Surge Protection Devices

Why bother with surge protection?

With electronic equipment becoming more susceptible to electrical spikes and insurance companies reluctant to pay claims without physical evidence, it is a wise investment to protect your valuable equipment with Hager surge protection devices (SPD's). Hager SPD's will direct a lightning surge or electrical switching spike down to earth and away from your electrical installation.

The Hager system prevents damage to sensitive electronic devices by diverting transient overvoltages to earth and maintaining the residual voltage (Up) at 800V. In the majority of cases this will eliminate your electrical and equipment failures and eliminate downtime.

see product details on page 160

Protection and Connection

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Moulded Case Circuit Breakers

h125 and h160xs

description

Hager MCCB's offer contractors, switchboard builders and OEM's, a wide choice of options.

The range is available in 1, and 3 poles with breaking capacities including 25kA, 40kA and 70kA.

technical data

- Connection capacity
  h125: 95mm² - rigid
  h125: 50mm² - flexible
  h160xs: 95mm² - rigid
  h160xs: 75mm² - flexible

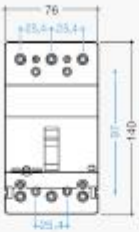
approvals and tests

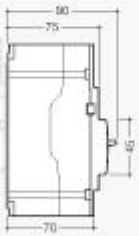
- AS3947-2
- IEC60947-2

thermal setting 0.8 - 1 x In
magnetic setting fixed at 10-20xIn

frame	I_{cu}	U_n	U_i
h125h	25kA	240/415V~	500V
h160h	25kA	240/415V~	500V
h125n	40kA	240/415V~	500V
h125e	70kA	240/415V~	500V

HH147





description	*current rating (A)*	*poles 1*	*pack qty*	*price ex-GST*	*poles 3*	*pack qty*	*price ex-GST*
frame:							
H125H- 25kA							
MCCB	16	**HH101**	1	92.90	-		
MCCB	20	**HH102**	1	92.90	-		
MCCB	25	**HH103**	1	92.90	**HH143**	1	218.40
MCCB	32	**HH104**	1	92.90	-		
MCCB	40	**HH105**	1	92.90	**HH145**	1	218.40
MCCB	50	**HH106**	1	92.90	-		
MCCB	63	**HH107**	1	92.90	**HH147**	1	218.40
MCCB	80	**HH108**	1	142.00	**HH148**	1	349.50
MCCB	100	**HH109**	1	142.00	**HH149**	1	349.50
MCCB	125	**HH110**	1	169.30	**HH150**	1	469.60
frame:							
H160H - 25kA							
MCCB	160	-			**HH151**	1	698.90
frame:							
H125N - 40kA							
MCCB	25	-			**HN143**	1	262.10
MCCB	40	-			**HN145**	1	262.10
MCCB	63	-			**HN147**	1	262.10
MCCB	80	-			**HN148**	1	393.20
MCCB	100	-			**HN149**	1	393.20
MCCB	125	-			**HN150**	1	513.30
frame:							
H125E - 70kA							
MCCB	25	-			**HE143**	1	480.50
MCCB	40	-			**HE145**	1	480.50
MCCB	63	-			**HE147**	1	480.50
MCCB	80	-			**HE148**	1	611.60
MCCB	100	-			**HE149**	1	611.60
MCCB	125	-			**HE150**	1	655.20

HY121

description	*characteristics*	*pack qty*	***cat ref.***	*price ex-GST*
shunt trip	24V - 60V~	1	**HX101E**	202.10
shunt trip	110V - 240V~	1	**HX104E**	202.10
shunt trip	380V - 600V~	1	**HX105E**	202.10
undervoltage release	48V - 60V~	1	**HX111E**	234.80
undervoltage release	208V - 240V~	1	**HX114E**	234.80
undervoltage release	380V - 500V~	1	**HX115E**	234.80
auxiliary switch	1 NO/NC, 230V/6A	1	**HX121**	163.80
auxiliary switch	2 NO/NC, 230V/6A	1	**HX122**	163.80
aux / alarm switch	1 NO/NC + 1NO/NC 230V/6A	1	**HX123**	174.80
rotary handle	c/w: 200mm shaft	1	**HX131A**	262.10
locking kit		1	**HX139**	30.60
interphase barrier		3	**HY119**	26.30
terminal cover		2	**HY121**	35.00

Moulded Case Circuit Breakers

h250

description
Hager MCCB's offer contractors, switchboard builders and OEM's, a wide choice of options.

The range, h250 is available in 3 pole with breaking capacities including 40kA and 70kA.

technical data
approvals and tests
- AS3947-2
- IEC60947-2
- Connection capacity
  : 185mm² - rigid
  : 185mm² - flexible

- electromechanical trip unit
thermal setting 0.8 - 1.0 x In
magnetic setting 5 - 10 x In

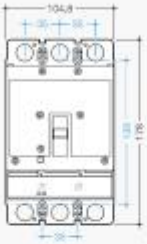
- electronic trip unit
thermal setting 0.4 - 1 x In
magnetic setting 2 - 14 x In
delay setting 0 - 300ms

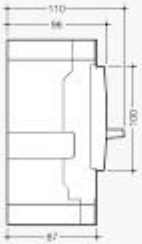
frame	I_{cu}	U_n	U_i
h250n	40kA	400V~	690V
h250e	70kA	400V~	690V

HN204

description	*current rating (A)*	*pack qty*	*poles 3*	*price ex-GST*
frame : h250n - 40kA				
electromechanical trip unit	160	1	**HN254**	546.00
electromechanical trip unit	200	1	**HN203**	873.60
electromechanical trip unit	250	1	**HN204**	944.60
electronic trip unit	250	1	**HN205**	1059.30
frame : h250e - 70kA				
electronic trip unit	250	1	**HE205**	1277.70

accessories and auxiliaries





description	*characteristics*	*pack qty*	*cat ref.*	*price ex-GST*
shunt trip	24V - 60V~	1	**HX101E**	202.10
shunt trip	110V - 240V~	1	**HX104E**	202.10
shunt trip	380V - 600V~	1	**HX105E**	202.10
undervoltage release	48V - 60V~	1	**HX111E**	234.80
undervoltage release	208V - 240V~	1	**HX114E**	234.80
undervoltage release	380V - 500V~	1	**HX115E**	234.80
auxiliary switch	1 NO/NC, 230V/6A	1	**HX121**	163.80
auxiliary switch	2 NO/NC, 230V/6A	1	**HX122**	163.80
aux / alarm switch	1 NO/NC + 1NO/NC 230V/6A	1	**HX223E**	174.80
rotary handle	c/w: 200mm shaft	1	**HX231**	262.10
rotary handle	mounted on device	1	**HX230**	207.50
locking kit		1	**HX239**	38.30
interphase barrier		3	**HY219**	26.30
terminal cover		2	**HY221**	45.90
cable connection terminals	25 - 185mm²	3	**HY201**	27.30
busbar extensions		3	**HY212**	92.90

Moulded Case Circuit Breakers

h400xs

description
Hager MCCB's offer contractors, switchboard builders and OEM's, a wide choice of options.

The range, h400xs is available in 3 pole with breaking capacities including 50kA and 70kA.

technical data
approvals and tests
- AS3947-2
- IEC60947-2
- Connection capacity
  : 240mm² - rigid
  : 195mm² - flexible

- electromechanical trip unit

thermal setting	0.8 - 1.0 x In
magnetic setting	5 - 10 x In

- electronic trip unit

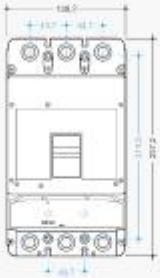
thermal setting	0.4 - 1 x In
magnetic setting	2 - 14 x In
delay setting	0 - 300ms

frame	I_{cu}	U_n	U_i
h400n	50kA	400V~	750V
h400e	70kA	400V~	750V

HN303E

description	*current rating (A)*	*pack qty*	*poles 3*	*price ex-GST*
frame :				
h400n - 50kA				
electromechanical trip unit	320	1	**HN302E**	1294.10
electromechanical trip unit	400	1	**HN303E**	1294.10
electronic trip unit	400	1	**HN305E**	1392.30
frame :				
h400e - 70kA				
electronic trip unit	400		**HE305E**	1616.20

accessories and auxiliaries



description	*characteristics*	*pack qty*	***cat ref.***	*price ex-GST*
shunt trip	24V - 60V~	1	**HX101E**	202.10
shunt trip	110V - 240V~	1	**HX104E**	202.10
shunt trip	380V 600V~	1	**HX105E**	202.10
undervoltage release	48V - 60V~	1	**HX111E**	234.80
undervoltage release	208V - 240V~	1	**HX114E**	234.80
undervoltage release	380V - 500V~	1	**HX115E**	234.80
auxiliary switch	1 NO/NC, 230V/6A	1	**HX121**	163.80
auxiliary switch	2 NO/NC, 230V/6A	1	**HX122**	163.80
aux / alarm switch	1 NO/NC + 1NO/NC 230V/6A	1	**HX223E**	174.80
rotary handle	mounted on device	1	**HX330E**	245.70
rotary handle	c/w: 200mm shaft	1	**HX331E**	278.50
locking kit		1	**HX339E**	49.20
interphase barrier		3	**HY719**	14.20
terminal cover		2	**HY321E**	59.00
cable connection terminals	35 - 240mm²	3	**HY301E**	81.90
cable connection twin terminals	35 - 240mm²	3	**HY303E**	120.20
bus bar extensions	spreaders	3	**HY312E**	125.60

Moulded Case Circuit Breakers

h630xs

description

Hager MCCB's offer contractors, switchboard builders and OEM's, a wide choice of options.

The range, h630xs is available in 3 pole with breaking capacities including 50kA and 70kA.

technical data

approvals and tests

- AS3947-2
- IEC60947-2
- Connection capacity
  : 240mm² - rigid
  : 195mm² - flexible

- electromechanical trip unit

thermal setting	0.8 - 1.0 x In
magnetic setting	5 - 10 x In

- electronic trip unit

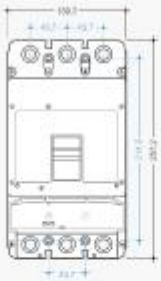
thermal setting	0.4 - 1 x In
magnetic setting	2 - 14 x In
delay setting	0 - 300ms

frame	I_{cu}	U_n	U_i
h630n	50kA	400V~	750V
h630e	70kA	400V~	750V

HN353E

description	*current rating (A)*	*pack qty*	*pole 3*	*price ex-GST*
frame :				
h630n - 50kA				
electromechanical trip unit	500	1	**HN352E**	1632.60
electromechanical trip unit	630	1	**HN353E**	1632.60
electronic trip unit	630	1	**HN355E**	1763.60
frame :				
h630e - 70kA				
electromechanical trip unit	630	1	**HE355E**	1960.20

accessories and auxiliaries



description	*characteristics*	*pack qty*	***cat ref.***	*price ex-GST*
shunt trip	24V - 60V~	1	**HX101E**	202.10
shunt trip	110V - 240V~	1	**HX104E**	202.10
shunt trip	380V 600V~	1	**HX105E**	202.10
undervoltage release	48V - 60V~	1	**HX111E**	234.80
undervoltage release	208V - 240V~	1	**HX114E**	234.80
undervoltage release	380V - 500V~	1	**HX115E**	234.80
auxiliary switch	1 NO/NC, 230V/6A	1	**HX121**	163.80
auxiliary switch	2 NO/NC, 230V/6A	1	**HX122**	163.80
aux / alarm switch	1 NO/NC + 1NO/NC 230V/6A	1	**HX223E**	174.80
rotary handle	mounted on device	1	**HX330E**	245.70
rotary handle	c/w: 200mm shaft	1	**HX331E**	278.50
locking kit		1	**HX339E**	49.20
interphase barrier		3	**HY719**	14.20
terminal cover		2	**HY321E**	59.00
cable connection terminals	35 - 240mm²	3	**HY301E**	81.90
cable connection twin terminals	35 - 240mm²	3	**HY303E**	120.20
bus bar extensions	spreaders	3	**HY312E**	125.60

Moulded Case Circuit Breakers

h800

description
Hager MCCB's offer contractors, switchboard builders and OEM's, a wide choice of options.

The h800 is available in 3 pole with breaking capacities including 50kA.

technical data
approvals and tests
- AS3947-2
- IEC60947-2
- Connection capacity
  : 240mm² - rigid
  : 195mm² - flexible

- electronic trip unit

thermal setting	0.5 - 1 x In
magnetic setting	2 - 8 x In
delay setting	0 - 300ms

frame	**I_{cu}**	**U_n**	**U_i**
h800n	50kA	400V~	750V

HN806

description	*current rating (A)*	*pack qty*	*poles 3*	*price ex-GST*
frame :				
h800n - 50kA				
electronic trip unit	800	1	**HN806**	4033.90

accessories and auxiliaries

description	*characteristics*	*pack qty*	***cat ref.***	*price ex-GST*
auxiliary switch	2 x N/O -2 x N/C 230V/6A~	1	**HX821**	330.90
alarm/auxiliary switch	1 x N/O-N/C - 1 x NO-N/C 230V/6A~	1	**HX822**	405.20
shunt trip	110V - 440V~	1	**HX804**	275.20
undervoltage release	208V - 240V~	1	**HX814**	281.80
undervoltage release	380V - 500V~	1	**HX815**	281.80
rotary handle	handle c/w: 200mm shaft	1	**HX831**	393.20
rotary handle	mounted on device	1	**HX830**	334.20
interphase barriers		2	**HY819**	16.40
terminal kit	2 X 185 - 240mm²	3	**HY801**	138.70
padlockable handle kit		1	**HY850**	95.10

Moulded Case Circuit Breakers

h1250

description
Hager MCCB's offer contractors, switchboard builders and OEM's, a wide choice of options.

The range, h1250 is available in 3 pole with breaking capacities including 50kA and 70kA.

technical data
approvals and tests
- AS3947-2
- IEC60947-2
- Connection capacity
  : 240mm² - rigid
  : 195mm² - flexible

- electronic trip unit

thermal setting	0.5 - 1.0 x In
magnetic setting	2 - 8 x In
delay setting	0 - 300ms

frame	I_{cu}	U_n	U_i
h1250n	50kA	400V~	750V
h1250e	70kA	400V~	750V

HN903

description	*current rating (A)*	*pack qty*	*poles 3*	*price ex-GST*
frame : h1250n - 50kA electronic trip unit	1250	1	**HN903**	7552.30
frame : h1250e - 70kA electronic trip unit	1250	1	**HE903**	7764.20

accessories and auxiliaries

description	*characteristics*	*pack qty*	***cat ref.***	*price ex-GST*
auxiliary switch 2 pole	2 x N/O-2 x N/C 230V/6A	1	**HX921**	206.40
alarm/auxiliary switch	1 x N/O-N/C - 1 x NO-N/C 230V/6A	1	**HX922**	288.30
shunt trip	110V - 240V~	1	**HX904**	282.90
shunt trip	380V - 440V~	1	**HX905**	282.90
undervoltage release	208V - 240V~	1	**HX914**	530.80
undervoltage release	380V - 500V~	1	**HX915**	530.80
rotary handle	mounted on device	1	**HX930**	659.60
rotary handle	c/w 200mm shaft	1	**HX931**	756.80
interphase barriers		3	**HY919**	59.00
busbar extension		3	**HY910**	349.50

Moulded Case Circuit Breakers

h1600

description
Hager MCCB's offer contractors, switchboard builders and OEM's, a wide choice of options.

The range, h1600 is available in 3 pole with breaking capacities including 50kA.

technical data
approvals and tests
- AS3947-2
- IEC60947-2
- Connection capacity supplied with rear connection bars

- electronic trip unit

thermal setting	0.5 - 1.0 x In
magnetic setting	2 - 8 x In
delay setting	0 - 300ms

frame	I_{cu}	U_n	U_i
h1600n	50kA	400V~	750V

HN904

description	*current rating (A)*	*pack qty*	*poles 3*	*price ex-GST*
frame :				
h1600n - 50kA				
electronic trip unit	1600	1	**HN904**	8539.50

accessories and auxiliaries

description	*characteristics*	*pack qty*	***cat ref.***	*price ex-GST*
auxiliary switch 2 pole	2 x N/O-2 x N/C 230V/6A	1	**HX921**	206.40
alarm/auxiliary switch	1 x N/O-N/C - 1 x NO-N/C 230V/6A	1	**HX922**	288.30
shunt trip	110V - 240V~	1	**HX904**	282.90
shunt trip	380V - 440V~	1	**HX905**	282.90
undervoltage release	208V - 240V~	1	**HX914**	530.80
undervoltage release	380V - 500V~	1	**HX915**	530.80
rotary handle	mounted on device	1	**HX930**	659.60
rotary handle	c/w 200mm shaft	1	**HX931**	756.80
interphase barriers		3	**HY919**	59.00
busbar extension		3	**HY910**	349.50

Load Break Switches

description
the HA series are a multi-pole load disconnector switch with manual operation. They enable making and breaking on load and safety isolation of any low voltage installation.

technical data
- visualised breaking
- double breaking per phase
- DIN rail mounting
- 3 or 4 pole
- padlockable handle
- auxiliary contacts
- rotary handles complete with extension shaft
- complying with IEC60947-3

HA302

HA307

HA354

description	*module mm*	*characteristics*	*width in 17.5mm*	***cat ref.***	*price ex-GST*
3 pole isolator 690V~	2	In 40A - AC22	36	**HA302**	62.50
	3	In 63A - AC23	54	**HA303**	85.00
3 pole isolator 400V~	6	In 80A - AC22	108	**HA304**	95.20
	6	In 100A - AC22	108	**HA305**	110.30
	6	In 125A - AC22	108	**HA306**	110.30
	8.5	In 160A - AC23	142	**HA307**	143.20
	8.5	In 200A - AC23	142	**HA308**	333.20
3 pole isolator 400V~	-	In 250A - AC23	-	**HA354**	418.50
	-	In 400A - AC23	-	**HA356**	634.00
	-	In 630A - AC23	-	**HA358**	986.00
	-	In 800A - AC23	-	**HA360**	1226.60
	-	In 1250A - AC23	-	**HA362**	2033.20
	-	In 1600A - AC23	-	**HA364**	2568.80
4 pole isolator 400V~	6	In 125A - AC22	108	**HA406**	324.30
	8.5	In 200A - AC23	142	**HA408**	381.00

ref.	**HA302**	**HA303**	**HA304**	**HA305**	**HA306 HA406**	**HA307**	**HA308 HA408**	**HA354**	**HA356 HA457**	**HA358 HA458**	**HA360**	**HA362**	**HA364**
rating (A)	40	63	80	100	125	160	200	250	400	630	800	1250	1600
insulation voltage (U_i)	800	800	690	690	690	690	690	750	800	1000	1000	1000	1000
motor load ratings (Kw)	11	30	37	55	55	90	90	132	220	220	450	560	560
peak withstand current (kA)	6	10	12	15	15	20	20	30	45	45	50	100	100
withstand current Isec (kA)	1.26	1.5	2.5	2.5	2.5	4	4	9	13	13	26	50	50
max cable section (mm^2)	16	35	50	50	50	95	95	150	240	2 x300	2x300	4x185	6x240

Load Break Switches

description
the HA series are a multi-pole load disconnector switch with manual operation. They enable making and breaking on load and safety isolation of any low voltage installation.

technical data
- visualised breaking
- double breaking per phase
- DIN rail mounting
- 3 or 4 pole
- padlockable handle
- auxiliary contacts
- rotary handles complete with extension shaft
- complying with IEC60947-3

HA457

description	*module mm*	*characteristics*	*width in 17.5mm*	***cat ref.***	*price ex-GST*
4 pole isolator 400V~	-	In 400A - AC23	-	**HA457**	563.60
	-	In 630A - AC23	-	**HA458**	915.50
accessories					
rotary handles					
black IP65 to suit HA360/HA362/HA364				**HZC003**	127.70
black IP55 to suit HA354/HA356				**HZC002**	46.38
black IP55 to suit HA304/HA305/HA306/HA307/HA308				**HZC001**	39.70
extension shafts					
320mm to suit HA360/HA362/HA364				**HZC106**	63.77
320mm to suit HA354/HA356				**HZC102**	17.39
200mm to suit HA304/HA305/HA306/HA307/HA308				**HZC103**	16.40
auxiliary contacts		In 5A - 250V~ suitable for HA302/HA303		**HZ021**	69.40
		In 5A -250V~ suitable for HA304/HA305/ HA306/HA307/HA308		**HZ022**	69.40
		In 16A - 250V~ suitable for HA354/HA356/ HA358		**HZ023**	71.90
terminal shrouds					
	1	to suit HA354/switch-line / load side		**HZC203**	34.20
	1	to suit HA356/HA358/ switch-line /load side		**HZC205**	48.40
	1	to suit HA307/HA308/ switch-line/load side		**HZ062**	18.50
	1	to suit HA307/HA308/ switch c/- cable clamp/ line/load side		**HZ072**	33.40

HZC106

HZC003

HZC002

MCB - 4.5kA C - Curve

description
protection and control of circuits against overloads and short-circuits:
- In domestic installations

technical data
- complies with AS/NZS60898
- tripping characteristics: magnetic level is set at 5 - 10 x In(C - curve)
- breaking capacity : 4500A
- voltage rating : 230/400V
- current rating : 6 to 40 A
- mechanical life : 20,000 operations

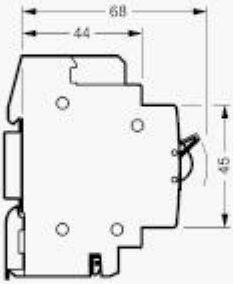
connection capacity
- rigid conductor 25mm²
  flexible conductor 16mm²
- bi-connect allowing two connection points

accessories
- LZ060, MZN175

NS120

description	*current rating (A)*	*width in 17.5mm*	*pack qty*	***cat ref.***	*price ex-GST*
single pole					
	6	1	12	**NS106**	10.40
	10	1	12	**NS110**	10.40
	13	1	12	**NS113**	10.40
	16	1	12	**NS116**	10.40
	20	1	12	**NS120**	10.40
	25	1	12	**NS125**	10.40
	32	1	12	**NS132**	10.40
	40	1	12	**NS140**	10.40
double pole					
	10	2	6	**NS210**	30.20
	16	2	6	**NS216**	30.20
	20	2	6	**NS220**	30.20
	25	2	6	**NS225**	30.20
	32	2	6	**NS232**	30.20
	40	2	6	**NS240**	30.20

MCB - 6kA C - Curve



description
protection and control of circuits against overloads and short-circuits:
- In commercial installations

Technical data
- complies with AS/NZS 60898
- tripping characteristics: magnetic level is set at 5 - 10 x In(C - curve)
- breaking capacity : 6000 A
- voltage rating : 230/400Vac
- current rating : 2 to 63 A
- mechanical life : 20,000 operations
- bi-connect allowing two connection points

connection capacity
- 25mm² rigid
- 16mm² flexible

accessories
- LZ060, MZN175, MZ201, MZ202,MZ203, MZ206

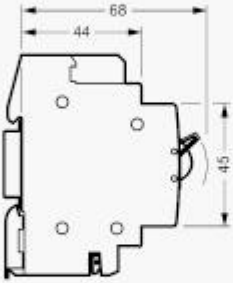
NT110C

NT216C

NT304C

description	*current rating (A)*	*width in 17.5mm*	*pack qty*	***cat ref.***	*price ex-GST*
single pole					
	2	1	12	**NT102C**	14.80
	4	1	12	**NT104C**	14.80
	6	1	12	**NT106C**	14.80
	10	1	12	**NT110C**	14.80
	16	1	12	**NT116C**	14.80
	20	1	12	**NT120C**	14.80
	25	1	12	**NT125C**	14.80
	32	1	12	**NT132C**	14.80
	40	1	12	**NT140C**	14.80
	50	1	12	**NT150C**	14.80
	63	1	12	**NT163C**	14.80
double pole					
	6	2	6	**NT206C**	49.20
	10	2	6	**NT210C**	49.20
	16	2	6	**NT216C**	49.20
	20	2	6	**NT220C**	49.20
	25	2	6	**NT225C**	49.20
	32	2	6	**NT232C**	49.20
	40	2	6	**NT240C**	49.20
	50	2	6	**NT250C**	49.20
	63	2	6	**NT263C**	49.20
triple pole					
	2	3	4	**NT302C**	67.40
	4	3	4	**NT304C**	67.40
	6	3	4	**NT306C**	67.40
	10	3	4	**NT310C**	67.40
	16	3	4	**NT316C**	67.40
	20	3	4	**NT320C**	67.40
	25	3	4	**NT325C**	67.40
	32	3	4	**NT332C**	67.40
	40	3	4	**NT340C**	67.40
	50	3	4	**NT350C**	67.40
	63	3	4	**NT363C**	67.40

MCB - 10kA D - Curve



description
protection and control of circuits against overloads and short-circuits:
- In commercial and light industrial installations

technical data
- complies with AS/NZS 60898
- tripping characteristics: magnetic level is set at10 - 20 x In
- breaking capacity : 10,000A
- voltage rating : 230/400V
- current rating : 6 to 63 A
- mechanical life : 20,000 operations

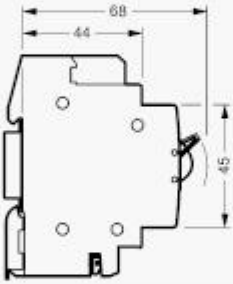
connection capacity
- 25mm² rigid
- 16mm² flexible

accessories
- LZ060, MZN175, MZ201, MZ202,MZ203, MZ206, MZN120, MZN121

NDN220A

description	*current rating (A)*	*width in 17.5mm*	*pack qty*	***cat ref.***	*price ex-GST*
single pole					
	6	1	12	**NDN106A**	39.30
	10	1	12	**NDN110A**	39.30
	16	1	12	**NDN116A**	39.30
	20	1	12	**NDN120A**	39.30
	25	1	12	**NDN125A**	39.30
	32	1	12	**NDN132A**	39.30
	40	1	12	**NDN140A**	39.30
	50	1	12	**NDN150A**	39.30
	63	1	12	**NDN163A**	39.30
double pole					
	6	2	6	**NDN206A**	119.50
	10	2	6	**NDN210A**	119.50
	16	2	6	**NDN216A**	119.50
	20	2	6	**NDN220A**	119.50
	25	2	6	**NDN225A**	119.50
	32	2	6	**NDN232A**	119.50
	40	2	6	**NDN240A**	119.50
	50	2	6	**NDN250A**	119.50
	63	2	6	**NDN263A**	119.50
triple pole					
	6	3	4	**NDN306A**	139.30
	10	3	4	**NDN310A**	139.30
	16	3	4	**NDN316A**	139.30
	20	3	4	**NDN320A**	139.30
	25	3	4	**NDN325A**	139.30
	32	3	4	**NDN332A**	139.30
	40	3	4	**NDN340A**	139.30
	50	3	4	**NDN350A**	139.30
	63	3	4	**NDN363A**	139.30
four pole					
	6	4	3	**NDN406A**	159.20
	10	4	3	**NDN410A**	159.20
	16	4	3	**NDN416A**	159.20
	20	4	3	**NDN420A**	159.20
	25	4	3	**NDN425A**	159.20
	32	4	3	**NDN432A**	159.20
	40	4	3	**NDN440A**	159.20
	50	4	3	**NDN450A**	159.20
	63	4	3	**NDN463A**	159.20

MCB - 10kA C - Curve



description
protection and control of circuits against overloads and short-circuits:
- In commercial and light industrial installations

technical data
- complies with AS/NZS 60898
- tripping characteristics: magnetic level is set at 5 - 10 x In
- breaking capacity : 10,000A
- voltage rating : 230/400Vac
- current rating : 1 to 63 A
- mechanical life : 20,000 operations

connection capacity
- 25mm² rigid
- 16mm² flexible

accessories
- LZ060, MZN175, MZ201, MZ202,MZ203, MZ206, MZN120, MZN121

NCN220A

description	*current rating (A)*	*width in 17.5mm*	*pack qty*	***cat ref.***	*price ex-GST*
single pole					
	1	1	12	**NCN101A**	36.20
	2	1	12	**NCN102A**	36.20
	3	1	12	**NCN103A**	36.20
	4	1	12	**NCN104A**	36.20
	6	1	12	**NCN106A**	36.20
	10	1	12	**NCN110A**	36.20
	16	1	12	**NCN116A**	36.20
	20	1	12	**NCN120A**	36.20
	25	1	12	**NCN125A**	36.20
	32	1	12	**NCN132A**	36.20
	40	1	12	**NCN140A**	36.20
	50	1	12	**NCN150A**	36.20
	63	1	12	**NCN163A**	36.20
double pole					
	1	2	6	**NCN201A**	108.20
	2	2	6	**NCN202A**	108.20
	3	2	6	**NCN203A**	108.20
	4	2	6	**NCN204A**	108.20
	6	2	6	**NCN206A**	108.20
	10	2	6	**NCN210A**	108.20
	16	2	6	**NCN216A**	108.20
	20	2	6	**NCN220A**	108.20
	25	2	6	**NCN225A**	108.20
	32	2	6	**NCN232A**	108.20
	40	2	6	**NCN240A**	108.20
	50	2	6	**NCN250A**	108.20
	63	2	6	**NCN263A**	108.20
triple pole					
	1	3	4	**NCN301A**	140.60
	2	3	4	**NCN302A**	140.60
	3	3	4	**NCN303A**	140.60
	4	3	4	**NCN304A**	140.60
	6	3	4	**NCN306A**	140.60
	10	3	4	**NCN310A**	140.60
	16	3	4	**NCN316A**	140.60
	20	3	4	**NCN320A**	140.60
	25	3	4	**NCN325A**	140.60
	32	3	4	**NCN332A**	140.60
	40	3	4	**NCN340A**	140.60
	50	3	4	**NCN350A**	140.60
	63	3	4	**NCN363A**	140.60

Miniature circuit breakers 80 - 125A

Thermal magnetic circuit breakers

Curves - 'C' - 'D'
In 80 to 125A

These circuit breakers are intended for the protection of circuits against overloads and short circuits in residential, commercial and industrial premises.

The circuit breakers, curve 'C', are adapted to the protection of the circuits in residential and Commercial premises.

The circuit breakers, curve 'D', are particularly adapted to the protection of the circuits where the installations are subject to high in-rush currents.

HMC curve 'C' 15000
15kA of 80 - 100 - 125A :
width 1.5I / pole

HMD curve 'D' 15000
15kA of 80 - 100 - 125 A :
width 1.5I / pole

HMF curve 'C' 10000
10kA of 80 - 100 - 125 A :
width 1.5I / pole

Series HMC, HMD, HMF at a glance;

Reinforcement of terminal harness:
The reduction in distortion ensures maximum torque can be applied directly to conductor. 3.5Nm

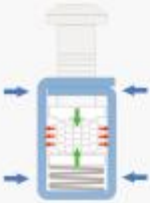
Front product labelling.
MCB's are equipped with a pull down window that allows identification of protective device.

The 'OFF' position is clearly shown by a green indicator on the handle.

Trip free mechanism:
MCB's have quick and simultaneous closing of contacts, regardless of operating cycle, hence, the working life is increased.

Options ;
Auxiliaries; standard 63A MCB auxiliaries (shunt, trip etc...) can be facilitated.

Accessories,
Interphase barriers and terminal cover.



Tightening compensation system;
The unique design of the terminal compensates and corrects any cable distortion.

Fast on connection;
The MCB's are equipped with top & bottom 'fast-on' terminals. They are used to supply low powered auxiliaries such as meters, indicating lights etc...

Lockable handle ;
MCB's can be locked in the <OFF> position by the integrated locking facility within the handle. The lock allows either sealing wire or a cable tie that may have a warning card attached ensuring safe working environment.

Model	Icc/Curve	Accessories	Fast-on connection	Tightening comp. system	Lockable handle	Front product labelling
HMF	10kA, C	YES	YES	YES	YES	YES
HMD, HMC	15kA, C, D	YES	YES	YES	YES	YES

Miniature circuit breakers 80 - 125A
HMF : 'C' 10000 - 10kA

new

Curve 'C' 10000
(IEC 60898-1)
10kA
IEC 60947-2
In 80 to 125A

Tripping curves :
'C' magnetic setting between 5 and 10In.

Use :
residential, commercial and industrial premises

Connection capacity :
- 35mm flexible wire
- 70mm rigid wire

KEMA
In conformity with the IEC 60898-1, 947-2 approved

HMF199T

HMF299T

HMF399T

description	*In / A*	*width in 17.5mm*	***cat ref.***	*price ex-GST*
Circuit breakers 1 pole	80	1.5	**HMF180T**	75.00
	100	1.5	**HMF190T**	75.00
	125	1.5	**HMF199T**	101.80
Circuit breaker 2 pole	80	3	**HMF280T**	169.70
	100	3	**HMF290T**	169.70
	125	3	**HMF299T**	253.60
Circuit breakers 3 poles	80	4.5	**HMF380T**	226.80
	100	4.5	**HMF390T**	226.80
	125	4.5	**HMF399T**	310.70

Miniature circuit breakers 80 - 125A
HMC : 'C' 15000 - 15kA

new

Curve 'C' 15000
(IEC 60898-1)
15kA
IEC 60947-2
In 80 to 125A

Tripping curves :
'C' magnetic setting between 5 and 10In.

Use :
residential, commercial and industrial premises

Connection capacity :
- 35mm flexible wire
- 70mm rigid wire

KEMA
In conformity with the IEC 60898-1, 947-2 approved

HMC199T

HMC299T

HMC399T

HMC499T

description	*In / A*	*width in 17.5mm*	*cat ref.*	*price ex-GST*
Circuit breakers 1 pole	80	1.5	**HMC180T**	105.50
	100	1.5	**HMC190T**	105.50
	125	1.5	**HMC199T**	153.70
Circuit breaker 2 pole	80	3	**HMC280T**	305.30
	100	3	**HMC290T**	305.30
	125	3	**HMC299T**	362.50
Circuit breakers 3 poles	80	4.5	**HMC380T**	312.50
	100	4.5	**HMC390T**	312.50
	125	4.5	**HMC399T**	375.00
Circuit breakers 4 poles	80	6	**HMC480T**	548.20
	100	6	**HMC490T**	548.20
	125	6	**HMC499T**	812.50

Miniature circuit breakers 80 - 125A
HMD : 'D' 15000 - 15kA

new

Curve 'D' 15000
(IEC 60898-1)
15kA
IEC 60947-2
In 80 to 125A

Tripping curves :
'D' magnetic setting between 10 and 20In.

Use :
commercial and industrial premises

Connection capacity :
- 35mm flexible wire
- 70mm rigid wire

KEMA
In conformity with the IEC 60898-1, 947-2 approved

HMD199T

HMD399T

HMD499T

description	*In / A*	*width in 17.5mm*	*cat ref.*	*price ex-GST*
Circuit breakers 1 pole	80	1.5	**HMD180T**	116.20
	100	1.5	**HMD190T**	116.20
	125	1.5	**HMD199T**	164.40
Circuit breaker 2 pole	80	3	**HMD280T**	267.80
	100	3	**HMD290T**	267.80
	125	3	**HMD299T**	396.40
Circuit breakers 3 poles	80	4.5	**HMD380T**	339.30
	100	4.5	**HMD390T**	339.30
	125	4.5	**HMD399T**	455.30
Circuit breakers 4 poles	80	4.5	**HMD480T**	603.60
	100	4.5	**HMD490T**	603.60
	125	4.5	**HMD499T**	910.60

Accessories for circuit breakers
HMC, HMC, HMD

new

MZN130

MZN131

description	*characteristics*	*cat ref.*	*price ex-GST*
Terminal covers	terminal cover, sealable	**MZN130**	5.20
Phase barrier	1 set of 3 phase barriers	**MZN131**	4.00

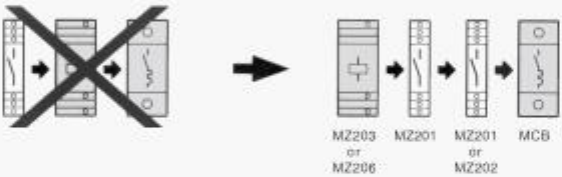
MCB - Accessories

description
all auxiliaries are common to both single and multi-pole circuit breakers. These auxiliaries are fitted to the left hand side of devices, 6kA, 10kA and 15kA

MZ202

MZ203

description	*pack qty*	*characteristics*	*width in 17.5mm*	***cat ref.***	*price ex-GST*
auxiliary contact 5A - 230V~	1	NO + 1NC allows remote indication of main contact status	1/2	**MZ201**	25.10
auxiliary contact with reset	1	auxiliary contact as above. Reset switch triggers on overload or short circuit	1/2	**MZ202**	27.80
shunt trip relay	1	allows for remote tripping of MCB. The coil is protected by a contact which cuts the supply after MCB trips	1	**MZ203**	46.60
undervoltage	1	if supply falls to 35 to 70% of nominal voltage the MCB will trip	1	**MZ206**	54.60



MCB - Accessories

description
all auxiliaries are common to both single and multi-pole circuit breakers. These auxiliaries are fitted to the left hand side of devices, 6kA, 10kA and 15kA

MZN175

description	*pack qty*	*characteristics*	*width in 17.5mm*	***cat ref.***	*price ex-GST*
locking device		to lock the MCB handle in on/off position	2	**MZN175**	15.40
heat dissipation inserts	12	avoids overheating for DIN rail modules when several devices mounted side by side are carrying high continuous loads	1/2	**LZ060**	3.50
terminal cover &screw shield	4			**MZN120**	13.30
phase barriers (1set of 3)	1			**MZN121**	10.00

fault loop impedance

With the introduction of AS/NZS 3000:2000 there are new wiring rules for electrical contractors and electrical consultants to consider when designing an electrical installation.

This guide is only concerned with one new area, fault loop impedance, and it's affect on the choice of conductor and circuit breaker for a given circuit. Voltage drop and overcurrent requirements should also be given consideration.

A fault situation is caused when an active conductor comes into contact with an earthed conductor. A short-circuit is formed and fault current flows. Contractors and consultants must make sure that the conductors in a circuit will allow sufficient energy to flow to cause the circuit breaker to trip in the required time (disconnection time for 230V supply is 0.4 s for socket–outlets up to 63A, or handheld Class 1 equipment intended for manual movement during use. 5 seconds for other circuits including submains and final sub circuits supplying fixed or stationary equipment (cl. 1.7.4.3.4).

To make sure that this fault current is large enough to trip a circuit breaker in the required time the fault loop impedance (Zs) must be below a certain value (Cl. 1.7.4.3.3*). If Zs is too large then the circuit breaker may take too long to trip(> 0.4s) or may not trip at all.

Circuit length – Circuit impedance increases with the length of a circuit.
Cross -sectional area of cable – The smaller the cross -sectional area of a cable, the higher it' s impedance per meter will be.
Thermal and magnetic settings of a circuit breaker – hager circuit breakers have both thermal and magnetic characteristics.

The higher the thermal and magnetic settings, the more energy is required to trip the circuit breaker in the required time (< 0.4 s). So a circuit breaker with a magnetic setting of 14 x In will require more energy to trip it (in the required time) than a circuit breaker with a magnetic setting of 7.5 x In.

If more energy is required to flow, then a larger cross-sectional area cable may be needed. If this is not possible then installing a hager RCD will provide a simple and economical solution.

So circuit length, cross sectional area of the cable and circuit breaker settings all need to be taken into account to ensure correct function of a circuit.

The tables below are a guide to the maximum circuit length and maximum circuit impedance for a given hager circuit breaker. Using these tables will help ensure that the disconnection time for a 230V a.c. supply is met according to AS/NZS 3000:2000.

Conductor size		protective device rating	hager MCB range				
			C - Curve MCB's		D - Curve MCB's		Max Zs for all ranges - 5 secs
active mm²	earth mm²	A	MCL(m)	Max Zs Ω 0.4secs	MCL(m)	MaxZs Ω 0.4secs	
1	1	1	409	23.00	-	-	57.50
1	1	2	204	11.50	-	-	28.75
1	1	3	136	7.67	-	-	19.17
1	1	4	102	5.75	-	-	14.38
1	1	6	68	3.83	34	1.92	9.58
1	1	10	41	2.30	20	1.15	5.75
1.5	1.5	10	31	2.30	31	1.15	5.75
1.5	1.5	13	47	1.77	-	-	4.42
2.5	1.5	13	79	1.77	-	-	4.42
1.5	2.5	16	38	1.44	19	0.72	3.59
2.5	2.5	16	64	1.44	32	0.72	3.59
2.5	2.5	20	51	1.15	26	0.58	2.88
4	2.5	25	50	0.92	25	0.46	2.30
4	2.5	32	39	0.72	20	0.36	1.80
6	2.5	32	45	0.72	23	0.36	1.80
6	2.5	40	36	0.58	18	0.29	1.44
10	4	40	58	0.58	29	0.29	1.44
10	4	50	47	0.46	23	0.23	1.15
16	6	63	57	0.37	28	0.18	0.91
16	6	80	45	0.29	22	0.14	0.72
25	6	80	49	0.29	25	0.14	0.72
25	6	100	40	0.23	20	0.12	0.58
35	10	100	64	0.23	32	0.12	0.58

TABLE 2
Maximum circuit length (MCL) and maximum circuit impedance (Zs) for hager MCBs (NSxxx range, NTxxxC range, NCNxxxA range, NMxxxT, NDNxxxA range).

Where: MCL = Maximum circuit length
Zs = Maximum circuit impedance
Above table based on supply of voltage of 230V / 400V (AS/NZS 3000: 2000 Amdt1)

Calculation of Prospective Short Circuit Current
Several excellent proprietary computer programs are now available for calculating the prospective fault level at any point in the installation. They are also able to select the correct size and type of cable and match this with the correct circuit protective device.

Estimation of Prospective Fault Current
Actually calculating prospective short-circuit current is not in itself difficult but it does require basic data which is not always available to the electrical installation designer.
It is therefore usual to use a simple chart as shown in Fig 10 to estimate the prospective short circuit current. This type of chart always gives a prospective fault level greater than that which would have been arrived at by calculation using accurate basic data. Therefore it is safe to use but sometimes may result in an over engineered system.

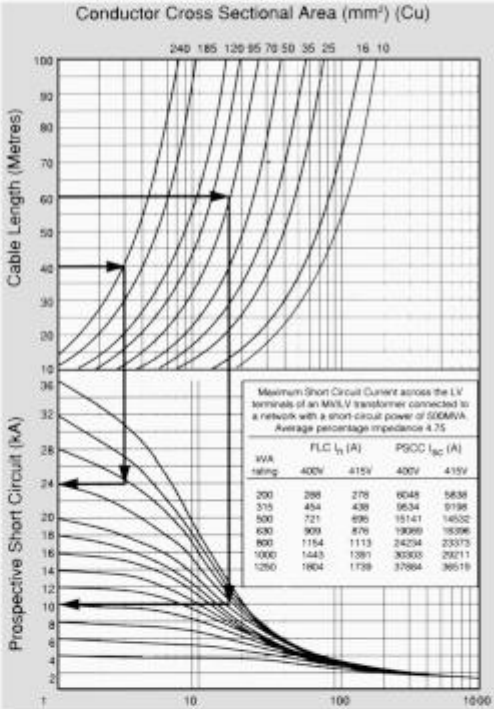


FIGURE : 10

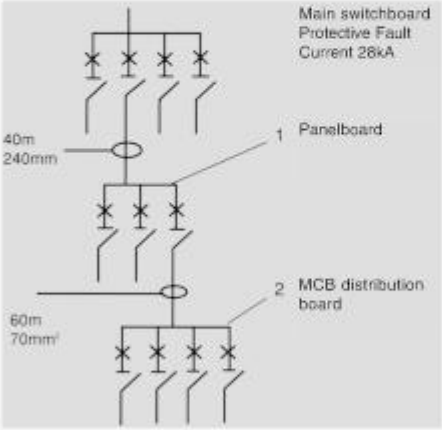


FIGURE : 11

Example

1 Project 40m of cable length across on to the 240mm² cable curve. From this point project down onto the 28kA curve. From this point projecting across we note that the prospective fault level at the panelboard is 24kA.

2 Project 60m of cable length across onto the 70mm² cable curve. From this point project down on to the 24kA curve. From this point projecting across we see that the prospective fault level at the MCB distribution board is 10kA.

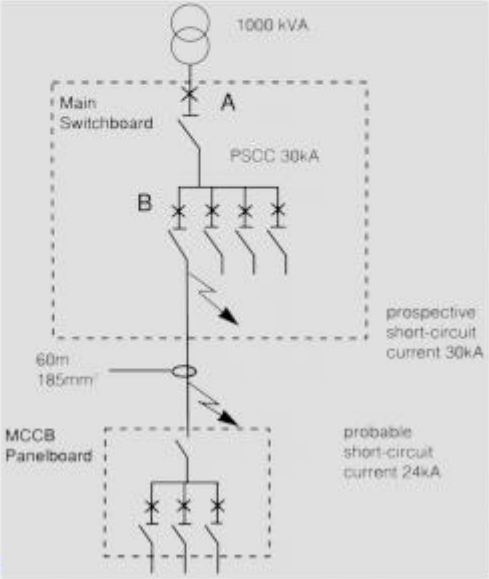


FIGURE : 12

The relationship between probable short-circuit current and service short-circuit breaking capacity is explained. The probable short circuit is the type of short circuit which is most likely to occur; this is nearly always at the extremity of the protected cable and more often than not a single phase or earth fault. Fig 11 shows a typical 3 phase 4 wire 400V system fed by a 1000 kVA transformer. The transformer is adjacent to the main switchboard so the prospective short-circuit current (PSCC*) on the main switchboard busbars is estimated as 30kA. The probable short-circuit current on the panelboard feeder circuit is estimated as 24kA, if it were a 3 phase symmetrical fault, or 12kA for a phase to neutral fault, which in fact would be the most likely type of fault. (Note: when estimating a phase to neutral prospective short-circuit current the length of conductor is doubled.)

Therefore for this application the main switchboard incoming circuit breaker
(A) should have an I_{cs} 30kA and an I_{cu} 30kA.

The panelboard feeder circuit breaker
(B) should have an I_{cu} 30kA and an I_{cs} 24kA.

*Prospective Short Circuit Current (PSCC).

Fuse Carriers

description
protection and control of circuits against overloads and short circuits:
- suitable for fuses which comply with BS88: Part I:1998

technical data
- rated voltage: 415V ac
  250V dc
- fusing factor : class Q1
- rated breaking capacity:
  80kA at 415 Vac
  40kA at 250 Vdc
- fuse cartridge not supplied

connection capacity
- 16mm² rigid cable
- 16mm² flexible + busbar

L50145

description	*current rating (A)*	*width in 17.5mm*	*pack qty*	***cat ref.***	*price ex-GST*
fuse carriers for BS88 fuses. (supplied without fuse cartridge)	32A max	1	12	**L50145**	15.00
BS88 cartridge fuse 29 x 12.7mm	6A			**L17300**	9.70
	8A			**L17400**	9.70
	10A			**L17500**	9.70
	16A			**L17600**	9.70
	20A			**L17700**	9.70
	25A			**L17800**	13.40
	32A			**L17900**	13.40
handle link pin		2		**L022**	1.00
handle link pin		3		**L023**	1.60
handle link pin		4		**L02400**	2.80
spare fuse holder (DIN mounted)		1		**L14700**	3.30
service fuse back-wired 100A for 22mm				**LH901**	29.60
service fuse back-wired 100A anti-intrusion				**LH904**	34.20
fuse carrier (wedge) to suit LH901				**LH901/W**	23.60
100A neutral link, 4 way				**KM06A**	35.90

DIN HRC Fuse Carriers

description
size according to DIN from 00 to 2 to suit fuses according to AS/NZS60269

technical data
DIN fuses typically have breaking capacity to 100kA at 500V (supplied without fuse cartridge)

connection capacity
70 - 240mm

LT150

description	*characteristics*	*pack qty*	*cat ref.*	*price ex-GST*
fuse switch disconnectors	3 x size 00 160A DIN blade fuses		**LT052**	98.60
DIN blade fuses	3 x size 1 250A		**LT150**	342.40
	3 x size 2 400A DIN blade fuses		**LT250**	409.50
cable clamps	suitable for LT052 (6 - 70mm²)	1	**LZ051**	47.00
	suitable for LT150 (70 - 150mm²)	1	**LZ151**	62.30
	suitable for LT250 (120 - 240mm²)	1	**LZ152**	73.20

DIN Socket Outlets

SNO15DA

description	*width in 17.5mm*	*cat ref.*	*price ex-GST*
DIN mounted socket outlets			
DIN mounted 10A double pole auto switched complete with safety shutters and 'on' indicator	2.5	**SNO10DA**	19.20
DIN mounted 15A double pole auto switched complete with safety shutters and 'on' indicator	2.5	**SNO15DA**	21.30

Earth Leakage Add-on Blocks

description
for use with NCN + NDN + NT MCB's

- these devices are designed to be fitted to the right hand side of 2, 3 or 4 pole MCBs
- the combination device then provides protection against overload, short circuits and earth leakage faults. Satisfies mechanical protection clauses of AS3000:2000
- all devices have a test facility
- all devices are type A
- nuisance tripping protection
- protected against transient voltages

technical data

- complies with AS/NZS61009.1

connection capacity

flexible: 25A = 6mm²
40A = 16mm²
63A = 16mm²

rigid: 25A = 10mm²
40A = 25mm²
63A = 25mm²

NT363C + BD363T
items are sold separately

description	*residual current I△n*	*current rating (A)*	*width in 17.5mm*	*pack qty*	***cat ref.***	*price ex-GST*
2 pole RCCB add-on blocks	30mA	25A	2	1	**BD225T**	83.50
	30mA	40A	2	1	**BD240T**	103.70
	30mA	63A	2	1	**BD263T**	121.50
	100mA	25A	2	1	**BE225T**	104.90
	100mA	63A	2	1	**BE263T**	167.60
	300mA	25A	2	1	**BF225T**	108.20
	300mA	40A	2	1	**BF240T**	149.20
	300mA	63A	2	1	**BF263T**	218.40
3 pole RCCB add on blocks	30mA	25A	2	1	**BD325T**	133.20
	30mA	40A	3	1	**BD340T**	156.60
	30mA	63A	3	1	**BD363T**	170.20
	100mA	63A	3	1	**BE363T**	196.60
	300mA	63A	3	1	**BF363T**	227.50
4 pole RCCB add-on blocks	30mA	25A	2	1	**BD425T**	183.50
	30mA	40A	3	1	**BD440T**	199.20
	30mA	63A	3	1	**BD463T**	201.00
	100mA	25A	2	1	**BE425T**	203.20
	100mA	63A	3	1	**BE463T**	217.70
	300mA	25A	2	1	**BF425T**	216.60
	300mA	40A	3	1	**BF440T**	220.40
	300mA	63A	3	1	**BF463T**	228.20

Safety Switches

description
the safety switch is designed to open a circuit automatically in the case of a fault between phase and earth and or neutral and earth, greater than or equal to rated tripping current.
use in domestic, commercial or industrial installations

technical data
- complies with - AS/NZS61008.1
- 10mA, 2 modules, 16A
- 30mA, 2 and 4 modules, 25A, 40A, 63A, 80A, 100A
- 100mA, 2 modules, 25A, 40A,63A, 80A, 100A, 4 modules -80A, 100A
- voltage rating, 230/400V~

connection capacity
- 25mm² - Rigid (50mm² for 80A,100A)
- 16mm² - Flexible (35mm² for 80A, 100A)
- positive contact indication windows
- earth fault indication window
- trip free mechanisms

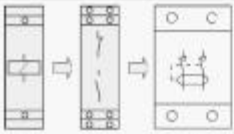
accessories
- auxiliary & alarm contacts
- toggle locking device
- neutral links
- 400V shunt trip
- 230V undervoltage release

CD240T

CD440T

description	*residual current I△n*	*current rating (A)*	*width in 17.5mm*	*pack qty*	***cat ref.***	*price ex-GST*
double pole type AC	30mA	25A	2	1	**CD225T**	74.40
	30mA	40A	2	1	**CD240T**	84.10
	30mA	63A	2	1	**CD263T**	91.90
	30mA	80A	2	1	**CD280T**	104.90
	30mA	100A	2	1	**CD284T**	131.20
	100mA	25A	2	1	**CE225T**	72.10
	100mA	40A	2	1	**CE240T**	82.90
	100mA	63A	2	1	**CE263T**	90.70
	100mA	80A	2	1	**CE280T**	100.70
	100mA	100A	2	1	**CE284T**	128.40
four pole type AC	30mA	25A	4	1	**CD425T**	80.90
	30mA	40A	4	1	**CD440T**	91.90
	30mA	63A	4	1	**CD463T**	113.70
	30mA	80A	4	1	**CD480T**	115.80
	30mA	100A	4	1	**CD484T**	142.10
	100mA	80A	4	1	**CE480T**	110.40
	100mA	100A	4	1	**CE484T**	146.40
double pole type A AC and pulsating DC residual currents	10mA	16A	2	1	**CC216T**	139.60
	30mA	25A	2	1	**CD227T**	170.50
	30mA	40A	2	1	**CD242T**	177.90
	30mA	63A	2	1	**CD265T**	203.10
	100mA	80A	2	1	**CE281T**	208.30
	100mA	100A	2	1	**CE285T**	225.10
four pole type A pulsating DC and AC residual currents	30mA	25A	4	1	**CD427T**	199.80
	30mA	40A	4	1	**CD442T**	208.80
	30mA	63A	4	1	**CD465T**	231.90
	30mA	80A	4	1	**CD481T**	242.00
	30mA	100A	4	1	**CD485T**	251.30
	100mA	80A	4	1	**CE481T**	236.40
	100mA	100A	4	1	**CE485T**	253.30

CZ001

function	description	width in 17.5mm	cat ref.	price ex-GST
combination auxiliary & alarm switch 6A-230V~ 3A-440V~	CA allows remote indication of main contact status SD indicates a fault condition (eg Safety Switch tripped)	1	**CZ001**	36.80
If shunt trip or undervoltage release is required, the CZ001 must be used as a coupler.				
auxiliary switch -10+1C 6A-230V~ 3A-440V~	allows remote indication of main contact status	0.5	**MZ201**	25.10
alarm switch -10+1C 6A-230V~ 3A-440V~	indication of a fault condition	0.5	**MZ202**	27.80
AC shunt trip 230-415V AC 110-130V DC	allows remote tripping of device	1	**MZ203**	46.60
AC undervoltage	- when voltage falls by 35% of Un; fitted with an auxiliary switch	1	**MZ206**	54.60
Looking Kit supplied without padlock	allows locking of the device; toggle in the on/off position; will accept two padlocks . with hasps of 4.75mm diameter max		**MZN175**	15.40

Surge Protective Devices

description
hager SPD's protect electric and electronic equipment against transients, originating from lightning and switching transient sources .
These transients can cause anything from the premature aging of equipment, logic failures and down time, to the complete destruction of electrical components and the entire electrical distribution system.
Surge protective devices are strongly recommended in sites that are exposed to lightning, to protect sensitive and expensive electrical equipment such as TV's, washing machines, Hi-Fi's, PC's, VCR's, alarms etc..
For detailed information, please consult the hager Surge Protective Devices technical handbook

SPA212A

description	*poles*	I_{max} *kA*	*In* *kA*	*Up* *kV*	*Uc* *V*	*width in 17.5mm*	***cat ref.***	*price ex-GST*
Class I								
Spark gap arrester for areas where risk of lightning is prevalent. Test wave 10/350us	2	12.5	-	<2.5	255	4	**SPA212A**	480.00
	4	12.5	-	<2.5	255	8	**SPA412A**	959.90

SPA412A

description	*poles*	I_{max}	*In* *kA*	*Up* *kV*	*Uc* *V*	*width in 17.5mm*	***cat ref.***	*price ex-GST*
Class II								
Medium Protection	1	65	20	<1.5	275	1	**SPN165R**	174.10
Metal Oxide	1	40	15	<1.2	275	1	**SPN140R**	138.30
Varistors								
(MOV's)	1	40	15	<1.2	275	1	**SPN140D**	119.00
high diverting	1	15	5	<1.0	275	1	**SPN115R**	120.10
capacity	1	15	5	<1.0	275	1	**SPN115D**	99.70
replaceable cartridge								
reserve option indication and changeover contact on 'R' catalogue reference								

SPN208S

description	*poles*	I_{max}	*In* *kA*	*Up* *kV*	*Uc* *V*	*width in 17.5mm*	***cat ref.***	*price ex-GST*
Class II								
Fine Protection	2	8	2	1.2	255	2	**SPN208S**	154.40
to be used in	4	8	2	1.25	255	3	**SPN408S**	307.60
cascade with medium protection devices								
Refer to cascade table for Up values								

Surge Protective Devices

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hager SPD's protect electric and electronic equipment against transients, originating from lightning and switching transient sources .
These transients can cause anything from the premature aging of equipment, logic failures and down time, to the complete destruction of electrical components and the entire electrical distribution system.
Surge protective devices are strongly recommended in sites that are exposed to lightning, to protect sensitive and expensive electrical equipment such as TV's, washing machines, Hi-Fi's, PC's, VCR's, alarms etc..
For detailed information, please consult the hager Surge Protective Devices technical handbook

SPN040D

Designation	*Poles*	*reserve status ind.*	*standard status ind.*	*width in 17.5mm*	**cat ref.**	*price ex-GST*
Class II replacement cartridge for	1	Yes	-	1	**SPN065R**	136.20
SPN1XXX	1	Yes	-	1	**SPN040R**	120.10
	1	-	Yes	1	**SPN040D**	103.90
	1	Yes	-	1	**SPN015R**	99.70
	1	-	Yes	1	**SPN015D**	87.90

SPN505

designation	*line*	*In kA*	*characteristics*	*width in 17.5mm*	**cat ref.**	*price ex-GST*
Protection for those devices connected to the telephone network. Protection is assured in both common & differential modes.	analog	10	Un: 130vd.c Uc: 170vd.c	1.5	**SPN505**	216.50

SPD selection for residential, rural and commercial areas

Direct lightning protection

The criteria for installing a lightning protective product.

- Does the installation contain a lightning rod?
- Is the installation adjacent to tall structures, tall trees or near a hill top in a lightning prone area?

If the answer is YES to any of the above, it is recommended to install the SPA212A (3 phase = SPA412A) spark gap device. This will provide protection against direct lightning strikes.

Both references, SPA212A & SPA412A (single & three phase respectively) have dual earth and phase / neutral terminals. This connection method reduces any additional voltage drop in the connecting cables to virtually zero thereby obtaining the best possible Up to the installation. Further installation protection is provided by the fact that the devices are connected in both common and differential modes (L-E/N-E/L-N) together within inbuilt auto protection up to 12.5kA.

If the answer is NO to the above, then a spark gap device is not required.

Tip: *If maximum demand of the installation is 125A or less then use both terminal screws per pole for through connection. This will minimise the residual current. If the maximum demand is greater than 125A then tap off each phase for parallel connection. Refer to the user instructions for a wiring diagram.*

The next step is the selection of the Transient Protective device.

Indirect Transient Protection

To ensure protection of the installation it is vital to have adequate protection from the harmful effect of transients.

Hager Thunder Day Map

This regional map illustrates the lightning activity across Australia and is based upon the 'Thunder Day Map' that appears in AS/NZS 1768 (Int): 2003. This map is compiled by the Bureau of Meteorology.
As indicated, the country is split into three zones of activity. The orange zone is maximum exposure, the yellow zone is high exposure and the grey zone is moderate exposure to lightning activity. The process of selecting the correct SPD for protection against transients is a simple one.

- In what region is the installation located?

1 Install SPN165R; the installation is protected from indirect transients up to 65kA.

2 Install SPN140D/R; the installation is protected from indirect transients up to 40kA.

3 Install SPN115D/R; the installation is protected from indirect transients up to 15kA.

Tip: *For three phase installations, you will require three of the selected SPDs E.g: 3 x SPN165R*

All Hager Class II medium protection products have plug-in cartridges available in two versions:

- SPD's with a base element and cartridge with a status indicator (to show the end of the life of the device). This is indicated with the suffix D at the end of the item number.
- SPD's with a base element which contains an auxiliary contact for remote signalling (audible and visual), and a cartridge with a reserve status indicator. The reserve status function has an added intermediate step which indicates that the cartridge needs to be replaced. While the installation is still protected, the cartridge should be replaced as soon as possible. This product is indicated with the suffix R at the end of the item number.
- SPN165 only available as R

The next system consideration is the protection of the installation's sensitive and valuable electronic equipment.

Equipment Protection

To ensure that today's and importantly tomorrow's, sensitive and valuable electronic devices continue to provide entertainment and service, it is vital to bring the residual voltage below 800V. This will minimise the chance of damage to microchips within these devices.
Answering the question below will allow you to ascertain which Hager device best suits the needs of the installation.

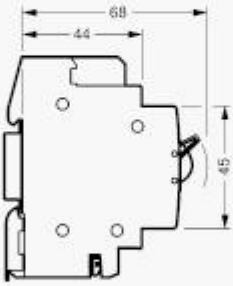
- Does the installation contain electronic appliances? Eg. TV's,VCR's, microwave ovens, Hi-Fi system, computers, fax machines, DVD players, etc...

If the answer is YES, install SPN208S. By installing this device the residual voltage (Up) remaining in the system will be less than 800V. If the installation is 3 phase then install a SPN408S.

If the answer is NO, the installation requires no further protection.

For quick selection of the best SPD product while in the field, please refer to the Hager 'pocket size SPD selection guide'.

RCBO's



description
Compact combination devices which provide MCB overcurrent protection & earth leakage protection. All units are single pole with switched neutral & are 2 modules wide.
The units are available with various current rating ranging from 6A-40A. The range includes Type A & Type AC devices. Type AC devices are the standard unit & will detect an a.c. sinusoidal residual current. Type A device is designed with intrinsic features that can detect a.c. as well as pulsating d.c. residual currents.
Solid state devices that are connected to permanent wiring have an increased possibility of generating residual current containing a d.c. component. Type A devices are able to tolerate this d.c. component. Standard type AC devices may become saturated by the d.c. component & may not detect a residual current.

features
- earth fault indication window
- trip free mechanisms

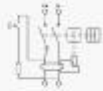
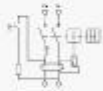
connection capacity
- 16mm² flexible
- 25mm² rigid

accessories
- auxiliary & alarm contact earth
- toggle locking device
- shunt trip
- undervoltage release

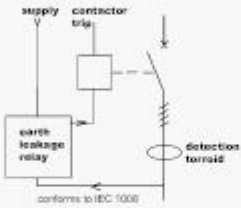
AD820T

AD917T

AD120T

description	residual current I△n	current rating (A)	width in 17.5mm	pack qty	cat ref.	price ex-GST
2 module RCBO 4.5 kA Type AC	30mA	6A	2	1	**AD806T**	88.50
	30mA	10A	2	1	**AD810T**	88.50
	30mA	13A	2	1	**AD813T**	88.50
	30mA	16A	2	1	**AD816T**	88.50
	30mA	20A	2	1	**AD820T**	88.50
	30mA	25A	2	1	**AD825T**	88.50
	30mA	32A	2	1	**AD832T**	88.50
2 module RCBO 4.5kA Type A	30mA	10A	2	1	**AD811T**	186.90
	30mA	16A	2	1	**AD817T**	186.90
	30mA	20A	2	1	**AD821T**	186.90
	30mA	32A	2	1	**AD833T**	186.90
2 module RCBO 6kA Type AC 	30mA	6A	2	1	**AD906T**	99.70
	30mA	10A	2	1	**AD910T**	99.70
	30mA	13A	2	1	**AD913T**	99.70
	30mA	16A	2	1	**AD916T**	99.70
	30mA	20A	2	1	**AD920T**	99.70
	30mA	25A	2	1	**AD925T**	99.70
	30mA	32A	2	1	**AD932T**	99.70
	30mA	40A	2	1	**AD940T**	99.70
2 module RCBO 6kA Type A	10mA	10A	2	1	**AC911T**	221.70
	10mA	16A	2	1	**AC917T**	221.70
2 module RCBO 6kA Type A 	30mA	6A	2	1	**AD907T**	200.90
	30mA	10A	2	1	**AD911T**	204.20
	30mA	13A	2	1	**AD914T**	200.90
	30mA	16A	2	1	**AD917T**	204.20
	30mA	20A	2	1	**AD921T**	204.20
	30mA	25A	2	1	**AD926T**	204.20
	30mA	32A	2	1	**AD933T**	204.20
	30mA	40A	2	1	**AD941T**	200.90
1 module RCBO 6kA Type AC	30mA	10A	1	1	**AD110T**	146.40
	30mA	16A	1	1	**AD116T**	146.40
	30mA	20A	1	1	**AD120T**	146.40
	30mA	25A	1	1	**AD125T**	146.40
	30mA	32A	1	1	**AD132T**	146.40

Earth Leakage Relays & Torroids



description
These units ensure the protection of electrical installations and the protection of persons against direct and indirect contact. This range of products contains a set of earth leakage relays, designed on an electronic basis, which ensure the monitoring of earth fault currents. When the fault current rises above the selected level, the outputs of the relay operate & depending on the relay selected, it can have both adjustable sensitivity and time delay that can provide selectivity/discrimination. The relays are linked with detection torroids.

common characteristics
- positive safety: the relay trips in the event of a break in the connection between relay and torroid.
- positive / local reset required after a fault is detected.
- protected against nuisance tripping
- class A
- output: 1 c/o contact 250V~ 6A AC1
- visual display of fault
- supply voltage 230V +/- 20% 50 / 60Hz
- adjustable sensitivity & time delay (sealable)
- display of fault current prior to triggering relay (5%-75%)
- extra output contact (250V-AC1/6A) to enable remote indication of fault currents above 50% of I△n
- remote test and reset by three wire link

torroid
circular diameter;
- 35mm
- 70mm
- 105mm
- 140mm

connection capacity
- flexible - 1 to 2.5mm
- rigid - 1.5 to 4mm

HR410

HR420

HR441

HR804

description	*width in 17.5mm*	*characteristics*	*cat ref.*	*price ex-GST*
earth leakage relay standard	3	c/o contact 250V 6A ~ AC1 adjustable sensitivity I△n= 0.03/0.1/0.3/0.5/1/3/10A adjustable time delay △t= 0/0.1/0.3/0.4/0.5/1/3sec	**HR410**	457.30
earth leakage relay premium	3	c/o contact 250V 6A ~ AC1 fail safe contact 250V 6A ~ AC1 pre-alarm contact 250V 6A ~ AC1 adjustable sensitivity I△n= 0.03/0.1/0.3/0.5/1/3/10A adjustable time delay △t= 0/0.1/0.3/0.4/0.5/1/3sec bargraph = 5% - 75% I△n	**HR420**	537.60
earth leakage relay integral torroid	6	c/o contact 250V 6A ~ AC1 adjustable s sensitivity I△n= 0.03/0.1/0.3/0.5/1/3A adjustable time delay △t= 0/0.1/0.3/0.5/0.75/1sec Ø of torroid: 35mm	**HR441**	613.70
circular section torroids		Ø of torroid: 35mm	**HR801**	175.10
		Ø of torroid: 70mm	**HR802**	208.70
		Ø of torroid: 105mm	**HR803**	329.40
		Ø of torroid: 140mm	**HR804**	349.80

Discrimination between Residual Current Devices

In theory it is possible to achieve current discrimination between residual current devices, but the limit of discrimination is far too low for practical purposes. Time delay is the only reliable and by far the best method used to obtain discrimination. It can only be achieved by delaying the tripping of the upstream residual current devices.

The down stream device would typically be a 30mA or occasionally a 10mA residual current device. Typically they will operate within 40ms and occasionally much faster.

hager residual current relays (HR210, HR212) have adjustable time delay and residual current settings. They can be used as an upstream device to achieve residual current protection of the entire installation. It is advisable to set the residual current relay at a residual higher tripping current than a downstream devices (> 30mA) since the upstream device will see the accumulation of leakage currents from the entire installation. The residual current setting will depend on the quantity and type of equipment connected to the installation (Immersion water heaters, switch mode power supplies are particularly prone to leak currents to earth). The time delay should be set above zero to 300ms.

If further levels of protection are required upstream from the hager residual current relay, then another residual current relay can be installed upstream and the settings of the upstream device (time and residual current) adjusted higher again.

Enclosure Packages

description
for applications where an RCCB is being added to an existing installation or where other DIN type fixing facilities are not available.

To overcome this problem we present a range of RCCBs complete with DIN rail enclosures and where necessary an integral neutral link for up to three circuits.

This range has been designed for ease of installation and ease of ordering.

JT201

description	*residual current I△n*	*current rating (A)*	*width in 17.5mm*	*pack qty*	***cat ref.***	*price ex-GST*
2 pole RCCB complete with enclosure and 2 holes neutral link	30mA	40A	2	1	**JT201**	95.20
2 pole RCCB complete with enclosure	30mA	40A	2	1	**JT202**	92.30
2 pole RCCB complete with enclosure and 3 holes neutral link	30mA	63A	2	1	**JT203**	104.20
4 pole RCCB complete with enclosure	30mA	40A	4	1	**JT204**	101.40
4 pole RCCB complete with enclosure and 3 holes neutral link	30mA	40A	4	1	**JT205**	104.20

Enclosure Packages

description
Enclosures that provide added convenience & time savings for money of the common installation types. Each of the references are supplied with a choice of various configurations and of swichgear and enclosure types

JT001

description	*characteristics*		***cat ref.***	*price ex-GST*
surface enclosure	c/-1 x VS12PT, 1 xSB163T, 2 x NS110, 2 x NS120, 1 x CD240T,	12	**JT001**	168.70
flush enclosure	c/- 1 x VF12PT, 1 x SB163T, 2 x NS110, 2x NS120, 1 x NS132, 1 x CD240T	12	**JT001F**	168.70
surface enclosure	c/- 1 x VS12PT, 1 x SB163T, 2x NS110, 2 x NS120, 1 x NS132, 1 x CD240T	12	**JT002**	188.00
surface enclosure	c/- 1 x VS12PT, 1 xSB180T, 2 x NS110, 2x NS120, 2 x CD240T, 2 x KM03A	12	**JT003**	250.80

Emergency Lighting Discharge Test Package EMERGC1

description
The Hager Emergency Lighting Discharge Test Package has been developed to meet the needs of the electrical industry.

In accordance with AS2293.1-2005 and AS/NZS2293.2 1995 'Emergency Evacuation Lighting for Buildings' a discharge test circuit MUST be installed in both existing and new installation for the purpose of testing the charge.

application
Hager's EMERGC1 offers a convenient and versatile discharge test facility for maintenance of emergency lighting systems. This package may be mounted separately using the supplied enclosure in situations where space in the switchboard is limited. It can also be included in the hager range of Jyka panelboards by taking advantage of the DIN rail area at the top of the switchboard

The EMERGC1 test package includes
- 6 pole surface mount enclosure, together with a lockable door
- IP 40
- 4 Pole 40A N/C Contactor
- push button 1N/O (green) + 1N/C (red)
- delay timer 0.1 second to 10 hours

use and implementation
The EMERGC1 works on the following principle:
Upon engaging the Green push button for 1 second, the timer starts it's operation and energises the contactor coil. The four normally closed contacts open, initiating operation of the emergency lights. The timer, to be set at 2 hours (2hrs for initial commissioning, 90mins thereafter, completes its operation, de-energising the contactor coil returning the contacts to the normally closed position.

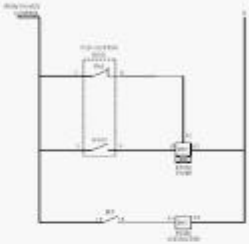
In accordance with AS2293.1-2005 4.3.1(b) the test facility is capable of being manually reset. If the red push button is pressed the timer resets and is ready for the green push button to start the timing cycle again.

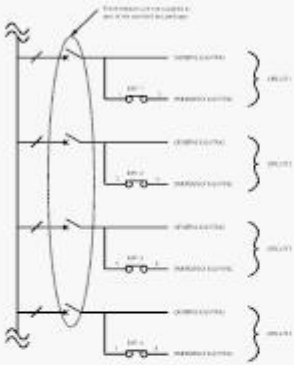
This 'off-the -shelf' package offers the contractor a time saving solution and answers the needs of the industry in regard to the testing and maintenance of emergency lighting systems.

EMERGC1

description	*characteristics*	***cat ref.***	*price ex-GST*
emergency lighting discharge test package	c/- 1xGD106T, 1xGP106T, 1xVZ313 1xES480, 1xEZ004, 1xSV031	**EMERGC1**	317.20

Wiring Diagram





1. Standard Emergency Test Components:

SV031: Momentary Pushbutton, 6A 240V
1 NO (green, Pushbutton A), 1 NC (red, Pushbutton B)

EZ004: Delay Timer (EET)
Set at 2 hours for initial commissioning (90mins there after)
Clauses 2.2.1 and 2.2.2 of AS2293.1-2005

ES480: 4 pole normally closed contactor (EM1)
4P 40A AC1, 240V AC coil

2. Basic Operating Procedure:

Upon engaging Pushbutton A for 1 second the Delay Timer (EET) starts its operation and energises the coil of Contactor EM1. The four normally closed contacts of EM1 then open, initiating the operation of the emergency lights. After 2 hours Timer EET completes its operation, de-energising the coil of EM1 and returning the contacts to the normally closed position. In accordance to AS2293.1-2005 4.3.1(b) the test facility is capable of being manually reset. If the Red Pushbutton is pressed for 1 second, Timer EET resets and is ready for Green Pushbutton to start the timing cycle again.

Emergency Lighting Discharge Test Package EMERGC2

description
The Hager Emergency Lighting Discharge Test Package has been developed to meet the needs of the electrical industry.

In accordance with AS2293.1-2005 and AS/NZS2293.2 1995 'Emergency Evacuation Lighting for Buildings' a discharge test circuit MUST be installed in both existing and new installation for the purpose of testing the charge.

application
Hager's EMERGC2 offers a convenient and versatile discharge test facility for maintenance of emergency lighting systems. This package may be mounted separately using the supplied enclosure in situations where space in the switchboard is limited. It can also be included in the hager range of Jyka panelboards by taking advantage of the DIN rail area at the top of the switchboard

The EMERGC2 test package includes
- 4 pole surface mount enclosure, together with a lockable door
- IP 40
- 2 Pole 25A N/C Contactor
- push button 1N/O (green) + 1N/C (red)
- delay timer 0.1 second to 10 hours

use and implementation
The EMERGC2 works on the following principle:
Upon engaging the Green push button for 1 second, the timer starts it's operation and energises the contactor coil. The two normally closed contacts the open, initiating operation of the emergency lights. The timer, to be set at 2 hours (2hrs for initial commissioning, 90mins there after) completes its operation, de-energising the contactor coil returning the contacts to the normally closed position.

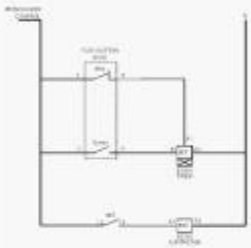
In accordance with AS2293.1-2005 4.3.1(b) the test facility is capable of being manually reset. If the red push button is pressed the timer resets and is ready for the green push button to start the timing cycle again.

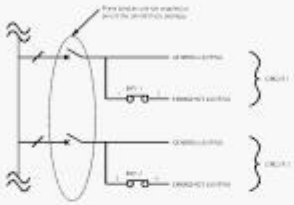
This 'off-the -shelf' package offers the contractor a time saving solution and answers the needs of the industry in regard to the testing and maintenance of emergency lighting systems.

EMERGC2

description	*characteristics*	***cat ref.***	*price ex-GST*
emergency lighting discharge test package	c/- 1xGD104T, 1xGP104T, 1xVZ313 1xES230, 1xEZ004, 1xSV031	**EMERGC2**	193.20

Wiring Diagram





1. Standard Emergency Test Components:

SV031: Momentary Pushbutton, 6A 240V
1 NO (green, Pushbutton A), 1 NC (red, Pushbutton B)

EZOO4: Delay Timer (EET)
Set at 2 hours for initial commissioning (90mins there after)
Clauses 2.2.1 and 2.2.2 of AS2293.1-2005

ES230: 2 pole normally closed contactor (EM1)
2P 25A AC2, 240V AC coil.

2. Basic Operating Procedure:

Upon engaging the Green Pushbutton for 1 second the Delay Timer (EET) starts its operation and energises the coil of Contactor EM1. The two normally closed contacts of EM1 then open, initiating the operation of the emergency lights. After 2 hours Timer EET completes its operation, de-energising the coil of EM1 and returning the contacts to the normally closed position. In accordance to AS2293.1-2005 4.3.1(b) the test facility is capable of being manually reset. If the Red Pushbutton is pressed for 1 second, Timer EET resets and is ready for Green Pushbutton to start the timing cycle again.

Insulated Busbars and Connectors

description
a range of connection devices to simplify installation of modular devices such as MCB's, RCD's etc...
Uimp: 4.5kV

KB380A

description	*characteristics*	*width in 17.5mm*	***cat ref.***	*price ex-GST*
insulated busbars - fork type	1 phase 80A	12	**KDN180A**	10.40
	1 phase 80A	18	**KD180G**	14.20
	2 phase 80A	12	**KDN280A**	28.30
	2 phase 80A	18	**KD280G**	42.50
	3 phase 80A	12	**KDN380A**	45.50
	3 phase 80A	18	**KD380G**	63.60
insulated busbars - tongue type	1 phase 80A	24	**KB190C**	14.90
	2 phase 80A	12	**KB280A**	28.30
	2 phase 80A	18	**KB280G**	42.50
	3 phase 80A	12	**KB380A**	45.50
	3 phase 80A	18	**KB380G**	63.60
insulating busbar ends	- KDN2XX/KDN3XX		**KZN023**	5.10
insulated busbars without connector - tongue type	1 phase 100A	6	**DBS1/06**	6.30
	1 phase 100A	9	**DBS1/09**	8.40
	1 phase 100A	18	**DBS1/18**	12.90

KM03A

description	*characteristics*	***cat ref.***	*price ex-GST*
busbar connector	slide on 100A (for DBS series)	**DBS1/C**	6.30
cable connectors - tongue type	connection from top of cables : 25mm2	**KF81A**	7.70
	connection from top of cables : 2 x 16 mm2	**KF82A**	9.80
	connection from side for cables : 25mm2	**KF83A**	7.70
cable connectors - fork type	connection from side for cables : 25mm2	**KF84A**	7.70
RCD neutral links	3 hole for fitting to RCD's	**KM03A**	12.00