



Kraus & Naimer

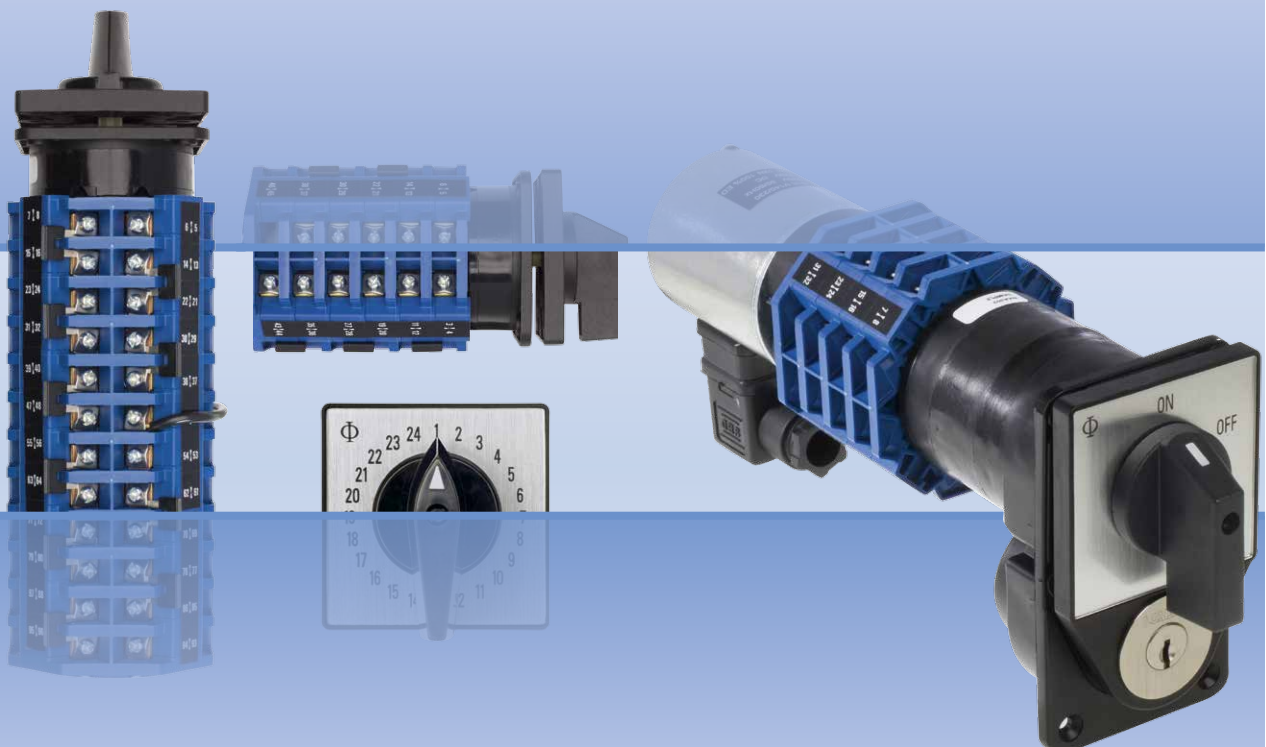
BLUE LINE switchgear

since 1907

Catalog 110 Control Switches for Special Applications

05/2016

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



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

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

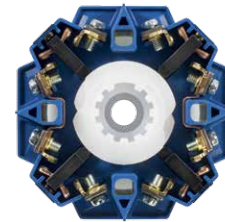
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Construction Data

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.

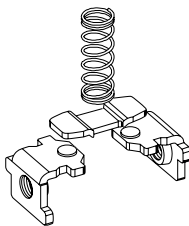


Switch type	Switching angle	Max. number of switch positions
A11, AD11, AD12	15°, 20°, 30°, 45°, 60°, 90°	24
A25	15°, 20°, 30°, 45°, 60°, 90°	24

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

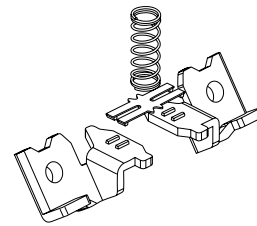
2 different Contact Systems are available

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

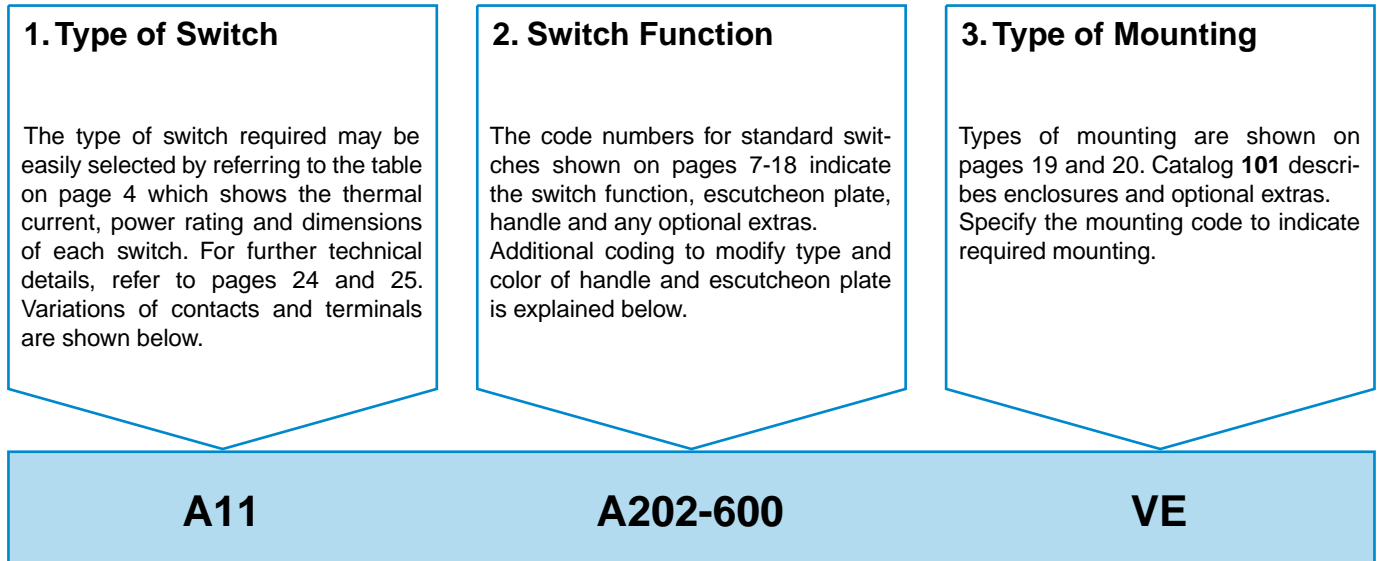
Rated Values

Switch Size	Type	According to IEC 60947-3/VDE 0660 part 107			
		Thermal Current I_u/I_{th} 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	-
	A11	20	7,5	20 A	6
	A25	25	11	25 A	8
S2	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.



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**.

Modification of Switches

The part number for switch function and options may be modified in cases where items are required other than standard. The modification may involve the escutcheon plate inscription, color combination of escutcheon plate and handle, type of escutcheon plate and handle, or the optional extra.

Size	Escutcheon Plate Frame	Handle	Escutcheon Plate Backing	Escutcheon Plate Lettering	Dash-Number
S1, S2	black	black	brushed alu	black	-600
S1, S2	black	black	black	mat silver	-700

The standard switch consists of a transparent escutcheon plate with brushed aluminum backing and black inscription. The escutcheon plate frame is black as well as the handle. Above there are further color combinations of escutcheon plate and handle which are available. The appropriate dash-number must be substituted in the switch function coding to specify other color combinations as required.



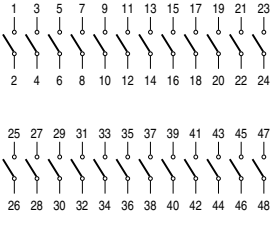





















































Example: The complete coding for switch type A11 with a 3 pole ON/OFF switch function, black handle and black escutcheon plate frame with brushed aluminum backing and black inscription which reads 0-1 is as follows: **A11 A202-600 E**.

¹Technical data on request.

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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ON/OFF Switches with 60° Switching

[Dimensions p.29](#)

1 pole	 F070		A200-600	1	 1-24 pole
2 pole			A201-600	1	
3 pole			A202-600	1	
3 pole with red handle			A202-626	1	
3 pole with V850 padlock attachment			A202-627	1	
4 pole			A203-600	1	
5 pole			WAA 341	2	
6 pole			A342-600	2	
8 pole			A344-600	2	
10 pole			A346-600	3	
12 pole			A348-600	3	
14 pole			WAA 350	4	
16 pole			WAA 352	4	
18 pole			WAA 354	5	
20 pole		WAA 356	5		
22 pole		WAA 358	6		
24 pole		WAA 360	6		
1 pole	 F088		A200-620	1	
2 pole			A201-620	1	
3 pole			A202-620	1	
4 pole			A203-620	1	
5 pole			WAA 341	2	
6 pole			A342-620	2	
8 pole			A344-620	2	
10 pole			A346-620	3	
12 pole			A348-620	3	
14 pole			WAA 350	4	
16 pole			WAA 352	4	
18 pole			WAA 354	5	
20 pole			WAA 356	5	
22 pole			WAA 358	6	
24 pole		WAA 360	6		
1 pole	 F088-PRL		A200-621	1	
2 pole			A201-621	1	
3 pole			A202-621	1	
4 pole			A203-621	1	
5 pole			WAA 341	2	
6 pole			A342-621	2	
1 pole	 F198		A200-622	1	
2 pole			A201-622	1	
3 pole			A202-622	1	
4 pole			A203-622	1	
5 pole			WAA 341	2	
6 pole			A342-622	2	
1 pole	 F198-PRL		A200-623	1	
2 pole			A201-623	1	
3 pole			A202-623	1	
4 pole			A203-623	1	
5 pole			WAA 341	2	
6 pole			A342-623	2	

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Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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ON/OFF Switches with 60° Switching

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1 pole	 F328-PRL		A200-624	1	 1-6 pole
2 pole			A201-624	1	
3 pole			A202-624	1	
4 pole			A203-624	1	
5 pole			WAA 341	2	
6 pole			A342-624	2	
1 pole	 F323-PRL		A200-625	1	
2 pole			A201-625	1	
3 pole			A202-625	1	
4 pole			A203-625	1	
5 pole			WAA 341	2	
6 pole			A342-625	2	

ON/OFF Switches with 90° Switching



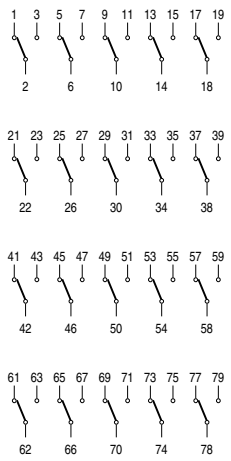
1 pole contacts preclose 30°	 F056		A290-600	1	 contacts preclose 30° 1-3 pole
2 pole contacts preclose 30°			A291-600	1	
3 pole contacts preclose 30°			A292-600	1	
4 pole 1 contact precloses 60° 3 contacts preclose 30°			A293-600	1	
1 pole contacts preclose 30°	 F063		A290-620	1	 3 contacts preclose 30° 1 contact precloses 60° 4 pole
2 pole contacts preclose 30°			A291-620	1	
3 pole contacts preclose 30°			A292-620	1	
4 pole 1 contact precloses 60° 3 contacts preclose 30°			A293-620	1	

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Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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

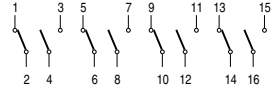
Double-throw Switches without „OFF“ 60° Switching

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

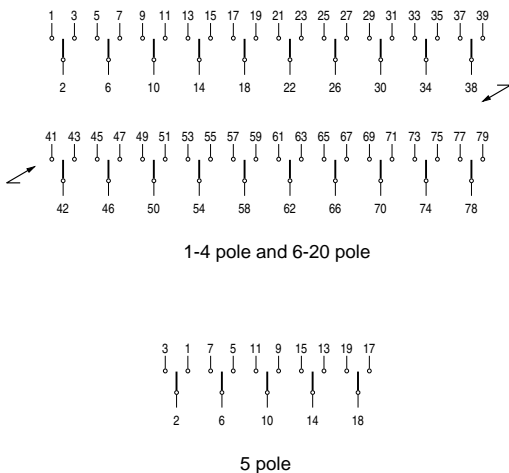
1 pole	 <p>F072</p>		A220-600	1	 <p>1-20 pole</p>
2 pole			A221-600	1	
3 pole			A222-600	2	
4 pole			A223-600	2	
6 pole			A370-600	3	
8 pole			A372-600	4	
10 pole			WAA 374	5	
12 pole			WAA 376	6	
14 pole			WAA 660	7	
16 pole			WAA 661	8	
18 pole	WAA 662	9			
20 pole	WAA 663	10			

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

1 pole	 <p>F072</p>		A720-600	1	 <p>1-4 pole</p>
2 pole			A721-600	1	
3 pole			A722-600	2	
4 pole			A723-600	2	

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

1 pole	 <p>F071</p>		A210-600	1	 <p>1-4 pole and 6-20 pole</p> <p>5 pole</p>
2 pole			A211-600	1	
3 pole			A212-600	2	
4 pole			A213-600	2	
5 pole			A361-600	3	
6 pole			A362-600	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“ 60° Switching [Dimensions p.29](#)

1 pole 2 pole 3 pole			A210-620 A211-620 A212-620	1 1 2	 1-4 and 6-8 pole
4 pole 5 pole 6 pole 8 pole			A213-620 A361-620 A362-620 WAA 364	2 3 3 4	
1 pole 2 pole 3 pole			A210-621 A211-621 A212-621	1 1 2	
1 pole 2 pole 3 pole			A210-622 A211-622 A212-622	1 1 2	
1 pole 2 pole 3 pole			A210-623 A211-623 A212-623	1 1 2	
1 pole 2 pole 3 pole 4 pole			A210-624 A211-624 A212-624 A213-624	1 1 2 2	 5 pole

Double-throw Switches with Center „OFF“ and electrically isolated contacts

1 pole 2 pole 3 pole			A710-600 A711-600 A712-600	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			A714-600 A715-600 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			A214-600 A215-600 A216-600	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			A214-620 A215-620 A216-620	1 1 2	



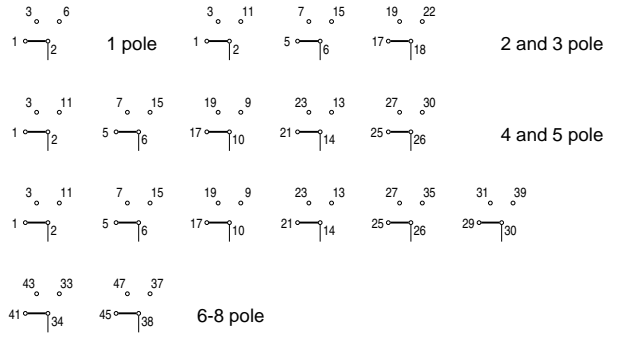

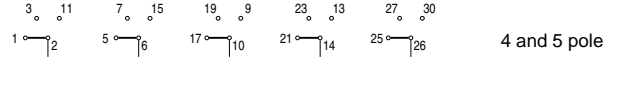

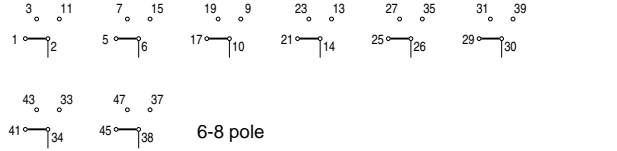


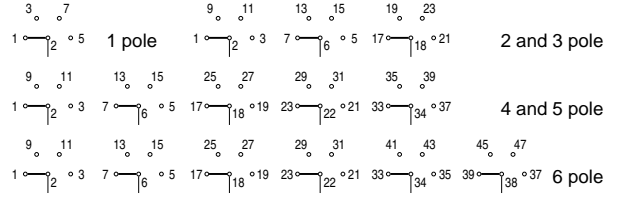

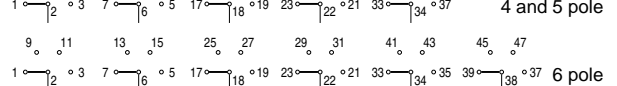


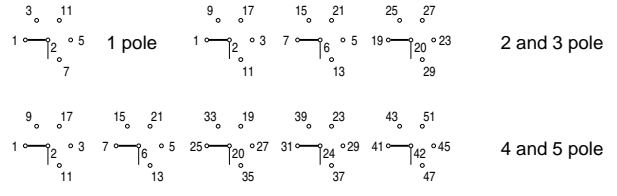


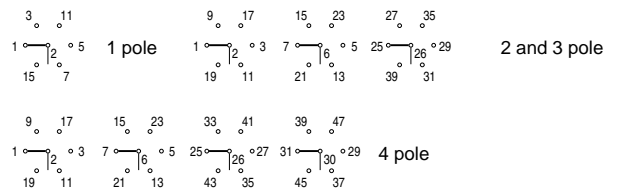


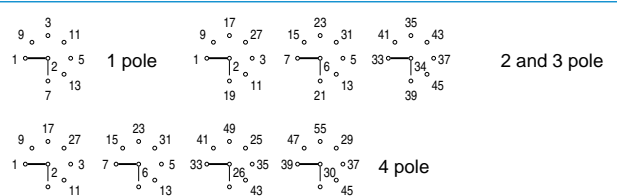


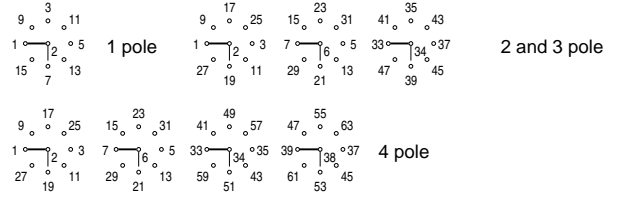


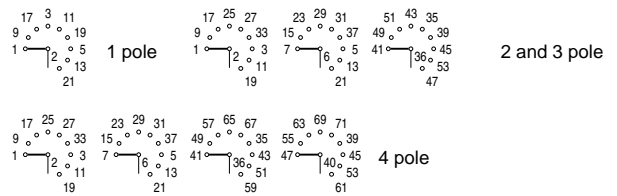
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Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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Multi-step Switches without „OFF“

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1 pole 3 Step 2 pole 3 pole	 <p>F076</p>		A230-600 A250-600 A270-600	1 2 3	
4 pole 5 pole 6 pole			A476-600 WAA 484 WAA 489	3 4 5	
7 pole 8 pole			WAA 494 WAA 497	6 6	
1 pole 4 Step 2 pole 3 pole	 <p>F077</p>		A231-600 A251-600 A271-600	1 2 3	
4 pole 5 pole 6 pole			A477-600 WAA 485 WAA 490	4 5 6	
1 pole 5 Step 2 pole 3 pole 4 pole 5 pole	 <p>F078</p>		A232-600 A252-600 WAA 272 WAA 478 WAA 676	2 3 4 5 7	
1 pole 6 Step 2 pole 3 pole 4 pole	 <p>F079</p>		A233-600 WAA 253 WAA 273 WAA 479	2 3 5 6	
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	
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	
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	

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“



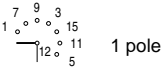
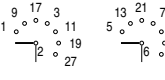


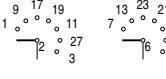
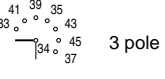


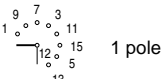
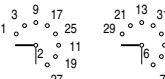


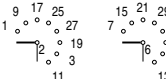


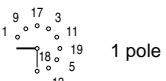
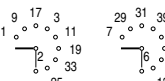


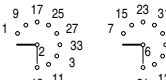


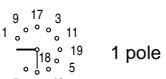
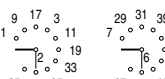


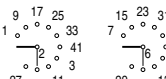


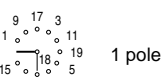
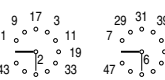


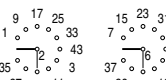


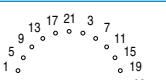


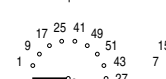


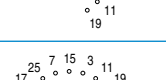


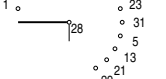
1 pole 2 pole 3 pole 5 pole			A240-600 A260-600 A280-600 WAA 486	1 1 2 3	 	1- and 2 pole
1 pole 2 pole 3 pole 5 pole			A240-620 A260-620 A280-620 WAA 486	1 1 2 3	 	3 and 5 pole
1 pole 2 pole 3 pole 5 pole			A241-600 A261-600 A281-600 WAA 487	1 2 3 4	 	2 and 3 pole
1 pole 2 pole 3 pole 5 pole			A241-620 A261-620 A281-620 WAA 487	1 2 3 4	 	5 pole
1 pole 2 pole			A241-621 A261-621	1 2		
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			A242-620 WAA 262 WAA 282	1 2 3		
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			A243-620 WAA 263 WAA 283	2 3 5		
1 pole 2 pole 3 pole			A244-600 WAA 264 WAA 284	2 3 5	 	2 and 3 pole
1 pole 2 pole 3 pole			A244-620 WAA 264 WAA 284	2 3 5		

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

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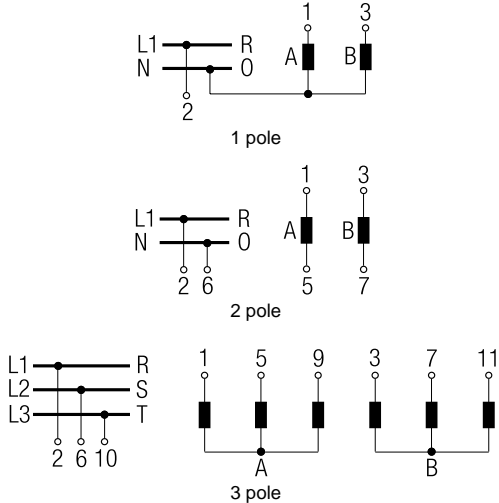


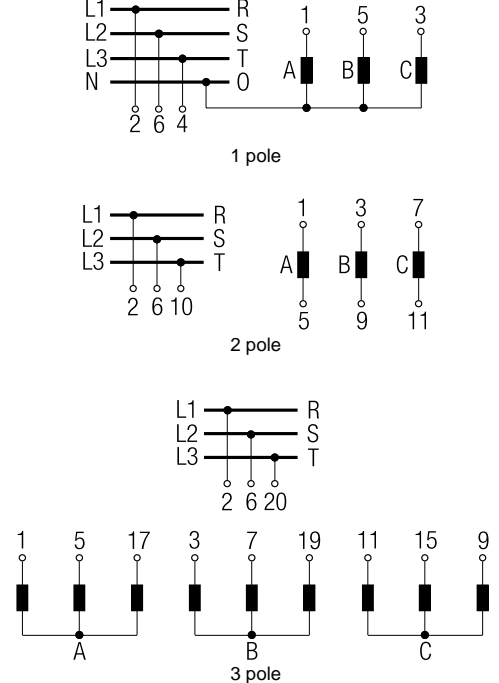
1 pole 2 pole 3 pole			WAA 245 WAA 265 WAA 285	2 4 6	 1 pole  2 pole
1 pole 2 pole 3 pole			WAA 245 WAA 265 WAA 285	2 4 6	 1 pole  3 pole
1 pole 2 pole 3 pole			WAA 246 WAA 266 WAA 286	2 4 6	 1 pole  2 pole
1 pole 3 pole			WAA 246 WAA 286	2 6	 3 pole
1 pole 2 pole 3 pole			WAA 247 WAA 267 WAA 287	3 5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

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

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<p>1 pole 2 Gang 2 pole 3 pole</p> <p>Switching sequence: 0, A, A+B</p> <p>1 pole 2 pole 3 pole</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>1 pole 2 pole 3 pole</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“

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3 phase to phase	<p>F019</p>		A004-600	1	
	<p>F030</p>		A004-620	1	
	<p>F154-PRL</p>		A004-621	1	
	<p>F183</p>		A004-622	1	
	<p>F374-PRL</p>		A004-623	1	
	<p>F301</p>		A004-624	1	
3 phase to phase and 3 phase to neutral	<p>F020</p>		A007-600	2	
	<p>F031</p>		A007-620	2	
	<p>F156-PRL</p>		A007-621	2	
	<p>F734</p>		A007-622	2	
	<p>F189-PRL</p>		A007-623	2	
	<p>F303</p>		A007-624	2	
2 separate 3 phase with center „OFF“	<p>F027</p>		WAA 008	2	
	<p>F032</p>		WAA 008	2	
	<p>F157-PRL</p>		WAA 008	2	
	<p>F304</p>		WAA 008	2	

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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Ammeter Switches

Dimensions p. 29





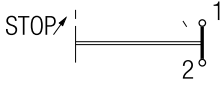





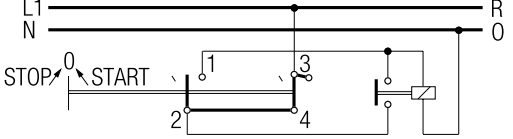


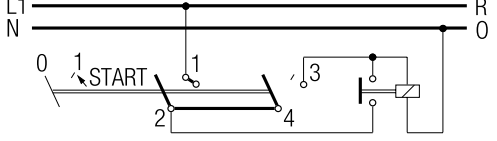



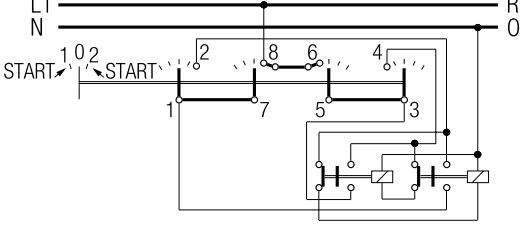


Single pole with 3 current transformers with „OFF“ 360° rotation			A048-600	2	
	F059		A048-620	2	
			A048-621	2	
	F066		A048-622	2	
			A048-623	2	
Single pole with 2 current transformers (3 readings)			A021-600	1	
	F172-PRL		A021-620	1	
2 pole, 3 current transformers			WAA 019	3	
	F181-PRL		WAA 019	3	
	F719		A038-600	3	
			A038-620	3	
	F059		A038-620	3	
			A038-621	3	
	F172-PRL		A038-621	3	

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Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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Control Switches

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Stop switch	 F022		WAA 174	1	
Start switch	 F023		A175-600	1	
Stop start switch single pole	 F024		A176-600	1	
Stop start switch with spring return from start to run	 F119		A178-600	1	
	 F130		A178-620	1	
Stop start switch with spring return to run for 2 units	 F121		WAA 177	1	
	 F132		WAA 177	1	

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Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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Motor Reversing Switches

Dimensions p. 29

3 pole			A401-600	2	
			A401-620	2	
			A401-621	2	

Star-delta Switches

Off-star-delta			A410-600	2	
			A410-620	2	
With auxiliary contact closed in „OFF“ position			WAA 416	3	

Motor Control Switches

2 speed single winding			A440-600	2	
			A440-620	2	
2 speed single winding with center „OFF“			A441-600	2	
			A441-620	2	
2 speed single winding reversing			A442-600	4	
			A442-620	4	





Motor Control Switches

3 speed 2 winding 0 - AΔ - BΥ - AΥΥ			WAA 457	3	
			WAA 457	3	

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Four Hole Panel Mounting	Code	A11 AD11 AD12	A25	A11C A25C
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	<p>Panel Mounting</p> <p>Four hole panel mounting, Protection IP 40</p> <p>Four hole panel mounting, Protection IP 65/67/69k</p>	E EF	● ●	● ●	● ●
	<p>Panel and base mounting</p> <p>Four hole panel mounting, Protection IP 40</p> <p>Four hole panel mounting, Protection IP 65/67/69k</p>	ER ERF	● ●	● ●	● ●
	<p>Panel mounting using larger escutcheon plate and handle</p> <p>Four hole panel mounting, Protection IP 40</p> <p>Four hole panel mounting, Protection IP 65/67/69k</p>	EG EGF	● ●	● ●	
	<p>Panel mounting with heavy duty stop and metal shaft</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	● ●	● ●	

Single Hole Mounting 40 mm	Code	A11 AD11 AD12	A25	A11C A25C
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	<p>Single hole mounting</p> <p>Without escutcheon plate, Protection IP 40</p>	EL1	●	●	
	<p>With square escutcheon plate, Protection IP 40</p>	EL2	●	●	
	<p>With rectangular escutcheon plate (PRC), Protection IP 40 EL2 + PRC</p>	EL4	●	●	

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Base Mounting










	<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

Black and Red are standard colours. White and Electro-Grey available on request.

R-Handle 	black red white electro-gray	G001 G002 G003 G007	● ● ● ● ● ● ● ●
F-Handle 	black red white electro-gray	G221 G222 G223 G227	● ● ● ● ● ● ● ●
S-Handle 	black red white electro-gray	G301 G302 G303 G307	● — ● — ● — ● —
P-Handle 	black red white electro-gray	G211 G212 G213 G217	● ● ● ● ● ● ● ●
O-Handle 	black red white electro-gray	G971	● — ● — ● — ● —
I-Handle 	black red white electro-gray	G251 G252 G253 G257	● ● ● ● ● ● ● ●
B-Handle 	black red white electro-gray	G521 G522 G523 G527	● — ● — ● — ● —
L-Handle 	black red white electro-gray	G501 G502 G503 G507	● — ● — ● — ● —
K-Handle 	black red white electro-gray	G411 G412 G413 G417	● ● ● ● ● ● ● ●

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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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Selection Data	A11 A11C	AD11 AD11C	AD12 AD12C	A25 A25C
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Rated Insulation Voltage U_i	IEC 60947-3 ¹ VDE 0660 part 107 ¹ UL/Canada min. operational voltage	V V V	690 600 20	600 600 1	600 600 6	690 600 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 UL/Canada	A A	20 10	6 6	6 6	25 25 ⁵	
Rated Operational Current I_e							
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
Short Circuit Protection Max. fuse size Rated short-time withstand current	(gG-characteristic) (1s-current)	A A	20 120	6 45	6 75	35 220	
DC Switching Capacity²						Rated Operational Current I_e	
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 – – 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 1,8 – – 2,5 0,7 – – 1 0,3 – – 0,4
Min. Ambient Temperature of Stage Max. Ambient Temperature of Stages^{3,4}	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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¹Valid for lines with grounded common neutral termination, overvoltage category III, pollution degree 3. Values for other supply systems on request. ²DC switching capacity applies to ON/OFF switches. Switching capacity for other configurations on request. ³For electromagnetic optional extras see additional data in Catalog 101. ⁴Storage temperature: -40 °C to 85 °C (in case of temperature below -5 °C no shock load permissible). ⁵A25-4 and A25C-4: 22A

Selection Data	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			
Ratings		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
Max. Permissible Wire Gage - Use copper wire only								
	Single-core or stranded wire			mm ²	2,5	2,5	2,5	4
				AWG	12	12	12	10
	Flexible wire (sleeving in accordance with DIN 46228)			mm ²	2,5	2,5	2,5	2,5
				AWG	(2,5)	(2,5)	(2,5)	(2,5)
	Flexible AWG wires (without sleeve)				14	14	14	12

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	AD11-C	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 Materiekkontrol		+	+	+	+
Norway	Norges Elektriske Materiekkontroll		+	+	+	+
Sweden	Svenska Elektriska Materiekkontrollanstalten		+	+	+	+
Finland	Sähkötar-kastuskeskus		+	+	+	+
Austria	Österreichischer Verband für Elektrotechnik		+	+	+	+
Federal Republic of Germany	Verband Deutscher Elektrotechniker	VDE 0660 ²	+	+	+	+
Great Britain	British Standards Institution	BS EN 60947 ²	+	+	+	+
Europe		EN 60947 ²	+	+	+	+
International Electrical Commission (IEC) Recommendation		IEC 60947 ²	+	+	+	+

● Switch approved

+ Switch conforms to requirements

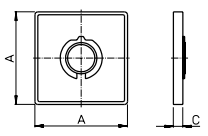
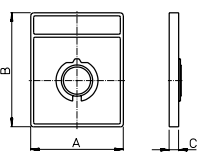
¹Approved under the "Component Program" (UL-Recognized Industrial Component). File No. E35541, Category Control Number NLRV2 and NLRV8 resp. File No. E60262, Category Control Number NRNT2 and NRNT8.

²Industrial 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.

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

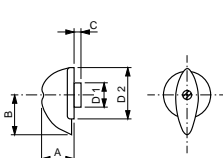
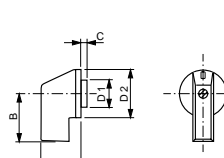
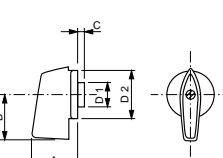
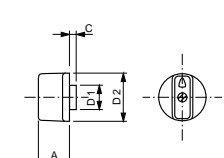
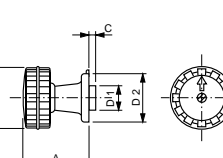
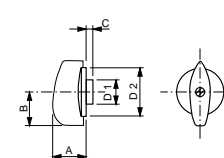
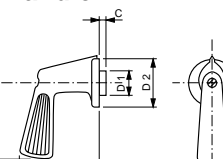
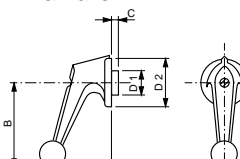
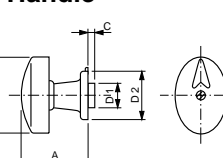
Dimensions mm
 inch

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						
	S1	64		7,4				S1	64	78,8	7,4		
		2.52		.29					2.52	3.10	.29		
	S2	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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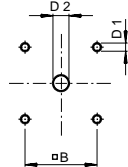
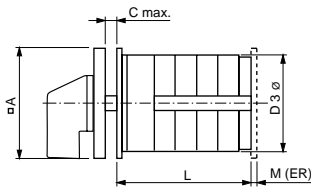
R-Handle 	S1 S2	23 0.91 30 1.18	31,5 1.24 42 1.65	5 .20 5 .20	18,2 .72 25,4 1.00	36 1.42 50,0 1.97	I-Handle 	S1	27 1.06	31,8 1.25	2,5 .10	18,2 .72	36 1.42
F-Handle 	S1 S2	34 1.34 44,7 1.76	34 1.34 45 1.77	5 .20 5 .20	18,2 .72 25,4 1.00	36 1.42 50 1.97	B-Handle 	S1	23 .91	5 .20	18,2 .72	36 1.42	
S-Handle 	S1	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 S2	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	K-Handle 	S1 S2	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
O-Handle 	S1	50 1.97	56 2.2	5 .20	18,2 .72	36 1.42							

Dimensions mm
 inch

Four Hole Panel Mounting	A11		
	AD11		A11C
	AD12	A25	A25C

Dimensions in brackets for rear mounting plate with ER

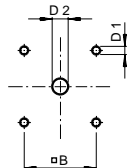
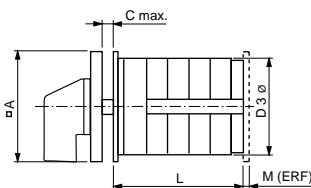
E, ER



	E		
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

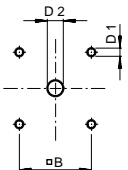
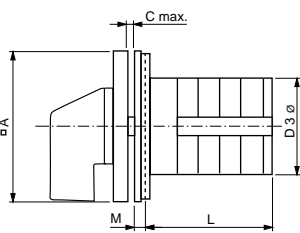
Dimensions in brackets for rear mounting plate with ERF

EF, ERF



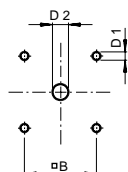
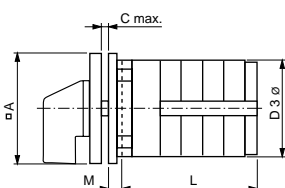
A	4 2.52	64 (88) 2.52	88 3.46
B	48 1.89	48 (68) 1.89	68 2.68
C	4 .16	4 .16	5.5 .22
D1	5 (4.1) .20	5 (5.4) .20	6 (5.4) .24
D2	19-22 .75-.87	19-22 .75-.87	26-30 1.02-1.18
D3	60 2.36	70 2.76	84 3.31

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

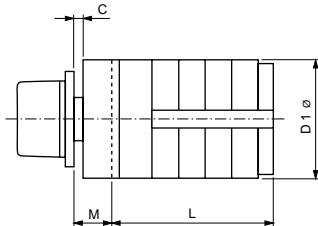
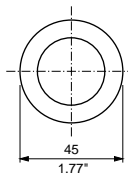
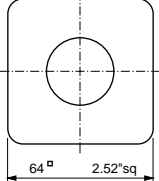
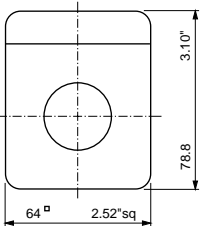
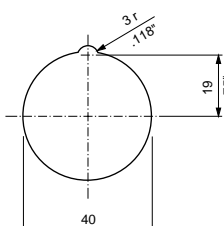


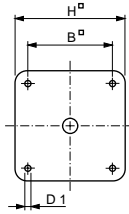
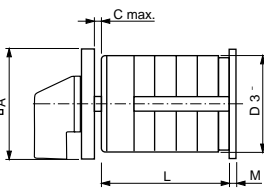
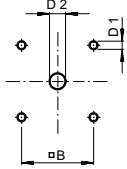
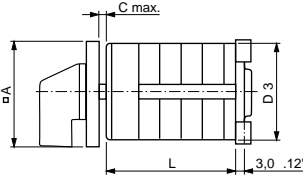
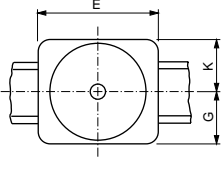
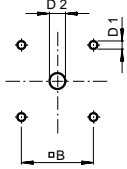
A	60 2.36	60 2.36
B	48 1.89	48 1.89
C	4 .16	4 .16
D1	5 .20	5 .20
D2	10-22 .39-.87	10-22 .39-.87
D3	60 2.36	70 2.76

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Dimensions mm
inch

Single Hole Mounting 40 mm	A11 AD11 AD12	A25
-----------------------------------	---------------------	-----

EL1	EL2	EL4							
									
			<table border="1"> <tr> <td>D1</td> <td>60 2.36</td> <td>70 2.76</td> </tr> <tr> <td>C</td> <td>1-6.3 .04-.25</td> <td>1-6.3 .04-.25</td> </tr> </table>	D1	60 2.36	70 2.76	C	1-6.3 .04-.25	1-6.3 .04-.25
D1	60 2.36	70 2.76							
C	1-6.3 .04-.25	1-6.3 .04-.25							

Base Mounting	A11 AD11 AD12	A25	A11C A25C																																												
Dimensions in brackets for rear mounting plate with VE																																															
VE																																															
VE1																																															
			<table border="1"> <tr> <td>A</td> <td>64 2.52</td> <td>64 (88) 2.52</td> <td>88 3.46</td> </tr> <tr> <td>B</td> <td>48 1.89</td> <td>48 (68) 1.89</td> <td>68 2.68</td> </tr> <tr> <td>C</td> <td>13,5 .53</td> <td>13,5 .53</td> <td>16 .63</td> </tr> <tr> <td>D1</td> <td>5 (4.1) .20</td> <td>5 (5.4) .20</td> <td>6 (5.4) .24</td> </tr> <tr> <td>D2</td> <td>10-22 .39-.87</td> <td>10-22 .39-.87</td> <td>13-30 .51-1.18</td> </tr> <tr> <td>D3</td> <td>60 2.36</td> <td>70 2.76</td> <td>84 3.31</td> </tr> <tr> <td>D4</td> <td>4,1 .16</td> <td>4,1 .16</td> <td>5,4 .21</td> </tr> <tr> <td>E</td> <td>70 2.76</td> <td>70 2.76</td> <td>- -</td> </tr> <tr> <td>G</td> <td>30 1.18</td> <td>30 1.18</td> <td>- -</td> </tr> <tr> <td>K</td> <td>30 1.18</td> <td>30 1.18</td> <td>- -</td> </tr> <tr> <td>H</td> <td>64 2.52</td> <td>88 3.46</td> <td>88 3.46</td> </tr> </table>	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
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																																												

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Length L	A11 AD11 AD12	A25	Additional Length M ¹	A11 AD11 AD12	A25
Mounting E	Mounting + switch with latching mechanism size S2				
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			

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

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

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