Catalog

ABB industrial drives
ACS800, single drives, 0.75 to 6000 hp
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ABB industrial drives

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ABB industrial drives

ABB industrial drives are designed for industrial applications, and especially for applications in process industries such as the converting, pulp & paper, metals, mining, cement, power, chemical, and oil & gas industries. ABB industrial drives are highly flexible AC drives that can be configured to meet the precise needs of industrial applications, and therefore order-based configuration is an integral part of the offering. These drives cover a wide range of powers and voltages, including industrial voltages up to 690 V. ABB industrial drives come with a wide range of built in options. A key feature of these drives is programmability, which makes adaptation to different applications easy.

Industrial design

ABB industrial drives are designed with current ratings to be used in industrial environments for applications requiring high overloadability. The heart of the drive is DTC, Direct Torque Control, that provides high performance and significant benefits: e.g. accurate static and dynamic speed and torque control, high starting torque and use of long motor cables. Built in drive options make the installation work fast and easy. The robust enclosures and cabinets, with a wide range of enclosure classes, as well as power terminals, are designed for harsh environments.

One of the most significant design criteria of ABB industrial drives has been long lifetime. Wearing parts such as fans and capacitors have been selected accordingly. This means - together with extensive protection features - excellent reliability in demanding industrial applications.

DTC Motor Control

Direct Torque Control (DTC) developed by ABB has improved motor control accuracy without the requirement of speed feedback device. Accurate speed and torque control of the manufacturing process optimizes the quality of the end product. Many applications no longer require additional speed feedback when the ACS800 with DTC is used.

IndustrialIT enabled

ABB industrial drives are IndustrialIT enabled. This guarantees the user that ABB industrial drives can be easily integrated into ABB Industrial IT systems.

Single drives

The single drive configuration contains a rectifier, DC link and an inverter in one single AC drive unit.

The single drives are complete AC drives that can be installed without any additional cabinet or enclosure. The single drives are available as wall-mounted, free-standing and cabinet-built constructions. The standard protection class of the single drives is UL Type 1 and higher protection classes are available as an option.

Type Code

This is the unique reference number that clearly identifies your drive by construction, power rating voltage and selected options. By type code you can specify your drives from the wide range of available options, customer specific ones are added to the type code using the corresponding + code.
Direct Torque Control Technology

**DTC Technology - key in the ACS800 family**

Direct Torque Control is an optimized motor control method for AC drives that allows direct control of all the core motor variables. This opens up AC drive capabilities never before realized and offers benefits for all applications.

**What is Direct Torque Control?**

Direct Torque Control, DTC, is a revolutionary motor control method for AC drives which allows accurate control of both motor speed and torque without pulse encoder feedback from the motor shaft, down to zero speed. In DTC, stator flux and torque are used as primary control variables. The motor state calculations are updated by the high speed digital signal processor at 40,000 times a second in the advanced motor software model. Due to the continuous updating of the motor state and the comparison of the actual values to the reference values, every single switching in the drive is determined separately. This feature will always produce the optimal switching combination and can instantly react to dynamic changes such as load shocks or power interruptions. In DTC, there is no need for a separate voltage and frequency controlled pulse width modulator.

**Unequalled motor speed & torque control**

Open loop dynamic speed control accuracy matches that of AC drives using closed loop flux vector control. The ACS800 delivers static speed control accuracy of 0.1% to 0.5% of nominal speed - more than adequate for most industrial applications. In applications requiring even more precise speed regulation, an optional pulse encoder can be used. With an open loop torque step rise time of less than 5 milliseconds - compared to over 100 ms in AC drives using sensorless flux vector control - the ACS800 AC drive is unbeatable.
**Single drive main features**

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>Compact and complete</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compact size, everything integrated</td>
<td>Less space and installation work required.</td>
<td>No need to install extra components such as input chokes or EMC filter.</td>
</tr>
<tr>
<td>Built in harmonic filter in all ACS800 drives</td>
<td>Low harmonics, meaning less interference and less heating in cables and transformers.</td>
<td>For the lowest harmonic level, ACS800-37 offers almost a harmonic free solution.</td>
</tr>
<tr>
<td></td>
<td>Filter also protects the drive from line side transients.</td>
<td></td>
</tr>
<tr>
<td>Wide range of options available</td>
<td>Standard solutions available from ABB to meet most customers application needs.</td>
<td>Custom made solutions are available in the ACS800-U7/07/17/37.</td>
</tr>
<tr>
<td>Versatile braking options</td>
<td>Optimal braking options are always available.</td>
<td>Brake chopper built inside all frame sizes (standard/optional).</td>
</tr>
<tr>
<td>Versatile braking options</td>
<td>No need for an external braking chopper thus reducing size and installation cost.</td>
<td>Regenerative braking with ACS800-U11 and ACS800-17.</td>
</tr>
<tr>
<td>User interface</td>
<td></td>
<td></td>
</tr>
<tr>
<td>User friendly customer interface</td>
<td>Easy and fast commissioning and operation.</td>
<td>Clear, alphanumeric display with start-up assistant that guides through the start-up procedure.</td>
</tr>
<tr>
<td>Versatile connections and communications</td>
<td>Standard I/O covers most requirements. Connectable to commonly used fieldbuses.</td>
<td>Extensive standard and optional I/O.</td>
</tr>
<tr>
<td>Extensive programmability</td>
<td>Flexibility. Possible to replace relays or even a PLC in some applications.</td>
<td>Two levels of programmability: 1. Parameter programming (standard) 2. Adaptive programming (free block programming) - standard feature - more blocks available as options - all I/Os are programmable</td>
</tr>
<tr>
<td>Industrial design</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wide power and voltage range</td>
<td>One product series can be used to meet all application needs, meaning less training and spare parts and standardized interface to drives.</td>
<td>0.75 to 3000 Hp 208 to 690 Vac</td>
</tr>
<tr>
<td>Wide range of robust enclosures available</td>
<td>Industrial suitable solutions available for different environments.</td>
<td>UL Type 1, UL Type 1 filtered, UL Type 12</td>
</tr>
<tr>
<td>Robust main circuit design</td>
<td>Suitable for heavy industrial use. Reliability.</td>
<td>Components dimensioned for heavy duty and long lifetime.</td>
</tr>
<tr>
<td></td>
<td>Long motor cables can be used without extra output filters.</td>
<td>Advanced thermal model allows high overloadability.</td>
</tr>
</tbody>
</table>
# Single drive main features

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<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Industrial design</strong></td>
<td><strong>Benefits</strong></td>
<td><strong>Notes</strong></td>
</tr>
<tr>
<td>Extensive protection features</td>
<td>Enhanced reliability, fewer process interruptions. Possibility to also protect motors and process.</td>
<td>Several adjustable limits to protect other equipment included.</td>
</tr>
<tr>
<td>Galvanic isolation of I/O</td>
<td>Safe and reliable operation without separate isolators and relays.</td>
<td>Isolated input signals and relay outputs as standard.</td>
</tr>
<tr>
<td>All terminals designed for industrial use</td>
<td>Sufficient size even for large aluminum cables. No need for special tools in I/O cabling.</td>
<td></td>
</tr>
<tr>
<td>Worldwide approvals: CE, UL, cUL, CSA, C-Tick, GOST R</td>
<td>Products that can be used everywhere in the world.</td>
<td></td>
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<tr>
<td><strong>Right performance for every application</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DTC, accurate dynamic and static speed and torque control</td>
<td>Excellent process control even without speed feedback device - improved product quality, productivity, reliability and lower investment cost.</td>
<td></td>
</tr>
<tr>
<td>DTC - allows high overloadability and gives high starting torque</td>
<td>Reliable, smooth start without overdimensioning the drive.</td>
<td></td>
</tr>
<tr>
<td>DTC, fast control</td>
<td>No unnecessary trips or process interruptions. Fast reaction to load or voltage variations prevents tripping. Rides through power interruptions by using kinetic energy of the load.</td>
<td></td>
</tr>
<tr>
<td>DTC, flux optimization and sophisticated motor model</td>
<td>Excellent motor and drive efficiency - cost savings for non-dynamic applications like pumps or fans. Optimal flux in the motor reduces losses on applications where Dynamic Response requirements are minimal.</td>
<td></td>
</tr>
<tr>
<td>DTC, line supply control</td>
<td>High performance and robust control in active supply unit with programmable power factor. Applies for ACS800-U11, ACS800-17, ACS800-U31, and ACS800-37</td>
<td></td>
</tr>
</tbody>
</table>

## Made by ABB


World wide service and support network. Professional support available around the world.
Technical specification

**Mains connection**

- **Voltage and power range**
  - 3-phase, \( U_{2IN} = 208 \text{ to } 240 \text{ V} \), ± 10%, except -U2,-U7,-07,-17,-37
  - 3-phase, \( U_{5IN} = 380 \text{ to } 500 \text{ V} \), ± 10%
  - 3-phase, \( U_{7IN} = 525 \text{ to } 690 \text{ V} \), ± 10%
    (600 V UL, CSA)

- **Short Circuit Current Rating (SCCR)**
  - ACS800-U1,-U11,-U31 = 65ka
  - ACS800-PC,-U2,-U7/07,-17,-37 = 100ka

- **Frequency**
  - 48 to 63 Hz

- **Nominal Impedance**
  - 3% Nominal Impedance
    - R2-R3, DC Bus Choke
    - R4 and greater, AC Reactor

- **Power factor**
  - ACS800-U1,-PC,-U2,-U7/07: \( \cos \phi_1 = 0.98 \) (fundamental)
    \( \cos \phi = 0.93...0.95 \) (total)
  - ACS800-U11,-17,-U31,-37: \( \cos \phi_1 = 1 \) (fundamental)
    \( \cos \phi = 0.99 \) (total)

- **Efficiency (at nominal power)**
  - ACS800-U1,-PC,-U2,-U7/07, 07LC
    - 98%
  - ACS800-U11,-17,-U31,-37
    - 97%

**Motor connection**

- **Voltage for > 500 V units**
  - 3-phase output voltage \( 0...U_{2IN}/U_{5IN}/U_{7IN} \)
    please see Filter selection table for ACS800" under the du/dt filters on page 33

- **Frequency**
  - 0...±300 Hz
    (0...±120 Hz for -U7/-07 frames R6-R8 with du/dt filters and external du/dt filters)

- **Field weakening point**
  - 8...300 Hz

- **Motor control**
  - ABB’s exclusive Direct Torque Control (DTC)

- **Torque control**
  - Torque step rise time
    - Open loop <5 ms with nominal torque
    - Closed loop <5 ms with nominal torque
  - Non-linearity:
    - Open loop ±4% with nominal torque
    - Closed loop ±1% with nominal torque

- **Speed control**
  - Static accuracy
    - Open loop 10% of motor slip
    - Closed loop 0.01% of nominal speed
  - Dynamic accuracy
    - Open loop 0.3...0.4 sec. with 100% torque step
    - Closed loop 0.1...0.2 sec. with 100% torque step

**Environmental**

- **Ambient temperature**
  - Transport: -40...+70°C
  - Storage: -40...+70°C
  - Operation: -15...+50°C, no frost allowed
    - 40...55°C at reduced output current
      (1% / 1°C)

- **Operation**
  - 0 to +55°C, no frost allowed
    (ACS800-07LC)
    - +45 to 55°C, at reduced output current
      (1% / 1°C)

- **Cooling method**
  - Dry clean air

- **Altitude**
  - 0...1000 m without derating
    - 1000...4000 m with derating (1% / 100 m)
    (600 V units 1000...2000 m with derating)

- **Relative humidity**
  - 5 to 95%, no condensation allowed

- **Protection class**
  - UL Type 1 standard for -U1,-PC,-U2,-U7/07,07LC, -U11, -17,-U31,-37
  - UL Type 1 filtered option for -U7/07,-17,-37
  - UL Type 12 option for -U1,-PC,-U2,-U7/07,07LC, -U11,-17,-U31,-37

- **Paint color**
  - -PC,-U7/07,07LC: RAL 7035
    (RAL 90021, PMS 420 C)
  - -U1,-U11,-U2,-U31: NCS 1502-Y

- **Contamination levels**
  - No conductive dust allowed
    - Storage IEC60721-3-1, Class 1C2 (chemical gases),
      Class 1S2 (solid particles)
  - Transportation IEC60721-3-2, Class 2C2 (chemical gases),
    Class 2S2 (solid particles)
  - Operation IEC60721-3-3, Class 3C1/3C2* (chemical gases),
    Class 3S2 (solid particles)

- **C = chemically active substances
  S = mechanically active substances**

**Product compliance**

- UL & cUL (508A or 508C) and CSA C22.2 NO.14-95, C-Tick, GOST R
  - NEC 430.126(A)(2) Motor Overtemperature Protection
  - UL & CE (Available)
  - Machinery Directive 98/37/EC

**EMC (according to EN 61800-3)**

- 2nd environment, unrestricted distribution category C3 as standard in
  - -07 (frame size nxR8i), 07LC, -17 and -37 (frame sizes R7i-nxR8i), option in the others
  - 1st environment, restricted distribution category C2 as option up to
    1000 A input current

- NOTE: Available options are shown in the Summary of features options table. Please see pages 48-49.
ACS800 Product Description

Wall-mounted drive, ACS800-U1

The wall-mounted drive, ACS800-U1 offers all that you need up to 200 Hp. All important features and options are built inside the drive: line choke, EMC filter, brake chopper etc. The user gets everything in a single and complete UL Type 1 or UL Type 12 package. Still the drive is also extremely small. A wide range of software alternatives makes this drive suitable for almost any application.

Cabinet-built drive, ACS800-PC

The cabinet built ACS800-PC is a US only construction using the industrial Rittal™ standard enclosure and is available from 125 to 600Hp at 480Vac. The ACS800-PC is a standardized package product that includes an input disconnect switch (circuit breaker) and class T input fuses. The drive is available in UL Type 1 enclosure up to 400Hp and optional in UL Type 12 enclosure up to 600Hp. The ACS800-PC offers a variety of options for factory installation including; I/O expansion, line contactor with E-Stop, and aux motor starter for motor cooling fan.

Free-standing drive, ACS800-U2

The free-standing drive, ACS800-U2, with power ratings from 125 to 600Hp, is available in an extremely compact UL Type 1 enclosure and uniquely offers two mounting directions. It also offers a wide range of built in options including, EMC filters, brake choppers, line apparatus such as fuse disconnect switch and contactor.

Cabinet-built drive, ACS800-U7/07

The cabinet-built drive, ACS800-U7/07 offers standardized configurations that can be adapted to any application. It covers a wide power range up to 3000 Hp and is very compact, the largest drive is only 10.5 feet wide. It is available with UL Type 1, UL Type 1 filtered and UL Type 12 protection classes. A wide range of built in options is available and application engineering services can be offered when customization is needed.

Regenerative drive, ACS800-U11/17

The ACS800 regenerative drive is equipped with an active supply unit. It offers a full performance regenerative drive in a single compact package. It is intended to drive applications where regenerative operation is required. All important features and options including an LCL line filter and EMC filter are built inside the drive.

The power ratings of the wall-mounted drive, ACS800-U11 start from 7.5 Hp and go up to 125 Hp. It is available in UL Type 1 protection class enclosure.

The power ratings of the cabinet-built drive, ACS800-17 start from 60 Hp and go up to 2,600 Hp. It is available with UL Type 1, UL Type 1 filtered and UL Type 12 protection classes. The cabinet-built drive has an extensive range of standardized configurations that can be adapted to any application.

Ultra low harmonic drive, ACS800-U31/37

The ultra low harmonic drive provides a unique ultra-low harmonic solution fully incorporated inside the drive. This design provides unmatched harmonic mitigation fulfilling IEEE 519-1992 requirements at the drive input terminals without any additional external hardware. The active supply unit also allows the drive to operate at unity power factor and the harmonic mitigation is not effected by input line imbalances up to and exceeding 3% voltage imbalance.

The wall-mounted drive, ACS800-31 is available from 7.5 to 125 Hp in a UL Type 1 enclosure. The cabinet-built drive, ACS800-37 is available from 60 to 2,800 Hp with UL Type 1, UL Type 1 filtered and UL Type 12 protection classes.

Liquid-cooled drive, ACS800-07LC

ACS800 liquid-cooled frequency converter offers robust design for medium and high power applications. The compact size with a totally enclosed cabinet is optimized for harsh environmental conditions. The ACS800 liquid-cooled product series provides advanced reliability for both industrial and marine sector. Liquid cooling minimizes the noise level and improves heat transfer without a need for air conditioning equipment.
Wall-mounted drive
ACS800-U1, 1 to 200 Hp

**Compact and complete drive**

The ACS800-U1 offers all that you need in a single, extremely small, wall-mounted package making it a compact and complete drive. The standard degree of protection is UL Type 1. Optional UL Type 12 allows full performance without derating. Power ratings start from 1 Hp heavy-duty rating and go up to 200 Hp continuous load rating. There are five different mechanical frame sizes covering the power range. Each frame size is optimized for performance, size and weight.

**Main standard hardware features**

- Wall mounting
- UL Type 1 protection class
- Compact design
- Harmonic filtering AC choke inside
- Input rectifier protection
- Brake chopper (in frame sizes R2-R3; R4 only 690 V)
- Long lifetime cooling fan and capacitors
- Extensive, programmable I/O with galvanically isolated inputs
- Three I/O and fieldbus extension slots inside
- Alphanumeric, multilingual control panel with start-up assistant feature
- Large power terminals allowing use of a wide range of cable sizes

**Options for ACS800-U1**

**Built in options:**
- UL Type 12 protection class
- Brake chopper (in frame sizes R4-R6)
- EMC filter for 1st environment, restricted distribution according to EN 61800-3
- EMC filter for 2nd environment, unrestricted distribution according to EN 61800-3
- Analog and digital I/O extension modules
- Fieldbus modules (Communication)
- Pulse encoder interface module
- Resolver interface (Limited SW Support)

**External options:**
- Brake resistor
- Output du/dt filters

**Everything inside**

From the smallest to the largest ACS800-U1 there is an extensive range of built in features and options. Standard features include an AC Line Choke for harmonic filtering and drive protection, extensive and flexible I/O, user-friendly control panel with Start-up Assistant feature and a silent, long lifetime cooling fan. Brake chopper is included as standard in the two smallest frame sizes R2 and R3 as well as in the 690V R4 frame. In other frames the chopper is a built in option. Other built in options include EMC filters and extension modules for additional I/O, fieldbus and pulse encoder interface modules.

NEMA 12 Enclosure
### Ratings and dimensions

#### ACS800-U1

<table>
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<tr>
<th>Type code</th>
<th>Frame size</th>
<th>Input</th>
<th>Nameplate current A</th>
<th>Normal Duty</th>
<th>Heavy-duty use</th>
<th>Noise Level</th>
<th>Air flow</th>
<th>Heat dissipation BTU/hr</th>
</tr>
</thead>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>I&lt;sub&gt;2N&lt;/sub&gt;</td>
<td>I&lt;sub&gt;1HD&lt;/sub&gt;</td>
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<td>P&lt;sub&gt;n&lt;/sub&gt;</td>
<td>I&lt;sub&gt;1max&lt;/sub&gt;</td>
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<td>Heat dissipation BTU/hr</td>
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<td></td>
<td></td>
<td></td>
<td>ft/min</td>
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</tbody>
</table>

*3-phase supply voltage 208, 220, 230, 240. The power ratings are valid at nominal voltage, 240Vac (50 & 60Hz)*

ACS800-U1-0002-2

- **Input**: A
- **Nameplate current A**: 5.2
- **Normal Duty**: I<sub>2N</sub> = 8.2, P<sub>n</sub> = 6.6
- **Heavy-duty use**: I<sub>1max</sub> = 12, P<sub>1HD</sub> = 8.1
- **Noise Level**: 62 dB
- **Air flow**: 21 ft/min
- **Heat dissipation**: 350 BTU/hr

ACS800-U1-0011-2

- **Input**: A
- **Nameplate current A**: 31.4
- **Normal Duty**: I<sub>2N</sub> = 46, P<sub>n</sub> = 10
- **Heavy-duty use**: I<sub>1max</sub> = 29.8
- **Noise Level**: 62 dB
- **Air flow**: 21 ft/min
- **Heat dissipation**: 350 BTU/hr

ACS800-U1-0016-2

- **Input**: A
- **Nameplate current A**: 38.6
- **Normal Duty**: I<sub>2N</sub> = 42, P<sub>n</sub> = 15
- **Heavy-duty use**: I<sub>1max</sub> = 31.1
- **Noise Level**: 62 dB
- **Air flow**: 21 ft/min
- **Heat dissipation**: 350 BTU/hr

ACS800-U1-0020-2

- **Input**: A
- **Nameplate current A**: 49.7
- **Normal Duty**: I<sub>2N</sub> = 54, P<sub>n</sub> = 20
- **Heavy-duty use**: I<sub>1max</sub> = 42
- **Noise Level**: 62 dB
- **Air flow**: 21 ft/min
- **Heat dissipation**: 350 BTU/hr

ACS800-U1-0025-2

- **Input**: A
- **Nameplate current A**: 64.8
- **Normal Duty**: I<sub>2N</sub> = 89, P<sub>n</sub> = 25
- **Heavy-duty use**: I<sub>1max</sub> = 54
- **Noise Level**: 62 dB
- **Air flow**: 21 ft/min
- **Heat dissipation**: 350 BTU/hr

ACS800-U1-0030-2

- **Input**: A
- **Nameplate current A**: 75
- **Normal Duty**: I<sub>2N</sub> = 80, P<sub>n</sub> = 26
- **Heavy-duty use**: I<sub>1max</sub> = 68
- **Noise Level**: 62 dB
- **Air flow**: 21 ft/min
- **Heat dissipation**: 350 BTU/hr

ACS800-U1-0040-2

- **Input**: A
- **Nameplate current A**: 102
- **Normal Duty**: I<sub>2N</sub> = 104, P<sub>n</sub> = 30
- **Heavy-duty use**: I<sub>1max</sub> = 80
- **Noise Level**: 62 dB
- **Air flow**: 21 ft/min
- **Heat dissipation**: 350 BTU/hr

ACS800-U1-0050-2

- **Input**: A
- **Nameplate current A**: 126
- **Normal Duty**: I<sub>2N</sub> = 132, P<sub>n</sub> = 40
- **Heavy-duty use**: I<sub>1max</sub> = 104
- **Noise Level**: 62 dB
- **Air flow**: 21 ft/min
- **Heat dissipation**: 350 BTU/hr

ACS800-U1-0060-2

- **Input**: A
- **Nameplate current A**: 153
- **Normal Duty**: I<sub>2N</sub> = 157, P<sub>n</sub> = 50
- **Heavy-duty use**: I<sub>1max</sub> = 130
- **Noise Level**: 62 dB
- **Air flow**: 21 ft/min
- **Heat dissipation**: 350 BTU/hr

ACS800-U1-0070-2

- **Input**: A
- **Nameplate current A**: 190
- **Normal Duty**: I<sub>2N</sub> = 192, P<sub>n</sub> = 60
- **Heavy-duty use**: I<sub>1max</sub> = 154
- **Noise Level**: 62 dB
- **Air flow**: 21 ft/min
- **Heat dissipation**: 350 BTU/hr

ACS800-U1-0080-2

- **Input**: A
- **Nameplate current A**: 252
- **Normal Duty**: I<sub>2N</sub> = 254, P<sub>n</sub> = 70
- **Heavy-duty use**: I<sub>1max</sub> = 65
- **Noise Level**: 62 dB
- **Air flow**: 21 ft/min
- **Heat dissipation**: 350 BTU/hr

### NOTES:

1 Overload may be limited to 5% at higher motor speeds (speed >90% motor base speed) by the internal power limit of the drive.

2 Overload may be limited to 40% at higher motor speeds (speed >90% motor base speed) by the internal power limit of the drive.

3 Rating not applicable for all motors. Available for some 4-pole 460V high efficiency NEMA motors.

7 ACS800 - U1 - XXXX - 5 + XXXX

---

### Enclosure

**Degree of Protection:**
- UL Type 1 (Standard)
- UL Type 12 (Optional)

**Paint color:**
- NCS1502-Y (RAL 90021/PMS 420C)

### Single Drives

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Customized solutions

The ACS800-PC is built in a robust cabinet designed for heavy-duty industrial applications with power ratings from 125 to 600 Hp. It is available in UL Type 1 and UL Type 12 enclosures.

Note: 450Hp and greater is only available in UL Type 12.

The ACS800-PC is a standardized packaged cabinet drive specifically designed for the US. This drive comes standard with a door interlock disconnect switch (circuit breaker) and current limiting fast acting Class T fuses. The disconnect switch is lockable in the off position. The ACS800-PC also offers a wide variety of options such as I/O expansion, Line Contactor with E-Stop and Aux Motor Starter.

Extensive range of features

The ACS800-PC has an extensive range of built in features and options. Typical option choices include extended I/O and fieldbus options, line contactor, EMC filtering, Aux Motor Starter, all mountable within the single cabinet.

Main standard features

- Compact design
- UL Type 1 protection class (0170-5 to 0400-5)
- UL Type 12 protection class (0440-5 to 0610-5)
- Built in harmonic filtering AC choke
- Common mode filters for motor protection
- Line disconnect switch (Circuit Breaker)
- Current Limiting Fast Acting Class T Fuses
- Extensive, programmable I/O
- Inputs galvanically isolated
- Long lifetime cooling fan and capacitors
- I/O and fieldbus extension slots inside
- Alphanumeric multilingual control panel with start-up assistant feature
- Top entry and exit of cables
- Coated Boards

Options for ACS800-PC

- Analog and digital I/O extension modules
- Brake chopper and resistor (resistor external)
- Customer terminal block
- EMC filter for 2nd environment, unrestricted distribution according to EN 61800-3 (standard in frame R8)
- Fieldbus modules
- UL Type 12 enclosure class
- Line contactor with emergency stop push button
- Output for fan motor (Aux Motor Starter)
- Pulse encoder interface module
- 1 or 2 thermistor relays
- 3 PT100 relays
- Resolver Interface (Limited SW Support)
Ratings and dimensions
ACS800-PC

<table>
<thead>
<tr>
<th>Type code</th>
<th>Frame size</th>
<th>Input A</th>
<th>I\textsubscript{max} A</th>
<th>Normal Duty (I\textsubscript{2N}) A</th>
<th>(P\textsubscript{N}) Hp</th>
<th>Heavy-duty use (I\textsubscript{2HD}) A</th>
<th>(P\textsubscript{HD}) Hp</th>
<th>Noise Level</th>
<th>Air flow ft\textsuperscript{3}/min</th>
<th>Heat Dissipation BTU/hr</th>
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<td>10100</td>
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<td>370</td>
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NOTES:
\(1\) 50% overload is allowed if ambient temperature is 30°C or less. Overload is limited to 40% at 40°C \(I\textsubscript{max}\) current available for 10 seconds at start.
\(I\textsubscript{2N}\) continuous base current at 40°C (104°F). Overload cycle 110\% \(I\textsubscript{2N}\) for 1 minute / 5 minutes allowed.
\(I\textsubscript{2HD}\) continuous base current at 40°C (104°F). Overload cycle 150\% \(I\textsubscript{max}\) for 1 minute / 5 minutes allowed.

- Current ratings do not change with different supply voltages.
- Horsepower ratings are based on NEMA motor ratings for typical 4-pole motors (1800 rpm). Check motor nameplate current for compatibility.

Enclosure
Degree of Protection:
UL Type 1
UL Type 12
Paint color:
Light beige RAL 7035 semi-gloss
Free-standing drive
ACS800-U2, 125 to 600 Hp

Compact and complete drive
The ACS800-U2 single drive is a unique, extremely compact bookshelf-style unit with a new innovative free-standing enclosure. The power ratings start from 125 Hp and go up to 600 Hp continuous load rating. It is available only in UL Type 1 protection class.

Fits anywhere
The ACS800-U2 drive is extremely compact without sacrificing user-friendliness. When using bookshelf mounting, even side-by-side installation is possible. In addition to bookshelf mounting, the ACS800-U2 offers the possibility for flat type (sideways) mounting, making it possible to optimize depth instead of width.

Everything inside
The ACS800-U2 has an extensive selection of built-in features and options. Standard features include an AC choke for harmonic filtering and drive protection, extensive and flexible I/O, user-friendly control panel with Start-up Assistant feature and a silent, long lifetime cooling fan.

Built in options include EMC filters, brake chopper, common mode filter for motor protection and extension modules for additional I/O, fieldbus and pulse encoder interface modules.

Main standard hardware features
- Free-standing
- UL Type 1 protection class
- Line fuse disconnect switch
- Harmonic filtering AC choke inside
- Input rectifier protection
- Long lifetime cooling fan and capacitors
- Extensive, programmable I/O with galvanically isolated inputs
- Three I/O and fieldbus extension slots inside
- Alphanumeric, multilingual control panel with start-up assistant feature
- Large power terminals allowing the use of a wide range of cable sizes
- The ACS800-U2 includes the extension enclosure as standard

Options for ACS800-U2

Built in options:
- Brake chopper
- EMC filter for 1st environment, restricted distribution according to EN 61800-3
- EMC filter for 2nd environment, unrestricted distribution according to EN 61800-3
- Analog and digital I/O extension modules
- Fieldbus modules
- Pulse encoder interface module
- Resolver Interface (Limited SW Support)
- Common mode filters for motor protection

Options available with standard enclosure extension:
- Contactor with emergency stop push button
- 1 or 2 thermistor relays
- 3 PT100 relays
- Cable bottom entry and exit
- Customer terminal block

External options:
- Brake resistor
- Output du/dt filters
## Single Drives

### Type code

<table>
<thead>
<tr>
<th>Type code</th>
<th>Frame size</th>
<th>Input</th>
<th>Normal Duty</th>
<th>Heavy-duty use</th>
<th>Noise Level</th>
<th>Air flow</th>
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<td>A</td>
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</table>

3-phase supply voltage 380, 400, 415, 460, 480, 500. The power ratings are valid at nominal voltage, 480Vac 60Hz.

<table>
<thead>
<tr>
<th>Type code</th>
<th>Frame size</th>
<th>Input</th>
<th>Normal Duty</th>
<th>Heavy-duty use</th>
<th>Noise Level</th>
<th>Air flow</th>
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### Enclosure

Degree of Protection:
UL Type 1 (Standard)
Paint color:
NCS 1502-Y (RAL 90021/PMS 420C)

### Ratings and dimensions

**UL Type 1**

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<th>Width (in)</th>
<th>Depth (in)</th>
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<th>Weight without enclosure extension* (lbs)</th>
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*Weights are for the basic configuration with switch fuse, but without contactor and other options.

### Notes:

1. 50% overload is allowed if ambient temperature is 30°C or less. Overload is limited to 40% at 40°C.
2. $I_{2N}$ current available for 10 seconds at start. $I_{2N}$ continuous base current at 40°C (104°F).
3. $I_{2HD}$ overload cycle 110% $I_{2N}$ for 1 minute / 5 minutes allowed.
4. $I_{2HD}$ continuous base current at 40°C (104°F). Overload cycle 150% $I_{2HD}$ for 1 minute / 5 minutes allowed.

- Current ratings do not change with different supply voltages.
- Horsepower ratings are based on NEMA motor ratings for typical 4-pole motors (1800 rpm). Check motor nameplate current for compatibility.
- ACS800-02 product is no longer available. If the -02 type product is required, select ACS800-U2-xxxx-0C111. This will delete the extension enclosure and force Bottom Entry/Exit. Adding +H350+H352 is not required.
Cabinet-built drive
ACS800-U7 75 to 600 Hp

**Customized solutions**

The ACS800-U7 is built in a robust cabinet designed for heavy-duty industrial applications with power ratings from 75 to 600 Hp.

The ACS800-U7 offers a wide variety of standardized configurations to adapt to different application requirements, from line contactor to prevention of unexpected motor start.

If your application requires more, ABB’s application engineering services can add special features to the standard product such as an additional cabinet for customer specific devices to ensure exact suitability for the application.

**Extensive range of features**

The ACS800-U7 has an extensive range of built-in features and options. Typical option choices include extended I/O and fieldbus options, line contactor, EMC filtering, common mode filtering and du/dt (voltage rise) filtering, all mountable within the single cabinet.

**Main standard features**

- Compact design
- UL Type 1 protection class
- Built in harmonic filtering AC choke
- Common mode filters for motor protection
- Line fuse disconnect switch
- Extensive, programmable I/O
- Inputs galvanically isolated
- Long lifetime cooling fan and capacitors
- 3 I/O and fieldbus extension slots inside
- Alphanumeric multilingual control panel with start-up assistant feature
- Top entry and exit of cables

**Options for ACS800-U7**

- Analog and digital I/O extension modules
- Brake chopper and resistor
- Cabinet heater
- Customer terminal block
- Ground fault monitoring for ungrounded network
- EMC filter for 1st environment, restricted distribution according to EN 61800-3
- EMC filter for 2nd environment, unrestricted distribution according to EN 61800-3
- Fieldbus modules
- UL Type 1 Filtered and UL Type 12 enclosure classes
- Line contactor with emergency stop push button
- Output for aux fan motor
- Pulse encoder interface module
- Prevention of unexpected start up of motor
- 1 or 2 thermistor relays
- 3, 5 or 8 PT100 relays
- Resolver Interface (Limited SW Support)

Plus tailor made options through ABB’s application engineering.
## Ratings and dimensions

### ACS800-U7

<table>
<thead>
<tr>
<th>Type code</th>
<th>Frame size</th>
<th>Input A</th>
<th>I_max A</th>
<th>I_2N A</th>
<th>P_N Hp</th>
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<th>Noise Level dBA</th>
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<td>R8</td>
<td>299</td>
<td>480</td>
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<td>718</td>
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<td>336</td>
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<td>361</td>
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<td>424</td>
<td>588</td>
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<td>250</td>
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<td>R8</td>
<td>498</td>
<td>588</td>
<td>510</td>
<td>400</td>
<td>370</td>
<td>300</td>
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<td>840</td>
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<td>400</td>
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<td>840</td>
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<td>1017</td>
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<td>33000</td>
</tr>
</tbody>
</table>

### Enclosure

- **Degree of Protection:**
  - UL Type 1
  - UL Type 1 Filtered, UL Type 12

- **Paint color:**
  - Light beige RAL 7035 semi-gloss

### Notes:

1. 50% overload is allowed if ambient temperature is 30°C or less. Overload is limited to 40% at 40°C
2. The higher rating is available when output frequency is above 41 Hz.

**NOTES:**

- Current ratings do not change with different supply voltages.
- Horsepower ratings are based on NEMA motor ratings for typical 4-pole motors (1800 rpm). Check motor nameplate current for compatibility.
Customized solutions

The ACS800-07 is built in a robust cabinet designed for heavy industrial applications.

The ACS800-07 offers a wide variety of standardized configurations to adapt to different application requirements, from line contator to prevention of unexpected motor start.

If your application requires more, ABB’s application engineering services can add special features to the standard product such as an additional cabinet for customer specific devices to ensure exact suitability for the application.

Smart module concept

ACS800-07 drives consist of separate rectifier and inverter modules, which have plug-in power connectors providing easy maintenance and redundancy with parallel connected units. If one module becomes defective, the drive can continue running with reduced power after disconnecting the faulty module.

Extensive range of features

The ACS800-07 has an extensive range of built in features and options. Typical option choices include extended I/O and fieldbus options, line contator, EMC filtering, common mode filtering and du/dt (voltage rise) output filtering, all mountable within the single cabinet.

Main standard features

- Compact design
- UL Type 1 protection class
- Built in harmonic filtering choke
- du/dt output filters
- Common mode filters for motor protection
- Line fuse disconnect switch
- Extensive, programmable I/O
- Inputs galvanically isolated
- Long lifetime cooling fan and capacitors
- 3 I/O and fieldbus extension slots inside
- Alphanumeric multilingual control panel with start-up assistant feature
- EMC filter for 2nd environment, unrestricted distribution according to EN 61800-3
- Top entry and exit of cables

Options for ACS800-07

- 6- or 12-pulse operation
- Analog and digital I/O extension modules
- Brake chopper and resistor
- Cabinet heater
- Customer terminal block
- Ground fault monitoring for ungrounded network
- EMC filter for 1st environment, restricted distribution according to EN 61800-3
- Fieldbus modules
- UL Type 1 Filtered and UL Type 12 enclosure classes
- Line contator with emergency stop push button
- Output for aux fan motor
- Pulse encoder interface module
- Prevention of unexpected start up of motor
- 1 or 2 thermistor relays
- 3, 5 or 8 Pt100 relays
- Resolver Interface (Limited SW Support)

Plus tailor made options through ABB’s application engineering group.
### Ratings and dimensions

**ACS800-07-XXXX-57+XXXX**

<table>
<thead>
<tr>
<th>Type code</th>
<th>Frame size</th>
<th>Input</th>
<th>I(_\text{max})</th>
<th>I(_\text{2N}) (\text{A})</th>
<th>I(_\text{N}) (\text{Hp})</th>
<th>I(_\text{2HD}) (\text{A})</th>
<th>I(_\text{HD}) (\text{Hp})</th>
<th>Noise Level (dBA)</th>
<th>Air flow (\text{ft}^3/\text{min})</th>
<th>Heat Dissipation (\text{BTU/hr})</th>
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<tbody>
<tr>
<td>ACS800-07-0760-5+C129+H359</td>
<td>1D4+2R8i</td>
<td>793</td>
<td>1321</td>
<td>848</td>
<td>700</td>
<td>660</td>
<td>550</td>
<td>73</td>
<td>1836</td>
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<td>ACS800-07-0870-7+C129+H359</td>
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<td>1091</td>
<td>700</td>
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<td>600</td>
<td>73</td>
<td>1836</td>
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<td>850</td>
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<td>700</td>
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<td>1208</td>
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<td>1900</td>
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<td>1993</td>
<td>2250</td>
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<td>4144</td>
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<td>2300</td>
<td>78</td>
<td>5933</td>
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</tbody>
</table>

3-phase supply voltage 380, 400, 415, 460, 480, 500. The power ratings are valid at nominal voltage, 480Vac 60Hz.

### Notes:
- \(I_{\text{max}}\) current available for 10 seconds at start.
- \(I_{\text{2N}}\) continuous base current at 40°C (104°F). Overload cycle 110% \(I_{\text{2N}}\) for 1 minute / 5 minutes allowed.
- \(I_{\text{HD}}\) continuous base current at 40°C (104°F). Overload cycle 150% \(I_{\text{HD}}\) for 1 minute / 5 minutes allowed.
- Current ratings do not change with different supply voltages.
- The rated current of the ACS800 must be greater than or equal to the rated motor current to achieve the rated motor power given in the table.
- Horsepower ratings are based on NEMA motor ratings for typical 4-pole motors (1800 rpm). Check motor nameplate current for compatibility.
Liquid-cooled drive
ACS800-07LC, 350 to 6,000 Hp

Ultimate solution for high power applications

The new liquid-cooled ACS800 frequency converter offers robust design for high power applications. The compact size with a totally enclosed cabinet is optimized for harsh environmental conditions. The liquid-cooled ACS800 product series provides advanced reliability for medium and high power applications.

The ACS800-07LC single drive is available from 350 HP up to 6,000 HP at 380 to 690 V supply voltages.

Advanced liquid cooling

The ACS800 liquid-cooled drive utilizes direct liquid cooling which makes the converter extremely compact and silent. Liquid cooling reduces the need for high power filtered air-cooling in the installation rooms. Along with the high efficiency, direct liquid cooling offers low noise and easy heat transfer without air filtering.

Customized solutions

The modular hardware design and advanced software features of the liquid-cooled single drive enable the most sophisticated drive solutions for both induction and permanent magnet motors. The design meets the international standards.

The ACS800-07LC product offering includes variety of standardized configurations to adapt to different application requirements. If your application requires more, ABB’s application engineering services can add special features to the standard product. ABB’s extensive application and product know-how is at your service.

Intelligence and high availability

The ABB ACS800 liquid-cooled series has a number of unique features as standard, and which are not available in previous generations of ABB drives. These include:

- Built in redundancy through parallel connected modules - each module is a complete three-phase inverter
- Ability to run with partial load even when one of the modules is not operating - enabling higher drive availability and greater process uptime.

With ABB drives, you get more than the most reliable equipment and systems. ABB drives are backed by our full service and support network, which covers field service and training as well as spare parts. This ensures reliable and economic operation under all conditions “Compact and easy” – are the watchwords to describe the entire ACS800 liquid-cooled drive range. They demonstrate how technology enables ABB to add more and more features into a shrinking space – and still give the benefits of easy installation, access and use.
### Ratings and dimensions

**ACS800-07LC**

<table>
<thead>
<tr>
<th>Type code</th>
<th>Frame Size</th>
<th>Input A (AC)</th>
<th>Imax A (AC)</th>
<th>Normal duty</th>
<th>Heavy-duty use</th>
<th>Noise level</th>
<th>Liquid Qty</th>
<th>Mass flow gpm</th>
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<td></td>
<td></td>
<td>A2N</td>
<td>PN</td>
<td>I2N</td>
<td>PHD</td>
<td>12N</td>
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<td>HP</td>
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<td>1xD3 + 1xR8i</td>
<td>673</td>
<td>524</td>
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<td>408</td>
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<td>1100</td>
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<td>1550</td>
<td>1371</td>
<td>1200</td>
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<td>2100</td>
<td>1828</td>
<td>1600</td>
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<td>3581</td>
<td>3200</td>
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</table>

3-phase supply voltage: 380, 400, 415, 460, 480, 500. The power ratings are valid at nominal voltage, 480Vac 60Hz.

ACS800-07LC-0700-7 | 1xD3 + 1xR8i | 872 | 560 | 600 | 436 | 450 | 55 | 12 | 1.7 | 8.5 |
| ACS800-07LC-0940-7 | 1xD3 + 2xR8i | 1182 | 759 | 800 | 591 | 600 | 56 | 17 | 2.1 | 12 |
| ACS800-07LC-1070-7 | 1xD3 + 2xR8i | 1344 | 863 | 950 | 672 | 700 | 56 | 19 | 2.1 | 12 |
| ACS800-07LC-1370-7 | 1xD3 + 3xR8i | 1710 | 1097 | 1200 | 855 | 950 | 56 | 22 | 2.1 | 12 |
| ACS800-07LC-1590-7 | 1xD3 + 3xR8i | 1996 | 1281 | 1400 | 998 | 1100 | 57 | 28 | 2.1 | 16 |
| ACS800-07LC-2030-7 | 1xD4 + 3xR8i | 2538 | 1629 | 1800 | 1269 | 1400 | 57 | 34 | 2.1 | 15 |
| ACS800-07LC-2680-7 | 2xD4 + 3xR8i | 3350 | 2150 | 2400 | 1675 | 1800 | 58 | 44 | 2.1 | 24 |
| ACS800-07LC-3330-7 | 2xD4 + 5xR8i | 4166 | 2673 | 3000 | 2083 | 2400 | 58 | 55 | 2.1 | 27 |
| ACS800-07LC-3970-7 | 2xD4 + 5xR8i | 4974 | 3191 | 3600 | 2487 | 2800 | 59 | 66 | 2.1 | 31 |
| ACS800-07LC-4630-7 | 3xD4 + 5xR8i | 5802 | 3723 | 4200 | 2901 | 3300 | 60 | 76 | 2.1 | 37 |
| ACS800-07LC-5300-7 | 3xD4 + 6xR8i | 6630 | 4265 | 4800 | 3315 | 3700 | 61 | 87 | 2.1 | 43 |
| ACS800-07LC-5960-7 | 3xD4 + 7xR8i | 7460 | 4787 | 5400 | 3730 | 4200 | 62 | 99 | 2.1 | 46 |
| ACS800-07LC-6620-7 | 3xD4 + 10xR8i | 8288 | 5319 | 6000 | 4144 | 4700 | 62 | 112 | 2.1 | 49 |

3-phase supply voltage: 525, 550, 575, 600, 690. The power ratings are valid at nominal voltage, 575Vac 60Hz.

<table>
<thead>
<tr>
<th>Frame Size</th>
<th>Height</th>
<th>Width w/o LC unit</th>
<th>Width with LC unit</th>
<th>Depth</th>
<th>Weight</th>
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<tbody>
<tr>
<td>1xD3 + 1xR8i</td>
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<td>1xD4 + 2xR8i</td>
<td>78.9</td>
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<td>48.4</td>
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<td>1918</td>
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<td>1xD4 + 3xR8i</td>
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<td>44.5</td>
<td>56.3</td>
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<td>2293</td>
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</tbody>
</table>

NOTES:

These ratings apply at 45 ºC degrees ambient temperature. At higher temperatures (up to 55ºC) the derating is 1% / 1 ºC.

Nominal Ratings:

- **Imax**: maximum output current. Available for 10 seconds at start, otherwise as long as allowed by drive temperature.
- **IN**: continuous base current allowing 110% overload for 1 minute / 5 minutes.
- **Ihd**: continuous base current allowing 150% overload for 1 minute / 5 minutes.

The current ratings are the same regardless of the supply voltage within one voltage range.

1) Total height with marine supports is 82.2 inches
2) Pressure release lids require an additional 15.7 inches
Regenerative AC drive, wall-mounted
ACS800-U11, 7.5 to 125 Hp

Wall-mounted regenerative drive

The ACS800-U11 is a wall-mounted drive equipped with an active supply unit. It offers a full performance regenerative drive in one compact package. The drive has extensive selection of built in features and options. The power ratings start from 7.5 Hp heavy-duty rating and go up to 125 Hp continuous rating. It is only available with UL Type 1 protection class.

Complete regenerative drive

The ACS800-U11 offers you a complete regenerative drive in a single, compact wall-mounted package. All the functions of a regenerative drive, such as an active supply unit, LCL line filter and charging circuitry, are integrated inside the drive. All this makes it possible to save installation time and space on the site, and also prevents installation mistakes as the drive is tested at the factory as a complete package.

Energy savings

The regenerative drive offers significant energy savings compared with other braking methods such as mechanical and resistor braking, as energy is fed back to the AC line network. No external brake resistor is needed, which translates into simplified installation and no electrical energy wasted as heat.

Main standard hardware features

- Wall-mounting
- UL Type 1 protection class
- LCL line filter inside
- Active supply unit inside
- Long lifetime cooling fan and capacitors
- Extensive, programmable I/O with galvanically isolated inputs
- Three I/O and fieldbus extension slots inside
- Alphanumeric, multilingual control panel with start-up assistant feature
- Large power terminals allowing the use of a wide range of cable sizes

Options for ACS800-U11

Built in options:
- EMC filter for 1st environment, restricted distribution according to EN 61800-3
- EMC filter for 2nd environment, unrestricted distribution according to EN 61800-3
- Analog and digital I/O extension modules
- Fieldbus modules
- Pulse encoder interface module
- Resolver Interface (Limited SW Support)

External options:
- Output du/dt filters
### Ratings and dimensions

**ACS800-U11**

<table>
<thead>
<tr>
<th>Type code</th>
<th>Frame size</th>
<th>Input A</th>
<th>$I_{\text{max}}$ A</th>
<th>$I_{2\text{N}}$ A</th>
<th>$P_{\text{N}}$ Hp</th>
<th>$I_{2\text{HD}}$ A</th>
<th>$P_{\text{PHD}}$ Hp</th>
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<th>Air flow ft/min</th>
<th>Heat Dissipation BTU/hr</th>
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### 3-phase supply voltage 380, 400, 415, 460, 480, 500. The power ratings are valid at nominal voltage, 480Vac 60Hz

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### 3-phase supply voltage 525, 575, 600. The power ratings are valid at nominal voltage, 575Vac 60Hz

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<th>$P_{\text{PHD}}$ Hp</th>
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</table>

**NOTES:**
- $I_{\text{max}}$ current available for 10 seconds at start.
- $I_{2\text{N}}$ continuous base current at 40°C (104°F). Overload cycle 110% $I_{2\text{N}}$ for 1 minute / 5 minutes allowed.
- $I_{2\text{HD}}$ continuous base current at 40°C (104°F). Overload cycle 150% $I_{2\text{HD}}$ for 1 minute / 5 minutes allowed.
- Current ratings do not change with different supply voltages.
- Horsepower ratings are based on NEMA motor ratings for typical 4-pole motors (1800 rpm). Check motor nameplate current for compatibility.
Regenerative AC drive, cabinet-built
ACS800-17, 125 to 2600 Hp

Complete regenerative drive

The ACS800-17 offers you a complete regenerative drive in a single, compact cabinet-built package. The drive includes everything that is needed for regenerative operation, including line filter. The active supply unit allows full power flow both in motoring and regenerating modes.

Energy savings

Compared with other braking methods such as mechanical and resistor braking, the energy savings can be significant with the ACS800-17. The braking energy is returned to the AC Line network, not wasted as heat. Handling of waste heat may also be a problem if braking power is significant. As no external braking devices are needed with the ACS800-17, installation work is simpler and the space requirement for installation is less.

High performance

The ACS800-17 is especially suitable for demanding applications. Transition between motoring and generating is fast due to the patented DTC motor control method. The active supply unit is able to boost output voltage, which guarantees full motor voltage even when the supply voltage is below nominal.

The active supply unit combined with the DTC motor control can even compensate for fast variations in line voltage. There is no risk of fuse blow or component damage due to voltage drops in the network while regenerating.

Extensive range of features

Adaptation to different application requirements is possible by selecting from a wide range of standardized configurations. The cabinet-built drive series enables having a significant number of features and accessories as built in options.

Main standard features

- Compact design
- UL Type 1 protection class
- LCL line filter inside
- EMC filter for 2nd environment, unrestricted distribution according to EN 61800-3
- Main disconnect switch with aR fuses (ultra fast)
- Line contactor
- Withdrawable air circuit breaker (in frame size nxR8i)
- Du/dt filters (in frame size nxR8i)
- Coated boards
- Extensive, programmable I/O
- Long lifetime cooling fan and capacitors
- Inputs galvanically isolated
- 3 I/O and fieldbus extension slots inside
- Alphanumeric multilingual control panel with start-up assistant feature

Options for the ACS800-17

- Analogue and digital I/O extension modules
- ATEX approved motor protection
- Cabinet heater
- Customer terminal block
- du/dt output filters (frames R7i -R8i)
- Ground fault monitoring for ungrounded network
- EMC filter for 1st environment, restricted distribution according to EN 61800-3
- Fieldbus modules
- UL Type 1 Filtered & UL Type 12 enclosure classes
- Emergency stop, category 0 or 1
- Output for aux motor fan
- Pulse encoder interface module
- Prevention of unexpected start up of motor
- Top entry and exit of cables
- 1 or 2 thermistor relays
- 3, 5 or 8 PT100 relays
- Resolver Interface (Limited SW Support)

Plus tailor made accessories through ABB’s application engineering.
### Ratings and dimensions

**ACS800-17**

**Ratings and dimensions**

<table>
<thead>
<tr>
<th>Type code</th>
<th>Frame size</th>
<th>Input</th>
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<th>Heavy-duty use</th>
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<td>( P_{n} )</td>
<td>( I_{2HD} )</td>
<td>( P_{HD} )</td>
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<td>Air flow</td>
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<td>A</td>
<td>Hp</td>
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#### Notes:

- Current ratings do not change with different supply voltages.
- The rated current of the ACS800 must be greater than or equal to the rated motor current to achieve the rated motor power given in the table.
- Horsepower ratings are based on NEMA motor ratings for typical 4-pole motors (1800 rpm). Check motor nameplate current for compatibility.

### Enclosure

**Degree of Protection:**
- UL Type 1 (Standard)
- UL Type 1 Filtered, UL Type 12 (opt)

**Paint color:**
- Light beige RAL 7035 semi-gloss

### Diagram

**Single Drives**

25
Ultra low harmonic, wall mounted
ACS800-U31, 7.5 to 125 Hp

Simple low harmonic solution

There is increasing concern among end users and power companies about the harmful effects of harmonics. Harmonic distortion may disturb or even damage sensitive equipment connected in the same environment. Harmonic standards are thus becoming stricter and there is a growing demand for low harmonic solutions.

The ACS800-U31 drive offers an easy solution to the problem of harmonics. The solution itself is incorporated in the drive, eliminating the need for any additional filtering equipment or complicated and large multi-pulse transformer arrangements.

Meets the strictest standards

The ACS800-U31 eliminates low order harmonics with the active converter controlled with DTC, and high order harmonics with an LCL line filter. The result is exceptionally low harmonic content in the network; exceeding the requirements set by standard IEEE519 at the drive input terminals even on the weakest AC line network. The ACS800-U31 provides you with a simple, compact and complete solution to meet stringent power quality standards.

Beats external solutions

The ACS800-U31 does not require a dedicated multi-pulse transformer and thus is simpler in terms of cabling arrangements and requires less floor space. Harmonic performance is better than with 12- and 18-pulse solutions. Passive or active external filtering devices are avoided with the ACS800-U31, making the solution compact and simple. Other advantages of the ACS800-U31 is that it always operates with unity power factor 1 and is impervious to AC Line Voltage imbalances up to and over 3%. The system efficiency is also better than 12 and 18-pulse solutions due to the simplified transformer.

Main standard features

- Meets IEEE519-1992 at Drive input terminals
- Wall mounting
- Compact design
- UL Type 1 protection class
- Built in low harmonic LCL filter
- Coated boards
- Extensive, programmable I/O
- Long lifetime cooling fan and capacitors
- Inputs galvanically isolated
- 3 I/O and fieldbus extension slots inside
- Alphanumeric multilingual control panel with a start-up assistant feature

Options for ACS800-U31

- Braking chopper
- EMC filter for 1st environment, restricted distribution according to EN 61800-3
- EMC filter for 2nd environment, unrestricted distribution according to EN 61800-3
- Analog and digital I/O extension modules
- Fieldbus modules
- Pulse encoder interface module
- Resolver interface (limited SW Support)
### Ratings and dimensions

**ACS800-U31**

<table>
<thead>
<tr>
<th>Type code</th>
<th>Frame size</th>
<th>Input A</th>
<th>Normal Duty</th>
<th>Heavy-duty use</th>
<th>Noise Level</th>
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<td>P(_{\text{N}}) Hp</td>
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*3-phase supply voltage 208, 220, 230, 240. The power ratings are valid at nominal voltage, 240Vac (50 & 60Hz)*

<table>
<thead>
<tr>
<th>Type code</th>
<th>Frame size</th>
<th>Input A</th>
<th>Normal Duty</th>
<th>Heavy-duty use</th>
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<td>I(_{\text{max}}) A</td>
<td>I(_{\text{2N}}) A</td>
<td>P(_{\text{N}}) Hp</td>
<td>I(_{\text{2HD}}) A</td>
<td>P(_{\text{H}}) Hp</td>
<td>dBA</td>
</tr>
<tr>
<td>ACS800-U31-0020-5</td>
<td>R5</td>
<td>29</td>
<td>29</td>
<td>20</td>
<td>25</td>
<td>15</td>
<td>70</td>
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<tr>
<td>ACS800-U31-0025-5</td>
<td>R5</td>
<td>33</td>
<td>34</td>
<td>25</td>
<td>30</td>
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<td>70</td>
</tr>
<tr>
<td>ACS800-U31-0030-5</td>
<td>R5</td>
<td>44</td>
<td>45</td>
<td>30</td>
<td>37</td>
<td>25</td>
<td>70</td>
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<td>ACS800-U31-0040-5</td>
<td>R5</td>
<td>54</td>
<td>55</td>
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<td>47</td>
<td>30</td>
<td>70</td>
</tr>
<tr>
<td>ACS800-U31-0050-5</td>
<td>R5</td>
<td>65</td>
<td>67</td>
<td>50</td>
<td>57</td>
<td>40</td>
<td>70</td>
</tr>
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<td>ACS800-U31-0060-5</td>
<td>R5</td>
<td>76</td>
<td>78</td>
<td>60</td>
<td>62</td>
<td>50</td>
<td>70</td>
</tr>
<tr>
<td>ACS800-U31-0070-5</td>
<td>R6</td>
<td>112</td>
<td>114</td>
<td>75</td>
<td>86</td>
<td>60</td>
<td>73</td>
</tr>
<tr>
<td>ACS800-U31-0100-5</td>
<td>R6</td>
<td>129</td>
<td>132</td>
<td>100</td>
<td>114</td>
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<td>ACS800-U31-0120-5</td>
<td>R6</td>
<td>145</td>
<td>156</td>
<td>125</td>
<td>125</td>
<td>100</td>
<td>73</td>
</tr>
</tbody>
</table>

*3-phase supply voltage 380, 400, 415, 460, 480, 500. The power ratings are valid at nominal voltage, 480Vac 60Hz*

<table>
<thead>
<tr>
<th>Type code</th>
<th>Frame size</th>
<th>Input A</th>
<th>Normal Duty</th>
<th>Heavy-duty use</th>
<th>Noise Level</th>
<th>Air flow</th>
<th>Heat Dissipation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>I(_{\text{max}}) A</td>
<td>I(_{\text{2N}}) A</td>
<td>P(_{\text{N}}) Hp</td>
<td>I(_{\text{2HD}}) A</td>
<td>P(_{\text{H}}) Hp</td>
<td>dBA</td>
</tr>
<tr>
<td>ACS800-U31-0060-7</td>
<td>R6</td>
<td>53</td>
<td>54</td>
<td>50</td>
<td>43</td>
<td>40</td>
<td>73</td>
</tr>
<tr>
<td>ACS800-U31-0070-7</td>
<td>R6</td>
<td>73</td>
<td>75</td>
<td>60</td>
<td>50</td>
<td>50</td>
<td>73</td>
</tr>
<tr>
<td>ACS800-U31-0100-7</td>
<td>R6</td>
<td>86</td>
<td>88</td>
<td>75</td>
<td>71</td>
<td>60</td>
<td>73</td>
</tr>
</tbody>
</table>

*3-phase supply voltage 525, 575, 600. The power ratings are valid at nominal voltage, 575Vac 60Hz*

### Alternatives in reducing AC line harmonics

**6 pulse rectifier**

- Transformer and cabling simple
- Current very distorted >I\(_{\text{thd}}\) 30%

**12 pulse rectifier**

- Transformer and cabling complicated
- Current distorted >I\(_{\text{thd}}\) 12%

**18 pulse rectifier**

- Transformer and cabling complicated
- Current wave form good >I\(_{\text{thd}}\) 6%

**ACS800-U31**

- Transformer and cabling simple
- Current wave form best I\(_{\text{thd}}\) ~ 4.5%

**NOTES:**

- \(I_{\text{thd}}\) continuous base current at 40°C (104°F). Overload cycle 110% \(I_{\text{thd}}\) for 1 minute / 5 minutes allowed.
- \(1_{\text{thd}}\) continuous base current at 40°C (104°F). Overload cycle 150% \(I_{\text{thd}}\) for 1 minute / 5 minutes allowed.
- Horsepower ratings are based on NEMA motor ratings for typical 4-pole motors (1800 rpm). Check motor nameplate current for compatibility.

### Enclosure

**Degree of Protection:**
- UL Type 1 (Standard)

**Paint color:**
- NCS 1502-Y (RAL 90021/PMS 420C)

### UL Type 1

<table>
<thead>
<tr>
<th>Frame size</th>
<th>Height (in)</th>
<th>Width (in)</th>
<th>Depth (in)</th>
<th>Weight (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R5</td>
<td>32.1</td>
<td>10.4</td>
<td>15.4</td>
<td>143</td>
</tr>
<tr>
<td>R6</td>
<td>38.2</td>
<td>11.8</td>
<td>17.3</td>
<td>220.5</td>
</tr>
</tbody>
</table>

**NOTES:**

- \(I_{\text{thd}}\) current available for 10 seconds at start.
- \(I_{\text{thd}}\) continuous base current at 40°C (104°F). Overload cycle 110% \(I_{\text{thd}}\) for 1 minute / 5 minutes allowed.
- \(I_{\text{thd}}\) continuous base current at 40°C (104°F). Overload cycle 150% \(I_{\text{thd}}\) for 1 minute / 5 minutes allowed.
- Current ratings do not change with different supply voltages.
- Horsepower ratings are based on NEMA motor ratings for typical 4-pole motors (1800 rpm). Check motor nameplate current for compatibility.
Ultra low harmonic drive, cabinet-built
ACS800-37, 125 to 2800 Hp

Simple low harmonic solution

There is increasing concern among end users and power companies about the harmful effects of harmonics. Harmonic distortion may disturb or even damage sensitive equipment connected in the same environment. Harmonic standards are thus becoming stricter and there is a growing demand for low harmonic solutions.

The ACS800-37 drive offers an easy solution to the problem of harmonics. The solution itself is incorporated in the drive, eliminating the need for any additional filtering equipment or complicated and large multi-pulse transformer arrangements.

Meets the strictest standards

The ACS800-37 eliminates low order harmonics with the active converter controlled with DTC, and high order harmonics with an LCL line filter. The result is exceptionally low harmonic content in the network; exceeding the requirements set by standard IEEE519 at the drive input terminals even on the weakest AC line network. The ACS800-37 provides you with a simple, compact, and complete solution to meet stringent power quality standards.

Beats external solutions

The ACS800-37 does not require a dedicated multi-pulse transformer and thus is simpler in terms of cabling arrangements and requires less floor space. Harmonic performance is better than both 12- and 18-pulse solutions. Passive or active external filtering devices are avoided with the ACS800-37, making the solution compact and simple. Other advantages of the ACS800-37 is that it always operates with unity power factor 1 and is impervious to AC line voltage imbalances up to and over 3%. The system efficiency is also better than 12 and 18-pulse solutions due to the simplified transformer.

Extensive range of features

In line with other ACS800 cabinet-built drives, the ACS800-37 offers a wide variety of standardized configurations to adapt to different application requirements. The smart module concept enables easy maintenance and redundancy in the high power range where multiple identical power modules make one power structure. If one power module fails the drive may be operated at reduced capacity.

Main standard features

- Meets IEEE519-1992 at Drive input terminals
- Compact design
- UL Type 1 protection class
- Built in low harmonic LCL filter
- EMC filter for 2nd environment, unrestricted distribution according to EN 61800-3
- Main switch with aR fuses
- Line contactor
- Removable air circuit breaker (in frame size nxR8i)
- Du/dt filters (in frame size nxR8i)
- Coated boards
- Extensive, programmable I/O
- Long lifetime cooling fan and capacitors
- Inputs galvanically isolated
- 3 I/O and fieldbus extension slots inside
- Alphanumeric multilingual control panel with a start-up assistant feature

Options for ACS800-37

- Analogue and digital I/O extension modules
- Braking chopper and resistor
- Cabinet heater
- Customer terminal block
- Du/dt filters (in frame sizes R7i-R8i)
- Earth fault monitoring for unearthed network
- EMC filter for 1st environment, restricted distribution according to EN 61800-3
- Fieldbus modules
- UL Type 1 Filtered or UL Type 12 enclosure classes
- Emergency stop, category 0 or 1
- Output for motor fan
- Pulse encoder interface module
- Prevention of unexpected start up of motor
- Bottom entry and exit of cables
- 1 or 2 thermistor relays
- 3, 5 or 8 PT100 relays

Plus tailor made accessories through ABB’s application engineering.
### Alternatives in reducing AC line harmonics

<table>
<thead>
<tr>
<th>Transformer and cabling</th>
<th>Transformer and cabling</th>
<th>Transformer and cabling</th>
<th>Transformer and cabling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple</td>
<td>Complicated</td>
<td>Simple</td>
<td>Simple</td>
</tr>
<tr>
<td>Current very distorted</td>
<td>Current distorted</td>
<td>Current wave form good</td>
<td>Current wave form best</td>
</tr>
<tr>
<td>&gt;Ithd 30%</td>
<td>&gt;Ithd 12%</td>
<td>&gt;Ithd 6%</td>
<td>Ithd ~ 4.5%</td>
</tr>
</tbody>
</table>

### Ratings and dimensions

**ACS800-37**

<table>
<thead>
<tr>
<th>Type code</th>
<th>Frame size</th>
<th>Input</th>
<th>I&lt;sub&gt;max&lt;/sub&gt;</th>
<th>Normal Duty</th>
<th>Heavy-duty use</th>
<th>Noise Level</th>
<th>Air flow</th>
<th>Heat Dissipation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>I&lt;sub&gt;2N&lt;/sub&gt;</td>
<td>P&lt;sub&gt;H&lt;/sub&gt;</td>
<td>I&lt;sub&gt;2HD&lt;/sub&gt;</td>
<td></td>
<td>ft/min</td>
<td>BTU/Hr</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>dBA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Alternatives

- **6 pulse rectifier**
- **12 pulse rectifier**
- **18 pulse rectifier**
- **ACS800-37**

**NOTES:**
- I<sub>0</sub> current available for 10 seconds at start.
- I<sub>2N</sub> continuous base current at 40°C (104°F).
- Overload cycle 110% I<sub>2N</sub> for 1 minute / 5 minutes allowed.
- I<sub>2HD</sub> continuous base current at 40°C (104°F).
- Overload cycle 150% I<sub>2N</sub> for 1 minute / 5 minutes allowed.

- Current ratings do not change with different supply voltages.
- The rated current of the ACS800 must be greater than or equal to the rated motor current to achieve the rated motor power given in the table.
- Horsepower ratings are based on NEMA motor ratings for typical 4-pole motors (1800 rpm). Check motor nameplate current for compatibility.

#### Enclosure

- Degree of Protection: UL Type 1 (Standard) UL Type 1 Filtered and UL Type 12 (opt)
- Paint color: Light beige RAL 7035 semi-gloss

#### Alternatives

- **6 pulse rectifier**
- **12 pulse rectifier**
- **18 pulse rectifier**
- **ACS800-37**

**NOTES:**
- I<sub>0</sub> current available for 10 seconds at start.
- I<sub>2N</sub> continuous base current at 40°C (104°F).
- Overload cycle 110% I<sub>2N</sub> for 1 minute / 5 minutes allowed.
- I<sub>2HD</sub> continuous base current at 40°C (104°F).
- Overload cycle 150% I<sub>2N</sub> for 1 minute / 5 minutes allowed.

- Current ratings do not change with different supply voltages.
- The rated current of the ACS800 must be greater than or equal to the rated motor current to achieve the rated motor power given in the table.
- Horsepower ratings are based on NEMA motor ratings for typical 4-pole motors (1800 rpm). Check motor nameplate current for compatibility.

#### Alternatives in reducing AC line harmonics

<table>
<thead>
<tr>
<th>Current very distorted</th>
<th>Current distorted</th>
<th>Current wave form good</th>
<th>Current wave form best</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;Ithd 30%</td>
<td>&gt;Ithd 12%</td>
<td>&gt;Ithd 6%</td>
<td>Ithd ~ 4.5%</td>
</tr>
</tbody>
</table>

**Ithd** = Total Harmonic Distortion Current
Brake options

The ACS800 series has built in brake choppers for all types. Therefore, no additional space or installation time is needed. The brake chopper is part of the standard delivery for the frame sizes R2 - R3 and at 690V frame R4. For the other frames a brake chopper is a selectable option.

Braking control is integrated into the ACS800 series. It controls the braking, supervises the system status and detects failures such as brake resistor and resistor cable short circuits, chopper short circuit, and calculated resistor overtemperature.

Brake chopper

The ACS800 series has built in brake choppers for all types. Therefore, no additional space or installation time is needed. The brake chopper is part of the standard delivery for the frame sizes R2 - R3 and at 690V frame R4. For the other frames a brake chopper is a selectable option.

Brake chopper

Brake resistor

Brake resistors are separately available for all ACS800 types. Resistors other than the standard resistors may be used providing the specified resistance value is not decreased, and the heat dissipation capacity of the resistor is sufficient for the drive application.

For ACS800 units, no separate fuses in the brake circuit are required if the following conditions are met:
- The ACS800 mains cable is protected with fuses
- No mains cable/fuse overrating takes place

Dynamic Braking Table - 200-240V applications, stopping duty only

<table>
<thead>
<tr>
<th>Drive P/N</th>
<th>HP</th>
<th>ND</th>
<th>Duty Cycle = 3sec on / 27sec off</th>
<th>Duty Cycle = 10sec on / 50sec off</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABB-48431-020</td>
<td>44.0</td>
<td>324</td>
<td>12Wx5Dx5H</td>
<td>ABB-48431-020</td>
</tr>
<tr>
<td>ABB-48431-020</td>
<td>44.0</td>
<td>324</td>
<td>12Wx5Dx5H</td>
<td>ABB-48431-020</td>
</tr>
<tr>
<td>ABB-48431-020</td>
<td>44.0</td>
<td>324</td>
<td>12Wx5Dx5H</td>
<td>ABB-48431-020</td>
</tr>
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<td>44.0</td>
<td>324</td>
<td>12Wx5Dx5H</td>
<td>ABB-48431-020</td>
</tr>
<tr>
<td>ABB-48431-020</td>
<td>44.0</td>
<td>324</td>
<td>12Wx5Dx5H</td>
<td>ABB-48431-020</td>
</tr>
<tr>
<td>ABB-48431-020</td>
<td>44.0</td>
<td>324</td>
<td>12Wx5Dx5H</td>
<td>ABB-48431-020</td>
</tr>
<tr>
<td>ABB-48431-020</td>
<td>44.0</td>
<td>324</td>
<td>12Wx5Dx5H</td>
<td>ABB-48431-020</td>
</tr>
<tr>
<td>ABB-48431-020</td>
<td>44.0</td>
<td>324</td>
<td>12Wx5Dx5H</td>
<td>ABB-48431-020</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Drive P/N</th>
<th>HP</th>
<th>ND</th>
<th>Duty Cycle = 30sec on / 180sec off</th>
<th>Duty Cycle = 60sec on / 180sec off</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABB-48431-020</td>
<td>44.0</td>
<td>324</td>
<td>12Wx5Dx5H</td>
<td>ABB-48431-020</td>
</tr>
<tr>
<td>ABB-48431-020</td>
<td>44.0</td>
<td>324</td>
<td>12Wx5Dx5H</td>
<td>ABB-48431-020</td>
</tr>
<tr>
<td>ABB-48431-020</td>
<td>44.0</td>
<td>324</td>
<td>12Wx5Dx5H</td>
<td>ABB-48431-020</td>
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<td>ABB-48431-020</td>
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<td>324</td>
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<td>324</td>
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<td>ABB-48431-020</td>
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<tr>
<td>ABB-48431-020</td>
<td>44.0</td>
<td>324</td>
<td>12Wx5Dx5H</td>
<td>ABB-48431-020</td>
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<tr>
<td>ABB-48431-020</td>
<td>44.0</td>
<td>324</td>
<td>12Wx5Dx5H</td>
<td>ABB-48431-020</td>
</tr>
</tbody>
</table>

Hardware Options
**Brake options**

Dynamic Braking Table - 380-480V applications, stopping duty only

<table>
<thead>
<tr>
<th>Drive P/N ACS800-U1-</th>
<th>HP ND</th>
<th>Duty Cycle = 3 sec on / 27 sec off</th>
<th>Duty Cycle = 10 sec on / 50 sec off</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Resistor Part No.</td>
<td>Ohms</td>
</tr>
<tr>
<td>0004-5</td>
<td>3</td>
<td>ABB-48431-020</td>
<td>44.0</td>
</tr>
<tr>
<td>0005-5</td>
<td>3</td>
<td>ABB-48431-020</td>
<td>44.0</td>
</tr>
<tr>
<td>0006-5</td>
<td>5</td>
<td>ABB-48431-021</td>
<td>44.0</td>
</tr>
<tr>
<td>0009-5</td>
<td>8</td>
<td>ABB-48431-021</td>
<td>44.0</td>
</tr>
<tr>
<td>0011-5</td>
<td>10</td>
<td>ABB-48431-021</td>
<td>44.0</td>
</tr>
<tr>
<td>0016-5</td>
<td>15</td>
<td>ABB-48431-002</td>
<td>22.0</td>
</tr>
<tr>
<td>0020-5</td>
<td>20</td>
<td>ABB-48431-003</td>
<td>22.0</td>
</tr>
<tr>
<td>0025-5</td>
<td>25</td>
<td>ABB-48431-004</td>
<td>22.0</td>
</tr>
<tr>
<td>0030-5</td>
<td>30</td>
<td>ABB-48431-031</td>
<td>13.0</td>
</tr>
<tr>
<td>0040-5</td>
<td>40</td>
<td>ABB-48431-032</td>
<td>13.0</td>
</tr>
<tr>
<td>0050-5</td>
<td>50</td>
<td>ABB-48431-006</td>
<td>8.5</td>
</tr>
<tr>
<td>0060-5</td>
<td>60</td>
<td>ABB-48431-097</td>
<td>8.5</td>
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<tr>
<td>0070-5</td>
<td>75</td>
<td>ABB-48431-120</td>
<td>8.0</td>
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<td>0100-5</td>
<td>100</td>
<td>ABB-48431-159</td>
<td>5.3</td>
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<td>0120-5</td>
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<td>4.3</td>
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<tr>
<td>0140-5</td>
<td>150</td>
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<td>4.3</td>
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<tr>
<td>0205-5</td>
<td>200</td>
<td>ABB-48431-184</td>
<td>4.3</td>
</tr>
</tbody>
</table>
## Brake options

Dynamic Braking Table - 380-480V applications, stopping duty only

<table>
<thead>
<tr>
<th>Drive P/N</th>
<th>HP</th>
<th>Duty Cycle = 3sec on / 27sec off</th>
<th>Duty Cycle = 10sec on / 50sec off</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Resistor Part No.</td>
<td>Ohms</td>
</tr>
<tr>
<td>0170-5</td>
<td>150</td>
<td>ABB-48431-271</td>
<td>2.9</td>
</tr>
<tr>
<td>0210-5</td>
<td>200</td>
<td>ABB-48431-271</td>
<td>2.9</td>
</tr>
<tr>
<td>0260-5</td>
<td>200</td>
<td>ABB-48431-271</td>
<td>2.9</td>
</tr>
<tr>
<td>0270-5</td>
<td>250</td>
<td>ABB-48431-271</td>
<td>2.9</td>
</tr>
<tr>
<td>0300-5</td>
<td>300</td>
<td>ABB-48431-331</td>
<td>2.2</td>
</tr>
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<td>0320-5</td>
<td>350</td>
<td>ABB-48431-331</td>
<td>2.2</td>
</tr>
<tr>
<td>0400-5</td>
<td>400</td>
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<td>0440-5</td>
<td>450</td>
<td>ABB-48431-480</td>
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<td>0490-5</td>
<td>500</td>
<td>ABB-48431-514</td>
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<td>0550-5</td>
<td>550</td>
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<tr>
<td>0610-5</td>
<td>600</td>
<td>ABB-48431-515</td>
<td>1.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Drive P/N</th>
<th>HP</th>
<th>Duty Cycle = 30sec on / 180sec off</th>
<th>Duty Cycle = 60sec on / 180sec off</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Resistor Part No.</td>
<td>Ohms</td>
</tr>
<tr>
<td>0170-5</td>
<td>150</td>
<td>ABB-48431-273</td>
<td>2.9</td>
</tr>
<tr>
<td>0210-5</td>
<td>200</td>
<td>ABB-48431-274</td>
<td>2.9</td>
</tr>
<tr>
<td>0260-5</td>
<td>200</td>
<td>ABB-48431-274</td>
<td>2.9</td>
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<tr>
<td>0270-5</td>
<td>250</td>
<td>ABB-48431-334</td>
<td>2.2</td>
</tr>
<tr>
<td>0300-5</td>
<td>300</td>
<td>ABB-48431-334</td>
<td>2.2</td>
</tr>
<tr>
<td>0320-5</td>
<td>350</td>
<td>ABB-48431-334</td>
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</tr>
<tr>
<td>0400-5</td>
<td>400</td>
<td>ABB-48431-396</td>
<td>1.7</td>
</tr>
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<td>0440-5</td>
<td>450</td>
<td>ABB-48431-484</td>
<td>1.2</td>
</tr>
<tr>
<td>0490-5</td>
<td>500</td>
<td>ABB-48431-518</td>
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<tr>
<td>0550-5</td>
<td>550</td>
<td>ABB-48431-518</td>
<td>1.0</td>
</tr>
<tr>
<td>0610-5</td>
<td>600</td>
<td>ABB-48431-518</td>
<td>1.0</td>
</tr>
</tbody>
</table>

* Requires two resistor assemblies each rated as show and connected in series. (Order quantity 2)
Brake options

Brake chopper and resistor options for ACS800-07 in frame sizes 2xR8i and 3xR8i.

<table>
<thead>
<tr>
<th>Type</th>
<th>Nominal ratings</th>
<th>Duty cycle</th>
<th>Duty cycle</th>
<th>Brake chopper type</th>
<th>Resistor type</th>
<th>Additional width mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pbr. max kW</td>
<td>R ohm A</td>
<td>Imax A</td>
<td>Ps max kW</td>
<td>I max A</td>
<td>E r kJ</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>500 V</td>
<td>806</td>
<td>2x1.43 1142</td>
<td>272 218 634</td>
<td>782 806 996</td>
<td>-</td>
<td>2xNBRA659</td>
</tr>
<tr>
<td></td>
<td>806</td>
<td>2x1.43 1142</td>
<td>272 218 634</td>
<td>782 806 996</td>
<td>-</td>
<td>2xNBRA659</td>
</tr>
<tr>
<td></td>
<td>1208</td>
<td>3x1.43 1713</td>
<td>408 327 951</td>
<td>1173 1209 1494</td>
<td>-</td>
<td>3xNBRA659</td>
</tr>
<tr>
<td></td>
<td>1208</td>
<td>3x1.43 1713</td>
<td>408 327 951</td>
<td>1173 1209 1494</td>
<td>-</td>
<td>3xNBRA659</td>
</tr>
<tr>
<td></td>
<td>806</td>
<td>2x1.35 1210</td>
<td>134 108 333</td>
<td>412 575 710 21600</td>
<td>2xNBRA659</td>
<td>2x2xSAFUR200F500</td>
</tr>
<tr>
<td></td>
<td>806</td>
<td>2x1.35 1210</td>
<td>134 108 333</td>
<td>412 575 710 21600</td>
<td>2xNBRA659</td>
<td>2x2xSAFUR200F500</td>
</tr>
<tr>
<td></td>
<td>1208</td>
<td>3x1.35 1815</td>
<td>201 162 500</td>
<td>447 862 771 32400</td>
<td>3xNBRA659</td>
<td>3x2xSAFUR200F500</td>
</tr>
<tr>
<td></td>
<td>1208</td>
<td>3x1.35 1815</td>
<td>201 162 500</td>
<td>447 862 771 32400</td>
<td>3xNBRA659</td>
<td>3x2xSAFUR200F500</td>
</tr>
<tr>
<td>690 V</td>
<td>807</td>
<td>2x2.72 828</td>
<td>214 238 596</td>
<td>534 808 722</td>
<td>-</td>
<td>2xNBRA669</td>
</tr>
<tr>
<td></td>
<td>807</td>
<td>2x2.72 828</td>
<td>214 238 596</td>
<td>534 808 722</td>
<td>-</td>
<td>2xNBRA669</td>
</tr>
<tr>
<td></td>
<td>1211</td>
<td>3x2.72 1242</td>
<td>321 357 894</td>
<td>901 1212 1083</td>
<td>-</td>
<td>3xNBRA669</td>
</tr>
<tr>
<td></td>
<td>1211</td>
<td>3x2.72 1242</td>
<td>321 357 894</td>
<td>901 1212 1083</td>
<td>-</td>
<td>3xNBRA669</td>
</tr>
<tr>
<td></td>
<td>807</td>
<td>2x1.35 1670</td>
<td>194 108 333</td>
<td>298 575 514</td>
<td>21600</td>
<td>2x2NBRA659</td>
</tr>
<tr>
<td></td>
<td>807</td>
<td>2x1.35 1670</td>
<td>194 108 333</td>
<td>298 575 514</td>
<td>21600</td>
<td>2x2NBRA659</td>
</tr>
<tr>
<td></td>
<td>1211</td>
<td>3x1.35 2505</td>
<td>291 162 500</td>
<td>447 862 771 32400</td>
<td>3xNBRA669</td>
<td>3x2xSAFUR200F500</td>
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<tr>
<td></td>
<td>1211</td>
<td>3x1.35 2505</td>
<td>291 162 500</td>
<td>447 862 771 32400</td>
<td>3xNBRA669</td>
<td>3x2xSAFUR200F500</td>
</tr>
</tbody>
</table>

Note: SAFUR resistors available as open chasis (IP00). Not available with UL. As an enclosed option only offered NEMA 1 in drive line up (800-07, 800-37)

Brake chopper and resistor options for ACS800-37 in frame sizes R6-2xR8i.

<table>
<thead>
<tr>
<th>Type</th>
<th>Nominal ratings</th>
<th>Duty cycle</th>
<th>Duty cycle</th>
<th>Brake chopper type</th>
<th>Resistor type</th>
<th>Additional width mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pbr. max kW</td>
<td>R ohm A</td>
<td>Imax A</td>
<td>Ps max kW</td>
<td>I max A</td>
<td>E r kJ</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>500 V</td>
<td>268</td>
<td>2.15 380 101 81 268 331 268 331</td>
<td>-</td>
<td>NBR658</td>
<td>-</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>403</td>
<td>1.43 571 135 109 317 391 403 498</td>
<td>-</td>
<td>NBR659</td>
<td>-</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>806</td>
<td>2x1.43 1142 272 218 634 782 806 996</td>
<td>-</td>
<td>NBR658</td>
<td>-</td>
<td>800</td>
</tr>
<tr>
<td></td>
<td>1208</td>
<td>3x1.43 1713 408 327 951 1173 1209 1494</td>
<td>-</td>
<td>NBR659</td>
<td>-</td>
<td>1200</td>
</tr>
<tr>
<td></td>
<td>806</td>
<td>2x1.35 1670 194 108 333 298 575 514</td>
<td>21600</td>
<td>2x2NBRA659</td>
<td>2x2SAFUR200F500</td>
<td>2400</td>
</tr>
<tr>
<td></td>
<td>806</td>
<td>2x1.35 1670 194 108 333 298 575 514</td>
<td>21600</td>
<td>2x2NBRA659</td>
<td>2x2SAFUR200F500</td>
<td>2400</td>
</tr>
<tr>
<td></td>
<td>1211</td>
<td>3x1.35 2505 291 162 500 447 862 771 32400</td>
<td>3xNBRA659</td>
<td>3x2xSAFUR200F500</td>
<td>3600</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1211</td>
<td>3x1.35 2505 291 162 500 447 862 771 32400</td>
<td>3xNBRA659</td>
<td>3x2xSAFUR200F500</td>
<td>3600</td>
<td></td>
</tr>
<tr>
<td>690 V</td>
<td>404</td>
<td>2.72 414 107 119 298 267 404 361</td>
<td>-</td>
<td>NBR659</td>
<td>-</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>807</td>
<td>2x2.72 828 214 238 596 534 808 722</td>
<td>-</td>
<td>NBR659</td>
<td>-</td>
<td>800</td>
</tr>
<tr>
<td></td>
<td>1211</td>
<td>3x2.72 1242 321 357 894 801 1212 1083</td>
<td>-</td>
<td>NBR659</td>
<td>-</td>
<td>1200</td>
</tr>
<tr>
<td></td>
<td>404</td>
<td>1.35 835 97 54 167 149 287 257 10800</td>
<td>NBR659</td>
<td>2x2SAFUR200F500</td>
<td>1200</td>
<td></td>
</tr>
<tr>
<td></td>
<td>807</td>
<td>2x1.35 1670 194 108 333 298 575 514 21600</td>
<td>2x2NBRA659</td>
<td>2x2SAFUR200F500</td>
<td>2400</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1211</td>
<td>3x1.35 2505 291 162 500 447 862 771 32400</td>
<td>3xNBRA659</td>
<td>3x2xSAFUR200F500</td>
<td>3600</td>
<td></td>
</tr>
</tbody>
</table>

Brake choppers and resistors for larger types are available as customised option.

The drive may limit the available braking power. The maximum short time braking power is limited by the drive.

\[ P_{br, max} = \text{Maximum short time braking power.} \]
\[ R = \text{Recommended braking resistor resistance.} \]
\[ I_{max} = \text{Maximum peak current during braking.} \]

Current is achieved with recommended resistor resistance.

- \( P_{br, max} \) = Maximum continuous braking power.
- \( E_r \) = SAFUR resistor nominal braking capacity without forced cooling.
- \( P_{br} \) = Braking power during corresponding cycle load.
- \( I_{max} \) = Corresponding rms current per chopper during load cycle.

Hardware Options

33
EMC filter options

1st environment vs 2nd environment

1st environment
1st environment includes domestic premises. It also includes establishments directly connected without intermediate transformer to a low-voltage power supply network which supplies buildings used for domestic purposes.”

2nd environment
2nd environment includes all establishments other than those directly connected to a low-voltage power supply network which supplies buildings used for domestic purposes.”

Declaration of conformity

All declarations concerning CE marking can be found on the www.abb.com/motors&drives website.
The electrical/electronic equipment must be able to operate without problems within an electromagnetic environment. This is called immunity. The ACS800 is designed to have adequate immunity against interference from other equipment. Likewise, the equipment must not disturb or interfere with any other product or system within its locality. This is called emission. Each ACS800 model can be equipped with an inbuilt filter to reduce high frequency emission.

**EMC standards**

The EMC product standard [EN 61800-3 (1996) + Amendment A11 (2000)] covers the requirements stated for drives within the EU. The new revision of EN 61800-3 (2004) product standard can be applied from now on, but latest from 1 October 2007. In some cases other standards may be applicable. The emission limits are comparable according to the following table, EMC standards.

**Selecting an EMC filter**

The following table gives the correct filter selection.
du/dt output filters and the ACS800

du/dt output filtering suppresses inverter output voltage spikes and rapid voltage changes that stress motor insulation. Additionally, du/dt filtering reduces capacitive leakage currents and high frequency emission of the motor cable as well as high frequency losses and bearing currents in the motor.

The need for du/dt filtering depends on the motor insulation. For information on the construction of the motor insulation, consult the motor manufacturer. If the motor does not fulfill the following requirements, the lifetime of the motor might decrease.

Insulated N-end (non-driven end) bearings and/or common mode filters are also required for motor bearing currents with motors bigger than 100 kW. For more information please see the ACS800 hardware manuals.

### Filter selection table for ACS800

<table>
<thead>
<tr>
<th>Motor type</th>
<th>Nominal mains voltage (U_n)</th>
<th>Motor insulation requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABB M2 and M3 motors</td>
<td>U_n ≤ 500 V</td>
<td>Standard insulation system.</td>
</tr>
<tr>
<td></td>
<td>500 V &lt; U_n ≤ 600 V</td>
<td>Standard insulation system in conjunction with du/dt filtering or reinforced insulation.</td>
</tr>
<tr>
<td></td>
<td>600 V &lt; U_n ≤ 690 V</td>
<td>Reinforced insulation system in conjunction with du/dt filtering.</td>
</tr>
<tr>
<td>ABB form-wound HXR and AM motors</td>
<td>380 V &lt; U_n ≤ 690 V</td>
<td>Standard insulation system.</td>
</tr>
<tr>
<td>ABB random-wound HXR and AM motors</td>
<td>380 V &lt; U_n ≤ 690 V</td>
<td>Check motor insulation system with the motor manufacturer. du/dt filtering with voltages over 500 V.</td>
</tr>
<tr>
<td>Non-ABB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Random-wound and Form-wound</td>
<td>U_n ≤ 420 V</td>
<td>Insulation system must withstand ( \dot{U}_{LL}=1300 ) V.</td>
</tr>
<tr>
<td></td>
<td>420 V &lt; U_n ≤ 500 V</td>
<td>If the insulation system withstands ( \dot{U}<em>{LL}=1600 ) V and ( \Delta t=0.2 ) ( \mu ) s, du/dt filtering is not required. With du/dt filtering, the insulation system must withstand ( \dot{U}</em>{LL}=1300 ) V.</td>
</tr>
<tr>
<td></td>
<td>500 V &lt; U_n ≤ 600 V</td>
<td>If the insulation system withstands ( \dot{U}<em>{LL}=1800 ) V, du/dt filtering is not required. With du/dt filtering, the insulation system must withstand ( \dot{U}</em>{LL}=1600 ) V.</td>
</tr>
<tr>
<td></td>
<td>600 V &lt; U_n ≤ 690 V</td>
<td>If the motor insulation system withstands ( \dot{U}<em>{LL}=2000 ) V and ( \Delta t=0.3 ) ( \mu ) s, du/dt filtering is not required. With du/dt filtering, the insulation system must withstand ( \dot{U}</em>{LL}=1800 ) V.</td>
</tr>
</tbody>
</table>

### Symbol Explanation

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>U_n</td>
<td>Nominal AC Line voltage.</td>
</tr>
<tr>
<td>U_{LL}</td>
<td>Peak line to line voltage at motor terminals.</td>
</tr>
<tr>
<td>( \Delta t )</td>
<td>Rise time, i.e. interval during which line to line voltage at motor terminals changes from 10% to 90% of full voltage range.</td>
</tr>
</tbody>
</table>
**du/dt output filter options**

### External du/dt output filters for ACS800-U1/-U2/-U11

<table>
<thead>
<tr>
<th>ACS800</th>
<th>du/dt filter type</th>
<th>(3 - 1 phase filters included in kits marked *)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unprotected (IP 00)</td>
<td>Protected to IP 22</td>
</tr>
<tr>
<td>500 V</td>
<td>NOCH0016-60</td>
<td>NOCH0030-60</td>
</tr>
<tr>
<td></td>
<td>NOCH0070-60</td>
<td>NOCH0050-62</td>
</tr>
<tr>
<td></td>
<td>NOCH016-62</td>
<td>NOCH016-65</td>
</tr>
<tr>
<td>690 V</td>
<td>NOCH0016-60</td>
<td>NOCH0030-60</td>
</tr>
<tr>
<td></td>
<td>NOCH0070-60</td>
<td>NOCH0050-62</td>
</tr>
<tr>
<td></td>
<td>NOCH016-62</td>
<td>NOCH016-65</td>
</tr>
</tbody>
</table>

### Applicability

Factory-installed du/dt filters are available for the ACS800-07/-17/-37. They are installed inside the drive cabinet. The du/dt output filters are also separately available for other ACS800 types.

Separate filters need to be mounted separately. Unprotected IP 00 filters must be placed in an enclosure with an adequate degree of protection.

### Dimensions and weights of the du/dt filters

<table>
<thead>
<tr>
<th>du/dt filter</th>
<th>Height in</th>
<th>Width in</th>
<th>Depth in</th>
<th>Weight lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOCH0016-60</td>
<td>7.68</td>
<td>5.51</td>
<td>4.53</td>
<td>5.29</td>
</tr>
<tr>
<td>NOCH0030-60</td>
<td>12.72</td>
<td>7.63</td>
<td>60.60</td>
<td>13.23</td>
</tr>
<tr>
<td>NOCH0050-62</td>
<td>8.46</td>
<td>6.50</td>
<td>5.12</td>
<td>10.36</td>
</tr>
<tr>
<td>NOCH0070-60</td>
<td>10.28</td>
<td>7.09</td>
<td>5.91</td>
<td>20.94</td>
</tr>
<tr>
<td>NOCH0120-60</td>
<td>17.05</td>
<td>10.98</td>
<td>7.95</td>
<td>34.17</td>
</tr>
<tr>
<td>NOCH0120-62</td>
<td>7.87</td>
<td>6.06</td>
<td>4.17</td>
<td>15.43</td>
</tr>
<tr>
<td>NOCH016-62</td>
<td>30.12</td>
<td>12.13</td>
<td>10.08</td>
<td>99.21</td>
</tr>
<tr>
<td>NOCH260-70**</td>
<td>13.39</td>
<td>7.48</td>
<td>9.53</td>
<td>45.64</td>
</tr>
<tr>
<td>NOCH400-70**</td>
<td>13.39</td>
<td>7.48</td>
<td>10.12</td>
<td>50.46</td>
</tr>
</tbody>
</table>

** 3 filters included, dimensions apply for one filter.

*) Note the exceptions for the ACS800-U11-0100-5.
Sine filter options

ABB sine filter solution

The ACS800 sine filter solution is an ACS800 industrial drive equipped with a sine filter. It enjoys most of the premium features of the standard ACS800 industrial drive. The LC filter suppresses the high frequency components of the output voltage.

This means that the output voltage waveform is almost sinusoidal without high voltage peaks.

Filters are available in IP 00 degree of protection over the whole power range. The ACS800-U1 power range also has NEMA 1 filters available. The ACS800-U7/07 drive sine filters are complete cabinet-built units.

The ABB sine filter solution can be used in a variety of applications:
- Motor does not have adequate insulation for VSD duty
- Total motor cable length is long e.g. there are a number of parallel motors
- Step-up applications e.g. medium voltage motor needs to be driven
- Step-down applications
- There are industry specific requirements for peak voltage level and voltage rise time
- Motor noise needs to be reduced
- Maximum safety and reliability is needed in e.g. explosive applications
- Submersible pumps with long motor cables e.g. in the oil industry

Main features

- Optimized LC filter design that takes into account switching frequency, voltage drop and filtering characteristics
- Proven technology as ABB has delivered hundreds of sine filter solutions over the last 20 years in a wide range of applications.
- Cost effective solution
- Standard software has all the parameters that need to be set

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefit</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sinusoidal output voltage</td>
<td>No additional stress on the motor insulation: non-VSD compliant motors can be used, motor reliability and lifetime are maximized.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Allows the use of transformers in the drive output to match any required motor voltage.</td>
<td>Voltage drop at motor cable can be compensated with transformer i.e. there are no restrictions to motor cable length.</td>
</tr>
<tr>
<td></td>
<td>Standard distribution transformer can be used in step-up solutions.</td>
<td>High starting torque is available with special transformer design.</td>
</tr>
<tr>
<td></td>
<td>Less motor noise.</td>
<td>Usually the motor fan is the biggest noise source with sine filter solutions.</td>
</tr>
<tr>
<td>AP programming, advanced IR-compensation and flux control</td>
<td>The effects of load changes to motor voltage can be compensated i.e. the motor always has the optimum voltage.</td>
<td>Scalar control is required with sine filters.</td>
</tr>
</tbody>
</table>

Output current derating is required. Contact the factory for quoting.
Standard user interface
Control panel

The industrial drive control panel has a multilingual alpha-numeric display (4 lines x 20 characters) with plain text messages in 14 languages.

The control panel is removable and can be mounted on the drive enclosure or remotely.

### Start-up assistant

Easy commissioning with the start-up assistant. The start-up assistant actively guides you through the commissioning procedure step by step. It also has a unique on-line help function.

### Actual value display

The control panel can display three separate actual values simultaneously. Examples of these are:

- Motor speed
- Frequency
- Current
- Torque
- Power
- References
- DC bus voltage
- Output voltage
- Heatsink temperature
- Operating hours
- Kilowatt hours
- I/O status

### Fault memory

A built in fault memory stores information relating to the last 64 faults, each with a time stamp.

### Parameter copying

Parameter copy feature allows all drive parameters to be copied from one frequency converter to another simplifying commissioning.

### Centralized control

One panel can control up to 31 drives.

### Easy programming

Parameters are organized into groups for easy programming.

The ACS800 keypad is backward compatible to the ACS600.
Analog 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 analog or digital I/O connections.

Below are the standard drive control I/O of the ABB industrial drive for the Factory Macro. For other ACS800 application macros the default functions may be different.
Additional I/O options

Standard I/O can be extended by using analog and digital extension modules or pulse encoder interface modules which are mounted in the slots on the ASC800 control board. The control board has two slots available for extension modules. More extension modules can be added with the I/O extension adapter which has three additional slots. The available number and combination of I/O's depends on the control software used. The standard application software supports 2 analog, 2 digital extension modules and 1 encoder interface module.

Optional I/O

Analog I/O extension module RAIO-01 (+L500)
- 2 analog inputs: galvanically isolated from 24 V supply and ground
  - ±0(2)...10 V, 0(4)...20 mA or ±0...2 V, resolution 12 bits
- 2 analog outputs: galvanically isolated from 24 V supply and ground
  - 0(4)...20 mA, resolution 12 bit

Digital I/O extension module RDIO-01 (+L501)
- 3 digital inputs: individually galvanically isolated
  - Signal level 24 to 250 V DC or 115/230 V AC
- 2 relay (digital) outputs:
  - Form C contacts
  - 24 V or 115/230 V AC
  - Max. 2 A

Pulse encoder interface module RTAC-01 (+L502)
- 1 incremental encoder input:
  - Channels A, B and Z (zero pulse)
  - Signal level and power supply for the encoder is 24 or 15 V
  - Single ended or differential inputs
  - Maximum input frequency 200 kHz

Resolver Interface Module (Limited SW Support)

I/O extension adapter AIMA-01
- Three slots for I/O extension modules
- Connection to the ACS800 control board through fiber optic link
- Dimensions: 3.1 × 12.8× 1.1 in
- Mounting: onto 1.4 × 0.3 in DIN rail
- External power supply connection
- Supply voltage: 24 V DC ±10%
- Current consumption: depends on connected I/O extension modules. (Recommend 1A 24 Vdc supply)
Communications options
Fieldbus control

ABB industrial drives have connectivity to most major automation systems. This is achieved with a dedicated gateway concept between the fieldbus systems and ABB drives.

The fieldbus gateway module can easily be mounted inside the drive. Because of the wide range of fieldbus gateways, your choice of automation system is independent of your decision to use first-class ABB AC drives.

### Manufacturing flexibility

**Drive control**
The drive control word (16 bit) provides a wide variety of functions from start, stop and reset to ramp generator control. Typical setpoint values such as speed, torque and position can be transmitted to the drive with 15 bit accuracy.

**Drive monitoring**
A set of drive parameters and/or actual signals, such as torque, speed, position, current etc., can be selected for cyclic data transfer providing fast data for operators and the manufacturing process.

**Drive diagnostics**
Accurate and reliable diagnostic information can be obtained via the alarm, limit and fault words, reducing the drive downtime and therefore the downtime of the manufacturing process.

**Drive parameter handling**
Total integration of the drives in the production process is achieved by single parameter read/write up to complete parameter set-up or download.

### Reduced installation and engineering effort

**Cabling**
Substituting the large amount of conventional drive control cabling with a single communication cable reduces costs and increases system reliability.

**Design**
The use of fieldbus control reduces engineering time at installation due to the modular structure of the hardware and software.

**Commissioning and assembly**
The modular machine configuration allows pre-commissioning of single machine sections and provides easy and fast assembly of the complete installation.

### Currently available gateways

<table>
<thead>
<tr>
<th>Fieldbus</th>
<th>Protocol</th>
<th>Device profile</th>
<th>Baud rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROFIBUS (+K454)</td>
<td>DP, DPV1</td>
<td>PROFIdrive ABB Drives *)</td>
<td>9.6 kbit/s - 12 Mbit/s</td>
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<tr>
<td>DeviceNet (+K451)</td>
<td>-</td>
<td>AC/DC drive ABB Drives *)</td>
<td>125 kbit/s - 500 kbit/s</td>
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<tr>
<td>ControlNet (+K462)</td>
<td>-</td>
<td>AC/DC drive ABB Drives *)</td>
<td>5 Mbit/s</td>
</tr>
<tr>
<td>Modbus (+K458)</td>
<td>RTU</td>
<td>ABB Drives *)</td>
<td>600 bit/s - 19.2 kbit/s</td>
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<td>Ethernet (+K466)</td>
<td>Ethernet/IP Modbus/TCP</td>
<td>ABB Drives *)</td>
<td>10 Mbit/s / 100 Mbit/s</td>
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<tr>
<td>ProfNet (+K467)</td>
<td>Profinet IO Modbus/TCP</td>
<td>PROFIdrive ABB Drives *)</td>
<td>10 Mbits / 100 Mbits</td>
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<tr>
<td>CANopen (+K457)</td>
<td>-</td>
<td>Drives and motion control ABB Drives *)</td>
<td>10 kbit/s - 1 Mbit/s</td>
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<tr>
<td>InterBUS-S (+K453)</td>
<td>I/O, PCP</td>
<td>ABB Drives *)</td>
<td>500 kbit/s</td>
</tr>
</tbody>
</table>

*) Vendor specific profile
Additional options
Remote monitoring and diagnostics tool

**Browser-based, user-friendly**

The intelligent ethernet NETA-01 module gives simple access to the drive via the internet, communicating via a standard web browser. The user can set up a virtual monitoring room wherever there is a PC with an internet connection or via a simple dial-up modem connection. This enables remote monitoring, configuration, diagnostics and, when needed, control. The drive can also provide process related information, such as load level, run time, energy consumption and I/O data, the bearing temperature of the driven machine, for instance.

This opens up new possibilities for the monitoring and maintenance of unmanned applications across a range of industries, for instance water, wind power, building services and oil & gas, as well as any application where the user needs access to the drives from more than one location. The NETA-01 also provides an opportunity for OEMs and system integrators to support their installed base globally.

**Powerful and versatile**

Up to nine drives can be connected to the intelligent ethernet module via fiber optic links. It is available as an option for new drives, as well as an upgrade for existing systems. Access to the module is secured by user ID and passwords.

The intelligent ethernet NETA-01 module connects to the drive with fiber optic cables. The size of the module is 3.7(h) x 1.4(w) x 3.0(d) in

The web page of the module is opened like any other web address. The home page shows a general overview of the system with traffic lights and action buttons to guide the user through the different sections.

**Features**

- Virtual monitoring room for
  - Monitoring
  - Configuration of parameters
  - Diagnostics
  - Control, if needed
- Browser-based access via
  - Intra-/extra-/internet or
- Email Client
  - Event notification
  - Drive status update
- No PC needed at the local end
- Can be used as a Modbus/TCP bridge for process control
- The NETA-01 module may be used in conjunction with other Fieldbus modules from the previous page
Standard application software

Based on ABB’s exclusive Direct Torque Control technology, the ACS800 offers highly advanced features as standard. The ACS800 standard application software provides solutions to virtually all AC drives applications.

Adaptive programming

In addition to parameters, industrial drives have the possibility for function block programming as standard. Adaptive programming with 15 programmable function blocks makes it possible to replace relays or even a PLC in some applications. Adaptive programming can be done either by standard control panel or DriveAP, a user-friendly PC tool.

The standard application macros

The ACS800 features built in, pre-programmed application macros for configuration of such parameters as inputs, outputs and signal processing:

- FACTORY SETTINGS for basic industrial applications
- HAND/AUTO CONTROL for local and remote operation
- PID CONTROL for closed loop processes
- SEQUENTIAL CONTROL for repetitive cycles
- TORQUE CONTROL for processes where torque control is required
- USER MACRO 1 & 2 for user’s own parameter settings

Software features

A complete set of standard software features offers premium functionality and flexibility.

- Flux braking
- Flux optimization
- IR compensation
- Master/follower control
- Mechanical brake control
- Motor identification
- Parameter lock
- Power loss ride-through
- Process PID control
- Programmable I/O
- Scalar control
- Speed controller tuning
- Start-up assistant
- Support for sine filter in the drive output
- Trim function
- User-selectable acceleration and deceleration ramps
- User adjustable load supervision/limitation

Pre-programmed protection functions

A wide range of features provides protection for the drive, motor and the process.

- Ambient temperature
- DC overvoltage
- DC undervoltage
- Drive temperature
- Input phase loss
- Overcurrent
- Power limits
- Short circuit

Programmable protection functions

- Adjustable power limits
- Control signal supervision
- Critical frequencies lock-out
- Current and torque limits
- Earth fault protection
- External fault
- Motor phase loss
- Motor stall protection
- Motor thermal protection
- Motor underload protection
- Panel loss
ABB provides a set of ready-made control solutions for specific industrial AC drive applications. Such software adds application-dedicated features and protection without an external PLC - improving productivity and reducing costs.

**Main advantages of ABB’s control solutions**

- Application-dedicated features
- Improved production
- No external PLC
- User-friendly
- Easy to use
- Energy savings
- Smooth power loss ride-through
- Reduced costs
- Adaptive protection

**Master/follower control**

Reliable control via the fiber optic link of several drives when they are controlled by one master. This is needed e.g. if the motor shafts are coupled together. The master/follower function enables the load to be evenly distributed between the drives.

**Pump control**

Intelligent pump control software is a combination of traditional PFC which is specially designed for multi-motor pumping (or compressor, etc.) stations. While directly controlling one motor, the drive is able to start additional, direct-on-line motors whenever a higher capacity is needed.

**Level control function**

The liquid level of a container can be used as a process variable for a pumping station either filling or emptying the container when the level control function is activated. Three drives can be used in a master/follower configuration.

**Flow calculation**

The flow calculation contains a function that enables reasonably accurate calculation of flow without the installation of a separate flow meter.

**Anti-jam function**

The anti-jam function can be used for preventing solids from building up on pump impellers. The anti-jam procedure consists of a programmable sequence of forward and reverse runs of the pump, effectively shaking off any residue on the impeller.

**Progressive Cavity Pump**

Software to provide protection and optimization for Progressive Cavity Pumps and Electrical Submersible Pumps for the Oil and Gas industry. The software is designed to protect the pump rods from over torque situation during adverse conditions and provides safe shutdown through controlled backspin. It also provides for input from external sensors for further protection and returns feedback in pump terminology (rod speed and torque etc.).
Optional application software
Control solutions for different applications

**Centrifuge control**

Practical programmable sequences for conventional centrifuges. Integrated decanter control for the accurate speed difference control of two shafts, where direct communication via the fiber optic link between bowl and scroll is used.

**Crane drive control**

Crane drive control with optimal operational safety and performance built into the drive.

- Easy installation and start-up reduces the total project costs
- Ready to use with proven crane functionality
- Accurate and fast response increases the operational productivity
- Multiple drives can be synchronized with internal fiber optic link, reducing the need for separate controllers. Everything needed is built in
- Available as single drive or multi-drive with dynamic and regenerative braking

**Spinning control & traverse control**

Spinning control and traverse control make a perfect pair for the precise control of spinning and traverse drives in textile machines.

**Inline Control**

The application software is designed for web process line Draw / Dancer / Tension control. An inline section on a process line is a section controlling the web in the machine after an extruder or unwind and before the winder or sheeter. This application program focuses on the converting and web handling industries and is commonly paired with the Center Winder/Unwind program.

- **Draw Macro**- Configures the drive to operate with manual speed adjustment from an operator control station.
- **Dance Macro**- Configures the drive to maintain setpoint dancer position based on dancer position feedback. The force on the dancer determines the tension on the web.
- **Tension Macro**- Configures the drive to maintain setpoint web tension based on a web force measurement device such as a loadcell. The ACS800 adjusts the speed of the section to maintain the desired web tension.
- **Master-Follower** communications via fiber optics are supported for process line coordination
## Center Winder/Unwind

The Center Winder/Unwind software is designed for process lines. The program supports tension control of a web using dancer trim, tension trim, or torque control. Included are a diameter calculator, tension regulators, inertia compensation, and roll change logic for continuous process lines. This application program focuses on the converting and web handling industries and is commonly paired with the Inline Control program.

- **Draw Macro** - Configures the drive to operate with manual speed adjustment from an operator control station.
- **Dance Macro** - Configures the drive to maintain setpoint dancer position based on dancer position feedback. The force on the dancer determines the tension on the web.
- **Tension Macro** - Configures the drive to maintain setpoint web tension by varying speed or torque of the section.
  - Closed Loop Tension Control uses a web force measurement device such as a loadcell. Based on the feedback value, the ACS800 adjusts speed or torque (setup option) to maintain setpoint tension.
  - Open Loop Tension Control operates in torque control mode and does not require a web force measurement device. The torque required to maintain setpoint tension is calculated from setup variables.
- **Master-Follower communications via fiber optics** are supported for process line coordination
- **Built-in diameter calculator** using web velocity and spindle speed to calculate actual diameter of the wound roll. The diameter calculation is used to trim the actual speed of the spindle axis as material is wound or unwound from the spindle thus maintaining accurate surface speed.
- **Built-in inertia compensation with dynamic inertia adjustment** based on actual roll diameter and web density
- **Support for automatic roll change.**

## Position Control

ABB’s Position Control Software provides an ideal solution for OEM machine builders and system integrators seeking to implement accurate position control in their applications. This software incorporates accurate positioning, synchronization, and DTC performance for position control applications. This software is designed to be an optimal solution to replace systems that implement sensors and PLCs as the main control apparatus for positioning systems.

This software offers four control modes:

- **Speed & Torque control**
- **Position & Synchronization Control**

These basic position control functions are included:

- **Homing and Cyclic Corrections**
- **Gear functions for load, motor, and synchronization**
- **Selectable physical units for position values (mm, inch, increment, degree, and revolution)**
- **Probe latching through digital inputs**

## Additional Application Support

### Extended I/O

An analog and digital I/O extension is typically installed on the AIMA-01 I/O extension adapters. Three extension modules can be installed on each I/O extension adapter and a fiber optic link connects the I/O extension adapters to the drive control board. The maximum number of I/O connections is 62.

### Programming

Function blocks are easy to program using the DriveAP 2 PC tool. For example, there are PROFIBUS fieldbus blocks available to help users to understand the block program connections between the drive and Profibus master. Block program information, as well as text comments, symbolic names of block outputs and page header information is saved in the flash memory of the control board of the drive.
DriveSize is a PC program for helping the user to select the optimal motor, frequency converter, and transformer, especially in those cases where a straightforward selection from a catalog is not possible. Additionally, it can be used to compute currents, network harmonics, and to create documents about the dimensioning based on actual load. DriveSize contains the current versions of the ABB motor and frequency converter catalogs.

The default values make DriveSize simple to use, but the user is provided with ample options for drive selection. The shortcut keys make drive selection easy while giving the optimal dimensioning result. A manual selection mode is also supported.

DriveSize is currently used by more than 1,000 engineers globally.

DriveSize is for drive system components

- 3-phase standard, customized, and user-defined motors
- ABB low voltage AC drives
- Transformers

DriveSize features

- Selects the optimal motor, drive unit, supply unit, and transformer
- Calculates network harmonics for a single supply unit or for the whole system
- Allows importation of own motor database
- Supplies dimensioning results in graphical and numerical format
- Prints and saves the results

The DriveSize PC program can be downloaded from www.abb.com/motors&drives
- Drives
- Drive PC Tools
- DriveSize
DriveAP

Programming tool

DriveAP is a PC software tool for creating, documenting, editing and downloading adaptive programs and multiblock programming programs. DriveAP 1.1 supports adaptive programming, whereas DriveAP 2 supports both adaptive programming and multiblock programming applications. The adaptive programming contains 15 function blocks and is available in a standard application. The multiblock programming application contains over 200 function blocks, and also includes PROFIBUS fieldbus and drive I/O blocks. DriveAP offers a clear and easy way to develop, test and document these programs with a PC.

It is a user-friendly tool for modifying function blocks and their connections. No special programming skills are required, a basic knowledge about block programming is enough. DriveAP supports IEC61131.

The adaptive programs are easy to document as hard copies or store as PC files. The multiblock programming with all related information is saved directly to the drive.

Upload or download

Both program types can be uploaded from connected drives and displayed graphically on a PC screen for service or documentation purposes.

The adaptive programs and multiblock programming programs made off-line can be downloaded to any of the connected drives that support corresponding programs.

Three operating modes

- Stand-alone mode - DriveAP is not connected to a drive. The adaptive programming and multiblock programming can be carried out in the office, for example, and later downloaded to a drive.
- Off-line mode - DriveAP is connected to a drive. The adaptive programming and multiblock programming can be carried out in batch mode.
- On-line mode - DriveAP is connected to a drive. Changes to the adaptive programs and multiblock programs are written immediately to the drive and actual values are shown on the screen in real-time.

DriveAP features

- Easy-to-use tool, no special skills required
- Create and download new programs
- Document programs
- Upload existing programs from the drive
- Operating modes
  - Stand-alone
  - Off-Line
  - On-Line
ABB’s DriveWindow is an advanced, easy-to-use PC software tool for the start-up and maintenance of ABB industrial AC drives. Its host of features and clear, graphical presentation of the operation make it a valuable addition to your system, providing information necessary for troubleshooting, maintenance and service, as well as training.

With DriveWindow the user is able to follow the operation of several drives simultaneously by collecting the actual values from the drives on a single screen or printout.

Additionally, the client part of DriveWindow may reside on one intranet PC, and the server on another PC closer to the drives. This enables easy plant-wide monitoring with two PCs.

DriveWindow uses a high-speed fibre optic cable network with DDCS communication protocol. This enables very fast communication between PC and drives. The fibre optic network is safe and highly immune to external disturbance. A fiber optic communication card inside the computer is needed.

DriveWindow allows the entire control board software to be saved and restored later, if needed. This makes it possible to use one control board as a spare part for many different sizes of drives.

DriveWindow features

- Easy-to-use tool for commissioning and maintenance
- Several drives connected and monitored at the same time
- Monitor, edit or save signals and parameters, clear graphical presentation
- High speed communication between PC and drive
- Versatile back-up functions
- View data collected and stored in the drive
- Fault diagnostics; DriveWindow indicates the status of drives, and also reads fault history data from the drive.

Drive parameters can be saved to the PC with DriveWindow, and can easily be downloaded back to the drive whenever needed. The same goes for the software. DriveWindow allows the entire control board software to be saved and restored later, if needed. This makes it possible to use one control board as a spare part for many different sizes of drives.
DriveWindow Light 2

Start-up and maintenance tool

DriveWindow Light 2 is an easy-to-use start-up and maintenance tool for ACS800 drives. It supports the following software: standard application, pump control, and spinning and traverse control. The DriveWindow Light 2 only supports drive frame sizes of R2-R8.

DriveWindow Light uses the drive’s panel connector for communication, which makes communication setup very easy.

Light software with heavy features

DriveWindow Light offers many functions in an easy-to-use package. It can be used in an offline mode, which enables parameter setting at the office even before going to the actual site. The parameter browser enables viewing, editing and saving of parameters. The parameter comparison feature makes it possible to compare parameter values between the drive and the file. With the parameter subset you can create your own parameter sets. Controlling of the drive is naturally one of the features in DriveWindow Light.

With DriveWindow Light, you can monitor up to four signals simultaneously. This can be done in both graphical and numerical format. Any signal can be set to stop the monitoring from a predefined level.

Highlights

- Viewing and setting parameters in offline mode
- Editing, saving and downloading parameters
- Comparing parameters
- Graphical and numerical signal monitoring
- Drive control

DriveWindow Light requirements

- Windows 98/NT/2000/XP
- Free serial port from a PC
- Free control panel connector
- NPCU-01 PC connection unit (serial communications)
## Summary of features and options

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<thead>
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<th>Power &amp; voltage range</th>
<th>Ordering Code</th>
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<tr>
<td>Optional software optimized for different applications or for enhanced programmability: for more details see section &quot;Application software and programming&quot;</td>
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<td>7 pcs digital outputs, programmable, galvanically isolated - can be divided into two groups</td>
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<td>Built-in I/O extension and speed feedback modules: for more details see section &quot;Control connections and communications&quot;</td>
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### Notes
- 1) [Details]
- 2) [Details]
- 3) [Details]
- 4) [Details]
- 5) [Details]
- 6) [Details]
- 7) [Details]
## Summary of features and options

### Power & voltage range

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<th>Power &amp; Voltage Range</th>
<th>Ordering Code</th>
<th>U1</th>
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<th>U7</th>
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<td>500 V</td>
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<td>690 V</td>
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</table>

### Braking
- Brake Chopper
  - D150
- Brake Resistor
  - X
- Regenerative Braking
  - -

### Rectifier Bridge
- 12-pulse (can be connected as a 6-pulse also)
  - -
- Low Harmonic IEEE519-1992 at input terminals
  - -
- Adjustable Power Factor
  - (Default = Unity)
  - -

### Line Fuses
- aR line fuses
  - F260
- bG line fuses
  - F251

### Line side apparatus
- Main switch
  - -
- Line contactor + emergency stop, category 0
  - F250+Q951
- Air circuit breaker + emergency stop, category 0
  - F255+Q951
- Air circuit breaker
  - -

### Cabinet Options
- Control voltage 115 VAC
  - -
- Control voltage 230 VAC
  - G320
- Cabinet heater (ext. supply)
  - G300
- Output for motor heater (ext. supply)
  - G313
- Customized options
  - P902

### Safety Options
- Prevention of unexpected start-up
  - -
- Earth fault monitoring, earthed mains
  - -
- Earth fault monitoring, unearthed mains
  - -
- Emergency stop
  - (see Line side apparatus)

### Approvals
- CE Low Voltage Directive
  - -
- CE, EMC
  - -
- UL, CUL
  - -
- CSA
  - -
- GOST R
  - -
- C-Tick
  - -

### Notes:
- Standard
- Selectable option, built in
- Selectable option, external
- Not available
- Only in standard software.
- Always 3 pcs.
- Not for 690 V.
- Only 0760-5.
- Available for R6 only.
- Selectable option, built in in frame size R6.
- Not available for R6.
- Standard in ACS800-U1 frame sizes R2 and R3 and at 690 V also in R4.
## Services and support

### Global service network

ABB provides professional spare part, maintenance and repair services using its own authorized and certified service personnel as well as the personnel of the ABB channel partners all over the world.

Note: Though all services are available globally, local services may vary.

For more information on our ACS800 services and service network, please contact your local ABB representative.

### Productized services

ABB’s drive lifecycle management model provides customers with the maximum profit for the purchased assets by maintaining high availability, eliminating unplanned repair costs and extending drive lifetime. The lifecycle management model comprises many dedicated services for the entire lifecycle of ACS800 drives.

### Start-up services

Using ABB’s start-up services you can trust that your drives are correctly commissioned and tuned to their application. ABB global service network personnel are authorized professionals who are thoroughly trained for their job.

### Training services

ABB offers dedicated training on ACS800 drives for your service and operating personnel for acquiring the required skills to use your ABB drives correctly and safely and to run the application in the most effective way.

### ACS800 single drive training courses

#### Global Training

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Duration</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>G152A</td>
<td>Web course run in Training Center with support</td>
<td>1 Day</td>
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<tr>
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<td>from teacher in classroom ACS800 single drive</td>
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<tr>
<td>G152B</td>
<td>Web course run in Training Center with support</td>
<td>2 Days</td>
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<td>from teacher in classroom ACS800 single drive</td>
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<td>Fundamentals</td>
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<tr>
<td>G152C</td>
<td>Web course run in Training Center with support</td>
<td>2 Days</td>
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<td>from teacher in classroom ACS800 single drive</td>
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<td>Fundamentals</td>
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For more information on our training services, please contact your local ABB representative or visit the ABB University website: [http://www.abb.com/abbuniversity](http://www.abb.com/abbuniversity).

#### US Specific Training

<table>
<thead>
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<th>Course Name</th>
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<tbody>
<tr>
<td>US 188</td>
<td>ACS800 Customer Maintenance</td>
<td>3 Day</td>
<td>+1 Day</td>
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<tr>
<td>US 189</td>
<td>ACS800 SERIAL COMM</td>
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USA website: [http://www.abb-drives.com/training](http://www.abb-drives.com/training)

### On-site spares kits

ACS800 drive on-site spares kits contain the most critical spare parts. You can choose your ACS800 drive spares kits from a separate table. If you do not have a copy, please contact your local ABB representative.
Notes:
ABB’s worldwide presence is built on strong local companies working together with the local distributor and channel partner network across borders to achieve a uniform level of services for all our customers. By combining the experience and know-how gained in local and global markets, we ensure that our customers in all industries can gain the full benefit from our products.

For further details about all our variable speed drive products and services please contact your nearest ABB office or visit the ABB website: http://www.abb-drives.com
Contact us

ABB Inc.
Low Voltage Drives
16250 W. Glendale Drive
New Berlin, WI 53151 USA
Phone: (800) 752-0696
Fax: (262) 785-0397
Web: www.abb.us/drives

ABB Inc.
Low Voltage Drives- Canada
3299 J.B. Deschamps Blvd
Lachine, Quebec H8T 3E4
Phone: (800) 215-3066
Fax: (514) 420- 3137
Web: www.abb.com