

Ultra low harmonic drive, cabinet-built

ACS800-37, 125 to 2800 Hp

Simple low harmonic solution

There is increasing concern among end users and power companies about the harmful effects of harmonics. Harmonic distortion may disturb or even damage sensitive equipment connected in the same environment. Harmonic standards are thus becoming stricter and there is a growing demand for low harmonic solutions.

The ACS800-37 drive offers an easy solution to the problem of harmonics. The solution itself is incorporated in the drive, eliminating the need for any additional filtering equipment or complicated and large multi-pulse transformer arrangements.

Meets the strictest standards

The ACS800-37 eliminates low order harmonics with the active converter controlled with DTC, and high order harmonics with an LCL line filter. The result is exceptionally low harmonic content in the network; exceeding the requirements set by standard IEEE519 at the drive input terminals even on the weakest AC line network. The ACS800-37 provides you with a simple, compact, and complete solution to meet stringent power quality standards.

Beats external solutions

The ACS800-37 does not require a dedicated multi-pulse transformer and thus is simpler in terms of cabling arrangements and requires less floor space. Harmonic performance is better than both 12- and 18-pulse solutions. Passive or active external filtering devices are avoided with the ACS800-37, making the solution compact and simple. Other advantages of the ACS800-37 is that it always operates with unity power factor 1 and is impervious to AC line voltage imbalances up to and over 3%. The system efficiency is also better than 12 and 18-pulse solutions due to the simplified transformer.

Extensive range of features

In line with other ACS800 cabinet-built drives, the ACS800-37 offers a wide variety of standardized configurations to adapt to different application requirements. The smart module concept enables easy maintenance and redundancy in the high power range where multiple identical power modules make one power structure. If one power module fails the drive may be operated at reduced capacity.

Main standard features

- Meets IEEE519-1992 at Drive input terminals
- Compact design
- UL Type 1 protection class
- Built in low harmonic LCL filter
- EMC filter for 2nd environment, unrestricted distribution according to EN 61800-3
- Main switch with aR fuses
- Line contactor
- Removable air circuit breaker (in frame size nxR8i)
- Du/dt filters (in frame size nxR8i)
- Coated boards
- Extensive, programmable I/O
- Long lifetime cooling fan and capacitors
- Inputs galvanically isolated
- 3 I/O and fieldbus extension slots inside
- Alphanumeric multilingual control panel with a start-up assistant feature

Options for ACS800-37

- Analogue and digital I/O extension modules
- Braking chopper and resistor
- Cabinet heater
- Customer terminal block
- Du/dt filters (in frame sizes R7i-R8i)
- Earth fault monitoring for unearthed network
- EMC filter for 1st environment, restricted distribution according to EN 61800-3
- Fieldbus modules
- UL Type 1 Filtered or UL Type 12 enclosure classes
- Emergency stop, category 0 or 1
- Output for motor fan
- Pulse encoder interface module
- Prevention of unexpected start up of motor
- Bottom entry and exit of cables
- 1 or 2 thermistor relays
- 3, 5 or 8 PT100 relays

Plus tailor made accessories through ABB's application engineering.

Ratings and dimensions

ACS800-37

ACS800	-	37	-	XXXX	-	5 7	+	XXXX
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Type code	Frame size	Input	I _{max}	Normal Duty		Heavy-duty use		Noise Level	Air flow	Heat Dissipation
				I _{2N}	P _N	I _{2HD}	P _{HD}			
		A	A	A	Hp	A	Hp	dBA	ft³/min	BTU/Hr
3-phase supply voltage 380, 400, 415, 460, 480, 500. The power ratings are valid at nominal voltage, 480Vac 60Hz										
ACS800-37-0070-5+C129	R6	112	168	114	75	88	60	73	295	8200
ACS800-37-0100-5+C129	R6	129	234	132	100	114	75	73	295	9600
ACS800-37-0120-5+C129	R6	145	264	156	125	125	100	73	295	11600
ACS800-37-0170-5+C129	R7i	180	291	192	150	156	125	74	765	20500
ACS800-37-0210-5+C129	R7i	220	355	240	200	183	150	74	765	27300
ACS800-37-0260-5+C129	R8i	270	438	302	250	226	150	75	1860	30700
ACS800-37-0320-5+C129	R8i	329	530	361	300	273	200	75	1860	37600
ACS800-37-0400-5+C129	R8i	410	660	437	350	340	250	75	1860	47800
ACS800-37-0460-5+C129	R8i	473	762	504	400	393	300	75	1860	54700
ACS800-37-0510-5+C129	R8i	536	863	571	450	445	350	75	1860	61500
ACS800-37-0610-5+C129	R8i	630	1016	672	550	524	400	75	1860	78600
ACS800-37-0780-5+C129+H359	2xR8i	803	1294	856	700	667	550	77	3770	88800
ACS800-37-0870-5+C129+H359	2xR8i	900	1458	965	800	752	650	77	3770	109000
ACS800-37-1160-5+C129+H359	2xR8i	1200	1941	1284	1050	1001	850	77	3770	150000
ACS800-37-1330-5+C129+H359	3xR8i	1376	2217	1467	1250	1143	1000	78	6030	157000
ACS800-37-1820-5+C129+H359	3xR8i	1888	2956	1956	1650	1524	1300	78	6030	229000
ACS800-37-2200-5+C129+H359	4xR8i	2344	3670	2428	2050	1892	1600	79	7530	277000
3-phase supply voltage 525, 550, 575, 600, 690. The power ratings are valid at nominal voltage, 575Vac 60Hz										
ACS800-37-0060-7+C129	R6	53	86	54	50	43	40	73	294	6142
ACS800-37-0070-7+C129	R6	73	120	75	60	60	50	73	294	8190
ACS800-37-0100-7+C129	R6	86	142	88	75	71	60	73	294	9554
ACS800-37-0170-7+C129	R7i	125	202	133	125	104	100	74	765	27300
ACS800-37-0210-7+C129	R7i	146	235	156	150	121	100	74	765	30700
ACS800-37-0260-7+C129	R8i	180	301	193	200	150	150	75	1860	41000
ACS800-37-0320-7+C129	R8i	250	417	268	250	209	200	75	1860	51200
ACS800-37-0400-7+C129	R8i	300	502	322	300	251	250	75	1860	61500
ACS800-37-0440-7+C129	R8i	344	571	367	350	286	300	75	1860	64900
ACS800-37-0540-7+C129	R8i	400	668	429	450	334	350	75	1860	71700
ACS800-37-0790-7+C129+H359	2xR8i	593	985	632	650	493	500	77	3770	120000
ACS800-37-0870-7+C129+H359	2xR8i	657	1091	700	750	545	600	77	3770	126000
ACS800-37-1160-7+C129+H359	2xR8i	853	1425	914	1000	713	750	77	3770	157000
ACS800-37-1330-7+C129+H359	3xR8i	1001	1663	1067	1150	831	900	78	6030	185000
ACS800-37-1510-7+C129+H359	3xR8i	1164	1879	1206	1300	940	1050	78	6030	212000
ACS800-37-2320-7+C129+H359	4xR8i	1729	2791	1791	2000	1396	1500	79	7530	304000
ACS800-37-2780-7+C129+H359	5xR8i	2091	3472	2228	2450	1736	1900	79	10550	362000
ACS800-37-3310-7+C129+H359	6xR8i	2470	3987	2559	2800	1999	2200	79	11300	413000

Frame size	Width in	Height UL Type 1 in	Height UL Type 12 in	Depth top entry/exit ^{B)} in	Weight lb
R6	16.9	83.9	91.1	25.4	550
R7i	24.8	83.9	91.1	25.4	880
R8i	48.4 ^{A)}	83.9	91.1	25.4	2090
2xR8i	107.5	83.9	91.1	25.4	4982
3xR8i	139.0	83.9	91.1	25.4	6746
4xR8i	178.3	83.9	91.1	25.4	7937
5xR8i	225.6	83.9	91.1	25.4	10538
6xR8i	243.4	83.9	91.1	25.4	10869

^{A)} 60.2 in if equipped with 1st environment filter and common motor terminal.

^{B)} The depth without the handle.

NOTES:

I_{max} current available for 10 seconds at start.

I_{2N} continuous base current at 40°C (104°F).

Overload cycle 110% I_{2N} for 1 minute / 5 minutes allowed.

I_{2HD} continuous base current at 40°C (104°F).

Overload cycle 150% I_{2HD} for 1 minute / 5

minutes allowed.

- Current ratings do not change with different supply voltages.

- The rated current of the ACS800 must be greater than or equal to the rated motor current to achieve the rated motor power given in the table.

- Horsepower ratings are based on NEMA motor ratings for typical 4-pole motors (1800 rpm). Check motor nameplate current for compatibility.

Enclosure

Degree of Protection:

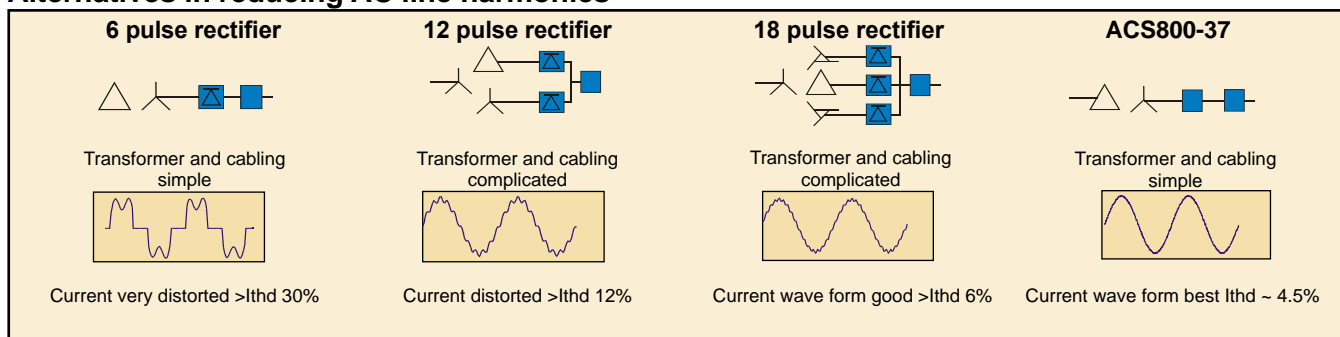
UL Type 1 (Standard)

UL Type 1 Filtered and UL Type 12 (opt)

Paint color:

Light beige RAL 7035 semi-gloss

Alternatives in reducing AC line harmonics



I_{thd} = Total Harmonic Distortion Current

Single drive main features

Features	Benefits	Notes
Compact and complete		
Compact size, everything integrated	Less space and installation work required.	No need to install extra components such as input chokes or EMC filter.
Built in harmonic filter in all ACS800 drives	<p>Low harmonics, meaning less interference and less heating in cables and transformers.</p> <p>Filter also protects the drive from line side transients.</p>	For the lowest harmonic level, ACS800-37 offers almost a harmonic free solution.
Wide range of options available	Standard solutions available from ABB to meet most customers application needs.	Custom made solutions are available in the ACS800-U7/07/17/37
Versatile braking options	<p>Optimal braking options are always available.</p> <p>No need for an external braking chopper thus reducing size and installation cost.</p>	<p>Brake chopper built inside all frame sizes (standard/optional).</p> <p>Regenerative braking with ACS800-U11 and ACS800-17.</p>
User interface		
User friendly customer interface	Easy and fast commissioning and operation.	<p>Clear, alphanumeric display with start-up assistant that guides through the start-up procedure.</p> <p>Easy to use PC tools available for commissioning, maintenance, monitoring and programming.</p>
Versatile connections and communications	Standard I/O covers most requirements. Connectable to commonly used fieldbuses.	Extensive standard and optional I/O.
Extensive programmability	Flexibility. Possible to replace relays or even a PLC in some applications.	<p>Two levels of programmability:</p> <ol style="list-style-type: none"> 1. Parameter programming (standard) 2. Adaptive programming (free block programming) <ul style="list-style-type: none"> - standard feature - more blocks available as options - all I/Os are programmable
Industrial design		
Wide power and voltage range	One product series can be used to meet all application needs, meaning less training and spare parts and standardized interface to drives.	0.75 to 3000 Hp 208 to 690 Vac
Wide range of robust enclosures available	Industrial suitable solutions available for different environments.	UL Type 1, UL Type 1 filtered, UL Type 12
Robust main circuit design	<p>Suitable for heavy industrial use.</p> <p>Reliable.</p> <p>Long motor cables can be used without extra output filters.</p>	<p>Components dimensioned for heavy duty and long lifetime.</p> <p>Advanced thermal model allows high overloadability.</p>

Single drive main features

Features	Benefits	Notes
Industrial design		
Extensive protection features	Enhanced reliability, fewer process interruptions. Possibility to also protect motors and process.	Several adjustable limits to protect other equipment included.
Galvanic isolation of I/O	Safe and reliable operation without separate isolators and relays.	Isolated input signals and relay outputs as standard.
All terminals designed for industrial use	Sufficient size even for large aluminum cables. No need for special tools in I/O cabling.	
Worldwide approvals: CE, UL, cUL, CSA, C-Tick, GOST R	Products that can be used everywhere in the world.	
Right performance for every application		
DTC, accurate dynamic and static speed and torque control	Excellent process control even without speed feedback device - improved product quality, productivity, reliability and lower investment cost.	
DTC - allows high overloadability and gives high starting torque	Reliable, smooth start without overdimensioning the drive.	
DTC, fast control	No unnecessary trips or process interruptions.	Fast reaction to load or voltage variations prevents tripping. Rides through power interruptions by using kinetic energy of the load.
DTC, flux optimization and sophisticated motor model	Excellent motor and drive efficiency - cost savings for non-dynamic applications like pumps or fans.	Optimal flux in the motor reduces losses on applications where Dynamic Response requirements are minimal.
DTC, mechanics friendly	Less stress for mechanics improves reliability.	No shock torques. No torque ripple - minimized risk for torsional vibration. Active oscillation damping.
DTC, line supply control	High performance and robust control in active supply unit with programmable power factor.	Applies for ACS800-U11, ACS800-17, ACS800-U31, and ACS800-37
Made by ABB		
Global market leader in AC drives. Long experience.	Well proven, safe and reliable solutions. Application know-how.	
World wide service and support network	Professional support available around the world.	

Technical specification

Mains connection

Voltage and power range	3-phase, $U_{2IN} = 208$ to 240 V, $\pm 10\%$, except -U2,-U7,-07,-17,-37 3-phase, $U_{5IN} = 380$ to 500 V, $\pm 10\%$ 3-phase, $U_{7IN} = 525$ to 690 V, $\pm 10\%$ (600 V UL, CSA)
Short Circuit Current Rating (SCCR)	ACS800-U1,-U11,-U31 = 65ka ACS800-PC,-U2,-U7/07,-17,-37 = 100ka
Frequency	48 to 63 Hz
Nominal Impedance	3% Nominal Impedance R2-R3, DC Bus Choke R4 and greater, AC Reactor
Power factor	
ACS800-U1,-PC,-U2,-U7/07	$\cos\phi_1 = 0.98$ (fundamental) $\cos\phi = 0.93...0.95$ (total)
ACS800-U11,-17,-U31,-37	$\cos\phi_1 = 1$ (fundamental) $\cos\phi = 0.99$ (total)
Efficiency (at nominal power)	
ACS800-U1,-PC,-U2,-U7/07, 07LC	98%
ACS800-U11,-17,-U31,-37	97%

Motor connection

Voltage for > 500 V units	3-phase output voltage $0...U_{2IN}/U_{5IN}/U_{7IN}$ please see "Filter selection table for ACS800" under the du/dt filters on page 33
Frequency du/dt	$0... \pm 300$ Hz ($0... \pm 120$ Hz for -U7/-07 frames R6-R8 with du/dt filters and external du/dt filters)
Field weakening point	$8...300$ Hz
Motor control	ABB's exclusive 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	$\pm 1\%$ 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...0.4% sec. with 100% torque step
Closed loop	0.1...0.2% sec. with 100% torque step

Environmental

Ambient temperature	
Transport	-40...+70°C
Storage	-40...+70°C
Operation	-15...+50°C, no frost allowed 40...50°C at reduced output current (1% / 1°C)
Operation (ACS800-07LC)	0 to +55°C, no frost allowed +45 to 55°C, at reduced output current (1% / 1°C)
Cooling method	Dry clean air
Altitude	
0...1000 m	without derating
1000...4000 m	with derating ~ (1% / 100 m) (690 V units 1000...2000 m with derating)
Relative humidity	5 to 95%, no condensation allowed
Protection class	
UL Type 1	standard for -U1,-PC,-U2,-U7/07,07LC, -U11, -17,-U31,-37
UL Type 1 filtered	option for -U7/07,-17,-37
UL Type 12	option for -U1,-PC,-U7/07,07LC, -17,-37
Paint color	-PC,-U7/07,07LC, -17,-37: RAL 7035 -U1,-U11,-U2,-U31: NCS 1502-Y (RAL 90021, PMS 420 C)
Contamination levels	No conductive dust allowed
Storage gases),	IEC60721-3-1, Class 1C2 (chemical)
Transportation	Class 1S2 (solid particles)
gases),	IEC60721-3-2, Class 2C2 (chemical)
Operation	Class 2S2 (solid particles)
	IEC60721-3-3, Class 3C1/3C2* (chemical gases), Class 3S2 (solid particles)
C = chemically active substances	
S = mechanically active substances	

Product compliance

UL & cUL (508A or 508C) and CSA C22.2 NO.14-95, C-Tick, GOST R NEC 430.126(A)(2) Motor Overtemperature Protection
Quality assurance system ISO 9001 and
Environmental system ISO 14001
CE (Available)
Low Voltage Directive 73/23/EEC with amendment 93/68/EEC
Machinery Directive 98/37/EC
EMC Directive 89/336/EEC with amendment 93/68/EEC

EMC (according to EN 61800-3)

2nd environment, unrestricted distribution category C3 as standard in -07 (frame size nxR8i), 07LC, -17 and -37 (frame sizes R7i-nxR8i), option in the others
1st environment, restricted distribution category C2 as option up to 1000 A input current

NOTE: Available options are shown in the Summary of features options table. Please see pages 48-49.