



SPORLAN

Combination Moisture & Liquid Indicator

See-All[®]



ENGINEERING YOUR SUCCESS.



The ZoomLock Advantage



ZoomLock™ compatible SA-PZK See•Alls and braze-free fittings make your job of joining copper tubes simpler and faster. The one-piece fittings, specially designed to work without brazing, are reliably secure, leak-proof and more repeatable than brazed connections — so there's no compromise on quality or performance. Professionals who have tried ZoomLock braze-free couplings report that their time and labor costs on tube connections are typically reduced 40 – 60% on average by eliminating the need for brazing. The biggest benefit of that improved efficiency is more productivity and increased profit potential, but there are also many other exciting advantages to braze-free tube connecting:

- Less equipment and no gas needed
- Safer conditions, no fire hazards
- No hot work permits required
- More environment-friendly
- No solder-related quality issues
- More flexible access to job sites
- No need to nitrogen-purge

See•All® Moisture and Liquid Indicator

9 OUTSTANDING BENEFITS

ONE INDICATOR for all REFRIGERANTS — provides a true moisture indication for Refrigerant 22, 32, 134a, 290, 404A, 407A, 407C, 407F, 410A, 448A, 449A, 450A, 507, 513A, 744, 1234ze.

RELIABLE and ACCURATELY CALIBRATED COLOR CHANGE POINTS — in parts per million of moisture for each refrigerant.

REPLACEABLE INDICATOR ELEMENT — the color indicator paper can be changed on fused glass models manufactured since 1984 without removing the See•All from the line.

INDICATOR PROTECTED from DISCOLORATION and DIRT — by a filter pad and screen. This prevents washing of the indicator by the refrigerant and protects it from system contamination and turbulence.

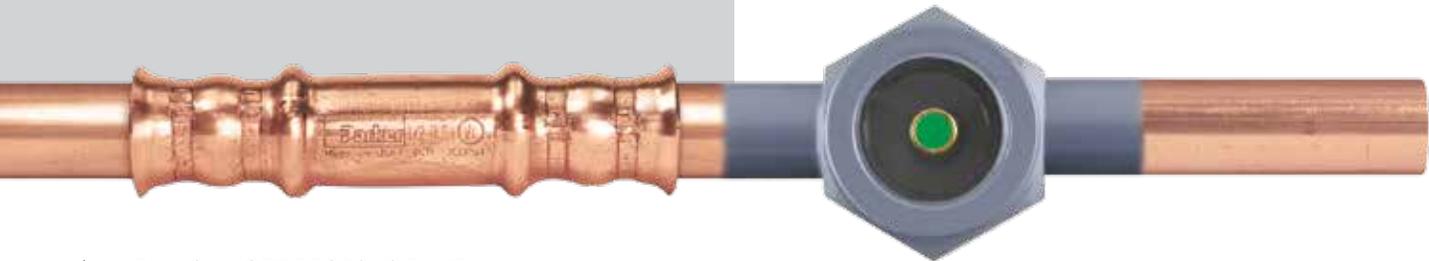
COLOR CHANGES ARE EASILY DISTINGUISHED and REVERSIBLE — indicator colors differ so widely between the wet and dry condition, there is no possibility of confusion. Colors reverse as often as moisture concentration in the system changes.

LARGE FULL VIEW SIGHTGLASS — extra large crystal clear sightglass for viewing the refrigerant. Bubbles indicate a shortage of refrigerant or a restriction in the liquid line.

DISASSEMBLY FOR INSTALLATION IS UNNECESSARY — with extended fittings on small size solder models. See•Alls are easy to braze.

PLASTIC CAP — is supplied with See•All to keep the glass free from dust, dirt and grease.

ZOOMLOCK COMPATIBLE — multiple models are available for use with ZoomLock fittings, couplings, adapters, and tees.



⚠ WARNING – USER RESPONSIBILITY

Failure or improper selection or improper use of the products described herein or related items can cause death, personal injury and property damage.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.

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

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

OFFER OF SALE

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated in the detailed "Offer of Sale" elsewhere in this document or available at www.parker.com.

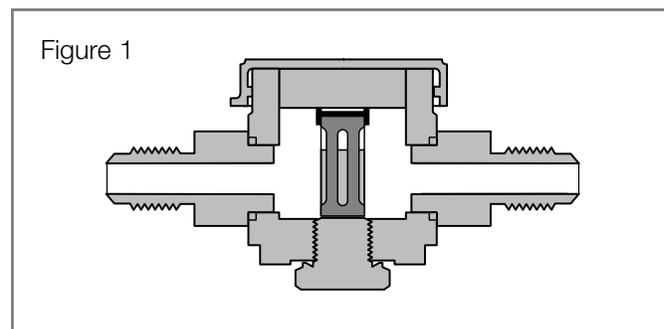
Bulletin 70-10, November 2016 supersedes Bulletin 70-10, June 2015 and all prior publications.

The Sporlan See•All Moisture and Liquid Indicator combines the two functions of moisture and liquid indication into a single economical product. It takes the guess work out of servicing refrigeration and air conditioning equipment. The See•All assists the technician in determining the state of the circulating refrigerant at a particular location and if a safe moisture level exists in the system. Excessive moisture in refrigerant systems can cause unwanted chemistries such as hydrolysis of lubricants and other materials, corrosion of metals, copper plating, ice formation at the meeting device and a chemical change in the motor insulation of a hermetic compressor.

HOW IT'S MADE

The solid copper fittings are brazed to the plated body. A glass disc is inserted in the body and heated just to the melting point under carefully controlled conditions. This **fuses the glass to the body** in a permanent leak-free joint. The indicator paper (retained in a small brass ferrule) is inserted from the back and held in place with a slotted cylinder. The slotted cylinder and indicator assembly is mounted on a post that screws into the bottom of the body, and seals with a knife-edge joint. This overall construction is highly effective in preventing refrigerant leakage. The unit is painted to protect it from corrosion.

Paper indicator elements are made under the strictest quality control procedures. The indicator is tested for proper color change ability in the laboratory and twice more during assembly.



HOW IT WORKS

The indicator is a porous filter paper impregnated with a chemical salt that is sensitive to moisture. The salt changes color according to the moisture content (relative saturation) in the refrigerant. A dark green color indicates the refrigerant is DRY and yellow indicates a WET condition. The indicator is formulated so that it changes color at the moisture levels generally accepted as the safe operating range.

The See•All calibration information in Table 1 is based on detailed experimental data for Refrigerants 22, 32, 134a, 290, 404A, 407A, 407C, 407F, 410A, 448A, 449A, 450A, 507, 513A, 744, 1234ze. The calibration information on other refrigerants was obtained from a comparison of their properties with these refrigerants. For Refrigerants 123, 401A and 402A; Refrigerant 22 moisture calibration is suggested. For other refrigerants, contact Sporlan Division.

FOR AIR — Tests on air show that the See•All changes color in the range of **0.5% to 2.0% R.H.** In ordinary air lines this means that the See•All will change color at dew points in the range of minus 40°F to minus 60°F.

BRAZING

See•Alls with 1/4" through 1-1/8" ODF Solder connections are constructed with long fittings made from either heavily copper plated steel or copper. Both fitting types are suitable for soldering or brazing using any of the common alloys, such as silver solder, soft solder, Sta-Brite, or Sil-Fos or PhosCopper. These See•Alls do not require disassembly in the field for brazing because the extended fittings reduce the possibility of damaging the moisture indicator element when the See•All is brazed into the system. To prevent damaging the See•All ensure

SPECIFICATIONS			
Connection Sizes (in.)	Type No.	Overall Length (in.)	See•All
Male Flare			
1/4	SA-12	2.87 (72.9mm)	
3/8	SA-13	3.37 (85.6mm)	
1/2	SA-14	3.82 (97mm)	
5/8	SA-15	4.12 (105mm)	
Female X Male Flare			
1/4	SA-12FM	2.56 (65mm)	
3/8	SA-13FM	2.97 (75.4mm)	
1/2	SA-14FM	3.44 (87.4mm)	
Male Flare X Swivel Nut			
3/8	SA-13U	3.16 (80.3)	
1/2	SA-14U	3.74 (95mm)	
Swivel Nut X Swivel Nut			
3/8	SA-13UU	2.99 (75.9mm)	
1/2	SA-14UU	3.66 (93mm)	
5/8	SA-15UU	3.79 (96.3mm)	
Female Flare X Swivel Nut			
3/8	SA-13FU	2.83 (71.9mm)	
1/2	SA014FU	3.36 (83.3mm)	
Swivel Nut X ODF Solder			
3/8	SA-13SU	3.83 (97.3mm)	
1/2	SA-14SU	4.27 (108mm)	
5/8	SA-15SU	4.33 (110mm)	
ODF Solder			
1/4	SA-12S	4.63 (118mm)	
3/8	SA-13S		
12mm	SA-M12-S	4.63 (118mm)	
1/2	SA-14S	4.88 (124mm)	
5/8	SA-15S		
22mm	SA-M22-S	6.32 (161mm)	
7/8	SA-17S	6.31 (160mm)	
1-1/8	SA-19S		
1-3/8	SA-211	8 (203mm)	
1-5/8	SA-213		
2-1/8	SA-217		
ZoomLock Compatible			
3/8 ODM	SA-13-PZK	4.63 (118 mm)	
1/2 ODM	SA-14-PZK	4.63 (118 mm)	
5/8 ODM	SA-15-PZK	4.88 (124 mm)	
7/8 ODM	SA-17-PZK	6.42 (163 mm)	

Most solder connections can be used as male fittings as well as female fittings. The 1/4" ODF is 3/8" ODM, the 3/8" ODF is 1/2" ODM, the 1/2" ODF is 5/8" ODM and the 5/8" ODF is 3/4" ODM. Models with female flare and/or swivel nut connections are supplied with a copper gasket in the fitting. ZoomLock compatible models have ODM X ODM fittings and can be brazed to ODF components or fittings

Overall width is: 1.31" for 1/4" and 3/8" sizes, 1.58" for 1/2" and 5/8" sizes, and 1.38" for 7/8" and 1-1/8" sizes. Shipping weight is: 7 oz. for 1/4" and 3/8" sizes, 10 oz. for 1/2" and 5/8" sizes, 15 oz. for 7/8" and 1-1/8" sizes and 1.5 lbs. for the SA-200 series. UL and ULC Listed - Guide - SEYW - File No. SA-3182. Maximum Rated Pressure is 650 psig.

Table 1

MOISTURE CONTENT – PPM				
REFRIGERANT	LIQUID LINE TEMPERATURE	SEE • ALL SHOWS		
		● Green - DRY	● Chartreuse - CAUTION	● Yellow - WET
R-22	75°F / 24°C	↓30	30-90	↑90
	100°F / 38°C	↓45	45-130	↑130
R-32	75°F / 24°C	↓125	125-500	↑500
	100°F / 38°C	↓145	145-580	↑580
R-134a	75°F / 24°C	↑50	50-200	↑200
	100°F / 38°C	↓80	80-225	↑225
R-290	75°F / 24°C	↓15	15-30	↑30
	100°F / 38°C	↓45	45-60	↑60
R-404A	75°F / 24°C	↓15	15-90	↑90
R-507	100°F / 38°C	↓30	30-140	↑140
R-407A R-407C R-407F	75°F / 24°C	↓120	120-280	↑280
R-410A	75°F / 24°C	↓75	75-150	↑150
R-448A	75°F / 24°C	↓45	45-150	↑150
R-449A	100°F / 38°C	↓50	50-255	↑255
R-450A	75°F / 24°C	↓30	30-90	↑90
R-513A*	100°F / 38°C	↓50	50-150	↑150
R-744	20°F / -7°C	↓40	40-65	↑65
R-1234ze	75°F / 24°C	↓40	40-80	↑80
	100°F / 38°C	↓55	55-120	↑120

NOTE: Change or add Catch-All Filter-Drier when paper turns from green to chartreuse.

ample heat is supplied to the fittings and point the torch tip away from the See•All body. Proper brazing technique ensures proper capillary action of the alloy.

The ODF Solder connections on the See•All are clean when shipped. Polishing the inside of the fittings before brazing is unnecessary.

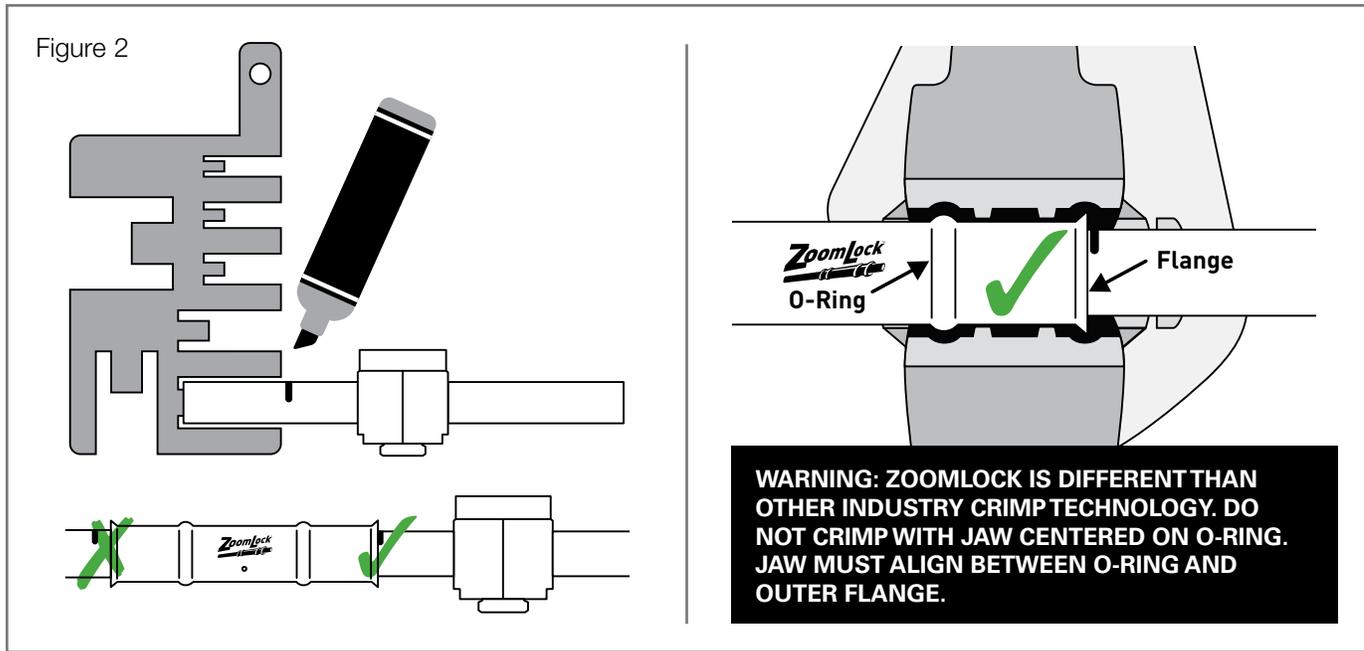
The larger See•Alls with 1-3/8", 1-5/8", and 2-1/8" ODF Solder connections utilize copper connections and require removal of the cartridge from the brass saddle adaptor before brazing. The cartridge is shipped hand tight for easy removal.

The See•All may be installed anywhere in the the liquid line, but preferably after the Catch-All Filter-Drier and ahead of the metering device.

ZOOMLOCK

The Type PZK models with ODM X ODM connections are compatible with ZoomLock™ braze-free fittings. Please see SD-404 for thorough instructions for installing ZoomLock braze-free fittings.

1. Deburr and clean copper to ensure tube ends are free and clear of any residual burrs, oxidation, dirt or debris. Use the ZoomLock depth gauge to determine the proper insertion depth. Mark the tubing with a permanent marker to indicate proper insertion depth on every tube.
2. Push the ZoomLock fitting onto the tube. Use the mark to assure insertion depth and secure fit.



3. Use the grooves in the jaws as a guide to properly place the crimping jaws onto the fitting. (See illustration below for proper crimping alignment.) Press and continue to hold the trigger on the ZoomLock Crimping Tool until the tool completes its cycle. Remove the Crimping Tool from the fitting and visually inspect for a “RLS” mark on the tube connection, indicating a proper crimp. **WARNING: ZOOMLOCK IS DIFFERENT THAN OTHER INDUSTRY CRIMP TECHNOLOGY. DO NOT CRIMP WITH JAW CENTERED ON O-RING. JAW MUST ALIGN BETWEEN O-RING AND OUTER FLANGE.**

NOTE: The Type PZK ODM X ODM models can be brazed into the ODF solder connections of other components or tubing using the brazing instructions contained herein.

APPLICATION

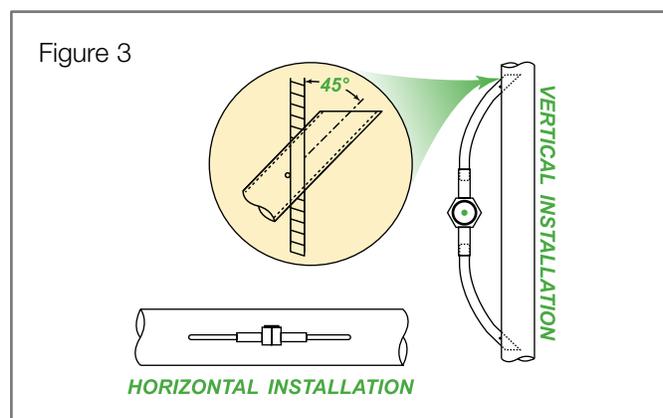
The indicator element of the See•All prior to installation will be yellow, indicating a wet condition. This is a normal situation since the air in contact with the element is above 0.5% Relative Humidity. This does not affect the operation or calibration of the See•All. As soon as it is installed in a system, the indicator element will begin to change according to the moisture content of the refrigerant. Some change may take place rapidly at the start-up of a new system or after replacement of a drier on existing installations. In some cases the See•All will change in as short a time as 15 minutes. However, it is **recommended that the equipment operate for about 12 hours** to allow the moisture in the system and the See•All color to come to complete equilibrium. The action of the indicator element is completely reversible and will change color as often as the moisture content of the system varies.

The drying of the system should be continued until the indicating element changes from chartreuse to green. The actual moisture content of the refrigerant will be in accordance with Table 1.

For best results with the nickel plated SAE flare fittings that are used on See•Alls, **lubricate the flare surface** and the back of the flare nut with refrigerant grade oil during assembly. This is particularly necessary to avoid leaks if the See•All is being assembled to another plated steel flare fitting, such as the Catch-All Filter-Drier.

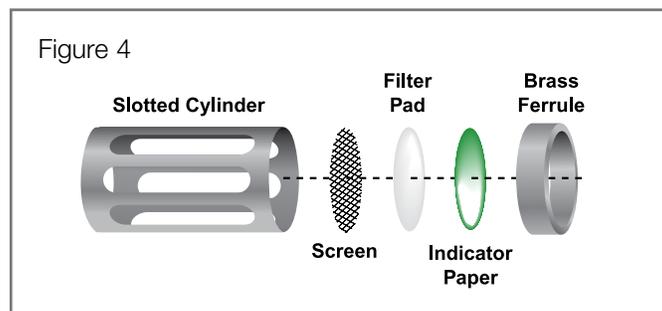
BYPASS INSTALLATION

On systems having liquid lines larger than 2-1/8” O.D., the See•All should be installed in a bypass line. During the operating cycle this will provide sufficient flow to obtain a **satisfactory reading for both moisture and liquid indication.**



Best results will be obtained if the bypass line is parallel to the main liquid line and the take off and return tubes **project into the main liquid line** at a 45° angle.

While satisfactory liquid and moisture indication will generally be obtained in any position, the preferred methods of installation are shown in Figure 3.



Kits of preformed 1/4” or 3/8” tubing are available as a separate item at a nominal cost; application instructions and a detailed template are included. The kits can be used with either SAE Flare or ODF Solder type See•Alls.

Table 2

Tube Size ODF	Kit No.	SAE Flare	ODF SOLDER
1/4”	AC-2	SA-12	SA-12S
3/8”	AC-3	SA-13	SA-13S

SERVICE POINTERS

REPLACEMENT INDICATOR PAPER — Sporlan kit K-SA-4 consisting of a slotted cylinder and indicator paper assembly is available for replacing the indicator in the fused glass style Sporlan See•Alls (1/4” thru 1-1/8” sizes). Replacement is through the bottom (see Figure 1). If the indicator becomes damaged, it is generally recommended that the entire See•All be replaced. However, the parts kit can be used in situations where it is difficult to remove the See•All.

LIQUID WATER — On occasion it is possible for large quantities of water to enter a refrigeration system. An example would be a broken tube in a water cooled condenser. If this happens and **free water** comes in contact with the indicator element, the element will be damaged.

All moisture indicating elements use a chemical salt (see “How it Works”). These salts must be soluble in water in order to change color, **If excessive water is present then the salts will dissolve causing permanent damage to the indicator. The indicator paper may remain yellow or turn white.**

HERMETIC MOTOR BURNOUTS — After a hermetic motor burnout, install a **Catch-All Filter-Drier** to remove the acid and sludge contamination. When the system has operated for 48 hours, replace the Catch-All Filter-Drier and install a See•All.

Since the **acid formed by the burnout** may damage the indicator element of the See•All, it is preferable to install it after most of the contaminants have been removed.

EXCESS OIL — When a system is circulating an excessive amount of oil, the See•All indicator paper may become saturated. This causes the **indicator to appear brown** or translucent and lose its ability to change color, but does not permanently damage the See•All. **Let the See•All remain in the system.** The circulating refrigerant will remove the excess oil, and the indicator element will return to its proper color.

LEAK DETECTORS — Certain dye type liquid leak detectors may interfere with the color change of the indicator paper. If desired, many of these leak detectors can be removed by installing a Sporlan HH style **Catch-All** in the liquid line. The See•All can then be installed on the system without risk of damaging the indicator paper.

ALCOHOL — Do **NOT** install a See•All in a system that contains methyl alcohol or similar liquid dehydrating agents. Remove the alcohol by using a Catch-All Filter-Drier, and then install the See•All. Otherwise the alcohol will damage the See•All color indicator

REMOVABLE CARTRIDGE

Types SA-211, 213 and 217 have copper connections and feature a removable cartridge containing the moisture indicating element. The cartridge has a **knife edge joint** and is available as a separate unit for field replacement purposes if necessary. It is designated as AC-20 and fits all three sizes.



AC-20

ATEX COMPLIANCE

The ODF solder models within this Bulletin are designed to be used with A2L and A3 refrigerants (flammable) along with complying with the European Directives (97/23/CE) “Pressure Equipment Directive” and (94/9/CE) “ATEX Directive” for equipment intended for use in potentially explosive atmospheres.

Products bearing this mark have been evaluated and tested to the requirements found in the ATEX Directive 94/9/CE. The products will fall under “II 3 G TX Ta -46°C to +65°C” (-50°F to 149°F) and are considered suitable for installation in potentially explosive atmospheres.

INSTALLATION — For safety reasons, only authorized persons who are certified in installing and maintaining refrigeration and air conditioning systems containing flammable hydrocarbons must do the installation and maintenance. All local requirements or codes regarding use of hydrocarbons in refrigeration and air conditioning systems must be followed.

The refrigeration or air conditioning system must be designed so no abnormal impact (e.g. vibration, liquid hammer, pressure pulsations) can create risk for damage to the system.

When replacing parts, **ONLY** use Sporlan replacement parts.

Parker Hannifin – Sporlan Division takes no responsibility for the classification of the refrigeration and/or air conditioning systems

SAFETY — When used in a zone noted as Hazardous (ATEX), the possibility of Electrostatic charge build up on the external surface has to be prevented either during installation or service of this product. If the Sporlan product must be handled, do so using a damp cloth in order to avoid electrostatic buildup.

Protect the Sporlan product against external impact that may cause a spark.

Personnel handling or working on or with this product must be qualified for that task. In an ATEX zone, the personnel must be educated in the risks of explosion. It is the responsibility of the installer to check the installation so that there is no leakage after it is installed, especially in case of explosive atmospheres. The valve and its control must not undergo any modification without prior approval from the Sporlan Division. Sporlan is not responsible for any damage which may be caused by the misuse or installation of our parts, accessories or controls which are not original parts.

OFFER OF SALE

The goods, services or work (referred to as the “Products”) offered by **Parker-Hannifin Corporation**, its subsidiaries, groups, divisions, and authorized distributors (“Seller”) are offered for sale at prices indicated in the offer, or as may be established by Seller. The offer to sell the Products and acceptance of Seller’s offer by any customer (“Buyer”) is contingent upon, and will be governed by all of the terms and conditions contained in this Offer of Sale. Buyer’s order for any Products specified in Buyer’s purchase document or Seller’s offer, proposal or quote (“Quote”) attached to the purchase order, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer.

1. Terms and Conditions. Seller’s willingness to offer Products for sale or accept an order for Products is subject to the terms and conditions contained in this Offer of Sale or any newer version of the same, published by Seller electronically at www.parker.com/saleterms/. Seller objects to any contrary or additional terms or conditions of Buyer’s order or any other document or other communication issued by Buyer.

2. Price; Payment. Prices stated on Seller’s Quote are valid for thirty (30) days, except as explicitly otherwise stated therein, and do not include any sales, use, or other taxes or duties unless specifically stated. Seller reserves the right to modify prices to adjust for any raw material price fluctuations. Unless otherwise specified by Seller, all prices are F.C.A. Seller’s facility (INCO-TERMS 2010). Payment is subject to credit approval and payment for all purchases is due thirty (30) days from the date of invoice (or such date as may be specified by Seller’s Credit Department). Unpaid invoices beyond the specified payment date incur interest at the rate of 1.5% per month or the maximum allowable rate under applicable law.

3. Shipment; Delivery; Title and Risk of Loss. All delivery dates are approximate. Seller is not responsible for damages resulting from any delay. 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 shipment carrier at Seller’s facility. Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferral of shipment at Buyer’s request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer’s acts or omissions.

4. Warranty. Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of twelve (12) months from the date of delivery or 2,000 hours of normal use, whichever occurs first. All prices are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY: THIS WARRANTY IS THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING DESIGN, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

5. Claims; Commencement of Actions. Buyer shall promptly inspect all Products upon receipt. No claims for shortages will be allowed unless reported to the Seller within ten (10) days of delivery. No other claims against Seller will be allowed unless asserted in writing within thirty (30) days after delivery. Buyer shall notify Seller of any alleged breach of warranty within thirty (30) days after the date the defect is or should have been discovered by Buyer. Any claim or action against Seller based upon breach of contract or any other theory, 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.

6. LIMITATION OF LIABILITY. IN THE EVENT OF A BREACH OF WARRANTY, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE WITHIN A REASONABLE PERIOD OF TIME. **IN NO EVENT IS SELLER LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER’S WRITTEN CONSENT, 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 OF THE PRODUCTS.**

7. User Responsibility. The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met.

The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.

8. Loss to Buyer’s Property. Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer’s property, will be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer ordering the items manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller’s possession or control.

9. Special Tooling. A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller’s property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture 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 in its sole discretion at any time.

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

11. Improper Use and Indemnity. 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, patent, trademark or copyright infringement or any other claim, brought by or incurred by Buyer, Buyer’s employees, or any other person, arising out of: (a) improper selection, application, design, specification or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller’s use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Products; or (d) Buyer’s failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.

12. Cancellations and Changes. Buyer may not cancel or modify or cancel 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. Seller may change Product features, specifications, designs and availability.

13. Limitation on Assignment. Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.

14. Force Majeure. Seller does not assume the risk and is not liable for delay or failure to perform any of Seller’s obligations by reason of events or circumstances beyond its reasonable control (hereinafter “Events of Force Majeure”). Events of Force Majeure shall include without limitation: accidents, strikes or labor disputes, acts of any government or government agency, acts of nature, delays or failures in delivery from carriers or suppliers, shortages of materials, or any other cause beyond Seller’s reasonable control.

15. Waiver and Severability. Failure to enforce any provision of this agreement will not invalidate that provision; nor will any such failure prejudice Seller’s right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.

16. Termination. Seller may terminate this agreement for any reason and at any time by giving Buyer thirty (30)

days prior written notice. Seller may immediately terminate this agreement, in writing, if Buyer: (a) breaches any provision of this agreement (b) appoints a trustee, receiver or custodian for all or any part of Buyer’s property (c) files a petition for relief in bankruptcy on its own behalf, or one if filed by a third party (d) makes an assignment for the benefit of creditors; or (e) dissolves its business or liquidates all or a majority of its assets.

17. Governing Law. This agreement 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 this agreement.

18. Indemnity for Infringement of Intellectual Property Rights. Seller is not liable for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets (“Intellectual Property Rights”). 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 an allegation that a Product sold pursuant to this agreement infringes the Intellectual Property Rights of a third party. Seller’s obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and refund the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller is not liable for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section constitute Seller’s sole and exclusive liability and Buyer’s sole and exclusive remedy for infringement of Intellectual Property Rights.

19. Entire Agreement. This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged. The terms contained herein may not be modified unless in writing and signed by an authorized representative of Seller.

20. Compliance with Laws. Buyer agrees to comply with all applicable laws, regulations, and industry and professional standards of care, including those of the United Kingdom, the United States of America, and the country or countries in which Buyer may operate, including without limitation the U. K. Bribery Act, the U.S. Foreign Corrupt Practices Act (“FCPA”), the U.S. Anti-Kickback Act (“Anti-Kickback Act”) and the U.S. Food Drug and Cosmetic Act (“FDCA”), each as currently amended, and the rules and regulations promulgated by the U.S. Food and Drug Administration (“FDA”), and agrees to indemnify and hold harmless Seller from the consequences of any violation of such provisions by Buyer, its employees or agents. Buyer acknowledges that it is familiar with the provisions of the U. K. Bribery Act, the FCPA, the FDA, and the Anti-Kickback Act, and certifies that Buyer will adhere to the requirements thereof. In particular, Buyer represents and agrees that Buyer will not make any payment or give anything of value, directly or indirectly to any governmental official, any foreign political party or official thereof, any candidate for foreign political office, or any commercial entity or person, for the purpose of influencing such person to purchase Products or otherwise benefit the business of Seller.

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