

FaultBreak™ FBC600

Series Contactor

Sensata's FaultBreak™ FBC600 series contactor is a high-voltage control and protection device that combines contactor switching functionality with passive fuse capability to reduce system complexity in modern EV architectures. The FaultBreak contactor interrupts overcurrent and short-circuit events through a self-triggering magnetic-force mechanism that opens the circuit in under 2 ms, eliminating the need for external detection electronics or software. Its hermetically sealed contacts maintain low, stable contact resistance over the product lifetime, supporting continuous operation up to 600 A and fault interruption validated to 16 kA at 1 kV. The device is resettable after most overcurrent events, enabling rapid system recovery and minimizing service requirements compared to pyrotechnic or thermal fuses. By integrating fault-clearing and switching into a single unit, the contactor reduces component count, busbar thermal losses, and total system cost while meeting demanding automotive and commercial vehicle environmental requirements.

Highlights

- Short-circuit interrupt rating: Validated series interruption up to 16 kA @ 1000 VDC in <2ms
- Continuous current rating: Up to 600 A continuous operation
- Contact resistance: $\leq 0.2 \text{ m}\Omega$ at end of life
- Coil power consumption: $\sim 3 \text{ W}$
- Mechanical life: 100,000 cycles minimum
- Mechanical shock rating: 25G (closed), 35G (open), 11 ms pulse
- Insulation resistance: $\geq 100 \text{ M}\Omega$ @ 1000 VDC (BOL); $\geq 1 \text{ M}\Omega$ @ 1000 VDC (EOL)
- Demonstrated fault-clearing response: Passive auto-trigger clearing in $\sim 1.5 \text{ ms}$ at 650–1000 V and 14–16 kA limited current scenarios (no venting, arc fully extinguished)

Features

- **Market-leading fault clearing performance** – Protects against full battery short circuits, ensuring safety and reliability.
- **Passive fuse functionality** – No external electronics required; operates on pure physics for ultimate reliability.
- **Resettable protection** – Recovers after nuisance or temporary overcurrent events, reducing the risk of stranded vehicles and minimizing service needs.
- **Hermetic, low-loss design** – Ensures stable, ultra-low contact resistance and long-life durability while reducing system complexity.
- **System-level simplification** – Consolidates both contactor and fuse function into one device, lowering component count and total system cost.

Applications



BEV's



Hybrid EV's



Commercial Trucks



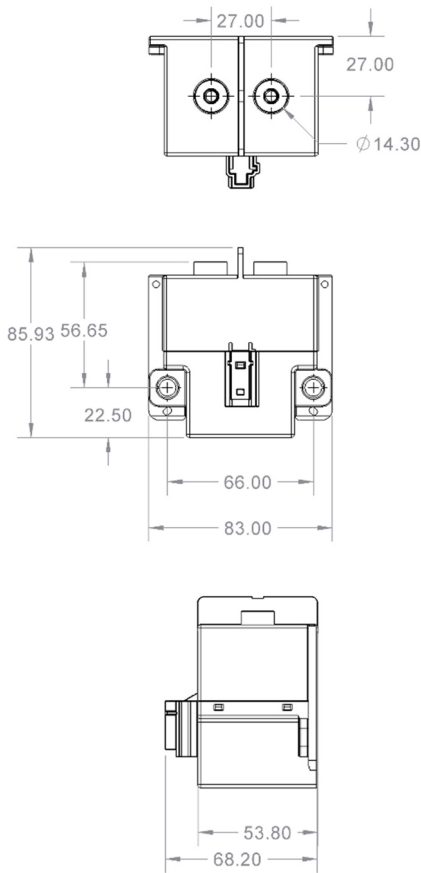
Charge Stations

Preliminary & Indicative Figures

FaultBreak Contactor

Technical Specifications

Dimensions



Notes

1. Height measured from top of HV stationaries (HV mounting interface) to bottom of housing cover
2. Dimensions are in mm
3. Please contact Sensata Technologies for tolerance

Item	Specifications
Contact Arrangement	1 Form A(normally open)
Contact Resistance Initial	$\leq 0.14\text{m}\Omega$ (@600A)
Rated Load Current	600A(@200mm ² busbar)
Rated Switching Voltage	850VDC
Rated Switching Power	510kW
Max. Switching Voltage	1000VDC
Max. Switching Power	600kW
Max. Breaking Current	2000A 850VDC (1op)
Short circuit	1000V/20000A (Series Interrupt)
Current Endurance ^[2]	600A, Cont.
	800A, 40min
	1000A, 10min
	1500A, 85s
	2000A, 30s
Electrical Endurance ^[1]	Capacitive load
	Switch on :10×10 ⁴ times (20VDC, 160A)
	Switching :10×10 ⁴ times (20A, 850V)
	Resistive load
	Switch off :1500 times (250A, 850V)
	Switch off :1 time (2000A, 850V)
	Switch off :5 time (1400A, 850V)

Coil Data

Rated voltage	Max. Allowable Voltage	Max.Operate Voltage	Min. Release Voltage	Power	DUTY
12VDC	16VDC	9V	1V	45W/3W	PWM
24VDC	32VDC	20V	2V	45W/3W	PWM

Characteristics

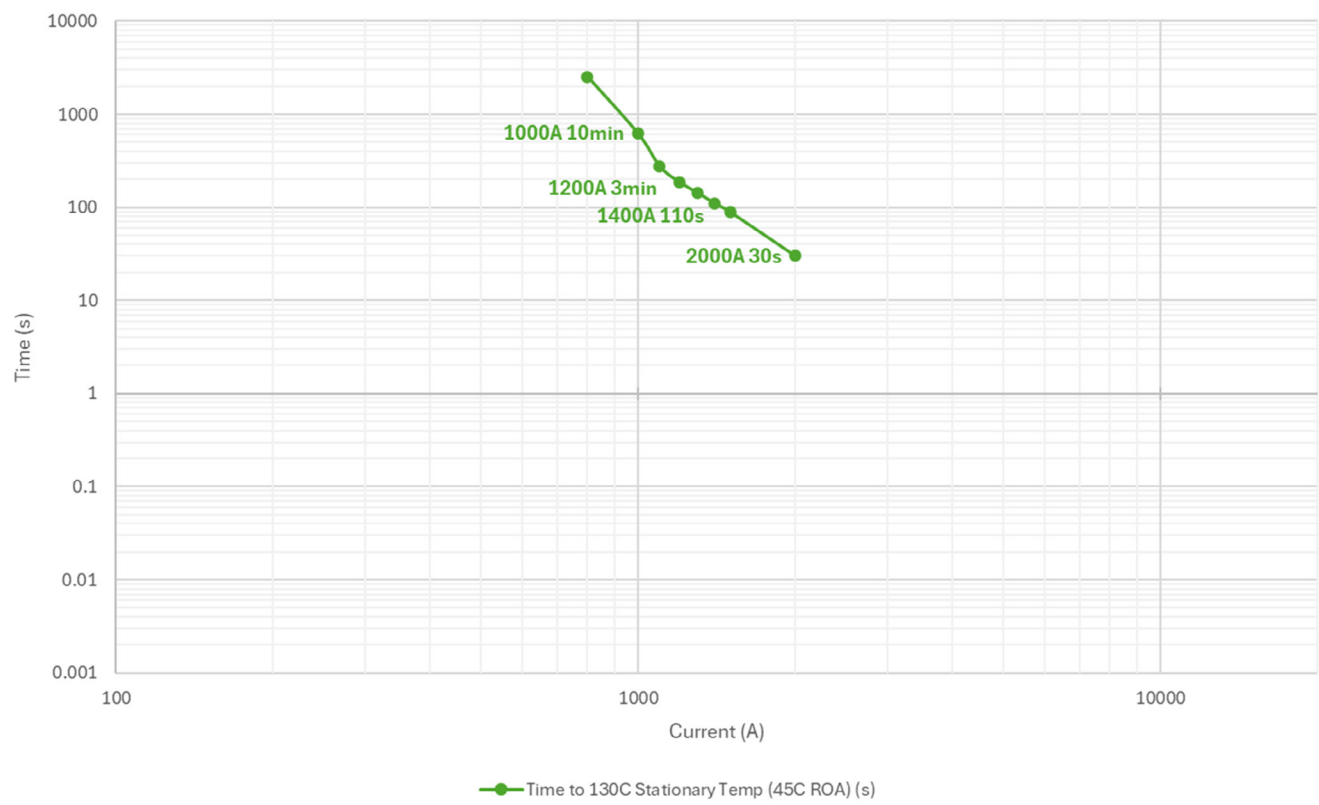
Insulating Property	Dielectric Strength	3000VAC 1min, between open contacts
		3000VAC 1min, between coil and contact
	Insulation Resistance	1000 M Ω at 1000 VDC, between open contacts 1000 M Ω at 1000 VDC, between coil and contact
Time Parameter	Operate Time	$\leq 30\text{ms}$
	Release Time	$\leq 10\text{ms}$
Mechanical Performance	Shock Resistance (Functional)	For ON : Min. 245 m/s ² (half-sine shock pulse : 6ms)
		For OFF : Min. 343 m/s ² (half-sine shock pulse : 6ms)
	Vibration	10Hz to 500Hz, 49m/s ²
	Mechanical Endurance	2×10 ⁵ times , on-off ratio: 0.5s:0.5s
Environment Parameter	Operating Temperature	-40°C~85°C
	Operating Humidity	20% RH ~85%RH
	Storage Temperature	-40°C~85°C
	Storage Humidity	20% RH ~85%RH
Weight		Approx. <600g

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Technical Specifications

Characteristic curves

Diagram of Curves for Current Endurance



Characteristic curves notes

1. The curve data is provided for design reference. Actual verification shall prevail during component selection and short-circuit matching of fuses.
2. Bus bars must be sized to limited terminal inface temperatures to <130°C.
3. Operation beyond the safety curve carries risks of ignition and explosion. Immediate contactor replacement is mandatory when exceeding specified parameters.
4. The safety and functional temperature rise curves are based on 85°C ambient temperature.

FaultBreak Contactor

Technical Specifications

Ordering information

	FBC	600	850	-12	N	V	-001
Series	FBC						
Load current		600: 600A					
Load voltage			Load voltage 1000: 1000VDC				
Coil voltage				12: 12VDC			
Aux. contact form					N: without A: Normally open B: Normally close		
Installation form						V: Vertical H: Horizontal	
Special code							

Note:

After the customer's special requirements are reviewed by our company, they are identified in the form of characteristic numbers.

Example:

No	Model	Model Description
1	FBC6001000-12NV-001	Product : FBC; Load rated current : 600A; Rated voltage of load : 1000VDC; Coil rated voltage : 12V; N: no aux contacts; V: Installation form : Vertical; Special code: 001, represent other characteristics of the product, including but not limited to load extraction of the contactor, coil extraction, functionality, and customer specific requirements

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