



Complete power supply solutions for medical locations with the regulation and control system *HospEC®*

The Equipment

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Expertise in low-voltage and medium-voltage switchgear and controlgear assembly

ESA Elektroschaltanlagen Grimma GmbH is an expanding medium-sized company in the electrical industry. We were established in 1992 on starting production of low-voltage switchgear and controlgear assembly. Today we provide worldwide system solutions for safe power supply for railways, industrial buildings and hospitals.

- Own technical innovations,
- Continuous product development,
- Expertise and experience,
- Quality, reliability and
- service

form the basis for future-oriented technical solutions and shape the corporate philosophy of ESA Elektroschaltanlagen Grimma GmbH.

The guiding principle of our action is always:
The highest personnel and operational safety of our products!

Services

- Consultation on the preparation of concepts
- Implementation of network analyses
- Planning, configuration and project management
- Training and instruction of your staff
- Hotline service
- Maintenance and repair service



Production and management on 9,000 m² - modern switchgear manufacturing, CNC machining centre, sheet metal production, electronics production (research and development in Leipzig branch office)



Approved hospital quality

Our products and system solutions

- comply with the latest standards and guidelines, especially IEC 60364-7-710 and DIN VDE 0100 Part 710,
- are tested and certified by independent test labs.

We work on the basis of a quality management system and are certified in accordance with DIN ISO 9001:2008.

You can also take advantage of our many years of experience for the special requirements of the safe power supply of hospitals and medical institutions!



Our Products

- The medium voltage switchgear and controlgear assembly 12/24 kV, in type-tested version compliant with IEC 62271-200
- Low-voltage switchgear and controlgear assembly in type-tested version compliant with DIN EN 61439-1/-2
- Regulation and control system for power supply compliant with IEC 60364-7-710 and DIN VDE 0100 Part 710
- IT system distribution board with insulation fault detection system
- BSV - Battery supported power supply
- Annunciator and control panel in touch and foil technology
- Insulation, residual- and operating current monitoring systems
- Consumption data acquisition and evaluation for energy management



Requirements

The focal point of a hospital or medical facility is the patient. An interruption in the power supply could result in a critical situation of treatment and thus in extreme cases endanger the health of the patients.

Medical locations therefore deserve the most modern and secure electrical supply facilities. Under these provisions, the *HospEC®* regulation and control system was developed by ESA Elektroschaltanlagen Grimma GmbH for the safe supply of hospitals. We therefore fulfil the high requirements on the reliability of the power supply in medical locations in accordance with IEC 60364-7-710 and DIN VDE 0100 Part 710.

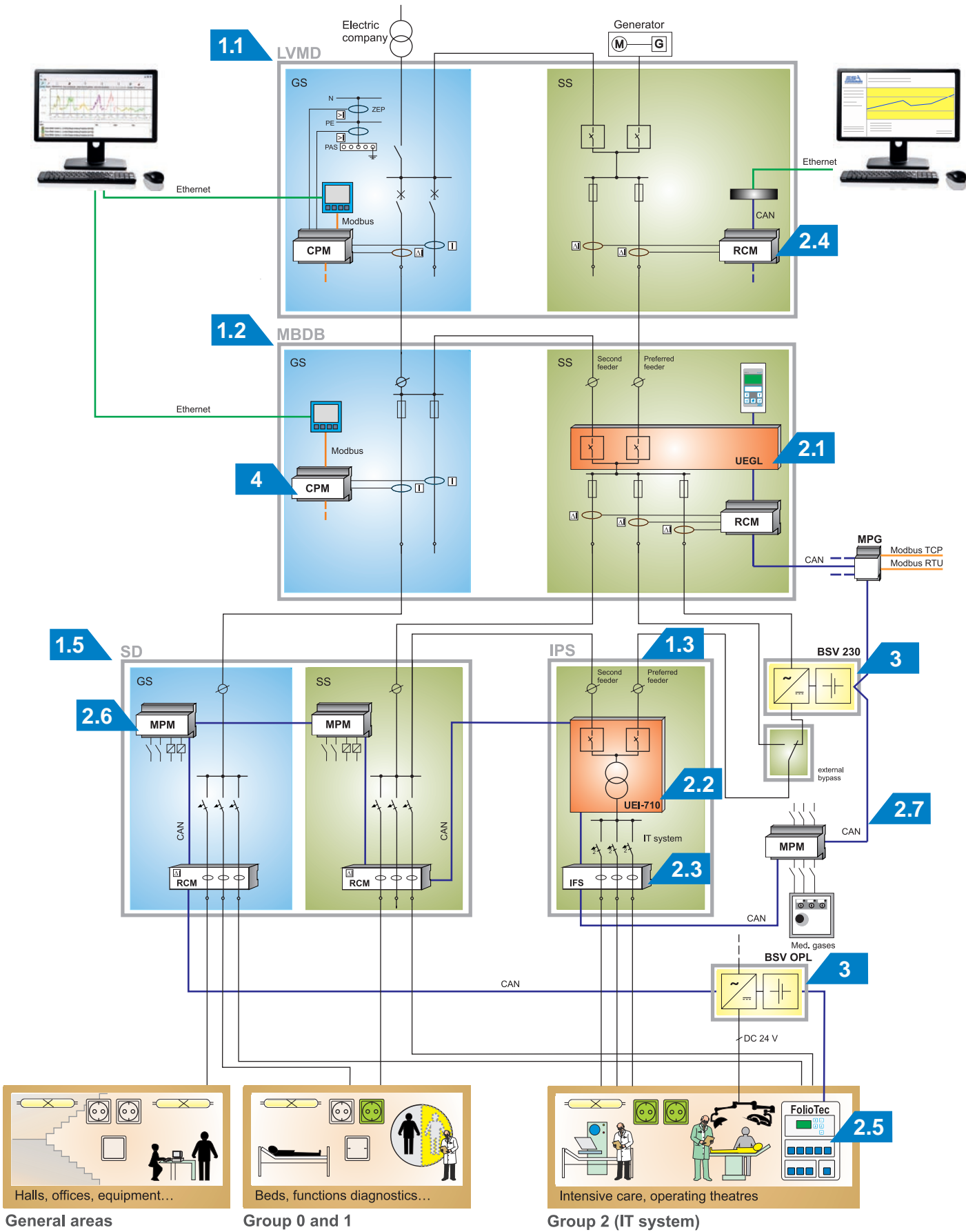
Our Solution *HospEC®* - One system

The *HospEC®* regulation and control system is a holistic system solution for secure, comfortable and economical power supply of hospitals. With our technology, we optimally realize all necessary regulation, monitoring and control tasks of a hospital or medical facility.

The flexibility of *HospEC®* allows it to be used rationally in a wide variety of individual application cases. The system impresses with complex functionality, simple planning and installation. It also provides significant cost advantages for operation and maintenance, as well for expansions or changes.

Your Benefits

- Safe monitoring, archiving, control and display of the operating status of the system in accordance with IEC 60364-7-710 and DIN VDE 0100 Part 710
- Holistic concept with open system structure
- Compatibility with external facilities by linking with other bus systems via digital I/O-device and bus coupler
- Easy expansion or adaptation due to its modular structure
- All the information is also available outside of sterile locations
- Implementation of energy, capacity and cost optimization
- Time and cost advantages for planning, installation and operation
- High availability and reliability due to mutual monitoring of all system components
- Competent service and maintenance



Products and systems for the power supply of medical locations according to IEC 60364-7-710 and DIN VDE 0100-710

- 1 Low-voltage switchgear and controlgear combinations
- 1.1 Low-voltage main distribution board LVMD
- 1.2 Main building distribution board MBDB with change-over module *UEGL*
- 1.3 IT system distribution board *IPS* for Group 2 areas with change-over and monitoring module *UEI-710* and *IFS* insulation fault detection system
- 1.4 Complete battery supported IPS system specifically designed for safe power supply of medical treatment centres, clinics and medical practices
- 1.5 SD subdistributors for Group 0 and 1 areas as well as for the supply of general areas
- 2 *HospEC®* regulation and control systems
- 2.1 Change-over module for main building distribution board MBDB *UEGL*
- 2.2 Change-over and monitoring module for *UEI-710*, *UEI-710* IT system distribution boards
- 2.3 *IFS* insulation fault detection system
- 2.4 Residual and operating current monitoring with monitoring system *WedViz-EC®*
- 2.5 Display and operating system
- 2.6 Lighting control/interfacing third-party systems with *MPM* digital I/O-devices
- 2.7 Standard field bus CAN
- 3 BSV - Battery supported power supply
- 4 Energy management system
- 5 Regulation and control devices *HospEC®*

HospEC® – Schematic diagram of switchgear systems and functional systems in the hospital

Requirements

The low-voltage main distribution board LVMD is the central switchgear system within a hospital. The basic network structure for the general supply (GS) and safety power supply (SS) is established within it. Due to its great importance, there are high demands on operational safety and the protection of persons and equipment. Accordingly, it must be designed as a type-tested low-voltage switchgear and controlgear assembly according to DIN EN 61439-1/-2 and IEC 61439-1/-2.

The solution

Our low-voltage main distribution boards are comprised of:

- Infeeds / outgoing lines of the general supply (GS)
- Infeeds / outgoing lines of the safety power supply (SS)
- Compensation system

Project-specific expansion with:

- Residual and operating current monitoring device **RCM** for localization and early detection of faulty outgoing lines or consumers
- Current and consumption monitoring devices **CPM** for power and consumption detection for operational energy management as well as for residual- and operating current detection
- Optional: Connection of the switch positions and coupling of external systems by **MPM** digital I/O-devices on the field bus (CAN)
- Data interface to the **HarpeC** regulation and control system via the field bus (CAN)

Your benefits

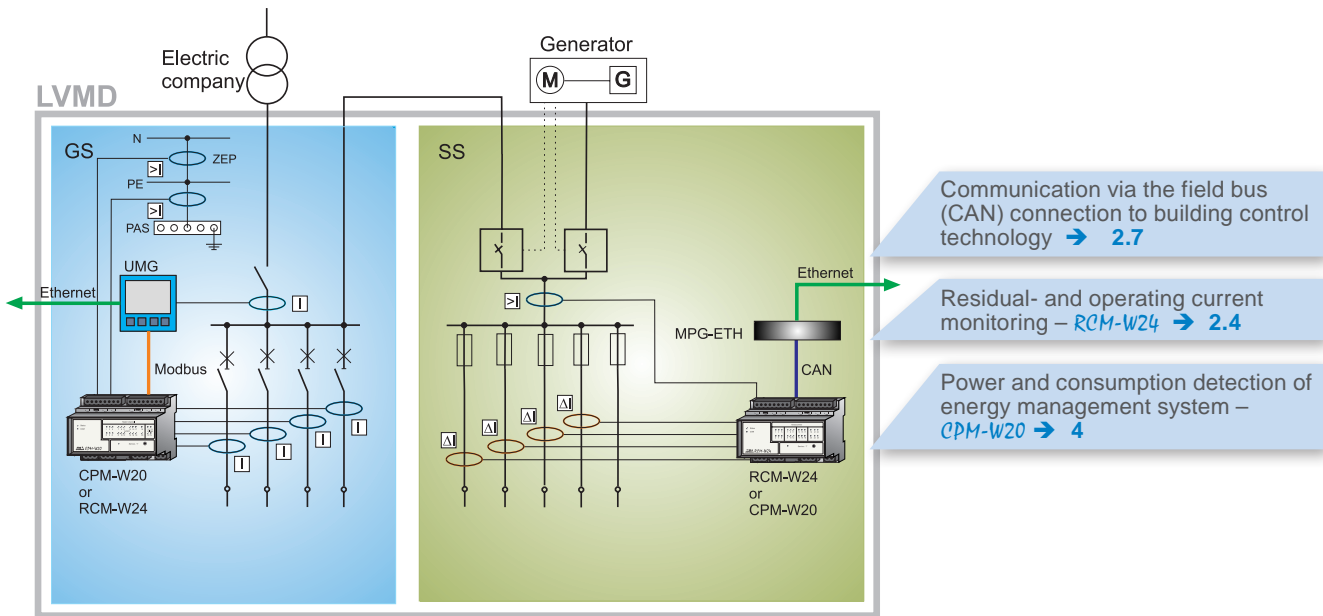
- Modular design of the switchgear system, and of functional systems and devices
- Individual planning, configuration and execution for every application
- Arc-resistant separation between busbar, devices and terminal compartment
- High level of operating safety, personnel safety and availability
- Design type-tested according to DIN EN 61439-1/-2 and IEC 61439-1/-2
- Safe separation between the systems (GS and SS)
- Fixed installation, plug-in and modular system for highest availability

Our Products

- Low-voltage main distribution board
 - Switchgear system GNS 5.1 for standard power distributions and individually adapted system solutions.
 - FourLine switchgear system from Striebel & John (identical to ABB MNS 3.0)
 - Sivacon S8 switchgear system – Siemens
- **HarpeC** regulation and control systems
 - **RCM** residual and operating current monitoring devices
 - **CPM** current and consumption monitoring devices
 - Optional: **MPM** digital I/O-devices
 - with data connection via standard field bus (CAN)

Technical data of LVMD (switchgear system GNS 5.1)

Standards / Version	Type-tested switchgear and controlgear assemblies compliant with IEC 61439-1-2 and DIN VDE 0660 Part 600
Electrical characteristics	
Rated operational voltage U_n	AC 690 V
Rated frequency	up to 60 Hz
Rated impulse withstand voltage	8 kV
Rated insulation voltage U_i	1 kV
Overvoltage category	III
Pollution degree	3
Mechanical characteristics	
Degree of protection as per IEC 60529	Standard IP30, max. IP42 (IP54 on request)
Protection class	I (grounded)
Internal division	Form 1 to Form 4b
Basic grid dimension	25 mm = 1E as per DIN 43660
Ambient operating temperatures	-25°C...+45°C
Storage temperatures	-40°C...+70°C
Main busbar	
Rated current I_n	Up to 6300 A
Rated peak withstand current I_{pk}	Up to 330 kA
Rated short-time withstand current (1s) I_{cw}	Up to 150 kA
Arcing strength (300 ms)	Up to 65 kA
Field busbars	
Rated current I_n	Up to 1900 A (LV HRC switch rails), Up to 1000 A (MCC modular system)
Rated peak withstand current I_{pk}	Up to 220 kA
Rated short-time withstand current (1s) I_{cw}	Up to 100 kA
Dimensions	
Height (mm)	2200, 2000
Width (mm)	400, 600, 800, 1000, 1200
Depth (mm)	400, 600, 800, 1000, 1200
Transport units	Individual fields



Schematic representation of a low-voltage main distribution board



Switchgear system GNS 5.1



Assembly of a switchgear system

Requirements

The main building distribution board MBDB is used for further installation of the network structure of the general supply (GS) and safety power supply (SS), and should be used in the following conditions:

- When a hospital is made up of several buildings.
- When the hospital is just in one building, but cable routing is laid on the ground to supply a building section.
- The hospital is a single building that is structurally clearly divided into several functional areas.
- The low voltage main distribution is in a separate building.

The solution

Our main building distributions are comprised as follows:

- Infeeds / outgoing lines of the general supply (GS)
- Infeeds / outgoing lines of the safety power supply (SS)
- UEGL change-over module according to DIN VDE 0100-710 for changeover to the safety power supply network

Project-specific expansion with:

- Residual and operating current monitoring device RCM for localization and early detection of faulty outgoing lines or consumers
- Current and consumption monitoring devices CPM for power and consumption detection for operational energy management as well as for residual- and operating current detection
- Operating and annunciator terminal BMTI 5 s for the display of measured values as well as the operating and fault messages
- Optional: Connection of the switch positions and coupling of external systems by MPM digital I/O-devices on the field bus (CAN)
- Data interface to the HopsEQ® regulation and control system via the field bus (CAN)

Your benefits

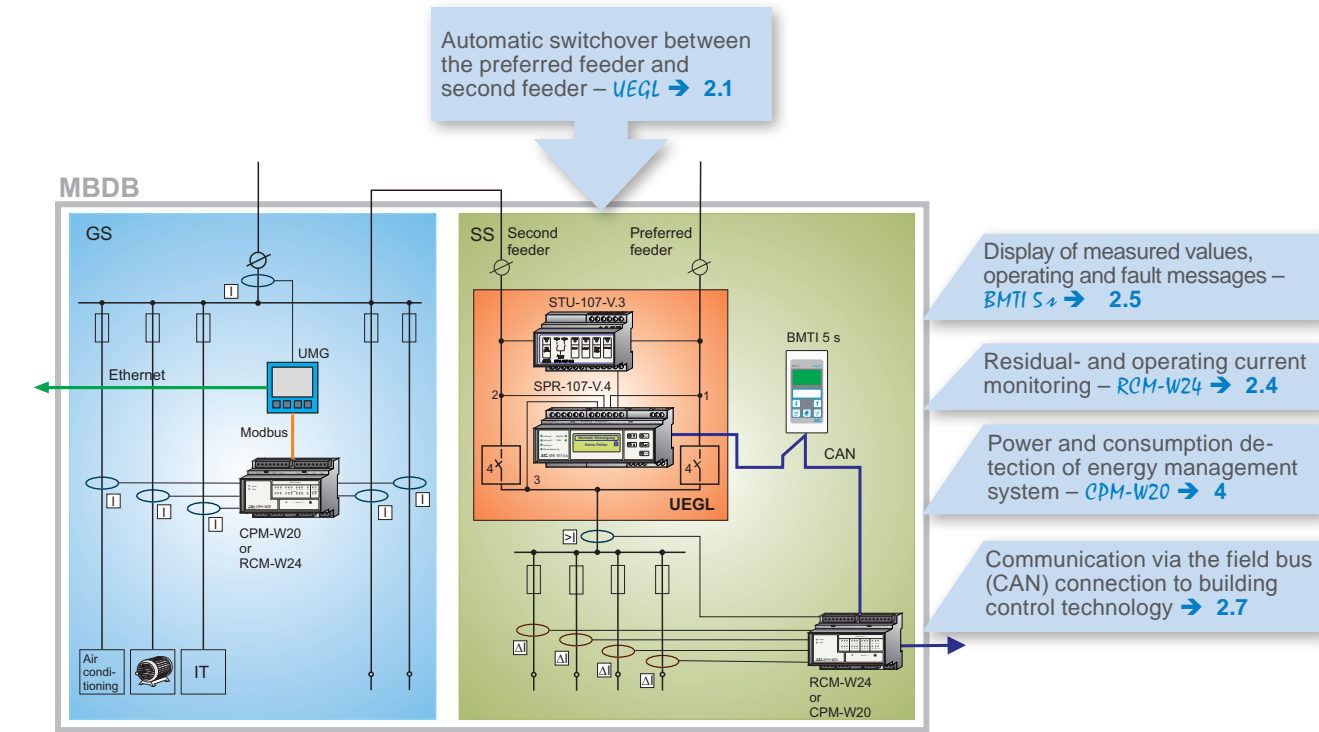
- Modular design of the distribution, the change-over module and of functional systems and devices
- Optimization of maintenance and increase the operational and system safety by monitoring of residual- and operating current
- Individual planning, configuration and execution for every application
- Arc-resistant separation between busbar, devices and terminal compartment
- High level of operating safety, personnel safety and availability
- Design type-tested according to DIN EN 61439-1/-2 and IEC 61439-1/-2
- Safe separation between the systems (GS and SS)
- Fixed installation, plug-in and modular system for highest availability

Our Products

- Building main distribution
 - Switchgear system GNS 5.1 for standard power distributions and individually adapted system solutions.
 - FourLine switchgear system from Striebel & John (identical to ABB MNS 3.0)
 - Sivacon S8 switchgear system – Siemens
 - Supplied with standard change-over device UEGL
- HopsEQ® regulation and control systems
 - RCM residual and operating current monitoring devices
 - CPM current and consumption monitoring devices
 - BMTI 5 s operating and annunciator terminal
 - Optional: MPM digital I/O-devices
 - With data connection via standard field bus (CAN)

Technical data

The data correspond to those for the low-voltage main distribution board, Section 1.1.



Schematic representation of a main building distribution board with the change-over module UEGL



Main building distribution board MBDB

Requirements

IT system distribution boards are used for supply of Group 2 medical locations, which must be fitted with protective isolation with insulation monitoring as a protective measure, and that can be equipped with an insulation fault search facility for rapid troubleshooting in the event of the first error. For example, they supply the following locations:

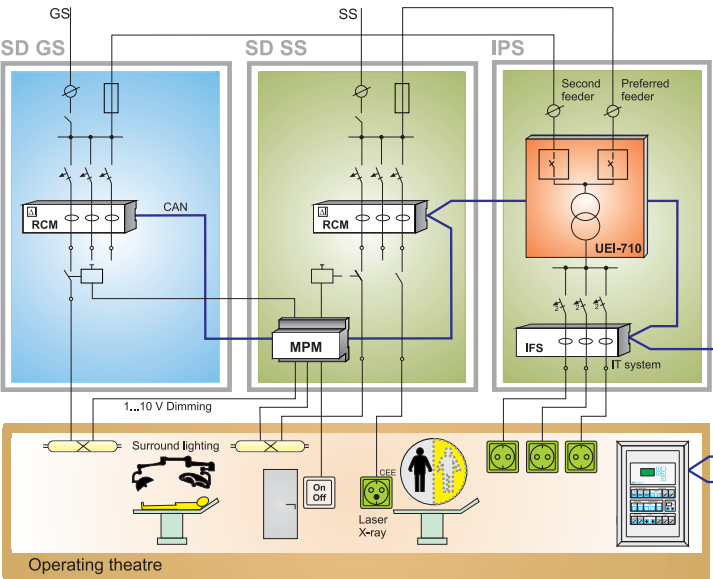
- Operating theatres
- Intensive care units

The solution

IT system distribution boards from ESA Elektroschaltanlagen Grimma GmbH can be designed as modular systems in accordance with the project-specific requirements using our functional systems.

Depending on the configuration, the essential components of the GIV switchgear cabinet system are:

- Change-over and monitoring module as per DIN VDE 0100-710 of type *UEI-710* for
 - Automatic switchover between the preferred feeder and a second feeder with power unit for transformers up to 10 kVA
 - Insulation, load and temperature monitoring
- IT system isolating transformer (3.15 - 10 kVA)
- Separate, closed area for IT system isolating transformers in the distribution for optimal thermal conditions and highest contact safety
- Optional: Insulation fault detection system *IFS* for fast fault detection of individual IT-system circuits, and for maintenance optimization
- Data interface to the *HotEC*® regulation and control system via the field bus (CAN)



Group 2 (IT system)

Special features of complete *IPS-ICU-710* IT system distribution board:

- Change-over and monitoring module, type *UEI-710* with multifunctional change-over and monitoring device *UEI-710-V.5*
- Standard integrated insulation fault detection system (*IFS*) for up to 30 outgoing lines
- Complete documentation of faults using the past events memory for all operating and error messages with date and time with the device *UEI-710-V.5*
- Monitoring of periodic inspection in accordance with DIN VDE 0100-710 and triggering of „silent“ alarm when exceeding the inspection time limits, and forwarding to GLT via CAN bus with the device *UEI-710-V.5*
- Small cabinet dimensions with a large terminal compartment due to compact design
- (H x W x D in mm: 2000 x 350 x 400)

Your benefits

- Compact design of the distributions with isolating transformer, change-over and IT system monitoring
- Maintenance optimization by insulation fault detection system
- Separate transformer room for optimal thermal conditions
- Low space requirement in the LV switch room with heights up to 2300 mm
- Individual planning, configuration and execution for every application
- Customizable to requirements, easy expansion and retrofitting
- High level of operating safety, personnel safety and availability

Application example: Supply of an operating theatre

Our Products

- IT system distribution board (*IPS-OP-710*) with GIV switchgear cabinet system, with:
 - Change-over and monitoring module *UEI-710* with power unit and IT system transformer (3.15 - 10 kVA)
- IT system distribution board (*IPS-ICU-710*) with GIV switchgear cabinet system, with:
 - Change-over and monitoring module *UEI-710* with power unit and IT system transformer (3.15 - 10 kVA)
 - Insulation fault detection system *IFS*
- *HotEC*® regulation and control systems
 - Operating and annunciator terminal for IT systems *BMTI 2*, *BMTI 5*
 - Annunciator and control panel system *FolioTec*
 - Annunciator and control panels *Touch Control* and *Kombi*

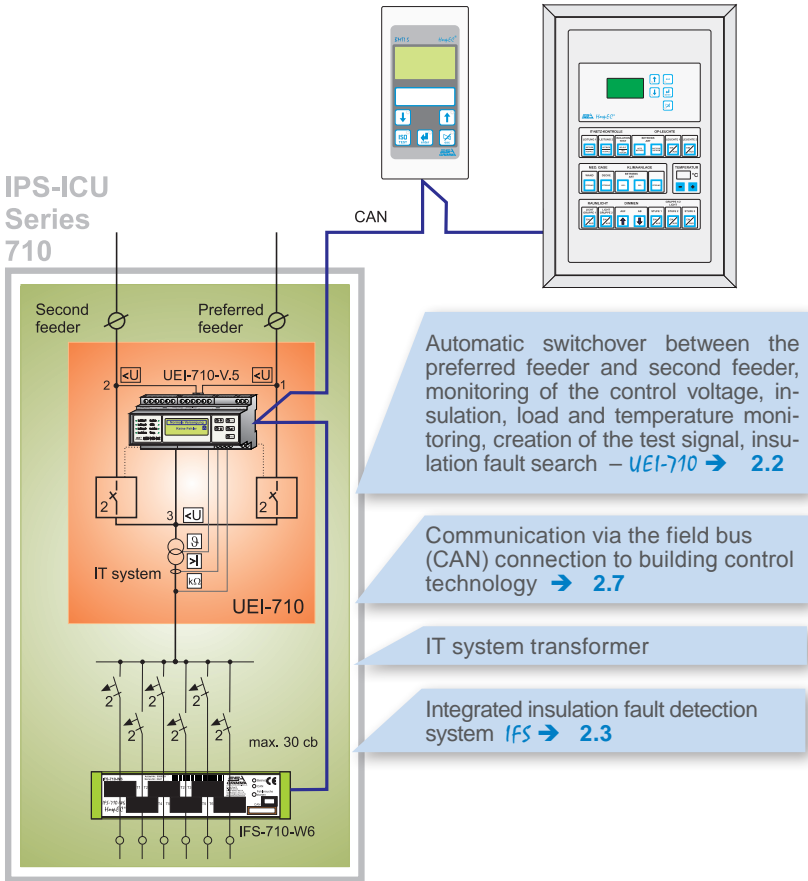
Note: In Germany, transformers are only approved up to 8 kVA according to DIN VDE 0100-710.

Technical data (switchgear cabinet system GIV)

For technical data for the switchgear cabinet system GIV, see section 1.5.



Complete IT system distribution board *IPS-ICU-710* with integrated insulation fault detection system



- Automatic switchover between the preferred feeder and second feeder, monitoring of the control voltage, insulation, load and temperature monitoring, creation of the test signal, insulation fault search – *UEI-710* → 2.2
- Communication via the field bus (CAN) connection to building control technology → 2.7
- IT system transformer
- Integrated insulation fault detection system *IFS* → 2.3

1.4



Safe
power supply

Necessary
and vital

Safety of
the patient

The top
priority



Requirements

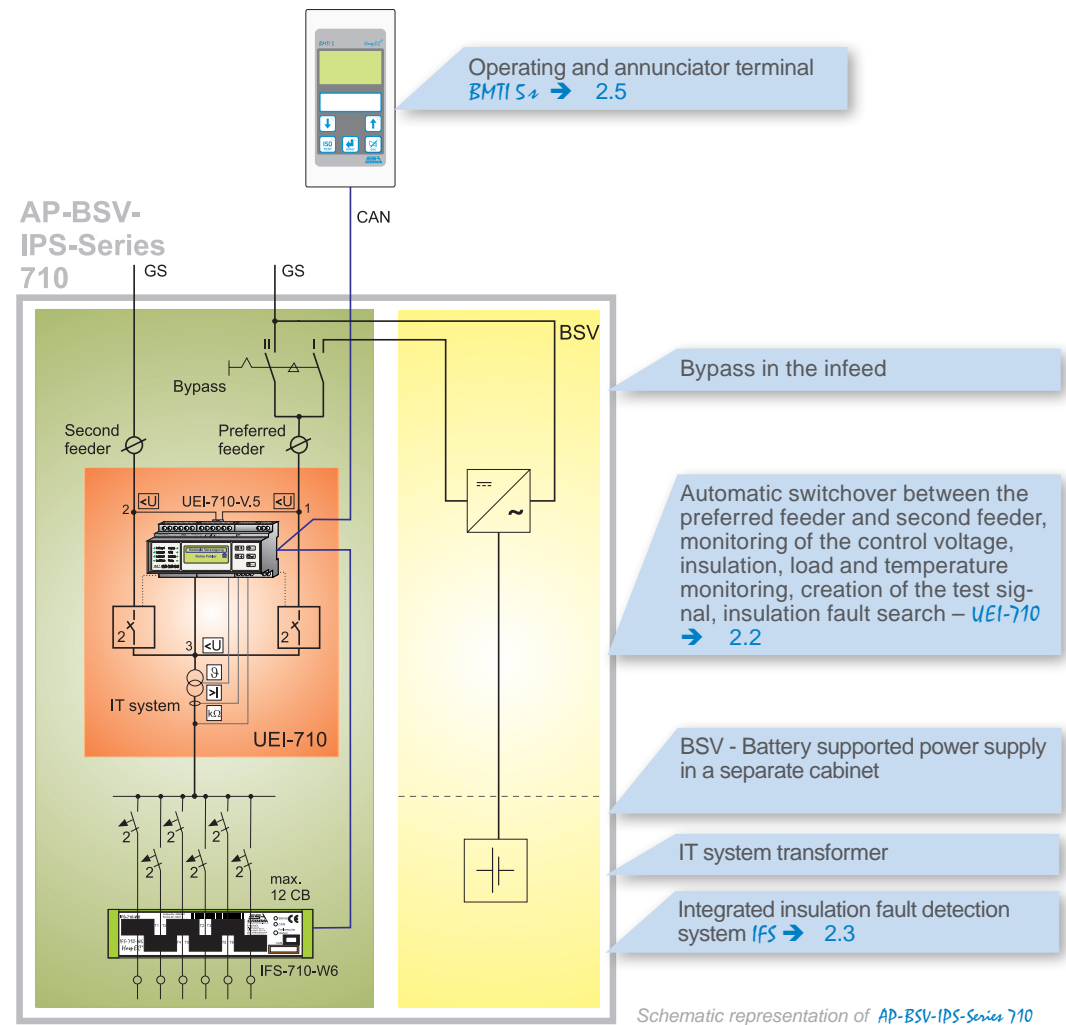
Today, medical interventions are increasingly being carried out not just in hospitals, but also in medical care centres, clinics and medical practices. This results in increased demands on the design of electrical systems - especially with regard to the aspects of failure safety and personal protection. The dependence of electro-medical devices presents an increased risk, which needs to be taken into account. In hospitals, this is standard. But also in medical care centres and medical practices, a safe power supply is essential and vital.

The solution

The *AP-BSV-IPS-Series 710* was developed according to IEC 60364-7-710, DIN VDE 0100-710 and DIN VDE 0558-507 and purposefully adapted to the power supply requirements for medical care centres and medical practices. A high level of flexibility ensures that the systems meet various requirements, especially in respect to the required performance and the required degree of autonomy.

- 100% compliance to standards
- IT system as a standardized *Heag-EC® IPS* complete distribution board with integrated external bypass
- Minimal housing dimensions due to separate configuration
- Power range from 1.6 up to 3 kVA with an autonomy from 1 h to 3 h
- IT system isolating transformer 3.15 kVA
- Automatic fuse to B 10 A (6 or 12 pieces)
- Sealed lead-acid battery (Eurobat service life > 12 years)
- Optional connection of the operating theatre lights (24 V DC)
- Primary pulsed rectifier with very high power factor 0.99
- Battery galvanic isolation (floating)
- Galvanic separation of the battery and the consumer
- Single phase inverter (PWM) with MOSFET technology
- Very high short-circuit current for selective switch-off
- Optional *IFS* insulation fault detection system

1.4



Schematic representation of *AP-BSV-IPS-Series 710*

Your benefits

- Complete battery-supported IPS cabinet
- Small cabinet dimensions with a large terminal compartment (e.g. H x W x D 2000 x 600+350 x 400 mm)
- Complete documentation of faults using past events memory for all operating and error messages with date and time
- Good system overview at a central display
- Monitoring of periodic inspection in accordance with DIN VDE 0100-710 by „silent alarm“ in the case of overshoot (forwarding to building technology by bus system), integrated buffered real-time clock (RTC)
- Hot-swappable change-over and monitoring device *UEI-710-v.S* with plug-in connection terminals
- Self-monitoring of the IT system of all internal and external functions
- Fast troubleshooting with *IFS* (optional) Insulation fault detection devices *IFS-710-W6* in the second level
- Separate, closed transformer and battery rooms for optimal thermal conditions

Our Products

- Complete distributors of the series *AP-BSV-IPS-Series 710*
- *BMTI S* operating and annunciator terminal

Technical data (extract)

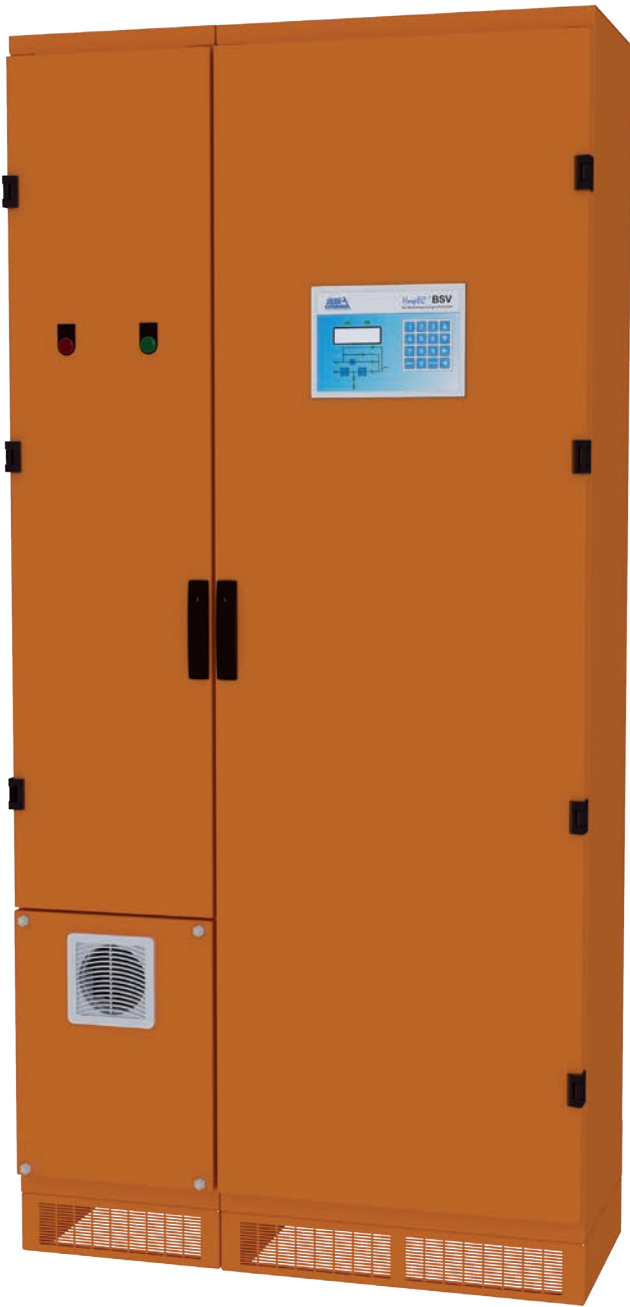
Standards / Version	DIN VDE 0100-710 und DIN VDE 0558-507
Rectifier input	
Rated voltage, single-phase / back-up fuse	AC 230 V, 50...60 Hz / gG 25 A
Voltage tolerance	+/- 20%
Max. input current	14 A
Power factor	0,99
Rectifier technology	Primary clocked
Bypass input	
Rated voltage, single-phase / back-up fuse	AC 230 V, 50...60 Hz / gG 25 A
Change-over time	< 0,5 s
Inverter output	
Rated power, single-phase	1,6...3,0 kVA
Rated power kW at cos phi 0.8	1,3...2,4 kVA
Output current	7...13 A
Voltage	220-230-240 V (adjustable)
Change-over time	< 8 ms (uninterrupted)
Overload capacity	200% continuously
Maximum permissible protection in the IT output	10 A 2-pin B characteristic
Inverter technology	MOSFET power element
Battery	
Type	Sealed lead-acid
Lifetime	> 12 years
Number of cells / voltage	24 / 48 V
Charging time	6 hours
Autonomy	1 h...3 h
System	
Safety Standards	Safety EN 62040-1-2, EMV EN 62040-2 Performance and testing requirements of EN 62040-3 class 1
Degree of protection	IP41
Dimensions H x W x D (mm)	2000 x 600 (850) +350 x 400 (600)
Approx. weight (kg)	600 - 900

1.4

1.4



Operating and annunciator terminal *BMTI S*



Example representation of type *AP-BSV-IPS-1.9-60*

Requirements

Sub-distribution boards are used for the supply of Group 0 and 1 medical locations, as well as all general areas. This concerns e.g. the following rooms:

- Rooms for functional diagnostics (CT, MRT, EEC, etc.)
- Wards, corridors, management-, work- and technical rooms
- Labs and server rooms (computer IT)

Especially in the hospital sector, a large number of special functional conditions have to be met, including:

- Centralized and decentralized lighting control - also with dimming functions - using normal installation devices (switches and pushbuttons)
- Monitoring of residual and operating currents for the early detection of faults, minimization of downtimes, increased system security and optimization of maintenance
- Detection of signals from third-party systems - e.g. medical gases, heating, ventilation and air-conditioning systems - and cut-in field bus for further evaluation (e.g. reporting and signalling panels *FolioTec*) up to the building control technology

The solution

Our subdistributors are designed specifically for the project, and built with the GIV switchgear system we have developed. Depending on the specific requirements, the subdistributors include:

- Infeeds and outgoing lines
- Switching and protection devices
- Residual current monitoring devices *RCM* for localization and early detection of faulty outgoing lines or consumers
- Current and consumption monitoring devices *CPM* for power and consumption detection for operational energy management
- Digital I/O devices *MPM*; for example for the activation of switch positions, detection of signals from external systems, and for comfortable light control - also with dimming function for energy saving - and for the implementation of relevant regulation and control functions of a hospital
- Data interface to the *HospEC*® regulation and control system via the field bus (CAN)



Distribution with the switchgear cabinet system GIV

Your benefits

- Stable, safe and high-quality GIV switchgear system
- Low space requirement in the LV switch room with heights up to 2300 mm
- Switchgear system completely equipped with all hospital and location-typical functions
- Comprehensive control and monitoring functions in accordance with the project requirements can be implemented with devices from the *HospEC*® system - no compatibility problems
- Individual planning, configuration and execution for every application
- Customizable to requirements, easy expansion and retrofitting
- High level of operating safety, personnel safety and availability

Our Products

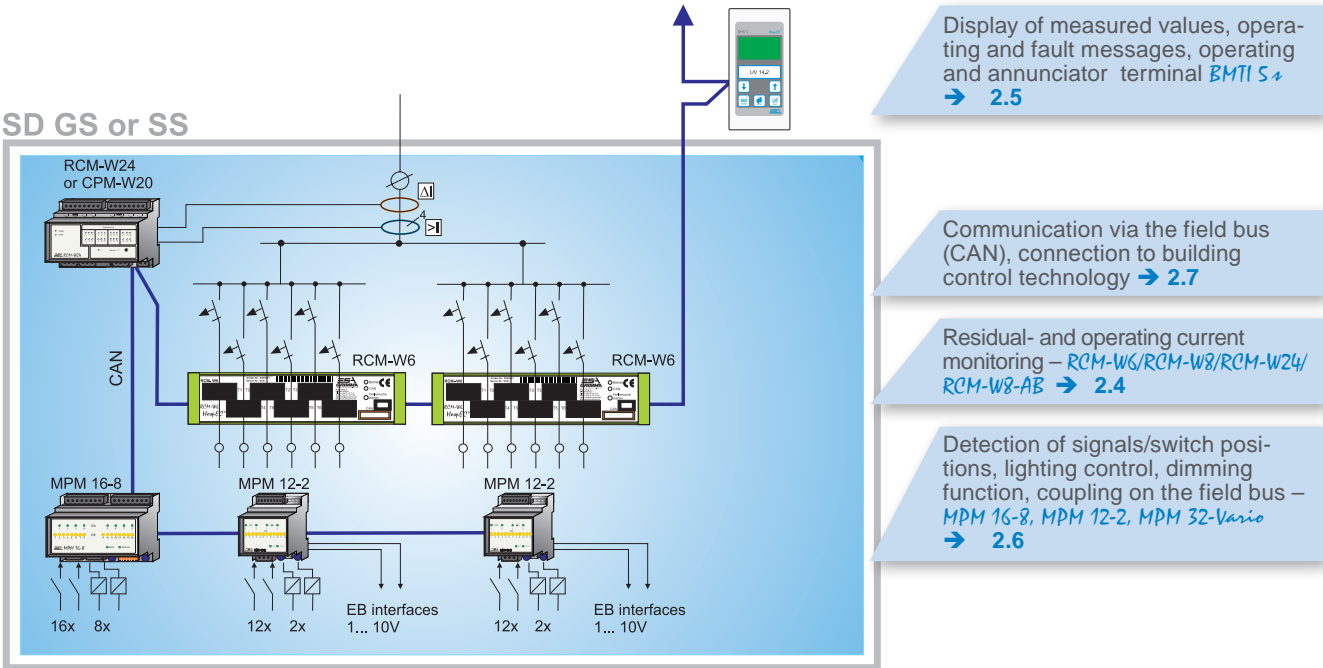
- Subdistributor (SD) with switchgear cabinet system GIV,

Equipped on a project-specific basis with:

- *HospEC*® regulation and control systems
 - *RCM* residual- and operating current monitoring devices
 - *CPM* current and consumption monitoring devices
 - *MPM* digital I/O-devices with dimming functions
 - Annunciator and control panel system *FolioTec*, *Touch Control*, *Kombi*
 - *BMTI S+* operating and annunciator terminal with data connection via standard field bus (CAN)

Technical data of switchgear cabinet system GIV

Standards / Version	Type-tested free-standing cabinet system compliant with DIN EN 61439-1/-2, IEC 61439-1/-2 and DIN VDE 0660 Part 600
Degree of protection	IP 41
Protection class	I (grounded)
Installation	Indoor installation
Housing	Galvanized steel, powder-coated, RAL 7035 (standard), other colours available on request
Doors	Door opening angle 180°, Double doors from width 600 mm possible Can be closed by double-bit or bolt with levered handle
Dimensions	
Height in mm	2000 / 2300
Width in mm	350 / 600 / 850 / 1100 / 1350
Depth in mm	250 / 400



Schematic representation of a sub-distribution system

Requirements

Building the main distribution boards (main distributor) must have an automatic switching device according to DIN VDE 0100-710 for change-over to the safety power supply network.

The solution

In main building distributions, our type *UEGL* change-over module reliably switches between the preferred feeder and the second feeder. It meets all the normative requirements, e.g. with respect to:

- Voltage monitoring of all active conductors (line 1, 2 and outgoing line 3)
- Automatic change-over to the second (redundant) feeder in the event of a failure of the supply voltage of the preferred feeder
- Automatic switching back to the preferred feeder
- Configurable change-over times
- Control functions with single-fault security
- Display/notification of readiness for operation and faults
- Possibility of function test on site

Implementation of the functions by:

- Voltage monitoring device with switchover control *SPR-107-V.4*
- Control voltage switching device *STU-107-v.3*

Optionally expandable with:

- Operating and annunciator terminal *BMTI 5* for the display of measured values as well as the operating and fault messages

Your benefits

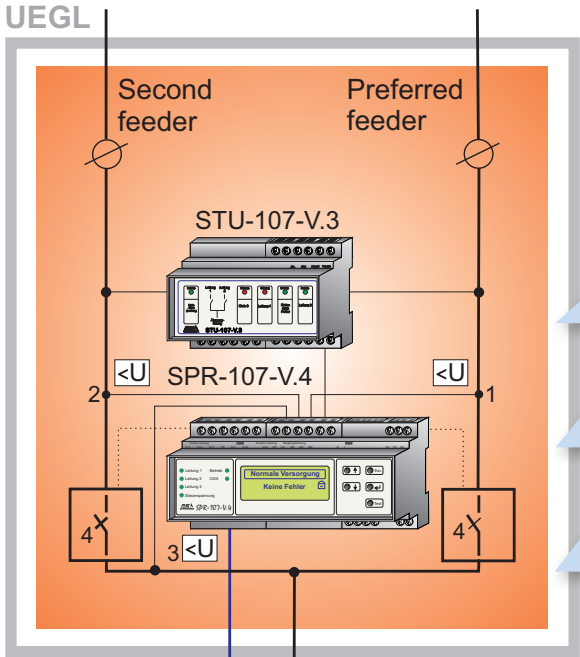
- Standard-compliant and safe design
- Simple operation
- An integral part of the *HotEC®* system
- Communication via CAN bus with all devices from the *HotEC®* system
- Can be connected to building control technology

Our Products

- 4-pin switching device *UEGL*, type designation: *UEGLxxx/4-V.4* (xxx = rated operational current)

Technical Data of *UEGL*

Rated operating current	Version for AC 65 / 80 / 100 / 160 / 250 / 400 / 630 A
Rated operating voltage	AC 230/400 V, 50 Hz
Control voltage	AC 230 V, 50 Hz
Voltage monitoring (line 1, 2 and 3) monitored system	1/N AC 0...290 V, 3/N AC 0...500 V, 2 AC 0...500 V – 50...60 Hz
Lower response value (undervoltage), configurable	150...230 V / 260...400 V
Upper response value (overvoltage), configurable	230...260 V / 400...460 V
Change-over/pause times, configurable	0...20 s (in 0.5 s steps)
Signal outputs	1 changeover contact (floating)
Display	Operating and error messages via plain text display and LED, via the field bus (CAN) to peripheral devices
Communication interface/protocol	CAN / CAN (2.0) as per ISO 11898
Degree of protection to DIN EN 60529	IP00
Protection class	I or II



Control voltage switching device *STU-107-V.3* → 5.1

Voltage monitoring device with change-over control *SPR-107-V.4* → 5.1

4-in switch disconnectors, motor driven (other versions on request)

Communication via the field bus (CAN) connection to building control technology → 2.7

Operating and annunciator terminal *BMTI 5*, on-site display of measured values/ messages → 2.5/5.13

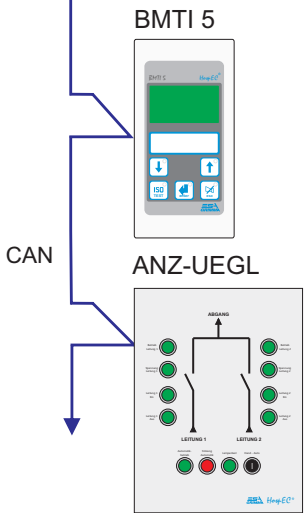
Annunciator and control panel *ANZ-UEGL* for remote control of the *UEGL* to manual or automatic mode



UEGL 160/4-V.4



UEGL 80/4-V.4



Schematic representation of change-over module *UEGL*

Part of IT system distribution boards are change-over and monitoring modules according to DIN VDE 0100-710 for changing over between the preferred feeder and a second feeder, as well as for insulation, load and temperature monitoring in the IT network.

2.2

All normative and functional requirements can be implemented using our change-over and monitoring devices, e.g. with respect to:

- Voltage monitoring of all active conductors (line 1, 2 and outgoing line 3)
- Automatic change-over to the second (redundant) feeder in the event of a failure of the supply voltage of the preferred feeder
- Automatic switching back to the preferred feeder
- Configurable change-over times
- Control functions with single-fault security
- Insulation monitoring in the IT system
- Load and temperature monitoring of the IT system transformer
- Display and notification of readiness for operation and faults
- Possibility of function test on site

Implementation of the functions by:

- Multi-functional change-over and monitoring device
UEI-710-V-S
- For on-site display of messages and for triggering test functions:
- Operating and annunciator terminal *BMT1-S*
- Annunciator and control panels *FolioTec, Touch Control, Kombi*



Multi-functional change-over and monitoring device UEI-710-V.5

- Standard-compliant and safe design
- Simple operation
- An integral part of the *HotspEC®* system
- Communication via CAN bus with all devices from the *HotspEC®* system
- Can be connected to building control technology

Our product

- For example, change-over and monitoring module [UEI-710](#), 2-pin change-over and monitoring module with change-over control for single-phase networks up to 250 V AC, 50 Hz, insulation monitoring of the IT system, load and temperature monitoring of the IT system transformer (integrated insulation fault detection system optional) - Type designation: [UEI-710-63/2-L](#) / [UEI-710-80/2-L](#)



UEI-710

Versions with multi-function device UEI-710-w.S	UEI-710-63/2-L , UEI-710-80/2-L
Maximum rated power of IT system transformers	10 kVA (UEI-710-63/2-L up to 6.3 kVA, UEI-710-80/2-L up to 10 kVA)
Voltage monitoring (line 1, 2 and 3) monitored system	1/N AC 0...290 V 50...60 Hz
Lower response value (undervoltage), configurable	150...230 V
Upper response value (overvoltage), configurable	230...260 V
Change-over/pause times, configurable	0...20 s (in 0.2 s steps)
Insulation monitoring for 230 V AC, configurable	50...250 kΩ
Load current monitoring, configurable	5 - 50 A
Temperature monitoring (using NC or PTC thermistor)	120 °C
Test signal generator and insulation fault detection system is integrated (with IFS-710-W6) - use is optional (types UEI-710-../2-IFS)	A maximum of 96 channels
Signal outputs	1 changeover contact (floating)
Display	Operating and error messages via plain text display and LED at the device, via the field bus (CAN) to peripheral devices
Communication interface/protocol	CAN / CAN (2.0) as per ISO 11898
Degree of protection to DIN EN 60529	IP00
Protection class	I or II

230 V system

Second feeder

Preferred feeder

UEI-710-V.5

CAN

2X

2X

IT system

IFS-710-W6

Multifunctional change-over and monitoring device with integrated test signal generator and insulation fault detection system
UEI-710-V.5 → 2.3/5.3

2-in switch disconnectors, motor driven (other versions on request)

IT system transformer

Communication via the field bus (CAN) connection to building control technology
→ 2.7

Integrated insulation fault detection system, max. 96 outgoing lines –
IFS → 2.3

Schematic representation of changeover and monitoring module
UEI-710-../2-IFS, with the device UEI-710-VS and integrated
insulation fault detection system, 230 V system

Requirements

Any insulation faults in IT systems are immediately reported by insulation monitoring devices; however, the IT system will continue to be operated. A rapid localization and elimination of the insulation fault is now required. Localization and reporting of the affected outlet circuit should be indicated comfortably by an insulation fault detection system, without a system shutdown or separation of consumers. Maintenance and repair work is therefore limited to a minimum.

2.3 The solution

With our insulation fault detection system (IFS), faulty outgoing circuits are automatically detected without shutdown of the IT system. This is done without any measures being required by the technical department or the medical staff. A message is output and a clear text display of the name of the fuse or the location of the faulty circuit, as well as the measured insulation resistance. Time-consuming manual troubleshooting is thus no longer necessary.

Implementation of the insulation fault detection system by:

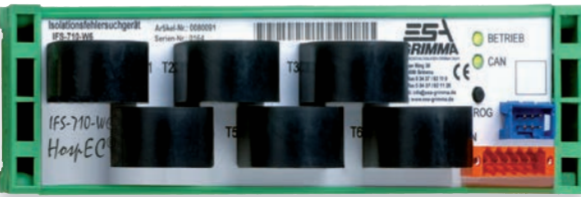
- Multi-functional change-over and monitoring device UEI-710-V.S
- Insulation fault detection device IFS-710-W6

Or with:

- Insulation, load and temperature monitoring device ILT-710-V.S
- Insulation fault detection device IFS-710-W6

Display of messages, e.g. on:

- Multifunctional change-over and monitoring device UEI-710-V.S
- Insulation, load and temperature monitoring device ILT-710-V.S
- Operating and annunciator terminal for IT systems BMTI S
- Operating and annunciator terminals FolioTec, Touch Control, Kombi



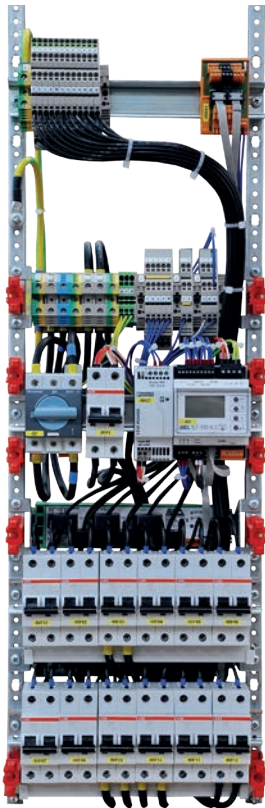
Insulation fault detection device IFS-710-W6

Your benefits

- Fast and automatic localization of faulty circuits during running operation
- No operator actions required
- No time-consuming manual search for faults
- Optimization of maintenance
- Increase in plant safety
- Reporting and storage of the fault
- An integral part of the HespEC® system
- Communication via CAN bus with all devices from the HespEC® system
- Can be connected to building control technology

Our Products

- Multifunctional change-over and monitoring device UEI-710-V.S
- Insulation, load and temperature monitoring device ILT-710-V.S
- Insulation fault detection device IFS-710-W6
- HespEC® regulation systems
 - Operating and annunciator terminal BMTI S, BMTI S+
 - Operating and annunciator terminals FolioTec, Touch Control, Kombi with data connection via standard field bus (CAN)



Section of an IT system distribution board IPS-ICU-710 with insulation fault detection system (IFS)

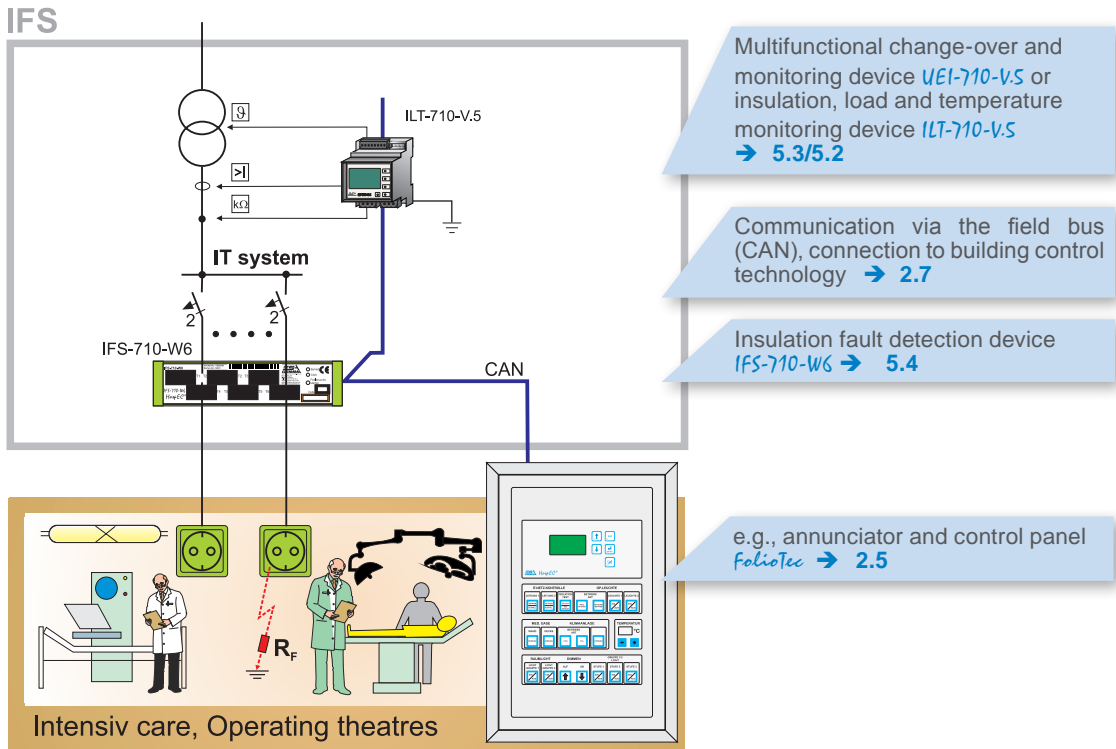
Basic sequence of an insulation fault detection

The insulation monitoring device (ILT-710-V.S/UEI-710-V.S) determines and constantly monitors the insulation resistance of the IT system. If the insulation resistance drops below a specified value, the detection process is started by the test signal generator (integrated into ILT-710-V.S and UEI-710-V.S). This feeds a test signal (limited to 1 mA) into the IT system. The test signal is registered by the integrated converter (per outlet circuit) of the insulation fault detection device (IFS-710-W6) -

the faulty circuit is detected. The test signal generator evaluates the error search and transmits the evaluation on the field bus (CAN). Corresponding messages are now generated at the insulation monitoring device and the peripheral display devices. The operator receives detailed information on the faulty circuit, and messages can be saved for later evaluations. All devices communicate via the standard field bus (CAN).

Technical data of IFS

Number of measuring channels per IFS-710-W6	6 (measuring transformers integrated)
Number of measuring channels per IT system	Maximum 96
Troubleshooting time	Approx. 5 s for a maximum of 4 µF power leakage capacitance
Test signal is limited to	max. 1 mA
Measured value acquisition	Parallel (no multiplexing method)
Communication interface/protocol	CAN / CAN (2.0) as per ISO 11898
Messages at ILT-710-V.S/UEI-710-V.S	Designation of the faulty fuse circuit, insulation resistance
Messages to peripheral display devices (e.g. BMTI S, FolioTec)	Audible alarm, insulation resistance, freely configurable texts on the location and name of faulty circuits



Schematic representation of an insulation fault detection system IFS with UEI-710-V.S

Requirements

The early detection and reporting of faults to avoid shutdowns is an important goal of plant operators, who have high requirements with regard to availability and operational safety of the electrical equipment.

To ensure this, the mostly gradual increases in residual currents, for example caused by insulation faults, and the high operating currents of plant parts or consumers must be monitored, evaluated and reported before outages occur!

The technology used should not require intervention by staff, and should be easy to handle, regardless of the size of the plant to be monitored. Fault messages should be sent to any recipients via E-mail. The existing maintenance personnel thereby receive a vital help for repair work.

The solution

With our operating and residual current monitoring device, faults in the power supply can be avoided by early warning. Furthermore, plant protection and fire protection are also increased.

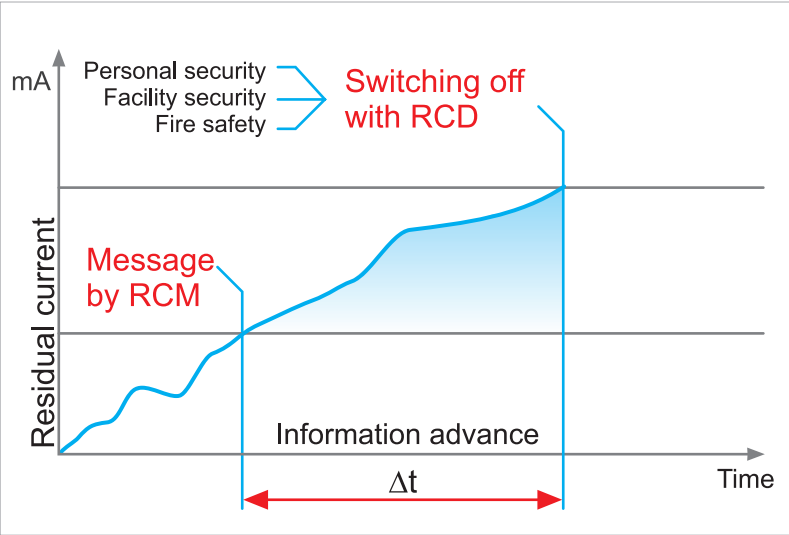
Measured values and messages can be transferred to databases. The multichannel monitoring devices with attachable or integrated current transformers are used in TN and TT systems, and also in IT systems for operating current measurement.

Current transformers are used, e.g.:

- In the feeders,
- In the outgoing lines (consumers and equipment),
- In PEN and N-conductors (for stray currents in TN-S systems),
- At central grounding points.

There are various ways of issuing alarms and messages in the event of a fault - right up to remote monitoring and notification by E-Mail. When fully configured, the system itself does not require any operation.

As a web-based solution, the *WebVisEC®* monitoring system provides the widest range of options for parameterization/configuration of the monitoring devices and display of measured values, right up to the graphical representation of the measurement value curve.



Message before shutting down - an objective of residual current monitoring



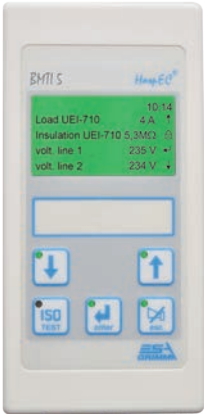
Web-based monitoring solution - monitoring system *WebVisEC®*

Your benefits

- Fault localization without shutdown
- Cost savings through early repair of electrical installations and equipment (in accordance with UVV / BGV A3)
- Early warning of system faults
- Avoidance of costly or dangerous plant shutdowns - the availability of the equipment is increased.
- Lower overhead for fault finding and repairs by locating individual faulty outgoing lines or consumers
- Overloads of the N conductor and critical fault currents are identified at an early stage, thereby ensuring higher fire safety.
- By configuring the plant in new condition, all changes in the state of the plant are recognizable from the time of commissioning.
- Comfortable monitoring and configuration using web browser - easy handling - Monitoring System *WebVisEC®*.
- Connection of customer-managed databases

Our Products

- Residual current monitoring device *RCM-W6* -> 5.5
- Residual and operating current monitoring device *RCM-W8* -> 5.6
- AC/DC sensitive residual current monitoring device *RCM-W8-AB* -> 5.7
- Residual and operating current monitoring device *RCM-W24* -> 5.8
- Data nodes of the *MPG-ETH* series
- Operating and annunciator terminal *BMTI 5* -> 5.13



Operating and annunciator terminal *BMTI 5*



Residual current monitoring device *RCM-W6*



Residual and operating current monitoring device *RCM-W8*



Residual and operating current monitoring device *RCM-W24*



AC/DC sensitive residual current monitoring device *RCM-W8-AB*

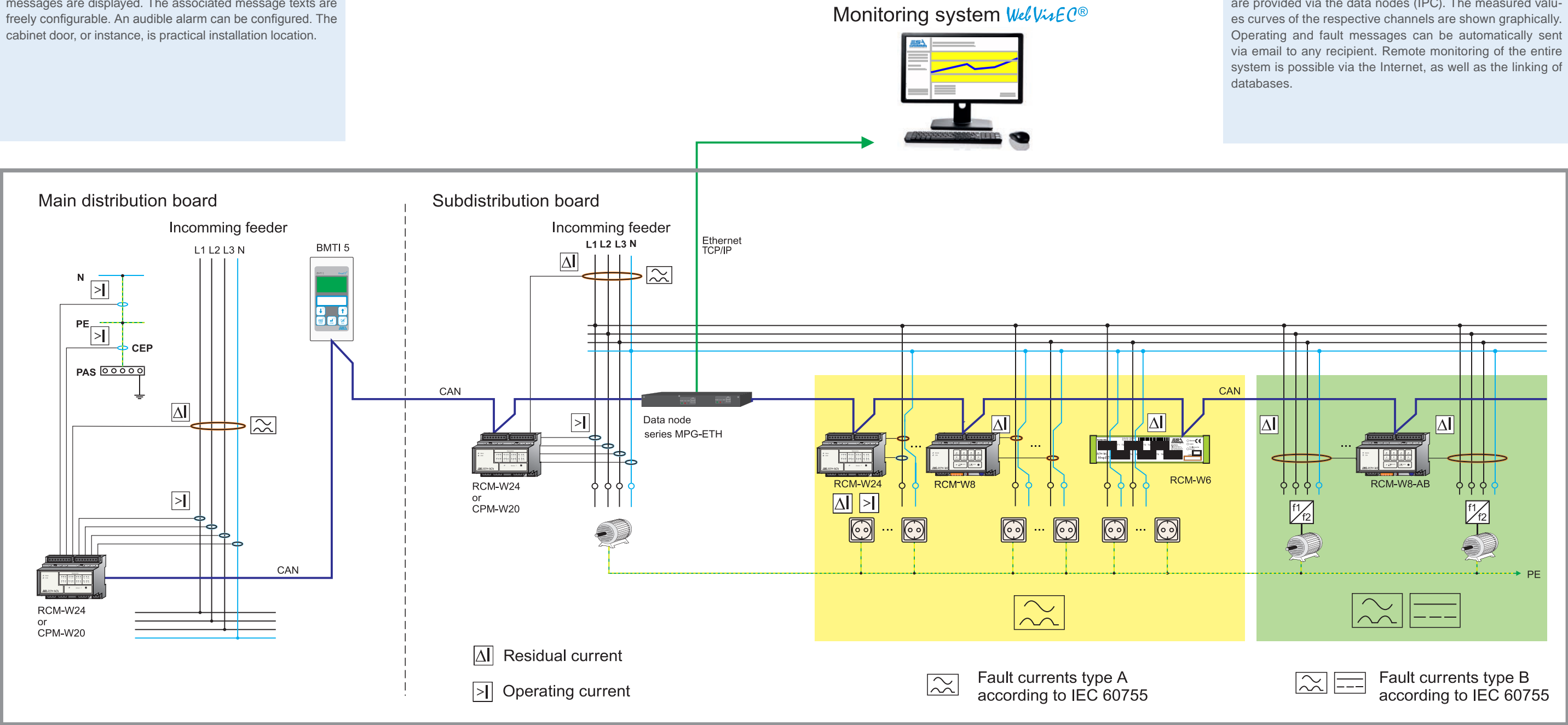
Channel-specific measured values of the power monitoring devices can be displayed on-site using the *BMTI 5* operating and annunciator terminal.

If warning or fault messages are issued, the measured value display is automatically suppressed and the corresponding messages are displayed. The associated message texts are freely configurable. An audible alarm can be configured. The cabinet door, or instance, is practical installation location.

The most convenient solution for the monitoring, documentation and configuration is provided by the *WebVisEC®* monitoring system. The data stored in the monitoring devices (e.g., location information, monitored resources) as well as their measured values and the violation of configured thresholds are provided via the data nodes (IPC). The measured values curves of the respective channels are shown graphically. Operating and fault messages can be automatically sent via email to any recipient. Remote monitoring of the entire system is possible via the Internet, as well as the linking of databases.

2.4





2.4





Schematic representation: Residual- and operating current monitoring – Monitoring system *WebVisEC®*

Type *RCM-W6* monitoring devices only monitor residual currents with their 6 integrated current transformers. Fault currents are detected against ground or other paths. *RCM-W6*: Fault currents in accordance with IEC 60755 Type A.

The 8- or 24-channel *RCM-W8/-W24* monitoring devices can be used as required with the appropriate current transformer for residual- and operating current monitoring. In residual current monitoring, fault currents are detected against ground or other paths. *RCM-W8/-W24*: Fault currents in accordance with IEC 60755 Type A, *RCM-W8-AB*: Fault currents in accordance with IEC 60755 Type B (no operating current monitoring).

		
	RCM-W6	RCM-W8
Measuring channels / evaluation		
Number of measuring channels (measuring transformer)	6	8
Maximum number of measuring channels for each CAN bus segment	96	128
Maximum number of measuring channels using monitoring system <i>WebVisEC®</i> (web-based solution)	Unlimited	Unlimited
Parallel acquisition and processing of measuring values, real effective-value measurement (True RMS)	✓	✓
Evaluation of residual currents only	✓	-
Evaluation of residual- and operating currents (channels can be used as required)	-	✓
Residual current type as per IEC 60755	A 	A 
Evaluation range of residual current (rated response residual current IΔn)	5...1000 mA	5...1000 mA
Evaluation range of operating current (depending on the type of measuring transformer)	-	1...6000 A
Measuring transformer		
Integrated in the device	✓	-
Can be connected to the device (external)	-	✓
Rated voltage (relative to network configuration)	AC 20...720 V	AC 20...720 V
Rated frequency (relative to network configuration)	50 / 60 Hz	50 / 60 Hz
Rated current (relative to network configuration)	50 A	1...6000 A
Standard residual current measuring transformer, e.g. DW Series or DW-T (DWT only for type A fault currents) Ratio of all types: x/1 (e.g.: 500/1, 600/1, 700/1)	-	✓
Operating current measuring transformers e.g. ASK or KBU series Ratio xx/1 or xx/100 mA	-	✓
Freely configurable values per channel		
Lower and upper alarm threshold (leave the normal range = window function during operating current detection)	✓	✓
Lower and upper response threshold (reaching the critical range)	✓	✓
Hysteresis for response thresholds	✓	✓
Time delay for messages when over- or undershooting the threshold values (affects all channels equally)	✓	✓
Messages / interfaces / configuration		
Alarm output with relay, 1 change-over contact (floating)	-	✓
Display with LED on the device	✓	✓
External messages via field bus (CAN) e.g. at the <i>BMTI S</i> , web-based via data nodes (TCP/IP) - Monitoring system <i>WebVisEC®</i>	✓	✓
Communication interface CAN / CAN protocol (2.0) according to ISO 11898	✓	✓
Configurable in the web browser - Monitoring system <i>WebVisEC®</i>	✓	✓
Non-volatile storage of all configuration data in the device (including location information, identification of operating materials, plain text details of the monitored operating resources per channel)	✓	✓
Power supply / dimensions / assembly / standards		
Supply voltage Us (PELV) via field bus CAN	24 V DC	24 V DC
Internal consumption	approx. 2,5 W	approx. 2,5 W
Dimensions (H x W x D in mm)	46 x 190 x 60 (11 TE)	90 x 105 x 73 (6 TE)
Mounted on top hat rail according to EN 60715	✓	✓
Version compliant with DIN EN 62020 (VDE 0663)	✓	✓

	
RCM-W8-AB	RCM-W24
8	24
128	128
Unlimited	Unlimited
✓	✓
✓	-
-	✓
B  	A 
7...800 mA	5...1000 mA
-	1...6000 A
-	-
✓	✓
AC 20...720 V	AC 20...720 V
50 / 60 Hz	50 / 60 Hz
1...6000 A	1...6000 A
✓	✓
-	✓
✓	✓
✓	✓
✓	✓
✓	✓
✓	✓
✓	✓
✓	✓
✓	✓
24 V DC	24 V DC
approx. 2,5 W	approx. 2,5 W
90 x 105 x 73 (6 TE)	90 x 105 x 73 (6 TE)
✓	✓
✓	✓

Standard residual current transformers – an advantage of our system

In principle, all common (standard) types of attachable current transformers with transformation ratio x/1 are suitable - a decisive advantage in the conversion of older systems, if existing transformers can still be used!

This also applies to universal current sensitive monitoring. For new installations we recommend the residual current transformers of the DW series or DW-T (DW-T only for type A fault currents).

When selecting the current transformer, the geometric dimensions of the conductors must be observed in addition to the transformation ratio (see table); some types require the installation of an additional shunt. We will be happy to provide you with precise information and ordering details for your concrete project.

Requirements

Information on the overall system - from the medical-technical right up to the building-technical side - must be assigned centrally, locally, and to individual areas, and made available to the user. Similarly, operator actions must be run from these locations. As especially in hospitals the staff has to deal with a flood of information at all times, this display and operating system must satisfy the principle of „show only as much as necessary“. If operator actions are required, these must be doable quickly, intuitively and at a glance.

The solution

With our display and control devices, we provide the user with a system that integrates all the necessary monitoring and control functions and that also meets the typical requirements in a hospital:

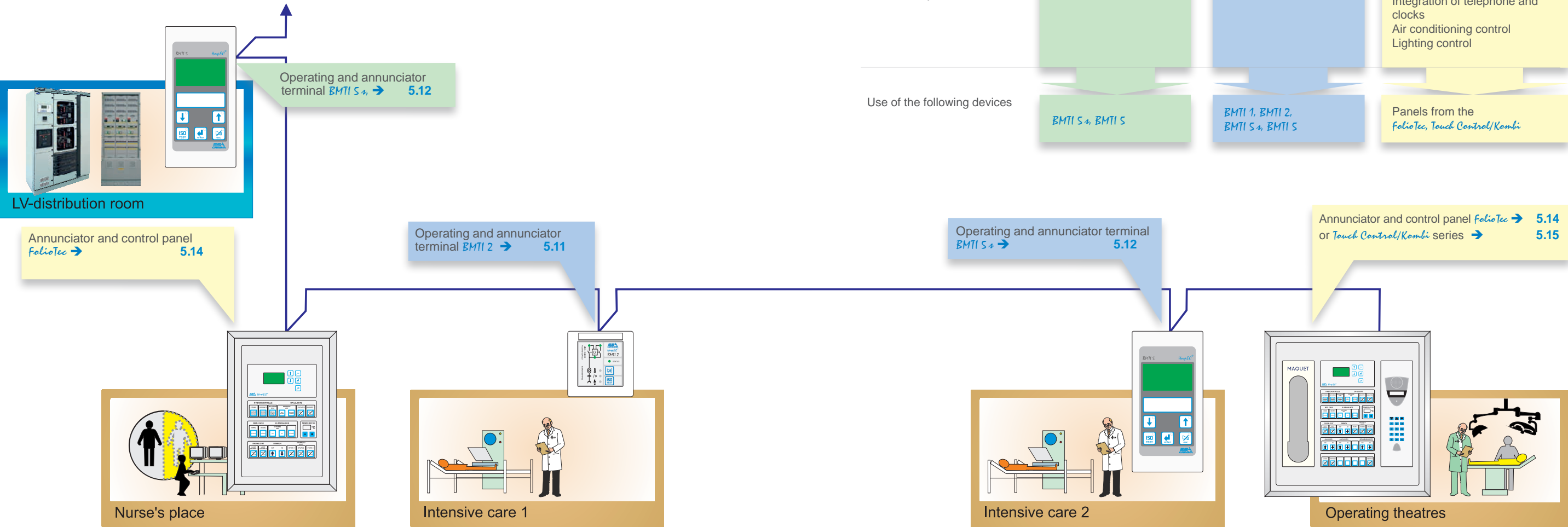
- Simple handling using fewer control buttons and a simple menu structure

Your benefits

- Specially designed for the use in medical locations
- Designed for quick acquisition of all necessary messages
- Simple, clear and intuitive operation possible
- Transparent button and display elements back-lit by multi-coloured LED
- Closed, multi-layered and permanently stable foil surface that is resistant to cleaning agents and disinfectants, UV-resistant
- High degree of protection of the user interfaces (IP54)
- Communication via standard field bus (CAN) with all devices from the *HospEC®*-system
- Problem-free integration into the building control technology
- Control and monitoring function connections also for third-party systems
- General processing of system data, not set to predefined warning messages and operating messages

Our Products

- Operating and annunciator terminal *BMTI 1* -> 5.10 for the display of alarms from monitored IT systems with ISO-test function
- Operating and annunciator terminal *BMTI 2* -> 5.11 for the display of alarms from change-over and monitoring modules with ISO-test function
- Operating and annunciator terminal *BMTI S* and *BMTI 5* -> 5.12/5.13 e.g. for display of status and error messages of the IT system in medical locations, messages and measured values from other devices from the *HospEC®* system, messages from external facilities, with ISO-test function.
- Annunciator and control panel series *FolioTec* -> 5.14 with touch display: *Touch Control/Kombi* -> 5.15 e.g. for display of status and error messages of the IT system, change-over modules, messages and measured values from other devices from the *HospEC®* system, for messages from external facilities, for operating theatre table control, integration of linguistic communication, shutter/blind control, air conditioning control, representation and control of additional processes of the overall system.



HospEC® - display and operating system in the hospital

Requirements

The lighting controls for all areas, taking into account the different requirements of each, should be designed simply and conveniently. Advantageous is when „normal“ switches and pushbuttons can be used as installation equipment.

This should take into consideration, and cost-effectively implement, the linking of central and local operator control functions, natural light, time and presence-dependent functions, as well as the specific requirements when supplying the light circuit from the GS and SS system, and user-friendly control of the area lighting in operating theatres.

There are also numerous control and monitoring tasks. Signals from the building technology must be evaluated, linked to each other, displayed and provided at different locations for integration or display in other process control systems.

The solution

With our bus-capable digital I/O devices with independent logic function from the **MPM** series, you are able to cost-effectively implement all lighting controls and other control and monitoring tasks. With their features and compliance with the necessary safety requirements („single fault security“), they replace conventional and sophisticated technology, especially when used in medical locations such as hospitals.

Your benefits

- Control functions for safety and general lighting (SS and GS circuits)
- Simple and convenient control for ambient lighting in the operating theatre
- Cost-effective implementation of multifunctional light controllers - also with dimming functions
- Input circuits can be designed using standard installation pushbuttons and switches
- Integration into the existing bus system of signals from the entire building technology
- Safety feature by defined output states after reset - such as voltage interruption (low, high, last status before the reset)
- A high degree of flexibility in the planning and subsequent functional changes by simple reprogramming of the logic functions - no changes to the wiring and installation.

- The devices can also be operated independently without bus connection (standalone), safety functions if the bus is turned off.
- Reduced fire load due to reduction of control cables
- Lower installation effort - shorter assembly times

And as a significant advantage when used in medical locations:

- The highest level of security and reliability by standalone distributed logic functions of each device and specified switching functions in the event of a failure of the monitored nodes or failure of the field bus. This is ensured by the „single fault security“ required as per IEC 60364-7-710 and DIN VDE 0100-710.

2.6

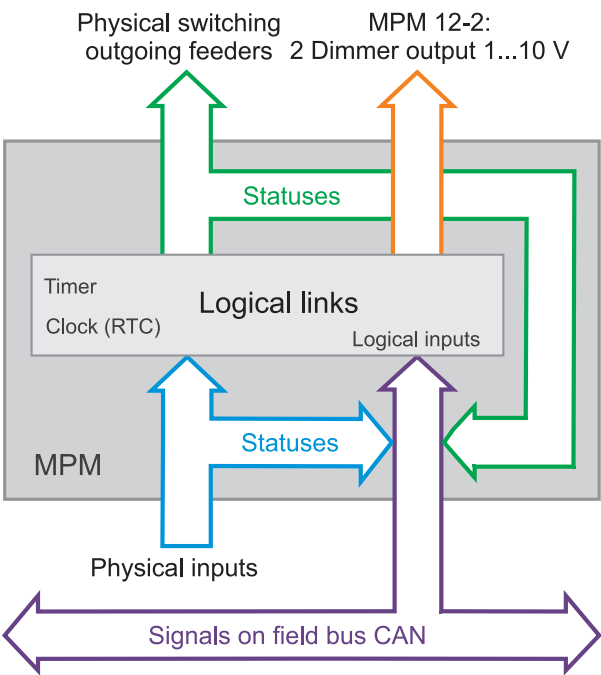
2.6

Basic functions

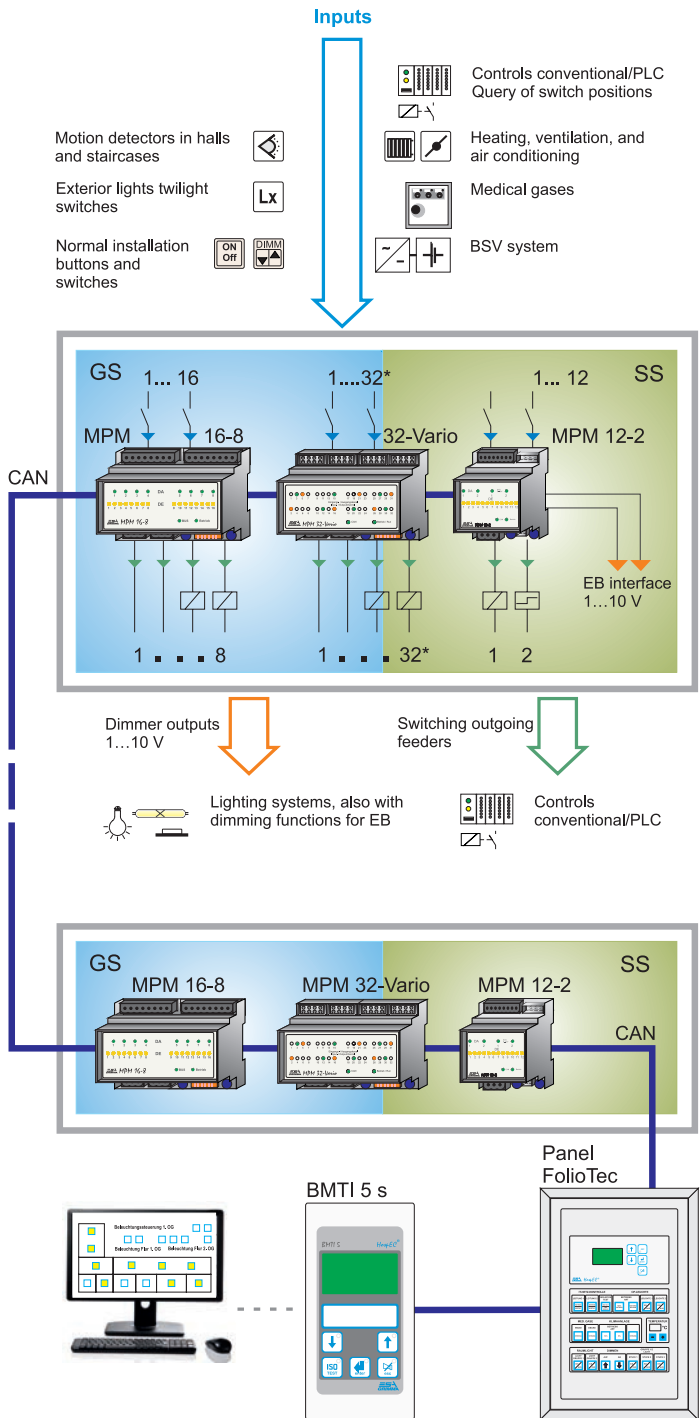
The devices detect any digital signals with their physical inputs (floating or non-floating). Logical inputs are also detected. These are the signals that are located on the field bus (CAN). They come from other field bus devices, such as other devices of the **MPM** series, annunciator and control panels, and all other ESA bus nodes. All signals can be logically linked with each other and made available to the physical switching outputs for evaluation and control purposes.

The conditions of the physical inputs and outputs are permanently transmitted on the field bus and are therefore available to other devices for evaluation.

The **MPM 12-2** also has 2 interfaces for the control of electronic ballasts (EB) with a 1 - 10 V interface and convenient dimming function. The 32 channels of the **MPM 32-Vario** can be configured as required as inputs or outputs



Simplified functional principle **MPM 12-2 / 16-8 / 32-Vario**



Connection options of the **MPM**

- Detection of signals/switch positions
- Logical links
- Time switching functions
- Control functions
- Lighting control - also with dimming function

- Signal coupling on the fieldbus (CAN) with
 - MPM 12-2** → 5.16
 - MPM 16-8** → 5.17
 - MPM 32-Vario** → 5.18

* **MPM 32-Vario**: 32 channels, selectable as input or output

- Communication via the fieldbus (CAN)
- Stand-alone application possible (without bus connection)

- Lighting control with annunciator and control panel **FolioTec** → 2.5/5.14
- Display of status, warning and fault messages with **BMTI 5** → 2.5/5.13
- Connection to the control system

Our Products

- Digital I/O device with its own logic function *MPM 16-8*
- Digital I/O device with its own logic function and variable use of the channels as inputs or outputs *MPM 32-Vario*
- Digital I/O device with its own logic function and dimming control for EB *MPM 12-2*
- *HayEC®* regulation and control systems
 - Annunciator and control panels *FolioTec*, *Touch Control*, *Kombi*
 - *BMTI S* operating and annunciator terminal with data connection via standard field bus (CAN)

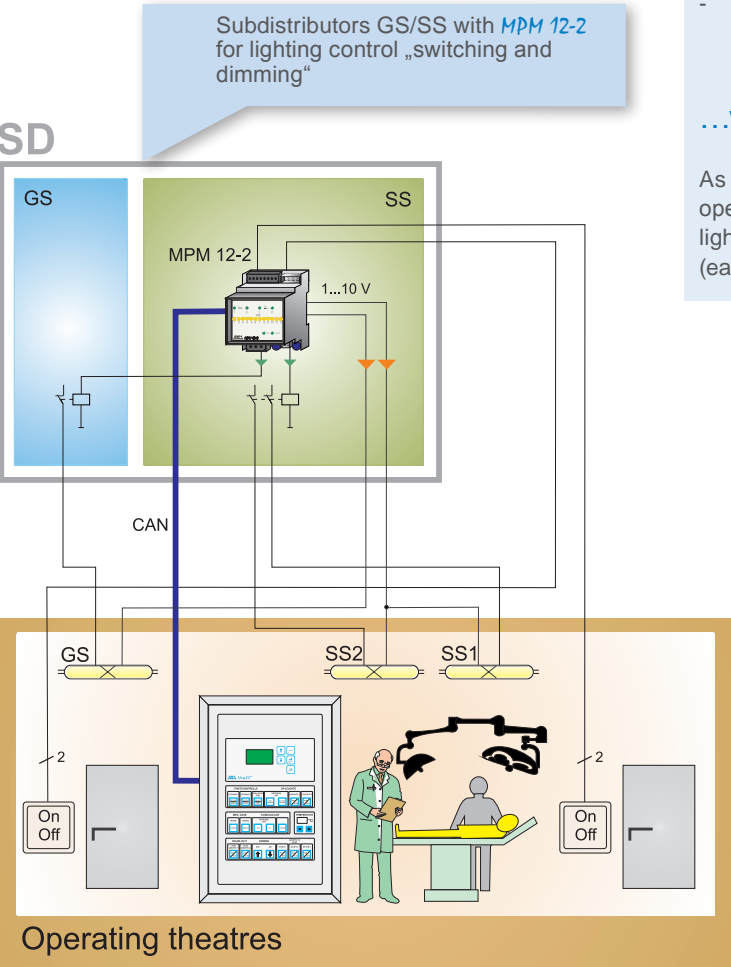
Example: Ambient lighting in the operating theatre

Your requirements...

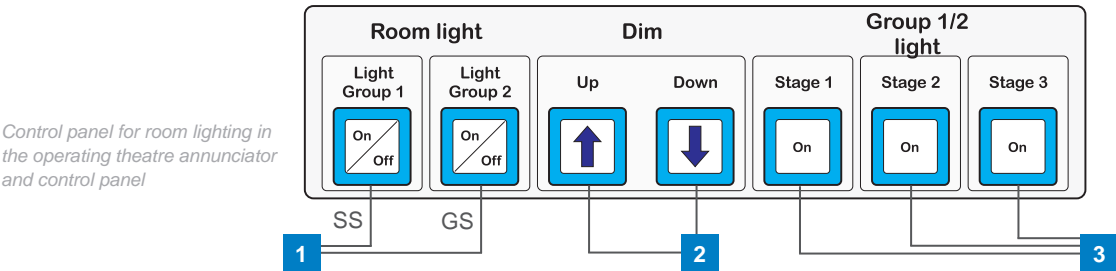
- Simple and easy-to-understand control
- Lighting supply via 2 separate circuits (general supply - GS, safety supply - SS)
- Common or separate connection of both circuits via the control panel in the operating theatre
- Light scene control (memory function) storable by the user
- Lighting dimming via EB with standard interface 1...10 V
- Common or separate dimming of both circuits (GS and SS)
- „Cleaning women“ function for external button (button next to the door)
- Soft on and soft off behaviour of the individual circuits (switch-on and pleasant dim lighting level up to the full illumination value or the maximum value, or inverse function when switching off)
- Switch on of the safety lighting during network replacement operation (only SS), depending on the switch position of the light circuits before the power interruption (if only the GS circuit was in operation before the power failure, the SS circuit should kick in automatically).
- If dimmed down, the SS circuit should be automatically set to 100% if the GS fails.

...we implement:

As a standard, all ESA annunciator and control panels in operating theatres are fitted with a controller for separate 2 light groups. These are supplied from separate supply areas (each 1 x general supply - GS and 2 x safety supply - SS).



The standard version of the ambient lighting in operating theatres



Control panel for room lighting in the operating theatre annunciator and control panel

ON-OFF

For switching on or off of the groups; if the group is switched on, this is indicated by the green lighting of the respective button.

Dimming function

For dimming the groups; this function acts on both light groups at the same time and in parallel, even if e.g. light group 2 is not in operation. If this group is then also connected, the previously selected dimming value is also set for this group.

Memory function

To retrieve stored dimming values (brightness values) - acts on both groups; 3 default presets are stored. A simple routine allows the user to make modifications.

Technical Data of MPM

	MPM 12-2 with dimming function	MPM 16-8	MPM 32-Vario
Physical inputs	12	16 (2 groups á 8)	32* (4 groups á 8)
Type of inputs	Floating or non-floating (max. 24 V DC)		Non-floating (24 V DC)
Physical outputs	2 (relay contacts 230 V/ 1500 VA) 2 digital potentiometers for control of dimmable EB with 1 - 10 V interface	8 (relay contacts AC 230 V/ 1500 VA)	32* open collectors (24 V DC, 350 mA, short-circuit-proof) *(32 channels, configurable as either input or output)
Features	<ul style="list-style-type: none">- Transfer of relay messages in the standard field bus (CAN)- Lighting control and other control functions via an installation button/switch, or operating panel- Transfer and processing of messages from the field bus- Output of messages/commands to switch outputs and the field bus Additionally for MPM 12-2 : <ul style="list-style-type: none">- Light scene control can be stored by the user (max. 2 circuits, each with 4 scenes)- Extensive dimming functions (e.g. common or separate dimming of both circuits, 1- or 2-button design, soft on and soft off circuits)- Cleaning function can be connected for on-site button- Switch on of the safety lighting during network replacement operation (only SS), depending on the switch position of the light circuits before the power interruption (if only the GS circuit was in operation before the power failure, the SS circuit should kick in automatically). The device communicates with the relevant voltage-monitoring device for this.- If dimmed down, the SS circuit is automatically set to 100% if the GS fails.		
Software features	<ul style="list-style-type: none">- Free assignment of input/output channels (status/warning/fault messages)- Defined output states after reset (low, high, last state before the reset)- Logical linking of variables (physical inputs of the device and status messages from the field bus)- Control functions for safety and general lighting (SS and GS circuits)- 120 logical inputs (messages from the field bus) can be processed (MPM 12-2: 80)- Logic operators AND, OR, XOR - up to 20 operands per logic formula, 13 timer operands, reset and output operand- Stand-alone operation (without a bus connection)- Monitoring of other field bus nodes (sign of life)- 32 timer channels with integrated real-time clock (RTC) (MPM 12-2: 8)		
Configuration	PC Software „HayEC® Configurator“ (via USB CAN adapter), (MPM 12-2 : also via DIP switch in stand-alone application)		
Displays	With LED: Status displays of the inputs/outputs / operation / bus		
Communication interface	CAN / protocol CAN (2.0) according to ISO 11898		

Requirements

All devices used from the *HospEC®* regulation and control system need to communicate with each other.

For example, messages from change-over and monitoring devices in IT system distribution boards must be transferred to on-site display and operating systems such as operating and annunciator terminals (*BMTI S*) or annunciator and control panels (series *Folio-Tec*, *Touch Control* or *Kombi*) in operating theatres and intensive care units.

Measured values, control commands, fault and error messages as well as other signals from ESA devices must be transferred. Furthermore, the communication system must be able to also incorporate signals from other facilities.

The focus is on a simple but safe transfer procedure, because medical locations in particular have the highest safety requirements.

2.7

The solution

In the *HospEC®* system, the communication system of the standard CAN field bus (Controller Area Network) is used.

The CAN bus, as a serial multi-master bus system, ensures reliable function and high transmission reliability even under difficult ambient conditions. Any error expectation is extremely small due to the application of several security mechanisms. Due to its outstanding feature - the high transmission reliability - it is therefore increasingly used for applications in extremely safety-critical areas.

Linking of the *HospEC®* bus system (CAN) with other systems is ensured. For instance, protocols such as EIB or Modbus® can be integrated and processed.

Signals from the CAN bus can also be transferred to these bus systems. Additionally, binary signals (e.g. floating contacts) can also be connected, output and even processed. The above-mentioned options ensure a high degree of compatibility with all third-party systems.

Principle of operation and bus topology

The key principle is that all bus nodes are quasi-equals in the bus. The CAN controllers of each mode control access to the bus, send and receive the data, evaluate values and initiate corrections. Messages from safety-relevant nodes are transmitted and evaluated with a higher priority.

There is no „main controller“ that could cause the entire system to crash if it fails. This is therefore often referred to as a „multi-master system“. This assures the high and reliable availability of this bus system.

In principle, the shape of the bus topology for the individual bus segments is linear. Bus segments can be connected by appropriate micro-controllers, e.g. in panels. Gateways are used to connect to other bus systems to the CAN bus and to expand the system.

Special safety aspects in the *HospEC®* system

Even the safest technique may fail under certain circumstances, and grossly negligent human behaviour is often a factor - this has been shown (unfortunately) time and again in practice. We make allowances for this fact by a series of specific measures:

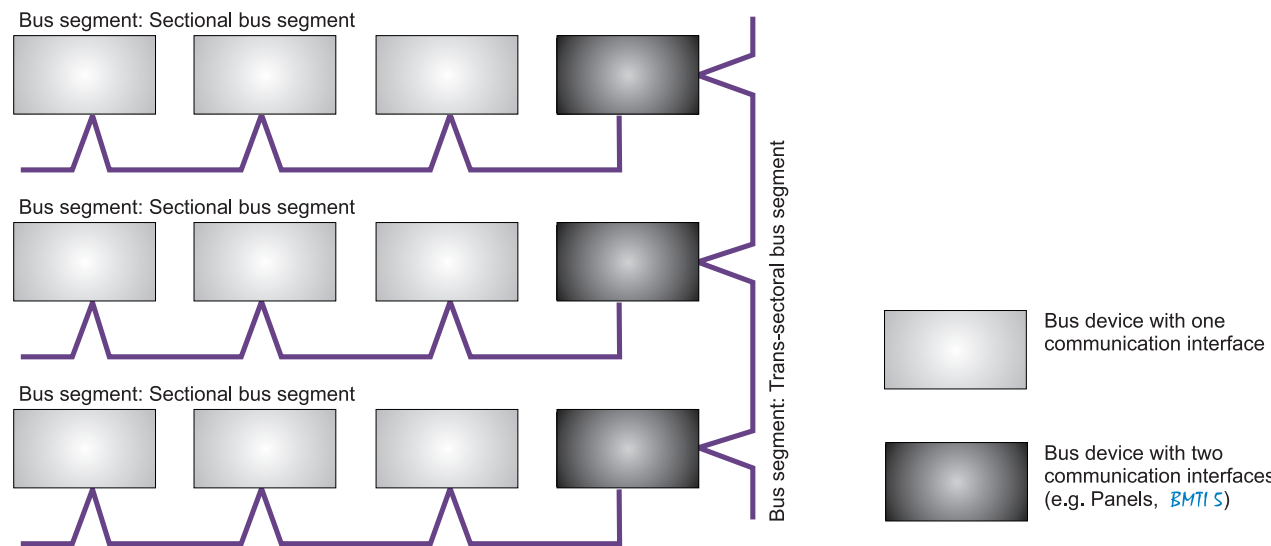
Your benefits

- Future-proof standard field bus system with CAN protocol 2.0 (as per ISO 11898)
- Highest transmission reliability - even under difficult ambient conditions
- Simple and clear bus structure
- Maximum extension of bus segment up to 2500 m
- Use of standard cable for the data circuit (J-Y(ST)Y 4 x 2 x 0.8 Lg according to VDE 0815 with standardized colour coding of the wire pairs)
- Integration of binary signals and protocols such as EIB or Modbus® is possible

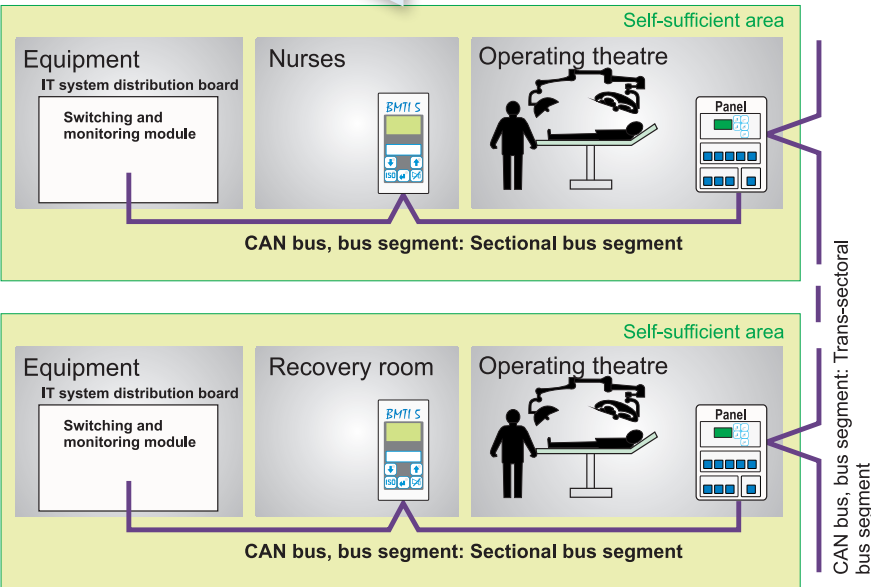
For example ...

- Change-over modules between the GS and SS power supply system continue to function reliably even when there are bus faults. Their control and monitoring devices then issue fault messages via alarm relays.
 - The power supply of the bus and the CAN controller of all bus nodes is via parallel power supplies (24 V DC) from the safety power supply (SS) that can be connected in parallel.
 - Among other things, independent functional bus segments are established to further increase the level of security. These are, for example, the change-over and monitoring module for an operating theatre, the associated display and operating systems, and all other bus nodes associated with this area.
 - This “area buses” operate autonomously; if any other bus segment failures, all other areas continue to function reliably!
 - The CAN bus system used was developed from the perspective of single fault security. This applies to the individual devices and their communication with each other.
- The *MPM* digital I/O devices can detect failures of bus nodes (time-out function) and issue messages via floating contacts if there is no „sign of life“.

2.7



Basic bus topology



Principle of the autonomous locations

The CAN bus in the *HotEC*[®] system

In principle, the shape of the bus topology for the individual bus segments is linear. Bus segments can be connected by appropriate micro-controllers, e.g. in panels or *BMTI 5*.

Terminating:
The data transfer lines in the bus (CAN low/CAN high) must be connected at the beginning and end of each bus segment with a resistor (120 Ω, 0.25 W) to avoid reflections.

Each distribution has an XCAN terminal adapter. It forms a defined transfer point for the (external) bus and the bus section within the distribution. Power supplies can be connected at this terminal adapter. It also has a switching resistor for termination.

Panels also have an internal terminal adapter for the same purpose.

Parallel-switching power supplies provide the 24 V DC supply voltage for the bus and its nodes within the distribution line. If other devices on the same bus segment require a power supply via the CAN-bus (e.g. *BMTI 5*), then additional power supplies in the distribution lines can provide this supply via the XCAN terminal adapter. Panels have a separate power supply.

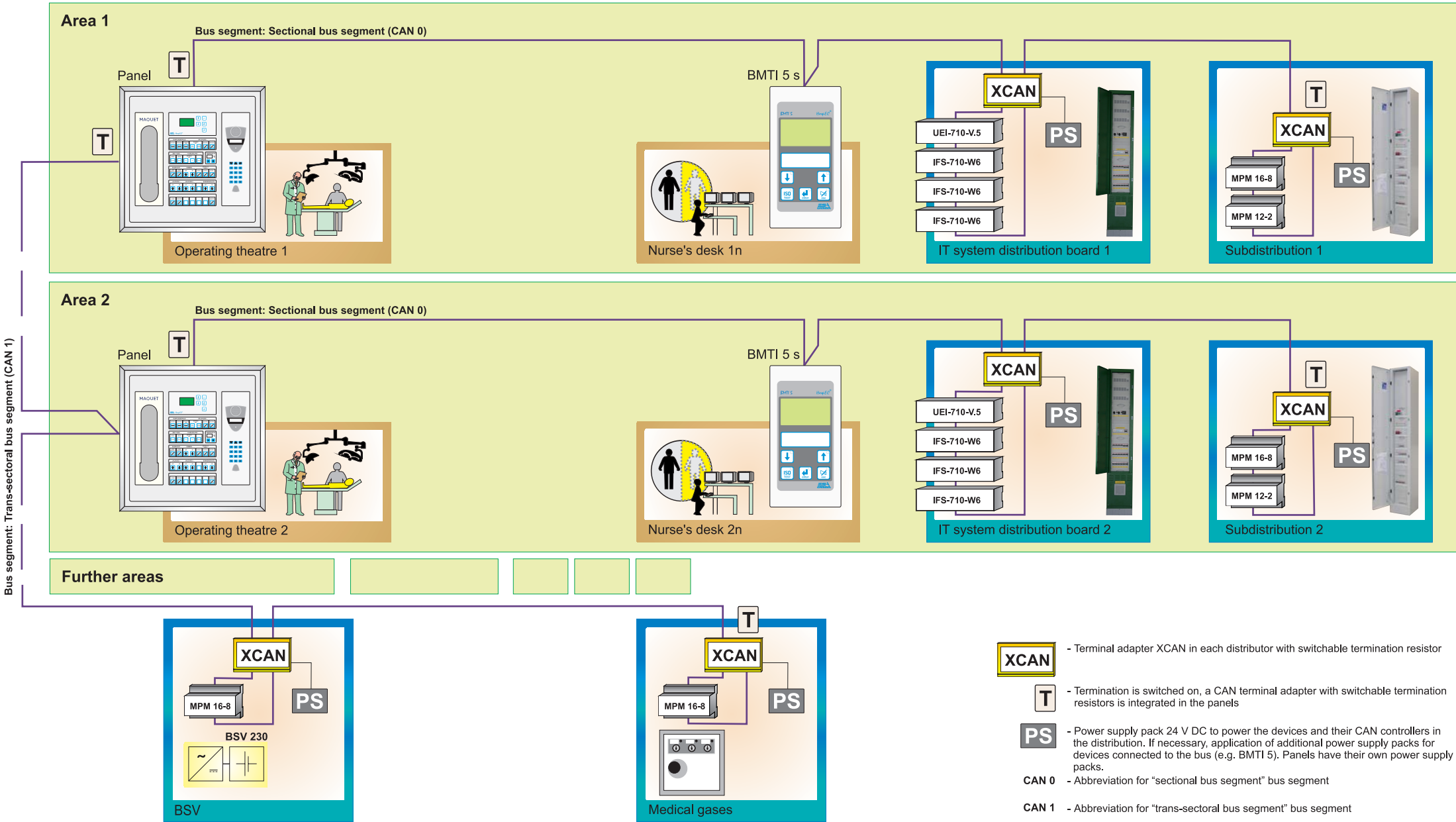


Technical data

Protocol	CAN (2.0) as per ISO 11898
Supply voltage	DC 24 V
Maximum bus length	2500 m (for each bus segment)
Cable type	J-Y(St)Y 4 x 2 x 0.8 Lg (VDE 0815) With standardized colour coding of the wire pairs
Nodes per bus segment	max. 110
Possible protocol / signal links	EIB, Modbus [®] , RS232, RS485, TCP/IP, binary

2.7

2.7



- XCAN** - Terminal adapter XCAN in each distributor with switchable termination resistor
- T** - Termination is switched on, a CAN terminal adapter with switchable termination resistors is integrated in the panels
- PS** - Power supply pack 24 V DC to power the devices and their CAN controllers in the distribution. If necessary, application of additional power supply packs for devices connected to the bus (e.g. *BMTI 5*). Panels have their own power supply packs.
- CAN 0** - Abbreviation for "sectional bus segment" bus segment
- CAN 1** - Abbreviation for "trans-sectoral bus segment" bus segment

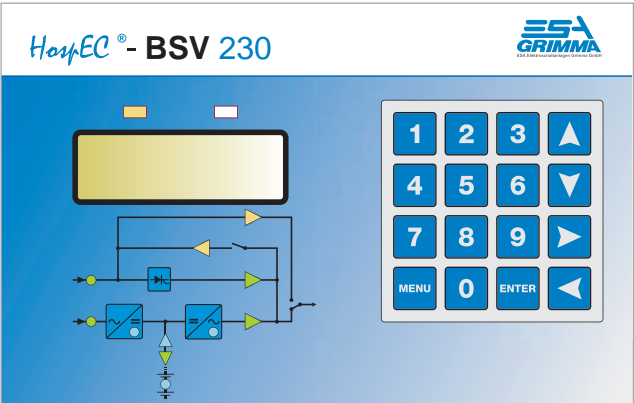


Example for bus structure

HospEC® - BSV 230
Power supply for AC voltage consumers
(230 V/400 V AC)

Brief specification

- Rated output voltage: Single phase or 3-phase 230 400 V
- Rated outputs (depending on type): 5 ... 80 kVA
- Very high output short-circuit current (6...7.5 x I_n)
- System bus connection (CAN field bus) for messages
- Function and capacity check with energy recovery
- Inverter or inverter with electronic change-over module (EUE), depending on the requirement
- Display of all measured values and messages in plain text with integrated electronic signalling and test system with readable memory
- Charging device with galvanic isolation
- External bypass for complete isolation of plant with consumer outlets (NH 00 or D02)
- Use of batteries with a minimum life expectancy as per electro-BAT of 12 years



Operator control and display unit for *HospEC*® - BSV 230

Optional:

- Battery single cell or block monitoring
- Logging on printer
- Bus system connection
- Visualization via Ethernet

Operating modes (depending on the requirements of the consumers):

- Hot standby with electronic switching device (EUE) class ≤ 0.5
- Continuous operation (online) class 0 - no interruption

Requirements

For the supply of lighting and vital medical electrical equipment that requires a power supply within 0.5 seconds or faster in the event of a power failure, a battery-supported central power supply system (BSV) must be provided.

The solution

In the event of failure or interruption of the general power supply (power line), the equivalent network activates with absolutely reliability. Thereafter, an emergency operation time of 3 hours or one hour (when there is a second back-up power supply, e.g. diesel network) must be guaranteed by the connected battery system.

The *HospEC*® systems from the BSV series completely fulfil these requirements according to DIN VDE 0558-507 and DIN VDE 0100-710!

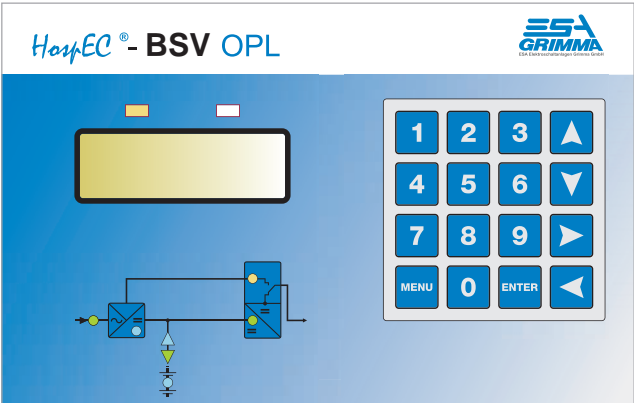


Device cabinet for *HospEC*® - BSV 230

HospEC® - BSV OPL
Special power supply for operating theatre lights (24 V DC)

Brief specification

- Maximum lamp power (W): 430 ... 4180 (larger systems on request)
- Network connection (depending on type): 230/400 V AC
- Maximum number of operating theatre controllers: 8 (larger systems on request)
- Combination cabinet (max. 8 regulators, max. 1200 VA) with regulators, controllers and batteries in a compact cabinet (H x W x D) 2000 x 950 x 600 mm
- The permanent monitoring of each outgoing circuit of operating theatre lights
- Synchronized outlet control for stable lamp voltages
- Adjustable voltage drops for each operating theatre light with overvoltage protection circuit
- Exact state of the battery charge can be retrieved
- Display of all measured values and messages in plain text with integrated electronic signalling and test system with readable memory
- Use of batteries with a minimum life expectancy as per electro-BAT of 12 years
- Charging device with galvanic isolation
- System bus connection (CAN field bus) for messages and for connection of the individual circuits



Operator control and display unit for *HospEC*® - BSV OPL

Optional:

- Single block battery monitoring
- Logging on printer
- Bus system connection
- Visualization via Ethernet

And the added advantage:

- Automatic insulation fault detection system

Operating modes:

- Standby parallel operation



Requirements

The “Law on energy services and other energy efficiency measures” (German, EDL-G) describes the introduction of an energy management system as per section 8 paragraph 3 number 1 of EDL-G for companies subject to mandatory audit. Companies are freed from the auditing requirement if they are operate a certified energy management system according to DIN EN ISO 5001 or equivalent.

A functioning energy management system should enable a company to observe their energy-policy obligations and to continuously improve its energy performance by use of a systematic approach.

The solution

Together with the devices and software of our solution partners Janitza[®], we offer you a 3-in-1 solution for a certified energy management system according to DIN EN ISO 5001 for the electrical consumption as a complete system. At its core is our current and consumption monitoring devices of type *CPM-W20*. These 20-channel devices determine the consumption and measure the voltage. Attachable-hinged current transformers allow for measurement of up to 600 amps without having to open the circuits to loop-in the transformer. This is advantageous when the measurements have to be run in existing systems. Determination and evaluation of residual and operating currents using current and consumption monitoring devices of type *CPM-W20*.

3 steps lead to a certified energy management:

- a) Consumption data acquisition
- b) Certified evaluation system
- c) Certification by external service providers



Current and consumption monitoring device *CPM-W20*

Your benefits

- 20 current measuring channels in just one device *CPM-W20*
- Certified Energy Management System according to DIN EN ISO 5001
- When required, determination of residual and operating currents by the *CPM-W20*
- Logging of all data
- Compliance with the legal requirements

Our Products

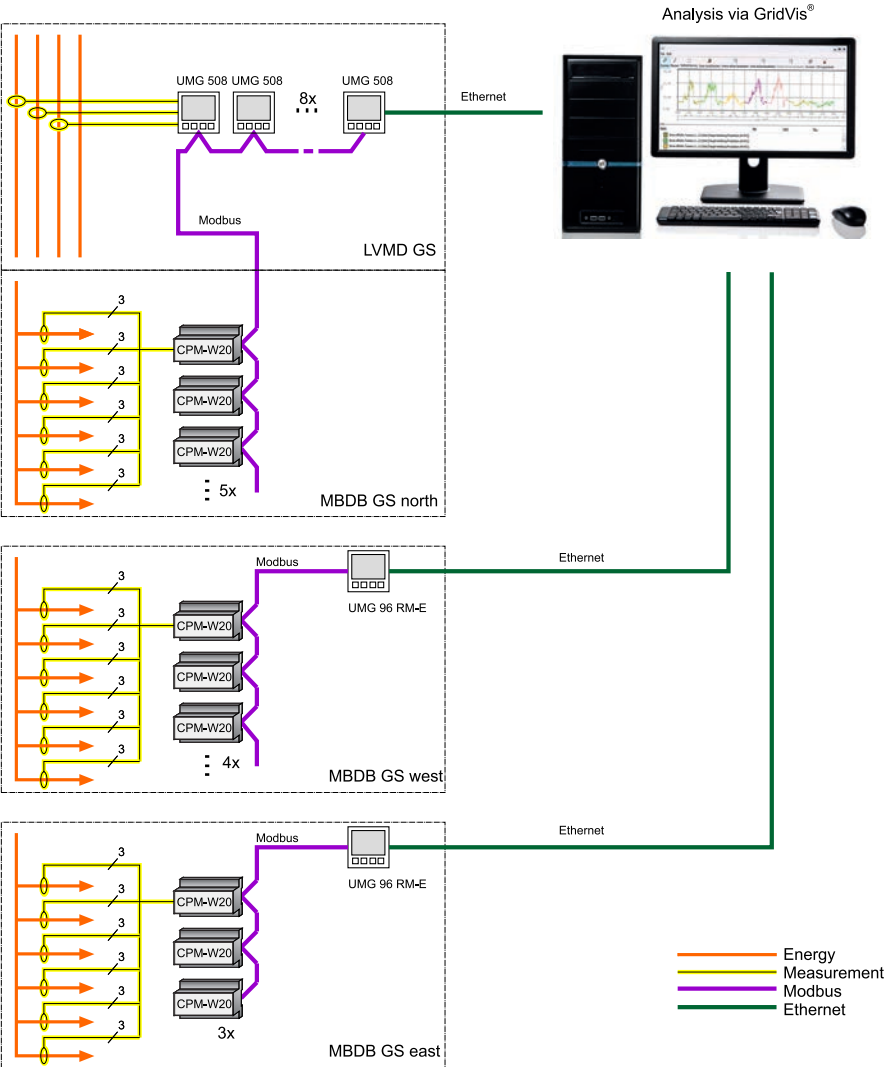
- 20-channel current and consumption monitoring devices *CPM-W20*.
- Network analysers with Modbus[®] gateway function of the UMG series (measuring devices of Class A), produced by Janitza[®]
- Certified evaluation software GridVis[®], produced by Janitza[®]

Janitza[®]
Solution Partner



Technical data of the *CPM-W20* (extract)

Supply voltage	AC 100...240 V, 50/60 Hz
Use in network configuration	TN- and TT systems with 230 V L-N and 50 Hz
Measuring range of residual current	10 mA ... 1 A
Measuring range of operating current	Up to 600 A
Measurement and determination	- Star and line-to-line voltages - Residual and operating currents with limit value monitoring - Active, reactive and apparent power - Active energy - Amount and phase angle of voltages and currents - Power factor and cos φ
Accuracy class	1 for active power and active energy
Measuring inputs	4x voltage 20x current
Interface/communication	RS 485, Modbus [®] – RTU/Slave / CAN
Digital outputs	2
Displays	Status LED for voltages and currents
Installation	On top hat rail according to DIN EN 60715
Device dimensions	90 x 105 x 73 mm (H x W x D), 6 TE



Schematic representation of recording of energy consumption implemented in a hospital (only showing the GS side)

Areas of application

As a control and monitoring device for the change-over between the general supply (GS) and safety supply (SS) in automatic change-over modules (type [UEQL](#)) according to DIN VDE 0100-710.

Product description

- Monitoring of all voltages in single or three-phase networks for compliance with the tolerance limits preselected on the device:
 - Voltage monitoring of the preferred feeder, the second feeder as well as for undervoltage and overvoltage after the change-over module
- Interruption monitoring of the N-conductor in three-phase networks (also where there is a symmetrical network load)
- Change-over control for load switch with motor drive (other versions on request)
- Monitoring of the overall change-over module:
 - Internal intrinsic device monitoring
 - Wire breakage monitoring of the control circuits
 - The correct switching states and switching times of load switching devices



SPR-107-V.4

- Voltage supply of the control circuits with control voltage switching device [STU-107-V.3](#)
- LED display of the operating states
- Text display (full-graphic display) for detailed information and view menu
- Operation via buttons on the device
- Configuration via password-protected, user-friendly menu, e.g.:
 - Response values of the voltage monitoring
 - Switching delay times
 - Activation times of the load switching devices

Technical data

Monitored system	1/N AC 0...290 V / 3/N AC 0...500 V / 2 AC 0...500 V / each 50...60 Hz
Configurable values	
Undervoltage response	230/400 V system: 150...230 V / 260...400 V
Overvoltage response	230/400 V system: 230...260 V / 400...460 V
Triggering delay time Tv _h	0...20 s in 0.5 s steps
Release delay time Tv _r	0...20 s in 0.5 s steps
No-load time (pause time) T _{nu}	0...20 s in 0.5 s steps
Control time for load switching devices	0.10...4 s in 0.02 s steps
Operation	5 buttons
Configuration	Via menu
Displays	Full-graphic display (backlit) and LED
Messages	Plain text display / LED / alarm relay / externally via field bus (CAN) e.g. at the BMTI S
Communication interface/protocol	CAN / CAN (2.0) as per ISO 11898
Supply voltage U _s	24 V DC (PELV)
Internal consumption	Approx. 7 W
Dimensions (H x W x D in mm) / Installation	90 x 160 x 73 (9 TE) / top hat rail according to DIN EN 60715

Detailed information is provided in the technical documentation for the device.

Areas of application

The [ILT-710-V.5](#) is used as a monitoring device for IT systems according to IEC 60364-7-710 and DIN VDE 0100-710. With integrated test signal generator to setup an insulation fault detection system with insulation fault detection devices [IFS-710-W.6](#).

Product description

- Monitoring of:
 - Insulation resistance of a single-phase 230 V AC IT system
 - Load current of the transformer and the converter via
 - Temperature of the transformer (via PTC or NC contact)
- Monitoring of all measurement connection lines in accordance with DIN VDE 0100-710
- Internal intrinsic device monitoring
- Can be expanded in conjunction with at least one [IFS-710-W.6](#) (insulation fault detection device) as an insulation fault detection system. The faulty outgoing circuit (fuse name) is then displayed on the device and on peripheral display devices (e.g. [BMTI S](#), panels)



ILT-710-V.5

- Complete documentation of faults using the past events memory, RTC integrated
- Text display (full-graphic display) for detailed information and view menu
- Operation via buttons on the device
- Configuration via password-protected, user-friendly menu, e.g.:
 - Response values of the insulation monitoring
 - Response values of the load current monitoring

Insulation, load and temperature monitoring device [ILT-710-V.4](#)

The [ILT-710-V.4](#) device (not shown) has the same properties as the [ILT-710-V.5](#). However, it has no test signal generator and is used when no insulation fault detection system is to be installed.

Technical data

Monitored IT system	1 AC 50/60 Hz 110...250 V, DC 110...250 V
Configurable values	
Response value of insulation monitoring 230 V	50...250 kΩ
Response value of load current monitoring	0...50 A with transformer ILT-W
Temperature monitoring response value / release value	Fixed: 120 °C, 4 kΩ/1.5 kΩ
Permissible system leakage capacitance	max. 4 μF
Max. number of insulation fault detection devices IFS-710-W.6	16 (96 channels)
Test signal (test current)	Limited to 1 mA
Operation	4 buttons
Configuration	Via menu
Displays	Full-graphic display (backlit) and LED (status)
Messages	Plain text display / LED / 2 OptoMos relays / externally via field bus (CAN) e.g. at the BMTI S / acoustic signal generator
Communication interface/protocol	CAN / CAN (2.0) as per ISO 11898 RS 485 / Modbus®-RTU
Supply voltage U _s	AC 50/60 Hz 110...250 V / DC 110...250 V
Internal consumption	Approx. 8 W
Dimensions (H x W x D in mm) / Installation	90 x 71 x 73 (4 TE) / top hat rail according to DIN EN 60715

Detailed information is provided in the technical documentation for the device.

Areas of application

5.3

As a control and monitoring device for the change-over between the general supply (GS) and safety supply (SS) in automatic change-over modules (type **UEI-710**) and their connected IT systems With integrated test signal generator to setup an insulation fault detection system with insulation fault search devices **IFS-710-W6**.



UEI-710-V.5

Product description

- Monitoring of all voltages in single phase networks for compliance with the tolerance limits preselected on the device:
 - Voltage monitoring of the preferred feeder, the second feeder as well as for undervoltage and overvoltage after the change-over module
- Change-over control for motor-driven switch disconnectors
- Monitoring of the overall change-over module:
 - Internal intrinsic device monitoring
 - Wire breakage monitoring of the control circuits
 - The correct switching states and switching times of load switching devices
- Implementation of the voltage supply of the control circuits (with integrated control voltage switchover)
- Monitoring of
 - Insulation resistance of a single-phase 230 V AC IT system
 - Load current of the IT transformer using converter
 - Temperature of the transformer (via PTC or NC contact)
- Monitoring of all measurement connection lines in accordance with DIN VDE 0100-710
- Integrated test signal generator, together with **IFS-710-W6** (insulation fault detection devices), the implementation of a complete insulation fault detection system
- Complete documentation of faults using the past events memory, RTC integrated
- Monitoring of the periodic inspection and triggering of „silent alarm“ in the case of overshoot
- Complete plug-in connection contacts - device can be replaced without switching off the consumers

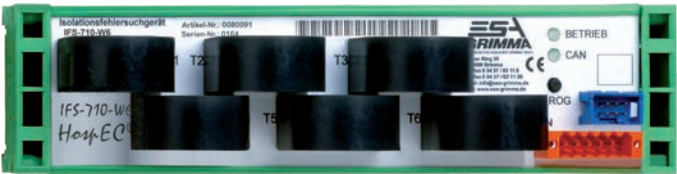
Technical data

Monitored system (voltage)	1/N AC 0...290 V / 50...60 Hz
Monitored IT system	AC 120...265 V / 50...60 Hz
Configurable values	
Undervoltage response	150...230 V
Overvoltage response	230...260 V
Triggering delay time Tv _h	0...20 s in 0.2 s steps
Release delay time Tv _r	0...20 s in 0.2 s steps
No-load time (pause time) T _{nu}	0...20 s in 0.2 s steps
Response value of insulation monitoring 230 V	50...250 kΩ
Response value of load current monitoring	5...50 A with transformer ILT-W
Temperature monitoring response value / release value	Fixed: 120 °C, 4 kΩ/1.5 kΩ
Insulation fault detection system	With IFS-710-W6, outgoing circuit-related error detection, max. 96 channels
Test current limited to a maximum of	1 mA
Operation	Buttons
Configuration	Via menu
Displays	Full-graphic display (backlit) and LED
Messages	Plain text display / LED / alarm relay / externally via field bus (CAN) e.g. at the BMTLS
Communication interface/protocol	CAN / CAN (2.0) as per ISO 11898
Supply voltage U _s	230 V AC 50 Hz
Internal consumption	Approx. 5 W
Dimensions (H x W x D in mm) / Installation	90 x 160 x 73 (9 TE) / top hat rail according to DIN EN 60715

Detailed information is provided in the technical documentation for the device

Areas of application

To setup an insulation fault detection system in IT systems for medical locations; insulation fault detection system in accordance with DIN EN 61557-9 (VDE 0413-9).
The devices always form a functional unit with a test signal generator, integrated in the insulation, load and temperature-monitoring device (**ILT-710-V.5**) or in the multifunctional change-over and monitoring device (**UEI-710-v.5**).



IFS-710-W6

5.4

Product description

- Test current detection with integrated current transformers
- 6 measuring channels
- Parallel acquisition and processing of measuring values, no multiplex procedure
- Compact design
- Internal intrinsic device monitoring
- Communication with the associated test signal generator (**ILT-710-V.5** / **UEI-710-V.5**) via standard field bus (CAN)
- Can be configured using devices **ILT-710-V.5** or **UEI-710-V.5**

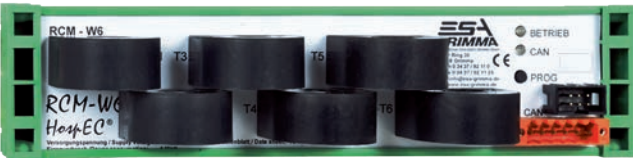
Technical data

Number of measuring channels	6 (measuring transformers integrated)
Number of measuring channels for each IT system	Max. 132 (96 with UEI-710-V.5 and ILT-710-V.5)
Measured value acquisition	In parallel, no multiplex procedure
Troubleshooting time	Approx. 3 s
Response value of the test current	0.5 mA
Monitored system	
Rated voltage	AC 20...265 V
Rated frequency	45...400 Hz
Displays	LED
Messages	LED / field bus (CAN)
Communication interface/protocol	CAN / CAN (2.0) as per ISO 11898
Supply voltage U _s	24 V DC (PELV) via CAN bus
Internal consumption	Approx. 2.6 W
Dimensions (H x W x D in mm) / Installation	46 x 190 x 60 (11 TE) / top hat rail according to DIN EN 60715

Detailed information is provided in the technical documentation for the device

Areas of application

In grounded networks (TN/TT systems) for monitoring and evaluation of fault currents flowing against earth or other paths (detected as residual currents). The compact device with integrated transformers is used mainly in the distribution outlets for consumers and plants. In conjunction with other devices of the RCM series, display devices or devices for data interfacing to third-party systems, it provides a complete residual and operating current monitoring system - *WebVisEC®*.



RCM-W6

Product description

- Residual current detection with integrated current transformers (fault currents according to IEC 60755 Type A)
- 6 measuring channels, compact design
- Parallel acquisition and processing of measuring values, no multiplex procedure
- Real effective value measurement (True RMS)
- User-friendly configuration options for each channel, such as:
 - Value of the alarm threshold (leaving the normal range)
 - Value of the response threshold (reaching the critical range)
 - Time delay for respective warning and response messages (on overshooting/undershooting the threshold values)
 - Adjustable hysteresis range for response threshold
- Internal intrinsic device monitoring
- LED display of the operating states

Technical data

Number of measuring channels	6 (measuring transformers integrated)
Number of measuring channels in the system	Unlimited (max. 96 per bus segment)
Measured value acquisition	In parallel, real effective value measurement (True RMS)
Evaluation	Residual currents
Residual current type as per IEC 60755	A
Residual current evaluation range	5 - 1000 mA
Transformer rated voltage	AC 20...720 V
Transformer rated frequency	50...60 Hz
Transformer rated current	50 A
Configurable values per channel	Warning and response threshold / hysteresis for response threshold / time delay for messages
Configuration	In the web browser - <i>WebVisEC®</i> monitoring system, alternatively (not in the <i>WebVisEC®</i> monitoring system) with <i>BMTI S</i> or <i>BMTI S+</i>
Displays	LED
Messages	LED / externally via field bus (CAN) monitoring system <i>WebVisEC®</i> (web browser), at the <i>BMTI S</i> or <i>BMTI S+</i>
Communication interface/protocol	CAN / CAN (2.0) as per ISO 11898
Supply voltage Us	24 V DC (PELV) via CAN bus
Internal consumption	Approx. 2.5 W
Dimensions (H x W x D in mm) / Installation	46 x 190 x 60 (11 TE) / top hat rail according to DIN EN 60715

Detailed information is provided in the technical documentation for the device

Areas of application

The **RCM-W8** is used in grounded systems (TN/TT systems) for monitoring and evaluation of fault currents flowing against ground or other paths (detected as residual currents) and of operating currents (also in IT systems). The device, with attachable converters, is mainly used in feeds and outlets of distributions for consumers and systems, as well as for the monitoring of stray currents in TN-S systems (PEN and N-conductor), and at central grounding points. In conjunction with other devices of the RCM series, display devices or devices for data interfacing to third-party systems, it provides a complete residual and operating current monitoring system - *WebVisEC®*.



RCM-W8

Product description

- Residual or operating current acquisition with attachable current transformers (Fault currents in accordance with IEC 60755 Type A)
- 8 measuring channels, can be used freely for residual or operational current detection
- Parallel acquisition and processing of measuring values, no multiplex procedure
- Real effective value measurement (True RMS)
- User-friendly configuration options for each channel, such as:
 - Lower and upper alarm threshold values (leave the normal range) = window function during operating current detection
 - Lower and upper response threshold values (reaching the critical range)
 - Time delay for respective warning and response messages (on overshooting/undershooting the threshold values)
 - Adjustable hysteresis range for response thresholds
- Internal intrinsic device monitoring
- LED display of the operating states

Technical data

Number of measuring channels	8 (measuring transformers can be connected to the device)
Number of measuring channels in the system	Unlimited (max. 128 per bus segment)
Measured value acquisition	In parallel, real effective value measurement (True RMS)
Evaluation	Residual- and operating currents (channels can be used as required)
Residual current evaluation range	5 - 1000 mA
Residual current type as per IEC 60755	A
Evaluation range of operating current	1...6000 A (depending on transformer)
Transformer types / transformation ratio	Residual current transformers of the DW or DW-T / 700/1 series, Operating current measuring transformers, e.g. series ASK or KBU / 100/1 up to 4000/1
Transformer rated voltage	AC 20...720 V
Transformer rated frequency	50...60 Hz
Transformer rated current	1...6000 A (type-dependent)
Configurable values per channel	Warning and response thresholds / hysteresis for response thresholds / time delay for messages (0...10 s) / reset delay for messages (0...10 s) / window function for operating current measurement
Configuration	In the web browser - <i>WebVisEC®</i> monitoring system, alternatively (not in the <i>WebVisEC®</i> monitoring system) with <i>BMTI S</i> or <i>BMTI S+</i>
Displays	LED
Messages	LED / relay / externally via field bus (CAN) monitoring system <i>WebVisEC®</i> (web browser), at the <i>BMTI S</i> or <i>BMTI S+</i>
Communication interface/protocol	CAN / CAN (2.0) as per ISO 11898
Supply voltage Us	24 V DC (PELV)
Internal consumption	Approx. 2.5 W
Dimensions (H x W x D in mm) / Installation	90 x 105 x 73 (6 TE) / top hat rail according to DIN EN 60715

Detailed information is provided in the technical documentation for the device

Areas of application

In grounded networks (TN/TT systems) for monitoring and evaluation of fault currents flowing against earth or other paths (detected as residual currents). The device with attachable transformers is used mainly in the feeds and outlets of distributions for consumers and plants. In conjunction with other devices of the RCM series, display devices or devices for data interfacing to third-party systems, it provides a complete residual and operating current monitoring system - *WdV-i-EC®*.



RCM-W8-AB

Product description

- Residual current measurement with attachable current transformers (Fault currents in accordance with IEC 60755 Type B)
- 8 measurement channels for residual current measurement
- Parallel acquisition and processing of measuring values, no multiplex procedure
- Real effective value measurement (True RMS)
- User-friendly configuration options for each channel, such as:
 - Values of the upper alarm threshold (leaving the normal range)
 - Values of the upper response threshold (reaching the critical range)
 - Time delay for respective warning and response messages (on overshooting/undershooting the threshold values)
 - Adjustable hysteresis range for response thresholds
- Internal intrinsic device monitoring
- LED display of the operating states

Technical data

Number of measuring channels	8 (measuring transformers can be connected to the device)
Number of measuring channels in the system	Unlimited (max. 128 per bus segment)
Measured value acquisition	In parallel, real effective value measurement (True RMS)
Evaluation	Residual currents
Residual current evaluation range	7 - 800 mA
Residual current type as per IEC 60755	B
Transformer types / transformation ratio	Residual current transformers, series DW / 700/1
Transformer rated voltage	AC 20...720 V
Transformer rated frequency	50...60 Hz
Transformer rated current	1 - 6000 A
Configurable values per channel	Warning and response thresholds / hysteresis for response thresholds / time delay for messages (0...10 s) / reset delay for messages (0...10 s)
Configuration	In the web browser - <i>WdV-i-EC®</i> monitoring system, alternatively (not in the monitoring system <i>WdV-i-EC®</i>) with <i>BMTI S</i> or <i>BMTI S+</i>
Displays	LED
Messages	LED / relay / externally via field bus (CAN) monitoring system <i>WdV-i-EC®</i> (web browser), at the <i>BMTI S</i> or <i>BMTI S+</i>
Communication interface/protocol	CAN / CAN (2.0) as per ISO 11898
Supply voltage Us	24 V DC (PELV)
Internal consumption	Approx. 2.5 W
Dimensions (H x W x D in mm) / Installation	90 x 105 x 73 (6 TE) / top hat rail according to DIN EN 60715

Detailed information is provided in the technical documentation for the device

Areas of application

RCM-W24 is used in grounded systems (TN/TT systems) for monitoring and evaluation of fault currents flowing against ground or other paths (detected as residual currents) and of operating currents (also in IT systems). The device, with attachable converters, is mainly used in feeds and outlets of distributions for consumers and systems, as well as for the monitoring of stray currents in TN-S systems (PEN and N-conductor), and at central grounding points. In conjunction with other devices of the RCM series, display devices or devices for data interfacing to third-party systems, it provides a complete residual and operating current monitoring system - *WdV-i-EC®*.



RCM-W24

Product description

- Residual or operating current acquisition with attachable current transformers (Fault currents in accordance with IEC 60755 Type A)
- 24 measuring channels, can be used freely for residual or operational current detection
- Parallel acquisition and processing of measuring values, no multiplex procedure
- Real effective value measurement (True RMS)
- User-friendly configuration options for each channel, such as:
 - Lower and upper alarm threshold values (leave the normal range) = window function during operating current detection
 - Lower and upper response threshold values (reaching the critical range)
 - Time delay for respective warning and response messages (on overshooting/undershooting the threshold values)
 - Adjustable hysteresis range for response thresholds
- Internal intrinsic device monitoring
- LED display of the operating states

Technical data

Number of measuring channels	24 (measuring transformers can be connected to the device)
Number of measuring channels in the system	Unlimited (max. 128 per bus segment)
Measured value acquisition	In parallel, real effective value measurement (True RMS)
Evaluation	Residual- and operating currents (channels can be used as required)
Residual current evaluation range	5 - 1000 mA
Residual current type as per IEC 60755	A
Evaluation range of operating current	1...6000 A (depending on transformer)
Transformer types / transformation ratio	Residual current transformers of the DW or DW-T / 700/1 series, Operating current measuring transformers, e.g. series ASK or KBU / 100/1 up to 4000/1
Transformer rated voltage	AC 20...720 V
Transformer rated frequency	50...60 Hz
Transformer rated current	1...6000 A (type-dependent)
Configurable values per channel	Warning and response thresholds / hysteresis for response thresholds / time delay for messages (0...10 s) / reset delay for messages (0...10 s) / window function for operating current measurement
Configuration	In the web browser - <i>WdV-i-EC®</i> monitoring system, alternatively (not in the monitoring system <i>WdV-i-EC®</i>) with <i>BMTI S</i> or <i>BMTI S+</i>
Displays	LED
Messages	LED / relay / externally via field bus (CAN) monitoring system <i>WdV-i-EC®</i> (web browser), at the <i>BMTI S</i> or <i>BMTI S+</i>
Communication interface/protocol	CAN / CAN (2.0) as per ISO 11898
Supply voltage Us	24 V DC (PELV)
Internal consumption	Approx. 2.5 W
Dimensions (H x W x D in mm) / Installation	90 x 105 x 73 (6 TE) / top hat rail according to DIN EN 60715

Detailed information is provided in the technical documentation for the device

Areas of application

CPM-W20 is for the measurement and calculation of electrical parameters such as voltage, current, residual current, power, energy, harmonics, etc. in the building installation at distribution boards, circuit breakers and busbar trunking systems. Measurement voltages and measurement currents must originate from the same network. The voltage measuring inputs are designed for measurements in grounded low-voltage networks with a rated voltage of L-N 230 V, and in ungrounded networks with a rated voltage L-L of 230 volts. A comfortable energy management system can be configured using the *CPM-W20*.



CPM-W20

5.9

Product description

- Measurement in TN and TT networks
- 4 voltage measuring inputs (300 V CAT III)
- 20 current measuring inputs
- RS485 interface (Modbus®-RTU/slave)
- 2 digital outputs
- Monitoring of currents for compliance with adjustable limit values
- Generation of warning and response messages when a limit value is exceeded
- Display of the status of the limit value monitoring with 20 LEDs
- Transformer connection monitoring for fault current measurement
- Continuous scanning of the voltage and current measurement inputs, scanning frequency 20 kHz
- Work measurement, measurement uncertainty class 1 (IEC/EN 61557-12)

Measurement and calculation

- Star and line-to-line voltages of the network
- Operating currents of the consumers
- Line frequency
- Amplitude and phase angle of the fundamental components of voltages and currents
- Active, reactive and apparent power
- Active energy
- Power factor
- cos(φ)
- Peak factor of voltages and currents
- Harmonic factor of voltages and currents
- 1st to 63rd Harmonic components of voltages and currents
- Fault currents of consumers (fault currents according to IEC 60755, Type A)

Technical data

Number of measuring channels	24 (20x current, 4x voltage)
Use in network configuration	TN- and TT systems with 230 V L-N and 50 Hz
Residual current evaluation range	10 mA ... 1 A
Evaluation range of operating current	0.1 ... 600 A
Residual current type as per IEC 60755	A
Measuring and acquisition	<div>- Star and line-to-line voltages</div> <div>- Residual and operating currents with limit value monitoring</div> <div>- Active, reactive and apparent power</div> <div>- Active energy</div> <div>- Amount and phase angle of voltages and currents</div> <div>- Power factor and cos φ</div>
Transformation ratio of attachable transformer	At least 500/1
Accuracy class	1 for active power and active energy
Interface/communication	RS 485 / Modbus® – RTU/Slave / CAN
Digital outputs	2
Configuration	GridVis® evaluation software (Janitza®)
Displays	Status LED for voltages and currents
Messages	LED / digit. outputs / GridVis® evaluation software (Janitza®)
Supply voltage Us	AC 100...240 V, 50/60 Hz
Internal consumption	Approx. 2.5 W
Dimensions (H x W x D) / Installation	90 x 105 x 73 (6 TE) / top hat rail according to DIN EN 60715

Detailed information is provided in the technical documentation for the device.

Residual current transformer (selection of transformers)

Type	Max. operating current in A	Transformation ratio	Inner diameter in mm	Accuracy class	Dimensions in mm (H x W x D)
DW-13/700 ¹⁾	63	700/1	17	3	45 x 53 x 20
DW-35/700	150	700/1	35	3	113 x 92 x 56
DW-80/700	300	700/1	80	3	160 x 125 x 56
DW-140/700	1200	700/1	140	3	234 x 200 x 56
DW-210/700	1800	700/1	210	3	323 x 290 x 64
DW-SC-110/700	600	700/1	110	3	219 x 235 x 79
DW-SC-150/700	1200	700/1	150	3	259 x 275 x 79
DW-SC-300/700	2000	700/1	300	3	428 x 400 x 30

¹⁾ with pre-installed connecting cable (2 m)

5.9

Multiway operating current transformers up to 600 A (selection of transformers)

Type	Max. operating current in A	Transformation ratio	Max. diameter of primary conductor in mm	Accuracy in %	Dimensions in mm (H x W x D)
SC-CT-20-100*	100	3000/1	16	1	55 x 29,5 x 31
SC-CT-20-200*	200	3000/1	24	1	74,5 x 45 x 34
SC-CT-20-300*	300	3000/1	24	1	74,5 x 45 x 34
SC-CT-20-400*	400	4000/1	36	0,5	91 x 57 x 40
SC-CT-20-500*	500	5000/1	36	0,5	91 x 57 x 40
SC-CT-20-600*	600	6000/1	36	0,5	91 x 57 x 40

* incl. pre-assembled connecting cable; 1.5 m with load and spring-type terminal for operating current measurement



Areas of application

The device is used to display error messages of monitored power supply systems for medical locations according to IEC 60364-7-710 and DIN VDE 0100-710 (device type *ILT*). The device also enables the triggering of the test function of connected IT system-monitoring devices (device type *ILT*). Communication is via the standard CAN field bus.



BMTI 1

Product description

5.10

- Display error messages from monitoring devices (with Device Type *ILT*) with multi-colour LED
- Triggering of the test function of the monitored IT system monitoring device (Device Type *ILT*) „ISO test“
- Acoustic signalling of messages („horn“)
- 5 LEDs and 2 operator buttons
- Closed, multi-layered and permanently stable foil surface that is resistant to cleaning agents and disinfectants, UV-resistant
- High degree of protection of the user interface (IP54)
- Prepared for installation in standard flush-mounting/hollow-wall socket

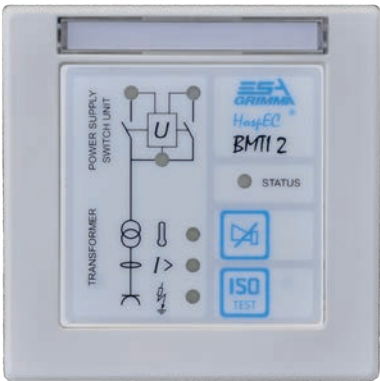
Technical data

Source of the messages	Insulation monitoring devices with device type <i>ILT</i>
Displays	5 LED
Buttons	2
Acoustic signalling	Horn
Messages	- Overtemperature IT system transformer - Overcurrent (load) IT system transformer - Insulation fault in the monitored IT system - Voltage in the IT system / device fault, type <i>ILT</i>
Configuration	On the device with the buttons (the <i>BMTI 1</i> is delivered pre-configured)
User interface	Closed, multi-layered and permanently stable foil surface that is resistant to cleaning agents and disinfectants, UV-resistant
Communication interface/protocol	CAN / CAN (2.0) as per ISO 11898
Supply voltage Us	24 V DC (PELV) via CAN bus
Internal consumption	Approx. 0.5 W
Dimensions (H x W x D in mm) / Installation	55 x 55 x 37 / standard flush-mounting or hollow-wall socket

Detailed information is provided in the technical documentation for the device.

Areas of application

BMTI 2 is used to display error messages of monitored power supply systems of medical locations according to IEC 60364-7-710 and DIN VDE 0100-710. The messages issued are from change-over and monitoring devices (device type *UEI-710*). The device also enables the triggering of the test function of connected IT system-monitoring devices (device type *UEI-710*). Communication is via the standard CAN field bus.



BMTI 2

Product description

- Status display and display of error messages from change-over and monitoring modules (with device type *UEI-710*) with multi-colour LED
- Triggering of the test function of the monitored IT system monitoring device (device type *UEI-710*) „ISO test“
- Acoustic signalling of messages („horn“)
- 7 LEDs and 2 operator buttons
- Closed, multi-layered and permanently stable foil surface that is resistant to cleaning agents and disinfectants, UV-resistant
- High degree of protection of the user interface (IP54)
- Prepared for installation in standard flush-mounting/hollow-wall socket

5.11

Technical data

Source of the messages	Change-over and monitoring modules with device type <i>UEI-710</i>
Displays	7 LED
Buttons	2
Acoustic signalling	Horn
Messages	- Overtemperature IT system transformer - Overcurrent (load) IT system transformer - Insulation fault in the monitored IT system - States of lines 1, 2 and 3
Configuration	On the device with the buttons (the <i>BMTI 2</i> is delivered pre-configured)
User interface	Closed, multi-layered and permanently stable foil surface that is resistant to cleaning agents and disinfectants, UV-resistant
Communication interface/protocol	CAN / CAN (2.0) as per ISO 11898
Supply voltage Us	24 V DC (PELV) via CAN bus
Internal consumption	Approx. 0.5 W
Dimensions (H x W x D in mm) / Installation	55 x 55 x 37 / standard flush-mounting or hollow-wall socket

Detailed information is provided in the technical documentation for the device.

Areas of application

The device is used for display of status and error messages of monitored power supply systems of medical locations according to IEC 60364-7-710 and DIN VDE 0100-710 (device type *SPR/ILT/UEI-710*) and of other devices from the *HotEC*[®] system, as well as of third-party systems. The device also enables the triggering of the test function of connected IT system-monitoring devices.



BMTI 5

Product description

- Display of status, warning and fault messages of devices from the *HotEC*[®] system and third-party systems
- Connection of air-conditioning systems via Modbus[®] (with additional board)
- Text display (full-graphic display) for detailed information and display of menu, multi-coloured, backlit
- Fast detection of message priorities by a colour change on the display
- Operated by buttons on the device and intuitive menu control
- Preconfigured with standard message texts
- Display of up to 1000 different operating states
- Option of entering individual message texts
- Message memory for 500 messages in a zero-voltage (non-volatile) safe memory (EEPROM)
- Date and time with RTC
- Removable storage medium for history, firmware and configuration (microSD card)
- Configured via menu
- Closed, multi-layered and permanently stable foil surface that is resistant to cleaning agents and disinfectants, UV-resistant
- High degree of protection of the user interface (IP54)

Technical data

Source of the messages	All devices from the <i>HotEC</i> [®] system (with additional board also directly from third-party systems)
Number of different messages	Max. 1000 individual line texts
Display	Full-graphic display (multi-coloured, backlit)
Messages	Plain text display / display of the message priority by colour change on the display / horn
Message texts	Standard texts (preconfigured) / individual texts
Message memory	500 integrated, with date / time
Operation	Plastic foil keyboard
Test functions	For IT-system monitoring devices, "ISO Test"
Configuration	Via the menu / PC configuration software via the CAN bus / transfer of projects from the MicroSD card
Additional inputs/outputs	16 with additional board, can be configured as required as an input/output (open collector)
Special feature	Several BMTI 5's can be combined into groups for common acknowledgements, and mutually monitor each other's functions
Communication interface/protocol	1 x CAN / CAN (2.0) nach ISO 11898 RS485 / Modbus [®] RTU (mit Zusatzplatine)/ Modbus [®] als Gateway
User interface	Multi-layer foil surface that is resistant to cleaning agents and disinfectants
Supply voltage Us	24 V DC (PELV), via CAN bus by default
Internal consumption	Approx. 2.5 W
Degree of protection to DIN EN 60529	IP30 / IP20 (fixtures / terminals), IP54 (user interface)
Dimensions of front panel (H x W x D in mm) / Installation	171 x 86 (installation depth 54 mm) / hollow-wall / flush / surface

Detailed information is provided in the technical documentation for the device.

Areas of application

BMTI 5 is used for display of status and error messages of monitored power supply systems of medical locations according to IEC 60364-7-710 and DIN VDE 0100-710 (device type *SPR/ILT/UEI-710*) and of other devices from the *HotEC*[®] system, as well as of third-party systems. The device also enables the triggering of the test function of connected IT system-monitoring devices.



BMTI 5

Product description

- Display of status, warning and fault messages of devices from the *HotEC*[®] system and third-party systems
- Connection of air-conditioning systems via Modbus[®] (with additional board)
- Text display (full-graphic display) for detailed information and display of menu, multi-coloured, backlit
- Fast detection of message priorities by a colour change on the display
- Operated by buttons on the device and intuitive menu control
- Preconfigured with standard message texts
- Display of up to 1000 different operating states
- Option of entering individual message texts
- Message memory for 500 messages in a zero-voltage (non-volatile) safe memory (EEPROM)
- Date and time with RTC
- Removable storage medium for history, firmware and configuration (microSD card)
- Configured via menu
- Closed, multi-layered and permanently stable foil surface that is resistant to cleaning agents and disinfectants, UV-resistant
- High degree of protection of the user interface (IP54)

Technical data

Source of the messages	All devices from the <i>HotEC</i> [®] system (with additional board also directly from third-party systems)
Number of different messages	Max. 1000 individual line texts
Display	Full-graphic display (multi-coloured, backlit)
Messages	Plain text display / display of the message priority by colour change on the display / horn
Message texts	Standard texts (preconfigured) / individual texts
Message memory	500 integrated, with date / time
Operation	Plastic foil keyboard
Test functions	For IT-system monitoring devices, "ISO Test"
Configuration	Via the menu / PC configuration software via the CAN bus / transfer of projects from the MicroSD card
Relay output	1 change-over contact as general group alarm
Additional inputs/outputs	16 with additional board, can be configured as required as an input/output (open collector)
Special feature	- Several BMTI 5's can be combined into groups for common acknowledgements, and mutually monitor each other's functions - Gateway function for connection of two CAN bus segments
Communication interface/protocol	2 x CAN / CAN (2.0) as per ISO 11898 RS485 / Modbus [®] RTU (with additional board) / Modbus [®] as gateway
User interface	Multi-layer foil surface that is resistant to cleaning agents and disinfectants
Supply voltage Us	24 V DC (PELV), via CAN bus by default
Internal consumption	Approx. 2.5 W
Degree of protection to DIN EN 60529	IP30 / IP20 (fixtures / terminals), IP54 (user interface)
Dimensions of front panel (H x W x D in mm) / Installation	171 x 86 (installation depth 54 mm) / hollow-wall / flush / surface

Detailed information is provided in the technical documentation for the device.

Areas of application

The panels of the *FolioTec* series are used in all areas. For example, to display status and error messages of the IT-system monitoring, change-over controllers, the display of measured values and messages of all other devices from the *HotEC®* system, for messages from third-party systems - such as the medical gas supply, for operating theatre table control, integration of linguistic communication, for lighting and climate control, as well as mapping and control of additional processes of the overall system.

Product description

Freely configurable pushbuttons and LED displays can be combined into function blocks, each with a maximum of 10 mounting locations, and are then assigned to a particular system (e.g. climate control; function block technology FBT).

A full-graphics LCD display is available for the text output (multi-coloured, backlit). These are assigned in blocks to freely programmable multifunction illuminated pushbuttons, each with a maximum of 7 mounting locations (text technology LCD).

Multifunction illuminated pushbutton or signalling LEDs can be freely placed, or placed in the form of a table (location plan technology LPT) to display building layouts or to map processes. All methods can be combined flexibly in a panel.



Annunciator and control panel *FolioTec* (design variant)

Technical data

Source of the messages	Devices from the <i>HotEC®</i> system / external systems
Number of different messages	Max. 1000 individual line texts
Display	Full-graphics display 64 x 128 pixels with RGB background lighting and LED
Messages	Plain text display / LED / horn
Message texts	Individual texts (max. 1000 different message texts)
Message memory	Integrated, with RTC, max. 500, protected against power failures
Operation	Plastic foil keyboard
Additional installation options	E.g. operating theatre table controls, clocks (analogue/digital display) with time of day/timer/counter, devices for linguistic communication, digital displays
Configuration	PC configuration software, via USB CAN adapter
Relay outputs	Possible
Special feature	Freely configurable functions for LEDs, pushbutton and multifunction illuminated pushbutton (tactile or screen)
Process connections	CAN, via gateways/MPM: EIB, PLC, binary, RS232, Modbus®, TCP/IP
Communication interface (standard)/protocol	2x CAN / CAN (2.0) as per ISO 11898, RS485 / Modbus® / Modbus® as gateway
User interface	Closed, multi-layered and permanently stable foil surface that is resistant to cleaning agents and disinfectants, UV-resistant
Supply voltage Us	24 V DC (PELV) (power supply 230 V AC/24 V DC, 48 VA integrated)
Internal consumption	Depending on the stage of expansion
Degree of protection to DIN EN 60529	IP30 / IP20 (fixtures/terminals), IP54 (user interface)
Frame / surface-mounted housing	Aluminium, anodized
Dimensions (H x W x D in mm)	Max. 800 x 800 x 110 or max. 800 x 800 x 130 mm (surface-mounted)
Installation	Hollow-wall / flush / control cabinet doors or surface

Detailed information is provided in the technical documentation for the device.



- Simple and clear messaging, operation and monitoring
- Freely configurable functions for LEDs, pushbutton and multifunction illuminated pushbutton (tactile or screen)
- Clear and concise display of information by backlit, multi-coloured full-graphics display
- Display of status, warning and fault messages of devices from the *HotEC®* system
- All process controls and process monitoring can be integrated
- General processing of system data, not set to predefined warning messages and operating messages
- Process connection using standard systems such as CAN, EIB, PLC, binary, RS232, MODBUS®, TCP/IP via separate gateways
- Installation option for intercom, phones, charging stations for operating theatre table controls
- Configurable acoustic messages
- Installation option for clock systems (e.g. with time of day/timer/counter) and digital displays (e.g. room temperature)
- Display of individual message texts (max. 1000), message memory
- Functional changes can also be easily made for operating and display elements due to use of standard special hardware and software
- Closed, multi-layered and permanently stable foil surface that is resistant to cleaning agents and disinfectants, UV-resistant
- Dimensions can be adapted to the tile grid
- Attractive design, individual design possibility of foil surface
- High degree of protection of the user interface (IP54)

Areas of application

The panels are used in all areas. For example, to display status and error messages of the IT-system monitoring, change-over controllers, the display of measured values and messages of all other devices from the *HotpEC®* system, for messages from third-party systems - such as the medical gas supply, for operating theatre table control, integration of linguistic communication, for lighting and climate control, as well as mapping and control of additional processes of the overall system.

Product description

Annunciator and control panel *Kombi*

In this version, a touch screen is used in combination with a classic panel. A full-graphics LCD display is additionally available for the text output (multi-coloured, backlit). These are assigned in blocks to freely programmable multifunction illuminated pushbuttons, each with a maximum of 7 mounting locations.

Annunciator and control panel *Control*

In this version, the panel is comprised solely by a 15-inch touch screen. All messages, displays and operator actions are carried out via the touch screen. Intuitive menu navigation facilitates the handling of the device.



Annunciator and control panel *Touch Control und Kombi*

Technical data

Source of the messages	Devices from the <i>HotpEC®</i> system / external systems
Number of different messages	Max. 1000 individual line texts
Display	15 inch touch screen (<i>Kombi</i> additional full-graphic display 64 x 128 pixels with RGB backlighting)
Messages	Plain text display / display elements / horn
Message texts	Individual texts (max. 1000 different message texts)
Message memory	Integrated, with RTC, max. 500, protected against power failures
Operation	Touch screen (<i>Kombi</i> also plastic foil keyboard)
Additional installation options	E.g. operating theatre table controls, clocks (analogue/digital display) with time of day/timer/counter, devices for linguistic communication, digital displays
Configuration	PC configuration software
Relay outputs	Possible
Special feature	<i>Kombi</i> : Freely configurable functions for LEDs, pushbutton and multifunction illuminated pushbutton (tactile or screen)
Process connections	CAN, via gateways/ <i>MPM</i> : EIB, PLC, binary, RS232, Modbus®, TCP/IP
Communication interface (standard) /protocol	2x CAN / CAN (2.0) as per ISO 11898, RS485 / Modbus® / Modbus® as gateway
User interface	Closed, multi-layered and permanently stable foil surface that is resistant to cleaning agents and disinfectants, UV-resistant
Supply voltage Us	AC 230 V (DC 24 V internal power supply)
Internal consumption	Depending on the stage of expansion
Degree of protection to DIN EN 60529	IP30 / IP20 (fixtures/terminals), IP54 (user interface)
Frame / surface-mounted housing	Aluminium, anodized
Dimensions (H x W x D in mm)	<i>Touch Control</i> : 597 x 447 x 130 (additional, project-specific)
Installation	Hollow-wall / flush / control cabinet doors or surface

Detailed information is provided in the technical documentation for the device.

5.15

- Simple and clear messaging, operation and monitoring
- Freely configurable functions for control and signalling elements
- Clear and concise display
- Display of status, warning and fault messages of devices from the *HotpEC®* system
- All process controls and process monitoring can be integrated
- General processing of system data, not set to predefined warning messages and operating messages
- Process connection using standard systems such as CAN, EIB, PLC, binary, RS232, MODBUS®, TCP/IP via separate gateways
- Installation option for intercom, phones, charging stations for operating theatre table controls
- Configurable acoustic messages
- Installation option for clock systems (e.g. with time of day/timer/counter) and digital displays (e.g. room temperature)
- Display of individual message texts (max. 1000), message memory
- Functional changes can also be easily made for operating and display elements due to use of standard special hardware and software
- Closed, multi-layered and permanently stable foil surface that is resistant to cleaning agents and disinfectants, UV-resistant
- Dimensions can be adapted to the tile grid
- Attractive design
- High degree of protection of the user interface (IP54)



Annunciator and control panel *Kombi* (design variant)



5.15

Areas of application

For the acquisition of digital signals via physical inputs or via the field bus (CAN). The signals can be logically linked and are available to other bus nodes for control purposes, as well as on the field bus. With convenient dimming functions and interfaces for electronic ballasts (EB), these devices are mainly used for the lighting control.

Product description

- Configurable input/output device with its own logic function
 - Inputs can be assigned with floating contacts - even standard installation switches and pushbuttons
 - Outputs as a relay output
 - 2 digital potentiometers for control of dimmable EB with 1 - 10 V interface
- Convenient dimming and control functions - especially for medical locations
 - Single-fault security of devices
 - Internal intrinsic device monitoring
 - LED display of the operating states



MPM 12-2

Technical data

Physical inputs	12
Type of inputs	Floating or non-floating (max. 24 V DC)
Physical outputs	2
Type of outputs	Relay contact AC 230 V / 1500 VA
Dimmer outputs	2 digital potentiometers for control of dimmable EB with 1 - 10 V interface
Features	<div><ul style="list-style-type: none">- Transfer of relay messages in the standard field bus (CAN)- Lighting control and other control functions via an installation button/switch, or operating panel- Transfer and processing of messages from the field bus- Output of messages/commands to switch outputs and the field bus- Light scene control can be stored by the user (max. 2 circuits, each with 4 scenes)- Extensive dimming functions (e.g. common or separate dimming of both circuits, 1- or 2-button design, soft on and soft off circuits)- "Cleaning women" function can be connected for on-site button- Switch on of the safety lighting during network replacement operation (only SS), depending on the switch position of the light circuits before the power interruption (if only the GS circuit was in operation before the power failure, the SS circuit should kick in automatically). The device communicates with the relevant voltage-monitoring device for this.- If dimmed down, the SS circuit is automatically set to 100 % if the GS fails.</div>
Software features	<div><ul style="list-style-type: none">- Free assignment of input/output channels (status/warning/fault messages)- Defined output states after reset (low, high, last state before the reset)- Logical linking of variables (physical inputs of the device and status messages from the field bus)- Control functions for safety and general lighting (SS and GS circuits)- 80 logical inputs (messages from the field bus) can be processed- Logic operators AND, OR, XOR, NOT- Up to 20 operands per logic formula, 13 timer operands, reset and output operand- Stand-alone operation (without a bus connection)- Failure detection of other field bus nodes (sign of life)- 8 timer channels with integrated real-time clock (RTC)</div>
Configuration	PC Software "HomEC® Configurator" (via USB CAN adapter), also via DIP switch in stand-alone application
Displays	With LED: Status displays of the inputs/outputs / operation / bus
Communication interface/protocol	CAN / CAN (2.0) as per ISO 11898
Supply voltage Us	24 V DC (PELV)
Internal consumption	Approx. 3.6 W
Dimensions (H x W x D in mm) / Installation	90 x 70 x 73 (4 TE) / top hat rail according to DIN EN 60715

Detailed information is provided in the technical documentation for the device.

Areas of application

The device is used for the acquisition of digital signals via physical inputs or via the field bus (CAN). The signals can be logically linked and are available to other bus nodes for control purposes, as well as on the field bus. Use e.g. for lighting control, acquisition of switch positions - such as the auxiliary contacts of the circuit breakers, floating signalling contacts of third-party systems, general control tasks.

Product description

- Configurable input/output device with its own logic function
 - Inputs can be assigned with floating contacts - also normal light switches and pushbuttons
 - Outputs as a relay output
- Single-fault security of devices
 - Internal intrinsic device monitoring
 - LED display of the operating states



MPM 16-8

Technical data

Physical inputs	16 (2 groups á 8)
Type of inputs	Floating or non-floating (max. 24 V DC)
Physical outputs	8
Type of outputs	Relay contact AC 230 V / 1500 VA
Features	<div><ul style="list-style-type: none">- Transfer of relay messages in the standard field bus (CAN)- Lighting control and other control functions via an installation button/switch, or operating panel- Transfer and processing of messages from the field bus- Switch on of the safety lighting during network replacement operation (only SS), depending on the switch position of the light circuits before the power interruption (if only the GS circuit was in operation before the power failure, the SS circuit should kick in automatically). The device communicates with the relevant voltage-monitoring device for this.</div>
Software features	<div><ul style="list-style-type: none">- Free assignment of input/output channels (status/warning/fault messages)- Defined output states after reset (low, high, last state before the reset)- Logical linking of variables (physical inputs of the device and status messages from the field bus)- Control functions for safety and general lighting (SS and GS circuits)- 120 logical inputs (messages from the field bus) can be processed- Logic operators AND, OR, XOR, NOT- Up to 20 operands per logic formula, 13 timer operands, reset and output operand- Stand-alone operation (without a bus connection)- Failure detection of other field bus nodes (sign of life)- 32 timer channels with integrated real-time clock (RTC)</div>
Configuration	PC-Software "HomEC® Configurator" (via USB-CAN adapter)
Displays	With LED: Status displays of the inputs/outputs / operation / bus
Communication interface/protocol	CAN (2.0) as per ISO 11898
Supply voltage Us	24 V DC (PELV)
Internal consumption	Approx. 5 W
Dimensions (H x W x D in mm) / Installation	90 x 105 x 73 (6 TE) / top hat rail according to DIN EN 60715

Detailed information is provided in the technical documentation for the device.

Areas of application

MPM 32-Vario is used for the acquisition of digital signals via physical inputs or via the field bus (CAN). The signals can be logically linked and are available to open collector outputs for control purposes, as well as on the field bus. All 32 channels can be used for as inputs or outputs (selectable) after being configured. Use e.g. for lighting control, acquisition of switch positions - such as the auxiliary contacts of the circuit breakers, floating signalling contacts of third-party systems, general control tasks, connection to building control technology.



Product description

- Configurable input/output device with its own logic function
- Inputs can be assigned with floating contacts - also normal light switches and pushbuttons
- Outputs as an open collector output, short circuit and over-load protected
- 32 channels can be used as input or output (selectable)
- Single-fault security of devices
- Internal intrinsic device monitoring
- LED display of the operating states

Technical data

Physical inputs	32* (4 groups á 8)
Type of inputs	Non-floating (24 V DC = auxiliary voltage)
Physical outputs	32* (* channels can be used as input or output (selectable))
Type of outputs	Open collector (24 V DC, 350 mA, short-circuit proof)
Features	<div>- Transfer of relay messages in the standard field bus (CAN)</div> <div>- Lighting control and other control functions via an installation button/switch, or operating panel</div> <div>- Transfer and processing of messages from the field bus</div> <div>- Specific control functions for the safety lighting (such as <i>MPM 12-2 / MPM 16-8</i>)</div> <div>- Free assignment of input/output channels (status/warning/fault messages)</div> <div>- Defined output states after reset (low, high, last state before the reset)</div> <div>- Logical linking of variables (physical inputs of the device and status messages from the field bus)</div> <div>- Control functions for safety and general lighting (SS and GS circuits)</div> <div>- 120 logical inputs (messages from the field bus) can be processed</div> <div>- Logic operators AND, OR, XOR, NOT</div> <div>- Up to 20 operands per logic formula, 13 timer operands, reset and output operand</div> <div>- Stand-alone operation (without a bus connection)</div> <div>- Failure detection of other field bus nodes (sign of life)</div> <div>- 32 timer channels with integrated real-time clock (RTC)</div>
Software features	
Configuration	PC-Software „HospEC® Configurator“ (via USB-CAN adapter)
Displays	With LED: Status displays of the inputs/outputs / operation / bus
Communication interface/protocol	CAN / CAN (2.0) as per ISO 11898
Supply voltage Us	24 V DC (PELV) (24 V DC auxiliary voltage required for the inputs/outputs)
Internal consumption	Approx. 5 W
Dimensions (H x W x D in mm) / Installation	90 x 105 x 73 (6 TE) / top hat rail according to DIN EN 60715

Detailed information is provided in the technical documentation for the device.

Areas of application

For configuration of devices from the *HospEC®* system. The configuration created with the software is sent from a PC/laptop to the devices (filed devices) connected to the field bus (CAN). The setting values already stored in the field devices can also be read out and displayed, edited and saved in the *HospEC®* configurator. The PC/laptop is connected to the field devices in the CAN bus by the USB interface using a USB-CAN adapter (CAN dongle), and via a CAN-bus terminal adapter permanently installed in a distribution. The *HospEC®* Configurator is the basic module of the configuration software; a plug-in is available for each device family (currently *MPM/RCM*). Expansion to other devices is in preparation. The user interface of the program is tailored to a simple and clear representation. All devices assigned to a project are always displayed in a tree structure; additional descriptions, e.g. locations, can be made to facilitate fast assignment. The settings are made in the device-specific configuration windows. The Help menu provides examples and explanations as required.

When do you require the software?

You will always receive a new „ready-to-go“ system, and of course our service is constantly available for changes to the device settings. However, using the *HospEC®* Configurator operators are also able to make any required changes to the device settings on their own.

System requirements

- Intel Pentium 3/AMD Athlon
- 128 MB memory
- 30 MB free space on the hard disk
- USB 2.0 interface
- Microsoft® Windows 7 operating system



Sample *HospEC®* system

Our fully functional sample systems can be used for test and demonstration purposes; the following components are housed with all necessary accessories in the smallest space:

- Change-over and monitoring module *UEI-710* with IT system transformer and integrated insulation fault detection system (complete IT system) with devices *UEI-710-V-S* and *IFS-710-W6*
- Operating and annunciator terminal *BMTI 1*
- Operating and annunciator terminal *BMTI 2*
- Operating and annunciator terminal *BMTI 5*
- Operating and annunciator terminal *BMTI 5+*
- Devices connected to the field bus (CAN)

All functions of the devices can be tested and viewed under realistic conditions.





Quality and service from one source

A constant monitoring of our own standard-compliant -developments, also by independent test labs, ensures consistent and sound quality. Constant contact with experienced planning and test engineers as well as members of the standards bodies (DKE) also provides a maximum degree of safety. Our Engineering department and a comprehensive service is available to you for your project - from planning to completion, right up to the standard-compliant maintenance.

Our services for you

You have questions or require personal advice for your specific problem?

We will help you quickly and easily.

- Service working days
- Short-term and individual help
- Technical information and advice

Our service team

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Our range of services

- Commissioning of ESA products as well as of third-party and competitive brands
- System acceptance test with experts
- Training of the operating personnel
- On-site training
- Network and load analyses
- Fault-clearing service
- Short-circuit current and selectivity calculations
- Plant modernization
- Repeat tests/inspections
- Insulation fault search
- Spare part deliveries
- Maintenance, maintenance contracts
- Documentation and the upgrade of existing installations

Your benefits

- Guarantee of plant safety and operating safety
- Securing a high level of plant availability
- Personal training with regard to system functions and operation



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