

How to select a drive

How to build up your ordering code

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.

Ordering information ACS380
How to build 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 2-ACS380-0425-0246-4 (V/O & Modbus variant, not possible to add options as pluscode)
Sample type code 2-ACS380-0425-0246-4 (V/O & Modbus variant, not possible to add options as pluscode)

Segment	A	B	C	D	E	F
ACS380	04	2	C	0246	4	Option codes

Product series
Types and construction
Rating
Voltage
Option code

Basic codes

Segment	Option	Description
A	04	Construction
B	2	EMC filter
C	C	Connectivity
D	0246	Current rating
E	4	Voltage rating

Option codes for configured variant

Segment	Code	Option	Description
1	0000	Standard	Standard
2	0001	0001	0001
3	0002	0002	0002
4	0003	0003	0003
5	0004	0004	0004
6	0005	0005	0005
7	0006	0006	0006
8	0007	0007	0007
9	0008	0008	0008
10	0009	0009	0009
11	0010	0010	0010
12	0011	0011	0011
13	0012	0012	0012
14	0013	0013	0013
15	0014	0014	0014
16	0015	0015	0015
17	0016	0016	0016
18	0017	0017	0017
19	0018	0018	0018
20	0019	0019	0019
21	0020	0020	0020
22	0021	0021	0021
23	0022	0022	0022
24	0023	0023	0023
25	0024	0024	0024
26	0025	0025	0025
27	0026	0026	0026
28	0027	0027	0027
29	0028	0028	0028
30	0029	0029	0029
31	0030	0030	0030
32	0031	0031	0031
33	0032	0032	0032
34	0033	0033	0033
35	0034	0034	0034
36	0035	0035	0035
37	0036	0036	0036
38	0037	0037	0037
39	0038	0038	0038
40	0039	0039	0039
41	0040	0040	0040
42	0041	0041	0041
43	0042	0042	0042
44	0043	0043	0043
45	0044	0044	0044
46	0045	0045	0045
47	0046	0046	0046
48	0047	0047	0047
49	0048	0048	0048
50	0049	0049	0049
51	0050	0050	0050
52	0051	0051	0051
53	0052	0052	0052
54	0053	0053	0053
55	0054	0054	0054
56	0055	0055	0055
57	0056	0056	0056
58	0057	0057	0057
59	0058	0058	0058
60	0059	0059	0059
61	0060	0060	0060
62	0061	0061	0061
63	0062	0062	0062
64	0063	0063	0063
65	0064	0064	0064
66	0065	0065	0065
67	0066	0066	0066
68	0067	0067	0067
69	0068	0068	0068
70	0069	0069	0069
71	0070	0070	0070
72	0071	0071	0071
73	0072	0072	0072
74	0073	0073	0073
75	0074	0074	0074
76	0075	0075	0075
77	0076	0076	0076
78	0077	0077	0077
79	0078	0078	0078
80	0079	0079	0079
81	0080	0080	0080
82	0081	0081	0081
83	0082	0082	0082
84	0083	0083	0083
85	0084	0084	0084
86	0085	0085	0085
87	0086	0086	0086
88	0087	0087	0087
89	0088	0088	0088
90	0089	0089	0089
91	0090	0090	0090
92	0091	0091	0091
93	0092	0092	0092
94	0093	0093	0093
95	0094	0094	0094
96	0095	0095	0095
97	0096	0096	0096
98	0097	0097	0097
99	0098	0098	0098
100	0099	0099	0099

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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.

Type designation: ACS380 - 040X - XXXX - X + XXXX

Product series
Types and construction
Rating
Voltage
Options

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

Ratings, types and voltages

ACS380

U_N = 480 V (range 480 to 600 V). The power ratings are valid at nominal voltage 480 V (0.95 to 1.05 kW).

Motor	Heavy-duty use		Light-duty use		Nonlinear ratings		Type designation	Size
	P _N	I _N	P _N	I _N	P _N	I _N		
0.37	2.8	4.3	0.55	3.5	0.55	3.5	ACS380-040-0347-1	R0
0.55	4.7	6.7	0.75	4.6	0.75	4.6	ACS380-040-0348-1	R1
0.75	6.9	10.4	1.1	6.6	1.1	6.6	ACS380-040-0349-1	R1
1.1	10	14.6	1.5	7.4	1.5	7.4	ACS380-040-0350-1	R1
1.5	13	19.5	2.2	9.3	2.2	9.3	ACS380-040-0351-1	R2
2.2	18	27.0	3.0	11.6	3.0	11.6	ACS380-040-0352-1	R2

U_N = 600 V (range 600 to 690 V). The power ratings are valid at nominal voltage 600 V (0.95 to 1.05 kW).

Motor	Heavy-duty use		Light-duty use		Nonlinear ratings		Type designation	Size
	P _N	I _N	P _N	I _N	P _N	I _N		
0.37	3.7	5.3	0.55	3.7	0.55	3.7	ACS380-040-0347-2	R0
0.55	5.8	8.2	0.75	5.3	0.75	5.3	ACS380-040-0348-2	R1
0.75	8.6	12.4	1.1	8.1	1.1	8.1	ACS380-040-0349-2	R1
1.1	12.5	17.5	1.5	10.4	1.5	10.4	ACS380-040-0350-2	R1
1.5	16.5	23.2	2.2	13.3	2.2	13.3	ACS380-040-0351-2	R2
2.2	22.5	31.5	3.0	18.0	3.0	18.0	ACS380-040-0352-2	R2

U_N = 690 V (range 690 to 720 V). The power ratings are valid at nominal voltage 690 V (0.95 to 1.05 kW).

Motor	Heavy-duty use		Light-duty use		Nonlinear ratings		Type designation	Size
	P _N	I _N	P _N	I _N	P _N	I _N		
0.37	4.7	6.7	0.55	4.7	0.55	4.7	ACS380-040-0347-3	R0
0.55	7.2	10.4	0.75	7.2	0.75	7.2	ACS380-040-0348-3	R1
0.75	10.4	15.5	1.1	10.4	1.1	10.4	ACS380-040-0349-3	R1
1.1	15.5	22.5	1.5	15.5	1.5	15.5	ACS380-040-0350-3	R1
1.5	20.4	29.5	2.2	20.4	2.2	20.4	ACS380-040-0351-3	R2
2.2	27.5	39.5	3.0	27.5	3.0	27.5	ACS380-040-0352-3	R2

Maximal ratings

P_N = Rated current continuously without overheating at 50 °C.
I_N = Rated current continuously without overheating at 50 °C.
P₁₅₀ = 150% overload power for 1 minute every 10 minutes at 50 °C.
I₁₅₀ = 150% overload current for 1 minute every 10 minutes at 50 °C.
P₂ = 200% overload power for 2 seconds at start. When as long as allowed by drive temperature.
I₂ = 200% overload current for 2 seconds at start. When as long as allowed by drive temperature.

Light overloads

P₁₀ = 100% continuous current allowing 10% overload for 1 minute every 10 minutes at 50 °C.
I₁₀ = 100% continuous current allowing 10% overload for 1 minute every 10 minutes at 50 °C.
P₅ = 50% continuous current allowing 5% overload for 5 minutes every 10 minutes at 50 °C.
I₅ = 50% continuous current allowing 5% overload for 5 minutes every 10 minutes at 50 °C.

The ratings apply at 50 °C ambient temperature.
For derating factors, ambient temperature, or switching frequencies, see the user's VME manual, document code 3ABD00000000726.

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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.

Option code	Description	Type designation
+L304	External I/O DC	BMIO-01
+L305	External relay output (NPN)	BMIO-02
+L306	I/O extension	BMIO-03

Option code	Description	Option
+L307	Encoder Interface - External I/O DC	BMIO-04

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Ordering information

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

The table shows the primary drive variants.

Sample type code 1: ACS380-040S-02A6-4 (I/O & Modbus variant, not possible to add options as pluscode)

Sample type code 2: ACS380-040C-02A6-4+K475+ L535 (Configured variant, possible to add options as pluscode)

Segment	A	B	C	D	E	F
ACS380	04	0	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 (480 V variant) or C4 (230 V Variant) - Standard for USA 2 = High filtering level for First environment (EN 61800-3, Class C2) - (Contact factory)
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, 2 = 3-phase 230 V, 4 = 3-phase 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 Preconfigured 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		+R700	English
		+R707	French
		+R708	Spanish
		+R714	Turkish

*Preconfigured K490, K491, K492 coming during 2020. In the meantime functionality can be done using K475.

Ratings, types and voltages

$U_N = 200\text{ V}$ (range 200 to 240 V). The power ratings are valid at nominal voltage 230 V (0.25 to 3.0 kW)								
Light-overload use (230V)			Heavy-duty use (230V)			Maximum output current (230V)	Type designation	Frame size
I_{Ld}	P_{Ld}	P_{Ld}	I_{Hd}	P_{Hd}	P_{Hd}	I_{max}		
A	Hp	kW	A	Hp	kW	A		
2.3	0.5	0.37	1.8	0.33	0.25	3.2	ACS380-040x-02A4-1	R0
3.5	0.75	0.55	2.4	0.5	0.37	4.3	ACS380-040x-03A7-1	R0
4.6	1	0.75	3.7	0.75	0.55	6.7	ACS380-040x-04A8-1	R1
6.6	1.5	1.1	4.8	1	0.75	8.6	ACS380-040x-06A9-1	R1
7.4	2	1.5	6.9	1.5	1.1	12.4	ACS380-040x-07A8-1	R1
9.3	3	2.2	7.8	2	1.5	14.0	ACS380-040x-09A8-1	R2
11.6	3	3.0	9.8	3	2.2	17.6	ACS380-040x-12A2-1	R2

$U_N = 200\text{ V}$ (range 200 to 240 V). The power ratings are valid at nominal voltage 230 V, 1/3 to 15 Hp (0.25 to 3.0 kW)								
Light-overload use (230V)			Heavy-duty use (230V)			Maximum output current (230V)	Type designation	Frame size
I_{Ld}	P_{Ld}	P_{Ld}	I_{Hd}	P_{Hd}	P_{Hd}	I_{max}		
A	Hp	kW	A	Hp	kW	A		
2.3	0.5	0.4	1.8	0.33	0.25	3.2	ACS380-040x-02A4-2	R1
3.5	0.75	0.6	2.4	0.5	0.37	4.3	ACS380-040x-03A7-2	R1
4.6	1	0.8	3.7	0.75	0.55	6.7	ACS380-040x-04A8-2	R1
6.6	1.5	1.1	4.8	1	0.75	8.6	ACS380-040x-06A9-2	R1
7.5	2	1.5	6.9	1.5	1.1	12.4	ACS380-040x-07A8-2	R1
9.3	3	2.2	7.8	2	1.5	14	ACS380-040x-09A8-2	R1
11.6	3	3	9.8	3	2.2	17.6	ACS380-040x-12A2-2	R2
16.7	5	4	12.2	3	3	22	ACS380-040x-17A5-2	R3
24.2	7.5	5.5	17.5	5	3.7	31.5	ACS380-040x-25A0-2	R3
30.8	10	7.5	25	7.5	5.5	45	ACS380-040x-032A-2	R3
46.2	15	11	32	10	7.5	57.6	ACS380-040x-048A-2	R4
52.8	20	15	48	15	11	86.4	ACS380-040x-055A-2	R4

$U_N = 400\text{ V}$ (range 380 to 480 V). The power ratings are valid at nominal voltage 480 V, 1/2 to 30 Hp (0.37 to 22 kW)								
Light-overload use (480V)			Heavy-duty use (480V)			Maximum output current (480V)	Type designation	Frame size
I_{Ld}	P_{Ld}	P_{Ld}	I_{Hd}	P_{Hd}	P_{Hd}	I_{max}		
A	Hp	kW	A	Hp	kW	A		
1.6	0.75	0.55	1.1	0.50	0.37	2	ACS380-040x-01A8-4	R0
2.1	1	0.75	1.6	0.75	0.55	2.9	ACS380-040x-02A6-4	R1
3	1.5	1.1	2.1	1	0.75	3.8	ACS380-040x-03A3-4	R1
3.5	2	1.5	3	1.5	1.1	5.4	ACS380-040x-04A0-4	R1
4.8	2	2.2	3.4	2	1.5	6.1	ACS380-040x-05A6-4	R1
6	3	3	4	2	2.2	7.2	ACS380-040x-07A2-4	R1
7.6	5	4	4.8	3	3	8.6	ACS380-040x-09A4-4	R1
11	7.5	5.5	7.6	5	4	13.7	ACS380-040x-12A6-4	R2
14	10	7.5	11	7.5	5.5	19.8	ACS380-040x-17A0-4	R3
21	15	11	14	10	7.5	25.2	ACS380-040x-25A0-4	R3
27	20	15	21	15	11	37.8	ACS380-040x-032A-4	R4
34	25	19	27	20	15	48.6	ACS380-040x-038A-4	R4
40	30	22	34	25	18.5	61.2	ACS380-040x-045A-4	R4
42	30	22	40	30	22	72	ACS380-040x-050A-4	R4

I_{MAX} Maximum output current. Available for 2 seconds at start, then as long as allowed by drive temperature.

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.

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.

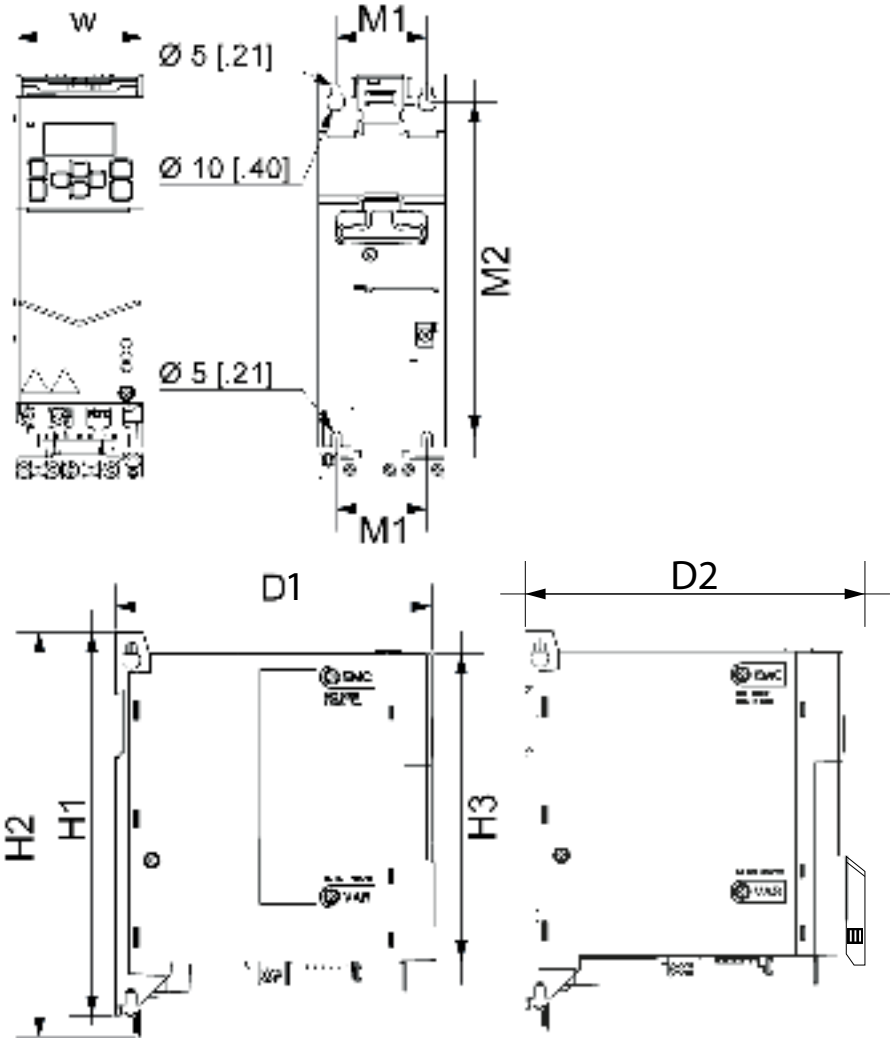
For derating at higher altitudes, temperatures or switching frequencies, see the user's HW manual, document code: 3AXD50000029274



Dimensions

ACS380 IP20																		
Frames	Height (H1)		Height (H2)		Height (H3)		Width (W)		Depth (D1)		Depth (D2)		(M1)		(M2)		Weight	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	kg
R0	8.07	205	8.66	220	6.69	170	2.76	70	6.85	174	7.52	191	1.97	50	7.52	191	3.1	1.4
R1	8.07	205	8.66	220	6.69	170	2.76	70	6.85	174	7.52	191	1.97	50	7.52	191	3.5	1.6
R2	8.07	205	8.66	220	6.69	170	3.74	95	6.85	174	7.52	191	2.95	75	7.52	191	4.2	1.9
R3	8.07	205	8.66	220	6.69	170	6.65	169	6.85	174	7.52	191	5.83	148	7.52	191	6.4	2.9
R4	8.07	205	8.66	220	6.69	170	10.24	260	6.85	174	7.52	191	9.37	238	7.52	191	12.7	5.8

- H1 Mounting surface height - back
H2 Height including grounding plate - back
H3 Enclosed height - front
W Width
D1 Depth
D2 Depth 2 (with deeper cover)
M1 Mounting hole distance 1
M2 Mounting hole distance 2



Drive commissioning and adaptable use with your control panel

ACS380 has as standard an icon based control panel with clear display. If there is need for other type of panel or mounting the panel in the door of the enclosure, also that is possible.



Control panel as standard

Almost anyone can set up and commission the machinery drive using available control panels. The ACS380 comes with the integrated icon based control panel as standard. You do not need to know any drive parameters as the control panel helps you to set up the essential settings quickly and get the drive into action. In addition, ACS380 supports the assistant control panel (AP-I, AP-S or AP-W).



Assistant control panel, ACS-AP-I*

The optional Assistant control has a graphical, multilingual display. There is no need to know any drive parameters, as the control panel helps you set up the essential settings quickly and get the drive into action without a hassle. Panel can be used with any products belonging to ABB all-compatible product portfolio.



Bluetooth control panel, ACS-AP-W*

The optional Bluetooth panel enables connection with the Drivetune mobile app. The app is available for free from Google Play and the Apple App store. Together with the Drivetune app and the Bluetooth panel, users can, for example, commission and monitor the drive remotely.



Basic control panel, ACS-BP-S

If there is a need to install basic panel into cabinet door, ACS-BP-S is right choice. The icon based control panel supports users with basic operation, settings and fault tracking when nothing extra is needed.



Control panel mounting platform, DPMP-01

This mounting platform is for flush mountings. The panel mounting platform does not include the control panel.



Control panel mounting platform, DPMP-02

This mounting platform is for surface mounting. The panel mounting platform does not include the control panel.

* Also compatible with other ABB all-compatible drives: ACS480, ACS580, and ACS880 drives.

Control panel options	
Type designation	Description
ACS-AP-I	Assistant control panel
ACS-AP-S	Assistant control panel
ACS-AP-W	Assistant control panel with bluetooth interface
ACS-BP-S	Basic control panel
DPMP-01	Control panel mounting platform (flush mounted)
DPMP-02	Control panel mounting platform (surface mounted)

Tools for configuration, monitoring and process tuning

ACS380 has various tools simplifying the commissioning, operation and monitoring of the drive.



Easy configuration for unpowered drives

With CCA-01 tool it is possible to configure drive parameters and even download a new software from PC to the unpowered ACS380. The power supply is taken from a PC USB port.

Connect multiple drives to one control panel

The BSPL-01 panel bus adapter (RJ45 splitter) and the BPLG-01 termination plug allow the daisy chain connection of up to 32 ACS380 drives to one assistant control panel.



PC tools

The Drive composer PC tool offers fast and harmonized setup, commissioning and monitoring. The free version of the tool provides startup and maintenance capabilities and gathers all drive information, such as parameter loggers, faults, and backups into a support diagnostics file. Drive composer pro provides additional features such as custom parameter windows, graphical control diagrams of the drive's configuration, and improved monitoring and diagnostics.



Using the BCBL-01 cable, the PC can be connected directly to the RJ-45 panel port on the top of the ACS380 drive.

When using the Assistant control panel, the Drive composer tool is connected to the drive using the mini USB connection on the panel.

Type designation	Description
BPLG-01	Panel bus termination plug
BSPL-01	Panel bus adapter (RJ45 Splitter)
BCBL-01	PC cable, USB to RJ45
CCA-01	Cold configurator adapter, packed kit
DCPT-01-KIT	Drive Composer Pro

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 preconfigured 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:

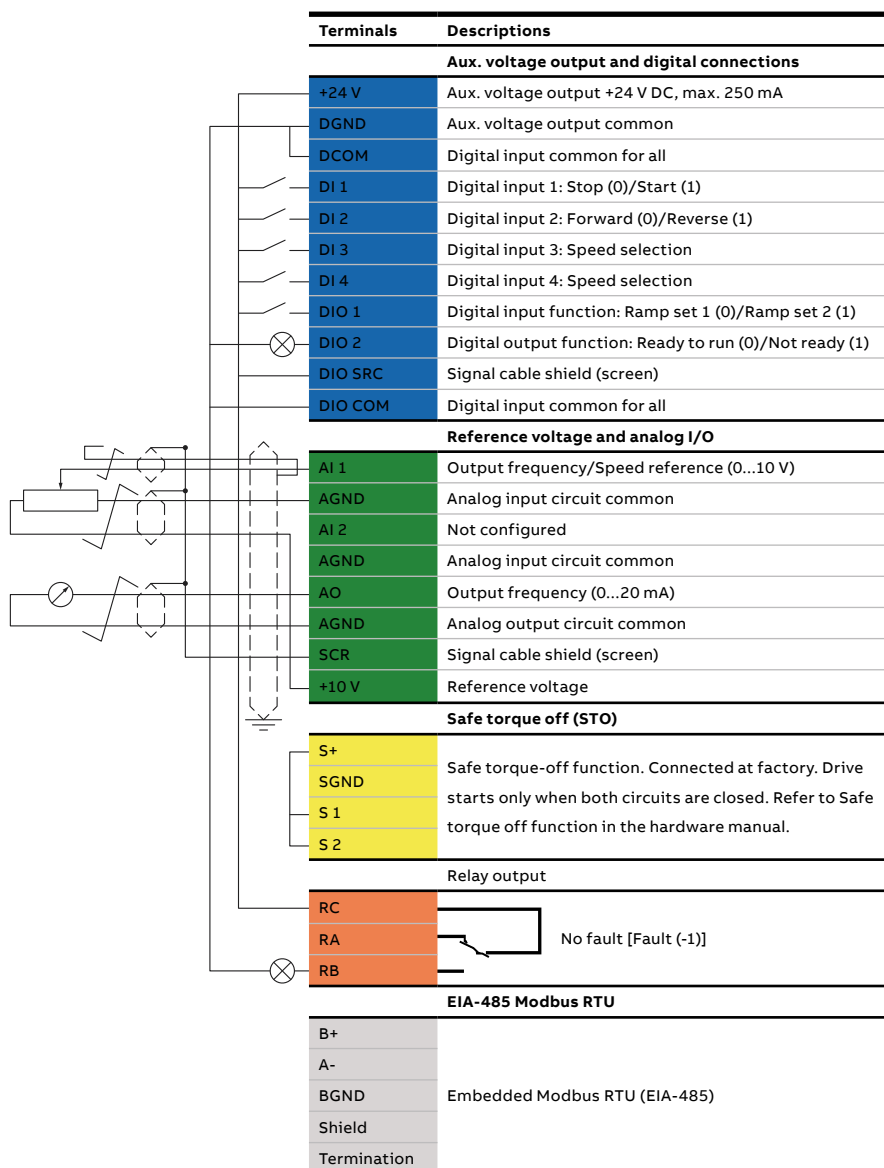
Option code	Fieldbus protocol	Adapter
+K451	DeviceNet®	FDNA-01
+K454	PROFIBUS DP, DPV0/DPV1	FPBA-01
+K457	CANopen®	FCAN-01
+K469	EtherCAT®	FECA-01
+K470	Ethernet POWERLINK®	FEPL-01
+K475	Two port EtherNet/IP™, Modbus TCP, PROFINET IO	FENA-21
+K490	Ethernet/IP, dual port	FEIP-21
+K491	Modbus/TCP, dual port	FMBT-21
+K492	PROFINET IO, dual port	FPNO-21
+K495	CANopen Interface	BCAN-01



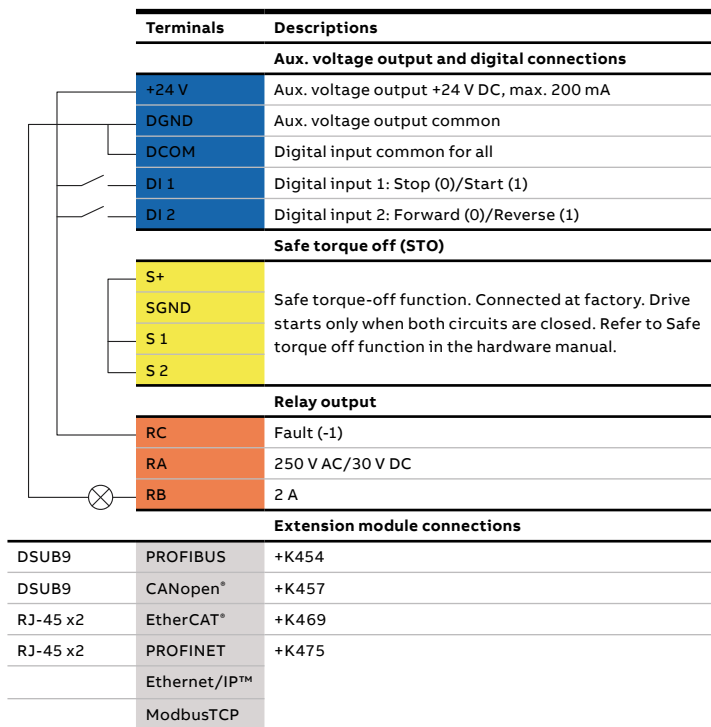
Default I/O connections of standard variant

Standard interface and extensions for ACS380 machinery drives

The ACS380 machinery drives offer two different standard interfaces: the standard variant (I/O and Modbus) and the configured variant with different interfaces. In addition, the drive has one option slot available that can be used for speed feedback, relay extensions or options which allow an external +24 V supply. For further information please see the ACS380 hardware and firmware manuals.



Default I/O connections of configured variant



Configured variant I/O can be expanded using the BIO-01 module

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 on the side of 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
+L534	External 24 C DC	BAPO-01
+L511	External relay option (4xRO)	BREL-01
+L515	I/O extension*	BIO-01

* For use with fieldbus modules only

Feedback interface module options		
Option code	Connections	Option
+L535	Encoder interface + External 24 V DC	BTAC-02

EMC – electromagnetic compatibility

The ACS380 machinery drives are equipped with a built-in filter to reduce high frequency emissions. Drives with low EMC filters (C3 for 230 V and 480 V) are standard for the US and denoted by type codes ACS380-040X. Drives with high EMC filters (C2 for all voltages) are denoted by type codes ACS380-042X. Consult ABB for availability. C1 can be achieved with an external EMC filter.

EMC standards

The EMC product standard (EN 61800-3) covers the specific EMC requirements stated for drives (tested with motor and cable) within the EU. EMC standards such as EN 55011 or EN 61000-6-3/4 are applicable to industrial and domestic equipment and systems including components inside the

drive. Drive units complying with the requirements of EN 61800-3 are compliant with comparable categories in EN 55011 and EN 61000-6-3/4, but not necessarily vice versa. EN 55011 and EN 61000-6-3/4 do not specify cable length or require a motor to be connected as a load. The emission limits are comparable to EMC standards according to the table below.

Domestic environments versus public low voltage networks

The first environment includes domestic premises. It also includes establishments directly connected without an intermediate transformer to a low voltage power supply network that supplies buildings used for domestic purposes. The second environment includes all establishments directly connected to public low voltage power supply networks.

Comparison of EMC standards

EMC according to EN 61800-3 product standard	EN 61800-3 product standard	EN 55011, product family standard for industrial, scientific and medical (ISM) equipment	EN 61000-6-4, generic emission standard for industrial environments	EN 61000-6-3, generic emission standard for residential, commercial and light-industrial environment
1 st environment, unrestricted distribution	Category C1	Group 1, Class B	Not applicable	Applicable
1 st environment, restricted distribution	Category C2	Group 1, Class A	Applicable	Not applicable
2 nd environment, unrestricted distribution	Category C3	Group 2, Class A	Not applicable	Not applicable
2 nd environment, restricted distribution	Category C4	Not applicable	Not applicable	Not applicable

Motor cable length

The drive is designed to operate with optimum performance with the following maximum motor cable lengths. The motor cable lengths may be extended with an output choke as shown in the table.

Frame size	Maximum motor cable length	
	m	ft
Standard drive, without external options		
R0	150	492
R1, R2	150	492
R3, R4	150	492
With external output chokes		
R0	60	195
R1-R3	250	820
R4	200	656

Note: In multimotor systems, the calculated sum of all motor cable lengths must not exceed the maximum motor cable length given in the table.

Cooling and sound level

Cooling

ACS380 drives are fitted with variable-speed cooling air fans. The cooling air must be free from corrosive materials and not exceed the maximum ambient temperature of 50°C (60°C with derating*).

Cooling air flow

1-phase $U_N = 200...240$ V (200, 208, 220, 230, 240 V)

		Heat dissipation*		Air flow		Max. sound level
		W	BTU/Hr	m³/h	ft³/min	
ACS380-040x-02A4-1	R0	52	178	-*	-*	<30
ACS380-040x-03A7-1	R0	66	226	-*	-*	<30
ACS380-040x-04A8-1	R1	84	287	57	33	63
ACS380-040x-06A9-1	R1	109	373	57	33	63
ACS380-040x-07A8-1	R1	120	408	57	33	63
ACS380-040x-09A8-1	R2	140	477	63	37	59
ACS380-040x-12A2-1	R2	170	579	63	37	59

Cooling air flow

3-phase $U_N = 380...480$ V (380, 400, 415, 440, 460, 480 V)

		Heat dissipation		Air flow		Max. sound level
		W	BTU/Hr	m³/h	ft³/min	
ACS380-040x-01A8-4	R0	46	156	-*	-*	<30
ACS380-040x-02A6-4	R1	60	205	57	33	63
ACS380-040x-03A3-4	R1	67	229	57	33	63
ACS380-040x-04A0-4	R1	75	256	57	33	63
ACS380-040x-05A6-4	R1	93	317	57	33	63
ACS380-040x-07A2-4	R1	112	383	57	33	63
ACS380-040x-09A4-4	R1	139	476	57	33	63
ACS380-040x-12A6-4	R2	183	624	63	37	59
ACS380-040x-17A0-4	R3	232	793	128	75	66
ACS380-040x-25A0-4	R3	346	1182	128	75	66
ACS380-040x-032A-4	R4	460	1570	216	127	69
ACS380-040x-038A-4	R4	561	1916	216	127	69
ACS380-040x-045A-4	R4	663	2263	216	127	69
ACS380-040x-050A-4	R4	663	2263	216	127	69

*Frame size R0 with free convection cooling

Cooling air flow

3-phase $U_N = 200...240$ V (200, 208, 220, 230, 240 V)

		Heat dissipation*		Air flow		Max. sound level
		W	BTU/Hr	m³/h	ft³/min	
ACS380-040x-02A4-2	R1	39	133	57	33	63
ACS380-040x-03A7-2	R1	46	157	57	33	63
ACS380-040x-04A8-2	R1	56	189	57	33	63
ACS380-040x-06A9-2	R1	63	213	57	33	63
ACS380-040x-07A8-2	R1	71	240	57	33	63
ACS380-040x-09A8-2	R1	84	302	57	33	63
ACS380-040x-12A2-2	R2	107	366	63	37	59
ACS380-040x-17A5-2	R3	138	472	128	75	66
ACS380-040x-25A0-2	R3	182	620	128	75	66
ACS380-040x-032A-2	R4	247	845	216	127	69
ACS380-040x-048A-2	R4	349	1191	216	127	69
ACS380-040x-055A-2	R4	465	1587	216	127	69

Fuses and circuit protection

Fuse and circuit breakers

ABB UL file E211945 Volume 15, Section 4 lists the ABB Type E manual motor protectors MS132 & S1-M3-25 & MS165 as an alternate to UL classified fuses as a means of branch circuit protection. This is in accordance with the National Electrical Code (NEC). When the correct ABB Type E manual motor protector is selected from the table and used for branch circuit protection the drive is suitable for use in a circuit capable of delivering not more than 65 kA RMS symmetrical amperes at the drive

maximum rated voltage. See the following combined micro drive table for the appropriate ratings.

Combinations of Type E MMP's and drives installed with UL Type 1 kits are NOT included in the listing. Drive & MMP combinations must be assembled in an enclosure conforming to minimum enclosure volume. Consult ABB document LVD-PNTN22U-EN for alternate UL fuse selections

Type designation	Frame Size	IEC fuses		UL fuses	Manual motor protector		Min. Encl. Vol. (cu in) ⁵	Maximum MMP Size for Group Installation ⁶	
		Type gG (A)	Type gR (A)	UL class T (A)	Input Amps I _N (A)	MMP Type E ^{1,2}			
Selection table									
1-phase AC supply, 200 to 240V									
ACS380-040x-02A4-1	R0	10	32	10	5.0	MS132-6.3 & S1-M3-25 ³	1850	MS162-20	
ACS380-040x-03A7-1	R0	10	32	10	7.8	MS132-10 & S1-M3-25 ³	1850	MS162-20	
ACS380-040x-04A8-1	R1	16	40	20	10.1	MS165-16	1850	MS162-20	
ACS380-040x-06A9-1	R1	20	50	20	14.5	MS165-16	1850	MS162-20	
ACS380-040x-07A8-1	R1	25	63	25	16.4	MS165-20	1850	MS162-20	
ACS380-040x-09A8-1	R2	32	63	25	20.6	MS165-25	1850	MS162-32	
ACS380-040x-12A2-1	R2	35	63	35	25.6	MS165-32	1850	MS162-32	
3-phase AC supply, 200 to 240V									
ACS380-040x-02A4-2	R1	6	25	6	3.6	MS132-6.3 & S1-M3-25 ³	1850	MS165-20	
ACS380-040x-03A7-2	R1	10	32	10	5.6	MS132-10 & S1-M3-25 ³	1850	MS165-20	
ACS380-040x-04A8-2	R1	10	32	10	7.2	MS132-10 & S1-M3-25 ³	1850	MS165-20	
ACS380-040x-06A9-2	R1	16	40	20	10.4	MS165-16	1850	MS165-20	
ACS380-040x-07A8-2	R1	16	40	20	11.7	MS165-16	1850	MS165-20	
ACS380-040x-09A8-2	R1	16	40	20	14.7	MS165-20	1850	MS165-20	
ACS380-040x-12A2-2	R2	25	50	25	18.3	MS165-25	1850	MS165-25	
ACS380-040x-17A5-2	R3	32	63	35	24.6	MS165-32	1850	MS165-42	
ACS380-040x-25A0-2	R3	50	80	40	35.1	MS165-42	1850	MS165-42	
ACS380-040x-032A-2	R3	63	100	60	45.0	MS165-54	4577	MS165-80	
ACS380-040x-048A-2	R4	100	160	100	57.6	MS165-80	4577	MS165-80	
ACS380-040x-055A-2	R4	100	160	100	60.0	MS165-80	4577	MS165-80	
3-phase AC supply, 440 to 480V ⁴									
ACS380-040x-01A8-4	R0	4	25	6	2.6	MS132-4.0 & S1-M3-25 ³	1850	MS165-20	
ACS380-040x-02A6-4	R1	6	25	6	3.4	MS132-6.3 & S1-M3-25 ³	1850	MS165-20	
ACS380-040x-03A3-4	R1	6	25	6	4.8	MS132-6.3 & S1-M3-25 ³	1850	MS165-20	
ACS380-040x-04A0-4	R1	10	32	10	5.4	MS132-10 & S1-M3-25 ³	1850	MS165-20	
ACS380-040x-05A6-4	R1	10	32	10	7.7	MS132-10 & S1-M3-25 ³	1850	MS165-20	
ACS380-040x-07A2-4	R1	16	40	20	9.6	MS165-16	1850	MS165-20	
ACS380-040x-09A4-4	R1	16	40	20	12.2	MS165-16	1850	MS165-20	
ACS380-040x-12A6-4	R2	25	50	25	17.6	MS165-20	1850	MS165-25	
ACS380-040x-17A0-4	R3	32	63	35	22.4	MS165-32	1850	MS165-42	
ACS380-040x-25A0-4	R3	50	80	50	33.6	MS165-42	1850	MS165-42	
ACS380-040x-032A-4	R4	63	100	60	37.9	MS165-54	4577	MS165-80	
ACS380-040x-038A-4	R4	80	125	80	44.7	MS165-65	4577	MS165-80	
ACS380-040x-045A-4	R4	100	160	100	49.8	MS165-73	4577	MS165-80	
ACS380-040x-050A-4	R4	100	160	100	50.4	MS165-80	4577	MS165-80	

¹ All manual motor protectors listed are Type E self-protected up to 65 kA. See ABB publication 2CDC131060M0202 - Manual Motor Starters Guide for complete technical data on the ABB Type E manual motor protectors. In order for these manual motor protectors to be used for branch circuit protection, they must be UL listed Type E manual motor protectors, otherwise they can be used only as an At Motor Disconnect. "At Motor Disconnect" is a disconnect just ahead of the motor on the load side of the panel.

² Manual motor protectors may require adjusting the trip limit from the factory setting at or above the drive input Amps to avoid nuisance tripping. If the manual motor protector is set to the maximum current trip level and nuisance tripping is occurring, select the next size MMP. (MS132-10 is the highest size in the MS132 frame size to meet Type E at 65kA; next size up is MS165-16.)

³ Requires use of the S1-M3-25 line side feeder terminal with the manual motor protector to meet Type E self-protection class.

⁴ 480V/277V delta systems only. Short-circuit protective devices with slash voltage ratings (e.g. 480V/277 VAC) can be applied only in solidly grounded networks where the voltage from line-to-ground does not exceed the lower of the two ratings (e.g. 277 V AC), and the voltage from line-to-line does not exceed the higher of the two ratings (e.g. 480 V AC). The lower rating represents the device's interrupting capability per pole.

⁵ For all drives, the enclosure must be sized to accommodate the specific thermal considerations of the application as well as provide free space for cooling. For UL compliance the minimum enclosure volume is specified in the UL listing when applied with the ABB Type E MMP shown in the table. ACS380 drives must be mounted in an enclosure when used with MMP's. The UL Type 1 kit does not meet the requirements of an enclosure for this purpose. See ACS380 Hardware Manual 3AXD50000029274 for free space requirements.

⁶ Branch circuit short-circuit protection for group installation by circuit breakers: Suitable for motor group installation on a circuit that is capable of delivering no more than 65 kA RMS symmetrical amperes, 480 V max. Use a circuit breaker with an interrupting rating of no less than 65 kA RMS symmetrical amperes, 480 V max. This is a condensed table for reference only. Refer to the complete tables in the ACS380 Hardware Manual 3AXD50000029274, including sizing for group installations, before sizing and selecting components.

Brake resistor sizing

Brake chopper

The brake chopper is built-in as standard for the ACS380. It not only controls braking, but also supervises system status and detects failures such as brake resistor and resistor cable short-circuits, chopper short-circuit, and calculated resistor over-temperature.

Control of the mechanical brake

Mechanical brake control is integrated into the ACS380 machinery drives. It uses state machine logic to control brake opening, closing, holding, wait and delay to integrate complex brake operation into the application.

Brake resistor

The brake resistors are separately available for the ACS380. Resistors other than the standard option resistors may be used, provided that the specified resistance value is within the specified limits and that the heat dissipation capacity of the resistor is sufficient for the drive application (see hardware manual). No separate fuses in the brake circuit are required if the conditions for e.g., the mains cable is protected with fuses and no mains cable/fuse overrating takes place.

Internal brake chopper					
	Frame	P_{BRcont} (Hp)	R_{min} (ohm)	R_{max} (ohm)	P_{BRmax} (Hp)
1-phase $U_N = 200...240$ V (200, 208, 220, 230, 240 V)					
ACS380-040x-02A4-1	R0	0.33	33	468	0.5
ACS380-040x-03A7-1	R0	0.5	33	316	0.74
ACS380-040x-04A8-1	R1	0.75	33	213	1.1
ACS380-040x-06A9-1	R1	1	33	145	1.5
ACS380-040x-07A8-1	R1	2	33	97	2.2
ACS380-040x-09A8-1	R2	2	33	70	3.0
ACS380-040x-12A2-1	R2	3	20	47	4.4
1-phase $U_N = 200...240$ V (200, 208, 220, 230, 240 V)					
ACS380-04xx-02A4-2	R1	0.33	39	474	0.5
ACS380-04xx-03A7-2	R1	0.5	39	319	0.74
ACS380-04xx-04A8-2	R1	0.75	39	217	1.1
ACS380-04xx-06A9-2	R1	1	39	145	1.5
ACS380-04xx-07A8-2	R1	1.5	39	105	2.2
ACS380-04xx-09A8-2	R1	2	20	71	3
ACS380-04xx-12A2-2	R2	2	20	52	4.4
ACS380-04xx-17A5-2	R3	3	16	38	6
ACS380-04xx-25A0-2	R3	5	16	28	8
ACS380-04xx-032A-2	R4	7.5	3	20	11
ACS380-04xx-048A-2	R4	10	3	14	15
ACS380-04xx-055A-2	R4	15	3	10	22
3-phase $U_N = 380...480$ V (380, 400, 415, 440, 460, 480 V)					
ACS380-040x-01A8-4	R0	0.5	99	933	.74
ACS380-040x-02A6-4	R1	0.75	99	628	1.1
ACS380-040x-03A3-4	R1	1	99	428	1.5
ACS380-040x-04A0-4	R1	1.5	99	285	2.2
ACS380-040x-05A6-4	R1	2	99	206	3
ACS380-040x-07A2-4	R1	2	53	139	4.4
ACS380-040x-09A4-4	R1	3	53	102	6
ACS380-040x-12A6-4	R2	5	32	76	8
ACS380-040x-17A0-4	R3	7.5	32	54	11
ACS380-040x-25A0-4	R3	10	23	39	15
ACS380-040x-032A-4	R4	15	6	29	22
ACS380-040x-038A-4	R4	20	6	24	30
ACS380-040x-045A-4	R4	25	6	20	37
ACS380-040x-050A-4	R4	30	6	20	44