

Sigmadrive

AC INDUCTION AND DC MOTOR CONTROLLERS



- 24-80V 175-650A power ratings
- AC and DC motor control
- Traction, pump and steering control
- Dual traction options
- Assured gradient control
- Elegant, low-profile package
- High power-to-size ratio
- Exceptional thermal performance
- High-efficiency, minimal switching losses
- Heatsinking of all internal components
- No internal cables or connections
- High reliability
- CANbus communications
- Field upgradeable software



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MI



M2



B-



A



B

POWER ● ● TRIP

Sigmadrive

SUPERIOR CONTROL FOR INDUSTRIAL APPLICATIONS



The Sigmadrive family of AC and DC motor controllers have been developed for use in a wide range of electric vehicle applications, including Materials Handling, Airport Ground Support, Industrial, Utility and MobileWork Platforms. The range spans power ratings of 24V/175A to 80V/650A in three package sizes, each intended to give optimal price and performance.

Because of the universal nature of the design, the same hardware can be easily configured to work as either a traction, pump or steering controller. Furthermore, in total, four different motor technologies - AC induction, DC series, DC separately excited and DC permanent magnet are supported.

Insulated Metal Substrate (IMS) technology is fully utilized to provide state-of-the-art thermal performance and exceptional reliability. The innovative design means there is no internal cabling or inter-board connections, as well as providing direct heatsinking for all components and terminals. This increases reliability and enables Sigmadrive to provide a higher power-to-size ratio than competitive controllers of the same rating.

Dual traction applications can be easily and effectively addressed by connecting two controllers in a master-slave configuration. The speed output of each is then determined by the steering angle of the vehicle. In this mode of operation, there is a great deal of flexibility offered by a number of specialist programmable parameters, thereby ensuring smooth comfortable control under all conditions. Assured gradient control comes via selectable Hill-hold and Restraint functions, which are designed to hold the vehicle steady even when no drive signal is present.

CANbus communication provides a safe and reliable electrical connection method to gauges and programmers, as well as between controllers themselves. Additionally, the CANbus can be used to load software updates into the Sigmadrive, meaning a vehicle can be upgraded to include new and improved functions.



- 7 x low impedance digital inputs
- 3 x analogue inputs
- 3 x 3A contactor outputs
- In-built coil suppression
- 12V, 20mA output pin
- Under and over-voltage protected
- Robust to external short-circuits
- Throttle wire-off detection
- Hill-hold and Restraint
- Proportional, direction or neutral braking
- Electromagnetic brake control
- 3 traction cutback speeds
- Belly-button function
- Programmable inching speed
- 6 pump speeds
- Pump inhibit input
- Power steer timer

Sigmadrive Controller Dimensions

| Dimensions (mm) | Sigmadrive Frame Size | | |
|-----------------|-----------------------|--------|-------|
| | Small | Medium | Large |
| Length | 177 | 225 | 320 |
| Width | 155 | 200 | 200 |
| Height | 41 | 49 | 51 |
| Weight (kg) | 1.2 | 4.1 | 6.1 |

ACCESSORIES

SIGMADRIVE LCD VEHICLE DISPLAY



The SigmaGauge LCD is a highly versatile vehicle display, which can be easily configured to meet the OEM's requirements. The backlit, dot-matrix display receives its information over the CANbus, and presents vehicle status and diagnostic information to the operator in clear, easy-to-read icons. The operator, via pushbuttons on the front panel, is also able to select which details are displayed on the screen.

- Large, dot-matrix display with backlight
- Operator selectable display
- Displays include BDI, speeds and timers
- CANbus communications
- Field upgradeable software

SIGMADRIVE HAND-HELD PROGRAMMER



The SigmaDrive Hand-held Programmer (HHP) is a powerful tool that can be used to configure all Sigmadrive controllers, as well as the SigmaGauge display. In addition to multiple programming menus, there are status and test functions that provide vehicle designers and service engineers with powerful, real-time system information, making set-up or diagnosis particularly intuitive.

SIGMADRIVE CANBUS I/O MODULE

This module expands the Sigmadrive's I/O count by allowing many extra connections to be put onto the CANbus, thus into the Sigmadrive itself. Full environmental protection is afforded via totally encapsulated electronics.

- 4x digital inputs
- 2x analogue inputs
- 4x contactor outputs
- 4x low-current outputs
- 3x analogue outputs

| Sigmadrive AC Model | Voltage | Current rms/Time | Current rms (1 hour) | Size |
|---------------------|---------|------------------|----------------------|--------|
| Traction | | | | |
| ACT865L | 72-80V | 460A/60s | 240A | Large |
| ACT835M | 72-80V | 250A/60s | 120A | Medium |
| ACT817S | 72-80V | 120A/20s | 70A | Small |
| ACT465L | 24-48V | 460A/60s | 260A | Large |
| ACT445M | 24-48V | 320A/60s | 180A | Medium |
| ACT425S | 24-48V | 180A/20s | 80A | Small |
| ACT225S | 24V | 180A/60s | 80A | Small |
| Pump | | | | |
| ACP865L | 72-80V | 460A/60s | 240A | Large |
| ACP835M | 72-80V | 250A/60s | 120A | Medium |
| ACP817S | 72-80V | 120A/20s | 70A | Small |
| ACP465L | 24-48V | 460A/60s | 260A | Large |
| ACP445M | 24-48V | 320A/60s | 180A | Medium |
| ACP425S | 24-48V | 180A/20s | 80A | Small |

| Sigmadrive SEM Model | Voltage | Current/Time | Current (1 hour) | Size |
|----------------------|---------|--------------|------------------|--------|
| Traction | | | | |
| SET865L | 72-80V | 650A/60s | 240A | Large |
| SET835M | 72-80V | 350A/60s | 120A | Medium |
| SET465L | 24-48V | 650A/60s | 260A | Large |
| SET445M | 24-48V | 450A/60s | 180A | Medium |
| SET425S | 24-48V | 250A/20s | 80A | Small |
| SET225S | 24V | 250A/60s | 80A | Small |

| Sigmadrive Series Model | Voltage | Current/Time | Current (1 hour) | Size |
|-------------------------|---------|--------------------|------------------|--------|
| Traction | | | | |
| SRT865L | 72-80V | 650A/60s | 240A | Large |
| SRT850M | 72-80V | 500A/60s | 180A | Medium |
| SRT465M | 24-48V | 650A/15s | 260A | Medium |
| SRT445M | 24-48V | 450A/60s | 180A | Medium |
| SRT425S | 24-48V | 250A/20s | 80A | Small |
| Pump | | | | |
| SRP865L | 72-80V | 650A/60s | 240A | Large |
| SRP850M | 72-80V | 500A/60s | 180A | Medium |
| SRP465M | 24-48V | 650A/15s | 260A | Medium |
| SRP445M | 24-48V | 450A/60s | 180A | Medium |
| SRP425S | 24-48V | 250A/20s | 80A | Small |
| Pump and steering | | | | |
| SRD865L | 72-80V | 650A/60s & 60A/60s | 240A & 50A | Large |
| SRD445M | 24-48V | 450A/60s & 50A/60s | 180A & 35A | Medium |

| Sigmadrive PM Model | Voltage | Current/Time | Current (1 hour) | Size |
|---------------------|---------|--------------|------------------|--------|
| Traction | | | | |
| PMT835M | 72-80V | 350A/60s | 120A | Medium |
| PMT465L | 24-48V | 650A/60s | 260A | Large |
| PMT445M | 24-48V | 450A/60s | 180A | Medium |
| PMT425S | 24-48V | 250A/20s | 80A | Small |
| Steering | | | | |
| PME817S | 72-80V | 175A/20s | 70A | Small |
| PME425S | 24-48V | 250A/20s | 80A | Small |

● Sigmadrive AC

Can be tuned to any AC motor. High resolution current measurement, combined with advanced flux control techniques, provides smooth control of torque and speed. This approach is particularly efficient with highly dynamic loads, such as those experienced on an electric vehicle. Easy to set-up and program, the Sigmadrive AC is available in traction, pump and steering configurations.

● Sigmadrive Separately Excited (SEM)

Offers the same advanced technology and design features of the Sigmadrive AC controllers, to provide a range of powerful and flexible traction units.

● Sigmadrive Series

Available in traction and pump versions, as well as an innovative, combined pump and steering configuration.

● Sigmadrive Permanent Magnet (PM)

Smooth and predictable control of a wide power range of permanent magnet motors.