

Sand Probe Relays
Sand Probe Adaptors
Sand Probe “Pipe” Elements
Special Manufacture - Adaptor/Elements
Special Manufacture - Flange Assemblies & Accessories
Sample Quills (Probes) - Injection Quills
Product List

The listings which follows, depicts our most frequently utilized products and some Special Manufacture items. We can develop and supply unique components for specific applications. An information form is also provided to assist with the design criteria of the unique product required. **Red text denotes Special Manufacture products or specific features.**

- SAND PROBE RELAYS

Two Position, Three Way, **Flow Control Valves**, Media Pressure Operated, with Manual Reset Feature. 10,000 PSI Working Pressure at the Process Connection or Pilot Supply port, (unless stated otherwise).

MODEL NUMBER	FUNCTION - FEATURES (FIELD MOUNT MODELS)
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HLR 7550A.....Normally Open, Standard Service.

HLR 350-20A.....Normally Open, 15,000 PSI Working Pressure.

HLR 7740.....Normally Closed.

MODEL NUMBER	FUNCTION - FEATURES (PANEL MOUNT MODELS)
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HLR 7930.....Normally Open.

HLR 7930R.....Normally Open, Red Knob.

HLR 7935.....Normally Closed.

HLR 150-1.....Universal Ports (NC,C,NO).

- **SAND PROBE ADAPTORS**

The Adaptor is the central component of a standard, **three piece companion (Relay, Adaptor, "Pipe" Element), field mounted assembly.** The Adaptors listed below have a 1/4"-18 N.P.T. "Female" Connection for installing a Male tube end, Sand Probe Pipe Element. All Adaptors are manufactured from 316 Stainless Steel.

MODEL NUMBER	CONNECTIONS
HLR 7620	1/2"-14 N.P.T. Male x Female. (Standard)
HLR 34AE12	3/4"-14 Male x 1/2"-14 N.P.T. Female. <u>Manufactured upon Order entry only.</u>

- **SAND PROBE "PIPE" ELEMENTS**

A 1/4"-18 "M" N.P.T. Male Tube End, Sealed Tube component installed within a well stream's flowline to provide a sand impingement surface. This component requires a companion Sand Probe Adaptor for new installations. See our **Order Selection Chart for Working Pressure/Wall Thickness correlation and order information.**

MODEL NUMBER	FLOWLINE SIZE & MATERIAL
HLR 7620-2	2" Alloy Steel.
HLR 7620-3	3" Alloy Steel.
HLR 7620-4	4" Alloy Steel.
HLR 7620-6	6" Alloy Steel.

Note: Sand Probe (Pipe) Elements for flowline sizes larger than 6", are routinely provided as special order items. Additionally, any material other than Alloy Steel, will be classified as a Special Manufacture item. **The Stainless Steel Elements listed, are manufactured after the entry of a Purchase Order only. Specify Grade of Stainless Steel required when ordering.**

MODEL NUMBER	FLOWLINE SIZE & MATERIAL
HLR 7620-2SS	2" - Stainless Steel.
HLR 7620-3SS	3" - Stainless Steel.
HLR 7620-4SS	4" - Stainless Steel.
HLR 7620-6SS	6" - Stainless Steel.

- ONE PIECE ADAPTOR/ELEMENT COMBINATION

The following Adaptor/Elements are selected for use with high temperature and /or high pressure applications (above 5,000 PSI), and/or high velocity (above 40 feet per second) applications. Both Male & Female connections are 1/2"-14 N.P.T. A 1/2"-14 N.P.T. Connection or "Thread-O-Let" Weld Coupling is required for its installation. See our "Order Selection Chart" for a Working Pressure/Wall Thickness correlation and order information.

MODEL NUMBER FLOWLINE SIZE & MATERIAL

HLR 7620MR2.....2" 410 Stainless Steel

HLR 7620MR3.....3" 410 Stainless Steel

HLR 7620MR4.....4" 410 Stainless Steel

HLR 7620MR6.....6" 410 Stainless Steel

- Special Manufacture ADAPTOR/ELEMENTS (with an Internal Stiffener)

The following Adaptor/Elements are selected for installation in a 3/4"-14 N.P.T. Connection or "Thread-O-Let" Weld Coupling. The HLR 34AE12 "M" Series Sand Probe Adaptor/Element is provided with an internal "Stiffener" for well streams with a high flow velocity or large diameter pipe applications. The Stiffener strengthens the wall without adding to its thickness. Stiffeners are generally used in the large diameter pipe sizes (6" and above). An example designation is provided next. Note: The "Male" Connection is a 3/4"-14 N.P.T. and the Female (Outlet) Connection is 1/2"-14 N.P.T.

Example Model Number: HLR 34AE12M6-STF-050 (SOI)

Designation: **6** - Assembly is for an **6"** Flowline
 STF - Internal Stiffener
 050 - A Wall Thickness of .050" is required
 (SOI) - Client - Shell Offshore Inc.

Example Model Number: HLR 34AE12M8-STF-065 (SOI)

Designation: **8** - Assembly is for an **8"** Flowline
 STF - Internal Stiffener required
 065 - A Wall Thickness of .065" is required
 (SOI) - Client - Shell Offshore Inc.

These special manufacture Adaptor/Elements are designed from the information provided by clients or their representative engineers. These items are manufactured upon entry of a Purchase Order only. Consult with HLR Controls, Inc. to design and provide Model Number designations, etc., for specific application requirements.

- **High Pressure “Cone & Thread” Connections**
(For 1" Medium Pressure Autoclave, Butech, HIP installations)

The Sand Probe “Cone & Thread” Adaptor/Element combinations are utilized in 15,000 PSI (and above) Operating Pressure applications. Our special Adaptor/Elements are also designed according to information provided by clients or their representative engineers. A 1” Medium Pressure (1-3/8”-12-2B “Female” Threads) Connection is required for its installation. High Pressure Adaptor/Elements are manufactured after entry of a confirming Purchase Order only. Consult with HLR Controls, Inc. to design and provide Model Number designations, etc. for usage of these special manufacture items.

- **Special Manufacture Flange Assemblies & Accessories**

Some Oil & Gas Producers prohibit the use of threaded couplings or National Pipe Threads (N.P.T.) connections on flowlines. We provide “flanged” assemblies for these specific requirements. The components required are designed to client specifications and assigned model numbers which will also identify the client. Our description of designations and some example flange assemblies are provided as next:

Example Model Number: SPF-1.5RTJ-900CS-MOB

Designation: **SPF** - Sand Probe Flange
1.5RTJ - 1-1/2" Ring Type Joint
900CS - # 900 Series, Carbon Steel Material
MOB - Mobil Nigeria Special (Client)

Example Model Number: SPF-1.5RTJ-2500CS-MOB

Designation: **SPF** - Sand Probe Flange
1.5RTJ - 1-1/2" Ring Type Joint
2500CS - # 2500 Series, Carbon Steel Material
MOB - Mobil Nigeria Special (Client)

Example Model Number: SPF-1.5RF-1500CS-PCS

Designation: **SPF** - Sand Probe Flange
1.5RF - 1-1/2" Raise Face
1500CS - # 1500 Series, Carbon Steel Material
PCS - Petronas Carigali Sarawak (Client)

Each of the flange models shown, were provided with *special manufacture* Sand Probe Adaptor/Elements. The criteria provided from the listings (as found on the next page) will determine the Sand Probe Flange and “Pipe Elements” specific design.

Flowline (Pipe) Size: _____

Flowline's Outside Diameter (O.D.): _____

Flowline's Inside Diameter (I.D.): _____

Flange Size or Connection: _____

Material Required: _____

Center-of-Pipe to Face-of-Flange Dimension: _____

Normal Operating Pressure: _____

Maximum Pressure: _____

Well Stream Contents: _____

H2S _____ *CO2* _____ *Other:* _____

Operating Temperature: _____

Well Stream Velocity: _____

Providing the information from each item listed above, will allow a specific assembly to be designed from the application criteria. See our Order Assistance Form for a more detailed listing of options.

* A **Special Probe Adaptor/Element** component is necessary to complete the Flanged Sand Probe assembly.

Consult with HLR Controls, Inc. to design and provide Model Number designations, etc. for usage of these special manufacture products.

All special manufacture Sand Probe Adaptor/Elements are recognizable by the **SPAE 25-** prefix designation. These Adaptor/Elements are individually designed for unique (specific) application, process conditions and/or location.

The prefix designation **SPAE**, will identify **Special Probe Adaptor/Element** component usage.

HLR 7620 Series Sand Probe "Pipe" Element Model Number Selection Chart

The HLR 7620 Series Pipe Element is one component of a typical three piece Sand Probe companion assembly. It is selected whenever all of the following process conditions exists:

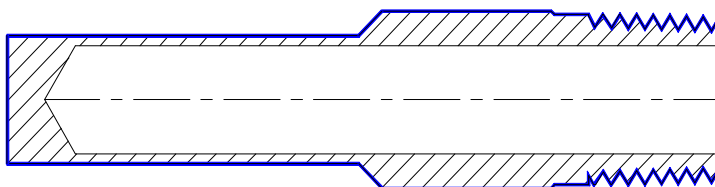
1. The process temperature is **below 140° F. (60° C.)**
2. The Pipe Element is subjected to pressure **below 5,000 PSI.**
3. A velocity **below 40 feet per second exist** in the flowline pipe segment.

Selecting the proper Sand Probe Pipe Element Model Number

Model Number	Pipe Size	<i>Determine the designation by selecting the basic Model Number and its corresponding Flowline Pipe Size, as shown on left.</i>
HLR 7620-2-***	2" (2.375" O.D.)	
HLR 7620-3-__	3" (3.500" O.D.)	
HLR 7620-4-__	4" (4.500" O.D.)	
HLR 7620-6-__	6" (6.625" O.D.)	

Operating Pressure	*** Wall Thickness	<i>Next, add the three digit Wall Thickness (***) number to complete the designation.</i>
400 - 1,000 PSI	.025"	
1,000 - 2,160 PSI	.035"	
2,160 - 5,000 PSI	.050"	

Example Model Number: HLR 7620-2-025 for a 2" Flowline installation, with a .025" Wall Thickness (required for use in a 750 PSI operating pressure, system).



HLR 7620 Series
Sand Probe Pipe Element

1/4" - 18 NPT

HLR 7620 “MR” Series Sand Probe Adaptor/Element Model Number Selection Chart

The HLR 7620 “MR” Series is one part of a two piece Sand Probe companion assembly. It is selected whenever any of the following process conditions exists:

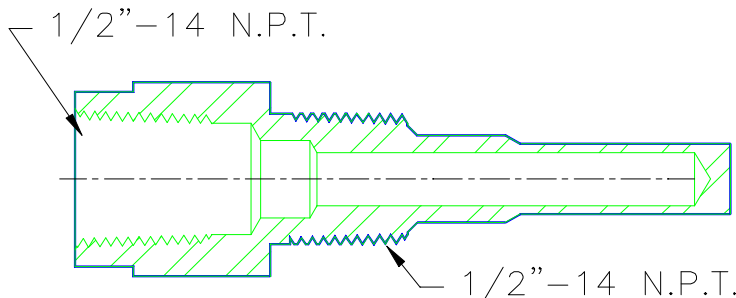
1. The process temperature is **above 140° F.** (60° C.)
2. The Adaptor/Element may be subjected to pressure **above 5,000 PSI.**
3. A velocity **above 40 feet per second** exist in the flowline pipe segment.

Selecting the proper Adaptor/Element Model Number

Model Number	Pipe Size	Determine the designation by selecting the basic Model Number and its corresponding Flowline Pipe Size, as shown on left.
HLR 7620MR2-***	2" (2.375" O.D.)	
HLR 7620MR3-___	3" (3.500" O.D.)	
HLR 7620MR4-___	4" (4.500" O.D.)	
HLR 7620MR6-___	6" (6.625" O.D.)	

Operating Pressure	*** Wall Thickness	Next, add the three digit Wall Thickness (***) number to complete the designation.
400 - 1,000 PSI	.025"	
1,000 - 2,160 PSI	.035"	
2,160 - 5,000 PSI	.050"	
5,000 - 10, 000 PSI	.065"	

Example Model Number: HLR 7620MR2-025 for a 2" Flowline installation, with a .025" Wall Thickness (required for use in a 750 PSI operating pressure, system).



HLR 7620 “MR”
Series
Sand Probe
Adaptor/Element



HLR CONTROLS, INC.
Sand Probe Relays & Associated Components
Order Assistance Form

-Sand Probe Relay (Please Check or "Tick" as Required)

Mounting: _____ Field (Local, Process Conn.) _____ Panel
Application: _____ Three Way "Block & Bleed" _____ Two Way Bleed
Control Configuration: _____ Normally Open _____ Normally Closed
Working Pressure: _____ 10,000 PSI _____ 15, 000 PSI
Seals Required: _____ Viton (Standard) _____ Aflas (High Temperature)
Material: _____ 316 S.S. (Standard) _____ Other _____

-Flowline (Please complete or fill-in information as required)

Size: _____ Outside Diameter: _____ Inside Diameter: _____
Operating Pressure: _____ Maximum Pressure: _____
Velocity: _____ Operating Temperature: _____
Well Stream Contents: _____ H₂S: _____ CO₂: _____ (% each)

-Connection

N.P.T. Coupling Size: _____ 1/2"-14 _____ 3/4"-14 _____ 1"-11-1/2
Flange Size: _____ Rating: _____ Material: _____
Center-of-Pipe to Face-of-Flange Dimension: _____

-Sand Probe "Pipe" Element

Material: _____ Wall Thickness: _____

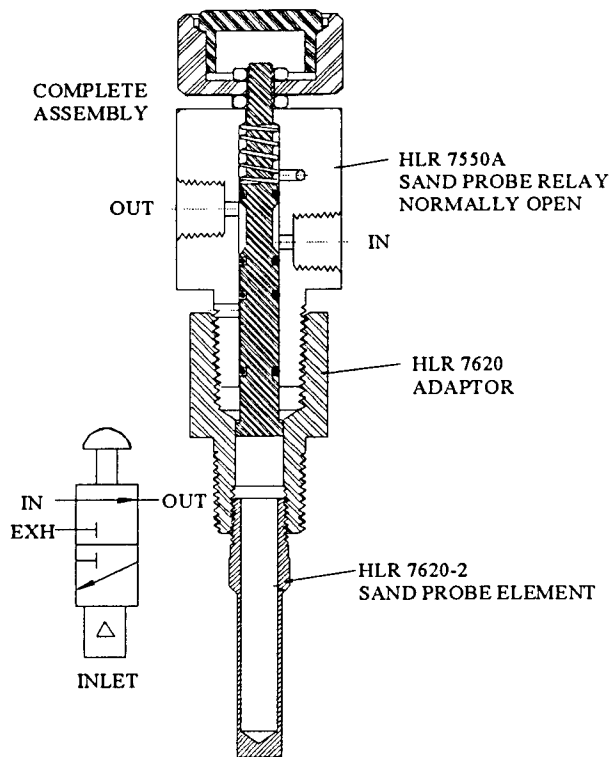
SAND PROBE RELAYS

Are two position, three way, manual reset, pneumatic flow control valves that are media pressure operated.

Designed to provide Surface Safety Valve (SSV) closure (through loss of operating instrument supply pressure) or initiate an alarm sequence, upon penetration of the Sand Probe "Pipe" Element. All Sand Probe Relays are media or process pressure operated. Assembly illustrations and instrumentation symbols are provided to depict the most commonly utilized Relays.

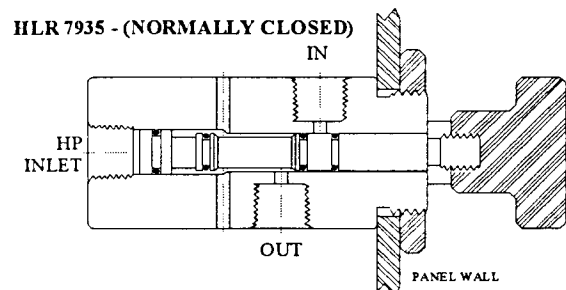
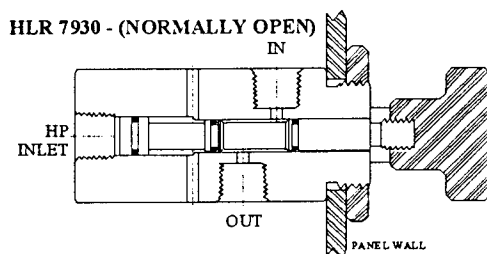
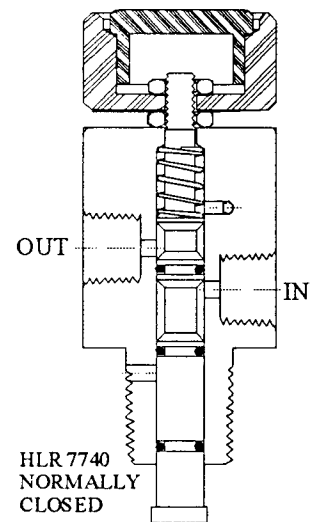
Special Features: Each Relay has a Knob (Palm Button) to facilitate periodic control circuit testing and manual reset after actuation. Up to 10,000 PSI of pressure can be applied at the process connection to actuate the Relay. A safety vent prevents the flowline's pressure from entering the lower pressure, pneumatic instrument supply control circuit. All "Field Mount" models have a Spring to compensate for thermal expansion that may occur within the Adaptor/Element sealed tube assembly.

Reason to Use: Flowline cutouts due to sand erosion will pose serious safety, fire and pollution risks. Our Sand Probe Relays and associated components have proven reliable to shut-in wells before flowline rupture occurs.



FEATURES

1. **Working Pressures:**
 Process - up to 10,000 PSI (Max.).
 Control (I, O) - up to 200 PSI (Max.).
2. **Connections:**
 Process - 1/2"-14 "M" N.P.T. (Field Mount models only).
 Control - 1/4"-18 "F" N.P.T.
3. **Material:** 316 Stainless Steel.
4. **Seals:** Viton.

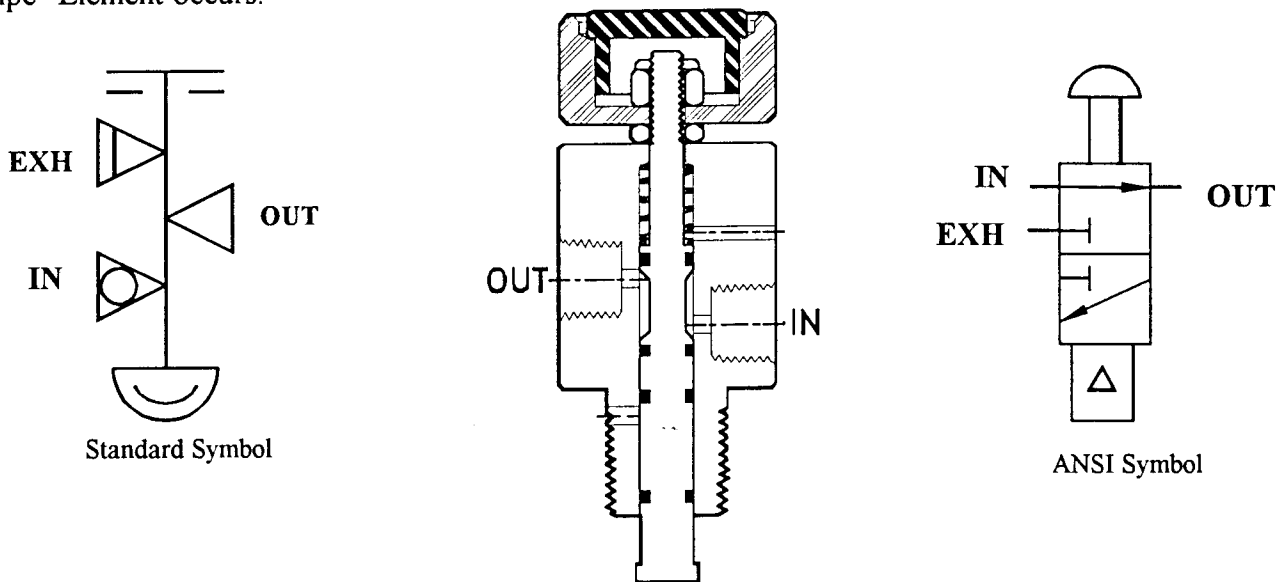


SAND PROBE RELAY - HLR 7550A

Designed for typical three way Normally Open “Block & Bleed” control circuit applications that require a loss of instrument “output” pressure upon penetration of the Sand Probe Element. The HLR 7550A is a two position, three way Normally Open, field mounted, manual reset, flow control valve. It is media or process pressure operated. As shown in the assembly illustration and depicted by instrumentation symbols, a Normally Open flow path exist between the Inlet and Outlet control ports. **The application of flowline pressure at its process connection will change the valve’s shelf or unactuated position to (1) Block the Inlet port, (2) Establish an Outlet (Cyl.) to Exhaust flow path.**

Special Features: It has a Knob (Palm Button) to facilitate periodic control circuit testing and manual reset after actuation. Up to 10,000 PSI of pressure can be applied at the process connection to actuate the Relay. A safety vent prevents the flowline’s pressure from entering the lower pressure, pneumatic instrument supply (Safety System) control circuit. The Spring is provided to compensate for thermal expansion that may occur within the Adaptor/Element’s sealed tube.

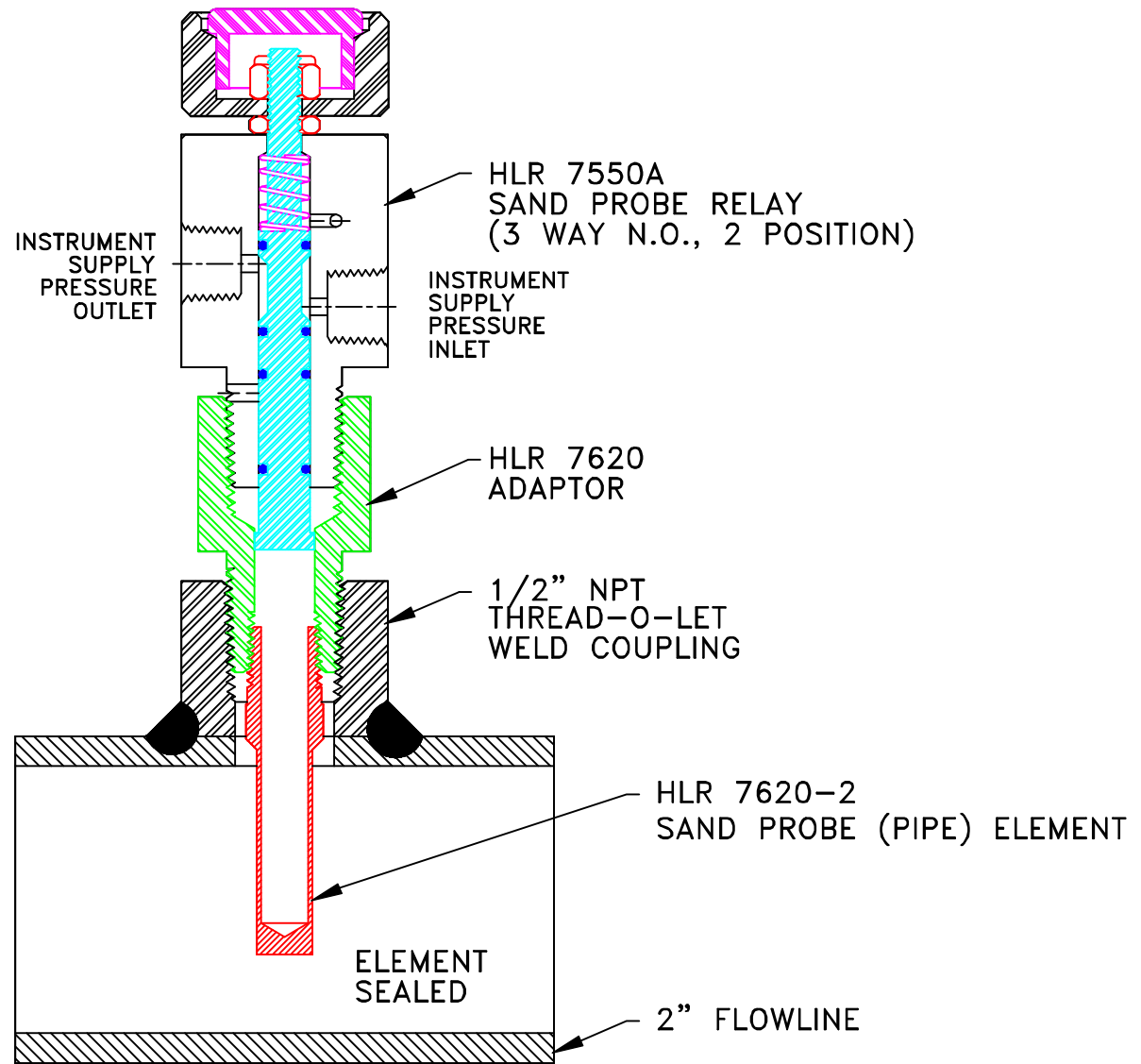
Reason to Use: Flowline cutouts due to sand erosion will pose serious safety, fire and pollution risks. Our Sand Probe Relays and associated components have proven reliable to shut-in wells before flowline rupture occurs. Typical pneumatic safety systems utilize the Sand Probe Relay to initiate closure of a Surface Safety Valve (SSV) after penetration of the Sand Probe “Pipe” Element occurs.



Characteristics

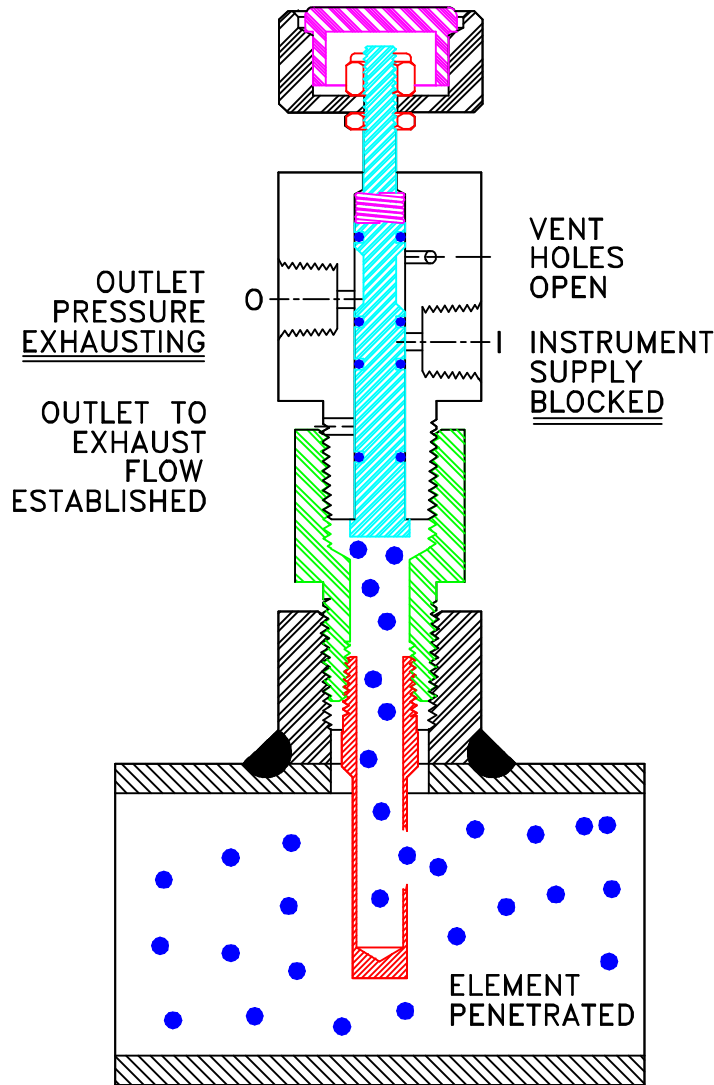
1. Working Pressures: Process - up to 10,000 PSI (Max.).
Control (I, O) - up to 200 PSI (Max.).
2. Connections: Process - 1/2”-14 “M” N.P.T.
Control - 1/4”-18 “F” N.P.T.
3. Material: 316 Stainless Steel.
4. Seals: Viton.

TYPICAL 2" FLOWLINE FIELD INSTALLATION DETAIL DRAWING
SAND PROBE RELAY/ADAPTOR/ELEMENT

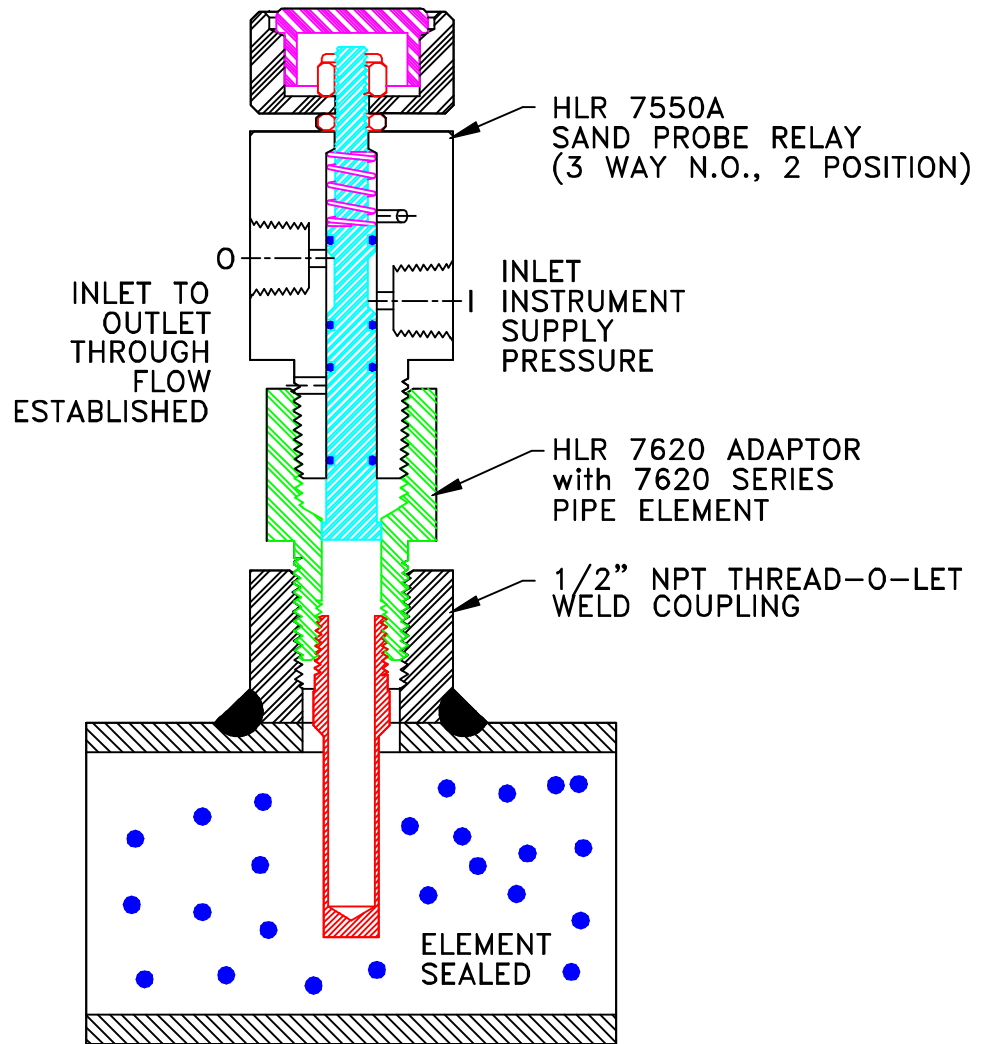


STATUS: IN-SERVICE (INLET TO OUTLET FLOW ESTABLISHED)

STATUS DRAWING FOR
 HLR 7550A SERIES – SAND PROBE RELAY
 for a
 Typical Field Mount Installation Assembly



RELAY STATUS: ACTUATED



RELAY STATUS: NORMAL OPERATING PLACEMENT

INSTRUCTIONAL SCHEMATIC

ANSI Symbols for

HLR 7550A Series – Sand Probe Relay

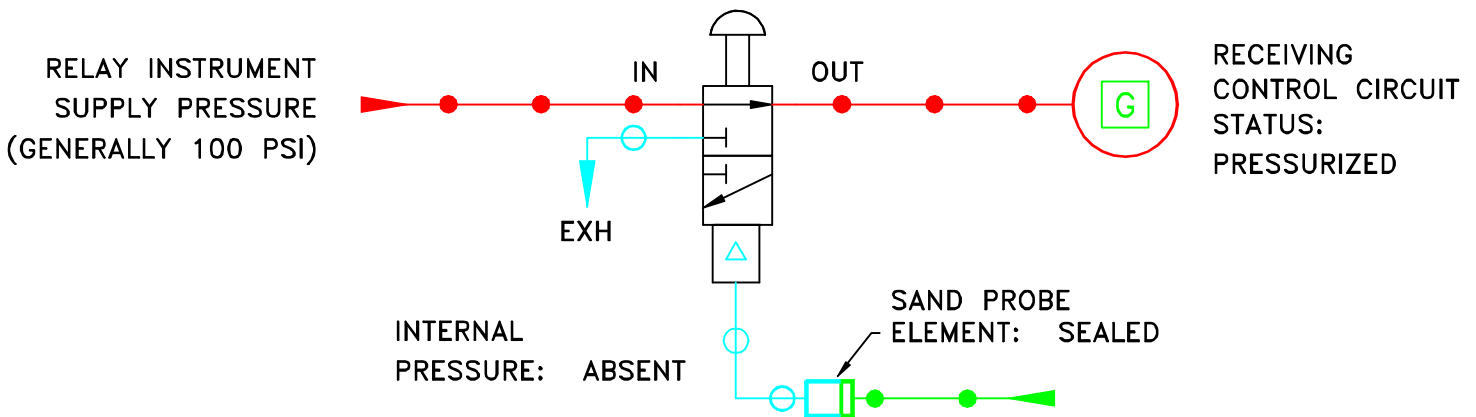
PNEUMATIC CIRCUIT APPLICATION: NORMALLY OPEN 3 WAY BLOCK & BLEED
Loss of Instrument Supply Pressure upon penetration
of the Sand Probe Element

CONNECTION – FUNCTION

IN – SUPPLY PRESSURE INLET

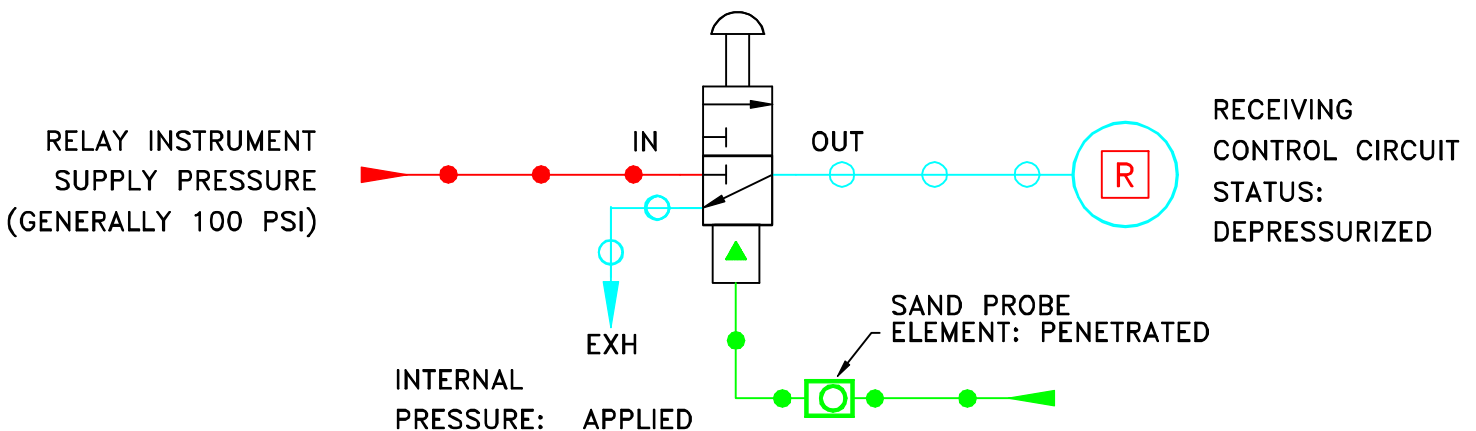
OUT – OUTPUT (CYL.)

EXH – EXHAUST



RELAY STATUS: IN-SERVICE (NORMAL OPERATION)

PUSH-TO-RESET



STATUS: ACTUATED (FOR SHUTDOWN/ALARM)

Sand Probe Relay - HLR 350-20A

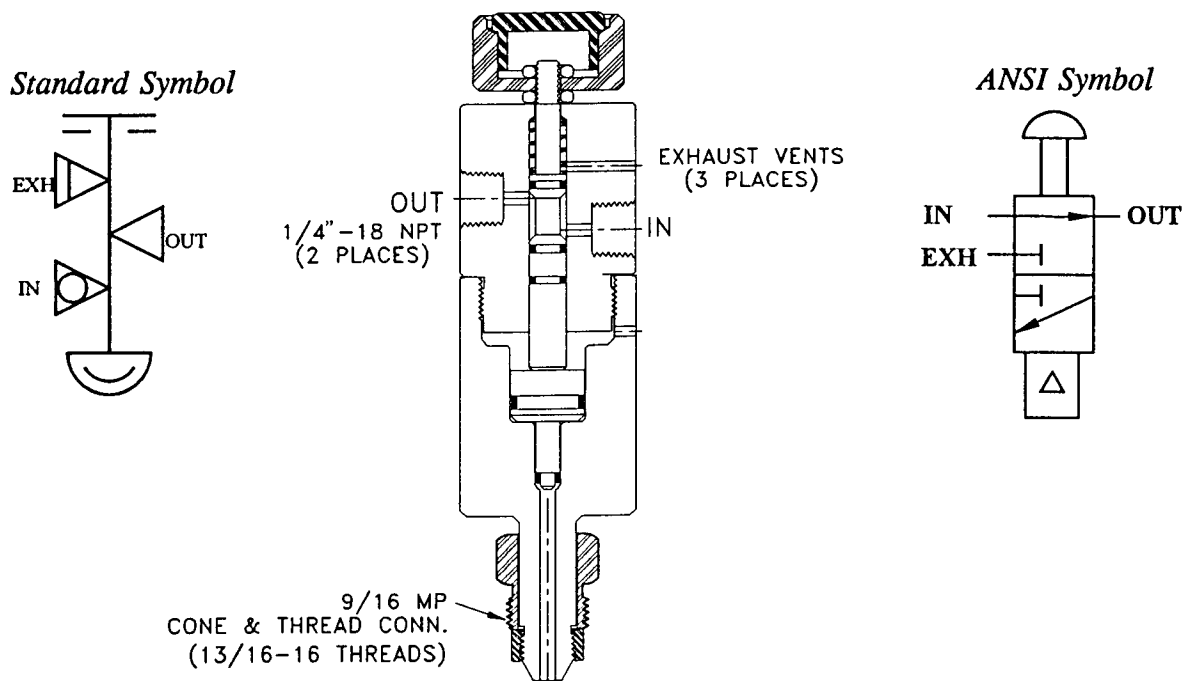
NACE - Special Manufacture

Designed for typical, three way "Block & Bleed", control circuit applications that require a loss of operating, instrument supply pressure upon penetration of the companion Sand Probe Adaptor/Element. The HLR 350-20A is a two position, three way **Normally Open**, manual reset, flow control valve. This assembly is a **15,000 PSI Working Pressure** model, that is Field Mounted.

Operating Features: A Normally Open (through) flow path exist between the valve's Inlet and Outlet connections while it is in the shelf or normal operating placement. Operating pressure applied at the base of the Piston assembly, will change the Stem's placement. A loss of operating pressure will occur the receiving control circuit.

Reason To Use: The HLR 350-20A is the flow control valve portion of the typical Sand Probe assembly which is necessary for all installations. A Sand Probe Adaptor/Element is the companion component required to complete the installation.

Note: *The accompanying Sand Probe Adaptor/Element is designed and manufactured specifically for each site's process conditions. A 1" MP (1-3/8"-12 UNF Threads) Autoclave Cone & Thread, "Weld-O-Let" is the process connection required for the Adaptor/Element.*



Characteristics

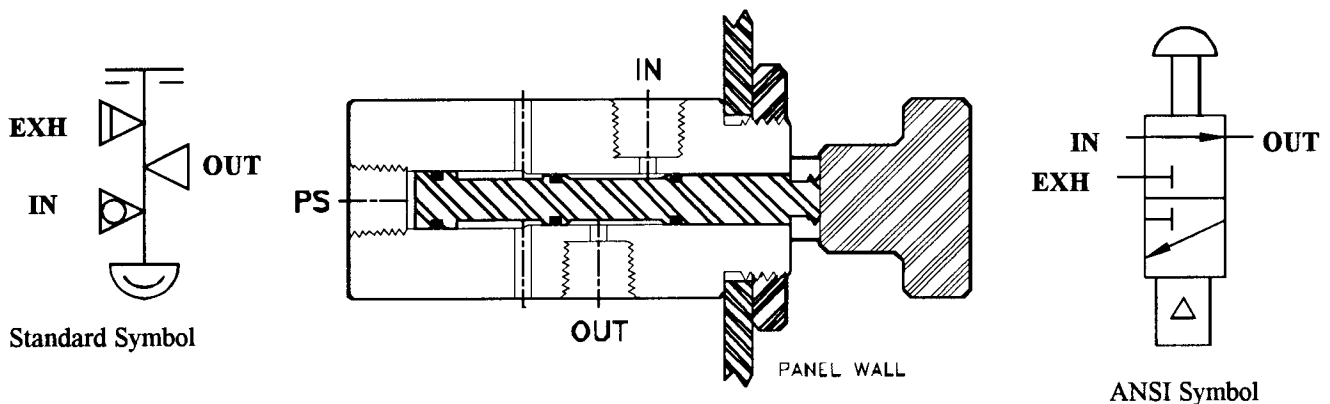
1. Dimensions: 1.750" Dia. X 6.500" L.
2. Working Pressure:
Control Ports - up to 200 PSI Max.
Process - up to 15,000 PSI Max.
3. Connections: Control - 1/4"-18 N.P.T.
Process - 9/16" MP
4. Material: 316 Stainless Steel
5. Weight: 3.0 Lb.

SAND PROBE RELAY - HLR 7930

Designed for typical three way **Normally Open** “Block & Bleed” control circuit applications that require a **loss of instrument supply output pressure upon pressurization of the Pilot Supply port**. The HLR 7930 is a two position, **three way Normally Open**, panel mounted, manual reset, flow control valve. It is media or process pressure operated. As shown in the assembly illustration and depicted by instrumentation symbols, a Normally Open flow path exist between the Inlet and Outlet control ports. **The application of operating pressure at the Pilot Supply port will change the valve’s shelf or unactuated position to (1) Block the Inlet port, (2) Establish an Outlet (Cyl.) to Exhaust flow path.**

Special Features: It has a Knob (Palm Button) to facilitate periodic control circuit testing and **manual reset after actuation**. Up to 10,000 PSI of pressure can be applied at the Pilot Supply port to actuate the Relay. A safety vent in the Pilot Supply portion of the valve body, prevents high process or media pressure from entering the lower pressure, pneumatic instrument supply (Safety System) control circuit.

Reason to Use: Typical pneumatic safety systems utilize the Sand Probe Relay to initiate closure of a Surface Safety Valve (SSV) after penetration of the Sand Probe “Pipe” Element occurs. Most large, multiple well offshore production platforms have a central “control panel” to operate its numerous pneumatic safety system, control circuits. Our panel mounted HLR 7930 is ideally suited for use with these installations. It receives flowline pressure from a single instrument tubing line connected to the Sand Probe Adaptor/Element assembly. This “one line installation” technique is preferred by many Instrument Engineers since it significantly reduces both labor and material cost.



- Characteristics**
1. Working Pressures: Process (PS) - up to 10,000 PSI (Max.).
Control (I, O) - up to 200 PSI (Max.).
 2. Connections: 1/4"-14 "F" N.P.T.
 3. Material: 316 Stainless Steel.
 4. Seals: Viton.
 5. Panel Hole Cutout Required: 1.250" Dia. (31.75 MM).

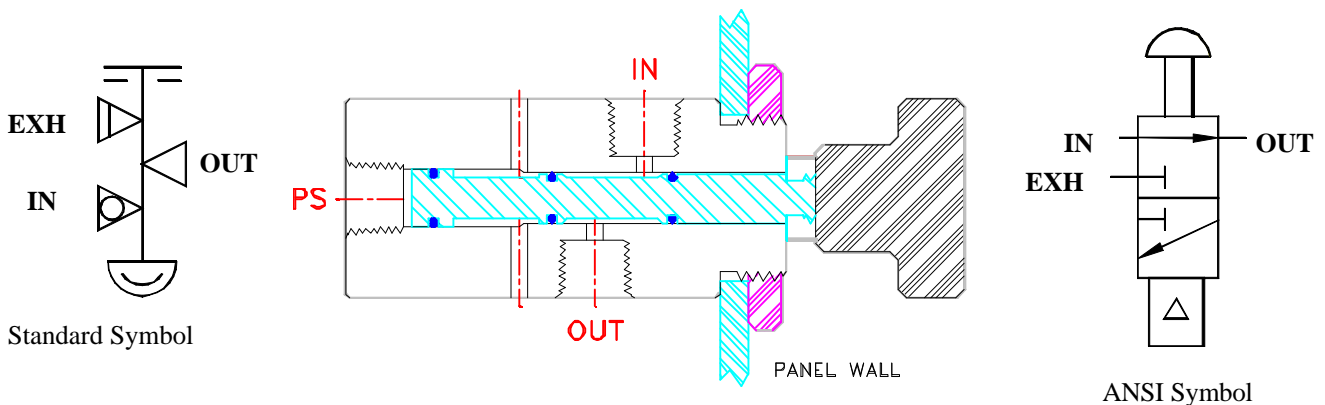
SAND PROBE RELAY - HLR 7930R

(SPECIAL – RED KNOB)

Designed for typical three way **Normally Open** “Block & Bleed” control circuit applications that **require a loss of instrument supply output pressure upon pressurization of the Pilot Supply port**. The **HLR 7930R** is a two position, **three way Normally Open**, panel mounted, manual reset, flow control valve. It is media or process pressure operated. As shown in the assembly illustration and depicted by instrumentation symbols, a Normally Open flow path exist between the Inlet and Outlet control ports. **The application of operating pressure at the Pilot Supply port will change the valve’s shelf or unactuated position to (1) Block the Inlet port, (2) Establish an Outlet (Cyl.) to Exhaust flow path.**

Special Features: It has a **Red** Knob (Palm Button) to facilitate periodic control circuit testing and **manual reset after actuation**. Up to 10,000 PSI of pressure can be applied at the Pilot Supply port to actuate the Relay. A safety vent in the Pilot Supply portion of the valve body, prevents high process or media pressure from entering the lower pressure, pneumatic instrument supply (Safety System) control circuit.

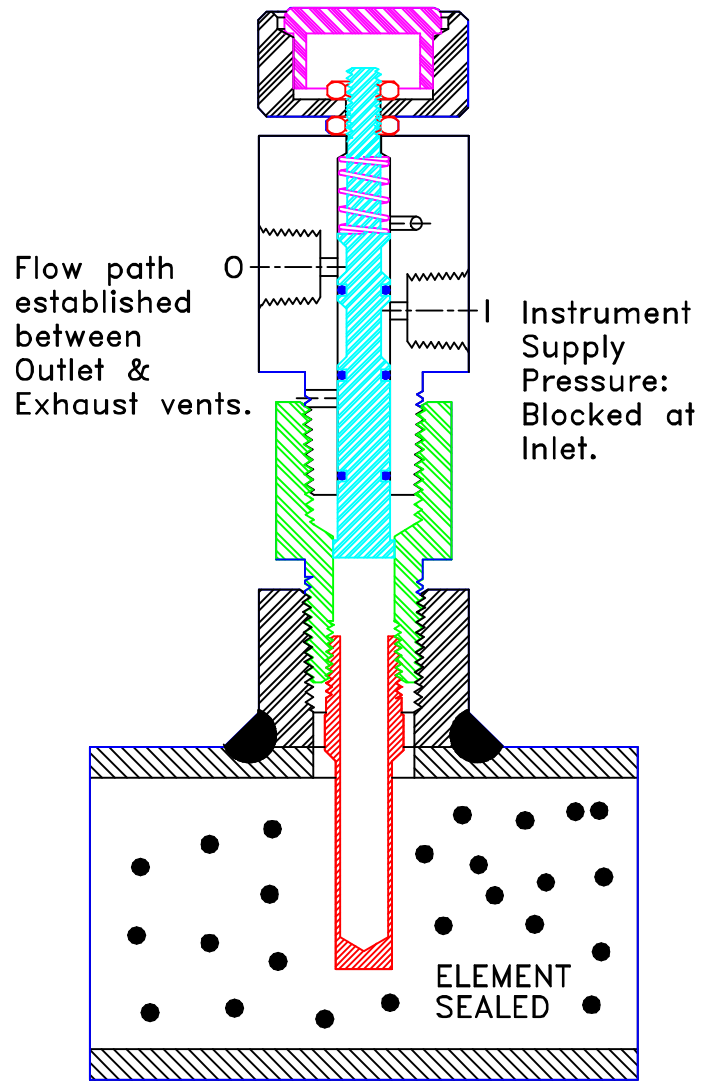
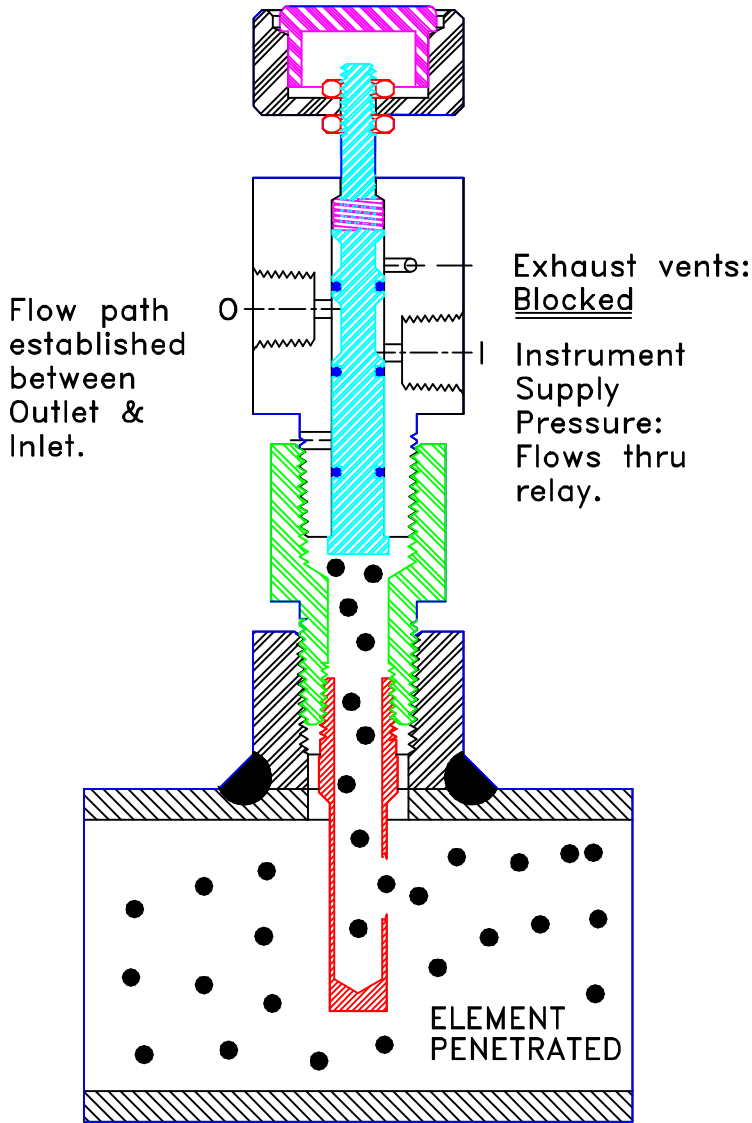
Reason to Use: Typical pneumatic safety systems utilize the Sand Probe Relay to initiate closure of a Surface Safety Valve (SSV) after penetration of the Sand Probe “Pipe” Element occurs. Most large, multiple well offshore production platforms have a central “control panel” to operate its numerous pneumatic safety system, control circuits. Our panel mounted HLR 7930R is ideally suited for use with these installations. It receives flowline pressure from a single instrument tubing line connected to the Sand Probe Adaptor/Element assembly. This “one line installation” technique is preferred by many Instrument Engineers since it significantly reduces both labor and material cost.



- Characteristics**
1. Working Pressures: Process (PS) - up to 10,000 PSI (Max.).
Control (I, O) - up to 200 PSI (Max.).
 2. Connections: 1/4"-14 "F" N.P.T.
 3. Material: 316 Stainless Steel.
 4. Seals: Viton.
 5. Panel Hole Cutout Required: **1.250" Dia.** (31.75 MM).

RELAY STATUS: ACTUATED
 MEDIA PRESSURE APPLIED

RELAY STATUS: UNACTUATED (IN-SERVICE)
 NORMAL SHELF POSITION



SAND PROBE RELAY – HLR 7740 SERIES
 Normally Closed Valve

HLR File: 23-19 7-15-97

INSTRUCTIONAL SCHEMATIC

ANSI Symbols
for

HLR 7740 Series – Sand Probe Relay

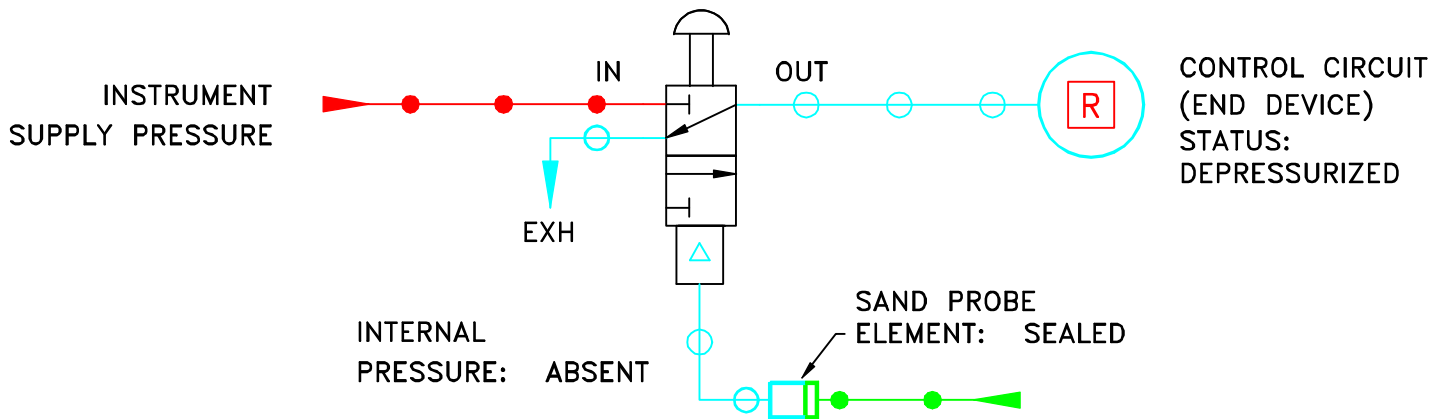
PNEUMATIC CIRCUIT APPLICATION: NORMALLY CLOSED 3 WAY BLOCK & BLEED
Gain of Instrument Supply Pressure upon penetration
of the Sand Probe Element

CONNECTION FUNCTION

IN – SUPPLY INLET

OUT – OUTLET

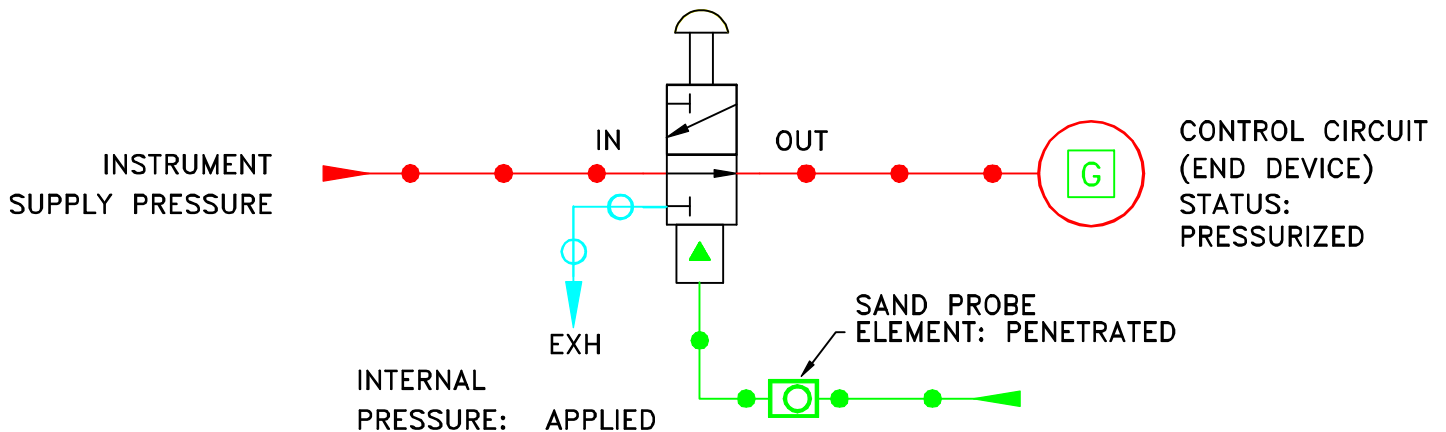
EXH – EXHAUST



RELAY STATUS: NORMAL OPERATION

KNOB POSITION: IN

PUSH-TO-RESET



STATUS: ACTUATED (FOR SHUTDOWN/ALARM)

KNOB POSITION: OUT

INSTRUCTIONAL SCHEMATIC

ANSI Symbols
for

HLR 7740 Series – Sand Probe Relay

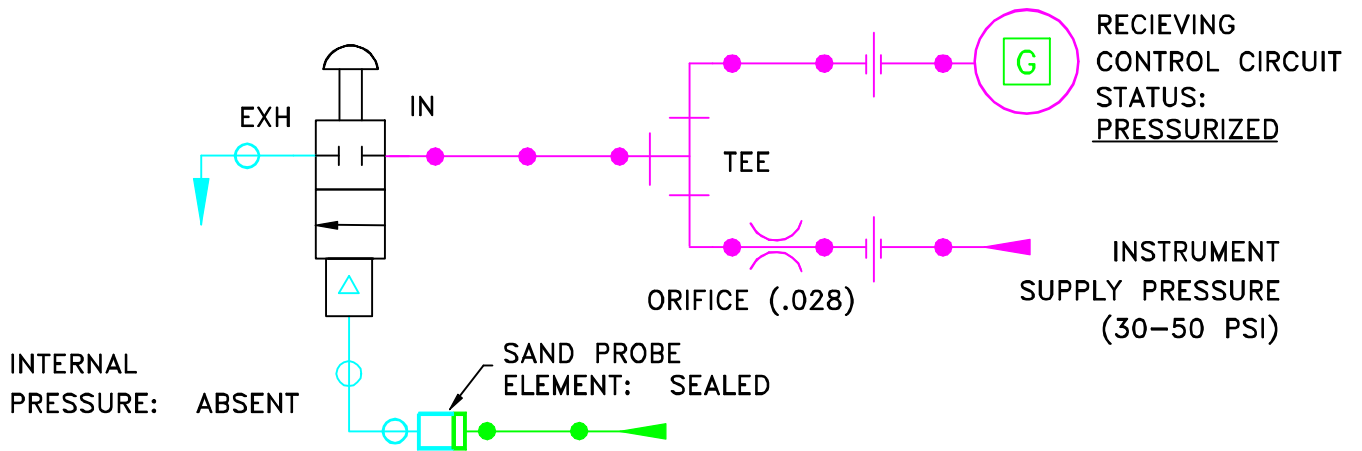
PNEUMATIC CIRCUIT APPLICATION: NORMALLY CLOSED 2 WAY

Loss of Instrument Supply Pressure upon penetration of Sand Probe Element

CONNECTION FUNCTION

IN – SUPPLY INLET

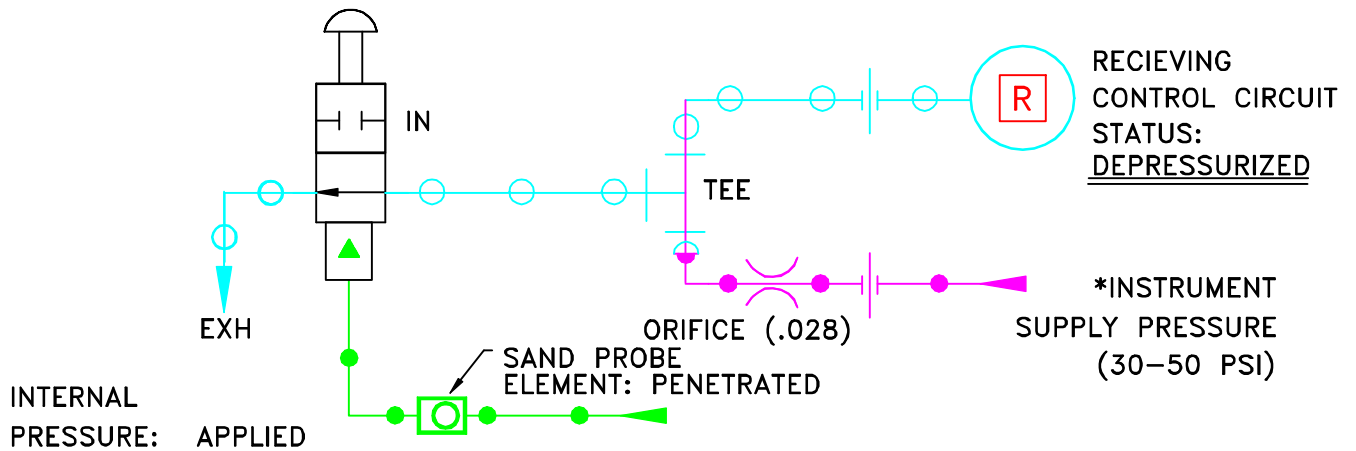
OUT – OUTLET (EXHAUST)



RELAY STATUS: NORMAL OPERATION

KNOB POSITION: IN

PUSH-TO-RESET



STATUS: ACTUATED (FOR SHUTDOWN/ALARM)

KNOB POSITION: OUT

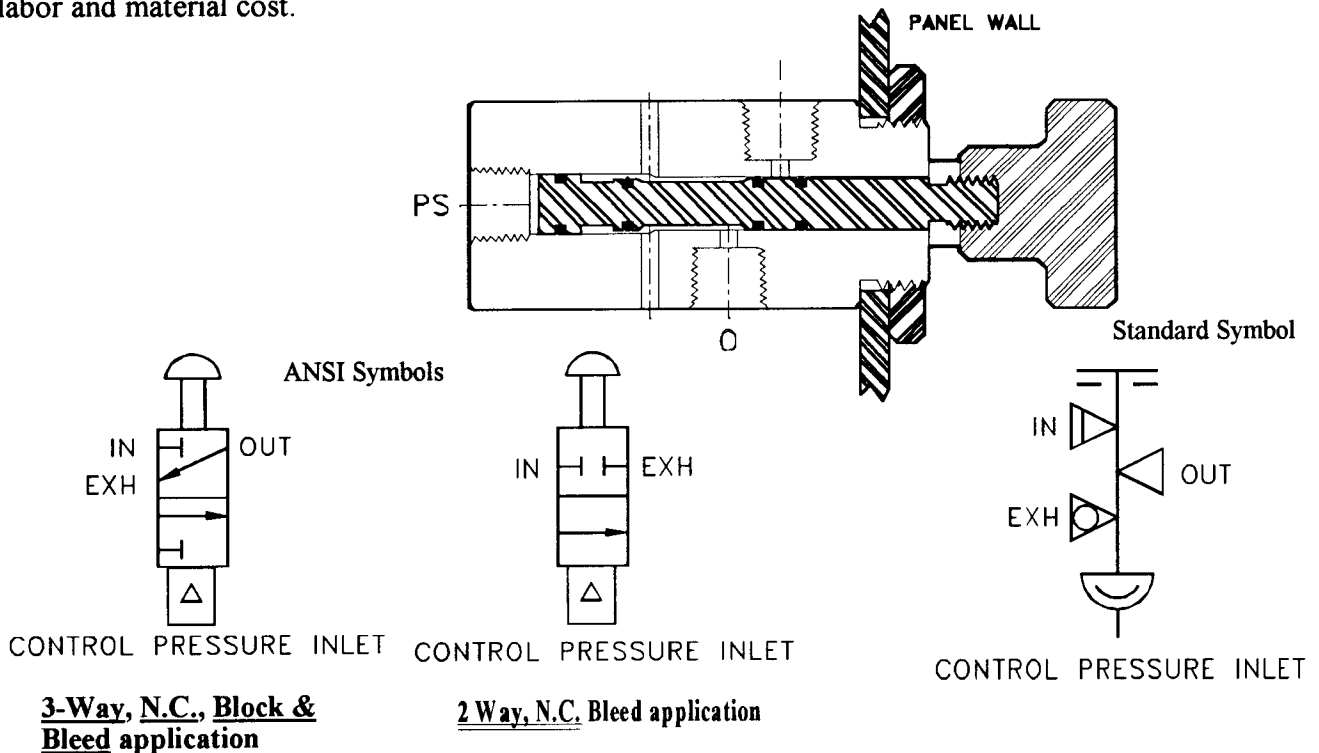
*INSTRUMENT SUPPLY PRESSURE WILL BECOME BLOCKED
AFTER MANUAL RESET RELAY TRIPS

SAND PROBE RELAY - HLR 7935

Designed for typical three way **Normally Closed** “Block & Bleed” control circuit applications that require a **gain** of instrument supply output pressure upon pressurization of the **Pilot Supply port**. The HLR 7935 is a two position, three way **Normally Closed**, panel mounted, manual reset, flow control valve. It is media or process pressure operated. As shown in the assembly illustration and depicted by instrumentation symbols, a Normally Closed (Blocked) flow path exist at the Inlet control port. **The application of operating pressure at the Pilot Supply port will change the valve’s shelf or unactuated position to (1) Establish an Inlet to Outlet (Cyl.) flow path (2) Block the Exhaust vent holes.**

Special Features: It has a Knob (Palm Button) to facilitate periodic control circuit testing and **manual reset after actuation**. Up to 10,000 PSI of pressure can be applied at the Pilot Supply port to actuate the Relay. A safety vent in the Pilot Supply portion of the valve body, prevents high process or media pressure from entering the lower pressure, pneumatic instrument supply (Safety System) control circuit.

Reason to Use: Typical pneumatic safety systems utilize the Sand Probe Relay to initiate closure of a Surface Safety Valve (SSV) after penetration of the Sand Probe “Pipe” Element occurs. Most large, multiple well offshore production platforms have a central “control panel” to operate its numerous pneumatic safety system, control circuits. Our panel mounted HLR 7935 is ideally suited for use with these installations. It receives flowline pressure from a single instrument tubing line connected to the Sand Probe Adaptor/Element assembly. This “one line installation” technique is preferred by many Instrument Engineers since it significantly reduces both labor and material cost.



- Characteristics**
1. Working Pressures: Process (PS) - up to 10,000 PSI (Max.).
Control (I, O) - up to 200 PSI (Max.).
 2. Connections: 1/4"-14 "F" N.P.T.
 3. Material: 316 Stainless Steel.
 4. Seals: Viton.
 5. Panel Hole Cutout Required: **1.250" Dia.** (31.75 MM).

HLR 7620 Series Sand Probe "Pipe" Element Model Number Selection Chart

The HLR 7620 Series Pipe Element is one component of a typical three piece Sand Probe companion assembly. It is selected whenever all of the following process conditions exists:

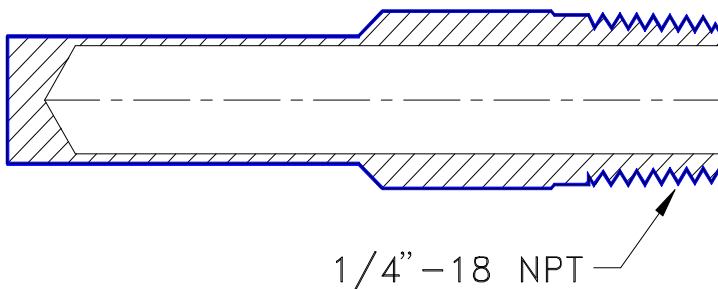
1. The process temperature is **below 140° F. (60° C.)**
2. The Pipe Element is subjected to pressure **below 5,000 PSI.**
3. A velocity **below 40 feet per second exist** in the flowline pipe segment.

Selecting the proper Sand Probe Pipe Element Model Number

Model Number	Pipe Size	<i>Determine the designation by selecting the basic Model Number and its corresponding Flowline Pipe Size, as shown on left.</i>
HLR 7620-2-***	2" (2.375" O.D.)	
HLR 7620-3-__	3" (3.500" O.D.)	
HLR 7620-4-__	4" (4.500" O.D.)	
HLR 7620-6-__	6" (6.625" O.D.)	

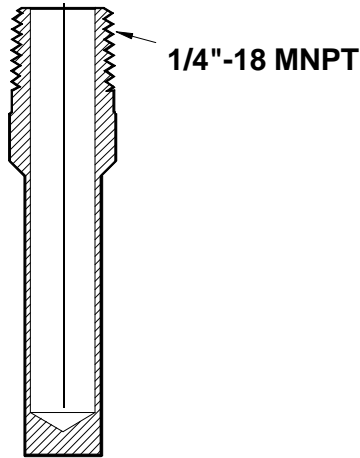
Operating Pressure	*** Wall Thickness	<i>Next, add the three digit Wall Thickness (***) number to complete the designation.</i>
400 - 1,000 PSI	.025"	
1,000 - 2,160 PSI	.035"	
2,160 - 5,000 PSI	.050"	

Example Model Number: HLR 7620-2-025 for a 2" Flowline installation, with a .025" Wall Thickness (required for use in a 750 PSI operating pressure, system).



HLR 7620 Series
Sand Probe Pipe Element

Sand Probe "Pipe" Element - HLR 7620-2



Designed to be penetrated by sand particle impingement within well stream piping. The Element is essentially a hollow tube that has a sealed end. Its large diameter provides an excellent surface area upon which, sand impingement can occur. Penetration or rupture of the Element's wall, will allow media pressure to accumulate within its annular space. The applied pressure is then transferred to a receiving device (Relay) or Indicator.

Sand Probe Elements are the portion of a typical Sand Probe assembly that protrudes past the center of the flowline pipe. The HLR 7620-2 is generally **one part** of a **three piece companion assembly** (which additionally consist of the **Sand Probe Relay** and **Adaptor**).

Special Features: Our HLR 7620-2 is specifically **sized** for use in a **2" flowline** pipe. A **1/4"-18 N.P.T. "Female" Connection** is required for its installation.

Reason To Use: This **replaceable** Element is selected whenever **all** of the following well stream conditions exist:

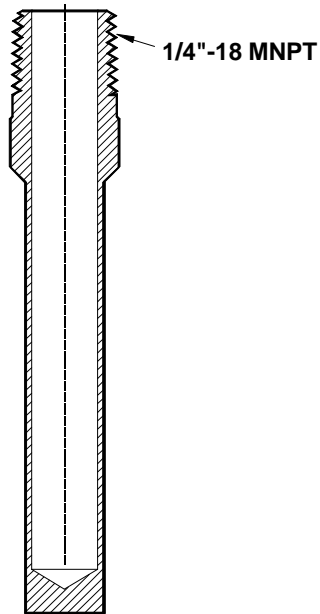
1. The well stream's media temperature is **below** 140° F (60°C).
2. The Flowline segment's operating pressure is **below** 5,000 PSI.
3. Well stream velocity is **below** forty (40) feet per second.

*Note: This standard Element is machined from **Alloy Steel**. Selection of this material will effectively provide the **same corrosion and erosion wear characteristics** typical of flowlines fabricated from **A106 Grade B (Carbon Steel) pipe**.*

Characteristics

1. Dimensions: .562" Dia. X 2.375" L.
2. Working Pressure: **See Chart List**
3. Connections: 1/4"-18 N.P.T.
4. Material: Alloy Steel
5. Weight: 2 Oz.

Sand Probe "Pipe" Element - HLR 7620-3



Designed to be penetrated by sand particle impingement within well stream piping. The Element is essentially a hollow tube that has a sealed end. Its large diameter provides an excellent surface area upon which, impingement can occur. Penetration or rupture of the Element's wall, will allow media pressure to accumulate within its annular space. The applied pressure is then transferred to a receiving device (Relay) or an Indicator.

Sand Probe Elements are the portion of a typical Sand Probe assembly that protrudes past the center of the flowline pipe. The HLR 7620-3 is generally **one part** of a **three piece companion assembly** (which additionally consist of the **Sand Probe Relay** and **Adaptor**).

Special Features: Our HLR 7620-3 is sized for use in a 3" flowline. A 1/4"-18 N.P.T. "Female" Connection is required for its installation.

Reason To Use: This **replaceable** Element is selected whenever all of the following process conditions exist:

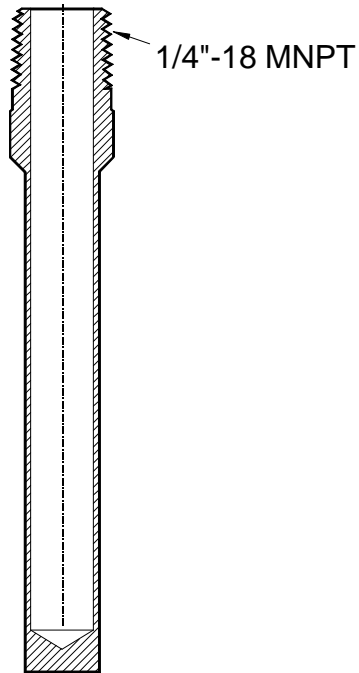
1. The process media temperature is below 140°F (60°C).
2. The Flowline's operating pressure is below 5,000 PSI.
3. Wellstream velocity is below forty (40) feet per second.

Note: This standard Element is machined from Alloy Steel. Its material effectively provides the **same corrosion and erosion wear characteristics** typical of flowlines fabricated from **A106 Grade B (Carbon Steel) pipe**.

Characteristics

1. Dimensions: .562" Dia. X 3.125" L.
2. Working Pressure: **See Chart List**
3. Connections: 1/4"-18 N.P.T.
4. Material: Alloy Steel
5. Weight: 3 Oz.

Sand Probe "Pipe" Element - HLR 7620-4



Designed to be penetrated by sand particle impingement within well stream piping. The Element is essentially a hollow tube that has a sealed end. Its large diameter provides an excellent surface area upon which, impingement can occur. Penetration or rupture of the Element's wall, will allow media pressure to accumulate within its annular space. The applied pressure is then transferred to a receiving device (Relay) or an Indicator.

Sand Probe Elements are the portion of a typical Sand Probe assembly that protrudes past the center of the flowline pipe. The HLR 7620-4 is generally **one part** of a **three piece companion assembly** (which additionally consist of the **Sand Probe Relay** and **Adaptor**).

Special Features: Our HLR 7620-4 is sized for use in a 4" flowline. A 1/4"-18 N.P.T. "Female" Connection is required for its installation.

Reason To Use: This replaceable Element is selected whenever all of the following process conditions exist:

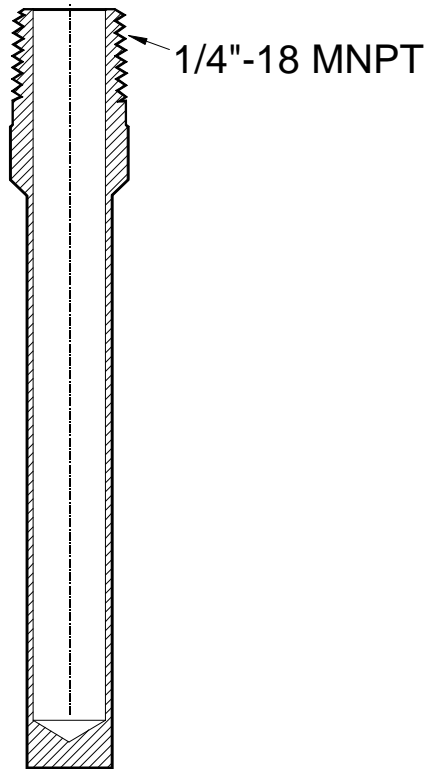
1. The process media temperature is below 140°F (60°C).
2. The Flowline's operating pressure is below 5,000 PSI.
3. Wellstream velocity is below forty (40) feet per second.

Note: This standard Element is machined from Alloy Steel. Its material effectively provides the **same corrosion and erosion wear characteristics** typical of flowlines fabricated from **A106 Grade B (Carbon Steel) pipe**.

Characteristics

1. Dimensions: .562" Dia. X 3.625" L.
2. Working Pressure: **See Chart List**
3. Connections: 1/4"-18 N.P.T.
4. Material: Alloy Steel
5. Weight: 4 Oz.

Sand Probe "Pipe" Element - HLR 7620-6



Designed to be penetrated by sand particle impingement within well stream piping. The Element is essentially a hollow tube that has a sealed end. Its large diameter provides an excellent surface area upon which, impingement can occur. Penetration or rupture of the Element's wall, will allow media pressure to accumulate within its annular space. The applied pressure is then transferred to a receiving device (Relay) or an Indicator.

Sand Probe Elements are the portion of a typical Sand Probe assembly that protrudes past the center of the flowline pipe. The HLR 7620-6 is generally **one part** of a **three piece companion assembly** (which additionally consist of the **Sand Probe Relay** and **Adaptor**).

Special Features: Our HLR 7620-6 is sized for use in a 6" flowline. A 1/4"-18 N.P.T. "Female" Connection is required for its installation.

Reason To Use: This **replaceable** Element is selected whenever all of the following process conditions exist:

1. The process media temperature is below 140°F (60°C).
2. The Flowline's operating pressure is below 5,000 PSI.
3. Wellstream velocity is below forty (40) feet per second.

Note: This standard Element is machined from Alloy Steel. Its material effectively provides the **same corrosion and erosion wear characteristics** typical of flowlines fabricated from **A106 Grade B** (Carbon Steel) pipe.

Characteristics

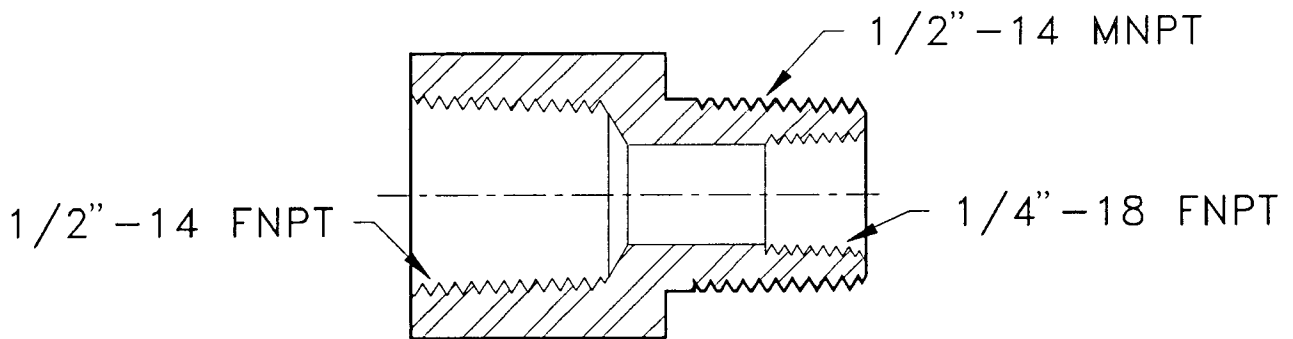
1. Dimensions: .562" Dia. X 4.750" L.
2. Working Pressure: **See Chart List**
3. Connections: 1/4"-18 N.P.T.
4. Material: Alloy Steel
5. Weight: 5 Oz.

HLR 7620

SAND PROBE ADAPTOR

The HLR 7620 Sand Probe Adaptor is the **central** component in a typical **three piece** assembly. Both the Sand Probe Relay and Sand Probe “Pipe” Element are installed in the Adaptor. This Adaptor’s male thread connection is normally installed in a flowline’s 1/2”-14 N.P.T. “Thread-O-Let” Weld Coupling or pipe connection.

All of the Adaptor’s connections are depicted in the illustration provided.



Features

1. Dimensions: 1.500" (Hex) X 2.000" L.
2. Working Pressure: up to 10,000 PSI Max.
3. Weight: 1/2 Lb.
4. Material: 316 Stainless Steel.

HLR 7620 “MR” Series Sand Probe Adaptor/Element Model Number Selection Chart

The HLR 7620 “MR” Series is one part of a two piece Sand Probe companion assembly. It is selected whenever any of the following process conditions exists:

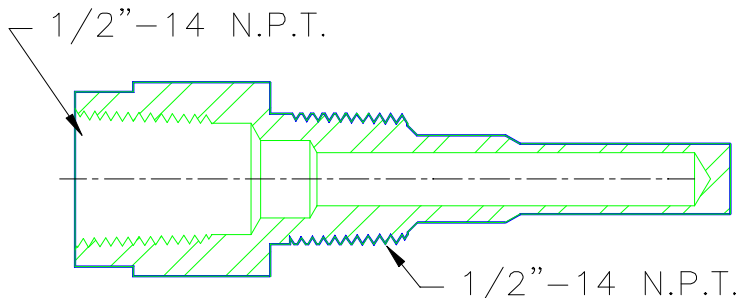
1. The process temperature is **above 140° F.** (60° C.)
2. The Adaptor/Element may be subjected to pressure **above 5,000 PSI.**
3. A velocity **above 40 feet per second** exist in the flowline pipe segment.

Selecting the proper Adaptor/Element Model Number

Model Number	Pipe Size	Determine the designation by selecting the basic Model Number and its corresponding Flowline Pipe Size, as shown on left.
HLR 7620MR2-***	2" (2.375" O.D.)	
HLR 7620MR3-___	3" (3.500" O.D.)	
HLR 7620MR4-___	4" (4.500" O.D.)	
HLR 7620MR6-___	6" (6.625" O.D.)	

Operating Pressure	*** Wall Thickness	Next, add the three digit Wall Thickness (***) number to complete the designation.
400 - 1,000 PSI	.025"	
1,000 - 2,160 PSI	.035"	
2,160 - 5,000 PSI	.050"	
5,000 - 10, 000 PSI	.065"	

Example Model Number: HLR 7620MR2-025 for a 2" Flowline installation, with a .025" Wall Thickness (required for use in a 750 PSI operating pressure, system).



HLR 7620 “MR”
Series
Sand Probe
Adaptor/Element

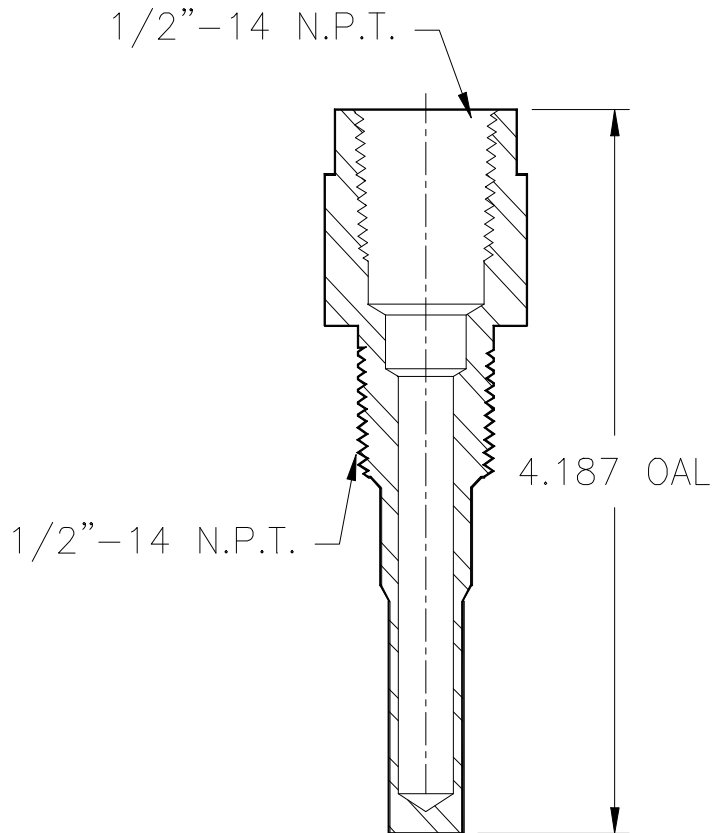
HLR 7620MR2 - Sand Probe Adaptor/Element

for a

2" Flowline Installation

Special Manufacture Item

Designed to be penetrated by sand particle impingement within well stream piping. The Adaptor/Element is essentially a hollow tube, that has a sealed end. Its large diameter provides an excellent surface area upon which, sand particle impingement can occur. The Element is the assembly portion that protrudes past the center of the flowline pipe. Penetration or rupture of the Element's wall, will allow process pressure to accumulate within its annular space. The applied pressure is then transferred to a receiving device (Sand Probe Relay or Indicator) or an alarm control circuit.



Reason To Use: Our HLR 7620MR2 is specifically designed for high velocity well streams or extreme service applications. It is used in applications, that normally develop a resonance or vibration in the Sand Probe Element. In some applications, vibration occurs whenever the Element is located in close proximity to the pressure regulating Choke. The vibration can create a stress crack and then premature failure of the standard Sand Probe Element.

Note: The HLR 7620MR2 requires a 1/2"-14 N.P.T. Thread-O-Let, Weld Coupling or other similarly configured, connection for its installation.

Characteristics

1. Dimensions: 1.250" Dia. X 4.187" L.
2. Working Pressure: **See Chart Listing**
3. Connections: 1/2"-14 N.P.T.
4. Material: 416 L Stainless Steel
5. Weight: .500 Lbs..

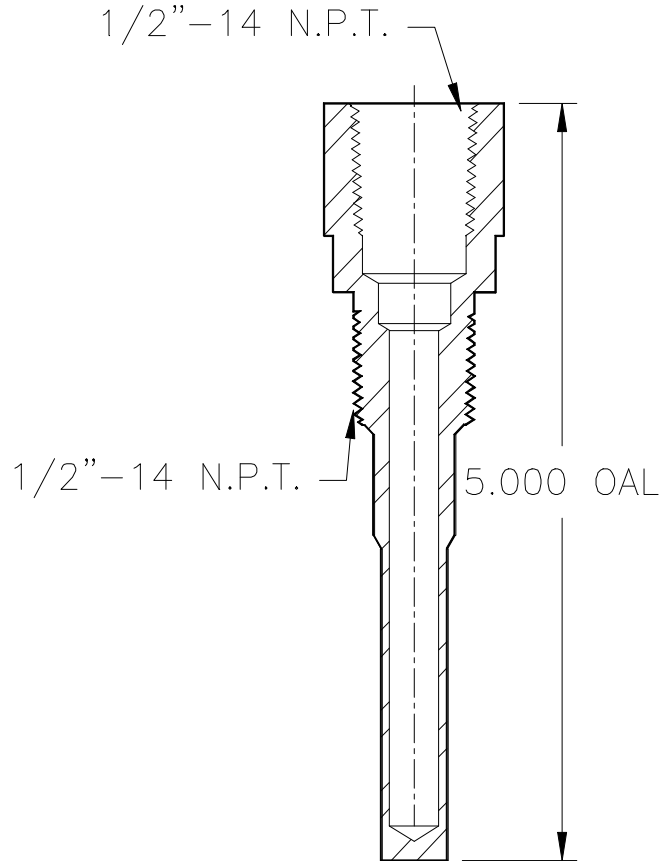
HLR 7620MR3 - Sand Probe Adaptor/Element

for a

3" Flowline Installation

Special Manufacture Item

Designed to be penetrated by sand particle impingement within well stream piping. The Adaptor/Element is essentially a hollow tube, that has a sealed end. Its large diameter provides an excellent surface area upon which, sand particle impingement can occur. The Element is the assembly portion that protrudes past the center of the flowline pipe. Penetration or rupture of the Element's wall, will allow process pressure to accumulate within its annular space. The applied pressure is then transferred to a receiving device (Sand Probe Relay or Indicator) or an alarm control circuit.



Reason To Use: Our HLR 7620MR3 is specifically designed for high velocity well streams or extreme service applications. It is used in applications, that normally develop a resonance or vibration in the Sand Probe Element. In some applications, vibration occurs whenever the Element is located in close proximity to the pressure regulating Choke. The vibration can create a stress crack and then premature failure of the standard Sand Probe Element.

Note: The HLR 7620MR3 requires a 1/2"-14 N.P.T. Thread-O-Let, Weld Coupling or other similarly configured, connection for its installation.

Characteristics

1. Dimensions: 1.250" Dia. X 5.000" L.
2. Working Pressure: **See Chart Listing**
3. Connections: 1/2"-14 N.P.T.
4. Material: 416 L Stainless Steel
5. Weight: .500 Lbs..

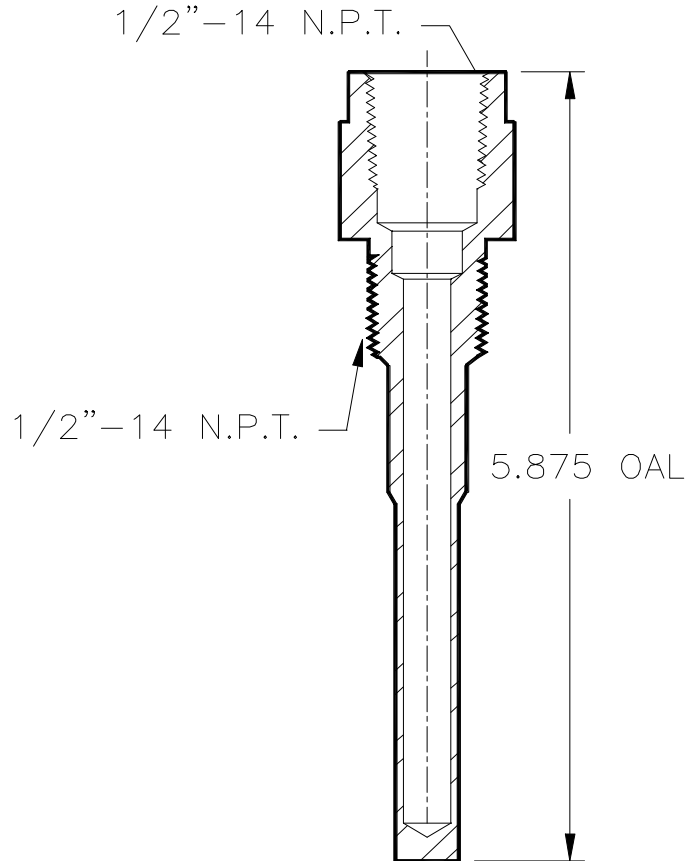
HLR 7620MR4 - Sand Probe Adaptor/Element

for a

4" Flowline Installation

Special Manufacture Item

Designed to be penetrated by sand particle impingement within well stream piping. The Adaptor/Element is essentially a hollow tube, that has a sealed end. Its large diameter provides an excellent surface area upon which, sand particle impingement can occur. The Element is the assembly portion that protrudes past the center of the flowline pipe. Penetration or rupture of the Element's wall, will allow process pressure to accumulate within its annular space. The applied pressure is then transferred to a receiving device (Sand Probe Relay or Indicator) or an alarm control circuit.



Reason To Use: Our HLR 7620MR4 is specifically designed for high velocity well streams or extreme service applications. It is used in applications, that normally develop a resonance or vibration in the Sand Probe Element. In some applications, vibration occurs whenever the Element is located in close proximity to the pressure regulating Choke. The vibration can create a stress crack and then premature failure of the standard Sand Probe Element.

Note: The HLR 7620MR4 requires a 1/2"-14 N.P.T. Thread-O-Let, Weld Coupling or other similarly configured, connection for its installation.

Characteristics

1. Dimensions: 1.250" Dia. X 5.875" L.
2. Working Pressure: See Chart Listing
3. Connections: 1/2"-14 N.P.T.
4. Material: 416 L Stainless Steel
5. Weight: .500 Lbs..

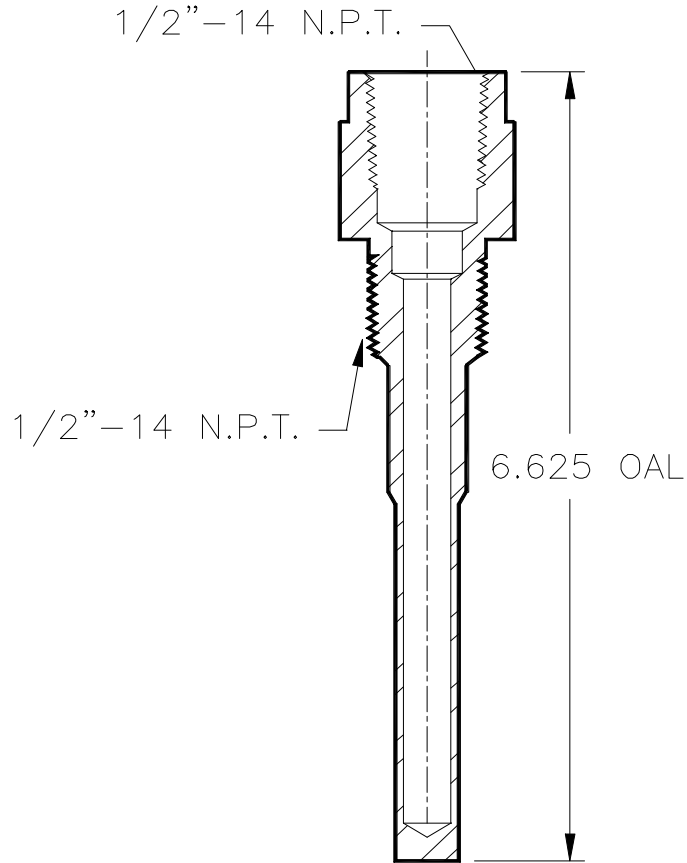
HLR 7620MR6 - Sand Probe Adaptor/Element

for a

6" Flowline Installation

Special Manufacture Item

Designed to be penetrated by sand particle impingement within well stream piping. The Adaptor/Element is essentially a hollow tube, that has a sealed end. Its large diameter provides an excellent surface area upon which, sand particle impingement can occur. The Element is the assembly portion that protrudes past the center of the flowline pipe. Penetration or rupture of the Element's wall, will allow process pressure to accumulate within its annular space. The applied pressure is then transferred to a receiving device (Sand Probe Relay or Indicator) or an alarm control circuit.



Reason To Use: Our HLR 7620MR6 is specifically designed for high velocity well streams or extreme service applications. It is used in applications, that normally develop a resonance or vibration in the Sand Probe Element. In some applications, vibration occurs whenever the Element is located in close proximity to the pressure regulating Choke. The vibration can create a stress crack and then premature failure of the standard Sand Probe Element.

Note: The HLR 7620MR6 requires a 1/2"-14 N.P.T. Thread-O-Let, Weld Coupling or other similarly configured, connection for its installation.

Characteristics

1. Dimensions: 1.250" Dia. X 6.625" L.
2. Working Pressure: See Chart Listing
3. Connections: 1/2"-14 N.P.T.
4. Material: 416 L Stainless Steel
5. Weight: .500 Lbs..

HLR 34AE12 “M” Series

Sand Probe Adaptor/Element for use in a 3/4" N.P.T. Connection

Model Number Selection Chart

The **HLR 34AE12 “M” Series Adaptor/Element** is one part of a complete, two piece Sand Probe “companion” assembly. It is selected whenever any of the following process conditions exists:

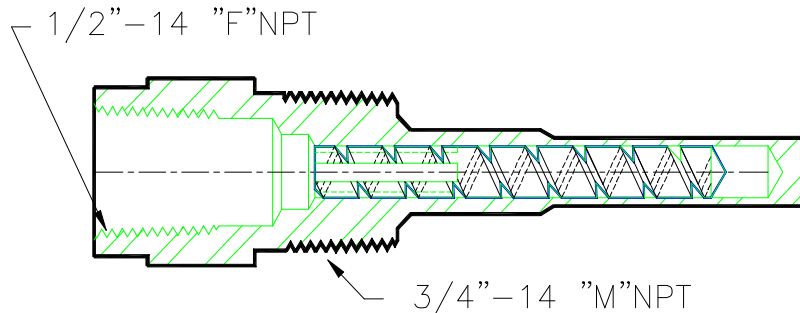
1. The process temperature is **above 140° F.** (60° C.)
2. The Adaptor/Element may be subjected to pressure **above 5,000 PSI.**
3. A velocity **above 40 feet per second exist** in the flowline pipe segment.

Selecting the proper Adaptor/Element Model Number

Model Number	Pipe Size	
HLR 34AE12M2-***	2" (2.375" O.D.)	Determine the designation by selecting the basic Model Number and its corresponding Flowline Pipe Size, as shown on left.
HLR 34AE12M3-__	3" (3.500" O.D.)	
HLR 34AE12M3-__	3" (3.500" O.D.)	
HLR 34AE12M4-__	4" (4.500" O.D.)	
HLR 34AE12M6-__	6" (6.625" O.D.)	
HLR 34AE12M8-__	8" (8.625" O.D.)	

Operating Pressure	*** Wall Thickness	
400 - 1,000 PSI	.025"	Next, add the three digit Wall Thickness (***) number to complete the designation.
1,000 - 2,160 PSI	.035"	
2,160 - 5,000 PSI	.050"	
5,000 - 10, 000 PSI	.065"	

Example Model Number: **HLR 34AE12M6-050** for a 6" Flowline installation, with a .050" Wall Thickness (required for use in a 4,800 PSI operating pressure system).



Note: An internal “Stiffener” (as shown in the example 34AE12 M Series) is generally installed in high velocity applications or long projection installations (Pipe diameters 8" or greater).

Consult with HLR Controls, Inc. to develop and provide an exact model number for special applications. Sand Probe Adaptor/Elements for flowline sizes 10" and above, are also available.

Sand Probe Assembly (Standard Usage)

Typical Three Piece Component (Companion) Set for a

2" Flowline Installation

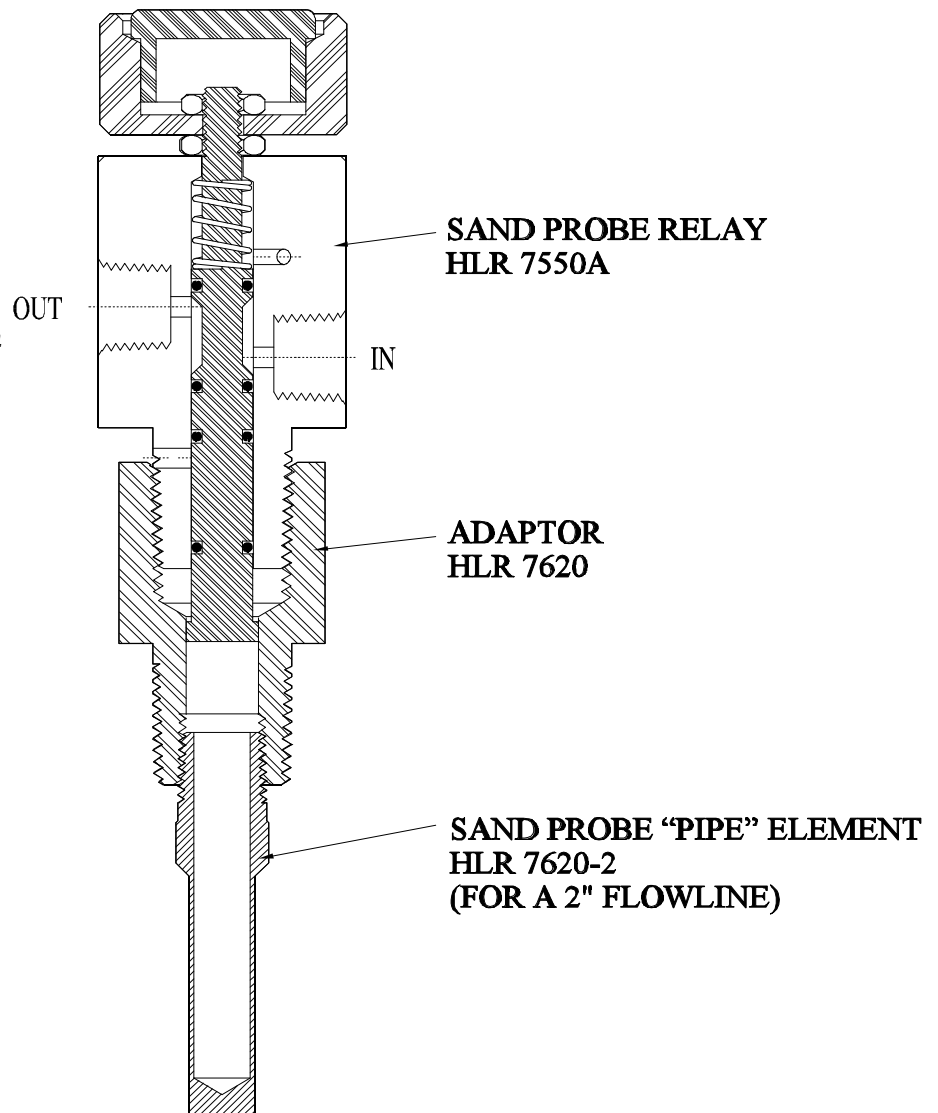
Usage: This standard assembly is selected whenever all of the following well stream conditions exist:

1. The well stream's media temperature is below 140° F (60° C).
2. The Flowline segment's operating pressure is below 5,000 PSI.
3. Well stream velocity is below forty (40) feet per second.

Flowline Connection Required for Installation: 1/2"-14 N.P.T. Thread-O-Let Weld Coupling (or similar weld connection) on a 2" (2.375" O.D.)

Flowline.

Note: Our standard HLR 7620-2 Pipe Element is machined from 4140 Alloy Steel. This material will effectively provide the **same corrosion and erosion wear characteristics** typical of flowlines fabricated from A106 Grade B (Carbon Steel) pipe.



Sand Probe Assembly (Standard Usage)

Typical Three Piece Component (Companion) Set for a

3" Flowline Installation

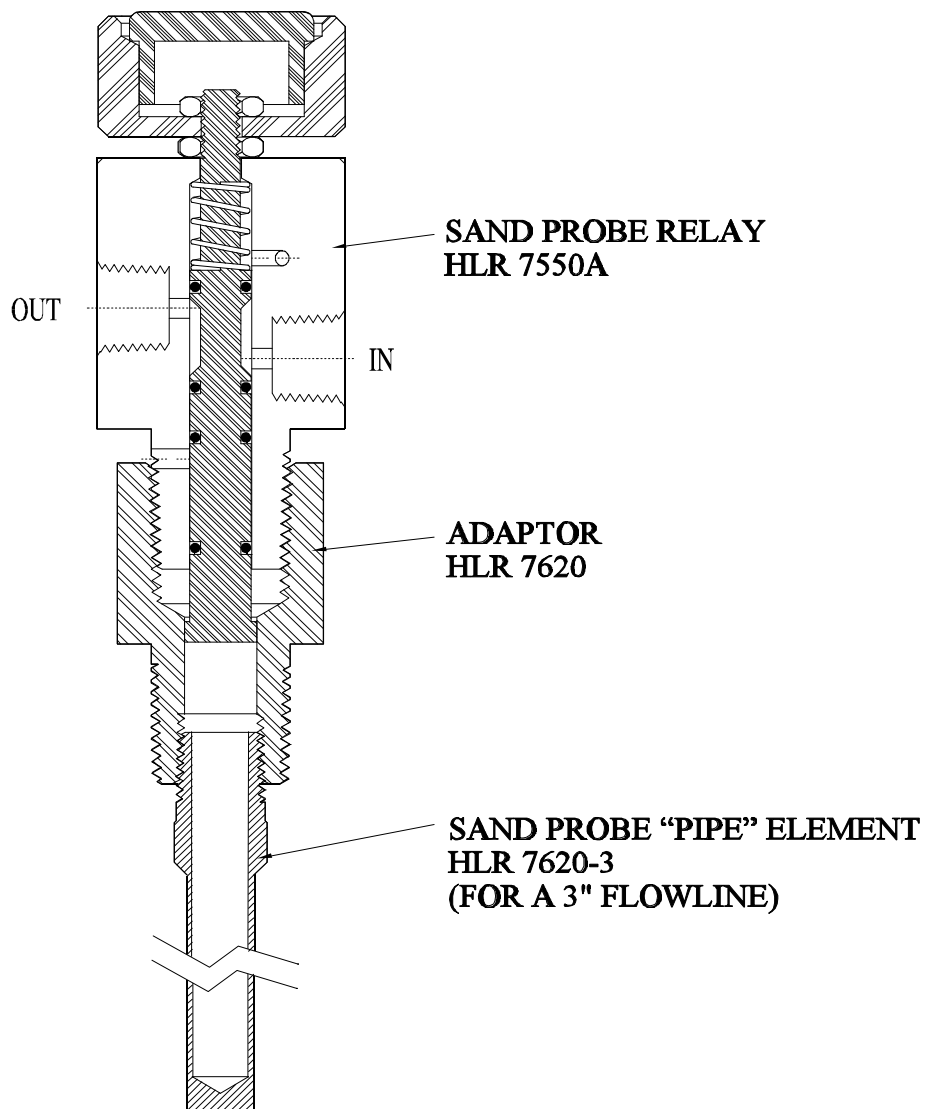
Usage: This standard assembly is selected whenever all of the following well stream conditions exist:

1. The well stream's media temperature is below 140° F (60° C).
2. The Flowline segment's operating pressure is below 5,000 PSI.
3. Well stream velocity is below forty (40) feet per second.

Flowline Connection Required for Installation: 1/2"-14 N.P.T.
Thread-O-Let Weld Coupling (or similar weld connection) on a
3" (3.500" O.D.)

Flowline.

Note: Our standard HLR 7620-3 Pipe Element is machined from **4140 Alloy Steel**. This material will effectively provide the **same corrosion and erosion wear characteristics** typical of flowlines fabricated from **A106 Grade B (Carbon Steel) pipe**.



Sand Probe Assembly (Standard Usage)

Typical Three Piece Component (Companion) Set for a

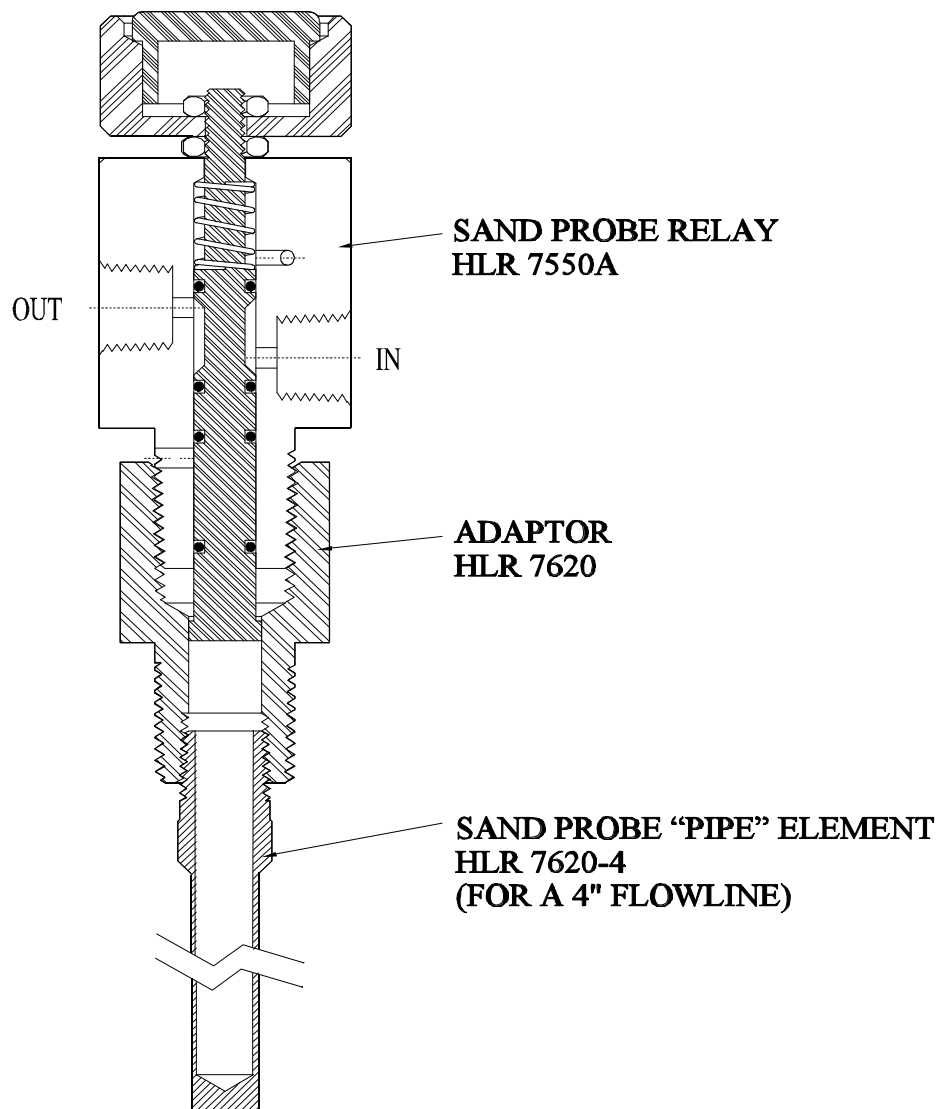
4" Flowline Installation

Usage: This standard assembly is selected whenever all of the following well stream conditions exist:

1. The well stream's media temperature is below 140° F (60° C).
2. The Flowline segment's operating pressure is below 5,000 PSI.
3. Well stream velocity is below forty (40) feet per second.

Flowline Connection Required for Installation: 1/2"-14 N.P.T.
Thread-O-Let Weld Coupling (or similar weld connection) on a
4" (4.500"
O.D.) Flowline.

Note: Our standard HLR 7620-4 Pipe Element is machined from **4140 Alloy Steel**. This material will effectively provide the **same corrosion and erosion wear characteristics** typical of flowlines fabricated from **A106 Grade B (Carbon Steel) pipe**.



Sand Probe Assembly (Standard Usage)

Typical Three Piece Component (Companion) Set for a

6" Flowline Installation

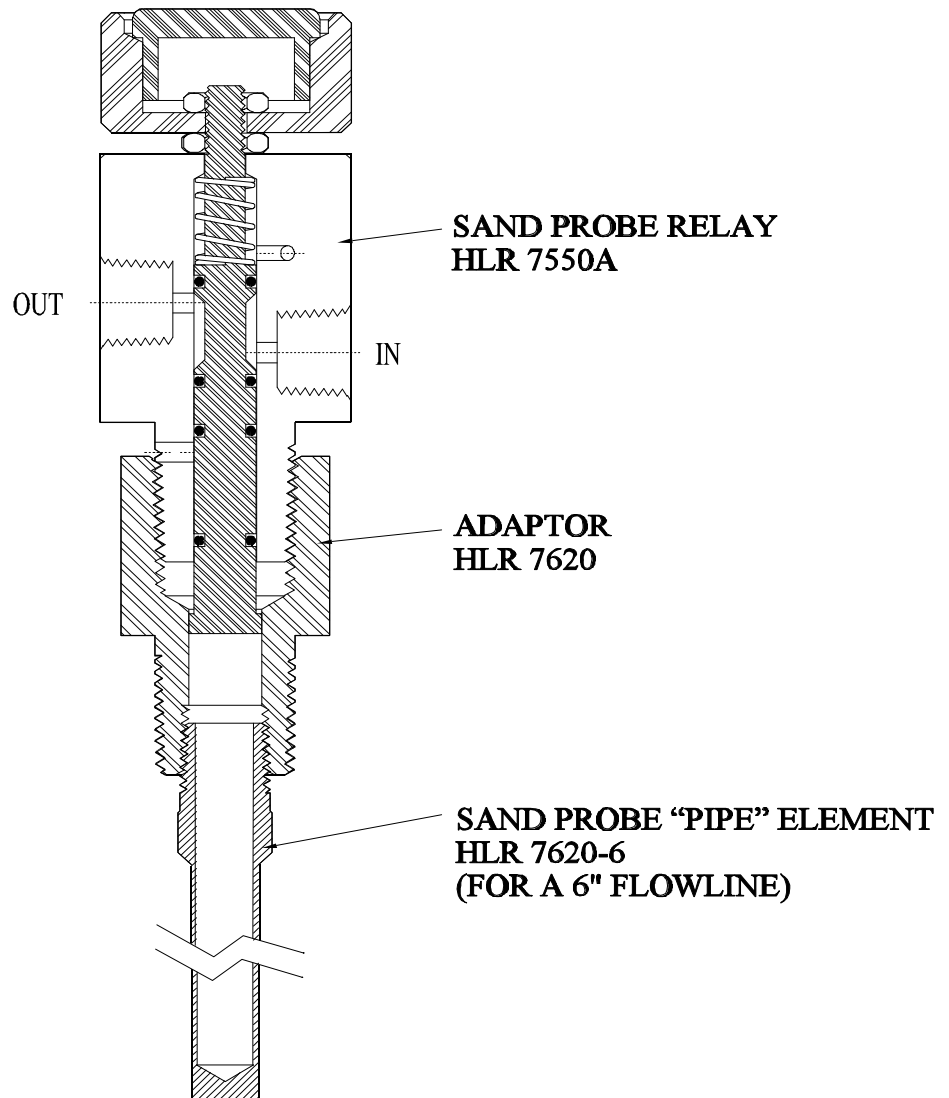
Usage: This standard assembly is selected whenever all of the following well stream conditions exist:

1. The well stream's media temperature is below 140° F (60° C).
2. The Flowline segment's operating pressure is below 5,000 PSI.
3. Well stream velocity is below forty (40) feet per second.

Flowline Connection Required for Installation: 1/2"-14 N.P.T.
Thread-O-Let Weld Coupling (or similar weld connection) on a
6" (6.625" O.D.)

Flowline.

Note: Our standard HLR 7620-6 Pipe Element is machined from 4140 Alloy Steel. This material will effectively provide the same corrosion and erosion wear characteristics typical of flowlines fabricated from A106 Grade B (Carbon Steel) pipe.



Sand Probe Assembly (Standard Usage)

Typical Three Piece Component (Companion) Set for a 6" Flowline Installation

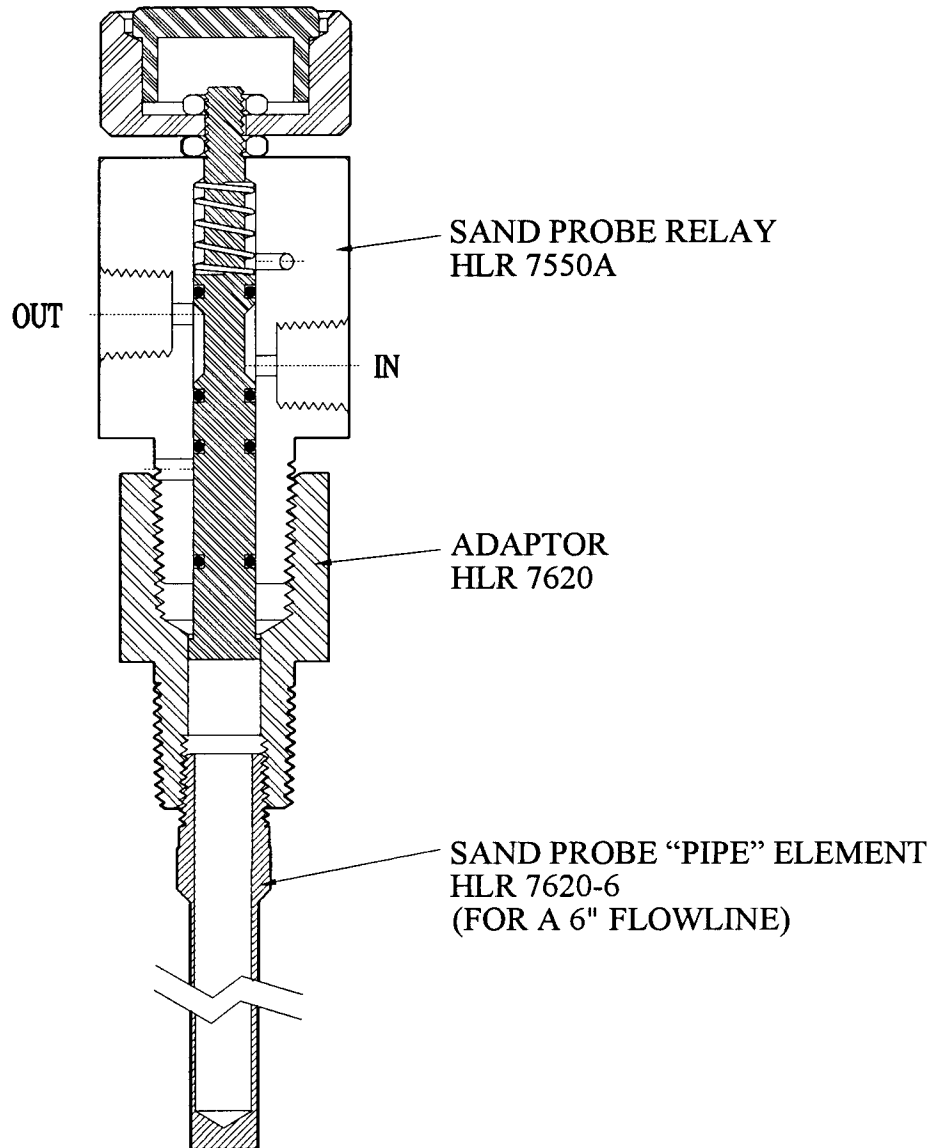
Usage: This standard assembly is selected whenever all of the following well stream conditions exist:

1. The well stream's media temperature is below 140⁰ F (60⁰ C).
2. The Flowline segment's operating pressure is below 5,000 PSI.
3. Well stream velocity is below forty (40) feet per second.

Flowline Connection Required for Installation: 1/2"-14 N.P.T. Thread-O-Let Weld Coupling (or similar weld connection) on a 6" (6.625" O.D.)

Flowline.

Note: Our standard HLR 7620-6 Pipe Element is machined from 1018 Carbon Steel. This material will effectively provide the same corrosion and erosion wear characteristics typical of flowlines fabricated from A106 Grade B (Carbon Steel) pipe.





**SAND PROBE ELEMENT
INSTALLATION AND REPLACEMENT
RECORD**

Company: _____

Location: _____

Lease Number: _____ AFE: _____ GL Code: _____

Flowline Size: _____

Operating Pressure: _____ Max. Pressure _____

Operating Temperature: _____ Velocity: _____

Tag Number: _____ Well Number: _____

Date Installed: _____ By: _____

Date Replaced: _____ By: _____

Reporting Supervisor: _____

Notes: _____

Items Purchased: _____
