

New markets targeted with
ABB's variable-speed microdrive

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ACS50

sizing up the consumer industry



Advances in AC drive technology have brought about a 'small revolution', and at the same time presented ABB with a whole host of new market opportunities for its variable-speed drives. The revolution is the newly launched ABB component drive ACS50, while the new opportunities are to be found in the vast consumer industry. Here, applications for very small, affordable drives abound, for example in home and medical appliances.

ABB is a market leader in the design and supply of electrical drive equipment for industrial, commercial and building applications. The company offers one of the largest portfolios of variable-speed drives and backs it up with in-depth application know-how. ABB drives are used, for example, in the cement, chemical, metal, oil and gas, and pulp and paper industries, in marine applications, in food and beverage production, and in power plants.

To hold on to this number one market position, ABB follows a strategy of increasing market share through sustainable innovation and of breaking into new markets with smaller and easy-to-use products.

To increase market share, ABB continues to enhance its portfolio by making drives:

- Easier to use by implementing advanced software

- More cost-effective, and therefore more competitive
- Smarter

Some remarkable advances in AC drive technology over the past 20 years have also made it possible for ABB to enter new markets. Advanced technology, plus understanding the customers' needs and the markets in which they operate, is the key to everything. With an eye on the domestic appliance mar-

ket, ABB conducted customer surveys to discover what the most desirable features are when it comes to variable-speed drives. In order of popularity, these are:

- Simple controls and setups
- A user-friendly operator interface
- Programmability
- Price

From these findings, ABB knew that it could cleverly use simple adaptations of known technologies and provide products that are technologically straightforward to target these customers and markets. But the company additionally knew that not just simpler, but also smaller drives were needed to fit the required applications.

Here, ABB had the advantage that miniaturization has been one of the most striking successes of its AC drive development efforts. What is more, making drives even smaller continues to be a key goal of the company's R&D teams. Miniaturization is possible in the first place thanks to the continuous development of power semiconductors and use of advanced cooling techniques. Advanced flow modeling, in particular, is steadily improving heat sink design and performance.

Among other things, miniaturization keeps costs down and facilitates new applications. Smaller drives mean less material, so manufacturing costs are reduced and the cost of the end product is lower.

Component integration is another important factor; reducing the number of parts not only contributes to lower costs but also improves reliability.

The fruit of all this labor is the ACS50 component drive. Rated from 0.18 kW to 0.75 kW, the ACS50 is small and compact (in fact it is currently the smallest 370-W drive on the market) as well as easy to install and use. Its core platform puts the company in a position to tailor drives for a wide range of home appliances, such as washing machines, refrigerators and freezers

The ABB component drive ACS50

The ABB component drive ACS50 belongs to the Drive^{IT} Low Voltage

The new drive's core platform enables ABB to tailor the ACS50 for a wide range of home appliances, such as washing machines, refrigerators and freezers.

AC Drives family, with powers from 0.12 kW to 4500 kW. The drive is available for either 100–120 V AC, or

200–240 V AC single-phase systems. It is also suitable for three-phase motors with ratings from 0.12 kW to 0.75 kW and

230 V. In addition to being the smallest on the market, it is by far the easiest drive in its class. No special knowledge of drives is required prior to setup.

Installation and manual configuration require just a few minutes; there is no need for any programming! Also, since there is no control panel, there are no hidden functions. What you see is what you get.

The ACS50 can be used with domestic networks due to its good electromagnetic compatibility (EMC) even without an external filter. It is in fact available with a built-in EMC filter for first environment applications (see 1st panel) and is protected to the IP20 standard. An optional EMC filter is available for long motor cables, with unrestricted sales distribution up to 75 meters in the second environment and restricted sales distribution up to 30 meters in the first environment (see 2nd panel). It comes equipped with a choice of silent or standard noise control.

The user interface features three control potentiometers and eight dual in-line package (DIP) switches located on the front panel. The potentiometers control the motor thermal protection, acceleration/deceleration time (variable between 0.1 and 30 seconds), and the maximum frequency. The ACS50 drive is configured via the DIP switches, which are used to set functions such as:

- Nominal frequency of the motor
- Motor noise control
- Minimum analog input
- Drive auto reset for faults

First and second environments

Drive systems can be connected to either industrial or public distribution networks. The environment class (of which there are two, known as the first and second environment) depends on how the system is connected to the power supply.

The first environment includes domestic and other premises directly connected to a low-voltage power supply network supplying residential buildings without an immediate transformer.

The second environment includes all establishments other than those directly connected to a low-voltage power supply network supplying residential buildings.

Restricted and unrestricted classes

A drive's route to market is divided into unrestricted and restricted sales distribution classes.

Unrestricted distribution is a mode of sales distribution in which the supply of equipment is not dependent on the EMC competence of the customer or user with regard to drive applications.

Restricted distribution is a mode of sales distribution in which the manufacturer restricts the supply of equipment to suppliers, customers or users who separately or jointly have the required EMC competence with regard to drive applications.

Standard input/output functionality is provided via a control terminal on the front of the unit.

Applications: from the usual to the unusual

Aimed at simple applications in industries like heating, ventilation and air-conditioning (HVAC), or food and beverages, the ACS50 is seen as a substitute for existing products such as contactors, soft starters, multispeed motors, tri-acs and regulating transformers.

Aimed at simple applications in various industries, the ACS50 is seen as a substitute for contactors, soft starters, multispeed motors, tri-acs and regulating transformers.



ACS50 component drive models

ABB expects the ACS50 to open up new markets with unusual applications as diverse as automated gate control, medical scanners and pizza ovens. In fact, customers have already tested the drive in some of these areas, and all have commented that it could be quickly installed – usually in less than five minutes! – and was extremely easy to use. Other foreseeable applications include packaging machines, scanners, and pumps and fans.

Here, likely purchasers will be small- to medium-size OEMs who demand simple, easy-to-use products. It is anticipated that these OEMs will account for 90 percent of sales.

The drive can be either DIN-rail or wall mounted and comes in two frame sizes. The smaller model is 45 mm wide by 146.5 mm high and 128 mm deep while the larger version is 67 mm wide with the other dimensions the same. These dimensions make it the thinnest drive available on the market today.

Application-specific intelligence

ABB knows that each customer application is unique. Designers at the company therefore created a core platform that ensures an extremely fast design cycle for special product variants of the AC component drive offered to larger OEMs.

This means that, depending on the application, specific functionality, such as unbalance control in washing machines, can be added to suit customer requirements. Besides providing products with better control, this also increases ABB's competitiveness in the high-volume design area.

The component drive ACS50 is the latest product of the 'small revolution' under way in AC drives at ABB. The company has taken the 'simple is best' approach and developed a compact,

easy-to-use drive that will make the life of system designers easier as well as improve the performance of many consumer electrical products.

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