



**TEST REPORT OF A FALL DETECTOR, BRAND
DRÄGER, TYPE FD100, IN CONFORMITY WITH
CFR 47 PART 15 (2001-12-18).**

Accredited by : RvA, STERLAB accreditation number L385
FCC listed : 90828
Industry Canada : IC3501

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FCC ID: QBM-5730527
Test specification(s): CFR 47 Part 15.231 (2001-12-18)
Description of EUT: Fall Detector
Manufacturer: Dräger HomeCare
Brand mark: Dräger
Type: FD100

MEASUREMENT/TECHNICAL REPORT

DRÄGER MEDICAL B.V.

TYPE: FD100

FCC ID: QBM-5730527

May 16, 2002

This report concerns:			
Original grant/certification	Class 2 change	Verification	
Equipment type: Fall Detector operating on 167.500 MHz			
Deferred grant requested per 47 CFR 0.457(d)(1)(ii) ?			
	Yes	No	n.a.
Report prepared by:	Name	: P.A.J.M. Robben, B.Sc.E.E.	
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The data taken for this test and report herein was done in accordance with CFR 47 Part 15 and the measurement procedures of ANSI C63.4-1992. TNO Electronic Products & Services (EPS) B.V., Niekerk, The Netherlands, certifies that the data is accurate and contains a true representation of the emission profile of the Equipment Under Test (EUT) on the date of the test as noted in the test report. I have reviewed the test report and find it to be an accurate description of the test(s) performed and the EUT so tested.

Date: May 16, 2002

Signature:

P. de Beer
TNO Electronic Products & Services (EPS) B.V.



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Description of test item

Test item : Fall Detector
Manufacturer : Dräger HomeCare
Brand : Dräger
Type : FD100
Serial number : 0151711
Revision : n.a.
Receipt number : 1
Receipt date : November 29, 2001


Applicant information

Applicant's representative : Mr. J. Schasfoort
Company : Dräger Medical B.V.
Address : Kanaaldijk 29
Postal code : 5683 CR
City : Best
PO-box : 10.100
Postal code : 5680 GA
City : Best
Country : The Netherlands
Telephone number : +31 499 331 331
Telefax number : +31 499 331 222
Order number : n.a.

Test(s) performed

Location : Niekirk
Test(s) started : November 29, 2001
Test(s) completed : January 18, 2002
Purpose of test(s) : Type approval / certification
Test specification(s) : CFR 47 Part 15.231 (2001-12-18)

Test engineer : P.A.J.M. Robben, B.Sc.E.E.

Project leader : P.A.J.M. Robben, B.Sc.E.E. 

Report written by : P.A.J.M. Robben, B.Sc.E.E.

Report approved by : P. de Beer 

Report date : May 16, 2002

This report is in conformity with EN 45001.

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The test results relate only to the item(s) tested.



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1 General information

1.1 Product description

1.1.1 Introduction.

The Fall Detector is a device intended to be worn on a person's body. If the person falls, the Fall Detector will transmit a RF signal to a base station. The base station will send out an alert signal in case it receives a RF signal generated by a Fall Detector. The alert signal will trigger people to look for the person who fell down in order to give (medical) assistance. It is also possible to manually enable a RF signal, indicating the need for (medical) assistance, by pushing a button on the device.

1.1.2 Choice of operating frequency.

The operating frequency of the Fall Detector, brand Dräger, type FD100, is 167.500 MHz.

1.1.3 Operating principles.

The Fall Detector is a battery-powered device with an integral antenna. The Fall Detector generates a modulated RF carrier at a frequency of 167.500 MHz. The carrier is modulated by a code in order to make a distinction between the various Fall Detectors, which may be in the vicinity of a base station. The carrier will be automatically switched off after a certain period of time. The modulated carrier at 167.500 MHz can also be enabled by means of a push-button on the device. Also in this case the carrier will be automatically switched off after a certain period of time.

1.2 Related submittal(s) and/or Grant(s)

Not applicable.

1.3 Tested system details

Details and an overview of the system and all of its components, as it has been tested, may be found in table 1 below. FCC ID's are stated in this overview where applicable. The EUT is listed in the first row of table 1.

Description	Manufacturer	Type number	Serial number	FCC ID	Cable descriptions
Fall Detector	Dräger HomeCare	FD100	0151711	QBM-5730527	n.a.

Table 1 - Tested system details overview.



FCC ID: QBM-5730527
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1.4 Test methodology

The test methodology used is based on the requirements of CFR 47 Part 15, issue of December 18, 2001, section 15.231. Tests in accordance with CFR 47 Part 15.231 (a)(1), 15.231 (a)(2), 15.231 (b) and 15.231 (c) have been carried out. Other tests as listed in CFR 47 Part 15.231 have been deemed to be not applicable.

The test methods, which have been used, are based on ANSI C63.4: 1992.

Radiated emission tests above 30 MHz were performed at a measurement distance of 3 meters. Below 30 MHz the radiated emission tests were carried out at measurement distances of 3 and 10 meters. The test results regarding the radiated emission tests on frequencies below 30 MHz have been extrapolated in order to determine the field strength of the measured values at measurement distances of 30 and 300 meters (as required by CFR 47 Part 15).

The bandwidth of the receiver is switching automatically to the right bandwidth in accordance with CISPR 16. This is implemented in the receiver. The antenna factors are programmed in the test receiver. The receiver automatically calculates the appropriate correction factor for the utilized antenna and also the appropriate antenna factor for the cable loss. The total correction is automatically added to the measured value.

1.5 Test facility

The Federal Communications Commission has reviewed the technical characteristics of the test facilities at TNO Electronic Products & Services (EPS) B.V., located in Niekerk, 9822 TL Smidshornerweg 18, The Netherlands, and has found these test facilities to be in compliance with the requirements of CFR 47 Part 15, section 2.948, per October 23, 2000, with reference 90828.

The description of the test facilities has been filed at the Office of the Federal Communications Commission. The facility has been added to the list of those laboratories performing these test services for the public on a fee basis.

The list of all public test facilities is available on the Internet at <http://www.fcc.gov>.

1.6 Product labeling

In accordance with CFR 47 Part 15.19 (a)(3) the following text shall be placed on a label, which shall be attached to the EUT:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The FCC ID of the EUT must be placed on a label, which shall be attached to the EUT.

For further details about the labeling requirements (size, legibility, etc.) as set by the Federal Communications Commission see CFR 47 Part 15.19 (a)(3), CFR 47 Part 15.19 (b)(2), CFR 47 Part 15.19 (b)(4), CFR 47 Part 2.925 and CFR 47 Part 2.926.



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2 System test configuration

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it). During all tests the EUT was set up to function in accordance with the manufacturer's instructions.

The justification and manipulation of cables and equipment in order to simulate a worst-case behavior of the test setup has been carried out as prescribed in ANSI C63.4: 1992.

Tests were performed with the EUT operating at a frequency of 167.500 MHz.

2.2 EUT mode of operation

During the radiated emission measurements, the EUT was configured to transmit continuously in order to simulate a worst-case behavior. During all other tests, the EUT was configured for normal operation. Fresh and fully charged batteries were used during all tests.

2.3 Special accessories

No special accessories are used and/or needed to achieve compliance with the appropriate sections of CFR 47 Part 15.

2.4 Equipment modifications

None.



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2.5 Configuration of the tested system

Unit title	:	Fall Detector
Model number	:	FD100
Part number	:	n.a.
FCC ID	:	QBM-5730527
Frequency range	:	167.500 MHz
Description/details	:	see section 1.1 of this test report
Power supply	:	Two batteries of +3.0 Volts DC each
Clock Oscillator(s)	:	
Cabinet & Screening	:	Plastic
Interface Cable(s)	:	Not applicable
Method of screening	:	Not applicable
Method of grounding	:	Not applicable
Operating configuration	:	see section 1.3 of this test report



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2.6 Block diagram of the EUT

The block diagram is available in the technical documentation package as an addendum to this test report.

2.7 Schematics of the EUT

The schematics are available in the technical documentation package as an addendum to this test report.

2.8 Part list of the EUT

The part list is available in the technical documentation package as an addendum to this test report.



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3 Test results

3.1 Field strength of emissions


Frequency (MHz)	Measurement results dB(μV)/m @ 3 meters Quasi-peak		Limits dB(μV)/m @ 3 meters Quasi-peak
	Vertical	Horizontal	
58.83	17.7	21.4	40.0
111.67	20.5	26.5	43.5
167.50	56.6	61.6	70.6
223.33	19.5	22.5	51.5

Table 2

The results of the radiated emission tests, carried out in accordance with CFR 47 Part 15, section 15.231 (b), with the EUT operating in continuous transmit mode on 167.500 MHz, are depicted in table 2.

Note: - Field strength values of radiated emissions at frequencies not listed in table 2 are more than 20 dB below the applicable limit.

Test engineer

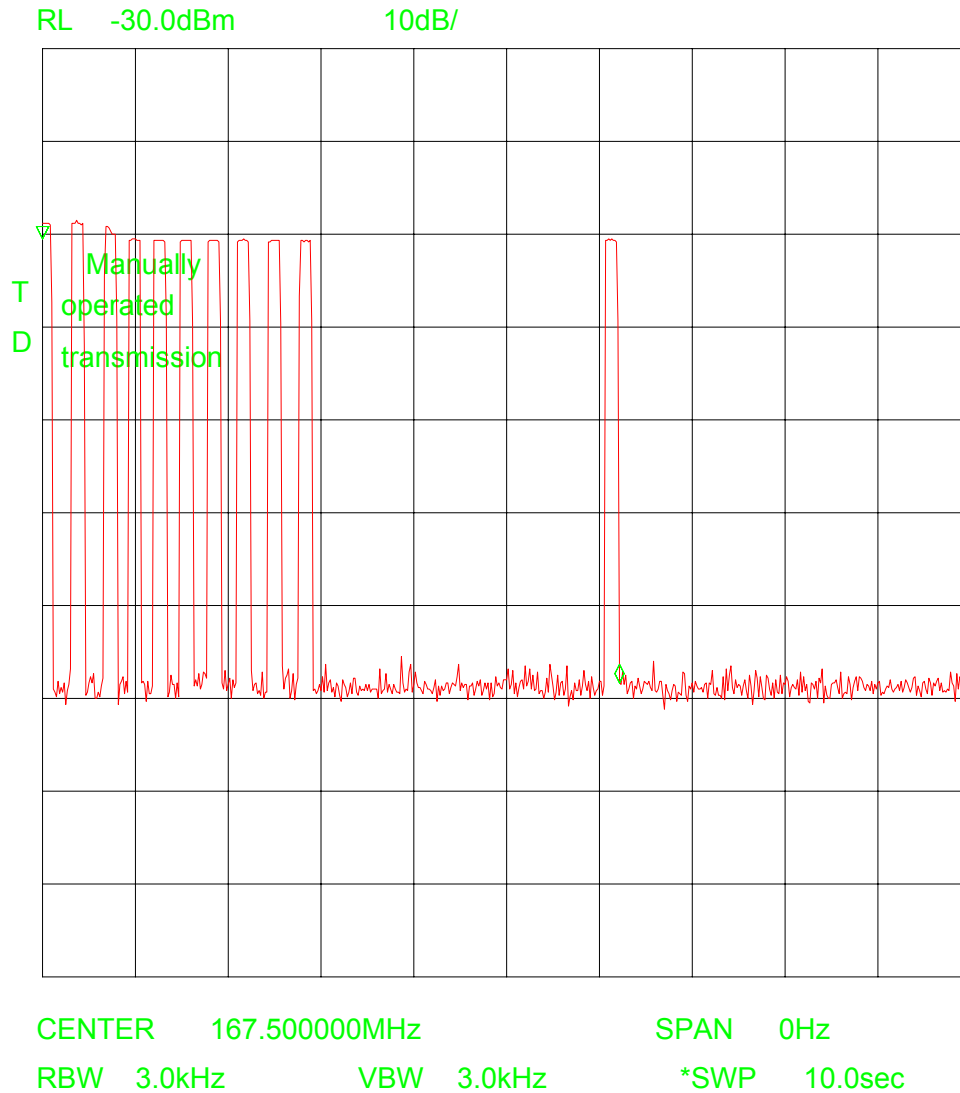
Signature : 

Name : P.A.J.M. Robben, B.Sc.E.E.

Date : May 16, 2002



3.2 Deactivation of manually operated transmitter



Plot 1 – Automatic deactivation of manually operated transmitter

Tests have been carried out in order to determine compliance with CFR 47 Part 15, section 15.231 (a)(1). The automatic deactivation of the transmitter is depicted by means of plot 1. The last impulse is considered to be an automatic transmission.

Test engineer

Signature :

Name

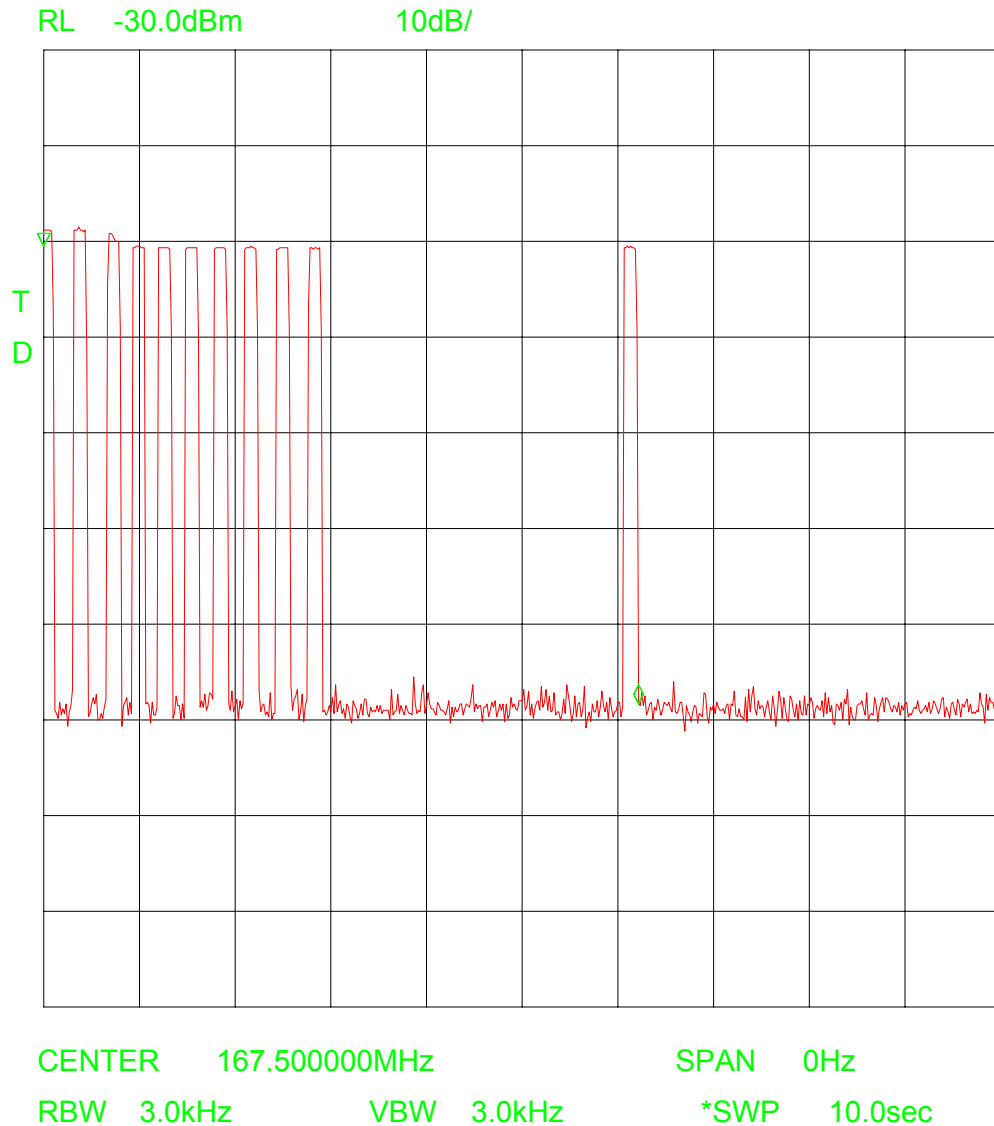
: P.A.J.M. Robben, B.Sc.E.E.

Date

: May 16, 2002



3.3 Deactivation of automatically activated transmitter



Plot 2 – Automatic deactivation of automatically activated transmitter

Tests have been carried out in order to determine compliance with CFR 47 Part 15, section 15.231 (a)(2). The automatic deactivation of the transmitter is depicted by means of plot 2. The last impulse is considered to be an automatic transmission.

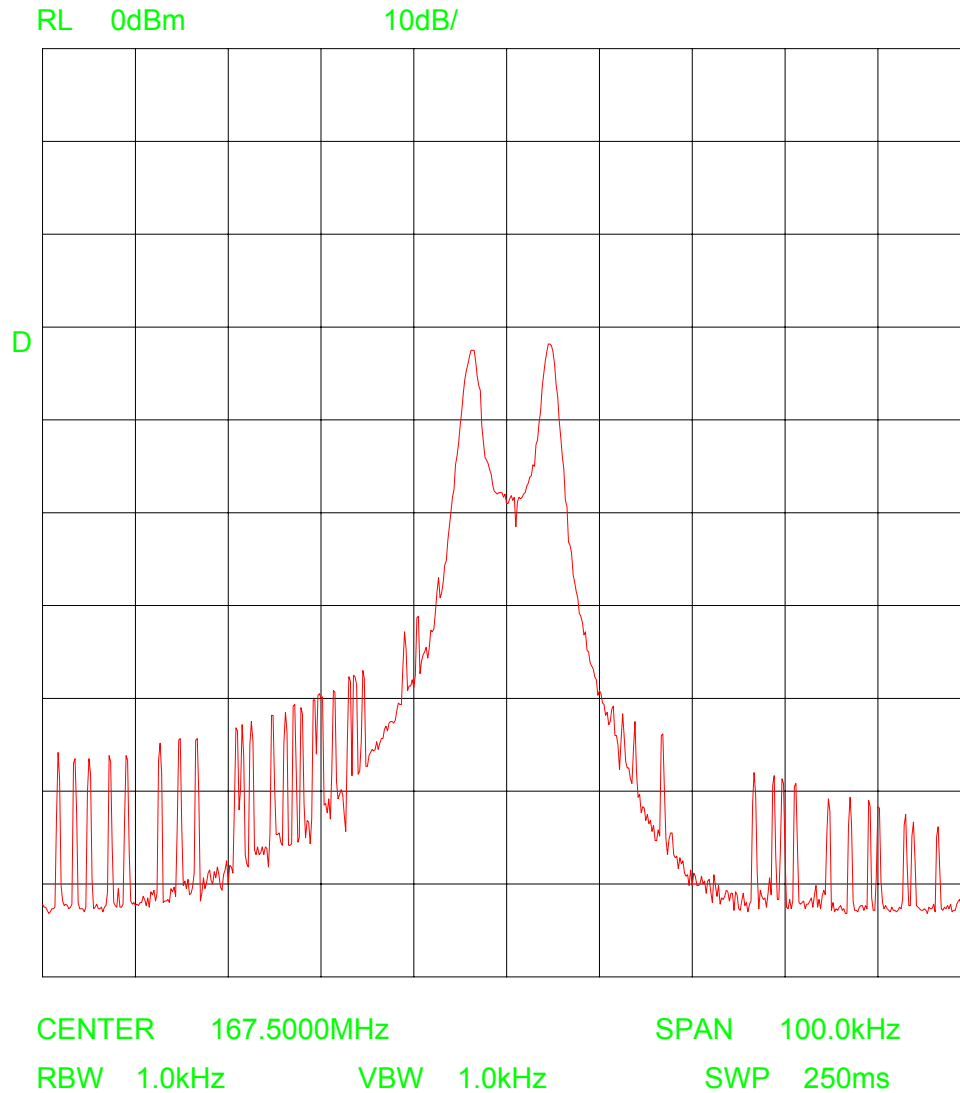
Test engineer

Signature :

Name : P.A.J.M. Robben, B.Sc.E.E. Date : May 16, 2002



3.4 Bandwidth of emission



Plot 3 – Bandwidth of emission

Tests have been carried out in order to determine compliance with CFR 47 Part 15, section 15.231 (c). The test results are depicted by means of plot 3. It was determined that the bandwidth of emission is 0.1%.

Test engineer

Signature

:

Name

: P.A.J.M. Robben, B.Sc.E.E.

Date

: May 16, 2002



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4 List of utilized test equipment

Inventory number	Description	Brand	Type
12471	Biconical antenna 20MHz-200MHz	EATON	94455-1
12473	Log-per antenna 200-1000MHz	EATON	96005
12476	Antenna mast	EMCO	TR3
12477	Antenna mast 1-4 mtr	Poelstra	--
12482	Loop antenna	EMCO	6507
12483	Guidehorn	EMCO	3115
12484	Guidehorn	EMCO	3115
12488	Guidehorn 18 - 26.5 GHz	EMCO	RA42-K-F-4B-C
12533	Signalgenerator	MARCONI	2032
12559	Digital storage oscilloscope	Le Croy	9310M
12561	DC Power Supply 20A/70V	DELTA	SM7020D
12567	Plotter	HP	7440A
12605	calibrated dipole 28MHz-1GHz	Emco	3121c
12608	HF milliwattmeter	Hewlett Packard	HP435a
12609	Power sensor 10MHz-18GHz	Hewlett Packard	HP8481A
12636	Polyester chamber	Polyforce	--
12640	Temperature chamber	Heraeus	VEM03/500
13664	Spectrum analyzer	HP	HP8593E
13078	Preamplifier 0.1 GHz - 12 GHz	Miteq	AMF-3D-001120-35-14p
13452	Digital multi meter	HP	34401A
13526	Signalgenerator 20 GHz	Hewlett & Packard	83620A
13594	Preamplifier 10 GHz - 25 GHz	Miteq	AMF-6D-100250-10p
13886	Open Area testsite	Comtest	--
14051	Anechoic room	Comtest	--
14450	2.4 GHz bandrejectfilter	BSC	XN-1783
15633	Biconilog Testantenna	Chase	CBL 6111B
15667	Measuring receiver	R&S	ESCS 30
99045	DC Power Supply 3A/30V	DELTA	E030/3
99055	Non-conducting support	NMi	--
99061	Non-conducting support 150cm	NMi	--
99068	Detector N-F/BNC-F	Radiall	R451576000
99069	Cable 5m RG214	NMi	--
99071	Cable 10m RG214	NMi	--
99076	Bandpassfilter 4 - 10 GHz	Reactel	7AS-7G-6G-511
99077	Regulating trafo	RFT	LTS006
99112	Tripod	Chase	--
99136	Bandpassfilter 10 - 26.5 GHz	Reactel	9HS-10G/26.5G-S11