The 3VA2 molded case circuit breaker.
Intelligent power distribution with added value – communicative and compact.

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Contents

The new generation of circuit breakers. 04 – 05
One system. Many options. 06
Communication is everything. For perfect monitoring. 08 – 09
Optimum support thanks to efficient and intelligent tools. 10
Integrated measuring function and external measured value recording. 11
High transparency. 12
Communication: All the components at a glance. 13
The increase in digitalization and automation is creating tremendous challenges for electrical power distribution. Reliable protection of personnel, high plant availability, direct control options, and greater energy efficiency are essential. Therefore, systems and components must reliably communicate with one another to keep production plants and machines running.

The 3VA2 molded case circuit breakers ensure a totally safe, efficient, and flexible power supply, while at the same time guaranteeing seamless production processes – through a triple integration of electrical power distribution into digital environments.

The 3VA2 molded case circuit breakers can be easily integrated ...

1. Integration into automated engineering processes
   ... via a comprehensive range of software and CAx data

2. Integration into industrial automation
   ... via a variety of bus systems and open interfaces

3. Integration into holistic energy efficiency concepts
   ... via integrated measuring functions for highly transparent power consumption values
The new generation of circuit breakers.

3VA2 molded case circuit breakers are at the core of highly available power distribution systems. The extremely variable, integrated system assists you every step of the way, from initial planning to the actual operation of electrical power distribution.

**Highlights**
- Modular, well thought-out, highly variable system
- Easy integration into energy management and automation systems
- Integrated measuring function with the ETU 8-series
- Simple, efficient monitoring
- Numerous communication options available via standard bus systems

**Easy to integrate**
3VA2 molded case circuit breakers can be seamlessly integrated into an existing technical infrastructure and automation environment via standard bus systems. Comprehensive CAx data is also available for the engineering process and can be integrated into all standard planning and project management tools.

**Highly communicative**
3VA2 molded case circuit breakers are genuine all-rounders, particularly when it comes to energy savings and efficient power distribution. Integrated measuring functions and optional communication ensure that the status of power distribution and its energy flows will always be sufficiently transparent.
Triple integration as a basis for safe and efficient power distribution in digital factories and buildings.
Communication-capable 3VA2 molded case circuit breakers are suitable for a variety of applications and perform a wide range of functions in industry, buildings, and infrastructure.

Best of all: With open interfaces and standard protocols (PROFIBUS, PROFINET, Modbus TCP, Modbus RTU), 3VA2 molded case circuit breakers can be seamlessly integrated into an existing technical infrastructure and automation environment, ensuring that the processes in your plant will always be transparent.
System safety – securely protect sensitive areas

Identification of potential savings – trace loads with high power consumption

Application monitoring – minimize plant downtimes
The new system strategy: Maximum fail-safe level.

Take precautions to ensure sufficient protection for sensitive systems and system components (a data center, for example) – and be confident of trouble-free operation. Critical system statuses, caused by harmonics or overload, for instance, can be recognized at an early stage, allowing a rapid response.

Keep an eye on all data
Communications capability and integrated measuring function mean the 3VA2 molded case circuit breakers and the 7KM PAC measuring devices form an ideal basis for monitoring your system. Set limit values can be monitored using monitoring software, such as powermanager, or as part of a control system, enabling an impending overload to be identified at an early stage. If a fault still occurs because of an overload or short circuit, the selective 3VA2 molded case circuit breakers ensure that only the affected system component is switched off, thus preventing your entire system from being shut down.

Functions:
1. 3VA2 molded case circuit breakers measure power consumption and support load management
2. 3VA2 molded case circuit breakers monitor the power supply for asymmetry (power quality); 7KM PAC measuring devices monitor the harmonics (line quality)
3. 7KM PAC measuring devices monitor the uninterrupted power supply

Highlights:
- Outstanding selectivity to ensure high system availability
- Comprehensive communicative properties to transmit measured values and system statuses
- Recording of diagnostic data to prevent dangerous system statuses and thus prevent outages
Right for building technology: Transparent power distribution.

Typical loads such as ventilation systems, compressors, pumps, elevators, and lighting are in constant use within buildings. The motor protection versions of the 3VA2 molded case circuit breakers make it possible to monitor these loads selectively by feeder and quickly track down loads with unusual high power consumption.

Find inefficient loads more quickly
The motor protection versions of the 3VA2 molded case circuit breakers protect the various loads against overload and short circuits. The integrated measuring function can also transmit consumption data to higher-level building automation systems, in addition to providing the protection function. This makes each individual load's power consumption transparent, so peak loads can be specifically avoided and consumption behavior adapted as appropriate. In addition, inefficient loads can be individually located and replaced.

Potential savings

3VA2 molded case circuit breakers constantly record consumption values and indicate where power usage by individual loads is disproportionately high. The result: targeted energy and cost efficiency.

Example: Individual applications in a building

Functions:
1. Main infeed: 3VA2 molded case circuit breakers with integrated measuring function record total plant consumption
2. Partial infeed: Motor protection versions of the 3VA2 molded case circuit breakers monitor and record measured values from individual loads selectively by feeder

Highlights:
- Targeted recording of power consumption by individual loads
- Easy identification of loads with high power consumption
- Reduction of peak loads, adaptation of consumption behavior
Preventing a shutdown: Efficient plant monitoring.

Processes must work together smoothly in manufacturing. If the amount of power used by a specific load changes, the measured values recorded in the process enable conclusions to be drawn about the mechanical or electrical condition of that part of the system, which lets you adapt your maintenance intervals and avoid costly plant downtimes.

Automatically maintain an overview
Impending damage to a bearing, a torn belt or a pump running dry will always have repercussions on a motor’s consumption behavior. The diagnostic data supplied by the 3VA2 molded case circuit breakers (e.g. reason for tripping, violation of set threshold values) makes it quick and easy to locate faults of this type. The integrated measuring function also makes it possible to identify a slow change in load performance (such as bearing damage) at an early stage. You can then carry out preventive maintenance or adapt your maintenance schedules before expensive mechanical damage occurs. This also means you can keep downtimes or maintenance times to a minimum.

Functions:
1. Main infeed: 3VA2 molded case circuit breakers ensure reliable protection for the entire plant
2. Infeed for a subapplication: Motor protection versions of the 3VA2 molded case circuit breakers with integrated measuring function provide early identification of potential faults

Highlights:
- Monitoring of consumption behavior of individual plant components
- Rapid fault location and identification using measurement and diagnostic data
- Adjustment of maintenance intervals and avoidance of costly plant downtimes
Increased energy awareness: Intelligent power monitoring.

Since 2015 it is mandatory for companies throughout Europe to perform energy audits, with big fines for those who do not comply. Using the measured values from the 3VA2 molded case circuit breakers and the 7KM PAC measuring devices, your company can meet its responsibilities in the low-voltage power distribution area.

Identify and manage potential savings
Efficient energy management starts with data collection and documentation, which makes your potential savings visible. To do this, you need a clean record of consumption values for entire applications, partial infeeds within the application and the individual loads. The data is forwarded to a higher-level power monitoring system, e.g. the powermanager power monitoring software or a SIMATIC system, via a communications connection. It is then further processed for documentation and cost center billing.

Functions:
1. 3VA2 molded case circuit breakers and 7KM PAC measuring devices record consumption and power data
2. powermanager power monitoring software evaluates, documents, and archives the acquired energy data

Highlights:
- Accurate recording of performance data and documentation of individual load values to provide a comprehensive overview of all energy-relevant data
- Perfect preparation for mandatory energy audits according to EN 16247

Example: Power monitoring in a factory
Communication is everything. For perfect monitoring.

It’s easy to make optimal use of the energy data acquisition and communication capabilities of 3VA2 molded case circuit breakers. The following coordinated components support the measurement and communication capabilities of 3VA2 molded case circuit breakers:

**Efficient software support and visualization**

The powerconfig configuration software facilitates timesaving and safe commissioning as well as detailed maintenance work. The powermanager power monitoring software manages and archives the acquired energy data, which can then be analyzed in a variety of ways and displayed as a report.

**3VA2 molded case circuit breaker with ETU 5-series (ETU550, ETU560)**

Acquires current values and diagnostic data; with parameterization option, measured value display, and optional communication.

**3VA2 molded case circuit breaker with ETU 8-series (ETU850, ETU860 und ETU860M)**

Acquires current, voltage, and power values as well as diagnostic data; with

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**Various communication options – flexibility all along the line**

Communicative: The 3VA2 molded case circuit breakers can be connected to higher-level management systems via standard bus systems.
parameterization option, measured value display, and optional communication.

**COM060 communication module**
COM060 communication modules are mounted in the right-hand accessories compartment of the 3VA2 molded case circuit breaker and establish a connection to the 3VA-line via T-Connectors. This connection is used to transmit measured and diagnostic data and to forward the resulting information to the COM100 / COM800 breaker data servers.

**T-Connectors and preassembled connecting cables**
Installation of the 3VA-line is fast and flexible using the T-Connectors and corresponding connecting cables of varying lengths. The cables can be up to 20 meters long. The 3VA-line is furnished with a terminating resistor at each outer end.

**COM100 and COM800 breaker data servers**
For linking one or up to eight 3VA2 molded case circuit breakers to standard bus systems. COM100 / COM800 breaker data servers feature an integrated Ethernet interface (10/100 Mbit/s) and an interface to the expansion modules for optional bus connections.

**7KM PAC Switched Ethernet PROFINET, 7KM PAC PROFIBUS DP, and 7KM PAC Modbus RTU expansion modules**
Expansion modules for the COM100 and COM800 breaker data servers, for connecting to the PROFIBUS, PROFINET, Ethernet (Modbus TCP), and Modbus RTU bus systems. Modbus TCP is integrated into the COM100 / COM800 breaker data servers and the 7KM PAC Switched Ethernet expansion module.

**DSP800 display**
Situated in an easily accessible location (for example, in the cubicle door), the DSP800 display serves to display the data (for example, measured variables, parameters, diagnostic data) of up to eight 3VA2 molded case circuit breakers without programming effort.

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**Highlights**
- Protection, measurement, and communication in a single device
- Efficient connection of up to eight 3VA2 molded case circuit breakers to various bus systems
- Integrated current transformer and voltage tap
- Display of measured values from up to eight molded case circuit breakers
Optimum support thanks to efficient and intelligent tools.

The series of 3VA2 molded case circuit breakers is an integral part of Siemens’ tool environment and greatly simplifies planning, parameterization, and integration into automation and energy management systems.

Efficient planning with the SIMARIS tools
The 3VA2 molded case circuit breakers are fully supported by the SIMARIS tools. SIMARIS design makes it possible to calculate networks and plan the mechanical design, while SIMARIS project generates bids. SIMARIS curves can assist in the display and analysis of tripping characteristics in conjunction with other protection devices, such as fuses.

Fast parameterization with powerconfig
The powerconfig configuration software is a commissioning and service tool for communication-capable measuring devices and circuit breakers in the SENTRON product family. The PC-based tool makes device parameterization easier, which results in considerable time savings – particularly when multiple devices require setup. powerconfig can also be used to parameterize, document, operate, and monitor 3VA2 molded case circuit breakers via their various communication interfaces.

Efficient monitoring with powermanager
3VA2 molded case circuit breakers supply important measured values and diagnostic data via standardized bus systems. The PC-based powermanager power monitoring software makes it easy to analyze, archive, and monitor the measured values acquired. In conjunction with the 7KM PAC measuring devices from the SENTRON portfolio, it helps you to create the ideal technical basis for an operational energy management system according to ISO 50001.

Integration into automation
3VA2 molded case circuit breakers can be easily integrated into all Siemens automation platforms. Libraries of pregenerated program and image blocks are available for the SIMATIC PCS7 process control system. To facilitate the integration of 3VA2 molded case circuit breakers into SIMATIC STEP7 (Classic) and SIMATIC TIA-Portal automation systems, we offer prepared, sample applications that can easily be modified, making them flexible to use. Applications are also available for the Desigo building automation system.
**Communication: All the components at a glance.**

**3VA2 molded case circuit breakers with ETU 5-series**

- Line protection: ETU550, ETU560
  - Acquisition of current values
  - Parameterization and measured value display directly at the ETU
  - Optional communication

**3VA2 molded case circuit breakers with ETU 8-series**

- Line protection: ETU850, ETU860 / motor protection: ETU860M
  - Acquisition of current, voltage, and power values
  - Parameterization and measured value display directly at the ETU
  - Optional communication

### Communication accessories in the molded case circuit breaker

**COM060 communication module**
- For mounting in the right-hand accessories compartment of the 3VA2 molded case circuit breaker
- Communication with breaker data server
- Includes a T-Connector

**Breaker data server**

**COM800 / COM100 breaker data server**
- For connecting 3VA2 molded case circuit breakers to standard bus systems
  - Integrated Ethernet interface (10/100 Mbit/s)
  - Includes two terminating resistors
  - COM800 breaker data server: central communication module for connecting up to eight 3VA2 molded case circuit breakers via the 3VA-line

**7KM PAC expansion modules**
- Switched Ethernet PROFINET / PROFIBUS DP / Modbus RTU
- Interface expansion for COM100 and COM800 breaker data servers
- Mounted on a breaker data server by means of plug-in technology

**Accessories for communication**

- **T-Connector (spare part)**
  - Provides spur line feeder to COM060 communication module and loops through to the next circuit breaker

- **Preassembled connecting cable**
  - T-Connector-to-T-Connector or T-Connector-to-COM800 / COM100
    - 0.4 m long
    - 1 m long
    - 2 m long
    - 4 m long

- **Preassembled connecting cable for extending the COM060-to-T-Connector spur line connection**
  - 0.4 m long
  - 0.8 m long

### Accessories for communication

- **Additional bus terminating resistors (spare part)**
  - 3VA9987-OTE10

- **Voltage tap to external N conductor (spare part)**
  - 3VA9987-0UC10
  - Cables for connecting the neutral point for the measuring function of the ETU 8-series, 1.5 m long

- **External current transformer for N conductor**
  - 3VA9907-0NA10
  - 3VA99107-0NA10
  - 3VA99307-0NA10
  - Spare part: cable for connecting an external current transformer for an N conductor

**Display**

- **DSP800 display**
  - For displaying the status, measured values, and parameters of up to eight 3VA2 molded case circuit breakers
  - Connection to COM800 / COM100 breaker data server via integrated Ethernet interface

**Software**

- **powerconfig configuration software**
  - Commissioning and service tool for communication-capable circuit breakers and measuring devices from the SENTRON portfolio
  - Download free of charge at [http://support.automation.siemens.com/WW/view/de/63452759](http://support.automation.siemens.com/WW/view/de/63452759)

- **Library 7KM PAC3200 for SIMATIC PCS 7**
  - 3ZS2781-1CC11-0YG0
  - Library 3WL / 3VA / 3VL for SIMATIC PCS 7
  - 3ZS2782-1CC10-0YG0

- **Function block libraries for the seamless integration of circuit breakers and measuring devices in SIMATIC PCS 7 and SIMATIC WinCC**
  - Library 7KM PAC3200 for SIMATIC WinCC
  - 3ZS2791-1CC11-0YG0

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*Frame sizes 3VA2 100 A, 160 A, 250 A
**Frame sizes 3VA2 400 A, 630 A*
Integrated measuring function and external measured value recording.

<table>
<thead>
<tr>
<th>Ambient conditions</th>
<th>Retrofit / conversion of a power distribution board</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional space in cubicle / installation effort</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measuring requirements</th>
<th>Measuring accuracy / update time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2% power / faster than 2 s</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System-specific requirements</th>
<th>Diagnosis of protection device (molded case circuit breaker)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Measured value acquisition for each load feeder</td>
</tr>
</tbody>
</table>

Without circuit breaker replacement: upgrade measuring function and communication only

Additional current transformers required
Installation and wiring of three / four current transformers, fuse-protected voltage taps, and feedback on circuit breaker status

With circuit breaker replacement

No additional space required, all transformers integrated into 3VA2 molded case circuit breaker

2% power per IEC 61775-12 / 2 s

Integrated

Access to circuit breaker data via communication interface

Motor protection version with integrated measuring function
High transparency.

Protect, measure, and communicate, all with a single device – that’s exactly what the 3VA2 molded case circuit breakers from the SENTRON portfolio enable you to do. It’s an integrated system for a fail-safe, highly available power supply.

The table on the right compares the technical features of the 3VA2 molded case circuit breakers with integrated measuring function with those of the 7KM PAC measuring devices.

<table>
<thead>
<tr>
<th>Performance</th>
<th>7KM PAC3100 measuring device</th>
<th>7KM PAC3200 measuring device</th>
<th>3VA2 molded case circuit breaker with ETU 8-series</th>
<th>7KM PAC4200 measuring device</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range / connection</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. input voltage L-L / L-N</td>
<td>480 V / 276 V x/5 A</td>
<td>690 V / 400 V x/1 A /x5 A</td>
<td>690 V / 400 V Integrated x/1 A /x5 A</td>
<td>690 V / 400 V</td>
</tr>
<tr>
<td>Transformer connection version</td>
<td>–</td>
<td>–</td>
<td>25 A – 630 A</td>
<td>–</td>
</tr>
<tr>
<td>Direct connection version</td>
<td>–</td>
<td>22 – 65 V / 110 – 340 V DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Version with DC extra-low-voltage power supply unit</td>
<td>–</td>
<td>24 V DC</td>
<td>22 – 65 V / 110 – 340 V DC</td>
<td></td>
</tr>
<tr>
<td>Basic variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Current, voltage, power, frequency, power factor</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>Power detection</td>
<td></td>
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<tr>
<td>Apparent, active, reactive power</td>
<td>■ / ■ / ■</td>
<td>■ / ■ / ■</td>
<td>■ / ■ / ■</td>
<td>■ / ■ / ■</td>
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<tr>
<td>Extended variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load profile recording with time stamp and min. / max. values</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
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<tr>
<td>Total harmonic distortion factor THD (voltage, current)</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Harmonics (voltage, current)</td>
<td>–</td>
<td>–</td>
<td>3rd – 31st</td>
<td>–</td>
</tr>
<tr>
<td>Phase angle, phase diagram</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Monitoring function</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating hours counter</td>
<td>–</td>
<td>■</td>
<td>■</td>
<td>■</td>
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<tr>
<td>Limit-value monitoring</td>
<td>–</td>
<td>■</td>
<td>■</td>
<td>■</td>
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<tr>
<td>Logic functions</td>
<td>–</td>
<td>■</td>
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<td>–</td>
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<tr>
<td>Event log</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>&gt; 4000 events</td>
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<tr>
<td>Gateway function</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>System integration and communication</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital inputs (DI) / digital outputs (DO)</td>
<td>2 / 2</td>
<td>1 / 1</td>
<td>via EFB300: 1/4</td>
<td>2 / 2</td>
</tr>
<tr>
<td>SO interface</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>4DI / 2DO expansion module</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>optional</td>
</tr>
<tr>
<td>Modbus RTU</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
</tr>
<tr>
<td>Ethernet with Modbus TCP</td>
<td>–</td>
<td>optional</td>
<td>optional</td>
<td>optional</td>
</tr>
<tr>
<td>PROFIBUS DPV1</td>
<td>–</td>
<td>optional</td>
<td>optional</td>
<td>optional</td>
</tr>
<tr>
<td>PROFINET IO / PROFInergy</td>
<td>–</td>
<td>optional</td>
<td>optional</td>
<td>optional</td>
</tr>
<tr>
<td>Parameterizing software</td>
<td>powerconfig</td>
<td>powerconfig</td>
<td>powerconfig</td>
<td>powerconfig</td>
</tr>
<tr>
<td>Integration into power monitoring system</td>
<td>powermanager</td>
<td>powermanager</td>
<td>powermanager</td>
<td>powermanager</td>
</tr>
<tr>
<td>General data</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measuring accuracy – current, voltage</td>
<td>0.5 % – 0.2 %</td>
<td>0.5 % – 0.2 %</td>
<td>1 % / 1 %</td>
<td>0.5 % – 0.2 %</td>
</tr>
<tr>
<td>Measuring accuracy – active, reactive power</td>
<td>1/2</td>
<td>0.5 S/2</td>
<td>Class 2 per IEC 61557-12</td>
<td>0.5 S/2</td>
</tr>
<tr>
<td>Installation</td>
<td>Front mounting</td>
<td>Front mounting</td>
<td>Fixed mounting, plug-in technology, draw-out technology</td>
<td>Front mounting</td>
</tr>
<tr>
<td>Dimensions</td>
<td>96 x 96 x 56 mm</td>
<td>96 x 96 x 56 mm</td>
<td>Depending on size</td>
<td>96 x 96 x 82 mm</td>
</tr>
<tr>
<td>Measured value display</td>
<td>Display</td>
<td>Display</td>
<td>Display in the ETU / optional: DSP800</td>
<td>Display</td>
</tr>
</tbody>
</table>

1) Without transformer
2) Including transformer 1% in the 0.2 – 1.2 xIn range
3) Including transformer 1% in the 80 – 800 V range
Want to know more?
Attend our training course “Communication with SENTRON components” (LV-CBCOM) and learn all about the communication capability of our low-voltage power distribution devices.

Take advantage of our training offer

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