The Next
Generation
Scrubber-Dryer
Control System
The Trio+ control system represents the next step in control systems designed specifically for battery operated scrubber-dryers. It is perhaps the most advanced controller available to floorcare machine OEM’s today, offering major enhancements in reliability, performance and function. Trio+ controls every major function on a typical scrubber dryer, while having the required level of robustness and ruggedness to survive both the harsh environments and the user abuse that floorcare machines are regularly subjected to.
The Trio+ control system performs all the functions required of large pedestrian and small to medium ride-on scrubber driers. The powerful configuration software offers a huge amount of programmable parameters, which allow the operation of the various output devices to be defined exactly. This approach provides the flexibility that floorcare OEM’s require to incorporate the functionality unique to their machines, and effectively create their own bespoke control system using an established product.

PROGRAMMABLE PERFORMANCE

- Programmable for 24V or 36V operation
- Self-protecting outputs
- Low impedance inputs
- Auto control of squeegee blade actuator
- Auto control of brush deck actuator
- Optional LCD command & control module
- Soft stop
- Battery lockout
- Sleep mode
- Diagnostic output
- System log - provides a permanent record of all trip conditions
- Hours run timer function
- Handheld or Windows PC programming
- Electronics sealed to IPX5
- Designed For UL recognition
- EMC tested to EN55022 Class B
- Documentation for international approvals

**TRACTION MOTOR OUTPUT**
Programmable, high frequency PWM full bridge provides up to 150A of power, with smooth acceleration and regenerative braking in both forward and reverse directions.

**SOLENOID BRAKE OUTPUT**
Provides automatic control of electromagnetic solenoid brakes fitted to traction motor.

**BRUSH MOTOR OUTPUT**
Provides up to 100A of power with programmable soft start, current limit, variable speed and timers.

**VACUUM MOTOR OUTPUT**
Provides up to 50A of power with programmable soft start, current limit, variable speed and timers.

**BRUSH DECK ACTUATOR OUTPUT**
Bi-directional output allows full control of linear actuators to raise and lower the brush deck. Programmable current limit and stall detect allows actuators without end of travel switches to be used.

**SQUEEGEE ACTUATOR OUTPUT**
Bi-directional output allows full control of linear actuators to raise and lower the squeegee blade. Programmable current limit and stall detect allows actuators without end of travel switches to be used.

**SOLUTION PUMP OUTPUT**
Uni-directional output allows speed or flow control of a cleaning solution pump. Programming options allow a number of preset flow rates to be configured.

**AUXILIARY OUTPUT**
Fully programmable uni-directional output can be used for other devices such as re-circulation pumps or anti-drip valves.

**REVERSE ALARM OUTPUT**
Can be programmed to provide a pulsed or steady signal at 12, 24 or 36V when the machine is backing up.

**WARNING LIGHT OUTPUT**
Can be programmed to drive warning beacons, brake lights or similar at 12, 24 or 36V.

**OUTPUT PROTECTION**
All outputs are fully self-protected against overcurrent, short circuit or wiring errors, and the high-power outputs have programmable current limits. This means that there is no need to fit the fuses and circuit breakers that would normally be required to protect the motors and pumps connected to the Trio+ control system.

**INPUT PROTECTION**
All inputs are programmable and are protected against possible damage by wiring errors. The input impedance is sufficiently low to prevent problems due to moisture and conductive contaminants.
The LCD module provides the user with a backlit, dot-matrix display of the various functions on the machine, together with a battery status display and hour meters. Diagnostic information is also displayed when required, identifying the nature and location of the fault detected — for example, a short-circuited vacuum motor. The display software can be customized to suit each manufacturer’s requirements, so that product differentiation is maintained.

The LCD module also provides alternate connections for all of the control switches, and allows the use of membrane keypads by accepting momentary pushbuttons and providing an LED output driver for each associated input.

OPTIONAL LCD COMMAND AND CONTROL MODULE

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TRUCHARGE DIAGNOSTIC CODES

- HIGH BATTERY VOLTAGE
- SOLENOID BRAKE FAULT
- POSSIBLE CONTROL SYSTEM FAULT
- THROTTLE FAULT
- INHIBIT ACTIVE
- VACUUM MOTOR FAULT
- FREEWHEEL ACTIVE
- BRUSH MOTOR FAULT
- TRACTION MOTOR FAULT
- LOW BATTERY VOLTAGE
PRODUCT CODES

TRIO+

T+ 50                                   50A Maximum Current
T+ 100                                 100A Maximum Current
T+ 150                                 150A Maximum Current

SUPPORT PRODUCTS

LCD Control Panel Module
122 x 32 Graphic LCD includes control connection

TruCharge Display
10-bar LED display showing BDI and Diagnostics.

TruCharge Module 1
TruCharge display, encased

TruCharge Module 2
TruCharge display, circuit board

PROGRAMMING

PGDT’s Industrial PC Programmer software and interface cable allows Trio+ to be programmed by any PC running Microsoft (XP, NT and Windows 98 or later.) Using the familiar windows format, PC Programmer allows all parameters to be viewed and modified, saved as files and copied between controllers. Parameters can be modified off line and saved, creating new controller variants instantly and remotely. Whole sets of parameters can be transferred from programmer to controller, or vice-versa by a single command.

PC Programmer therefore provides manufacturers with the ability to quickly create customer-specific settings, allowing a single Trio+ to be configured to suit each vehicle on the production line, thus eliminating the need to stock several variants of the same controller.

SYSTEM LOG

A powerful system log allows the Trio+ to record the number of occurrences of the last eight detected system problems. These can be viewed at any time when connected to a programming tool, and provide invaluable assistance when attempting to diagnose intermittent machine faults. Hours run timers are also included, so the total number of hours elapsed are recorded. The system log and hours run timers are stored in permanent memory, so they will not be lost even if the Trio+ is disconnected from the battery supply.

TRUCHARGE MODULES

The PGDT TruCharge display offers an accurate representation of the charge remaining in the batteries, unlike most simple voltmeter displays. The user is presented with a display comprising of 3 red, 4 yellow and 3 green LEDs, which provide an intuitive display thus inspiring confidence in the battery status. This display also provides diagnostic information to pinpoint simple problems, by flashing a number of LEDs as shown. The display is available in two versions - either enclosed in a case for panel mounting, or as a bare board for inclusion behind membrane-type tiller overlays.

PG DRIVES TECHNOLOGY

* Microsoft® Windows 98 or later, NT, XP
SPECIFICATIONS

Supply Voltage: 24V-36Vdc
Operating Voltage: 16Vdc to 48Vdc
Peak Voltage: 50Vdc
Reverse Battery Voltage: 40Vdc
Traction Output: 50/100/150A full bridge
Traction PWM Frequency: 15KHz ± 1%
Brake Voltage: 24/36Vdc
Brake Current: 2A max. continuous
Brush Output: 100A, Fully programmable
Vacuum Output: 50A, Fully programmable
Auxiliary 1 & 2 Output: 7A Fully programmable for actuator control
Auxiliary 3 & 4 Output: Fully programmable, 5A sink,
Reverse Alarm Output: 12/24/36V dc, 2A sink
Warning Lamp Output: 12/24/36V dc, 2A sink
Battery Connections: M6 threaded brass pillars
Traction Motor Connections: PGDT Proprietary
Brush Motor Connections: PGDT Proprietary
Vacuum Motor Connections: PGDT Proprietary
Control Connections: Molex® Mini-Fit, Jr™
Moisture Resistance: Electronics to IP56
Operating Temperature: -20°C to +55°C
Storage Temperature: -30°C to +55°C
Safety: Multiple hardware & software strategy
Designed to EN60335/2/67
EMC on sample machine
Susceptibility: Tested at 30V/m
Emissions: To EN55022 Class B
ESD: IEC801 part 2
Weight: 1.7 Kg

For further details, refer to TRIO+ Technical Manual SK76886

DIMENSIONS

165 mm (6.5 ins)
50 mm (1.97 ins)
160 mm (6.3 ins)
150 mm (5.91 ins)