GOSSEN METRAWATT

MEDICAL MEASURING AND TEST TECHNOLOGY 2020 / 2021

MAIN CATALOG

EDITORIAL

Marcel Hutka
Managing Director
GMC-I Messtechnik GmbH

ilac-MRA DAkkS
Deutsche
Akkreditierungsstelle
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Dear reader,

We're pleased to be able to present you with a host of current new developments in the pages that follow with our comprehensive portfolio of measuring and test technology. For more than 111 years, Gossen Metrawatt has been combining safety with innovation and has made a decisive contribution to the development of measuring technology during this time. Our brand-name philosophy is always targeted at the safe use of electrical energy. This is underscored by our customers who evaluate measuring and test systems from Gossen Metrawatt as especially safe to operate, reliable and efficient.

As a result of digital networking amongst energy, data and communications technologies, requirements are becoming more and more expansive for testing electrical safety, data management and power analysis. Intelligent test instruments, measuring technology and software solutions assure that our customers are always on the safe side – in the future as well. We take advantage of digital advances to make daily work with our instruments and analysis tools even simpler, as well as more flexible and dynamic. A good example of this is the newly launched GMC-Instruments cloud platform for comprehensive test data management with our instrument-independent IZYTRONIQ software, and many other services for our customers.

We're growing along with our customers, and with the tasks and perspectives which arise in the exciting field of measuring and test technology. This is why we consistently align our product development efforts to your practical needs and assist you with services, consultation, project engineering, training and on-site support. Our customer-oriented sales network with highly qualified sales engineers is your guarantee for competent, personal advice directly from the manufacturer. All of this together makes us a reliable partner, in the future as well – and dependably innovative.

1934 Relocation to the acquired factory building Sedanstraße 20.

1933 Company rebranded from Dr. Siegfried Guggenheimer AG to Metrawatt AG.
1934: 253 employees
1963: 333 employees

1942 Death of Paul Gossen.
Change in stockholders' equity due to legal succession.
New managing directors: Dr. Karl Klarner and Hans Gossen.
July 1942: 1000 employees

1948 – 1949 Construction of the "Tippa" factory in Glückstraße (production of the compact "Tippa" typewriter).
1950: 1200 employees

September 1919
Founding of P. Gossen & Co. K.-G by 46 year old engineer Paul Gossen.
Purpose of the company:
Manufacture and sale of electrical measuring instruments
Place of business: Baiersdorf, workshop and production plant with 3 employees(Willi Bachmann, Wilhelm Striegel and Andreas Link)

October 1919: 7 employees
October 1920: 28 employees

1906 Dr. Siegfried Guggenheimer founded a company under his own name for production and sales of electronic measuring instruments.

1939 – 1945
Changeover to production of measuring instruments for army, air force and navy.

June 1955 Procurement of the factory grounds of Weber & Ott in Erlangen (north of the main building)
August 1955 Establishment of repair service for exposure meters in our Frankfurt office – 1956 Service extended to the repair of measuring instruments.

111+ YEARS
EVOLUTION TO
THE BEST ON THE WORLD MARKET
1906 - TODAY

1963 Transfer of shares to Siemens & Halske, Munich (30%) and Bergmann AG, Berlin (70%).

1965 Construction of the new shipping facility. Bergmann AG acquires the remaining 30% of GOSSEN GmbH from S & H.

1966: 2471 employees

GOSSEN
1946 - 1967

GOSSEN
1967 - 1978

2005 Takeover of Gossen Metrawatt GmbH by managing director Dr. Hans-Peter Opitz together with a holding company.

Rebranding to GMC-I Messtechnik GmbH

SEAWARD

2015 Acquisition of the British Seaward Group

KURTH ELECTRONIC

2016 Takeover of Kurth Electronic GmbH, measuring technology specialists in the field of telecommunications, data technology and electrical installation

1956 Conversion of the residential and commercial building at Nürnberger Straße 47, which was acquired in 1954, into a workshop and office building.

1988 ASEA and BBC merge to form the ABB Group, rebranding to ABB Metrawatt GmbH.

1990 Takeover of GOSSEN GmbH by the Röchling Group.

1992 Takeover of ABB Metrawatt GmbH by the Röchling Group and rebranding to Metrawatt GmbH.

GOSSEN METRAWATT CAMILLE BAUER

1993 Merger of Röchling subsidiaries GOSSEN GmbH, Metrawatt GmbH and Camille Bauer to form *Gossen Metrawatt GmbH.*

DRANETZ

2007 Acquisition of Dranetz, a market leader in the field of power quality and power analysis, which was founded in 1962.

PROSyS

2008 Founding of British subsidiary GMC-I PROSyS Ltd. The new company produces primarily current clamps.

MEDICAL MEASURING INSTRUMENTS AND TESTERS

The SECULIFE brand name is synonymous with outstanding reliability and highly precise measurement results for testing medical devices. SECULIFE products are distinguished by highest possible measuring precision, outstanding quality and ease of use – because responsibility necessitates top performance, especially in the field of medicine.

Use in combination with IZYTRONIQ software products assures standards-compliant, convenient documentation of safety and metrological inspection results.
All SECULIFE instruments permit precision measurements and documentation of results in accordance with binding international standards for medical devices.

The spectrum covered by the SECULIFE brand name includes instruments for testing electrical safety, test instruments for defibrillators, infusion pumps, ultrasound systems, HF electrosurgical generators and multi-patient simulators, as well as test instruments for photometry and interior light monitoring.

A broad range of the test technology required by medical institutions and manufacturers of medical products is made available by the instruments offered under the SECULIFE brand name. Depending of the respective instrument variant, options are included for data storage, documentation and data communication.

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SECULIFE ST BASE / BASE25 / PRO

Test Instruments for Testing Electric and Medical Devices up to 400 V

SECULIFE ST BASE

SECULIFE ST BASE25

SECULIFE ST PRO

BENEFITS:

The new SECULIFE series now provides you even more safety and convenience when testing electric devices in all applications in the field of medical technology. The unique, intuitive operating concept based on a rotary switch with two operating levels assures error-free, quick and safe testing. The optimized test cycles and automatic test sequences make it additionally possible to complete more tests per day.

User-defined, application-specific test sequences can be easily created at any time and assigned to a switch position. It's not without reason that GOSSEN METRAWATT's test instruments with the green triangle have served as a guarantee for reliable measurement results in the field of medical technology for more than 20 years.

COMPLIANCE WITH LAWS, REGULATIONS AND STANDARDS MADE EASY:

Testing the electrical safety of electric medical devices is necessary in many applications and is required in accordance with legislation and regulations set forth by official authorities, operating companies and insurance companies. SECULIFE test instruments make it possible for electro-technically trained persons to conduct quick and safe testing in accordance with a great variety of different application and product standards, for example:

- IEC / DIN EN 60601
- IEC / DIN EN 62353
- IEC / DIN VDE 0701-0702
- DIN EN 60974-4

FEATURES:

- **2-TREE STRUCTURE** – The instrument's database tree includes a "Customer" as well as a "Location" tree view.

- **4 mm APP SOCKETS** – Easily accessible application part connections on the top of the device

- **TEST SEQUENCES** – 8 + 1 preconfigured test sequences for quick device testing (expandable to as many as 24 user-defined test sequences *)

- **UDI** – Management of "unique device identification" numbers is fully supported.

- **AUTOMATIC CONNECTION DETECTION** – Automatic DUT connection and protection category detection

- **UNIVERSAL INTERFACE** – For data entry (2 ea. USB A) and data exchange (1 ea. USB B), report and barcode printing with compatible printers

- **OBJECT RELOCATION *** – Structure elements, including subordinate elements, can be moved within the test object database in the test instrument.

- **EASY OPERATION** – Quick access to measuring and test functions via the rotary switch with two operating levels, direct selection keys, softkeys and touchscreen option

- **ANTIMICROBIAL PROPERTIES** – Rugged housing with antimicrobial properties prevents contamination with viruses and bacteria.

- **DATA MANAGEMENT & STORAGE CONCEPT** – Extensive data management and storage concept for automated test sequences and individual measurements – for up to 50,000 data records

- **MULTIPLE MEASUREMENT** – Unique multiple measurement permits convenient recording of several measuring points.

* Included with DB Comfort

SECULIFE ST BASE IQ	M694A
SECULIFE ST BASE25 IQ	M694B
SECULIFE ST PRO IQ	M694C

SECULIFE ST BASE / BASE25 / PRO

Test Instruments for Testing Electric and Medical Devices up to 400 V

FEATURES AND FUNCTIONS:

- IZYTRONIQ report and data exchange software included
- Measurement type, connection type and measuring method can be selected with a key
- Selectable leakage current measurement method: direct/differential/alternative
- Testing of permanently connected devices and 3-phase devices *
- Voltage measurement up to 300 V *
- Extensive setting options for international use (language, keyboard, character set, date, time)
- Testing of protective conductor resistance at DUTs with PRCDs
- DB+ Z583R database expansion for bidirectional data exchange, remote control and generation of personalized test sequences

	SECULIFE ST		
	BASE IQ	**BASE25 IQ**	**PRO IQ**
	M694A	**M694B**	**M694C**
10 A test current	■	—	■
25 A R_{PE} test current	—	■	—
Touchscreen keyboard	■	■	■
Second test probe	■	■	■
Voltage measuring inputs	■	■	■
Antimicrobial properties	■	■	■
Database expansion	■	■	■
DB Comfort	❑	❑	■
Sockets for applied parts	—	—	■
IEC 60601 test sequences	—	—	■
Bluetooth	❑	❑	❑

* Required depending on model and/or optional accessory

❑ Optionally available
Customer-specific variants upon request

SECULIFE HIT AM

Handheld Digital TRMS Multimeter – Housing, Rubber Holster and Measurement Cable with Antimicrobial Properties

BENEFITS:

This multimeter from the SECULIFE HIT series has been furnished with antimicrobial properties. This is intended to inhibit the growth of germs, counteract microbial colonization and destroy microorganisms.

INTERFACE:

- Bidirectional infrared interface for communication with the PC (38.4 kBd)
- Optionally available IR-USB adapter

HOUSING, RUBBER HOLSTER AND MEASURE-MENT CABLE WITH ANTIMICROBIAL PROPERTIES

- Voltage measurement
- Auto-ranging current measurement from 100 μA (resolution:10 nA) to 10 A (16 A)
- Capacitance and resistance measurement, diode and continuity testing
- Measuring categories: 600 V CAT III and 300 V CAT IV
- 1 kHz low-pass filter
- TRMS AC and AC+DC, 20 kHz bandwidth
- Data storage for more than 15,000 measured values
- Extremely rugged, dust and water-proof, with IP 65 protection

Type	Article
SECULIFE HIT AM	M687A

SECULIFE HIT MD

Handheld Digital TRMS Multimeter with 23 Functions, Specially Designed for Use in Medical Technology

BENEFITS:

The SECULIFE HIT MD is protected against liquid ingress and is resistant to disinfectants. A hygiene assessment was prepared for the device by the Institut für Medizinische Mikrobiologie und Hygiene (Institute for Medical Microbiology and Hygiene) at Philipps University in Marburg in order to confirm its special suitability for hygienically sensitive areas.

The ability to safely disinfect the SECULIFE HIT MD was tested on the basis of the specifications of the German Society for Hygiene and Microbiology (DGHM) and the Association for Applied Hygiene (VAH).

Testing was conducted with regard to test germs by analogy, and in accordance with the specifications of the German Society for Hygiene and Microbiology (DGHM) for disinfection procedures in stress tests under realistic conditions.

MULTIMETER WITH HYGIENE ASSESSMENT AND 23 FUNCTIONS

- Voltage measurement
- Auto-ranging current measurement from 100 μA (resolution:10 nA) to 10 A (16 A)
- Capacitance and resistance measurement, diode and continuity testing
- Measuring categories: 600 V CAT III and 300 V CAT IV
- 1 kHz low-pass filter
- TRMS AC and AC+DC, 20 kHz bandwidth
- Data storage for more than 15,000 measured values
- Extremely rugged, dust and water-proof, with IP 65 protection

INTERFACE:

- Bidirectional infrared interface for communication with the PC (38.4 kBd)
- Optionally available IR-USB adapter

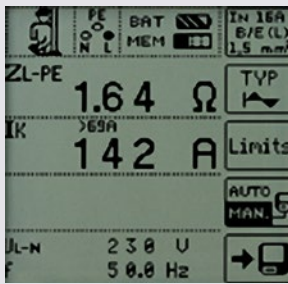| Type	Article
SECULIFE HIT MD	M687B

SECULIFE IP

Safety Tester

SECULIFE IP

Display

ProfiScan App

Side View

BENEFITS:

Test Instrument for Protective Measures for Electrical Systems in Medical Technology

The **SECULIFE IP** is capable of executing all measurements for testing the effectiveness of safety measures in medical electrical systems in accordance with IEC 60364-6 / DIN VDE 0100-600 / DIN VDE 0105-100, and as specified in the individual sections of EN61557 / VDE 0413. And thus it's ideally suited for approvals and periodic testing of stationary electrical installations. With measuring category IV, the **SECULIFE IP** provides the user with maximum possible safety.

In electrical systems and especially in the field of medical technology, insulation resistance is an important quantity with regard to personal safety and fire prevention. Testing of insulation monitoring devices used to this end in ungrounded systems (IT systems) is one of the primary capabilities of the new **SECULIFE IP**.

Whether it's used in private, commercial or industrial objects – the **SECULIFE IP** assures the user that his installation complies with all applicable regulations, and that it functions reliably.

Test results for up to 50,000 measuring points can of course be transferred to a PC and documented in detail as verification of correct installation.

In actual practice, the **SECULIFE IP** is distinguished by extremely easy operation and a broad ranging spectrum of tests. Its advanced technical concept is consistently oriented towards everyday tasks in the field of electrical engineering. In addition to basic standard tests, the instrument also offers numerous additional measuring and test functions for subjecting installations to the acid test, which provide highly accurate results.

A special advantage of the **SECULIFE IP** is its intelligent, ergonomic design.

Control is simple and safe, and data can be conveniently read from the large, illuminated display. An extensive range of accessories offers the right connection options for every task.

The **SECULIFE IP** is setting new standards where time savings, safety and convenience are concerned: a combination of innovative design and an ergonomic operating concept make it the ideal companion for any electrician. Test sequences can be edited, changed and expanded. Previously created test sequences can also be cloned, allowing for the use of identical sequences at several test instruments.

The **SECULIFE IP** test instrument is equipped with an integrated Bluetooth interface. Various device functions can be addressed via this interface.

Amongst other things, users can read the current system structure in and out at a tablet PC or a smartphone with Android operating system and use the keyboard mode, as well as set up and manage structures with the help of the free **ProfiScan** app.

Tests and measurements can be conducted with the instrument in all alternating and 3-phase electrical systems with voltages from 65 to 500 V and frequencies of 15.4 to 420 Hz.

FEATURES:

- Bidirectional data exchange via USB port
- Connection of an RFID reader or a barcode scanner
- Includes ETC software (Electrical Testing Center)
- Testing of RCD types A, AC, B, B+, EV, S and G/R, as well as PRCD types S and K
- Measurements in IT systems, Z_{L-N}
- Testing of insulation monitoring devices (IMDs)
- Measurement of earthing resistance
- Leakage current measurement per IEC 62353 (medical) with PRO-AB adapter
- Bluetooth interface for ProfiScan app

Type	Article
SECULIFE IP	M520U

SECULIFE DF BASE

Test Instrument for Defibrillators

BENEFITS:

Defibrillator analyzer for performing function tests on external defibrillators.

The specified energy level is measured using an integrated load which simulates the human body (50 Ω). Quick and direct observation and selection of the desired ECG waveforms and test data is also made possible.

A 12-channel ECG with arrhythmias and power waveforms is available for determining the current pulse. These can be recorded and viewed at the defibrillator's display. The **SECULIFE DF BASE** is fully AED compatible and is equipped with an auto-sequence function that can execute up to 50 test sequences which have been preprogrammed by the user. The tests are configured with easy-to-use software.

FEATURES:

- Monophasic, biphasic and biphasic pulsed energy measurement
- Cardioversion delay measurement
- Capacity: 5000 V, 1000 joule
- 10 universal patient cable connector sockets
- Flash programmable for upgrades

Type	Article
SECULIFE DF BASE	M695Q

SECULIFE DF PRO

Test Instrument for Defibrillators

BENEFITS:

The **SECULIFE DF PRO** multimode defibrillator analyzer is an intelligent instrument for testing the latest generation of defibrillators. It measures discharged energy and provides information regarding the defibrillator pulse. The measured pulse can be graphically displayed as well.
The tester is suitable for manual, semi-automatic and automatic defibrillators with **monophasic, biphasic and pulsed waveform output.**

Furthermore, the **SECULIFE DF PRO** can also be used for testing transcutaneous cardiac pacemakers.

The **SECULIFE DF PRO** makes it possible to quickly and directly observe and select the desired waveforms and test data.

All operating information can be viewed at the graphics-compatible display (240 x 64 pixels), which makes it easy to navigate through the parameters and to scroll through all available options.

FEATURES:

- Test for shock algorithms
- Fully AED compatible
- Cardioversion delay measurement (PRO)
- 26 selectable internal loads (PRO)
- Complete pulse analysis (PRO)
- Power demand sensitivity test (PRO)
- Refractory period tests (PRO)
- Defibrillator protection for pacemaker input (PRO)

Type	Article
SECULIFE DF PRO	M695R

SECULIFE VL

Variable Load for Defibrillator Test

BENEFITS:

The **SECULIFE VL** makes it possible to adjust the variable loads of the **SECULIFE DF BASE / PRO** from 25 Ω to 200 Ω and back down again in 25 Ω steps by simply turning a knob.

Connection via the RS 232 port permits automatic detection of the selected external load.

Type	Article
SECULIFE VL	M695V

SECULIFE IF PRO

Infusion Pump Tester

SECULIFE IF PRO

SECULIFE IF PRO BASE UNIT

SECULIFE IF PRO FLOW MODULE

BENEFITS:

The SECULIFE IF PRO is the most compact, fully equipped 4-channel analyzer available on the market.

The new test system with patent pending is driven by a stepper motor and permits continuous monitoring of the flow of liquid without any need for stopping and intermittent cleaning. This provides the infusion pump under test with a more realistic flow path, thus resulting in more accurate measured values.

The independent stepper motor controller for the new ceramic valves not only makes it possible for the system to run more quietly and smoothly, it also permits the propulsion of fluid in both directions during the cleaning cycle.

The SECULIFE IF PRO is equipped with integrated auto-sequence functions which make it possible for the user to execute automated test procedures. This makes it possible to perform the specific test routines stipulated by various manufacturers, which saves a great deal of time and reduces the risk of human error.

IEC 60601-2-24 not only sets forth special requirements for flow rates, but rather for back pressure simulation, bolus measurements (PCA) and for checking occlusion pressure as well. All of these requirements have been implemented as features in the SECULIFE IF PRO and can be easily selected via the on-screen menu.

The SECULIFE IF PRO is laid out for up to 4 SECULIFE IF FM flow modules. These modules are individually serialized and calibrated so that they can be moved from channel to channel, and even from unit to unit. After installation, they're recognized by the SECULIFE IF PRO and the serial number, as well as NIST traceable calibration information, appear at the display and are used in all data reports.

The interchangeable modules provide users with unprecedented flexibility within their infusion pump test systems. In the event of calibration, there's no need to suspend testing — only the flow modules have to be calibrated.

The same applies to servicing. If there's a problem with any given channel, only the affected module needs to be repaired, thus avoiding downtime.

FEATURES:

- Flow measurement
- PCA/bolus
- Back pressure simulation
- Occlusion alarm
- Trumpet curve analysis
- 1, 2, 3 and 4-channel models available (customer retrofittable)
- Interchangeable test modules
- Calibration of the test modules without the basic unit
- Device can be operated during calibration
- For testing in accordance with IEC 60601-2-24
- Measuring range: 10 µL to 1600 mL/hr
- Configurable pressure (mmHg, psi, bar, kPa)
- Double syringe system (trouble-free discharge cycle)
- 32 GB internal memory
- Highly accurate (down to 1%)
- User-adjustable test limits
- Automatic test sequences
- Pass/fail or numeric results display
- Flash programmable, upgrades possible on-site
- Printing of test results with optional printer

SOFTWARE:

BC-FlowTM software is always delivered with the SECULIFE IF PRO and permits control via a PC as well as display, storage and recovery of system data.

A SECULIFE IF PRO test software module makes it possible to integrate the SECULIFE IF PRO into the SECULIFE IF PRO test system.

Type	Article
SECULIFE IF PRO BASE UNIT	M696A
SECULIFE IF PRO1 (single-channel)	M6960A01
SECULIFE IF PRO2 (2-channel)	M6960A02
SECULIFE IF PRO3 (3-channel)	M6960A03
SECULIFE IF PRO4 (4-channel)	M6960A04
SECULIFE IF PRO FLOW MODULE	Z696V

SECULIFE DP BASE

Pressure Gauge

BENEFITS:

The **SECULIFE DP BASE** is a **microprocessor controlled digital pressure gauge** which permits positive as well as negative pressure measurement in liquids and gases using various physical units of measure.

SECULIFE DP tester instruments are designed for use by qualified technicians for the evaluation and maintenance of a wide range of medical devices.

FEATURES:

- Range: -13.50 to 100.00 PSI
- Pressure scale with PSI, inH_2O, cmH_2O and mmHg
- Digital calibration and zero balancing
- Pressure accuracy: ±0.1%
- 5 digit LCD display
- Measurement of liquids and gases

Type	Article
SECULIFE DP BASE	M695S

SECULIFE DP PRO

Pressure Gauge

BENEFITS:

The **SECULIFE DP PRO** is a **high-precision digital pressure gauge**. It measures compatible gas and liquid pressure values in various units of measures.

It's equipped with one or two pressure sensors and an optional temperature sensor input, in order to be able to acquire pressure and temperature with a single measuring instrument. An analog output is also available as an option.

Selectable pressure sensor ranges: 0.3, 5, 10, 75, 100 psi

FEATURES:

- 16-bit measurement
- Digital calibration and zero balancing
- Measurement of pressure and partial vacuum
- Measurement of liquids and gases
- Optional DC or HF outputs (cycle rates of up to 100 Hz)
- Pressure measuring accuracy: ±0.05%
- Selectable display options and digit sizes
- Large graphic display with selection of options and parameters setup using a cursor

Type	Article
SECULIFE DP PRO	M6950

Please refer to the data sheets for further technical specifications.

SECULIFE ES PRO

Measuring Instrument for Electrosurgical Devices

BENEFITS:

The SECULIFE ES PRO is an analyzer for electro-surgical devices with extremely high accuracy which approaches calibration quality.

It's suitable for use by manufacturers and users of high frequency surgical equipment who want to test their HF generators in precisely the same way as the manufacturers of medical devices do, because it boasts a measuring accuracy of just 1%.

FEATURES:

- Displays: mV, mV peak, mA, crest factor and power
- Large graphic display with selection of options and parameter settings using a cursor
- 1% deviation from the measured value
- Digital data read-out via USB and RS 232
- Optional PC application software provides additional functionality, versatility and the ability to store data.
- Digital calibration – no potentiometers to adjust

- Graphic display of generator waveforms with scroll and zoom functions
- Internally shielded input circuits
- Acquisition, saving and printing of waveforms read out by HF generators with up to 32,768 data points by means of special computer software
- Internal data memory for 3 complete data records with HF waveforms
- Creation of a user-specific table for load resistors based on the most commonly used load resistors
- Selectable data displays
- Smallest and lightest tester for HF surgical equipment

Type	Article
SECULIFE ES PRO	M695B
Current transformer, 1:1	Z697A
Current transformer, 0.1:1	Z697B
Load resistors	Z696A - Z696U

SECULIFE ES XTRA
SECULIFE ES PRIME

Electrosurgical Analyzer

BENEFITS:

With its unprecedented features, the **SECULIFE ES XTRA / ES PRIME** has set entirely new standards for electrosurgical analyzers with comprehensive functionality.

Thanks to the use of internal, induction-free high-precision test loads ranging from 0 Ω to 6400 Ω in previously unavailable 1 Ω steps, the **SECULIFE ES XTRA / ES PRIME** offers the required compatibility for hospitals as well as for manufacturers. For all eventualities, an option has been provided for adding an external load which assures 100% compatibility with test load requirements during the years to come.

With an HF current range of 2 to 7000 mA RMS (power range: 500 W RMS), the **SECULIFE ES XTRA / ES PRIME** surpasses all currently and previously available analyzers where measuring range is concerned.

The accuracy of the new analyzer, which approaches calibration quality, overcomes previous obstacles.

The **SECULIFE ES XTRA / ES PRIME** makes it possible for the user to execute mobile test sequences and calibration procedures with unequaled precision and accuracy, even for the newest generators offered by leading manufacturers.

Functions like automated power/load curve tests with multiple power steps per load setting and automated, user-defined test sequences with an unlimited number of steps, each of which can be furnished with nearly unrestricted ASCII text descriptions, have also contributed to catapulting the **SECULIFE ES XTRA / ES PRIME** into a class of its own.
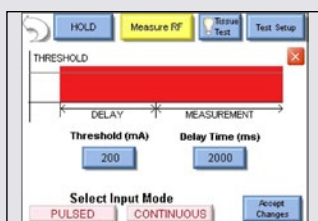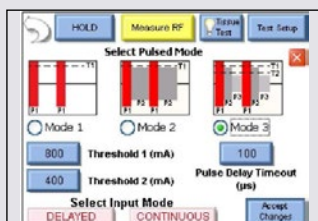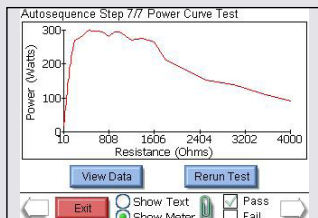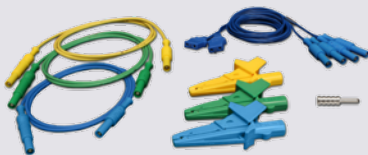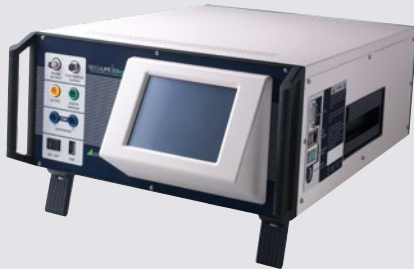
It's even possible to individually program an automated test report for REM/ARM/CQM tests and/or HF leakage current measurements.

This makes it the logical choice for customers who are looking for an analyzer with comprehensive functionality.

As compared with the **SECULIFE ES XTRA**, the **high sampling rate** of the **SECULIFE ES PRIME** enables **measurement and analysis of pulsed waveforms with up to three different amplitudes.**

FEATURES:

- HF current measurement per industry standard for **multiple, pulsed waveforms** (**SECULIFE ES PRIME**)
- Ultra-fast digitalization of complex HF waveforms
- Compatible with continuous and pulsed output waveforms
- Integrated real-time operating system with ¼ VGA color touchscreen
- Displays up to 15 different measuring parameters in selectable, definable views
- Internal precision test loads from 1 Ω to 6400 Ω in 1 Ω steps
- Compatible with external test loads
- Automated current-power curves with various power levels per load value setting
- Automated, freely definable test sequences
- Printing of test results at printers with RS 232 or USB connection
- USB (3), RS 232 and Ethernet communication ports
- Compatible with external keyboard and mouse thanks to dedicated connectors
- Automatic or manual activation of the HF generator during the load curve test
- Remote control of the HF generator is possible
- REM/ARM/CQM test with 500 Ω load, adjustable in 1 Ω steps
- HF leakage current measurement

Type	Article
SECULIFE ES XTRA	M695C
SECULIFE ES PRIME	M695U

Remote Control

SECULIFE UP

Digital Ultrasound Power Meter

BENEFITS:

The SECULIFE UP ultrasound power meter was designed for testing diagnostic and therapeutic transducers.

This compact, lightweight instrument fulfills all of the requirements of a portable test instrument with the reliability and the time-tested performance of the SECULIFE-U series. The SECULIFE UP make use of a test tank which is 2.7 cm in diameter and 8.9 cm high.

The most reliable and reproducible method for measuring ultrasonic energy is the acoustic radiation force process. The transducer under test is centered above a 45° cone target with air bearing in degas-ified water. Coupling is established to a precision scale with measuring accuracy of ±0.15 W.

When acoustic energy acts upon the cone, the resultant force is directly proportional to total radiated power. The test tank is lined with sound-absorbing rubber to prevent the reflection of sound. The scale is programmed such that it converts forces within the milligram range directly into results in watts with high resolution.

FEATURES:

- Resolution: 50 mW
- Measuring range: 0 to 30 W
- Frequency range: 0.5 to 10 MHz
- Pulse current measurement
- Continuous current measurement
- Results in watts
- Results in grams
- Battery operation
- Mains operation (adapter for external power supply)
- Digital liquid crystal display
- Automatic zero adjustment
- Automatic stabilization
- Five-point certification
- Traceable to NIST

Type	Article
SECULIFE UP	M695Y

SECULIFE UL

Ultrasound Leakage Current Tester

BENEFITS:

The SECULIFE UL was specially designed for testing the electrical safety of all types of diagnostic ultra-sound transducers – independent of the ultrasound devices with which these are usually used.

FEATURES:

- Checks upper and lower leakage current limit values in accordance with the manufacturer's specifications
- Programmable test limits based on ultrasound transducer manufacturer and type
- Automatic range adjustment for improved accuracy over the entire range
- Range: 0.5 to 500 µA
- Large, backlit graphics display
- 1% accuracy over the entire range
- Test results as pass/fail or numeric display
- Read-out of test results to optionally available printer
- Audiovisual signals indicate test status
- Counter mode for extensive measuring times
- Test report function as part of the software
- Data protocol with storage of 99 test reports
- PC utility software for setting up configurations and remote control
- Programmable counter voltage source (test voltage) and frequency
- Selectable test voltage (90 to 275 V AC) and frequency (50 or 60 Hz)
- Time and calendar function in the instrument for date and time stamps on the test reports

Type	Article
SECULIFE UL	M695X
Short test probe	ULT-PC-15
Long test probe	ULT-PC-20
Flexible test probe	ULT-PC-30
ULT adapter	PA10 - PA30

OVERVIEW   Patient Simulators

Model	PS100	PS200	PS300	BP PRO
General				
Display	11 LEDs	1 graphic LCD, 128 x 64 pixels	2 graphic LCDs, 128 x 64 pixels	1 graphic LCD, 128 x 64 pixels
Background illumination	No	Yes	Yes	Yes
Terminals for continuity test	Yes	Yes	Yes	No
RS 232	No	Yes	Yes	Yes
Power supply	1 ea. 9 V battery	2 ea. 9 V battery	2 ea. 9 V battery	6 ea. 1.5 V AA
External power pack	Yes	Yes	Yes	Yes
ECG-NSR	Yes	Yes	Yes	Yes
Connections	10	10	10	10
Pulse rhythms	4	7	17	4
Amplitudes	1	4	19	1
QRS interval	Adult	Adult	Adult + pediatric	Adult, neonatal, hyper-tensive, hypotensive
ST segment elevation	No	No	19	No
ECG performance	Yes	Yes	Yes	Yes
Sinusoidal curves	3	8	8	3
Square wave curves	2	2	2	2
Triangle wave curves	1	1	2	1
Pulsing	–	–	3	–
Respiration	No	Yes	Yes	Yes
Rate	–	8	8	4
Impedance baselines	–	2	4	1
Respiration impedance test range	–	6	6	1
Pacemaker	No	No	Yes	Yes
Arrhythmias	No	12	49	6
Blood pressure	No	1	2	1
Temperature simulation	No	YSI 400/700: 0, 24, 30, 37, 40 °C	YSI 400/700: 0, 24, 30, 37, 40 °C	YSI 400/700: 0, 24, 30, 37, 40 °C
NIPB	No	No	No	Yes
Rates	–	–	–	80.94 BPM
Pressure range	–	–	–	± 500 mmHg
Special Functions				
SpO$_2$ simulation	No	With SECULIFE OX	With SECULIFE OX	With SECULIFE OX
Fetal/maternal	No	ECG only	Option	Option
Cardiac output	No	No	Option	Option
Training mode	No	No	Yes	No
Leak test	No	No	No	Yes
Pressure gauge	No	No	No	Yes
Physical				
Dimensions (cm)	18.44 x 11.33 x 3.84	21.92 x 11.33 x 4.14	21.92 x 11.33 x 4.14	17.78 x 12.7 x 10.16
Weight	0.454 kg	0.908 kg	0.908 kg	1.4 kg

Please refer to the data sheets for further technical specifications.

SECULIFE PS100

Patient Simulator

BENEFITS:

The **SECULIFE PS100** is a microprocessor-controlled patient simulator. It offers patient simulation with 4 waveforms in a fixed mode. 3 sine, 2 square and 2 triangle waveforms can be selected.

FEATURES:

- 10 universal plugs for patient connector cables
- ECG: 30, 60, 120 and 240 bpm

- Sinusoidal: 10, 60 and 100 Hz square: 0.125 and 2.000 Hz
- Delta: 2000 Hz
- High level output (1 Vpp)
- Amplitude accuracy: ±2%
- Frequency accuracy: ±0.5% of setting value

Type	Article
SECULIFE PS100	M695L

SECULIFE PS200

Patient Simulator

BENEFITS:

The **SECULIFE PS200** makes it possible to freely select all available options via dropdown lists, and to retrieve the last used settings or customer-specific settings. Automated sequences can be selected for BDM, as well as for static pressure level.

It can be easily expanded to include an SpO_2 function. 1 channel for blood pressure and 12 arrhythmias are available.

The microprocessor-based patient simulator offers ECG patient simulation, 12 arrhythmias, auto-sequences for BPM, static pressure and performance. And thus you're provided with a lifelike, independent curve display of the ECG signals.

The instrument can be remote controlled via RS 232 and flash programmed in the field.

FEATURES:

- Functions: ECG, blood pressure, respiration, pacemaker and simple fetal/maternal simulation
- Temperature simulation (YSI 400 & 700)
- SpO_2 simulation (optional)
- Battery or external power pack: 90 to 264 V AC

Type	Article
SECULIFE PS200	M695M
FingerSim set	Z695B
SECULIFE OX	Z695A

SECULIFE PS300

Patient Simulator

BENEFITS:

The **SECULIFE PS300** is an easy to use patient simulator with which all parameters can be selected via a graphic display. Automated sequences can be selected for BDM and pressure.

10 patient ports are provided. It can be easily expanded to include an SpO_2 function. 2 channels for blood pressure and 49 arrhythmias are available.

Two graphic displays permit display and editing of all possible parameters. Whether for testing, inspection or vocational training, the **SECULIFE PS300** supplies the necessary simulations.

SpO_2 simulation (option) and full fetal/maternal simulation (including intrauterine pressure), as well as a cardiac output (option) are available in addition to ECG, blood pressure, respiration and temperature.

FEATURES:

- Functions: ECG, blood pressure, respiration, pacemaker and fetal/maternal
- Temperature simulation (YSI 400 & 700), cardiac output (option)
- SpO_2 simulation (option), fetal/maternal simulation (option)
- 49 arrhythmias / training mode for continuing education

Type	Article
SECULIFE PS300	M695N
FingerSim set	Z695B
SECULIFE OX	Z695A
Fetal/maternal	Z695P
Cardiac output	Z695O

SECULIFE BP PRO

NIBP simulator for testing patient monitors

BENEFITS:

The **SECULIFE BP PRO** is the high-end product from the new range of NIBP simulators and is distinguished by a great variety of functions.
It includes functions such as NIBP, IBP, ECG, temperature, arrhythmia, respiration, leak detection and much more.

Specially developed to cover a great diversity of functions and nevertheless to ensure a compact design, the **SECULIFE BP PRO** fulfills the requirements of modern medical technology. It makes no compromises with regard to functionality and input diversity. There's hardly another product with a similarly large range of features.

And the ability to provide offsets for specific NIBP manufacturers is otherwise only made available by systems with considerably higher procurement costs.
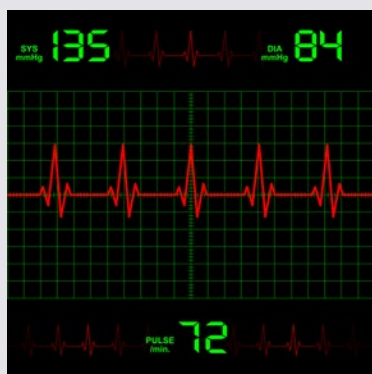
In addition to visualizing selected parameters and functions, the utilized graphic display can also be used for the visual representation of waveforms and to display pressure values.

Integrated flash memory permits trouble-free firmware upgrades.

It's equipped with freely selectable modes including adult, neonatal, hypersensitive and hyposensitive. It can be easily expanded to include an SpO_2 function.

FEATURES:

- NIBP, IBP, ECG, temperature, arrhythmia, respiration, leak detection and much more
- SpO_2 can be connected – compatible with SECULIFE OX1
- Small, portable, lightweight
- Easy operation with just a single key
- 0 to 500 mmHg pressure gauge
- ±1% deviation from measured pressure value
- Digital pressure envelope offset
- Total pressure and BP waveform displays
- Available modes: adult, neonatal, hypertensive and hypotensive
- Various display screens and character sizes
- Expandable during mobile use by means of flash programming
- RS 232 port
- Peak pressure detection with simple reset function
- ECG read-out with complete NSR waveform
- Simulation of sinusoidal respiration
- ECG performance test waveforms
- Pacemaker waveform
- ECG alarm test
- Read-out of synchronized invasive blood pressure
- Selectable IBP sensitivity: 5 or 40 µV / V / mmHg
- Leak test
- ECG arrhythmia waveforms
- ECG arrhythmia sequences
- YSI 400 and 700 simulation temperature
- 10 universal plugs for patient connector cables (BP PRO)
- Multi-connect ports
- Fetal/maternal, cardiac output option

BP PRO Multi-Connect Ports

Type	Article
SECULIFE BP PRO	M695P
SECULIFE BP PRO kit	M695W
Fetal/maternal	Z695P
Cardiac output	Z6950

Please refer to the data sheets for further technical specifications.

CABLE MATRIX

Invasive Blood Pressure Cable – mini DIN

Intended for use with multi-parameter patient simulators from GMC-I Messtechnik, these cables are equipped with a mini DIN connector (see connector type AA in the cable connector index), which is identical to the connector on older simulators from Bio-Tek Instruments and the current models of Fluke Biomedical's multi-parameter simulators.
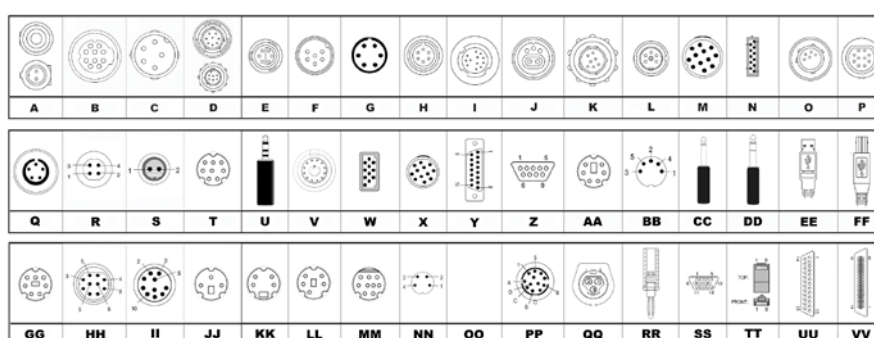
Monitor Manufacturer	Description (blood pressure cable connector, listed below, mini DIN plug at simulator)	Article # Mini DIN	Blood Pressure Cable Connection Overview
Burdick	10-pin female	20-40303	B
Care	5-pin male	Info obtainable from manufacturer	C
Corometrics	3-pin male / 3-pin female	Info obtainable from manufacturer	E
Corometrics	12-pin male	Info obtainable from manufacturer	M
Criticare	6-pin male	20-40301	H
Critikon	6-pin male	20-40301	H
Datascope	6-pin female	20-40302	F
Datex DX-1	10-pin female	20-40303	B
Fukuda Denshi FD-2 / DS3300	12-pin male	20-41311	V
Gould/Statham	5-pin male	Info obtainable from manufacturer	C
Hewlett Packard / Agilent / Philips	5-pin female	Info obtainable from manufacturer	J
Hewlett Packard / Agilent / Philips	12-pin male	20-41315	I
Hewlett Packard / Agilent / Philips	12-pin male (5 uV) (most common)	20-41314	I
Hewlett Packard / Agilent / Philips	12-pin male (IUP cable)	20-41344	PP
Invivo Research	6-pin male	20-41301	H
Ivy Biomedical	6-pin male	20-41301	H
Kontron/Roche	12-pin female	20-41318	X
GE Marquette 7000	8-pin male	Info obtainable from manufacturer	P
GE Marquette -3	11-pin male (most common)	20-41320	N
GE Marquette Twin	7-pin male / 8-pin male	Call factory	D
GE Marquette MQ-2	9-pin female	20-41319	OO
Medical Data Electronics (MDE)	6-pin male	20-41322	H
Mennen Medical	10-pin male	20-41323	II
Nihon Kohden	5-pin male	20-41324	O
North American Drager	6-pin male	20-41301	H
Novametrix	3-pin male / 3-pin female	Info obtainable from manufacturer	E
Ohmeda	6-pin male	20-41301	H
Physio Control	6-pin male	20-41301	H
Protocol Systems	6-pin male	20-41301	H
Puritan Bennett	10-pin female	Info obtainable from manufacturer	B
Puritan Bennett	10-pin female	20-41309	B
Siemens Medical Solutions SM-1	10-pin male	20-41329	HH
Siemens Medical Solutions SM-3	15-pin male	20-41328	Y
SMEC	6-pin female	20-41308	F
Spacelabs (TK-1)	6-pin male (most common)	20-41301	H
Spacelabs/Squib	5-pin male	20-41331	Q
Tektronix/Squib	6-pin male	20-41301	H
Vitastat	5-pin male	20-41331	Q
Vitatek/Squib	6-pin male	20-41301	H
Witt	6-pin female	20-41355	F
Universal BP Kabel	Unterminated pigtail	20-41340	Not shown
Universal adapter	Blood pressure cable adapter – mini DIN plug to large DIN socket	20-40736	AA – BB
Universal adapter	Blood pressure cable adapter – mini DIN socket to large DIN plug	20-40737	BB – AA

CABLE MATRIX

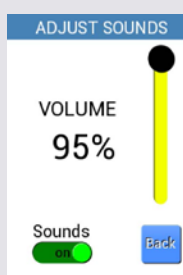| Universal External Power Supply (external power pack)	Description	Compatible with	Article #
	External power pack SECULIFE IF+ DP PRO/BASE / 9 V DC	IF+, DP PRO/BASE	**Z695L**
	External power pack for SECULIFE DF PRO/BASE, PS100/PS200/PS300 / 10 V DC	DF PRO/BASE, PS100/PS200/PS300	**Z695M**
	External power pack for SECULIFE NIBP / 12 V DC	NIBP	**Z695N**

Cable Connector Overview

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P

Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF

GG	HH	II	JJ	KK	LL	MM	NN	OO	PP	QQ	RR	SS	TT	UU	VV

Temperature Cables	Description	Connector A	Connector B	Article #
	UT-1 universal temperature cable YSI-400 series (PS-200 & PS-300 family)	T (male)	CC	**20-41333**
	UT-2 universal temperature cable YSI-700 series (PS-200 & PS-300 family)	T (male)	DD	**20-41334**
	Universal temperature cable (unterminated)	T (male)	None	**20-41351**
	Temperature cable, Hewlett Packard simulation cable	U (3.5 mm plug)	S (plug)	**Ask manu-facturer**
	UT-1 temperature cable, MaxiSim/416M YSI-400	NN	CC	**20-30010**
	UT-2 temperature cable, MaxiSim/416M YSI-700	NN	DD	**20-30020**
	UT-3 temperature cable, MaxiSim/416M without cable connector	NN	None	**20-30030**
	Temperature cable, Hewlett Packard YSI-400	NN	S (plug)	**20-30035**

Cardiac Output Cables	Description	Connector A	Connector B	Article #
	Cardiac output cable, HP injectate assembly	CC (¼" phone plug)	R (4-pin socket)	**20-41335**
	Cardiac output cable, HP temperature cable	A (socket, ¼" phone plug)	A (2-pin HP plug)	**20-41336**

Communication Cables and Other Cables	Description	Connector A	Connector B	Article #
	Communication cable for PS-200, PS-300, NIBP series, (mini DIN M to DB 9 F) – also used with flash update programming utility software	GG (male)	Z (female)	**20-41337**
	Cable adapter for PS-200, PS-300, NIBP series, DF+(USB to DB 9 M) – used on a PC that doesn't have an RS 232 port – includes cable and CD with driver software	EE	Z (plug)	**20-41339**
	Communication cable for DF+ and ES ranges (DB 9 M to DB 9 F)	Z (plug)	Z (female)	**20-41341**
	Communication cable for ES range, USB(A) plug to USB(B) plug	EE	FF	**20-41352**
	IF+ instrument to chamber connector cable (mini DIN male to mini DIN male)	T (male)	T (male)	**20-40607**
	RS 232 communication, USB(A)M to mini DIN male	GG (male)	EE	**20-41361**

Please refer to the data sheets for further technical specifications.

SECULIFE SP BASE

SpO$_2$ Simulator with Numerous Functions

BENEFITS:

The SECULIFE SP BASE is a digital SpO$_2$ simulator with numerous functions.

This high-performance instrument is distinguished by its minimal external dimensions in combination with an intuitive menu at the 2.4" color touchscreen. The simple operating structure permits easy access to, and a simple view of all setting and function parameters.

A manual mode is available for the performance of more specific assessments, which permits individual control of each parameter.
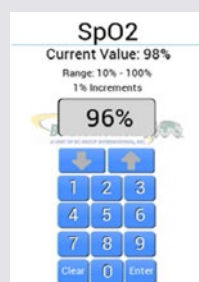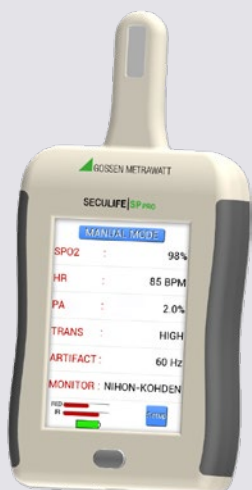
Existing presets for Nellcor, Masimo, Nonin, Nihon Kohden, Mindray, GE-Ohmeda, Philips/HP and BCI permit simple and convenient testing of SpO$_2$ monitors.

FEATURES:

- Intuitive user interface with color touchscreen
- Preset and manual mode
- 6 saturation levels from 80 to 99% with 2% accuracy
- Heart rates from 30 to 240 BPM with 1% accuracy
- Adjustable perfusion index
- Pulse synchronized with SECULIFE BP PRO, PS200 and PS300

Type	Article
SECULIFE SP BASE	M696B

SECULIFE SP PRO

SpO$_2$ Simulator with Extended Functions

BENEFITS:

The SECULIFE SP PRO is a digital SpO$_2$ simulator with extended functions.

The simple menu structure permits easy access to, and a simple view of all setting and function parameters.

This high-performance instrument is distinguished by its minimal external dimensions in combination with an intuitive menu at the 2.4" color touchscreen.

The SECULIFE SP PRO includes numerous factory settings in order to make testing your SpO$_2$ monitor easier.

Existing presets for Nellcor, Masimo, Nonin, Nihon Kohden, Mindray, GE-Ohmeda, Philips/HP and BCI permit simple and convenient testing of SpO$_2$ monitors.

Transmittance can be selected for small, medium or large fingers. Furthermore, artifacts such as respiration or ambient light can be selected for simulation.

A manual mode is available for the performance of more specific assessments, which permits individual control of each parameter. The SpO$_2$ rate can be set in steps of 1%. The BPM rate can be set in BPM steps.

FEATURES:

- Intuitive user interface with color touchscreen
- Preset and manual mode
- Saturation adjustable from 10 to 100% with 2% accuracy
- Heart rates from 25 to 240 BPM with 1% accuracy
- Adjustable perfusion index
- Adjustable transmission level
- Selectable artifacts
- Pulse synchronized with SECULIFE BP PRO, PS200 and PS300
- Compatible with Madimo Rainbow®

Type	Article
SECULIFE SP PRO	M696C

MAVOLUX B / C / BASE

Luxmeters

BENEFITS:

The MAVOLUX is a high-precision luxmeter for use in hospitals and medical practices.

It reliably measures the illuminance of daylight, as well as all types of artificial light sources, and is ideally suited for quality assurance:

Due to its outstanding accuracy in accordance with class B, the **MAVOLUX 5032 B** is used primarily for certification and inspection applications.

An additional measuring range with a high initial sensitivity of 0.01 lux makes it possible to measure extremely small illumination intensities. This even permits reliable measurement of emergency lighting.

With accuracy in accordance with class C, the **MAVOLUX 5032 C** is used primarily for general applications as an industrial measuring instrument.

The smallest of four measuring ranges begins with an initial sensitivity of 0.1 lux.
$V(\lambda)$ matching deviation, which amounts to f1' < 7.5%, is considerably better than the permissible error limit for class C.

As opposed to the **MAVOLUX B/C**, the **MAVOLUX 5032C BASE** Class C has **no USB interface**.

Great emphasis is placed upon reliability by means of calibration at GOSSEN. For the purpose of verification, a factory calibration certificate or a DAkkS calibration certificate can be ordered along with either variant.

FEATURES:

- Automatic and manual measured value switching
- Measured value memory
- Luminance attachment (optional)
- Illuminated display

Type	Article
MAVOLUX 5032 B	F503N
MAVOLUX 5032 C	F502N
MAVOLUX 5032C BASE	F502B

MAVO-MONITOR

Luminance Meter

BENEFITS:

Monitor screen luminance can be precisely measured and documented with the help of the MAVO-MONITOR precision measuring instrument.

This high precision luminance meter for contact measurements is assigned to class B in accordance with DIN 5032-7, appendix B of IEC 13032-1 and CIE 69. It measures the perceived brightness of luminous surfaces in candelas per square meter (cd/m²) or foot-lamberts (fL)

Excellent matching to the spectral brightness sensitivity of the human eye $V(\lambda)$ is highly precise with minimal deviation of just f1' < 3%, which is significantly better than specified in the standard.

The included adapter disc protects the meter from light leakage from the side during measurement, and the velvety coating prevents scratching of self-luminous and transilluminated surfaces.

In industrial, commercial and service applications, luminance can be measured at monitors of any type, TV screens, light tables, trough luminaires, illuminated advertising surfaces, traffic signs and viewing screens.

FEATURES:

- Automatic and manual measuring range selection
- Measured value memory
- USB port
- For contact measurements

Type	Article
MAVO-MONITOR	F504G

MAVO-SPOT

Luminance Measurements

BENEFITS:

The MAVO-SPOT is a precision instrument for the measurement of luminance with a measuring angle of 1°.

Luminance measurements at distances of 1 m to ∞ can be performed with the instrument. Close-up lenses available as accessories make measurements at distances of 34 to 50 cm or 51 to 100 cm possible.

The **MAVO-SPOT** features mirror reflex optics with a 15° field of view, a sharply marked 1° measuring circle in the center and a focusing mechanism.

Luminance can be measured directly at displays with the help of the optionally available probe for contact measurements. This permits testing of the homogeneity of monitor displays, as well as measurement of the homogeneity of multi-display systems.

The light sensitive sensor is color corrected, i.e. its spectral sensitivity is matched to the spectral luminous efficiency of the human eye in daylight $V(\lambda)$.

Classification of luminance meters is specified in DIN 5032, part 7, and DIN EN 13032, appendix B. The **MAVO-SPOT** fulfills class B requirements in accordance with these standards.

The instrument is equipped with a measured value memory module with up to 1000 memory locations which can be read out and processed either directly via the keypad and display, or via the integrated USB port with the help of the included standard software.

FEATURES:

The **MAVO-SPOT** is suitable for the measurement of, for example:

- Monitors in consideration of ambient light, for example approval and constancy testing in the field of medical technology in accordance with DIN 6868-57, DIN 6868-157, IEC 61223-2-5 (QS-RL dated 20 Nov. 2003) and IEC 62563-1

- Street, tunnel and airport illumination

- Sports lighting

- Contrast measurements at workstations (ASR)

- Illumination in museums and public buildings

- Projection screens (inspection for uniform illumination)

Type	
MAVO-SPOT 2	F508G

Probe for Contact Measurement

Designation per DIN 5032, Part 7	Permissible Error Limit per DIN 5032, Class B	SECULIFE IA
$V(\lambda)$ matching f_1	6%	< 3.0%
Influence of surrounding luminance f_2 (u)	2%	< 1.5%
Linearity error f_3	2%	< 1.5%
Temperature coefficient α_0, α_{25}	1% / K	≤ 0.5% / K
Polarization error $f8$	2%	< 0.8%

MAVOMAX 60 / RK1

Lighting Fixture Monitor

BENEFITS:

The **MAVOMAX** has been developed specifically for interior light monitoring and fulfills the latest requirements in medical settings.

The **MAVOMAX** simplifies quality assurance for diagnostic monitors and medical viewing devices in the field of medicine in accordance with DIN 6856-1.

It assures constant illumination and performs interior light monitoring at diagnostic workstations in accordance with DIN EN 61223-2-5 (QS-RL dated 20 Nov. 2003), DIN V 6868-57 / 6868-157.

2 models are currently available with measuring ranges including 20 to 60 lux (MAVOMAX 60) and 1 to 5 lux (MAVOMAX RK1). This makes room classification monitoring possible in accordance with the new DIN 6868-157.
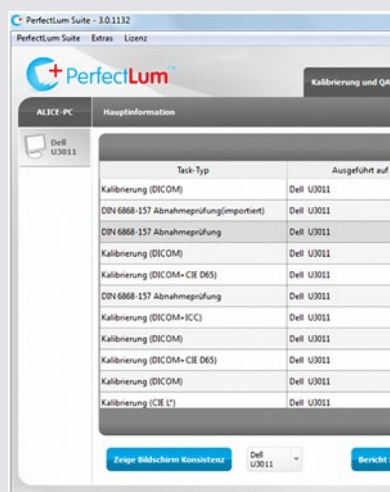
FEATURES:

- Power supply via USB or external power pack

- Color display (red/green) when the monitoring range is exceeded or fallen short of

Type	Article
MAVOMAX 60	F518G
MAVOMAX RK1	F517G

PERFECTLUM

Medical Monitor Quality Assurance Suite

BENEFITS:

PerfectLum 3.x Suite is a medical monitor quality assurance suite based on the following medical standards: NEMA DICOM part 14 GSDF, AAPM TG18, DIN 6868-57, DIN 6868-157, JESRA X-0093 and IEC 62563-1.

The medical monitor QA tool performs calibrations, as well as approval and conformity tests.
The consistency of all medical workstations is thus assured.

Use of this software makes it possible for technical medical personnel to ensure adherence to national and international standards.

Hospitals and clinics subject their medical equipment to a quality management program. Nevertheless, displays used for diagnostics and observation are frequently not included in these quality assurance procedures.

No monitor – medical or otherwise – displays images perfectly. Poor image quality results in fatigue for the doctors, additional time spent on observation and, in some case, to incorrect diagnoses. Decisions of vital importance which are based on the observation of computer displays necessitate calibration and quality assurance.

The DICOM Standard was developed and published by NEMA in the USA (National Electrical Manufacturers Association).

Part 14 of this standard describes how pixel values should be interpreted and displayed.

It also establishes a function which places pixel values in relationship to the displayed luminance values. This function is designated GSDF (gray scale display function).

In some countries, the legislators stipulate acceptance tests for diagnostic and observation displays when they're installed, as well as constancy tests at regular intervals for quality assurance.

Important QS standards include: AAPM TG18, DIN 6868-57, DIN 6868-157, JESRA X-0093 and IEC 62563-1.

Testing performed in accordance with these standards consist of visual and metrological tests which check for compliance with the requirements set forth in the standards.

FEATURES:

- Calibration of all displays in accordance with part 14 of the DICOM GSDF standard, and the CIE L standard
- Updating of the video LUT or the display LUT for monitors which comply with the DDC / CI standard
- Calibration of multi-monitor systems
- Execution report for comparing and checking calibration results
- Test images for visual monitoring of calibration results
- DICOM conformity
- Option for color measurement
- Support for commercially available photometers
- License is available to all users at the installed workstation
- Remote control

PERFECTLUM SUITE, ADDITIONAL FUNCTIONS:

- Performance of acceptance tests per DIN V 6868-57, DIN 6868-157 and IEC 62563-1
- Performance of constancy tests per DIN V 61223-2, DIN 6868-5 and IEC 6868-157
- Performance of tests in accordance with JESRA and AAPM
- Report generator for documents in accordance with legal requirements
- Automated quality assurance
- Scheduler with reminder function for planning tests
- Language support for German, English, Chinese, Japanese and Korean

SYSTEM REQUIREMENTS:

Microsoft Windows XP SP3, Vista SP1, 7, 8 or 10

Mac OS X, 10.5 to10.8 – Intel hardware required

Type	Article
PERFECTLUM	Z799A
PERFECTLUM Suite	Z799I
PERFECTLUM Dental	Z799K

IZYTRONIQ

A New Dimension of Test Technology

IZYTRONIQ is newly developed test software with which the entire testing scenario can be visualized, managed and documented in an audit-proof, instrument-independent fashion. And thus for the first time ever, you can combine and document measurement and test data from various test instruments and multimeters into a single test.

Intuitive operation and a modern look assure quick access to all functions. By intelligently selecting and hiding tools and workspaces, users are only offered options for action which are actually relevant for the respective task. Usability is supported by a creative design with expressive icons and the representation of complex database relationships in tree structures.

New IZYTRONIQ test software makes the entire testing sequence simpler and more flexible. Even complex tasks with numerous measuring points and different test sequences can be processed quickly, professionally and reliably. Sequences which are matched to the applicable standards can be programmed with individual test steps, in order to assure that all required measurements are conducted properly and recorded in the test report in a legally secure manner. As a result, the software supports electricians and test teams during initial and periodic testing of electrical systems, switchgear/controlgear assemblies and machines, as well as during safety and function tests for electrical and technical medical devices.

APPLICATIONS:

Testing of Technical Medical Devices

In order to assure that technical medical devices function safely and to their fullest extent, IZYTRONIQ supports you in fulfilling the relevant legal requirements quickly and simply, and permits especially efficient but nevertheless individual test documentation.

Testing of Electrical Devices

Regardless of whether testing after repair, initial testing or periodic testing is involved, – IZYTRONIQ places diverse options at your disposal for efficient, time-saving test procedures. As an alternative, individually created sequences can be transferred to the safety tester and executed there.

Testing of Machines

The complex structure of modern production machines necessitates a great variety of test steps, which are included in the overall measuring procedure. IZYTRONIQ does justice to this requirement through the use of individually programmable test sequences.

Testing of Equipment and Installations

IZYTRONIQ permits the entry of electrical systems using a tree structure and component-oriented allocation of test results by means of push-print communication via Bluetooth/USB. Even complex tree structures for multiple measurements at various test points can be transferred to the test instrument bidirectionally.

OVERVIEW — Perfectly Matched Software Packages for Your Requirements

IZYTRON .IQ

Functions	Business				Enterprise	
	Starter	Advanced	Professional[1]	Premium[1]	Premium[2]	Ultimate[3]
Stationary objects (machines and systems)	■	■	■	■	■	■
Portable objects (equipment and medical devices)	■	■	■	■	■	■
Tree structure for machines and systems	■	■	■	■	■	■
Tree structure for equipment and medical devices	■	■	■	■	■	■
Tree structure for locations (properties, buildings, floors and rooms)	■	■	■	■	■	■
Push-print	■	■	■	■	■	■
Test instrument management	■	■	■	■	■	■
User administration	■	■	■	■	■	■
Sequence management and sequence editor	■	■	■	■	■	■
Catalog management and editing	■	■	■	■	■	■
Universal report as PDF file	■	■	■	■	■	■
List generator (PDF, Excel)	■	■	■	■	■	■
Individualized report template generation with Microsoft Word®		■	■	■	■	■
Company logo integratable into report		■	■	■	■	■
Scanned signature integratable into report		■	■	■	■	■
Barcode generator		■	■	■	■	■
PROFISCAN list generator		■	■	■	■	■
Remote function			■	■	■	■
Manual entry of measured values			■	■	■	■
Images/photos integratable into test reports			■	■	■	■
Document management			■	■	■	■
MULTI changes			■	■	■	■
Dashboard function in home screen			■	■	■	■
Quick links			■	■	■	■
Analysis and trend indication for identical tests conducted on a given object			■	■	■	■
Global statistics with failure rate as percentage as PDF printout			■	■	■	■
Role and rights management for users				■	■	■
Window designer and data field editor for individualizing the application				■	■	■
Network-compatibility – connection to an external MS SQL database (server)					■	
Multi-user operation as floating license model					■	
Data replication (reconciliation of mobile data) only in combination with Enterprise Premium						■
Article Number	S101V	S102V	S103V	S105V	S107V	S109V

[1] Scope of functions is identical to Education Professional (art. no. S104V) and Education Premium versions (art. no. S106V)

[2] Scope of functions is identical to the Premium Cloud version

[3] Prerequisite for use: at least one ENTERPRISE Premium license

Education		.IQ
Professional	Premium	CLOUD
S104V	S106V	

GMC INSTRUMENTS CLOUD

Cloud computing is probably the most important technological development in recent years. The world's going digital, and data is no longer stored locally but rather in the cloud. But which benefits does cloud computing offer for measuring and test applications?

Getting started with the modern world of cloud computing is easy. The GMC-INSTRUMENTS CLOUD can provide you with a platform solution for working more efficiently, easier and more securely. The required IT infrastructure is made available by means of a computer network with various applications. Instead of high initial investment costs and complex setup of the required server landscapes, services are made available immediately as a package in return for a monthly fee. As a user, you can conveniently book services online at any time of day, 365 days a year, or add further users and functions via the GMC-INSTRUMENTS CLOUD portal.
Security is a very important issue for us. This is why special

attention was already focused on data protection and data security during the conceptualization and implementation phases.
The GMC-INSTRUMENTS GROUP uses European server landscapes. All of our data is stored at data centers which maintain highest possible security standards. Where contract and payment processing is concerned, we work together with companies based in Germany and guarantee that we handle your data with utmost care and in accordance with German law.
All links between the individual services are of course SSL-encrypted and secured.

MORE SECURE

Security is fundamental. From data backups and encrypted communication, right on up to security updates – we offer comprehensive protection. Our cloud solution is hosted on European servers and of course complies with the General Data Protection Regulation (GDPR).

MORE FLEXIBLE

We supply the required IT infrastructure in combination with the necessary software components. Our cloud is at your disposal 365 days a year. If your cloud tasks or requirements grow, you can extend them yourself with only minimal lead-time.

MORE EFFECTIVE

Perfectly matched components have a lasting effect on your test process and furnish it with a well-organized structure. Efficiency is thus increased, and testing costs are reduced.

MORE INTELLIGENT

Measurement and test data from various instruments can be combined into a single test, documented and shared with your customers without any post-processing time.

IZYTRONIQ CLOUD COLLECTION

The **IZYTRONIQ CLOUD COLLECTION** provides you with perfectly matched components which ensure structurally organized execution of tests and their documentation in compliance with the standards. The establishment of orderly test structures is imperative due to legally stipulated employer responsibility.

IZYTRONIQ CLOUD COLLECTION simplifies work in the test team and the creation of a legally secure test organization at especially attractive prices. And you can always access your data – regardless of your geographic location.

The package includes IZYTRONIQ, VIZIONIQ and ELEXONIQ.

✔ **Easy testing**

✔ **Easy inventory taking**

✔ **Easy provision of data**

✔ **Anytime, anywhere**

✔ **For companies of all sizes**

✔ **At attractive prices**

Your Benefits

- Immediate availability
- Audit-proof data and report management in the cloud
- Simple test organization setup

- Time and cost savings
- Increased efficiency thanks to process-optimized, flexible application
- Faster availability of test documentation

IZYTRONIQ PREMIUM CLOUD – TESTING SOFTWARE

The cloud version of the testing software is installed locally on a notebook, a tablet or a computer. It offers all of the functionality provided by a IZYTRONIQ ENTERPRISE Premium license: quick and easy setup of complex structures and tests.

✔ **Work in teams without having your own server**

✔ **Multiple users, central data**

✔ **Easy to use, creative design**

ELEXONIQ INVENTORY – THE INVENTORY APP

Take inventory and synchronize various locations and objects directly in the cloud with ELEXONIQ Inventory. Available for Android, iOS and Windows, inventory can easily be taken online or offline using a smartphone, a tablet or a notebook.

✔ **Quick data acquisition thanks to optimized views**

✔ **Universal usability/flexibility**

VIZIONIQ DASHBOARD - THE CUSTOMER PORTAL

Provide your customers with insight into test data with the VIZIONIQ Dashboard! For example, test reports can be opened as PDF files in the portal via the browser. Beyond this, all data concerning objects can be viewed, including test results. Selection can be made as to who's permitted to see which data.

✔ **Provision of test reports and attachments for end customers**

✔ **Overview lists of devices under test**

✔ **Simple administration and independent expandability**

Please refer to the data sheets for further technical specifications.
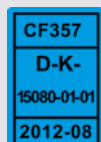
CALIBRATION

Calibration of Measuring Equipment at the World's Largest DAkks Calibration Center for Electrical Quantities or in Gossen Metrawatt's Accredited Light Laboratory

Accreditation

Calibration Stamp

Calibration Seal

Factory Calibration Certificate

Why do measuring instruments have to be calibrated?

As a standard for quality management systems, **DIN EN ISO 9001:2008** stipulates essential requirements for monitoring measuring equipment in section 7.6, insofar as it's used to assure compliant results, and thus uniform product quality as well.

Measuring instruments must be traced to national standards at regular intervals by means of calibration, and if necessary adjusted, and clearly labeled with their calibration status.

Consequently, calibration at regular intervals assures the quality of the respective product or service on the basis of internationally comparable measurement results. This provides for legal security with respect to product liability, as well as for approval tests and audits.

Accredited Calibration (DAkkS calibration)

The Deutsche Akkreditierungsstelle GmbH (DAkkS) is the national accreditation body for the Federal Republic of Germany for, amongst other functions, auditing, accreditation and monitoring of test and calibration laboratories in accordance with **DIN EN ISO/IEC 17025.**

This standard includes requirements for the technical qualifications and competence of the laboratory, as well as its quality management system.

DAkkS calibration certificates can only be issued for the measured quantities described in the accredited laboratory's QM manual and published by DAkkS.

External audits and reaccreditation at regular intervals assure high levels of quality.

Worldwide recognition of DAkkS calibration certificates represents an additional advantage of accredited calibration.

Factory Calibration (ISO calibration)

Factory calibration is frequently conducted by manufacturers or non-accredited laboratories, whose measuring equipment is subject to monitoring in accordance with DIN EN ISO 9001:2008.

As opposed to accredited laboratories, no external assessment of technical qualifications and competence is required in this case.

The content to be included in factory calibration certificates can be agreed upon in cooperation with the calibration laboratory.

If the utilized measuring procedure is not recognized, traceability of the measurement results must be substantiated in the calibration certificate.

Calibration Intervals

Elapsed time between any two calibration procedures for measuring and test instruments is known as the calibration interval and must be established and monitored by the user in accordance with his own requirements. Essential criteria for determining the calibration interval include:

- Measured quantity and permissible tolerance
- The extent to which the measuring and test equipment is subject to stressing
- Frequency of use
- Ambient conditions
- Stability of previous calibrations
- Required measuring accuracy
- Company-specific requirements stipulated by the quality assurance system

We recommend a calibration interval of 1 to 2 years for use under normal conditions.

We recommend a calibration interval of 1 year for measuring instruments which are used on a regular basis for audits, evaluating work safety and assuring the quality of products and services, as well as under severe ambient conditions.

Terms and Conditions of Sale and Delivery

The "general terms and conditions of delivery for electrical industry products and services" apply, including the supplement regarding extended reservation of proprietary rights, in the respectively most up-to-date revision.

Subject to change without notice. Errors excepted.

Prices

All prices are specified in euros. They represent non-binding recommended prices ex-factory not including packaging. Respectively applicable value added tax is invoiced as a separate item.

Prices and standard equipment included with instruments or components do not include project engineering, programming, initial start-up or the like.

Prices are subject to change without notice. The currently valid price on the day on which delivery takes place shall be invoiced.

The minimum net order value is €100.00.

A surcharge of €20.00 will be added to orders amounting to less than the minimum net order value.

Order Information

Please enter complete, explicit order information in order to avoid unnecessary enquiries and misunderstandings during the course of order processing.
Devices and components can be ordered either by entering the designation and description in plain text, or by entering the article number and all required features.

Export and Customs Documentation

One service charge will be invoiced per document for shipping instructions which deviate from normal shipping conditions within the Federal Republic of Germany, for example preparation of certificates of origin, issuance of delivery notes in foreign languages, preparation of export declarations etc.

Online Information

Available from our website and our online shop at: www.gossenmetrawatt.com

DAkkS and Factory Calibration Certificates for Recalibration, and Test Reports for Periodic Testing

Additional information and prices for calibration certificates and reports, in particular for instruments which could not be included in this price list due to space limitations (e.g. calibration certificates for clamp meters, probes and measuring adapters), can be found:

- In our services catalog
- On the Internet at: www.gmci-service.com

Orders / RFQs (pre-sales service)

Experienced employees can be contacted by phone at:
+49-911-8602-111
at the following times:

Monday to Thursday	7:30 a.m. to 5 p.m. and
Friday	7:30 a.m. to 3 p.m.

Address: GMC-I Messtechnik GmbH
Order Processing
Südwestpark 15
90449 Nürnberg, Germany
Phone: +49-911-8602-111
Fax: +49-911-8602-777
e-mail: vertrieb@gossenmetrawatt.com

Service Offerings (after-sales service)

Repair of all measuring and test instruments supplied by ourselves. Delivery of replacement parts within three workdays.

- Rental instrument service
- DAkkS calibration center
- Test equipment management
- Disposal of old instruments

Address: GMC-I Service GmbH
Technical Services
Beuthener Str. 41
90471 Nürnberg, Germany

Information: Phone: +49-911-817718-0
Fax: +49-911-817718-253
e-mail: service@gossenmetrawatt.com
Internet: www.gmci-service.com

Training Offerings

Comprehensive seminar offerings are available for technical training with all of our measuring instruments.
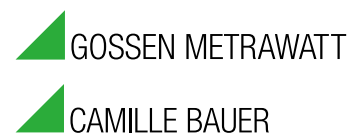
Please request a seminar calendar.

Address: GMC-I Messtechnik GmbH
Training Department
Südwestpark 15
90449 Nürnberg, Germany

Information: Phone: +49-911-8602-935
Fax: +49-911-8602-724
e-mail: training@gossenmetrawatt.com

GMC **I**NSTRUMENTS

GOSSEN METRAWATT

CAMILLE BAUER

THE GMC GROUP IS PRESENT ALL OVER THE WORLD WITH SUBSIDIARIES AND SALES PARTNERS.

Your Sales Partner

ELECTROMEDICIONES KAINOS S.A.
Poligon Industrial Est · Energía, 56
E-08940 Cornellá de Llobregat · Barcelona
Phone: +34 934 742 333 · Fax: +34 934 743 470
www.kainos.es · kainos@kainos.es

GMC-INSTRUMENTS ITALIA S.R.L.
Via Romagna, 4
I-20046 Biassono (MB)
Phone: +39 039 2480 51 · Fax: +39 039 2480 588
www.gmc-instruments.it · info@gmc-i.it

GMC-INSTRUMENTS NEDERLAND B.V.
Daggeldersweg 18
NL-3449 JD Woerden
Phone: +31 348 42 11 55 · Fax: +31 348 42 25 28
www.gmc-instruments.nl · info@gmc-instruments.nl

CAMILLE BAUER METRAWATT AG
Aargauerstrasse 7
CH–5610 Wohlen AG, Switzerland
Phone: +41 44 308 80 80 · Fax: +41 44 308 80 88
www.gmc-instruments.ch · salesch@camillebauer.com

GMC-INSTRUMENTS FRANCE SARL
3 rue René Cassin
F-91349 Massy Cedex
Phone: +33 1 6920 8949 · Fax: +33 1 6920 5492
www.gmc-instruments.fr · info@gmc-intruments.fr

GMC-MĚŘICÍ TECHNIKA S.R.O.
Fügnerova 1a
CZ-67801 Blansko
Phone: +420 516 482 611/-617 · Fax: +420 516 410 907
www.gmc-cz · gmc@gmc.cz

GMC-INSTRUMENTS AUSTRIA GMBH
Richard-Strauss-Str. 10 / 2
A-1230 Vienna
Phone: +43 1 890 2287 · Fax: +43 1 890 2287 99
www.gmc-instruments.co.at · office@gmc-instruments.co.at

GMC-INSTRUMENTS (TIANJIN) CO., LTD.
Rm.710 · Jin Ji Ye BLD. No. 2 · Sheng Gu Zhong Rd.
P.C.: 100022 · Chao Yang District
Phone: +86 10 84798255 · Fax: +86 10 84799133
www.gmci-china.cn · info@gmci-china.cn