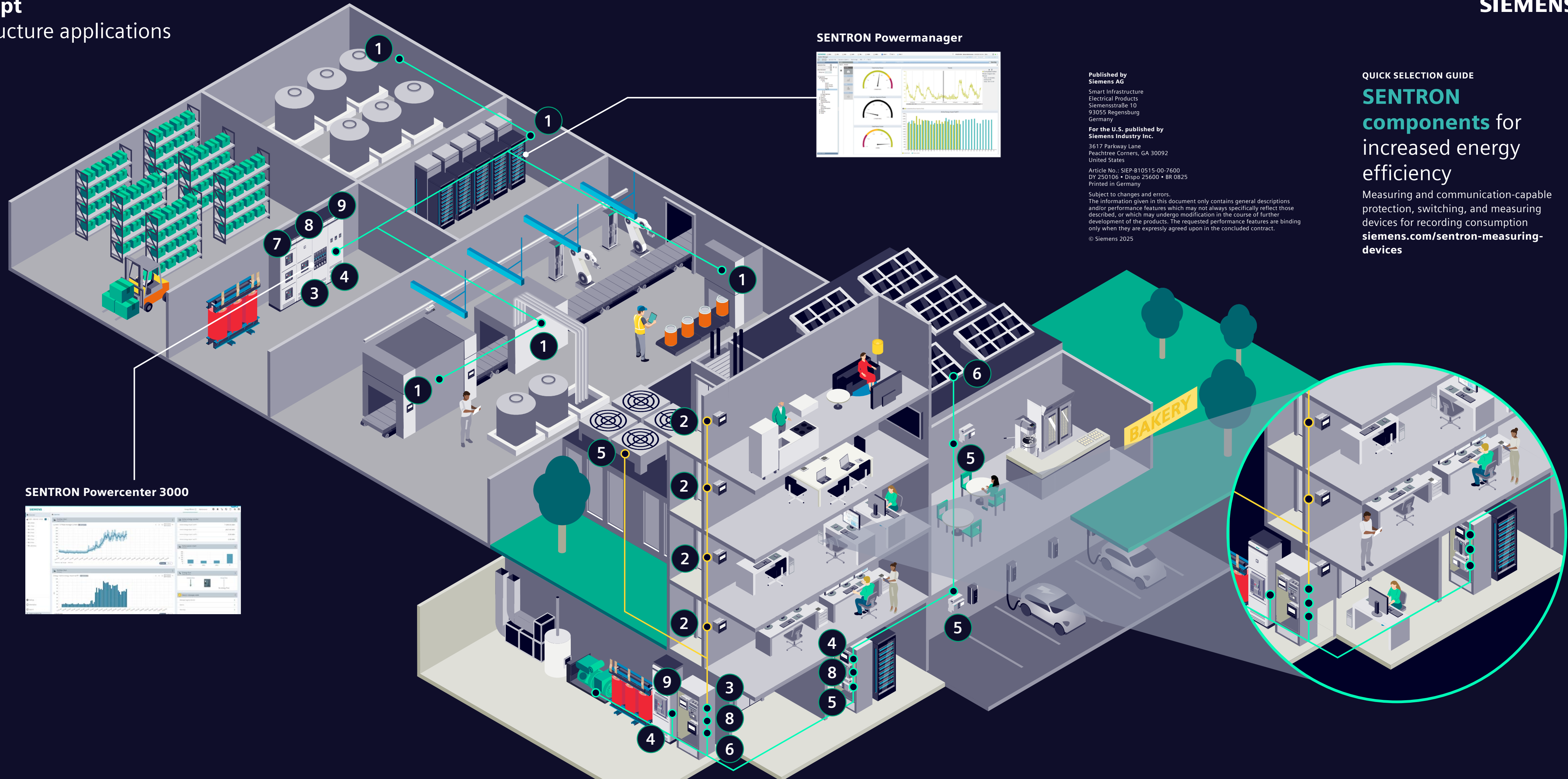


# Measuring point concept for industrial and infrastructure applications

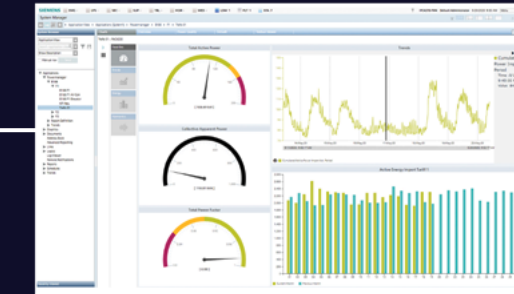
## What and where to measure?

Whether in buildings, industrial plants, or infrastructure, energy efficiency is a prerequisite for reduced carbon emissions, climate neutrality, and a distributed power supply that is successful over the long term. It starts with the measurement of energy consumption, which requires the cooperation of hardware and software with an optimally coordinated measuring point concept.

Note: All consumers that are relevant for billing energy costs to external cost centers must be measured using MID-certified meters.



SENTRON Powermanager



Published by  
Siemens AG  
Smart Infrastructure  
Electrical Products  
Siemensstraße 10  
93055 Regensburg  
Germany

For the U.S., published by  
Siemens Industry Inc.  
3617 Parkway Lane  
Peachtree Corners, GA 30092  
United States

Article No.: SIEP-B10515-00-7600  
DY 250106 • Dispo 25600 • BR 0825  
Printed in Germany

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The information given in this document only contains general descriptions and/or performance features which may not always specifically reflect those described, or which may undergo modification in the course of further development of the products. The requested performance features are binding only when they are expressly agreed upon in the concluded contract.

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## QUICK SELECTION GUIDE



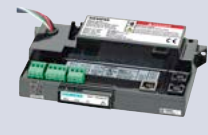
















**SENTRON**  
components for  
increased energy  
efficiency

Measuring and communication-capable protection, switching, and measuring devices for recording consumption  
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- 1 SENTRON 7KM PAC3220
- 2 SENTRON 7KM PAC3120
- 3 SENTRON 7KM PAC4220
- 4 SENTRON 7KM PAC5200
- 5 SENTRON 7KM PAC2200
- 6 SENTRON 7KT PAC1600
- 7 SENTRON Powercenter 3000
- 8 SENTRON 3VA molded case circuit breaker
- 9 SENTRON 3WA air circuit breaker

SENTRON Powercenter 3000



	Multichannel current measuring system	Multichannel current measuring system	Measuring device	Measuring device	Measuring device	Measuring device	Measuring device	Measuring device	Measuring device	Measuring device	Multifunctional recorder	Modular measuring device	Molded case circuit breaker	Air circuit breaker	Electronic circuit protection device	Arc fault detection device and miniature circuit breaker	Data transceiver	Energy monitoring software (pre-installed and ready to use)
	7KT PAC1200	SEM3	7KT PAC1600 / 7KT PAC1600 MID	7KM PAC1020	7KM PAC2200 (MID / CLP)	7KM PAC3120 / 7KM PAC3120 MID	7KM PAC3200T	7KM PAC3220 / 7KM PAC3220 MID	7KM PAC4220	7KM PAC5200	SICAM Q100 / Q200	AI Energy Meter	3VA2 ETU 8-series	3WA	ECPD 5TY1 COM	AFDD/LS 55V6 COM, LS 55L6 COM	SENTRON Powercenter 1100/2000	SENTRON Powercenter 3000
																		
<b>SENTRON portfolio for power monitoring</b>	The flexible solution for multichannel measuring in final circuits	The efficient solution for multichannel current measuring in the main distribution	The entry-level solution when it comes to energy measurement	The cost-effective entry into power measurement and transparency	The energy meter solution for DIN rail	The cost-effective solution for digital measurement	The compact solution for precise energy measurement	The specialist solution for precise energy measurement	The professional solution for communication and monitoring	The specialist solution for measured value recording and power supply quality	The class A solution for power supply quality	The integrated energy measurement in automation	The specialist solution for protection and energy measurement	The incoming circuit breaker with communication	Innovation – the electronic circuit protection device	The communication-capable circuit protection devices		
<b>U, I, P, f, λ</b>	U <sup>3</sup> , I, P, S, Q <sup>1)</sup> , f <sup>1)</sup> , λ <sup>1)</sup>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
<b>Apparent   active   reactive energy   cosφ</b>	x   x   x   –	x   x   x   x	x   x   x   –	–   x   x   –	x   x   x   –	x   x   x   x	x   x   x   –	x   x   x   x	x   x   x   x	x   x   x   x	x   x   x   x	x   x   x   x	x   x   x   x	x   x   x   x	x   x   x   x	x   x   x   –		
<b>Maximum input voltage L-L / L-N</b>	400 V / 230 V	480 V / 277 V	400 V / 230 V	400 V / 230 V	400 V / 230 V	690 V / 400 V	400 V / 230 V	690 V / 400 V	690 V / 400 V	690 V / 400 V galvanically separated	690 V / 400 V galvanically separated	480 V / 277 V	690 V / 400 V (integrated)	1000 V / 577 V (integrated)	–   230 V	–   230 V		
<b>Current transformer connection   direct measuring</b>	x   x (up to 63 A)	x   –	x   x (up to 63A – 1-phase, up to 80A – 3-phase)	x/1 A   x/5 A	x   x (bis 65 A)	x   –	x   –	x   –	x   –	x   –	x   –	x   –	Transformer (integrated)	Transformer (integrated)	–   x	–   x		
<b>DI / DO</b>	–	2/1	1/2	1/1	1/1	2/2	1/1	2 / 2 (10 / 6 with expansion module)	2 / 2 (10 / 6 with expansion module)	0/2	Q100: 2/2 Q200: 6/6	via ET200 / via S7-1200	EFB300 (optional)	optional	1/1	–		
<b>Integrated communication</b>	Modbus TCP	BACnet IP, MSTP, SNMP, NTP, SMT, Modbus TCP, Modbus RTU	Modbus RTU, M-Bus, SO	Modbus RTU	Modbus TCP, Modbus RTU, M-Bus	Modbus RTU	Modbus TCP	Modbus TCP	Modbus TCP	Modbus TCP	Modbus TCP, IEC 61850	PROFINET PROFIBUS	–	–	Wireless	Wireless		
<b>Communication via expansion module</b>	–	–	–	–	PROFINET via SENTRON PROFINET Proxy SPP2000	–	PROFINET via SENTRON PROFINET Proxy SPP2000	Modbus RTU PROFINET PROFIBUS	Modbus RTU PROFINET PROFIBUS	–	Q100: 1 x Modbus TCP + IEC 61850 Q200: 2 x Modbus TCP + IEC 61850	Modbus TCP via CPU	Modbus TCP Modbus RTU PROFINET PROFIBUS	Modbus TCP PROFINET	Modbus TCP via SENTRON Powercenter 1100/2000	Modbus TCP via SENTRON Powercenter 1100/2000		
<b>I(N), I(Diff)</b>	–	–	–	–	–	–	–	with expansion module	with expansion module	–	x	–	x	x	x	Optional RCM		
<b>Analog input</b>	–	–	–	–	–	–	–	with expansion module	with expansion module	–	–	via ET200 / via S7-1200	–	–	–	–		
<b>Load profile record</b>	x	x	–	–	x (PAC2200 CLP)	–	–	–	x	x	x	in S7 CPU	x	x	–	–		
<b>Software interfaces</b>	Webinterface, App (iOS & Android), SENTRON Powerconfig, SENTRON Powermanager	Webinterface, SENTRON Powermanager	SENTRON Powerconfig, SENTRON Powermanager	SENTRON Powerconfig, SENTRON Powermanager	Webinterface, SENTRON Powerconfig, SENTRON Powermanager	SENTRON Powerconfig, SENTRON Powermanager	Webinterface, SENTRON Powerconfig, SENTRON Powermanager	Webinterface, SIMATIC Energy Suite, SIMATIC Energy Manager PRO, SENTRON Powerconfig, SENTRON Powermanager	Webinterface, SIMATIC Energy Suite, SIMATIC Energy Manager PRO, SENTRON Powerconfig, SENTRON Powermanager	Webinterface, SENTRON Powerconfig, SENTRON Powermanager	Webinterface / SICAM PQS/PQA, SENTRON Powermanager (real-time values)	SIMATIC / SIMATIC Energy Suite	SIMATIC Energy Suite, SIMATIC Energy Manager PRO, SENTRON Powerconfig, SENTRON Powermanager	SIMATIC Energy Suite, SIMATIC Energy Manager PRO, SENTRON Powerconfig, SENTRON Powermanager	via SENTRON Powercenter 1100/2000: SENTRON Powerconfig, SENTRON Powermanager	via SENTRON Powercenter 1100/2000: SENTRON Powerconfig, SENTRON Powermanager		
<b>THD   Flicker, fault recorder, EN 50160 reporting</b>	–   –	–   –	–   –	–   –	–   –	x   –	x   –	x   –	x   –	x   x	x   x Transient recording up to 1 μs (Q200)	x   x	x   –	x   –	–   –	–   –		
<b>Harmonics</b>	–	–	1. ... 15. <sup>2)</sup>	–	–	–	–	–	1. ... 64.	2. ... 40.	Q100: 2–50 kHz Q200: 2–63 kHz, 2–9 kHz, 9–150 kHz Harmonic Direction	2. ... 40.	1. ... 19.	2. ... 31.	–	–		
<b>Accuracy class active energy   reactive energy</b>	1 <sup>1)</sup>   1 <sup>1)</sup> 2   –	0.2   1	1   2	1   2	1   1	0.5   2	0.5   1	0.5   2	0.2   2	0.5   2	0.2 S   2	0.5   1	2 S   2 (incl. transformer)	2 S   2 (incl. transformer)	Class 1 <sup>6)</sup>	Class 1 <sup>6)</sup>		
<b>Standard measuring devices</b>	IEC 62053-21	IEC 62052-11, IEC 62053-23, IEC 61010-1, UL 61010-1	IEC 50470-3, IEC 62053-21, IEC 62053-23	IEC 62053-21 <sup>3)</sup> , IEC 62053-233)	IEC 62053-22, IEC 62053-23, IEC 61557-12	IEC 62053-22, IEC 62053-23, UL 61010-1	IEC 62053-22, IEC 62053-23, IEC 61557-12	IEC 62053-22, IEC 62053-23, IEC 61557-12, UL 61010-1	IEC 62053-22, IEC 62053-23, IEC 61557-12, UL 61010-1	IEC 62053-22, IEC 62053-23, IEC 61557-12, IEC 61000-4-30	IEC 62586-1, IEC 61000-4-30, IEC 61000-4-7, IEC 61000-4-15	IEC 61557-12	IEC 61557-12	IEC 61557-12	IEC 61557-12, IEC 62053-22, IEC 62053-23 <sup>4)</sup>	IEC 61557-12, IEC 62053-22, IEC 62053-23 <sup>4)</sup>		
<b>MID certified</b>	–	–	x <sup>5)</sup>	–	x <sup>6)</sup>	x <sup>5)</sup>	–	x <sup>5)</sup>	–	–	–	–	–	–	–	–		
<b>PMD class according to IEC60364-8-1</b>	PMD 1	PMD 2	PMD 2	PMD 1	PMD 2	PMD 3	PMD 3	PMD 3	PMD 3	PMD 3	PMD 3	PMD 3	PMD 3	PMD 1-3	PMD 2	PMD 2		
<b>Order information</b>	<a href="https://www.siemens.com/product?7KT12">siemens.com/product?7KT12</a>	<a href="https://www.siemens.com/product?US2:SEM3">siemens.com/product?US2:SEM3</a>	<a href="https://www.siemens.com/product?7KT16">siemens.com/product?7KT16</a>	<a href="https://www.siemens.com/product?7KM1020">siemens.com/product?7KM1020</a>	<a href="https://www.siemens.com/product?7KM22">siemens.com/product?7KM22</a>	<a href="https://www.siemens.com/product?7KM31">siemens.com/product?7KM31</a>	<a href="https://www.siemens.com/product?7KM32">siemens.com/product?7KM32</a>	<a href="https://www.siemens.com/product?7KM32">siemens.com/product?7KM32</a>	<a href="https://www.siemens.com/product?7KM42">siemens.com/product?7KM42</a>	<a href="https://www.siemens.com/product?7KM5">siemens.com/product?7KM5</a>	<a href="https://www.siemens.com/product?7KG9">siemens.com/product?7KG9</a>	<a href="https://www.siemens.com/product?6ES7">siemens.com/product?6ES7</a>	<a href="https://www.siemens.com/product?3VA2">siemens.com/product?3VA2</a>	<a href="https://www.siemens.com/product?3WA">siemens.com/product?3WA</a>	<a href="https://www.siemens.com/product?5TY1">www.siemens.com/product?5TY1</a>	<a href="https://www.siemens.com/product?Messfunktion%2C%20kommunikation">siemens.com/product?Messfunktion%2C%20kommunikation</a>	<a href="https://www.siemens.com/product?7KKN">siemens.com/product?7KKN</a>	<a href="https://www.siemens.com/product?7KKN">siemens.com/product?7KKN</a>

<sup>1)</sup> Measured in data manager

<sup>2)</sup> 7KT PAC1600 Multimeter

<sup>3)</sup> Uncertainty limit acc. to these standards

<sup>4)</sup> CLP version additionally certified acc. to PTB A50.7

<sup>5)</sup> Versions available with or without MID

<sup>1)</sup> Apparent | active | reactive power

<sup>6)</sup> Values correspond to the standards/classes