

Soft start units

Characteristics :
pages 24071/3 to 24071/5
References :
page 24072/2
Dimensions :
pages 24072/3 and 24072/4
Schemes :
pages 24072/5 to 24072/7

LH4 soft start units

Presentation

Presentation



LH4-N244Q7

Asynchronous motors are widely used because they are robust, reliable, standardised and inexpensive. Starting this type of motor has always required a careful compromise between the cost of the starter unit and performance :

- Torque peaks which may damage the mechanics
- Current peaks on power up
- Significant line voltage drops

The **LH4-N1** starting torque controller is used for single-phase and 3-phase motors whenever surges caused on starting need to be suppressed. It can only be used with low-power motors.

The **LH4-N2** soft start - soft stop unit can be used to control starting torque and soft stops, while significantly reducing starting current.

Principle, use

Unlike electromechanical starters, **LH4** electronic starters can be used to adjust starting torque, thus eliminating mechanical shocks which result in increased wear, maintenance and production downtime.

LH4-N1 soft start units are recommended for use with conveyors, conveyor belts, fragile or noisy automatic doors, drag lifts, small gantries such as those used in car washes and all machines equipped with drive belts.

LH4-N2 soft start - soft stop units are used for fans, pumps, cold compressors, compressed air equipment and all types of high inertia machinery. On machines which do not require electrical isolation, they eliminate the need for a line contactor.

LH4-N2 units, which give higher performance, can be used instead of LH4-N1 units.

Operation

LH4 soft start units start with reduced voltage. The voltage rises gradually until it reaches its rated value. This reduces torque surges which can be harmful both to the motor and to the mechanism being driven, and also reduces starting currents (with the LH4-N2).

The user can adjust the starting torque using one of the LH4 potentiometers.

Starting time can also be adjusted via the second potentiometer.

The motor connected to the LH4 must be able to start the load at reduced voltage.

A third potentiometer on LH4-N2 units can be used to adjust deceleration time.

On the LH4-N2, a relay, which indicates product faults and can be used to control the line contactor (isolation), gives a signal when the product is operating. This signal can be used to control the line contactor.

Once the starting process has finished, a relay or contactor integrated in the LH4 shunts the electronics limiting electromagnetic interference and temperature rises. This contactor drops out on the stop request, whether deceleration takes place or not.

For the LH4-N230 rating and above, end of starting data can be obtained by adding an attachment which can be mounted on the electronics shunting contactor without dismantling the product.

Description of the range

The range of LH4-N soft start units comprises 2 product families :

- LH4-N1 units, comprising 3 ratings from 6 to 22 A
- LH4-N2 units, comprising 7 ratings from 6 to 85 A

The following products are designed for 3-phase voltages (the LH4-N1 can also operate in single phase) :

- 230, 400 and 460 V at 50 or 60 Hz for ratings up to 22 A
- 200 to 690 V and 400 V at 50 or 60 Hz for ratings from 32 to 85 A

The maximum power for start units, at an operating voltage of 400 V, is 45 kW.

Adjustments and start-up

All start and stop units have 2 potentiometers which can be used to :

- adjust acceleration time
- obtain the starting torque required for an immediate start following the run signal

On LH4-N2 units, there is a third potentiometer for adjusting deceleration time

These functions can be sealed to avoid the risk of settings being lost.



LH4-N285Q7

Soft start units

Presentation :
page 24071/2
References :
page 24072/2
Dimensions :
pages 24072/3 and 24072/4
Schemes :
pages 24072/5 to 24072/7

LH4 soft start units

Characteristics

Environment

Rated insulation voltage (Ui)	Conforming to IEC 947	V	690
Rated impulse withstand voltage (Uimp)	Conforming to IEC 947	kV	6 and 8 for LH4-N2●●LY7 products
Conforming to standards			IEC 60947-4-2
Product certifications			ECC (low voltage and EMC) - UL - CSA
Degree of protection			IP 20 (front panel)
Maximum relative humidity			93 % without condensation or dripping water
Maximum ambient pollution			Degree 3 conforming to IEC 664-1 and UL 508
Ambient air temperature around the device	For operation	°C	0...+ 40 with derating of 1.2 % per °C above 40 °C and up to 60 °C 0...+ 55 for LH4-N2 from 32 A.
	For storage	°C	- 25...+ 70
Maximum operating altitude		m	2000 - (above this, derate the power by 0.5 % for each additional 100 m)
Operating positions	Without derating		± 30° in relation to the vertical for permanent operation, any position for temporary operation.
Shock resistance	Conforming to IEC/EN 68-2-27		8 gn, 11 ms
Vibration resistance	Conforming to IEC/EN 68-2-6		2 gn
Immunity to radiated radioelectric interference	Conforming to IEC/EN 60947-4-2		Conforming to EN 61000-4-3 level 3
Radiated and conducted emissions	Conforming to IEC/EN 60947-4-2		Conforming to EN 61000-4-6 level 3
Electrostatic discharge	Conforming to IEC/EN 60947-4-2		Conforming to EN 61000-4-2 level 3 and EN 55011
Immunity to electrical transients	Conforming to IEC/EN 60947-4-2		Conforming to EN 61000-4-4 level 4
Voltage/current shock wave	Conforming to IEC/EN 60947-4-2		Conforming to EN 61000-4-5 level 3
Radio frequency emissions	Conforming to IEC/EN 60947-4-2		According to CISPR 11 and EN 55011 class A

Output relay characteristics

Rated operating current	Conforming to IEC 947-5-1		Category of use AC-15 : Ie 3 A, Ue 250 V Category of use DC-13 : Ie 2 A, Ue 24 V
Rated power of contacts	~ 250 V	VA	2000 (6 A-250 V)
Minimum switching capacity	17 V	mA	10
Conventional thermal current		A	6
Maximum operating voltage	≈ 50/60 Hz	V	250
gG type fuse protection	IEC 947-5-1	A	6

Soft start units

Presentation :
page 24071/2
References :
page 24072/2
Dimensions :
pages 24072/3 and 24072/4
Schemes :
pages 24072/5 to 24072/7

LH4 soft start units

Characteristics (continued)

Type of starter			LH4-N106●●●	LH4-N112●●●	LH4-N125●●●
-----------------	--	--	-------------	-------------	-------------

Electrical characteristics

Rated operating voltage (U _e)		V	200...240 (LH4-N1●●LU7), 380...415 (LH4-N1●●QN7), 440...480 (LH4-N1●●RT7) with - 15...+ 10 % on all values		
Control voltage			Internal to the product		
Frequency		Hz	50 or 60		
Rated operating current		A	6	12	22
Starting time	Voltage ramp	s	Adjustable from 1 to 5		
Stopping time	Voltage ramp	s	-		
Starting torque			Adjustable from 0.3 to 0.8 of the direct motor starting torque		
Power loss	At full load at the end of starting	W	2	3	3.5
	Transient operation	W	20	39	70
	Average duty 10%	W	2.5	3.6	4.3
Protection against short-circuits	Type 1 and 2 coordination	A	See list of required parts, pages 24072/8 and 24072/9		
Starting and stopping current	Max duty of 360 seconds of starting and stopping per hour	A	18	36	75
LED displays	Green		Lit, device powered up		
	Yellow		Lit, full speed		
Logic inputs		mA	-		

Connection

Power circuit	Flexible cable, no sleeve	1 conductor	mm ²	1.5...6	1.5...6	1.5...6
		2 conductors	mm ²	1.5...6	1.5...6	1.5...6
	Flexible cable with sleeve	1 conductor	mm ²	1.5...4	1.5...4	1.5...4
		2 conductors	mm ²	1.5...4	1.5...4	1.5...4
	Rigid cable	1 conductor	mm ²	1.5...6	1.5...6	1.5...6
		2 conductors	mm ²	1.5...6	1.5...6	1.5...6
Control circuit	Flexible cable, no sleeve	1 conductor	mm ²	-	-	-
		2 conductors	mm ²	-	-	-
	Flexible cable with sleeve	1 conductor	mm ²	-	-	-
		2 conductors	mm ²	-	-	-
	Rigid cable	1 conductor	mm ²	-	-	-
		2 conductors	mm ²	-	-	-
Earth connection			-			

LH4-N206●●●	LH4-N212●●●	LH4-N225●●●	LH4-N230●●●	LH4-N244●●●	LH4-N272●●●	LH4-N285●●●
-------------	-------------	-------------	-------------	-------------	-------------	-------------

200...240 (LH4-N2●●LU7), 380...415 (LH4-N2●●QN7), 440...480 (LH4-N2●●RT7) with - 15...+ 10 % on all values			400 (LH4-N2●●Q7), 200...690 (LH4-N2●●LY7) with - 15...+ 10 % on all values			
Internal to the product, except on LH4-N2●●LY7 units, which must be supplied externally with 115 V/50 or 60 Hz (approximately 20 VA)						
50 or 60						
6	12	22	32 (5 minimum)	44 (5 minimum)	72 (16 minimum)	85 (16 minimum)
Adjustable from 1 to 5			Adjustable from 1 to 25			
Adjustable from 0 to 5			Adjustable from 0 to 25			
Adjustable from 0.3 to 0.8 of the direct motor starting torque						
3	4	5	22	22	23	23
40	76	130	184	268	436	514
4	6	8	37	44	59	66
See list of required parts, pages 24072/8 and 24072/9						
18	36	75	90	132	216	255
Lit, device powered up						
Lit, full speed						
Logic state 1 : I < 10 - Logic state 0 : I > 3 Voltage supplied by the product 24 V± 25 % (no power available)						

1.5...6	1.5...6	1.5...6	6...25	6...25	6...25	6...25
1.5...6	1.5...6	1.5...6	6...25	6...25	6...25	6...25
1.5...4	1.5...4	1.5...4	4...25	4...25	4...25	4...25
1.5...4	1.5...4	1.5...4	4...16	4...16	4...16	4...16
1.5...6	1.5...6	1.5...6	6...35	6...35	6...35	6...35
1.5...6	1.5...6	1.5...6	6...25	6...25	6...25	6...25
0.75...2.5	0.75...2.5	0.75...2.5	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5
-	-	-	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5
0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5
-	-	-	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5
1...2.5	1...2.5	1...2.5	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5
-	-	-	0.75...1.5	0.75...1.5	0.75...1.5	0.75...1.5
-			Tin-coated terminal. Fixed with ø 6 screws			