



# Kraus & Naimer Pty.Ltd.

## BLUE LINE switchgear

### Short Form Catalogue



FOR COMPLETE PRODUCT RANGE VISIT  
[www.krausnaimer.com.au](http://www.krausnaimer.com.au)



# Kraus & Naimer

## BLUE LINE switchgear

The development of the Blue Line rotary switch, load break switch disconnecter, contactor and motor starter product ranges is based on One Hundred years experience by Kraus & Naimer. In the Design and manufacture of electrical switchgear, Kraus and Naimer have pioneered the introduction of the cam operated rotary switch, and continues to be recognised 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 recognised for their quality and workmanship. They are supported by the world-wide sales and service organisation.

The Kraus & Naimer Registered Trademark



WORLDWIDE SYMBOL  
FOR QUALITY SWITCHGEAR



<b>Rotary Cam Switches 10A - 2400A</b>	<b>5 - 12</b>
<ul style="list-style-type: none"> <li>- Control, Instrument, Motor Switches</li> <li>- Infinite number of switch programmes</li> <li>- CA / CG / CH Switches with fingerproof terminals</li> <li>- CA / CG / CH Switches with captive plus-minus terminal screws</li> <li>- CAD Switches having self-cleaning "H" Bridge with 'cross wire' contacts</li> <li>- CHR Switches with captive terminal screws for use with ring terminals</li> <li>- Special Switches designed to any contact programme</li> </ul>	

<b>UPS Maintenance Bypass Switches</b>	<b>13</b>
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<b>Smart Switches (Available from wholesalers)</b>	<b>14 - 15</b>
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<b>Enclosed KG Main Switches 20A - 315A</b>	<b>16 - 18</b>
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- Padlockable maintenance and safety switches
- Enclosed IP 65 protection in Plastic or Stainless Steel
- 3, 4, 6 and 8 pole models available
- Enclosure cable entries top, bottom, sides and rear, or blank

<b>KG Main Switches 20A - 315A</b>	<b>16 - 18</b>
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- Padlockable main and emergency switches
- Modular frame sizes
- 3, 4, 6 and 8 pole models available
- Forced positive contact movement
- Cam operated auxiliary contacts



<b>Application Guide AS/NZS 947 - 3 3F Lockout Isolators</b>	<b>19</b>
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<b>Mains off Generator Switches Base Mount and Enclosed</b>	<b>20 - 21</b>
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<b>Optional Extras and Mounting Options</b>	<b>22 - 23</b>
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<b>Special Drive Options &amp; Enclosures</b>	<b>24 - 25</b>
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<b>Disconnectors For Photovoltaic (PV) Power Systems</b>	<b>26</b>
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<b>New Products</b>	<b>27 - 29</b>
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<b>Push Buttons, Pilot Lights</b>	<b>30 - 31</b>
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- Control and indicating devices
- 22mm IP65 / IP69K
- Fingerproof connections
- Pot drive unit

<b>Fortress - Trapped Key Interlocking Systems</b>	<b>32</b>
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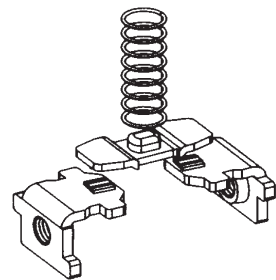
# Technical Data

Rated Operational Current								
Multi cross point contacts		1V	6V	12V	24V	48V	110V	240V
<b>CA4/CG4</b>	AC21A	-	-	-	10	10	10	10
	DC21 B	-	-	-	10	6	0.7	0.2
H-Bridge cross wire contacts								
<b>CGD4 - 1</b>	AC21A	5	2	1.2	0.7	0.45	0.25	0.15
	DC21B	3	1.2	0.7	0.4	0.25	0.13	0.08
<b>CAD11</b>	AC21A	5	3	2	1	0.8	0.4	0.2
	DC21B	4	2.5	1.5	0.8	0.3	0.2	0.1
<b>CAD12</b>	AC21A	-	5	5	5	4	3	2
	DC21B	-	4	3	2.2	1.2	0.6	0.3

## Special Contact Systems

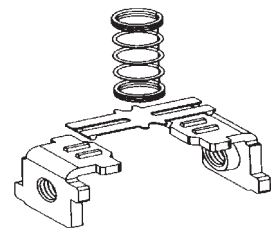
### CA4/CG4 (0,5 μm)

A high contact reliability is achieved by the use of multiple crosspoint contacts, having a fourpoint contact face to minimise contact resistance. Terminals on the CA series are accessible from both sides, and the terminals on the CG series are accessible from the rear. Both switches have finger proof terminals. These are the smallest cam switch 30mm sq.



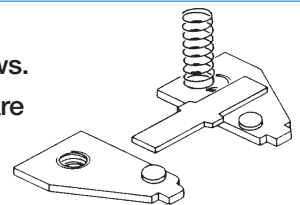
### CAD11/CAD12 / CGD4 - 1

H-bridge cross wire contact system. The moving contact is made of spring type material to absorb possible contact bounce. These corrosive resistant contacts are capable of operating on systems voltages as low as 1 volt. CAD11 = Gold contacts. CAD12 = Silver contacts. Both switches have screw driver guides, finger proof terminals and captive plus-minus terminal screws capable of accepting two variant cable sizes.



### C/CA

Switches C/CA have finger proof terminals and captive plus-minus terminal screws. Each stage contains two rigid, double-break silver alloy contacts. The terminals are accessible from both sides. Ranging from 20 ~ 315 amperes these switches will accept a wide range of "optional extras".

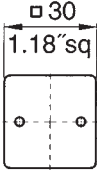
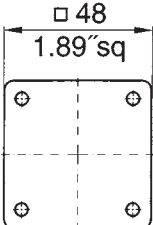
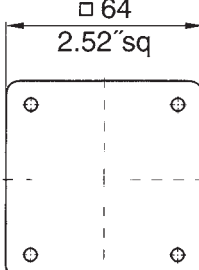
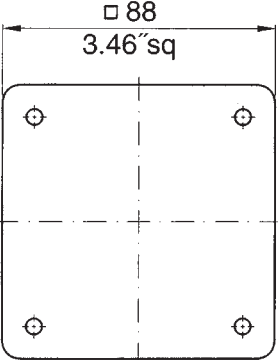
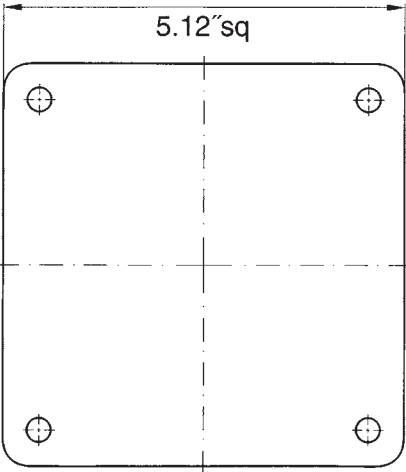


**KG/KH Switches:** This durable switch line possesses high short circuit withstand capabilities, with positive movement during both making and breaking functions. The KG/KH range of isolators and changeover switches exhibit excellent AC-3 and AC-23 making and breaking capabilities.

This 'Short Form' catalogue illustrates only a small selection of the KRAUS & NAIMER switches. Other switches available are:- A11, A14, AD11, AD12, CH10 ~ CHR16B, DH, DHR, DK, DKR, L350 ~ L1251, X200 ~ X630. Additional information available on request.

# Rotary Cam Switches

# Rated Values

Escutcheon Plate Dimensions Note: for drilling details refer to pages 34 & 35		TYPE	According to IEC 60947-3/VDE 0660, part 107					
			Cable mm <sup>2</sup>	Nominal Voltage U <sub>i</sub> v	Thermal Current I <sub>u</sub> /I <sub>th</sub> A	Motor Rating 3 x 380 V - 440 V AC-23A    AC-3 kW            kW		
<b>S00</b>		<b>CA4</b>	2 x 1.5	440	10	3            2.2		
		<b>CG4</b>	2 x 1.5	440	10	3            2.2		
<b>S0</b>		<b>CG 8</b>	2 x 2.5	690	20	7.5            5.5		
		<b>CA10</b>	2 x 2.5	690	20	7.5            5.5		
		<b>CA20</b>	2 X 4	690	25	11            7.5		
		<b>CA25</b>	2 x 6	690	32	15            11		
		<b>CH10</b>	2 x 4	690	20	7.5            5.5		
		<b>CH16</b>	2 x 4	690	25	11            7.5		
<b>S1</b>		<b>CA10B</b>	2 x 2.5	690	20	7.5            5.5		
		<b>CA20B</b>	2 x 4	690	25	11            7.5		
		<b>CA25B</b>	2 x 6	690	32	15            11		
		<b>CA40</b>	1 x 16	690	40	18.5            15		
		<b>CA50</b>	1 x 16	690	50	22            18.5		
		<b>CA63</b>	1 x 16	690	63	30            18.5		
		<b>C26</b>	2 x 6	690	32	15            11		
		<b>C32</b>	2 x 10	690	50	22            15		
		<b>C42</b>	2 x 16	690	63	30            18.5		
		<b>CHR10B</b>	Ring	690	20	7.5            5.5		
<b>S2</b>		<b>CHR20B</b>	Ring	690	25	11            7.5		
		<b>C43</b>	2 x 16	690	63	30            18.5		
		<b>C80</b>	35	690	115	45            30		
		<b>C125</b>	70	690	150	75            37		
		<b>C200-4</b>	M8	690	200	75            37		
		<b>S3</b>		<b>C315</b>	M12	690	315	132            55
				<b>C316</b>	M12	1000	315	132            55
				<b>L400</b>	M12	690	500	132            55
<b>L600</b>	M16			690	800*	132            55		
<b>L800</b>	M16			690	1100*	132            55		
<b>L1200</b>	M16			690	1450*	132            55		
<b>L1600</b>	2 X M16			690	1900*	132            55		
<b>L2000</b>	2 X M16	690	2400*	132            55				

For further technical details, refer to Catalogue 100 and 120.  
Gold contacts and quick connects see Catalogue 100 P4.

\* MAX AMBIENT TEMP, 35°C

# Rotary Cam Switches - Panel Mounting

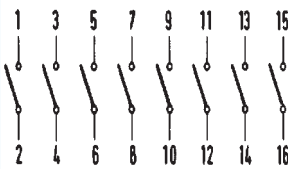
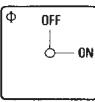
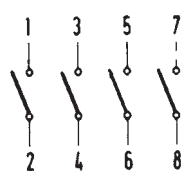
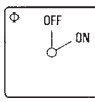


CG4 A290 FS2




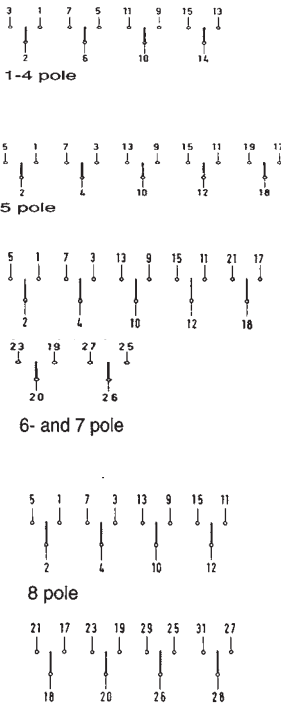

CA10 A291 E

Selection Data		IEC 60947-3, EN 60947, VDE 0660		CG 4	CG 8 CH 10 CA 10	CA20	C26	C32	
				CA 4	CA 10	CA20B	CA25	CA 40	CA 50
Rated Thermal Current		$I_U = I_{th}$	A	10	20	25	32	40	50
Rated Category	3 x 380 V/440 V	AC-23A	kW	3	7.5	11	15	18.5	22
				C 42 CA 63	C 80	C125	C200-4	C315	L400
Rated Thermal Current		$I_U = I_{th}$	A	63	115	150	200	315	500
Rated Category	3 x 380 V/440 V	AC-23A	kW	30	45	75	75	132	132

Function	Front Plate	Code No.	No. of Stages	Code No.	No. of Stages
<b>OFF / ON Switches</b> <b>90° Switching</b>  Waterproof switches to IP 65 available in E24 Mounting - no additional price    1 - 8 Pole		<b>1 Pole</b>		<b>2 Pole</b>	
		CG 4 A290-621 E	1	CG 4 A291-621 E	1
		CA 10 A290-621 E	1	CA 10 A291-621 E	1
		CH 10 A290-621 E	1	CH 10 A291-621 E	1
		CA20 A290-621 E	1	CA20 A291-621 E	1
		CA25 A290-621 E	1	CA25 A291-621 E	1
		CA40/C26 A290-621 E	1	CA40/C26 A291-621 E	1
		CA50/C32 A290-621 E	1	CA50/C32 A291-621 E	1
		CA63/C42 A290-621 E	1	CA63/C42 A291-621 E	1
		C80 A290-621 E	1	C80 A291-621 E	1
		C125 A290-621 E	1	C125 A291-621 E	1
		C200-4 A290-621 E	1	C200-4 A291-621 E	1
		C315 A290-621 E	1	C315 A291-621 E	1
		<b>3 Pole</b>		<b>4 Pole</b>	
		CG 4 A292-621 E	2	CG 4 A324-621 E	2
		CA10 A292-621 E	2	CA10 A324-621 E	2
		CH10 A292-621 E	2	CH10 A324-621 E	2
		CA20 A292-621 E	2	CA20 A324-621 E	2
		CA25 A292-621 E	2	CA25 A324-621 E	2
		CA40/C26 A292-621 E	2	CA40/C26 A324-621 E	2
		CA50/C32 A292-621 E	2	CA50/C32 A324-621 E	2
		CA63/C42 A292-621 E	2	CA63/C42 A324-621 E	2
		C80 A292-621 E	2	C80 A324-621 E	2
		C125 A292-621 E	2	C125 A324-621 E	2
		C200-4 A292-621 E	2	C200-4 A324-621 E	2
		C315 A292-621 E	2	C315 A324-621 E	2
		<b>6 Pole</b>		<b>8 Pole - 60°</b>	
		CG 4 A326-621 E	3	CG 4 A344-620 E	4
		CA10 A326-621 E	3	CA10 A344-620 E	4
		CH10 A326-621 E	3	CH10 A344-620 E	4
		CA20 A326-621 E	3	CA20 A344-620 E	4
		CA25 A326-621 E	3	CA25 A344-620 E	4
		CA40/C26 A326-621 E	3	CA40/C26 A344-621 E	4
		CA50/C32 A326-621 E	3	CA50/C32 A344-621 E	4
		CA63/C42 A326-621 E	3	CA63/C42 A344-621 E	4
		C80 A326-621 E	3	C80 A344-620 E	4
		C125 A326-621 E	3	C125 A344-620 E	4
		C200-4 A326-621 E	3	C200-4 A344-620 E	4
		C315 A326-621 E	3	C315 A344-620 E	4
<b>OFF / ON Switches</b> <b>60° Switching</b>    1 - 4 Pole		<b>1 Pole</b>		<b>3 Pole</b>	
		CG 4 A200-620 E	1	CG 4 A202-620 E	2
		CA 10 A200-620 E	1	CA 10 A202-620 E	2
		CH 10 A200-620 E	1	CH 10 A202-620 E	2
		CA20 A200-620 E	1	CA20 A202-620 E	2
		CA25 A200-620 E	1	CA25 A202-620 E	2
		CA40/C26 A200-620 E	1	CA40/C26 A202-620 E	2
		CA50/C32 A200-620 E	1	CA50/C32 A202-620 E	2
		CA63/C42 A200-620 E	1	CA63/C42 A202-620 E	2
		C80 A200-620 E	1	C80 A202-620 E	2
		C125 A200-620 E	1	C125 A202-620 E	2
		C200-4 A200-620 E	1	C200-4 A202-620 E	2
		C315 A200-620 E	1	C315 A202-620 E	2

## Rotary Cam Switches - Panel Mounting

	<b>Selection Data</b>	IEC 60947-3, EN 60947, VDE 0660	CG 4 CA 4	CG 8 CH 10 CA 10	CA20 CA20B	C26 CA25	CA 40	C32 CA 50	
	Rated Thermal Current	$I_U = I_{th}$	A	10	20	25	32	40	50
Rated Category	3 x 380 V/440 V	AC-23A	kW	3	7.5	11	15	18.5	22
Rated Thermal Current	$I_U = I_{th}$	A	C 42 CA 63	C 80	C125	C200-4	C315	L400	
Rated Category	3 x 380 V/440 V	AC-23A	kW	30	45	75	75	132	132

Function	Front Plate	Code No.	No of Stages	Code No.	No. of Stages
		<b>1 Pole</b>		<b>2 Pole</b>	
		CG4 A210 - 620 E	1	CG4 A211 - 620 E	2
		CA10 A210 - 620 E	1	CA10 A211 - 620 E	2
		CH10 A210 - 620 E	1	CH10 A211 - 620 E	2
		CA20 A210 - 620 E	1	CA20 A211 - 620 E	2
		CA25 A210 - 620 E	1	CA25 A211 - 620 E	2
		CA40/C26 A210 - 620 E	1	CA40/C26 A211 - 620 E	2
		CA50/C32 A210 - 620 E	1	CA50/C32 A211 - 620 E	2
		CA63/C42 A210 - 620 E	1	CA63/C42 A211 - 620 E	2
		C80 A210 - 620 E	1	C80 A211 - 620 E	2
		C125 A210 - 620 E	1	C125 A211 - 620 E	2
		C200-4 A210 - 620 E	1	C200-4 A211 - 620 E	2
		C315 A210 - 620 E	1	C315 A211 - 620 E	2
		<b>3 Pole</b>		<b>4 Pole<sup>(1)</sup></b>	
		CG4 A212 - 620 E	3	CG4 A213 - 620 E	4
		CA10 A212 - 620 E	3	CA10 A213 - 620 E	4
		CH10 A212 - 620 E	3	CH10 A213 - 620 E	4
		CA20 A212 - 620 E	3	CA20 A213 - 620 E	4
		CA25 A212 - 620 E	3	CA25 A213 - 620 E	4
		CA40/C26 A212 - 620 E	3	CA40/C26 A213 - 620 E	4
CA50/C32 A212 - 620 E	3	CA50/C32 A213 - 620 E	4		
CA63/C42 A212 - 620 E	3	CA63/C42 A213 - 620 E	4		
C80 A212 - 620 E	3	C80 A213 - 620 E	4		
C125 A212 - 620 E	3	C125 A213 - 620 E	4		
C200-4 A212 - 620 E	3	C200-4 A213 - 620 E	4		
C315 A212 - 620 E	3	C315 A213 - 620 E	4		
<b>6 Pole</b>		<b>8 Pole</b>			
CA10 A362 - 620 E	6	CA10 WAA364 - 620 E	8		

### Gang Switches - Sequence Switching

Function	Code No.	Function	Code No.
OFF / A / A + B 60° Switching	1 Pole	OFF / A / A + B 60° Switching	3 Pole
	CA10 A310 - 620 E		CA10 WAA314 - 620 E
OFF / A / A + B 60° Switching	2 Pole	OFF / A / A + B/ A+B+C 30° Switching	Without Bridges
	CA10 A312 - 620 E		CA10 A311 - 620 E


## Special Application


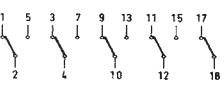

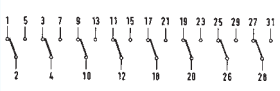
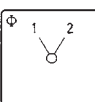
Ship To Shore, UPS Bypass<sup>(2)</sup>, Series Parallel, Special Meter,  
For further information, contact your nearest KRAUS & NAIMER stockist.

(1) If Preclosing 4th Pole Required Change A213 To A663

(2) UPS Bypass Switches, see p13

# Rotary Cam Switches - Panel Mounting

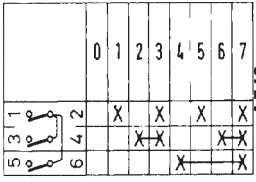
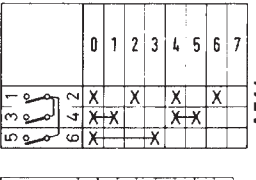
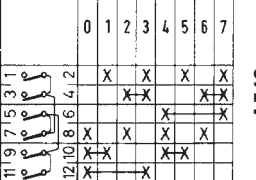
 <p><b>KG Switch</b> See P17~ P20</p> <p><b>CA10 A220 E</b></p>	<b>Selection Data</b>	IEC 60947-3, EN 60947, VDE 0660	CG 4	CG 8 CH 10	CA20	C26	C32		
			CA 4	CA 10	CA20B	CA25	CA 40	CA 50	
	Rated Thermal Current	$I_U = I_{th}$	A	10	20	25	32	40	50
	Rated Category	3 x 380 V/440 V	AC-23A	kW	3	7.5	11	15	18.5
			C 42 CA 63	C 80	C125	C200-4	C315	L400	
Rated Thermal Current	$I_U = I_{th}$	A	63	115	150	200	315	500	
Rated Category	3 x 380 V/440 V	AC-23A	kW	30	45	75	75	132	132

Function	Front Plate	Code No.	No of Stages	Code No.	No. of Stages
<b>Changeover Switches without Centre "OFF" 60° Switching</b>   <p>1-4 pole</p>  <p>5 pole</p>  <p>6- and 7 pole</p>  <p>8 Pole</p>		<b>1 Pole</b>		<b>2 Pole</b>	
		CG4 A220 - 600 E	1	CG4 A221 - 600 E	2
		CA10 A220 - 600 E	1	CA10 A221 - 600 E	2
		CH10 A220 - 600 E	1	CH10 A221 - 600 E	2
		CA20 A220 - 600 E	1	CA20 A221 - 600 E	2
		CA25 A220 - 600 E	1	CA25 A221 - 600 E	2
		CA40/C26 A220 - 600 E	1	CA40/C26 A221 - 600 E	2
		CA50/C32 A220 - 600 E	1	CA50/C32 A221 - 600 E	2
		CA63/C42 A220 - 600 E	1	CA63/C42 A221 - 600 E	2
		C80 A220 - 600 E	1	C80 A221 - 600 E	2
		C125 A220 - 600 E	1	C125 A221 - 600 E	2
		C200-4 A220 - 600 E	1	C200-4 A221 - 600 E	2
		C315 A220 - 600 E	1	C315 A221 - 600 E	2
		<b>3 Pole</b>		<b>4 Pole (1)</b>	
		CG4 A222 - 600 E	3	CG4 A223 - 600 E	4
		CA10 A222 - 600 E	3	CA10 A223 - 600 E	4
		CH10 A222 - 600 E	3	CH10 A223 - 600 E	4
		CA20 A222 - 600 E	3	CA20 A223 - 600 E	4
		CA25 A222 - 600 E	3	CA25 A223 - 600 E	4
		CA40/C26 A222 - 600 E	3	CA40/C26 A223 - 600 E	4
		CA50/C32 A222 - 600 E	3	CA50/C32 A223 - 600 E	4
		CA63/C42 A222 - 600 E	3	CA63/C42 A223 - 600 E	4
		C80 A222 - 600 E	3	C80 A223 - 600 E	4
		C125 A222 - 600 E	3	C125 A223 - 600 E	4
C200-4 A222 - 600 E	3	C200-4 A223 - 600 E	4		
C315 A222 - 600 E	3	C315 A223 - 600 E	4		
<b>6 Pole</b>		<b>8 Pole</b>			
CA10 A370-600 E	6	CA10 A372-600 E	8		

**Binary Coded Decimal Switches - from 1 Volt. For PLC and Electronic Applications.**

Additional positions and combinations available on request.


CG4-1 = Gold Plated Contact POA  
CAD11 = Gold Wiping H-bridge Contacts  
CAD12 = Silver Wiping H-bridge Contacts

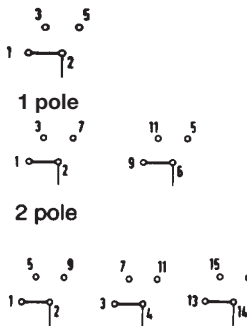

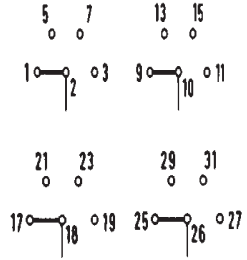

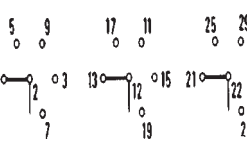

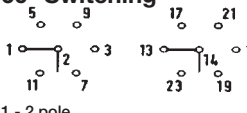
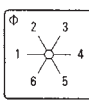
Front Plate	Code No.	No of Stages	Code No.	No of Stages
 <p><b>A540</b></p>  <p><b>A541</b></p>  <p><b>A542</b></p>	<b>0-7 Binary</b>		<b>0-11 Binary</b>	
	CAD11 A540 - 600 E	2	CAD11 A543 - 600 E	2
	CAD12 A540 - 600 E	2	CAD12 A543 - 600 E	2
	<b>0-7 Complement</b>		<b>0-9 Binary</b>	
	CAD11 A541 - 600 E	2	CAD11 A550 - 600 E	2
	CAD12 A541 - 600 E	2	CAD12 A550 - 600 E	2
	<b>0-7 + Complement</b>		<b>0-9 Complement</b>	
	CAD11 WAA542 - 600 E	3	CAD11 A551 - 600 E	2
	CAD12 WAA542 - 600 E	3	CAD12 A551 - 600 E	2

(1) If Preclosing 4th Pole Required Change A223 To A673





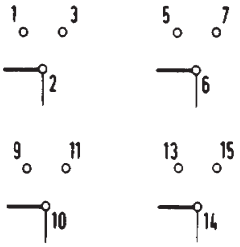
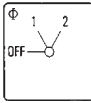
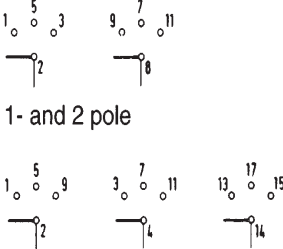

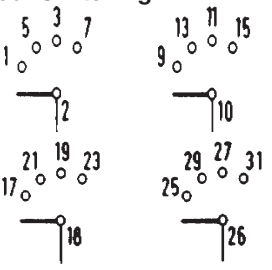

# Rotary Cam Switches - Panel Mounting

 <p>CG4 A230 FS2      CA10 A251 E</p>	<b>Selection Data</b> IEC 60947-3, EN 60947, VDE 0660		CG 4	CG 8	CA20	C26	C32		
			CA 4	CH 10	CA20B	CA25	CA 40	CA 50	
	Rated Thermal Current	$I_U = I_{th}$	A	10	20	25	32	40	50
	Rated Category	3 x 380 V/440 V	AC-23A	kW	3	7.5	11	15	18.5
			C 42	C 80	C125	C200-4	C315	L400	
Rated Thermal Current	$I_U = I_{th}$	A	CA 63	63	115	150	200	315	500
Rated Category	3 x 380 V/440 V	AC-23A	kW	30	45	75	75	132	132

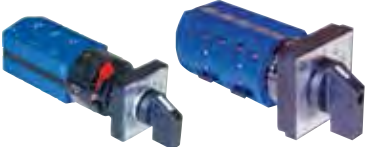
Function	Front Plate	Code No.	No. of Stages	Code No.	No. of Stages
<b>3 Step Switches without "OFF" 60° Switching</b>  1 pole 2 pole 3 pole 1 - 3 Pole Drawing for 4 - 6 Pole on Request		<b>1 Pole</b>		<b>2 Pole</b>	
		CG 4 A230 - 600 E	2	CG 4 A250 - 600 E	3
		CA10 A230 - 600 E	2	CA10 A250 - 600 E	3
		CH10 A230 - 600 E	2	CH10 A250 - 600 E	3
		CA20 A230 - 600 E	2	CA20 A250 - 600 E	3
		<b>3 Pole</b>		<b>4 Pole</b>	
		CG 4 A270 - 600 E	5	CG 4 A476 - 600 E	6
		CA10 A270 - 600 E	5	CA10 A476 - 600 E	6
		CH10 A270 - 600 E	5	CH10 A476 - 600 E	6
		CA20 A270 - 600 E	5	CA20 A476 - 600 E	6
<b>5 Pole</b>		<b>6 Pole</b>			
CA10 WAA484 - 600 E	8	CA10 WAA489 - 600 E	9		
<b>4 Step Switches without "OFF" 60° Switching</b>  1 - 4 Pole		<b>1 Pole</b>		<b>2 Pole</b>	
		CG 4 A231 - 600 E	2	CG 4 A251 - 600 E	4
		CA10 A231 - 600 E	2	CA10 A251 - 600 E	4
		CH10 A231 - 600 E	2	CH10 A251 - 600 E	4
		CA20 A231 - 600 E	2	CA20 A251 - 600 E	4
		<b>3 Pole</b>		<b>4 Pole</b>	
		CG 4 A271 - 600 E	6	CG 4 A477 - 600 E	8
		CA10 A271 - 600 E	6	CA10 A477 - 600 E	8
		CH10 A271 - 600 E	6	CH10 A477 - 600 E	8
		CA20 A271 - 600 E	6	CA20 A477 - 600 E	8
<b>5 Step Switches without "OFF" 60° Switching</b>  1 - 3 Pole		<b>1 Pole</b>		<b>2 Pole</b>	
		CG 4 A232 - 600 E	3	CG 4 A252 - 600 E	5
		CA10 A232 - 600 E	3	CA10 A252 - 600 E	5
		CH10 A232 - 600 E	3	CH10 A252 - 600 E	5
		CA20 A232 - 600 E	3	CA20 A252 - 600 E	5
		<b>3 Pole</b>		Refer to catalogue or enquire for details on additional 'standard' switches.	
		CG 4 WAA272 - 600 E	8		
		CA10 WAA272 - 600 E	8		
		CH10 WAA272 - 600 E	8		
		CA20 WAA272 - 600 E	8		
	8				
<b>6 Step Switches without "OFF" 60° Switching</b>  1 - 2 pole		<b>1 Pole</b>		<b>2 Pole</b>	
		CG 4 A233 - 600 E	3	CG 4 WAA253 - 600 E	6
		CA10 A233 - 600 E	3	CA10 WAA253 - 600 E	6
		CH10 A233 - 600 E	3	CH10 WAA253 - 600 E	6
		CA20 A233 - 600 E	3	CA20 WAA253 - 600 E	6
			3		6

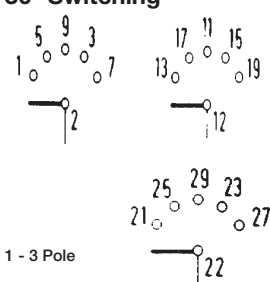

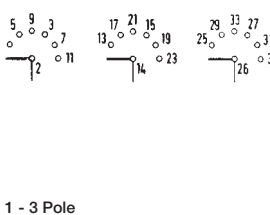

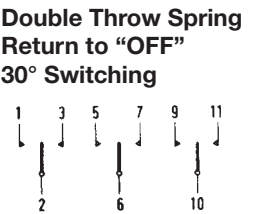

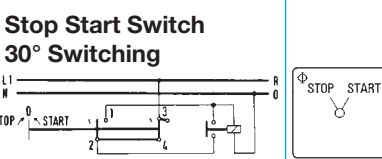

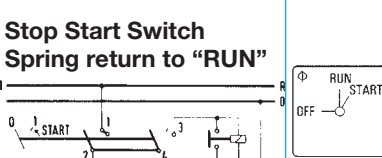

# Rotary Cam Switches - Panel Mounting

 <p>CG4 A240 FS2    CA10 A280 E</p>	<b>Selection Data</b> IEC 60947-3, EN 60947, VDE 0660			CG 4	CG 8	CA20	C26	C32		
				CA 4	CH 10	CA20B	CA25	CA 40	CA 50	
	Rated Thermal Current	$I_U = I_{th}$	A	10	20	25	32	40	50	
	Rated Category	3 x 380 V/440 V	AC-23A	kW	3	7.5	11	15	18.5	22
				C 42	C 80	C125	C200-4	C315	L400	
				CA 63	63	115	150	200	315	500
Rated Thermal Current	$I_U = I_{th}$	A	A	30	45	75	75	132	132	
Rated Category	3 x 380 V/440 V	AC-23A	kW							


Function	Front Plate	Code No.	No. of Stages	Code No.	No. of Stages
<b>6 Step Switches cont.</b>  3 Pole		<b>3 Pole</b>		Refer to catalogue or enquire for details on additional 'standard' switches.	
		CA10 WAA273-600 E CH10 WAA273-600 E CA20 WAA273-600 E	9		
			9		
<b>2 Step Switches with "OFF"</b> <b>60° Switching</b>    1 - 4 Pole		<b>1 Pole</b>		<b>2 Pole</b>	
		CG 4 A240 - 620 E CA10 A240 - 620 E CH10 A240 - 620 E CA20 A240 - 620 E	1	CG 4 A260 - 620 E CA10 A260 - 620 E CH10 A260 - 620 E CA20 A260 - 620 E	2
			1		2
			1		2
			1		2
			1		2
		<b>3 Pole</b>		<b>4 Pole</b>	
		CG 4 A280 - 620 E CA10 A280 - 620 E CH10 A280 - 620 E CA20 A280 - 620 E	3	CG 4 WAA480 - 620 E CA10 WAA480 - 620 E CH10 WAA480 - 620 E CA20 WAA480 - 620 E	4
			3		4
			3		4
			3		4
<b>3 Step Switches with "OFF"</b> <b>45° Switching</b>    1- and 2 pole  1 - 3 Pole 4 Pole Drawing on Request		<b>1 Pole</b>		<b>2 Pole</b>	
		CG 4 A241 - 620 E CA10 A241 - 620 E CH10 A241 - 620 E CA20 A241 - 620 E	2	CG 4 A261 - 620 E CA10 A261 - 620 E CH10 A261 - 620 E CA20 A261 - 620 E	3
			2		3
			2		3
			2		3
			2		3
		<b>3 Pole</b>		<b>4 Pole</b>	
		CG 4 A281 - 620 E CA10 A281 - 620 E CH10 A281 - 620 E CA20 A281 - 620 E	5	CG 4 WAA481 - 620 E CA10 WAA481 - 620 E CH10 WAA481 - 620 E CA20 WAA481 - 620 E	6
			5		6
			5		6
			5		6
<b>4 Step Switches with "OFF"</b> <b>30° Switching</b>    1 - 4 Pole		<b>1 Pole</b>		<b>2 Pole</b>	
		CG 4 A242 - 620 E CA10 A242 - 620 E CH10 A242 - 620 E CA20 A242 - 620 E	2	CG 4 WAA262 - 620 E CA10 WAA262 - 620 E CH10 WAA262 - 620 E CA20 WAA262 - 620 E	4
			2		4
			2		4
			2		4
			2		4
		<b>3 Pole</b>		<b>4 Pole</b>	
		CG 4 WAA282 - 620 E CA10 WAA282 - 620 E CH10 WAA282 - 620 E CA20 WAA282 - 620 E	6	CG 4 WAA482 - 620 E CA10 WAA482 - 620 E CH10 WAA482 - 620 E CA20 WAA482 - 620 E	8
			6		8
			6		8
			6		8
This catalogue lists some of the many common 'Standard Switches' available. For additional selection refer to catalogue 100 or enquire.					


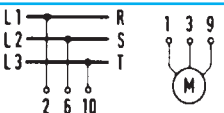
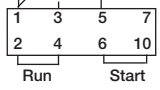
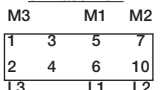

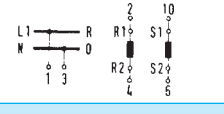

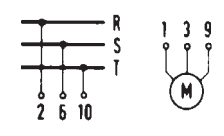
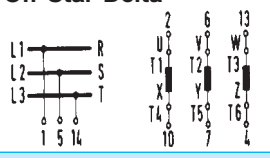
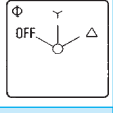
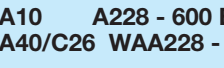
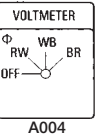
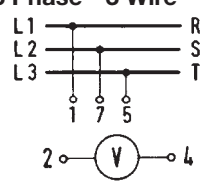
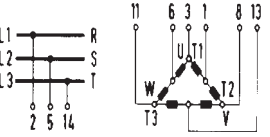
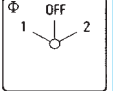
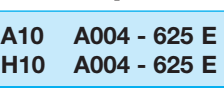
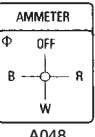
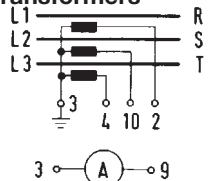
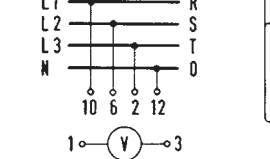
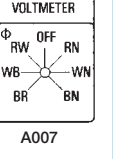
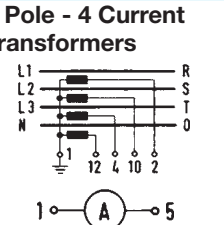
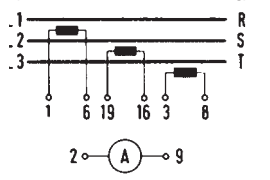
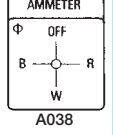
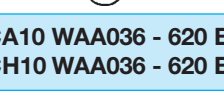
# Rotary Cam Switches - Panel Mounting

 <p>CG4 A244 FS2    CA10 A263 E-V</p>	<b>Selection Data</b> IEC 60947-3, EN 60947, VDE 0660		CG 4	CG 8	CA20	C26	C32		
			CA 4	CH 10	CA20B	CA25	CA 40	CA 50	
	Rated Thermal Current	$I_U = I_{th}$	A	10	20	25	32	40	50
	Rated Category	3 x 380 V/440 V	AC-23A	kW	3	7.5	11	15	18.5
			C 42	C 80	C125	C200-4	C315	L400	
			CA 63	63	115	150	200	315	500
Rated Thermal Current	$I_U = I_{th}$	A	30	45	75	75	132	132	
Rated Category	3 x 380 V/440 V	AC-23A	kW	30	45	75	75	132	132

Function	Front Plate	Code No.	No. of Stages	Code No.	No. of Stages
<b>5 Step Switches with "OFF" 30° Switching</b>  <p>1 - 3 Pole</p>		<b>1 Pole</b>	3	<b>2 Pole</b>	5
		CG 4 A243 - 620 E		CG 4 WAA263 - 600 E	
		CA10 A243 - 620 E		CA10 WAA263 - 600 E	
		CH10 A243 - 620 E		CH10 WAA263 - 600 E	
		CA20 A243 - 620 E	CA20 WAA263 - 600 E		
		<b>3 Pole</b>	8	Refer to catalogue or enquire for details on additional 'standard' switches.	5
		CG 4 WAA283 - 620 E			
		CA10 WAA283 - 620 E			
		CH10 WAA283 - 620 E			
		CA20 WAA283 - 620 E			
<b>6 Step Switches with "OFF" 30° Switching</b>  <p>1 - 3 Pole</p>		<b>1 Pole</b>	3	<b>2 Pole</b>	6
		CG 4 A244 - 620 E		CG 4 WAA264 - 620 E	
		CA10 A244 - 620 E		CA10 WAA264 - 620 E	
		CH10 A244 - 620 E		CH10 WAA264 - 620 E	
		CA20 A244 - 620 E	CA20 WAA264 - 620 E		
		<b>3 Pole</b>	9	Refer to catalogue or enquire for details on additional 'standard' switches.	6
		CA10 WAA284 - 620 E			
		CH10 WAA284 - 620 E			
		CA20 WAA284 - 620 E			
<b>Double Throw Spring Return to "OFF" 30° Switching</b>  <p>1 - 3 Pole</p>		<b>1 Pole</b>	1	<b>2 Pole</b>	2
		CA10 A214 - 620 E		CA10 A215 - 620 E	
		CH10 A214 - 620 E		CH10 A215 - 620 E	
		<b>3 Pole</b>	3	Refer to catalogue or enquire for details on additional 'standard' switches.	2
		CA10 A216 - 620 E			
		CH10 A216 - 620 E			
<b>Stop Start Switch 30° Switching</b> 		<b>1 Pole</b>	1	<b>2 Pole</b>	2
		CA10 A176 - 600 E		CA10 WAA183 - 600 E	
		CH10 A176 - 600 E	CH10 WAA183 - 600 E		
<b>Stop Start Switch Spring return to "RUN"</b> 		<b>1 Pole</b>	1	Refer to catalogue or enquire for details on additional 'standard' switches.	
		CA10 A178 - 620 E			

# Rotary Cam Switches - Panel Mounting

 <p>CA10 AU9Y96-600FT2</p>	<b>Selection Data</b> IEC 60947-3, EN 60947, VDE 0660			CG 4	CG 8 CH 10	CA20	C26	C32	
				CA 4	CA 10	CA20B	CA25	CA 40	CA 50
	Rated Thermal Current	$I_U = I_{th}$	A	10	20	25	32	40	50
	Rated Category	3 x 380 V/440 V	AC-23A	kW	3	7.5	11	15	18.5
				C 42 CA 63	C 80	C125	C200-4	C315	L400
Rated Thermal Current	$I_U = I_{th}$	A		63	115	150	200	315	500
Rated Category	3 x 380 V/440 V	AC-23A	kW	30	45	75	75	132	132

Function	Front Plate	Code No.	No. of Stages	Code No.	No. of Stages		
<b>Motor Reversing</b> 3 Phase 60° Switching		 <b>CA10 A401 - 620 E</b> <b>CA40/C26 A401 - 620 E</b>	3	<b>Single or Three phase</b> 90° Enclosed IP65 Single Phase Rev.  Run Start 3 Phase Rev. 			
		<b>Split Phase</b>   <b>CA10 WAA622 - 600 E</b> <b>CA20B WAA622 - 600 E</b>	3			<b>CA10C2Y096*PFAUS0001</b> <b>CA10 AU9Y96600FT20002</b>	3
<b>Motor Reversing</b> 3 Phase Spring Return		 <b>CA10 A228 - 600 E</b> <b>CA40/C26 WAA228 - 600 E</b>	3	<b>Off-Star-Delta</b>  	4		
		 <b>CA10 A410 - 620 E</b> <b>CA40/C26 A410 - 620 E</b>	3			<b>CA10 A441 - 620 E</b> <b>CA20 A441 - 620 E</b>	4
<b>Meter/Motor Switches</b>		<b>3 Phase - 3 Wire</b>  <b>CA10 A004 - 625 E</b> <b>CH10 A004 - 625 E</b>	2	<b>Δ Y Tap wound Motor</b> (2 Speed)  	4		
		 <b>CA10 A441 - 620 E</b> <b>CA20 A441 - 620 E</b>	2			<b>CA10 A441 - 620 E</b> <b>CA20 A441 - 620 E</b>	4
<b>Meter Switches</b>		<b>1 Pole - 3 Current Transformers</b>  <b>CA10 A058/AUN0180 E</b> <b>CH10 A058/AUN0180 E</b>	3	<b>3 Ph - Ph / 3 Ph - N</b>  	3		
		<b>1 Pole - 4 Current Transformers</b>  <b>CA10 WAA036 - 620 E</b> <b>CH10 WAA036 - 620 E</b>	4			<b>2 Pole - 3 Current Transformers</b> (Can be used for direct reading)  	5
		 <b>CA10 A038 - 622 E</b> <b>CA40/C26A038 - 622 E</b>	4			<b>CA10 A038 - 622 E</b> <b>CA40/C26A038 - 622 E</b>	

# UPS – Maintenance Bypass Switches

## Maintenance Bypass Switches

Kraus & Naimer Maintenance Bypass Switches are an accepted industrial standard wherever emergency power equipment is installed and maintained.

The Maintenance Bypass Switch can be utilized as a simple method of isolating a UPS without interrupting the power source. This allows servicing of the UPS with complete safety to maintenance personnel. A wide range of models has been established, while a broad selection of designer specified options is available on request.

### Options Include

Maintenance Bypass Switches are available as - Switch only, Enclosed or Enclosed wired to terminals.

1. Key interlock (V760) with auxiliaries for signal confirmation on locking/unlocking or to shut down the inverter of a UPS prior to switching to the bypass position.
2. Push button interlock with auxiliaries (V400). Switching only possible if push button is depressed, simultaneously closing or opening auxiliaries for signal confirmation to the UPS.
3. A solenoid interlock device (V140) that prevents the operation of the switch except under predetermined electrical conditions.
4. Automatic changeover switches also available.

Current rating to AC22A – 240v	amps	max. cable size	KVA ratings to AC22A – 240v	KVA
CA10B	16	2.5mm	CA10B	3.68
C26	32	6mm	C26	7.3
C42	63	16mm	C42	14
Current rating to AC22A – 415V	amps	max. cable size	KVA ratings to AC22A – 415v	KVA
CA10B	16	2.5mm	CA10B	11.5
C26	32	6mm	C26	23
C42	63	16mm	C42	45
C80	100	35mm	C80	72
C125	150	70mm	C125	107
C200-4	200	M8 95mm	C200-4	143
C315	315	M12 185mm	C315	225



Enclosed & Wired to Terminals

## Smart Switch

These devices only fit switches with the same colour identification label



Key KN14

Padlock Red/Yellow KN15

Padlock Red/Black KN25



Key KN18  
Key Removable  
Off Only



Key KN21  
Key Removable  
Both Positions

**Match the label colours** to ensure the switch body and handle, key or padlock device are compatible.

## Switch Body



Off - On

KN11 1 Pole 20 A  
KN12 2 Pole 20 A  
KN13 3 Pole 20 A  
KN27 3 Pole 32 A



Man - Off - Auto

KN16 1 Pole  
KN17 3 Pole



Man - Auto

KN19 1 Pole  
KN20 3 Pole



KN26  
Reversing Switch  
Single or 3 Phase

## Black Label - Handles and Optional Extras fit all Switches



3.2mm  
24.1mm  
22.3mm

Handle KN23




Handle KN22

IP 65 Enclosed KN24

DIN Rail Mnt KN30

## Smart Switches 22mm IP66 Protection

Amps	Description	Code
OFF - ON switch body only		
20	1 Pole	 <b>KN11</b> <b>KN12</b> <b>KN13</b>
20	2 Pole	
20	3 Pole	
MAN - OFF - AUTO switch body only		
20	1 Pole	 <b>KN16</b> <b>KN17</b>
20	3 Pole	
MAN - AUTO switch body only		
20	1 Pole	<b>KN19</b> <b>KN20</b>
20	3 Pole	
FOR - OFF - REV switch body only		
20	1 phase or 3 phase	<b>KN26</b>
FOR - OFF - REV switch enclosed - IP 66		
Padlocking Handles		
	Red / Yellow	 <b>KN15</b>
Key Operators <i>Select by Switch Function</i>		
	For OFF ON For MAN OFF AUTO For MAN AUTO	 <b>KN14</b> <b>KN18</b> <b>KN21</b>
Handle Operators (Plates are included with switch body)		
	Round bezel Standard square frame	 <b>KN22</b> <b>KN23</b>
Mounting Accessories		
	Drilled enclosure	<b>KN24</b>

	Frame Size	Type	IEC 60947-3/VDE 0660, part 107				
			Rated Values				
			Cable Size mm <sup>2</sup>	Thermal Current $I_u/I_{th}$ A	Operational Current AC-21A A	Utilization AC-23A 3 x 380 V - 440 V kW	Category AC-3 kW
S0 = 48mm x 48mm 	S0/S1	KG10A/KG10B	2.5	20	20	5.5	3.7
	S0/S1	KG20A/KG20B	6	25	25	7.5	5.5
	S0/S1	KG32A/KG32B	6	32	32	11	7.5
S1 = 64mm x 64mm 	S0/S1	KG41/KG41B	16	40	40	15	11
	S0/S1	KG64/KG64B	16	63	63	22	18.5
	S1	KG80	50	80	80	30	22
	S1	KG100	50	100	100	37	30
	S1	KG105	50	125	125	45	37
S2 = 88mm x 88mm 	S2	KG125 (Tunnel)	95				
	S2	KG126 (Lugs)	M10	125	125	45	37
	S2	KG127 (Both)	Both				
	S2	KG160 (Tunnel)	95				
	S2	KG161 (Lugs)	M10	160	160	55	45
	S2	KG162 (Both)	Both				
	S2	KG210 (Tunnel)	185				
	S2	KG211 (Lugs)	M12	200	200	75	55
	S2	KG212 (Both)	Both				
	S2	KG250 (Tunnel)	185				
S2	KG251 (Lugs)	M12	250	250	90	55	
S2	KG252 (Both)	Both					
S2	KG315 (Tunnel)	185					
S2	KG316 (Lugs)	M12	315	315	110	75	
S2	KG317 (Both)	Both					

**FOR HIGHER CURRENT RATINGS**

Please contact your nearest KRAUS & NAIMER stockist.

**IEC 60947-3 SWITCHES - DISCONNECTORS - SWITCH DISCONNECTORS**

IEC 60947 is a safety and performance standard for low voltage switchgear (up to 1000V) which has universally replaced IEC 408 and combined specific requirements of many individual national standards. IEC 60947 is a uniform standard for most countries around the world and establishes a truly global marketplace. IEC 60947-3 is a section of the standard specific to switches. Importantly, it recognises that devices for the switching function and isolating function require very different performance criteria. Switching requires high performance of current carrying parts to make and break loads under normal and overload conditions, ie., motor reversing applications. Isolation requires high insulation, sufficient spacing of current carrying parts and mechanical integrity that the handle corresponds to actual contact position for the safety of maintenance personnel.






Practicality of real life applications calls for three definitions within IEC 60947-3; Switches, Disconnectors and Switch Disconnectors. A switch does not have to satisfy the isolation and mechanical strength tests, and a disconnector likewise the load tests. A Switch Disconnector must satisfy all tests and is suitable for safety switch applications. A switch disconnector must have a direct drive late make early break auxiliary contact in series with a load breaking device to be suitable as a safety switch.

Kraus & Naimer have developed complete products which satisfy all IEC 60947 criteria, some of which are listed overleaf. For further information, please contact our offices.



# KG Main Switches - Padlockable Panel Mount, Enclosed Plastic or Stainless Steel

Selection Data			Switch Type							KG125	KG160	KG210	KG250	KG315	
IEC 60947, EN 60947, VDE 0660			KG10	KG20	KG32	KG41	KG64			KG126	KG161	KG211	KG251	KG316	
IEC 204, EN 60204, VDE 0113			KG10B	KG20B	KG32B	KG41B	KG64B	KG80	KG100	KG105	KG127	KG162	KG212	KG252	KG317
Nominal Voltage	$U_i$	V	690	690	690	690	690	690	690	690	1000 <sup>(2)</sup>	1000 <sup>(2)</sup>	1000 <sup>(2)</sup>	1000 <sup>(2)</sup>	1000 <sup>(2)</sup>
Thermal Current	$I_U / I_{th}$	A	20	25	32	40	63	80	100	125	125	160	200	250	315
Enclosed Thermal Current	$I_{the}$	A	20	25	32	40	63	80	100	125	125	160	200	250	315
Operational Current AC21A	$I_e$	A	20	25	32	40	63	80	100	125	125	160	200	250	315
Utilisation Category		kW	5,5	7,5	11	15	22	30	37	45	45	55	75	90	110

Product	Code No.		Code No.
<b>Panel Mount IP65</b> Size 0 = 48 x 48 Red / Yellow Padlock Handle - V840G/D C/W Off . On Escutcheon 	<b>Panel Mount - Lockable 3 Pole</b> KG10B K300*AU2100 E KG20B K300*AU2100 E KG32B K300*AU2100 E KG41B K300*AU2100 E KG64B K300*AU2100 E KG80 K300*AU2100 E KG100 K300*AU2100 E KG105 K300*AU2100 E KG126 K300*AU2100 E KG161 K300*AU2100 E KG211 K300*AU2100 E KG251 K300*AU2100 E KG316 K300*AU2100 E	<b>Plastic Enclosure IP65</b> Red / Yellow Padlock Handle - V840G 	<b>Enclosed - Plastic - Lockable 3 Pole</b> KG20A T203/AU1902 PFE1 KG32A T203/AU1902 PFE1 KG41 K302-PFE1 AUS0001 KG41 K302*AU0162*KL12 KG64 K302-PFE1 AUS0001 KG64 K302*AU0162*KL12 KG80 K302*AU0163*KL12 KG100 K302*AU0163*KL12 KG126 K302*AU0760*6FE KG161 K302*AU0760*6FE KG211 K302*AU0171*6FE KG251 K302*AU0171*6FE KG316 K302*AU0171*6FE
	<b>Panel Mount - Lockable 3 Pole .</b> KG10B K302*AU2100 E KG20B K302*AU2100 E KG32B K302*AU2100 E KG41B K302*AU2100 E KG64B K302*AU2100 E KG80 K302*AU2100 E KG100 K302*AU2100 E KG105 K302*AU2100 E KG126 K302*AU2100 E KG161 K302*AU2100 E KG211 K302*AU2100 E KG251 K302*AU2100 E KG316 K302*AU2100 E		<b>Enclosed - Plastic - Lockable 3 Pole</b> KG20B K302*AU0160*KL12 KG32B K302*AU0160*KL12 KG41B K302*AU0152*KL12 KG64B K302*AU0152*KL12 KG80 K302*AU0153*6FE KG100 K302*AU0153*6FE KG126 K302*AU0761*6FE KG161 K302*AU0761*6FE KG211 K302*AU0172*6AE <sup>metal</sup> KG251 K302*AU0172*6AE <sup>metal</sup> KG316 K302*AU0172*6AE <sup>metal</sup>
<b>Panel Mount IP65</b> Size 1 = 64 x 64 Red / Yellow Padlock Handle - V840G/D C/W Off . On Escutcheon 	<b>Panel Mount - Lockable 4 Pole</b> KG10B K400*AU2100 E KG20B K400*AU2100 E KG32B K400*AU2100 E KG41B K400*AU2100 E KG64B K400*AU2100 E KG80 K400*AU2100 E KG100 K400*AU2100 E KG105 K400*AU2100 E KG126 K400*AU2100 E KG161 K400*AU2100 E KG211 K400*AU2100 E KG251 K400*AU2100 E KG316 K400*AU2100 E	<b>Plastic Enclosure IP65</b> Red / Yellow Padlock Handle - V845 	<b>Enclosed - Plastic - Lockable 3 Pole C/O with centre OFF</b> KG20B K900*AU0157*KL12 KG32B K900*AU0157*KL12 KG41B K900*AU0158*KL12 KG64B K900*AU0158*KL12 KG80 K900*AU0159*6FE KG100 K900*AU0159*6FE
	<b>Enclosed - Lockable Stainless Steel 3 Pole</b> KG20A K302*AUN0478*6SS0 KG32A K302*AUN0478*6SS0 KG41B K302*AUN0479*6SS1 KG64B K302*AUN0479*6SS1 KG80 K302*AUN0479*6SS1 KG100 K302*AUN0479*6SS1 KG125 K302*AUN0480*6SS2 KG161 K302*AUN0480*6SS2 Variations on request:- Stop/Start Pushbuttons. Control & Changeover Switches. Selection of auxiliary contacts.		<b>Enclosed - Lockable Stainless Steel 3 pole</b> KG41B K302*AU1150*6SH1 KG64B K302*AU1150*6SH1 KG80 K302*AU1148*6SH1 KG100 K302*AU1148*6SH1 KG125 K302*AU1145*6SH2 KG161 K302*AU1145*6SH2 KG211 K302*AU1151*6SH3 KG251 K302*AU1151*6SH3 KG316 K302*AU1151*6SH3
<b>Stainless Steel Enclosure IP65</b> 			<b>Stainless Steel Enclosures. . .</b> Marine Grade 316 IP65 N/O contact late make early break. Finish:- Bead Blast or Food Industry.(FI) Available on request:- Integrated Rain Hood. Hinged Door. Mounting Flanges Stainless Steel Padlock Device

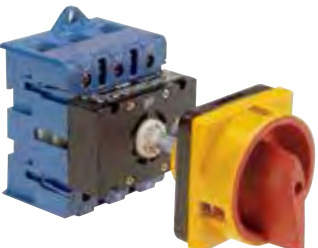


(1) 4 Pole changeover enclosed. Refer page 20.

For Panel and Base mount 4 Pole changeover Refer to page 20.

(2) Suitable for no load switching (AC-20A) above 690v.

# KG Main Switches - Base Mounted Padlockable with Extension Shafts

Selection Data		Switch Type								KG125	KG160	KG210	KG250	KG315
		KG10	KG20	KG32	KG41	KG64	KG126	KG161	KG211	KG251	KG316			
IEC 60947-3, EN 60947, VDE 0660		KG10B	KG20B	KG32B	KG41B	KG64B	KG80	KG100	KG105	KG127	KG162	KG212	KG252	KG317
Nominal Voltage	$U_i$	V	690	690	690	690	690	690	690	1000 <sup>(1)</sup>	1000 <sup>(1)</sup>	1000 <sup>(1)</sup>	1000 <sup>(1)</sup>	1000 <sup>(1)</sup>
Thermal Current	$I_U / I_{In}$	A	20	25	32	40	63	80	100	125	160	200	250	315
Enclosed Thermal Current	$I_{the}$	A	20	25	32	40	50	63	80	100	140	200	250	315
Operational Current AC21A	$I_e$	A	20	25	32	40	63	80	100	125	160	200	250	315
Utilisation Category	$3 \times 380V / 440V$ AC-23A/B	kW	5,5	7,5	11	15	22	30	37	45	55	75	90	110

Product	Code No.		Code No.
KG10B - KG100 = Base/DIN Mount Base Mounted with Door Clutch M280E 300mm Shaft Extension Padlock Device V840G/D 	Door Clutch <b>M280E/EF</b> P'lockable Handle <b>V840G/D</b> Esc. plate <b>OFF - ON</b> <b>3 Pole</b>		Door Clutch <b>M280E/EF</b> P'lockable Handle <b>V840G/D</b> Esc. plate <b>OFF - ON</b> <b>3 Pole + 1N/O 1 N/C aux.</b> (N/O aux. early break)
	KG10B K300*AUN0481 VE KG20B K300*AUN0481 VE KG32B K300*AUN0481 VE KG41B K300*AUN0481 VE KG64B K300*AUN0481 VE KG80 K300*AUN0481 VE KG100 K300*AUN0481 VE KG105 K300*AUN0481 VE KG126 K300*AUN0481 VE KG161 K300*AUN0481 VE KG211 K300*AUN0481 VE KG251 K300*AUN0481 VE KG316 K300*AUN0481 VE	KG10B K302*AUN0483 VE KG20B K302*AUN0483 VE KG32B K302*AUN0483 VE KG41B K302*AUN0483 VE KG64B K302*AUN0483 VE KG80 K302*AUN0483 VE KG100 K302*AUN0483 VE KG105 K302*AUN0483 VE KG126 K302*AUN0483 VE KG161 K302*AUN0483 VE KG211 K302*AUN0483 VE KG251 K302*AUN0483 VE KG316 K302*AUN0483 VE	
KG10B - KG100 = Base/DIN Mount Base Mounted with Door Clutch M280E 300mm Shaft Extension Padlock Device V845 	Door Clutch <b>M280E/EF</b> P'lockable Handle <b>V845</b> Esc. plate <b>OFF - ON</b> <b>3 Pole (without aux's)</b>	<b>VE-Mounting</b>	Door Clutch <b>M280E/EF</b> P'lockable Handle <b>V840G/D</b> Esc. plate <b>OFF - ON</b> <b>4 Pole</b>
	KG10B K300*AUN0482 VE KG20B K300*AUN0482 VE KG32B K300*AUN0482 VE KG41B K300*AUN0482 VE KG64B K300*AUN0482 VE KG80 K300*AUN0482 VE KG100 K300*AUN0482 VE KG105 K300*AUN0482 VE KG126 K300*AUN0482 VE KG161 K300*AUN0482 VE KG211 K300*AUN0482 VE KG251 K300*AUN0482 VE KG316 K300*AUN0482 VE	KG10B K400*AUN0481 VE KG20B K400*AUN0481 VE KG32B K400*AUN0481 VE KG41B K400*AUN0481 VE KG64B K400*AUN0481 VE KG80 K400*AUN0481 VE KG100 K400*AUN0481 VE KG105 K400*AUN0481 VE KG126 K400*AUN0481 VE KG161 K400*AUN0481 VE KG211 K400*AUN0481 VE KG251 K400*AUN0481 VE KG316 K400*AUN0481 VE	
6 Pole Isolator  Aux. Contacts fitted on request 8 Pole Isolators and 4 Pole c/o also available	6 Pole Isolator Panel Mounted Escutcheon plate OFF-ON		3 Pole Change Over Panel Mounted with OFF Escutcheon 1/OFF/2
	KG20B K600*AU2103 E KG32B K600*AU2103 E KG41B K600*AU2103 E KG64B K600*AU2103 E KG80 K600*AU2103 E KG100 K600*AU2103 E KG126 K600*AU2103 E KG161 K600*AU2103 E	KG20B K900-620 E KG32B K900-620 E KG41B K900-620 E KG64B K900-620 E KG80 K900-620 E KG100 K900-620 E KG126 K900-620 E KG161 K900-620 E	
<b>TERMINATION:</b> KG10 ~ KG125, KG160, KG210 KG250 & KG315 Tunnel. KG126, KG161, KG211, KG251 & KG316 Lugs. KG127, KG162, KG212, KG252 & KG317 Tunnel & Lugs.			




(1) Suitable for no load switching (AC-20A) above 690v.

# Application Guide AS/NZS 947-3 3F Lockout Isolators

Get a Handle on Safety with your Eyes Closed





<b>Product Features</b>
<b>M700 Door Interlock</b>
<ul style="list-style-type: none"> <li>• Padlockable in 'OFF' only - safety requirement according to AS/NZS 947-3</li> <li>• In 'ON' the door interlock is engaged - the cabinet cannot be opened</li> <li>• In 'ON' the door interlock can be defeated by using a tool - authorised entry only</li> <li>• The door interlock re-engages when the door is closed after authorised defeat in 'ON'</li> <li>• In 'OFF' and padlocked, the door interlock defeat is disabled - no access</li> <li>• When the door is opened the handle position is locked - assured alignment</li> <li>• Mechanical Position Indicator on the switch module - visible when the door is open</li> <li>• Internal Padlock Device on switch module</li> <li>• Robust, keyed, floating head on switch shaft</li> </ul>
<b>KG Switch Disconnectors</b>
<ul style="list-style-type: none"> <li>• 13/14mm contact gap. 690v - 1000v insulation</li> <li>• High AC3 and AC23 ratings</li> <li>• Large, finger proof IP20 box type terminals</li> <li>• Double break forced opening safety rated auxiliary contacts. Silver or Gold 1 to 6 N/O - N/C</li> <li>• Positive drive make and break main contacts. 3 to 8 poles OFF ON, 3 or 4 pole C/O</li> <li>• IEC 947-3 3F disconnecter handle. Isolation is assured 'OFF' is 'OFF'</li> </ul>
<b>General Features</b>
<ul style="list-style-type: none"> <li>• Custom colours and engraving for escutcheon plates and header labels</li> <li>• Scratch-proof reverse engraving</li> <li>• IP65 dust and water protection</li> <li>• Robust, double insulated handle</li> <li>• Asymmetric shaft and interlock profiles ensure the handle position matches the switch position</li> <li>• Fixed length shaft ensures shaft must engage with the handle</li> </ul>

Telephone now for a demonstration

<b>IEC 947-1</b>
<b>Equipment Suitable For Isolation - The Following Clauses Apply</b>
<b>Clause 7.1.6</b> Additional constructional requirements for equipment suitable for isolation
<b>Clause 7.1.6.1</b> Additional constructional requirements
Equipment suitable for isolation shall provide, in the open position (see 2.4.21) an isolation distance in accordance with the requirements necessary to satisfy the isolation function (see 7.2.3.1 and 7.2.2) (dielectric test)
Indication of the position of the mains contacts shall be provided by one or more of the following means:
(1) The position of the actuator (2) A separate mechanical indicator (3) Visibility of the moving contacts
The effectiveness of each of the means of indication provided on the equipment and its mechanical strength shall be verified in accordance with clause 8.2.5
<b>Clause 8.2.5</b> Verification of the effectiveness of indication of the main contact position of equipment suitable for isolation
To verify the effectiveness of the indication of the main contact position, all means of indication of contact position shall continue to function correctly after the operational performance type tests, and special durability type tests (if performed).
<b>Switch Classifications</b>
All low voltage switches installed in Australia and New Zealand shall meet AS/NZS 60947 and carry the appropriate easily identifiable symbol depending on the switch classification.
<b>Switch</b> 
A mechanical switching device capable of making and breaking currents under normal conditions, which may include specified overload conditions according to the duty, and abnormal circuit conditions such as short-circuit. (motor reversing switches, control switches, start delta switches, etc)
<b>Disconnecter</b> 
A mechanical switching device which in the open position, complies with the requirements specified for the isolating function (Off load isolator)
<b>Switch Disconnecter</b> 
A 'Switch' which in the open position, complies with the requirements specified for the isolating function (On load isolator)






## Changeover Switches Base Mount & Enclosed

Product	Base Mount Code No.		Base Mount Code No.
<b>VE2-Mounting</b> 	<b>Base Mount Code No.</b> <b>2 Pole Changeover</b> <b>Din Rail Mtg - MCB cut out</b> <b>Eng: Mains Off Gen</b>	<b>VE-Mounting</b> 	<b>3 Pole changeover (unenclosed)</b> <b>with M280E door clutch</b> <b>Eng: Mains Off Gen</b>
	KH32 T902*NZ0001 VE2 KH40 T902*NZ0001 VE2 KH63 T902*NZ0001 VE2 KH80 T902*NZ0001 VE2		KG20B K900*AUN0123 VE KG32B K900*AUN0123 VE KG41B K900*AUN0123 VE KG64B K900*AUN0123 VE KG 80 K900*AUN0123 VE KG100 K900*AUN0123 VE KG126 K900*AUN0124 VE KG161 K900*AUN0124 VE
	<b>3 Pole Changeover</b> <b>Din Rail Mtg - MCB cut out</b> <b>Eng: Mains Off Gen</b>		
	KG32A T903*NZ0001 VE2 KG41B T903*NZ0001 VE2 KG64B T903*NZ0001 VE2 KG80 T903*NZ0001 VE2 KG100 T903*NZ0001 VE2		
<b>VE2-Mounting</b> 	<b>3 Pole Changeover</b> <b>Din Rail Mtg - MCB cut out</b> <b>Eng: Mains Off Aux</b>		<b>3 Pole changeover (unenclosed)</b> <b>with M280E door clutch</b> <b>Eng: Mains Off Aux</b>
	KG32A T903*AUV0290 VE2 KG41B T903*AUV0290 VE2 KG64B T903*AUV0290 VE2 KG80 T903*AUV0290 VE2 KG100 T903*AUV0290 VE2		KG20B K900*AUV0291 VE KG32B K900*AUV0291 VE KG41B K900*AUV0291 VE KG64B K900*AUV0291 VE KG 80 K900*AUV0291 VE KG100 K900*AUV0291 VE KG126 K900*AUV0291 VE KG161 K900*AUV0291 VE
	<b>4 Pole Changeover</b> <b>Din Rail Mtg - MCB cut out</b> <b>Eng: Mains Off Gen</b>		
	KG32A T904*AUN0127 VE2 KG41B T904*AUN0127 VE2 KG64B T904*AUN0127 VE2 KG 80 T904*AUN0127 VE2 KG100 T904*AUN0127 VE2		<b>4 Pole Changeover (unenclosed)</b> <b>with M280E door clutch</b> <b>Eng: Mains Off Gen</b>
		<b>Enclosed- Plastic</b> 	KG20B K950*AUN0125 VE KG32B K950*AUN0125 VE KG41B K950*AUN0125 VE KG64B K950*AUN0125 VE KG 80 K950*AUN0125 VE KG100 K950*AUN0125 VE KG126 K950*AUN0126 VE KG161 K950*AUN0126 VE 6KE252 K950*AUN0130 VE(250A) 6KE402 K950*AUN0130 VE(400A)

For Further Information Regarding The Range of Enclosed Isolators

Refer to the Kraus & Naimer "Enclosed Switch Catalogue" on [www.krausnaimer.com.au](http://www.krausnaimer.com.au)

## Changeover Switches Base Mount & Enclosed

Product	Base Mount Code No.		Base Mount Code No.
 <p><b>6AE-Enclosure Mains Off Gen Metal Enclosure</b></p>	<p><b>Enclosed Code No.</b></p> <p><b>3 Pole Changeover Enclosed - Plastic IP65 Eng: Mains Off Gen</b></p> <p>KG20B K900*AUN0115*KL12            KG32B K900*AUN0115*KL12            KG41B K900*AUN0116*KL12            KG64B K900*AUN0116*KL12            KG 80 K900*AUN0117*6FE            KG100 K900*AUN0117*6FE            KG126 K900*AUN0118*6FE            KG161 K900*AUN0118*6FE</p>	<p><b>Enclosure for Domestic / Commercial Installations</b></p> <p>Suitable for VE2            2 &amp; 3 Pole Changeover To 63 Amp IP40</p> <p>Suitable for VE2            2 Pole Changeover To 40 Amp IP65</p>	<p>64CC6</p>
	<p><b>3 Pole Changeover Enclosed - Plastic IP65 Eng: Mains Off Aux</b></p> <p>KG20B K900*AUV0290*KL12            KG32B K900*AUV0290*KL12            KG41B K900*AUV0290*KL12            KG64B K900*AUV0290*KL12            KG 80 K900*AUV0290*6FE            KG100 K900*AUV0290*6FE            KG126 K900*AUV0290*6FE            KG161 K900*AUV0290*6FE</p>		<p>6FKV</p>
 <p><b>ENCL: 6AE Mains Off Gen Metal Enclosure C/W Right Angle Drive</b></p>	<p><b>4 Pole Changeover Enclosed - Plastic IP65/Metal IP65 Eng: Mains Off Gen</b></p> <p>KG20B K950*AUN0119*6FE            KG32B K950*AUN0119*6FE            KG41B K950*AUN0120*6FE            KG64B K950*AUN0120*6FE            KG 80 K950*AUN0121*6FE            KG100 K950*AUN0121*6FE            KG126 K950*AUN0122*6FE            KG161 K950*AUN0122*6FE            6KE252 K950*AUN0128*6AE(250A) *            6KE402 K950*AUN0129*6IP (400A) *</p>	 <p><b>64CC6</b></p> <p><b>6FKV</b></p>	
		<p><b>Enclosure &amp; cable size</b></p> <p><b>For 3 Pole changeover</b>            KG20B - 190 x 100 x 90 - 6mm            KG32B - 190 x 100 x 90 - 6mm            KG41B - 250 x 145 x 100 - 16mm            KG64B - 250 x 145 x 100 - 16mm            KG KG80 - 280 x 190 x 130 - 35mm            KG100 - 280 x 190 x 130 - 35mm            KG126 - 560 x 380 x 180 - M10 (Lugs) - 95mm            KG161 - 560 x 380 x 180 - M10 (Lugs) - 95mm</p> <p><b>For 4 Pole changeover</b>            KG20B - 190 x 190 x 130 - 6mm            KG32B - 190 x 190 x 130 - 6mm            KG41B - 280 x 190 x 130 - 16mm            KG64B - 280 x 190 x 130 - 16mm            KG 80 - 380 x 280 x 130 - 35mm            KG100 - 380 x 280 x 130 - 35mm            KG126 - 560 x 380 x 180 - M10 (Lugs) - 95mm            KG161 - 560 x 380 x 180 - M10 (Lugs) - 95mm            6KE252 - 600 x 600 x 350 Metal - M10 (Lugs) - 150mm            6KE402 - 800 x 600 x 400 Metal - M10 (Lugs) - 240mm</p>	




















For Further Information Regarding The Range of Enclosed Isolators

Refer to the Kraus & Naimer "Enclosed Switch Catalogue" on [www.krausnaimer.com.au](http://www.krausnaimer.com.au)

## Optional Extras

Keylocks	Code	Mounting Units	Code
Direct drive operator	V750/A9 	Panel mount 2 or 4 screw	E 
For base mounting	V750D/ VE21 	Panel mount 2 or 4 screw IP65	EFA 
IP66 For single hole 22mm Standard K&N Key	V750D/3 	Base mounting 4 screw mount	VE 
Direct Drive Key Operator Mounted in a IP66 Hinged / Flip Lid Enclosure	V755/ 6CL 	Base mount DIN rail	VE1 
Direct Drive Key Operator <u>Nominate key barrel:-</u> 570 Lockwood, Bi-Lock, Lock Focus, KabaQuattro, Efco, Schlage, CL, etc..... <u>Customised key systems:-</u> Key Indication, cylinder removable from front (RL), Electronic key interlocks etc. <u>Nominate Mounting:-</u> Panel mount, Wall Plate mounting, enclosed (plastic,s/steel etc),	6S0LW V755/A 	Base mount DIN rail with MCB cut out	VE2 
Separate Drive Key Lock Programmable locking positions using <u>Strebor</u> barrel	V760/A.E 	Double end mount 4 screw fixing	ER 
Separate Drive Key Lock Programmable locking positions for: Lockwood 5-6 pin barrels C4 (201). Bi - Lock.(specify) <i>Includes: Kraus &amp; Naimer Pty. Ltd.</i> standard barrel:- 6S1 V760 S (Lockwood type).	V760/A 	Double end mount for fixing of plate with DIN mounting	VE1E 
		IP66 Single hole without plate 16/22mm 22/30mm	FS1 FT1 
		IP66 Single hole square plate 16/22mm 22/30mm	FS2 FT2 
<b>Mounting Units</b>	<b>Code</b>		
Right Angle Drive	K3 M330/A K3 M330/B 	Next size up handle and plate	EG 
<b>Terminal Covers</b>			
<b>3 main contacts</b> KG 20 - KG 100 KG 126 / KG 161 KG 251 / KG 316	M160 / 3 M160 / 33 M160 / 4 	Single hole with plate 16/22mm Rectangle 30 x 39 Single hole with plate 16/22mm Rectangle 48 x 59 Single hole with plate 16/22mm Rectangle 64 x 78 Header 2 Lines Header 3 Lines	FS4  FT6 
<b>4 main contacts</b> KG 20 - KG 100 KG 126 / KG 161 KG 251 / KG 316	M160 / 43 M160 / 43 M160 / 41		FH4  PRC PRA

## Optional Extras

Padlock	Code	Door Clutch & Shaft Extensions	Code
The padlock is an integral part of the switch handle	V840A 	Door clutch for misaligned doors with locking handle Note: Knowledgeable personnel using a simple tool are able to defeat the interlock Refer to Page 19	M700 
Locking handle for DIN cutout handles	V840B 	Door clutch with shaft extension Interlocked or Non Interlocked Available	M280E 
For a padlocks	V845 	IP66 Single hole 22mm door clutch and locking handle	V840G/B 
Padlock with integral flat or raised handle - 2 padlock	V840D 	IP66 Single hole 22mm door clutch and locking handle	V840G 
Padlock with integral flat or raised handle - 3 padlock	V840G/B 	IP66 Single hole 22mm door clutch and locking handle	V845 
Padlock with integral flat or raised handle - 4 padlock	V840G 	Single hole 22mm door clutch and locking handle	V840E 
Padlock device	V850 	Single hole 22mm door clutch	M295A 
Shaft locking device	V840VE 	IP66/67 Single hole mounting with integrated door clutch ★Override fuction in On-Position	M800 
Heavy Duty Stainless Steel Lock-out safety device	6SS V840 	Shaft extensions asymmetric profile	M004D 
Clip on aux contacts - base mount for KG20 -KG32 for KG41 - KG64	K0-H010/A11-VE K1-H010/A11-VE	Shaft extensions square profile	L100A/M004E 
Clip on aux contacts - panel mount for KG20 -KG32 for KG41 - KG64	K0-H010/A11-E K1-H010/A11-E		

## Special Drive Options & Enclosures

Special Drives	Optional Code No.	Description
	G800/A	<p><b>Heavy Duty Drive</b> Create your own handle/drive unit and weld it onto the removable plate. Long rods, T-bars, etc.</p> <p>E Panel Mount, PK Plastic Encl. GK Aluminium Enclosure</p>
	G800/B	<p><b>Limit Switch</b> Heavy duty roller &amp; actuator for spring return or stepping applications.</p> <p>E Panel Mount PK Plastic Enclosure GK Aluminium Enclosure Also Available in 6CL 56 Plastic Enclosure.</p>
	G900/B	<p><b>Rope Operator</b></p> <p>Heavy duty for GK / PK or 6CL 56 series enclosures.</p> <p>Drive Only Also Available in 6CL 56 Plastic Enclosure</p>
	GK	<p><b>Aluminium Enclosures for Drives</b></p> <p>Switch length 4 stages.</p> <p>Various sizes available on request.</p>
	PK	<p><b>Plastic Enclosures for Drives</b></p> <p>Switch length 4 stages.</p> <p>Various sizes available on request.</p>
	DIP Exd	<p><b>HAZARDOUS AREAS</b></p> <p>Dust Ignition Proof</p> <p>Flame Proof</p>
	6S	<p><b>Stainless Steel Enclosures</b> <b>Marine Grade 316</b></p> <p>208H x 113W x 96D 240H x 140W x 120D 350H x 230W x 170D 500H x 320W x 175D 710H x 320W x 175D C/W rain hood (Other sizes available on request)</p> <p><b>Finish:-</b> Bead Blast or Food Industry. (N° 4)</p> <p><b>Options:-</b> Rain Hood. Hinge Door.</p> <p><b>Variations on request:-</b> Stop / Start Pushbuton. Control &amp; Changeover Switches. Selection of auxiliary contacts.</p>



## Standard Enclosures






### Enclosure Information

The following options can be included by substituting suffix code "E" for the optional code number.. PF, KS, KL, 6CL...

**Note:** KG enclosed isolators listed complete on page 17

**Example:** 3pole 20Amp Off/On Switch  
Enclosed with Padlockabe handle

CA 10 A292-621 PF  
V840G

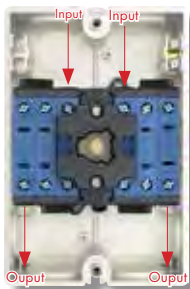
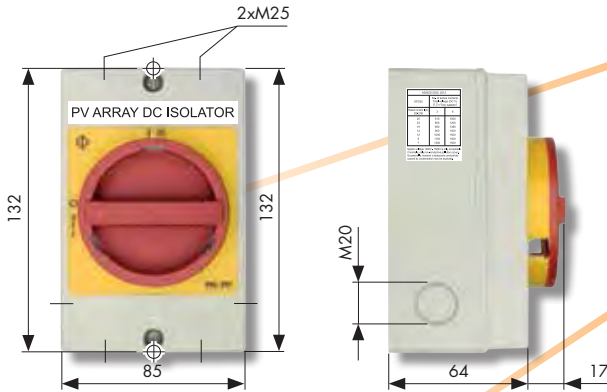
Enclosures	Description	Code No.
 KS enclosure	<b>KS</b> <b>KS</b>	<b>CG 4 &amp; CA 4 Switches</b> Material - Very high UV resistance - High chemical resistance Dimensions mm 1 stage - 90L x 70W x 60H 2 stage - 90L x 70W x 72.5H
 PF enclosure	<b>PF</b>	<b>Standard without Cover Interlock</b>  Very high UV resistance Excellent chemical resistance
 6 CL 56/98 enclosure	<b>6 CL 56/98</b> <b>6 CL 56/98-4</b> <b>6 CL 56/195</b>	<b>Industrial Enclosure IP66</b> Dimensions mm - 101L x 101W x 91H /98 series - 198L x 101W x 91H /195 series Flip Lid  Chemical resistant orange available on request. (Nominate entries preferred).
 6 FE enclosure	<b>6FE B85AG</b> <b>6FE C65AG</b> <b>6FE C85AG</b> <b>6FE D85AG</b> <b>6FE M95AG</b>	<b>General Purpose ABS Enclosures</b> Excellent Chemical resistance IP67.  6FE B85AG - 110H x 80W x 85D  6FE C65AG - 140H x 80W x 65D  6FE C85AG - 140H x 80W x 85D  6FE D85AG - 170H x 60W x 85D  6FE M95AG - 230H x 140W x 95D
 6 FEC enclosure		<b>Polycarbonate Enclosures IP67</b> 6FEC - 190H x 190W x 130D 6FEC - 190H x 190W x 180D 6FEC - 280H x 190W x 130D 6FEC - 280H x 190W x 180D 6FEC - 280H x 280W x 130D 6FEC - 380H x 280W x 130D 6FEC - 380H x 280W x 180D 6FEC - 560H x 380W x 180D 6FEC - 560H x 380W x 230D
 AE enclosure	<b>6AE 1033</b> <b>6AE 1385</b> <b>6AE 1338</b>	<b>Metal Enclosures IP67</b> Switches mounted to gear tray with door interlock. 6AE 1033/300 x 300 x 210 6AE 1385/380 x 380 x 250 6AE 1338/600 x 380 x 350  Additional metal enclosures available

FOR FURTHER INFORMATION ON LARGER ENCLOSURES  
PLEASE CALL YOUR NEAREST BRANCH



DC Disconnectors for Solar Photovoltaic (PV) Power Supply System  
acc. to IEC 60364-7-712:2002 and AS/NZS 5033:2012

Disconnectors for  
**Photovoltaic**



This enclosure is made from **self-extinguishing** material and conforms to UL94-V0

Suggested wiring diagram - Non Polarised	Tightening torque for terminal screws	Strip length
	KFD25B 1,25 Nm	KFD25B 9

**Contact development: 2 pole, 6 contacts per circuit (2 x 3 in series)**

**General Data**

Switch Disconnector according to EN 60947-3 respectively VDE 0660 Part 107

Utilization Category: for Photovoltaic Application with rapid handle operation **DC-21B** (Switching of resistive loads, including moderate overloads)

Overvoltage category III, pollution degree II

Terminal Lugs finger-proof according to VDE 0660-514 and BGV A3, IP 20

Maximum permissible wire size (use copper wire only)

single core wire or stranded wire

flexible wire

KFD25: 6 mm<sup>2</sup>

KFD25: 4 mm<sup>2</sup>, or 6 mm<sup>2</sup> flexible wire with a diameter not larger than 3,9mm after the insulation has been removed and the end has been reshaped.

**Mounting**

Plastic Enclosures, Protection IP66/67, totally insulated, threaded entries

OFF-position lockable with padlocks, cover coupling with interlock

**Rated Value / Order Number**

Operational Current (enclosed up to 50 °C) DC-21B	7 A	9 A	12 A	14 A	19 A	23 A	25 A
1,2 x Voc 2 pol	1500 V	1500 V	1500 V	1500 V	1380 V	1200 V	1000 V
1,2 x Voc on each side	1200 V	1100 V	1000 V	900 V	690 V	600 V	510 V
Insulation Voltage	1500 V	1500 V	1500 V	1500 V	1500 V	1500 V	1500 V

**Order Number**

----- **KFD25 T206/AUP0013 KT11V** -----

## New Product

### G20 (S) - DC Switch With Knife Contacts

Kraus and Naimer have developed and designed a new DC Switch; the G20(S)

The 'Knife contacts' have been designed in a new way resulting in a switching capacity of 20 Amps at 690V DC (DC-22A) and high short circuit withstand capability.

Finger-proof terminals according to EN 50274 and protection degree IP20 offer maximum safety.

With a standard latching mechanism, the G20 complies with all regulations required for main switches according to IEC/EN 60204.

In addition the G20 is also ideal for AC applications with high short circuit fault levels, as well as electronic circuitry with low current and voltages.

- Self-cleaning and vibration resistant knife contacts
- Compact design
- High DC switching capacity
- Highest contact reliability (better than any H-bridge contact system)
- High short circuit withstand capability
- Finger-proof terminals (IP20) even if jumper leads are used
- Terminal extensions (accessory item) for ring type cable lugs (max. width 6mm) and quick connect lugs available
- Heat resistant contact system according to standard EN 12101-3

G20 - with normal latching (in preparation)

G20S - with snap action latching



Utilisation Category	No. of Series Contacts G20S Total Voltage in Volts						Rated Operational Current Ie/A
	1	2	3	4	5	6	
DC-21A	250	500	750	1000	-	-	20
	440	880	-	-	-	-	13
DC-22A	250	500	750	1000	-	-	20
	330	660	990	-	-	-	10
	440	880	-	-	-	-	5
DC-23A	48	96	144	192	240	144	20
	60	120	180	240	300	288	15
	110	220	330	440	550	360	12
	160	320	480	640	-	-	8
	250	500	750	1000	-	-	5
	330	660	990	-	-	-	3
	440	880	-	-	-	-	1

### KF Switch Range 1 Pole per module (16-32A)

The innovative modular system is both simple and very safe while offering enormous flexibility.

The position of the various modules in relation to each other can be defined by the user.

Than assembled in the factory

Rotating contact movement (instead of the classical vertical lifting) allows

- Big contact gaps
- High mechanical life expectancy
- Very precise movement sequence
- Self cleaning contacts
- Forced opening and closing of contacts
- Compact (very shallow design)
- Up to 1000V insulation voltage according to IEC possible
- Lateral drive possible (latching module not in the centre but on left or right hand side)
- Coupling profile determines pre-closing function of switched 4th pole
- Visible contacts (windows) available on request
- Design allows a big variation of terminal markings



*Telephone now for a demonstration*

New Product

Maintenance Switches For EMC - Frequency Regulated Motor

According to IEC 60204 and VDE 0113



# Kraus & Naimer

BLUE LINE switchgear

since 1907

Maintenance Switches for

***EMC-compliant connection***



**DOWNLOAD NOW FROM**  
**[www.krausnaimer.com.au](http://www.krausnaimer.com.au)**



**NEW**

## IP66 Stainless Steel Enclosed Motor Isolators.

The new IP66 Stainless Steel Enclosed Motor Isolators.

The new range of enclosures added to the Kraus & Naimer 6S Series of Stainless Steel Enclosures provide rigorous protection for vital switchgear and can replace popular plastic versions currently installed.

These units are ideally suited for the use in the Dairy, Beverage, Meat and Poultry Processing areas.

They are also suitable for use in the Marine, Waste Water Treatment, Mining, Material Handling and Conveyor Systems.







### The 6S Series Enclosures are Australian Manufactured and Features:

- IP66 Rating,
- Marine Grade 316 Stainless Steel, 1.6mm Thickness,
- Removable Mounting Feet,
- Bottom Threaded Entries,
- 4 Screw Cover Fixing,



SYDNEY	VICTORIA	QUEENSLAND	SOUTH AUSTRALIA
379 Liverpool Road	14 Brunson Street	22 Brookes Street	Unit 9/780-802 South Road
Ashfield, NSW 2131	Bayswater, VIC, 3153	Bowen Hills, QLD 4006	Glandore, SA 5037
Telephone: (02) 9797 7333	Telephone: (03) 9720 9777	Telephone: (07) 3252 8344	Telephone: (08) 8371 1443


## Control & Signalling Units 22mm - Assembled Units

Item	Code No.	Item	Code No.
<b>Push Button</b> IP67/IP69K   Green Red Yellow Blue White	1 Normally Open AC - 15 240v 6A	<b>Push Button</b> IP67/IP69K   Green Red Yellow Blue White	1 Normally Closed AC - 15 240v 6A
	PSN-WD0001 PSN*NZ0007 PSN*NZ0015 PSN*AUN0148 PSN*NZ0017		PSN*NZ0018 PSN-WD0002 PSN*NZ0019 PSN*NZ0009 PSN*NZ0020
<b>Pilot Light</b> IP67/IP69K   Green Red Yellow Blue White	c/w 24V LED	<b>Pilot Light</b> IP67/IP69K   Green Red Yellow Blue White	c/w 240V LED
	PSN-WD0003 PSN-WD0004 PSN*NZ0021 PSN*NZ0022 PSN*NZ0023		PSN-WD0005 PSN-WD0006 PSN*NZ0004 PSN*NZ0012 PSN*NZ0013
<b>Double - Push Button</b> IP67/IP69K  	c/w 240V LED	<b>Emergency Stop</b> Non-Illuminated IP67/IP69K  	*Reset by twisting 1 Normally Closed
	PSN/DDDL/GR/X1-XO-K11		
	c/w 24V LED		PSN*NZ0006 (enclosurew available on request)
	PSN*AUN0144		

For further information refer to Catalogue 302

\*NOTE ALSO AVAILABLE AS RESET BY PULLING OR KEY OPERATION

## Palm Push Buttons AC-15 230v 6A, IP66

<b>Foot &amp; Palm Switch</b> Red & Yellow Reset By Pulling			<b>Foot &amp; Palm Switch Spring Return</b> Black & White Enclosed with Red Operator		
1 x N/C	PFT/R-V-KC01-IY		N/O x N/C	PFT/R-KC11-I	

## Potentiometer Units Heavy Duty & Standard 22mm Mounting

<b>Heavy Duty With K&amp;N Switch Front IP65</b> Reinforced Stop. Optional Keyed or Stepping 48mm Square Front Engraved With Swoop			<b>Standard IP66 3 Screw Terminals</b> P max = 0.5 watt		
1k	CA10NZQ172*02FT2		1.0k Ohm	PSN/R1k	
2.2	CA10NZU606*01FT2		4.7k Ohm	PSN/R4K7	
4.7k	CA10NZU607*01FT2		10k Ohm	PSN/R10K	
10k	CA10NZV049*02FT2				
<b>64mm Square Front Engraved With Swoop</b>					
1k	CA10NZQ172*02FH3				
2.2k	CA10NZU606*01FH3				
4.7k	CA10NZQ607*01FH3				
10k	CA10NZQ049*02FH3				

### Heavy Duty Pot Units.

Developed by Kraus & Naimer for use in industrial applications.

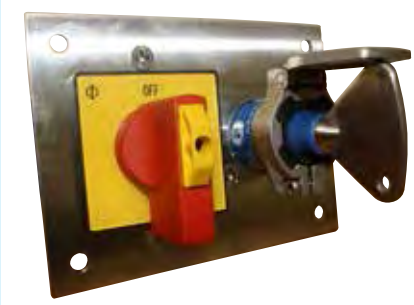
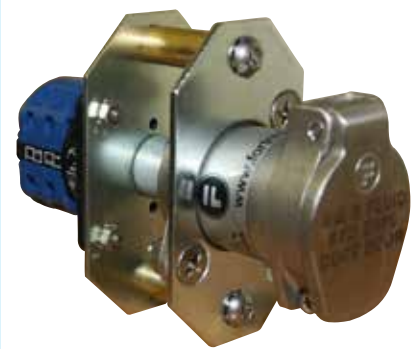
The 270° single turn pot drive features a HEAVY DUTY drive, large operator handle and sealing to IP65. With easy mount 22mm single hole mounting the drive has smooth stepless operation and comes complete with a header label. Options include keys and additional contacts

## Control & Signalling Units 22mm - Loose Components

Push Buttons AC-15 230v 6A, IP67/IP69K					
Push Buttons Front Element Flush Illuminated			Push Buttons Front Element Flush Illuminated		
Green	PSN/DL/G		Green	PSN/DLH/G	
Red	PSN/DL/R		Red	PSN/DLH/R	
Push Buttons AC-15 230v 6A, IP67/IP69K					
Push Buttons Front Element Flush Non Illuminated			Push Buttons Front Element Flush Non Illuminated		
Green	PSN/D/G		Green	PSN/DH/G	
Red	PSN/D/R		Red	PSN/DH/R	
Rotary Switches AC-15 230v 6A, IP66					
Rotary Switch Front Element Latching Non Illuminated (changeable to spring return)			Rotary Switch Front Element Latching Non Illuminated (changeable to spring return)		
2 Position	PSN/WRK		2 Position	PSN/WRLK/*K	
2 Position	PSN/WKV		2 Position	PSN/WKLK3/*	
3 Position	PSN/WRK3		*Specify colour - G,R,Y,B,O		
Rotary Switch Front Element Latching Key Operated (changeable to spring return)			Colour		
2 Position (1)	PSN/WRS		Green - G		
2 Position (2)	PSN/WKS/A1		Red - R		
3 Position (3)	PSN/WRS3		Yellow - Y		
3 Position (2)	PSN/WRS3/A1		Blue - B		
Key Removable Programme (1) Both Pos (2) Centre Off Pos (3) Three Pos			Opaque - O		
Double Push Buttons AC-15 230v 6A, IP66 Colour Cap Opaque					
Double Push Button Non Illuminated			Double Push Button Non Illuminated		
Red/Green	PSN/DDL/GR		Black/Black		
Red/Green	PSN/DDL/GR/X1-X0		Arrow/Arrow	PSN/DDL/S/X7-X7	
Red/Green	PSN/DDL/GR/GB1-GB0		Black/White		
STOP START			PSN/DDL/WS		
Pilot Lights IP67/69K					
Flush			Extended (conical)		
Green	PSN/L/G		Green	PSN/LH/G	
Red	PSN/L/R		Red	PSN/LH/R	
Yellow	PSN/L/Y		Yellow	PSN/LH/Y	
Blue	PSN/L/B		Blue	PSN/LH/B	
Opaque	PSN/L/W		Opaque	PSN/LH/W	
Push Buttons Pilot Lights Accessories					
Contact Blocks Front Mounting			Contact Blocks Base Mounting		
N/O	PSN/K10		N/O	PSN/KC10	
N/C	PSN/K01		LED Pilot Assemblies 85-260v AC/DC		
LED Pilot Assemblies 12-30v AC/DC			Green	PSN/LED230/G	
Green	PSN/LED/G		Red	PSN/LED230/R	
Red	PSN/LED/R		White	PSN/LED230/W	
White	PSN/LED/W		DIN Rail Mounting	PSN/IVS	
Coupling Plate			Protection Extras (not with legend carriers)		
PB's & Lights	PSN/A		Single PB's	PSN/T/D	
Legend Carrier W/O Legend			Double PB's	PSN/T/DD	
PB's Lights	PSB/ST/X		Shroud	PSN/XGWK	
Double PB's	PSB/STDD/X		Bulb Extractor	PSN/LG	
Legend Insert	PSN/XST		Blank Plug	PSN/B	
Engraving	F*AU		Emergency Stop Extras		
Plastic Enclosure			Shroud	PSN/XGPV	
Top Yellow, Bottom Black			Plate 60mm	PSN/XAK1	
1 x 22.5mm	PSN/IY1		Plate 90mm	PSN/XBK1	
			LED Test Elements For Press To Test		
			12v to 30v	PSN/XLED/T	
		85v to 260v	PSN/XLED230/T		
		Resistor Element			
		42v -60v	PSN/XLED60		










# Castell & Fortress Trapped Key Interlocking Systems

Products	Applications
Panel Door Interlock Multiple Panel Door Interlock	As part of an interlock system, the locks are used to control access to areas, e.g. switchgear panels or machines where hazards may be present, until a safe condition has been achieved.
Key Operated Rotary Switches	As part of an interlock system, the switch units are used for the direct control or isolation of control or power circuits controlling the plant or machinery.
Solenoid Controlled Interlock Unit	As above with a solenoid facility to integrate with other electronic control processes within the system.
Key Operated Rotary Switch for Use in Hazardous Areas	A key operated rotary switch for use as part of an interlocked system, in areas where explosive/flammable gases or dust particles may be present. BASEEFA certified (EExdIIc T6 Zones 1 & 2.)
H31 Basic Interlock and Keys	This form of basic interlock is normally used in the mechanical interlocking of electrical switchgear. Used in conjunction with other interlocking systems.
Door Interlock	Specifically designed for sliding doors.
Interlock Deadlock	Single or multi-keyed deadlocks, with either claw bolt or limit switch.
Mechanical Key Exchange Boxes	A range of mechanical key exchange units into which any sequence of trapped and freed keys can be incorporated.
Electronic Time Delay Rotation Sensing Unit Temperature Sensing	As part of an interlock system, the locks are used to control access to areas, e.g. switchgear panels or machines where hazards may be present, until a safe condition has been achieved.
Other Products	Fortress Amgard Modular Safety Systems. Castell Products. Smith Ellis – Valve Interlocks. HF Securite Products. Load banks



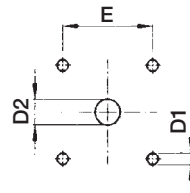
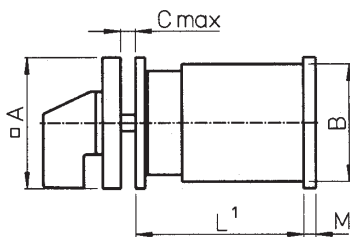


## Handles

Type	Colour	Code	Size 00 0 1 2 3	Type	Colour	Code	Size 00 0 1 2 3
<b>I - Handle</b> <i>"Standard Handle"</i> 	Black	<b>G251</b>	√ √ √ √ -	<b>R - Handle</b> 	Black	<b>G001</b>	- √ √ √ √
	Red	<b>G252</b>	√ √ √ √ -		Red	<b>G002</b>	- √ √ √ √
	Electro-grey	<b>G257</b>	√ √ √ √ -		Electro-grey	<b>G007</b>	- √ √ √ √
<b>F - Handle</b> 	Black	<b>G221</b>	√ √ √ √ -	<b>B - Handle</b> 	Black	<b>G521</b>	- √ √ - -
	Red	<b>G222</b>	√ √ √ √ -		Red	<b>G522</b>	- √ √ - -
	Electro-grey	<b>G227</b>	√ √ √ √ -		Electro-grey	<b>G257</b>	- √ √ - -
					White (For UE mtg)	<b>G258</b>	- - √ - -
<b>K - Handle</b> 	Black	<b>G411</b>	- - √ √ √	<b>P - Handle</b> 	Black	<b>G211</b>	- √ √ √ √
	Red	<b>G412</b>	- - √ √ √		Red	<b>G212</b>	- √ √ √ √
	Electro-grey	<b>G417</b>	- - √ √ √		Electro-grey	<b>G217</b>	- √ √ √ √
<b>L Handle</b> 	Black	<b>G501</b>	- - √ - -	S0	S1 ~ S3		
	Red	<b>G502</b>	- - √ - -	<b>S Handle</b> 	Black	<b>G301</b>	- √ √ - -
	Electro-grey	<b>G507</b>	- - √ - -		Red	<b>G302</b>	- √ √ - -
			Electro-grey		<b>G307</b>	- √ √ - -	
<b>Handwheel</b> 	Black		- - - - √	S0	S1		
	<p>The Handles listed are for the Kraus &amp; Naimer standard profile shafts, enquire for Handle code numbers suitable for square shafts.</p>						

## Dimensions mm

### Rotary Cam Switches - Panel Mounting



### E Panel Mounting Size 0 - Size 3

	CG4	CAD's CA10	CA20	CA25	CA63 CA50 CA40 C26	C32	C42	C80	C200-4 C125	C315 L400
<b>A</b>	30	48	48	48	64	64	64	88	88	130
<b>B</b>	28	43	45	46	45/58	60	66	84	88	126
<b>C</b>	4	4	4	4	4	4	4	5,5	5,5	7
<b>D1</b>	3,2	5	5	5	5	5	5	6	6	7
<b>D2</b>	8	8	8	10	10	10	10	13	13	16
<b>E</b>	-	36	36	36	48	48	48	68	68	104
<b>M</b>	-	4,5	4,5	5,5	6,5	7,5	7,5	9,4	9,4	11,9

### Length L

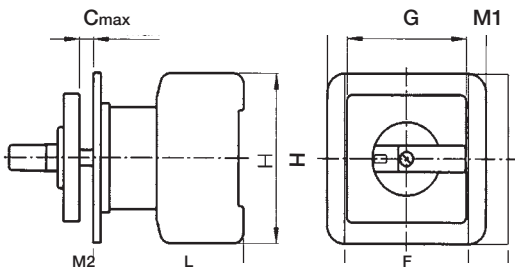
Stages	CG4	CAD's CA10	CA20	CA25	CA63 CA50 CA40 C26	C32	C42	C80	C200-4 C125	C315 L-switches Size S3
<b>1</b>	38,5	31,7	35,9	37,2	41	45,8	49,8	61,5	67,5	78,6
<b>2</b>	50	41,2	48,6	51,2	53,7	63,3	71,3	88	100	117,2
<b>3</b>	62,5	50,7	61,3	65,2	66,4	80,8	92,8	114,5	132,5	155,8
<b>4</b>	74,5	60,2	74	79,2	79,1	98,3	114,3	141	165	194,4
<b>5</b>	86,5	69,7	86,7	93,2	91,8	115,8	135,8	167,5	197,5	233
<b>6</b>	94,5	79,2	99,4	107,2	104,5	133,3	157,3	194	230	271,6
<b>7</b>	110,5	88,7	112,1	121,2	117,2	150,8	178,8	220,5	262,5	310,2
<b>8</b>	122,5	98,2	124,8	135,2	129,9	168,3	200,3	247	295	348,8
<b>9</b>	-	107,7	137,5	149,2	142,6	185,8	221,8	273,5	327,5	387,4
<b>10</b>	-	117,2	150,2	163,2	155,3	203,3	243,3	300	360	426
<b>11</b>	-	126,7	162,9	177,2	168	220,8	264,8	326,5	392,5	464,6
<b>12</b>	-	136,2	175,6	191,2		238,3	286,3	353	425	503,2

# Dimensions mm

## KG Main Switches

### Panel Mounting

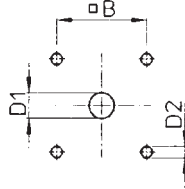
3 and 4 Pole



KG10A  
KG20A, KG32A  
KG20B, KG32B  
KG41B, KG64B  
KG80, KG100, KG105  
KG126, KG161  
KG251, KG316

A	B	C	D1	D2	F	G	H	L	M1	M2	M3
48	36	4	11	5	48	48	50	48.2			
48	36	4	10	5	48	42	54	53.8			
64	48	4	10	5	64	42	54	53.8	13.5	9	2
64	48	4	10	5	64	50	64	60.5	16	12.5	16
64	48	4	10	5	70	70	80	70.6	22	10	25
88	68	5.5	13	6	-	112	108	96	38	21	22
88	68	5.5	13	6	-	145	126	103	52.5	21	24.5 x 2

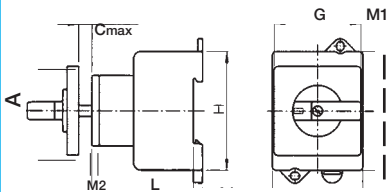
M1 = Extra Length 4th Pole / Neutral Contact / Earth Block  
M2 = Extra Length Top Mounted Auxiliary Contacts  
M3 = Extra Length Terminal Cover



### Base Mounted

3 and 4 Pole

Note : 6 Pole Width = 3 Pole Width x 2



KG10  
KG20A, KG32A  
KG20B, KG32B  
KG41B, KG64B  
KG80, KG100, KG105  
KG126, KG161  
KG251, KG316

A	B	C	D1	D2	G	H	L	M1	M2	M3
48	36	12	8	5	48	50	49.2			
48	36	12	8	5	42	54	50			
64	48	13.5	10	5	42	54	50	13.5	-	20
64	48	13.5	10	5	50	64	61	16	10	16
64	48	13.5	10	5	70	80	68	22	10	25
88	68	16	13	6	112	108	91	38	0	22
88	68	16	13	6	145	126	98	52.5	0	24.5 x 2

M1 = Extra Length 4th Pole / Neutral Contact / Earth Block  
M2 = Extra Length Top Mounted Auxiliary Contacts  
M3 = Extra Length Terminal Cover

### Padlock Device V840G

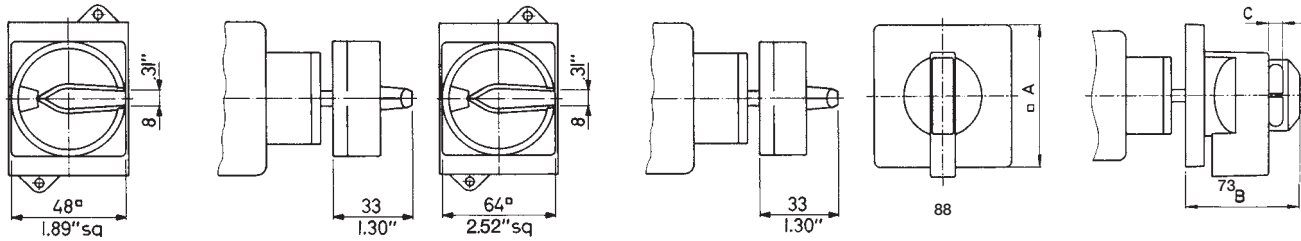
36 mm sq. Fixation  
KG10, KG20, KG32

### Padlock Device V840G

48 mm sq. Fixation  
KG10B, KG20B, KG32B, KG41B, KG64B,  
KG80, KG100, KG105

### Padlock Device V845

68mm sq. Fixation  
KG126, KG161, KG251, KG316



### Door Interlock M280E 48mm sq.

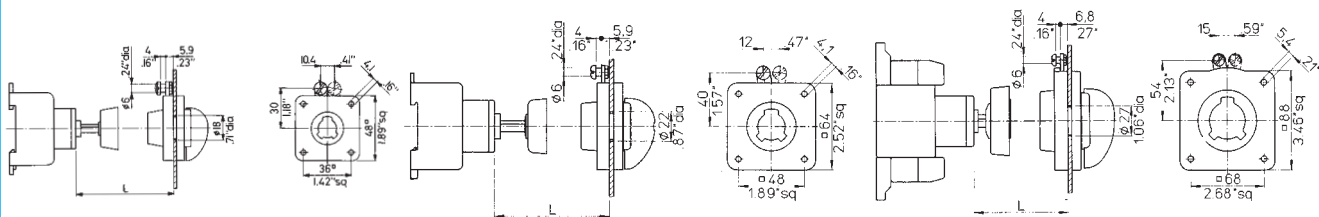
36 mm sq. Fixation  
KG10, KG20, KG32

### Door Interlock M280E 64mm sq.

48 mm sq. Fixation  
KG10, KG20, KG32, KG41, KG64, KG80, KG100, KG105

### Door Interlock M280E 88mm sq.

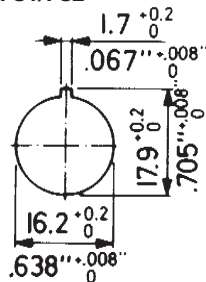
68 mm sq. Fixation  
KG126, KG161, KG251, KG316



### Single Hole Mounting FS1/FS2

(Size 00)

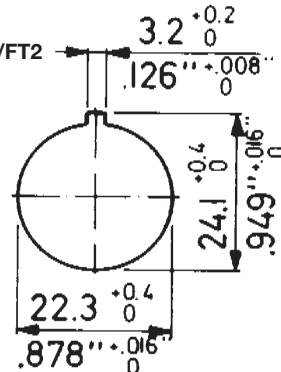
To accommodate  
16.2 in 22.3 Hole  
S00 T160 - 01



### Single Hole Mounting FT1/FT2

(Size 0)

To accommodate  
22.3 in 30.5 Hole  
S0E T160 - 01



## SWITCH ORDERING CHART

### Mounting Requirements

- |  |   |
|--|---|
| <input type="checkbox"/> <b>E</b> Panel Mount. (5 hole mount)                              | <input type="checkbox"/> <b>L100</b> Various shaft lengths (metal)          |
| <input type="checkbox"/> <b>VE</b> Base mount suitable for door clutch etc.                | <input type="checkbox"/> <b>M004</b> Adjustable shaft (advise length).      |
| <input type="checkbox"/> <b>E - V</b> Panel Mount.(vertical access to terminals            | <input type="checkbox"/> <b>PF</b> Enclosure ABS IP56                       |
| <input type="checkbox"/> <b>E22</b> Panel mount. ( 3 hole, size 0)                         | <input type="checkbox"/> <b>GK</b> Enclosure aluminium IP54.                |
| <input type="checkbox"/> <b>ER</b> Combined panel square base plates.                      | <input type="checkbox"/> <b>M280E</b> Door clutch (specify depth required). |
| <input type="checkbox"/> <b>T146 K</b> DIN rail mounting plate. (size 0 and size 1)        | <input type="checkbox"/> <b>6 CL</b> Enclosure 56 series.                   |
| <input type="checkbox"/> <b>FT1</b> Single hole mtg. w/o esc. plate IP65. (S0 = 22.3mm)    | <input type="checkbox"/> <b>6 SS</b> Enclosure stainless steel.             |
| <input type="checkbox"/> <b>FT2</b> Single hole mtg. with square plate IP65. (S0 = 22.3mm) | <input type="checkbox"/> <b>KS/KL</b> Enclosures IP65.                      |
| <input type="checkbox"/> <b>EF</b> Panel seal IP65. (mounts between switch and panel).     | <input type="checkbox"/> <b>6S115 x 70</b> Wall plate stainless or Plastic  |
| <input type="checkbox"/> <b>KD/KN</b> Heavy duty mounting plate and metal shaft.           | <input type="checkbox"/> Other, nominate type of mounting required.         |

### Handle Operation

- |   |   |
|---|---|
| <input type="checkbox"/> Normal/standard handle (G251) or .....               | <input type="checkbox"/> <b>V840A/.</b> Padlockable handle (S0 & S1). |
| <input type="checkbox"/> <b>V750D</b> Key operator size 00 ~ 0.               | <input type="checkbox"/> <b>V845</b> Padlock Handle. (c/w esc.plate)  |
| <input type="checkbox"/> <b>V755A</b> or <b>C</b> Key operator (530 series) . | <input type="checkbox"/> <b>V840G</b> Padlock device.                 |
| <input type="checkbox"/> <b>V750/A9</b> Key operator size 0 switch.(Lockwood) | <input type="checkbox"/> <b>V850</b> Padlockable with handle device   |
| <input type="checkbox"/> <b>6SOLW V750</b> Key operator (201 Lockwood etc.)   | <input type="checkbox"/> <b>V400</b> Push-button interlock device.    |
| <input type="checkbox"/> <b>V760</b> Seperate key and handle (programmable).  | <input type="checkbox"/> Other specify                                |

### Essential Data

1. Switch/circuit requirement. . . Amp ..... Volts ..... kW .....
2. Cable size ..... or limiting dimensions .....
3. AC or DC (DC voltage required).....Duty:- AC21/AC22/AC23/AC11 or other.
4. PLC/Electronic circuit/dry circuit or standard switch.

KRAUS & NAIMER “The Switchgear Innovators“

# Ohm's Law

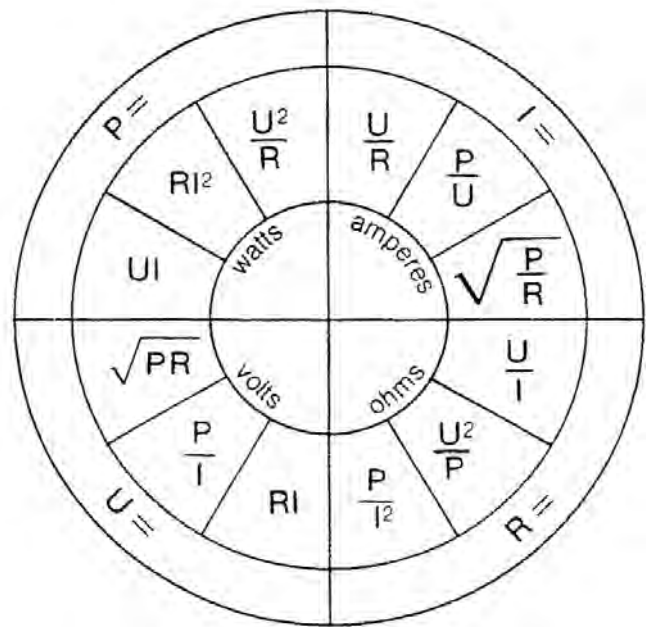
## SYMBOLS

U = Voltage in volts

I = Current in amperes

R = Resistance on ohms

P = Power in watts



## Useful Formulae

$kW = kVA \times pF$	$Line\ Amps = \frac{hp \times 746}{Line\ volts \times 1.732 \times Eff \times pF}$
$kW = \frac{hp \times 746}{1000 \times Eff} = \frac{hp \times 746 \times 100}{1000 \times \%Eff}$	$Horsepower = \frac{kVA \times 1000 \times Eff}{746}$ (hp)
$kW = \frac{Line\ amps \times Line\ volts \times 1.732 \times pF}{1000}$	$hp = \frac{kVA \times 1000 \times Eff \times pF}{746}$
$kVA = \frac{kW}{pF}$	$hp = \frac{Line\ amps \times Line\ volts \times 1.732 \times Eff \times pF}{746}$
$kVA = \frac{hp \times 756}{1000 \times Eff \times pF}$	1 Watt = 1 joule/second
$kVA = \frac{Line\ amps \times Line\ volts \times 1.732}{1000}$	1 hp = 746 Watts
$Line\ Amps = \frac{kVA \times 1000}{Line\ volts \times 1.732}$	1 hp = 746 joules/second
$Line\ Amps = \frac{kW \times 1000}{Line\ volts \times 1.732 \times pF}$	

## VOLT-DROP Single Phase

Service Voltage = 240V

$$Max\ Permissible\ Vd = \frac{240 \times 2.5}{100} \quad (2.5\% \text{ Service Voltage})$$

$$= 6V$$

$$Max\ Unit\ Vd = \frac{Max\ Vd \times 1000}{1 \times distance} \quad (\text{Length of cable run})$$

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**AC-1**  
 Resistive or low inductive loads.

**AC-3**  
 Direct on line starting, star delta starting.

**AC-4**  
 Direct on line starting, reversing, plugging and inching.

**AC-21**  
 Switching of resistive loads, including moderate overloads.

**AC-23A**  
 Frequent switching of motors or other highly inductive loads (selection criteria for main switches).

**AC-22**  
 Isolation of 6 Pole star delta motor circuits

POWER Motor Size		CURRENT three phase 50-60 Hz	
kW	h.p.	415V	440V
0.37	0.5	1.2	1
0.55	0.75	1.6	1.3
0.75	1	2	1.68
1.1	1.5	2.5	2.37
1.5	2	3.5	3.06
2.2	3	5	4.42
3	4	6.5	5.77
4	5.5	7.5	7
5.5	7.5	11	10.4
7.5	10	14	13.7
10	13.5	19	16.5
11	15	21	20.1
15	20	28	26.5
18.5	25	35	32.8
22	30	40	39
30	40	55	51.5
37	50	66	64
45	60	80	76.3
55	75	100	90
75	100	135	125
90	125	165	156
110	150	200	186
132	175	230	216
160	220	280	256
200	270	340	321
220	300	385	353
250	350	450	400
315	430	535	500

## IP Ratings

IP65 - where 6 means complete protection against accidental contact with live or internal moving parts. Protection against the ingress of dust (dust tight). Where 5 means water projected by nozzle against the equipment from any direction shall have no harmful effect.

IP66 - where 6 means complete protection against accidental contact with live or internal moving parts. Protection against the ingress of dust (dust tight). Where 6 means water projected by powerful jets against the enclosure from any direction shall have no harmful effect.

IP69K - where 6 means complete protection against accidental contact with live or internal moving parts. Protection against the ingress of dust (dust tight). Where 9K means where water directed against the enclosure under extremely high pressure from any direction must not have any harmful effect. Water pressure of 100 bar. Water temperature of 80 deg C.

# The Range of Blue Line Switchgear

Technical Catalogues for the following products are available from our website. [www.krausnaimer.com.au](http://www.krausnaimer.com.au)

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<b>Main Switches and Main Switches with Emergency Function 16 A-315 A</b> <b>Maintenance Switches 20 A-315 A</b> <b>Switch Disconnectors 20 A-315 A</b> According to IEC 60947 - 3, EN 60947 - 3, VDE 0660 part 107, IEC 60204, EN 60204 and VDE 0113	<b>500</b>
<b>CL SWitches 10 A-20 A</b> <b>C, CA and CAD Switches 10 A-315 A and L Switches 350 A-2400 A</b> 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.	<b>100</b>
<b>Optional Extras and Enclosures</b> 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.	<b>101</b>
<b>A and AD Switches 6 A-25 A</b> 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 column.	<b>110</b>
<b>CG, CH and CHR Switches 10 A-25 A</b> 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.	<b>120</b>
<b>DH, DHR, DK and DKR Switches 6 A-16 A</b> 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.	<b>130</b>
<b>X Switches 80 A-630 A</b> X switches can be applied for load, tap and gang duties. They incorporate 6 contacts in each switching stage. Their compact design provides a minimum length dimension for mounting purpose.	<b>140</b>
<b>KG Switches 20 A-315 A and KH and KHR Switches 16 A-80 A</b> KC, 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. KC switches offer spring cage terminals for greater termination security.	<b>150</b>
<b>Push Buttons and Pilot Lights, 22.5 mm Ø</b> A complete range of state-of-the-art push buttons and pilot lights represent an ideal combination of functional security economical efficiency in a modular design.	<b>302</b>
<b>Disconnectors for Photovoltaic</b>	
<b>Maintenance Switches for EMC - Compliant Connection</b> Frequency regulated motors.	

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We reserve the right to make technical and dimensional changes without prior notice. Any errors or omissions are not binding.



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