



nutronics corporation

# ***SUPERPRESSURE***

*FOR THE INSTRUMENTATION ENGINEER*

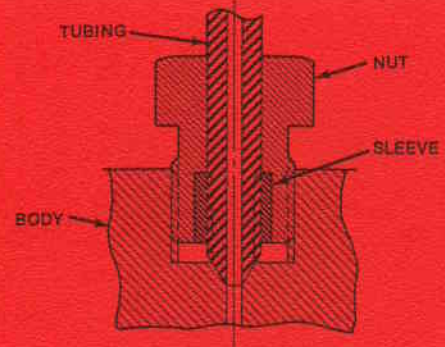
***FITTINGS AND COMPONENTS***

# SUPERPRESSURE DESIGN CRITERIA

Superpressure fittings and components manufactured by King Nutronics Corporation are designed for use in systems operated at pressures up to 10,000 psig. Fittings featured in this catalog are machined from

Type 303 stainless steel and are passivated for improved corrosion resistance. For maximum safety, all superpressure fittings and components have a minimum burst pressure of 40,000 psig.

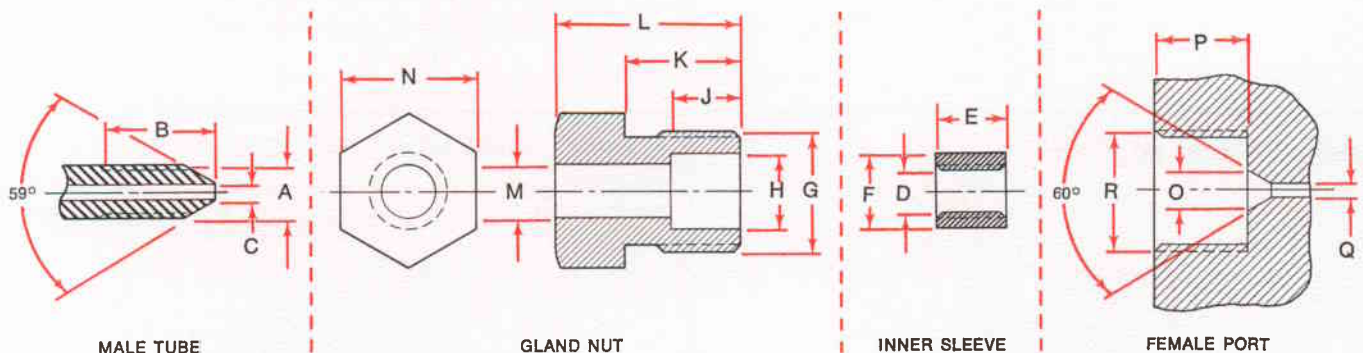
Originally developed by the U.S. Government, the superpressure design has been in use for many years in laboratory and field applications. The complete connection consists of four parts: a male tube, a gland nut, an inner sleeve, and a female port. The 59° conical surface of the male tube seats in the corresponding 60° conical surface of the female port, forming a joint which is leak tight at elevated pressures with minimum wrench torque required on the gland nut. The low cross-sectional area of the joint together with the threaded tubing connection preclude the possibility of fitting failure.



## SUPERPRESSURE CONNECTOR DESIGN DIMENSIONS

The illustrations and tables below provide all dimensions necessary to adapt superpressure fittings to your design. Gland nuts and sleeves must be separately ordered in the appropriate quantities for use with the superpressure fittings selected. Although this catalog

features superpressure fittings and components used with 1/4-inch OD tubing, dimensional data for 3/8- and 9/16-inch sizes are listed below for reference purposes.



TUBING SIZE (IN.)	TUBING OD X ID (IN.)	DIMENSIONS (IN.)							
		A (LH THREAD)	B	C (CONE DIA.)	D (LH THREAD)	E	F	G (RH THREAD)	H
1/4	1/4 x 1/16	1/4-28	9/16	1/8	1/4-28	.375	.358	9/16-18	3/8
3/8	3/8 x 1/8	3/8-24	3/4	7/32	3/8-24	.520	.500	3/4-16	33/64
9/16	9/16 x 3/16	9/16-18	15/16	7/32	9/16-18	.625	.812	1 1/8-12	27/32

TUBING SIZE (IN.)	TUBING OD X ID (IN.)	DIMENSIONS (IN.)								
		J	K	L	M	N (HEX)	O	P	Q	R (RH THREAD)
1/4	1/4 x 1/16	3/8	9/16	15/16	.272	5/8	3/16	7/16	1/8	9/16-18
3/8	3/8 x 1/8	17/32	11/16	1 1/16	.397	3/4	9/32	9/16	5/32	3/4-16
9/16	9/16 x 3/16	5/8	15/16	1 3/8	.593	1 1/4	7/16	3/4	1/4	1 1/8-12



# FITTINGS

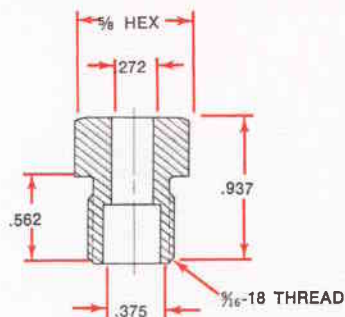
**MATERIAL: TYPE 303 STAINLESS STEEL**

**PRESSURE: 10,000 PSIG**

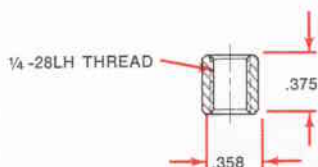
Superpressure fittings are available in a variety of styles for use in plumbing high-pressure test and instrumentation setups. Compatible nipples which can be easily formed with a tube bender are provided in a wide range of standard lengths. Bulkhead connections are included as a means of supporting tubing runs and components.

ALL DIMENSIONS ARE IN INCHES

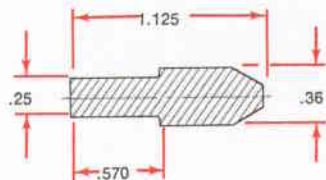
## GLAND NUT • PART NO. 104-1



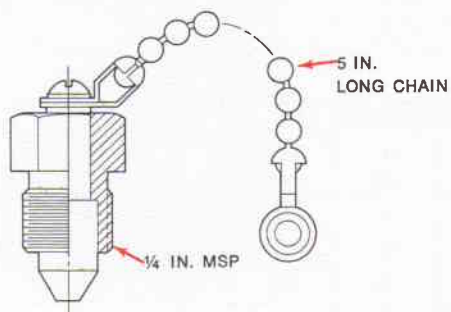
## SLEEVE • PART NO. 104-2



## PLUG • PART NO. 104-3

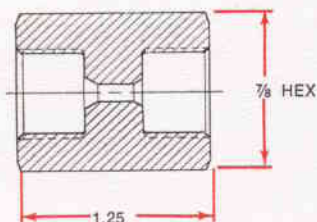


## PLUG ASSEMBLY • PART NO. 104-4 (with chain)



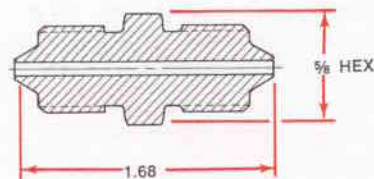
## COUPLING • PART NO. 114-1

PORTS: 1/4 IN. FSP  
ORIFICE: 1/8 IN.



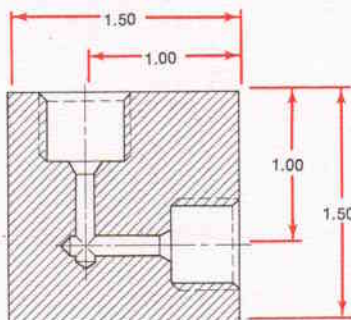
## UNION • PART NO. 114-2

PORTS: 1/4 IN. MSP  
ORIFICE: 3/32 IN.



## ELBOW • PART NO. 114-3

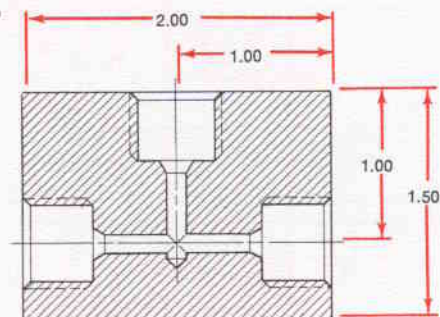
PORTS: 1/4 IN. FSP  
ORIFICE: 1/8 IN.



BODY THICKNESS: 1.00 INCH

## TEE • PART NO. 114-4

PORTS: 1/4 IN. FSP  
ORIFICE: 1/8 IN.



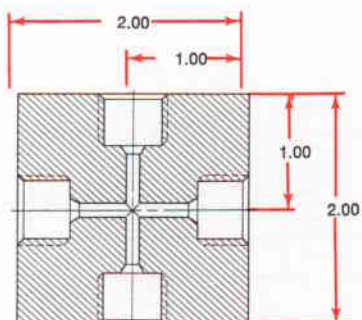
BODY THICKNESS: 1.00 INCH

GLAND NUT AND SLEEVE NOT FURNISHED WITH FITTINGS



### CROSS • PART NO. 114-5

PORTS: 1/4 IN. FSP  
ORIFICE: 1/8 IN.

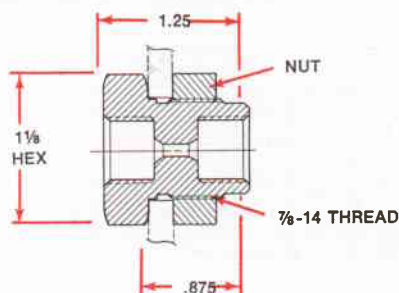


BODY THICKNESS: 1.00 IN.

### BULKHEAD COUPLING (WITH NUT)

**PART NO. 114-6**

PORTS: 1/4 IN. FSP  
ORIFICE: 1/8 IN.

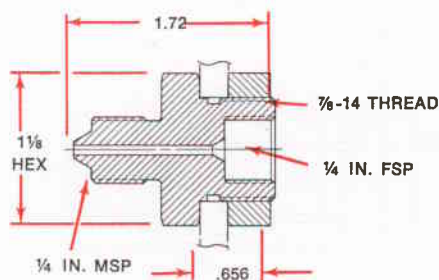


PANEL NUT INCLUDED

### BULKHEAD CONNECTOR (WITH NUT)

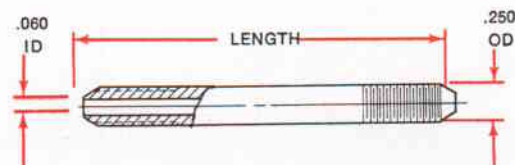
**PART NO. 114-7**

ORIFICE: 3/32 IN.



PANEL NUT INCLUDED

### NIPPLE • PART NO. 124



PART NO.	LENGTH (IN.)
124-2 1/2	2 1/2
124-3	3
124-3 1/2	3 1/2
124-4	4
124-4 1/2	4 1/2
124-5	5
124-5 1/2	5 1/2
124-6	6
124-7	7
124-8	8
124-9	9
124-10	10
124-11	11
124-12	12
124-14	14
124-16	16
124-18	18
124-20	20
124-22	22
124-24	24
124-28	28
124-32	32
124-36	36
124-42	42
124-48	48

NON-STANDARD LENGTHS AVAILABLE ON REQUEST

GLAND NUT AND SLEEVE NOT FURNISHED WITH FITTINGS

## TUBE BENDER

**PART NO. 914-1**

The tube bender is a simple hand tool used to bend superpressure tubing to suit a particular application. The tube bender is a standard Parker-Hannifin design modified for use with 1/4-inch, heavy wall tubing. It can be used to make bends of up to 180° with 9/16-inch bend radius without flattening. The bend angles are inscribed on the radius block of the tool.



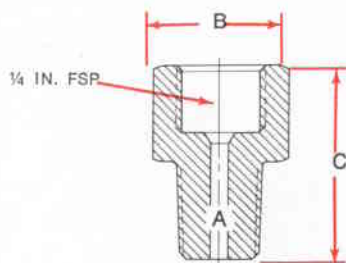
# ADAPTERS

**MATERIAL: TYPE 303 STAINLESS STEEL**

**PRESSURE: 10,000 PSIG**

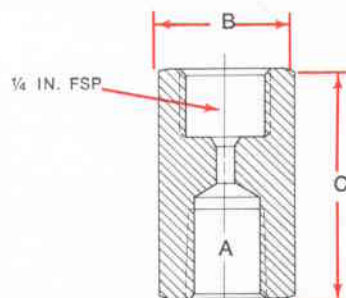
A wide selection of adapters is available to provide a convenient method for connecting various pipe and AN tubing to superpressure plumbing and components.

ALL DIMENSIONS ARE IN INCHES



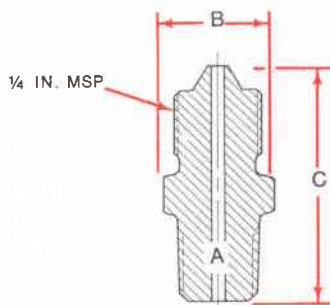
## MALE PIPE THREAD • SERIES 204

PART NO.	A (NPT)	B (HEX)	C	ORIFICE
204-1	1/8-27	3/4	1.25	1/8
204-2	1/4-18	3/4	1.25	1/8
204-3	3/8-18	3/4	1.37	1/8
204-4	1/2-14	7/8	1.37	1/8



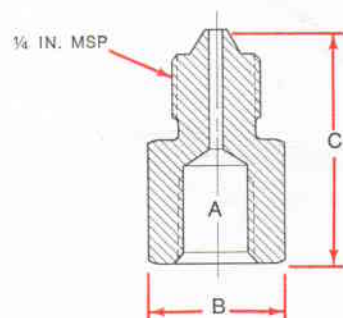
## FEMALE PIPE THREAD • SERIES 214

PART NO.	A (NPT)	B (HEX)	C	ORIFICE
214-1	1/8-27	3/4	1.50	1/8
214-2	1/4-18	3/4	1.50	1/8
214-3	3/8-18	1	1.75	1/8
214-4	1/2-14	1 1/4	1.81	1/8



## MALE PIPE THREAD • SERIES 224

PART NO.	A (NPT)	B (HEX)	C	ORIFICE
224-1	1/8-27	5/8	1.55	3/32
224-2	1/4-18	5/8	1.55	3/32
224-3	3/8-18	7/8	1.72	3/32
224-4	1/2-14	7/8	1.72	3/32



## FEMALE PIPE THREAD • SERIES 234

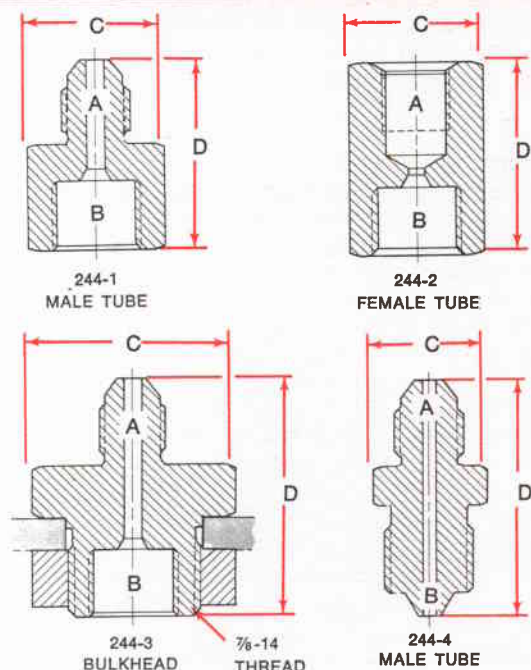
PART NO.	A (NPT)	B (HEX)	C	ORIFICE
234-1	1/8-27	3/4	1.53	3/32
234-2	1/4-18	3/4	1.53	3/32
234-3	3/8-18	1	1.88	3/32
234-4	1/2-14	1 1/4	1.88	3/32

GLAND NUT AND SLEEVE NOT FURNISHED WITH ADAPTERS





## AN ADAPTERS • SERIES 244

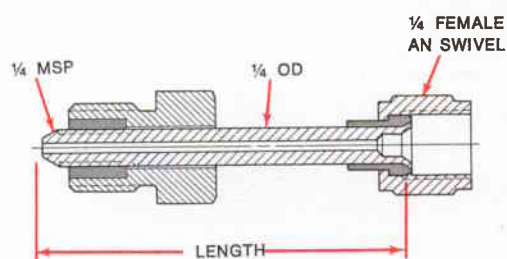


PART NO.	A (TUBE PORT)	B	C (HEX)	D	ORIFICE
244-1	AN10056-4	1/4 FSP	3/4	1.25	1/8
244-2	AN10050-4	1/4 FSP	3/4	1.25	1/8
*244-3	AN10056-4	1/4 FSP	1 1/8	1.55	1/8
244-4	AN10056-4	1/4 MSP	5/8	1.53	3/32

\*PANEL NUT INCLUDED

AN10050-4 IS 1/4 IN. FEMALE TUBE  
AN10056-4 IS 1/4 IN. MALE TUBE (37° FLARE)

## AN ADAPTER TUBING • SERIES 254

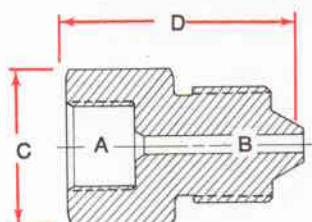


GLAND NUT AND SLEEVE INCLUDED

PART NO.	LENGTH	ORIFICE
254-2	2 INCHES	.060
254-4	4 INCHES	.060
254-6	6 INCHES	.060

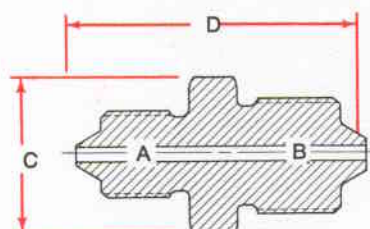
NON-STANDARD LENGTHS AVAILABLE ON REQUEST

## REDUCER BUSHINGS • SERIES 266



PART NO.	A	B	C (HEX)	D	ORIFICE
266-1	1/4 FSP	3/8 MSP	7/8	1.55	1/8
266-2	1/4 FSP	9/16 MSP	1 1/4	1.85	1/8

## REDUCER BUSHINGS • SERIES 269



PART NO.	A	B	C (HEX)	D	ORIFICE
269-1	1/4 MSP	3/8 MSP	7/8	1.90	3/32
269-2	1/4 MSP	9/16 MSP	1 1/4	2.25	3/32

EXCEPT FOR SERIES 254 TUBING, GLAND NUT AND SLEEVE NOT FURNISHED WITH ADAPTERS

# VALVES

**MATERIAL: TYPE 303 STAINLESS STEEL**

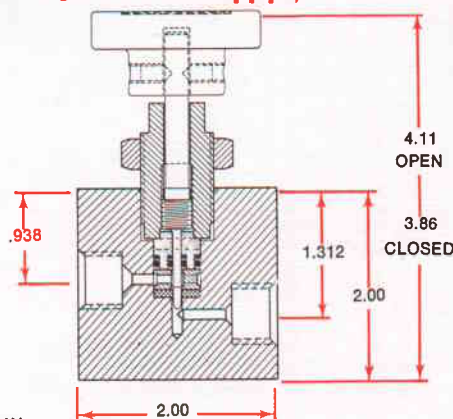
**PRESSURE: 10,000 PSIG**

The precision micro-metering valves depicted on this page are designed to provide extremely fine metering capability at operating pressures of 0 to 10,000 psig. The valves are equipped with a resilient nylon seat which can be replaced without removing the valve from the test circuit. A metal-to-metal bottom is designed into the valve to prevent seat damage due to overtightening. The valve stems are specially finished to provide precision control through the ranges of 0 to 10,000 psig. Because of the low cross-sectional area of the stem, no more than 2 inch-pounds of torque is required at 10,000 psi of pressure. All valve configurations are designed for panel mounting and include a jam nut. Repair Parts Kit, Part No. 903-3 contains all parts necessary for valve repair.

ALL DIMENSIONS ARE IN INCHES

## METERING VALVE • PART NO. 414-1

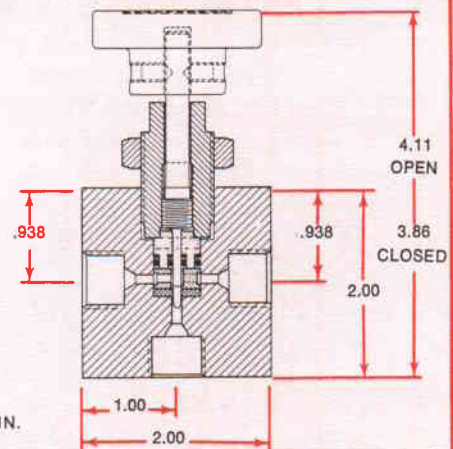
PORTS: 1/4 IN. FSP  
ORIFICE: 0.060 IN.



BODY THICKNESS: 1.00 IN.  
PANEL OPENING: 3/4 IN.

## METERING VALVE • PART NO. 414-4

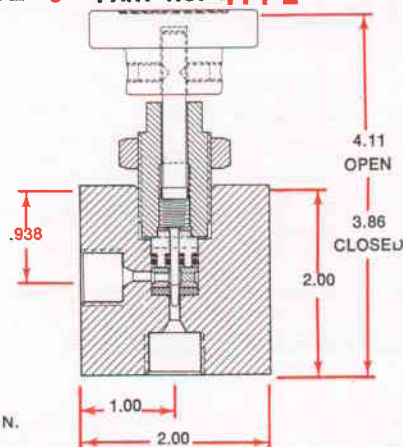
PORTS: 1/4 IN. FSP  
ORIFICE: 0.060 IN.



BODY THICKNESS: 1.00 IN.  
PANEL OPENING: 3/4 IN.

## METERING VALVE • PART NO. 414-2

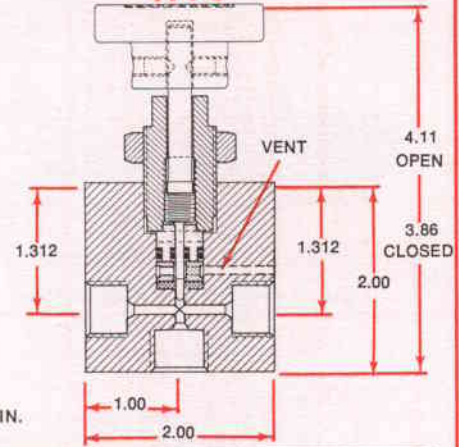
PORTS: 1/4 INCH FSP  
ORIFICE: 0.060 IN.



BODY THICKNESS: 1.00 IN.  
PANEL OPENING: 3/4 IN.

## VENT VALVE • PART NO. 414-5

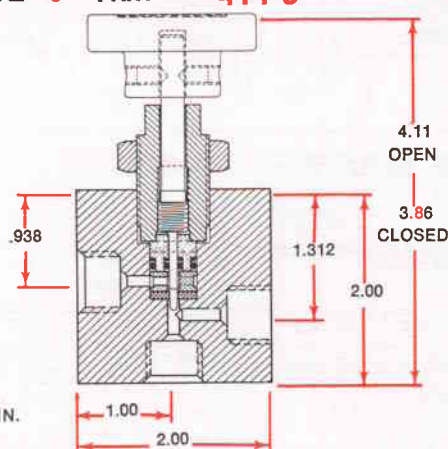
PORTS: 1/4 IN. FSP  
ORIFICE: 0.060 IN.



BODY THICKNESS: 1.00 IN.  
PANEL OPENING: 3/4 IN.

## METERING VALVE • PART NO. 414-3

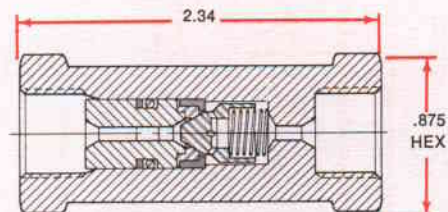
PORTS: 1/4 INCH FSP  
ORIFICE: 0.060 IN.



BODY THICKNESS: 1.00 IN.  
PANEL OPENING: 3/4 IN.

## CHECK VALVE • PART NO. 424-1

PORTS: 1/4 IN. FSP  
ORIFICE: 1/2 IN.



FURNISHED WITH BUNA N  
SEATS AS STANDARD;  
NYLON SEATS AVAILABLE  
REPAIR PARTS KIT, PART NO. 904-8





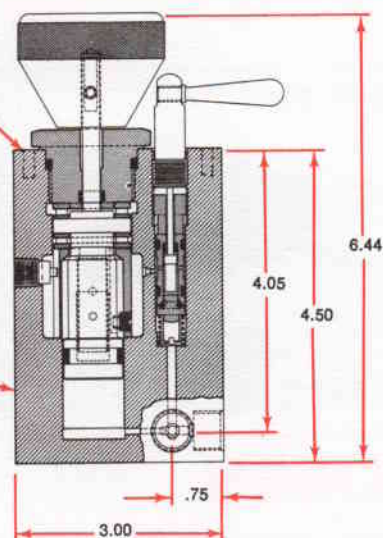
## VERNIER VALVE • PART NO. 544-1

The vernier control valve can be added to any test circuit to provide extremely precise adjustments of test pressures. A non-rising, precision leadscrew is used to position an internal piston, which alters the total volume of the test circuit. An integral piston bypass valve is opened to equalize the pressures on both sides of the piston prior to making the vernier adjustment, thereby allowing the piston to move freely for the final pressure setting. The vernier control contains an automatic relief valve to avoid trapping high-pressure gas within the valve after venting the test circuit. The valve can be panel mounted. Repair parts kits containing all necessary internal packings are available.

PORTS: 1/4 IN. FSP

MTG HOLES  
10-32 THD  
ON 1 1/2 X  
2 1/2 PATTERN

BODY  
THICKNESS:  
2.00



ALL DIMENSIONS ARE IN INCHES

REPAIR PARTS KIT, PART NO. 904-7

## BURST DISC

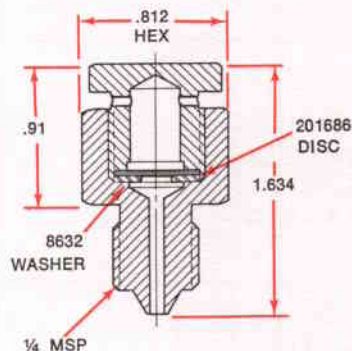
MATERIAL: BODY AND PLUG: TYPE  
303 STAINLESS STEEL

DISC: BRASS SHEET  
WASHER: PHENOLIC

The burst discs are designed for installation in any circuit requiring overpressure protection. Burst pressure is controlled by varying the critical bearing diameter of the burst plugs, thus, all pressure ranges use identical discs. The burst disc plugs are designed to vent to atmosphere.

ALL DIMENSIONS ARE IN INCHES

ORIFICE: 1/2 IN.

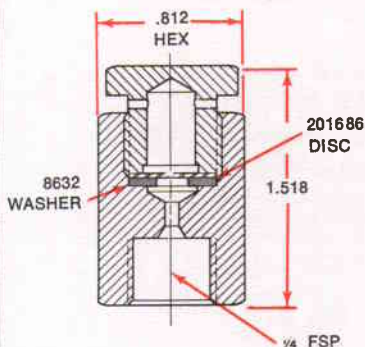


### BURST DISC (MSP) • SERIES 704

PART NO.	SYSTEM OPERATING PRESSURE (PSIG)	ACTUAL BURST PRESS. (±5%) (PSIG)
704-3,000	3,000	3,300
704-4,000	4,000	4,400
704-5,000	5,000	5,500
704-6,000	6,000	6,600

PART NO.	SYSTEM OPERATING PRESSURE (PSIG)	ACTUAL BURST PRESS. (±5%) (PSIG)
704-7,000	7,000	7,600
704-8,000	8,000	8,500
704-9,000	9,000	9,500
704-10,000	10,000	10,500

ORIFICE: 1/2 IN.



### BURST DISC (FSP) • SERIES 714

PART NO.	SYSTEM OPERATING PRESSURE (PSIG)	ACTUAL BURST PRESS. (±5%) (PSIG)
714-3,000	3,000	3,300
714-4,000	4,000	4,400
714-5,000	5,000	5,500
714-6,000	6,000	6,600

PART NO.	SYSTEM OPERATING PRESSURE (PSIG)	ACTUAL BURST PRESS. (±5%) (PSIG)
714-7,000	7,000	7,600
714-8,000	8,000	8,500
714-9,000	9,000	9,500
714-10,000	10,000	10,500



## QUICK-DISCONNECTS

**MATERIAL: ALUMINUM WITH SERIES 300  
STAINLESS STEEL INTERNAL  
PARTS**  
**PRESSURE: 10,000 PSIG**

The quick-disconnect coupling provides a safe and simple means for connecting various high-pressure components to calibration and pressure systems. As a safety feature, the coupling contains internal locking pins which prevent disengagement of a probe at pressures above 250 psig. The coupling is designed to mate with the high-pressure probes shown below. The standard packing material used in the couplings is BUNA-N; other materials are available. Repair parts kits containing all necessary internal packings are in stock. Dust plugs and dust covers are available for protection of the couplings and probes when not in use.

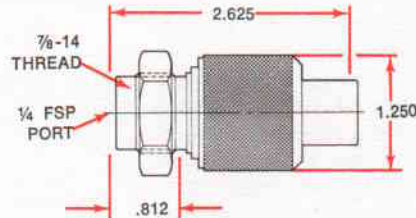
ALL DIMENSIONS ARE IN INCHES

### QD AND DUST PLUG



### QUICK-DISCONNECT COUPLING

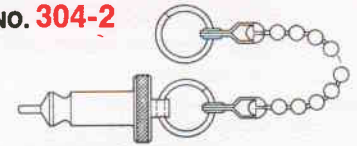
**PART NO. 304-1**



PANEL NUT INCLUDED  
REPAIR PARTS KIT, PART NO. 904-1

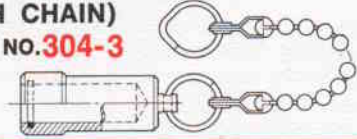
### DUST PLUG (WITH CHAIN)

**PART NO. 304-2**



### PROBE DUST COVER (WITH CHAIN)

**PART NO. 304-3**

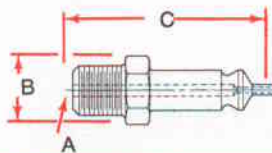


## PROBES

**MATERIAL: TYPE 303 STAINLESS STEEL**  
**PRESSURE: 10,000 PSIG**  
**ORIFICE: .047 INCH**

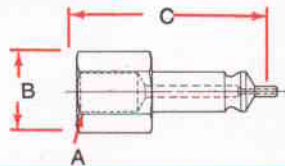
ALL DIMENSIONS ARE IN INCHES  
GLAND NUT AND SLEEVE NOT FURNISHED  
MSP: MALE SUPERPRESSURE  
FSP: FEMALE SUPERPRESSURE

### MALE PIPE THREAD PROBE SERIES 314



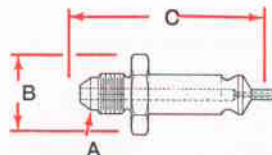
PART NO.	A (NPT)	B (HEX)	C
314-1	1/8-27	5/8	2.19
314-2	1/4-18	5/8	2.19
314-3	3/8-18	7/8	2.35
314-4	1/2-14	7/8	2.35

### FEMALE PIPE THREAD PROBE SERIES 324



PART NO.	A (NPT)	B (HEX)	C
324-1	1/8-27	3/4	2.19
324-2	1/4-18	3/4	2.19
324-3	3/8-18	1	2.55
324-4	1/2-14	1 1/4	2.55

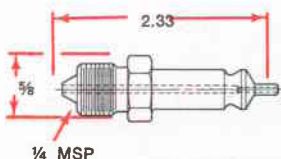
### AN PROBE SERIES 334



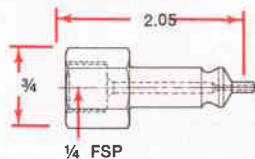
PART NO.	A (TUBE PORT)	B (HEX)	C
334-1	AN10050-4	3/4	2.19
334-2	AN10056-4	3/4	2.09
334-3	AN10057-4	3/4	2.63

AN10050-4 IS 1/4 IN. FEMALE TUBE  
AN10056-4 IS 1/4 IN. MALE TUBE  
AN10057-4 IS 1/4 IN. BULKHEAD TUBE

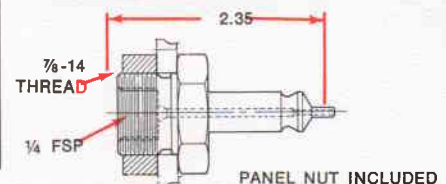
### MALE SUPERPRESSURE PROBE PART NO. 344-1



### FEMALE SUPERPRESSURE PROBE PART NO. 344-2



### FEMALE BULKHEAD SUPERPRESSURE PROBE PART NO. 344-3



# HOSES

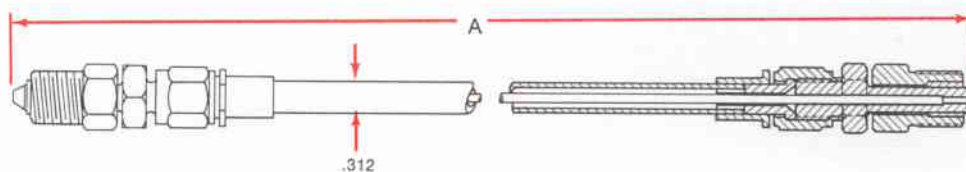
**MATERIAL: TYPE 303 STAINLESS STEEL**  
**PRESSURE: 10,000 PSIG**

The superpressure hoses presented below provide a safe means for transfer of high pressure gas in a test circuit. For ease of installation, all hoses are equipped with swivel end fittings. The pressure element is a flexible, stainless-steel capillary tube with an inside diameter of 0.037 inch. The element is sheathed within a Teflon-lined stainless-steel hose to prevent kinking or chafing. Minimum burst pressure is in excess of 40,000 psig.

ALL DIMENSIONS ARE IN INCHES

## HOSE • SERIES 604

PORTS: 1/4 IN. MSP (SWIVEL)  
 CAPILLARY SIZE: 3/32 OD X .037 ID  
 MINIMUM BEND RADIUS: 2.5 IN.



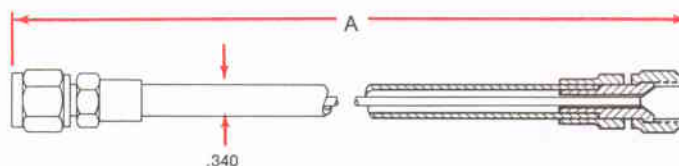
PART NO.	A (IN.)
604-060	6.0
604-120	12.0
604-180	18.0
604-240	24.0

PART NO.	A (IN.)
604-360	36.0
604-480	48.0
604-600	60.0
604-1200	120.0

DASH NO. INDICATES LENGTH IN INCHES AND TENTHS OF INCHES; NON-STANDARD LENGTHS AVAILABLE ON SPECIAL ORDER.

## HOSE • SERIES 614

PORTS: 1/4 IN. FEMALE AN (SWIVEL)  
 CAPILLARY SIZE: 3/32 OD X .037 ID  
 MINIMUM BEND RADIUS: 2.5 IN.



PART NO.	A (IN.)
614-060	6.0
614-120	12.0
614-180	18.0
614-240	24.0

PART NO.	A (IN.)
614-360	36.0
614-480	48.0
614-600	60.0
614-1200	120.0

DASH NO. INDICATES LENGTH IN INCHES AND TENTHS OF INCHES; NON-STANDARD LENGTHS AVAILABLE ON SPECIAL ORDER.



# INTENSIFIER

**RATIO: 10 TO 1**

**PRESSURE: 10,000 PSIG**

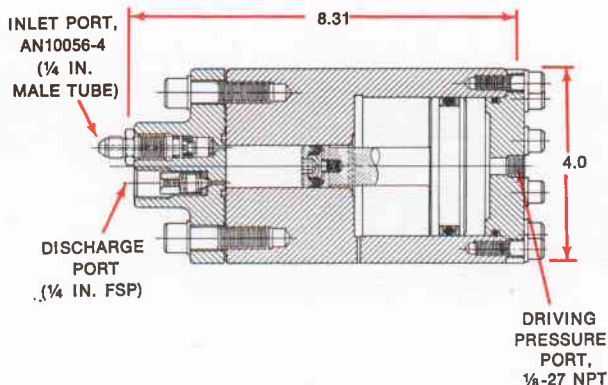
The intensifier contains a free-floating differential area piston with a 10:1 amplification ratio. The intensifier has integral check valves at the high-pressure end to prevent reverse flow during the pump cycle. Stacked Teflon chevron seals are used in the high-pressure end of the piston for efficient sealing. The check valve seats are nylon for extended life and maintenance-free operation. The piston and high-pressure head are stainless steel. The cylinder body and low pressure end cap are aluminum. Repair parts kits are available from stock.

ALL DIMENSIONS ARE IN INCHES

## INTENSIFIER • PART NO. 514-1



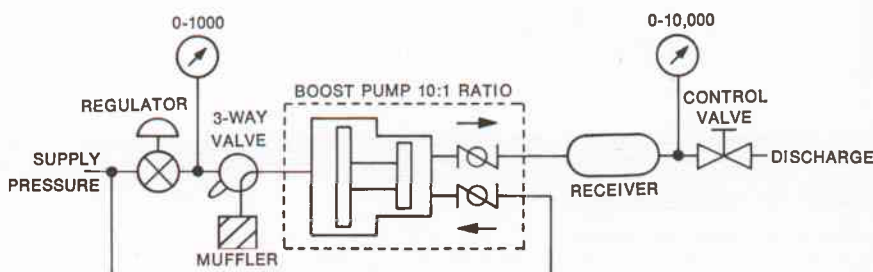
### CROSS SECTION



REPAIR PARTS KIT, PART NO. 904-5

The schematic illustrates the intensifier in a typical application. Supply pressure from an external source is fed directly into the high-pressure end of the intensifier through the integral inlet check valve. Regulated pressure is admitted to the low-pressure end of the piston and is applied to the large piston diameter, stroking the piston to compress gas in the high-pressure end of the intensifier by a ratio of 10:1 (output pressure to regulated pressure). From the high-pressure end of the intensifier, gas is delivered to the receiver through the integral outlet check valve. Cycling of the piston is controlled by the 3-way valve. In one position, regulated pressure is applied to the large piston diameter; in the other position, the low-pressure end is vented to atmosphere and supply pressure returns the piston to the original position.

### SCHEMATIC



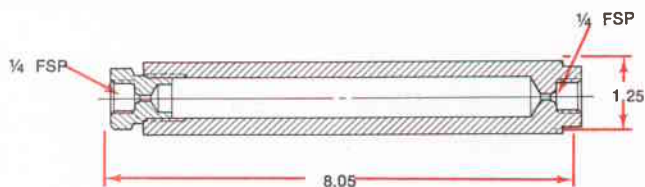
# RECEIVERS

**PRESSURE: 10,000 PSIG**

The receivers are used in conjunction with the intensifier to store high-pressure gas. To permit in-line mounting, the receivers are equipped with female superpressure ports at each end. Each receiver is proof tested to 15,000 psig and has a minimum burst pressure, by test, in excess of 40,000 psig.

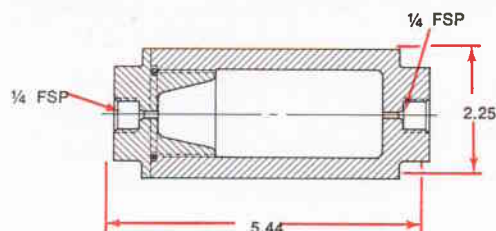
MSP: MALE SUPERPRESSURE  
FSP: FEMALE SUPERPRESSURE

## RECEIVER • PART NO. 524-1 (2½ CU. IN.)



MATERIAL: TYPE 303 STAINLESS STEEL

## RECEIVER • PART NO. 524-2 (5 CU. IN.)



MATERIAL: STAINLESS STEEL (17-4 PH)

# FLUID SEPARATORS

**PRESSURE: 10,000 PSIG**

ALL DIMENSIONS ARE IN INCHES  
FSP: FEMALE SUPERPRESSURE



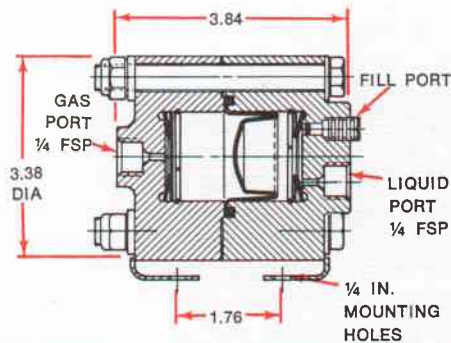
The fluid separator is a pressure transmitter designed for the pneumatic calibration of fluid-filled or contaminated test instruments. The separator is available with anodized aluminum body and stainless steel internal parts, or with all stainless steel construction. The standard separator contains a soft Buna-N diaphragm (also available as options: Neoprene, Silicon Rubber, Ethylene Propylene, Butyl, Viton A, Viton B) which transmits the calibrating pressure but acts as a divider between liquid and gas systems, or between non-compatible fluids. Automatic valves within the separator prevent diaphragm rupture in the event of leakage or fluid loss. A liquid charger is furnished with each fluid separator to charge the separator and test item with fluid.

## SPECIFICATIONS:

Rated Pressure ..... 10,000 psig  
Minimum Burst Pressure ..... 40,000 psig  
Displacement Volume ..... 3.5 cu. in.  
Maximum Error ..... 0.1 psig  
Ports ..... 1/4 in. FSP

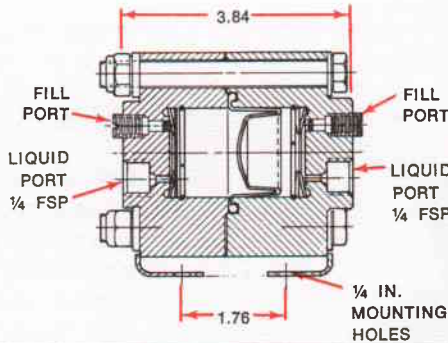
## GAS-TO-LIQUID SEPARATOR

PART NO. **534-1** (ALUMINUM)  
**534-1SS** (TYPE 303  
STAINLESS STEEL)



## LIQUID-TO-LIQUID SEPARATOR

PART NO. **534-2** (ALUMINUM)  
**534-2SS** (TYPE 303  
STAINLESS STEEL)



Standard diaphragm material is Buna-N. To order other material, select the appropriate code from the following table and suffix the code to the desired part number. For example, Part No. 534-1SS(A) defines an all stainless steel Gas-to-Liquid separator with Neoprene diaphragm.

## MATERIAL CODES

CODE	MATERIAL	CODE	MATERIAL
A	Neoprene	D	Viton B
B	Silicon Rubber	E	Butyl
C	Viton A	F	Ethylene Propylene

STANDARD DIAPHRAGM REPLACEMENT KIT, PART NO. 904-6; REFER TO ABOVE TABLE FOR SPECIAL DIAPHRAGM MATERIALS.

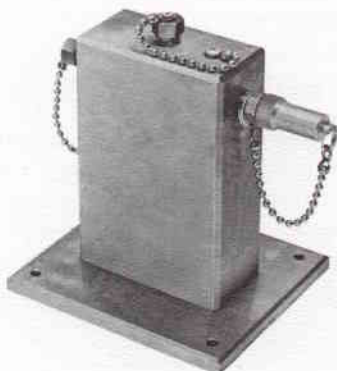
# GAUGE STAND

**MATERIAL: TYPE 303 STAINLESS STEEL**

**PRESSURE: 10,000 PSIG**

MSP: MALE SUPERPRESSURE  
FSP: FEMALE SUPERPRESSURE

The gauge stand assembly consists of a stainless-steel block used to support a gauge under test. Two 1/4-inch female superpressure ports are provided to accommodate either bottom or back connected gauges. These ports can be conveniently adapted to fit standard gauge ports by use of superpressure adapters. The pressure fitting of the stand is a high-pressure male quick-disconnect probe which mates with a female quick-disconnect coupling, installed on high-pressure hoses.



## GAUGE STAND • PART NO. 554-1

