



STATCOM

Dynamic reactive power compensation

Brochure | Edition 08-/2025

Based on Innomotics
SM150/SH150 technology

INNOMOTICS

Contents

Introduction	3
Modern solution	4
Modular multi cell SH150	5
General data	6
STATCOM cabinet design	8
SM150 STATCOM air & liquid-cooled units	9
SH150 STATCOM liquid-cooled units	10
STATCOM cabinet configuration	11

Future grid stability. Dynamic reactive power compensation.

As the demand for safe, stable, and reliable electricity continues to rise, the way we manage energy must evolve. At Innomotics, we believe in building smarter infrastructure that not only keeps pace with growth — but drives it.

The Innomotics Static Synchronous Compensator (STATCOM) represents a powerful step forward in dynamic reactive power compensation. It is engineered to strengthen grid performance, enhance reliability, and unlock the full potential of modern energy systems.

Strategically deployed, STATCOM technology empowers real-time voltage regulation, facilitates seamless integration of variable renewable energy sources, and ensures precise balancing of supply and demand — enhancing grid stability and resilience in an increasingly dynamic energy landscape. It delivers continuous, high-resolution compensation across all phases, responding in milliseconds to reactive power fluctuations and switching events. This ensures a stable reactive power balance from generation through to end use.

Unlike fixed reactive power solutions such as traditional capacitor-based systems, the Innomotics STATCOM eliminates delays, instability, and resonance risks. With advanced control systems based on IGBT technology, it provides smooth, accurate reactive power management — even under unbalanced load conditions.

Whether supporting transmission networks, industrial operations, or renewable integration, Innomotics STATCOM delivers the intelligence, speed, and flexibility needed to power the future of energy.



Modern solution

STATCOM

Take control of your power regulation with a STATCOM system that dynamically generates and absorbs reactive power — ensuring smooth and stable operation. Deploy it quickly thanks to its modular design, and stay flexible for future expansions. You'll benefit from a compact footprint and lower installation costs compared to traditional solutions. Operate efficiently with minimal power losses, even in environments where space is limited. Plus, you can rely on steady-state negative sequence current to effectively mitigate voltage unbalance.

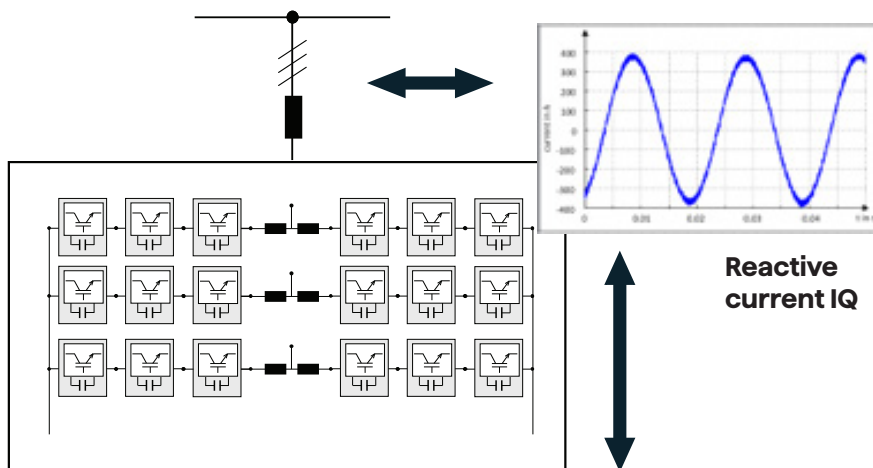
And that's just the beginning. Discover even more advantages:

- High dynamic software and hardware control
- One system with different functionality
- Low maintenance costs (no mechanical switching devices)
- Delivers superior transient response (response time less than 2 ms)
- Capable of power oscillation damping
- Capable of fast dynamic voltage compensation

Industrial applications:

- Dynamic reactive power compensation
- Power oscillation damping
- Dynamic voltage compensation
- Reactive power balance
- Power factor correction $PF = 1$
- Motor starting compensation

Innomotics modular multi cell SH150



+ Modular multi level converter grid friendly converter

+ Marine classification for harsh corrosive environments

+ Robust & reliable with cell redundancy

+ Transformer-less

+ Liquid cooled with optimized thermal management

+ Low harmonics

General data

General data	
Control method	Closed loop current control & open loop voltage control
Voltage control with droop	Yes
Power factor control	Yes
Reactive power control	Yes
Reactive current control	Yes
Negative phase sequence comp	On request
Power oscillation damping	Yes
Transient voltage control	Yes
Dynamic voltage compensation	Yes
Voltage	MV connection with /without transformer
Frequency	50/60Hz
Efficiency	>98%
Short circuit withstand	25kA 0.5 second
LVRT	Yes
HVRT	Yes (typically 1.1 V pu application specific, higher HVRT on request)
Fault ride through	LVRT, HVRT, LFRT, HFRT * on request
Response time	Less than 2ms delay, and 10% to 90% in 20ms
Interface	
Analogue inputs	x2, + - 10 V or 0 to 20 mA
Analogue outputs	x2, + - 10 V or 0 to 20 mA
Digital inputs	6+, +24 V Opto
RTD monitoring	Optional
Relay outputs	3+, (240Vac)
Voltage & current	x2, voltage and current sensing modules

General data			
Communication	Modbus TCP/IP, modbus RTU		
	Profinet, Profibus-DP		
	CAN Bus		
	IEC 61850,		
	IEC 60870-5-101, IEC 60870-5-104		
Mechanical data			
Degree of protection	IP20/IP4x/IP54		
Protection class	I acc. to EN 61800-5-1		
Touch protection	EN 50274 for the intended purpose		
Paint finish	RAL 7035		
Type of cooling	Forced air cooling AF acc. to EN 60146 or Liquid cooled		
Ambient conditions	Storage	Transport	Operation
Ambient temperature	-25.....+70°C	-25.....+70°C	+40°C upto +50°C with derating
Liquid cooled			+40°C
Relative humidity (Condensation not permissible)	5....95%	5....95% (at 40°C)	5....95% (at 40°C)
Climatic conditions	Class 1K4 to EN 60721-3-1-3	Class 2K3 to EN 60721-3-2	Class 3K3 to EN 60721-3-3
Environmental class harmful chemical substances	Class 1C2 acc. to EN 60721-3-1	Class 2C2 acc. to EN 60721-3-2	Class 3C2 acc. to EN 60721-3-3
Organic/biological influences	Class 1B1 acc. to EN 60721-3-1	Class 2B1 acc. to EN 60721-3-2	Class 3B1 acc. to EN 60721-3-3
Degree of pollution	2 acc. to EN 61800-5-1	2 acc. to EN 61800-5-1	2 acc. to EN 61800-5-1
Installation altitude	Up to 2000m above sea level without derating, > 2000m, see derating data		

STATCOM cabinet design



Innomotics STATCOM units are available in IP43 cabinets for indoor installations. Outdoor container arrangements are available on request.

Standards

ISO 3744*	Specifies methods for determining the sound power level or sound energy level
ISO 13849 - 1*	Provides safety requirements and guidance on the principles for the design and integration of safety-related parts
IEC 60146 - 1 - 1*	Specifies the requirements for the performance of all semiconductor power converters
IEC 61346 - 1*	General principles for describing the structure of information about systems
IEC 61800 - 2	Specifies energy efficiency indicators of power electronics
IEC 61800 - 3	Specifies electromagnetic compatibility (EMC) requirements

* Only as far as referenced in the standards IEC 61800-3 or IEC 61800-5-1

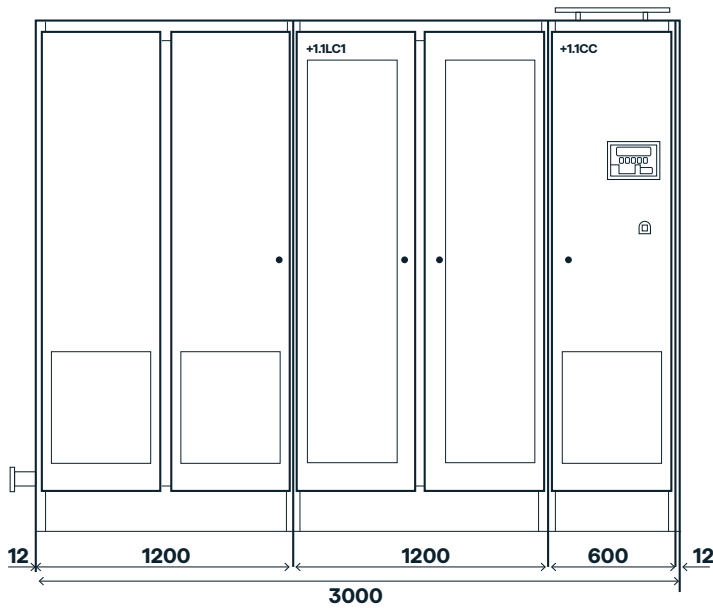
Innomotics SM150

Technical specifications – air & liquid-cooled units				
		SM150 4MVA _r	SM150 4.5MVA _r	
Cooling type		Air-cooled		Liquid-cooled
Rated power STATCOM				
Rated power @ 40°C	kVA _r	4000	4500	
Rated voltage (3 AC)				
Rated voltage	V	3700	3700	
Line rated current (3 AC)				
Rated current I _{rated I}	A	800	1000	
Maximum current I _{max I} for 3 s	A	800	1000	
Auxiliary power supply				
230 V AC	A	4	4	
400 V AC	A	43	20	
Power loss, max				
At 50 Hz	kW	59	73	
At 60 Hz	kW	59	73	
Cooling air requirement	m ³ s ⁻¹	4.7		
Cooling liquid requirement	l/s		283	
Sound pressure level L_{pA}				
(1m) at 50/60 Hz	dB	85	76	
Cable Cross Section				
DIN VDE	mm ²	3×240	3×240	
AWG/MCM		3×500MCM	3×500MCM	
Dimensions				
Width	mm	1800	3000	
Height	mm	2570	2280	
Depth	mm	1275	1275	
Weight	kg	2850	3500	

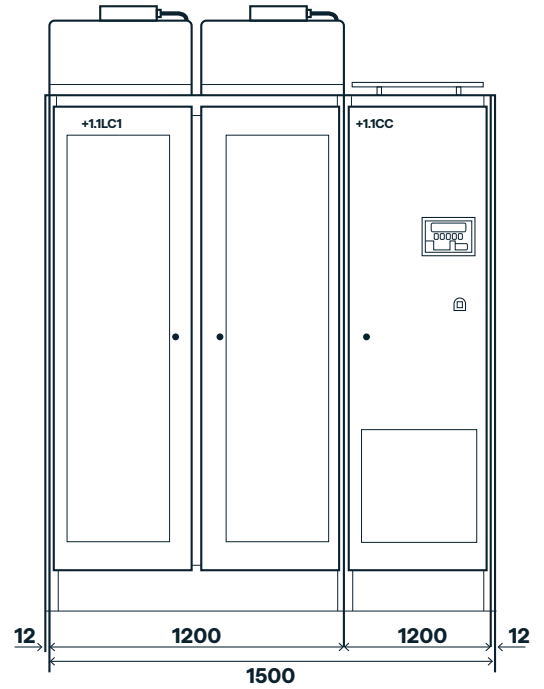
Innomotics SH150

Technical specifications – liquid-cooled units			
		SH150 13 MVar	SH150 20 MVar
Cooling type		Liquid	Liquid
Rated power STATCOM			
Rated power @ 40°C	MVar	50Hz: 13 MVar 60Hz: 15 MVar	50Hz: 20 MVar 60Hz: 23 MVar
Rated voltage (3 AC)			
Rated voltage	V	11000	11000
Line rated current (3 AC)			
Rated current I _{rated} I	A	1100	1100
Maximum current I _{max} for 3 s	A	1100	1100
Auxiliary power supply			
230 V AC	A	4	4
400 V AC	A	20	20
Power loss, max			
At 50 Hz	kW	230	330
At 60 Hz	kW	240	340
Cooling requirement			
Cooling water requirement	l/min	341	341
Sound pressure level LpA (1m) at 50/60 Hz			
	dB	76	76
Cable Cross Section			
DIN VDE	mm ²	3×240	3×240
AWG/MCM		3×500 MCM	3×500 MCM
Dimensions			
Width	mm	8940	8940
Height	mm	2832	2832
Depth	mm	1580	1980
Weight	kg	11.500	12.100

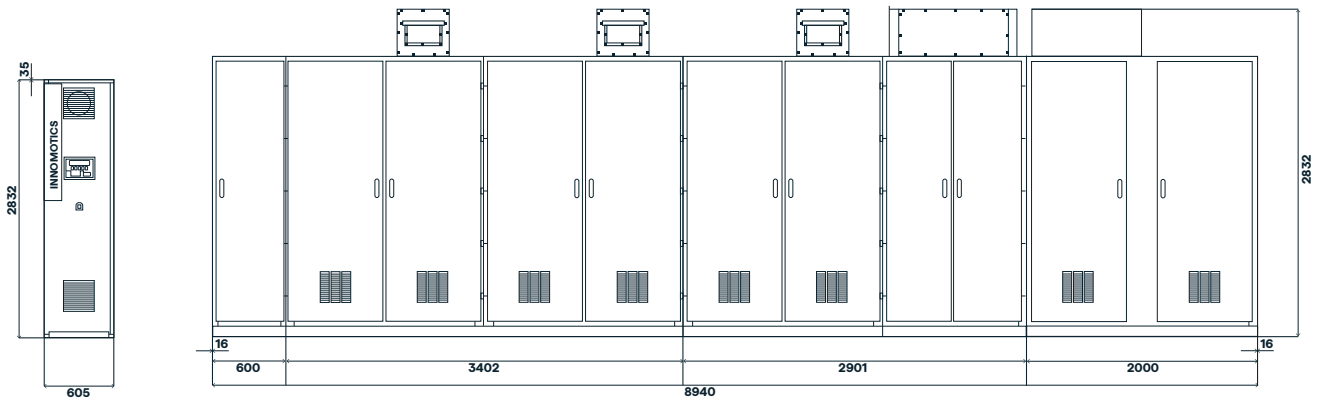
STATCOM cabinet configuration



Innomotics SM150 water cooled



Innomotics SM150 air cooled



Innomotics Perfect Harmony SH150 water cooled

reliable motion for a better tomor row

Published by
Innomotics GmbH
Vogelweiherstr. 1-15
90441 Nuremberg
Germany

© Innomotics 2025

Subject to changes and errors.

The information given in this document only contains general descriptions and/or performance features which may not always specifically reflect those described, or which may undergo modification in the course of further development of the products.

The requested performance features are binding only when they are expressly agreed upon in the concluded contract.

All product designations may be trademarks or product names of Innomotics GmbH or other companies whose use by third parties for their own purposes could violate the rights of the owners.

INNOMOTICS