



# Miniature Solenoid Valves

G4 Series - G4 & G4c  
1/8" NPT | Cartridge



ENGINEERING YOUR SUCCESS.

 **WARNING - USER RESPONSIBILITY**

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Possible consequences of failure or improper use of these Products include but are not limited to:

- Gas leakage leading to explosion or rupture of a pressure vessel.
- Leakage or other release of toxic or otherwise hazardous liquids or gases.
- Unintended or mistimed cycling or motion of machine members, or failure of machine members to cycle.
- Sudden moving or falling objects.
- Work piece 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.
- Electrical shorts, burns, burn out of equipment or fires.

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The product 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.

 **WARNING - CALIFORNIA PROPOSITION 65**

The products described in this catalog can expose you to chemicals, including Lead, which is known to the State of California to cause cancer and birth defects, or other reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov) .

# G4 Series

G4 & G4c Miniature Solenoid Valves  
1/8" NPT | Cartridge



## Introduction

### 1/8" NPT | CARTRIDGE-MOUNT

2-Way and 3-Way valves available in two compact forms: 1/8" NPT G4, or cartridge-mount G4c

## Features

### LONG LIFE

Proprietary internal corrosion resistance  
Life up to 20 million cycles\*  
Available water-tight solenoid coils\*\*  
Standard 303 stainless steel and FKM

### HIGH PERFORMANCE

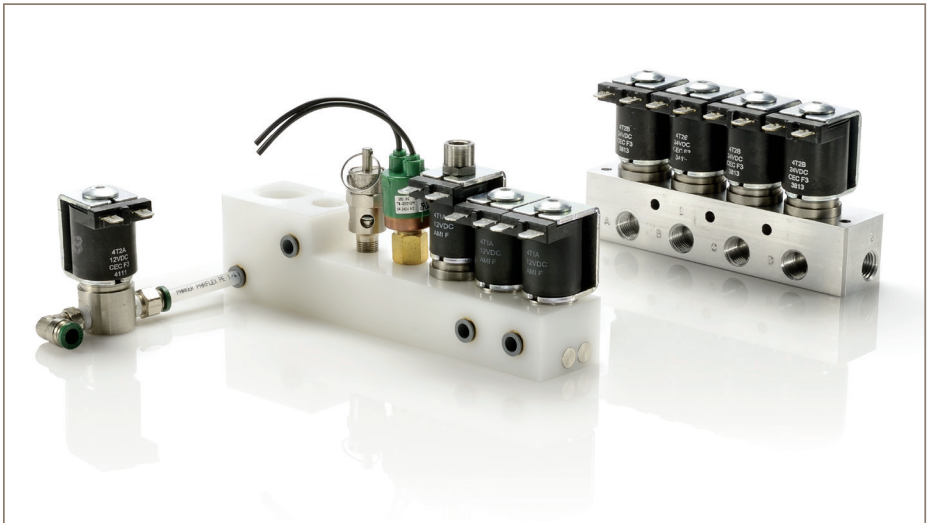
Up to 950 psi operating pressure  
Up to 0.38 Cv flow factor  
Fast response times / cycle rates

### COMPACT & EFFICIENT

Miniature footprint, yet high performance  
Excellent direct current (DC) ratings  
Efficient power-to-performance ratio  
Cartridge design minimizes leak paths

\* demonstrated in laboratory conditions

\*\* NEMA 4, 4X; plus thermal shock-resistant technology



## Benefits

### MORE DESIGN FREEDOM

Develop more compact machines without compromising fluid control performance.

A compact design that doesn't sacrifice performance; G4 and G4c valves deliver industry-leading pressure and flow characteristics and give OEMs more design freedom, even in tight design envelopes.

G4c cartridge valves are easily integrated into OEM equipment, minimizing design complexity, leak paths, and optimizing total cost of ownership.

### TRUSTED SAFETY & RELIABILITY

UL approvals for US and Canada, life up to 20 million cycles\*, available NSF 169 certified models, a corrosion-resistant construction, water-tight solenoid coils, and various specialty configurations help OEMs deliver reliable solutions to market.

### FASTER PRODUCT DEVELOPMENT

Agency approvals, flexible electrical options, modular design scheme, and Parker's vast global network facilitate expedited development and approval cycles for OEMs. G4 Series is designed and assembled in USA and available globally.

# Small, but Mighty

Economical G4 and G4c valves deliver durability and reliability in a compact, easy-to-integrate package

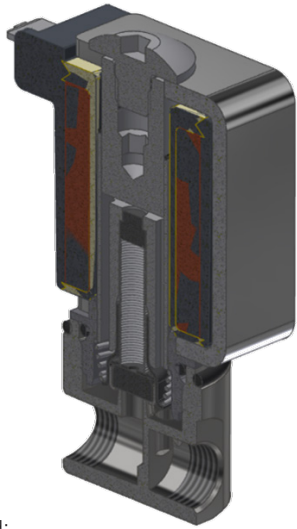
Diverse electrical connection and voltage options

No special tools required for maintenance

Short valve stroke for fast response time

Proprietary anti-corrosion flange design for media compatibility and life

NPT or cartridge standard; other options available for OEM needs



Standard 303 SS body

Water-tight\*\* solenoid coil options with integrated gland seals for moisture/thermal shock resistance

Laser-welded sleeve assembly for tight control of flow and consistent performance valve-to-valve, and over life cycle of valve

Standard FKM or NSF+ EPDM seals; diverse specialty seals available

Floating plunger seal design for self-adjusting, bubble-tight shutoff; up to 20 million cycles\*

CFD-optimized body footprint designed for optimal flow rates

Range	
Port Size	1/8"   Cartridge
Flow	Up to 0.38 Cv
Pressure	Up to 950 psi
Media Temp.	Up to 240 °F
Ambient Temp.	Up to 135 °F

**2-WAY | 3-WAY  
NORMALLY CLOSED  
NORMALLY OPEN  
UNIVERSAL  
NSF 169+**

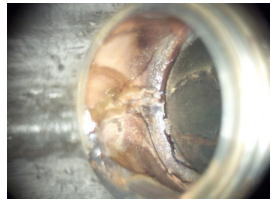
\* demonstrated in laboratory conditions  
 \*\* NEMA 4,4X; plus thermal shock-resistant technology  
 + available in NSF 169 certified configurations; consult factory

## Proprietary Corrosion-Resistant Design

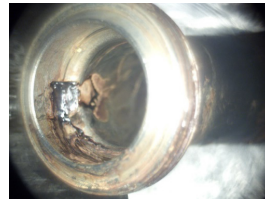
Enhanced internal corrosion resistance leads to better, cleaner, higher-performing OEM equipment.



Parker G4 Series



Other Valve A



Other Valve B



Other Valve C

| 720 hours salt spray - ASTM B117 |

## Online Resources



Configure, CAD, Manuals



Competitor Cross Reference

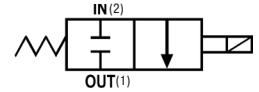


Locate a Distributor



# G4 Series - G4 & G4c - 2 Way

2-Way Normally Closed - Direct Acting - 303 SS

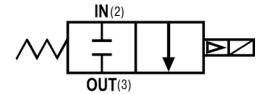


	Port Size	Orifice Dia.	Flow Factor Cv	Operating Pressure Differential (MOPD) psi				Max. Media Temp.	Seal Mat'l	Power AC/DC Watts	Ordering No. Mechanical Prefix		Elect. Agency Suffix Chart
				Min	Air, Inert Gas	Water	Light Oil				°F	G4 Conventional	
<b>AC</b>	1/8	3/64	0.06	0	950	950	950	240	FKM	8.5	20CC02EV4	209CL5EV4	9 ■
	1/8	1/16	0.10	0	625	625	625	240	FKM	8.5	20CC02GV4	209CL5GV4	9 ■
	1/8	5/64	0.15	0	450	450	450	240	FKM	8.5	20CC02JV4	209CL5JV4	9 ■
	1/8	3/32	0.22	0	320	320	320	240	FKM	8.5	20CC02LV4	209CL5LV4	9 ■
	1/8	7/64	0.28	0	245	245	245	240	FKM	8.5	20CC02MV4	209CL5MV4	9 ■
	1/8	1/8	0.32	0	175	175	175	240	FKM	8.5	20CC02PV4	209CL5PV4	9 ■
	1/8	5/32	0.38	0	100	100	100	240	FKM	8.5	20CC02QV4	209CL5QV4	9 ■
Max. Ambient Temp. 135°F													
<b>DC</b>	1/8	3/64	0.06	0	390	390	390	240	FKM	8	20CC02EV4	209CL5EV4	9 ■
	1/8	1/16	0.10	0	255	255	255	240	FKM	8	20CC02GV4	209CL5GV4	9 ■
	1/8	5/64	0.15	0	180	180	180	240	FKM	8	20CC02JV4	209CL5JV4	9 ■
	1/8	3/32	0.22	0	130	130	130	240	FKM	8	20CC02LV4	209CL5LV4	9 ■
	1/8	7/64	0.28	0	100	100	100	240	FKM	8	20CC02MV4	209CL5MV4	9 ■
	1/8	1/8	0.32	0	60	60	60	240	FKM	8	20CC02PV4	209CL5PV4	9 ■
	1/8	5/32	0.38	0	30	30	30	240	FKM	8	20CC02QV4	209CL5QV4	9 ■
Max. Ambient Temp. 125°F													

■ Safety Shutoff: C-UL-US "Listed" with described seal material and conduit solenoid coil; C-UR-US "Recognized" in other coil configurations

## 2-Way Normally Open PIBOS - Direct Acting - 303 SS

PIBOS: Pressure In Body (2), Out Sleeve (3)



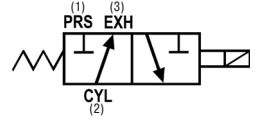
	Port Size	Orifice Dia.	Flow Factor Cv	Operating Pressure Differential (MOPD) psi				Max. Media Temp.	Seal Mat'l	Power AC/DC Watts	Ordering No. Mechanical Prefix		Elect. Agency Suffix Chart
				Min	Air, Inert Gas	Water	Light Oil				°F	G4 Conventional	
<b>AC/DC</b>	1/8	1/32	0.02	0	375	375	375	240	FKM	10 / 8	20CF02AV4	209FL5AV4	9 ●
	1/8	3/64	0.06	0	230	230	230	240	FKM	10 / 8	20CF02EV4	209FL5EV4	9 ●
	1/8	1/16	0.10	0	150	150	150	240	FKM	10 / 8	20CF02GV4	209FL5GV4	9 ●
	1/8	5/64	0.14	0	105	105	105	240	FKM	10 / 8	20CF02JV4	209FL5JV4	9 ●
	1/8	3/32	0.20	0	80	80	80	240	FKM	10 / 8	20CF02LV4	209FL5LV4	9 ●
Max. Ambient Temp. 135°F (AC), 125°F (DC)													

● General Purpose: C-UL-US "Listed" with described seal material and conduit solenoid coil; C-UR-US "Recognized" in other coil configurations



# G4 Series - G4 & G4c - 3 Way

## 3-Way Normally Closed - Direct Acting - 303 SS

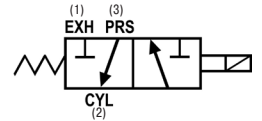


AC DC	Port Size	Orifice Dia. IN	Orifice Dia. IN	Flow Factor IN	Flow Factor EXH	Operating Pressure Differential (MOPD) psi				Max. Media Temp.	Seal Mat'l	Power AC/DC	Ordering No. Mechanical Prefix		Elect. Agency Suffix Chart
	NPT	Inch	Inch	Cv	Cv	Min	Air, Inert Gas	Water	Light Oil	°F		Watts	G4 Conventional	G4c Cartridge	
	1/8	1/32	1/32	0.02	0.02	0	250	250	250	240	FKM	10 / 8	30CC02AV4	309CL5AV4	9 ●
1/8	3/64	3/64	0.05	0.05	0	200	200	200	240	FKM	10 / 8	30CC02EV4	309CL5EV4	9 ●	
1/8	1/16	1/16	0.09	0.10	0	130	130	130	240	FKM	10 / 8	30CC02GV4	309CL5GV4	9 ●	
1/8	5/64	5/64	0.15	0.14	0	90	90	90	240	FKM	10 / 8	30CC02JV4	309CL5JV4	9 ●	
1/8	3/32	3/32	0.19	0.20	0	75	75	75	240	FKM	10 / 8	30CC02LV4	309CL5LV4	9 ●	
1/8	7/64	3/32	0.25	0.20	0	50	50	50	240	FKM	10 / 8	30CC02MV4	309CL5MV4	9 ●	
1/8	1/8	3/32	0.32	0.20	0	40	40	40	240	FKM	10 / 8	30CC02PV4	309CL5PV4	9 ●	
1/8	5/32	3/32	0.38	0.20	0	25	25	25	240	FKM	10 / 8	30CC02QV4	309CL5QV4	9 ●	

Max. Ambient Temp. 135°F (AC), 125°F (DC)

- General Purpose: C-UL-US "Listed" with described seal material and conduit solenoid coil; C-UR-US "Recognized" in other coil configurations

## 3-Way Normally Open - Direct Acting - 303 SS

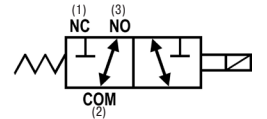


AC DC	Port Size	Orifice Dia. IN	Orifice Dia. IN	Flow Factor IN	Flow Factor EXH	Operating Pressure Differential (MOPD) psi				Max. Media Temp.	Seal Mat'l	Power AC/DC	Ordering No. Mechanical Prefix		Elect. Agency Suffix Chart
	NPT	Inch	Inch	Cv	Cv	Min	Air, Inert Gas	Water	Light Oil	°F		Watts	G4 Conventional	G4c Cartridge	
	1/8	1/32	1/32	0.02	0.02	0	375	375	375	240	FKM	10 / 8	30CF02AV4	309FL5AV4	9 ●
1/8	3/64	3/64	0.05	0.05	0	230	230	230	240	FKM	10 / 8	30CF02EV4	309FL5EV4	9 ●	
1/8	1/16	1/16	0.10	0.09	0	150	150	150	240	FKM	10 / 8	30CF02GV4	309FL5GV4	9 ●	
1/8	5/64	5/64	0.14	0.15	0	105	105	105	240	FKM	10 / 8	30CF02JV4	309FL5JV4	9 ●	
1/8	3/32	3/32	0.20	0.19	0	80	80	80	240	FKM	10 / 8	30CF02LV4	309FL5LV4	9 ●	

Max. Ambient Temp. 135°F (AC), 125°F (DC)

- General Purpose: C-UL-US "Listed" with described seal material and conduit solenoid coil; C-UR-US "Recognized" in other coil configurations

## 3-Way Universal - Direct Acting - 303 SS



AC DC	Port Size	Orifice Dia. NC	Orifice Dia. NO	Flow Factor NC	Flow Factor NO	Operating Pressure Differential (MOPD) psi				Max. Media Temp.	Seal Mat'l	Power AC/DC	Ordering No. Mechanical Prefix		Elect. Agency Suffix Chart
	NPT	Inch	Inch	Cv	Cv	Min	Air, Inert Gas	Water	Light Oil	°F		Watts	G4 Conventional	G4c Cartridge	
	1/8	1/32	1/32	0.02	0.02	0	200	200	200	240	FKM	10 / 8	30CU02AV4	309UL5AV4	9 ●
1/8	3/64	3/64	0.05	0.05	0	150	150	150	240	FKM	10 / 8	30CU02EV4	309UL5EV4	9 ●	
1/8	1/16	1/16	0.09	0.10	0	100	100	100	240	FKM	10 / 8	30CU02GV4	309UL5GV4	9 ●	
1/8	5/64	5/64	0.15	0.14	0	70	70	70	240	FKM	10 / 8	30CU02JV4	309UL5JV4	9 ●	
1/8	3/32	3/32	0.19	0.20	0	50	50	50	240	FKM	10 / 8	30CU02LV4	309UL5LV4	9 ●	
1/8	7/64	3/32	0.25	0.20	0	40	40	40	240	FKM	10 / 8	30CU02MV4	309UL5MV4	9 ●	
1/8	1/8	3/32	0.32	0.20	0	30	30	30	240	FKM	10 / 8	30CU02PV4	309UL5PV4	9 ●	
1/8	5/32	3/32	0.38	0.20	0	20	20	20	240	FKM	10 / 8	30CU02QV4	309UL5QV4	9 ●	

Max. Ambient Temp. 135°F (AC), 125°F (DC)

- General Purpose: C-UL-US "Listed" with described seal material and conduit solenoid coil; C-UR-US "Recognized" in other coil configurations

# G4 & G4c - Electrical Suffix

## Chart 9 Solenoid Coils

	Ordering No. Electrical Suffix	Voltage	Enclosure Electrical Termination	Enclosure Rating	Insulation Class
	D6A	12 VDC	Integrated DIN 43650A/ ISO 4400	NEMA 4, 4X + integrated gland seals	H
	D6B	24 VDC			
	D6E	24/60			
	D6F	120/60, 110/50			
	D6G	240/60, 220/50			
	C4A	12 VDC	Integrated 1/2" Conduit with 18" Leads	NEMA 4, 4X + integrated gland seals	F
	C4B	24 VDC			
	C4E	24/60			
	C4F	120/60, 110/50			
	C4G	240/60, 220/50			
	B4A	12 VDC	Integrated 18" Leads	integrated gland seals	F
	B4B	24 VDC			
	B4E	24/60			
	B4F	120/60, 110/50			
	B4G	240/60, 220/50			
	L2A	12 VDC	Open Frame 18" Leads	N/A	F
	L2B	24 VDC			
	L2E	24/60			
	L2F	120/60, 110/50			
	L2G	240/60, 220/50			
	T2A	12 VDC	Open Frame 1/4" Tab/ Spade	N/A	F
	T2B	24 VDC			
	T2E	24/60			
	T2F	120/60, 110/50			
	T2G	240/60, 220/50			

## Chart 9 Electrical Accessories



**DIN 43650A / ISO 4400 – Cable Gland**

**Ordering No.** ELECD1

Gasket Included




**DIN 43650A / ISO 4400 – 1/2" Conduit**

**Ordering No.** ELECD2

Gasket Included

# G4c - Manifolds

## Factory Manifolds for G4c Cartridge-Mount Valves

	Ordering No.	Stations	Flow Pattern	Material
	4C204	4	2 Way Normally Closed	303 Stainless Steel
	4C206	6		
	4A204	4	2 Way Normally Closed	6061-T6 Aluminum
	4A206	6		
	4A304	4	3 Way Normally Closed	6061-T6 Aluminum

CAD models available at [www.parker.com/fcd](http://www.parker.com/fcd) | G4c Cartridge Valve Manifolds

## Integrate G4c valves directly into your equipment

G4c valves can also be directly integrated into OEM equipment or custom manifolds.

E-mail Parker FCD Technical Support/ Applications Engineering for the latest cavity drawings and supporting documentation.



[fcd.technical@support.parker.com](mailto:fcd.technical@support.parker.com)

## Manifold Accessories



### Isolation Plug (5 pieces kit)

**Ordering No.** 4K008

Seals empty valve cavity and manifold outlet  
303 SS, FKM



### Sensor Port Adapter (5 pieces kit)

**Ordering No.** 4K009

Adapts empty valve cavity to 1/4" NPT  
for accessories such as sensors  
303 SS, FKM





# Technical Reference

## Materials of Construction

Wetted Materials	Valve Models			
Valve Component	20C-	30C-	209-	309-
Body	303 SS			
Plunger Assembly	430FR SS			
Sleeve Assembly	304 SS, 430FR SS			
Shading Ring	Copper (AC & DC)			
Springs	18-8 SS			
Seals	Vary by Model **			

### \*\* Standard Seals

FKM

### Specialty Seals

EPDM (NSF)

FKM (NSF)

etc.

### Solenoid Coils

Thermoplastic  
Class F or Class H  
FKM Gland Seals

### Consult Factory for Specialty Constructions

NSF Models  
No Shading Ring (dedicated DC service)  
Helium Leak Test  
Hydrocarbon Cleaned for Oxygen Service  
Vacuum Service  
etc.

# Offer of Sale

## PARKER-HANNIFIN CORPORATION OFFER OF SALE

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“Confidential Information” means any technical, commercial, or other proprietary information of Seller, including, without limitation, pricing, technical drawings or prints and/or part lists, which has been or will be disclosed, delivered, or made available, whether directly or indirectly, to Buyer.

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

“Intellectual Property Rights” means any patents, trademarks, copyrights, trade dress, trade secrets or similar rights.

“Products” means the Goods, Services and/or Software as described in a Quote.

“Quote” means the offer or proposal made by Seller to Buyer for the supply of Products.

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“Services” means any services to be provided by Seller.

“Software” means any software related to the Goods, whether embedded or separately downloaded.

“Special Tooling” means equipment acquired by Seller or otherwise owned by Seller necessary to manufacture Goods, including but not limited to tools, jigs, and fixtures.

“Terms” means the terms and conditions of this Offer of Sale.

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3. Price; Payment. The Products set forth in the Quote are offered for sale at the prices indicated in the Quote. Unless otherwise specifically stated in the Quote, prices are valid for thirty (30) days and do not include any sales, use, or other taxes or duties. Seller reserves the right to modify prices for any reason and at any time by giving ten (10) days prior written notice. Unless otherwise specified by Seller, all prices are F.C.A. Seller’s facility (INCOTERMS 2020). All sales are contingent upon credit approval and full payment for all purchases is due thirty (30) days from the date of invoice (or such date as may be specified in the Quote). Under any circumstances, Buyer may not withhold or suspend payment

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4. Shipment; Delivery; Title and Risk of Loss. All delivery dates are approximate, and Seller is not responsible for damages or additional costs resulting from any delay. All deliveries are subject to our ability to procure materials from our suppliers. Regardless of the manner of shipment, delivery occurs and title and risk of loss or damage pass to Buyer, upon placement of the Products with the carrier at Seller’s facility. Unless otherwise agreed prior to shipment and for domestic delivery locations only, Seller will select and arrange, at Buyer’s sole expense, the carrier and means of delivery. When Seller selects and arranges the carrier and means of delivery, freight and insurance costs for shipment to the designated delivery location will be prepaid by Seller and added as a separate line item to the invoice. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer’s acts or omissions. Buyer shall not return or repackage any Products without the prior written authorization from Seller, and any return shall be at the sole cost and expense of Buyer.

5. Warranty. The warranty for the Products is as follows:

(i) Goods are warranted against 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; (ii) Services shall be performed in accordance with generally accepted practices and using the degree of care and skill that is ordinarily exercised and customary in the field to which the Services pertain and are warranted for a period of six (6) months from the date of completion of the Services; and (iii) Software is only warranted to perform in accordance with applicable specifications provided by Seller to Buyer for ninety (90) days from the date of delivery or, when downloaded by a Buyer or end-user, from the date of the initial download. All prices are based upon the exclusive limited warranty stated above, and upon the following disclaimer: EXEMPTION CLAUSE; DISCLAIMER OF WARRANTY, CONDITIONS, REPRESENTATIONS: THIS WARRANTY IS THE SOLE AND ENTIRE WARRANTY, CONDITION, AND REPRESENTATION, PERTAINING TO PRODUCTS. SELLER DISCLAIMS ALL OTHER WARRANTIES, CONDITIONS, AND REPRESENTATIONS, WHETHER STATUTORY, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THOSE RELATING TO DESIGN, NONINFRINGEMENT, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE. SELLER DOES NOT WARRANT THAT THE SOFTWARE IS ERROR-FREE OR FAULT-TOLERANT, OR THAT BUYER’S USE THEREOF WILL BE SECURE OR UNINTERRUPTED, UNLESS OTHERWISE AUTHORIZED IN WRITING BY SELLER, THE SOFTWARE SHALL NOT BE USED IN CONNECTION WITH HAZARDOUS OR HIGH-RISK ACTIVITIES OR ENVIRONMENTS. EXCEPT AS EXPRESSLY STATED HEREIN, ALL PRODUCTS ARE PROVIDED “AS IS”.

6. Claims; Commencement of Actions. 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 the non-conformance is or should have been discovered by Buyer. Any claim or action against Seller based upon breach of contract or any other theo-

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ry, including tort, negligence, or otherwise must be commenced within twelve (12) months from the date of the alleged breach or other alleged event, without regard to the date of discovery.

7. LIMITATION OF LIABILITY. IN THE EVENT OF A BREACH OF WARRANTY, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE THE NON-CONFORMING PRODUCTS, 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, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES INCLUDING ANY LOSS OF REVENUE OR PROFITS, WHETHER BASED IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE PAID FOR THE PRODUCTS.

8. Confidential Information. Buyer acknowledges and agrees that Confidential Information has been and will be received in confidence and will remain the property of Seller. Buyer further agrees that it will not use Seller's Confidential Information for any purpose other than for the benefit of Seller and shall return all such Confidential Information to Seller within thirty (30) days upon request.

9. Loss to Buyer's Property. Buyer's Property will be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer ordering the Products manufactured using Buyer's Property. Also, Seller shall not be responsible for any loss or damage to Buyer's Property while it is in Seller's possession or control.

10. Special Tooling. Seller may impose a tooling charge for any Special Tooling. Special Tooling shall be and remain Seller's property. In no event will Buyer acquire any interest in the Special Tooling, even if such Special Tooling has been specially converted or adapted for manufacture of Goods for Buyer and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller has the right to alter, discard or otherwise dispose of any Special Tooling or other property owned by Seller in its sole determination at any time.

11. Security Interest. To secure payment of all sums due from Buyer, 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 Seller's security interest.

12. User Responsibility. Buyer, through its own analysis and testing, is solely responsible for making the final selection of the Products and assuring that all performance, endurance, maintenance, safety and warning requirements of the application of the Products are met. Buyer must analyze all aspects of the application and follow applicable industry standards, specifications, and any technical information provided with the Quote or the Products, such as Seller's instructions, guides and specifications. If Seller provides options of or for Products based upon data or specifications provided by Buyer, Buyer is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products. In the event Buyer is not the end-user of the Products, Buyer will ensure such end-user complies with this paragraph.

13. Use of Products, Indemnity by Buyer. Buyer shall comply with all instructions, guides and specifications provided by Seller with the Quote or the Products. If Buyer uses or resells the Products in any way prohibited by Seller's instructions, guides or specifications, or Buyer otherwise fails to comply with Seller's instructions, guides and specifications, Buyer acknowledges that any such use, resale, or non-compliance is at Buyer's sole risk. Further, Buyer shall indemnify, defend, and hold Seller harmless from any losses, claims, liabilities, damages, lawsuits, judgments and costs (including attorney fees and defense costs), whether for personal injury, property damage, intellectual property infringement or any other claim, arising out of or in connection with: (a) improper selection, design, specification, application, or any misuse of Products; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of Buyer's Property; (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, use with goods not provided by Seller, or opening, modifying, deconstructing, tampering with or repackaging the Products; or (e) Buyer's failure to comply with these Terms, including any legal or administrative proceedings, collection efforts, or other actions arising from or relating to such failure to comply. Seller shall not indemnify Buyer under any circumstance except as otherwise provided in these Terms.

14. Cancellations and Changes. Buyer may not cancel or modify, including but not limited to movement of delivery dates for the Products, any order for any reason except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage and any additional expense. Seller, at any time, may change features, specifications, designs and availability of Products.

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

16. Force Majeure. Seller is not liable for delay or failure to perform any of its obligations by reason of any events or circumstances beyond its reasonable control. Such circumstances include without limitation: accidents, labor disputes or stoppages, government acts or orders, acts of nature, pandemics, epidemics, other widespread illness, or public health emergency, cyber related disruptions, cyber-attacks, ransomware sabotage, delays or failures in delivery from carriers or suppliers, shortages of materials, sudden increases in the price of raw material or components, shutdowns or slowdowns affecting the supply of raw materials or components, or the transportation thereof, oil shortages or oil price increases, energy crisis, energy or fuel interruption, war (whether declared or not) or the serious threat of same, riots, rebellions, acts of terrorism, embargoes, fire or any reason whether similar to the foregoing or otherwise. Seller will resume performance as soon as practicable after the event of force majeure has been removed. All delivery dates affected by an event of force majeure shall be tolled for the duration of such event of force majeure and rescheduled for mutually agreed dates as soon as practicable after the event of force majeure ceases to exist. The right to allocate capacity is in the Seller's sole discretion. An event of force majeure shall not include financial distress, insolvency, bankruptcy, or other similar conditions affecting one of the parties, affiliates and/or sub-contractors. An event of force majeure in the meaning of these Terms means any circumstances beyond Seller's control that permanently or temporarily hinders performance, even where that circumstance was already foreseen. Buyer shall not be entitled to cancel any orders following its claim of an event of force majeure.

17. Waiver and Severability. Failure to enforce any provision of these Terms will not invalidate that provision; nor will any such failure prejudice either party's right to enforce that provision in the future. Invalidation of any provision of these Terms shall not invalidate any other provision herein and, the remaining provisions will remain in full force and effect.

18. Duration. Unless otherwise stated in the Quote, any agreement governed by or arising from these Terms shall: (a) be for an initial duration of one (1) year; and (b) shall automatically renew for successive one-year terms unless terminated by Buyer with at least 180-days written notice to Seller or if Seller terminates the agreement pursuant to Section 19 of these Terms.

19. Termination. Seller may, without liability to Buyer, terminate any agreement governed by or arising from these Terms for any reason and at any time by giving Buyer thirty (30) days prior written notice. Seller may immediately terminate, in writing, if Buyer: (a) breaches any provision of these Terms, (b) becomes or is deemed insolvent, (c) appoints or has appointed a trustee, receiver or custodian for all or any part of Buyer's property, (d) files a petition for relief in bankruptcy on its own behalf, or one is filed against Buyer by a third party, (e) makes an assignment for the benefit of creditors; or (f) dissolves its business or liquidates all or a majority of its assets.

20. Ownership of Rights. Buyer agrees that (a) Seller (and/or its affiliates) owns or is the valid licensee of Seller's IP and (b) the furnishing of information, related documents or other materials by Seller to Buyer

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does not grant or transfer any ownership interest or license in or to Seller's IP to Buyer, unless expressly agreed in writing. Without limiting the foregoing, Seller retains ownership of all Software supplied to Buyer. In no event shall Buyer obtain any greater right in and to the Software than a right in a license limited to the use thereof and subject to compliance with any other terms provided with the Software. Buyer further agrees that it will not, directly or through intermediaries, reverse engineer, decompile, or disassemble any Software (including firmware) comprising or contained within a Product, except and only to the extent that such activity may be expressly permitted, either by applicable law or, in the case of open source software, the applicable open source license.

21. Indemnity for Infringement of Intellectual Property Rights. Seller is not liable for infringement of any Intellectual Property Rights except as provided in this Section. Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on a third-party claim that one or more of the Products infringes the Intellectual Property Rights of a third party in the country of delivery of the Products by Seller to Buyer. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of any such claim, and Seller having sole control over the defense of the claim including all negotiations for settlement or compromise. If one or more Products is subject to such a claim, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Products, replace or modify the Products to render them non-infringing, or offer to accept return of the Products and refund the purchase price less a reasonable allowance for depreciation. Seller has no obligation or liability for any claim of infringement: (i) arising from information provided by Buyer (including Seller's use of Buyer's Property); or (ii) directed to any Products for which the designs are specified in whole or part by Buyer; or (iii) resulting from the modification, combination or use in a system of any Products. The foregoing provisions of this Section constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for claims of infringement of Intellectual Property Rights.

22. Governing Law. These Terms, the terms of any Quote, and the sale and delivery of all Products are deemed to have taken place in, and shall be governed and construed in accordance with, the laws of the State of Ohio, as applicable to contracts executed 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.

23. Entire Agreement. These Terms, along with the terms set forth in the Quote, forms the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale and purchase. In the event of a conflict between any term set forth in the Quote and these Terms, the terms set forth in the Quote shall prevail. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter shall have no effect. No modification to these Terms will be binding on Seller unless agreed to in a writing that is signed by an authorized representative of Seller, excluding email correspondence, 'clickwrap' or other purported electronic assent to different or additional terms. Sections 2-25 of these Terms shall survive termination or cancellation of any agreement governed by or arising from these Terms.

24. No 'Wrap' Agreements/No Authority to Bind. Seller's clicking any buttons or any similar action, such as clicking "I Agree" or "Confirm," to utilize Buyer's software or webpage for the placement of orders, is NOT an agreement to Buyer's Terms and Conditions. NO EMPLOYEE, AGENT OR REPRESENTATIVE OF SELLER HAS THE AUTHORITY TO BIND SELLER BY THE ACT OF CLICKING ANY BUTTON OR SIMILAR ACTION ON BUYER'S WEBSITE OR PORTAL.

25. Compliance with Laws. Buyer agrees to comply with all applicable laws, regulations, and industry and professional standards, including those of the United States of America, and the country or countries in which Buyer may operate, including without limitation the U.S. Foreign

Corrupt Practices Act ("FCPA"), the U.S. Anti-Kickback Act ("Anti-Kickback Act"), U.S. and E.U. export control and sanctions laws ("Export Laws"), the U.S. Food Drug and Cosmetic Act ("FDCA"), and the rules and regulations promulgated by the U.S. Food and Drug Administration ("FDA"), each as currently amended. Buyer agrees to indemnify, defend, and hold harmless Seller from the consequences of any violation of such laws, regulations and standards by Buyer, its employees or agents. Buyer represents that it is familiar with all applicable provisions of the FCPA, the Anti-Kickback Act, Export Laws, the FDCA and the FDA and certifies that Buyer will adhere to the requirements thereof and not take any action that would make Seller violate such requirements. Buyer represents and agrees that Buyer will not make any payment or give anything of value, directly or indirectly, to any governmental official, foreign political party or official thereof, candidate for foreign political office, 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. Buyer further represents and agrees that it will not receive, use, service, transfer or ship any Products from Seller in a manner or for a purpose that violates Export Laws or would cause Seller to be in violation of Export Laws. Buyer agrees to promptly and reliably provide Seller all requested information or documents, including end-user statements and other written assurances, concerning Buyer's ongoing compliance with Export Law.





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