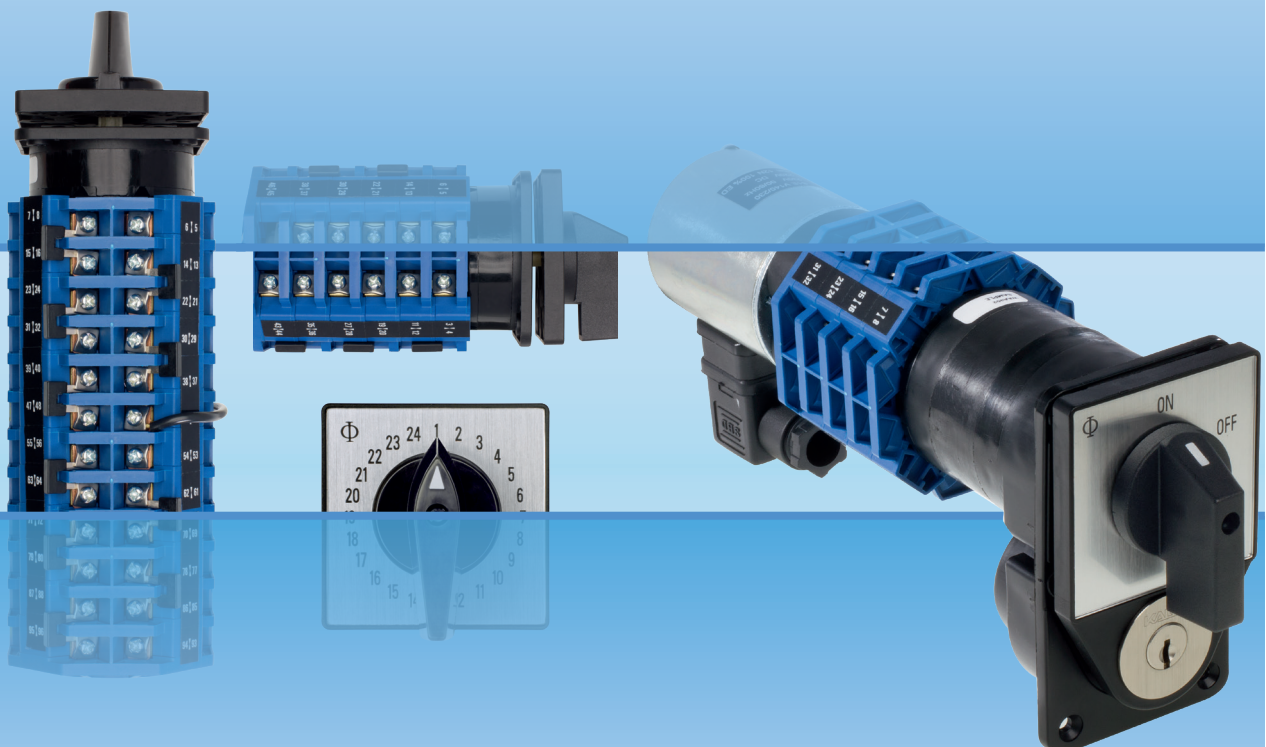


Control Switches for Special Applications

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

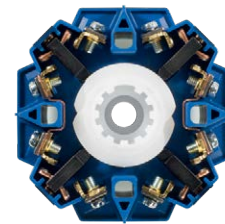
	Page
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How to order	5, 6
Switch Function and Configuration	
ON/OFF Switches	8
Double-throw Switches	9, 10
Multi-step Switches	11-13
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Construction Data

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.

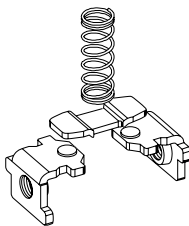


Switch type	Switching angle	Max. number of switch positions
A11, AD11, AD12	15°, 20°, 30°, 45°, 60°, 90°	24
A25	15°, 20°, 30°, 45°, 60°, 90°	24

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

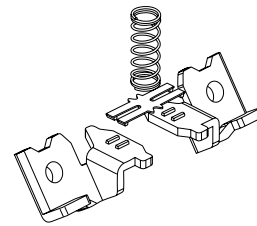
2 different Contact Systems are available

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

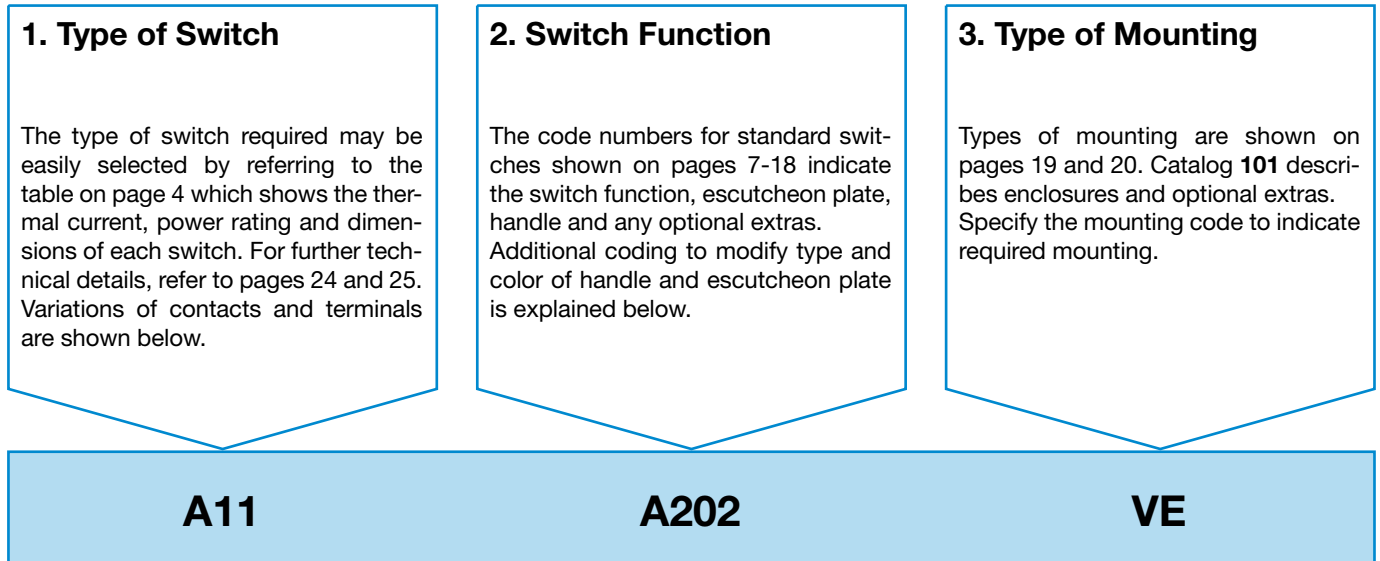
Rated Values

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	-
		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.



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Type of Switch

Extending the switch type coding the following combinations will define:

Amendment	Definition	For switch types
-1	with gold contacts 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**.

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.

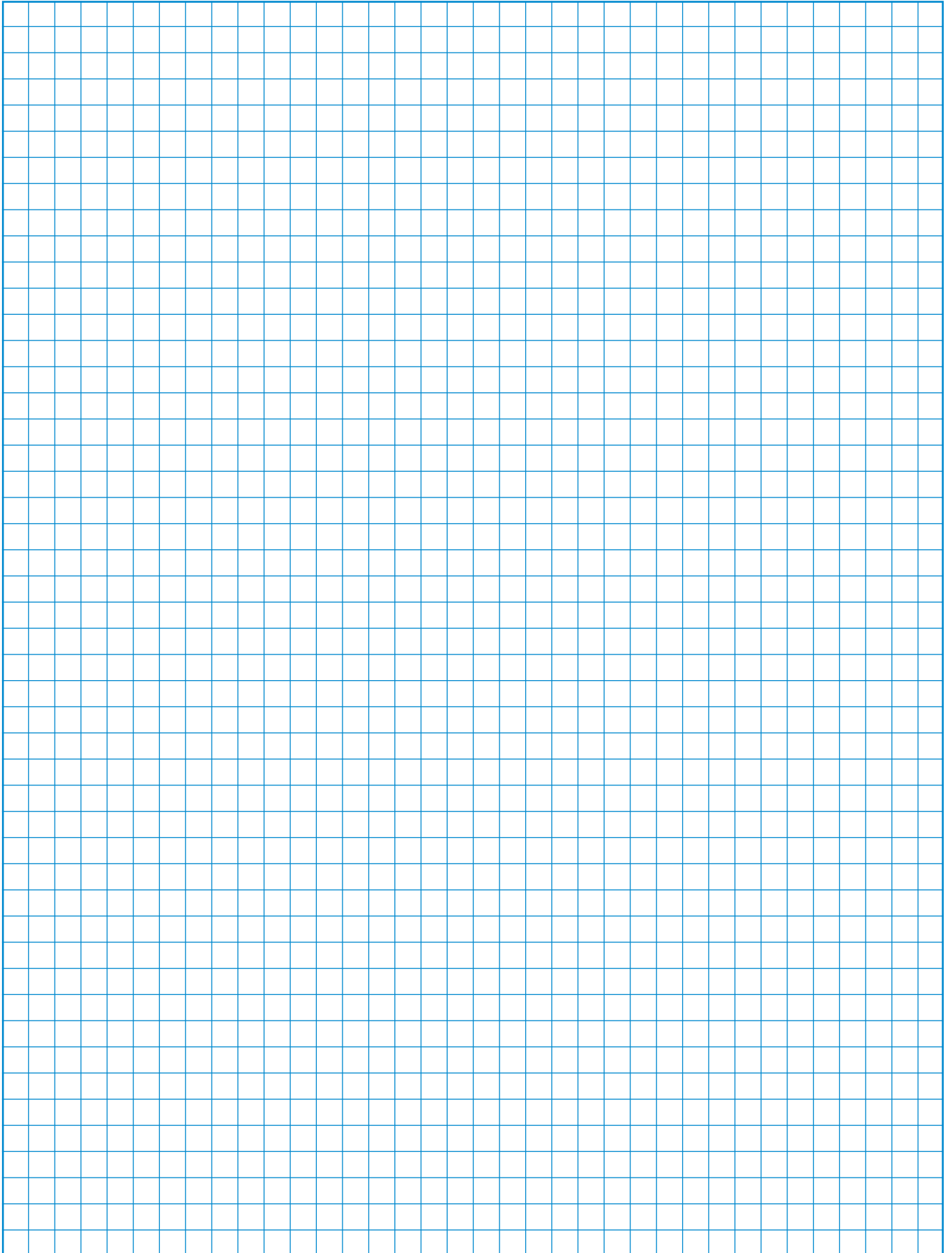
When a handle, escutcheon plate or optional extra is required but not covered by the dash-number, the code number for the selected component should be entered separately. A comprehensive range of available standard escutcheon plates is illustrated on pages 23-25. Non-standard or special escutcheon plate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



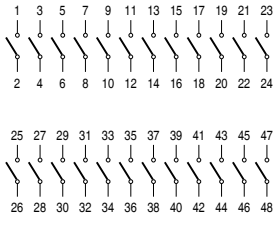


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



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

[Dimensions p. 29](#)

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

ON/OFF Switches with 90° Switching




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

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Function	Escutch. Plate	Handle	Code	Stages	
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

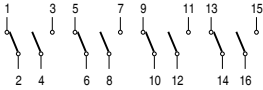
Double-throw Switches without „OFF“ 60° Switching

[Dimensions p.29](#)



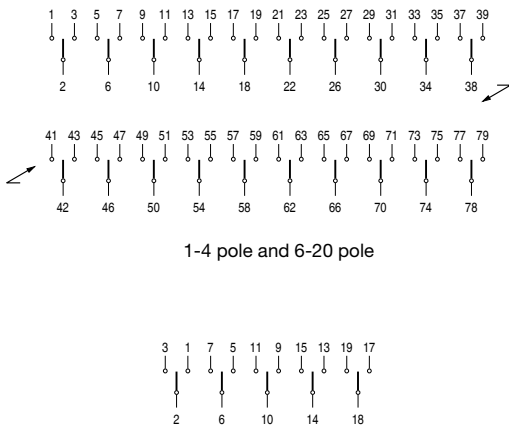
1 pole	 <p>F072</p>		A220	1	
2 pole			A221	1	
3 pole			A222	2	
4 pole			A223	2	
6 pole			A370	3	
8 pole			A372	4	
10 pole			WAA 374	5	
12 pole			WAA 376	6	
14 pole			WAA 660	7	
16 pole			WAA 661	8	
18 pole	WAA 662	9			
20 pole	WAA 663	10			

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



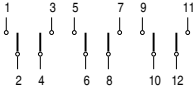



1 pole	 <p>F072</p>		A720	1	 <p>1-4 pole</p>
2 pole			A721	1	
3 pole			A722	2	
4 pole			A723	2	

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



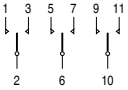
1 pole	 <p>F071</p>		A210	1	 <p>1-4 pole and 6-20 pole</p> <p>5 pole</p>
2 pole			A211	1	
3 pole			A212	2	
4 pole			A213	2	
5 pole			A361	3	
6 pole			A362	3	
8 pole			WAA 364	4	
10 pole			WAA 366	5	
12 pole			WAA 368	6	
14 pole			WAA 655	7	
16 pole	WAA 656	8			
18 pole	WAA 657	9			
20 pole	WAA 658	10			

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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Double-throw Switches with Center „OFF“ and electrically isolated contacts [Dimensions p.29](#)

1 pole 2 pole 3 pole	 F071		A710 A711 A712	1 1 2	 1-3 pole
1 pole with spring return to center 2 pole with spring return to center 3 pole with spring return to center	 F025		A714 A715 WAA 716	1 1 2	 1-3 pole

Double-throw Switches with Spring Return to Center



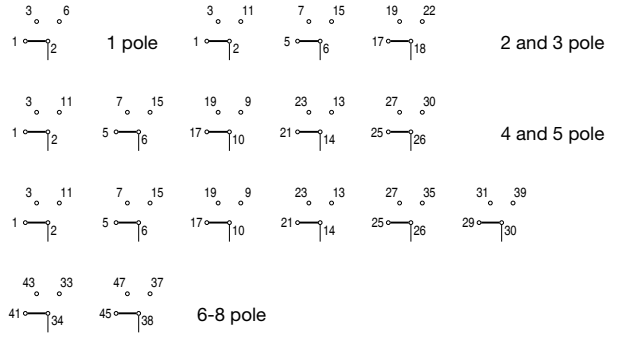

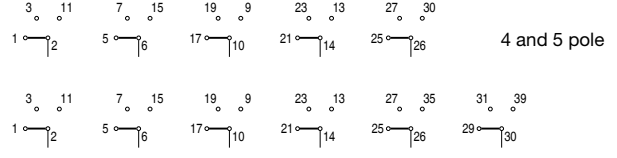

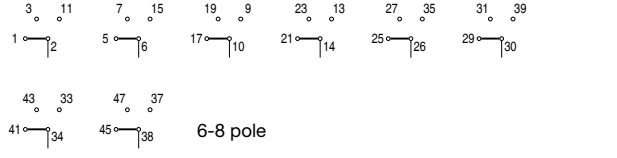


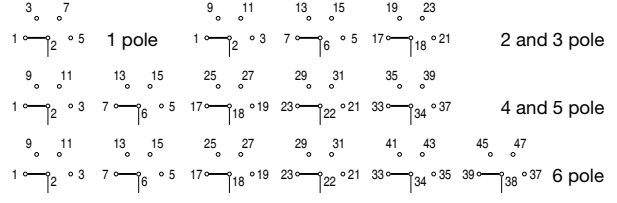

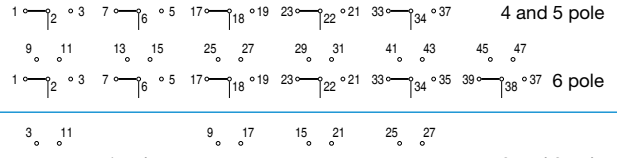


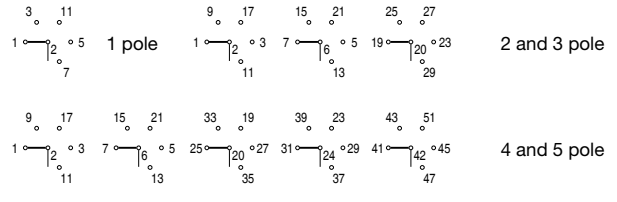


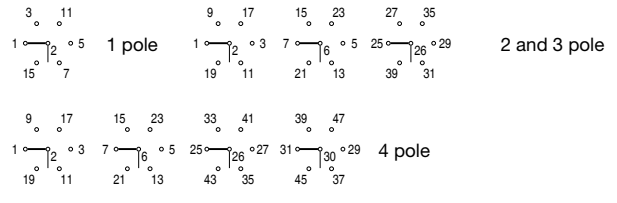


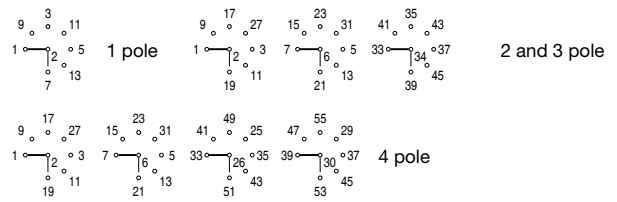


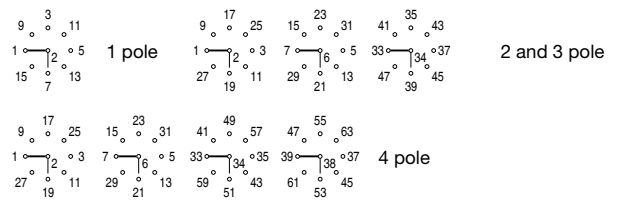


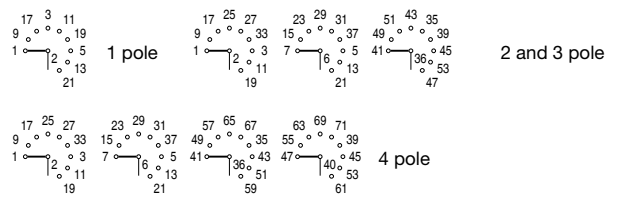
1 pole with spring return to center 2 pole with spring return to center 3 pole with spring return to center	 F025		A214 A215 A216	1 1 2	 1-3 pole
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Escutch. Plate	Handle	Code	Stages	Connection Diagram
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Multi-step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

[Dimensions p.29](#)

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1 pole 3 Step 2 pole 3 pole	 <p>F076</p>		A230 A250 A270	1 2 3	
4 pole 5 pole 6 pole			A476 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 A251 A271	1 2 3	
4 pole 5 pole 6 pole			A477 WAA 485 WAA 490	4 5 6	
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	
1 pole 6 Step 2 pole 3 pole 4 pole	 <p>F079</p>		A233 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“

Dimensions p. 29



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

1 pole 2 pole 3 pole 5 pole			A240-600 A260-600 A280-600 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 5 pole
1 pole 2 pole 3 pole			A242-600 WAA 262 WAA 282	1 2 3	 	2 and 3 pole
1 pole 2 pole 3 pole			A243-600 WAA 263 WAA 283	2 3 5	 	2 and 3 pole
1 pole 2 pole 3 pole			A244-600 WAA 264 WAA 284	2 3 5	 	2 and 3 pole

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

[Dimensions p.29](#)



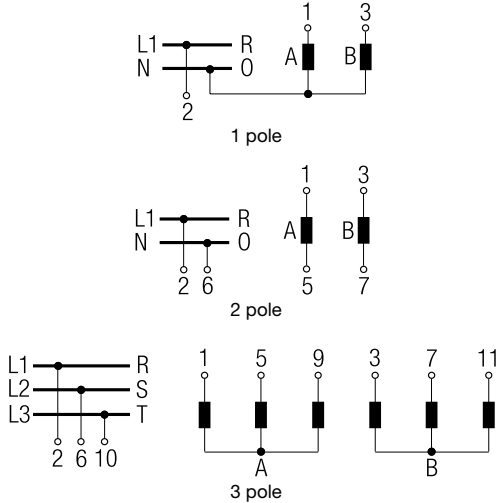


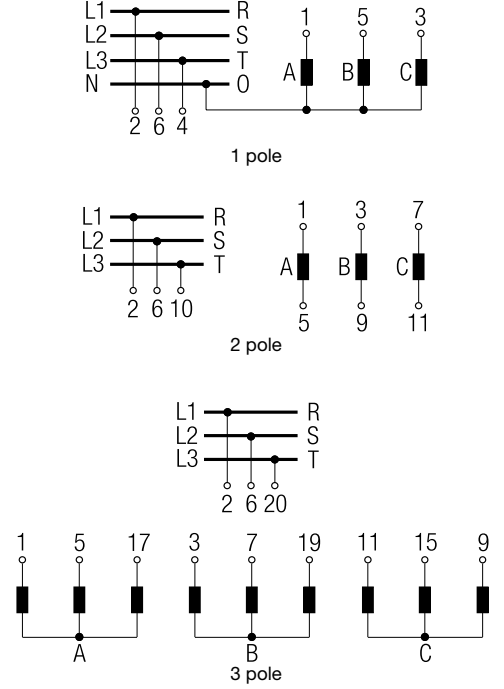
1 pole 2 pole 3 pole	 F005 F044		WAA 245 WAA 265 WAA 285	2 4 6	 1 pole 2 pole 3 pole
1 pole 2 pole 3 pole	 F045		WAA 246 WAA 266 WAA 286	2 4 6	 1 pole 2 pole 3 pole
1 pole 2 pole 3 pole	 F007 F046		WAA 247 WAA 267 WAA 287	3 5 8	 1 pole 2 pole 3 pole
1 pole 2 pole 3 pole	 F008 F047		WAA 248 WAA 268 WAA 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

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Function	Escutch. Plate	Handle		Stages	Connection Diagram
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General Application Switches

[Dimensions p.29](#)



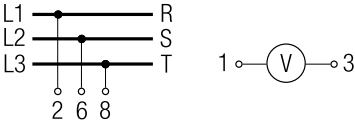


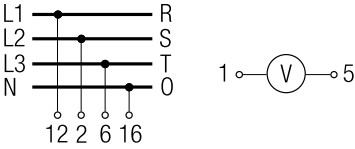


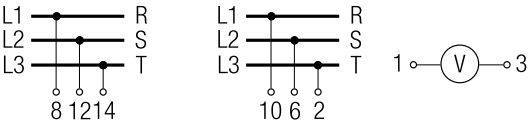
<p>1 pole 2 Gang 2 pole 3 pole</p> <p>Switching sequence: 0, A, A+B</p>	 <p>F075</p>		<p>A310-600 A312-600 WAA 314</p>	<p>1 1 2</p>	 <p>1 pole</p> <p>2 pole</p> <p>3 pole</p>
<p>1 pole 3 Gang 2 pole 3 pole</p> <p>Switching sequence: 0, A, A+B, A+B+C</p>	 <p>F001</p>		<p>A311-600 WAA 313 WAA 315</p>	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

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

[Dimensions p.29](#)

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

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Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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Ammeter Switches

[Dimensions p.29](#)



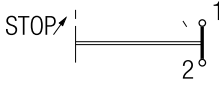





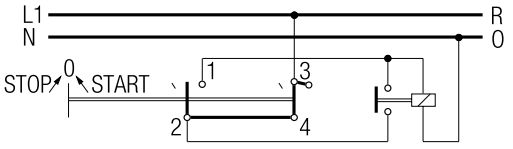


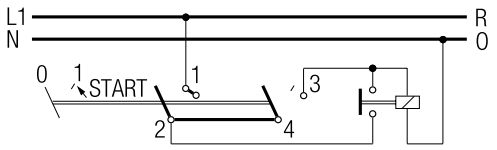


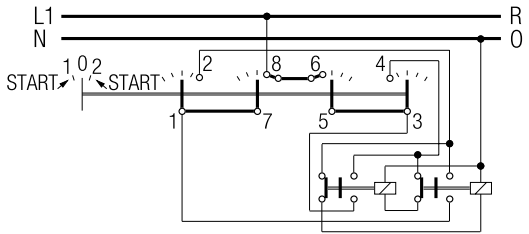
Single pole with 3 current transformers with „OFF“ 360° rotation			A048	2	
Single pole with 2 current transformers (3 readings)			WAA021	1	
2 pole, 3 current transformers			WAA019	3	
			A038	3	

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Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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Control Switches

[Dimensions p.29](#)



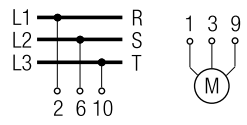
Stop switch	 F022		WAA174	1	
Start switch	 F023		A175	1	
Stop start switch single pole	 F024		A176	1	
Stop start switch with spring return from start to run	 F119		A178	1	
Stop start switch with spring return to run for 2 units	 F121		WAA177	1	

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

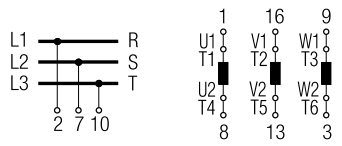


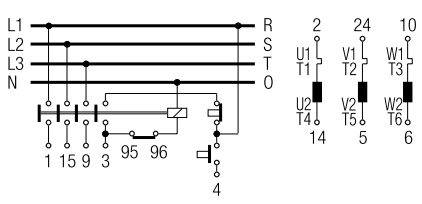
Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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Motor Reversing Switches



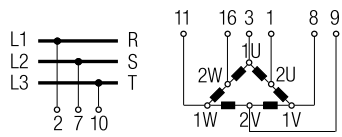


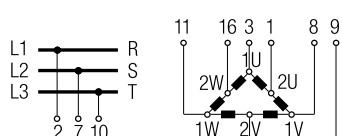


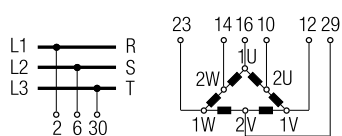
Dimensions p.29

			A401	2	
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

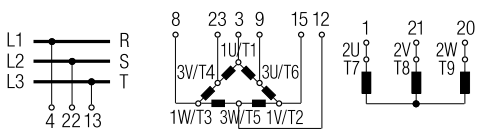
Star-delta Switches

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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	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	●	●	

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> <p>Snap-on base mounting for track EN 50022, Protection IP 40</p>	<p>VE</p> <p>VE1</p>	<p>●</p> <p>●</p>	<p>●</p> <p>●</p>	<p>●</p> <p></p>
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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	● ● ● ●	

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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.

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

30° switching

45° switching

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Face plates

60° switching

F070	F087	F088	F089	F133 HAUPTSCHALTER	F197 GOVERNOR	F198 FRAN TILL	F232 SYNCHROSCOPE	F243 POWERFACTOR METER	F247 VARMETER	F263 OLO ELO	F268 OLO ELO	F310 AUS EN	F311 ARRET MARCHE	F323 HUMIDBRYTARE	F328 HUMIDBRYTARE	F352	F367 MAIN SWITCH
F379	F380	F470	F754	F072	F163 RAISE LOWER	F164 RAISE LOWER	F192 VOLTMETER	F193 POWERFACTOR METER	F196 VARMETER	F230	F231 SYNCHROSCOPE	F234	F244	F257 DAG NATT	F262 HALL- SNAG- LADDONLADDON	F264	F282 PROV DREFT
F288	F291	F313	F382	F441 LOKAL FJERR	F705 TRIP NORMAL	F721	F722	F750	F757 REMOTE SUPER DISARM	F758 LOCAL REMOTE	F075	F076	F098	F220 CIRCUIT BREAKER CONTROL	F223 TRIP CLOSE	F356	F357
F377 PUMP BURNER	F723 TRIP CLOSE	F071	F073	F080	F081	F085	F086	F090	F091	F092	F093	F094	F104	F194 SYNCHRONIZING	F235 PHASE ISOUND	F237	F239 VOLTMETER
F240 SELECTOR	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 AMMETER	F325 AMMETER	F326	F720	F074	F082	F096	F097	F195 TEMPERATURE INDICATOR	F724
F256	F079	F083	F084	F095	F099	F185	F190 VOLTMETER	F199 AMMETER	F233 TEMPERATURE INDICATOR	F236	F238 VOLTMETER	F242	F283	F725	F730	F731	F736
F737																	

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90° switching

F056	F063	F068	F134 HAUPTSCHALTER	F201 MAIN SWITCH	F251	F252	F346	F456	F058	F065	F069	F177 WATTMETER	F178 POWERFACTOR METER	F182	F208	F253 SYNCHROSCOPE	F254																		
F340 AMMETER	F360 MAIN SWITCH	F378 HAUPTSCHALTER	F458	F443 MEET UPS	F700	F743	F057	F061 VOLTMETER	F064 AMMETER	F067	F171 AMMETER	F181 AMMETER	F205 WATTMETER	F207 TRANSFER	F210 POWERFACTOR METER	F218 SYNCHRONIZING	F320 AMMETER	F349 AMMETER																	
F437 NETZ-STROM	F445 MAIN-GEN	F715	F719	F059	F060	F066	F170 VOLTMETER	F172 AMMETER	F173 AMMETER	F174 AMMETER	F175 VOLTMETER	F176 WATTMETER	F179 POWERFACTOR METER	F180 SYNCHRONIZING	F186	F188	F202	F204 TEMPERATURE INDICATOR	F206	F250 PAR. TRANSFER SWITCH	F265	F266	F286	F318 AMMETER	F327 AMMETER	F338 AMMETER	F339 AMMETER	F425 AMMETER	F716 VOLTMETER	F717 VOLTMETER	F718 VOLTMETER	F719 VOLTMETER	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 ANSLUTTSKED	F806 MOTOR CONTROL	F807 SPEED CONTROL	F808 SELECTOR	F809 VOLTMETER	F810 GOVERNOR	F811 AMMETER	F812 VOLTMETER	F813 WATTMETER	F814 POWERFACTOR METER	F815 SYNCHRONIZING	F816 VARMETER	F817 TEMPERATURE INDICATOR	F818 TRANSFER	F819 SYNCHROSCOPE	F820 PAR. TRANSFER SWITCH	F821 ISOLATOR	F822 HAUPTSCHALTER	
F823 WAHLSCHALTER	F824 MAIN SWITCH	F825 HUMIDBRYTARE	F826 SERHETSRYTARE	F827 SERHETSRYTARE	F828 INTERRUPTEUR	F829 TURVAKYTTIN	F830 KALMTEMPARE	F831 INTERRUPTEUR	F832 HAUPTSCHALTER	F833 VOLTMETER	F834 AMPERMETRE	F835 HOUTSCHAKELAR	F837 HEATER	F838 MAIN SWITCH	F839 INTERRUPTEUR	F840 INTERRUPTEUR	F841 INTERRUPTEUR	

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 ⁴
	UL/Canada		A	10	6	6	25 ⁴
Rated Operational Current I_e							
AC-21A Switching of resistive loads, including moderate overloads	IEC 60947-3 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
Power loss per contact at I_u				0,9	0,5	0,2	0,7
Resistance to vibration					on request		
Resistance to shock					on request		
Short Circuit Protection							
Max. fuse size	(gG-characteristic)		A	20	6	6	35
Rated short-time withstand current	(1s-current)		A	120	45	75	220
Min. Ambient Temperature of Stage				-25 °C (valid only without optional extra)			
Max. Ambient Temperature of Stages ^{2,3}	open at 100 % I_u/I_{th}			55 °C during 24 hours with peaks up to 60 °C			
	enclosed at 100 % I_{the}			35 °C during 24 hours with peaks up to 40 °C			

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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. ²For electromagnetic optional extras see additional data in Catalog 101. ³Storage temperature: -40 °C to 85 °C (in case of temperature below -5 °C no shock load permissible). ⁴A25-4 und A25C-4: 22A

	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	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)			AWG	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/R _s 1ms	110 220 330 440 550 660 -	A	6	-	-	6
	220 440 660 - - - -	A	0,9	-	-	1
Utilization category	24 48 72 96 120 144 192	A	14	-	-	18
DC-22A, DC-22B	48 96 144 192 240 288 384	A	13	-	-	17
Time constant L/R _s 1ms	60 120 180 240 300 360 480	A	12	-	-	16
and inductive load	110 220 330 440 550 660 -	A	1,9	-	-	2
f.e. shunt motors	220 440 660 - - - -	A	0,3	-	-	0,3
Time constant L/R _s 2,5ms						
Utilization category	24 48 72 96 120 144 192	A	13	-	-	16
DC-23A, DC-23B	48 96 144 192 240 288 384	A	12	-	-	15
Switching of highly 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/R _s 15ms	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

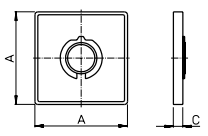
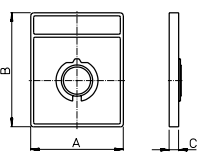
¹Approved under the "Component Program" (UL-Recognized Industrial Component). File No. E60262, Category Control Number NRNT2 and NRNT8.

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.

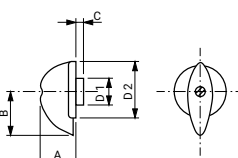
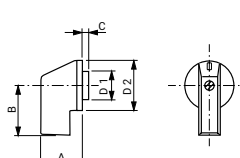
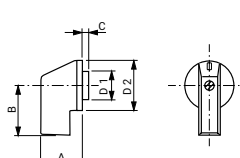
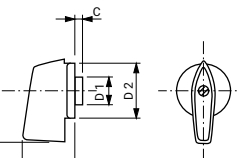
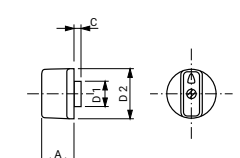
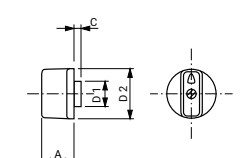
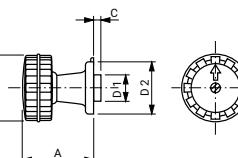
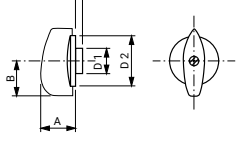
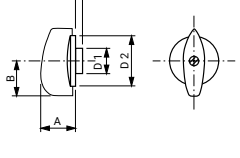
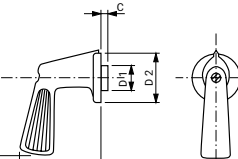
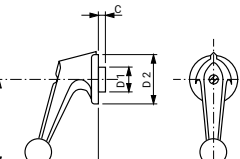
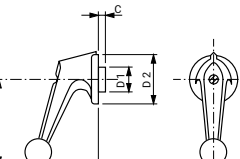
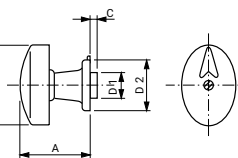
Dimensions mm
inch

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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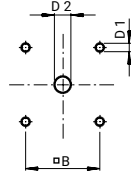
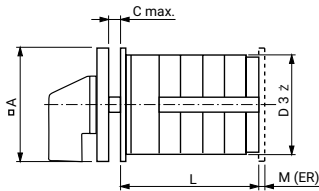
R-Handle 							I-Handle 						
	S1	23	31,5	5	18,2	36		S1	27	31,8	2,5	18,2	36
		0,91	1,24	.20	.72	1,42				1,06	1,25	.10	.72
	S2	30	42	5	25,4	50,0							
		1,18	1,65	.20	1,00	1,97							
F-Handle 							B-Handle 						
	S1	34	34	5	18,2	36		S1	23		5	18,2	36
		1,34	1,34	.20	.72	1,42				.91		.20	.72
	S2	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
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
	S2	70	68	5	25,4	50		S2	55	71	5	25,4	50
		2,76	2,68	.20	1,00	1,97			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

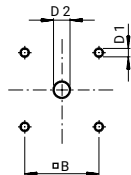
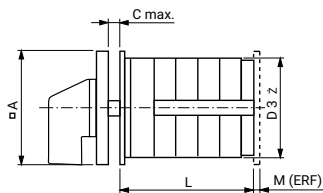
E, ER



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

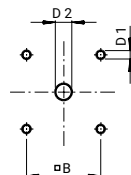
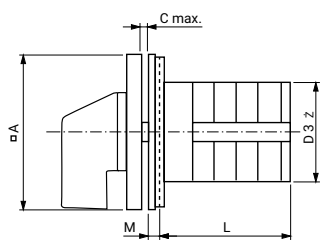
Dimensions in brackets for rear mounting plate with ERF

EF, ERF



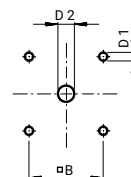
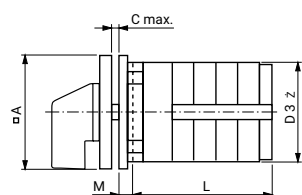
A	4 2.52	64 (88) 2.52	88 3.46
B	48 1.89	48 (68) 1.89	68 2.68
C	4 .16	4 .16	5.5 .22
D1	5 (4.1) .20	5 (5.4) .20	6 (5.4) .24
D2	19-22 .75-.87	19-22 .75-.87	26-30 1.02-1.18
D3	60 2.36	70 2.76	84 3.31

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	EG .51-1.18	EG .51-1.18	-
D2	EGF 1.02-1.18	EGF 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

Base Mounting	A11		
	AD11		
	AD12	A25	A11C A25C

Dimensions in brackets for rear mounting plate with VE

A	64	64 (88)	88
	2.52	2.52	3.46
B	48	48 (68)	68
	1.89	1.89	2.68
C	13,5	13,5	16
	.53	.53	.63
D1	5 (4.1)	5 (5.4)	6 (5.4)
	.20	.20	.24
D2	10-22	10-22	13-30
	.39-.87	.39-.87	.51-1.18
D3	60	70	84
	2.36	2.76	3.31
D4	4,1	4,1	5,4
	.16	.16	.21
E	70	70	-
	2.76	2.76	-
G	30	30	-
	1.18	1.18	-
K	30	30	-
	1.18	1.18	-
H	64	88	88
	2.52	3.46	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	8,7
1	42,5	43,5			.26	.34
	1.67	1.71		EG/EGF	0,5	0,5
2	55,2	56,2			.02	.02
	2.17	2.21		KN1/KD1	7	7
3	67,9	68,9			.28	.28
	2.67	2.71		VE	5	5
4	80,6	81,6			.20	.20
	3.17	3.21		A11C/A25C	8,2	8,2
5	93,3	94,3			.32	.32
	3.67	3.71				
6	106	107				
	4.17	4.21				
7	118,7	119,7				
	4.67	4.71				
8	131,4	132,4				
	5.17	5.21				
9	144,1	145,1				
	5.67	5.71				
10	156,8	157,8				
	6.17	6.21				
11	169,5	170,5				
	6.67	6.71				
12	182,2	183,2				
	7.17	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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