TOYOTA FUEL CELL MODULES

A SUSTAINABLE ZERO-EMISSION SOLUTION

Contact us:

TOYOTA

TOYOTA FUEL CELL MODULE (TFCM)

At Toyota we started investing in fuel cell development in 1992, and we are continuously innovating and refining our hydrogen technology. Thanks to our multiple partners in many sectors, our Fuel Cell Modules are used worldwide in a wide variety of applications.

QUALITY, DURABILITY AND RELIABILITY

Toyota's values in the automotive world have always been rooted in QDR: Quality, Durability and Reliability. The same high attention to these values is applied to our hydrogen products. This ensures that our Fuel Cell Modules are assembled with outstanding craftsmanship and offer superior safety and reliability.

SECOND GENERATION, TWO SHAPES

Our second-generation Fuel Cell Modules (TFCM2s) were first made available in 2021. To offer our customers and partners increased flexibility, we provide them in two shape packages:

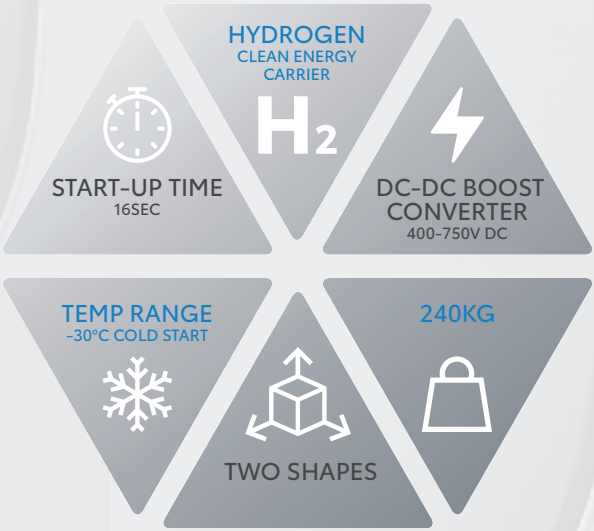
- A box shape (TFCM2s-B)
- A flat execution (TFCM2s-F).

Each type can be used as a single unit or as multiple units that can be combined to perfectly fit a specific application.

MADE IN EUROPE

Both TFCM2s types are assembled at Toyota Motor Europe's Technical Centre near Brussels, Belgium. This new facility houses a pilot assembly line following the principles of the Toyota Production System.

Toyota's second-generation Fuel Cell Modules European production facility.



BENEFITS OF TFCM2s

Versatile and flexible product line-up

- Four module variations (two shapes, two outputs) are offered for different applications.
- Modularity enables easy integration and installation.
- Wide voltage range and integrated boost converter enable direct connection to existing electrical systems.

Safety in operations

- Strict hydrogen and high-voltage safety measures are inherited from our experience with Fuel Cell Electric Vehicles (FCEV) and Hybrid Electric Vehicles (HEV).
- Suitable for a broad range of conditions in regard to temperature, altitude and vibration.

Extensive global support

- Toyota Motor Europe acts as a solution provider to ensure optimal power output, lifetime, efficiency, and overall design.

FUEL CELL BUSINESS GROUP

Toyota Motor Europe has established a dedicated Fuel Cell Business Group. Its responsibilities cover commercial, engineering, and module assembly, as well as local after-sales capabilities and spare parts supply.

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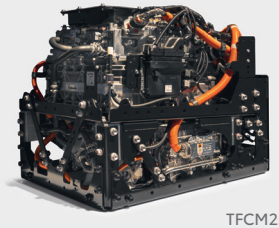
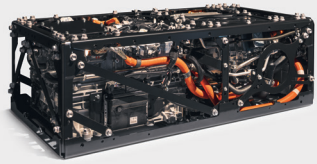
FUEL CELL MODULE OPTIONS



TFCM2s-B



TFCM2s-F

TYPE		TFCM2s-B	TFCM2s-F
DIMENSIONS (LxWxH)		880 x 630 x 690	1270 × 630 × 410
WEIGHT (except FC coolant)		Approx. 235kg	Approx. 240kg
OUTPUT POWER (NET)	Rated Power (EOL)	65kW/85kW (65kW/68kW) †1	
	MINIMUM	0kW (idle), 10kW	
	RESPONSE	40kW/sec	
OUTPUT VOLTAGE		400~750V DC (DC-DC converter included)	
EFFICIENCY PEAK (%)	STACK	66%	
	SYSTEM (incl. DC/DC converter)	56%	
TEMPERATURE RANGE	OPERATING	-30°~70°C (the maximum intake temperature is 45°C)	
	COLD START	-30°C	
	STORAGE	-40°~+85°C	
START-UP TIME	25°C	16sec	
	-30°C (COLD START)	<160sec †1	
ALTITUDE		Max. 3,400m †2	
DURABILITY		Depends on load profile and coolant temperature	
COMMUNICATION		CAN 2.0 A (11bit ID)	
ELECTRICAL POWER SOURCE		12V DC	
FUEL	HYDROGEN QUALITY	Type I Grade D (ISO14687-2 2019) (SAE J2719)	
	PRESSURE	0.89~1.60 MPa abs †3	
AIR		Ambient air †4	
COOLING		Water cooled	
VIBRATION TOLERANCE		ISO19453-6 Category2	
INGRESS PROTECTION		IP66 & IP67 (excl. ACP breather)	
DESIGN STANDARDS†5		GTR13 / UN-R134 / UN-R100 / ISO 26262 †6 / ISO 6469-2,-3 / ISO 23273	

†1 Based on customer request and usage condition. †2 Over 500m altitude operation may affect durability and performance.
†3 Minimum pressure depends on EOL power requirements. †4 Filter for severe environment is possible.
†5 Product designed according to listed standards. †6 Defined with customer.

Contributing to the UN Sustainable Development Goals, Toyota is working to achieve carbon neutrality in its entire business across Europe. Toyota views hydrogen as one of the key building blocks towards carbon neutrality, using fuel cell technology for mobility and in the wider economy beyond transport. As a hydrogen frontrunner and constant innovator, Toyota's advanced fuel cell technology is already integrated into passenger cars, buses, trucks, trains, marine and stationary applications for a range of business customers and other OEMs.