



SMIKS48V (Smart Motor Inverter Kongsberg Simrad 48V)

Specification Controller & Inverter Card

Controller Card:

Serial number: XXX
Production date: yyyy/mm/dd
Software version: 1.13

Inverter Card:

Serial number: XXX
Production date: yyyy/mm/dd

Standards:

Soldered and mounted according to IPC-A-610 and IPC-A-600 class 3.

Delivery test:

The complete unit has been tested and correct operation has been verified according to the SMIKS48V test procedure.

Features:

- Control system with optimal efficiency.
- Speed regulated sensorless control system with $\pm 2\%$ accuracy on speed estimation above 18rpm.
- Real time torque estimation.
- Reprogramming from serial line

Implemented Safety Features:

- Timeout function on serial communication.
- SW protocol with CRC16 checksum error detection on serial communication.
- Short circuit protection on motor and rudder drive.
- High temperature protection on PCB and heat sink.
- High and low DC voltage protection
- Levels of error states:
 - Warning: Take action. Reduced function of motor drive.
 - Error: Motor drive will stop or is not functioning properly.

Dimensions & Weight:

External dimensions (lxbxh): 160x100x55 mm
Total weight 775g

Specifications

General

- 2x galvanic isolated RS232, 1kV, with 9-pin D-SUB connectors.
- 6 pin power connector for 0.5 – 10 mm² cable.
- Current measurement on DC-supply with $\pm 80\text{A}$ current measurement range. (0.7% accuracy and 0.1% linearity.)

DC Bus Voltage (V_{DC}):

Nominal	48 V	
Max torque	>42 V (min)	
Warnings	38 V (low)	50.5 V (high)
Limits	30 V (min)	55 V (max)

Temperature Levels:

PCB	60 °C (warning)	75 °C (max)
Heat sink	60 °C (warning)	80 °C (max)

Motor drive:

Duty cycle	0,6% - 99,4% duty cycle
Dead band	1,0 μ s (Reduced for better control and efficiency)
PWM switching frequency	14793Hz

- Current measurement on output with $\pm 80\text{A}$ current measurement range. (0.7% accuracy and 0.1% linearity.)
- Double output transistors

Output power		
Nominal	600W	(25°C, natural convection)
Output current (I_{F}):		
Nominal	20A RMS	
Warnings	63.1A (warning)	
Limits	74.2A (max)	
Output Voltage (V_{LL}):		
Max	$0.67 \cdot V_{\text{DC}}$ (32.2V at 48VDC)	
Output Frequency		
Max	72.5 Hz	
Efficiency	~90 %	(at nominal power)

Rudder interface:

Switching and sampling frequency:	29586Hz	
Rudder servo control loop update frequency:	1000Hz	(mean of sampled values)
Output current protection:	0,50ADC	
Rudder timeout	1 min	(if not reached position)

- Rudder offset adjustable in software
- 4 x analogue inputs. 0 – 5 volt w/software filtering
- 4 x full bridge output drivers (min 51V rated) with current measurement and disable function.
- 2 x 9 pin D-SUB connector for rudder drive.