



Translation

(1)

EC-Type Examination Certificate

(2)

**- Directive 94/9/EC -
Equipment and protective systems intended for use
in potentially explosive atmospheres**

(3)

DMT 99 ATEX E 085

(4)

Equipment: Ultraschallsensor Prosonic Type FDU 83-* and Type FDU 84-*****

(5)

Manufacturer: Endress + Hauser GmbH + Co.

(6)

Address: D 79690 Maulburg

(7)

The design and construction of this equipment and any acceptable variation thereto are specified in the schedule to this type examination certificate.

(8)

The certification body of Deutsche Montan Technologie GmbH, notified body no. 0158 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in confidential test and assessment report BVS PP 99.2092 EG.

(9)

The Essential Health and Safety Requirements are assured by compliance with:
EN 50281-1-1:1998 (VDE 0170/0171 Teil 15-1-1/10.99) Electrical apparatus for use in the presence of
combustible dust, part 1-1: Electrical apparatus protected by enclosures,
Construction and testing

(10)

If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11)

This EC-Type Examination Certificate relates only to the design and construction of the specified equipment. Further requirements of Directive 94/9/EC apply to the manufacture and placing on the market of this equipment.

(12)

The marking of the equipment shall include the following:



II 1 / 2 D IP 68 T110 °C for Type FDU 83-***

II 1 / 2 D IP 68 T110 °C for Type FDU 84-***

Deutsche Montan Technologie GmbH

Essen, dated 01. December 1999

Signed: Dr. Jockers

Signed: Dr. Dill

DMT-Certification body

Head of special services unit

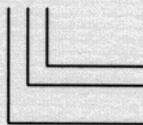
(13) Appendix to

(14) **EC-Type Examination Certificate**

DMT 99 ATEX E 085

(15) 15.1 Subject and Type

Ultrasonic sensor Prosonic
 type FDU 83 - * * * and
 type FDU 84 - * * *



cable length
 process connection
 certificate

15.2 Description

The Prosonic ultrasonic sensor type FDU 83-*** or type FDU 84-*** is a level measurement device based on ultrasonics and is used for non-contact level measurement in vessels of all types containing powdery or grainy bulk solids.

The enclosure consists of non-conductive plastic material which is completely covered by a membrane and a protective cover made of stainless steel as well as by a thread connector made of stainless steel or aluminium. The complete measurement system consists of the Prosonic ultrasonic sensor type FDU 83-*** or type FDU 84-*** and an evaluation and trigger unit Prosonic FMU 86* installed outside the explosion-hazardous area. The sensor and the evaluation and trigger unit are connected to each other by three-wire cabling.

15.3 Electrical, mechanical and thermal parameters

15.3.1 Electrical data

15.3.1.1 Emitting and signal circuit (FMU 86* for FDU 83-*** or FDU 84-***)

	FDU 83-***	FDU 84-***
Emitting voltage	≤ 55 V _{eff}	≤ 60 V _{eff}
NTC supply voltage	≤ DC 5,5 V	≤ DC 5,5 V
NTC measuring current	≤ 1 mA	≤ 1 mA

15.3.1.2 Piezo circuit

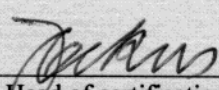
	FDU 83-***	FDU 84-***
Ultrasonic frequency (emitting frequency)ca.	30 kHz	ca. 21 kHz
Eff. emitting voltage	≤ 275 V _{eff}	≤ 300 V _{eff}
Pulse duration	≤ 0,8 ms	≤ 1,2 ms
Pulse pause	≥ 90 ms	≥ 140 ms
Eff. continuous power output (apparent outp.)	≤ 1,2 VA	≤ 1,8 VA

15.3.2	Thermal data	
15.3.2.1	Prosonic type FDU 83-***	
	Maximum surface temperature T of the sensor (category 1) at 40 °C ambient temperature	70 °C
	Maximum surface temperature T of the sensor (category 1) at 80 °C ambient temperature	110 °C
	Permitted ambient temperature at the sensor (category 1)	- 20 °C... + 80 °C
15.3.2.2	Prosonic type FDU 84-***	
	Maximum surface temperature T of the sensor (category 1) at 40 °C ambient temperature	71 °C
	Maximum surface temperature T of the sensor (category 1) at 80 °C ambient temperature	111 °C
	Permitted ambient temperature at the sensor (category 1)	- 20 °C... + 80 °C
15.3.3	Type of protection according to EN 60529	IP 68
(16)	<u>Test report</u> Nr. BVS PP 99.2092 EG 10 pages	
(17)	<u>Special conditions for safe use</u> Not applicable	


We confirm the correctness of the translation from the german original.
In the case of arbitration only the german wording shall be valid and binding.

45307 Essen, 01.12.1999
BVS-HK/Kn A 9900005

Deutsche Montan Technologie GmbH



Head of certification body



Head of special services unit