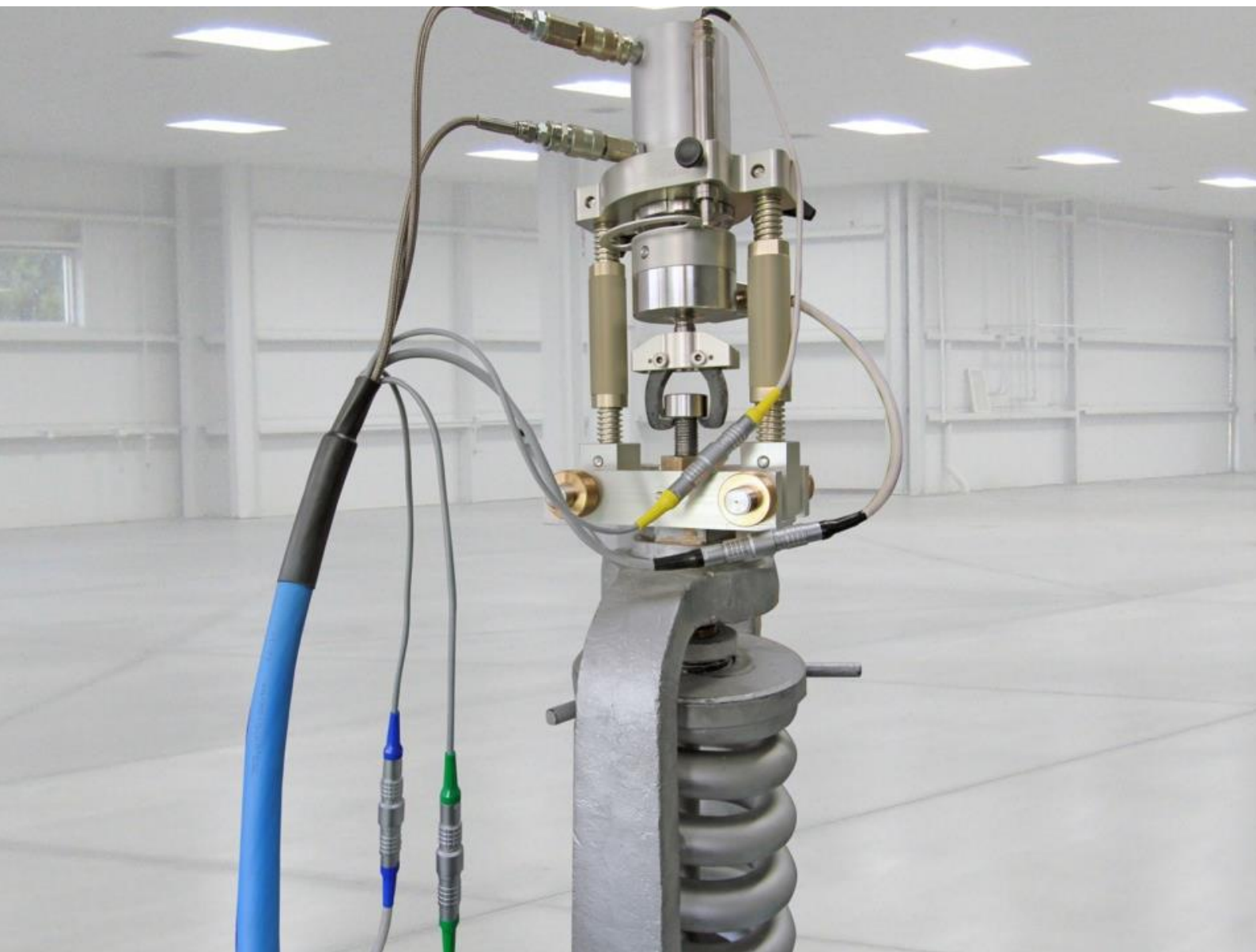


## ONLINE PSV TESTER



## PreVenTest LTC 2.0

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## PreVenTest LTC

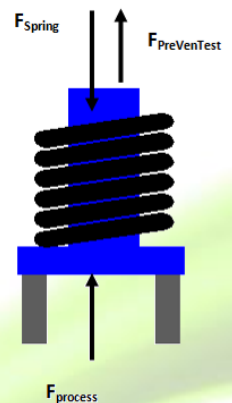
The Ventil PreVenTest system is a robust, but ingenious build system for testing all types and sizes of spring operated Pressure Safety Valves 'In-Situ', in process and under the normal operating conditions. The portable system enables you to proof the correct working and performance or identify Pressure Safety Valves in need of repair/maintenance without plant shut-down. The design and configuration is based on many years of experience in online PSV testing, resulting in a light weight and robust device. The PreVenTest unit is fully built in-house and only first class components and materials are used.

## Working method, how does it work?

Here is the basic principle. A force is applied to the valve spindle to overcome the spring tension of the valve. This is achieved by using a hydraulic power pack linked to an electronic force transducer. A computer is then used to measure the force applied. By combining this data with the information about the valve seat and line pressure of the valve it is possible to assess the set pressure.

## Advantages!

- ✓ Only valves that require an overhaul need to be removed from the plant.
- ✓ Welded in valves can be adjusted without costly removal from the line.
- ✓ No need for temperature correction.
- ✓ No interruption to plant production during testing.
- ✓ Reduced time needed to commission plant after shutdown.



## Operation range.

Safety valves can be tested with PreVenTest only when they have an external spindle where the test rig can be attached to. This makes it possible to lift the valve. Some safety valves might require a little spindle modification for connecting the rig. The range of safety valves is not related to the valve size or highest set pressure level but depends on the maximum difference between the set pressure and line / process pressure. As this difference is directly related to the maximum pulling force of the PreVenTest.

## Pulling Rig.

The bracket is made from airplane aluminum and design for quick installation at the valve. In case the valve needs readjustment the rig can be removed and placed back on the valve in seconds. The turn buckles provide an easy and quick adjustment of the rig to the valve configuration.

## Forced close.

When doing on-line testing it might happen that a safety valve that is PreVenTested remains open after the test. In order to make sure that the safety valve can be closed, the PreVenTest is equipped with a system to close the safety valve in such an event.

## Power supply.

PreVenTest LTC is battery operated. The battery is designed to meet airline criteria as per FAA and TSA requirements. The unit comes standard with a quick charger (110/230V dual voltage), the battery capacity is sufficient to perform about 300 test before a recharge.

## PreVenTest Software and Computer System.

Using the advanced, in house developed software guarantees reliable and safe test procedures.

### Ruggedized Laptop.

PreVenTest is delivered with a top-of-the-line full ruggedized laptop. The notebook delivers dependable performance under the most challenging environmental conditions. In case these conditions are exceeded the laptop can always be removed from the harsh environment. Due to the premium industrial wireless communication protocol, the note book can still receive the measurements at distance from the valve being tested.

### PreVenTest Software.

The software collects and records the transmitter signals of displacement, force and (process) pressure and checks the test procedure data at the same time by comparing the signals with the set safety limits.

### Seat Diameter database.

A reliable and accurate online test can only be done when having the right seat area dimensions. The required area is typically not available in the safety valve documentation and quite hard to get from other sources. For this reason PreVenTest has a database with all the major valve brands with their dimensions available for selecting. New dimensions can be entered by the operator or downloaded (free of charge) by doing a PreVenTest software upgrade via internet connection.

### Valve Record Management.

Valve details and test results is stored into the database and is efficiently organized by plant, unit or customer. Individual valve records are quickly and intuitively located by tag number, manufacturer serial number or user-defined information. Test reports, valve information and test parameters can be entered, viewed or modified via a user friendly and intuitively interface.

### Working in Native Language.

The CRS is can be set in a variety of languages. If a language is not standard installed, a translation function can be used to adapt the program text.

### Ventil Web Service Portal

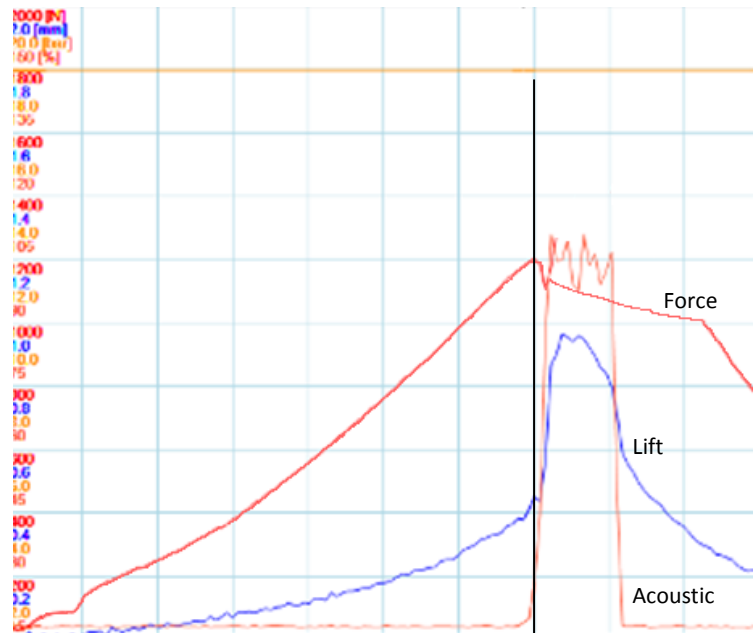
When starting up the PreVenTest software, a connection is made to the Ventil Web Service Portal to check availability of new seat area or software upgrades. In case of availability of software patches, the operator will be prompted to upload the new data. Calibration data and certificates are available for download at any time and are automatically transferred to the laptop.





## Analysis and Results.

At set pressure level the system pressure applies force on the valve disc that is helping / relieving the PreVenTest hydraulic cylinder and subsequently generating a decline in measured force. The set pressure level can be obtained through graph analysis. The cursor (vertical line) allows scrolling in the diagram in order to find the right level. Beside the standard diagram displaying all signal (in different colours) the system can as well generate the spring performance. The software is automatically calculating the set pressure based on the found results. The results are printed at the 'result panel' at the right side of the screen.



## Finger Print Method

In some cases where the seat area is not available in the database or elsewhere, the area can be determined using the 'finger print method' in which the same test is carried out twice but under a different system pressure. Based on the found results, which are tested for accuracy using a linear regression method, PreVenTest will calculate the seat area and provide the right set pressure. The found seat area is stored in the database and available for future use.

## Support and Trouble shooting.

Need help, an upgrade or additional function, the Ventil IT service department is available for answering questions. The remote access over internet allows efficient and quick service anytime, anywhere.

## Customized Test Report / Certificate.

Whether the PreVenTest is used in a nuclear power plant or water treatment plant, the customer will appreciate receiving a detailed test report showing the found results and test circumstances in a clear format. The Ventil PreVenTest software is completed with an integrated report generator, to design a customized certificate lay-out. This includes add texts, adapting the language and placing company logo and other details at the report.

Report are stored in the database and can be exported to PDF format.



## Scope of Supply.

Online – In-situ test system for safety valves, existing of the following main parts;

- ✓ Light weight, 'airplane' aluminum test bracket, fully prepared and adjustable for all sorts of spring operated PSV's.
- ✓ Set universal adapters for all sorts of spindle diameters.
- ✓ 1 kN hydraulic cylinder and load cell.
- ✓ 10 kN hydraulic cylinder and load cell.
- ✓ 20 kN hydraulic cylinder and load cell.
- ✓ Lift sensor.
- ✓ Acoustic sensor with quick-clamp.
- ✓ Carrying bag for the pump, laptop and small accessories.
- ✓ Cables and hose assembly set (communication. between control box – test bracket), length 10 meter.
- ✓ Robust, industrial laptop computer with Windows 7 Pro and PreVenTest Software program with extended safety valve database installed.
- ✓ Premium industrial wireless module. (wireless testing at distance from the valve)
- ✓ Unlimited access to Web Service Portal, for new seat diameters, software upgrades etc.
- ✓ Operation manual including test and calibration certificates.
- ✓ Packed in (1) Canvas bag and 2 robust (trolley) cases.





## Training and Assistance

### Training course at Ventil Training Center

The PreVenTest is designed for easy and user friendly operation but Ventil recommends that all technicians attend a training course for safe on-line testing and use of the PreVenTest software. The Ventil training center at our headquarters in The Netherlands is equipped with an installation to simulate the plant situation. During the training course your staff will experience all kinds of different situations that can occur in the plant during on-line testing. From a failing test to a safety valve that is not closing after the test. On request the training course can be extended with a general valve test and maintenance course.



### Training on site

Alternatively a Ventil senior engineer can conduct a theoretic training on-site. During this course we cannot conduct the plant simulation as distinct from the in-house course where these issues will be addressed in detail during the training.

### Approval assistance

PreVenTest is certified by Lloyds Netherlands issued to Ventil Test Equipment. A lot of our customers are required by law to have an approval from a local inspection authority or insurance company. We are experienced and always ready to support you with obtaining this local approval.



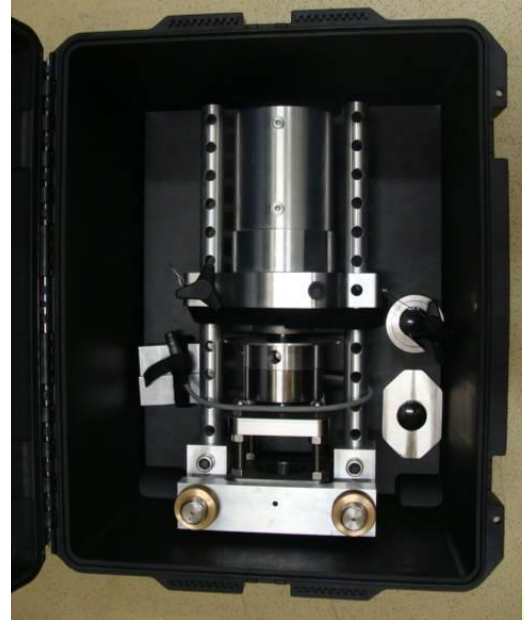
## Optional Features.

### Option 170 – 50 kN bracket and load cell.

The 50 kN set is generally needed for;

- ✓ Testing large orifice safety valves with high set pressures.
- ✓ Testing larger / high pressure safety with a reduced or no process (line) pressure.

In both cases more force than the standard 20 kN force might be required. The 50 kN set exists of a complete separate bracket (test rig) with hydraulic cylinder, spindle adapter.



Note that the 50 kN upgrade can be added to the PreVenTest system at a later stage as well