



Instruction Manual

Effective: April 01, 2011

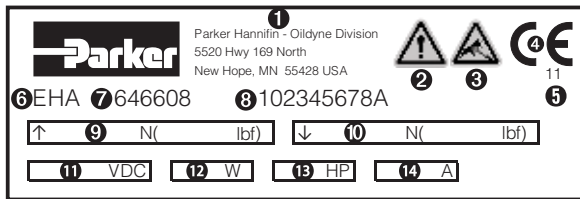
Parker Compact Electro-Hydraulic Actuator (EHA)



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How to read the label on your EHA:



- | | |
|----------------------------------|-----------------------------------|
| 1 Name & address of manufacturer | 8 Unique identifier/serial number |
| 2 WARNING - see page 3 | 9 Maximum extend force |
| 3 WARNING - see page 3 | 10 Maximum retract force |
| 4 CE Mark | 11 Motor voltage |
| 5 Year of product manufacture | 12 Motor watts |
| 6 Product type | 13 Motor horsepower |
| 7 Part number | 14 Maximum Amperage draw |



WARNING – USER RESPONSIBILITY

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise. The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

Offer of Sale

Please contact your Parker representation for a detailed 'Offer of Sale'.

Introduction

This manual provides descriptive operation and maintenance instructions for the Parker Compact EHA (Electro-Hydraulic Actuator) manufactured by the Parker Hannifin Corporation, Oildyne Division. Any additional information may be obtained from Parker by referencing the unit's part number printed on the nameplate or by contacting your local authorized Parker Distributor.

Some of the Information in this manual may not apply to your EHA. Information about custom units may require service and application information from other sources.

Warning

This Instruction Manual should be read in its entirety and understood prior to installing and operating the Parker Compact EHA.

It is imperative that personnel involved in the installation, service, and operation of the Oildyne units should be familiar with how the equipment is to be used. They should be aware of the limitations of the system and its component parts and have knowledge of good hydraulic practices in terms of safety, installation, and maintenance.

Explanation of Warning Labels

The following labels will be used in this Instruction Manual and on all applicable Oildyne products.



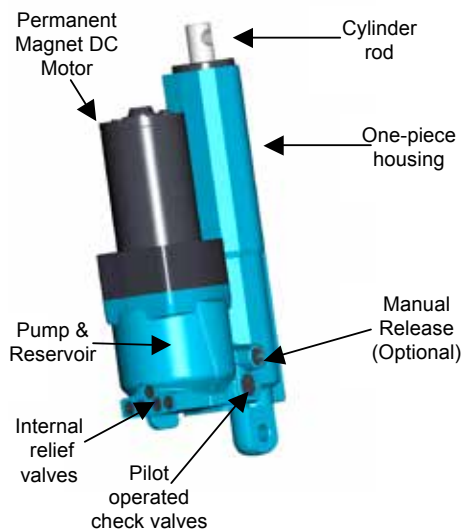
Be careful; take precautions; examine instructions before operation.



There may be hydraulic liquid under pressure. Do not open unit or break pipe connections until hydraulic pressure has been released.

Description

The Parker Compact Electro-Hydraulic Actuator (EHA) is a self-contained, bi-directional DC motor driven gear or gerotor pump with an integral hydraulic cylinder.



See **Figures 1, 2, and 3** for dimensional drawings. The internal components are determined by the specifications provided by customers for each specific application.

See **Figure 4** for a hydraulic schematic.

The life expectancy of Parker Oildyne units is directly tied to the frequency of use, the product in which they are incorporated and the application.

Unit weight will fall into a range from 3.6 kg (8.0 lbs) to 5.5 kg (11.9 lbs) based on stroke length and motor size. See below:

Base unit by stroke length:

102 mm (4 in)	2.1 kg (4.7 lbs)
152 mm (6 in)	2.8 kg (6.5 lbs)
203 mm (8 in)	3.5 kg (7.6 lbs)

Add for motor:

12 VDC or 24 VDC 245W	+1.5 kg (3.3 lb)
12 VDC or 24 VDC 560W	+2.0 kg (4.3 lb)

EHA is intended to be used for specific applications requiring actuation defined by the customer. Listed below are the acceptable operation parameters:

Maximum forces for actuator extend:

21,350 Nf (4,800 lbf) with gear pump

Maximum forces for actuator retract:

16,000 Nf (3,600 lbf)

Note: The maximum forces listed above are the highest forces available for an EHA unit. The maximum forces listed on your unit label will match the specific unit configured for your application.

Power range for intermittent duty:

12 or 24 VDC
.25 kW to .56 kW (.33 to .75 hp)

Operating temperature: -34°C to +65°C (-30°F to +150°F)

Storage temperature: -34°C to +93°C (-30°F to +200°F)

Maximum rate: 84 mm/sec (3.3 in/sec) at no load

EHA is intended for intermittent use only. It is not designed for continuous operation.

Parker Hannifin Corporation takes no responsibility for safety of any unit if it is not used for the intended purposes detailed in this Instruction Manual.

Examples of Abnormal Use:

- Use of unit with pressure other than that for which it was intended
- Use with a higher or more frequent duty cycle other than that for which it was intended
- Use with higher or lower Voltage than required for optimal use
- Use in a different mounting orientation other than that for which it was intended
- Use of fluids other than those recommended

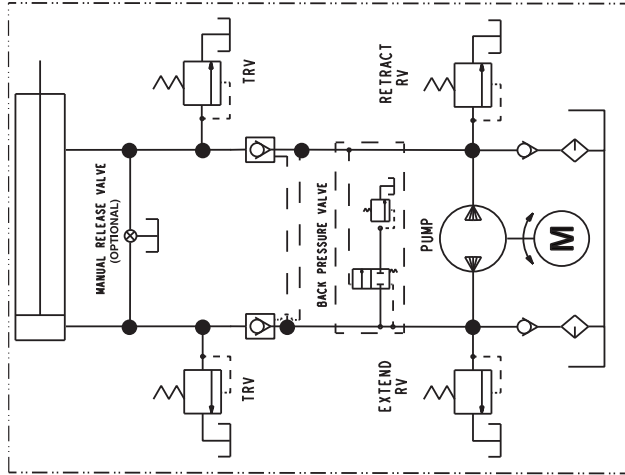
Preparation for Use

Unpacking and Checking

All units were carefully packed in boxes, and may or may not be on skids. In any case, do not remove anything from the skid or any packaging until it has been carefully checked for damage that may have occurred in transit. Report all damage immediately to the carrier and send a copy to the vendor.

Storage

If the unit is not going to be installed immediately, it should be stored indoors, covered with a waterproof sheet.



THIRD ANGLE
PROJECTION

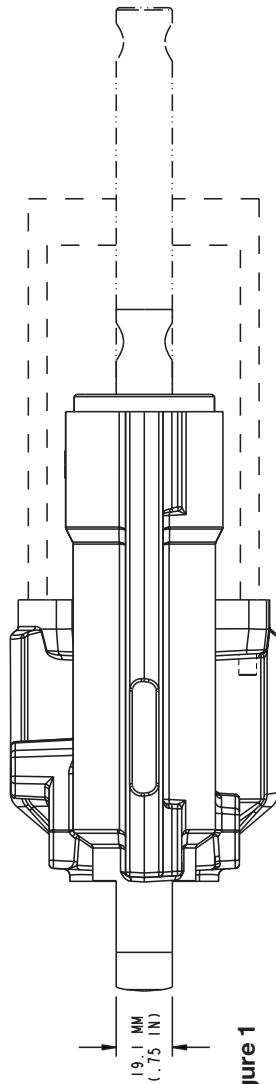


Figure 1

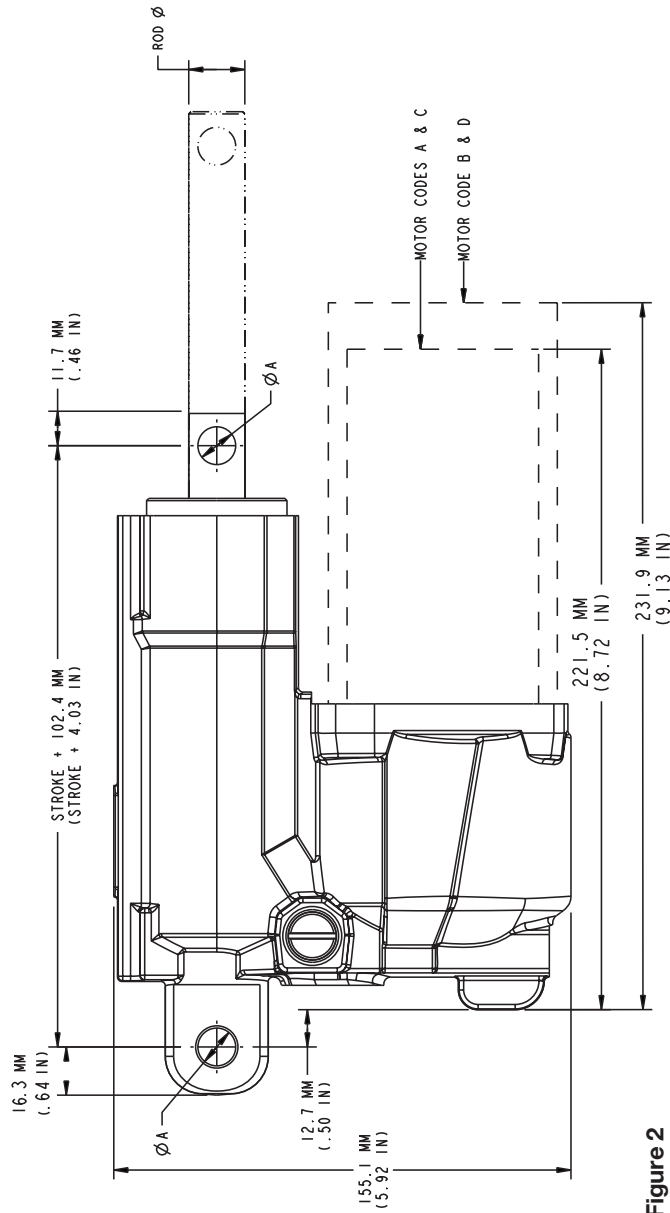


Figure 2

ADD 25.4 MM (1.0 IN) FOR 152MM OR 203 MM (6 IN OR 8 IN) STROKE.

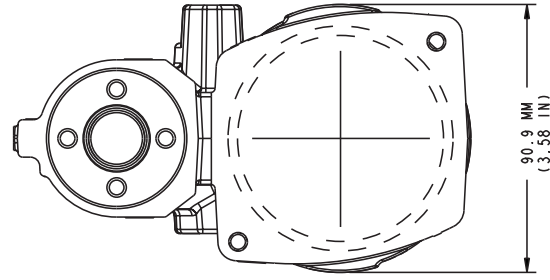


Figure 4

Figure 3

All dimensions are shown in millimetres (inches).

Installation

Locating EHA

The unit should preferably be installed indoors in a clean, dry environment with an ambient temperature of 16° to 37°C (60°F to 100°F).

Parker Oildyne products should not be installed where they are at risk of objects falling from overhead or where there is any risk of impact with external objects.

Mounting the Unit

Each Parker Compact EHA is designed to be mounted and connected in a specific way. Be sure to use the proper size mounting hardware to match the mate end on the rod or base end of the EHA.

Connect one end of the EHA unit to its corresponding mount on the machine.

The load must be supported by its own guidance system. The axis of the cylinder and that of the load should not be unduly displaced to ensure that there are no imposed side loads following installation or significant reaction forces of the cylinder. It is the user's responsibility to properly position the unit to keep the load in axial alignment with the center line of the EHA rod. The degree of accuracy needed will vary from unit to unit based on the configuration so every effort should be made to be as accurate as possible.

The unit should be positioned in the machine to ensure good ventilation.

For environmental protection a rubber gaiter or boot may be placed round the piston shaft. This serves to prevent access to the moving piston shaft but this is only an option. The provision of a rubber gaiter or boot for safety purposes is not mandatory. However it is recommended that a gaiter or boot might be fitted if the end user does not intend to provide any alternative form of protection such as guarding. The piston shaft is stainless steel and is resistant against wear. But, if a dusty environment is involved a gaiter or boot may still be used to protect seals.

If the unit has a yellow sticker designating "THIS SIDE UP" or "THIS END UP", make sure that the unit is mounted with that sticker up, or on top of the unit.

If the unit is mounted to the machine using bolts (user supplied), make sure to use the correct tightening torque to ensure a secure mounting and no damage to the hardware.

Electrical Service Connections

Connect the motor to the power source following good practices as outlined in the National Electric Codes and any local codes which may apply. Verify that the available Voltage is the same as the Voltage identified on the label. A **suggested** example for wiring is illustrated in **Figure 5**.

The blue lead (positive) extends the unit and green lead (positive) retracts the unit. Refer to **Figure 6** for wire colors and corresponding operation.

Once the motor is connected, extend or retract the unit to align the pin connection or specified mounting at the free end of the EHA with the machine mounting. Attach to the machine using appropriate mounting hardware.

The machine in which the EHA is incorporated should be bonded to earth. Each EHA unit must be bolted to the frame of the machinery in which it is incorporated. Therefore, if lightning strikes, this will immediately be returned to ground potential.

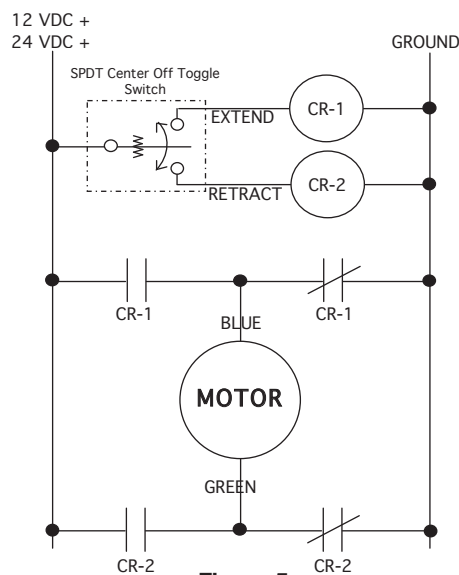


Figure 5

Function	Positive	Ground
Extend	Blue	Green
Retract	Green	Blue

Figure 6

Start-Up Procedures

Fuse protection can be added to the wiring circuit if desired. Use a slow blow fuse so it will not be tripped from the inrush current. Make sure the fuse is sized above the maximum requirement for the application and below the maximum available from the power supply. See **Figure 7** for approximations of maximum amperage based on basic configurations.

The following is the standard operation of the Parker Compact EHA and can be considered as a functional test for unit at the completion of installation or at any time during usage:

1. With the unit fully installed, actuate the extend switch for 2 seconds and release. The rod should stop and lock in position.
2. Press and hold the extend switch until the rod reaches the end of the stroke. When rod stops, release switch. The motor should turn off and the rod should lock in place.
3. Actuate the retract switch for 2 seconds and release. The rod should stop and lock in position.
4. Actuate the retract switch until the rod fully retracts into the cylinder. When rod stops, release switch. The motor should turn off and the rod should lock in place.

If required, any tests for radiated and conducted emissions should be performed in accordance with the Electromagnetic Compatibility (EMC) Generic Emission standards for environments appropriate to the end use product to confirm compliance with the EMC Directive.

If required, any tests for radiated and conducted immunity should be performed in accordance with the Electromagnetic Compatibility (EMC) Generic Immunity standard for environments appropriate to the end use product to confirm compliance with the EMC Directive.

Special Tools

No dismantling, service or maintenance is recommended for EHA so no special tools are required.

Safe Operating Procedures

Should a failure of the electrical power supply occur, power should not be returned to these power units without a conscious action by the operator.

The power switch must be de-activated once the rod reaches either end of stroke. If not, the pressure will build and run over the relief valve which may cause the motor to trip the thermal overload and shut down.

In the unlikely event of sound levels exceeding 70 dBA it is recommended that hearing protection should be worn. If sound levels exceed 80 dBA it is necessary to take measures to reduce sound levels. This is normally achieved by placing machinery in an acoustically lined enclosure.

Motor Voltages for EHA will be 12 VDC or 24 VDC. If these motors are operated at Voltages other than those specified, the life expectancy and safety of these units cannot be guaranteed.

Operating temperature requirements:
-34°C to +65°C (-30°F to +150°F)

The EHA unit must not be operated on a duty cycle or stroke frequency that exceeds those identified in Operation instructions. When necessary, cooling must be provided to ensure that the temperature of the internal fluids used never exceed suitable temperatures for operation.

The Parker Compact EHA can support a load for a finite time determined by the loads and operating conditions of the application. There is no guarantee that an EHA will hold a load indefinitely and some creep should be anticipated.

Removal From Service

If for some reason, the EHA must be removed from service, follow these instructions:

1. Wear protective eye gear.
2. Remove electrical power from the motor.
3. Mechanically hold or block the load held by the actuator should there be any movement once pressure is relieved.
4. Only after the load is mechanically held in place, remove the EHA.
5. When reinstalling the EHA, follow all the procedures and startup instructions given previously.

Operation

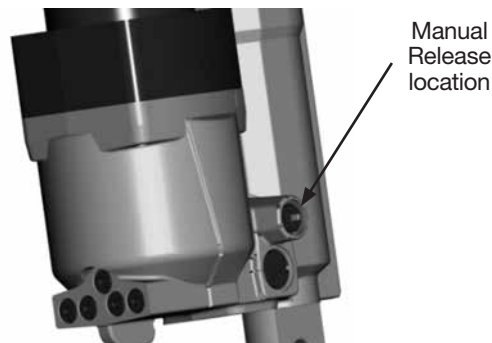
Suitable lighting requirements for operation of this unit are the responsibility of the machine manufacturer.

See **Figure 7** for performance curves to identify parameters of operation and **Figure 8** to identify motor duty cycle characteristics.

Operation of Manual Release Option

Manual release functionality is provided as an option for the Parker Compact EHA. This feature is intended for infrequent emergency use only. It is NOT intended to provide functionality for regular operation.

To engage the manual release, turn the assembly in a counter-clockwise direction using the slot on the end of the assembly. Turn the release until it cannot turn any more. This will release the pressure in the unit so that the actuator rod can be manually moved in and out.



To disengage the manual release and continue regular operation, turn the assembly in a clockwise direction until it won't go any further. Provide power to the motor, pressure will rebuild and the unit will operate as usual.



**THE PARKER COMPACT EHA
SHOULD NOT BE DISMANTLED.**

**Dismantling the Parker Compact EHA
will void any warranty.**

Maintenance

Maintenance should only be conducted when units are disconnected from their power supply.

Maintaining Proper Oil Temperature

Hot oil in your equipment's hydraulic system is one of the primary causes of poor operation, component failure and downtime. Here are some pointers on maintaining proper oil temperature.

1. The oil in your hydraulic system was designed for operation within a specified temperature range. You may be able to run it at hotter temperatures for short periods of time, intermittently, without adverse effects.
2. "Hot oil" is a relative term. In most cases, 49°C (120°F) at the reservoir is considered an ideal operating temperature.
3. Keep your equipment clean. A thick layer of dirt acts as insulation. It will prevent the hydraulic system from getting rid of heat.

Measuring Oil Temperature

Because your machine does not have a reservoir thermometer, use the "palm test". The reservoir is located adjacent to the motor. First check the reservoir with your fingertip; if it's not too hot to touch, place your palm on the reservoir. You'll be able to hold it there without discomfort if the oil temperature is about 55°C (130°F) or below.

The maximum force and speed available and Amperage draw on rod extend for different combinations of motor, pump and cylinder bore can be determined from the tables below:

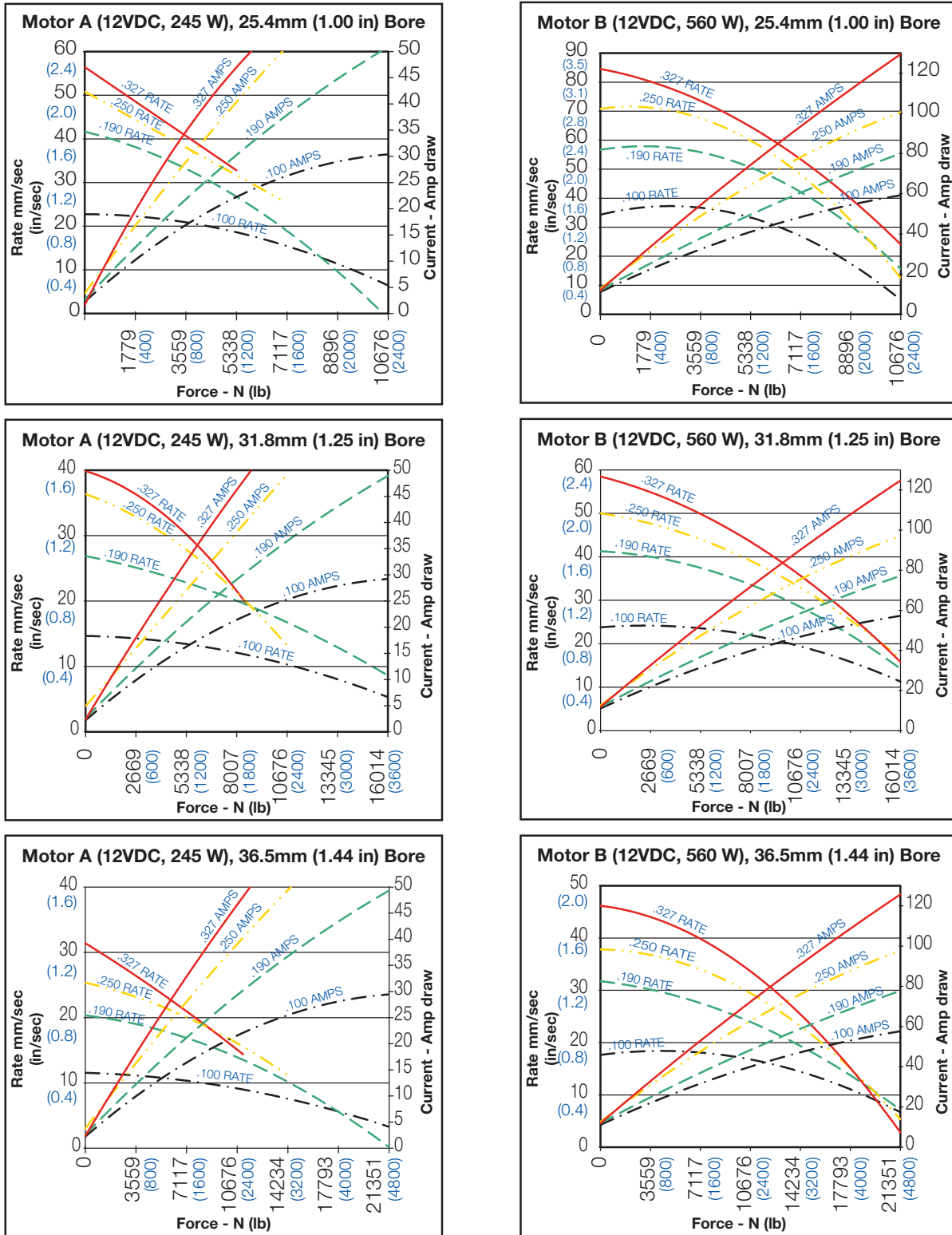


Figure 7

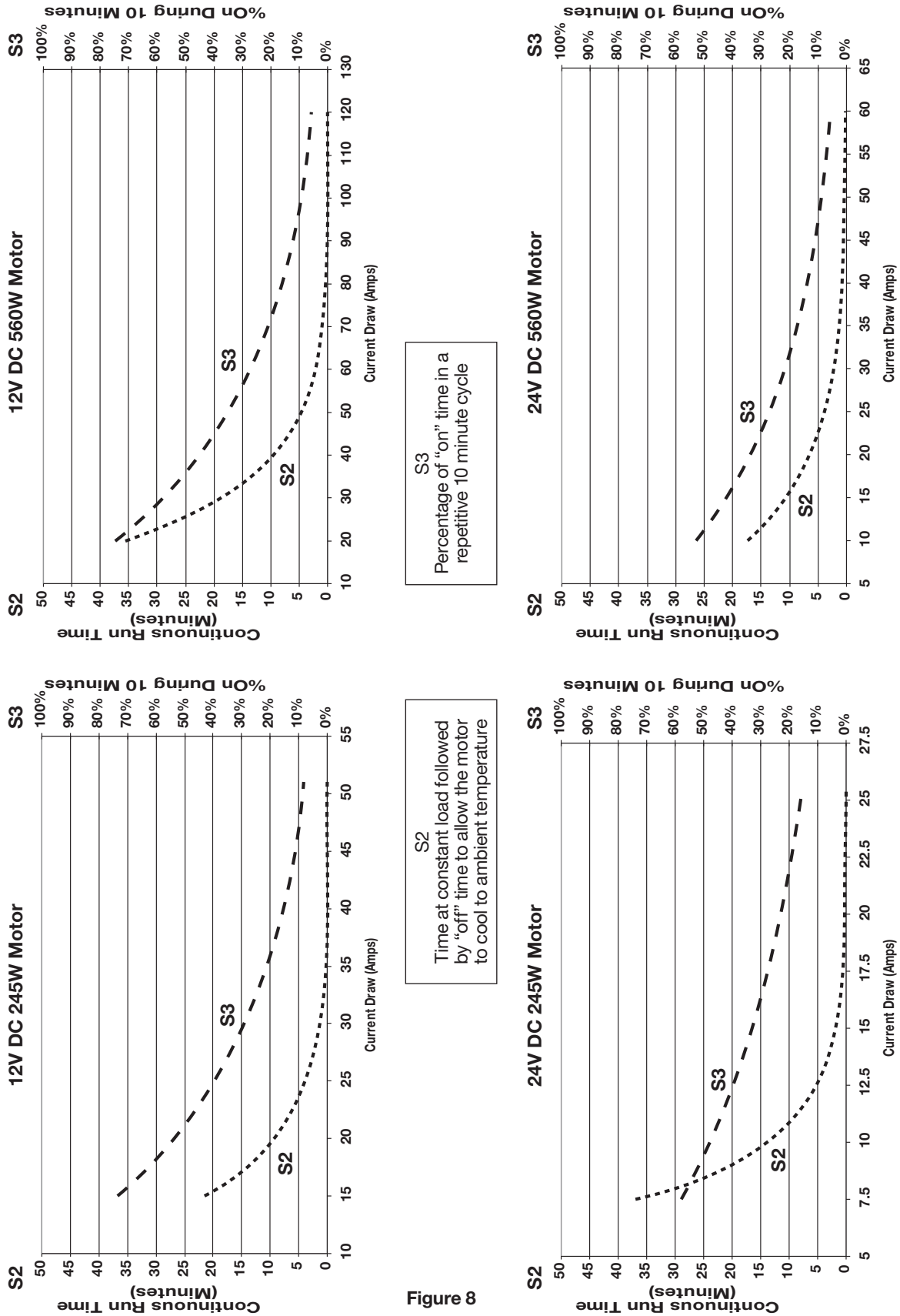
Current draw for Motor C (24VDC, 245 W) and Motor D (24VDC, 560 W) will be approximately ½ of Amp draw shown above.

Retract Forces: The maximum force available on **rod retract** is lower than on extend due to the presence of the piston rod which reduces the effective surface area of the piston. When the force required to retract the piston rod approaches that required for extend, please contact the factory.

Note: Performance data is based on **rod extend**, not retract, and is for reference only.



Standard Motor Duty Cycle Characteristics



Troubleshooting

Recommended Spare Parts

There are no recommended spare parts for the EHA as it is a sealed unit. Any warranty repair would be done at the Oildyne Division.

Troubleshooting

The information provided in this section will provide some ideas on how to resume normal operation given certain conditions.



Do not attempt to open the EHA unit to make internal adjustments or repairs; it will void the warranty on the unit.



The Parker Compact EHA is NOT field servicable.

Troubleshooting Areas

Unit fails to operate

1. Power source is not charged – recharge.
2. Amperage from power source is not sufficient to operate unit – use power supply with adequate Amperage to operate EHA.
3. Wiring harness from EHA motor is not securely fastened to power source or wiring – tighten connections to power source.
4. Motor has failed due to higher or more frequent duty cycle than the unit was intended for – replace unit.
5. Motor has run for an extended time and the internal thermal breaker tripped.

Unit slows during operation

1. Voltage from power source has changed – examine power supply for source of varying Voltage.
2. Unit is stalling due to high loads– reduce load against unit to the forces prescribed in the specifications.
3. Unit is mis-aligned and is causing side loading – cease operation until alignment is corrected.
4. The load is increased on the unit – this is to be expected.

Unit makes excessive noise

1. Operating temperature too low – operate EHA above -34°C (-30°F).
2. Unit is mounted in the wrong orientation – cease operation. Contact the factory.

Instruction Manual Compact EHA

Speed of unit varies during operation

Unit is being used with higher or lower Voltage than for which it is designed (12 VDC or 24 VDC) – cease operation. Use unit with power source of appropriate Voltage.

Rod stops moving

1. Power source has become disconnected – reconnect power source.
2. Motor thermal breaker has been tripped due to high temperature in the motor, causing motor to stop – allow motor to return to ambient temperature and restart operation.

Overheating of unit



Warning: If motor stops due to thermal overload, de-actuate the power switch. Otherwise, when the motor cools, it will start up again.

1. Continuous operation at relief setting – cease operation. Allow the unit to return to ambient temperature before resuming operation.
2. Stalling under load – cease operation. Ensure loads being moved are within the prescribed specifications outlined in this manual.
3. Improper air circulation around reservoir – relocate unit to area in assembly that will provide adequate air circulation to maintain the operating temperature range of -34°C to +65°C (-30°F to 150°F).
4. EHA operating in direct sunlight or ambient temperature is too high – move unit to location that will be lower than the specified maximum operating temperature of +65°C (+150°F).
5. EHA operating at a continuous duty cycle – cease operation. Discontinue use until required operation of the unit will fall within the duty cycle characteristics illustrated in **Figure 7**.

Should the user encounter any other conditions, please contact your local authorized Parker Oildyne distributor or the Oildyne Division directly for further information or to arrange for warranty replacement/repair if within the warranty period.

Conclusive Unit Failure

If the operation of the unit cannot be restored after attempts at the troubleshooting suggestions listed previously, please contact your local authorized Parker Oildyne distributor or the Oildyne Division directly to arrange for warranty replacement/repair if within the warranty period.

EC Declaration of Incorporation.**Manufacturer's Name:** Parker Hannifin Corporation**Manufacturer's Address:** Oildyne Division
5520 Highway 169 North
New Hope, MN 55428 USA

Declare that the partially complete machinery described below conforms to applicable health and safety requirements of Part 1 of Annex 1 of Machinery Directive 2006/42/EC taking full account of requirements for pressure equipment. This partly completed machinery must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the Machinery Directive. Confidential technical documentation has been compiled as described in Part B of Annex VII of Machinery Directive 2006/42/EC and is available to European national authorities on written request. If a request is received documentation will be transmitted either electronically or by post.

Description: Compact Electro-Hydraulic Actuator (EHA)**Model Number:** All**Sizes:** All**Serial Number:** All

The following standards have either been referred to or complied with in part or in full as relevant:

- | | | |
|----------------------------------|---|---|
| ENISO 12100 – 2 Machinery Safety | - | Basic concepts, general principles for design
– Part 2: Technical principles and specifications. |
| EN13849 Machinery Safety | - | Safety Related Parts of Control Systems – Part 1: General Principles for Design. |
| EN 982:1996Machinery Safety | - | Safety requirements for fluid power systems and their components – Hydraulics. |

Full Name of responsible person Van Mancuso**Place of signing:**Parker Hannifin Corporation
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5520 Highway 169 North
New Hope, MN 55428 USA**Position** General Manager**Signature****Date** March 17, 2011**Full Name of Authorized European Representative** Stephen Fryer**Place of signing:**Parker Hannifin Ltd.
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