



# Low Voltage & Products Consistent product portfolio for the IEC market



Ingenuity for life

#### **Industrial applications**

### Infrastructure and buildings

















**ACB** 





**LBS** 



**PMC** 









Medium & Low Voltage Partnering System

SIMOPRIME & Sivacon S8



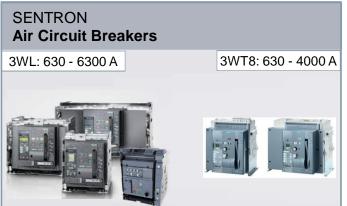


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Page 3 EM LP SI TM

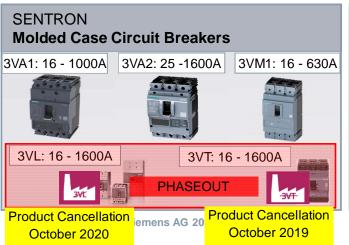
### **Low-Voltage Power Distribution Products SENTRON-Products**















### **3VA and 3VM Product Overview**

# SIEMENS Ingenuity for life



3VA1 breakers are equipped with Thermal Magnetic Trip Unit (TMTU) 3VA2 breakers are equipped with Electronic Trip Units (ETU)

3VA – Line according to UL489 / IEC 60947

125 A 250 A 150 A 250 A 400 A 600 A 3VA6



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### Welcome to the World of 3VA! **SIEMENS** Ingenuity for life Compact and packed Large ETU display Rotary double with innovations Kulary L. System Power metering according Integrated voltage tab to IEC 61557-12 Optimized connectivity **PROFINET** Modbus RTU Excellent selectivity Communication S0 interface

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Page 8 05/3/2019 Very high breaking capacity

up to 150 kA

Modbus TCP

**Profibus DP** 

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### **3VA** molded case circuit breaker

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3VA1 breakers are equipped with Thermal Magnetic Trip Unit (TMTU) 3VA2 breakers are equipped with Electronic Trip Units (ETU)

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### **3VA1** molded case circuit breaker





The world's smallest molded case circuit breaker with up to 70 kA and  $I_{cs}$  = 100%  $I_{cu}$ !

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# **3VA1 molded case circuit breaker Highlights**

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#### 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 @ 415 V AC
- Thermal-magnetic trip unit
- 1- to 4-pole breakers available
   (1- and 2-pole in frame size160 A)
- "Real" switch disconnector up to 630A<sup>1)</sup> 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** molded case circuit breaker Frame sizes and nominal current



		3VA1 Frame Sizes and Rated Currents							
		3VA10 100 A	3VA11 160 A	3VA12 250 A	3VA13 400 A	3VA14 630 A	3VA15 1000 A		
Rated Current In/A	16	3p, 4p	1p, 2p, 3p, 4p						
	20	3p, 4p	1p, 2p, 3p, 4p						
	25	3p, 4p	1p, 2p, 3p, 4p			•			
	32	3p, 4p	1p, 2p, 3p, 4p						
	40	3p, 4p	1p, 2p, 3p, 4p		NIEW 7	NIEW	NIEW		
	50	3p, 4p	1p, 2p, 3p, 4p		NEW	NEW	NEW		
	63	3p, 4p	1p, 2p, 3p, 4p						
	80	3p, 4p	1p, 2p, 3p, 4p						
	100	3p, 4p	1p, 2p, 3p, 4p						
	125		1p, 2p, 3p, 4p						
	160		1p, 2p, 3p, 4p	3p, 4p					
	200			3p, 4p					
	250			3p, 4p					
	320				3p, 4p				
	400				3p, 4p	On 4n			
	500 630					3p, 4p	2n 4n		
	800					3p, 4p	3p, 4p 3p, 4p		
	1.000						3p, 4p		



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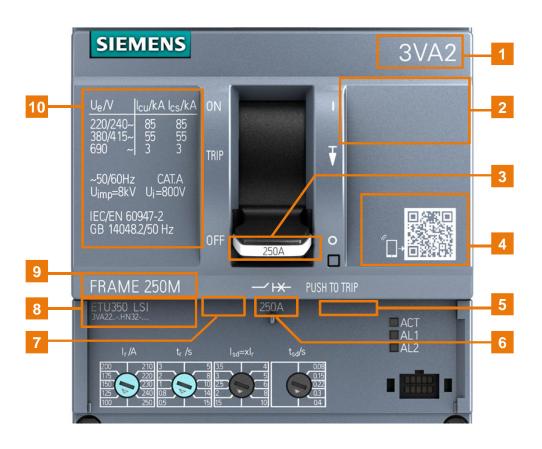
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### **Labelling of 3VA Breakers**

# SIEMENS Ingenuity for life

- 1 Breaker type
- 2 Approbations
- 3 Rated current
- 4 Knowledge Manager
- 5 Serial number
- 6 Rated current
- 7 Product version
- 8 Trip unit type and order no.
- 9 Size and breaking capacity class
- 10 Name plate



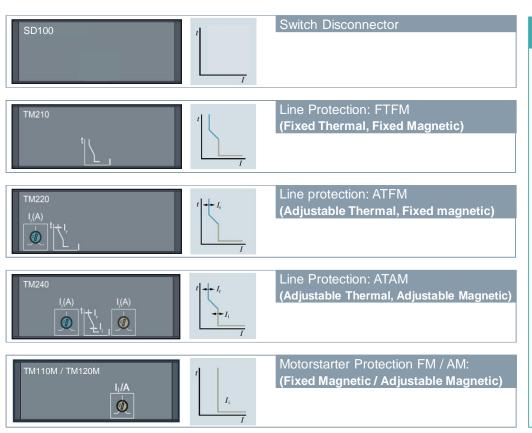
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# **3VA1 molded case circuit breaker Trip unit overview**





#### Line / Generator protection / Switch disconnectors

- Line protection TM210, TM220, TM240
- Switch disconnector SD100
- Starter protection TM110M and TM120M
- Neutral protection available for 4-pole breakers: 0%, 50%, and 100%
- Usable for AC and DC networks
- No derating up to 50°C

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3VA2 molded case circuit breaker (up to 1000A)

Overview / Technical Data

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#### 3VA2 molded case circuit breaker

### **SIEMENS**

Ingenuity for life



- Rated currents 25 A 1000 A
- Short-circuit breaking capacity
   55 kA 150 kA @ 415 V
- Communication via Ethernet (Modbus TCP),
   Modbus RTU, PROFIBUS, PROFINET
- Metering function according to IEC 61557-12
- Line, motor, starter and generator protection



- Rated currents 800 A 1600 A
- Short-circuit breaking capacity
   55 kA 110 kA @ 415 V
- Communication via Ethernet (Modbus TCP),
   Modbus RTU, PROFIBUS, PROFINET \*
- Metering function according to IEC 61557-12
- Line, motor, starter protection and non-automatic air circuit breaker

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## **3VA2** molded case circuit breaker up to 1000 A Highlights





### Line / generator / motor / starter protection

- Rated currents 100 A 1000 A
- 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

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### **Molded Case Circuit Breaker 3VA2 up to 1000A Frames and Rated Currents**



	3VA2 – Frame Sizes and Rated Currents						
3VA2	3VA20 100 A	3VA21 160 A	3VA22 250 A	3VA23 400 A	3VA24 630 A	3VA25 1000A	
25	3p, 4p	3p, 4p					
40	3p, 4p	3p, 4p					
63	3p, 4p	3p, 4p					
100	3p, 4p	3p, 4p					
160		3p, 4p	3p, 4p				
250			3p, 4p	3p, 4p			
400				3p, 4p	3p, 4p		
500					3p, 4p		
630					3p, 4p	3p, 4p	
800						3p, 4p	
1000						3p, 4p	





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# 3VA2 molded case circuit breaker (up to 1000A) Trip Units

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# **3VA2 molded case circuit breaker up to 1000A Electronic Trip Units**



**ETU 3er-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

#### **ETU 5er-series**



- Display with menu
- · Optional communication available
- Optional external N-CT

#### Line / generator protection:

- ETU550 LSI
- ETU560 LSIG

#### **Motor protection:**

ETU550M LSI

#### **Starter protection:**

• -

#### **ETU 8er-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:

• \_

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3VA molded case circuit breaker (up to 1000A)
Accessories

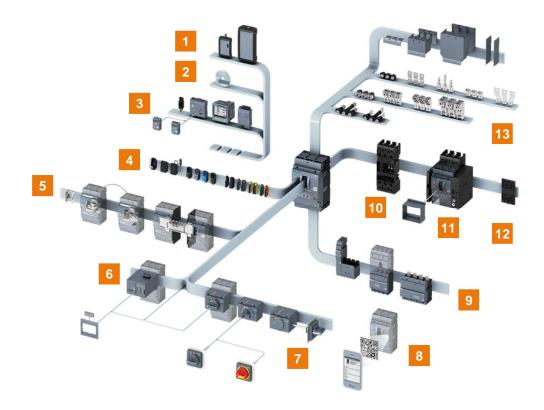
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### **3VA molded case circuit breaker Extensive and flexible accessories**

# SIEMENS Ingenuity for life

- 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



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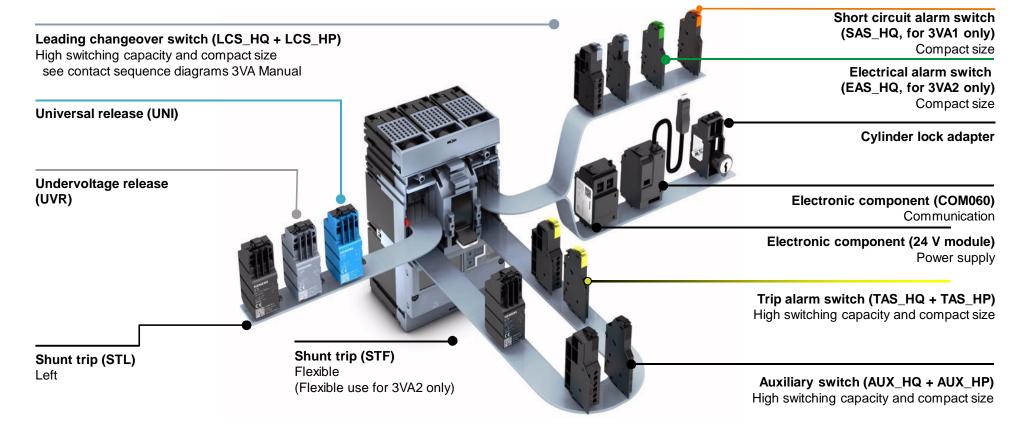
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# Internal accessories for 3VA1 and 3VA2 up to 1000A Manifold functions and easy installation

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### Motor operators for 3VA up to 630A

# SIEMENS Ingenuity for life

#### **Front Mounted Motor Operator MO320**

- Motorized remote control of 3VA MCCBs
- The MO320 front-mounted motor operator is available for all 3VA MCCBs up to 630A
- Available for several standardized voltage levels



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### Side Mounted Motor Operator MO310

- Motorized remote control of <u>3VA1</u> MCCBs
- The MO310 front-mounted motor operator is available for all 3VA MCCBs up to 160A
- Available for several standardized voltage levels



#### **Stored Energy Operator SEO520**

- Remote control of 3VA2 MCCBs through charged spings (ON/OFF)
- Communications capable and non communications capable
- The SEO520 front-mounted motor operator is available for all 3VA2 MCCBs up to 250A
- Available for several standardized voltage levels

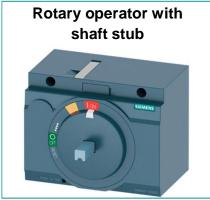


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# **Manual operators Overview**



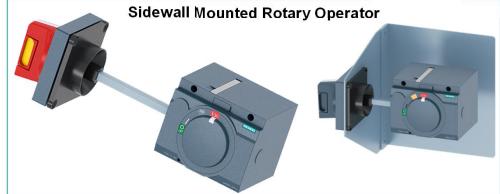












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### **3VA Plug In Units and Withdrawable Units**



# **Plug In Units** Available for: • 3VA11 - 3VA14 • 3VA20 - 3VA24

# Withdrawable Units Available for: • 3VA12 - 3VA14 • 3VA20 - 3VA24

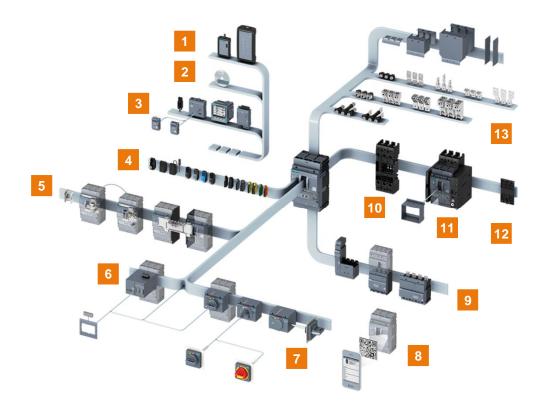
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### **3VA molded case circuit breaker Extensive and flexible accessories**

# SIEMENS Ingenuity for life

- 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



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The 3VA27 molded case circuit breaker 800 A up to 1,600 A

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The 3VA27 molded case circuit breaker

Overview / Technical Data

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#### 3VA2 molded case circuit breaker

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- Rated currents 25 A 1000 A
- Short-circuit breaking capacity
   55 kA 150 kA @ 415 V
- Communication via Ethernet (Modbus TCP),
   Modbus RTU, PROFIBUS, PROFINET
- Metering function according to IEC 61557-12
- Line, motor, starter and generator protection



- Rated currents 800 A 1600 A
- Short-circuit breaking capacity
   55 kA 110 kA @ 415 V
- Communication via Ethernet (Modbus TCP),
   Modbus RTU, PROFIBUS, PROFINET \*
- Metering function according to IEC 61557-12
- Line, motor, starter protection and non-automatic air circuit breaker

### The 3VA27 molded case circuit breaker Overview



Depending upon the application, the 3VA27 molded case circuit breaker takes over the **line/motor/starter protection** within the low voltage power distribution and provides a supplement to the existing 3VA IEC portfolio.

The 3VA27 is designed for applications with the following requirements:

- Circuit breakers for AC according to IEC 60947-2
- Non-automatic air circuit breakers in circuit breaker design according to IEC 60947-3
- Integration option in switchboards according to IEC 61439
- High breaking capacity up to 110 kA (I<sub>cu</sub> at 415 V)
- Communication capability
- Metering function according to IEC 61557-12
- Available with toggle lever or stored energy mechanism



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# One molded case circuit breaker – two possible operating mechanisms



Two operating mechanisms are available for the 3VA27, having no influence on the current limiting contact system of the 3VA27.



**3VA27** with stored energy mechanism (motor operator capability)<sup>1)</sup>



### **3VA27** with toggle operating mechanism

è typically for molded case circuit breakers tripping is indicated by the "trip position"

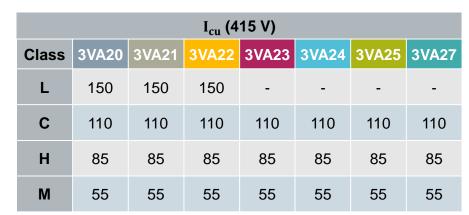
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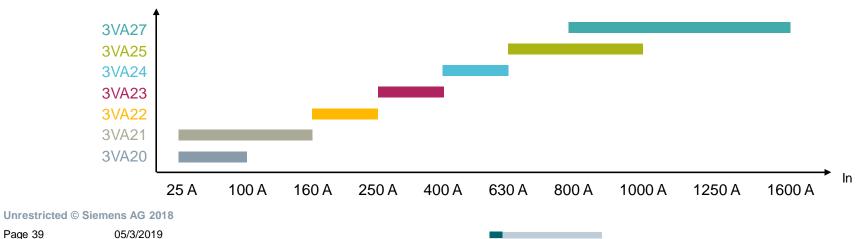
### **3VA27 technical specifications** Integration of the 3VA27 into the Siemens 3VA2 portfolio

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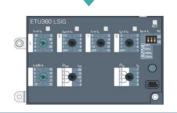
# The 3VA27 molded case circuit breaker Trip Units

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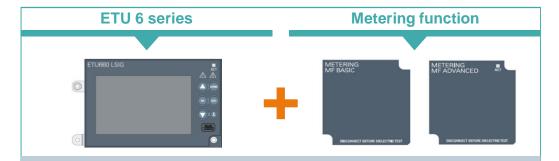
#### Electronic trip units and metering functions of the 3VA27 3/6-series ETU overview







- LI, LSI, LSIG protection function
- Adjustable N-conductor protection
- Rotary coding switch in 3VA design
- Tripping characteristics with selective design for the 3WL and 3VA family
- Operation in temperature range of -25°C to +70°C



- · LSI, LSIG protection function
- Adjustable N-conductor protection
- Display & modular expandable functionalities:
- Fine-tuning for increased selectivity requirements
- Communication-capable
- Metering function (basic & advanced)
- Enhanced protection functions for customized applications and specialized network requirements
- Improved ground fault detection (residual current protection Rc, ground fault protection at the neutral point G\_ret)
- Interactive I / O functionalities
- Operation in temperature range of -25°C to +70°C



#### The 3VA27 molded case circuit breaker

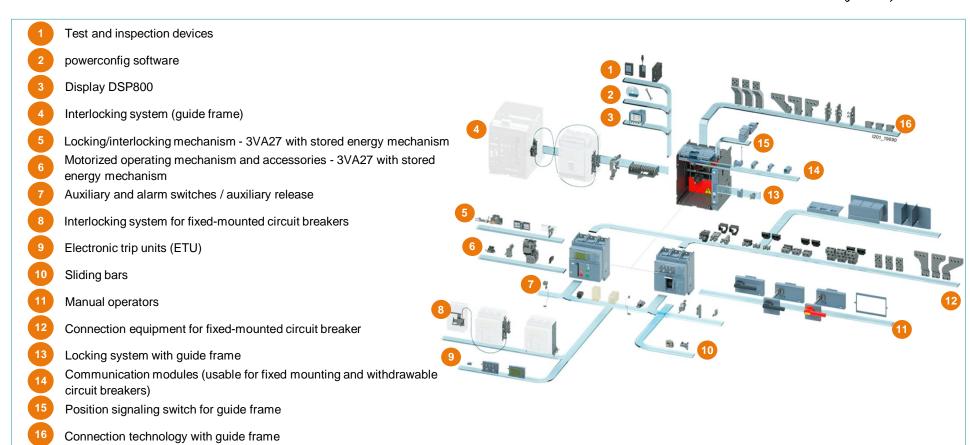
Accessories

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## 3VA27 total overview Exploded view





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#### **3VA27 Internal Accessories**

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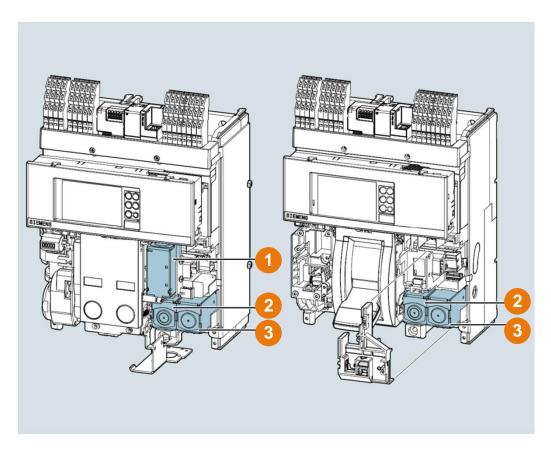
- Auxiliary switch (AUX)
- External auxiliary switch (AUX)
- Tripped signaling switch (TAS)
- Tripped signaling switch (S24)
- Tripped signaling switch (UVR/ST)
- Ready-to-close signaling switches (RTC)
- Leading changeover switch (S26)
- Stored energy mechanism status switch (S21)
- Position signaling switch (PSS)



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## **3VA27 Internal Accessories Mounting Example**





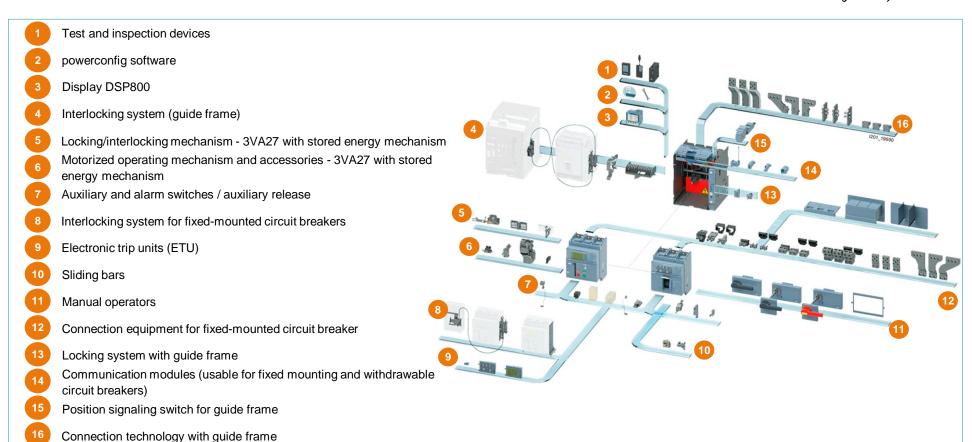
- Closing coil (CC) (for stored energy mechanism version only)
- 2 Undervoltage release (UVR) / Shunt trip (ST2)
- 3 Shunt trip (ST)

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## 3VA27 total overview Exploded view





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#### 3VA2 molded case circuit breaker Communication

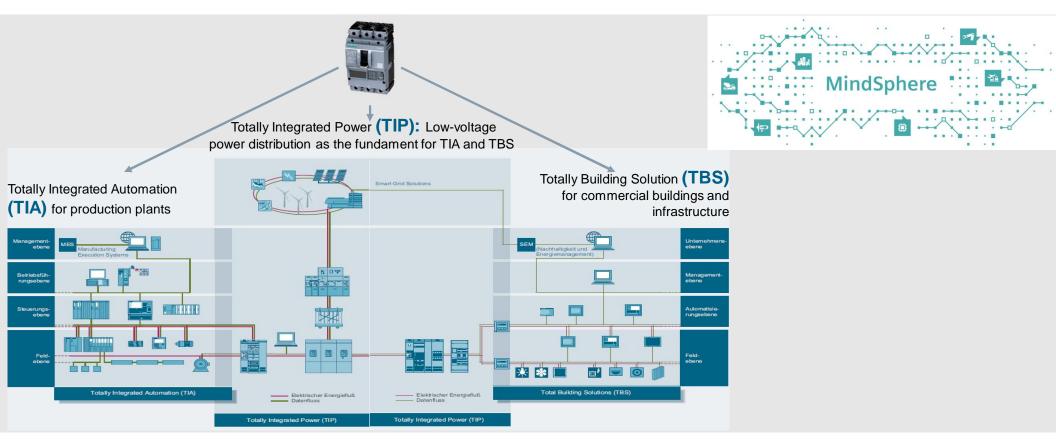
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## Integration of 3VA molded case circuit breaker into three system concepts: TIA, TIP, TBS

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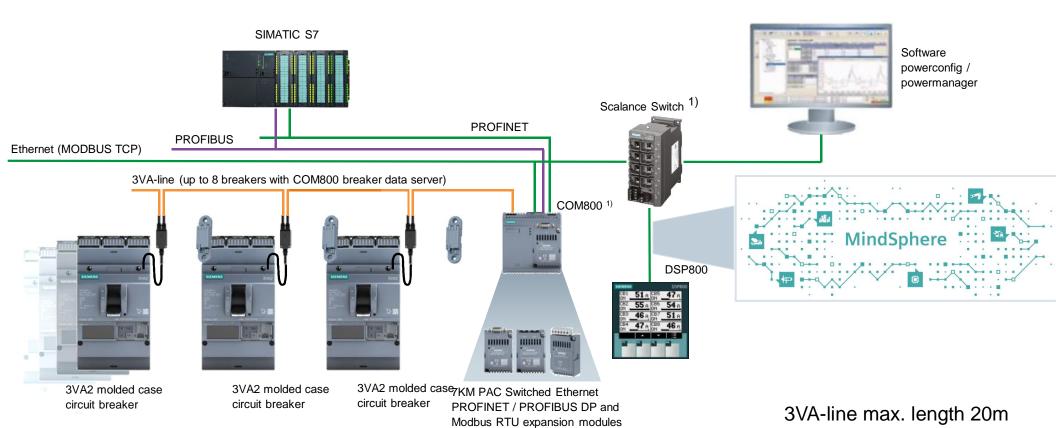
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#### High transparency regarding usage data and system states

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1) COM100 breaker data server ' one breaker

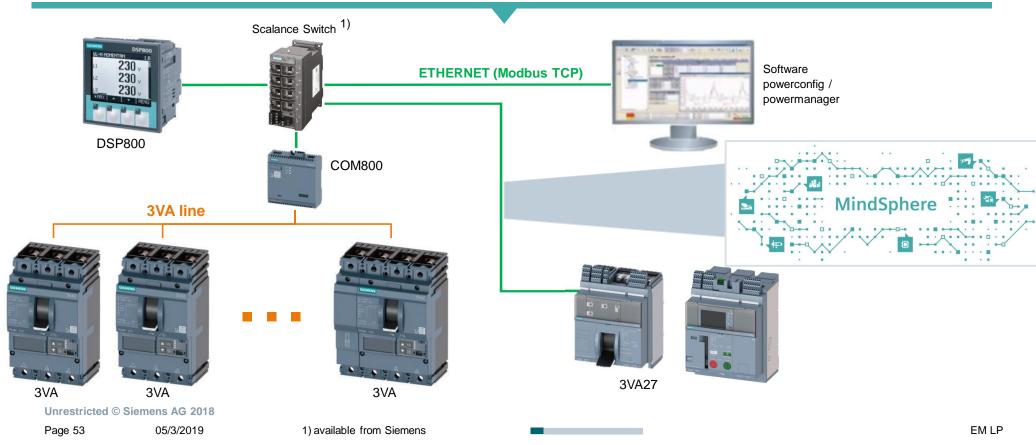
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## **Communication Integration in DSP800 external display**

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Maximum of 8 circuit breakers, including a maximum of 3 x 3VA27 circuit breakers with ETU650/ETU660 and COM43





# 3VM molded case circuit breakers

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# 3VM molded case circuit breakers Overview/Technical Data

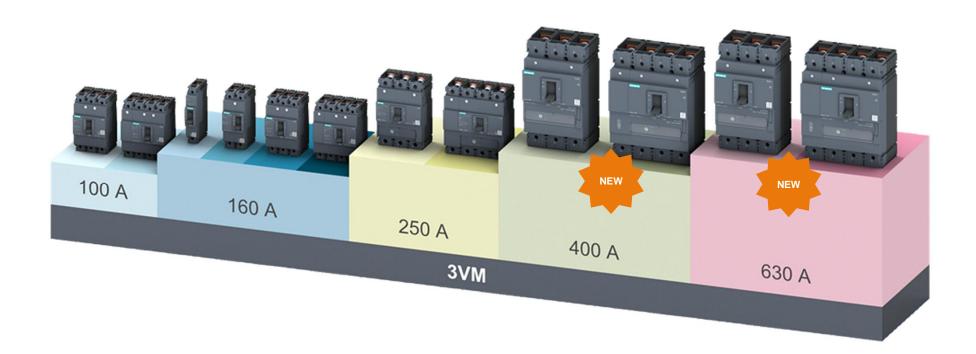
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## **3VM molded case circuit breaker Portfolio overview**





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## **3VM** molded case circuit breaker Highlights



#### Line / starter protection / switch disconnector

- Compact design
- Rated current from 16 A up to 630 A
- Breaking capacity from 16 kA to 55 kA @415V AC
- Thermal-magnetic trip units
- 1- to 4-pole breakers available (1- and 2-pole in frame size160 A)
- "Real" switch disconnector up to 630 A<sup>1)</sup> according to IEC 60947-3 in MCCB design
- Complete and uniform accessory platform across all 3VM frames



1) LBS 630A Planned for 2019

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## **3VM molded case circuit breakers Sizes and rated currents**



		3VM10	2\/\/11	3VM12	3VM13	3VM14
Frame		100 A	3VM11 160 A	250 A	400A	630A
	8					
Rated current I <sub>n</sub> / A	12.5					
	16	3p, 4p	1p, 2p, 3p, 4p			
	20	3p, 4p	1p, 2p, 3p, 4p			
	25	3p, 4p	1p, 2p, 3p, 4p			
	32	3p, 4p	1p, 2p, 3p, 4p			
	40	3p, 4p	1p, 2p, 3p, 4p		NEW (	NEV
	50	3p, 4p	1p, 2p, 3p, 4p			
	63	3p, 4p	1p, 2p, 3p, 4p			
	80	3p, 4p	1p, 2p, 3p, 4p			
	100	3p, 4p	1p, 2p, 3p, 4p			
Ra	125		1p, 2p, 3p, 4p			
	160		1p, 2p, 3p, 4p			
	200			3p, 4p		
	250			3p, 4p		
	320				3p, 4p	
	400				3p, 4p	
	500					3p, 4p
	630					3p, 4p

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# 3VM molded case circuit breakers Trip Units

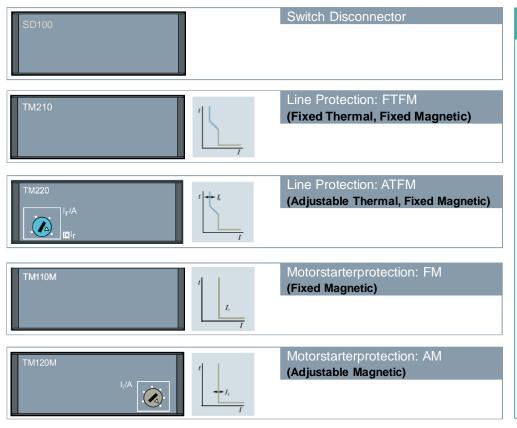
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### **3VM** molded case circuit breaker Trip unit overview





#### Line / Generator protection / Switch disconnectors

- Line protection TM210 and TM220
- Switch disconnector SD100
- Starter protection TM110; TM120M
- Neutral protection available for 4-pole breakers:
   0% and 100%
- Usable for AC and DC networks
- No derating up to 50°C

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# 3VM molded case circuit breakers Accessories

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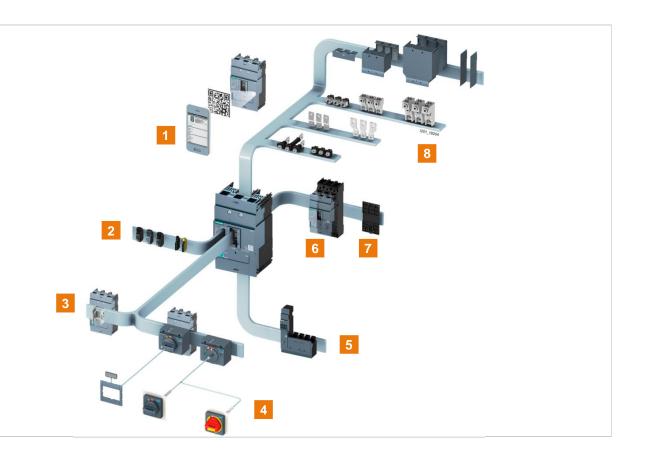


## **3VM** molded case circuit breakers All important accessory components

#### **SIEMENS**

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- 1 Knowledge Manager
- 2 Internal accessories
- 3 Locking
- 4 Manual operators
- 5 Residual current device
- 6 Plug-in technology
- 7 DIN rail adapter
- 8 Connection technology



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# 3VA / 3VM Molded Case Circuit Breakers General

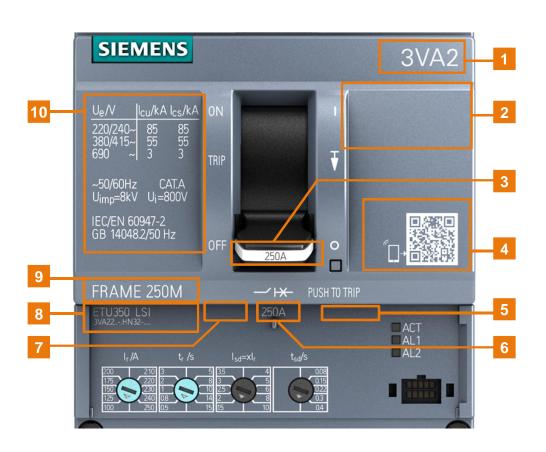
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## 3VA / 3VM molded case circuit breaker Labeling front side

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- 1 Breaker type
- 2 Approbations
- 3 Rated current (3VA only)
- 4 Knowledge Manager
- 5 Serial number
- 6 Rated current
- 7 Product version
- 8 Trip unit type and order no.
- 9 Size and breaking capacity class
- 10 Name plate



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## Comprehensive 3VA2 CAx data support Digital data support



#### 12 different CAx data types – overview

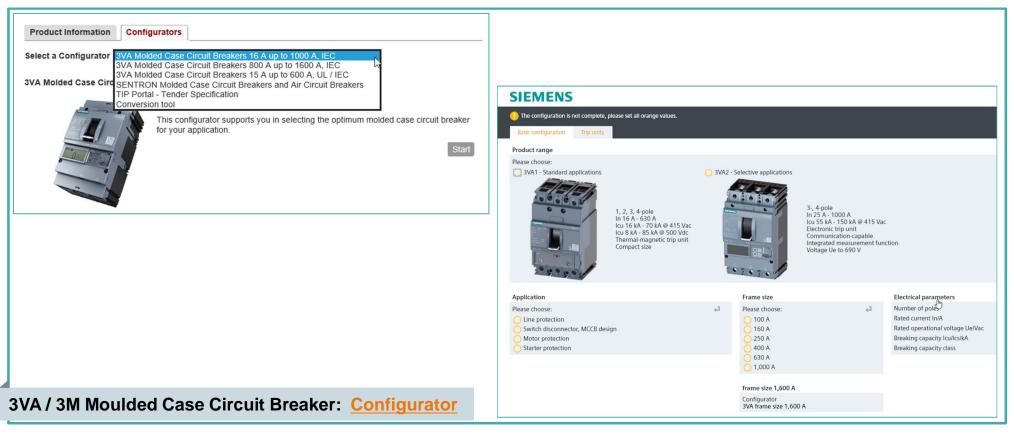
Wiring diagrams		2D dimensional drawings		Operating instructions	
Circuit diagrams	0000	3D Models		Product photos	
Commercial and technical product data		Manuals		Product data sheets	
Characteristic curves		EPLAN Macros	6	Certificates	PDF

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#### **Configurator**





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#### **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 in process** 

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