

# Medical Technology

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# EDITORIAL

Dear reader,

Thank you for your interest in our products and services covering all aspects of measuring and test technology. Our product range is distinguished by values such as quality, reliability, safety and advanced technology, as well as dynamic design, extremely easy operation and a unique innovative spirit. After all, our measuring and test technology expertise is built into each of our products – and has been for more than 100 years.

Again and again, users tell us that “measuring and test systems from GOSSEN METRAWATT are safe, reliable and economic”, and we’re very pleased to hear it because this is precisely what we strive to accomplish, and that’s what differentiates us from the competition. And we’re self-assured enough to go one step beyond this as well:

**GOSSEN METRAWATT stands for reliability and competence in measuring and test technology.**

We’re ready to meet the challenges of future market developments with attractive new products, as well as services, consultation, project engineering, training and on-site assistance.

You get support and competent, personalized advice. This is your guarantee of a customer-oriented sales network with highly qualified sales engineers.

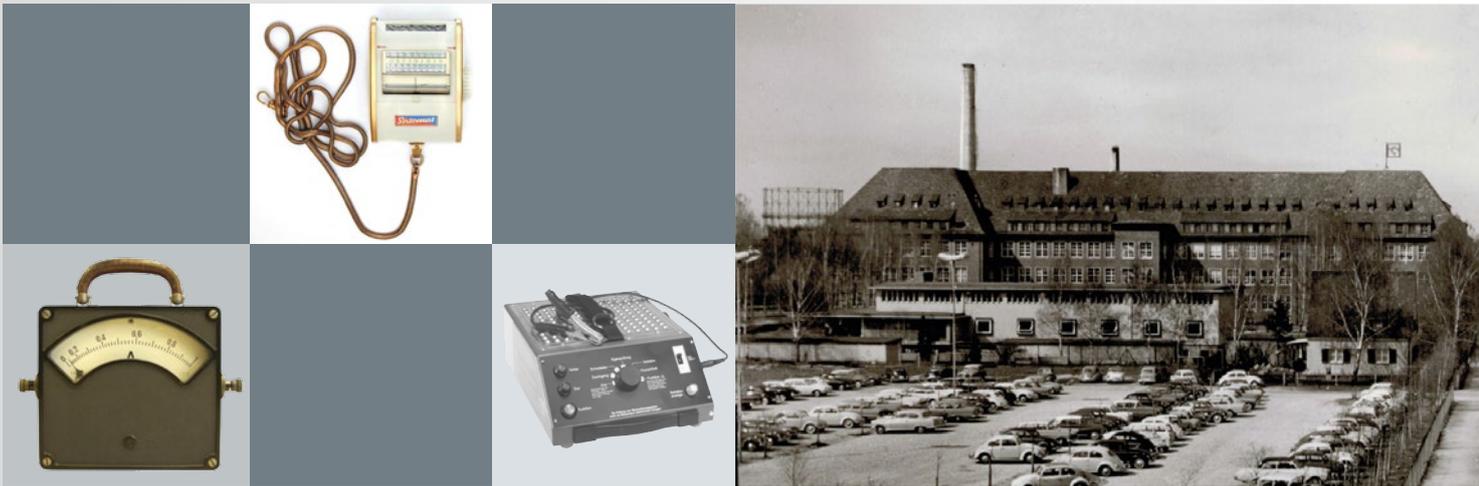
We’ve grown together with you over a period of many decades, and have always striven to align ourselves to your requirements

**You can count on us!**



Deutsche  
Akkreditierungsstelle  
D-K-15080-01-01





## QUALITY AND INNOVATION BASED ON 100 YEARS OF EXPERIENCE

The GOSSEN METRAWATT, CAMILLE BAUER and DRANETZ brand names are hallmarks of innovation and quality for measuring and test instruments, industrial measuring and control technology, and for mains quality and analysis in the electronic capital goods market. Beyond this, Gossen Photo- und Lichtmesstechnik GmbH produces industrial photometry equipment.

Our international production facilities are located in Germany, Switzerland, England and the USA.

GMC-I Messtechnik GmbH offers consultation, sales, training and competent after-sales support including service, calibration and repair.

Additional sales organizations are located in Italy, the Netherlands, the Czech Republic, Switzerland, Austria, France, Spain and China. In England, our products are marketed by GMC-I ProSys.

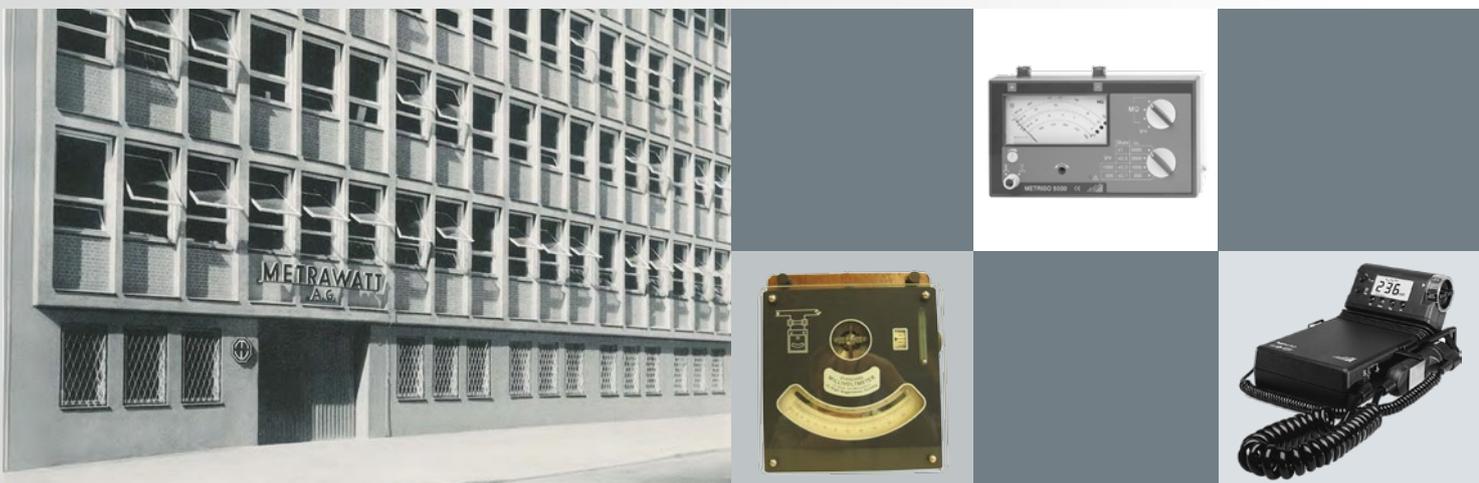
### Guggenheimer AG (Metrawatt AG)

On the 20<sup>th</sup> of August in 1906, Siegfried Guggenheimer registered a company in Nuremberg for the production and marketing of electric measuring instruments, which he named after himself. In 1933, the company was rebranded to Metrawatt AG.

### Paul Gossen Co.K.G

On 1 September 1919, Paul Gossen founded the Paul Gossen Co.K.G. factory for electrical measuring instruments in Baiersdorf. One year later, the company moved to Erlangen.

**The two companies merged in 1992.**





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## SECULIFE | ST



SECULIFE | ST with (P)Si Module

Type	Article
SECULIFE ST	M693A

## Safety Testers for IEC 60601 and IEC 62353

### Benefits:

All safety relevant, characteristic electrical values can be measured and documented for portable and stationary medical devices with the menu-driven **SECULIFE | ST**. And you even have the choice between fully automated or manual test sequences.

The **SECULIFE | ST** detects mains supply power, safety class and any mains connection errors at the device under test. The test sequence is significantly simplified by means of the automatic mode:

- ▲ Select a regulation.
- ▲ Press the start key.
- ▲ Read the results.

Complete function tests can be also conducted with mains power for powerful, large devices with the integrated test socket.

The **SECULIFE | ST** is equipped with an operator safety switch.

The **SECULIFE | ST** is the only measuring instrument available on the market which has been designed to test medical devices operated with 3-phase electrical current. AT3-IIIE and AT3-IIS 3-phase current adapters can be furnished to this end as optional accessories.

Possible areas of use and measurements performed with the **SECULIFE | ST** are expanded with numerous multimeter functions. The performance of individually configured single measurements is thus made possible.

As a standard feature, the **SECULIFE | ST** is equipped with an RS 232 port for transferring measurement and test reports to a PC or a printer.

The instrument can be optionally expanded to include a printer-memory-interface with GOSSEN METRAWATT's external (P)Si module. The **SECULIFE | ST** is compatible with PS 3, GMST, visualFM, Fundamed, MD Data, PC doc Word/Excel, PC doc Access other software.

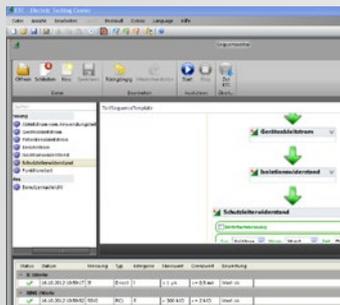
### Features:

- ▲ Protective conductor resistance with 200 mA and 10 A or (25 A test current – option)
- ▲ Insulation resistance
- ▲ Earth leakage current
- ▲ Touch current (device leakage current)
- ▲ Patient leakage current, AC and DC
- ▲ Patient auxiliary current
- ▲ Equivalent leakage current procedure
- ▲ Direct measurement
- ▲ Differential current measurement
- ▲ Up to 10 applied parts can be connected (2 mm) and individually assigned to groups
- ▲ Internal memory for 125 tests
- ▲ RS 232 port
- ▲ Mains connection for 110 V / 60 Hz, 230 V / 50 Hz
- ▲ Comprehensive accessories for testing 3-phase devices
- ▲ Safety for the inspector in the event of mains faults or excessive residual current due to mains power shutdown
- ▲ High-voltage test (option)

### Electrical safety testing:

- ▲ Electrical medical devices per IEC 62353 and IEC 60601
- ▲ Electrical devices per DIN VDE 0701-0702
- ▲ Routine tests in production, e.g. per IEC 60601, IEC 60950, IEC 61010 etc.

## SECULIFE | SR



Remote Control

Type	Article
SECULIFE SR	M692A

## Safety Tester for IEC 62353 Including Test Sequence Generator

### Benefits

Safety relevant, characteristic electrical quantities can be accurately measured at medical and other electrical devices and documented with the **SECULIFE | SR**. During the course of routine daily work, the **SECULIFE | SR** is distinguished by streamlined, time-saving test sequences: select the measurement, press the start key, read the results. The **SECULIFE | SR** can be operated in two different modes, depending upon the measuring task.

**Local:** Measurements are controlled using the user interface at the measuring instrument.

**Remote:** Control from a PC is also possible. ETC software with integrated test sequence generator for creating your own test sequences is included in the scope of delivery free of charge.

The user is also able to integrate all measurements into his user interface at the PC.

The **SECULIFE | SR** has an approximate weight of only 1.8 kg, and can be easily transported. The **SECULIFE | SR** is compatible with PS 3, visualFM and Fundamed.

### Measurement of the following values in accordance with applicable regulations:

- ▲ Protective conductor resistance
- ▲ Insulation resistance
- ▲ Device leakage current
- ▲ Touch current
- ▲ Patient leakage current, AC and DC

### Measuring methods for leakage current:

- ▲ Equivalent leakage current measurement
- ▲ Direct measurement
- ▲ Differential current measurement

### Electrical safety testing:

- ▲ Periodic testing per DIN VDE 0701-0702
- ▲ Electrical medical devices per IEC 62353 and DIN VDE 0751

## SECULIFE | SB



Type	Article
SECULIFE SB	M691A

## Safety Tester for IEC 62353 Including Database

### Benefits

The **SECULIFE | SB** provides medical technicians with the opportunity of completing tasks as efficiently as possible. The various test and measuring procedures can be individually adapted to the requirements specified in applicable medical device user regulations.

All of the data which are relevant for the hospital or medical practice can be saved to the instrument, and are always available on-site. All required electrical tests in accordance with IEC 62353 can be executed with the **SECULIFE | SB**.

Data for several thousand medical devices can be saved to the **SECULIFE | SB**. The instrument is LAN compatible. Thanks to its open software interface, the **SECULIFE | SB** is compatible with programs such as PS 3 and visualFM. Data can be exchanged with many other applications such as Fundamed and SAP by means of XML export.

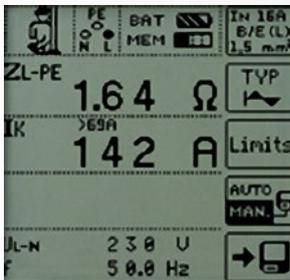
### Advantages:

- ▲ Predefined, standardized test steps and test sequences
- ▲ Individualized test steps and test sequences
- ▲ Suitable for use by trained persons
- ▲ External sensors can be connected via the USB port, e.g. for temperature, atmospheric humidity and luminous intensity
- ▲ Data storage for more than 2000 medical devices
- ▲ Data entry with softkeys or external keyboard
- ▲ List generator for the evaluation of stored object data
- ▲ 4-port USB hub for connecting PC, printers and sensors
- ▲ USB, CF connection for data exchange
- ▲ RS 232 port
- ▲ Battery and mains operation

## SECULIFE | IP



SECULIFE | IP



ProfiScan app



Side View

Type	Article
SECULIFE IP	M520U

## Test Instrument

### 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 approval testing and periodic testing of stationary electrical installations. Thanks to 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.

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

In actual practice, the **SECULIFE | IP** is distinguished by extremely easy operation and a great variety of tests: its advanced technical concept is consistently aligned to electrical engineering tasks encountered on a daily basis. 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 the 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
- ▲ Including 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

SECULIFE | DFBASE



Remote Control

Type	Article
SECULIFE DFBASE	M695Q

Function Tester

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 | DFBASE 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

SECULIFE | DFPRO



Remote Control

Type	Article
SECULIFE DFPRO	M695R

Function Tester

Benefits

The SECULIFE | DFPRO 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 biphasic pulsed waveform output**.

Furthermore, the SECULIFE | DFPRO can also be used for testing transcutaneous cardiac pacemakers.

The SECULIFE | DFPRO 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)

SECULIFE | VL



Type	Article
SECULIFE VL	M695V

Variable Load

Benefits

The SECULIFE | VL makes it possible to adjust the variable loads of the SECULIFE | DFBASE /PRO from 25 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.



**SECULIFE | IF+**



Type	Article
SECULIFE IF+	M695D

**Infusion Pumps**

The **SECULIFE | IF+** is intended for testing the flow rate values of intravenous infusion pumps, in order to assure flawless functioning.

All tests are controlled by a microprocessor which calculates and displays the results.

The fluid path is free of obstacles, which makes cleaning easy. The tubing is made of plastic instead of glass, thus making it more rugged. The cables and chambers are replaceable.

**Features:**

- ▲ Simultaneous testing of two infusion pumps
- ▲ Two chamber sizes (3.5 and 35 ml)
- ▲ Ranges: 0 to 999.9 ml per hour and 0 to 9999 ml per hour
- ▲ ±1% deviation from the measured flow rate value
- ▲ Digital calibration – no potentiometers to adjust
- ▲ Sealed fill-level sensors
- ▲ Manual or automatic test start can be programmed

**SECULIFE | DPBASE**



Type	Article
SECULIFE DPBASE	M695S

**Pressure Gauge**

**Benefits:**

The **SECULIFE | DPBASE** 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.

**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

**SECULIFE | DPPRO**



Type	Article
SECULIFE DPPRO	M695O

**Pressure Gauge**

**Benefits:**

The **SECULIFE | DPPRO** 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 and 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

SECULIFE | ESBASE



Type	Article
SECULIFE ESBASE	M6950

Testing of High Frequency Generators

Benefits:

The SECULIFE | ESBASE is an easy-to-use power meter for testing high frequency generators used in the field of HF surgery.

Measured values are indicated at a large analog display. The display's color coded scale makes it easy to read the measurement results.

The SECULIFE | ESBASE works without any external power supply and without batteries.

Two selectable current ranges are available: 0 to 1500 mA and 0 to 3000 mA. The SECULIFE | ESBASE has been equipped with 6 different load resistors for the 1500 mA range (50, 75, 100, 200, 300 and 500 Ω). A 50 Ω load resistor is used in the 3000 mA range.

No active front panel controls: switching back and forth between the 1.5 and 3 A ranges is accomplished by replugging the ESM-1 switching module. At the same time, the module blocks the terminals of the unused range.

Features:

- ▲ Minimal weight
- ▲ No power supply required
- ▲ Color coded analog display
- ▲ Easy, intuitive power measurement
- ▲ No switching relays
- ▲ Protective fuse with short response time

SECULIFE | ESPRO



Type	Article
SECULIFE ESPRO	M695B

Analyzer for Electrosurgical Devices

Benefits:

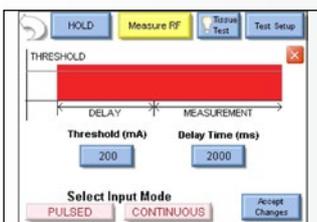
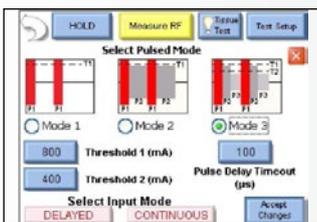
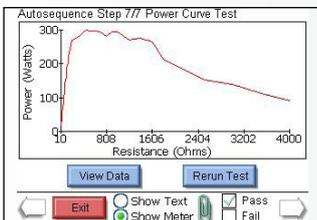
The SECULIFE | ESPRO is an analyzer for electrosurgical devices with extremely high accuracy which approaches calibration quality.

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 uncertainty 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, diversity and an option for saving 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 ESU generators with up to 32,768 data points by means of special computer software
- ▲ Internal data memory for 3 complete data records with ESU 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

SECULIFE | ESxTRA / ESPRIME



Remote Control

Type	Article
SECULIFE ESxTRA	M695C
SECULIFE ESPRIME	M695U

## Electrosurgical Analyzer

### Benefits:

With its unprecedented features, the SECULIFE | ESxTRA / ESPRIME has attained to entirely new standards for electrosurgical analyzers with comprehensive functionality.

It offers an unparalleled range of applications and features – all in a single, self-contained electrosurgical analyzer.

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 | ESxTRA / ESPRIME 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 of 500 W RMS), the SECULIFE | ESxTRA / ESPRIME 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 which thwarted other analyzers that boasted comprehensive functionality.

The SECULIFE | ESxTRA / ESPRIME 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 | ESxTRA / ESPRIME 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.

Use of state-of-the-art technology makes strict adherence to the standards of the electrosurgical industry possible through the performance of HF current measurements (instead of voltage measurements). This not only applies to measurements for conventional generators with "continuous" waveform output, but rather for generators with "pulsed" output as well.

The new SECULIFE | ESxTRA / ESPRIME is in a class of its own, and its real-time operating system provides for nearly unlimited expansion options for future tasks. This makes it the logical choice of customers who are looking for an analyzer with comprehensive functionality.

As compared with the SECULIFE | ESxTRA, the high sampling rate of the SECULIFE | ESPRIME 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 | ESPRIME)
- ▲ Ultra-fast digitizing of complex HF waveforms
- ▲ Compatible with continuous and pulsed output waveforms
- ▲ Integrated real-time operating system with ¼ VGA color touch-screen
- ▲ 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 ESU generator during the load curve test
- ▲ Remote control of the ESU generator is possible
- ▲ REM/ARM/CQM test with 500 Ω load, adjustable in 1 Ω steps
- ▲ HF leakage current measurement
- ▲ Acquisition, storage and print-out of HF waveforms

OVERVIEW

Patient Simulators

Model	PS100	PS200	PS300	NIBP
<b>General</b>				
Display	11 LEDs	1 graphic LCD, resolution: 128 x 64 pixels	2 graphic LCD, resolution: 128 x 64 pixels	1 graphic LCD, resolution: 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 battery
External power pack	Yes	Yes	Yes	Yes
<b>ECG-NSR</b>				
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, hypertensive, hypotensive
ST segment elevation	No	No	19	No
<b>ECG performance</b>				
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	-
<b>Respiration</b>				
Respiration	No	Yes	Yes	Yes
Rate	-	8	8	4
Impedance baselines	-	2	4	1
Respiration impedance test range	-	6	6	1
<b>Pacemaker</b>				
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
<b>NIBP</b>				
NIBP	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	No
Cardiac output	No	No	Option	No
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



Type	Article
SECULIFE PS100	M695L

Patient Simulator

Benefits:

The **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 wave: 0.125 and 2.000 Hz
- ▲ Delta: 2.000 Hz
- ▲ High level output (1 Vpp)
- ▲ Amplitude accuracy: ± 2%
- ▲ Frequency accuracy: ± 0.5% of the setting
- ▲ 9 V battery voltage

SECULIFE | PS200



Remote Control

Type	Article
SECULIFE PS200	M695M

Patient Simulator

Benefits:

The **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

SECULIFE | PS300



Remote Control

Type	Article
SECULIFE PS300	M695N

Patient Simulator

Benefits:

The **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 allow for display and editing of all possible parameters. Whether for testing, inspection or vocational training, the **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.

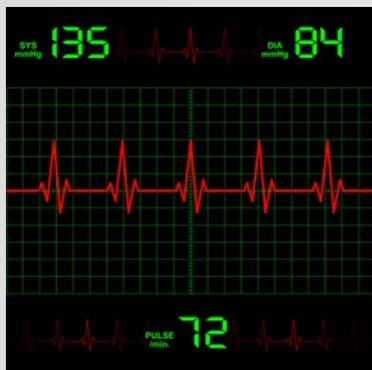
Features:

- ▲ 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
- ▲ Battery or external power pack: 90 to 264 V AC

SECULIFE | NIBP / BPPRO



SECULIFE OX + FingerSim Set



Universal plugs BPPRO

Type	Article
SECULIFE NIBP	M695E
SECULIFE NIBP KIT	M695K
SECULIFE OX	Z695A
FingerSim Set	Z695B

Multi-Parameter Patient Simulator

Benefits:

The SECULIFE | NIBP is the high-end product from the new range of microprocessor-based 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 | NIBP 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.

The SECULIFE O<sub>x</sub> one FingerSIM™ test system makes it possible for technical medical personnel to evaluate pulse oximeters and sensor functions under three simulated light absorption conditions. Typical values of 80%, 90% and 97% SpO<sub>2</sub> can be simulated.

With the help of this new simulation method, interaction between the sensor's sensitivity to light and oximeter calibration is taken into consideration.

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 mm Hg 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 / mm Hg
- ▲ Leak test
- ▲ ECG arrhythmia waveforms
- ▲ ECG arrhythmia sequences
- ▲ YSI 400 and 700 simulation temperature
- ▲ 10 universal plugs for patient connector cables (BPPRO)

# CABLE MATRIX

## CABLE MATRIX

Invasive blood pressure cable – mini DIN	Invasive blood pressure cable – large 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.	These cables are equipped with a 5-pin DIN large connector (see connector type BB in the cable connector index), which is identical to the older blood pressure cable from Dynatech Nevada (DNI Nevada) and Fluke's current Prosim range.

Monitor Manufacturer	Description (blood pressure cable connector, listed below, mini/large DIN plug at simulator)	Article # Mini DIN	Article # Large DIN	Blood Pressure Cable Connector Overview
Burdick	10-pin socket	20-40303	20-40303	B
Care	5-pin plug	Consult manufacturer	Consult manufacturer	C
Corometrics	3-pin plug / 3-pin socket	Consult manufacturer	Consult manufacturer	E
Corometrics	12-pin plug	Consult manufacturer	Consult manufacturer	M
Criticare	6-pin plug	20-40301	20-40301	H
Critikon	6-pin plug	20-40301	20-40301	H
Datascope	6-pin socket	20-40302	20-40302	F
Datex DX-1	10-pin socket	20-40303	20-40303	B
Fukuda Denshi FD-2 / DS3300	12-pin plug	20-41311	20-40304	V
Gould/Statham	5-pin plug	Consult manufacturer	Consult manufacturer	C
Hewlett Packard / Agilent / Philips	5-pin socket	Consult manufacturer	Consult manufacturer	J
Hewlett Packard / Agilent / Philips	12-pin plug	20-41315	20-40310	I
Hewlett Packard / Agilent / Philips	12-pin plug (5 uV) (most commonly)	20-41314	20-40309	I
Hewlett Packard / Agilent / Philips	12-pin plug (IUP cable)	20-41344	–	PP
Invivo Research	6-pin plug	20-41301	20-40301	H
Ivy Biomedical	6-pin plug	20-41301	20-40301	H
Kontron/Roche	12-pin socket	20-41318	–	X
GE Marquette 7000	8-pin plug	Consult manufacturer	Consult manufacturer	P
GE Marquette -3	11-pin plug (most commonly)	20-41320	20-40308	N
GE Marquette Twin	7-pin plug / 8-pin plug	Call factory	Call factory	D
GE Marquette MQ-2	9-pin socket	20-41319	20-40307	OO
Medical Data Electronics (MDE)	6-pin plug	20-41322	20-40314	H
Mennen Medical	10-pin plug	20-41323	20-40315	II
Nihon Kohden	5-pin plug	20-41324	20-40316	O
North American Drager	6-pin plug	20-41301	20-40301	H
Novamatrix	3-pin plug / 3-pin socket	Consult manufacturer	Consult manufacturer	E
Ohmeda	6-pin plug	20-41301	20-40301	H
Physio Control	6-pin plug	20-41301	20-40301	H
Protocol Systems	6-pin plug	20-41301	20-40301	H
Puritan Bennett	10-pin socket	Consult manufacturer	Consult manufacturer	B
Puritan Bennett	10-pin socket	20-41309	20-40303	B
Siemens Medical Solutions SM-1	10-pin plug	20-41329	20-40318	HH
Siemens Medical Solutions SM-3	15-pin plug	20-41328	20-40319	Y
SMEC	6-pin socket	20-41308	20-40302	F
Spacelabs (TK-1)	6-pin plug (most commonly)	20-41301	20-40301	H
Spacelabs/Squib	5-pin plug	20-41331	20-40320	Q
Tektronix/Squib	6-pin plug	20-41301	20-40301	H
Vitastat	5-pin plug	20-41331	20-40320	Q
Vitatek/Squib	6-pin plug	20-41301	20-40301	H
Witt	6-pin socket	20-41355	–	F
Universal BP Kabel	Connecting wires without connector	20-41340	20-40332	Not shown
Universal-Adapter	Blood pressure cable adapter – mini DIN plug to large DIN socket	20-40736	20-40736	AA – BB
Universal-Adapter	Blood pressure cable adapter – mini DIN socket to large DIN plug	20-40737	20-40737	BB – AA

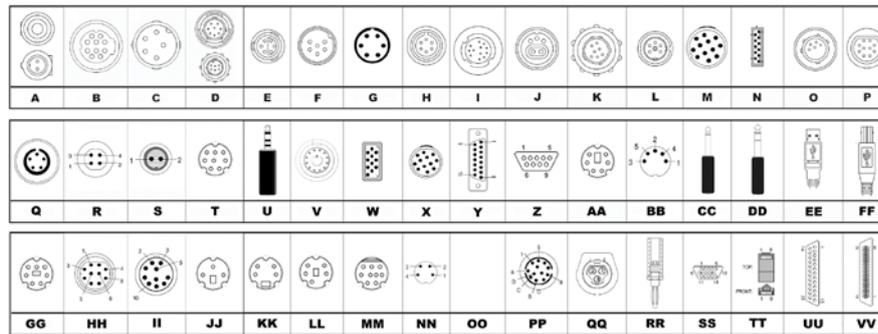
CABLE MATRIX

Universal External Power Supply (external power pack)



Description	Compatible with	Article #
External power pack for SECULIFE IF+ DPpro/base / 9 V DC	IF+, DPpro/base	Z695L
External power pack for SECULIFE DFpro/base, PS100/PS200/PS300 / 10 V DC	DFpro/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 and PS-300 range)	T (plug)	CC	20-41333
UT-2 universal temperature cable, YSI-700 series (PS-200 and PS-300 range)	T (plug)	DD	20-41334
Universal temperature cable (without cable connector)	T (plug)	None	20-41351
Temperature cable, Hewlett Packard simulation cable	U (3.5 mm plug)	S (plug)	Manufacturer information
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 cable



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 (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 range (mini DIN plug to DB 9 socket) – also with utility software for flash update/programming	GG (plug)	Z (socket)	20-41337
Cable adapter for PS-200, PS-300, NIBP range, DF+(USB to DB 9 M) – utilized at the PC which is not used via the 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 (socket)	20-41341
Communication cable for ES range, USB(A) plug to USB(B) plug	EE	FF	20-41352
IF+ instrument to camera connection cable (mini DIN plug to mini DIN plug)	T (plug)	T (plug)	20-40607
RS 232 communication, USB(A)M to mini DIN plug	GG (plug)	EE	20-41361

SECULIFE IT-B / IT-C / ITBASE



Type	Article
SECULIFE ITB	M688A
SECULIFE ITC	M688E
SECULIFE ITBASE	M688M

Luxmeter

Benefits:

The SECULIFE | IT 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 SECULIFE | IT-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 allows for reliable measurement of emergency lighting.

With accuracy in according to class C, the SECULIFE | IT-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 SECULIFE | IT-B / IT-C, the class C SECULIFE | ITBASE doesn't have a USB port.

Great emphasis is placed upon reliability by means of calibration at GOSSEN For purposes of substantiation, 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

SECULIFE | IM



Type	Article
SECULIFE IM	M688D

Luminance Meter

Benefits:

Monitor screen luminance can be precisely measured and documented with the help of the SECULIFE | IM 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

SECULIFE | IA



Probe for Contact Measurement

Type	Article
SECULIFE IA	M688C

Luminance Measurements

Benefits:

The SECULIFE | IA 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 SECULIFE | IA 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 SECULIFE | IA fulfills class B requirements in accordance with these standards.

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 $f_2$ ( $l$ )	2%	< 1.5%
Linearity error – $f_3$	2%	< 1.5%
Temperature coefficient $\alpha_0, \alpha_{25}$	1% / K	≤ 0.5% / K
Polarization error – $f_8$	2%	< 0.8%

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.

The SECULIFE | IA 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
- ▲ Illumination at sports facilities
- ▲ Contrast measurements at workstations (ASR)
- ▲ Illumination in museums and public buildings
- ▲ Projection screens (inspection for uniform illumination)

SECULIFE | IS / ISRK1, ISRK2



Type	Article
SECULIFE IS	M688B
SECULIFE ISRK1	M688F
SECULIFE ISRK2	M6880

Lighting Fixture Monitor

Benefits:

The SECULIFE | IS has been developed specifically for interior light monitoring and fulfills the latest requirements in medical settings.

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

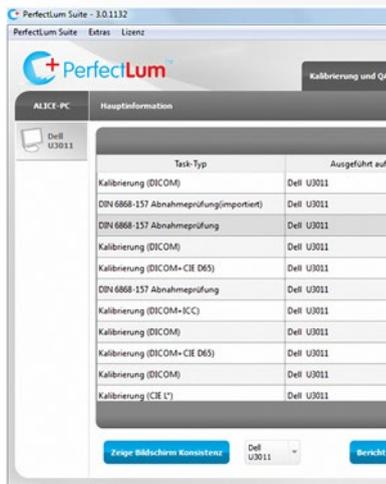
It assures constant illumination and performs interior light monitoring at diagnostic workstations in accordance with DIN EN 61223-2-5 (QS-RL dated 20 Nov. 2003), DIN V 6868-57 / 6868-157.

3 models are currently available with measuring ranges including 20 to 60 lux (SECULIFE IS) 10 to 50 lux (SECULIFE IS RK1) and 50 to 100 lux (SECULIFE IS RK2). This makes room classification monitoring possible in accordance with the new DIN 6868-157 for classes 1 and 2, as well as for class 5 (diagnostics in the field of dentistry).

Features:

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

PERFECTLUM



Type	Article
PERFECTLUM	Z799A

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 QA 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.

Functions:

- ▲ 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

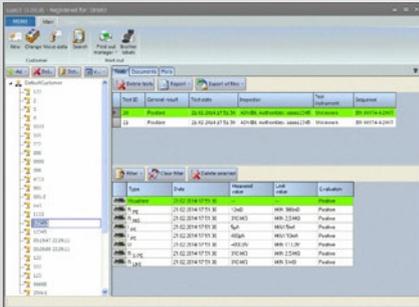
PerfectLum Suite, additional functions:

- ▲ 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 or 8  
Mac OS X, 10.5 to 10.8 – Intel hardware required

**GMST**



**Free Demo Version**

[www.gmst.eu](http://www.gmst.eu)

Type	Article
GMST	Z712C

**Report Generating Software**

**Benefits:**

GMST (pat Manager) is database software for the management of documentation and test data.

For measurements with instruments from the following product ranges:

**SECUTEST, SECULIFE and PROFITEST**

**Features:**

- ▲ Search and filter database entries according to: ID number, customer, device, inventory number, standard, date
- ▲ Print test reports as PDF files, print test labels
- ▲ Display in tabular format
- ▲ Test history
- ▲ Network operation is possible
- ▲ Modern and simple user interface in German, English, Polish and Russian

**GMST HostService**

Permits internal networking of GMST software thanks to the modular license.

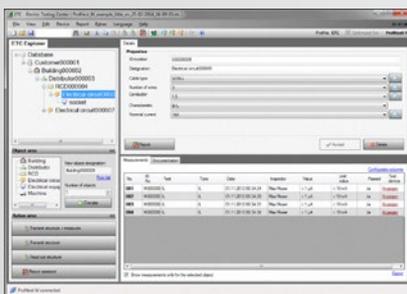
Multiple access to measurements and test data is thus made possible from various workstations.

**System requirements:**

Microsoft Windows XP SP3, Vista SP1, 7 or 8

Microsoft .NET Framework, version 2.0

**ETC**



Type	Article
ETC	Z712A

**Report Generating Software**

**Benefits:**

**Report Generating Software for SECULIFE SR Test Instruments**

ETC offers a wide variety of support options for data acquisition and management, reports generating and the control of test sequences.

**Features:**

- ▲ The software copies measured values from the test instruments.
- ▲ Report data can be supplemented.
- ▲ Limit values can be set.
- ▲ Test reports can be saved as PDF files.
- ▲ SecuStore memory adapter for the SECUTEST range and the SECULIFE ST
- ▲ The software copies test reports from the memory adapter and saves them automatically as PDF files.

**System requirements:**

Microsoft Windows XP SP3, Vista SP1, 7 or 8

Microsoft .NET Framework 4 Client Profile

Microsoft Excel as of the XP version for sending reports or structures via e-mail

Acrobat Reader as of version 10 for report previews

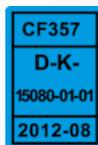
## CALIBRATION



Accreditation



Calibration Stamp



Calibration Seal



Factory Calibration Certificate

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

### 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 retraced to national standards at regular intervals by means of calibration, and if necessary adjusted, and plainly 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, retraceability of the measurement results must be substantiated in the calibration certificate.

### Calibration Intervals

Time between any two calibrations of 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 specified 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](http://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), are included:

- ▲ In our services catalog
- ▲ On the Internet at: [www.gmci-service.com](http://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](mailto:vertrieb@gossenmetrawatt.com)





## **GOSSEN METRAWATT**

### **GMC-I Messtechnik GmbH**

Südwestpark 15  
90449 Nürnberg, Germany  
Phone: +49-911-8602-999  
Fax: +49-911-8602-125  
e-mail: [export@gossenmetrawatt.com](mailto:export@gossenmetrawatt.com)  
[www.gossenmetrawatt.com](http://www.gossenmetrawatt.com)

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  
e-mail: [kainos@kainos.es](mailto:kainos@kainos.es)  
[www.kainos.es](http://www.kainos.es)

GMC-Instruments Italia S.r.l.  
Via Romagna, 4  
I-20046 Blassono (MI)  
Phone: +39 039 2480 51  
Fax: +39 039 2480 588  
e-mail: [info@gmc-i.it](mailto:info@gmc-i.it)  
[www.gmc-instruments.it](http://www.gmc-instruments.it)

GMC-Instruments Nederland B.V.  
Daggeldersweg 18  
NL-3449 JD Woerden  
Phone: +31 348 42 11 55  
Fax: +31 348 42 25 28  
e-mail: [info@gmc-instruments.nl](mailto:info@gmc-instruments.nl)  
[www.gmc-instruments.nl](http://www.gmc-instruments.nl)

GMC-Instruments Schweiz AG  
Glattalstr. 63  
CH-8052 Zürich  
Phone: +41 44 308 80 80  
Fax: +41 44 308 80 88  
e-mail: [info@gmc-instruments.ch](mailto:info@gmc-instruments.ch)  
[www.gmc-instruments.ch](http://www.gmc-instruments.ch)

GMC-Instruments France SAS  
3 rue René Cassin  
F-91349 Massy Cedex  
Phone: +33 1 6920 8949  
Fax: +33 1 6920 5492  
e-mail: [info@gmc-instruments.fr](mailto:info@gmc-instruments.fr)  
[www.gmc-instruments.fr](http://www.gmc-instruments.fr)

GMC-měřicí technika s.r.o.  
Fügnerova 1a  
CZ-67801 Blansko  
Phone: +420 516 482 611/-617  
Fax: +420 516 410 907  
e-mail: [gmc@gmc.cz](mailto:gmc@gmc.cz)  
[www.gmc.cz](http://www.gmc.cz)

GMC-Instruments Austria GmbH  
Richard-Strauss-Str. 10/2  
A-1230 Wien  
Phone: +43 1 890 2287  
Fax: +43 1 890 2287 99  
e-mail: [office@gmc-instruments.co.at](mailto:office@gmc-instruments.co.at)  
[www.gmc-instruments.co.at](http://www.gmc-instruments.co.at)

GMC-Instruments (Tianjin) Co., Ltd.  
Phone: +86 10 84798255  
Fax: +86 10 84799133  
Rm.710, Jin Ji Ye BLD. No.2,  
Sheng Gu Zhong Rd.  
P.C.: 100022, Chao Yang District  
[info@gmci-china.cn](mailto:info@gmci-china.cn), [www.gmci-china.cn](http://www.gmci-china.cn)

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