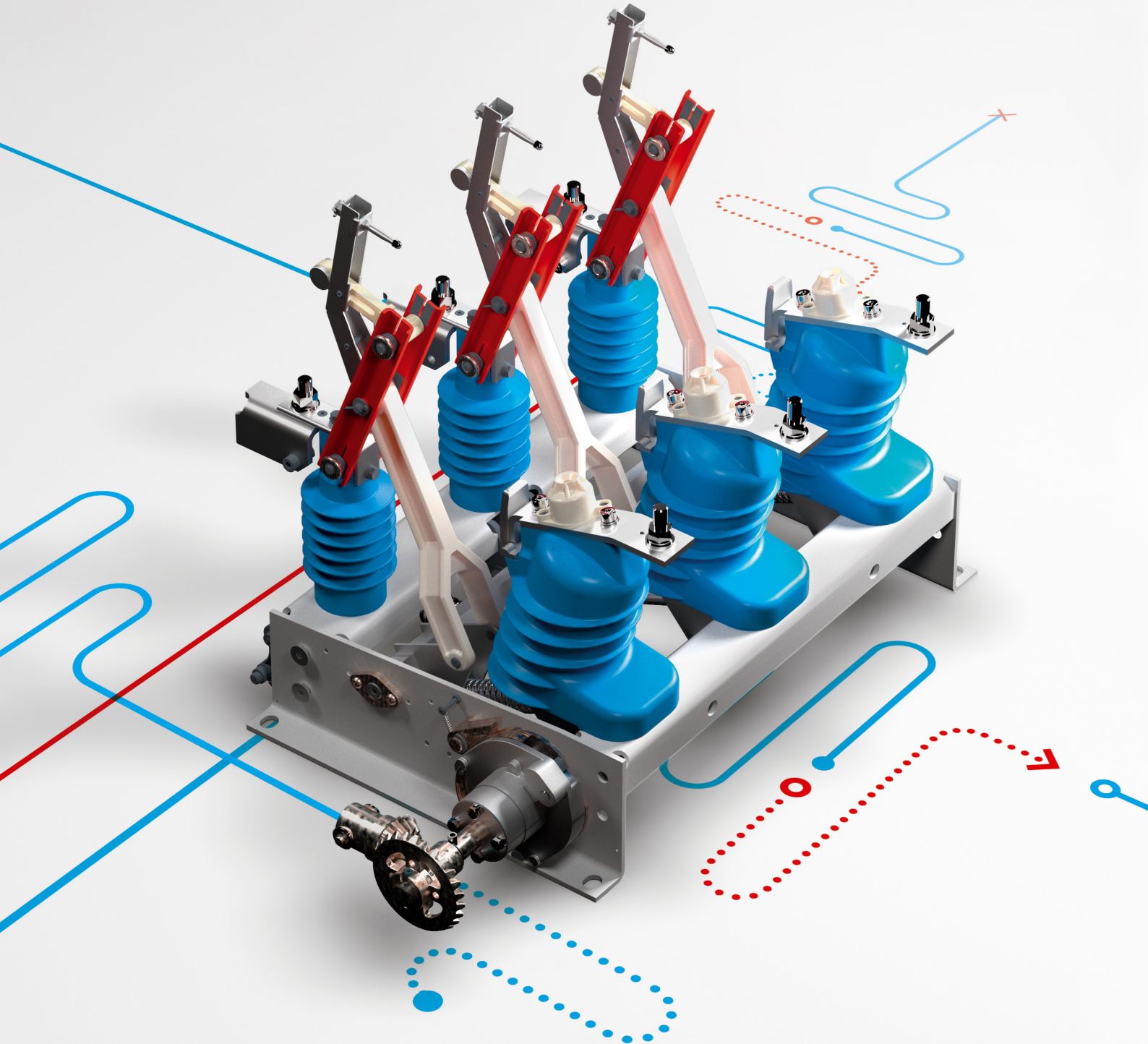




Edition 1

CATALOGUE



We connect
with ENERGY

Contents

01. HV Switchgear

| | |
|--|-----|
| MARK40/G60 Vertical disconnecter | _06 |
| TFP Pantograph disconnecter | _08 |
| ONIII Horizontal centre-break disconnecter | _10 |
| UNIII Earthing switch | _14 |
| NSO80 Motor operating mechanism | _16 |
| NR-5 Manual operating mechanism | _18 |

02. MV Outdoor Switchgear

| | |
|-------------------------------------|-----|
| RS MV outdoor switch disconnecter | _22 |
| ONIIIS MV outdoor disconnecter | _24 |
| NSL60 Motor operating mechanism | _26 |
| NR-5S Manual operating mechanism | _28 |

03. MV Indoor Switchgear

| | |
|---|-----|
| 3AH5 Vacuum circuit-breaker | _32 |
| OM/OMB Indoor switch disconnecter | _36 |
| OW Indoor disconnecter | _40 |
| OW High current indoor disconnecter | _44 |
| OWS The highest current indoor disconnecter | _48 |
| OW-I-25 Indoor disconnecter 660V, 25.000A | _50 |
| UW/UDS Indoor earthing switch | _52 |
| UWS High current earthing switch | _54 |
| NSW30 Motor operating mechanism | _56 |
| NSP20 Motor operating mechanism | _60 |
| NR-1 Manual operating mechanism | _62 |

04. Accessories

| | |
|---------------------------------|-----|
| WN/ WNS Voltage indicator | _66 |
| LP-1 Auxiliary contact switch | _68 |
| PB Fuse base | _70 |
| Notes | _72 |

We connect
with ENERGY



ABOUT US

Headquarters ZWAE

ZWAE Sp. z o.o. Zakład Wytwórczy Aparatów Elektrycznych

ZWAE provides HV and MV switchgear and continues tradition of Polish apparatus production in Lębork.

Our offer is aimed both at power engineering and industrial plants using power equipment. Among our customers there are virtually all divisions of power concerns in Poland and many industrial plants. Our apparatus is also sold to companies from other countries.

The advantage of our company is experienced and highly qualified personnel who are able to meet the challenges of modern power engineering.

Our products have owned all of the most important certificates. Besides, our apparatus have gained recognition among many electrical power engineering companies, both domestic and foreign.

Our goal is to become an important partner for power engineering and industry in the domestic market. We aim to meet expectations of customers, sustaining high quality of offered solutions and prompt completion of works. While designing switchgear, we strive for keeping it compatible in terms of assembly with currently used devices in order to make their exchanging as simple as it is possible.

You are welcome to visit our website where you can find detailed information concerning our company and offered products.

01.

HV SWITCHGEAR

Outdoor HV disconnectors

MARK40/G60

TFP

ONIII

Outdoor HV earthing switches

UNIII

HV switchgear operating mechanisms

NS080

NR-5

WARNING: As a result of introduce changes due to technological development, the diagrams in catalogue have only a visual character

MARK40/G60

Vertical disconnector
123, 245 i 420kV



CHARACTERISTICS

- High peak and short-circuit parameters 160/63 kA
- Very good conduction and endurance during whole exploitation period
- Fast icing removing (20 mm) at the end phase of closing disconnector
- High durability against forces, e.x. seismic, short-circuit without negative influence on operating mechanisms thanks to 'dead point' solution (crank mechanism)
- High short-circuit parameters of G60 earthing switch
- Excellent anti-corrosion protection
- Reliability of working in hard weather condition
- Simple adjustment

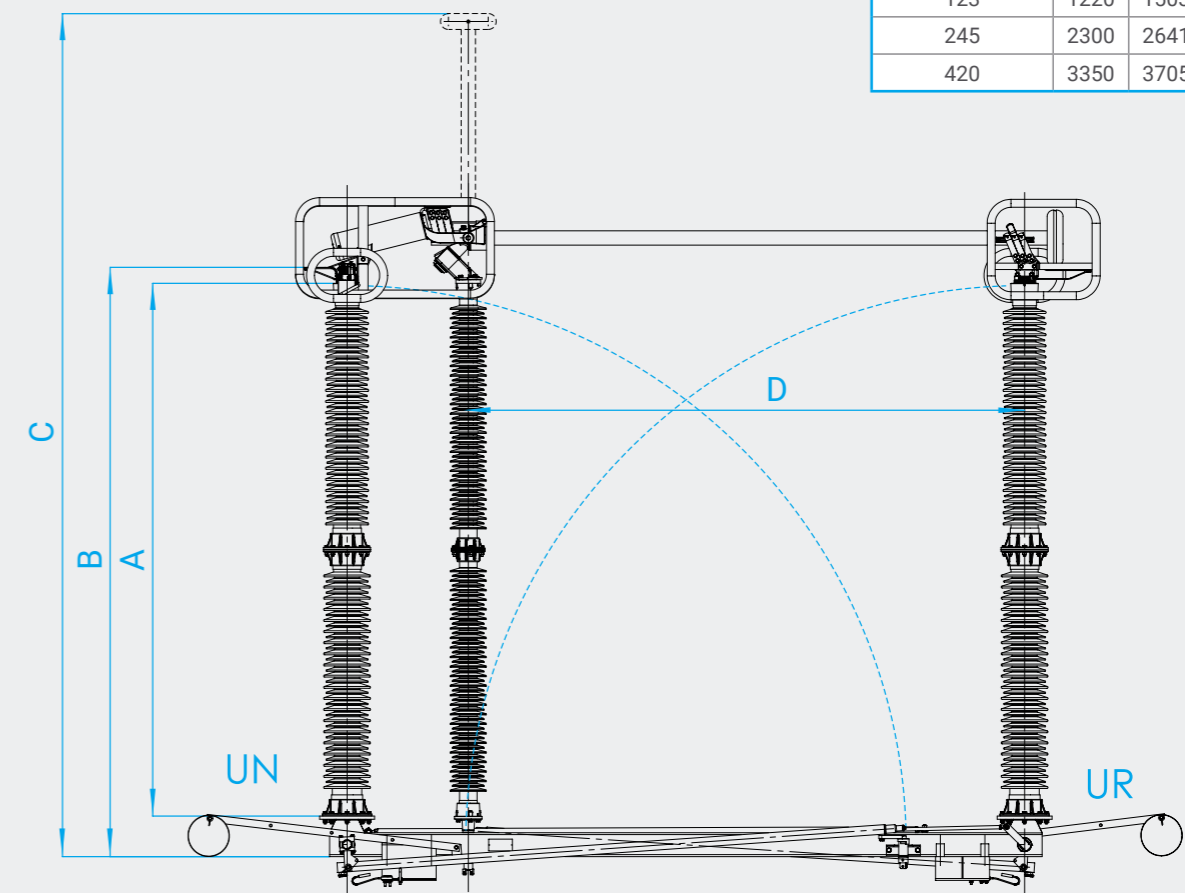
SPECIFICATION

| Item | Parameter | Value | | |
|------|---|-------------|-------------|-------------------|
| | | 123 [kV] | 245 [kV] | 420 [kV] |
| 1. | Rated operating voltage | 123 [kV] | 245 [kV] | 420 [kV] |
| 2. | Rated continuous current | 2500 [A] | 2500 [A] | 2500 [A] |
| | | 3150 [A] | 3150 [A] | 3150 [A] |
| | | 4000 [A] | 4000 [A] | 4000 [A] |
| 3. | Peak current | 160 [kA] | 160 [kA] | 160 [kA] |
| 4. | Short-circuit current, 1 sec. | 63 [kA] | 63 [kA] | 63 [kA] |
| 5. | Test voltage (50 Hz): - earth and pole to pole insulation - contact to contact insulation | 230 [kV] | 460 [kV] | 520 [kV] |
| | | 265 [kV] | 530 [kV] | 610 [kV] |
| 6. | Surge test voltage: - earth and pole to pole insulation - contact to contact insulation | 550 [kV] | 1050 [kV] | 1425 [kV] |
| | | 630 [kV] | 1200 [kV] | 1425 (+240)* [kV] |
| | | - | - | - |
| 7. | Operational rated surge test voltage: - earth insulation - contact to contact insulation | - | - | 1050 [kV] |
| | | - | - | 900 (+345)* [kV] |
| 8. | Radio interference voltage | <2500 [uV] | <2500 [uV] | <2500 [uV] |
| 9. | Mechanical strength | 2000 cycles | 2000 cycles | 2000 cycles |
| 10. | Motor operating mechanism | NSO80 | NSO80 | NSO80 |

* Peak values of alternating voltage at the opposite terminal are shown in parentheses.

DIAGRAMS

| Rated operating voltage [kV] | Dimensions (mm) | | | |
|------------------------------|-----------------|------|------|------|
| | A | B | C | D |
| 123 | 1220 | 1503 | 3310 | 1450 |
| 245 | 2300 | 2641 | 5765 | 2648 |
| 420 | 3350 | 3705 | 7458 | 3498 |



TFP 123-420 kV

Pantograph disconnector

CHARACTERISTICS

- High peak and short-circuit parameters 160/63 kA
- Minimalization of distance between poles in diagonal arrangement
- High durability against forces, e.x. seismic, short-circuit without negative influence on operating mechanisms thanks to 'dead point' solution (crank mechanism)
- Many variants of engaging with busbars system
- Gear mechanism of the current path closed in aluminum housing box
- Excellent anti-corrosion protection
- Reliability of working in hard weather conditions
- One operating mechanism for three-pole apparatus up to 145 kV, above 145 kV separate operating mechanism for each pole
- Cooperating with Swiss company ALPHA Elektrotechnik AG



Current and voltage – our passion



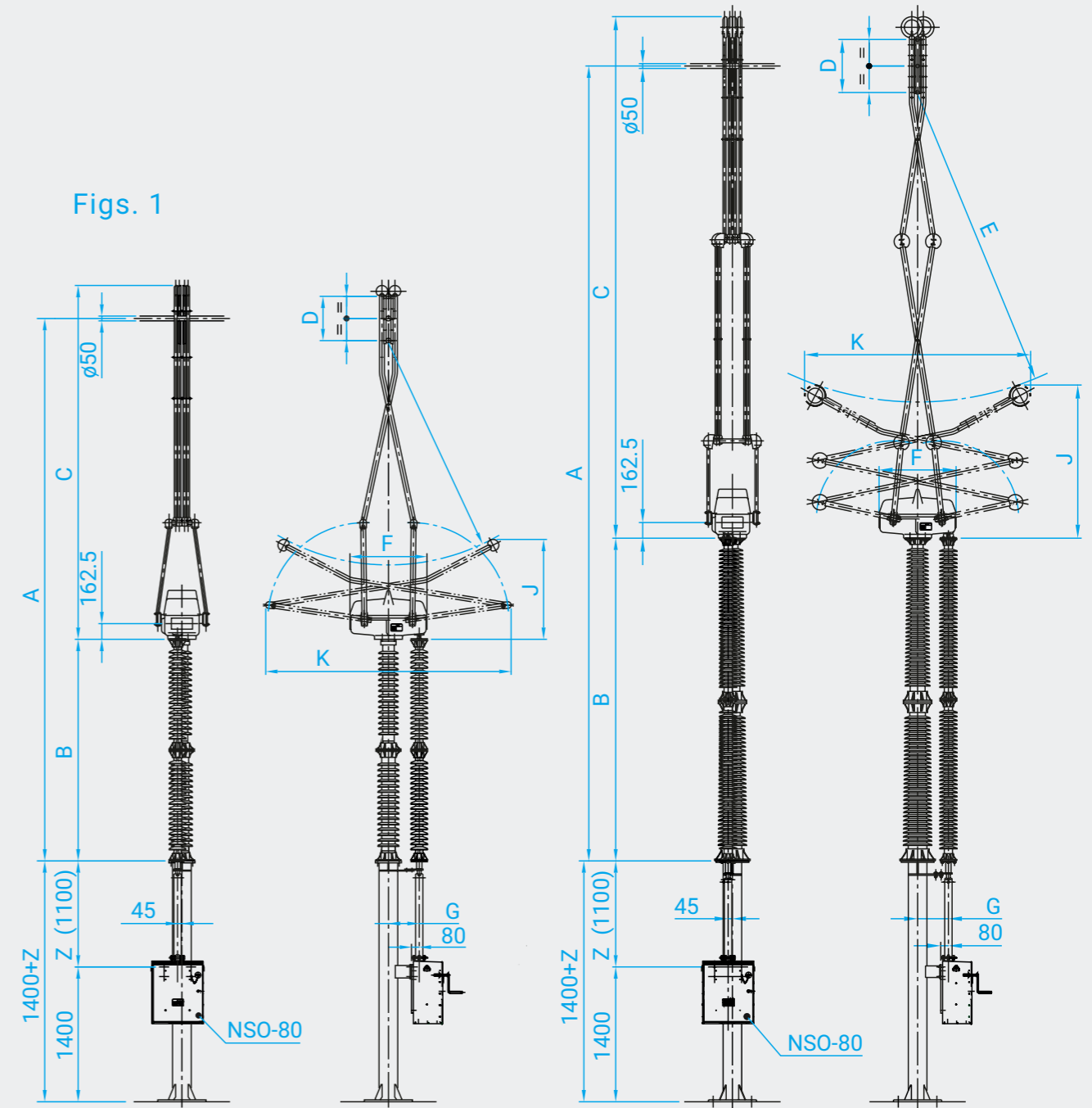
SPECIFICATION

| Item | Parameter | Value | | | |
|------|--|----------|--------------|-----------------|-----------------|
| | | 123 [kV] | 170 [kV] | 245 [kV] | 420 [kV] |
| 1. | Rated voltage | 123 [kV] | 170 [kV] | 245 [kV] | 420 [kV] |
| 2. | Rated continuous current | 2200 [A] | 2200 [A] | 2500 [A] | 2500 [A] |
| | | 2500 [A] | 3150 [A] | 3150 [A] | 3150 [A] |
| | | 4000 [A] | 4000 [A] | 4000 [A] | 4000 [A] |
| 3. | Rated peak withstand current | 100 [kA] | 100/160 [kA] | 160 [kA] | 160 [kA] |
| 4. | Rated short-circuit withstand current | 40 [kA] | 40/63 [kA] | 63 [kA] t=3s | 63 [kA] t=3s |
| 5. | Rated power-frequency withstand voltage: - to earth - across open disconnector | 230 [kV] | 325 [kV] | 460 [kV] | 520 [kV] |
| | | 265 [kV] | 375 [kV] | 530 [kV] | 610 [kV] |
| 6. | Rated lightning impulse withstand voltage: - to earth - across open disconnector | 550 [kV] | 750 [kV] | 1050 [kV] | 1425 [kV] |
| | | 630 [kV] | 860 [kV] | 1200 [kV] | 1665 [kV] |
| 7. | Rated switching impulse withstand voltage: - to earth - across open disconnector | - | - | - | 1050 [kV] |
| | | - | - | - | 1245 [kV] |

DIAGRAMS

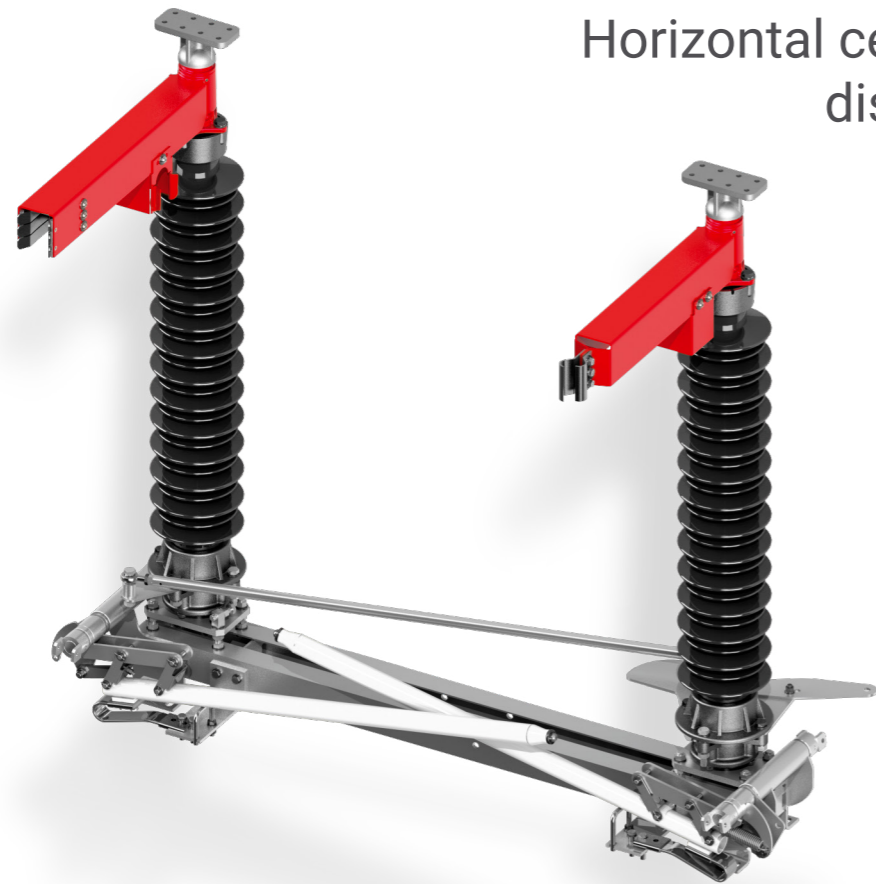
Figs. 2

Figs. 1



SPECIFICATION

| Type | Rated voltage [kV] | Fig | Dimensions (mm) | | | | | | | | |
|------|--------------------|-----|-----------------|------|------|-----|------|-----|-----|------|------|
| | | | A | B | C | D | E | F | G | J | K |
| TFPK | 123 | 1 | 2890 | 1220 | 1800 | 300 | 1150 | 630 | 260 | 682 | 1250 |
| TFPK | 145 | 1 | 3590 | 1500 | 2404 | 300 | 1465 | 630 | 260 | 642 | 1672 |
| TFPK | 170 | 1 | 3982 | 1700 | 2580 | 300 | 1570 | 630 | 260 | 628 | 1810 |
| TFPA | 170 | 1 | 4390 | 1700 | 4308 | 300 | 1630 | 800 | 320 | 968 | 2145 |
| TFPA | 245 | 1 | 5630 | 2300 | 3690 | 460 | 2280 | 800 | 320 | 1044 | 2540 |
| TFP | 245 | 2 | 6250 | 2300 | 4417 | 460 | 2350 | 800 | 320 | 1478 | 1740 |
| TFP | 420 | 2 | 8250 | 3350 | 2404 | 550 | 3150 | 800 | 320 | 1590 | 2285 |



ONIII

Horizontal centre-break disconnector

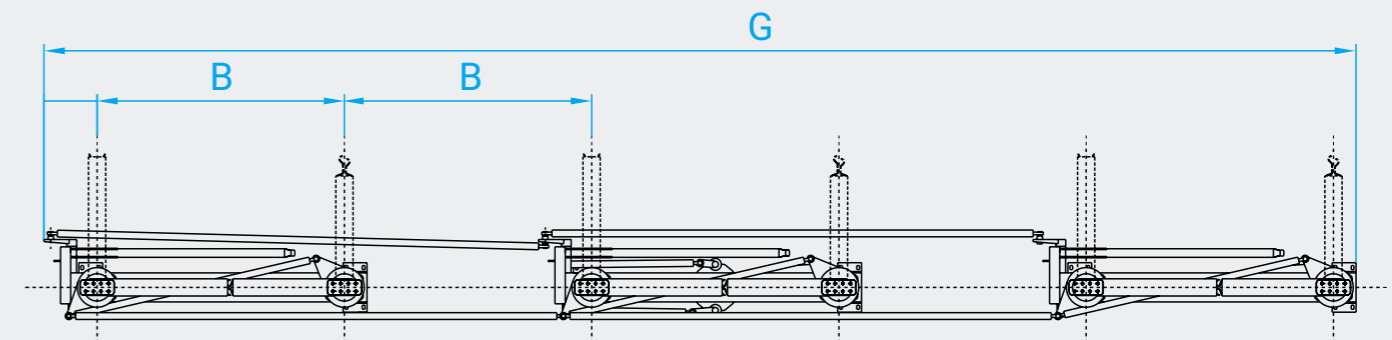
CHARACTERISTICS

- High peak and short-circuit parameters 125/50 kA
- 123 kV and 145 kV versions available with composite insulators inside silicone cover
- High durability against forces, e.x. seismic, short-circuit without negative influence on operating mechanisms thanks to 'dead point' solution (crank mechanism)
- Versions up to 145 kV are delivered completely assembled and adjusted
- Indefective working in hard weather conditions
- Possibility of engaging operating mechanisms with any pole
- Available variants in arrangements: parallel, serial, tandem
- Simple assembling and engaging of disconnector/earthing switch with operating mechanism
- Possibility of assembling apparatus on site according to the client's requirement

SPECIFICATION

| Item | Parameter | Value | | | |
|------|---|-------------|-------------|-------------|-------------|
| | | 72,5 [kV] | 123 [kV] | 145 [kV] | 245 [kV] |
| 1. | Rated operating voltage | 72,5 [kV] | 123 [kV] | 145 [kV] | 245 [kV] |
| 2. | Rated continuous current | 1600 [A] | 1600 [A] | 1600 [A] | 1600 [A] |
| | | 2500 [A] | 2500 [A] | 2500 [A] | 2500 [A] |
| | | 3150 [A] | 3150 [A] | 3150 [A] | 3150 [A] |
| | | 4000 [A] | 4000 [A] | 4000 [A] | 4000 [A] |
| 3. | Peak current | 125 [kA] | 125 [kA] | 125 [kA] | 125 [kA] |
| 4. | Short-circuit current, 1 sec. | 50 [kA] | 50 [kA] | 50 [kA] | 50 [kA] |
| 5. | Test voltage (50 Hz): - earth and pole to pole insulation - contact to contact insulation | 140 [kV] | 230 [kV] | 275 [kV] | 460 [kV] |
| | | 160 [kV] | 265 [kV] | 315 [kV] | 530 [kV] |
| 6. | Surge test voltage: - earth and pole to pole insulation - contact to contact insulation | 325 [kV] | 550 [kV] | 650 [kV] | 1050 [kV] |
| | | 375 [kV] | 630 [kV] | 750 [kV] | 1200 [kV] |
| 7. | Radio interference voltage | <1000 [µV] | <1000 [µV] | <1000 [µV] | <100 [µV] |
| 8. | Mechanical strength | 2000 cycles | 2000 cycles | 2000 cycles | 2000 cycles |
| 9. | Operating mechanisms: - motor - manual | NSO80 | NSO80 | NSO80 | NSO80 |
| | | NR-5 | NR-5 | NR-5 | NR-5 |

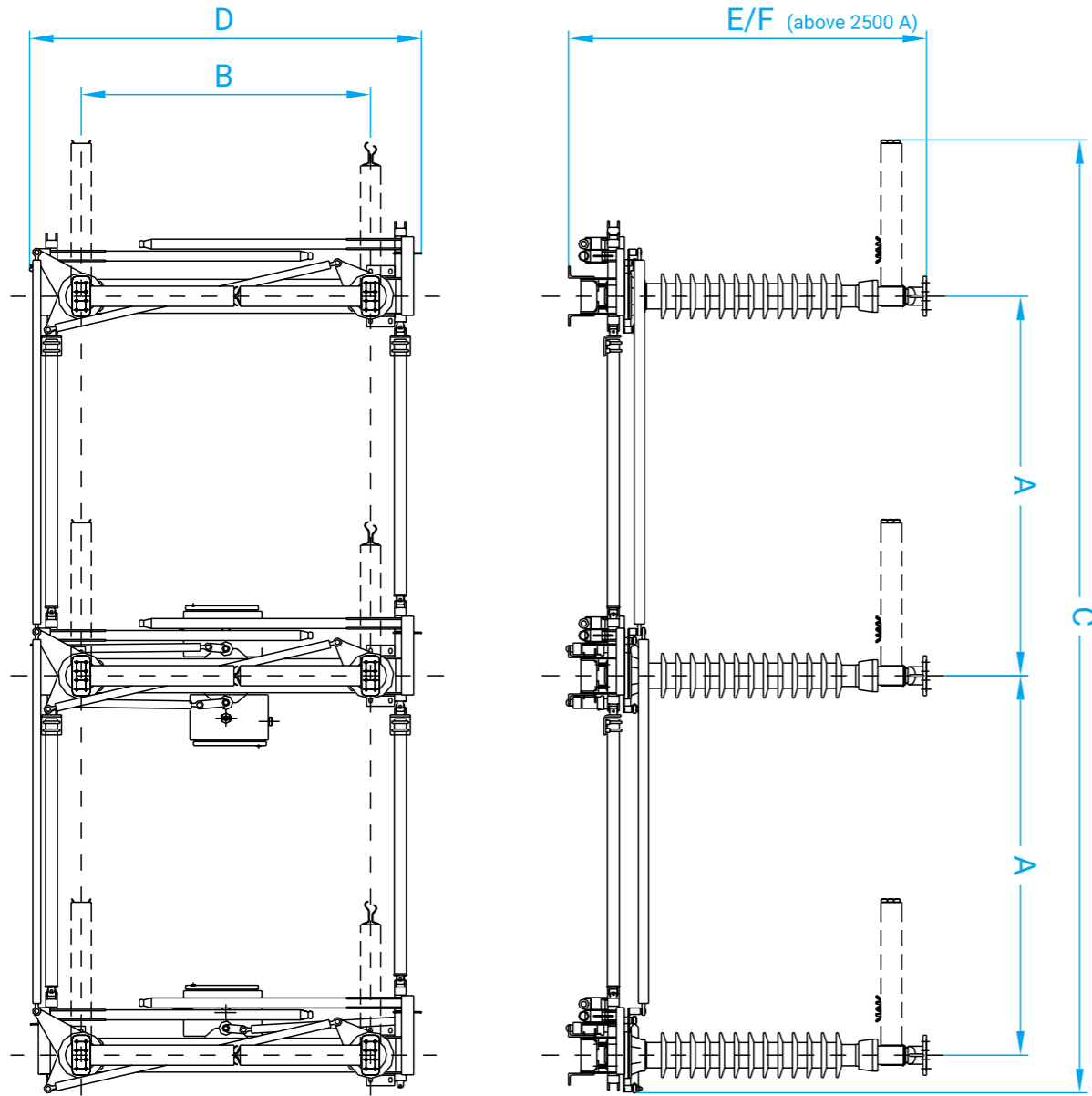
DIAGRAMS



SPECIFICATION

| Type | Dimensions (mm) | |
|-----------|-----------------|-------|
| | B | G |
| ONIII-72 | 900 | 4940 |
| ONIII-123 | 1450 | 7690 |
| ONIII-145 | 1600 | 8440 |
| ONIII-245 | 2295 | 12230 |

DIAGRAMS



SPECIFICATION

| Type | Dimensions (mm) | | | | | |
|-----------|-----------------|------|------|------|------|------|
| | A | B | C | D | E | F |
| ONIII-72 | 1300 | 900 | 3170 | 1425 | 1334 | 1380 |
| ONIII-123 | 1900 | 1450 | 4770 | 1964 | 1794 | 1840 |
| ONIII-145 | 2100 | 1600 | 5245 | 2100 | 2075 | 2120 |
| ONIII-245 | 3500 | 2295 | 8620 | 2810 | 2990 | 3135 |



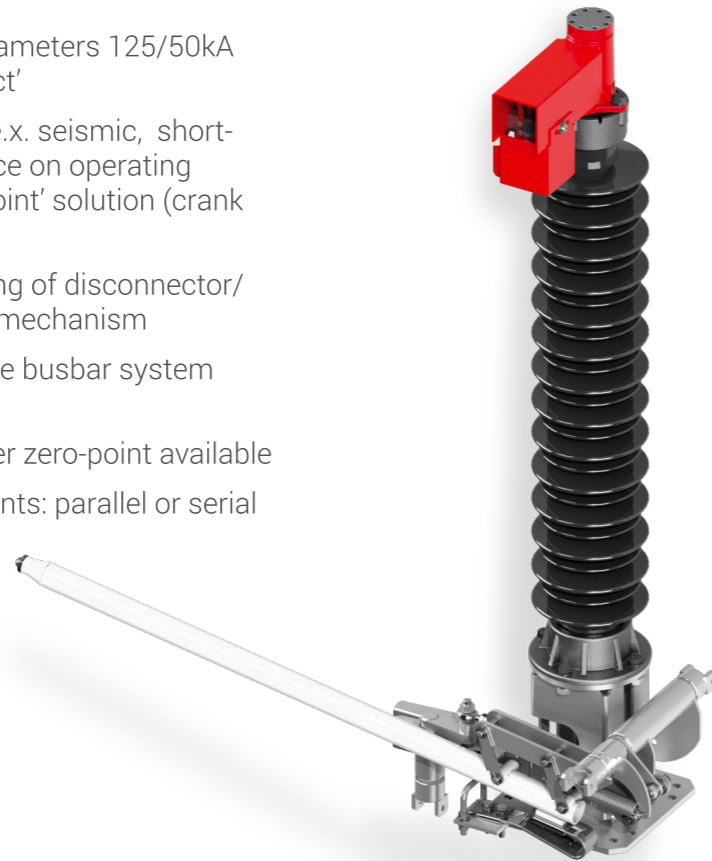
We connect with ENERGY

UNIII

Earthing switch

CHARACTERISTICS

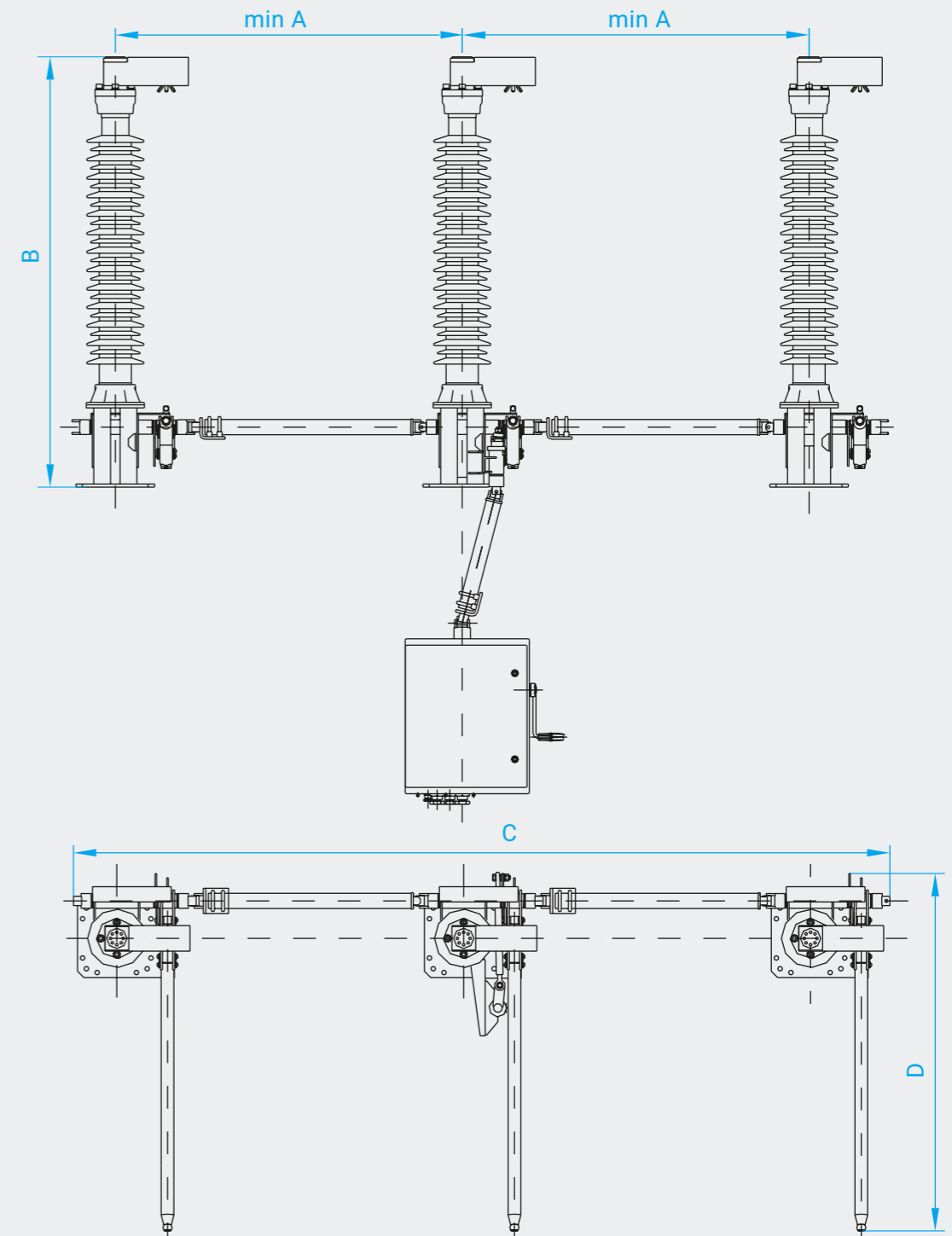
- High peak and short-circuit parameters 125/50kA up to and including 'tulip contact'
- High durability against forces, e.x. seismic, short-circuit without negative influence on operating mechanisms thanks to 'dead point' solution (crank mechanism)
- Simple assembling and engaging of disconnector/ earthing switch with operating mechanism
- Three-pole version for aggregate busbar system available
- One-pole version for transformer zero-point available
- Available variants in arrangements: parallel or serial
- Possibility of assembling apparatus on site according to the client's requirement



SPECIFICATION

| Item | Parameter | Value | | | |
|------|-------------------------------------|-------------|-------------|-------------|-------------|
| | | 72,5 [kV] | 123 [kV] | 145 [kV] | 245 [kV] |
| 1. | Rated operating voltage | 72,5 [kV] | 123 [kV] | 145 [kV] | 245 [kV] |
| 2. | Peak current | 125 [kA] | 125 [kA] | 125 [kA] | 125 [kA] |
| 3. | Short-circuit current, 1 sec. | 50 [kA] | 50 [kA] | 50 [kA] | 50 [kA] |
| 4. | Test voltage (50 Hz) for insulation | 140 [kV] | 230 [kV] | 275 [kV] | 530 [kV] |
| 5. | Surge test voltage for insulation | 325 [kV] | 550 [kV] | 650 [kV] | 1050 [kV] |
| 6. | Radio interference voltage | <1000 [µV] | <1000 [µV] | <1000 [µV] | <100 [µV] |
| 7. | Mechanical strength | 2000 cycles | 2000 cycles | 2000 cycles | 2000 cycles |
| 8. | Operating mechanisms: | | | | |
| | - motor | NS080 | NS080 | NS080 | NS080 |
| | - manual | NR-5 | NR-5 | NR-5 | NR-5 |

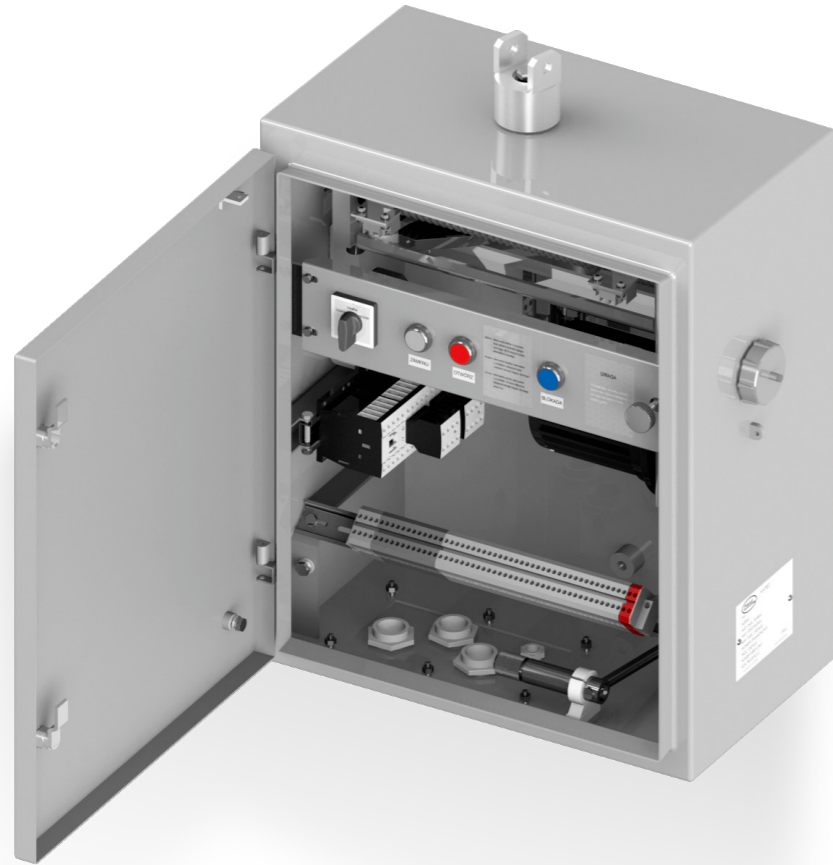
DIAGRAMS



| Type | Dimensions (mm) | | | |
|-----------|-----------------|------|------|------|
| | A | B | C | D |
| UNIII-72 | 1200 | 1255 | 2879 | 953 |
| UNIII-123 | 1370 | 1700 | 3225 | 1412 |
| UNIII-145 | 1530 | 1990 | 3545 | 1695 |
| UNIII-245 | 2500 | 2835 | 5500 | 2530 |

NS080

Motor operating mechanism



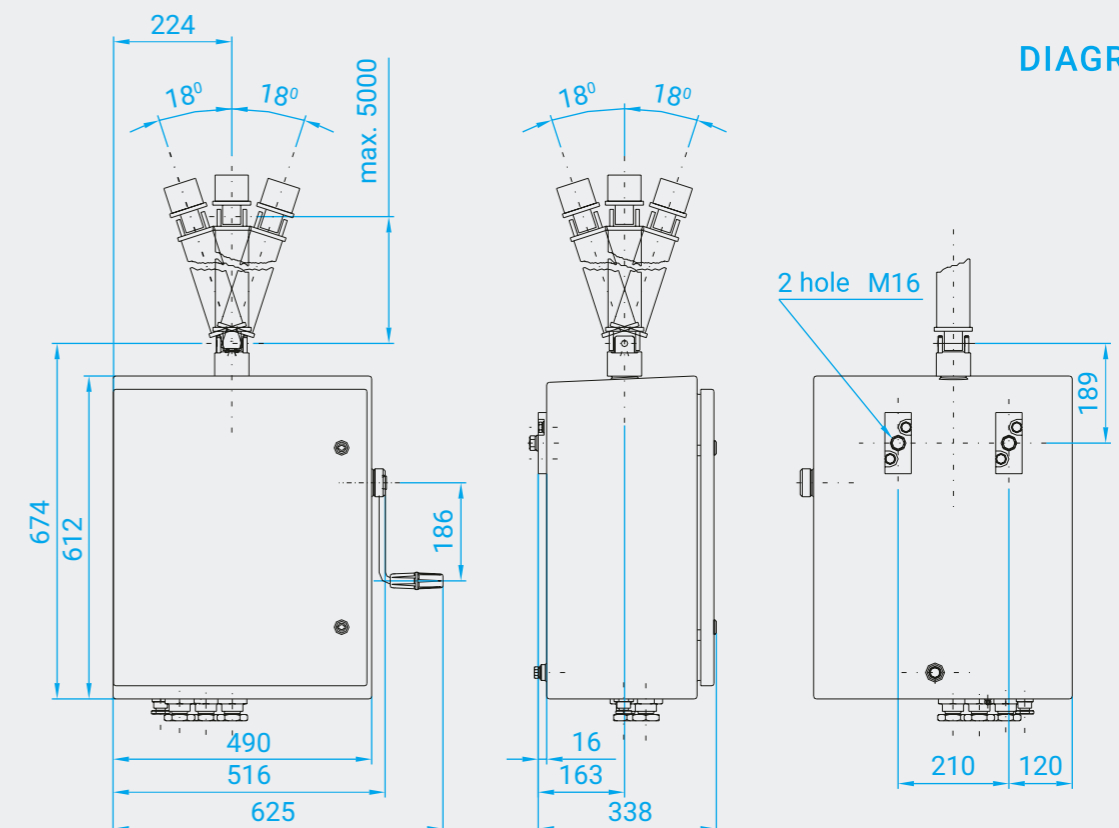
CHARACTERISTICS

- Excellent anti-corrosion protection of the housing box
- Variants 3-phase, AC or DC available
- Parabolic characteristic of the torque available in the limit positions required during closing/opening of the apparatus
- Possibility to adapt mechanism for other producers' disconnectors

SPECIFICATION

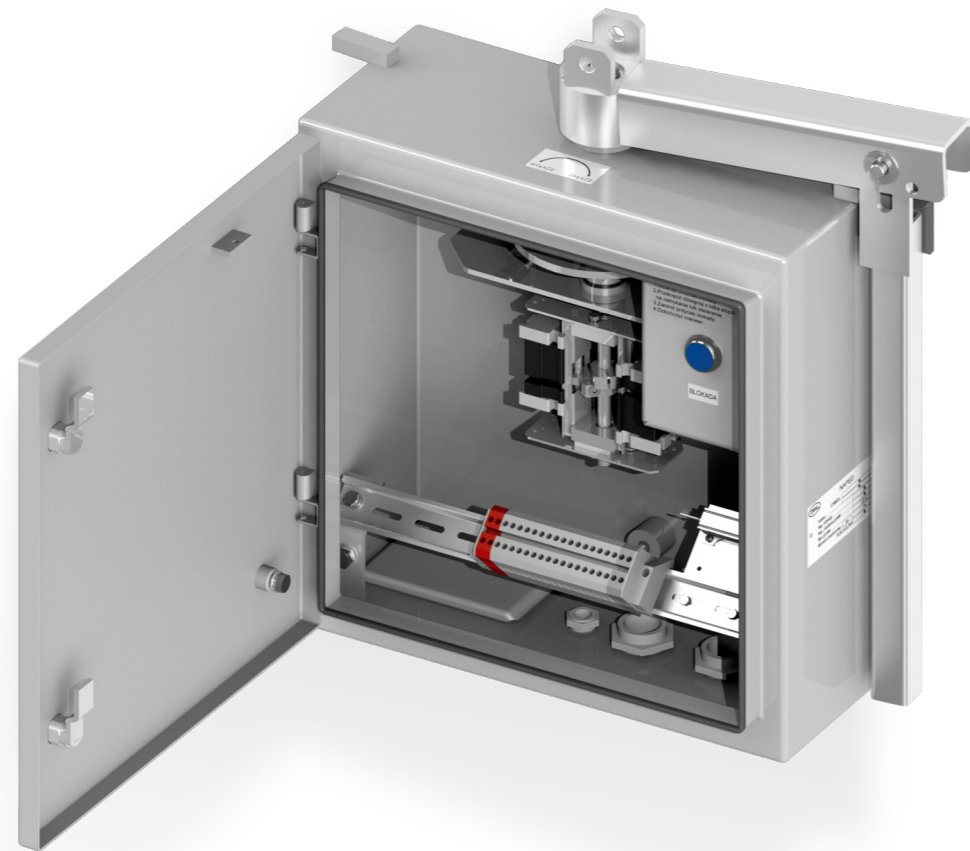
| Item | Parameter | Value |
|------|--|--|
| 1. | Rated voltage / rated current - squirrel cage motor - series motor | 3x400 [VAC] / 4,5 [A] 220 [VDC] / 4 [A] 110 [VDC] / 10 [A] |
| | - contactor coil of motor supply voltage control (depending on motor rated voltage) | 400 [VAC] 220 [VDC] 110 [VDC] |
| | - contactor coil | 220 [VDC] 230 [VAC] 110 [VDC] 110 [VAC] |
| | - heater | 230 [VAC] 220 [VDC] 110 [VDC] |
| | - electromagnetic lock | 220 [VDC] 110 [VDC] |
| 2. | Rated power: - squirrel cage motor - series motor - contactor coil - heater - electromagnetic lock coil | 750 [W] 500 [W] 7 [W] 25 [W] 7 [W] |
| 3. | Shaft torque: - rated - maximum | 300/500/1000 [Nm] 500/800/1600 [Nm] |
| 4. | HV switching time | 7/11/16 [s] |
| 5. | Crank handle speed | ca. 100 |
| 6. | Main shaft angular displacement | 90/125/192 [°] |
| 7. | Rated switching capability of control switch | AC-15; 230 [V]; 2,5 [A] DC-13; 220 [V]; 0,25 [A] |
| 8. | Maximum conductor cross section | 4 [mm ²] |
| 9. | Enclosure protection rating | IP 55 |
| 10. | Rated mechanical strength | 2000 cycles |

DIAGRAMS



NR-5

Manual operating mechanism



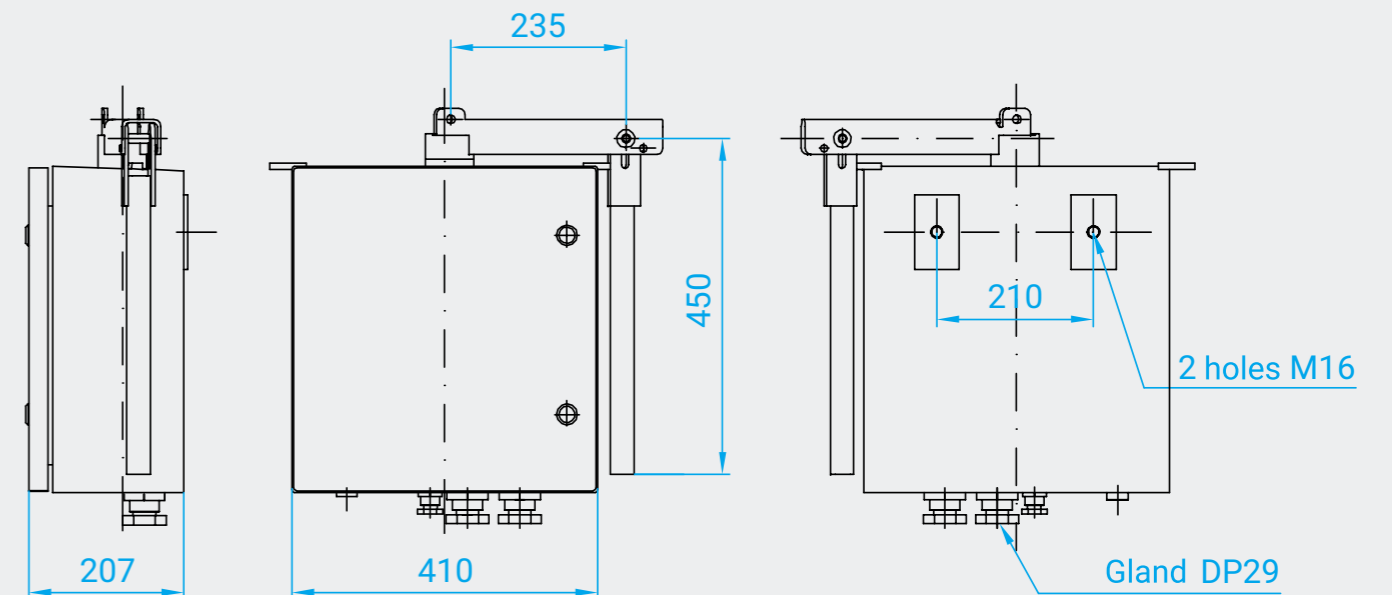
CHARACTERISTICS

- Excellent anti-corrosion protection of the housing box
- Small power to maneuver required
- Short time of maneuvering
- Possibility of using padlock as the mechanical blockade in limit positions
- Simple replacement manual operating mechanism to motor operating mechanism without any additional changes in the construction

SPECIFICATION

| Item | Parameter | Value | | |
|------|--|--|--|---|
| 1. | Rated torque | 300 [Nm] | | |
| 2. | Rated voltage: - electromagnetic lock | 230 [VAC] 220 [VDC] 110 [VDC] | | |
| | | - heater | 230 [VAC] 220 [VDC] 110 [VDC] | |
| 3. | Rated power: - electromagnet coil - DC / AC start - electromagnet coil - DC / AC operation - heater | 220 [W] / 700 [W] 1,5 [W] / 1,5 [W] 25 [W] | | |
| | | 4. | Main shaft angular displacement | 192 [°] |
| | | 5. | Rated switching capability of control switch | AC-15; 230 [V]; 2,5 [A] DC-13; 220 [V]; 0,25 [A] |
| 6. | Maximum conductor cross section | 4 [mm ²] | | |
| 7. | Enclosure protection rating | IP 55 | | |
| 8. | Rated mechanical strength | 2000 cycles | | |

DIAGRAMS



02.

MV OUTDOOR
SWITCHGEAR

MV Outdoor switch disconnectors
RS

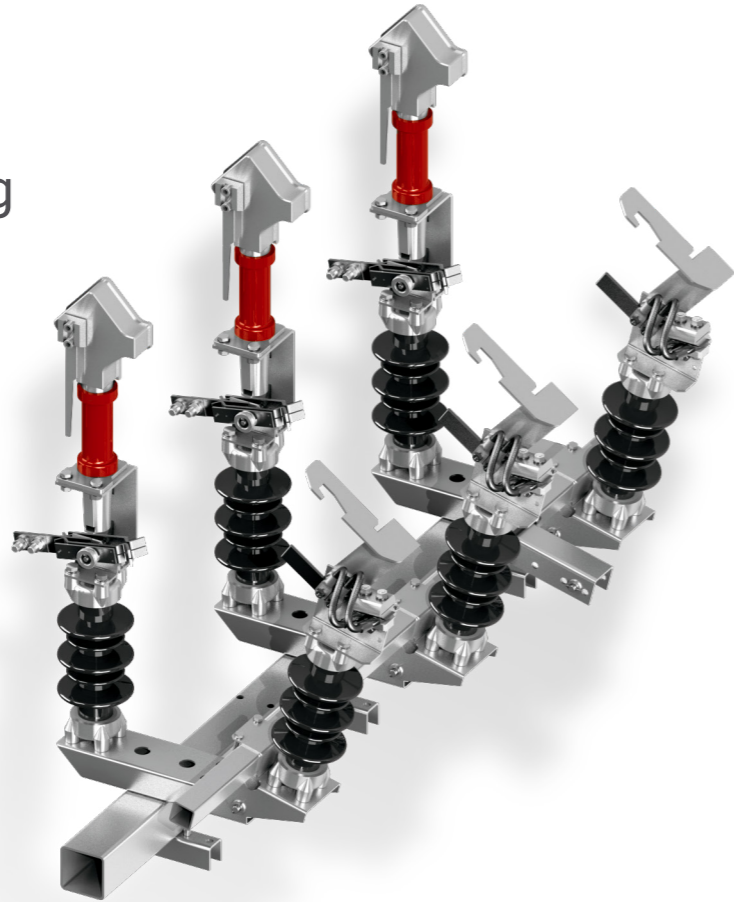
MV Outdoor disconnectors
ONIIIS

MV Outdoor switchgear operating mechanisms
NSL60
NR-5S

WARNING: As a result of introduce changes due to technological development,
the diagrams in catalogue have only a visual character

RS

Outdoor switch disconnector
Manual operating mechanism
NNO/NNP



CHARACTERISTICS

- High performance parameters
- Available with breaking chambers or arching contacts
- Excellent anti-corrosion protection
- Module design which allows to assemble apparatus very easily on the top or next to a pole
- Equipped with elastic connector and with ice-proof self-counterblow contact system
- Available with composite and porcelain insulators
- Version with motor operating mechanism NSL60 available with remote control
- Possibility of working realisation in three-position with earthing switch: closed/open/earthed
- Padlock locking system available

SPECIFICATION

| Item | Parameter | Value | |
|------|--|----------------------------|------------------------------|
| | | with arcing contact | with air breaking chamber |
| 1. | Rated voltage | 24 [kV] | |
| 2. | Rated continuous current | 630 [A] | |
| 3. | Rated frequency | 50 [Hz] | |
| 4. | Lightning surge test voltage: - earth and pole to pole insulation - contact to contact insulation | 125 [kV] 145 [kV] | |
| 5. | Rated alternating test voltage: - earth and pole to pole insulation - contact to contact insulation | 50 [kV] 60 [kV] | |
| 6. | Rated current: - low inductive reactance circuit - in ring network circuits - in cable and overhead lines, idle state | 20 [A] 10 [A] 20 [A] | 25 [A] 630 [A] 630 [A] |
| 7. | Rated peak current | 40 [kA] | |
| 8. | Rated short-circuit current, 1 sec. | 16 [kA] | |
| 9. | Mechanical strength | 1000 cycles | |

DRAWING



NNO - Version for spun concrete pole



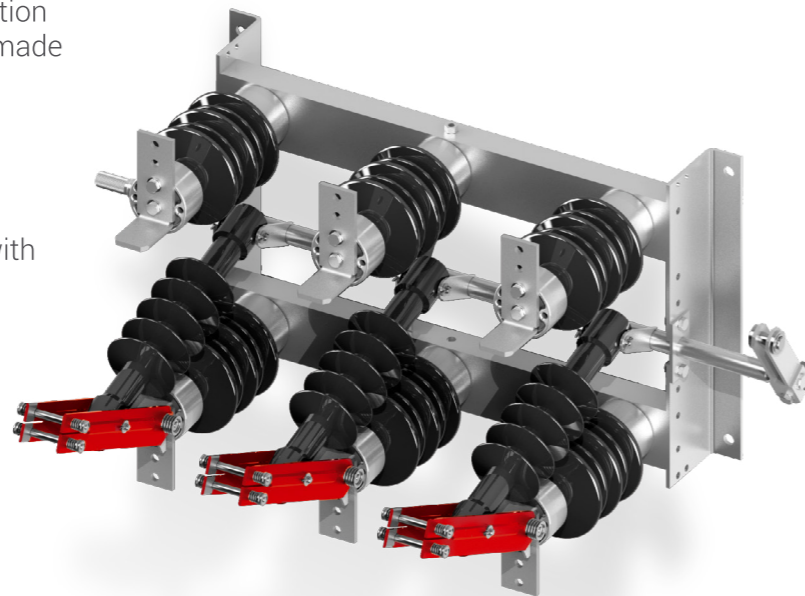
NNP - Version for ŻN/BSW pole

ONIIIS

Outdoor disconnector

CHARACTERISTICS

- High performance parameters
- Excellent anti-corrosion protection (hot-deep galvanized parts or made of stainless steel)
- Available with composite and porcelain insulators
- Version with motor operating mechanism NSL60 available with remote control
- Possibility of operating with manual mechanism



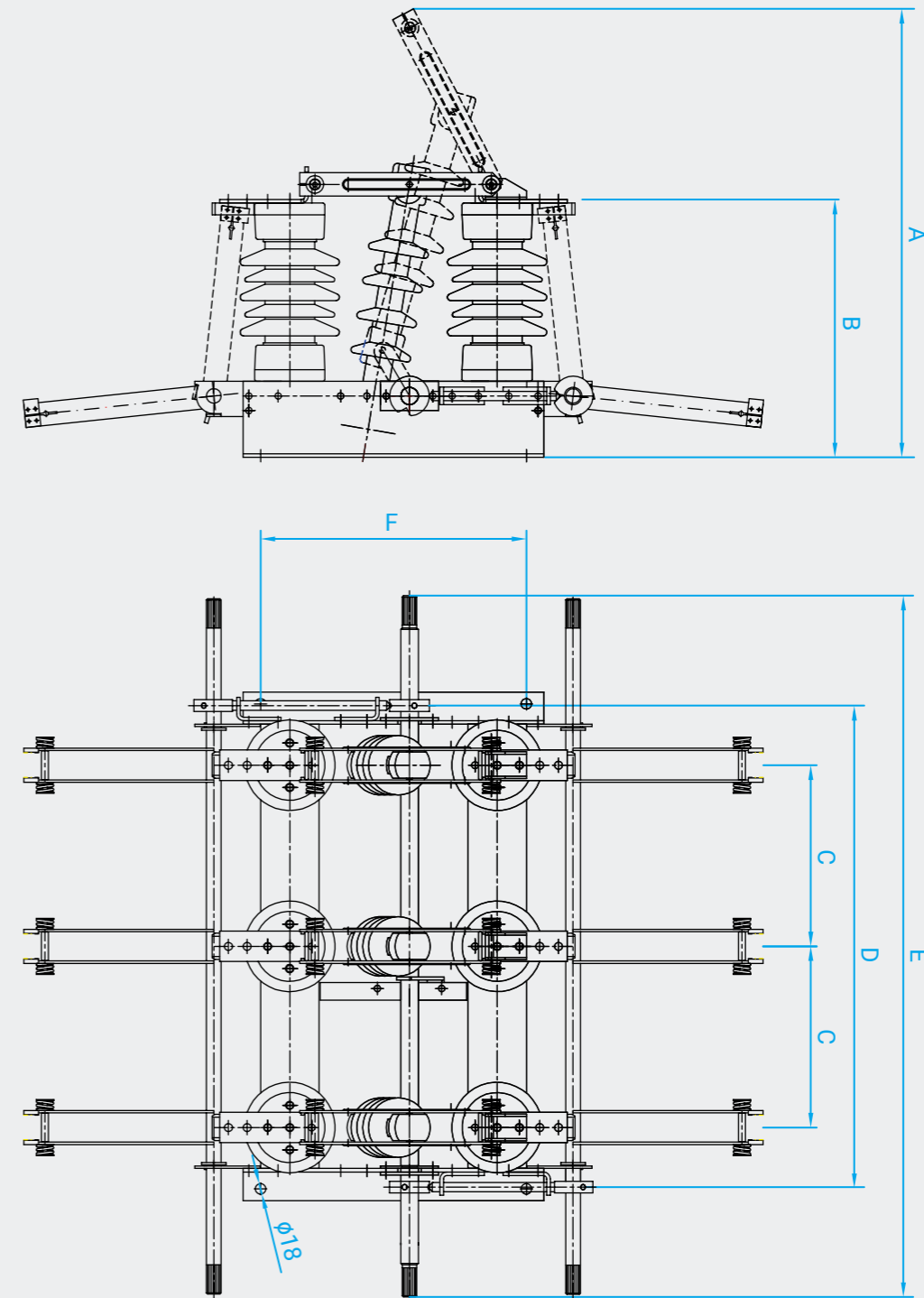
SPECIFICATION

| Item | Parameter | Value | | | |
|------|---|---------------------|-----------|--------------|---------------------|
| | | ONIIIS-24 | | ONIIIS-36 | |
| 1. | Disconnector type | ONIIIS-24 | | ONIIIS-36 | |
| 2. | Rated continuous disconnector current | 800 [A] 1600 [A] | 2000 [A] | | 800 [A] 1600 [A] |
| 3. | Rated peak disconnector current | 50 [kA] | 80 [kA] | 100 [kA] | 50 [kA] |
| 4. | Short-circuit disconnector current, 1 sec. | 20 [kA] | 31,5 [kA] | 40 [kA] | 20 [kA] |
| 5. | Test voltage (50 Hz): - earth and pole to pole insulation - contact to contact insulation | 55 [kV] | 55 [kV] | 55 [kV] | 75 [kV] |
| | | 75 [kV] | 75 [kV] | 75 [kV] | 100 [kV] |
| 6. | Surge test voltage: - earth and pole to pole insulation - contact to contact insulation | 125 [kV] | 125 [kV] | 125 [kV] | 170 [kV] |
| | | 145 [kV] | 145 [kV] | 145 [kV] | 195 [kV] |
| 7. | Earth insulation creepage distance: - rated - increased | 420 [mm] | 630 [mm] | | 770 [mm] |
| | | 460 [mm] | 770 [mm] | | 900 [mm] |
| | | - | 900 [mm] | | 1116 [mm] |
| 8. | Earthing switch peak rated current | 40 [kA] | 80 [kA] | 80 [kA] | 40 [kA] |
| 9. | Earthing switch short-circuit current, 1 sec. | 16 [kA] | 31,5 [kA] | 31,5 [kA] | 16 [kA] |
| 10. | Rated mechanical strength | 2000 cycles | | 2000 cycles | |
| 11. | Operating mechanism: - motor - manual | NSL60 NNP | | NSL60 NNP | |

DIAGRAMS

25

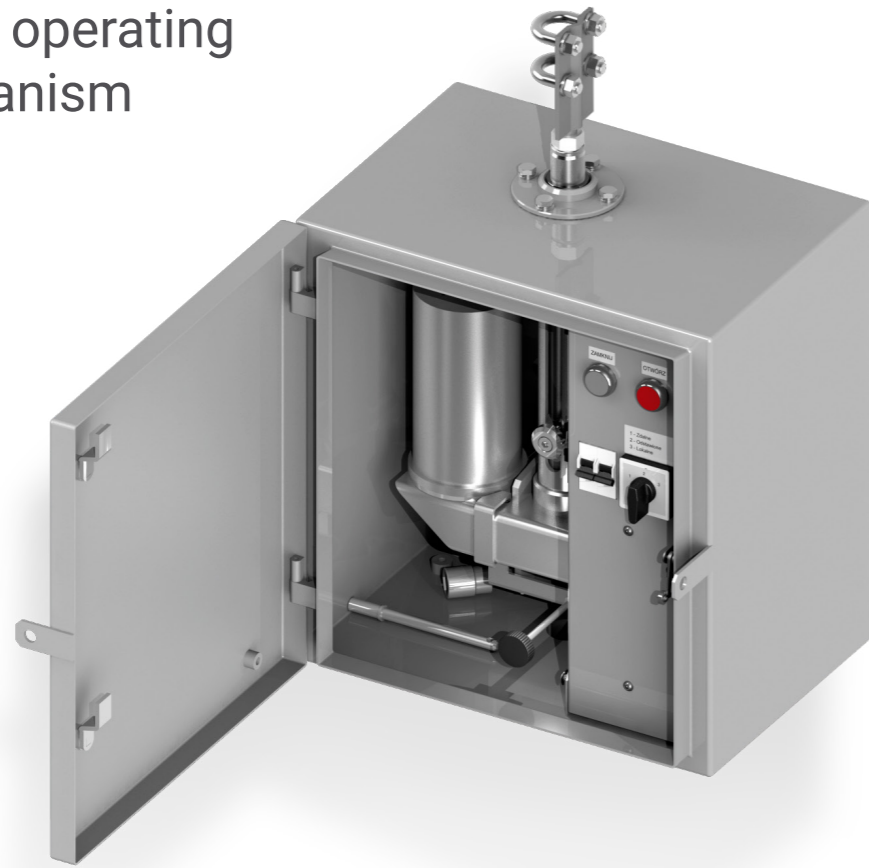
We connect with ENERGY



| Disconnector type | Dimensions [mm] | | | | | |
|-------------------|-----------------|-----|-----|------|------|-----|
| | A | B | C | D | E | F |
| ONIIIS-24/8/U2 | 768 | 441 | 310 | 830 | 1200 | 455 |
| ONIIIS-36/8/U2 | 850 | 527 | 400 | 1070 | 1480 | 634 |

NSL60

Motor operating mechanism



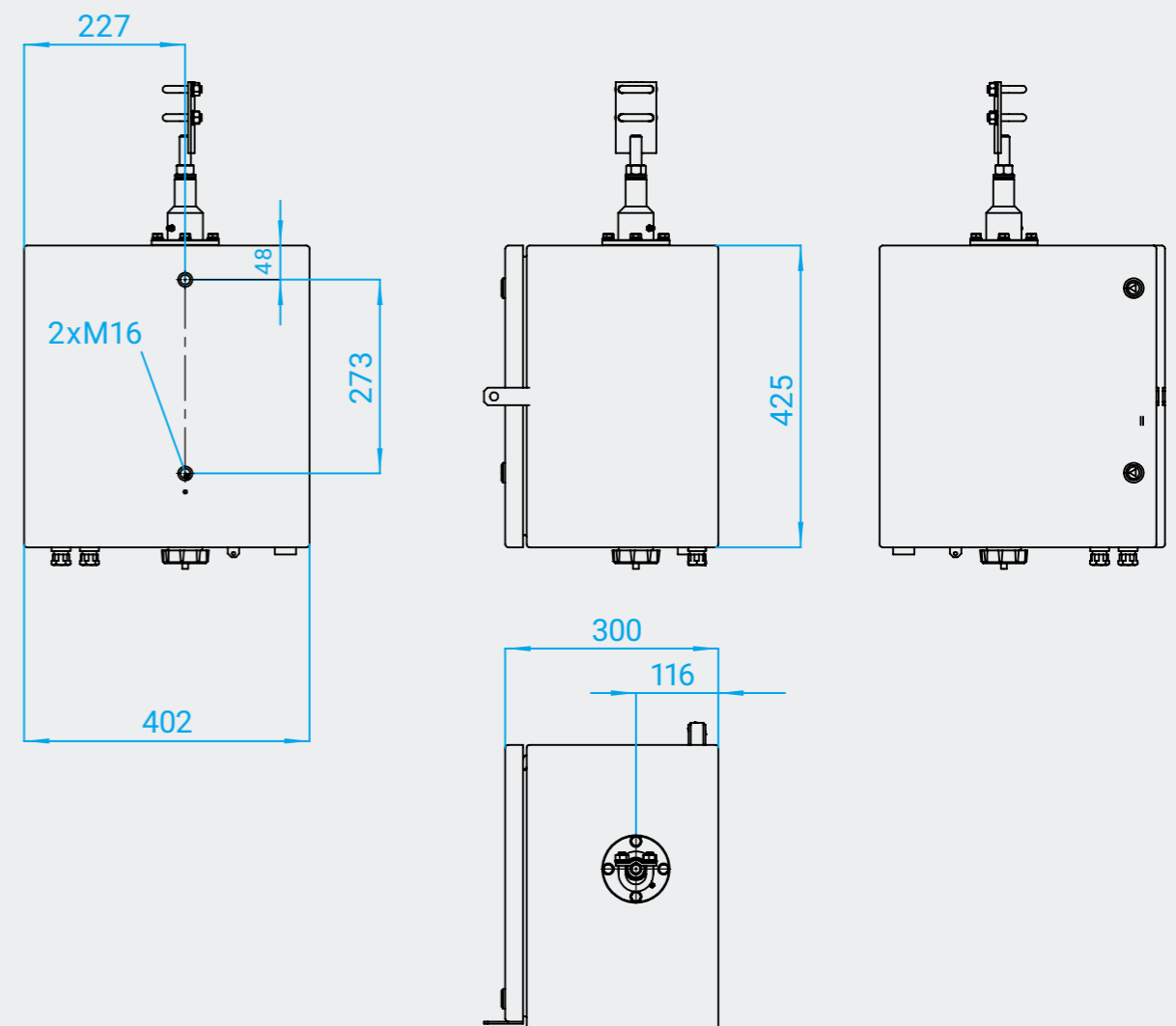
CHARACTERISTICS

- Excellent anti-corrosion protection
- Indefective working in hard weather
- Versions with motors 24, 110, 220 VDC/AC available
- High durability - 10.000 cycles
- Range or shaft movement regulation and eganging it with disconnecter/switch disconnecter
- High axis power - 6,5 kN allows to use mechanism to most demanding apparatus
- Possibility to adapt mechanism for other producers' disconnectors
- Application of electromagnetic and mechanical service blockade

SPECIFICATION

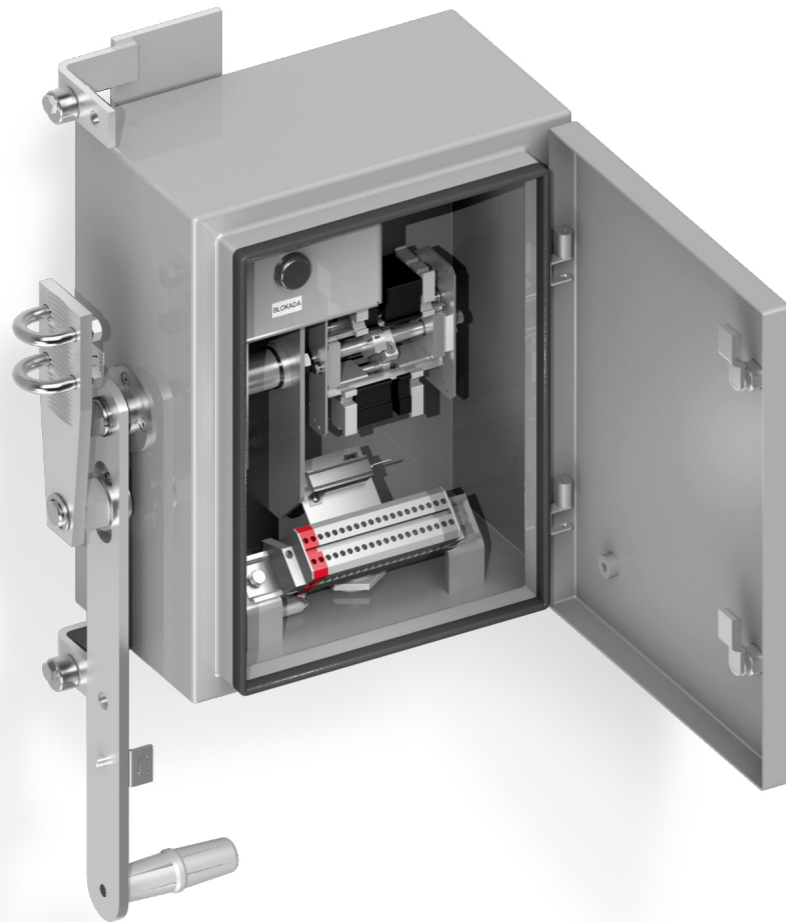
| Item | Parameter | Value |
|------|---|---|
| 1. | Motor rated voltage | 24 [VDC] 110 [VDC] 220 [VDC] 230 [VAC] |
| 2. | Rated power | 300 [W] |
| 3. | Motor rated current | 19 [A] 4 [A] 2,2 [A] |
| 4. | Maximum axial force | 6,5 [kN] |
| 5. | Switching time | ca. 4 sek. |
| 6. | Max. conductor cross-section for connection of terminal strip | 2,5 [mm ²] |
| 7. | Rated mechanical strength | 10 000 cycles |

DIAGRAMS



NR-5S

Manual operating mechanism



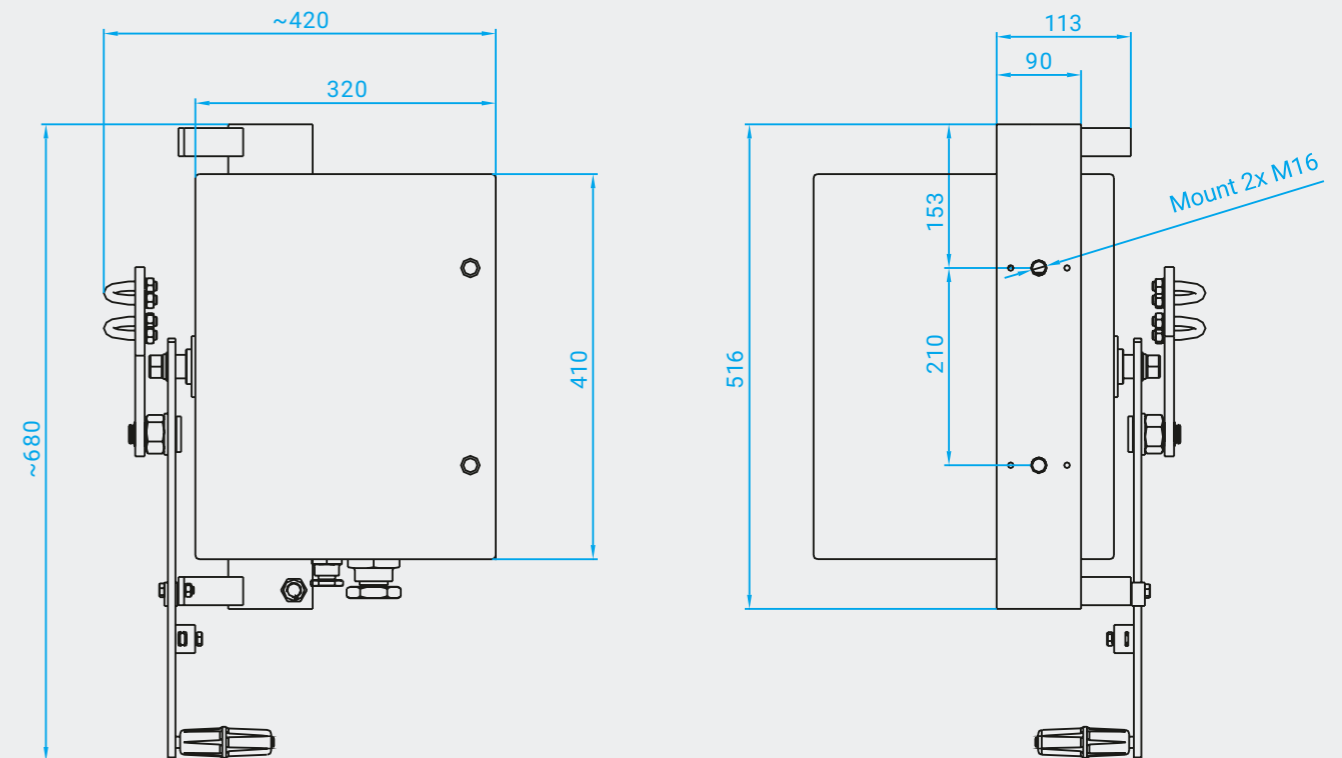
CHARACTERISTICS

- Excellent anti-corrosion protection
- Simple operating of MV disconnector/switch disconnector
- Extra blocking system with padlock available in limit positions
- Versions with auxiliary contacts, electromagnetic interlock and terminal block available
- Indefective working

SPECIFICATION

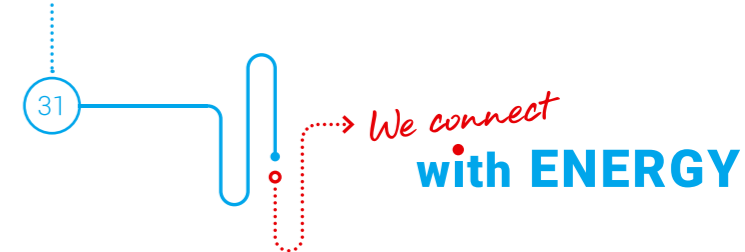
| Item | Parameter | Value |
|------|--|--|
| 1. | Rated torque | 300 [N] |
| 2. | Rated voltage: - electromagnetic lock | 220 [VDC] 230 [VAC] 110 [VDC] |
| 3. | Rated power: - elektromagnet coil – DC/AC start - elektromagnet coil – DC/AC operation | 220 [W] / 700 [W] 1,5 [W] / 1,5 [W] |
| 4. | Main shaft angular displacement | 192 [°] |
| 5. | Rated switching capability of control switch | AC-15; 230 [V]; 2,5 [A] DC-13; 220 [V]; 0,25 [A] DC-13; 110 [V]; 1 [A] |
| 6. | Maximum conductor cross section | 4 [mm ²] |
| 7. | Enclosure protection rating | IP 55 |
| 8. | Rated mechanical strength | 2000 cycles |

DIAGRAMS



03.

MV INDOOR SWITCHGEAR



MV Vacuum circuit breakers
3AH5

MV Indoor switch disconnectors
OM/OMB

MV Indoor switches
OW
OW High current
OWS The highest current
OW-I-25

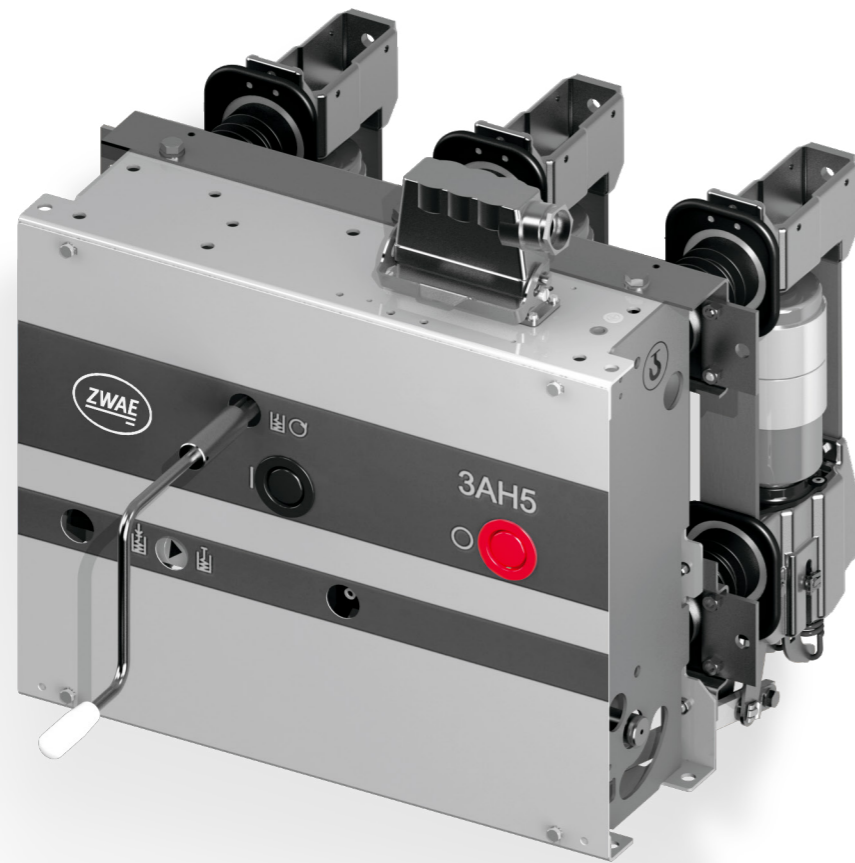
MV Indoor earthing switches
UW/UDS
UWS

MV Indoor switchgear operating mechanisms
NSW30
NSP20
NR-1

WARNING: As a result of introduce changes due to technological development, the diagrams in catalogue have only a visual character

3AH5

Vacuum circuit-breaker



CHARACTERISTICS

- Production technology according to SIEMENS' license
- Indefective working
- Many years experience in exploitation by SIEMENS
- Perfect as a retrofit for oil vacuum circuit-breakers - the same distance between poles
- Possibility of adapting the apparatus to individual client's requirements
- Possibility to use additional equipment: open/close coil, undervoltage: auxiliary contact switch with 12 or 16 contacts

SPECIFICATION

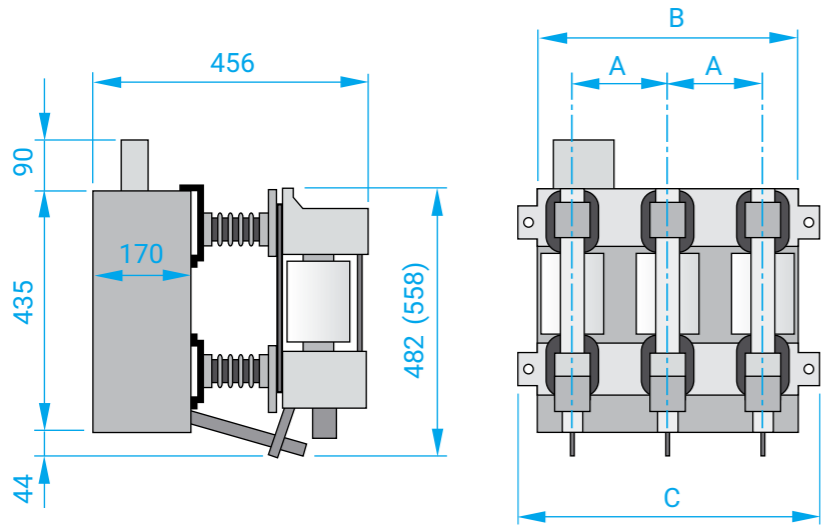
| Item | U _r kV | I _{sc} kV | I _{ma} kV | PMB* mm | Type | I _r (complements order number) | | | |
|------|--|-----------------------|--------------------------|----------------------|--------------------------|---|-------|-------|-------|
| | | | | | | 800A | 1250A | 2000A | 2500A |
| 1. | 12 U _p = 75 kV U _d = 28 kV | 13,1 | 32,8 | 160 210 | 3AH5 121-□ 3AH5 131-□ | ←1 | | | |
| | | | | | | ←1 | | | |
| | | 16 | 40 | 160 210 | 3AH5 122-□ 3AH5 132-□ | ←1 ——— 2 ←1 ——— 2 | | | |
| | | | | | | | | | |
| | | 20 | 50 | 160 210 | 3AH5 123-□ 3AH5 133-□ | ←1 ——— 2 ←1 ——— 2 | | | |
| 25 | 63 | 160 210 | 3AH5 124-□ 3AH5 134-□ | ←1 ——— 2 ←1 ——— 2 | | | | | |
| | | 31,5 | 80 | 210 | 3AH5 135-□ | ← ——— 2 ——— 6 | | | |
| 2. | 17,5 U _p = 95 kV U _d = 38 kV | 25 | 63 | 160 210 | 3AH5 204-□ 3AH5 214-□ | ←1 ——— 2 ←1 ——— 2 ——— 6 | | | |
| | | | | | | | | | |
| | | 31,5 | 80 | 210 | 3AH5 215-□ | ← ——— 2 ——— 6 | | | |
| 3. | 24 U _p = 125 kV U _d = 50 kV | 16 | 40 | 210 275 | 3AH5 272-□ 3AH5 282-□ | ←1 ——— 2 ←1 ——— 2 | | | |
| | | | | | | | | | |
| | | 20 | 50 | 210 275 | 3AH5 273-□ 3AH5 283-□ | ←1 ——— 2 ——— 6 ←1 ——— 2 ——— 6 | | | |
| | | 25 | 63 | 210 275 | 3AH5 274-□ 3AH5 284-□ | ← ——— 2 ——— 6 ← ——— 2 ——— 6 | | | |
| 4. | 36 U _p = 170 kV U _d = 70 kV | 16 | 40 | 350 | 3AH5 312-□ | ← ——— 2 | | | |
| | | | | | | | | | |
| | | 25 | 63 | 350 | 3AH5 314-□ | ← ——— 2 ——— 4 | | | |

* Pole pitch

- I_r Rated work current
- I_{sc} Rated short-circuit breaking current
- I_{ma} Rated short-circuit making current
- U_r Insulation rated voltage
- U_d Rated test voltage at mains frequency
- U_p Rated surge test voltage

03. MV INDOOR SWITCHGEAR

3AH5 | MV Vacuum circuit breakers

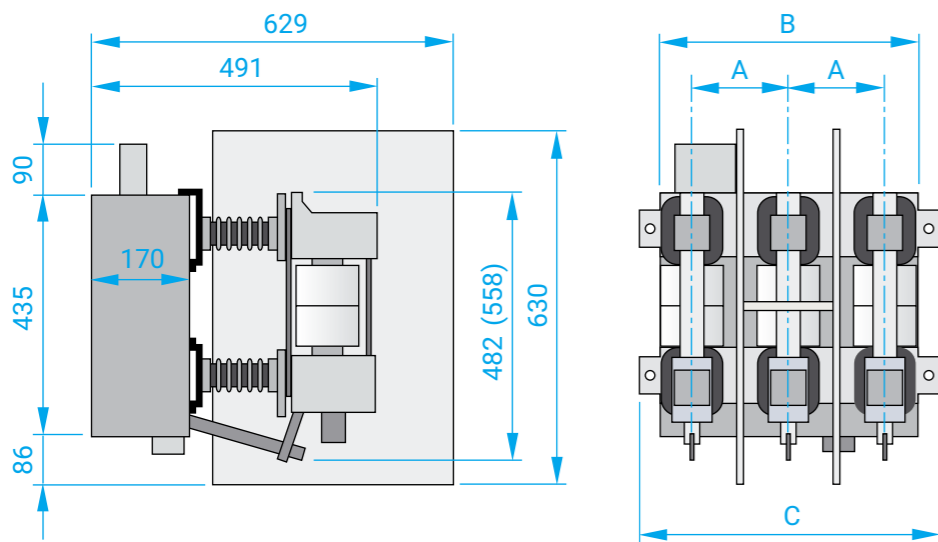


In parentheses for 2,500 A

| 12 kV | | | | | | | | | |
|-----------------------|---------------------|---------------|---------|---------|--------------|---------------|---------|---------|--------------|
| I _{sc} kA | I _r A | PMB* 160 [mm] | | | | PMB* 210 [mm] | | | |
| | | a mm | b mm | c mm | Ciężar kg | a mm | b mm | c mm | Ciężar kg |
| 13,1 do 16 | do 1250 | 160 | 390 | 490 | 35 do 45 | 210 | 490 | 592 | 40 do 50 |
| 20 do 25 | do 1250 | 160 | 405 | 490 | 40 do 45 | 210 | 505 | 592 | 45 do 50 |
| 31,5 | 1250 | - | - | - | - | 210 | 505 | 592 | 50 |
| 31,5 | 2500 | - | - | - | - | 210 | 539 | 592 | 70 |

| 17,5 kV | | | | | | | | | |
|-----------------------|---------------------|---------------|---------|---------|--------------|---------------|---------|---------|--------------|
| I _{sc} kA | I _r A | PMB* 160 [mm] | | | | PMB* 210 [mm] | | | |
| | | a mm | b mm | c mm | Ciężar kg | a mm | b mm | c mm | Ciężar kg |
| 25 | do 1250 | 160 | 422 | 490 | 40 do 45 | 210 | 522 | 592 | 45 do 50 |
| 31,5 | do 1250 | - | - | - | - | 210 | 522 | 592 | 45 do 50 |
| 25 do 31,5 | 2500 | - | - | - | - | 210 | 539 | 592 | 65 |

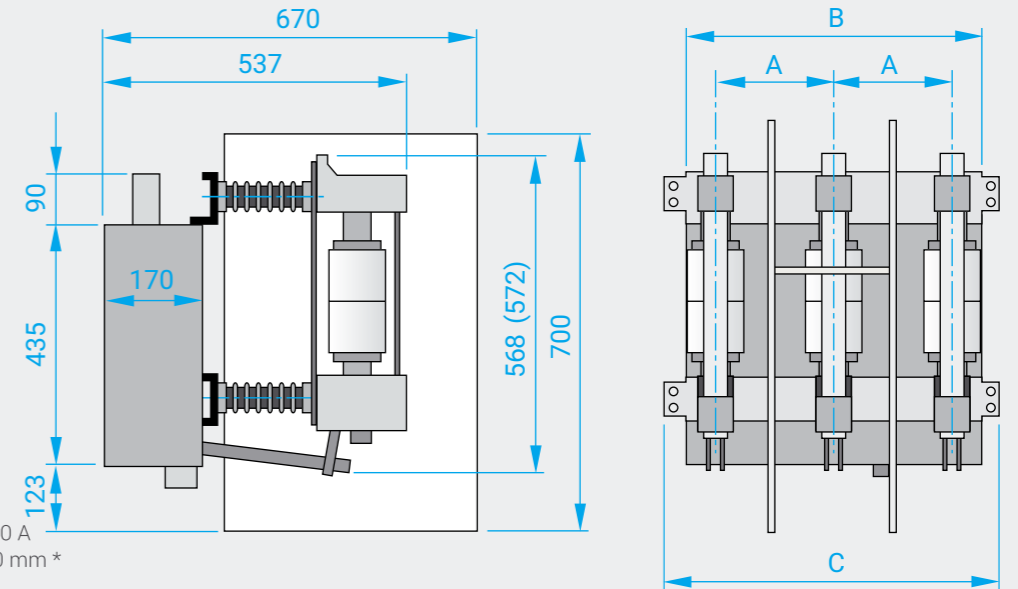
In parentheses for 2,500 A
Insulation plates at 160 mm*



DIAGRAMS

35

We connect with ENERGY

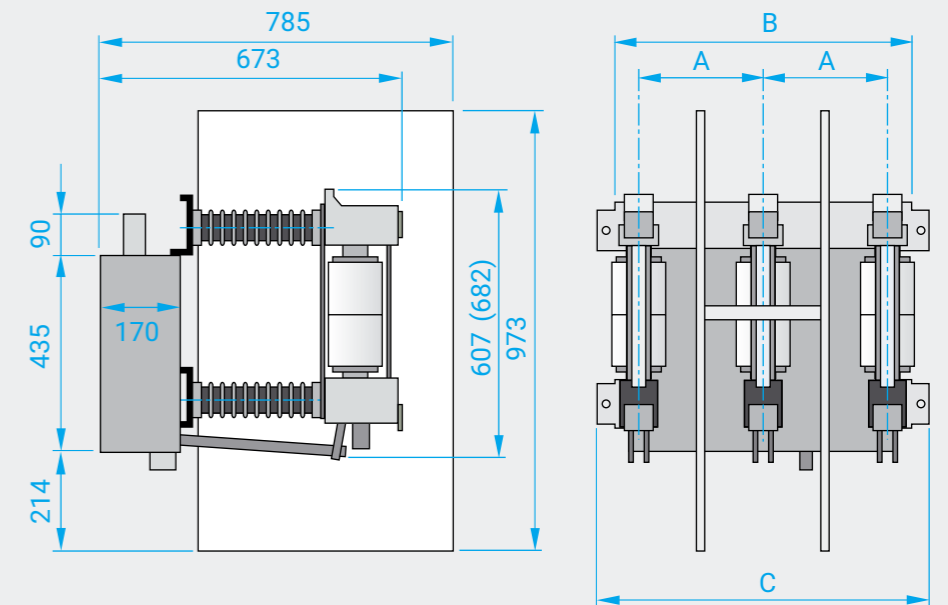


In parentheses for 2,500 A
Insulation plates at 160 mm*

| 24 kV | | | | | | | | | |
|-----------------------|---------------------|---------------|---------|---------|--------------|---------------|---------|---------|--------------|
| I _{sc} kA | I _r A | PMB* 210 [mm] | | | | PMB* 275 [mm] | | | |
| | | a mm | b mm | c mm | Ciężar kg | a mm | b mm | c mm | Ciężar kg |
| 16 do 25 | do 1250 | 210 | 516 | 592 | 55 do 70 | 275 | 646 | 708 | 55 do 70 |
| 20 do 25 | 2500 | 210 | 539 | 592 | 70 do 85 | 275 | 669 | 708 | 70 do 85 |

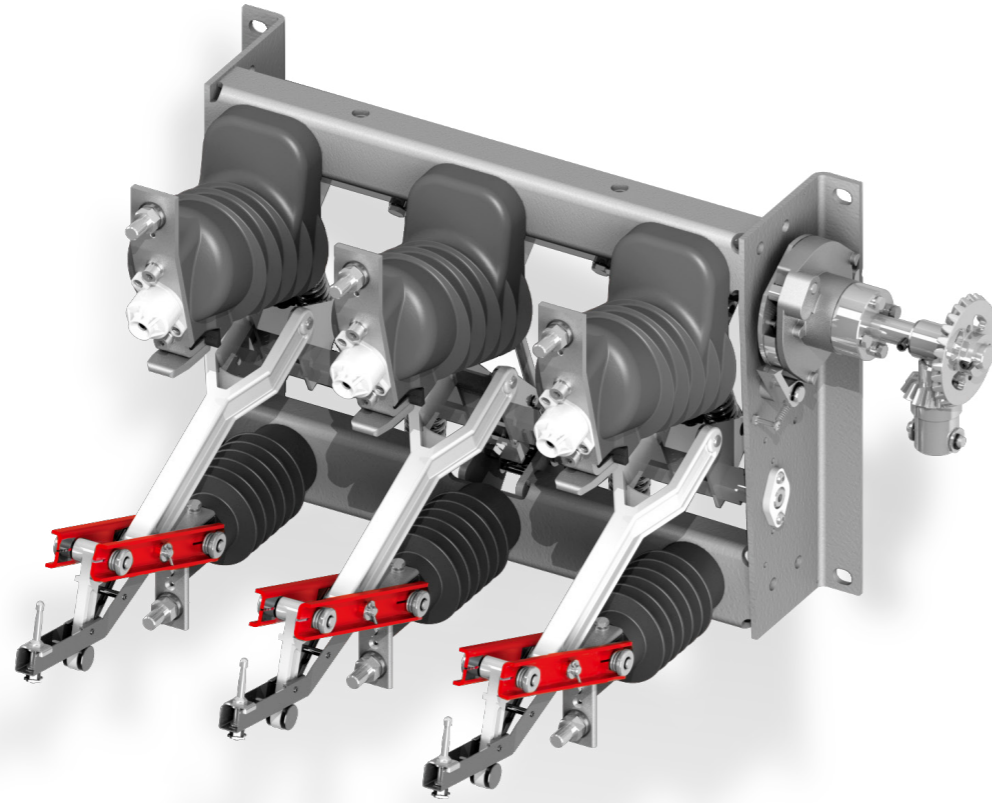
| 36 kV | | | | | |
|-----------------------|---------------------|---------------|---------|---------|--------------|
| I _{sc} kA | I _r A | PMB* 350 [mm] | | | |
| | | a mm | b mm | c mm | Ciężar kg |
| 16 do 25 | do 1250 | 350 | 819 | 868 | 85 do 95 |
| 25 | 2000 | 350 | 819 | 868 | 100 do 110 |

In parentheses for 2000 A



OM/OMB

Indoor switch disconnector



CHARACTERISTICS

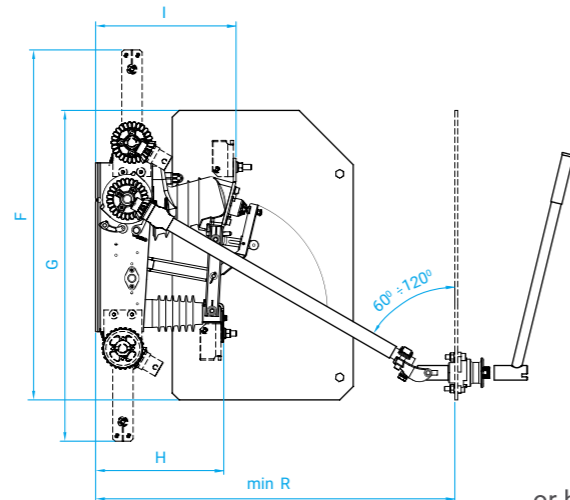
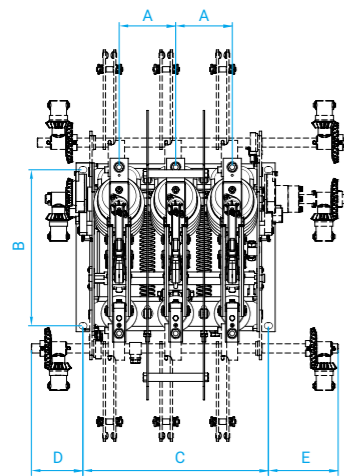
- High switching parameters
- Construction solutions guaranteeing indefective work - extinguishing system, arching contact
- Module design which allows to adapt apparatus to clients' requirements
- Version with fast moving earthing switch UDS - short-circuit making current
- Possibility to use motor operating mechanism with remote
- Many dimensions of distance between poles available
- A few versions of assembling in switchgears - front, rear
- Possibility to use additional equipment: voltage indicator, electromagnetic shunt trip, auxiliary contact switch, insulators with voltage detector

SPECIFICATION

| Lp. | Parameter | Value | |
|-----|--|------------------------------|------------------------------|
| | | OM/OMB-12 | OM/OMB-24 |
| 1. | Rated operating voltage | 12 [kV] | 24 [kV] |
| 2. | Rated frequency | 50 [Hz] | 50 [Hz] |
| 3. | Rated continuous current | 630 [A] | 630 [A] |
| 4. | Rated transitive current | 700 [A] | 1000 [A] |
| 5. | Work switching capabilities: - low inductance circuit - ring network circuits - cable and overhead line loading | 630 [A] 630 [A] 50 [A] | 630 [A] 630 [A] 25 [A] |
| 6. | Maximum fuse cartridge size | 100 [A] ¹ | 63 [A] |
| 7. | Rated short-circuit making current | 50 [kA] | 40 [kA] |
| 8. | Peak withstand current | 50 [kA] | 50 [kA] |
| 9. | Short-circuit withstand current, 1 sec. | 20 [kA] | 20 [kA] |
| 10. | Test voltage (50 Hz): - earth and pole to pole insulation - terminal to terminal insulation | 28 [kV] 32 [kV] | 50 [kV] 60 [kV] |
| 11. | Surge test voltage: - earth and pole to pole insulation - terminal to terminal insulation | 75 [kV] 85 [kV] | 125 [kV] 145 [kV] |
| 12. | Mechanical strength | 2000 cycles | 2000 cycles |

¹ Compatible with HH type 120 A fuse cartridge by SIBA

OM/OMB | MV Indoor switch disconnectors



OM-12 and OM-24 type indoor switch disconnector with top or bottom earthing switch

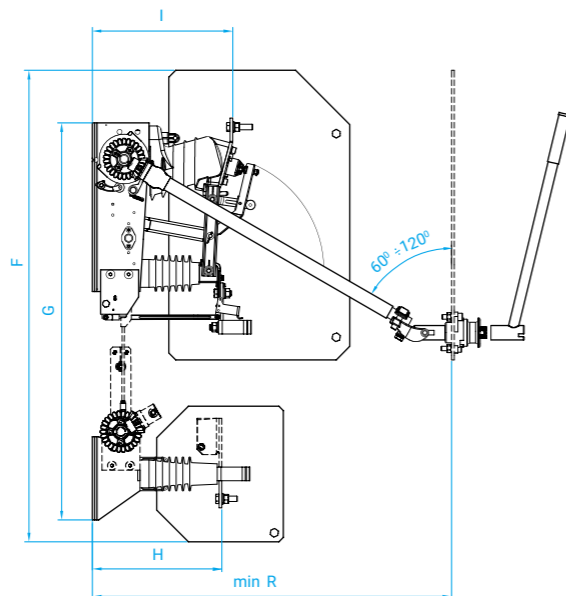
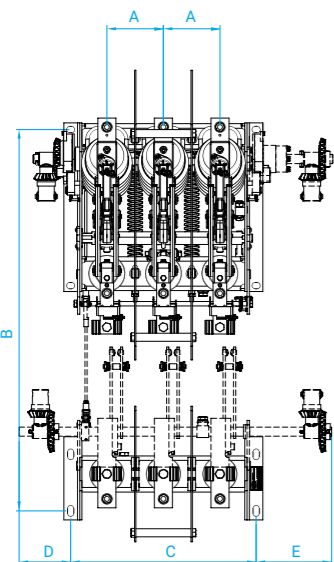


| Switch disconnector type | Dimensions [mm] | | | | | | | | | |
|--------------------------|-----------------|-----|-----|------|------|-----|-----|-----|-----|------|
| | A | B | C | D | E | F | G | H | I | R |
| OM-12/UD/UG/125/ LO PO | 125 | 345 | 410 | 114* | 170* | 775 | 732 | 283 | 310 | 800 |
| OM-12/UD/UG/185/ LO PO | 185 | | 530 | | | - | - | | | |
| OM-24/UD/UG/160/ LO PO | 160 | 395 | 480 | 170 | 170 | 982 | 890 | 365 | 387 | 1000 |
| OM-24/UD/UG/275/ LO PO | 275 | | 710 | | | - | - | | | |

* Possibility of reducing the dimensions

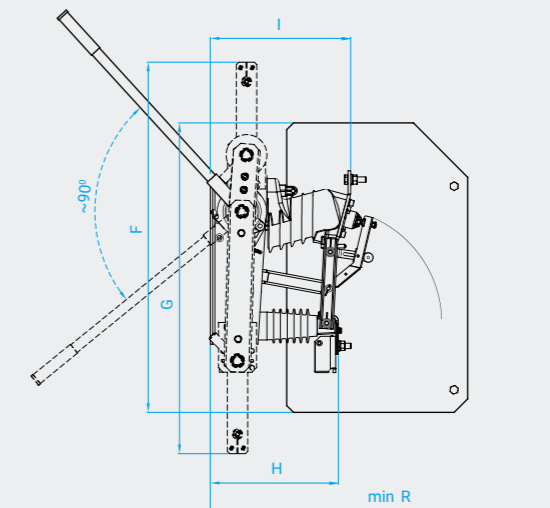
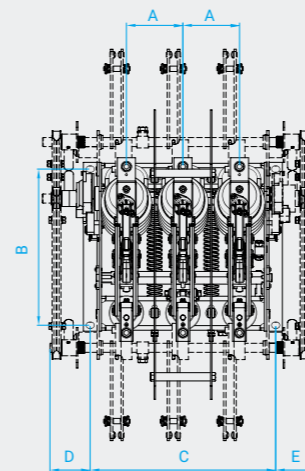
| Switch disconnector type | Dimensions [mm] | | | | | | | | | |
|--------------------------|-----------------|------|-----|------|------|------|------|-----|-----|------|
| | A | B | C | D | E | F | G | H | I | R |
| OMB-12/BD/UD/125/ LO PO | 125 | 843 | 410 | 114* | 170* | 1042 | 877 | 286 | 310 | 800 |
| OMB-12/BD/UD/185/ LO PO | 185 | | 530 | | | - | | | | |
| OMB-24/BD/UD/160/ LO PO | 160 | 1043 | 480 | 170 | 170 | 1354 | 1078 | 371 | 387 | 1000 |
| OMB-24/BD/UD/275/ LO PO | 275 | | 710 | | | - | | | | |

Dimensions for fuse cartridge 12 kV e=292, 24 kV e=442. For different dimensions - drawings according to an inquiry
* Possibility of reducing the dimensions



Switch disconnector set with OMB-12/BD and OMB-24/BD type fuses

DIAGRAMS



OM-12/T and OM-24/T type switch disconnector with top and bottom earthing switch

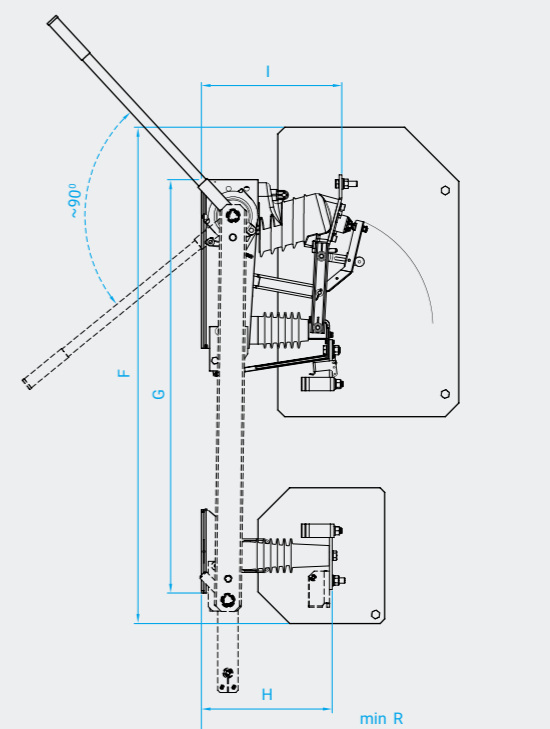
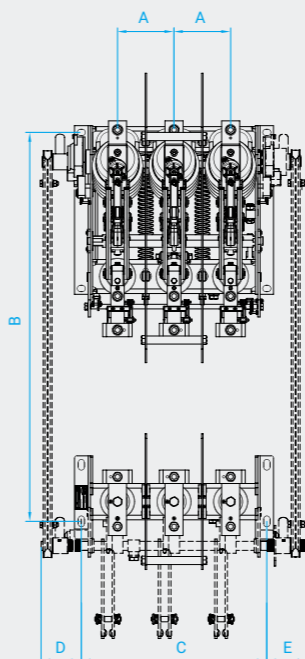


| Switch disconnector type | Dimensions [mm] | | | | | | | | | |
|--------------------------|-----------------|-----|-----|-----|------|-----|-----|-----|-----|------|
| | A | B | C | D | E | F | G | H | I | R |
| OM-12/T/UD/UG/125/ LP PP | 125 | 345 | 410 | 92* | 100* | 775 | 732 | 283 | 310 | 800 |
| OM-24/T/UD/UG/160/ LP PP | 160 | 395 | 480 | 90* | 90* | 982 | 890 | 365 | 387 | 1000 |

* Possibility of reducing the dimensions

| Switch disconnector type | Dimensions [mm] | | | | | | | | | |
|----------------------------|-----------------|------|-----|-----|------|------|------|-----|-----|------|
| | A | B | C | D | E | F | G | H | I | R |
| OMB-12/T/BDT/UD/125/ LP PP | 125 | 860 | 410 | 92* | 100* | 1097 | 914 | 286 | 310 | 800 |
| OMB-24/T/BDT/UD/160/ LP PP | 160 | 1060 | 480 | 90* | 90* | 1408 | 1114 | 371 | 387 | 1000 |

Dimensions for fuse cartridge: 12 kV e=292, 24 kV e=442. For different dimensions - drawings according to an inquiry
* Possibility of reducing the dimensions



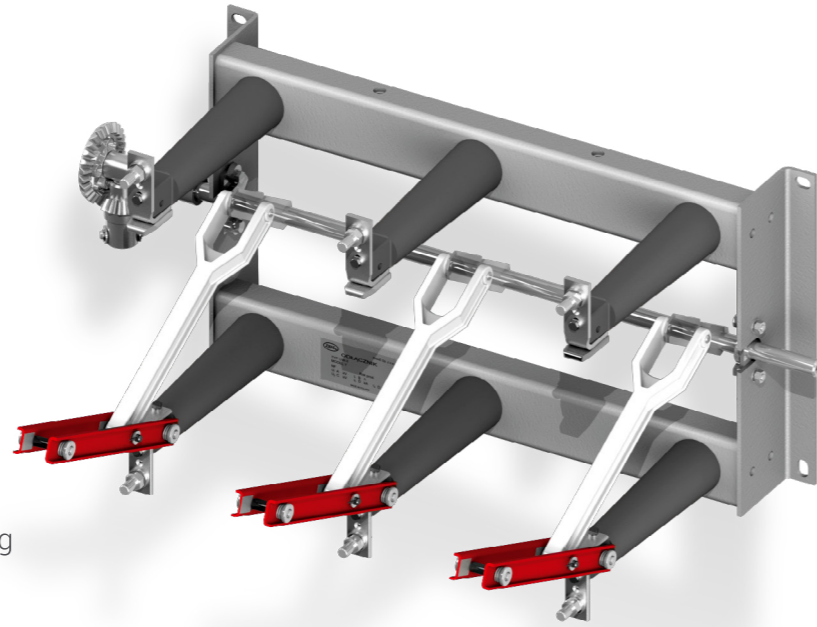
Switch disconnector set with OMB-12/T/BDT and OMB-24/T/BDT type fuses

OW

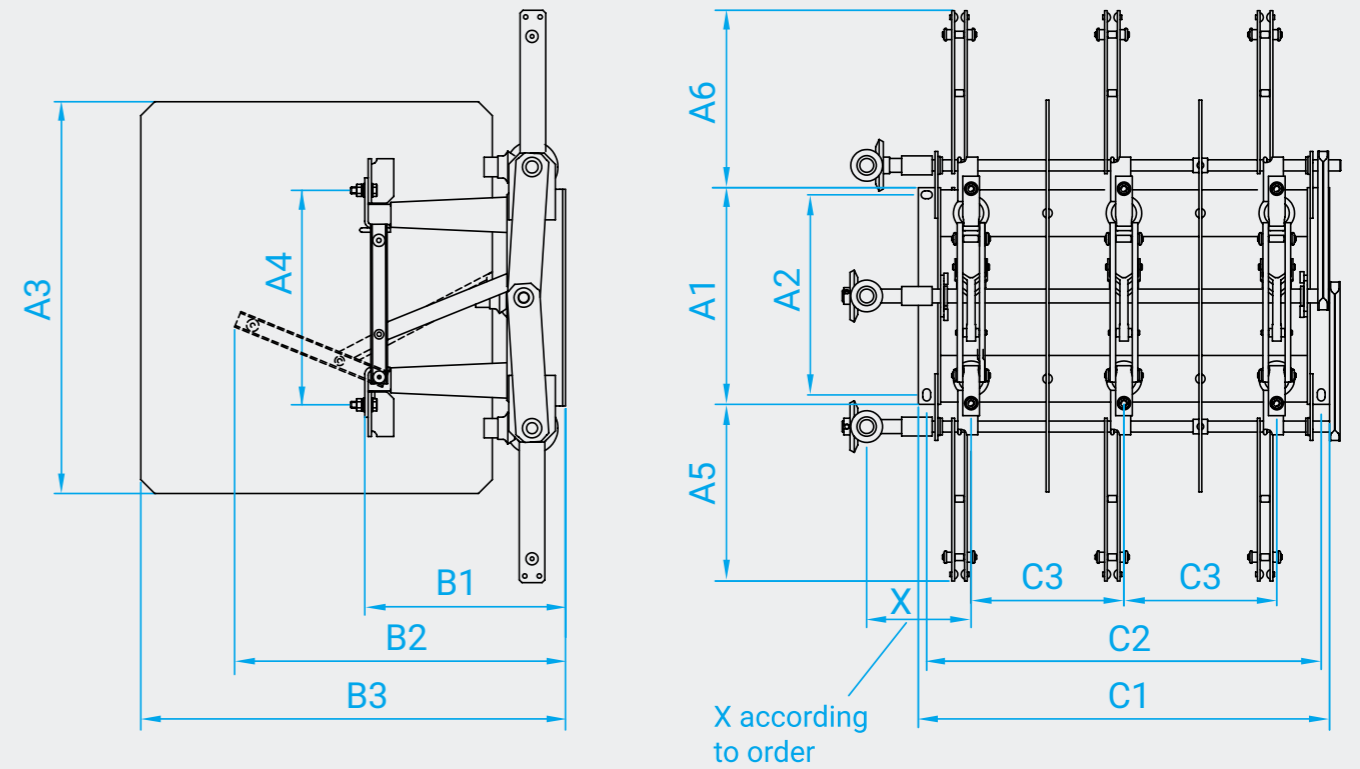
Indoor disconnecter

CHARACTERISTICS

- High performance parameters
- Vertical movement of the current paths allowing to get minimum distance between poles
- Possibility to adapt apparatus to clients' requirements
- Insulators with voltage detector available
- Version with fast moving earthing switch UDS - short-circuit making current ability
- Possibility to use motor operating mechanism with remote control



DIAGRAMS



OW type three-pole indoor disconnecter for 12; 17.5 and 24 kV and 800 A rated current

SPECIFICATION

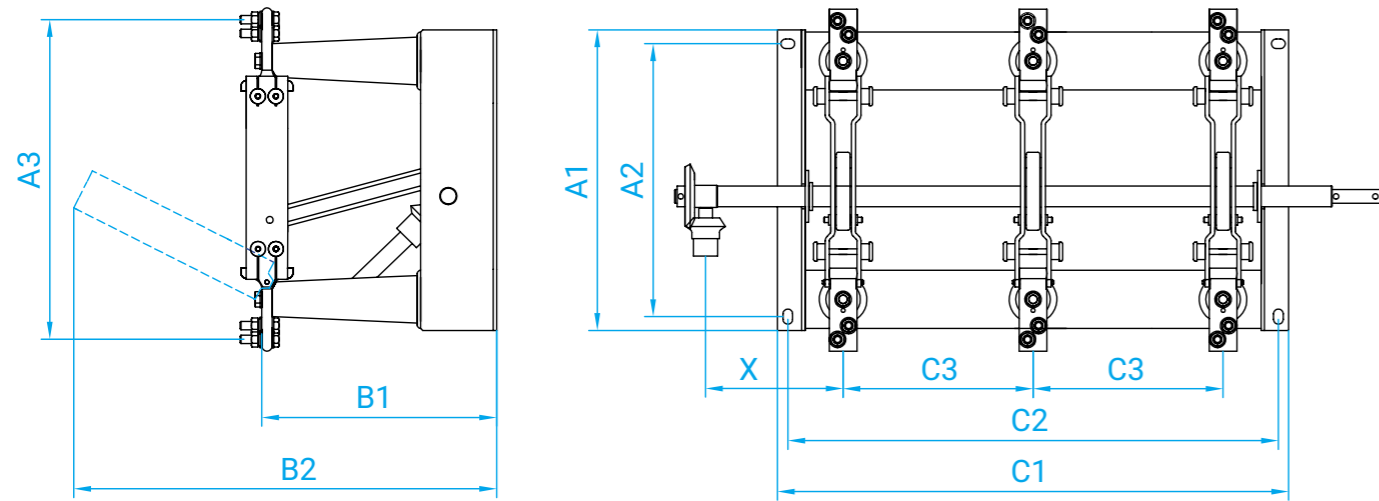
| Item | Parameter | Value | | | | | | | | | |
|------|--|----------|-----------|-----------|----------|-----------|-----------|----------|----------|-----------|-----------|
| | | 12 [kV] | 12 [kV] | 12 [kV] | 12 [kV] | 17,5 [kV] | 17,5 [kV] | 24 [kV] | 24 [kV] | 36 [kV] | |
| 1. | Rated operating voltage | 12 [kV] | 12 [kV] | 12 [kV] | 12 [kV] | 17,5 [kV] | 17,5 [kV] | 24 [kV] | 24 [kV] | 36 [kV] | |
| 2. | Rated continuous current | 800 [A] | 1600 [A] | 1600 [A] | 2000 [A] | 800 [A] | 1600 [A] | 800 [A] | 1600 [A] | 1600 [A] | |
| 3. | Peak current | 80 [kA] | 80 [kA] | 100 [kA] | 100 [kA] | 50 [kA] | 63 [kA] | 40 [kA] | 80 [kA] | 80 [kA] | |
| 4. | Short-circuit current | 1 sec. | - | - | 40 [kA] | 40 [kA] | 20 [kA] | 25 [kA] | 16 [kA] | 31,5 [kA] | 31,5 [kA] |
| | | 3 sec. | 31,5 [kA] | 31,5 [kA] | - | - | - | - | - | - | - |
| 5. | Test voltage (50Hz): - earth and pole to pole insulation - terminal to terminal insulation | 28 [kV] | 28 [kV] | 28 [kV] | 28 [kV] | 38 [kV] | 38 [kV] | 50 [kV] | 50 [kV] | 95 [kV] | |
| | | 32 [kV] | 32 [kV] | 32 [kV] | 32 [kV] | 45 [kV] | 45 [kV] | 60 [kV] | 60 [kV] | 120 [kV] | |
| 6. | Surge test voltage: - earth and pole to pole insulation - terminal to terminal insulation | 75 [kV] | 75 [kV] | 75 [kV] | 75 [kV] | 95 [kV] | 95 [kV] | 125 [kV] | 125 [kV] | 190 [kV] | |
| | | 85 [kV] | 85 [kV] | 85 [kV] | 85 [kV] | 110 [kV] | 110 [kV] | 145 [kV] | 145 [kV] | 220 [kV] | |
| 7. | Pole pitch: - air insulation - air insulation with additional insulating barrier | 200 [mm] | 180 [mm] | 180 [mm] | 210 [mm] | 160 [mm] | 180 [mm] | 275 [mm] | 275 [mm] | 390 [mm] | |
| | | 125 [mm] | - | - | - | - | - | 160 [mm] | - | - | |

Attention: Built-in earthing switches with short-circuit parameters 40/16 kA; 50/20 kA or 80/31,5 kA (3 s)

| Disconnecter type | Dimensions [mm] | | | | | | | | | | | |
|---|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | A1 | A2 | A3 | A4 | A5 | A6 | B1 | B2 | B3 | C1 | C2 | C3 |
| OW-12/8/Z/125 (with insulating barriers) | 300 | 260 | 485 | 298 | - | - | 292 | 438 | 500 | 440 | 410 | 125 |
| OW-12/8/Z/UG/125 (with insulating barriers) | 300 | 260 | 486 | 298 | - | 230 | 292 | 438 | 500 | 440 | 410 | 125 |
| OW-12/8/Z/UD/125 (with insulating barriers) | 300 | 260 | 486 | 298 | 230 | - | 292 | 438 | 500 | 440 | 410 | 125 |
| OW-12/8/Z/200 | 300 | 260 | - | 298 | - | - | 292 | 438 | - | 590 | 560 | 200 |
| OW-12/8/Z/UG/200 | 300 | 260 | - | 298 | - | 230 | 292 | 438 | - | 590 | 560 | 200 |
| OW-12/8/Z/UD/200 | 300 | 260 | - | 298 | 230 | - | 292 | 438 | - | 590 | 560 | 200 |
| OW-17/8/Z/160 | 322 | 296 | - | 348 | - | - | 286 | 486 | - | 464 | 434 | 160 |
| OW-24/8/Z/160 (with insulating barriers) | 390 | 360 | 705 | 386 | - | - | 361 | 595 | 745 | 510 | 480 | 160 |
| OW-24/8/Z/UG/160 (with insulating barriers) | 390 | 360 | 705 | 386 | - | 318 | 361 | 595 | 745 | 510 | 480 | 160 |
| OW-24/8/Z/UD/160 (with insulating barriers) | 390 | 360 | 705 | 386 | 318 | - | 361 | 595 | 745 | 510 | 480 | 160 |
| OW-24/8/Z/275 | 390 | 360 | - | 386 | - | - | 361 | 595 | - | 740 | 710 | 275 |
| OW-24/8/Z/UG/275 | 390 | 360 | - | 386 | - | 318 | 361 | 595 | - | 740 | 710 | 275 |
| OW-24/8/Z/UD/275 | 390 | 360 | - | 386 | 318 | - | 361 | 595 | - | 740 | 710 | 275 |

03. MV INDOOR SWITCHGEAR

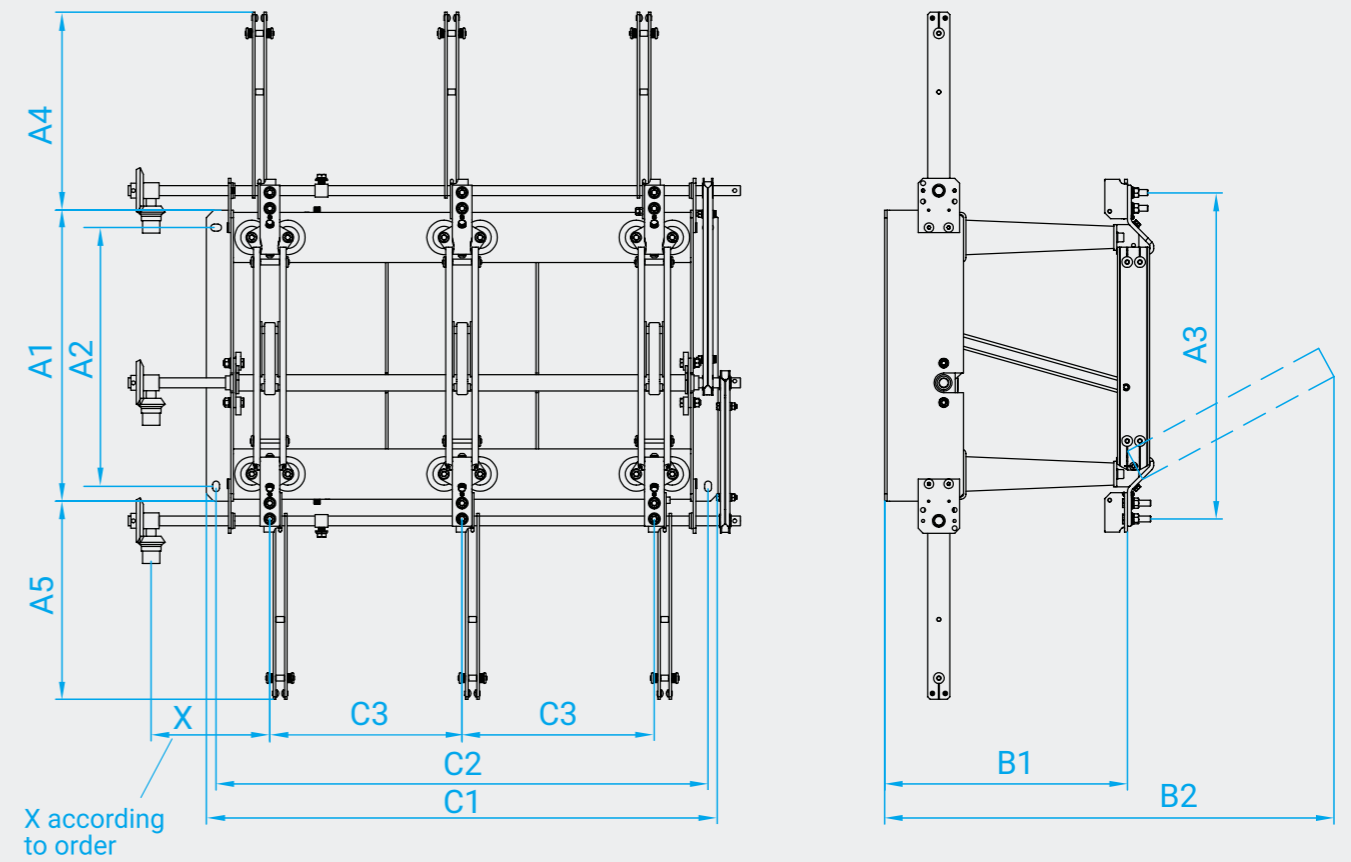
OW | MV Indoor disconnecter



OW type three-pole indoor disconnecter for 12/24 kV and 800 A rated current

| Disconnecter type | Dimensions [mm] | | | | | | | |
|-------------------|-----------------|-----|-----|-----|-----|-----|-----|-----|
| | A1 | A2 | A3 | B1 | B2 | C1 | C2 | C3 |
| OW-12/16/Z/180 | 370 | 330 | 396 | 290 | 490 | 550 | 520 | 180 |
| OW-17/16/Z/180 | 405 | 370 | 492 | 290 | 490 | 520 | 490 | 180 |
| OW-24/16/Z/275 | 435 | 395 | 461 | 340 | 590 | 740 | 710 | 275 |

DIAGRAMS

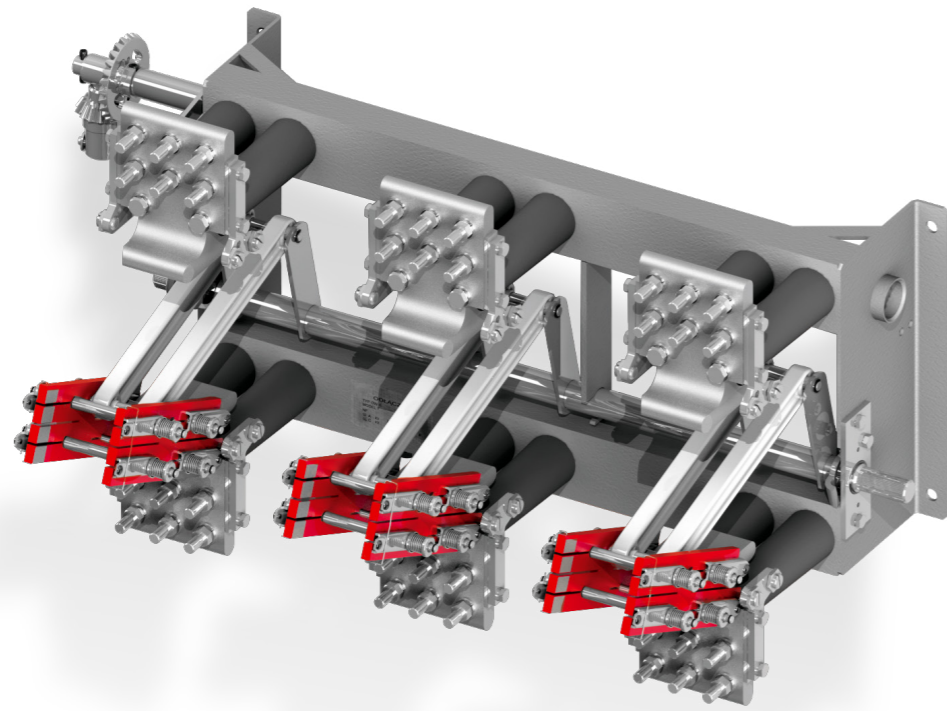


OW type three-pole indoor disconnecter 36 kV and 1600 A rated current

| Disconnecter type | Dimensions [mm] | | | | | | | | | |
|-------------------|-----------------|-----|-----|-----|-----|-----|-----|------|-----|-----|
| | A1 | A2 | A3 | A4 | A5 | B1 | B2 | C1 | C2 | C3 |
| OW-36/16/Z/390 | 590 | 525 | 661 | - | - | 492 | 913 | 1038 | 998 | 390 |
| OW-36/16/Z/390/UD | 590 | 525 | 661 | - | 413 | 492 | 913 | 1038 | 998 | 390 |
| OW-36/16/Z/390/UG | 590 | 525 | 661 | 413 | - | 492 | 913 | 1038 | 998 | 390 |

OW

High current indoor disconnecter



CHARACTERISTICS

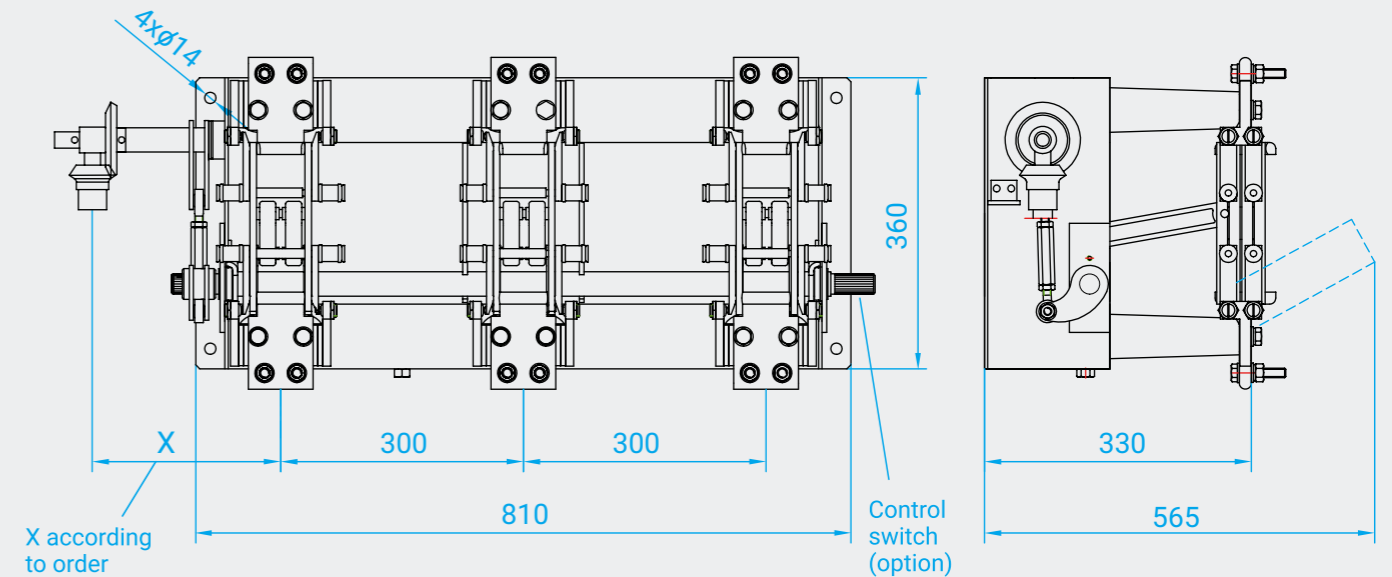
- High performance parameters
- Vertical movement of the current paths allowing to get minimum distance between poles
- Possibility to adapt apparatus to clients' requirements
- Insulators with voltage detector available
- Version with fast moving earthing switch UDS - short-circuit making current ability
- Possibility to use motor operating mechanism with remote control

SPECIFICATION

| Item | Parameter | Value | | | | | | | |
|------|--|--------------------|--------------------|--------------------|--------------------|----------------------|----------------------|----------------------|---------|
| | | 3,6 [kV] | 3,6 [kV] | 12 [kV] | 12 [kV] | 24 [kV] | 36 [kV] | 36 [kV] | |
| 1. | Rated operating voltage | 3,6 [kV] | 3,6 [kV] | 12 [kV] | 12 [kV] | 24 [kV] | 36 [kV] | 36 [kV] | |
| 2. | Rated continuous current | 2500 [A] | 4000 [A] | 2500 [A] | 4000 [A] | 2000 [A] | 2500 [A] | 3150 [A] | |
| 3. | Peak current | 150 [kA] | 150 [kA] | 160 [kA] | 160 [kA] | 125 [kA] | 125 [kA] | 150 [kA] | |
| 4. | Short-circuit current | 1 sec. | 60 [kA] | 60 [kA] | 64 [kA] | - | 50 [kA] | 50 [kA] | 60 [kA] |
| | | 3 sec. | - | - | - | 63 [kA] | - | - | - |
| 5. | Test voltage (50Hz): | | | | | | | | |
| | - earth and pole to pole insulation - terminal to terminal insulation | 10 [kV] 12 [kV] | 10 [kV] 12 [kV] | 28 [kV] 32 [kV] | 28 [kV] 32 [kV] | 50 [kV] 60 [kV] | 70 [kV] 80 [kV] | 70 [kV] 80 [kV] | |
| 6. | Surge test voltage: | | | | | | | | |
| | - earth and pole to pole insulation - terminal to terminal insulation | 40 [kV] 46 [kV] | 40 [kV] 46 [kV] | 75 [kV] 85 [kV] | 75 [kV] 85 [kV] | 125 [kV] 145 [kV] | 170 [kV] 195 [kV] | 170 [kV] 195 [kV] | |
| 7. | Pole pitch: | | | | | | | | |
| | - air insulation | 260 [mm] | 260 [mm] | 300 [mm] | 300 [mm] | 350 [mm] | 360 [mm] | 520 [mm] | |

DIAGRAMS

OW type indoor disconnecter for 12 kV and 2500 A rated current

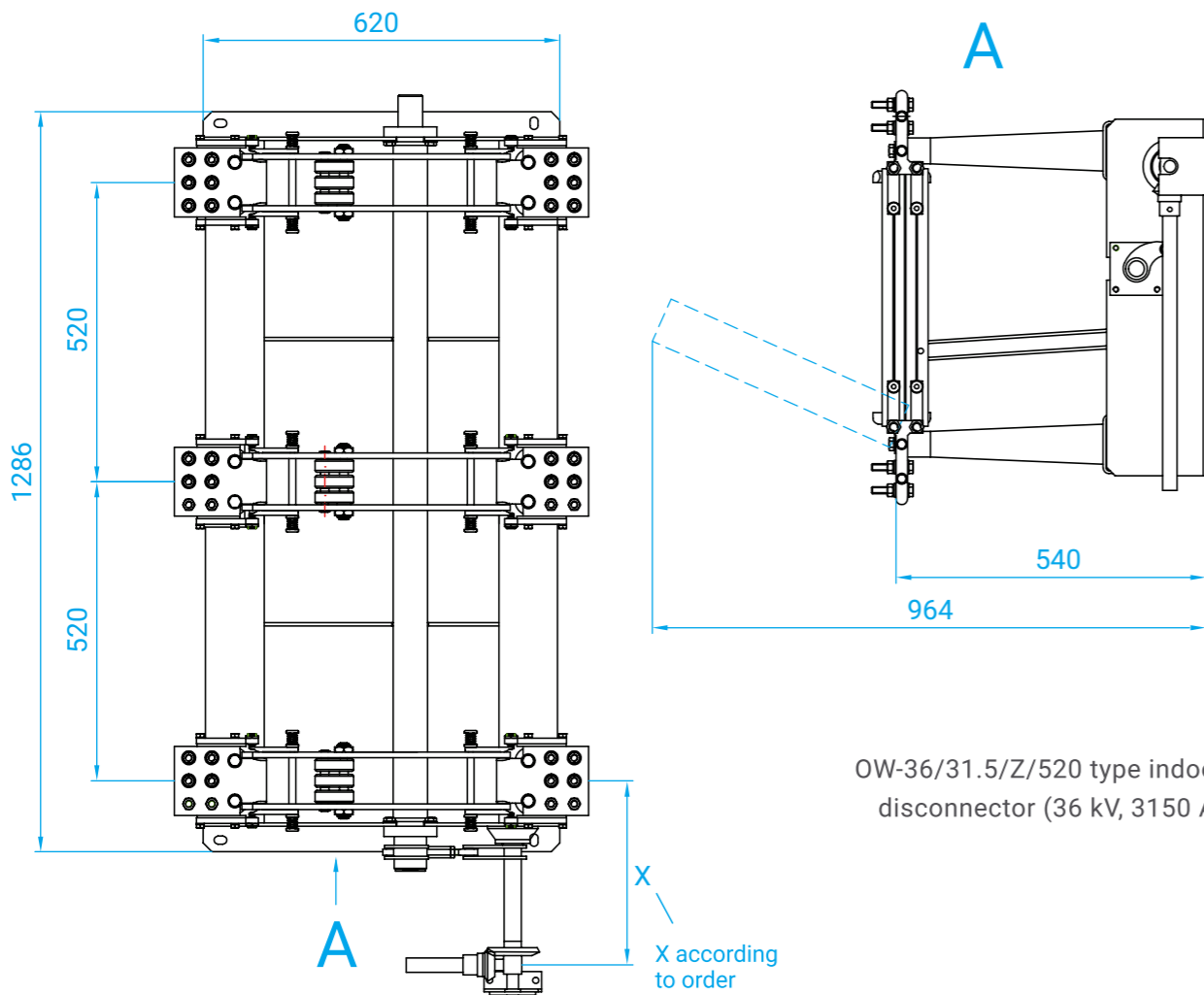
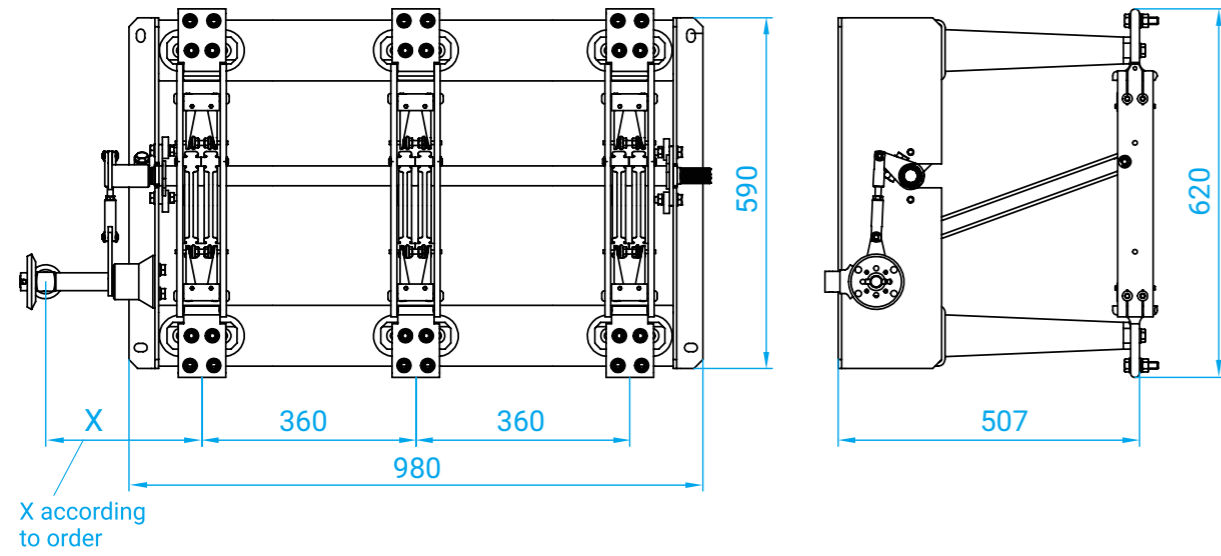


03. MV INDOOR SWITCHGEAR

OW | MV Indoor disconnecter

DIAGRAMS

OW-36/25/Z/360 type indoor disconnecter: (36 kV, 2500 A)

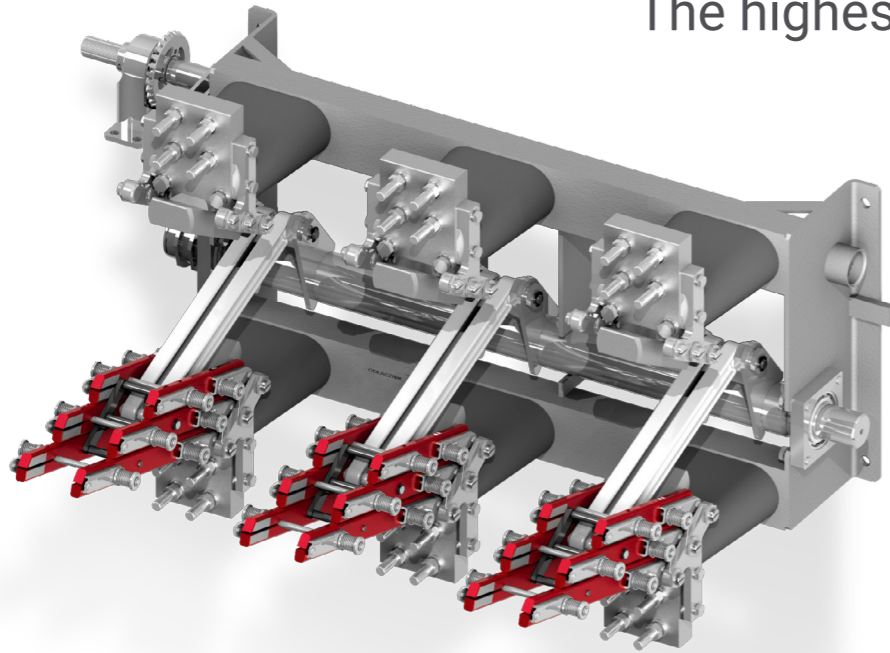


OW-36/31.5/Z/520 type indoor disconnecter (36 kV, 3150 A)



OWS

The highest current indoor disconnecter

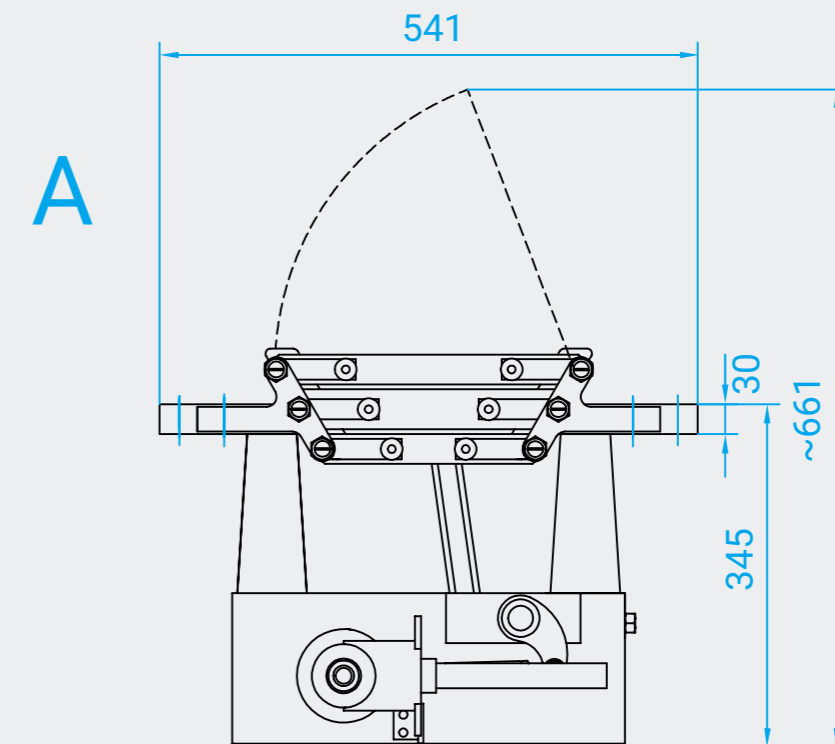
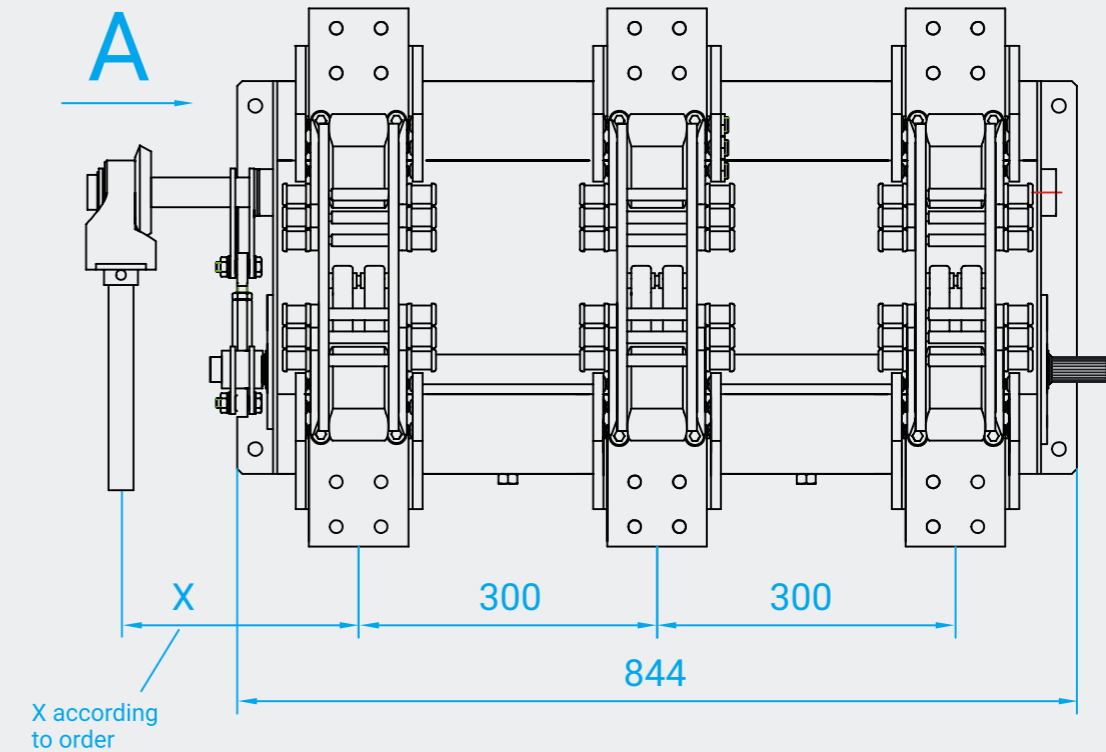


CHARACTERISTICS

- High performance parameters
- Very high short-circuit and peak current - up to 90/225kA
- Vertical movement of the current paths allowing to get minimum distance between poles
- Possibility to adapt apparatus to clients' requirements
- Insulators with voltage detector available
- Version with fast moving earthing switch UDS - short-circuit making current ability
- Possibility to use motor operating mechanism with remote control

SPECIFICATION

| Item | Parameter | Value |
|------|--|----------------------|
| 1. | Rated operating voltage | 12 [kV] |
| 2. | Rated continuous current | 4000 [A] |
| 3. | Peak current | 190 [kA] 225 [kA] |
| 4. | Short-circuit current, 1 sec. | 76 [kA] 90 [kA] |
| 5. | Test voltage (50Hz): - earth and pole to pole insulation - terminal to terminal insulation | 28 [kV] 32 [kV] |
| 6. | Surge test voltage: - earth and pole to pole insulation - terminal to terminal insulation | 75 [kV] 85 [kV] |
| 7. | Pole pitch - air insulation | 300 [mm] |

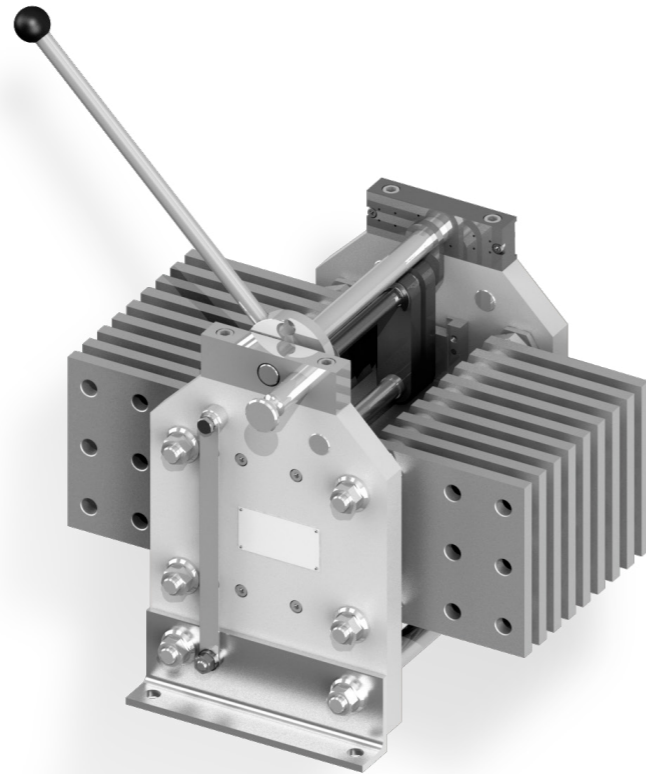


OW-I-25

Indoor disconnecter 660 V, 25.000 A

CHARACTERISTICS

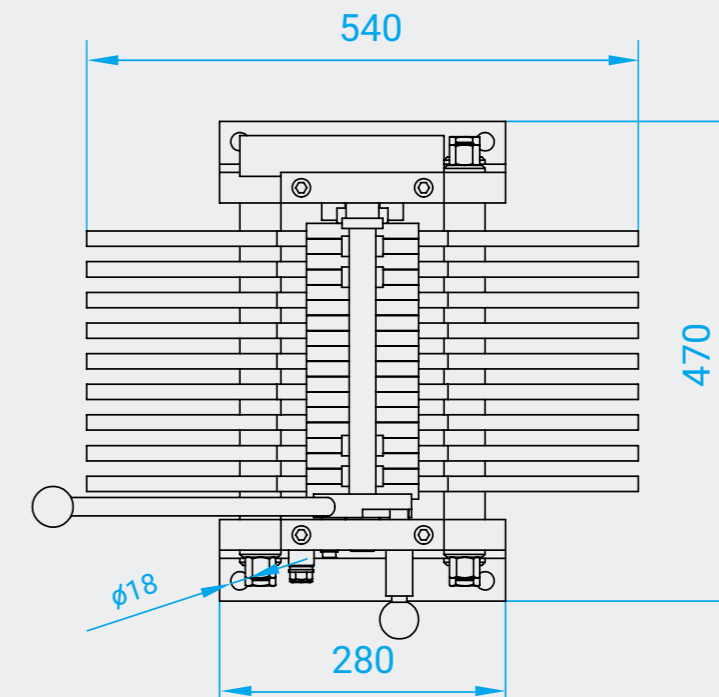
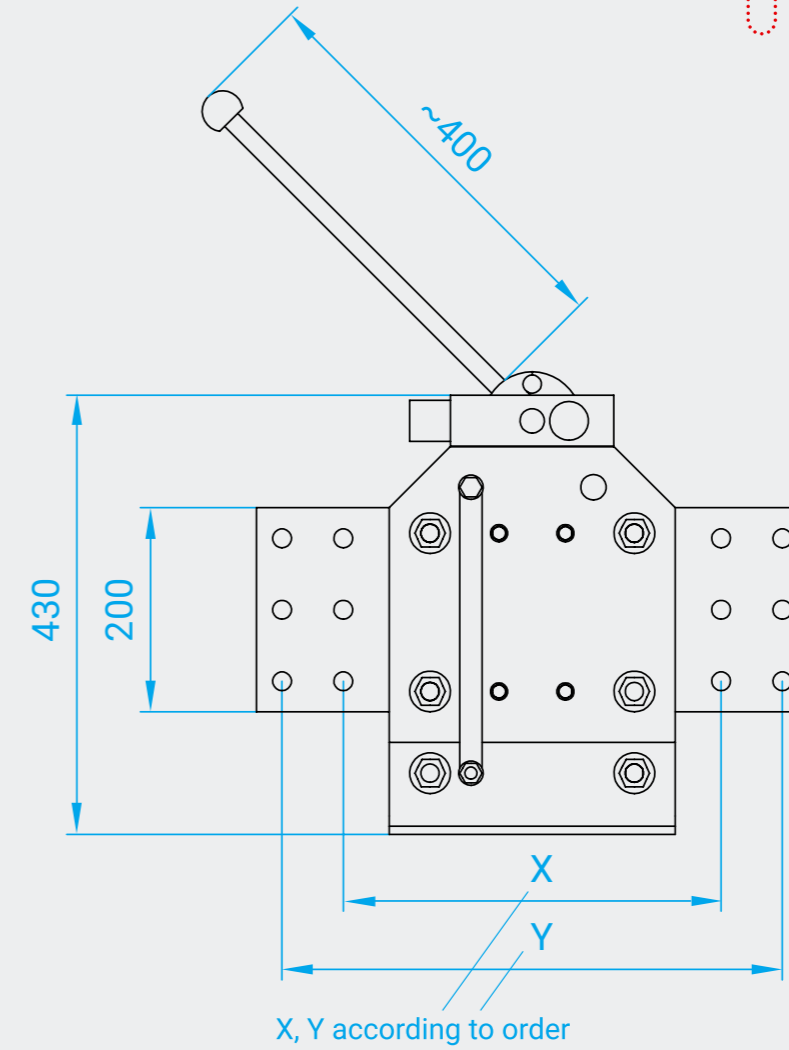
- High performance parameters
- Possibility to adapt apparatus to clients' requirements
- Possibility to use motor operating mechanism with remote control
- Indefective working



SPECIFICATION

| Item | Parameter | Value |
|------|---|------------|
| 1. | Rated operating voltage | 660 [V] |
| 2. | Rated continuous current | 25000 [A] |
| 3. | Rated short-time withstand current (1 sec.) | 80 [kA] |
| 4. | Rated peak withstand current | 200 [kA] |
| 5. | Test voltage (50Hz) for insulation | 3500 [V] |
| 6. | Operational category | AC20, DC20 |
| 7. | Control switch rated voltage | 250 [V] |
| 8. | Control switch rated continuous current | 10 [A] |

DIAGRAMS

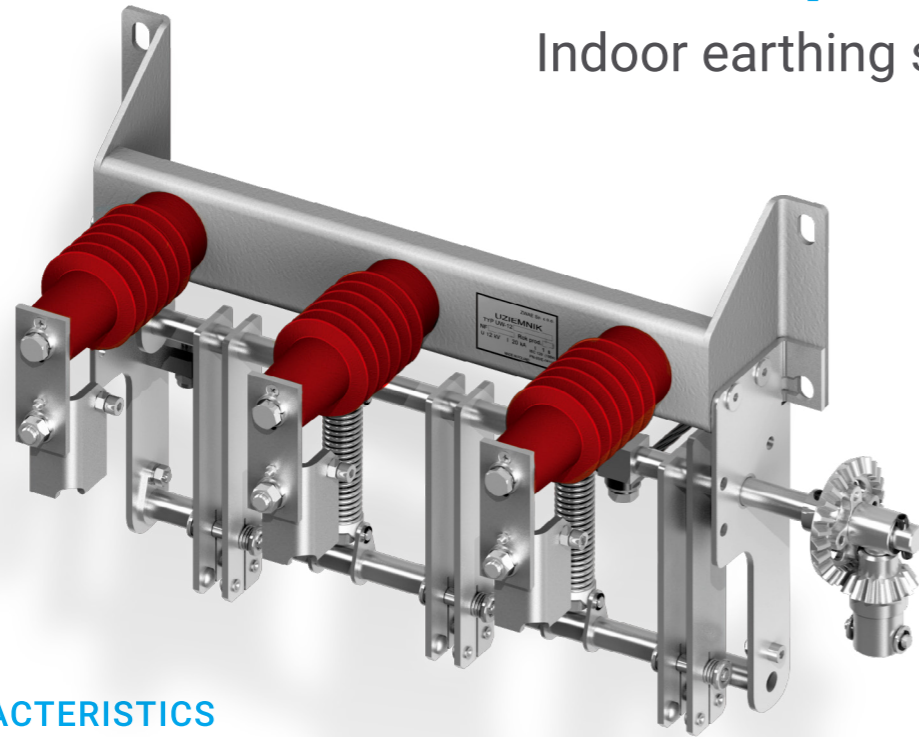


03. MV INDOOR SWITCHGEAR

MV Indoor earthing switches

UW/UDS

Indoor earthing switch



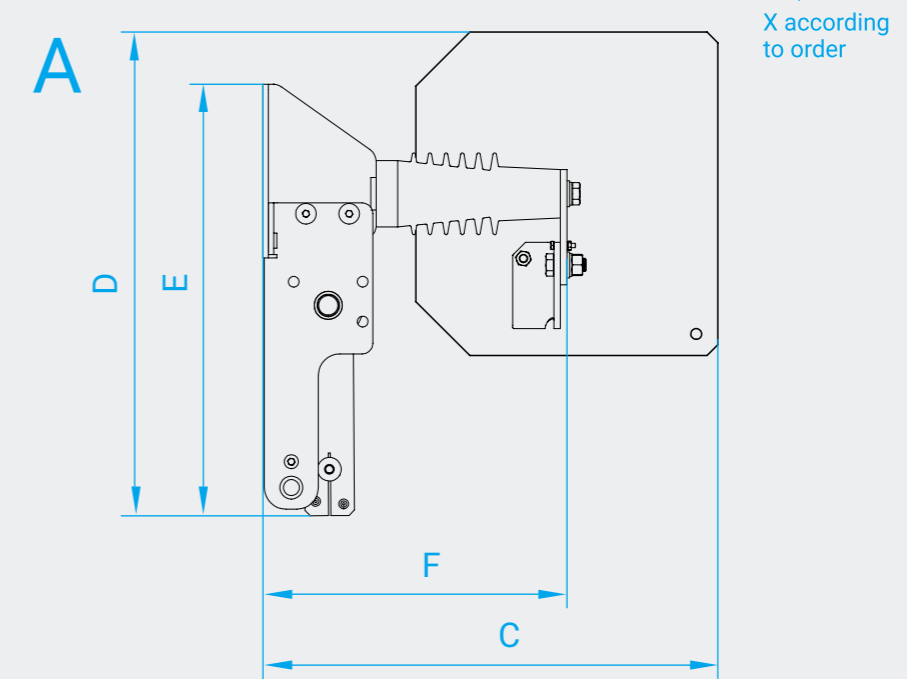
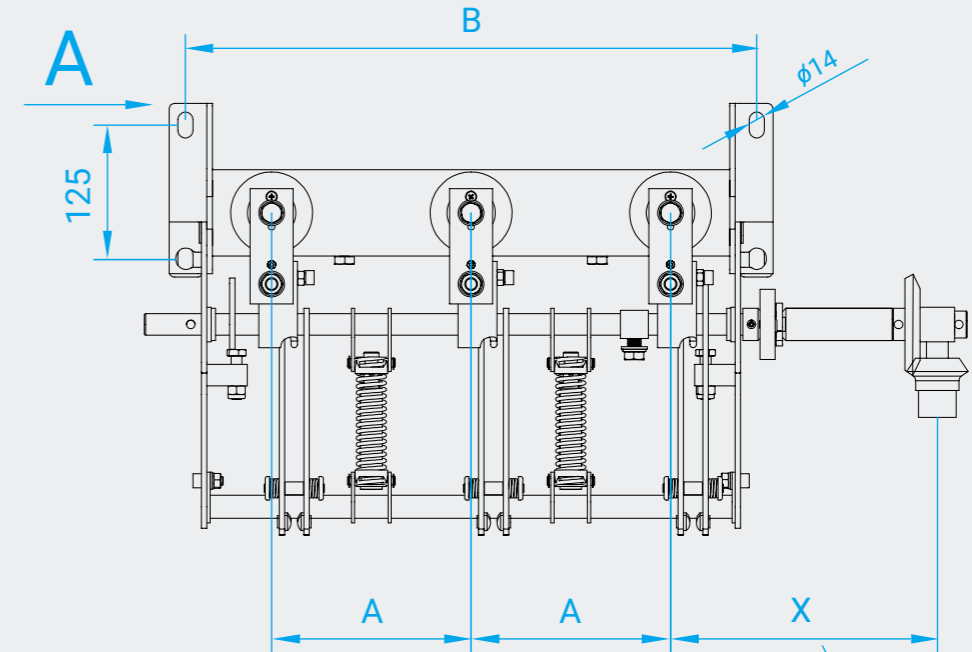
CHARACTERISTICS

- High performance parameters
- Indefective working
- Possibility to adapt apparatus to clients' requirements
- Possibility to manuever with manual or motor operating mechanism
- Simple operation

SPECIFICATION

| Item | Parameter | Value | | | |
|------|---|---------|----------|---------|----------|
| | | UW-12 | UW-24 | UDS-12 | UDS-24 |
| 1. | Rated operating voltage | 12 [kV] | 24 [kV] | 12 [kV] | 24 [kV] |
| 2. | Rated frequency | 50 [Hz] | 50 [Hz] | 50 [Hz] | 50 [Hz] |
| 3. | Peak withstand current | 50 [kA] | 50 [kA] | 50 [kA] | 50 [kA] |
| 4. | Rated short-time withstand current | 20 [kA] | 20 [kA] | 20 [kA] | 20 [kA] |
| 5. | Rated short-circuit making current | - | - | 40 [kA] | 40 [kA] |
| 6. | Test voltage (50Hz) for earth and pole to pole insulation | 28 [kV] | 50 [kV] | 28 [kV] | 50 [kV] |
| 7. | Surge test voltage for earth and pole to pole insulation | 75 [kV] | 125 [kV] | 75 [kV] | 125 [kV] |

DIAGRAMS



SPECIFICATION

| Earthing switch type | Dimensions [mm] | | | | | |
|----------------------|-----------------|-----|-----|-----|-----|-----|
| | A | B | C | D | E | F |
| UW/UDS 12 kV/185 mm | 185 | 530 | - | - | 400 | 282 |
| UW/UDS 12 kV/160 mm | 160 | 480 | - | - | 400 | 282 |
| UW 12 kV/125 mm | 125 | 410 | 422 | 441 | 400 | 282 |
| UW/UDS 24 kV/275 mm | 275 | 710 | - | - | 483 | 367 |
| UW/UDS 24 kV/160 mm | 160 | 480 | 532 | 552 | 483 | 367 |

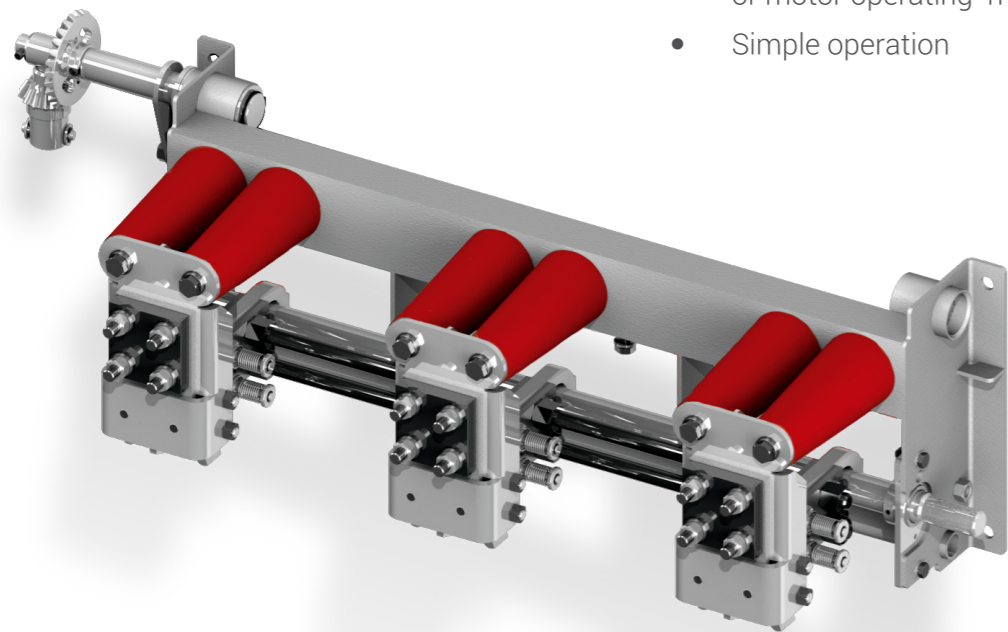


UWS

High current earthing switch

CHARACTERISTICS

- High performance parameters
- Very high short-circuit and peak current - up to 76/190kA
- Indefective working
- Possibility to adapt apparatus to clients' requirements
- Possibility to maneuver with manual or motor operating mechanism
- Simple operation



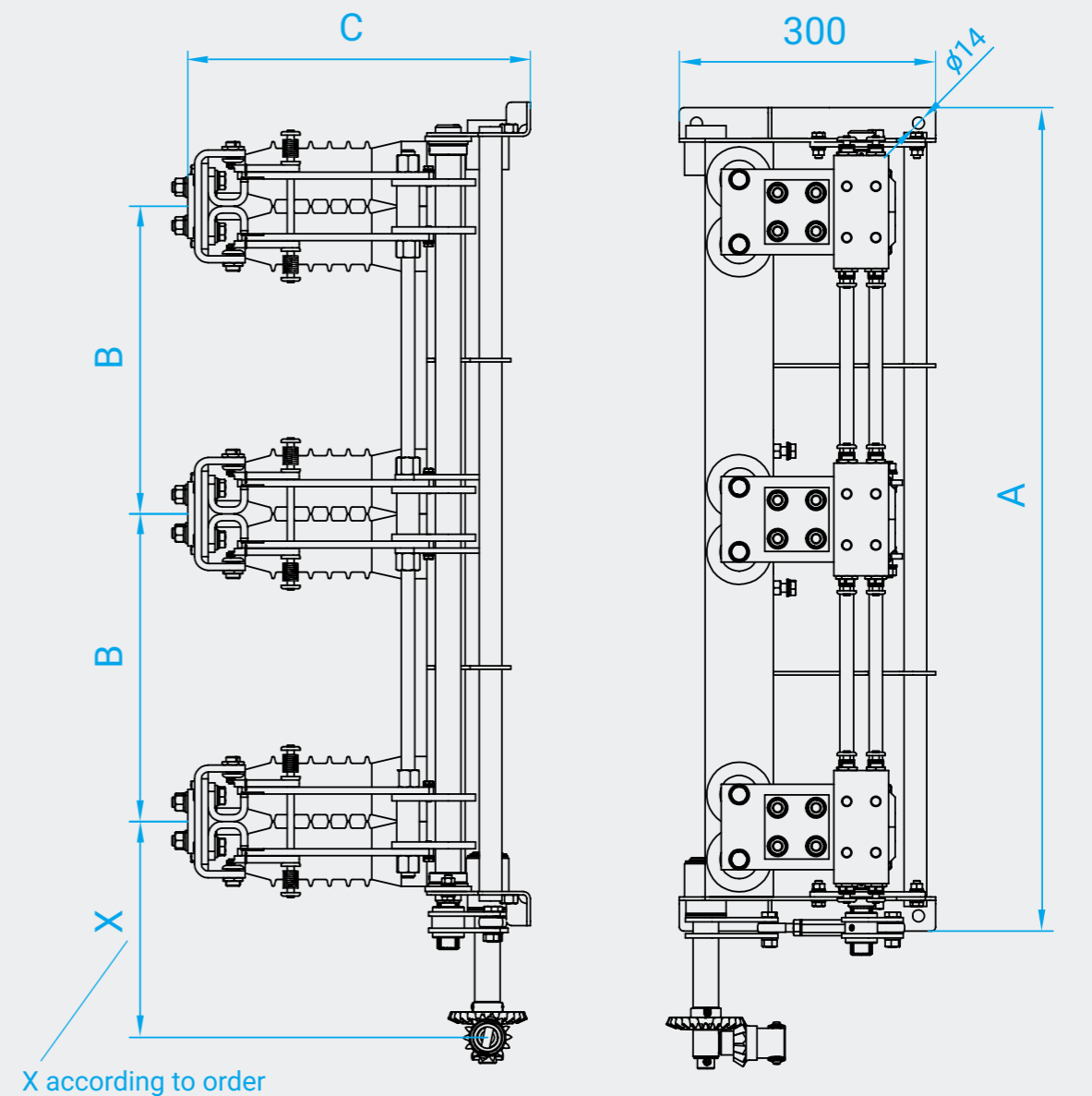
SPECIFICATION

| Item | Parameter | Value | |
|------|---|--------------|--------------|
| | | UWS-12 | UWS-24 |
| 1. | Rated operating voltage | 12 [kV] | 24 [kV] |
| 2. | Rated frequency | 50/60 [Hz] | 50/60 [Hz] |
| 3. | Peak withstand current | 160/190 [kA] | 125 [kA] |
| 4. | Rated short-time withstand current | 65/76 [kA] | 50 [kA] |
| 5. | Test voltage (50Hz) for earth and pole to pole insulation | 28/32 [kV] | 50/60 [kV] |
| 6. | Surge test voltage for earth and pole to pole insulation | 75/85 [kV] | 125/145 [kV] |

SPECIFICATION

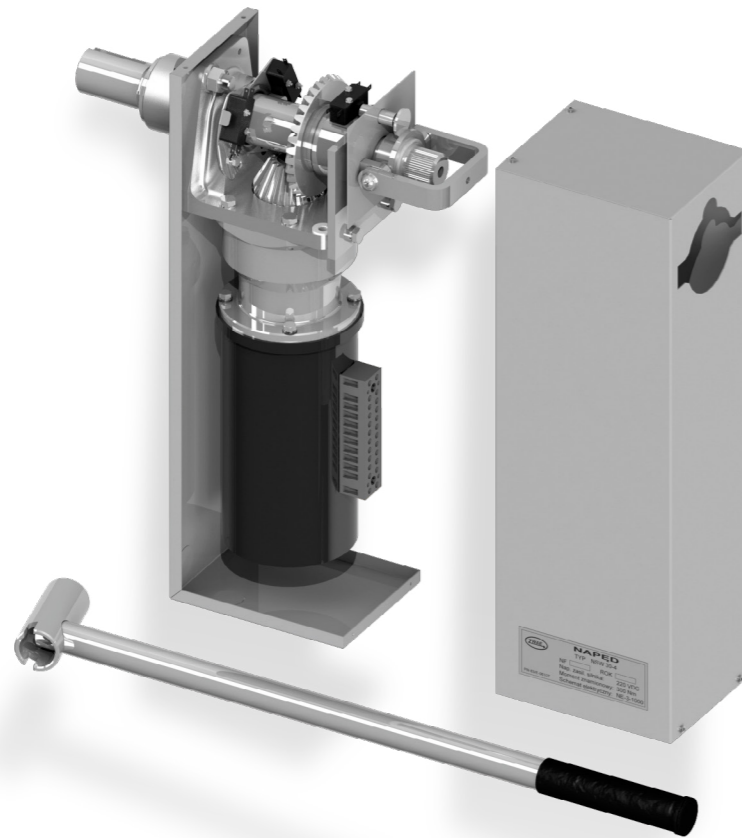
| Earthing switch type | Dimensions [mm] | | | | |
|----------------------|-----------------|-----|-----|-----|-----|
| | A | B | C | D | E |
| 12 kV | 844 | 300 | 311 | 312 | 397 |
| 24 kV | 964 | 360 | 401 | 402 | 488 |

DIAGRAMS



NSW30

Motor operating mechanism



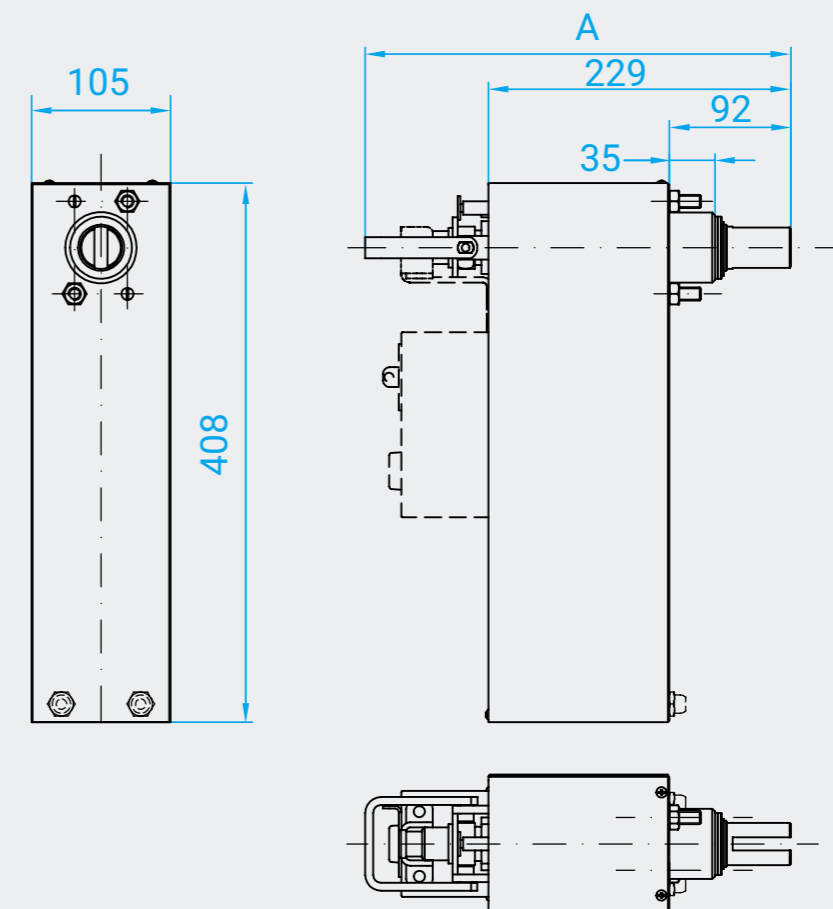
CHARACTERISTICS

- Simple assembling of the mechanism
- Possibility to application with many kinds of apparatus
- High torque allowing to application in hard conditions
- Simple regulation of the angle up to 210° with limit switches assembled directly in the mechanism
- Limit switches assembled directly on the apparatus
- Compatibility as a replacement for manual operating mechanism NR-1
- Many voltage versions available: 24, 110, 220 VDC/AC
- Possibility to equip with electromagnetic interlock
- Many options of engaging with apparatus, e.x. with aple gear
- Possibility to adapt control system of the mechanism for clients' requirements

SPECIFICATION

| Item | Parameter | Value | |
|------|---------------------------------------|---|----------------------|
| | | NSW30-3 | NSW30-4 |
| 1. | Operating mechanism type | NSW30-3 | NSW30-4 |
| 2. | Applied motor type | with permanent magnets | series |
| 3. | Motor rated voltage | 220 [VDC/AC] 110 [VDC] 24 [VDC/AC] | 220 [VDC/AC] |
| 4. | Rated power | 300 [W] | 300 [W] |
| 5. | Motor rated current | 2 [A] / 220 [V] 4 [A] / 110 [V] 19 [A] / 24 [V] | 2,2 [A] / 220 [V] |
| 6. | Shaft torque: - rated - maximal | 150 [Nm] 300 [Nm] | 150 [Nm] 300 [Nm] |
| 7. | Switching time | ca. 5s | ca. 5s |
| 8. | Maximum conductor cross section | 4 [mm ²] | 4 [mm ²] |
| 9. | Rated mechanical strength | 2000 cycles | 2000 cycles |

DIAGRAMS

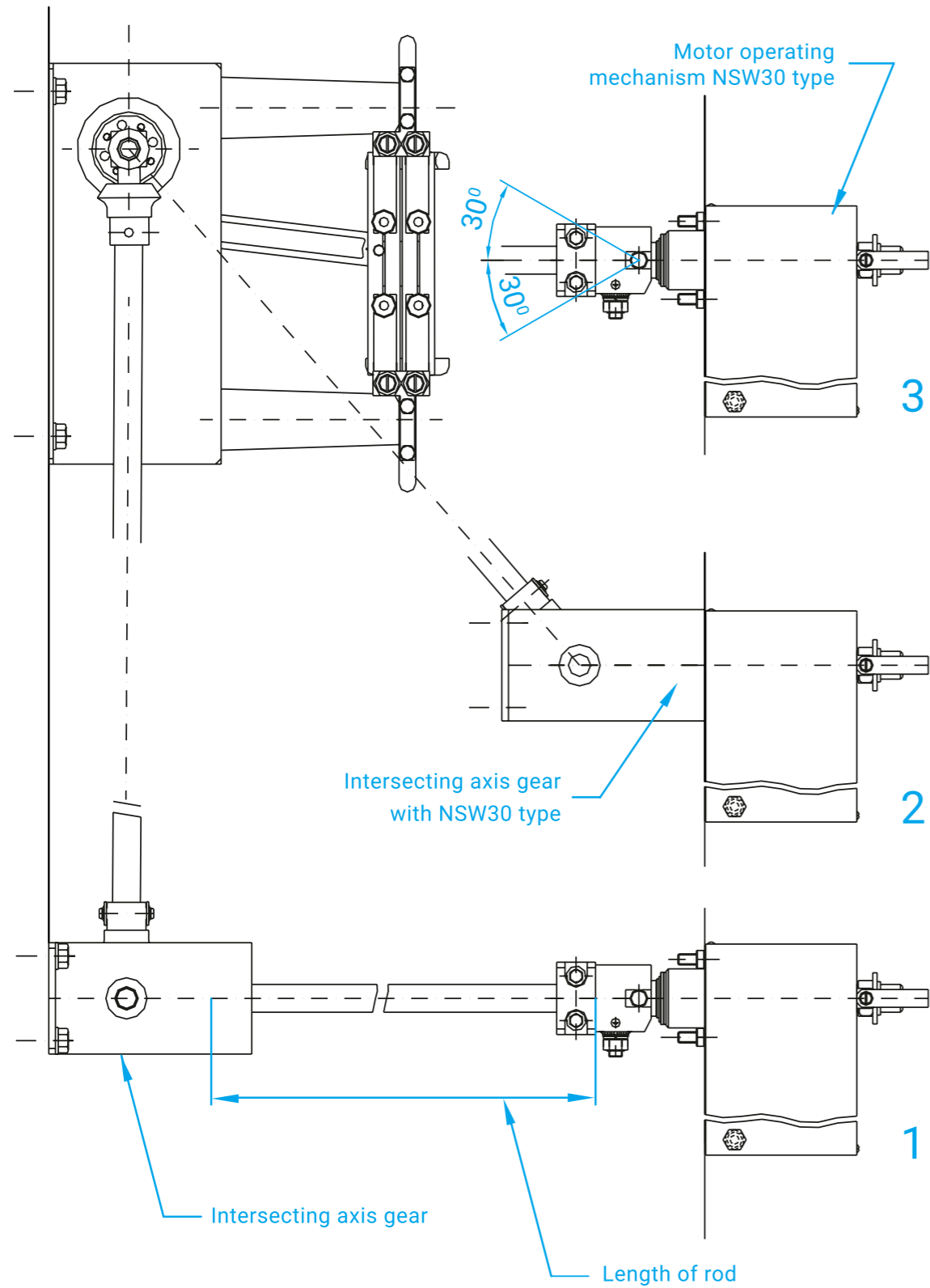


| NSW30 type | A |
|-------------------|-----|
| without interlock | 296 |
| with interlock | 306 |

NSW30 | MV Indoor switchgear operating mechanisms

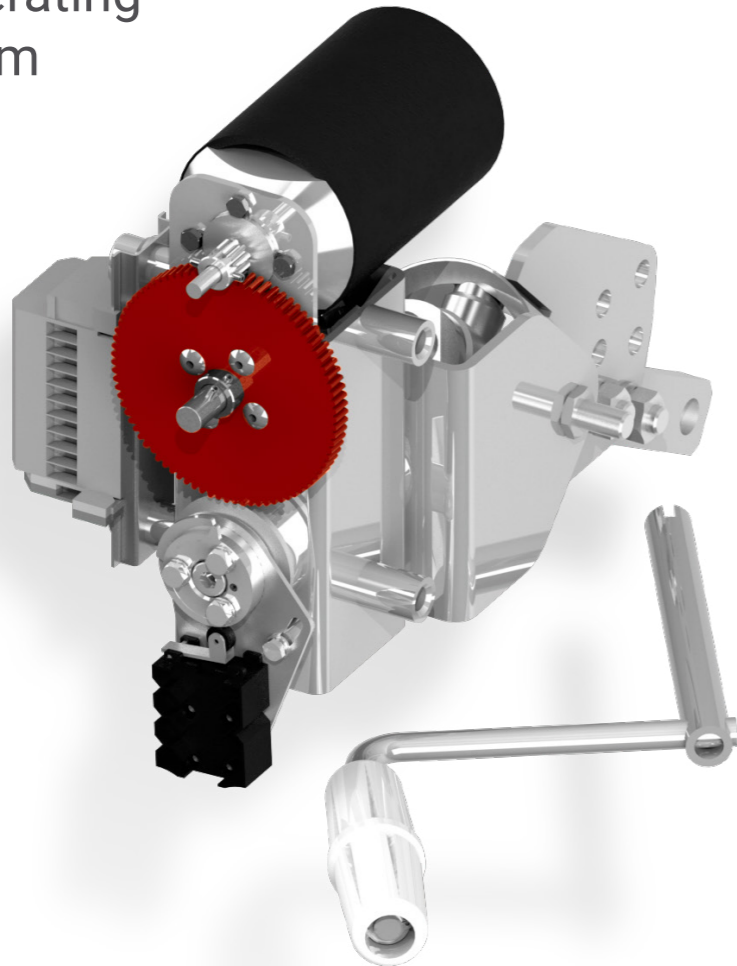
.....● DIAGRAMS

Coupling methods of the operating mechanism NSW30 type with MV indoor switchgear



NSP20

Motor operating mechanism



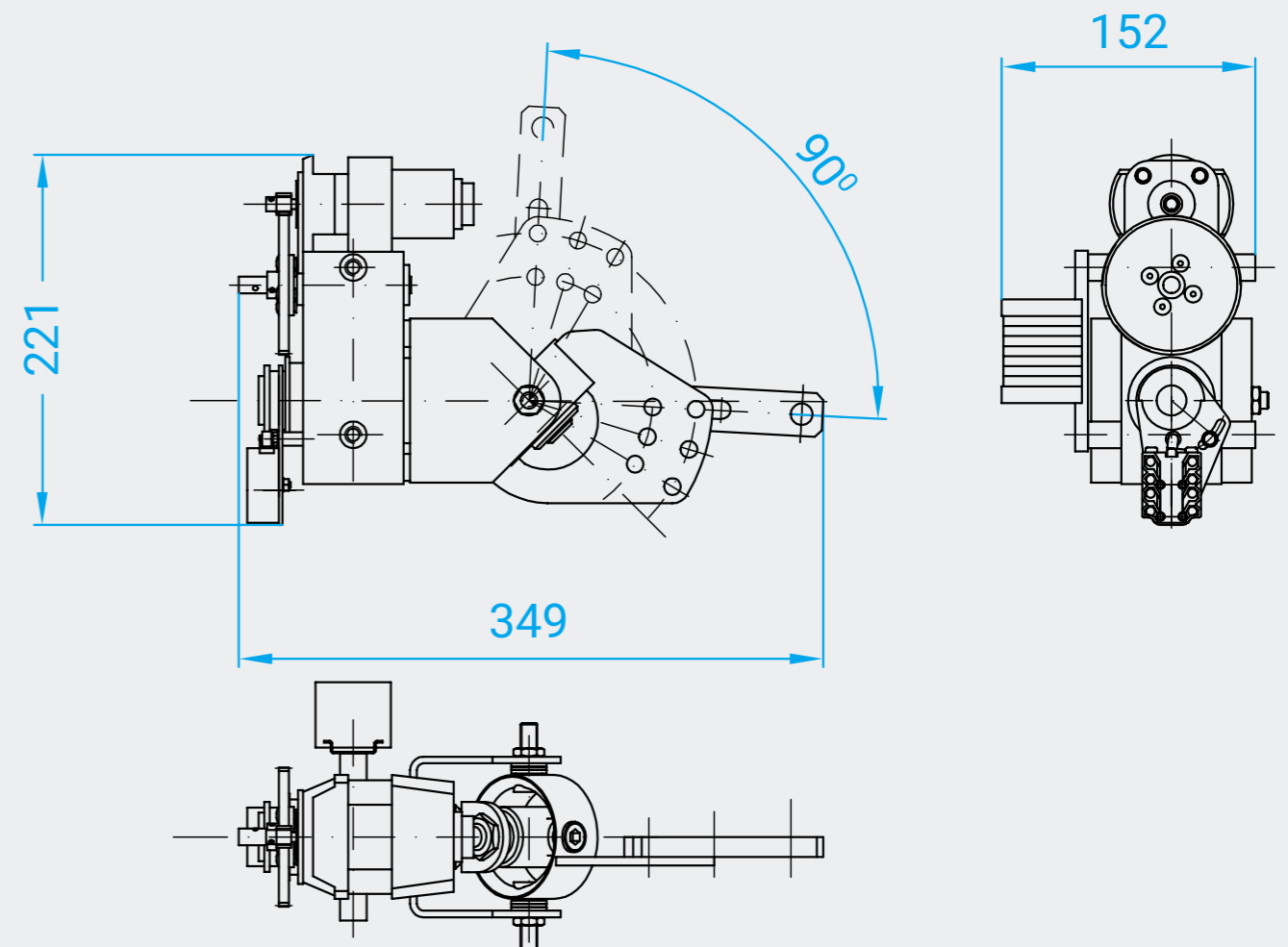
CHARACTERISTICS

- Simple assembling of the mechanism
- Possibility to application with many kinds of apparatus
- Indefective working
- Easy to use as a retrofit for pneumatic type mechanisms
- Fast assembling and simple adjustment

SPECIFICATION

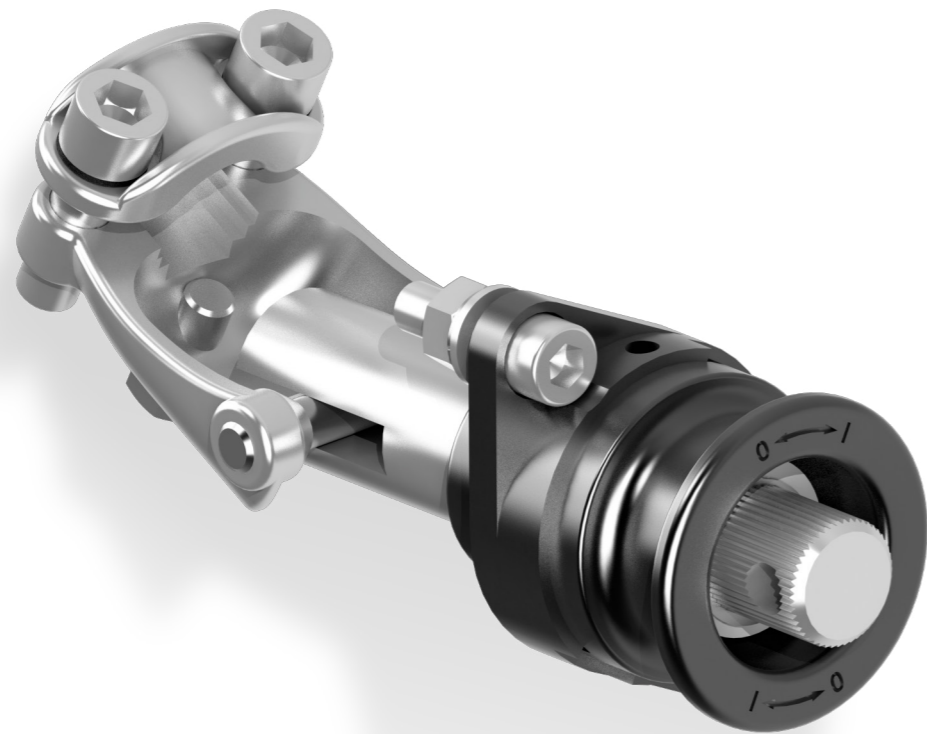
| Item | Parameter | Value |
|------|---------------------------------|--------------------------------------|
| 1. | Motor rated voltage | 220 [VDC/AC] 110 [VDC/AC] |
| 2. | Rated power | 65 [W] |
| 3. | Motor rated current | 0,5 [A] / 220 [V] 1 [A] / 110 [V] |
| 4. | Shaft torque | max. 200 [Nm] |
| 5. | Switching time | ca. 3s |
| 6. | Maximum conductor cross section | 4 [mm ²] |
| 7. | Rated mechanical strength | 2000 cycles |

DIAGRAMS



NR-1

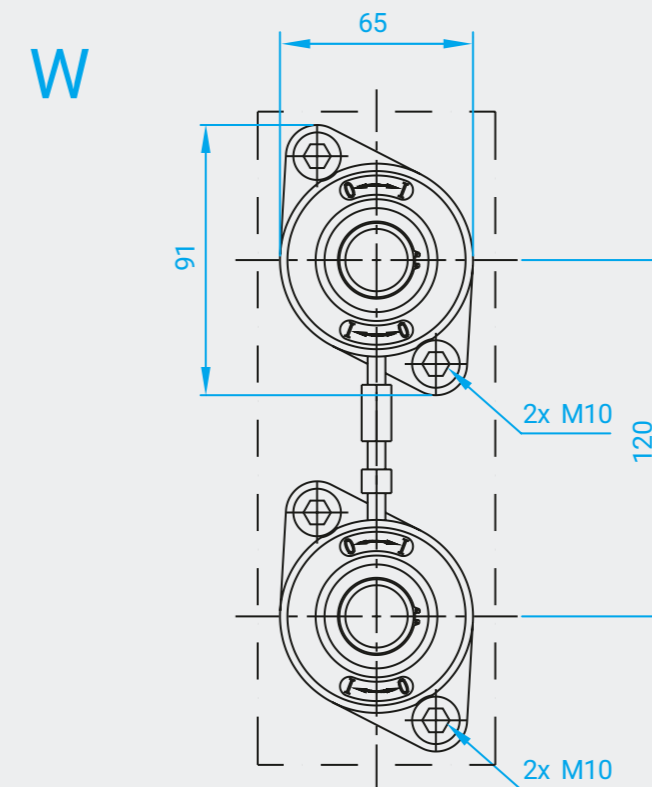
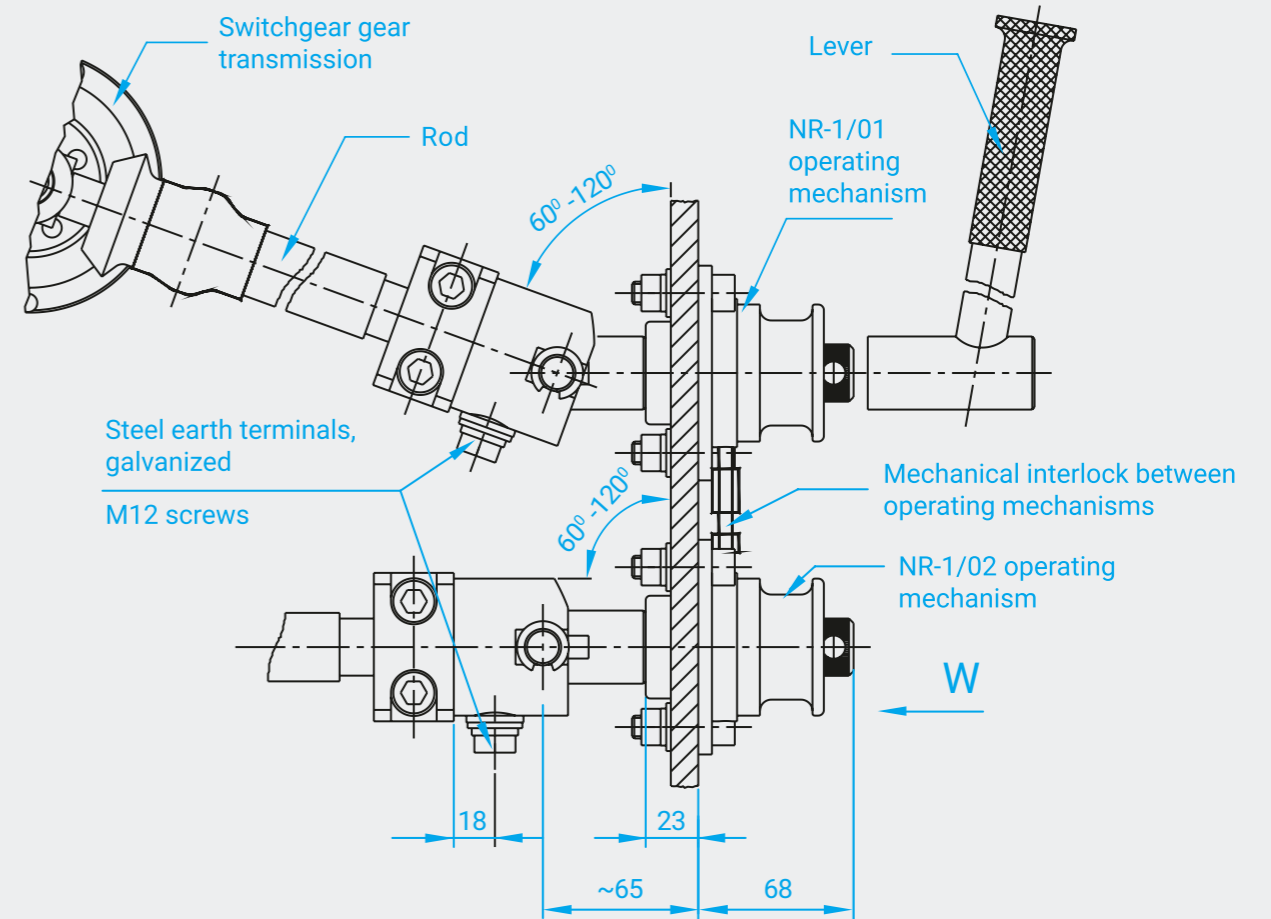
Manual operating mechanism



CHARACTERISTICS

- Simple operation
- Compatibility as a replacement for manual operating mechanism NSW30
- Application of mechanical locking between operating mechanisms of (switch) disconnector/earthing switch
- Possibility to equip with electromagnetic interlock or padlock blocking apparatus in limit positions
- Small dimensions

DIAGRAMS



04

ACCESSORIES

WN/WNS

LP-1

PB

WARNING: As a result of introduce changes due to technological development, the diagrams in catalogue have only a visual character

WN/WNS

Voltage indicator
Voltage indicator with
electromagnetic interlock



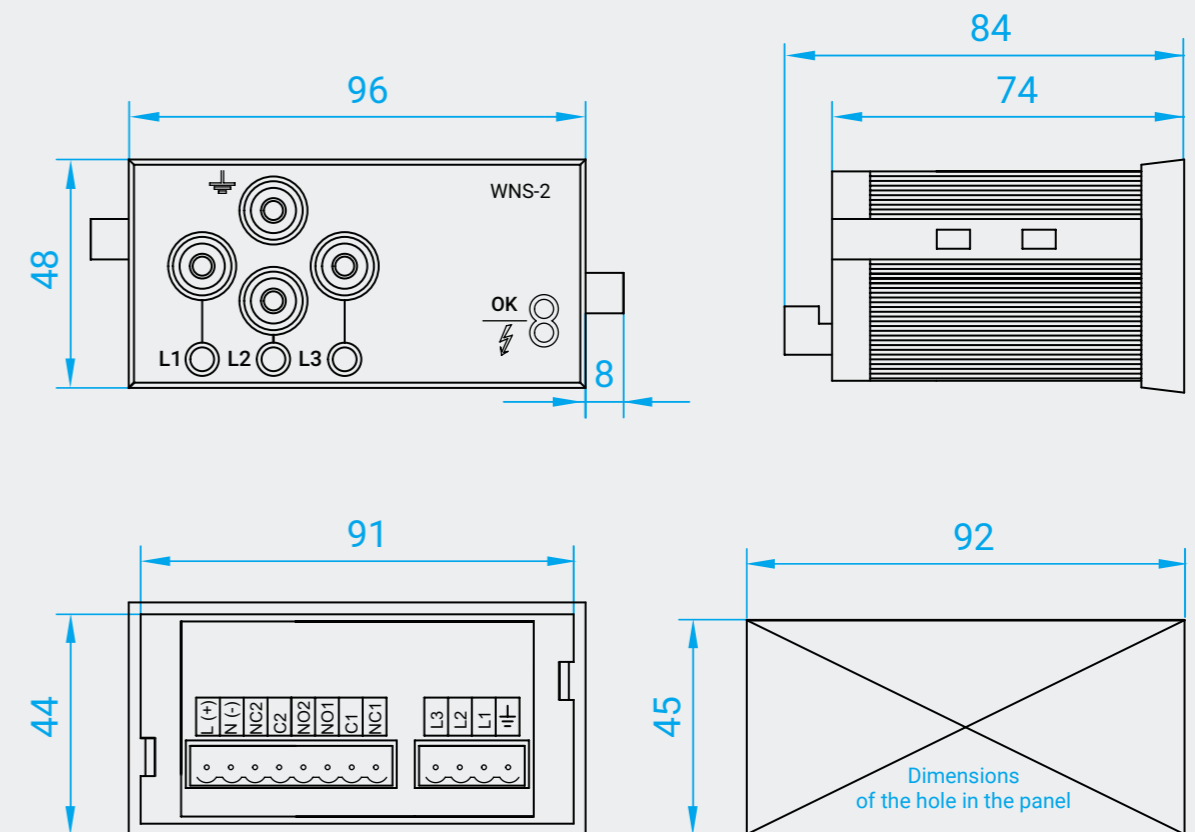
CHARACTERISTICS

- Possibility of application with MV switch disconnectors and disconnectors
- Allows to control voltage presence in MV circuits
- Gives additional protection
- Low power input from auxiliary power
- Simple operation and assembling

SPECIFICATION

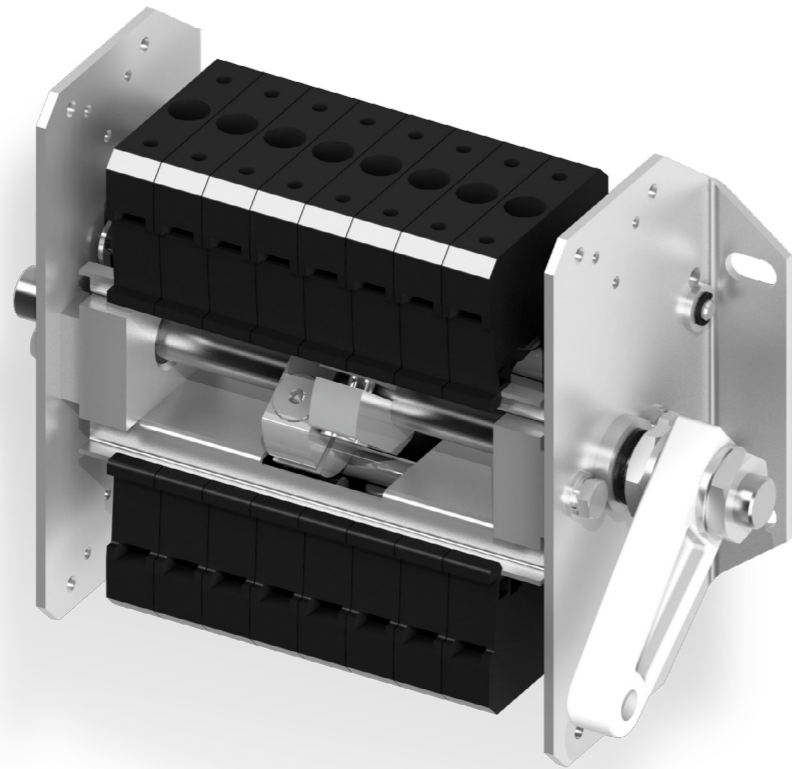
| Item | Parameter | Value |
|------|---|----------------------------|
| 1. | Limiting (minimum) detection current | $I = 60 [\mu\text{A min}]$ |
| 2. | Rated detection current | $I = 270 [\mu\text{A}]$ |
| 3. | Substitutive impedance of a single detector phase | $Z = 220 [\text{k}\Omega]$ |
| 4. | Auxiliary contacts - two pairs | 2P |
| 5. | Auxiliary contact rated load | 8 [A] / 230 [VAC] |
| 6. | Auxiliary rated voltage | 85-265 [VAC/VDC] |
| 7. | Input power | <2 [VA] |
| 8. | Max. conductor cross section | 2,5 [mm ²] |

DIAGRAMS



LP-1

Auxiliary contact switch



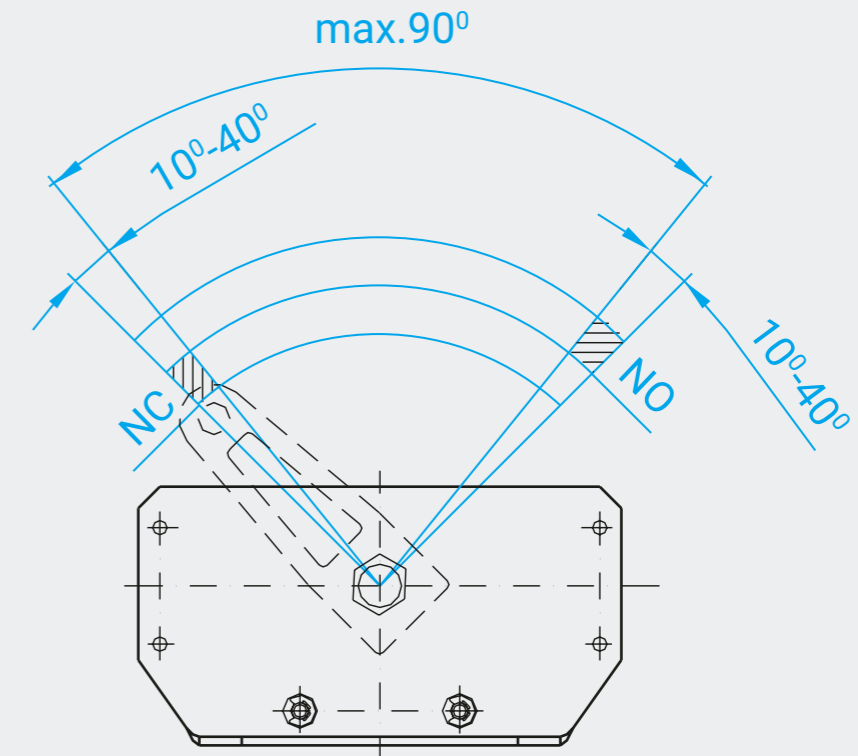
CHARACTERISTICS

- Simple construction
- Standard contacts application
- Small dimensions
- Possibility to adjust the angle working
- Possibility to set various combinations of contacts

SPECIFICATION

| Item | Parameter | Value | | | | | | | | |
|-------------------|--|---|-------|-------|-------------------|----------------|-------------------|-----------------|-------------------|--------------------|
| 1. | Rated continuous current | 500 [V] | | | | | | | | |
| 2. | Insulation rated voltage $I_u=I_{th}$ | 10 [A] | | | | | | | | |
| 3. | Rated switching currents | <table border="1"> <tr> <th>AC-15</th> <th>DC-13</th> </tr> <tr> <td>220 [V] - 2,6 [A]</td> <td>24 [V] - 4 [A]</td> </tr> <tr> <td>380 [V] - 1,6 [A]</td> <td>110 [V] - 1 [A]</td> </tr> <tr> <td>500 [V] - 1,6 [A]</td> <td>220 [V] - 0,25 [A]</td> </tr> </table> | AC-15 | DC-13 | 220 [V] - 2,6 [A] | 24 [V] - 4 [A] | 380 [V] - 1,6 [A] | 110 [V] - 1 [A] | 500 [V] - 1,6 [A] | 220 [V] - 0,25 [A] |
| AC-15 | DC-13 | | | | | | | | | |
| 220 [V] - 2,6 [A] | 24 [V] - 4 [A] | | | | | | | | | |
| 380 [V] - 1,6 [A] | 110 [V] - 1 [A] | | | | | | | | | |
| 500 [V] - 1,6 [A] | 220 [V] - 0,25 [A] | | | | | | | | | |
| 4. | Switching reliability - at rated voltage and rated operational currents - switching AC electromagnets - switching DC electromagnets | 0.2 million cycles 1 million cycles to 80 [VA] 1 million cycles to 10 [W] | | | | | | | | |
| 5. | Operating temperature | -5\leftrightarrow+50 [°C] | | | | | | | | |
| 6. | Connection cable cross-section: - rigid - stranded | 2 x 1\leftrightarrow1,25 [mm ²] 2 x 0,75\leftrightarrow1,5 [mm ²] | | | | | | | | |
| 7. | Operating position | any | | | | | | | | |

DIAGRAMS

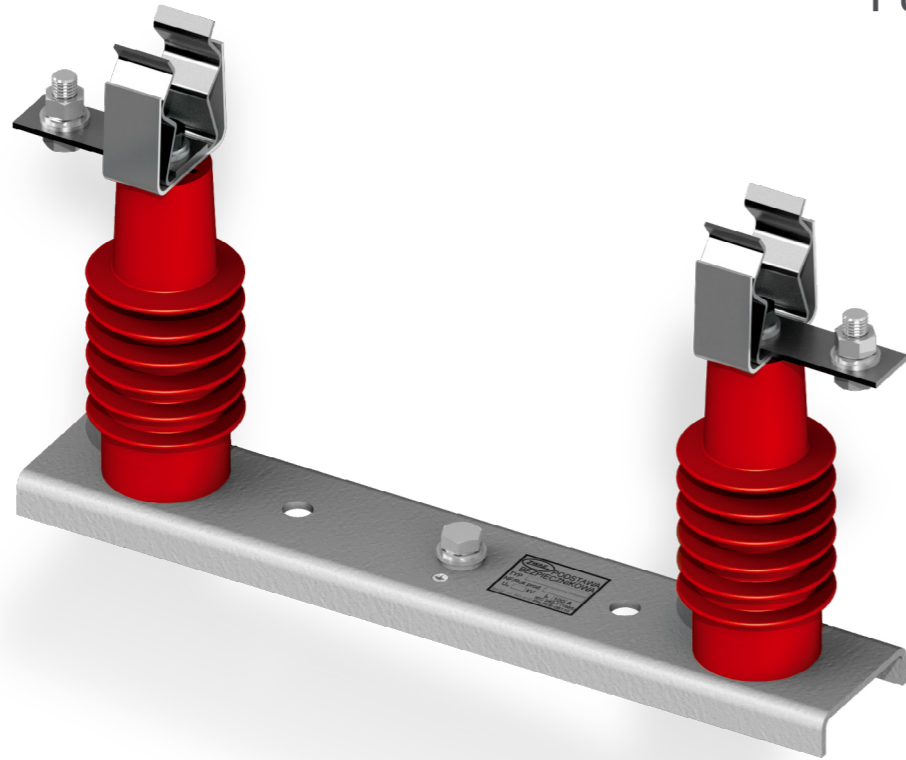


Contact Configuration at the Left hand lever position

| | | | | | | | |
|----|----|----|----|----|----|----|----|
| 1 | 5 | 9 | 13 | 17 | 21 | 25 | 29 |
| 2 | 6 | 10 | 14 | 18 | 22 | 26 | 30 |
| NO | NO | NO | NO | NO | NO | NO | NO |
| 3 | 7 | 11 | 15 | 19 | 23 | 27 | 31 |
| 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 |
| NC | NC | NC | NC | NC | NC | NC | NC |

PB

Fuse base



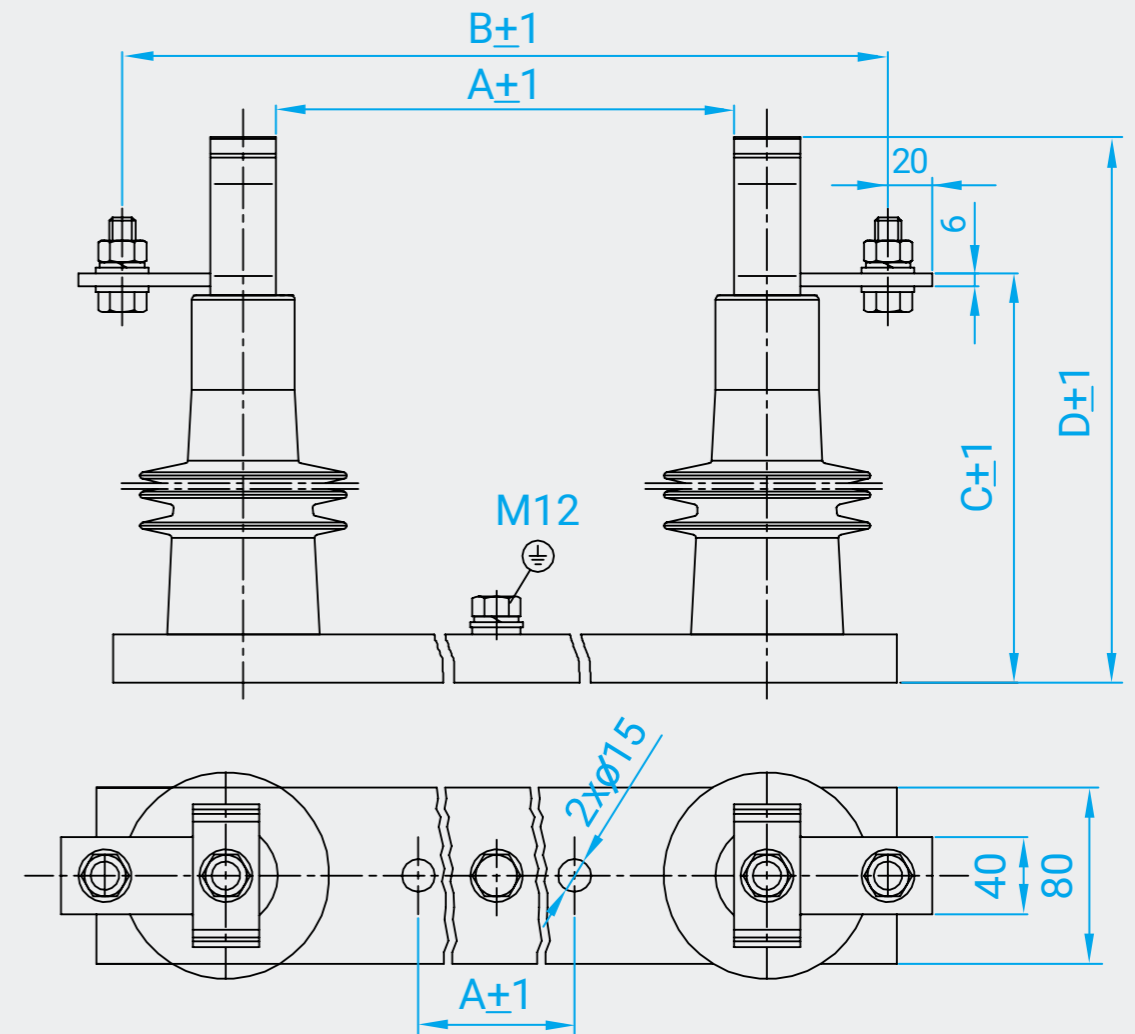
CHARACTERISTICS

- Simple construction
- Easy assembling
- Possibility to applicate common fuse cartridges
- Auxiliary contacts to signalize the fuses tripping

SPECIFICATION

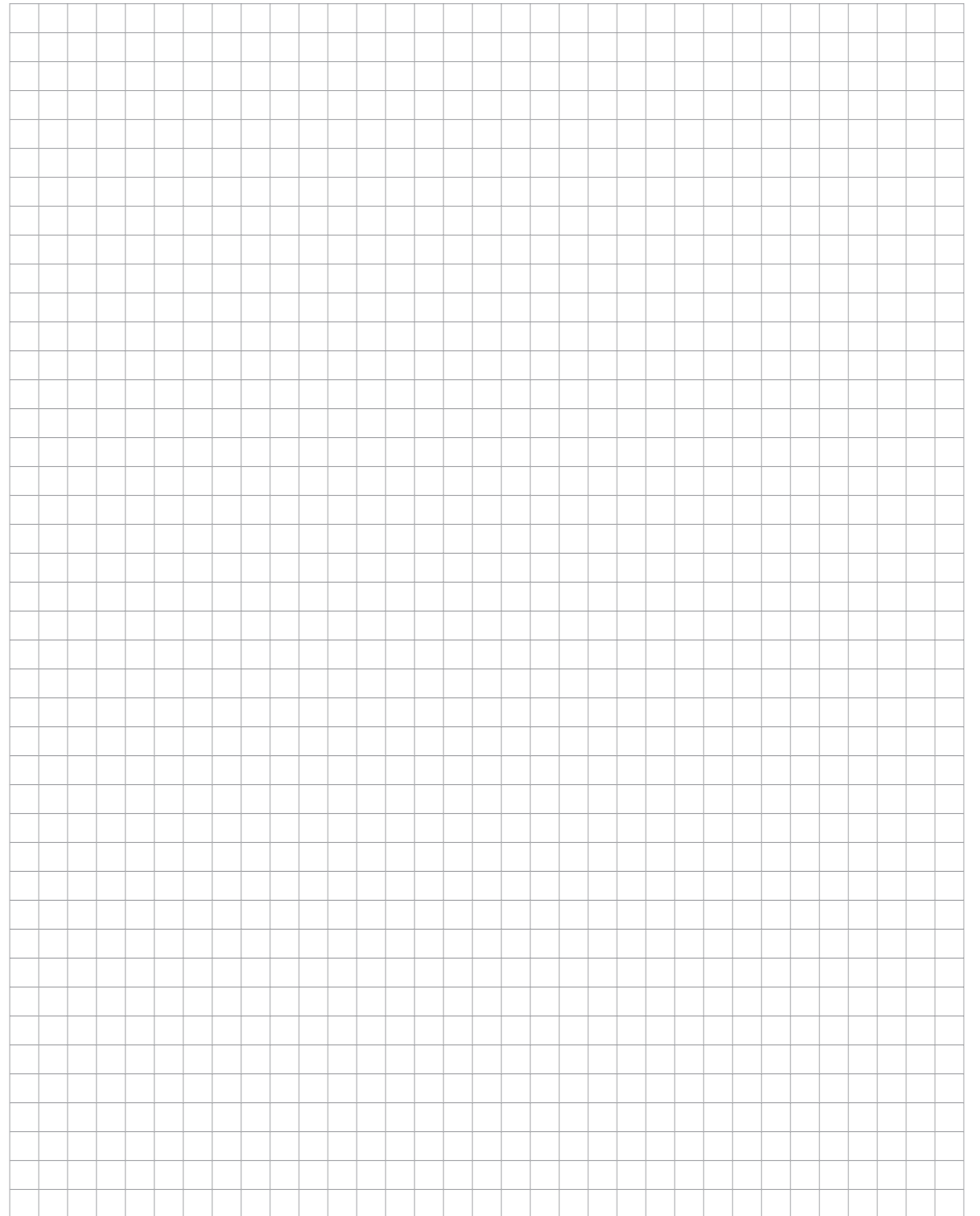
| Item | Parameter | Value | | |
|------|--------------------------|---------|----------|----------|
| 1. | Insulation rated voltage | 12 [kV] | 24 [kV] | 36 [kV] |
| 2. | Test voltage (50 Hz) | 28 [kV] | 50 [kV] | 70 [kV] |
| 3. | Surge test voltage | 75 [kV] | 125 [kV] | 170 [kV] |

DIAGRAMS



SPECIFICATION

| Fuse base type | Dimensions [mm] | | | | |
|----------------|-----------------|-----|-----|-----|-----|
| | A | B | C | D | E |
| 12 kV/537 mm | 540 | 680 | 200 | 268 | 380 |
| 12 kV/292 mm | 295 | 435 | 200 | 268 | 180 |
| 24 kV/537 mm | 540 | 680 | 282 | 350 | 380 |
| 24 kV/442 mm | 445 | 585 | 282 | 350 | 300 |
| 36 kV/537 mm | 540 | 680 | 380 | 448 | 380 |





**Zakład Wytwórczy
Aparatów Elektrycznych Sp. z o.o.**

ul. Gdańska 60
84-300 Lębork, POLAND
e-mail: zwae@zwae.com.pl
tel.: +48 59 86 336 15
fax: +48 59 86 333 86

MARKETING :

tel.: +48 59 86 651 62 

tel.: +48 59 86 651 63 

tel.: +48 59 86 651 64 

tel.: +48 59 86 651 70 



zwae.com.pl