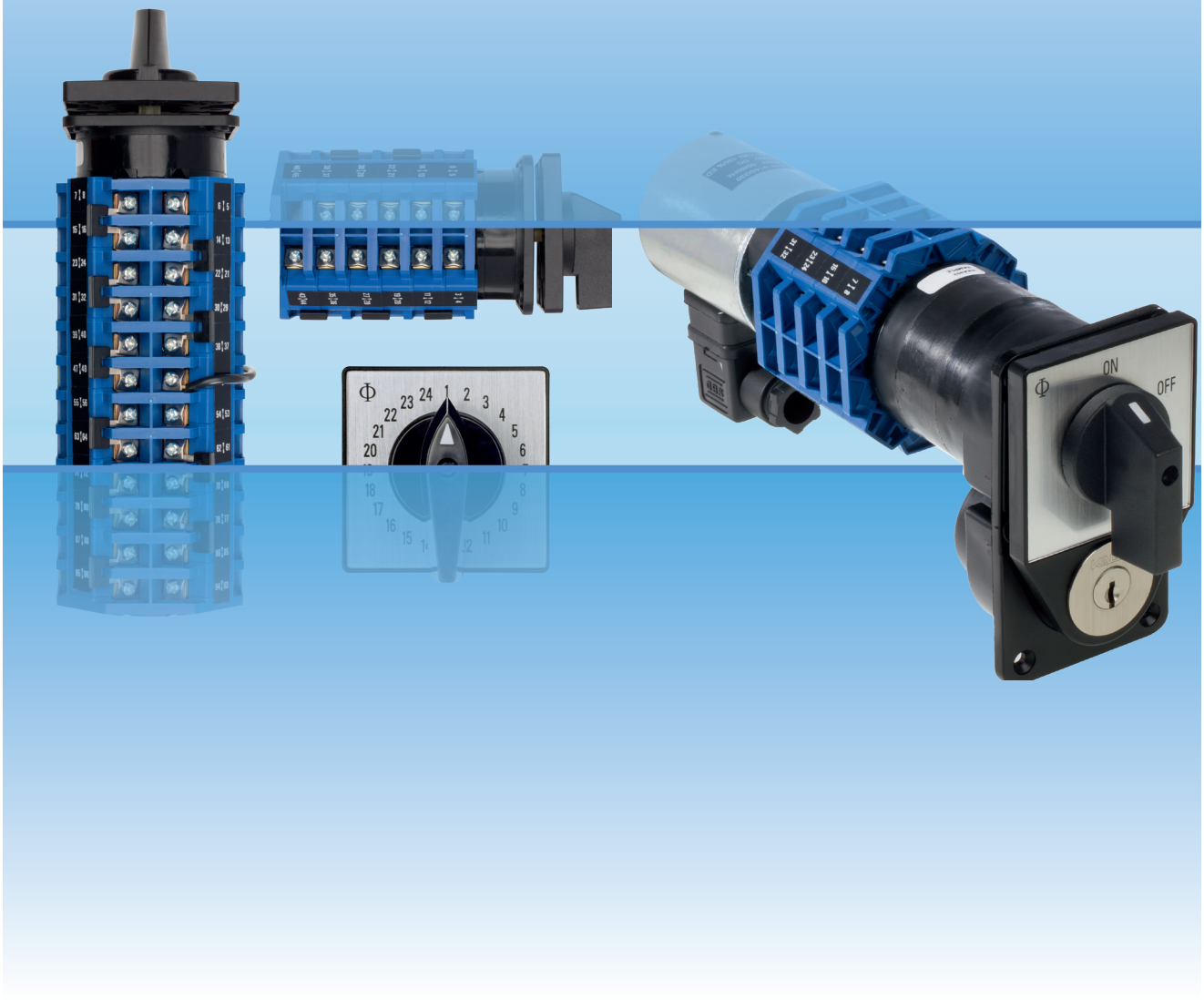
Kraus & Naimer

Catalog 110
12/2023

Control Switches for Special Applications

A type up to 25 A
AD type up to 6 A



Kraus & Naimer

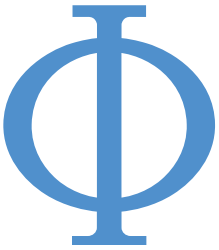
The development of the Blue Line rotary switch and motor starter product ranges is based on more than hundred years experience by Kraus & Naimer in the design and manufacture of electrical switchgear. Kraus & Naimer pioneered the introduction of the cam operated rotary switch and continues to be recognized as the world leader in that product field.

BLUE LINE

Blue Line products are protected by numerous patents through-out the industrial world. They are built to national and international standards and designed to withstand adverse temperatures and climates.

Blue Line products are accepted and universally recognized for their quality and workmanship. They are supported by a worldwide sales and service organization.

The Kraus & Naimer Registered Trademark



WORLDWIDE SYMBOL FOR QUALITY SWITCHGEAR

Disconnectors and Main Switches acc. to IEC 60947-3 see Catalog 500

	Page
Construction Data	4
Dimensions and Nominal Ratings	4
How to order	5, 6
Switch Function and Configuration	
ON/OFF Switches	8
Double-throw Switches	9, 10
Multi-step Switches	11-13
General Application Switches	14
Voltmeter Switches	15
Ammeter Switches	16
Control Switches	17
Motor Switches	18
Types of Mounting	
Panel Mounting	19
Base Mounting	20
Handles	21
Face Plates	22, 23
Technical Data	24-26
International Standards and Approvals	26
Dimensions	
Handles and Escutcheon Plates	27
Panel Mounting	28
Base Mounting	29
Overall Switch Lengths	29
Blue Line Switchgear: Summary	30

Construction Data

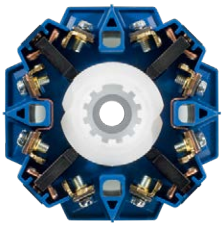
A Switches

A switches are used in applications where available depths behind the mounting plates are limited and the switching programs require a large number of contacts. They are used when more than 12 switching positions are required. Typical applications for A switches are multi-step switches, multi-pole step switches, instrumentation switches and control switches where depth problems exist. The A switch has 4 double-break contacts which are controlled by two independent cams.



The switch column can contain up to 12 stages representing a total of 48 contacts. Additional contacts can be added by using a tandem drive to operate more than one switch column with a single handle.

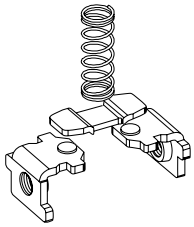
Switch type	Switching angle	Max. number of switch positions
A11, AD11, AD12	15°, 20°, 30°, 45°, 60°, 90°	24
A25	15°, 20°, 30°, 45°, 60°, 90°	24



A wide range of optional extras, escutcheon plates, handles, mountings and enclosures is available.

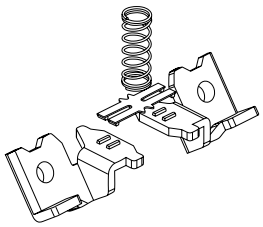
2 different Contact Systems are available

A11 and A25



A rigid, double-break bridge with silver alloy contacts provides high making and breaking capabilities for regular control applications.

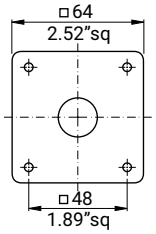
AD11 and AD12

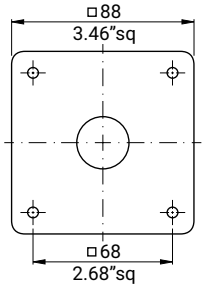


High contact reliability by H-bridge design with self-cleaning “cross-wire“ contacts. The contact system with gold-plated contacts (AD12 with silver contact) allows for low voltages, electronic compatible.

< back to table of contents >

Switch Size	Type	Rated Values			
		According to IEC 60947-3/VDE 0660 part 107			
		Thermal Current I_u/I_{th} **A**	Motor Rating 3 x 380 V/440 V AC-23A **kW**	Operational Current I_e AC-21A	AC-15/220 V **A**
S1	**AD11**	6	-	1 V/ 6 A 24 V/ 1 A 110 V/ 0,4 A 220 V/ 0,2 A 380 V/ 0,13 A	-
	AD12	6	- - - - -	6 V/ 6 A 24 V/ 5 A 110 V/ 3 A 220 V/ 2 A 380 V/ 1,3 A	-
S2	**A11**	20	7,5	20 A	6
	A25	25	11	25 A	8
	A11C	20	7,5	20 A	6
	A25C	25	11	25 A	8





How to order

Disconnectors and Main Switches according to IEC 60947-3 see Catalog 500

Three types of data (shown below) are required for ordering Blue Line cam-operated switches. Code numbers for ordering are shown in this catalog.

1. Type of Switch

The type of switch required may be easily selected by referring to the table on page 4 which shows the thermal current, power rating and dimensions of each switch. For further technical details, refer to pages 24 and 25. Variations of contacts and terminals are shown below.

2. Switch Function

The code numbers for standard switches shown on pages 7-18 indicate the switch function, escutcheon plate, handle and any optional extras. Additional coding to modify type and color of handle and escutcheon plate is explained below.

3. Type of Mounting

Types of mounting are shown on pages 19 and 20. Catalog **101** describes enclosures and optional extras. Specify the mounting code to indicate required mounting.

A11 **A202** **VE**

< back to table of contents >

Type of Switch

Extending the switch type coding the following combinations will define:

Amendment	Definition	For switch types
-1	with gold contacts[1]	A11-1
-4	with quick connects	A11-4, A25-4, A25C-4
-5	with quick connects and gold contacts	A11-5
C	S1 switches with latching mechanism size S2	A11C, AD11C, A25C
L	with lockout-relay w/o manual release for std. switches	A11L, A25L
M	with lockout-relay with manual release for std. switches	A11M, A25M
X	with power failure release	A25X

Example: Coding for switch type **A11** with gold contacts is **A11-1**.

[1]Technical data on request.

Handles, Escutcheon Plates and Optional Extras

The handles for standard switches shown on pages 7-18 are suitable for mounting units with four hole panel mounting. Alternative types of handles available are illustrated on pages 19-21.
When a handle, escutcheon plate or optional extra is required but not covered by the dash-number, the code number for the selected component should be entered separately. A comprehensive range of available standard escutcheon plates is illustrated on pages 23-25. Non-standard or special escutcheon plate engravings are available at extra cost.
The large number of optional extras and enclosures is covered in Catalog **101**.

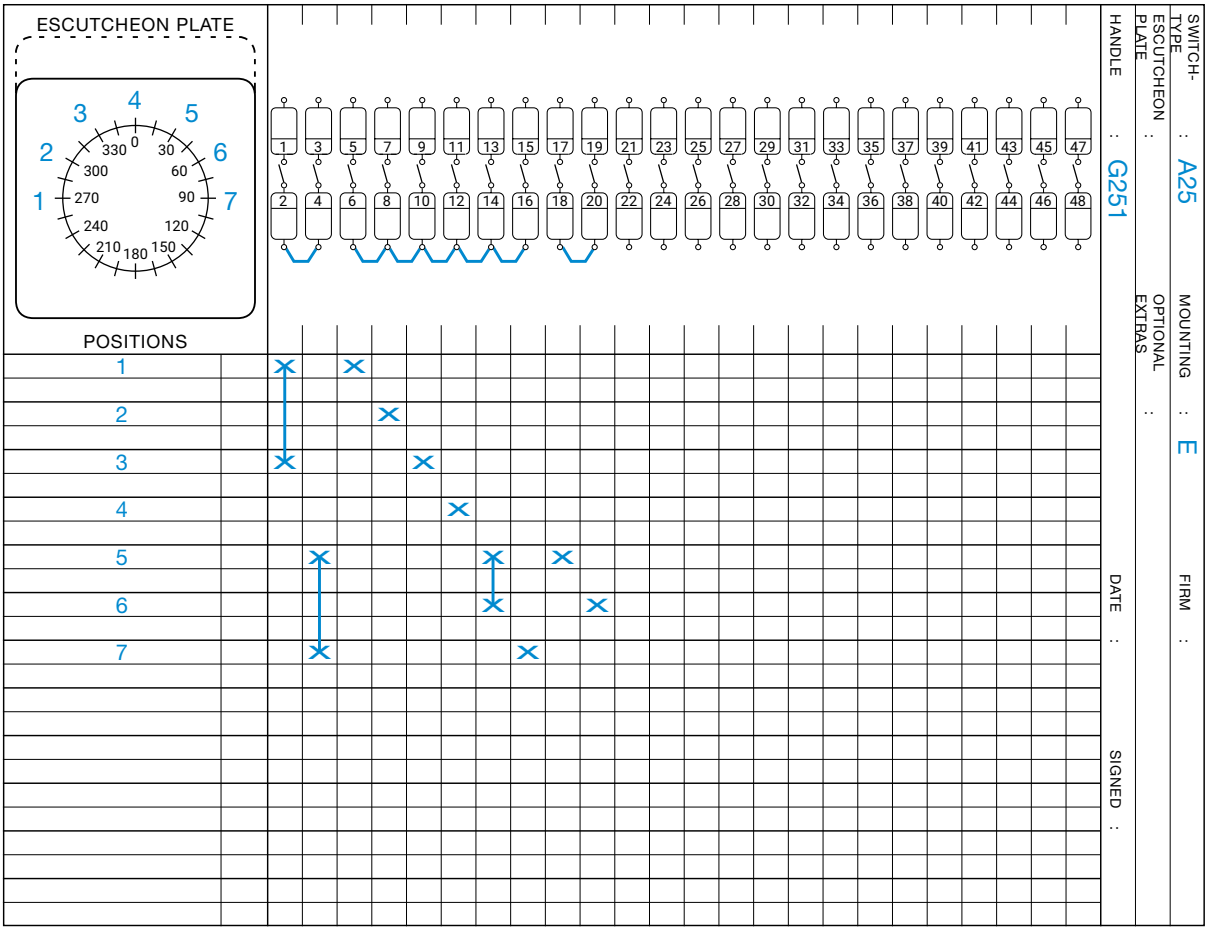
Switch Size

Blue Line A switches are available in sizes S1 and S2. These size codes indicate the dimensions of the mounting, the escutcheon plate and the handle as well as the size of the optional devices and enclosures. Page 4 lists these sizes and the various switch types they include.

Ordering of Special Switches and Escutcheon Plates

When ordering special switches and escutcheon plates it is advisable to use our order form, as illustrated. The customer's requirements are shown in blue as an example.

For technical reasons, it may not be possible to follow the sequence of contacts requested by the customer. The final contact development which is sent with every switch will show the customer's original terminal markings.



Order forms are available on request.

< back to table of contents >

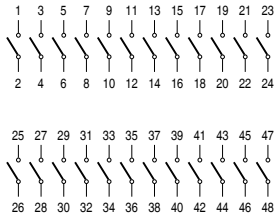
Notes:

< back to table of contents >

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram

ON/OFF Switches with 60° Switching

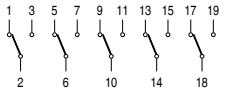
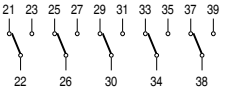
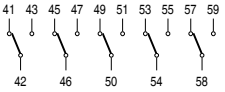
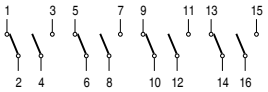
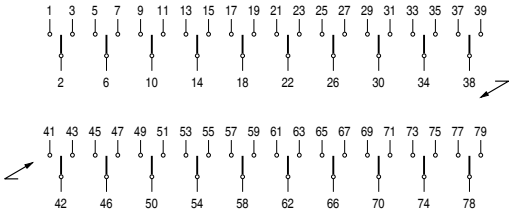
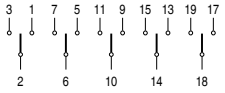
Dimensions p. 29

1 pole	 F070			1	 1-24 pole
2 pole				1	
3 pole				1	
4 pole				1	
5 pole				2	
6 pole				2	
8 pole				2	
10 pole				3	
12 pole				3	
14 pole				4	
16 pole				4	
18 pole				5	
20 pole				5	
22 pole				6	
24 pole				6	

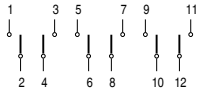
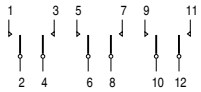
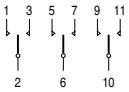
ON/OFF Switches with 90° Switching

1 pole contacts preclose 30°	 F056		A290	1	 contacts preclose 30° 1-3 pole
2 pole contacts preclose 30°			A291	1	
3 pole contacts preclose 30°			A292	1	
4 pole 1 contact precloses 60° 3 contacts preclose 30°			A293	1	 3 contacts preclose 30° 1 contact precloses 60° 4 pole

< back to table of contents >

Function	Escutch. Plate	Handle	Code	Stages	
Double-throw Switches without „OFF“ 60° Switching Dimensions p. 29					
1 pole	 F072		A220	1	
2 pole			A221	1	
3 pole			A222	2	
4 pole			A223	2	
6 pole			A370	3	
8 pole			A372	4	
10 pole			WAA 374	5	
12 pole			WAA 376	6	
14 pole			WAA 660	7	
16 pole			WAA 661	8	
18 pole			WAA 662	9	
20 pole			WAA 663	10	
Double-throw Switches without „OFF“ with electrically isolated contacts					
1 pole	 F072		A720	1	 1-4 pole
2 pole			A721	1	
3 pole			A722	2	
4 pole			A723	2	
Double-throw Switches with Center „OFF“ 60° Switching					
1 pole	 F071		A210	1	 1-4 pole and 6-20 pole
2 pole			A211	1	
3 pole			A212	2	
4 pole			A213	2	
5 pole			A361	3	
6 pole			A362	3	
8 pole			WAA 364	4	
10 pole			WAA 366	5	
12 pole			WAA 368	6	
14 pole			WAA 655	7	
16 pole			WAA 656	8	
18 pole			WAA 657	9	
20 pole			WAA 658	10	 5 pole

< back to table of contents >

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
Double-throw Switches with Center „OFF“ and electrically isolated contacts Dimensions p. 29					
1 pole 2 pole 3 pole	 F071		A710 A711 A712	1 1 2	 1-3 pole
1 pole with spring return to center 2 pole with spring return to center 3 pole with spring return to center	 F025		A714 A715 WAA 716	1 1 2	 1-3 pole
Double-throw Switches with Spring Return to Center					
1 pole with spring return to center 2 pole with spring return to center 3 pole with spring return to center	 F025		A214 A215 A216	1 1 2	 1-3 pole

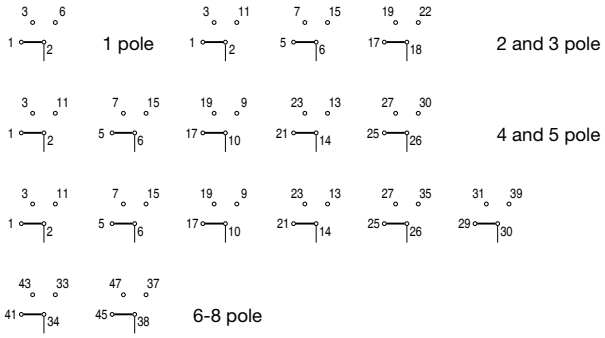
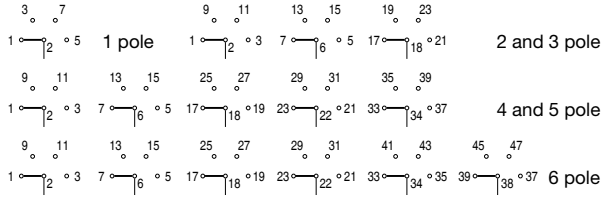
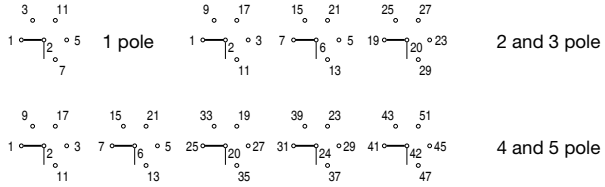
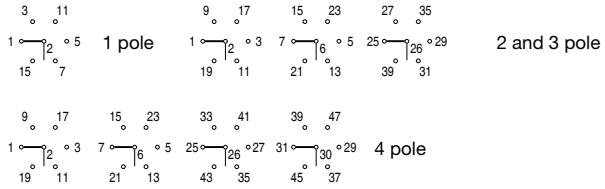
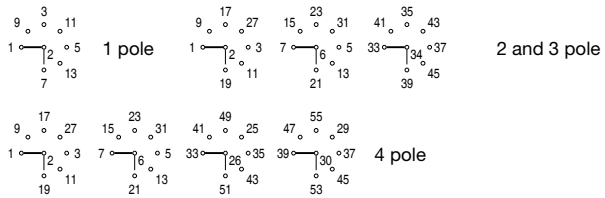
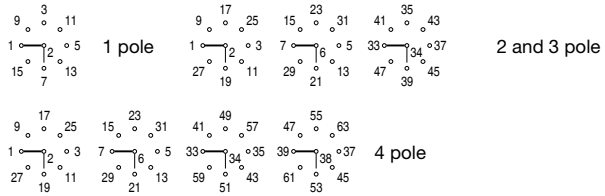
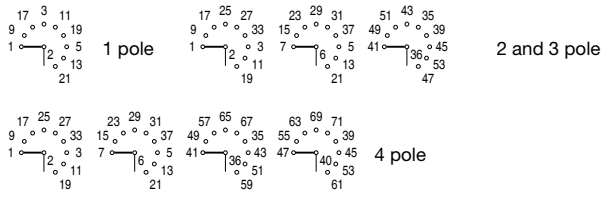
< back to table of contents >

< back to table of contents >

	Escutch. Plate	Handle	Code	Stages	Connection Diagram

Multi-step Switches without „OFF“

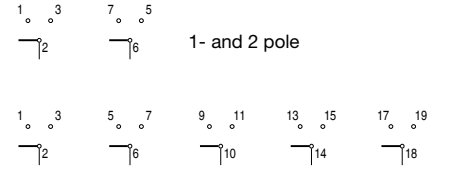
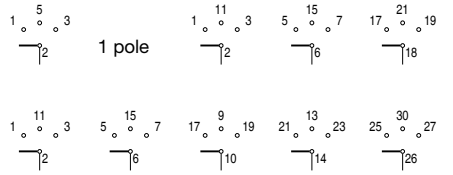
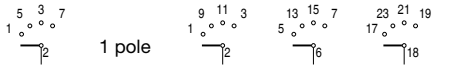
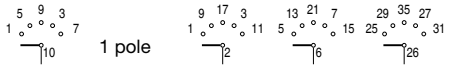
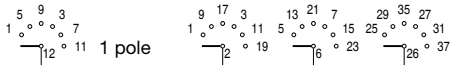
Dimensions p. 29

1 pole 3 Step 2 pole 3 pole 4 pole 5 pole 6 pole 7 pole 8 pole	 F076		A230 A250 A270 A476 WAA 484 WAA 489 WAA 494 WAA 497	1 2 3 3 4 5 6 6	 1 pole 2 and 3 pole 4 and 5 pole 6-8 pole
1 pole 4 Step 2 pole 3 pole 4 pole 5 pole 6 pole	 F077		A231 A251 A271 A477 WAA 485 WAA 490	1 2 3 4 5 6	 1 pole 2 and 3 pole 4 and 5 pole 6 pole
1 pole 5 Step 2 pole 3 pole 4 pole 5 pole	 F078		A232 A252 WAA 272 WAA 478 WAA 676	2 3 4 5 7	 1 pole 2 and 3 pole 4 and 5 pole
1 pole 6 Step 2 pole 3 pole 4 pole	 F079		A233 WAA 253 WAA 273 WAA 479	2 3 5 6	 1 pole 2 and 3 pole 4 pole
1 pole 7 Step 2 pole 3 pole 4 pole	 F110		WAA 234 WAA 254 WAA 274 WAA 670	2 4 6 7	 1 pole 2 and 3 pole 4 pole
1 pole 8 Step 2 pole 3 pole 4 pole	 F111		WAA 235 WAA 255 WAA 275 WAA 671	2 4 6 8	 1 pole 2 and 3 pole 4 pole
1 pole 9 Step 2 pole 3 pole 4 pole	 F010		WAA 236 WAA 256 WAA 276 WAA 672	3 5 7 9	 1 pole 2 and 3 pole 4 pole

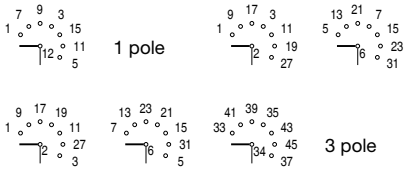
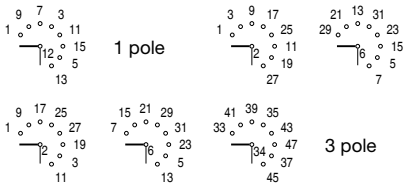
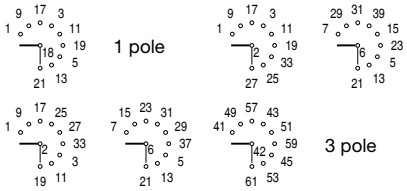
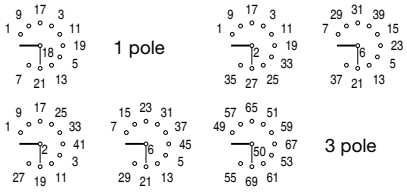
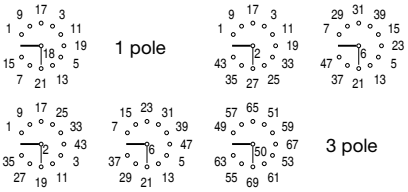
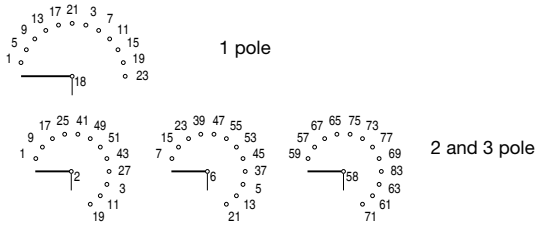
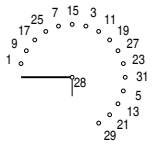
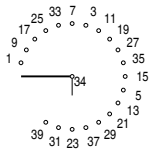
Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram

Multi-step Switches without „OFF“

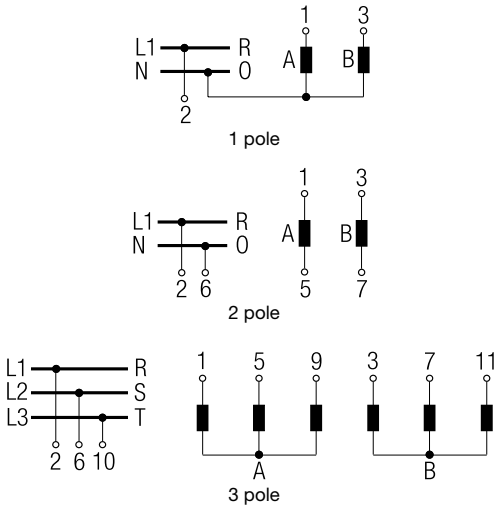
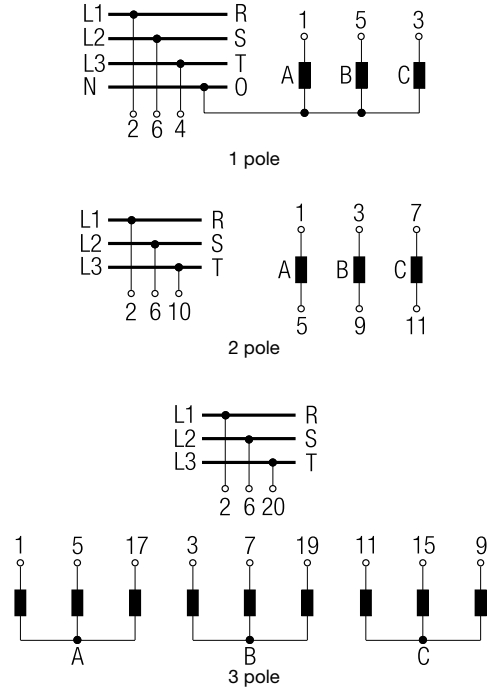
Dimensions p. 29

1 pole 10 Step 2 pole 3 pole	 F011		WAA 237 WAA 257 WAA 277	3 5 8	 1 pole 2 and 3 pole
1 pole 11 Step 2 pole 3 pole	 F012		WAA 238 WAA 258 WAA 278	3 6 9	 1 pole 2 and 3 pole
1 pole 12 Step 2 pole 3 pole	 F013		WAA 239 WAA 259 WAA 279	3 6 9	 1 pole 2 and 3 pole
1 pole 2 Step 2 pole 3 pole 5 pole	 F075		A240-600 A260-600 A280-600 WAA 486	1 1 2 3	 1- and 2 pole 3 and 5 pole
1 pole 3 Step 2 pole 3 pole 5 pole	 F109		A241-600 A261-600 A281-600 WAA 487	1 2 3 4	 1 pole 2 and 3 pole 5 pole
1 pole 4 Step 2 pole 3 pole	 F002		A242-600 WAA 262 WAA 282	1 2 3	 1 pole 2 and 3 pole
1 pole 5 Step 2 pole 3 pole	 F003		A243-600 WAA 263 WAA 283	2 3 5	 1 pole 2 and 3 pole
1 pole 6 Step 2 pole 3 pole	 F004		A244-600 WAA 264 WAA 284	2 3 5	 1 pole 2 and 3 pole

< back to table of contents >

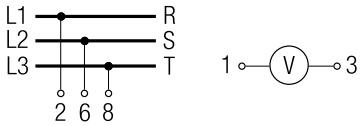
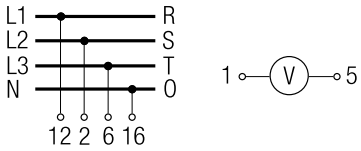
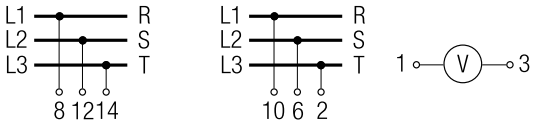
Function	Escutch. Plate	Handle	Code	Stages	
Multi-step Switches with „OFF“					Dimensions p. 29
1 pole 7 Step 2 pole 3 pole	 F005  F044		WAA 245 WAA 265 WAA 285	2 4 6	 1 pole 2 pole 3 pole
1 pole 8 Step 2 pole 3 pole	 F045		WAA 246 WAA 266 WAA 286	2 4 6	 1 pole 2 pole 3 pole
1 pole 9 Step 2 pole 3 pole	 F007  F046		WAA 247 WAA 267 WAA 287	3 5 8	 1 pole 2 pole 3 pole
1 pole 10 Step 2 pole 3 pole	 F008  F047		WAA 248 WAA 268 WAA 288	3 5 9	 1 pole 2 pole 3 pole
1 pole 11 Step 2 pole 3 pole	 F009  F048		WAA 249 WAA 269 WAA 289	3 6 9	 1 pole 2 pole 3 pole
1 pole 12 Step 2 pole 3 pole	 F270  F275		WAA 630 WAA 635 WAA 644	3 7 11	 1 pole 2 and 3 pole
1 pole 16 Step	 F271		WAA 631	4	 1 pole
1 pole 20 Step	 F272		WAA 632	5	 1 pole

< back to table of contents >

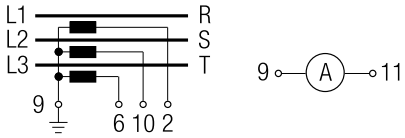
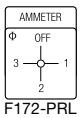
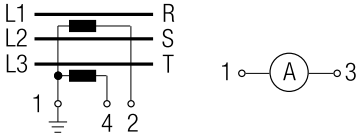
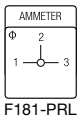
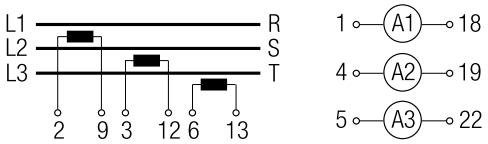
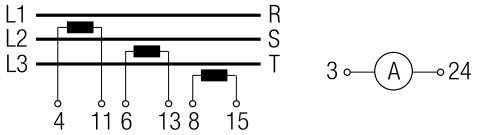
Function	Escutch. Plate	Handle		Stages	Connection Diagram
General Application Switches					
1 pole 2 Gang 2 pole 3 pole Switching sequence: 0, A, A+B	 F075		A310-600 A312-600 WAA 314	1 1 2	 1 pole 2 pole 3 pole
1 pole 3 Gang 2 pole 3 pole Switching sequence: 0, A, A+B, A+B+C	 F001		A311-600 WAA 313 WAA 315	1 2 3	 1 pole 2 pole 3 pole

Dimensions p. 29

< back to table of contents >

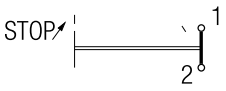
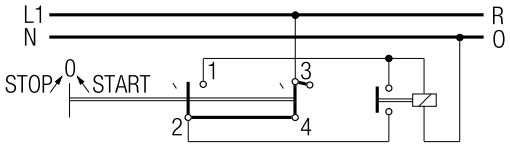
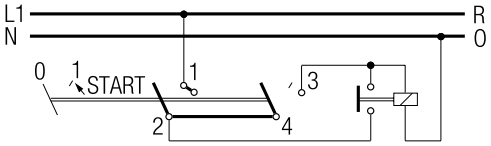
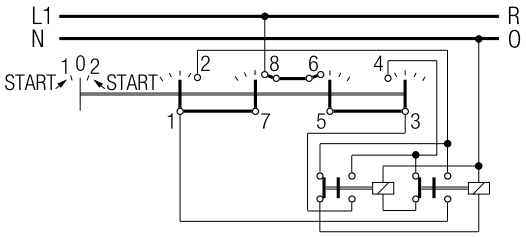
Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
Voltmeter Switches with „OFF“ Dimensions p. 29					
3 phase to phase	 F019		A004	1	
3 phase to phase and 3 phase to neutra			A007	2	
2 separate 3 phase with center „OFF“	 F020		WAA008	2	

< back to table of contents >

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
Ammeter Switches					
Single pole with 3 current transformers with „OFF“ 360° rotation	 F059		A048	2	
Single pole with 2 current transformers (3 readings)	 F172-PRL		WAA021	1	
2 pole, 3 current transformers	 F181-PRL		WAA019	3	
	 F059		A038	3	

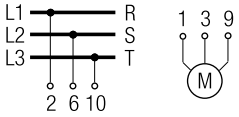
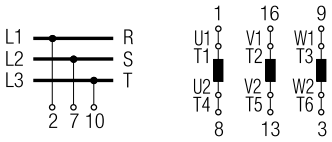
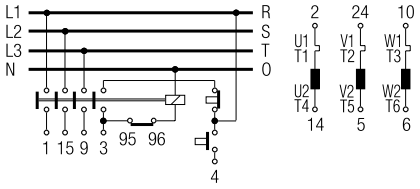
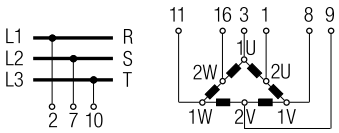
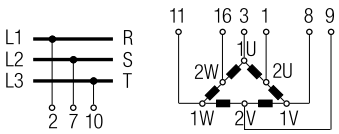
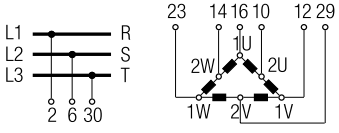
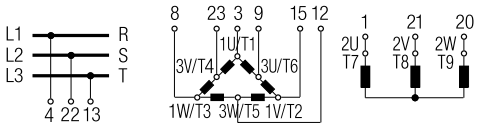
Dimensions p. 29

< back to table of contents >

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
Control Switches					
Stop switch	 F022		WAA174	1	
Start switch	 F023		A175	1	
Stop start switch single pole	 F024		A176	1	
Stop start switch with spring return from start to run	 F119		A178	1	
Stop start switch with spring return to run for 2 units	 F121		WAA177	1	

Dimensions p. 29

< back to table of contents >

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
Motor Reversing Switches					
	 F071		A401	2	
Star-delta Switches					
Off-star-delta	 F080		A410	2	
With auxiliary contact closed in „OFF“ position	 F080		WAA416	3	
Motor Control Switches					
2 speed single winding	 F073		A440		
2 speed single winding with center „OFF“	 F071		A441		
2 speed single winding reversing	 F105		A442		
Polumschalter					
3 speed 2 winding 0 - A△ - BY - AYY	 F109		WAA457	3	

Dimensions p. 29

< back to table of contents >

	Code	A11 AD11 AD12	A25	A11C A25C
	**Panel Mounting**			
	Four hole panel mounting, Protection IP 40	E	●	●	●
	Four hole panel mounting, Protection IP 65/67/69k	EF	●	●	●
	**Panel and base mounting**			
	Four hole panel mounting, Protection IP 40	ER	●	●	●
	Four hole panel mounting, Protection IP 65/67/69k	ERF	●	●	●
	**Panel mounting using larger escutcheon plate and handle**			
	Four hole panel mounting, Protection IP 40	EG	●	●	
	Four hole panel mounting, Protection IP 65/67/69k	EGF	●	●	
	Panel mounting with heavy duty stop and metal shaft			
	Four hole panel mounting, Protection IP 40 Mounting plate, escutcheon plate and handle of size S1	KN1	●	●	
	Four hole panel mounting, Protection IP 40 Mounting plate, escutcheon plate and handle of size S1 and 6 mm square metal shaft	KD1	●	●	

< back to table of contents >

Base Mounting	Code	A11 AD11 AD12	A25	A11C A25C
 Base mounting Base mounting - four hole, Protection IP 40	VE	●	●	●
 Snap-on base mounting for track EN 50022, Protection IP 40	VE1	●	●	

< back to table of contents >

Handles

Type	Color	Code	Size S1	Size S2
R-Handle 	black red	G001 G002	● ●	● ●
F-Handle 	black red	G221 G222	● ●	● ●
S-Handle 	black red	G301 G302	● ●	— —
P-Handle 	black red	G211 G212	● ●	● ●
O-Handle 	black red	G321 G322	● ●	— —

	Color	Code	Size S1	Size S2
I-Handle 	black red	G251 G252	● ●	● ●
B-Handle 	black red	G521 G522	● ●	
L-Handle 	black red	G501 G502	● ●	— —
K-Handle 	black red	G411 G412	● ●	● ●

< back to table of contents >

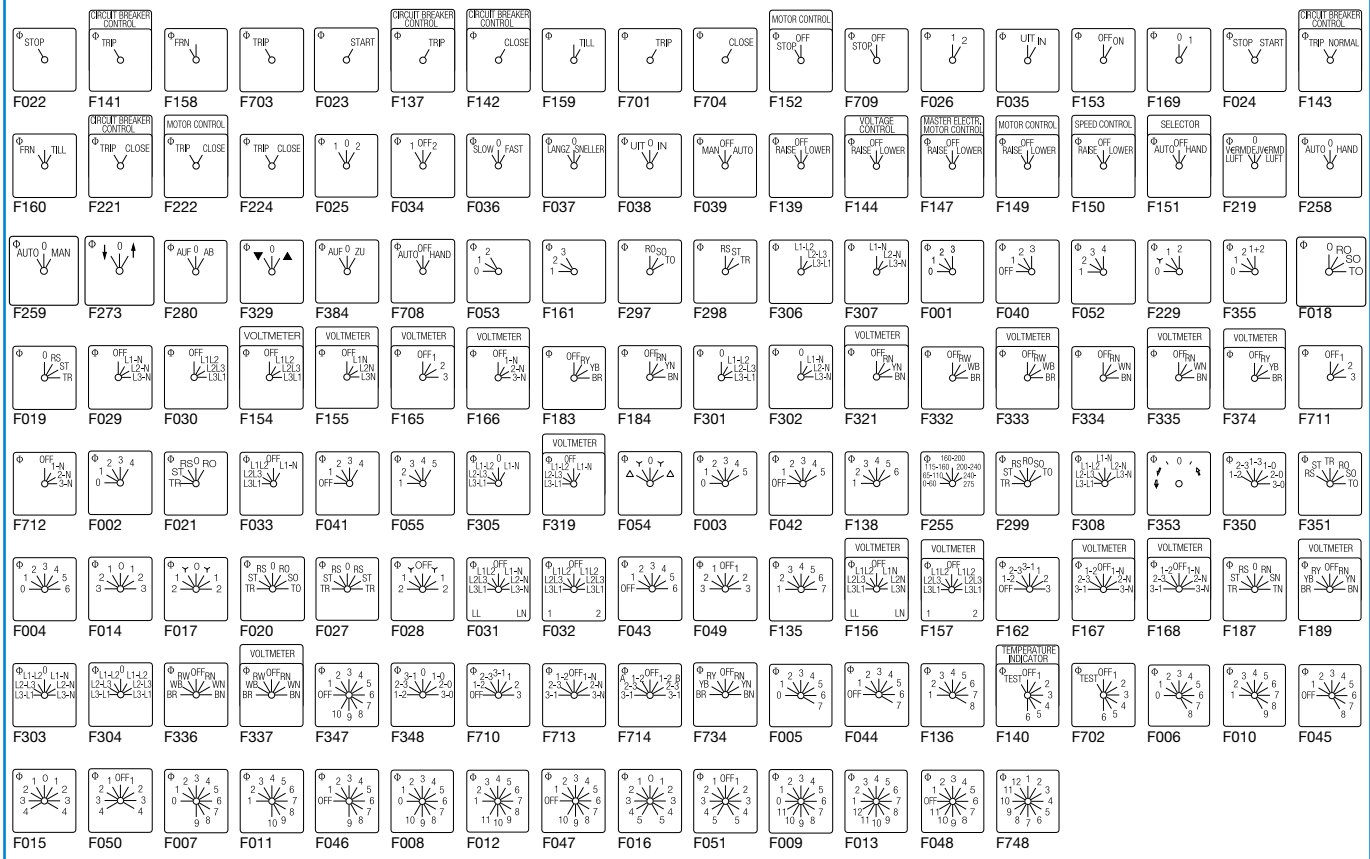
Escutcheon Plates



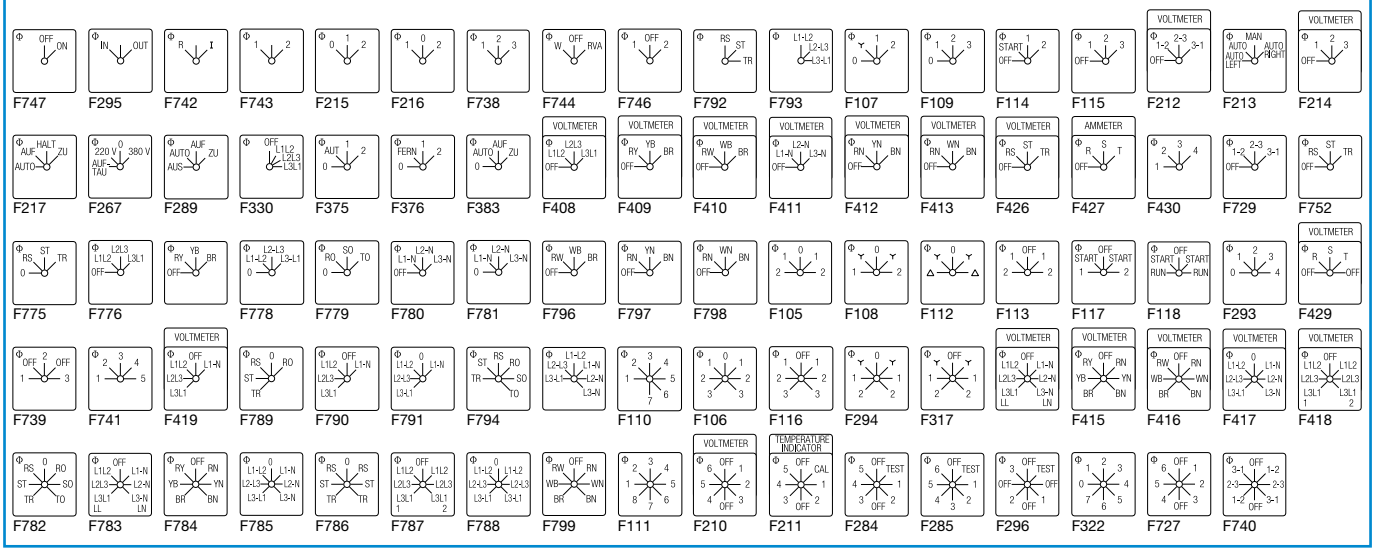
Square and rectangular escutcheon plates are available for each size of switch. The escutcheon plate consists of a frame and a faceplate having the switch positions which is than embossed with hot-foil backing. The escutcheon plate frame is an essential part of the switch and serves as a bearing surface for the handle. If the switch is to be mounted without an escutcheon plate we would recommend the handle bearing plate T100-04.

(Over 500 standard letterings, special letterings upon request.)

30° switching



45° switching



< back to table of contents >

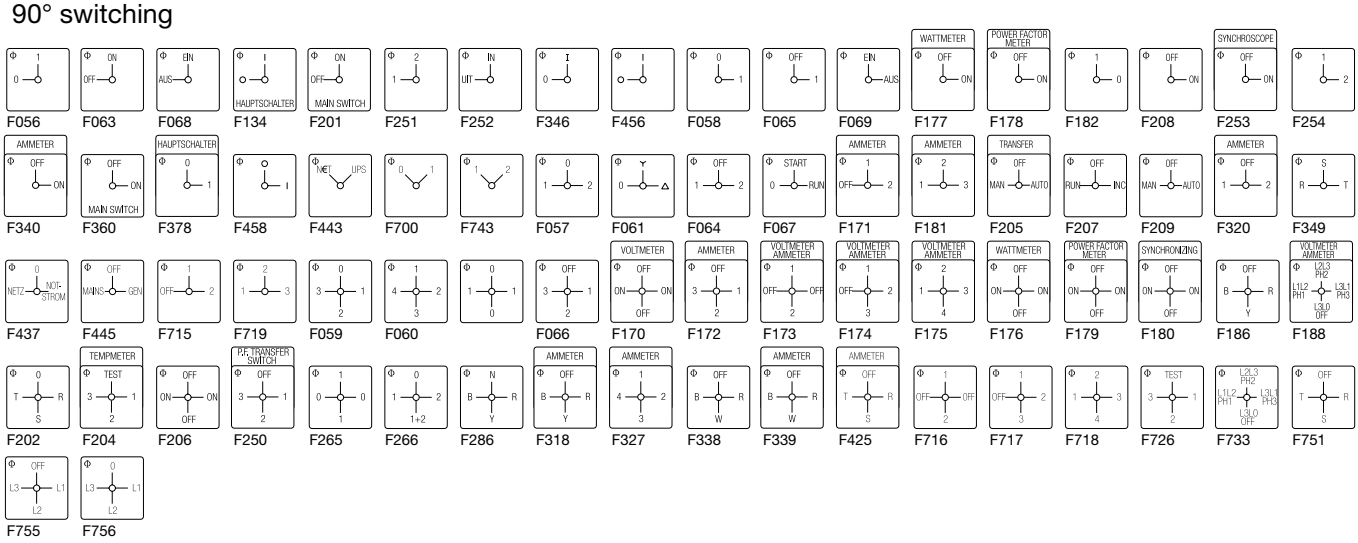
Face plates

< back to table of contents >

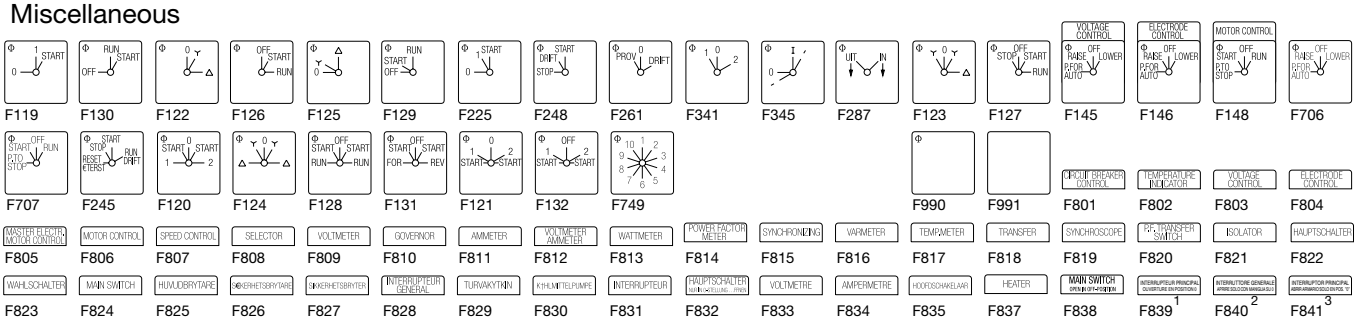
60° switching



90° switching



Miscellaneous



[1]INTERRUPTEUR PRINCIPAL, OUVERTURE EN POSITION 0 [2]INTERRUTTORE GENERALE, APRIRE SOLO CON MANIGLIA SU 0
[3]INTERRUPTOR PRINCIPAL, ABRIR ARMARIO SOLO EN POS. "0"

				A11 A11C	AD11 AD11C	AD12 AD12C	A25 A25C
Rated Insulation Voltage U_i	IEC 60947-3[1]						
	VDE 0660 part 107[1]		V	690	600	600	690
	UL/Canada		V	600	600	600	600
	min. operational voltage		V	20	1	6	20
Rated Impulse Withstand Voltage U_{imp}			kV	6	on request	on request	6
Rated Thermal Current I_u/I_{th}	IEC 60947-3						
	VDE 0660 part 107		A	20	6	6	25
	UL/Canada		A	10	6	6	25[4]
Rated Operational Current I_e							
AC-21A Switching of resistive loads, including moderate overloads	IEC 60947-3	1 V	A	–	6	–	–
	VDE 0660 part 107	6 V	A	–	3	6	–
		12 V	A	–	2	6	–
		24/48 V	A	20	1/0,8	5/4	25
		110/220 V	A	20	0,4/0,2	3/2	25
		380/440 V	A	20	0,13/0,1	1,3/1	25
		500/600 V	A	20	0,08/0,05	0,8/0,5	25
		660/690 V	A	20	–	–	25
AC-22A Switching of combined resistive or low inductive loads including moderate overloads	IEC 60947-3	220 V-500 V	A	20	–	–	25
	VDE 0660 part 107	660 V-690 V	A	16	–	–	25
AC-15 Switching of control devices, contactors, valves etc.	IEC 60947-5-1	220 V-240 V	A	6	–	–	8
	VDE 0660 part 200	380 V-440 V	A	4	–	–	5
Pilot Duty	UL/Canada	Heavy	VAC	600	–	–	600
Ampere Rating Resistive or low inductive loads	UL/Canada		A	10	see AC-21A	see AC-21A	25
Power loss per contact at I_u				0,9	0,5	0,2	0,7
Resistance to vibration			W		on request		
Resistance to shock					on request		
Short Circuit Protection							
Max. fuse size		(gG-characteristic)	A	20	6	6	35
Rated short-time withstand current		(1s-current)	A	120	45	75	220
Min. Ambient Temperature of Stage				-25 °C (valid only without optional extra)			
Max. Ambient Temperature of Stages[2, 3]		open at 100 % I_u/I_{th}		55 °C during 24 hours with peaks up to 60 °C			
		enclosed at 100 % I_{the}		35 °C during 24 hours with peaks up to 40 °C			

[1]Valid for lines with grounded common neutral termination, overvoltage category III, pollution degree 3. Values for other supply systems on request. [2]For electromagnetic optional extras see additional data in Catalog 101. [3]Storage temperature: -40 °C to 85 °C (in case of temperature below -5 °C no shock load permissible). [4]A25-4 und A25C-4: 22A

< back to table of contents >

					A11 A11C	AD11 AD11C	AD12 AD12C	A25 A25C
Rated Utilization Category		IEC 60947-3 VDE 0660 part 107						
AC-2	Slip ring motor starting, reversing and plugging, star-delta starting	3 phase 3 pole	220 V-240 V 380 V-440 V 500 V 660 V-690 V	kW	4 7,5 10 10	– – – –	– – – –	5,5 11 15 13
AC-3	Direct-on-line starting, star-delta starting A11, A25	3 phase 3 pole	220 V-240 V 380 V-440 V 500 V 660 V-690 V	kW	3 5,5 5,5 5,5	– – – –	– – – –	4 7,5 7,5 7,5
		1 phase 2 pole	110 V 220 V-240 V 380 V-440 V	kW	0,6 2,2 3	– – –	– – –	1,5 3 3,7
AC-4	Direct-on-line starting, reversing, plugging and inching	3 phase 3 pole	220 V-240 V 380 V-440 V 500 V 660 V-690 V	kW	0,55 1,5 1,5 1,5	– – – –	– – – –	1 2,2 2,5 2,5
		1 phase 2 pole	110 V 220 V-240 V 380 V-440 V	kW	0,15 0,25 0,55	– – –	– – –	0,2 0,5 0,8
AC-23A	Frequent switching of motors or other high inductive loads	3 phase 3 pole	220 V-240 V 380 V-440 V 500 V 660 V-690 V	kW	3,7 7,5 7,5 7,5	– – – –	– – – –	5,5 11 11 11
		1 phase 2 pole	110 V 220 V-240 V 380 V-440 V	kW	0,75 2,2 3,7	– – –	– – –	1,5 3 5,5
Ratings		UL/Canada						
	Standard motor load DOL-Rating (similar AC-3)	3 phase 3 pole	120 V 240 V 480 V 600 V	HP	1 1 1 1	– – – –	– – – –	1,5 3 7,5 10
-		1 phase 2 pole	120 V 240 V 277 V 480 V 600 V	HP	0,5 1 1 1 1	– – – – –	– – – – –	0,75 1,5 2 3 5
	Max. Permissible Wire Gage - Use copper wire only							
	Single-core or stranded wire			mm^2 AWG	2,5 12	2,5 12	2,5 12	4 10
	Flexible wire (sleeving in accordance with DIN 46228) Flexible AWG wires (without sleeve)			mm^2 AWG	2,5 (2,5) 14	2,5 (2,5) 14	2,5 (2,5) 14	2,5 (2,5) 12

< back to table of contents >

	A11 A11C	AD11 AD11C	AD12 AD12C	A25 A25C
Tightening torque of screws	Nm lb-in	0,8 7	0,8 7	0,8 7	1,3 12
DC Switching Capacity[1]		**Rated Thermal Current I_e**			
contacts in series:	1 2 3 4 5 6 8 Permissible voltage in volts				
Utilization category	24 48 72 96 120 144 192	A	16	–	–	21
DC-21A, DC-21B	48 96 144 192 240 288 384	A	14	–	–	18
Switching of resistive load	60 120 180 240 300 360 480	A	13	–	–	17
Time constant L/R≤1ms	110 220 330 440 550 660 –	A	6	–	–	6
	220 440 660 – – – –	A	0,9	–	–	1
Utilization category	24 48 72 96 120 144 192	A	14	–	–	18
DC-22A, DC-22B	48 96 144 192 240 288 384	A	13	–	–	17
Time constant L/R≤1ms	60 120 180 240 300 360 480	A	12	–	–	16
and inductive load	110 220 330 440 550 660 –	A	1,9	–	–	2
f.e. shunt motors	220 440 660 – – – –	A	0,3	–	–	0,3
Time constant L/R≤2,5ms						
Utilization category	24 48 72 96 120 144 192	A	13	–	–	16
DC-23A, DC-23B	48 96 144 192 240 288 384	A	12	–	–	15
Switching of highly	60 120 180 240 300 360 480	A	10	–	–	14
inductive loads	110 220 330 440 550 660 –	A	1,5	–	–	1,7
f.e. series motors	220 440 660 – – – –	A	0,2	–	–	0,2
Time constant L/R≤15ms						

[1]DC switching capacity applies to ON/OFF switches. Switching capacity for other configurations on request.

International Standards and Approvals

		Mark or Standard	A11	AD11	AD12	A25
USA/Canada	Underwriters Laboratories	c FU us [1]		●	●	
		c UL us [3]	●			●
Europe		EN 60947[2]	+	+	+	+
International Electrical Commission (IEC) Recommendation		IEC 60947[2]	+	+	+	+

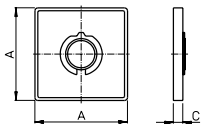
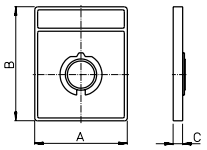
Switch approved — Switch conforms to requirements

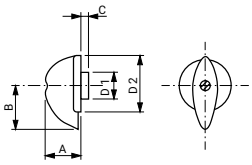
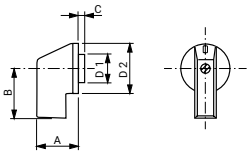
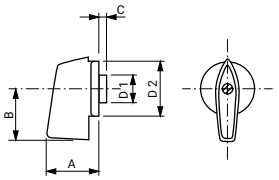
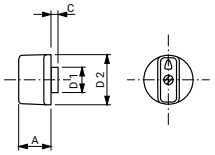
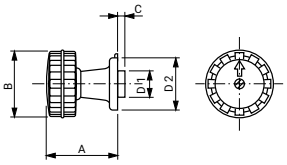
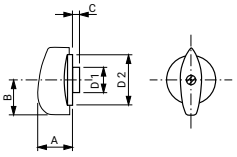
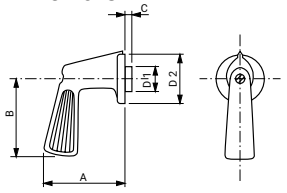
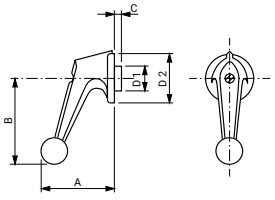
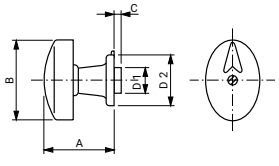
[1]Approved under the “Component Program” (UL-Recognized Industrial Component). File No. E60262, Category Control Number NRNT2 and NRNT8.
[2]Industrial switchgear is not required to bear a symbol but must conform to requirements. By referring to the specific specification on the product the manufacturer implies that these requirements have been met.
[3]Approved under the “Listing-Program”. File No. E35541, Guide No. NLRV and NLRV7.

< back to table of contents >

Dimensions

mm
inch

Escutcheon Plates and Handles	Size	A	B	C	D1ø	D2ø	Escutcheon Plates and Handles	Size	A	B	C	D1ø	D2ø
PE-Escutcheon Plate 	**S1**	64 2.52		7,4 .29			**PR-Escutcheon Plate** 	**S1**	64 2.52	78,8 3.10	7,4 .29		
	S2	88 3.46		8,5 .34									
Dimensions for the E, EF, ER, ERF, EG, EGF, KN1, KD1, VE and VE1 escutcheon plates. Dimensions of the escutcheon plates used for other mounting, refer to page 29.													

R-Handle 	**S1**	23 0.91	31,5 1.24	5 .20	18,2 .72	36 1.42	**I-Handle** 	**S1**	27 1.06	31,8 1.25	2,5 .10	18,2 .72	36 1.42
	S2	30 1.18	42 1.65	5 .20	25,4 1.00	50,0 1.97							
F-Handle 	**S1**	34 1.34	34 1.34	5 .20	18,2 .72	36 1.42	**B-Handle** 	**S1**	23 .91		5 .20	18,2 .72	36 1.42
	S2	44,7 1.76	45 1.77	5 .20	25,4 1.00	50 1.97							
S-Handle 		50 1.97	45 1.77	5 .20	18,2 .72	36 1.42	**L-Handle** 	**S1**	24 .95	24,1 .95	5 .20	18,2 .72	36 1.42
P-Handle 	**S1**	58 2.28	57,5 2.26	5 .20	18,2 .72	36 1.42	**K-Handle** 	**S1**	54 2.13	64 2.52	5 .20	18,2 .72	36 1.42
	S2	70 2.76	68 2.68	5 .20	25,4 1.00	50 1.97		**S2**	55 2.17	71 2.80	5 .20	25,4 1.00	50 1.97
O-Handle 		50 1.97	56 2.2	5 .20	18,2 .72	36 1.42							

< back to table of contents >

Dimensions

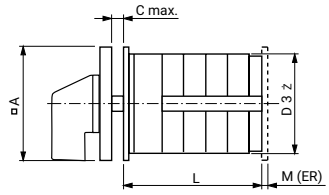
mm
inch

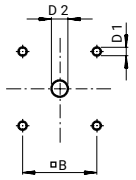
Four Hole Panel Mounting

A11
AD11
AD12
A25
A11C
A25C

Dimensions in brackets for rear mounting plate with ER

E, ER

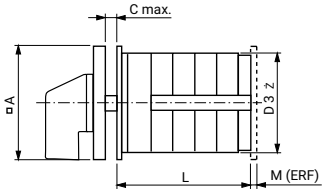


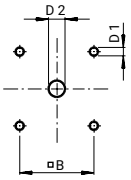


A	64 2.52	64 (88) 2.52	88 3.46
B	48 1.89	48 (68) 1.89	68 2.68
C	4 .16	4 .16	5,5 .22
D1	5 (4.1) .20	5 (5.4) .20	6 (5.4) .24
D2	10-22 .39-.87	10-22 .39-.87	13-17 .51-.67
D3	60 2.36	70 2.76	84 3.31

Dimensions in brackets for rear mounting plate with ERF

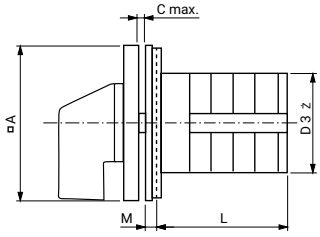
EF, ERF

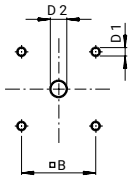




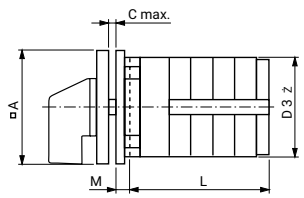
A	4 2.52	64 (88) 2.52	88 3.46
B	48 1.89	48 (68) 1.89	68 2.68
C	4 .16	4 .16	5,5 .22
D1	5 (4.1) .20	5 (5.4) .20	6 (5.4) .24
D2	19-22 .75-.87	19-22 .75-.87	26-30 1.02-1.18
D3	60 2.36	70 2.76	84 3.31

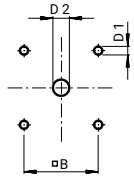
EG, EGF





A		88 3.46	88 3.46	- -
B		68 2.68	68 2.68	- -
C		5,5 .22	5,5 .22	- -
D1		6 .24	6 .24	- -
D2	EG	13-30 .51-1.18	13-30 .51-1.18	- -
D2	EGF	26-30 1.02-1.18	26-30 1.02-1.18	- -
D3		60 2.36	70 2.76	- -





A	60 2.36	60 2.36
B	48 1.89	48 1.89
C	4 .16	4 .16
D1	5 .20	5 .20
D2	10-22 .39-.87	10-22 .39-.87
D3	60 2.36	70 2.76

< back to table of contents >

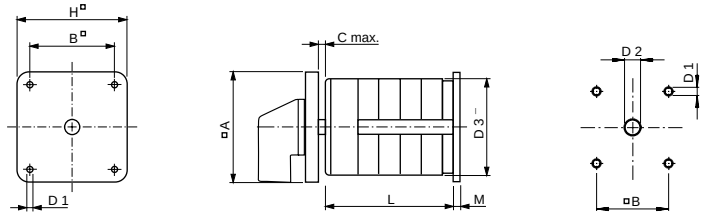
Dimensions

mm
inch

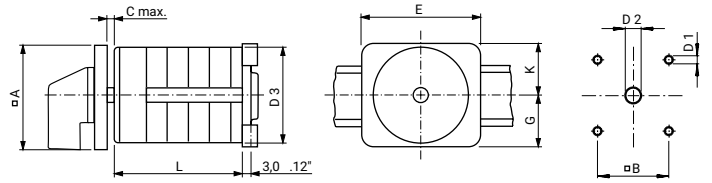
Base Mounting	A11 AD11 AD12	A25	A11C A25C

Dimensions in brackets for rear mounting plate with VE

VE

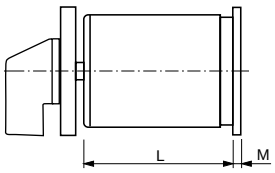


VE1



A	64 2.52	64 (88) 2.52	88 3.46
B	48 1.89	48 (68) 1.89	68 2.68
C	13,5 .53	13,5 .53	16 .63
D1	5 (4.1) .20	5 (5.4) .20	6 (5.4) .24
D2	10-22 .39-.87	10-22 .39-.87	13-30 .51-1.18
D3	60 2.36	70 2.76	84 3.31
D4	4,1 .16	4,1 .16	5,4 .21
E	70 2.76	70 2.76	- -
G	30 1.18	30 1.18	- -
K	30 1.18	30 1.18	- -
H	64 2.52	88 3.46	88 3.46

Length L	A11 AD11 AD12	A25
Mounting E		
No. of stages		
1	42,5 1.67	43,5 1.71
2	55,2 2.17	56,2 2.21
3	67,9 2.67	68,9 2.71
4	80,6 3.17	81,6 3.21
5	93,3 3.67	94,3 3.71
6	106 4.17	107 4.21
7	118,7 4.67	119,7 4.71
8	131,4 5.17	132,4 5.21
9	144,1 5.67	145,1 5.71
10	156,8 6.17	157,8 6.21
11	169,5 6.67	170,5 6.71
12	182,2 7.17	183,2 7.21



Additional Length M[1]	A11 AD11 AD12	A25
Mounting +		
switch with latching mechanism size S2		
ER/ERF	6,5 .26	8,7 .34
EG/EGF	0,5 .02	0,5 .02
KN1/KD1	7 .28	7 .28
VE	5 .20	5 .20
EL1	11 .43	11 .43
EL2	11 .43	11 .43
EL4	11 .43	11 .43
A11C/A25C	8,2 .32	8,2 .32

[1] Additional length plus length shown in the E mounting table = overall length

< back to table of contents >

The Range of “Blue Line” Switchgear

Technical literature covering the following products is available on request.

	Catalog Number
Main Switches and Main Switches with Emergency Function 16 A-315 A **Maintenance Switches 20 A-315 A** **Switch Disconnectors 20 A-315 A** According to IEC 60947-3, EN 60947-3, VDE 0660 part 107, IEC 60204, EN 60204 and VDE 0113	**500**
CL Switches 10 A-20 A **C, CA and CAD Switches 10 A-315 A and L Switches 350 A-2400 A** C, CA and CAD switches are designed for universal application. They are recommended for instrument, isolator, double-throw and motor control. L switches are designed for load and off-load applications. They are used to switch resistive or low inductive loads.	**100**
Optional Extras and Enclosures The complete product line, a large number of optional extras is available, including door interlocks, push-pull devices, cylinder and padlock attachments, control and indicator devices, AC motor drives, as well as enclosures, both insulated and metal.	**101**
A and AD Switches 6 A-25 A A and AD switches have 4 contacts in each switching stage. These switches provide an extensive range of switch functions and require a minimum mounting depth. Up to 36 switching positions are possible, with availability of 48 contacts per 12 stage switch column.	**110**
CG, CH and CHR Switches 10 A-25 A Ultra compact CG, CH and CHR switches are ideally suited for control and instrumentation applications. Switch terminals are “finger-proof” and conveniently accessible for wiring and are delivered open. All CG4 switches offer specially designed gold plated contacts or H-bridges with “cross-wire” contact systems, which facilitates their use in electronic circuitry and chemically aggressive environments.	**120**
DH, DHR, DK and DKR Switches 6 A-16 A DH, DHR, DK and DKR switches incorporate unique corrosion resistant contacts that permit operation on system voltage as low as 1 V. They have fully enclosed and protected contacts which can be operated either by rotary and/or lateral handle movement. D switches are used in calibration and semiconductor circuits. They are also used for relay and contactor control.	**130**
X Switches 80 A-630 A X switches can be applied for load, tap and gang switching duties. They incorporate 6 contacts in each switching stage. Their compact design provides a minimum length dimension for mounting purposes.	**140**
KG Switches 20 A-315 A and KH and KHR Switches 16 A-80 A KG, KH and KHR switches are excellent circuit interruptors. They have high through fault and fault making capacities and are especially designed for use as isolators and safety switches for machine tools, distribution panels and switchboards. KG ON/OFF switches offer unusually high dimensioned air and creepage distances between terminals which are designed for time saving “straight-line” wiring. ON/OFF switches are available with up to 8 poles and double-throw switches are available with up to 4 poles.	**150**
Push Buttons and Pilot Lights, 22,5 mm Ø A complete range of state-of-the-art push buttons and pilot lights represent an ideal combination of functional security and economical efficiency in a modular design.	**302**

We reserve the right to make technical and dimensional changes without prior notice.

SALES AND SERVICE ORGANIZATION

Australia
Kraus & Naimer Pty. Ltd.
379 Liverpool Road, ASHFIELD, N.S.W. 2131
P: 1800 567 948
E: sales-au@krausnaimer.com

Austria
Kraus & Naimer GmbH
Schumanngasse 39
1180 WIEN
P: +43 1 404 06 0
E: sales-at@krausnaimer.com

Belgium, Luxembourg
Kraus & Naimer B.V.
Ikaros Business Park
Ikaroslaan 83
1930 ZAVENTHEM
P: +32 2 757 0141
F: +32 2 757 1640
E: sales-be@krausnaimer.com

Brazil
Central and South America
Kraus & Naimer Ind. Com. Ltda.
Rua Santa Monica, 1061
Parque Industrial San Jose
P: +55 11 2198 1288
F: +55 11 2198 1251
E: knbrasil@krausnaimer.com.br

Canada
Kraus & Naimer Ltd.
219 Connie Crescent, Unit 13A
CONCORD, Ontario, L4K 1L4
P: +1 905 738 1666
E: sales-ca@krausnaimer.com

Cyprus
ELECTROMATIC CONSTRUCTIONS LTD.
72, Evagoras Pallikarides Str., 2235 LATSIA-Nicosia
P. O. Box 12630, 2251 LATSIA-Nicosia
P: +357 2 48 41 41
F: +357 2 48 57 47
E: electromatic@cytanet.com.cy

Czech Republic
OBZOR, výrobní družstvo Zlín
Na Slanici 378
763 02 ZLÍN
P: +420 577 195 150
F: +420 577 195 152
E: odbyt@obzor.cz

Denmark
THIIM A/S
Transformervej 31
2860 SOEBORG
P: +45 4485 8000
F: +45 4485 8005
E: thiim@thiim.com

Finland
Kraus & Naimer Oy
Kiitoradankuja 8
01530 VANTAA
P: +358 9 825 424 0
E: sales-fi@krausnaimer.com

France
Kraus & Naimer s.a.s.
33, rue Bobillot
75013 PARIS
P: +33 1 58 40 80 80
E: sales-fr@krausnaimer.com

Germany
Kraus & Naimer GmbH
Wikingerstraße 20-28, 76189 KARLSRUHE
Postfach 10 01 24, 76231 KARLSRUHE
P: +49 721 59 88 0
E: sales-de@krausnaimer.com

Great Britain
Kraus & Naimer Ltd.
115 London Road
NEWBURY/BERKSHIRE RG14 2AH
P: +44 1635 262626
F: +44 1635 37807
E: sales-uk@krausnaimer.com

Greece
KALAMARAKIS-SAPOUNAS S. A.
Ionias & Neromilou Str., P. O. Box 46566
13671 ACHARNES/ATHENS
P: +30 2 10 240 6000 6
F: +30 2 10 240 6007
E: kalamarakis.sapounas@ksa.gr

Hungary
GANZ KK KFT.
X. Kőbányai út 41/c, Postfach 87
1475 BUDAPEST
P: +36 1 261 5479
E: ganzkk@ganzkk.hu

Iceland
JOHAN RÖNNING LTD.
Klettagarðar 25
104 REYKJAVIK
P: +354 5200 800
E: ronning@ronning.is

Republic of Ireland
Kraus & Naimer Ltd.
4235 Atlantic Avenue
Westpark Business Campus
Shannon, Co. Clare
P: +353 61 704700
F: +353 61 471084
E: sales-ie@krausnaimer.com

Italy
Kraus & Naimer s.r.l.
Via Terracini, 9
24047 TREVIGLIO (BG)
P: +39 0363 30 11 12
E: sales-it@krausnaimer.com

Japan
Kraus & Naimer Ltd.
Yoshiwada Building 2F
1-11-6 Hamamatsucho
Minato-Ku, TOKYO 105-0013
P: +81 3 3436 6151
F: +81 3 3436 6325
E: sales-jp@krausnaimer.com

Mexico
JC INGENIERÍA Y CONTROL, SA DE CV.
Ángel Gaviño 30.
C. Satélite, C. Medicos,
Naucalpan Edo. de Mexico, C.P. 53100
P: +52 55 55 62 75 77
F: +52 55 55 62 04 34
E: ventas@jcingenieriaycontrol.com

Netherlands
Kraus & Naimer B.V.
Wegtersweg 38-40, Postbus 199
7556 BR HENGELO (Ov.)
P: +31 74 291 9441
F: +31 74 291 98380
E: sales-nl@krausnaimer.com

New Zealand
Kraus & Naimer Ltd.
42 Miramar Avenue, WELLINGTON 6022
P. O. Box 15-009, WELLINGTON 6243
P: + 64 0800 736 522
E: sales-nz@krausnaimer.com

Norway
Kraus & Naimer AB Avd. Norge
Postboks 27 Vollebekk
0516 Oslo
P: +47 22 64 44 20
E: sales-no@krausnaimer.com

Poland
ASTAT LOGISTYKA SP. Z O.O.
Dąbrowskiego 441
60451 POZNAŃ
P: +48 61 849 80 89
E: k.swiderski@astat.pl

Portugal
ELECTRICOL-DAMAS, FERREIRA & DAMASCENO, LDA.
Apartado 1063, S. Ant. Cavaleiros
2670 LOURES
P: +351 21 989 8939
F: +351 21 988 6464
E: electricol@electricol.pt

Singapore, India, Middle East – UAE
Kraus & Naimer Pte. Ltd.
115A, Commonwealth Drive
#03-17/23
SINGAPORE 149 596
P: +65 6473 8166
E: sales-sg@krausnaimer.com

Slovenia
SCHRACK TECHNIK D.O.O.
Pameče 175
SI-2380 SLOVENJ GRADEC
P: +386 2 88 392 00
F: +386 2 88 434 71
E: d.goljat@schrack.si

Republic of South Africa
Kraus & Naimer Pty. Ltd.
7 Village Crescent, Linbro Village
Linbro Business Park, SANDTON 2065
P. O. Box 511, KELVIN 2054
P: +27 11 608 6060
E: sales-za@krausnaimer.com

Spain
Kraus & Naimer B.V.
P: +34 662 696 014
E: sales-es@krausnaimer.com

Sweden
Kraus & Naimer AB
Dr. Widerströms Gata 11, Hägersten
Box 42097, 126 14 STOCKHOLM
P: +46 8 97 00 80
E: sales-se@krausnaimer.com

Switzerland
AWAG Elektrotechnik AG
Sandbüelstraße 2
CH-8604 VOLKETSWIL
P: +41 44 908 19 19
E: info@awag.ch

Turkey
KARDES ELEKTRIK SANAYI VE TICARET A.S.
Yassioren Mah. Hifa Sok. No: 4
34277 Arnavutkoy-Istanbul-Turkey
P: +90 212 624 92 04 118
F: +90 212 592 48 10
E: info@unalkardes.com.tr

USA
Kraus & Naimer Inc.
760 New Brunswick Road
SOMERSET, NJ 08873
P: +1 732 560 1240
E: sales-us@krausnaimer.com

Kraus & Naimer

Contact us:

www.krausnaimer.com