

LOW VOLTAGE AC DRIVES

ABB drives for cranes

ACS380, 0.37 to 22 kW



Designed to move your overhead and tower cranes reliably day after day.

- All built-in for efficient overhead and tower crane movements**

The drive includes built-in control for hoist, trolley and long travel/slew movements and the essential functions for typical crane applications. It works precisely both in open and closed loop configurations.

- Reliable operation**

With their coated circuit boards, 50 °C ambient rating and advanced cooling system, ACS380 drives are made to last even in demanding atmospheres.

- A lot packed into a compact unit**

The drive includes an integrated brake chopper for dynamic braking and safe torque off (SIL 3) as standard. The drive can be installed in a crane cabinet either to a DIN rail or with a screw installation.



Technical data

Voltage and power range	1-phase, 200 to 240 V, +10%/-15% 0.25 to 3 kW 3-phase, 200 to 240 V, +10%/-15% 0.25 to 15 kW 3-phase, 380 to 480 V, +10%/-15% 0.37 to 22 kW Built-in braking chopper and common DC connection with internal charging circuit
Frequency	50/60 Hz ±5%
Degree of protection	IP20 as standard (UL open type)
Ambient conditions	-10 to +50 °C (14 to 122 °F), up to +60 °C (140 °F) with derating (except R0)
Altitude	230 V units: 0 to 2000 m above sea level (with derating above 1000 m) 400 V units: 0 to 4000 m above sea level (with derating above 1000 m, see manual for usage restriction at 4000 m)
Compliance	CE, RoHS, UL, EAC, CSA, TÜV NORD
Safety	Safe torque off (STO) acc. to EN/IEC 61800-5-2: IEC 61508 ed2: SIL 3, IEC 61511: SIL 3, IEC 62061: SIL CL 3, EN ISO 13849-1: PL e
EMC	EMC category C2 (200 V & 400 V) or EMC category C4 (200 V) and C3 (400 V), according to EMC Directive 2014/30/EU, EN 61800-3:2004 + A1 2012
User interface	Integrated icon-based control panel
Drive programming	Adaptive programming
Motor control	Vector and scalar, both in open or closed loop

Ordering variants



IO controlled crane drive

4 DI + 2 DI/DO + 2 AI + 1 AO + 1 R0 + STO
Embedded modbus

Options:

- One of following side extension options
 - HTL/TTL encoder & ext. 24 V DC supply
 - 4 × relay output module
 - External 24 V DC supply



Fieldbus controlled crane drive

2 DI + 1 R0 + STO + one preconfigured fieldbus

Options:

- **Fieldbus options**
PROFIBUS, PROFINET, EtherNet/IP™, Modbus TCP/IP, EtherCAT®, POWERLINK, DeviceNet™, CanOpen®
- One of following side extension options
 - HTL/TTL encoder & ext. 24 V DC supply
 - 4 × relay output module
 - External 24 V DC supply
- One front extension I/O option
can be used together with fieldbus
3 DI + 1 DO + 1 AI

Learn more from ACS380 product catalog



For more information contact your local ABB representative or visit:

www.abb.com/drives/cranes
www.abb.com/drivespartners

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ACS380 - part of ABB's all-compatible crane drives portfolio

Why select ABB's all-compatible crane drives?

- The ACS380 and ACS880 drives give the same user experience
- Possibility to use same assistant control panel or PC tool
- Adaptive block programming for extended crane functionality

Works with following crane interfaces

- Joystick
- Pendant controller
- Motor potentiometer
- Fieldbus control

Built-in crane application includes

- Slowdown logic
- End limit logic
- Fast stop function
- Mechanical brake control
- And much more

Robust design

- Advanced cooling system
- Earth fault protection based on three-phase current measurement

Ratings, types and voltages

ACS380

$U_N = 200 \text{ V}$ (range 200 to 240 V). The power ratings are valid at nominal voltage 200 V (0.25 to 3.0 kW)									
Heavy-duty use		Maximum output current		Light-overload use		Nominal ratings		Type designation	Frame size
P_{Hd} kW	I_{Hd} A	I_{max} A	P_{Ld} kW	IL_d A	P_N kW	I_N A			
0.25	1.8	3.2	0.37	2.3	0.37	2.4	ACS380-04xx-02A4-1	R0	
0.37	2.4	4.3	0.55	3.5	0.55	3.7	ACS380-04xx-03A7-1	R0	
0.55	3.7	6.7	0.75	4.6	0.75	4.8	ACS380-04xx-04A8-1	R1	
0.75	4.8	8.6	1.1	6.6	1.1	6.9	ACS380-04xx-06A9-1	R1	
1.1	6.9	12.4	1.5	7.4	1.5	7.8	ACS380-04xx-07A8-1	R1	
1.5	7.8	14.0	2.2	9.3	2.2	9.8	ACS380-04xx-09A8-1	R2	
2.2	9.8	17.6	3.0	11.6	3.0	12.2	ACS380-04xx-12A2-1	R2	

$U_N = 400 \text{ V}$ (range 380 to 480 V). The power ratings are valid at nominal voltage 400 V (0.37 to 22 kW)									
Heavy-duty use		Maximum output current		Light-overload use		Nominal ratings		Type designation	Frame size
P_{Hd} kW	I_{Hd} A	I_{max} A	P_{Ld} kW	IL_d A	P_N kW	I_N A			
0.37	1.2	2.2	0.55	1.7	0.55	1.8	ACS380-04xx-01A8-4	R0	
0.55	1.8	3.2	0.75	2.5	0.75	2.6	ACS380-04xx-02A6-4	R1	
0.75	2.6	4.7	1.1	3.1	1.1	3.3	ACS380-04xx-03A3-4	R1	
1.1	3.3	5.9	1.5	3.8	1.5	4	ACS380-04xx-04A0-4	R1	
1.5	4	7.2	2.2	5.3	2.2	5.6	ACS380-04xx-05A6-4	R1	
2.2	5.6	10.1	3	6.8	3	7.2	ACS380-04xx-07A2-4	R1	
3	7.2	13	4	8.9	4	9.4	ACS380-04xx-09A4-4	R1	
4	9.4	16.9	5.5	12	5.5	12.6	ACS380-04xx-12A6-4	R2	
5.5	12.6	22.7	7.5	16.2	7.5	17	ACS380-04xx-17A0-4	R3	
7.5	17	30.6	11	23.8	11	25	ACS380-04xx-25A0-4	R3	
11	25	44	15	31	15	32	ACS380-04xx-032A-4	R4	
15	32	57	18.5	36	18.5	38	ACS380-04xx-038A-4	R4	
18.5	38	68	22	43	22	45	ACS380-04xx-045A-4	R4	
22	45	81	22	48	22	50	ACS380-04xx-050A-4	R4	

Nominal ratings	
I_N	Rated current available continuously without overloadability at 50 °C.
P_N	Typical motor power in no-overload use.
Maximum output current	
I_{max}	Maximum output current. Available for 2 seconds at start, then as long as allowed by drive temperature.
Heavy-duty use	
I_{Hd}	Continuous current allowing 150% I_{Hd} for 1 minute every 10 minutes at 50 °C.
P_{Hd}	Typical motor power in heavy-duty use.
Light-overload use	
I_{Ld}	Continuous current allowing 110% I_{Ld} for 1 minute every 10 minutes at 50 °C.
P_{Ld}	Typical motor power in light-overload use.

The ratings apply at 50 °C ambient temperatures.

For derating at higher altitudes, temperatures or switching frequencies, see the user's HW manual, document code: 3AXD50000029274

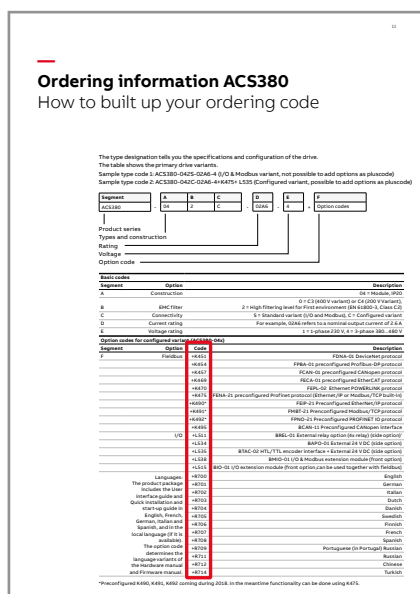
How to select a drive

It is very easy to select the right drive. This is how you build up your own ordering code using the type designation key.

Start with identifying your supply voltage
This tells you what rating table to use. See
page 12.

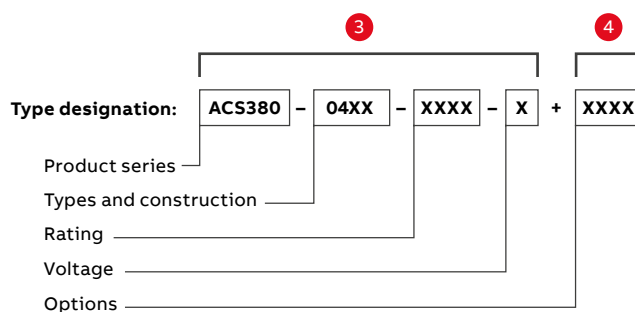
Select the ordering code for the ACS380 machinery drive by choosing either the standard or the configured variant (page 11). Then choose the desired EMC level on page 11. If the configured variant is selected, choose your fieldbus protocol (page 16) by selecting the correct option code and add the option codes to drive's ordering code.

Choose your motor's power and current rating from the ratings table on page 12.



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Choose other options (on page 18) and add the option codes to the drive's order code. Remember to use a "+" mark before each option code.



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ABB MACHINE DRIVERS, ACCESS, CATALOG

Ratings, types and voltages

AC5380

AC 5380 V (50 Hz) 200 V to 240 V. The power ratings are valid at nominal voltage 200 V (230 V at 50 Hz).

Hourly duty cycle	Maximum current		Light overload zone		Nominal ratings		Type designation	Frame size
	I_{sc}	I_{sc}	I_{sc}	I_{sc}	I_N	I_N		
α	β	α	β	α	β	α		
0.25 / 1.0	1.4	3.2	3.27	2.3	0.87	2.4	AC5380-04-024A-1	W1
0.57 / 2.0	1.8	3.8	3.85	2.5	0.90	2.7	AC5380-04-030A-1	R1
0.75 / 3.0	2.0	4.2	4.25	2.6	0.93	3.0	AC5380-04-036A-1	R1
0.85 / 4.0	2.1	4.5	4.5	2.7	0.95	3.3	AC5380-04-042A-1	R1
1.0 / 5.0	2.3	4.9	4.9	2.8	1.0	3.6	AC5380-04-048A-1	R1
1.0 / 7.5	2.4	5.0	5.0	2.9	1.0	3.9	AC5380-04-054A-1	R1
2.0 / 10.0	2.6	5.4	5.4	3.0	1.1	4.2	AC5380-04-060A-1	R1
2.0 / 15.0	2.8	5.8	5.8	3.1	1.2	4.5	AC5380-04-066A-1	R1

AC 5380 V (50 Hz) 440 V to 480 V. The power ratings are valid at nominal voltage 440 V (480 V at 50 Hz).

Hourly duty cycle	Maximum current		Light overload zone		Nominal ratings		Type designation	Frame size
	I_{sc}	I_{sc}	I_{sc}	I_{sc}	I_N	I_N		
α	β	α	β	α	β	α		
0.25 / 1.0	1.4	3.2	3.27	2.3	0.75	2.0	AC5380-04-024A-2	R1
0.57 / 2.0	1.6	3.6	3.6	2.5	0.78	2.2	AC5380-04-030A-2	R1
0.75 / 3.0	1.7	3.9	3.9	2.6	0.80	2.4	AC5380-04-036A-2	R1
0.85 / 4.0	1.8	4.1	4.1	2.7	0.82	2.6	AC5380-04-042A-2	R1
1.0 / 5.0	1.9	4.3	4.3	2.8	0.84	2.8	AC5380-04-048A-2	R1
1.0 / 7.5	2.0	4.5	4.5	2.9	0.86	3.0	AC5380-04-054A-2	R1
2.0 / 10.0	2.1	4.7	4.7	3.0	0.88	3.2	AC5380-04-060A-2	R1
2.0 / 15.0	2.2	4.9	4.9	3.1	0.90	3.4	AC5380-04-066A-2	R1

Hourly duty cycle	Maximum current		Light overload zone		Nominal ratings		Type designation	Frame size
	I_{sc}	I_{sc}	I_{sc}	I_{sc}	I_N	I_N		
α	β	α	β	α	β	α		
0.25 / 1.0	1.4	3.2	3.27	2.3	0.62	1.6	AC5380-04-024A-3	R1
0.57 / 2.0	1.6	3.6	3.6	2.5	0.64	1.8	AC5380-04-030A-3	R1
0.75 / 3.0	1.7	3.9	3.9	2.6	0.66	2.0	AC5380-04-036A-3	R1
0.85 / 4.0	1.8	4.1	4.1	2.7	0.68	2.2	AC5380-04-042A-3	R1
1.0 / 5.0	1.9	4.3	4.3	2.8	0.70	2.4	AC5380-04-048A-3	R1
1.0 / 7.5	2.0	4.5	4.5	2.9	0.72	2.6	AC5380-04-054A-3	R1
2.0 / 10.0	2.1	4.7	4.7	3.0	0.74	2.8	AC5380-04-060A-3	R1
2.0 / 15.0	2.2	4.9	4.9	3.1	0.76	3.0	AC5380-04-066A-3	R1

Motor ratings

Motor current available continuously without overloading at 50 °C.

I_N Type of motor power to be controlled on

I_{sc} Short-circuit current

α Motor current limit. Available for 40 s, then it is allowed by thermal protection.

Motor duty cycle

β Continuous current available 100% 1 s, 1 minute every 10 minutes at 50 °C.

α Short-circuit current available 100% 1 s, 1 minute every 10 minutes at 50 °C.

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ABB MACHINERY DRIVES, ACCESSORY CATALOG

Input/output, extension and feedback modules for increased connectivity

Standard input and output of ACS380 machinery drives can be extended by using optional input/output extension modules. The modules are easily installed in the extension slots located in the drive. It is also possible to use an optional speed feedback module that supports TTL and HTL pulse encoders.

Extension module options

Option code	Description	Type designation
+LS4	External P.T.C. OC	84PD-01
+LS1	External relay output (NPN)	84PD-02
+LS3	IO extension	84D-03

Feedback interface module options

Option code	Connection	Type designation
+F02	Encoder interface + External HTL or TTL	84PD-04

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Technical data

Mains connection	
Voltage and power range	1-phase, 200 to 240 V, +10%/-15% 0.25 to 2.2 kW 3-phase, 380 to 480 V, +10%/-15% 0.25 to 22 kW
Frequency	50/60 Hz $\pm$ 5%
Common DC connection	
DC voltage level	-1 types 270 to 325 V $\pm$ 10% -4 types 485 to 620 V $\pm$ 10%
Charging circuit	Internal charging circuit
Motor connection	
Voltage	0 to U_N , 3-phase
Frequency	0 to 599 Hz
Motor control	Scalar control Vector control
Switching frequency	1 to 12 kHz, default 4 kHz
Dynamic braking	Flux braking (moderate or full) Resistor braking (optional)
Motor control performance	
Speed control performance, open loop	
Static accuracy	20% of motor rated slip
Dynamic accuracy	1% s with 100% torque step
Speed control performance, closed loop	
Static accuracy	0.1% of motor rated speed
Dynamic accuracy	<1% s with 100% torque step
Torque control performance	
Torque step rise time	< 10 ms, rated torque step
Non-linearity	$\pm$ 5% with rated torque
Braking power connection	
Brake chopper	Built-in brake chopper as standard
Brake resistor	External resistor connected to drive

Functional safety	
Built-in safety features	Safe torque off (STO) acc. to EN/IEC61800-5-2: IEC61508 ed2: SIL 3, IEC 61511: SIL 3, IEC 62061: SIL CL 3, EN ISO 13849-1: PL e
Environmental limits	
Ambient temperature	
Transportation and storage	-40 to +70 °C (-40 to +158 °F)
Operation	-10 to +50 °C (14 to 122 °F), with derating up to 60 °C (except R0, which has max temperature of 50 °C)
Cooling method	Air-cooled, dry clean air
Altitude	0 to 4000 m, (0 to 13000 ft) for 400 V units (see allowed power systems in HW manual) 0 to 2000 m, (0 to 6600 ft) for 200 V units derating above 1000 m (3300 ft)
Relative humidity	5 to 95%, no condensation allowed
Degree of protection	IP20 as standard
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)
Product compliance	
CE	
Low Voltage Directive 2006/95/EC, EN 61800-5-1: 2007	
Machinery Directive 2006/42/EC, EN 61800-5-2: 2007	
EMC Directive 2004/108/EC, EN 61800-3: 2004 + A1: 2012	
UL, cUL certification	
TUV Certification for functional safety	
Quality assurance system ISO 9001	
Environmental system ISO 14001	
Waste electrical and electronic equipment directive (WEEE) 2002/96/EC	
RoHS directive 2011/65/EU	
EAC	

Ordering information ACS380

How to built up your ordering code

The type designation tells you the specifications and configuration of the drive.

The table shows the primary drive variants.

Sample type code 1: ACS380-042S-02A6-4 (I/O & Modbus variant, not possible to add options as pluscode)

Sample type code 2: ACS380-042C-02A6-4+K475+ L535 (Configured variant, possible to add options as pluscode)

Segment	A	B	C	D	E	F
ACS380	04	2	C	02A6	4	Option codes
Product series						
Types and construction						
Rating						
Voltage						
Option code						

Basic codes			
Segment	Option	Description	
A	Construction	04 = Module, IP20	
B	EMC filter	0 = C3 (400 V variant) or C4 (200 V Variant), 2 = High filtering level for First environment (EN 61800-3, Class C2)	
C	Connectivity	S = Standard variant (I/O and Modbus), C = Configured variant	
D	Current rating	For example, 02A6 refers to a nominal output current of 2.6 A	
E	Voltage rating	1 = 1-phase 230 V, 4 = 3-phase 380...480 V	
Option codes for configured variant (ACS380-04x)			
Segment	Option	Code	Description
F	Fieldbus	+K451	FDNA-01 DeviceNet protocol
		+K454	FPBA-01 preconfigured Profibus-DP protocol
		+K457	FCAN-01 preconfigured CANopen protocol
		+K469	FECA-01 preconfigured EtherCAT protocol
		+K470	FEPL-02 Ethernet POWERLINK protocol
		+K475	FENA-21 preconfigured Profinet protocol (Ethernet/IP or Modbus/TCP built-in)
		+K490*	FEIP-21 Preconfigured EtherNet/IP protocol
		+K491*	FMBT-21 Prenconfigured Modbus/TCP protocol
		+K492*	FPNO-21 Preconfigured PROFINET IO protocol
		+K495	BCAN-11 Preconfigured CANopen interface
	I/O	+L511	BREL-01 External relay option (4x relay) (side option)'
		+L534	BAPO-01 External 24 V DC (side option)
		+L535	BTAC-02 HTL/TTL encoder interface + External 24 V DC (side option)
		+L538	BMIO-01 I/O & Modbus extension module (front option)
	+L515	BIO-01 I/O extension module (front option,can be used together with fieldbus)	
Languages: The product package includes the User interface guide and Quick installation and start-up guide in English, French, German, Italian and Spanish, and in the local language (if it is available). The option code determines the language variants of the Hardware manual and Firmware manual.	+R700	English	
	+R701	German	
	+R702	Italian	
	+R703	Dutch	
	+R704	Danish	
	+R705	Swedish	
	+R706	Finnish	
	+R707	French	
	+R708	Spanish	
	+R709	Portuguese (in Portugal) Russian	
	+R711	Russian	
	+R712	Chinese	
	+R714	Turkish	

*Preconfigured K490, K491, K492 coming during 2018. In the meantime functionality can be done using K475.

Flexible connectivity to automation networks

Fieldbus communication reduces wiring costs when compared with traditional hard wired input/output connections.

The ACS380 configured variant is compatible with a wide range of fieldbus protocols. Fieldbus modules come as preinstalled and proconfigured thus reducing commissioning time and allowing drive commissioning from the PLC. The ACS380

standard variant comes with built-in Modbus RTU protocol.

Support tools for integration with automation

Support for the fieldbuses is not always enough alone to get the full functionality and to make the integration easy. Due to this ABB also offers tools for seamless integration to automation systems of various manufacturers.

Universal communication with ABB fieldbus adapters

The machinery drives support the following fieldbus protocols:

Option code	Fieldbus protocol	Adapter
+K454	PROFIBUS DP, DPV0/DPV1	FPBA-01
+K457	CANopen®	FCAN-01
+K469	EtherCAT®	FECA-01
+K475	Two port EtherNet/IP™, Modbus TCP, PROFINET IO	FENA-21
+K470	Ethernet POWERLINK	FEPL-02



Dimensions

ACS380 IP20				
	Height	Width	Depth	Weight
Frames	mm	mm	mm	kg
R0	223	70	174	1.4
R1	223	70	174	1.6
R2	223	95	174	1.9
R3	223	169	174	3.0
R4	223	260	174	5.8

