

## Probe Retractor for Pipeline Interface Detector

**Introduction.** This bulletin describes the Probe Retractor used with NuSonics Division Model 86 Pipeline Interface Detector. Its design permits the withdrawal of the interface detector probe assembly from the pipe under flow conditions for maintenance, line "pigging" or in order to facilitate installation of the probe without line shutdown.

**Features.** One of the key features of the probe retractor is the ability to install the entire probe assembly using standard procedures. The retractor can be mounted at any position perpendicular to the pipe, can be used with 4-inch ball or gate valves, and is available in 150#, 300# and 600# flange ratings. The probe assembly can be inserted up to 32 inches into the line, and when fully inserted, the exterior threads are protected against exposure to weather.

**Description.** Figures 1 and 2 show the probe assembly fully retracted and fully inserted, respectively. Figure 3 is an outline drawing of the probe retractor and Figure 4 is an outline of a typical installation.

The interface detector's transducers are mounted on a stainless steel cylinder capped on either end with teflon guides which make contact with the riser wall and prevent the probe assembly from "strumming" under flow conditions. The probe assembly is connected to a polished stainless steel rod which passes through a pair of Molythane ring seals at the retractor's pressure bulkhead. These seals prevent the

pipeline liquid from reaching the retractor housing.

A threaded lead screw attached to the polished rod moves back and forth in the retractor housing as the handle of the retractor is rotated. Thus, neither the connection head nor probe assembly rotate. Both the lead screw and polished rod are hollow, to accommodate wiring to the probe assembly.

The probe retractor contains another line of defense against possible leaks which could occur through inadvertent destruction of the probe assembly, for example, through operator failure to retract the assembly before pigging. The probe assembly itself contains a set of seals

and an optional back-up pressure seal is available between the lead screw and connection head.

A large seal nut with a polyurethane insert is located at the top of the lead screw. When the probes are fully extended, this seal nut rests at the top of the handle of the retractor, and creates a watertight seal preventing exposure of the lead screw to weather.

When specifying the probe retractor, flange rating and extension length should be considered. Units manufactured with 150# and 300# flanges include schedule 40 pressure housings (see fig. 2) while 600# flanged units include schedule 80 pressure housings.

For most applications such as gasoline and lighter fuel oils, field data indicate that the mixing of liquids within the measurement zone is virtually instantaneous. Thus, a maximum extension length may be calculated such that the tip of the probe assembly lies about one inch within the riser. In such cases, there would be no need to withdraw the probes for pigging, and the risk of probe damage by metal fragments in the line is significantly reduced. For high viscosity liquids, slow mixing of liquids may induce a time delay if the probes are recessed as described above. It is suggested that for such applications a probe extension of 1.75 inches into the line be allowed for when making extension length calculations. The probe assembly cylinder should still be contained within the riser.



Figure 1 - RETRACTOR WITHDRAWN

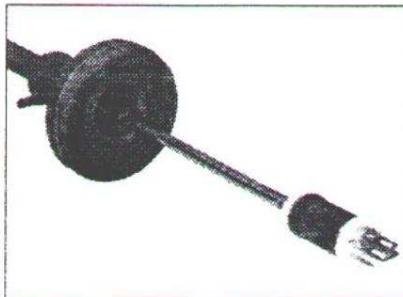
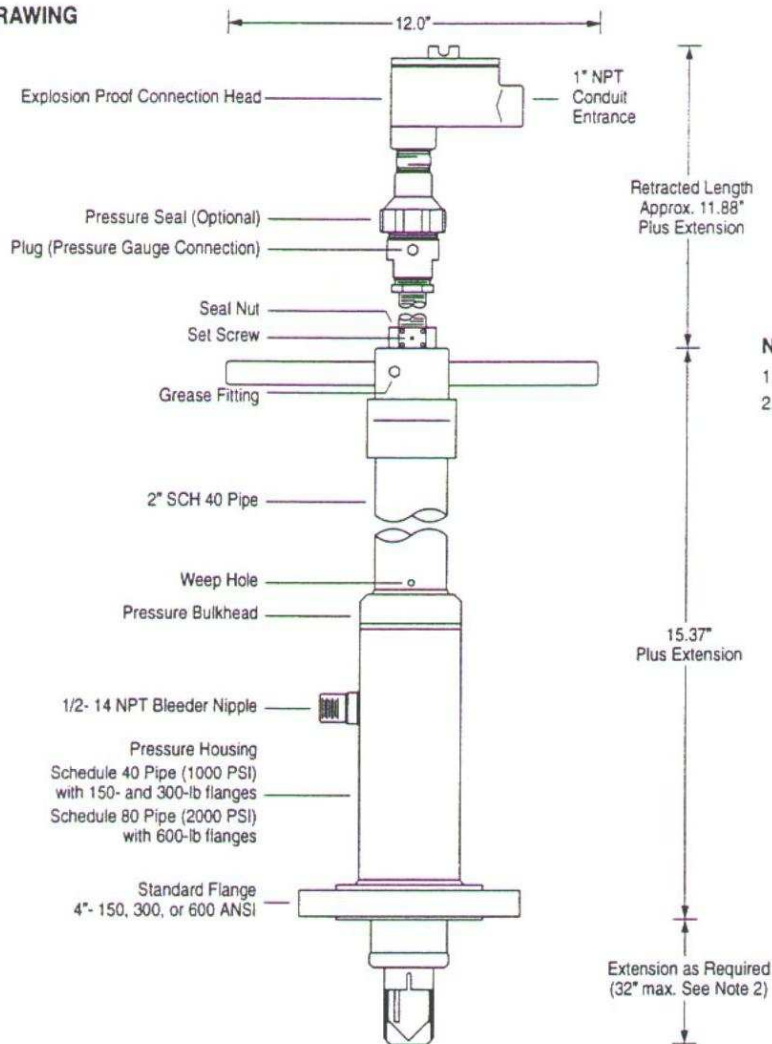


Figure 2 - RETRACTOR INSERTED

# PROBE RETRACTOR DIMENSIONS FOR PIPELINE INTERFACE DETECTOR

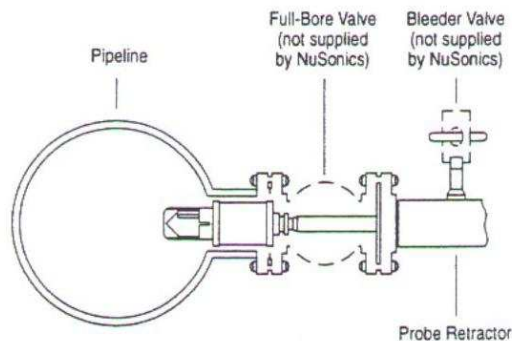
Figure 3 – OUTLINE DRAWING



**NOTES:**

1. All dimensions are in inches.
2. Unless otherwise specified, extension is 32" (91.25" overall length) and seal nut is factory set to position transducers properly inside pipeline.

Figure 4 – TYPICAL INSTALLATION



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