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# ПРОМЫШЛЕННЫЕ ПРИВОДЫ

## Техническое описание на преобразователи ACS800-11, ACS800-U11



# Operation principle and hardware description

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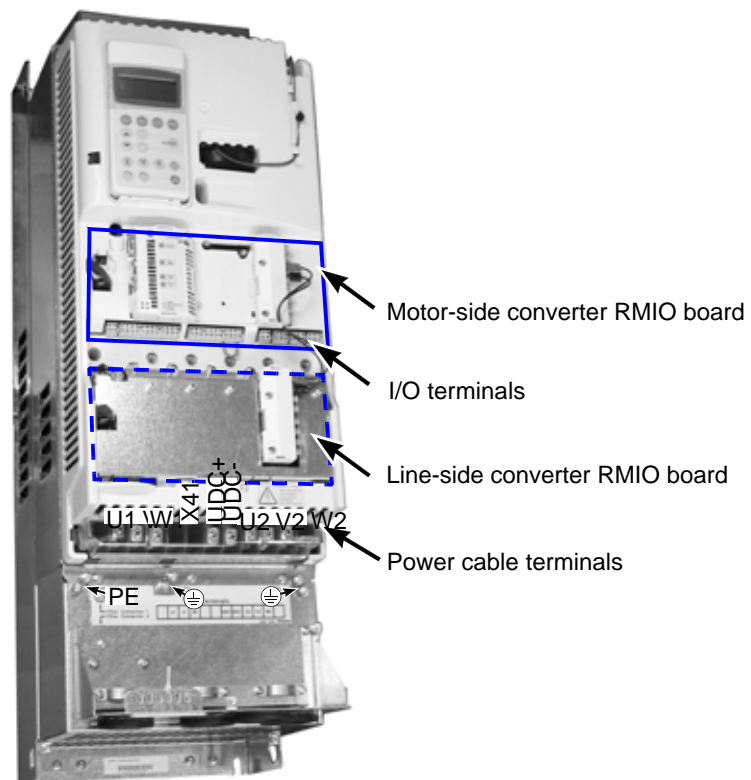
## What this chapter contains

This chapter describes the operating principle and construction of the drive in short.

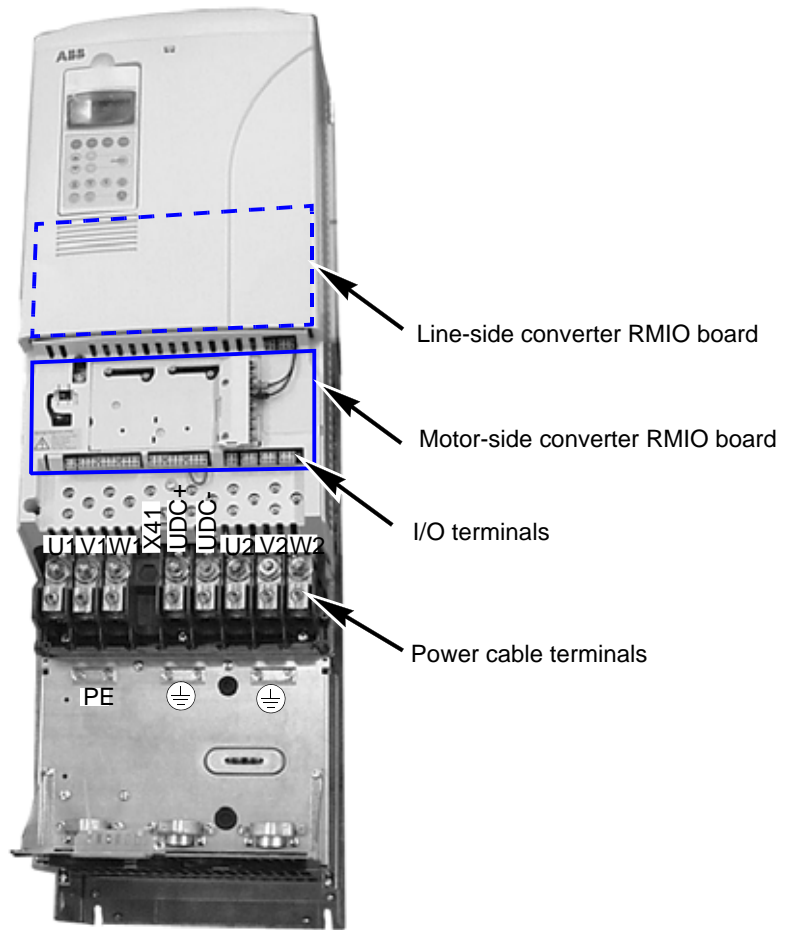
## Product overview

The ACS800-11/U11 is a four-quadrant wall mountable drive for controlling AC motors. The main circuit consists of two IGBT converters, a line-side converter and a motor-side converter, integrated into the same frame.





*Frame size R5 without front and connection box covers*



Frame size R6 without front and connection box covers

# Technical data

## What this chapter contains

This chapter contains the technical specifications of the drive, e.g. the ratings, sizes and technical requirements, provisions for fulfilling the requirements for CE and other markings and warranty policy.

## IEC data

### Ratings

The IEC ratings for the ACS800-11 with 50 Hz and 60 Hz supplies are given below. The symbols are described below the table.

ACS800-11 type	Nominal ratings		No overload $I_{HS}$	Light-overload use		Heavy-duty use		Frame size	Air flow $m^3/h$	Heat dissipation $W$
	$I_{cont. max}$	$I_{max} x_A$		$P_{cont. max}$	$I_2$ $N_A$	$P$ $N_W$	$I_{2h}$ $d_A$			
Three-phase supply voltage 208 V, 220 V, <b>230 V</b> or 240 V										
-0011-2	34	52	7.5	32	7.5	26	5.5	R5	350	505
-0016-2	47	68	11	45	11	38	7.5	R5	350	694
-0020-2	59	90	15	56	15	45	11	R5	350	910
-0025-2	75	118	22	69	18.5	59	15	R5	350	1099
-0030-2	88	137	22	83	22	72	18.5	R5	350	1315
-0040-2	120	168	37	114	30	84	22	R6	405	1585
-0050-2	150	234	45	143	45	117	30	R6	405	2125
-0060-2	169	264	45	157	45	132	37	R6	405	2530
Three-phase supply voltage 380 V, <b>400 V</b> or 415 V										
-0016-3	34	52	15	32	15	26	11	R5	350	550
-0020-3	38	61	18.5	36	18.5	34	15	R5	350	655
-0025-3	47	68	22	45	22	38	18.5	R5	350	760
-0030-3	59	90	30	56	30	45	22	R5	350	1000
-0040-3	72	118	37	69	37	59	30	R5	350	1210
-0050-3	86	137	45	83	45	65	30	R5	350	1450
-0060-3	120	168	55	114	55	88	45	R6	405	1750
-0070-3	150	234	75	143	75	117	55	R6	405	2350
-0100-3	165	264	90	157	75	132	75	R6	405	2800
Three-phase supply voltage 380 V, 400 V, 415 V, 440 V, 460 V, 480 V or <b>500 V</b>										
-0020-5	31	52	18.5	29	18.5	25	15	R5	350	655
-0025-5	36	61	22	34	22	30	18.5	R5	350	760
-0030-5	47	68	30	45	30	37	22	R5	350	1000
-0040-5	58	90	37	55	37	47	30	R5	350	1210
-0050-5	70	118	45	67	45	57	37	R5	350	1450
-0060-5	82	130	55	78	45	62	37	R5	350	1750
-0070-5	120	168	75	114	75	88	55	R6	405	2350
-0100-5	139	234	90	132	90	114	75	R6	405	2800
-0120-5	156	264	110	148	90	125	75	R6	405	3400
Three-phase supply voltage 525 V, 550 V, 575 V, 600 V, 660 V or <b>690 V</b>										
-0060-7	57	86	55	54	45	43	37	R6	405	1750
-0070-7	79	120	75	75	55	60	55	R6	405	2350
-0100-7	93	142	90	88	75	71	55	R6	405	2800

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## Symbols

### Nominal ratings

$I_{\text{cont.max}}$  continuous rms output current. No overload capability at 40 °C (104 °F).

$I_{\text{max}}$  maximum output current. Available for 10 s at start, otherwise as long as allowed by drive temperature.

### Typical ratings:

#### No-overload use

$P_{\text{cont.max}}$  typical motor power. The power ratings apply to most IEC 60034 motors at the nominal voltage, 230 V, 400 V, 500 V or 690 V.

#### Light-overload use (10% overload capability)

$I_2$  continuous rms current. 10% overload is allowed for one minute every 5 minutes.

$N$  typical motor power. The power ratings apply to most IEC 60034 motors at the nominal voltage, 230 V, 400 V, 500 V or 690 V.

#### Heavy-duty use (50% overload capability)

$I_{2h}$  continuous rms current. 50% overload is allowed for one minute every 5 minutes.

$d$  typical motor power. The power ratings apply to most IEC 60034 motors at the nominal voltage, 230 V, 400 V, 500 V or 690 V.

## Sizing

The current ratings are the same regardless of the supply voltage within one voltage range. To achieve the rated motor power given in the table, the rated current of the drive must be higher than or equal to the rated motor current.

**Note 1:** The maximum allowed momentary motor shaft power is limited to approximately  $1.3 \cdot P_{\text{cont.max}}$ . If the limit is exceeded, motor torque and current are automatically restricted. The function protects the input bridge and LCL filter of the drive against overload.

**Note 2:** The ratings apply at an ambient temperature of 40 °C (104 °F). At lower temperatures the ratings are higher (except  $I_{\text{max}}$ ).

**Note 3:** Use the DriveSize PC tool for a more accurate dimensioning if the ambient temperature is below 40 °C (104 °F) or the drive is loaded cyclically.

## Derating

The load capacity (current and power) decreases if the installation site altitude exceeds 1000 metres (3300 ft), or if the ambient temperature exceeds 40 °C (104 °F).

### Temperature derating

In the temperature range +40 °C (+104 °F) to +50 °C (+122 °F) the rated output current is decreased 1 % for every additional 1 °C (1.8 °F). The output current is calculated by multiplying the current given in the rating table by the derating factor.

**Example** If the ambient temperature is 50 °C (+122 °F), the derating factor is  $100\% - 1 \cdot \frac{\%}{\text{°C}}$  90 % or 0.90. The output current is then  $0.90 \cdot I_{2N}$  or  $0.90 \cdot I_{2hd}$ .

### Altitude derating

In altitudes from 1000 to 4000 m (3300 to 13123 ft) above sea level, the derating is 1% for every 100 m (328 ft). For a more accurate derating, use the DriveSize PC tool.

## Mains cable fuses

Fuses for short-circuit protection of the mains cable are listed below. The fuses also protect the adjoining equipment of the drive in case of a short-circuit. **Check that the operating time of the fuse is below 0.1 seconds.** The operating time depends on the supply network impedance and the cross-sectional area and length of the supply cable.

**Note 1:** In multicable installations, install only one fuse per phase (not one fuse per conductor).

**Note 2:** Larger fuses must not be used.

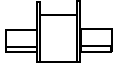
**Note 3:** Fuses from other manufacturers can be used if they meet the ratings.

ACS800-11 type	Input current	Fuse					
		A	$Z_s^*$	V	Manufacturer	Type	IEC size
Three-phase supply voltage 208 V, 220 V, <b>230 V</b> or 240 V							
-0011-2	32	40	9140	500	ABB Control	OFAF000H40	000
-0016-2	44	50	15400	500	ABB Control	OFAF000H50	000
-0020-2	55	63	21300	500	ABB Control	OFAF000H63	000
-0025-2	70	80	34500	500	ABB Control	OFAF000H80	000
-0030-2	82	100	63600	500	ABB Control	OFAF000H100	000
-0040-2	112	125	103000	500	ABB Control	OFAF000H125	00
-0050-2	140	160	200000	500	ABB Control	OFAF000H160	00
-0060-2	157	200	350000	500	ABB Control	OFAF1H200	1
Three-phase supply voltage 380 V, <b>400 V</b> or 415 V							
-0016-3	32	40	9140	500	ABB Control	OFAF000H40	000
-0020-3	35	40	9140	500	ABB Control	OFAF000H40	000
-0025-3	44	50	15400	500	ABB Control	OFAF000H50	000
-0030-3	55	63	21300	500	ABB Control	OFAF000H63	000
-0040-3	67	80	34500	500	ABB Control	OFAF000H80	000
-0050-3	80	100	63600	500	ABB Control	OFAF000H100	000
-0060-3	112	125	103000	500	ABB Control	OFAF000H125	00
-0070-3	140	160	200000	500	ABB Control	OFAF000H160	00
-0100-3	153	200	350000	500	ABB Control	OFAF1H200	1
Three-phase supply voltage 380 V, 400 V, 415 V, 440 V, 460 V, 480 V or <b>500 V</b>							
-0020-5	29	40	9140	500	ABB Control	OFAF000H40	000
-0025-5	33	40	9140	500	ABB Control	OFAF000H40	000
-0030-5	44	50	15400	500	ABB Control	OFAF000H50	000
-0040-5	54	63	21300	500	ABB Control	OFAF000H63	000
-0050-5	65	80	34500	500	ABB Control	OFAF000H80	000
-0060-5	76	100	63600	500	ABB Control	OFAF000H100	000
-0070-5	112	125	103000	500	ABB Control	OFAF000H125	00
-0100-5	129	160	200000	500	ABB Control	OFAF000H160	00
-0120-5	145	200	350000	500	ABB Control	OFAF1H200	1
Three-phase supply voltage 525 V, 550 V, 575 V, 600 V, 660 V or <b>690 V</b>							
-0060-7	53	63	28600	690	ABB Control	OFAA0GG63	0
-0070-7	73	80	52200	690	ABB Control	OFAA0GG80	0
-0100-7	86	100	93000	690	ABB Control	OFAA1GG100	1

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\* maximum total  $\hat{I}_t$  value for 550 V

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aR fuses							
ACS800-11 type	Input current	Fuse					
		A	$I_{nS}$ (@660V)	V	Manufacturer	Fuse size	Type DIN 43620 
Three-phase supply voltage 208 V, 220 V, <b>230 V</b> or 240 V							
-0011-2	32	63	1450	690	Bussmann	000	170M1565
-0016-2	44	80	2550	690	Bussmann	000	170M1566
-0020-2	55	100	4650	690	Bussmann	000	170M1567
-0025-2	70	125	8500	690	Bussmann	000	170M1568
-0030-2	82	125	8500	690	Bussmann	000	170M1568
-0040-2	112	160	7500	690	Bussmann	1*	170M3814
-0050-2	140	200	15000	690	Bussmann	1*	170M3815
-0060-2	157	250	28500	690	Bussmann	1*	170M3816
Three-phase supply voltage 380 V, <b>400 V</b> or 415 V							
-0016-3	32	63	1450	690	Bussmann	000	170M1565
-0020-3	35	80	2550	690	Bussmann	000	170M1566
-0025-3	44	80	2550	690	Bussmann	000	170M1566
-0030-3	55	100	4650	690	Bussmann	000	170M1567
-0040-3	67	125	8500	690	Bussmann	000	170M1568
-0050-3	80	125	8500	690	Bussmann	000	170M1568
-0060-3	112	160	7500	690	Bussmann	1*	170M3814
-0070-3	140	200	15000	690	Bussmann	1*	170M3815
-0100-3	153	250	28500	690	Bussmann	1*	170M3816
Three-phase supply voltage 380 V, 400 V, 415 V, 440 V, 460 V, 480 V or <b>500 V</b>							
-0020-5	29	63	1450	690	Bussmann	000	170M1565
-0025-5	33	80	2550	690	Bussmann	000	170M1566
-0030-5	44	80	2550	690	Bussmann	000	170M1566
-0040-5	54	100	4650	690	Bussmann	000	170M1567
-0050-5	65	125	8500	690	Bussmann	000	170M1568
-0060-5	76	125	8500	690	Bussmann	000	170M1568
-0070-5	112	160	7500	690	Bussmann	1*	170M3814
-0100-5	129	200	15000	690	Bussmann	1*	170M3815
-0120-5	145	250	28500	690	Bussmann	1*	170M3816
Three-phase supply voltage 525 V, 550 V, 575 V, 600 V, 660 V or <b>690 V</b>							
-0060-7	53	100	4650	690	Bussmann	000	170M1367
-0070-7	73	125	8500	690	Bussmann	000	170M1368
-0100-7	86	160	7500	690	Bussmann	1*	170M3164

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## Cable types

The table below gives copper and aluminium cable types for different load currents. Cable sizing is based on max. 9 cables laid on a cable ladder side by side, ambient temperature 30 °C, PVC insulation, surface temperature 70 °C (158 °F) (EN 60204-1 and IEC 60364-5-2/2001). For other conditions, size the cables according to local safety regulations, appropriate input voltage and the load current of the drive.

Copper cables with concentric copper shield		Aluminium cables with concentric copper shield	
Max. load current A	Cable type mm <sup>2</sup>	Max. load current A	Cable type mm <sup>2</sup>
34	3x6	61	3x25
47	3x10	75	3x35
62	3x16	91	3x50
79	3x25	117	3x70
98	3x35	143	3x95
119	3x50	165	3x120
153	3x70	191	3x150
186	3x95	218	3x185
215	3x120		
249	3x150		
284	3x185		

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## Cable entries

Mains, DC link and motor cable terminal sizes (per phase), accepted cable diameters and tightening torques are given below.

Frame size	U1, V1, W1, U2, V2, W2, UDC+,UDC-			Earthing PE	
	Wire size mm <sup>2</sup>	Max. cable Ø IP21 mm	Tightening torque N·m	Wire size mm <sup>2</sup>	Tightening torque N·m
R5	6...70	35	10	6...35	15
R6	95...185 *	53	20...40	16...95	8

\* with cable lugs 16...70 mm<sup>2</sup>, tightening torque 20...40 N·m

## noise

Frame size	IP21				Noise dB
	Height mm	Width mm	Depth mm	Weight kg	
<b>Drive</b>					
R5	816	265	390	65	70
R6	970	300	439	100	73
<b>Package</b>					
R5	1085	400	549	5	
R6	1145	400	585	4	

## NEMA data

### Ratings

The NEMA ratings for the ACS800-U11 and ACS800-11 with 60 Hz supplies are given below. The symbols are described below the table. For sizing, derating and 50 Hz supplies, see [IEC data](#).

ACS800-U11 type ACS800-11 type	$I_{ma}$ x A	Normal use		Heavy-duty use		Frame size	Air flow ft <sup>3</sup> /min	Heat dissipation BTU/Hr
		$I_2$ N	$P$ Np	$I_{2h}$ dA	$P_h$ φp			
Three-phase supply voltage 208 V, 220 V, <b>230 V</b> or 240 V								
-0011-2	52	32	10	26	7.5	R5	206	1730
-0016-2	68	45	15	38	10	R5	206	2380
-0020-2	90	56	20	45	10	R5	206	3110
-0025-2	118	69	25	59	15	R5	206	3760
-0030-2	137	83	30	72	20	R5	206	4500
-0040-2	168	114	40	84	25	R6	238	5420
-0050-2	234	143	50	117	30	R6	238	7260
-0060-2	264	157	60	132	40	R6	238	8650
Three-phase supply voltage 380 V, 400 V, 415 V, 440 V, <b>460 V</b> or 480 V								
-0020-5	52	28	10	25	15	R5	206	2240
-0025-5	61	34	15	30	20	R5	206	2600
-0030-5	68	45	20	37	25	R5	206	3420
-0040-5	90	55	30	47	30	R5	206	4140
-0050-5	118	67	40	57	40	R5	206	4960
-0060-5	130	78	50	62**	50**	R5	206	5980
-0070-5	168	114	60	88	60	R6	238	8030
-0100-5	234	132	80	114	75	R6	238	9570
-0120-5	264	148*	100	125*	100	R6	238	11620
Three-phase supply voltage 525 V, <b>575 V</b> or 600 V								
-0060-7	86	48	30	48	40	R6	238	5980
-0070-7	120	75	40	60	50	R6	238	8030
-0100-7	142	88	50	71	60	R6	238	9570

\* 156 A, motor power ≤ 125 hp and a reactive power reference of 0 allowed with 460 V \*\* 65 A, motor power ≤ 50 hp and a reactive power reference of 0 allowed with 460 V

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## Symbols

### Nominal ratings

$I_{ma}$  maximum output current. Available for 10 s at start, otherwise as long as allowed by drive temperature.

### Normal use (10% overload capability)

$I_{2N}$  continuous rms current. 10% overload is typically allowed for one minute every 5 minutes.

$P_N$  typical motor power. The power ratings apply to most 4-pole NEMA rated motors (230 V, 460 V or 575 V).

### Heavy-duty use (50% overload capability)

$I_{2h}$  continuous rms current. 50% overload is typically allowed for one minute every 5 minutes.

$P_{hd}$  typical motor power. The power ratings apply to most 4-pole NEMA rated motors (230 V, 460 V or 575 V).

**Note 1:** The ratings apply at an ambient temperature of 40 °C (104 °F). In lower temperatures the ratings are higher (except  $I_{max}$ ).

## Input cable fuses

The ratings of UL listed fuses for branch circuit protection are listed below. The fuses also prevent damage to the adjoining equipment of the drive in case of a short-circuit inside the drive. **Check that the operating time of the fuse is below 0.1 seconds.** The operating time depends on the supply network impedance and the cross-sectional area and length of the supply cable. The fuses must be of the “non-time delay” type.

**Note 1: In multicable installations, install only one fuse per phase (not one fuse per conductor).**

**Note 2:** Larger fuses must not be used.

**Note 3:** Fuses from other manufacturers can be used if they meet the ratings.

ACS800-U11 type ACS800-11 type	Input current A	Fuse				
		A	V	Manufacturer	Type	UL class
Three-phase supply voltage 208 V, 220 V, <b>230 V</b> or 240 V						
-0011-2	32	40	600	Bussmann	JJS-40	T
-0016-2	44	70	600	Bussmann	JJS-70	T
-0020-2	55	80	600	Bussmann	JJS-80	T
-0025-2	70	90	600	Bussmann	JJS-90	T
-0030-2	82	100	600	Bussmann	JJS-100	T
-0040-2	112	150	600	Bussmann	JJS-150	T
-0050-2	140	200	600	Bussmann	JJS-200	T
-0060-2	157	200	600	Bussmann	JJS-200	T
Three-phase supply voltage 380 V, 400 V, 415 V, 440 V, <b>460 V</b> , 480 V or 500 V						
-0020-5	29	40	600	Bussmann	JJS-40	T
-0025-5	33	50	600	Bussmann	JJS-50	T
-0030-5	44	70	600	Bussmann	JJS-70	T
-0040-5	54	80	600	Bussmann	JJS-80	T
-0050-5	65	90	600	Bussmann	JJS-90	T
-0060-5	76	100	600	Bussmann	JJS-100	T
-0070-5	112	150	600	Bussmann	JJS-150	T
-0100-5	129	200	600	Bussmann	JJS-200	T
-0120-5	145	200	600	Bussmann	JJS-200	T
Three-phase supply voltage 525 V, <b>575 V</b> or 600 V						
-0060-7	53	80	600	Bussmann	JJS-80	T
-0070-7	73	100	600	Bussmann	JJS-100	T
-0100-7	86	125	600	Bussmann	JJS-125	T

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