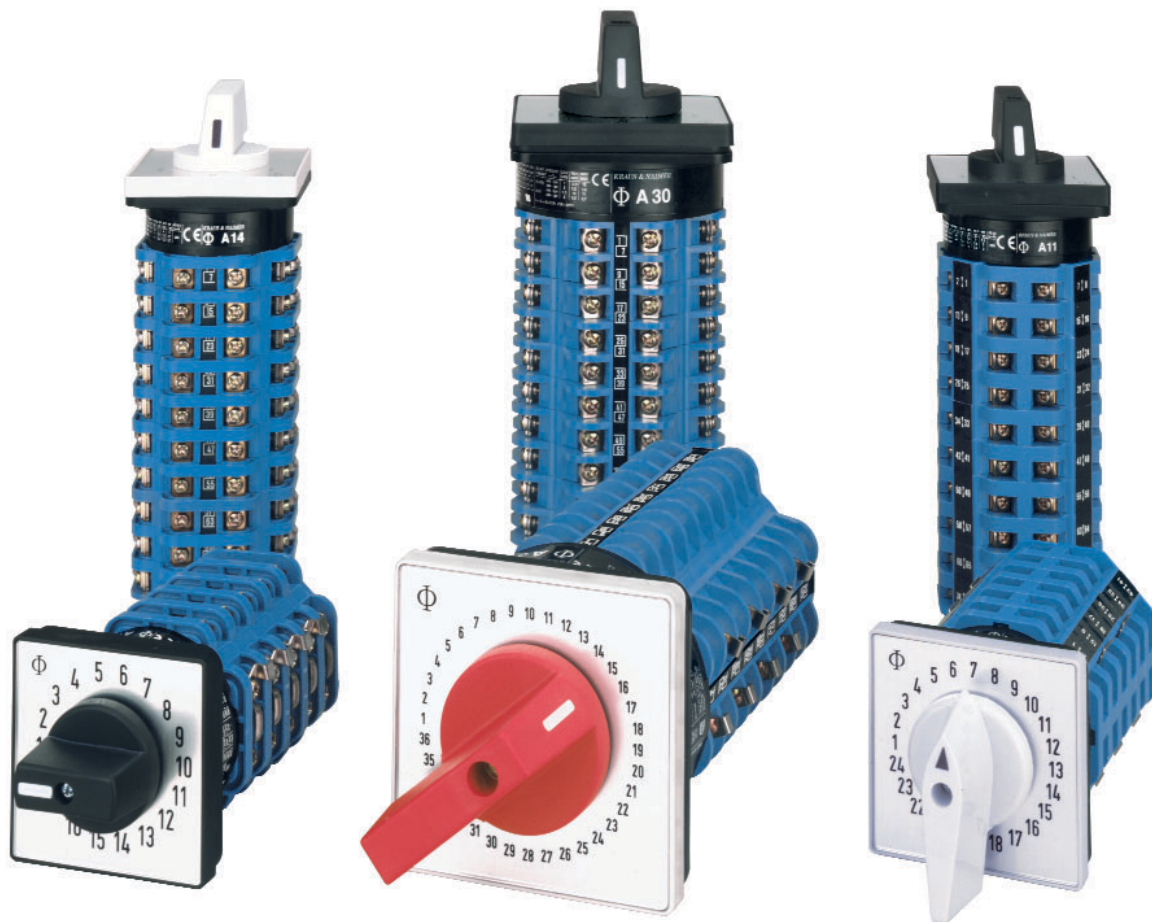


Catalog 110
A, AD Switches
6 A-25 A



KRAUS & NAIMER

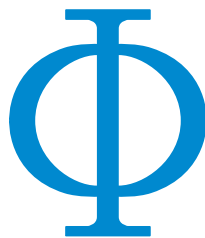
The development of the Blue Line rotary switch, contactor and motor starter product ranges is based on more than seventy-five years experience by Kraus & Naimer in the design and manufacture of electrical switchgear. Kraus & Naimer pioneered the introduction of the cam operated rotary switch and continues 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	Page
Construction Data	2
Dimensions and Nominal Ratings	2
How to order	3, 4
Switch Function and Configuration	
ON/OFF Switches	5, 6
Double-throw Switches	7, 8
Multi-step Switches	9-11
General Application Switches	12
Voltmeter Switches	13
Ammeter Switches	14
Control Switches	15
Motor Switches	16
Types of Mounting	
Panel Mounting	17, 18
Base Mounting	18
Handles	19
Escutcheon Plates	20, 21
Technical Data	22, 23
International Standards and Approvals	24
Dimensions	
Handles and Escutcheon Plates	25
Panel Mounting	26, 27
Base Mounting	27
Overall Switch Lengths	27
Blue Line Switchgear: Summary	28

Construction Data

A Switches

A11, A14, A30

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 or 18 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.

Switches AD11 and AD12 incorporate a self-cleaning H-bridge with a cross-wire contact system and are available with either silver (AD12) or gold (AD11) contacts. Their construction guarantees maximum contact security even at low voltages.

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
A30	10°, 15°, 20°, 30°, 45°, 60°, 90°	36

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

Switch Size

Type

Rated Values

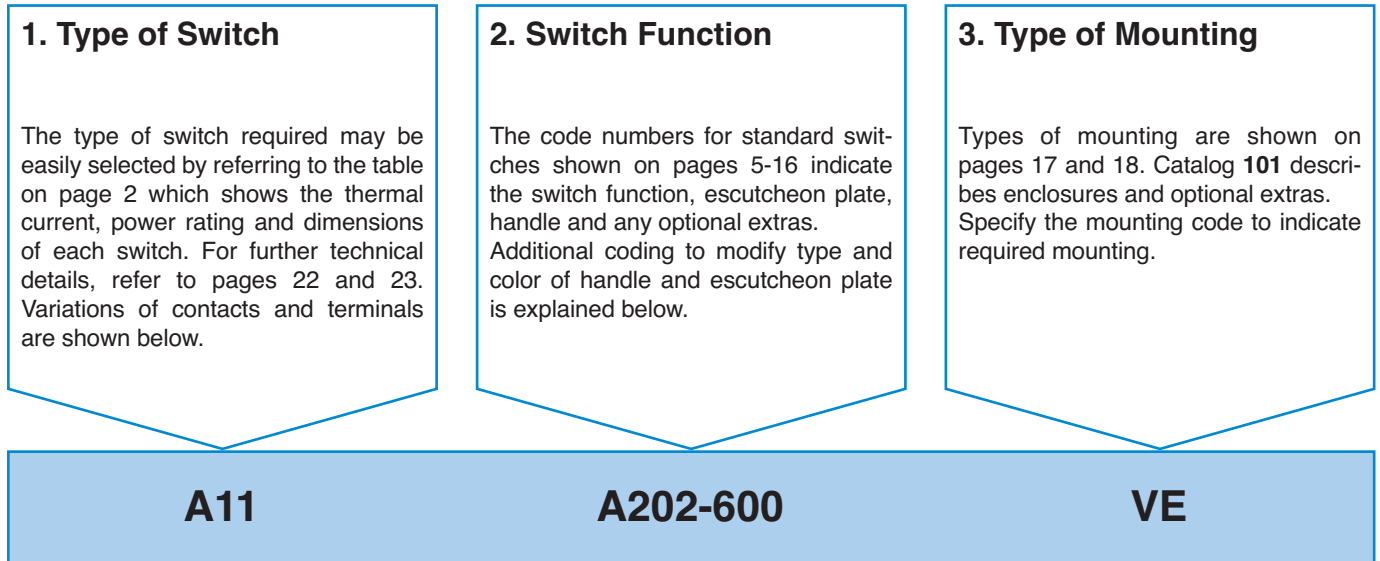
Switch Size	Type	According to IEC 60947-3/VDE 0660 part 107			
		Thermal Current I_u/I_{th} A	Motor Rating 3 x 380 V/440 V AC-23A kW	Operational Current I_o A	
				AC-21A	AC-15/220 V
S1	AD11	6	-	1 V/ 6 A 24 V/ 1 A 110 V/ 0,4 A 220 V/ 0,2 A 380 V/ 0,13 A	-
	AD12	6	-	6 V/ 6 A 24 V/ 5 A 110 V/ 3 A 220 V/ 2 A 380 V/ 1,3 A	-
	A11 A14	20 25	7,5 11	20 A 25 A	6 10
S2	A11C	20	7,5	20 A	6
	A14C	25	11	25 A	10
	A30	25	12,5	25 A	14

To furnish with gold contacts, AMP terminals or gold contacts and AMP terminals see page 3.

How to order

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

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



Type of Switch

Extending the switch type coding the following combinations will define:

Amendment	Definition	For switch types
-1	with gold contacts ¹	A11, 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





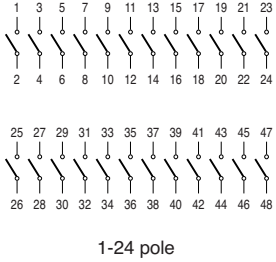






The standard switch consists of a transparent escutcheon plate with brushed aluminum backing and black inscription. The escutcheon plate frame is black as well as the handle. Above there are further color combinations of escutcheon plate and handle which are available. The appropriate dash-number must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



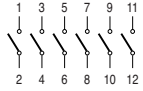


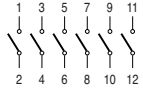
Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
----------	----------------	--------	------	--------	--------------------

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					
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
----------	----------------	--------	------	--------	--------------------

ON/OFF Switches with 60° Switching

1 pole			A200-624	1	
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	
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	
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			

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
----------	----------------	--------	------	--------	--------------------

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	

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
----------	----------------	--------	------	--------	--------------------

Multi-step Switches without „OFF“

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

Switch Function and Configuration

A Switches

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
----------	----------------	--------	------	--------	--------------------

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			A241-621 A261-621	1 2	
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	



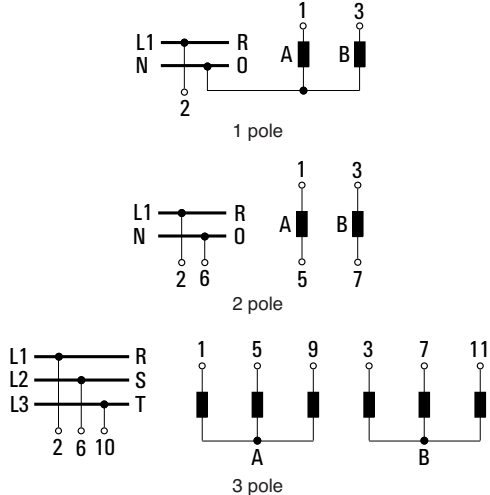


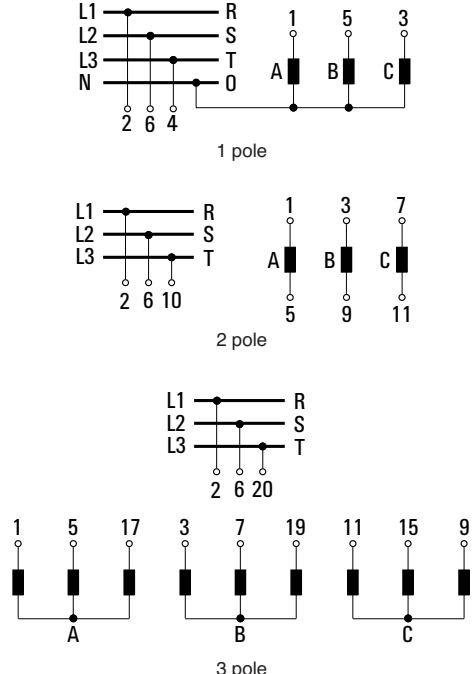
Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
----------	----------------	--------	------	--------	--------------------

Multi-step Switches with „OFF“

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

Function	Escutch. Plate	Handle	Code	Stages	Connection Diagram
----------	----------------	--------	------	--------	--------------------

General Application Switches

<p>1 pole 2 Gang 2 pole 3 pole</p> <p>Switching sequence: 0, A, A+B</p> <p>1 pole 2 pole 3 pole</p>			<p>A310-600 A312-600 A314-600</p> <p>A310-620 A312-620 A314-620</p>	<p>1 1 2</p> <p>1 1 2</p>	
<p>1 pole 3 Gang 2 pole 3 pole</p> <p>Switching sequence: 0, A, A+B, A+B+C</p> <p>1 pole 2 pole 3 pole</p>			<p>A311-600 A313-600 A315-600</p> <p>A311-620 A313-620 A315-620</p>	<p>1 2 3</p> <p>1 2 3</p>	

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	

¹Type A30 with handle

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	1	
			A178-620	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
----------	----------------	--------	------	--------	--------------------

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 A30
---------------------------------	-------------	---------------------	-----	---------------------

	<p>Panel Mounting</p> <p>Four hole panel mounting</p> <p>Four hole panel mounting, protection IP 65</p>	E EF	● ●	● ●	● ●
	<p>Panel and base mounting</p> <p>Four hole panel mounting</p> <p>Four hole panel mounting, protection IP 65</p>	ER ERF	● ●	● ●	● ●
	<p>Panel mounting using larger escutcheon plate and handle</p> <p>Four hole panel mounting</p> <p>Four hole panel mounting, protection IP 65</p>	EG EGF	● ●	● ●	A30 A30
	<p>Panel mounting with heavy duty stop and metal shaft</p> <p>Four hole panel mounting Mounting plate, escutcheon plate and handle of size S1</p> <p>Four hole panel mounting Mounting plate, escutcheon plate and handle of size S1 and 6 mm square metal shaft</p>	KN1 KD1	● ●	● ●	
	<p>Panel mounting with protective cover</p> <p>Four hole panel mounting Protection front IP 40 rear IP 42</p> <p>Four hole panel mounting Protection front IP 65 rear IP 42</p>	EC ED	● ●	● ●	



Mounting

A, AD Switches

Single Hole Mounting 40 mm	Code	A11 AD11 AD12	A14	A11C A14C A30
----------------------------	-------------	---------------------	-----	---------------------

	<p>Single hole mounting</p> <p>Without escutcheon plate</p>	EL1	●	●	
	<p>With square escutcheon plate</p>	EL2	●	●	
	<p>With rectangular escutcheon plate</p>	EL4	●	●	

Base Mounting

	<p>Base mounting</p> <p>Base mounting - four hole</p>	VE	●	●	●
	<p>Snap-on base mounting for track EN 50022</p>	VE1	●	●	

Handles

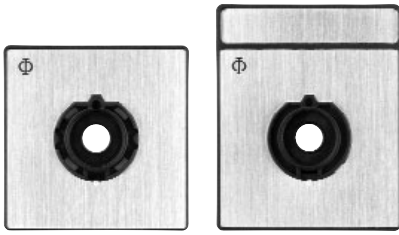
Type	Color	Code	Size	
			S1	S2

Type	Color	Code	Size	
			S1	S2

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

<p>I-Handle</p> 	black red white electro-gray	G251 G252 G253 G257	● ● ● ● ● ● ● ●
<p>B-Handle</p> 	black red white electro-gray	G521 G522 G523 G527	● — ● — ● — ● —
<p>L-Handle</p> 	black red white electro-gray	G501 G502 G503 G507	● — ● — ● — ● —
<p>K-Handle</p> 	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 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

Selection Data	A11	AD11	AD12	A14	A30
	A11C	AD11C	AD12C	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	220 V-240 V	kW	4	–	–	5,5	7	
		3 pole	380 V-440 V		7,5	–	–	11	12,5	
			500 V		10	–	–	15	16	
			660 V-690 V		10	–	–	13	15	
AC-3	Direct-on-line starting, star-delta starting A11, A14, A30	3 phase	220 V-240 V	kW	3	–	–	4	5,5	
		3 pole	380 V-440 V		5,5	–	–	7,5	10	
			500 V		5,5	–	–	7,5	11	
			660 V-690 V	5,5	–	–	7,5	11		
			1 phase	110 V	kW	0,6	–	–	1,5	1,5
			2 pole	220 V-240 V		2,2	–	–	3	3
		380 V-440 V	3	–	–	3,7	5,5			
AC-4	Direct-on-line starting, reversing, plugging and inching	3 phase	220 V-240 V	kW	0,55	–	–	1	2,7	
		3 pole	380 V-440 V		1,5	–	–	2,2	5	
			500 V		1,5	–	–	2,5	6	
			660 V-690 V	1,5	–	–	2,5	6		
			1 phase	110 V	kW	0,15	–	–	0,2	0,7
			2 pole	220 V-240 V		0,25	–	–	0,5	1,3
		380 V-440 V	0,55	–	–	0,8	2,5			
AC-23A	Frequent switching of motors or other high inductive loads	3 phase	220 V-240 V	kW	3,7	–	–	5,5	7	
		3 pole	380 V-440 V		7,5	–	–	11	12,5	
			500 V		7,5	–	–	11	15	
			660 V-690 V	7,5	–	–	11	15		
			1 phase	110 V	kW	0,75	–	–	1,5	1,5
			2 pole	220 V-240 V		2,2	–	–	3	3
		380 V-440 V	3,7	–	–	5,5	5,5			
Ratings		UL/Canada								
Standard motor load DOL-Rating (similar AC-3)	3 phase 3 pole	120 V	HP	1	–	–	1,5	3		
		240 V		1	–	–	3	7,5		
		480 V		1	–	–	7,5	15		
		600 V		1	–	–	10	20		
Heavy motor load ¹ Reversing-Rating (similar AC-4)	3 phase 3 pole	120 V	HP	0,5	–	–	0,75	2		
		240 V		1	–	–	1,5	3		
		277 V		1	–	–	2	5		
		480 V		1	–	–	3	7,5		
		600 V		1	–	–	5	10		
1 phase 2 pole	HP	120 V	–	–	–	–	1	2		
		240 V	–	–	–	–	2	3		
		480 V	–	–	–	–	5	10		
		600 V	–	–	–	–	5	10		
1 phase 2 pole	HP	120 V	–	–	–	–	0,33	0,5		
		240 V	–	–	–	–	0,75	1,5		
		277 V	–	–	–	–	0,75	1,5		
Max. Permissible Wire Gage - Use copper wire only										
Single-core or stranded wire				mm ²	2,5	2,5	2,5	4	4	
				AWG	12	12	12	10	10	
Flexible wire				mm ²	2,5	2,5	2,5	2,5	2,5	
(sleeving in accordance with DIN 46228)					(2,5)	(2,5)	(2,5)	(2,5)	(2,5)	
Flexible AWG wires (without sleeve)				AWG	14	14	14	12	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	A30
USA/Canada	Underwriters Laboratories			●	●		●
			●			●	
Switzerland	Schweizerischer Elektrotechnischer Verein		+	+	+	+	+
Denmark	Danmarks Elektriske Materielkontrol		+	+	+	+	+
Norway	Norges Elektriske Materielkontrol		+	+	+	●	+
Sweden	Svenska Elektriska Materielkontrollanstalten		+	+	+	+	+
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

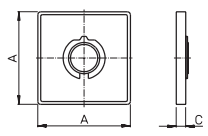
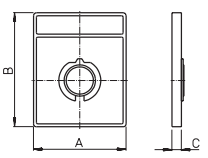
¹Approved under the "Component Program" (UL-Recognized Industrial Component). File No. E35541, Guide No. NLRV2 and NLRV8.

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.

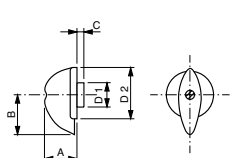
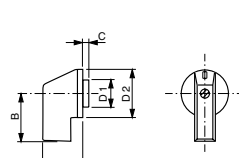
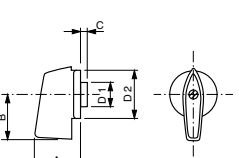
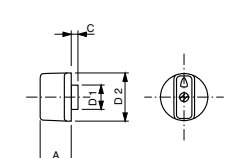
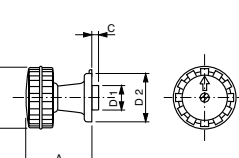
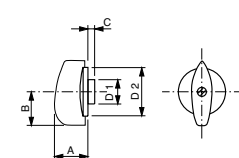
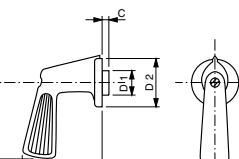
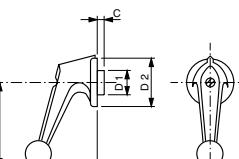
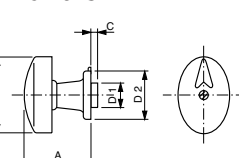
³Approved under the "Listing-Program". File No. E35541, Guide No. NLRV and NLRV7 resp. File No. E60262, Guide No. NRNT and NRNT7.

Dimensions mm
inch

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

PE-Escutcheon Plate	Size	A	B	C	D1ø	D2ø	PR-Escutcheon Plate	Size	A	B	C	D1ø	D2ø
	S1	64 2.52		7,4 .29				S1	64	78,8	7,4		
	S2	88 3.46		8,5 .34					2.52	3.10	.29		

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	Size	A	B	C	D1ø	D2ø	I-Handle	Size	A	B	C	D1ø	D2ø
	S1	23 0.91	31,5 1.24	5 .20	18,2 .72	36 1.42		S1	27	31,8	2,5	18,2	36
	S2	30 1.18	42 1.65	5 .20	25,4 1.00	50,0 1.97			1.06	1.25	.10	.72	1.42
	S1	34 1.34	34 1.34	5 .20	18,2 .72	36 1.42		S1	23		5	18,2	36
	S2	44,7 1.76	45 1.77	5 .20	25,4 1.00	50 1.97			.91		.20	.72	1.42
	S1	50 1.97	45 1.77	5 .20	18,2 .72	36 1.42		S1	24	24,1	5	18,2	36
									.95	.95	.20	.72	1.42
	S1	58 2.28	57,5 2.26	5 .20	18,2 .72	36 1.42		S1	54	64	5	18,2	36
	S2	70 2.76	68 2.68	5 .20	25,4 1.00	50 1.97			2.13	2.52	.20	.72	1.42
	S1	50 1.97	56 2.2	5 .20	18,2 .72	36 1.42							

Dimensions mm
 inch

Four Hole Panel Mounting	A11		A11C	
	AD11	A14	A14C	A30
	AD12			

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

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

EG, EGF		A	88 3.46	88 3.46	-	130 5.12
		B	68 2.68	68 2.68	-	104 4.09
		C	5.5 .22	5.5 .22	-	7 .28
		D1	6 .24	6 .24	-	7 .28
		D2 EG	13-17 .51-.67	13-17 .51-.67	-	15.5-20 .61-.79
		D2 EGF	26-30 1.02-1.18	26-30 1.02-1.18	-	22-25 .87-.98
		D3	60 2.36	65 2.56	-	88 3.46

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 A14 AD12
-----------------------------------	--

EL1	EL2	EL4								
				<table border="1"> <tr> <td>D1</td> <td>60 2.36</td> <td>65 2.56</td> </tr> <tr> <td>C</td> <td>1-6,3 .04-.25</td> <td>1-6,3 .04-.25</td> </tr> </table>	D1	60 2.36	65 2.56	C	1-6,3 .04-.25	1-6,3 .04-.25
D1	60 2.36	65 2.56								
C	1-6,3 .04-.25	1-6,3 .04-.25								

Base Mounting	A11 AD11 A14 AD12	A11C A14C A30
----------------------	--	--

VE																																																						
VE1																																																						
				<table border="1"> <tr> <td>A</td> <td>64 2.52</td> <td>64 2.52</td> <td>88 3.46</td> <td>88 3.46</td> </tr> <tr> <td>B</td> <td>48 1.89</td> <td>48 1.89</td> <td>68 2.68</td> <td>68 2.68</td> </tr> <tr> <td>C</td> <td>13,5 .53</td> <td>13,5 .53</td> <td>16 .63</td> <td>16 .63</td> </tr> <tr> <td>D1</td> <td>5 .20</td> <td>5 .20</td> <td>6 .24</td> <td>6 .24</td> </tr> <tr> <td>D2</td> <td>10-15 .39-.59</td> <td>10-15 .39-.59</td> <td>13-17 .51-.67</td> <td>13-17 .51-.67</td> </tr> <tr> <td>D3</td> <td>60 2.36</td> <td>65 2.56</td> <td>84 3.31</td> <td>88 3.46</td> </tr> <tr> <td>D4</td> <td>4,1 .16</td> <td>4,1 .16</td> <td>5,4 .21</td> <td>5,4 .21</td> </tr> <tr> <td>E</td> <td>70 2.76</td> <td>70 2.76</td> <td>-</td> <td>-</td> </tr> <tr> <td>G</td> <td>30 1.18</td> <td>30 1.18</td> <td>-</td> <td>-</td> </tr> <tr> <td>K</td> <td>30 1.18</td> <td>30 1.18</td> <td>-</td> <td>-</td> </tr> </table>	A	64 2.52	64 2.52	88 3.46	88 3.46	B	48 1.89	48 1.89	68 2.68	68 2.68	C	13,5 .53	13,5 .53	16 .63	16 .63	D1	5 .20	5 .20	6 .24	6 .24	D2	10-15 .39-.59	10-15 .39-.59	13-17 .51-.67	13-17 .51-.67	D3	60 2.36	65 2.56	84 3.31	88 3.46	D4	4,1 .16	4,1 .16	5,4 .21	5,4 .21	E	70 2.76	70 2.76	-	-	G	30 1.18	30 1.18	-	-	K	30 1.18	30 1.18	-	-
A	64 2.52	64 2.52	88 3.46	88 3.46																																																		
B	48 1.89	48 1.89	68 2.68	68 2.68																																																		
C	13,5 .53	13,5 .53	16 .63	16 .63																																																		
D1	5 .20	5 .20	6 .24	6 .24																																																		
D2	10-15 .39-.59	10-15 .39-.59	13-17 .51-.67	13-17 .51-.67																																																		
D3	60 2.36	65 2.56	84 3.31	88 3.46																																																		
D4	4,1 .16	4,1 .16	5,4 .21	5,4 .21																																																		
E	70 2.76	70 2.76	-	-																																																		
G	30 1.18	30 1.18	-	-																																																		
K	30 1.18	30 1.18	-	-																																																		

Length L	A11 AD11 AD12	A14	A30	Length L	A11 AD11 AD12	A14	Additional Length M ¹	A11 AD11 AD12	A14	A30
----------	---------------------	-----	-----	----------	---------------------	-----	-------------------------------------	---------------------	-----	-----

Mounting E	Mounting EC and ED	Mounting + switch with latching mechanism size S2
------------	-----------------------	--

No. of stages	A11 AD11 AD12	A14	A30	No. of stages	EC, ED	EC, ED	ER/ERF	6,5 .26	6,5 .26	9,4 .37
1	42,5 1.67	42,5 1.67	47,2 1.86	1	41,5 1.63	47,2 1.86	EG/EGF	0,5 .02	0,5 .02	2 .08
2	55,2 2.17	55,2 2.17	59,9 2.36	2	54,2 2.13	59,9 2.36	KN1/KD1	7 .28	7 .28	-
3	67,9 2.67	67,9 2.67	72,6 2.86	3	66,9 2.63	72,6 2.86	VE	5 .20	5 .20	8,9 .35
4	80,6 3.17	80,6 3.17	85,3 3.36	4	79,6 3.13	85,3 3.36	EL1	11 .43	11 .43	-
5	93,3 3.67	93,3 3.67	98 3.86	5	92,3 3.63	98 3.86	EL2	11 .43	11 .43	-
6	106 4.17	106 4.17	110,7 4.36	6	105 4.13	110,7 4.36	EL4	11 .43	11 .43	-
7	118,7 4.67	118,7 4.67	123,4 4.86	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	136,1 5.36	8	130,4 5.13	136,1 5.36				
9	144,1 5.67	144,1 5.67	148,8 5.86	9	143,1 5.63	148,8 5.86				
10	156,8 6.17	156,8 6.17	161,5 6.36	10	155,8 6.13	161,5 6.36				
11	169,5 6.67	169,5 6.67	174,2 6.86	11	168,5 6.63	174,2 6.86				
12	182,2 7.17	182,2 7.17	186,9 7.36	12	181,2 7.13	186,9 7.36				

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. CG switch terminals are “finger-proof”, according to VDE 0106. Terminals are 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

SALES AND SERVICE ORGANIZATION

Australia

australian solenoid Φ co.pty. ltd.

379 Liverpool Road, ASHFIELD, N.S.W. 2131
P. O. Box 1093, ASHFIELD, N.S.W. 1800
Tel: +61 2 9797-7333, Fax: 0092
e-mail: sales@austrasol.com.au

Austria

austro solenoid Φ ges.m.b.h.

Schumanngasse 35, Postfach 431
A-1181 WIEN
Tel: +43 1 404 06, Fax: 404 06-190
e-mail: aso@krausnaimer.com

Belgium, Luxembourg

solenoid benelux Φ b. v.

Stationstraat 34
B-3070 KORTENBERG
Tel: +32 2 757-0141, Fax: 1640
e-mail: info@solenoid.be

Brazil

solenoid do brasil Φ ltda.

Avenida Berna 230
04774-020 SAO PAULO
Tel: +55 11 5524-1288, Fax: 5521-4659/9633
e-mail: knbrasil@krausnaimer.com.br

Canada

canadian solenoid Φ inc.

219 Connie Crescent, Unit 13A
CONCORD, Ontario, L4K 1L4
Tel: +1 905 738-1666, Fax: 9327
e-mail: cdnsolenoid@cansol.on.ca

Chile

ASEA BROWN BOVERI S. A.
Vicuña Mackenna 1602, Casilla 3555
SANTIAGO DE CHILE
Tel: +56 2 544-7411, Fax: 7418

Cyprus

ELECTROMATIC CONSTRUCTIONS LTD.
72, Evagoras Pallikarides Str., CY-2235 LATSIA-Nicosia
P. O. Box 12630, CY-2251 LATSIA-Nicosia
Tel: +357 2 48 41 41, Fax: 48 57 47

Czech Republic

OBZOR, výrobní družstvo Zlín
Louky-Slanica 378
CZ-76413 ZLÍN
Tel: +420 57 7195-111/-153 (Techn. Supp.)
Fax: +420 57 7195-152/-138
e-mail: ots@obzor.cz

Denmark

C. THIIM A/S Ingeniørfirma
Transformervej 31
DK-2730 HERLEV
Tel: +45 44 85 80 00, Fax: 80 05
e-mail: thiim@thiim.com

Finland

suomen solenoid Φ oy

Karitie 7
FIN-01530 VANTAA
Tel: +358 9 825-4240, Fax: 42410
e-mail: etunimi.sukunimi@finsol.fi

France

solenoid france Φ s. a.

33, rue Bobillot
F-75013 PARIS
Tél: +33 1 58 40 80 80, Fax: 45 80 91 19
e-mail: sales@solfrance.fr

Germany

deutsche solenoid Φ vertriebs-gmbH

Wikingerstraße 20-28, D-76189 KARLSRUHE
Postfach 10 01 24, D-76231 KARLSRUHE
Tel: +49 721 59 88-0, Fax: 59 28 28
e-mail: desol@krausnaimer.com

Great Britain

u. k. solenoid Φ ltd.

115 London Road
NEWBURY/BERKSHIRE RG14 2AH
Tel: +44 1635 45991, Fax: 37807
e-mail: sales@uksol.co.uk

Greece

KALAMARAKIS-SAPOUNAS S. A.
Ionias & Neromilou Str., P. O. Box 46566
GR-13671 ACHARNES/ATHENS
Tel: +30 2 10 240-6000-6, Fax: 240-6007
e-mail: ksa@ksa.gr

Hungary

GANZ, Schalter- u. Geräterfabrik
X. Kőbányal út 41/c, Postfach 87
H-1475 BUDAPEST
Tel: +36 1 261-5479, Fax: 4685
e-mail: ganzkk@ganzkk.hu

Iceland

BRAEDURNIR ORMSSON EHF
Lágmúli 6-9, P. O. Box 8670
REYKJAVIK
Tel: +354 530-28 00, Fax: 28 10
e-mail: skuli@ormsson.is

Iran

RBS technische und kommerzielle
Beratungsgesellschaft mbH
Kohlriege 14
D-33758 SCHLOSS HOLTE
Tel: +49 5207 9111-0, Fax: 9111-19
e-mail: kontakt@rbs-gmbh.de

Republic of Ireland

irish solenoid Φ ltd.

Bay 145, Shannon Free Zone
SHANNON, Co. Clare
Tel: +353 61 704700, Fax: 471084
e-mail: salesirs@krausnaimer.ie

Italy

solenoid italia Φ s.r.l.

Via Terracini, 9
I-24047 TREVIGLIO (BG)
Tel: +39 0363-30 11 12, Fax: 30 21 13

Japan

solenoid japan Φ co. ltd.

Yoshiwada Building 2F
1-11-6 Hamamatsucho
Minato-Ku, TOKYO 105-0013
Tel: +81 3 3436-6151, Fax: 6325

Kuwait

AMMAR & PARTNERS ELECTRICAL CO.
P. O. Box 1871
13019 SAFAT
Tel: +965 483-0122/483-0133
Fax: +965 484-1818

Malaysia

INDUSTRIAL AUTOMATION (M) Sdn Bhd
30-3 & 30-4 Loke New Road
55200 KUALA LUMPUR
Tel: +60 3-9-2210511, Fax: 2222299
e-mail: inquiry@iasb.com.my

Mexico

ING. JAVIER CABALLERO B.
A. Gaviño 30, Satélite,
53100, Edo. de Mexico, MEXICO
Tel: +52 5555 62-7577, Fax: 0434
e-mail: j_caballero_b@infosel.net.mx

Netherlands

solenoid benelux Φ b. v.

Wegtersweg 38, Postbus 199
NL-7556 BR HENGEL0 (Ov.)
Tel: +31 74 291-9441, Fax: 8380
e-mail: info@solenoid.nl

New Zealand

new zealand solenoid Φ co. ltd.

42 Miramar Avenue, P. O. Box 15-009
WELLINGTON
Tel: +64 4 380-9888, Fax: 9877
e-mail: sales@nzsolenoid.co.nz

Norway

norsk solenoid Φ a/s

Hjalmar Brantings vei 8, P. O. Box 21, Økern
N-0508 OSLO
Tel: +47 22 64 44 20, Fax: 65 39 49
e-mail: nos@norsksol.no

Poland

ASTAT sp. z o.o.
ul. Dąbrowskiego 461
PL-60451 POZNAŃ
Tel: +48 61 848-8871/72, Fax: 8276
e-mail: info@astat.com.pl

Portugal

ELECTRICOL-DAMAS, FERREIRA & DAMASCENO, S. A.
Apartado 1083
P-2671-852 SANTO ANTÓNIO DOS CAVALEIROS
Tel: +351 21 989-8939, Fax: 988-6464

Kingdom of Saudi-Arabia

HAWA ELECTRIC PANEL BOARD FACTORY
Industrial Area, P. O. Box 1684
DAMMAM 31441
Tel: +966 3 847-2061, Fax: 2056

Singapore

solenoid singapore Φ pte. ltd.

115A, Commonwealth Drive
03-17/23
SINGAPORE 149 596
Tel: +65 6473-8166, Fax: 8643
e-mail: krausnaimer@singsol.com.sg

Slovenia

SCHRACK Energietechnik d.o.o.
Glavni trg 47
SI-2380 SLOVENJ GRADEC
Tel: +386 2 88 392 00, Fax: 434 71
e-mail: schrack.sg@schrack-energietechnik.si

Republic of South Africa

south african solenoid Φ co.pty. ltd.

7 Village Crescent, Linbro Village
Linbro Business Park, SANDTON 2065
P. O. Box 511, KELVIN 2054
Tel: +27 11 608-6060, Fax: 608-2874
e-mail: sales@sasolenoid.co.za

Spain

HAZEMEYER ESPAÑOLA S. A.
Crta. de Tiana s/n, Esq. N-2
BADALONA-BARCELONA
Tel: +34 93 389-4262, Fax: 384-3586
e-mail: heshaze@catworld.net

Sweden

skandinaviska solenoid Φ ab

Dr. Widerströms Gata 11, FRUÅNGEN
Box 42097, S-126 14 STOCKHOLM
Tel: +46 8 97 00 80, Fax: 97 87 33
e-mail: order@skansol.se

Switzerland

AWAG Elektrotechnik AG
Sandbühlstraße 2, Postfach
CH-8604 VOLKETSCHWIL
Tel: +41 1 908-1919, Fax: 1999
e-mail: info@awag.ch

Taiwan

NUWTEC ENTERPRISE Co Ltd
No. 301, Sec. 1, Nan Kang Road
TAIPEI 115, Taiwan, R. o. C.
Tel: +886 2 265-13279, Fax: 13264
e-mail: nathan.nuwtec@msa.hinet.net

Turkey

ÜNAL KARDEŞ ELEKTRİK GEREÇLERİ A. Ş.
Beşyol, Eski Londra Asfaltı-6
TR-34630 SEFAKÖY-Istanbul
Tel: +90 212 624-9204, Fax: 592-4810
e-mail: info@unal kardes.com.tr

USA

american solenoid Φ co. inc.

760 New Brunswick Road, P. O. Box 430
SOMERSET, NJ 08873
Tel: +1 732 560-1240, Fax: 8823
e-mail: amsol@krausnaimer-us.com

