

# Noise impact in healthcare

## Introduction

Pressure relieving air mattress systems are powered by a control unit that controls the pressure (the airflow) inside the mattress. Traditionally the control unit causes vibrations and noise while continuously distributing air. This tends to disrupt patient sleep, rest and overall experience<sup>(1)</sup>.

## Noise impact healing abilities

According to research<sup>(2)(3)</sup> sleep and a calm environment are key components for recovery and wellbeing. When developing aids for healthcare, we believe in a full patient centered view for the best possible patient outcome. Therefore we have designed control units with software that offers non-continuous- and minimal sound levels.

High quality parts are engineered to fit in an innovative way inside our control units that yields close to no vibrations. Combined with automated software it allows for an almost silent experience.

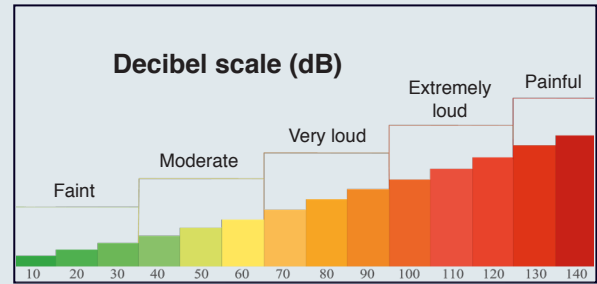


### ISO noise level measurements

ISO 11201:2010 and ISO 3746:2010 are standardised measuring techniques for noise levels. Each standard has it's own measuring technique, therefore yielding different results.

**ISO 11201:2010 Acoustics** — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections.

**ISO 3746:2010 Acoustics** — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane.



## Standards of measuring sound

Noise produced by control units can be measured in numerous ways. Usually results are presented in dB (decibel) regardless of measuring techniques, meaning two different measuring techniques could yield different results for the exact same control unit.

## ISO standards for CE-labelled products

All CE-marked powered medical devices are bound to use noise measuring standard ISO 3746:2010. All Care of Sweden control units sound levels are measured according to ISO 3746:2010 and performed by an accredited research institute.

Care of Sweden also measure noise according to ISO 11201:2010 since it's an internationally used standard.

## Care of Sweden control unit sound level (dB)

Product	ISO 11201	ISO 3746
CuroCell S.A.M.® PRO	22 dB	39 dB
CuroCell UNO®	23 dB	35 dB
CuroCell® IQ	23 dB	35 dB
CuroCell® A4	23 dB	35 dB

<sup>1</sup>Hagerman I et al., "Influence of intensive coronary care acoustics on the quality of care and physiological state of patients", *Int J Cardiol.* 2005 Feb 15;98(2):267-70

<sup>2</sup>Hsu et al., "Noise pollution in hospitals: Impacts on patients", *J. Clin. Out. Mgmt.* 2012, vol 19, no 7, p301-309

<sup>3</sup>Johansson et al., "The sound environment in an ICU patient room - a content analysis of sound levels and patient experiences", *Intensive and Critical Care Nursing Journal*, Oct 2012, 28(5), p.269-279