Füllstand | Druck | Durchfluss | Temperatur | Flüssigkeits-analyse | Registrierung | Systeme Komponenten | Services | Solutions

Technical Information

Nivotester FTR325

1-channel switch amplifier for the Soliwave M microwave barrier

Area of application

The Nivotester FTR325 is suitable as a 1-channel switch amplifier for the Soliwave M microwave barrier. You can use the FTR325 for level detection for any type of solids or for control and counting tasks for packaged goods.

Advantages at a glance

- High level of operational safety through line monitoring up to the sensor
- LED display of operating and switching state
- Selectable pick up and/or drop out delay of the switching output
- Compact housing for easy inline mounting on standard rack rails
- Easy wiring via pluggable terminal block connectors

TI377F/97/en/08.05

Endress+Hauser

People for Process Automation

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Function and system design

Measuring principle

The Nivotester FTR325 monitors the Soliwave M microwave barrier's open collector output and uses a relay (change-over gate) to provide this output for many user applications. An LED displays the switching state of the relay. Problems such as a cable breakage are also displayed.

The input on the Nivotester FTR325 is galvanically isolated from main power and output. It is connected to the microwave barrier via a three-wire cable (ring or star wiring), whereupon the Nivotester provides distribution (DC) voltage to the microwave barrier.

Limit switch signal function

The appropriate setting for the limit switch signal function (see page 8) ensures that the relay for signal output and fault is always activated (fail-safe mode) in idle state.

In combination with the Soliwave M microwave barrier the following secure modes are possible:
- The relay drops out when the switch point is reached (microwave barrier interrupted), a fault occurs or the distribution voltage fails.
- The relay drops out when the switch point is underrun (microwave barrier uninterrupted), a fault occurs or the distribution voltage fails.

Function monitoring system

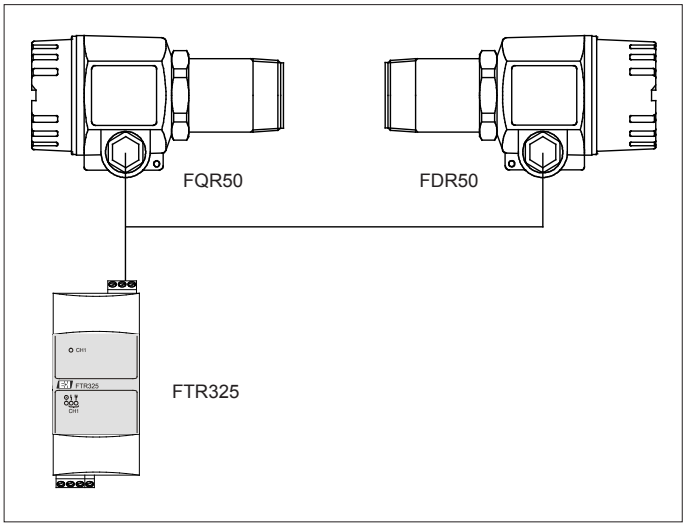
The Nivotester FTR325 is equipped with function monitoring system for improved fail-safe operation. A fault is indicated by an LED, the signal output and fault relay falls off.

In combination with the microwave barrier the Nivotester can recognise the following faults and use an LED to indicate them:
- Breakage in the distribution voltage cable to the Soliwave M microwave barrier
- Microwave barrier power input (FDR50 / FQR50) too high

Manual function monitoring can be carried out by pushing the test button.

Measuring system

The complete measuring system for level measurement detection consists of:
- a FQR50 emitter,
- a FDR50 receiver and
- a Nivotester FTR325 switch amplifier



Nivotester FTR325 with Silowave M microwave barrier

Optical or acoustic signal transmitters, gates, relays, magnetic valves, etc. can be connected to the Nivotester.

Characteristics

Measured value

A limit signal is generated when the microwave barrier is either inter-rupted or uninterrupted, depending on the type of limit signal selected.

Input signal

- FTR325 input:
  - Soliwave M microwave barrier
  - input galvanically isolated from power supply

Output signal

- Relay output:
  - galvanically isolated from power supply
  - a potential-free switching contact for the limit signal
  - a potential-free switching contact for fault notification

- Breaking capacity for relay contacts:
  U~ max. 253 VAC
  I~ max. 2 A (AC)
  P~ max. 500 VA (cos $\varphi \geq 0{,}7$)
  U– max. 40 VDC
  I– max. 2 A (DC)
  P– max. 80 W

- Service life: min. 10^5 switching operations at max. contact load

- Function indicators: LEDs for
  - On (green)
  - Limit signal (yellow)
  - Fault (red)

- Power for microwave barrier:
  - supplied by the Nivotester FTR325

Auxiliary energy

Supply voltage

- AC voltage model
  - Voltage range: 85 .. 253 VAC, 50/60 Hz
  - Power consumption: max. 1,75 W

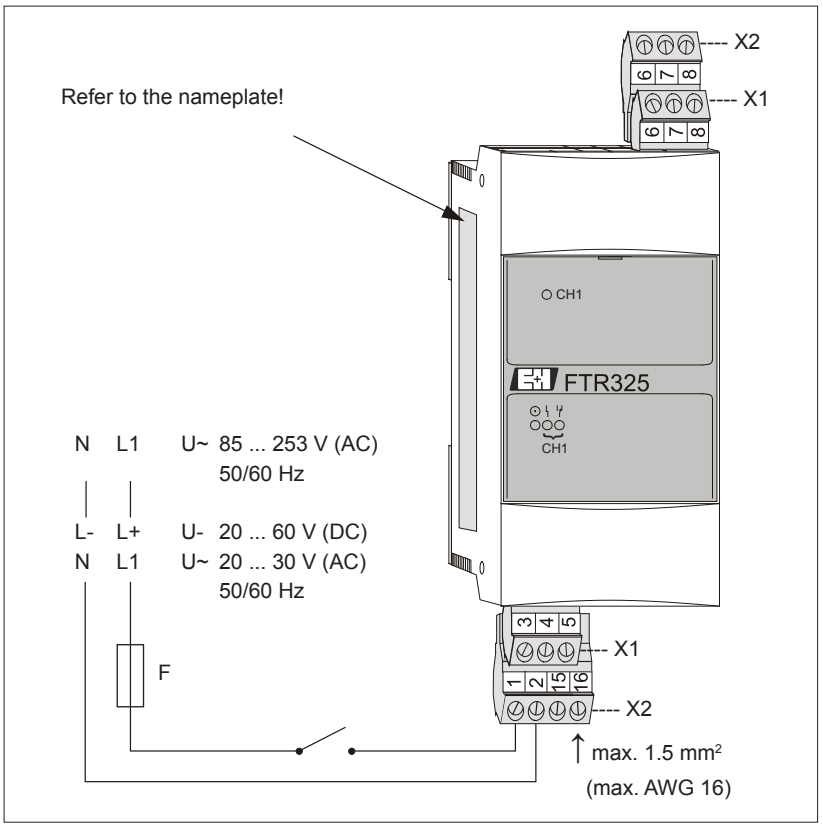
- DC voltage model
  - Voltage range: 20 .. 30 VAC / 20 .. 60 VDC
  - Power: max. 1,75 W
  - Verpolungsschutz

Electrical connection

Connecting cable

- Connecting cable: three-wire, shielded recommended
- Impedance: max. 25 Ω per wire
- Signal transmission: transistor output (open collector)

The supply voltage is attached to terminals 1&2. Internally there is a micro-fuse built into the supply voltage circuit so that only one fuse for short circuits in the feed line to the FTR325 must be upstream.



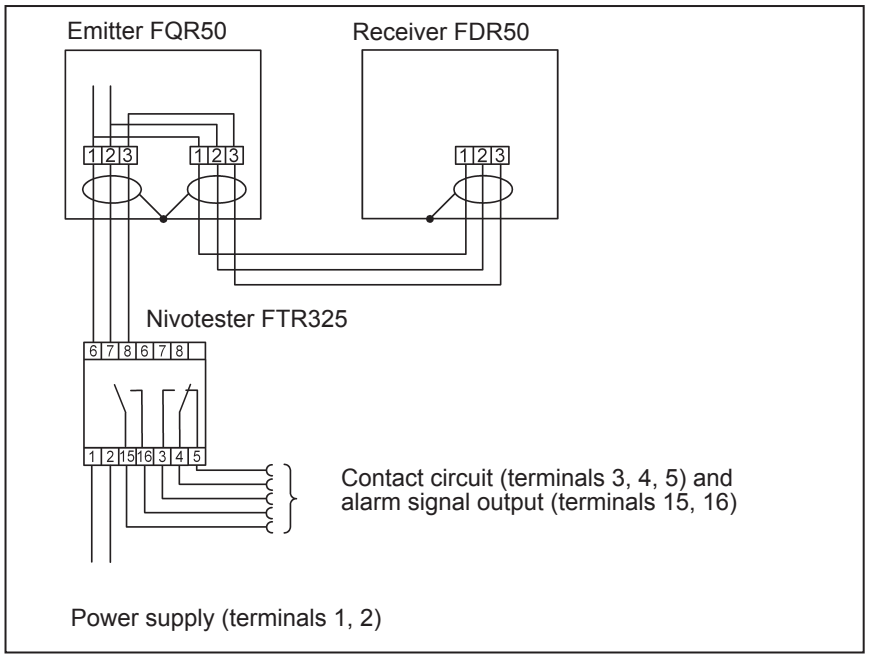
Connecting supply voltage

Wiring

When connected to the Nivotester FTR325 a Soliwave M microwave barrier can be wired via a choice of ring or star connection. Required backup power of 24 VDC ± 20% is provided by the FTR325.

Ring wiring

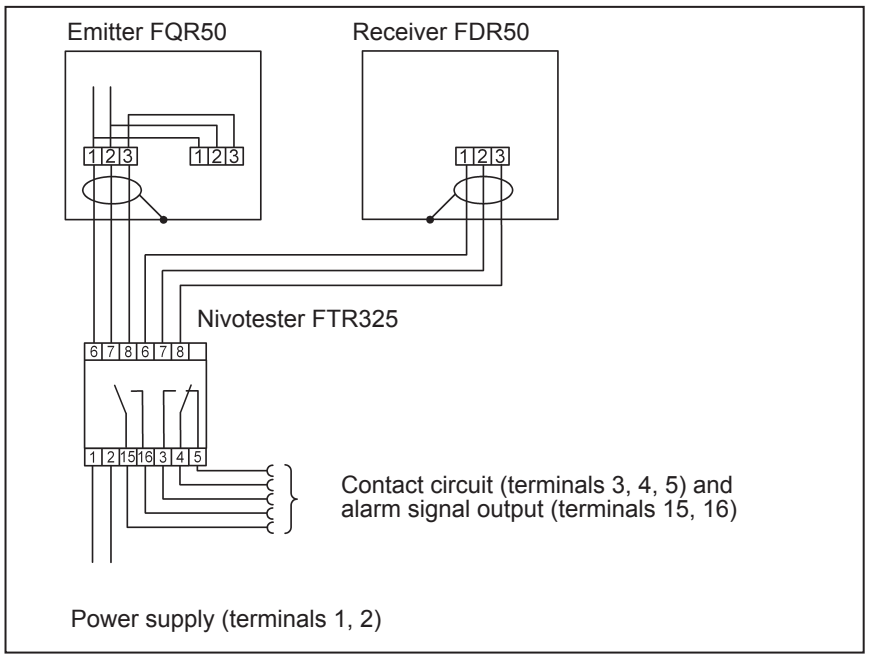
Wiring example 1:
Nivotester FTR325 with ring connection to Soliwave M microwave barrier



FTR325 with ring connection to Soliwave M

Star wiring

Wiring example 2:
Nivotester FTR325 with star connection to Soliwave M microwave barrier



FTR325 with star connection to Soliwave M

Controls and instrumentation

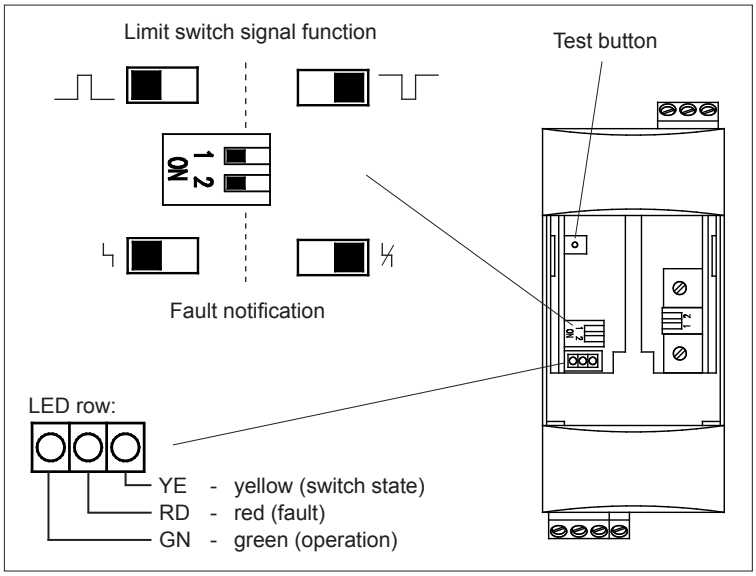
Control concept

On site adjustments using switches and potentiometers behind the hinged face plate.

Indicators

- Green LED: operational state
- Yellow LED: switching state
- Red LED: fault

Control elements



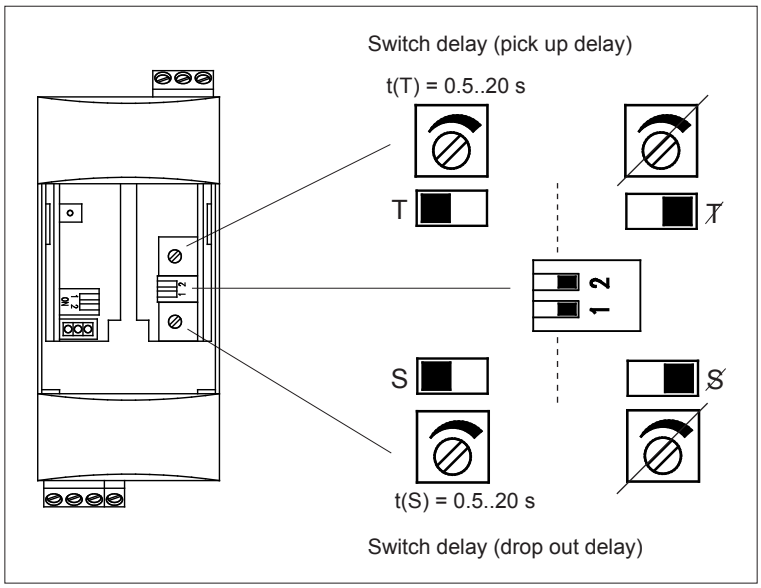
Control elements for limit switch signal, fault and test

- Limit switch signal function:
  - Switches the limit switch relay on or off when the microwave barrier is either interrupted or uninterrupted, depending on the type of limit signal selected.
  - Optical indication of switching state via yellow LED

- Fault notification:
  - When activated switches on the fault relay when a fault occurs
  - Optical indication of a fault via red LED

- Fault notification:
  - When activated switches on the fault relay when a fault occurs
  - Optical indication of a fault via red LED

You can find detailed information on the different settings options in the KA205F/97/a6 compact manual.



Control elements switch delay

- Switch delay (pick up delay):
  - When switch delay activated limit switch relay switches on pick up delay after time t(T)
  - Adjustable time: t(T) = 0.5 .. 20 s

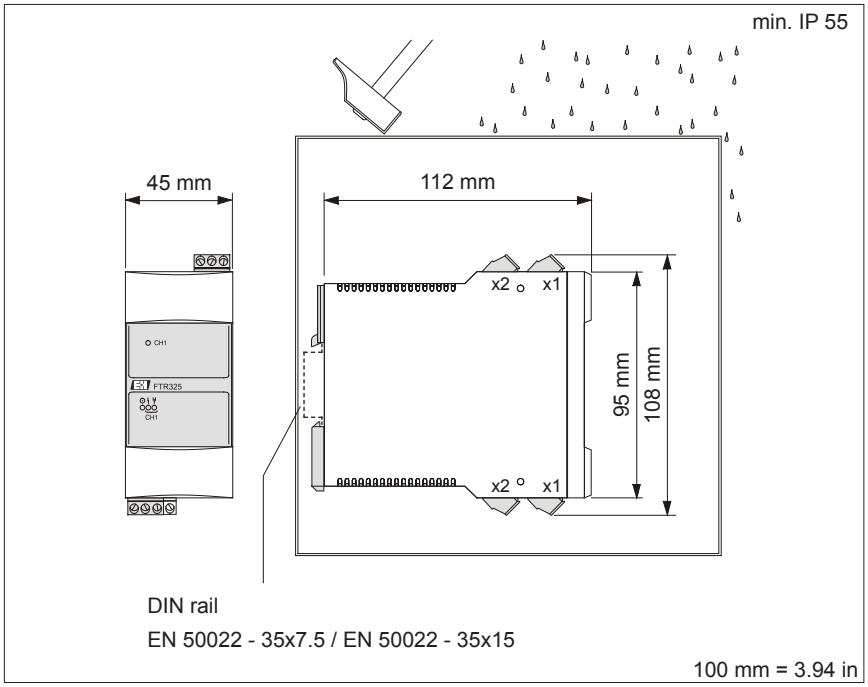
- Switch delay (drop out delay):
  - When switch delay activated limit switch relay switches off drop out delay after time t(S)
  - Adjustable time: t(S) = 0.5 .. 20 s

You can find detailed information on the different setting options in the KA205F/97/a6 compact manual.

Operating conditions

Installation location

The Nivotester FTR325 is mounted upright on a DIN rail (TS 35 as per EN 50022). A protective case (IP 65, see accessories) is available for external installation.



DIN rail mounting

Ambient conditions

When installed individually
- – 20°C ... + 60°C

When installed in-line without clearance spaces
- – 20°C ... + 50°C

When installed in protective case
- – 20°C ... + 40°C

Storage temperature
- – 20°C ... + 85°C (preferably at + 20°C)

Note!
If possible mount devices so that they are not subjected to direct sunlight. This applies especially to use in warmer climates.

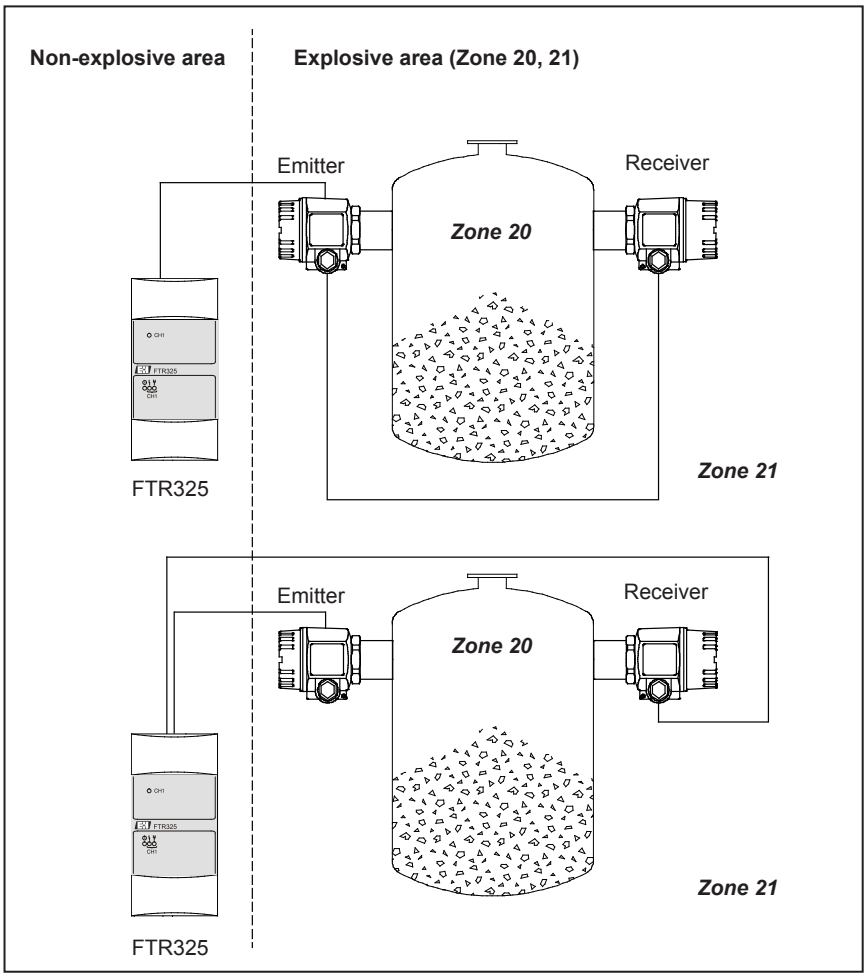
Protection type (according to EN 60529)

IP 20

Safety instructions

Installation

The Nivotester FTR325 may not be used in explosive areas.



Classification of zone areas of the measuring system

Safety notes for electrical equipment for potentially explosive atmospheres

- Incorrect use of the device poses a danger.
- The device may be installed, hooked up and put into operation only by qualified and authorized persons with special attention paid to
  - the operating manual,
  - the relevant standards and
  - legal rules and regulations.
- The Nivotester can be serviced by the manufacturer only.

Mechanical construction

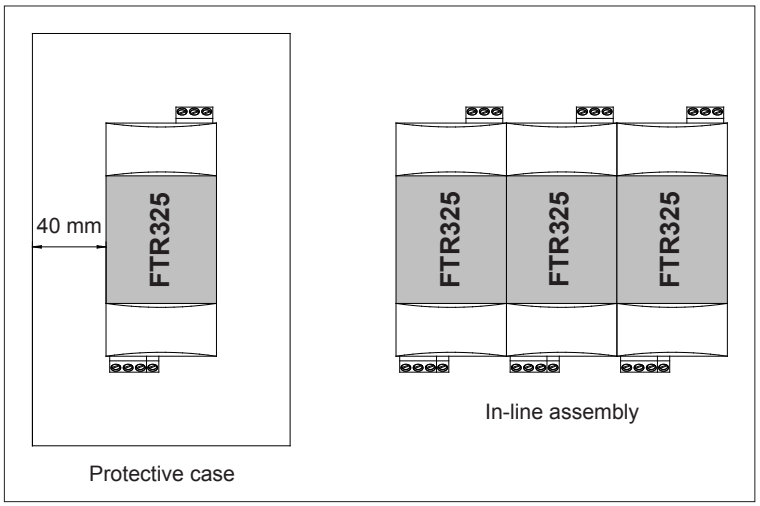
Structure shape

- Housing: In-line case (Minipac shape) made of plastic
- Installation: on DIN rails according to EN 50022 - 35 x 7.5 or EN 50022 - 35 x 15
- Protecting class according to EN 60529: IP 20

Materials

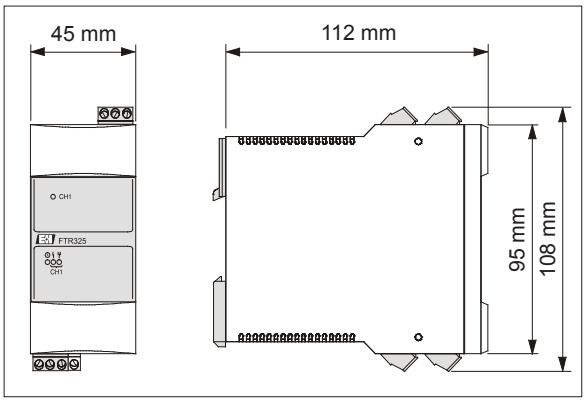
- Housing:
  - Polycarbonate
  - Color: Light grey, RAL 7035
- Front panel:
  - Polyamide PA6
  - Color: Blue, RAL 5012
- Mounting slide (for attaching to the DIN rail):
  - Polyamide PA6
  - Color: Black, RAL 9005

Clearances



Clearances

Dimensions



Dimensions

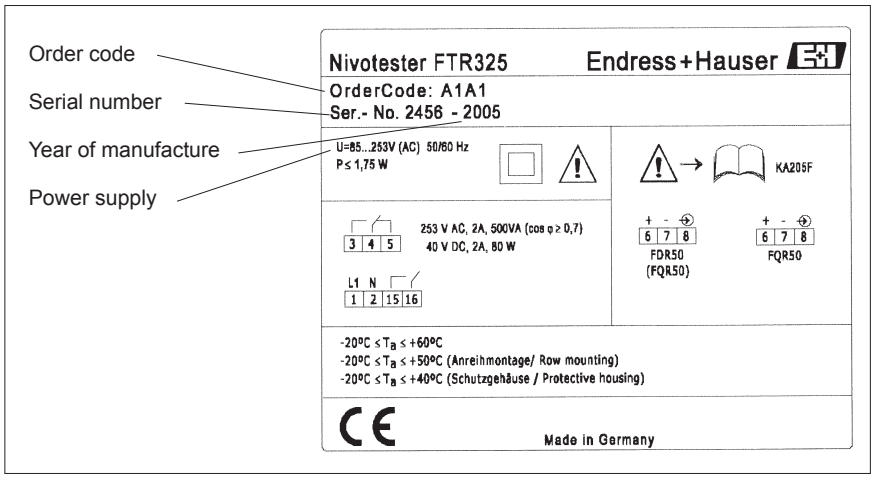
Ordering information

Ordering information Nivotester FTR325

10	**Certificate:**					
	A	Variants for the ex-free atmosphere				
	Y	Special version, to be specified				
20		**Model:**				
		1	DIN rail mounting, b = 45 mm			
		9	Special version, to be specified			
30			**Power supply:**			
			A	85 - 253 VAC, 50/60 Hz		
			E	20 - 60 VDC / 20 - 30 VAC, 50/60 Hz		
			Y	Special version, to be specified		
40				**Output:**		
				1	1x Filling level SPDT + 1x Alarm/filling level SPST	
				9	Special version, to be specified	
FTR325 -						Order code

Designation

Nameplate



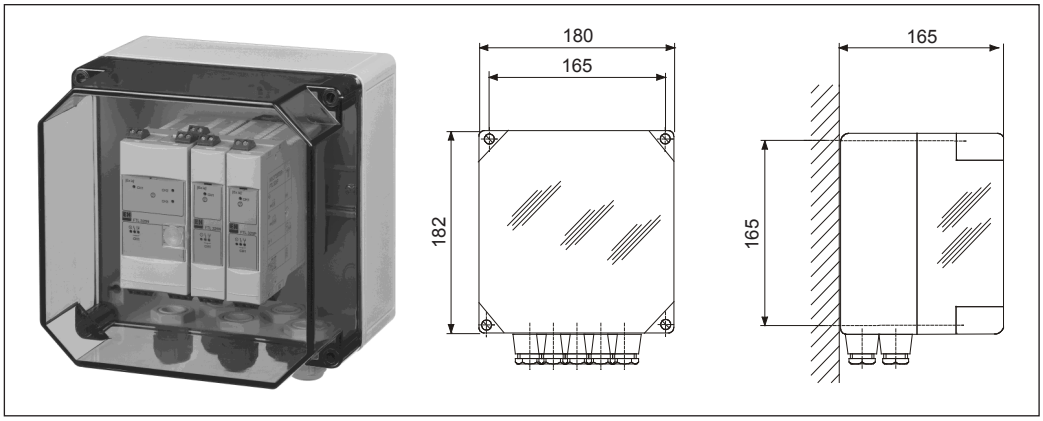
Nameplate FTR325

Accessories

Protective housing

A protective housing for field installation of top-hat rail devices e. g. Nivotester FTR325 is available.
In this housing there is space for several top-hat rail devices (to a maximum installation width of 145 mm).

- Technical data
  - Order code: 52010132
  - Protection type (according to EN 60529): IP 66
  - Lower housing section: fibre-glass reinforced polycarbonate, grey
  - Upper housing section: polycarbonate, transparent
  - Seal: PU seal
  - Top-hat rail (EN 50022): galvanized
  - Cable entries: 5 pieces M20 x 1.5



Protective housing for FTR325

Certificates and approvals

CE symbol

The Nivotester FTR325 fulfils the legal requirements of the EEC directives. The manufacturer confirms the successful examination of the equipment by using the CE mark.

External standards and directives

- **EN 60529**
  Type of protection housings (IP code)
- **EN 61010-1**
  Safety directives for electrical measuring, control, regulating and laboratory devices
- **EN 61326**
  Interference emissions (Equipment class B) and interference resistance (Attachment A – industrial systems)
- **RL 89/336/EWG**
  EMC guidelines

Supplementary documentation

Operating instructions (KA)

Nivotester FTR325
KA205F/97/a6

Soliwave M FQR50/FDR50
KA206F/97/a6

Technical informations

Soliwave M FQR50/FDR50
TI378F/97/de

Protective Housing for Field Installation of Top-hat Rail Devices
TI367F/00/de

Subject to modification

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InDesign 2.0.2