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

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.
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 drive 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

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C3-200</td>
<td>200Arms drive, switched hydraulic control</td>
</tr>
<tr>
<td>C3-250</td>
<td>250Arms drive, switched hydraulic control</td>
</tr>
<tr>
<td>Add ‘-CAN’</td>
<td>Accepts CAN tiller signals, proportional hydraulic control</td>
</tr>
<tr>
<td>GS2</td>
<td>52mm diameter iGauge</td>
</tr>
<tr>
<td>TruCharge</td>
<td>10 segment, LED gauge</td>
</tr>
<tr>
<td>DTT</td>
<td>Diagnostic Test Tool - handheld programmer</td>
</tr>
<tr>
<td>4-way Molex Cable</td>
<td>Cable for DTT</td>
</tr>
<tr>
<td>C3 PCP Service</td>
<td>Service PC Programmer - Service access</td>
</tr>
<tr>
<td>C3 PCP OEM</td>
<td>PC Programmer - OEM and manufacturing access</td>
</tr>
</tbody>
</table>

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Voltage</th>
<th>Current-2min.</th>
<th>Current-1hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>C3-200</td>
<td>24V</td>
<td>200Arms</td>
<td>80Arms min.</td>
</tr>
<tr>
<td>C3-250</td>
<td>24V</td>
<td>250Arms</td>
<td>100Arms min.</td>
</tr>
</tbody>
</table>

Supply Voltage: 16-30Vdc
Peak Voltage: 36Vdc
Reverse Battery Voltage: 40Vdc
PWM Frequency: 20kHz
Contactor Outputs: 2A, protected
Valve Outputs: 2A, PWM, protected
Power Connections: M6
Main Control Connector: 20-way Molex® Mini-Fit Jr.
Motor Encoder Connector: 6-way Molex® Mini-Fit Jr.
Serial Connector: 4-way Molex® Mini-Fit Jr.
Moisture Resistance: Electronics to IP65
Operating Temperature: -25°C to 50°C
Storage Temperature: -40°C to 65°C
EMC (on sample machine): Tested to EN12895:2000

Dimensions

<table>
<thead>
<tr>
<th></th>
<th>Length</th>
<th>Width</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>172mm</td>
<td>146mm</td>
<td>63mm</td>
</tr>
<tr>
<td></td>
<td>6.77ins</td>
<td>5.75ins</td>
<td>2.48ins</td>
</tr>
</tbody>
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For further details, refer to the C3 Technical Manual, SK79834.
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