

### **Notice Regarding the Use of Pressure Monitoring for Leak Detection**

Leak detection by means of monitoring pressure has some inherent challenges that must be understood and mitigated in order to specify, operate and maintain a reliable valve testing system. By its very nature, any pressure drop observed is the result of leakage in the valve under test IN ADDITION TO leakage in the testing equipment itself. For this reason, a device that is under test may appear to have greater leakage than is actually the case because of test equipment leakage. Very small volumes of leakage can result in large pressure drops – especially when performing hydrostatic tests.

During valve testing, the test equipment and device under test must be considered as an integral system. The required settling time of the integral system can vary from as little as one minute to as long as an hour or more depending on the device under test and other factors. Test pressure readings are subject to temperature changes, valve volume, air bubbles, trapped air pockets, valve seating, etc. The temperature of the test medium (air or water) should remain at ambient temperature +/- 5° F; changes in the temperature of the test medium or ambient surroundings will result in variation of test pressure. Any test results must be adjusted or interpreted by taking these variables into account.

Based on CLIMAX's experience with similar systems, at time of delivery the test equipment specified in this quotation is expected to have a maximum pressure loss in each outlet line of approximately 1% over 10 minutes. (This estimate is based on a length of hose between the console and clamp fixture of 12 feet maximum, and is also based on the maximum operating pressure as stated in the quotation.) The pressure-loss baseline, for the test equipment itself, is established with a blind flange mounted in the clamp fixture and measured after the expiration of an initial settling time allowance.

Among other factors, the amount of leakage in the testing equipment is dependent on the condition of test equipment components as they wear over time. The customer is advised to create a plan to monitor and record system leakage in each testing condition in order to anticipate proactive replacement of wearable components (such as valves) in the test equipment.

The test equipment, as proposed, is designed to monitor pressure. However, depending on the valve test procedure that is required, other criteria in addition to pressure monitoring may be required to perform a complete evaluation. For example, if the valve test protocol requires a visual inspection or volumetric measurement of external leakage, the test equipment is not capable of providing that inspection, as currently proposed.

The product specifications and services herein are selected based on the information provided by the customer and/or other information or requirements as CLIMAX deems relevant. CLIMAX seeks to provide equipment as closely matched to customer specifications as possible. However, the specifications in this quotation may vary from the specifications requested in the inquiry for various reasons including technical feasibility, the implementation of previously-developed design concepts, manufacturability, economic factors, and applicable industry standards.

The specifications herein supersede any specifications that may be included as part of the customer's inquiry and also supersede the specifications of any prior proposal from CLIMAX that is related to this inquiry. Adherence to particular design standards, or a customer's personal preference as to features that may or may not constitute a complete system DO NOT APPLY unless specifically detailed in the quotation.

In the event that this quotation identifies exceptions from the specifications in the inquiry, such information is provided FOR REFERENCE ONLY and may not constitute an exhaustive listing of all possible relevant exceptions. It is the customer's responsibility to review the specifications in this document to assure that it meets the customer's safety requirements and that it is suited for the intended application.

This quote is considered non-binding until a purchase order is provided that references this quote number AND CLIMAX formally accepts the purchase order with a written Sales Order Acknowledgement.