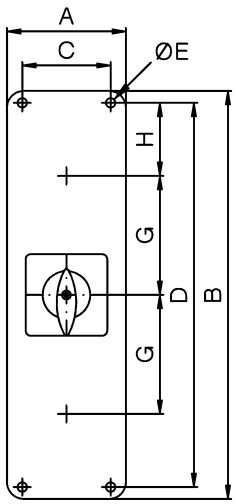


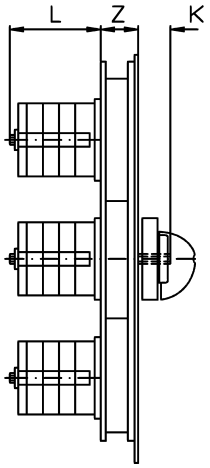


Type	A	B	C	D	E	G	H	Z
M10H, M20	70	170	52	156	5,5	70	43	22
N20, N33F	70	170	52	156	5,5	70	43	22
N40, N60, N80, L100, L160	170	190	150	168	6,5	100	43	23
N100, N200, L400, L600, L800, L1200	180	340	150	310	6,5	140	80	25

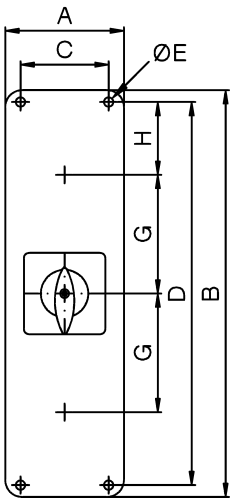
Further dimensions see pages 256 and 257

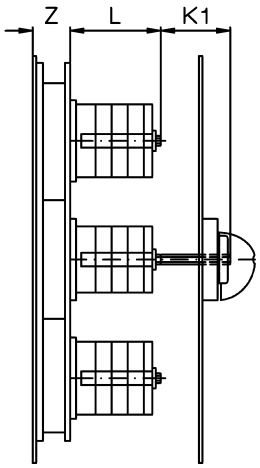
Geared switch with tree columns ZK3
Panel mounting E





Base mounting V

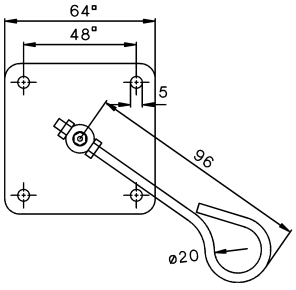


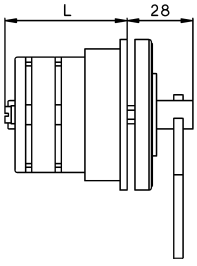


Type	A	B	C	D	E	G	H	Z
M10H, M20	70	240	52	226	5,5	70	43	22
N20, N33F	70	240	52	226	5,5	70	43	22
N40, N60, N80, L100, L160	170	290	150	269	6,5	100	43	23
N100, N200, L400, L600, L800, L1200	180	490	150	460	6,5	140	80	25

Further dimensions see pages 256 and 257

Neon safety switch N20 E .. +FEU, N33F E .. +FEU





Further dimensions see pages 256

Order sheet D399E

Cam switches with special switching program

Benedict GmbH
A-1220, Vienna, Lieblgasse 7
Tel.: 251 51-0 Fax: 251 51-88

Customer:

Switch Type

M4H			
M10			
M10H			
M20			
N20			
N33F		L100	
N40		L160	
N60		L400	
N80		L600	
N100		L800	
N200		L1200	

Design

Panel mounting	E	
Central fixing	Z	
	ZO	
Base mounting	V	
Snap-on mount.SM		
	SMA	
Plastic enclosure	P	
IP65	PF	
Cast enclosure	G	
IP65	GF	

Optional extras

Circular switch

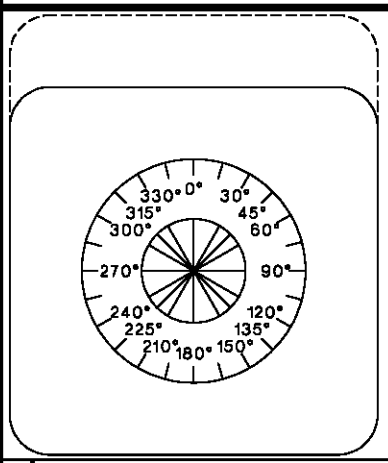
Key removeable

Explanations:

Contact closed over several positions

Spring return from pos.

Handles			Handle colour	
Instrument knob	**G** (standard)		black (standard)	
Twist knob	**R** (standard N40 ->)		red	
Toggle knob	**K** (standard SMA)		grey (standard SMA)	
Ball type handle	**B**		white	
Hand wheel	**HR**		cream-coloured	
			yellow	
			blue	



Connect.

Terminals 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47

Terminals 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Connect.

Marking for switch positions	Degree