

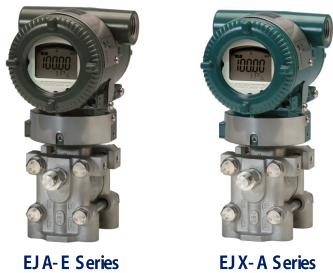
Pressure Safety

Introduction

Yokogawa's pressure transmitters are designed from the ground up with safety in mind. Traditionally different transmitters are used for process control and safety applications. However, the same DPharp transmitter can be used for both applications. This allows the plant to significantly reduce the spares inventory. Every transmitter is designed with safety as standard. This means: no additional cost for safety, improved reliability for all applications, and plant wide standardization.

Applicable Models

- > **EJA-E Series:** All models
- > **EJX-A Series:** All models



How it Works

The unique DPharp digital sensor provides the most stable and precise measurement available today. DPharp digital sensors use two single crystal silicon resonators vibrating at their natural frequencies. When pressure is applied, one of the resonators goes into tension, while the other goes into compression mode. The CPU directly counts the sensor output frequencies without any addition A/D conversion. Due to the excellent elastic properties of silicon material, the DPharp sensor exhibits greater linearity and repeatability with no inherent hysteresis. Resonant sensors also provide a large output signal resulting in greater sensitivity and higher turndown.

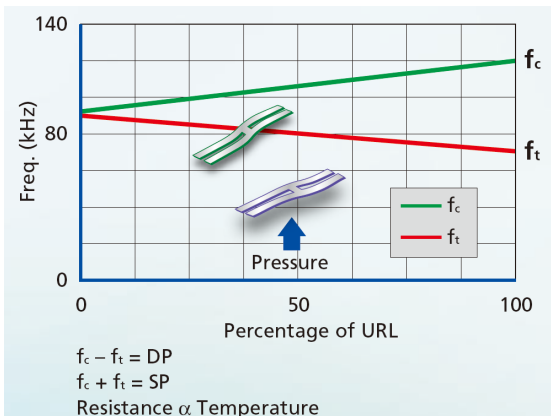


Table 1. Output Signal

Active Sensor Technology

DPharp is an active pressure sensor, so even with no pressure applied the resonators oscillate at their natural frequencies. Two independent resonators are utilized. If either one or both fail, the transmitter diagnostics detects a capsule error. The DPharp sensor is inherently fail-safe with no undiscovered failure modes.

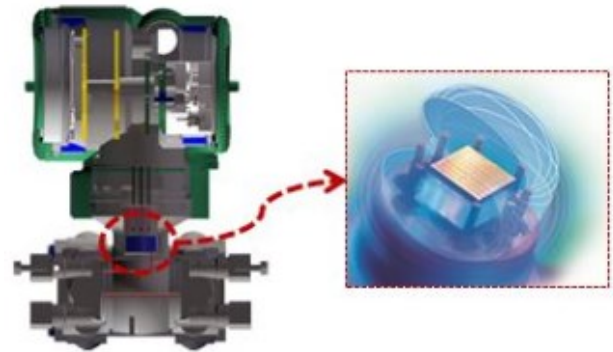


Figure 1. Active Sensor Technology

Dynamic Compensation

The DPharp digital sensor also features dynamic compensation. This technology compensates for changes in the process to improve the accuracy of the device. Figure 2 below lays out this process that happens automatically in the transmitter.

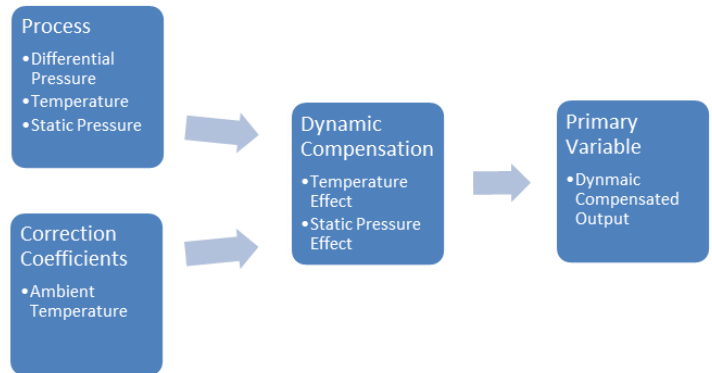


Figure 2. Dynamic Compensation Process



Back Check Technology

DPharp devices complete over 40 diagnostics to ensure proper operations. Active Sensor Technology monitors the DPharp sensor while the patented Back-check Technology is reverse checking all calculations in real time. This technology reduces the unscheduled maintenance by 60%. Figure 3 below shows this reverse calculation process.

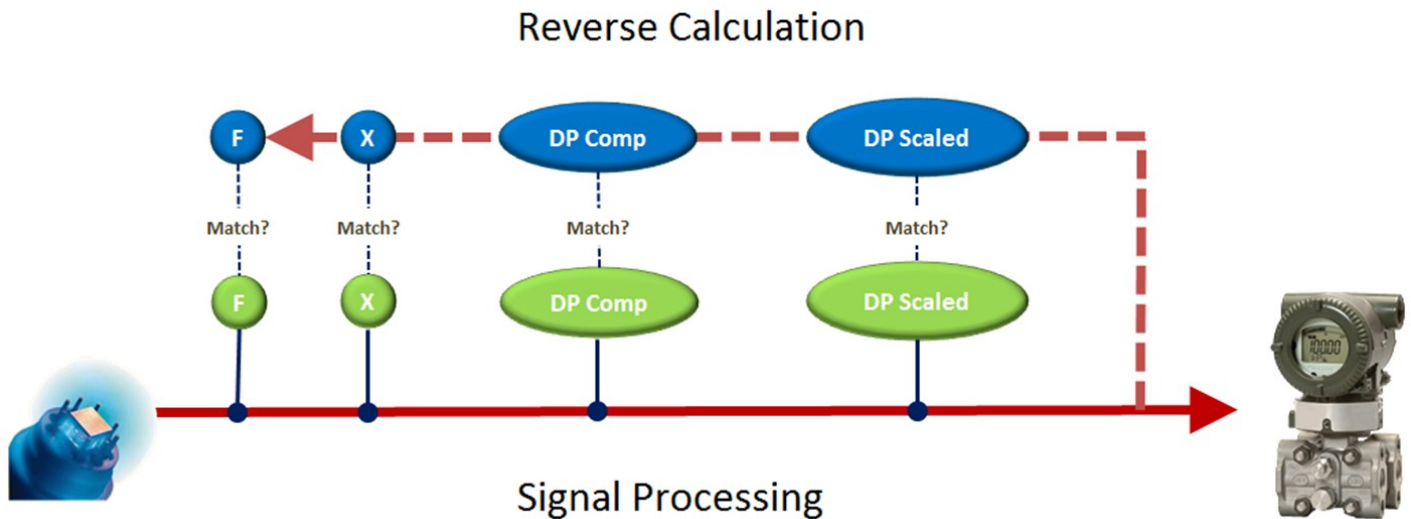


Figure 3. Patented Reverse Calculation

Conclusion

Yokogawa has developed a digital sensor that sets a new standard for pressure measurement. The digital evolution with the enhancement of the DPharp digital sensor delivers best in class pressure measurement solutions, while not taking the focus away from safety. The new sensors feature active sensor technology, dynamic compensation, and back-check technology to maximize the full potential of the applied process. With these features the Yokogawa is able to provide safety as standard, instead of just an option. Yokogawa transmitters can be used for safety and process applications. All DPharp transmitters are certified to meet IEC61508 for single use in SIL2 applications or dual use in SIL3 applications as a standard. *No special option needed.*



At Yokogawa, Safety is never an option.

