



GE VERNOVA

MM7 MODULAR MULTILEVEL CONVERTER (MMC)

Having the right partner is as vital as having the right technology.

Around the world, industrial customers, renewable/utility, and rail grid operators are facing growing challenges of increasing grid availability, improving power quality, to meet growing energy demand, improved reliability, and scalable solution to address the complex market needs.

Based on the proven and mature MV7 technology, Power Conversion has developed the answer - a modular multilevel converter, the MM7.

The MM7 provides a modular approach to achieve a customized solution across different applications. It is a multifaceted premium converter (Transformerless, N+1 or 2 redundancy, lower losses, remote support capabilities, and grid monitoring) that improves power quality to meet grid requirements, increases operational efficiency for industrial application, and provides higher availability.

How do we meet today's customer requirements?

Today customers aim for highest operational efficiency and the highest possible availability. Thanks to our modular design, transformer less solution with standard in built submodule redundancy, we are able to increase MTBF (Mean Time Between Failure) as well as decrease MTTR (Mean Time to Repair). In addition, we provide an increased system performance, thanks to a modular multilevel design and active filtering on grid side.

We understand, assessing the total cost of ownership is what defines the value in the long run. When choosing among alternatives in a purchasing decision, buyers should look not just at an item's short-term price, known as its purchase price, but also at its long-term price, which is its total cost of ownership. The item with the lower total cost of ownership is the better value in the long run. With MM7 we can offer a solution that lower overall investment cost due to reduced footprint and lower operating expenditure thanks to significantly longer maintenance cycle, redundant and reliable system.

TECHNICAL FEATURES

- Scalable up to 300MVA, 36kV in power through standard and modular power cells arrangement
- Redundancy N+1 - containment of single failure at local submodule level
- Reduced inventory
- Transformerless solutions are available at system voltage up to 36kV
- Simplified cooling system architecture
- Active Filtering
- Proven Power Stack with robust case rupture free press pack IGBTs

ADDITIONAL BENEFITS

- Increased system stability and power quality (including P_{st} flicker for EAF)
- Decreased down time
- Low harmonics without additional passive components
- Four quadrant operation for regenerative applications
- Transformer-less design allows for compactness
- Visor Connect supports warranty with remote monitoring and diagnostics

The advantage of MM7 technology

Optimized performance

Increased system stability and power quality.

Increased efficiency

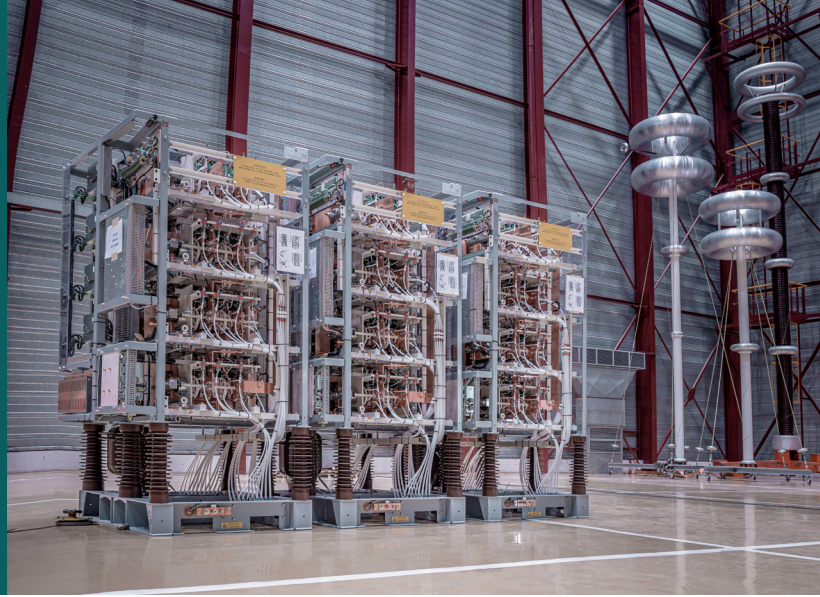
The active part efficiency increases up to 99.3%.

Reliable availability

MM7 provide a high level of planning security and will protect you from unplanned downtime.

Smart investment

Overall system's cost of ownership is competitive to available marketed solution



MM7 uses high power cells in series to achieve scalability up to 300MVA and 36kV. (Design based on the example of STATCOM)

HIGH RELIABILITY AND AVAILABILITY

Over 14 million hours in operation across an installed base of over 15+GW speaks for itself. MM7 is based on a proven and mature technology, just taken to the next level. With its multiple configuration options its adaptable to wide range of industry applications.

Various configurations are possible - at improved delivery time and competitive price.

SYSTEM DATA

	O&G OFFSHORE	RAIL	HYDRO	INDUSTRY	
Application	Electrification SFC / MVDC	SFC	PSP	STATCOM EAF	STATCOM Renewable
MV quantity on same network	1	1-2	4-8	1	1
Configuration	AFE/AFE Tx-less	AFE/AFE	DFE / AFE	MMC Tx-less	MM7 Tx-less or w/trafo
Output/ connection voltage	11-13.8kV MVDC up to 100kVdc	15kV-16Hz2/3 15kV-25Hz	10-20kV	13,8-36kV	13,8-36kV
Voltage fluctuation	+/- 10%	+/- 10%	+/- 10%	+/-10%	+/-10%
Input frequency	50Hz/60Hz	50/60Hz	50/60Hz	50/60Hz	50/60Hz
Network PF control	Yes	Yes	Yes	Yes	Yes
Type motor	Induction or synchronous	NA	SM	NA	NA
Power range	30-150MW	15-50MW	40-150MW	30-300Mvar	30-80Mvar



GE VERNOVA

Our services – a focus on availability

We understand the vital importance of process availability – and our focus on service keeps us actively engaged, both when things are going right, and when they are going wrong.

Our world-class Global Customer Service and Support Center is available 24/7, 365 days a year. Our strategic distribution centers and authorized distributors are there to ensure we will quickly fulfill your genuine replacement part needs, no matter where you are located.

With a comprehensive global network of service engineers and technicians, Power Conversion is uniquely positioned to provide the knowledge, experience, and skills for your full range of industrial service requirements. From system design to maintenance and outage support, we have the resources and capabilities to advance your equipment's performance and reliability.

We also provide managed system upgrade paths for our legacy systems and has significant experience in replacing systems from other manufacturers with low disruption to the existing infrastructure.

Remote support

Connectix, Power Conversion's remote diagnostic and support system, is based on highly secure satellite communications links. It enables our experts, regardless of their geographical location, to look over the shoulder of your onsite equipment operator or technician and advise and assist you on fault finding and resolution. We understand the vital importance of process availability – and our focus on service keeps us actively engaged, both when things are going right, and when they are going wrong. Through our Maintenance+ Service Agreements, we can continuously monitor health status of your assets and provide you on time solutions and advice for your imminent issues, before they happen.

Overall system, project, and service capabilities

Our offerings cover each step of your project, namely conceptual design, engineering, manufacturing, equipment transportation and commissioning of the plant.

We will accompany you from the initial talks, system analysis, consulting, and sales pitches to the handover of the commissioned plant. From our perspective, overall system engineering (during planning phase) along with experienced project managers (during execution phase) are key to success – our system consultants work with you on finalizing the requirements and project managers coordinate the individual contractors, immediately perceive uprising challenges, and manage them in a structured and well organized manner.

Productive Process Analysis

- Site survey & measurement
- Technical regulations compliance
- Rotating train productivity and efficiency study
- Service maintainability, availability and reliability study

Integration and Testing

- Integration into existing customer site
- Type tests
- Factory acceptance tests and site acceptance tests
- Commissioning support, expert consulting & support

Project and Service Support

- Product lifecycle management
- Up-time increase
- Remote monitoring & diagnostics
- Health checks
- Control modernization & upgrades
- On demand field services engineering support, evolving to system operation profiles & needs

SOME KEY BENEFITS OF OUR SUPPORT ARE:

- Single point of contact
- Reduced call-out rates
- 24/7 availability
- Rapid mobilization of engineers
- Routine maintenance visits
- Training
- System health checks
- Spares management
- Obsolescence management



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About Power Conversion, a GE Vernova business

GE Vernova's Power Conversion business provides energy conversion technologies, systems, and services across the power and energy intensive industries, driving the electric transformation of the world's energy and industrial infrastructure.

Contact us to know more about our solutions

www.gevernova.com/power-conversion/

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