Lucifer® EPP4 Electronic Proportional Regulator
Catalog 0728P
\textbf{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.

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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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# Lucifer® EPP4 Electronic Proportional Regulator

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Lucifer® EPP4
Programmable Pressure Regulator

EPP4 is an electronic proportional regulator. Pulsed width modulated solenoid valves control the output pressure proportionally to an analog input signal.

Very high accuracy is guaranteed thanks to a high precision closed loop signal provided by a built-in pressure sensor.

Market
Buildings
Instrumentation
Machine tools
Mobile
Paper industry
Robotics
Semi conductor
Textile

Description of Applications
Adaptive suspension control cutting
Humidification
Painting
Polishing
Presses
Sanding
Speed and brake control
Tension regulation
Welding
Value Propositions for the Lucifer® EPP4 Proportional Pressure Regulators

- All parameters fully adjustable through the PC software Calys
- Easy to use software
- Long life expectancy
- Compact and light
- Limited inventory
- Low power
- Flexible remote display positioning
- Proven expertise of Parker, a pioneer in pressure regulation technology

Calys Software - for EPP4

Calys is a free software developed to configure all the parameters of the EPP4. To use CALYS, communications cable number 496449 is required. This cable permits the communication between the EPP4 and a PC.

Calys offers many capabilities:
- Recording of parameters in excel file, live monitoring, adjustment of pressure ranges and control signal (0-10 V or 4-20 mA), adjustable alarms (pressure and timing limits), complete and interactive help files, etc.
- Engineers designing a pneumatic system are able to monitor precisely all the important values (electrical or pneumatic) directly on their laptop.
- Technicians are able to receive via email all the parameters measured by the EPP4 installed on a machine, wherever its location, allowing remote maintenance operation.
- PID regulation parameters can be adjusted with Calys to match required regulator response (like slow or reactive).
Lucifer® EPP4 Introduction

Description Operation

The EPP4 Series is a family of electrically remote-controlled pneumatic pressure regulators with closed loop integrated electronic control.

It allows regulating the outlet pressure proportionally to an electrical control signal.

The EPP4 regulator comprises a traditional servo-operated pneumatic pressure regulator, where the pilot chamber is fed by one or the other of two pulse width modulated 2-way solenoid valves.

The pressure sensor measures the outlet pressure of the regulator and provides a feedback signal to the controller.

Any difference between the control signal and the feedback signal is converted to a digital signal to energize the coil of one or the other 2-way valves to correct the position of the regulator.

The control signal comes standard as voltage (0-10 V) or a current (4-20 mA). The inlet of the “Filling Valve” is connected directly to the main inlet P of the regulator; when energized this valve will fill the servo-chamber for increasing the pressure at the outlet A of the regulator.

When the other “exhaust valve” is energized (reduction of pressure at the outlet A of the regulator), the pressure of the servo-chamber will be exhausted through a discharge orifice located between the cover and the body and directly fed to the atmosphere without silencer.

The exhaust of the main regulated pressure will be made through the quick exhaust R.

The use of a conventional silencer is recommended.

Both solenoid valves assure the Filling or Emptying of the servo-chamber in order to increase or decrease the pressure at the outlet of the regulator.

In rest position of the valves, all ports are blocked.
Block Diagram

The controller receives both the control signal (set pressure) and the feedback signal from the sensor (outlet pressure).

Any difference between the two amplifier inputs results in a corresponding output which drives the appropriate 2-way pulse width modulated solenoid valve so that the pilot piston moves to correct the pressure.

The same feedback signal from the sensor is used for the output feedback in voltage and current. The digital signal (alarm) is activated when the conditions (out of pressure or time tolerance) are met.

EPP4 Possible Executions

EPP4 regulators have a second M12 connector, that can be used to connect a remote display showing the current regulated pressure, or a PC to easily set the regulation’s parameters. These are the key feature options for a comfortable use.

The B connector offers connection to the remote display or the PC.
**Lucifer® EPP4 1/4"**, **1/2"** & **1/2" HP**

**Common Part Numbers**

<table>
<thead>
<tr>
<th>Part number</th>
<th>Pipe</th>
<th>Max inlet pressure bar (PSIG)</th>
<th>Pressure range bar (PSIG)</th>
<th>Control signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>P4CN2001C001</td>
<td>1/4 NPT</td>
<td>1 to 12 (15 to 174)</td>
<td>0 to 10 (0 to 145)</td>
<td>0 to 10 V **</td>
</tr>
<tr>
<td>P4CN4001C001</td>
<td>1/2 NPT</td>
<td>1 to 12 (15 to 174)</td>
<td>0 to 10 (0 to 145)</td>
<td>0 to 10 V **</td>
</tr>
<tr>
<td>P4CG4201D003†</td>
<td>1/2 BSPP</td>
<td>1 to 21 (15 to 305)</td>
<td>0 to 20 (0 to 290)</td>
<td>0 to 10 V **</td>
</tr>
</tbody>
</table>

Notes: For thread type NPT use **N**, for BSPP use **G**.
- **HP** (High Pressure).
- **4-20mA available via Calys software.**
- † Only available in BSPP.
- For other configurations not listed please consult factory. (Example: ATEX Series EX: II 3 D/G, O2 compatible, External Pilot, etc.)

**Flow Curves**

**Flow Curve 1/4"**

**Flow Curve 1/2" HP**
## Lucifer® EPP4 1/4" & 1/2"

### Technical Data

<table>
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<tr>
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<th>EPP4 1/4&quot;</th>
<th>EPP4 1/2&quot;</th>
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<tr>
<td><strong>Fluids:</strong></td>
<td>Lubricated or non lubricated air and neutral gases - Recommended filtration: 40 μm or better</td>
<td></td>
</tr>
<tr>
<td><strong>Temperature range:</strong></td>
<td>Ambient: 0°C to 50°C (32°F to 122°F)</td>
<td>Fluid: 0°C to 50°C (32°F to 122°F)</td>
</tr>
<tr>
<td><strong>Inlet pressure range:</strong></td>
<td>1 to 12 bar (14.5 to 174 PSIG)</td>
<td>1 to 12 bar (14.5 to 174 PSIG)</td>
</tr>
<tr>
<td><strong>Outlet pressure range:</strong></td>
<td>0.05 to 10 bar (.725 to 145 PSIG)</td>
<td></td>
</tr>
<tr>
<td><strong>Hysteresis:</strong></td>
<td>± 50 mbar (.725 PSIG) (factory set up)</td>
<td></td>
</tr>
<tr>
<td><strong>Air consumption at constant control signal:</strong></td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Supply voltage:</strong></td>
<td>24 V DC ± 15 % (Max. ripple 1 V)</td>
<td></td>
</tr>
<tr>
<td><strong>Power consumption:</strong></td>
<td>Max. 2.8 W with 24 V DC and constant changes of the control signal &lt; 1.5 W without change of control signal</td>
<td></td>
</tr>
<tr>
<td><strong>Control signal:</strong></td>
<td>Analog 0 - 10 V</td>
<td></td>
</tr>
<tr>
<td><strong>Outlet sensor signal:</strong></td>
<td>Analog 4 - 20 mA field convertible</td>
<td></td>
</tr>
<tr>
<td><strong>Max. flow:</strong></td>
<td>70 m³/h (41 SCFM)</td>
<td>150 m³/h (88 SCFM)</td>
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<tr>
<td><strong>Indicative response time:</strong></td>
<td>With a volume of 330 cm³ (20.14 in³) at the outlet of the regulator</td>
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<tr>
<td>Filling 2 to 4 bar (29 to 58 PSI);</td>
<td>50 msec</td>
<td>60 msec</td>
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<tr>
<td>Filling 2 to 8 bar (29 to 116 PSI);</td>
<td>100 msec</td>
<td>120 msec</td>
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<td>Emptying 4 to 2 bar (29 to 116 PSI);</td>
<td>70 msec</td>
<td>90 msec</td>
</tr>
<tr>
<td>Emptying 8 to 2 bar (29 to 116 PSI);</td>
<td>130 msec</td>
<td>190 msec</td>
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</table>

- In case of control signal failure or if it is less than 50 mV, the regulated pressure drops automatically to 0 bar (atmospheric pressure).
- In case of voltage supply failure, the regulated pressure will be kept constant.

### Electrical connection:

- M12 - 8 pin; male connector power supply/control signal
- M12 - 5 pin; male connector communication

### Life expectancy:

- > 50 million changes of control signal steps

### Mounting position:

- Indifferent (recommended position: upright; electronic part on top)

### Resistance to vibrations:

- 30 g in all directions

### Degree of protection:

- IP65

### Assembly:

- Silicone free

### Electromagnetic compatibility:

- EN 61000-6-1: 2001
- EN 61000-6-2: 2001
- EN 61000-6-3: 2001
- + A11 2004 edition (01/07/07)
- EN 61000-6-4: 2001

### Installation and setting instructions:

See Bulletin 408128, 408134 and appendix supplied with the product.

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**Note:** Parker reserves the right to change specifications without notification.
Lucifer® EPP4 1/2" HP
Technical Data

EPP4 1/2" HP

Fluids: Lubricated or non lubricated air and neutral gases - Recommended filtration: 50 μm

Temperature range:
- Ambient: 0°C to 50°C (32°F to 122°F)
- Fluid: 0°C to 50°C (32°F to 122°F)

Inlet pressure range:
- The inlet pressure must always be at least 1 bar above the regulated pressure.
- 1 to 21 bar (14.5 to 305 PSIG)

Outlet pressure range:
- 0.05 to 20 bar (.73 to 290 PSIG)

Hysteresis:
- ≤ 100 mbar (1.45 PSIG) if P inlet ≤ 10 bar (145 PSIG)
- ≤ 200 mbar (2.90 PSIG) if P inlet > 10 bar (145 PSIG)

Air consumption at constant control signal:
- 0

Supply voltage:
- 24V DC ± 15%

Power consumption:
- Max. 6 W with 24 V DC and constant changes of the control signal < 2 W without change of control signal

Control signal:
- Analog 0 - 10 V
- Analog 4 - 20 mA field convertible

Outlet sensor signal:
- Analog 0 - 10 V
- Standard for 0 - 10 bar; Adjustable
- Analog 4 - 20 mA
- Standard for 0 - 10 bar; Adjustable

Max. flow:
- 150 m³/h (88 SCFM)

Indicative response time:
- With a volume of 330 cm³ (20.14 in³) at the outlet of the regulator
  - Filling 2 to 8 bar (29 to 116 PSI): 120 msec
  - Emptying 8 to 2 bar (116 to 29 PSI): 190 msec

Safety position:
- In case of control signal failure or if it is less than 50 mV, the regulated pressure drops automatically to 0 bar atmospheric pressure (for pressure ranges from 0-10 bar, 100 mV for pressure range over 10 bar). In case of voltage supply failure, the regulated pressure will be kept constant.

Electrical connection:
- M12 - 8 pin; male connector power supply/control signal
- M12 - 5 pin; male connector communication

Life expectancy:
- > 20 Million changes of control signal steps

Mounting position:
- Indifferent (recommended position: upright; electronic part on top)

Resistance to vibrations:
- 30 g in all directions

Degree of protection:
- IP65

Assembly:
- Silicone free

Electromagnetic compatibility:
- EN 61000-6-1: 2001
- EN 61000-6-2: 2001
- EN 61000-6-3: 2001
- + A11 2004 edition (01/07/07)
- EN 61000-6-4: 2001

Installation and setting instructions:
- See Bulletin 408193 and appendix supplied with the product.

Note: Parker reserves the right to change specifications without notification.
Lucifer® EPP4 1/4" & 1/2"

Dimensions EPP4 1/4"

Dimensions EPP4 1/2"

Note: Mounting bracket ships loose.
Lucifer® EPP4 1/2" HP

Dimensions EPP4 1/2" HP

INLET 1/2"  OUTLET 1/2"  EXHAUST 1/2"

Ø 3.6 for self-tapping screw 1/4"
Lucifer® EPP4 Accessories
Mounting Brackets for EPP4 1/4"

Note: Mounting bracket comes standard with all EPP4 1/4" units, and is shipped loose.

Mounting Brackets for EPP4 1/2"

L Bracket
Part Number 491367

Foot Bracket
Part Number 491366
Lucifer® EPP4 Accessories

Power Supply / Control Signal and Communication Cables

EPP4 Cable

• 2m cable with molded straight M12-8 pole to flying lead

Part Number RKC8T-2

Contact factory to order specific lengths

First M12 / 8 pole connector: power supply & control signal

Electrical Connection A

Supply voltage 24V

Control Signal 0...10 or 4...20mA

Option

Alarm 24/0V

U out 4...10V

I out 4...20mA

Ground

Second M12 / 5 pole connector: remote display or PC communication

Electrical Connection B

U out 0...10V

Rx

Rx

Ground

24V out

Part Number 496449

• 2m cable with molded straight M12-5 pole to USB

Cable Pin Color

1 White
2 Brown
3 Green
4 Yellow
5 Grey
6 Pink
7 Blue
8 Red

Contact factory to order specific lengths

0.59 Dia. (15mm)
0.22 Dia. (5.7mm)
1.97 (50mm)
1.65 (42mm)
0.28 (7mm)
Lucifer® EPP4 Accessories

Calys Software

Calys is developed to configure all the parameters of the EPP4. A specific cable is needed for the communication between the EPP4 and a PC.

To download free Calys software click on [link]

Calys offers many capabilities:
- Live monitoring (control signal, regulated pressure, supply voltage,...)
- Recording of the main parameters (control signal, regulated pressure, supply voltage,...) in an Excel file
- Free calibration for the inputs and outputs
- Adjustable alarm (positive-negative, pressure limits, delays)
- Configuration files are easy to duplicate
- Complete and interactive help file
- Data in 4 different pressure units
- Menus in 4 languages (English, German, French and Italian)

Specific communication cable with M12, 5-pole to USB connection

Part Number 496449
### Safety Guide For Selecting And Using Pneumatic Division Products And Related Accessories

**WARNING:**

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF PNEUMATIC DIVISION PRODUCTS, ASSEMBLIES OR RELATED ITEMS (“PRODUCTS”) CAN CAUSE DEATH, PERSONAL INJURY, AND PROPERTY DAMAGE. POSSIBLE CONSEQUENCES OF FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THESE PRODUCTS INCLUDE BUT ARE NOT LIMITED TO:

- Unintended or mistimed cycling or motion of machine members or failure to cycle
- Work pieces or component parts being thrown off at high speeds.
- Failure of a device to function properly for example, failure to clamp or unclamp an associated item or device.
- Explosion
- Suddenly moving or falling objects.
- Release of toxic or otherwise injurious liquids or gasses.

Before selecting or using any of these Products, it is important that you read and follow the instructions below.

### 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, for 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, keytones, 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:
• Follow all government, state and local safety and servicing practices prior to service including but not limited to all OSHA Lockout Tagout procedures (OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – Lockout / Tagout).
• 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.
4. Shipment; Delivery; Title and Risk of Loss. If Buyer fails to make any payments when due, Buyer shall incur interest at the rate of 1.5% per month or the maximum allowable rate under applicable law. 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 purchase order or purchase order number shall in no way constitute an acceptance of any of Buyer's terms and conditions of sale. No modification to these Terms will be binding on Seller unless in writing and signed by an authorized representative of Seller.

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 date interface or otherwise shall constitute an offer to purchase Products. Reference in Seller’s order acknowledgement to Buyer’s additional terms or conditions of Buyer. Reference in Seller’s order acknowledgement to Buyer’s electronic commerce, shall constitute acceptance of these Terms. Seller objects to any contrary or additional terms or conditions of Buyer. Buyer is responsible for determining that the proposed changes or modifications are suitable for all applications and reasonably foreseeable uses of the Products. In the event the Buyer is not the end-user, Buyer will ensure such end-user complies with this paragraph.

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

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 regulations. The Seller makes no representation or warranty that the Products will comply with any custom application. Buyer is solely responsible for the correct selection of the Products based upon data or specifications provided by the Buyer, the Buyer is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products. Buyer shall also be responsible for the correct selection of the Products for any reasons prohibited in Seller’s instructions, guides or specifications. Buyer otherwise fails to comply with Seller’s instructions, guides and specifications, Buyer acknowledges that any such failure by Buyer could result in failure or reduction of the warranty by the Seller.

12. Use of Products, Indemnity by Buyer. Buyer shall comply with all instructions, guides and specifications of Seller with respect to the use of the Products. Buyer is responsible for the correct selection of the Products for any uses prohibited in Seller’s instructions, guides or specifications. Buyer otherwise fails to comply with Seller’s instructions, guides and specifications, Buyer acknowledges that any such failure by Buyer could result in failure or reduction of the warranty by the Seller. Buyer shall notify Seller of any alleged breach of warranty within thirty (30) days after the date the Buyer discovers or should have discovered the alleged breach. Unless otherwise agreed, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferral of shipment at Buyer’s request beyond the respective indicated shipping date will be made except on terms that will indemnify, defend and hold Seller harmless against all direct, and indirect, and consequential loss or damage. Seller, at any time, may change any provision of these Terms without notice to Buyer.

13. Cancellations and Changes. Buyer may not cancel or modify any order for any reason, except with Seller’s written consent. Buyer may not change its address without giving at least thirty (30) days prior written notice to Seller. Seller may refuse to accept any order for any reason.