



AC-S1 Controller

The AC-S1 Controller is designed for small material handling machines and light electrical vehicles with AC motors up to 5kW. Based on high reliable DCB technology and exceptionally stable ITC Control Algorithm, AC-S1 Controller is a revolutionary high quality solution for small power applications.

Additional DC Controller is available for applications on Stackers with DC series excited pump motor up to 3,5 kW.

AC-S1 Controller in EPS configuration is suitable also for steer by wire applications: Dual Microprocessors and CAN-Bus communication protocol ensure the maximum safety in compliance with CE and UL standards.

Typical applications:

Pallet Trucks, Stackers, Order Picking Trucks, Cleaning Machines, Golf Cars, Aerial Lifts, Utility Vehicles, Tow Trucks.

Technical Characteristics

Technology:

- Low Rds(on) MOSFET
- 16 bits DSP controlling 1 AC motor + 1 DC series excited motor (optional)
- Safety Microprocessors (in EPS configuration)
- High Speed FLASH Memory
- Switching Frequency: 9kHz
- Integrated Hall Effect Current Sensors
- Communication: RS232, Lin and CAN-Bus

Supply Voltage (V):

24,36,48,72,80

Maximum Current:

(24V) 150-300 Arms (2')
 (36/48V) 100-200-300 Arms (2')
 (72/80V) 63-125-250 Arms (2')

Working temperature range:

-30°C +40°C

Maximum heat sink temperature:

100°C

Mechanical Characteristics:

Dimensions: 140x180x59
 Connector: Ampseal 35 Pins
 Environmental Protection: IP65
 Available with Al baseplate or finned Heatsink

I/O

N° 14 Digital Inputs
 N° 5 Analogue Inputs
 N° 5 Outputs



AC-M1 Controller

The AC-M1 Controller is designed to control AC motors up to 10kW. Based on high reliable DCB technology, an exceptionally smooth and stable ITC Control Algorithm, AC-M1 Controller is a revolutionary and high quality solution for medium power applications.

The AC-M1 can be easily connected to other peripherals to perform a complex network in which all nodes communicate with one another via Can bus.

In pump configuration, it can be connected to AC-M2 controller for counterbalanced applications with twin AC traction motors.

Typical applications:

Counterbalanced Lift Trucks, Cleaning Machines, Aerial Lifts, Utility Vehicles, Tow Trucks, Tractors.

Technical Characteristics

Technology:

- Low Rds(on) MOSFET
- 16 bits DSP controlling 1 AC motor
- High Speed FLASH Memory
- Switching Frequency: 9kHz
- Integrated Hall Effect Current Sensors
- Communication: RS232, Lin and CAN-Bus

Supply Voltage (V):

24,36,48,72,80

Maximum Current:

(24V) 350 - 450 - 600Arms (2')
 (36/48V) 375 - 500 Arms (2')
 (72/80V) 350 - 450 Arms (2')

Working temperature range:

-30°C +40°C

Maximum heat sink temperature:

100°C

Mechanical Characteristics:

Dimensions: 210x145x91
 Connector: 2x23 Ampseal
 Environmental Protection: IP65
 Available with Al baseplate or finned Heatsink

I/O

N° 21 Digital Inputs
 N° 8 Analogue Inputs
 N° 5 Outputs



AC-L1 Controller

The AC-L1 Controller is designed to control AC motors up to 35kW. Based on a high reliable DCB technology and an exceptionally smooth and stable ITC Control Algorithm, AC-L1 Controller is a compact and high quality solution for high power applications.

The AC-L1 can be easily connected to other peripherals to perform a complex network in which all nodes communicate with one another via Can bus.

In pump configuration, it can be connected to AC-M2 controller for counterbalanced applications with twin AC traction motors.

Typical applications:

Counterbalanced Lift Trucks, Cleaning Machines, Aerial Lifts, Tractors.

Technical Characteristics

Technology:

- Low Rds(on) MOSFET
- 16 bits DSP controlling 1 AC motor
- High Speed FLASH Memory
- Switching Frequency: 9kHz
- Integrated Hall Effect Current Sensors
- Communication: RS232, Lin and CAN-Bus

Supply Voltage (V):

24,36,48,72,80

Maximum Current:

(24V) 800 Arms (2')
 (36/48V) 625 - 750 Arms (2')
 (72/80V) 600 - 750 Arms (2')

Working temperature range:

-30°C +40°C

Maximum heat sink temperature:

100°C

Mechanical Characteristics:

Dimensions: 210x190x91
 Connector: 2x23 Ampseal
 Environmental Protection: IP65
 Available with Al baseplate or finned Heatsink

I/O

N° 21 Digital Inputs
 N° 8 Analogue Inputs
 N° 5 Outputs



AC-S2 Controller

The AC-S2 Controller is designed for lift trucks and electrical vehicles using dual AC motors up to 15kW. Based on high reliable DCB technology and exceptionally smooth and stable ITC Control Algorithm, AC-S2 Controller ensures the best performances without use of mechanical differential.

The AC-S2 Controller is also suitable to control:

- 1 AC Traction Motor + 1 AC Pump Motor
- 2 AC Traction Motors

SME Electronic Differential included in a single DSP, thanks to the high precision of motors torque control, performs extreme steering angle up to the inversion of the traction wheels in the safest, smoothest and most efficient way.

Electronic Differential Lock guarantees the maximum traction in difficult environmental conditions too.

The AC-S2 can be connected via CAN bus to other AC controllers for 3-4 AC motors applications.

Typical applications:

Counterbalanced Lift Trucks, Reach Trucks, Order Picking Trucks, Very Narrow Aisle Trucks, Cleaning Machines, Tractors, Aerial Lifts, Utility Vehicles.

Technical Characteristics

Technology:

- Low Rds(on) MOSFET
- 16 bits DSP controlling 2 AC motors
- High Speed FLASH Memory
- Switching Frequency: 9kHz
- Integrated Hall Effect Current Sensors
- Communication: RS232, Lin and CAN-Bus

Supply Voltage (V):

24,36,48,72,80

Maximum Current:

2 x (24V) 350 - 450 - 600 Arms (2')
 2 x (36/48V) 375 - 500 Arms (2')
 2 x (72/80V) 250 Arms (2')

Working temperature range:

-30°C +40°C

Maximum heat sink temperature:

100°C

Mechanical Characteristics:

Dimensions: 210x160x91
 Connector: 2x23 Ampseal
 Environmental Protection: IP65
 Available with Al baseplate or finned Heatsink

I/O

N° 21 Digital Inputs
 N° 8 Analogue Inputs
 N° 5 Outputs



AC-M2 Controller

The AC-M2 Controller is designed for lift trucks and electrical vehicles using dual AC motors up to 26kW. Based on high reliable DCB technology and exceptionally smooth and stable ITC Control Algorithm, AC-M2 Controller ensures the best performances without use of mechanical differential.

The AC-M2 Controller is also suitable to control:

- 1 AC Traction Motor + 1 AC Pump Motor
- 2 AC Traction Motors

SME Electronic Differential included in a single DSP, thanks to the high precision of motors torque control, performs extreme steering angle up to the inversion of the traction wheels in the safest, smoothest and most efficient way.

Electronic Differential Lock guarantees the maximum traction in difficult environmental conditions too.

The AC-M2 can be connected via CAN bus to other AC controllers for 3-4 AC motors applications.

Typical applications:

Counterbalanced Lift Trucks, Very Narrow Aisle Trucks, Cleaning Machines, Tractors, Aerial Lifts, Utility Vehicles.

Technical Characteristics

Technology:

- Low Rds(on) MOSFET
- 16 bits DSP controlling 2 AC motors
- High Speed FLASH Memory
- Switching Frequency: 9kHz
- Integrated Hall Effect Current Sensors
- Communication: RS232, Lin and CAN-Bus

Supply Voltage (V):

24,36,48,72,80

Maximum Current:

2 x (24V) 600 - 800 Arms (2')
 2 x (36/48V) 500 - 625 - 750 Arms (2')
 2 x (72/80V) 350 - 450 - 600 Arms (2')

Working temperature range:

-30°C +40°C

Maximum heat sink temperature:

100°C

Mechanical Characteristics:

Dimensions: 210x300x91
 Connector: 2x23 Ampseal
 Environmental Protection: IP65
 Available with Al baseplate or finned Heatsink

I/O

N° 21 Digital Inputs
 N° 8 Analogue Inputs
 N° 5 Outputs



EVC-1 Hydraulic Valves Controller

The EVC-1 Controller is designed to control proportional or On/Off Hydraulic Electro-Valves.

It can be easily connected to other peripherals to perform a complex network in which all nodes communicate with one another via Can bus.

It can be applied also in IC Lift Trucks to control Hydraulic system.

Typical applications:

Counterbalanced Lift Trucks, Reach Trucks, Aerial Lifts, Very Narrow Aisle Trucks.

Technical Characteristics

Technology:

- 16 bits DSP
- High Speed FLASH Memory
- Direct Battery PWM supply
- Communication: RS232 and CAN-Bus

Supply Voltage(V):

24,36,48,72,80

Working temperature range:

-30°C +40°C

Mechanical Characteristics:

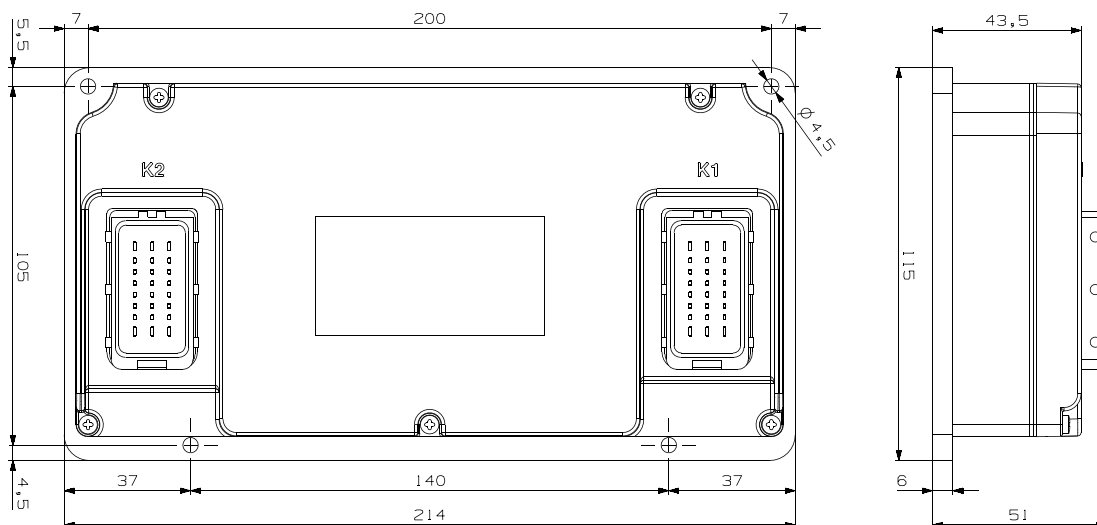
Dimensions: 214x115x51

Connector: 2x24 FCI

Environmental Protection: IP65

I/O

- N° 2 digital input
- N° 12 analogue input (or 6 digital input + 6 analogue input)
- N° 12 2A PWM proportional or ON/OFF output
- N° 4 10mA open collector output
- N° 1 0-5V analogue output
- N° 1 CAN-OPEN protocol interface
- N° 1 RS232 I/O
- N° 2 encoder interface input
- N° 1 12V 200mA supply (for proximity sensors)
- N° 2 5V 200mA supply (for 5V sensors)



AC INDUCTION MOTORS



SME AC motors are four or six pole induction motors with squirrel cage rotor and three phase winding on the stator.

Thanks to their robust construction, thanks to the total absence of brushes and commutators and to the SME speed sensor, SME motors represent the best solution on forklifts and other electric vehicles.

In the AC motors, the high electromagnetic field and the high working temperature cause a lot of problems to sensor bearing and, as a consequence, a very poor reliability. A lot of AC lift truck users agree that it was easier to replace brushes in DC motor (programmed maintenance) than change speed sensor every 1-2 years (random maintenance).

SME has solved this problem developing a dedicated Hall effect Speed Sensor for AC motors application.

Main features are:

- Lower working temperature because electronic circuit is separated from the bearing.
- High immunity to electro-magnetic noise.
- Easy substitution in case of damage.

SME can offer a large range of traction and pump motors from 1kW to 26kW, in IP20, IP54 and IP66 configuration.

Main Technical Data

Nominal Voltage (Vac):
15 to 50

Power S2 60' (kW):
1 to 25

Power S3 15% (kW):
2 to 30

Insulation Class:
F or H

Degree of Protection:
IP 20-54-66

Complies with Standards:
CE and UL

Temperature Sensor:
Type NK103 located in the stator winding