

# TECHNIS

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## CERTIFICATE of RELIABILITY and FUNCTIONAL SAFETY

This is to certify that

The AWT 210 Transmitter, provided by ABB Limited, Oldends Lane, Stonehouse, GL10 3TA, Gloucestershire, UK has been assessed and is considered suitable for use in low and high demand safety functions:

- As a simplex item (ie hardware fault tolerance of 0) at SIL 1 (low and high demand)

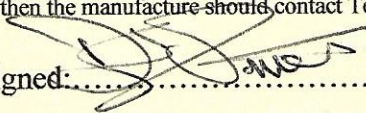
This claim is in respect of an FMEDA and some data, addressing random hardware failures and architectural constraints (ie safe failure fraction). The assessment was based on the assumptions and recommendations given in Technis Report T1065 (Issue 1.0). The product was assessed against the failure modes:

- Fail to provide an appropriate 4-20ma output
  - Spurious response despite no valid change

The assessment was carried out having regard to the guidance in IEC 61508 [2010] and the related body of guidance in respect of Random Hardware Failures and Architectural Constraints [route 1H]

	PFD	So called "dangerous" Failure Rate pa	SFF
Digital pH Failure to provide an appropriate 4-20mA output	$2.5 \cdot 10^{-3}$	$1.1 \cdot 10^{-2}$	>87% Type B
Analogue pH Failure to provide an appropriate 4-20mA output	$2.3 \cdot 10^{-3}$	$9.8 \cdot 10^{-3}$	>87% Type B
Conductivity 2E Failure to provide an appropriate 4-20mA output	$2.2 \cdot 10^{-3}$	$9.8 \cdot 10^{-3}$	>87% Type B
Conductivity 4E Failure to provide an appropriate 4-20mA output	$2.2 \cdot 10^{-3}$	$9.7 \cdot 10^{-3}$	>87% Type B
Conductivity Toroidal Failure to provide an appropriate 4-20mA output	$2.2 \cdot 10^{-3}$	$9.8 \cdot 10^{-3}$	>87% Type B

The validity of this certificate requires that the product is used in accordance with any assumptions, limitations or intervals stipulated in the underpinning reliability/integrity report. The product build state continues to conform to the drawings and issues quoted in the underpinning reliability/integrity report. The product is used having regard to the instructions, limitations of use, intervals etc as outlined in the manufacturer's Safety Manual. The manufacturer maintains a credible level of Functional Safety Management in respect of (for example) design configuration control, procurement, manufacturing and defect analysis. The certificate will not apply to any product variation/modification or to the use of functions not addressed in the original study. It is recommended that the design, defect records and the company FSM procedure are reviewed, at least every 2 years, and should any changes have occurred since the original certification then the manufacture should contact Technis to request re-certification.

Signed:  (Certificate No T1065-213) – 8 Sept 2022

Dr David J. Smith BSc, PhD, CEng, FIEE, FIQA, HonFSaRS, MIGasE

This certificate does not warrant fitness for any specific applications related purpose and is based on probabilistic and statistical assessment