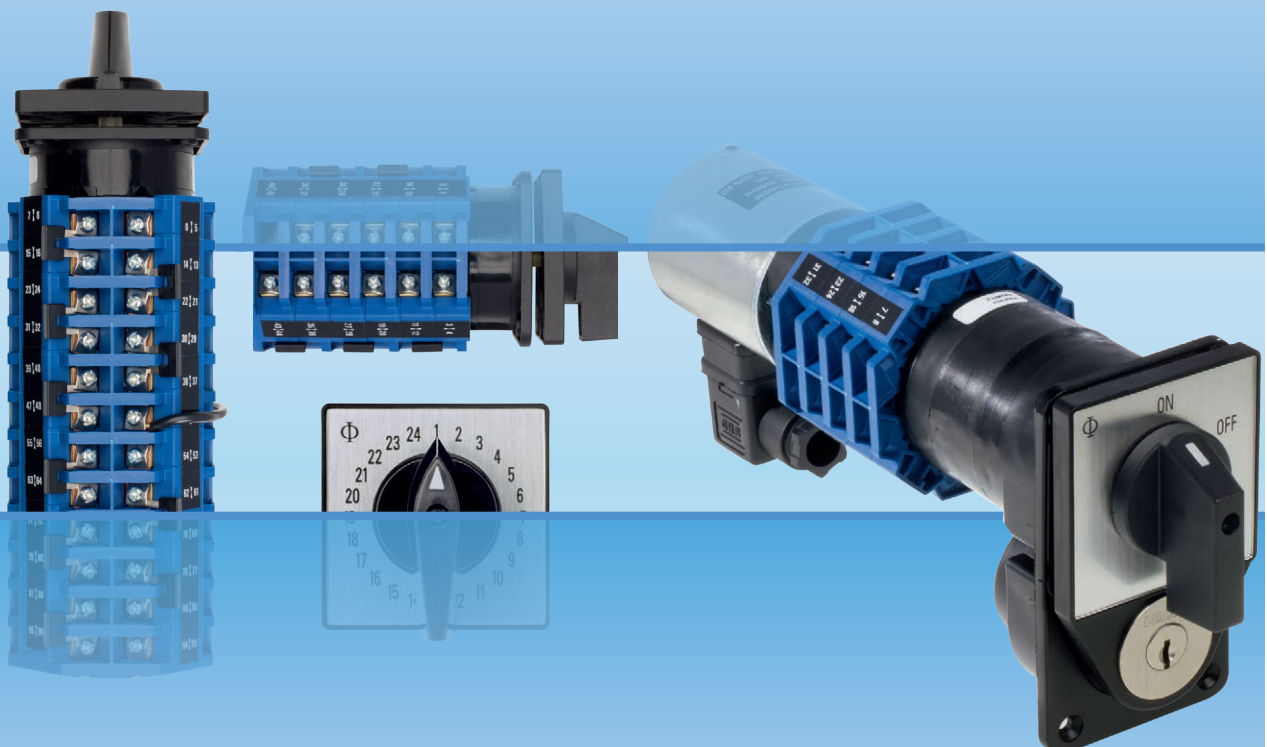


Control Switches for Special Applications

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



Kraus & Naimer

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

BLUE LINE

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

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

The Kraus & Naimer Registered Trademark



WORLDWIDE SYMBOL
FOR QUALITY SWITCHGEAR

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

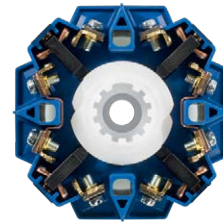
	Page
Construction Data	4
Dimensions and Nominal Ratings	4
How to order	5, 6
Switch Function and Configuration	
ON/OFF Switches	8
Double-throw Switches	9, 10
Multi-step Switches	11-13
General Application Switches	14
Voltmeter Switches	15
Ammeter Switches	16
Control Switches	17
Motor Switches	18
Types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

Construction Data

A Switches

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

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

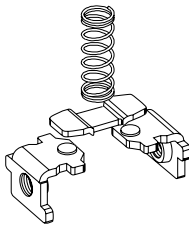


Switch type	Switching angle	Max. number of switch positions
A11, AD11, AD12	15°, 20°, 30°, 45°, 60°, 90°	24
A25	15°, 20°, 30°, 45°, 60°, 90°	24

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

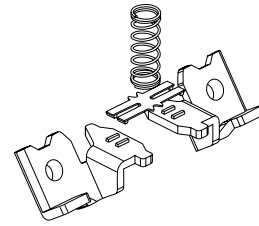
2 different Contact Systems are available

A11 and A25



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

AD11 and AD12



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

Switch Size

Type

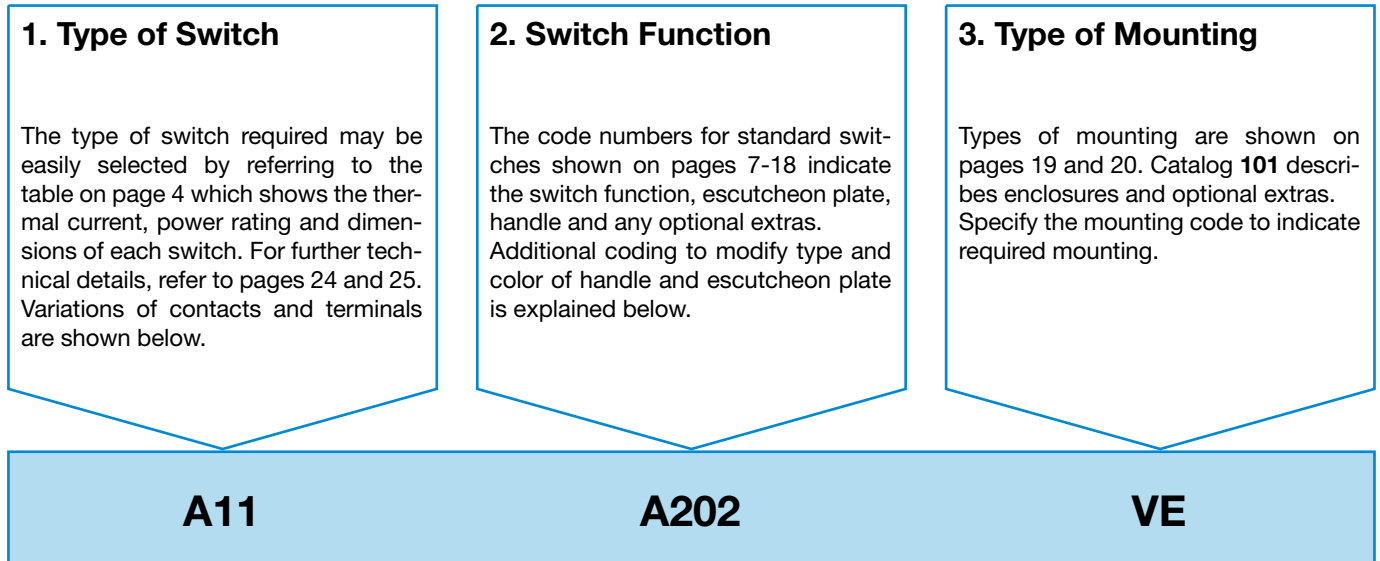
Rated Values

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	-
		6	-	6 V/ 6 A 24 V/ 5 A 110 V/ 3 A 220 V/ 2 A 380 V/ 1,3 A	-
	AD12	20	7,5	20 A	6
		25	11	25 A	8
S2	A11 A25	20	7,5	20 A	6
		25	11	25 A	8
	A11C A25C	20	7,5	20 A	6
		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.



[< back to table of contents >](#)

Type of Switch

Extending the switch type coding the following combinations will define:

Amendment	Definition	For switch types
-1	with gold contacts ¹	A11-1
-4	with quick connects	A25-4, A25C-4
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**.

¹Technical 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.

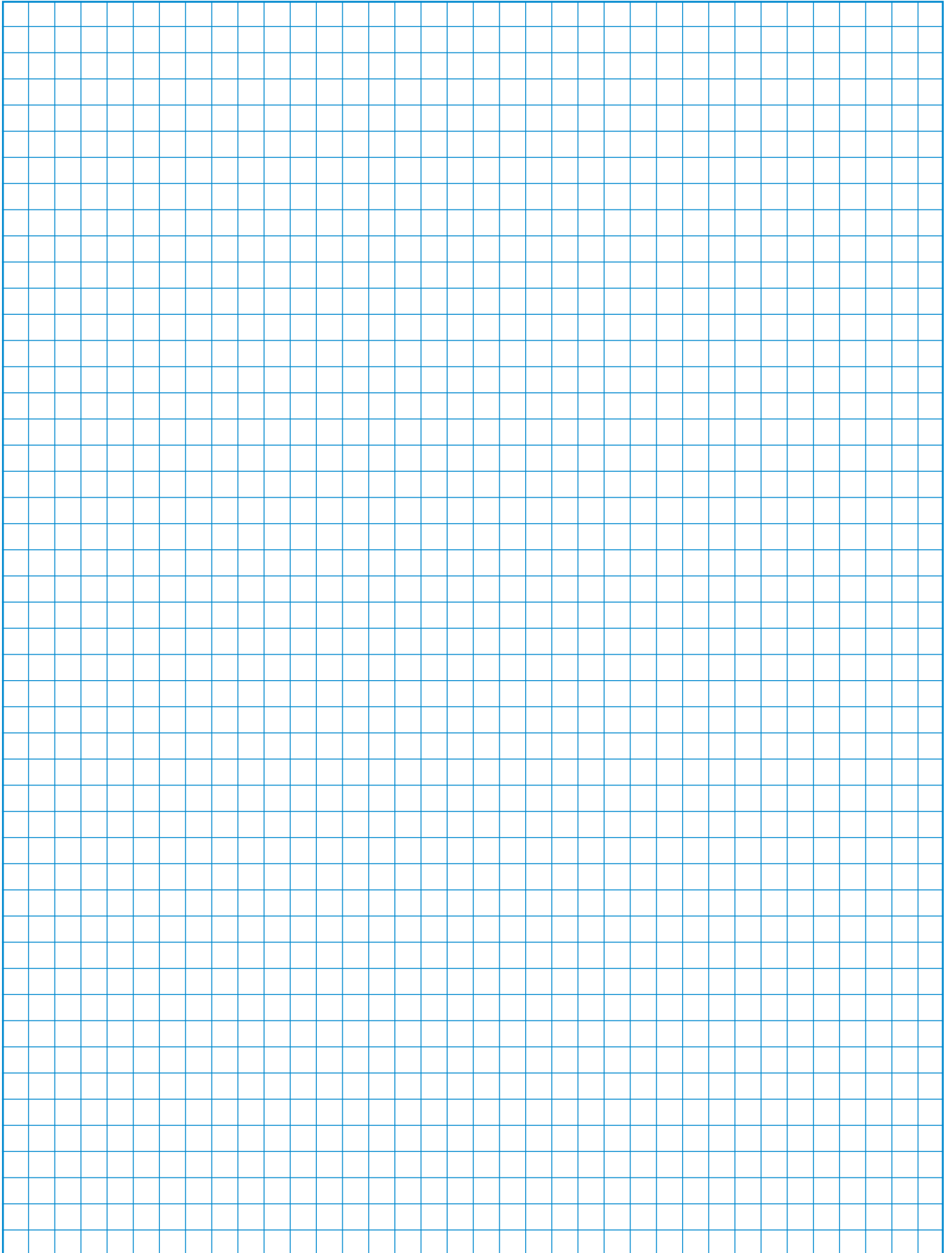
When a handle, escutcheon plate or optional extra is required but not covered by the dash-number, the code number for the selected component should be entered separately. A comprehensive range of available standard escutcheon plates is illustrated on pages 23-25. Non-standard or special escutcheon plate 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:





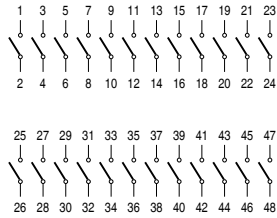
[< back to table of contents >](#)

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	 <p>1-24 pole</p>
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



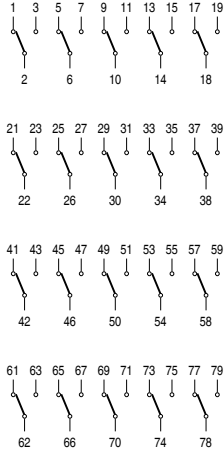
1 pole contacts preclose 30°	 F056		A290	1	 <p>contacts preclose 30°</p> <p>1-3 pole</p>  <p>3 contacts preclose 30°</p> <p>1 contact precloses 60°</p> <p>4 pole</p>
2 pole contacts preclose 30°			A291	1	
3 pole contacts preclose 30°			A292	1	
4 pole 1 contact precloses 60° 3 contacts preclose 30°		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

[< back to table of contents >](#)

Function	Escutch. Plate	Handle	Code	Stages
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

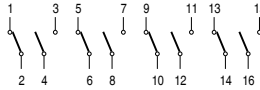
Double-throw Switches without „OFF“ 60° Switching

[Dimensions p.29](#)



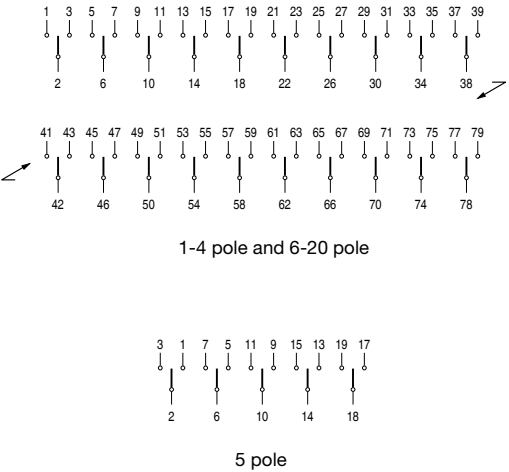
1 pole	 <p>F072</p>		A220	1	
2 pole			A221	1	
3 pole			A222	2	
4 pole			A223	2	
6 pole			A370	3	
8 pole			A372	4	
10 pole			WAA 374	5	
12 pole			WAA 376	6	
14 pole			WAA 660	7	
16 pole			WAA 661	8	
18 pole	WAA 662	9			
20 pole	WAA 663	10			

[< back to table of contents >](#)

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



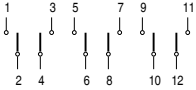



1 pole	 <p>F072</p>		A720	1	 <p>1-4 pole</p>
2 pole			A721	1	
3 pole			A722	2	
4 pole			A723	2	

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



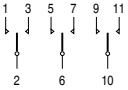
1 pole	 <p>F071</p>		A210	1	 <p>1-4 pole and 6-20 pole</p> <p>5 pole</p>
2 pole			A211	1	
3 pole			A212	2	
4 pole			A213	2	
5 pole			A361	3	
6 pole			A362	3	
8 pole			WAA 364	4	
10 pole			WAA 366	5	
12 pole			WAA 368	6	
14 pole			WAA 655	7	
16 pole	WAA 656	8			
18 pole	WAA 657	9			
20 pole	WAA 658	10			

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



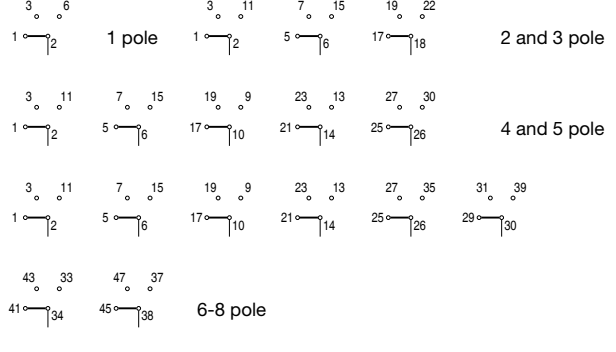


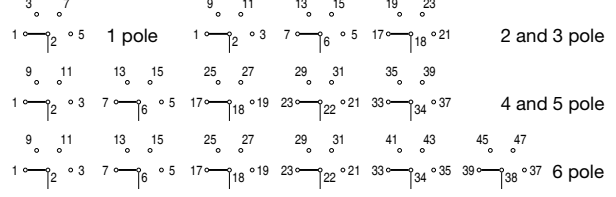


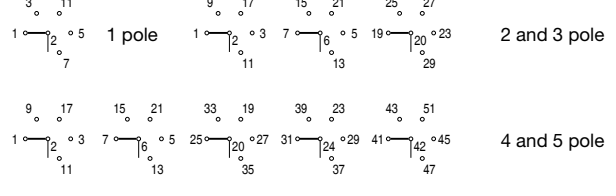


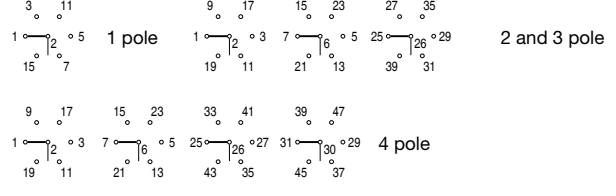


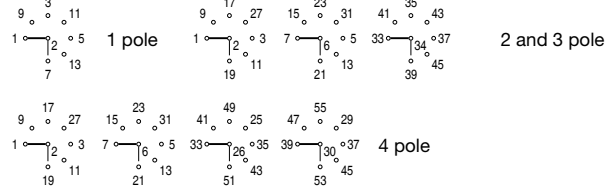


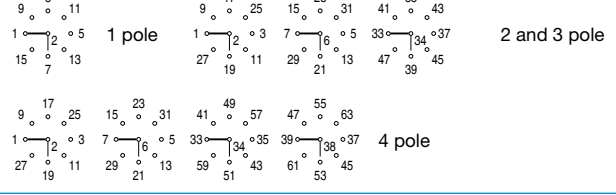


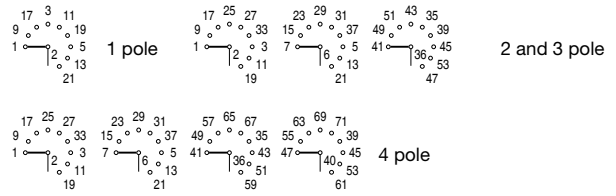
1 pole with spring return to center 2 pole with spring return to center 3 pole with spring return to center	 F025		A214 A215 A216	1 1 2	 1-3 pole
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Escutch. Plate	Handle	Code	Stages	Connection Diagram
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Multi-step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

[Dimensions p.29](#)

[< back to table of contents >](#)

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“

Dimensions p. 29



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

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

[< back to table of contents >](#)

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

[Dimensions p.29](#)



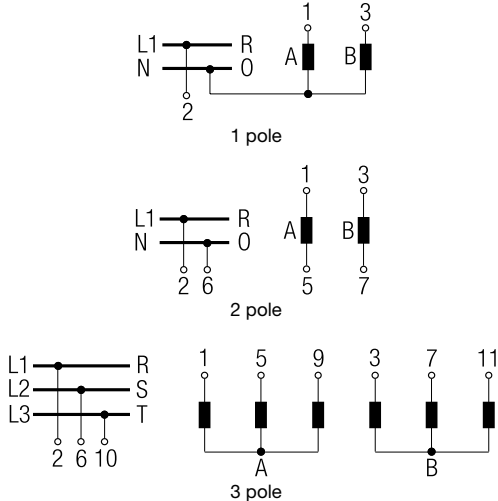


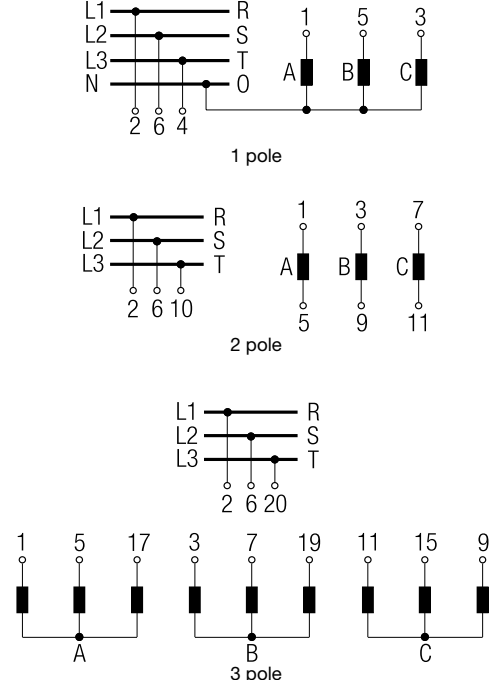
1 pole 2 pole 3 pole	 F005 F044		WAA 245 WAA 265 WAA 285	2 4 6	 1 pole 2 pole 3 pole
1 pole 2 pole 3 pole	 F045		WAA 246 WAA 266 WAA 286	2 4 6	 1 pole 2 pole 3 pole
1 pole 2 pole 3 pole	 F007 F046		WAA 247 WAA 267 WAA 287	3 5 8	 1 pole 2 pole 3 pole
1 pole 2 pole 3 pole	 F008 F047		WAA 248 WAA 268 WAA 288	3 5 9	 1 pole 2 pole 3 pole
1 pole 2 pole 3 pole	 F009 F048		WAA 249 WAA 269 WAA 289	3 6 9	 1 pole 2 pole 3 pole
1 pole 2 pole 3 pole	 F270 F275		WAA 630 WAA 635 WAA 644	3 7 11	 1 pole 2 pole 2 and 3 pole
1 pole	 F271		WAA 631	4	 1 pole
1 pole	 F272		WAA 632	5	 1 pole

< back to table of contents >

Function	Escutch. Plate	Handle		Stages	Connection Diagram
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General Application Switches

[Dimensions p.29](#)



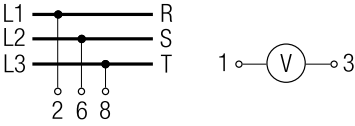


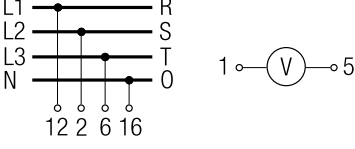


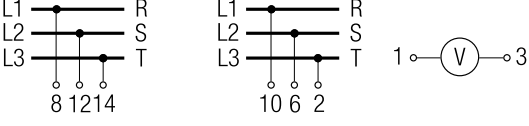
<p>1 pole 2 Gang 2 pole 3 pole</p> <p>Switching sequence: 0, A, A+B</p>	 <p>F075</p>		<p>A310-600 A312-600 WAA 314</p>	<p>1 1 2</p>	 <p>1 pole</p> <p>2 pole</p> <p>3 pole</p>
<p>1 pole 3 Gang 2 pole 3 pole</p> <p>Switching sequence: 0, A, A+B, A+B+C</p>	 <p>F001</p>		<p>A311-600 WAA 313 WAA 315</p>	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

[< back to table of contents >](#)

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	

< back to table of contents >

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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Ammeter Switches

[Dimensions p.29](#)





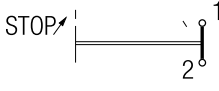





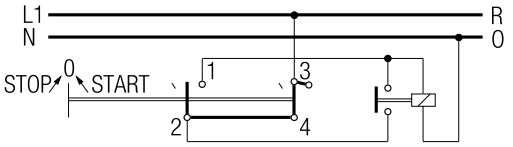


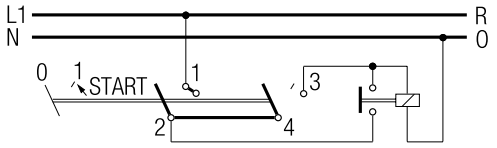


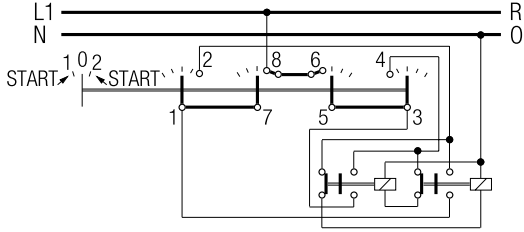
Single pole with 3 current transformers with „OFF“ 360° rotation			A048	2	
Single pole with 2 current transformers (3 readings)			WAA021	1	
2 pole, 3 current transformers			WAA019	3	
			A038	3	

[< back to table of contents >](#)

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	



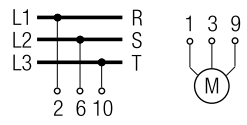
< back to table of contents >

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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

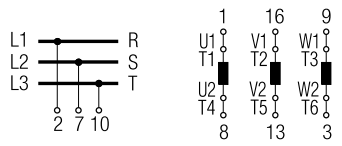


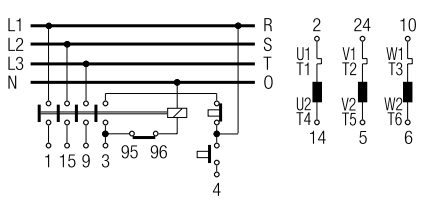
Motor Reversing Switches

Dimensions p. 29



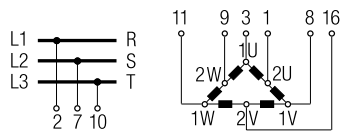


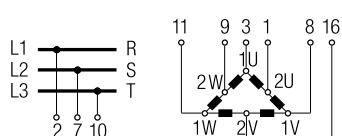


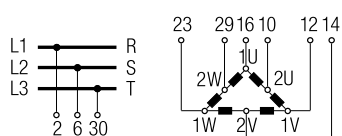


			A401	2	
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

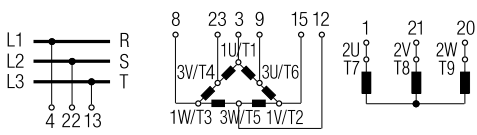
Star-delta Switches

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

Motor Control Switches

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





Polumschalter

3 speed 2 winding 0 - AΔ - BY - AY			WAA457	3	
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[< back to table of contents >](#)

	Code	A11 AD11 AD12	A25	A11C A25C
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[< back to table of contents >](#)

	<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	●	●

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 60715, Protection IP 40</p>	VE1	●	●	
	<p>Snap-on base mounting for track EN 60715, Escutcheon plate can be fastened by screws at the switch, Protection IP 40</p>	VE1E		●	

[< back to table of contents >](#)

Handles

Type	Color	Code	Size	
			S1	S2

	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	● ● ● ●

< back to table of contents >

Escutcheon Plates



Square and rectangular escutcheon plates are available for each size of switch. The escutcheon plate consists of a frame and a faceplate having the switch positions which is 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.

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

30° switching

45° switching

[> back to table of contents](#)

Face plates

60° switching

F070	F087	F088	F089	F133	F197	F198	F232	F243	F247	F263	F268	F310	F311	F323	F328	F352	F367
F379	F380	F470	F754	F072	F163	F164	F192	F193	F196	F230	F231	F234	F244	F257	F262	F264	F282
F288	F291	F313	F382	F441	F705	F721	F722	F750	F757	F758	F075	F076	F098	F220	F223	F356	F357
F377	F723	F071	F073	F080	F081	F085	F086	F090	F091	F092	F093	F094	F104	F194	F235	F237	F239
F240	F241	F249	F260	F269	F274	F281	F290	F292	F312	F314	F315	F316	F324	F331	F344	F354	F358
F359	F364	F370	F371	F373	F381	F385	F442	F444	F469	F732	F735	F759	F077	F100	F101	F102	F309
F342	F343	F361	F362	F363	F365	F366	F078	F191	F325	F326	F720	F074	F082	F096	F097	F195	F724
F256	F079	F083	F084	F095	F099	F185	F190	F199	F233	F236	F238	F242	F283	F725	F730	F731	F736
F737																	

90° switching

F056	F063	F068	F134	F201	F251	F252	F346	F456	F058	F065	F069	F177	F178	F182	F208	F253	F254
F340	F360	F378	F458	F443	F700	F743	F057	F061	F064	F067	F171	F181	F205	F207	F210	F320	F349
F437	F445	F715	F719	F059	F060	F066	F170	F172	F173	F174	F175	F176	F179	F180	F186	F188	
F202	F204	F206	F250	F265	F266	F286	F318	F327	F338	F339	F425	F716	F717	F718	F726	F733	F751
F755	F756																

Miscellaneous

F119	F130	F122	F126	F125	F129	F225	F248	F261	F341	F345	F287	F123	F127	F145	F146	F148	F706						
F707	F245	F120	F124	F128	F131	F121	F132	F749										F990	F991	F801	F802	F803	F804
F805	F806	F807	F808	F809	F810	F811	F812	F813	F814	F815	F816	F817	F818	F819	F820	F821	F822						
F823	F824	F825	F826	F827	F828	F829	F830	F831	F832	F833	F834	F835	F837	F838	F839	F840	F841						

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

	A11 A11C	AD11 AD11C	AD12 AD12C	A25 A25C
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Rated Insulation Voltage U_i	IEC 60947-3 ¹		V	690	600	600	690
	VDE 0660 part 107 ¹		V	600	600	600	600
	UL/Canada		V	20	1	6	20
	min. operational voltage		V	20	1	6	20
Rated Impulse Withstand Voltage U_{imp}			kV	6	on request	on request	6
Rated Thermal Current I_U/I_{th}	IEC 60947-3		A	20	6	6	25
	VDE 0660 part 107		A	10	6	6	25 ⁵
	UL/Canada		A	10	6	6	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	A	–	6	–	–
		6 V	A	–	3	6	–
		12 V	A	–	2	6	–
		24/48 V	A	20	1/0,8	5/4	25
		110/220 V	A	20	0,4/0,2	3/2	25
		380/440 V	A	20	0,13/0,1	1,3/1	25
		500/600 V	A	20	0,08/0,05	0,8/0,5	25
		660/690 V	A	20	–	–	25
AC-22A Switching of combined resistive or low inductive loads including moderate overloads	IEC 60947-3 VDE 0660 part 107	220 V-500 V	A	20	–	–	25
		660 V-690 V	A	16	–	–	25
AC-15 Switching of control devices, contactors, valves etc.	IEC 60947-5-1 VDE 0660 part 200	220 V-240 V	A	6	–	–	8
		380 V-440 V	A	4	–	–	5
Pilot Duty	UL/Canada	Heavy	VAC	600	–	–	600
Ampere Rating Resistive or low inductive loads	UL/Canada		A	10	see AC-21A	see AC-21A	25
DC Switching Capacity²							
DC-1 Resistive load T = 1 ms	IEC 60947-3, EN 60947-3 VDE 0660 part 107 North America	1 V/6 V	A	–	4/2,5	–/4	–
		12 V/24 V	A	–	1,5/0,8	3/2	–
		48 V	A	–	0,3	1,2	–
		110 V/220 V	A	–	0,2/0,1	0,6/0,3	–
		380 V/440 V	A	–	0,06/0,05	0,2/0,15	–
		550 V/600 V	A	–	0,03/0,02	0,1/0,1	–
Power loss per contact at I_U				0,9	0,5	0,2	0,7
Resistance to vibration					on request		
Resistance to shock			W		on request		
Short Circuit Protection							
Max. fuse size	(gG-characteristic)		A	20	6	6	35
Rated short-time withstand current	(1s-current)		A	120	45	75	220
Min. Ambient Temperature of Stage				-25 °C (valid only without optional extra)			
Max. Ambient Temperature of Stages^{3,4}	open at 100 % I_U/I_{th}			55 °C during 24 hours with peaks up to 60 °C			
	enclosed at 100 % I_{the}			35 °C during 24 hours with peaks up to 40 °C			

[< back to table of contents >](#)

¹Valid for lines with grounded common neutral termination, overvoltage category III, pollution degree 3. Values for other supply systems on request. ²Values for switches with spring return 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 und A25C-4: 22A

	A11 A11C	AD11 AD11C	AD12 AD12C	A25 A25C
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[< back to table of contents >](#)



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	120 V	HP	1	-	-	1,5
			240 V		1	-	-	3
			480 V		1	-	-	7,5
			600 V		1	-	-	10
		1 phase	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	

	A11 A11C	AD11 AD11C	AD12 AD12C	A25 A25C
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Tightening torque of screws		Nm lb-in	0,8 7	0,8 7	0,8 7	1,3 12
DC Switching Capacity¹			Rated Thermal Current I_e			
contacts in series:	1 2 3 4 5 6 8					
	Permissible voltage in volts					
Utilization category	24 48 72 96 120 144 192	A	16	-	-	21
DC-21A, DC-21B	48 96 144 192 240 288 384	A	14	-	-	18
Switching of resistive load	60 120 180 240 300 360 480	A	13	-	-	17
Time constant L/Rs1ms	110 220 330 440 550 660 -	A	6	-	-	6
	220 440 660 - - - -	A	0,9	-	-	1
Utilization category	24 48 72 96 120 144 192	A	14	-	-	18
DC-22A, DC-22B	48 96 144 192 240 288 384	A	13	-	-	17
Time constant L/Rs1ms	60 120 180 240 300 360 480	A	12	-	-	16
and inductive load	110 220 330 440 550 660 -	A	1,9	-	-	2
f.e. shunt motors	220 440 660 - - - -	A	0,3	-	-	0,3
Time constant L/Rs2,5ms						
Utilization category	24 48 72 96 120 144 192	A	13	-	-	16
DC-23A, DC-23B	48 96 144 192 240 288 384	A	12	-	-	15
Switching of highly inductive loads	60 120 180 240 300 360 480	A	10	-	-	14
f.e. series motors	110 220 330 440 550 660 -	A	1,5	-	-	1,7
Time constant L/Rs15ms	220 440 660 - - - -	A	0,2	-	-	0,2

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

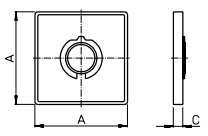
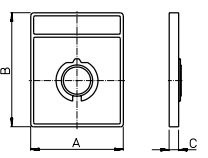
International Standards and Approvals

		Mark or Standard	A11	AD11	AD12	A25
USA/Canada	Underwriters Laboratories	 ¹		●	●	
		 ³	●			●
Europe		EN 60947 ²	+	+	+	+
International Electrical Commission (IEC) Recommendation		IEC 60947 ²	+	+	+	+
Switch approved		Switch conforms to requirements				
¹ Approved under the "Component Program" (UL-Recognized Industrial Component). File No. E60262, Category Control Number NRNT2 and NRNT8. ² Industrial switchgear is not required to bear a symbol but must conform to requirements. By referring to the specific specification on the product the manufacturer implies that these requirements have been met. ³ Approved under the "Listing-Program". File No. E35541, Guide No. NLRV and NLRV7.						

[< back to table of contents >](#)

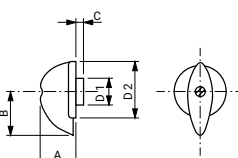
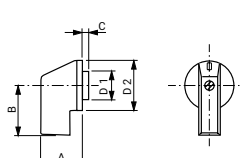
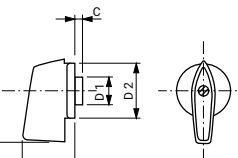
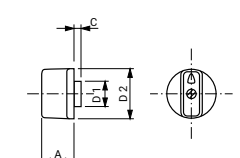
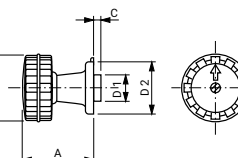
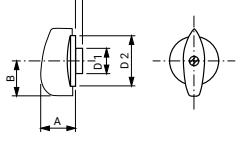
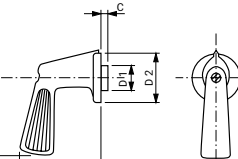
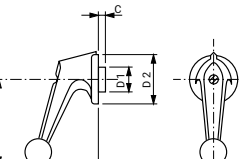
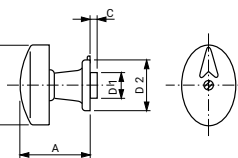
Dimensions mm
inch

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

PE-Escutcheon Plate							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.

[< back to table of contents >](#)

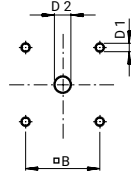
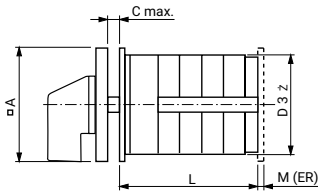
R-Handle							I-Handle						
	S1	23	31,5	5	18,2	36		S1	27	31,8	2,5	18,2	36
		0,91	1,24	.20	.72	1,42			1,06	1,25	.10	.72	1,42
	S2	30	42	5	25,4	50,0							
		1,18	1,65	.20	1,00	1,97							
F-Handle							B-Handle						
	S1	34	34	5	18,2	36		S1	23		5	18,2	36
		1,34	1,34	.20	.72	1,42			.91		.20	.72	1,42
	S2	44,7	45	5	25,4	50							
		1,76	1,77	.20	1,00	1,97							
S-Handle							L-Handle						
		50	45	5	18,2	36		S1	24	24,1	5	18,2	36
		1,97	1,77	.20	.72	1,42			.95	.95	.20	.72	1,42
P-Handle							K-Handle						
	S1	58	57,5	5	18,2	36		S1	54	64	5	18,2	36
		2,28	2,26	.20	.72	1,42			2,13	2,52	.20	.72	1,42
	S2	70	68	5	25,4	50							
		2,76	2,68	.20	1,00	1,97		S2	55	71	5	25,4	50
									2,17	2,80	.20	1,00	1,97
O-Handle													
		50	56	5	18,2	36							
		1,97	2,2	.20	.72	1,42							

Dimensions mm
inch

Four Hole Panel Mounting	A11		
	AD11		A11C
	AD12	A25	A25C

Dimensions in brackets for rear mounting plate with ER

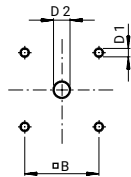
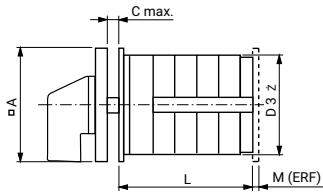
E, ER



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

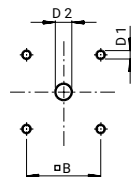
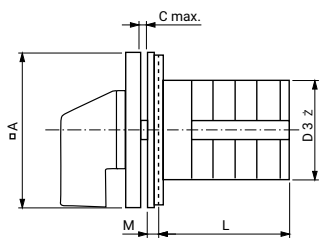
Dimensions in brackets for rear mounting plate with ERF

EF, ERF



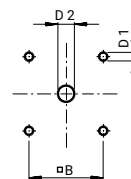
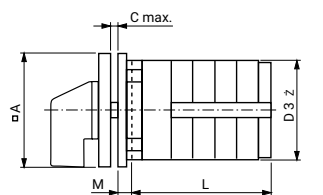
A	4 2.52	64 (88) 2.52	88 3.46
B	48 1.89	48 (68) 1.89	68 2.68
C	4 .16	4 .16	5.5 .22
D1	5 (4.1) .20	5 (5.4) .20	6 (5.4) .24
D2	19-22 .75-.87	19-22 .75-.87	26-30 1.02-1.18
D3	60 2.36	70 2.76	84 3.31

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	13-30 .51-1.18	13-30 .51-1.18	-
D2	EG	EG	-
D2	EGF	EGF	-
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

< back to table of contents >

Dimensions mm
inch

Base Mounting	A11		
	AD11		
	AD12	A25	A11C A25C

Dimensions in brackets for rear mounting plate with VE

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 ¹	A11 AD11 AD12	A25
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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	A11C/A25C	8,2 .32	8,2 .32
5	93,3 3.67		94,3 3.71			
6	106 4.17		107 4.21			
7	118,7 4.67		119,7 4.71			
8	131,4 5.17		132,4 5.21			
9	144,1 5.67		145,1 5.71			
10	156,8 6.17		157,8 6.21			
11	169,5 6.67		170,5 6.71			
12	182,2 7.17		183,2 7.21			

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

[< back to table of contents >](#)

The Range of “Blue Line” Switchgear

Technical literature covering the following products is available on request.

	Catalog Number
Main Switches and Main Switches with Emergency Function 16 A-315 A Maintenance Switches 20 A-315 A Switch Disconnectors 20 A-315 A According to IEC 60947-3, EN 60947-3, VDE 0660 part 107, IEC 60204, EN 60204 and VDE 0113	500
CL Switches 10 A-20 A C, CA and CAD Switches 10 A-315 A and L Switches 350 A-2400 A C, CA and CAD switches are designed for universal application. They are recommended for instrument, isolator, double-throw and motor control. L switches are designed for load and off-load applications. They are used to switch resistive or low inductive loads.	100
Optional Extras and Enclosures The complete product line, a large number of optional extras is available, including door interlocks, push-pull devices, cylinder and padlock attachments, control and indicator devices, AC motor drives, as well as enclosures, both insulated and metal.	101
A and AD Switches 6 A-25 A A and AD switches have 4 contacts in each switching stage. These switches provide an extensive range of switch functions and require a minimum mounting depth. Up to 36 switching positions are possible, with availability of 48 contacts per 12 stage switch column.	110
CG, CH and CHR Switches 10 A-25 A Ultra compact CG, CH and CHR switches are ideally suited for control and instrumentation applications. Switch terminals are “finger-proof” and conveniently accessible for wiring and are delivered open. All CG4 switches offer specially designed gold plated contacts or H-bridges with “cross-wire” contact systems, which facilitates their use in electronic circuitry and chemically aggressive environments.	120
DH, DHR, DK and DKR Switches 6 A-16 A DH, DHR, DK and DKR switches incorporate unique corrosion resistant contacts that permit operation on system voltage as low as 1 V. They have fully enclosed and protected contacts which can be operated either by rotary and/or lateral handle movement. D switches are used in calibration and semiconductor circuits. They are also used for relay and contactor control.	130
X Switches 80 A-630 A X switches can be applied for load, tap and gang switching duties. They incorporate 6 contacts in each switching stage. Their compact design provides a minimum length dimension for mounting purposes.	140
KG Switches 20 A-315 A KG 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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