



Features

- Protocol conversion gateway for substation automation:
 - Process communication: LON-LAG, SPA, IEC 60870-5-103, IEC 61850-8-1, Modbus serial, Modbus TCP, DNP3 serial, DNP3 TCP
 - Remote communication: IEC 60870-5-101, IEC 60870-5-104, DNP 3.0 Serial, DNP 3.0 LAN/WAN, SPA Router, External OPC Client (DA, AE)
- True IEC 61850 communication gateway:
 - IEC 61850-6 - Substation Configuration Language (SCL)
 - IEC 61850 -7 - Communication modeling and cross-referencing between protocols
 - IEC 61850-8-1 - Mapping for MMS-TCP/IP – Ethernet
- Configuration:
 - Efficient and intuitive configuration tool
 - Cross-referencing between protocols based on the IEC61850-7 models
 - Drag-and-drop protocol mapping to map complete structures from the source data
 - Efficient handling of large amounts of data in list views
 - Tooltips
 - Remote configuration and administration
- Communication redundancy (requires optional LAN card)
 - IEC 62439/PRP (parallel redundancy protocol)
 - SFT (switch fault tolerance)
- Extensive support for commissioning and diagnostics:
 - Online diagnostics for different components
 - Communication diagnostic counters on the network and device level
 - Real time process data monitoring and controlling for all devices and protocols
 - Source data monitoring and simulation:
 - Testing the data mapping for NCCs also with no online IEDs
 - Simulating complete IEDs
 - Communication diagnostic event list for all devices and protocols:
 - Resembles a high level protocol analyzer
 - Monitors the reported values and events and the received control commands
- Web server for diagnostic information:
 - Requires only a web browser and a TCP/IP connection - no pre-installations
- MNS iS connectivity
 - Connectivity to ABB's Low Voltage Motor Control Center MNS iS with an OPC server in COM600. COM600 receives data from the MNS iS devices and provides HMI and gateway functionality
- Security:
 - User authentication
 - Individual user accounts
 - Password authentication
 - Role-based access control
 - Host-based firewalls
 - Communication encryption HTTPS

Application

COM610 3.2 is a communication gateway that maps signals between the protection and control IEDs in industrial or utility substations and higher-level systems such as Network Control Centres (NCC) or Distributed Control Systems (DCS).

COM610 3.2 sends information for monitoring and controlling the process to NCC and DCS and receives process control commands from them. COM610 3.2 also handles system co-ordination tasks, such as the dynamic assignment of control command authorisation

and communication supervision. COM610 3.2 is typically connected to a NCC via a tele-control protocol, or to a DCS using the OPC Server/Client technology. You can use different protocols to connect process devices to COM610 3.2. COM610 3.2 is a true IEC 61850 gateway and supports all applicable IEC 61850 parts.

Fig. 1 displays an overview of a typical utility system with the COM610 Gateway.

Fig. 2 displays an industrial system overview.

Application (cont'd)

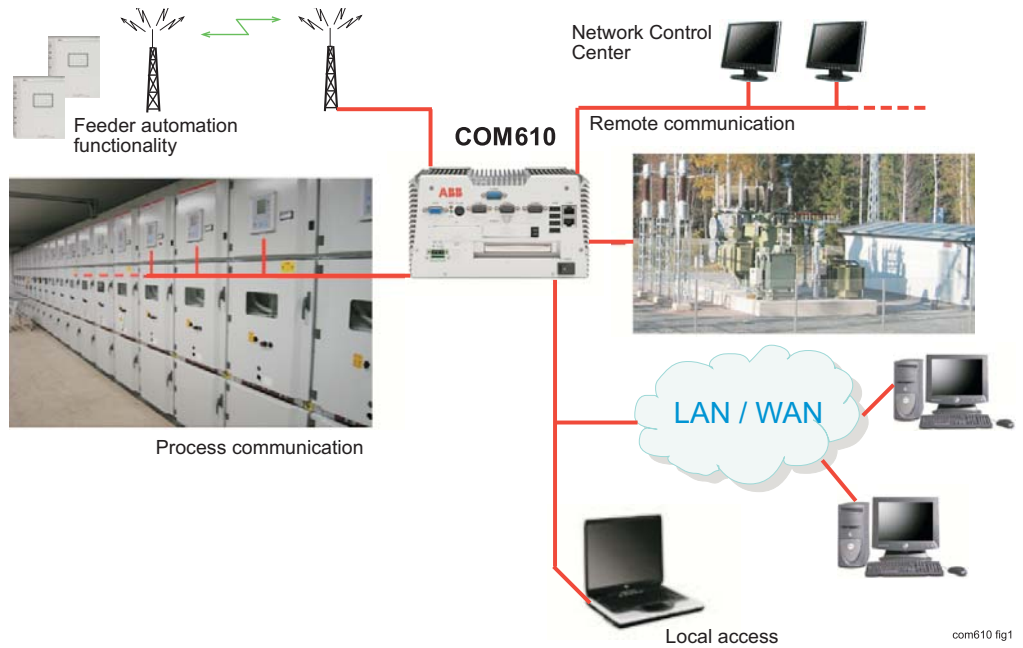


Fig. 1 Utility system overview

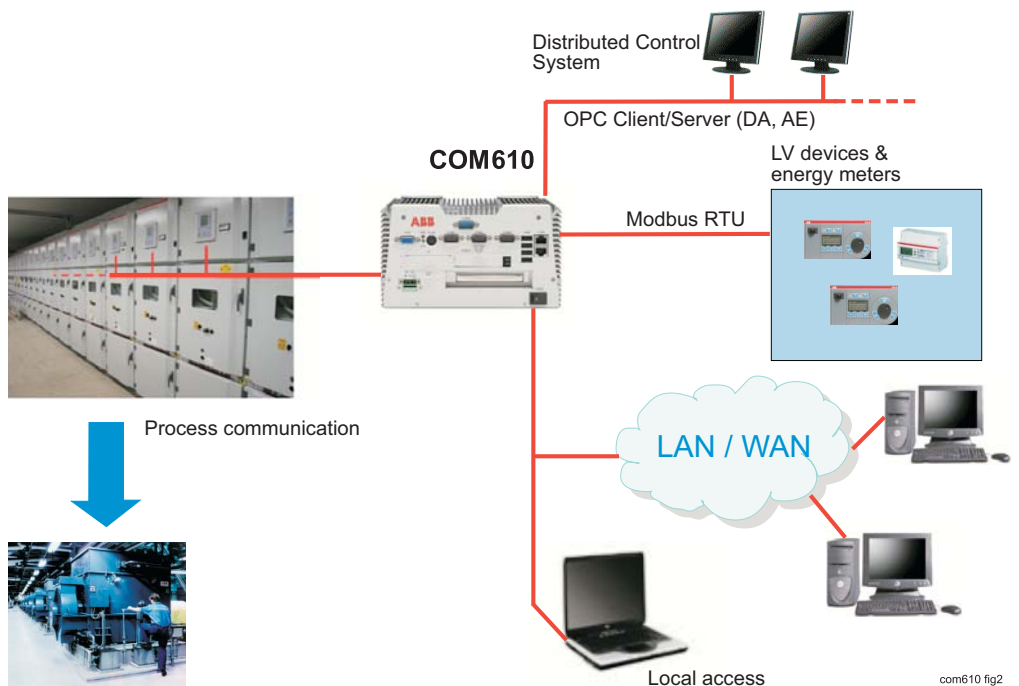


Fig. 2 Industrial system overview

The supported protocols can be freely combined in one gateway, limited only by the number of hardware interfaces.

Example:

COM610 3.2 has four serial ports. That allows a maximum of four connections using a serial protocol, for example, 3 SPA + 1 IEC_101 or 2 SPA + 1 IEC_103 + 1 IEC_101, etc.

Application (cont'd)

The LON-LAG protocol uses a specific board to connect the fibres, both plastic and glass. COM610 3.2 can have one board, that is, one LON line.

It is possible to extend COM610 3.2 by increasing the number of Ethernet interfaces thus increasing the number of Ethernets lines.

Connectivity Packages

To make the configuration of COM610 3.2 more efficient, Connectivity Packages are available for ABB's protection and control IEDs. A Connectivity Package includes descriptions of data and signals available in the IED, and the descriptions are used to automatically configure the master communication in the COM610 3.2 gateway. Connectivity Packages for some IEDs are already

available, and more will be released in due course. At present the following Connectivity Packages are available:

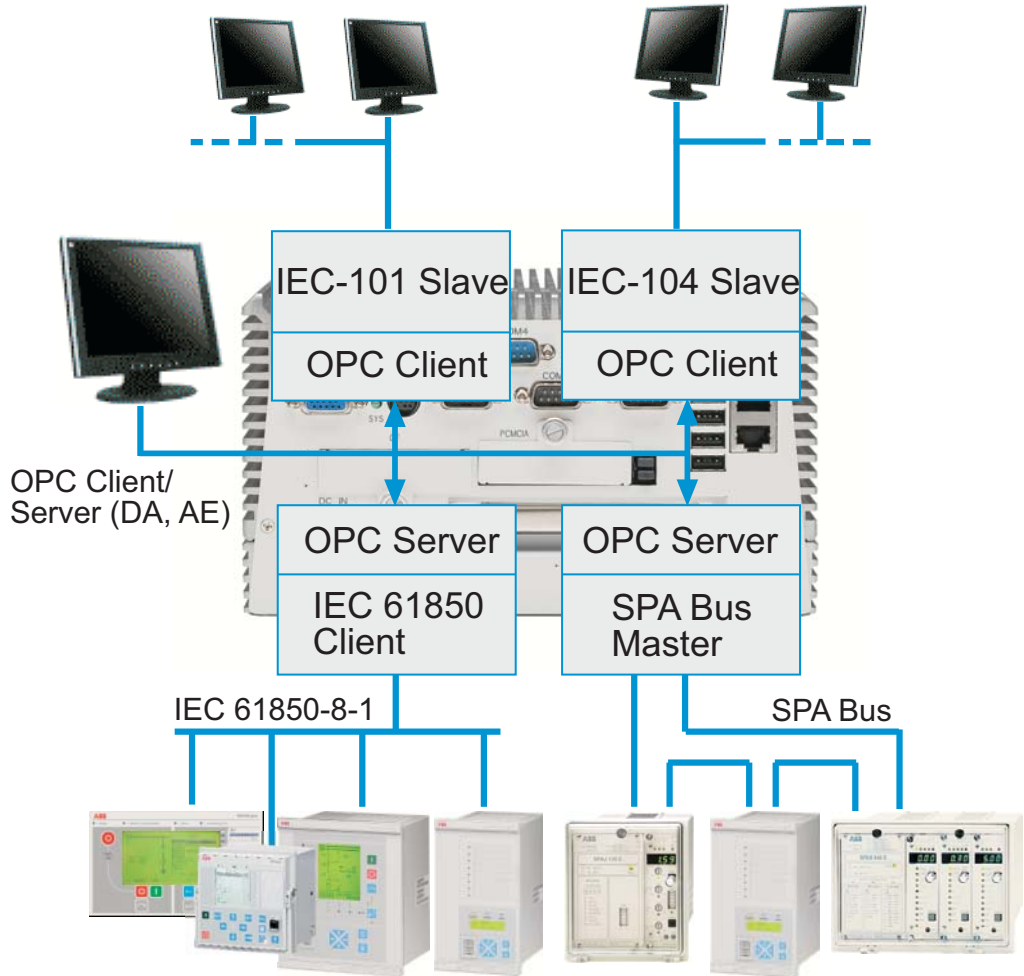
- REF 541/3/5, REM 543/5, RET 541/3/5
- REF 542plus
- REX 521
- RE_610
- SPACOM (Conn Pack v. 2.0 supports SPAJ 140, SPAJ 141, SPAJ 142, SPAJ 144, SPAD 346, SACO 16D1, SACO 16D2, SACO 64D4)

COM610 gateway unit's configurability and functionality depends on the type of communication protocol used for communication between the COM610 and the IEDs. For more details, please refer to the document "Protocols versus Functions for IEDs", 1MRS756223.

Design

The COM610 gateway consists of the OPC Data Access (DA, AE) server and client components. The OPC Servers provide the master/client protocol stacks access to the data in the devices connected with the protocol. The

slave/server protocol stacks use the OPC Clients to provide the external systems access to the data available in the OPC Servers.



com610 fig 3

Fig. 3 Example of COM610 Gateway components

Available protocols

The table below displays the protocols supported by COM610 Gateway. New protocols will be available according to the market demands.

The process communication uses the master protocols and the upper level communication uses the slave protocols. For more detailed information on the protocols, refer to the User's guides listed in *References*.

Master	Slave
LON - LAG	IEC 60870-5-101
SPA	IEC 60870-5-104
IEC 60870-5-103	DNP 3.0 Serial
IEC 61850-8-1	DNP 3.0 LAN/WAN
Modbus serial	SPA Router
Modbus TCP	External OPC Client
DNP3 serial	
DNP3 TCP	

System requirements for the Communication Engineering Tool

Hardware requirements

The Communication Engineering Tool runs on Microsoft® Windows® XP. A PC capable of running this program is usually sufficient also for running the Communication Engineering Tool.

Microsoft® .NET Framework 2.0 is required for running the Communication Engineering Tool.

It is automatically installed during the installation of the Communication Engineering Tool if it is not already available on the PC.

- Free hard disk space required: minimum 500 MB, recommended 1 GB.

Technical data

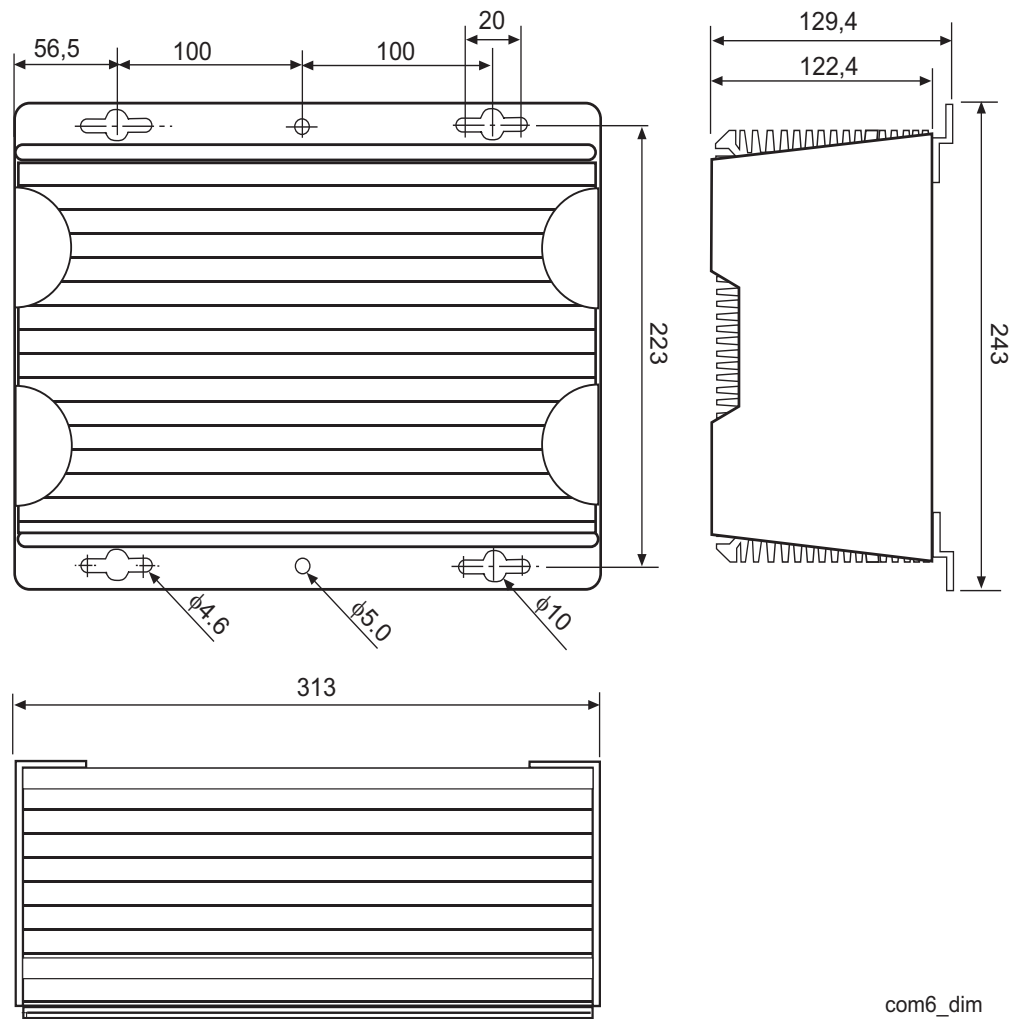
Hardware Design

- Ruggedised mechanics
 - No moving parts - no fans, no hard disks
- System
 - Intel® Pentium® M 1.6 GHz
 - 1 GB SDRAM System Memory
 - 2 GB Industrial SSD Compact Flash memory
- Power supply units:
 - 76-240 V dc
- Interfaces
 - 3 RS 232 serial ports
 - 1 RS 232/485 serial port
 - 2 10/100Base-TX RJ-45 connector
 - 4 USB 2.0 ports
- Optional PCI extensions:
 - 1 LON interface (Operating temperature 0°C - +70°C)
 - 8 RS232/485 serial interfaces (Operating temperature 0°C - +55°C)
 - 2 10/100/1000Base-TX RJ-45 connectors (Operating temperature 0°C - +60°C)
- Mechanics and Environment:
 - Operation -25°C to +70°C
 - Storage -40°C to +70°C
 - Dimensions (without fastening brackets): 214 mm (W) x 122.5 mm (H) x 313 mm (D)
 - Net weight: 6.8 kg
 - Degree of protection: IP 4x
 - Operating humidity: 5-95% at +40°C, non-condensing
 - EMC CE/FCC class B
 - Anti-vibration and anti-shock tests

Mounting

COM610 is attached with four screws.

Refer to Fig. 4 below.



com6_dim

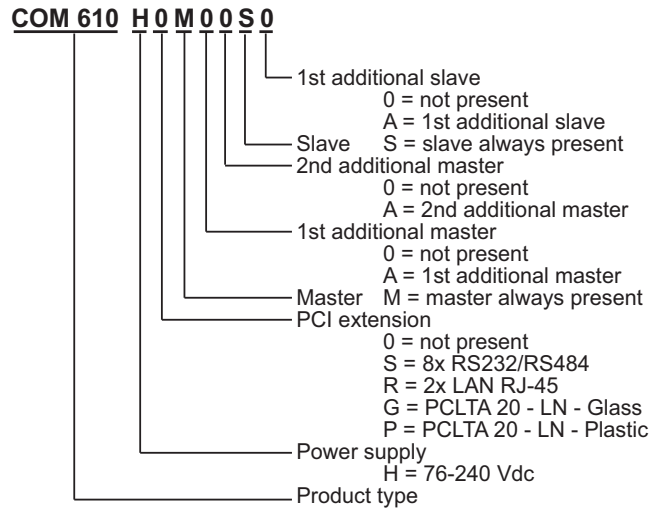
Fig. 4 COM610 mounting dimensions

Ordering

When ordering COM610 3.2, use Fig. 5 to generate the correct ordering code.

The ordering code specifies the HW and the SW. If you need an additional PCI card, specify it by selecting the corresponding letter. The

standard delivery of a COM610 3.2 includes one communication protocol for the process devices and one communication protocol for a higher-level system.



COM610order

Fig. 5 COM610 ordering code

Also specify in the ordering code:

- if you need to gather data from a substation using two or three different protocols.
- if you need to send data from COM610 using two different protocols.

You do not need to specify the protocols in the order. The protocols needed are selected when the COM610 unit is configured. COM610 3.2

is limited only by the number of the slaves and masters ordered. When ordering please state language, simplified Chinese, Russian or Spanish, if not English which is the default language.

For more information about ordering and availability, please contact ABB Oy, Distribution Automation.

References

The product documentation is included on the Communication Engineering Tool CD-ROM.

You can also download the latest documents from the www.abb.com/substationautomation.pe tests

COM600 3.2, User's Guide	1MRS756125
COM605 3.2, Operator's Guide	1MRS756121
COM610 3.2, Operator's Guide	1MRS756122
COM615 3.2, Operator's Guide	1MRS756123
COM605, 615 3.2 HMI Configuration Manual	1MRS756124
LON-LAG Master (OPC) 3.2	1MRS755284
SPA Master (OPC) 3.2	1MRS752275
SPA Router (OPC) 3.2	1MRS755497
Modbus Serial Master (OPC) 3.2	1MRS756126
Modbus TCP Master (OPC) 3.2	1MRS756445
IEC 60870-5-103 Master (OPC) 3.2	1MRS752278
IEC 61850 Master (OPC) 3.2	1MRS755321
External OPC Client Access 3.2	1MRS755564
IEC 60870-5-101 Slave (OPC) 3.2	1MRS755382

IEC 60870-5-104 Slave (OPC) 3.2	1MRS755384
DNP 3.0 Serial Slave (OPC) 3.2	1MRS755495
DNP 3.0 LAN/WAN Slave (OPC) 3.2	1MRS755496
DNP 3.0 Serial Master (OPC) 3.2	1MRS756567
DNP 3.0 LAN/WAN Master (OPC) 3.2	1MRS756566
MNS iS Connectivity (OPC) 3.2	1MRS756569

Type tests

Table 1: Inspection of mechanical structure

Description	Reference
Markings and mechanical structure	IEC 60255-5, -6
Degree of protection by enclosure	IEC 60529
Clearance and creepage distances	IEC 60255-5

Table 2: Power supply module tests

Description	Reference
Auxiliary voltage	IEC 60255-6
Aux. voltage interruptions	IEC 60255-11
Ripple in auxiliary dc voltage	IEC 60255-11 12%, $f = 2 \times f_n$
Power consumption	CE EN 61010

Table 3: Insulation tests

Test	Reference	Requirement
Dielectric test	IEC 60255-5	2 kV, 50 Hz for 1 minute
Impulse voltage test	IEC 60255-5	5 kV, 1.2/50 μ s, 0.5 J
Insulation resistance	IEC 60255-5	>100 M Ω , 500 Vdc
Protective bonding impedance	IEC 60255-27	<0.1 Ω .

Table 4: Electromagnetic compatibility tests

Test	Reference	Requirement
1 MHz burst test	IEC 60255-22-1	- differential mode: 1 kV - common mode: 2.5 kV
ESD	IEC 61000-4-2 IEC 60255-22-2	- contact discharge: 6 kV - air discharge: 8 kV
RF field immunity	IEC 61000-4-6	3 V/m (80% amp.mod.) $f = 80$ MHz...1000 MHz 30 V/m (pulse mod.) $f = 900$ MHz
Fast transient	IEC 61000-4-4 IEC 60255-22-4	Power supply: common mode 4 kV: - current inputs CT1...CT5 - voltage inputs VT1...VT4 - sensor inputs (coupling clamp) Power outputs: common mode 2 kV: - signal outputs - digital inputs - IRF relay
Surge	IEC 61000-4-5 IEC 60255-22-5	4 kV line to earth /2 kV line to line - power supply - current inputs CT1...CT5 - voltage inputs VT1...VT4 - power outputs 2 kV line to earth /1 kV line to line - signal outputs - digital inputs - IRF relay
Conducted radio frequency disturbance	IEC 61000-4-6 IEC 60255-22-6	10 V (80% amp.mod.) $f = 150$ kHz...80 MHz

Table 4: Electromagnetic compatibility tests

Test	Reference	Requirement
Power frequency (50 Hz) magnetic field	IEC 61000-4-8	300 A/m, continuous
Voltage dips and short interruptions	IEC 61000-4-11	30% reduction for 10 ms 60% reduction for 100 ms 60% reduction for 1000 ms >95% reduction for 5000 ms
Emission test	EN 55011 IEC 60255-25	class A

Table 5: Climatic environmental tests

Test	Reference	Requirement
Dry heat test	IEC 60068-2-2	+55°C, 96 hours +70°C, 4 hours
Cold test	IEC 60068-2-1	-10°C, 96 hours -25°C, 4 hours
Damp heat, cyclic	IEC 60068-2-30	+25°...55°C, Rh > 93% 6 cycles (12h+12h)
Storage	IEC 60068-2-48	+70°C, 72 hours -40°C, 72 hours

Table 6: Mechanical tests

Test	Reference	Requirement
Vibration tests	IEC 60068-2-6 IEC 60255-21-1	Vibration response test: - f = 10...150 Hz - ± 0.035 mm, 10...58 Hz - 5 m/s ² , 58...150 Hz
		Vibration endurance test: - f = 10...150 Hz - ± 0.075 mm, 10...58 Hz - 10 m/s ² , 58...150 Hz
Shock and bump tests	IEC 60068-2-27 IEC 60068-2-29 IEC 60255-21-2	Shock response test: - peak acceleration: 5 x g _n - pulse duration: 11 ms - numbers of pulses in each direction: 3 Shock withstand test: - peak acceleration: 15 x g _n - duration of the pulse: 11 ms - number of pulses in each direction: 3 Bump test: - peak acceleration: 10 x g _n - pulse duration: 16 ms - number of pulses in each direction: 1000
Seismic test	IEC 60255-21-3	Test method B: biaxial multi-frequency random seismic test - 2 x g _n in horizontal direction - 1 x g _n in vertical direction



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