



# Kraus & Naimer

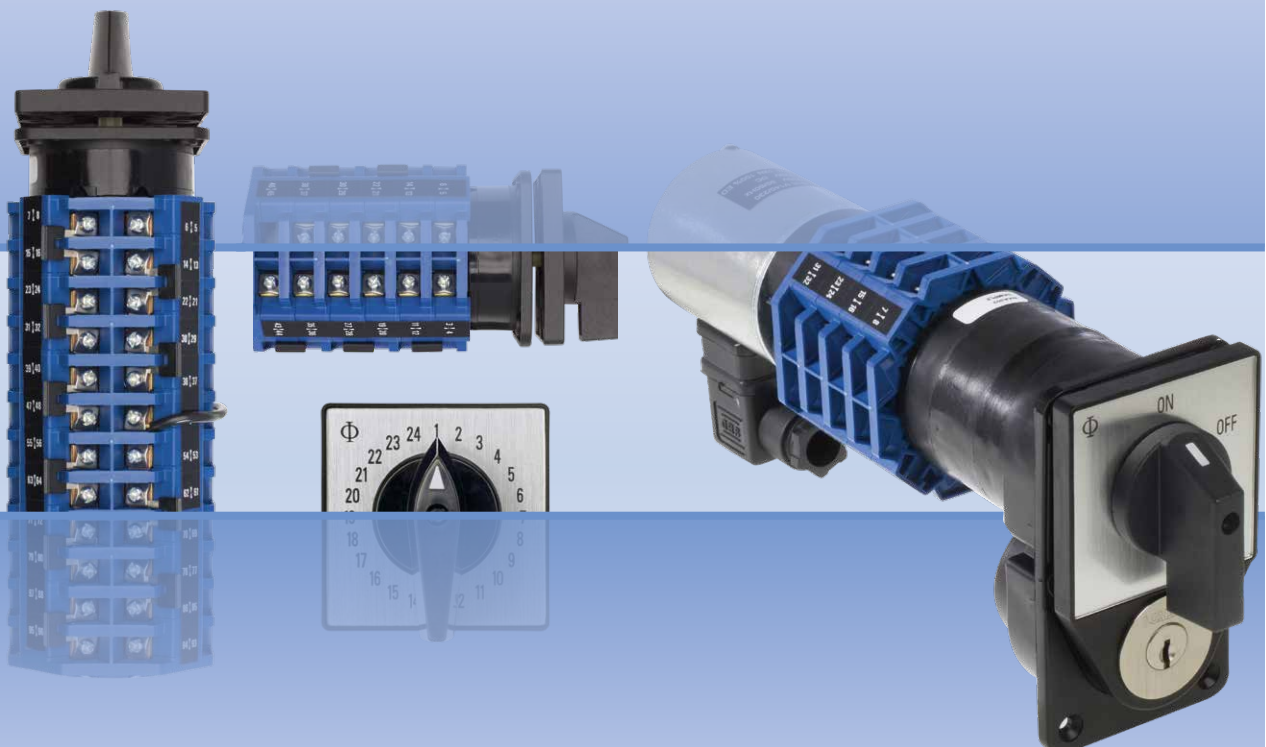
BLUE LINE switchgear

since 1907

## Catalog 110 Control Switches for Special Applications

02/2018

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



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# Kraus & Naimer

The development of the Blue Line rotary switch, contactor 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 throughout 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

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

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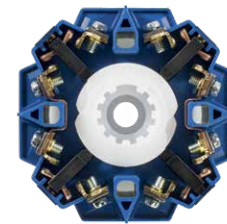
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## Construction Data

### 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.

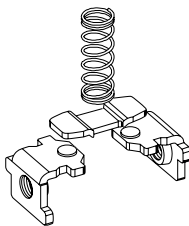


Switch type	Switching angle	Max. number of switch positions
A11, AD11, AD12	15°, 20°, 30°, 45°, 60°, 90°	24
A25	15°, 20°, 30°, 45°, 60°, 90°	24

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

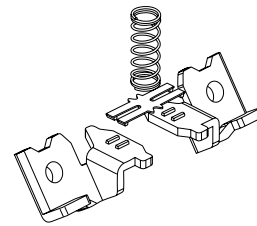
### 2 different Contact Systems are available

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.

### Switch Size

### Type

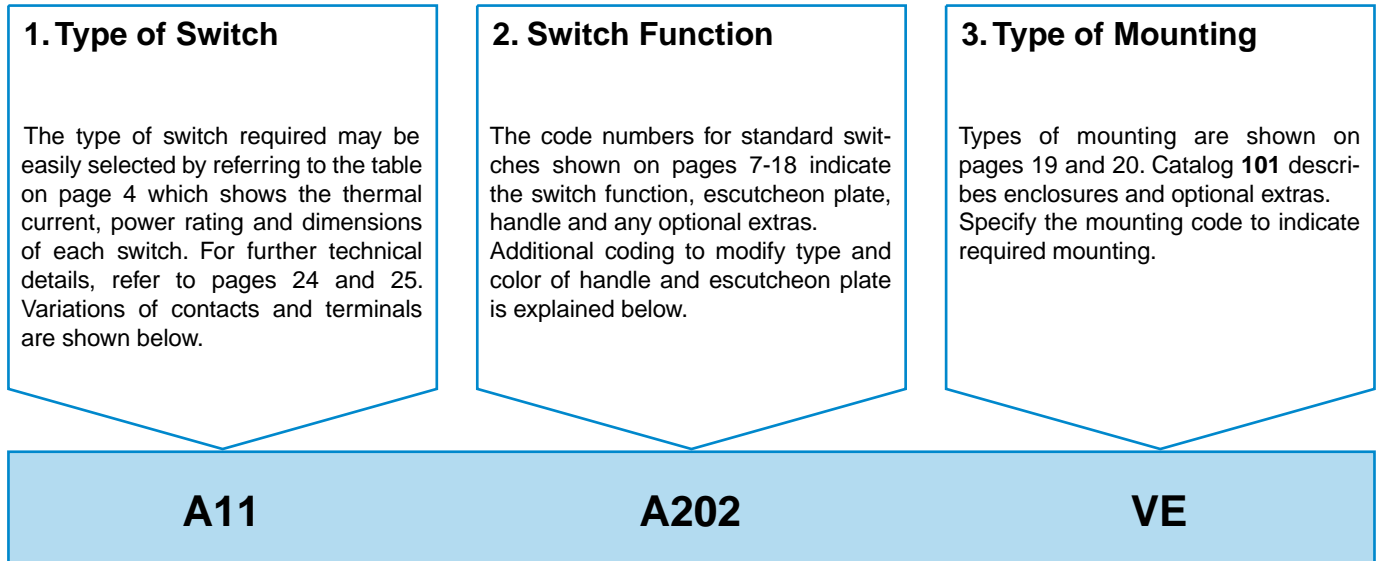
### Rated Values

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



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### Type of Switch

Extending the switch type coding the following combinations will define:

Amendment	Definition	For switch types
-1	with gold contacts <sup>1</sup>	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**.

<sup>1</sup>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.

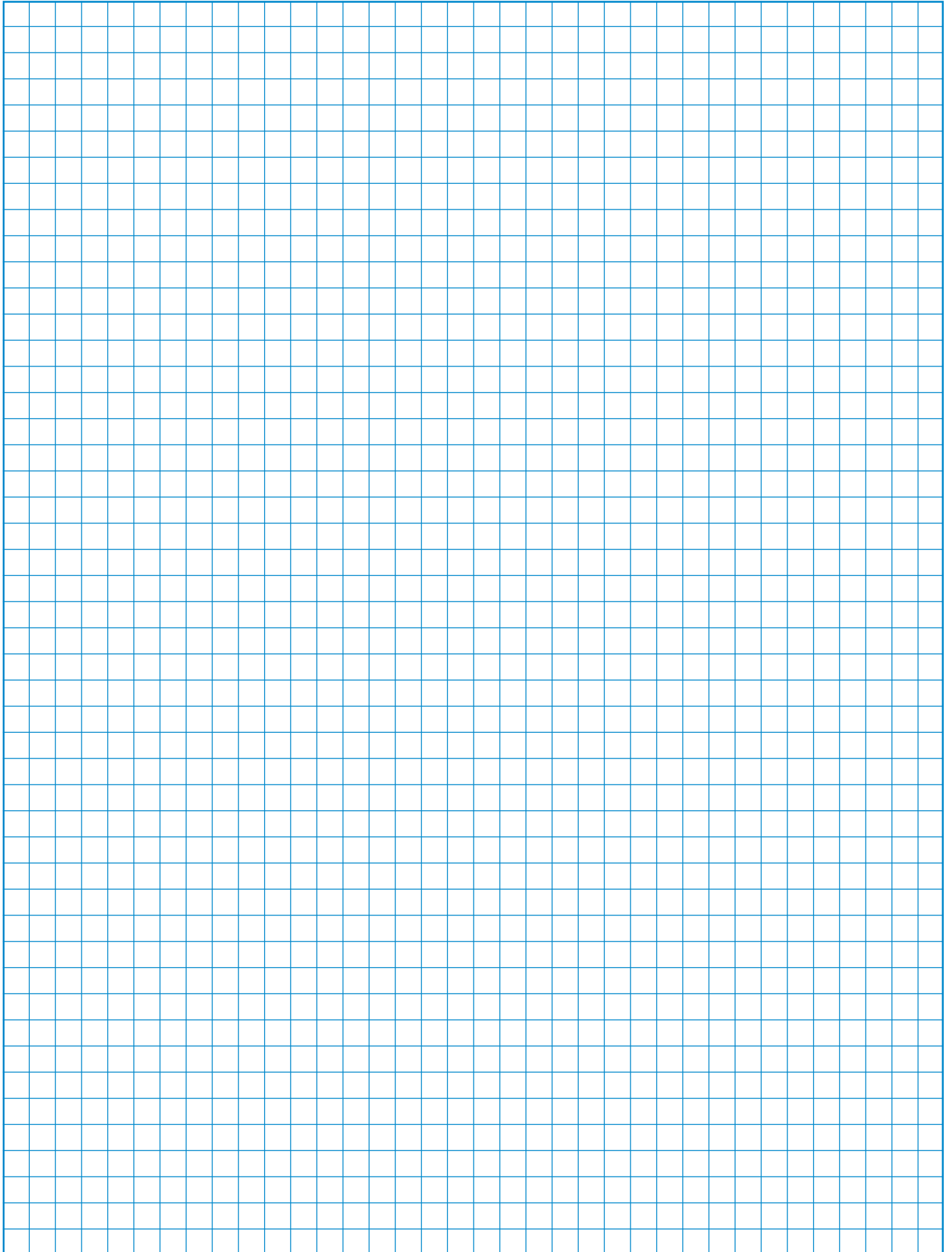
The large number of optional extras and enclosures is covered in Catalog **101**.

### 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.



**Notes:**





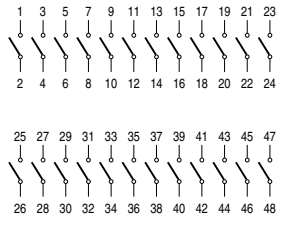
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Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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


**ON/OFF Switches with 60° Switching**

[Dimensions p. 29](#)



1 pole	 F070		A200	1	 1-24 pole
2 pole			A201	1	
3 pole			A202	1	
4 pole			A203	1	
5 pole			WAA341	2	
6 pole			A342	2	
8 pole			A344	2	
10 pole			A346	3	
12 pole			A348	3	
14 pole			WAA350	4	
16 pole			WAA352	4	
18 pole			WAA354	5	
20 pole			WAA356	5	
22 pole			WAA358	6	
24 pole	WAA360	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	



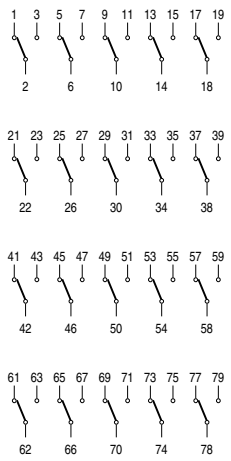
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Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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

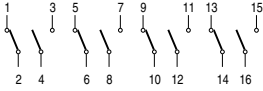
Double-throw Switches without „OFF“ 60° Switching

[Dimensions p.29](#)



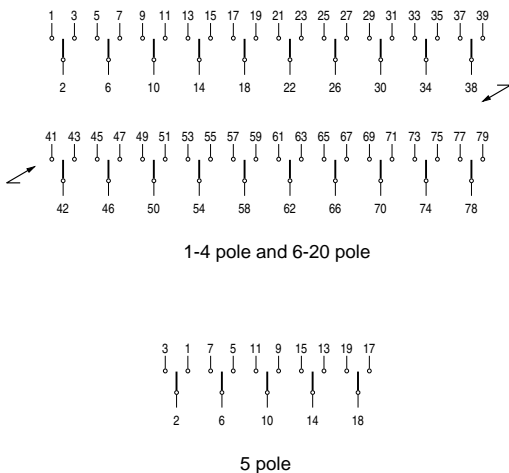
1 pole	 <p>F072</p>		A220	1	 <p>1-20 pole</p>
2 pole			A221	1	
3 pole			A222	2	
4 pole			A223	2	
6 pole			A370	3	
8 pole			A372	4	
10 pole			WAA 374	5	
12 pole			WAA 376	6	
14 pole			WAA 660	7	
16 pole			WAA 661	8	
18 pole	WAA 662	9			
20 pole	WAA 663	10			

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Double-throw Switches without „OFF“ with electrically isolated contacts



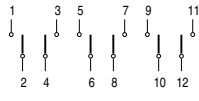



1 pole	 <p>F072</p>		A720	1	 <p>1-4 pole</p>
2 pole			A721	1	
3 pole			A722	2	
4 pole			A723	2	

Double-throw Switches with Center „OFF“ 60° Switching



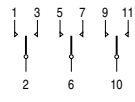
1 pole	 <p>F071</p>		A210	1	 <p>1-4 pole and 6-20 pole</p> <p>5 pole</p>
2 pole			A211	1	
3 pole			A212	2	
4 pole			A213	2	
5 pole			A361	3	
6 pole			A362	3	
8 pole			WAA 364	4	
10 pole			WAA 366	5	
12 pole			WAA 368	6	
14 pole			WAA 655	7	
16 pole	WAA 656	8			
18 pole	WAA 657	9			
20 pole	WAA 658	10			

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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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



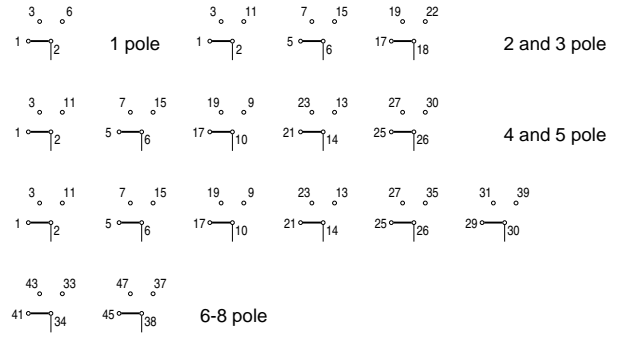


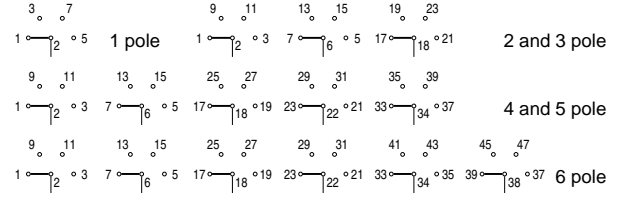


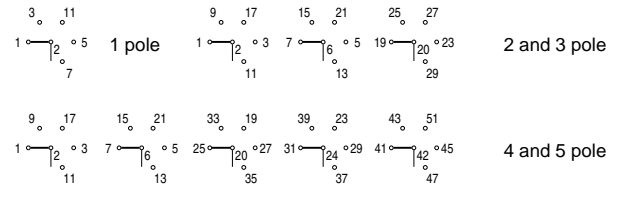


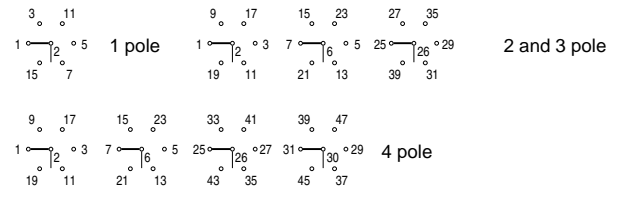


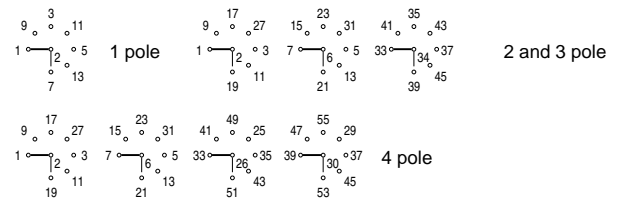


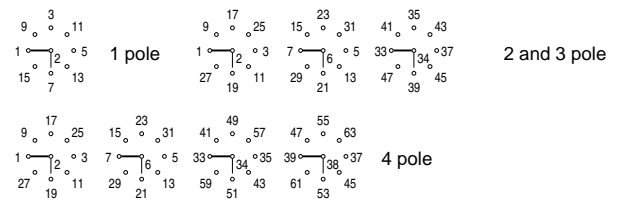


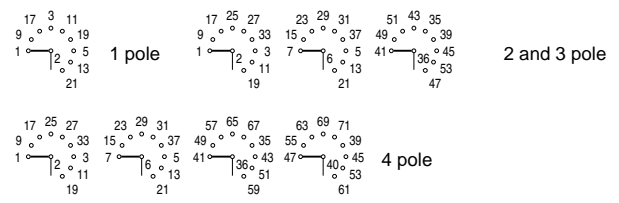
1 pole with spring return to center 2 pole with spring return to center 3 pole with spring return to center	 F025		A214 A215 A216	1 1 2	 1-3 pole
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Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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Multi-step Switches without „OFF“

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

# Switch Function and Configuration

# A Switches

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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## Multi-step Switches without „OFF“

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1 pole 2 pole 3 pole			WAA 237 WAA 257 WAA 277	3 5 8	  	2 and 3 pole
1 pole 2 pole 3 pole			WAA 238 WAA 258 WAA 278	3 6 9	  	2 and 3 pole
1 pole 2 pole 3 pole			WAA 239 WAA 259 WAA 279	3 6 9	  	2 and 3 pole

## Multi-step Switches with „OFF“






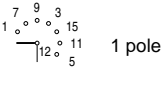
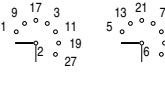
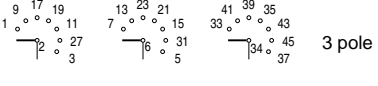





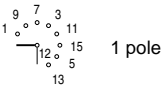
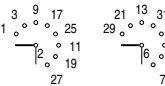
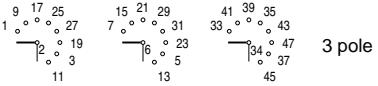





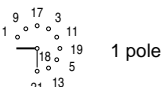
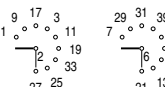
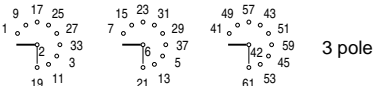





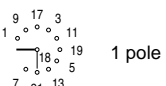
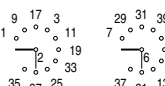
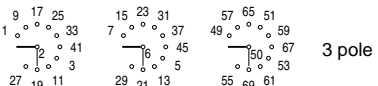





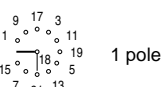
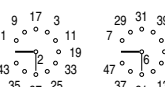
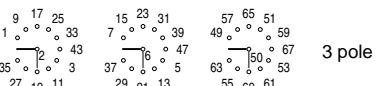





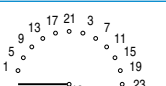
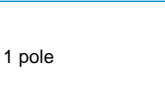
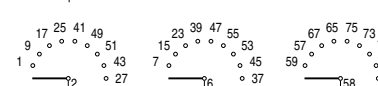


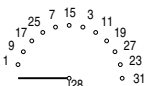


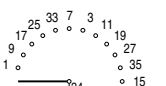
1 pole 2 pole 3 pole 5 pole			A240-600 A260-600 A280-600 WAA 486	1 1 2 3	   	1- and 2 pole  3 and 5 pole
1 pole 2 pole 3 pole 5 pole			A241-600 A261-600 A281-600 WAA 487	1 2 3 4	   	2 and 3 pole  5 pole
1 pole 2 pole 3 pole			A242-600 WAA 262 WAA 282	1 2 3	  	2 and 3 pole
1 pole 2 pole 3 pole			A243-600 WAA 263 WAA 283	2 3 5	  	2 and 3 pole
1 pole 2 pole 3 pole			A244-600 WAA 264 WAA 284	2 3 5	  	2 and 3 pole

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Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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Multi-step Switches with „OFF“

[Dimensions p.29](#)



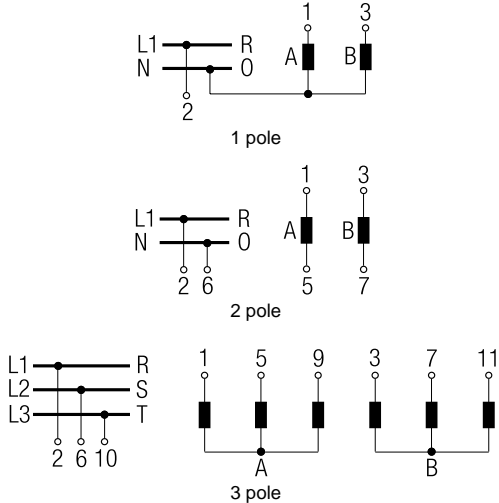


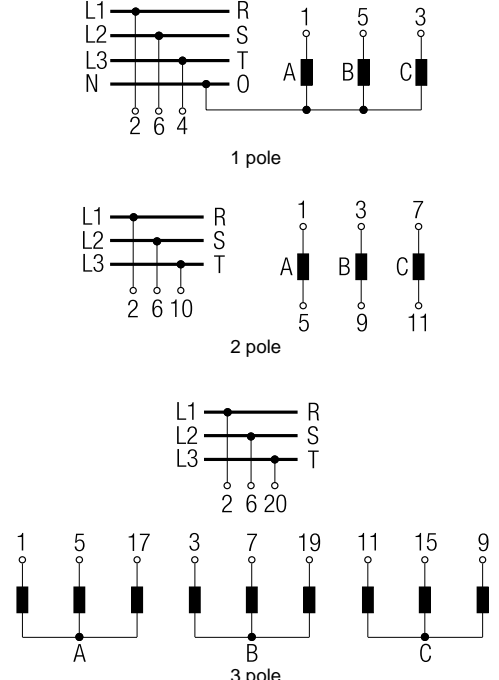
1 pole 2 pole 3 pole	 	  	<b>WAA 245</b> <b>WAA 265</b> <b>WAA 285</b>	2 4 6	 1 pole  2 pole  3 pole
1 pole 2 pole 3 pole	 	  	<b>WAA 246</b> <b>WAA 266</b> <b>WAA 286</b>	2 4 6	 1 pole  2 pole  3 pole
1 pole 2 pole 3 pole	 	  	<b>WAA 247</b> <b>WAA 267</b> <b>WAA 287</b>	3 5 8	 1 pole  2 pole  3 pole
1 pole 2 pole 3 pole	 	  	<b>WAA 248</b> <b>WAA 268</b> <b>WAA 288</b>	3 5 9	 1 pole  2 pole  3 pole
1 pole 2 pole 3 pole	 	  	<b>WAA 249</b> <b>WAA 269</b> <b>WAA 289</b>	3 6 9	 1 pole  2 pole  3 pole
1 pole  2 pole 3 pole	 	  	<b>WAA 630</b>  <b>WAA 635</b> <b>WAA 644</b>	3  7 11	 1 pole  2 pole  2 and 3 pole
1 pole			<b>WAA 631</b>	4	 1 pole
1 pole			<b>WAA 632</b>	5	 1 pole

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Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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General Application Switches

[Dimensions p.29](#)



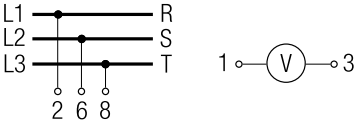


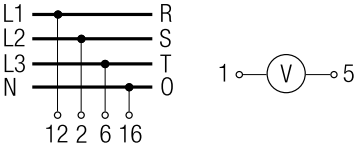


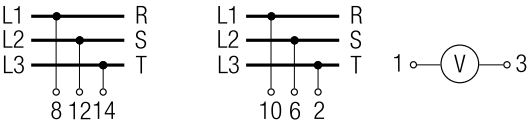
<p>1 pole 2 Gang 2 pole 3 pole</p> <p>Switching sequence: 0, A, A+B</p>	 <p>F075</p>		<p>A310-600 A312-600 WAA 314</p>	<p>1 1 2</p>	
<p>1 pole 3 Gang 2 pole 3 pole</p> <p>Switching sequence: 0, A, A+B, A+B+C</p>	 <p>F001</p>		<p>A311-600 WAA 313 WAA 315</p>	<p>1 2 3</p>	

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Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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Voltmeter Switches with „OFF“

[Dimensions p.29](#)

3 phase to phase			A004	1	
3 phase to phase and 3 phase to neutra			A007	2	
2 separate 3 phase with center „OFF“			WAA008	2	

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Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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**Ammeter Switches**

[Dimensions p.29](#)



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	



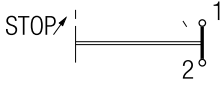





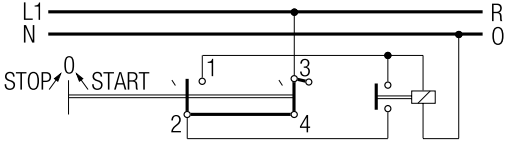


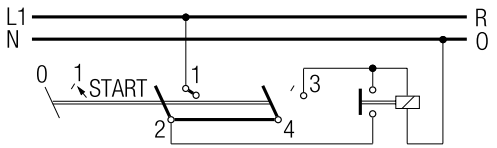


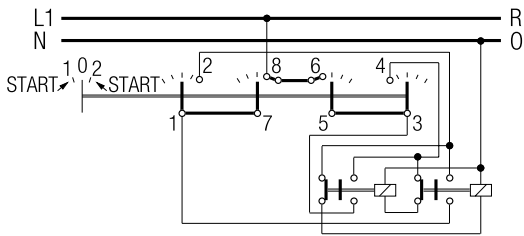
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Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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Control Switches

[Dimensions p.29](#)

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	



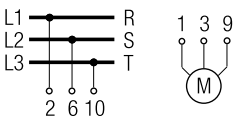
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Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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

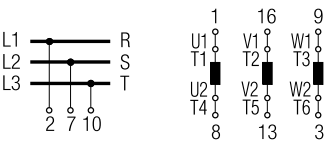


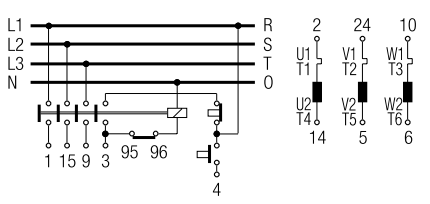
## Motor Reversing Switches

*Dimensions p. 29*



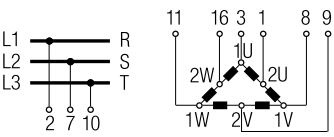


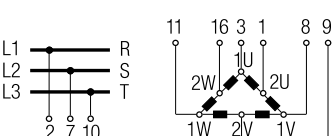


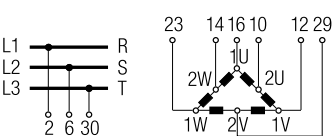


3-polig			A401	2	
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

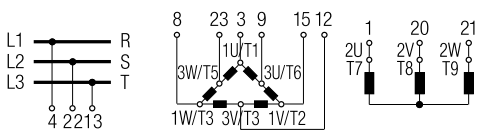
## Star-delta Switches

Off-star-delta			A410	2	
With auxiliary contact closed in „OFF“ position			WAA416	3	

## Motor Control Switches





2 speed single winding			A440	2	
2 speed single winding with center „OFF“			A441	2	
2 speed single winding reversing			A442	4	

## Polumschalter



3 speed 2 winding 0 - AΔ - BY - AY			WAA457	3	
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<b>Four Hole Panel Mounting</b>	<b>Code</b>	A11 AD11 AD12	A25	A11C A25C
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	<p><b>Panel Mounting</b></p> <p>Four hole panel mounting, Protection IP 40</p> <p>Four hole panel mounting, Protection IP 65/67/69k</p>	E EF	● ●	● ●	● ●
	<p><b>Panel and base mounting</b></p> <p>Four hole panel mounting, Protection IP 40</p> <p>Four hole panel mounting, Protection IP 65/67/69k</p>	ER ERF	● ●	● ●	● ●
	<p><b>Panel mounting using larger escutcheon plate and handle</b></p> <p>Four hole panel mounting, Protection IP 40</p> <p>Four hole panel mounting, Protection IP 65/67/69k</p>	EG EGF	● ●	● ●	
	<p><b>Panel mounting with heavy duty stop and metal shaft</b></p> <p>Four hole panel mounting, Protection IP 40 Mounting plate, escutcheon plate and handle of size S1</p> <p>Four hole panel mounting, Protection IP 40 Mounting plate, escutcheon plate and handle of size S1 and 6 mm square metal shaft</p>	KN1 KD1	● ●	● ●	

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

# Handles

Type	Color	Code	Size	
			S1	S2

Type	Color	Code	Size	
			S1	S2

<p>R-Handle</p> 	black red	G001 G002	● ● ● ●	
<p>F-Handle</p> 	black red	G221 G222	● ● ● ●	
<p>S-Handle</p> 	black red	G301 G302	● — ● —	
<p>P-Handle</p> 	black red	G211 G212	● ● ● ●	
<p>O-Handle</p> 	black red	G321 G322	● — ● —	

<p>I-Handle</p> 	black red	G251 G252	● ● ● ●	
<p>B-Handle</p> 	black red	G521 G522	● — ● —	
<p>L-Handle</p> 	black red	G501 G502	● — ● —	
<p>K-Handle</p> 	black red	G411 G412	● ● ● ●	

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# 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 then 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.

## Standard Letterings Available

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

### 30° switching


### 45° switching


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# Escutcheon Plates

## 60° switching

60° switching

Labels: F070, F087, F088, F089, F133, F197, F198, F232, F243, F247, F263, F268, F310, F311, F323, F328, F352, F379, F380, F470, F754, F072, F163, F164, F192, F193, F196, F230, F231, F234, F244, F257, F262, F264, F288, F291, F313, F382, F441, F705, F721, F722, F750, F757, F758, F075, F076, F098, F220, F223, F356, F377, F723, F071, F073, F080, F081, F085, F086, F090, F091, F092, F093, F094, F104, F194, F235, F237, F240, F241, F249, F260, F269, F274, F281, F290, F292, F312, F314, F315, F316, F324, F331, F344, F354, F359, F364, F370, F371, F373, F381, F385, F442, F444, F469, F732, F735, F759, F077, F100, F101, F102, F342, F343, F361, F362, F363, F365, F366, F078, F191, F325, F326, F720, F074, F082, F096, F097, F195, F256, F079, F083, F084, F095, F099, F185, F190, F199, F233, F236, F238, F242, F283, F725, F730, F731, F737

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## 90° switching

90° switching

Labels: F056, F063, F068, F134, F201, F251, F252, F346, F456, F058, F065, F069, F177, F178, F182, F208, F253, F340, F360, F378, F458, F443, F700, F743, F057, F061, F064, F067, F171, F181, F205, F207, F209, F320, F437, F445, F715, F719, F059, F060, F062, F066, F170, F172, F173, F174, F175, F176, F179, F180, F186, F202, F204, F206, F250, F265, F266, F286, F318, F327, F338, F339, F425, F716, F717, F718, F726, F733, F755, F756

## Miscellaneous

Miscellaneous

Labels: F119, F130, F122, F126, F125, F129, F225, F248, F246, F261, F341, F345, F287, F123, F127, F145, F146, F706, F707, F245, F120, F124, F128, F131, F121, F132, F749, F990, F991, F801, F802, F803, F805, F806, F807, F808, F809, F810, F811, F812, F813, F814, F815, F816, F817, F818, F819, F820, F821, F823, F824, F825, F826, F827, F828, F829, F830, F831, F832, F833, F834, F835, F837, F838, F839, F840

<sup>1</sup>INTERRUPTEUR PRINCIPAL, OUVERTURE EN POSITION 0 <sup>2</sup>INTERRUPTORE GENERALE, APRIRE SOLO CON MANIGLIA SU 0  
<sup>3</sup>INTERRUPTOR PRINCIPAL, ABRIR ARMARIO SOLO EN POS. "0"

<b>Selection Data</b>	A11 A11C	AD11 AD11C	AD12 AD12C	A25 A25C
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<b>Rated Insulation Voltage <math>U_i</math></b>	IEC 60947-3 <sup>1</sup> VDE 0660 part 107 <sup>1</sup> UL/Canada min. operational voltage	V V V	690 600 20	600 600 1	600 600 6	690 600 20	
<b>Rated Impulse Withstand Voltage <math>U_{imp}</math></b>		kV	6	on request	on request	6	
<b>Rated Thermal Current <math>I_u/I_{th}</math></b>	IEC 60947-3 VDE 0660 part 107 UL/Canada	A A	20 10	6 6	6 6	25 25 <sup>5</sup>	
<b>Rated Operational Current <math>I_e</math></b>							
AC-21A	Switching of resistive loads, including moderate overloads	IEC 60947-3 VDE 0660 part 107	1 V 6 V 12 V 24/48 V 110/220 V 380/440 V 500/600 V 660/690 V	A A A A A A A A	– 6 3 2 20 20 20 20 20	– – 6 6 5/4 3/2 1,3/1 0,8/0,5 –	– – – – 25 25 25 25 25
AC-22A	Switching of combined resistive or low inductive loads including moderate overloads	IEC 60947-3 VDE 0660 part 107	220 V-500 V 660 V-690 V	A A	20 16	– –	25 25
AC-15	Switching of control devices, contactors, valves etc.	IEC 60947-5-1 VDE 0660 part 200	220 V-240 V 380 V-440 V	A A	6 4	– –	8 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 $I_u$ Resistance to vibration Resistance to shock				W	0,9	0,5 on request on request	0,2 0,7
<b>Short Circuit Protection</b> Max. fuse size Rated short-time withstand current	(gG-characteristic) (1s-current)	A A	20 120	6 45	6 75	35 220	
<b>DC Switching Capacity<sup>2</sup></b>						<b>Rated Operational Current <math>I_e</math></b>	
No. of series contacts	1 2 3 4 5 6 8						A11 AD11 AD12 A25
Resistive loads $T \leq 1$ ms, DC-1	1 2 3 4 5 6 8 6 12 18 24 30 36 48 12 24 36 48 60 72 96 24 48 72 96 120 144 190 48 96 140 190 240 290 360 60 120 180 240 300 360 450 110 220 330 440 550 660 – 220 440 660 – – – – 240 480 – – – – – 440 660 – – – – – 550 – – – – – – 600 – – – – – –						– 4 – – – 2,5 4 – A – 1,5 3 – – 0,8 2,2 16 10 0,3 1,2 15 3,5 0,27 1 5 0,8 0,2 0,6 1,2 0,35 0,1 0,3 0,38 0,3 0,08 0,25 0,35 0,25 0,05 0,15 0,25 0,15 0,03 0,1 0,2 0,1 0,02 0,1 –
Inductive loads $T = 50$ ms	24 48 72 96 120 144 190 30 60 90 120 150 180 240 48 95 140 190 240 290 350 60 120 180 240 300 360 450 110 220 330 440 550 660 –						10 – – 16 5 – – 7 A 1,8 – – 2,5 0,7 – – 1 0,3 – – 0,4
<b>Min. Ambient Temperature of Stage</b> <b>Max. Ambient Temperature of Stages<sup>3,4</sup></b>	open at 100 % $I_u/I_{th}$ enclosed at 100 % $I_{the}$					–25 °C (valid only without optional extra) 55 °C during 24 hours with peaks up to 60 °C 35 °C during 24 hours with peaks up to 40 °C	

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<sup>1</sup>Valid for lines with grounded common neutral termination, overvoltage category III, pollution degree 3. Values for other supply systems on request. <sup>2</sup>DC switching capacity applies to ON/OFF switches. Switching capacity for other configurations on request. <sup>3</sup>For electromagnetic optional extras see additional data in Catalog 101. <sup>4</sup>Storage temperature: -40 °C to 85 °C (in case of temperature below -5 °C no shock load permissible). <sup>5</sup>A25-4 and A25C-4: 22A



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

## Tightening torque of screws

Type	Tightening torque		Type	Tightening torque		Type	Tightening torque	
A11	0,8 Nm	7 lb-in	A25	1,3 Nm	12 lb-in	A25M	1,3 Nm	12 lb-in
A11-1	0,8 Nm	7 lb-in	A25-4	1,3 Nm	12 lb-in	A25X	1,3 Nm	12 lb-in
A11C	0,8 Nm	7 lb-in	A25C	1,3 Nm	12 lb-in	AD11	0,8 Nm	7 lb-in
A11L	0,8 Nm	7 lb-in	A25C-4	1,3 Nm	12 lb-in	AD11C	0,8 Nm	7 lb-in
A11M	0,8 Nm	7 lb-in	A25L	1,3 Nm	12 lb-in	AD12	0,8 Nm	7 lb-in

## International Standards and Approvals

Country	Authority	Mark or Standard	A11	AD11	AD12	A25
USA/Canada	Underwriters Laboratories			●	●	
			●			●
Switzerland	Schweizerischer Elektrotechnischer Verein		+	+	+	+
Denmark	Danmarks Elektriske Materielkontrol		+	+	+	+
Norway	Norges Elektriske Materielkontroll		+	+	+	+
Sweden	Svenska Elektriska Materielkontroll-anstalten		+	+	+	+
Finland	Sähkötar-kastuskeskus		+	+	+	+
Austria	Österreichischer Verband für Elektrotechnik		+	+	+	+
Federal Republic of Germany	Verband Deutscher Elektrotechniker	VDE 0660 <sup>2</sup>	+	+	+	+
Great Britain	British Standards Institution	BS EN 60947 <sup>2</sup>	+	+	+	+
Europe		EN 60947 <sup>2</sup>	+	+	+	+
International Electrical Commission (IEC) Recommendation		IEC 60947 <sup>2</sup>	+	+	+	+

● Switch approved

+ Switch conforms to requirements

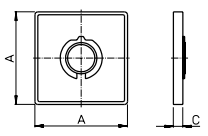
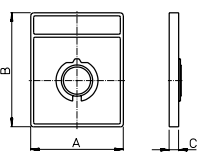
<sup>1</sup>Approved under the "Component Program" (UL-Recognized Industrial Component). File No. E35541, Category Control Number NLRV2 and NLRV8 resp. File No. E60262, Category Control Number NRNT2 and NRNT8.

<sup>2</sup>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.

<sup>3</sup>Approved under the "Listing-Program". File No. E35541, Guide No. NLRV and NLRV7 resp. File No. E60262, Category Control Number NRNT and NRNT7.

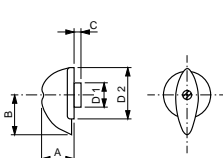
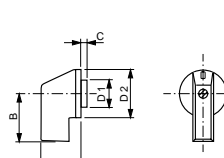
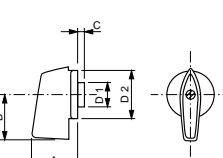
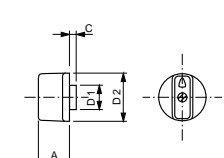
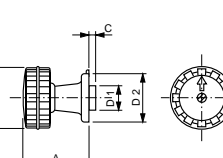
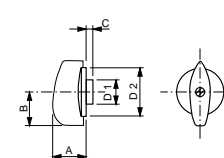
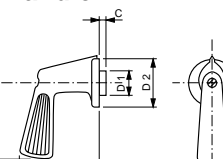
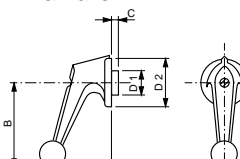
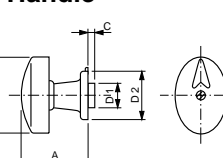
**Dimensions**      mm  
                              inch

Escutcheon Plates and Handles	Size	A	B	C	D1ø	D2ø	Escutcheon Plates and Handles	Size	A	B	C	D1ø	D2ø
-------------------------------	------	---	---	---	-----	-----	-------------------------------	------	---	---	---	-----	-----

PE-Escutcheon Plate							PR-Escutcheon Plate						
	<b>S1</b>	64		7,4				<b>S1</b>	64	78,8	7,4		
		2.52		.29					2.52	3.10	.29		
	<b>S2</b>	88		8,5									
		3.46		.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.

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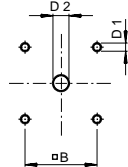
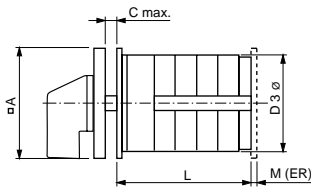
<b>R-Handle</b> 	<b>S1</b>  <b>S2</b>	23 0.91  30 1.18	31,5 1.24  42 1.65	5 .20  5 .20	18,2 .72  25,4 1.00	36 1.42  50,0 1.97	<b>I-Handle</b> 	<b>S1</b>	27 1.06	31,8 1.25	2,5 .10	18,2 .72	36 1.42
<b>F-Handle</b> 	<b>S1</b>  <b>S2</b>	34 1.34  44,7 1.76	34 1.34  45 1.77	5 .20  5 .20	18,2 .72  25,4 1.00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

**Dimensions**      mm  
                              inch

<b>Four Hole Panel Mounting</b>	<b>A11</b>		
	<b>AD11</b>		<b>A11C</b>
	<b>AD12</b>	<b>A25</b>	<b>A25C</b>

Dimensions in brackets for rear mounting plate with ER

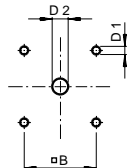
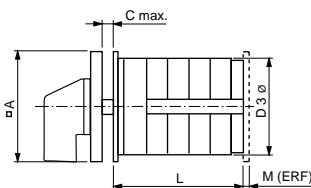
**E, ER**



	<b>E</b>		
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

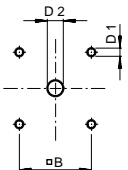
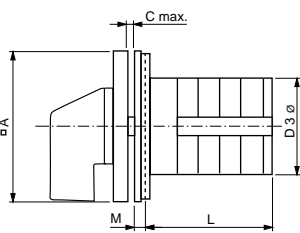
Dimensions in brackets for rear mounting plate with ERF

**EF, ERF**



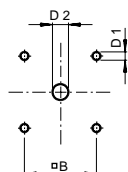
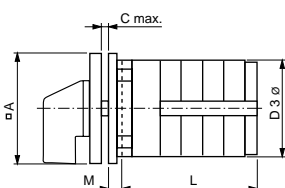
A	4 2.52	64 (88) 2.52	88 3.46
B	48 1.89	48 (68) 1.89	68 2.68
C	4 .16	4 .16	5.5 .22
D1	5 (4.1) .20	5 (5.4) .20	6 (5.4) .24
D2	19-22 .75-.87	19-22 .75-.87	26-30 1.02-1.18
D3	60 2.36	70 2.76	84 3.31

**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	-

**KN1, KD1**



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

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**Dimensions** mm  
inch

<b>Base Mounting</b>	A11		
	AD11		A11C
	AD12	A25	A25C

Dimensions in brackets for rear mounting plate with VE

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	Additional Length M <sup>1</sup>	A11 AD11 AD12	A25
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Mounting E	Mounting + switch with latching mechanism size S2
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No. of stages			ER/ERF	6,5 .26	8,7 .34	
1	42,5 1.67		43,5 1.71	EG/EGF	0,5 .02	0,5 .02
2	55,2 2.17		56,2 2.21	KN1/KD1	7 .28	7 .28
3	67,9 2.67		68,9 2.71	VE	5 .20	5 .20
4	80,6 3.17		81,6 3.21	EL1	11 .43	11 .43
5	93,3 3.67		94,3 3.71	EL2	11 .43	11 .43
6	106 4.17		107 4.21	EL4	11 .43	11 .43
7	118,7 4.67		119,7 4.71	A11C/A25C	8,2 .32	8,2 .32
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			

<sup>1</sup>Additional length plus length shown in the E mounting table = overall length

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# The Range of “Blue Line” Switchgear

Technical literature covering the following products is available on request.

	<b>Catalog Number</b>
<b>Main Switches and Main Switches with Emergency Function 16 A-315 A Maintenance Switches 20 A-315 A Switch Disconnectors 20 A-315 A</b> According to IEC 60947-3, EN 60947-3, VDE 0660 part 107, IEC 60204, EN 60204 and VDE 0113	<b>500</b>
<b>CL Switches 10 A-20 A C, CA and CAD Switches 10 A-315 A and L Switches 350 A-2400 A</b> 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.	<b>100</b>
<b>Optional Extras and Enclosures</b> 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.	<b>101</b>
<b>A and AD Switches 6 A-25 A</b> 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.	<b>110</b>
<b>CG, CH and CHR Switches 10 A-25 A</b> 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.	<b>120</b>
<b>DH, DHR, DK and DKR Switches 6 A-16 A</b> 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.	<b>130</b>
<b>X Switches 80 A-630 A</b> 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.	<b>140</b>
<b>KG Switches 20 A-315 A and KH and KHR Switches 16 A-80 A</b> 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.	<b>150</b>
<b>Push Buttons and Pilot Lights, 22,5 mm Ø</b> 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.	<b>302</b>

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