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Miniature circuit breakers 10kA type NBN, NCN, NDN

hager

Description
- Protects circuits against overload & short circuit faults
- Provides isolation to downstream circuits

Technical data
- Conforms to IEC 60898-1:2002 IS/IEC 60898-1:2002
- ISI marking
- CE marking
- Ratings - 0.5 to 63 A
- No. of poles - 1P, 2P, 3P & 4P
- Tripping curves - B, C & D
- Breaking capacity 10kA (as per IEC 60898-1)
- Suitable for isolation as per IEC 60947

Features & benefits
- Positive Contact Isolation ensuring complete protection to user
- Ergonomined toggle for comfort switching
- Insulated safety shutter for finger touch proof terminal
- Laser marking to ensure permanent information
- Front product labeling for displaying of load information
- Energy Limiting Class 3 to ensure low let through energy to limit thermal & mechanical stress on cables
- Direct mounting of wide range of accessories like OV, UV, ST, AX, AL, OV + UV release

Connection
25sq mm rigid cables
16sq mm flexible cables

NCN110N

NCN220N

NCN316N

NCN432N

Description	Modules	In (Amp)	B Curve	C Curve	D Curve
1P	1	0.5		**NCN100N**	**NDN100N**
	1	1		**NCN101N**	**NDN101N**
	1	2		**NCN102N**	**NDN102N**
	1	3		**NCN103N**	**NDN103N**
	1	4		**NCN104N**	**NDN104N**
	1	6	**NBN106N**	**NCN106N**	**NDN106N**
	1	10	**NBN110N**	**NCN110N**	**NDN110N**
	1	16	**NBN116N**	**NCN116N**	**NDN116N**
	1	20	**NBN120N**	**NCN120N**	**NDN120N**
	1	25	**NBN125N**	**NCN125N**	**NDN125N**
	1	32	**NBN132N**	**NCN132N**	**NDN132N**
	1	40	**NBN140N**	**NCN140N**	**NDN140N**
	1	50	**NBN150N**	**NCN150N**	**NDN150N**
	1	63	**NBN163N**	**NCN163N**	**NDN163N**
2P	2	0.5		**NCN200N**	**NDN200N**
	2	1		**NCN201N**	**NDN201N**
	2	2		**NCN202N**	**NDN202N**
	2	3		**NCN203N**	**NDN203N**
	2	4		**NCN204N**	**NDN204N**
	2	6	**NBN206N**	**NCN206N**	**NDN206N**
	2	10	**NBN210N**	**NCN210N**	**NDN210N**
	2	16	**NBN216N**	**NCN216N**	**NDN216N**
	2	20	**NBN220N**	**NCN220N**	**NDN220N**
	2	25	**NBN225N**	**NCN225N**	**NDN225N**
	2	32	**NBN232N**	**NCN232N**	**NDN232N**
	2	40	**NBN240N**	**NCN240N**	**NDN240N**
	2	50	**NBN250N**	**NCN250N**	**NDN250N**
	2	63	**NBN263N**	**NCN263N**	**NDN263N**
3P	3	0.5		**NCN300N**	**NDN300N**
	3	1		**NCN301N**	**NDN301N**
	3	2		**NCN302N**	**NDN302N**
	3	3		**NCN303N**	**NDN303N**
	3	4		**NCN304N**	**NDN304N**
	3	6	**NBN306N**	**NCN306N**	**NDN306N**
	3	10	**NBN310N**	**NCN310N**	**NDN310N**
	3	16	**NBN316N**	**NCN316N**	**NDN316N**
	3	20	**NBN320N**	**NCN320N**	**NDN320N**
	3	25	**NBN325N**	**NCN325N**	**NDN325N**
	3	32	**NBN332N**	**NCN332N**	**NDN332N**
	3	40	**NBN340N**	**NCN340N**	**NDN340N**
	3	50	**NBN350N**	**NCN350N**	**NDN350N**
	3	63	**NBN363N**	**NCN363N**	**NDN363N**
4P	4	0.5		**NCN400N**	**NDN400N**
	4	1		**NCN401N**	**NDN401N**
	4	2		**NCN402N**	**NDN402N**
	4	3		**NCN403N**	**NDN403N**
	4	4		**NCN404N**	**NDN404N**
	4	6	**NBN406N**	**NCN406N**	**NDN406N**
	4	10	**NBN410N**	**NCN410N**	**NDN410N**
	4	16	**NBN416N**	**NCN416N**	**NDN416N**
	4	20	**NBN420N**	**NCN420N**	**NDN420N**
	4	25	**NBN425N**	**NCN425N**	**NDN425N**
	4	32	**NBN432N**	**NCN432N**	**NDN432N**
	4	40	**NBN440N**	**NCN440N**	**NDN440N**
	4	50	**NBN450N**	**NCN450N**	**NDN450N**
	4	63	**NBN463N**	**NCN463N**	**NDN463N**

Miniature circuit breakers 80-125A, 10kA type HLF

Description
- Protects circuits against over-load & short circuit faults
- Provides isolation to down-stream circuits

Technical data
- Conforms to IEC 60947
- **CE marking**
- Ratings – 80A,100A &125A
- No. of poles - 1P, 2P, 3P & 4P
- Tripping curve - C
- Breaking capacity - 10kA (as per IEC 60947)
- Suitable for isolation as per IEC 60947

Features & benefits:
- MCBs handle can be locked in "off" position
- Large terminal capacity - upto 70 sq mm
- Steel reinforcement plate to improve terminal strength
- Serrations on jaws to provide better grip on cables
- Line-load reversible
- **RoHS compliant, " Green" product**
- Wide range of accessories are available

Connection capacity
- 35 sq mm flexible wire (50 sq mm possible with some cable end-caps)
- 70 sq mm rigid wire

IP2X terminals

HLF199S

HLF299S

HLF399S

HLF499S

Description	In (Amp)	Modules	Catalogue No.
1P	80	1.5	**HLF180S**
	100	1.5	**HLF190S**
	125	1.5	**HLF199S**
2P	80	3	**HLF280S**
	100	3	**HLF290S**
	125	3	**HLF299S**
3P	80	4.5	**HLF380S**
	100	4.5	**HLF390S**
	125	4.5	**HLF399S**
4P	80	6	**HLF480S**
	100	6	**HLF490S**
	125	6	**HLF499S**

Characteristics	ML	NB	NC	ND	HLF
Poles	SP+N	SP DP TP FP	SP DP TP FP	SP DP TP FP	SP DP TP FP
Rated operational voltage U_e(V)	230	230/415	230/415	230/415	230/415
Nominal Current	6-40A	6-63A	0.5-63A	0.5-63A	80-100-125A
Breaking capacity to IEC 60 898	6kA	10kA	10kA	10kA	10kA
Breaking capacity to IEC 60 947-2	-	15kA	15kA	15kA	10kA
Rated insulation voltage U_i(V)	500V	500V	500V	500V	500V
Rated impulse voltage U_{imp} (kV)	4000V	4000V	4000V	6000V	6000V
Electrical endurance					
0.5 to 32A	10000	20000	20000	20000	
40 to 63A		10000	10000	10000	
80 to 125A					4000

Power loss
The power loss of MCB's is closely controlled by the standards and is calculated on the basis of the voltage drop across the main terminals measured at rated current. The power loss of Hager circuit breakers is very much lower than that required by the Standard, so in consequences run cooler and are less affected when mounted together.

The table below gives the watts loss per pole at rated current

MCB rated current (A)	0.5	1	2	3	4	6	10	16	20	25	32	40	50	63	80	100	125
Watts loss per pole (W)	1.3	1.5	1.7	2.1	2.4	2.7	1.8	2.6	2.8	3.3	3.9	4.3	4.8	5.2	5	5.5	8

For use with DC
Because of their quick make and break design and excellent arc quenching capabilities Hager circuit breakers are suitable for DC applications.

The following parameters must be considered.

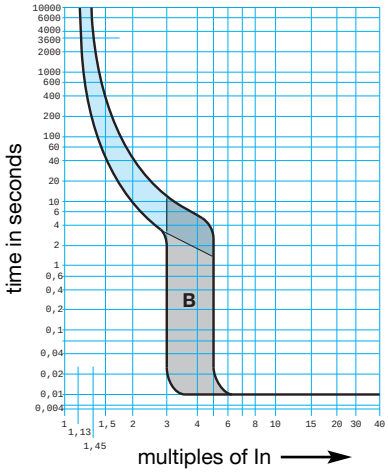
1. system voltage:
   Determined by the number of poles connected in series
2. short-circuit current:
3. tripping characteristics:
   - the thermal trip remains unchanged
   - the magnetic trip will become less sensitive requiring derating by Ö2 the ac value.

No. of poles	**1 pole**		**2 poles in series**	
Range	Max voltage	Breaking capacity L/R=15ms	Max voltage	Breaking capacity L/R=15ms
NB, NC	60V	10kA	125V	10kA
ND	125V	10kA	250V	10kA
HLF	60V	15kA	125V	15kA

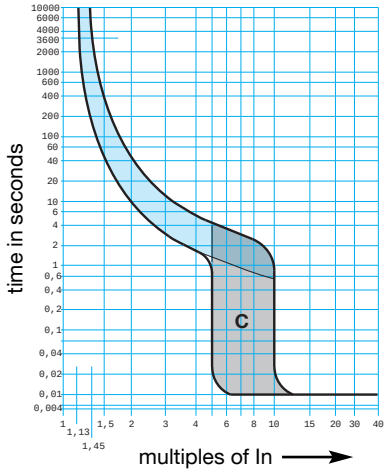
NB, NC, ND						
Characteristic curve	**B**		**C**		**D**	
Magnetic trip	50Hz	dc	50Hz	dc	50Hz	dc
Irm1	3 In	4.5 In	5 In	7.5 In	10 In	15 In
Irm2	5 In	7.5 In	10 In	15 In	20 In	30 In

HLF (IEC 60-898)		
Characteristic curve	**C**	
Magnetic trip	50Hz	dc
Irm1	5 In	7.1 In
Irm2	10 In	14.1 In

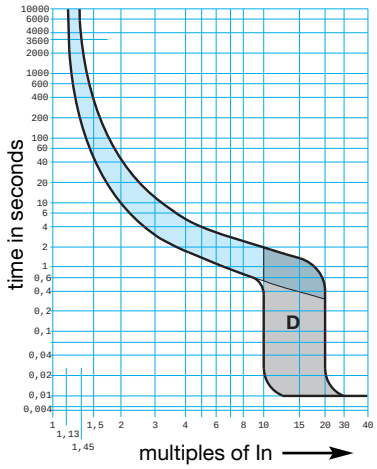
‘ B’ curve (IEC 60898)
MCBs: NB rated 6-63A



‘ C’ curve (IEC 60898)
MCBs: NC rated 0.5-63A
HLF rated 80-125A

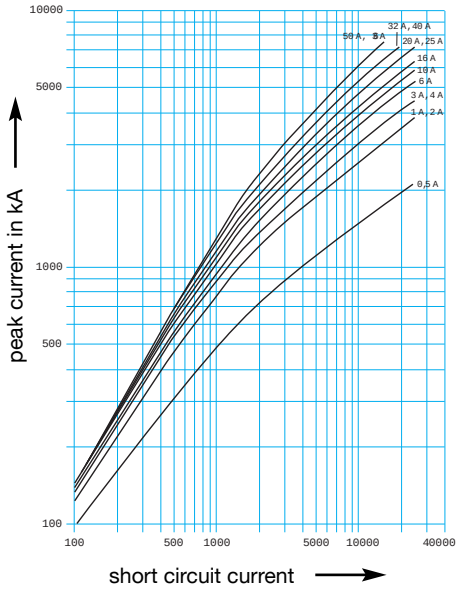


‘ D’ curve (IEC 60898)
MCBs: ND rated 0.5-63A

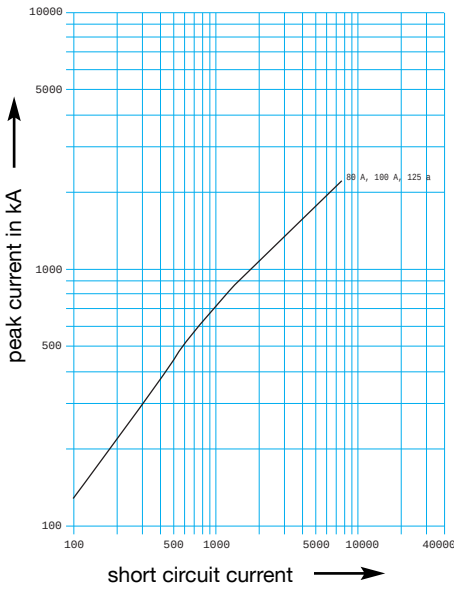


current limiting at 400V

NB NC ND

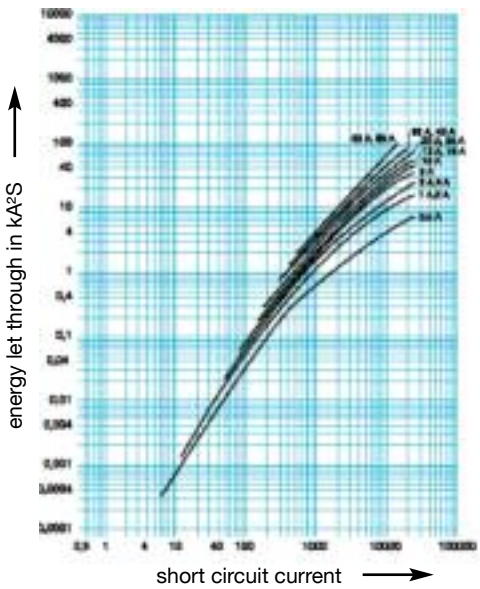
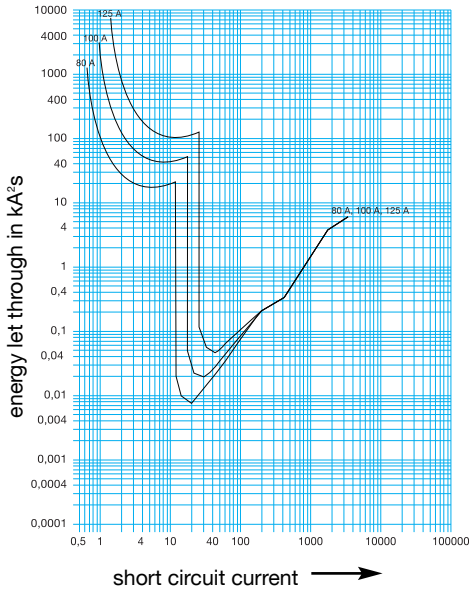


HLF



I²t characteristics

NB NC ND



HLF