

## Surface Well Test Equipment



Expro's horizontal, three-phase Test Separator has automated controls on gas pressure, gas/oil and oil/water interfaces, mounted on an oilfield structural steel skid with drip pan, crash frame and three-coat, offshore type paint system, rated for sour (H<sub>2</sub>S) service. The unit is fully manifolded for complete flexibility of operation, including bypassing and/or co-mingling oil, gas or water. The Test Separator is designed with a removable crash frame which reduces the overall weight of the unit for carnage. There are many different sizes and configurations of Expro's test separator to meet varying requirement.

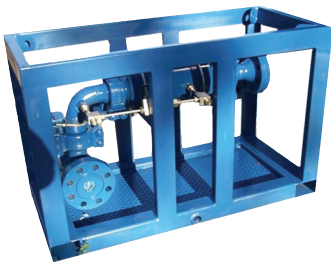
## Steam Heater

The Expro steam heater offers a high-efficiency heat transfer with a small foot print. The steam heater is mounted on a sturdy, oilfield-type skid with a lifting/crash frame enclosure. Heat transfer is accomplished by applying superheated steam directly to the high-pressure upstream pre-heat process tube bundle with a full opening two-inch adjustable choke separating the low-pressure downstream post-heat process tube bundle. The tubes are sealed in an ASME vessel set with automated steam process controls for both temperature and pressure control. Steam condensate is directed to a steam trap for recycling back to the steam generator.



The steam heater comes with a high-pressure diverter (by-pass) manifold on the inlet to the outlet for bypassing the tube bundles. Safety systems in this type of heater include a relief-valve and rupture-disc located on the heater vessel, and a fail-safe temperature control device. A high-pressure pilot monitoring the vessel pressure is available for interfacing with an Expro ESD system. The steam heater is built in accordance with Expro Equipment Sales "Engineering Standards and Practices" which meets or exceeds most International standards and codes, and is offered with third party Independent Design Review Certification and fabrication Certificate of Conformance.

## Multi Sensor Relief Valve (MSRV)



The MSRV is a rapid acting relief valve without the limitations of existing safety valves, allowing a greater flexibility in safety system design. In an over-pressure situation the MSRV will respond through utilization of its safety logic and protect the whole system. Its ball valve design is hydraulically actuated by well pressure from primary sensor points. These points constantly monitor the process pressure, and when it exceeds a pre-determined value, the rupture disc inside the sensor point ruptures and the respective impulse line is energized thus opening the valve. Once actuated, the MSRV will remain open until pressure is applied to the respective closure.

The MSRV is typically installed between the choke manifold and the heater. The purpose is to protect the heater tube bundle from over pressure if the upstream choke cuts out due to sand erosion etc.

The MSRV has the following advantages over a conventional relief valve:

- High relief capacity**
- Insensitive to system back pressure**
- Positive acting with no simmering or chattering**
- Accurate set point pressure**
- Extreme high pressure integrity**
- Four impulse port multi sensor facility**
- Multi operable capability**
- ESD control logic**

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