

# ACS 1000, ACS 1000i

Medium voltage AC drives for control of induction motors from 315 – 5000 kW



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**ABB**



# ACS 1000, ACS 1000i – reliable power control

The ACS 1000 family of drives, one of the most successful variable speed drives in its class, provides simple and reliable power control.

## Power control of induction motors

Drawing from over a century of industrial manufacturing experience, ABB provides a simple and reliable approach to power control: the ACS 1000 family of drives for speed and torque control of 315 to 5000 kW induction motors for voltages of 2.3, 3.3, 4.0 and 4.16 kV. It is available with air or water cooling.

The air-cooled drive can be supplied with separate input transformer (ACS 1000) or as a fully integrated drive (ACS 1000i) which includes input transformer and, optionally, input contactor.

## Operational experience

With over one thousand installations worldwide, the ACS 1000 family is one of the most successful variable speed drives in its class.

Since its introduction in 1997, it has set the benchmark for reliable and efficient control of medium voltage applications such as pumps, fans, conveyors, extruders and compressors.

## Key product features

- Retrofit-ready for existing motors and suitable for most medium voltage applications
- Output sine filter for pure sinusoidal voltage and current output: standard motors, no motor derating, no voltage stress and no common mode voltages on the motor insulation
- Fuseless design for reliable, non-aging, maintenance-free circuit protection
- DTC control platform for exceptionally high torque and speed control performance
- Integrated or separate input transformer for highest system design flexibility

## Fields of application

Industries	Applications
Cement, Mining and Minerals	Conveyors, crushers, mills, fans and pumps
Chemical, Oil and Gas	Pumps, compressors, extruders, mixers and blowers
Metals	Fans and pumps
Pulp and Paper	Fans, pumps, refiners, vacuum pumps and chippers
Power Generation	Fans, pumps, conveyors and coal mills
Water	Pumps
Other Applications	Test stands and wind tunnels

# Retrofit-ready simplicity

The ACS 1000 family is optimized for retrofits. With its network-friendly diode rectifiers, the motor-friendly output sine filter and its input transformer flexibility, it can fit where you need it.

## Network friendly

Depending on the network conditions, the drives of the ACS 1000 family can be equipped with a 12- or 24-pulse diode rectifier which meets the stringent requirements for current and voltage harmonic distortion as defined by IEEE, IEC and EN. This eliminates the need for costly harmonic analysis or installation of network filters when applying a new drive.

## 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.

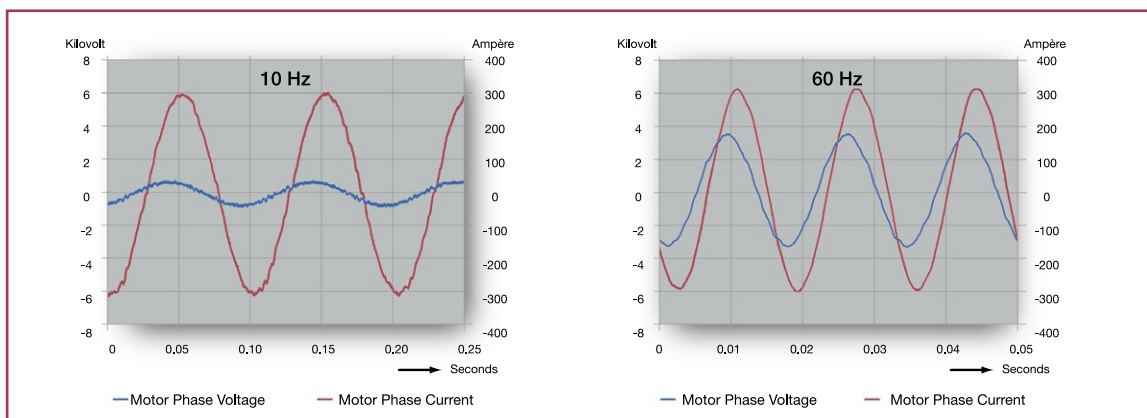
With an ACS 1000 or ACS 1000i, all these detrimental effects are totally eliminated by its unique output sine filter, being an integral part of the drive. The result is an excellent waveform of voltage and current, supplied to the motor.

## System design flexibility

The ACS 1000 family can be configured with either an integrated dry-type or separately installed input transformer. This flexibility enables the use of oil-filled transformers when the transformer will be mounted outdoors. The advantage is that heat losses from the input transformer are not dissipated in the electrical room. The integrated input transformer, on the other hand, simplifies installation and commissioning (three cables in / three cables out).

## Benefits

- Compatibility with standard induction motors without derating
- Ability to retrofit to existing motors
- Motor efficiency same as Direct-On-Line (DOL) operation
- Reduced motor noise
- Use of standard cables
- No limitation of motor cable length



The ACS 1000 drives family provides smooth and accurate motor control even at low speed and full torque (left diagram: 10 Hz, 100 % torque) throughout the full operating range of speed and load (right diagram: 60 Hz, 100 % torque).

# Reliable and efficient components

## Reliable components

### IGCT semiconductors

The ACS 1000 and ACS 1000i use a power semiconductor known as IGCT (Integrated Gate Commutated Thyristor), which is the ideal switch for high-powered medium voltage applications. It combines the best of two traditional semiconductor technologies: the fast switching of the IGBT with the proven reliability of the GTO. The use of IGCTs results in low parts count, providing an efficient and reliable drive.

### Fuseless

The converter design does not require any medium voltage power fuses, which are known to be unreliable, costly and subject to aging. The ACS 1000 and ACS 1000i use dedicated IGCTs, instead, which provide faster and better protection for the power components.

### Long-life capacitors

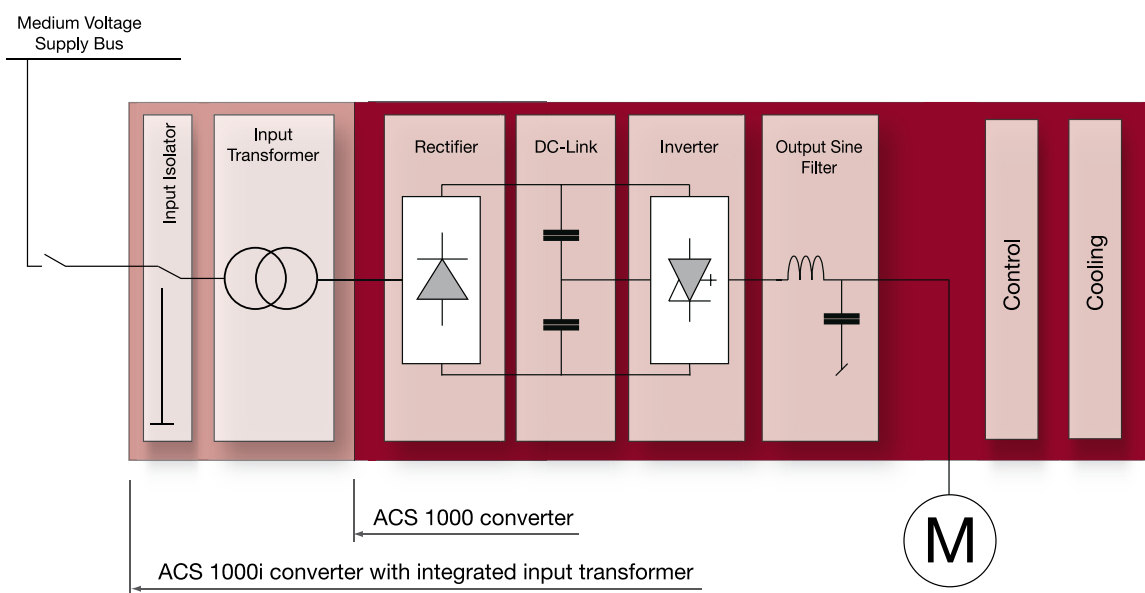
Electrolytic capacitors, which have a poor life expectancy, are not used in the ACS 1000 and ACS 1000i. Advanced, environmental friendly, rapeseed oil-filled foil capacitors, designed for a long lifetime, are used instead.

### Powerful motor control platform

The motor control platform of the ACS 1000 drives family 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.

### Power loss RideThrough

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 ACS 1000 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.*

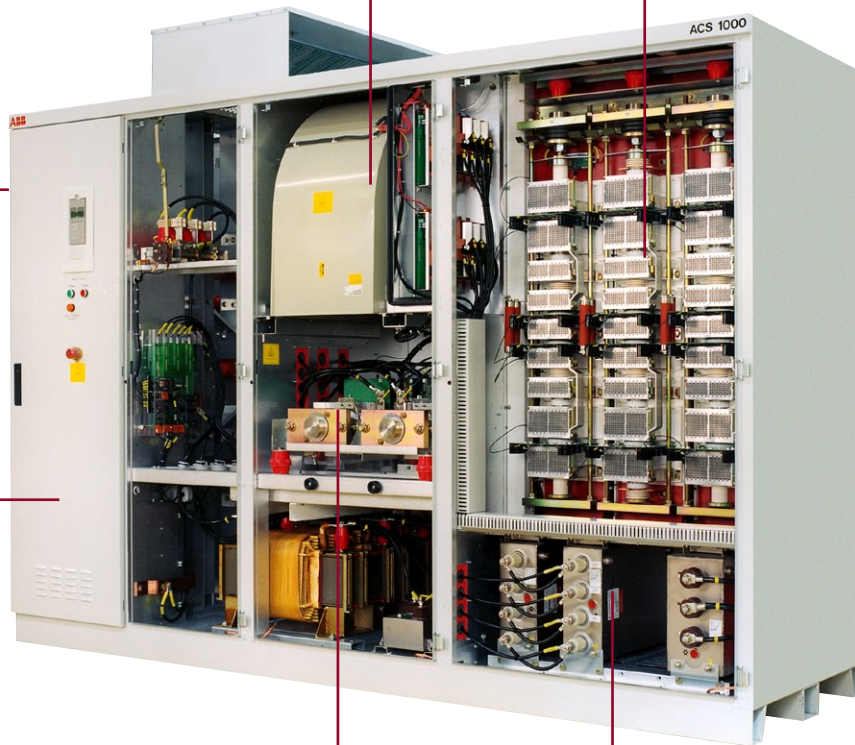
# ACS 1000 air cooled



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

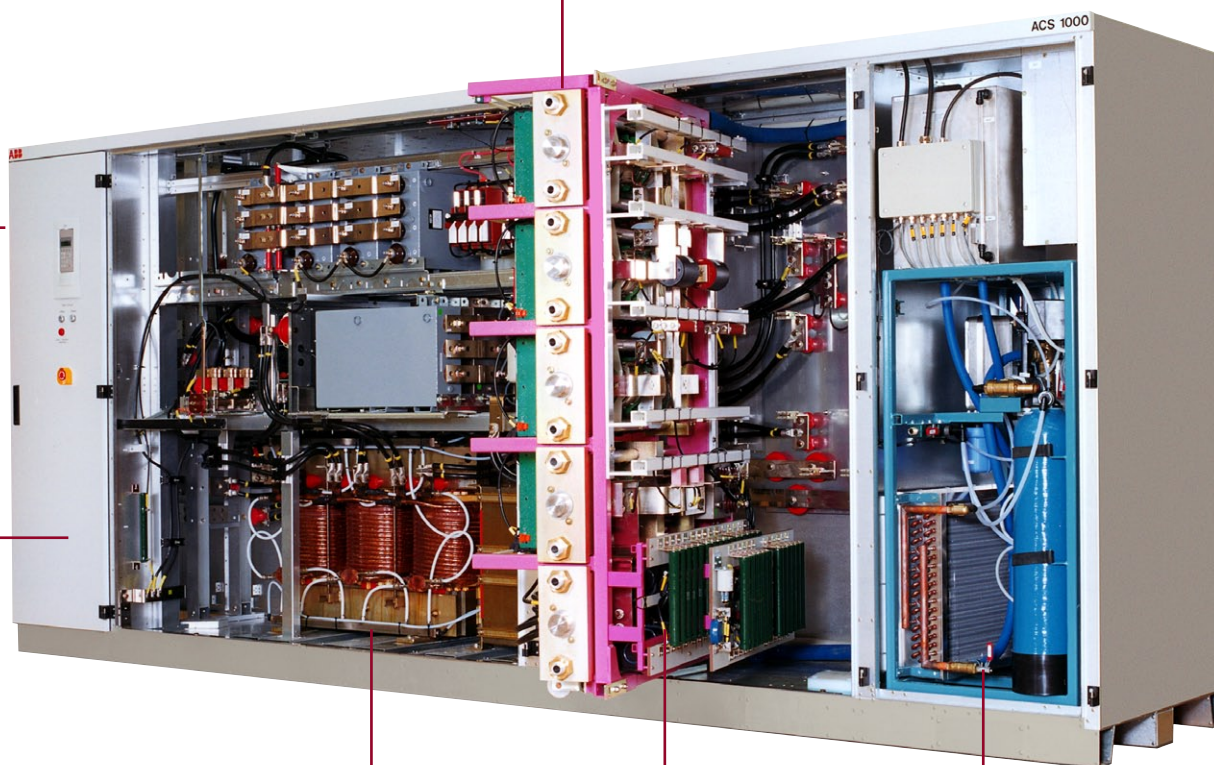
Output filter capacitor

# ACS 1000 water cooled



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

# ACS 1000i air cooled with integrated input transformer and input contactor (optional)

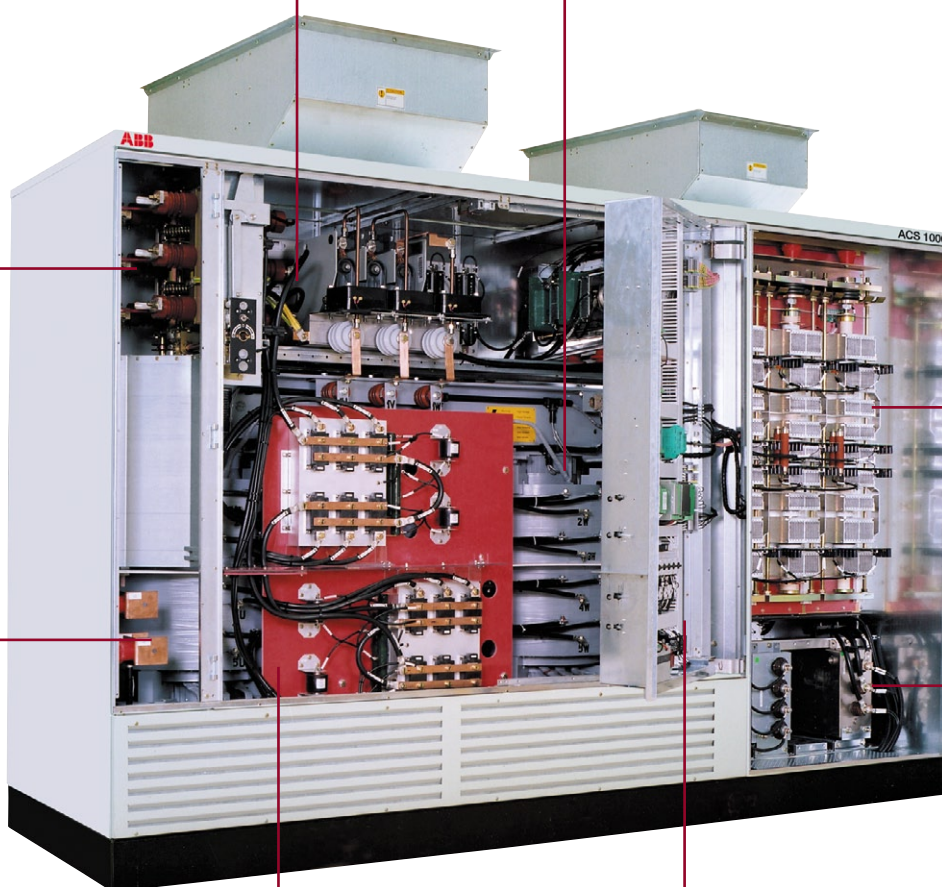


Input isolator

Fused input contactor (optional)

24-pulse input transformer

Inverter unit 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

DC link capacitor

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

Fiber optics for noise immunity and galvanic isolation



# Features and benefits

Benefits	Features
<p>Highest input transformer flexibility:</p> <ul style="list-style-type: none"> <li>• Integrated transformer for quick installation and commissioning.</li> <li>• Separate transformer reduces the air-conditioning requirements. The losses from the transformer do not dissipate into the electrical room.</li> </ul>	<p>Flexible input transformer configuration. The air-cooled drives of the ACS 1000 family are available with integrated or separate input transformer, which can be placed outside the electrical room.</p>
<p>Elimination of voltage stresses for a longer motor lifetime. Motors can be used without derating and long cable runs between motor and drive are not a problem.</p>	<p>The sine filter gives an excellent output waveform, eliminating harmonics and common mode voltage and reducing stress on the motor.</p>
<p>Minimum network harmonics to avoid system interferences and utility penalties.</p>	<p>The 12-/24-pulse rectifier meets the most stringent requirements of international standards for current and voltage harmonic distortion.</p>
<p>High reliability for minimum downtime.</p>	<p>ABB's IGCT high power switching device results in low parts count, providing an efficient and reliable converter.</p> <p>The cooling equipment is available with redundant fans or pumps.</p>
<p>Fast, accurate and robust process control for constant product quality, minimum raw material waste and minimum machinery wear.</p>	<p>The fast control provided by Direct Torque Control (DTC) allows optimum process control and exact motor performance with minimum torque ripple and lowest energy consumption.</p>
<p>Power loss RideThrough</p>	<p>A special feature of DTC is its ability to ride through short main supply voltage interruptions.</p>
<p>Simple and efficient maintenance</p>	<p>The ACS 1000 and ACS 1000i have been designed to allow easy front access.</p>
<p>User-friendly drive monitoring and remote diagnostics.</p>	<p>DriveMonitor™ provides monitoring access to the drive even from remote locations.</p>
<p>Around the clock access to drive specialists and spare parts.</p>	<p>ABB, the largest drives supplier worldwide, has a global support network, which provides assistance and spare parts 24 hours/day, 365 days/year.</p>

# Control

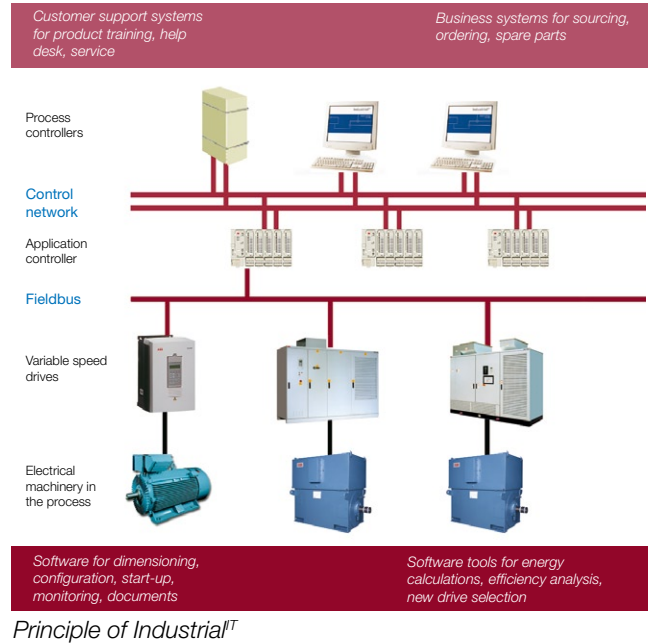
The ACS 1000 and ACS 1000i allow smooth and simple system integration into industrial environments.

## Open control system

ABB offers an open communication strategy, enabling connection to higher-level process controllers. The ACS 1000 and ACS 1000i can be installed with all major fieldbus adapters for smooth integration, monitoring and controlling of different processes, according to customer requirements.

## Industrial<sup>IT</sup>

ABB's Industrial<sup>IT</sup> means increased standardization and seamless interaction of different ABB products. The ACS 1000 and ACS 1000i bear the Industrial<sup>IT</sup> Enabled symbol, a special mark indicating that the drives can be easily integrated into the Industrial<sup>IT</sup> architecture in a 'plug & produce' manner.



# Monitoring and diagnostics

The ACS 1000 and ACS 1000i are available with an intelligent remote monitoring and diagnostics system, which allows secure access to the drive from any location in the world.

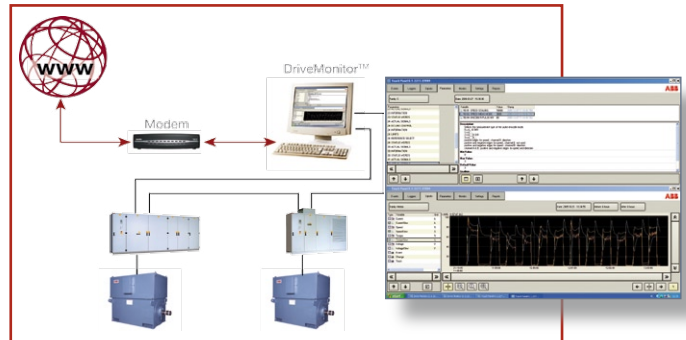
DriveMonitor<sup>TM</sup> allows real-time access to the drive. It supports monitoring, configuration and diagnostics of ABB drives for new and existing installations.

The optional tool consists of a hardware module inside the drive, as well as a software layer that automatically collects and analyzes selected drive signals and parameters.

Long-term monitoring functions deliver important information on equipment status, maintenance tasks needed and possible performance improvements. Diagnostic procedures and trending can cover not only the converter itself but other parts of the shaft train as well.

## Benefits:

- Early detection to avoid costly repairs
- Reduction of process-critical faults
- Optimization of maintenance cost and schedule over the product life cycle
- Long-term statistics for optimization of process performance
- Easier root cause analysis - reduced Mean Time To Repair (MTTR)



# Testing, service and support

The ACS 1000 and ACS 1000i are backed by unrivalled service and support from the customer's initial inquiry throughout the entire life cycle of the drive system.

## Testing

ABB is committed to ensuring the reliability of every drive it delivers. To ensure that quality standards and customer requirements are fully met, every component of a drive is subjected to thorough testing in ABB's modern test facilities.

Routine tests and functional tests form an integral part of the scope of supply of ABB's medium voltage drives. They are performed in accordance with international standards and ABB quality assurance procedures.

Additionally, ABB can perform a combined test with the complete drive system – including transformer, converter and motor – to verify the performance and to ensure a smooth integration into the customer's facility.

## Installation and commissioning

Proper installation and commissioning of the equipment, done by ABB's qualified and certified commissioning engineers, will reduce start-up time, increase safety and reliability and decrease life-cycle costs. In addition, operators can be given practical training by experienced specialists on site.

## Life-cycle management

ABB's drive life-cycle management model provides customers with the maximum profit for their purchased assets by maintaining high availability, eliminating unplanned repair costs and extending the lifetime of the drive. Life-cycle management maximizes the value of the equipment and maintenance investment by:

- providing spare parts and expertise throughout the life cycle
- providing efficient product support and maintenance for improved reliability
- adding functionality to the initial product by following the upgrade path
- providing a smooth transition to a new technology at the end of the life cycle

## Training

Extensive training for ABB's medium voltage drives can be provided at the ABB University. A range of training programs is offered from basic tutorials to programs tailored to the customer's specific needs. -> [www.abb.com/abbuniversity](http://www.abb.com/abbuniversity)

## Global network, local presence

Aftersales service is an integral part of providing the customer with a reliable and efficient drive system. The ABB Group of companies operates in more than 100 countries and has a worldwide network of service operations. Wherever you are, ABB is there for you.

## Services for ABB's medium voltage drives

- Supervision of installation and commissioning
- Training
- Remote diagnostics
- Customized maintenance contracts
- Local support
- 24 x 365 support line
- Spare parts and logistics network
- Worldwide service network

# Data sheet ACS 1000, ACS 1000i

## Inverter type

Three-level Voltage Source Inverter (VSI) with fast-switching power semiconductors – Integrated Gate Commutated Thyristors (IGCTs), without parallel or series connected devices

## Motors

Induction motors;  
ACS 1000: 315 – 2000 kW air cooled  
1800 – 5000 kW water cooled  
ACS 1000i: 315 – 2000 kW air cooled

## Standards

All common standards including EN (IEC), CE, UL, cUL

## Input

ACS 1000:  
Any medium voltage level, 50 Hz or 60 Hz, can be applied to the appropriate primary side of the converter input transformer.

ACS 1000i:  
Voltage range: 4.16 – 7.2 kV, 60 Hz/6.0 – 6.6 kV, 50 Hz, on request up to 11 kV

*Variation (ACS 1000, ACS 1000i):*  
±10 % of nominal voltage, down to –25 % safe operation with derated output

## Auxiliary voltage

400 VAC ±10 %, 50/60 Hz  
480 VAC ±10 %, 60 Hz  
575 VAC ±10 %, 60 Hz, 3 phase

## UPS (Uninterruptible Power Supply)

If available, a UPS can be connected for control power supply, 110 – 240 VAC ±10 %, single phase. Alternatively the drive can be equipped with back-up batteries.

## Output frequency

0 to ±66 Hz (±82.5 Hz optional)

## Output voltage

*Standard:* Sinusoidal, 0 – 2.3 kV,  
0 – 3.3 kV, 0 – 4.0/4.16 kV  
*Optional:* Higher voltages with step-up transformer

## Input bridge

ACS 1000 *Standard:* 12-pulse  
*Optional:* 24-pulse  
ACS 1000i *Standard:* 24-pulse

## Efficiency of converter

ACS 1000 typically > 98 %  
ACS 1000i typically > 96 % (incl. integrated transformer)

## Input power factor

*Fundamental:* > 0.97  
*Total:* > 0.96

## Overload capacity

*Standard:* Normal use, 10% short term overload capacity allowed for one minute every 10 minutes  
*Optional:* For higher overload capacity contact ABB

## Ambient temperature

+1° C to 40° C (higher with derating)  
34° F to 104° F (higher with derating)

## Enclosure classes

ACS 1000  
Air cooled: IP21, IP22, IP31, IP32, IP42  
Water cooled: IP31, IP54  
ACS 1000i IP21, IP42

**Industrial<sup>IT</sup>** Compatible (Level 1)

## Protective functions

Overcurrent, short circuit, earth fault, input phase loss, output phase loss, overvoltage, undervoltage, over-temperature, motor overload, motor underload, motor stall protection, and many others

## Optional

- Redundant cooling fan (air-cooled and water-cooled ACS 1000) and pump (water-cooled ACS 1000) for enhanced reliability
- Braking chopper for effective motor braking and short deceleration times
- Bi-directional bypass (start-up bypass for synchronous transfer of up to 4 motors to the line and taking back machine from line to VSD operation)

## Optional control connections

Extensive range of additional I/O features available

## Control interface (optional)

All common fieldbuses including Profibus, Modbus, Allen-Bradley DeviceNet, Ethernet, ABB Advant Fieldbus AF100 (others on request)

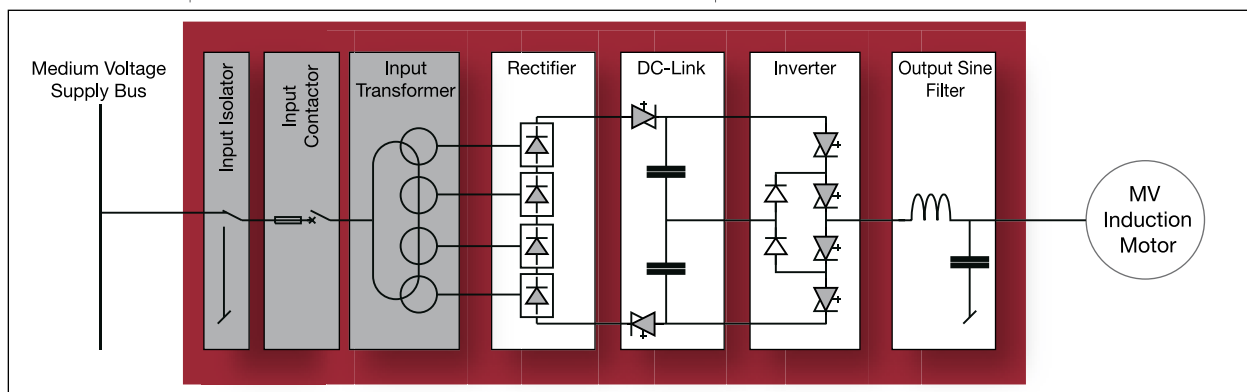
# Data sheet ACS 1000i with integrated transformer

Motor Data				Converter		Converter Data			
Type	Voltage** kV	Shaft Power* kW      hp		Cooling	Type Code	Power kVA	Current* A	Length mm	Weight*** kg
Induction motors	3.3	315	420	Air cooled	ACS 1043-A1-A	400	70	3300	3900
	3.3	355	480		ACS 1043-A1-B	450	79	3300	3900
	3.3	400	540		ACS 1043-A1-C	500	870	3300	3900
	3.3	450	600		ACS 1043-A1-D	550	96	3300	3900
	3.3	500	670		ACS 1043-A1-E	600	105	3300	3900
	3.3	560	750		ACS 1043-A1-F	700	122	3300	4300
	3.3	630	840		ACS 1043-A2-G	750	131	3300	4300
	3.3	710	950		ACS 1043-A2-H	850	149	3300	4300
	3.3	800	1070		ACS 1043-A2-J	950	166	3300	4300
	3.3	900	1210		ACS 1043-A2-K	1100	192	3300	4300
	3.3	1000	1340		ACS 1043-A2-L	1200	210	3300	5100
	3.3	1120	1500		ACS 1043-A3-M	1350	236	3300	5100
	3.3	1250	1680		ACS 1043-A3-N	1500	262	3300	5100
	3.3	1400	1880		ACS 1043-A3-P	1700	297	3300	5500
	3.3	1500	2010		ACS 1043-A3-Q	1900	332	3300	5500
	4.0/4.16	300	400		ACS 1044-A1-A	400	58	3300	4000
	4.0/4.16	340	450		ACS 1044-A1-B	400	58	3300	4000
	4.0/4.16	370	500		ACS 1044-A1-C	450	65	3300	4000
	4.0/4.16	450	600		ACS 1044-A1-D	550	79	3300	4000
	4.0/4.16	520	700		ACS 1044-A1-E	650	94	3300	4000
	4.0/4.16	600	800		ACS 1044-A1-F	750	108	3300	4000
	4.0/4.16	670	900		ACS 1044-A1-G	800	115	3300	4000
	4.0/4.16	750	1000		ACS 1044-A1-H	900	130	3300	4000
	4.0/4.16	930	1250		ACS 1044-A2-J	1150	166	3300	4900
	4.0/4.16	1120	1500		ACS 1044-A2-K	1350	195	3300	4900
	4.0/4.16	1300	1750		ACS 1044-A3-L	1550	224	3300	5600
	4.0/4.16	1490	2000		ACS 1044-A3-M	1800	260	3300	5600
4.0/4.16	1680	2250	ACS 1044-A3-N	2000	289	3300	5600		
4.0/4.16	2010	2700	ACS 1044-A3-P	2330	347	3300	5600		

- Notes:**
- \* Indicative information only.
  - \*\* Higher output voltages available with step-up transformer.
  - \*\*\* Weight indications are approximate; based on 6.0–6.6kV/50Hz line supply voltage.

**General dimension: ACS 1000i air cooled**  
**Frame size A1**

	Frame size A1	Frame size A2/A3
Cabinet height	2050 mm (6 ft 7 in) excl. cooling fans 2517 mm (8 ft 3 in) incl. fan hood 2617 mm (8 ft 6 in) incl. redundant fan hood and/or IP 42	2150 mm (7 ft 1 in) excl. cooling fans 2562 mm (8 ft 4 in) incl. fan hood 2662 mm (8 ft 7 in) incl. redundant fan hood and/or IP 42
Cabinet depth	1121 mm (3 ft 8 in)	1121 mm (3 ft 8 in)



Typical ACS 1000i diagram

# Data sheet ACS 1000 for induction motors (external transformer)

Motor Data				Converter		Converter Data			
Type	Voltage** kV	Shaft Power*		Cooling	Type Code	Power kVA	Current* A	Length mm	Weight*** kg
		kW	hp						
Induction motors	2.3	300	400	Air cooled	ACS 1012-A1-A	400	100	3000	1600
	2.3	340	450		ACS 1012-A1-B	400	100	3000	1600
	2.3	370	500		ACS 1012-A1-C	450	113	3000	1600
	2.3	450	600		ACS 1012-A1-D	550	138	3000	1600
	2.3	520	700		ACS 1012-A1-E	650	163	3000	1600
	2.3	600	800		ACS 1012-A1-F	750	188	3000	1600
	2.3	670	900		ACS 1012-A1-G	800	201	3000	1600
	2.3	750	1000		ACS 1012-A1-H	900	226	3000	1600
	2.3	930	1250		ACS 1012-A2-J	1150	289	3000	1750
	2.3	1120	1500		ACS 1012-A2-K	1350	339	3000	1750
	2.3	1300	1750		ACS 1012-A3-L	1550	389	3000	2000
	2.3	1490	2000		ACS 1012-A3-M	1800	452	3000	2000
	2.3	1680	2250		ACS 1012-A3-N	2000	502	3000	2000
	3.3	315	420		ACS 1013-A1-A	400	70	3000	1600
	3.3	355	480		ACS 1013-A1-B	450	79	3000	1600
	3.3	400	540		ACS 1013-A1-C	500	87	3000	1600
	3.3	450	600		ACS 1013-A1-D	550	96	3000	1600
	3.3	500	670		ACS 1013-A1-E	600	105	3000	1600
	3.3	560	750		ACS 1013-A1-F	700	122	3000	1600
	3.3	630	840		ACS 1013-A1-G	750	131	3000	1600
	3.3	710	950		ACS 1013-A1-H	850	149	3000	1600
	3.3	800	1070		ACS 1013-A2-J	950	166	3000	1750
	3.3	900	1210		ACS 1013-A2-K	1100	192	3000	1750
	3.3	1000	1340		ACS 1013-A2-L	1200	210	3000	1750
	3.3	1120	1500		ACS 1013-A2-M	1350	236	3000	1750
	3.3	1250	1680		ACS 1013-A2-N	1500	262	3000	1750
	3.3	1400	1880		ACS 1013-A2-P	1700	297	3000	1750
3.3	1600	2150	ACS 1013-A3-Q	1900	332	3000	2000		
3.3	1800	2410	ACS 1013-A3-R	2150	376	3000	2000		
3.3	2000	2680	ACS 1013-W1-S	2400	420	4200	3300		
3.3	2250	3020	ACS 1013-W1-T	2700	472	4200	3300		
3.3	2500	3350	ACS 1013-W1-U	3000	525	4200	3300		
3.3	2800	3750	ACS 1013-W2-V	3350	586	4700	3680		
3.3	3150	4220	ACS 1013-W2-W	3750	656	4700	3680		
3.3	3550	4760	ACS 1013-W2-X	4250	744	4700	3680		
3.3	4000	5360	ACS 1013-W3-Y	4750	831	4700	3680		
3.3	4500	6030	ACS 1013-W3-Z	5350	936	4700	3680		
3.3	5000	6710	ACS 1013-W3-1	5950	1041	4700	3680		

- Notes:**
- \* Indicative information only.
  - \*\* Higher output voltages available with step-up transformer.
  - \*\*\* Weight indications are approximate.

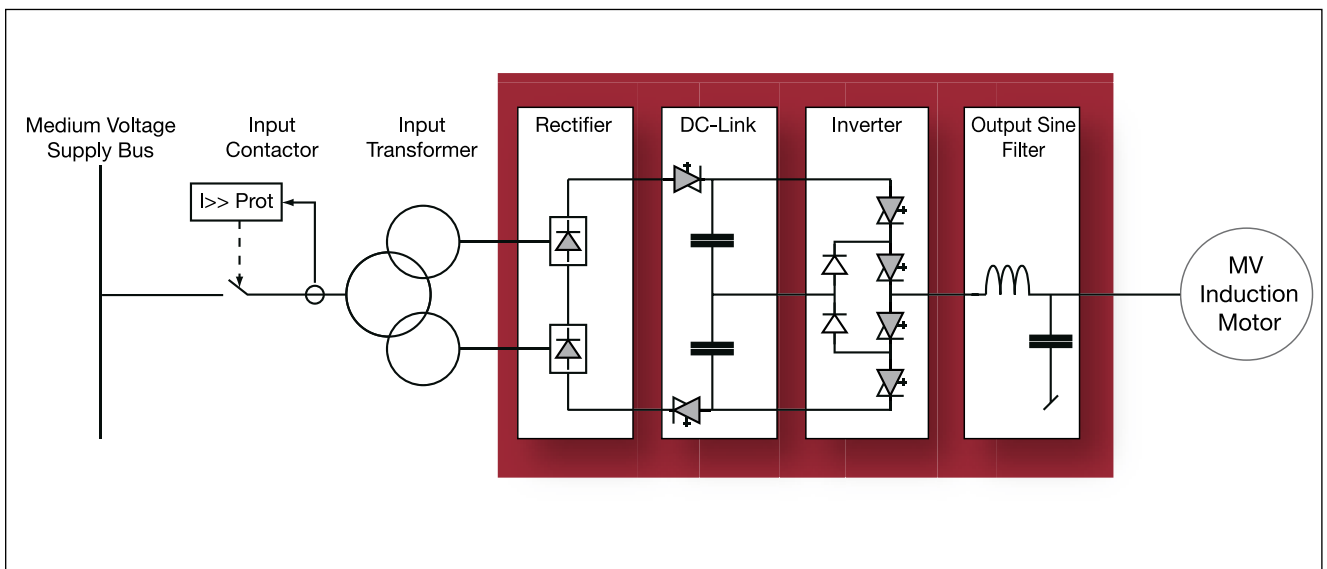
General dimension:	Air cooled	Water cooled
Cabinet height	2005 mm (6 ft 6 in) 2070 mm (6 ft 8 in) incl. lifting eyes 2285 mm (7 ft 6 in) incl. air exhaust hood	2020 mm (6 ft 6 in) 2070 mm (6 ft 8 in) incl. lifting eyes
Cabinet depth	900 mm (3 ft)	900 mm (3 ft)

# Data sheet ACS 1000 for induction motors (external transformer) continued

Motor Data				Converter		Converter Data				
Type	Voltage** kV	Shaft Power* kW    hp		Cooling	Type Code	Power kVA	Current* A	Length mm	Weight*** kg	
Induction motors	4.0	300	400	Air cooled	ACS 1014-A1-A	400	58	3000	1600	
	4.0	340	450		ACS 1014-A1-B	400	58	3000	1600	
	4.0	370	500		ACS 1014-A1-C	450	65	3000	1600	
	4.0	450	600		ACS 1014-A1-D	550	79	3000	1600	
	4.0	520	700		ACS 1014-A1-E	650	94	3000	1600	
	4.0	600	800		ACS 1014-A1-F	750	108	3000	1600	
	4.0	670	900		ACS 1014-A1-G	800	115	3000	1600	
	4.0	750	1000		ACS 1014-A1-H	900	130	3000	1600	
	4.0	930	1250		ACS 1014-A2-J	1150	166	3000	1750	
	4.0	1120	1500	ACS 1014-A2-K	1350	195	3000	1750		
	4.0	1300	1750	ACS 1014-A3-L	1550	224	3000	2000		
	4.0	1490	2000	ACS 1014-A3-M	1800	260	3000	2000		
	4.0	1680	2250	ACS 1014-A3-N	2000	289	3000	2000		
	Induction motors	4.0	1860	2500	Water cooled	ACS 1014-W1-P	2300	332	4200	3300
		4.0	2240	3000		ACS 1014-W1-Q	2700	390	4200	3300
		4.0	2610	3500		ACS 1014-W2-R	3100	447	4700	3680
		4.0	2980	4000		ACS 1014-W2-S	3600	520	4700	3680
		4.0	3360	4500		ACS 1014-W2-T	4000	577	4700	3680
4.0		3730	5000	ACS 1014-W2-U		4500	650	4700	3680	
4.0		4100	5500	ACS 1014-W3-V		4900	707	4700	3680	
4.0		4470	6000	ACS 1014-W3-W		5300	765	4700	3680	
4.0		5000	6700	ACS 1014-W3-X		5800	837	4700	3680	

- Notes:**
- \* Indicative information only.
  - \*\* Higher output voltages available with step-up transformer.
  - \*\*\* Weight indications are approximate.

General dimension:	Air cooled	Water cooled
Cabinet height	2005 mm (6 ft 6 in) 2070 mm (6 ft 8 in) incl. lifting eyes 2285 mm (7 ft 6 in) incl. air exhaust hood	2020 mm (6 ft 7 in) 2070 mm (6 ft 8 in) incl. lifting eyes
Cabinet depth	900 mm (3 ft)	900 mm (3 ft)



Typical ACS 1000 diagram



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