

Low voltage AC drives

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Drives feature finder

The table highlights the differences between the various ABB drives families. It also lists some of the key features of the different ABB drives. However, the table is not exhaustive and if you are seeking a feature which does not appear in the table, please contact ABB for information.



Drive range

Drive range		ABB micro drives (ACS55 - p30) (ACS150 - p32)	ABB machinery drives (ACS355 - p35)	ABB general purpose drives for fans and pumps (ACS310 - p39)
Voltage & power	Details or additional notes	(ACS55) 1-ph 100 - 120 V: 0.18 - 0.37 kW 1-ph 200 - 240 V: 0.18 - 2.2 kW (ACS150) 3ph 380 - 480 V, 0.37 - 4.0 kW	1-ph 200 - 240 V: 0.37 - 2.2 kW 3-ph 200 - 240 V: 0.37 - 11 kW 3-ph 380 - 480 V: 0.37 - 22 kW	1-ph 200 - 240 V: 0.37 - 2.2 kW 3-ph 200 - 240 V: 0.37 - 11 kW 3-ph 380 - 480 V: 0.37 - 22 kW
Other rectifier options (assume 6-pulse as standard)	12-pulse diode Low harmonics regenerative (4Q) Low harmonics non-regenerative (2Q) Common DC link connectability	- - - -	- - - -	- - - -
EMC compliance (EN 61800-3, 2004)	No EMC filter 2nd unrestricted (C3) 1st restricted (C2) 1st unrestricted (C1)	● (or remove EMC screw) ● ■ (ACS150) ● - (ACS150)	● (remove EMC screw) ● ■ -	● (remove EMC screw) ● ■ -
Harmonic filter / choke / active (EN 61000-3-4)	Choke (AC or DC) Swinging choke (better harmonic performance) Low harmonic (best performance)	■ - -	■ - -	■ - -
Enclosure class	IP00 IP20 IP21 (or near equivalent) IP22 IP42 IP54/ IP54R/ IP55 IP66/69K	- ● ○ (Nema 1, ACS150) - - - -	- ● ○ (Nema 1) - - - ●	- ● ○ (Nema 1) - - - -
Mechanical construction	Module - panel mountable (IP20 minimum) Wall-mounted (IP21 or equiv. minimum) Free-standing, floor-standing Cabinet built by ABB	●* (DIN mount + screw) ○ (Nema 1, ACS150) - -	●* (DIN mount + screw) ○ (Nema 1 kit) - -	●* (DIN mount + screw) ○ (Nema 1 kit) - -
Cooling method	Direct air-cooling Water-cooling Through panel/flange mount	● - -	● - -	● - -
Dynamic braking chopper	Range of resistors available from ABB	-(ACS55), ● (ACS150)	●	-
Switching frequency		4 to 16 kHz	4 to 12 kHz	4 to 16 kHz
Motor control Drives can control induction (IM) PM, SynRM unless stated	DTC (open/closed loop) Sensorless vector Scalar, VVVF	- - ● (IM)	- ● (IM) ● (IM)	- - ● (IM)
Programmability	Parameter programming Adaptable programming IEC61131 programmability	uses dip (ACS55), ● (ACS150) - -	● ● (sequencer) -	● - -
Start-up assistance and help	Aids to commissioning and diagnostics	-	● (assistant panel)	● (assistant panel)
Cold configure	Program the drive whilst still in its box	●	●	●
Removable memory module	No recommissioning time needed	-	-	-
Real-time clock	With assistant control panel	-	●	●
I/O built-in	Analogue input/output Digital input/output Speed feedback (encoder) Motor thermal protection STO (safe torque-off)	1 / 0 3 / 1r (ACS55), 5 / 1r (ACS150) - - -	2 / 1 5 / 1r+1t+(3r) ○ ○ configurable ●	2 / 1 5 / 1r+1t+(3r) - ○ configurable -
() = via add on expansion module				
+24V live control panel + comms	External 24V supply can be connected	-	○ (MPOW)	-
Fieldbuses	Modbus embedded Fieldbus interface (popular networks) Drive-to-drive link BACnet	- - - -	○ ○ - -	● - - -
Remote monitoring	Report info and status remotely	-	■ (SREA)	■ (SREA)
Safety options (TUV certified hardware)	Emergency stop (CAT.0, CAT.1) Safe torque-off (SIL2/PL d) Safe torque-off (SIL3/PL e) Dedicated safety module, extended safety	- - - -	- - ● -	- - - -
ATEX	ATEX certified for use with ABB motors	-	● Ex tD and DIP only	-
PC tools	DriveConfig tool (programme in box) DriveWindow Light DriveWindow DriveAP IEC 61131 tool Drive Composer (Entry or Pro)	■ (ACS55), - (ACS150) - - - - -	- ■ - - - -	- ■ - - - -
Industry specific products	HVAC	-	-	-
Products with hardware or software specifically designed for the industry specified	Food and beverage Machinery / OEMs in general Water and wastewater Aggregates	○ ● - -	● ○ (IP66/69) ● ○ ● ○ (IP66/69)	○ ● ○ ●

● = standard ○ = option, internal or fitted ■ = option, external - = not available * = can be bookcase or flat mounted r = relay output, t = transistor output, c = configurable to be input or output

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Low voltage AC drives

ABB micro drives

0.18 kW to 2.2 kW, ACS55

Motor control method - scalar

200/240 V, 1-phase supply, 3-phase output, 0.18 kW - 2.2 kW

100/120 V, 1-phase supply, 3-phase output, 0.18 kW - 0.37 kW

What is an ABB micro drive, ACS55?

The ABB micro drive meets the requirements of OEMs, machinery builders and panel builders. It is a component that is purchased, together with other components, from a distributor. ABB micro drive is so small and simple that users of contactors and softstarters can switch to the benefits of variable-speed control. The ACS55 is a simple drive, programmed by switches. Extended programming is possible via a PC if required, as is programming without power.

Highlights

- Quick and easy installation - less than five minutes
- User interface via three rotary switches and a further eight on/off function DIP switches located on panel front
- Can be programmed via DriveConfig if needed to access extended functions (useful to OEMs)
- Compact size and narrow shape
- Ideal drive for DIN-rail mounting
- Two mounting orientations
- 110 V single phase - input gives 240V, 3-phase output
- IP20 as standard
- Potentiometer option
- Integral EMC filter for 1st environment (EN61800-3), unrestricted distribution (C1)
- Optimised switching frequency for low noise (up to 16 kHz silent motor)



Where can it be used?

- Washing machines
- Mixers
- Pizza ovens
- Vacuum cleaners
- Sliding doors
- Dryers
- Dishwashers
- Treadmills
- Car washing machines
- Rotating billboards
- Electric gates

Feature	Advantage	Benefit
No programming is required	Inverter parameter settings with DIP switches and potentiometers. Extended programming is possible via DriveConfig if needed	Faster set up Easier configuration Easy -to-use drive for new users
Compact size and narrow shape	Up to 0.37 kW, 45 mm width; 2.2 kW, 67.5 mm width	Less space required for installation
Removable mounting clip	Removable clip allows DIN-rail and wall-mounting from back and side of the unit	Flexible and easy mounting, book case or flat
DriveConfig kit	Fast and safe configuration of an unpowered drive	Simple programming for high volume OEMs - programming in the box, no mains power needed
EMC	First environment. C1 EMC filters as standard ('E' model)	Low EMC emissions
Automatic switching frequency	Increases switching frequency automatically when drive temperature is decreased	Provides lowest possible noise without derating the drive
110-240 V AC, single-phase supplies	Output always capable of full 240 V, 3-phase, regardless of supply voltage	Can easily replace single-phase cap start motors
RoHS compliance	Compliance achieved during 2007	Environmentally friendly drives

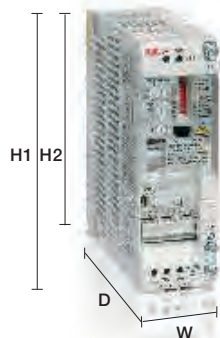
Low voltage AC drives

ABB micro drives

ACS55 – Ratings, types, voltages, prices and dimensions

Dimensions and weights

Frame	H1	H2	W	D	Weight
size	mm	mm	mm	mm	Kg
A	170	146.5	45	128	0.65
B	170	146.5	67.5	128	0.70
C	194	171	70	159	1.1
D	226	203	70	159	1.1



200/240 V, 1-phase supply, 3-phase output

Nominal	Input current	Output current	Max output	Frame	Fuse A	Heat dissipation	Cooling requirements	Type	Price
kW	A	A	A		Type gG	W	m³/h		£
With EMC filter									
0.18	4.4	1.4	2.1	A	10	21	*Nat Vent	ACS55-01E-01A4-2	£98
0.37	6.9	2.2	3.3	A	16	32	*Nat Vent	ACS55-01E-02A2-2	£108
0.75	10.8	4.3	6.5	B	16	51	*Nat Vent	ACS55-01E-04A3-2	£129
1.5	18.2	7.6	11.4	D	25	74	26	ACS55-01E-07A6-2	£179
2.2	22	9.8	14.7	D	32	103	26	ACS55-01E-09A8-2	£209
Without EMC filter									
0.18	4.4	1.4	2.1	A	10	21	*Nat Vent	ACS55-01N-01A4-2	£93
0.37	6.9	2.2	3.3	A	16	32	*Nat Vent	ACS55-01N-02A2-2	£102
0.75	10.8	4.3	6.5	B	16	51	*Nat Vent	ACS55-01N-04A3-2	£120
1.5	18.2	7.6	11.4	C	25	74	26	ACS55-01N-07A6-2	£167
2.2	22	9.8	14.7	C	32	103	26	ACS55-01N-09A8-2	£196

* Ensure minimum installation space is provided, see User's Manual for details

100/120 V, 1-phase supply, 3-phase output

Nominal	Input current	Output current	Max output	Frame	Fuse A	Heat dissipation	Cooling requirements	Type	Price
kW	A	A	A		Type gG	W	m³/h		£
With EMC filter									
0.18	6.4	1.4	2.1	A	10	24	*Nat Vent	ACS55-01E-01A4-1	£107
0.37	9.5	2.2	3.3	A	16	35	*Nat Vent	ACS55-01E-02A2-1	£119
Without EMC filter									
0.18	6.4	1.4	2.1	A	10	24	*Nat Vent	ACS55-01N-01A4-1	£103
0.37	9.5	2.2	3.3	A	16	35	*Nat Vent	ACS55-01N-02A2-1	£112

* Ensure minimum installation space is provided, see User's Manual for details



Options and interfaces

Potentiometer

Potentiometer with two switches: start/stop and forward/reverse direction. No external power source is needed for the potentiometer, connects directly to drive I/O.



DriveConfig programming with no power

To increase the number of applications possible with the ACS55, the DriveConfig kit can be used to access an extended parameter set. It is still possible to programme in the usual way, if these extended features are not required. DriveConfig also allows programming in the box without power.

Low voltage AC drives

ABB micro drives

0.37 kW to 4 kW, ACS150

Motor control method - scalar

200/240 V, 1-phase supply, 0.37 kW - 2.2 kW

200/240 V, 3-phase supply, 0.37 kW - 2.2 kW

380/480 V, 3-phase supply, 0.37 kW - 4 kW

What is an ABB micro drive, ACS150?

The ABB micro drive meets the requirements of OEMs, machinery builders and panel builders. It is a component that is purchased, together with other components, from a logistical distributor. ABB micro drives are designed to encourage users of contactors and softstarters to move to the benefits of variable-speed control. The ACS150 extends the capability of the ACS55 (page 30), by adding an extended range of power frames and programmability. The ACS150 can solve more difficult tasks like PID functionality. To retain the simplicity of an ABB micro drive, the ACS150 does not have a serial communications interface or extended options but does have a fixed keypad and speed control potentiometer.

Highlights

- PID controller built-in
- DC hold stop ensures stationary motor shaft
- IR compensation improves starting torque for heavy loads
- Parameter lock prevents tampering by unauthorised staff
- DIN rail or screw mounting as standard
- IP20 enclosure
- Fixed basic control panel
- Two-year warranty
- Flashdrop - parameter programming whilst drive still in its box - excellent for OEMs
- Protected against wiring errors: shows fault if power cable is inadvertently connected to motor terminals
- Automatic noise reduction
- Optional short or long parameter mode for standard or advanced users
- Unified height across the power range simplifies cabinet design



Where can it be used?

ACS150 can be used to control less demanding components in any machine, fans or pumps or anywhere where a fixed speed motor needs to go to variable-speed control. The functionality of the drive is designed to compliment the ABB machinery drives and ABB motion control drives.

Feature	Advantage	Benefit
FlashDrop*	Faster and easier drive set-up and commissioning for volume manufacturing. Programming in the box	No need for high voltage safe programming areas Parameters can be hidden for clarity Programme the drive during machine production build-up
Fixed interface	Simple drive with comfortable and robust interface Easy to navigate parameter structure	Integrated control panel with clear LCD, backlight and buttons for editing and control
Fixed potentiometer	Intuitive speed setting	Integrated potentiometer. Settings shown on the control panel
Programmable functions	Useful control functions like PID, accelerating rates and start/stop modes included	Take control of the motor and reduce cost in the installation
Built-in EMC filter	No need for external filtering	2nd environment built-in filter. Complying with IEC 61800-3 as standard
Built-in brake chopper	Reduced cost, saved space and simple wiring	100 percent braking capability
Flexible installation	Optimum layout and efficient cabinet space usage	Screw, DIN-rail, sideways and side-by-side mounting Unified height and depth
Drive protection	Latest solutions to protect the drive and offer troublefree use and the highest quality	The drive protects itself when power is connected to the motor terminals. I/O protected against short-circuit. Coated boards included as standard
Brand labelling	Drive logo, control panel logo, manuals and box can be printed with machine builders logo and name	Drives and packaging badged to your design
RoHS compliance	Compliance achieved during 2007	Environmentally friendly drives

* For details of FlashDrop, see user interfaces in ABB machinery drive section (page 38)

Low voltage AC drives

ABB micro drives

ACS150 – Ratings, types, voltages and prices

200/240 V, 1-phase supply voltage

Nominal kW	Nominal output current A	Max output A	Frame	Fuse A Type gG	Heat dissipation W	Cooling requirements m³/h	Type	List Price £
0.37	2.4	4.2	R0	10	25	+Nat Vent	ACS150-01E-02A4-2	£105
0.75	4.7	8.2	R1	16	46	24	ACS150-01E-04A7-2	£123
1.1	6.7	11.7	R1	20	71	24	ACS150-01E-06A7-2	£155
1.5	7.5	13.1	R2	25	73	21	ACS150-01E-07A5-2	£174
2.2	9.8	17.2	R2	35	96	21	ACS150-01E-09A8-2	£208

+ Ensure enough space around the unit - refer to the User's Manual for details

200/240 V, 3-phase supply voltage

3-phase, 240 V is available for customers supplying the North American market. Please enquire for details.

380/480 V, 3-phase supply voltage

Nominal kW	Nominal output current A	Max output A	Frame	Fuse A Type gG	Heat dissipation W	Cooling requirements m³/h	Type	List Price £
0.37	1.2	2.1	R0	10	11	+Nat Vent	ACS150-03E-01A2-4	£167
0.55	1.9	3.3	R0	10	16	+Nat Vent	ACS150-03E-01A9-4	£177
0.75	2.4	4.2	R1	10	21	13	ACS150-03E-02A4-4	£193
1.1	3.3	5.8	R1	10	31	13	ACS150-03E-03A3-4	£212
1.5	4.1	7.2	R1	16	40	13	ACS150-03E-04A1-4	£231
2.2	5.6	9.8	R1	16	61	19	ACS150-03E-05A6-4	£331
3	7.3	12.8	R1	16	74	24	ACS150-03E-07A3-4	£398
4	8.8	15.4	R1	20	94	24	ACS150-03E-08A8-4	£453

+ Ensure enough space around the unit - refer to the User's Manual for details

The drive can be fitted with the NEMA 1 kit for easy wall-mounting and convenient protection, see user interfaces in ABB machinery drive section, page 38.



Low voltage AC drives

ABB micro drives

ACS150 – Dimensions, I/O and options

Dimensions and weights

Cabinet-mounted drives, wall mounted drives

Frame size	IP20 (UL open)						NEMA 1					
	H1 mm	H2 mm	H3 mm	W mm	D mm	Weight Kg	H4 mm	H5 mm	W mm	D mm	Weight Kg	
R0	169	202	239	70	142	1.1	257	280	70	142	1.5	
R1	169	202	239	70	142	1.3	257	280	70	142	1.5	
R2	169	202	239	105	142	1.5	257	282	105	142	1.5	

H1 = Height without fastenings and clamping plate

H2 = Height with fastenings but without clamping plate

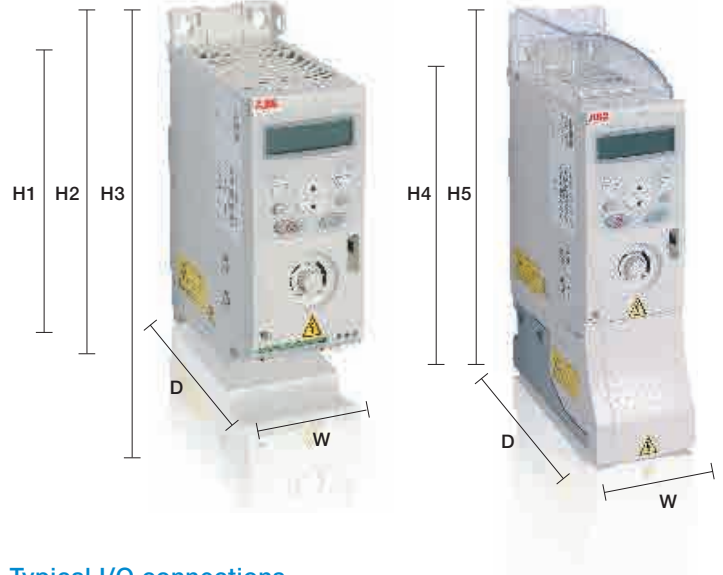
H3 = Height with fastenings and clamping plate

H4 = Height with fastenings and NEMA 1 connection box

H5 = Height with fastenings, NEMA 1 connection box and hood

W = Width

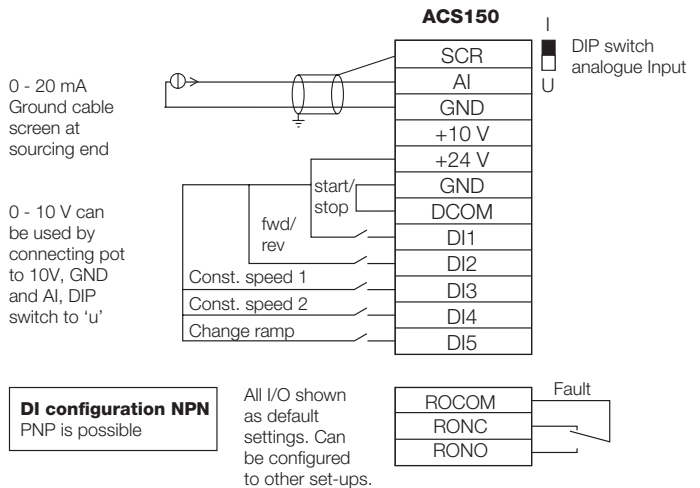
D = Depth



Options available

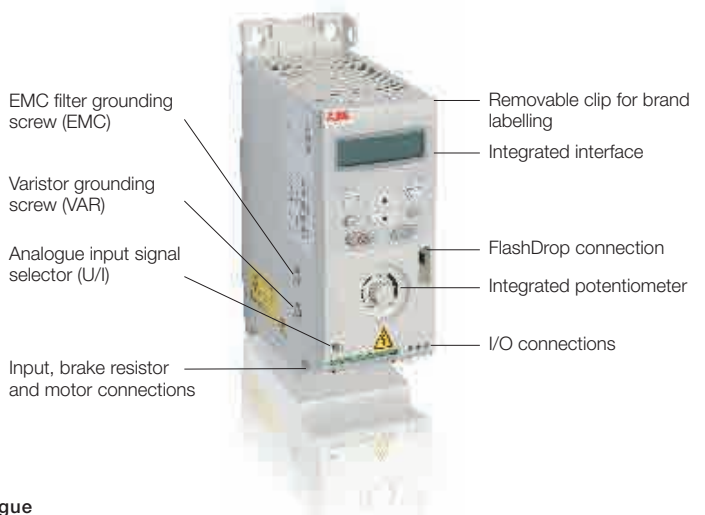
- Input and output chokes
- Brake chopper resistors (all drives in the ACS150 range have integral chopper)
- First environment EMC filters - footprint style
- Low leakage EMC filters < 30 mA leakage
- FlashDrop - programming without power
- NEMA kit allows installations to be neater and provides mechanical support for glanded cables

Typical I/O connections



User interfaces

The ACS150 has a simple user interface, consisting of I/O connections and a fixed programming keypad. An integrated speed control potentiometer is also provided.



Low voltage AC drives

ABB machinery drive

0.37 kW to 22 kW, ACS355

Motor control method - scalar, vector (open and closed loop)

200/240 V, 1-phase supply, 0.37 kW - 2.2 kW

200/240 V, 3-phase supply, 0.37 kW - 11 kW

380/480 V, 3-phase supply, 0.37 kW - 22 kW

What is an ABB machinery drive?

ABB machinery drives are designed for the machine building sector. In serial type manufacturing the consumed time per unit is critical. The drive is designed to be optimal in terms of installation, setting parameters, available machinery features and commissioning. The basic product is user-friendly, yet provides high intelligence. The drive offers diverse functionality to cater for the most demanding needs. The drive is also equipped with a dual-channel safe torque-off interface to SIL3/PL e.

Highlights

- FlashDrop - parameter programming with drive still in its box - excellent for OEMs
- Sequence programming designed for food and beverage and materials handling applications - Eight-steps included
- Unified height and depth across the power range simplifies cabinet design
- Protected against wiring errors: shows fault if power cable is inadvertently connected to motor terminals
- Automatic noise reduction
- Own branding possible for large users



Where can it be used?

ABB machinery drives are designed to meet the requirements of an extensive range of machinery applications. The drive is ideal for food and beverage, material handling, textile, printing, rubber and plastics and woodworking applications. The higher IP66 class variant meets all of the relevant hygiene requirements for the food and beverage industry.

Feature	Advantage	Benefit
FlashDrop*	Faster and easier drive set-up and commissioning for volume manufacturing. Programming with no power	Fast, safe and troublefree method to set up and commission without powering up the drive - patented
Safe torque-off	Built-in compliance to new machinery directive	SIL3/PL e certified dual channel input - TÜV approved
Sequence programming	Application specific 8-state programming with comprehensive triggering conditions, 16 conditions with option code	Logic programming included as standard. Reduces the need for external PLC
Common DC link	Connection to existing DC power sources (patented)	Easy integration into high performance machines
User interfaces	Wide range, including Assistant panel	Cost efficient approach - meets requirements of OEM
Fieldbus	Extensive range of industrial fieldbus option modules available	Connectability to all of the most popular fieldbuses
24 V 'live keypad' operation	Connect 24 V to the drive via the MPOW option	Keep fieldbus, control card and I/O healthy while able to remove the main supply - safer maintenance
Built-in EMC filter	2nd environment filter complying with IEC 61800-3 as standard	No extra space, parts, time or cost required
Built-in brake chopper	100 percent braking capability	Reduces cost, saves space and simplifies wiring
Drive protection	Latest solutions to protect the drive and offer troublefree use and the highest quality	The drive protects itself when power is connected to the motor terminals. I/O protected against short-circuit. Coated boards included as standard
IP66/69k enclosure option	Makes drive suitable for hose down applications	Meets food hygiene standards in a wall-mounted enclosure
Brand labelling	Drive logo, control panel logo, manuals and box can be printed with machine builders logo and name	Drives and packaging badged to your design
RoHS compliance	Compliance achieved during 2007	Environmentally friendly drives

* For details of FlashDrop, see user interfaces in ABB machinery drive section, page 38

Low voltage AC drives

ABB machinery drive

ACS355 - Ratings, types, voltages and prices

200/240 V, 1-phase supply voltage

Nominal	Output current	Max output	Frame	Fuse A	Heat dissipation	Cooling requirements	Type (code shown is IP20)	IP20 list price without control panel*	IP66 list price with control panel**
kW	A	A		Type gG	W	m³/h			
0.37	2.4	4.2	R0	10	48	*Nat Vent	ACS355-01E-02A4-2	£117	n/a
0.75	4.7	8.2	R1	16	72	24	ACS355-01E-04A7-2	£146	n/a
1.1	6.7	11.7	R1	20	97	24	ACS355-01E-06A7-2	£172	n/a
1.5	7.5	13.1	R2	25	101	21	ACS355-01E-07A5-2	£188	n/a
2.2	9.8	17.2	R2	35	124	21	ACS355-01E-09A8-2	£230	n/a

* Ensure enough space around the unit - refer to the User's Manual for details

* Note: IP20 drives require a keypad for parameter alteration, it can then be removed if required

** Note: IP66 drives are always delivered with the Assistant keypad

200/240 V, 3-phase supply voltage

3-phase, 240 V is also available for customers supplying the North American market. Please enquire for details.

380/480 V, 3-phase supply voltage

Nominal	Output current	Max output	Frame	Fuse A	Heat dissipation	Cooling requirements	Type (code shown is IP20)	IP20 list price without control panel*	IP66 list price with control panel**
kW	A	A		Type gG	W	m³/h			
0.37	1.2	2.1	R0	10	35	*Nat Vent	ACS355-03E-01A2-4	£199	£420
0.55	1.9	3.3	R0	10	40	*Nat Vent	ACS355-03E-01A9-4	£209	£423
0.75	2.4	4.2	R1	10	50	13	ACS355-03E-02A4-4	£229	£438
1.1	3.3	5.8	R1	10	60	13	ACS355-03E-03A3-4	£260	£487
1.5	4.1	7.2	R1	16	69	13	ACS355-03E-04A1-4	£315	£553
2.2	5.6	9.8	R1	16	90	19	ACS355-03E-05A6-4	£366	£630
3	7.3	12.8	R1	16	107	24	ACS355-03E-07A3-4	£477	£816
4	8.8	15.4	R1	20	127	24	ACS355-03E-08A8-4	£543	£927
5.5	12.5	21.9	R3	25	161	52	ACS355-03E-12A5-4	£629	£1,096
7.5	15.6	27.3	R3	30	204	52	ACS355-03E-15A6-4	£816	£1,299
11	23.1	40.4	R3	50	301	71	ACS355-03E-23A1-4	£997	n/a
15	31.0	54.3	R4	80	408	96	ACS355-03E-31A0-4	£1,277	n/a
18.5	38.0	66.5	R4	100	498	96	ACS355-03E-38A0-4	£1,516	n/a
22	44.0	77.0	R4	100	588	96	ACS355-03E-44A0-4	£1,853	n/a

* Ensure enough space around the unit - refer to the User's Manual for details

* Note: IP20 drives require a keypad for parameter alteration, it can then be removed if required

** Note: IP66 drives are always delivered with the Assistant keypad

Control panel

Control panel	Type	Price
		£
Assistant control panel	ACS-CP-A	£94†
Basic keypad	ACS-CP-C	£27

† Price of control panel only when purchased with drive

Panel mounting kit and user interface descriptions, see page 38

Low voltage AC drives

ABB machinery drive

ACS355 – Dimensions, I/O and options

Dimensions and weights

IP20 UL Open							NEMA 1/UL Type 1							IP66/67/UL Type 4x			
Frame	H1	H2	H3	W	D1	D2	Weight	H4	H5	W	D1	D2	Weight	H	W	D1	Weight
size	mm	mm	mm	mm	mm	mm	Kg	mm	mm	mm	mm	mm	Kg	mm	mm	mm	Kg
R0	169	202	239	70	161	187	1.2	257	280	70	169	187	1.6	-	-	-	-
R1	169	202	239	70	161	187	1.2	257	280	70	169	187	1.6	305	195	281	7.7
R2	169	202	239	105	165	191	1.5	257	282	105	169	191	1.9	-	-	-	-
R3	169	202	236	169	169	195	2.5	260	299	169	177	195	3.1	436	246	277	13
R4	181	202	244	260	169	195	4.4	270	320	260	177	195	5.0	-	-	-	-

H = Height

H1= Height without fastenings and clamping plate

H2 = Height with fastenings but without clamping plate

H3 = Height with fastenings and clamping plate

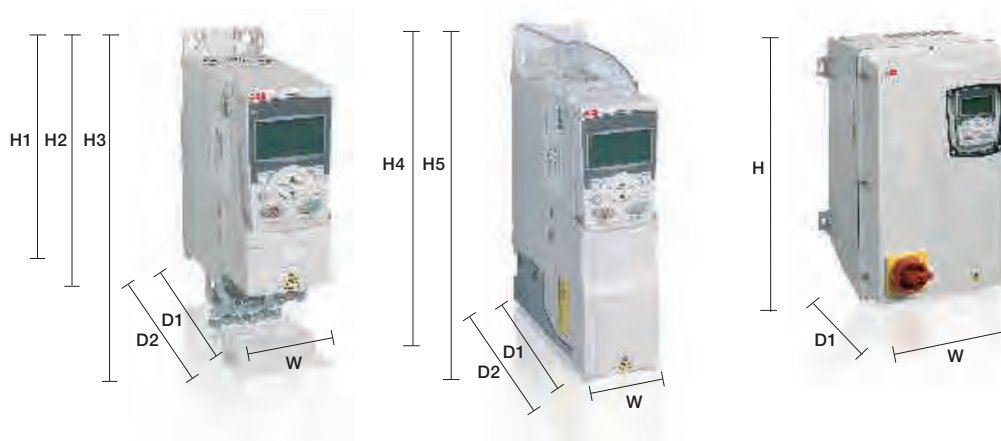
H4 = Height with fastenings and NEMA 1 connection box

H5 = Height with fastenings, NEMA 1 connection box and hood

W = Width

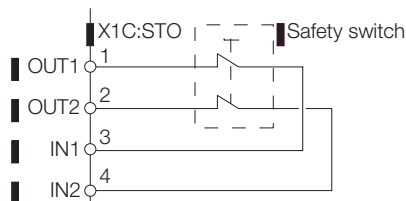
D1 = Standard depth

D2 = Depth with MREL or MTAC option



STO connections

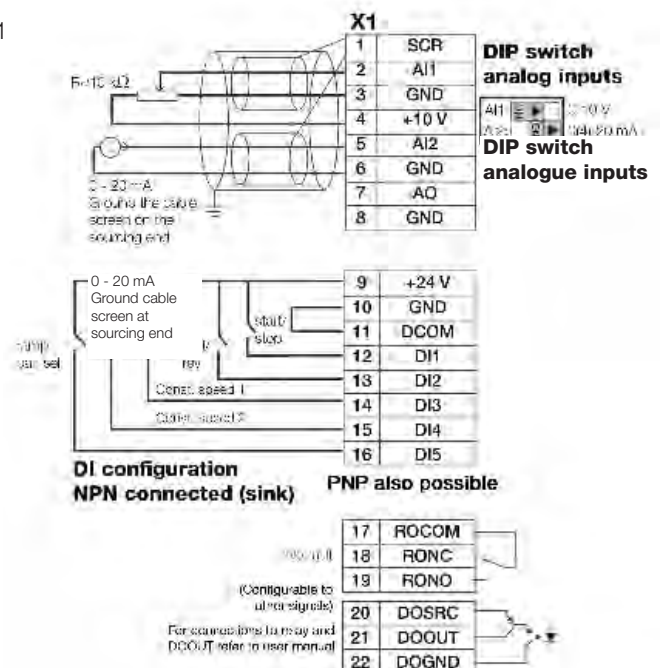
The ACS355 has a dual channel STO (safe torque-off) input as standard, certified to BS EN 62061 and BS EN 13849-1



Options available

- Input and output chokes
- Brake chopper resistors (all drives in the ACS355 range have integral chopper)
- First environment EMC filters - footprint style
- Low leakage EMC filters < 30 mA leakage
- FlashDrop, programming in the box without power
- Fieldbus modules
- NEMA kit allows installations to be neater and provides mechanical support for glanded cables
- An extensive range of user interfaces is available - please see following pages
- IP66 pressure relief valves

Typical control connections



Low voltage AC drives

ABB machinery drive

ACS355 – User interfaces

Assistant control panel (+J400)

Features a multilingual alphanumeric display for easy drive programming. The control panel has various assistants and a built-in help function to guide the user. It includes a real-time clock, which is used during fault logging and in controlling the drive, such as start/stop. The control panel can be used for copying parameters for backup or for downloading to another drive. A large graphical display and soft keys make it extremely easy to navigate.



Basic control panel (+J404)

Features a single line numeric display. The panel can be used to control the drive, set the parameter values or copy them from one drive to another, or view changes.



Panel cover

The panel cover protects the drive when no control panel is used. The ABB machinery drive is delivered with a panel cover as standard. In addition, there are two alternative control panels available as options, see above.



NEMA 1 kit

The NEMA 1 kit is a convenient cover which is added to the drive and enables easy wall-mounting. It includes a connection box for cable gland or conduit tube installation and a hood for protection against dirt and dust.



Panel mounting kits, IP54 and IP66

The panel mounting kits enable mounting of control panels onto cabinet doors. These kits include a 3 m extension cable, a gasket, mounting screws and a mounting template - two versions are now available, IP54 and IP66. The IP66 has an additional keypad membrane cover.

Note: IP66 cover is not suitable for outdoor use.



Relay extension module (+L511)

Add an additional three relays to the ACS355 to allow greater use of the drives programme. Fits behind the keypad.



Potentiometer (+J402)

Potentiometer with two switches: start/stop and forward/reverse direction. No external power source is needed for the potentiometer. Fits to the drive I/O.



FlashDrop

Programme the drive whilst still in the box, with no power. Perfect for OEMs and machine builders. FlashDrop is a powerful palm-sized tool for fast and easy parameter selecting and setting. It gives the possibility to hide selected parameters to protect the machine. The tool stores 20 parameter sets, which can be moved between a PC and a drive. Safe programming during machine building production for unskilled staff.



Fieldbus interfaces

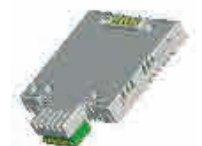
Extensive range of plug-in fieldbus interfaces, allowing connection to Profibus, DeviceNet, CanOpen, Modbus RTU and Ethernet and many others.



24V "live keypad" options

There are two ways of powering the fieldbus modules, so that they operate when the main power is removed.

FEPA - maintains power to the fieldbus module only.



MPOW (+G406) - powers the fieldbus module, the control card, the drive I/O and the drive keypad, generating the functionality commonly known as 'live keypad' operation.



DriveWindow Light PC tool

The tool is a parameterisation and commissioning tool used to set-up and commission the drive. Monitoring and diagnostic facilities are included, as well as a local control panel. Wizards are included to guide the user through the most commonly performed tasks.



Low voltage AC drives

ABB general purpose drive for fans and pumps

0.37 kW to 22 kW, ACS310

Motor control method – scalar

200/240 V, 1-phase supply, 0.37 kW - 2.2 kW

200/240 V, 3-phase supply, 0.37 kW - 11 kW

380/480 V, 3-phase supply, 0.37 kW - 22 kW

What is an ABB general purpose drive for fans and pumps?

A dedicated fan and pump controller, designed for squared-torque applications such as booster, submersible and irrigation pumps and centrifugal fans.

The drive benefits pump and fan applications with features including built-in PID controllers and PFC (pump and fan control). The drives also have pre-programmed protection functions such as pipe cleaning (anti-jam) and duty standby functionality, including soft pipe filling to reduce leaks.

These features, combined with pre-programmed application macros, an intuitive user interface, and several assistant screens, speed up the installation, parameter setting and commissioning of the drive.

Highlights

- Pump, soft pump and fan control (PFC and SPFC), for multi-pump and soft fill control
- Pipe cleaning (anti-jam) and pipe fill functions
- Multiple PID set points, allowing for automatic duty/assist/standby schemes to be implemented
- Energy efficiency counters, real-time clock
- Energy optimiser – optimises the motor control for the application to run with minimum energy requirements
- Load analyser for optimised dimensioning of the drive, motor and process
- Embedded Modbus RS-485 fieldbus interface
- FlashDrop tool for fast parameter setting, without mains power



For more details, please refer to Technical Catalogue 3AUA0000051082

Where can it be used?

The ABB general purpose drive's software features are ideal for solving the challenges and issues surrounding pumping in general, and those of water and wastewater in particular.

The drive is designed to compliment the features offered by the industry specific products for water and wastewater (see page 51).

Feature	Advantage	Benefit
Pump and fan control (PFC) feature to control pumps and fans in parallel	One drive controls several pumps or fans and eliminates the need for an external programmable logic controller Interlock function enables one motor to be disengaged from the mains supply while others continue operating in parallel	Saves cost of additional drives and external PLC Longer life for pump or fan system while reducing maintenance time and costs. Maintenance can be carried out safely without stopping the process
Soft pump and fan control feature (SPFC)	Reduces unwanted pressure peaks in pumps and pipelines when an auxiliary motor is started or main pump started	Reduces maintenance costs and leaks typically seen in DOL starting. Longer life for pump or fan system. Ideal for irrigation systems
Pump protection functions	Pre-programmed features like: Pipe cleaning (anti-jamming), inlet/outlet pressure supervision and detection of under or overload for preventive maintenance	Reduces maintenance costs Smoother processes: improved and optimised system Longer life for pump and fan system, reduced maintenance costs
Energy monitoring and optimising features	Drive monitors the saved energy compared to equivalent DOL operation Drive controls the motor voltage dependant on the load	Energy savings presented in local currency and CO ₂ Consumed energy optimised across the speed and load range
Full output current at 50°C ambient	Drive can be operated in ambient temperatures up to 50°C without de-rating the output current	Optimised drive dimensioning for wide temperature range
Unified height and depth	Optimum installation layout, as all drive frames are the same height – only the width changes	Space savings. Easier to lay the cabinet back panel out
Best-in-class user interfaces	Assistant and Basic keypads with intuitive operation. Short and long menus, Assistants and wizards for ease of use	Users are supported as they program the drive, can tailor the open menu views to suite there customer needs
FlashDrop*	Faster and easier drive set up and commissioning for volume manufacturing	Fast, safe and troublefree method to set up and commission without powering up the drive - patented
RoHS compliance	Compliance achieved during 2007	Environmentally friendly drives

* For details of FlashDrop, see user interfaces (page 42)

Low voltage AC drives

ABB general purpose drive for fans and pumps

ACS310 – Ratings, types, voltages and prices

200/240 V, 1-phase supply voltage

Nominal kW	Nominal output current A	Max output A	Frame	Fuse A Type gG	Heat dissipation W	Cooling requirements m³/h	Type	IP20 list price without control panel*
0.37	2.4	4.0	R0	10	48	+Nat Vent	ACS310-01E-02A4-2	£116
0.75	4.7	7.9	R1	16	72	24	ACS310-01E-04A7-2	£132
1.1	6.7	11.4	R1	20	97	24	ACS310-01E-06A7-2	£154
1.5	7.5	12.6	R2	25	101	21	ACS310-01E-07A5-2	£171
2.2	9.8	16.5	R2	35	124	21	ACS310-01E-09A8-2	£207

+ Ensure enough space around the unit - refer to the User's Manual for details

* Drives require a control panel for parameter alteration, it can then be removed if required
For 50°C ratings contact ABB

200/240 V, 3-phase supply voltage

3-phase, 240 V is available for customers supplying the North American market. Please enquire for details.

380/480 V, 3-phase supply voltage

Nominal kW	Nominal output current A	Max output A	Frame	Fuse A Type gG	Heat dissipation W	Cooling requirements m³/h	Type	IP20 list price without control panel*
0.37	1.3	2.1	R0	10	35	+Nat Vent	ACS310-03E-01A3-4	£180
0.55	2.1	3.3	R0	10	40	+Nat Vent	ACS310-03E-02A1-4	£189
0.75	2.6	4.2	R1	10	50	13	ACS310-03E-02A6-4	£207
1.1	3.6	5.8	R1	10	60	13	ACS310-03E-03A6-4	£230
1.5	4.5	7.2	R1	15	69	13	ACS310-03E-04A5-4	£300
2.2	6.2	9.8	R1	15	90	19	ACS310-03E-06A2-4	£331
3	8	12.8	R1	20	107	24	ACS310-03E-08A0-4	£425
4	9.7	15.4	R1	25	127	24	ACS310-03E-09A7-4	£482
5.5	13.8	21.9	R3	30	161	52	ACS310-03E-13A8-4	£560
7.5	17.2	27.3	R3	35	204	52	ACS310-03E-17A2-4	£738
11	25.4	40.4	R3	50	301	71	ACS310-03E-25A4-4	£900
15	34.1	54.3	R4	80	408	96	ACS310-03E-34A1-4	£1,157
18.5	41.8	66.5	R4	100	498	96	ACS310-03E-41A8-4	£1,349
22	48.4	77.0	R4	100	588	96	ACS310-03E-48A4-4	£1,648

+ Ensure enough space around the unit - refer to the User's Manual for details

* Drives require a control panel for parameter alteration, it can then be removed if required
For 50°C ratings contact ABB

Control panel

Control panel	Type	Price £
Assistant control panel	ACS-CP-A	£94**
Basic keypad	ACS-CP-C	£27

** Price of control panel only when purchased with drive

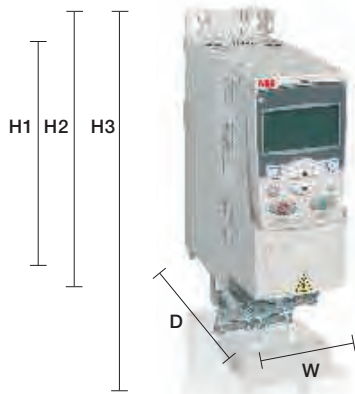
Panel mounting kit and user interface descriptions, see page 42

Low voltage AC drives

ABB ACS310 general purpose drive for fans and pumps

ACS310 – Dimensions, I/O and options

Dimensions and weights



Cabinet-mounted drives (IP20 UL open)



Wall-mounted drives (NEMA 1)

Frame size	IP20 UL open						NEMA 1/UL Type 1					
	H1 mm	H2 mm	H3 mm	W mm	D mm	Weight Kg	H4 mm	H5 mm	W mm	D mm	Weight Kg	
R0	169	202	239	70	161	1.1	257	280	70	169	1.5	
R1	169	202	239	70	161	1.3	257	280	70	169	1.7	
R2	169	202	239	105	165	1.5	257	282	105	169	1.9	
R3	169	202	236	169	169	2.9	260	299	169	177	3.5	
R4	181	202	244	260	169	4.4	270	320	260	177	5.0	

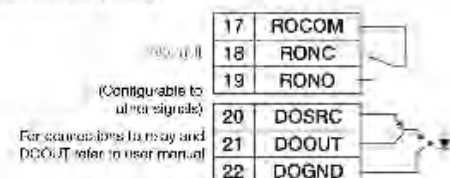
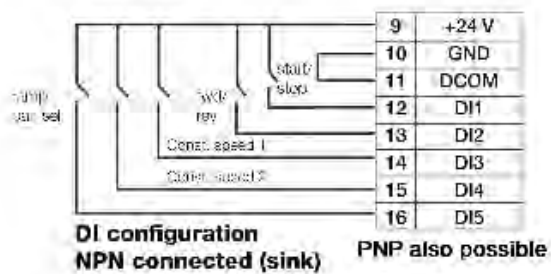
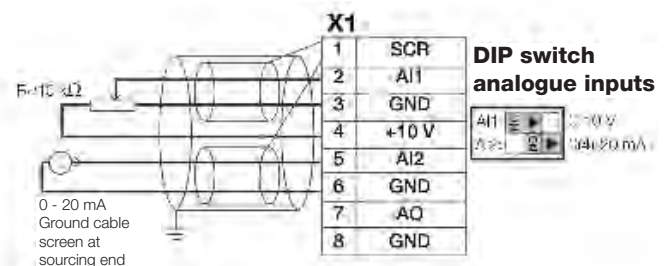
H1 = Height without fastenings and clamping plate
H2 = Height with fastenings but without clamping plate
H3 = Height with fastenings and clamping plate
H4 = Height with fastenings and NEMA 1 connection box
H5 = Height with fastenings, NEMA 1 connection box and hood
W = Width
D = Depth

Options available

- Input and output chokes
- ACS310 has no braking options
- First environment EMC filters - footprint style
- Low leakage EMC filters < 30 mA leakage
- FlashDrop
- NEMA kit allows installations to be neater and provides mechanical support for glanded cables
- An extensive range of user interfaces is available - please see following pages

Typical control connections

- All I/O are programmable for other configurations



Low voltage AC drives

ABB general purpose drive for fans and pumps

ACS310 – User interfaces

Assistant control panel (+J400)

Features a multilingual alphanumeric display for easy drive programming. The control panel has various assistants and a built-in help function to guide the user. It includes a real-time clock, which is used during fault logging and in controlling the drive, such as start/stop. The control panel can be used for copying parameters for backup or for downloading to another drive. A large graphical display and softkeys make it extremely easy to navigate.



Basic control panel (+J404)

Features a single line numeric display. The panel can be used to control the drive, set the parameter values or copy them from one drive to another.



Panel cover

The panel cover protects the drive's connection when no control panel is used. The ABB general purpose drive is delivered with a panel cover as standard, thereby providing a cost effective package. In addition, there are two alternative control panels available as options, see above.



NEMA 1 kit

The NEMA 1 kit is a convenient cover which is added to the drive and enables easy wall-mounting. It includes a connection box for cable gland or conduit tube installation and a hood for protection against dirt and dust.



Panel mounting kit, IP54 and IP66

The panel mounting kit enables mounting of control panels on cabinet doors. These kits include a 3 m extension cable, a gasket, mounting screws and a mounting template - two versions are now available, IP54 and IP66. The IP66 has an additional keypad membrane cover.



Note: IP66 cover is not suitable for outdoor use.

Relay extension module (+L511)

Add an additional three relays to the ACS310 to allow greater use of the PFC program. Fits behind the keypad.



FlashDrop

Programme the drive whilst still in the box, with no power. Perfect for OEMs and machine builders. FlashDrop is a powerful palm-sized tool for fast and easy parameter selecting and setting. It gives the possibility to hide selected parameters to protect the machine. The tool stores 20 parameter sets, which can be moved between a PC and a drive. Safe programming during machine building production for unskilled staff.



Fieldbus communications

ACS310 has no industrial fieldbus interfaces, but it does have an RS485 Modbus communications link built-in. This link can be used to communicate to industrial HMIs or remote monitoring devices or to a fieldbus via a suitable gateway.

DriveWindow Light PC tool

This tool is a parameterisation and commissioning tool used to set-up and commission the drive. Monitoring and diagnostic facilities are included, as well as a local control panel. Wizards are included to guide the user through the most commonly performed tasks.



Low voltage AC drives

ABB general purpose drive

0.55 kW to 500 kW, ACS580

Motor control method – scalar or vector control (open or closed loop)

380 - 480 V, 3-phase supply, 0.55 kW to 500 kW

What is an ABB general purpose drive?

The ACS580 is stocked and delivered by ABB's authorised value provider network, and handles a very wide range of applications. It is a highly useable drive incorporating ABB's most intuitive keypad functionality. The "primary settings" guide the user much like a smart phone. The drive retains the swinging choke harmonic suppression technology, which has been updated to permanent magnet technology. The drive includes built-in machinery safety functionality with safe torque-off (STO) to SIL 3 PL e as standard, and has more frames to optimise the commercial and power offering.

Highlights

- Improved internal options including external 24 V support
- Integral EMC filter for 1st and 2nd environment as standard
- Assistant control panel with improved primary settings menu and backups-smartphone useability
- Wide power range in wall-mounted IP21 and IP55 variants
- Extended power range with ACS580-04 and ACS580-07 to 500 kW
- Patented permanent magnet swinging choke for superior harmonic reduction, even at reduced motor loads
- Safe torque-off (STO) as standard, SIL 3 PL e
- Flexible fieldbus system with built-in Modbus and numerous internally mountable fieldbus adapters
- SynRM, permanent magnet (PM) and induction motor (IM) control with improved motor platform



For more details, please refer to Technical Catalogue 3AUA0000145061

Where can it be used?

The ABB general purpose drive is ideal in those situations where there is a need for simplicity to install, commission and use and where reasonable amounts of flexibility and functionality are required. The addition of STO, 24 V support and improved fieldbus support and wider powers, extends the applications.

Feature	Advantage	Benefit
Intuitive modern keypad	High contrast, high definition display giving intuitive access to the drive parameters. Built-in "Help" button, giving programming hints. Real-time clock, allows timed tracing of faults and setting of parameters to activate functions at various times of day. Changed parameters menu also included, so you can see your edits	Easy commissioning, programming, maintenance and fault finding, making the drive easy to own and use across all activities. Allows drive cloning for easy set up of multiple drives
Primary settings menu	Assisted set-up for all of the drives common settings. Intuitive and context sensitive makes navigation easier for the user, like a smartphone	Even easier to configure the drive to the application. Next level of VSD usability
Text editing capabilities	Rename drive variables or warning messages	Tailor the drive to "speak" in the language of the application
Adaptive programming	Drive contains a freely programmable environment allowing changes and adaptations to the drive parameters. Easy to use and flexible	The drive can easily be flexed to meet the needs of the application, without external devices, existing controls, timers, relays etc
Improved backups	Keypad can store backups with a time stamp, or automatic backups can be taken. Backups can be viewed before download, or partial downloads can be performed	Easy to manage installed base and speeds up commissioning. Auto backup means you never forget
Integrated safety. STO as standard SIL3 PL e	TÜV approved STO is on board the drive. Makes it easy to generate safety systems without the need for external contactors	Minimise installation time and space. Shorter design times using TÜV approved interface
Energy monitoring and optimising features	Drive controls the motor voltage dependant on the load. Drive monitors the saved energy compared to equivalent DOL operation	Consumed energy optimised across the speed and load range. Energy savings presented in local currency and tonnes of CO ₂
24 V operation	Power the drive control card, I/O and fieldbus from an external 24 V. Frames R0 to R5 require a CMOD; standard in R6 and above	Safer diagnostics and maintenance activities can be undertaken without the need for mains voltages
Cold configuration - Programming without mains power whilst in the box	Quicker parameter programming for OEM users. Drive can be programmed with a PC interface that injects the parameters directly into the drive whilst it is still in the box	Quicker, cheaper manufacturing for OEM's. Easier spares handling in store without the need to power on the drive

Low voltage AC drives

ABB general purpose drive

ACS580 – Variants, ratings voltages and prices



Wall-mounted single drive

Series ACS580-01

- 0.55 kW to 250 kW, (380 - 480 V)
- Largest power for wall-mount drive on market
- Coated boards as standard
- Variable-speed cooling fans
- TÜV approved safe torque-off (STO) to SIL 3 PL e standard
- IP21 as standard, IP55 as option
- IP55 variant similar footprint to IP21 variant
- Brake chopper standard to R3 frame, option thereafter
- Optional UK cable box for SWA cables
- EMC filter for C3 category according to EN 61800-3 (2004) standard
- Internal fieldbus options
- Optional relay expansion, PTC and 115 V/240 V DI's

Cabinet built single drives

Series ACS580-07

- 250kW to 500kW
- Contains the 580-04 module described below, so adopts all of it features
- Optimised list of options covering IP rating, cable entry and door furniture, to ensure a fast and efficient build and delivery time schedule
- New cabinet designs containing the ACS580-01 module expected in 2017



Cabinet mounted single drive

Series ACS580-04

- 250 kW to 500 kW
- Most compact floor standing module
- Coated boards as standard
- Variable-speed redundant cooling fans
- TÜV approved safe torque-off (STO) to SIL 3 PL e
- IP00 module, mounted on wheels
- Brake chopper optional
- EMC, fieldbus and relay expansion as per ACS580-01

380 – 480 V, 3-phase supply voltage (ratings shown are for 415 V)

No-overload (nominal) use		Light-duty use		Heavy-duty use		Max output A	Frame	Fuse A	Heat dissipation	Cooling requirements	Type (+J400 + H358 to order keypad & SWA gland plate)	Price IP21	Price IP55 (+B056)
P _N kW	I _N A	P _{Ld} kW	I _{Ld} A	P _{hd} kW	I _{hd} A			Type gG	W	m ³ /h			
0.75	2.6	0.75	2.5	0.55	1.8	3.2	R0	4	45	34	ACS580-01-02A6-4	£466	£547
1.1	3.3	1.1	3.1	0.75	2.6	4.7	R0	6	55	34	ACS580-01-03A3-4	£490	£582
1.5	4	1.5	3.8	1.1	3.3	5.9	R0	6	66	34	ACS580-01-04A0-4	£587	£661
2.2	5.6	2.2	5.3	1.5	4	7.2	R0	10	84	34	ACS580-01-05A6-4	£644	£732
3	7.2	3	6.8	2.2	5.6	10.1	R1	10	106	50	ACS580-01-07A2-4	£703	£781
4	9.4	4	8.9	3	7.2	13	R1	16	133	50	ACS580-01-09A4-4	£790	£918
5.5	12.6	5.5	12	4	9.4	14.1	R1	16	174	50	ACS580-01-12A6-4	£938	£1,031
7.5	17	7.5	16.2	5	12.6	22.7	R2	25	228	128	ACS580-01-017A-4	£1,073	£1,248
11	25	11	23.8	7.5	17	30.6	R2	32	322	128	ACS580-01-025A-4	£1,286	£1,456
15	32	15	30.4	11	24.6	44.3	R3	40	430	116	ACS580-01-032A-4	£1,571	£1,753
18.5	38	18.5	36.1	15	31.6	56.9	R3	50	525	116	ACS580-01-038A-4	£1,976	£2,178
22	45	22	42.8	18.5	37.7	67.9	R3	63	619	116	ACS580-01-045A-4	£2,369	£2,553
30	62	30	58	22	45	76	R4	80	835	134	ACS580-01-062A-4	£2,966	£3,123
37	73	37	68	30	61	104	R4	100	1024	134	ACS580-01-073A-4	£3,287	£3,462
45	88	45	82.7	37	72	122	R5	100	1240	139	ACS580-01-088A-4	£4,084	£4,302
55	106	55	100	45	87	148	R5	125	1510	139	ACS580-01-106A-4	£4,236	£4,460
75	145	75	138	55	105	178	R6	160	1476	435	ACS580-01-145A-4	£4,762	£5,063
90	189	90	161	75	145	247	R7	250	1976	450	ACS580-01-169A-4	£6,142	£6,643
110	206	110	196	90	169	287	R7	315	2346	550	ACS580-01-206A-4	£7,907	£8,442
132	246	132	234	110	206	350	R8	355	3336	550	ACS580-01-246A-4	£9,641	£10,174
160	293	160	278	132	246	418	R8	425	3936	1150	ACS580-01-293A-4	£11,465	£12,001
200	363	200	345	160	293	498	R9	500	4836	1150	ACS580-01-363A-4	£13,918	£14,341
250	430	200	400	200	363	617	R9	630	6036	1150	ACS580-01-430A-4	£17,020	£17,631

For 440 to 480 V data see the User's Manual, document code: 3AUA0000076333

For ACS580-04 variant, please contact ABB or your local authorised value provider (see page 8 for details)

Low voltage AC drives

ABB general purpose drive

ACS580-01 – Dimensions and options

Dimensions and weights, wall-mounted drives

IP21				
Frame size	Height mm	Width mm	Depth mm	Weight kg
R0	303	125	210	4.5
R1	303	125	223	4.6
R2	394	125	227	7.5
R3	454	203	228	14.9
R4	600	203	258	19
R5	732	203	283	23
R6	727	252	369	45
R7	880	284	370	55
R8	965	300	393	70



IP55				
Frame size	Height mm	Width mm	Depth mm	Weight kg
R0	303	125	222	5.1
R1	303	125	233	5.1
R2	394	125	239	8.0
R3	454	203	237	15.4
R4	600	203	265	20
R5	732	203	320	29
R6	726	252	380	45.5
R7	880	284	381	55.5
R8	965	300	452	72



Options for ACS580-01

ACS580-01 is a wall mounted drive, so all options fit inside:

- IP55 variant
- Internal fieldbus options
- Optional additional industrial fieldbus
- Optional relay expansion
- Optional isolated PTC option
- Optional 115/230 V digital inputs
- UK gland box to accommodate SWA cable
- Brake chopper (up to frame R3 fitted as standard)

Apart from IP55, the above also applies to ACS580-04 and ACS580-07.

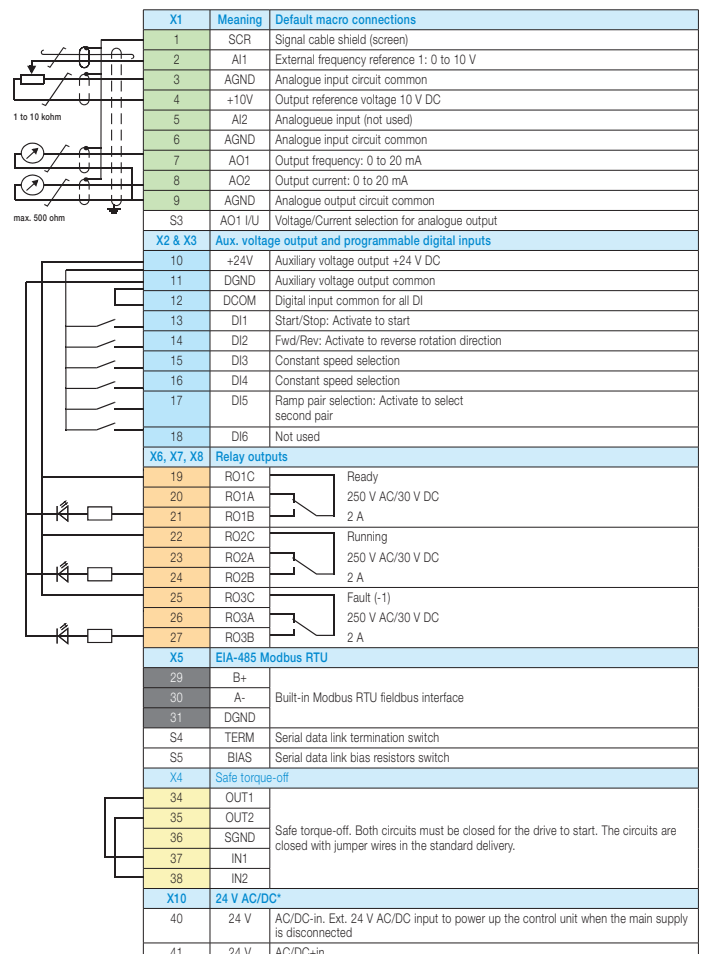
All ABB general purpose drives use the same common options and user interfaces. These are detailed on page 46. They are also part of the “all compatible family” so keypad interfaces, common PC tools, parameter structures and programing methods are all common, even across other drive ranges.

Cold configuration adapter – CCA-01

ACS580 drives can be programmed without the need for mains power or without taking the drive out of the box using the CCA-01. This specifically allows rapid programming for OEM without the need for safe areas in production.

Typical I/O connections for ACS580

These connections are shown as examples only. Please refer to the User's Manual – macro section, for more detailed information and for different I/O configurations.



*Standard on R6 frames and above and is optional on smaller frames (requires a CMOD)

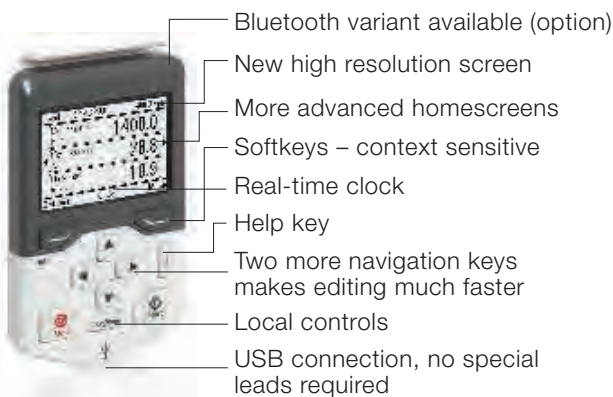
Low voltage AC drives

ABB general purpose drive

ACS580 – Common user interfaces

Control panel

State-of-the-art, high resolution keypad brings a new level of usability to the drives marketplace. The ACS580 uses the keypad platform from the new “all compatible” range of drives from ABB. The main difference, is that the ACS580 includes a “primary settings” menu, a guided set-up procedure similar to that of a smart phone, making it very easy to commission.



See page 65 for further keypad info

Bluetooth keypad and DriveTune app

Using a special Bluetooth enabled keypad, ABB offers connection to a mobile phone using an app called DriveTune. There are versions of the app for IOS and Android operating systems.



Fieldbus (various Plus codes)

The ACS580 supports an extensive list of fieldbus modules for connectivity to industrial networks. These modules are common with other drives within the ABB drives range. Modbus embedded as standard.



I/O extension and external 24 V (+L501)

The CMOD-01 offer additional two relay outputs (changeover) and one digital output, as well as giving a place to connect external 24 V (AC or DC).

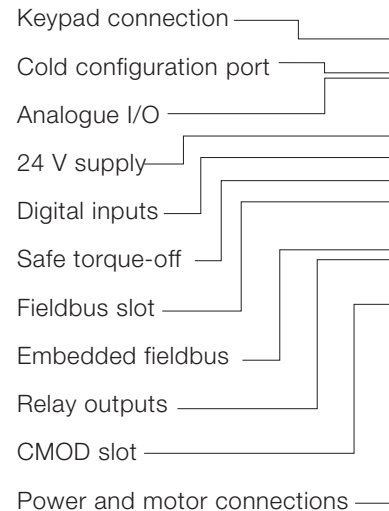


Panel/keypad bus adapter - CDPI-01(+K450)

The ACS580 can be connected onto a panel bus, where 32 drives can be daisy chained using a simple CAT5 cable. The chain would have one keypad mounted on the cabinet door, communicating to the other drives via the CDPI module, which fits where the keypad normally connects on the drive.



Interface



Isolated PTC input and external 24 V (+L523 or L537)

The CMOD-02 offers an isolated PTC interface, as well as giving a place to connect external 24 V (AC or DC). The CPTC-02 offers isolated PTC with ATEX certification.



High voltage I/O extension (+L512)

The CHDI-01 offers an additional six high voltage (115/230 V) digital inputs and two relay outputs (changeover); allows high voltage connection without interposing relays.

Drive Composer PC tool

Drive Composer is the new PC tool for the ACS580 family. The PC tool comes in two variants – the “Entry” level is a free of charge point-to-point tool and allows simple parameter editing and storage, as well as monitoring and commissioning support, while the “Pro” level has all of this as well as animated control diagrams and extended commissioning, monitoring and diagnostic support, as well as the ability to program the safety functions. The Pro tool allows the user to connect to multiple drives either over “panel bus” where the keypad port is used, or ever Ethernet.



Door mounting kit, DPMP-EXT (IP65)

The keypad can be mounted onto a panel door using a two part kit. The kit includes a CDPI which is mounted onto the drive, then the DPMP-02 (pictured) is mounted onto the door and a CAT5 cable is used to connect between the two. When keypad is installed the assembly is IP65.



Low voltage AC drives

ABB drive for HVAC

0.55 kW to 250 kW, ACH580

Motor control method - scalar, vector speed (open and closed loop)

380/480 V, 3-phase supply, 0.55 kW - 250 kW

What is an ABB HVAC drive?

ACH580 is the new dedicated low voltage AC drive for heating, ventilation & air-conditioning (HVAC) applications. The drives are designed to meet - straight out of the box - the HVAC market requirements including harmonics and EMC standards and for easy integration with building management systems. HVAC features such as override functionality are enhanced to further make this drive an industry specialist. The new platform is able to accurately and properly control induction, permanent magnet and SynRM motors. With improved built-in PID control, native BACnet communication, timers, real-time clock and a calendar, ABB HVAC drives provide flexible solutions for a wide range of HVAC needs.

Where can it be used?

ABB HVAC drives make maintaining a buildings comfort zone easy, quick and energy efficient. The drives control the speed of pump, fan and refrigeration compressor motors used in air handling units, cooling towers, chillers and other HVAC applications. They help reduce the HVAC system's energy consumption by up to 70 percent, and quite often have payback times of less than a year. These highly reliable drives with built-in BACnet easily integrate into building management systems.



Highlights

- Built-in BACnet
- Accurate and efficient control of induction, permanent magnet and SynRM motors
- New energy monitoring features record energy, CO₂ and money saved (compared to equivalent DOL)
- Wide power range in wall-mounted IP21 and IP55 variants
- Intelligent HVAC control panel
- Assistant control panel with improved primary settings menu and backups, smartphone useability
- STO SIL3, PL e

Feature	Advantage	Benefit
Intuitive modern keypad	High contrast, high definition display giving intuitive access to the drive parameters. Built-in "Help" button, giving programming hints. Real-time clock, allows timed tracing of faults and setting of parameters to activate functions at various times of day	Easy commissioning, programming, maintenance and fault finding, making the drive easy to own and use across all activities
Primary settings menu	Assisted set-up for all of the drives common settings. Intuitive and context sensitive makes navigation easier for the user, like a smartphone	Even easier to configure the drive to the application. Next level of VSD usability
Swinging choke, improved	Patented by ABB Reduces the drives' harmonic signature, especially on partial loads. Improved with permanent magnet technology	Reduces part load harmonics by up to 25 percent, in comparison with traditional chokes. Variable air volume (VAV) systems run on partial loads at least 95 percent of the time
EMC (manufacturer's statement available)	Integrated category C2 (1st environment) filters to BS EN 61800-3	EMC filters suitable for 400 V network connection built-into the drive as standard will save panel space, avoid additional wiring, earthing and assembly costs
Advanced serial communications	HVAC protocols built-in as standard. BACnet, Modbus RTU embedded. Fieldbus adapters allow connection of: BACnet IP, Profibus-DP, CANopen, DeviceNet, Modbus/TCP, ControlNet, Ethernet	Can connect to any building management system (BMS), native BACnet as standard, Ethernet based BACnet as an option
Real-time clock	Easily set up at time of installation and protected by its own battery back-up. The time allows the drive to timestamp events and operate functions at set times, thus removing the need for external devices	Can be used together with timer functions of the drive to trigger various events (via relays or outputs) within the application software such as time / speed profile, allowing the drive to be a stand alone unit without the need for BMS input
System diagnostics	Diagnostic assistant, on-board fault history with real-time of when fault occurred, covering voltage, current, DC link level etc	Instant fault tracking and date stamping, gives status of drive to enable rapid drive diagnostics
Energy efficiency counters	Works out energy savings of the application in kWh and MWh; the cost of the energy saved in a local currency; and the carbon dioxide (CO ₂) emissions equivalent of the energy saved	Can assist with electricity billing in accordance with Part L2 Building Regulations. Allows verification of energy savings before making investments in capital equipment

Low voltage AC drives

ABB drive for HVAC

ACH580 – Variants, ratings voltages and prices

The drive is programmed by the most intuitive and user friendly keypad ABB has produced and incorporates a “primary settings” menu that guides the user through the most common settings. The new PC tool is designed to incorporate all of the latest functionality that new operating systems bring, including a free of charge entry level version and a chargeable Pro version.

The drive retains the same swinging choke harmonic suppression technology, which has been updated to permanent magnet technology, making the package lighter. The IP rating has improved to IP55. Improvements are made to terminal sizes and fieldbus offerings, as well as being powered by an external 24 V.

Motor control has been vastly updated. The drive can control, induction, permanent magnet (PM) and SynRM motors. It can accurately catch spinning leads and ride through power dips.

The drive includes built-in machinery safety functionality with safe torque-off (STO) to SIL 3 PL e as standard. There are more frame sizes, extending the power range to 250 kW in a wall-mounted format and the IP55 variant is significantly smaller, occupying almost the same space as the IP21 equivalent.



For more details, please refer to Technical Catalogue 3AUA0000186691

Wall-mounted single drive Series ACH580-01

- Wall-mounted or cabinet, frame sizes R1-R9
- Two variants, IP21 and IP55
- Built-in EMC filter (1st & 2nd environment)
- HVAC software, easy to configure
- Built-in BACnet and Modbus interfaces
- Cable connection box with SWA glanding
- Control of IM, PM and SynRM motors
- HVAC assistant control panel, NEW design
- Built-in patented swinging choke, improved
- Sensorless vector control, scalar control
- CCA-01 compatible, programming in the box
- RoHS compliant
- New rules for outdoor mounting available

380 – 480 V, 3-phase supply voltage (ratings shown are for 415 V)

No-overload (nominal) use		Light-duty use		Heavy-duty use		Max output A	Frame	Fuse A	Heat dissipation	Cooling requirements	Type (+J400 + H358 to order keypad & SWA gland plate)	Price IP21	Price IP55 (+B056)
P _N kW	I _N A	P _{Ld} kW	I _{Ld} A	P _{hd} kW	I _{hd} A			Type gG	W	m³/h			
0.75	2.6	0.75	2.5	0.55	1.8	3.2	R0	4	45	34	ACH580-01-02A6-4	£433	£520
1.1	3.3	1.1	3.1	0.75	2.6	4.7	R0	6	55	34	ACH580-01-03A3-4	£466	£531
1.5	4	1.5	3.8	1.1	3.3	5.9	R0	6	66	34	ACH580-01-04A0-4	£531	£606
2.2	5.6	2.2	5.3	1.5	4	7.2	R0	10	84	34	ACH580-01-05A6-4	£563	£682
3	7.2	3	6.8	2.2	5.6	10.1	R1	10	106	50	ACH580-01-07A2-4	£617	£736
4	9.4	4	8.9	3	7.2	13	R1	16	133	50	ACH580-01-09A4-4	£693	£855
5.5	12.6	5.5	12	4	9.4	14.1	R1	16	174	50	ACH580-01-12A6-4	£812	£920
7.5	17	7.5	16.2	5.5	12.6	22.7	R2	25	228	128	ACH580-01-017A-4	£952	£1,007
11	25	11	23.8	7.5	17	30.6	R2	32	322	128	ACH580-01-025A-4	£1,180	£1,331
15	32	15	30.4	11	24.6	44.3	R3	40	430	116	ACH580-01-032A-4	£1,515	£1,688
18.5	38	18.5	36.1	15	31.6	56.9	R3	50	525	116	ACH580-01-038A-4	£1,721	£1,894
22	45	22	42.8	18.5	37.7	67.9	R3	63	619	116	ACH580-01-045A-4	£1,969	£2,250
30	62	30	58	22	44.6	76	R4	80	835	134	ACH580-01-062A-4	£2,348	£2,694
37	73	37	68	30	61	104	R4	100	1024	134	ACH580-01-073A-4	£2,661	£3,018
45	88	45	82.7	37	72	122	R5	100	1240	139	ACH580-01-088A-4	£3,364	£3,699
55	106	55	100	45	87	148	R5	125	1510	139	ACH580-01-106A-4	£4,543	£5,268
75	145	75	138	55	105	178	R6	160	1476	435	ACH580-01-145A-4	£5,646	£6,598
90	189	90	161	75	145	247	R7	250	1976	450	ACH580-01-169A-4	£6,836	£7,755
110	206	110	196	90	169	287	R7	315	2346	550	ACH580-01-206A-4	£7,744	£8,556
132	246	132	234	110	206	350	R8	355	3336	550	ACH580-01-246A-4	£9,258	£10,188
160	293	160	278	132	246	418	R8	425	3936	1150	ACH580-01-293A-4	£12,139	£13,387
200	363	200	345	160	293	498	R9	500	4836	1150	ACH580-01-363A-4	£15,371	£16,188
250	430	200	400	200	363	617	R9	630	6036	1150	ACH580-01-430A-4	£18,899	£19,903

For 440 to 480 V data see the User's Manual, document code: 3AUA0000076333

Low voltage AC drives

ABB drive for HVAC

ACH580-01 – Dimensions and options

Dimensions and weights, wall-mounted drives

IP21				
Frame size	Height mm	Width mm	Depth mm	Weight kg
R0	303	125	210	4.5
R1	303	125	223	4.6
R2	394	125	227	7.5
R3	454	203	228	14.9
R4	600	203	258	19
R5	732	203	283	23
R6	727	252	369	45
R7	880	284	370	55
R8	965	300	393	70
R9	955	380	418	98



IP55				
Frame size	Height mm	Width mm	Depth mm	Weight kg
R0	303	125	222	5.1
R1	303	125	233	5.1
R2	394	125	239	8.0
R3	454	203	237	15.4
R4	600	203	265	20
R5	732	203	320	29
R6	726	252	380	45.5
R7	880	284	381	55.5
R8	965	300	452	72
R9	955	380	477	100



Options for ACH580-01

ACH580-01 is a wall mounted drive, so all of the options fit inside:

- IP55 variant
- Internal fieldbus options
- Optional additional industrial fieldbus
- Optional relay expansion
- Optional isolated PTC option
- Optional 115/230 V digital inputs
- UK gland box to accommodate SWA cable
- Brake chopper (up to frame R3 fitted as standard)

All ABB HVAC drives use the same common options and user interfaces. These are detailed on page 50. They are also part of the “all compatible family” so keypad interfaces, common PC tools, parameter structures and programming methods are all common.

Cold configuration adapter – CCA-01

ACH580 drives can be programmed without the need for mains power or without taking the drive out of the box using the CCA-01. This specifically allows rapid programming for OEM without the need for safe areas in production.

Typical I/O connections for ACH580

These connections are shown as examples only. Please refer to the User's Manual – macro section, for more detailed information and for different I/O configurations.

X1	Meaning	Default connections
1	SCR	Signal cable shield (screen)
2	AI1	External frequency reference 1: 0 to 10 V
3	AGND	Analogue input circuit common
4	+10V	Output reference voltage 10 V DC
5	AI2	Analogue input (not used)
6	AGND	Analogue input circuit common
7	AO1	Output frequency: 0 to 20 mA
8	AO2	Output current: 0 to 20 mA
9	AGND	Analogue output circuit common
S3	AO1 I/U	Voltage/Current selection for analogue output
X2 & X3 Aux. voltage output and programmable digital inputs		
10	+24V	Auxiliary voltage output +24 V DC
11	DGND	Auxiliary voltage output common
12	DCOM	Digital input common for all DI
13	DI1	Start/Stop: Activate to start
14	DI2	Not configured
15	DI3	Constant speed selection
16	DI4	Not configured
17	DI5	Not configured
18	DI6	Not configured
X6, X7, X8 Relay outputs		
19	RO1C	Ready
20	RO1A	250 V AC/30 V DC
21	RO1B	2 A
22	RO2C	Running
23	RO2A	250 V AC/30 V DC
24	RO2B	2 A
25	RO3C	Fault (-1)
26	RO3A	250 V AC/30 V DC
27	RO3B	2 A
X5 EIA-485 Modbus RTU		
29	B+	Embedded modbus
30	A-	
31	DGND	
S4	TERM	Serial data link termination switch
S5	BIAS	Serial data link bias resistors switch
X4 Safe torque-off		
34	OUT1	Safe torque-off. Both circuits must be closed for the drive to start. The circuits are closed with jumper wires in the standard delivery.
35	OUT2	
36	SGND	
37	IN1	
38	IN2	
X10 24 V AC/DC*		
40	24 V	AC/DC-in. Ext. 24 V AC/DC input to power up the control unit when the main supply is disconnected
41	24 V	AC/DC-in.

*Standard on R6 frames and above and is optional on smaller frames (requires a CMOD)

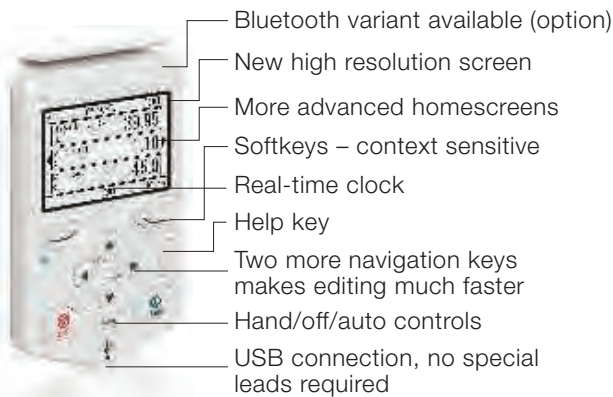
Low voltage AC drives

ABB drive for HVAC

ACH580 – Common user interfaces

Control panel

State-of-the-art high resolution keypad brings a new level of usability to the drives marketplace. The ACH580 uses a HVAC specific keypad with hand/off/auto buttons. The ACH580 includes a “primary settings” menu that is suited to HVAC users, a guided set-up procedure similar to that of a smart phone.



Bluetooth keypad and DriveTune app

Using a special Bluetooth enabled keypad, ABB can offer connection to the mobile phone using an app called DriveTune. There are versions of the app for IOS and Android operating systems.



I/O extension and external 24 V (+L501)

The CMOD-01 offer additional two relay outputs (changeover) and one digital output, as well as giving a place to connect external 24 V (AC or DC).



Fieldbus (various Plus codes)

The ACH580 supports an extensive list of fieldbus modules including BACnet IP, for connectivity to industrial networks. These modules are common with other drives within the ABB drives range.

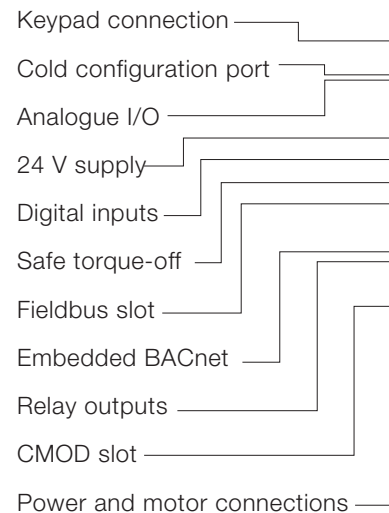


Panel/keypad bus adapter - CDPI-01(+K450)

The ACH580 can be connected onto a panel bus, where 32 drives can be daisy chained using a simple CAT5 cable. The chain would have one keypad mounted on the cabinet door, communicating to the other drives via the CDPI module, which fits where the keypad normally connects on the drive.



Interface



Isolated PTC input and external 24 V (+L523)

The CMOD-02 offers an isolated PTC interface, as well as giving a place to connect external 24 V (AC or DC)



High voltage I/O extension (+L512)

The CHDI-01 offers an additional six high voltage (115/230 V) digital inputs and two relay outputs (changeover); allows high voltage connection without interposing relays.



Drive Composer PC tool

Drive Composer is the new PC tool for the ACH580 family. The PC tool comes in two variants – the “Entry” level is a free of charge point-to-point tool and allows simple parameter editing and storage, as well as monitoring and commissioning support, while the “Pro” level has all of this as well as animated control diagrams and extended commissioning, monitoring and diagnostic support, as well as the ability to program the safety functions. The Pro tool allows the user to connect to multiple drives either over “panel bus” where the keypad port is used, or over Ethernet.



Door mounting kit, DPMP-EXT (IP65)

The keypad can be mounted onto a panel door using a two part kit. The kit includes a CDPI which is mounted onto the drive, then the DPMP-02 (pictured) is mounted onto the door and a CAT5 cable is used to connect between the two. When keypad is installed the assembly is IP65.



Low voltage AC drives

ABB drive for water and wastewater

0.75 kW to 250 kW, ACQ580

Motor control method – Scalar, vector speed and torque (open and closed loop)

380-480 V, 3-phase supply, 0.75 kW - 250 kW

What is the next generation ABB drive for water and wastewater?

This new industry-specific drive is part of the ABB all compatible platform, and allows smooth control of induction, permanent magnet and SynRM motors. The modules feature tailor-made pump control functions for single and multipump systems that ensure smooth, disturbance-free operation, maximised energy efficiency and reduced downtime.

Highlights

- Intelligent solution for controlling pump performance
- Remote monitoring and diagnostics
- Pump cleaning/de-ragging algorithms
- Full multipump software including auto charge
- Easy and cost-effective cabinet assembly
- Improved internal options, including external 24 V support
- Assistant control panel with intelligent primary settings menu and backups
- SynRM, permanent magnet and induction motor control with improved motor platform



For further information, see Technical Catalogue 3AUA0000194172

Where can it be used?

The drive can be used for any of the variable-speed applications contained within the water and wastewater industry, to optimise the system and to save energy. Wall or cabinet assembly, the drives are easily mounted side-by-side. Highly intuitive primary settings menus allows the drive to be configured like a smart phone and coupled with intelligent start-up assistant ensures that drive commissioning is straightforward. The functions needed for most pumping systems can be easily implemented using the primary settings applications. Starting up a pumping system and optimising its performance is now even easier.

Feature	Advantage	Benefit
Pump cleaning or de-ragging	Used in wastewater pumping stations to prevent pump and pipe clogging and expensive maintenance activities	Triggers against different commands e.g on each pump start; on monitoring if the pump is becoming blocked; in response to a digital input or PLC command
Multi-pump control	Optimal control of applications where several parallel pumps are operated together and the required flow rate is variable	Maintains stable process conditions optimising the speed and number of the pumps needed without over-riding controller
Pump priority	Optimal control of applications where the consumption rate varies based on demand	Operate higher capacity pumps during daytime and smaller units at night. This allows pumps to be operated closer to their best efficiency point
Quick ramps	Drive has special high speed ramps to quickly accelerate bore hole pumps and submersible pumps to operating speed	Allows the pump to operate properly, ensuring the bearings operate properly and reduces turbidity during start-up
Safe torque-off	TUV certified safely to SIL3	Remove the contactor from MCC builds, saving cost
Intuitive modern keypad	High contrast, high definition display giving intuitive access to the drive parameters. Built-in "Help" button, giving programming hints. Real-time clock, allows timed tracing of faults and setting of parameters to activate functions at various times of day. Changed parameters menu also included, so you can see your edits	Easy commissioning, programming, maintenance and fault finding, making the drive easy to own and use across all activities. Cloning drives is easy with parameter copying facilities
Primary setting menu	Assisted set-up for all of the drives common settings. Intuitive and context sensitive makes navigation easier for the user	Even easier to configure the drive to the application
Text editing capabilities	Rename drive variables or warning messages	Tailor the drive to "speak" in the language of the application
Improved backups	Keypad can store backups with a time stamp, or automatic backups can be taken. Backups can be viewed before download, or partial downloads can be performed	Easy to manage installed base and speeds up commissioning. Auto backup means you never forget
Modern PC tools	Entry level (FOC) and Pro level PC tools are available for commissioning, tuning, parameter management and monitoring	Keep copies of the parameters for back-up. Use the PC tools to optimise the application
Fieldbus gateways	Built-in Modbus using RS 485. Extensive optional plug-in fieldbus modules also available	Reduced cost, full access to industrial networks for monitoring and control
Energy monitoring and optimising features	Drive controls the motor voltage dependant on the load. Drive monitors the saved energy compared to equivalent DOL operation	Consumed energy optimised across the speed and load range. Energy savings presented in local currency and tonnes of CO ₂
24V operation	Power the drive control card, I/O and fieldbus from an external 24V	Safer diagnostics and maintenance activities can be undertaken without the need for mains voltages

Low voltage AC drives

ABB drive for water and wastewater

ACQ580 – Variants, ratings voltages and prices

The drive features, specific to water and wastewater applications, are programmed by the most intuitive and user friendly keypad ABB has produced and incorporates an intelligent “primary settings” menu that guides the user through the most common settings.

The drive includes a built in swinging choke harmonic suppression technology as standard, which uses permanent magnet technology, making the package lighter. The drive can control induction, permanent magnet (PM) and SynRM motors. It can accurately catch spinning leads and ride through power dips.

There are more frame sizes, extending the power range to 250 kW in a wall-mounted format and the IP55 variant is extremely compact occupying almost the same space as the IP21 equivalent.

The new PC tool is designed to incorporate all of the latest functionality that new operating systems bring, including a free of charge entry level version and a chargeable Pro version.



For more details, please refer to Technical Catalogue 3AXD50000035866A

Wall-mounted single drive Series ACQ580-01

- Wall-mounted or cabinet, frame sizes R1-R9
- Two variants, IP21 and IP55
- Built-in EMC filter (1st environment)
- Water and wastewater software, easy to configure
- Multipump control of pump system
- Built-in Modbus interface
- Cable connection box with SWA glanding
- Control of IM, PM and SynRM motors
- Assistant control panel, NEW design
- Built-in patented swinging choke
- Sensorless vector control, scalar control
- RoHS compliant
- Safe torque off to SIL3 PLe as standard

380 – 480 V, 3-phase supply voltage (ratings shown are for 415 V)

No-overload (nominal) use		Light-duty use		Heavy-duty use		Max output A	Frame	Fuse A	Heat dissipation	Cooling requirements	Type (+J400 + H358 to order keypad & SWA gland plate)	Price IP21	Price IP55 (+B056)
P _N kW	I _N A	P _{Ld} kW	I _{Ld} A	P _{hd} kW	I _{hd} A			Type gG	W	m³/h			
0.75	2.6	0.75	2.5	0.55	1.8	3.2	R0	4	45	34	ACQ580-01-02A6-4		
1.1	3.3	1.1	3.1	0.75	2.6	4.7	R0	6	55	34	ACQ580-01-03A3-4		
1.5	4	1.5	3.8	1.1	3.3	5.9	R0	6	66	34	ACQ580-01-04A0-4		
2.2	5.6	2.2	5.3	1.5	4	7.2	R0	10	84	34	ACQ580-01-05A6-4		
3	7.2	3	6.8	2.2	5.6	10.1	R1	10	106	50	ACQ580-01-07A2-4		
4	9.4	4	8.9	3	7.2	13	R1	16	133	50	ACQ580-01-09A4-4		
5.5	12.6	5.5	12	4	9.4	14.1	R1	16	174	50	ACQ580-01-12A6-4		
7.5	17	7.5	16.2	5.5	12.6	22.7	R2	25	228	128	ACQ580-01-017A-4		
11	25	11	23.8	7.5	17	30.6	R2	32	322	128	ACQ580-01-025A-4		
15	32	15	30.4	11	24.6	44.3	R3	40	430	116	ACQ580-01-032A-4		
18.5	38	18.5	36.1	15	31.6	56.9	R3	50	525	116	ACQ580-01-038A-4		
22	45	22	42.8	18.5	37.7	67.9	R3	63	619	116	ACQ580-01-045A-4		
30	62	30	58	22	44.6	76	R4	80	835	134	ACQ580-01-062A-4		
37	73	37	68	30	61	104	R4	100	1024	134	ACQ580-01-073A-4		
45	88	45	82.7	37	72	122	R5	100	1240	139	ACQ580-01-088A-4		
55	106	55	100	45	87	148	R5	125	1510	139	ACQ580-01-106A-4		
75	145	75	138	55	105	178	R6	160	1476	435	ACQ580-01-145A-4		
90	189	90	161	75	145	247	R7	250	1976	450	ACQ580-01-169A-4		
110	206	110	196	90	169	287	R7	315	2346	550	ACQ580-01-206A-4		
132	246	132	234	110	206	350	R8	355	3336	550	ACQ580-01-246A-4		
160	293	160	278	132	246	418	R8	425	3936	1150	ACQ580-01-293A-4		
200	363	200	345	160	293	498	R9	500	4836	1150	ACQ580-01-363A-4		
250	430	200	400	200	363	617	R9	630	6036	1150	ACQ580-01-430A-4		

For 440 to 480 V data see the User's Manual, document code: 3AXD50000035866A

Low voltage AC drives

ABB drive for water and wastewater

ACQ580-01 – Dimensions and options

Dimensions and weights, wall-mounted drives

IP21				
Frame size	Height mm	Width mm	Depth mm	Weight kg
R0	303	125	210	4.5
R1	303	125	223	4.6
R2	394	125	227	7.5
R3	454	203	228	14.9
R4	600	203	258	19
R5	732	203	283	23
R6	727	252	369	45
R7	880	284	370	55
R8	965	300	393	70
R9	955	380	418	98



IP55				
Frame size	Height mm	Width mm	Depth mm	Weight kg
R0	303	125	222	5.1
R1	303	125	233	5.1
R2	394	125	239	8.0
R3	454	203	237	15.4
R4	600	203	265	20
R5	732	203	320	29
R6	726	252	380	45.5
R7	880	284	381	55.5
R8	965	300	452	72
R9	955	380	477	100



Options for ACQ580-01

ACQ580-01 is a wall mounted drive, so all of the options fit inside:

- IP55 variant
- Internal fieldbus options
- Optional additional industrial fieldbus
- Optional relay expansion (CMOD-01)
- Optional isolated PTC option (CMOD-02)
- Optional 115/230 V digital inputs (CHDI-01)
- UK gland box to accommodate SWA cable
- Brake chopper (up to frame R3 fitted as standard)

All ABB water and wastewater drives use the same common options and user interfaces. These are detailed on page 54. They are also part of the “all compatible family” so keypad interfaces, PC tools, parameter structures and programing methods are all common.

Cold configuration adapter – CCA-01

ACH580 drives can be programmed without the need for mains power or without taking the drive out of the box using the CCA-01. This specifically allows rapid programming for OEM without the need for safe areas in production.

Typical I/O connections for ACQ580

These connections are shown as examples only. Please refer to the User's Manual for more detailed information and for different I/O configurations.

X1	Meaning	Default connections
1	SCR	Signal cable shield (screen)
2	AI1	External frequency reference 1: 0 to 10 V
3	AGND	Analogue input circuit common
4	+10V	Output reference voltage 10 V DC
5	AI2	Analogue input (not used)
6	AGND	Analogue input circuit common
7	AO1	Output frequency: 0 to 20 mA
8	AO2	Output current: 0 to 20 mA
9	AGND	Analogue output circuit common
S3	AO1 I/U	Voltage/Current selection for analogue output
X2 & X3 Aux. voltage output and programmable digital inputs		
10	+24V	Auxiliary voltage output +24 V DC
11	DGND	Auxiliary voltage output common
12	DCOM	Digital input common for all DI
13	DI1	Start/Stop: Activate to start
14	DI2	Not configured
15	DI3	Constant speed selection
16	DI4	Not configured
17	DI5	Not configured
18	DI6	Not configured
X6, X7, X8 Relay outputs		
19	RO1C	Ready
20	RO1A	250 V AC/30 V DC
21	RO1B	2 A
22	RO2C	Running
23	RO2A	250 V AC/30 V DC
24	RO2B	2 A
25	RO3C	Fault (-1)
26	RO3A	250 V AC/30 V DC
27	RO3B	2 A
X5 EIA-485 Modbus RTU		
29	B+	Embedded modbus
30	A-	
31	DGND	
S4	TERM	Serial data link termination switch
S5	BIAS	Serial data link bias resistors switch
X4 Safe torque-off		
34	OUT1	Safe torque-off. Both circuits must be closed for the drive to start. The circuits are closed with jumper wires in the standard delivery.
35	OUT2	
36	SGND	
37	IN1	
38	IN2	
X10 24 V AC/DC*		
40	24 V	AC/DC-in. Ext. 24 V AC/DC input to power up the control unit when the main supply is disconnected
41	24 V	AC/DC-in.

*Standard on R6 frames and above and is optional on smaller frames (requires a CMOD)



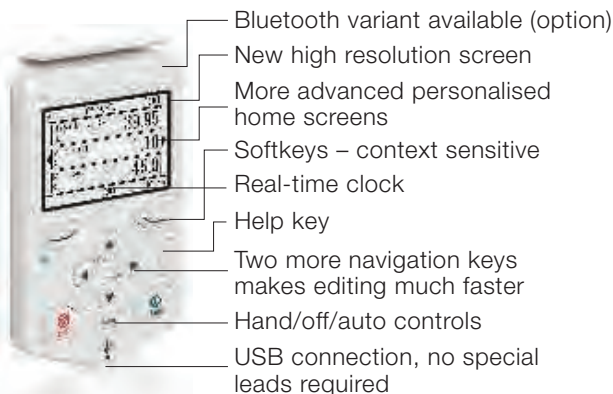
Low voltage AC drives

ABB drive for water and wastewater

ACQ580 – Common user interfaces

Control panel

State-of-the-art high resolution keypad brings a new level of usability to the drives marketplace. The ACQ580 uses a specific keypad with hand/off/auto buttons. The ACQ580 includes a “primary settings” menu that is suited to water and wastewater industry users, a guided set-up procedure similar to that of a smart phone.



Bluetooth keypad and DriveTune app

Using a special Bluetooth enabled keypad, ABB can offer connection to the mobile phone using an app called DriveTune. There are versions of the app for IOS and Android operating systems.



I/O extension and external 24 V (+L501)

The CMOD-01 offer additional two relay outputs (changeover) and one digital output, as well as giving a place to connect external 24 V (AC or DC).



Fieldbus (various and codes)

The ACQ580 supports an extensive list of fieldbus modules including Profibus, Ethernet IP and Devicenet for connectivity to industrial networks. These modules are common with other drives within the ABB drives range.

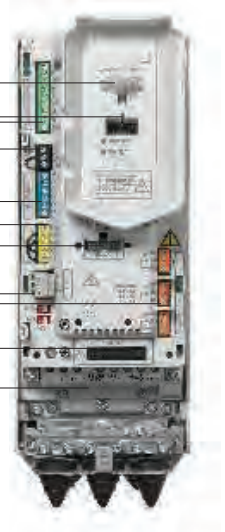
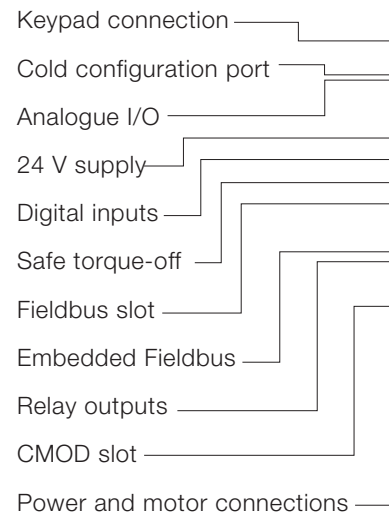


Panel/keypad bus adapter - CDPI-01(+K450)

The ACQ580 can be connected onto a panel bus, where 32 drives can be daisy chained using a simple CAT5 cable. The chain would have one keypad mounted on the cabinet door, communicating to the other drives via the CDPI module, which fits where the keypad normally connects on the drive.



Interface



Isolated PTC input and external 24 V (+L523)

The CMOD-02 offers an isolated PTC interface, as well as giving a place to connect external 24 V (AC or DC)



High voltage I/O extension (+L512)

The CHDI-01 offers an additional six high voltage (115/230 V) digital inputs and two relay outputs (changeover); allows high voltage connection without interposing relays.

Drive Composer PC tool

Drive Composer is the new PC tool for the ACQ580 family. The PC tool comes in two variants – the “Entry” level is a free of charge point-to-point tool and allows simple parameter editing and storage, as well as monitoring and commissioning support, while the “Pro” level has all of this as well as animated control diagrams and extended commissioning, monitoring and diagnostic support, as well as the ability to program the safety functions. The Pro tool allows the user to connect to multiple drives either over “panel bus” where the keypad port is used, or ever Ethernet.



Door mounting kit, DPMP-EXT, (IP65)

The keypad can be mounted onto a panel door using a two part kit. The kit includes a CDPI-01 which is mounted onto the drive, then the DPMP-02 (pictured) is mounted onto the door and a CAT5 cable is used to connect between the two. When keypad is installed the assembly is IP65.



Low voltage AC drives

ABB drive for water and wastewater



0.37 kW to 500 kW, ACQ810

Motor control method – DTC

200/480 V, 3-phase supply, 0.37 kW - 500 kW

What is an ABB drive for water and wastewater?

This industry-specific drive is designed for all of the applications commonly used in the water and wastewater industry. The modules feature tailor-made pump control functions for single and multi-pump systems. These functions ensure smooth, disturbance-free operation of water and wastewater processes, maximising energy efficiency while reducing unnecessary downtime. The drives' pump-specific functions decrease the life cycle cost of the pumping system, helping to save time and money. The power range is extended with the introduction of the G1 and G2 frame sizes.

Highlights

- Optimal pump control for various applications
- Intelligent solution for controlling pump performance
- Remote monitoring and diagnostics
- Pump auto change
- Full multipump software functionality
- Flow measurement feature suitable, ideal for leak detection
- Anti-jam pump cleaning algorithms
- Easy and cost-effective cabinet assembly



For further information, see Technical Catalogue 3AUA0000055685

Where can it be used?

The ABB industry-specific drive module can be used for the variable-speed applications contained within the water and wastewater industry, to optimise the system and to save energy. The modules are designed for cabinet assembly and are easily mounted side-by-side. Intelligent start-up assistant ensures that drive commissioning is straightforward. The functions needed for most pumping systems can be easily implemented with the pre-programmed macros. Starting up a pumping system and optimising its performance is extremely easy.

Feature	Advantage	Benefit
Direct torque control	Premium motor control platform	Lower losses, improved energy saving
Soft pipe filling	Provides a pump with a smooth build-up of flow and pressure in pipes	This avoids pressure peaks and reduces the stresses on weak or ageing water mains when demand changes
Pump cleaning or anti-jam	Used in wastewater pumping stations to prevent pump and pipe clogging and expensive maintenance activities	The function can be set to trigger against different commands e.g on each pump start; on monitoring if the pump is becoming blocked; in response to a digital input or PLC command. If the pump cleaning function runs too often, an alarm is raised. Benefits: reduced downtime, increased efficiency
Flow calculation	The drive has a flow meter routine that very accurately determines the flow rate within a process	Avoids the need for costly external flow meters and is suitable for applications where the flow data is not needed for invoicing purposes
Level control	Used to effectively control the filling or emptying of water or wastewater storage tanks	Fast-ramp starting creates a flush effect to keep pipes clear. Users can define the "efficiency speed" based on the pumps best efficiency point
Multi-pump control	Optimal control of applications where several parallel pumps are operated together and the required flow rate is variable	Maintains stable process conditions optimising the speed and number of the pumps needed without over-riding controller
Pump priority	Optimal control of applications where the consumption rate varies based on demand	Operate higher capacity pumps during daytime and smaller units at night. This allows pumps to be operated closer to their best efficiency point
Pump specific protection features	The protection functions indicate if the pre-defined process conditions change	Underload and overload functions are pre-defined across the speed range at five distinct points. Belt breaks or dry sumps can be detected
Safe torque-off	TUV certified safely to SIL3	Remove the contactor from MCC builds, saving cost

Low voltage AC drives

ABB industrial drive



0.55 kW to 5600 kW, ACS880

Motor control method – DTC or scalar

208 / 240 V, 3-phase supply, powers dependent on range

380 / 415 V, 3-phase supply, powers dependent on range

380 / 500 V, 3-phase supply, powers dependent on range

525 / 690 V, 3-phase supply, powers dependent on range

What is the ABB industrial drive?

The ACS880 is a build to order, custom configurable drive encompassing a wide power range with a choice of rectifiers and build formats, the most comprehensive industrial drive on the market. The ACS880 contains a new harmonised parameter set, taking its features from all of the best functions within the existing ABB drive's family. The drive is programmed by ABB's most intuitive and user-friendly keypad yet. A new PC tool incorporates all of the latest functionality including a free-of-charge entry level version and a professional level version. The drive also contains the latest 4th generation DTC motor control core, making the drive all-compatible with any motor available on the market including asynchronous (induction), permanent magnet and synchronous reluctance (SynRM) motors.

Where can it be used?

The ABB industrial drive is targeted at demanding industrial applications offering constant torque and torque at zero speed. Suitable applications include cranes, winders, hoists, extruders, heavy conveyors and crushers. Applications with high breakaway torque, like rubber mixers and high precision applications like paper machines and engine dynamometers are easily handled by the drive.

The ACS880 is a system drive that is fully scaleable and can be tailored to any application, allowing architecture to be either centralised (traditional PLC approach) or de-centralised, by operating the safety and the application programmes inside the drive, which saves installation and cabling costs.

Highlights

- Built-to-order and customisable
- Wide power range and choice of rectifiers, modules, cabinets or multidrives
- Marine certified
- Built-in safety functionality to IEC 62061 and ISO 13849-1
- Removable memory unit providing zero re-commissioning
- Adaptive programming as standard, full IEC61131 (CODESYS) as an option
- Common user and process interface with fieldbus
- Common software tools for sizing and commissioning
- Innovative hardware variants including modular and cabinet installation kits
- Energy efficiency counters and energy optimiser
- Load analyser for optimised dimensioning of the drive, motor and process



Low voltage AC drives

ABB industrial drive

Feature	Advantage	Benefit
Fully customisable built-to-order	Drive can be ordered and built to the exact requirements of the customer. Wall mount, cabinet built, module kits, multidrives, all formats available. The formats can include 6- and 12-pulse, regenerative or ultra low harmonic rectifiers. Global certifications	The drive can arrive in exactly the format required by the application; including HW variants, built-in safety and PLC programme all in one package
Direct torque control (DTC)	Full torque at zero speed without encoder Accurate speed and torque control	Consistently excellent performance ensures that drive is not the limiting factor in the process
Control all motor types	Induction motor, permanent magnet motor and SynRM control all possible with the same drive	High quality control allows simpler selection and easy upgrades in the future
Intuitive modern keypad	High contrast, high definition display giving intuitive access to the drive parameters	Easy commissioning, programming, maintenance and fault finding
Start-up assistant	Guides user through all essential settings without going to parameter list	Easy set-up of parameters, your own language, on-line information system always available
Removable memory unit	Programme, parameter edits, motor calibrations and fault histories stored in the removable memory unit	Zero re-commissioning in case of drive failure, just move the memory unit, very short MTTR
Safe torque-off (STO)	Standard feature always in the drive. SIL3 PLc, TÜV approved	Convenient safety built-in. ATEX approved for hazardous areas
Adaptive programming	Drive contains a freely programmable environment allowing changes and adaptations to the drive parameters. Easy to use and flexible	The drive can easily be flexed to meet the needs of the application, without external devices, existing controls, timers, relays etc
IEC61131 programming (CODESYS)	Familiar PLC programming on the drive de-centralise the application, import from other devices	Decide to have distributed or central control of your process. Program can copy from PLC to drive using same tool
Integrated, patented, TÜV approved safety module option	No need to use external programmable safety hardware for drive specific functions. The module carries out drive specific safety functionality more efficiently than external programmable devices, as they are designed to work directly with the drive. Patented safety monitoring functions allow the drive to undertake speed related safety functions with no additional speed feedback devices needed	Minimise installation time and space. Shorter design times using TÜV approved module. Drive specific safety functions save time and money as they are built-in, and do not require additional speed monitoring devices to operate
Modern PC tools; DriveComposer	Entry level free-of-charge and Pro level PC tools are available for commissioning, tuning, parameter management and monitoring	Keep copies of the parameters for back-up. Use the PC tools to optimise the application
Fieldbus gateway	Snap-on module that is easily mounted inside drive	Access to all major automation platforms
I/O extension modules	Additional I/O can be added to the drive	Easy addition of extra I/O to allow the drive to control the application properly
Speed feedback modules	A large array or high performance speed feedback devices can be interfaced to the drive via these modules	Higher performances can be achieved or position control can be undertaken
Energy monitoring and optimising features	Drive controls the motor voltage dependant on the load. Drive monitors the saved energy compared to equivalent DOL operation	Consumed energy optimised across the speed and load range. Energy savings presented in local currency and tonnes of CO ₂
Drive-to-drive link	Built-in industrial control link	Built-in ability to undertake master-follower applications with no extra hardware
ATEX approved packages	ATEX 2014/34/EU type tested motor/drive packages from one supplier. ATEX STO and ATEX PTC connections	Easy selection of fully approved ATEX drive and motor packages, easier to satisfy ATEX rules with a more cost effective offering
Specific firmware for applications	Crane, winch, winder etc. ABB designed and verified firmware sets ready made and documented	Quick realisation of complex applications using ABB expertise, faster and cheaper engineering



Low voltage AC drives ABB industrial drive



ACS880-01 - Variants, ratings, types, voltages and prices

Wall-mounted single drive

- 0.55 kW to 250 kW, (208 - 690 V)
- Largest power wall-mounted drive on market
- Coated boards as standard
- TÜV approved safe torque-off (STO) to SIL 3 PL e standard
- IP21 as standard, IP55 as option
- IP55 variant same footprint as IP21 variant
- Brake chopper standard to R4 frame, option thereafter
- Wide range of built-in options
- EMC filter for C3 category according to EN 61800-3 (2004) standard (category C2 optional)
- Optional UK cable box for SWA cables
- Optional internal fieldbus
- Optional safety module for extended safety functionality
- Optional I/O expansion
- Optional IEC61131 programming (CODESYS), full system capability



For further information, see Technical Catalogue 3AUA0000098111

380 to 415 V, 3-phase supply voltage. The power ratings are valid at nominal voltage (400 V)

No-overload (nominal) use		Light-duty use		Heavy-duty use		Max output A	Frame	Fuse A	Heat dissipation	Cooling requirements	Type (+ E200, + R700 + H358 to order EMC & SWA gland plate)	Price IP21	Price IP55 (+B056)
P _N kW	I _N A	P _{Ld} kW	I _{Ld} A	P _{hd} kW	I _{hd} A			Type gG					
0.75	2.4	0.75	2.3	0.55	1.8	3.1	R1	4	30	44	ACS880-01-02A4-3	£909	£947
1.1	3.3	1.1	3.1	0.75	2.4	4.1	R1	6	40	44	ACS880-01-03A3-3	£951	£991
1.5	4.0	1.5	3.8	1.1	3.3	5.6	R1	6	52	44	ACS880-01-04A0-3	£983	£1,024
2.2	5.6	2.2	5.3	1.5	4.0	6.8	R1	10	73	44	ACS880-01-05A6-3	£1,121	£1,165
3	8	3	6.8	2.2	5.6	9.5	R1	10	94	44	ACS880-01-07A2-3	£1,185	£1,232
4	10	4	8.9	3	7.2	12.2	R1	16	122	44	ACS880-01-09A4-3	£1,323	£1,374
5.5	12.9	5.5	12	4	9.4	16	R1	16	172	44	ACS880-01-12A6-3	£1,577	£1,632
7.5	17	7.5	16	5.5	12.6	21	R2	25	232	88	ACS880-01-017A-3	£1,671	£1,732
11	25	11	24	7.5	17	29	R2	32	337	88	ACS880-01-025A-3	£2,127	£2,200
15	32	15	30	11	25	42	R3	40	457	134	ACS880-01-032A-3	£2,434	£2,518
18.5	38	18.5	36	15	32	54	R3	50	562	134	ACS880-01-038A-3	£2,604	£2,699
22	45	22	43	19	38	64	R4	63	667	200	ACS880-01-045A-3	£2,960	£3,072
30	61	30	58	22	45	76	R4	80	907	200	ACS880-01-061A-3	£3,501	£3,634
37	72	37	68	30	61	104	R5	100	1117	280	ACS880-01-072A-3	£3,950	£4,105
45	87	45	83	37	72	122	R5	100	1120	280	ACS880-01-087A-3	£4,787	£4,964
55	105	55	100	45	87	148	R6	125	1295	435	ACS880-01-105A-3	£5,106	£5,304
75	145	75	138	55	105	178	R6	160	1440	435	ACS880-01-145A-3	£5,657	£5,886
90	169	90	161	75	145	247	R7	Δ 315	1940	450	ACS880-01-169A-3	£7,452	£7,744
110	206	110	196	90	169	287	R7	Δ 315	2310	450	ACS880-01-206A-3	£8,662	£9,023
132	246	132	234	110	206	350	R8	Δ 350	3300	550	ACS880-01-246A-3	£10,583	£11,047
160	293	160	278	132	246*	418	R8	Δ 400	3900	550	ACS880-01-293A-3	£12,238	£12,784
200	363	200	345	160	293	498	R9	Δ 550	4800	1150	ACS880-01-363A-3	£15,108	£15,771
250	430	250	400	200	363**	545	R9	Δ 630	6000	1150	ACS880-01-430A-3	£18,385	£19,131

*130% overload, **125% overload

† For fuse selection, refer to the hardware manual. Weak networks may require aR fuses

Δ These fuses are aR fuses, ABB does not recommend gG fuses on these larger drives

Note: Current rating match IE3 motor nameplates

Note: Prices include keypad, EMC filter and SWA gland plates and full manuals

Low voltage AC drives

ABB industrial drive

ACS880-01 – Dimensions and options



Drive dimensions and weights wall mounted drives

Frame size	Height ¹ IP21 mm	Depth ² IP21 mm	Width mm	Depth mm	Weight kg
R1	405	370	155	226	6
R2	405	370	155	249	8
R3	471	420	172	261	10
R4	573	490	203	274	18.5
R5	730	596	203	274	23
R6	726	569	251	357	45
R7	880	600	284	365	55
R8	963	681	300	386	70
R9	955	680	380	413	98

H1 - Height with cable entry box
H2 - Height without cable entry box
Width and depth with cable entry box



Frame size	Height ¹ IP55 mm	Width mm	Depth mm	Weight kg
R1	450	162	295	6
R2	450	162	315	8
R3	525	180	327	10
R4	576	203	344	18.5
R5	730	203	344	23
R6	726	251	421	45
R7	880	284	423	55
R8	963	300	452	72
R9	955	380	477	100



Options

ACS880-01 is a wall-mounted drive, so all of the options fit inside:

- IP55 variant
- Can be ordered without covers for cabinet installation
- Extensive range of expansion I/O options
- Extensive range of motor feedback devices
- Extensive range of fieldbus options
- IEC61131 (CODESYS) environment
- Built-in safety option module, TÜV approved
- UK gland box to accommodate SWA cable
- Different levels of EMC compliance
- Extended warranty
- ATEX compliant options

All ABB industrial drives use the same common options and user interfaces. These are detailed on page 65.

- The IP55 variant is designed to occupy the same physical space as the IP21 unit, thus minimising wall space required to support this module.
- The drive has three slots for I/O and fieldbus expansion and one drive-to-drive serial communication link.

- I/O modules can be chosen from analogue expansion, digital expansion, encoder and resolver feedback options
- Fieldbus modules can be connected to any slot and all of the major industrial fieldbus modules are available. The drive also supports two fieldbus modules at a time, so can control via a traditional industrial fieldbus, but data gather via an Ethernet based protocol
- Remote monitoring modules can be employed to monitor the drive over the web
- The safety module occupies a separate dedicated connection point ensuring safety integrity
- The drive is operated and commissioned either from a keypad or from a PC tool. The PC tool used with ACS880 is Drive Composer
- 32 drives can be connected onto a panelbus. The panelbus can be used to communicate to many drives, either using the keypad or the composer Pro tool
- 156K of IEC61131 environment is available

User interfaces

Please refer to page 65 for details of the ACS880 common user interfaces.

Low voltage AC drives ABB industrial drive

ACS880-04- Variants, ratings, types, voltages and prices



Single drive modules

- 200 kW to 1400 kW, (380 - 690 V)
- Highest power density from a module on the market, extremely compact power module
- Wheeled module supplied with extendable ramp
- Coated boards as standard
- Speed controlled redundant fan cooling arrangement
- TÜV approved safe torque-off (STO) to SIL 3 PL e standard
- Plastic IP20 shrouds supplied which can be substituted for a pair of IP20 cabling panels which allow the module to be removed from the cabinet without disturbing wiring
- Brake chopper optional
- Wide range of cabinet installation options, including instructions for Rittal cabinet installation
- EMC filter for C3 category according to EN 61800-3 (2004)
- Optional common-mode filter
- Optional fieldbus modules, safety module, I/O expansion
- Optional fan kits and cabinet installation kits



For more information – see Technical Catalogue 3AUA0000115038

The following table details the R10 and R11 frames (pictured above).

If you require information on the higher power modules (D8T and R8i), or the extended power range (-XT) please contact ABB.

380 to 415 V, 3-phase supply voltage. The power ratings are valid at nominal voltage (400 V)

No-overload (nominal) use		Light-duty use		Heavy-duty use		Max output A	Frame	Fuse A	Heat dissipation	Cooling requirements	Type (+ E210 + E208 + J410 + R700 to order filters, cable boxes and keypad door mounting)	Price IP20
P _N kW	I _N A	P _{Ld} kW	I _{Ld} A	P _{hd} kW	I _{hd} A			Type aR	W	m³/h		
250	505	250	485	200	361	560	R10	800	5602	1200	ACS880-04-505A-3	£16,893
315	585	315	575	250	429	680	R10	1000	6409	1200	ACS880-04-585A-3	£19,955
355	650	355	634	250	477	730	R10	1000	8122	1200	ACS880-04-650A-3	£22,308
400	725	400	715	315	566	850	R11	1250	8764	1200	ACS880-04-725A-3	£24,500
450	820	450	810	355	625	1020	R11	1600	9862	1200	ACS880-04-820A-3	£26,245
500	880	500	865	400	725	1100	R11	1600	10578	1420	ACS880-04-880A-3	£27,988

*For fuse selection refer to the hardware manual, weak networks may require a different rating

Price shown is complete with keypad door mounting kit, cabling panels, EMC filter, CMF filter and manuals

Note: Currents match IE3 motor ratings

The ACS880-04 can be supplied in two major variant variants. The standard variant comes complete with IP20 shrouds (plastic) a telescopic ramp, separate control unit and keypad. The customer power cabling is taken directly to the module and would need to be disconnected to allow module removal.

The second variant comes complete with cable panels (option + H381) which fit inside the cabinet. The customer power cabling is attached to these panels, which allows the module to be removed without disconnecting the customer cabling.

In both cases the module is withdrawn down the ramp which is provided.

There is a wide range of other control card and keypad mounting options to allow the unit to integrate into a cabinet. The manual gives extensive instructions for Rittal cabinet installation, including a list of Rittal parts required.



IP20 shrouds as standard



+ H381 cabling panel option

Low voltage AC drives

ABB industrial drive

ACS880-04 – Dimensions and options



Dimensions and weights for drives modules

Basic module dimensions (no shrouds or panels)

Frame size	Height (H1) mm	Height (H2) (no pedestal) mm	Width (W1) mm	Depth mm	Weight kg
R10	1462 (1541)	1337	350	506	161
R11	1662 (1741)	1537	350	506	199

Numbers in brackets to top of shroud

Module dimensions including the cable panels +H381

Frame size	Height (H3) mm	Height (H4) (no pedestal) mm	Width (W2) mm	Depth mm	Weight kg
R10	1591	1466	329	506	161
R11	1741	1616	329	506	199

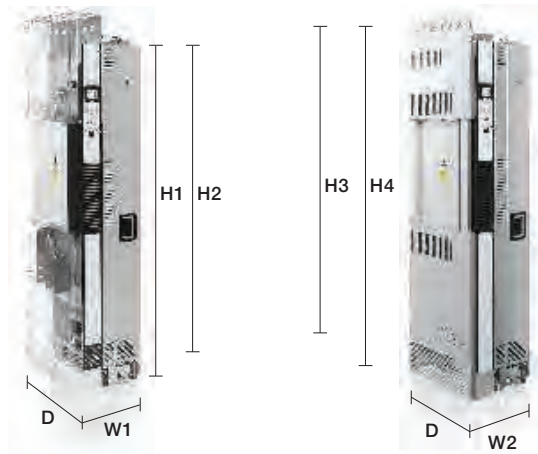
Options

ACS880-04 is a cabinet mounted drive, so the options are designed to complement cabinet installation:

- Cabling is arranged to come in at the top and motor out at the bottom
- Standard offering comes with plastic IP20 shrouds for input and output, and motor terminals are supplied “full sized” allowing for parallel motor cables. The standard configuration is supplied with a separate control unit and keypad
- Option +H370 requests “full sized” terminals on the input power connections, allowing for parallel mains cables
- Option +H381 request full cable panels, which bolt onto the side of the module and onto the side of the cabinet wall (replaces the standard IP20 shrouds and fixed full size cable terminals)
- Option +H356 request DC terminals
- Option +P905 request the control unit to be fitted to the power module
- Option +J414 integrates the control panel onto the front of the power module
- Option +J410 includes a keypad door mounting kit with the module
- EMC filters and common mode filters can be included
- Shrouds, keypads and wheeled pedestal can be removed if required
- Fan kits and cabinet assembly kits are also available
- ATEX compliant options
- Extended power range by paralleling modules (-XT)

All ACS880 drives use the same common options and user interfaces. These are detailed on page 65.

- The drive has three slots for I/O and fieldbus expansion and one drive-to-drive serial communication link
- I/O modules can be chosen from analogue expansion, digital expansion, encoder and resolver feedback options



Module showing plastic shrouds fixed

Module showing cabling panels

- Fieldbus modules can be connected to any slot and all of the major industrial fieldbus modules are available. The drive also supports two fieldbus modules at a time, so can control via a traditional industrial fieldbus, but data gather via an Ethernet based protocol
- Remote monitoring modules can also be employed to monitor the drive over the internet
- The safety module occupies a separate dedicated connection point ensuring safety integrity
- The drive is operated and commissioned either from a keypad or from a PC tool. The PC tool used with ACS880 is Drive Composer
- 32 drives can be connected onto a panelbus. The panelbus can be used to communicate to many drives using the keypad or the Composer Pro PC tool

User interfaces

The ACS880-04 can be supplied with a keypad door mounting arrangement, which requires a single rectangular hole for the cabinet door.



Please refer to page 65 for details of the other ACS880 common user interfaces.

Low voltage AC drives

ABB industrial drive

ACS880-07 – Variants, ratings, types, voltages and prices



Cabinet-built single drive

- 45 kW to 2,800 kW, (380 - 690 V)
- IP21 as standard, IP42 and IP54 as options
- 250 kW based on a single module including rectifier and inverter
- Coated boards as standard
- TÜV approved safe torque-off (STO) to SIL 3 PL e standard
- TÜV approved emergency stopping options
- Extremely compact, internal swinging gate for control options minimises cabinet size, but ensures easy access
- Internal customer wiring is redesigned to give easier access, with pluggable connectors included
- Drive module can be extracted using a set of maintenance rails
- Factory-built cabinet with EMC and thermally type-tested for trouble-free operation
- Extensive range of standard options, that are increased to incorporate the most popular engineered options ordered with the ACS800 range
- Optional UK cable for SWA cables
- Optional motor thermistor and PTC connections
- Internal fieldbus options
- Optional safety module
- Optional I/O modules
- ATEX compliant options



For further information, see Technical Catalogue 3AUA0000098111

380 to 415 V, 3-phase supply voltage. The power ratings are valid at nominal voltage (400 V)

No-overload (nominal) use		Light-duty use		Heavy-duty use		Max output A	Frame	Fuse A		Heat dissipation	Cooling requirements	Type (+ E200, + R700 + H358 to order EMC & SWA gland plate)	Price
P _N kW	I _N A	P _{Ld} kW	I _{Ld} A	P _{hd} kW	I _{hd} A			Type	aR				
55	105	55	100	45	87	148	R6	160	1795	435	435	ACS880-07-0105A-3	ABB panels can be ordered with a wide range of standard options. Price on application
75	145	75	138	55	105	178	R6	250	1940	435	435	ACS880-07-0145A-3	
90	169	90	161	75	145	247	R7	250	2440	450	450	ACS880-07-0169A-3	
110	206	110	196	90	169	287	R7	315	2810	450	450	ACS880-07-0206A-3	
132	246	132	234	110	206	350	R8	400	3800	550	550	ACS880-07-0246A-3	
160	293	160	278	132	246*	418	R8	500	4400	550	550	ACS880-07-0293A-3	
200	363	200	345	160	293	498	R9	630	5300	1150	1150	ACS880-07-0363A-3	
250	430	250	428	200	363**	545	R9	700	6500	1150	1150	ACS880-07-0430A-3	

*130% overload, **125% overload

† For fuse selection, refer to the hardware manual

ABB recommends the use of aR fuses for their cabinet drives, other fuses could be used if their melting curve matches ABB's recommendations

Low voltage AC drives

ABB industrial drive

ACS880-07 – Dimensions and options

Dimensions and weights, for cabinet-built drives

Frame size	Height H1 IP22/42 mm	Height H2 IP54 mm	Width mm	Depth mm	Weight kg
R6	2145	2315	430	673	240
R7	2145	2315	430	673	250
R8	2145	2315	430	673	265
R9	2145	2315	830	698	375

Larger powers use R8i modules, please contact ABB for information.

Note: these are the dimensions of the basic cabinet, dimensions will change with the addition of some options

Options

ACS880-07 is a cabinet-built drive, so its options fit inside the cabinet. The cabinet drive can be fitted with:

- IP21, IP42, IP54, variants
- Emergency stop variants, TÜV approved
- Motor thermistor relays
- Marine construction
- UL approved components
- Various types of cable markings, cabinet heaters, door furniture and lighting etc.
- Top or bottom cable entry for either motor or power cables
- UK gland plates for SWA cables
- 24 V control inside the cabinet
- Different levels of EMC compliance
- Extended warranty
- Additionally, ABB can accommodate any specialised option or feature by using its in-house application design team
- ATEX compliant options

ACS880-07 comes with options that are fitted to the drive module which is inside the cabinet:

- The drive module has three slots for I/O and fieldbus expansion and one drive-to-drive serial communication link.
- I/O modules can be chosen from analogue expansion, digital expansion, encoder and resolver feedback options
- Fieldbus modules can be connected to any slot and all of the major industrial fieldbus modules are available. The drive also supports two fieldbus modules at a time, so can control, via a traditional industrial fieldbus, but data gathers via an Ethernet-based protocol
- Remote monitoring modules can be employed to monitor the drive over the internet

- The safety module occupies a separate dedicated connection point ensuring safety integrity
- The drive is operated and commissioned either from a keypad or from a PC tool. The PC tool used with ACS880 is Drive Composer
- 32 drives can be connected onto a panelbus. The panelbus can be used to communicate to many drives, either using the keypad or the Composer Pro tool

User interfaces

Please refer to page 65 for details of the ACS880 common user interfaces



Low voltage AC drives

ABB industrial drive

ACS880 – Multidrive



A multidrive is a custom-made system to suit a larger application or a process line. The system contains multiple inverter stages of differing size, supplied from a common DC bus.

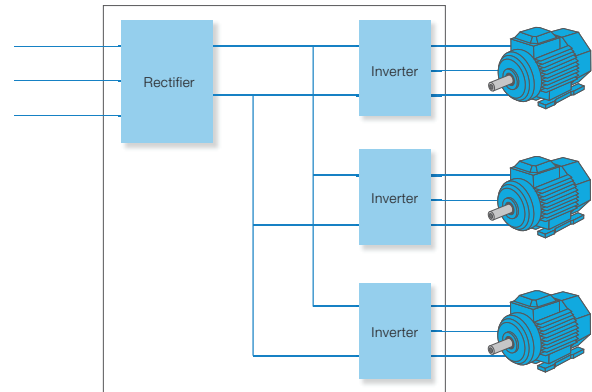
ABB can provide a ready-made cabinet, or it can provide system integrators with a comprehensive range of power modules and mechanical kits to build bespoke cabinets for end clients.

Multidrive cabinets

- 1.5 kW to 5600 kW
- IP21 as standard IP42 as option
- High packing density with 16 inverter units (up to frame size R2i) can be installed into one 1000 mm cabinet
- Diode bridge that is highly reliable with high power density
- Fast connectors for motor cables in the bottom part of the cabinet, making installation easy
- Integrated safety including safe torque-off (STO) as standard with several safety functions as options
- Coated boards as standard
- Braking options
- DC fuse disconnectors, DC fuses or DC fuse switch including charging circuit for inverters
- Cabinet light and heater options
- Highly efficient thermal handling as heat loss of each inverter unit is guided to the back of the cabinet. All cabinets are their own separate compartment
- Long lifetime capacitors and high efficiency cooling fan with speed or on-off control
- TÜV approved emergency stops
- ACS880 user interfaces described later

Multidrive modules

- 1.5 kW to 3200 kW
- A range of IP20 modules and IP00 kits to generate bespoke multidrive systems built-into system integrators own panels
- Modules have no rectifiers, they are inverters only and range in frames from R2i to R8i (i=inverter only)
- Contain internal pre-charge circuits making them easier to integrate
- Selection of rectifiers available to generate DC link for the system. Active IGBT rectifiers and diode modules are available
- New style diode module (DxD) only contains diodes, making it more competitively priced and more reliable
- New RRU modules, regenerative rectifiers, cost efficient regeneration
- Cabinet kits ensure easy integration
- New redundancy configurations for the modules and the fan control for better problem ridethrough



For further information, see Technical Catalogue 3AUA0000115037



For further information, see Technical Catalogue 3AUA0000115038

- Safe torque-off (STO) as standard with several safety functions as options using the new safety module
- Coated boards as standard

Low voltage AC drives ABB industrial drive

ACS880 – Common user interfaces



Control panel/keypad

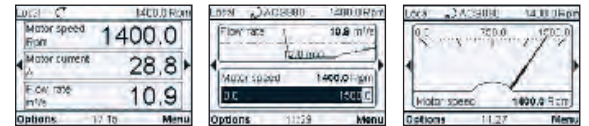
State-of-the-art high resolution keypad brings a new level of usability to the drives marketplace. The keypad ensures maximum usability and intuitive use. The keypad display is extremely high definition and is visible in any control room. Innovative views, transitions and screen will be very familiar to users of smart phones. The display supports graphics and icons to help the user navigate. The keypad also supports text editing to allow users to re-name fault messages to match plant specific actions. Customer specific start-up images and parameter favourites make the keypad easily tailorable to customers and OEMs alike.



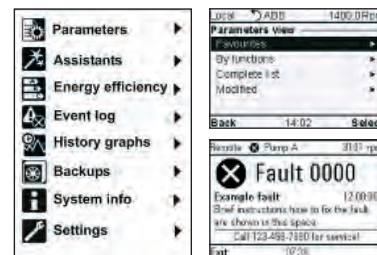
Bluetooth variant as standard

High resolution, high contrast display

Multiple display screens supporting graphs, bar graphs and graphical meters



Icon driven menu selections and displays



Real-time clock

USB connection – no special leads required

Bluetooth keypad and DriveTune app

Using a special Bluetooth enabled keypad, ABB can offer connection to the mobile phone using an app called DriveTune. There are versions of the app for IOS and Android operating systems.



Removable memory unit

The memory unit stores the complete parameter and firmware set for the drive. Should a drive need to be replaced, swapping the memory unit to the new drive will transfer a complete drive set-up – absolutely no recommissioning is required. This reduces down time.



Fieldbus

The ACS880 supports an extensive list of fieldbus modules for connectivity to industrial networks. These modules are common with other drives within the ABB drives range. Two modules can be operated together.



Expansion for analogue and digital I/O and speed feedback

Additional I/O can be added to the ACS880. This I/O can be addressed by the fieldbus so that the ACS880 can be used as an I/O “nest”, giving connectability from the process to the drive, for example, flow or level transducers. All modern speed feedback devices are supported.



Safety modules built in, FSO-12, FSO-21 and FSE-31

SIL3 rated TÜV approved safety modules. FSO-12 and FSO-21 offer a wide range of functions from the IEC 61800-5-2 standard. FSE-31 offers a safe encoder interface, and the whole family can communicate over a ProfiSafe network.



ATEX approves PTC interface FPTC-02

ACS880 has an ATEX certified STO, meaning no “upstream” contactor is required. With the FPTC-02 the motor PTC can be connected directly to the drive (no external relays). The FPTC-02 has a direct connection to the STO (and can connect to the FSO if needed) making a totally integrated ATEX solution.



Drive Composer PC tool

New PC tool for the ACS880 family come in two variants – the “entry” level is a free of charge point-to-point tool and allows simple parameter editing and storage, as well as monitoring and commissioning support, while the “Pro” level has all of this as well as animated control diagrams and extended commissioning, monitoring and diagnostic support, as well as the ability to program the safety functions. The Pro tool also allows the user to connect to multiple drives either over “panelbus” where the keypad port is used, or over Ethernet.



Low voltage AC drives

ABB industrial drive

ACS880 – Variants, ratings, types, voltages and prices

Typical I/O and control connections

The ABB industrial drive family uses the same keypad and software structure throughout its entire range. There are three control cards that have different physical shapes, but the same interfaces. All I/Os are fully configurable to be whatever function is required. The diagram shows a typical I/O connection.

The ACS880 uses macros to configure its I/O. The macros pre-define the I/O functionality to comply with popular industrial configurations. It is also possible to configure the I/O manually to any function required.



The ACS880-01 control card showing the colour coded terminal strips

	XPOW		External power input		
	1	+24VI	24 V DC, 2 A		
	2	GND			
	XAI		Reference voltage and analogue inputs		
	1	+VREF	10 V DC, R_L 1 to 10 kohm		
	2	-VREF	-10 V DC, R_L 1 to 10 kohm		
	3	AGND	Ground		
	4	AI1+	Speed reference 0(2) to 10 V, R_{in} > 200 kohm		
	5	AI1-			
	6	AI2+	By default not in use.		
7	AI2-	0(4) to 20 mA, R_{in} > 100 ohm			
J1	J1	AI1 current/voltage selection jumper			
J2	J2	AI2 current/voltage selection jumper			
	XAO		Analogue outputs		
	1	AO1	Motor speed rpm 0 to 20 mA, R_L < 500 ohm		
	2	AGND			
	3	AO2	Motor current 0 to 20 mA, R_L < 500 ohm		
	4	AGND			
	XD2D		Drive-to-drive link		
	1	B	Drive-to-drive link or built-in Modbus		
	2	A			
	3	BGND			
	J3	J3	Drive-to-drive link termination switch		
XRO1, XRO2, XRO3		Relay outputs			
1	NC		Ready 250 V AC/30 V DC 2 A		
2	COM				
3	NO				
1	NC		Running 250 V AC/30 V DC 2 A		
2	COM				
3	NO				
1	NC		Faulted (-1) 250 V AC/30 V DC 2 A		
2	COM				
3	NO				
	XD24		Digital interlock		
	1	DIIL	By default not in use		
	2	+24VD	+24 V DC 200 mA		
	3	DICOM	Digital input ground		
	4	+24VD	+24 V DC 200 mA		
	5	DIOGND	Digital input/output ground		
	J6	J6	Ground selection switch		
	XDIO		Digital input/outputs		
	1	DIO1	Output: Ready		
	2	DIO2	Output: Running		
XDI		Digital inputs			
1	DI1	Stop (0)/Start (1)			
2	DI2	Forward (0)/Reverse (1)			
3	DI3	Reset			
4	DI4	Acceleration and deceleration select			
5	DI5	Constant speed 1 (1=On)			
6	DI6	By default not in use			
XSTO		Safe torque-off			
1	OUT1	Safe torque-off. Both circuits must be closed for the drive to start.			
2	SGND				
3	IN1				
4	IN2				
X12		Safety functions module connection			
X13		Control panel connection			
X205		Memory unit connection			

Low voltage AC drives

ABB industrial drive - variants

ACS800 – Variants, ratings, types, voltages and prices



Low harmonic, active rectifier drives

These are a dedicated range of low harmonic drives based on active rectifier technology. No regenerative capability ensures no mistakes on generator supplies, while still retaining a low 2-4 percent total harmonic distortion (THD) signature.

ACS800-31, wall-mounted

- 5.5 kW to 110 kW (230 - 690 V)
- IP21 as standard
- Single package for easy cabinet installation, reducing installation time and cabinet space

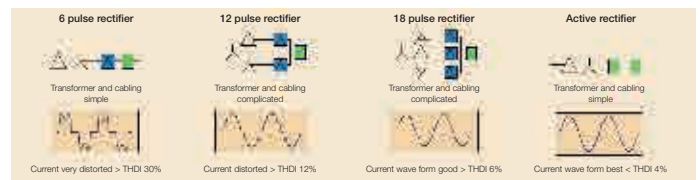
ACS800-37 and ACS880-37 cabinet-built

- ACS800 power range from 37 kW to 2700 kW (230 to 690 V)
- ACS880 power range from 250 kW to 3200 kW
- IP21 as standard; IP22, IP42, IP54 and IP54 R available as options
- Wheel-out power modules for improved manual handling
- Plug-in power connectors for easy maintenance and redundancy
- Power module redundancy for improved availability
- Factory-built cabinets ensure good installation

The R5 and R6 modules are detailed below. Please contact ABB if you require higher powers. Also, fully regenerative products are available - ACS800-11 and ACS800-17. Please refer to page 69 for more information.



For further information, see Technical Catalogue 3AFE68375126



Alternatives in reducing line harmonics

Low harmonic, wall-mounted drives - ACS800-31

380, 400 or 415 V, 3-phase supply voltage. The power ratings are valid at nominal voltage (400 V)

No-overload use		Light overload		Heavy-duty use		Max output	Frame	Fuse A	Heat dissipation	Cooling requirements	Type (+E200 to order the EMC filter)	IP21 price with keypad
P _{cont. max} kW	I _{cont. max} A	P _N kW	I _N A	P _{hd} kW	I _{hd} A	A		†Type gG	W	m³/h		
15	34	15	32	11	26	52	R5	40	550	350	ACS800-31-0016-3	£4,873
18.5	38	18.5	36	15	34	61	R5	40	655	350	ACS800-31-0020-3	£5,501
22	47	22	45	18.5	38	68	R5	50	760	350	ACS800-31-0025-3	£6,264
30	59	30	56	22	45	90	R5	63	1000	350	ACS800-31-0030-3	£7,171
37	72	37	69	30	59	118	R5	80	1210	350	ACS800-31-0040-3	£8,476
45	86	45	83	30	65	137	R5	100	1450	350	ACS800-31-0050-3	£10,094
55	120	55	114	45	88	168	R6	125	1750	405	ACS800-31-0060-3	£11,575
75	150	75	143	55	117	234	R6	160	2350	405	ACS800-31-0070-3	£13,518
90	165	75	157	75	132	264	R6	200	2800	405	ACS800-31-0100-3	£15,661

Other ratings and voltage ranges available, 230 V, 500 V, 690 V. Price on application.

Price includes 2nd environment EMC filter and control panel

Prices for low harmonic cabinet drives ACS800-37 available on application

† For fuse selection, refer to the hardware manual. Weak networks may require aR fuses

Low voltage AC drives

ABB industrial drive - other variants

ACS800 & ACS880 – Dimensions and options



Dimensions and weights, ACS800-31

Frame	H	W	D	Weight
size	mm	mm	mm	Kg
R5	816	265	390	62
R6	970	300	440	100

Height includes cable box, one enclosure, no external items

Options for ACS800-31, wall-mounted

- UK gland box to accommodate SWA cable
- Different levels of EMC compliance
- SIL2 safe torque-off interface (unit mounts outside the drive)
- Coated boards standard
- Extended warranty
- Marine certification mounts and kits

Options for ACS800-37, cabinet-built

Being a cabinet drive, all of the options available for ACS800-31 are valid as they fit inside the cabinet.

Additionally, the cabinet drive can be fitted with:

- IP21, IP22, IP42, IP54, IP54R variants (no IP55)
- Emergency stop variants
- Motor thermistor relays
- ATEX-approved motor protection
- Marine construction
- UL-approved components
- Various types of cable markings, cabinet heaters, door furniture and lighting etc.
- Sine filter fitted to output (for older motors)
- Top or bottom cable entry for either motor or power cables
- UK gland plates for SWA cables
- 110 V control inside the cabinet
- ABB can accommodate any specialised option or feature, by using its in-house application design team
- SIL2/PL d safe torque-off interface
- Coated boards

ACS880-37 cabinet-built options and user interfaces

The ACS880-37 is part of the all compatible ACS880 range. It follows the same build format and options as the ACS880-07 (see page 63) and has the same ACS880 user interfaces (see page 65)



Ratings and dimensions for larger variants available on request

User interfaces

All ACS800s use the same common options and user interfaces, these are detailed on page 71.

- The drive has two slots for I/O and fieldbus expansion and one slot for an optical interface (an additional mother board can also be added – giving three more slots)
- I/O modules can be chosen from analogue expansion, digital expansion, encoder and resolver feedback options
- Fieldbus modules are always fixed to slot one, and all of the major industrial fieldbus modules are available
- The drive can be ordered with specially designed application specific software variants. There are 11 variants available including crane, master follower, winder control, etc. The advantage of selecting these pre-written software variants is that they cover the market requirements. They are tested and certified by ABB and come complete with a User Manual and cabling instructions.

Low voltage AC drives

ABB industrial drive - other variants

ACS800 – Variants, ratings, types, voltages and prices



Regenerative, active rectifier drives

ACS 800-11, wall-mounted

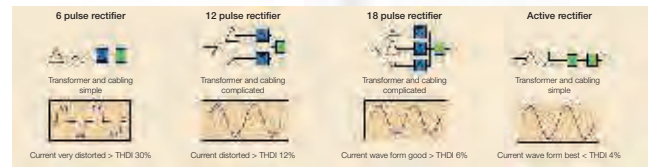
- 5.5 kW to 110 kW (230 - 690 V)
- IP21 as standard
- Active rectifier unit
- Single package for easy cabinet installation, reducing installation time and cabinet space

ACS800-17 and ACS880-17, cabinet-built

- ACS800, 45 kW to 2500 kW (230 - 690 V)
- ACS880-17, 250 kW to 3200 kW
- IP21 as standard, IP22, IP42, IP54 and IP54 R available as options
- Wheel-out power modules for improved manual handling
- Plug-in power connectors for easy maintenance and redundancy
- Power module redundancy for improved availability
- Factory-built cabinets ensure good installation and compliance with standards
- ATEX approved PTC interfaces and blanket certification with ABB motors



For further information see Technical Catalogue 3AFE 68375126



Alternatives in reducing line harmonics

Regenerative, active rectifier drive modules - low harmonic ACS800-14

- 75 kW to 1700 kW (380 - 690 V)
- IP00 kits
- Assembly kits for Rittal cabinets and generic cabinets
- Separate controllers for galvanic isolation
- Requires a separate +24 V DC supply at 3 A
- Active supply unit can be configured for low harmonic mode (2-4 percent harmonic distortion) or regenerative mode, for better dynamic performance
- Comprehensive installation instructions and CAD drawings



For further information see Technical Catalogue 3AFE 68404592

Liquid cooled modules

ACS800-x04LC

- Extremely compact size, compared to air-cooled
- 98 percent of drive losses transferred to liquid - removes the need for air-conditioned control rooms
- Tested electrical/mechanical kits available - which make different solutions easy to build
- ACAD, PDF and full 3D EPLAN® modelling support
- Pre-designed mounting frames available to reduce design time
- Liquid / liquid-heat exchanger assemblies can be supplied by ABB
- Module features:
 - Diode supply modules include line side chokes
 - Inverter modules include du/dt filters
 - Easy structure, fewer components
 - Inverter units, IGBT supply units and dynamic braking units are based on one common R8i module



For further information see Technical Catalogue 3AFE68404592

Low voltage AC drives

ABB industrial drive - other variants

ACS800 – Variants, ratings, types, voltages and prices

Liquid-cooled drives

ACS800 - 17LC and ACS800 - 37LC

- 37 kW to 2700 kW, (380-690 V)
- IP42 as standard, IP54 as option
- ACS800-17LC, fully regenerative, ACS800-37LC, low harmonic
- Provides reliable operation in adverse conditions
- Silent and safe operation without the need for air ventilation or air conditioning, fully enclosed cabinets, smaller than previous generation
- Extensive range of cabinet options, including water pumping and heat exchanger cabinets
- Marine enclosure available
- Parallel modules allow redundant configuration
- Ideal where space is limited, in harsh environments, or at sites that require quieter operation, in applications where cooling water is freely available
- IEC, UL, CSA, Lloyds, DNV, ABS approvals
- ATEX-approved PTC interfaces and blanket certification with ABB motors



For further information see Technical Catalogue 3AFE68375126

Low voltage AC drives

Other variants

ACS800 – Common user interfaces

Control panel

The control panel features a full-text multilingual display. Dedicated keys allow fast access to actual signals, parameters, assistant functions and drive information. The panel can be used for parameter copying and for configuring adaptive programmes, working as a PLC inside the drive. Local motor control and parameter copying is also possible.



Panel mounting kits

Kits are available that allow mounting on the cabinet door, or in a holder inside the cabinet. The panel can be screwed to the cabinet door, without the need for an additional holder.



Fieldbus

The ACS800 supports an extensive list of fieldbus modules for connectivity to industrial networks.



I/O expansion

ACS800 can be fitted with a large range of analogue and digital I/O modules to expand its I/O capability.



DriveWindow - PC Tool

DriveWindow is a high specification, high speed commissioning, maintenance and monitoring tool for the ACS800 drive range. It operates over an optical fibre link. (Drive requires an RCDO module)

DriveAP - PC Tool

DriveAP allows access to the ACS800 adaptive, block programming environment.

Typical I/O and control connections

The ABB industrial drive family uses the same control card, keypad and software structure throughout its entire range. Analogue and digital I/O channels are used for different functions such as control, monitoring and measurement purposes (e.g. motor temperature). In addition, optional I/O extension modules are available providing additional analogue or digital I/O connections.

Below are the standard drive control I/O of the ABB industrial drive with factory macro. For other ACS800 application macros the functions may be different. Please refer to the firmware manual for details.

