

## General

Rotary cam switches type MN10, MN16, MN25, MN40, MN63, MN100, MN200, MN400, MN630, MN800, MN1000 and MN1200 are designed in accordance with the up-to-date principles and achievements in electrical engineering, using the high quality insulating materials and contact parts.

The basic components of cam switches are typified for mass production, so that a switching device can be assembled within a short time according to any assembling programme using standard components.

These switches can meet various requirements in low-voltage part of a transformer station, switchboards, etc.

They are distinguished by high quality, high breaking capacity, overload capacity, and they are capable to with-stand short circuit currents of short duration.

## Application

Rotary cam switches series MN are intended for multiple switching operations in main as well as in auxiliary circuits:

- as motor switches they are designed for direct-online starting and stoping of single-phase and three-phase motors. They also cam out as star-delta switches, reversing switches, pole-change over motor switches
- in auxiliary circuits they are assembled in compliance with the switching programe according to preference: switching for control, signalling and measuring circuits
- switches, selector switches and step switches e.g. for transformers and welding apparatuses
- group switches e.g. for switching operations of resistors and heaters
- control switch with automatic return etc.

### APPLICATION CATEGORIES

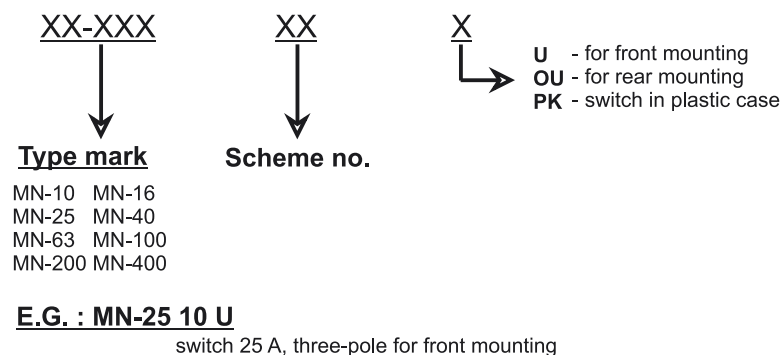
CATEGORIES	APPLICATION
AC-20	Connecting and disconnecting under no-load conditions
AC-21	On-Off switching of resistive loads, including moderate overloads
AC-22	Switching mixed resistive and inductive loads, including moderate overloads
AC-2	Starting slip-ring motors and plugging
AC-23	Switching motor loads or other highly inductive loads
AC-3	Starting squirrel-cage motors and switching of motors when running
AC-4	Starting squirrel-cage motors, plugging, inching, reversing
AC-11	Control switch for switching magnetic devices, contactors, valves

## Regulations

Rotary cam switches type MN10, MN16, MN25, MN40, MN63, MN100, MN200 and MN400 fully comply with regulations JUS N.K5.012, JUS N.K5.013 and recommendations IEC 408.

TECHNICAL DATA		TYPE								
JUS.N.K5.012 JUS.N.K5.013 IEC 408		MN10	MN16	MN25	MN40	MN63	MN100	MN200	MN400	
Rated insulation voltage $U_i$	V	380	660	660	660	660	660	660	660	
Rated thermal current $I_{th}$	A	10	16	25	50	63	125	200	400	
	Max. rated current $I_n$	10	16	25	50	63	125	250	400	
Connector	Terminal screw	M3	M4	M4	M5	M5	2xM6	M10	M12	
	Max. Conductor cross-section	mm <sup>2</sup>	2x1,5	2x2,5	2x4	2x10	2x10	50	95	
	Short time current , 3 sec.	A	130	250	400	530	1100	1500	2000	
3 x 380 V	AC21	kW	9	10	15	24	39	63	125	260
	AC22,AC23,AC2,AC3	kW	5	7,5	11	18,5	22	30	30	30
	AC4	kW	3	5,5	7,5	11	15	18,5	■	■
	AC11	A	3,5	10	15	■	■	■	■	■

## Ordering code



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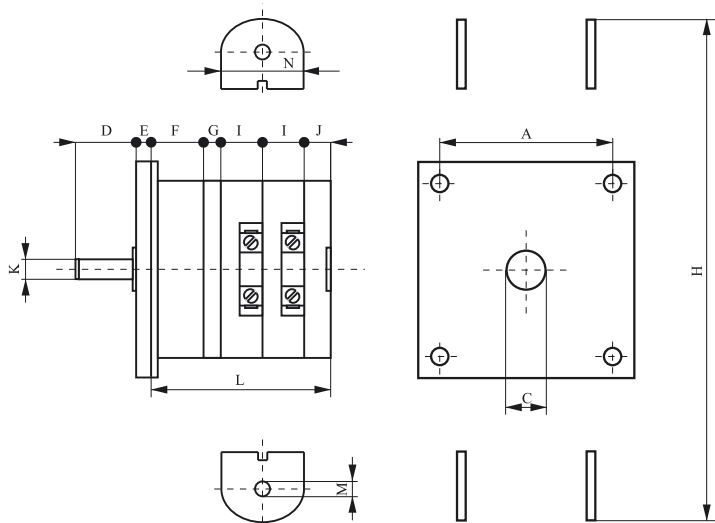
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## Dimension

### Front mounting U

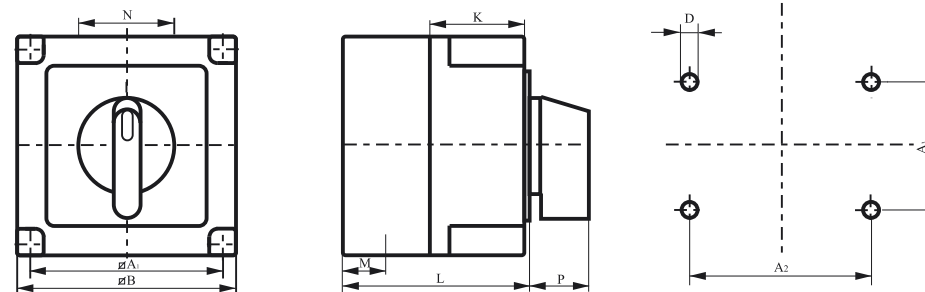


TYPE	A	B	C	D	E	F	G	H	I	J	K	M	N
MN10	36	48	10	15	5,5	8,8	5	-	10	5	4	-	-
MN16	48	64	11	18	5,5	13,5	6	-	13,5	6	6	-	-
MN25	48	64	11	18	5,5	13,5	6	-	13,5	6	6	-	-
MN40	73	91	15,5	28	7,5	17,5	8	-	18,4	8,5	8	-	-
MN63	73	91	15,5	28	7,5	17,5	8	-	18,4	8,5	8	-	-
MN100	102	130	19	30	9,7	19	8,8	-	30	17	10	-	-
MN200	102	130	19	30	9,7	19	8,8	145	30	17	10	10,5	20
MN400	102	130	19	30	9,7	19	8,8	170	30	17	10	13,5	45

### No. of elements L/mm

TYPE	1	2	3	4	5	6	7	8	9	10	11	12
MN10	28.8	38.8	48.8	58.8	68.8	78.8	88.8	98.8	108.8	118.8	128.8	138.8
MN16	39	52.5	66	79.5	93	106.5	120	133.5	147	160.5	174	187.5
MN25	39	52.5	66	79.5	93	106.5	120	133.5	147	160.5	174	187.5
MN40	52.4	70.8	89.2	107.6	126	144.4	162.8	181.2	199.6	218	236.4	254.8
MN63	52.4	70.8	89.2	107.6	126	144.4	162.8	181.2	199.6	218	236.4	254.8
MN100	74.8	104.8	134.8	164.8	194.8	224.8	-	-	-	-	-	-
MN200	74.8	104.8	134.8	164.8	194.8	224.8	-	-	-	-	-	-
MN400	-	104.8	-	164.8	-	224.8	-	-	-	-	-	-

## PK - plastic case



Group		D	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	B	M	N	P	No. of elements (mm)				K mm
		?	?			?				1	2	3	4	
A <sub>1</sub>	MN10	4.3	55	38	54	85	13	25	19	65	65	65	95	28
	MN16	4.3	75	75	75	85	19	34	25	65	65	95	95	28
A <sub>2</sub>	MN25	4.3	75	75	75	85	19	34	25	65	65	95	95	28
	MN40	5.3	109	91	107	120	29	45	32	85	85	123	123	36
	MN63	5.3	109	91	107	120	29	45	32	85	85	123	123	36

# Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
10	3 pole			60°   2
11	Reversing switch 3 pole			60°   3
12	Switch star-delta			60°   4
13	Motor switch with Dahlander connection, 2 speeds Δ - 0 - Δ			60°   4
15	Switch for single-phase motors			90°   2 30°+
19	Motor switch with Dahlander connection 2 speeds 0 Δ Δ			60°   4

# Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
20	Motor switch with Dahlander connection, 2 speeds 2 rotary directions Δ Δ 0 Δ Δ			45°   7
21	Star-delta switch, 2 turning directions Δ Δ 0 Δ Δ			30°   5
22	Motor switch with separated winding (star or delta)			60°   3
23	Motor switch with separated winding, 2 windings, 2 speeds 2 rotary directions (star or delta)			60°   5 30°
24	2-pole reversing switch			60°   2
25	2-pole reversing switch, return to 0			30°   2

# Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
26	3-pole reversing switch, return to 0			30° 3
27	3-pole reversing switch for combination with contactor Return from Start to 1 and 2			60° 30°+ 5
28	Star-delta switch return from $\Delta$ to 0			30° 60°+ 4
29	Star-delta switch with counter-current breaking, return from star to 0 $\Delta$			30°+30° +60° 5
30	Star-delta switch as a voltage switch			60° 4
31	Star-delta switch for combination with a contactor			90° 4

# Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
32	Motor switch in Dahlander connection for combination with contactor			60° 5
33	Switch for 2-speed motor, with 2 separate windings, for combination with contactor			60° 4
34	Switch for three-speed motors, with 2 windings $0 \Delta \Delta \Delta$ (1 and 3 speed, Dahlander connection)			30° 45° 6
35	Switch for three-speed motors, with 2 windings $0 \Delta \Delta \Delta$ (1 and 2 speed, Dahlander connection)			30° 45° 6
36	Switch for three-speed motors, with 2 windings $0 \Delta \Delta \Delta$ (2 and 3 speed, Dahlander connection)			30° 45° 6
51	1 pole			60° 90° 1

# Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
52	2 pole			60° 90°   2
53	3 pole			60° 90°   3
54	1 pole			90°   1
55	2 pole			90°   2
56	3 pole			90°   3
57	Three-pole change-over switch, for changing over of current transformers			90°   3



# Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
58	To measure current in 3 phases with or without current transformers			90°   5
60	To measure 1 phase voltage and 3 line voltages			90°   3
62	10 pole			90°   10
63	3 poles contacts 30° precede			90°   2
66	To measure phase and line voltages			30°   3
67	To measure line voltages			30°   2



## Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
68	To measure phase voltages			30°   2
69	4 pole			90°   4
70	5 pole			90°   5
71	6 pole			90°   6
72	7 pole			90°   7
73	8 pole			90°   8



## Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
74	9 pole			90°   9
75	4 pole			60°   4 90°   4
76	5 pole			60°   5 90°   5
77	6 pole			60°   6 90°   6
78	7 pole			60°   7 90°   7
79	8 pole			60°   8 90°   8



# Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
80	9 pole			60° 90°   9
81	10 pole			60° 90°   10
82	1 pole			60°   2
83	1 pole			60°   2
84	1 pole			60°   3
85	1 pole			60°   3



# Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
86	2 pole			60°   3
87	2 pole			60°   4
88	2 pole			60°   5
89	2 pole			60°   6
90	1 pole			60° 90°   1
91	2 pole			60° 90°   1



# Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
92	4 pole			60° 90°   2
93	3 pole			60°   5
94	3 pole			60°   6
95	3 pole			60°   8
96	3 pole			60°   9
97	With off position to measure current in 3 phases with or without current transformers			90°   6



# Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
98	With off position to measure current in 3 phases with current transformer			90°   4
99	5 polna			60° 90°   3
100	6 pole			60° 90°   3
101	1 pole			30° 45°   4
102	1 pole			45°   4
103	1 pole			30°   5





## Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
104	1 pole			30°   5
105	1 pole			30°   6
106	1 pole			30°   6
107	1 pole			60°   1
108	1 pole			30°   45°   2
109	1 pole			30°   2

## Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
110	1 pole			30°   3
111	1 pole			30°   4
112	1 pole			30°   4
113	1 pole			30°   5
114	1 pole			30°   5
115	1 pole			30°   6

# Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
116	1 pole			30°   6
117	2 poles			45°   7
118	2 poles			45°   8
119	2 poles			30°   9
120	2 poles			30°   10
121	2 poles			30°   11



# Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
122	2 poles			30°   12
123	2 poles			60°   2
124	2 poles			30°   45°   3
125	2 poles			30°   4
126	2 poles			30°   5
127	2 poles			30°   7



Production program				
Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
128	2 poles			30°   8
129	2 poles			30°   9
130	2 poles			30°   10
131	2 poles			30°   11
132	2 poles			30°   12
133	3 poles			45°   11

Production program				
Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
134	3 poles			45°   12
135	3 poles			60°   3
136	3 poles			45°   5
137	3 poles			30°   6
138	3 poles			30°   8
139	3 poles			30°   11

# Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
140	3 poles			30°   12
141	4 poles			60°   6
142	4 poles			60°   8
143	4 poles			60°   10
144	4 poles			60°   12
145	4 poles			60°   4



# Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
146	4 poles			30°   6
147	4 poles			30°   8
148	4 poles			30°   10
149	5 poles			60°   8
150	5 poles			60°   10
151	5 poles			60°   5



Production program				
Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
152	5 poles		30°	8
153	5 poles		30°	10
154	6 poles		60°	9
155	6 poles		60°	12
156	6 poles		60°	6
157	6 poles		30°	9

Production program				
Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
158	6 poles		30°	12
159	7 poles		60°	11
160	7 poles		60°	7
161	7 poles		30°	11
162	8 poles		60°	12
163	8 poles		60°	8

# Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
164	8 pole		30°	12
201	With 1 make contact turning left and right		30°	1
202	With 2 make contact turning left and right		30°	2
203	With 3 make contact turning left and right		30°	3
204	With 1 make and 1 brake contact		30°	1
205	With 2 make and 2 brake contact		30°	2



# Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
206	With 3 make and 3 brake contacts		30°	3
207	For contactor control with 1 make contact at turning to the right and 1 brake contact at turning to the left		30°	1
208	With 1 brake and 1 make contact at turning to the left and right respectively		30°	2
209	With 2 make and 2 brake contact at turning to the left and right respectively		30°	4
210	Combination of switch and pushbutton with turn to the left and right		30°	5
251	Group switch, 2 groups, 1 pole 0, A, A+B		60°	1



# Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
252	Group switch 2 groups, 2 poles, 0, A, A+B		60°	2
253	Group switch, 2 groups, 3 poles, 0, A, A+B		60°	3
254	Group switch 3 groups, 1 pole, 0, A, A+B, A+B+C		30°	2
255	Group switch 3 groups, 2 poles, 0, A, A+B, A+B+C		30°	3
256	Group switch 3 groups, 3 poles, 0, A, A+B, A+B+C		30°	5
257	Serial-group switch 2 groups, 1 pole, 0, A, B, A+B		30°	1



# Production program

Diagram no.	Description and application	Diagram connection	Front panel	
			Switching angle	No. Of elements
258	Serial-group switch 2 groups, 2 poles, 0, A, B, A+B		30°	2
259	Serial-group switch 2 groups, 3 poles, 0, A, B, A+B		30°	3
260	Serial-group switch 2 groups, 2 poles, 0, A+B, serial, A, B, A+B parallel		30°	2
270	1 pole switch contact 30° precedes		90°	1
271	2 pole switch contacts 30° precede		90°	1
272	4 pole switch 3 contacts 30° precede, 2 contacts 60° precede		90°	2



