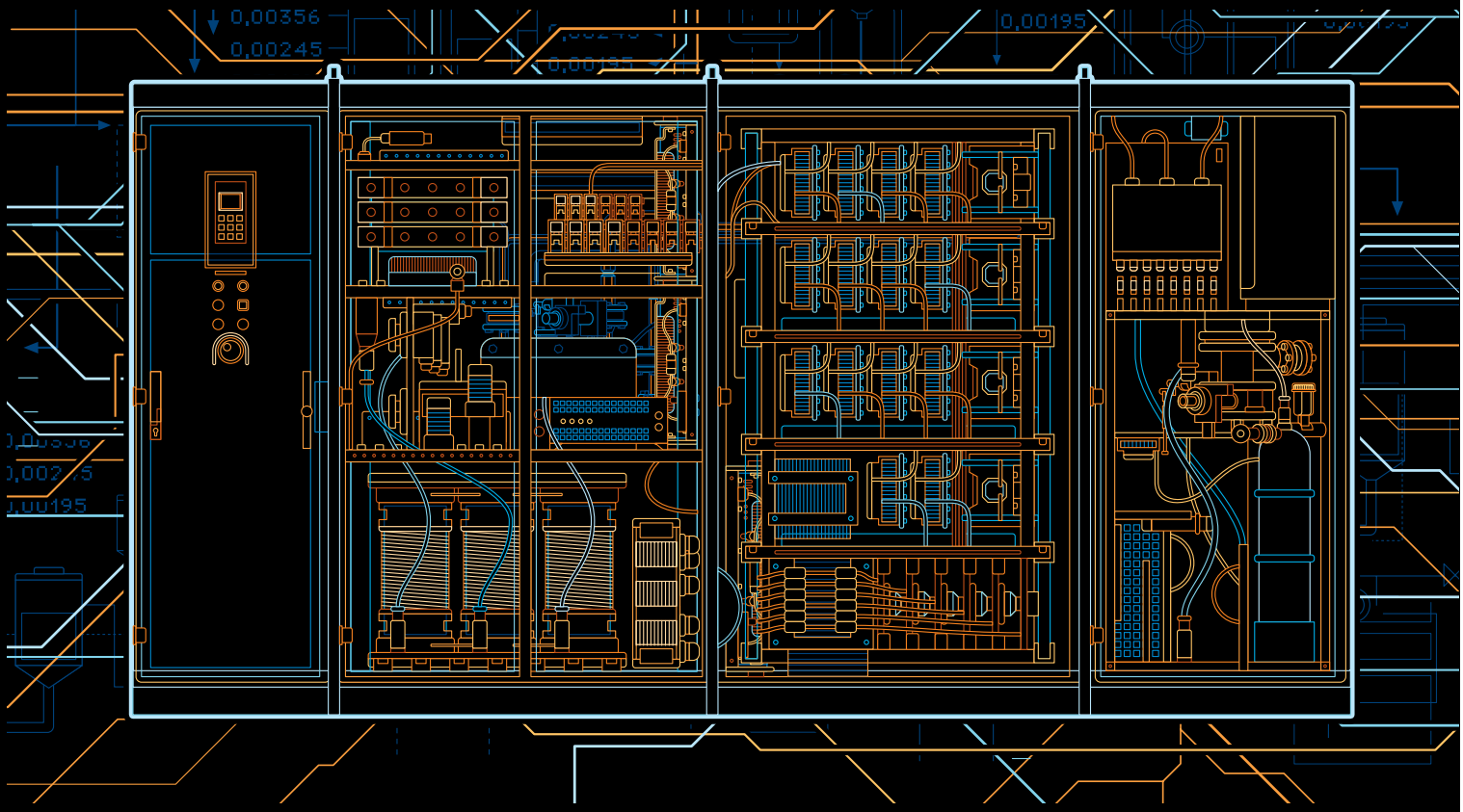


400 HP – 6700 HP, 2.3 – 4.16 kV

ACS1000 Medium Voltage Drive

The flexibility you require. The reliability you expect.

Power and productivity
for a better world™

The ACS1000 industrial drive

The ACS1000 medium voltage drive is part of ABB's industrial drives family that meets the needs of your industrial applications.

Our strong industrial drives family includes the features and functions you require, and make it easy for your business opportunities to work. They support you in improving your processes by integrating your variable speed process control needs into a flexible and comprehensive drive solution. These are our industrial drives, our benchmark of performance, expertise and quality.

The industrial drives cover a wide power and voltage range, including voltages up to 6.9 kV and powers up to 8000 HP. At the core of the drives is ABB's Direct Torque Control (DTC) technology that enables highly accurate process control.

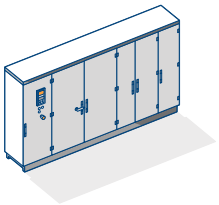
Use our industrial drives for applications such as those found in mining, cement, power, chemical, oil and gas, water and wastewater, marine, food and beverage.

Contents


ACS 1000
ACS 1000

ABB Medium Voltage Drives
Product portfolio

A broad range of variable speed drives for medium voltage applications allows you to select the drive that best meets your individual requirements. Get the perfect match for you.



ACS1000 industrial drive
Whatever your industry, the ACS1000 is an all-rounder to control your standard applications and optimize your processes.

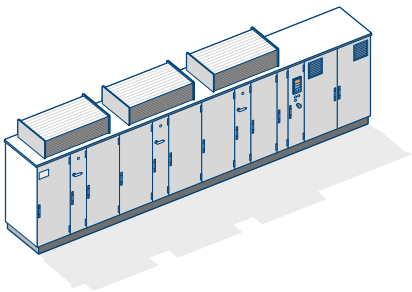
Power range
400 – 6700 HP

Output voltage
2.3 – 4.16 kV

ACS2000 industrial drive
The ACS2000 is an industrial all-rounder that perfectly adapts to a wide variety of standard applications across all industries.

Power range
300 – 4,300 HP

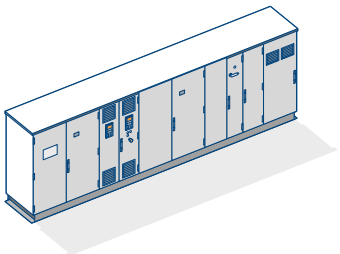
Output voltage
4.0 – 6.9 kV



ACS5000 special purpose drive
The ACS5000 effortlessly controls your high power applications such as compressors, pumps and fans.

Power range
1500 – 48,250 HP
(higher on request)

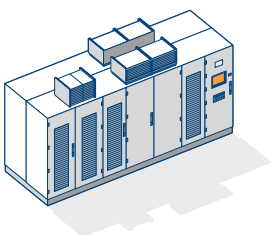
Output voltage
6.0 – 13.8 kV



ACS6000 special purpose drive
Look no further than the ACS6000 if your high performance applications require a single- or multi-motor drive solution.

Power range
6800 – 48,250 HP

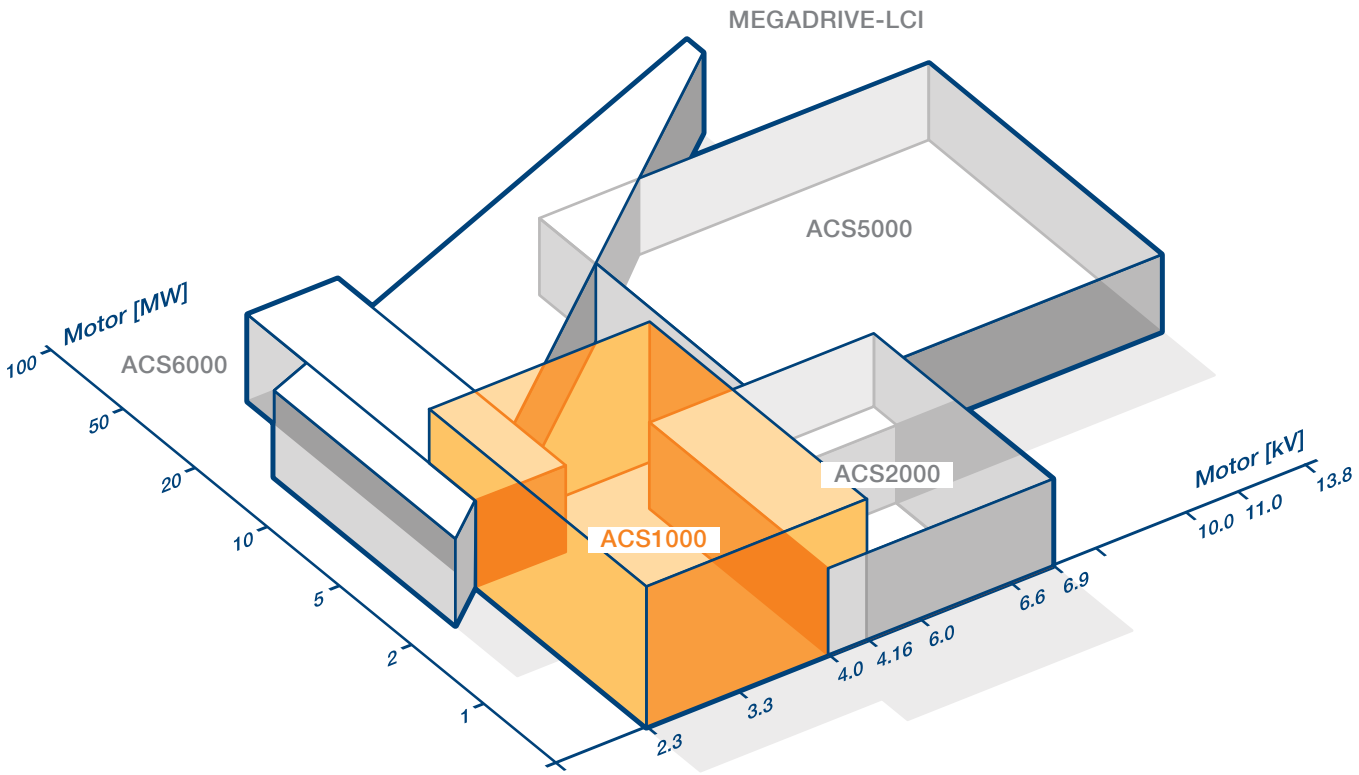
Output voltage
2.3 – 3.3 kV



MEGADRIVE-LCI special purpose drive
The well-proven technology offered in the MEGADRIVE-LCI controls your high power applications and provides soft starting of large synchronous motors.

Power range
1500 – 100,000 HP
(higher on request)

Output voltage
2.1 – 10 kV



Our product portfolio comprises medium voltage drives in the range of 250 kW to more than 100 MW.

Get more using less

Our broad portfolio of medium voltage drives will help you to increase your productivity and profitability. Your processes will use only the energy required to carry out the job and no more. Precise control ensures efficient operation with high uptime and optimized use of raw materials. This will all add up to cost and time savings for you.

Delivering global support and peace of mind

Our worldwide network offers you fast service and support around the clock, providing peace of mind by always being there when you need us.

Reliable performance you can count on

Depending on your industry and application, we provide you with drive solutions that meet your individual needs and requirements. Our variable speed drives – from 250 kW to more than 100 MW – control a wide range of medium voltage applications.

Through the use of quality components and the integration of special features our drives ensure high process availability and safety for your business. With well-proven drive technology at the heart, your operations will run smoothly and reliably every day.

ACS1000
The solution for everyday process control

The all-rounder drives a wide variety of standard applications in all industries and provides reliable motor control. The well-proven ACS1000 medium voltage drive ensures high productivity, availability and efficiency of your operations.

Flexible and reliable

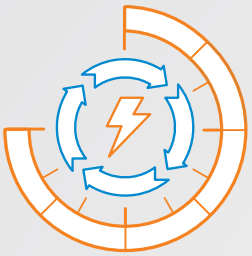
With its flexible network connections, its motor-friendly output sine filter and a constant power factor, the ACS1000 can be easily integrated into your existing or new systems.

Tailor the drive to your specific application by selecting from an extended choice of pre-engineered options. The ACS1000 is available with air or water cooling. The air-cooled drive can be supplied with an external input transformer (ACS1000) or with an integrated input transformer (ACS1000i).

Great versatility makes the ACS1000 suitable for operation in different conditions and environments.

High reliability in your daily business is ensured by the drive's simple design and robust control platform that has proven itself over many years.

ACS1000
Benefits that add value

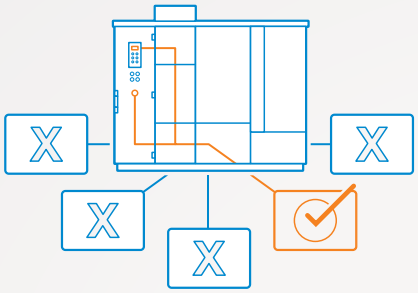


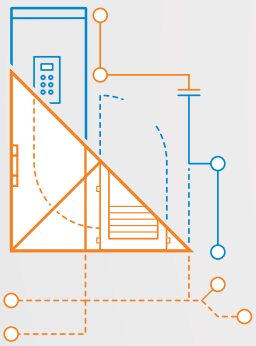
Energy efficiency

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.

Best fit for your application

The ACS1000 is the perfect fit for your standard applications in any industry. It features a range of pre-engineered solutions to control applications such as pumps, fans, conveyors, extruders and compressors, even in harsh environments.



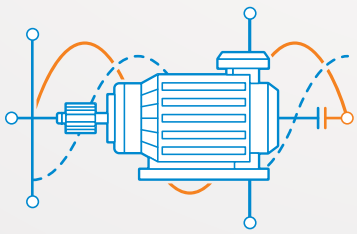


Design flexibility for smooth integration

Integrating the ACS1000 into your systems is easy and effortless. The drive can be configured with an integrated or external transformer. The flexible design concept eliminates the need for costly harmonic analyses or the installation of network filters.

Maximum motor compatibility

Thanks to the integrated output sine filter, you can drive standard induction motors, retrofit older motors and use long motor cables. Grounding configurations that comply with industry standards make the ACS1000 suitable for underground mining and special applications.

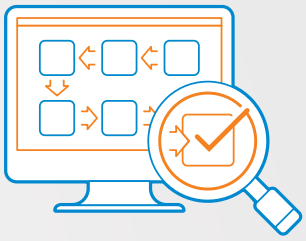


High reliability through well-proven design

Availability of your operations is ensured thanks to the simple, fuseless design. A low parts count and proven components contribute to high uptime and a long lifetime of your drive. Reliability is further increased with the drive's power loss ride-through function.

Increased productivity due to precise process control

Reduce your energy consumption and increase process efficiency with ABB's DTC technology. The drive control is immediate and smooth in any conditions, ensuring optimum output and productivity.

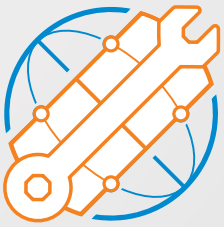


High personnel safety

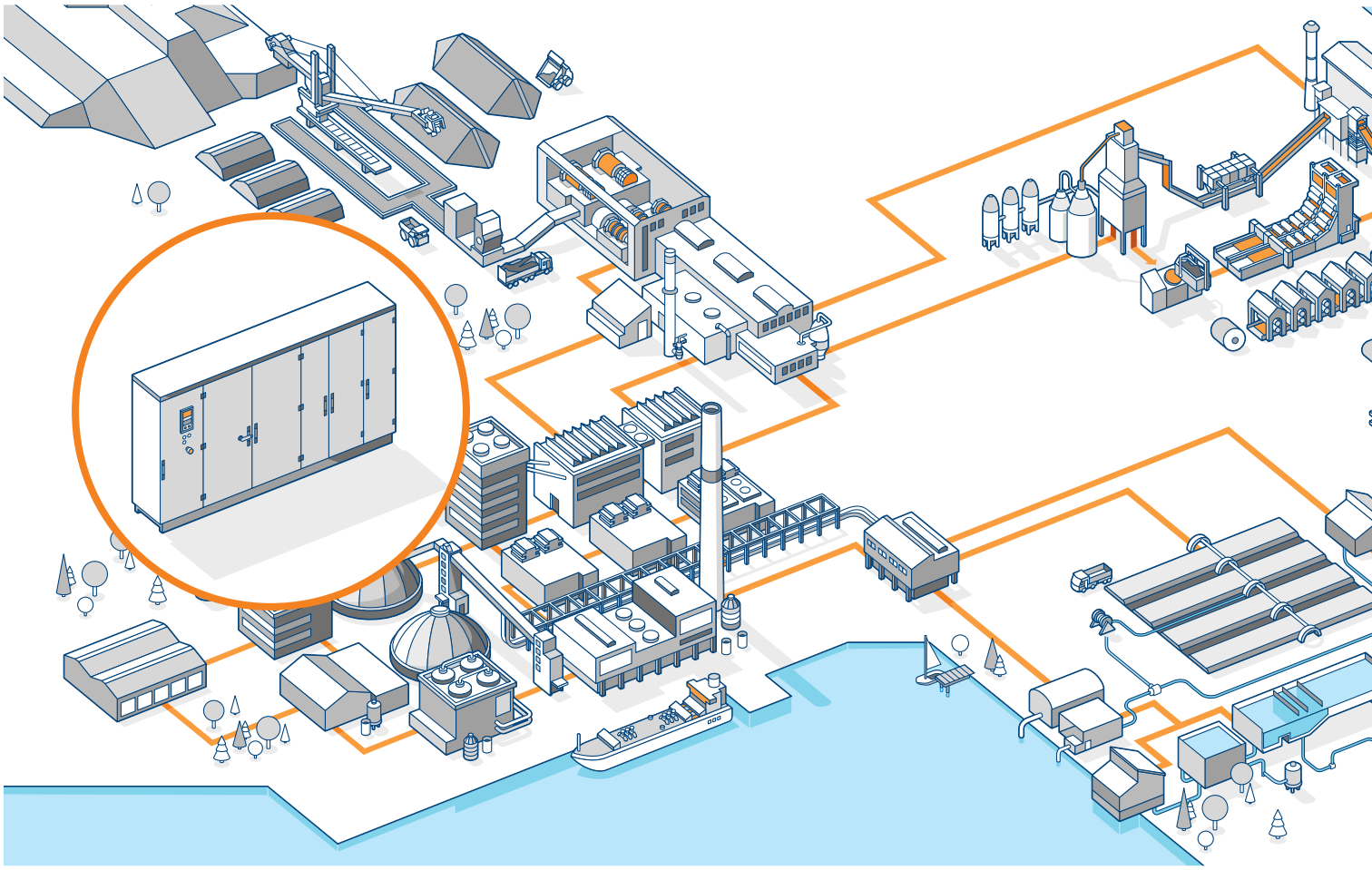
Your workforce and goods are protected from dangerous electric arcs due to the arc-resistant design of the ACS1000. Certified functional safety features and an integrated DC grounding switch make your systems safe and reliable.

Serviceability

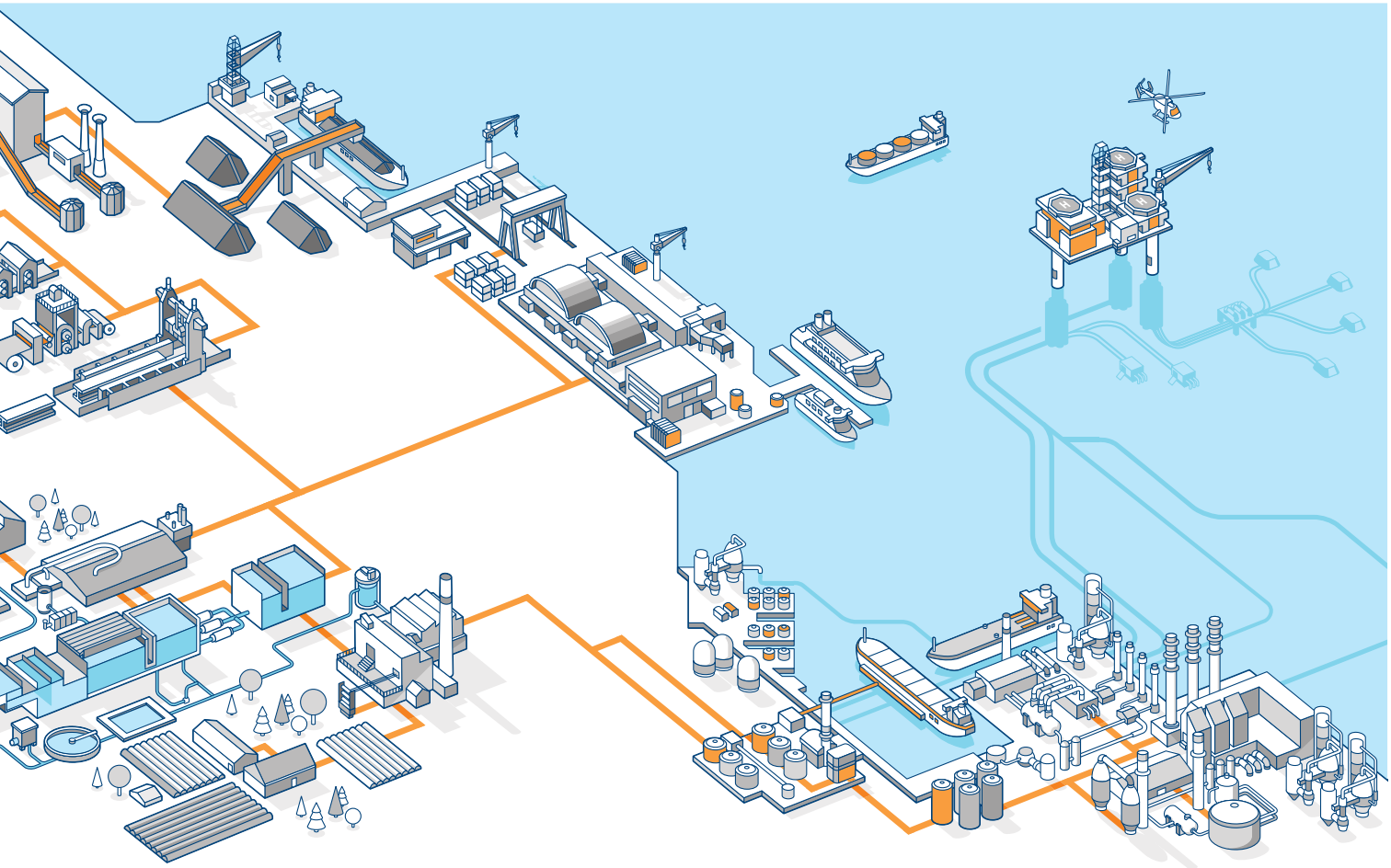
Easy front access to all components ensures that maintenance of the ACS1000 is simple and smooth. In addition to powerful diagnostic tools, you will profit by convenient remote monitoring.



ACS1000
Reliability across all applications



The ACS1000 medium voltage drive provides reliable motor control for a wide range of applications.



Applications

Cement, mining and minerals

Conveyors, crushers, mills, mine hoists, fans and pumps

Chemical, oil and gas

Pumps, compressors, extruders, mixers and blowers

Metals

Fans and pumps

Marine

Fans, pumps, compressors, propulsion and thrusters

Power generation

Fans, pumps, conveyors and coal mills

Water

Pumps

Food and beverage

Fans, pumps, sugar mills

Other applications

Test stands and wind tunnels

ACS1000
Simple drive system integration

Installing a medium voltage drive could not be easier with ABB's three cables in – three cables out concept.

Easier than you think
The ACS1000 can be easily integrated into your processes and systems thanks to its design flexibility and advanced software tools.

Transformer flexibility
You can connect the ACS1000 to the grid through an integrated or external transformer. The ACS1000i with integrated transformer makes the installation and commissioning particularly fast and simple (three cables in – three cables out). The use of an external transformer reduces the heat losses into the electrical room while decreasing your costs for ventilation systems.

Simple motor connection
The standard sine wave output filter allows easy connection of the drive with standard induction motors for your new or existing installations.

Flexible control interface
We offer an open communication concept, enabling connection to higher-level process controllers. The ACS1000 can be fitted with all major fieldbus adapters for smooth integration, monitoring and controlling of different processes, according to your specific requirements.

ACS1000
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.

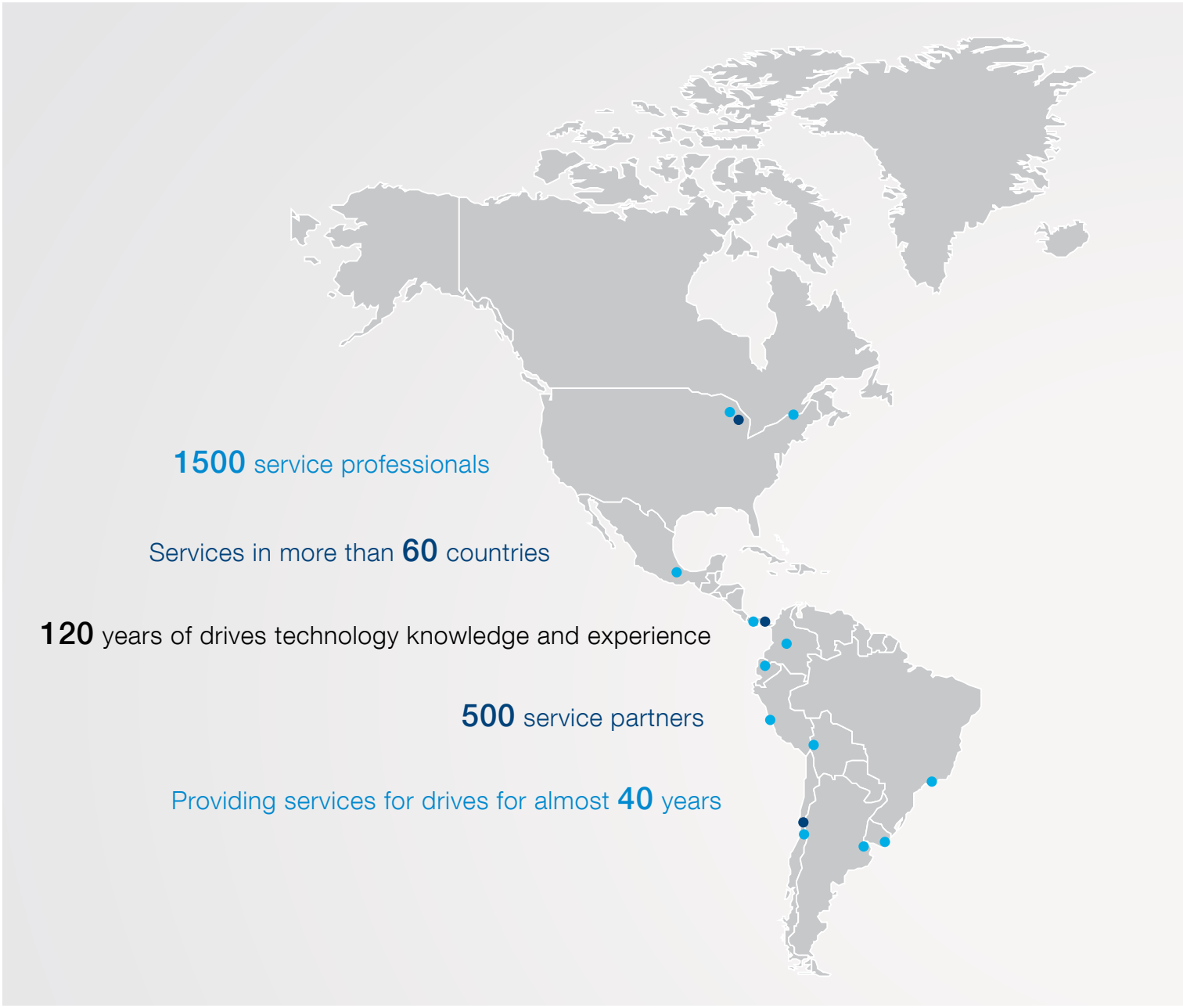
Matched performance
To ensure design integrity and an optimum match of equipment, ABB products have undergone combined tests ensuring performance predictability for your application.

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 induction motors for your applications 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.

Service and support
You choose, we respond, globally



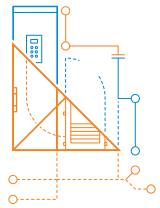
For everyone who makes the decision to choose our expert drive service solutions, we are with them every step of the way. To guide and facilitate whatever service choices suit their business, for the entire drive's lifetime. With expert service and advice and on-time delivery, every time.

For decades we have built one of the most comprehensive service networks, globally. It is well-structured to ensure you have all the experts close at hand, locally and globally. We have local drives and control service units complemented by external ABB value providers in over 60 countries. Regional service centers, training centers and authorized drive service workshops form a well-structured and large service organization, making sure that ABB drives and control service team is never too far from your site.

Regional Service Centers

Local Service Units

Technical features
Standard solution with versatile features



System design flexibility

The ACS1000 can be operated with an external or integrated input transformer, each configuration offering unique benefits.

External transformer

Depending on your needs, you can use the ACS1000 with an external input transformer. The flexible design concept enables the use of oil-filled transformers when the transformer is to be mounted outdoors.

Integrated transformer

Alternatively, the ACS1000 can be operated with an integrated dry-type transformer and, optionally, an input contactor for easy installation and commissioning.

Cooling systems

The ACS1000 is available with air and water cooling, the latter increasing overall efficiency and minimizing the heat dissipation into the electrical room, eliminating your need for additional ventilation systems.

Reliable and efficient components

The simple and well-proven design of the ACS1000 ensures high reliability for your operations.

Efficient topology

The three-level inverter, without series or parallel connected power semiconductors, is one of the least complex and most robust drive topologies.

IGCT semiconductors

The ACS1000 uses a power semiconductor known as IGCT (Integrated Gate Commutated Thyristor), which is an ideal switch for high-powered medium voltage applications. The use of IGCTs results in a low components count, providing a reliable drive.

Fuseless design

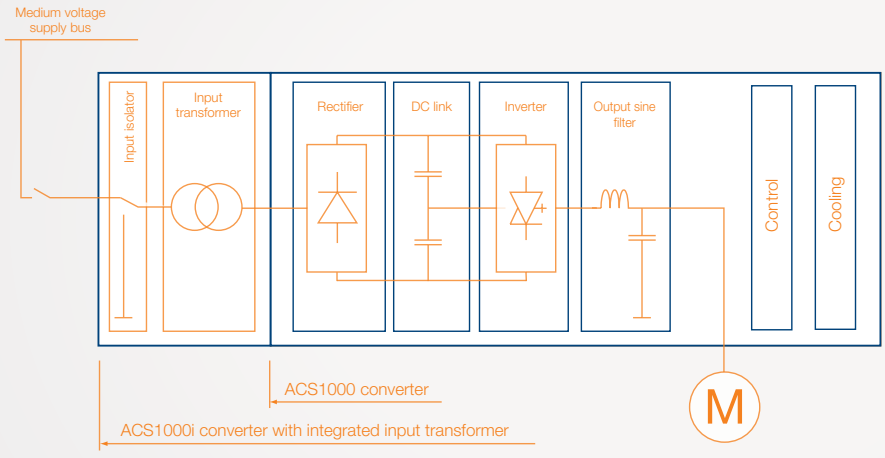
The converter design does not require any medium voltage power fuses which are known to be unreliable, costly and subject to aging. The ACS1000 and ACS1000i use dedicated IGCTs, instead, which provide faster and more reliable protection of the drive.

Long-life capacitors

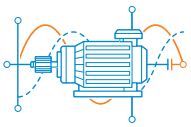
Electrolytic capacitors, which have a poor life expectancy, are not used in the ACS1000 and ACS1000i. Advanced, environmentally friendly, rapeseed oil-filled foil capacitors, designed for a long lifetime, are used instead.

Power loss ride-through

A special feature of DTC is its ability to ride through short main supply voltage interruptions so that in most cases the process is not affected.



The ACS1000 drives family's well proven three-level inverter, without series or parallel connected power semiconductors, is one of the least complex, most robust and efficient drive topologies.



Motor-friendly output waveform

Depending on the network conditions, the ACS1000 drive can be equipped with a 12- or 24-pulse diode rectifier that meets the stringent requirements for current and voltage harmonic distortion as defined by IEEE, IEC and EN. When applying a new drive, you do not have to conduct costly harmonic analysis or install any network filters.

Output sine filter – perfect for standard motors and retrofit applications

Voltage reflections and common mode voltages, caused by any inverter topology, are a real concern for medium voltage motors. They cause excessive stress to a standard motor insulation and create harmful bearing currents, both with potentially disastrous consequences. Furthermore, the motor is subjected to additional harmonic heating generated by the inverter switching if no further precautions are taken.

With an ACS1000, all these detrimental effects are totally eliminated by its unique output sine filter, which is a standard feature of the drive. The result is an excellent sinusoidal voltage and current waveform, supplied to the motor.

Retrofit-ready simplicity

The ACS1000 is optimized for retrofits to existing motors and is suitable for applications that require very long motor cables.

Powerful performance with DTC

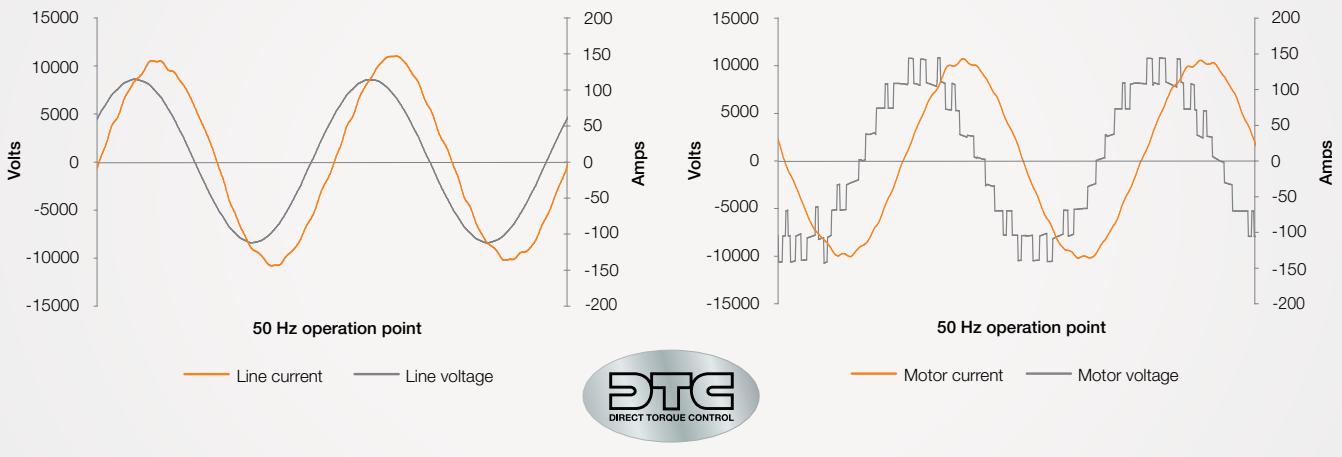
Precise and reliable process control, together with low energy consumption, result in top performance. The motor control platform of the ACS1000 drives is ABB's award-winning Direct Torque Control (DTC). It provides rapid, accurate and stepless control from zero to full speed, and can deliver full torque with optimal speed accuracy over the whole speed range, even without encoder.

High level of personnel safety

Electric arcs represent a hazard source for people and equipment. For systems where large and dangerous arc fault currents can occur, special attention is required.

The ACS1000 medium voltage drives fulfill the IAC requirements for arc containment, assuring personnel safety. For higher currents, the drive cabinet can be equipped with a pressure relief flap. Optionally, the ACS1000 is available with ABB's Arc Guard System™ for fast arc detection.

Line and motor current and voltage



ACS1000
Water-cooled

Heat dissipation directly into the cooling water eliminates the need for additional ventilation systems which maximizes system efficiency.

Cable connection section for top and bottom entry/exit

IGCT inverter stacks on swing frame for easy access

Control electronics mounted on swing frame

Application and motor control board with fast digital signal processor and DTC

Fiber optics for noise immunity and galvanic isolation

Output filter choke

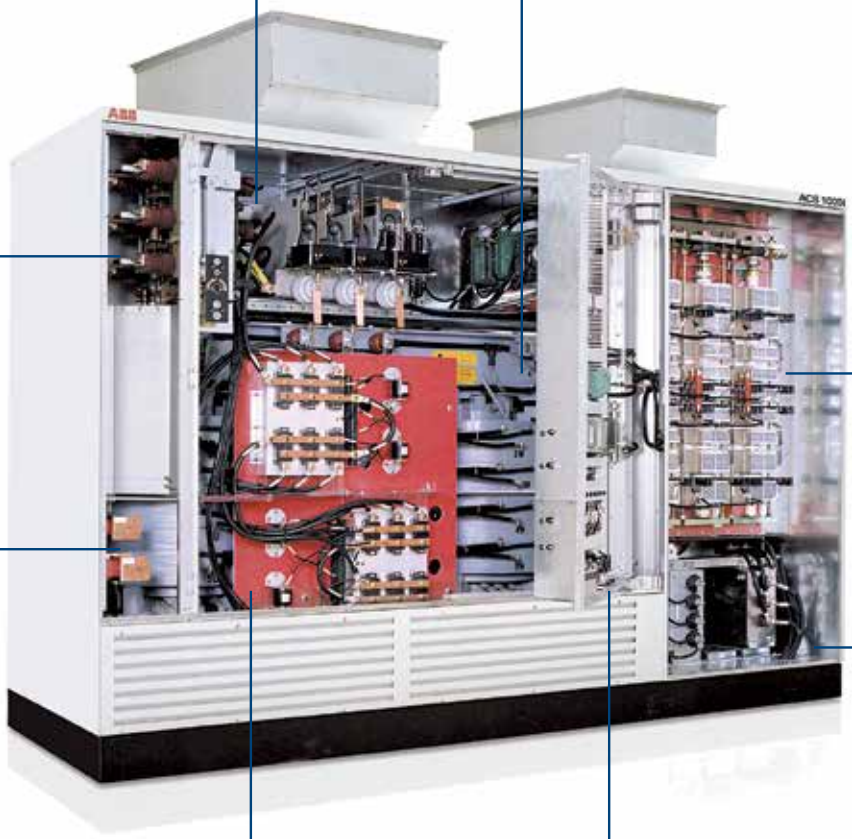
12-pulse input bridge as standard

24-pulse input bridge as option

Water cooling cabinet with heat exchangers and deionization unit

ACS1000i
Air-cooled with integrated transformer

Easy installation is possible with the ACS1000 with integrated transformer, simplifying the integration of the drive into your systems.



Input isolator

Fused input contactor (optional)

24-pulse input transformer

3-level voltage source inverter using IGCT power semiconductors

Power cable connection section for top and bottom entry

24-pulse input bridge as standard

Control electronics mounted on swing frame

Application and motor control board with fast digital signal processor and DTC

Fiber optics for noise immunity and galvanic isolation

DC link capacitor

ACS1000
Air-cooled with external transformer

A small footprint and lower heat losses will reduce your space and ventilation requirements.

Cable connection section for top and bottom entry/exit

Integrated fan for low noise level

IGCT power semiconductors

Control electronics mounted on swing frame

Application and motor control board with fast digital signal processor and DTC

Fiber optics for noise immunity and galvanic isolation

12-pulse input bridge as standard

24-pulse input bridge as option

Output sine filter capacitor

Technical data
At a glance

Input	
Input configuration	12- or 24-pulse diode rectifier
Input voltage	1327, 1903, 2305 V, external transformer 3.3, 6 – 6.6, 10 – 11 kV, 50 Hz, integrated transformer 2.3, 4.16, 6.9 kV, 60 Hz, integrated transformer
Input voltage variation	±10%
Input frequency	50/60 Hz
Input frequency variation	<5%
Input power factor	>0.95
Input harmonics	Compliance with IEEE 519
Auxiliary voltage	110, 220 V, DC 120, 230 V, 50/60 Hz 400, 440, 480, 500, 575, 690 V, 50/60 Hz, 3 phase
Output	
Output power	400 – 6700 HP (315 – 5000 kW)
Output voltage	2.3, 3.3, 4.0, 4.16 kV
Output frequency	0 – 82.5 Hz
Motor type	Induction
Efficiency of converter	>98%, external transformer >96%, integrated transformer
Motor harmonics	<2% THDi
Mechanical	
Enclosure	Standard: IP21, IP31
Cable entry	Top/bottom
Environmental	
Altitude	5500 m.a.s.l., air-cooled 4000 m.a.s.l., water-cooled
Ambient air temperature	+0 °C – +40 °C, air-cooled +1 °C – +50 °C, water-cooled
External cooling water temperature	+4 °C – +27 °C
Noise	<75 dB (A), air-cooled, external transformer <80 dB (A), air-cooled, integrated transformer <70 dB (A), water-cooled
Cooling type	Air, water
Standards	IEC, EN, UL

Ratings, types and voltages
With integrated transformer

Motor data			Converter data			
Nominal rating			Type code	Power kVA	Length inches (mm)	Weight lbs
kW	hp	A				
3300 V - air-cooled						
315	420	70	ACS1000-033-A01A-J4-010	400	130 (3300)	8598
355	480	79	ACS1000-033-A01B-J4-010	450	130 (3300)	8598
400	540	87	ACS1000-033-A01C-J4-010	500	130 (3300)	8598
450	600	96	ACS1000-033-A01D-J4-010	550	130 (3300)	8598
500	670	105	ACS1000-033-A01E-J4-010	600	130 (3300)	8598
560	750	122	ACS1000-033-A01F-J4-010	700	130 (3300)	9479
630	840	131	ACS1000-033-A02A-J4-010	750	130 (3300)	9479
710	950	149	ACS1000-033-A02B-J4-010	850	130 (3300)	9479
800	1070	166	ACS1000-033-A02C-J4-010	950	130 (3300)	9479
900	1210	192	ACS1000-033-A02D-J4-010	1100	130 (3300)	9479
1000	1340	210	ACS1000-033-A02E-J4-010	1200	130 (3300)	11243
1120	1500	236	ACS1000-033-A03A-J4-010	1350	130 (3300)	11243
1250	1680	262	ACS1000-033-A03B-J4-010	1500	130 (3300)	11243
1400	1880	297	ACS1000-033-A03C-J4-010	1700	130 (3300)	12125
1500	2010	332	ACS1000-033-A03D-J4-010	1900	130 (3300)	12125
4000 V / 4160 V - air-cooled						
300	400	52	ACS1000-040-A01A-J4-010	400	130 (3300)	8818
340	450	58	ACS1000-040-A01B-J4-010	400	130 (3300)	8818
370	500	65	ACS1000-040-A01C-J4-010	450	130 (3300)	8818
450	600	79	ACS1000-040-A01D-J4-010	550	130 (3300)	8818
520	700	94	ACS1000-040-A01E-J4-010	650	130 (3300)	8818
600	800	108	ACS1000-040-A01F-J4-010	750	130 (3300)	8818
670	900	115	ACS1000-040-A01G-J4-010	800	130 (3300)	8818
750	1000	130	ACS1000-040-A01H-J4-010	900	130 (3300)	8818
930	1250	166	ACS1000-040-A02A-J4-010	1150	130 (3300)	10802
1120	1500	195	ACS1000-040-A02B-J4-010	1350	130 (3300)	10802
1300	1750	224	ACS1000-040-A03A-J4-010	1550	130 (3300)	12345
1490	2000	260	ACS1000-040-A03B-J4-010	1800	130 (3300)	12345
1680	2250	289	ACS1000-040-A03C-J4-010	2000	130 (3300)	12345
2010	2700	347	ACS1000-040-A03D-J4-010	2330	130 (3300)	12345

Notes:
Indicative information only

Ratings, types and voltages
With external transformer

Motor data			Converter data			
Nominal rating			Type code[1]	Power kVA	Length inches (mm)	Weight lbs
kW	hp	A				
2300 V - air-cooled						
300	400	94	ACS1000-023-A01A-Ex-010	400	119 (3000)	3527
340	450	100	ACS1000-023-A01B-Ex-010	400	119 (3000)	3527
370	500	113	ACS1000-023-A01C-Ex-010	450	119 (3000)	3527
450	600	138	ACS1000-023-A01D-Ex-010	550	119 (3000)	3527
520	700	163	ACS1000-023-A01E-Ex-010	650	119 (3000)	3527
600	800	188	ACS1000-023-A01F-Ex-010	750	119 (3000)	3527
670	900	201	ACS1000-023-A01G-Ex-010	800	119 (3000)	3527
750	1000	226	ACS1000-023-A01H-Ex-010	900	119 (3000)	3527
930	1250	289	ACS1000-023-A02A-Ex-010	1150	119 (3000)	3858
1120	1500	339	ACS1000-023-A02B-Ex-010	1350	119 (3000)	3858
1300	1750	389	ACS1000-023-A03A-Ex-010	1550	119 (3000)	4409
1490	2000	452	ACS1000-023-A03B-Ex-010	1800	119 (3000)	4409
1680	2250	502	ACS1000-023-A03C-Ex-010	2000	119 (3000)	4409
3300 V - air-cooled						
315	420	70	ACS1000-033-A01A-Ex-010	400	119 (3000)	3527
355	480	79	ACS1000-033-A01B-Ex-010	450	119 (3000)	3527
400	540	87	ACS1000-033-A01C-Ex-010	500	119 (3000)	3527
450	600	96	ACS1000-033-A01D-Ex-010	550	119 (3000)	3527
500	670	105	ACS1000-033-A01E-Ex-010	600	119 (3000)	3527
560	750	122	ACS1000-033-A01F-Ex-010	700	119 (3000)	3527
630	840	131	ACS1000-033-A01G-Ex-010	750	119 (3000)	3527
710	950	149	ACS1000-033-A01H-Ex-010	850	119 (3000)	3527
800	1070	166	ACS1000-033-A02A-Ex-010	950	119 (3000)	3858
900	1210	192	ACS1000-033-A02B-Ex-010	1100	119 (3000)	3858
1000	1340	210	ACS1000-033-A02C-Ex-010	1200	119 (3000)	3858
1120	1500	236	ACS1000-033-A02D-Ex-010	1350	119 (3000)	3858
1250	1680	262	ACS1000-033-A02E-Ex-010	1500	119 (3000)	3858
1400	1880	297	ACS1000-033-A02F-Ex-010	1700	119 (3000)	3858
1600	2150	332	ACS1000-033-A03A-Ex-010	1900	119 (3000)	4409
1800	2410	376	ACS1000-033-A03B-Ex-010	2150	119 (3000)	4409
2000	2680	420	ACS1000-033-A03C-Ex-010	2400	119 (3000)	4409
4000 V - air-cooled						
300	400	52	ACS1000-040-A01A-Ex-010	400	119 (3000)	3527
340	450	58	ACS1000-040-A01B-Ex-010	400	119 (3000)	3527
370	500	65	ACS1000-040-A01C-Ex-010	450	119 (3000)	3527
450	600	79	ACS1000-040-A01D-Ex-010	550	119 (3000)	3527
520	700	94	ACS1000-040-A01E-Ex-010	650	119 (3000)	3527
600	800	108	ACS1000-040-A01F-Ex-010	750	119 (3000)	3527
670	900	115	ACS1000-040-A01G-Ex-010	800	119 (3000)	3527
750	1000	130	ACS1000-040-A01H-Ex-010	900	119 (3000)	3527
930	1250	166	ACS1000-040-A02A-Ex-010	1150	119 (3000)	3858
1120	1500	195	ACS1000-040-A02B-Ex-010	1350	119 (3000)	3858
1300	1750	224	ACS1000-040-A03A-Ex-010	1550	119 (3000)	4409
1490	2000	260	ACS1000-040-A03B-Ex-010	1800	119 (3000)	4409
1680	2250	289	ACS1000-040-A03C-Ex-010	2000	119 (3000)	4409
1860	2500	330	ACS1000-040-A03D-Ex-010	2300	119 (3000)	4409

Notes:

[1] 'x' indicates the different pulse numbers
2 - 12 pulse diode front end
4 - 24 pulse diode front end

Indicative information only

Ratings, types and voltages
With external transformer (continued)

Motor data			Converter data			
Nominal rating			Type code[1]	Power kVA	Length inches (mm)	Weight lbs
kW	hp	A				
3000 V - water-cooled						
2000	2680	420	ACS1000-033-W01A-Ex-010	2400	166 (4200)	7275
2250	3020	472	ACS1000-033-W01B-Ex-010	2700	166 (4200)	7275
2500	3350	525	ACS1000-033-W01C-Ex-010	3000	166 (4200)	7275
2800	3750	586	ACS1000-033-W02A-Ex-010	3350	186 (4700)	8113
3150	4220	656	ACS1000-033-W02B-Ex-010	3750	186 (4700)	8113
3550	4760	744	ACS1000-033-W02C-Ex-010	4250	186 (4700)	8113
4000	5360	831	ACS1000-033-W03A-Ex-010	4750	186 (4700)	8113
4500	6030	936	ACS1000-033-W03B-Ex-010	5350	186 (4700)	8113
5000	6710	1041	ACS1000-033-W03C-Ex-010	5950	186 (4700)	8113
4000 V - water-cooled						
1860	2500	332	ACS1000-040-W01A-Ex-010	2300	166 (4200)	7275
2240	3000	390	ACS1000-040-W01B-Ex-010	2700	166 (4200)	7275
2610	3500	447	ACS1000-040-W02A-Ex-010	3100	186 (4700)	8113
2980	4000	520	ACS1000-040-W02B-Ex-010	3600	186 (4700)	8113
3360	4500	577	ACS1000-040-W02C-Ex-010	4000	186 (4700)	8113
3730	5000	650	ACS1000-040-W02D-Ex-010	4500	186 (4700)	8113
4100	5500	707	ACS1000-040-W03A-Ex-010	4900	186 (4700)	8113
4470	6000	765	ACS1000-040-W03B-Ex-010	5300	186 (4700)	8113
5250	7035	879	ACS1000-040-W03C-Ex-010	6090	186 (4700)	8113

Notes:

[1] 'x' indicates the different pulse numbers
2 - 12 pulse diode front end
4 - 24 pulse diode front end

Indicative information only

Notes


DEMAG

Contact us

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