Dräger Medical

CUSTOMER-SPECIFIC SUBRACKS FOR ANESTHESIA SYSTEMS

ELECTRONICS FOR THE “DEEP SLEEP”

Anesthesia system “Zeus” from Dräger Medical
(Source: Dräger Medical AG & Co. KgaA)

INTRODUCTION

To meet today’s stringent customer demands, standard 19-in. subracks must be modular, flexible, affordable, and above all, able to be used in numerous application areas. However, in some instances it may make sense not to use standard subracks but to construct and individually configure a subrack.

The integration of electronic components into complex medical equipment is an example where specialized customer requirements for location and application might require standard product modifications.

ONE PLATFORM FOR ALL ANESTHESIA TECHNOLOGIES

nVent SCHROFF Dräger Medical AG & Co., Lübeck, Germany, is a world-leading manufacturer of medical equipment that offers integrated system solutions and services in line with the patient process chain in CareArea, emergency medicine, OP and anesthesia, intensive care, prenatal medicine, and home care.

Dräger Medical’s innovative concepts are the result of years of experience, particularly with the anesthesia system called Zeus.

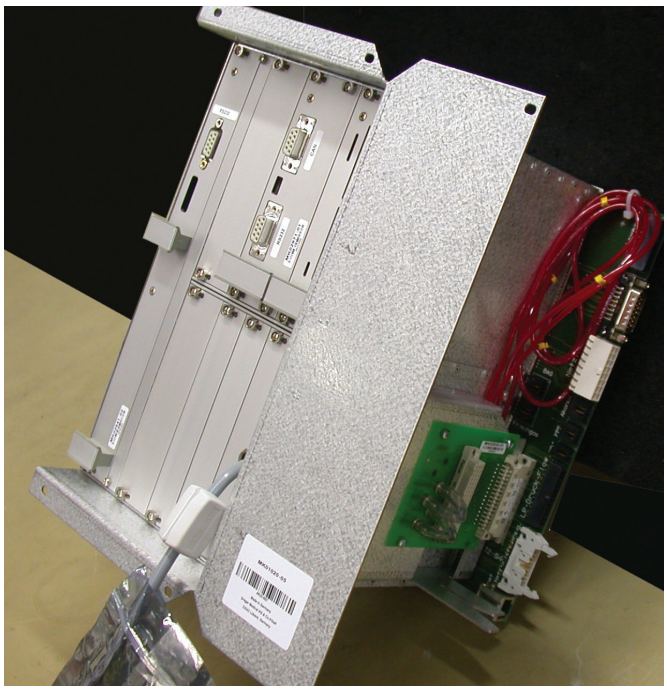
Through data connection and the integration with hemodynamic monitoring (and, integration with hospital information systems), a healthcare professional can obtain comprehensive information about a patient’s status with Zeus.

The Zeus anesthesia system integrates all types of anesthesia, patient monitoring and documentation. Apart from manually directed gas dosage, for instance, automatic administration of oxygen, carrier gas and volatile anesthetics can be carried out.

CONTROL UNIT: THE HEART OF THE SYSTEM

During the manufacture of a core component of the Zeus system, Dräger Medical worked in cooperation with MSC Freiburg GmbH, a developer and manufacturer of electronic components, systems and equipment based in Freiburg, Germany.

A core part of the system’s electronics—the central control unit of the anesthesia workstation, consisting of several electronics modules—is manufactured by MSC. Corresponding subracks were required for housing MSC’s modules. During the design phase, it became clear that a standard 19-in. subrack, available on the market from different manufacturers, could not be used. Even modular and flexibly assembled products could not do justice to the degree of individuality required, according to Dräger Medical, which adds that the specified installation areas and fixing possibilities of the end-product made unique construction necessary.



A customer-specific subrack protects the electronics (Source: SCHROFF GmbH)

MSC relied on SCHROFF for the know-how and years of experience of electronic design packaging for the development and manufacture of this subrack.

Despite SCHROFF's very flexible 19-in. subrack range EuropacPRO, only a few standard components such as horizontal rails and guide rails could be utilized from its portfolio of products.

According to Dräger Medical, approximately 80% of the subrack had to be constructed from customized parts. The subrack is constructed of aluminum zinc sheet metal and incorporates SCHROFF subrack parts for PCB and backplane integration.

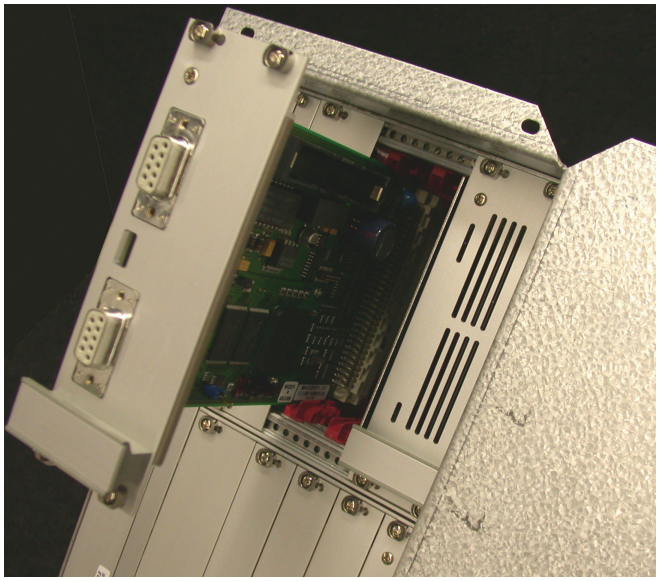
EMC requirements, which are a must for applications in medical technology, were achieved easily because the frame for the assembly into the end-unit consists of one continuous part. The front panels from SCHROFF are equipped with textile EMC seals maintaining EMC integrity standards.The modular construction was one of the prerequisites determined by Dräger Medical so that components could be exchanged quickly if necessary. In addition, all electronic components manufactured by MSC are shielded from one another by using individual shielding screens to achieve solid electrical safety levels.

No special measures were required for cooling the electronic component as outlets and perforations allowed heat dissipation via natural convection. According to Dräger Medical, their main objective was to ensure interaction between EMC shielding and airflow.

CLOSE COOPERATION AND EXPERIENCE BRING RESULTS

The entire mechanical construction was developed in close cooperation between Dräger Medical, MSC and SCHROFF, in order to utilize each firm's design expertise and technical manufacturing skills.

SCHROFF supplies a pre-assembled 6 U high subrack, with a separated interior for four 3 U plug-in units and a 6 U plug-in unit. This layout is a standard design capability in EuropacPRO subrack.



Different board modules guarantee communication between the active and sensory parts

The backplane was integrated at MSC where the module containing the electronic components was thoroughly tested. Five modules are installed in each unit, but additional scalability is built into the design.

Europe

Straubenhardt, Germany
Tel: +49.7082.794.0

Betschdorf, France
Tel: +33.3.88.90.64.90

Warsaw, Poland
Tel: +48.22.209.98.35

Hemel Hempstead,
Great Britain
Tel: +44.1442.24.04.71

Assago, Italy
Tel: +39.02.5776151.224

North America

All locations
Tel: +1.800.525.4682

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Tel: +971.4.37.81.700

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Shanghai, China
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