

Variable speed drives for asynchronous motors

Altivar 38 Motor starters



NS80HMA
+
LC1 D
+
ATV 38

Applications

Circuit-breaker/contactor/drive combinations can be used to ensure continuous service of the installation with optimum safety.

The selected circuit-breaker/contactor combination can reduce maintenance costs in the event of a short-circuit by minimising the time required to make the necessary repairs and the cost of replacement equipment. The combinations suggested correspond to type 2 coordination:

Type 2 coordination: A short-circuit will not damage the device or affect its settings. The motor starter should be able to operate once the electrical fault has been removed. The electrical isolation provided by the circuit-breaker will not be affected by the short-circuit. Welding of the contactor contacts is permissible if they can be separated easily.

The downstream contactor is not affected by type 2 coordination.

The drive controls the motor, provides protection against short-circuits between the drive and the motor and protects the motor cable against overloads. This overload protection is provided by the drive's motor thermal protection.

If this protection is removed, external thermal protection should be provided.

Before restarting the installation, the cause of the trip must be removed.

3-phase supply voltage: 380 to 415 V (for 0.75 to 315 kW motors)

Motor circuit-breaker: NSppppMA: product sold under the Merlin Gerin brand

Composition of contactors:

LC1-D09 to LC1-D115: 3 poles + 1 "N/O" auxiliary contact and 1 "N/C" auxiliary contact

LC1-Fpp to LC1-D115: 3 poles + 1 "N/O" auxiliary contact and 1 "N/C" auxiliary contact

Motor (1) Power kW	Circuit-breaker Reference (2)	Rating A	Line contactor Reference (3)	Downstream contactor Reference (4)	Variable speed drive Reference (5)
0.75	GV2 L08	4	LC1 D18pp	LC1 D09BL	ATV 38HU18N4
1.5	GV2 L10	6.3	LC1 D18pp	LC1 D09BL	ATV 38HU29N4
2.2	GV2 L14	10	LC1 D18pp	LC1 D09BL	ATV 38HU41N4
3	GV2 L16	14	LC1 D18pp	LC1 D09BL	ATV 38HU54N4
4	GV2 L16	14	LC1 D18pp	LC1 D09BL	ATV 38HU72N4
5.5	GV2 L22	25	LC1 D25pp	LC1 D09BL	ATV 38HU90N4
7.5	NS80HMA50	50	LC1 D40pp	LC1 D09BL	ATV 38HD12N4
11	NS80HMA50	50	LC1 D40pp	LC1 D25BL	ATV 38HD16N4
15	NS80HMA50	50	LC1 D40pp	LC1 D25BL	ATV 38HD23N4
18.5	NS80HMA50	50	LC1 D40pp	LC1 D25pp	ATV 38HD25N4p
22	NS80HMA50	50	LC1 D50pp	LC1 D32pp	ATV 38HD28N4p
30	NS80HMA80	80	LC1 D65pp	LC1 D40pp	ATV 38HD33N4p
37	NS80HMA80	80	LC1 D80pp	LC1 D50pp	ATV 38HD46N4p
45	NS100HMA100	100	LC1 D80pp	LC1 D80pp	ATV 38HD54N4p
55	NS160HMA150	150	LC1 D115pp	LC1 D80pp	ATV 38HD64N4p
75	NS160HMA150	150	LC1 D150pp	LC1 D115pp	ATV 38HD79N4p
90	NS250pMA	220	LC1 F185pp	LC1 D115pp	ATV 38HC10N4X
110	NS250pMA	220	LC1 F225pp	LC1 D115pp	ATV 38HC13N4X
132	NS250pMA	220	LC1 F265pp	LC1 D1505pp	ATV 38HC15N4X
160	NS400pMA	320	LC1 F330pp	LC1 F225pp	ATV 38HC19N4X
200	NS400pMA	320	LC1 F400pp	LC1 F265pp	ATV 38HC23N4X
220	NS630pMA	500	LC1 F400pp	LC1 F330pp	ATV 38HC25N4X
250	NS630pMA	500	LC1 F500pp	LC1 F400pp	ATV 38HC28N4X
280	NS630pMA	500	LC1 F630pp	LC1 F400pp	ATV 38HC31N4X
315	NS630pMA	500	LC1 F630pp	LC1 F500pp	ATV 38HC33N4X

(1) Standard power ratings for 4-pole, 50/60 Hz, 400 V motors

(2) Replace p with N, H or L, according to the breaking capacity, in the table below.

Breaking capacity of circuit-breakers according to standard IEC60947-2

380/415 V	Icu (kA)		
GV2 L	50		
NS80HMA	70		
380/415 V	N	H	L
NS100pMA	25	70	130
NS160pMA, NS250pMA	35	70	130
NS400pMA, NS630pMA	–	70	130

(3) Replace pp with the control circuit voltage reference indicated in the table on the opposite page.

(4) LC1-DppBL contactors have 24 V d.c. low consumption coils (100 mA). Up to 15 kW, they are powered by an internal drive power supply. For power ratings above this level, use an external supply and complete the contactor coil voltage as shown in the table (3).

(5) For drives without integrated EMC filter, replace the p with an X.

Nota : The maximum line current is determined with a maximum upstream short-circuit power rating of 5 kA at between 0.75 and 5.5 kW (22 kA between 7.5 and 315 kW).

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Motor starters



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3-phase supply voltage: 440 to 460 V (for 0.75 to 315 kW motors)

Motor circuit-breaker

NSppppMA: product sold under the Merlin Gerin brand

Composition of contactors

LC1-D09 to LC1-D115: 3 poles + 1 "N/O" auxiliary contact and 1 "N/C" auxiliary contact

LC1-Fpp to LC1-D115: 3 poles + 1 "N/O" auxiliary contact and 1 "N/C" auxiliary contact

Motor (1)	Circuit-breaker	Line contactor	Downstream contactor	Variable speed drive	
Power kW	Reference (2)	Rating A	Reference (3)	Reference	
0.75	GV2 L08	4	LC1 D1810pp	LC1 D09BL	ATV 38HU18N4
1.5	GV2 L10	6.3	LC1 D2510pp	LC1 D09BL	ATV 38HU29N4
2.2	GV2 L10	6.3	LC1 D2510pp	LC1 D09BL	ATV 38HU41N4
3	GV2 L14	10	LC1 D2510pp	LC1 D09BL	ATV 38HU54N4
4	GV2 L14	10	LC1 D2510pp	LC1 D09BL	ATV 38HU72N4
5.5	NS80HMA50	50	LC1 D4011pp	LC1 D09BL	ATV 38HU90N4
7.5	NS80HMA50	50	LC1 D4011pp	LC1 D09BL	ATV 38HD12N4
11	NS80HMA50	50	LC1 D4011pp	LC1 D25BL	ATV 38HD16N4
15	NS80HMA50	50	LC1 D4011pp	LC1 D25BL	ATV 38HD23N4
18.5	NS100LMA50	50	LC1 D8011pp	LC1 D2510pp	ATV 38HD25N4p
22	NS100LMA50	50	LC1 D8011pp	LC1 D3210pp	ATV 38HD28N4p
30	NS100LMA50	50	LC1 D8011pp	LC1 D4011pp	ATV 38HD33N4p
37	NS100LMA80	100	LC1 D8011pp	LC1 D5011pp	ATV 38HD46N4p
45	NS100LMA100	100	LC1 D8011pp	LC1 D8011pp	ATV 38HD54N4p
55	NS100LMA100	100	LC1 D115pp	LC1 D8011pp	ATV 38HD64N4p
75	NS160pMA150	150	LC1 D115pp	LC1 D150pp	ATV 38HD79N4p
90	NS160pMA	150	LC1 D115pp	LC1 D150pp	ATV 38HC10N4X
110	NS250pMA	220	LC1 F185pp	LC1 D115pp	ATV 38HC13N4X
132	NS250pMA	220	LC1 F185pp	LC1 F265pp	ATV 38HC15N4X
160	NS400pMA	320	LC1 F265pp	LC1 F225pp	ATV 38HC19N4X
200	NS400pMA	320	LC1 F330pp	LC1 F265pp	ATV 38HC23N4X
220	NS400pMA	320	LC1 F400pp	LC1 F330pp	ATV 38HC25N4X
250	NS630pMA	500	LC1 F400pp	LC1 F400pp	ATV 38HC28N4X
280	NS630pMA	500	LC1 F500pp	LC1 F400pp	ATV 38HC31N4X
315	NS630pMA	500	LC1 F500pp	LC1 F500pp	ATV 38HC33N4X

(1) Standard power ratings for 4-pole motors 50/60 Hz 400 V

(2) Replace p with N, H or L, according to the breaking capacity, in the table below.

Breaking capacity of circuit-breakers according to standard IEC60947-2

400/460 V	Icu (kA)		
GV2 L08, L10	> 100		
GV2 L14, L16, L22	20		
NS80HMA	65		
440/460 V		N	L
NS100pMA	25	65	130
NS160pMA, NS250pMA	35	65	130
NS400pMA, NS630pMA	–	65	130

(3) Replace pp with the control circuit voltage reference indicated in the table below.

a.c. control circuit

Volts AC	24	48	110	115	220	230	240	400
50/60 Hz	B7	E7	F7	FE7	M7	P7	U7	V7

(4) LC1-DppBL contactors have 24 V d.c. low consumption coils (100 mA). Up to 15 kW, they are powered by an internal drive power supply. For power ratings above this level, use an external supply and complete the contactor coil voltage as shown in the table (3).

Nota : The maximum line current is determined with a maximum upstream short-circuit power rating of 5.5 kA at between 0.75 and 5.5 kW (22 kA between 7.5 and 315 kW).