Fuji Electric

Innovating *Energy Technology*

FRENIC-Lift

NEW

Finest drives specialized in lift applications

Fuji Electric 3 Year Warranty

CEN-LM2EN15.09

Fuji Electric

The new Lift inverter

Smaller, smarter.

In 2005, Fuji Electric designed the first FRENIC-Lift inverter to fulfill the requirements of lift applications. FRENIC-Lift is nowadays the most preferred inverter for lift applications. By using the experiences in the market, we have now developed the upgraded version of FRENIC-Lift: smaller but smarter.

★ *Available only for FRN0011LM2A-7E, other capacities coming soon*

Save energy to support Green Building.
Your input to sustainability with Fuji Electric's FRENIC-Lift.

Benefits

The upgraded FRENIC-Lift offers you several new benefits which are much attractive and efficient for Lift applications: smaller but smarter.

Book type shape up to 15 kW (32 A) with new advantages

- Side mounting:
  Install the inverter in the most convenient way depending on space limitations (e.g. door frames).
- Removable power terminals:
  Easier and faster installation by pre-wiring thanks to removable power terminals.
- IP 54 heatsink:
  Stronger IP level allows feed through mounting for heatsink, making cabinet design smaller and cheaper for shaft installation.

Certified functional safety functions according to EN81-1/2 and EN81-20/50 for an easier installation

- Needless of the two motor contactors between inverter and motor (contactorless)
- Brake monitoring function for UCM
- Travel direction change safety counter for belt/coated ropes lifts

Different energy saving modes

Following the standards and directives for saving energy (Draft ISO 25745 & VDI 4707), different saving energy modes are available. Put the inverter to sleep mode by activating a digital input. Charging circuits are highly robust and allow high number of power ups per hour.

Customizable logic capability

Customize your own functions with the built-in PLC function. Easily program your PLC via loader software. Create up to 200 steps program (macro steps / function blocks).

Connected to the world

CANopen (402 & 417), DCP (3 & 4*) and Modbus RTU are available thanks to the 3 built-in communication ports.

**coming soon*

Built-in EMC filter

Built-in EMC filter compliant to EN12015 and EN12016.
Saves space inside the cabinet and makes wiring easier.

Easy rescue operation

Rescue operation available by means of UPS or batteries. Thanks to the new 24 VDC input, rescue can be performed from 48 VDC only. Software functions help as well to optimize UPS or batteries sizing by choosing the most favourable rescue direction.

Able to control any motor

With its additional new motor control modes, FRENIC-Lift is able to control any motor in the market. Even able to control a motor with peripheral encoder.

Stronger coating

New coating makes PCB stronger against humidity and dust.
Robustness for lift shaft environments.

TYPE CODE

FRN 0022 LM2 A - 4 E

- FRN: Series name: FRENIC
- 0022: Applicable rated current
- LM2: Applied for: Lift
- A: Destination: E (Europe)
- 4: Input power supply: 4 (3-phase 400 VAC) / 7 (1-phase 200 VAC)

Dimensions

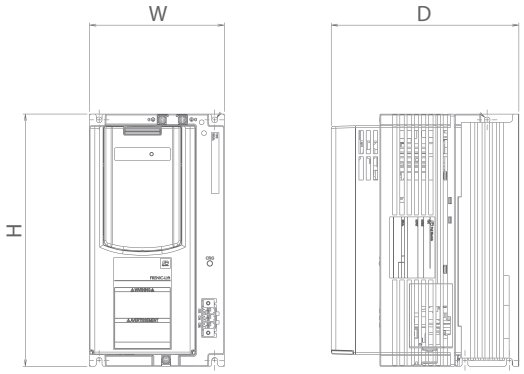
External Dimensions

Power Supply Voltage	Type	Applied motor current	*Applied motor capacity*	W (mm)	H (mm)	D (mm)
3-phase 400 VAC	FRN0006LM2A-4E	6,1 A	*2.2 kW*	140	260	195
	FRN0010LM2A-4E	10 A	*4.0 kW*			
	FRN0015LM2A-4E	15 A	*5.5 kW*			
	FRN0019LM2A-4E	18.5 A	*7.5 kW*			
	FRN0025LM2A-4E	24.5 A	*11 kW*	160	360	19t5
	FRN0032LM2A-4E	32 A	*15 kW*			
	FRN0039LM2A-4E	39 A	*18.5 kW*	250	400	195
	FRN0045LM2A-4E	45 A	*22 kW*			
	FRN0060LM2A-4E	60 A	*30 kW*	326,2	550	261,3
	FRN0075LM2A-4E	75 A	*37 kW*			
	FRN0091LM2A-4E	91 A	*45 kW*	361,2	615	276,3
1-phase 200 VAC	FRN0011LM2A-7E	11 A	*2.2 kW*	140	260	195
	FRN0018LM2A-7E*	18 A	*4.0 kW*			

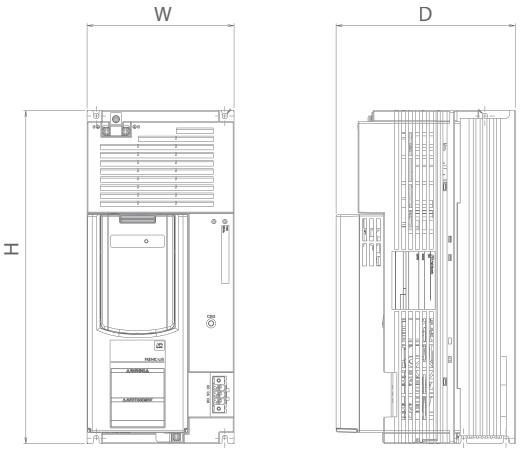
**coming soon (dimensions may change before product launch)*

FRN0006LM2A-☐E to FRN0019LM2A-☐E

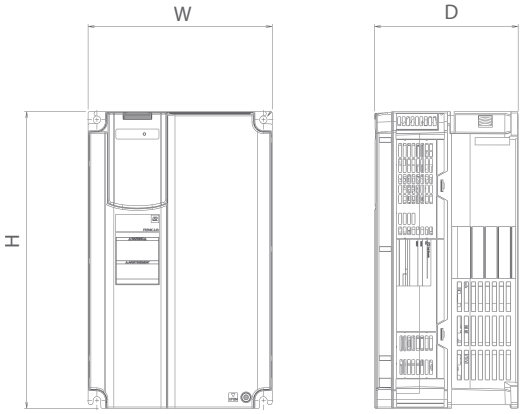
☐: 4 / 7



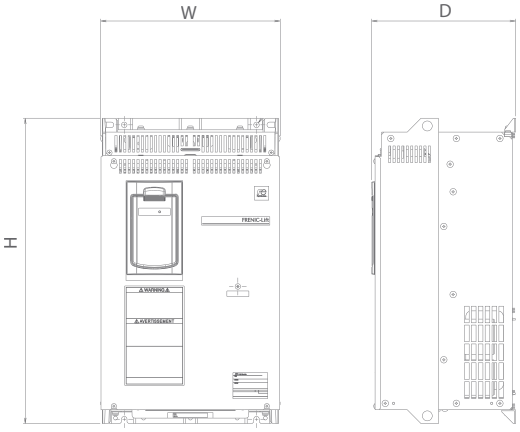
FRN0025LM2A-4E to FRN0032LM2A-4E



FRN0039LM2A-4E to FRN0045LM2A-4E



FRN0060LM2A-4E to FRN0091LM2A-4E



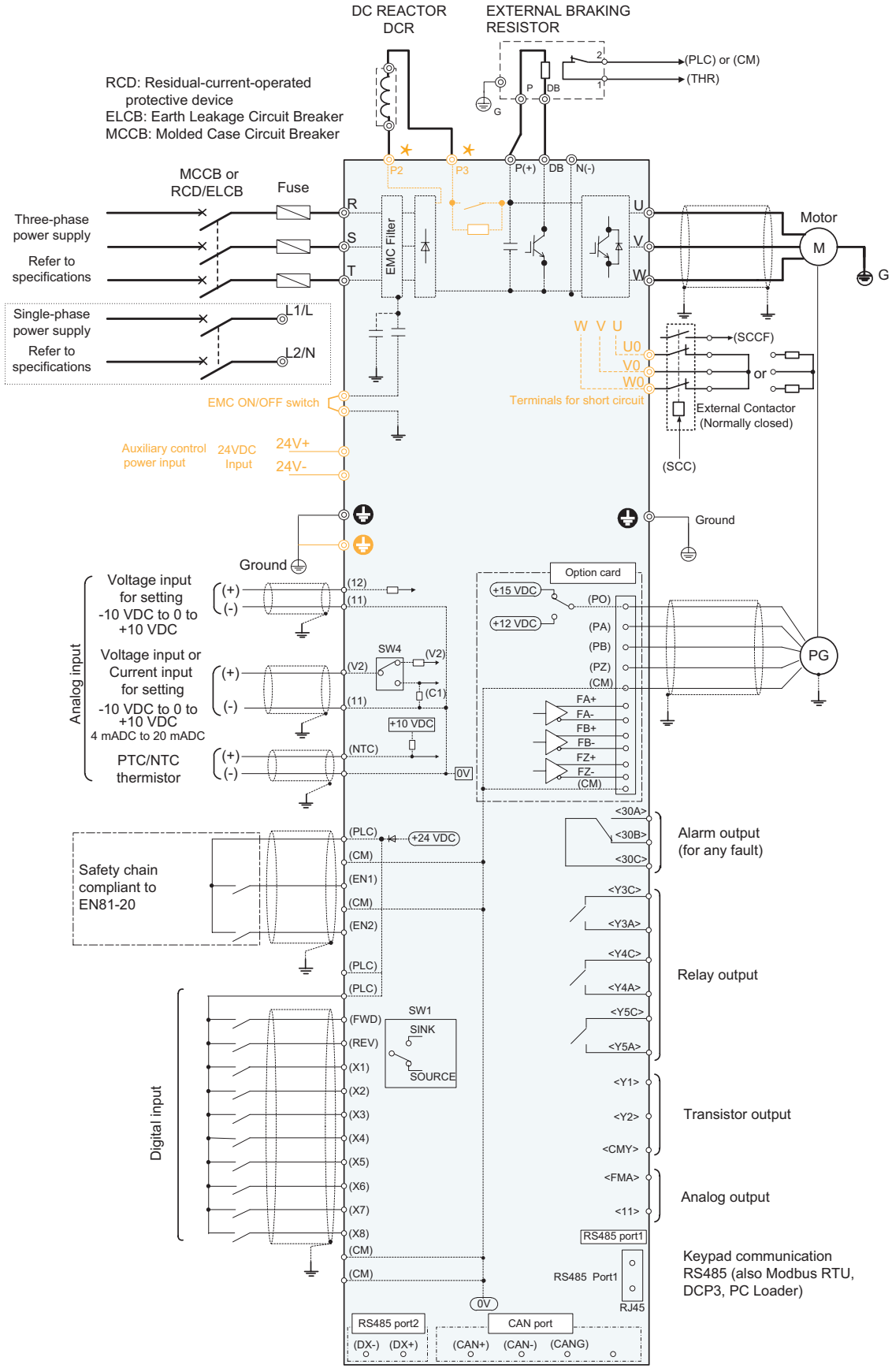
Specifications

Item				3-phase 400 V										1-phase 200 V	
Type FRN__LM2A-☐E ☐: 4 / 7				0006	0010	0015	0019	0025	0032	0039	0045	0060	0075	0091	0011	0018★
Nominal applied motor [kW]				2.2	4.0	5.5	7.5	11	15	18.5	22	30	37	45	2.2	4.0
Output ratings	Rated capacity[1] [kVA]			4.6	7.6	11	14	18	24	29	34	45	57	69	4.1	6.8
	Rated voltage[2] [V]			3-phase 380 to 480 VAC											3-ph 200 to 240 VAC	
	Rated current[3] [A]			6.1	10.0	15.0	18.5	24.5	32.0	39.0	45.0	60.0	75	91	11.0	18.0
	Overload capacity [A] (Permissible overload time)			11 (3s)	18.0 (3s)	27.0 (3s)	37.0 (3s)	49.0 (3s)	64.0 (3s)	78.0 (3s)	90.0 (3s)	120 (3s)	150 (3s)	182 (3s)	22.0 (3s)	36.0 (3s)
	Rated frequency [Hz]			50, 60 Hz												
Input ratings	Main power supply	Normal operation	Phases, Voltage, Frequency	3-phase 380 to 480 VAC, 50/60 Hz											1-ph 200 to 240 VAC, 50/60 Hz	
				Variations: Voltage: +10 to -15% (Voltage unbalance: 2% or less[4]), Frequency: +5 to -5%												
			Rated current[5] [A] with DCR	4.5	7.5	10.6	14.4	21.1	28.8	35.5	42.2	57.0	68.5	83.2	17.5	29.5
			Rated current[5] [A] without DCR	8.2	13	17.3	23.2	33.0	43.8	52.3	60.6	77.9	94.3	114	24	40.4
			Required power supply capacity (with DCR) [kVA]	3.2	5.2	7.4	10	15	20	25	30	40	48	58	3.5	5.9
		UPS operation	Input power for driving Phases, Voltage, Frequency	1-phase 220 to 480 VAC, 50/60 Hz												
				Variations: Voltage: +10 to -10%, Frequency: +5 to -5%												
			Operation time [s]	180												
		Battery operation	Input power for driving Voltage	48 VDC or more in the direct current voltage conversion												
			Operation time [s]	180												
			Aux. control power Voltage	24 VDC (22 to 32 VDC), Maximum 40 W						1-phase 220 to 480 VAC, 50/60 Hz[8]					24 VDC (22 to 32 VDC), Maximum 40 W	
Braking	Braking time[7] [s]			60												
	Braking duty-cycle (%ED)[7] [%]			50												
	Rated regenerative power[7] [kW]			1.8	3.2	4.4	6.0	8.8	12	14.8	17.6	24	29.6	36	1.8	3.2
	Minimum resistance [Ω][6]			160	96	47	47	24	24	16	16	10	8.5	8	33	24
Conformity standard				- Lift Directive (95/16/EC) - Replacement of two motor contactors: interrupting the current to the motor (to stop the machine), as required by EN 81-1:1998+A3:2009 12.7.3 a), EN 81-2:1998+A3:2009 12.4.1 a) and EN 81-20:2014 5.9.2.5.4 d), 5.9.3.4.1 d). - Brake monitoring for UCM:EN 81-1:1998+A3:2009 9.11.3 and EN 81-20:2014 5.6.7.3 - Travel direction change counter for lifts with belt or coated ropes - Machinery Directive - EN ISO13849-1: PL-e - EN60204-1: stop category 0 - EN61800-5-2: STO SIL3 - EN62061: SIL3 - Low Voltage Directive - EN61800-5-1: Over voltage category 3 - EMC Directive - EN12015, EN12016, EN 61800-3 +A1, EN 61326-3-1 (Emission) Built-in EMC filter type: Category 2 (0025 (11kW) or lower) / Category 3 (0032 (15kW) or higher) (Immunity) 2nd Env. - Canadian and U.S. standards (Range of application: FRN0011LM2A-7E) - Can/CSA C22.2 No.14-13: Industrial Control Equipment - CSA C22.2 No.274-13: Adjustable speed drives - UL 508 C (3rd Edition): Power Conversion Equipment - According to CSA B44.1-11/ASME A17.5-2014: Elevator and escalator electrical equipment														
Enclosure (IEC60529)				IP20						IP20		IP00			IP20	
				Heat sink: IP54						Heat sink: IP20		Heat sink: IP00			Heat sink: IP54	
Cooling method				Fan cooling												

★coming soon (specifications may change before product launch)

*1) Rated capacity is calculated by regarding the output rated voltage as 440 VAC.
*2) Output voltage cannot exceed the power supply voltage.
*3) These values correspond to the following conditions: carrier frequency is 10 kHz (2 phase modulation) and ambient temperature is 45°C. Select the inverter capacity such that the square average current during operation is not higher than the 80% of the rated current of the inverter.
*4) Voltage unbalance [%] = (Max.voltage [V] - Min.voltage [V])/ Three-phase average voltage [V] x 67 (IEC61800-3). Just for 3ph 400 VAC input supply case.
*5) The power supply capacity is 500kVA (ten times the inverter capacity when the inverter capacity exceeds 50kVA), and the value of the power supply impedance is %X=5%.
*6) The admissible error of minimum resistance is ±5%.
*7) Braking time and duty cycle (%ED) are defined by cycle operation at the rated regenerative power.
*8) Variations (Voltage: +10 to -10%, Frequency: +5 to -5%)

Basic Wiring Diagrams



The orange marked parts represent the model "book type" lift inverter (FRN0032LM2A-4E or lower).

*In case of FRN0039LM2A-4E, the DC Reactor is connected between P1 and P(+).

Options

Option Cards

OPC-PR

Option card for encoders with SinCos incremental signals and SinCos absolute signals. Specific for PMS motors. Includes pulse repetition signals for controller (Line Driver with frequency divider function).

OPC-PS

Option card for encoders with SinCos incremental signals and serial communication. Protocols implemented are EnDat 2.1, Biss and SSI. Specific for PMS motors. Includes pulse repetition signals for controller (Line Driver with frequency divider function).

OPC-PSH

Same features as OPC-PS plus Hiperface protocol.

OPC-PG3 *coming soon

Option card for incremental encoders with open collector / complementary signals. For induction and PMS motors. Includes pulse repetition signals for controller (Line Driver with frequency divider function).

OPC-PMPG *coming soon

Option card for incremental encoders with line driver signals and 3 channels (U, V, W) for absolute position detection. For induction and PMS motors. Includes pulse repetition signals for controller (Line Driver with frequency divider function).

Extra Options

Extra options are available to fulfill your specific requirements such as user friendly LCD keypad, varieties of encoder, and dual mounting attachment to save your cabinet space.

DC Reactor

Compliant to EN12015 harmonic levels. More compact. Reduces input current.

Braking Resistor

Burns regenerated energy when the lift is in braking mode. Different braking resistors available according to lift speed and traffic.

DA-LM2

Keypad adapter for side mounting installation. Includes cable. Depending on the attachment, width and height will change.

TP-A1-LM2

Advanced LCD keypad. Intuitive and user friendly menu. Monitoring and maintenance information. Up to 3 inverter settings can be recorded in internal memory. Different speed units selectable (rpm, Hz, mm/s). Available in different languages: English, Japanese, German, French, Spanish, Italian, Chinese, Russian, Greek, Turkish, Polish, Czech, Swedish, Portuguese, Dutch and user customized language.

TP-E1U

Basic keypad with 7-segment display. Mini-USB connector included for a direct communication between FRENIC-Lift and PC loader software.

PC Loader Software

Free software for monitoring and programing FRENIC-Lift. Oscilloscope function available. Includes an application to program built-in PLC. Download for free from our web page: http://www.fujielectric-europe.com/

European Subsidiaries

Fuji Electric

European Headquarters (Germany)
Fuji Electric Europe GmbH
Goethering 58
63067 Offenbach/Main
Germany
Tel.: +49 69 66 90 29 0
Fax: +49 69 66 90 29 58
info.inverter@fujielectric-europe.com
www.fujielectric-europe.com

Spain
Fuji Electric Europe GmbH
Sucursal en España
Ronda Can Fatjó 5, Edifici D, Local B
Parc Tecnològic del Vallès
08290 Cerdanyola (Barcelona)
Tel.: +34 93 58 24 333
Fax: +34 93 58 24 344
info.spain@fujielectric-europe.com
www.fujielectric-europe.com

United Kingdom
Fuji Electric Europe GmbH
Tel.: +44 7 989 090 783
info.uk@fujielectric-europe.com
www.fujielectric-europe.com

Italy
Fuji Electric Europe GmbH
Filiale Italiana
Via Rizzotto 46
41126 Modena (MO)
Tel.: +39 059 47 34 266
Fax: +39 059 47 34 294
info.italy@fujielectric-europe.com
www.fujielectric-europe.com

Switzerland
Fuji Electric Europe GmbH
Park Altenrhein
9423 Altenrhein
Tel.: +41 71 858 29 49
Fax: +41 71 858 29 40
info.swiss@fujielectric-europe.com
www.fujielectric-europe.com

France
Fuji Electric France SAS
46 rue Georges Besse - ZI du Brezet
63039 Clermont-Ferrand CEDEX 02
Tel.: +33 4 73 98 26 98
Fax: +33 4 73 98 26 99
sales.dpt@fujielectric.fr
www.fujielectric.fr

Global Headquarters (Japan)
Fuji Electric Co., Ltd.
Gate City Ohsaki East Tower
11-2 Osaki 1-chome, Shinagawa-ku,
Tokyo 141-0032
Japan
Tel.: +81 3 5435 7058
Fax: +81 3 5435 7420
www.fujielectric.com