

Metalom oklopljena, plinom izolirana VAKUUMSKA DISTRIBUCIJSKA APARATURA (RING MAIN UNIT)

Serije VDA Σ

Metal enclosed, gas-insulated VACUUM DISTRIBUTION SWITCHGEAR (RING MAIN UNIT)

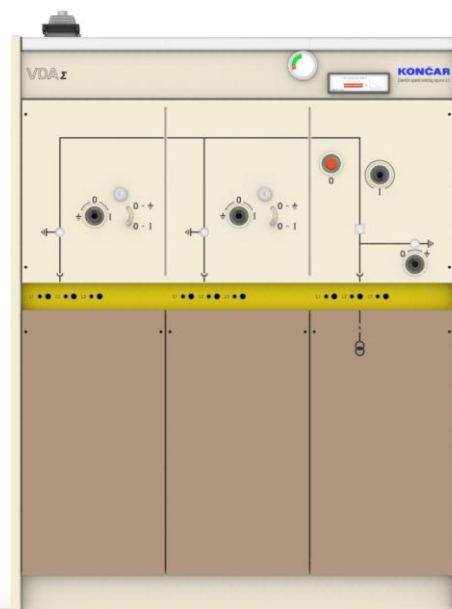
Series VDA Σ

OSNOVNE ZNAČAJKE

- ◆ Kompaktnost
- ◆ Jednostavnost
- ◆ Vakuumski prekidač u trafo polju
- ◆ Vakuumske rastavne sklopke u vodnim poljima
- ◆ Plin SF₆ za izolaciju dijelova pod naponom
- ◆ Izolacijske pregrade između kablskih priključaka pojedinih polja
- ◆ Mogućnost daljinskog upravljanja svim aparatima
- ◆ Mikroprocesorski relej za upravljanje zaštitom energetskog transformatora do 2,5 MVA
- ◆ Kablski priključci u skladu s IEC 60502/DIN 47363

BASIC CHARACTERISTICS

- ◆ Compact design
- ◆ Simplicity
- ◆ Vacuum circuit breaker in transformer feeder
- ◆ Vacuum load break switches in ring main feeders
- ◆ SF₆ gas - insulation between live parts
- ◆ Insulation barriers between cable connectors of the ring main feeders
- ◆ Possibility of remote control for each apparatus
- ◆ Microprocessor protection relay for power transformer protection, up to 2,5 MVA
- ◆ Cable connectors in accordance with IEC 60502 / DIN 4736



Kompaktni sklopni moduli (distribucijske sklopne aparature) srednjeg napona serije VDAΣ grade se za nazivni stupanj izolacije 24 kV, a koriste na nazivnim naponima 12, (17,5) i 24 kV. Koriste se za razvod električne energije u transformatorskim stanicama do 2500 kVA, 10(20)/0,4 kV.

Aparature serije VDAΣ predviđene su za ugradnju u zatvorene prostore uz normalne pogonske uvjete, u skladu s normama IEC 62271-200 i IEC 62271-1.

Vakuumske distribucijske kompaktne aparature serije VDAΣ odlikuju se visokom pouzdanošću pogona, potpunom neovisnošću o vanjskim utjecajima, te višestruko smanjenim volumenom u odnosu na klasične sklopne blokove s rastavnim sklopkama izoliranim zrakom.

Osnovne izvedbe kompaktnih aparatura serije VDAΣ imaju dva, tri ili četiri vodna polja opremljena tropoložajnim vakuumskim rastavnim sklopkama, te jedno ili dva transformatorska polja s vakuumskim prekidačem za zaštitu energetskog transformatora.

Svaka izvedba ima zasebno plinonepropusno kućište (stupanj zaštite od dodira IP 65) od čeličnog lima u koje su smješteni sklopni i ostali elementi strujnog puta, te plin sumporni heksafluorid SF₆, što služi za izoliranje među elementima i prema uzemljenom kućištu.

Proces sklapanja u prekidaču transformatorskog polja, kao i u tropoložajnim rastavnim sklopkama vodnih polja odvija se u vakuumskim komorama, a plin pod tlakom punjenja od 1,3 bar služi isključivo kao izolacijski medij među elementima strujnog puta i prema kućištu odnosno zemlji. Pri tome su sve električne karakteristike zadržane i kod tlaka plina od 1 bar, to znači kod tlaka zraka iz okoline.

Budući da je sumporni heksafluorid SF₆ u ovoj izvedbi potpuno inertan i ne koristi se za gašenje električnog luka, ne dolazi do oslobađanja nepoželjnih tvari, što ovaj proizvod čini potpuno ekološki prihvatljivim.

Prema zahtjevu korisnika, postoje dva temeljna rješenja pogonskih mehanizama: pogonski mehanizam za ručno upravljanje, te pogonski mehanizam za daljinsko upravljanje svim funkcijama u svim poljima.

Zaštitu energetskog transformatora osigurava vakuumski prekidač upravljan samonapajajućim mikroprocesorskim relejem serije Sigma XS. Zaštitni releji serije Sigma XS osiguravaju zaštitu od preopterećenja i kratkog spoja. Karakteristike releja se usklađuju s energetskim dijelom i načinom upravljanja aparaturom, te zahtjevima korisnika.

Na donjoj prednjoj strani kućišta su priključni (kabelski) odjeljci s provodnim izolatorima u jednoj ravnini. Za priključak kabela na blok se ugrađuju provodni izolatori izvedeni prema HRN EN 50181. Provodni izolatori za priključak kabela u transformatorskim poljima su tip A (250 A). Provodni izolatori u vodnim poljima su tip C (630 A). Odjeljci polja su međusobno su odvojeni metalnim pregradama, a s prednje strane zatvoreni poklopcima sa stupnjem zaštite IP 4X.

Medium voltage compact switchgear (ring main units) series VDAΣ are built for nominal insulation level 24 kV, for implementation at operational voltages 12, (17,5) and 24 kV. Their main purpose is secondary distribution of electrical energy in transformer substation up to 2500 kVA; 10(20)/0,4 kV.

The ring main units series VDAΣ and are intended for indoor installation under normal operation conditions, in accordance with IEC 62271-200 i IEC 62271-1.

Vacuum distributive compact ring main units series VDAΣ have high reliability and availability. They are completely independent on environment conditions and their overall dimensions have been minimized in comparison to classic air-insulated switchgear equipped with load break switches.

Basic versions of compact ring main units series VDAΣ have the following combinations: Two ring main and one transformer feeder, three ring main and one transformer feeder, four ring main and one ring main feeder, two ring main and two transformer feeders and finally three ring main and two transformer feeders.

Each of five available variants have gas-tight container filled with SF₆ gas (degree of protection IP 65) in which are placed all apparatus and current path elements. The gas is insulation medium between live parts and to earth.

The current breaking in circuit breaker (transformer feeder) and load break switches (ring main feeders) takes place in vacuum interrupters.

Gas (filling pressure 1,3 bar) serves only as an insulation medium between phases and to earthed parts. In case of gas loss all electrical parameters remain the same under the gas pressure 1 bar which equals environment pressure.

SF₆ gas is completely inert in these series - it is not used as arc-quenching medium, which prevents release of undesirable substances. Therefore, this series is fully environment friendly product. In accordance with customers requirements we developed two basic variants of operating mechanisms: manual operating mechanism (for local operation only, no possibility of remote control) and sophisticated operating mechanism for remote control of each apparatus.

Power transformer protection is performed by vacuum circuit breaker controlled by self-powered microprocessor relay series Sigma XS. Protection relays series Sigma XS enable overload protection and short-circuit protection. The characteristics of electronic relay can be adjusted to fit power transformer, mode of operation and special requirements.

The bushings for cable connectors are located at lower front side in one line. The bushings for power cable connection comply with HRN EN 50181. The bushings for power transformer connection are type A (250 A). The bushings in cable feeders are type C (630 A). The compartments are intersected by metal barriers at lateral sides and covered with metal lids at front side (degree of protection IP 4X).

2. OSNOVNI TEHNIČKI PODACI

2. BASIC TECHNICAL DATA

Vakuumska distribucijska sklopna aparatura serije VDAΣ Vacuum distribution switchgear series VDAΣ		24 kV
Nazivni napon Rated voltage		24 kV
Nazivni stupanj izolacije Rated insulation level		24 kV
Nazivni podnosivi udarni napon (1,2/50μs) Rated lightning impulse voltage (1,2/50μs)		125 kV
Nazivni podnosivi napon industrijske frekvencije (50 Hz/1min) Rated power frequency withstand voltage (50 Hz/1min)		50 kV
Nazivna frekvencija Rated frequency		50 Hz
Nazivna struja sabirnica Rated busbar current		630 A
Vakuumski prekidač Vacuum circuit breaker		24 kV
Nazivni napon Rated voltage		24 kV
Nazivni stupanj izolacije Rated insulation level		24 kV
Nazivni podnosivi udarni napon (1,2/50μs) Rated lightning impulse voltage (1,2/50μs)		125 kV
Nazivni podnosivi napon industrijske frekvencije (50 Hz/1min) Rated power frequency withstand voltage (50 Hz/1min)		50 kV
Nazivna struja Rated current		630 A
Nazivna prekidna moć Rated breaking capacity		16 kA
Nazivna uklopna moć Rated making capacity		40 kA
Nazivna kratkotrajna podnosiva struja (1s) Rated short time withstand current (1s)		16 kA
Mehanička trajnost prekidača Mechanical endurance of the circuit breaker		≥ 10000
Isklopno vrijeme za kratki spoj Switch-off time (short circuit)		45 s
Tropoložajna vakuumska sklopka Three-positional vacuum load break switch		24 kV
Nazivni napon Rated voltage		24 kV
Nazivni podnosivi udarni napon 1,2/50 μs Rated lightning impulse voltage 1,2/50 μs	prema zemlji to earth	125 kV
	na rastavnom razmaku across insulating distance	145 kV
Nazivni podnosivi jednominutni napon industrijske frekvencije Rated power frequency withstand voltage 50 Hz/1min	prema zemlji to earth	50 kV
	na rastavnom razmaku across insulating distance	60 kV
Nazivna struja Rated current		630 A

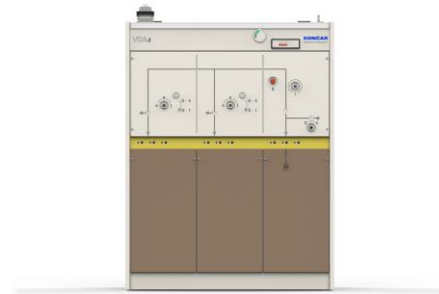
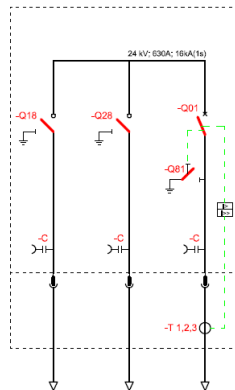
Nazivna prekidna moć <i>Rated breaking capacity</i>	0,63 kA
Nazivna uklopna moć <i>Rated making capacity</i>	40 kA
Nazivna kratkotrajna podnosiva struja (1s) <i>Rated short time withstand current (1s)</i>	16 kA
Trajnost <i>Endurance</i>	
Broj radnih ciklusa, mehanički / klasifikacija <i>Mechanical endurance / classification</i>	1000 / M1
Broj radnih ciklusa, električki / klasifikacija <i>Electrical endurance / classification</i>	100 / E3

3. JEDNOLINE SHEME OSNOVNIH KONFIGURACIJA

3. SINGLE LINE DIAGRAMS OF BASIC CONFIGURATION

3.1. VDAΣ 24 – 2VT

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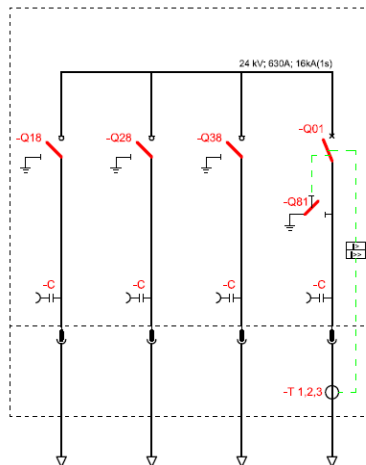
- Dva vodna polja opremljena tropoložajnim vakuumskim rastavnim sklopkama.
- Jedno transformatorsko polje opremljeno vakuumskim prekidačem upravljanim elektroničkim zaštitnim relejem tipa Sigma XS.
- Zemljospojnik iza prekidača.

Description:

- Two ring main feeders with vacuum three-positional load break switches
- One transformer feeder equipped with vacuum circuit breaker, controlled by electronic protection relay type Sigma XS
- Earthing device behind each circuit breaker.

3.2. VDAΣ 24 – 3VT

3.2. VDAΣ 24 – 3VT



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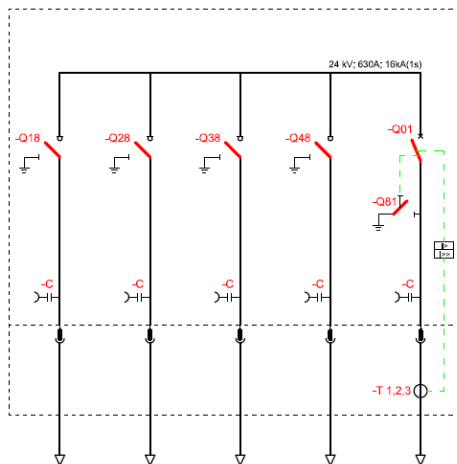
- Tri vodna polja opremljena tropoložajnim vakuumskim rastavnim sklopkama.
- Jedno transformatorsko polje opremljeno vakuumskim prekidačem upravljanim elektroničkim zaštitnim relejem tipa Sigma XS.
- Zemljospojnik iza prekidača.

Description:

- Three ring main feeders with vacuum three-positional load break switches
- One transformer feeder equipped with vacuum circuit breakers controlled by electronic protection relay type Sigma XS
- Earthing device behind each circuit breaker.

3.3. VDAΣ 24 – 4VT

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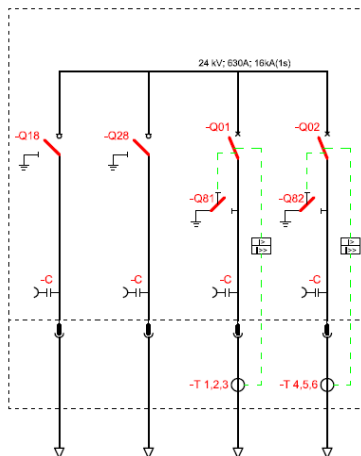
- Četiri vodna polja opremljena tropoložajnim vakuumskim rastavnim sklopkama.
- Jedno transformatorsko polje opremljeno vakuumskim prekidačem upravljanim elektroničkim zaštitnim relejem tipa Sigma XS.
- Zemljospojnik iza prekidača.

Description:

- Four ring main feeders with vacuum three-positional load break switches
- One transformer feeder equipped with vacuum circuit breakers controlled by electronic protection relay type Sigma XS.
- Earthing device behind each circuit breaker.

3.4. VDAΣ 24 – 2V2T

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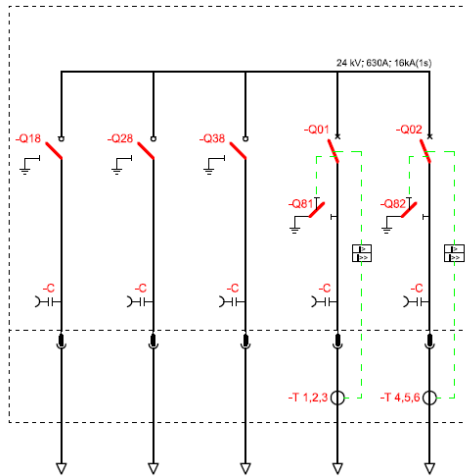


Opis:

- Dva vodna polja opremljena tropoložajnim vakuumskim rastavnim sklopkama.
- Dva transformatorska polja, svako opremljeno vakuumskim prekidačem upravljanim elektroničkim zaštitnim relejem Sigma XS.
- Zemljospojnik iza prekidača.

Description:

- Two ring main feeders with vacuum three-positional load break switches
- Two transformer feeders equipped with vacuum circuit breakers controlled by electronic protection relay type Sigma XS.
- Earthing device behind each circuit breaker.

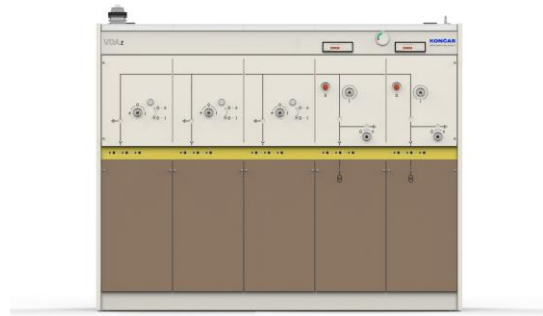


Opis:

- Tri vodna polja opremljena tropoložajnim vakuumskim rastavnim sklopkama.
- Dva transformatorska polja, svako opremljeno vakuumskim prekidačem upravljanim elektroničkim zaštitnim relejem Sigma XS.
- Zemljospojnik iza prekidača.

Description:

- Three ring main feeders with vacuum three-positional load break switches
- Two transformer feeders equipped with vacuum circuit breakers controlled by electronic protection relay type Sigma XS
- Earthing device behind each circuit breaker.

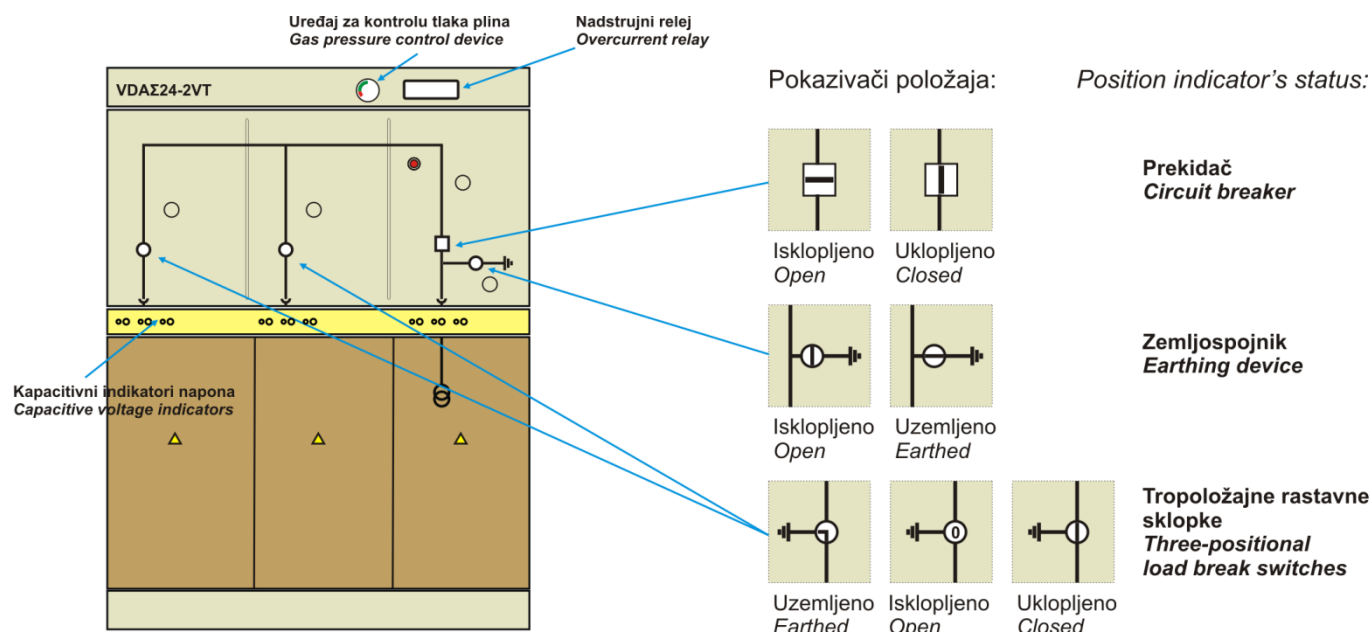


4. PRIKAZ PREDNJE PLOČE

4. FRONT PANEL OVERVIEW

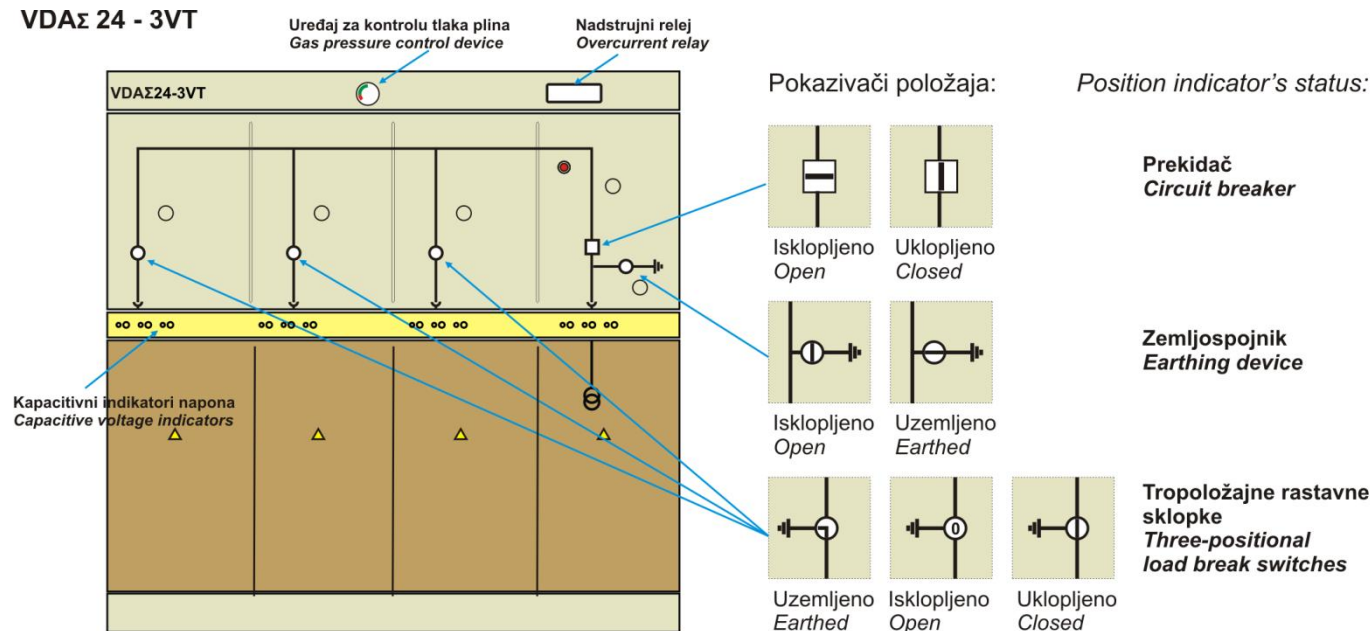
4.1. VDAΣ 24 – 2VT

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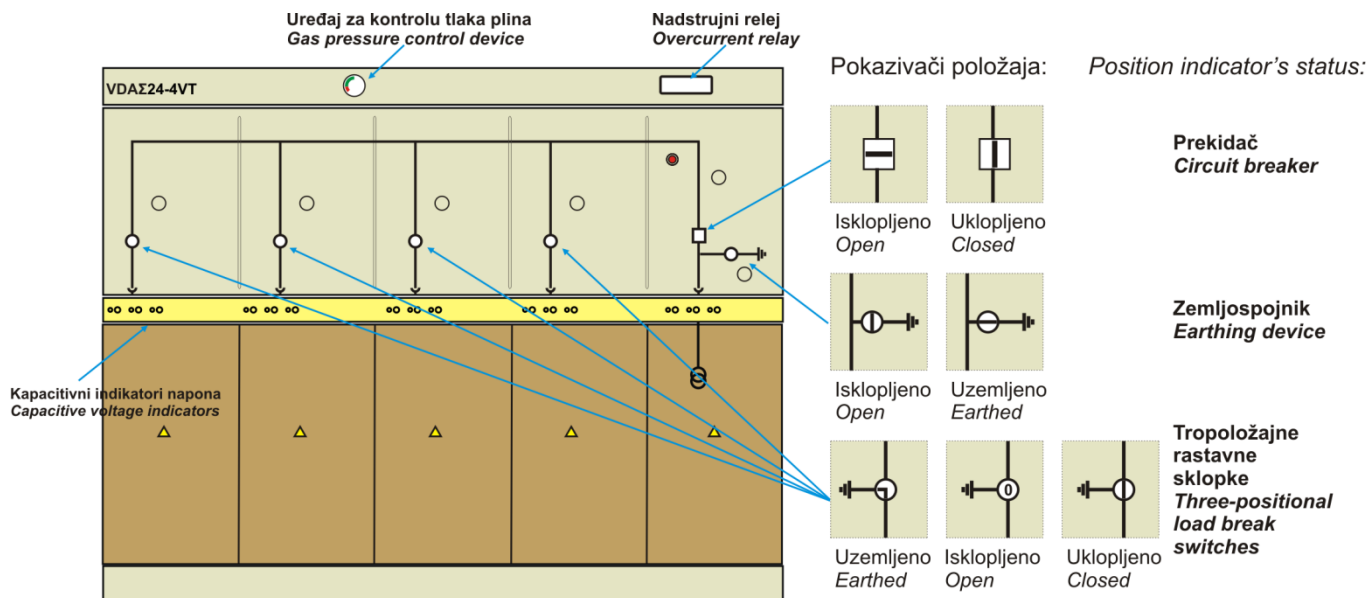
4.2. VDAΣ 24 – 3VT

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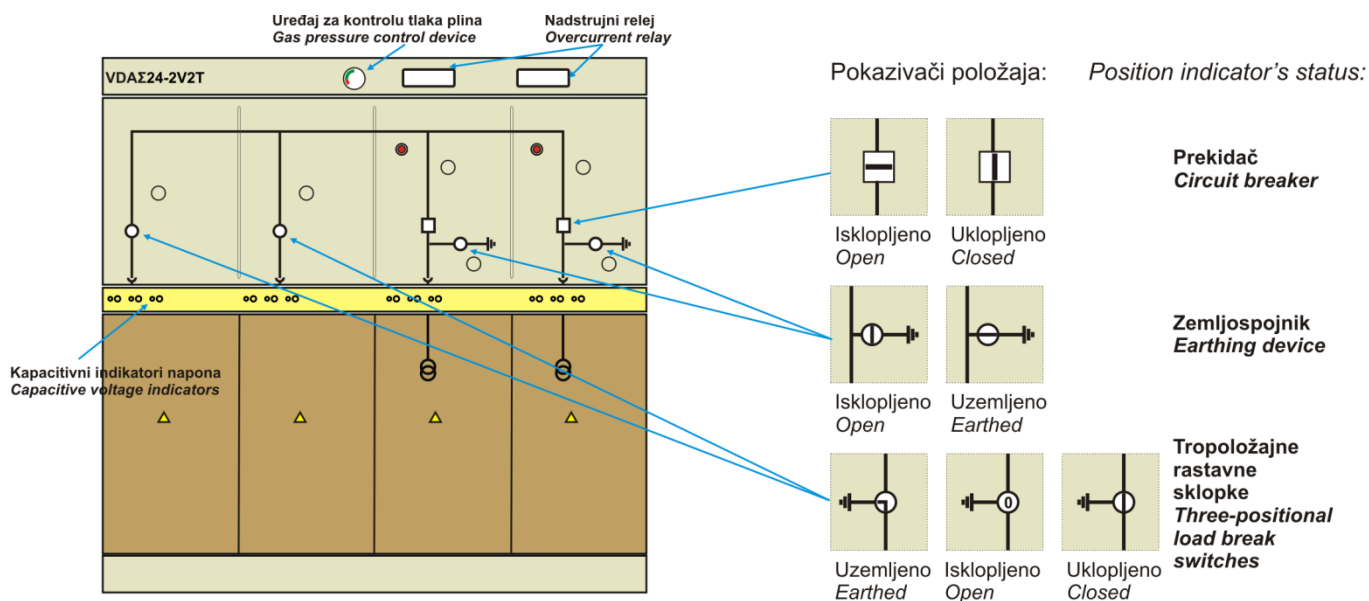
4.3. VDAΣ 24 – 4VT

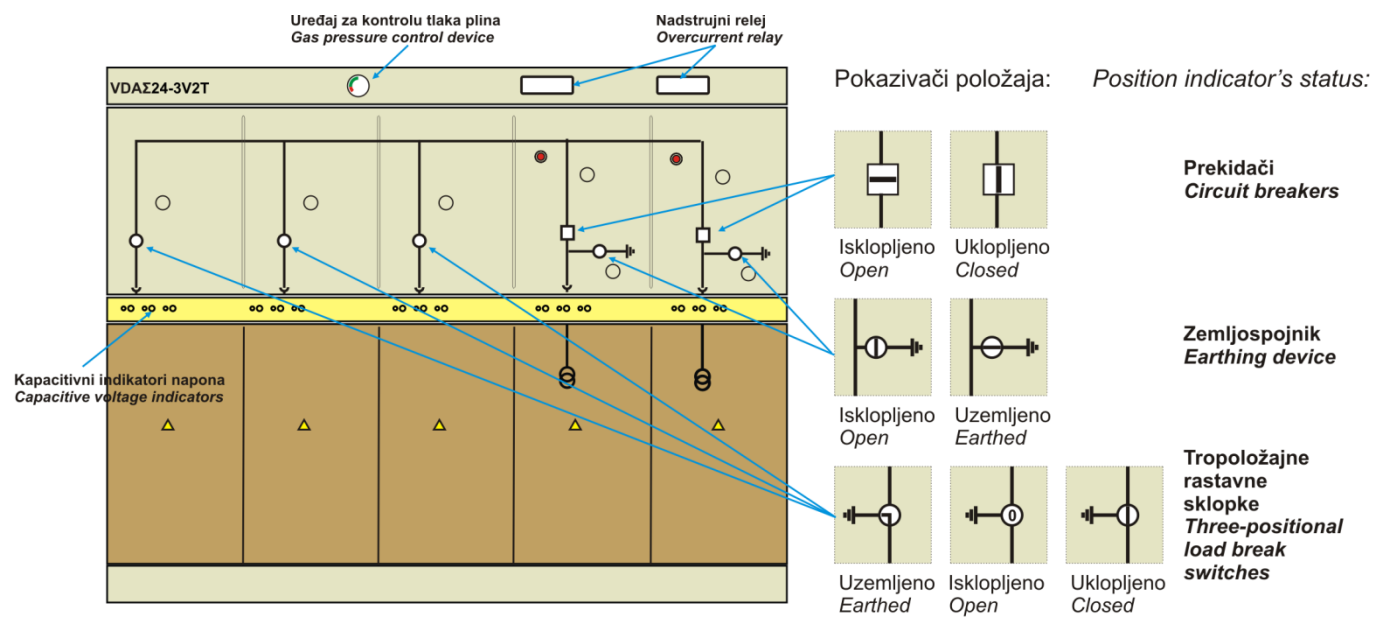
4.3. VDAΣ 24 – 4VT



4.4. VDAΣ 24 – 2V2T

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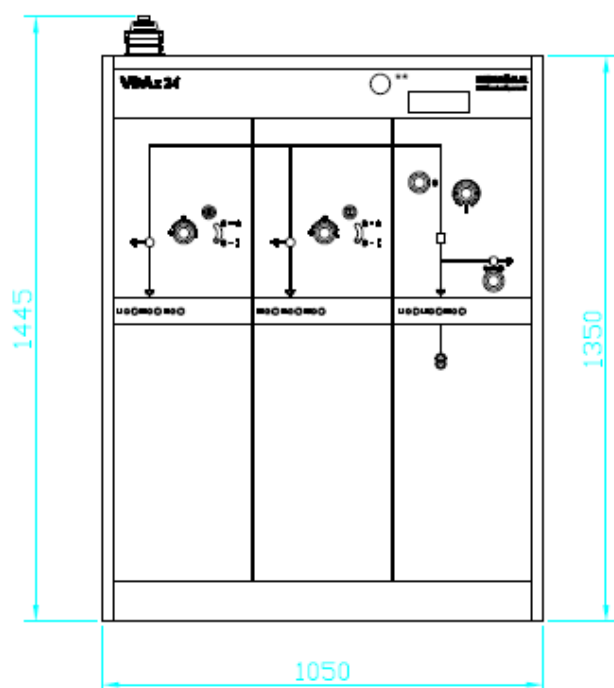


5. INFORMATIVNE MJERNE SKICE

5. INFORMATIVE DIMENSIONAL DRAWINGS

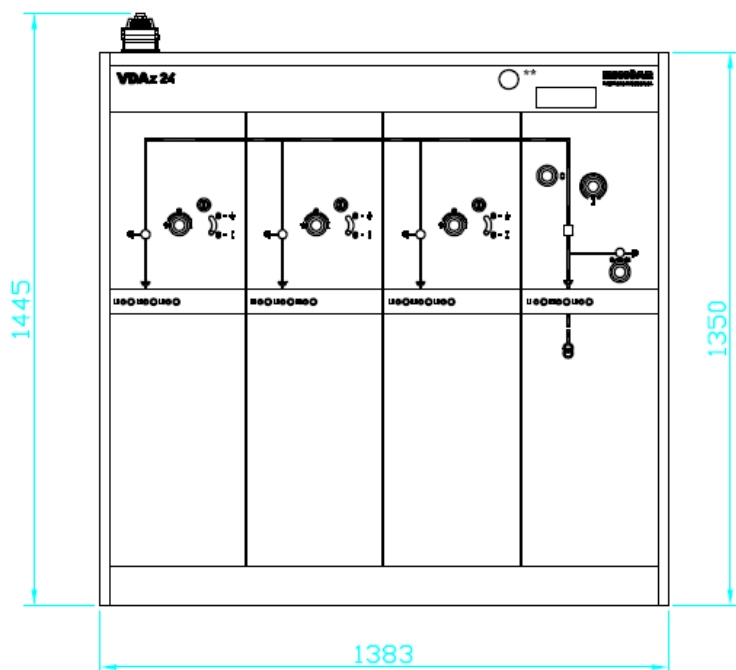
5.1. VDAΣ 24 – 2VT

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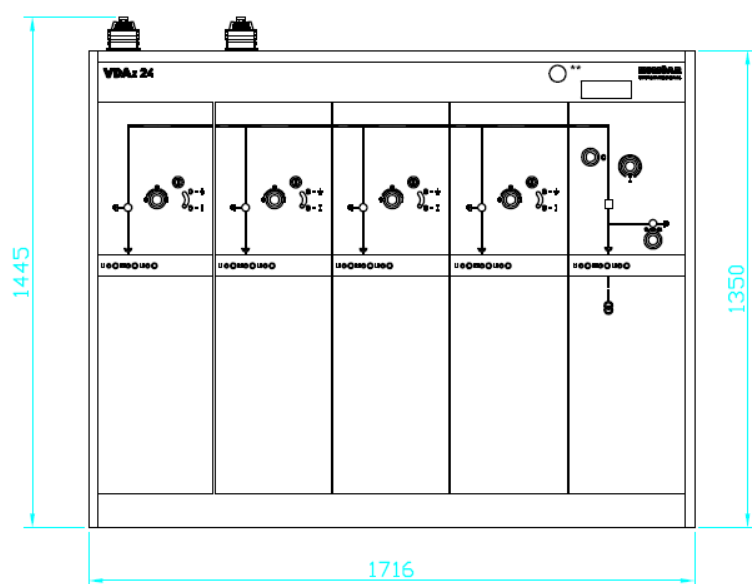
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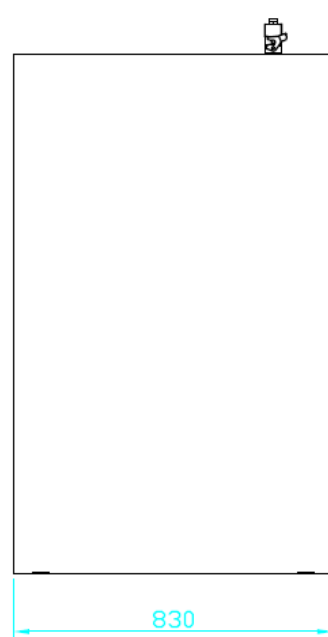
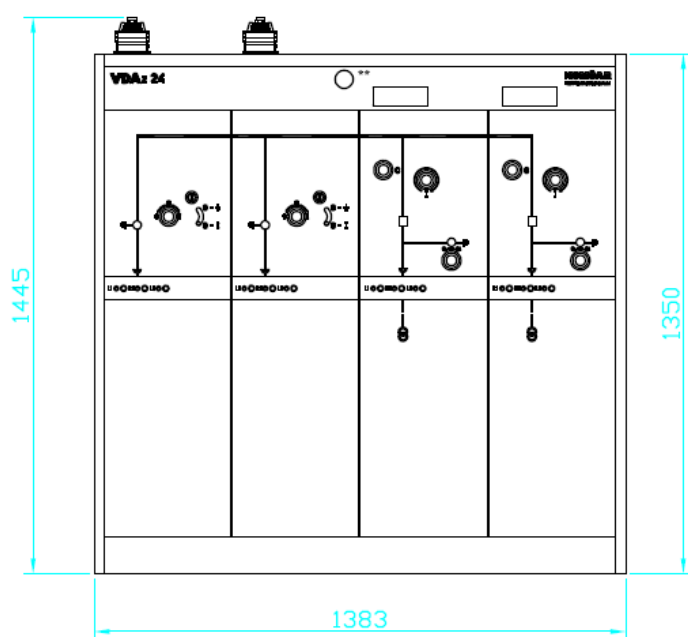
5.3. VDAΣ 24 – 4VT

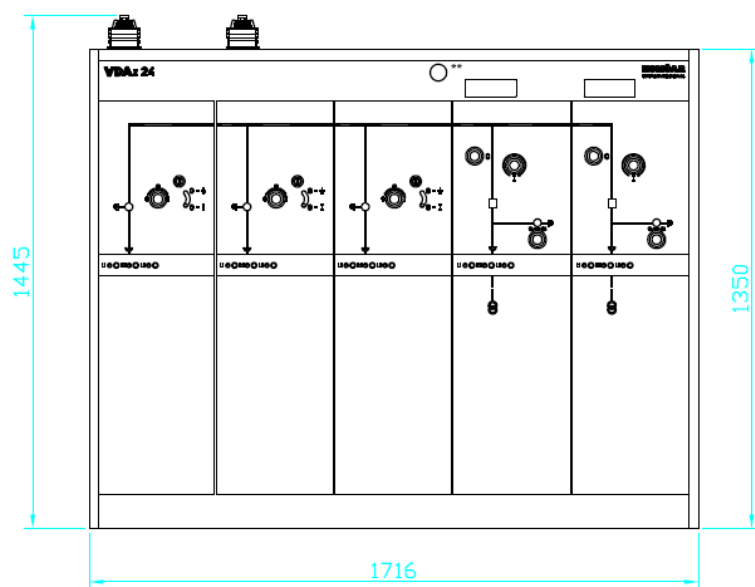
5.3. VDAΣ 24 – 4VT



5.4. VDAΣ 24 – 2V2T

5.4. VDAΣ 24 – 2V2T





6. OSTALI PODACI

Za izradu ponude potrebno je dostaviti jednopolnu shemu i pripadajuće tehničke podatke.

Ostale podloge i obvezujuće podatke (npr. mjerne skice, sheme unutarnjeg ožičenja, jednopolne sheme modula koji nisu navedeni u ovom letku, izvještaje o tipskim ispitavanjima) dostavljamo na zahtjev.

NAPOMENA:

Svi podaci navedeni u ovom katalogu informacijskog su karaktera. Proizvođač pridržava pravo izmjene.

Obvezujuće podatke i mjerne skice dajemo na zahtjev

6. ADDITIONAL DATA

For more detail information and quotation, please submit single line diagram and relevant technical data.

Obligatory data (e.g. dimensional drawings, wiring diagram, other single line diagrams which are not presented in this leaflet, type test reports) available on request.

NOTICE:

Technical characteristics, dimensional drawings and other relevant data are subject to change.

Obligatory data only on request.



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