

MV Gas Insulated Switchgear

**TGS**

**Technical Data**

TGOOD  
2017.1

**TGOOD**



### Operating environmental conditions

- Place of installation: Indoor or outdoor
- Ambient temperature:  $-5^{\circ}\text{C}$  ( $-25^{\circ}\text{C}$  optional)  $\sim +40^{\circ}\text{C}$  ( $+55^{\circ}\text{C}$  optional)
- Altitude: 1000m (no limitation for specially ordered products)
- Average value over 24 hours (max.):  $+35^{\circ}\text{C}$
- Air humidity: Daily average  $\geq 95\%$ ; monthly average  $\geq 90\%$  ( $25^{\circ}\text{C}$ )
- Wind speed:  $\geq 35\text{m/s}$  (wind pressure  $\leq 700\text{Pa}$ )
- Irradiance:  $\leq 0.1\text{W/cm}^2$  (wind speed:  $0.5\text{m/s}$ )
- Earthquake intensity: Horizontal acceleration  $\leq 0.5\text{g}$ ; vertical acceleration  $\leq 0.5\text{g}$ ;
- Ice thickness:  $\leq 10\text{mm}$
- Creepage distance:  $25\text{mm/kV}$  (pollution level III),  $31\text{mm/kV}$  (pollution level IV)
- Type of insulating gas: Sulphur hexafluoride (SF6)
- Rated pressure at  $+20^{\circ}\text{C}$ :  $0.03\text{MPa}$

This product shall be placed in a site without risk of fire hazard, explosion, chemical corrosion and sharp vibration.

### Standard compliance

- Switchboard: IEC 62271-200, IEC 62271-1
- Behavior in the event of internal faults: IEC 62271-200
- Earthing switch (in C, F, V, De, I): IEC 62271-102
- Disconnecter (in V, I): IEC 62271-102
- General use switch (C): IEC 62271-103
- Switch-disconnector fuse combination (F): IEC 62271-105
- Circuit-breaker (in V, I): IEC 62271-100
- Current transformer: IEC 61869-2
- Voltage transformer: IEC 61869-3
- Voltage presence indicators: IEC 62271-206
- Voltage detection systems: IEC 61243-5
- Protection against accidental contact, foreign bodies and ingress of water: IEC 60529

**TGS technical data**

Description	Unit	Value
<b>General Details</b>		
Manufacturer's Name	-	TGOOD Electric Co. Ltd
Manufacturer's Address	-	Chengdu, Sichuan, China
Country of Manufacture	-	China
Manufacturer's Ref. code / Make / Type		TGS
Applicable Standard		IEC
<b>Service Condition</b>		
Indoor / Outdoor	-	Indoor/ Outdoor
Minimum Ambient Temperature	°C	*-5 (-25 optional)
Maximum Ambient Temperature	°C	*+40 (+55 optional)
Maximum Altitude	m	1500 (higher is optional)
Relative Humidity Range	%	95
Pollution Level	I, II, III, IV	Yes
<b>Design and Construction</b>		
Loss of Service Continuity Category	LSC1/2A/2B	LSC1/2A/2B
Partition Class	PM / PI	PM / PI
Material for Partition and Shutters	-	N/A
Type of Accessibility - Busbar (Tools or Interlock?)	-	Tools
Type of Accessibility - Main Device (Tools or Interlock?)	-	Interlock
Type of Accessibility - Cable (Tools or Interlock?)	-	Interlock
Type of Accessibility - CT (Tools or Interlock?)	-	Interlock
Type of Accessibility - VT (Tools or Interlock?)	-	Tools & Interlock
Internal Arc Classification	Yes / No	Yes
Accessibility Type	A (F, L, R)	AFLR (IEC 62271-200)
Arc Test Current	kA	20
Arc Test Current Duration	s	1
Insulation Medium (Air / Gas)	-	Gas
Rated Filling Level for Insulation	Pa	40,000
Alarm Level for Insulation	Pa	30,000
Minimum Functional Level for Insulation	Pa	30,000

## TGS Technical Data

Insulating Fluid and Mass	kg	5 (CCF)
Degree of Protection - Compartment	IP	3X
Degree of Protection - Enclosure Outdoor	IP	33
Busbar Material and Cross Section	-	Red copper/T2Y/40mm×8mm
Busbar Insulated? If yes, please specify material	-	SF6
Support Insulator Material	-	Epoxy resin
Support Insulator Creepage Distance	mm	135
Earth Bar Material and Cross Section	-	Red copper/T2Y/25mm×8mm
Limit of Temperature Rise - Main Circuits	°C / K	75
Limit of Temperature Rise - Contacts	°C / K	65
Limit of Temperature Rise - Connections	°C / K	75
Limit of Temperature Rise - Terminals	°C / K	75
Limit of Temperature Rise - Insulating Material	°C / K	120
Limit of Temperature Rise - Accessible Parts	°C / K	30
Switchgear Overall Surface Finish and Color	-	RAL7035
Typical Panel Dimensions (L x D x H)	mm	1050mm×800mm×1500mm
Typical Panel Weight	kg	650
<b>General Electrical Characteristics</b>		
No. of Phases	-	3
Rated Voltage	kV	12, 24
Rated Frequency	Hz	50/60
Type of Neutral Earthing (Effectively Earthed?)	-	Effectively Earthed
Rated Lightning Impulse Withstand Voltage to Earth	kVp	Refer table 1
Rated Lightning Impulse Withstand Voltage Across Isolation	kVp	Refer table 1
Rated Power Frequency Withstand Voltage to Earth	kV	Refer table 1
Rated Power Frequency Withstand Voltage Across Isolation	kV	Refer table 1
Rated Busbar Normal Current	A	630/1250A
Rated Short-Time Withstand Current	kA	25/1s and 20/3
Rated Peak Withstand Current	kAp	52kA/65kA
Rated Duration of Short Circuit	s	1 and 3
Rated Auxiliary Voltage for Operation	V	220-30V
Rated Auxiliary Voltage Frequency for Operation	AC / DC	AC / DC
Rated Auxiliary Voltage for Heating Circuit	V	220-30V
Rated Auxiliary Voltage Frequency for Heating	AC / DC	AC / DC

## TGS Technical Data

Partial Discharge Guarantee @ 1.1 Ur	pC	10
<b>Circuit Breaker</b>		
Manufacturer's Name	-	TGOOD
Country of Manufacture	-	China
Manufacturer's Ref. code / Make / Type	-	TGS-V
Applicable Standard		IEC 62271-200
Circuit Breaker Interrupting Medium	SF6 / Vacuum	Vacuum
Type of Circuit Breaker (Fix / Withdrawable)	-	Fixed
If Withdrawable, Is It Motorized or Manual Rack-in	-	N/A
Is Breaker Trip Free?	-	Yes
Rated Normal Current	A	630A
Rated Short Circuit Breaking Current	kA	20/25
Rated Duration of Short Circuit	s	1 and 3
DC Component of Rated Short Circuit Breaking Current	%	52
Rated X/R Ratio	-	
Rated Out of Phase Breaking Current	kA	5/6.25
Rated Out of Phase Recovery Voltage	kV	13.8/27.6
Rated Line Charging Breaking Current	A	10
Rated Cable Charging Breaking Current	A	25/31.5
Rated Single Capacitor Bank Breaking Current	A	/
Rated Back-to-Back Capacitor Bank Breaking Current	A	/
Rated Capacitor Bank Inrush Making Current	kA	/
Rated Back-to-Back Capacitor Bank Inrush Making Current	kA	/
Rated Filling Pressure for Operation	MPa	0.04
Rated Filling Pressure for Interruption	MPa	0.03
Rated Operating Sequence	-	0-0.3s-CO-180-CO
Maximum Opening Time	ms	50
Maximum Break Time	ms	10
Maximum Closing Time	ms	60
Maximum Make Time	ms	10
Electrical Endurance Class	E1 / E2	Refer to 4.6.1.1
Capacitive Restrike Probability Class	C1 / C2	C2
Mechanical Endurance Class	M1 / M2	M2

## TGS Technical Data

Switching Class	S1 / S2	S1
First Pole-To-Clear Factor - Terminal Fault	p.u.	1.5
First Pole-To-Clear Factor - Out of Phase	p.u.	2.5
Amplitude Factor - Terminal Fault	p.u.	1.4
Amplitude Factor - Out of Phase	p.u.	1.25
TRV Peak Value, kpp - Terminal Fault	kV	20.6/41
TRV Peak Value, kpp - Out of Phase	kV	30.6/61
Time, t3 - Terminal Fault	us	61/87
Time, t3 - Out of Phase	us	118/174
Time Delay, td - Terminal Fault	us	9/13
Time Delay, td - Out of Phase	us	18/26
Voltage, u' - Terminal Fault	kV	6.9/13.7
Voltage, u' - Out of Phase	kV	10/20
Time, t' - Terminal Fault	us	29/42
Time, t' - Out of Phase	us	56/83
RRRV, uc/t3 - Terminal Fault	kV/us	0.34/0.47
RRRV, uc/t3 - Out of Phase	kV/us	0.26/0.35
Circuit Breaker Operating Mechanism (Spring / Hydraulic)	-	Spring
Drive Motor Minimum and Maximum Operating Voltage	V	110/220 AC/DC
Drive Motor Power Consumption	W	120
Spring Motor Charging Time	s	15
Method of Tripping (Magnetic Actuator / Shunt Trip)	-	Shunt Trip
Number of Trip Coil	-	Two
Trip Coil Minimum and Maximum Operating Voltage	V	110/220 AC/DC
Trip Coil Current at Rated Voltage	A	1.7
Trip Coil Power Consumption	W	374
Method of Closing (Magnetic Actuator / Shunt Trip)	-	Shunt Trip
Number of Close Coil	-	One
Close Coil Minimum and Maximum Operating Voltage	V	110/220 AC/DC
Close Coil Current at Rated Voltage	A	1.7
Close Coil Power Consumption	W	374
No. of NO/NC Auxiliary Contact	-	Up to 4NO 4NC
<b>Earthing Switch</b>		

## TGS Technical Data

Manufacturer's Name	-	TGOOD
Country of Manufacture	-	China
Manufacturer's Ref. code / Make / Type	-	TGS-E
Applicable Standard	IEC	IEC62271-102
Rated Short-Time Withstand Current	kA	20/25
Rated Duration of Short Circuit	S	1 and 3
Short Circuit Making Capability	E1 / E2	E2
Mechanical Endurance Class	M1 / M2	M1
Minimum Isolating Distance (Live Parts to Earth)	mm	60
Motorized Operation Available?	-	Option if available
No. of NO/NC Auxiliary Contact	-	2NO 2NC
<b>Disconnecter Switch (If Applicable)</b>		
Manufacturer's Name	-	TGOOD
Country of Manufacture	-	China
Manufacturer's Ref. code / Make / Type	-	TGS-D
Applicable Standard	IEC	IEC62271-102
Rated Normal Current	A	630
Rated Short-Time Withstand Current	kA	20/25
Rated Duration of Short Circuit	s	1 and 3
Mechanical Endurance Class	M1 / M2	M1
Minimum Isolating Distance (Live Parts to Earth)	mm	60
Minimum Isolating Distance (Clearance Bet. Open Contacts)	mm	60
Motorized Operation Available?	-	Option if available
No. of NO/NC Auxiliary Contact	-	Up to 4 NO 4 NC
<b>Fuse Switch (If Applicable)</b>		
Manufacturer's Name	-	TGOOD
Country of Manufacture	-	China
Manufacturer's Ref. code / Make / Type	-	TGS-F
Applicable Standard	IEC	IEC62271-102
Rated Normal Current	A	200
Rated Short-Time Withstand Current	kA	20/25
Rated Duration of Short Circuit	s	1 and 3
Mechanical Endurance Class	M1 / M2	M1
Minimum Isolating Distance (Live Parts to Earth)	mm	60

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Minimum Isolating Distance (Clearance Bet. Open Contacts)	mm	60
Motorized Operation Available?	-	
No. of NO/NC Auxiliary Contact	-	2 NO 2NC (If specified)
<b>Voltage Transformer</b>		
Manufacturer's Name	-	TGOOD specify
Country of Manufacture	-	TGOOD specify
Manufacturer's Ref. code / Make / Type	-	TGOOD specify
Applicable Standard	IEC	IEC61869-3
Voltage Transformer Type	-	3 phase dry type
Voltage Transformer Primary and Secondary Ratios	-	11000V/110V
Voltage Transformer Secondary Winding Classes	-	0.5
Withdrawable VT Available for Incomer Panel?	-	Fixed
Withdrawable VT Available for Busbar?		Optional
<b>MV Cable Compartment</b>		
Cable Compartment Accessible Side	Front / Rear	Front
Cable Box Insulation (Air / Gas)	-	Air
Cable Termination Type	-	Dry screened/unscreened
Cable testing facility		Optional
Maximum Cable Size per Phase	-	300mm <sup>2</sup>
Maximum Cable Quantity per Phase	-	2



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