

ABB AC DRIVES

ACS 400 **Adjustable Speed AC Drives** for advanced speed control of 3 to 50 Hp induction motors

ACS 400 AC Drive – The standard has just been raised



The ACS 400 drive combines a sophisticated microprocessor with an advanced IGBT power switching technology to deliver the highest performance control of AC motors. Its extensive library of pre-programmed application macros maximizes convenience and minimizes start-up time. This drive can handle the most demanding industrial applications in an efficient, dependable, and economic manner.

Features of the ACS 400 Drive include:

- Standard, versatile software
- Numerous fieldbus modules for serial communications
- Universal alphanumeric interface that “speaks” in plain English phrases, greatly simplifying set-up, operation, and fault diagnosis.
- An extensive library of pre-programmed application macros
- UL, CUL and CE approved

Easily Integrated:

- No need for input device conversion logic
- Galvanically isolated I/O
- Standard, 3-wire and alternative control connections
- Space-saving bookshelf design



ACS 400 Technical Data

Input connection

Voltage: 3-phase
200 to 480 V
±10%, permitted tolerance
Frequency: 48...63 Hz
± 2 Hz

Output connection

Voltage: 0 to max
Frequency: 0 to 250 Hz

Environmental limits

Ambient operating temperature:
0° to 40° C

Enclosure

NEMA 1, NEMA 12

Standard control connection

- 2 programmable analog inputs (1 voltage signal, 1 current signal)
- 5 programmable digital inputs
- 1 programmable analog output
- 2 programmable relay outputs

Options

- Dynamic braking
- RFI filters
- Drive Windows Software
- DDCS fiber optic link
- Fieldbus Adaptor Modules: DeviceNet™, Modbus Plus™, Interbus-S, Profibus

Protection

- Overcurrent
- Ground fault
- Overtemperature (heatsink)
- Auxiliary voltage short circuit protection
- Motor overload (I^2t) UL508C approved
- Overvoltage
- Undervoltage
- Microprocessor fault
- Motor stall

Dimensions	R1		R2		R3		R4	
	inches	mm	inches	Mm	inches	mm	Inches	mm
W	4.92	125	4.92	125	7.99	203	7.99	203
W1	3.86	98	3.86	98	6.3	160	6.30	160
H	12.99	330	16.93	430	21.46	21.46	25.04	636
H1	12.52	318	16.42	417	20.79	528	24.37	619
H2	11.81	300	15.75	400	19.69	500	23.62	600
D	8.23	209	8.70	221	9.72	247	11.02	280
Weight	12.76 lb	5.8 kg	19.8 lb	9.0 kg	40.7 lb	18.5 kg	59.4 lb	27.0 kg

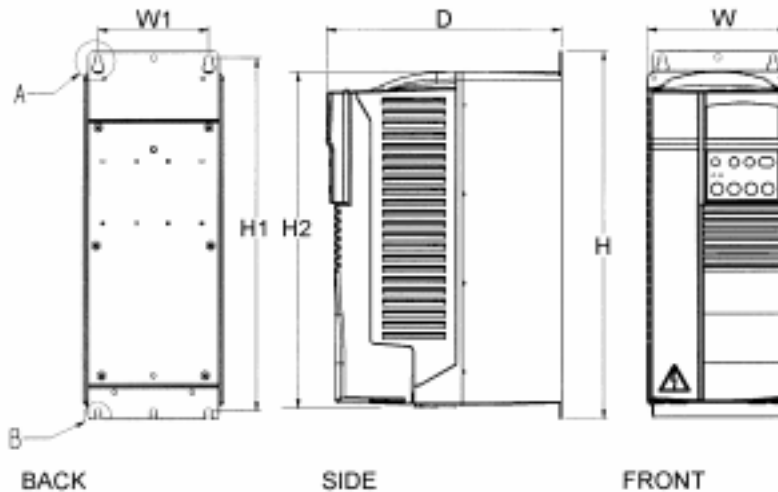


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Supersedes: None

General Type Code Description

Field:	1	2	3	4	5	6	7
	AC	S	401	6	011	3	2

Description of the Type Code fields

Field 1: AC = AC Drive

Field 2: S= Industrial Drive

Field 3: Product Family and Enclosure Type
 401 = Wall mounted (ACS 401)

Field 4: Operator, Documentation, Firmware
 6 = ACS-PAN-A, English, Standard

Field 5: Rated Output Power
 See rating tables

Field 6: Voltage Rating
 1 = 200 – 240 VAC
 3 = 380 – 480 VAC

Field 7: Enclosure Rating
 2 = NEMA 1
 5 = NEMA 12

Standard Products

200 - 230 VAC Models

NEMA 1 (IP22) Type Codes	Normal Use (10% overload capacity)			Frame Size
	I _N (A)	P _N (kW)	P _N (HP)	
ACS401600612	11.6	2.2	3	R1
ACS401600912	15.3	4.0	5	R2
ACS401601112	23.0	5.5	7.5	
ACS401601612	30.0	7.5	10	R3
ACS401602012	38.0	11	15	
ACS401603012	59.0	15	20	R4
ACS401604112	72.0	18.5	25	

NEMA 12 (IP54) Type Codes	Normal Use (10% overload capacity)			Frame Size
	I _N (A)	P _N (kW)	P _N (HP)	
ACS401600615	11.6	2.2	3	R1
ACS401600915	15.3	4.0	5	R2
ACS401601115	23.0	5.5	7.5	
ACS401601615	30.0	7.5	10	R3
ACS401602015	38.0	11	15	
ACS401603015	59.0	15	20	R4
ACS401604115	72.0	18.5	25	

380 - 480 VAC Models

NEMA 1 (IP22) Type Codes	Normal Use (10% overload capacity)			Frame Size
	I _N (A)	P _N (kW)	P _N (HP)	
ACS401600432	6.6	3.0	3	R1
ACS401600532	8.8	4.0	5	
ACS401600632	11.6	5.5	7.5	
ACS401600932	15.3	7.5	10	R2
ACS401601132	23	11	15	R3
ACS401601632	30	15	20	
ACS401602032	38	18.5	25	
ACS401602532	44	22	30	R4
ACS401603032	59	30	40	
ACS401604132	72	37	50	
ACS402640032	480	315	400	

NEMA 12 (IP54) Type Codes	Normal Use (10% overload capacity)			Frame Size
	I _N (A)	P _N (kW)	P _N (HP)	
ACS401600435	6.6	3.0	3	R1
ACS401600535	8.8	4.0	5	
ACS401600635	11.6	5.5	7.5	
ACS401600935	15.3	7.5	10	R2
ACS401601135	23	11	15	R3
ACS401601635	30	15	20	
ACS401602035	38	18.5	25	
ACS401602535	44	22	30	R4
ACS401603035	59	30	40	
ACS401604135	72	37	50	

Standard Features

ACS 400 in Brief

The ACS 400 series is a microprocessor based Pulse Width Modulated (PWM) adjustable frequency AC drive. The ACS 400 drive takes advantage of sophisticated microprocessor control and advanced IGBT power switching technology to deliver high-performance control of AC motors for a wide range of applications.

With drives ranging from 3 to 50HP, the ACS 400 series features a universal alphanumeric interface that “speaks” to the operator in plain English phrases, greatly simplifying set-up, operation, and fault diagnosis. The ACS 400 is also programmable in eleven other languages.

Each ACS 400 drive comes equipped with an extensive library of pre-programmed application macros, which at a touch of a button, allow rapid configuration of inputs, outputs, and performance parameters for specific applications to maximize convenience and minimize start-up time. The ACS 400 series can handle the most demanding commercial applications in an efficient, dependable, and economic manner.

Standard Features

- UL and cUL
- CE Marked
- 30 Character Multi-lingual Alphanumeric Display For:

Output Frequency (Hz)	Speed (RPM)
Motor Current	Calculated % Motor Torque
Calculated Motor Power (kW)	DC Bus Voltage
Output Voltage	Heatsink Temperature
Elapsed Time Meter (resettable)	kWh (resettable) and MWh Meter
Parameter Set-Up	Fault Text
Warning Text	Supervision Text
- RS-485 Communications (Modbus protocol standard)
- Two (2) Analog Inputs
- Five (5) Programmable Digital Inputs
- One (1) Programmable Analog Output
- Two (2) Programmable Digital Relay Outputs
- Adjustable Filters On Analog Inputs and Outputs
- Input Speed Signals

Current 0(4)-20 mA	Voltage 0(2)-10 VDC
Accel/Decel Contacts	RS-485 Communications
- Start/Stop

2 Wire (Dry Contact Closure)	3 Wire (Momentary Contacts)
Application Of Input Power	Analog input level
Serial Communications	
- All Control Inputs Isolated From Power, Control circuit grounded through 1 MOhm
- Protection Circuits

Over Current	Ground Fault
Over Voltage	Under Voltage
Over Temperature	Adaptable Electronic Motor Overload (I ² t)
Loss of Input Power Phase	
- Two (2) Current Limit Circuits
- Automatic Electronic Reverse
- DC Injection Braking at start (programmable), anti-windmill protection
- Scalable Process Variable Display
- Auto Restart-Customer Selectable and Adjustable
- Two (2) sets of Independently Adjustable Accel and Decel Ramps
- Linear Or “S” Curve Accel/Decel Ramps
- Ramp Or Coast To A Stop
- Programmable Maximum Frequency To 250 Hz
- Integral Programmable PID Setpoint Controller
- Bumpless transfer, Hand to Auto and Auto to Hand
- Seven (7) Preset Speeds
- Two(2) Critical Frequency Lockout Bands
- V/Hz Shape

Linear	Squared
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- Start Functions
 - Ramp Flying Start
 - Automatic Torque Boost Automatic Torque Boost with Flying Start
- IR Compensation
- Automatic Extended Power Loss Ride Through (selectable)
- Line Reactor(s)

Optional Features

- RFI Filters
- Drives Windows Software
- DDCS Link
- Fieldbus Adaptor Modules
 - DeviceNet[™] Interbus-S
 - ProfibusI

B Dimensions (in/mm)

Units with IP 21/NEMA 1 Enclosures

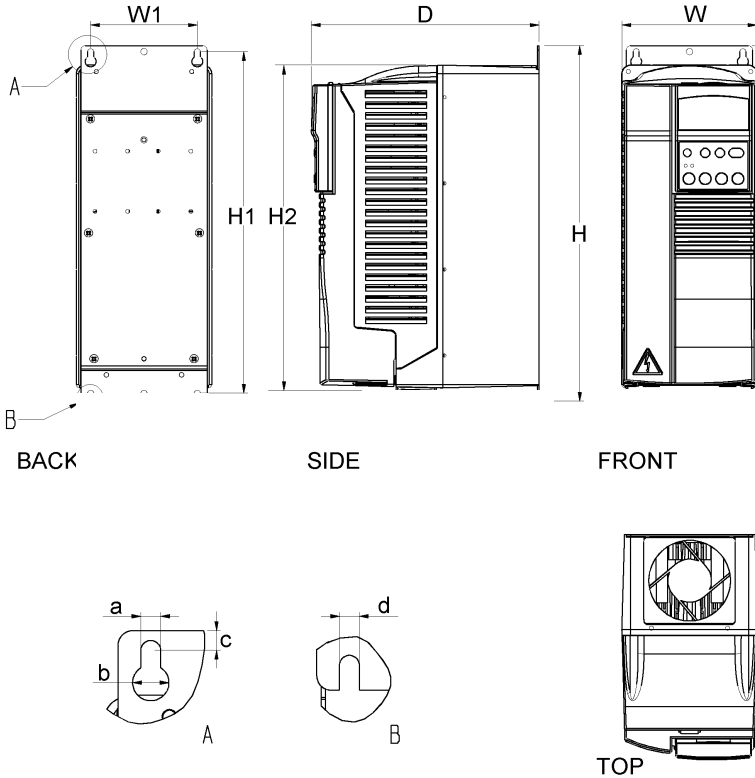


Figure 2 IP 21/NEMA 1 enclosures

Table 1 Dimensions of units with IP 21/NEMA 1 enclosures

Dimension Reference (in/mm)	Frame Size, IP21/NEMA 1 (See Paragraph S for frame size assignments of type codes)			
	R1	R2	R3	R4
W	4.92/125	4.92/125	7.99/203	7.99/203
W1	3.86/98	3.86/98	3.86/98	3.86/98
H	12.99/330	16.93/430	21.46/545	25.04/636
H1	12.52/318	16.42/417	20.79/528	24.37/619
H2	11.81/300	15.75/400	19.69/500	23.62/600
D	8.23/209	8.70/221	9.72/247	11.02/280
a	0.217/5.5	0.217/5.5	0.256/6.5	0.256/6.5
b	0.394/10	0.394/10	0.512/13	0.512/13
c	0.217/5.5	0.217/5.5	0.256/6.5	0.256/6.5
Mass (lb/kg)	12.76/5.8	19.80/9.0	40.70/18.5	59.40/27

Units with IP 54/NEMA 12 Enclosures

The IP 54/NEMA 12 protection class has a different outer plastic cover. The IP 54/NEMA 12 enclosure uses the same internal plastic shell as the IP21 enclosure, but an internal fan is added to improve cooling. This structure increases the dimensions compared to the IP 21 enclosure, but does not require a de-rating.

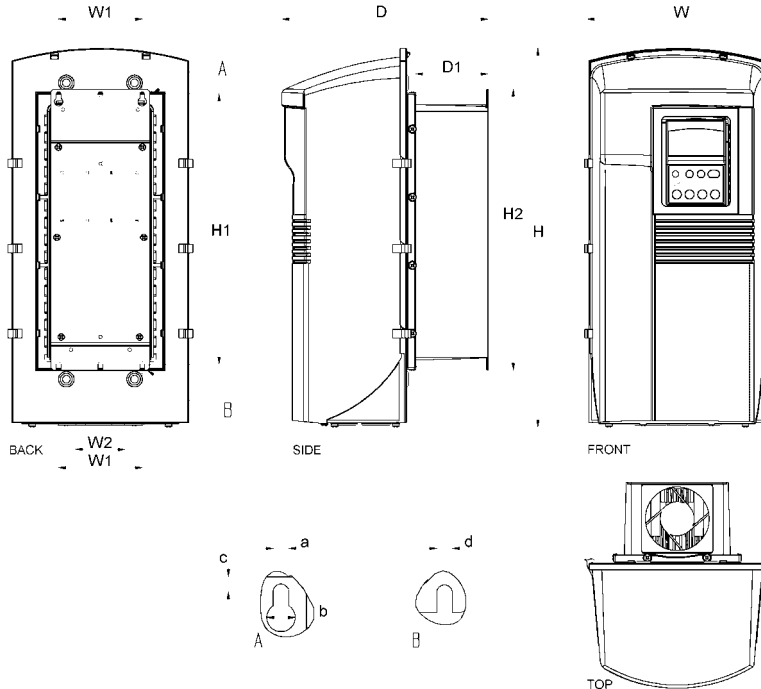


Figure 3 IP 54/NEMA 12 enclosures

Table 2 Dimensions of units with IP 54/NEMA 12 enclosures.

Dimension Reference (in/mm)	Frame Size, IP54/NEMA 12 (See Paragraph S for frame size assignments of type codes)			
	R1	R2	R3	R4
W	8.46/215	8.46/215	10.12/257	10.12/257
W1	3.86/98	3.86/98	3.86/98	3.86/98
H	17.72/450	21.65/550	25.28/642	29.21/742
H1	12.52/318	16.42/417	20.79/528	24.37/619
H2	12.49/330	16.93/430	21.46/545	25.04/636
D	9.49/241	9.96/253	10.98/279	12.28/312
a	0.217/5.5	0.217/5.5	0.256/6.5	0.256/6.5
b	0.394/10	0.394/10	0.512/13	0.512/13
c	0.217/5.5	0.217/5.5	0.256/6.5	0.256/6.5
Weight (lb/kg)	12.76/5.8	19.80/9.0	40.70/18.5	61.60/28