ARYA

DEFINING THE INSTRUMENTS

ACCESSORIES

INDEX

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An ISO 9001:2000 Certified Company

ISO 9001 REGISTERED

DNV

MGMT. SYS. RvA C 024

DNV Certification B.V., The Netherlands

Do you want to protect your pressure instruments, gauges, switches & transmitters from high temperature process fluids? Then we, would like to help you by the product, Syphons. Syphons are used to protect those directly coming in contact with high temperature process fluids or vapors. These reduce steam or other process media temperature prior to enter into theses instruments. They are filled with condensation fluids and are mounted between process and pressure instrument. They reduce process pulsation, act as heating dispenser and generate cooling affect to save instrument to work at dangerous temperature.

SPECIFICATION

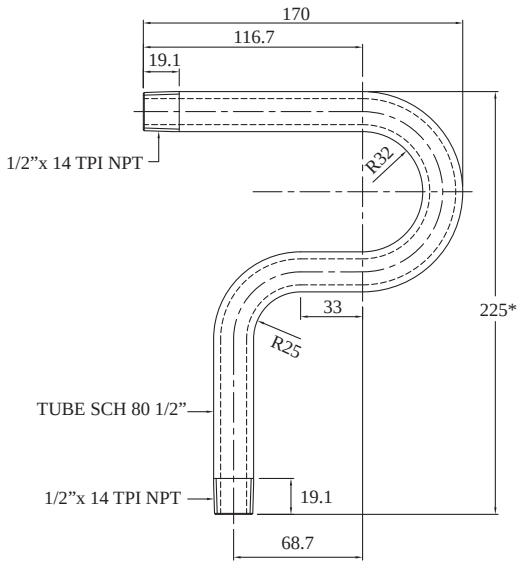
- Type - 'U' and Coil 'O'
- Operating Temperature - Carbon Steel : 210 Kg/Cm^2 at 20°C
- Material of Construction - Stainless Steel : 260 Kg/Cm^2 at 20°C
  - Gr. B. Carbon Steel, SS304, SS316
- Connection - 1/4", 3/8", 1/2" BSP or NPT Male & Female
- Pipe Size - 1/4" & 1/2" inches, Schedule 80/40

FEATURES

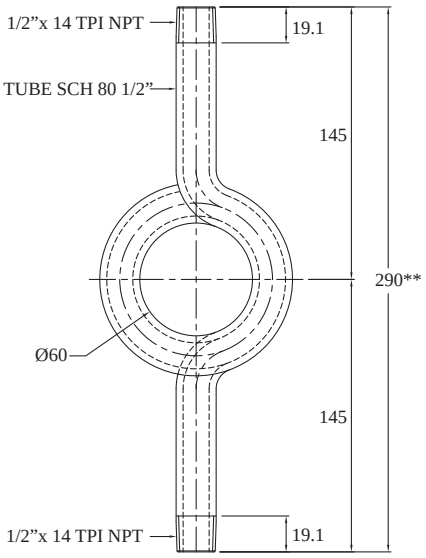
- Schedule 40 & schedule 80 seamless pipe construction

OPTIONS

- Schedule 80, schedule 160 and 45 degree angle



SYPHONE 'U' TYPE



SYPHONE 'PIG TAIL' TYPE

ORDERING PROCEDURE

SP — [ ] — [ ] — [ ] — [ ] — [ ] — [ ]

Basic Model : SP

Type

Type	Code
U	U
Coil	O

Material of Construction

Type	Code
SS304	S
SS316	SS
Carbon Steel	CS

Thickness

Type	Code
Schedule 40	4
Schedule 80	8

Connection

Type	Code
1/4"	4
3/8"	6
1/2"	8

Thread Type

Type	Code
BSPP	G
NPT	N

Thread

Type	Code
Male x Male	MM
Female x Female	FF
Male x Female	MF

* for 1/4" x 3/8" 200mm
** for 1/4" x 3/8" 195mm

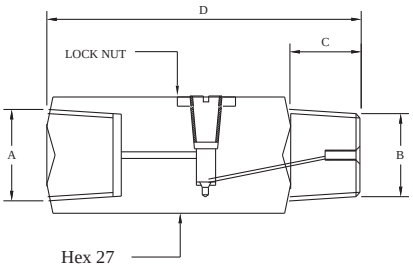
Note : Dimensions are reference only and are subject to change.

ARYA's innovative manufacturing unit, offers an accessory that will increase the life span of Pressure instruments. Pulsation Dampeners are designed to protect pressure instruments from sudden pressure changes and fluctuations of pressuring fluids. Thus sudden pressure changes are damped before they reach the pressure sensing element to minimize stress on it and giving longer life. You can use this with any instruments subjected to rapidly fluctuating pressure or sudden shock pressures.

SPECIFICATION	NEEDLE DAMPENERS	POROUS DAMPENERS
Working Pressures	Up to 400 Kg/Cm^2	Up to 1000 Kg/Cm^2
Working Temperature	-20°C to 150°C	-40°C to 400 C
Working Pressures	Up to 400 Kg/Cm^2	Up to 1000 Kg/Cm^2
Working Temperature	-20°C to 150°C	-40°C to 400°C
Wetted parts	AISI 316 Stainless Steel	AISI 316 Stainless Steel
Principle of operation	Adjustable needle	Porous metal filter disc

APPLICATION

• Hydraulic Machines • Compressors • Process Plants, etc.



Pulsation Dampner (Snubber)

A x B	C	D
1/4" BSP M x 1/4" BSP F	15.5	66
1/4" NPT M x 1/4" NPT F	15.5	66
1/2" BSP M x 1/2" BSP F	20	66
1/2" NPT M x 1/2" NPT F	20	66

ORDERING PROCEDURE

SN — [ ] — [ ] — [ ]

Basic Model: SN / GS

Material of Construction

Type	Code
SS304	4
SS316	6

Connection

Type	Code
BSP	B
NPT	N

Thread Type

Type	Code
1/4”	4
3/8”	8
1/2”	2

Also available in Brass.

Note : Dimensions are reference only and are subject to change.

Over Load Protector (Gauge Saver)

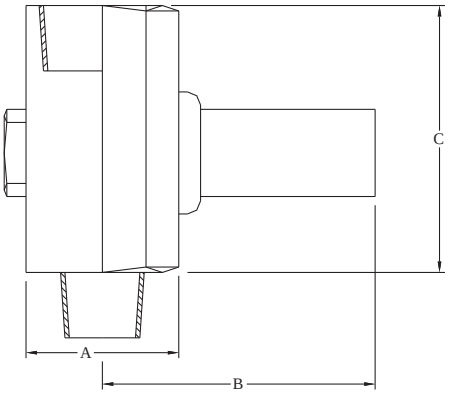
Are you worried about the process pressure, which is exceeding the specified pressure range and makes some problems to your pressure instruments? If yes, would like to give you one solution by the product Gauge Saver. These Gauge Savers are designed to protect pressure instruments from over pressure exceeding the specified pressure range by sudden & excessive pressure fluctuation from surge or spike. This device blocks the higher pressure exceeding the allowed value, until it comes back to normal.

SPECIFICATION

Setting Range	: 0.2 to 400 Kg/Cm^2 / BAR
Reset Value	: -30% of Set Value
Max. Working Pressure	: 500 Kg/Cm^2
Operating Temperature	: -25°C to 120°C
Wetted Parts	: SS 316 / Monel

FEATURES

- Bellows, Piston Types
- 1/4" ,3/8 ", 1/2" BSP/ NPT,
- Male x Female



Over Load Protector (Gauge Saver)

A x B	C	D
1/4" BSP M x 1/4" BSP F	15.5	66
1/4" NPT M x 1/4" NPT F	15.5	66
1/2" BSP M x 1/2" BSP F	20	66
1/2" NPT M x 1/2" NPT F	20	66

ORDERING PROCEDURE

GS | | | | |

Basic Model: SN / GS

Material of Construction

Type	Code
SS304	S
SS316	SS

Connection

Type	Code
BSPP	G
NPT	N

Thread Type

Type	Code
1/4"	4
3/8"	6
1/2"	8

SET PRESSURE

Note : a, 0.6 Kg/Cm^2 to 1.6 Kg/Cm^2 Bellow type.
b, 1.6 Kg/Cm^2 to 400 Kg/Cm^2 Standard type.

Note : Dimensions are reference only and are subject to change.

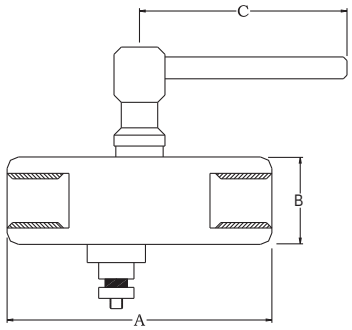
Arya offers accessory, “Gauge Cock” to your pressure gauge to extend the service life of it. Gauge Cocks are intended to isolate the pressure gauge from the medium in order to enable inspection or replacement of the pressure gauge and also to extend the service life of gauge, where the pressure is continuously pulsating. In OFF position, the pressure medium is blocked and pressure gauge system is open to the atmosphere. In ON position, the pressure gauge is open to the pressure, to the pressure medium. These are available with VENT also by which the system can be vented and the medium can escape into the atmosphere.

CONTAINS

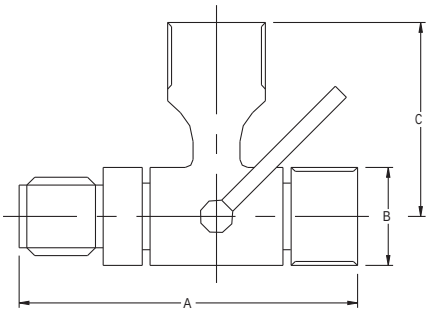
Construction	: Forged or Bar Stock
Working Pressure	: Upto 400 psi
Testing Pressure	: Upto 600 psi
Working Temp.	: 10°C to150°C
Design	: Female-Female / Male-Female

FEATURES

- Smooth Operation.
- Bubble tight shut - off.
- Rugged construction.
- P.T.F.E. packing.



Female x Female



3 Way

ORDERING PROCEDURE

Basic Model: GC

GC — [ ] — [ ] — [ ] — [ ] — [ ]

Material of Construction

Type	Code
Brass	B
SS304	S
SS316	SS

Vent

Type	Code
Without	-

Connection

Type	Code
BSPP	G
NPT	N

Thread Type

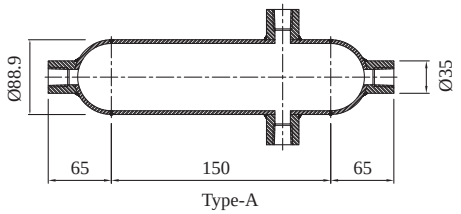
Type	Code
1/4”	4
3/8”	6
1/2”	8

Thread

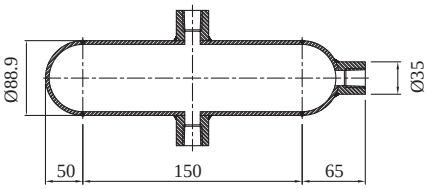
Type	Code
Male x Male	MM
Female x Female	FF
Male x Female	MF

Note : Dimensions are reference only and are subject to change.

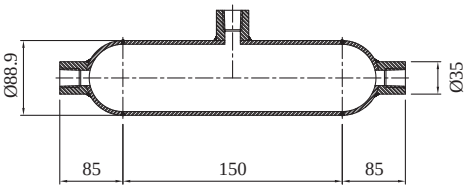
Design : ACP



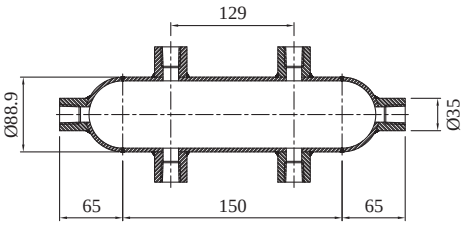
Type-A



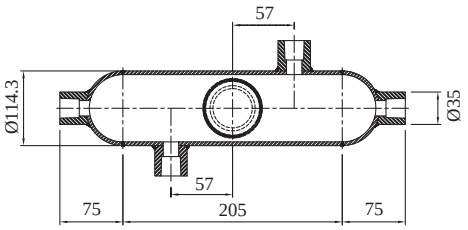
Type-B



Type-C



Type-D



Type-E

Condensate is steam that has been condensed back into water. When the condensate enters the boiler feed pump additional chemicals are added and the product is now called boiler feed water.

FEATURES:

- Use as liquid or condensate traps, seal pots, vapor chambers and knockout pots.
- All connectors are protected with plastic plugs.
- Chambers are made from seamless carbon steel pipe and weld caps. All pipe connections are #3000 half-couplings mounted on 90 Degree angle. Extra connections can be furnished upon customer request.
- Heat code traceability provided upon request.
- All welding as per ASME SEC. IX
- All butweld joints will be 100% radiographed and fillet weld will be D.P tested.

TECHNICAL SPECIFICATIONS :

Size: pipe size 2",3",4" and larger size upon request.

- Length : Pipe length 8", 10", 12" and larger length upon request.
- Working pressure: 6000 PSI (413 Bar)
- Material of construction: SS 316, SS 304,ASTM A 106 Gr B
- Optional Sour Gas service pots are available confirming to NACE Std. MR-01-75
- Pipe Schedule: 40, 80, 160, XX seamless pipe.
- Chamber as per ISA RP3
- NPT as per ANSI B2.1 taper pipe thread 1/2" furnished.
- Socketweld as per ANSI B16.11
- Buftweld as per ANSI B16.9
- All chamber are 100% Factory tested prior to shipment.

APPLICATION

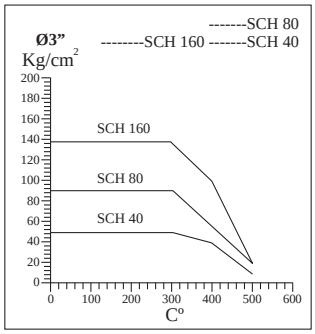
Used in process systems. Which are systems difficult to shut off due to solid contents dust, rust, dirt, etc.

TESTING

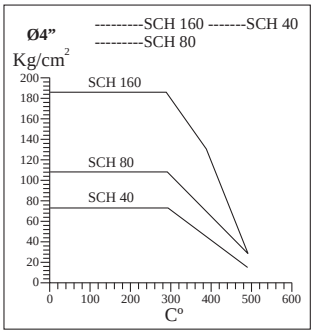
Hydrostatic shell test is performed at 1.5 times the working pressure.

Material	Schedule-40		Schedule-80		Schedule-160	
	Pressure Test		Pressure Test		Pressure Test	
	Kg./Cm^2	PSI	Kg./Cm^2	PSI	Kg./Cm^2	PSI
A106 Gr. B	80	1150	125	1800	210	3000
AISI 316	95	1350	155	2200	–	–

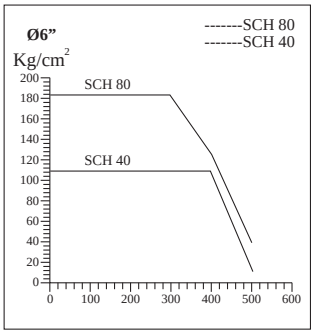
Maximun Non Shock rating



Maximun Non Shock rating



Maximun Non Shock rating



ORDERING INFORMATION

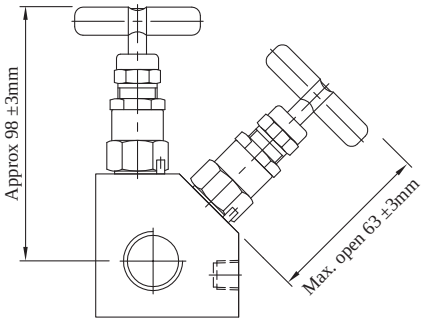
- Design Type (see type design)
- Material of construction
- Pipe size & schedules
- Pipe length
- End connection type & size

Note : Dimensions are reference only and are subject to change.

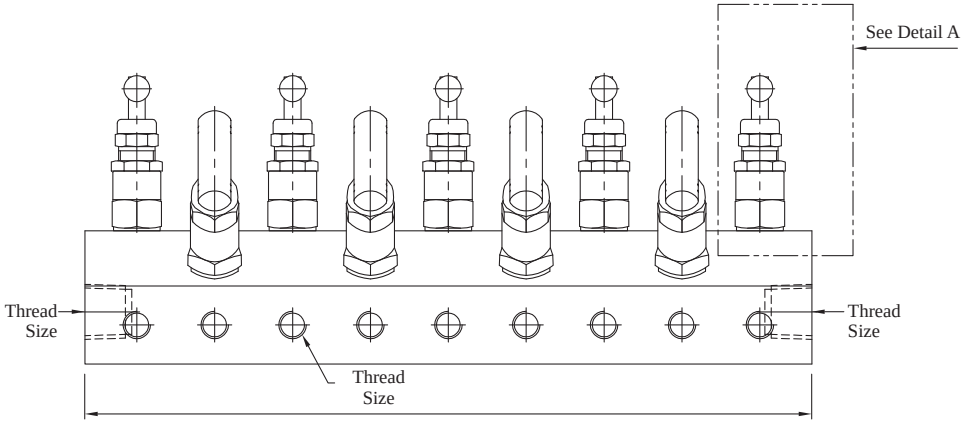
Air Header Distributor (Bar Stock)

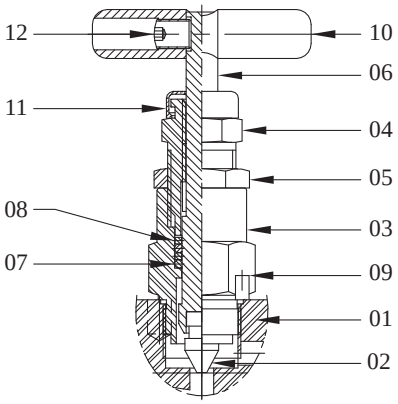
ARYA
DEFINING THE INSTRUMENTS

Design : AHD-B



SIDE VIEW





TYP. DETAIL - A

#	Description	Material
1	Body	SS 316
2	Spindle Tip	17-4 PH
3	Bonnet	SS 316
4	Adjustable Bonnet	SS 316
5	Check Nut	SS 316
6	Spindle	SS 316
7	Seal (O-ring)	Viton
8	Packing	Teflon
9	Stopper Pin	S
10	Handle	SS
11	Dust Cap	Nylon
12	Grub Screw	CS

FEATURES

- Connecting Inlet 1/2"NPT(F) & Outlet 1/2"NPT(F), Drain or Vent 1/4" NPT(F), 1/8" NPT(F), Nos. of valves upto 20, Other configuration upon request.
- Heat code traceability, upon request.

BONNET ASSEMBLY

- Screwed bonnet design.
- Bonnet-back seated blow out proof.
- Spindle tip-Non rotating tip shut off type.
- Dust cap protects stem threads from externals contamination.
- Leak tight seal with low operating torque.

TECHANICAL SPECIFICATIONS

- Size: 1/2" Inlet x 1/2" Outlet, or 3/4" Inlet x 3/4" Outlet
- End connection: NPT,BSPT,Socket weld.
- Working Pressure: 6000 psi (413 Bar)
- Temperature Rating: PTFE 450°F (232°C), Graphoil 700°F (371°C)
- Material of construction: SS 316, SS 304, C.S.
- Optional Sour Gas service valves are available confirming to NACE Std. MR - 01 - 75
- Stem packing: PTFE, Graphoil.
- Orifice: Dia. 4.7mm
- All manifolds are 100% Factory tested prior to shipment.

APPLICATION

- Refineries, liquid petroleum gas processing plant, petrochemical plants, etc.

TESTING

- Pneumatic Seat test is performed at 70 bar Nitrogen pressure.
- Hydrostatic shell test is performed at 1.5 times the working pressure.

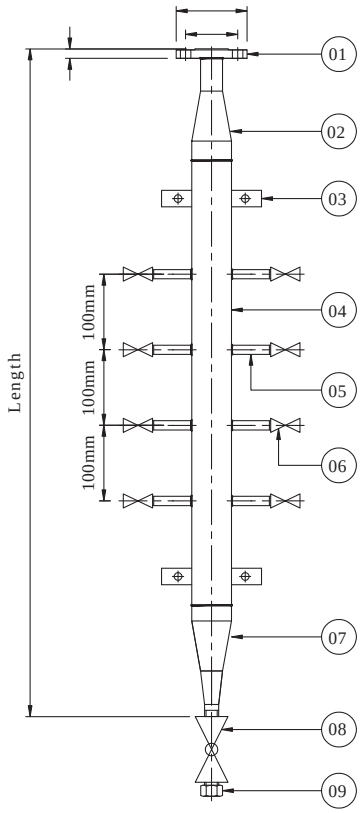
ORDERING INFORMATION, Please specify followings :

- Material of construction
- Number of ports
- Thread connection (Input & Output)
- Length of Manifold
- Working Pressure
- Temperature rating

Note : Dimensions are reference only and are subject to change.

Air Header Distributor (Pipe)

Design : AHD-P



FEATURES

Pipe air header distributor. Connects pipe to pipe or flange to flange Drain / Vent connection & 1/4" NPT, 1/2"NPT on either side of pipe.

TECHNICAL SPECIFICATIONS

- Inlet /Outlet : 1/2", 3/4", 1" threaded or flanged.
- End connection: NPT, BSPT, and BSPP Nipple
- Working Pressure: 6000 psi (413 bar)
- Temperature Rating: PTFE 450 Deg. F (232 Deg.C), Graphoil 700 Deg. F (371 Deg. C)
- Material of construction : SS 316, SS 304, C.S.
- Optional Sour Gas service valves are available confirming to NACE Std. MR - 01 - 75
- All Air Headers are 100% Factory tested prior to shipment

APPLICATION

- Refineries, liquid petroleum gas processing plant, etc.

TESTING

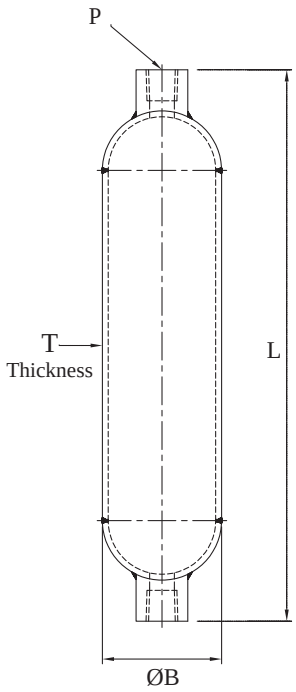
- Pneumatic is performed at 7 bar.
- Hydrostatic shell test is performed at 1.5 times the working pressure.

#	Description	Material
1	Flange NB RF	SS 316
2	Reducer NB x NB	SS 316
3	Mounting bracket	SS 304
4	Body seamless pipe	SS 316
5	Nipple NB x NPT(M) 3"long	SS 316
6	Needle Valve (FxF)	SS 316
7	Reducer NB x NPT(M)	SS 316
8	Ball Valve (NPT FxF)	SS 316
9	NPT (M) Male Plug	SS 316

ORDERING INFORMATION, Please specify followings :

- Material of construction
- Number of ports and connection
- End connection (Input & Output)
- Pipe outer diameter & Thickness
- Length
- Working Pressure
- Temperature rating
- With Needle valves, Ball valve or Threaded Nipple

Sampling Cylinder



FUTURES

- Material of construction : Seamless pipes.
- Internal volume capacity : 150ml. to 370ml.
- Thread connection : 1/4", 1/2" or 3/4" NPT.
- Internal surface : Smooth & Cleaned
- Max. working pressure : 1800 PSI.

PART No.	P NPT - F	Pressure Rating PSIG	Capacity (Internal Vol.)$cm^{3\pm5\%}$	L mm	B mm	T mm
ASC150-4N	1/4"	1800	150	135	50.8	2.5
ASC300-4N	1/4"	1800	300	225	50.8	2.5
ASC400-4N	1/4"	1800	400	290	50.8	2.5
ASC500-4N	1/4"	1800	500	350	50.8	2.5
ASC1000-4N	1/4"	1800	1000	275	88.9	4.6
ASC2250-4N	1/4"	1800	2250	435	120	5.2
ASC3785-4N	1/4"	1800	3785	680	120	5.2
ASC1000-8N	1/2"	1800	1000	275	88.9	4.6
ASC2250-8N	1/2"	1800	2250	435	102	5.2
ASC3785-8N	1/2"	1800	3785	680	102	5.2
ASC1000-12N	3/4"	1800	1000	275	88.9	4.6
ASC2250-12N	3/4"	1800	2250	435	102	5.2
ASC3785-12N	3/4"	1800	3785	680	102	5.2

Note : Dimensions are reference only and are subject to change.

INTRODUCTION

Athermowell is a thermally conductive socket recommended to :

- protect delicate instrument sensing elements against corrosive effects.
- Permit instrument interchange or calibration check without disturbing or closing down the process.

Thermowell are available for high pressure,high temperatures and high velocity applications. Selected on the basis of pressure, temperature, flow, vibration and corrosion service parameters, basic thermowell types include :

- Barstock execution or built-up execution
- Threaded (Screwed)
- Socket weld
- Flanged

All Arya Thermowells should be carefully selected to meet the demands of the particular application. The information contained in this catalog is only offered as a guide to assist in making the proper selection. Improper application may cause failure of the thermowell, resulting in possible personal injury or property damage.

HOW TO ORDER

Arya Thermowell are ordered by part number as listed in this catalogue or as per customer drawing requirement

Selecting a Thermowell

Arya Thermowells are available for use with all Temperature Instrumentation and Control Products, including: Thermometers, Thermocouples, RTD's, Temperature Recorders, and Temperature Controllers.

Connection

Arya Thermowells are available in a variety of process connection styles. Threaded connections in 1/2", 3/4" and 1" NPT are the most widely specified. Socket weld, weld-in, raised face flanged, Van Stone flanged, and sanitary (Tri-Clamp) connection styles are also available All Arya Bimetal Thermowells are provided with a 1/2" NPSTM instrument connection to allow for pressure relief within the thermowell.

U-Length

The U-length (insertion length) of a thermowell indicates its insertion depth into a process vessel or piping system and is measured from the tip of the thermowell to the underside of the threads.

The U-length must equal or exceed the length of the sensitive portion of the temperature instrument's stem or bulb. Arya Thermowells are available in U-lengths from 2" to 12" in general, maximum upto 36"

Material

The material chosen must be compatible with the process medium to which it is exposed. In application of high pressure or velocity, the material may be chosen for its strength or durability. Arya offers thermowells in a variety of materials, including: Brass, Carbon steel, Stainless Steel, Monel, Hastelloy B or C, Inconel 600, Incoloy 800, Nickel and Titanium. Other alloys or compounds may also be available on request. Threaded, welded and flanged thermowells are made from forgings or bar stock. Raised face flanged and sanitary thermowells are of a two piece welded construction.

Bore

Each Arya Thermowell is designed to fit the sensing element of a specific instrument sheath outside diameter.

Shank

Arya Thermowells are available in stepped, tapered, and straight shank configurations. Stepped shank thermowells are normally used on standard duty applications. Tapered shank thermowells are designed for use on heavy duty applications. Straight shank thermowells are designed for use with instruments that have wide stem diameters or short stem lengths.

Lagging Extension

Lagging extension thermowells are used on applications where insulation covers the vessel or piping system. The extension length (T-length) is the measurement between the instrument connection and process of the thermowell.

Test Wells

All Arya Thermowells can be ordered with a protective cap and chain for use in non permanent instrument installations.

QUALITY ASSURANCE

Manufacturing and ordering processes are tightly controlled by a quality assurance programme in line with ISO 9001-2000 to produce high quality consistently. The products are stringently tested in the state of art in house testing laboratory according to:

- Construction drawing.
- Hydrostatic test pressure.
- Dye penetrant test.
- Inspection and material certificate according to EN 10204 3.1.B., 3.1.C.
- Heat number stamped on well and flange.
- Certificate according to NACE MR.01.75
- Tensile test, impact test, Heat treatment certificate.
- Welding procedure specification (W.P.S.).

APPLICATION

Arya thermowells are recommended whenever a temperature element is to be inserted into a process where corrosion, pressure, abrasion, or shear forces may threaten the life of the element. In addition thermowells allow for a defective instrument to be removed without shutting down or draining the process.

FEATURES

Constructive Characteristics

Insertion length

Built-up, bar-stock thermowells are built with lengths from mim. 70 to max. 1000 mm.

Identification

All built-up or bar-stock thermowells are stamped with the type of material and tags on flanged thermowells are stamped for the size, rating and material.

Recommendations

Operating Pressure

The operating pressure that thermowells can be used at, decreases with respect to chemical characteristics of the process fluid.

Temperature Limits For Material Appliciations

Bar-stock Thermowells

- Brass -10 + 200^{0}C
- Carbon steel -30 + 350^{0}C
- AISI 304 200 + 800^{0}C
- AISI 316 -200 + 800^{0}C

Built-up Thermowells

For built-up thermowells the application limits depend on the type of welding :

- + 65^{0}C for tin alloy welding.
- + 120^{0}C for silver alloy welding
- + 400^{0}C for argon welding.

THERMOWELL FAILURE

Industrial Thermowells fail for several reasons. The four main factors are:

Mechanical	Bending or breakage caused by an applied force in excess of the thermowell yield strength.
Corrosion	Induced by chemicals and/or elevated temperatures.
Erosion	Resulting from high-speed particle impingement on the thermowell
Vibrational	Failure due to Von Karmen Trail Effect
Fatigue	The above failure modes can be minimized through proper engineering and material selection. However, vibrational fatigue failure is less familiar and often overlooked in thermowell design. Vibrational fatigue occurs as a stream of product passes the thermowell, creating a wake on the downstream side. When this wake oscillates at a frequency that is equal to the natural frequency of the thermowell, a resonance is created, which can cause thermowell failure.

The phenomenon is known as the Von Karman Trail Effect, and has a defined frequency that is based upon the well configuration and the velocity of the flow. Given reliable process information, the suitability of a thermowell can be determined. As in other engineering calculations, safety factors should be employed to compensate for unforeseen process variables.

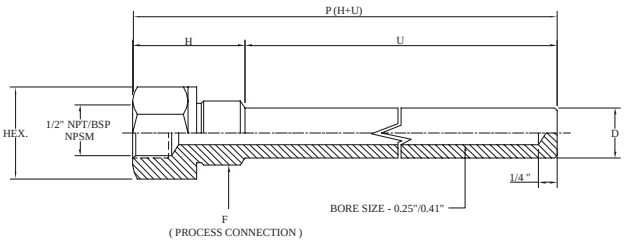
Consideration of these factors and proper calculations of the results can eliminate all but the most unusual thermowell failures.

ATW Screwed Straight 01 (Bar Stock)

ATW\SC\ST\01

F	H	Hex	D
1/2" NPT/BSP	1-7/8"	1-1/8"	5/8"
3/4" NPT/BSP	1-7/8"	1-1/4"	3/4"
1" NPT/BSP	2"	1-7/16"	3/4"

U	2”	3”	4”	5”	6”	8”	10”	12”	18”	24”

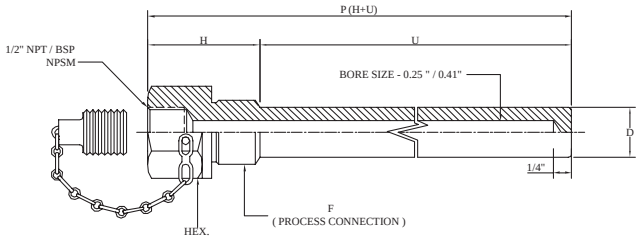


ATW Screwed Straight 03 (Test Well)

ATW\SC\ST\03

F	H	Hex	D
1/2" NPT/BSP	1-7/8"	1-1/8"	5/8"
3/4" NPT/BSP	1-7/8"	1-1/4"	3/4"
1" NPT/BSP	2"	1-7/16"	3/4"

U	2”	3”	4”	5”	6”	8”	10”	12”	18”	24”

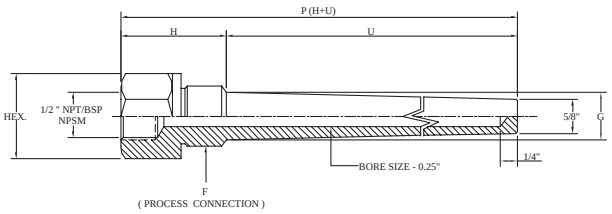


ATW Screwed Tappered 01

ATW\SC\TP\01

F	H	Hex	D
1/2" NPT/BSP	1-7/8"	1-1/8"	3/4”
3/4" NPT/BSP	1-7/8"	1-1/4"	7/8”
1" NPT/BSP	2"	1-7/16"	1-1/8”

U	2”	3”	4”	5”	6”	8”	10”	12”	18”	24”

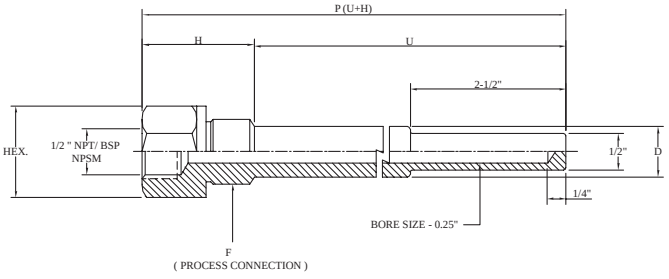


ATW Screwed Stepped 01

ATW\SC\SP\01

F	H	Hex	D
1/2" NPT/BSP	1-7/8"	1-1/8"	5/8”
3/4" NPT/BSP	1-7/8"	1-1/4"	3/4”
1" NPT/BSP	2"	1-7/16"	7/8”

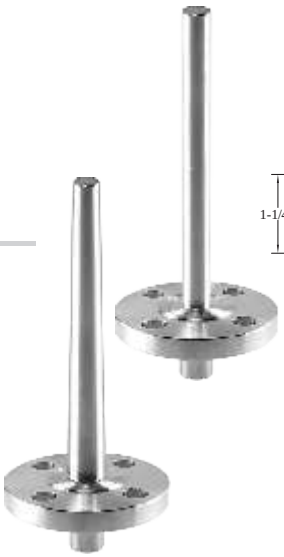
U	2”	3”	4”	5”	6”	8”	10”	12”	18”	24”

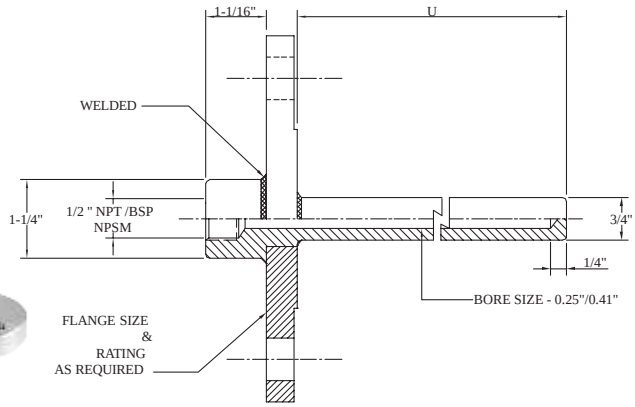


Note : Dimensions are reference only and are subject to change.

ATW Flanged Straight (Bar Stock)

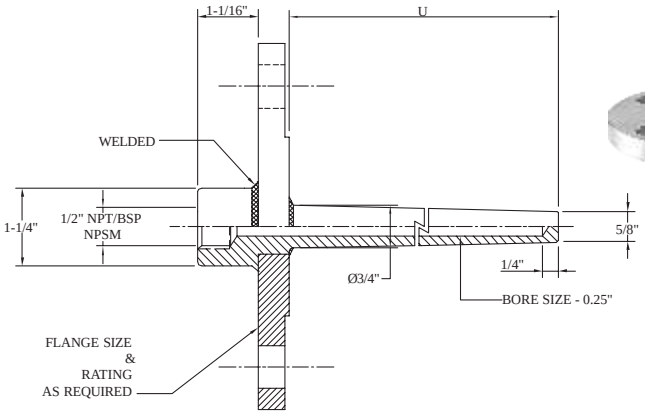
ATW\FG\ST





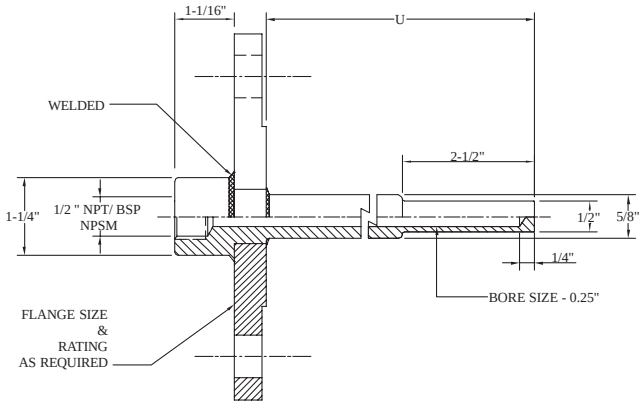
ATW Flanged Tappered

ATW\FG\TP



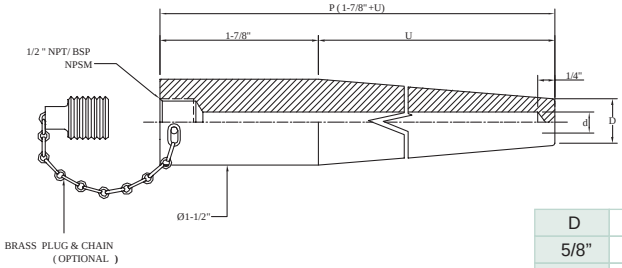
ATW Flanged Stepped

ATW\FG\SP



ATW Weld-in

ATW\WI

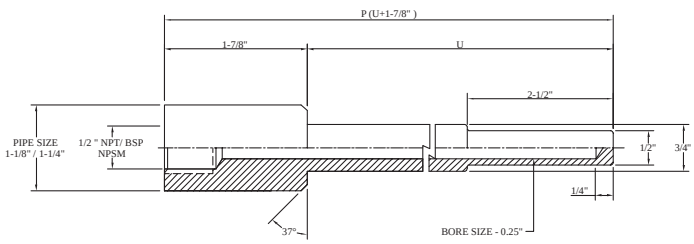


D	d
5/8"	0.25"
3/4"	0.41"

U	2"	3"	4"	5"	6"	8"	10"	12"	18"	24"

ATW Socket Weld Stepped

ATW\SW\SP



U	2"	3"	4"	5"	6"	8"	10"	12"	18"	24"

Note : For more Thermowell model specifications, etc.
please visit www.aryaengg.com for detailed catalogue or write to us.

Warning for Your Safety

The system designer and user have the sole responsibility to select products suitable for their special application requirements to ensure the proper installation. Operation and maintenance of the product. Application details, material compatibility and product ratings should all be considered in the individual selection. Improper selection or use of products can cause property damage or personal injury. Arya accept no liability for any improper selection, installation, operation or maintenance.