



**TM4™**

# LVI400 Series Low-Voltage Inverter

## AC Motor Controller

The Dana TM4 LVI400 Inverter Series is designed to control all synchronous and asynchronous motor types used in Battery Electric Vehicles.

Adaptable motor control, using a Flux Vector Control algorithm, offers best performance for drive systems.

## Dedicated Safety Functions

LVI400 is being developed to support up to PLd (ISO 13849 Cat. 2, ISO 19014-4, EN 1175:2020) capability for different inverter configurations such as Single & Dual Drive, Working Functions, Actuator, and any combination of these. Furthermore, the availability of the Safety Manual will support easy integration of the inverter into the final application.

## Vehicle Application Development

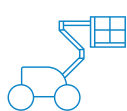
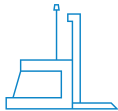
The inverter specific installation can be supported by the One Dana Diagnostic Tool (ODDT).

The ODDT is a framework to access and manage all Dana mechatronics products. Main features include:

- Device Status and Monitoring
- Tuning and Parameter Setting
- Graphical Data Acquisition, Storage and Export
- Diagnostics and Error Codes Management
- Firmware Updates



Ideal for Off-Highway applications.



# Dana TM4 LVI400 Series Low-Voltage Inverter

## Features

### Firmware Platform based on RTOS

- Infineon Aurix™ Microcontroller
- Multicore Real Time Operating System

### Advanced motor control performance

- Multi Motor Control capable for ACIM, SPM, IPM, SynRM and PMASynRM motors.
- Flux Vector Control for best drive performance in all speed and torque modes, and minimal power losses in the drive system

### Designed for quality and reliability

- Baseplate design: Plate, Finned and Liquid Cooling options
- Protected I/O and Wire Off detection
- Very high Power Density to facilitate inverter installation, due to DBC (Direct Bonded Copper) with patented MOSFET multilayer power module technology

### Communications

- CANOpen, J1939 and UDS protocols

Product Specifications	Number
Key Switch Input (10A Max)	1
Digital Input	8
Analog Input 0...5V	6
Driver Output 2A	4
Digital Output 2A	2
Motor Temperature Sensor	1..2
Motor Encoder (incremental A/B and sin/cos)	1..2
Sensor power supply, 5/12V programmable	2 (5V) 1 (5..12V)
CAN interface	1..2

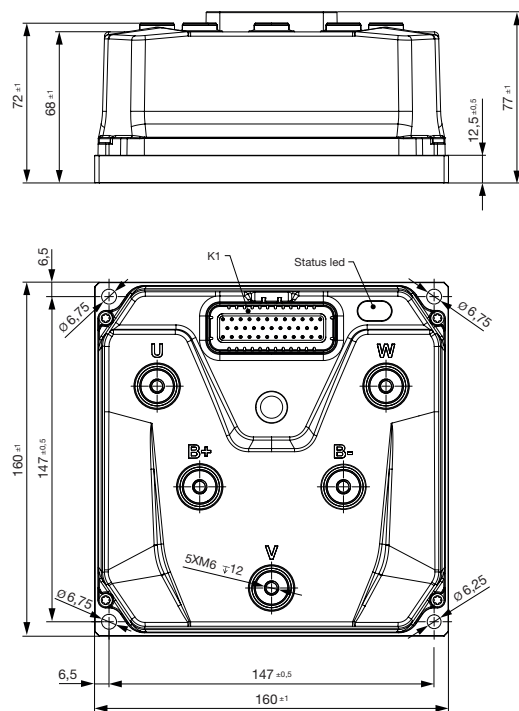
### Mechanical Interface

Operation signal	2 built-in LEDs (red and green)
Signal line connectors	AMPSEAL 35 pins
Power line connectors	M6, M8
Liquid Cooled connectors	Pending

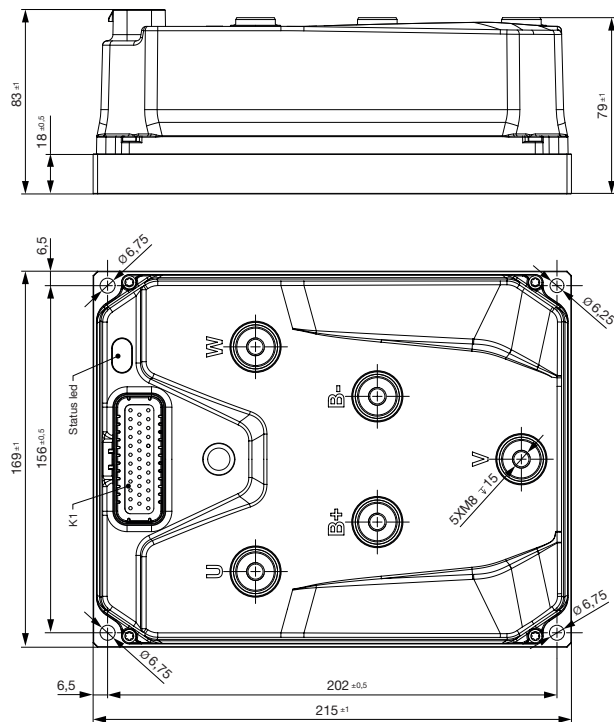
Specifications	
Efficiency	min 98% at nominal output
Output frequency	0...599 Hz
Storage Temperature range	-40°C - 95°C (96h)
Operating Ambient Temperature Range	-40°C - 65°C
Thermal Cutback / Derating	w/o Cutback: +100°C Linear Cutback to 50%: +115°C Cutoff: +120°C
IP protection	IP66 and IP67 with membrane IP6k9k pending
EMC/ESD Compliance	EN12895:2019 EN13766, Part1 - Part2 ECE-R10 Rev6
Safety	Product development process based on: ISO 13849, EN 1175 and ISO 19014
Vibration IEC 60068-2-64 Shock IEC 60068-2-27 Free Fall IEC 60068-2	10g 50g 1m
UL	UL583 pending

## Dimensions

### LVI420 Low-Voltage Inverter





### LVI430 Low-Voltage Inverter



# Dana TM4 LVI400 Series Models with Battery Voltage Logic Supply

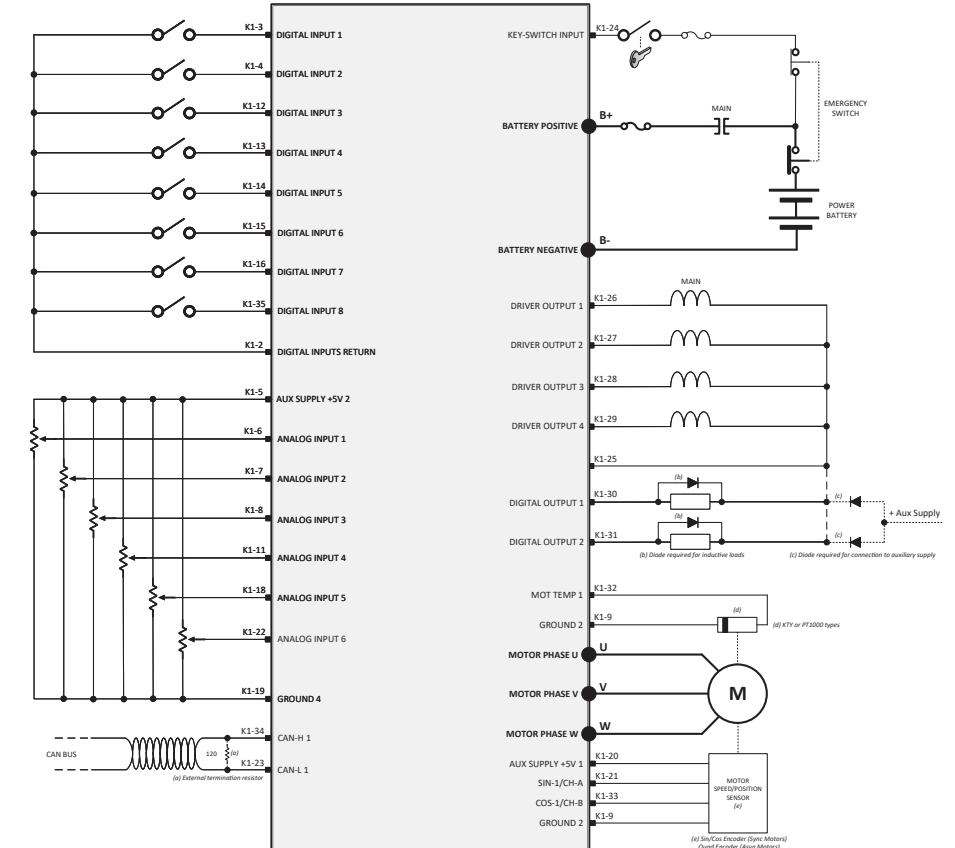
## Features

- Inverters with Nominal Voltage ranging from 24V to 80V having the logic supply sharing the same reference with the main battery ground.
- Key Switch Input is supplied by the main battery voltage.

Model	Description (*)	Nominal Voltage Range (V)	Nominal Current S2 2min (Arms)	Cont. Current (Arms) (**)	Boost Curr. 10 Sec. (Arms)	Heat Sink Types available	Size LxWxH (mm)	Weight (kg)		
	LVI420-SM-24/48-300-XX-BS	24..48	300	C – 150 Av – 150 W – 195	360	C - Plate	C - 160x160x77	C – 2,15		
	LVI420-SM-24/48-400-XX-BS	24..48	400	C – 200 Av – 200 W – 260	480		Av – pending	Av – pending		
	LVI420-SM-24/48-500-XX-BS	24..48	500	C – 250 Av – 250 W – 325	600		W – pending	W – pending		
	LVI420-SM-48/80-300-XX-BS	48..80	300	C – 150 Av – 150 W – 195	360	Av - Air cooled vertical	C - 169x215x83	C – 3,70		
	LVI420-SM-48/80-400-XX-BS	48..80	400	C – 200 Av – 200 W – 260	480				W - Water cooled	Av – pending
	LVI430-SM-24/48-600-XX-BS	24..48	600	C – 300 Av – 300 W – 390	720				W – pending	W – pending
	LVI430-SM-24/48-800-XX-BS	24..48	800	C – 400 Av – 400 W – 390	960	W - Water cooled	C - 169x215x83	C – 3,70		
	LVI430-SM-48/80-600-XX-BS	48..80	600	C – 300 Av – 300 W – 390	720				Av – pending	Av – pending
	LVI430-SM-48/80-800-XX-BS	48..80	800	C – 400 Av – 400 W – 520	960				W – pending	W – pending

\* XX = C/Av/W according to the Heat Sink type selected

\*\* Boundary conditions for coolings to be specified





# Dana TM4 LVI400 Series

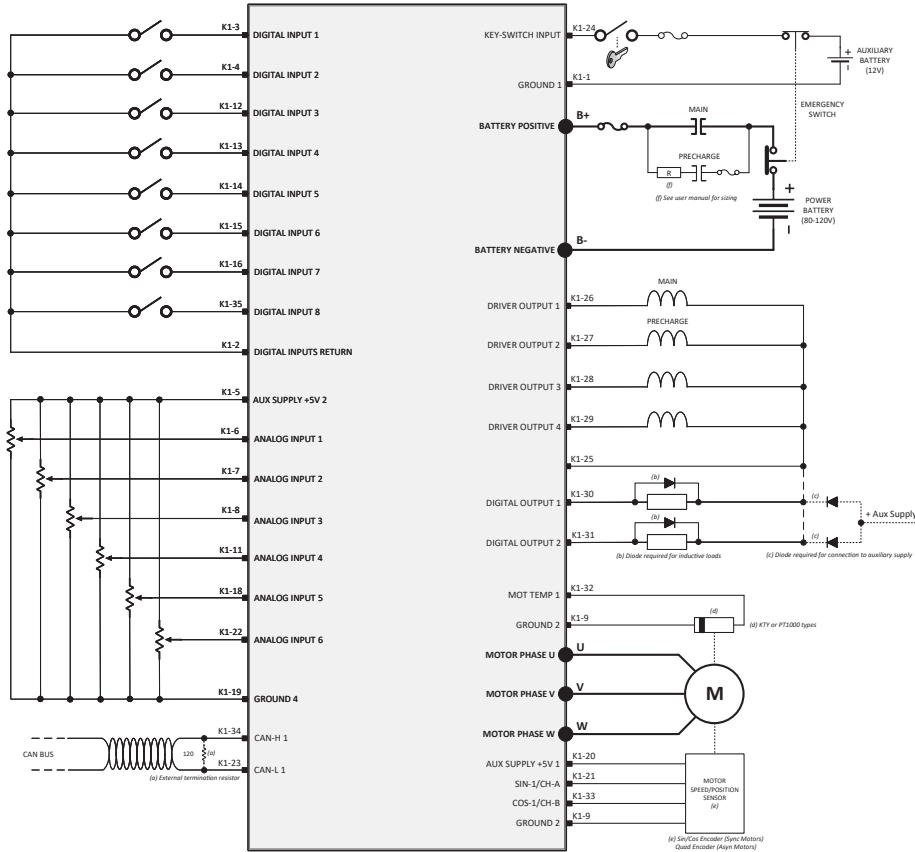
## Models with Auxiliary Voltage Logic Supply

### Features

- Inverters with Nominal Voltage ranging from 80V to 120V having the logic supply galvanically isolated from the main battery ground.
- Key Switch Input is a 12V Nominal which may be supplied by an auxiliary voltage logic supply such as a 12V battery, a DC/DC converter, etc.

Model	Description (*)	Nominal Voltage Range (V)	Nominal Current S2 2min (Arms)	Cont. Current (Arms) (**)	Boost Curr. 10 Sec. (Arms)	Heat Sink Types available	Size LxWxH (mm)	Weight (kg)
	LVI420-SM-80/100-250-XX-AS	80..100	250	C - 125 Av - 125 W - 163	300	C - Plate  Av - Air cooled vertical	C - 160x160x77	C - 2,15
	LVI420-SM-80/100-375-XX-AS	80..100	375	C - 188 Av - 188 W - 244	450			
LVI420-SM-100/120-250-XX-AS	100..120	250	C - 125 Av - 125 W - 163	300				
	LVI430-SM-80/100-500-XX-AS	80..100	500	C - 250 Av - 250 W - 325	600	W - Water cooled	C - 169x215x83	C - 3,70
	LVI430-SM-80/100-750-XX-AS	80..100	750	C - 375 Av - 375 W - 488	900			
	LVI430-SM-100/120-500-XX-AS	100..120	500	C - 250 Av - 250 W - 325	600			
	LVI430-SM-100/120-500-XX-AS	100..120	500	C - 250 Av - 250 W - 325	600			

\* XX = C/Av/W according to the Heat Sink type selected  
 \*\* Boundary conditions for coolings to be specified



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### Application Policy

Capacity ratings, features, and specifications vary depending upon the model and type of service. Application approvals must be obtained from Dana; contact your representative for application approval. We reserve the right to change or modify our product specifications, configurations, or dimensions at any time without notice.

