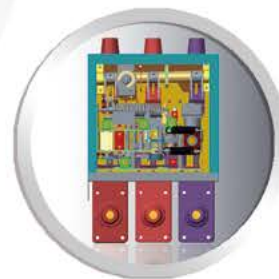
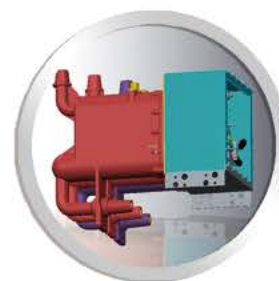
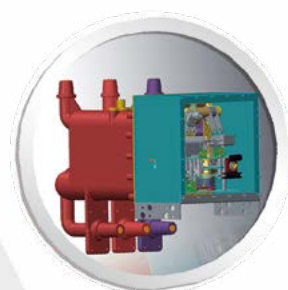


## SOLID INSULATED MV SWITCHGEAR

2<sup>nd</sup> Generation for Ring Main Unit, Primary and Secondary Power Distribution  
12kV, 630A/1250A; 24kV, 630A



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SF<sub>6</sub> is one of the six greenhouse gases listed “undesirable” in the Kyoto Protocol. It has a global warming potential (GWP) 23,900 times that of CO<sub>2</sub>, and an average lifespan of 3,400 years. Every year, more than 4,500 tons of SF<sub>6</sub>, equivalent to 120 million tons of CO<sub>2</sub>, is consumed in the power distribution system for insulation, affecting hundreds of generations of human beings.

## Switchgear with SF<sub>6</sub> gas

Despite its wide usage, switchgear with SF<sub>6</sub> gas continue to face unavoidable challenges, such as potential leakage of SF<sub>6</sub> gas, liquidation of SF<sub>6</sub> gas under low temperatures, and distortion of SF<sub>6</sub> gas at higher altitudes, all of which lowers gas density and weakens the ability to insulate.

As the concentration of SF<sub>6</sub> gas increases over the years, finding alternatives for the SF<sub>6</sub> switchgear could be the best answer for the time being.

## SOJO's alternative for SF<sub>6</sub> switchgear

SOJO commenced the research and development of non-gas MV switchgears in the year of 2005. Through marketing research and electrified analysis, it was discovered that solid insulation has a wider application as compared to the traditional SF<sub>6</sub> gas insulation, and the solid insulation technology is more stable than gas insulation under extreme circumstances. SOJO also discovered potential substitutes for insulation, such as the vacuum interrupter, and high-quality solid insulation materials.

SOJO's first solid insulation application started in the year of 2007, and with the creation of SVI (Solid, Vacuum,

Intelligent) Switchgear, it gained astounding performance records over the years, supporting key projects for utility companies, oil industries, railways, mining, and aviation industries. With the support for a greener cause, SOJO was granted the complete DNV-KEMA test certificate in 2012.

The 2<sup>nd</sup> generation of SVI Switchgear was launched in November 2013, structurally customized and optimized for SOJO's '57' Express automated production line for greater accuracy and production volume. This new production line is able to produce 30,000 panels a year, allows a margin error of only 0.5mm, and has a shorter assembly time of only 7 minutes. The 24kV SVI Switchgear was also introduced in the same year, increasing variety and flexibility for consumers.

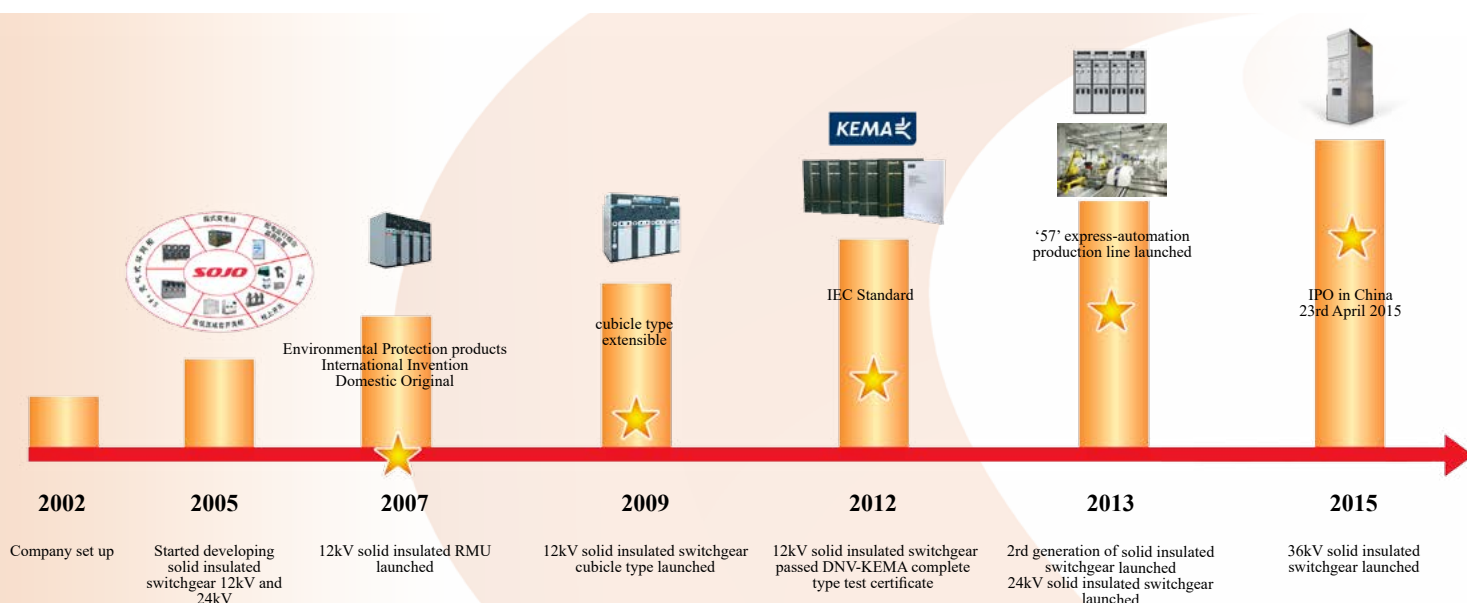
In the year of 2015, SOJO launched 36kV SVI switchgear further complete the product line of solid insulated switchgears.

## SOJO in Retrospect

Since 2007, SOJO has installed more than 40,000 panels of SVI Switchgears, with demand increasing exponentially over the years. The SVI Switchgear has been sold mainly in China and also other European regions such as Denmark, Finland, Norway, Sweden, Russia, and New Zealand, Peru, Thailand.

SOJO is currently listed on the stock exchange, facilitating greater research and development potential for the SVI Switchgears in the near future.

## SOJO Development History



## Features

### 01 Safety

- Single phase/pole insulated, no potential hazard of phase to phase discharging
- Single inspection window fitted at the front for checking open contacts
- Multiple interlocking functions to prevent fault operations
- Optional configuration for shielded solid insulation

### 02 Green Products

- SF<sub>6</sub> Free
- Clean and environmentally-friendly insulation material

### 03 Maintenance Free

- Sealed for life, all live parts enclosed into epoxy resin housing, all sealed parts reach IP67 degree of protection.
- Mechanisms sealed in metal box, prevent from dust, moist and pollution.
- Mechanical endurance reaches 10,000 times.

### 04 Long Lasting

- 30 years lifespan

### 05 Cost Performances

- Decreases total expenditure by half, low maintenance cost
- Competitive cost price due to high productivity of the "57" Express production line

### 06 Smart Grid for Efficiency

- WIC1 self-powered relay as standard configuration for circuit breaker modular, other relays also available upon request.
- Remote control, monitoring and analyzing available through DTU(Data Transfer Unit) and RTU(Remote Terminal Unit)



### 07 Compact and Modular Design

- Dimensions for 12kV standard 3 ways units: 1200mm(Length)×780mm(Width)×1430mm(Height)
- Dimensions for 24kV standard 3 ways units: 1200mm(Length)×800mm(Width)×1430mm(Height)
- Modular design enables field assembling, good for applications at locations with small entrances: mining industry, wind farm, compact secondary substation



### 08 Flexible

- Modular structure, as many combinations/panels as possible
- Both left and right sides extensible
- Allows field assembling
- Enables retrofit motorization
- Optional cable testing points on front panel
- Incoming cable terminates at the front
- Able to place panels beside walls – saving GFA, reduce the MV switch room size, and also this panels can be located in the basement

### 09 Operates under Extreme Conditions

- Ambient Temperature: -50 °C to 70 °C
- Altitude: ≤ 5500 Meters
- Humidity: Daily Average ≤ 95%; Monthly Average ≤ 90%
- 24 hour water resistance at a pressure of 0.3 bar and voltage of 12kV
- Sealed electrified body IP67; Fuse tube IP67; Metal enclosure IP4X

## Technical Data

| No. | Item                                          | Unit | Parameters |      |       |      |
|-----|-----------------------------------------------|------|------------|------|-------|------|
|     |                                               |      | 12kV       |      | 24kV  |      |
| 1   | Rated Voltage                                 | kV   | 12         |      | 24    |      |
| 2   | Rated Current                                 | A    | 630        | 1250 | 630   |      |
| 3   | Rated Frequency                               | Hz   | 50/60      |      | 50/60 |      |
| 4   | Rated Power Frequency Withstand Voltage 1 min | kV   | 48         |      | 50    | 65   |
| 5   | Rated Lightning Impulse Withstand Voltage     | kV   | 85         |      | 125   | 125  |
| 6   | Rated Short-time Withstand Current            | kA/S | 20/4       | 25/4 | 20/4  | 20/4 |
| 7   | Rated Breaking Current                        | kA   | 20         | 25   | 16/20 | 20   |
| 8   | Rated Short Circuit Making Current (Peak)     | kA   | 50         | 62.5 | 40/50 | 50   |

**SVI-12/24 complies with:**

- IEC 62271-200(2011), IEC 62271-1, IEC 62271-100, IEC 62271-102 (2012), IEC 62271-103(2011), IEC 62271-105, IEC 60529;
- GB 1984-2003, GB 3906-2006, GB 1985-2004, GB 3804-2004, GB/T 11022-1999.