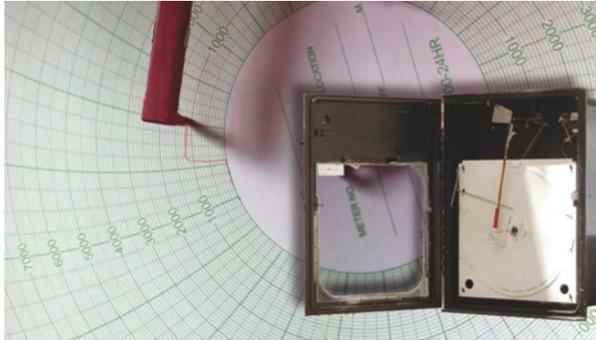


A CHART RECORDER is an instrument that creates a paper chart record of the pressure in a system. It relies on ink pens mounted on mechanical arms, which pivot in response to pressure. Its primary advantage is an ability to record for extended periods in remote locations.



An experienced user may provide preliminary analysis on the chart output in the field, but communicating or storing the data electronically becomes possible only after a technician enters or scans the chart into a computer. This process can take days before results become available.

Chart recorders are bulky and heavy, and must be handled with extreme care. They rely on many moving parts that can degrade over time; especially in harsh environments, and especially if dropped. Even in normal conditions, pens can dry out and paper may be depleted or damaged by heat and humidity.

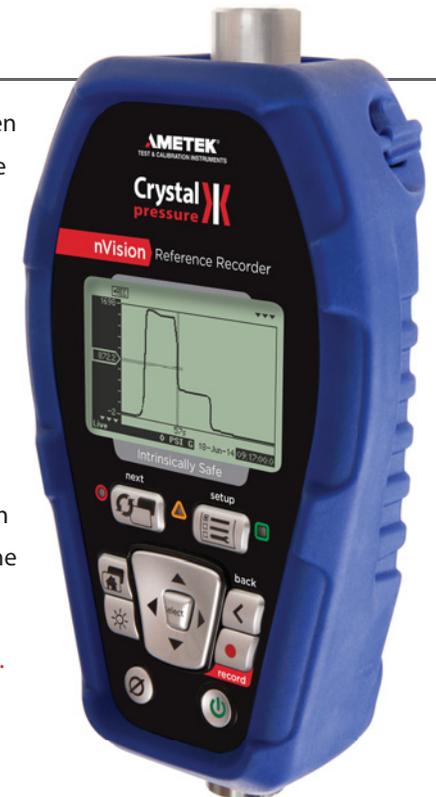
A BETTER APPROACH

Crystal has a better solution. The nVision reference recorder can collect and store up to 1 million data points at logging intervals as fast as ten per second. The data is collected electronically and stored in non-volatile memory, meaning that if the batteries deplete while testing, the data will not be lost. The batteries will last up to one year when in Ultra Low Power Mode.

The stored data can be viewed on the screen in an easy-to-read graphical format, or exported to a .xls, .csv, or .pdf file. You can even create a tamper-proof, secure, signed .pdf file, which produces read-only files that cannot be manipulated.

The nVision is designed for rough environments. It contains no moving parts and can withstand dropping without damage. Each unit is IP67 rated, meaning it can be submersed in 1 meter of water for up to 30 minutes. Combined with its light weight and compact size, it is the unit of choice for pipeline companies doing work from the cold in Alaska to the heat of Iraq.

Featuring 0.025% of reading accuracy, the nVision can provide deadweight tester accuracy in the field. Accuracy remains constant with temperature changes, is protected from high over-pressure events, and is not affected if the gauge is dropped. Unlike a chart recorder, if the nVision sensor is damaged, it will stop recording and thus prevent the chance of providing erroneous data.



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FEATURE COMPARISON

Durability and Size

nVision	Chart Recorder
No moving parts.	Multiple moving parts.
Drop-tested to withstand damage.	Easily damaged if dropped.
IP67 rated. (Submersible in 1 meter of water for up to 30 minutes.)	Not IP67 rated. Susceptible to damage from moisture and harsh environments.
No additional equipment required.	Requires paper charts which must be replenished, and pens that can dry out.
Compact and light. 8" (204 mm) high and weighing just 1.5 lbs (680 g).	Bulky and heavy. Typically weighing from 25 to 70 lbs.

Accuracy

nVision	Chart Recorder
0.025% of Reading accuracy.	0.25% to 1% of span.
Accuracy remains consistent with temperature changes.	Ambient temperature and thickness of pens can cause an error of up to 1%.
Protected from high overpressure events.	Overpressure and damage from dropping can add to the recording error.

Reliability of Data

nVision	Chart Recorder
Secure electronic records are downloaded using CrystalControl software.	End result is a paper chart. If available, computer output is complex and costly.
Downloaded file is an easy-to-read, simple spreadsheet; or a signed, tamper-proof pdf that can not be manipulated by the user.	Interpreting paper chart data is subjective and requires training. Paper chart data can be easily manipulated by the user. (Tamper-proof pdfs are unavailable.)
Sensor ceases to record if damaged.	Damage to the unit can go undetected, resulting in erroneous data.