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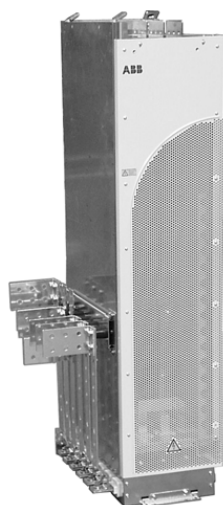
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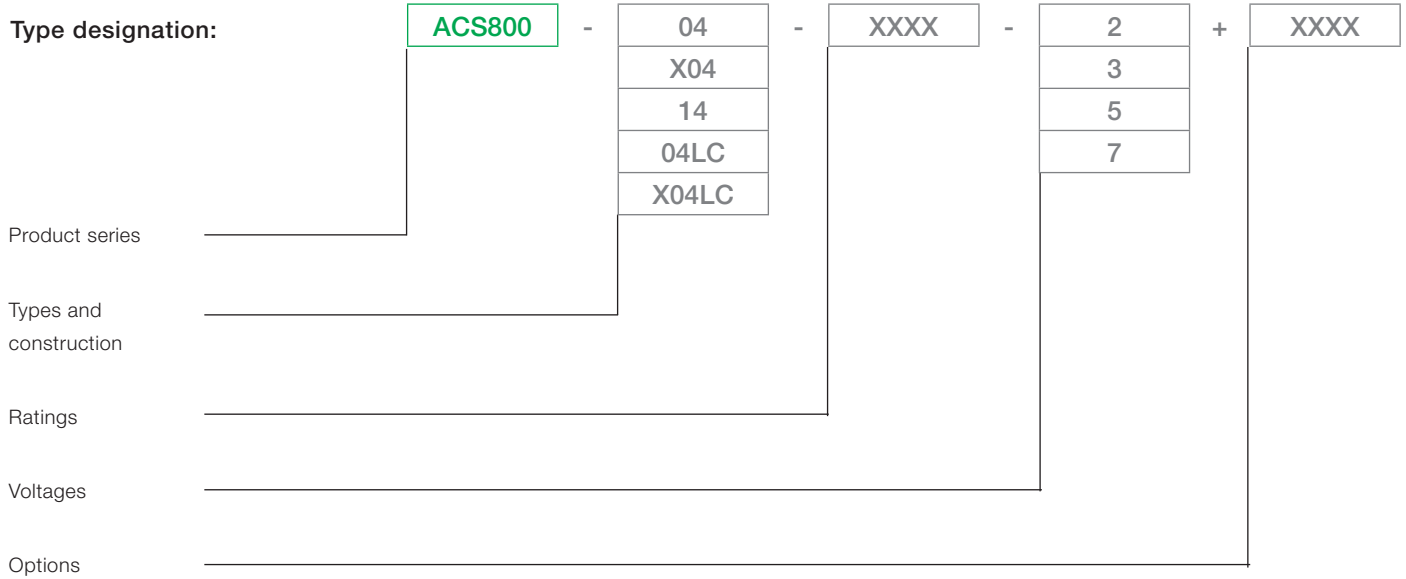
# ПРОМЫШЛЕННЫЕ ПРИВОДЫ

## Техническое описание на преобразователи ACS800-04LC



# Selecting and ordering your drive

Build up your own ordering code using the type designation key below or contact your local ABB drives sales office and let them know what you want. Use page 3 as a reference section for more information.



# ABB industrial drives



## ABB industrial drives

ABB industrial drives are designed for industrial applications, and especially for applications in process industries such as the pulp and paper, metals, mining, cement, power, chemical, and oil and gas industries. ABB industrial drives are highly flexible AC drives that can be configured to meet the precise needs of these applications, and hence order-based configuration is an integral part of the offering. These drives cover a wide range of powers and voltages, including voltages up to 690 V. ABB industrial drives come with a wide range of built-in options. A key feature of these drives is programmability, which makes adaptation to different applications easy.

## Industrial design

ABB industrial drives are designed with current ratings to be used in industrial environments for applications requiring high overloadability. The heart of the drive is DTC, direct torque control, that provides high performance and significant benefits: e.g. accurate static and dynamic speed and torque control, high starting torque and long motor cables. Built-in drive options make the installation work fast and easy.

One of the most significant design criteria of ABB industrial drives has been the long lifetime. Wearing parts such as fans and capacitors have been selected accordingly. Together with the extensive protection features this results in excellent reliability in the demanding industrial market.

## Drive modules

Drive modules are designed to be built into a customer's own cabinet. The modules typically have an IP00 or IP20 enclosure class. ABB's module package also includes cabinet assembly documentation.

## Type designation

This is the unique reference number that clearly identifies your drive by construction, power rating voltage and selected options. Using the type designation you can specify your drives from the wide range of options available, customer specific options are added to the type designation using the corresponding + code.

## ABB's module offering - common features

ABB industrial drive modules are meant for system integrators and/or machine builders who are making their own applications, which include the cabinet structure as well as the software features needed.

ACS800 modules include everything that is required for a complete drive, there is always a built-in harmonic filtering choke, for example. There is also a wide selection of built-in options such as EMC filtering and different I/O and communication options. In addition to these a selection of external accessories is also available. All the modules can be mounted side by side.

In addition to the modules being designed for cabinet assembly, cabinet assembly documentation is included. The documentation gives examples of different cabinet installations, examples of drawings, and hints on the selection of auxiliary equipment. The flexibility and programmability of the modules makes them very viable for various application needs in different areas of industry.

## Functional safety

The ABB functional safety solution complies with the requirements of the European Union machinery directive 2006/42/EC. This directive is associated with standards such as IEC 62061 (Safety Integrity Level) and ISO 13849-1 (Performance Level), which require both a documented and proven safety performance and life cycle approach to safety. Safe torque-off is a certified solution offering SIL2 and PL d (Cat.2) safety levels.

ABB drives can be provided, as an option, with the safe torque-off function. Safe torque-off can be used for the prevention of unexpected startup and represents a cost-effective and certified solution for basic safety. Other safety functions include safe stop 1 (SS1) and safely-limited speed (SLS), which can be used to achieve SIL2 or PL d (Cat.3) safety levels.

Other products:  
Please also see the separate catalogs  
ACS800 multidrives, code 3AFE68248531 EN,  
ACS800 single drives, code 3AFE68375126 EN.

# Technical data



## Mains connection

<b>Supply voltage</b>	3-phase $U_{3IN} = 380$ to $415$ V, $\pm 10\%$ 3-phase $U_{5IN} = 380$ to $500$ V, $\pm 10\%$ 3-phase $U_{7IN} = 525$ to $690$ V, $\pm 10\%$
<b>Frequency</b>	48 to 63 Hz
<b>Power factor</b>	$\cos\phi_1 = 0.98$ (fundamental) $\cos\phi = 0.93$ to $0.95$ (total)
<b>Efficiency (at nominal power)</b>	> 98

## Motor connection

<b>3-phase supply voltage</b>	Output voltage: 0 to $U_{3IN} / U_{5IN} / U_{7IN}$
<b>Frequency</b>	0 to $\pm 300$ Hz
<b>Field weakening point</b>	8 to 300 Hz
<b>Motor control</b>	ABB's direct torque control (DTC)
<b>Torque control:</b>	Torque step rise time:
Open loop	<5 ms with nominal torque
Closed loop	<5 ms with nominal torque
	Non-linearity:
Open loop	$\pm 4\%$ with nominal torque
Closed loop	$\pm 3\%$ with nominal torque
<b>Speed Control:</b>	Static accuracy:
Open loop	10% of motor slip
Closed loop	0.01% of nominal speed
	Dynamic accuracy:
Open loop	0.3 to 0.4% sec. with 100% torque step
Closed loop	0.1 to 0.2% sec. with 100% torque step

## Enclosure

<b>Degree of protection</b>	IP00
<b>Paint color module front</b>	Light beige RAL 7035

## Environmental limits

<b>Ambient temperature</b>	
Transportation	-40 to +70 °C
Storage	-40 to +70 °C
Operation in totally enclosed cabinet	0 to 55 °C, no frost allowed 45 to 55 °C at reduced output power (0.5% /1 °C)
<b>Relative humidity</b>	5 to 95%, no condensation allowed
<b>Vibration</b>	0.7 g, 13.2 Hz to 100 Hz, 1 mm displacement 2 to 13.2 Hz
<b>Cooling Method</b>	Liquid-cooled, closed loop
<b>Internal cooling circuit</b>	Drinking water +42 °C max, 42 to 48 °C at reduced output power (1.0% /1 °C)
<b>External cooling circuit with optimal liquid cooling unit</b>	Industrial or sea water +38 °C max, 38 to 45 °C at reduced output power (1.0% /1 °C)
<b>Altitude</b>	
0 to 1000 m	Without derating
1000 to 4000 m	With derating ~ (1%/100 m) (690 V units 1000 to 2000 m with derating)
<b>Storage</b>	IEC 60721-3-1, class 1C2 (chemical gases), Class 1S2 (solid particles)
<b>Transportation</b>	IEC 60721-3-2, Class 2C2 or 3C2* (chemical gases), Class 2S2 (solid particles)
<b>Operation</b>	IEC 60721-3-3, Class 3C2 (chemical gases), Class 3S2 (solid particles without air inlet filters)

C = chemically active substances  
S = mechanically active substances  
\* = coated circuit boards

## Product compliance

CE, UL, CSA, GOST-R  
Low Voltage Directive 2006/95/EC  
Machinery Directive 2006/42/EC  
EMC Directive 2006/108/EC  
Quality assurance system ISO 9001 and  
Environmental system ISO 14001

## EMC according to EN 61800-3

2<sup>nd</sup> environment, unrestricted distribution category C3 - as option in ACS800-04 up to frame size R8  
1<sup>st</sup> environment, restricted distribution category C2 as option up to 1000 A input current

# Liquid-cooled modules

## ACS800-04LC/-X04LC



### Solutions for high power drives

The liquid-cooled ACS800 frequency converter modules offer robust design for high-power applications. The liquid-cooled ACS800 product family provides advanced reliability and availability in all industry sectors.

### Customer specific design

The liquid-cooled ACS800 is available for single and system drive purposes. The modular hardware design and advanced software features enable the most sophisticated drive solutions. Our customised solutions provide the optimum customer benefits for any demanding application. Our product know-how is at your service.

### Advanced liquid-cooling

The ACS800 can utilize direct liquid-cooling which makes the converter extremely compact and silent. Liquid-cooling reduces the need for high-power filtered air cooling in the installation rooms. Along with the high efficiency, direct liquid-cooling offers low noise and easy heat transfer without air filtering problems.

### Support for cabinet assembly

A full selection of both mechanical and electrical installation kits is available for liquid-cooled ACS800 frequency converter modules. These make cabinet installation into RITTAL TS8 cabinets efficient and easy. A large variety of support material such as dimensional drawings and circuit diagrams is also available for making cabinet assembly, planning and implementation as straightforward and rapid as possible. It is also possible to use optional installation racks instead of cabinets. Installation racks are a compact and cost efficient way to assemble a full liquid-cooled ACS800 frequency converter drive system inside a closed environment such as, for example, a container without an existing air-conditioning system.

### Full selection of drive module products

The liquid-cooled ACS800 frequency converter module product family includes diode and regenerative IGBT supply units, a large variety of inverter units, high power dynamic braking unit modules, and liquid cooling units for all demanding customer needs. Both diode supply units and regenerative IGBT supply units are available with a wide power range and high power density. When high capacity braking is needed and the drive cannot be equipped with a regenerative supply unit, it is possible to use three-phase liquid-cooled dynamic braking unit modules. With a liquid cooling unit it is possible to add supply, inverter and brake unit piping and heat exchangers to the same closed-loop cooling system. The liquid-cooled modules are available in both multidrive and single drive modules.



ACS800-704LC, D4

ACS800-104LC, R8i

# Ratings, types and voltages

## ACS800-04LC, single drive module, $U_N = 400$ to 690 V



Nominal ratings		No-overload use	Light-overload use		Heavy-duty use		Heat dissipation kW	Mass flow <sup>1)</sup> l/min	Type designation	Frame size
$I_{cont. max}$ A	$I_{max}$ A	$P_{cont. max}$ kW	$I_N$ A	$P_N$ kW	$I_{hd}$ A	$P_{hd}$ kW				
<b><math>U_N = 400</math> V (Range 380 to 415 V) The power ratings are valid at nominal voltage 400 V.</b>										
563	674	315	540	315	421	200	8.7	32	ACS800-04LC-0390-3	1xD3 + 1xR8i
678	837	355	651	355	507	250	10	32	ACS800-04LC-0470-3	1xD3 + 1xR8i
889	1037	500	853	400	665	355	14	32	ACS800-04LC-0620-3	1xD3 + 1xR8i
1103	1279	630	1059	560	825	450	16	45	ACS800-04LC-0760-3	1xD4 + 2xR8i
1329	1590	710	1276	710	994	500	21	45	ACS800-04LC-0920-3	1xD4 + 2xR8i
1742	1994	900	1673	900	1303	710	26	45	ACS800-04LC-1210-3	1xD4 + 2xR8i
1973	2347	1120	1894	1120	1476	900	28	77	ACS800-04LC-1370-3	2xD4 + 3xR8i
2587	2941	1400	2484	1400	1935	1120	37	77	ACS800-04LC-1790-3	2xD4 + 3xR8i
3414	3906	2000	3277	2000	2553	1400	51	90	ACS800-04LC-2370-3	2xD4 + 4xR8i
<b><math>U_N = 500</math> V (Range 380 to 500 V). The power ratings are valid at nominal voltage 500 V.</b>										
546	673	355	524	355	408	315	8.7	32	ACS800-04LC-0470-5	1xD3 + 1xR8i
630	838	400	605	400	471	355	10	32	ACS800-04LC-0550-5	1xD3 + 1xR8i
840	1042	560	806	560	628	400	13	32	ACS800-04LC-0730-5	1xD3 + 1xR8i
1070	1280	710	1027	710	800	560	16	45	ACS800-04LC-0930-5	1xD4 + 2xR8i
1235	1589	900	1185	900	924	630	19	45	ACS800-04LC-1070-5	1xD4 + 2xR8i
1646	1996	1120	1581	1120	1232	710	25	45	ACS800-04LC-1430-5	1xD4 + 2xR8i
1833	2344	1250	1760	1250	1371	900	29	58	ACS800-04LC-1590-5	1xD4 + 3xR8i
2444	2943	1600	2347	1600	1828	1250	36	77	ACS800-04LC-2120-5	2xD4 + 3xR8i
3226	3885	2240	3097	2240	2413	1600	49	90	ACS800-04LC-2790-5	2xD4 + 4xR8i
<b><math>U_N = 690</math> V (Range 525 to 690 V). The power ratings are valid at nominal voltage 690 V.</b>										
583	872	560	560	500	436	400	12	32	ACS800-04LC-0700-7	1xD3 + 1xR8i
790	1182	710	759	710	591	560	17	45	ACS800-04LC-0940-7	1xD3 + 2xR8i
898	1344	900	863	900	672	630	19	45	ACS800-04LC-1070-7	1xD3 + 2xR8i
1143	1710	1120	1097	1120	855	710	22	45	ACS800-04LC-1370-7	1xD4 + 2xR8i
1334	1996	1250	1281	1250	998	900	28	58	ACS800-04LC-1590-7	1xD4 + 3xR8i
1697	2538	1600	1629	1600	1269	1250	34	58	ACS800-04LC-2030-7	1xD4 + 3xR8i
2239	3350	2240	2150	2000	1675	1600	44	90	ACS800-04LC-2680-7	2xD4 + 4xR8i

<sup>1)</sup> Pressure loss 100 kPa. Hydrostatic pressure loss 120 kPa due to 2 m height difference.

### Dimensions

Frame size	Height mm	Width mm	Depth <sup>1)</sup> mm	Weight kg
D3	975	311	474	140
D4	975	311	474	210
R8i	918	214	478	115

<b>Nominal ratings</b>	
$I_{cont. max}$	Rated current available continuously without overloadability at 42 °C liquid temperature.
$I_{max}$	Maximum output current. Available for 10 s at start, otherwise as long as allowed by drive temperature. Note: max. motor shaft power is 150% $P_{hd}$ .
<b>Typical ratings: No-overload use</b>	
$P_{cont. max}$	Typical motor power in no-overload use.
<b>Light-overload use</b>	
$I_N$	Continuous base current allowing 110% overload for 1 min /5 min.
$P_N$	Typical motor power in light-overload use.
<b>Heavy-duty use</b>	
$I_{hd}$	Continuous base current allowing 150% overload for 1 min /5 min.
$P_{hd}$	Typical motor power in heavy-duty use.
<b>Losses</b>	
$P_{loss}$	Power loss conducted to coolant.

The current ratings are the same regardless of the supply voltage within one voltage range.

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