REPORT ON EXPOSURE TO ELECTROMAGNETIC FIELDS

No. 2401854STO-104

EQUIPMENT

Equipment:	Time of flight sensor with BLE capability
Type/Model:	Tork Level Sensor 3.0
Additional type/model*:	652918
Manufacturer:	Essity Hygiene and Health AB
Tested by request of:	Essity Hygiene and Health AB

*See opinions and interpretations clause 2.2

SUMMARY

Based on the assessment in this statement, the equipment is determined to **comply** with the following requirements without testing:

CFR 47 §1.1307, §1.1310
RSS-102 Issue 6

Date of issue: October 3, 2024

Tested by: Anna Undall on behalf of Björn Utermöhl

Approved by: Anders Svensson

Revision History

Test report number	Date	Description	Changes
2401854STO -104	October 3 2024	First release	

CONTENTS

1 CLIENT INFORMATION

This assessment has been done by request of:

Company	Essity Hygiene and Health AB Mölndals Bro 2 405 03 Göteborg Sweden
Name of contact	Rickard Holmersson Ph no: +46 72 716 06 63 Email: rickard.holmersson@essity.com

2 EQUIPMENT

2.1 Identification of the equipment

Equipment:	Time of flight sensor with BLE capability
Type/Model:	Tork Level Sensor 3.0
Additional model:	652918
Brand name:	Essity
Manufacturer:	Essity Health & Hygene
Transmitter frequency range:	2402 – 2480 MHz
Measured output power (conducted) at antenna port*:	+7.6 dBm
Declared output power (conducted):	+8 dBm
Antenna gain:	+1.6 dBi
Source based duty cycle:	100%
User separation distance:	20 cm
Exposure conditions:	☐ Controlled environment (occupational) ☒ Uncontrolled environment (general population)

* Reference for measurement: Test report 2401854STO-102

2.2 Opinions and interpretations

No additions, deviations or exclusions have been made from standards and accreditation.

3 TEST SPECIFICATIONS

3.1 Standards

CFR 47: Code of Federal Regulations Title 47: Telecommunications §1.1307, §1.1310
KDB447498 D01 v06

RSS-102 Issue 6: Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

3.2 Additions, deviations and exclusions from standards

No additions, deviations or exclusions have been made from standards.

3.3 Decision rule

The statements of conformity are reported as:
Passed – When the measured values are within the specified limits.
Failed – When one or more measures values are outside the specified limits.

4 SUMMARY

The evaluation has been carried out at the Intertek Semko AB premises in Kista, Sweden.
The results in this report apply only to sample tested:

Test	Result
RF Exposure, single transmitter	PASS
RF Exposure, multiple simultaneous transmitters	NA[1]

[1]EUT only has a single transmitter or transmitters cannot operate simultaneously

5 RF EXPOSURE, SINGLE TRANSMITTER

Result:	PASS

5.1 Limits

Reference: CFR 47 §1.1310 TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	$*900/f^2$	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	$*180/f^2$	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

Reference: RSS-102 Issue 6 – Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) Issue 6

Section 6,6,

Field reference level (FRL) exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm (i.e. mobile devices), except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 1 W (adjusted for tune-up tolerance)
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance)
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than $1.31\times10^{-2}\,f^{\,0.6834}$W (adjusted for tune-up tolerance), where f is in MHz
- at or above 6 GHz and the source-based, time-averaged maximum EIRP of the device is equal to or less than 5 W (adjusted for tune-up tolerance)

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the EIRP was derived.

5.2 Calculations

EIRP: $Power\ to\ antenna\ (dBm) + Antenna\ gain\ (dBi) = EIRP\ dBm$
Declared EIRP = 9.6 dBm
Measured EIRP = 9.2 dBm

Conversion dBm to W:

EIRP: $1\ mW * 10^{\left(EIRP\frac{dBm}{10}\right)} = 8.32\ mW$ =0.01 W

Time averaged maximum power:

EIRP: $EIRP\ mW * Duty\ cycle = EIRP\ mW$

MPE calculation

A worst-case calculation for power density:

$$S = \frac{dc \times EIRP}{4 \times \pi \times r^2}$$

dc = 1
S = W / m^2
r = 20 cm

S = 0.0017 mW / cm^2

5.3 Results

Standard	Reference for limit	Value	Unit	Limit	Result
§1.1310	§1.1310	0.0017	mW /cm^2	1	PASS
RSS-102	RSS-102	0.01	W	2.7	PASS