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 Parker Hannifin Corporation, 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 system 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 Parker Hannifin Corporation and its subsidiaries at any time without notice.

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PS1E Series
Electro-pneumatic Interface Valves

Section B

Features ................................................................. B2-B3
Complete Units ....................................................... B4
Component Parts .................................................... B5
Technical Data, Dimensions ..................................... B6
Kits & Accessories ................................................. B7
Compact, easy to install, reliable...

Easy To Meet System Design Needs
- Full flow capacity allows direct operation of small cylinders (single or double acting) or pneumatic piloting of larger control valves (pneumatic or hydraulic).
- Valve configurations in 3/2 or 4/2 (single or double acting).
- Outlet fittings (push-in) for 5/32" or 1/4" tubing.
- System modification or expansion simplified by easily adding modules to stack.
- Wide range of voltages available.
- Multiple pressures possible in one assembly.

Easy To Install In Your System
- Modules snap together and mount on 35mm (DIN) rail.
- Micro-valve stack and PLC may be mounted in the same enclosure.
- Common air supply, exhaust, and electrical supply reduce connections to 1 wire and 1 tube per module.
- Supply and exhaust air can be piped with only one tube for each.
- Fast hook-up with captive wire clamp connections and push-in fittings.
- Compatible pneu-electric module provides integrated feedback capability for the PLC.
- Eliminates cumbersome electrical connections on machine mounted solenoid valves.

Easy To Maintain System Operation
- Manual override for setup and troubleshooting.
- Poppet design for long, trouble free life (lubricated or non-lubricated air).
- Integrated diagnostics (main air test point, output pneumatic indicator, optional suppressor / LED) provide system status at a glance.
- All electrical connections are in a protected enclosure.
- Modular design and easy connection aid in module replacement or system expansion.
Caution: Because these are poppet valves, the common air supply pressure must be built up rapidly (never use a slow start valve 2/2 on the air supply for the interfaces).

When pressure is applied, the 4/2 valve takes up a predetermined position (unactuated) when no electrical signal is present.

- Output 2 (yellow indicator) passing.
- Output 4 (red indicator) non-passing.
All units include pop-up indicator for pneumatic output. Red indicates NNP / NC function. Yellow indicates NP / NO function. All model numbers shown include non-locking manual override. (For other voltages, use component parts shown on next page).

### Assembled Units

#### Single Solenoid - Spring Return 3/2 -
- **Voltage**: 12V DC
- **Output Port Push-In Connection Size**: 5/32" (4 mm) Tube
- **Weight**: 0.21 lb (0.095 kg)

#### Double Solenoid 4/2
- **Voltage**: 12V DC
- **Output Port Push-In Connection Size**: 5/32" (4 mm) Tube
- **Weight**: 0.45 lb (0.205 kg)

### Valves Without Solenoid Operators

#### Output Port Push-In Connection Size

<table>
<thead>
<tr>
<th>Size</th>
<th>5/32&quot; (4mm) Tube</th>
<th>6mm Tube</th>
<th>1/4&quot; Tube</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS1E111</td>
<td>PS1E116</td>
<td>PS1E1167</td>
<td></td>
</tr>
</tbody>
</table>

#### Head and Tail Sets

Used to mount valves to DIN rail and provide supply and exhaust ports. All hardware is included.

- Single supply type supplies from one end of the manifold assembly with the other end blocked.
- Double supply type provides pressure and exhaust ports on both ends of the assembly.

### Intermediate Supply Module - PS1E10387

1/8" Pipe port for supply and exhaust ports.

Allows replenishment or isolation of the supply and / or exhaust ports using included plugs.

- **Weight**: 0.28 lb (0.125 kg)
Line Mounted Pressure Switch
Includes pop-up indicator to show presence of pressure.
Includes Clip for mounting on 35mm DIN Rail.
1 SPDT Contact
5A 250V
5/32 (4 mm) Push-In Tubing Port
8mm Pin Spacing

<table>
<thead>
<tr>
<th>Switching Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 PSIG Fixed</td>
</tr>
<tr>
<td>30 - 75 Adjustable</td>
</tr>
<tr>
<td>PS1P1081</td>
</tr>
<tr>
<td>PS1P1091</td>
</tr>
</tbody>
</table>

Wt: 0.11 lb (0.050 kg)

Plug-In Solenoid Operators
15mm Solenoids / Kits
(8mm Pin Spacing) DIN 43650C

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Non-Locking Kit</th>
<th>Replacement Solenoid</th>
<th>Locking Kit</th>
<th>Replacement Solenoid</th>
</tr>
</thead>
<tbody>
<tr>
<td>12VDC</td>
<td>PS3441B45P</td>
<td>P2E-KS32B1</td>
<td>PS3441C45P</td>
<td>P2E-KS32B2</td>
</tr>
<tr>
<td>24VDC</td>
<td>PS3441B49P</td>
<td>P2E-KS32C1</td>
<td>PS3441C49P</td>
<td>P2E-KS32C2</td>
</tr>
<tr>
<td>24V 50/60Hz</td>
<td>PS3441B42P</td>
<td>P2E-KS31C1</td>
<td>PS3441C42P</td>
<td>P2E-KS31C2</td>
</tr>
<tr>
<td>120V 60Hz</td>
<td>PS3441B53P</td>
<td>P2E-KS31F1</td>
<td>PS3441C53P</td>
<td>P2E-KS31F2</td>
</tr>
</tbody>
</table>

Kit includes: solenoid, (2) machine screws, (2) self threading screws, (1) gasket, (1) 3-cell gasket, (1) L-shaped 3-cell gasket.

Plug-In Solenoid Operators
(9.4mm Pin Spacing) For Older Version
(Replacement Parts Only)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12 VDC</td>
<td>1.2W</td>
<td>—</td>
<td>PS1E2302J</td>
<td>PS1E2352J</td>
</tr>
<tr>
<td>24 VDC</td>
<td>1.2W</td>
<td>5</td>
<td>PS1E2302B</td>
<td>PS1E2352B</td>
</tr>
<tr>
<td>48 VDC</td>
<td>1.2W</td>
<td>2.5</td>
<td>PS1E2302E</td>
<td>PS1E2352E</td>
</tr>
<tr>
<td>24 V 50-60 Hz</td>
<td>1.6VA**</td>
<td>22</td>
<td>PS1E2301B</td>
<td>PS1E2351B</td>
</tr>
<tr>
<td>48 V 50-60 Hz</td>
<td>1.6VA**</td>
<td>12</td>
<td>PS1E2301E</td>
<td>PS1E2351E</td>
</tr>
<tr>
<td>120V 60Hz / 115V 50Hz</td>
<td>1.6VA**</td>
<td>5</td>
<td>PS1E2301F</td>
<td>PS1E2351F</td>
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</table>

** 3.5VA Inrush
* The solenoid valves are programmable controller compatible provided that leakage currents of the PLC outputs are lower than the drop-out current value.

** 3.5VA Inrush
Weight: 0.10 lb (0.043 kg)
**Valve Specifications**

- **Body Material**: Glass Filled Polyamide
- **Electrical Connection**: Captive Wire Clamp
- **LED / Noise Suppressor**
  - 120/240VAC LED Only (No noise suppressor)
  - Combination LED (green) and zener diode
- **Life Expectancy**: 10 Million Operations
- **Maximum Operating Frequency**: 10 Hz
- **Medium Quality**
  - Standard shop air, lubricated or non-lubricated, 50µ filtered
- **Mounting**: 35mm (DIN) Rail
- **Operating Medium**: Compressed air
- **Operating Pressure Range**: 40 to 120 PSI (3 to 8 bar)
- **Operating Principal**
  - Solenoid Pilot Operated Poppet Valve
- **Operating Temperature Range**: 5° to 140°F (-15° to 60°C)

**Pressure Switch Specifications**

- **Body Material**: Glass Filled Polyamide
- **Contact Material**: Silver
- **Contact Rating**: 10A / 250VAC
- **Maximum Operating Frequency**: 10 Hz
- **Mechanical Life**: 30 million operations
- **Operating Pressure Range**
  - Fixed Pressure: 19 to 120 PSI (1.3 to 8 bar)
  - Adjustable Pressure: 30 to 120 PSI (2 to 8 bar)
- **Operating Temperature Range**: 5° to 140°F (-15° to 60°C)
- **Operating Principal**: Pressure Operated Micro Switch
- **Seal Material**
  - Poppet: Polyurethane
- **Seals**
  - Nitrile (Buna N)
- **Switch Pressure**
  - Fixed Pressure: >19 PSI (>1.3 bar)
  - Adjustable Pressure: 30 to 75 PSI (2 to 5 bar)

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**Contact life**

<table>
<thead>
<tr>
<th>Contact Life</th>
<th>AC 24V</th>
<th>48V</th>
<th>120V</th>
<th>240V</th>
<th>DC 12V</th>
<th>24V</th>
<th>48V</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Million Operations</td>
<td>Inductive</td>
<td>25</td>
<td>56</td>
<td>115</td>
<td>140</td>
<td>17</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Resistive</td>
<td>86</td>
<td>190</td>
<td>370</td>
<td>440</td>
<td>42</td>
<td>58</td>
</tr>
<tr>
<td>2 Million Operations</td>
<td>Inductive</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Resistive</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>30</td>
<td>43</td>
</tr>
<tr>
<td>5 Million Operations</td>
<td>Inductive</td>
<td>10</td>
<td>14</td>
<td>19</td>
<td>21</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Resistive</td>
<td>35</td>
<td>82</td>
<td>160</td>
<td>200</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Dimensions**

- **3/2 and Single Head and Tail Set**
  - Electrical Common
  - 3.07 (78) 0.35 (9) 2.99 (76) 1.26 (32) 0.69 (17.5) 0.69 (17.5) 0.55 (14)

- **4/2 and Double Head and Tail Set**
  - LED (Optional)
  - 3.07 (78) 0.35 (9) 3.07 (78) 1.26 (32) 1.26 (32) 1.38 (35) 1.38 (35) 1.38 (35) 1.57 (40) 0.69 (17.5)

- **35mm (DIN) Rail**
  - 3.07 (78) 0.69 (17.5) 0.69 (17.5) 0.60 (15) 2.18 (55)

- **Intermediate Module**
  - 3.07 (78) 0.69 (17.5) 0.69 (17.5) 1.38 (35) 1.38 (35) 1.38 (35) 1.57 (40) 0.69 (17.5)

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*Rail at less than 0.6” does not allow enough room for mounting clips and may cause air leaks.*
Suppressor and LED Indicators for PS1E
Mount between Solenoid Valve and the Interface Module

![Circuit Diagram]

PS1E Series Electro-pneumatic Interface Valves

Marking Accessories
To be used in place of Write-On Marking Tabs

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Voltage Description</th>
<th>Part Number</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indication by LED</td>
<td>24 VDC and 50/60 Hz</td>
<td>P8V-CR26C</td>
<td>.022</td>
</tr>
<tr>
<td></td>
<td>48 VDC and 50/60 Hz</td>
<td>P8V-CR26D</td>
<td>.022</td>
</tr>
<tr>
<td>Sold in Lots of 5</td>
<td>115 V / 50 Hz 120 V / 60 Hz</td>
<td>P8V-CR24F</td>
<td>.028</td>
</tr>
<tr>
<td></td>
<td>230 V / 50 Hz 240 V / 60 Hz</td>
<td>P8V-CR24J</td>
<td>.028</td>
</tr>
</tbody>
</table>

Clip-On Marker Strips

| Strip of 10 Identical Numerals (State the Number required) | AB1-R* |
| Strip of 10 Identical Letters (State the Letter required)  | AB1-G* |
| Strip of 10 - Signs*                                      | AB1-R13 |

*Sold in Lots of 25 Strips of 10 Markers

Spare Parts

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 lot of 100 O-ring Seals Between Modules (Pressure - Exhaust)</td>
<td>PPR-L12</td>
</tr>
<tr>
<td>1 lot of 50 Seals Between Modules 3/2 or 4/2 and Coil PS1-E23</td>
<td>PPR-L13</td>
</tr>
<tr>
<td>- 25 Seals (Type A) for Modules 3/2 and 4/2 Bistable</td>
<td></td>
</tr>
<tr>
<td>- 25 Seals (Type B) for Modules 4/2 Monostable and Bistable</td>
<td></td>
</tr>
</tbody>
</table>
1. GENERAL INSTRUCTIONS

1.1. Scope: This safety guide is designed to cover general guidelines on the installation, use, and maintenance of Pneumatic Division Valves, FRLs (Filters, Pressure Regulators, and Lubricators), Vacuum products and related accessory components.

1.2. Fail-Safe: Valves, FRLs, Vacuum products and their related components can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of associated valves, FRLs or Vacuum products will not endanger persons or property.


1.4. Distribution: Provide a copy of this safety guide to each person that is responsible for selection, installation, or use of Valves, FRLs or Vacuum products. Do not select, or use Parker valves, FRLs or vacuum products without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.

1.5. User Responsibility: Due to the wide variety of operating conditions and applications for valves, FRLs, and vacuum products Parker and its distributors do not represent or warrant that any particular valve, FRL or vacuum product is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:
   • Making the final selection of the appropriate valve, FRL, Vacuum component, or accessory.
   • Assuring that all user’s performance, endurance, maintenance, safety, and warning requirements are met and that the application presents no health or safety hazards.
   • Complying with all existing warning labels and / or providing all appropriate health and safety warnings on the equipment on which the valves, FRLs or Vacuum products are used; and,
   • Assuring compliance with all applicable government and industry standards.

1.6. Safety Devices: Safety devices should not be removed, or defeated.

1.7. Warning Labels: Warning labels should not be removed, painted over or otherwise obscured.

1.8. Additional Questions: Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the product being considered or used, or call 1-800-CPARKER, or go to www.parker.com, or telephone numbers of the appropriate technical service department.

2. PRODUCT SELECTION INSTRUCTIONS

2.1. Flow Rate: The flow rate requirements of a system are frequently the primary consideration when designing any pneumatic system. System components need to be able to provide adequate flow and pressure for the desired application.

2.2. Pressure Rating: Never exceed the rated pressure of a product. Consult product labeling, Pneumatic Division catalogs or the instruction sheets supplied for maximum pressure ratings.

2.3. Temperature Rating: Never exceed the temperature rating of a product. Excessive heat can shorten the life expectancy of a product and result in complete product failure.

2.4. Environment: Many environmental conditions can affect the integrity and suitability of a product for a given application. Pneumatic Division products are designed for use in general purpose industrial applications. If these products are to be used in unusual circumstances such as direct sunlight and/or corrosive or caustic environments, such use can shorten the useful life and lead to premature failure of a product.

2.5. Lubrication and Compressor Carryover: Some modern synthetic oils can and will attack nitrile seals. If there is any possibility of synthetic oils or greases migrating into the pneumatic components check for compatibility with the seal materials used. Consult the factory or product literature for materials of construction.

2.6. Polycarbonate Bowls and Sight Glasses: To avoid potential polycarbonate bowl failures:
   • Do not locate polycarbonate bowls or sight glasses in areas where they could be subject to direct sunlight, impact blow, or temperatures outside of the rated range.
   • Do not expose or clean polycarbonate bowls with detergents, chlorinated hydro-carbons, ketones, esters or certain alcohols.
   • Do not use polycarbonate bowls or sight glasses in air systems where compressors are lubricated with fire resistant fluids such as phosphate ester and di-ester lubricants.
2.7. Chemical Compatibility: For more information on plastic component chemical compatibility see Pneumatic Division technical bulletins Tec-3, Tec-4, and Tec-5

2.8. Product Rupture: Product rupture can cause death, serious personal injury, and property damage.
   - Do not connect pressure regulators or other Pneumatic Division products to bottled gas cylinders.
   - Do not exceed the maximum primary pressure rating of any pressure regulator or any system component.
   - Consult product labeling or product literature for pressure rating limitations.

3. PRODUCT ASSEMBLY AND INSTALLATION INSTRUCTIONS

3.1. Component Inspection: Prior to assembly or installation a careful examination of the valves, FRLs or vacuum products must be performed. All components must be checked for correct style, size, and catalog number. DO NOT use any component that displays any signs of nonconformance.

3.2. Installation Instructions: Parker published Installation Instructions must be followed for installation of Parker valves, FRLs and vacuum components. These instructions are provided with every Parker valve or FRL sold, or by calling 1-800-CPARKER, or at www.parker.com.

3.3. Air Supply: The air supply or control medium supplied to Valves, FRLs and Vacuum components must be moisture-free if ambient temperature can drop below freezing.

4. VALVE AND FRL MAINTENANCE AND REPLACEMENT INSTRUCTIONS

4.1. Maintenance: Even with proper selection and installation, valve, FRL and vacuum products service life may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a component failure, and experience with any known failures in the application or in similar applications should determine the frequency of inspections and the servicing or replacement of Pneumatic Division products so that products are replaced before any failure occurs. A maintenance program must be established and followed by the user and, at minimum, must include instructions 4.2 through 4.10.

4.2. Installation and Service Instructions: Before attempting to service or replace any worn or damaged parts consult the appropriate Service Bulletin for the valve or FRL in question for the appropriate practices to service the unit in question. These Service and Installation Instructions are provided with every Parker valve and FRL sold, or are available by calling 1-800-CPARKER, or by accessing the Parker web site at www.parker.com.


4.4. Visual Inspection: Any of the following conditions requires immediate system shut down and replacement of worn or damaged components:
   - Air leakage: Look and listen to see if there are any signs of visual damage to any of the components in the system. Leakage is an indication of worn or damaged components.
   - Damaged or degraded components: Look to see if there are any visible signs of wear or component degradation.
   - Kinked, crushed, or damaged hoses: Kinked hoses can result in restricted air flow and lead to unpredictable system behavior.
   - Any observed improper system or component function: Immediately shut down the system and correct malfunction.
   - Excessive dirt build-up: Dirt and clutter can mask potentially hazardous situations.

Caution: Leak detection solutions should be rinsed off after use.

4.5. Routine Maintenance Issues:
   - Remove excessive dirt, grime and clutter from work areas.
   - Make sure all required guards and shields are in place.

4.6. Functional Test: Before initiating automatic operation, operate the system manually to make sure all required functions operate properly and safely.

4.7. Service or Replacement Intervals: It is the user’s responsibility to establish appropriate service intervals. Valves, FRLs and vacuum products contain components that age, harden, wear, and otherwise deteriorate over time. Environmental conditions can significantly accelerate this process. Valves, FRLs and vacuum components need to be serviced or replaced on routine intervals. Service intervals need to be established based on:
   - Previous performance experiences.
   - Government and / or industrial standards.
   - When failures could result in unacceptable down time, equipment damage or personal injury risk.

4.8. Servicing or Replacing of any Worn or Damaged Parts: To avoid unpredictable system behavior that can cause death, personal injury and property damage:
   - Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
   - Disconnect air supply and depressurize all air lines connected to system and Pneumatic Division products before installation, service, or conversion.
   - Installation, servicing, and / or conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
   - After installation, servicing, or conversions air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or if the product does not operate properly, do not put product or system into use.
   - Warnings and specifications on the product should not be covered or painted over. If masking is not possible, contact your local representative for replacement labels.

4.9. Putting Serviced System Back into Operation: Follow the guidelines above and all relevant Installation and Maintenance Instructions supplied with the valve FRL or vacuum component to insure proper function of the system.
1. Definitions. As used herein, the following terms have the meanings indicated.

Buyer: means any customer receiving a Quote for Products from Seller.

Goods: means any tangible part, system, or component to be supplied by Seller.

Products: means the Goods, Services and/or Software as described in a Quote provided by the Seller.

Price: means the offer or proposal made by Seller to Buyer for the supply of Products.

Seller: means Parker-Hannifin Corporation, including all divisions and businesses theretofore and hereafter doing business under the Parker-Hannifin name.

Services: means any services to be supplied by the Seller.

Software: means any software related to the Products, whether embedded or separately downloaded.

Terms: means the terms and conditions of this Offer of Sale or any newer version of the same as published by Seller electronically at www.parker.com/saleterms.

2. Terms. All sales of Products by Seller are contingent upon, and will be governed by, these Terms and, these Terms are incorporated into any Quote provided by Seller to any Buyer. Buyer’s order for any Products whether communicated to Seller verbally, in writing, by electronic data interface or other electronic means, is irrevocable and binding upon Seller at the time indicated in Seller’s Quote. Unless otherwise specifically stated in Seller’s Quote, prices are valid for a period of thirty (30) days from the date of the Offer of Sale. Buyer may not modify any Offer of Sale or price quoted by Seller, and Seller retains the right to modify prices at any time to adjust for any raw material price fluctuations. Unless otherwise specified by Seller, all prices are F.C.A. Seller’s facility (INCOTERMS 2010). All sales are contingent upon Buyer’s timely payment for all purchases.

3. Price; Payment. The Products set forth in Seller’s Quote are offered for sale at the prices indicated in Seller’s Quote. Unless otherwise specifically stated in Seller’s Quote, prices are valid for thirty (30) days and do not include taxes, duties, or other charges. Seller reserves the right to modify prices at any time to adjust for any raw material price fluctuations. Unless otherwise specified by Seller, all prices are F.C.A. Seller’s facility (INCOTERMS 2010). All sales are contingent upon Buyer’s timely payment for all purchases.

4. Warranty. The warranty related to the Products is as follows: (i) Goods are warranted against defect in material or workmanship for a period of twelve (12) months from the date of delivery or 2,000 hours of use, whichever occurs first; (ii) Services are warranted in accordance with generally accepted practices and are subject to the normal wear and tear in the course of their use; and (iii) Software is warranted for a period of sixty (60) days from the date of delivery or use, whichever occurs first.

5. Cancellations and Changes. Buyer shall promptly inspect all Products upon receipt. No claims for shortages will be allowed unless reported to Seller within ten (10) days of delivery. Buyer shall notify Seller of any alleged breach of warranty within thirty (30) days after the date of delivery.

6. Limitation of Liability. In the event of a breach of warranty, Seller will, at its option, repair or replace the non-conforming product, re-perform the services, or refund the purchase price paid within a reasonable period of time. In no event is Seller liable for any special, incidental, indirect or consequential damages arising out of, or as the result of, the sale, delivery, non-delivery, services, or the use of, or inability to use the products or any part thereof, loss of data, identity, privacy, or confidentiality, or for any charges or expenses of any nature incurred without the written consent of Seller. The foregoing does not affect Seller’s liability for defects in material or workmanship for a period of twelve (12) months from the date of delivery or 2,000 hours of use, whichever occurs first.

7. Payment. Payment terms are as set forth in Seller’s Quote. Unless otherwise specifically stated in Seller’s Quote, prices are valid for a period of thirty (30) days from the date of the Offer of Sale. Buyer may not modify any Offer of Sale or price quoted by Seller, and Seller retains the right to modify prices at any time to adjust for any raw material price fluctuations.

8. Loss to Buyer’s Property. Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items or persons to be purchased or ordered therefor or in connection with the manufacture or sale of the Products shall be owned by Buyer and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts constructed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to the sale and delivery of the Products.

9. Export Laws. Buyer acknowledges that it is familiar with all applicable provisions of the FCPA, the Anti-Kickback Act, Export Laws, the FDA and the FDA and certifies that Buyer will adhere to the requirements thereof. Buyer acknowledges that Buyer will not make any payment or give anything of value, directly or indirectly, to any government or political official, representative of a foreign government, agent of a government or any other person, whether in the foreign or domestic government, in an attempt to influence in any manner, directly or indirectly, the awarding of any business or commercial entity or person, for any improper purpose, including the purpose of influencing such person to purchase Products or otherwise benefit the business of Seller.

10. Security Interests. To secure payment of all sums due, Seller retains a security interest in all Products delivered to Buyer and, Buyer’s acceptance of these Terms is deemed to be a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer’s behalf all documents Seller deems necessary to perfect its security interest.

11. User Responsibility. The Buyer through its own analysis and testing, is solely responsible for making the final selection of the Products and ensuring that all performance, endurance, maintenance, safety and warning requirements of the application of the Products are met. The Buyer must analyze all aspects of the application and follow applicable industry standards, specifications, and other regulations in connection with the use of the Products. The Buyer may not resell the Products for any products prohibited in Seller’s instructions, guides or specifications. Buyer otherwise fails to comply with Seller’s instructions, guides and specifications. Buyer acknowledges that such restrictions are reasonable, necessary and for the purpose of protecting Buyer and its employees, or any other person, arising out of: (a) improper selection, application, design, specification or other misuse of Products provided by Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller’s use of services, equipment, supplies or materials designed, prepared, or selected by Buyer; or (d) things furnished by Buyer; (d) damage to the Products from an external cause, repair or attempted repair by anyone other than Seller, failure to follow instructions, guides and specifications provided by Seller, or Buyer’s failure to follow proper instructions or procedures for the Product.

12. Force Majeure. Seller does not assume the risk and is not liable for delay or failure to perform any of Seller’s obligations by reason of events or circumstances beyond its reasonable control (“Events of Force Majeure”). Events of Force Majeure include but are not limited to: strikes or labor disputes, acts of government or government agency, acts of nature, delays or failures in delivery of carriers or suppliers, shortages of materials, or any other cause beyond Seller’s control.

13. Cancellations and Changes. Buyer may not cancel or modify any order for any reason, except with Seller’s written consent or upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller, at any time, may change price, terms of purchase, or cancel this Quote provided by the Seller.

14. Limitation on Assignment. Buyer may not assign its rights or obligations without the prior written consent of Seller.

15. Indemnity for Infringement of Intellectual Property Rights. Buyer is not liable for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights ("Intellectual Property Rights") except as provided in this Section. Seller will defend and indemnify Buyer from any infringement claim of any such claims of infringement of Intellectual Property Rights by a third party in the country of delivery of the Products by the Seller to the Buyer.

16. Governing Law. These Terms and the sale and delivery of all Products are deemed to have taken place in the State of Ohio and shall be governed and construed in accordance with the laws of the State of Ohio as applicable to contracts constructed and wholly performed therein and without regard to conflicts of laws principles.

17. Entire Agreement. These Terms, along with the terms set forth in the main body of a Quote and these Terms, the terms set forth in the main body of the Quote shall prevail. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter of these Terms shall have no effect. These Terms may not be modified unless written and signed by an authorized representative of Seller.