

SIL DECLARATION OF CONFORMITY Model FS10 SERIES

We, *Fluid Components International LLC*, located at 1755 La Costa Meadows Drive, San Marcos, California 92078-5115 USA, declare as manufacturer, that the *FS10 Series* of products is suitable for use in a safety instrumented system for SIL 2, flow and temperature measurement.

The FS10 Series has been classified as Type B subsystem according to IEC 61508-1 Chapter 7.4.4.1.3 with a Hardware tolerance (HFT) of 0.

The Failure Modes, Effects and Diagnostic Analysis (FMEDA) report carried out by *exida*, resulted in following failure ratings:

SIL (Safety Integrity Level) : 2
 HFT (Hardware Fault Tolerance) : 0
 Subsystem type : B

Failure rates according to IEC 61508-1

Device Configuration	SFF	PFD AVG	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
Relay output, alarm on low or high flow	90%	1.54E-03	900	240	860	232
Transistor output, alarm on low or high flow	90%	1.44E-03	900	220	860	213
Current output, alarm on low or high flow	90%	1.54E-03	-	217	1784	215

Terminology:

SFF = Safe Failure fraction

λ_{DU} = failure rate dangerous undetected faults

λ_{SU} = failure rate safe undetected faults

FIT = Failure Rate in 10^{-9} /hour

PFD = Probability of failure on demand

λ_{DD} = failure rate dangerous detected faults

λ_{SD} = failure rate safe detected faults

Above analysis is based on assuming:

- The PC interface is only used for setup, calibration, and diagnostics purposes, not for safety critical operation.
- The programming push-buttons are monitored for short circuit failures. (Firmware v4.02 or greater)
- The application program in the logic solver is constructed in such a way that Fail High and Fail Low failures are detected regardless of the effect, safe or dangerous, on the safety function.
- Materials are compatible with process conditions.
- The device is installed per manufacturer's instructions.
- External power supply failure rates are not included.
- Worst-case internal fault detection time is 3 seconds. This is based on the default 0 second Time Delay and includes the default 2 second Filter Setting
- With the relay output option ,either the NC or the NO contacts are used.
- With the relay output option the customer must provide components to limit the contact current to 60% of the rating and provide transient voltage protection (600mA resistive, refer to manual for inductive loads).
- Proof test interval of 1 year.

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Flow/Liquid Level/Temperature Instrumentation

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