

SM1P Ex

MANUAL

ENGLISH

**IEC Controlled Document – modifications to this document
must follow IEC Document Control Procedures.**

Document
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IECEX126

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INTRODUCTION

The SM1P/PW/B/DP/XBT Ex Series of Headsets is a state of the art hearing protection (ie protects against harmful noise) communication system that allows you to retain situational awareness whilst remaining in full contact with your team via Short Range technology, as well as two-way radio or cellular device via Bluetooth® or wired connection.

The product meets the following international standards for use in explosive gas environments. Check the product label to identify the ratings applicable to the headset.

II 1G Ex ia IIC T3 Ga (-20°C ≤ Ta ≤ +40°C)
I M1 Ex ia I Ma (-20°C ≤ Ta ≤ +60°C)

Class I, Division 1 Groups A-D, T3C (-20°C ≤ Ta ≤ +40°C)
Class I, Zone 0, AEx ia IIC T3 Ga (-20°C ≤ Ta ≤ +40°C)
Ex ia IIC T3 Ga (-20°C ≤ Ta ≤ +40°C)

Or

II 2G Ex ib IIC T4 Gb (-20°C ≤ Ta ≤ +40°C)
II 2D Ex ib IIIC T155°C Db (-20°C ≤ Ta ≤ +40°C)
I M2 Ex ib I Mb (-20°C ≤ Ta ≤ +60°C)

CI I, Div 1 Grp A-D, T4 (-20°C ≤ Ta ≤ +40°C)
CI I, Zn 1, AEx ib IIC T4 Gb (-20°C ≤ Ta ≤ +40°C)
CI II, Zn 21, AEx ib IIIC T155°C Db (-20°C ≤ Ta ≤ +40°C)

Situational awareness is provided by **SENS**® processing technology and environmental microphones mounted within the headset.

Contact through two-way radios is enabled by the SRCK61XXCCXX* cable assembly available separately. Cable numbers vary depending on the two-way radio model. Please consult with the website for more information.

*SRCK61XXCCXX part numbers vary depending on the radio connector. Consult your supplier for the appropriate cable.

For language translated manuals and further information, please refer to the website.

MAINTENANCE AND SAFETY INSTRUCTIONS

The SM1P Ex has been designed such that minimal user maintenance is required. Only those parts listed on page 25 of this instruction manual are user replaceable.

SPECIFIC CONDITIONS OF USE Potential Electrostatic hazard, clean with damp cloth only.

WARNING The SM1P Ex must not be disassembled. In the event of a malfunction the unit should be switched off and returned to Sensear Pty Ltd. The battery is not user replaceable; the SM1P Ex must be returned to Sensear for battery replacement. Substitution of components may impair Intrinsic Safety.

WARNING Connection to the USB Connector located in the connector compartment of the right-hand ear-cup is not permitted. The USB is for service only.

WARNING The SM1P Ex must not be charged in a hazardous area. The battery shall only be charged when the equipment is located in a safe area using the class II charging supply via the jack socket on the left-hand ear cup; the maximum permitted voltage at this charging input is $U_m = 6V$.

WARNING Connection to the multi-pin Hirose connector of the SM1P Ex (wired version) shall only be done via an SRCK61XXCCXX SM1P Ex Intrinsically Safe interface cable. No direct connection to the multi-pin Hirose connector is permitted.

ENTITY PARAMETERS

The following entity parameters are for when SM1P Ex is used with SRCK61XXCCXX at the radio end of the interface cable.

Entity parameter	Value
Ui	8.4 V
Ci	0.15 μ F
Li	0 μ H
Co	\geq Ci + Ccable
Lo	\geq Li + Lcable

MARKINGS

The SM1P Ex contains the following markings:

Hazardous location class and group and temperature class

A scratch-resistant classification label is located at the top of the left-side earcup on the headset.

IECEX BAS 18.0035X Baseefa18ATEX0049X Ex II 1G Ex ia IIC T3 Ga Ex I M1 Ex ia I Ma SGSNA/18/SUW/00190X Intrinsic Safety / Sécurité Intrinsèque Class I, Div 1 Groups A-D, T3C Class I, Zone 0, AEx ia IIC T3 Ga Dwg SGSCUS003	Sensear 199 Great Eastern Hwy Belmont WA 6104 C €0518
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Or

II 2G Ex ib IIC T4 Gb II 2D Ex ib IIIC T155°C Db I M2 Ex ib I Mb IECEX BAS 18.0035X Baseefa18ATEX0049X SGSNA/18/SUW/00190X Intrinsic Safety / Sécurité Intrinsèque Class I, Div 1 Grp A-D, T4 Class I, Zn 1, AEx ib IIC T4 Gb Class II, Zn 21, AEx ib IIIC T155°C Db	Sensear 199 Great Eastern Hwy Belmont WA 6104 C €XXXX	Dwg SGS CUS 005
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where "XXXX" is the number of the ATEX Notified Body responsible for the ATEX GAN.

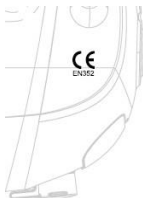
Product model, number code and serial number

A product model name, number and serial label are located at the top of the right-side earcup on the headset.

An eight-digit product code followed by a unique eight-digit serial number will be visible on the top of the outer cup and of the form:

MFPOOPPPSSSSSSSSSS where 'MFPOOPPP;' is the product number and 'SSSSSSSS' is the serial number

CE mark



HEADSET ANATOMY

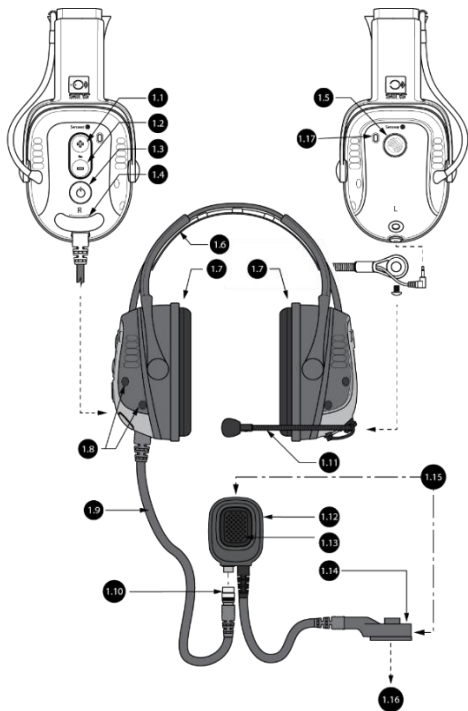


Figure 1

FIGURE 1

#	Description
1.1	Volume up button
1.2	Volume down button
1.3	Power button
1.4	Hatch cover, for programming and charging
1.5	Multi-function button (MFB)
1.6	Headband*
1.7	Ear cushions
1.8	SENS Microphones
1.9	Headset cable
1.10	Headset connector
1.11	Boom microphone Mount - M5 Hex screw Connector - 2.5mm Audio jack
1.12	Inline PTT
1.13	Inline PTT button
1.14	Two-way radio connector (note, these will vary depending on your two-way radio)
1.15	SRCK61XXCCXX cable assembly
1.16	To the two-way radio
1.17	LED light (one on each side of headset)

WEARING THE HEADSET

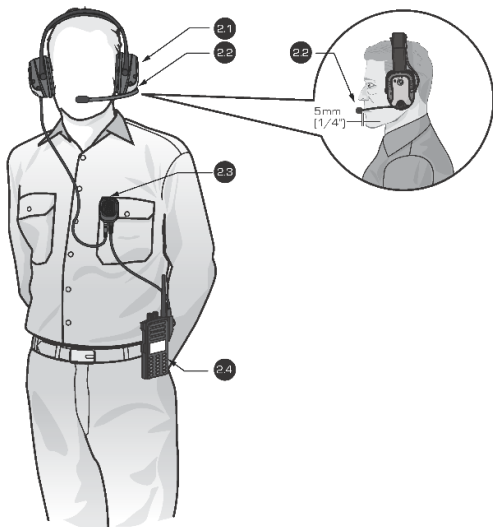


FIGURE 2

#	Description
2.1	Headset
2.2	Boom microphone
2.3	Inline PTT
2.4	Two-way radio

The SM1P Ex headset is designed to be worn with the headset sealing around the ears. Specific examples of how to fit the headset around the ears are covered in the next three pages. The fit does alter slightly depending on what style of brace is used - headband, behind the neck or mounted to a helmet directly.

The boom microphone should be placed approximately 5mm (1/4") in front of the mouth. Check to ensure the white dot or microphone label is facing towards you. The orientation is essential as the microphone is directional. If the microphone faces a different direction, this may lead to a reduction in transmission quality.

The inline PTT has a rotatable clip behind it to allow it to attach to the shirt / upper garment.

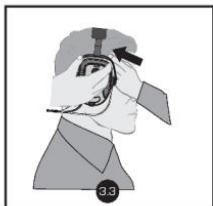
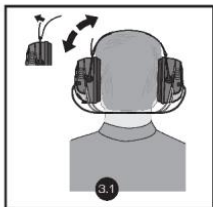
The inline PTT must be connected to the two-way radio using the multi-pin connector.

FITTING THE HEADSET

It is recommended that the wearer should ensure that;

- The ear muffs are fitted, adjusted and maintained in accordance with the manufacturer's instructions
- The ear muffs are worn at all times in high noise conditions

If the above recommendations are not adhered to, the protection afforded by the ear muffs will be severely impaired.



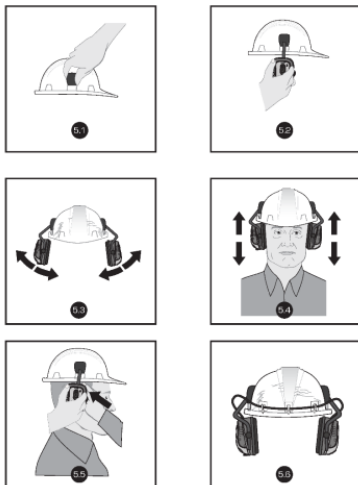
Behind the neck mount fitting instructions

#	Description
3.1	Adjust velcro strap so that the ear muff cups completely enclose the ears.
3.2	The ear muff cushions should seal firmly against the head.
3.3	For best results, remove all hair from under the ear cushion.
3.4	Noise reduction will be adversely affected by anything that breaks the seal of the ear muff ear cushions.



Headband mount fitting instructions

#	Description
4.1	Adjust the headband by pulling the centre band out equally on both sides.
4.2	Ensure no hair is inside the muff ear cushions.
4.3	Fit the ear muffs over the ears ensuring a tight fit around the ears.
4.4	Ensure the muff completely surrounds the ears.
4.5	Press down on the headband to obtain a snug and comfortable fit.



Helmet mount fitting instructions

#	Description
5.1	Attach the adaptors to each side of the helmet by sliding them into the slots.
5.2	Attach the earmuffs by sliding into the adaptors.
5.3	Ensure the earmuff is firmly attached by lifting the arm up and down.
5.4	Place the helmet on the head and adjust by sliding the ear muffs up and down.
5.5	Earmuffs should seal firmly against the head. For best results, remove hair from under the ear muffs.
5.6	Three adhesive mounts and ties are included to secure the ear muff cable to the helmet. The mounts should be evenly spaced around the rear outside of the helmet. Fit the tie through the mount. The cable should feed through each tie and secured in place.

Dual protection fitting instructions



Locate the ear buds inside the ear cup.



Place earmuff away from the ears while fitting the ear buds. Insert ear tips following the ear tip fitting instructions on next page.

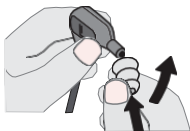


Place the earmuff back over the ears. Ensure the retractable, coiled cable is fully located within the ear cup. Noise reduction will be adversely affected by anything that breaks the seal of the earmuff cushions.

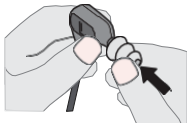
Silicone ear tip fitting instructions



DO NOT roll the ear tip between your fingers as the tip has been pre-shaped for easy insertion

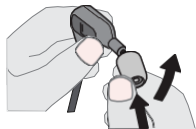


Place ear tip at an angle to the plastic canal

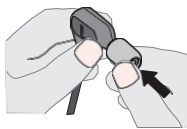


Push the ear tip firmly over the plastic canal

Foam ear tip fitting instructions



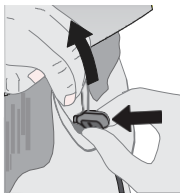
Ensure hands and foam tip are clean before insertion. Place foam tip at an angle to plastic canal



Push the ear tip firmly over the plastic canal



Compress the foam to form a cylindrical shape being careful not to create the foam



Gently pull your ear up and backwards with one hand while inserting the ear plug into the ear. Foam ear tips should be inserted within 5 seconds of compressing the foam. Make sure the plug seals well into the ear canal. The ear tip should not protrude out of the ear canal. If using foam ear tips hold the plug in place for 20 seconds or until the foam has fully expanded.

OPERATING THE HEADSET

POWER ON:

1. Press and release the "Power" button shown in Figure 1.
2. All the LEDs will turn on briefly, & an audible sound will be heard through the headset.
3. The Green LED will flash at a normal rate as described below.

POWER OFF:

1. Press and hold the "Power" button for 2 seconds.
2. All the LEDs will turn on briefly and an audible sound will be heard through the headset as the headset powers off.

SENS® MODE:

When the headset is powered up, the unit is set into 'SENS' mode** *. By pressing the power button, this toggles 'SENS' mode'.

'SENS' mode' allows full situational awareness of your surroundings in addition to two-way radio communications.

- The power button toggles between Quiet mode and SENS® mode
- The volume control buttons can be used to raise or lower the audio level of the SENS® mode.
- **The default mode on power up can be programmed using the Sensear app.

QUIET MODE:

By pressing the power button, this toggles 'Quiet mode'. Quiet mode only allows two-way radio communications to pass through the headset.

SENS® mode	Green LED, blink twice every 4 seconds
Quiet mode	Green LED, blink once every 4 seconds

SETUP MODE:

Setup mode enables a limited number of settings to be changed directly via the headset. This mode is separate from the normal headset operating mode. Some options will not be available if the product model does not support a feature or headset programming has removed the setup mode option. For further setup, a programming tablet will be required,



The options (with fully available feature set) are:

1. Short Range - region
2. Short Range - channel frequencies
3. FM Radio - enable/disable
4. VOX - feature assignment
5. VOX - trigger level

A short press and release of the power button will cycle through these options when in setup mode.


Enter/exit setup mode:

1. Headset is powered off
2. Hold Volume Up button
3. While holding Volume Up, Press & release Power button
4. Will hear "system setup"
5. Release Volume Up button

 (short)	Cycle down through system setup options
 (long)	Power off the headset.



The headset needs to be powered down before it can be powered up into its normal operating mode. Changes will be saved upon powering off the headset from setup mode.

Changing Short Range region: Ensure you hear "short range FM region".

 (short)	Increment/decrement through regions 1, 2 or 3.
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Region	EIRP (μ W)	Standards	FM frequency range (MHz)
1	8.02	AS/NZS 4268	88.1 - 107.9
2	0.048	EN301357-1	88.1 - 107.9
3	0.012	FCC-15.239 / IC RSS-210	88.1 - 97.0


Changing Short Range frequencies: Ensure you hear "short range FM frequency".

 (short)	<p>Change frequency:</p> <p>up = increment 0.1MHz, down = decrement 0.1MHz</p>
 (long)	<p>Change bank:</p> <p>up = increment bank, down = decrement bank</p>


Note, frequency range is 88.1MHz to 107.9MHz (97.0 MHz for region 3).

The frequency/bank last selected in the setup mode will be the frequency/bank used when Short Range is turned on in normal operating mode.


Changing FM radio enable: Ensure you hear “FM radio”.

	Toggle between “enable” and “disable”.
---	--

Changing VOX assignment: Ensure you hear “VOX setup”.

	Toggle between “disable” and “Short Range”
---	--

Changing VOX trigger level: Ensure you hear “VOX level”.

	cycle through “low”, “medium” and “high” trigger levels
---	---

“low” is the most sensitive/easiest to trigger VOX and “high” is the least sensitive/hardest to trigger VOX.

COMMUNICATING

COMMUNICATING OVER TWO-WAY RADIO:

Only approved two-way radio cables containing a certified IS barrier (SRCK61XXCCXX) may be used with SM1P Ex.

To transmit over the two-way radio:

- Press and hold the button located on the inline PTT.
- Release the inline PTT button to cease transmission.
- To change the volume of the two-way radio communications, use the two-way radio's volume controls

Notes:



- When the headset is powered off (and disconnected from the inline PTT), the inline PTT button may not activate the two-way radio. The PTT located on the two-way radio should be used.
- When the headset is powered on, the two-way radio PTT may not activate the two-way radio

COMMUNICATING OVER SHORT-RANGE:



[short press] together to toggle Short Range on / off.


When on:

	Short Range PTT
 [long]	Increment/decrement preset frequency bank

When the headset is powered off it remembers the last selected frequency bank and the Short Range on/off state.

Short Range VOX: [See Operating the Headset - Setup Mode section for VOX setup information]


If VOX is assigned to Short Range, when Short Range turns on, you will hear the Short Range frequency announcement and then "VOX on". VOX can be toggled on and off:

 [short]	Toggle VOX on and off (while Short Range is turned on)
--	--


VOX does not trigger while there is an active signal on the Short Range frequency. A VOX transmission can be interrupted by pressing and releasing the Short Range PTT (i.e. MFB).

VOX will also not trigger when two-way is transmitting, Bluetooth® is in a phone call or when connected to a Bluetooth® radio.

LISTENING TO FM RADIO:

 [short press] together to toggle FM radio on /off. Note, FM radio cannot be turned on while Short Range is turned on and vice versa.

When on:

 (long)	Scan up/down to the next FM radio.
---	------------------------------------

When a Bluetooth phone call is entered, FM radio audio is muted. It will return when the call ends.

When the headset is powered off it remembers the last tuned FM radio frequency and the FM radio on/off state.

COMMUNICATING OVER BLUETOOTH®:

First time pairing: Press and hold the multi-function button (MFB) to put the headset into pairing mode. “Bluetooth® discoverable” when pairing mode is entered. Will hear a connection tone if connection successful. Pairing mode times out after 2 minutes.

Note, if Short Range is turned on, you must first turn it off to use the MFB for Bluetooth® pairing (see Short Range section). After the headset is in Bluetooth® pairing mode, Short Range can be turned back on.

Reconnect: When powered on the headset will try to reconnect to the last paired device. Alternatively, if the headset is not currently paired to another device, prompt the reconnection from a device (e.g. mobile phone that has the headset stored in its device list).

Incoming call	Answer call: <ol style="list-style-type: none"> From handset Press and release MFB Reject call: <ol style="list-style-type: none"> From handset Press and hold Multi-function button
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During call	End call: <ol style="list-style-type: none"> a. From handset b. Press and hold Multi-function button c. Call hung up on the far end
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Two-way radio Bluetooth®: To transmit, use the radio's PTT. For some select device, MFB will perform as a Bluetooth® PTT (if short range off).

Contact Sensear representative for compatible devices.

Bluetooth® phone call: During a Bluetooth® phone call, if two-way radio or short range are transmitting, outgoing Bluetooth® is muted while incoming audio is still heard. Once two-way and Short Range stop transmitting, outgoing Bluetooth® is restored.

Bluetooth® Audio streaming: Audio streaming can **only** be used in **Quiet mode**. Streamed audio will be mute in **SENS®** mode. This is often used for streaming music but industrial use cases include Bluetooth® machine health analyzers.

Blue LED Indicator:

Solid	Pairing mode
Blinking slowly	Paired
Blinking fast	Incoming phone call

USER MAINTENANCE AND STORAGE

This product may be adversely affected by certain chemical substances. Further information should be sought from the manufacturer.

The headset contains replaceable cushions (Part #: SMHK0006 or SMHK0005). Cushions are recommended to be replaced every 3-6 months to maintain the appropriate hearing protection that the product is certified to. Cushions should be inspected regularly for signs of damage or wear. Cushions can be removed simply by gripping the cushion and pulling firmly to unclip from the baseplate. Replacement cushions may be pushed into the clips around the baseplate.

The headset should be stored at room temperature (between 15°C/59°F and 25°C/77°F).

ACCESSORIES AND SPARE PARTS

The following accessories and spare parts may be ordered separately:

SRCK61XXCCXX01	Intrinsically Safe. Various models, two-way radio interface cables for most popular two-way radios.
SMHK0006	Ear muff hygiene kits
SMHK0005	Dual Protection hygiene kits
SMBE0000	Behind-the-neck replacement band
SMBB0000	Headband replacement band
SMMK0001	Smart Muff Helmet Mount Replacement
SMHA0000	SM1 Helmet Adaptor – 3718
SMHA0001	SM1 Helmet Adaptor – 3713
SMHA0002	SM1 Helmet Adaptor – 3714
SMBM0003	Ex Replacement boom microphone
SMBM0002	Replacement throat microphone
MFPO0062B	Dual Protection replacement earbud pair
SMAPO000	Absorbent Pads X5 Pair
SMWS0001	Smart Muff Wind Protector Kit
SMBMHK01	Smart Muff Boom Microphone Wind Sock X5
SMPW0001	Wall Charger 5.5V 1.0A
PRGTAB01	Programming Tablet

Further information may be obtained from your Sensear representative, via the Sensear web site, or by emailing or writing to the address on this User Manual.

CHARGING

The headset is supplied with an AC adapter that operates globally when fitted with the appropriate electrical regional adapter. Charging must only be performed in the safe area.

To charge the headset, follow the steps below:

1. Plug the Sensear AC adapter into an appropriate power outlet.
2. Insert the cable end of the Sensear AC adapter into the DC power socket on the SM1P headset (located on the left-hand-side of the unit).
3. The LEDs will flash as indicated below:

Red LED (RHS) blink twice every 5 seconds	Battery low (< 1 hour left)
Red LED (LHS) solid	Charging
Green LED (LHS) solid	Charge complete

Note, when the DC plug is inserted into the headset, the headset will be in a charge-only state. Other operating features will not be useable.

TECHNICAL SPECIFICATIONS

	Headband	Behind-the-neck	Helmet Mount
Weight	495g (17.46 oz.)	428g (15.09 oz.)	480g (16.93 oz.)
Operating temperature	<p>Non- Hazardous Environments: -20°C to +60°C (-4°F to 140°F)</p> <p>II 1G Ex ia IIC T3 Ga (-20°C ≤ Ta ≤ +40°C)</p> <p>I M1 Ex ia I Ma (-20°C ≤ Ta ≤ +60°C)</p> <p>Class I, Division 1 Groups A-D, T3C (-20°C ≤ Ta ≤ +40°C)</p> <p>Class I, Zone 0, AEx ia IIC T3 Ga (-20°C ≤ Ta ≤ +40°C)</p> <p>Ex ia IIC T3 Ga (-20°C ≤ Ta ≤ +40°C)</p> <p>Or</p> <p>II 2G Ex ib IIC T4 Gb (-20°C ≤ Ta ≤ +40°C)</p> <p>II 2D Ex ib IIIC T155°C Db (-20°C ≤ Ta ≤ +40°C)</p> <p>I M2 Ex ib I Mb (-20°C ≤ Ta ≤ +60°C)</p> <p>Cl I, Div 1 Grp A-D, T4 (-20°C ≤ Ta ≤ +40°C)</p> <p>Cl I, Zn 1, AEx ib IIC T4 Gb (-20°C ≤ Ta ≤ +40°C)</p> <p>Cl II, Zn 21, AEx ib IIIC T155°C Db (-20°C ≤ Ta ≤ +40°C)</p> <p>Check the product label to identify the ratings applicable to the headset.</p>		
Charging temperature	0°C to +40°C (32°F to 104°F)		
Battery charge time	4 hours		
Operating time	18-24 hours		

DECLARATION OF CONFORMITY

We, the undersigned,

Company	Sensear Pty Ltd
Address	197-199 Great Eastern Highway, Belmont, WA,
Country	Australia
Telephone Number	+61 8 9277 7332
Web	http://www.sensear.com
Email	admin@sensear.com

Declare that:

Model SM1P in accordance with the following directives:

- 2011/65/EU
- 89/686/EEC
- 2014/53/EU
- 2014/35/EU
- 2014/30/EU
- 2014/34/EU

Has been designed and manufactured to the following specifications:

- Single Protection: EN 352-1:2002, EN352-3:2002, EN352-4:2001, EN 352-6:2002
- Double Protection: EN352-6:2002, EN352-7:2002, EN352-8:2008
- EN 301 489-1: V2.1.1 (2017-02)
- EN 301 489-17: V3.1.1 (2017-02)
- EN 300 328: V2.1.1 (2016-11)
- EN 61000-6-2 Ed 3.0
- EN 61000-6-3 Ed 2.1
- EN 60950-1:2006 inc amendments A1, A2, A11, A12