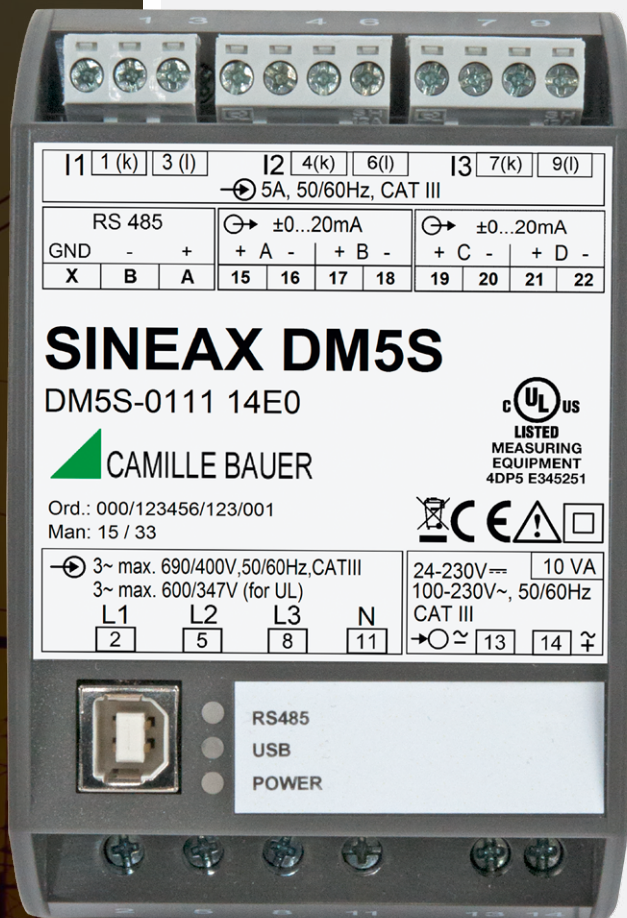CAMILLE BAUER

THE NEXT TRANSDUCER GENERATION

ADJUSTABLE HIGH-ACCURACY HEAVY-CURRENT SENSORS

SINEAX DM5S/DM5F

Heavy-current sensor for grid monitoring.

SINEAX DM5S and SINEAX DM5F are free-programmable universal measurement devices for heavy-current systems: Classical high-accuracy transducers, suited for monitoring tasks and retrofit applications in energy distribution and industry. The devices can be adapted fast and easily to the measurement task by means of the CB-Manager software – even if there is no power supply available. Depending on the device version measured quantities can be mapped proportionally to analog DC current outputs or to Modbus.

DYNAMIC

Response times starting at 15ms (for DM5F)

Automatic scaling of measuring inputs possible

Uninterrupted measurement of input variables

ACCURATE

0.15% (U,I) and 0.2% (P,Q,S)

Meter accuracy for active energy 0.5S (DM5S only)

Adjustable meter resolution

FLEXIBLE

Scalable hardware approach (you only pay for what you need)

Device function completely programmable

Combinable Modbus image for optimised data retrieval

USER-FRIENDLY

Little space required in the control cabinet

Programmable also without auxiliary energy

Independently tested quality (UL listed)

DM5S/DM5F

The measurement is done uninterrupted in all four quadrants and can be adapted optimally to the system to be monitored. Both the average time of the measurement and the expected maximum signal level can be configured.

Commissioning is very easy and is supported by means of service functions, such as nameplate printing, connection check, measurement acquisition as well as simulation and trimming of the analog outputs.

DEVICE VERSION	SINEAX DM5S	SINEAX DM5F
Measurement time, programmable	4...1024 cycles	½, ½ (1), 2,4, 8 cycles
Fastest response time (at 50Hz)	85...165 ms	15...25 ms
Energy metering	max. 32 meters	not supported
Auto-scaling V/I inputs	supported	not supported

SYSTEM STATE MONITORING IN CLASS 0.2

These instantaneous values will be calculated in regular configurable intervals and provided to analog outputs and Modbus interface.

DESCRIPTION	14	2L	3G	3U	3A	4U	4O
System voltage	Yes	Yes	–	–	–	–	–
Voltage L1-N	–	Yes	–	–	–	Yes	Yes
Voltage L2-N	–	Yes	–	–	–	Yes	Yes
Voltage L3-N	–	–	–	–	–	Yes	Yes
Voltage L1-L2	–	–	Yes	Yes	Yes	Yes	Yes
Voltage L2-L3	–	–	Yes	Yes	Yes	Yes	Yes
Voltage L3-L1	–	–	Yes	Yes	Yes	Yes	Yes
Zero displacement voltage	–	–	–	–	–	Yes	Yes
System current	Yes	–	Yes	–	–	–	–
Current in phase L1	–	Yes	–	Yes	Yes	Yes	Yes
Current in phase L2	–	Yes	–	Yes	Yes	Yes	Yes
Current in phase L3	–	–	–	Yes	Yes	Yes	Yes
Neutral current (calculated)	–	Yes	–	–	–	Yes	Yes
Active power of the system	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Active power in phase L1	–	Yes	–	–	–	Yes	Yes
Active power in phase L2	–	Yes	–	–	–	Yes	Yes
Active power in phase L3	–	–	–	–	–	Yes	Yes
Reactive power of the system	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reactive power in phase L1	–	Yes	–	–	–	Yes	Yes
Reactive power in phase L2	–	Yes	–	–	–	Yes	Yes
Reactive power in phase L3	–	–	–	–	–	Yes	Yes
Apparent power of the system	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Apparent power in phase L1	–	Yes	–	–	–	Yes	Yes
Apparent power in phase L2	–	Yes	–	–	–	Yes	Yes
Apparent power in phase L3	–	–	–	–	–	Yes	Yes

DESCRIPTION	14	2L	3G	3U	3A	4U	4O
System frequency	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Active power factor of the system, PF=P / S	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Active power factor in phase L1	–	Yes	–	–	–	Yes	Yes
Active power factor in phase L2	–	Yes	–	–	–	Yes	Yes
Active power factor in phase L3	–	–	–	–	–	Yes	Yes
Reactive power factor of the system, QF=Q / S	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Reactive power factor in phase L1	–	Yes	–	–	–	Yes	Yes
Reactive power factor in phase L2	–	Yes	–	–	–	Yes	Yes
Reactive power factor in phase L3	–	–	–	–	–	Yes	Yes
LF factor of the system, $sign(Q)\cdot(1-abs(PF))$	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LF factor in phase L1	–	Yes	–	–	–	Yes	Yes
LF factor in phase L2	–	Yes	–	–	–	Yes	Yes
LF factor in phase L3	–	–	–	–	–	Yes	Yes
Average voltage	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average current	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average current with sign of P	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bimetal current of the system	Yes	–	Yes	–	–	–	–
Bimetal current in phase L1	–	Yes	–	Yes	Yes	Yes	Yes
Bimetal current in phase L2	–	Yes	–	Yes	Yes	Yes	Yes
Bimetal current in phase L3	–	–	–	Yes	Yes	Yes	Yes
Slave pointer of bimetal current of the system	Yes	–	Yes	–	–	–	–
Slave pointer of bimetal current in phase L1	–	Yes	–	Yes	Yes	Yes	Yes
Slave pointer of bimetal current in phase L2	–	Yes	–	Yes	Yes	Yes	Yes
Slave pointer of bimetal current in phase L3	–	–	–	Yes	Yes	Yes	Yes

14 = Single phase system or 4-wire balanced or 3-wire unbalanced phase shift
2L = two-phase system (split phase)
3G = 3-wire balanced

3U = 3-wire unbalanced
3A = 3-wire unbalanced in Aron connection
4U = 4-wire unbalanced
4O = 4-wire unbalanced in Open-Y connection

DM5S: ENERGY CONSUMPTION MONITORING IN CLASS 0.5S

The DM5S supports up to 32 energy meters. To each of these meters a base measurement quantity and a tariff can be assigned. The present tariff is set via Modbus.
For application with short measurement times, e.g. energy consumption for a single working day or production lot, the resolution can be adapted.
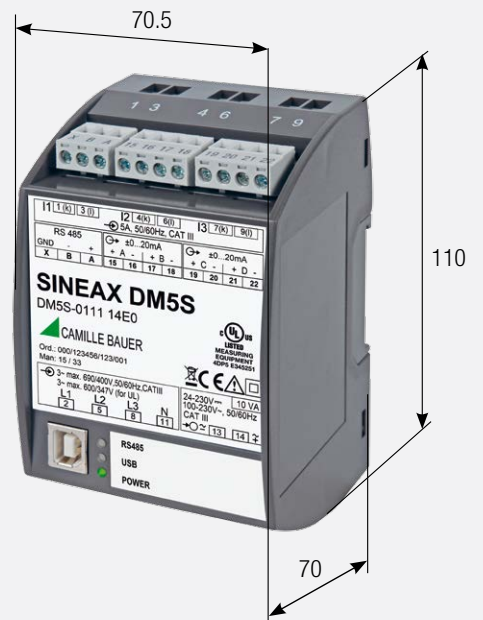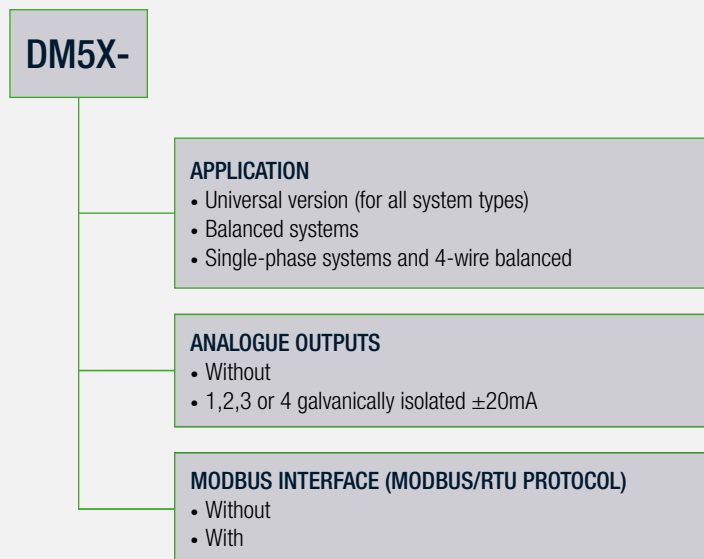Thanks to uninterrupted measurement and automatic range detection a high accuracy is achieved.

- Up to 32 meters
- Up to 16 tariffs (control via Modbus)
- Free selectable base quantity (P, Q, S, I)
- High accuracy 0.5S
- Uninterrupted measurement
- Free selectable meter resolution

FREE DEVICE ASSEMBLY

For parameterization the DM5 is equipped with a USB interface as a standard.
The measurement output can be performed via analog outputs and / or a Modbus interface.
For the designation of the device the marking of the Power LED can be overwritten with the device description. The associated label can then be printed.

DM5X-

APPLICATION
- Universal version (for all system types)
- Balanced systems
- Single-phase systems and 4-wire balanced

ANALOGUE OUTPUTS
- Without
- 1,2,3 or 4 galvanically isolated ±20mA

MODBUS INTERFACE (MODBUS/RTU PROTOCOL)
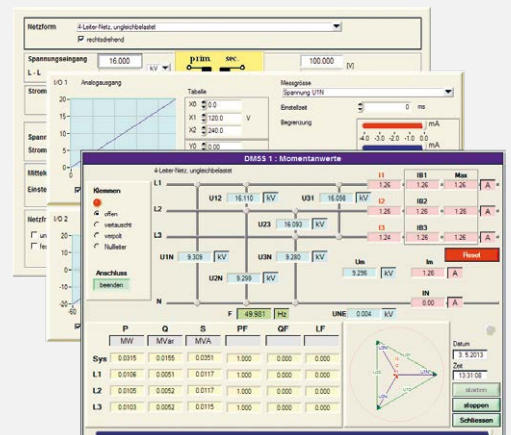- Without
- With

PARAMETERIZATION, SERVICE AND MEASUREMENT ACQUISITION

The CB-Manager software provides the following functions to the user:
- Full parameterization of DM5S/DM5F
  - Locally: Via USB interface (even without power supply)
  - Remote: Via Modbus interface
  - OFFLINE: No device connected
  - Data label printing of present parameterization
  - Free selectable LED marking
- Acquisition and recording of measured quantities
- Check of proper device connection
- Archiving of configuration and measurement files
- Setting or resetting of meter contents
- Simulation and trimming of analog outputs
- Comprehensive parameterization help

A security system can be activated to restrict the access to device data.

TECHNICAL DATA

INPUTS — via screw terminals 6 mm^2

Nominal current: adjustable 1...5 A
Maximum: 7.5 A (sinusoidal)
Consumption: $\leq$ I2 x 0.01 Ω per phase
Overload capability: 10 A continuous
100 A, 10 x 1 s, interval 100 s

Nominal voltage: 57.7…400 V$_{LN}$, 100...693 V$_{LL}$
Maximum: 480 V$_{LN}$, 832 V$_{LL}$ (sinusoidal)
Consumption: $\leq$ U2 / 1.54 MΩ per phase
Impedance: 1.54 MΩ per phase
Overload capability: 480 V$_{LN}$, 832 V$_{LL}$ continuous
600 V$_{LN}$, 1040 V$_{LL}$, 10 x 10 s, interval 10 s
800 V$_{LN}$, 1386 VLL, 10 x 1 s, interval 10 s
Nominal frequency: 45… 50 / 60 …65 Hz
Measurement TRMS: up to 31st harmonic

TYPES OF CONNECTION

Single phase
Split phase (2 phase system)
3-wire, balanced load
3-wire, balanced load, phase shift (DM5S only)
3-wire, unbalanced load
3-wire, unbalanced load, Aron connection
4-wire, balanced load
4-wire, unbalanced load
4-wire, unbalanced load, Open-Y

POWER SUPPLY — via screw terminals 6 mm^2

Nominal voltage: 100…230 V AC ±15%, 50...400 Hz
24...230 V DC ±15%
Consumption: $\leq$ 10 VA

ANALOG OUTPUTS — via plug-in terminals 2.5 mm^2, galvanically isolated

Linearization: Linear or kinked
Range: ± 20 mA (24 mA max.), bipolar
Uncertainty: ± 0.1% (included in basic accuracy)
Response time (50Hz): DM5S: 85…165ms (for 4 cycles measurement)
DM5F: 15…25ms (for ½ cycle measurement)
Burden: $\leq$ 500 Ω (max. 10 V / 20 mA)
Burden influence: $\leq$ 0.1%
Residual ripple: $\leq$ 0.2%

MODBUS/RTU — via plug-in terminals 2.5 mm^2

Physics: RS-485, max. 1200 m (4000 ft)
Baud rate: 2.4 up to 115.2 kBaud
Number of participants: $\leq$ 32

CONFIGURATION INTERFACE USB

Physics: USB, max. 3 m
Connection: Socket USB-B
Device class: Human interface device (HID)

MEASUREMENT UNCERTAINTY

Reference conditions: Ambient 23°C ±1K, sinusoidal, PF=1,
(acc. IEC/EN 60688) Frequency 50…60 Hz, burden 250 Ω,
Measurement over 8 cycles (DM5S), 1 cycle (DM5F)
Voltage, current: ± 0.15% FSU / FSI [1] [2]
Power: ± 0.2% (FSU x FSI) [2]
Power factor: ± 0.1° [2]
Frequency: ± 0.01 Hz
Active energy: Class 0.5S, EN 62 053-22 (DM5S only)
Reactive energy: Class 2, EN 62 053-23 (DM5S only)

[1] FSU / FSI – Configured maximum value of voltage / current inputs
[2] Additional uncertainty if neutral wire not connected (3-wire connections)
 • Voltage, power: 0.1% of measurement value; Load factor: 0.1°
 • Energy: Voltage influence x 2, angle uncertainty x 2

SAFETY

Current inputs are galvanically isolated from each other.
Protection class: II (protective insulation, voltage inputs via protective impedance)
Pollution degree: 2
Protection rating: IP30 (housing), IP20 (terminals)
Overvoltage category: CAT III up to 600V

AMBIENT CONDITIONS, GENERAL INFORMATION

Operating temperature: −20 up to 22 up to 24 up to +55°C
Storage temperature: −25 up to +70 °C
Temperature influence: 0.5 x measurement uncertainty per 10 K
Long term drift: 0.5 x measurement uncertainty per year
Usage group: II (acc. EN 60 688)
Relative humidity: < 95% no condensation
Altitude: $\leq$ 2000m max.
Device to be used indoor only!

MECHANICAL ATTRIBUTES

Dimensions (H x B x D): 110 x 70 x 70mm
Housing material: Polycarbonat
Weight: 500 g
Flammability class: V-0 acc. UL94, self-extinguishing, non dripping, free of halogen

ORDER CODE

SINEAX DM5S, PROGRAMMABLE, UP TO 4 ANALOG OUTPUTS, USB, MODBUS/RTU, METERS	
SINEAX DM5F, PROGRAMMABLE, 1/2 CYCLE MEASUREMENT, UP TO 4 ANALOG OUTPUTS, USB, MODBUS/RTU	DM5X-
1. BASIC DEVICE	
Without display, for rail mounting	0
2. APPLICATION	
Universal version for all applications (3U,3I)	1
Single phase, 3/4-wire balanced load (3U,1I)	2
Single phase or 4-wire balanced load (1U,1I)	3
3. NOMINAL FREQUENCY RANGE	
45...50/60...65 Hz	1
4. POWER SUPPLY	
Nominal voltage 24...230 V DC, 100...230 V AC	1
5. BUS CONNECTION	
Without	0
RS-485 (Modbus/RTU protocol)	1
6. OUTPUTS	
Without	0
1 analog output, bipolar ±20mA	1
2 analog outputs, bipolar ±20mA	2
3 analog outputs, bipolar ±20mA	3
4 analog outputs, bipolar ±20mA	4
7. TEST CERTIFICATE	
Without test certificate	0
Test certificate in German	D
Test certificate in English	E
8. CONFIGURATION	
Basic configuration	0

SMARTCOLLECT

SMARTCOLLECT CLIENT

SMARTCOLLECT CLIENT   MORE CLIENTS POSSIBLE
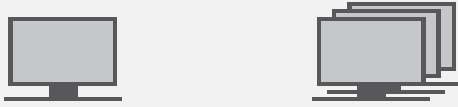
- Graphic visualisation of queried data
- Export via Excel file
- User interface to define the data sources to be read out as well as error and warning messages via email.
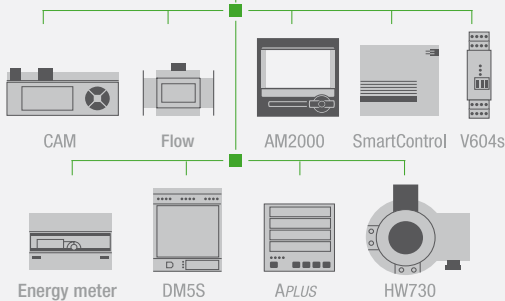
SMARTCOLLECT DATABASE

SQL DATABASE

- MS SQL database (depending on the scope Express or Server)
- Contains the collected data
- Open and unencrypted

SMARTCOLLECT SERVER

SMARTCOLLECT SERVER

- Collects and configures data from active sources and channels and writes the same directly into the central database.
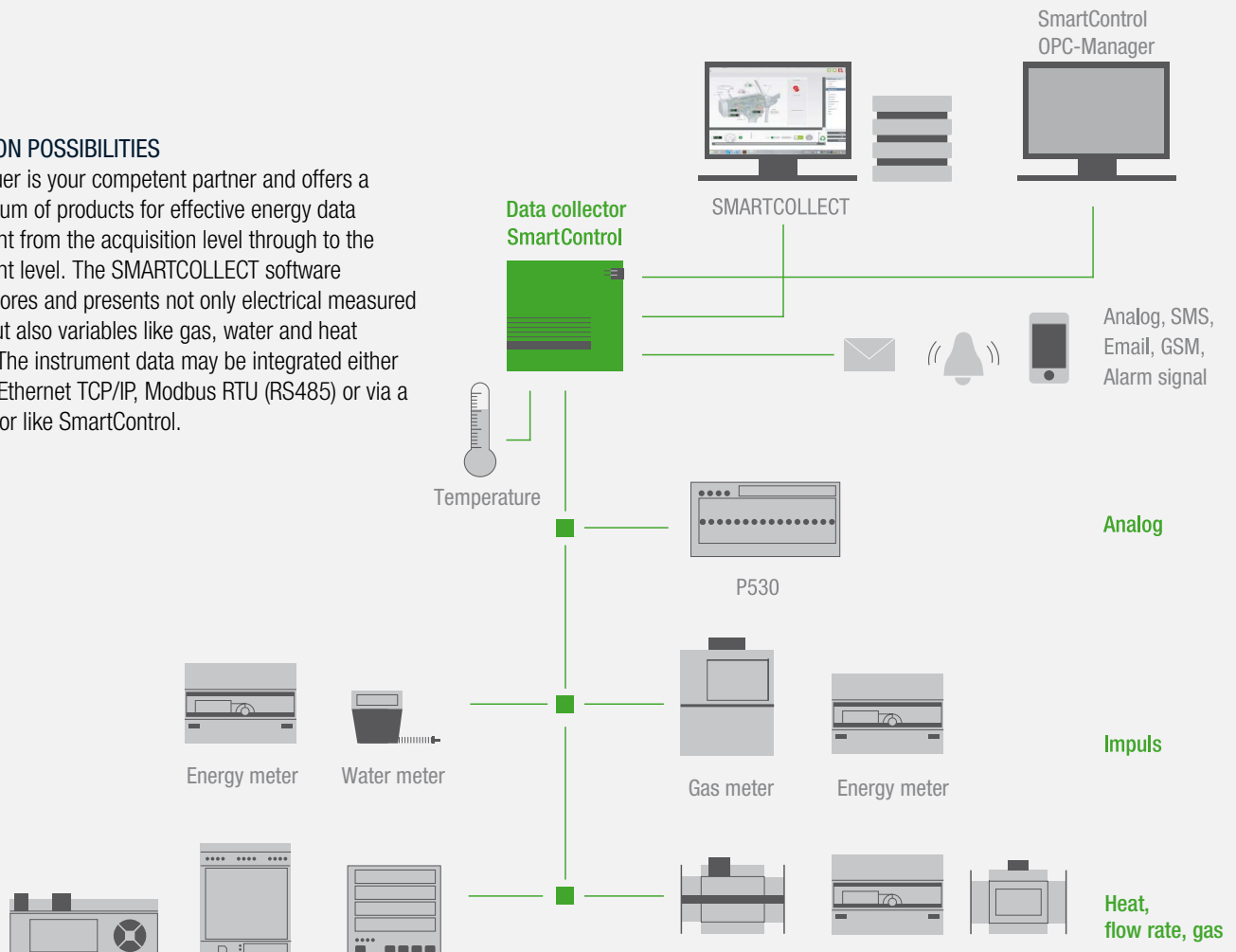
SMARTCOLLECT software components may be installed on an individual system or on several servers or computers.

CAM   Flow   AM2000   SmartControl   V604s

Energy meter   DM5S   A*PLUS*   HW730

SmartControl
OPC-Manager

SMARTCOLLECT

CONNECTION POSSIBILITIES

Camille Bauer is your competent partner and offers a wide spectrum of products for effective energy data management from the acquisition level through to the management level. The SMARTCOLLECT software acquires, stores and presents not only electrical measured variables but also variables like gas, water and heat quantities. The instrument data may be integrated either directly via Ethernet TCP/IP, Modbus RTU (RS485) or via a data collector like SmartControl.

Data collector
SmartControl

Analog, SMS,
Email, GSM,
Alarm signal

Temperature

Analog

P530

M-Bus

Energy meter   Water meter

Gas meter   Energy meter

Impuls

Modbus

Heat,
flow rate, gas

GMC INSTRUMENTS

GOSSEN METRAWATT

CAMILLE BAUER

Subject to change without notice ▪ SM-1032-00-03-EN-08.17