

# MEDICAL MEASURING AND TEST TECHNOLOGY 2022 / 2023

MAIN CATALOG





# EDITORIAL



**Marcel Hutka**  
**Managing Director**  
**Gossen Metrawatt GmbH**



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.

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

**October 1919:** 7 employees  
**October 1920:** 28 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)

**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

**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



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

**Rebranding to GMC-I Messtechnik GmbH**



**2015** Acquisition of the British Seaward Group



**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.



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



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



**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.

## TABLE OF CONTENTS

---

### MEDICAL MEASURING INSTRUMENTS AND TESTERS

02	EDITORIAL
03	GOSSEN METRAWATT – COMPANY HISTORY
04	TABLE OF CONTENTS
05	INSTRUMENTS – OVERVIEW
06	SECULIFE ST BASE / BASE25 / PRO SAFETY TESTERS
08	SECULIFE HIT AM / MD SAFETY TESTERS
09	SECULIFE UP / UL MEASURING INSTRUMENTS
10	SECULIFE DF BASE / DF PRO FUNCTION TESTERS
11	SECULIFE DF BASE / DF PRO FUNCTION TESTERS – VARIABLE LOAD SECULIFE VL
12	SECULIFE IF BASE / IF PRO MEASURING INSTRUMENT
13	SECULIFE DP BASE / DP PRO MEASURING INSTRUMENTS
14	SECULIFE ES PRO HF SURGERY MEASURING INSTRUMENTS
15	SECULIFE ES TECH HF SURGERY MEASURING INSTRUMENTS
16	SECULIFE ES XTRA / ES PRIME HF SURGERY MEASURING INSTRUMENTS
17	PATIENT SIMULATORS – OVERVIEW
18	SECULIFE PS100, PS200, PS300 PATIENT SIMULATORS
19	SECULIFE BP PRO PATIENT SIMULATOR
20	CABLE MATRIX
22	SECULIFE SP BASE / SP PRO
23	MAVOLUX B/C/BASE / MAVO-MONITOR PHOTOMETRY INSTRUMENTS
24	MAVO-SPOT / MAVOMAX 60 / RK1 PHOTOMETRY INSTRUMENTS
25	PERFECTLUM SOFTWARE
26	IZYTRONIQ SOFTWARE



SAFETY TESTERS



SECULIFE ST BASE  
PAGE 06



SECULIFE ST PRO  
PAGE 07



SECULIFE HIT MD / AM  
PAGE 08

FUNCTION TESTERS



SECULIFE DF BASE / PRO  
PAGE 10



SECULIFE IF BASE  
PAGE 12



SECULIFE IF PRO  
PAGE 12



SECULIFE DP BASE / PRO  
PAGE 13

HF SURGERY FUNCTION TESTERS



SECULIFE ES PRO  
PAGE 14



SECULIFE ES TECH  
PAGE 15



SECULIFE ES XTRA /  
ES PRIME  
PAGE 16



SECULIFE UP  
PAGE 09



SECULIFE UL  
PAGE 09

PATIENT SIMULATORS



SECULIFE  
PS100  
PAGE 18



SECULIFE  
PS200  
PAGE 18



SECULIFE  
PS300  
PAGE 18



SECULIFE  
BP PRO  
PAGE 19



SECULIFE  
SP BASE  
PAGE 22

PHOTOMETRY



MAVOLUX B/C/BASE  
PAGE 23



MAVO-MONITOR  
PAGE 23



MAVO-SPOT  
PAGE 24



MAVOMAX 60/RK1  
PAGE 24

SOFTWARE



PERFECTLUM  
PAGE 25



IZYTRONIQ  
PAGE 26





## 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

Type	Article
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	SECULIFE ST BASE25	SECULIFE ST PRO
	M694A	M694B	M694C
IEC 62353 / 61010 / 60601 Individual Measurements	■	■	■
Auto sequence with sequence and limit values	■	■	■
Automatic sequences for:			
IEC 62353	■	■	■
IEC 61010	—	—	■
IEC 60601	—	—	■
DIN EN50678 (VDE 0701)	■	■	■
DIN EN50699 (VDE 0702)	■	■	■
Memory + Interface	■	■	■
Test current 10A	■	—	■
Test current 25A	—	■	optional
Connections for applied parts	—	—	10
Housing with antimicrobial efficiency	■	■	■
Weight	2,5 kg	4,0 kg	2,5 kg

\* Required depending on model and/or optional accessory

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 MEASUREMENT CABLE WITH ANTIMICROBIAL PROPERTIES

- Voltage measurement
- Auto-ranging current measurement from 100  $\mu$ A (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  $\mu$ A (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 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 degasified water. Coupling is established to a precision scale with measuring accuracy of  $\pm 0.15$  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 ultrasound 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  $\mu$ A
- 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



## 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  $\Omega$ ). 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



Model	SECULIFE DF BASE	SECULIFE DF PRO	SECULIFE VL
Performance test	■	■	—
Transcutaneous external pacemaker testing	—	■	—
ECG Simulation, Algorithms	■	■	—
Test loads for external pacemakers	—	■	—
Mono-, bi- und pulsatile biphasic energy measurement	■	■	—
Test with variable patient loads	■ with VL	■ with VL	■ with DF
Standard-Patient-Testloads	50 Ω	50 Ω	—
Refractory period test	—	■	—







## SECULIFE IF BASE



### Ein-Kanal Infusionspumpengerät

#### BENEFITS:

The SECULIFE IF BASE infusion pump tester is a portable, battery-operated measuring device, which can be used to test and measure the performance of infusion devices in medical institutions. The SECULIFE IF BASE measures the pressure generated during blockages of the fluid line (occlusions) and the flow rate as well as the volume delivered.

The performance of many infusion devices can be analysed, including syringes, droppers, peristaltic and volumetric pumps.

The product is intended for use by service providers, hospital biomedical engineering departments and infusion device manufacturers. The product works only with distilled or deionised water.

#### FEATURES:

- Flow measurement 0.1 to 1100 ml/h 1 to 2 % accuracy
- Volume measurement 0 to 9999 ml 1% accuracy
- Occlusion -5 bis 50 psi
- Resolution 0.01 PSI, Accuracy 0.1% FS
- Operation via 5.0 inch colour LCD, capacitive touch screen
- Memory for 100 tests
- Internal rechargeable smart lithium battery
- Metering pump
- Self-venting

Type	Article
SECULIFE DP BASE	M696D

## 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 SECULIFE IF PRO is equipped with integrated auto-sequence functions which make it possible for the user to execute automated test procedures.

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. 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.

#### FEATURES:

- Flow measurement
- PCA/bolus
- Back pressure simulation
- Occlusion alarm
- Trumpet curve analysis
- Interchangeable test modules
- Calibration of the test modules without the basic unit
- Device can be operated during calibration
- Testing in accordance with IEC 60601-2-24
- Measuring range: 10 µL to 1600 mL/hr
- Configurable pressure (mmHg, psi, bar, kPa)
- 32 GB internal memory
- Highly accurate (down to 1%)
- User-adjustable test limits
- Automatic test sequences
- Flash programmable on-site
- Printing of test results with optional printer

#### SOFTWARE:

BC-Flow™ 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.

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<sub>2</sub>O, cmH<sub>2</sub>O 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



Model	SECULIFE ES PRO	SECULIFE ES TECH	SECULIFE ES XTRA	SECULIFE ES PRIME
1% measuring accuracy	■	1,5 %	■	■
Current measurement method	■	■	■	■
Load resolution	—	5 Ω	1 Ω	1 Ω
Variable loadbank	—	0-5600 Ω	0-6400 Ω	0-6400 Ω
HighCrest Factor	■	■	■	■
1% REM/CQM/ARM accuracy	Option	2,5 %	■	■
Basis-Measurements pulsed mode	■	—	■	■
Advanced-Measurements in pulsed mode	—	—	—	■
Simulation of tissue response	—	—	Option	Option
Communication with DUT	—	—	■	■
Touch Screen Interface	—	■	■	■
Software-Updates via Web-Interface	—	■	■	■
Network capability for almost unlimited data storage	—	■	■	■
PDF format can be stored locally for maximum stand-alone usability	—	■	■	■

## 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

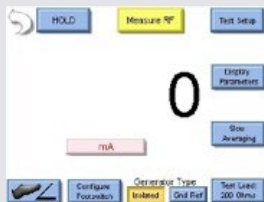
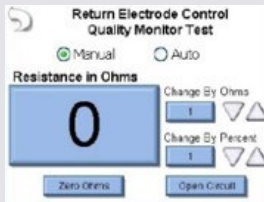
Type	Article
SECULIFE ES PRO	M695B
Current transformer, 1:1	Z697A
Current transformer, 0.1:1	Z697B
Load resistors	Z696A - Z696U





## SECULIFE ES TECH

### Electrosurgical Analyser



#### BENEFITS:

Electrosurgical units (ESUs) use a high-frequency electric current to cut tissue and control bleeding by causing coagulation. The resistance of the tissue to the high-frequency current causes a heating effect that leads to tissue destruction. The HF surgical generators can use a monopolar or a bipolar mode.

In monopolar mode, the electric current is delivered to the patient via an active cable and an electrode. The current returns to the unit via a counter-electrode pad or plate to disperse the return current, preventing concentrated heat that can cause burns. In bipolar mode, two electrodes, typically the tips of tweezers or scissors, serve as the equivalent of active and dispersive leads in monopolar mode.

The SECULIFE ES TECH allows the user to perform mobile test procedures as well as calibration procedures even on the latest generators from leading manufacturers with unprecedented precision and accuracy.

Features such as automated power load curve tests with multiple power steps per load setting and automated, definable test auto sequences with an unlimited number of steps, each with virtually unlimited ASCII text descriptions, also help put the new SECULIFE ES TECH in a class of its own.

#### FEATURES:

- Industry standard RF current measurement for RF waveforms.
- Ultra-fast digitisation of the complete RF waveform
- Performs CQM (Contact Quality Monitor) tests using internal loads
- Displays up to 15 different measurement parameters on selectable and definable screens
- Internal precision test loads from 0 to 5600 in 5 steps
- Compatible with external test loads
- Automated current load curves with different power levels per load setting
- Automated, freely definable test sequences
- Bluetooth
- Printout of test results on printers with RS232 or USB connection
- USB (3), and Ethernet ports
- REM/ARM/CQM testing using 500 load, adjustable in 1 increment
- RF leakage current measurement

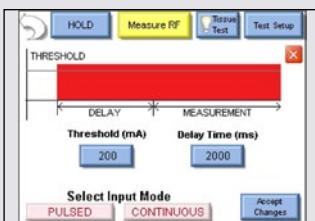
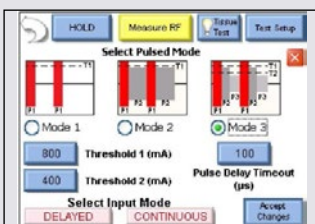
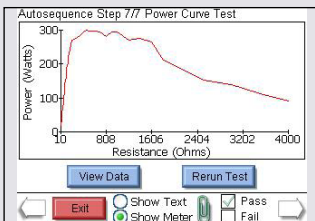
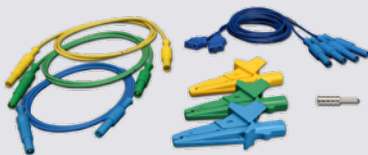
Type	Article
SECULIFE ES TECH	M695T





# SECULIFE ES XTRA SECULIFE ES PRIME

## Electrosurgical Analyzer



Remote Control

### 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 unequalled 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



## OVERVIEW

## Patient Simulators

Model	PS100	PS200	PS300	BP PRO
<b>General</b>				
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. 9V battery	2 ea. 9V battery	2 ea. 9V battery	6 ea. 1.5V 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
<b>Special Functions</b>				
SpO <sub>2</sub> 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
<b>Physical</b>				
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





## 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:  $\pm 2\%$
- Frequency accuracy:  $\pm 0.5\%$  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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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<sub>2</sub> 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.

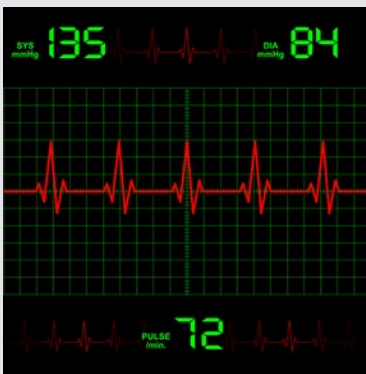
In addition to visualizing selected parameters and functions, the utilized graphic display can also be used for the visual representation of waveforms and to display pressure values.

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<sub>2</sub> function.

#### FEATURES:

- NIBP, IBP, ECG, temperature, arrhythmia, respiration, leak detection and much more
- SpO<sub>2</sub> 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  $\mu\text{V} / \text{V} / \text{mmHg}$
- 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



## 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
Novamatrix	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/Squibb	5-pin male	20-41331	Q
Tektronix/Squibb	6-pin male	20-41301	H
Vitastat	5-pin male	20-41331	Q
Vitatek/Squibb	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

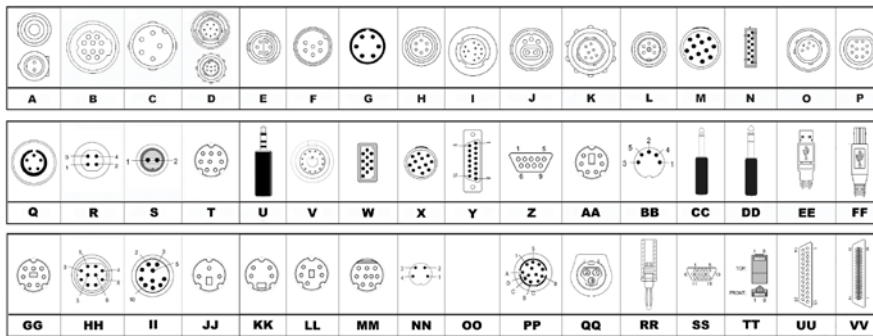




## CABLE MATRIX

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



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 manufacturer
	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 (1/4" phone plug)	R (4-pin socket)	20-41335
	Cardiac output cable, HP temperature cable	A (socket, 1/4" 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



## SECULIFE SP BASE

### SpO<sub>2</sub> Simulator with Numerous Functions



#### BENEFITS:

The SECULIFE SP BASE is a digital SpO<sub>2</sub> simulator with numerous functions.

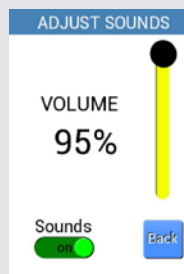
This high-performance instrument is distinguished by its minimal external dimensions in combination with an intuitive menu at the 2.4" color touchscreen. The simple operating structure permits easy access to, and a simple view of all setting and function parameters.

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<sub>2</sub> 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



## 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 ( $cd/m^2$ ) 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



Probe for Contact Measurement

#### 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

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 $\alpha_{20}, \alpha_{25}$	1% / K	≤ 0.5% / K
Polarization error $f_8$	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:

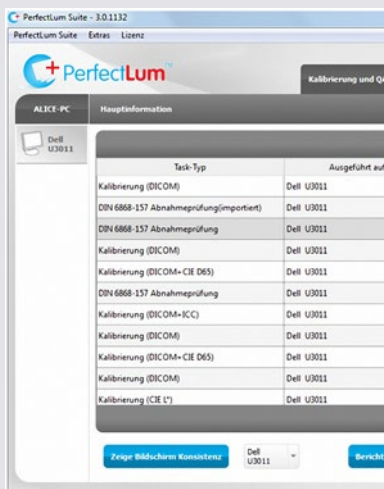
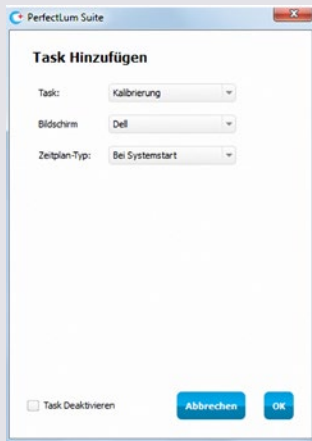
- Power supply via USB or external power pack
- Color display (red/green) when the monitoring range is exceeded or fallen short of

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 to 10.8 – 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



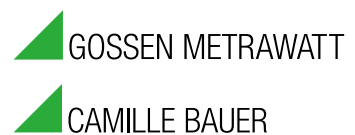
IZYTRON

Functions	Business			
	Starter	Advanced	Professional <sup>1</sup>	Premium <sup>1</sup>
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 <sup>®</sup>		■	■	■
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

<sup>1</sup> Scope of functions is identical to Education Professional (art. no. S104V) and Education Premium versions (art. no. S106V)

Education	
Professional	Premium
S104V	S106V

# GMC INSTRUMENTS



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

**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-instruments.fr

**GMC-MĚŘÍČÍ TECHNIKA S.R.O.**

Függerova 1a  
CZ-67801 Blansko  
Phone: +420 516 482 611/-617 · Fax: +420 516 410 907  
www.gmc-cz · gmc@gmc.cz

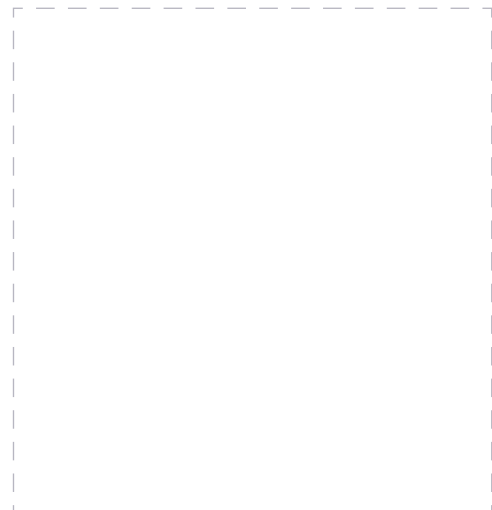
**GMC-INSTRUMENTS AUSTRIA GMBH**

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

Your Sales Partner



**Gossen Metrawatt GmbH**

Südwestpark 15 · 90449 Nürnberg · Germany  
Phone: +49 911 8602-0 · Fax: +49 911 8602-669

www.gossenmetrawatt.com · info@gossenmetrawatt.com