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ABB Sectos Presentation

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Sectos – Pole mounted SF6 Load Break Switch

Overview and features for NXB, NXBD and NXA range





Sectos load breaking switch offers the following features:

- Complete sealed stainless steel tank
- 2-position(ON OFF) or 3-position(ON OFF EARTH)
- Reliable spiral spring operation mechanism with light reflecting and clear position indicator
- Stable gas density switch with a temperature compensated gauge
- Mechanical manual locking device or low gas locking device
- Multiple mounting modes
- Complete feeder automation ready solution
 - Easily upgraded from manual to motor operation
 - ABB controls with communication capabilities



NXB and NXBD

Technical Parameter

	NXB	NXBD
Rated voltage	24 kV	24 kV
Rated current	630 A	630 A
Number of breaking operation C - O	400	400
Short time withstand current (4 sec)	20 kA	20 kA
Peak withstand current	50 kA	50 kA
Making current (kA / operations)	50kA / 5 31.5kA / 10	50kA / 5 31.5kA / 10
Mechanical endurance C-O		
Main switch	5000	5000
Earthing switch	2000	2000
Creepage distance	620/960 mm	620/960 mm
Two-way load break switch	Yes	-
Three-way load break switch	_	Yes

NXB

Two-way load break switch

– Three-position: ON / OFF /EARTH



NXBD

Three-way load break switch

- Three-position: ON / OFF /EARTH

Sectos Load Breaking Switch NXBD



NXBD: double NXB 3-way switch disconnector Has all the features and functions of NXB Especial useful for loop power supply 1 input + 2 outputs or 2 inputs + 1

switched way no.1 1 2 way no.2 tapped way

Two-position 3-way switch types NXBD__A_

output

Three-position 3-way switch types NXBD__C_

NXA

Technical Parameter

	NXA
Rated voltage	36 kV
Rated current	400 A 630 A
Number of breaking operation C - O	400 50
Short time withstand current (3 sec)	12.5 kA
Peak withstand current	31.5 kA
Making current (kA / operations)	31.5kA / 3
Mechanical endurance C- O	5000
Creepage distance	1440 mm
Two position switch – ON / OFF	Yes

NXA



Main Components of Sectos

Tank

- 3mm stainless steel
- Laser cutting and robot welding
- Special fire-proof material at bottom
- Silicon rubber insulator



Main Components of Sectos

Contact system

- Contact material: copper with silver-plating
- Short time withstand current: 20kA / 4 seconds(NXB)
- Making current: 50kA / 5 times(NXB)
- Effective arc extinction by cooling plate
- Large clearance between open contact gaps



Main Components of Sectos

Earth Switch

- Integrated earth switch for NXB & NXBD type
- Earth Switch for safety maintenance
- Close-open-earth operations sequence, Only earth the switch when SECTOS is opened
- Mechanical endurance 2000 CO
- Earth switch is only operated by manual operation



Main Components of Sectos

Operation Mechanism

- Reliable manual and motor operation mechanism.
- Independent spiral spring operation mechanism
- Easy to be upgraded from manual operation to motor operation at site



Main Components of Sectos

Position Indicator

- Large position indicator symbols
- Reflective colours
- The reliable indication of the device meets the design and testing of IEC 129 A2



Main Components of Sectos

Gas Pressure Indicators

- Temperature compensated gas density switch and gauge
- Gas density switch: gas-low alarm will be active and sent by the relay when the gas pressure is below 1.2bar(NXB)/1.65(NXA)
- Gas gauge: under the tank, with large indication symbols.



Main Components of Sectos

Gas Pressure Locking Devices

- Optional gas-low locking device and manual locking device.
- Gas-low locking device will lockout the switch when gas pressure is below 1.1bar (NXB) /1.6bar(NXA) for the safety consideration
- The switch will be completely lockout when manual locking device is active. Both remote control and local control will be blocked to prevent the unauthorized operation



Main Components of Sectos

Measurement Input Signals-CT

Ring type current transformer

- Installed around the bushings for protection and monitoring
- Easily to be installed and replaced.
- Service conditions: -40...+40 ℃.
- I_{th}/I_{dyn}: 20/50 kA.
- Accuracy: IEC Class 0.5 and 10P25.

Measurement Input Signals-VT

Traditional VT

- 12, 24 and 36 kV outdoor
- 75, 110 and 200 kV BIL
- HCEP Encapsultating material reduces weathering erosion and outdoor aging for composite insultaors





Installation and Operation

Above crossarm



Below crossarm



Mounted on pole directly



Installations





Sectos Load Breaking Switch Installations



Installations





Installation and Operation

Manual Operation-Operate by down rod



Manual Operation-Operate by hook stick



Installation and Operation

Motor Operation-Motor Up (With Relay)



Motor Operation-Motor Down (W/O Relay)



Feeder Automation Categories

Local Feeder Automation

the operation of the field device is initiated locally, based on measurements at the point of the field device.

Distributed Feeder Automation – FTU or substation centered

the field devices along the feeder are cooperating to locate and isolate the fault (FTU centered) or the operation of the field devices are controlled from the substation (substation centered)

Centralized Feeder Automation

the field devices are communicating with the overall SCADA and DMS system. Operation of the field devices are initiated from the central system.

Various combinations of Centralized, Distributed and Local





Feeder Automation

Controller



Feeder Automation Automatic sectionalizer - example

Permanent fault, needs 3 reclosing shots

Sectionalizer settings: Counts to trip = 2 (Can be up to 5)



Benefits of using Sectionalizes

Benefit to the distribution company – Utilities

- Continuity of power supply for the consumers
- Reduce the time of power supply disconnection in cases of transient faults
- Reduce the unsold energy due to faults
- Maximum utilization of the network components
- Ability to connect to SCADA system

Quality Control

Partial Discharges Test



Robot Welding



Sandblasting



Quality Control

Gas Leakage Detection



- Helium gas leakage detection (the molecular weight of Helium is 1/36.5 of SF₆).
- SF₆ leakage rate: <0.1% per year.

Final Test





Completely sealed stainless steel tank (Leakage<0.15% per year) ABB patent spiral spring operation mechanism with clear indicator Reliable, stable gas density switch and gauge with temperature compensation Gas-low locking device or manual locking device as options Easily upgrading from manual to motor operation Suitable for Feeder Automation requirements - IEC Safe, compact design and wide dynamic range of the sensor solution Powerful relay function Full options for Sectionalizer: Current-count and Voltage-time

