TM4 Smartmotion™ AC-M1
Low-Voltage Inverters

Controller for AC Induction Motor

Dana TM4 inverters provide advanced control of AC induction motors for traction or pump functions of any electrical vehicle working with speed or torque control algorithms.

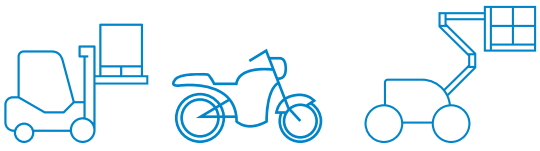
Mobile Machine Management

SmartMotion is an integrated controller which can manage multi-function and fully configurable I/O pins for any I/O functions like digital & analogue inputs and outputs, capable of driving fans, relays' and hydraulic valves' coils, contactors, negative brakes and many others inductive/resistive loads.

Vehicle Application Development

Users develop AC-M1 applications with the TM4 TAU™ System: All features are offered as standard ("one fits all" philosophy). Virtually everything can be changed with one click in an intuitive graphical tuning environment. The clone file technology allows uploads, downloads and modifications of your configuration. With TM4 TAU system, a first run for a wired vehicle can be made in minutes (not days).

Ideal for Off-Highway Applications.



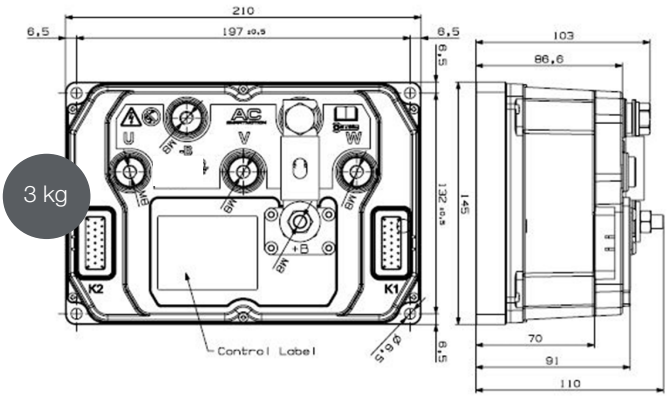
TM4 Smartmotion™ AC-M1 **Low-Voltage Inverter**

AC motor control features:

- Indirect Field Oriented Control (IFOC) with unsurpassed dynamic and performance in full speed range by decoupling and regulating flux and torque vectors of stator current components
- Advanced Space Vector Modulation (SVM) technique for high system efficiency reducing motor harmonics and losses
- Accurate Rotor Flux Model and Fully Developed Field Weakening technique for high motor efficiency and dynamic across full speed range
- Motor model fully compatible with IEEE Standard in order to get the parameters of motor's equivalent circuit from no-load and blocked rotor tests; it can work with all AC motors of all manufactures
- Quick and easy selection between Torque Control and Speed Control

General features

- Fully configurable through supplied GUI TM4 TAU™ called SmartView™, which reduces abruptly the time to market start-up of the system
- Flexible configuration of I/O in order to couple them to any provided functions
- Standard and same firmware for all inverter series (easily extendable to future models)
- Robust, safe and self-diagnostic (both for hardware and software fault conditions)
- CAN Open and serial interfaces
- Powerful logging of all sensible working variables
- Fulfils automotive EMC standard ECE R10-05, Annex 7-8-9-10



AC-M1	24V		36-48V		72-80V	
Nom. voltage (Vdc)	24		36-48		72-80	
Input voltage range (Vdc)	11-32.4		22-64.8		42-108	
Cont. current (Arms)	175	225	188	250	175	225
Nom. current S2- 2 min (Arms)	350	450	375	500	350	450
Output voltage (VAC)	3 x 0…16 V (@24 VDC)		3 x to 24 (@36 VDC) 3 x 0 to 32 (@ 48 VDC)		3 x 0 to 47 (@72 VDC) 3 x 0 to 53 (@80 VDC)	
Power terminals	M8(U/V/W/-B), M10(+B)					

Specifications	
Switching frequency	9Khz
Efficiency	95%
Output frequency	0-300 Hz
Ambient temperature range	-40°C to 55°C
Maximum heat-sin temp @ Full current @ linear de-rated current (down to 50%) @ 50% current	80°C 80°C– 95°C 95°C– 100°C
Signal line connectors	2x AMPSEAL 23 pins
IP protection	IP65
EMC	EN12895 / ECE R10-05, Annex 7-8-9-10
Safety	EN 1175-1
Vibration IEC 60068-2-6 Shock IEC 60068-2-27 Bump IEC 60068-2-29	5g, 10 – 500 Hz, 3 axes +/-30g +/-10g
UL	Designed to meet UL583

Interface	Number
Digital input	19
Analog input unipolar 0…10V	8
Analog input bipolar ± 10V	0
Digital output	2
PWM output	3
Motor temp sensor	1
Incremental encoder	1
5V sensor power supply	1
12V sensor power supply	1
CAN interface	1
Serial Interface RS232	1
LIN Bus	1

Product part number	
AC-M1 24V 350A SWS	ACM1P35000000
AC-M1 24V 450A SWS	ACM1P45000000
AC-M1 36/48V 375A SWS	ACM1Q37000E00
AC-M1 36/48V 500A SWS	ACM1Q50000E00
AC-M1 72/80V 350A SWS	ACM1R35000000
AC-M1 72/80V 450A SWS	ACM1R45000Y00

*Plate-Type Heat Sink. For other heat sink type please contact us

Related product part number	
AMPSEAL 23 pin Mating Connector Bag	900KC00000019
Fuse 300A	744EFCNL300
Fuse 400A	744EFCNL400
Fuse 500A	744EFCNL500
Kit Fuse Support for AC-M1	900KC00000022
Thermal Pad for AC-M1	768VR455A00

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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 TM4; 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.