LOW VOLTAGE AC DRIVES

ABB general purpose drives
ACS480, 0.75 to 22 kW
Get it fast.
Use it easily.
Improve efficiency.
ACS480: compact general purpose drives.
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The all-compatible ACS480 series
Essential process efficiency and simplicity

Some applications need only the essentials from their drives: efficiency and simplicity in a small package, delivered as effortlessly as possible. The ACS480 general purpose drive is exactly that: it brings all the essentials effortlessly together for you to run basic speed-controlled applications and save costs.

Efficiency and simplicity for many applications
All the essential features are built-in, which makes the drive suitable for a broad range of applications. Built-in features and components simplify drive selection and reduce the need for additional hardware. The user-friendly, functionality-focused menu with multiple languages on the ACS480 control panel provides smart and quick commissioning and startup of the drive. Users can also upgrade the panel to an optimal Bluetooth control panel for wireless commissioning and monitoring. Primary settings and integrated macros are designed to make setting parameters and commissioning as simple as possible with only a few clicks.

Scalable offering
What if you require even more flexibility? You can choose the next member of the all-compatible drives portfolio, such as the ACS580 general purpose drive, or for even more demanding applications, the ACS880 is there to help you. These drives share similar user interfaces and options, enabling you to use the knowledge you have gained with the ACS480 drives. You increasingly keep saving time, as it is not wasted on learning one new interface after another. And saving time translates to saving money and improving profit potential.

Instant availability
ACS480 products are available from central stocks around the world for immediate delivery. The product is also widely available from ABB distributors.

Maximum reliability
Design features like coated circuit boards, minimized airflow through the control board section, earth fault protection and design for 50 °C ambient temperature make the ACS480 a safe choice. These features prolong the lifetime of the drives and protect your applications from unexpected downtimes. In addition, all the units are tested during production in maximum temperature with nominal loads.

ABB general purpose drives
Industries and applications
Simplicity at the core of your application

Built-in features and primary settings simplify ordering and delivery and reduce commissioning costs. Everything is provided in a single, compact and ready-to-use package for you to run your applications effectively.

Startup and maintenance tool
Drive Composer PC tool for startup, configuration, monitoring and process tuning. The PC tool is connected to the drive’s control panel via a USB interface.

Simple to select, install and use
Built-in features, such as an EMC C2 filter, a Modbus RTU fieldbus interface and safe torque off functionality, simplify drive selection, installation and use.

Simplicity at your fingertips as standard
The control panel’s straightforward primary settings menu with assistants help you set up and operate the drive quickly and effectively.

Part of the all-compatible offering
All-compatible drives, ACS480, ACS380, ACS580, and ACS880, share the same software platform, tools, user interfaces and options. Yet, there is an optimal drive from the smallest water pump to the biggest cement kiln. When you have learned to use one drive it is easy to use other drives in the portfolio.

Easiness with the built-in STO SIL 3 / PL e
STO protects both people and machines by preventing unexpected startup and stopping-related functions, enabling safe machine maintenance and operation.
Leverage the compact design of the ACS480 for a cost-effective and efficient solution. The cabinet optimized design with built-in features and control functions provide you with streamlined process automation and efficiency to improve your bottom line.

Easiness with all major automation networks
Optional fieldbus adapters enable connectivity with all major industrial automation networks. A fieldbus enables communication between drives and PLC systems, I/O devices and the process, while reducing wiring costs compared to traditional hardwired input/output connections.

Boosting energy efficiency
Energy efficiency information is available in the energy optimizer feature to help you optimize your processes. The energy optimizer feature operates both in scalar and vector control modes, ensuring maximum torque per ampere and reducing energy drawn from the supply. You can follow the saved energy, CO₂ emissions or money, and see how fast the drive brings you a return on investment.

Easiness with built-in brake chopper
A brake chopper is built-in as standard for all the ACS480 drives. The brake chopper enables shorter and more accurate braking times, which instantly increases productivity.

Easiness with the built-in EMC C2 filter
High-frequency noise can directly affect sensitive electronic equipment and high-speed communication fieldbuses. Each ACS480 drive is equipped with a built-in EMC filter to reduce high-frequency emissions. The built-in EMC C2 filter allows the drive to be used in industrial and commercial (building) environments without a need to buy and install any external filters.

Easiness with extensive I/O connections and built-in Modbus RTU
The ACS480 comes as standard with an I/O module that features extensive input and output connections for flexible configuration in various applications. In addition, the I/O module includes Modbus RTU interface that easily connects to the automation network. Colored terminals and a possibility to remove the I/O module ensure easy configuration and minimize mistakes in wiring.
Typical industries and applications

ACS480 drives improve process performance, increase productivity, reduce external components and ensure machine and personnel safety.
Typical applications
ACS480 drives improve process reliability, increase productivity and ensure machine and personnel safety.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Application</th>
<th>Customer benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food and beverage</td>
<td>Blowers, compressors, conveyors, fans, mills, pumps, dryers</td>
<td>• Accurate control of the process increases the speed of food production while saving energy and improving work safety. Precise speed control increases production uptime even when the load varies.&lt;br&gt;• Increased starting torque with boost function allows the same drive series to be used in different applications in the manufacturing plant.&lt;br&gt;• Safe torque off (SIL 3/PL e) function ensures machine and personnel safety.&lt;br&gt;• The easy-to-use control panel with multiple local languages and robust design reduces the time needed for maintenance.</td>
</tr>
<tr>
<td>Material handling</td>
<td>Conveyors</td>
<td>• Accurate and precise speed control increases production uptime even when the load varies.&lt;br&gt;• Safe torque off (SIL 3/PL e) function ensures machine and personnel safety.&lt;br&gt;• Minimized downtime with robust and reliable design.&lt;br&gt;• Integrated brake chopper enabling faster and more accurate start and stop cycles.&lt;br&gt;• User load curve function monitors an input signal as a function of frequency or speed, and load, and gives a warning or fault if the curve does not stay within a user-defined profile.</td>
</tr>
<tr>
<td>Printing</td>
<td>Compressors, presses, winders</td>
<td>• Smooth acceleration prevents breaking the paper.&lt;br&gt;• The robust design of the drive reduces mechanical stress on process line equipment, lowering maintenance costs and capital expenditure.&lt;br&gt;• Precise speed control of applications increases process uptime by optimizing motor control.</td>
</tr>
<tr>
<td>Textile</td>
<td>Bleaching machines, compressors, conveyors, fans, jet dyeing machines, pumps</td>
<td>• Precise speed control for high stretching accuracy and better quality of the end product.&lt;br&gt;• Adjustable acceleration/deceleration ramps to improve pump control.&lt;br&gt;• Real-time clock and timed functions for process optimization.&lt;br&gt;• Increased productivity and faster payback times with multiple setups.&lt;br&gt;• Built-in counters for additional energy savings and preventive maintenance.</td>
</tr>
<tr>
<td>Water handling</td>
<td>Compressors, pump stations</td>
<td>• Additional energy savings with energy optimizer function.&lt;br&gt;• Adjustable acceleration/deceleration ramps to improve pump control.&lt;br&gt;• Built-in PFC macro to control up to six pumps or compressors, allowing flow optimization.&lt;br&gt;• Soft pipe fill help to avoid sudden pressure peaks and reduce the risk of water hammer.&lt;br&gt;• Dry run protection to prevent the pump from running dry.&lt;br&gt;• Pump clean function to prevent unplanned downtime caused by pump blockages.&lt;br&gt;• PID/loop control to optimize motor speed according to the process variable, such as pressure or flow.</td>
</tr>
<tr>
<td>Agriculture</td>
<td>Fans, irrigators, pumps, sorters</td>
<td>• Optimized for cabinet installations with unified height and depth and panel door mounting options.&lt;br&gt;• Timed functions to adjust the process control depending on e.g. the time of the day.&lt;br&gt;• Three relay outputs and PFC feature to control up to four pumps and to optimize output.</td>
</tr>
<tr>
<td>Sawmill</td>
<td>Wood drying kilns, conveyors for chips</td>
<td>• Safe torque off (SIL 3/PL e) function ensures machine and personnel safety.&lt;br&gt;• Integrated brake chopper speeds up braking and productivity.&lt;br&gt;• Heavy-duty rating and higher starting torque improves robustness.&lt;br&gt;• Three relay outputs connects even four fans without external components.&lt;br&gt;• Turning on and off parallel fans based on the humidity of air (requires an external sensor).</td>
</tr>
<tr>
<td>Automotive</td>
<td>Conveyors, fans, pumps</td>
<td>• Increased productivity and faster payback times with multiple setups.&lt;br&gt;• Enhanced quality of end products with smooth control of the motor and process.&lt;br&gt;• Safe torque off (SIL 3/PL e) function ensures machine and personnel safety.&lt;br&gt;• Common fieldbus networks supported.&lt;br&gt;• The robust design of the drive reduces mechanical stress on process line equipment, lowering maintenance costs and ensuring high production quality.</td>
</tr>
</tbody>
</table>
Standard ACS480 drive software with versatile features

**Improve the performance of the motor and process** with sophisticated process control in scalar and vector control modes. Scalar control is a good choice when simplicity is at the core, while vector control is especially for accurate and energy-efficient speed control in demanding applications.

**Save commissioning and learning time** with the assistant control panel’s clear and intuitive user interface and different assistants.

**Optimize energy efficiency** with features that help you save and manage energy. You can monitor the hourly, daily and cumulative energy consumption via kWh counters. Support for high-efficiency induction, synchronous reluctance and permanent magnet motors enables even higher system efficiency.

**Reduce motor noise** by spreading the switching frequencies over a user-specified range.

**Reduce costs** with the built-in and standalone process PID. It makes the ACS480 a self-governing unit requiring only an external process measurement. No external logic input from the control room is needed.

**Analyze and optimize the application** with the load profile log, which shows you how the drive is operating. Monitor values that matter to you on multiple home view displays.

**Control delicate loads with care** with mechanical brake control. It prevents small movements of, for example, a belt conveyor while halted.

**Save time with primary settings** that enable quick access to the most commonly used parameters and settings without a need to go through the complete parameter list.

**Analyze and resolve issues** with the control panel’s diagnostics menu. You can quickly analyze why the drive is performing as it is; running, stopped or running at the present speed.

**Reduce manual work** with functions that do it for you. The timing function switches between different setpoints based on a predefined schedule, the accel/decel ramps accelerate and decelerate the motor as you want, and the ready made PFC macro sets on and off parallel motors in order to ensure optimal output.
Software features for water and wastewater applications

The ACS480 drive has a built-in pump specific functionality for securing smooth water flow. The functions protect the pumping system and help you to save on operating costs, increase energy efficiency and reduce CO₂ emissions.

- **Soft pipe filling**
  The soft pipe fill function manages the pressure of water by filling the pipeline with a gentle approach. This helps to avoid sudden pressure peaks and reduces the risk of water hammer which can cause damage to the water pipes.

- **Pump cleaning**
  Achieve savings by preventing unplanned downtime. This function keeps the impeller of the pump clean by running a sequence of aggressive ramps between minimum and maximum pump speed.

- **Dry run protection**
  This function prevents the pump from running dry. The water pump shaft and impeller are rotating at fast rates. If there is no dry pump protection, the released heat can damage the pump over time, limiting its lifetime.

- **The PID/loop control**
  Optimizes the motor speed according to the process variable, such as pressure. It makes the drive a self-governing unit that requires no external logic input from the control room but requires only an external process measurement.

- **Adaptive programming**
  This functionality provides extra flexibility by offering easy alternative for simple programming needs.

- **Pump and fan control**
  With a built-in PFC macro one drive controls up to six pumps or blowers in parallel and eliminates the need for an external programmable logic controller. This results in reduced stress on the mains and the system as well as in lower maintenance and operation costs.
How to select a drive

The standard delivery includes all the built-in features, the assistant control panel and the I/O module. The control panel and the I/O module can be replaced with other panels and fieldbus options. The following instructions show you how to order the right drive for your application.

Determine the voltage range and the overload in your application. Typically, fans and pumps can be dimensioned according to light-duty use, while for applications requiring higher torque, it is recommended to dimension according to heavy-duty use.

2 Select your drive’s order code from the rating table based on your motor’s power rating according to light-duty or heavy-duty use.

Choose your panels and options (on page 18) and add the codes to the drive’s order code if needed. Remember to use a “+” mark before each option code.

3

Type designation:  
Product series: ACS480  
- 04  
- 03A3  
- 4  
+  
3J425

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The EU has agreed upon new, more demanding regulation (EU) 2019/1781, replacing regulation 640/2009. The new Ecodesign Regulation (EU) 2019/1781 sets the minimum efficiency levels not only for direct-on-line rated low voltage induction motors but now also for variable speed drives with a voltage up to 1000 V. The regulation will be implemented in two steps July 1, 2021 and July 1, 2023.

**Variable speed drives**

**Step 1: July 1, 2021**

**IE2 efficiency level mandatory for AC drives**
- Power range from 0.12 to 1000 kW.
- 3-phase drives with diode rectifier including ABB’s micro, machinery, general purpose, industrial and industry-specific drives.
- Drive manufacturers must declare power losses in percentage of the rated apparent output power at 8 different operating points as well as standby losses. The international IE level is given at the nominal point. Drives fulfilling the requirements will be CE marked.
- All the covered ABB products fulfill the requirements.

**Excluded from the regulation:**
- All drives without CE marking
- Following low voltage AC drives: regenerative drives, low-harmonic drives (THD < 10%), multiple AC-output drives and single-phase drives.
- Drive cabinets with already conformity assessed modules
- Medium voltage drives, DC drives and traction drives

**Markings on the ABB AC drives**

- Unique identifier QR code to Ecodesign information
- IE class and % loss of rated apparent power 50 Hz, 400 V

Unique QR codes are located on the rating plate and/or the front side of the drive.

**Step 2: July 1, 2023**

No changes for drives from July 1, 2021

For more information, see Ecodesign tool: https://ecodesign.drivesmotors.abb.com/
Technical data

Mains connection
- Voltage and power range: 3-phase, 380 to 480 V, +10%/-15% from 0.75 up to 22 kW
- Frequency: from 48 to 63 Hz
- Efficiency class (IEC 61800-9-2): IE2

Motor connection
- Voltage: 0 to UN, 3-phase
- Frequency: 0 to 599 Hz
- Motor control: Scalar and vector control
- Speed control: Static accuracy: 20% of motor nominal slip, Dynamic accuracy: 1% seconds with 100% torque step

Product compliance
- CE
- RoHS directive 2011/65/EU
- Environmental system ISO 14001
- Waste electrical and electronic equipment directive (WEEE) 2002/96/EC
- RoHS directive 2011/65/EU
- TÜV certification for functional safety
- UKCA
- Ecodesign (EU) 2019/1781

Environmental limits
- Ambient temperature
  - Transport: -40 to +70°C
  - Storage: -40 to +70°C
  - Operation area: -10 to +50°C no derating required, no frost allowed, +50°C - +60°C with derating
- Cooling method: Air-cooled Dry clean air
- Altitude
  - 0 to 1,000 m: Without derating
  - 1,000 to 2,000 m: With derating of 1%/100 m
  - Above 2,000 m: For information on the correct derating values, contact your local ABB representative.
- Relative humidity
  - 5 to 95%, no condensation allowed
- Degree of protection
  - IP20
- Functional safety
  - Safe torque off (STO according EN 61800-5-2)
- Contamination levels
  - No conductive dust allowed
    - Storage: IEC 60721-3-1. Class 1C2 (chemical gases). Class 1S2 (solid particles)
    - Transportation: IEC 60721-3-2. Class 2C2 (chemical gases). Class 2S2 (solid particles)
    - Operation: IEC 60721-3-3. Class 3C2 (chemical gases). Class 3S2 (solid particles)
- *C = chemically active substances
- *S = mechanically active substances

ACS480 cabinet-mounted drive with built-in C2 category filter as standard

Dimensions

<table>
<thead>
<tr>
<th>Frames</th>
<th>Height (mm)</th>
<th>Width (in)</th>
<th>Depth (mm)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>223.0</td>
<td>8.78</td>
<td>73.0</td>
<td>207.1</td>
</tr>
<tr>
<td>R2</td>
<td>223.0</td>
<td>8.78</td>
<td>96.6</td>
<td>207.1</td>
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<tr>
<td>R3</td>
<td>220.0</td>
<td>8.66</td>
<td>171.7</td>
<td>207.1</td>
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<tr>
<td>R4</td>
<td>240.0</td>
<td>9.45</td>
<td>260.0</td>
<td>212.1</td>
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</tbody>
</table>

*Footprint height of the drive with clamp
Ratings, types and voltages

Wall-mounted drives, ACS480-04 (3-phase supply voltage range 380-480 V)

<table>
<thead>
<tr>
<th>Frame size</th>
<th>Frame type</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>ACS480-04-02A7-4</td>
</tr>
<tr>
<td>R1</td>
<td>ACS480-04-03A4-4</td>
</tr>
<tr>
<td>R1</td>
<td>ACS480-04-04A1-4</td>
</tr>
<tr>
<td>R1</td>
<td>ACS480-04-05A7-4</td>
</tr>
<tr>
<td>R1</td>
<td>ACS480-04-07A3-4</td>
</tr>
<tr>
<td>R1</td>
<td>ACS480-04-09A5-4</td>
</tr>
<tr>
<td>R2</td>
<td>ACS480-04-12A7-4</td>
</tr>
<tr>
<td>R3</td>
<td>ACS480-04-018A-4</td>
</tr>
<tr>
<td>R3</td>
<td>ACS480-04-026A-4</td>
</tr>
<tr>
<td>R4</td>
<td>ACS480-04-033A-4</td>
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<tr>
<td>R4</td>
<td>ACS480-04-046A-4</td>
</tr>
<tr>
<td>R4</td>
<td>ACS480-04-050A-4</td>
</tr>
</tbody>
</table>

Nominal ratings

- $I_n$: Rated current available continuously without overloadability at 50 °C.
- $P_n$: Typical motor power in no-overload use.

Light-duty use

- $I_{ld}$: Continuous current allowing 110% $I_{ld}$ for 1 minute every 10 minutes at 50 °C.
- $P_{ld}$: Typical motor power in light-duty use.

Heavy-duty use

- $I_{hd}$: Continuous current allowing 150% $I_{hd}$ for 1 minute every 10 minutes at 50 °C.
- $P_{hd}$: Typical motor power in heavy-duty use.

Maximum output current

- $I_{max}$: Maximum output current. Available for 2 seconds at start.

The ratings apply at 50 °C ambient temperatures.

For derating at higher altitudes, temperatures or switching frequencies, see the hardware manual, document code: 3AXD50000047392

Overloadability and output current illustration

- $1.5 \times I_n$
- $1.1 \times I_{ld}$
- $I_n$
- $I_{ld}$
- $I_{hd}$

Definition

- ACS480
  - No overload: $I_n$
  - 110% overload 1 min / 10 minutes: $I_{ld}$
  - 150% overload 1 min / 10 minutes: $I_{hd}$
Easiness on a whole new level

The assistant control panel’s intuitive user interface, assistants and ready-made macros offer simplicity for your every day life and saves your time. The panel guides you through commissioning without a need to know any drive parameters and helps in unclear situations.

Assistant control panel, ACS-AP-S
Set up the drive, fine-tune motor control and monitor values that matter using the assistant control panel, delivered as standard with all ACS480 drives. The assistant control panel can also be used with the ACS580 and the ACS380.

Commission without a hassle
Select language, set time and date, name the drive, enter motor values, test rotating the motor.

Primary settings
Select ready-made macros, perform ID-run, fine-tune settings related to e.g. ramps, limits, PIDs, fieldbuses, reset to defaults.

Input/output menu
Set and monitor your input/output (I/O) connections for real-time diagnostics.

Home view displays
Monitor the values that are the most important to you. You can select values for monitoring from a ready-made list or choose user-defined parameters.

Help button
The help button provides more information about your selection and it can be pressed in any view.
Control panel options and mounting kits

The standard delivery of the ACS480 includes the assistant control panel, but it can be replaced by other panels using the +J codes.

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**Bluetooth control panel, ACS-AP-W**

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

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**Basic control panel, ACS-BP-S**

The icon-based control panel supports users with parameter backup, settings and fault tracking in basic operation.

---

**Blank control panel cover with RJ-45 connector, RDUM-01**

The RDUM-01 panel is used in cabinet installations to connect the assistant control panel, basic control panel, or Bluetooth control panel on the cabinet door to the drive with the RJ-45 cable.

---

**Industrial control panel, ACS-AP-I**

The industrial control panel is compatible with all ABB drives, making it simple to use a single panel with different products.

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**Control panel mounting platform, DPMP-01**

This mounting platform is for flush mountings. This requires also RDUM-01 (blank control panel with the RJ-45 connector) and a control panel (assistant, basic, Bluetooth or industrial).

---

**Control panel mounting platform, DPMP-02**

This mounting platform is for surface mountings. This requires also RDUM-01 (blank control panel with the RJ-45 connector) and a control panel (assistant, basic, Bluetooth or industrial).

---

**Door mounting kit, DPMP-EXT2**

The door mounting kit is ideal for cabinet installations. A kit for one drive includes one DPMP-02 and one RDUM-01 (blank control panel cover with RJ-45 connector). If a different control panel than the assistant panel is desired for cabinet door installation, it needs to be ordered separately.

---

**Control panel bus adapters, CDPI-02**

Control panel bus adapters are used to connect HVAC control panels with a RJ-45 cable to the drive from a distance, e.g. when mounting the control panel on a cabinet door. In addition, CDPI adapters can be used to daisy chain several ACH drives together to be controlled with a single control panel or PC tool.

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**Control panel mounting kit for outdoor installation, DPMP-04/05**

Enables control panel outdoor mounting thanks to IP66 protection class, UV resistance and IK07 impact protection rating.

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*) Also compatible with other ABB all-compatible drives: ACS380, ACS580, and ACS880 drives.
ACS480 drives are optimized especially for cabinet installations. Uniform height and depth across the full power range allow easy installation using a single rail inside the cabinet, and side-by-side mounting saves space and enables smaller cabinets to be used. The door mounting kit simplifies drive operation, as the control panel is easy to mount on the cabinet door.

<table>
<thead>
<tr>
<th>Loose option code</th>
<th>Plus code</th>
<th>Description</th>
<th>Type designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>3AUA0000064884</td>
<td></td>
<td>Assistant control panel as standard</td>
<td>ACS-AP-S</td>
</tr>
<tr>
<td>3AUA0000088311</td>
<td>+J425</td>
<td>Industrial Assistant control panel</td>
<td>ACS-AP-I</td>
</tr>
<tr>
<td>3AXD500000225965</td>
<td>+J429</td>
<td>Control panel with Bluetooth interface</td>
<td>ACS-AP-W</td>
</tr>
<tr>
<td>3AXD50000028828</td>
<td>+J404</td>
<td>Basic control panel</td>
<td>ACS-BP-S</td>
</tr>
<tr>
<td>3AXD50000040850</td>
<td>+J424</td>
<td>Blank control panel cover with RJ-45 connector</td>
<td>RDUM-01</td>
</tr>
<tr>
<td>3AUA0000108878</td>
<td></td>
<td>Control panel mounting platform (flush mounted, requires also panel bus adapter on the drive)</td>
<td>DPMP-01</td>
</tr>
<tr>
<td>3AXD500000009374</td>
<td></td>
<td>Control panel mounting platform (surface mounted, requires also panel bus adapter on the drive)</td>
<td>DPMP-02</td>
</tr>
<tr>
<td>3AXD500000048730</td>
<td></td>
<td>Door mounting kit for the panel (for one drive, contains DPMP-02 and RDUM-01)</td>
<td>DPMP-EXT2</td>
</tr>
</tbody>
</table>

+0J400

If no control panel is needed, the assistant control panel can be removed from the standard delivery.
Standard interface and extensions for plug-in connectivity

ACS480 drives offer a wide range of standard interfaces. In addition, the drive has one slot for either an I/O module or a fieldbus module.

The standard delivery of the ACS480 includes the I/O module. If a fieldbus adapter is needed instead, it should be ordered with a corresponding plus code.
### Options

The standard delivery includes an I/O module with Modbus RTU fieldbus interface. The I/O module can be replaced by various fieldbus adapters. Side options bring even more functionality to match your needs.

#### Fieldbus adapter modules

The ACS480 general purpose drives are compatible with a wide range of fieldbus protocols. Fieldbus communication reduces wiring costs when compared to traditional hardwired input/output connections. A fieldbus adapter replaces an I/O module, meaning they cannot be used simultaneously. Note also that the Modbus RTU fieldbus interface is included in the I/O module.

#### Input/output extension

A fieldbus adapter replaces the standard I/O module, leaving only the base unit’s I/O connections. If the base unit is not sufficient an I/O extension, BIO-01, can be installed underneath the fieldbus adapter, adding the number of available I/O terminals.

### Fieldbus adapters

<table>
<thead>
<tr>
<th>Loose option code</th>
<th>Plus code</th>
<th>Fieldbus protocol</th>
<th>Adapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>68469325</td>
<td>+K454</td>
<td>PROFIBUS DP, DPV0/DPV1</td>
<td>FPBA-01</td>
</tr>
<tr>
<td>3AU0000089109</td>
<td>+K475</td>
<td>Two port EtherNet/IP™, Modbus TCP, PROFINET IO</td>
<td>FENA-21</td>
</tr>
<tr>
<td>68469341</td>
<td>+K451</td>
<td>DeviceNet</td>
<td>FDNA-01</td>
</tr>
<tr>
<td>3AXD5000049964</td>
<td>+K491</td>
<td>Two-Port Modbus/TCB</td>
<td>FMBT-21</td>
</tr>
<tr>
<td>3AXD5000192786</td>
<td>+K490</td>
<td>Two-Port Ethernet/IP</td>
<td>FEIP-21</td>
</tr>
<tr>
<td>3AXD5000192779</td>
<td>+K492</td>
<td>Two-Port PROFINET IO</td>
<td>FPNO-21</td>
</tr>
<tr>
<td>68469376</td>
<td>+K457</td>
<td>CANopen</td>
<td>FCAN-01</td>
</tr>
<tr>
<td>3AU0000094512</td>
<td>+K462</td>
<td>ControlNet</td>
<td>FCNA-01</td>
</tr>
<tr>
<td>3AU0000072069</td>
<td>+K490</td>
<td>EtherCAT</td>
<td>FECA-01</td>
</tr>
<tr>
<td>3AU0000072120</td>
<td>+K470</td>
<td>POWERLINK</td>
<td>FEPL-02</td>
</tr>
</tbody>
</table>

#### I/O extension

<table>
<thead>
<tr>
<th>Loose option code</th>
<th>Plus code</th>
<th>Description</th>
<th>Adapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>3AXD5000191635</td>
<td>+L515</td>
<td>I/O extension module including three digital inputs, one digital output and one analog input.</td>
<td>BIO-01</td>
</tr>
<tr>
<td>+L534</td>
<td></td>
<td>Auxiliary power extension module enables the use of an external auxiliary power supply with the drive. It is not compatible with BREL.</td>
<td>BAPO-01</td>
</tr>
<tr>
<td>+L511</td>
<td></td>
<td>Relay output extension module adds four relay outputs to the drive.</td>
<td>BREL-01</td>
</tr>
</tbody>
</table>

#### Remove the I/O module

+OL540

Removes the I/O module (RIIO-01) and Modbus RTU interface from the delivery leaving only the base unit I/O connections (2 x digital input, 1 x relay output STO).
Tools

Enjoy the easiness offered by the cold configuration tool and Drive Composer PC tool. These tools lighten your workload, especially if there are many drives. The cold configurator tool provides a quick way to parametrize unpowered drives even in their boxes, and the Drive Composer PC tool offers advanced means, for example, for commissioning and monitoring.

Safe configuration for unpowered drives
The CCA-01 cold configuration adapter provides a serial communication interface for unpowered ACS480 drives. With the adapter, safety isolation of both serial communication and control board power supply is possible. The power supply is taken from a PC USB port.

Drive Composer
The Drive Composer PC tool offers fast and harmonized setup, commissioning and monitoring for all-compatible drives. The free version of the tool provides startup and maintenance capabilities and gathers all drive information, such as parameter loggers, faults, backups and lists, into a support diagnostics file. Drive Composer pro provides additional features such as custom parameter windows, graphical control diagrams of the drive’s configuration, and improved monitoring and diagnostics.
**Automation Builder**

ABB Automation Builder is the integrated software suite for machine builders and system integrators wanting to automate their machines and systems in a productive way. Combining the tools required for configuring, programming, debugging and maintaining automation projects in a common, intuitive interface, Automation Builder addresses the largest single cost element of most of today’s industrial automation projects: software.

**Adaptive programming**

Adaptive programming software, embedded inside the drive, is especially handy when there is a need to distribute some of the machine’s control logic to the drive. Adaptive programming brings energy savings when the drive is adjusted to control the application optimally. You can use our Drive Composer pro PC tool to set up the adaptive programming. The drive also offers sequence programming capabilities. Adaptive programming makes it possible to enhance the existing application control program to precisely fit users’ application needs. The program is also handy for ensuring that the drive’s electrical design is connected as it should be with working drive signals.

**Drive manager**

Drive Manager for SIMATIC (DM4S-01) is a plug-in device tool that can be easily installed, for example, in the STEP 7 and TIA Portal. It utilizes the TCI interface of the SIMATIC PLC to communicate with drives connected to PROFIBUS or a PROFINET network.

Drive Manager for SIMATIC offers several useful, ready-made features that simplify the setup of ABB low voltage drives used in combination, for example, with SIMATIC S7 PLCs including:
- Network connection over PROFIBUS and PROFINET (single point of access)
- Online and offline configuration of drives
- Monitoring of actual drive values
- Export to/import from the drive-dedicated PC tools
- Saving drive parameter settings within the SIMATIC PLC project
EMC – electromagnetic compatibility

What is EMC?
EMC stands for electromagnetic compatibility. It is the ability of electrical/electronic equipment to operate without problems in an electromagnetic environment.

Likewise, the equipment must not disturb or interfere with any other product or system in its locality. This is a legal requirement for all equipment taken into service within the European Economic Area (EEA).

Installation environments
A power drive system (PDS) can be connected to either industrial or public power distribution networks. The environment class depends on the way the PDS is connected to power supply.

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

The 2nd environment includes all establishments directly connected to public low voltage power supply networks.

EMC solutions
To fulfill the EMC requirements, the drives are equipped with standard or optional RFI filtering for HF disturbances.
• Using ferrite rings in power connection points
• Using an AC or DC choke (while they are meant to protect against harmonics, they reduce HF disturbances as well)
• Using an LCL filter in the case of regenerative drives
• Using a du/dt filter

The product standard EN 61800-3 divides PDSs into four categories according to the intended use:

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 – 1st environment</td>
<td>Household appliances&lt;br&gt;Usually plug connectible to any wall outlet&lt;br&gt;Anyone can connect these to the network&lt;br&gt;Examples: washing machines, TV sets, computers, microwave ovens, etc.</td>
</tr>
<tr>
<td>C2 – 1st environment</td>
<td>Fixed household and public appliances&lt;br&gt;Need to be installed or operated by a professional&lt;br&gt;Examples: elevators, rooftop fans, residential booster pumps, gates and barriers, supermarket freezers, etc.</td>
</tr>
<tr>
<td>C3 – 2nd environment</td>
<td>Professional equipment&lt;br&gt;Needs to be installed or operated by a professional&lt;br&gt;In some rare cases, may also be pluggable&lt;br&gt;Examples: any equipment for industrial usage only, such as conveyors, mixers, etc.</td>
</tr>
<tr>
<td>C4 – 2nd environment</td>
<td>Professional equipment&lt;br&gt;Needs to be fixed installation and operated by a professional&lt;br&gt;Examples: paper machines, rolling mills, etc.</td>
</tr>
</tbody>
</table>
EMC – ELECTROMAGNETIC COMPATIBILITY

Comparison of EMC standards

<table>
<thead>
<tr>
<th>EN 61800-3, product standard</th>
<th>EN 55011, product family standard for industrial, scientific and medical (ISM) equipment</th>
<th>EN 61000-6-4, generic emission standard for industrial environments</th>
<th>EN 61000-6-3, generic emission standard for residential, commercial and light-industrial environments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category C1</td>
<td>1st environment, unrestricted distribution</td>
<td>Group 1. Class B</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Category C2</td>
<td>1st environment, restricted distribution</td>
<td>Group 1. Class A</td>
<td>Applicable</td>
</tr>
<tr>
<td>Category C3</td>
<td>2nd environment, unrestricted distribution</td>
<td>Group 2. Class A</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Category C4</td>
<td>2nd environment, restricted distribution</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

EMC product standard (EN 61800-3) category C2 is fulfilled in wall-mounted drives and in cabinet-built drives up to frame size R9. Category C3 is fulfilled in drive modules and cabinet-built drives (frames R10 and R11) with no external filters.

EMC compliance and maximum cable length of ACS480-04 units

<table>
<thead>
<tr>
<th>Type</th>
<th>Voltage</th>
<th>Frame sizes</th>
<th>1st environment, restricted distribution, C1, grounded network (TN)</th>
<th>1st environment, restricted distribution, C2, grounded network (TN)</th>
<th>2nd environment, unrestricted distribution, C3, grounded network (TN)</th>
<th>2nd environment, unrestricted distribution, C3, ungrounded network (IT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS480-04</td>
<td>380-480 V</td>
<td>R1-R5</td>
<td>30m with an optional external EMC filter</td>
<td>10m as standard</td>
<td>10m as standard</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>30m with an optional external EMC filter</td>
<td></td>
<td></td>
<td>–</td>
</tr>
</tbody>
</table>

(*) For the maximum motor cable length and further information, see the Hardware manual 3AXD50000047392.

Every ACS480 drive is equipped with a built-in filter to reduce high-frequency emissions.
Cooling and fuses

Cooling
ACS480 drives are fitted with variable-speed cooling air fans. The cooling air must be free from corrosive materials and not exceed the maximum ambient temperature of 50 °C (60 °C with derating). The speed-controlled fans cool the drive only when needed, which reduces overall noise level and energy consumption.

Fuse connections
Standard fuses can be used with ABB general purpose drives. For input fuses, see the table below.

<table>
<thead>
<tr>
<th>Drive type</th>
<th>Frame size</th>
<th>Cooling air flow 380 to 415 V units</th>
<th>Recommended input protection fuses 380 to 415 V units ***</th>
<th>IEC fuses</th>
<th>IEC fuses</th>
<th>UL fuses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Heat dissipation *</td>
<td>Air flow</td>
<td>Max. noise level **</td>
<td>Fuse type</td>
<td>Fuse type</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(W) (BTU/h)</td>
<td>(m³/h)</td>
<td>(ft³/min)</td>
<td>(dBA)</td>
<td>(A)</td>
</tr>
<tr>
<td>ACS480-04-02A7-4</td>
<td>R1</td>
<td>55</td>
<td>189</td>
<td>57</td>
<td>33</td>
<td>63</td>
</tr>
<tr>
<td>ACS480-04-03A4-4</td>
<td>R1</td>
<td>62</td>
<td>213</td>
<td>57</td>
<td>33</td>
<td>63</td>
</tr>
<tr>
<td>ACS480-04-04A1-4</td>
<td>R1</td>
<td>70</td>
<td>240</td>
<td>57</td>
<td>33</td>
<td>63</td>
</tr>
<tr>
<td>ACS480-04-05A7-4</td>
<td>R1</td>
<td>88</td>
<td>302</td>
<td>57</td>
<td>33</td>
<td>63</td>
</tr>
<tr>
<td>ACS480-04-07A3-4</td>
<td>R1</td>
<td>108</td>
<td>368</td>
<td>57</td>
<td>33</td>
<td>63</td>
</tr>
<tr>
<td>ACS480-04-09A5-4</td>
<td>R1</td>
<td>135</td>
<td>461</td>
<td>57</td>
<td>33</td>
<td>63</td>
</tr>
<tr>
<td>ACS480-04-12A7-4</td>
<td>R2</td>
<td>178</td>
<td>609</td>
<td>63</td>
<td>37</td>
<td>59</td>
</tr>
<tr>
<td>ACS480-04-01B4-4</td>
<td>R3</td>
<td>230</td>
<td>784</td>
<td>128</td>
<td>75</td>
<td>66</td>
</tr>
<tr>
<td>ACS480-04-02B4-4</td>
<td>R3</td>
<td>344</td>
<td>1174</td>
<td>128</td>
<td>75</td>
<td>66</td>
</tr>
<tr>
<td>ACS480-04-03B3-4</td>
<td>R4</td>
<td>465</td>
<td>1587</td>
<td>150</td>
<td>88</td>
<td>69</td>
</tr>
<tr>
<td>ACS480-04-03B9-4</td>
<td>R4</td>
<td>566</td>
<td>1934</td>
<td>150</td>
<td>88</td>
<td>69</td>
</tr>
<tr>
<td>ACS480-04-04B6-4</td>
<td>R4</td>
<td>668</td>
<td>2281</td>
<td>150</td>
<td>88</td>
<td>69</td>
</tr>
<tr>
<td>ACS480-04-05B5-4</td>
<td>R4</td>
<td>668</td>
<td>2281</td>
<td>150</td>
<td>88</td>
<td>69</td>
</tr>
</tbody>
</table>

* Heat dissipation value is a reference for cabinet thermal design.
** The maximum noise level at full fan speed. When the drive is not operating at full load and at maximum ambient temperature the noise level is lower.
*** For detailed fuse sizes and types, please see the ACS480 hardware manual, document code: 3AXD50000047392.
Input chokes, du/dt filters, C1 filters

External input chokes can be used with the ACS480 drives if there is a need to optimize the line-side harmonics. Du/dt filtering, on the other hand, suppresses inverter output voltage spikes and rapid voltage changes that stress motor insulation. Additionally, du/dt filtering reduces capacitive leakage currents and high-frequency emissions from 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.

To comply with European EMC Directive Category C1 (standard IEC/EN 61800-3) with optional external EMC filter, use motor cables with maximum length of 10 meters for 4 kHz switching frequency. In addition, please note that Category C1 is with conducted emissions only.

<table>
<thead>
<tr>
<th>Drive type</th>
<th>Frame size</th>
<th>Input choke, max. ambient temp. 40 °C</th>
<th>du/dt filter type, max. ambient temp. 40 °C</th>
<th>EMC C1 filter code/ Schaffner code</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS480-04-02A7-4</td>
<td>R1</td>
<td>CHK-01</td>
<td>ACS-CHK-B3</td>
<td>RFI-32/ FN 3268-7-44</td>
</tr>
<tr>
<td>ACS480-04-03A4-4</td>
<td>R1</td>
<td>CHK-01</td>
<td>ACS-CHK-B3</td>
<td>RFI-32/ FN 3268-7-44</td>
</tr>
<tr>
<td>ACS480-04-04A1-4</td>
<td>R1</td>
<td>CHK-02</td>
<td>ACS-CHK-C3</td>
<td>RFI-32/ FN 3268-7-44</td>
</tr>
<tr>
<td>ACS480-04-05A7-4</td>
<td>R1</td>
<td>CHK-02</td>
<td>ACS-CHK-C3</td>
<td>RFI-32/ FN 3268-7-44</td>
</tr>
<tr>
<td>ACS480-04-07A3-4</td>
<td>R1</td>
<td>CHK-02</td>
<td>NOCH0016-6x</td>
<td>RFI-32/ FN 3268-16-44</td>
</tr>
<tr>
<td>ACS480-04-09A5-4</td>
<td>R1</td>
<td>CHK-03</td>
<td>NOCH0016-6x</td>
<td>RFI-32/ FN 3268-16-44</td>
</tr>
<tr>
<td>ACS480-04-12A7-4</td>
<td>R2</td>
<td>CHK-03</td>
<td>NOCH0016-6x</td>
<td>RFI-33/ FN 3268-16-44</td>
</tr>
<tr>
<td>ACS480-04-018A-4</td>
<td>R3</td>
<td>CHK-04</td>
<td>NOCH0030-6x</td>
<td>RFI-33/ FN 3268-30-33</td>
</tr>
<tr>
<td>ACS480-04-026A-4</td>
<td>R3</td>
<td>CHK-04</td>
<td>NOCH0030-6x</td>
<td>RFI-33/ FN 3268-30-33</td>
</tr>
<tr>
<td>ACS480-04-033A-4</td>
<td>R4</td>
<td>CHK-05</td>
<td>NOCH-0030-6x</td>
<td>RFI-34/ FN 3258-100-35</td>
</tr>
<tr>
<td>ACS480-04-039A-4</td>
<td>R4</td>
<td>CHK-05</td>
<td>NOCH-0070-6x</td>
<td>RFI-34/ FN 3258-100-35</td>
</tr>
<tr>
<td>ACS480-04-046A-4</td>
<td>R4</td>
<td>CHK-05</td>
<td>NOCH-0070-6x</td>
<td>RFI-34/ FN 3258-100-35</td>
</tr>
<tr>
<td>ACS480-04-050A-4</td>
<td>R4</td>
<td>CHK-06</td>
<td>NOCH-0070-6x</td>
<td>RFI-34/ FN 3258-100-35</td>
</tr>
</tbody>
</table>

For information on the construction of the motor insulation, consult the manufacturer.

More information on the du/dt and C1 filters can be found in the ACS480 hardware manual.
Brake choppers and resistors

**Brake chopper and resistor**
All ACS480 drives are equipped with a built-in brake chopper. The brake chopper prevents the drive from tripping due to overvoltage while allowing faster braking. Faster braking enables shorter start and stop cycles, and thus productivity can be increased.

To benefit from the brake chopper, an external brake resistor needs to be connected to the chopper. The brake resistor transfers the braking energy into heat.

<table>
<thead>
<tr>
<th>Drive type</th>
<th>Frame size</th>
<th>Internal brake chopper</th>
<th>Example brake resistor(s)</th>
<th>Reference resistor types</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS480-04-02A7-4</td>
<td>R1</td>
<td>0.55 0.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACS480-04-03A4-4</td>
<td>R1</td>
<td>0.75 1.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACS480-04-04A1-4</td>
<td>R1</td>
<td>1.1 1.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACS480-04-05A7-4</td>
<td>R1</td>
<td>1.5 2.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACS480-04-07A3-4</td>
<td>R1</td>
<td>2.2 3.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACS480-04-09A5-4</td>
<td>R1</td>
<td>3.0 4.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACS480-04-12A7-4</td>
<td>R2</td>
<td>4.0 6.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACS480-04-018A-4</td>
<td>R3</td>
<td>5.5 8.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACS480-04-026A-4</td>
<td>R3</td>
<td>7.5 11.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACS480-04-033A-4</td>
<td>R4</td>
<td>11.0 17.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACS480-04-039A-4</td>
<td>R4</td>
<td>15.0 23.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACS480-04-046A-4</td>
<td>R4</td>
<td>18.5 28.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACS480-04-050A-4</td>
<td>R4</td>
<td>22.0 33.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Everything for your application

The ACS480 and ACS580 share the same assistant control panel and operation logic, making it easy to switch between them. The ACS480 offers the basic essentials while the ACS580 equips users e.g. with a wider power range, higher protection class for wall mounting, and more options.

ACS480
- Optimized for cabinets, IP20
- Power up to 22 kW
- Optimized and compact size for cabinet installations

ACS580
- Wall-mounted drives, cabinet-built drives, drive modules, flange mounting
- Power up to 500 kW
- IP55 across the full power range
- DC-choke for harmonics mitigation
- Speed controlled mains fan
- More I/O extensions and ATEX options
- Motor cables up to 300 meters

Programmable Logic Controllers PLCs
The AC500, AC500-eCo, AC500-S and AC500-XC scalable PLC ranges provide solutions for small, medium and high-end applications. Our AC500 PLC platform offers different performance levels and is the ideal choice for high availability, extreme environments, condition monitoring, motion control or safety solutions.

AC motors
ABB’s low voltage AC motors are designed to save energy, reduce operating costs and minimize unscheduled downtime. General performance motors ensure convenience, while process performance motors provide a broad set of motors for the process industries and heavy-duty applications.

Control panels
CP600-eCo and CP600 HMI control panels offer a wide range of features and functionalities for maximum operability. ABB control panels are distinguished by their robustness and high usability, providing all the relevant information from production plants and machines at one single touch.

All-compatible drives portfolio
The all-compatible drives share the same architecture: software platform, tools, user interfaces and options. Yet, there is an optimal drive from the smallest water pump to the biggest cement kiln, and everything in the between.

Automation Builder Engineering suite
ABB Automation Builder is the software for machine builders and system integrators wanting to automate their machines and systems in a unified and efficient way. Automation Builder connects the engineering tools for PLC, safety, control panels, SCADA, drives, motion and robots.

Jokab safety products
ABB Jokab Safety offers an extensive range of innovative products and solutions for machine safety systems. It is represented in standardization organizations for machine safety and works daily with the practical application of safety requirements in combination with production requirements.
Choose the right motor for your application

Choose the best motor for your application. A natural match for induction motors, ABB general purpose drives can also control high-efficiency motors such as permanent magnet or synchronous reluctance motors for greater efficiency.

**Induction motors, the industry workhorse**
Pair the ACS480 or ACS580 with an induction motor (IM) for simple and reliable operation in many applications and in a wide range of environments. Further simplifying setup, the general purpose drives can be integrated with virtually any type of IM by entering the nameplate motor data only.

**Permanent magnet motors for smooth operation**
Permanent magnet technology is used for improved motor characteristics in terms of energy efficiency and compactness. This technology is particularly well-suited for low speed control applications, as they eliminate the need to use gear boxes. Even without speed or rotor position sensors, the ACS480 or ACS580 drives control most types of permanent magnet motors.

**IE5 SynRM for optimized energy efficiency**
Combining ABB’s general purpose drive control technology with our synchronous reluctance motors will give you a motor and a drive package that ensures high energy efficiency, reduces motor temperatures, and provides a significant reduction in motor noise. The key is in the efficiency-optimized rotor design of our SynRM motors.
Synchronous reluctance motors
Ultimate efficiency and reliability to optimize your cost of ownership

Innovation inside
The idea is simple. Take a conventional, proven stator technology and an innovative rotor design. Then combine them with an ABB general purpose drive loaded with software with versatile features. Finally, optimize the whole package for applications such as compressors, conveyors, mixers, pumps, centrifuges, fans and many other variable and constant torque applications.

Magnet-free design
Synchronous reluctance technology combines the performance of a permanent magnet motor with the simplicity and service-friendliness of an induction motor. The new rotor has neither magnets nor windings, and suffers virtually no power losses. And because there are no magnetic forces in the rotor, maintenance is as straightforward as with induction motors.

Superior reliability to minimize the cost of not running
International Efficiency class IE5 synchronous reluctance motors (SynRM) have very low winding temperatures, which increases the reliability and lifetime of the winding. More importantly, a cool synchronous reluctance rotor means significantly lower bearing temperatures – an important factor because bearing failures cause about 70 percent of unplanned motor outages.

Perfect for retrofits
The SynRM package is a perfect solution for motor retrofits. The IE5 SynRM is the same size as an IE3 induction motor, eliminating the need for mechanical modifications. The increased efficiency will, on the other hand, reduce the payback time of the investment.

Full motor control, down to zero speed
Many processes require accurate speed control. SynRM always runs at reference speed with practically no error, without an encoder. Even the best slip compensation systems in an induction motor inverter will never match the precision of SynRM. Sometimes your application may require you to run your motor at slow speeds. If you are using SynRM and your drive cannot provide the necessary torque, it may trip. ABB drives provide full control and torque down to zero speed, even without speed sensors.

For all applications
This is important if you are planning on using the motor with applications other than quadratic torque applications like pumps and fans. Our drives provide full SynRM motor control for constant torque applications such as extruders, conveyors and wire drawing machines.

<table>
<thead>
<tr>
<th>SynRM technology</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher efficiency IE5</td>
<td>Lowest energy consumption</td>
</tr>
<tr>
<td>No rare earth metals</td>
<td>Environmental sustainability</td>
</tr>
<tr>
<td>Magnet-free rotor</td>
<td>Easy service</td>
</tr>
<tr>
<td>Lower winding and bearing</td>
<td>Longer life time, extended</td>
</tr>
<tr>
<td>temperatures</td>
<td>service intervals</td>
</tr>
<tr>
<td>Better controllability</td>
<td>Accurate speed and torque control</td>
</tr>
<tr>
<td>Lower noise level</td>
<td>Better working and living</td>
</tr>
<tr>
<td>Same size with IE3</td>
<td>environment</td>
</tr>
</tbody>
</table>

Total cost of ownership
= $ Purchase + $ Cost of running + $ Cost of not running
Drivetune mobile application for wireless access

User-friendly experience with Bluetooth connectivity.

Drivetune mobile app is a powerful tool for performing basic drive startup and troubleshooting tasks. It is possible to connect with drives and access data available in the Internet at the same time. The wireless Bluetooth connectivity means that users won’t need to enter hazardous or difficult-to-reach work areas to access information necessary to help them commission and tune the drive.

- Startup, commission and tune your drive and application with full parameter access
- Optimize performance via drive troubleshooting features
- Create and share backups and support packages
- Keep track of drives installed base

ABB Ability™ Mobile Connect for drives is a module in the Drivetune app. It gives you the access to the technical support for fast problem solving. Mobile Connect makes all the necessary data instantly available to the expert, providing support.

Remote and rapid access to ABB’s drive experts can save you and your team considerable time, money and headaches. Check Mobile Connect availability in your country.

Drive with Bluetooth panel

Mobile device with Drivetune app

Expert help with Mobile Connect license

Download Drivetune

Drivetune for commissioning and managing drives
ABB SmartGuide – ACS480

Being one of the handiest ways to get short and clear visual instructions on drive installation, startup and operation.

Mobile friendly digital user guides provide simple and animated step-by-step instructions to assist with wall mounting of drives, electrical installation and drive programming. The content is frequently updated and further developed, making it your comprehensive source of instructions and help.

Scan the QR code and test it yourself!

https://drives-abb.swipeguide.com/
We keep your world turning

Whatever your needs are, we offer the most extensive service offering for drives, motors and generators from spare parts and technical support to cloud-based condition monitoring solutions to keep your equipment running.

The global ABB service units complemented by external Value Providers form a service network on your doorstep. Maximize performance, uptime and efficiency throughout the life cycle of your assets.

With you every step of the way

Even before you buy a generator, drive, motor, bearing or softstarter, ABB’s experts are on hand to offer technical advice from dimensioning through to potential energy saving.

When you’ve decided on the right product, ABB and its global network of Value Providers can help with installation and commissioning. They are also on hand to support you throughout the operation and maintenance phases of the products life cycle, providing maintenance programs tailored to your facility’s needs.

ABB will ensure you are aware of any service opportunities. If you’ve registered your drives and motors with ABB, then its engineers will proactively contact you advising on your most effective service options. All of which helps maximize performance, uptime and efficiency throughout the lifetime of your powertrain.
**Agreements**
Comprehensive bundling of relevant services into one contract to suit your needs.

**Technical support & repairs**
Quick and accurate response during emergencies and efficient support during planned production breaks.

**Spares & consumables**
Authentic, high-quality ABB spares and consumables with quick delivery.

**Installation & commissioning**
Highly-trained and reliable installation and commissioning experts at your service.

**Training**
Comprehensive and professional training either at ABB premises or your own.

**Advanced services**
Gain the unique ABB Ability™ digital advantage through data collection and analytics with advanced services.

**Extensions, upgrades & retrofits**
Up-to-date systems and devices with the best possible performance level.

**Engineering & consulting**
Ways to identify and improve the reliability, usability, maintainability and safety of your production processes.

**Global service network 24/7**

“I need operational excellence, rapid response, improved performance and life cycle management.”
### ABB Drives Life Cycle Management

**A life time of peak performance**

You’re in control of every life cycle phase of your drives. At the heart of drive services is a four-phase product life cycle management model. This model defines the services recommended and available throughout drives lifespan.

Now it’s easy for you to see the exact service and maintenance available for your drives.

#### Full range of life cycle services and support
- **Product**: Active
  - Product is in active sales and manufacturing phase
  - Full range of life cycle services is available

#### Limited range of life cycle services and support
- **Product**: Classic
  - Serial production has ceased. Product may be available for plant extensions, as a spare or for installed base renewal

#### Replacement and end-of-life services
- **Product**: Limited
  - Product is no longer available
  - Replacement and end-of-life services are available

- **Product**: Obsolete
  - Product is no longer available
  - Limited range of life cycle services is available. Spare parts availability is limited to available stock
Keeping you informed throughout the life cycle

We notify you every step of the way using life cycle status statements and announcements.

Your benefit is clear information about your drives’ status and precise services available. It helps you plan the preferred service actions ahead of time and make sure that continuous support is always available.

Sales release
Details about product portfolio and release schedule.

Sales ramp down announcement
Last time buy and last deliveries dates, informed well in advance.

Life cycle phase change announcement
Early information about the upcoming life cycle phase change and affects on the service availability. Informed well in advance, minimum six months prior to the change.

Life cycle phase statement
Information about the current life cycle status, product and services availability and recommended actions. Plan for the next life cycle phase transition.
## Ordering information
How to build up your ordering code

### ACS480-04

The type designation tells you the specifications and configuration of the drive.
The table shows the primary drive variants.
Sample type code: ACS480-04-12A7-4+XXXX

#### Basic codes

<table>
<thead>
<tr>
<th>Segment</th>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>04</td>
<td>Wall mounted, IP20 (UL Type 1), assistant control panel with a USB port, EMC C2 filter (internal EMC filter), safe torque off, braking chopper, coated boards, quick installation and start-up guide</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td>Current rating</td>
</tr>
<tr>
<td>E</td>
<td>4</td>
<td>400/480 V (380...480 V)</td>
</tr>
</tbody>
</table>

#### Option codes

<table>
<thead>
<tr>
<th>Segment</th>
<th>Option</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>04</td>
<td>+0100</td>
<td>No control panel</td>
</tr>
<tr>
<td>F</td>
<td>04</td>
<td>+0400</td>
<td>ACS-AP-5 Assistant control panel (as standard)</td>
</tr>
<tr>
<td>F</td>
<td>04</td>
<td>+0404</td>
<td>ACS-BP-5 Basic control panel</td>
</tr>
<tr>
<td>F</td>
<td>4</td>
<td>+0424</td>
<td>Blank panel with RJ-45 connector (RDUM-01)</td>
</tr>
<tr>
<td>F</td>
<td>4</td>
<td>+0425</td>
<td>ACS-AP-1 Assistant control panel</td>
</tr>
<tr>
<td>F</td>
<td>4</td>
<td>+0429</td>
<td>ACS-AP-W Assistant control panel with a Bluetooth interface</td>
</tr>
<tr>
<td>F</td>
<td>4</td>
<td>+0431</td>
<td>USB to RJ-45 cable that is used together with RDUM-01 for PC connection</td>
</tr>
<tr>
<td>I/O</td>
<td>05</td>
<td>+0560</td>
<td>Standard I/O &amp; Modbus RTU module RIIO-01 (as standard)</td>
</tr>
<tr>
<td>I/O</td>
<td>06</td>
<td>+0680</td>
<td>Remove the standard I/O module RIIO-01</td>
</tr>
<tr>
<td>I/O</td>
<td>06</td>
<td>+0681</td>
<td>BIO-01 I/O extension module for 3xDI, 1xDO, 1xAI (can be used together with fieldbus)</td>
</tr>
<tr>
<td>I/O</td>
<td>06</td>
<td>+0685</td>
<td>DeviceNet™ (FDNA-01)</td>
</tr>
<tr>
<td>I/O</td>
<td>06</td>
<td>+0686</td>
<td>PROFIBUS® DP (FPBA-01)</td>
</tr>
<tr>
<td>I/O</td>
<td>06</td>
<td>+0687</td>
<td>CANopen® (FCAN-01)</td>
</tr>
<tr>
<td>I/O</td>
<td>06</td>
<td>+0688</td>
<td>ControlNet™ (FCNA-01)</td>
</tr>
<tr>
<td>I/O</td>
<td>06</td>
<td>+0690</td>
<td>EtherCAT® (FECA-01)</td>
</tr>
<tr>
<td>I/O</td>
<td>06</td>
<td>+0691</td>
<td>Ethernet POWERLINK (FEPL-01)</td>
</tr>
<tr>
<td>I/O</td>
<td>06</td>
<td>+0692</td>
<td>2-port Ethernet (EtherNet/IP™, Modbus®/TCP, PROFINET®)</td>
</tr>
<tr>
<td>I/O</td>
<td>06</td>
<td>+0693</td>
<td>EtherNet/IP™ (FEIP-21)</td>
</tr>
<tr>
<td>I/O</td>
<td>06</td>
<td>+0694</td>
<td>Modbus®/TCP (FMBT-21)</td>
</tr>
<tr>
<td>I/O</td>
<td>06</td>
<td>+0695</td>
<td>PROFINET® IO (FPNO-21)</td>
</tr>
</tbody>
</table>

#### Side I/O options

BREL-01 (relay option: 4xRO) and BAP0-01 (External +24 DC option) are available as loose items only.
Only one slot for side I/O option is available. For other options please contact local ABB.
Additional Information

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