

Technical Information

Nivotester FTC625

Level limit switch

With Intrinsically Safe Signal Circuit for Connection to a Capacitance Sensor



Applications

- Level limit detection in tanks containing liquids and silos containing bulk solids. For capacitance level probes, which may also be applied in hazardous areas of category ATEX II (1) GD
- Overspill protection for tanks containing flammable or non-flammable fluids hazardous to water
- Dry running protection for pumps

Your benefits

- Intrinsically safe signal circuit [Ex ia] IIC for using sensors in hazardous areas
- Calibration using operating keys
- High functional safety thanks to:
 - Fail-safe PFM technology
 - Cable monitoring up to sensor with FEI57S or EC27Z
 - Checkable relay function using operating keys
- Compact housing for easy series mounting on standard DIN rail in the cabinet
- Pluggable terminal blocks make wiring easy
- RS485 interface for connection, e.g. by Fieldgate technology, for remote monitoring
- RS232 diagnosis socket with connection to, for example, ToF Tool for reading out data
- Can be used also with EC16Z and EC17Z
- Permanent self-monitoring with FEI57S and EC27Z
- Protection against maloperation and manipulation
 - Every change in the switch setting triggers a red LED signal and a fault message
- Full- or empty push button calibration

Function and system design

Measuring principle

Function

Probe and tank (or ground tube/counterpotential) form a capacitor whose capacitance changes with the level of the product. The electronic insert converts the capacitance change into a PFM frequency change, which switches the output relay in the Nivotester FTC625.

Signal transmission

The Nivotester FTC625 limit switch's intrinsically safe signal input is galvanically isolated from the mains and from the output.

The Nivotester supplies the capacitance sensor with power via a two-wire cable with direct current and receives a frequency from it which signals whether the level limit has been reached or not.

Here, the transmitter superimposes current pulses (PFM signals) with a pulse width of approx. 200 μ s and an amperage of approx. 10 mA on the supply current.

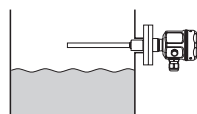
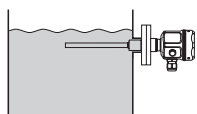
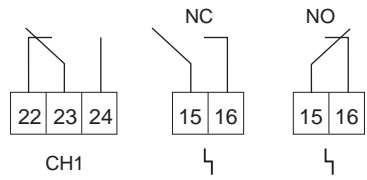
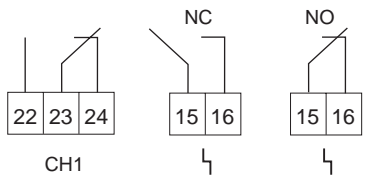
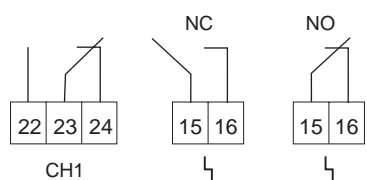
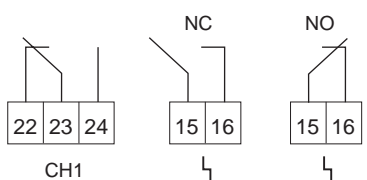
Signal analysis

The Nivotester analyses the frequency and switches the output relay for the level alarm. The switching state of the relay is displayed on the front panel of the Nivotester by means of a yellow light emitting diode (left).

Fail-safe circuit

Selecting the correct fail-safe circuit ensures that the relay always works in quiescent current fail-safe mode.

- Maximum fail-safe mode: the relay de-energises when the level rises above the switch point (sensor covered), a fault occurs or the power fails.
- Minimum fail-safe mode: the relay de-energises when the level falls below the switch point (sensor uncovered), a fault occurs or the power fails.

Level	 Probe uncovered	 Probe covered
Maximum safety circuit		
Minimum safety circuit		

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Function of the limit indicator dependent on the level and fail-safe circuit.

Certificates and approvals

CE mark	The Nivotester meets all the statutory requirements arising from EC directives. Endress+Hauser confirms the successful testing of the device by affixing the CE symbol.
Ex approval	Endress+Hauser Sales Centers provide information about the currently available versions for use in hazardous areas (ATEX EEx ia IIC; FM IS; CSA IS) All the relevant data for explosion protection is contained in separate Ex documentation (see: Supplementary Documentation), which can be requested.
Type of protection	[EEx ia] IIC
Overspill protection	WHG
Other standards and regulations	Other standards and regulations which were complied with during the conception and development of the Nivotester FTC625. <ul style="list-style-type: none"> ■ EN 60529 Degrees of protection provided by enclosures (IP code) ■ EN 61010 Safety requirements for electrical equipment for measurement, control and laboratory use ■ EN 61326 Interference emission (Equipment Class B), interference immunity (Appendix A - industrial applications)

Ordering information

Nivotester FTC625	10	Certificates	C	ATEX II (1) GD [EEx ia] IIC, WHG
			D	FM IS Cl. I, II, III Div. 1 Group A-G
			E	CSA IS Cl. I, II, III Div. 1 Group A-G
			Y	Special version
	20	Version	1	Rail mounting 1-channel 45 mm
			9	Special version
30	Power supply	A	Power supply 85...253 V AC, 50/60 Hz	
		B	Power supply 20... 30 V AC / 20... 60 V DC	
		Y	Special version	
40	Output	1	1x level SPDT + 1x alarm SPST NC (Normal closed)	
		2	1x level SPDT + 1x alarm SPST NO (Normal open)	
		9	Special version	
50	Additional option	1	Additional option not selected	
		9	Special version	
FTC625				Complete product name

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