Control and Monitoring Unit   COM605

Product Guide

Features

- Single-line diagram (SLD)
  - All primary SLD devices are displayed in one screen. The SLD recognises different voltage levels and different busbar systems, for example, single busbar, double busbar, duplex systems, etc. The SLD can include a Local/Remote selection switch indication. SLD can be used to view any available measured values from the process devices. Alarm and generic indication symbols can be placed in the SLD. Generic control buttons can further be added to control objects.

- BusBar colouring
  - Four different modes of BusBar colouring are available. The colours represent the busbar status. The colouring is freely configurable.

- Alarms and Events
  - Alarms and Events are identified by the following identifications: Date, Time, Bay, Device, Object Description and Status. Alarms and Events can be automatically filtered according to the voltage level or bay criteria. The maximum memory capacity is 65535 events. First-in, first-out logic is used for overwriting events.The user can export an event list to a .csv file for further analysis.

- Control
  - A separate control dialog is used for controlling the switching device. It provides information on switching device identification, reservation status and interlocking conditions. The *select before execute* logic is used to prevent malfunction. By reserving the switching device for only one user the risk of controlling the device from two different locations is eliminated. Tap changer function for RET 54_ is supported.

- Freely defined web links
  - The user can define web links during run time. This applies to any switching device.

- Measurements
  - Measured values from process devices are displayed on the Human Machine Interface (HMI).

- Disturbance Recorder upload
  - The protection and control IED generates disturbance records that can be uploaded from the HMI for further analysis.
  - The supported format is COMTRADE via IEC 61850-8-1.

- Parameter setting
  - The Parameter setting tool can be used for viewing and/or setting the parameters in IEDs supporting transparent SPA parameterization or IEC 61850 parameterization.

- System diagnostic
  - The communication diagnostic of each network level component is supervised. This includes process devices.

- User management
  - There are four different types of user: Viewer, Operator, Engineer and Administrator.

- National language support
  - The HMI can be translated to any language with the assistance of ABB Oy, Distribution Automation.

- Microsoft Internet Explorer with Adobe SVG viewer 3.03 is required for the HMI.

- Control and monitoring unit for substation automation.
  - Process communication: LON-LAG,SPA, IEC 60870-5-103, IEC 61850-8-1,Modbus serial, Modbus TCP, DNP3serial, DNP3 TCP

- True IEC 61850 communication gateway:
  - IEC 61850-6 - Substation Configuration Language (SCL)
  - IEC 61850 -7 - Communication modeling
  - IEC 61850-8-1 - Mapping for MMS TCP/IP – Ethernet

- Configuration:
  - Efficient and intuitive configuration tool
  - Tooltips
  - Remote configuration and administration

- Communication redundancy (requires optional LAN card)
  - IEC 64239/PRP (parallel redundancy protocol)
  - SFT (switch fault tolerance)

- 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 devies and provides HMI and gateway functionality

- 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 analyser

  - Monitors the reported values and events and the received control commands

- Security:

  - User authentication

  - Individual user accounts

  - Password authentication

  - Role-based access control

  - Host-based firewalls

  - Communication encryption - HTTPS

Application

COM605 is a Control and Monitoring unit that is a stand-alone HMI. It provides an interface, data and information from the substation. COM605 gathers data from protection and control IEDs, and from process devices, using different protocols. COM605 uses web technology to display data in a professional and user-friendly manner. It includes a web server that can provide the HMI on a monitor connected either directly to the unit or to any web client when COM605 is connected to the Intranet/Internet over LAN/WAN networks.

Fig. 1 displays an overview of a typical utility system with the COM605 Control and Monitoring Unit.

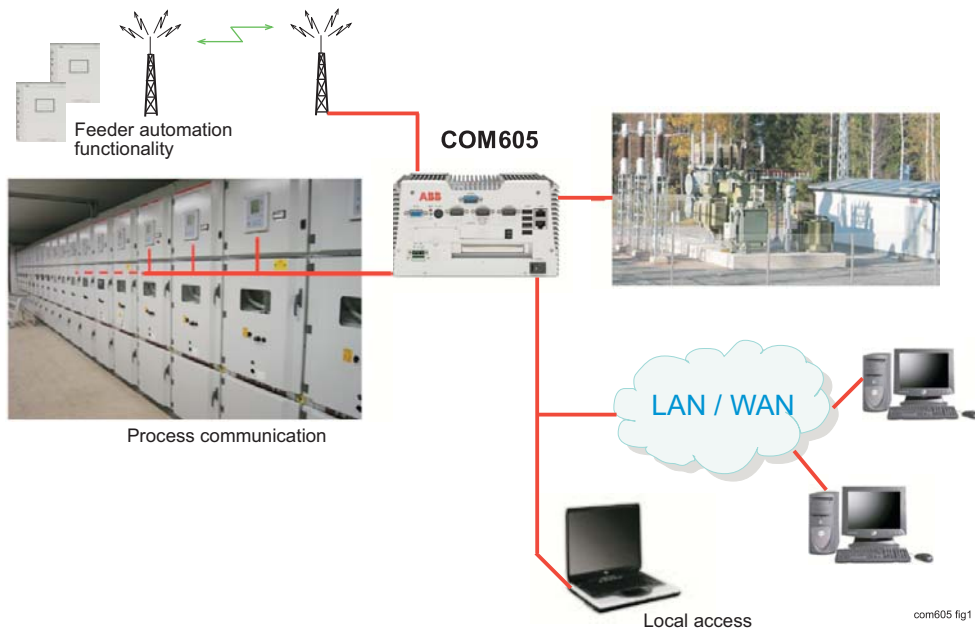Fig. 2 displays an industrial system overview.

Feeder automation functionality

COM605

Process communication

LAN / WAN

Local access

com605 fig1

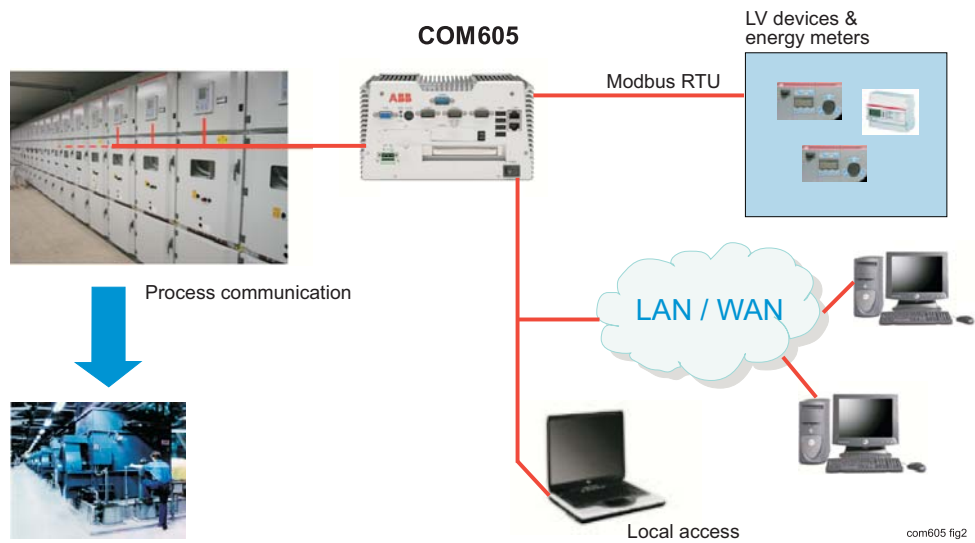Fig. 1   Utility system overview

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Fig. 2   Industrial system overview

The supported protocols for process communication can be freely combined in one Control and Monitoring Unit, limited only by the hardware interfaces.

Example:

COM605 has four serial ports: 3xRS232, 1xRS232/485. That allows a maximum of four connections using a serial protocol, for example, 3 SPA +Modbus RTU.

The LON-LAG protocol uses a specific board to connect the fibres, both plastic and glass. COM605 can have one board, that is, one LON line.

It is possible to extend COM605 by increasing the number of Ethernet interfaces. Thus increasing the number of Ethernets lines.

Connectivity packages

To make the configuration of COM605 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. These descriptions are used to automatically configure the master communication in the COM605 Control and Monitoring Unit. Connectivity packages for some IEDs are already available, and more will be released in due couse. 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)

COM605 control and monitoring unit's configurability and functionality depends on the type of communication protocol used for communication between the COM605 and the IEDs. For more details, please refer to the document "Protocols versus Functions for IEDs", 1MRS756223.

Design

The COM605 Control and Monitoring Unit 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 OPC Client exposes data for the embedded web server and enables external clients connected to the COM605 over LAN/WAN networks to access data available in the web server.
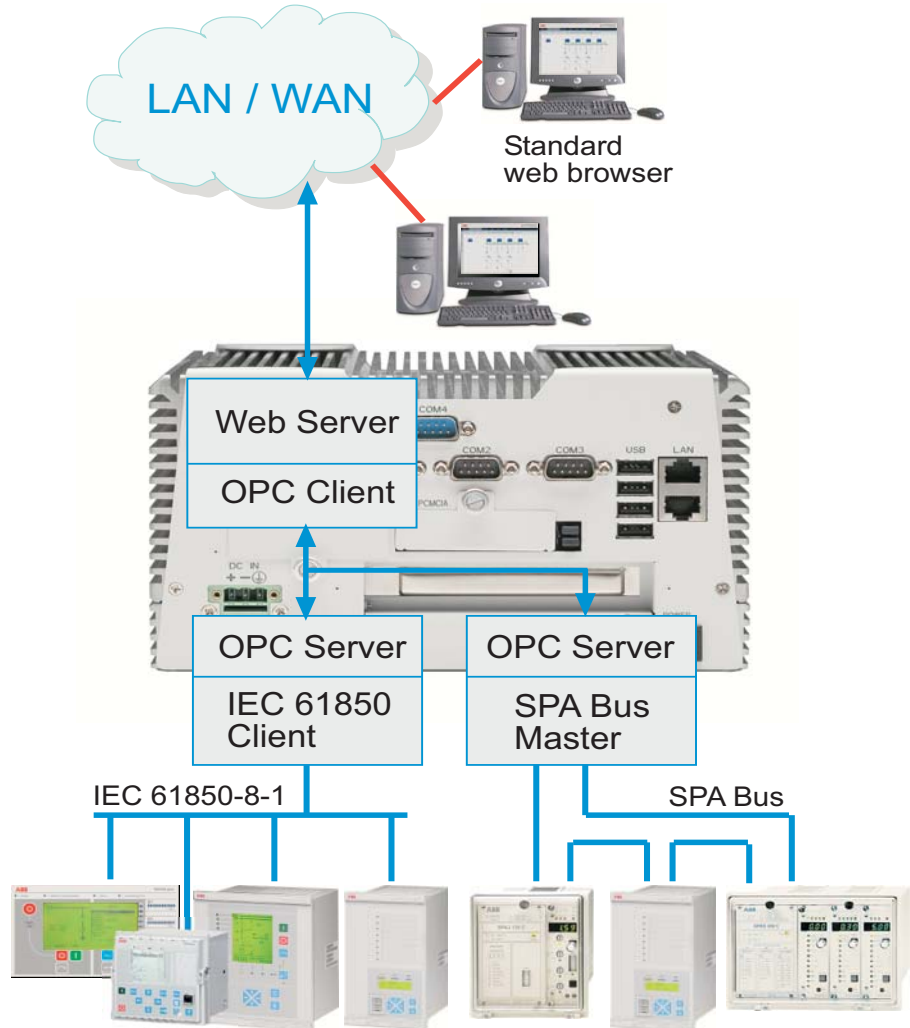
Fig. 3   Example of COM605 Control and Monitoring components

Available protocols

The table below displays the protocols supported by COM605 Control and Monitoring Unit. New protocols will be available according to the market demands.

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

Master
LON - LAG
SPA
IEC 60870-5-103
IEC 61850-8-1
Modbus serial
Modbus TCP
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:
  - voltage: 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

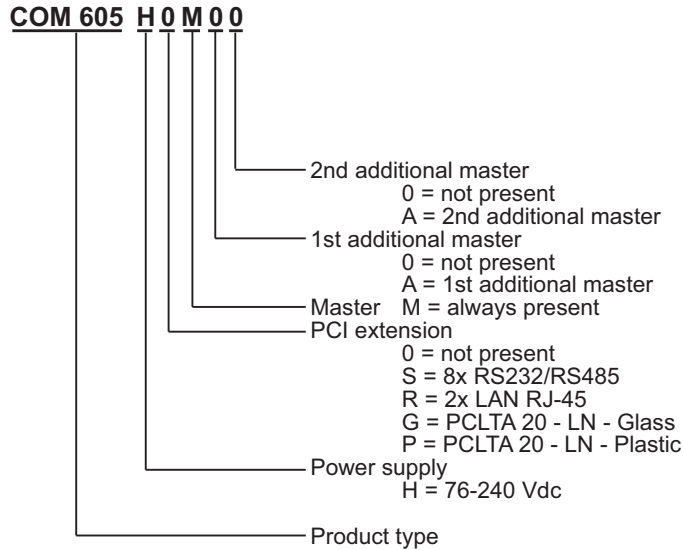COM605 is attached with four screws.   Refer to Fig. 4 below.
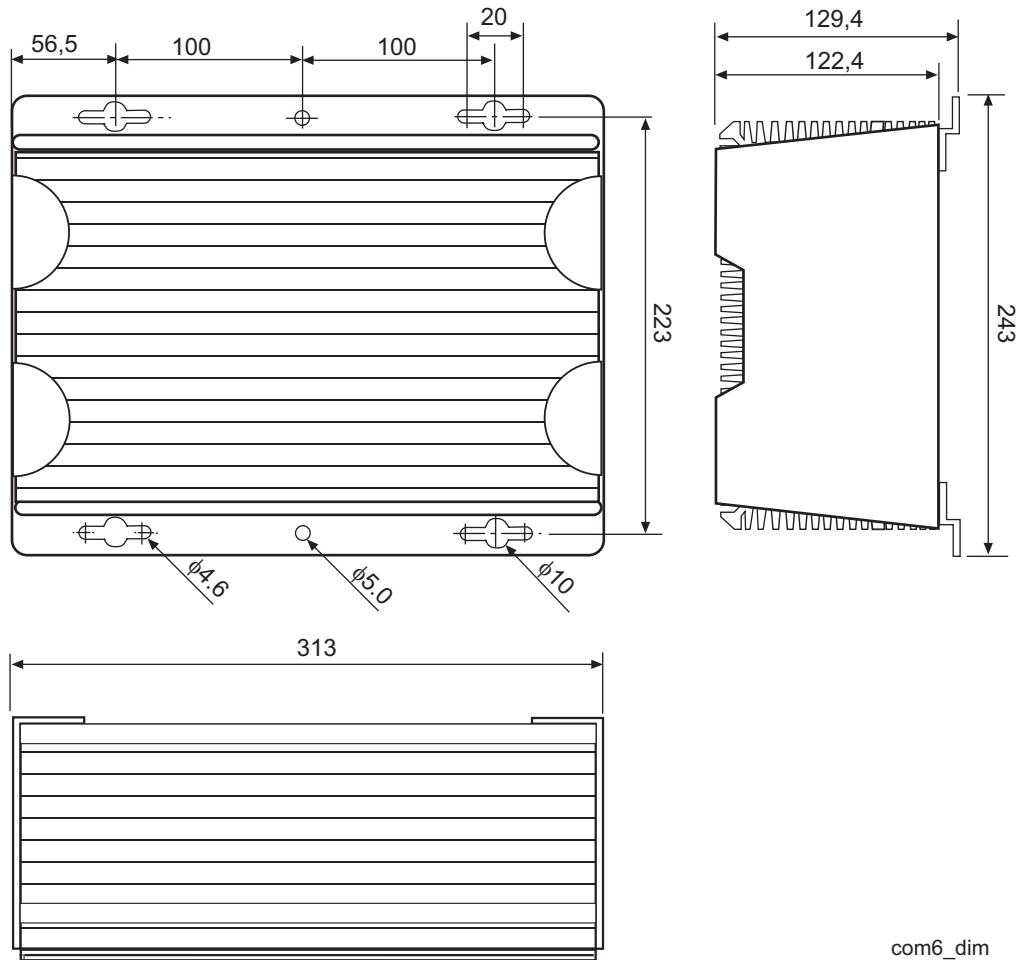
com6_dim

Fig. 4   COM605 mounting dimensions

Ordering

When ordering COM605, 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.

COM 605 H 0 M 0 0

2nd additional master
    0 = not present
    A = 2nd additional master
1st additional master
    0 = not present
    A = 1st additional master
Master   M = always present
PCI extension
    0 = not present
    S = 8x RS232/RS485
    R = 2x LAN RJ-45
    G = PCLTA 20 - LN - Glass
    P = PCLTA 20 - LN - Plastic
Power supply
    H = 76-240 Vdc

Product type

COM605order

Fig. 5   COM605 ordering code

Also specify in the ordering code:

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

You do not need to specify the protocols in the order. The protocols needed are selected when the COM605 unit is configured. COM605 is limited only by the number of the slaves ordered.

The standard delivery of a COM605 includes one communication protocol for the process devices and the HMI Web Server.

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/substationautoma-tion.

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 x fn
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 µs, 0.5 J
Insulation resistance	IEC 60255-5	>100 MΩ, 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 - duration of the pulse: 11 ms - numbers of pulses in each diretion: 3 Shock withstand test: - peak acceleration: 15 x g_n - pulse duration: 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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