

ABB industrial drives

ACS800, low harmonic drives, 5.5 to 5200 kW



Easy low harmonic solution

ABB's low harmonic drives offer an easy low harmonic solution that is incorporated in the drive. These drives use harmonics mitigation technology that does not require external filters or multi-pulse transformer. The low harmonic drives produce exceptionally low harmonic content in the drive input, with a total current distortion of less than 5.0%. The low harmonic drives thus provide you with a simple, cost efficient solution to meet stringent power quality standards.

Highlights

- Easy solution for minimum harmonic content
- Direct connection to the network
- No complex multi-winding transformer required
- No external filter equipment required
- Exceeds EN 61000-3-12 and IEEE519 requirements
- Genuine unity power factor - no compensation needed
- Voltage range from 208 to 690 V (except ACS800-37LC: 380 to 690 V)

Perfect line current - clean network

In a conventional frequency converter with a six-pulse diode bridge as a rectifier, the network side current is not sinusoidal, and has significant harmonic content, especially fifth and seventh harmonics. This is shown by the typical current distortion, which can be 30 – 50% in total. In an ABB low harmonic drive, the use of DTC principles, together with a low pass filter, will suppress the current harmonic content leaving distortion of less than 5%. The resulting clean sinusoidal current will therefore cause little or no distortion on the network voltage waveform.

Wall-mounted low harmonic drive ACS800-31, 5.5 to 110 kW

The ACS800-31 is a low harmonic drive in a single, complete wall-mounted package. In line with the ACS800 series, it has all the important features and options, including EMC filters and I/O extension modules, built inside the drive. The power ratings of the ACS800-31 start from the 5.5 kW heavy-duty rating and go up to 110 kW

continuous load rating. It is available with the IP21 protection class.

Cabinet-built low harmonic drive ACS800-37, 45 to 2700 kW

The ACS800-37 cabinet-built drive is a low harmonic solution in the power range of 45 kW up to 2700 kW. Like other cabinet-built single drives, it has a wide range of standardized configurations and is available with IP21, IP22, IP42, IP54 and IP54R protection classes.

Liquid-cooled low harmonic drive ACS800-37LC, 55 to 5200 kW

The ACS800-37LC is a cabinet-built drive that is equipped with both liquid cooling and regenerative capabilities. Liquid cooling eliminates the need for air cooling in equipment rooms and delivers effective heat transfer for high overall efficiency. Direct liquid cooling also allows to make the drive extremely compact and silent. This drive can be provided with DNV, LR and ABS marine certifications and comes in IP42 as standard, with optional IP54.

Technical data

Mains connection	
Voltage and power range	3-phase, $U_{2IN} = 208$ to 240 V, $\pm 10\%$ 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, $\pm 10\%$ (600 V UL, CSA)
Frequency	48 to 63 Hz
Power factor	$\cos\phi_1 = 1$ (fundamental) $\cos\phi_1 = 0.99$ (total)
THDI (total harmonic distortion of current)	< 5%
Efficiency (at nominal power)	97%
Motors connection	
Frequency	0 to ± 300 Hz 0 to ± 120 Hz with external du/dt filters
Field weakening point	8 to 300 Hz
Motor control software	ABB's direct torque control (DTC)
Torque control	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
Speed control	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
Environmental limits	
Ambient temperature	Transport -40 to +70 °C Storage -40 to +70 °C Operation ACS800-31/-37 0 to +40 °C, no frost allowed +40 to +50 °C at reduced output current (1%/1 °C) ACS800-37LC 0 to +45 °C, no frost allowed +45 to +55 °C at reduced output current (0.5%/1 °C)
Operation	Air cooled -15 to +50 °C, no frost allowed +40 to +50 °C at reduced output current (1%/1 °C) Liquid-cooled 0 to +55 °C, no frost allowed +45 to +55 °C at reduced output current (0.5%/1 °C)
Altitude	0 to 1000 m without derating 1000 to 4000 m with derating ~ (1%/100 m) (690 V units 1000 to 2000 m with derating)
Relative humidity	5 to 95%, no condensation allowed
Degree of protection	ACS800-31/-37 IP21 As option for ACS800-37 IP22, IP22R, IP42, IP54 ACS800-37LC IP42 As option IP54

Paint colour	ACS800-31: NCS 1502-Y ACS800-37/-37LC: RAL 7035
Contamination levels	No conductive dust allowed
Storage	IEC 60721-3-1, Class 1C2 (chemical gases), Class 1S2 (solid particles)
Transportation	IEC 60721-3-2, Class 2C2 (chemical gases), Class 2S2 (solid particles)
Operation	IEC 60721-3-3, Class 3C2 (chemical gases), Class 3S2 (solid particles without air inlet filters)
Vibration	IEC 60068-2-6, 10 to 58 Hz 0.075 mm displacement amplitude 58 to 150 Hz 10 m/s ² (1 g)
Vibration marine classification	2 to 13.2 Hz: ± 1.0 mm amplitude (peak) 13.2 to 100 Hz: 0.7g acceleration

C = chemically active substances
S = mechanically active substances

Product compliance

CE
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
ACS800-31/-37: UL, cUL 508A or 508C and CSA
C22.2 NO.14-95, C-Tick, GOST R
ACS800-37LC: UL, CSA
Marine type approvals for ACS800-37LC: ABS, DNV, Lloyd's Register

EMC according to EN 61800-3

2nd environment, unrestricted distribution category C3 as option
1st environment, restricted distribution category C2 as option up to 1000 A input current

For more information please contact your local ABB representative or visit:

www.abb.com/drives

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