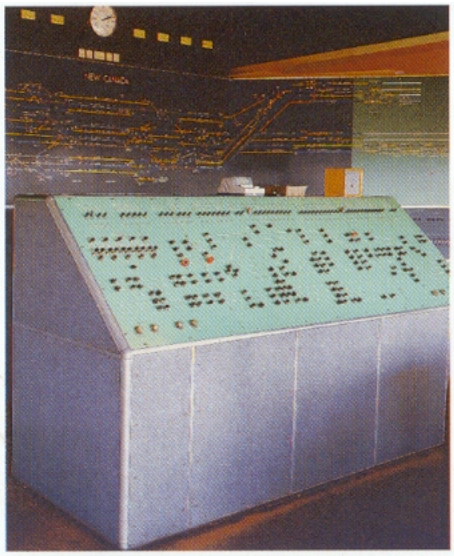
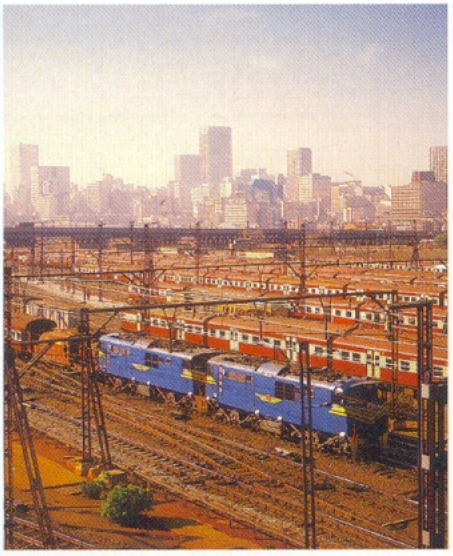
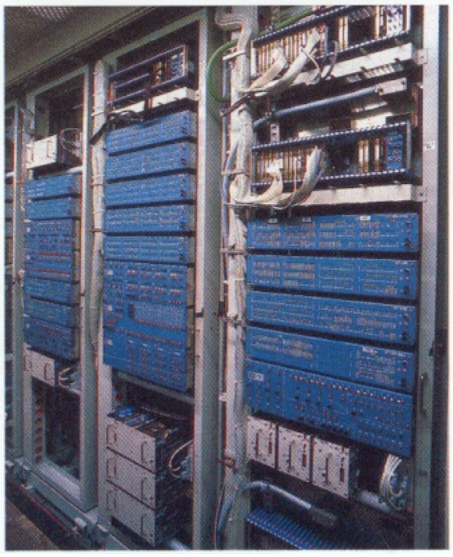
CIRCUIT BREAKERS FOR EQUIPMENT PROTECTION

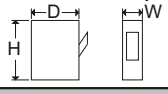





HY-MAG

SELECTION CHART

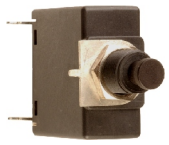
HY-MAG

TYPE		Q FRAME			
		QZ	QF	QL	QY
					
MAXIMUM NUMBER OF POLES		3	3	2	1
MAXIMUM NOMINAL VOLTAGE	AC	277/480V	277/480V	240/415V	N/A
	PER POLE DC	N/A	N/A	N/A	80V
MAXIMUM RATED CURRENT		50A	63A	25A	50A
TIME DELAYS		LOW	MEDIUM	MEDIUM	MEDIUM INSTANTANEOUS
RATED INTER. CAPACITY WITHOUT SERIES FUSE:	120/240V AC	5kA (1P)	N/A	10kA	N/A
	240/415V AC	3kA	6kA	6kA	N/A
	277/480V AC	3kA (1P) - 1kA (3P)	3kA	N/A	N/A
	125V DC	N/A	3kA	N/A	N/A
	80V DC	N/A	N/A	N/A	10kA
	65V DC	N/A	N/A	N/A	N/A
INTERNAL CIRCUIT		SERIES TRIP AUX. SWITCH ALARM SWITCH (2nd pole) AUX / ALARM SWITCH	SWITCH ONLY SERIES TRIP AUX. SWITCH ALARM SWITCH AUX / ALARM SWITCH	SWITCH ONLY SERIES TRIP AUX. SWITCH ALARM SWITCH AUX / ALARM SWITCH	SWITCH ONLY SERIES TRIP AUX. SWITCH ALARM SWITCH AUX / ALARM SWITCH
MOUNTING		MINI RAIL DIN RAIL SURFACE	MINI RAIL DIN RAIL SURFACE	MINI RAIL DIN RAIL SURFACE	MINI RAIL DIN RAIL SURFACE
TERMINATIONS		BOX TERMINALS	BOX TERMINALS	BOX TERMINALS	BOX TERMINALS PLUG-IN REAR STUDS
HANDLE TYPE		STANDARD	STANDARD	STANDARD	STANDARD
DIMENSIONS (mm) 	H	86,0	86,0	86,0	86,0
	W	13,0	18,0 (DIN) / 19,5 (MINI)	13,0	13,0
	D	65,0 (DIN) / 66,0 (MINI)	65,0 (DIN) / 66,0 (MINI)	66,0	65,0 (DIN) / 66,0 (MINI)
COMPLIANCE / APPROVALS		/CSA/IEC/CE	/CSA/IEC/CE	IEC60947-2/UL489/CE	UL489-A/CE VDE/IEC60947-2
ACCESSORIES		MOUNTING HARDWARE HANDLE LOCK ESCUTCHEON BLANKS SAFETY BLANKS	MOUNTING HARDWARE HANDLE LOCK ESCUTCHEON BLANKS SAFETY BLANKS	MOUNTING HARDWARE HANDLE LOCK ESCUTCHEON BLANKS SAFETY BLANKS	MOUNTING HARDWARE HANDLE LOCK ESCUTCHEON BLANKS SAFETY BLANKS

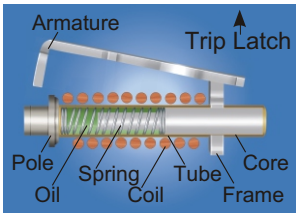
* Dimensions for rocker handle, ** With rear studs

May 2002

CBE SELECTION CHART

B FRAME	C FRAME	D FRAME	E FRAME	F FRAME
				
2	3	6	6	3
240V 65V	240/415V 277V 65V	277/480V 80V	240/415V 125V	240/525V 125/375V
25A	30A	100A (250A)	100A	250A (750A)
INSTANTANEOUS LOW - MEDIUM - HIGH	INSTANTANEOUS LOW - MEDIUM - HIGH	INSTANTANEOUS ULTRA SHORT LOW - MEDIUM - HIGH HIGH INRUSH	INSTANTANEOUS LOW - MEDIUM - HIGH	LOW - MEDIUM - HIGH
N/A 1kA N/A N/A N/A 0.5kA	N/A 3kA 3kA - 1P NA NA 1kA	10kA 5kA 5kA N/A 10kA N/A	N/A 5kA N/A 1.5kA N/A N/A	N/A 25kA N/A 10kA 25kA N/A
SWITCH ONLY SERIES TRIP SHUNT TRIP RELAY TRIP AUX. SWITCH	SWITCH ONLY SERIES TRIP AUX. SWITCH	SWITCH ONLY SERIES TRIP SHUNT TRIP RELAY TRIP DUAL CONTROL AUX. SWITCH TRIP ALARM	SWITCH ONLY SERIES TRIP SHUNT TRIP RELAY TRIP AUX. SWITCH	SWITCH ONLY SERIES TRIP RELAY TRIP AUX. SWITCH TRIP ALARM AUX / ALARM SWTICH
CENTRE LOCK NUT SNAP-IN	FRONT MOUNTING SNAP-IN	FRONT MOUNTING CENTRE LOCK NUT SNAP-IN DIN RAIL	FRONT MOUNTING SURFACE MOUNTING CLIP TRAY	FRONT MOUNTING SURFACE MOUNTING
PUSH-ON PCB MOUNTED	PUSH-ON PCB MOUNTED CLAMP TYPE	REAR STUDS CLAMP TYPE PUSH-ON PLUG-IN	REAR STUDS BOX TERMINAL CLAMP TYPE	REAR STUDS BOX TERMINAL LUG TERMINAL
BATON PADDLE SQUARE ROCKER PUSH-PULL PUSH-TO-RESET	SHORT STANDARD CUT-OFF	STANDARD REDUCED STANDARD ROCKER PADDLE BATON	STANDARD	STANDARD
40,0* / 35,0 17,3* / 17,3 40,0* / 33,5	50,8 19,0 41,2	63,5 19,0 49,0	131,8 26,0 101,3 ** / 66,3	210 50 / 105 100
/CSA/ IEC/ TUV/CE VDE (EN/IEC60934)	/CSA/CE IEC/UL489-A/ VDE (EN/IEC60934)	/CSA/CE IEC/UL489/ VDE (EN/IEC60934)	SABS/CE	IEC/CSA UL489-A
LEGEND PLATE MOUNTING HARDWARE	SCREW TERMINAL ADAPTOR	INTERPHASE BARRIERS LEGEND PLATE MOUNTING HARDWARE	HANDLE LOCK SHROUD MOUNTING HARDWARE	INTERPHASE BARRIERS TERMINAL COVERS HANDLE LOCK KEY LOCKING DEVICE TANDEM BOX TERMINALS EXTENDED LUG TERMINALS

PRINCIPLE OF THE HYDRAULIC MAGNETIC CIRCUIT BREAKERS

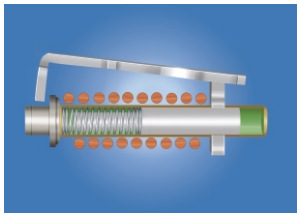


1

Hydraulic Magnetic Circuit Breakers (HMCB) operate on the magnetic force produced by a load current flowing through a series connected solenoid coil which is wound around an hermetically sealed tube containing an iron core, a spring and dampening fluid.

At currents below the circuit breaker rating, the magnetic flux in the solenoid is insufficient to attract the core towards the pole piece due to the spring pressure.

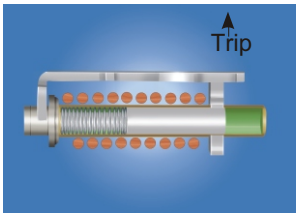
Where an overload occurs, i.e. currents above the circuit breaker rating, the magnetic flux in the solenoid produces sufficient pull on the core to commence its movement toward the pole piece.



2

During this movement, the hydraulic fluid regulates the cores speed of travel, thereby creating a controlled time delay which is inversely proportional to the magnitude of the current.

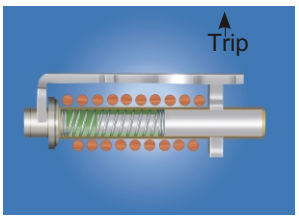
This time delay is useful in that if the overload is of short duration, i.e. start up of motors, etc, the core returns to its rest position once the overload disappears.



3

If the overload persists, the core reaches the pole piece after a time delay particular to that current and in so doing, the reluctance of the magnetic circuit drops considerably, so that the armature is attracted to the pole face with sufficient force to collapse the latch mechanism (toggle) and consequently trip the breaker.

The contacts separate, the current ceases to flow, and the core returns to its rest position.



4

With high values of overloads or short circuit, the magnetic flux produced by the coil is sufficient to attract the armature to the pole face and trip the breaker even though the core has not moved. This is called the instantaneous trip region of the circuit breaker characteristic.

Unlike thermal circuit breakers, the hydraulic magnetic circuit breaker's trip point is unaffected by ambient temperature. After tripping, the breaker may be re-closed immediately since there is no cooling down time necessary.

By the nature of the principle of operation, it is possible to obtain any variation of time / current characteristic.

FEATURES

- Circuit breakers can carry 100% of rated current independent of ambient temperature.
- Always trip at 125% of rated current independent of ambient temperature.
- Immediate resetting after trip.
- Any current rating possible.
- Large range of time delays available.

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