



KRAUS & NAIMER
BLUE LINE SWITCHGEAR

www.krausnaimer.com

SINCE 1907

Catalog 110

A, AD Switches

6 A-25 A



KRAUS & NAIMER

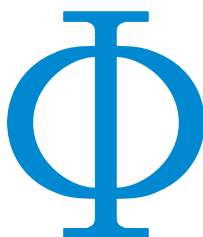
The development of the Blue Line rotary switch, contactor and motor starter product ranges is based on more than seventy-five years experience by Kraus & Naimer in the design and manufacture of electrical switchgear. Kraus & Naimer pioneered the introduction of the cam operated rotary switch and continues 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.

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WORLDWIDE SYMBOL
FOR QUALITY SWITCHGEAR

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

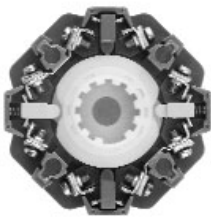
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Construction Data

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.

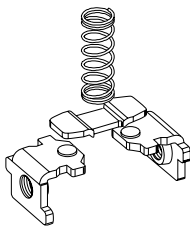


Switch type	Switching angle	Max. number of switch positions
A11, AD11, AD12	15°, 20°, 30°, 45°, 60°, 90°	24
A14	20°, 30°, 45°, 60°, 90°	18

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

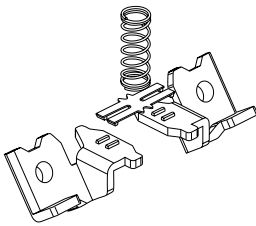
2 different Contact Systems are available

A11 and A14



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

AD11 and AD12

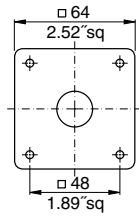
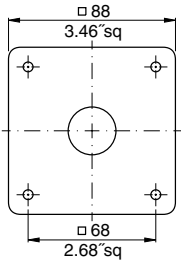


High contact reliability by H-bridge design with self-cleaning "cross-wire" contacts. The contact system with gold-plated contacts (AD12 with silver contact) allows for low voltages, electronic compatible.

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	AMP-Rating UL/Canada A	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	10 A	6
	A14	25	11	16 A	10
S2 	A11C	20	7,5	10 A	6
	A14C	25	11	16 A	10

How to order

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

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

1. Type of Switch

The type of switch required may be easily selected by referring to the table on page 2 which shows the thermal current, power rating and dimensions of each switch. For further technical details, refer to pages 22 and 23. Variations of contacts and terminals are shown below.

2. Switch Function

The code numbers for standard switches shown on pages 5-16 indicate the switch function, escutcheon plate, handle and any optional extras. Additional coding to modify type and color of handle and escutcheon plate is explained below.

3. Type of Mounting

Types of mounting are shown on pages 17 and 18. Catalog **101** describes enclosures and optional extras. Specify the mounting code to indicate required mounting.

A11

A202-600

VE

Type of Switch

Extending the switch type coding the following combinations will define:

Amendment	Definition	For switch types
-1	with gold contacts ¹	A11, A11C, A14, A14C
-4	with quick connects	A11, A11C
-5	with quick connects and gold contacts	A11, A11C
C	S1 switches with latching mechanism size S2	A11, A14
L	with lockout-relay w/o manual release for std. switches	A11, AD11, AD12, A14
M	with lockout-relay with manual release for std. switches	A11, AD11, AD12, A14
X	with power failure release	A11, AD11, AD12, A14

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	electro-gray	electro-gray	brushed alu	black	-100
S1, S2	electro-gray	electro-gray	black	mat silver	-500
S1, S2	black	black	brushed alu	black	-600
S1, S2	black	black	black	mat silver	-700

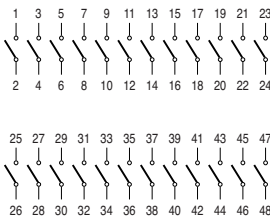
The standard switch consists of a transparent escutcheon plate with brushed aluminum backing and black inscription. The escutcheon plate frame is black as well as the handle. Above there are further color combinations of escutcheon plate and handle which are available. The appropriate dash-number must 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, electro-gray handle and electro-gray escutcheon plate frame with brushed aluminum backing and black inscription which reads 0-1 is as follows: **A11 A202-100 E**.

¹Technical data on request.

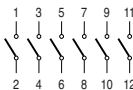
Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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ON/OFF Switches with 60° Switching

1 pole			A200-600	1	
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			A341-600	2	
6 pole			A342-600	2	
8 pole			A344-600	2	
10 pole			A346-600	3	
12 pole			A348-600	3	
14 pole			A350-600	4	
16 pole			A352-600	4	
18 pole			A354-600	5	
20 pole			A356-600	5	
22 pole			A358-600	6	
24 pole			A360-600	6	
1 pole			A200-620	1	 1-24 pole
2 pole			A201-620	1	
3 pole			A202-620	1	
4 pole			A203-620	1	
5 pole			A341-620	2	
6 pole			A342-620	2	
8 pole			A344-620	2	
10 pole			A346-620	3	
12 pole			A348-620	3	
14 pole			A350-620	4	
16 pole			A352-620	4	
18 pole			A354-620	5	
20 pole			A356-620	5	
22 pole			A358-620	6	
24 pole			A360-620	6	
1 pole			A200-621	1	
2 pole			A201-621	1	
3 pole			A202-621	1	
4 pole			A203-621	1	
5 pole			A341-621	2	
6 pole			A342-621	2	
1 pole			A200-622	1	
2 pole			A201-622	1	
3 pole			A202-622	1	
4 pole			A203-622	1	
5 pole			A341-622	2	
6 pole			A342-622	2	
1 pole			A200-623	1	
2 pole			A201-623	1	
3 pole			A202-623	1	
4 pole			A203-623	1	
5 pole			A341-623	2	
6 pole			A342-623	2	

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

1 pole			A200-624	1	 1-6 pole
2 pole			A201-624	1	
3 pole			A202-624	1	
4 pole			A203-624	1	
5 pole			A341-624	2	
6 pole			A342-624	2	
1 pole			A200-625	1	
2 pole			A201-625	1	
3 pole			A202-625	1	
4 pole			A203-625	1	
5 pole			A341-625	2	
6 pole			A342-625	2	

ON/OFF Switches with 90° Switching

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

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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Double-throw Switches without „OFF“ 60° Switching

1 pole			A220-600	1	
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			A374-600	5	
12 pole			A376-600	6	
14 pole			A660-600	7	
16 pole			A661-600	8	
18 pole			A662-600	9	
20 pole			A663-600	10	

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

1 pole			A720-600	1	
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			A210-600	1	
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			A364-600	4	
10 pole			A366-600	5	
12 pole			A368-600	6	
14 pole			A655-600	7	
16 pole			A656-600	8	
18 pole			A657-600	9	
20 pole			A658-600	10	

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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Double-throw Switches with Center „OFF“ 60° Switching

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 A364-620	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

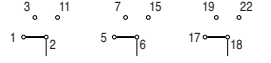
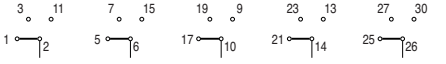
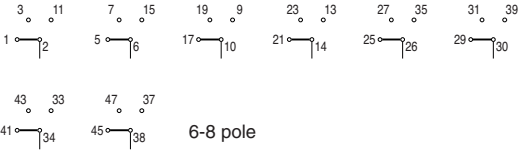
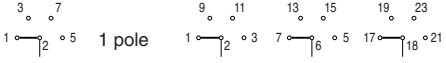
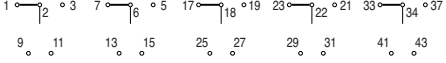
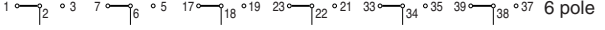
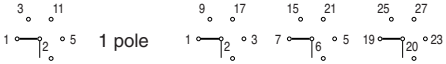
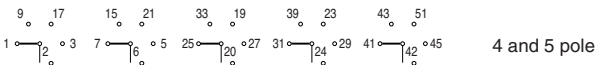
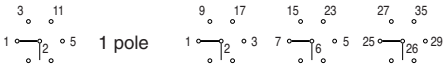
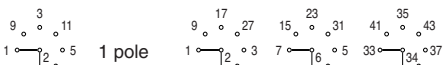
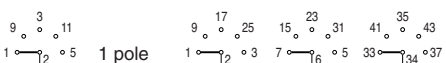
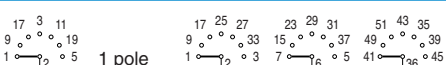
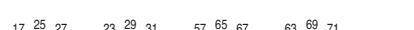
1 pole 2 pole 3 pole			A710-600 A711-600 A712-600	1 1 2	 1-3 pole
1 pole with spring return to center 2 pole with spring return to center 3 pole with spring return to center			A714-600 A715-600 A716-600	1 1 2	

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	

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

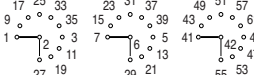
1 pole 2 pole 3 pole		  	A230-600 A250-600 A270-600	1 2 3	 1 pole  2 and 3 pole
4 pole 5 pole 6 pole		  	A476-600 A484-600 A489-600	3 4 5	 4 and 5 pole
7 pole 8 pole		 	A494-600 A497-600	6 6	 6-8 pole
1 pole 2 pole 3 pole		  	A231-600 A251-600 A271-600	1 2 3	 2 and 3 pole
4 pole 5 pole 6 pole		  	A477-600 A485-600 A490-600	4 5 6	 4 and 5 pole  6 pole
1 pole 2 pole 3 pole 4 pole 5 pole		    	A232-600 A252-600 A272-600 A478-600 A676-600	2 3 4 5 7	 2 and 3 pole  4 and 5 pole
1 pole 2 pole 3 pole 4 pole		   	A233-600 A253-600 A273-600 A479-600	2 3 5 6	 2 and 3 pole  4 pole
1 pole 2 pole 3 pole 4 pole		   	A234-600 A254-600 A274-600 A670-600	2 4 6 7	 2 and 3 pole  4 pole
1 pole 2 pole 3 pole 4 pole		   	A235-600 A255-600 A275-600 A671-600	2 4 6 8	 2 and 3 pole  4 pole
1 pole 2 pole 3 pole 4 pole		   	A236-600 A256-600 A276-600 A672-600	3 5 7 9	 2 and 3 pole  4 pole

Switch Function and Configuration

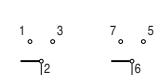
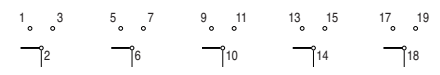
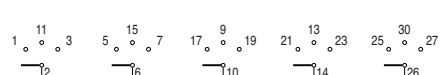
A Switches

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

1 pole 2 pole 3 pole		  	A237-600 A257-600 A277-600	3 5 8	 1 pole  2 and 3 pole
1 pole 2 pole 3 pole		  	A238-600 A258-600 A278-600	3 6 9	 1 pole  2 and 3 pole
1 pole 2 pole 3 pole		  	A239-600 A259-600 A279-600	3 6 9	 1 pole  2 and 3 pole

Multi-step Switches with „OFF“

1 pole 2 pole 3 pole 5 pole		   	A240-600 A260-600 A280-600 A486-600	1 1 2 3	 1- and 2 pole
1 pole 2 pole 3 pole 5 pole		   	A240-620 A260-620 A280-620 A486-620	1 1 2 3	 3 and 5 pole
1 pole 2 pole 3 pole 5 pole		   	A241-600 A261-600 A281-600 A487-600	1 2 3 4	 2 and 3 pole
1 pole 2 pole 3 pole 5 pole		   	A241-620 A261-620 A281-620 A487-620	1 2 3 4	 5 pole
1 pole 2 pole 3 pole		  	A242-600 A262-600 A282-600	1 2 3	 2 and 3 pole
1 pole 2 pole 3 pole		  	A242-620 A262-620 A282-620	1 2 3	
1 pole 2 pole 3 pole		  	A243-600 A263-600 A283-600	2 3 5	 2 and 3 pole
1 pole 2 pole 3 pole		  	A243-620 A263-620 A283-620	2 3 5	
1 pole 2 pole 3 pole		  	A244-600 A264-600 A284-600	2 3 5	 2 and 3 pole
1 pole 2 pole 3 pole		  	A244-620 A264-620 A284-620	2 3 5	

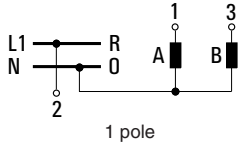
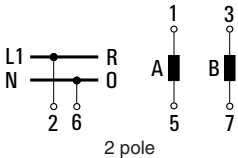
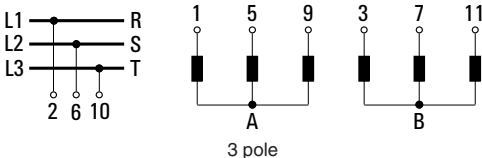
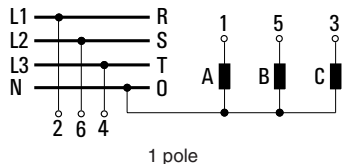
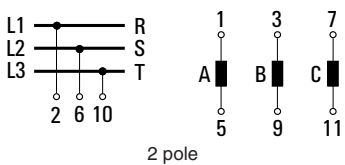
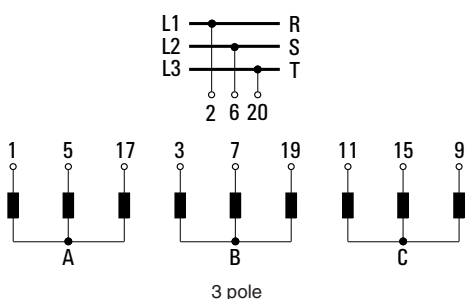
Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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Multi-step Switches with „OFF“

1 pole 7 Step 2 pole 3 pole			A245-600 A265-600 A285-600	2 4 6	1 pole 2 pole
1 pole 2 pole 3 pole			A245-620 A265-620 A285-620	2 4 6	1 pole 2 pole 3 pole
1 pole 8 Step 2 pole 3 pole			A246-600 A266-600 A286-600	2 4 6	1 pole 2 pole
1 pole 3 pole			A246-620 A286-620	2 6	1 pole 2 pole 3 pole
1 pole 9 Step 2 pole 3 pole			A247-600 A267-600 A287-600	3 5 8	1 pole 2 pole
1 pole 3 pole			A247-620 A287-620	3 8	1 pole 2 pole 3 pole
1 pole 10 Step 2 pole 3 pole			A248-600 A268-600 A288-600	3 5 9	1 pole 2 pole
1 pole 3 pole			A248-620 A288-620	3 9	1 pole 2 pole 3 pole
1 pole 11 Step 2 pole 3 pole			A249-600 A269-600 A289-600	3 6 9	1 pole 2 pole
1 pole 3 pole			A249-620 A289-620	3 9	1 pole 2 pole 3 pole
1 pole 12 Step			A630-600	3	1 pole
2 pole 3 pole			A635-600 A644-600	7 11	2 pole 3 pole
1 pole 16 Step			A631-600	4	1 pole
1 pole 20 Step			A632-600	5	1 pole

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

1 pole 2 Gang 2 pole 3 pole Switching sequence: 0, A, A+B			A310-600 A312-600 A314-600	1 1 2	 1 pole  2 pole  3 pole
1 pole 3 Gang 2 pole 3 pole Switching sequence: 0, A, A+B, A+B+C			A311-600 A313-600 A315-600	1 2 3	 1 pole  2 pole  3 pole

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

3 phase to phase			A004-600	1	
			A004-620	1	
			A004-621	1	
			A004-622	1	
			A004-623	1	
			A004-624	1	
3 phase to phase and 3 phase to neutral			A007-600	2	
			A007-620	2	
			A007-621	2	
			A007-622	2	
			A007-623	2	
			A007-624	2	
2 separate 3 phase with center „OFF“			A008-600	2	
			A008-620	2	
			A008-621	2	
			A008-622	2	

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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Ammeter Switches

Single pole with 3 current transformers with „OFF“ 360° rotation			A048-600	2	
			A048-620	2	
			A048-621	2	
			A048-622	2	
			A048-623	2	
Single pole with 2 current transformers (3 readings)			A021-600	1	
			A021-620	1	
2 pole, 3 current transformers			A019-600	3	
			A019-620	3	
			A038-600	3	
			A038-620	3	
			A038-621	3	

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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Control Switches

Stop switch			A174-600	1	
Start switch			A175-600	1	
Stop start switch single pole			A176-600	1	
Stop start switch with spring return from start to run			A178-600	1	
Stop start switch with spring return to run for 2 units			A177-600	1	
			A177-620	1	

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

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			A416-600	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 - BY - AY			A457-600	3	
			A457-620	3	

Four Hole Panel Mounting		Code	A11 AD11 AD12	A14	A11C A14C
 Panel Mounting Four hole panel mounting Four hole panel mounting, protection IP 65		E	●	●	●
		EF	●	●	●
 Panel and base mounting Four hole panel mounting Four hole panel mounting, protection IP 65		ER	●	●	●
		ERF	●	●	●
 Panel mounting using larger escutcheon plate and handle Four hole panel mounting Four hole panel mounting, protection IP 65		EG	●	●	
		EGF	●	●	
 Panel mounting with heavy duty stop and metal shaft Four hole panel mounting Mounting plate, escutcheon plate and handle of size S1 Four hole panel mounting Mounting plate, escutcheon plate and handle of size S1 and 6 mm square metal shaft		KN1	●	●	
		KD1	●	●	
 Panel mounting with protective cover Four hole panel mounting Protection front IP 40 rear IP 42 Four hole panel mounting Protection front IP 65 rear IP 42		EC	●	●	
		ED	●	●	

Mounting

A, AD Switches

Single Hole Mounting 40 mm

Code

A11
AD11
AD12

A14

A11C
A14C



Single hole mounting

Without escutcheon plate

EL1



With square escutcheon plate

EL2



With rectangular escutcheon plate

EL4



Base Mounting



Base mounting

Base mounting - four hole

VE



Snap-on base mounting for track EN 50022

VE1



Handles

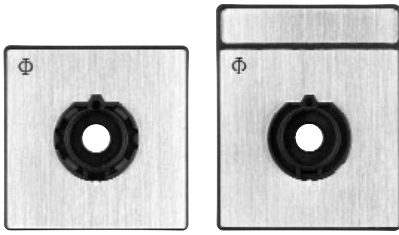
Type	Color	Code	Size	
			S1	S2

Type	Color	Code	Size	
			S1	S2

R-Handle 	black	G001	●	●
	red	G002	●	●
	white	G003	●	●
	electro-gray	G007	●	●
F-Handle 	black	G221	●	●
	red	G222	●	●
	white	G223	●	●
	electro-gray	G227	●	●
S-Handle 	black	G301	●	—
	red	G302	●	—
	white	G303	●	—
	electro-gray	G307	●	—
P-Handle 	black	G211	●	●
	red	G212	●	●
	white	G213	●	●
	electro-gray	G217	●	●
O-Handle 	black	G321	●	—
	red	G322	●	—
	white	G323	●	—
	electro-gray	G327	●	—

I-Handle 	black	G251	●	●
	red	G252	●	●
	white	G253	●	●
	electro-gray	G257	●	●
B-Handle 	black	G521	●	—
	red	G522	●	—
	white	G523	●	—
	electro-gray	G527	●	—
L-Handle 	black	G501	●	—
	red	G502	●	—
	white	G503	●	—
	electro-gray	G507	●	—
K-Handle 	black	G411	●	●
	red	G412	●	●
	white	G413	●	●
	electro-gray	G417	●	●

Escutcheon Plates

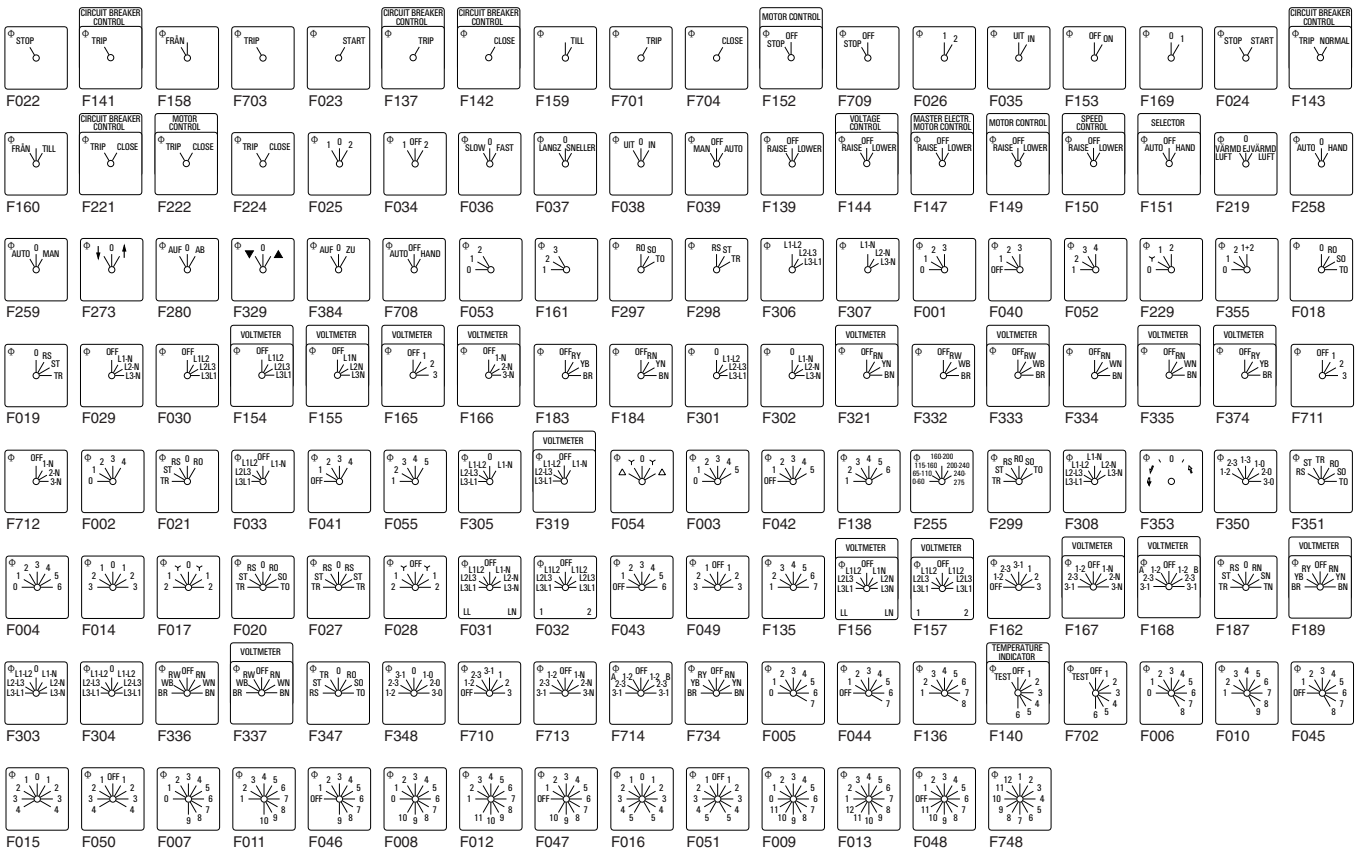


Square and rectangular escutcheon plates are available for each size of switch. The escutcheon plate consists of a frame and a faceplate having the switch positions which is then embossed with hot-foil backing. The escutcheon plate frame is an essential part of the switch and serves as a bearing surface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

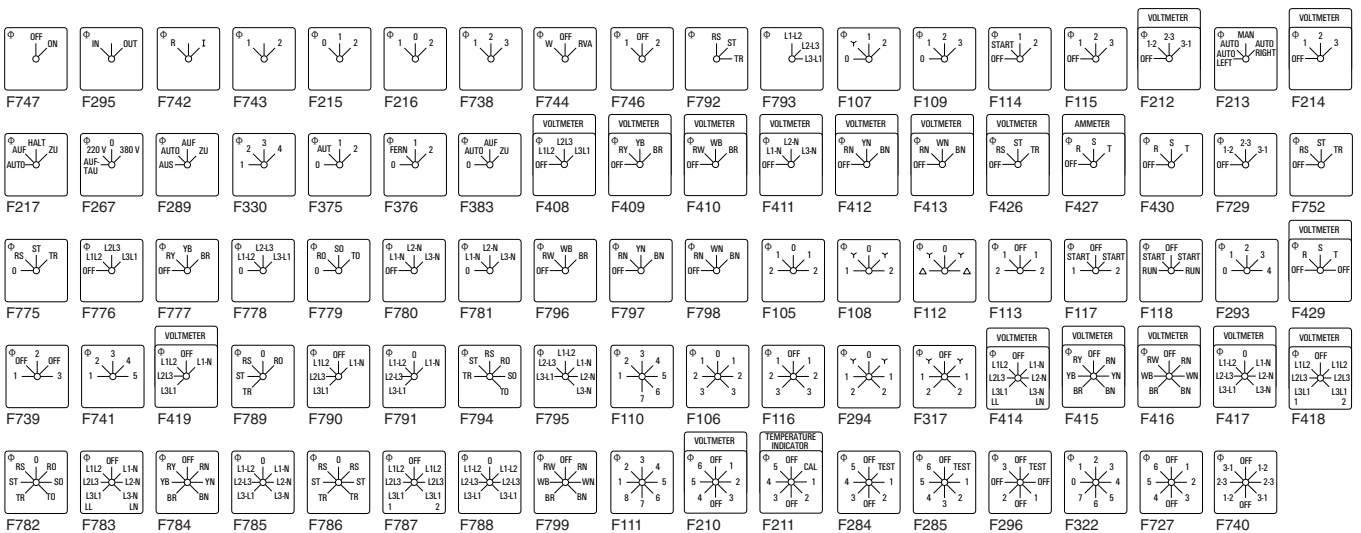
Standard Letterings Available

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

30° switching



45° switching



Escutcheon 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	F209	F320	F349
F437	F445	F715	F719	F059	F060	F062	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	F246	F261	F341	F345	F287	F123	F127	F145	F146	F148
F706	F707	F245	F120	F124	F128	F131	F121	F132	F749					F990	F991	F801	F802
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 ¹	F840 ²	F841 ³

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

Rated Insulation Voltage U _i				IEC 60947-3 ¹ VDE 0660 part 107 ¹ SEV ² UL/Canada CEE ² min. operational voltage	V V V V V	690 500 600 400 20	600 600 600 — 1	600 600 600 — 6	690 500 600 400 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 SEV ² UL/Canada	A A A	20 10 10	6 6 6	6 6 6	25 16 16	
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	—	—	20		
AC-15	Switching of control devices, contactors, valves etc.	IEC 60947-3 VDE 0660 part 107	220 V-240 V	A	6	—	—	10		
			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	16		
Resistive load/Motor load		CEE		A	10/6	—	—	16/10		
Power loss per contact at I _U Resistance to vibration Resistance to shock					W	0,9	0,5 on request on request	0,2	1,3	
Short Circuit Protection Max. fuse size Rated short-time withstand current					(gL/gG-characteristic) (1s-current)	A A	20 120	6 45	6 75	25 220
DC Switching Capacity ³						Rated Operational Current I _e				
No. of series contacts		1	2	3	4	5	6	8		
		Voltage V								
Resistive loads		1	2	3	4	5	6	8	A	
T ≤ 1 ms		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	—	—	—	—	—	—		
Inductive loads		24	48	72	96	120	144	190		
T = 50 ms		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	—		
Ambient Temperature of Stages ^{4, 5}					open at 100 % I _U /I _{th} enclosed at 100 % I _{the}	55 °C during 24 hours with peaks up to 60 °C 35 °C during 24 hours with peaks up to 40 °C				

Selection Data	A11 A11C	AD11 AD11C	AD12 AD12C	A14 A14C
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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		220 V-240 V	kW	4	—	—	5,5	
		3 phase	380 V-440 V		7,5	—	—	11	
		3 pole	500 V		10	—	—	15	
			660 V-690 V		10	—	—	13	
AC-3	Direct-on-line starting, star-delta starting A11, A14	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)		120 V	HP	1	—	—	1,5	
		3 phase	240 V		1	—	—	3	
		3 pole	480 V		1	—	—	7,5	
			600 V		1	—	—	10	
			120 V	HP	0,5	—	—	0,75	
		1 phase	240 V		1	—	—	1,5	
		2 pole	277 V		1	—	—	2	
			480 V		1	—	—	3	
	Heavy motor load ¹ Reversing-Rating (similar AC-4)		600 V	HP	1	—	—	5	
			120 V		—	—	—	1	
		3 phase	240 V		—	—	—	2	
		3 pole	480 V-600 V		—	—	—	5	
			120 V	HP	—	—	—	0,33	
		1 phase	240 V		—	—	—	0,75	
		2 pole	277 V		—	—	—	0,75	
Max. Permissible Wire Gage - Use copper wire only									
Single-core or stranded wire				mm²	2,5	2,5	2,5	4	
				AWG	12	12	12	10	
Flexible wire (sleeving in accordance with DIN 46228)				mm²	2,5	2,5	2,5	2,5	
					(2,5)	(2,5)	(2,5)	(2,5)	
Flexible AWG wires (without sleeve)				AWG	14	14	14	12	

¹Reversing-Rating is not part of the existing UL and Canada approvals.

International Standards and Approvals

Country	Authority	Mark or Standard	A11	AD11	AD12	A14
USA/Canada	Underwriters Laboratories			●	●	
			●			●
Switzerland	Schweizerischer Elektrotechnischer Verein		+	+	+	+
Denmark	Danmarks Elektriske Materielkontrol		+	+	+	+
Norway	Norges Elektriske Materielkontrol		+	+	+	+
Sweden	Svenska Elektriska Materielkontroll-anstalten		+	+	+	+
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

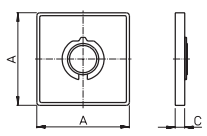
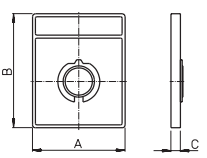
¹Approved under the "Component Program" (UL-Recognized Industrial Component). File No. E35541, Guide No. NLRV2 and NLRV8.

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.

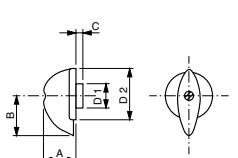
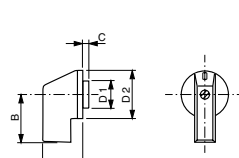
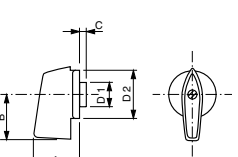
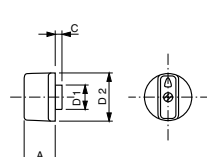
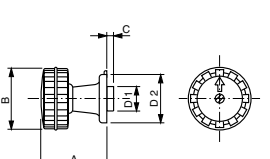
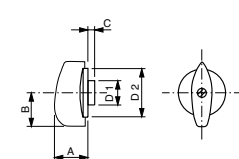
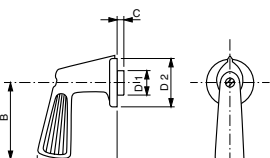
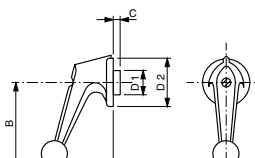
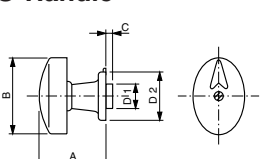
³Approved under the "Listing-Program". File No. E35541, Guide No. NLRV and NLRV7 resp. File No. E60262, Guide No. NRNT and NRNT7.

Dimensions mm inch

Escutcheon Plates and Handles	Size	A	B	C	D1ø	D2ø	Escutcheon Plates and Handles	Size	A	B	C	D1ø	D2ø
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PE-Escutcheon Plate 	S1 S2	64 2.52 88 3.46	7,4 .29 8,5 .34	PR-Escutcheon Plate 	S1	64 2.52 78,8 3.10 7,4 .29
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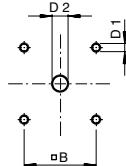
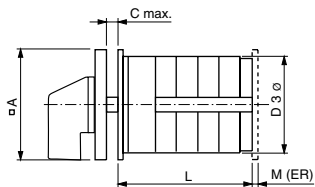
Dimensions for the E, EF, ER, ERF, EG, EGF, KN1, KD1, EC, ED, VE and VE1 escutcheon plates.
Dimensions of the escutcheon plates used for other mounting, refer to page 27.

R-Handle 	S1 S2	23 0.91 31,5 1.24 5 .20 18,2 .72 36 1.42 30 1.18 42 1.65 5 .20 25,4 1.00 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 34 1.34 5 .20 18,2 .72 36 1.42 44,7 1.76 45 1.77 5 .20 25,4 1.00 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 57,5 2.26 5 .20 18,2 .72 36 1.42 70 2.76 68 2.68 5 .20 25,4 1.00 50 1.97	K-Handle 	S1 S2	54 2.13 64 2.52 5 .20 18,2 .72 36 1.42 55 2.17 71 2.80 5 .20 25,4 1.00 50 1.97
O-Handle 	S1	50 1.97 56 2.2 5 .20 18,2 .72 36 1.42			

Four Hole Panel Mounting

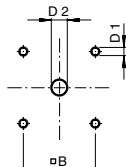
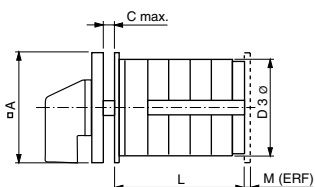
A11
AD11
AD12 A14 A11C
A14C

E, ER



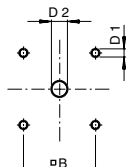
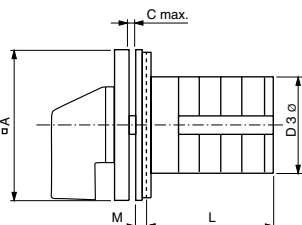
A	64 2.52	64 2.52	88 3.46
B	48 1.89	48 1.89	68 2.68
C	4 .16	4 .16	5.5 .22
D1	5 .20	5 .20	6 .24
D2	10-15 .39-.59	10-15 .39-.59	13-17 .51-.67
D3	60 2.36	65 2.56	84 3.31

EF, ERF



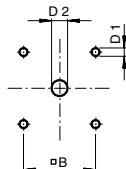
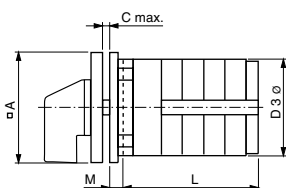
A	64 2.52	64 2.52	88 3.46
B	48 1.89	48 1.89	68 2.68
C	4 .16	4 .16	5.5 .22
D1	5 .20	5 .20	6 .24
D2	19-22 .75-.87	19-22 .75-.87	26-30 1.02-1.18
D3	60 2.36	65 2.56	84 3.31

EG, EGF



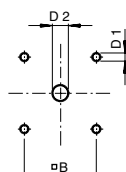
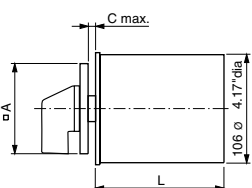
A	88 3.46	88 3.46	-
B	68 2.68	68 2.68	-
C	5.5 .22	5.5 .22	-
D1	6 .24	6 .24	-
D2 EG	13-17 .51-.67	13-17 .51-.67	-
D2 EGF	26-30 1.02-1.18	26-30 1.02-1.18	-
D3	60 2.36	65 2.56	-

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	10-15 .39-.59	10-15 .39-.59
D3	60 2.36	65 2.56

EC, ED



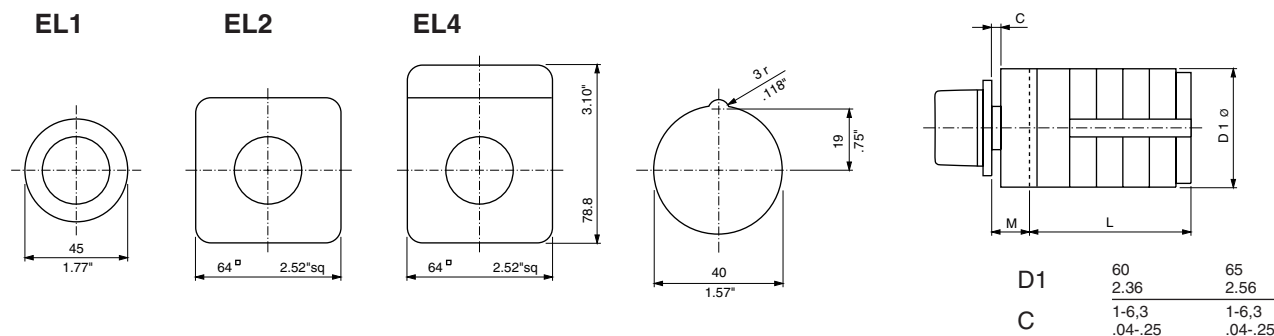
A	88 3.46	88 3.46
B	68 2.68	68 2.68
C EC	5.5 .22	5.5 .22
C ED	7.5 .30	7.5 .30
D1	6 .24	6 .24
D2 EC	13-17 .51-.67	13-17 .51-.67
D2 ED	28-33 1.10-1.30	28-33 1.10-1.30

Dimensions

mm
inch

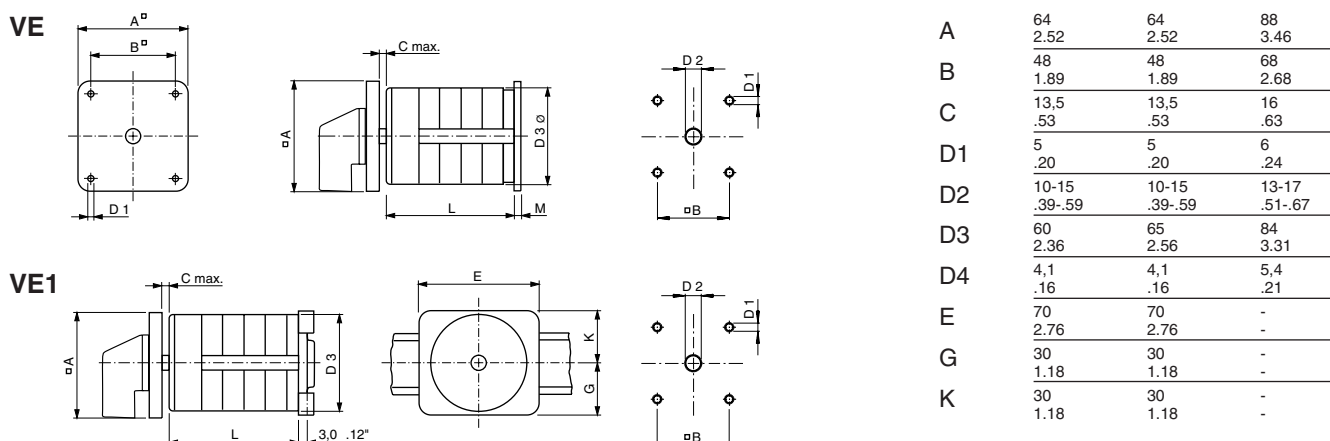
Single Hole Mounting 40 mm

A11
AD11
AD12 A14



Base Mounting

A11
AD11
AD12 A14 A11C
A14C



Length L	A11 AD11 AD12	A14	Length L	A11 AD11 AD12	A14	Additional Length M ¹	A11 AD11 AD12	A14
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Mounting E	Mounting EC and ED	Mounting + switch with latching mechanism size S2
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No. of stages	A11	AD11	AD12	A14	No. of stages	EC, ED	EC, ED	ER/ERF	A11	AD11	AD12	A14
1	42,5	1.67	42,5	1.67	1	41,5	47,2	EG/EGF	6,5	.26	6,5	.26
2	55,2	2.17	55,2	2.17	2	54,2	59,9	KN1/KD1	0,5	.02	0,5	.02
3	67,9	2.67	67,9	2.67	3	66,9	72,6	VE	7	.28	7	.28
4	80,6	3.17	80,6	3.17	4	79,6	85,3	EL1	5	.20	5	.20
5	93,3	3.67	93,3	3.67	5	92,3	98	EL2	11	.43	11	.43
6	106	4.17	106	4.17	6	105	110,7	EL4	11	.43	11	.43
7	118,7	4.67	118,7	4.67	7	117,7	123,4	A11C/A14C	8,2	.32	8,2	.32
8	131,4	5.17	131,4	5.17	8	130,4	136,1					
9	144,1	5.67	144,1	5.67	9	143,1	148,8					
10	156,8	6.17	156,8	6.17	10	155,8	161,5					
11	169,5	6.67	169,5	6.67	11	168,5	174,2					
12	182,2	7.17	182,2	7.17	12	181,2	186,9					

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
Contactors 16 A-115 A and Motor Starters 1,1 kW-55 kW These include control relays, motor contactors, two and four pole output contactors, heating contactors, thermal overload relays.	200
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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