

**RF-EXPOSURE REPORT****FCC 47 CFR Part 2.1091  
ISED RSS-102****RF-Exposure evaluation of mobile equipment****Report Reference No.** .....: G0M-1801-7169-TFC091ME-V02**Testing Laboratory** .....: Eurofins Product Service GmbHAddress .....: Storkower Str. 38c  
15526 Reichenwalde  
Germany

Accreditation .....:



FCC Test Firm Designation Number: DE0008

IC Testing Laboratory site: 3470A-2

**Applicant's name** .....: Dräger Safety AG & Co. KGaAAddress .....: Revalstraße 1  
23560 Lübeck  
GERMANY**Test specification:**Standard .....: 47 CFR 2.1091  
KDB 447498 D01 v06:2015-10-23  
RSS-102, Issue 5:2015-03  
SPR-002 Issue 1:2016-09**Equipment under test (EUT):**

Product description	Inductive Charger	
Model No.	Induktive Power Unit	
Additional Model(s)	None	
Brand Name(s)	Dräger	
Hardware version	8325825	
Firmware / Software version	8325897	
	FCC-ID: X6O-IC001	IC: 5895F-IC001
<b>Test result</b>	<b>Passed</b>	

Test Report No.: G0M-1801-7169-TFC091ME-V02

Eurofins Product Service GmbH  
Storkower Str. 38c, D-15526 Reichenwalde, Germany

**Possible test case verdicts:**

- neither assessed nor tested .....: N/N
- required by standard but not appl. to test object.....: N/A
- required by standard but not tested.....: N/T
- not required by standard for the test object .....: N/R
- test object does meet the requirement.....: P (Pass)
- test object does not meet the requirement.....: F (Fail)

**Testing:**

Test Lab Temperature .....: 20 – 23 °C

Test Lab Humidity .....: 32 – 38 %

Date of receipt of test item .....

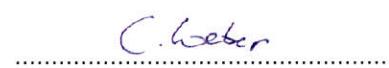
Date (s) of assessment .....: 2019-01-29

Compiled by .....: Toralf Jahn

Assessed by (+ signature) .....: Toralf Jahn  
(Responsible for Assessment)



Approved by (+ signature) .....: Christian Weber  
(Head of Lab)



Date of issue .....: 2019-02-13

Total number of pages .....: 14

**General remarks:**

**The test results presented in this report relate only to the object tested.**

**The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.**

This report shall not be reproduced, except in full, without the written approval of the issuing testing laboratory.

**Additional comments:**

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## Version History

Version	Issue Date	Remarks	Revised by
01	2019-01-29	Initial Release	
02	2019-02-13	Replaced document: G0M-1801-7169-TFC091ME-V01 Replaced by: G0M-1801-7169-TFC091ME-V02  Reason: FCC-ID and IC corrected.	T. Jahn

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## REPORT INDEX

<b>1</b>	<b>EQUIPMENT (TEST ITEM) DESCRIPTION</b>	<b>5</b>
1.1	Radiation Sources	6
1.2	Test Equipment Used	7
<b>2</b>	<b>RESULT SUMMARY</b>	<b>8</b>
<b>3</b>	<b>RADIATED FIELD MEASUREMENT</b>	<b>9</b>
3.1	Test Conditions and Results – Electric and magnetic field strength	9
<b>4</b>	<b>RF-EXPOSURE CLASSIFICATIONS</b>	<b>10</b>
<b>5</b>	<b>EVALUATION</b>	<b>11</b>
5.1	MPE Evaluation Conditions – 47 CFR 2.1091 / RSS-102	11
5.2	Transmitter Evaluation – 47 CFR 2.1091 / RSS-102 / SRP-002	13

## 1 Equipment (Test item) Description

<b>Description</b>	Inductive Charger
<b>Model</b>	Induktive Power Unit
<b>Additional Model(s)</b>	None
<b>Brand Name(s)</b>	Dräger
<b>Serial number</b>	None
<b>Hardware version</b>	8325825
<b>Software / Firmware version</b>	8325897
<b>PMN</b>	None
<b>HVIN</b>	Induktive Power Unit
<b>FVIN</b>	None
<b>HMN</b>	None
<b>FCC-ID</b>	X6O-IC001
<b>IC</b>	5895F-IC001
<b>Equipment type</b>	End product

### 1.1 Radiation Sources

Mode #	Description	
Wireless Power Tx	Frequency range [MHz]	0.07 – 0.142
	Channel spacing	None
	Modulations	None
Communication	Frequency range [MHz]	2.0
	Channel spacing	None
	Modulations	ASK

Comment: It is not possible to measure the standalone modes separately.

### Multi-transmitter Modes

	Wireless Power Tx	Communication
	N/A	Yes
Communication	Yes	N/A

## 1.2 Test Equipment Used

Field Strength Measurement					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic chamber	Frankonia	AC 2	EF00198	-	-
Exposure Level Tester	Narda Safety Test Solutions S.r.l.	ELT-400	EF00605	2018-02	2019-04
Magnetic field probe 100 cm <sup>2</sup>	Narda Safety Test Solutions S.r.l.	2300/90.10	EF00606	2018-02	2019-04
EM Radiation Monitor	Narda Safety Test Solutions	EMR-02	EF00058	2018-08	2019-08
Broadband Field Meter NBM-550	Narda Safety Test Solutions	2401/01B	EF00998	2018-08	2019-08
Magnetic field probe HF3061	Narda Safety Test Solutions	2402/05B	EF00999	2018-08	2019-08

## 2 Result Summary

<b>FCC 47 CFR Part 2.1091, IC RSS-102</b>			
<b>Product Specific Standard Section</b>	<b>Requirement</b>	<b>Result</b>	<b>Remarks</b>
47 CFR 2.1091	Maximum permissible exposure @ 20cm below limit	PASS	
RSS-102	Maximum permissible exposure @ 20cm below limit	PASS	
<b>Remarks:</b>			

### 3 Radiated Field Measurement

#### 3.1 Test Conditions and Results – Electric and magnetic field strength

<b>ELECTRIC AND MAGNETIC FIELD STRENGTH</b>									
Test frequency range		Tested frequencies							
		$F_{MID}$							
EUT test mode		RFID							
Measurement methode		radiated only							
<b>Test procedure</b>									
<ol style="list-style-type: none"> <li>1. EUT transmitter is activated in test mode under normal conditions</li> <li>2. The perimeter of the EUT is scanned with an electric and magnetic field probe at a fixed distance</li> <li>3. The electric and magnetic field strength is measured</li> <li>4. The maximum field strength values are recorded</li> </ol>									
<b>Test results</b>									
Channel	Frequency [MHz]	Mode	Distance [m]	Max. electric field strength [V/m]	Max. magnetic field strength [A/m]				
$F_{MID}$	0.1 + 2.0	1 charger standby	0.2	1	0.1				
$F_{MID}$	0.1 + 2.0	1 charger charging	0.2	7	0.3				
$F_{MID}$	0.1 + 2.0	10 chargers standby	0.2	2	0.1				
$F_{MID}$	0.1 + 2.0	10 chargers charging	0.2	7	0.3				
Comments:									

#### 4 RF-Exposure Classifications

Device Types	
Fixed	A fixed device is defined as a device physically secured at one fixed location and cannot be easily re-located.
Mobile	A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. (47 CFR 2.1091)
Portable	A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user. (47 CFR 2.1093)
Exposure Categories	
Occupational / Controlled	Limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.
General population / uncontrolled	Exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

## 5 Evaluation

### 5.1 MPE Evaluation Conditions – 47 CFR 2.1091 / RSS-102

MPE EVALUATION ACC. TO 47 CFR 2.1091 / ISED RSS-102		VERDICT: PASS		
Assessment according to reference		Reference Method		
		KDB 447498 D01 / RSS-102 & Safety Code 6		
Device type		mobile		
Exposure category		General public		
ISED Limits – Occupational / Controlled Exposure				
Frequency range [MHz]	Electric field strength [V/m]	Magnetic field strength [A/m]	Power density [W/m <sup>2</sup> ]	Averaging time [min]
0.003-10*	170	180	-	Instantaneous*
0.1-10	-	1.6 / $f$	-	6**
1.29-10	193 / $f^{0.5}$	-	-	6**
10-20	61.4	0.163	-10	6
20-48	129.8 / $f^{0.25}$	0.3444 / $f^{0.25}$	44.72 / $f^{0.5}$	6
48-100	49.33	0.1309	6.455	6
100-6000	15.60 $f^{0.25}$	0.04138 $f^{0.25}$	0.6455 $f^{0.5}$	6
6000-15000	137	0.364	50	6
15000-150000	137	0.364	50	616000 / $f^{1.2}$
150000-300000	0.354 $f^{0.5}$	$9.40 \times 10^{-4} f^{0.5}$	$3.33 \times 10^{-4} f$	616000 / $f^{1.2}$
ISED Limits – General Population / Uncontrolled Exposure				
Frequency range [MHz]	Electric field strength [V/m]	Magnetic field strength [A/m]	Power density [W/m <sup>2</sup> ]	Averaging time [min]
0.003-10*	83	90	-	Instantaneous*
0.1-10	-	0.73 / $f$	-	6**
1.1-10	87 / $f^{0.5}$	-	-	6**
10-20	27.46	0.0728	2	6
20-48	58.07 / $f^{0.25}$	0.1540 / $f^{0.25}$	8.944 / $f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 $f^{0.3417}$	0.008335 $f^{0.3417}$	0.02619 $f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000 / $f^{1.2}$
150000-300000	0.158 $f^{0.5}$	$4.21 \times 10^{-4} f^{0.5}$	$6.67 \times 10^{-5} f$	616000 / $f^{1.2}$
* = Based on nerve stimulation				
** = Bases on specific absorption rate				

<b>FCC Limits – Occupational / Controlled Exposure</b>				
Frequency range [MHz]	Electric field strength [V/m]	Magnetic field strength [A/m]	Power density [mW/cm <sup>2</sup> ]	Averaging time [min]
0.3 – 3.0	614	1.63	(100)*	6
3.0 - 30	1842 / f	4.89 / f	(900 / f <sup>2</sup> )*	6
30 - 300	61.4	0.163	1.0	6
300 - 1500	N/A	N/A	f / 300	6
1500 - 100000	N/A	N/A	5.0	6
<b>FCC Limits – General Population / Uncontrolled Exposure</b>				
Frequency range [MHz]	Electric field strength [V/m]	Magnetic field strength [A/m]	Power density [mW/cm <sup>2</sup> ]	Averaging time [min]
0.3 – 1.34	614	1.63	(100)*	30
1.34 - 30	842 / f	2.19 / f	(180 / f <sup>2</sup> )*	30
30 - 300	27.5	0.073	0.2	30
300 - 1500	N/A	N/A	f / 1500	30
1500 - 100000	N/A	N/A	1.0	30

\* = Plane wave equivalent power density; f in MHz

<b>Assessment procedure</b>
The evaluation is performed at a separation distance of 20 cm. The reference levels are taken from 47 CRF 1.1310 for FCC and RSS-102 for ISED according to the exposure category declared by customer.

For each radio and frequency band the worst case transmission mode with the highest output power is activated and the surrounding area around the EUT is scanned using an electric and a magnetic field probe at the distance given in the test report. The maximum electric and magnetic field strength values measured are compared to the corresponding reference levels. If both measured field strength values are below the reference levels the EUT has passed the RF-Exposure requirements.

**5.2 Transmitter Evaluation – 47 CFR 2.1091 / RSS-102 / SRP-002**

<b>Assessment results – Wireless Power Tx</b>	
Transmission mode	
Operating mode frequency range [MHz]	0.1
Assessment frequency (f) [MHz]	0.1
Compliance separation distance to EUT [m]	0.2
Electric Field	
Measured max. electric field strength [V/m]	7
Reference level [V/m]	83 (ISED) / 614 (FCC)
Verdict	Pass
Magnetic Field	
Measured max. magnetic field strength [A/m]	0.3
Reference level [A/m]	7.3 (ISED) / 1.63 (FCC)
Verdict	Pass
Verdict	
<b>The field strength level of the EUT are below the RF-Exposure reference level at the given compliance separation distance!</b>	
<b>Comments:</b> *Worst case RF-exposure limits with respect to ISED and FCC requirements.	

<b>Assessment results – Communication</b>	
Transmission mode	
Operating mode frequency range [MHz]	2
Assessment frequency (f) [MHz]	2
Compliance separation distance to EUT [m]	0.2
Electric Field	
Measured max. electric field strength [V/m]	7
Reference level [V/m]	61.5 (ISED) / 421 (FCC)
Verdict	Pass
Magnetic Field	
Measured max. magnetic field strength [A/m]	0.3
Reference level [A/m]	0.365 (ISED) / 16.3 (FCC)
Verdict	Pass
Verdict	
<b>The field strength level of the EUT are below the RF-Exposure reference level at the given compliance separation distance!</b>	
<b>Comments:</b> *Worst case RF-exposure limits with respect to ISED and FCC requirements.	

<b>Assessment results – Wireless Power Tx + Communication</b>	
Worst RF-Exposure Ratios	
Wireless Power Tx	0.034
Communication	0.686
Sum of Ratios	0.710
Verdict	Pass
Verdict	
<b>The combined field strength level of the EUT are below the RF-Exposure reference level at the given compliance separation distance!</b>	
<b>Comments:</b> *Worst case RF-exposure limits with respect to ISED and FCC requirements.	