

# OPERATION & MAINTENANCE MANUAL

## FLUIDTROL GS SERIES STRAINER

REV: 9/2016



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## **SIMPLEX STRAINERS**

### **MATERIALS OF CONSTRUCTION**

#### **1. BODIES**

FPT utilizes a composite laminate construction for strainer bodies to provide structural strength. Chemical resistance is maintained by providing wetted surfaces of PVC, CPVC, PP or PVDF. All Strainers are rated for 100 PSI at 73 deg F. Higher operating temperatures are allowable based upon the material selection. Potential Lower pressure ratings are possible as special lid features (easy open) are sometimes requested. See the temperature/pressure chart to determine the maximum allowable temperature for your pressure condition.

#### **2. BASKETS**

Baskets are manufactured in heavy gauge perforated plastic. Generally the same material as the strainer housing lining- PVC,CPVC, PP or PVDF.

- a) 1/8" holes on 3/16" staggered centers
- b) 1/4" holes on 3/8" staggered centers
- c) Woven screening from 10 Mesh to 200 Mesh

### **DESIGN**

#### **1. ENDS**

ALL INLETS AND OUTLETS are Flanged--loose rings are typically utilized- ANSI b16.5- 150 # Drill.

#### **2. TOPS**

FPT STRAINERS ARE SUPPLIED WITH QUICK-LOCK or BLIND FLANGE TOPS with EPDM GASKETS.

#### **3. PORT CONFIGURATIONS**

AS STANDARD FPT OFFERS AN "IN-LINE" DESIGN. FOR SPECIAL APPLICATIONS "OFF-SET", " ANGLED OFF-SET" AND "BOOT" MAY HAVE BEEN FABRICATED FOR YOUR SYSTEM. ALL UNITS ARE EQUIPPED WITH A SIDE BOTTOM DRAIN AS STANDARD.

### **PRESSURE DROP**

FPT STRAINERS ARE ENGINEERED TO OFFER THE LOWEST PRACTICAL DP. UTILIZING FULL FLOW PORTS, THE BASKET OPEN AREA AVERAGES 4 TIMES THE CROSS SECTIONAL AREA OF THE PIPE. THIS, ON AVERAGE, PROVIDES ADEQUATE PERFORMANCE FOR STRAINERS INSTALLED IN LINES THAT OPERATE UP TO 6 FPS FLOW VELOCITY. PRESSURE DROP THROUGH STRAINERS IS DETERMINED BY THE LINE SIZE FLOW RATE, SPECIFIC GRAVITY, AND % OF OPEN AREA IN THE BASKET. individual DP VS FOULING CHARTS ARE AVAILABLE. CONSULT FACTORY.

### **ACCESSORIES**

- 1.) PRESSURE TAPS ARE AVAILABLE TO BE USED WITH ANY OF THE FOLLOWING:
  - A.) GAUGES FOR VISUAL READING
  - B.)PRESSURE SWITCH WITH AUDIBLE AND VISUAL ALARM
  - C.)PRESSURE SWITCH WITH CONTACT CLOSURE ( TO OPERATE VALVES,PUMPS, ETC.)
2. AUTOMATIC SELF CLEANING STRAINERS ( SEE DATA SHEETS ON CLA SERIES)

### **OPERATION**

The function of a basket (or WYE) strainer is to filter particulate from a process line. The degree of filtering is dependent on the maximum size opening of the basket filter membrane. Fluidtrol (FPT) baskets come with standard perforations of 1/8" holes on 3/16" staggered centers and 1/4" holes on 3/8" staggered centers. Contact the factory or your local representative for perforation sizes on your particular units. Finer filtration may be utilized with the addition of a bag or mesh liner to the basket. Bags are rated according to their mesh and micron size. The mesh size number states the number of openings per square inch. The actual size of the opening is dependent upon the weave of the bag and the size of the bag material. The micron rating gives the maximum size of particle (in microns) which can pass through the bag.

A pressure drop is induced across the strainer. As the strainer fouls, the pressure drop increases. Clean strainers cause the least amount of pressure drop. FPT strainers are designed to minimize the loss of pressure by maintaining an open basket area of at least 4 times the cross sectional area of the process pipe. Graphs 1 - 6 provide pressure drop vs fouling for 3" through 12" strainers over several flow rates. For graphs of flows not shown here contact the factory.



# INSTALLATION

Prior to connecting to your piping system, check the following:

1. Directional flow of the basket strainer
2. Compatibility of connecting piping to the inlet and outlet connections provided on the strainer.
3. Piping supports. Be sure that the strainer is **NOT SUPPORTING ANY PIPING OR TANKS** as this can cause excessive stresses in the strainer body.

We do not recommend suspended strainer installations for GS Series. Please support strainer bodies at the bottom of the vertical housing. Install housing vertical- without angle. Failure to provide sufficient support on the strainer housing could result in damage that would not be covered under warranty.

Several inlet and outlet end connectors are available with the Fluidtrol strainers. The proper installation technique for each is outlined below.\*

## FLANGED CONNECTIONS

- A.** 1/8" thick soft full face gaskets are preferred for use with plastic flanges.
- B.** Make sure that all the bolt holes of the mating flanges match up with the strainer flange bolt holes. The flanges on the strainers are lined up such that the bolt holes straddle the vertical centerline.
- C.** Insert all bolts
- D.** Make sure that the faces of the mating flanges are not separated by more than 1/16". If there is a larger gap, it may be necessary to insert a spacer ring between the two flanges. Flush flange faces are required with all plastic flanges.
- E.** The bolts on the plastic flanges should be tightened by pulling down the nuts diametrically opposite each other using a torque wrench. Complete tightening should be accomplished in stages and the final torque values in the following table should be followed for the various sizes of flanges. Uniform stress across the flange will eliminate leaky gaskets. Refer to TABLE 1 for recommended torques.
- F.** Required bolt sizes are given in TABLE 2.
- G.** The drain and lid vent should be plumbed for use. Drain fittings are typically hard-piped to a suitable drain. The lid vent is typically plumbed with flexible hose to allow for lid removal. Quick disconnects are also a good practice for the lid vent line. Valves should be affixed to both positions.

**Table 1**

| Flange Size | Torque Value  |
|-------------|---------------|
| 3" and 4"   | 20-30 ft lbs  |
| 6" and 8"   | 33-55 ft lbs  |
| 10"         | 53-75 ft lbs  |
| 12"         | 80-110 ft lbs |

**Table 2**

| Flange Size | Bolt Size     |
|-------------|---------------|
| 3"          | 5/8" x 3"     |
| 4"          | 5/8" x 3-1/4" |
| 6"          | 3/4" x 3-1/2" |
| 8"          | 3/4" x 4"     |
| 10"         | 1" x 4-1/2"   |
| 12"         | 1" x 5"       |

# MAINTENANCE

When cleaning becomes necessary the guidelines listed below should be followed. NEVER ATTEMPT TO OPEN A STRAINER WHILE UNDER PRESSURE. Attempting to do so can result in a catastrophic failure causing personal injury and voiding warranty. Strainer basket cleaning is completely system dependent and should be performed as any preventative maintenance task once the frequency has been determined. Fluidtrol recommends cleaning the basket prior to the observance of a 4 psid (pressure drop across the vessel). This is calculated by the difference between the gauge pressure just upstream and the gauge pressure just downstream of the strainer. After the initial cleaning of the system, begin to monitor the pressure drop every hour to determine the cleaning frequency. Using the pressure drop charts on the pages above can provide some assistance, but generating data on your particular system will be necessary to determine proper cleaning frequency.

**1. Stop flow through strainer.** For simplex units this requires stopping the process flow. For duplex units, the process flow must be redirected into the secondary housing by means of the valves/ valve mechanism. Wye strainers, if to be cleaned via the drain valve and providing the installation is not on the suction side of a pump, do not require to have the flow stopped. (In-house operating procedures should be followed).

**2. Remove pressure from housing.** The drain plug at the base of the strainer or on the lid can be used for this purpose if other pressure relief methods are unavailable. NEVER remove the lid prior to depressurizing.

**3. Remove lid.** GS Series Strainers utilize T-Handles/ Swing Latch lid assemblies or Bolted Blind Flange Lids. Loosen the bolts of the lid by alternating between diametrically opposite bolts. Once all bolts are loose, swing the T-Handles to the side. If a blind flange lid is used- full removal of the nut is required before lifting cover.

**4. Remove and clean basket.** Various methods of cleaning are utilized, depending on the material in the basket and it's tenacity to the perforated surface. It is common to have 2 baskets to allow for the fouled basket to be quickly replaced with a clean basket. This allows for the minimum flow interruption and for the dirty basket to be cleaned as convenient at some point prior to the next basket change.

**5. Refill vessel with process fluid.** Reducing the air pocket at the top of the housing is critical for minimizing the potential to air lock the system pump. If possible, fill the vessel with process water to approximately 1" from the lid gasket.

**6. Replace lid and secure.** Tighten as tight as necessary to avoid water drips through the gasket and to avoid air in leakage due to vacuum. See Table 1 on previous page if your strainer uses a blind flange lid. Follow an alternating pattern when tightening- just as tightening lug nuts on a tire or flange bolts.

**7. Return to service and vent.** SLOWLY OPEN NECESSARY VALVES TO PUT THE STRAINER ON LINE. After the strainer is returned to service- it may be necessary to bleed off any remaining air trapped at the top of the housing. This is done with the 1/2" vent on the lid that the strainer is supplied with. The strainer housings are common air traps for the system, so routine bleeding at this location may help efforts to minimize air in system.



## **FPT STRAINERS**

### SPARE PARTS AND TECHNICAL SUPPORT

Your strainers are shipped with a 4 or 5 digit serial number on the permanent equipment tag. This number should be preserved in the event technical support or parts are required. Many of the parts will be commercially available from a local plumbing distributor, but items like the basket and special gaskets will require you to contact your Fluidtrol dealer.

You can contact Fluidtrol Process Technologies, Inc. at 888-551-0511 for support at any time during installation, commission or operation of your strainer.

# IMPORTANT STRAINER/SYSTEM DATA

In the event troubleshooting is required- it is optimum to have as much system/ equipment data collected as possible. The below lists represent most of the variables that would be of relevance.

## FLUID CHARACTERISTICS

Composition  
Operating Temperature F  
Operating Pressure  
Viscosity centipoise  
Minimum Size To Filter mesh micron inch mm  
Allowable Pressure Drop PSI (clean basket)  
Flow Rate GPM

## STRAINER CHARACTERISTICS

Type of Strainer  
Size  
Design Flow Rate GPM  
Design Pressure PSI  
Max Temperature  
Max Pressure  
Housing Material  
Gasket Material  
Basket Perforation  
Basket Material  
Liner Rating  
Liner Material  
Drain Size/Type  
End Connections  
Vent Size/Type  
Pressure Taps  
Model Number  
Date of Manufacture  
Serial Number



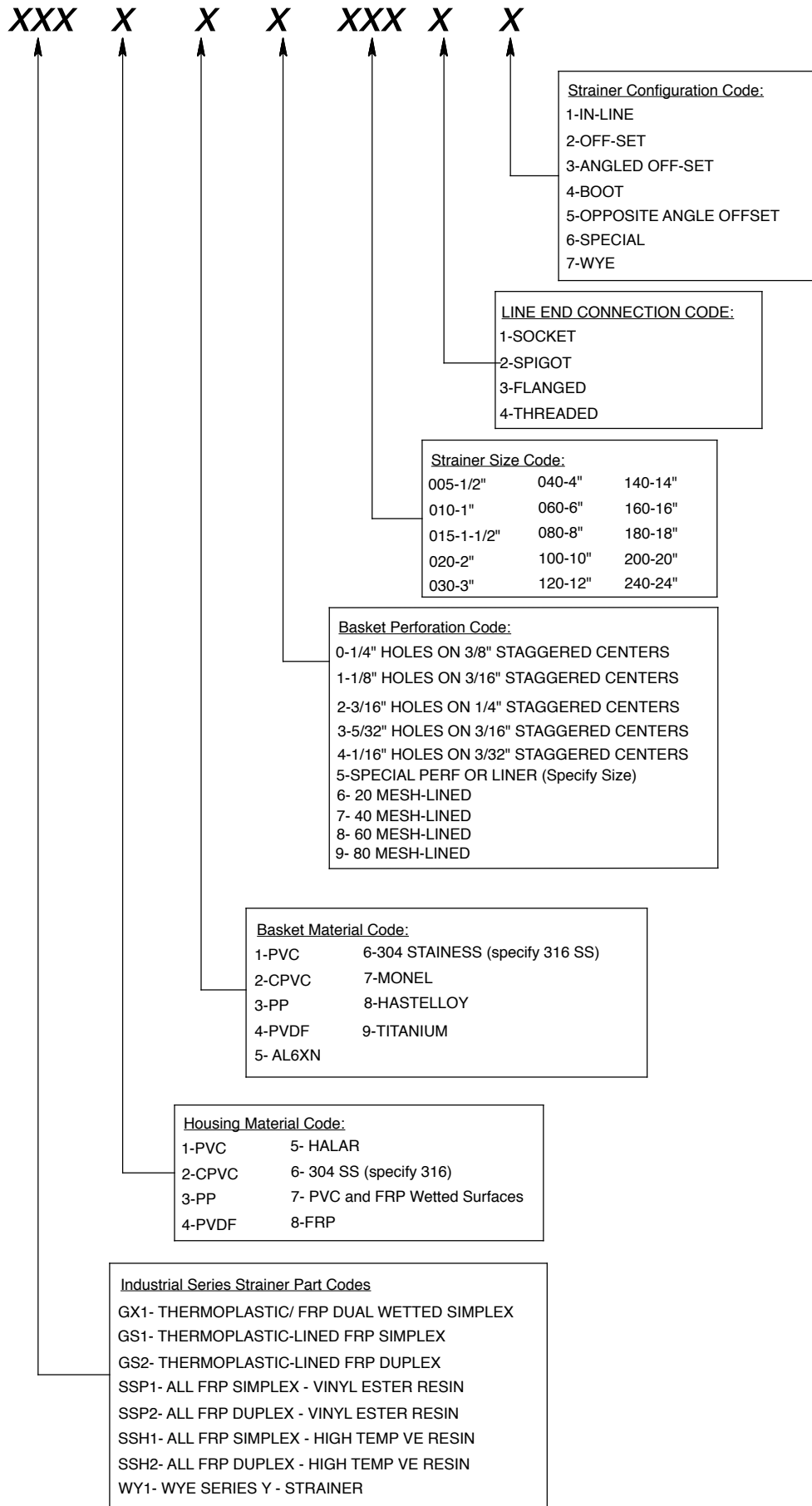
## STRAINER BASKET CLEANING FREQUENCY

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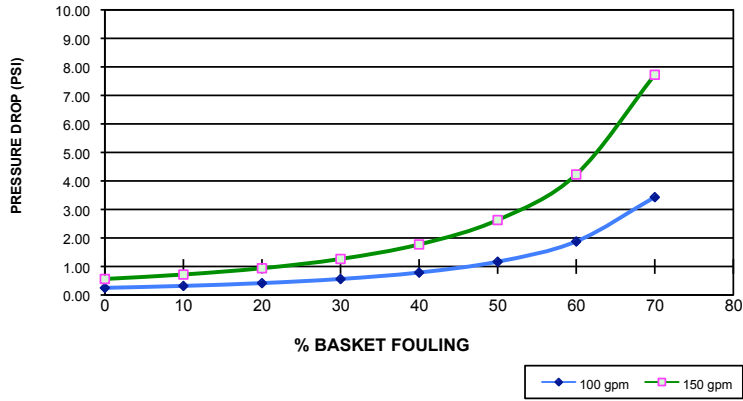
The initial operation of a basket strainer is an important period to establish the frequency of which the basket requires cleaning. This will be entirely system dependent and Fluidtrol recommends to clean the strainer basket prior to reaching a 4 psid across the strainer. The following pages provide some generic flow data for average velocity, viscosity and basket perforation open area. Different basket perforation patterns and mesh liners are only some of the variables that impact the pressure drop profile of a strainer. Failure of consistent basket cleaning can lead to strainer damage and flow restriction in the system.

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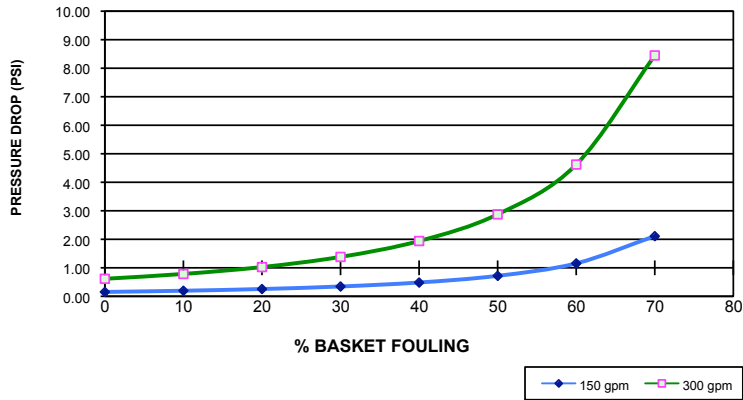
# INDUSTRIAL SERIES STRAINER PART NUMBER CODE



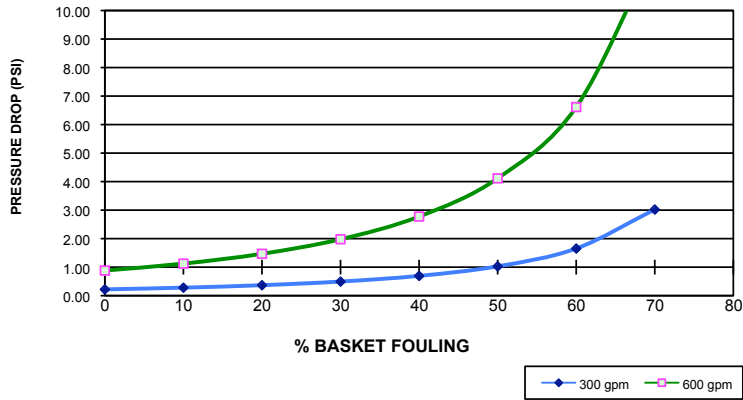
### 2-3 " Strainer



### 4 " Strainer

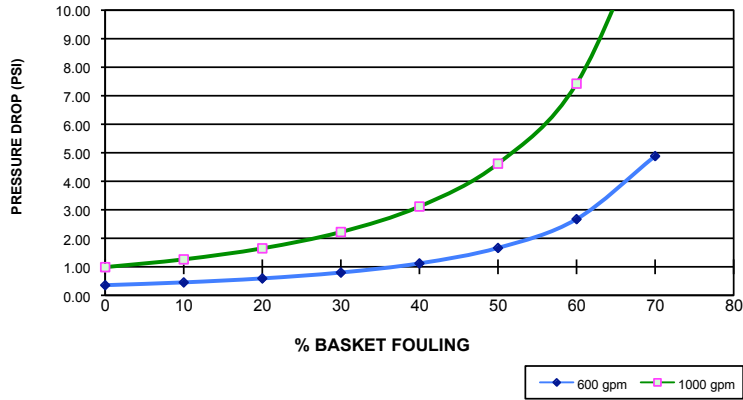


### 6 " Strainer

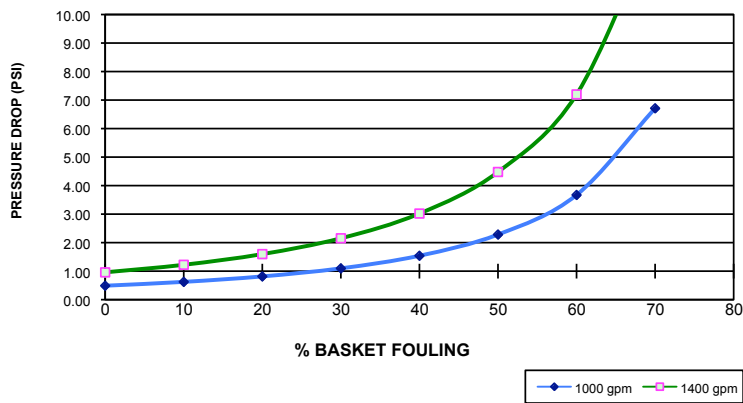


40 % OPEN AREA PERFORATION PATTERN- STANDARD 1/8" OR 1/4"

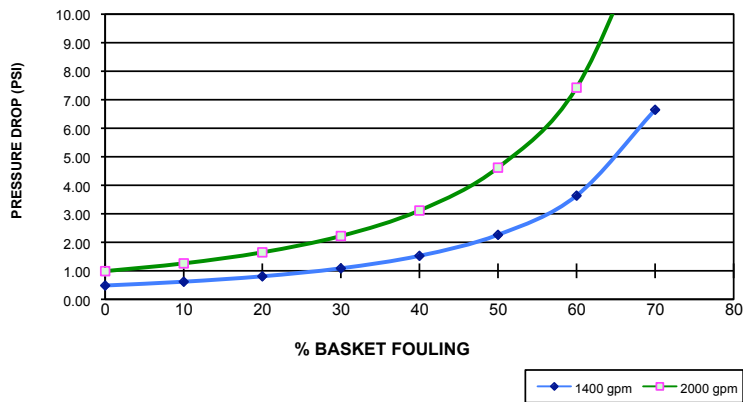
### 8" Strainer



### 10" Strainer



### 12" Strainer



40 % OPEN AREA PERFORATION PATTERN- STANDARD 1/8" OR 1/4"



## WARRANTY

FLUIDTROL PROCESS TECHNOLOGIES, INC. (“SELLER”) warrants that its products will be of the kind and quality described in the Sales Order or Contract and will be free of defects in workmanship or material. Should any failure to conform to this warranty appear within twelve (12) months after the initial date of delivery the Seller will, upon notification and substantiation that the product has been stored, installed and maintained in accordance with the Seller’s recommendation and standard industry practice, correct such defects by suitable repair or replacement at Seller’s expense. Seller shall be given the opportunity to inspect the product. Basket strainers are manufactured to meet specific specifications and no warranty is made where the original configuration is altered or modified for specialized applications or requirements.

THIS WARRANTY IS EXCLUSIVE AND IS IN LIEU OF ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHER WARRANTY OF QUALITY, WHETHER EXPRESS OR IMPLIED, EXCEPT OF TITLE.

NO WARRANTY IS INCLUDED AGAINST ANY EXPENSE FOR REMOVAL, REINSTALLATION OR OTHER CONSEQUENTIAL DAMAGES ARISING FROM ANY DEFECT.

Correction of non-conformities, in the manner and for the period of time provided above, shall constitute fulfillment of all liabilities of the Seller to the purchase, with respect to, or arising out of, the product, whether based on contract, negligence, strict tort or other legal theory.

The Seller shall not under any circumstances be liable for special or consequential damages such as, but not limited to, damage or loss of property or equipment, loss of profits or revenue, cost of capital, cost of purchased or replacement goods, or claims of customers for service interruptions. The remedies of the purchaser set forth herein are exclusive and the liability of Seller with respect to any contract or anything done in connection therewith, such as the performance or breach there of or from the manufacture, sale, delivery, resale, installation or use of any goods covered by or furnished under contract, whether arising out of contract negligence, strict tort or under any warranty, or otherwise shall not, except as expressly provided herein, exceed the price of the goods upon which such liability is based.