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.

The Kraus & Naimer Registered Trademark

WORLDWIDE SYMBOL
FOR QUALITY SWITCHGEAR

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

Contents

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.

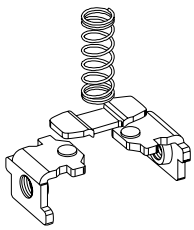
The switch column can contain up to 12 stages representing a total of 48 contacts. Additional contacts can be added by using a tandem drive to operate more than one switch column with a single handle.

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.

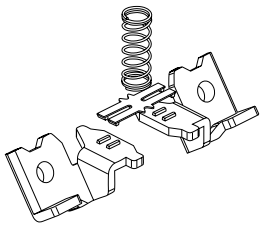
2 different Contact Systems are available

A11 and A14

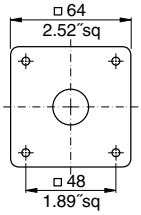
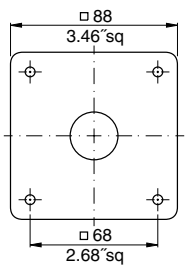


A rigid, double-break bridge with silver alloy contacts provides high making and breaking capabilities for regular control applications.

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		
			According to IEC 60947-3/VDE 0660 part 107		
			Thermal Current I_u/I_{th}	Motor Rating 3 x 380 V/440 V AC-23A	Operational Current I_e AC-21A
			A	**kW**	
S1		**AD11**	6	-	1 V/ 6 A 24 V/ 1 A 110 V/ 0,4 A 220 V/ 0,2 A 380 V/ 0,13 A
		AD12	6	- - - - -	6 V/ 6 A 24 V/ 5 A 110 V/ 3 A 220 V/ 2 A 380 V/ 1,3 A
		A11	20	7,5	20 A
		A14	25	11	25 A
S2		**A11C**	20	7,5	20 A
		A14C	25	11	25 A

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**.

[1]Technical data on request.

How to order

Special programs for escutcheon plate and handle combinations

The following is a list of special programs for escutcheon plate and handle combinations. They may be obtained by specifying any one of the following two (2) digits dash-numbers as a part of the overall dash-number. It is still necessary to prefix these two digit numbers with the first digit which represents the color combination required.

-000 = without escutcheon plate, without handle
- .01 = without escutcheon plate
- .02 = without handle
- .03 = with square escutcheon plate without lettering
- .04 = with rectangular escutcheon plate without lettering
- .05 = with square escutcheon plate without lettering and without handle
- .06 = with rectangular escutcheon plate without lettering and without handle
- .07 = standard escutcheon plate, without lettering on rectangular section
- .08 = with F-handle
- .09 = with P-handle
- .10 = escutcheon plate with frame and fixation ring only
- .11 = without escutcheon plate, but with handle bearing plate
- .12 = with yellow escutcheon plate backing and red handle
- .14 = with B-handle

Example: The complete coding for switch type A11 with a 3 pole ON/OFF switch function with electro-gray escutcheon plate frame, square escutcheon plate without lettering, brushed aluminum plate backing and electro-gray handle reads as follows: **A11 A202-103 E**.

Handles, Escutcheon Plates and Optional Extras

The handles for standard switches shown on pages 5-16 are suitable for mounting units with four hole panel mounting. Alternative types of handles available are illustrated on pages 17-19.
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 19-21. 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**.

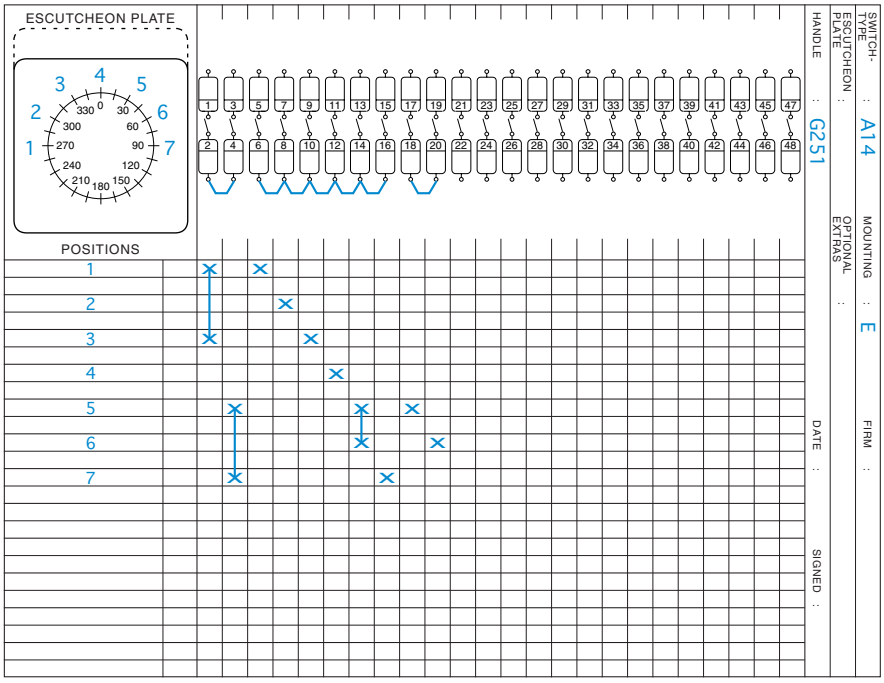
Switch Size

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 2 lists these sizes and the various switch types they include.

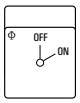
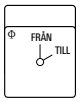
Ordering of Special Switches and Escutcheon Plates

When ordering special switches and escutcheon plates it is advisable to use our order form, as illustrated. The customer's requirements are shown in blue as an example.

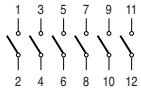
For technical reasons, it may not be possible to follow the sequence of contacts requested by the customer. The final contact development which is sent with every switch will show the customer's original terminal markings.

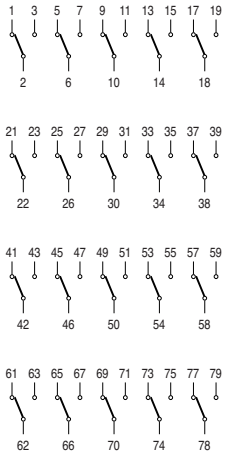
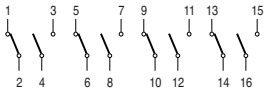
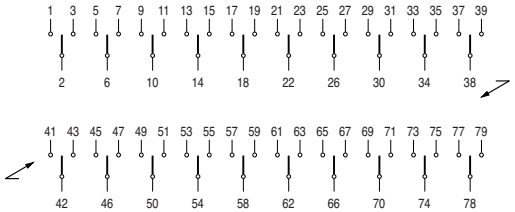


Order forms are available on request.

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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	
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	

1-24 pole

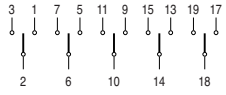
Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
ON/OFF Switches with 60° Switching					
1 pole			A200-624	1	 1-6 pole
2 pole			A201-624	1	
3 pole			A202-624	1	
4 pole			A203-624	1	
5 pole			A341-624	2	
6 pole			A342-624	2	
1 pole			A200-625	1	
2 pole			A201-625	1	
3 pole			A202-625	1	
4 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°			A290-600	1	 contacts preclose 30° 1-3 pole
2 pole contacts preclose 30°			A291-600	1	
3 pole contacts preclose 30°			A292-600	1	
4 pole 1 contact precloses 60° 3 contacts preclose 30°			A293-600	1	
1 pole contacts preclose 30°			A290-620	1	 3 contacts preclose 30° 1 contact precloses 60° 4 pole
2 pole contacts preclose 30°			A291-620	1	
3 pole contacts preclose 30°			A292-620	1	
4 pole 1 contact precloses 60° 3 contacts preclose 30°			A293-620	1	

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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	

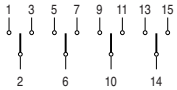
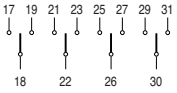
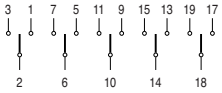
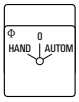
1-20 pole

1-4 pole

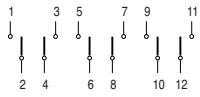
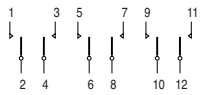
1-4 pole and 6-20 pole



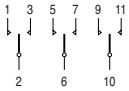
5 pole

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
Double-throw Switches with Center „OFF“ 60° Switching					
1 pole			A210-620	1	  1-4 and 6-8 pole  5 pole
2 pole			A211-620	1	
3 pole			A212-620	2	
4 pole			A213-620	2	
5 pole			A361-620	3	
6 pole			A362-620	3	
8 pole			A364-620	4	
1 pole			A210-621	1	
2 pole			A211-621	1	
3 pole			A212-621	2	
1 pole			A210-622	1	
2 pole			A211-622	1	
3 pole			A212-622	2	
1 pole			A210-623	1	
2 pole			A211-623	1	
3 pole			A212-623	2	
1 pole			A210-624	1	
2 pole			A211-624	1	
3 pole			A212-624	2	
4 pole			A213-624	2	

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

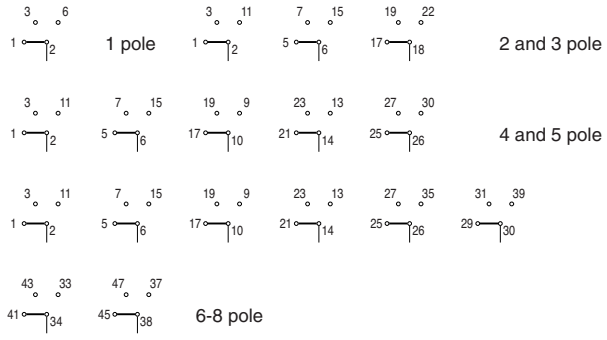
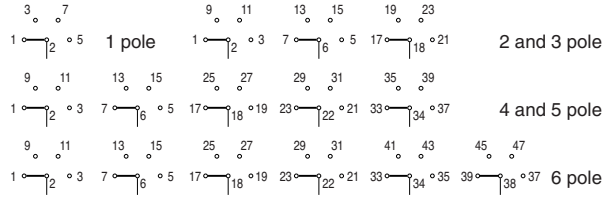
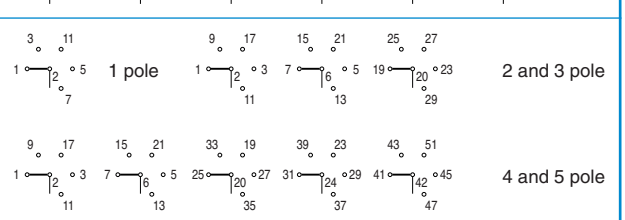
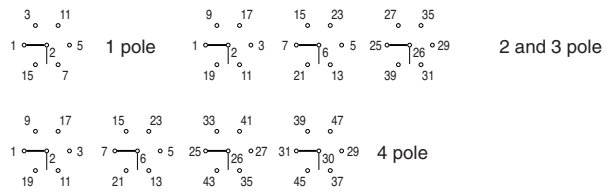
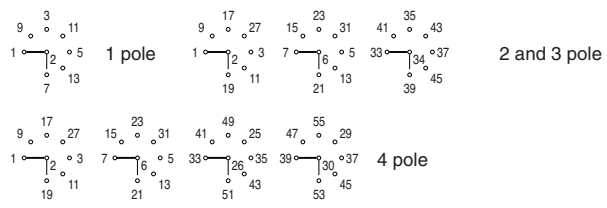
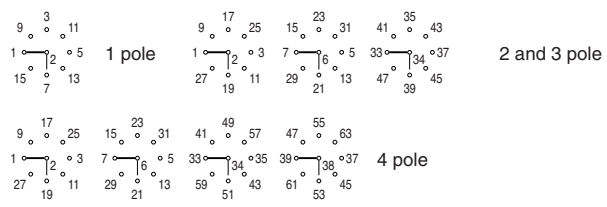
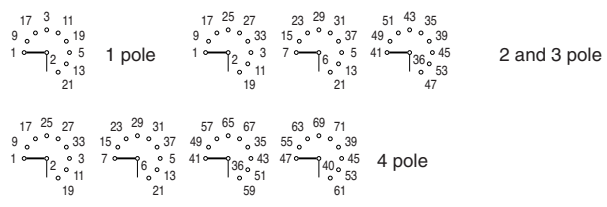
1 pole			A710-600	1	 1-3 pole  1-3 pole
2 pole			A711-600	1	
3 pole			A712-600	2	
1 pole with spring return to center			A714-600	1	
2 pole with spring return to center			A715-600	1	
3 pole with spring return to center			A716-600	2	

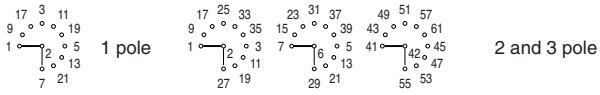
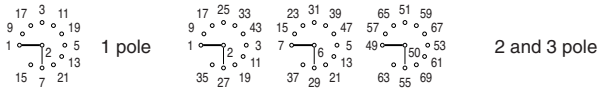
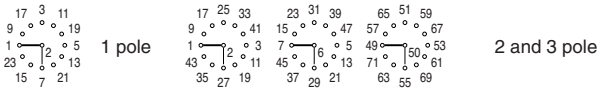
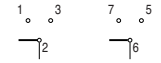
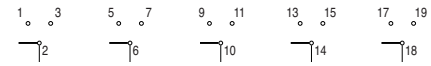
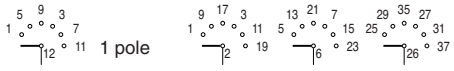
Double-throw Switches with Spring Return to Center

1 pole with spring return to center			A214-600	1	 1-3 pole
2 pole with spring return to center			A215-600	1	
3 pole with spring return to center			A216-600	2	
1 pole with spring return to center			A214-620	1	
2 pole with spring return to center			A215-620	1	
3 pole with spring return to center			A216-620	2	

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram

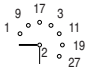
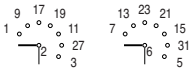
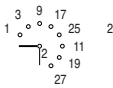
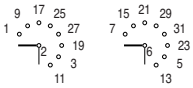
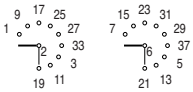
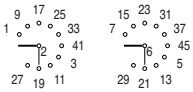
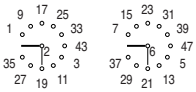
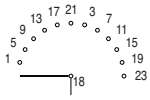
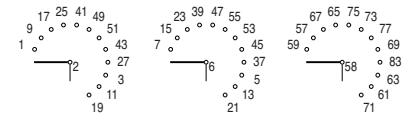
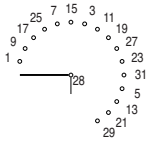
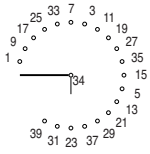
Multi-step Switches without „OFF“

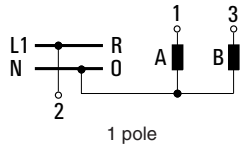
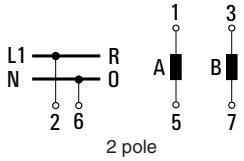
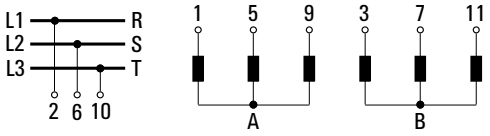
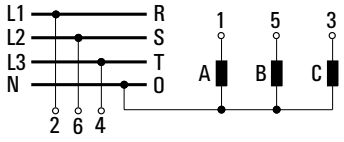
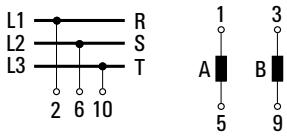
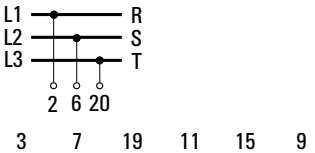
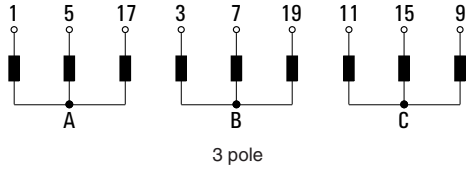
1 pole 3 Step 2 pole 3 pole 4 pole 5 pole 6 pole 7 pole 8 pole			A230-600 A250-600 A270-600 A476-600 A484-600 A489-600 A494-600 A497-600	1 2 3 3 4 5 6 6	
1 pole 4 Step 2 pole 3 pole 4 pole 5 pole 6 pole			A231-600 A251-600 A271-600 A477-600 A485-600 A490-600	1 2 3 4 5 6	
1 pole 5 Step 2 pole 3 pole 4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

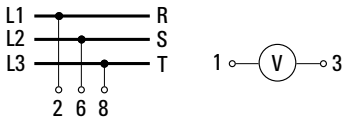
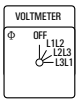
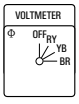
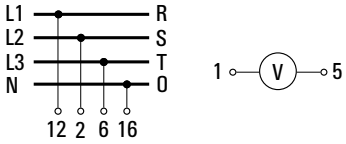
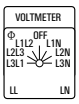
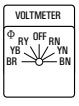
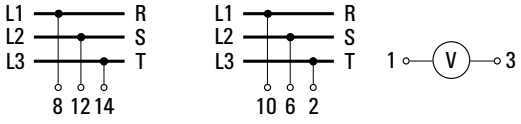
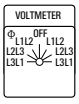
Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
Multi-step Switches without „OFF“					
1 pole 10 Step 2 pole 3 pole			A237-600 A257-600 A277-600	3 5 8	
1 pole 11 Step 2 pole 3 pole			A238-600 A258-600 A278-600	3 6 9	
1 pole 12 Step 2 pole 3 pole			A239-600 A259-600 A279-600	3 6 9	
Multi-step Switches with „OFF“					
1 pole 2 Step 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 3 Step 2 pole 3 pole 5 pole			A241-600 A261-600 A281-600 A487-600	1 2 3 4	 1 pole 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			A241-621 A261-621	1 2	
1 pole 4 Step 2 pole 3 pole			A242-600 A262-600 A282-600	1 2 3	 1 pole 2 and 3 pole
1 pole 2 pole 3 pole			A242-620 A262-620 A282-620	1 2 3	
1 pole 5 Step 2 pole 3 pole			A243-600 A263-600 A283-600	2 3 5	 1 pole 2 and 3 pole
1 pole 2 pole 3 pole			A243-620 A263-620 A283-620	2 3 5	
1 pole 6 Step 2 pole 3 pole			A244-600 A264-600 A284-600	2 3 5	 1 pole 2 and 3 pole
1 pole 2 pole 3 pole			A244-620 A264-620 A284-620	2 3 5	

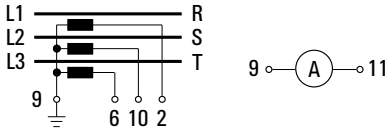
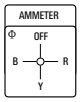
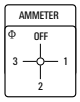
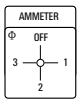
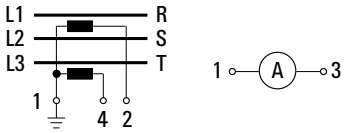
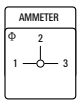
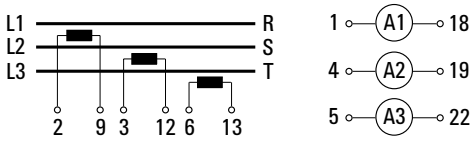
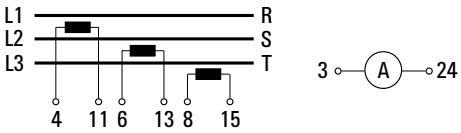
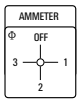
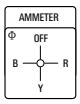
Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram

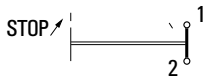
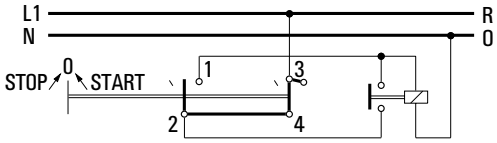
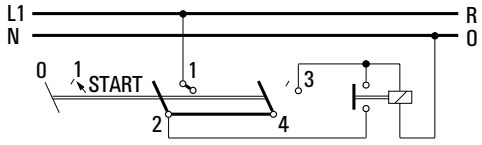
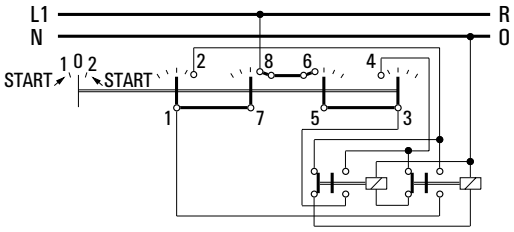
Multi-step Switches with „OFF“

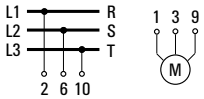
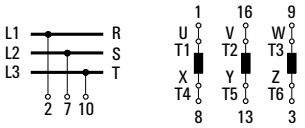
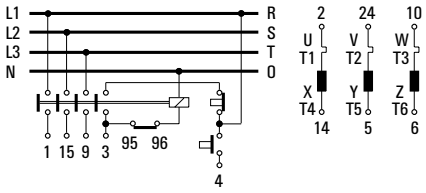
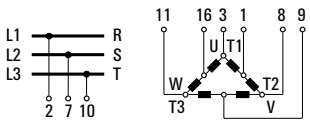
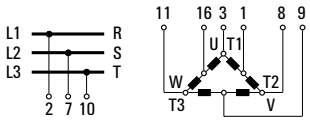
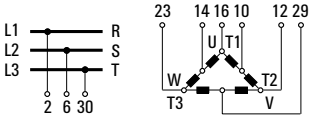
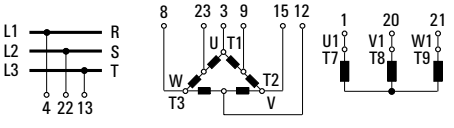
1 pole 7 Step 2 pole 3 pole			A245-600 A265-600 A285-600	2 4 6		1 pole
						2 pole
1 pole 2 pole 3 pole			A245-620 A265-620 A285-620	2 4 6		3 pole
1 pole 8 Step 2 pole 3 pole			A246-600 A266-600 A286-600	2 4 6		1 pole
						2 pole
1 pole 3 pole			A246-620 A286-620	2 6		3 pole
1 pole 9 Step 2 pole 3 pole			A247-600 A267-600 A287-600	3 5 8		1 pole
						2 pole
1 pole 3 pole			A247-620 A287-620	3 8		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		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		3 pole
1 pole 12 Step			A630-600	3		1 pole
2 pole 3 pole			A635-600 A644-600	7 11		2 and 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
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			A310-620 A312-620 A314-620	1 1 2	 
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			A311-620 A313-620 A315-620	1 2 3	  

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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
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
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 A178-620	1 1	
Stop start switch with spring return to run for 2 units	 	 	A177-600 A177-620	1 1	

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
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 - AYY			A457-600	3	
			A457-620	3	

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

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

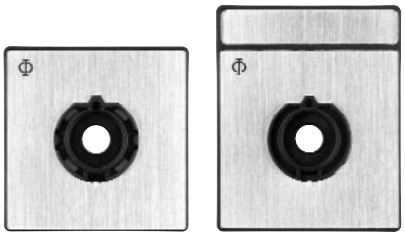
	Base mounting Base mounting - four hole	VE	●	●	●
	Snap-on base mounting for track EN 50022	VE1	●	●	

Handles

Type	Color	Code	Size S1	Size S2
R-Handle 	black red white electro-gray	G001 G002 G003 G007	● ● ● ●	● ● ● ●
F-Handle 	black red white electro-gray	G221 G222 G223 G227	● ● ● ●	● ● ● ●
S-Handle 	black red white electro-gray	G301 G302 G303 G307	● ● ● ●	— — — —
P-Handle 	black red white electro-gray	G211 G212 G213 G217	● ● ● ●	● ● ● ●
O-Handle 	black red white electro-gray	G321 G322 G323 G327	● ● ● ●	— — — —

Type	Color	Code	Size S1	Size S2
I-Handle 	black red white electro-gray	G251 G252 G253 G257	● ● ● ●	● ● ● ●
B-Handle 	black red white electro-gray	G521 G522 G523 G527	● ● ● ●	— — — —
L-Handle 	black red white electro-gray	G501 G502 G503 G507	● ● ● ●	— — — —
K-Handle 	black red white electro-gray	G411 G412 G413 G417	● ● ● ●	● ● ● ●

Escutcheon Plates

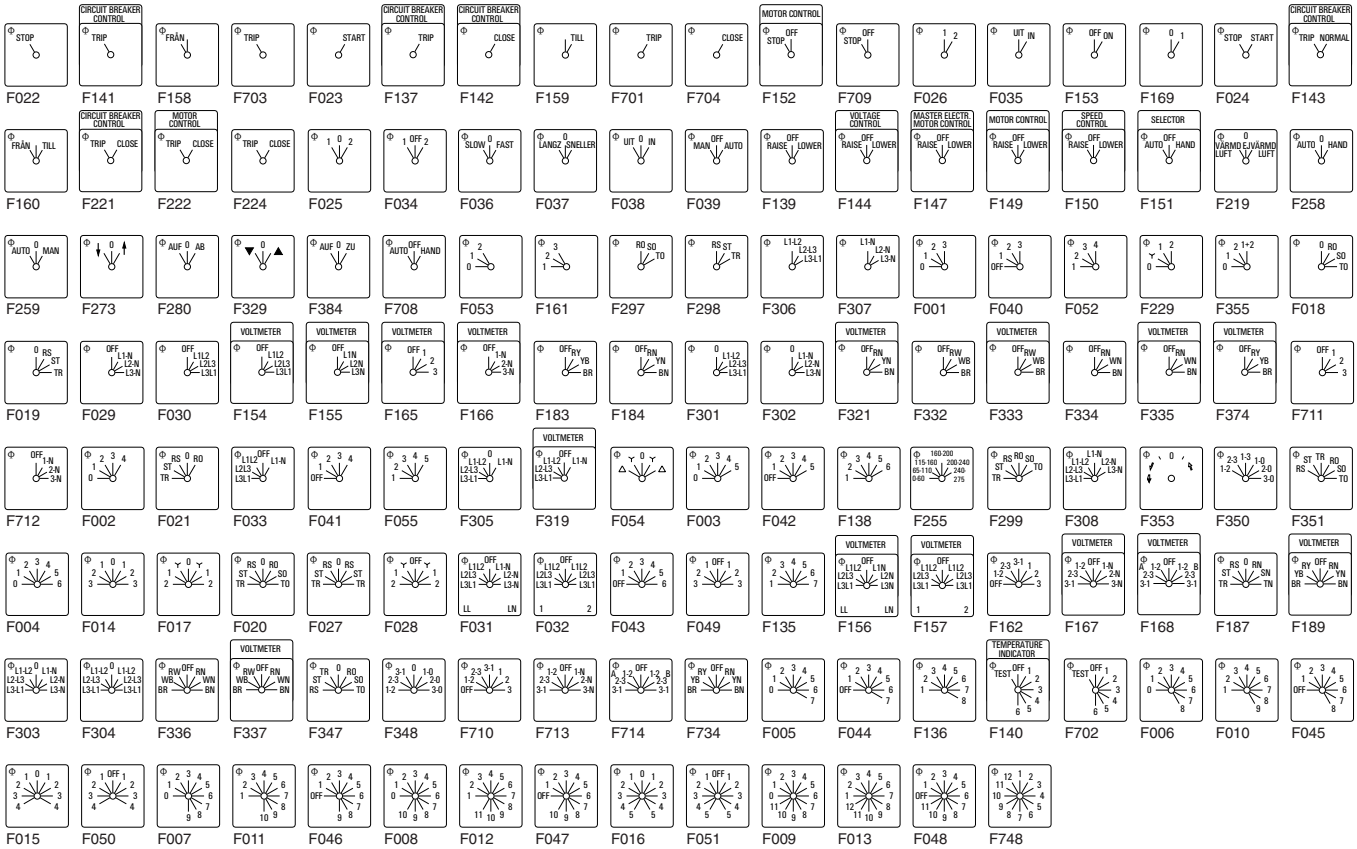


Square and rectangular escutcheon plates are available for each size of switch. The escutcheon plate consists of a frame and a faceplate having the switch positions which is than embossed with hot-foil backing. The escutcheon plate frame is an essential part of the switch and serves as a bearing surface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

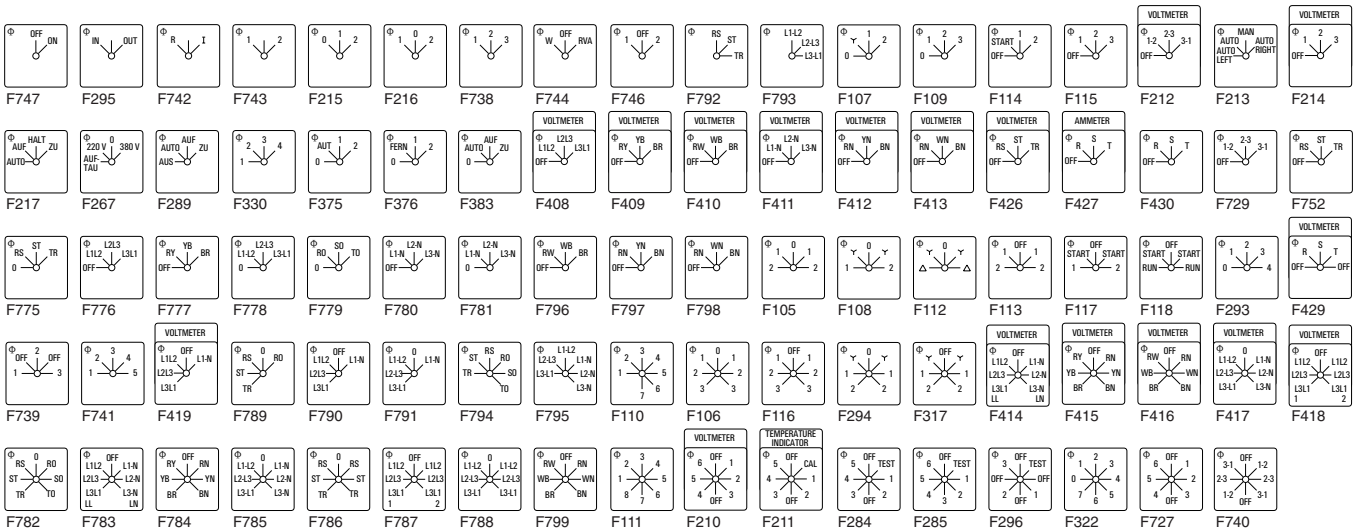
Standard Letterings Available

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

30° switching



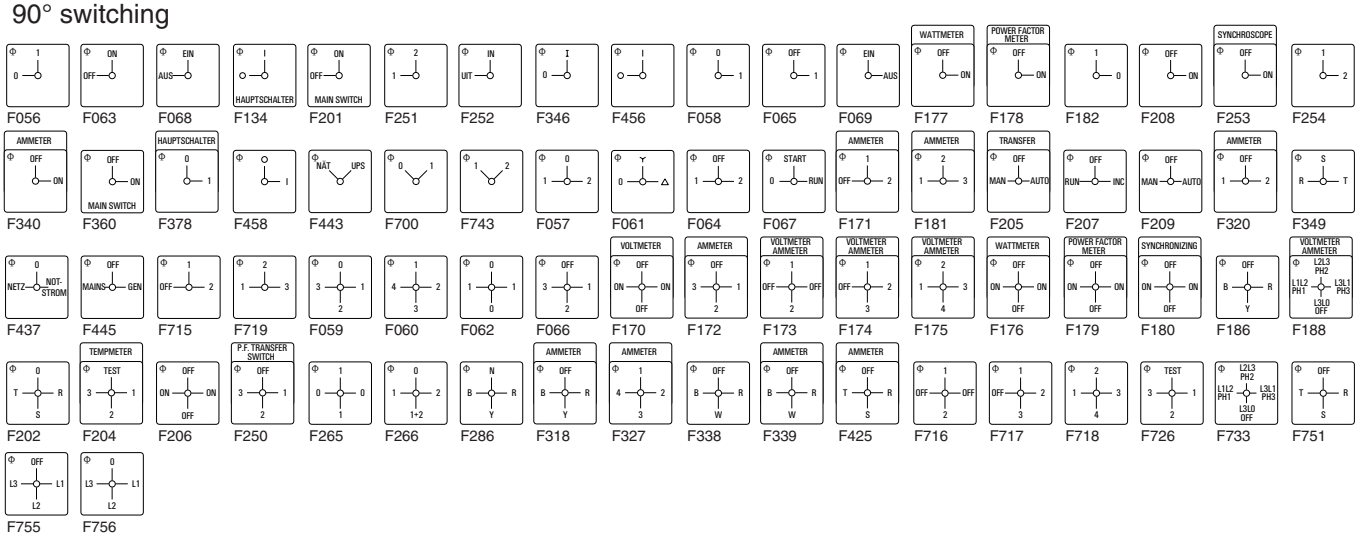
45° switching



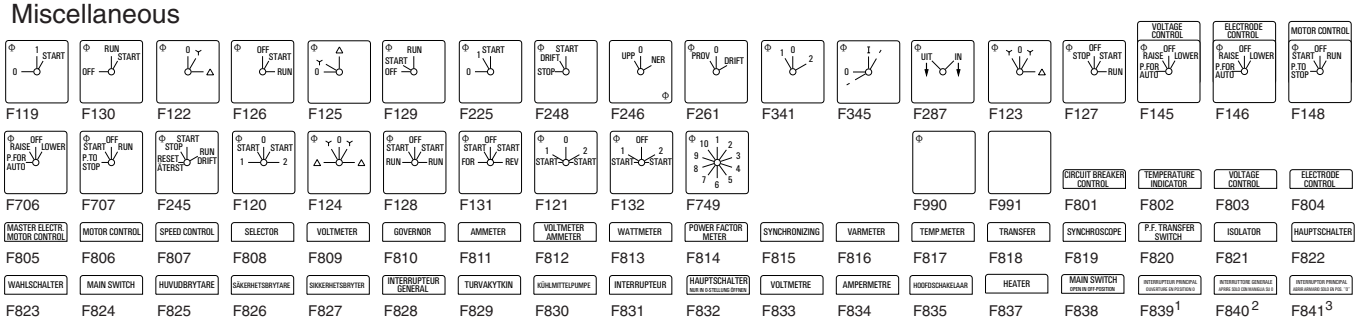
Escutcheon Plates

60° switching

90° switching



Miscellaneous



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

Selection Data				A11 A11C	AD11 AD11C	AD12 AD12C	A14 A14C
Rated Insulation Voltage U_i	IEC 60947-3[1]						
	VDE 0660 part 107[1]		V	690	600	600	690
	SEV[2]		V	500	600	600	500
	UL/Canada		V	600	600	600	600
	CEE[2]		V	400	–	–	400
	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						
	VDE 0660 part 107		A	20	6	6	25
	SEV[2]		A	10	6	6	16
	UL/Canada		A	10	6	6	16
Rated Operational Current I_e							
AC-21A Switching of resistive loads, including moderate overloads	IEC 60947-3	1 V	A	–	6	–	–
	VDE 0660 part 107	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	220 V-500 V	A	20	–	–	25
	VDE 0660 part 107	660 V-690 V	A	16	–	–	20
AC-15 Switching of control devices, contactors, valves etc.	IEC 60947-3	220 V-240 V	A	6	–	–	10
	VDE 0660 part 107	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			W	0,9	0,5	0,2	1,3
Resistance to vibration					on request		
Resistance to shock					on request		
Short Circuit Protection							
Max. fuse size		(gL/gG-characteristic)	A	20	6	6	25
Rated short-time withstand current		(1s-current)	A	120	45	75	220

DC Switching Capacity[3]

No. of series contacts	1	2	3	4	5	6	8	
	Voltage V							
Resistive loads	1	2	3	4	5	6	8	
T ≤ 1 ms	6	12	18	24	30	36	48	
	12	24	36	48	60	72	96	A
	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	A
	60	120	180	240	300	360	450	
	110	220	330	440	550	660	–	

Rated Operational Current I_e

A11	AD11	AD12	A14	
–	4	–	–	
–	2,5	4	–	
–	1,5	3	–	A
–	0,8	2,2	16	
10	0,3	1,2	15	
3,5	0,27	1	5	
0,8	0,2	0,6	1,2	
0,35	0,1	0,3	0,38	
0,3	0,08	0,25	0,35	
0,25	0,05	0,15	0,25	
0,15	0,03	0,1	0,2	
0,1	0,02	0,1	–	
10	–	–	16	
5	–	–	7	
1,8	–	–	2,5	A
0,7	–	–	1	
0,3	–	–	0,4	

Ambient Temperature of Stages[4, 5]		
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

[1]Valid for lines with grounded common neutral termination, overvoltage category III, pollution degree 3. Values for other supply systems on request. [2]International Standards and Approvals, refer to page 24. [3]DC switching capacity applies to ON/OFF switches. Switching capacity for other configurations on request. [4]For electromagnetic optional extras see additional data in Catalog 101. [5]Storage temperature: -40 °C to 85 °C (in case of temperature below -5 °C no shock load permissible).

Selection Data					A11 A11C	AD11 AD11C	AD12 AD12C	A14 A14C
Rated Utilization Category		IEC 60947-3 VDE 0660 part 107						
AC-2	Slip ring motor starting, reversing and plugging, star-delta starting	3 phase 3 pole	220 V-240 V 380 V-440 V 500 V 660 V-690 V	kW	4 7,5 10 10	– – – –	– – – –	5,5 11 15 13
AC-3	Direct-on-line starting, star-delta starting A11, A14	3 phase 3 pole	220 V-240 V 380 V-440 V 500 V 660 V-690 V	kW	3 5,5 5,5 5,5	– – – –	– – – –	4 7,5 7,5 7,5
		1 phase 2 pole	110 V 220 V-240 V 380 V-440 V	kW	0,6 2,2 3	– – –	– – –	1,5 3 3,7
AC-4	Direct-on-line starting, reversing, plugging and inching	3 phase 3 pole	220 V-240 V 380 V-440 V 500 V 660 V-690 V	kW	0,55 1,5 1,5 1,5	– – – –	– – – –	1 2,2 2,5 2,5
		1 phase 2 pole	110 V 220 V-240 V 380 V-440 V	kW	0,15 0,25 0,55	– – –	– – –	0,2 0,5 0,8
AC-23A	Frequent switching of motors or other high inductive loads	3 phase 3 pole	220 V-240 V 380 V-440 V 500 V 660 V-690 V	kW	3,7 7,5 7,5 7,5	– – – –	– – – –	5,5 11 11 11
		1 phase 2 pole	110 V 220 V-240 V 380 V-440 V	kW	0,75 2,2 3,7	– – –	– – –	1,5 3 5,5
Ratings		UL/Canada						
	Standard motor load DOL-Rating (similar AC-3)	3 phase 3 pole	120 V 240 V 480 V 600 V	HP	1 1 1 1	– – – –	– – – –	1,5 3 7,5 10
		1 phase 2 pole	120 V 240 V 277 V 480 V 600 V	HP	0,5 1 1 1 1	– – – – –	– – – – –	0,75 1,5 2 3 5
	Heavy motor load[1] Reversing-Rating (similar AC-4)	3 phase 3 pole	120 V 240 V 480 V-600 V	HP	– – –	– – –	– – –	1 2 5
		1 phase 2 pole	120 V 240 V 277 V	HP	– – –	– – –	– – –	0,33 0,75 0,75
Max. Permissible Wire Gage - Use copper wire only								
	Single-core or stranded wire			mm^2 AWG	2,5 12	2,5 12	2,5 12	4 10
	Flexible wire (sleeving in accordance with DIN 46228) Flexible AWG wires (without sleeve)			mm^2 AWG	2,5 (2,5) 14	2,5 (2,5) 14	2,5 (2,5) 14	2,5 (2,5) 12

[1]Reversing-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	c UL[1] us		●	●	
		c UL[3] us	●			●
Switzerland	Schweizerischer Elektrotechnischer Verein		+	+	+	+
Denmark	Danmarks Elektriske Materiellkontrol		+	+	+	+
Norway	Norges Elektriske Materiellkontroll		+	+	+	+
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]	+	+	+	+

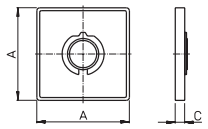
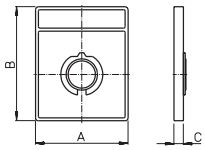
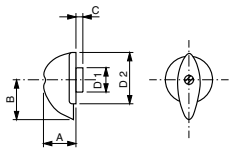
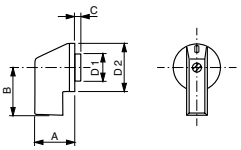
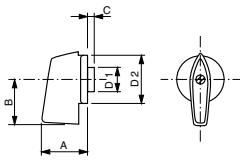
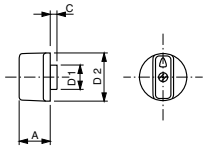
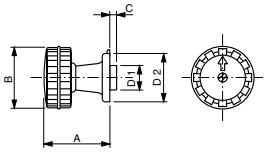
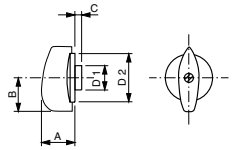
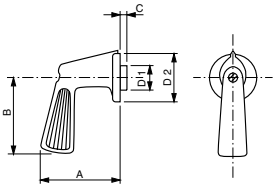
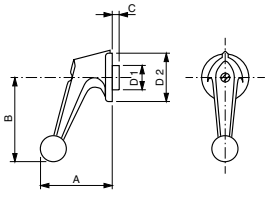
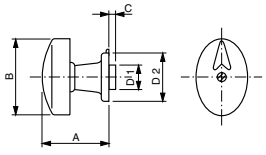
● Switch approved

+ Switch conforms to requirements

[1]Approved under the “Component Program” (UL-Recognized Industrial Component). File No. E35541, Guide No. NLRV2 and NLRV8.
[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 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
PE-Escutcheon Plate 	**S1**	64 2.52		7,4 .29			**PR-Escutcheon Plate** 	**S1**	64 2.52	78,8 3.10	7,4 .29		
	S2	88 3.46		8,5 .34									
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**	23 0.91	31,5 1.24	5 .20	18,2 .72	36 1.42	**I-Handle** 	**S1**	27 1.06	31,8 1.25	2,5 .10	18,2 .72	36 1.42
	S2	30 1.18	42 1.65	5 .20	25,4 1.00	50,0 1.97							
F-Handle 	**S1**	34 1.34	34 1.34	5 .20	18,2 .72	36 1.42	**B-Handle** 	**S1**	23 .91		5 .20	18,2 .72	36 1.42
	S2	44,7 1.76	45 1.77	5 .20	25,4 1.00	50 1.97							
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**	58 2.28	57,5 2.26	5 .20	18,2 .72	36 1.42	**K-Handle** 	**S1**	54 2.13	64 2.52	5 .20	18,2 .72	36 1.42
	S2	70 2.76	68 2.68	5 .20	25,4 1.00	50 1.97		**S2**	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							

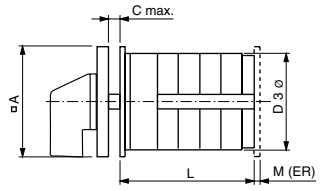
Dimensions

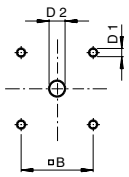
mm
inch

Four Hole Panel Mounting

A11
AD11
AD12
A14
A11C
A14C

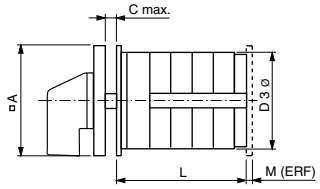
E, ER

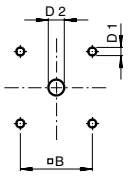




	A11 AD11 AD12	A14	A11C A14C
A	64 2.52	64 2.52	88 3.46
B	48 1.89	48 1.89	68 2.68
C	4 .16	4 .16	5,5 .22
D1	5 .20	5 .20	6 .24
D2	10-15 .39-.59	10-15 .39-.59	13-17 .51-.67
D3	60 2.36	65 2.56	84 3.31

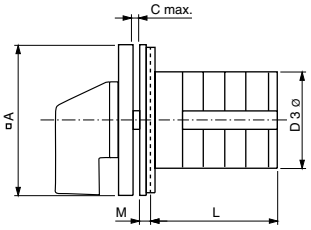
EF, ERF

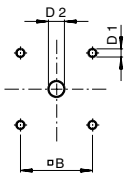




	A11 AD11 AD12	A14	A11C A14C
A	64 2.52	64 2.52	88 3.46
B	48 1.89	48 1.89	68 2.68
C	4 .16	4 .16	5,5 .22
D1	5 .20	5 .20	6 .24
D2	19-22 .75-.87	19-22 .75-.87	26-30 1.02-1.18
D3	60 2.36	65 2.56	84 3.31

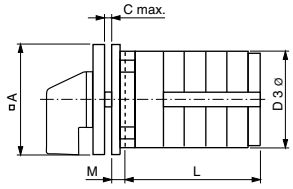
EG, EGF

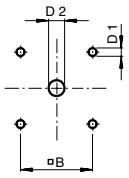




		A11 AD11 AD12	A14	A11C A14C
A		88 3.46	88 3.46	- -
B		68 2.68	68 2.68	- -
C		5,5 .22	5,5 .22	- -
D1		6 .24	6 .24	- -
D2	EG	13-17 .51-.67	13-17 .51-.67	- -
D2	EGF	26-30 1.02-1.18	26-30 1.02-1.18	- -
D3		60 2.36	65 2.56	- -

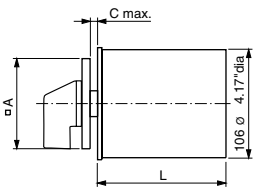
KN1, KD1

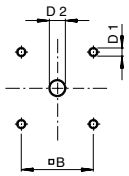




		A11 AD11 AD12	A14
A		60 2.36	60 2.36
B		48 1.89	48 1.89
C		4 .16	4 .16
D1		5 .20	5 .20
D2		10-15 .39-.59	10-15 .39-.59
D3		60 2.36	65 2.56

EC, ED





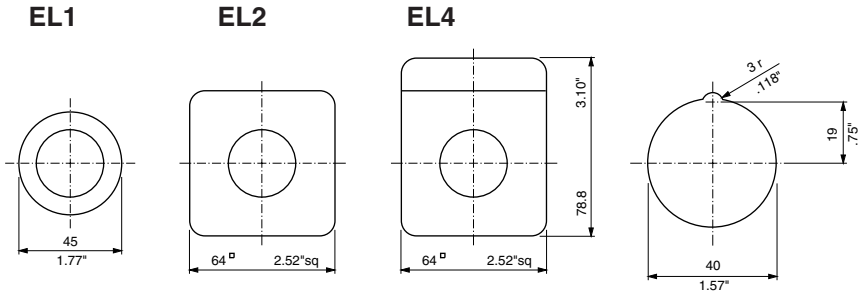
		A11 AD11 AD12	A14
A		88 3.46	88 3.46
B		68 2.68	68 2.68
C	EC	5,5 .22	5,5 .22
C	ED	7,5 .30	7,5 .30
D1		6 .24	6 .24
D2	EC	13-17 .51-.67	13-17 .51-.67
D2	ED	28-33 1.10-1.30	28-33 1.10-1.30

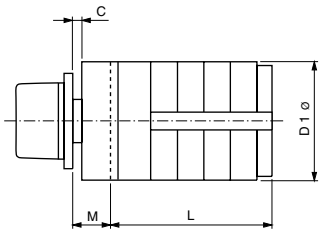
Dimensions

mm
inch

Single Hole Mounting 40 mm	A11 AD11 AD12 A14

EL1 **EL2** **EL4**

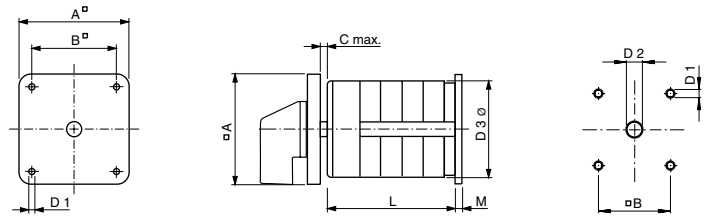




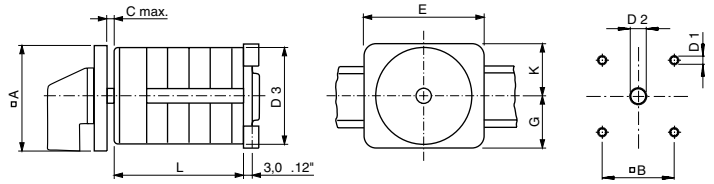
D1	60 2.36	65 2.56
C	1-6,3 .04-.25	1-6,3 .04-.25

Base Mounting	A11 AD11 AD12	A14	A11C A14C
A	64 2.52	64 2.52	88 3.46
B	48 1.89	48 1.89	68 2.68
C	13,5 .53	13,5 .53	16 .63
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
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	- -

VE



VE1



Length L	A11 AD11 AD12	A14	Length L	A11 AD11 AD12	A14	Additional Length M[1]	A11 AD11 AD12	A14
Mounting E			Mounting EC and ED			Mounting + switch with latching mechanism size S2		
No. of stages			No. of stages	EC, ED	EC, ED	ER/ERF	6,5 .26	6,5 .26
1	42,5 1.67	42,5 1.67	1	41,5 1.63	47,2 1.86	EG/EGF	0,5 .02	0,5 .02
2	55,2 2.17	55,2 2.17	2	54,2 2.13	59,9 2.36	KN1/KD1	7 .28	7 .28
3	67,9 2.67	67,9 2.67	3	66,9 2.63	72,6 2.86	VE	5 .20	5 .20
4	80,6 3.17	80,6 3.17	4	79,6 3.13	85,3 3.36	EL1	11 .43	11 .43
5	93,3 3.67	93,3 3.67	5	92,3 3.63	98 3.86	EL2	11 .43	11 .43
6	106 4.17	106 4.17	6	105 4.13	110,7 4.36	EL4	11 .43	11 .43
7	118,7 4.67	118,7 4.67	7	117,7 4.63	123,4 4.86	A11C/A14C	8,2 .32	8,2 .32
8	131,4 5.17	131,4 5.17	8	130,4 5.13	136,1 5.36			
9	144,1 5.67	144,1 5.67	9	143,1 5.63	148,8 5.86			
10	156,8 6.17	156,8 6.17	10	155,8 6.13	161,5 6.36			
11	169,5 6.67	169,5 6.67	11	168,5 6.63	174,2 6.86			
12	182,2 7.17	182,2 7.17	12	181,2 7.13	186,9 7.36			

[1]Additional 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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