



Kraus & Naimer Ltd.
BLUE LINE switchgear

NZ

SHORT FORM CATALOGUE 2012



Effective 1/12/12

www.krausnaimer.com

Prices exclusive of GST.

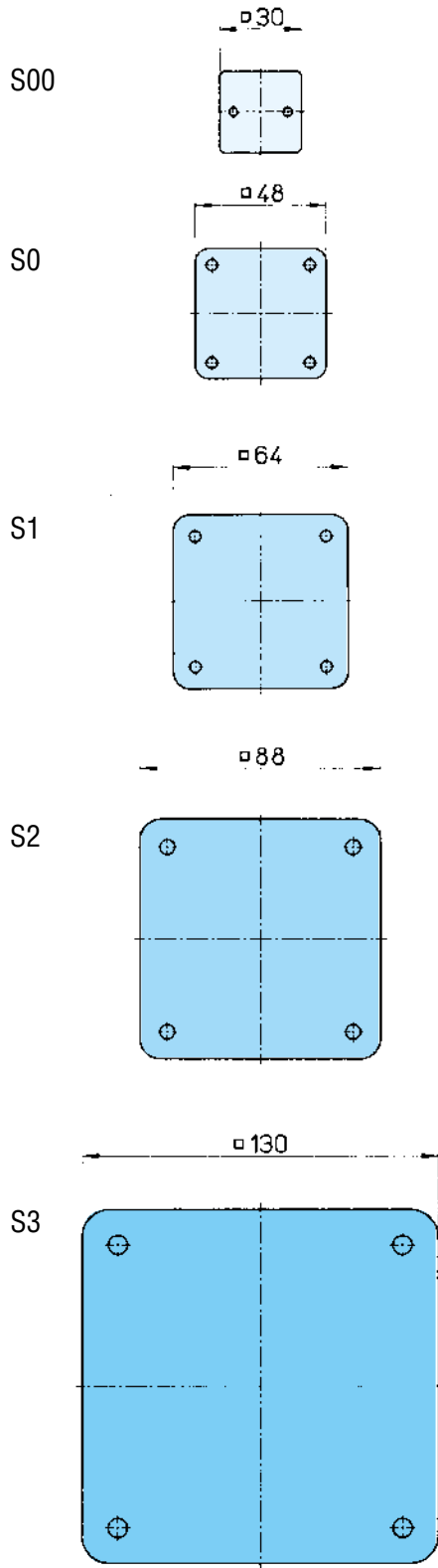
Contents

	Page
	C, CA & L Switch Nominal Values 1
	Rotary Cam Switches 10 - 200 amps 2 - 9
	<ul style="list-style-type: none"> - Smart switches - Low voltage switches - UPS bypass switches - New switches
	Optional Extras & Mounting Options 10 - 11
	KG, KH, KF & KE Switch Nominal Values 12 - 13
	KG, KH, KF & KE Main & Maintenance Switches 14 - 20
	<ul style="list-style-type: none"> - Padlockable isolators, maintenance & main switches - Padlockable isolators, maintenance & main switches enclosed - Stainless steel to dairy industry standards - Solar installation isolators (PV) - EMC screen connection isolators enclosed - Zone 21 ATEX isolators enclosed
	Specialist New Zealand Products 21 - 25
	<ul style="list-style-type: none"> - 56 series retrofit system - Timers, latching relays - Engraving - Rope switches, heat pump isolators - Enclosures for all switches, ABS, stainless steel, polycarbonate & steel - Zero energy safety systems, Fortress & Castell interlocks
	KG & KH Changeover Switches 26 - 28
	<ul style="list-style-type: none"> - Wiring guide - DIN rail mount (MCB cutout) - Enclosed
	Push Buttons, Pilot Lights 29 - 30
	Contactors, Thermal Overload Relays, Motor Starters 31 - 33
	<ul style="list-style-type: none"> - A complete range from 10 amps to 130 amps AC or DC coils - Clip on auxiliaries & options - DOL, reversing & Star delta starters
	Handy Hints, Notes & Index 34 - 37

K&N Cam Switches Nominal Values

According to IEC60947-3/VDE 0060 Part 107 & AS/NZS/3947-3

Switch Types



Type	Max cable size mm ²	Nominal Voltage U1 V	Thermal Current Iu/Ith A	Motor Rating	
				3 x 380V - 440V AC-23A kw	AC-3 kw

Size 00 - 30 x 30mm					
CA4	2 x 1.5	440	10	3	2.2
CG4	2 x 1.5	440	10	3	2.2

Size 0 - 48 x 48mm					
CG8	2 x 2.5	690	20	7.5	5.5
CA10	2 x 2.5	690	20	7.5	5.5
CA20	2 x 4	690	25	11	7.5
CA25	2 x 6	690	32	15	11

Size 1 - 64 x 64mm					
CA40	16	690	40	18.5	15
CA50	16	690	50	22	18.5
CA63	16	690	63	30	22

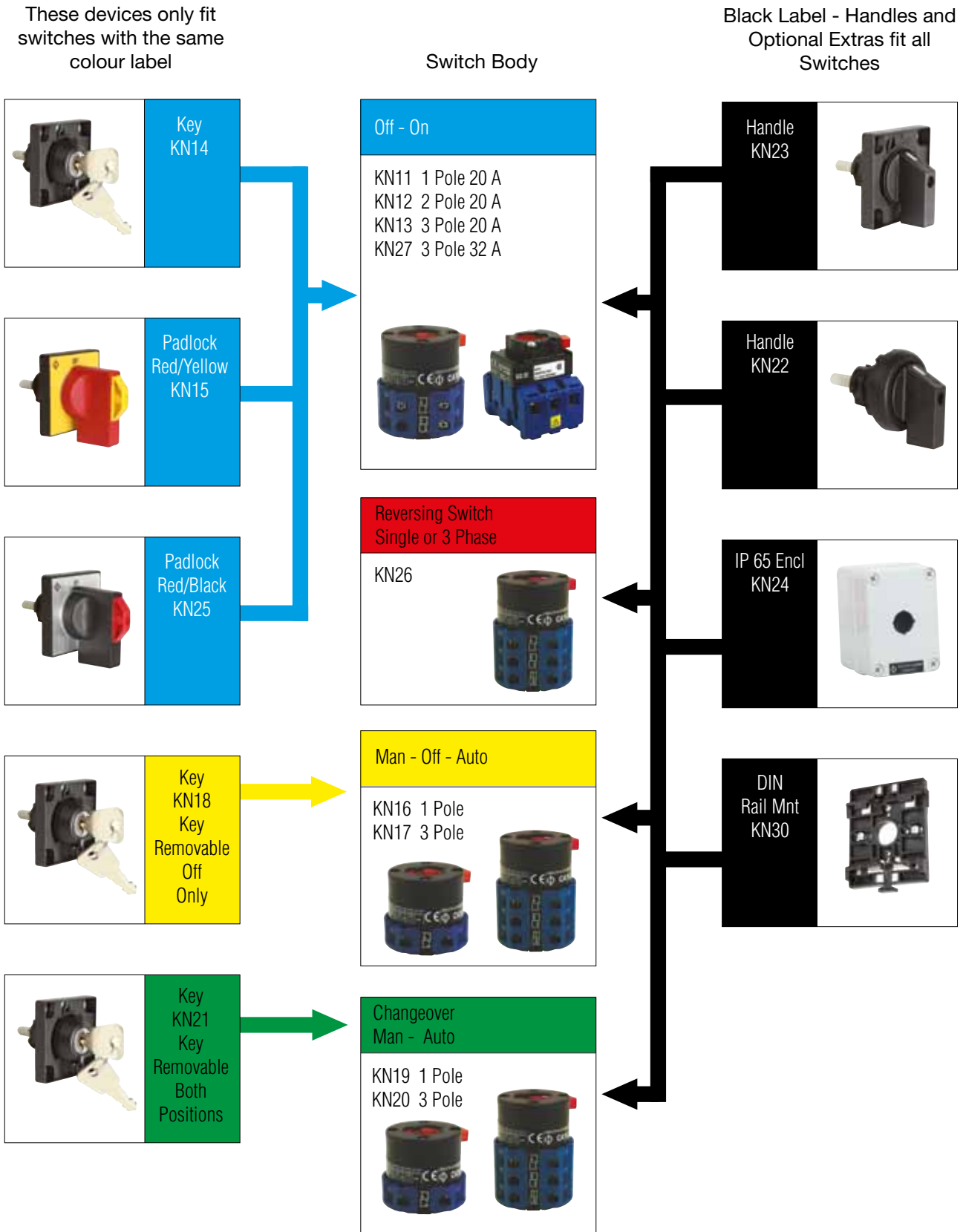
Size 2 - 88 x 88mm					
C80	35	690	115	45	30
C125	70	690	150	75	37
C200-4	M8 Lug	690	200	75	37

Size 3 - 130 x 130mm					
C315	185	690	315	132	55
L400	Bar	690	500	132	55
L600	Bar	690	800	132	55
L800	Bar	690	1100	132	55
L1200	Bar	690	1450	132	55
L1600	Bar	690	1900	132	55
L2000	Bar	690	2400	132	55

For further technical details, refer to Catalogue 100, 120 or www.krausnaimer.com

Smart Switch

Match the label colours (blue to blue, yellow to yellow) to ensure the switch body and handle, key or padlock device are compatible.



Smart Switch - Industrial Cam Switches, 20A Ith₂, 22mm, IP 66 Protection

Rotary cam switch bodies and operators for Off - On changeover and reversing applications.
 A complete range of standard and special developments from milli-amps to 2,4000 Amps are readily available, combined with Optional Extras including high security operators, interlocks, auxiliary contacts etc.

OFF - ON Switch Bodies		
KN11	1 pole, 20A	31.80
KN12	2 pole, 20A	39.30
KN13	3 pole, 20A	51.60
KN27	3 pole, 32A	67.20

Wiring Diagram

Off - On

Padlock Handles For OFF - ON Switch Bodies Only		
KN15	Red/Yellow	25.70
KN25	Black/Red	25.80

MAN - OFF - AUTO Switch Bodies		
KN16	1 pole, 20A	39.50
KN17	2 pole, 20A	79.20

Wiring Diagram

Man - Off - Auto

Key Operators - Select by Switch Function		
KN14	OFF ON	101.70
KN18	MAN OFF AUTO	101.70
KN21	MAN AUTO	101.70

MAN - AUTO Switch Bodies		
KN19	1 pole, 20A	39.50
KN20	2 pole, 20A	79.20

Wiring Diagram

Man - Auto

Handle Operators		
KN22	Round bezel	24.40
KN23	Square frame	26.30

1 or 3 Phase FOR-OFF-REV Switch Body		
KN26	1 Ph 0.5 Kw 3 Ph 1.5 Kw	79.50

Single Phase

Three Phase

Note: Fit Loop 1 - 5

Mounting Accessories		
KN24	Drilled enclosure	30.20
KN30	DIN rail plate	7.70

Note: Escutcheon plates included with switch body

1 or 3 Phase FOR-OFF-REV Switch Body Enclosed IP 66		
KN10	1 Ph 0.5 Kw 3 Ph 1.5 Kw	94.50

Single Phase

Three Phase

Note: Fit Loop 1 - 5

<p>KN11, KN12, KN13, KN27</p>	<p>KN16, KN17</p>	<p>KN19, KN20</p>
<p>KN26</p>	<p>KN16, KN17</p>	<p>KN19, KN20</p>

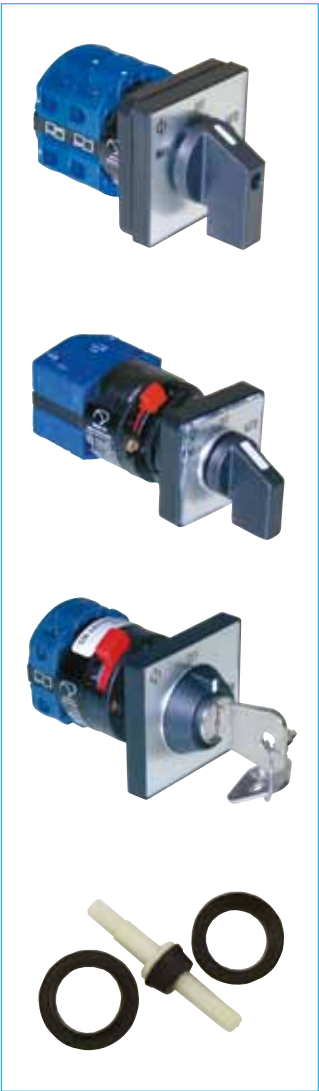
Rotary Cam Switches Off / On IP 66

Panel Mount (4 screw) IP 66							
Ith ₂ Amps	AC-23A kW	Max Cable	Code No	1 Pole	2 Pole	3 Pole	4 Pole
				A290*NZ1001 EF	A291*NZ1001 EF	A292*NZ1001 EF	A324*NZ1001 EF
20	5.5	2 x 2.5	CA10	93.70	109.30	133.80	149.40
25	7.5	2 x 4	CA20	127.10	145.00	189.60	207.40
32	11	2 x 6	CA25	182.90	209.60	265.40	292.10
Electronic Gold Contacts				A290 600 EF	A291 600 EF	A292 600 EF	A324 600 EF
1 - 20mA		2 x 2.5	CAD11	111.50	149.40	191.80	229.70

Panel Mount (22mm Single Hole) IP 66							
Ith ₂ Amps	AC-23A kW	Max Cable	Code No	1 Pole	2 Pole	3 Pole	4 Pole
				A290*NZ1001 FT2	A291*NZ1001 FT2	A292*NZ1001 FT2	A324*NZ1001 FT2
20	5.5	2 x 2.5	CA10	98.40	114.00	138.50	154.10
25	7.5	2 x 4	CA20	131.80	149.70	194.30	212.10
32	11	2 x 6	CA25	187.60	214.30	270.10	296.80
Specialist miniature switch				A290*NZ1001 FS2-V	A291*NZ1001 FS2-V	A292*NZ1001 FS2-V	A324*NZ1001 FS2-V
10	3	2 x 1.5	CG4	82.80	96.10	116.20	129.60
Electronic Gold Contacts				A290 600 FT2	A291 600 FT2	A292 600 FT2	A324 600 FT2
1 - 20mA		2 x 2.5	CAD11	116.20	154.10	196.50	234.40

Key Operated (22mm Single Hole) IP 66 Key Removable Off only							
Ith ₂ Amps	AC-23A kW	Max Cable	Code No	1 Pole	2 Pole	3 Pole	4 Pole
				A290*NZ0003*FT2	A291*NZ0001*FT2	A292*NZ0002*FT2	A324*NZ0001*FT2
20	5.5	2 x 2.5	CA10	197.30	212.70	237.20	252.80
25	7.5	2 x 4	CA20	230.50	248.40	293.00	310.80
32	11	2 x 6	CA25	286.30	313.00	368.80	395.50
Specialist miniature switch				A290*NZ0001*FS2-V	A291*NZ0002*FS2-V	A292*NZ0002*FS2-V	A324*NZ0001*FS2-V
10	3	2 x 1.5	CG4	139.20	152.50	172.60	186.00
Electronic Gold Contacts				A290*NZ0003*FT2	A291*NZ0003*FT2	A292*NZ0002*FT2	A324*NZ0003*FT2
1 - 20mA		2 x 2.5	CAD11	214.90	252.80	295.20	333.10

Additional Sealing Kit For Single Hole Mounting (22mm) Switches		
Factory Fit	SOD V110/NZZ141	7.90



Tip: Other key removable programmes available



Tip: Special switches can be made to your exact requirements. Direct replacement of any switch is possible - overnight.

Rotary Cam Switches Changeover IP 66

Changeover With Off Panel Mount (4 screw) IP 66					
Ith ₂ Amps	Max Cable	Code No	1 Pole	3 Pole	4 Pole
			A210 623 EF	A212 620 EF	A213 620 EF
20	2 x 2.5	CA10	109.30	189.60	229.70
25	2 x 4	CA20	145.60	269.80	334.50
32	2 x 6	CA25	209.60	374.60	457.20
Electronic Gold Contacts					
1 - 20mA	2 x 2.5	CAD11	149.40	313.00	390.30

Changeover With Off (22mm Single Hole Mount) IP 66					
Ith ₂ Amps	Max Cable	Code No	1 Pole	3 Pole	4 Pole
			A210 623 FT2	A212 620 FT2	A213 600 FT2
20	2 x 2.5	CA10	114.00	194.30	234.40
25	2 x 4	CA20	149.70	274.50	339.20
32	2 x 6	CA25	214.30	379.30	461.90
Specialist miniature switch					
10	2 x 1.5	CG4	96.10	163.00	196.50
Electronic Gold Contacts					
1 - 20mA	2 x 2.5	CAD11	154.10	314.70	395.00

Changeover Without Off Panel Mount (4 screw) IP 66					
Ith ₂ Amps	Max Cable	Code No	1 Pole	3 Pole	4 Pole
			A220 623 EF	A222 620 EF	A223 600 EF
20	2 x 2.5	CA10	109.30	189.60	229.70
25	2 x 4	CA20	145.00	269.80	334.50
32	2 x 6	CA25	209.60	374.60	457.20
Specialist miniature switch					
10	2 x 1.5	CG4	95.20	162.10	195.60
Electronic Gold Contacts					
1 - 20mA	2 x 2.5	CAD11	149.40	310.00	390.30

Changeover Without Off (22mm Single Hole Mount) IP 66					
Ith ₂ Amps	Max Cable	Code No	1 Pole	3 Pole	4 Pole
			A220 600 FT2	A222 600 FT2	A223 600 FT2
20	2x 2.5	CA10	114.00	194.30	234.40
25	2 x 4	CA20	149.70	274.50	339.20
32	2 x 6	CA25	214.30	379.30	461.90
Specialist miniature switch					
10	2 x 1.5	CG4	96.10	163.00	196.50
Electronic Gold Contacts					
1 - 20mA	2 x 2.5	CAD11	154.10	314.70	395.00

Changeover With Off Spring Return To Centre Off IP 66						
Ith ₂ Amps	Max Cable	Code No	Panel Mount		Single Hole Mount	
			1 Pole	2 Pole	1 Pole	2 Pole
			A214 600 EF	A215 600 EF	A214 600 FT2	A215 600 FT2
20	2 x 2.5	CA10	109.30	149.40	114.00	154.10
25	2 x 4	CA20	145.00	207.40	149.70	212.10
32	2 x 6	CA25	209.60	292.10	214.30	296.80
Specialist miniature switch						
10	2 x 1.5	CG4	91.40	124.90	96.10	129.60
Electronic Gold Contacts						
1 - 20mA	2 x 2.5	CAD11	149.40	229.70	154.10	234.40

Additional Sealing Kit For Single Hole Mounting (22mm) Switches		
Factory Fit	SOD V110/NZZ141	7.90

Tip: For switches with electrically isolated contacts change code No. to A7_etc.

*Tip: Special switches can be made to your exact requirements.
Direct replacement of any switch is possible - overnight.*



Rotary Cam Switches Multi-step IP 66

Multi-step With Off Panel Mount (4 screw) IP 66						
Ith ₂ Amps	Max Cable	Code No	2 Step With Off		3 Step With Off	
			1 Pole	2 Pole	1 Pole	2 Pole
			A240 620 EF	A260 620 EF	A241 620 EF	A261 620 EF
20	2 x 2.5	CA10	109.30	149.40	133.80	189.60
25	2 x 4	CA20	145.00	207.40	189.60	269.80
32	2 x 6	CA25	209.60	292.10	265.40	374.60
Electronic Gold Contacts			A240 620 EF	A260 620 EF	A241 620 EF	A261 620 EF
1 - 20mA	2 x 2.5	CAD11	149.40	229.70	191.80	310.00

Multi-step With Off Panel Mount (4 screw) IP 66						
Ith ₂ Amps	Max Cable	Code No	4 Step With Off		5 Step With Off	
			1 Pole	2 Pole	1 Pole	2 Pole
			A242 620 EF	WAA262 620 EF	A243 620 EF	WAA263 620 EF
20	2 x 2.5	CA10	149.40	229.70	173.90	269.80
25	2 x 4	CA20	207.40	334.50	252.00	397.00
32	2 x 6	CA25	292.10	457.20	350.10	539.60
Electronic Gold Contacts			A242 620 EF	WAA262 620 EF	A243 620 EF	WAA263 620 EF
1 - 20mA	2 x 2.5	CAD11	229.70	390.20	272.10	470.50

Multi-step Without Off Panel Mount (4 screw) IP 66						
Ith ₂ Amps	Max Cable	Code No	3 Step Without Off		4 Step Without Off	
			1 Pole	2 Pole	1 Pole	2 Pole
			A230 600 EF	A250 600 EF	A231 600 EF	A251 600 EF
20	2 x 2.5	CA10	133.80	189.60	149.40	229.70
25	2 x 4	CA20	189.60	269.80	207.40	334.50
32	2 x 6	CA25	265.40	374.60	292.10	457.20
Electronic Gold Contacts			A230 600 EF	A250 600 EF	A231 600 EF	A251 600 EF
1 - 20mA	2 x 2.5	CAD11	191.80	310.00	229.70	390.30

Multi-step Without Off Panel Mount (4 screw) IP 66						
Ith ₂ Amps	Max Cable	Code No	5 Step Without Off		6 Step Without Off	
			1 Pole	2 Pole	1 Pole	2 Pole
			A232 600 EF	A252 600 EF	A233 600 EF	WAA253 600 EF
20	2 x 2.5	CA10	173.90	269.80	189.60	309.90
25	2 x 4	CA20	252.00	396.90	269.80	459.40
32	2 x 6	CA25	350.10	539.70	374.60	624.40
Electronic Gold Contacts			A232 600 EF	A252 600 EF	A233 600 EF	WAA253 600 EF
1 - 20mA	2 x 2.5	CAD11	272.10	470.50	310.00	550.80

Motor Reversing Switches Panel Mount (4 screw) IP 66						
Ith ₂ Amps	AC-4 kW	Max Cable	Code No	Single Phase	3 Phase	1 & 3 Phase
				WAA622 600 EF	A401 620 EF	KN10 Enclosed
20	1.5	2 x 2.5	CA10	189.50	173.90	94.50
32	5.5	2 x 6	CA25	374.60	350.10	-

Motor Control Switches Panel Mount (4 screw) IP 66						
Ith ₂ Amps	AC-23 kW	Max Cable	Code No	Two Speed - Single Tapped Winding		Star Delta
				Off 1 2	1 Off 2	3 Phase
				A440 620 EF	A441 620 EF	A410 620 EF
20	7.5	2 x 2.5	CA10	229.70	229.70	229.70
32	15	2 x 6	CA25	457.20	457.20	457.20

Tip: A single tapped winding motor has only 6 terminals. Do not confuse with Star Delta motors.



Rotary Cam Switches Binary Code, Low Voltage & Metering

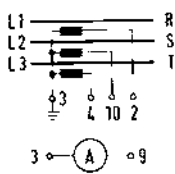
Cam Switches Low Voltage & Binary Code Switches				
Low Voltage and Electronic Circuit Switches from 30 mV				
Contact reliability depends on various parameters such as the number of operations per day, maximum permissible contact resistance, environmental conditions (dust, chemical contamination of the ambient air) and others. We recommend the use of K&N specialist switches for low voltage 4-20 mA applications				
Minimum Ratings				
Switch Code	Voltage V	Current mA	Contact system	Contact Material
CA10	20	5	Rigid Double Break Bridge	Silver Alloy
CA10-1	20	3	Rigid Double Break Bridge	Gold Alloy
CAD11	1*	1	H-bridge With Cross Wire Contact	Gold Alloy
CAD12	6	3	H-bridge With Cross Wire Contact	Silver Alloy
CG4	20	5	Multi Cross-point Contacts	Silver Alloy
CG4-1	12	3	Multi Cross-point Contacts	Gold Alloy
DH11	1*	1	H-bridge With Cross Wire Contacts	Gold Alloy
DH12	6	3	H-bridge With Cross Wire Contacts	Silver Alloy
G20	A new wiping 'knife' contact system is now available			

Tip: For Voltage Values less than 1v Please contact us

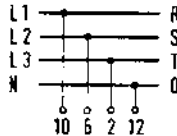
Cam Switches / Binary Code Panel Mount IP 65				
		Binary Code 0 - 7		Binary Code 0 - 9
Max Cable	Code No	3 Contact		4 Contact
		A540 600 FS2-V (Single Hole)		A550 600 FS2-V (Single Hole)
2 x 1.5	CG4-1	129.60		147.40
		A540 600 EF (4 Screw)		A550 600 EF (4 Screw)
2 x 2.5	CAD11	191.80		229.70
2 x 2.5	DH11	274.30		318.90
2 x 2.5	DH12	223.00		247.50
		Binary Code 0 - 11		
Max Cable	Code No	4 Contact		Numerous switching programmes available with low voltage contacts. Please contact us
		A543 600 FS2-V (Single Hole)		
2 x 1.5	CG4-1	147.40		
		A543 600 EF (4 Screw)		
2 x 2.5	CAD11	229.70		
2 x 2.5	DH11	318.90		
2 x 2.5	DH12	247.50		

Tip: With the correct contact system matched to the voltage, inputs are more reliable and accurate.

Metering Switches Panel Mount (4 screw) IP 66				
Voltmeter With Off RWBN				
lth ₂ Amps	Max Cable	Code No	3 Phase 3 Wire	3 Ph to Ph & 3 Ph to N
			A004 623 EF	A007 625 EF
20	2 x 2.5	CA10	153.90	194.00
Ammeter With Off RWB				
		Code No	2 Pole for 3 CT's or direct reading	1 Pole for 3 CT's only
			A038 621 EF	A048 624 EF
20	2 x 2.5	CA10	258.70	194.00



A048



A007

Tip: Special switches can be made to your exact requirements. Direct replacement of any switch is possible - overnight.



CG4 Contacts



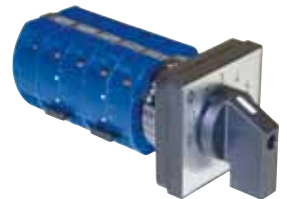
CA10 Contacts



CAD Contacts



G20 Knife Contacts



UPS Bypass Switches

Typical System

OFF - All contacts open. The load is isolated from the UPS & the Mains. UPS is isolated from the Mains.

NORMAL - Load supplied from the UPS. The load is isolated from the unconditioned Mains.

TEST - The Load is connected to the Mains. UPS has Mains supply for testing. Load is isolated from the UPS.

BYPASS - Load connected to the Mains. UPS is isolated and can be serviced safely.

K&N Bypass switches are designed to allow for the testing and isolation of a system without ever removing the power supply from the load.

This sequence may not suit all applications and other sequences are available.

Different UPS's have different requirements. Please advise the specification of each application.

Single Phase

Typical Rating Selections

Amps AC21	kVA AC22A	Max Cable
415V	415V	
16	11.5	2 x 2.5
32	23	2 x 6
63	45	2 x 16

Three Phase

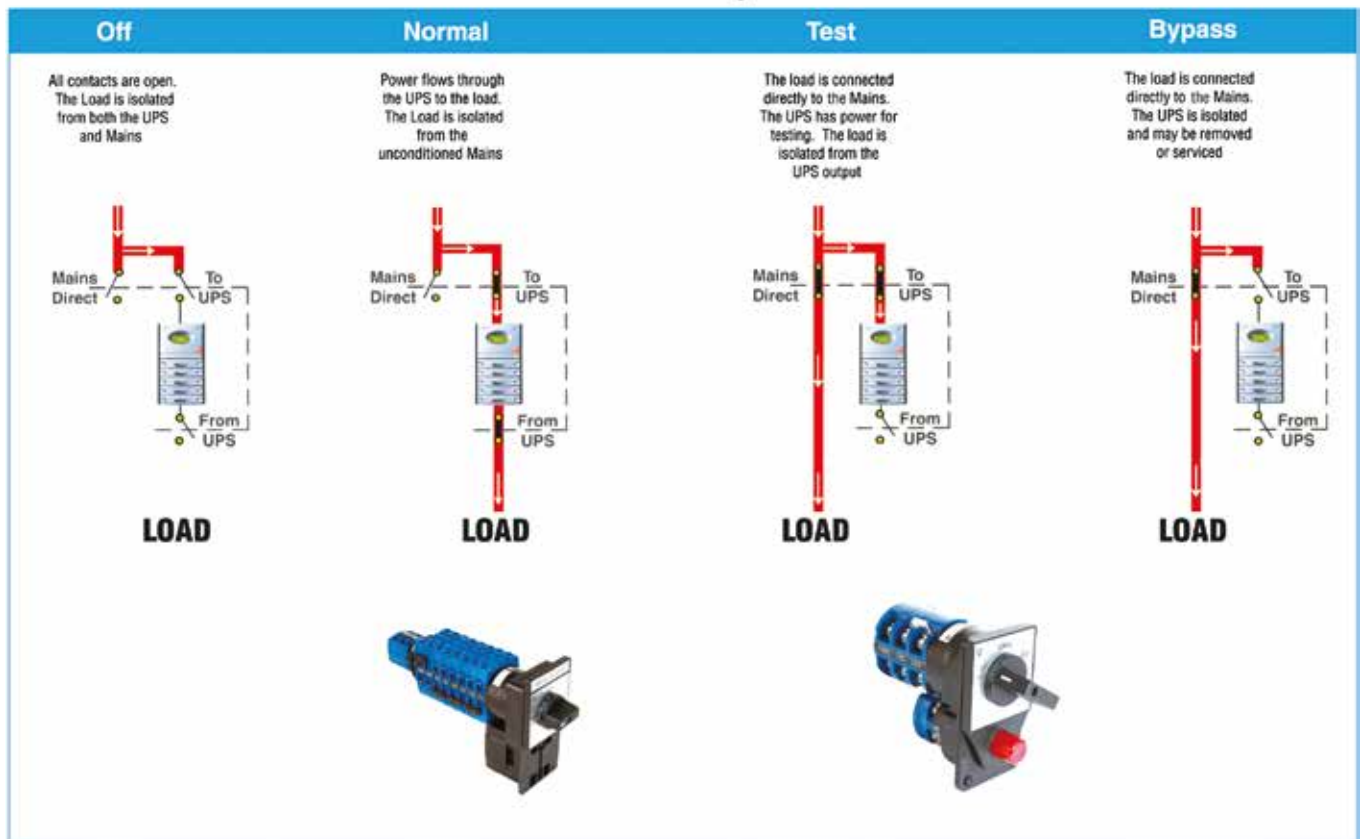
Typical Rating Selections

Amps AC21	kVA AC22A	Max Cable
415V	415V	
16	11.5	2 x 2.5
32	23	2 x 6
63	45	2 x 16
100	72	35
150	107	150
315	225	185

Options available for UPS Switches

- Push Button Interlock
- Key Lock
- Electrical Solenoid Interlock
- Interlock With Timer
- Castell Style Keyed Interlock
- Signal Aux. Contacts N/C
- Plastic Enclosure
- Steel Enclosure with Special Paint and Labeling
- High Current Systems 400 amp plus

Switch Function by Position



New From Kraus & Naimer

On Off Knife Contact DC Switches G20/G20S

Rated Utilisation Category	Rated Utilisation Current Ie/A		Contacts in Series Permissible Voltage					
	G20S	G20	1	2	3	4	5	6
DC-21A	20	8	250	500	670	1000	-	-
	13	4	440	880	-	-	-	-
	20	2	250	500	750	1000	-	-
DC-22A	10	1	330	600	990	-	-	-
	5	0.5	440	880	-	-	-	-
	20	20	24	48	72	96	120	144
DC-23A	20	12	48	96	144	192	240	288
	15	5	60	120	180	240	300	360
	12	3	110	220	330	440	550	660
	8	2	160	320	480	640	800	960
	5	1	250	500	750	1000	-	-
	3	0.5	330	660	990	-	-	-
	1	0.25	440	-	-	-	-	-

Changeover Knife Contact DC Switches G20S

Rated Utilisation Category	Rated Utilisation Current Ie/A	Contacts in Series Permissible Voltage					
		1	2	3	4	5	6
DC-21A	G20S	1	2	3	4	5	6
	7	250	500	750	1000	-	-
	1	440	880	-	-	-	-
DC-22A	3	250	500	750	1000	-	-
	1	330	660	990	-	-	-
DC-23A	20	24	48	72	96	120	144
	20	48	96	144	192	240	288
	15	60	120	180	240	300	360
	6	110	220	330	440	550	660
	3	160	320	480	640	800	960
	1	250	500	750	1000	-	-
























The G20S & G20 switches from Kraus & Naimer are a modern design DC switch. The compact and rugged disconnecter offers numerous application possibilities including photovoltaic inverters. The uniquely designed 'Knife contacts' result in a switching capacity of 20 Amps at 690V DC (DC-22A) and a high short circuit withstand capability. Finger-proof terminals and IP 20 offer maximum safety. Using a standard latching mechanism, the G20 complies with all regulations required for main switches. 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.

Of course the new G-Line can also be combined with many optional extras and enclosures from the Kraus & Naimer product line.

Utilisation Categories	A = Frequent operations. B = Infrequent operations
DC-20A, DC-20B	Connecting and disconnecting under no-load conditions.
DC-21A, DC-21B	Switching of resistive loads, including moderate overloads.
DC-22A DC-22B	Switching of mixed resistive and inductive loads, including moderate overloads (eg. shunt motors).
DC-23A DC-23B	Switching of motor loads or other highly inductive loads (eg. series motors).

Tip: Telephone now for a demonstration

Optional Extras

Padlock Device		Code	Door Clutch & Shaft Extensions		Code
For 1 Padlock	V840K		Single hole 22mm door clutch	M295A	
The padlock is an integral part of the switch handle	V840A		Single hole 22mm with door clutch and locking handle	V840E	
Locking handle for DIN cutout handles	V840B		Single hole 22mm with door clutch and locking handle	V840G	
For 4 padlocks	V845		Single hole 22mm with door clutch and locking handle	V840F	
Padlock with integral Raised handle - 2 padlock	V840D		Single hole 22mm with door clutch and locking handle	V845	
3 Padlock handle with Raised handle (F) - V840G/F Flat handle (B) - V840G/B			Door clutch with shaft extension	M280D	
4 Padlock handle with Raised handle (F) - V840F/F Flat handle (B) - V840F/B			Centering aid for door clutches	M600	
Padlock device - Heavy Duty	V850		Door clutch for misaligned doors with locking handle	M700	
Other colour options available			Single hole 22mm with door clutch and locking handle IP 66/67	M800 M810	
Shaft locking device (Locking at 9 O'Clock only)	V840VE		Shaft extensions up to 990mm	M004D	
Clip on aux contacts - base mount for KG20 - KG32 for KG41 - KG64 for KG80 - KG105	K0-H010/A11-VE K1-H010/A11-VE K2-H010/A11-VE		Standard Shaft	KOB M001 01	
Clip on aux contacts - panel mount for KG20 - KG32 for KG41 - KG64 for KG80 - KG105	K0-H010B/A11-E K1-H010/A11-E K2-H010/A11-E		Special Engraving Header 2 line Header 3 Line	PRC PRA	

Optional Extras


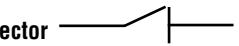
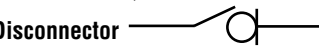
Keylocks	Code		Mounting Unit	Code	
Direct drive operator (Less switch and lock)	V750/A9		Panel mount 2 or 4 screw	E	
For base mounting VE21	V750D		Panel mount 2 or 4 screw IP 66	EF1	
For single hole 16/22mm Security key	V750D/1		Base mounting 4 screw mount	VE	
For single hole 16/22mm Standard K&N key	V750D/2		Base mount DIN rail	VE1	
For single hole 22mm Standard K&N key	V750D/3		Base mount DIN rail with MCB cut out	VE21	
Separate drive key lock Standard K&N key	V760/AE		Double end mount for fixing of esc. plate with DIN mounting base	VE1E	
Separate drive key lock Yale type key	V760/A		Double end mount for fixing of esc. plate with screw mounting base	ER	
With half-cylinder lock	V765		Single hole mount without esc plate 16/22mm 22/30mm	FS1 FT1	
5 Pin Barrel	9 201/5P		Single hole mount square plate 16/22mm 22/30mm	FS2 FT2	
Spare Keys Standard K&N	Ronis (601) S00 V750 S2 K&N (KN101) SOC V750 S2		Single hole with plate 16/22mm Rectangle 30x39	FS4	
Spare Keys Security	Kaba EG0031		Single hole with plate 16/22mm Rectangle 48x59	FT6	
			Single hole with plate 16/22mm Rectangle 64x78	FH4	
Special Engraving			Next size up handle and plate	EG	

Application Guide AS/NZS 3947-3 3F Lockout Isolators

Get a Handle on Safety with your Eyes Closed

Product Features
M700 Door Interlock
<ul style="list-style-type: none"> • Padlockable in 'OFF' only - safety requirement according to AS/NZS 3947-3 • In 'ON' the door interlock is engaged - the cabinet cannot be opened • In 'ON' the door interlock can be defeated by using a tool - authorised entry only • The door interlock re-engages when the door is closed after authorised entry in 'ON' • The 'OFF' and padlocked, the door interlock defeat is disabled - no access • When the door is opened the handle position is locked - assured alignment • Mechanical Position Indicator on the switch module - visible when the door is open • Internal Padlock Device on switch module • Robust, keyed, floating head on switch shaft
KG Switch Disconnectors
<ul style="list-style-type: none"> • 13/14mm contact gap. 690v - 1000v insulation • High AC3 and AC23 ratings • Large, finger proof IP 20 box type terminals • Double break forced opening safety auxiliary contacts. Silver or Gold 1 to 6 N/O - N/C • Positive drive make and break main contacts. 3 to 8 poles OFF ON, 3 or 4 pole C/O • IEC 60947-3 3F disconnector handle. Isolation is assured 'OFF' is 'OFF'
General Features
<ul style="list-style-type: none"> • Custom colours and engraving for escutcheon plates and header labels • Scratch-proof reverse engraving • IP 65 dust and water protection • Robust, double insulated handle • Asymmetric shaft and interlock profiles ensure the handle position matches the switch position • Fixed length shaft ensures shaft must engage with handle

Tip: Telephone now for a demonstration

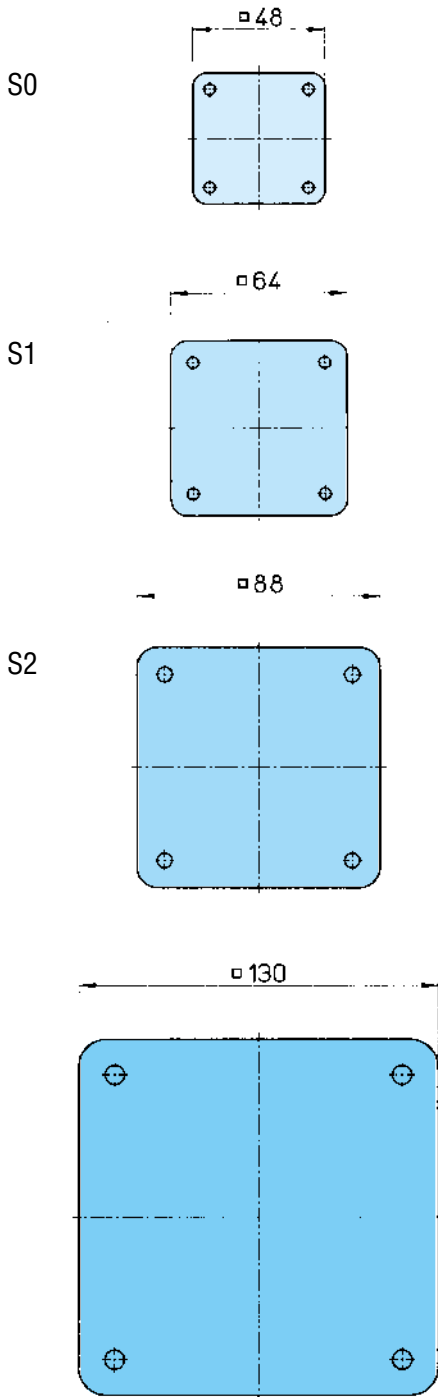
IEC 60947-1
Equipment Suitable For Isolation - The Following Clauses Apply
Clause 7.1.6 Additional constructional requirements for equipment suitable for isolation
Clause 7.1.6.1 Additional constructional requirements
Equipment suitable for isolation shall provide, in the open position (see 2.4.21) an 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 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
Clause 8.2.5 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)
Switch Classifications
All low voltage switches installed in Australia and New Zealand shall meet AS/NZS 3947-3 and carry the appropriate easily identifiable symbol depending on the switch classification.
Switch 
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.)
Disconnecter 
A mechanical switching device which in the open position, complies with the requirements specified for the isolating function (Off load isolator)
Switch Disconnecter 
A 'Switch' which in the open position, complies with the requirements specified for the isolating function (On load isolator)



K&N KG, KF, KE Switches Nominal Values

According to IEC60947-3/VDE 0060 Part 107 & AS/NZS/3947-3

Switch Types



Type	Max cable size mm ²	Nominal Voltage U1 V	Thermal Current Iu/Ith A	Motor Rating 3 x 380V - 440V	
				AC-23A kw	AC-3 kw

Size 0 - 48 x 48mm					
KG10A	2.5	690	20	7.5	3.7
KG20A	6	690	25	7.5	5.5
KG32A	6	690	32	11	7.5
KF20	6	690	20	10	6.5
KF25	6	690	25	12	7.5
KF32	6	690	32	16	11

Size 1 - 64 x 64mm					
KG20B	6	690	25	7.5	5.5
KG32B	6	690	32	11	7.5
KG41B	16	690	40	15	11
KG64B	16	690	63	22	18.5
KG80	50	690	80	30	22
KG100	50	690	100	37	30
KG105	50	690	125	45	37

Size 2 - 88 x 88mm					
KG126	M10 Lug	1000	125	45	37
KG161	M10 Lug	1000	160	55	45
KG211	M12 Lug	1000	200	75	55
KG251	M12 Lug	1000	250	90	55
KG316	M12 Lug	1000	315	110	75

Size 3 - 130 x 130mm					
KE252	Bar	1000	250	132	-
KE401	Bar	1000	400	220	-
KE631	Bar	1000	630	280	-
KE800	Bar	1000	800	450	-
KE1200	Bar	1000	1000	560	-



For further technical details, refer to Catalogue 150 or www.krausnaimer.com

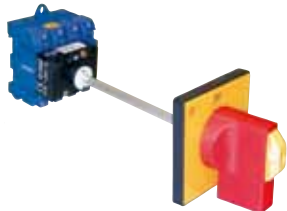

Padlockable Isolators, Maintenance Switches and Main Switches



Disconnectors and switch - disconnectors complying to the isolation tests of AS/NZS 3947 - 3:2001



For use as Main Switches, On-load Isolators, Motor isolators,

Red/Yellow locking handles indicate the switch is a point of Emergency Shut Down, and should be installed accordingly

3 Pole Panel Mount Isolators - Tag Padlock Handles IP 66									
Ith ₂ Amps	AC-23A kW	Max Cable	Switch	RED/YELLOW Emergency Switch		BLACK/GREY Main Switch			
				Code No		Code No			
20	5.5	2.5	KG10A	KN297		KN498		71.40	
25	7.5	6	KG20A	KN298		KN499		97.70	
32	11	6	KG32A	KN299		KN500		118.50	
40	15	16	KG41B	KN300		KN501		152.30	
63	22	16	KG64B	KN301		KN502		187.00	
80	30	50	KG80	KN302		KN503		253.30	
100	37	50	KG100	KN303		KN504		314.30	
125	45	50	KG105	KN304		KN505		411.30	

3 Pole Base Mount Isolators Single Hole Door Clutch - Tag Padlock Handles IP 66									
Ith ₂ Amps	AC-23A kW	Max Cable	Switch	RED/YELLOW Emergency Switch		BLACK/GREY Main Switch			
				Code No		Code No			
20	5.5	2.5	KG10B	KN311		KN508		149.70	
25	7.5	6	KG20B	KN312		KN509		177.40	
32	11	6	KG32B	KN305		KN510		198.20	
40	15	16	KG41B	KN306		KN511		183.10	
63	22	16	KG64B	KN307		KN512		212.60	
80	30	50	KG80	KN308		KN513		269.00	
100	37	50	KG100	KN309		KN514		320.80	
125	45	50	KG105	KN310		KN515		403.30	

3 Pole Base Mount Isolators - Disc Padlock Handles IP 66									
Ith ₂ Amps	AC-23A kW	Max Cable	Switch	RED/YELLOW Emergency Switch		BLACK/GREY Main Switch			
				Code No		Code No			
20	5.5	2.5	KG10A	KN320		KN340		71.40	
25	7.5	6	KG20A	KN321		KN341		92.20	
32	11	6	KG32A	KN322		KN342		113.00	
40	15	16	KG41B	KN323		KN343		154.20	
63	22	16	KG64B	KN324		KN344		188.90	
80	30	50	KG80	KN325		KN345		255.20	
100	37	50	KG100	KN326		KN346		316.20	
125	45	50	KG105	KN327		KN347		413.20	

3 Pole Base Mount Isolators Single Hole Door Clutch - Disc Padlock Handles IP 66									
Ith ₂ Amps	AC-23A kW	Max Cable	Switch	RED/YELLOW Emergency Switch		BLACK/GREY Main Switch			
				Code No		Code No			
20	5.5	2.5	KG10B	KN328		KN348		146.90	
25	7.5	6	KG20B	KN329		KN349		169.10	
32	11	6	KG32B	KN330		KN350		189.90	
40	15	16	KG41B	KN331		KN351		185.50	
63	22	16	KG64B	KN332		KN352		215.00	
80	30	50	KG80	KN333		KN353		271.40	
100	37	50	KG100	KN334		KN354		323.20	
125	45	50	KG105	KN335		KN355		405.70	

Padlockable Isolators, Maintenance Switches and Main Switches

Disconnectors and switch - disconnectors complying to the isolation function tests of AS/NZS 3947 - 3:2001

For use as Main Switches, On-load Isolators, Motor isolators

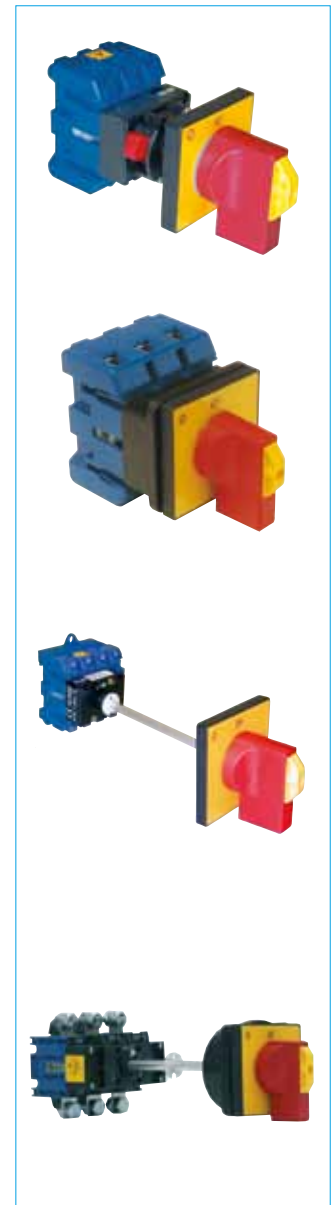
Red/Yellow locking handles indicate the switch is a point of Emergency Shut Down, and should be installed accordingly

3 Pole Panel Mount Isolators (22mm Single Hole) Tag Padlock Handles IP 66						
Ith ₂ Amps	AC-23A kW	Max Cable	Code No	3 Pole	3 Pole ^{1 N/O & 1 N/C Aux}	4 Pole
				T203*NZ1204 FT2	T223*NZ1207 FT2	T204*NZ1203 FT2
20	5.5	2.5	KG10A	80.80	103.10	90.50
25	7.5	6	KG20A	101.60	136.30	127.90
32	11	6	KG32A	122.40	157.10	154.30

3 Pole Panel Mount Isolators Tag Padlock Handles IP 66						
Ith ₂ Amps	AC-23A kW	Max Cable	Code No	3 Pole	3 Pole ^{1 N/O & 1 N/C Aux}	4 Pole
				T203*NZ1202 E	T223*NZ1204 E	T204*NZ1202 E
20	5.5	2.5	KG10A	71.40	92.20	81.10
25	7.5	6	KG20A	97.70	132.40	125.40
32	11	6	KG32A	118.50	153.20	151.80
40	15	16	KG41B	152.30	189.70	190.40
63	22	16	KG64B	187.00	224.40	232.00
80	30	50	KG80	253.30	301.80	311.60
100	37	50	KG100	314.30	362.80	391.90
125	45	50	KG105	411.30	459.80	523.60

Base/Din Rail Mount (22mm Single Hole Adjustable Shaft Length Interlocking Door Clutch) Tag Padlock Handles						
Ith ₂ Amps	AC-23A kW	Max Cable	Code No	3 Pole	3 Pole ^{1 N/O & 1 N/C Aux}	4 Pole
				T203*NZ1201 VE	T223*NZ1201 VE	T204*NZ1201 VE
20	5.5	2.5	KG10B	149.70	163.60	159.40
25	7.5	6	KG20B	177.40	212.10	205.10
32	11	6	KG32B	198.20	232.90	231.50
40	15	16	KG41B	183.10	252.60	253.30
63	22	16	KG64B	212.60	287.30	294.90
80	30	50	KG80	269.00	364.70	374.50
100	37	50	KG100	320.80	425.70	454.80
125	45	50	KG105	403.30	522.70	586.50

Base Mount (4 Screw Adjustable Shaft Length Interlocking Door Clutch) Tag Padlock Handles						
Ith ₂ Amps	AC-23A kW	Max Cable	Code No	3 Pole	3 Pole ^{1 N/O & 1 N/C Aux}	4 Pole
				T203*NZ1201 VE	T223*NZ1201 VE	T204*NZ1201 VE
125	45	M10 lug	KG126	646.70	716.00	807.50
160	55	M10 lug	KG161	785.30	854.60	993.20
200	75	M12 lug	KG211	939.70	996.00	1126.30
250	90	M12 lug	KG251	1007.10	1108.80	1273.20
315	110	M10 lug	KG316	1242.70	1300.90	1586.40



IEC 60947-3 SWITCHES, DISCONNECTORS, SWITCH DISCONNECTORS

IEC 60947 is a safety and performance standard for low voltage switchgear (up to 1000V). It has universally replaced IEC 408 and has 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 market place. IEC 60947-3 is a section 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 the current carrying parts to make and break loads under normal and overload conditions, e.g. motor applications. **Isolation** requires high insulation, sufficient spacing of current carrying parts and mechanical integrity, so that the handle corresponds to the actual contact position, so important for the safety of maintenance personnel.

The 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 **Disconnectors** does not have to satisfy the load tests. A **Switch Disconnectors** must satisfy all tests, and is suitable for safety switch applications. A **Switch Disconnectors** must have a direct drive late make, earlybreak auxiliary contact in series with a load breaking device (contactor) to be suitable as a safety switch.



















Kraus & Naimer have developed complete products which satisfy all IEC 60947-3 criteria, some of which are listed in this catalogue. For further information, please contact us.





















Padlockable Isolators, Maintenance Switches and Main Switches - Enclosed



Disconnectors and switch - disconnectors complying to the isolation function tests of AS/NZS 3947 - 3:2001

For use as Main Switches, On-load Isolators, Motor isolators,

Red/Yellow locking handles indicate the switch is a point of Emergency Shut Down, and should be installed accordingly

3 Pole Panel Mount Isolators - Disc Padlock Handles IP 66/67									
Ith ₂ Amps	AC-23A kW	Max Cable	Switch	RED/YELLOW Emergency Switch		BLACK/GREY Maintenance Switch		Encl size	
				Code No		Code No			
20	5.5	2.5	KG10	KGSW20R		KGSW20B		120x85x80	79.30
25	7.5	6	KF20	KFSW25R		KFSW25B		120x85x80	98.30
32	11	6	KF32	KFSW32R		KFSW32B		190x100x91	115.10
40	15	16	KG41	KGSW40R		KGSW40B		190x100x91	114.50
63	22	16	KG64	KGSW63R		KGSW63B		190x100x91	264.40
80	30	50	KG80	KGSW80R		KGSW80B		250x145x107	425.20
100	37	50	KG100	KGSW100R		KGSW100B		250x145x107	486.20
125	45	50	KG105	KGSW125R		KGSW125B		250x145x107	583.20

3 Pole Food Grade Stainless Isolators - Disc Padlock Handles with 2 x N/O aux contacts IP 54									
Ith ₂ Amps	AC-23A kW	Max Cable	Switch	RED/YELLOW Emergency Switch		BLACK/GREY Maintenance Switch		Encl size	
				Code No		Code No			
20	7.5	6	KG20B	KN920		KN820		200x120x100	420.40
40	15	16	KG41B	KN921		KN821		200x120x100	471.60
63	22	16	KG64B	KN922		KN822		200x120x100	506.30
63	22	16	KG64B	KN923		KN823		300x300x150	668.40
80	30	50	KG80	KN924		KN824		300x300x150	743.20
125	45	50	KG105	KN925		KN825		300x300x150	901.20
125	45	M10	KG126	KN926		KN826		300x300x150	1082.10
160	55	M10	KG161	KN927		KN827		300x300x150	1220.70
250	90	M12	KG251	KN928		KN828		400x300x300	1525.40
315	110	M12	KG316	KN929		KN829		400x300x300	1761.00
320	180	M12	KNS320	KN930				600x400x300	2605.20
400	220	M12	KNS400	KN931				800x600x300	2906.60
500	295	M12	KNS500	KN932				800x600x300	3257.40

3 Pole Food Grade Stainless Isolators - Disc Padlock Handles with 2 x N/O aux contacts IP 66									
Ith ₂ Amps	AC-23A kW	Max Cable	Switch	RED/YELLOW Emergency Switch		BLACK/GREY Maintenance Switch		Enclosure	
				Code No		Code No			
20	7.5	6	KG20B	KN933		KN833		200x120x100	438.50
40	15	16	KG41B	KN934		KN834		200x120x100	489.70
63	22	16	KG64B	KN935		KN835		200x120x100	524.40
63	22	16	KG64B	KN936		KN836		300x300x150	722.90
80	30	50	KG80	KN937		KN837		300x300x150	816.60
125	45	50	KG105	KN938		KN838		300x300x150	974.60
125	45	M10	KG126	KN939		KN839		300x300x150	1155.50
160	55	M10	KG161	KN940		KN840		300x300x150	1294.10
250	90	M12	KG251	KN941		KN841		400x300x300	1559.30
315	110	M12	KG316	KN942		KN842		400x300x300	1772.70
320	180	M12	KNS320	KN943				600x400x300	2683.80
400	220	M12	KNS400	KN944				800x600x300	3053.40
500	295	M12	KNS500	KN945				800x600x300	3414.70

Larger enclosures available on request

Padlockable Isolators, Maintenance Switches and Main Switches - Enclosed

Disconnectors and switch - disconnectors complying to the isolation function tests of AS/NZS 3947 - 3:2001

For use as Main Switches, On-load Isolators, Motor isolators,

Red/Yellow locking handles indicate the switch is a point of Emergency Shut Down, and should be installed accordingly

3 Pole Food Grade Stainless Isolators - Disc Padlock Handles Red/Yellow Emergency Switch IP 54

Black/Grey Handles available on request

Ith ₂ Amps	AC-23A kW	Max Cable	Enclosure Size mm	Code No	3 Pole	3 Pole 1 N/O & 1 N/C Aux
					T203*NZ1205 VE	T203*NZ1206
25	7.5	6	200x120x100	KG20B	393.40	420.60
32	11	6	200x120x100	KG32B	406.70	441.40
40	15	16	200x120x100	KG41B	434.40	471.80
63	22	16	200x120x100	KG64B	469.10	506.50
80	30	50	280x190x130	KG80	668.70	717.20
100	37	50	280x190x130	KG100	729.70	763.10
125	45	50	280x190x130	KG105	826.70	909.00
125	45	M10 lug	300x300x150	KG126	1001.10	1070.40
160	55	M10 lug	300x300x150	KG161	1139.70	1209.00
200	75	M12 lug	400x300x150	KG211	1405.60	1505.40
250	90	M12 lug	400x300x150	KG251	1474.90	1574.70
315	110	M12 lug	400x300x150	KG316	1710.50	1810.30

3 Pole Food Grade Stainless Isolators - Disc Padlock Handles Red/Yellow Emergency Switch IP 66 - B Series

Ith ₂ Amps	AC-23A kW	Max Cable	Enclosure Size mm	Code No	3 Pole	3 Pole 1 N/O & 1 N/C Aux
					T203*NZ1213 VE	T203*NZ1216
25	7.5	6	200x120x100	KG20B	411.50	447.00
32	11	6	200x120x100	KG32B	441.30	459.50
40	15	16	200x120x100	KG41B	452.50	489.90
63	22	16	200x120x100	KG64B	482.10	524.60
80	30	50	280x190x130	KG80	733.20	781.70
100	37	50	280x190x130	KG100	814.90	842.70
125	45	50	280x190x130	KG105	891.20	973.50
125	45	M10 lug	300x300x150	KG126	1074.50	1143.80
160	55	M10 lug	300x300x150	KG161	1213.10	1282.40
200	75	M12 lug	400x300x150	KG211	1439.50	1539.30
250	90	M12 lug	400x300x150	KG251	1508.80	1608.60
315	110	M12 lug	400x300x150	KG316	1744.40	1844.20

3 Pole Food Grade Stainless Isolators - Disc Padlock Handles Black/Grey Main Switch IP 66 - B Series

Ith ₂ Amps	AC-23A kW	Max Cable	Enclosure Size mm	Code No	3 Pole	3 Pole 1 N/O & 1 N/C Aux
					T103*NZ1213 VE	T103*NZ1216
25	7.5	6	200x120x100	KG20B	411.50	447.00
32	11	6	200x120x100	KG32B	441.30	459.50
40	15	16	200x120x100	KG41B	452.50	489.90
63	22	16	200x120x100	KG64B	482.10	524.60
80	30	50	280x190x130	KG80	733.20	781.70
100	37	50	280x190x130	KG100	814.90	842.70
125	45	50	280x190x130	KG105	891.20	973.50
125	45	M10 lug	300x300x150	KG126	1074.50	1143.80
160	55	M10 lug	300x300x150	KG161	1213.10	1282.40
200	75	M12 lug	400x300x150	KG211	1439.50	1539.30
250	90	M12 lug	400x300x150	KG251	1508.80	1608.60
315	110	M12 lug	400x300x150	KG316	1744.40	1844.20

Larger enclosures available on request - Entry holes punched to your specifications



EMC Screen Connection System - Insulated & Low Impedance

According to AS/NZS947-3. For use as Single Motor Isolators with Emergency Recognition Red & Yellow Handle
Padlockable; Welded Contact; Torque Tested; IP 66/67 Hose Protection

IP 66 Hose Proof Stainless Steel 304 Fonterra Eng. Specification c/w RFI Kit					
Ith ₂ Amps	Max Cable	AC-23A kW	RFI Kit mm	3 Pole 2 x N/O Aux	
				Code No	
25	6	7.5	25-32	KG20B T203*NZ2010 VE	509.90
40	16	15	25-32	KG41B T203*NZ2010 VE	561.10
63	16	22	32-40	KG64B T203*NZ2010 VE	610.00
63	16	22	32-40	KG64B T203*NZ2011 VE	762.60
80	50	30	40-50	KG80 T203*NZ2010 VE	1010.00
125	50	45	40-50	KG105 T203*NZ2010 VE	1168.00
125	Lug	45	50-60	KG126 T203*NZ2010 VE	1401.90
160	Lug	55	50-60	KG161 T203*NZ2010 VE	1540.50
250	Lug	90	50-60	KG251 T203*NZ2010 VE	1831.50
315	Lug	110	50-60	KG316 T203*NZ2010 VE	2026.10
320	Lug	180			POA
400	Lug	220			POA
500	Lug	295			POA

RFI Kits for Retro Fitting to Stainless Steel Enclosures & PDL 56				
Gland Size	Hole Size	Description	Code No	
2 x 20mm	25mm	2 x Isolated bushes, 110mm insulated brass coupling plate	RFIKIT 0	101.50
2 x 25mm	32mm	2 x Isolated bushes, 110mm insulated brass coupling plate	RFIKIT 1	54.90
2 x 32mm	40mm	2 x Isolated bushes, 150mm insulated brass coupling plate	RFIKIT 2	69.10
2 x 40mm	50mm	2 x Isolated bushes, 250mm insulated brass coupling plate	RFIKIT 3	163.90
2 x 50mm	60mm	2 x Isolated bushes, 250mm insulated brass coupling plate	RFIKIT 4	216.90
2 x 25mm	32mm	2 x bushes, 70mm insulated brass coupling plate	9RFIPDL 56	42.90

IP 66 Hose Proof Plastic Enclosure with RFI Wire Shield Carried Through					
Ith ₂ Amps	Max Cable	AC-23A kW	Code No	3 Pole	3 Pole with 1 N/O + 1x N/C Aux
				T203*NZ2012 KL12	T203*NZ2013 KL12
25	6	7.5	KG20	263.30	298.00
40	16	15	KG41	339.50	376.90
63	16	22	KG64	374.10	411.50
80	50	30	KG80	545.30	593.80
120	50	37	KG100	606.30	654.80





IP 66 Hose Proof Plastic Enclosure with EMC Gland Connection						
Ith ₂ Amps	Max Cable	AC-23A kW	3 Pole & Earth & RFI Kit		3 Pole + 1x N/O & Earth & RFI Kit	
25	6/10mm earth	7.5	ECO-1	222.30	ECO-1 AUX	244.50
40	16/10mm earth	15	ECO-2	278.40	ECO-2 AUX	303.40
63	16/16mm earth	22	ECO-3	313.10	ECO-3 AUX	338.10

Enclosure Sizes			
Stainless	Plastic	Entries	For Switch
-	120x85x80	2 x 32mm top & bottom	KG20
-	190x100x91	2 x 32mm top & bottom	KG41, KG64
-	250x145x100	2 x 40mm top & bottom	KG80, KG100, KG105
200x120x100	-	Punched to order	KG20B, KG41B, KG64B
300x300x150	-	Punched to order	KG64B, KG80, KG105, KG126, KG161
400x300x150	-	Punched to order	KG251, KG316
600x400x250	-	Punched to order	Higher Current Switches
800x600x250	-	Punched to order	Higher Current Switches
-	110x110x90	2 x 20mm	ECO-1
-	130x130x99	2 x 25mm	ECO-2
-	180x180x111	2 x 32mm	ECO-3
-	110x110x90	2 x 20mm + 16mm	ECO-1 AUX
-	130x130x99	2 x 25mm + 16mm	ECO-2 AUX
-	180x180x111	2 x 32mm + 16mm	ECO-3 AUX







Padlockable Isolators EX Series - Enclosed For Zone 21 IP 66





Maintenance & Safety switch according to EC ATEX - Directive 94/9/EG equipment group II, Category 2, Zone 21
Indication of field D Mechanical impact resistance 7J.

3 Pole Maintenance & Safety Switches with Disc Padlock Handles Zone 21 IP 66									
Ith ₂ Amps	AC-23B kW	Max Cable	Switch	RED/YELLOW Emergency Switch		BLACK/GREY Maintenance Switch		Enclosure Size - mm	
				Code No		Code No			
25	7.5	6	KG20	KG20 T203/NL-EXR		KG20 T103/NL-EXB		190x115x128	POA
32	11	6	KG32	KG32 T203/NL-EXR		KG32 T103/NL-EXB		190x115x128	POA
40	15	16	KG41	KG41 T203/NL-EXR		KG41 T103/NL-EXB		190x115x128	POA
55	22	16	KG64	KG64 T203/NL-EXR		KG64 T103/NL-EXB		190x115x128	POA





2 x M25 ATEX cable glands, 2 x M32/M25 adaptors & 1 x M20 dummy plug included

3 Pole Maintenance & Safety Switches with Disc Padlock Handles with 1 x N/O & N/C Aux Contacts Zone 21 IP 66									
Ith ₂ Amps	AC-23B kW	Max Cable	Switch	RED/YELLOW Emergency Switch		BLACK/GREY Maintenance Switch		Enclosure Size - mm	
				Code No		Code No			
25	7.5	6	KG20	KG20 T203/NL-EXRA		KG20 T103/NL-EXBA		190x115x128	POA
32	11	6	KG32	KG32 T203/NL-EXRA		KG32 T103/NL-EXBA		190x115x128	POA
40	15	16	KG41	KG41 T203/NL-EXRA		KG41 T103/NL-EXBA		190x115x128	POA
55	22	16	KG64	KG64 T203/NL-EXRA		KG64 T103/NL-EXBA		190x115x128	POA





2 x M25 ATEX cable glands, 2 x M32/M25 adaptors & 1 x M20 dummy plug included

4 Pole Maintenance & Safety Switches with Disc Padlock Handles Zone 21 IP 66									
Ith ₂ Amps	AC-23B kW	Max Cable	Switch	RED/YELLOW Emergency Switch		BLACK/GREY Maintenance Switch		Enclosure Size - mm	
				Code No		Code No			
25	7.5	6	KG20	KG20 T204/NL-EXR		KG20 T104/NL-EXB		190x115x128	POA
32	11	6	KG32	KG32 T204/NL-EXR		KG32 T104/NL-EXB		190x115x128	POA
40	15	16	KG41	KG41 T204/NL-EXR		KG41 T104/NL-EXB		190x115x128	POA
55	22	16	KG64	KG64 T204/NL-EXR		KG64 T104/NL-EXB		190x115x128	POA





2 x M25 ATEX cable glands, 2 x M32/M25 adaptors & 1 x M20 dummy plug included

4 Pole Maintenance & Safety Switches with Disc Padlock Handles with 1 x N/O & N/C Aux Contacts Zone 21 IP 66									
Ith ₂ Amps	AC-23B kW	Max Cable	Switch	RED/YELLOW Emergency Switch		BLACK/GREY Maintenance Switch		Enclosure Size - mm	
				Code No		Code No			
25	7.5	6	KG20	KG20 T204/NL-EXRA		KG20 T104/NL-EXBA		190x115x128	POA
32	11	6	KG32	KG32 T204/NL-EXRA		KG32 T104/NL-EXBA		190x115x128	POA
40	15	16	KG41	KG41 T204/NL-EXRA		KG41 T104/NL-EXBA		190x115x128	POA
55	22	16	KG64	KG64 T204/NL-EXRA		KG64 T104/NL-EXBA		190x115x128	POA

2 x M25 ATEX cable glands, 2 x M32/M25 adaptors & 1 x M20 dummy plug included

6 Pole Maintenance & Safety Switches with Disc Padlock Handles Zone 21 IP 66									
Ith ₂ Amps	AC-23B kW	Max Cable	Switch	RED/YELLOW Emergency Switch		BLACK/GREY Maintenance Switch		Enclosure Size - mm	
				Code No		Code No			
25	7.5	6	KG20	KG20 T203/NL-EXR		KG20 T103/NL-EXB		190x115x128	POA
32	11	6	KG32	KG32 T203/NL-EXR		KG32 T103/NL-EXB		190x115x128	POA

2 x M25 ATEX cable glands, 2 x M32/M25 adaptors & 1 x M20 dummy plug included

6 Pole Maintenance & Safety Switches with Disc Padlock Handles with 1 x N/O & N/C Aux Contacts Zone 21 IP 66									
Ith ₂ Amps	AC-23B kW	Max Cable	Switch	RED/YELLOW Emergency Switch		BLACK/GREY Maintenance Switch		Enclosure Size - mm	
				Code No		Code No			
25	7.5	6	KG20	KG20 T206/NL-EXRA		KG20 T106/NL-EXBA		190x115x128	POA
32	11	6	KG32	KG32 T206/NL-EXRA		KG32 T106/NL-EXBA		190x115x128	POA

2 x M25 ATEX cable glands, 2 x M32/M25 adaptors & 1 x M20 dummy plug included

Tip: Copies of EC - Type Examination Certificate available on request

Disconnectors For Photovoltaic (PV) Power Systems

DC Disconnectors Solar PV Power Supply Systems acc. IEC 60364-7-712:2002 UL approved switches on request AS/NZS 5033 (AS/NZS 3000/2007 7.3.2 (d))

Photovoltaic Disconnectors DC22-A - 2 Pole, 4 Contacts Per Circuit (2x2 in series)						
Rated Operational Current A	Operational Voltage	Max Off Load Volt Of PV Inverter	Rated Insulation Voltage	Max Cable	Code No	
12	500V DC	575V DC	690V	6	KG20A T304/D-P001 VE2	130.30
16	450V DC	520V DC	690V	6	KG20A T304/D-P001 VE2	130.30
20	500V DC	575V DC	690V	6	KG32A T304/D-P001 VE2	156.60
25	450V DC	520V DC	690V	6	KG32A T304/D-P001 VE2	156.60
32	450V DC	520V DC	690V	16	KG41 T304/D-P001 VE2	183.00

Photovoltaic Disconnectors DC22-A - 2 Pole, 6 Contacts Per Circuit (2x3 in series)						
Rated Operational Current A	Operational Voltage	Max Off Load Volt Of PV Inverter	Rated Insulation Voltage	Max Cable	Code No	
12	800V DC	920V DC	1000V	6	KG20A T306/D-P001 VE2	187.10
16	650V DC	750V DC	1000V	6	KG20A T306/D-P001 VE2	187.10
20	650V DC	750V DC	1000V	6	KG32A T306/D-P001 VE2	228.70
25	500V DC	575V DC	1000V	6	KG32A T306/D-P001 VE2	228.70
32	650V DC	750V DC	1000V	16	KG41B T306/D-P001 VE2	277.20
63	650V DC	750V DC	1000V	50	KG80 T306/D-P001 VE2	486.40

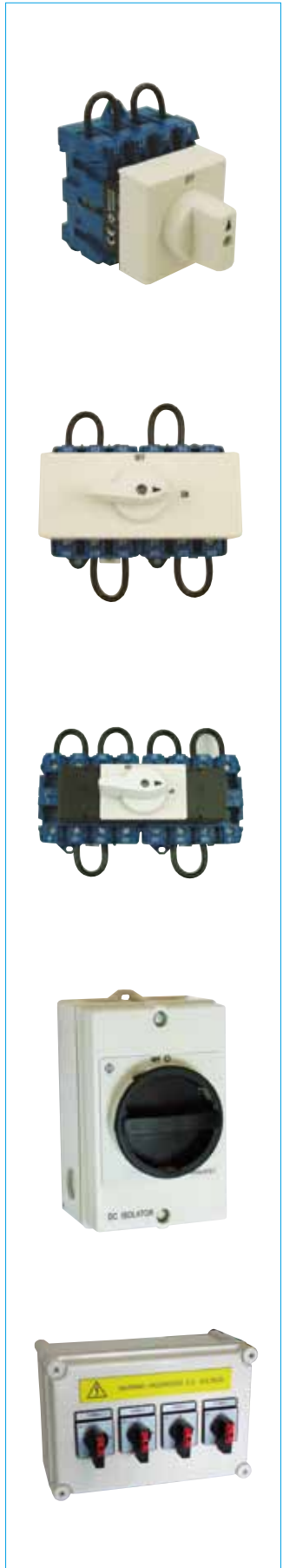
Photovoltaic Disconnectors DC22-A - 2 Pole, 8 Contacts Per Circuit (2x4 in series)						
Rated Operational Current A	Operational Voltage	Max Off Load Volt Of PV Inverter	Rated Insulation Voltage	Max Cable	Code No	
16	800V DC	920V DC	1000V	6	KG20A T308/D-P001 VE2	255.00
25	800V DC	920V DC	1000V	6	KG32A T308/D-P001 VE2	307.70
32	800V DC	920V DC	1000V	16	KG41B T308/D-P001 VE2	365.90
64	800V DC	920V DC	1000V	50	KG80 T308/D-P001 VE2	613.90

Photovoltaic Disconnectors DC22-A - 2 Pole, 4 Contacts Per Circuit (2x2 in series) Enclosed						
Rated Operational Current A	Operational Voltage	Max Off Load Volt Of PV Inverter	Rated Insulation Voltage	Max Cable	Code No	
12	500V DC	575V DC	690V	6	KG20 T204/D-P003 KL51V	190.00
16	450V DC	520V DC	690V	6	KG20 T204/D-P003 KL51V	190.00
20	500V DC	575V DC	690V	6	KG32 T204/D-P003 KL51V	216.40
25	450V DC	520V DC	690V	6	KG32 T204/D-P003 KL51V	216.40
32	450V DC	520V DC	690V	16	KG41 T204/D-P003 KL11V	273.20

Photovoltaic Disconnectors DC22-A - 2 Pole, 6 Contacts Per Circuit (2x3 in series) Enclosed						
Rated Operational Current A	Operational Voltage	Max Off Load Volt Of PV Inverter	Rated Insulation Voltage	Max Cable	Code No	
12	800V DC	920V DC	1000V	6	KG20B T206/D-P003 KL11V	278.70
16	650V DC	750V DC	1000V	6	KG20B T206/D-P003 KL11V	278.70
20	650V DC	750V DC	1000V	6	KG32B T206/D-P003 KL11V	320.30
25	500V DC	575V DC	1000V	6	KG32B T206/D-P003 KL11V	320.30
32	650V DC	750V DC	1000V	16	KG41B T206/D-P003 KL11V	444.40
63	650V DC	750V DC	1000V	50	KG80C T206/D-P003 STM	1255.70

Photovoltaic Disconnectors DC22-A - 2 Pole, 8 Contacts Per Circuit (2x4 in series) Enclosed						
Rated Operational Current A	Operational Voltage	Max Off Load Volt Of PV Inverter	Rated Insulation Voltage	Max Cable	Code No	
16	800V DC	920V DC	1000V	6	KG20B T208/D-P003 KL11V	423.60
25	800V DC	920V DC	1000V	6	KG32B T208/D-P003 KL11V	476.20
32	800V DC	920V DC	1000V	16	KG41B T208/D-P003 KL11V	533.10
64	800V DC	920V DC	1000V	50	KG80C T208/D-P003 STM	1383.20

Photovoltaic Disconnectors DC22-A Enclosed						
Any number of String Isolators Mounted in a Single Enclosure						POA



Enclosed Safety / Maintenance Switch - Disconnectors

Padlockable; Welded Contact Torque Tested; Isolation Tested; IP 66 Hose Proof Protection.
1 x Gold auxillary contact suitable for low voltage and low current control applications.

56 Series Base Mount Retrofits - Less Base					
Ith ₂ Amps	AC-23A kW	Max Cable	Code No		
3 Pole + 1 x N/O Aux Contact Panel Mount Switch, c/w Locking Handle					
20	7.5	6	KG20B	T203*NZ0076 E	158.00
63	22	16	KG64B	T203*NZ0076 E	242.90
3 Pole + 1 x N/O Aux Contact Panel Mount Switch, c/w Locking Handle and Lid					
20	7.5	6	KG20B	T203*NZ0075 E	203.40
63	22	16	KG64B	T203*NZ0075 E	288.30
3 Pole Base Mount Switch Only					
20	7.5	6	KG20B	T203*NZ0027 VE	110.20
63	22	16	KG64B	T203*NZ0027 VE	192.50
3 Pole + 1 x N/O Aux Contact Panel Mount Switch Only					
20	7.5	6	KG20B	T203*NZ0025 VE	155.90
63	22	16	KG64B	T203*NZ0025 VE	240.80
3 Pole Base Mount Switch c/w Locking Handle, Mounting Bracket and Lid					
20	7.5	6	KG20B	T203*NZ0026 VE	160.90
63	22	16	KG64B	T203*NZ0026 VE	290.00
3 Pole + 1 x N/O Aux Contact Base Mount Switch, c/w Locking Handle, Mounting Bracket and Lid					
20	7.5	6	KG20B	T203*NZ0023 VE	253.90
63	22	16	KG64B	T203*NZ0023 VE	338.80
Lid Only c/w Locking Handle - Fits All Base Mount Switches					
				S1 V840G/NZZ112	84.70

Vat Wash Timers, Latching Relays, Timers

Vat Wash Timers - IP 65 Enclosed			
230v Control		415v Control	
KN127	298.60	KN128	298.60
Latching Relays - Pulse On, Pulse Off. Other voltages available			
2 Pole C/O 024v		2 Pole C/O 110v	
9 F809/002 A024	93.80	9 F809/002 A110	93.80
2 Pole C/O 230v		2 Pole C/O 110v DC	
9 F809/002 A230	93.80	9 F809/002 D110	93.80
DIN Rail mounting plate - fits all			
9 F809-0-11	6.60		
8 Pin Timers c/w base. Selectable time ranges			
Control Volts	1 Sec to 60 Minutes 1 x Timed & 1 x Inst Contact	1 Sec to 60 Minutes 2 Timed Contacts Contact	60 Sec to 10 Hour - 230v only 1 x Timed & 1 x Inst Contact
024v	9 LS-3KC-A024 122.40	9 LS-3KB-A024 122.40	
230v	9 LS-3KC-A230 122.40	9 LS-3KB-A230 122.40	9 LS-3KD-A230 141.40
415v	9 LS-3KC-A415 122.40		



Rope Switches Heavy and Light Duty, Reversing Switches, Heat Pump Isolators

Rope Pull Switches Heavy Duty Plastic Enclosure IP 65						
Ith ₂ Amps	Max Cable	Code No	1 Pole Pull On, Pull Off		3 Pole Pull On, Pull Off	
			KN960	295.00	KN961	333.20
20	2 x 2.5	CAD11B				
			1 Pole Off On Spring Return		2 Pole Off On Spring Return	
			KN962	295.00	KN963	318.30
20	2 x 2.5	CAD11B				
			1 Pole Changeover Stepping		Intermediate Switch	
			KN964	333.20	KN971	333.20
20	2 x 2.5	CAD11B				

Rope Pull Switches Heavy Duty Metal Enclosure IP 65						
Ith ₂ Amps	Max Cable	Code No	1 Pole Pull On, Pull Off		3 Pole Pull On, Pull Off	
			KN965	369.20	KN966	406.70
20	2 x 2.5	CAD11B				
			1 Pole Off On Spring Return		2 Pole Off On Spring Return	
			KN967	369.20	KN968	392.10
20	2 x 2.5	CAD11B				
			1 Pole Changeover Stepping		1 Pole N/C Spring Return	
			KN969	406.70	KN970	369.20
20	2 x 2.5	CAD11B				

Cord Operated Light Duty Reversing Switch					
Ith ₂ Amps	AC-4 kW 415v	Max Cable	Code No	1 or 3 Ph Rev Switch	
				Latching Off For Off Rev NZP052*EG	Spring Return Off For Off Rev NZH972
20	1.5	2 x 2.5	CA10	132.70	132.70

Pull Switches with a lever mounting plate. Make your own operating lever					
Ith ₂ Amps	AC-4 kW 415v	Max Cable	Code No	1 or 3 Ph Rev Switch	
				Latching NZH789*E	Spring Return NZN282*E
20	1.5	2 x 2.5	CAD11B	296.10	296.10

Reversing Switches				
Standard Reversing Switch AC4 1.5kW 415v IP 65 1 Ph and 3 Ph IP 65 Enclosed		Bakers Reversing Switch AC4 1.5kW 415v 20 amp with aux contacts		
KN10	94.50	CAD10 NZB 581 EG	337.70	

Commercial & Machinery Switches				
Deep Fryer 3 Heat Switch 32 amp c/w Heat Resist Cams		Concrete Mixer Switch 2 Screw		Tyre Changing Machine Switch 4 Screw
C26 AH5458	297.20	CA4 NZQ471 EF	182.00	CA10 NZN883 149.50

Heat Pump Isolators - 1 Pole 20A Lockable IP 65				
Standard Enclosure 88x88x53		Oversize Enclosure 80x110x70		
KN908	53.80	KN907	53.80	



ABS, Sheet Steel and 304 Stainless Enclosures

All K&N switches can be supplied enclosed. Cable entry holes can be punched free of charge
EMC screening is possible for metal enclosures. See page 18 for details

Surface Mount DIN Enclosures - i.e. Gen Switches			
Enclosure Size	Code No	Best for Switch	
120x130x70	9 SE6P	2 pole C/O to 40 amps	45.00
160x160x65	9 ME8	3/4 pole & 4/4 pole to 63 amps	49.40

IP 65 ABS - Polycarbonate On Request			
Enclosure Size		Best for Switch	
110x80x70	87-84303	Push Buttons & CA10	27.30
110x80x85	87-84304	Push Buttons & CA10	30.20
170x140x95	87-84315	KH20/KH32 & KG20/KG32	48.70
250x150x100	87-84318	KG41/KG64 & KH60/KH80	58.60
190x190x130	767-80041	KG41/KG64 & KH60/KH80	108.80
280x190x130	767-80042	KG41/KG64 & KH60/KH80	136.90
280x280x130	767-80043	KG41/KG64 & KH60/KH80	170.20
380x280x130	767-80044	KG80/KG105	205.40
190x190x180	767-80001	KG41/KG64 & KH60/KH80	127.10
280x190x180	767-80002	KG80/KG105	152.90
280x280x180	767-80003	KG80/KG105	193.00
380x280x180	767-80004	KG80/KG105	235.50

IP 65 Sheet Steel Powder Coated Fixed Cover			
Enclosure Size		Best for Switch	
150x150x120	9CT151512	KH20/KH32 & KG20/KG32	74.40
200x200x120	9CT202012	KH20/KH32 & KG20/KG32	95.30

IP 65 Sheet Steel Powder Coated Hinged Door			
Enclosure Size		Best for Switch	
250x200x100	9CR252010	KG41/KG64 & KH60/KH80	122.20
250x200x150	9CR252015	KG41/KG64 & KH60/KH80	124.10
300x250x150	9CR302515	KG80/KG105	156.40
400x300x200	9CR403020	KG126/KG316	218.20

IP 54 Stainless Steel 304 with Flat Tops - Sloping Tops Available			
Enclosure Size		Best for Switch	
200x120x100	NZ2	KG41/KG64 & KH60/KH80	272.40
280x190x130	NZ9	KG41/KG64 & KH60/KH80	393.10
300x300x150	NZ3	KG80/KG105	444.20
400x300x150	NZ4	KG126/KG316	608.50
600x400x250	NZ6	Oversized for extra wiring room	1062.30
800x400x250	NZ8	Oversized for extra wiring room	1229.70

IP 66 Stainless Steel 304 with Flat Tops - Sloping Tops Available			
Enclosure Size		Best for Switch	
200x120x100	NZ2B	KG41/KG64 & KH60/KH80	291.60
280x190x130	NZ9B	KG41/KG64 & KH60/KH80	457.60
300x300x150	NZ3B	KG80/KG105	522.00
400x300x150	NZ4B	KG126/KG316	644.50
600x400x250	NZ6B	Oversized for extra wiring room	1094.10
800x400x250	NZ8B	Oversized for extra wiring room	1242.40


IP 54 Stainless Steel Control Stations 304 with 1, 2, or 3 22mm Holes			
Enclosure Size		Best for 22mm Controls	
100x100x85	NZPB1	1 - hole	196.70
160x100x85	NZPB2	2 - hole	206.00
220x100x85	NZPB3	3 - hole	217.60




Laser Engraving

Code No	Standard sizes	Price	- includes 1, 2 or 3 lines of text
KN1000	16X50	\$4.00	16X50 
KN1003	20X60	\$6.40	20X60 
KN1003	52X30	\$5.90	52X30 
KN1009	30X200	\$22.00	30X200 
KN1011	55X200	\$27.30	55X200 
KN1001	16X75	\$5.40	16X75 
KN1004	25X40	\$4.80	25X40 
KN1007	30X100	\$14.50	30X100 
KN1002	18X27	\$5.20	18X27 
KN1005	25X100	\$11.00	25X100 
KN1008	30X150	\$18.30	30X150 
KN1010	55X100	\$19.50	55X100 
KN1012	100X150	\$34.50	100X150 


Material Colour




White




Red



Blue



Black



Yellow

Optional Extras

- Mounting Holes,
- Pad Printing,
- Logos,
- Different Font Sizes & Styles,
- Boarders,
- Switch Plates,
- Push Button &
- Pilot Light Engraving

Solar Installation Labels
(available as a package)



WARNING
HAZARDOUS D.C. VOLTAGE



WARNING
MULTIPLE D.C. SOURCES
TURN OFF ALL D.C. ISOLATORS TO ISOLATE EQUIPMENT

PV ARRAY D.C. ISOLATOR



SOLAR ARRAY ON ROOF
Open Circuit Voltage.....V
Short Circuit Current.....A



WARNING
HAZARDOUS VOLTAGE
AUTHORISED ACCESS ONLY



Zero Energy Isolation

Power/Control & Pneumatics

- Ensure Hazards Are Site Safe
- Predetermined Access Ensures Sequence Safe Working Environments
- Suitable For Harsh Conditions
- Protection To SIL3 and Category 4 Risk



mGard



mGard is the premier range of modular trapped key interlocks for heavy duty applications.

Key Interlock Systems

amGard



amGard is the ultimate range of modular safety gate switch interlocks – for heavy duty applications.

Safety Gate Switch Interlocks

eGard



eGard is the totally modular approach to controlling access to hazardous machinery & equipment.

Access & Control Systems

A tried & true method of mechanically safeguarding dangerous machines & hazardous processes.

Mains Off Generator Changeover Switches To AS/NZS 3010:2005

Wiring Rules AS/NZS 3000:2007: Compliance with AS/NZS 3010: 2005 is deemed to satisfy clause 7.3.8.1
 The incoming neutral to a MEN switchboard shall not be switched. All Plates Engraved MAINS OFF GENERATOR

Example of connections to AS/NZS 3000:2007 & 3010:2005

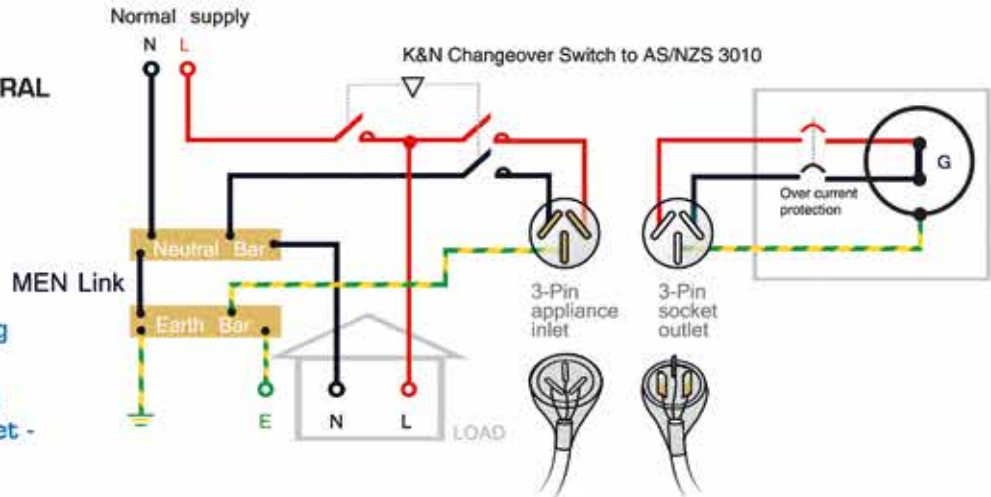
ADDITIONAL REQUIREMENTS FOR PLUG AND SOCKET CONNECTED GENERATING SETS.

AS/NZS 3010:2005 page 26

DO NOT switch the NORMAL SUPPLY NEUTRAL in a MEN system

The NEUTRAL of ALTERNATIVE SUPPLY must be switched

Connection of transportable generating set to an electrical installation using a 3-pin appliance inlet and socket-outlet arrangement



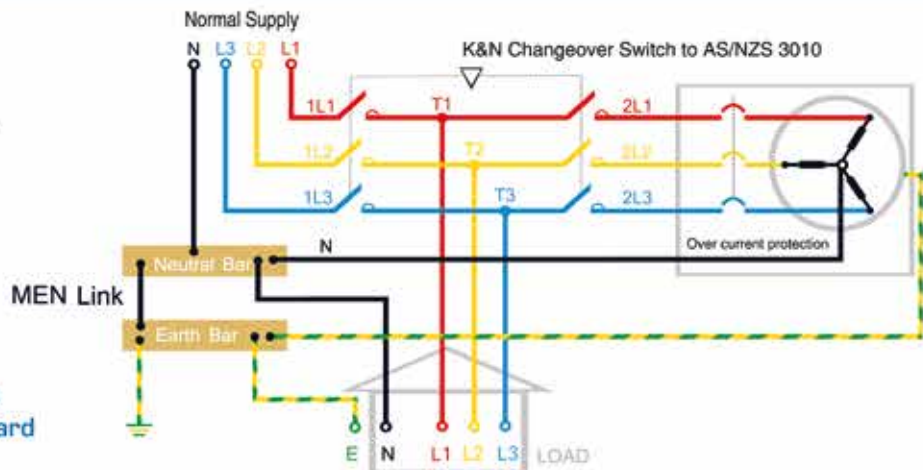
EXAMPLE OF CONNECTION WITH LOCAL MEN CONNECTION

AS/NZS 3010:2005 page 12

DO NOT switch the NORMAL SUPPLY NEUTRAL in a MEN system

The NEUTRAL of ALTERNATIVE SUPPLY may be switched

Three pole/three pole changeover arrangement for a three-phase generating set connected to a switchboard with a MEN link



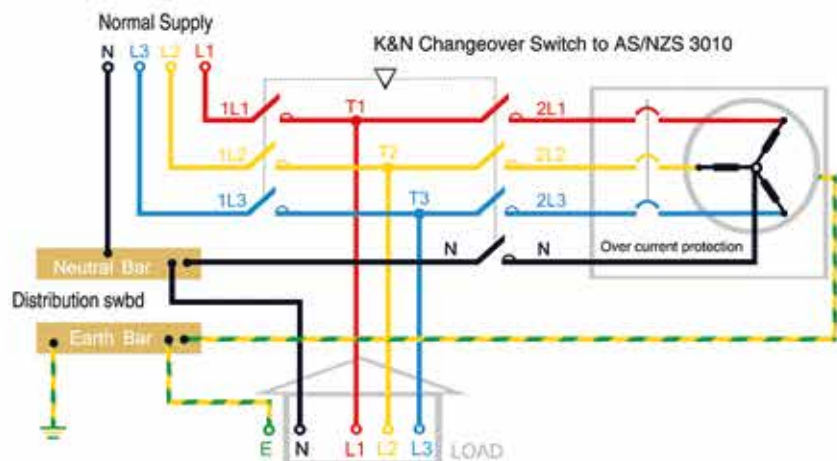
EXAMPLE OF CONNECTION WITHOUT LOCAL MEN CONNECTION

AS/NZS 3010:2005 page 16

DO NOT switch the NORMAL SUPPLY NEUTRAL

The NEUTRAL of ALTERNATIVE SUPPLY must be switched

Three pole/four pole changeover arrangement for a three-phase generating set connected to a switchboard without a MEN link



Mains Off Generator Changeover Switches To AS/NZS 3010: 2005

Wiring Rules AS/NZS 3000:2007 Compliance with AS/NZS 3010:2005 is deemed to satisfy clause 7.3.8.1
The incoming neutral to a MEN switchboard shall not be switched. All Plates Engraved MAINS OFF GENERATOR

Din Rail Mount with MCB Front Plate Knockout with Shallow Handle for Domestic Superboards						
Ith ₂ Amps	Max Cable	Code No	1 Pole & thru N Mains/2 Pole Gen		2 Pole Mains/2 Pole Generator	
			20	10	KH20	T922*NZ0001 VE2
32	10	KH32	T922*NZ0001 VE2	167.40	T902*NZ0007 VE2	167.40
40	10	KH40	T922*NZ0001 VE2	188.10	T902*NZ0007 VE2	188.10
63	35	KH63	T922*NZ0001 VE2	246.40	T902*NZ0007 VE2	246.40
80	35	KH80	T922*NZ0001 VE2	307.30	T902*NZ0007 VE2	307.30
			3 Pole Mains/3 Pole Generator		3 Pole Mains/4 Pole Generator	
25	6	KG20A	T903*NZ0008 VE2	181.20	T934*NZ0002 VE2	213.10
32	6	KG32A	T903*NZ0012 VE2	222.80	T934*NZ0002 VE2	260.20
40	16	KG41B	T903*NZ0010 VE2	289.30	T934*NZ0002 VE2	333.70
63	16	KG64B	T903*NZ0010 VE2	358.60	T934*NZ0002 VE2	409.90

Din Rail Mount with MCB Front Plate (45mm) Knockout with Standard Handle						
Ith ₂ Amps	Max Cable		1 Pole & thru N Mains/2 Pole Gen		2 Pole Mains/2 Pole Generator	
			20	10	KH20	T922*NZ0002 VE2
32	10	KH32	T922*NZ0002 VE2	163.80	T902*NZ0001 VE2	163.80
40	10	KH40	T922*NZ0002 VE2	184.50	T902*NZ0001 VE2	184.50
63	35	KH63	KN400	242.80	T902*NZ0001 VE2	242.80
80	35	KH80	T922*NZ0002 VE2	303.70	T902*NZ0001 VE2	303.70
			3 Pole Mains/3 Pole Generator		3 Pole Mains/4 Pole Generator	
25	6	KG20A	T903*NZ0006 VE2	177.40	T934*NZ0001 VE2	209.30
32	6	KG32A	T903*NZ0001 VE2	219.20	T934*NZ0001 VE2	256.60
40	16	KG41B	T903*NZ0001 VE2	285.70	T934*NZ0001 VE2	330.10
63	16	KG64B	T903*NZ0001 VE2	355.20	T934*NZ0001 VE2	406.30
80	50	KG80	T903*NZ0001 VE2	527.60	T934*NZ0001 VE2	610.70
100	50	KG100	T903*NZ0001 VE2	649.50	T934*NZ0001 VE2	752.10

Surface Mounting Enclosure For Domestic / Commercial Installations Max 63 amps		
Suitable for 2 Pole Changeover Switches with Off to 40 amps IP 40	9 SE6P	45.00
Suitable for 3/4 Pole & 4/4 Pole Changeover Switches with Off to 63 amps IP 40	9 ME8	49.40

Base Mount with Door Clutch IP 40						
Ith ₂ Amps	Max Cable		1 Pole & thru N Mains/2 Pole Gen			
			20	10	KH20	T922*NZ0003 VE
32	10	KH32	T922*NZ0003 VE	222.20		
40	10	KH40	T922*NZ0003 VE	243.00		
63	35	KH63	T922*NZ0003 VE	301.20		
80	35	KH80	T922*NZ0003 VE	362.20		
			3 Pole Mains/3 Pole Generator		3 Pole Mains/4 Pole Generator	
25	6	KG20A	T903*NZ0009 VE	238.00	T934*NZ0003 VE	265.20
32	6	KG32A	T903*NZ0008 VE	279.60	T934*NZ0003 VE	312.30
40	16	KG41B	T903*NZ0008 VE	357.70	T934*NZ0003 VE	395.50
63	16	KG64B	KN402	427.00	KN404	471.70
80	50	KG80	KN406	596.10	KN408	672.70
100	50	KG100	T903*NZ0008 VE	718.10	T934*NZ0003 VE	814.10
125	50	KG105	T903*NZ0001 VE	912.10	T934*NZ0003 VE	1042.80
125	M10 lug	KG126	T903*NZ0001 VE	994.60	T934*NZ0001 VE	1133.20
160	M10 lug	KG161	T903*NZ0007 VE	1271.80	T934*NZ0001 VE	1457.50

Tip: For examples of connections see page 26



Mains Off Generator Changeover Switches To AS/NZS 3010:2005

Wiring Rules AS/NZS 3000:2007 Compliance with AS/NZS 3010:2005 is deemed to satisfy clause 7.3.8.1
 The incoming neutral to a MEN switchboard shall not be switched. All Plates Engraved MAINS OFF GENERATOR

High Current Changeover Switches Base Mount with Door Clutch IP 40						
Ith ₂ Amps	Max Cable	Code No	3 Pole Mains/3 Pole Generator			
			200	M10 lug	C200-4	A212 620 VE
315	M10 lug	C315	A212 620 VE	2681.80		
4 Pole Mains/4 Pole Generator						
250	M10	KE252		-	K950	POA
400	M10	KE402		-	K950	POA
630	M12	KE632		-	K950	POA
800	M14	KE802		-	K950	POA
1200	4 x M10	KE1200		-	K950	POA



Enclosed in Large Plastic Enclosure						
Ith ₂ Amps	Max Cable	Code No	1 Pole Mains/2 Pole Generator			
			20	10	KH20	T922*NZ0004 VE
32	10	KH32	T922*NZ0004 VE	237.10		
40	10	KH40	T922*NZ0004 VE	274.40		
63	35	KH63	KN401	332.60		
80	35	KH80	T922*NZ0004 VE	492.60		
			3 Pole Mains/3 Pole Generator	3 Pole Mains/4 Pole Generator		
25	6	KG20A	T903*NZ0010 VE	260.90	T934*NZ0004 VE	292.80
32	6	KG32A	T903*NZ0009 VE	302.50	T934*NZ0004 VE	339.90
40	16	KG41B	T903*NZ0009 VE	494.60	T934*NZ0004 VE	539.00
63	16	KG64B	KN403	563.90	KN405	615.20
80	50	KG80	KN407	766.30	KN409	849.50
100	50	KG100	T903*NZ0009 VE	888.30	T934*NZ0004 VE	990.90
125	50	KG105	T903*NZ0002 VE	1098.90	T934*NZ0004 VE	1219.60
125	M10 lug	KG126	T903*NZ0008 VE	1341.30	T934*NZ0002 VE	1598.40
160	M10 lug	KG161	T903*NZ0008 VE	1618.50	T934*NZ0002 VE	1922.70

Enclosure Sizes	For Switch
170x140x95	KH20/32
230x140x95	KG20/32 KH40/KH63
280x190x130	KG41/64 KH40/KH63
280x280x130	KG80/KG100/KG105 KH80
380x280x180	KG126/KG161 3 pole
560x380x180	KG126/KG161 4 pole

Tip: For examples of connections see page 26

Motor Starters Direct On Line, Star Delta & Reversing

Please Order Overloads Separately

Enclosed Slimline Direct On Line Motor Starters					
Max Amps Ith ₂	AC3 kW 415v	Aux Contacts N/O N/C		Code No	Without O/L
With 230v Control					
9.2	4	-	-	NZS9B P1T09A230	161.40
16	7.5	-	-	NZS9B P1T16A230	248.60
With 400v Control					
9.2	4	-	-	NZS9B P1T09A400	161.40
16	7.5	-	-	NZS9B P1T16A400	248.60

Enclosed Direct On Line Motor Starters Large Enclosure					
With 230v Control					
9.2	4	-	-	NZS9B M10D1A230....M	332.80
12.75	5.5	-	-	NZS9B M14D1A230....M	345.60
16	7.5	-	-	NZS9B M18D1A230....M	399.50
25	11	-	-	NZS9B M22D1A230....M	531.60
30	15	-	-	NZS9B M32D1A230....M	584.90
With 400v Control					
9.2	4	-	-	NZS9B M10D1A400....M	332.80
12.75	5.5	-	-	NZS9B M14D1A400....M	345.60
16	7.5	-	-	NZS9B M18D1A400....M	399.50
25	11	-	-	NZS9B M22D1A400....M	531.60
30	15	-	-	NZS9B M32D1A400....M	584.90

DOL Motor Starter In Deep 56 Lid With 3 Pole 20 Amp Padlockable Isolator					
With 230v Control					
12.75	5.5	-	-	NZS9B K3-14*02	440.80
With 400v Control					
12.75	5.5	-	-	NZS9B K3-14*01	440.80

Enclosed Automatic Star Delta Starters (ABS Enclosure)					
With 400v Control					
16	7.5	-	-	NZS9B M15S1 A400/00000 M	1381.70
22	11	-	-	NZS9B M15S2 A400/00000 M	1449.30
30	15	-	-	NZS9B M17S1 A400/00000 M	1621.00
40	18.5	-	-	NZS9B M17S2 A400/00000 M	1669.30
46	22	-	-	NZS9B M26S2 A400/00000 M	1869.80
52	25	-	-	NZS9B M26S1 A400/00000 M	1942.40
65	30	-	-	NZS9B M27S1 A400/00000 M	2159.90
75	37	-	-	NZS9B M35S1 A400/00000 M	2840.70
85	45	-	-	NZS9B M36S1 A400/00000 M	2932.10
105	55	-	-	NZS9B M36S2 A400/00000 M	2993.80

Enclosed DOL Reversing Motor Starters (For Roller Doors) kW Rating AC4					
Max Amps Ith ₂	AC4 kW 415v	Aux Contacts N/O N/C		Code No	
With 230v Control					
9.2	4	-	-	NZS9B M10DC12300 M	446.00
12.75	5.5	-	-	NZS9B M14DC12300 M	503.80
With 400v Control					
9.2	4	-	-	NZS9B M10DC12301 M	446.00
12.75	5.5	-	-	NZS9B M14DC12301 M	503.80

Enclosed DOL Reversing Starters With 3 Pole 20 Amp Padlockable Isolator					
With 230v Control					
9.2	4	-	-	NZS9B M10DC12310 M	543.80
12.75	5.5	-	-	NZS9B M14DC12310 M	601.30
With 400v Control					
9.2	4	-	-	NZS9B M10DC12311 M	543.80
12.75	5.5	-	-	NZS9B M14DC12311 M	601.30



Contactors, Relays, Overloads & Accessories

Mini Relays Type K1					
Ith ₂ Amps	AC15 Amps 230v	Aux Contacts N/O N/C		Code Number Add Coil V	
10	3	4	-	NZS9B K1-07D40A	89.80
10	3	3	1	NZS9B K1-07D31A	89.80
10	3	2	2	NZS9B K1-07D22A	89.80

Aux Contact Blocks For Mini Relays					
	230v	400v			
10	3	2	-	2	NZS9B HK02 37.80
10	3	2	4	-	NZS9B HK40 65.20
10	3	2	-	4	NZS9B HK04 65.20
10	3	2	2	2	NZS9B HK22 65.20

3 Pole Contactors Type K3 4.5kW to 37kW					
Ith ₂ Amps	AC3 kW 415v	Aux Contacts N/O N/C		Code Number Add Coil V	
25	4.5	1	-	NZS9B K3-10A10	85.10
25	4.5	-	1	NZS9B K3-10A01	85.10
25	5.5	1	-	NZS9B K3-14A10	122.40
25	5.5	-	1	NZS9B K3-14A01	122.40
32	7.5	1	-	NZS9B K3-18A10	162.50
32	7.5	-	1	NZS9B K3-18A01	162.50
32	11	1	-	NZS9B K3-22A10	196.60
32	11	-	1	NZS9B K3-22A01	196.60
50	11	-	-	NZS9B K3-24A00	215.50
65	15	-	-	NZS9B K3-32A00	235.30
80	18.5	-	-	NZS9B K3-40A00	253.40
110	22	-	-	NZS9B K3-50A00	565.10
120	30	-	-	NZS9B K3-62A00	776.80
130	37	-	-	NZS9B K3-74A00	911.00

4 Pole Contactors Type K3 4 kW to 30 kW					
25	4	-	-	NZS9B K3-10A0040	137.00
32	7.5	-	-	NZS9B K3-18A0040	261.80
45	11	-	-	NZS9B K2-23A0040	347.80
50	15	-	-	NZS9B K2-30A0040	379.90
80	22	-	-	NZS9B K2-45A0040	774.00
100	30	-	-	NZS9B K2-60A0040	1102.80

4 Pole Modular Contactors 25 to 63 amps 230v coil					
Ith ₂ Amps	17.5 mm Modules	Main Poles N/O N/C		Code Number	
25	2	4	-	NZS9B R2540A230	133.60
25	2	2	2	NZS9B R2522A230	133.60
25	2	-	4	NZS9B R2504A230	133.60
40	3	4	-	NZS9B R4040A230	290.90
40	3	2	2	NZS9B R4022A230	290.90
40	3	-	4	NZS9B R4004A230	290.90
63	3	4	-	NZS9B R6340A230	399.30
63	3	2	2	NZS9B R6322A230	399.30
63	3	-	4	NZS9B R6304A230	399.30

Coil Data - Coils Available Ex Stock - AC Coils Dual Frequency					
AC Coils Voltage	50Hz/60Hz		60Hz		DC Coils - Double Wound Type Voltage
	Min	Max	Min	Max	
24v AC	22	24	24	27	24v DC
42v AC	42	47	47	52	48v DC
110v AC	100	110	100	122	110v DC
230v AC	220	240	230	264	Late break aux contacts must be used and will be fitted as standard.
400v AC	380	415	400	460	

*Ordering Example - NZS9B K3-10A10A230




Contactors, Relays, Overloads & Accessories


Top Mount Clip-on Aux Contacts For All Contactors (<i>Not Modular</i>)						
Ith ₂ Amps	AC15 230v	Amps 415v	Aux Contacts N/O N/C		Code No	
10	3	2	1	-	NZS9B HN10	24.60
10	3	2	-	1	NZS9B HN01	24.60
Side Mount Screw Fix Aux Contacts For Contactors K3-24 To K3-74						
10	3	2	1	1	NZS9B HB11	63.30
10	3	2	-	2	NZS9B HB02	63.30
Mechanical Interlocks For Contactors						
			For K3-10 To K3-40		NZS9B LG10889	31.80
			For K3-24 To K3-74		NZS9B LG10890	67.10
RC Coil Suppressor Units For All Contactors AC Or DC Coil						
			Coil Volts 12 - 48v		NZS9B RC-K324	56.70
			Coil Volts 48 - 127v		NZS9B RC-K3110	56.70
			Coil Volts 110v - 230v		NZS9B RC-K3230	56.70
Mechanical Latch - Local Or Remote Reset						
			For Contactors K3-10 To K3-22		NZS9B K2-L22	295.80
			For Contactors K3-24 To K3-40		NZS9B K2-L40	315.60
			For Contactors K3-50 To K3-74		NZS9B K2-L74	315.60
Amplifier For Contactor Control By PLC						
			For Contactors K3-10 To K3-74		9B K2 IM	POA
3 Pole Contactors For Changeover And Reversing			Contact Kraus & Naimer For Details			
3 Pole Contactors For Capacitor Switching			Contact Kraus & Naimer For Details			
3 Pole Contactors With DC Control			Contact Kraus & Naimer For Details			
Thermal Overload Relays						
Current Setting Amps For Contactors K3-10 To K3-22						
0.18 - 0.27		NZS9B U12/16E0.27			151.20	
0.27 - 0.4		NZS9B U12/16E0.4			151.20	
0.4 - 0.6		NZS9B U12/16E0.6			151.20	
0.6 - 0.9		NZS9B U12/16E0.9			151.20	
0.8 - 1.2		NZS9B U12/16E1.2			151.20	
1.2 - 1.8		NZS9B U12/16E1.8			151.20	
1.8 - 2.7		NZS9B U12/16E2.7			151.20	
2.7 - 4.0		NZS9B U12/16E4			151.20	
4 - 6		NZS9B U12/16E6			151.20	
6 - 9		NZS9B U12/16E9			172.00	
8 - 11		NZS9B U12/16E11			172.00	
10 - 14		NZS9B U12/16E14			172.00	
13 - 18		NZS9B U12/16E18			172.00	
17 - 23		NZS9B U12/16E23			172.00	
22 - 30		NZS9B U12/16E30			172.00	
Current Setting Amps For Contactors K3-24 To K3-40						
10 - 14		NZS9B U3/4214			565.10	
14 - 20		NZS9B U3/4220			565.10	
20 - 28		NZS9B U3/4228			565.10	
28 - 42		NZS9B U3/4242			565.10	
Current Setting Amps For Contactors K3-50 To K3-74						
20 - 28		NZS9B U3/7428			567.00	
28 - 42		NZS9B U3/7442			567.00	
40 - 52		NZS9B U3/7452			567.00	
52 - 65		NZS9B U3/7465			567.00	
60 - 74		NZS9B U3/7474			597.70	





Control & Signalling Units 22mm Assembled Units IP 67/IP69K


A State-of-the-art range of push buttons and lights delivering an ideal combination of functional security and economical efficiency in a modular design.


Emergency Stops 1 N/C Twist to Reset			
Code No			
KN51	Panel Mount	70.80	
KN66	Enclosed	107.40	


Emergency Stops 1 N/C Pull to Reset			
KN80		72.60	



Emergency Stops 1 N/C Reset by Key			
PSN/PVS-K01		135.90	


Push Buttons			
KN52	Green 1 x N/O	28.50	
PSN*NZ0067	Green - Start	30.80	
KN54	Blue Reset 1 x N/O	28.80	
KN63	Stop Start Button	62.30	


Push Buttons Double Black/Black			
PSN*NZ0111	White Arrows	62.30	


Push Buttons Stations			
KN69	Stop Start Buttons	85.90	
PSN*NZ0318	Start Button	53.40	
PSN*NZ0319	Stop Button	53.40	


FOR REV Stations with Potentiometer			
KN904	With 1 K pot	228.10	
KN906	With 4.7 K pot	228.10	
KN905	With 10K pot	228.10	


Pilot Lights 12 - 30v AC or DC			
KN55	Green	37.90	
PSN*NZ0122	Red - Fault		
KN56	Red	37.90	
PSN*NZ0121	Green - Run		
KN73	Blue	37.90	
KN75	White	37.90	
KN77	Yellow	37.90	


Potentiometer Units - Standard 3 Screw Terminals			
IP 65 p MAX = 0.5 watt, Accurate to + or -10%			
KN64	1.0k ohm	127.40	
KN67	4.7k ohm	127.40	
KN65	10k ohm	127.40	


Emergency Stops 1 N/C Red/Yellow Palm Push			
Code No			
KN68	Enclosed	179.40	


Emergency Stops 1 N/O + N/C Red/Yellow Palm Push			
PFT*NZ0001	Enclosed	189.10	



Palm Push Momentary 1 x N/O + 1 x N/C Black/White			
KN79	Enclosed Spring Return	144.60	


Push Buttons			
KN53	Red 1 x N/C	28.50	
PSN*NZ0068	Red - Stop	30.80	
KN59	Reset Rod 100mm	23.30	

Push Buttons 4 Way			
PSN*NZ0094	Black 4 N/O	167.20	
PSN*NZ0142	White Arrows 2 x N/O + Stop Start	171.70	
PSN*NZ0120	White Arrows	171.70	



Push Buttons Stations with Potentiometer			
KN901	With 1 K pot	217.00	
KN903	With 4.7 K pot	217.00	
KN902	With 10K pot	217.00	





Lock Nut Key			
PSN/MS	For PB's	14.10	
S00 T 170 09	For Switches	5.60	



Pilot Lights 85 - 264V AC			
KN57	Green	47.60	
PSN*NZ0171	Green - Run		
KN58	Red	47.60	
PSN*NZ0170	Red - Fault		
KN72	Blue	47.60	
KN74	White	47.60	
KN76	Yellow	47.60	



Potentiometer Units - Heavy Duty Switch Fronts			
Reinforced stop, optional stepping or key operation			
KN100	1.0k ohm 48 x 48	281.50	
KN102	2.2k ohm 48 x 48	281.50	
KN104	4.7k ohm 48 x 48	281.50	
KN106	10k ohm 48 x 48	281.50	
KN101	1.0k ohm 64 x 64	294.90	
KN103	2.2k ohm 64 x 64	294.90	
KN105	4.7k ohm 64 x 64	294.90	
KN107	10k ohm 64 x 64	294.90	






Control & Signalling Units 22mm - Loose Components

Push Button Front Elements AC-15 230v 6A, IP 67/IP 69K					
Push Buttons Front Element Flush Non Illuminated			Push Buttons Front Element Extended Non Illuminated		
Code No			Code No		
PSN/D/G	Green 14.20		PSN/DH/G	Green 17.90	
PSN/D/R	Red 14.20		PSN/DH/R	Red 17.90	

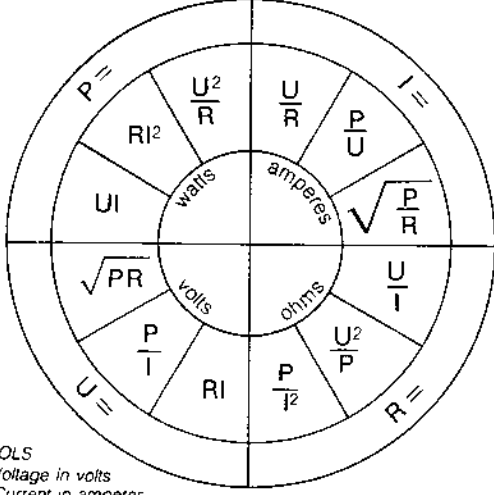
Rotary Switch Front Elements AC-15 230v 6A, IP 66					
Rotary Switch Front Element Latching Non Illuminated (changeable to spring return)			Rotary Switch Front Element Latching Key operated (changeable to spring return)		
PSN/WRK	2 Position ✓ 33.00		PSN/WRS	2 Position (1) 110.90	
PSN/WKV	2 Position √ 33.00		PSN/WKS/A1	2 Position (2) 110.90	
PSN/WRK3	3 Position ✓ 33.00	PSN/WRS3	3 Position (3) 110.90		
Rotary Switch Front Element Latching Illuminated (changeable to spring return)			4 Way Joystick Controller Spring Return		
PSN/WRLK/*	2 Position ✓ 40.00		P SN/WJ4	4 Position 136.90	
PSN/WKLK3/*	3 Position √ 40.00		P SN/A4	4 way coupling plate 9.10	
* Specify colour Green - G, Red - R, Yellow - Y, Blue - B, Opaque - O					

Double Push Button Front Elements AC-15 230v 6A, IP 66 Colour Cap Opaque					
Double Push Button Non Illuminated			Double Push Button Non Illuminated		
PSN/DD/GR	Red/Green 35.80		PSN/DD/S/X7-X7	Black/Black 38.30	
PSN/DD/GRX1-X0	Red/Green I O 38.30			Arrow/Arrow	
PSN/DD/GR/GB1-GB0	Red/Green 38.30		PSN/DD/WS	Black/White 35.80	
	STOP START			No Engraving	

Pilot Light Front Elements IP 67/69K					
Flush			Extended (conical)		
PSN/L/G	Green 13.50		PSN/LH/G	Green 17.00	
PSN/L/R	Red 13.50		PSN/LH/R	Red 17.00	
PSN/L/Y	Yellow 13.50		PSN/LH/Y	Yellow 17.00	
PSN/L/B	Blue 13.50		PSN/LH/B	Blue 17.00	
PSN/L/W	Opaque 13.50		PSN/LH/W	Opaque 17.00	

Push Button & Pilot Light Accessories					
Contact Blocks			Legend Carriers Complete With Engraved Plate		
KN60	N/O Front Mounting 9.70		PSB* NZ0001	PB's & Lights 7.90	
KN61	N/C Front Mounting 9.70		Legend Carriers (without legend)		
PSN/KC10	N/O Base Mounting 9.70		PSB/ST/X	PB's & Lights 1.40	
PSN/KC01	N/C Base Mounting 9.70		PSB/STDD/X	Double PB's 1.80	
LED Pilot Light Assemblies AC/DC			PSN/XST		Legend Insert 1.80
PSN/LED/G	12-30v Green 19.80		9PB Engraving		Legend Engraving 5.00
PSN/LED/R	12-30v Red 19.80		Drilled Push Button Enclosures ABS IP 65		
PSN/LED/W	12-30v White 19.80		PSN/11	1 Hole ABS 29.50	
PSN/LED/230/G	85-264v Green 29.50		PSN/12	2 Hole ABS 38.10	
PSN/LED/230/R	85-264v Red 29.50		NSN/13	3 Hole ABS 41.80	
PSN/LED/230/W	85-264v White 29.50	PSN/14	4 Hole ABS 53.70		
PSN/IVS	DIN Rail Mounting 13.70	PSN/16	6 Hole ABS 75.50		
LED Test Elements For Press To Test		Drilled Push Button Enclosures Stainless IP 65			
P SN/XLED/T	12v to 30v 19.80	NZPB1	100x100x85 1Hole 196.70		
P SN/XLED 230/T	85v to 264v 29.50	NZPB2	160x100x85 2 Hole 206.00		
Resistor Elements		NZPB3	220x100x85 3 Hole 217.60		
P SN/XLED60	19.80	Protection Extras (Not with Legend Carriers)			
Coupling Plate		KN70	Boot for Single PB's 8.60		
KN78	PB's & Lights 4.60	KN71	Boot for Double PB's 8.60		
Emergency Stop Extras		PSN/XGWK	Round Shroud 20.50		
PSN/XGPV	Emerg Stop Shroud 28.40	PSN/B	Blanking Plug Grey 6.80		
PN880-61	60mm Yellow Plate 10.50	PSB/B	Blanking Plug Black 6.80		

Handy Hints

<p>Approximate resistances for Elements, Common Contactors, Relays and Solenoid Operated Valve Coils</p>	<p>Useful Formulae for AC Note: - For DC utilisation categories see below</p>
<p>Hot Water Elements Cold Resistance: 1000W - 56 Ω 1500W - 35 Ω 2000W - 26 Ω 3000W - 18 Ω</p>	<p>$kW = kVA \times pF$</p>
<p>Contactors: 24V AC - 1.2 Ω 110V AC - 0.139 Ω 240V AC 587-655 Ω 400V AC - 1.909K Ω</p>	<p>$kW = \frac{hp \times 746}{1000 \times \text{Eff}}$ or $\frac{hp \times 746 \times 100}{1000 \times \% \text{Eff}}$</p>
<p>Plug-in relays: 6V DC - 40 Ω 12V DC - 99-101 Ω 24V AC - 1.06 Ω 24V DC - 0.416K Ω 240V AC - 8.44K Ω</p>	<p>$kW = \frac{\text{Line amps} \times \text{Line volts} \times 1.732 \times pF}{1000}$</p>
<p>Solenoid Operated Valves: 24V AC - 25.7 Ω 110V AC - 0.596 Ω 240V AC - 2.4-2.6 Ω 400V AC - 6.8K Ω All of the above are measured on a DMM Auto Range</p>	<p>$kVA = \frac{kW}{pF}$</p>
<p>Load Current: (230V Resistive) 1000V - 4.3A</p>	<p>$kVA = \frac{hp \times 746}{1000 \times \text{Eff} \times pF}$</p>
<p>Motor Connections: Dual Voltage Motor Terminals: If the voltage on the name plate reads: 220/240 - 380/420V. For 220/240V always connect in Delta with supply voltage to terminals A2.B2.C2 Join A2 and C1; B2 and A1; C2 and B1. For 380/420V always connect in Star with supply voltage to terminals A2.B2.C2. Join A1, B1, C1.</p>	<p>$kVA = \frac{\text{Line amps} \times \text{Line volts} \times 1.732}{1000}$</p>
<p>Ohm's law</p>  <p>SYMBOLS U = Voltage in volts I = Current in amperes R = Resistance in ohms P = Power in watts</p>	<p>Line Amps = $\frac{kW \times 1000}{\text{Line Volts} \times 1.732 \times pF}$</p>
	<p>Line Amps = $\frac{kVA \times 1000}{\text{Line Volts} \times 1.732}$</p>
	<p>Line Amps = $\frac{hp \times 756}{\text{Line Volts} \times 1.732 \times \text{Eff} \times pF}$</p>
	<p>Horsepower = $\frac{kVA \times 1000 \times \text{Eff}}{746}$ (hp)</p>
	<p>hp = $\frac{kVA \times 1000 \times \text{Eff} \times pF}{746}$</p>
	<p>hp = $\frac{\text{Line amps} \times \text{Line volts} \times 1.732 \times \text{Eff} \times pF}{746}$</p>
	<p>1 Watt = 1 joule/second</p>
	<p>1 hp = 746 Watts</p>
	<p>1 hp = 746 joules/second</p>
	<p>VOLT-DROP Single Phase: Service Voltage = 230V Max permissible Vd = $\frac{230 \times 2.5 \text{ (2.5\% Service voltage)}}{100} = 5.75V$ Max unit Vd = $\frac{\text{Max Vd} \times 1000}{1 \times \text{Distance (Length of cable run)}}$</p>
	<p>Utilisation Categories A = Frequent operations. B = Infrequent operations DC-20A, DC-20B Connecting and disconnecting under no-load conditions DC-21A, DC-21B Switching of resistive loads, including moderate overloads DC-22A, DC-22B Switching of mixed resistive and inductive loads, including moderate overloads (eg. shunt motors). DC-23A, DC-23B Switching of motor loads or other highly inductive loads (eg. series motors).</p>

Handy Hints

THREE PHASE MOTORS

Motor Output		Full Load Current at operational voltage		Motor Output		Full Load Current at operational voltage	
K w	H.P.	400v	415v	K w	H.P.	400v	415v
0.55	0.75	1.5	1.4	22	30	41	40
0.75	1	1.9	1.8	30	40	55	53
1.1	1.5	2.7	2.6	37	50	66	64
1.5	2	3.6	3.5	45	60	80	77
2.2	3	4.9	4.7	55	75	97	93
3	4	6.5	6.3	75	100	132	127
4	5.5	8.5	8.2	90	125	160	154
5.5	7.5	11.5	11	110	150	195	188
7.5	10	15.5	15	132	175	230	222
11	15	22	21	160	220	280	270
15	20	29	28	200	270	350	337
18.5	25	35	34	250	350	430	414

Average full load motor currents. Motor output figures relate to the full load currents. These values are for motor speeds of 1500R.P.M.

IP Ratings - Kraus & Naimer switchgear

SOLIDS

IP40



IP44



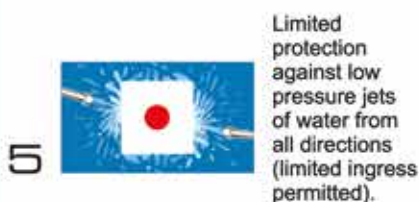
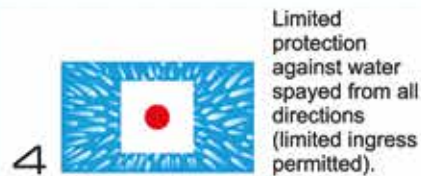
IP65



IP66



LIQUIDS



Utilisation Categories

AC-21A	Switching of resistive loads, including overloads
AC-1	Resistive or low inductive loads
AC-22A	Switching of combined resistive or low inductive loads including moderate overloads
AC-15	Switching of control devices, contactors, valves etc
AC-2	Slip ring motor starting reversing and plugging, star delta starting
AC-3	Direct on line starting and higher current start delta starting
AC-4	Direct on line starting, reversing, plugging and inching
AC-23A	Frequent switching of motors or other high inductive loads
AC-20A	No load operation
AC-21B	Switching of resistive loads, including moderate overloads
AC-23B	Occasional switching of motors or other high inductive loads

Order Sheet For Special Switches And Escutcheon Plates / Example

Escutcheon plate	Type of Switch / Configuration	Customer Information
<div style="border: 1px dashed black; padding: 5px; text-align: center; font-size: 24px; color: blue;">MILK PUMP</div>	Type of Switch: CA 10	Company: K&N Electrical
	Mounting: Single hole	Contact: Rory
	Escutcheon Plate: Special with header plate	Date: 29 - 10 - 2012
	Optional Extras: Key switch with Key out in FWD only	Tel: 03 - 123 4567
		Fax: 03 - 123 4568
		E-Mail: Rory@knelectrical.co.nz

Switching Function		
Position / Lettering	Degree	Customer's terminal markings
START	270	X
OFF	300	X X X
	330	X
FWD	0	X X X
	30	X X
ON	60	X X X
	90	
	120	
	150	
	180	
	210	
	240	

X Contact closed
 Contact closed during switching
 Contact Bridge

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

Index

2 speed switches	6	H		Pot drivers	32
2 way push buttons	32	Handy hints	34, 35	Potentiometers	32
3F disconnectors	12	Hose proof		Push buttons	32
4 way push buttons	32	* enclosures	23	Palm push buttons	32
4 way joy sticks	33	* seals	4, 5, 11	Photovoltaic switches	20
22mm control units	32, 33			PV isolators	20
56 series, retro fit	21				
A		I		R	
Additional sealing kit	4, 5	Impulse relays	21	Ratings	1, 13
Aircon isolators	22	IP ratings	35	Relays	30
Ammeter switches	7	J		Retro fit switches	21
ATEX rated switches	19	Joy sticks	33	Retro fit EMC gland plates	18
Auxiliary contacts (KG)	10	K		Reversing switches	
		kW ratings	1, 13	* enclosed	3, 22
B		Key driven switches	4, 11	Rope operated switches	22
Bakers reversing switch	22	Key lock units	11	Rotary cam switches	
Base mounting units	11	Key "OFF ON" switches	4	* Off On	4
Binary switches	7	KG main switches		* Changeover	5
Bypass switches	8	* current & kW ratings	13	* Multistep	6
		* disconnectors	14-18	* Low voltage	7
C		* enclosed	16-18	S	
Castell interlocks	25	KN 10 reversing switches	3	Sealing kits	4, 5, 11
Changeover switches		Knife contacts	9	Single hole mounting units	11
* rope operated	22	L		Smart switch	2, 3
* DIN cut out	27	Labels	24	Solar system isolators	20
* enclosed	27, 28	Latching relays	21	Special drive	22
* rotary cam	5	LED pilot lights	32	Special engraving	
Coding switches	7	Lockout isolators	12	* header plates	10
Contactors	30, 31	Low voltage switching	7	Special switches	36, 37
Current ratings	1, 13	M		Spring return switches	5
Cord operated switches	22	Mains Off Gen switches	26-28	Standard mounting options	10, 11
D		Main switches	14-18	Star Delta switches	6
DC switches	9, 20	Metering switches	7	Stainless enclosures	23
Dairy industry switches	16-18	Motor control switches		Stainless enclosed switches	16-18
Door clutches	10	* 2 speed tapped windings	6	Steel enclosures	23
Disconnectors	14-18, 21	* Off Star Delta	6	T	
E		* reversing 1 & 3 phase	3, 6	Thermal overload relays	31
EMC shielded switches	18	* rope operated	22	Timers	21
Emergency stop buttons	32	Motor starters		Trapped key systems	25
Enclosed generator switches	28	* DOL	29	Two speed switches	6
Enclosed safety switches	16, 17	* Star Delta	29	U	
Enclosures	23	* reversing	29	UPS bypass switches	8
Engraving	24	Multi step switches	6	V	
Extension shafts	10	O		Vat wash controllers	21
EX series isolators	19	Off On switches		Voltmeter switches	7
F		* enclosed	16-18, 22	W	
Fortress interlocking systems	25	* key operated	4	Waterproof seals	11
Food industry switches	16-18	Optional extras	10, 11	Z	
G		Overload relays	31	Zero energy isolation	25
G20(S)	9	P		Zone 21 isolators	19
Generator switches	26-28	Padlockable handle	10		
Gold contacts	7	Pilot lights	32		

2012

REFERENCE CALENDARS

SEPTEMBER

OCTOBER

NOVEMBER

DECEMBER

MO	3	10	17	24	
TU	4	11	18	25	
WE	5	12	19	26	
TH	6	13	20	27	
FR	7	14	21	28	
SA	1	8	15	22	29
SU	2	9	16	23	30

MO	1	8	15	22	29
TU	2	9	16	23	30
WE	3	10	17	24	31
TH	4	11	18	25	
FR	5	12	19	26	
SA	6	13	20	27	
SU	7	14	21	28	

MO	5	12	19	26	
TU	6	13	20	27	
WE	7	14	21	28	
TH	1	8	15	22	29
FR	2	9	16	23	30
SA	3	10	17	24	
SU	4	11	18	25	

MO	31	3	10	17	24
TU	4	11	18	25	
WE	5	12	19	26	
TH	6	13	20	27	
FR	7	14	21	28	
SA	1	8	15	22	29
SU	2	9	16	23	30

2013

JANUARY

FEBRUARY

MARCH

APRIL

MO	7	14	21	28	
TU	1	8	15	22	29
WE	2	9	16	23	30
TH	3	10	17	24	31
FR	4	11	18	25	
SA	5	12	19	26	
SU	6	13	20	27	

MO	4	11	18	25
TU	5	12	19	26
WE	6	13	20	27
TH	7	14	21	28
FR	1	8	15	22
SA	2	9	16	23
SU	3	10	17	24

MO	4	11	18	25	
TU	5	12	19	26	
WE	6	13	20	27	
TH	7	14	21	28	
FR	1	8	15	22	29
SA	2	9	16	23	30
SU	3	10	17	24	31

MO	1	8	15	22	29
TU	2	9	16	23	30
WE	3	10	17	24	
TH	4	11	18	25	
FR	5	12	19	26	
SA	6	13	20	27	
SU	7	14	21	28	

MAY

JUNE

JULY

AUGUST

MO	6	13	20	27	
TU	7	14	21	28	
WE	1	8	15	22	29
TH	2	9	16	23	30
FR	3	10	17	24	31
SA	4	11	18	25	
SU	5	12	19	26	

MO	3	10	17	24	
TU	4	11	18	25	
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FR	2	9	16	23	30
SA	3	10	17	24	31
SU	4	11	18	25	

SEPTEMBER

OCTOBER

NOVEMBER

DECEMBER

MO	30	2	9	16	23
TU	3	10	17	24	
WE	4	11	18	25	
TH	5	12	19	26	
FR	6	13	20	27	
SA	7	14	21	28	
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FR	1	8	15	22	29
SA	2	9	16	23	30
SU	3	10	17	24	

MO	30	2	9	16	23
TU	31	3	10	17	24
WE	4	11	18	25	
TH	5	12	19	26	
FR	6	13	20	27	
SA	7	14	21	28	
SU	1	8	15	22	29

Daylight Saving Starts - September 30th 2012 Finishes - April 7th 2013

Daylight Saving Starts - September 29th 2013 Finishes - April 6th 2014

ANNIVERSARY DAYS 2013

SOUTHLAND 14TH JAN **WELLINGTON** 21ST JAN **AK/NORTHLAND** 28TH JAN
NELSON/BULLER 4TH FEB **TARANAKI** 11TH MARCH **OTAGO** 25TH MARCH
STH CANTY 23RD SEPT **HAWKES BAY** 25TH OCT **MARLBROUGH** 4TH NOV
CANTERBURY 15TH NOV **WESTLAND** 2ND DEC

HOLIDAYS 2013

NEW YEAR JAN 1-2 **WAITANGI DAY** FEB 6 **GOOD FRIDAY** MARCH 29 **EASTER MONDAY** APRIL 1
ANZAC DAY APRIL 25 **QUEENS BIRTHDAY** JUNE 3 **LABOUR DAY** OCT 28 **CHRISTMAS** DEC 25 & 26



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BLUE LINE switchgear

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