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# **VA - 2 (RP)**

# **ADDENDUM**

# **mechanism VAS-2**


## **CIRCUIT BREAKER**



**User manual**

**MEVOCO**   
MEDIUM VOLTAGE COMPONENTS

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## 1 GENERAL DESCRIPTION

The vacuum circuit breakers of MEVOCO N.V. have been designed in a user- and maintenance-friendly way for protection of distribution and dispersion switchgear, transformers, generators and electrical motors. The circuit breakers can safely break or switch off the (normal) operating current as well as a fault current (current that occurs at a fault, thermal overload or short circuit). All circuit breakers can easily be installed and maintained.

In order to increase the performances and to make the operating conditions even safer, the circuit breakers can be provided with high-quality communication and measuring functions by applying the optional digital protection relay RP600.

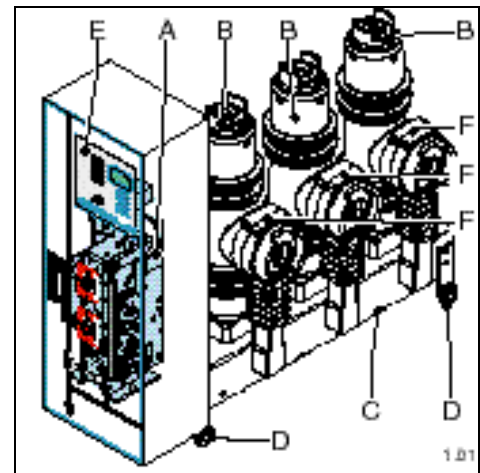
For a complete description of the working principle of the circuit breaker:

- See: "Operating principle of the circuit breaker VAS-2"
- See: "Operating principle digital protection relay RP600"

All circuit breakers of the VAS-2 type also fit in the modular concept of DF-2 switchgears from MEVOCO N.V.

The circuit breaker consists of the following main components:

- A Mechanical drive
- B Poles L1, L2 and L3
- C Chassis (supporting structure)
- D Runner (wheels)
- E Digital protection relay RP600 (optional)
- F Current transformers L1, L2 and L3 (optional)

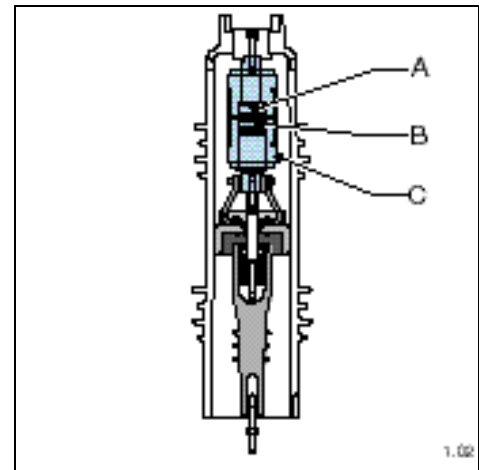


## 1.1 Operating principle of the circuit breaker VAS-2

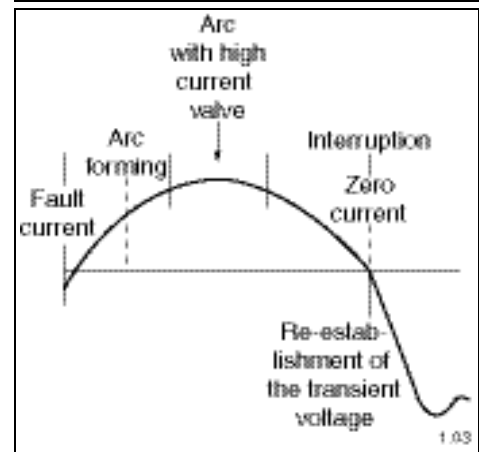
### 1.1.1 Vacuum interrupter (VI)

The circuit breaker consists of three poles. The function of each pole is to switch on or off the electrical power. Therefore a vacuum interrupter has been provided in the heart of each pole.

The vacuum interrupter consists of two contacts, one fixed contact (A) and a one moving (B), forming the breaker camber. The contacts are placed in an hermetically sealed ceramic enclosure (C). Due to the moving contact, the interrupter can be opened and closed. Opening and closing of the interrupter is done by means of a mechanical drive (see 'Mechanical drive').



The opening of the contacts (separation of the moving contacts from the fixed contact) provokes an arc. This arc consists of ions and electrons originated from the Cu/Cr metal alloy of the contacts. At the moment that the distance between the two contacts is large enough to make the current zero and the transient current comes up again, the arc will disappear. The special geometry of the contacts has been chosen in such a way, that the current can be switched off quickly and safely, thus restoring the vacuum.

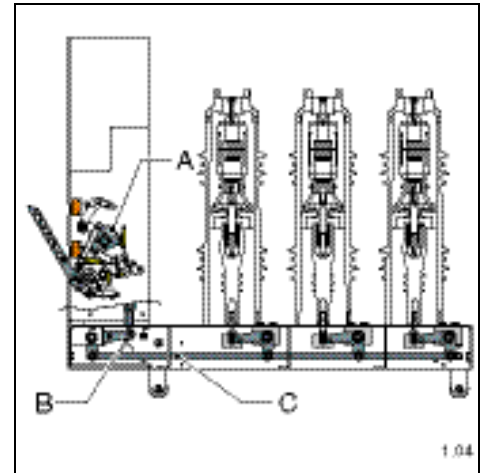


Arc and breaking phenomenon in vacuum

## 1.1.2 Mechanical drive VAS-2

The mechanical drive is of the CRR type (spring drive with reclosing). This is a mechanism in which the energy for opening and closing the contact is stored in a compression spring. Application of the mechanism allows quick succession of opening and closing cycles.

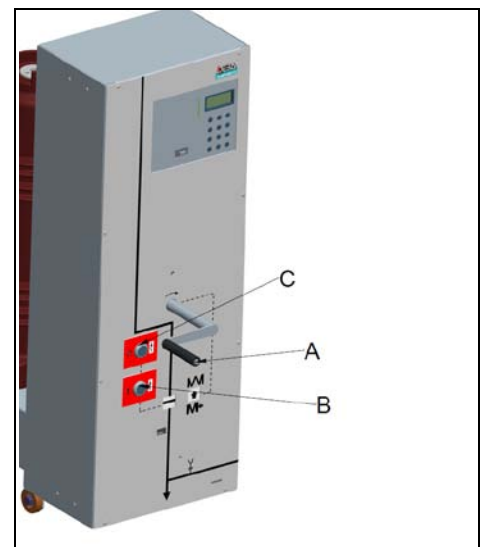
The compression spring, in which the energy is stored, is at the one end connected with the compression mechanism (A) and at the other end with the main mechanical drive shaft (B). The rotating movement of the main shaft simultaneously drives the three mobile contacts in the three poles through a transmission link (C). Thus the three interrupters can synchronically be opened and closed.



### 1.1.2.1 Energy storage

By compressing the spring energy can be stored for a closing and opening cycle. The compression spring can be tensioned in two ways:

- Manually by using the handle that can be pulled out (A).
- Automatically through an optional electric motor.

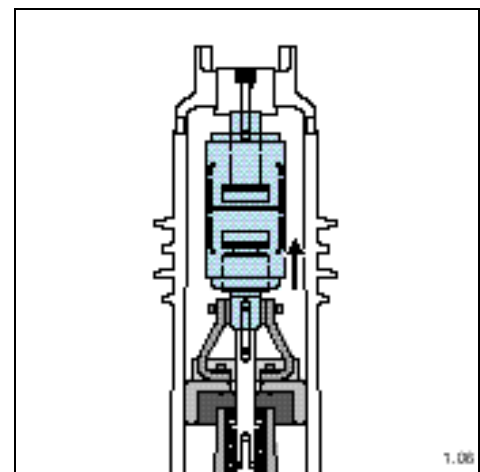


### 1.1.2.2 Closing the contacts

Only after the compression spring has been tensioned, the contacts of the vacuum interrupter can be closed. The closing of the contacts or the closing on of the circuit breaker can be done in two ways:

- Manually by pressing the switching-on button (fig. 1.05B).
- Automatically by sending an electric pulse to the shunt-closing coil.

After the closing of the contacts they are locked in the 'closed' position.



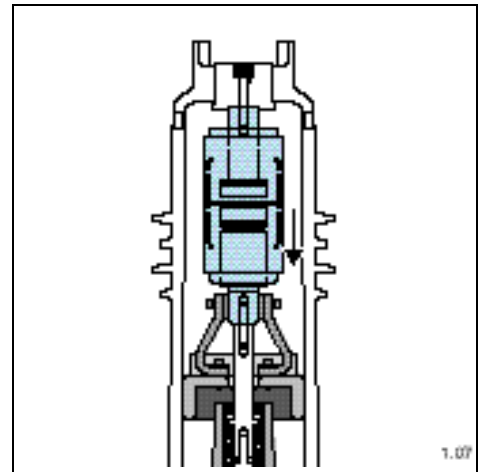
After closing of the contacts the tensioning transmission is released again, allowing manual retensioning of the compression spring. In case automatic tensioning is applied, the electric motor will be automatically switched on after closing of the contacts, automatically compressing the spring (in less than 15 seconds). If the compression spring is tensioned before the circuit breaker is opened, the circuit breaker is ready for an operating cycle of O – 0.3 s – CO. If automatic tensioning is applied, the spring will be compressed in less than 15 seconds, an operating cycle of O – 0,3 s – CO – 15 s – CO is possible.

### 1.1.2.3 Opening the contacts

The residual energy that is left in the compression spring when the compression spring is relaxed and the contacts are closed can open the contacts again.

The opening of the contacts or the switching off of the circuit breaker can be done in a number of ways:

- Manually by pressing the switching-off button (fig. 1.05C).
- Automatically by sending an electric pulse to the first or second shunt-trip coil.
- Automatically by zero voltage with the time delayed undervoltage trip coil (option delayed).
- Automatically when there is a fault current (current that occurs at a fault, thermal overload or short circuit) by application of the digital protection relay RP600 (see AG614102).



When opening the circuit breaker the contacts are locked in the 'open' position.



## 2 TECHNICAL SPECIFICATIONS

### 2.1 Circuit breaker VAS-2 (same as VA-2)

- See following table.

Specified item	Unit	400A	630A	800A	1,250A
Standards applied	-				
Rated voltage Un	kV	12 - 17.5 - 24	12 - 17.5 - 24	12 - 17.5 - 24	12 - 17.5 - 24
Rated withstand voltage at $f_n/1\text{min.}$	kV	28 - 38 - 50	28 - 38 - 50	28 - 38 - 50	28 - 38 - 50
Rated impulse withstand voltage 1.2/50 $\mu\text{s}$	kV	75 - 95 - 125	75 - 95 - 125	75 - 95 - 125	75 - 95 - 125
Rated frequency	Hz	50/60	50/60	50/60	50/60
Rated current	A	400	630	800	1250
Rated short duration current	kA	12.5 - 20 - 25	12.5 - 20 - 25	12.5 - 20 - 25	12.5 - 20 - 25
Duration of rated short circuit	s	3	3	3	3
Rated limit peak current	kA	31.5 - 50 - 63	31.5 - 50 - 63	31.5 - 50 - 63	31.5 - 50 - 63
Rated breaking capacity at $\leq U_n$	kA	12.5 - 20 - 25	12.5 - 20 - 25	12.5 - 20 - 25	12.5 - 20 - 25
DC component	%	36	36	36	36
Making current	kA	31.5 - 50 - 63	31.5 - 50 - 63	31.5 - 50 - 63	31.5 - 50 - 63
Switching order		O – 0.3s – CO – 15s – CO			
Rated breaking capacity at single connected cond. battery at Un and $f_n = 50[\text{Hz}]$	A	400	400	400	400
Overvoltage factor		< 2.5	< 2.5	< 2.5	< 2.5
Rated breaking capacity at unloaded cable	A	25	25	25	25
Overvoltage factor	%	< 4	< 4	< 4	< 4
Rated breaking capacity at unloaded transformer	A	12.5	12.5	12.5	12.5
Overvoltage factor		< 4	< 4	< 4	< 4
Rated closing time	ms	50	50	50	50
Rated opening time	ms	42	42	42	42
Rated breaking time	ms	60	60	60	60
Mechanical lifetime in number of CO switches of the contacts		30,000	30,000	30,000	30,000
Lifetime of the vacuum interrupter	year	30	30	30	30
Electrical lifetime in number of CO switches		10,000	10,000	10,000	10,000
Weight	kg	113	116	116	120

### 2.1.1 Available types of circuit breakers

- See following table.

Type	Rated voltage [kV]	Rated current [A]	Rated breaking capacity [kA]
VAS-2 12-25/4L	12	400	25
VAS-2 12-25/6L	12	630	25
VAS-2 12-25/8L	12	800	25
VAS-2 12-25/12L	12	1250	25
VAS-2 17.5-25/4L	17.5	400	25
VAS-2 17.5-25/6L	17.5	630	25
VAS-2 17.5-25/8L	17.5	800	25
VAS-2 17.5-25/12L	17.5	1250	25
VAS-2 24-20/4L	24	400	20
VAS-2 24-20/6L	24	630	20
VAS-2 24-20/8L	24	800	20
VAS-2 24-20/12L	24	1250	20
VAS-2RP 12-25/4L	12	400	25
VAS-2RP 12-25/6L	12	630	25
VAS-2RP 12-25/8L	12	800	25
VAS-2RP 17.5-25/4L	17.5	400	25
VAS-2RP 17.5-25/6L	17.5	630	25
VAS-2RP 17.5-25/8L	17.5	800	25

## 2.2 Available mechanical drive options

- See following table.

Option	Code	VAS-2 / VA – 2RP	
		Manual	Electric
1 <sup>st</sup> trip coil for VAS-2/VAS-2RP 24VDC	VAS001392	○	●
1 <sup>st</sup> trip coil for VAS-2/VAS-2RP 48VDC	VAS001393	○	●
1 <sup>st</sup> trip coil for VAS-2/VAS-2RP 110VAC	VAS001395	○	●
1 <sup>st</sup> trip coil for VAS-2/VAS-2RP 110VDC	VAS001396	○	●
1 <sup>st</sup> trip coil for VAS-2/VAS-2RP 230VAC	VAS001397	○	●
2 <sup>nd</sup> trip coil for VAS-2/VAS-2RP 24VDC	VAS001392	○	○
2 <sup>nd</sup> trip coil for VAS-2/VAS-2RP 48VDC	VAS001393	○	○
2 <sup>nd</sup> trip coil for VAS-2/VAS-2RP 110VAC	VAS001395	○	○
2 <sup>nd</sup> trip coil for VAS-2/VAS-2RP 110VDC	VAS001396	○	○
2 <sup>nd</sup> trip coil for VAS-2/VAS-2RP 230VAC	VAS001397	○	○
Direct undervoltage coil VAS-2/VAS-2RP 24VDC	VAS001292	○	○
Direct undervoltage coil VAS-2/VAS-2RP 48VDC	VAS001293	○	○
Direct undervoltage coil VAS-2/VAS-2RP 110VAC	VAS001295	○	○
Direct undervoltage coil VAS-2/VAS-2RP 110VDC	VAS001296	○	○
Direct undervoltage coil VAS-2/VAS-2RP 230VAC	VAS001297	○	○
Delayed undervoltage coil VAS-2/VAS-2RP 24VDC	VAS000292	○	○
Delayed undervoltage coil VAS-2/VAS-2RP 48VDC	VAS000293	○	○
Delayed undervoltage coil VAS-2/VAS-2RP 110VAC	VAS000295	○	○
Delayed undervoltage coil VAS-2/VAS-2RP 110VDC	VAS000296	○	○
Delayed undervoltage coil VAS-2/VAS-2RP 230VAC	VAS000297	○	○
Closing coil VAS-2 / VAS-2RP 24 VDC.	VAS000392	○	○
Closing coil VAS-2 / VAS-2RP 48 VDC.	VAS000393	○	○
Closing coil VAS-2 / VAS-2RP 110 VAC.	VAS000395	○	●
Closing coil VAS-2 / VAS-2RP 110 VDC.	VAS000396	○	○
Closing coil VAS-2 / VAS-2RP 230 VAC.	VAS000397	○	○
Motor equipment VAS-2/VAS-2RP 24VDC	VAS000013	○	●
Motor equipment VAS-2/VAS-2RP 48VDC	VAS000014	○	●
Motor equipment VAS-2/VAS-2RP 110VAC	VAS000015	○	●
Motor equipment VAS-2/VAS-2RP 110VDC	VAS000011	○	●
Motor equipment VAS-2/VAS-2RP 230VAC	VAS000010	○	●
Limit switch of the motor VAS-2/VAS-2RP	VAS252020	○	●
Auxiliary contact 1NO/1NC tensioned spring VAS-2/VAS-2RP	VAS000056	○	○
Auxiliary contact 2NO/2NC tensioned spring VAS-2/VAS-2RP	VAS000057	○	○
Auxiliary contact 3NO/3NC tensioned spring VAS-2/VAS-2RP	VAS000058	○	○
Auxiliary contact 1NO/1NC on VAS-2/VAS-2RP	VAS000041	○	○
Auxiliary contact 2NO/2NC on VAS-2/VAS-2RP	VAS000042	○	○
Auxiliary contact 3NO/3NC on VAS-2/VAS-2RP	VAS000043	○	○
Auxiliary contact 4NO/4NC on VAS-2/VAS-2RP	VAS000044	○	○
Auxiliary contact 5NO/5NC on VAS-2/VAS-2RP	VAS000045	○	○

Option	Code	VAS-2 / VA – 2RP	
		Manual	Electric
Auxiliary contact 6NO/6NC on VAS-2/VAS-2RP	VAS000046	○	○
Operation counter on VAS-2/VAS-2RP	VAS514519	●	●
<ul style="list-style-type: none"> <li>● Default present</li> <li>○ Available as an option</li> </ul>			

## 3 USE

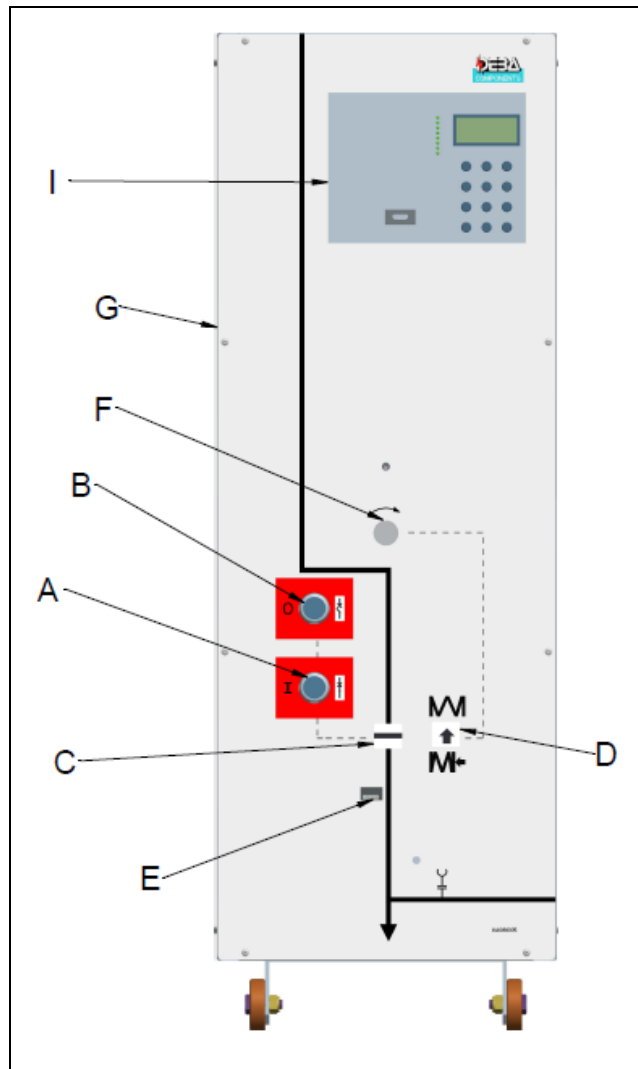
### 3.1 Safety regulations – use

- Also see “General safety regulations and instructions”.
- Use of the circuit breaker is restricted to qualified and trained operators, while observing the locally applicable safety regulations and guidelines.

### 3.2 Operation of the circuit breaker VAS-2

The circuit breaker is operated by the local operating panel on the front side of the circuit breaker. The following controls and indicators can be distinguished:

- A Switching-on button
- B Switching-off button
- C Switch position indicator
- D Spring position indicator
- E Operation counter
- F Handle
- G Cover
- H Cover fastening screws
- I Digital protection relay (optional)



### 3.2.1 Switching on the circuit breaker

Before the circuit breaker can be switched on, the following minimum conditions should be met:

- The circuit breaker must be open (i.e. the contacts opened).
- The compression spring must be tensioned (see "Tensioning the compression spring").
- 
- When these conditions are met, the circuit breaker can be switched on in two different ways (fig. 5.0):
- Manually by pressing the switching-on button (A).
- Electrically by operating the shunt-closing coil (optional).



Avoid damaging the mechanical drive when the cover (G) has been removed. Never change the position of the circuit breaker when the cover (G) has been removed. For safety reasons it is strictly forbidden to switch while the cover has been removed.

### 3.2.2 Switching off the circuit breaker

Before the circuit breaker can be switched off, the following minimum condition should be met:

- The circuit breaker must be closed (i.e. the contacts closed).
- When this condition is met, the circuit breaker can be switched off in a number of different ways (dependent on the options used) (fig. 5.0):
- Manually by pressing the switching-off button (B).
- Automatically by sending an electric impulse to the first or second shunt-trip coil.
- Automatically by zero voltage with the undervoltage trip coil (optional) or the time-delayed undervoltage trip coil (optional).
- Automatically when there is a fault current (current that occurs at a fault, thermal overload or short circuit) when the digital protection relay RP600 (see AG614102) is used.

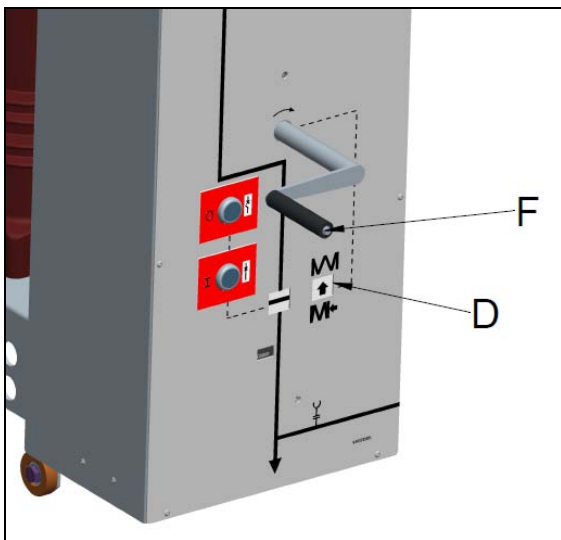


Avoid damaging the mechanical drive when the cover (G) has been removed. Never operate the position of the circuit breaker when the cover (G) has been removed.

### 3.2.3 Compressing the spring

The compression spring can be tensioned if one of the following conditions is met:

- The circuit breaker is open (i.e. the contacts opened) and the spring is relaxed.
- The circuit breaker is closed (i.e. the contacts closed).
- 
- When these conditions are met, the compression spring can be tensioned in two different ways (fig. 5.0):
- Manually by tensioning the spring using the handle (F) until the spring position indicator (D) is pointing down.



- Automatically by using an electric motor (optional). If one of the above-mentioned conditions is met, the electric motor will automatically tension the compression spring in less than 15 seconds, making it ready for the next closing and opening cycle.

## 4 MAINTENANCE

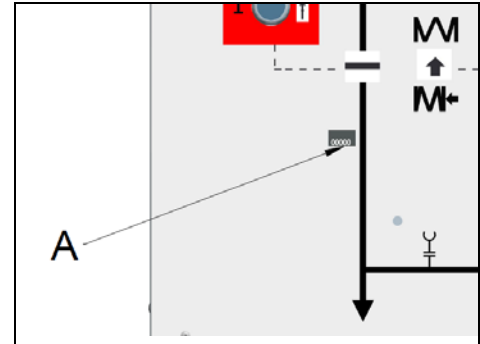
### 4.1 Safety regulations - maintenance

- Also see “General safety regulations and instructions”.
- The maintenance activities described are restricted to qualified and trained operators only while observing the locally applicable safety regulations and guidelines.
- All other maintenance activities not described are restricted to trained and authorised service personnel.
- Ensure that the circuit breaker is voltage free before carrying out the maintenance activities described.
- Only put the circuit breaker back into operation after any removed front panels and doors of the DF-2 cubicle(s) have been refitted and the work carried out has been carefully checked.
- Never leave tools or attachment material in or on top of the circuit breaker or the DF-2 cubicle(s).

## 4.2 Maintenance - general

The circuit breaker has been designed to operate problem free with a minimum of maintenance. To guarantee this a few simple maintenance and cleaning activities are required. If you exercise the necessary care and carefully carry out the activities described, any problems will usually be discovered and corrected before they lead to a standstill.

Technical maintenance of the circuit breaker must be carried out after 10,000 switching cycles. For this read the actual number of switches from the operation counter (A). This involves the adjustment of the compression and the stroke length of the contacts. For this purpose, contact MEVOCO N.V. or call in the help of trained and authorised service personnel.



When one or more vacuum interrupters have switched higher kA(s) values than specified (see Technical specifications), then these vacuum interrupter(s) should be replaced. For this purpose, contact MEVOCO N.V.



#### 4.2.1 General checking activities

- Regularly carry out a thorough, general visual inspection.
- Make sure that the circuit breaker is dust-free. Particularly check the poles and the insulating parts for accumulation of dust particles.
- In order to be able to check and clean the circuit breaker, the circuit breaker must be removed from the DF-2 cubicle.
- For detailed (dis)mounting instructions for the used VAS-2 in DF-2 cubicle(s), see “DF-2, Medium Voltage Switchgear, The Modular Concept” (order number: AG602101)

#### 4.2.2 Cleaning the circuit breaker



Contamination of the circuit breaker can initially be limited by following the recommendations on the installation area. See “Recommendations - installation area”.

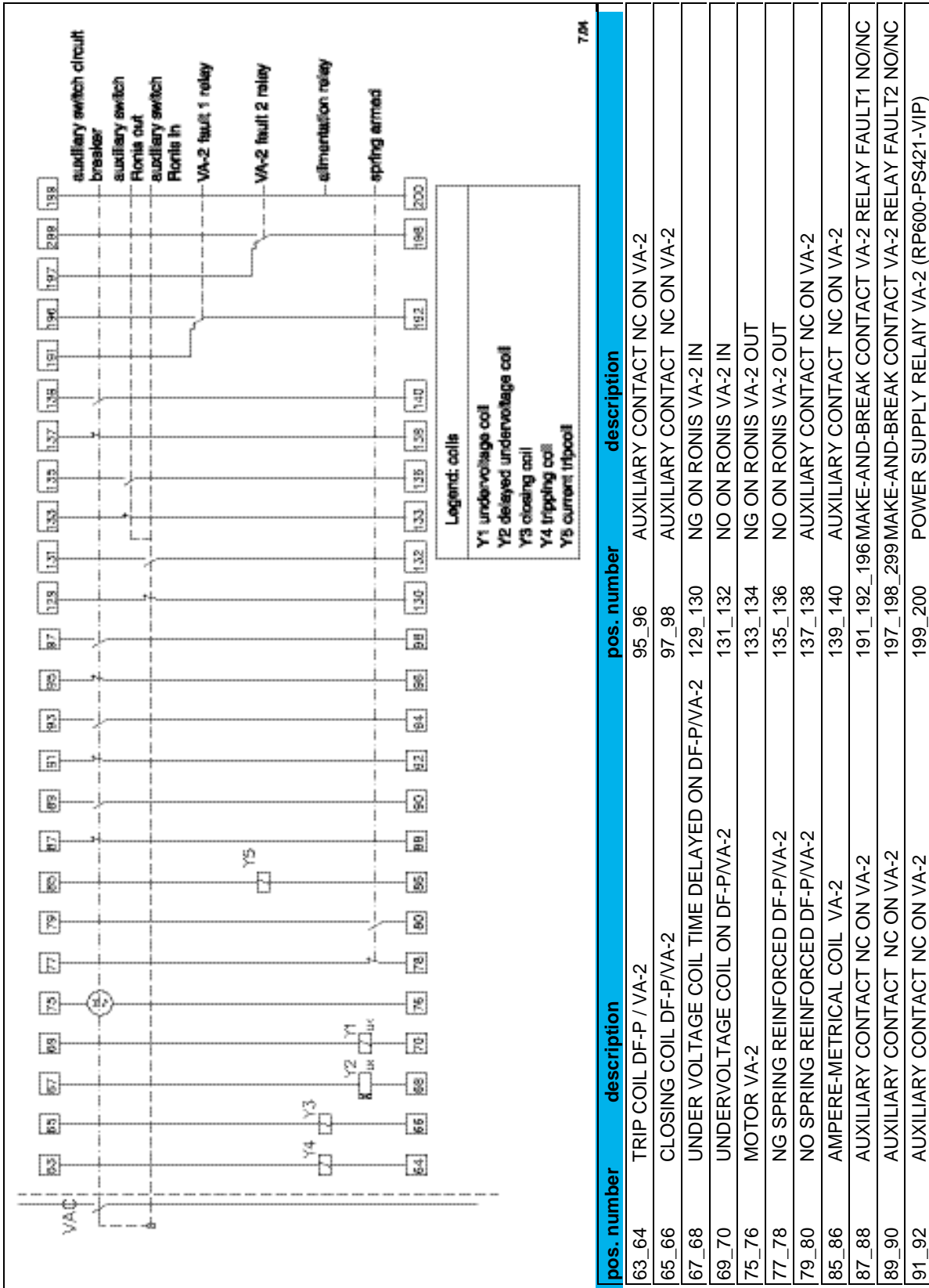
Adhere to the following steps when cleaning the circuit breaker:

- Read the safety regulations first. See “Safety regulations – maintenance”
- Clean the outside with a non-fluffy cloth and a non-corrosive cleaning agent.
- Thoroughly rub the cleaned surfaces dry.

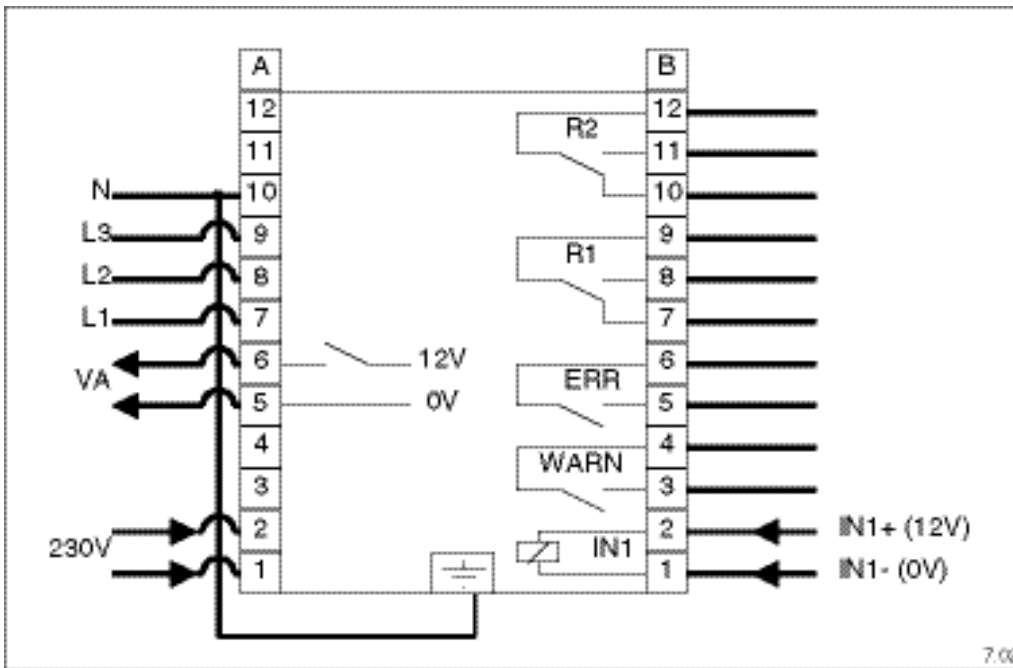


## 5 CONNECTING DIAGRAMS

### 5.1 Numbering of terminals



## 5.2 Connecting diagram of the digital protection relay RP600



## 6 MOUNTING OPTIONS

One or more of the options given below can be mounted on the VAS-2 (possibly combined):

- closing coil(s)
- trip coil(s)
- tensioning motor
- undervoltage coil(s)
- auxiliary contact(s)

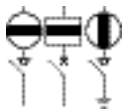
### 6.1 Closing coil

A closing coil can be mounted on the mechanical drive mechanism of the VAS-2 (RP), whether or not self-driven. With the help of this closing coil the circuit breaker can be closed automatically after having been manually or automatically reinforced.

#### 6.1.1 Preparation for mounting

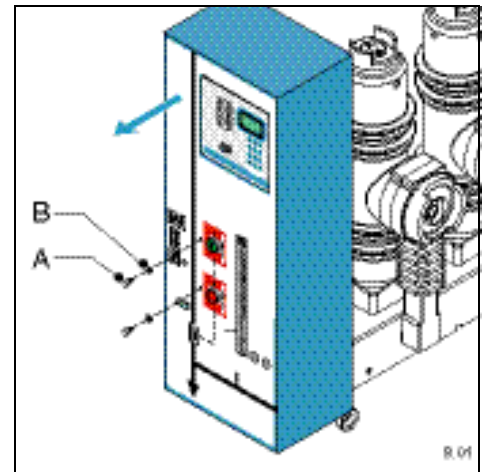
The following preparations must always be made **before** starting to mount the closing coil(s):

- Make the entire medium voltage switchgear and the circuit breaker voltage free.



- On the concerned cubicle, open both the load-break switch and the circuit breakers.
- The HV cable connection side must also be voltage free.
- Close the earthing switch of the medium voltage switchgear.

- Remove the door of the cubicle.
- Dismount the cover from the VAS-2 (RP).
  - Unscrew the 2 (fig. 9.01A) screws.
  - Remove the two screws with their PVC rings (fig. 9.01B).
  - Remove the cover.



### 6.1.2 Mounting the closing coil - general

Special mounting kits are available for mounting the closing coil. The composition of these mounting kits depends on the type of closing coil.

*Available mounting kits dependent on coil type:*

order number	description
VAS000392	Closing coil VAS-2 / VAS-2RP 24 VDC
VAS000393	Closing coil VAS-2 / VAS-2RP 48 VDC
VAS000395	Closing coil VAS-2 / VAS-2RP 110 VAC
VAS000396	Closing coil VAS-2 / VAS-2RP 110 VDC
VAS000397	Closing coil VAS-2 / VAS-2RP 230 VAC

*Order number mounting kit VSA00039x consists of:*

order number	description	number	pos. no.
Dependent on the chosen coil:			
OPS200024	Coil 24 VDC	1	fig. 9.02 A
OPS200048	Coil 48 VDC	1	fig. 9.02 A
OPS200110	Coil 110 VDC	1	fig. 9.02 A
OPS201110	Coil 110 VAC	1	fig. 9.02 A
OPS201230	Coil 230 VAC	1	fig. 9.02 A
Mounting material:			



### 6.1.2.1 Mounting instructions

- Slide the shaft (D) of the closing coil (A) over the premounted bolt on the white disc.
- Mount the closing coil from the top side of the support using the screws (B) and the lock washers (C).



Check the operation of the closing coil by pressing it - with the circuit breaker still opened and not reinforced - by hand. The shaft must be free and be able to move smoothly.

- Electrically connect the coil according to the connection diagram delivered.

#### 6.1.2.1.1 Electrical monitoring with external power source.



Prevent burning out of the coil. the voltage to the coil if the load-break switch is opened.  
Place an auxiliary contact if supply comes from an external power source (battery).

### 6.1.3 Final checking and commissioning

The following actions must always be carried out after mounting the closing coil(s).

- Check that the fitting materials are properly attached.
- Test the closing coil circuit using a multimeter. If the closing coil is supplied by an external power source, an auxiliary contact must always be placed.
- Mount the sheet metal shield of the VA-2 (RP).
- Put the entire medium voltage switchgear and the circuit breaker into operation.

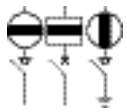
## 6.2 Tripping coil(s)

One or more tripping coils can be mounted on the mechanical drive of the VA-2(RP). With the help of these tripping coil(s) the compression spring that is to provide the energy for the opening cycle of the VA-2 can be automatically relaxed. After the VA-2(RP) has been closed, the circuit breaker can be opened with the help of the trip coil. The compression spring that is to provide the energy for the opening cycle of the VA-2(RP) is activated by the tripping coil that puts a trip mechanism into operation.

### 6.2.1 Preparation for mounting

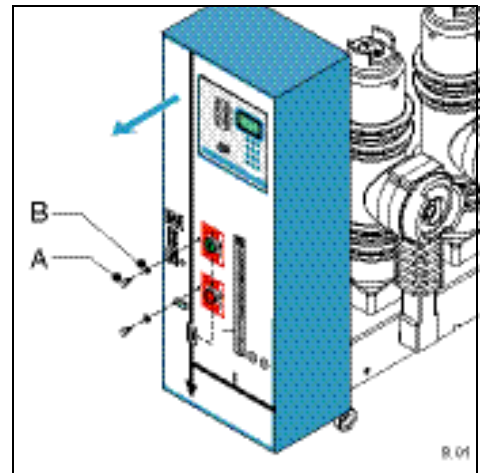
The following preparations must always be taken **before** you start mounting the trip coil(s):

- Make the entire medium voltage switchgear and the circuit breaker voltage free.



- Open on the particular cubicle both the load-break switch and the circuit breakers.
- The HV cable connection side must also be voltage free.
- Close the earthing switch of the medium voltage switchgear.

- Remove the door of the medium voltage switchgear.
- Dismount the sheet cover from the VA-2 (RP).
  - Unscrew the 2 (fig. 9.01A) screws.
  - Remove the two screws with their PVC rings (fig. 9.01B).
  - Remove the cover.



### 6.2.2 Mounting the tripping coil(s) - general

Special mounting kits are available for mounting the trip coil(s). The composition of these mounting kits depends on the type of trip coil.

*Available mounting kits dependent on coil type*

order number	description
VAS001392	Tripping coil VA-2 / VA-2RP 24 VDC
VAS001393	Tripping coil VA-2 / VA-2RP 48 VDC
VAS001395	Tripping coil VA-2 / VA-2RP 110 VAC
VAS001396	Tripping coil VA-2 / VA-2RP 110 VDC
VAS001397	Tripping coil VA-2 / VA-2RP 230 VAC



Order number mounting kit: VAS00139x consists of:

order number	description	number	pos. no.
Dependent on the chosen coil:			
OPS200024	Coil 24 VDC	1	fig. 9.02 A
OPS200048	Coil 48 VDC	1	fig. 9.02 A
OPS200110	Coil 110 VDC	1	fig. 9.02 A
OPS201110	Coil 110 VAC	1	fig. 9.02 A
OPS201230	Coil 230 VAC	1	fig. 9.02 A
Mounting material:			

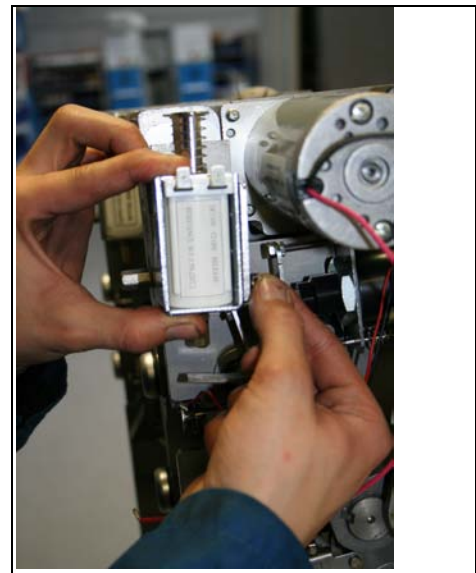


### 6.2.2.1 Mounting instructions

- Mount the coil by it 4 bolts with washers at the top right side of the mechanism



Check the operation of the tripping coil by pressing it - with the circuit breaker still opened and not closed - by hand. The shaft must be free and be able to move smoothly.



- Electrically connect the coil according to the electrical diagram delivered.



The connection cards of the coils(s) point at the tensioning handle of the VA-2 (RP).



Places for two tripping coils have been provided. They are placed along both sides of the shaft that rests on the white disc.

#### 6.2.2.1.1 *Electrical monitoring with external power source.*



Prevent burning out of the coil. Interrupt the voltage to the coil if the load break switch is open.

Place an auxiliary contact if supply comes from an external power source (battery).

### 6.2.3 Final checking and commissioning

The following activities must always be carried out after mounting the tripping coil.

- Check that the fitting materials are properly attached.
- Test the circuit using a multimeter. If the tripping coil is supplied by an external power source, an auxiliary contact must always be installed.
- Mount the sheet-metal shield of the VA-2 (RP).
- Put the entire medium voltage switchgear and the circuit breaker into operation.

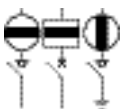
## 6.3 Positioning a motor

A motor can be mounted on the mechanical drive of the VA-2(RP). With the help of this motor the compression spring that is to provide the energy for the closing and opening cycles can be automatically tensioned. In almost all cases a VA-2(RP) with motor can also be equipped with a closing and tripping coil.

### 6.3.1 Preparation for mounting

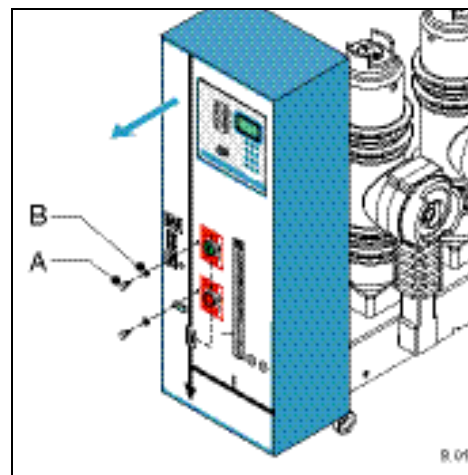
The following preparations must always be made **before** starting to mount the motor:

- Make the entire medium voltage switchgear and the circuit breaker voltage free.



- On the concerned cubicle, open both the load-break switch and the circuit breakers.
- The Hv cable connection side must also be voltage free.
- Close the earthing switch of the medium voltage switchgear.

- Remove the door of the medium voltage switchgear.
- Dismount the cover from the VA-2 (RP).
  - Unscrew the two (fig. 9.01A) screws.
  - Remove the two screws with their PVC rings (fig. 9.01B).
  - Remove the cover.



### 6.3.2 Mounting the motor - general

Special mounting kits are available for mounting the motor. The composition of these mounting kits depends on the type of motor.

*Available mounting kits dependent on motor type:*

order number	description
VAS000013	Motor equipment VA-2/VA-2RP 24 VDC
VAS000014	Motor equipment VA-2/VA-2RP 48 VDC
VAS000011	Motor equipment VA-2/VA-2RP 110 VDC
VAS000015	Motor equipment VA-2/VA-2RP 110 VAC
VAS000010	Motor equipment VA-2/VA-2RP 230 VAC

*Order number mounting kit: VA00001x consists of:*

order number	description	number	pos. no.
Dependent on the chosen motor:			
OPS500024	Motor 24 VDC	1	fig. 9.05 A
OPS500048	Motor 48 VDC	1	fig. 9.05 A
OPS500110	Motor 110 VDC	1	fig. 9.05 A
OPS501110	Motor 110 VAC	1	fig. 9.05 A
OPS501220	Motor 230 VAC	1	fig. 9.05 A
Mounting material:			



### 6.3.3 Mounting instructions

- Position the motor with the small gear wheel through the hole provided for this and fasten the motor using the 4 cylindrical screws, the locking rings.
- Electrically connect the motor according to the electrical diagram delivered. The motor should also run via contacts to limit the starting and ending rotation positions.



### 6.3.4 Final checking and commissioning

The following activities must always be carried out after mounting the motor.

- Check that the fitting materials are properly attached.
- Check that the intermediate gear wheel is running freely with a little play.
- Mount the sheet-metal shield of the VAS-2 (RP).
- Put the entire medium voltage switchgear and the circuit breaker into operation.

## 6.4 Auxiliary contacts

Auxiliary contacts can be mounted on the mechanical drive mechanism and always have an indicating function. There is room for placing up to 10 NO + 10 NC for the following indicating functions, including:

- The position of the circuit breaker: IN or OUT
- The closing and trip coil
- Automatic switching on again
- Other indications (e.g. optical signal, acoustic signal)

### 6.4.1 Preparation for mounting

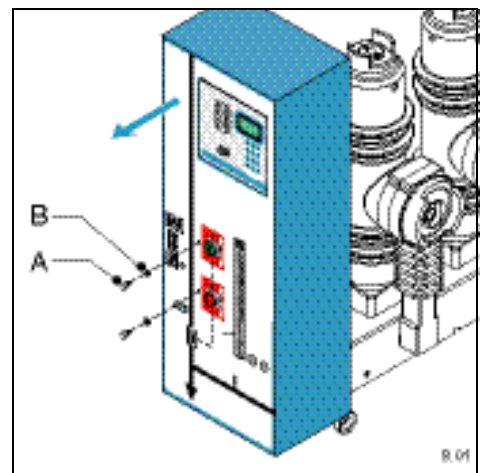
The following preparations must always be made **before** starting to mount one or more auxiliary contacts:

- Make the entire medium voltage switchgear and the circuit breaker voltage free.



- On the concerned cubicle, open both the load-break switch and the circuit breakers.
- The Hv cable connection side must also be voltage free.
- Close the earthing switch of the medium voltage switchgear.

- Remove the door of the medium voltage switchgear.
- Dismount the cover from the VAS-2 (RP).
  - Unscrew the two (fig. 9.01A) screws.
  - Remove the two screws with their PVC rings (fig. 9.01B).
  - Remove the cover.



### 6.4.2 Mounting the auxiliary contacts - general

Mounting kits are available for mounting the auxiliary contacts. The composition of these mounting kits depends on the required number of auxiliary contacts.

*Mounting kits available for the auxiliary contacts are:*

order number	description
VAS000056	Auxiliary contact tensioned spring 1NO/1NC on VAS-2/VAS-2RP

order number	description
VAS000057	Auxiliary contact tensioned spring 2NO/2NC on VAS-2/VAS-2RP
VAS000058	Auxiliary contact tensioned spring 3NO/3NC on VAS-2/VAS-2RP
VAS000041	Auxiliary contact 1NO/1NC on VAS-2/VA2-RP
VAS000042	Auxiliary contact 2NO/2NC on VAS-2/VA2-RP
VAS000043	Auxiliary contact 3NO/3NC on VAS-2/VA2-RP
VAS000044	Auxiliary contact 4NO/4NC on VAS-2/VA2-RP
VAS000045	Auxiliary contact 5NO/5NC on VAS-2/VA2-RP
VAS000046	Auxiliary contact 6NO/6NC on VAS-2/VA2-RP

### 6.4.3 Mounting the auxiliary contacts - mounting kit

The following kit is required for mounting each auxiliary contact. The numbers of the parts shall be multiplied in proportion to the number of auxiliary contacts required:

Order number mounting kit VA00004X or VA000050 consists of:

order number	description	number	pos. no.
GR071960	Schnorr M10	2	
GR040951	M10x30	2	
VOS212530	Auxiliary contactl	1	



### 6.4.4 Mounting instructions for the base support

- Position the auxiliary contact on the desired place and mount the auxiliary contact using the bolts M10.
- Connect the auxiliary contact according to the electric diagram.



#### **6.4.5 Final checking and commissioning**

The following actions must always be carried out after mounting the auxiliary contacts.

- Check that the fitting materials are properly attached.
- Test the auxiliary contacts circuit, in the closed as well as in the open position, using a multimeter.
- Connect the auxiliary contacts electronically using the plug connections according to the diagram delivered.
- Mount the cover of the VAS-2 (RP).
- Put the entire medium voltage switchgear and the circuit breaker into operation.
  - Remove the cover.

