

ABB industrial drives

Stand-alone single drives, ultra low harmonic cabinet-built drive
ACS800-37, 125 to 2800 HP

Technical Brochure



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 + XXXX
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Type code	Frame size	Input A	I_{max} A	Normal Duty		Heavy-duty use		Noise Level dBA	Air flow ft ³ /min	Heat Dissipation BTU/Hr
				I_{2N} A	P_N Hp	I_{2HD} A	P_{HD} Hp			
3-phase supply voltage 380, 400, 415, 460, 480, 500. The power ratings are valid at nominal voltage, 480Vac 60Hz										
ACS800-37-0170-5+C129	R7i	180	291	192	150	156	125	74	765	20472
ACS800-37-0210-5+C129	R7i	220	355	240	200	183	150	74	765	27297
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, 600Vac 60Hz										
ACS800-37-0170-7+C129	R7i	125	202	133	125	104	100	74	765	27297
ACS800-37-0210-7+C129	R7i	146	235	156	150	121	100	74	765	30709
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 in	Height UL Type 12 in	Depth top entry/exit ^{b)} in	Weight lb
R7i	28.7	83.9	91.1	25.4	882
R8i	48.4 ^{a)}	83.9	91.1	25.4	2646
2xR8i	97.0	83.9	91.1	25.4	4982
3xR8i	128.5	83.9	91.1	25.4	6746
4xR8i	177.0	83.9	91.1	25.4	7937
5xR8i	227.7	83.9	91.1	25.4	10538
6xR8i	243.4	83.9	91.1	25.4	10869

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

^{a)} 60.2 in if equipped with 1st environment filter and common motor terminal.
^{b)} The depth without the handle.

Alternatives in reducing AC line harmonics

6 pulse rectifier	12 pulse rectifier	18 pulse rectifier	ACS800-37
Transformer and cabling simple	Transformer and cabling complicated	Transformer and cabling complicated	Transformer and cabling simple
Current very distorted >I _{thd} 30%	Current distorted >I _{thd} 12%	Current wave form good >I _{thd} 6%	Current wave form best I _{thd} ~ 4%
I _{thd} = Total Harmonic Distortion Current			

Technical specifications

ACS800-37, 125 to 2800 HP

ACS800-37 - XXXX - X

Mains connection

Voltage and power range	$U_{SIN} = 380...500 \text{ V} \pm 10\%$ $U_{7IN} = 525...690 \text{ V} \pm 10\%$ (600V UL)
Frequency	48 to 63 Hz
Power factor	$\cos\phi_1 = 1$ (fundamental) $\cos\phi = 0.99$ (total)

Efficiency at nominal power

ACS800-37	97%
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Motor connection

3-Phase output voltage:	$0...U_{2IN}/U_{SIN}$
Frequency control:	$0... \pm 300 \text{ Hz}$ $0... \pm 120 \text{ Hz}$ with du/dt filters
Field weakening point:	$8...300 \text{ Hz}$
Motor control software:	ABB's Direct Torque Control (DTC)
Torque control:	<u>Torque step rise time:</u>
Open loop	<5 ms with nominal torque
Closed loop	<5 ms with nominal torque
	<u>Non-linearity:</u>
Open loop	$\pm 4\%$ with nominal torque
Closed loop	$\pm 1\%$ with nominal torque
Speed control:	<u>Static accuracy:</u>
Open loop	10% of motor slip
Closed loop	0.01% of nominal speed
	<u>Dynamic accuracy:</u>
Open loop	0.3...0.4% sec. with 100% torque step
Closed loop	0.1...0.2% sec. with 100% torque step

Environmental limits

Ambient temperature	
Transport	-40...+70°C
Storage	-40...+70°C
Operation	-15...+50°C, no frost allowed 40...40°C at reduced output current (derating from 40 to 55°C 1% / 1degree)
Cooling method:	Dry clean air
Relative humidity	5 to 95%, no condensation allowed
Protection class	UL Type 1 (IP 21) Option for UL Type 12 (IP54)
Paint colour	RAL 7035
Contamination levels	No conductive dust allowed
Storage	IEC60721-3-1, Class 1C2 (chemical gases), Class 1S2 (solid particles)
Transportation	IEC60721-3-2, Class 2C2 (chemical gases), Class 2S2 (solid particles)
Operation	IEC60721-3-3, Class 3C2 (chemical gases), Class 3S2 (solid particles without airinlet filters)
Vibration	IEC60068-2-6, 10...58 Hz 0.075 mm displacement amplitude 58...150 Hz 10m/s ² (1 g)
C = chemically active substances	
S = mechanically active substances	

Product compliance

CE, UL
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
Quality assurance system ISO 9001 and Environmental system ISO 14001
CE, cUL 508A or 508C and CSA C22.2 NO.14-95, C-Tick, GOST R

EMC (according to EN 61800-3)

1 st environment, restricted distribution, as option
2 nd environment, unrestricted distribution, as option



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