

BRAUN

Touchless + forehead thermometer



BNT 400

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AgeSmart™ is a trademark of Helen of Troy and/or its affiliates.

Manufactured for:

Kaz Europe Sàrl

A Helen of Troy Company

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Switzerland



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www.braunhealthcare.com

Patents: www.kaz.com/patents/braun

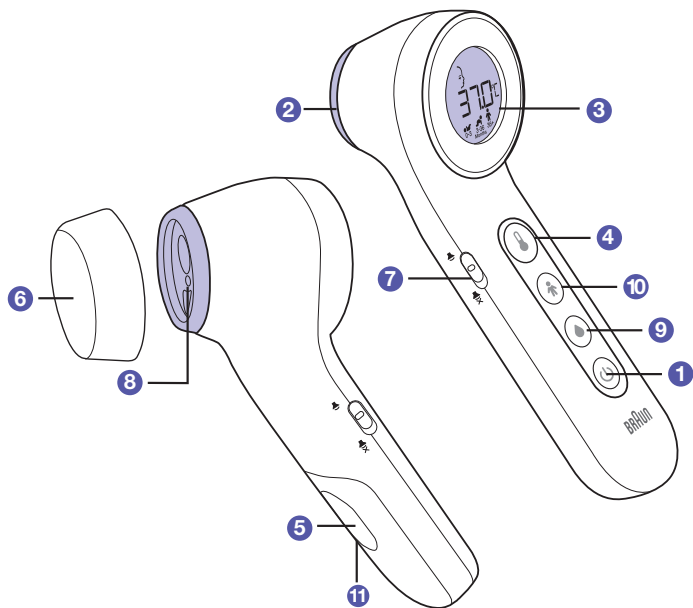


Printed in China

BNT400AU

PN: A002075R0

25OCT18



Thank you for purchasing the Touchless + forehead thermometer (BNT 400). This thermometer is a high-quality product incorporating the latest technology and tested in accordance with international standards. With its unique technology, the product can provide a stable, accurate reading with each measurement. The thermometer performs a self-test every time it is switched on to always guarantee the accuracy of measurements. The Braun Touchless + forehead thermometer is intended for the intermittent determination of human body temperature on people of all ages in a "Forehead" and "Touchless" mode, using the center of the forehead as the measurement site, in a home use environment.

Please read these instructions carefully before using this product and keep the instructions and the thermometer in a safe place.

Product description (See page 2)

- | | |
|-----------------------------------------------------------------|--------------------------|
| 1 Power button | 2 Scanner |
| 3 LCD screen | 4 Temperature button |
| 5 Battery door | 6 Protective scanner cap |
| 7 Silent mode switch | 8 Guidance light |
| 9 Food and bath temperature mode | 10 AgeSmart™ button |
| 11 Fahrenheit to Celsius switch
(inside battery compartment) | |



WARNINGS AND PRECAUTIONS

Keep out of reach of children under 12 years.

NEVER use the thermometer for purposes other than those for which it has been intended. Please follow the general safety precautions when using on children.

NEVER immerse the thermometer into water or other liquids (not waterproof). For cleaning and disinfecting please follow the instructions in the "Care and cleaning" section.

DO NOT store this thermometer in temperature extremes below -25 °C or over 55 °C (below -13 °F or over 131 °F) or in excessive humidity (above 95% non-condensing relative humidity).

If thermometer is stored in a location that is cooler or warmer than where it will be used, allow it to acclimate to the room temperature for 10 minutes before taking a measurement.

DO NOT use the thermometer if there are signs of damage on the scanner or on the thermometer itself. If damaged, **DO NOT** attempt to repair the product.

NEVER insert a sharp object into the scanner area or any other open surface on the thermometer.

This thermometer consists of high-quality precision parts. **DO NOT** drop the instrument. Protect it from severe impact and shock. **DO NOT** twist the instrument or the measuring sensor.

This thermometer is intended for household use only.

Use of this thermometer is not intended as a substitute for consultation with your physician.

Temperature elevation may signal a serious illness, especially in neonates and infants, or in adults who are old, frail, or have a weakened immune system. Please seek professional advice immediately when a temperature elevation occurs on persons that are:

- Neonates and infants under 3 months (Consult your physician immediately if the temperature exceeds 37.4 °C [99.4 °F])

- Individuals over 60 years of age (Fever may be blunted or absent in older individuals)
- Individuals having diabetes mellitus or a weakened immune system (e.g., HIV positive, cancer chemotherapy, chronic immunosuppressant treatment, splenectomy)
- Individuals who are bedridden (e.g., nursing home patient, stroke, chronic illness, paraplegia, quadriplegia, surgical recovery)
- A transplant recipient (e.g., liver, heart, lung, kidney).

This thermometer is not intended for pre-term babies or small-for-gestational-age babies. Pre-term is defined as babies with a calendar age of less than 37 weeks. Small-for-gestational-age is defined as a baby born at 37 weeks or later, with a weight below the 10th percentile for babies of the same gestational age.

This thermometer is not intended to interpret hypothermic temperatures. If the device displays a temperature of 36.4 °C (97.5 °F) or less with an LED backlight color of green or white, and the individual is exhibiting atypical symptoms or behaviors, contact your physician or health care professional.

DO NOT allow children to take their temperatures unattended.

Please consult your physician if you see symptoms such as unexplained irritability, vomiting, diarrhea, dehydration, changes in appetite or activity, seizure, muscle pain, shivering, stiff neck, pain when urinating, etc., even in the absence of fever.

Even in the absence of fever, those who exhibit a normal temperature may still need to receive medical attention. People who are on antibiotics, analgesics, or antipyretics should not be assessed solely on temperature readings to determine the severity of their illness.

DO NOT modify this equipment without the authorization of the manufacturer.

Why Braun Touchless + forehead?

Measurement in under 2 seconds

The innovative infrared technology allows measurement of forehead temperature in under 2 seconds whether you use the forehead or touchless option.



Accurate and reliable

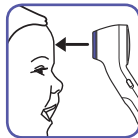
Due to the unique technology, the Touchless + forehead thermometer captures the heat naturally given off by the forehead to calculate body temperature value. Get the same professional accuracy whether touching your forehead or holding up to 2.5 cm (1 inch) away.



Easy to use

The Touchless + forehead thermometer is non-invasive. A measurement can be taken even while a child is sleeping.

The Touchless + forehead thermometer is less invasive to use on a child than a rectal thermometer and is easier to use than other methods.



Safe and hygienic

Touchless option helps minimize spreading of germs.

Completely safe for use on children and adults.

How does Braun Touchless + forehead work?

The Touchless + forehead thermometer measures infrared energy radiated from the skin at the center. This captured energy is collected through the lens and converted to an oral equivalent value.

The Touchless + forehead thermometer has been clinically tested and proven to be safe and accurate when used in accordance with its operating instruction manual.

AgeSmart™ colour-coded display

Clinical research shows the definition of fever changes as newborns grow into infants, infants grow into children and children grow into adults.¹

Select the appropriate age setting, take a temperature, and the display will glow green, yellow, or red to indicate whether the temperature is in a normal, moderate or high fever range, respectively.

The device is only intended for the measurement of human body temperature. It is not intended to diagnose or monitor a serious medical condition or disease. The device also has a food/bath mode.

1. Herzog L, Phillips S. Addressing Concerns About Fever. Clinical Pediatrics. 2011; 50(#5): 383-390.

Temperature taking hints

It is important to know each individual's normal temperature when they are well. This is the only way to accurately diagnose a fever. Take multiple readings when healthy to determine normal temperature.

A child's normal temperature can be as high as 37.7 °C (99.9 °F) or as low as 36.1 °C (97.0 °F). Be sure to note this unit reads 0.5 °C (0.9 °F) lower than a rectal digital measurement.

An individual must be inside for 30 minutes before taking a measurement.

Note: The thermometer and individual should be in the same ambient temperature for at least 10 minutes.

ALWAYS hold the thermometer and the forehead steady when taking a reading. **DO NOT** move the thermometer until you hear the final beep. **DO NOT** take a measurement while or immediately after nursing a baby.

Individuals should not drink, eat, or be physically active before/while taking the measurement. Remove hats and wait 10 minutes before taking a measurement.

Before taking a measurement, remove dirt or hair from the forehead area. Wait 10 minutes after cleaning before taking measurement.

ALWAYS take the temperature exactly as directed. Temperature results may vary if positioned in the wrong location.

For individuals measuring their own temperature, it is recommended to use the "forehead" option instead of "touchless".

In the following situations it is recommended that three temperatures in the same location be taken and the highest one taken as the reading:

- Newborn infants in the first 100 days.
- Children under three years of age with a compromised immune system and for whom the presence or absence of fever is critical.

- When the user is learning how to use the thermometer for the first time until he/she has familiarized himself/herself with the instrument and obtains consistent readings.

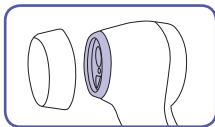
General precautions:

- Remove any sweat prior to measuring with a dry cloth.
- Avoid any cooling or warming cloths on the forehead for at least 30 minutes prior to measurement.
- **DO NOT** take temperature measurements over scar tissue, open sores, or abrasions.
- Keep the measurement sensor and lens clean. Avoid directly touching the sensor or lens.
- **ALWAYS** store the thermometer with the protective cap in place to prevent dirt and scratches from damaging the device.
- Make sure to remove the protective cap before taking a measurement and to put the cap back on after using the thermometer.

How to use your Braun Touchless + forehead

Note: The thermometer and individual should be in the same ambient temperature for at least 10 minutes.

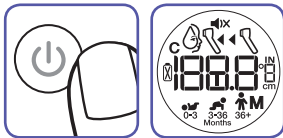
1 Remove protective cap



2 Power on

Press and release the power button once. Backlight will come on and the start-up sequence begins.

NOTE: Make sure to remove the protective scanner cap before taking a measurement.



3 Select age range

Select age with AgeSmart™ button.

Device will start cycling through the age ranges, highlighting the 3 ranges you may select; 0-3 months (👶), 3-36 months (👦), or 36+ months (👤).

Press the AgeSmart™ button to toggle through the age ranges until you select the age appropriate for the individual.

To set a preferred age range: (Locking an age setting)

To save a preferred age range, so that the preferred age range will be automatically selected when the thermometer is turned ON, follow these steps:

A. Make sure the thermometer is OFF.

B. Press and hold the power button (⏻) and AgeSmart™ button (⊕) for 4 seconds. The unit will turn on, displaying a yellow backlight and the 3 age range icons will flash.

C. Press the AgeSmart™ (⊕) button. The age range selected will flash. Press the AgeSmart™ button until your desired age range is flashing on the display.

D. Once the desired age range is selected, stop pressing the button and wait 3 seconds. The green backlight will illuminate, and the selected age range will turn solid. After 4 seconds, the thermometer will turn off.

E. The preferred age range will be automatically selected when the thermometer is turned ON.

Note: With a preferred age range, an alternate age range can be selected during each use, by pressing the AgeSmart™ button when the age range icon appears, after the thermometer is turned ON.

F. To remove the preferred age range, open the battery door, remove the batteries, wait 30 seconds and re-insert the batteries.

IMPORTANT: To ensure accurate readings, you must always take a temperature reading in the age range that corresponds to the individual's age.



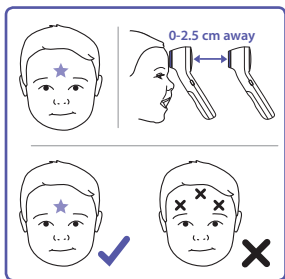
4 Position

Position thermometer on or up to 2.5 cm (1 inch) away from the center of the forehead, just between the eyebrows.

When the thermometer is ready and on or 2.5 cm (1 inch) away from the forehead a horizontal line of dashes ("---") will appear on the screen.

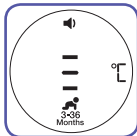
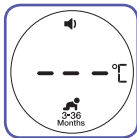
For touchless readings, the yellow guidance light will show you where you are aiming.

If the eyebrow area is covered with hair, sweat or dirt, please clean the area beforehand to improve the reading accuracy. It is important to hold the thermometer and the forehead steady during measurement. Movement will impact the temperature reading.



5 Take temperature

Three dashed lines mean the thermometer is ready to take a temperature. Press the temperature button. The display will show a dashed line animation while it takes a reading. Once the reading is complete a confirmation beep will be heard and the appropriate fever light color will be displayed on screen.



If the device is positioned too far away from the forehead, it will prompt you to move closer by displaying the characters "0-2 cm". Slowly move the device toward the forehead until the dashed line animation starts and a reading is displayed.

6 Read temperature

If temperature is in the normal range, a long beep will sound when the measurement is complete. If the temperature is in the fever range, ten short beeps will sound to indicate the measurement is complete.

Age range	Green Normal temperature	Yellow Moderate fever	Red High fever
0*-3 Months	≥35.8 – ≤37.4 °C (≥96.4 – ≤99.4 °F)		>37.4 °C (>99.4 °F)
3-36 Months	≥35.4 – ≤37.6 °C (≥95.7 – ≤99.6 °F)	>37.6 – ≤38.5 °C (>99.6 – ≤101.3 °F)	>38.5 °C (>101.3 °F)
36 Months- adult	≥35.4 – ≤37.7 °C (≥95.7 – ≤99.9 °F)	>37.7 – ≤39.4 °C (>99.9 – ≤103.0 °F)	>39.4 °C (>103.0 °F)

* 0 months is defined as having a gestational age of greater than or equal to 37 calendar weeks at birth.

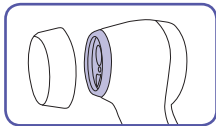
7 To turn off

Press the power button to turn off. Device will also shut off automatically after 30 seconds of no use.

Note: Put the protective cap on the device after use before storing.

How to use the Touchless setting to take a food/bath temperature

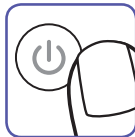
1 Remove protective cap



2 Power on

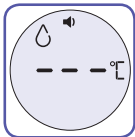
Press and release the power button once. Backlight will come on and the start-up sequence begins.

NOTE: Make sure to remove the protective scanner cap before taking a measurement.



3 Select food & bath temperature mode

Press and release the food & bath temperature mode button. A beep will sound, the food & bath icon (🍲) will be displayed, the screen backlight will turn blue and three dashes will show on the screen indicating the thermometer is ready to take a temperature.



4 Position

Position device up to 6 cm (2.5 inches) away from the bath water or food.

Note: When measuring food or bath temperature the thermometer must be aimed directly at the food or bath water. **DO NOT** aim at sides of container holding the liquids or food. **DO NOT** touch liquid or food with the thermometer.



5 Take temperature

Press the temperature button (you can press and hold the button or press and release it). The display will show a dashed line animation while it takes a reading. Once the reading is complete, the display will show the temperature reading.



6 Read temperature

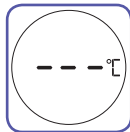
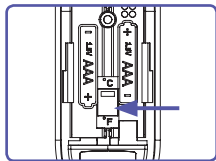
Remove the device and read the temperature.

Note: Put the protective cap on the device after use before storing

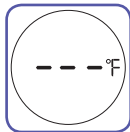


Changing the temperature scale

- 1 Open battery compartment and remove the batteries.
- 2 °C / °F switch is accessible in the battery compartment.
- 3 Slide switch to °C or °F to set preferred temperature scale.
- 4 Replace the batteries and close the battery door.



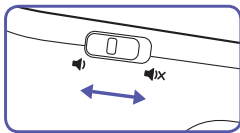
Celsius



Fahrenheit

Changing the sound mode

The Touchless + forehead thermometer allows you to silence the beeps on the thermometer to avoid waking a sleeping child. To activate the silence feature, slide the switch to the silent mode position and take a temperature reading. An icon will appear on the screen to indicate that the thermometer is in silent mode.



Calibration


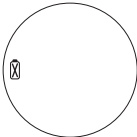


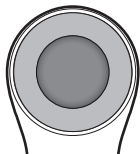
The thermometer is initially calibrated at the time of manufacture. If this thermometer is used according to the use instructions, periodic re-adjustment is not required. If at any time you question the accuracy, please contact customer service.

The LOT and SN of your device are located inside the battery compartment.

Manufacturing date is given by the LOT number. The first three (3) digits represent the Julian date that the product was manufactured and the next two (2) digits represent the last two numbers of the calendar year the product was manufactured. The last identifiers are the letters that represent the manufacturer.

An example: LOT 11614tav, this product has been manufactured on the 116th day of the year 2014.

Errors and troubleshooting

Error message	Situation	Solution
	When 20% of battery life is left, the display flashes the low battery warning symbol; however, the device can still work until the battery life has 0% left.	Replace batteries.
	If the steady battery icon is the only symbol shown on the display, the device cannot work. The battery should be replaced immediately.	Replace batteries.
	This message displays when the measured temperature is lower than 34 °C (93.2 °F) or higher than 43 °C (109.4 °F) or when the room temperature is outside the operating range of 15 °C – 40 °C (59 °F – 104 °F).	Re-measure the temperature, carefully following the instructions in "How to use" section.
	System error – self-check display flashes continuously and will not be followed by the ready beep and the ready symbol. If error persists, If error still persists,	Wait 1 minute until the thermometer turns off automatically, then turn on again. ... reset the thermometer by removing the batteries and putting them back in. ... please contact customer service.
	Blank display. Thermometer does not have power.	Please check if the batteries have been loaded correctly. Also check polarity (<+> and <->) of batteries. Contact customer service if thermometer still does not function.

Care and cleaning

Use an alcohol swab or cotton swab moistened with alcohol (70% isopropyl) to clean the thermometer casing and the measuring probe. Ensure that no liquid enters the interior of the thermometer. Never use abrasive cleaning agents, thinners or benzene for cleaning and never immerse the instrument in water or other cleaning liquids. Wait 10 minutes after cleaning before taking a temperature measurement. Make sure to replace the protective cap after use to prevent scratches or damage from occurring to the thermometer.

Never insert a sharp object into the scanner area or any other open surface on the thermometer.

Replacing the batteries

The Touchless + forehead thermometer comes with 2 AAA batteries. Replace with 2 new AAA batteries when the flashing battery symbol appears on the LCD screen. To change the batteries, slide open the battery cover and remove batteries. Replace the batteries being sure to align properly as indicated inside the battery compartment. Remove the battery from the product if it is not required for extended periods of time in order to avoid damage to the thermometer resulting from a leaking battery.



To protect the environment, dispose of empty batteries at appropriate collection sites according to national or local regulations.

Limited warranty

This product comes with limited warranty commencing on the date of purchase (See warranty card for details). Within the warranty period we will eliminate, free of charge, any defects in the appliance resulting from faults in materials or workmanship, by replacing the complete appliance.

This warranty is applicable only for the appliance supplied by the appointed distributor. This warranty does not cover: damage due to improper use, normal wear or use as well as defects that have a negligible effect on the value or operation of the appliance. The warranty becomes void if repairs are undertaken by unauthorized persons and if original Braun parts are not used.

Product specifications

Type:	Touchless + forehead (BNT 400)
Measuring range:	34 °C – 43 °C (93.2 °F – 109.4 °F)
Resolution:	0.1 °C (0.1 °F)
Laboratory accuracy:	0.2 °C for 35 °C – 42 °C (0.4 °F for 95 °F – 107.6 °F) outside that range ± 0.3 °C/0.5 °F (Ambient temperature: 15 °C to 40 °C (59 °F to 104 °F) This thermometer displays a calculated oral equivalent estimate.
Display:	Liquid Crystal Display, 4 digits plus special icons
Acoustic:	Audio: Normal temp range = Green temp range: 1 long beep for 0.4 second duration Fever = Red or Yellow temp range: 10 short beeps for 0.2 second duration
Operating temperature:	15 °C – 40 °C (59 °F – 104 °F)
Automatic switch-off:	Approx. 30 seconds after last measurement has been taken
Weight:	100 g. (with batteries), 82.5 g. (w/o batteries)
Services life:	5 years

Long term storage ranges

Storage/transport temperature:	-25 °C – 55 °C (-13 °F – 131 °F)
Humidity:	15–95% non-condensing
Battery:	(2) AAA Batteries - at least 500 measurements
Pressure:	700-1060 hPa (0.7-1.06 atm)

This infrared thermometer meets requirements established in ASTM Standard E 1965-98 (for the thermometer system). Full responsibility for the conformance of the product to the standard is assumed by Kaz Europe Sàrl, a Helen of Troy Company, Place Chauderon 18, CH-1003 Lausanne, Switzerland

ASTM laboratory accuracy requirements for the thermometer only in the display range of 36 °C to 39 °C (96.8 °F to 102.2 °F) for infrared thermometers is ± 0.3 °C (± 0.5 °F), whereas for mercury-in-glass and electronic thermometers, the requirement per ASTM Standards E 667-86 and E 1112-86 is ± 0.1 °C (± 0.2 °F).

This device conforms to the following standards:

EN 60601-1:2014 Medical electrical equipment. General requirements for basic safety and essential performance

ASTM E1965-98:2016 - Standard Specification for Infrared Thermometers for Intermittent Determination of Patient Temperature

ISO 80601-2-56:2017 Particular requirements for basic safety and essential performance of clinical thermometers for body temperature measurement

IEC 60601-1-2:2014: Medical electrical equipment – Part 1-2: General requirements for basic safety and essential performance – Collateral Standard: Electromagnetic disturbances – Requirement and tests

NOTE: Do not use this device in the presence of electromagnetic or other interference outside the normal range specified in IEC 60601-1-2:2007.

EN 1041: 2008 Information supplied by the manufacturer of medical devices

IEC 60601-1-11: 2015 Medical electrical equipment – Part 1-11: General requirements for basic safety and essential performance – Collateral standard: Requirements for medical electrical equipment and medical electrical systems used in the home healthcare environment



Equipment with type
BF applied parts



See Instruction for use



Operating temperature



Storage temperature



Keep it dry

Internally Powered Equipment

Continuous Operation

IP22: Protected against solid foreign objects of 12.5 mm diameter and greater. Protected against vertically falling water drops when the device is tilted up to 15 degrees.

MEDICAL ELECTRICAL EQUIPMENT needs special precautions regarding EMC.

For detailed description of EMC requirements please contact consumer service.

Portable and mobile RF communications equipment can affect MEDICAL ELECTRICAL EQUIPMENT.

Remove the battery from the instrument if it is not required for extended periods of time in order to avoid damage to the thermometer resulting from a leaking battery.



Please do not dispose of the product in the household waste at the end of its useful life.



To protect the environment, dispose of empty batteries at appropriate collection sites according to national or local regulations.

Guidance and manufacturer's declaration – electromagnetic immunity		
The BNT400 is intended for use in the electromagnetic environment specified below. The customer or the user of the BNT400 should ensure that it is used in such an environment.		
Phenomenon	Basic EMC standard or test method	IMMUNITY TEST LEVELS
		HOME HEALTHCARE ENVIRONMENT
ELECTROSTATIC DISCHARGE	IEC 61000-4-2	± 8 kV contact ± 2 kV, ± 4 kV, ± 8 kV, ± 15 kV air
Radiated RF EM fields ^{a)}	IEC 61000-4-3	10 V/m ^{f)} 80 MHz – 2,7 GHz ^{b)} 80 % AM at 1 kHz ^{c)}
Proximity fields from RF wireless communications equipment	IEC 61000-4-3	See RF wireless communication equipment immunity table below
RATED power frequency magnetic fields ^{d) e)}	IEC 61000-4-8	30 A/m ^{g)} 50 Hz or 60 Hz
<p>^{a)} The interface between the PATIENT physiological signal simulation, if used, and the ME EQUIPMENT or ME SYSTEM shall be located within 0,1 m of the vertical plane of the uniform field area in one orientation of the ME EQUIPMENT or ME SYSTEM.</p> <p>^{b)} ME EQUIPMENT and ME SYSTEMS that intentionally receive RF electromagnetic energy for the purpose of their operation shall be tested at the frequency of reception. Testing may be performed at other modulation frequencies identified by the RISK MANAGEMENT PROCESS. This test assesses the BASIC SAFETY and ESSENTIAL PERFORMANCE of an intentional receiver when an ambient signal is in the passband. It is understood that the receiver might not achieve normal reception during the test.</p> <p>^{c)} Testing may be performed at other modulation frequencies identified by the RISK MANAGEMENT PROCESS.</p> <p>^{d)} Applies only to ME EQUIPMENT and ME SYSTEMS with magnetically sensitive components or circuitry.</p> <p>^{e)} During the test, the ME EQUIPMENT or ME SYSTEM may be powered at any NOMINAL input voltage, but with the same frequency as the test signal (see Table 1).</p> <p>^{f)} Before modulation is applied.</p> <p>^{g)} This test level assumes a minimum distance between the ME EQUIPMENT or ME SYSTEM and sources of power frequency magnetic field of at least 15 cm. If the RISK ANALYSIS shows that the ME EQUIPMENT or ME SYSTEM will be used closer than 15 cm to sources of power frequency magnetic field, the IMMUNITY TEST LEVEL shall be adjusted as appropriate for the minimum expected distance.</p>		

Guidance and manufacturer's declaration – electromagnetic emissions		
The BNT400 equipment is intended for use in the electromagnetic environment specified below. The customer or the user of the BNT400 should ensure that it is used in such an environment.		
Emissions Test	Compliance	Electromagnetic environment – guidance
RF Emissions CISPR 11	Group 1	The ME equipment uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF Emissions CISPR 11	Class B	Complies
Harmonic emissions IEC 61000-3-2	Not Applicable	The ME equipment is solely battery powered.
Voltage fluctuations/ flicker emissions	Not Applicable	

Guidance and manufacturer's declaration – RF wireless communication equipment immunity

Test frequency (MHz)	Band ^{a)} (MHz)	Service ^{a)}	Modulation ^{b)}	Maximum power (W)	Distance (m)	IMMUNITY TEST LEVEL (V/m)
385	380 – 390	TETRA 400	Pulse modulation ^{b)} 18 Hz	1,8	0,3	27
450	430 – 470	GMRS 460, FRS 460	FM ^{c)} ± 5 kHz deviation 1 kHz sine	2	0,3	28
710	704 – 787	LTE Band 13, 17	Pulse modulation ^{b)} 217 Hz	0,2	0,3	9
745						
780						
810	800 – 960	GSM 800/900, TETRA 800, iDEN 820, CDMA 850, LTE Band 5	Pulse modulation ^{b)} 18 Hz	2	0,3	28
870						
930						
1 720	1 700 – 1 990	GSM 1800; CDMA 1900; GSM 1900; DECT; LTE Band 1, 3, 4, 25; UMTS	Pulse modulation ^{b)} 217 Hz	2	0,3	28
1 845						
1 970						
2 450	2 400 – 2 570	Bluetooth, WLAN, 802.11 b/g/n, RFID 2450, LTE Band 7	Pulse modulation ^{b)} 217 Hz	2	0,3	28
5 240	5 100 – 5 800	WLAN 802.11 a/n	Pulse modulation ^{b)} 217 Hz	0,2	0,3	9
5 500						
5 785						

a) For some services, **only** the uplink frequencies are included.

b) The carrier shall be modulated using a 50 % duty cycle square wave signal.

c) As an alternative to FM modulation, 50 % pulse modulation at 18 Hz may be used because while it does not represent actual modulation, it would be worst case.

