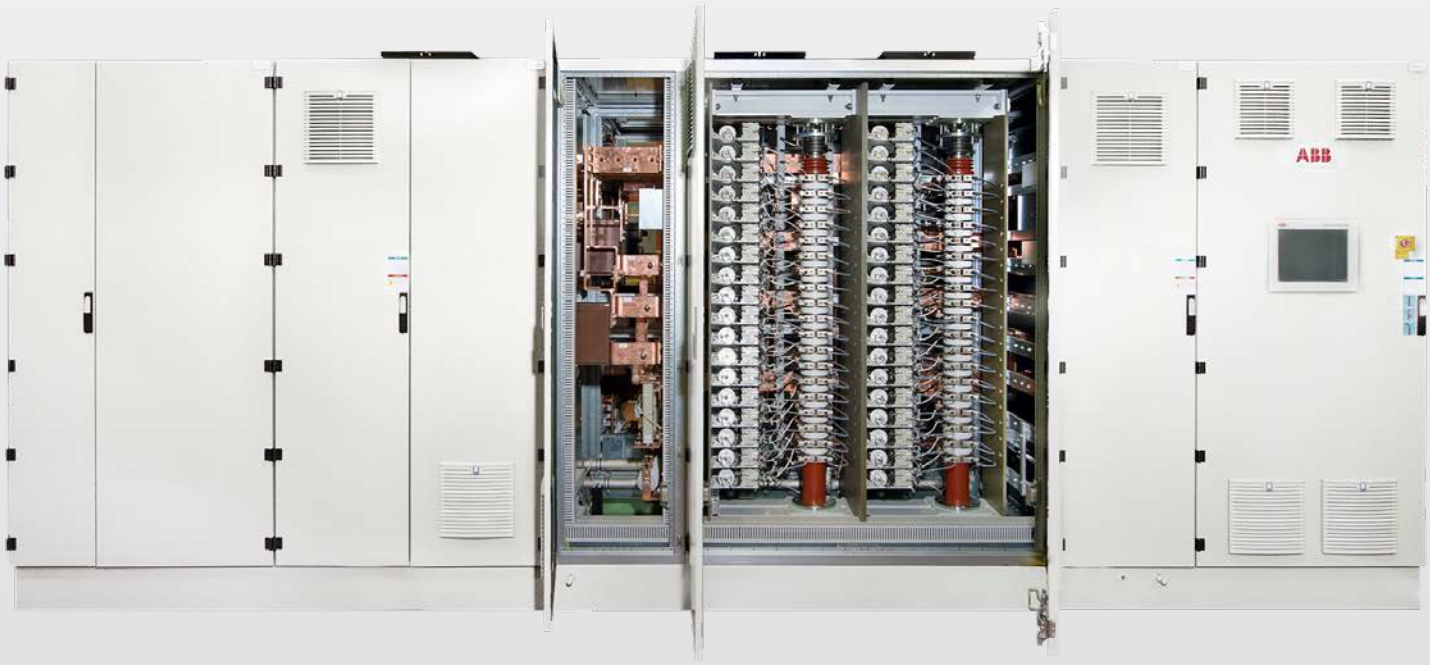
MEDIUM VOLTAGE AC DRIVES

ABB drives

MEGADRIVE-LCI

2 to 150 MW



The experience you require. The reliability you expect.

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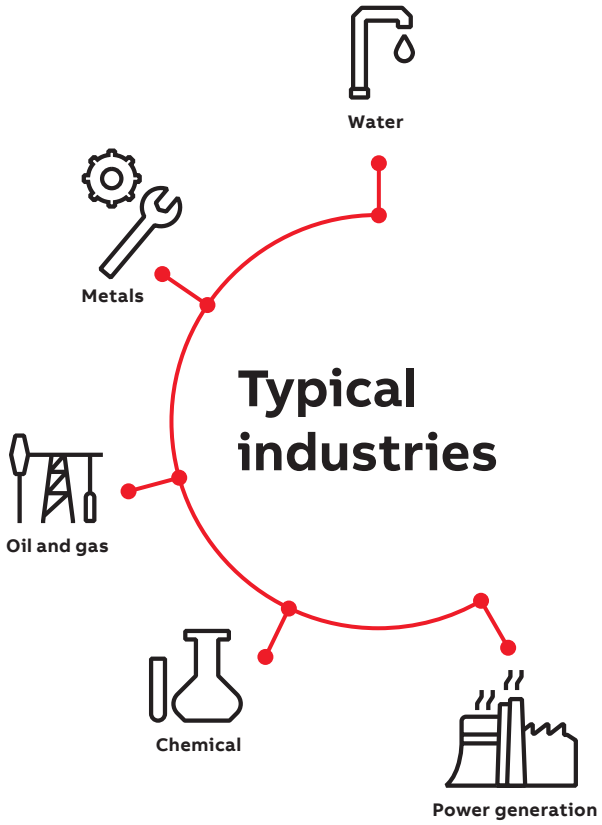
The MEGADRIVE-LCI medium voltage drive
Large synchronous motor variable speed control

The top performer for 40 years improves your industrial operations by using variable speed control and soft starting of your large synchronous machines.



The MEGADRIVE-LCI medium voltage drives are engineered drives specifically suitable for high power applications such large pumps, fans and compressors.

Industry-specific functions and unique features ensure reliable performance of your processes and systems, even in demanding environmental conditions.

Well-proven and reliable
The well-proven technology offered in the MEGADRIVE-LCI controls your high power applications and provides soft starting of large synchronous motors, reducing the impact on your network and machinery.

The larger the process and the higher the performance demands, the greater your benefits from electronic speed control. The energy savings will offset your costs of the drive system in a short time and reduced maintenance needs will help you to save additional money and time.

Thanks to many years of successful performance, the MEGADRIVE-LCI is renowned for its high availability and reliability. The drive's simple design and proven components enable trouble-free use and maximized uptime of your processes.

Get a drive solution that gives you peace of mind by ensuring efficient operation you can count on day after day, and year after year.


TAG-No.:113-KM-220-VSD
ABB

Benefits that add value

Get a drive solution that meets the requirements of your application and ensures high productivity and the optimum performance of your operations. Benefit from the built-in expertise of our medium voltage drives and take your business forward with everything working like clockwork.

Energy efficiency
Our medium voltage drives run your motors based on the demands of your process rather than running them at full speed and ensure optimized power consumption and process efficiency. In this way you can save energy and reduce CO_2 emissions.

Well-proven technology
For more than 40 years, MEGADRIVE-LCI drives and soft starters have proven their maximum reliability and availability in a wide range of industries and applications where both high power and high voltage are required.

High reliability through simple design
The MEGADRIVE-LCI features a simple, well-proven, fuseless drive design and robust thyristor components ensuring high reliability. Benefit from the drive's easy voltage scalability, minimized harmonic influence on the supply system and a converter efficiency of more than 99 percent.

Over 40 years of experience

Industry-specific solutions for individual needs
Tailored to your specific requirements, the MEGADRIVE-LCI is designed to perfectly fit your application. Use the drive to control large synchronous motors, for soft starting of large synchronous machines, or as a gas turbine starter for large synchronous generators.

Certified safety features

Model Predictive Control ensures high availability
Highest availability is achieved by using MPTC (Model Predictive Torque Control). MPTC ensures that the variable speed drive system is optimized online, and partial torque can be provided during grid disturbances.

High personnel safety
Your workforce and goods are protected from dangerous electric arcs with the arc-resistant design of the MEGADRIVE-LCI. The drive is equipped with certified functional safety features making your systems safe and reliable.

Serviceability
Easy access to all components ensures that service and maintenance for the MEGADRIVE-LCI is simple and smooth. Maintenance needs are minimized with maintenance free pumps. In addition to powerful diagnostic tools, you can profit by convenient remote monitoring.

Controlling your large synchronous motors in all industries

The MEGADRIVE-LCI allows variable speed control and soft starting of your large synchronous machines for many industrial applications.

Applications

Chemical, oil and gas
Compressors and extruders

Power generation
Starters for gas turbines and hydro pumped storage power plants, boiler feed-water pumps

Water
Pumps

Metals
Blast furnace blowers and wire rod mills

Other applications
Test stands and wind tunnels

Flexible drive system integration

To design your drive system, we consider all conditions ensuring an optimized solution for you.

Mechanical system interface
Variable speed drive systems are usually operated over a wide speed control range. They are generally subjected to torque pulsations, which occur in a broad band of frequencies. Aspects that concern the transfer of the torque between motor and driven machine have to be carefully considered when designing the mechanical system interface. A torsional study can clarify whether the shaft design is acceptable.

Power supply interface
The power system interface ensures that the converter withstands disturbances from the power system and that the harmonics from the converter do not cause distortions in the network that are non-compliant with the standards.

Automation and operator interface
The automation and operator interface is the integration of the drive system controls at the plant control level. The communication with the control room can be designed with conventional wiring using analog and binary input/output modules or with communication interfaces for serial data exchange.

Environment
Country and plant-specific characteristics have to be taken into account when designing a drive system. Equipment dimensions and weight, installation restrictions, the cooling medium and the power network have to be clarified. In addition, demands on environmental compliance, protection classes, electromagnetic compatibility (EMC) and noise emission need to be considered.

Optimized solution for your requirements

More efficiency with drive packages

Packaged drive solutions provide you with ultimate efficiency and reliability to optimize your cost of ownership.

All-in-one package
Committed to supporting you in your business, we offer packaged drive solutions for applications in various industries. Customer-specific drive packages including medium voltage converters, motors and transformers can be developed as turnkey solutions meeting your individual requirements.

Matched performance
To ensure design integrity and an optimum match of equipment, ABB products have undergone combined tests ensuring performance predictability for your application.

Single point of contact
The combined power of the ABB offering is geared to deliver on customer expectations. We deliver motor-drive solutions that support your technical and commercial needs, from quotation, through delivery and service, over the entire product life-cycle.

Converter motors
With ABB's motors you will benefit from high versatility, reliability and simplicity.

Converter transformers
ABB offers converter transformers for all ratings, as well as for indoor or outdoor mounting. Particularly designed for operation with variable speed drives, the transformer adapts the converter to the supply network and provides a galvanic isolation between drive and supply network.

Well-proven solution with unique features

Reliable and simple design
The MEGADRIVE-LCI uses well-proven components, which are specifically designed for high power and high voltage applications.

Thyristors
Thyristor power semiconductors are developed for high powers, highest reliability and low losses. They have low on-state and switching losses, which results in a converter efficiency of 99 percent, including the DC reactor. Its redundant power components allow reliability and availability to be further increased.

Rectifier
The rectifier is line commutated and forms a fully controllable DC current source in conjunction with the reactor in the DC link. 6-, 12- or 24-pulse rectifier configurations are available for minimized harmonic influence of the converter on the supply system. The MEGADRIVE-LCI meets the most stringent requirements for current and voltage harmonic distortion as defined by IEEE, IEC and EN.

Excitation converter
The excitation of the synchronous motor can be of the brushless or slip ring type. The excitation converter provides the motor field current in the entire speed range and at standstill.

Inverter
Thyristors in the inverter electronically switch the DC current to produce a 3-phase AC system of variable frequency and voltage for supplying the motor. The motor voltages commutate the inverter phase currents. At very low speeds (0–10 percent of rated speed), when the motor voltage is too low to guarantee reliable commutation, an artificial commutation is used. 6- or 12-pulse inverter configurations are available to minimize motor torque ripple.

Supply voltage dip ride-through
The MEGADRIVE-LCI has the ability to ride through short main and auxiliary supply voltage interruptions so that in most cases the process is not affected.

Encoderless control
Speed and rotor position encoders at the motor shaft are sensitive instruments in a harsh process environment and known to be susceptible to failures. ABB's MEGADRIVE-LCI operates without encoders, thereby ensuring a high level of availability and reducing maintenance costs.

User-friendly control terminal
An LCD touch screen provides the operator with a range of selectable displays showing information on the current status of the system in graphical and numerical form.

Energy efficient thanks to motor and generator operation
A synchronous motor, driven by a MEGADRIVE-LCI, can also be operated as a generator without additional power components. If required, the MEGADRIVE-LCI reverses the power flow and feeds the generated power back into the supply network. Regenerative operation is a cost efficient way to decelerate the motor.

Well-proven technology
As an undisputed performer offering reliable operation in even the harshest environments, the MEGADRIVE-LCI is available in power ratings up to 100 MW and beyond. Since its market introduction in 1974, the MEGADRIVE-LCI is the preferred choice when it comes to reliable and efficient operation of applications that require high power and high voltage.

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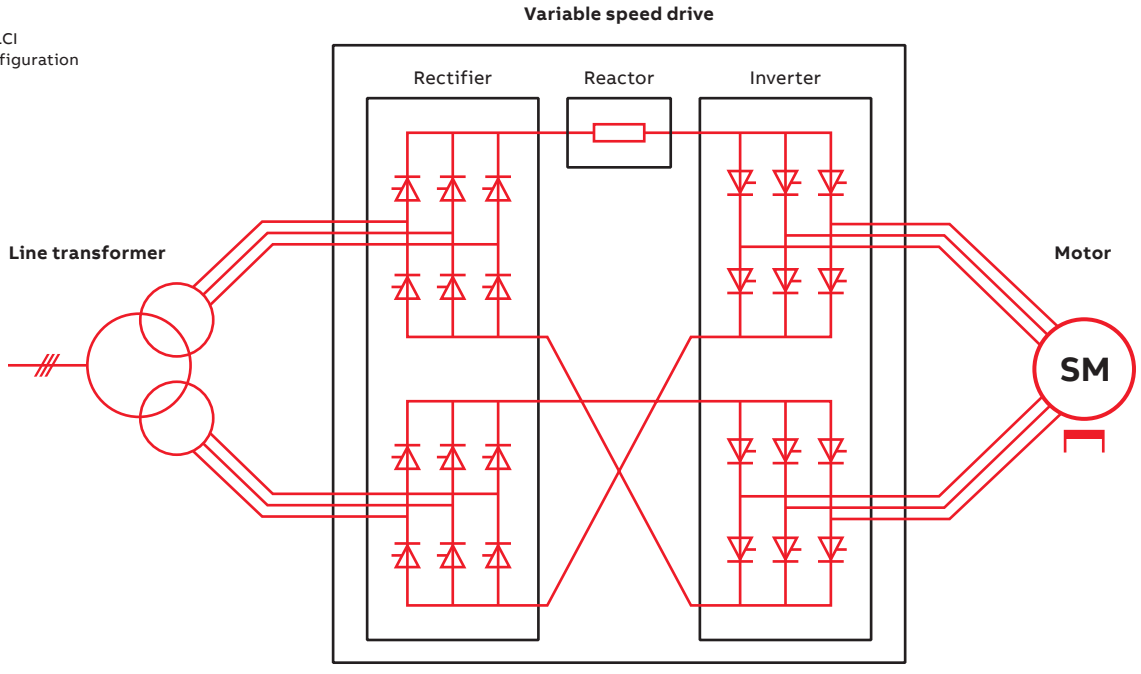
Example of MEGADRIVE-LCI converter configuration



Soft starting of large synchronous motors and generators
Direct-on-line starting of large synchronous machines causes starting currents of up to six times the nominal current and imposes large electrical stress on the supply network, thermal stress on the motor and mechanical stress on the shaft string.

These problems can be overcome with the use of a MEGADRIVE-LCI soft starter. It smoothly accelerates the motor and the load from zero to nominal speed, then the motor is automatically synchronized to the power system and the circuit breaker for fixed-speed operation is closed.

There are various starter configurations available that will reduce the starting impact on your network and machinery, and increase the lifetime of your equipment. With a single MEGADRIVE-LCI soft starter the sequential starting of several machines, even of different power ratings, is possible, to reduce your investment costs.

Gas turbine starters
Gas turbines often have to be started and run up quickly at short notice. MEGADRIVE-LCI gas turbine starters use the generator as motor and run it up to a speed that is above the ignition speed of the gas turbine. The gas turbine can then accelerate the generator independently to rated speed and synchronize it to the power system.

Drive robustness
The MEGADRIVE-LCI features a robust drive design combined with a state-of-the-art control method.

MPTC (Model Predictive Torque Control)
Installed in the MEGADRIVE-LCI, MPTC uses a control algorithm based on Model Predictive Control that ensures that the drive continues to operate during power and grid disturbances. MPTC enables advanced services like power factor optimization or even advanced process control and protection.

Fuseless design
The high, non-repetitive surge current capability of today's thyristors allows the design of fuseless converters, resulting in less spare parts and higher reliability. In case of a failure, a fast overcurrent protection immediately blocks the thyristor firing and initiates the opening of the main breaker.

Series connection for higher voltage and redundancy
Increasing the voltage by using thyristors in series connection, scales the MEGADRIVE-LCI up to very high powers. In addition, series connection allows the implementation of thyristor redundancy (n+1).

High level of personal and equipment safety
Electric arcs represent a hazard source for people and goods. For systems where large and dangerous arc fault currents can occur, special attention is required. Therefore, the MEGADRIVE-LCI features an arc resistant design to protect people and equipment and eliminate unnecessary production stops.

The MEGADRIVE-LCI is equipped with SIL (safety integrity level) and PL (performance level) certified functional safety features making your systems even safer and more reliable.

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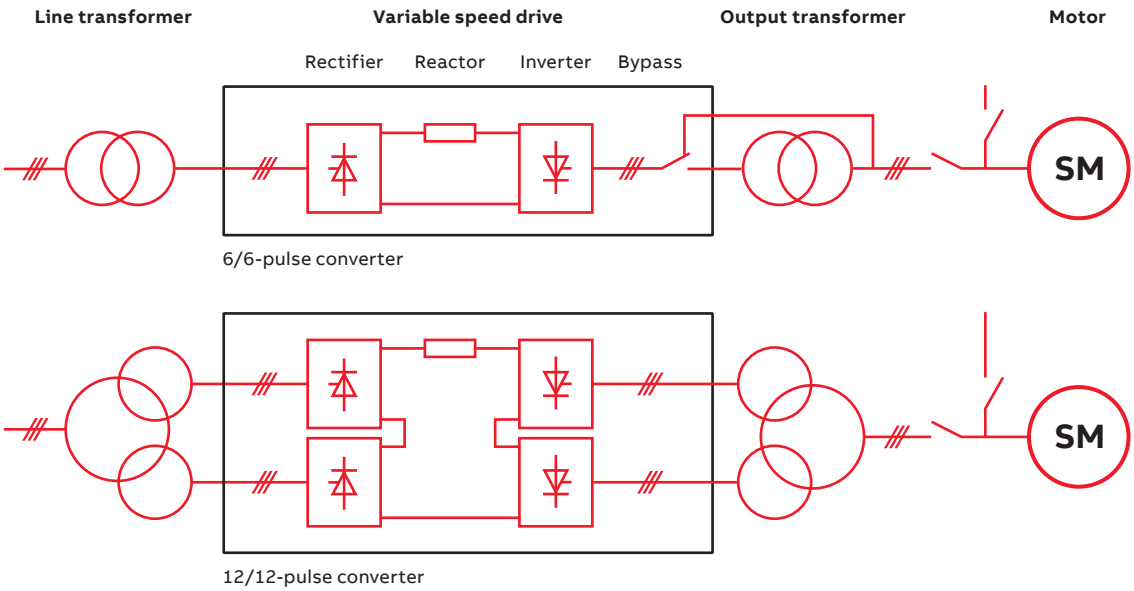
Examples of MEGADRIVE-LCI soft starter configurations



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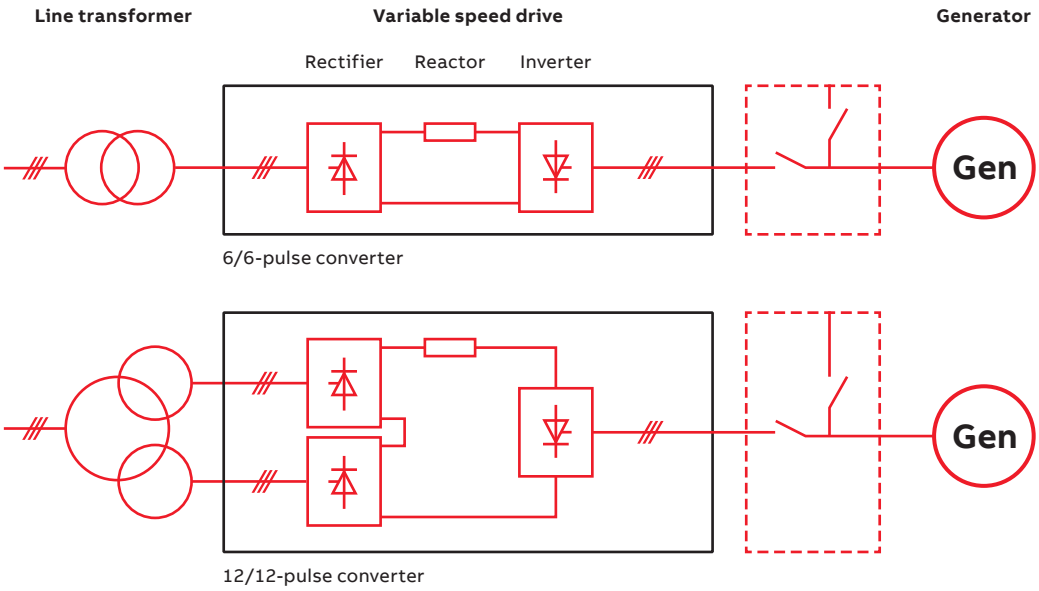
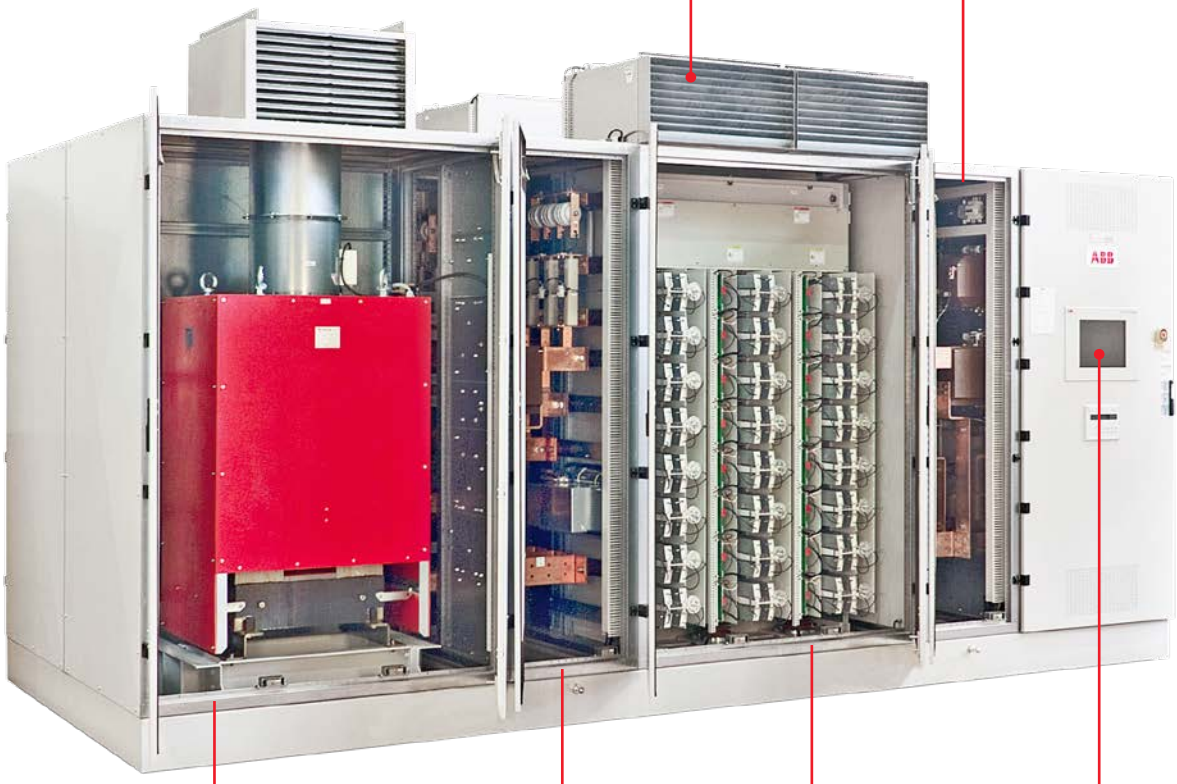
Examples of MEGADRIVE-LCI gas turbine starter configurations



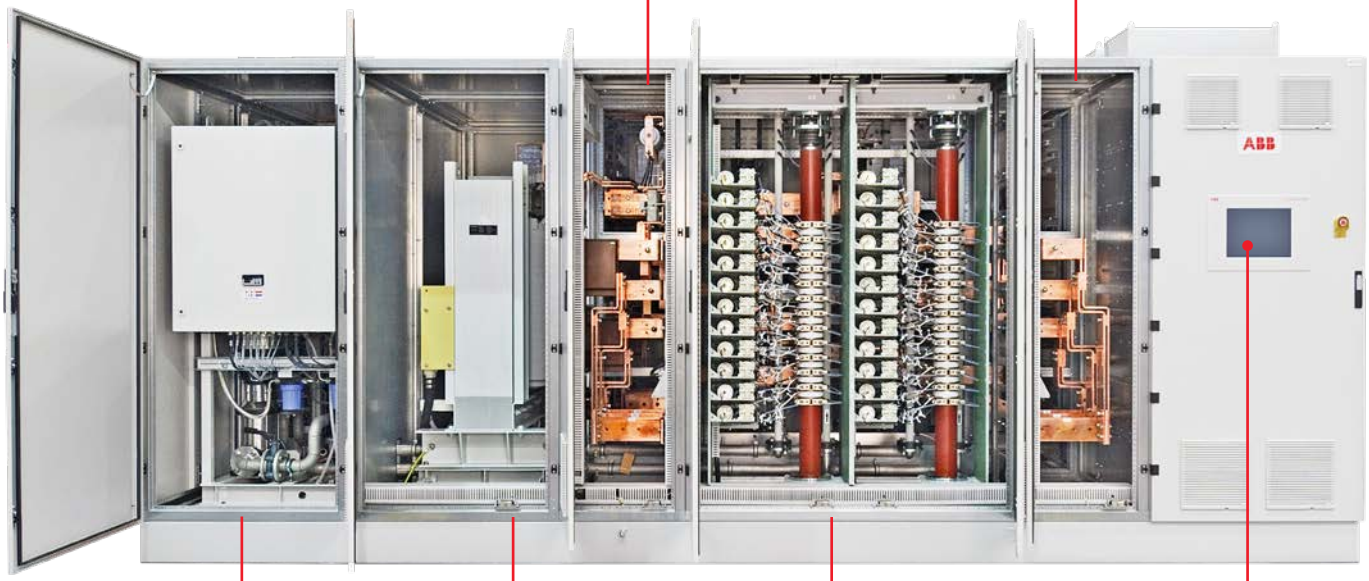
Air-cooled MEGADRIVE-LCI

The air-cooled MEGADRIVE-LCI is used as soft starter and for driving your applications in the lower power range.



Liquid-cooled MEGADRIVE-LCI

Increase efficiency with a liquid-cooled drive resulting in minimized losses into the equipment room and resistance to dusty and aggressive atmospheres.



Technical data

Input	
Input configuration	6-, 12- or 24-pulse thyristor rectifier
Input voltage	Any voltage level can be applied to the appropriate primary side of the MEGADRIVE-LCI input transformer.
Input voltage variation	±10% without derating +20/-50% with derating using MPTC (ride-through below -50%)
Input frequency	50/60 Hz
Input frequency variation	±5%
Input power factor	Approximately 0.85 inductive at rated speed/load
Input harmonics	IEC 61000-2-4, IEEE 519, GB/T 14549-93 compliance possible
Auxiliary voltage	380 to 690 V AC 50/60 Hz, 3-phase, ±10%
Control voltage	90 to 300 V DC or 90 to 265 V AC 50/60 Hz, ±10%
Output	
Output power	2000 to 150000 kW (higher on request)
Output voltage	2 to 2 x 10 kV (2 x 25 kV)
Output frequency	0 to 120 Hz
Motor type	Synchronous
Efficiency of converter	>99%
Mechanical	
Enclosure	Standard: IP30 Optional air-cooled: IP31, IP41 Optional liquid-cooled: IP31, IP41, IP54
Cable entry	Bottom (optional from top)
Environmental	
Altitude	1000 m.a.s.l. (higher with derating)
Ambient air temperature	+5 to +40 °C (higher with derating)
External cooling liquid temperature	+2 to +32 °C (lower and higher with derating)
Noise	Liquid-cooled: ≤75 dB(A) Air-cooled: ≤85 dB(A)
Cooling type	Air, liquid
Standards	EN, IEC, CE, (optional CSA)

Ratings, types and voltages
MEGADRIVE-LCI drives

Motor data			Converter data			
Nominal ratings			Type code	Power	Length	Weight
(kW)	(hp)	(A)		(kVA)	(mm)	(kg)
Liquid-cooled, 12/12-pulse						
14000	19040	2350	W1212-211N465	15000	5350	8500
24000	32640	2350	W1212-372N465	26000	6250	10000
36000	48960	2350	W1212-563N465	40000	6450	11500
46000	62560	2350	W1212-714N465	50000	8050	17000
48000	65280	2350	W1212-774N465	53000	10050	19000
55000	74800	2350	W1212-855N465	60000	13850 [1)]	22000
64000	87040	2350	W1212-986N465	70000	13850 [1)]	23000
72000	97920	2350	W1212-1107N465	80000	13850 [1)]	24000
Liquid-cooled, 12/12-pulse, with n+1 thyristor redundancy						
14000	19040	2350	W1212-212R465	15000	6050	9000
24000	32640	2350	W1212-373R465	26000	6250	11500
36000	48960	2350	W1212-564R465	40000	8050	14500
46000	62560	2350	W1212-715R465	50000	8050	18000
48000	65280	2350	W1212-775R465	53000	10050	20000
55000	74800	2350	W1212-856R465	60000	13850	23000
64000	87040	2350	W1212-987R465	70000	13850	24000
72000	97920	2350	W1212-1108R465	80000	13850	25000
Air-cooled, 12/12-pulse						
9100	12376	1600	A1212-211N465	10000	7250 [2)]	7000
15800	21488	2000	A1212-302N452	17000	4950	8000
23900	32504	2000	A1212-453N452	26000	6750	11500

Indicative information only
LCI depth in back to back configuration: 2250 mm
[1)] Increased depth to 2450 mm
[2)] No back to back configuration, depth: 1125 mm

Ratings, types and voltages
MEGADRIVE-LCI soft starters

Converter data						
Nominal ratings			Type code	Power	Length	Weight
(kW)	(hp)	(A)		(kVA)	(mm)	(kg)
Air-cooled, 6/6-pulse						
4600	6256	1800	A0606-211N465	6000	5250 [1)]	6000
8700	11832	1800	A0606-372N465	11000	5950 [1)]	7000
13100	17816	1800	A0606-553N465	17000	5250	9500
16700	22712	2200	A0606-594N452	22000	5250	10500
20500	27880	2200	A0606-715N452	27000	6750	14000
Air-cooled, 12/12-pulse						
9200	12512	1800	A1212-211N465	12000	7450 [1)]	7000
17400	23664	1800	A1212-372N465	23000	5250	9000
26200	35632	1800	A1212-553N465	34000	6750	12000
33400	45424	2200	A1212-594N452	44000	6750	13000
41000	55760	2200	A1212-715N452	54000	11950	18000
Air-cooled, 12/6-pulse						
6300	8568	1800	A1206-131/1N465	7000	7250 [1)]	7000
9200	12512	1800	A1206-171/2N465	11000	7650 [1)]	8500
16000	21760	1800	A1206-332/3N465	18000	5250	10000
17400	23664	1800	A1206-372/4N465	20000	5250	11000
23800	32368	2200	A1206-413/5N452	27000	6750	14000

Indicative information only
LCI depth in back to back configuration: 2250 mm
[1)] No back to back configuration, depth: 1125 mm

Ratings, types and voltages
MEGADRIVE-LCI gas turbine starters

Converter data						
Nominal ratings			Type code	Power	Length	Weight
(kW)	(hp)	(A)		(kVA)	(mm)	(kg)
Air-cooled, 6/6-pulse						
4500	6120	1600	A0606-211N465	5000	3850 [1)]	4500
9000	12240	2000	A0606-302N452	10000	4550 [1)]	7000
11800	16048	2000	A0606-453N452	13000	6250	8500
15500	21080	2000	A0606-604N452	18000	6250	8500
Air-cooled, 12/6-pulse						
5300	7208	1800	A1206-111/1N465	6000	5850 [1)]	5800
9000	12240	1800	A1206-171/2N452	10000	6250 [1)]	9000
11800	16048	2000	A1206-232/3N452	13000	7450	10000
15500	21080	2000	A1206-302/4N452	18000	7450	10000

Indicative information only
LCI depth in back to back configuration: 2250 mm
[1)] No back to back configuration, depth: 1125 mm

Services to match your needs

Your service needs depend on your operation, life cycle of your equipment and business priorities. We have identified our customers' four most common needs and defined service options to satisfy them. What is your choice to keep your drives at peak performance?

Is uptime your priority?

Keep your drives running with precisely planned and executed maintenance.

Example services include:
- ABB Ability™ Life Cycle Assessment
- Installation and Commissioning
- Spare Parts
- Preventive Maintenance
- Reconditioning
- ABB Drive Care agreement
- Drive Exchange

Operational efficiency

Is rapid response a key consideration?

If your drives require immediate action, our global network is at your service.

Example services include:
- Technical Support
- On-site Repair
- ABB Ability™ Remote Assistance
- Response time agreements
- Training

Rapid response

Drives service
Your choice, your future

The future of your drives depends on the service you choose.
Whatever you choose, it should be a well-informed decision. No guesswork. We have the expertise and experience to help you find and implement the right service for your drive equipment. You can start by asking yourself these two critical questions:
- Why should my drive be serviced?
- What would my optimal service options be?

From here, you have our guidance and full support along the course you take, throughout the entire lifetime of your drives.

Your choice, your business efficiency
ABB Drive Care agreement lets you focus on your core business. A selection of predefined service options matching your needs provides optimal, more reliable performance, extended drive lifetime and improved cost control. So you can reduce the risk of unplanned downtime and find it easier to budget for maintenance.

Need to extend your assets' lifetime?

Maximize your drive's lifetime with our services.

Example services include:
- ABB Ability™ Life Cycle Assessment
- Upgrades, Retrofits and Modernization
- Replacement, Disposal and Recycling

Life cycle management

Is performance most critical to your operation?

Get optimal performance out of your machinery and systems.

Example services include:
- ABB Ability™ Remote Services
- Engineering and Consulting
- Inspection and Diagnostics
- Upgrades, Retrofits and Modernization
- Workshop Repair
- Tailored services

Performance improvement

A lifetime of peak performance

You're in control of every life cycle phase of your drives. At the heart of drive services is a four-phase product life cycle management model. This model defines the services recommended and available throughout drives lifespan.

Now it's easy for you to see the exact service and maintenance available for your drives.

ABB drives life cycle phases explained:

	Active	Classic	Limited	Obsolete
	Full range of life cycle services and support		Limited range of life cycle services and support	Replacement and end-of-life services
Product	Product is in active sales and manufacturing phase.	Serial production has ceased. Product may be available for plant extensions, as a spare part or for installed base renewal.	Product is no longer available.	Product is no longer available.
Services	Full range of life cycle services is available.	Full range of life cycle services is available. Product enhancements may be available through upgrade and retrofit solutions.	Limited range of life cycle services is available. Spare parts availability is limited to available stock.	Replacement and end-of-life services are available.

Keeping you informed
We notify you every step of the way using life cycle status statements and announcements.

Your benefit is clear information about your drives' status and precise services available. It helps you plan the preferred service actions ahead of time and make sure that continuous support is always available.

Step 1

Life Cycle Status Announcement
Provides early information about the upcoming life cycle phase change and how it affects the availability of services.

Step 2

Life Cycle Status Statement
Provides information about the drive's current life cycle status, availability of product and services, life cycle plan and recommended actions.

ABB Ability™ Condition Monitoring for drives

ABB Ability™ Condition Monitoring for Drives is a service that delivers you accurate, real-time information about drive events to ensure your equipment is available, reliable and maintenable. When you have the facts, you can make the right decisions.

Make best decisions

You know your process, we know the drives. Our monitoring system provides you with data and information from the drives for your best decisions.

Reduce the risks

You have the information when needed most. Our monitoring system is continuously collecting data for you to set warning limits and to trouble-shoot potential problems.

Available on your need

You can combine Remote Assistance Service with Condition Monitoring. Our experts will always be on hand to consult with you.

Check the service availability for your drive types with your local ABB representative.

Need help?
Contact ABB or third party channel company.

abb.com/drives/services
abb.com/searchchannels

Notes

Additional information
We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

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