



### Powerful and Versatile

Although primarily intended for Class 3, pallet truck type applications, the C3 controller is equally suitable for small ride-on machines. Two versions are available - 200Arms and 250Arms - thereby allowing the most cost-effective solution for an application. Flexible, yet simple programming means the C3 is compatible with all types of AC induction motor; while a dedicated thermistor input allows motor temperature to be measured and the power to the motor to be reduced if it is becoming too warm.

- Suitable for walkie and ride-on vehicles
- 200Arms and 250Arms power options
- Compatible with all AC induction motors
- Auto-commission for efficient motor matching
- Motor thermistor input
- Versatile throttle input - resistive and voltage
- Switched or proportional hydraulic control
- CAN tiller compatible option
- Line Contactor drive
- Electro-magnetic Brake drive
- Intelligent Hill-Hold function
- Lift Contactor drive
- Proportional Lower Valve drive
- Hold Valve drive
- Software interlocking of drive and hydraulics
- Programmable start-up sequence options
- Belly-Button function
- Low battery management
- On-board Status LEDs
- Integrated service timers
- Serial interface to iGauge or TruCharge module
- Handheld or PC programming options
- Electronics protected to IP65
- Designed to meet EN1175, EN12895 and UL583 requirements
- RoHS compliant



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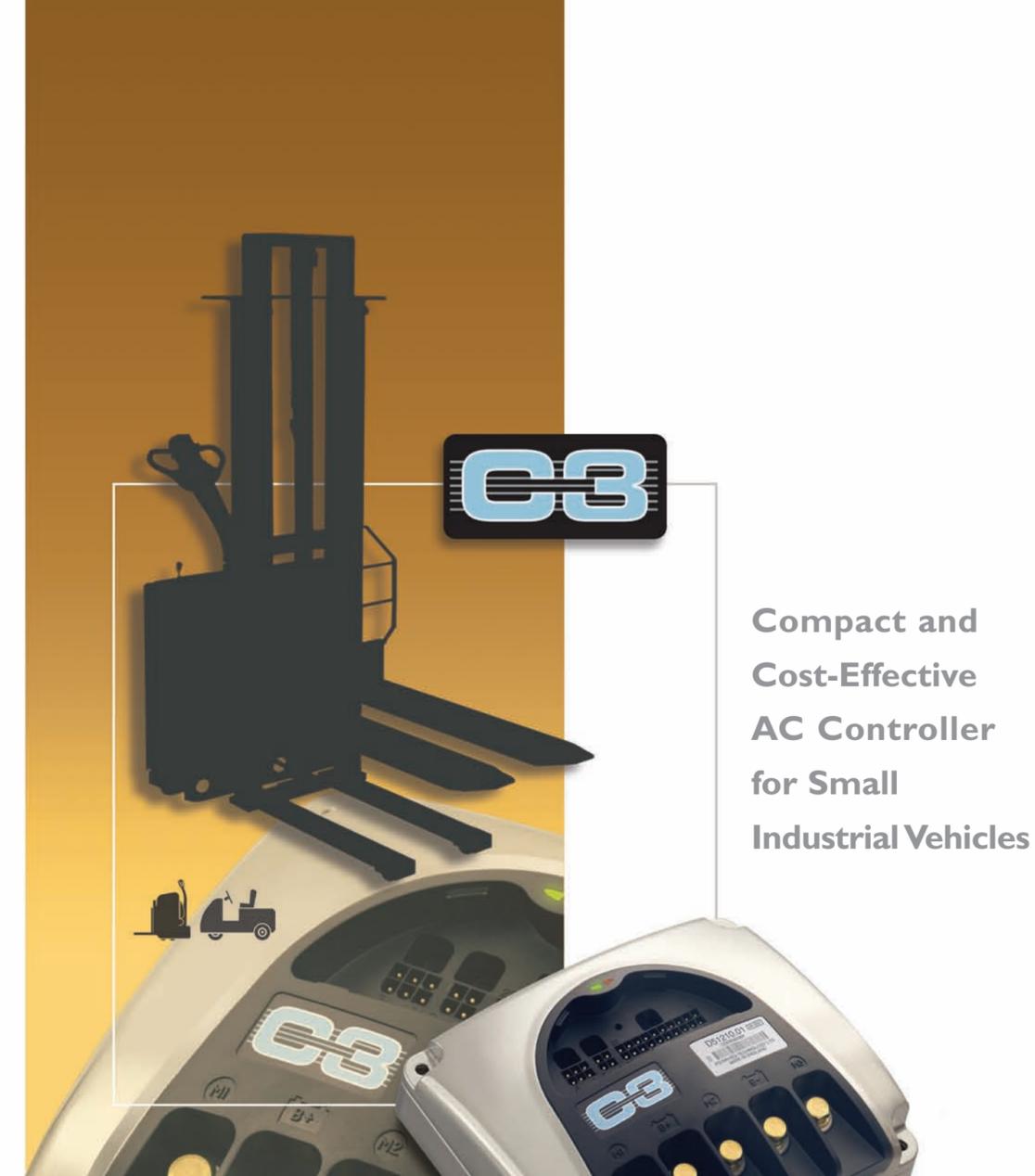
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**Compact and  
Cost-Effective  
AC Controller  
for Small  
Industrial Vehicles**



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## Compact and Cost-Effective AC Controller for Small Industrial Vehicles

### Comprehensive Inputs and Outputs

The C3 can accept multiple types of throttle connections, including 2 or 3-wire resistive and voltage. There are also inputs for direction switches, tiller switch, belly-button, seat switch, speed reduction and drive/hydraulic inhibit, as well as lift and lower signals, both switch or proportional types. Each digital input can be individually switched to 0V, open-circuit, B+ or a combination of these options to provide the active state.

Five 2A outputs provide control for line and lift contactors, lower and hold valves, plus an electro-magnetic brake. All outputs are protected against wiring errors and contain coil suppression circuits, meaning external diodes are not required.

### Flexibility and Protection

Because all the hydraulic functions are controlled via the C3's software, it is easy to cater for interlocking between drive and lift/lower. Further, the hydraulic functions can be disabled in response to a certain condition, such as a low battery voltage. This capability reduces the possibility of battery damage as a result of deep-discharge.

### Intelligent Hill-Hold

To ensure maximum efficiency, the C3 employs an intelligent Hill-Hold function that only takes power from the battery if the vehicle starts to roll. As soon as it is detected that Hill-Hold is not required, then no further power will be consumed. Traditionally, application of a brake switch has been needed to provide this function.

### Simple Motor Matching

For ease of installation and efficient performance, the C3 can be 'matched' to any AC induction motor, using an auto-commissioning sequence. This simple 3-step process is launched via the C3 PC Programmer. No specialist measuring equipment is required, just the basic motor 'nameplate' data. Once commissioning has been completed on the first vehicle, the C3 programming file can be saved, copied and then written to other vehicles equipped with the same motor type, greatly reducing set-up time.



Program motor 'nameplate' parameters



Initiate auto-commissioning routine



C3 and motor now matched

### User Information, Diagnostics and Service

If the C3 is used in combination with the PGDT iGauge, then information relating to battery charge, elapsed drive time, presence of speed limit condition and motor temperature can be relayed to the vehicle's operator. Diagnostic codes and service warnings can also be displayed on this gauge.

Two service timers - one for keyswitch hours and one for operational 'active' hours - can be set by an OEM or service agent, thereby ensuring an appropriate maintenance regime. After a service is complete, the timers can be set to the next service interval.

If just a simple, LED type battery indication is required, then the TruCharge module can be used. In addition to supplying accurate state-of-charge information, which is calculated within the C3 itself, in the event of an error, useful diagnostic information can be communicated to the operator or service technician.

Diagnostic information is also signalled by the C3's on-board LEDs, which is a useful feature if PGDT displays are not being used. To complete the comprehensive suite of service aids, a log of all errors is kept and can be accessed at any subsequent time using any compatible programming tool.

### Programming

The Diagnostic Test Tool (DTT) is a handheld programming and storage device that can be used with the C3. Not only does the DTT offer conventional adjustment of individual parameters, it can also read or write complete files from or to a controller. Via a USB port, these files can also be conveniently transferred between a DTT and a PC.

Using a familiar Windows format, the PC Programmer allows all parameters to be viewed and modified within a clear, easy-to-read user interface. The PC Programmer comes in various access levels, which are designed to be appropriate for service, OEM design work or for programming a vehicle on a production line.

### Safety and Environment

The innovative construction methods employed mean that it is relatively simple to ensure reliable and repeatable assembly of the electronic enclosure, which results in consistent protection of the electronic circuits from the environment and efficient transfer of heat to the baseplate. The design is compliant with all relevant legislation and takes into account critical dimensions as defined by UL. The product uses RoHS compliant materials throughout.

### Products

Product Code	Description
C3-200	200Arms drive, switched hydraulic control
C3-250	250Arms drive, switched hydraulic control
Add '-CAN'	Accepts CAN tiller signals, proportional hydraulic control
G52	52mm diameter iGauge
TruCharge	10 segment, LED gauge
DTT	Diagnostic Test Tool - handheld programmer
4-way Molex Cable	Cable for DTT
C3 PCP Service	PC Programmer - Service access
C3 PCP OEM	PC Programmer - OEM and manufacturing access

### Specifications

Model	Voltage	Current-2min.	Current-1hour
C3-200	24V	200Arms	80Arms min.
C3-250	24V	250Arms	100Arms min.

<b>Supply Voltage:</b>	16-30Vdc
<b>Peak Voltage:</b>	36Vdc
<b>Reverse Battery Voltage:</b>	40Vdc
<b>PWM Frequency:</b>	Programmable to 10 or 20kHz
<b>Contactor Outputs:</b>	2A, protected
<b>Valve Outputs:</b>	2A, PWM, protected
<b>Power Connections:</b>	M6
<b>Main Control Connector:</b>	20-way Molex® Mini-Fit Jr.™
<b>Motor Encoder Connector:</b>	6-way Molex® Mini-Fit Jr.™
<b>Serial Connector:</b>	4-way Molex® Mini-Fit Jr.™
<b>Moisture Resistance:</b>	Electronics to IP65
<b>Operating Temperature:</b>	-30°C to 55°C
<b>Storage Temperature:</b>	-40°C to 70°C
<b>EMC (on sample machine):</b>	Tested to EN12895:2000

For further details, refer to the C3 Technical Manual, SX80894

### Dimensions

<b>Length</b>	172mm	6.77ins
<b>Width</b>	146mm	5.75ins
<b>Depth</b>	63mm	2.48ins