



Translation

EC-Type Examination Certificate

(1)

(2)

- Directive 94/9/EC -

**Equipment and protective systems intended for use
in potentially explosive atmospheres**

(3)

BVS 05 ATEX E 009

(4)

Equipment: Ultrasonic sensor type PROSONIC S FDU 9*.*

(5)

Manufacturer: Endress + Hauser GmbH + Co. KG

(6)

Address: D - 79689 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 EXAM BBG Prüf- und Zertifizier 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 the test and assessment report BVS PP 05.2017 EG.

(9)

The Essential Health and Safety Requirements are assured by compliance with:

EN 60079-0:2004 General requirements
EN 60079-18:2004 Encapsulation 'm'
EN 50281-1-1:1998 +A1 Dust explosion protection

(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, examination and tests of the specified equipment in accordance to Directive 94/9/EC.

Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate

(12)

The marking of the equipment shall include the following:



II 2 G Ex ma II T6/T5

Type FDU91/2-J*



II 1/2 D IP65 T see 15.3.2 or II 2 D IP65 T see 15.3.2

Type FDU91/2-E*, FDU93/5/6-J*



II 2 G Ex ma II T6/T5



II 1/2 D IP65 T see 15.3.2 or II 2 D IP65 T see 15.3.2

Type FDU93/5/6-E*, FDU96-F*

EXAM BBG Prüf- und Zertifizier GmbH

Bochum, dated 15. February 2005

Signed: Dr. Jockers

Certification body

Signed: Dr. Eickhoff

Special services unit

(13) Appendix to

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

BVS 05 ATEX E 009

(15) 15.1 Subject and type

Ultrasonic sensor type PROSONIC S FDU 9*.*

Type PROSONIC S FDU 91-abcde

- a – certificate
 - E – ATEX II 1/2 D or II 2 D IP65 T..., ATEX II 2 G Ex ma II T6
 - J – ATEX II 2 G Ex ma II T6
- b – process connection
- c – cable length
- d – heating
 - A –without heating
- e – additional options, without relevance for the explosion protection

Type PROSONIC S FDU 92-abcd

- a – certificate
 - E – ATEX II 1/2 D or II 2 D IP65 T..., ATEX II 2 G Ex ma II T6
 - J – ATEX II 2 G Ex ma II T6
- b – process connection
- c – cable length
- d – additional options, without relevance for the explosion protection

Type PROSONIC S FDU 93-abcd

- a – certificate
 - E – ATEX II 1/2 D or II 2 D IP65 T...
 - J – ATEX II 1/2 D or II 2 D IP65 T..., ATEX II 2 G Ex ma II T6
- b – process connection
- c – cable length
- d – additional options, without relevance for the explosion protection

Type PROSONIC S FDU 95-abcde

- a – certificate
 - E – ATEX II 1/2 D or II 2 D IP65 T...
 - J – ATEX II 1/2 D or II 2 D IP65 T..., ATEX II 2 G Ex ma II T6
- b – temperature version
 - 1 – -40 °C...+ 80 °C
 - 2 – -40 °C...+130 °C
- c – process connection
- d – cable length
- e – additional options, without relevance for the explosion protection

Type PROSONIC S FDU 96-abcde

- a – certificate
 - E – ATEX II 1/2 D or II 2 D IP65 T...
 - F – ATEX II 1/2 D or II 2 D IP65 T...
 - J – ATEX II 1/2 D or II 2 D IP65 T..., ATEX II 2 G Ex ma II T6
- b – process connection
- c – cable length
- d – additional options, without relevance for the explosion protection

Alignment unit type FAU40-ab

a – process connection

b – sensor connection

15.2 Description

The ultrasonic sensor type Prosonic S FDU 9*-* is a level transmitter for non-contact level measurement of liquids and solids stored in vessels or silos of all kind as well as flow measurements over open channels or conveyor belts.

The sensor consist of a polymeric enclosure, a membrane on the lower end of the sensor and a process connection at the top. The sensor is rated category 1D or 2G, the process connection and the cable is rated category 2D or 2G.

The sensor can be installed with the help of the alignment unit type FAU40-**.

All sensors are fitted with a non-removable pigtail cable. The complete measuring system consists of the ultrasonic sensor type Prosonic S FDU 9*-* and an evaluating transmitter unit (e.g. Prosonic S FMU 90 or FMU 95) which is installed outside the hazardous area.

15.3 Parameters

15.3.1 Electrical data

15.3.1.1 Emitting and signal circuit for connection to Prosonic S FMU90/95

15.3.1.1.1 PROSONIC S FDU 91-*

operation voltage	≤	50	V _{eff}
operation frequency		43,0	kHz
power consumption of probe	≤	0,4	W

15.3.1.1.2 PROSONIC S FDU 92-*

operation voltage	≤	50	V _{eff}
operation frequency		30,5	kHz
power consumption of probe	≤	0,9	W

15.3.1.1.3 PROSONIC S FDU 93-*

operation voltage	≤	50	V _{eff}
operation frequency		27,3	kHz
power consumption of probe	≤	0,7	W

15.3.1.1.4 PROSONIC S FDU 95-*1

operation voltage	≤	50	V _{eff}
operation frequency		17,1	kHz
power consumption of probe	≤	0,7	W

15.3.1.1.5 PROSONIC S FDU 95-*2

operation voltage	≤	50	V _{eff}
operation frequency		18,1	kHz
power consumption of probe	≤	0,7	W

15.3.1.1.6 PROSONIC S FDU 96-*

operation voltage	≤	50	V _{eff}
operation frequency		10,9	kHz
power consumption of probe	≤	0,7	W

15.3.1.2 NTC/sensor identification circuit

operation voltage

≤ 12 V

mean power

≤ 0,4 mW

15.3.2 Thermal data

15.3.2.1 Ambient temperature/temperature class

Sensor type PROSONIC S	temperature class			
	T6	T5	T4	T3
	permissible ambient temperature			
FDU 91-J**A* FDU 91-E**A*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C...+80 °C	-40 °C...+80 °C
FDU 92-J* FDU 92-E*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C...+80 °C	-40 °C...+80 °C
FDU 93-J*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C...+80 °C	-40 °C...+80 °C
FDU 95-J*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C...+80 °C	-40 °C...+80 °C
FDU 96-J*	-40 °C...+75 °C	-40 °C...+90 °C	-40 °C...+125 °C	-40 °C...+140 °C

15.3.2.2 Maximum surface temperature

Sensor type PROSONIC S	permissible ambient temperature	max. surface temperature ²⁾ sensor cat. 1D	max. surface temperature ²⁾ sensor cat. 2D
FDU 91-E**A*	-40 °C...+ 80 °C	100 °C ¹⁾	100 °C
FDU 92-E*	-40 °C...+ 80 °C	100 °C ¹⁾	100 °C
FDU 93-J* FDU 93-E*	-40 °C...+ 80 °C	100 °C ¹⁾	100 °C
FDU 95-J1* FDU 95-E1*	-40 °C...+ 80 °C	100 °C ¹⁾	100 °C
FDU 95-E2*	-40 °C...+ 130 °C	165 °C ¹⁾	165 °C
FDU 96-J* FDU 96-E	-40 °C...+ 140 °C	168 °C ¹⁾	168 °C
FDU 96-F	-40 °C...+ 80 °C	105 °C ¹⁾	105 °C

¹⁾ thermal fuse

²⁾ at maximum permissible ambient temperature

15.3.3 Degrees of protection according to EN 60529 IP65

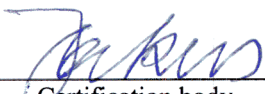
(16) Test and assessment report
BVS PP 05.2017 EG as of 15.02.2005

(17) Special conditions for safe use
None

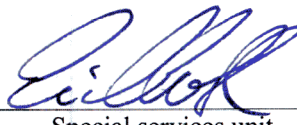
We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

44809 Bochum, 15. February 2005
BVS-Hk/Kw A 20040357

EXAM BBG Prüf- und Zertifizier GmbH



Certification body



Special services unit



Translation

1st Supplement

(Supplement in accordance with Directive 94/9/EC Annex III number 6)

**to the EC-Type Examination Certificate
BVS 05 ATEX E 009**

Equipment: Ultraschallsensor type PROSONIC S FDU 91, 92, 93, 95, 96
Manufacturer: Endress + Hauser GmbH + Co. KG
Address: 79690 Maulburg, Germany

Description

The operation voltage will be 55 V_{eff}.

The Ultrasonic sensor type PROSONIC S FDU 9*-* will be manufactured according to the documentation below.

The Essential Health and Safety Requirements of the modified equipment are assured by compliance with:

EN 60079-0:2004	General requirements
EN 60079-18:2004	Encapsulation 'm'
EN 50281-1-1:1998 +A1	Dust explosion protection

Parameters

Emitting and signal circuit for connection to Prosonic S FMU90/95

PROSONIC S FDU 91-*

operation voltage	≤	55 V _{eff}
operation frequency		43,0 kHz
power consumption of probe	≤	0,4 W

PROSONIC S FDU 92-*

operation voltage	≤	55 V _{eff}
operation frequency		30,5 kHz
power consumption of probe	≤	0,9 W

PROSONIC S FDU 93-*

operation voltage	≤	55 V _{eff}
operation frequency		27,3 kHz
power consumption of probe	≤	0,7 W

PROSONIC S FDU 95-*1

operation voltage	≤	55 V _{eff}
operation frequency		17,1 kHz
power consumption of probe	≤	0,7 W

PROSONIC S FDU 95-*2

operation voltage	≤	55 V _{eff}
operation frequency		18,1 kHz
power consumption of probe	≤	0,7 W

PROSONIC S FDU 96-*

operation voltage	≤	55	V _{eff}
operation frequency		10,9	kHz
power consumption of probe	≤	0,7	W

NTC/sensor identification circuit

operation voltage	≤	12	V
mean power	≤	0,4	mW

Thermal data without change

The marking has not changed:



II 2 G Ex ma II T6/T5

type FDU91/2-J*

Special conditions for safe use
none

Test and assessment report
BVS PP 05.2017 EG as of 14.12.2005

EXAM BBG Prüf- und Zertifizier GmbH

Bochum, dated 14. December 2005

Signed: Dr. Jockers

Certification body

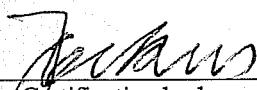
Signed: Dr. Eickhoff

Special services unit

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.

44809 Bochum, 14.12.2005
BVS-Hk/Mi A 20050603

EXAM BBG Prüf- und Zertifizier GmbH


Certification body


Special services unit



Translation

2nd Supplement

(Supplement in accordance with Directive 94/9/EC Annex III number 6)

**to the EC-Type Examination Certificate
BVS 05 ATEX E 009**

Equipment: Ultrasonic sensor type PROSONIC S FDU 9*-*
Manufacturer: Endress + Hauser GmbH + Co. KG
Address: 79689 Maulburg, Germany

Description

Type PROSONIC S FDU 91F-**** made of stainless steel is added to the Ultrasonic sensor.
The Ultrasonic sensor type PROSONIC S FDU 92-****, type PROSONIC S FDU 96-**** and
type PROSONIC S FDU 95-*2*** can also be manufactured according to the documentation below.

The complete model code is as follows

Ultrasonic sensor type PROSONIC S FDU 9*-*

Type PROSONIC S FDU 91-abcde

- a – certificate
 - E – ATEX II 1/2 D or II 2D IP65 T..., ATEX II 2 G Ex ma II T6
 - J – ATEX II 2 G Ex ma II T6
- b – process connection
- c – cable length
- d – heating
 - A – without heating
- e – additional options, without relevance for the explosion protection

Type PROSONIC S FDU 91F-abcd

- a – certificate
 - E – ATEX II 1/2 D or II 2D IP65 T..., ATEX II 2 G Ex ma II T6
 - J – ATEX II 2 G Ex ma II T6
- b – process connection
- c – cable length
- d – additional options, without relevance for the explosion protection

Type PROSONIC S FDU 92-abcd

- a – certificate
 - E – ATEX II 1/2 D or II 2 D IP65 T..., ATEX II 2 G Ex ma II T6
 - J – ATEX II 2 G Ex ma II T6
- b – process connection
- c – cable length
- d – additional options, without relevance for the explosion protection

Type PROSONIC S FDU 93-abcd

- a – certificate
 - E – ATEX II 1/2 D or II 2 D IP65 T...
 - J – ATEX II 1/2 D or II 2 D IP65 T..., ATEX II 2 G Ex ma II T6
- b – process connection
- c – cable length
- d – additional options, without relevance for the explosion protection

Type PROSONIC S FDU 95-abcde

- a – certificate
 - E – ATEX II 1/2 D or II 2 D IP65 T...
 - J – ATEX II 1/2 D or II 2 D IP65 T..., ATEX II 2 G Ex ma II T6
- b – temperature version
 - 1 – -40 °C...+80 °C
 - 2 – -40 °C...+130 °C
- c – process connection
- d – cable length
- e – additional options, without relevance for the explosion protection

Type PROSONIC S FDU 96-abcd

- a – certificate
 - E – ATEX II 1/2 D or II 2 D IP65 T...
 - F – ATEX II 1/2 D or II 2 D IP65 T...
 - J – ATEX II 1/2 D or II 2 D IP65 T..., ATEX II 2 G Ex ma II T6
- b – process connection
- c – cable length
- d – additional options, without relevance for the explosion protection

alignment unit type FAU40-ab

- a – process connection
- b – sensor connection

The Essential Health and Safety Requirements of the modified equipment are assured by compliance with:

EN 60079-0:2004	General requirements
EN 60079-18:2004	Encapsulation 'm'
EN 50281-1-1:1998 +A1	Dust explosion protection

Parameters

Electrical data

Emitting and signal circuit for connection to Prosonic S FMU90/95

PROSONIC S FDU 91-*

operation voltage	≤	55	V _{eff}
operation frequency		43,0	kHz
power consumption of probe	≤	0,4	W

PROSONIC S FDU 91F-*

operation voltage	≤	55	V _{eff}
operation frequency		42,0	kHz
power consumption of probe	≤	0,9	W

PROSONIC S FDU 92-*

operation voltage	≤	55	V _{eff}
operation frequency		30,5	kHz
power consumption of probe	≤	0,9	W

PROSONIC S FDU 93-*

operation voltage	≤	55	V _{eff}
operation frequency		27,3	kHz
power consumption of probe	≤	0,7	W

PROSONIC S FDU 95-#1

operation voltage	≤	50	V _{eff}
operation frequency		17,1	kHz
power consumption of probe	≤	0,7	W

PROSONIC S FDU 95-#2

operation voltage	≤	50	V _{eff}
operation frequency		18,1	kHz
power consumption of probe	≤	0,7	W

PROSONIC S FDU 96-*

operation voltage	≤	50	V _{eff}
operation frequency		10,9	kHz
power consumption of probe	≤	0,7	W

NTC/sensor identification circuit

operation voltage	≤	12	V
mean power	≤	0,4	mW

Thermal data
Ambient temperature/temperature class

Sensor type PROSONIC S	temperature class			
	T6	T5	T4	T3
	permissible ambient temperature			
FDU 91-J**A* FDU 91-E**A*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C...+80 °C	-40 °C...+80 °C
FDU 91F-J* FDU 91F-E*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C...+80 °C	-40 °C...+80 °C
FDU 92-J* FDU 92-E*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C...+80 °C	-40 °C...+80 °C
FDU 93-J*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C...+80 °C	-40 °C...+80 °C
FDU 95-J*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C...+80 °C	-40 °C...+80 °C
FDU 96-J*	-40 °C...+75 °C	-40 °C...+90 °C	-40 °C...+125 °C	-40 °C...+140 °C

Maximum surface temperature

Sensor type PROSONIC S	permissible ambient temperature	max. surface temperature ²⁾ sensor category 1D	max. surface temperature ²⁾ sensor category 2D
FDU 91-E**A*	- 40 °C...+ 80 °C	100 °C ¹⁾	100 °C
FDU 91F-E*	- 40 °C...+ 80 °C	100 °C ¹⁾	100 °C
FDU 92-E*	- 40 °C...+ 80 °C	100 °C ¹⁾	100 °C
FDU 93-J* FDU 93-E*	- 40 °C...+ 80 °C	100 °C ¹⁾	100 °C
FDU 95-J1* FDU 95-E1*	- 40 °C...+ 80 °C	100 °C ¹⁾	100 °C
FDU 95-E2*	- 40 °C...+ 130 °C	165 °C ¹⁾	165 °C
FDU 96-J* FDU 96-E	- 40 °C...+ 140 °C	168 °C ¹⁾	168 °C
FDU 96-F	- 40 °C...+ 80 °C	105 °C ¹⁾	105 °C

¹⁾ thermal fuse

²⁾ at maximum permissible ambient temperature

Degrees of protection according to EN 60529

IP65

The marking has not changed:

Type FDU91/2-J*, FDU91F-J*

 **II 2 G Ex ma II T6/T5**

Type FDU91/2-E*, FDU91F-E*, FDU93/5/6-J*

 **II 2 G Ex ma II T6/T5**
II 1/2 D IP65 T see manual or
II 2 D IP65 T see manual

Type FDU93/5/6-E*, FDU96-F*

 **II 1/2 D IP65 T** see manual or
II 2 D IP65 T see manual

Special conditions for safe use
 none

Test and assessment report
 BVS PP 05.2017 EG as of 07.06.2006

EXAM BBG Prüf- und Zertifizier GmbH

Bochum, dated 07. June 2006

Signed: Dr. Jockers

Signed: Dr. Eickhoff

Certification body

Special services unit

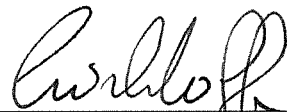
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44809 Bochum, 07.06.2006
BVS-Hk/Mi A 20060286

EXAM BBG Prüf- und Zertifizier GmbH



Certification body



Special services unit



Translation
3rd Supplement

(Supplement in accordance with Directive 94/9/EC Annex III number 6)

to the EC-Type Examination Certificate
BVS 05 ATEX E 009

Equipment: Ultrasonic sensor type PROSONIC S FDU 9*-*

Manufacturer: Endress + Hauser GmbH + Co. KG

Address: 79689 Maulburg, Germany

Description

The Ultrasonic sensor type PROSONIC S FDU 91-***** can alternatively be equipped with an additional heating. The type code for this version is PROSONIC S FDU 91-***B*.

The compliance with the maximum temperature is guaranteed by a thermo fuse.

The thermal data change and are listed in clause 4.2 of the test and assessment report.

The sensor PCB was changed slightly.

The complete model code is as follows

Ultrasonic sensor type PROSONIC S FDU 9*-*

Type PROSONIC S FDU 91-abcde

- a – certificate
 - E – ATEX II 1/2 D or II 2D IP65 T..., ATEX II 2 G Ex ma II T6
 - J – ATEX II 2 G Ex ma II T6
- b – process connection
- c – cable length
- d – heating
 - A – without heating
 - B – with heating (DC 24V)
- e – additional options, without relevance for the explosion protection

Type PROSONIC S FDU 91F-abcd

- a – certificate
 - E – ATEX II 1/2 D or II 2D IP65 T..., ATEX II 2 G Ex ma II T6
 - J – ATEX II 2 G Ex ma II T6
- b – process connection
- c – cable length
- d – additional options, without relevance for the explosion protection

Type PROSONIC S FDU 92-abcd

- a – certificate
 - E – ATEX II 1/2 D or II 2 D IP65 T..., ATEX II 2 G Ex ma II T6
 - J – ATEX II 2 G Ex ma II T6
- b – process connection
- c – cable length
- d – additional options, without relevance for the explosion protection

Type PROSONIC S FDU 93-abcd

- a – certificate
 - E – ATEX II 1/2 D or II 2 D IP65 T...
 - J – ATEX II 1/2 D or II 2 D IP65 T..., ATEX II 2 G Ex ma II T6
- b – process connection
- c – cable length
- d – additional options, without relevance for the explosion protection

Type PROSONIC S FDU 95-abcde

- a – certificate
 - E – ATEX II 1/2 D or II 2 D IP65 T...
 - J – ATEX II 1/2 D or II 2 D IP65 T..., ATEX II 2 G Ex ma II T6
- b – temperature version
 - 1 – -40 °C...+ 80 °C
 - 2 – -40 °C...+130 °C
- c – process connection
- d – cable length
- e – additional options, without relevance for the explosion protection

Type PROSONIC S FDU 96-abcd

- a – certificate
 - E – ATEX II 1/2 D or II 2 D IP65 T...
 - F – ATEX II 1/2 D or II 2 D IP65 T...
 - J – ATEX II 1/2 D or II 2 D IP65 T..., ATEX II 2 G Ex ma II T6
- b – process connection
- c – cable length
- d – additional options, without relevance for the explosion protection

Alignment unit type FAU40-ab

- a – process connection
- b – sensor connection

The Essential Health and Safety Requirements of the modified equipment are assured by compliance with:

EN 60079-0:2004	General requirements
EN 60079-18:2004	Encapsulation 'm'
EN 50281-1-1:1998 +A1	Dust explosion protection

Parameters

Electrical data

Emitting and signal circuit for connection to Prosonic S FMU90/95

PROSONIC S FDU 91-*

operation voltage	≤	55	V _{eff}
operation frequency		43,0	kHz
power consumption of probe	≤	0,4	W

heating circuit

operation voltage	24	V
current	220	mA

PROSONIC S FDU 91F-*

operation frequency		42,0 kHz
power consumption of probe	≤	0,9 W

PROSONIC S FDU 92-*

operation voltage	≤	55 V _{eff}
operation frequency		30,5 kHz
power consumption of probe	≤	0,9 W

PROSONIC S FDU 93-*

operation voltage	≤	55 V _{eff}
operation frequency		27,3 kHz
power consumption of probe	≤	0,7 W

PROSONIC S FDU 95-*1

operation voltage	≤	55 V _{eff}
operation frequency		17,1 kHz
power consumption of probe	≤	0,7 W

PROSONIC S FDU 95-*2

operation voltage	≤	55 V _{eff}
operation frequency		18,1 kHz
power consumption of probe	≤	0,7 W

PROSONIC S FDU 96-*

operation voltage	≤	55 V _{eff}
operation frequency		10,9 kHz
power consumption of probe	≤	0,7 W

NTC/sensor identification circuit

operation voltage	≤	12 V
mean power	≤	0,4 mW

Thermal data

Ambient temperature/temperature class

Sensor type PROSONIC S	temperature class			
	T6	T5	T4	T3
	permissible ambient temperature			
FDU 91-J**A* FDU 91-E**A* (without heating)	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C...+80 °C	-40 °C...+80 °C
FDU 91-J**B* FDU 91-E**B* (with heating)	-40 °C...+40 °C	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C...+80 °C
FDU 91F-J* FDU 91F-E*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C...+80 °C	-40 °C...+80 °C
FDU 92-J* FDU 92-E*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C...+80 °C	-40 °C...+80 °C
FDU 93-J*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C...+80 °C	-40 °C...+80 °C
FDU 95-J*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C...+80 °C	-40 °C...+80 °C
FDU 96-J*	-40 °C...+75 °C	-40 °C...+90 °C	-40 °C...+125 °C	-40 °C...+140 °C

Maximum surface temperature

Sensor type PROSONIC S	permissible ambient temperature	max. surface temperature ²⁾ sensor category 1D	max. surface temperature ²⁾ sensor category 2D
FDU 91-E**A* (without heating)	- 40 °C...+ 80 °C	100 °C ¹⁾	100 °C
FDU 91-E**B* (with heating)	- 40 °C...+ 80 °C	110 °C ¹⁾	100 °C
FDU 91F-E*	- 40 °C...+ 80 °C	100 °C ¹⁾	100 °C
FDU 92-E*	- 40 °C...+ 80 °C	100 °C ¹⁾	100 °C
FDU 93-J* FDU 93-E*	- 40 °C...+ 80 °C	100 °C ¹⁾	100 °C
FDU 95-J1* FDU 95-E1*	- 40 °C...+ 80 °C	100 °C ¹⁾	100 °C
FDU 95-E2*	- 40 °C...+ 130 °C	165 °C ¹⁾	165 °C
FDU 96-J* FDU 96-E	- 40 °C...+ 140 °C	168 °C ¹⁾	168 °C
FDU 96-F	- 40 °C...+ 80 °C	105 °C ¹⁾	105 °C

¹⁾ thermal fuse

²⁾ at maximum permissible ambient temperature

Degrees of protection according to EN 60529

IP65

The marking has not changed:

Type FDU91/2-J*, FDU91F-J*

 **II 2 G Ex ma II T6/T5**

Type FDU91/2-E*, FDU91F-E*, FDU93/5/6-J*

 **II 2 G Ex ma II T6/T5**
 **II 1/2 D IP65 T** see manual or
II 2 D IP65 T see manual

Type FDU93/5/6-E*, FDU96-F*

 **II 1/2 D IP65 T** see manual or
II 2 D IP65 T see manual

Special conditions for safe use

none

Test and assessment report

BVS PP 05.2017 EG as of 18.06.2007

DEKRA EXAM GmbH

Bochum, dated 18. June 2007

Signed: Dr. Jockers

Certification body

Signed: Dr. Eickhoff

Special services unit

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.

44809 Bochum, 18.06.2007

BVS-Hk/Ar A 20060843

DEKRA EXAM GmbH



Certification body



Special services unit



4th Supplement

(Supplement in accordance with Directive 94/9/EC Annex III number 6)

to the EC-Type Examination Certificate BVS 05 ATEX E 009

Equipment: Ultrasonic sensor type PROSONIC S FDU 9

Manufacturer: Endress + Hauser GmbH + Co. KG

Address: 79689 Maulburg, Germany

Description

The reason for this supplement is the up rating to the current standards and the addition of type PROSONIC S FDU 90*.

The complete model code is as follows:

Ultrasonic sensor type PROSONIC S FDU 9*-*

Type PROSONIC S FDU 90-abcde

- a – certificate
 - E – ATEX II 1/2D Ex ta/tb IIIC T... Da/Db IP65, ATEX II 2D Ex tb IIIC T... Db IP65
 - ATEX II 2G Ex ma IIC T5 Gb
 - J – ATEX II 2G Ex ma IIC T5 Gb
- b – process connection
- c – cable length
- d – heating
 - A –without heating
 - B –with heating (DC 24 V)
- e – additional options, without relevance for the explosion protection

Type PROSONIC S FDU 91-abcde

- a – certificate
 - E – ATEX II 1/2D Ex ta/tb IIIC T... Da/Db IP65, ATEX II 2D Ex tb IIIC T... Db IP65
 - ATEX II 2G Ex ma IIC T6 Gb
 - J – ATEX II 2G Ex ma IIC T6 Gb
- b – process connection
- c – cable length
- d – heating
 - A –without heating
 - B –with heating (DC 24 V)
- e – additional options, without relevance for the explosion protection

Type PROSONIC S FDU 91F-abcd

- a – certificate
 - E – ATEX II 1/2D Ex ta/tb IIIC T... Da/Db IP65, ATEX II 2D Ex tb IIIC T... Db IP65
 - ATEX II 2G Ex ma IIC T6 Gb
 - J – ATEX II 2G Ex ma IIC T6 Gb
- b – process connection
- c – cable length
- d – additional options, without relevance for the explosion protection

Type PROSONIC S FDU 92-abcd

- a – certificate
 - E – ATEX II 1/2 D Ex ta/tb IIIC T... Da/Db IP65, ATEX II 2D Ex tb IIIC T... Db IP65
 - ATEX II 2 G Ex ma IIC T6 Gb
 - J – ATEX II 2 G Ex ma IIC T6 Gb
- b – process connection
- c – cable length
- d – additional options, without relevance for the explosion protection

Type PROSONIC S FDU 93-abcd

- a – certificate
 - E – ATEX II 1/2 D Ex ta/tb IIIC T... Da/Db IP65, ATEX II 2D Ex tb IIIC T... Db IP65
 - J – ATEX II 1/2 D Ex ta/tb IIIC T... Da/Db IP65, ATEX II 2D Ex tb IIIC T... Db IP65
 - ATEX II 2 G Ex ma IIC T6 Gb
- b – process connection
- c – cable length
- d – additional options, without relevance for the explosion protection

Type PROSONIC S FDU 95-abcde

- a – certificate
 - E – ATEX II 1/2 D Ex ta/tb IIIC T... Da/Db IP65, ATEX II 2D Ex tb IIIC T... Db IP65
 - J – ATEX II 1/2 D Ex ta/tb IIIC T... Da/Db IP65, ATEX II 2D Ex tb IIIC T... Db IP65
 - ATEX II 2 G Ex ma IIC T6 Gb
- b – temperature version
 - 1 – -40 °C... +80 °C
 - 2 – -40 °C...+130 °C
- c – process connection
- d – cable length
- e – additional options, without relevance for the explosion protection

Type PROSONIC S FDU 96-abcde

- a – certificate
 - E – ATEX II 1/2 D Ex ta/tb IIIC T... Da/Db IP65 (-40°C ≤ Ta ≤ 140°C)
 - ATEX II 2D Ex tb IIIC T... Db IP65 (-40°C ≤ Ta ≤ 140°C)
 - F – ATEX II 1/2 D Ex ta/tb IIIC T... Da/Db IP65 (-40°C ≤ Ta ≤ 80°C)
 - ATEX II 2D Ex tb IIIC T... Db IP65 (-40°C ≤ Ta ≤ 80°C)
 - J – ATEX II 1/2 D Ex ta/tb IIIC T... Da/Db IP65, ATEX II 2D Ex tb IIIC T... Db IP65
 - ATEX II 2 G Ex ma IIC T6 Gb
- b – process connection
- c – cable length
- d – additional options, without relevance for the explosion protection

alignment unit type FAU40-ab

- a – process connection
- b – sensor connection

Parameters

Electrical data

Emitting and signal circuit for connection to Prosonic S FMU90/95

PROSONIC S FDU 90-*

operation voltage	≤	55	V _{eff}
operation frequency		90	kHz
power consumption of probe	≤	0.9	W

heating circuit

operation voltage	24	V
current	220	mA

PROSONIC S FDU 91-*

operation voltage	≤	55	V _{eff}
operation frequency		43.0	kHz
power consumption of probe	≤	0.4	W

heating circuit

operation voltage	24	V
current	220	mA

PROSONIC S FDU 91F-*

operation voltage	≤	55	V _{eff}
operation frequency		42.0	kHz
power consumption of probe	≤	0.9	W

PROSONIC S FDU 92-*

operation voltage	≤	55	V _{eff}
operation frequency		30.5	kHz
power consumption of probe	≤	0.9	W

PROSONIC S FDU 93-*

operation voltage	≤	55	V _{eff}
operation frequency		27.3	kHz
power consumption of probe	≤	0.7	W

PROSONIC S FDU 95-*1

operation voltage	≤	55	V _{eff}
operation frequency		17.1	kHz
power consumption of probe	≤	0.7	W

PROSONIC S FDU 95-*2

operation voltage	≤	55 V _{eff}
operation frequency		18.1 kHz
power consumption of probe	≤	0.7 W

PROSONIC S FDU 96-*

operation voltage	≤	55 V _{eff}
operation frequency		10.9 kHz
power consumption of probe	≤	0.7 W

NTC/sensor identification circuit

operation voltage	≤	12 V
mean power	≤	0.4 mW

Thermal data

Ambient temperature/temperature class

Sensor type PROSONIC S	temperature class			
	T6	T5	T4	T3
	permissible ambient temperature			
FDU 90-J**A* FDU 90-E**A* (without heating)	-	-40 °C...+60 °C	-40 °C... +80 °C	-40 °C... +80 °C
FDU 90-J**B* FDU 90-E**B* (with heating)	-	-40 °C...+60 °C	-40 °C... +80 °C	-40 °C... +80 °C
FDU 91-J**A* FDU 91-E**A* (without heating)	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C... +80 °C	-40 °C... +80 °C
FDU 91-J**B* FDU 91-E**B* (with heating)	-40 °C...+40 °C	-40 °C...+60 °C	-40 °C... +80 °C	-40 °C... +80 °C
FDU 91F-J* FDU 91F-E*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C... +80 °C	-40 °C... +80 °C
FDU 92-J* FDU 92-E*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C... +80 °C	-40 °C... +80 °C
FDU 93-J*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C... +80 °C	-40 °C... +80 °C
FDU 95-J*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C... +80 °C	-40 °C... +80 °C
FDU 96-J*	-40 °C...+75 °C	-40 °C...+90 °C	-40 °C...+125 °C	-40 °C...+140 °C

Maximum surface temperature

Sensor type PROSONIC S	permissible ambient temperature	max. surface temperature ²⁾ sensor category 1D	max. surface temperature ²⁾ sensor category 2D
FDU 90-E**A* (without heating)	-40 °C... +60 °C	100 °C ¹⁾	100 °C
FDU 90-E**B* (with heating)	-40 °C... +60 °C	110 °C ¹⁾	100 °C
FDU 91-E**A* (without heating)	-40 °C... +80 °C	100 °C ¹⁾	100 °C
FDU 91-E**B* (with heating)	-40 °C... +80 °C	110 °C ¹⁾	100 °C
FDU 91F-E*	-40 °C... +80 °C	100 °C ¹⁾	100 °C
FDU 92-E*	-40 °C... +80 °C	100 °C ¹⁾	100 °C
FDU 93-J* FDU 93-E*	-40 °C... +80 °C	100 °C ¹⁾	100 °C
FDU 95-J1* FDU 95-E1*	-40 °C... +80 °C	100 °C ¹⁾	100 °C
FDU 95-E2*	-40 °C...+130 °C	165 °C ¹⁾	165 °C
FDU 96-J* FDU 96-E	-40 °C...+140 °C	168 °C ¹⁾	168 °C
FDU 96-F	-40 °C... +80 °C	105 °C ¹⁾	105 °C

¹⁾ thermal fuse

²⁾ at maximum permissible ambient temperature

Degrees of protection according to EN 60529

IP65

The Essential Health and Safety Requirements of the modified equipment are assured by compliance with:

EN 60079-0:2009 General requirements
EN 60079-18:2010 Encapsulation
EN 60079-31:2009 Protection by enclosures

The marking of the equipment shall include the following:

Type FDU90-J*, FDU91/2-J*, FDU91F-J*

 **II 2G Ex ma IIC T6/T5 Gb**

Type FDU90-E*, FDU91/2-E*, FDU91F-E*, FDU93/5/6-J*

 **II 2G Ex ma IIC T6/T5 Gb**
 **II 1/2D Ex ta/tb IIIC T_{see manual} Da/Db IP65 or**
II 2D Ex tb IIIC T_{see manual} Db IP65

Type FDU93/5/6-E*, FDU96-F*

 **II 1/2D Ex ta/tb IIIC T_{see manual} Da/Db IP65 or**
II 2D Ex tb IIIC T_{see manual} Db IP65

Special conditions for safe use

None

Test and assessment report

BVS PP 05.2017 EG as of 17.11.2010

DEKRA EXAM GmbH

Bochum, dated 17. November 2010

Signed: Simanski

Certification body

Signed: Dr. Eickhoff

Special services unit

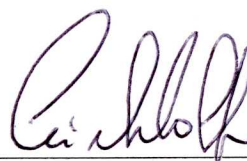
We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

44809 Bochum, 17.11.2010
BVS-Hk/Her A 20090470

DEKRA EXAM GmbH

A blue ink signature of 'Simanski' written in a cursive script.

Certification body

A blue ink signature of 'Dr. Eickhoff' written in a cursive script.

Special services unit

Translation

EU-Type Examination Certificate Supplement 5

Change to Directive 2014/34/EU

Equipment intended for use in potentially explosive atmospheres
Directive 2014/34/EU

EU-Type Examination Certificate Number: **BVS 05 ATEX E 009**

Product: **Ultrasonic sensor type PROSONIC S FDU 9*-***

Manufacturer: **Endress+Hauser SE+Co. KG**

Address: **Hauptstr. 1, 79689 Maulburg, Germany**

This supplementary certificate extends EC-Type Examination Certificate No. BVS 05 ATEX E 009 to apply to products designed and constructed in accordance with the specification set out in the appendix of the said certificate but having any acceptable variations specified in the appendix to this certificate and the documents referred to therein.

DEKRA Testing and Certification GmbH, Notified Body number 0158, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential Report No. BVS PP 05.2017 EU.

The Essential Health and Safety Requirements are assured in consideration of:

EN IEC 60079-0:2018

EN 60079-18:2015 + A1:2017

EN 60079-31:2014

General requirements

Encapsulation "m"

Protection by Enclosure "t"

If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Special Conditions for Use specified in the appendix to this certificate.

This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

The marking of the product shall include the following:

 II 2G Ex ma IIC T6/T5 Gb	Type FDU90-J*, FDU91/2-J*, FDU91F-J*
 II 1/2D Ex ta/tb IIIC T see 4.2 Da/Db or II 2D Ex tb IIIC T see 4.2 Db II 2G Ex ma IIC T6/T5 Gb	Type FDU90-E*, FDU91/2-E*, FDU91F-E*, FDU93/5/6-J*:
 II 1/2 D Ex ta/tb IIIC T see 4.2 Da/Db or II 2D Ex tb IIIC T see 4.2 Db	Type FDU93/5/6-E*, FDU96-F*:

DEKRA Testing and Certification GmbH
Bochum, 2021-05-17

Signed: Jörg-Timm Kilisch

Managing Director



Page 1 of 6 of BVS 05 ATEX E 009 / N5 – Jobnumber 342022000
This certificate may only be reproduced in its entirety and without any change.

DEKRA Testing and Certification GmbH, Handwerkstr. 15, 70565 Stuttgart, Germany
Certification body: Dinnendahlstr. 9, 44809 Bochum, Germany
Phone +49.234.3696-400, Fax +49.234.3696-401, e-mail DTC-Certification-body@dekra.com

13 **Appendix**

14 **EU-Type Examination Certificate**

BVS 05 ATEX E 009
Supplement 5

15 **Product description**

15.1 **Subject and type**

Ultrasonic sensor

Type PROSONIC S FDU 91-abcde

- a – Certificate
 - E – ATEX II 1/2D Ex ta/tb IIIC T... Da/Db, ATEX II 2D Ex tb IIIC T... Db
 - ATEX II 2G Ex ma IIC T6 Gb
 - J – ATEX II 2G Ex ma IIC T6 Gb
- b – Process connection
- c – Cable length
- d – Heating
 - A –without heating
 - B –with heating (DC 24 V)
- e – Additional options, without relevance for the explosion protection

Type PROSONIC S FDU 91F-abcd

- a – certificate
 - E – ATEX II 1/2D Ex ta/tb IIIC T... Da/Db, ATEX II 2D Ex tb IIIC T... Db
 - ATEX II 2G Ex ma IIC T6 Gb
 - J – ATEX II 2G Ex ma IIC T6 Gb
- b – Process connection
- c – Cable length
- d – Additional options, without relevance for the explosion protection

Type PROSONIC S FDU 92-abcd

- a – Certificate
 - E – ATEX II 1/2 D Ex ta/tb IIIC T... Da/Db, ATEX II 2D Ex tb IIIC T... Db
 - ATEX II 2 G Ex ma IIC T6 Gb
 - J – ATEX II 2 G Ex ma IIC T6 Gb
- b – Process connection
- c – Cable length
- d – Additional options, without relevance for the explosion protection

Type PROSONIC S FDU 93-abcd

- a – Certificate
 - E – ATEX II 1/2 D Ex ta/tb IIIC T... Da/Db, ATEX II 2D Ex tb IIIC T... Db
 - J – ATEX II 1/2 D Ex ta/tb IIIC T... Da/Db, ATEX II 2D Ex tb IIIC T... Db
 - ATEX II 2 G Ex ma IIC T6 Gb
- b – Process connection
- c – Cable length
- d – Additional options, without relevance for the explosion protection

Type PROSONIC S FDU 95-abcde

- a – Certificate
 - E – ATEX II 1/2 D Ex ta/tb IIIC T... Da/Db, ATEX II 2D Ex tb IIIC T... Db
 - J – ATEX II 1/2 D Ex ta/tb IIIC T... Da/Db, ATEX II 2D Ex tb IIIC T... Db
 - ATEX II 2 G Ex ma IIC T6 Gb
- b – Temperature version
 - 1 – -40 °C... +80 °C
 - 2 – -40 °C...+130 °C
- c – Process connection
- d – Length
- e – Additional options, without relevance for the explosion protection

Type PROSONIC S FDU 96-abcde

- a – Certificate
 - E – ATEX II 1/2 D Ex ta/tb IIIC T... Da/Db ($-40\text{ °C} \leq T_a \leq 140\text{ °C}$)
ATEX II 2D Ex tb IIIC T... Db ($-40\text{ °C} \leq T_a \leq 140\text{ °C}$)
 - F – ATEX II 1/2 D Ex ta/tb IIIC T... Da/Db ($-40\text{ °C} \leq T_a \leq 80\text{ °C}$)
ATEX II 2D Ex tb IIIC T... Db ($-40\text{ °C} \leq T_a \leq 80\text{ °C}$)
 - J – ATEX II 1/2 D Ex ta/tb IIIC T... Da/Db, ATEX II 2D Ex tb IIIC T... Db
ATEX II 2 G Ex ma IIC T6 Gb
- b – Process connection
- c – Cable length
- d – Additional options, without relevance for the explosion protection

Alignment unit type FAU40-ab

- a – Process connection
- b – Sensor connection

15.2 Description

With this supplement the certificate is changed to Directive 2014/34/EU.
(Annotation: In accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Supplementary Certificates to such EC-Type Examination Certificates, and new issues of such certificates, may continue to bear the original certificate number issued prior to 20 April 2016.)

Description of Product

The ultrasonic sensor type Prosonic S FDU 9*-* is a level transmitter for non-contact level measurement of liquids and solids stored in vessels or silos of all kind as well as flow measurements over open channels or conveyor belts.

The sensor consist of a polymeric enclosure, a membrane on the lower end of the sensor and a process connection at the top. The sensor corresponds EPL Da or Gb, the process connection and the cable corresponds Db or Gb.

The sensor can be installed with the help of the alignment unit type FAU40-**.

All sensors are fitted with a non-removable pigtail cable. The complete measuring system consists of the ultrasonic sensor type Prosonic S FDU 9*-* and an evaluating transmitter unit (e.g. Prosonic S FMU 90 or FMU 95) which is installed outside the hazardous area.

Reasons for the supplement:

- Change to Directive 2014/34/EU
- Updating to the current standards

15.3 Parameters

15.3.1 Electrical data

15.3.1.1 Emitting and signal circuit for connection to Prosonic S FMU90/95

15.3.1.1.1 PROSONIC S FDU 90-*

Operation voltage	≤	55	V _{eff}
Operation frequency		90	kHz
Power consumption of probe	≤	0.9	W
Heating circuit			
Operation voltage		24	V
Current		220	mA

15.3.1.1.2	PROSONIC S FDU 91-*			
	Operation voltage	≤	55	V _{eff}
	Operation frequency		43.0	kHz
	Power consumption of probe	≤	0.4	W
	Heating circuit			
	Operation voltage		24	V
	Current		220	mA
15.3.1.1.3	PROSONIC S FDU 91F-*			
	Operation voltage	≤	55	V _{eff}
	Operation frequency		42.0	kHz
	Power consumption of probe	≤	0.9	W
15.3.1.1.4	PROSONIC S FDU 92-*			
	Operation voltage	≤	55	V _{eff}
	Operation frequency		30.5	kHz
	Power consumption of probe	≤	0.9	W
15.3.1.1.5	PROSONIC S FDU 93-*			
	Operation voltage	≤	55	V _{eff}
	Operation frequency		27.3	kHz
	Power consumption of probe	≤	0.7	W
15.3.1.1.6	PROSONIC S FDU 95-*1			
	Operation voltage	≤	55	V _{eff}
	Operation frequency		17.1	kHz
	Power consumption of probe	≤	0.7	W
15.3.1.1.7	PROSONIC S FDU 95-*2			
	Operation voltage	≤	55	V _{eff}
	Operation frequency		18.1	kHz
	Power consumption of probe	≤	0.7	W
15.3.1.1.8	PROSONIC S FDU 96-*			
	Operation voltage	≤	55	V _{eff}
	Operation frequency		10.9	kHz
	Power consumption of probe	≤	0.7	W
15.3.1.2	NTC/sensor identification circuit			
	Operation voltage	≤	12	V
	Mean power	≤	0.4	mW

15.3.2 Thermal data

15.3.2.1 Ambient temperature/temperature class

Sensor type PROSONIC S	Temperature class			
	T6	T5	T4	T3
	Permissible ambient temperature			
FDU 90-J**A* FDU 90-E**A* (without heating)	-	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C... +80 °C
FDU 91-J**A* FDU 91-E**A* (without heating)	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C...+80 °C	-40 °C... +80 °C
FDU 90-J**B* FDU 90-E**B* (with heating)	-	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C... +80 °C
FDU 91-J**B* FDU 91-E**B* (with heating)	-40 °C...+40 °C	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C... +80 °C
FDU 91F-J* FDU 91F-E*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C...+80 °C	-40 °C... +80 °C
FDU 92-J* FDU 92-E*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C...+80 °C	-40 °C... +80 °C
FDU 93-J*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C...+80 °C	-40 °C... +80 °C
FDU 95-J*	-40 °C...+60 °C	-40 °C...+80 °C	-40 °C...+80 °C	-40 °C... +80 °C
FDU 96-J*	-40 °C...+75 °C	-40 °C...+90 °C	-40 °C...+125 °C	-40 °C...+140 °C

15.3.2.2 Maximum surface temperature

Sensor type PROSONIC S	Permissible ambient temperature	Max. surface temperature ²⁾ sensor category 1D	Max. surface temperature ²⁾ sensor category 2D
FDU 90-E**A* (without heating)	-40 °C...+60 °C	100 °C ¹⁾	100 °C
FDU 90-E**B* (with heating)	-40 °C...+60 °C	110 °C ¹⁾	110 °C
FDU 91-E**A* (without heating)	-40 °C...+80 °C	100 °C ¹⁾	100 °C
FDU 91-E**B* (with heating)	-40 °C...+80 °C	110 °C ¹⁾	100 °C
FDU 91F-E*	-40 °C...+80 °C	100 °C ¹⁾	100 °C
FDU 92-E*	-40 °C... +80 °C	100 °C ¹⁾	100 °C
FDU 93-J* FDU 93-E*	-40 °C... +80 °C	100 °C ¹⁾	100 °C
FDU 95-J1* FDU 95-E1*	-40 °C... +80 °C	100 °C ¹⁾	100 °C
FDU 95-E2*	-40 °C...+130 °C	165 °C ¹⁾	165 °C
FDU 96-J* FDU 96-E	-40 °C...+140 °C	168 °C ¹⁾	168 °C
FDU 96-F	-40 °C... +80 °C	105 °C ¹⁾	105 °C

¹⁾ Thermal fuse

²⁾ At maximum permissible ambient temperature

15.3.3 Degrees of protection according to EN 60529

IP65

16 **Report Number**

BVS PP 05.2017 EU, as of 2021-05-17

17 **Special Conditions for Use**

None

18 **Essential Health and Safety Requirements**

The Essential Health and Safety Requirements are covered by the standards listed under item 9.

19 **Drawings and Documents**

Drawings and documents are listed in the confidential report.

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.

DEKRA Testing and Certification GmbH
Bochum, 2021-05-17
BVS-Hk/MGR A20200892



Managing Director