



WHAT IS AN INTELLIGENT CLEANROOM CONTROL SYSTEM?

The manufacturing filling facility at Cambridge Pharma Ltd incorporates a state of the art, high performance cleanroom which is currently unique and unrivalled in the world. It is the first of a new concept for cleanrooms to be specifically built to deliver superior energy efficiency, contributing to meeting client net zero carbon goals. Here Keith Beattie of EECO2 explains the benefits of an intelligent clean room control system.

INTRODUCTION

Cleanrooms are incredibly energy-intensive spaces, with energy analysis revealing that they may be up to 100 times as energy-consuming as office buildings of a similar size. To reduce this intensity, the Intelligent Cleanroom Control System (ICCS), such as the one in operation at Cambridge Pharma, uses adaptive demand-based control of the HVAC system to create a variable supply air flow rate that changes depending on the particle concentration and other demands in the space. This adaptive control system ensures that the HVAC system provides the desired control of critical parameters (temperature, humidity, differential pressure and cleanliness) under all situations whilst using the

minimum amount of air. This avoids the wasteful processing of excess air when not needed to maintain the critical parameters (temperature, humidity, differential pressure and cleanliness) under all situations whilst using the minimum amount of air. This avoids the wasteful processing of excess air when not needed to maintain the critical parameters.

Most of the time, the resulting supply air rate is well below that commonly found level in a grade-C cleanroom, leading to significant energy reduction in comparison with a static system. Early data from the new facility is indicating a 50% energy reduction when compared with a fixed supply air rate equivalent to 15 air changes per hour.



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Many of the top 20 global pharma corporations have made public commitments to achieve net zero carbon across all 3 scopes of operation. For many CMOs who work closely with these organisations, this means exploring ways to reduce their scope 1 and 2 emissions. ICCS offers a method to tackle the hard to reduce energy expenditure of cleanrooms while still maintaining a fully GMP compliant facility.

At a time when energy costs are on the rise, reductions of 50%+ in cleanroom energy consumption can also mean reduced operational costs. Reducing operational expenditure in cleanrooms is a massive opportunity – 60-90% of cleanroom energy consumption is used by HVAC system.

ABOUT THE AUTHOR

“Keith has over 20 years of experience in pharmaceutical operations and has built a reputation for identifying & delivering significant energy & carbon reduction for customers around the world. He has led energy, waste and water sustainability improvements, and been part of the EECO2 global energy reduction team. Keith played a key role in developing ISO14644-16 (guide to energy efficiency in cleanrooms).”



Keith Beattie

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