

Installation & Operation Manual

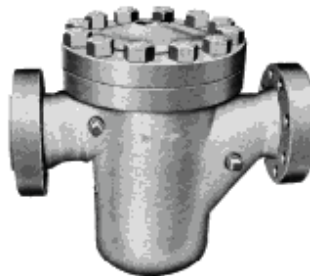
Strainers In-Line & Angle



D-1-1/4B



DA-3-150



D-3-1200



DA-3-4-150A

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Read Me First

Notice

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Brodie International
Statesboro, Georgia, USA

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Essential Instructions

General

Brodie Meter Co., LLC designs, manufactures and tests its products to meet many international standards. As the instruments are sophisticated technical products they must be installed, used and maintained properly to ensure they continue to operate within their normal specifications. The following instructions must be adhered to and incorporated into onsite safety programs where possible.

Read all instructions prior to installing, operating or servicing the product. If the instruction manual is not the correct one telephone +1 912 489 0200. Retain the instruction manual for future reference.

If you do not understand any of the instructions, contact your local Brodie representative for clarification.

Follow all warnings, cautions and instructions marked on or supplied with the product. It is the end users responsibility to operate the instrument with in the specifications as defined with in the instruction manual or marked on the instruments name plates.

Install the equipment as specified in the installation instructions of the appropriate manual and in accordance to local and national codes.

To ensure proper performance, use qualified personnel to install, operate, program and maintain the product.

Some types of equipment contain Carbon Steel, Cast Iron and/or Aluminium wetted parts, these instruments are not for use on water service.

It is the end users responsibility to assess the surface temperature of the device when it is in service, and if required take the necessary precautions to avoid personnel injury or damage to other equipment.

When replacement parts are required, ensure that qualified people use replacement parts specified by the manufacturer. Unauthorised parts and procedures can affect the products performance and place the safe operation of the process at risk. Look alike substitution may result in explosion, fire, electrical hazards, improper operation or personnel injury.

Use of this equipment for any other purpose than it is intended for may result in property damage and/or serious personal injury or death.

Essential Instructions for Measuring Equipment Including the European Union (Directive 2004/22/EC MID)

Although measurement transducers are not specifically included in the MID regulations as they do not form a complete measuring (system) instrument ref Article 1 and 4, Annex I and Annex MI-005. Brodie Meter Co., LLC implements the same stringent regulations for all products and tests to the same standards which are used for complete (systems) instruments.

The complete system must contain all the necessary components to meet the requirements of the local regulations. These components may include, pumps, air eliminators, strainers, valves, flow computers, etc.

The unit must be sealed in accordance with the local regulations; it is the end users responsibility to ensure this happens.

Flow measuring devices are provided with two labels which specify flow ranges. The name plate label which includes the factory serial number; details the operating flow range, this is the flow range the device will operate within without causing damage, and the custody transfer label; this label details the working flow range associated with a particular weights and measures approval.

It should be noted that these may not be the same; therefore in trade applications the flow ranges specified on the custody transfer label should be followed.

Essential Instructions for Electrical Equipment Including the European Union (Directive 2004/108/EC and 2004/22/EC)

This unit contains Electrostatic sensitive circuit boards. Electrostatic safety precautions should be taken to prevent damage.

When connecting wiring it is good practice to use shielded cable. The shield should be connected to earth at the read out or control systems end of the cable; the other end of the shield should not be connected.

This wiring practice is mandatory in order to comply with the requirements for electromagnetic compatibility as per the EMC directive 2004/108/EC and MID 2004/22/EC of the council of the European Union.

It is the end users responsibility to ensure that all protective covers are in place to prevent electrical shock and/or personnel injury.

Essential Instructions for Pressure Containing Equipment, Including the European Union (Directive 97/23/EC)

When installing the equipment the bolting must conform to the requirements of ASME B16.5 paragraph 5.3 and to the material requirements of ASME B16.5 Table 1B. Gaskets must conform to the requirements of ASME B16.20.

Although it is not expected for the device to be used in a service where it would come in to contact with unstable fluids, it is the end users responsibility to assess any risks and take any precautions necessary.

It is the end users responsibility to ensure that piping and other attachments connected to the Brodie instrument do not place adverse stresses upon it, the design of the instrument has not been assessed for the effects of traffic, wind or earthquake loadings.

It is the end users responsibility to ensure that the instrument is mounted when required on suitable supporting foundations.

It is the end users responsibility to install the device in a well designed system to avoid potential hazards such as water hammer, vacuum collapse or uncontrolled chemical reactions.

It is the end users responsibility to provide fire protection measures and equipment in accordance with the local regulations.

It is the end users responsibility to install suitable straining and air/gas elimination systems.

The instrument has been designed without allowance for corrosion or other chemical attack. The end user should implement a periodic inspection and maintenance program to ensure that none of the instruments pressure containing components has been subject to any corrosion. It is possible to examine the instrument for evidence of corrosion through the inlet and the outlet.

When the ambient temperature is below the minimum operating temperature specified on the device, it is the end users responsibility to ensure that the device is warmed to an appropriated temperature before being pressurized.

Do not exceed the operating pressure and temperature limits of the instrument as stamped on the nameplates.

It is the customer's responsibility to install this equipment in a system that provides adequate over pressure protection, and that limit pressure surges to 10% of the maximum allowable working pressure of the instrument.

It is the end users responsibility to provide fire protection measures and equipment in accordance with the local regulations.

Essential Instructions for Equipments To Be Used In Hazardous Locations, Including the European Union (Directive 94/9/EC)

Any Hazardous area approval applies to equipment without cable glands. When mounting the flameproof enclosure in a hazardous area only cable glands / conduit seals certified to meet or exceed the rating of the equipment should be used, refer to the type approval documentation for further details. It is the end users responsibility to ensure this happens.

Cable glands and cable must be suitable for the operating temperature of the device under its rated conditions, this is especially important is the device has an operating temperature above 1580F (700C).

The meter has been provided with an approved sealing device in one of the cable entries, the other entry has been closed with a plastic cap plug. It is the end users responsibility to remove the cap plug and replace it with a suitable cable gland or conduit seal before the equipment is put into service.

It is the end users responsibility to ensure when the instrument is located in a hazardous area that all cable glands and conduit seals must be installed in accordance with the local codes and regulations.

It is the end users responsibility to ensure that before opening an electronic enclosure in a flammable atmosphere; all the electrical circuits must be interrupted.

If replacement of the screws which secure the sensor housing, the UMB cover of the electronic register and its cover are required, they must be replaced with either factory direct parts or M6-1 x 16 (6g) mm hex socket head screws of equal length. The screws must be made from stainless steel grade A1-70 or A2-70 and be torqued to a value of 55 in lbs upon installation, its is the end users responsibility to ensure this happens.

It is the end users responsibility to assess the maximum surface temperature of the device and the equipment the device is attached to and located next to as this may exceed the temperature ratings of the device itself. If this happens, additional safety precautions will need to be implemented by the end user.

Flame proof housings contain Aluminium; although the composition of these enclosures is carefully maintained to prevent any risk of an ignition source it is the end users responsibility to ensure that the housing is not struck by rusty tools or objects.

If the equipment is to be installed in an area where dust deposits and build up are to be expected, a maintenance plan should be arranged to include regular removal of the dust build up. This will prevent the dusts forming a possible source of ignition.

The power supply requirements for this product are specified with in the operating and maintenance manual, it is the end users responsibility to operate the product with in these specified limits.

The instrument contains surfaces that constitute flames paths, these surfaces should not contain any mars or scratches, if any are present the factory or the local representative should be contacted immediately to obtain a new housing as the safety of the enclosure may be impaired. It is the end users responsibility to inspect these surfaces every time the enclosure is opened.

When flanged flame paths are reassembled the gap between them should be less than 0.0015" (0.038 mm) such that a +/- "(12.5mm) wide feeler 0.0015" (0.038mm) gauge will not enter the gap more than 1/8" (3mm). It is the end users responsibility to ensure this happens each time the enclosure is reassembled.

Receipt of Shipment

When the instrument is received, inspect the outside of the packing case for any damage that may have occurred during shipment. If the packing case is damaged notify the carrier immediately and follow their claim procedures. **Any damage incurred during shipment is the carrier's responsibility and is not part of the factory warranty.**

If the packaging is undamaged locate the envelope containing the packing list, this will generally be on the outside of the box. Carefully remove all the contents from the packaging checking for any damage. Make certain spare or replacement parts are not discarded with the packing material.

Check the items against the packing list for correct parts and quantities. If any items are incorrect or damage please contact your sales representative immediately, quoting the sales order reference number.

Storage

Brodie International instruments are precision devices and should be handled and stored with care. The inlet and outlet covers should remain on the instrument until the unit is ready for installation.

If extended storage is required it is recommend that the instrument be placed in an environmentally controlled warehouse, if it is not possible, the instrument should be stored in a water proof lined wooden box, desiccant packs should be taped to the inside of the instrument end connections before they are sealed to reduce the effect of humidity, depending on the storage time it may also be preferable to use a compatible corrosion inhibitor.

Care should be taken to remove any storage protection items before installing the instrument.

If an instrument is removed from service for an extended period of time it should be flushed with an appropriate corrosion inhibitor before being place in long term storage as mentioned above.

Return of Shipment

To be able to process returned goods quickly and efficiently, it is **IMPORTANT** that you provide essential information. Do not return any assembly or part without an "R.M.A." (Return Material Authorization). A letter describing the problem; corrective action (if any); and the work to be performed at the factory should be included with the shipment. "R.M.A." forms can be obtained from the local Sales Agent or Brodie International.

If an instrument has been exposed to process fluid, in addition to the RMA, a decontamination statement will be required.

A decontamination form is included in the back of this manual. **Note: When an instrument is removed from service it must be thoroughly drained and hazardous substances neutralized. Any material removed from the meter must be disposed of in accordance with local regulations.**

Placing the instrument upright on the inlet flange will aid drainage. Process connections must be sealed to prevent leakage of residual product during shipment. Contact the local carrier for information on requirements.

Any item must be securely packed and larger instruments mounted on wooden pallets or skids for shipment. The exterior of pallet mounted items should be protected by a suitable means such as a wooden crate.

Place a copy of the RMA inside the shipping container and attach it physically to the material being returned. A copy of your packing list should be placed inside an envelope and attached to the outside of the shipping container or placed inside the container.

Failure to follow the above procedures could possibly result in a considerable delay due to improperly or totally unidentified items.

Ship the container to:

Brodie Meter Co., LLC
Product Service Department
19267 Hwy. 301 North
Statesboro, GA 30461
Phone: 912-489-0200
Fax: 912-489-0294
service@brodiemeter.com

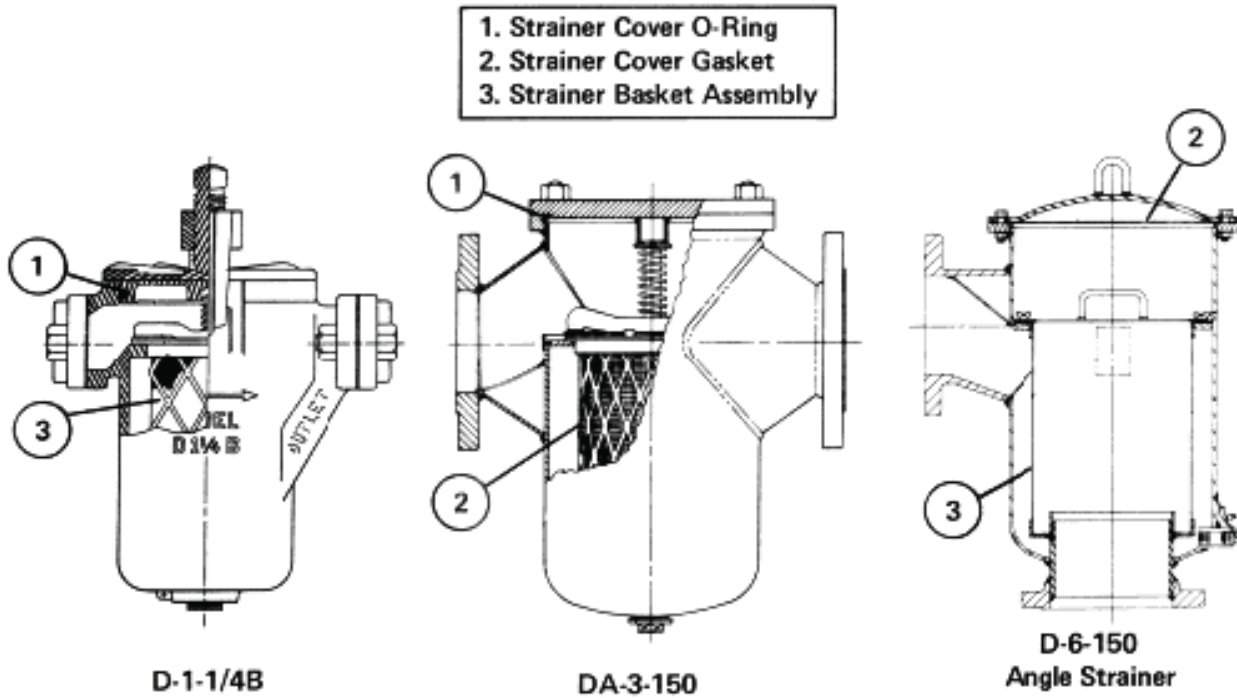
Introduction

Strainers are installed in pipe lines ahead of meters, pumps, valves, etc., to protect such equipment against intrusion of pipe scale, welding spatter and other foreign material. The use of the proper size strainer together with a basket of suitable mesh pays dividends in reduced maintenance on mechanisms which are in contact with flowing liquids. When it is known that comparatively large amounts of lint or iron oxide are present in a stream, a large strainer should be used as these materials clog up basket screens rapidly especially if resins, gums or varnishes are also present. Larger size foreign matter such as pebbles, welding beads, etc., should be removed at frequent intervals to prevent their abrasive action from damaging the basket screen. Strainers are available in sizes from 1-1/4" to 16", for maximum working pressures to 1440 psi (9928 kPa). See Bulletin M7100-10 for complete design specifications. There is a Strainer of the proper size and pressure rating to accommodate the full line of Meters. For meter specifications refer to corresponding Design Specification Sheet.

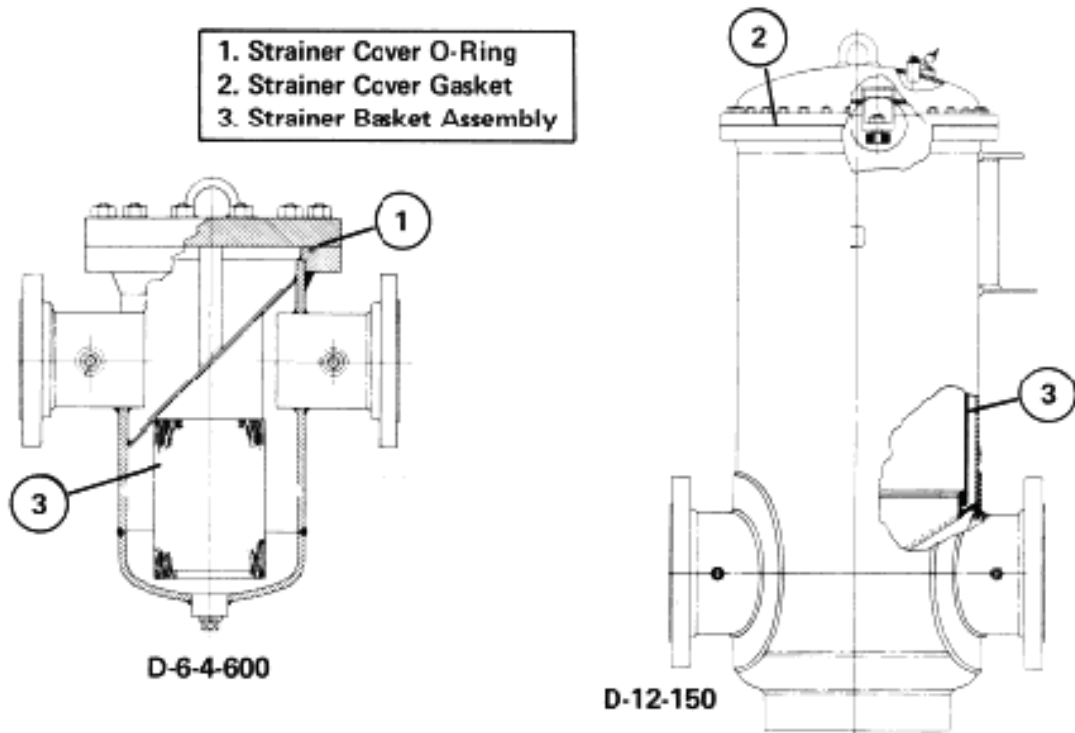
Maintenance

To be efficient, strainer baskets must be kept clean. A build-up of sediment increases pressure drop and decreases flow. If a basket is allowed to become completely clogged, damage will result. Pressure gauges on each side of the strainer - or a differential pressure gauge - give an indication of basket condition at a glance. A regular procedure should be set up for cleaning strainer baskets - the frequency depending on amount and character of foreign material in the stream. It is advisable to keep a spare basket (or inner screen) on hand

Recommended Mesh of Screens for various liquids:
Gasoline and similar liquids - 80 mesh for 2" strainers and smaller;
60 mesh for larger strainers.
Diesel Oil, No. 2 Oil, etc. - 40 Mesh.
No. 5 or 6 Heating Oils, etc. - 20 Mesh.



Typical Strainer Designs and Replacement Parts Location



Typical Strainer Designs and Replacement Parts Location



Model	Max. Press.		Strainer Cover O-Ring	Str. Cover Gasket	Strainer Basket Assembly							Torque	
	PSI	KPa			1/4 Mesh	10 Mesh	20 Mesh	40 Mesh	60 Mesh	80 Mesh	100 Mesh	ft-lbs	Nm
D-1-1/4B	125	862	152081 (Buna)		175115	175120	175125	175135	175145	175155	na	na	
D-2B	125	862	152081-002 (Butyl)	175315-004	175315	175320	175325	175335	175345	175355	na	na	
D 2BF	125	862	152081-022 (Viton)								na	na	
DS-1-1/4	300	2068		175193	175115	175120	175125	175135	175145	175155	50	68	
D2-600	720	4964	152082 (Buna)	175315-004	175315	175320	175325	175335	175345	175355	110	149	
D2-1200	1440	9928	152082-022 (Viton)	175315-004	175315	175320	175325	175335	175345	175355	110	149	
DA-3-150	150	1034	157008	175410-004	175410	175420	175425	175435	175445	175455	50	68	
D-3-300	300	2068		178617	175410	175420	175425	175435	175445	175455	50	68	
D-3-600	720	4964		178698	175410	175420	175425	175435	175445	175455	110	149	
D-3-1200	1440	9928		178679	175410	175420	175425	175435	175445	175455	310	420	
D-3-4-300	300	2068		178679	175410	175420	175425	175435	175445	175455	50	68	
D-3-4-600	1440	4964		178698	175410	175420	175425	175435	175445	175455	110	149	
D-6-4-150	150	1034		178709	178720-010	178720-020	178720-040	178720-060	178720-080	178720-100	50	68	
D-6-4-300	300	2068									50	68	
D-6-4-600	720	4964	157019	178750-004	178750-010	178750-020	178750-040	178750-060	178750-080	178750-100	110	149	
D-6-4-1200	1440	9928	157019	178750-004	178750-010	178750-020	178750-040	178750-060	178750-080	178750-100	310	420	
D-6-300	150	2068		178709	178720-010	178720-020	178720-040	178720-060	178720-080	178720-100	50	68	
D-6-1200	720	9928		178709	178750-010	178750-020	178750-040	178750-060	178750-080	178750-100	310	420	
D-8-150	150	1034		82884	178989-010	178989-020	178989-040	178989-060	178989-080	178989-100	110	149	
D-8-300	300	2068		83884			178930		178940		110	149	
D-8-600	720	4964		84434			178930		178940		310	420	
D-8-1200	1440	9928		85434	178920-010	178920-020	178920-040	178920-060	178920-080	178920-100	960	1302	
D-10-8-150	275	1896		103884	179135-010	179135-020	179135-040	179135-060	179135-080	179135-100	195	264	



Model	Max. Press.		Strainer Cover O-Ring	Str. Cover Gasket	Strainer Basket Assembly							Torque		
	PSI	kPa			1/4 Mesh	10 Mesh	20 Mesh	40 Mesh	60 Mesh	80 Mesh	100 Mesh	ft-lbs	Nm	
D-8-300	300	2068		83884			178930		178940				110	149
D-8-600	720	4964		84434			178930		178940				310	420
D-8-1200	1440	9928		85434	178920-004	178920-010	178920-020	178920-040	178920-060	178920-080	178920-100		960	1302
D-10-8-150	275	1896		103884	179135-004	179135-010	179135-020	179135-040	179135-060	179135-080	179135-100		195	264
D-10-8-300	300	2068		103884	179135-004	179135-010	179135-020	179135-040	179135-060	179135-080	179135-100		195	264
D-10-150	275	1896		103884	179135-004	179135-010	179135-020	179135-040	179135-060	179135-080	179135-100		195	264
D-10-300	300	2068		103884	179135-004	179135-010	179135-020	179135-040	179135-060	179135-080	179135-100		195	264
D-12-10-150	275	1896		103884	179235-004	179235-010	179235-020	179235-040	179235-060	179235-080	179235-100		195	264
D-12-10-300	300	2068		103884	179235-004	179235-010	179235-020	179235-040	179235-060	179235-080	179235-100		195	264
D-12-150	275	1896		103884	179235-004	179235-010	179235-020	179235-040	179235-060	179235-080	179235-100		195	264
D-12-300	300	2068		103884	179235-004	179235-010	179235-020	179235-040	179235-060	179235-080	179235-100		195	264
D-12-16-150	275	1896		103884	179235-004	179235-010	179235-020	179235-040	179235-060	179235-080	179235-100		195	264
Angle Strainer														
DA-3-150A	150	1034	157008		178115-004	178115-010	178115-020	178115	178115-060	178115-080	178115-100		50	68
DA-3-4-150A	150	1034			178590-004	178590-010	178590-020	178590	178590-060	178590-080	178590-100		50	68
D-6-4-150A	150	1034		178709	178120-004	178120-010	178120-020	178120	178120-060	178120-080	178120-100		50	68
D-6-150A	150	1034		" "	178625-004	178625-010	178625-020	178625	178625-060	178625-080	178625-100		50	68

Warranty Claim Procedures

1. Limited Warranty

Subject to the limitations contained in Section 2 herein and except as otherwise expressly provided herein, Brodie International, a Brodie Meter Co., LLC Company ("Brodie") warrants that the firmware will execute the programming instructions provided by Brodie, and that the Goods-manufactured or Services provided by "Brodie" will be free from defects in materials or workmanship under normal use and care until the expiration of the applicable warranty period.

Goods are warranted for twelve (12) months from the date of initial installation or eighteen (18) months from the date of shipment by "Brodie", whichever period expires first. Consumables and Services are warranted for a period of 90 days from the date of shipment or completion of the Services.

Products purchased by "Brodie" from a third party for resale to Buyer ("Resale Products") shall carry only the warranty extended by the original manufacturer.

Buyer agrees that "Brodie" has no liability for Resale Products beyond making a reasonable commercial effort to arrange for procurement and shipping of the Resale Products.

If Buyer discovers any warranty defects and notifies "Brodie" thereof in writing during the applicable warranty period, "Brodie" shall, at its option, promptly correct any errors that are found by "Brodie" in the firmware or Services, or repair or replace F. O. B. point of manufacture that portion of the Goods or firmware found by "Brodie" to be defective, or refund the purchase price of the defective portion of the Goods/Services.

All replacements or repairs necessitated by inadequate maintenance, normal wear and usage, unsuitable power sources, unsuitable environmental conditions, accident, misuse, improper installation, modification, repair, storage or handling, or any other cause not the fault of "Brodie" are not covered by this limited warranty, and shall be at Buyer's expense.

"Brodie" shall not be obligated to pay any costs or charges incurred by Buyer or any other party except as may be agreed upon in writing in advance by an authorized "Brodie" representative.

All costs of dismantling, reinstallation and freight and the time and expenses of "Brodie's" personnel for site travel and diagnosis under this warranty clause shall be borne by Buyer unless accepted in writing by "Brodie".

Goods repaired and parts replaced during the warranty period shall be in warranty for the remainder of the original warranty period or ninety (90) days, whichever is longer. This limited warranty is the only warranty made by Brodie and can be amended only in a writing signed by an authorized representative of "Brodie".

Except as otherwise expressly provided in the Agreement, THERE ARE NO REPRESENTATIONS OR WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, AS TO MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, OR ANY OTHER MATTER WITH RESPECT TO ANY OF THE GOODS OR SERVICES.

It is understood that - corrosion or erosion of materials is not covered by our guarantee.

2. Limitation of remedy and liability

Brodie International, a Brodie Meter Co., LLC Company ("Brodie") shall not be liable for damages caused by delay in performance.

The sole and exclusive remedy for breach of warranty hereunder shall be limited to repair, correction, replacement or refund of purchase price under the limited warranty clause in Section 1 herein.

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 "Brodie's" liability to buyer and/or its

customers exceed the price to buyer of the specific goods manufactured or services provided by Brodie giving rise to the claim or cause of action.

Buyer agrees that in no event shall Brodie'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, loss of use, loss of revenue and cost of capital.

Brodie International

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