



Sand Probe Relays 10,000 PSI Service

Pneumatic, three-way, two position manual reset, flow control valves

DESIGNED to be used in conjunction with conventional Sand Probe Element assemblies on process flowlines. These flow control valves will pneumatically initiate a shutdown or alarm sequence, whenever the Pipe Element is penetrated. Sand Probe Relay assemblies provide an indication that erosion is occurring and corrective action should be taken by the facilities operators.

HLR manufactures several types of Sand Probe Relays. The HLR 7550A and 7740 are Field Mount models, which are installed directly on flowlines. Our HLR 7930 and 7935 are Panel Mounted models.

SPECIAL FEATURE easy replacement of companion Sand Probe Pipe Elements. Speciality items are manufactured according to your needs.

REASON TO USE: HLR's Sand Probe Relays provide the positive control to quickly initiate the closure of the Safety Valve and possibly prevent flowline rupture. This averts pollution and/or injury to personnel. In a situation where Safety Valve closure is not necessary, HLR's relays can be used to sound a pneumatic horn or provide an alarm, to notify personnel of potential problems.

FEATURES

Working Pressure:

10,000 PSI max

15,000 PSI working pressure available. See page 6

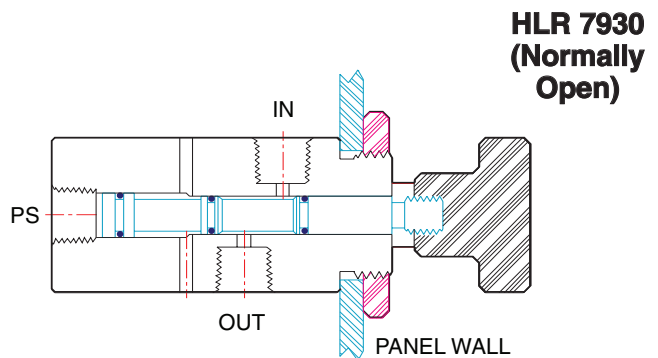
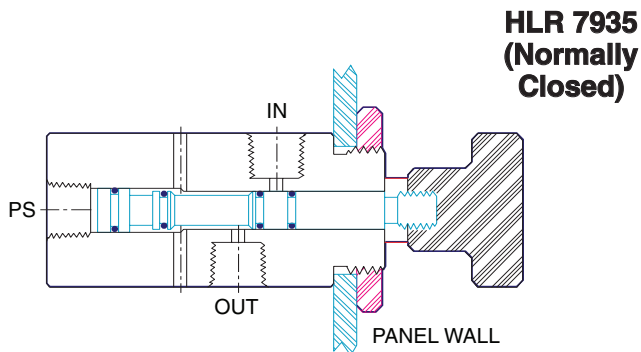
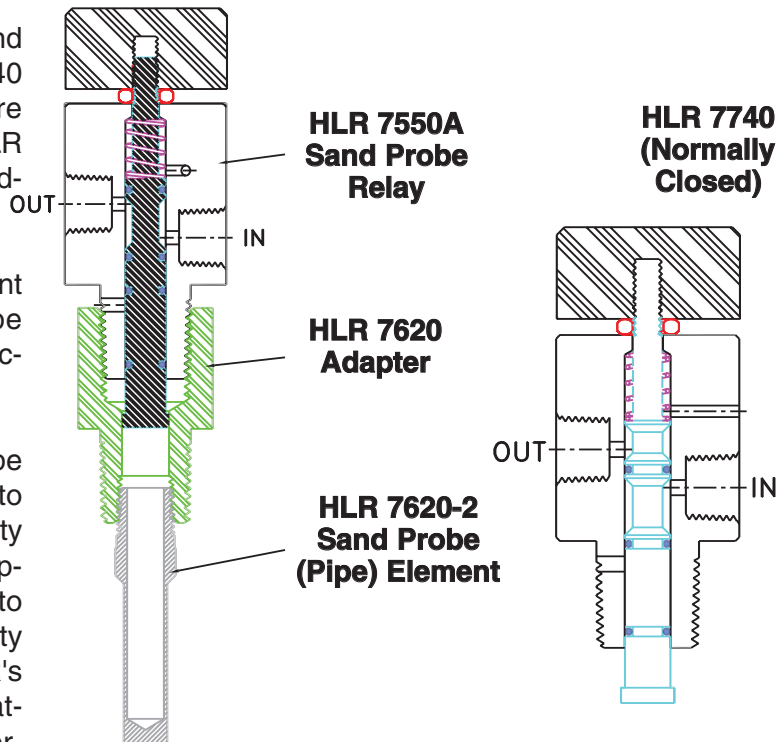
Relayed Pressure:

200 PSI max

Connections:

1/2"-14 NPT (Adaptor/Probe)

1/4"-18 NPT (Control Ports)



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 exist:

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

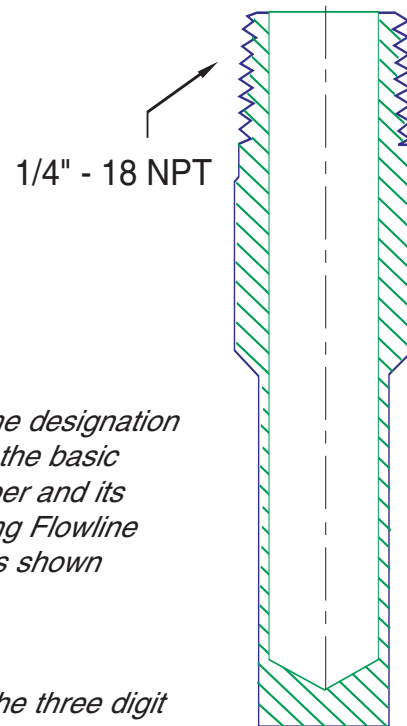
Model Number	Pipe Size
HLR 7620-2-***	2" (2.375" O.D.)
HLR 7620-3-___	3" (3.500" O.D.)
HLR 7620-4-___	4" (4.500" O.D.)
HLR 7620-6-___	6" (6.625" O.D.)

Operating Pressure	*** Wall Thickness
400 - 1,000 PSI	.025"
1,000 - 2,160 PSI	.035"
2,160 - 10,000 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).

The HLR 7620 Sand Probe Adaptor will be required to connect the HLR Sand Probe Relay to the HLR 7620 Series Probes.

**HLR 7620 Series
Sand Probe
Pipe Element**



Determine the designation by selecting the basic Model Number and its corresponding Flowline Pipe Size, as shown on left.

*Next, add the three digit Wall Thickness (***) number to complete the designation.*



7620 MR Series: Sand Probe Adaptor/Element

Model Number Selection Chart

The HLR 7620 "MR" Series Pipe Element is one component of a two piece Sand Probe companion assembly. It is selected whenever any of the following process conditions exist:

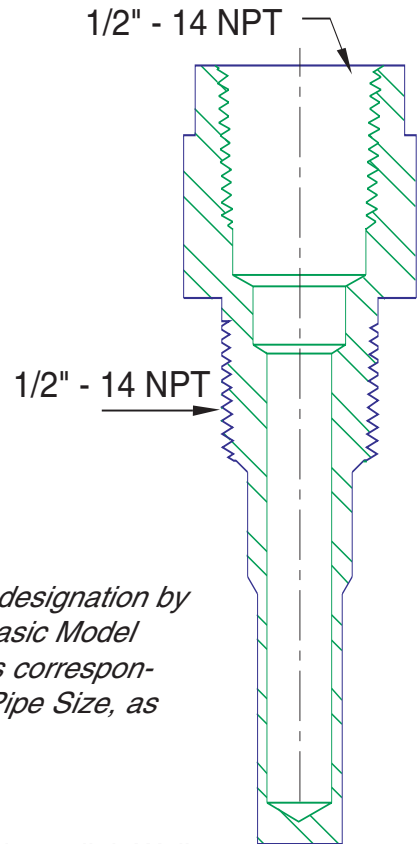
1. The process temperature is above **140° F.** (60° C.)
2. The Pipe Element is subjected to pressure **above 5,000 PSI.**
3. A velocity above **40 feet per second exist** in the flowline pipe segment.

Selecting the proper Sand Probe Pipe Element Model Number

Model Number	Pipe Size
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 Thickness	*** Wall
400 - 1,000 PSI	.025"
1,000 - 2,160 PSI	.035"
2,160 - 10,000 PSI	.050"

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).



Determine the designation by selecting the basic Model Number and its corresponding Flowline Pipe Size, as shown on left.

*Next, add the three digit Wall Thickness (***) number to complete the designation.*

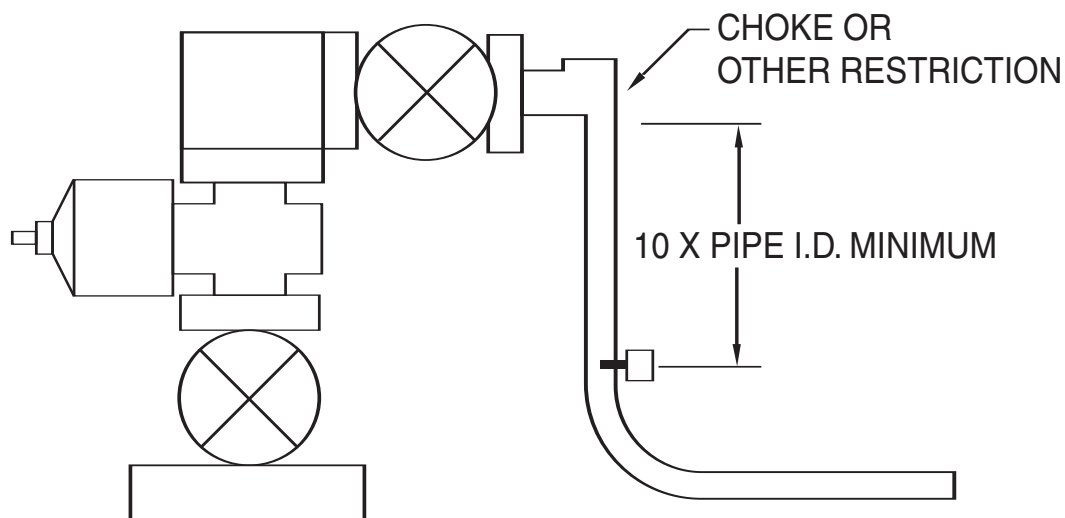
Factors for Proper Use of Sand Probe Elements



For Sand erosion probes to perform effectively, two factors must be taken into consideration.

1. The placement of the Probe

The Sand Erosion Probe must be placed in the area of Maximum Velocity. In most cases this is approximately 10 pipe diameters, or an average of two (2) feet, downstream from a choke. This will allow for maximum velocity to erode the probe and allow for turbulence to dampen and flow to be even all the way across the pipe. This location should be before the first 90° turn in the flowline.



The probe should also be placed in the flow stream so that the flow is 90° from the probe length.

2. The selection of the element.

There are three factors to consider in the selection of the sand erosion probe:

- Length**
- Material**
- Wall Thickness**

Length

HLR Controls has developed a standard probe length for 2, 3, 4, 6, 8, and 10 Flowlines. Sand Probes ordered for these flowline sizes will fit all schedule pipe with a standard 1/2" NPT threaded weld-o-let.

HLR Controls should be contacted directly for any installation not using standard piping with a 1/2" NPT weld-o-let. These installations would include use of instrument blocks or other flanged applications.



Factors for Proper Use of Sand Probe Elements

Material

Maximum correlation of erosion data between flowlines and probes is achieved by installing a probe of the same material as the flowline. For standard installations, HLR Controls recommends the use of 7620 Series Sand Probes manufactured of 4140 alloy steel.

Applications that involve severe service conditions such as high temperature, high velocity, or high pressure require the use of HLR 7620MR Series Sand Probes. The 7620MR Series Sand Probes are machine of solid bar stock 410 stainless steel.

In addition to 4140 alloy steel and 410 stainless steel, HLR Controls also manufactures probes in the following materials:

4140 "DD" Trim - same as 4140 but heat tempered and quenched for sour oil and gas

410 "FF" Trim - same as 410 SS but heat tempered and quenched for sour oil and gas, and corrosion service.

316 Stainless Steel - good for sour oil and gas in the annealed condition with RHC of 22 or less.

Duplex Stainless Steel - good for sour oil and gas and corrosion service.

Wall Thickness

Since several probes may fail before the piping must be repaired, greater accuracy can be obtained with a greater number of probes between overhauls. This means the probe wall needs to be thin.

The limit on how thin the wall can be is the amount of pressure that must be held. If the wall is too thin, the tube will collapse from external pressure.

HLR Part Number	Operating Pressure	Collapse Pressure
HLR 7620-pipe size-025	400 - 1,000 PSI	8,076 PSI
HLR 7620-pipe size-035	1,000 - 2,160 PSI	11,306 PSI
HLR 7620-pipe size-050	2,160 - 5,000 PSI	21,560 PSI
HLR 7620-pipe size-065	5,000 - 10,000 PSI	26,988 PSI
HLR 7620MR-pipe size-025	400 - 1,000 PSI	5,873 PSI
HLR 7620MR-pipe size-035	1,000 - 2,160 PSI	8,223 PSI
HLR 7620MR-pipe size-050	2,160 - 10,000 PSI	15,680 PSI
HLR 25 Series	up to 15,000 PSI	45,473 PSI

NOTES:

1. HLR 7620 Series External Pressure Design Criteria ASME Code Section VII, Div1.,UG-28 through UG-30, Code B31.3 Section 304.1,3
2. HLR 25 Series Design Criteria per API Bulletin 5C3