Single drive modules, ACS880-04

Our ACS880-04 single drive modules are optimized for easy and cost efficient cabinet assembly. With a compact and robust cabinet design, they save a lot of floor space and are easy to maintain and service. Being part of the all-compatible ACS880 industrial drives series, the single drive modules are easy to integrate into other systems and they provide great control performance with versatile drive features. This power intensive drive module is compatible with a wide range of industries including oil and gas, mining, metals, chemicals, cement, power plants, material handling, pulp and paper and woodworking. Applications range from cranes, extruders, conveyors, compressors to pumps and fans.

Easy and cost efficient cabinet assembly

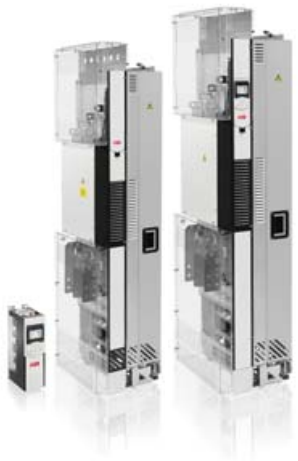
The module is designed with all the necessary components for making engineering, cabling and cabinet assembly easier. The module comes as a bookshelf and flat variant. It has a pedestal with wheels and a ramp for pushing the module inside the cabinet and connecting it to the optional cable panel. For optimized cabinet usage, features include power input connections on the top of the module and power output on the bottom. The control unit can be either installed inside or outside of the module, enabling free location of input/output terminals.

The built-in features include direct torque control (DTC), ABB's premier motor control technology, chokes for harmonic reduction, safe torque off (STO) and drive-to-drive communication as standard. Additional built-in options include EMC filters, braking chopper and common mode filters, several inputs/outputs terminals, fieldbus connectivity, integrated safety including several safety functions and option slots for speed feedback. The drive comes with IP20 enclosure class as standard, reducing engineering time and cabinet assembly costs.

ABB provides an extensive selection of support documentation for planning including dimension drawings in different formats, EPLAN P8 macros and line apparatus selection tool for selecting external components on the line side and motor side of the drive.

Main features

- Enclosure class IP20 as standard
- Power supply coming from the top part of the module and out from the lower part of the cabinet, enabling more optimal cabinet design
- Possibility for flat mounting enables cabinet assembly even into cabinets with limited depth
- Easy installation, commissioning and maintenance with pedestal on wheels, ramp and optional cable panel (+H381)
- Direct torque control (DTC) as standard, for high performance motor control
- Integrated safety including safe torque off (STO) as standard and the optional safety functions module (TÜV Nord certified)
- Supports various motor types including synchronous reluctance motors
- Intuitive control panel with USB connection
- Removable memory unit for easy maintenance
- Drive composer PC tool for commissioning and configuration
- Control unit with three option slots, that can be installed either inside the module or in different parts of the cabinet, supporting a wide range of fieldbuses, feedback devices and input/output options
- Coated boards as standard
- Built-in choke as standard for input harmonics reduction
- Built-in braking chopper (option)
- EMC filter option
- Power terminals are available as standard on the left side of the module. The power terminals can also be cabled on the right side of the module as option
- ACS880-04XT, frame sizes R10 or R11 single drive modules can be parallel connected for higher powers.
- ACS880-04XT can be connected as 6-pulse or as 12-pulse



Single drive modules, ACS880-04, frame sizes R10 (with external control unit) and R11 (with internal control unit and control panel integrated in the module), bookshelf mounting

Single drive modules, ACS880-04, flat mounting

Optional cabel panel installed inside the cabinet. ACS880-04 is pushed into the cabinet using a ramp and pedestal on wheels.

High power single drive module packages, ACS880-04

n×DxT supply units and n×R8i inverter units

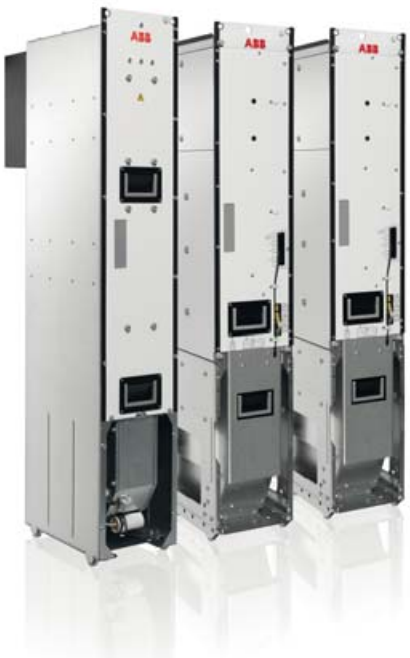
The ACS880-04 high power single drives module packages include the parallel connected R8i inverter module and D8T half controlled diode bridge with thyristor charging. The power range is from 700 to 2450 hp, and the voltage range is from 380 to 690 V.

These compact multidrive modules come as bookshelf variants. They have been optimized for assembly into customer's own cabinets. Installing and transporting them is easy, as they come equipped with wheels. Connecting the modules to the motor cables inside the cabinet is quick as the modules come with quick connectors as standard. The modules can also be quickly pulled out from a cabinet without any need for disconnecting the motor cables. This is done simply by disconnecting a couple of bolts. The R8i inverter module comes equipped with a removable fan pedestal, which makes motor cabling easy.

The control unit and the input/output connections can be located in the most optimal part inside the cabinet. The circuit boards in the modules are in a sealed compartment, keeping them clean and cool during operation. The cooling fans in the module are speed controlled as a standard, helping to lower the noise level of the module and making it more energy efficient. The fans also make the temperature for the semiconductors more stable.

Main features

- Optimized design for easy cabinet assembly (comes with wheels)
- Compact bookshelf design
- Easy access to power terminals
- Side-by-side mounting
- Direct torque control (DTC) as standard, for high precision motor control
- Long lifetime cooling fan and capacitors
- Built-in redundancy with parallel connected modules
- Extensive, programmable inputs/output with galvanically isolated inputs
- Integrated safety including safe torque off (STO) as standard and the optional safety functions module (TÜV Nord certified)
- Supports various motor types including synchronous reluctance motors
- Removable memory unit for easy maintenance
- Drive composer PC tool for commissioning and configuration
- Control unit BCU-X2 is used with all parallel connected modules, such as n×R8i and DxT. It has three option slots, and a slot for DDCS optical communication
- The control unit can be installed in different parts of the cabinet, and it supports a wide range of fieldbuses, feedback devices and input/output options
- Coated boards come as standard
- Speed controlled cooling fans, or DOL as an option for certain frames
- Large power terminals allowing the use of a wide range of cable sizes
- Complete cabinet design for Rittal TS8 cabinets



ACS880-04 single drive module package with 1×D8T and 2×R8i

Ratings, types and voltages
ACS880-04, -04XT

U_N =480 V (range 380 to 500 V). The power ratings are valid at nominal voltage 480 V.

Light-duty use			Heavy-duty use			Noise level	Heat dissipation	Air flow	Type designation	Frame size
I_{Ld} A	P_{Ld} hp	P_{Ld} kW	I_{Hd} A	P_{Hd} hp	P_{Hd} kW	dB(A)	W	cfm		
6-pulse										
483	400	315	361	300	250	72	5602	710	ACS880-04-503A-5	R10
573	450	400	414	350	250	72	6409	710	ACS880-04-583A-5	R10
623	500	450	477	400	315	72	8122	710	ACS880-04-635A-5	R10
705	600	500	566	450	400	72	8764	710	ACS880-04-715A-5	R11
807	700	560	625	500	450	71	9862	835	ACS880-04-820A-5	R11
857	700	560	697 [2]	500	500	71	11078	835	ACS880-04-880A-5	R11
6 or 12-pulse										
1146	1000	800	878	700	630	75	16244	1415	ACS880-04XT-1160A-5	2xR10
1570	1000	1000	1274 [2]	1000	900	74	21156	1670	ACS880-04XT-1610A-5	2xR11

U_N =575 V (range 525 to 690 V). The power ratings are valid at nominal voltage 575 V.

Light-duty use			Heavy-duty use			Noise level	Heat dissipation	Air flow	Type designation	Frame size
I_{Ld} A	P_{Ld} hp	P_{Ld} kW	I_{Hd} A	P_{Hd} hp	P_{Hd} kW	dB(A)	W	cfm		
6-pulse										
320	300	315	255	250	250	72	4403	710	ACS880-04-330A-7	R10
360	350	355	325	300	315	72	5602	710	ACS880-04-370A-7	R10
420	450	450	360 [1]	415	350	72	6409	710	ACS880-04-430A-7	R10
455	450	450	415	450	400	72	8122	710	ACS880-04-470A-7	R11
505	500	500	455	450	450	72	8764	710	ACS880-04-522A-7	R11
571	600	560	505	500	500	71	9862	710	ACS880-04-590A-7	R11
630	700	630	571 [3]	600	560	71	10578	835	ACS880-04-650A-7	R11
705	700	630	571 [3]	600	560	71	10578	835	ACS880-04-721A-7	R11
6 or 12-pulse										
791	800	710	678 [1]	700	630	75	12818	1415	ACS880-04XT-0810A-7	2xR10
1051	1000	1000	929	1000	900	75	19724	1415	ACS880-04XT-1080A-7	2xR11
1297	1250	1200	1051 [3]	1000	1000	74	21156	1670	ACS880-04XT-1320A-7	2xR11

Dimensions

Frame size	Height (H)		Width (W)		Depth (D)		Weight	
	(in)	(mm)	(in)	(mm)	(in)	(mm)	(lbs)	(kg)
R10	60.7	1541 [1]	13.8	350 [1]	19.9	506	355	161
R11	68.5	1741 [1]	13.8	350 [1]	19.9	506	439	199

[1] = 40 % overload
[2] = 45 % overload
[3] = 44 % overload

Light-duty use	
I_{Ld}	Continuous current allowing 10% I_{Ld} for 1 min/5 min at 40 °C.
P_{Ld}	Typical motor power in light-overload use.
Heavy-duty use	
I_{Hd}	Continuous current allowing 50% I_{Hd} for 1 min/5 min at 40 °C.
P_{Hd}	Typical motor power in heavy-duty use.

The ratings apply at 40 °C ambient temperature. At higher temperatures (up to 50 °C [2] or up to 55 °C [3]) the derating is 1%/1 °C.

[1] Without pedestal (+0H354) and without IP20 shrouds and full-size terminals (+0B051+0H371) height is 179 mm less and width 45 mm less. More information from HW manual.
[2] ACS880-04 high power single drive package.
[3] ACS880-04 single drive module.

Technical data and how to select a drive

Type designation: ACS880 – 01 / 04 / X4 / X04 – XXXX – X + XXXX

- Product series (ACS880)
- Types and construction (01, 04, X4, X04)
- Ratings (XXXX)
- Voltages (X)
- Options (XXXX)

To choose the right drive for your application, please refer to the rating tables on pages 12, 13, 16, 17, 19, 21, 24, 25, 26, 27, 28 and 29 or use ABB's DriveSize (page 48) dimensioning tool. The selected drive has a unique type designation, which identifies the drive by construction, power and voltage range. The options are added to the type designation with a "plus" code. Build up your own ordering code using the type designation key or contact your local ABB drives sales office and let them know your needs/requirements.

Mains connection

Voltage and power range	3-phase, U_{N2} = 208 to 240 V, +10/-15% (-01) 3-phase, U_{N5} = 380 to 500 V, +10/-15% (-01, -04) 3-phase, U_{N7} = 525 to 690 V, +10/-15% (-01, -04) 3-phase, U_{N5} = 380 to 500 V, ± 10% (-x04, -04 [3], -x4 [3]) 3-phase, U_{N7} = 525 to 690 V, ± 10% (-x04, -04 [3], -x4 [3]) 0.75 to 4250 hp Diode supply unit (DSU) 55 to 5445 kVA IGBT supply unit (ISU) 5.5 to 3679 kVA Regenerative rectifier unit (RRU) 400 to 4135 kVA
Frequency	50/60 Hz ±5%
Power factor	ISU: cosφ1 = 1 (fundamental) cosφ = 0.99 (total) DSU and RRU: cosφ1 = 0.98 (fundamental) cosφ = 0.93 to 0.95 (total)
Efficiency (at nominal power)	98% with DSU and RRU 97% with ISU

Motor connection

Voltage	3-phase output voltage 0 to U_{N2}/U_{N3} /U_{N5} /U_{N7}
Frequency	0 to ± 500 Hz [1) 4)]
Motor control	Direct torque control (DTC)
Torque control: Open loop Closed loop Open loop Closed loop	Torque step rise time: <5 ms with nominal torque <5 ms with nominal torque Non-linearity: ± 4% with nominal torque ± 3% with nominal torque
Speed control: Open loop Closed loop Open loop Closed loop	Static accuracy: 10% of motor slip 0.01% of nominal speed Dynamic accuracy: 0.3 to 0.4% seconds with 100% torque step 0.1 to 0.2% seconds with 100% torque step

Product compliance

- CE
- Low Voltage Directive 2006/95/EC
- Machinery Directive 2006/42/EC
- EMC Directive 2004/108/EC
- Quality assurance system ISO 9001 and Environmental system ISO 14001
- RoHS
- UL, cUL, UL508C and CSA, C22.2 NO.14-10, EAC/GOST R [5], C-Tick
- Functional safety: STO, TÜV Nord certificate
- ATEX-certified Safe Disconnection Function, Ex II (2) GD

EMC according to EN 61800-3 (2004)

Category C2 with internal option (-01)
1st environment category C2 included as option (-x4 [3])
2nd environment category C3 included as standard (-x04, -x4 [3])
2nd environment category C3 included as option (-01, -04)
2nd environment category C4 included as standard

Environmental limits

Ambient temperature Transport Storage Operation (air-cooled)	 -40 to +70 °C -40 to +70 °C -15 to +40 °C as standard (-04) 0 to +40 °C as standard (-x04, -04 [3], -x4 [3]) +40 to +55 °C with derating of 1%/1 °C (-04 /-01 [4]) +40 to +50 °C with derating of 1%/1 °C (-x04, -04 [3])
Cooling method Air-cooled	 Dry clean air
Altitude 0 to 1,000 m 1,000 to 4,000 m	 Without derating With derating 1%/100 m [7]
Relative humidity	5 to 95%, no condensation allowed
Degree of protection IP00 IP20	 (-04, -04 [3], -x4 [3], -x04) (-01, -04)
Paint color	RAL 9017, RAL 9002
Contamination levels	No conductive dust allowed
Storage	IEC 60721-3-1, Class 1C2 (chemical gases), Class 1S2 (solid particles)
Transportation	IEC 60721-3-2, Class 2C2 or 3C2 (chemical gases), Class 2S2 (solid particles without air inlet filters)
Operation	IEC 60721-3-3, Class 3C2 (chemical gases), Class 3S2 (solid particles)
Functional safety Standard	 Safe torque off (STO according EN/IEC 61800-5-2) IEC 61508 ed2: SIL 3, IEC 61511: SIL 3, EN/IEC 62061: SIL CL 3, EN ISO 13849-1: PL e
Internal safety option, the Safety functions module	Safe stop 1 (SS1), safely-limited speed (SLS), safe stop emergency (SSE), safe brake control, (SBC) and safe maximum speed (SMS), prevention of unexpected startup (POUS), Safe direction (SDI), Safe speed monitor (SSM) EN/IEC 61800-5-2, IEC 61508 ed2: SIL 3, IEC 61511: SIL 3, EN/IEC 62061: SIL CL 3, EN ISO 13849-1: PL e TÜV Nord certified [6]

C = Chemically active substances
S = Mechanically active substances
[1] For higher operational output frequencies please contact your local ABB office
[2] Please check availably per drive type
[3] Single drive module packages
[4] Operation above 120 Hz might require type specific derating, please contact your local ABB office
[5] EAC has replaced GOST R
[6] Pending (except for -01 and -04 single drive modules)
[7] Derating reduced by lower than 40 °C ambient temperature

Contact us

For more information please contact your local ABB representative or visit:

www.abb.com/drives

ACS880 drive modules web page

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