

# SECUSTAR FM+

## Modular Test System

3-349-310-03  
12/2.15

Modular test system for user-controlled execution of legally required or company specified work procedures and directives

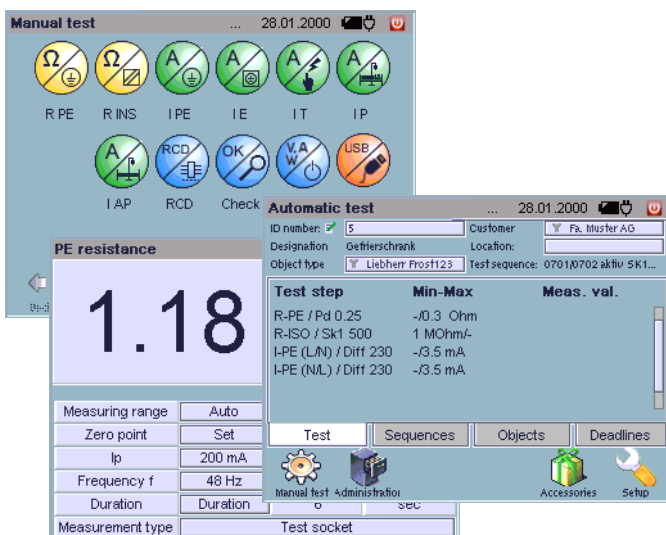
- **Testing for (electrical) safety of operating equipment** conducted by trained persons
- Predefined, **standardized test steps and test sequences**
- Can be easily supplemented with **individual test steps and sequences**
- **Operation via color touch-screen**
- **Sensors** for temperature, atmospheric humidity, luminous intensity etc. – can be connected via USB interface
- **Mains-independent operation** with rechargeable batteries
- Country-specific mains cable and test socket for electrical tests
- **Internal data memory** for more than 5000 objects
- **Data backup** with plug-in compact flash II card
- **Data entry with soft-keys**, external keyboard, barcode, RFID
- **List generator** for the evaluation of stored object data
- **Data interfaces:**
  - USB for connecting PC, printer or sensor
  - Ethernet
- **Safety for the user** thanks to integrated personal protection and layout as a safety class II device and/or storage battery mode



### Operation

There are two different operating modes.

- **Manual test:** All available tests are executed individually.
- **Automatic test:** All of the required tests allocated to the respective device under test are executed. A unique ID number is assigned to each device under test. The initial window lists all of the work steps. The operating menus are structured in a straightforward fashion in the form of index cards. Readily understandable symbols make operation easy.



### Applications

The **SECUSTAR FM+** has been developed for user-controlled execution of approvals, routine tests and periodic testing in accordance with legally specified directives (e.g. DGUV provision 3 (previously BGV A3), DGUV provision 2 (previously GUV A2), MPG, BetrSichV, fire safety etc.). Individual work steps can be combined by the user into complete work sequences to this end. Test sequences generated in this way can then be executed in a user-controlled fashion.

Test sequences, including all required measurements in accordance with the following standards, have been predefined:

DIN VDE 0701-0702

Test sequences for the following standards can be downloaded from our website:  
DIN VDE 0751, NEN 3140, ÖVE 8701-1, ÖVE 8751-1, IEC E 62353

In addition to this, the modular test system allows for the integration of testing tasks through the connection of sensors, e.g. for the measurement of ambient temperature, relative humidity and light.

In addition to test data archiving and management within the instrument, data exchange with **visual FM** or **PS3** is also possible. All of the values required for approval reports or device logbooks for electrical equipment (e.g. per ZVEH) can be measured with this instrument.

Test data can be printed in standard report forms by means of an interconnected printer.

# SECUSTAR FM+

## Modular Test System

### Characteristic Values

The test instrument includes the following electrical tests in accordance with DIN VDE 0404 and DIN VDE 0413:

- Protective conductor resistance
- Insulation resistance
- Protective conductor current for safety class I devices
- Contact current (for safety class II devices)
- Absence of voltage at exposed, conductive parts (= contact current)
- Patient leakage current (AC and DC components are measured separately)

Measuring methods:

- Direct measurement
- Equivalent leakage current
- Differential current

### Multiple Measurements

The automatic test sequence mode allows for the acquisition of several measuring points on one test object. The values of the individual measuring points are listed in a separate window one after the other. A test step result is calculated from these values which always represents the worst-case-value of all measured values.

### Connection with Line Voltage during Test Sequence

Automatic connection of DUT with line voltage with or without switching DUT off after measurement and request to switch DUT on or off.

External measurements and visual inspections can be configured such that voltage at the test socket is applied during their performance.

### Function Test with Power Analysis

(also suitable for high power DUTs with up to 16 A)

The device under test can be subjected to a function test with line voltage via the integrated test socket.

The following are measured or calculated automatically:

- Line voltage (RMS)
- Load current / current consumption (RMS)
- Active and apparent power
- Power factor
- Energy / electrical energy
- On-time (line voltage at test socket)

### Installation Test

Portable residual current devices (PRCDs) can be tested via the integrated test outlet and the probe, and permanently installed residual current devices (RCDs) can be tested via the mains cable. Shutdown conditions for overcurrent protective devices are determined by measuring time to trip.

- PRCD test
- RCD test

### Measurements with Sensors Connection via USB

Various sensors are assigned to the test module, and can be integrated into the test sequences.

Sensors for the following measurements with connection via the USB port:

- Temperature
- Humidity
- Illuminance measurement for planning, installation and monitoring of lighting equipment in accordance with DIN 5035, part 2
- Multiplexer for “automatic switching” of application parts in preparation
- Clip-on ammeters at probe (3/4) in preparation

### Report Generating Functions

All of the values required for approval reports or device logbooks for electrical equipment (e.g. per MPG or DGUV provision 3 (previously BGV A3)) can be measured with this instrument.

Data and comments can be added to the tests with the soft keys, or very conveniently with a connectable keyboard (optional).

All measurement data can be documented and archived with the measurement and test report, which can be saved to the device or printed out directly with an external printer.

The measurement and test report can be used by the operator as substantiation of regular maintenance and testing.

### Testing for Correct Mains Connection

The device automatically recognizes mains connection errors if the conditions in the following table have been fulfilled. The user is informed of the type of error, and all measuring functions are disabled in the event of danger.

Type of Mains Connection Error	Message	Condition	Measurements
Voltage at protective conductor PE to finger contact	Text at LCD panel	Contact the contact field, $U > 25 \text{ V}$	Disabled
Protective conductor PE and phase conductor L reversed and/or neutral conductor N interrupted	Text at LCD panel	Voltage at PE $> 65 \text{ V}$	impossible (no supply power)
Contact voltage at protective conductor PE to neutral conductor N or phase conductor L	Text at LCD panel	$U > 25 \text{ V}$	Disabled, but disabling can be deactivated (e.g. IT network)
Line voltage too low	Text at LCD panel	$U_{L-N} < 90 \text{ V}$	possible under certain circumstances

### Short-circuit Test – Test for Short-circuiting at the Device under Test

- 1 Test for short-circuiting of N and L
  - 2 Test for short-circuiting of N or L to the protective conductor
- $R < 0.5 \Omega \rightarrow$  short-circuit  
 $R > 5 \Omega \rightarrow$  no short-circuit

### On Test – determines whether the device under test is switched on or off

The on test is executed by measuring input impedance of the device under test at the test socket:

$R < 250 \text{ k}\Omega \rightarrow$  DUT switched on  $\rightarrow$  message: **ON**  
 $R > 300 \text{ k}\Omega \rightarrow$  DUT switched off  $\rightarrow$  message: **OFF**

### Probe Test (Probe Connection Test)

This test determines whether or not the test probe is plugged into sockets 1 and 2, i.e. whether or not a (low-impedance) connection exists between the two connector plugs.

Probe plugged in  $\rightarrow$  message: **OK**

Probe not plugged in  $\rightarrow$  message: **Error**

### Safety Class Detection (detection as part of test sequence in preparation)

Measurement of resistance between the protective earth terminal at the mains plug and the protective earth terminal at the test socket:

$R < 1 \Omega$ : protective conductor exists  $\rightarrow$  SC I  
 $R > 10 \Omega$ : no protective conductor  $\rightarrow$  SC II

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Function	Measured Quantity	Measuring Range / Nominal Range of Use	Resolution	Additional Info	Open-Circuit Voltage $U_0$	Additional Info	Short-Circuit Current $I_K$	Int. Resist. $R_I$	Ref. Resist. $R_{REF}$	Measuring Error <sup>2</sup>	Intrinsic Uncertainty <sup>2</sup>	Overload Capacity Value	Overload Capacity Time	
DIN VDE 0701-0702 / 0751 Tests	Protective conductor resistance <b>R PE</b>	man: 1 ... 999 mΩ auto: 0.01 ... 30.00 Ω 0.01 ... 3.30 Ω 0.1 ... 10.0 Ω	1 mΩ 10 mΩ 10 mΩ 100 mΩ	Electronic fuse + fuse link	4.0 ... 4.5 V AC TRMS	where $I_{sl} = 200$ mA~	220 ... 270 mA AC TRMS	—	—	< ±10% rdg. within a range of 0.1 ... 10 Ω for IP = 200 mA	±(2.5% rdg. + 10 mΩ) within a range of 0.1 ... 10 Ω where IP = 200 mA	264 V AC/DC	Cont.	
	Insulation resistance <b>R ISO</b>	10 ... 300 kΩ 0.01 ... 3.0 MΩ 0.1 ... 30.0 MΩ 1 ... 300 MΩ	10 kΩ 10 kΩ 100 kΩ 1 MΩ	Test voltage: 100/200/300/400/500 V DC	$U_N < U < 1.2 U_N$	Nominal current > 1 mA where $R_{ISO} = 500$ kΩ	2 mA	—	—	0.01 ... 100 MΩ: < ±10% rdg. > 100 MΩ: < ±20% rdg. where UP = 500 V each	0.1 ... 30 MΩ: ±(2.5% rdg. + 1 d) > 30 MΩ: ±(5% rdg. + 1 d) where UP = 500 V each	264 V AC/DC	Cont.	
	Equivalent leakage current <b>I EA, I EPA</b>	10 ... 300 μA~ 0.01 ... 3.00 mA~ 0.1 ... 30.0 mA~	10 μA 10 μA 100 mA	Test voltage: 110/220/230/240 V AC	110 ... 240 V~ -15 / +10%	Frequency 50/60/200/400 Hz	< 1.5 mA	> 150 kΩ	1 kΩ ±10Ω	20 μA ... 15 mA AC: < ±10% rdg. > 15.0 mA AC: < ±15% rdg.	20 μA ... 15 mA AC: ±(5% rdg. + 1 d) > 15.0 mA AC: ±(10% rdg. + 1 d)	264 V AC/DC	Cont.	
	Protective conductor current <sup>1</sup> <b>Direct I PE</b> between L and N	10 ... 300 μA≅ 0.01 ... 3.00 mA at 0.1 ... 30.0 mA at	10 μA 10 μA 100 mA	= Protective conductor current, direct Residual current monitoring, Mains shutdown: > 20 mA~ (25 ms)					—	—	0.5 ... 20.0 mA: < ±10% rdg.	20 ... 300 μA: ±(5% rdg. + 1 d) > 300 μA: ±(2.5% rdg. + 1 d)	264 V AC/DC	Cont.
	Contact current <sup>1</sup> <b>I B</b>	10 ... 300 μA≅ 0.01 ... 3.00 mA at 0.1 ... 30.0 mA at	10 μA 10 μA	Probe current monitoring: Probe shutdown: $I_B > 10$ mA~ (5 ms) Residual current monitoring Mains shutdown: $I_B > 10$ mA~ (25 ms)					1 kΩ ±10 Ω	—	0.02 ... 10 mA at: < ±10% rdg.	20 ... 300 μA at: ±(5% rdg. + 1 d) > 300 μA at: ±(2.5% rdg. + 1 d)	264 V AC/DC	Cont.
	Patient leakage current <sup>1</sup> <b>I PA</b>	10 ... 300 μA≅ 0.01 ... 3.00 mA at	10 μA 10 μA	Probe current monitoring: Probe shutdown: $I_{PA} > 10$ mA~ (5 ms) Residual current monitoring Mains shutdown: $I_B > 10$ mA~ (25 ms)					1 kΩ ±10 Ω	—	0.01 ... 3 mA at: < ±10% rdg.	10 ... 300 μA at: ±(7.5% rdg. + 1 d) 0.30 ... 3.00 mA at ±(2.5% rdg. + 1 d)	264 V AC/DC	Cont.
	Residual current <b>I PE</b> between L and N	10 ... 300 μA~ 0.01 ... 3.00 mA~ 0.1 ... 30.0 mA	10 μA 10 μA 100 mA	= Protective conductor current, direct Residual current monitoring Mains shutdown: > 20 mA~ (25 ms)					—	—	0.5 ... 20.0 mA: < ±10% rdg.	20 ... 300 μA: ±(5% rdg. + 1 d) > 300 μA: ±(2.5% rdg. + 1 d)	264 V AC/DC	Cont.
Protective conductor current <b>I PE</b> with current sensor	0.0 ... 100.0 mA	100 μA	Via current sensor as optional accessory (socket 3–4) with a transformation ratio of 1 mV / 1 mA					Depends upon current sensor characteristics						
PRCD	Time to trip	0 ... 400 ms	±5 ms	Test current: 30 mA	At nominal voltage of 230 / 240 V and 50 / 60 Hz, only during battery operation with mains connected									
	Time to trip	0 ... 400 ms	±2 ms	Test current: 30 mA	At nominal voltage of 230 / 240 V and 50 / 60 Hz,									
Function test (not during battery operation)	Line voltage (RMS) <b>U LN</b>	90 ... 264 V AC (45 ... 440 Hz)	0.1 V						±5.0% rdg. ±(2.5% rdg. + 1 d) 264 V AC Cont.					
	Load current (RMS) <b>I L</b>	0.02 ... 16.00 A AC (45 ... 440 Hz)	10 mA	Shutdown by mains relay at: $I_L > 16$ A~ where $t > 0.5$ s Shutdown by mains relay at: $I_L > 4$ A~ where internal temperature > 70° C					±5.0% rdg. ±(2.5% rdg. + 1 d) 4 A Cont.					
	Active power <b>P</b>	10 ... 4000 W	1 W	Measured value P and calculated value S are compared, and the smaller of the two is displayed. Shutdown at internal temperature > 70° C					f < 100 Hz ±7.5% rdg. P > 10 W, PF > 0.5 f < 100 Hz ±(5% rdg. + 10 d) < 1000 W Cont. f ≥ 100 Hz ±10% rdg. P > 10 W, PF > 0.5 ≥ 100 Hz ±(7.5% rdg. + 10 d) < 4000 W Int.					
				Calculated value $U_{L-N} \cdot I_L$ [OL display for ULN or I L overload] Shutdown at internal temperature > 70° C					f < 100 Hz ±7.5% M P > 10 W f < 100 Hz ±(5% rdg. + 10 d) < 1000 W Cont. f ≥ 100 Hz ±10% rdg. P > 10 W f ≥ 100 Hz ±(7.5% rdg. + 10 d) < 4000 W Int.					
	Power factor <b>PF</b> with sinusoidal waveshape: $\cos \varphi$	0.00 ... 1.00 inductive	0.01	Calculated value P / S, display as of P > 10 W					f < 100 Hz ±7.5% M P > 10 W, PF > 0.5 f < 100 Hz ±(5% rdg. + 10 d) — — f ≥ 100 Hz ±10% rdg. P > 10 W, PF > 0.5 f ≥ 100 Hz ±(7.5% rdg. + 10 d) — —					
				On-time t (E = P · t)					00:00:00 ... > 99:00:00 s 1 s On-time, line voltage to test socket, for calculating energy — — —					

<sup>1</sup> Direct leakage current

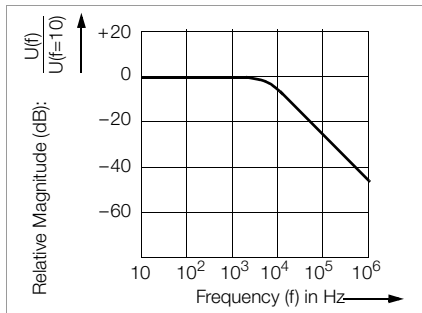
<sup>2</sup> The data are only valid for the values displayed at the test instrument. Data which are transmitted via the USB interface may deviate.

# SECUSTAR FM+

## Modular Test System

### Measuring Leakage Current

Frequency response is taken into consideration in accordance with the diagram to the right when leakage current is measured.



### Reference Conditions

Line voltage	230 V ±0.2%
Line frequency	50/60 Hz ±0.1%
Waveshape	Sine (deviation between effective and rectified value < 0.5%)
Battery supply power	9.2 ... 12.5 V
Ambient temperature	+23 °C ±2 K
Relative humidity	40 ... 60%
Load resistance	Linear

### Influencing Quantities and Influence Error

Influencing Quantity / Sphere of Influence	Designation per DIN VDE 0404	Influence Error ± ... % of Measured Value
Test instrument position	E1	2.5 at I PE (diff)
Test instrument supply voltage	E2	1
Ambient temperature (0° C ... +40° C)	E3	1
DUT current consumption	E4	2.5
Low frequency magnetic fields	E5	3.0 at I PE (diff)
DUT impedance	I6	2.5
Conductance leakage capacity during insulation measurement	E7	0.5
Waveshape of the measured test current	E8	2.5 at I PA 1 Other measuring ranges

### Ambient Conditions

Operating temperature	0 °C ... + 40 °C
Accuracy range	0 °C ... + 40 °C
Storage temp. range	- 20 °C ... + 60 °C
Relative humidity	max.75%, no condensation allowed
Elevation	max. 2000 m
Deployment	Indoors, except within specified ambient conditions

### Power Supply

#### Broad Range Variable Power Pack

Line voltage	90 ... 264 V
Line frequency	45 Hz ... 440 Hz
Power consumption	
Internal consumption	< 40 VA
Permissible DUT power consumption	≤ 4000 VA
Permissible DUT power consumption, cont. operation	≤ 1000 VA
Permissible DUT current consumption, cont. operation	≤ 4 A~
Switching capacity	≤ 16 A, AC1

#### Battery Operation

Battery pack	NiMH, 9.6 V / 3.2 Ah
Charging time	Approx. 3 hours in discharged state
Working range	9.2 ... 11 V
Service life	Operation: > 4 hours, 450 measuring cycles Standby function: approx. 24 hours Retention of configuration data during storage: approx. 4 months (assuming the battery has been fully charged)

#### Electrical Safety

Schmelzsicherungen	2 x FF (UR) 500 V/16 A AC; 6,3 mm x 32 mm; (Article number 3-578-215-01) 50 kA breaking capacity at 500 V AC protects the current measurement input in the 100 µA through 10 A ranges
Safety class	Disconnection from mains per SC II
Nominal voltage	230 V
Test voltage	2.2 kV AC or 3.3 kV DC
Measuring category	300 V CAT II
Fouling factor	2
Safety Shutdown	With following differential current at DUT during: – Function test 10 mA~ / < 25 ms – Contact current meas. 10 mA~ / < 25 ms – Residual current meas. 20 mA~ / < 25 ms – Protective conductor current measurement 20 mA~ / < 25 ms with following probe current during: – Contact current meas. 10 mA~ / < 5 ms – Protective conductor resistance measurement 300 mA~ / < 1ms

### Mechanical Design

Dimensions	(W x D x H) 325 x 250 x 90 mm
Weight	approx. 2.4 kg with battery pack
Protection	Housing: IP 40, connections: IP 20 per DIN VDE 0470 part 1/EN 60529

Table Excerpt Regarding Significance of the IP Code

IP XY (1 <sup>st</sup> digit X)	Protection against penetration of solid particles	IP XY (2 <sup>nd</sup> digit Y)	Protection against penetration by water
0	Not protected	0	Not protected
4	≥ 1.0 mm dia.	4	Splashing water

# SECUSTAR FM+ Modular Test System

## Data Interfaces

### USB Master

Output voltage	5 V DC $\pm$ 10%
Short-circuit current	Socket 1: 0.5 A, sockets 2 through 4: 0.1 A
USB port	4-pin type A, USB 1.1 compatible with USB 2.0
Connector pin assignments	1: VCC, 2: D-, 3: D+, 4: GND

### Slot for CF Card

Type II compact flash card

### Ethernet

10 MBit/s

### RS 232

Interface for factory settings entered by the manufacturer only

## Applicable Regulations and Standards

IEC 61010-1/EN 61010-1/ VDE 0411-1	Safety requirements for electrical equipment for measurement, control and laboratory use
IEC 61557/ EN 61557/ VDE 0413	Part 1: General requirements Part 2: Insulation resistance measuring instruments Part 3: Loop resistance measuring instruments Part 4: Instruments for measuring resistance at ground cables, protective conductors and equipotential bonding conductors Part 6: Devices for testing RCDs (residual current devices) for correct functioning, and the effectiveness of safety measures in TT and TN systems
DIN VDE 0404, part 1 part 3	Devices for technical safety testing of electrical equipment – general requirements
DIN VDE 0404, part 2	Devices for periodic testing
EN 60529 VDE 0470, part 1	Test instruments and test procedures Degrees of protection provided by enclosures (IP code)
DIN EN 61326 VDE 0843, part 20	Electrical equipment for control technology and laboratory use – EMC requirements

## Included

- 1 basic instrument: **SECUSTAR FM+**
- 1 mains power cable (at the tester: via 16 A inlet plug – mains side: country-specific)
- 1 probe cable with test probe
- 1 plug-on alligator clip
- 1 Type II compact flash card
- 1 DAkKS calibration certificate
- 1 abbreviated operating instructions
- 1 CD ROM with **visual FM / PS3 AM**  
Contents:
  - **visual FM / PS3 AM** PC software enabled for 20 objects
  - Operating instructions in German: ba\_d\_secustar.pdf, and English: ba\_gb\_secustar.pdf

## Accessories

### AT16-DI Three-phase 16 A Differential Current Adapter

### AT32-DI Three-phase 32 A Differential Current Adapter

For testing in accordance with DIN VDE 0701-0702 and 0751 at 3-phase devices with 5-pole CEE connection, in particular for the measurement of loop current using the differential current method.



### SECU-cal 10 Calibration Adapter



The calibration adapter is used for testing the measuring accuracy of test instruments in accordance with DIN VDE 0701/0702/0751. To meet the requirements set forth by accident prevention regulation DGUV provision 3 (previously BGV A3) and in accordance with the ISO 9000 quality standard, these instruments must generally be tested once each year, for certification.

All limit values for the required tests per DIN VDE, such as protective conductor resistance, insulation resistance, equivalent leakage current, differential and/or contact as well as housing leakage current must be tested.

# SECUSTAR FM+

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### SECULOAD / SECULOAD-N Test Adapter

Test Adapter for Testing Open-Circuit Voltage at Welding Units per IEC / EN 60974

In combination with the **SECUSTAR FM+**, the test adapter is used for testing welding units in accordance with the IEC / EN 60974-4 standard. This standard stipulates that peak values for open-circuit voltage may not exceed the limit values, regardless of the utilized settings.

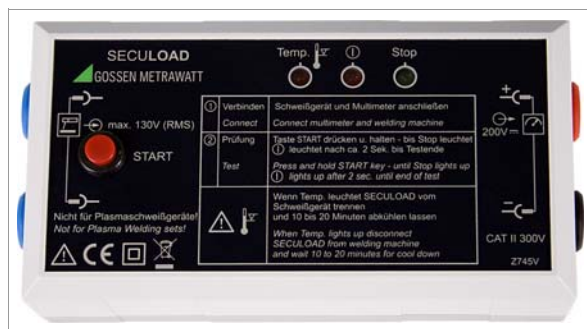
**SECUSTAR FM+** testing instrument includes a test sequence for testing welding instruments with these adapters.

- **SECULOAD (Z745V):**

The peak value of the open-circuit voltage is determined in the SECULOAD by means of a peak value rectifier with very fast diodes. As a result, the actual peak value of the open-circuit voltage is also issued for pulsed voltage sources with clock rates in the range of several 10 kHz, based upon the filter stipulated in the standard.

- **SECULOAD-N (Z745R):**

The peak value rectifier of the SECULOAD-N uses rectifier diode 1N 4007 recommended by the standard. This diode is a power rectifier diode and, due to its design principle, only suitable for voltage sources with a low clock rate in the line frequency range or for voltage sources with conventional transformers.



### F2010 SECUSTAR Carrying Pouch

Carrying pouch for mobile use, with retaining clips for sensors



### K2010 Carrying Case for SECUSTAR FM+ and Accessories



### F2000 Carrying Pouch for SECUSTAR FM+ and Accessories



# SECUSTAR FM+ Modular Test System

## visual FM/ PS3

**visual FM** – for commercial, infrastructural and technical administration of all types of properties and objects – from property management right on up to administration of buildings, floor space, rooms, systems, medical technology, building services, vehicle pools, furnishings, cable networks, electrical circuits etc. Building structures, machines, equipment etc. can be precisely implemented and represented in the form of any desired objects in accordance with your special requirements.

### Step by Step Implementation of Facility Management

**visual FM** is modular, thus allowing for implementation of facility management in small steps. It can be expanded step by step at any time in accordance with your requirements. Emphasis is placed upon return on investment, optimized quality, security, availability and quick information.

**visual FM** displays the respective object's data in the form of index cards. Index card layouts, as well as the number and type of visible index cards can be freely selected.

The screenshot shows a software window with a menu bar (Haustechnik, Termine, Ereignisse, Aufträge, Tätigkeiten, Zählerstände, Anlagenbuch) and a main data card for a heating system. The card contains the following information:

- Anlagenbez.:** Heizanlage
- Typ/Modell:** Z-020
- Seriesnr.:** 2572788
- Zuordnung:** Haustechnik
- Anlagen-ID:** 10
- Gehört zu:** (undefiniert)
- Kaufdatum:** 01.07.2003
- Baujahr:** 2003
- Fläche-ID:** (undefiniert)
- Raum-ID:** (undefiniert)
- Ebene-ID:** (undefiniert)
- Gebäude-ID:** (undefiniert)
- Liegen-ID:** (undefiniert)
- Kunden-ID:** Gossen-Metrawatt
- Abteilung:** Haustechnik
- Hersteller:** Allweiler GmbH
- Kd-Dienst:** Allweiler GmbH
- Lieferant:** Allweiler GmbH
- Verantwortl.:** Lottner
- Beauftragter:** (undefiniert)
- Bemerkung:** (empty field)
- Anleitung:** Ja (undefiniert)
- Status:** Aktiv (undefiniert)
- Besitz:** Eigen (undefiniert)
- Mandant:** (undefiniert)
- Niederlass.:** (undefiniert)

Bewegungsauswahl Haustechnik Anzahl: 27 Edit (F2) Akt. Multi

Anlagen-ID	Anlagenbez.	Typ/Modell	Terminart	Beginn am	Kd-Dienst
7	Faltrappe	Easy Go 152	Sicherheitsprüfung	03.05.2004	Hausahn GmbH
3	CO2-Löschanlage	FP-3001	Funktionskontrolle	14.05.2004	Bausinger GmbH & Scheltner GmbH
6	Ersatzstromversorgung	ESV 203	Vorbeugende Wartung	09.06.2004	Scheltner GmbH
8	Gasversorgungsanlage	GA 30	Wiederholungsprüfung	11.06.2004	Allweiler GmbH
4	Datenübertragungseinrich	Data S245	Analyse	05.07.2004	Apple GmbH
10	Heizanlage	Z-020	Sicherheitsprüfung	27.07.2004	Allweiler GmbH
12	Personenaufzug	PA-245	Sicherheitsprüfung	02.08.2004	Hausahn GmbH & Bausinger GmbH
1	Abgasanlagen	AA 019	Wartung	13.08.2004	Bausinger GmbH
5	Einbruchmeldeanlage	ELT 0212	Inspektion	06.09.2004	Allweiler GmbH
8	Gasversorgungsanlage	GA 30	Wiederholungsprüfung	10.09.2004	Allweiler GmbH
3	CO2-Löschanlage	FP-3001	Funktionskontrolle	15.09.2004	Bausinger GmbH & Scheltner GmbH
6	Ersatzstromversorgung	ESV 203	Vorbeugende Wartung	08.10.2004	Scheltner GmbH
1	Abgasanlagen	AA 019	Wartung	12.11.2004	Bausinger GmbH & Allweiler GmbH
6	Gasversorgungsanlage	GA 30	Wiederholungsprüfung	10.12.2004	Allweiler GmbH
4	Datenübertragungseinrich	Data S245	Analyse	05.01.2005	Apple GmbH
3	CO2-Löschanlage	FP-3001	Funktionskontrolle	14.01.2005	Bausinger GmbH & Scheltner GmbH
10	Heizanlage	Z-020	Sicherheitsprüfung	27.01.2005	Allweiler GmbH
12	Personenaufzug	PA-245	Sicherheitsprüfung	02.02.2005	Hausahn GmbH & Bausinger GmbH
2	Brandmeldeanlage	FP-283	Inspektion	03.02.2005	Bausinger GmbH & Scheltner GmbH
6	Ersatzstromversorgung	ESV 203	Vorbeugende Wartung	10.02.2005	Scheltner GmbH
1	Abgasanlagen	AA 019	Wartung	11.02.2005	Bausinger GmbH & Allweiler GmbH
5	Einbruchmeldeanlage	ELT 0212	Inspektion	04.03.2005	Allweiler GmbH

**visual FM** allows for bidirectional data exchange within the building services hierarchy (other hierarchies in preparation).

### Data Import to SECUSTAR FM+ for up to 5000 Objects from visual FM:

- Object data (master data from the building services hierarchy)
- Deadlines with work directives and work steps

### Data Export of All Objects from the SECUSTAR FM+ to visual FM / PS3:

- Object data (for the building services hierarchy)
- Activities with measurement and test results for each work step

### Services

A variety of services is available for optimizing the facility management system:

- Adaptation of **visual FM** to customer-specific requirements
- Creation of customer-specific requirements and forms
- On-site system installation
- Consultation during implementation
- Training and instruction
- Execution of various FM tasks (e.g. calibration, DGUV provision 3 (previously BGV A3) etc.)
- Maintenance contracts

# SECUSTAR FM+

## Modular Test System

### Order Information

Description	Type	Article Number
<b>Basic Instrument</b>		
Basic instrument with automated test sequence for DUTs with a line frequency of 50/60 Hz, USB and RS 232 interface, online instructions in German, earthing contact plug and outlet, probe cable with test probe, plug-on alligator clip, test report, operating instructions in all available languages as PDF file on CD ROM	<b>SECUSTAR FM+</b>	M761A
<b>Sensors, Plug Inserts and Adapters</b>		
3-phase 16 A differential current adapter	AT16-DI *	Z750A
3-phase 32 A differential current adapter	AT32-DI *	Z750B
Test probe with pulse current generator for <b>SECUSTAR FM+</b> , 300 V CAT I II 16 A	PGS10 <sup>D)</sup>	Z745Y
Probe for measuring protective conductor resistance, e.g. at rotating devices under test	Brush probe	Z745G
Test adapter in combination with <b>SECUSTAR FM+</b> for testing welding units in accordance with EN 60974-4:2007. The peak value of the open-circuit voltage is determined in the SECULOLOAD by means of a peak value rectifier with very fast diodes. As a result, the actual peak value of the open-circuit voltage is also issued for pulsed voltage sources with clock rates in the range of several 10 kHz, based upon the filter stipulated in the standard. Scope of delivery including 4 measuring cables and 2 plug-on alligator clips	SECULOLOAD	Z745V
Test adapter in combination with <b>SECUSTAR FM+</b> for testing welding units in accordance with EN 60974-4:2007. The peak value rectifier of the SECULOLOAD-N uses rectifier diode 1N 4007 recommended by the standard. This diode is a power rectifier diode and, due to its design principle, only suitable for voltage sources with a low clock rate in the line frequency range or for voltage sources with conventional transformers. Scope of delivery including 4 measuring cables and 2 plug-on alligator clips	SECULOLOAD-N	Z745R

Description	Type	Article Number
<b>Accessories</b>		
Barcode scanner, printer and RFID scanner see separate datasheet „ID systems“		
Adapter for testing single-phase extension cables for protective conductor continuity and insulation continuity between the short-circuited live and neutral conductors and protective earth	EL1 *	Z723A
SECUSTAR carrying pouch	Bagstar	Z700E
Carrying case	K2010	Z504L
Universal carrying pouch	F2000	Z700D
Calibration adapter for test instruments per DIN VDE 0701-0702 with test report	SECU-cal 10 <sup>D)</sup>	Z715A
Package of 3 touch-screen wands	Z753A	Z753A
Package of 2 retaining clips	Z753B	Z753B
<b>PC Analysis Software</b>		
Facility management software for technical building management – Equipment management – Maintenance management – Fire protection – Key management – Cleaning management – ... (approx. 25 hierarchies are currently available)	<b>visual FM</b>	Z7160
Facility management software for technical building management for all SECUTEST..., PROFITEST... and SECUSTAR... instruments with – Administration of customer, building, distributor and electrical circuit, production equipment – Read-out of devices	<b>PS3 AM</b>	ZZ531N
Update to <b>PS3 AM</b> version 9 including hazard analysis – Basic software: PS3 device module, basic module and add-on module (version 3 or 4)	PS3 update	Z530S
<b>Calibration, Maintenance</b>		
Maintenance contract	Z752B	Z752B

\* with German socket and German connector plug  
– other connections available on request

<sup>D)</sup> Data sheet available

For additional information regarding accessories please refer to

- Measuring Instruments and Testers catalog
- [www.gossenmetrawatt.com](http://www.gossenmetrawatt.com)

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