3VA molded case circuit breaker
up to 1600A
3VA molded case circuit breaker
New 3VA13/14 with TMTU (Thermal Magnetic Trip Unit)
New 3VA27 with ETU (Electronic Trip Unit)
3VA1 molded case circuit breaker

Highlights

**Line / generator / starter protection**

- Compact design
  (3VA1 frame size 160A ➔ 48% smaller than 3VL160X)
- Rated currents from 16A up to 630A
- Breaking capacity classes from 16 kA to 70 kA
- Thermal-magnetic trip unit
- 1- to 4-pole breakers available
  (1- and 2-pole in frame size 160 A)
- "Real" switch disconnector up to 630A\(^1\) according to IEC 60947-3 also available in MCCB design
- Complete and uniform accessory platform across all 3VA molded case circuit breakers

\(^1\) LBS 630A Planned for Q4 2018
3VA1: Excellent match with the infrastructure market
Most compact design for 160Amp!

<table>
<thead>
<tr>
<th>Type</th>
<th>Breedte (mm)</th>
<th>Modules (afgerond)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1P</td>
<td>24,4</td>
<td>1,5 mod</td>
</tr>
<tr>
<td>2P</td>
<td>50,8</td>
<td>3 mod</td>
</tr>
<tr>
<td>3P</td>
<td>76,2</td>
<td>5 mod</td>
</tr>
<tr>
<td>4P</td>
<td>101,6</td>
<td>6 mod</td>
</tr>
<tr>
<td>4P+DIFF</td>
<td>131,8</td>
<td>8 mod</td>
</tr>
</tbody>
</table>

3VA1 - 4P with side mounted RCD

3VA1 - 3P with din rail adapter
## 3VA1 molded case circuit breaker
### TM240 ATAM

<table>
<thead>
<tr>
<th>IEC 60947</th>
<th>100 A</th>
<th>160 A</th>
<th>250 A</th>
<th>400A</th>
<th>630A</th>
</tr>
</thead>
<tbody>
<tr>
<td>TU240 ATAM</td>
<td>–</td>
<td>3/4 - pole</td>
<td>3/4 - pole</td>
<td>3/4 - pole</td>
<td>3/4 - pole</td>
</tr>
<tr>
<td>• Adjust Thermal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Adjust Magnetic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-conductor, 4- pole available in form of:</td>
<td>–</td>
<td>• Without protection</td>
<td>• Without protection</td>
<td>• Without protection</td>
<td>• Without protection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 50% protection</td>
<td>• 50% protection</td>
<td>• 50% protection</td>
<td>• 50% protection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 100% protection</td>
<td>• 100% protection</td>
<td>• 100% protection</td>
<td>• 100% protection</td>
</tr>
</tbody>
</table>

### Front view

![Front view of TM240](image)

### Characteristic curve

![Characteristic curve](image)
3VA2 molded case circuit breaker

Compact and packed with innovations:
Our 3VA2 molded case circuit breaker!

- Excellent selectivity
- Rotary double contact system
- Communication function
- External function box
- Comm. RCD
- Large ETU display
- Power metering
  - Very high breaking capacity up to 150 kA

- Integrated voltage tab
- Optimized connectivity
- Rogowski coil
- S0 interface
3VA2 molded case circuit breaker

Highlights

- Line / generator / motor / starter protection
- Four breaking capacity classes
- Selective protection with a nominal current ratio of 1:2.5
- Electronic trip units (ETU 3-series, ETU 5-series, ETU 8-series)
- ETU 8-series with integrated metering function
- Communication via Ethernet (Modbus TCP), Modbus RTU, PROFIBUS, PROFINET
- Complete and uniform accessory platform across all 3VA molded case circuit breakers
3VA2 molded case circuit breaker
Electronic Trip Units

**ETU 300-series**
- Rotary switch with absolute values in Amps

**Line / generator protection:**
- ETU320 LI
- ETU330 LIG
- ETU350 LSI

**Line Protection**
- ETU340 fuse characteristic (ELISA)

**Motor protection:**
- ETU350M LSI

**Starter protection:**
- ETU310M I

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**ETU 500-series**
- Display with menu
- Optional communication available
- Optional external N-CT

**Line / generator protection:**
- ETU550 LSI
- ETU560 LSIG

**Motor protection:**
- –

**Starter protection:**
- –

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**ETU 800-series**
- Display with menu
- Power metering
- Optional communication available
- Optional external N-CT

**Line / generator protection:**
- ETU850 LSI
- ETU860 LSIG

**Motor protection**
- ETU860M

**Starter protection:**
- –
3VA2 molded case circuit breaker
Electronic trip units 3-series

- LI, LIG and LSI functionality
- Maximum 5 rotary coding switches with color differentiation
  - Overload protection
  - Short-time delayed short-circuit protection
  - Neutral conductor protection
- Easily adjustable through absolute values
- Sealable transparent cover
- Adjustable N conductor protection in 4-pole molded case circuit breakers
- LEDs
  - ACT
  - AL1 (I > 90% \(I_r\))
  - AL2 (I > 105% \(I_r\))
3VA2 molded case circuit breaker
Electronic trip units 5-series and 8-series

- With display
- Parameter settings via ETU buttons or PC
- Display of the currents $I_{L1}$ to $I_{L3}$, $I_N$ and $I_g$
- Display of voltage, frequency, power factor, active power, reactive power and energy for the 8-series ETUs with integrated measuring function
- Protection functions LSI and LSIG
- External N-CT can be connected
- Oversized neutral conductor protection (OSN) for 4-pole breakers with $I_n < I_{n, \text{max}}$ of the frame size

Example: 160 A in FS 250 A

$$I_{r, L1/L2/L3} = 32 \text{ A} \ldots 160 \text{ A}$$
$$I_{r, N} = 32 \text{ A} \ldots 250 \text{ A} \ (1,6 \times I_n)$$
### 3VA2 with metering device vs. 3VA2 with integrated metering function

**SENTRON 3VA2 (160A - ETU320) with SENTRON PAC 3200**

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Device</th>
<th>Order Nr.</th>
<th>List Price 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PAC 3200</td>
<td>7KM2112-0BA00-3AA0</td>
<td>358,02 €</td>
</tr>
<tr>
<td>1</td>
<td>3VA2 – 160A/3P</td>
<td>3VA2116-5HL36-0AA0</td>
<td>507,30 €</td>
</tr>
<tr>
<td>3</td>
<td>CT for PAC</td>
<td>4NC5122-2CE21</td>
<td>206,91 €</td>
</tr>
<tr>
<td>1</td>
<td>Auxiliary Switch</td>
<td>3VA9988-0AA12</td>
<td>16,04 €</td>
</tr>
<tr>
<td>1</td>
<td>Trip Signal Contact</td>
<td>3VA9988-0AB12</td>
<td>16,04 €</td>
</tr>
<tr>
<td>1</td>
<td>MCB 6A/4P</td>
<td>5SY4406-7</td>
<td>71,35 €</td>
</tr>
</tbody>
</table>

**Total:** 1,175,66 €

### Technical Features
- All metering data available via PAC3200
- No operating data available
- Significant cabling work

**Conclusion:** keen basic solution for low level system requirements
3VA2 with metering vs. 3VA2 with integrated metering function

SENTRON 3VA2 (160A - ETU850) with metering function and communication

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Device</th>
<th>Order Nr.</th>
<th>List Price 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3VA2 – 160A/3P</td>
<td>3VA2116-5KP36-0AA0</td>
<td>940,50 €</td>
</tr>
<tr>
<td>1</td>
<td>COM060</td>
<td>3VA9187-0TB10</td>
<td>231,00 €</td>
</tr>
<tr>
<td>1</td>
<td>Cable (3VA Line)</td>
<td>3VA9987-0TC10</td>
<td>15,38 €</td>
</tr>
<tr>
<td>1</td>
<td>COM800 (gateway for 8x3VA2)</td>
<td>3VA9987-0TA10</td>
<td>759,00 € (+8 = 94,87€)</td>
</tr>
</tbody>
</table>

1.281,75 €

Technical Features
- Very high accuracy of the metering function
- Big number of operating data available via communication
- Negligible cabling work
- Only 9% more expensive on hardware

Conclusion: Ideal solution for high end industry applications.
WEBINAR POLL:
"I would recommend a 3VA circuit-breaker with integrated energy metering and communication as a better and more economic solution to my customers."

ANSWER WEBINAR POLL QUESTION: YES / NO
3VA5 and 3VA6 molded case circuit breaker with UL certification

**Highlights**

- Product range for global operating machine and equipment manufacturers
- Certification acc. UL489 und IEC60947-2
- Versions with thermal-magnetic and electronic trip units available
- Minimal planning effort thanks to comprehensive 3D data offerings
- Knowledge Manager: Technical information can be retrieved directly at the installed device
- Easy adaptation to individual requirements thanks to a comprehensive range of accessories
Internal accessories
Manifold functions and easy installation

Leading changeover switch (LCS_HQ + LCS_HP)
High switching capacity and compact size
see contact sequence diagrams 3VA Manual

Universal release (UNI)

Undervoltage release (UVR)

Shunt trip (STF)
Flexible
(Flexible use for 3VA2 only)

Shunt trip (STL)
Left

Short circuit alarm switch (SAS_HQ, for 3VA1 only)
Compact size

Electrical alarm switch (EAS_HQ, for 3VA2 only)
Compact size

Cylinder lock adapter

Electronic component (COM060)
Communication

Electronic component (24 V module)
Power supply

Trip alarm switch (TAS_HQ + TAS_HP)
High switching capacity and compact size

Auxiliary switch (AUX_HQ + AUX_HP)
High switching capacity and compact size

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Internal accessories: leading aux. contact for switching off frequency drives

Leading aux. contact switches off the frequency drive 20ms earlier than the main contacts. (Important for the lifespan of the frequency drive)
3VA molded case circuit breaker
Extensive and flexible accessories

1. Test devices
2. powerconfig software
3. Communication
4. Internal accessories
5. Locking and interlocking
6. Motor operator
7. Manual operators
8. Knowledge Manager
9. Residual current devices
10. Plug-in
11. Draw-out
12. DIN rail adapter
13. Connection technology
Residual current devices
Advanced RCD820

1. Type designation
2. Tripped indicator
3. Active LED
4. Com LED
5. Alarm 1 LED
6. Alarm 2 LED
7. Delay time setting knob
8. Touch protection cover
9. Isolating arrester
   (to be removed during insulation tests)
10. RCD-ETU cable
11. Terminals for auxiliary contacts
12. Test button (direction of arrow)
13. Residual operating current setting knob
14. Transparent protective cover over the settings (sealable)

To be sealed if the application includes protection of persons
Residual current devices: type A and B
Portfolio
Manual operators
Supplementary handle for door mounted rotary operator

- For comfortable operation when cabinet door is open
- Operation only after "intentional act" (pushing-in of the handle)
- In gray or red (EMERGENCY-STOP version)
Manual operators
Illumination kit

- Illumination of the handle for clearer view of the switch position even in poor visual conditions (color coding analogous to switch position indicator)
- Can be used for front, door coupling and side wall mounted rotary operator
- 24 V DC voltage
Available in two contact systems: ACB / MCCB

New 3VA27 => 1600A

Selective → ACB
- \(I_{cu} = 66\text{kA}\)
- \(I_{cw(1s)} = 50\text{kA}\)
- + Higher \(I_{cw}\) for selective applications

Current limiting → MCCB
- \(I_{cu} = 110\text{kA}\)
- \(I_{cw(1s)} = 20\text{kA}\)
- + Optimized for energy and dynamic selectivity
- + Limiting let through current
External Function Box EFB300 Overview functionalities

<table>
<thead>
<tr>
<th>Signalling</th>
<th>Controlling</th>
<th>Counting</th>
<th>Warning</th>
<th>Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output of</td>
<td>With the load shedding and load restoring function it is possible to switch off consumers (pumps, compressors, HVAC) → easy way of powermanagement</td>
<td>With the function of the S0 interface an impulse can be distributed per energy contents (e.g. kWh). Simple energy management possible.</td>
<td>Frequency converters can be warned of an overload trip triggering for 200 ms.</td>
<td>With a ZSI function it is possible to reduce the tripping times of the S and G protection to 50 ms. In the fault case there is a considerably lower system load/stress.</td>
</tr>
<tr>
<td>Trip cause LSING</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overload warning AL1 (95%) und AL2 (105%) to local signalling devices</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
High transparency regarding usage data and system states

Communication via Modbus TCP IP, Modbus RTU, Profinet, Profibus

- DSP800
- Scalance Switch
- COM800
- Modbus TCP communication
- Computer with Powerconfig Software
- 3VA Line
- Circuit Breaker 1
- Circuit Breaker 2
- Circuit Breaker 3
- Circuit Breaker 4
- 3WL10
- 3VA27
One configuration software for all SENTRON products
Parameter, on-line status check, commissioning..

Simaris Powerconfig v3.11 (release 10-02-2018)
- 3VA Molded Case Circuit Breakers (incl. DSP800 display, COM800 data server)
- 3WL Air Circuit Breakers
- Energy Counters 7KT, PAC
- Automatic Transfer Switches

Free download (Updates incl.):
- http://www.siemens.com/sentron
Knowledge Manager

Scanning of the QR code provides MLFB-based technical information of the 3VA molded case circuit breaker.

- Direct connection to the Service & Support Portal
- Siemens Industry Support App
- QR-Reader i-nigma

Patent pending
Digitalization in Panel Building

Data-based Engineering

BIM Building Information Modeling (BIM)

Electrical dimensioning

- SIMARIS design
  - Network planning

- 1-pole overall network plan
  - Simaris Curves APP

Mechanical dimensioning

- SIMARIS project
  - Space requirement
  - Cost estimate

- SIMARIS configuration
  - Dimensioning of the plant

Electrotechnical planning

- 3-pole wiring diagram

Consistent support in the engineering process – from planning to commissioning
- Saves time
- Reduces effort
- Reduces costs

Consistent support in the engineering process – from planning to commissioning
- Saves time
- Reduces effort
- Reduces costs

- DIMARIS-Therm software: dimensioning of the heat dissipation IEC61439-2

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