IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx BKI 17.0005X

Issue No: 1

Certificate history:
Issue No. 1 (2018-04-04)
Issue No. 0 (2017-11-06)

Status: **Current**

Date of Issue: **2018-04-04**

Applicant: **TP Radio**
Agenavej 37
DK-2670 Greve
Denmark

Equipment: **UHF / VHF hand-held radio type TP9000EX (variants : RE-930/7EX and RE-930/2EX)**

Optional accessory: *charger (BL910 type) , USB-Serial converter, Hand microphone type HM930EX; Switch box type SW910EX ... SW919EX*

Type of Protection: **General requirements, Intrinsically safe**

Marking:

Ex ib I
Ex ib IIC T4
Ex ib IIIC T110°C

$-20\ °C \leq T_{amb} \leq +55\ °C$

Approved for issue on behalf of the IECEx Certification Body: Edit Molnár

Position: Head of the Certification Body

Signature:
(for printed version)

Date: 2018-04-04

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

Testing Station for Explosion Proof Equipment
H 1037 BUDAPEST
MIKOVINY S.u. 2-4
Hungary

Robbanásbiztos Berendezések BKI Vizsgáló Állomása Ex

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Manufacturer: **TP Radio**
Agenavej 37
DK-2670 Greve
Denmark

Additional Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:

The apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2017 Edition:7.0	Explosive atmospheres - Part 0: Equipment - General requirements
IEC 60079-11 : 2011 Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

HU/BKI/ExTR17.0004/00 HU/BKI/ExTR17.0004/01

Quality Assessment Report:

SE/RISE/QAR17.0002/00

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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The TP9000EX type (placed on the market under the trademark "Thor 1") 16-channel, battery-powered intrinsically safe hand-held radio can be operated in the following frequency ranges:
RE-930/7EX type equipment variant : UHF : 406 – 470 MHz,
RE-930/2EX type equipment variant : VHF : 145 – 174 MHz

See details in Addendum to IECEx BKI 17.0005 X.

SPECIFIC CONDITIONS OF USE: YES as shown below:

- Charging the battery unit type BP930EX must be done only with BL910 type charger.
Do not charge the battery in potentially hazardous area and outside temperature range +10°C to +40°C.

- The USB-Serial converter for programming the apparatus must be used only outside potentially hazardous areas.

See details in Addendum to IECEx BKI 17.0005 X.

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

Issue 1

- introduction of hand microphone type HM-930EX and switch box series SW910EX...SW919EX as accessories
- use of "O"-rings at the sealings of the radio apparatus

See details in Addendum to IECEx BKI 17.0005X Issue 1.

Annex:

Addendum to IECEx BKI 17.0005 X.pdf

Addendum to IECEx BKI 17.0005X Issue 1.pdf

ADDENDUM TO IECEx CERTIFICATE OF CONFORMITY

IECEx BKI 17.0005 X

1. Description

The TP9000EX type (placed on the market under the trademark "Thor 1") 16-channel, battery-powered intrinsically safe hand-held radio can be operated in the following frequency ranges:

- RE-930/7EX type equipment variant: UHF : 406 – 470 MHz ,
- RE-930/2EX type equipment variant: VHF : 145 – 174 MHz .

The radiofrequency output power of the apparatus: < 2 W .

The parts of radio are installed in an antistatic plastic housing.

Ingress protection of the equipment: IP 67

Electrical shock protection: SELV / safe extra low voltage / - IEC 364-4-41

2. Type assortment:

Type	Characteristics
RE-930/7EX type equipment variant	UHF frequency range : 406 – 470 MHz, operation mode : simplex / semi-duplex, bandwith : 64 MHz
RE-930/2EX type equipment variant	VHF frequency range : 145 – 174 MHz, operation mode : simplex / semi-duplex, bandwith : 29 MHz

3. Electrical data

The equipment is powered by a battery pack (accumulator unit) , for that the following cells are allowed :

- manufacturer : Panasonic
- type : 3 pcs. NCA 622944SA cells (prismatic, Li-ion) connected in parallel
- nominal cell voltage : 3,6 V
- nominal total capacity : 3000 mAh

The intrinsically safe design allows the removable battery pack of equipment to be replaced in potentially hazardous areas.

4. Ambient temperature range

$-20\ °C \leq T_{amb} \leq +55\ °C$

5. Special conditions for safe use

- Charging the battery unit type BP930EX must be done only with BL910 type charger.
  Do not charge the battery in potentially hazardous area and outside temperature range +10°C to +40°C.
- The USB-Serial converter for programming the apparatus must be used only outside potentially hazardous areas.

6. Manufacturer's Documents

Title:	Drawing No.:	Rev. Level:	Date:
General description	DD-0050	rev. 0.2	2017.10.23.
General description – insulation and clearance	DD-0101	rev. 0.0	2016.12.01.
Controller – Energy and barriers description	DD-0102	rev. 0.0	2016.12.09.
Radio – energy description	DD-0103	rev. 0.0	2017.04.25.
Battery – energy and barriers description	DD-0104	rev. 0.0	2016.12.07.
Parts list configuration tree	DD-0116	rev. 0.1	2017.01.26.
2M radio – list of items	RE930_2EX	rev. 0.1	2017.04.21.
UHF radio – list of items	RE930_7EX	rev. 0.0	2016.12.22.
UHF radio, SMD mounted PCB – list of items	TP-1497EX	rev. 0.0	2016.12.20.
2M radio, SMD mounted PCB – list of items	TP-1510EX	rev. 0.1	2017.04.21.
UHF radio, hand mounted PCB – list of items	TP-2497EX	rev. 0.0	2016.12.20.
2M radio, hand mounted PCB – list of items	TP-2510EX	rev. 0.1	2017.04.21.
Controller, SMD, bottom side – parts list, IS	TP-1497BEX	rev. 0.0	2016.11.21.
Controller board, power supply resp. loudspeaker's amplifier – schematic diagram	EA3-0490 pages 2, 3, 5, 6, 12	rev. 0.0	2016.12.20.
	pages 1, 8, 9, 10, 11	rev. 0.1	2017.01.20.
	page 4	rev. 0.1	2017.05.18.
Controller board, MCU circuit – schematic diagram	EA3-0491 pages 1, 2, 3	rev. 0.0	2016.12.20.
Controller board, audio circuit – schematic diagram	EA3-0493 pages 1, 2, 3	rev. 0.0	2016.12.20.
Connection of key PCB	EA4-0497	rev. 0.0	2016.10.29.
Interface PCB	EA4-0498	rev. 0.0	2015.11.16.
Controller board – clearance between IS areas	DD-0092	rev. 0.1	2017.05.08.
Controller board – coated areas	DD-0093	rev. 0.1	2017.05.08.
Controller board – component layout	DD-0094	rev. 0.1	2017.05.08.
Controller board – design rule report	DD-0114	rev. 0.1	2017.05.08.
Controller board – PCB specification	DD-0105 TP497E	rev. 0.1	2017.05.07.
Interface Flex – PCB specification	DD-0106 TP503A	rev. 0.0	2016.12.12.
PCB specification	DD-0118 TP510B	rev. 0.1	2017.07.02.
UHF radio, RF circuit description	DD-0110	rev. 0.0	2016.08.17.
UHF radio, RF circuit – design rule report	DD-0111	rev. 0.2	2017.06.26.
UHF radio, RF circuit – temperature calculations	DD-0112	rev. 0.1	2017.03.03.
UHF radio, RF circuit – temperature measurements	DD-0113	rev. 0.1	2017.03.03.
UHF radio, RF circuit – SMD assembly : RF, top side , IS	TP-1497TEX	rev. 0.1	2017.03.03.

Title:	Drawing No.:	Rev. Level:	Date:
UHF radio, RF circuit – schematic diagram	EA3-0494 page 1/4	rev. 0.2	2017.06.26.
UHF radio, RF circuit – IS components (table, evaluations)	EA3-0494 page 2/4	rev. 0.2	2017.06.26.
UHF radio, RF circuit – non-IS components (table, evaluations)	EA3-0494 page 3/4	rev. 0.2	2017.06.26.
UHF radio, RF circuit – clearances	EA3-0494 page 4/4	rev. 0.2	2017.06.26.
UHF radio, RF circuit – component layout	DD-0099	rev. 0.2	2017.07.03.
UHF radio, RF circuit – coated areas	DD-0100	rev. 0.2	2017.07.03.
2M radio, RF circuit – design rule report	DD-0120	rev. 0.0	2017.06.29.
2M radio, RF circuit – temperature calculations	DD-0121	rev. 0.1	2017.06.28.
2M radio, RF circuit – temperature measurements	DD-0122	rev. 0.1	2017.04.10.
2M radio, RF circuit – "how 2M differ from UHF"	DD-0126	rev. 1.0	2017.05.20.
2M radio, RF circuit – SMD assembly : RF, top side, IS	TP-1510TEX	rev. 0.0	2017.04.06.
2M radio, RF circuit – schematic diagram	EA3-0503 page 1/4	rev. 1.0	2017.06.28.
2M radio, RF circuit – IS components (table, evaluations)	EA3-0503 page 2/4	rev. 0.1	2017.03.03.
2M radio, RF circuit – non-IS components (table, evaluations)	EA3-0503 page 3/4	rev. 0.0	2017.04.07.
2M radio, RF circuit – clearances	EA3-0503 page 4/4	rev. 0.0	2017.04.07.
2M radio, RF circuit – board component layout	DD-0123	rev. 0.0	2017.07.03.
2M radio, RF circuit – differences from UHF	DD-0127	rev. 1.0	2017.06.30.
TP-492E battery safety circuit – circuit description	DD-0080	rev. 2.0	2017.09.08.
TP-492E battery safety circuit – parts list SMD	TP-1492	rev. 2.0	2017.09.07.
TP-492E battery safety circuit – safety component parts list SMD	DD-0081	rev. 2.0	2017.09.08.
TP-492E battery safety circuit – test principles	DD-0082	rev. 2.0	2017.09.08.
TP-492E battery safety circuit – schem. diagr., tables, evaluations	EA3-0488	rev. 2.0	2017.09.07.
TP-496E battery unit "Flex PCB" connection	EA4-0502	rev. 0.0	2017.06.07.
TP-492E battery safety circuit – component layout	DD-0084	rev. 2.0	2017.09.08.
TP-492E Battery safety circuit – layout & clearance	DD-0083	rev. 2.0	2017.09.08.
TP-492E Battery safety circuit – PCB specification	DD-0085	rev. 2.0	2017.09.07.
Battery safety circuit, thermal test report TP-492D	DD-0071	rev. 0.0	2016.05.17.
TP-496E "flex" PCB – component layout	DD-0086	rev. E	2017.06.01.
TP-496E "flex" PCB – layout & clearance	DD-0087	rev. E	2017.06.01.
TP-496E "flex" PCB – PCB specification	DD-0088	rev. 1.1	2017.06.01.
Stiffer on TP496	MA4-1609	rev. C	2017.06.08.
Radio, assembly drawing – IS parts list	MA4-1540	rev. A	2017.06.07.
RE-930-7EX batch and serie nr. label	MA4-1631	rev. B	2017.10.06.
RE-930-2EX batch and serie nr. label	MA4-1641	rev. B	2017.10.06.
Front text	MA4-1729		2017.10.09.
Battery, assembly drawing – IS parts list	MA4-1535	rev. A	2017.03.24.
BP930Ex batch nr. label	MA4-1630	rev. C	2017.10.24.
Battery, outside text	MA4-1722		2017.09.04.
Controller – IS circuit test	PV-1351	rev. 0.1	2017.07.12.
Production test – production testing all safety circuits	DD-0129	rev. 0.0	2017.09.06.
Test fixture for controller part	EA4-0510	rev. 1	2017.07.12.
Test fixture for the radio	A3-0504		2017.04.11.
User's guide (except : basic information and safety aspects)	TP9000EX Basic User Guide	vers. 1.11	2017.10.11.

as well as : data sheet of built-in components and applied materials

Accessories :

BL910 charger, TP-494C PCB circuit & test description	DD-0108	rev. 1.1	2017.09.12.
TP-494C charger – Zener barrier test report	DD-0079	rev. 0.0	2016.11.15.
TP-494C charger – SMD parts list, IS	TP-1494EX / DD-0117	rev. 0.0	2016.12.12.
TP-494C charger – schematic diagram	EA3-0501	rev. 1.2	2017.09.11.
TP-494C charger – component layout	DD-0090	rev. 1.2	2017.09.13.
TP-494C charger – layout & clearance	DD-0091	rev. 0.0	2016.12.08.
USB-Serial – SMD assembly parts list, IS	TP-1505EX	rev. 0.1	2017.01.18.
USB-Serial – schematic diagram	EA4-0500	rev. 0.1	2017.01.17.
USB-Serial – PCB specification	DD-0115	rev. 0.0	2016.12.19.
USB-Serial – creepage distances	DD-0097	rev. 0.0	2016.11.24.
USB-Serial – component layout	DD-0098	rev. 0.0	2016.11.24.

ADDENDUM TO IECEx CERTIFICATE OF CONFORMITY

IECEx BKI 17.0005 X Issue 1

1. Description

The following changes are introduced in this 1st issue of IECEx BKI 17.0005X:

- introduction of 2 accessories
  (hand microphone type HM-930EX and switch box series type Switch Box SW910EX...SW919EX, these are connectable by special connector to the connecting element for this purpose of radio apparatus. The ingress protection of the hand microphone type HM-930EX and switch box series type Switch Box SW910EX...SW919EX is IP67)
- use of "O"-rings at the sealings of the radio apparatus
  (this modification does not influence on the safety values and properties of apparatus; in all other aspects - construction, description, type designation, technical parameters - the product is unchanged according to the IECEx CoC nr. IECEx BKI 17.0005X Issue 0)

3. Electrical data

According to the base certificate it is unchanged adding the listed under:

3.1 Hand Microphone type HM-930EX

Entity parameters:

U_i = 4,2 V I_i = 595 mA P_i = 2,5 W L_i = 41 µH C_i = 220 pF

The apparatus contains :

1 pc. loudspeaker
2 pcs. microswitches
1 pc. microphone
1 pc. electronics on PCB
1 pc. connecting cable

3.2 Switch Box type SW-910EX... SW-919EX

Entity parameters :

U_i = 4,2 V I_i = 595 mA P_i = 2,5 W L_i = 100 nH C_i = 4901 nF

U_0 = 4,2 V I_0 = 595 mA P_0 = 2,5 W L_0 = 299 µH C_0 = 99 nF

the apparatus contains :

3 pcs. microswitches
1 pc. electronics on PCB
1 pc. connecting cable equipped with a NEXUS jack socket
1 pc. connecting cable

4. Ambient temperature range

-20 °C ≤ T_{amb} ≤ +55 °C

5. Special conditions for safe use

According to the base certificate it is unchanged:
Charging the battery unit type BP930EX must be done only with BL910 type charger.
Do not charge the battery in potentially hazardous area and outside temperature range +10°C to +40°C.

The USB-Serial converter for programming the apparatus must be used only outside potentially hazardous areas.

6. Manufacturer's Documents

Title:	Drawing No.:	Rev. Level:	Date:
HM930EX Hand microphone technical description	DD-0131	rev. 0.0 rev. 0.0	2017.11.29. 2018.01.18.
HM930EX – parts list	HM930EX	rev. 0.0	2017.11.20.
HM930EX – schematic diagram	EA4-0513	rev. 0.0	2017.11.15.
HM930EX – PCB specification	TP397C	C	2007.11.30.
HM930EX – Mechanical components (IS)	MA3-1737		2017.11.21.
HM930EX – Label	MA4-1738		2017.11.21.
HM930EX – Routine test instructions	PV-1354	rev. 0.0	2018.03.13.
HM930EX Hand microphone - User's guide	HM930EX	version 1.01	2018.03.13.
Switch box SW910EX...SW919EX technical description	DD-0133	rev. 0.0	2018.01.23.
Switch box SW910EX...SW919EX configuration tree and parts list	DD-0139	rev. 0.0	2018.01.23.
Switch box SW910EX...SW919EX – component layout, top side	DD-0135	rev. 0.0	2018.01.04.
Switch box SW910EX...SW919EX – component layout, bottom side	DD-0136	rev. 0.0	2018.01.04.
Switch box SW910EX...SW919EX – layout & clearance	DD-0137	rev. 0.0	2018.01.04.
Switch box SW910EX...SW919EX – PCB specification	DD-0138	rev. 0.0	2018.01.12.
Switch box SW910EX parts list	SW910EX	rev. 0.0	2018.01.26.
Switch box SW911EX parts list	SW911EX	rev. 0.0	2018.01.26.
Switch box SW912EX parts list	SW912EX	rev. 0.0	2018.01.26.
Switch box SW913EX parts list	SW913EX	rev. 0.0	2018.01.26.
Switch box SW914EX parts list	SW914EX	rev. 0.0	2018.01.26.
Switch box SW915EX parts list	SW915EX	rev. 0.0	2018.01.26.
Switch box SW916EX parts list	SW916EX	rev. 0.0	2018.01.26.
Switch box SW917EX parts list	SW917EX	rev. 0.0	2018.01.26.
Switch box SW918EX parts list	SW918EX	rev. 0.0	2018.01.26.

Title:	Drawing No.:	Rev. Level:	Date:
Switch box SW919EX parts list	SW919EX	rev. 0.0	2018.01.26.
Switch box, with amplifier (UK NATO design)	EA4-0516	rev. 0.0	2018.01.18.
Switch box, without amplifier (UK NATO design)	EA4-0517	rev. 0.0	2018.01.18.
Switch box, with amplifier (US NATO design)	EA4-0518	rev. 0.0	2018.01.18.
Switch box, without amplifier (US NATO design)	EA4-0519	rev. 0.0	2018.01.18.
Switch box installed board, parts list	TP-1519EX	rev. 0.0	2018.01.04.
Mechanical components (IS)	MA4-1803		2018.01.17.
Switch box SW910EX label	MA4-1810		2018.01.22.
Switch box SW911EX label	MA4-1811		2018.01.22.
Switch box SW912EX label	MA4-1812		2018.01.22.
Switch box SW913EX label	MA4-1813		2018.01.22.
Switch box SW914EX label	MA4-1814		2018.01.22.
Switch box SW915EX label	MA4-1815		2018.01.22.
Switch box SW916EX label	MA4-1816		2018.01.22.
Switch box SW917EX label	MA4-1817		2018.01.22.
Switch box SW918EX label	MA4-1818		2018.01.22.
Switch box SW919EX label	MA4-1819		2018.01.22.
Switch box, TP519 board – Routine test instructions	PV-1355	rev. 0.0	2018.03.13.
Switch box, SW910 ... SW919EX – Routine test instructions, functional test	PV-1356	rev. 0.0	2018.03.13.
SW91xEX PTT series - User's guide	SW91xEX PTT series	version 1.01	2018.03.13.
The certification documentation of the TP-9000Ex radio is modified as follows :			
Radio, assembly drawing – IS parts list	MA4-1540	B	2018.01.05.
Radio, User's guide	TP9000EX Basic User Guide	version 1.14	2018.02.26.