

■ Connectivity for
Business-Critical Continuity™

kwiQMate™ Connectors

Product Catalog



Johnson
Connectivity Solutions



EMERSON™
Network Power



Emerson Connectivity Solutions, provider of kwiQMate™ branded Johnson product line of QMA connectors features a push-on style interface. Traditionally SMA plugs need to be configured with extra space allowance for torque wrench coupling procedures. The kwiQMate™ connectors are designed for higher density packaging situations. The push-pull connector interface allows for more connectors per application. Our unique coupling spring provides excellent electrical and mechanical performance. kwiQMate™ meets or exceeds the performance requirements of MIL-PRF-39012. All designs are based on 50 ohm system impedance and operate at frequencies up to 12.4 GHz.

Connector bodies are offered with Tri-Alloy as a standard finish, and gold plating where soldering is required. All contacts are gold plated for excellent durability and high frequency performance. The Emerson line of kwiQMate™ connectors is fully compatible with other industry available QMA connectors.

Emerson Connectivity Solutions is a global provider with manufacturing, sales and engineering capabilities in the United States, United Kingdom and China, to meet our customers requirements, worldwide. Our goal is to continue to increase the breadth of range and the performance of our products to meet the most challenging needs.

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Johnson® kwiQMate™ Connectors meet or exceed the performance requirements of MIL-PRF-39012. All designs are based on 50 ohm system impedance and operate at frequencies up to 12.4 GHz.

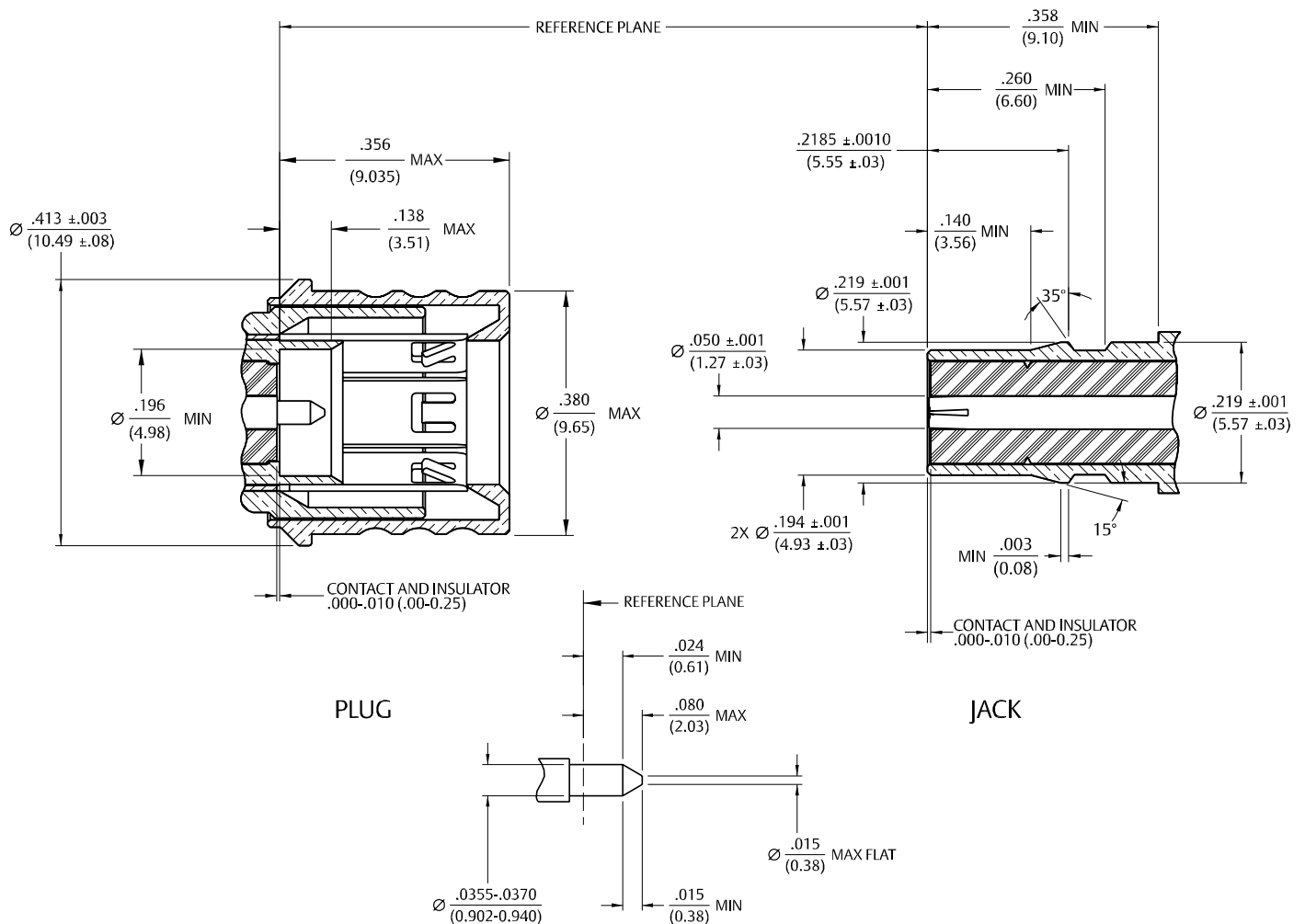
Applications

- Antennas
- Base Stations
- Broadcast
- Cable Assemblies
- Cellular
- Instrumentation
- Microwave Radio
- Radar
- Radios
- RF and Microwave Components
- Test Applications

Features

- All contacts are plated with 50 micro-inches of gold for excellent durability and high frequency performance.
- Connector bodies are offered with Tri-Alloy as a standard finish and gold plating where soldering is required.
- Cabled contacts are captivated upon assembly.
- Flexible cable straight contacts can be crimped or soldered.
- The right angle PC mount features a rugged one-piece body with a one-piece swept contact.
- Unique coupling device provides excellent connectivity.

MATING ENGAGEMENT FOR kwiQMate™



ELECTRICAL SPECIFICATIONS

Impedance: 50 Ohms

Frequency Range: 12.4 GHz

VSWR: (f = GHz)

	<u>Straight Cable Connectors</u>	<u>Right Angle Cable Connectors</u>
RG-316, RG-316 DS	1.15+.02f	1.15+.03f
Uncabled receptacles	N/A	

Insertion Loss: (dB max)

Straight flexible cable connectors	$0.06 \sqrt{f}$ (GHz), tested at 6 GHz
Right angle flexible cable connectors	$0.15 \sqrt{f}$ (GHz), tested at 6 GHz
Uncabled receptacles	N/A

Working Voltage: (Vrms max)

	<u>Sea Level</u>	<u>70K Feet</u>
RG-316, RG-316 DS	250	65
Uncabled receptacles	335	85

Dielectric Withstanding Voltage: Vrms min (at sea level)

Connectors for RG-316, RG-316 DS	750
Uncabled receptacles	1000

Corona Level: (Volts min at 70,000 feet)

Connectors for RG-316, RG-316 DS	190
Uncabled receptacles	250

RF High Potential Withstanding Voltage: (Vrms min, tested at 4 and 7 MHz)

Connectors for RG-316, RG-316 DS	500
Uncabled receptacles	670

Insulation Resistance: 5000 Megohms min

Contact Resistance: (milliohms max)

	<u>Initial</u>	<u>After Environmental</u>
Center contact (straight cabled connectors and Uncabled receptacles)	3.0	4.0
Center contact (right angle cabled connectors)	4.0	6.0
Outer Contact (all connectors)	2.0	N/A
Braid to Body (Tri-Alloy plated bodies)	3.0	N/A
Braid to Body (gold plated bodies)	0.5	N/A

RF Leakage: (dB max, tested at 3 GHz)

Cable connectors	-80
Uncabled receptacles	N/A

MECHANICAL SPECIFICATIONS

Engagement Design:

Durability: 500 cycles min

Engagement/Disengagement Force: 8 lbs max (5 lbs typical)

Coupling Retention Force: 10 lbs min

Contact Retention:

6 lbs min axial force (captivated contacts)

4 oz-in min torque (uncabled receptacles)

Cable Retention: (min*)

	<u>Axial Force (lbs)</u>	<u>Torque (oz-in)</u>
Connectors for RG-316, RG-316 DS	20.....	N/A

* Or cable breaking strength, whichever is less

MATERIAL SPECIFICATIONS

Bodies: Brass per QQ-B-626, Tri-Alloy (Cu/Sn/Zn) plated .0001" min

Contacts: Male - Brass per ASTM B16, Gold plated* per MIL-G-45204 .00005" min

Female – Beryllium Copper per ASTM B196, Gold plated* per MIL-G-45204 .00005" min

Insulators: PTFE Fluorocarbon per ASTM D1710 and ASTM D1457

Gaskets: Silicon Rubber per ZZ-R-765

Expansion Caps: Brass per QQ-B-613, Tri-Alloy (Cu/Sn/Zn) plated .0001" min

Crimp Sleeves: Copper per ASTM A75, Tri-Alloy (Cu/Sn/Zn) plated .0001" min

Coupling Retention Spring (Plugs): Beryllium Copper per ASTM B196, Tri-Alloy (Cu/Sn/Zn) plated .0001" min

Mounting Hardware: Brass per QQ-B-626, or QQ-B 613, Tri-Alloy (Cu/Sn/Zn) plated .0001" min

* Gold plated parts include a .00005" min nickel barrier layer

ENVIRONMENTAL SPECIFICATIONS

(Meets or Exceeds the Applicable Paragraph of MIL-PRF-39012)

Temperature Range: -65°C to +165°C

Thermal Shock: MIL-STD-202, Method 107, Condition B (except +85°C high temperature)

Corrosion: MIL-STD-202, Method 101, Condition B

Shock: MIL-STD-202, Method 213, Condition I

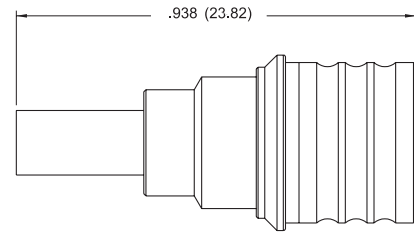
Vibration: MIL-STD-202, Method 204, Condition D

Moisture Resistance: MIL-STD-202, Method 106

COMPETITOR CROSS REFERENCE

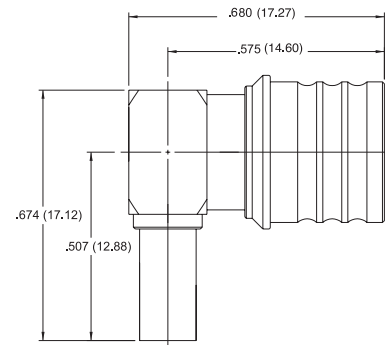
EMERSON PN	Amphenol	Huber Suhner	Molex	Radiall	Rosenberger	Telegartner	Tyco/AMP
146-0403-007	930-129P-51S	11_QMA-50-2-2/133_NE	73254-0090	R123 071 000	28 S 107- 302 N5	J01420A0005	1408333-1
146-0403-107	930-118P-51A	16_QMA-50-2-2/133_NE	73254-0110	R123 172 000	28 S 207- 302 N5	J01420A0035	1408336-1
146-0404-007	930-115P-51S	11_QMA-50-2-1/133_NE		R123 072 000	28 S 107- 303 N5	J01420A0055	1408333-3
146-0404-107		16_QMA-50-2-1/133_NE		R123 174 000	28 S 207- 303 N5	J01420A0095	1408336-3
146-0701-201	930-116J-51P	82_QMA-50-0-3/111_NH	73254-0260	R123 426 003	28 K 101- 400 L5	J01421A0033	1408332-1
146-0701-301	930-128J-51P	85_QMA-50-0-3/111_NH	73254-0240	R123 680 003	28 K 201- 400 N5	J01421A0043	1408337-1

Straight Crimp Type Plug - (3-piece) - Captivated Contact



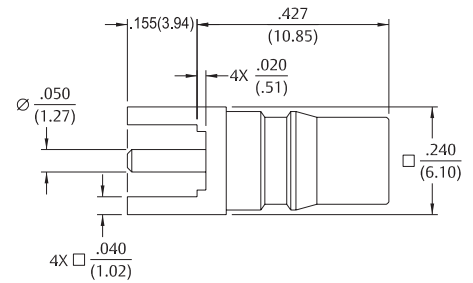
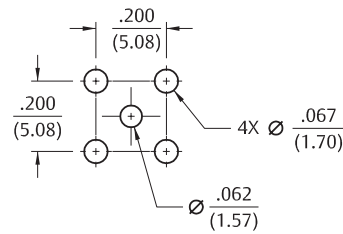
Cable Type	VSWR (f=GHz)	Tri-Alloy
RG-316	1.15 +.02f	146-0403-007
RG-316 DS	1.15 +.02f	146-0404-007

Right Angle Crimp Type Plug (1-piece body)- Captivated Contact



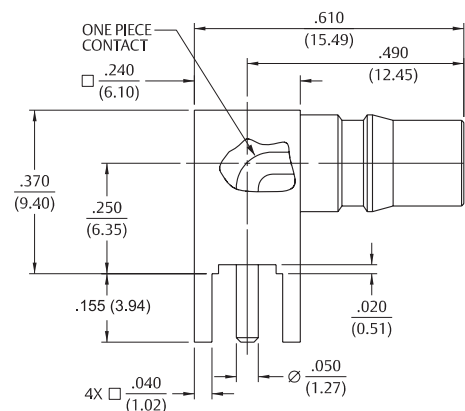
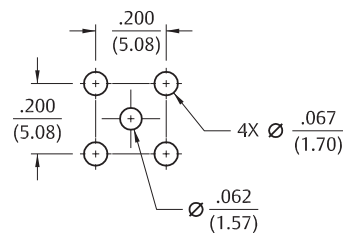
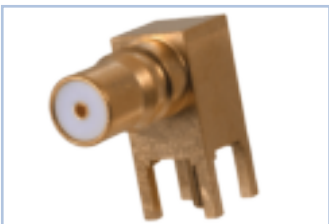
Cable Type	VSWR (f=GHz)	Gold Plated
RG-316	1.15 +.03f	146-0403-107
RG-316 DS	1.15 +.03f	146-0404-107

Straight Jack Receptacle



Gold Plated
146-0701-201

Right Angle Jack Receptacle

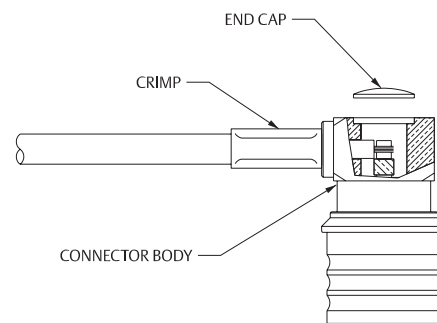
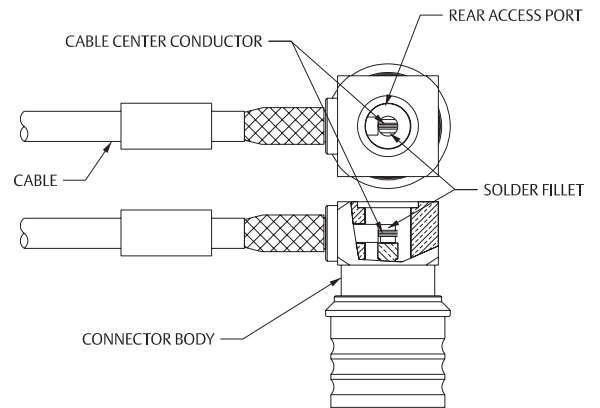
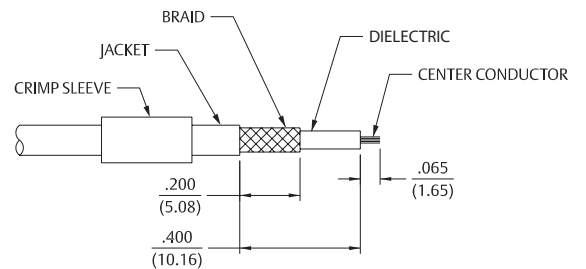
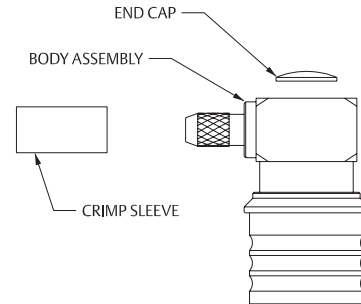


Gold Plated
146-0701-301

ASSEMBLY INSTRUCTIONS

kwiQMate™ Crimp Type Right Angle Plugs for Flexible Cable

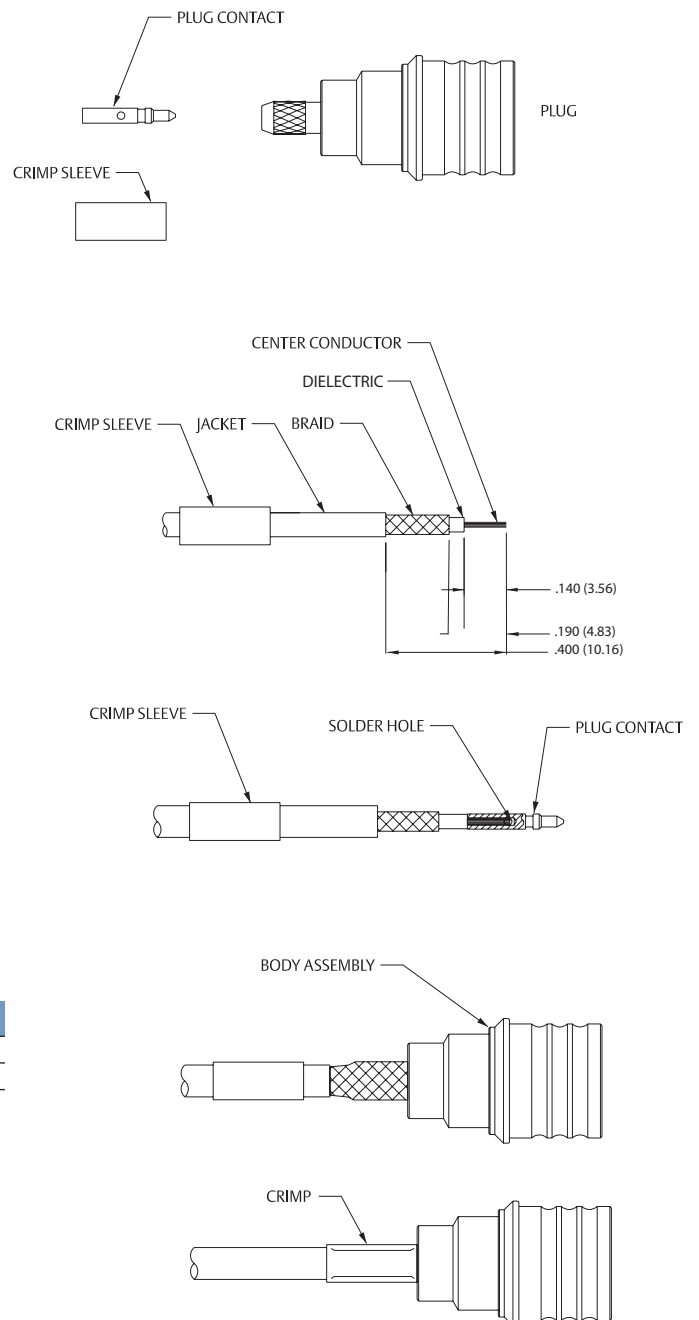
1. Identify connector parts. (3 piece parts)
2. Strip cable to dimensions shown. Do not nick braid or center conductor. Twist stranded center conductor into tight bundle and tin (optional). Slide crimp sleeve onto cable as shown.
3. Flare braid and slide cable into body making certain that the cable dielectric bottoms on center contact. Solder center conductor to contact through the rear access port. Use a minimum amount of solder for a full fillet joint. **.020 (0.51) diameter solder is recommended.**
4. Arrange braid uniformly around crimp stem. Slide crimp sleeve over braid and crimp securely using recommended crimp tool. Place expansion cap in access port and seat with .187 (4.75) diameter flat punch. Slide heat shrink tubing over crimp sleeve and shrink (as applicable).



Cable Type	Part No.	Crimp Hex
RG-316	146-0403-107	.128 (3.25)
RG-316 DS	146-0404-107	.151 (3.83)

kwiQMate™ Straight Plugs For Flexible Cable - Crimp or Solder Contacts

1. Identify connector parts. (3 piece parts)
2. Strip cable to dimensions shown. Do not nick braid or center conductor. Tin center conductor if contact will be solder attached. Do not tin center conductor if contact is to be crimp attached. Slide heat shrink (as applicable) and crimp sleeve onto jacket of cable.
3. Assemble contact onto cable as shown.
Solder Attachment: Solder contact to center conductor through solder hole using .020 (0.51) diameter solder. Use a minimum amount of solder for a good joint.
Crimp Attachment: Crimp contact to center conductor using Johnson® Hand Tool 144-0000-910, setting #2. Crimp location should be centered between end of contact and X-hole. Crimp attachment to solid center conductor cables is not recommended.
4. Flare braid and slide body assembly over contact and under braid. Then seat body assembly firmly onto contact. The cable may have to be held in a clamping fixture. Arrange braid uniformly around crimp stem. Slide crimp sleeve forward and crimp using recommended crimp tool. Slide heat shrink forward and shrink (as applicable).



Cable Type	Part No.	Crimp Hex
RG-316	146-0403-007	.128 (3.25)
RG-316 DS	146-0404-007	.151 (3.83)

Emerson Network Power Connectivity Solutions, Inc. is herein referred to as the "Seller" and the customer or person or entity purchasing goods ("Goods") from Seller is referred to as the "Buyer." These Terms and Conditions, any price list or schedule, quotation, acknowledgment or invoice from Seller relevant to the sale of the Goods and all documents incorporated by specific reference herein or therein, constitute the complete and exclusive statement of the terms of the agreement governing the sale of Goods by Seller to Buyer. Buyer's acceptance of the Goods will manifest Buyer's assent to these Terms and Conditions. Seller reserves the right in its sole discretion to refuse orders.

1. PRICES: Unless otherwise specified in writing by Seller, the price quoted or specified by Seller for the Goods shall remain in effect for thirty (30) days after the date of Seller's quotation or acknowledgment of Buyer's order for the Goods, whichever occurs first, provided an unconditional authorization from Buyer for the shipment of the Goods is received and accepted by Seller within such time period. If such authorization is not received by Seller within such thirty (30) day period, Seller shall have the right to change the price for the Goods to Seller's price for the Goods at the time of shipment. All prices are exclusive of taxes, transportation and insurance, which are to be borne by Buyer.

2. TAXES: Any current or future tax or governmental charge (or increase in same) affecting Seller's costs of production, sale, or delivery or shipment, or which Seller is otherwise required to pay or collect in connection with the sale, purchase, delivery, storage, processing, use or consumption of Goods, shall be for Buyer's account and shall be added to the price.

3. TERMS OF PAYMENT: Unless otherwise specified by Seller, terms are net thirty (30) days from date of Seller's invoice in U.S. currency. Seller shall have the right, among other remedies, either to terminate this agreement or to suspend further performance under this and/or other agreements with Buyer in the event Buyer fails to make any payment when due, which other agreements Buyer and Seller hereby amend accordingly. Buyer shall be liable for all expenses, including attorneys' fees, relating to the collection of past due amounts. If any payment owed to Seller is not paid when due, it shall bear interest, at a rate to be determined by Seller, which shall not exceed the maximum rate permitted by law, from the date on which it is due until it is paid. Should Buyer's financial responsibility become unsatisfactory to Seller, cash payments or security satisfactory to Seller may be required by Seller for future deliveries and for the Goods theretofore delivered. If such cash payment or security is not provided, in addition to Seller's other rights and remedies, Seller may discontinue deliveries.

4. SHIPMENT AND DELIVERY: While Seller will use all reasonable commercial efforts to maintain the delivery date(s) acknowledged or quoted by Seller, all shipping dates are approximate and not guaranteed. Seller reserves the right to make partial shipments. Seller, at its option, shall not be bound to tender delivery of any Goods for which Buyer has not provided shipping instructions and other required information. If the shipment of the Goods is postponed or delayed by Buyer for any reason, Buyer agrees to reimburse Seller for any and all storage costs and other additional expenses resulting therefrom. Risk of loss and legal title to the Goods shall transfer to Buyer for sales in which the end destination of the Goods is outside of the United States immediately after the Goods have passed beyond the territorial limits of the United States. For all other shipments, risk of loss for damage and responsibility shall pass from Seller to Buyer upon delivery to and receipt by carrier at Seller's shipping point. All shipments are F.O.B. Seller's shipping point. Any claims for shortages or damages suffered in transit are the responsibility of Buyer and shall be submitted by Buyer directly to the carrier.

Shortages or damages must be identified and signed for at the time of delivery. Buyer shall inspect Goods delivered to it by Seller immediately upon receipt, and, any course of dealing to the contrary notwithstanding, failure of Buyer to give Seller notice of any claim within 30 days after receipt of such Goods shall be an unqualified acceptance of such Goods.

5. LIMITED WARRANTY: Subject to the limitations of Section 6, Seller warrants that the Goods manufactured by Seller will be free from defects in material and workmanship under normal use and regular service and maintenance for a period of one year from the date of shipment of the Goods by Seller, unless otherwise specified by Seller in writing. **THIS IS THE SOLE AND EXCLUSIVE WARRANTY GIVEN BY SELLER WITH RESPECT TO THE GOODS AND IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, ARISING BY OPERATION OF LAW OR OTHERWISE, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHETHER OR NOT THE PURPOSE OR USE HAS BEEN DISCLOSED TO SELLER IN SPECIFICATIONS, DRAWINGS OR OTHERWISE, AND WHETHER OR NOT SELLER'S PRODUCTS ARE SPECIFICALLY DESIGNED AND/OR MANUFACTURED BY SELLER FOR BUYER'S USE OR PURPOSE.**

This warranty does not extend to any losses or damages due to misuse, accident, abuse, neglect, normal wear and tear, negligence (other than Seller's), unauthorized modification or alteration, use beyond rated capacity, unsuitable power sources or environmental conditions, improper installation, repair, handling, maintenance or application or any other cause not the fault of Seller. To the extent that Buyer or its agents has supplied specifications, information, representation of operating conditions or other data to Seller in the selection or design of the Goods and the preparation of Seller's quotation, and in the event that actual operating conditions or other conditions differ from those represented by Buyer, any warranties or other provisions contained herein which are affected by such conditions shall be null and void.

If within thirty (30) days after Buyer's discovery of any warranty defects within the warranty period, Buyer notifies Seller thereof in writing, Seller shall, at its option and as Buyer's exclusive remedy, repair, correct or replace F.O.B. point of manufacture, or refund the purchase price for, that portion of the Goods found by Seller to be defective. Failure by Buyer to give such written notice within the applicable time period shall be deemed an absolute and unconditional waiver of Buyer's claim for such defects. All costs of dismantling, reinstallation and freight and the time and expense of Seller's personnel and representatives for site travel and diagnosis under this warranty shall be borne by Buyer unless accepted in writing by Seller. Goods repaired or replaced during the warranty period shall be covered by the foregoing warranty for the remainder of the original warranty period or ninety (90) days from the date of shipment, whichever is longer.

Buyer assumes all other responsibility for any loss, damage, or injury to persons or property arising out of, connected with, or resulting from the use of Goods, either alone or in combination with other products/components.

Section 5 applies to any entity or person who may buy, acquire or use the Goods, including any entity or person who obtains the Goods from Buyer, and shall be bound by the limitations therein, including Section 6. Buyer agrees to provide such subsequent transferee conspicuous, written notice of the provisions of Sections 5 and 6.

6. LIMITATION OF REMEDY AND LIABILITY: THE SOLE AND EXCLUSIVE REMEDY FOR BREACH OF ANY WARRANTY HEREUNDER OTHER THAN THE WARRANTY PROVIDED UNDER SECTION 7 SHALL BE LIMITED TO REPAIR, CORRECTION OR REPLACEMENT, OR REFUND OF THE PURCHASE PRICE UNDER SECTION 5.

SELLER SHALL NOT BE LIABLE FOR DAMAGES CAUSED BY DELAY IN PERFORMANCE AND THE REMEDIES SET FORTH IN THIS AGREEMENT ARE EXCLUSIVE. IN NO EVENT, REGARDLESS OF THE FORM OF THE CLAIM OR CAUSE OF ACTION (WHETHER BASED IN CONTRACT, INFRINGEMENT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE), SHALL SELLER'S LIABILITY TO BUYER AND/OR ITS CUSTOMERS EXCEED THE PRICE PAID BY BUYER FOR THE SPECIFIC GOODS PROVIDED BY SELLER GIVING RISE TO THE CLAIM OR CAUSE OF ACTION. BUYER AGREES THAT IN NO EVENT SHALL SELLER'S LIABILITY TO BUYER AND/OR ITS CUSTOMERS EXTEND TO INCLUDE INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES. The term "consequential damages" shall include, but not be limited to, loss of anticipated profits, business interruption, loss of use, revenue, reputation and data, costs incurred, including without limitation, for capital, fuel, power and loss or damage to property or equipment.

Buyer expressly acknowledges and agrees that Seller has set its prices and entered into this agreement in reliance upon the limitations of liability and other terms and conditions specified herein, which allocates the risk between Seller and Buyer and form a basis of this bargain between the parties.

It is expressly understood that any technical advice furnished by Seller with respect to the use of the Goods is given without charge, and Seller assumes no obligation or liability for the advice given, or results obtained, all such advice being given and accepted at Buyer's risk.

7. PATENTS AND COPYRIGHTS: Subject to the limitations of the second paragraph of Section 6, Seller warrants that the Goods sold, except as are made specifically for Buyer according to Buyer's specifications, do not infringe any valid U.S. patent or copyright in existence as of the date of shipment. This warranty is given upon the condition that Buyer promptly notify Seller of any claim or suit involving Buyer in which such infringement is alleged and cooperate fully with Seller and permit Seller to control completely the defense, settlement or compromise of any such allegation of infringement. Seller's warranty as to use patents only applies to infringement arising solely out of the inherent operation according to Seller's specifications and instructions (i) of such Goods, or (ii) of

any combination of Goods acquired from Seller in a system designed by Seller. In the event such Goods are held to infringe such a U.S. patent or copyright in such suit, and the use of such Goods is enjoined, or in the case of a compromise or settlement by Seller, Seller shall have the right, at its option and expense, to procure for Buyer the right to continue using such Goods, or replace them with non-infringing Goods, or modify same to become non-infringing, or grant Buyer a credit for the depreciated value of such Goods and accept return of them. In the event of the foregoing, Seller may also, at its option, cancel the agreement as to future deliveries of such Goods, without liability.

8. EXCUSE OF PERFORMANCE: Seller shall not be liable for delays in performance or for non-performance due to acts of God; acts of Buyer; war; fire; flood; weather; sabotage; strikes or labor disputes; civil disturbances or riots; governmental requests, restrictions, allocations, laws, regulations, orders or actions; unavailability of or delays in transportation; default of suppliers; or unforeseen circumstances or any events or causes beyond Seller's reasonable control. Deliveries or other performance may be suspended for an appropriate period of time or canceled by Seller upon notice to Buyer in the event of any of the foregoing, but the balance of the agreement shall otherwise remain unaffected as a result of the foregoing.

If Seller determines that its ability to supply the total demand for the Goods, or to obtain material used directly or indirectly in the manufacture of the Goods, is hindered, limited or made impracticable due to causes set forth in the preceding paragraph, Seller may allocate its available supply of the Goods or such material without obligation to acquire other supplies of any such Goods or material among itself and its purchasers on such basis as Seller determines to be equitable without liability for any failure of performance which may result therefrom.

9. CANCELLATION: Unless otherwise agreed in writing by Seller, orders under this agreement may not be canceled by Buyer for any reason.

10. CHANGES: Buyer may request changes or additions to the Goods consistent with Seller's specifications and criteria. In the event such changes or additions are accepted by Seller, Seller may revise the price and dates of delivery.

Seller reserves the right to change designs and specifications for the Goods without prior notice to Buyer, except with respect to Goods being made-to-order for Buyer. Seller shall have no obligation to install or make such change in any Goods manufactured prior to the date of such change.

11. NUCLEAR/MEDICAL GOODS AND SERVICES SOLD HEREUNDER ARE NOT FOR USE IN CONNECTION WITH ANY NUCLEAR, MEDICAL, LIFE-SUPPORT AND RELATED APPLICATIONS. Buyer accepts goods and services with the foregoing understanding, agrees to communicate the same in writing to any subsequent purchasers or users and to defend, indemnify and hold harmless Seller from any claims, losses, suits, judgments and damages, including incidental and consequential damages, arising from such use, whether the cause of action be based in tort, contract or otherwise, including allegations that the Seller's liability is based on negligence or strict liability.

12. BUYER'S COMPLIANCE WITH LAWS: In connection with the transactions contemplated by this agreement, Buyer is familiar with and shall fully comply with all applicable laws, regulations, rules and other requirements of the United States and of any applicable state, foreign and local governmental body in connection with the purchase, receipt, use, transfer and disposal of the Goods.

13. EXPORT/IMPORT: Buyer agrees that all applicable import and export control laws, regulations, orders and requirements, including without limitation those of the United States and the European Union, and the jurisdictions in which the Seller and Buyer are established or from which Goods and Services may be supplied, will apply to their receipt and use. In no event shall Buyer use, transfer, release, import, export, Goods in violation of such applicable laws, regulations, orders or requirements.

14. TOOLING: Tool, die, and pattern charges, if any, are in addition to the price of the Goods and are due and payable upon completion of the tooling. All such tools, dies and patterns shall be and remain the property of Seller. Charges for tools, dies, and patterns do not convey to Buyer, title, ownership interest in, or rights to possession or removal, or prevent their use by Seller for other purchasers, except as otherwise expressly provided by Seller and Buyer in writing with reference to this provision.

15. RETURNED GOODS: Except as otherwise provided with respect to warranty defects in Section 5, advance written permission to return Goods must be obtained from Seller's customer service department. Such Goods must be current, unused, catalogued Goods and must be shipped, transportation prepaid, to the Seller's specified return location. Returns made without proper written permission will not be accepted by Seller. Credit or exchange for such returned Goods will be at the billing price or current price, whichever is lower, from which will be deducted an inspection, restocking and repacking charge and the cost of any reconditioning. Seller reserves the right to inspect Goods prior to authorizing return.

16. BUYER SUPPLIED DATA: To the extent that Seller has been provided by or on behalf of Buyer any specifications, description of operating conditions or other data and information in connection with the selection or design of the Goods, and the actual operating conditions or other circumstances differ from those provided by Buyer and relied upon by Seller, any warranties or other provisions contained herein which are affected by such conditions shall be null and void.

17. DRAWINGS: Seller's prints and drawings (including without limitation, the underlying technology) furnished by Seller to Buyer in connection with this agreement are the property of Seller and Seller retains all rights, including without limitation, exclusive rights of use, licensing and sale. Possession of such prints or drawings does not convey to Buyer any rights or license, and Buyer shall return all copies (in whatever medium) of such prints or drawings to Seller immediately upon request therefore.

18. ASSIGNMENT: Buyer shall not assign its rights or delegate its duties hereunder or any interest herein without the prior written consent of Seller, and any such assignment, without such consent, shall be void.

19. GENERAL PROVISIONS: These terms and conditions supersede all other communications, negotiations and prior oral or written statements regarding the subject matter of these terms and conditions. No change, modification, rescission, discharge, abandonment, or waiver of these terms and conditions shall be binding upon the Seller unless made in writing and signed on its behalf by a duly authorized representative of Seller. No conditions, usage of trade, course of dealing or performance, understanding or agreement purporting to modify, vary, explain, or supplement these terms and conditions shall be binding unless hereafter made in writing and signed by the party to be bound, and no modification or additional terms shall be applicable to this agreement by Seller's receipt, acknowledgment, or acceptance of purchase orders, shipping instruction forms, or other documentation containing terms at variance with or in addition to those set forth herein. Any such modifications or additional terms are specifically rejected and deemed a material alteration hereof. If this document shall be deemed an acceptance of a prior offer by Buyer, such acceptance is expressly conditional upon Buyer's assent to any additional or different terms set forth herein. No waiver by either party with respect to any breach or default or of any right or remedy, and no course of dealing, shall be deemed to constitute a continuing waiver of any other breach or default or of any other right or remedy, unless such waiver be expressed in writing and signed by the party to be bound. All typographical or clerical errors made by Seller in any quotation, acknowledgment or publication are subject to correction.

The validity, performance, and all other matters relating to the interpretation and effect of this agreement shall be governed by the law of the state of Missouri. Buyer and Seller agree that the proper venue for all actions arising in connection herewith shall be only in Missouri and the parties agree to submit to such jurisdiction. No action, regardless of form, arising out of transactions relating to this contract, may be brought by either party more than two (2) years after the cause of action has accrued. The U.N. Convention on Contracts for the International Sales of Goods shall not apply to this agreement.