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WARNING
Failure or improper selection or improper use of the products and/or systems described herein or related items can cause death, personal injury and property damage.
This document and other information from The Company, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure and review the information concerning the product or systems in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.
The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by The Company and its subsidiaries at any time without notice.

Enclosure Mounting
Drives should be mounted to an appropriate panel / enclosure depending on the application.
A minimum of 1/2 inch spacing should be used between the aluminum bases of multiple drives mounted side by side. A minimum of 1 inch of clearance should be used at the top and bottom of the drives also. These are intended as minimums only. Consideration should be given as to the type of enclosure, ambient conditions, and air flow through the enclosure as well as any other heat sensitive components that may be in the enclosure.

Board Setup
The board has a single jumper that is used to select between a P1DE32 and P1DE50. This jumper should be appropriately set from the factory. It is always wise to review this jumper and verify it is set correctly for the cylinder (see Figure #1 – Current Limit Jumper). Using a P1DE50 cylinder with a 32 drive will cause performance issues. Using a 50 drive with a P1DE32 cylinder will potentially overheat the unit causing damage.

Electrical Connections
All of the drive electrical connections pass through one Phoenix removable connector (Phoenix P/N: 1792074). Drive control signals (Forward, Reverse, and Enable) are 24VDC signals sourced from a PLC with minimum signal voltage of 12 VDC (5k input impedance). “Control –” is the ground connection for the previous “Forward”, “Reverse”, and “Enable” connections to a PLC. If separate power supplies are used for the PLC and main drive supply, this goes to the PLC power supply.
Main Drive Supply = 24VDC / 7.5 Amp peak for 032 / 15.0 Amp peak for 050 (jumper selectable). Actual current consumed will depend on the application / load.

WARNING
Use good standard Electrostatic Discharge (ESD) grounding techniques when handling any electronics.

Safety Guide
For more complete information on recommended application guidelines, see the Safety Guide section of Pneumatic Division catalogs or you can download the Pneumatic Division Safety Guide at: www.parker.com/safety

Introduction
Follow these instructions when installing, operating, or servicing the product.

Environmental Consideration
Maximum Ambient Temperature: 50°C (122°F)
– Fan cooling may be required in high ambient temperatures
Minimum Ambient Temperature: 0°C (32°F)
Humidity / Liquids: Keep the relative humidity below 95%, non-condensing. Do not allow liquids or fluids to come into contact with the Drive, motor, or its cables.
Airborne Contaminates: Particulate contaminants, especially electrically conductive material such as metal shavings or grinding dust, can damage the drive. Do not allow contaminants to come into contact with the drive. Enclosure mounting is highly recommended.

WARNING
Ensure all electrical supplies are connected to the drive in the correct manner.

Limit Jumper
2 x Ø4.50mm Drill Thru

Figure 1

WARNING
To avoid unpredictable system behavior that can cause death, personal injury, and property damage:
• Disconnect electrical supply before installation, servicing, or conversion.
• Operate within the manufacturer’s specified conditions.
• Service in accordance with procedures listed in these instructions.
• Installation, service, and conversion of these products must be performed by knowledgeable personnel who understand how electromechanical products are to be applied.
• After installation, servicing, or conversion, electrical supplies should be connected and the product tested for proper function. If the product does not function properly, do not put into use.
• Warnings and specifications on the product should not be covered by paint, etc. If masking is not possible, contact your local representative for replacement labels.

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**Motor Connector**

The standard connector for both of the P1DE motors are a Molex 43680-2002 housing with two 43178-2002 male blade crimp terminals. The mating connector components, for the cable, are one piece p/n 44441-2002 and two pieces 43375-1001.

**Potentiometer Definitions**

- **REV SPD** – Speed in the Reverse direction
- **REV ACL** – Time setting 0.1 to 1.0 seconds to accelerate to speed set by the “REV SPD” potentiometer (see #5 in Figure 2).
- **REV DEC** – Time setting 0.1 to 1.0 seconds to decelerate from the speed set by the “REV SPD” potentiometer to zero velocity (see #1 in Figure 2).
- **RUN LMT** – Scales the current (0% to 100%) supplied to the motor. This range is 0 amps up to 3.75 or 7.5 amps depending on motor size. The Continuous Current Limit level is selected by a jumper on the drive (32 = 3.75 amps / 50=7.5 amps).

Example:

- 75% on a 32 = 2.8 amps
- “BST CUR” - Scales the current (0% to 100%) supplied to the motor from the Continuous Current Limit to the Peak Current Limit. The available Boost Current is determined by the same jumper as the Continuous Current (32 = 3.75 amps to 7.5 amps / 50=7.5 amps to 15.0 amps).

Example:

- 75% on a 32 = (7.5 amp – 3.75) * 75% + 3.75 = 6.5 amps

Note: The boost current is the same in the forward and reverse directions unless the acceleration rate will not permit going that high before the Boost Time expires (i.e. Acceleration time is set longer than the boost time).

- **BST TIM** – Time setting 0.1 to 1.0 seconds / Delays the onset of the current clamp to the “Run Limit” set by the potentiometer (see #3 & 4 in Figure 2)

**WARNING**

Improper use of Boost Current (i.e. current above the continuous current rating of the particular motor) can cause the motor to overheat causing damage to the motor and the overall system including but not limited to the end users property and personnel. Parker Hannifin is in no way responsible for any misapplication of this product in strict adherence to Parker Hannifin’s “Offer Of Sale”.

Improper use of Boost Current is also not classified as normal use and therefore voids the product warranty.

- “FOR DEC” – Time setting 0.1 to 1.0 seconds to decelerate from the speed set by the “FOR SPD” potentiometer to zero velocity (see #6 in Figure 2).
- “FOR ACL” – Time setting 0.1 to 1.0 seconds to accelerate to speed set by the “FOR SPD” potentiometer (see #2 in Figure 2).
- “FOR SPD” – Speed in the Forward direction

Figure 2: Example of a normal extend / retract cycle with explanation of potentiometer settings. The below cylinder requires 4 seconds to extend. Upon reaching the extend position it immediately begins a 4 second retract cycle.

From the above current graph:

The drive has been setup to run a P1DE50 series cylinder by moving the jumper on the board to the appropriate location. This fixes the Peak Current Limit as well as the Continuous Current outputs of the drive at 15.0 amps and 7.5 amps respectively. This is a single jumper move (See board setup). Boost Current / “BST CUR” has been scaled to 80% (13.5 amps) Boost Time / “BST TIM” has been set to 1 second / see #3 in Figure 2 for the forward direction and #4 Figure 2 in the reverse direction. Run Limit / “RUN LIM” has been scaled to 80% (6 amps) The Forward Acceleration Time / “FOR ACL” has been set to 0.9 sec (see #2 Figure 2) The Forward Deceleration Time / “FOR DEC” has been set to 0.5 sec = 4 sec -3.5 sec (see #6 Figure 2) The Reverse Acceleration has been set to 0.7 sec (see #5 Figure 2). The Reverse Deceleration Time / “REV DEC” has been set to 0.8 sec (see #1 Figure 2)

**NOTE:** It is best to start the drive for the first time with all of the potentiometers turned fully counter clockwise. This makes the speeds as slow as possible and the currents as small as possible. While the accelerations and decelerations are as short as possible therefore the unit will stop as quickly as possible and not over run past the sensors.

**Recording / Duplicating Drive Setup**

After the drive has been adjusted with the setup desired the potentiometers / variable resistor values can be recorded using a standard digital Ohm meter. The drive board is equipped with labeled touch points / rings on the back of the board.

**WARNING**

Use good standard Electrostatic Discharge (ESD) grounding techniques when handling any electronics.

To access the back of the board, carefully remove the Phoenix power connection plug.

**WARNING**

Do not reinstall the plug until after the resistance values have been recorded. If the board has power while the readings are taken you may damage the board or cause a runaway condition in the cylinder.

Carefully remove the drive cover. Note there are clips injection molded into the cover on the top and bottom that hold the cover on. Locate one of the ground points (“GRD”) and attach the common lead from the Ohm meter.

Using the other lead touch off each of the other potentiometer points and record the readings.

Note: It is not recommended to use the actual resistor pins near the edge of the board. The rings are wired to consistently take the readings from one leg of each of the resistor.

The recorded information can then be used in a similar manner to adjust the potentiometers of a new drive and duplicate a given setup. Gently replace the cover and then the electrical connection plug after the setup is complete.

Note: There are two rail sets injection molded into the cover that the corners of the board slide into. NEVER use or store the drive without the cover securely attached.

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**P1DE50 Drive Current Example**

Figure 2