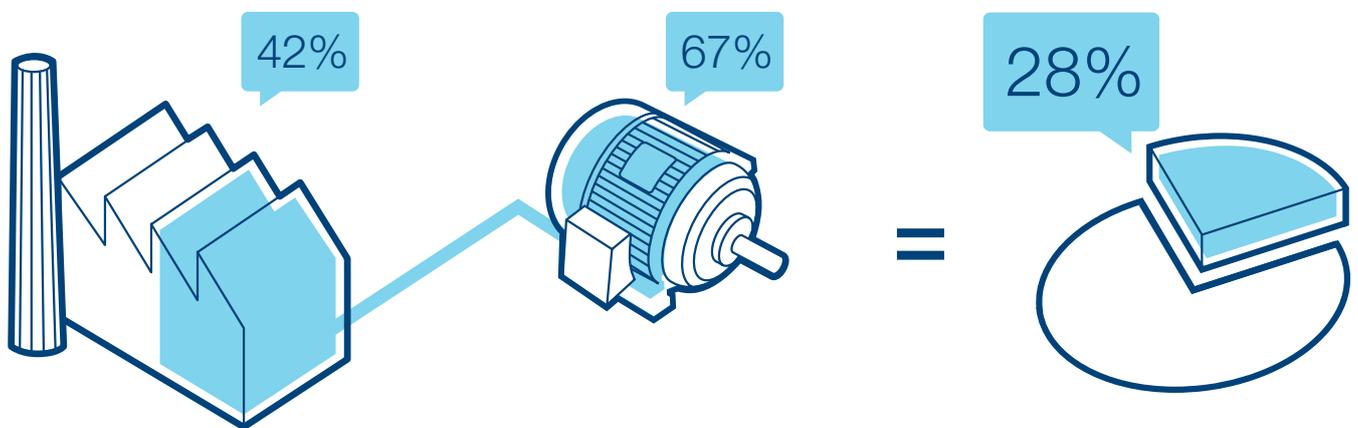




Brochure

Controlling the elements Softstarting the processes that run our world

A softstarter is a minor change that can have a major significance in improving our world.



42 percent of all electricity is used to power industry.

67 percent of this electricity is used by electric motors,

which accounts for 28 percent of the global electricity consumption.



Global resources are scarce and we strive collectively to control the extraction of natural resources and improve industrial process efficiency. Yet, there is vast potential for improvement.

Motors account for two thirds of industrial electricity consumption – corresponding to almost one third of the total global electricity use. So it is safe to say that reliable motor operation is crucial to our modern way of life.

There are millions of motors around the world that are currently not run optimally. The wear and tear associated

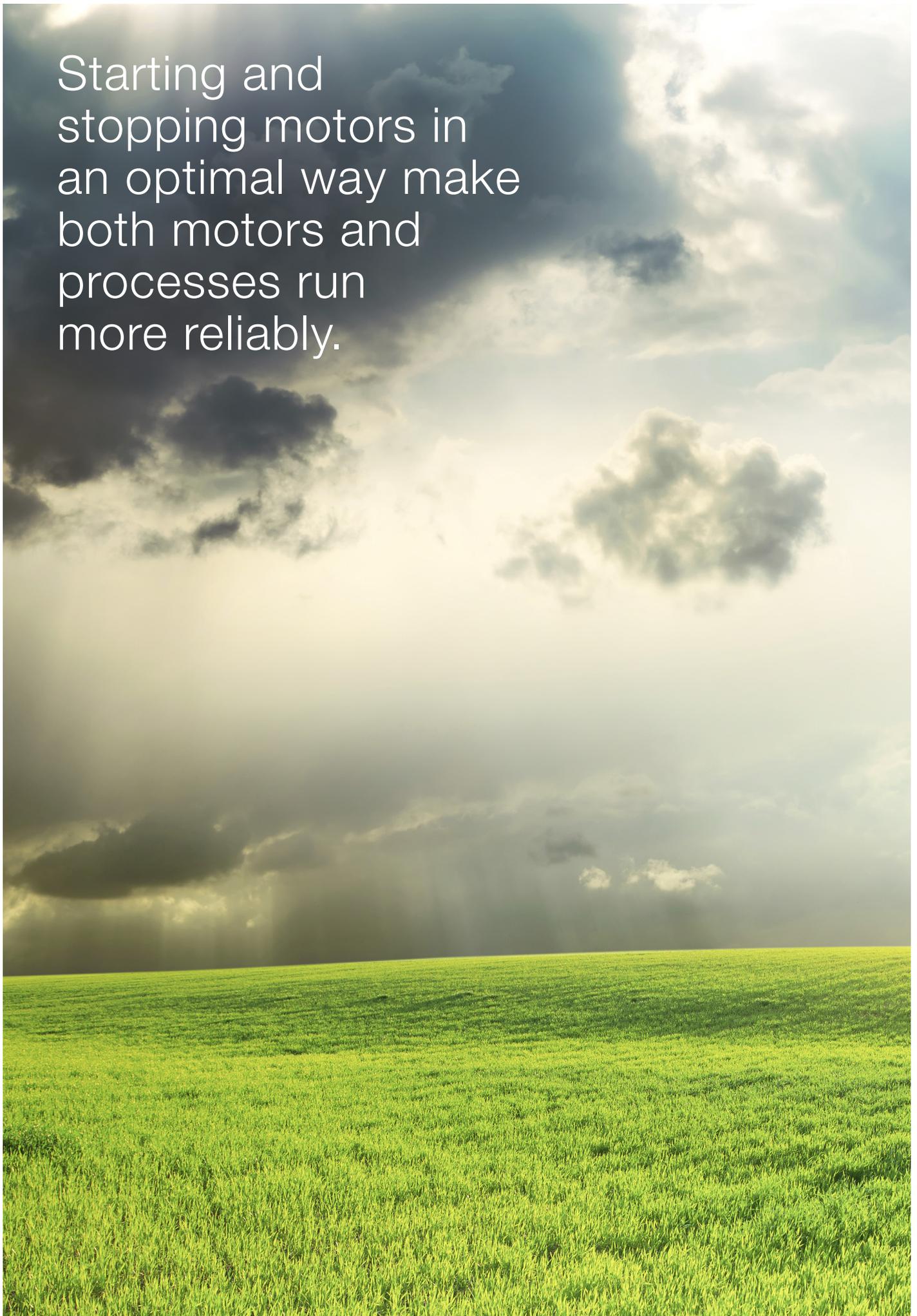
with frequent starts and stops cause unplanned stoppages and shortened operational lifetime.

The uptime and longevity of motors would be greatly improved if full-speed motors used softstarters. As the name implies, softstarters enables smooth starting and stopping of motors – optimizing new motors and bringing new life to existing ones.

As a motor saver on a global scale, a softstarter is a minor change that can have a major impact on our world. One that helps us take control of the elements around us.



Starting and
stopping motors in
an optimal way make
both motors and
processes run
more reliably.



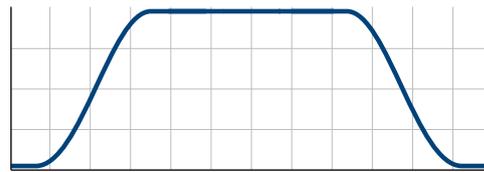


Softstarter

A softstarter is the optimal compromise between a direct on-line or star delta starter and an advanced variable speed drive in many motor applications. Like direct on-line or star delta starters, it is used in full-speed applications. Like variable speed drives, it can perform soft starts and stops.

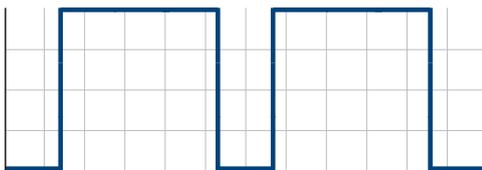
These capabilities make softstarters the right choice of motor starting for a wide range of motor applications. 90 percent of all motors are used in full-speed applications, where variable speed capabilities add no or little process value. However, if the full-speed application is repeatedly started and stopped, softstarting is necessary to control starting current and torque, not to cause unnecessary stress on motor components.

Uncontrolled stopping of pumps may cause water hammering, which in turn causes wear on equipment and potential leakage. The use of softstarters can prevent this from occurring. Pumps operating in wastewater treatment plants are preferably run at full speed, thus preventing clogging in pumps or pipes.



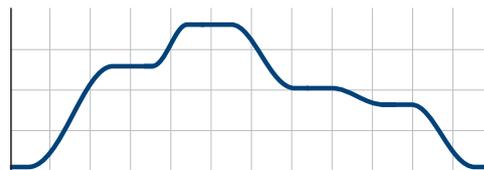
Direct on-line and star delta

Direct on-line and star delta starters are used in full-speed applications. They can perform direct starts and stops. However, unlike softstarters, starting and stopping is not carried out as softly as for softstarters, which makes the starting method suitable only for small motors.



Variable speed drive

Variable speed drives can perform soft starts and stops in applications where adjusting the speed is necessary during operation. This results in more energy efficient motor operation when full speed is not required.





Controlling the elements means controlling the processes that let us live off the earth's resources.

In harmony with earth's limitations

Living off the resources of the world, we need to co-exist with our planet to live sustainably here. What we extract must be in harmony with the earth's limitations.

Thousands of motors run the processes that we use to extract our natural resources. Motors must match our demands for productivity in the mining processes that extract our resources – whether on the surface or under ground.

Refining raw materials into the substances we need requires immense motor power. We need to soft start the motors that

run these mission-critical processes to keep them in good shape to run uninterruptedly year after year.

In industries with extensive use of materials, goods and products, the productivity of each part of the manufacturing chain matters. The ability to keep production running until next planned maintenance stop, even if a single component or sub-process should fail, guarantees full control of productivity.

Softstarters play an important role in securing the long-term motor reliability we need to sustainably harvest the earth's resources.

PSTX features that help you control earth

Limp mode

Pumps normally operate in processes where they need to perform 24/7, without interruption. The success of the operation depends on the reliability of the pump – and, ultimately, the reliability of the softstarter.

The PSTX includes a feature called limp mode. In case a thyristor set should fail, limp mode ensures that the softstarter can continue to run on only two thyristor sets. The pump will keep pumping and the operation can be secured before the softstarter is replaced or repaired.

Jog with slow speed

Jog with adjustable speed is a PSTX feature that makes it possible for the operator to slow-speed position, e.g. a conveyor belt, in one of three different speed levels. This is useful if something should get stuck in the conveyor belt, and the belt needs to be synchronized with a machine after re-start.

With a conventional softstarter, the conveyor belt would have to be fed as during a normal start, which makes it a lot more difficult for the operator to control the process.

Embedded diagnostics and warnings

When a problem is about to occur in your process, you want to know about it in advance, before the costly damage is a fact. Problems can be anything from variations in the electrical load to unforeseen changes in motor load.

The PSTX has many embedded diagnostics and warnings that will inform you in advance that there might be a problem. These features may well be the difference between an ordinary shutdown and a costly motor failure.



Shredding tires, waste – and downtime

Granutech Saturn Systems, Texas, USA, manufactures shredding, granulating and crushing machinery designed to reduce the size of waste in order to simplify logistics. Large motors rotate the cutting teeth that revert tire piles to rubber particles.

Granutech had experienced availability problems due to high starting currents and overload currents resulting from jamming teeth. Emergency starting after stoppages was also a problem since the bypass contactors were too small to handle direct on-line motor starting.

Switching to ABB's softstarter, the problems were reduced thanks to integrated motor overload protection. Starting currents were also reduced, relieving motor and machinery of stress during motor starting and stopping.

The use of softstarters from ABB helped Granutech convince customers to choose its tire shredding systems. Granutech estimates saving thousands of dollars per year on fewer service calls. They took control of their machinery – and shredded downtime in the process.



Granutech Saturn Systems, USA.
Saving thousands of dollars every year thanks to fewer service calls.



Controlling heat means controlling the reliability of the processes we use to refine and consume the materials we need.

Hot in the market with softstarters

Taming fire paved the way for human civilization. Today, controlling hot processes safely and efficiently is necessary for us in order to manufacture the products we need in our everyday life.

There is tremendous strain on motors operating in hot environments. Yet, these motors must be guaranteed to run uninterruptedly day in, day out. It is safe to say that this places particularly stringent requirements on motors in hot environments.

Implementing softstarters is a firm response to these challenges. They help already strained motors work more reliably, last longer, and ultimately, ensure the safe and continuous supply of the products we need in our lives.

With softstarters, motor availability is greatly improved so that you can reduce process stoppages. This means turning downtime into production time and losses into possibilities.

Staying hot in your market is made a lot easier using softstarters from ABB.

PSTX features that help you control heat

Coated circuit boards (PCBA)

The PSTX comes with a layer of plastic coating that protects the PCBAs from environmental impact. If your process is in an environment where humidity used to be a problem, the cost of the very equipment used to lower the humidity – such as fans and ventilation – can now be reduced.

Coated PCBAs also allows the PSTX to be used in harsh environments where dust, moist and vibrations could otherwise lead to failure of a conventional softstarter.

Detachable keypad

Opening the panel just to check on the softstarter can be hazardous. With the PSTX, ABB has solved this problem by designing a detachable keypad that you can put outside on the panel door.

With the user interface always easily available, the panel does not have to be opened for diagnostics – thus improving safety and increasing operational uptime.

Motor protection

Variations in the electrical network, or in motor load, can damage a motor or other equipment. The PSTX has many built-in motor protections that automatically stop the motor in many different scenarios before a problem causes damage.

One common problem is overheating of the motor, which can be disastrous. The PSTX can use the PT100 element in the motor to detect overheating and stop the motor to prevent any damage.



Reducing starting currents in CNG compression systems

Aspro TIS (Beijing) Co. Ltd. manufactures CNG compression systems that turn natural gas into compressed gas, energy-dense enough to enable transportation by bus, truck or car. Powerful compressors are used to compress the gas to storable volume.

High starting currents were previously causing standstills. The initial startup of a compressor is the most energy-consuming phase, with starting currents many times higher than the operational current. The problem rendered Aspro TIS' softstarters and compressors many stoppages.

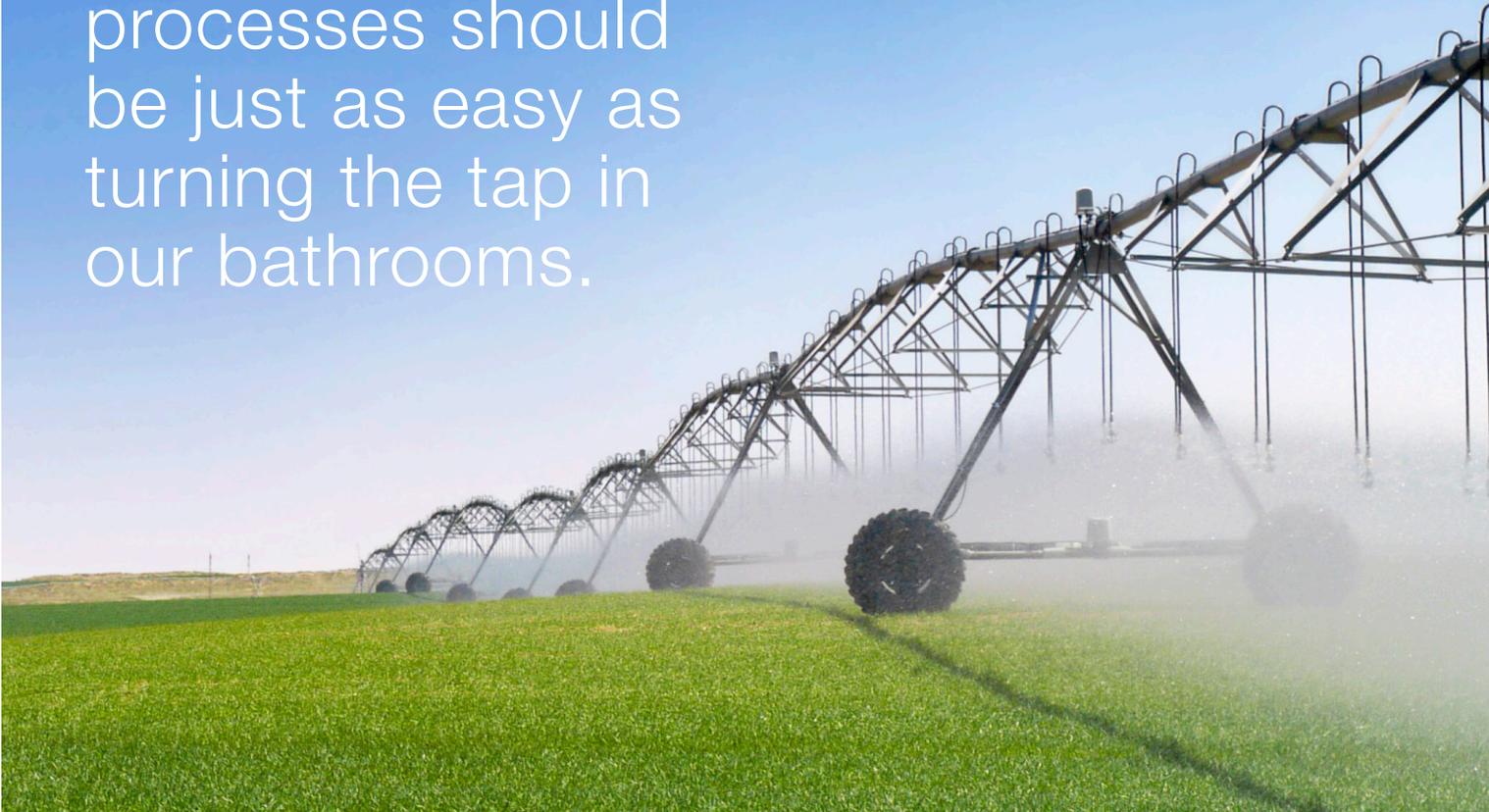
Another problem was high temperature inside the cabinets. The equipment had to be de-rated to withstand the temperature and to ensure consistency and reliability – a solution that was not acceptable to Aspro TIS.

Switching to ABB technology, the problems were soon solved. With a considerably lower de-rating factor than conventional technology, ABB's softstarters perform even in high temperatures, reducing waste of energy. The starting currents were also reduced, minimizing strain on transformers and compressors.



**Aspro TIS, China.
Significantly reduced
compressor
stoppages after
shifting to ABB
technology.**

Managing water processes should be just as easy as turning the tap in our bathrooms.



Water supply simply must work

Most of us take water for granted. Only when water supply fails do we realize just how dependent we are – whether in our homes or in industry.

We get our water from simply turning a tap. It should be just as easy to manage treatment and distribution of fresh water. We need processes that practically run themselves, without disturbances, 24/7.

Our continuous supply of water depends on easily managed water treatment processes that just keep working. Pumps form a crucial part of our water treatment processes. They

often operate in harsh environments and operating conditions, exposing motors to severe strain. Together with frequent starts and stops, this makes softstarters a vital tool to ensure maximum process availability.

Water controlled by man flows on a daily basis through pipes, dams and basins in massive quantities, unmatched by any other substance. Meanwhile, the hassle-free supply of fresh water is not merely business critical, it is vital to life itself. To deliver successfully on these stringent demands, we need simple, efficient and reliable processes – controlled by softstarters.

PSTX features that help you control water

Torque control

Water hammering is a well-known and undesired phenomenon that is frequently occurring in pipes. Besides causing disturbing noise, it puts excessive stress on pipes, valves and pumps.

Unlike conventional softstarters, ABB's torque control feature enables the softstarter to control the flow of the fluid with a feedback control loop. This will ensure true soft starting and stopping of pumps – and prolonging the lifetime of the equipment.

Motor heating

Motors operating in cold climates risk freezing during standstill. Motor heating is a built-in PSTX feature that keeps the motor warm and dry without spinning.

It works by transmitting just enough energy to the motor in order to keep it warm. The feature eliminates the need for external heating systems in cold and damp climates.

Pump cleaning

Clogging of pumps and pipes is a common cause of downtime and time-consuming service work in wastewater facilities. Thanks to a smart pump cleaning feature, the PSTX lets you clean pumps and pipes, directly from the softstarter.

By simply alternating between forward and reversing of the pump flow, pipes are easily cleaned thus enabling higher uptime of your pump system.



Reducing water hammering in aquacultural farms

The Colombian manufacturer of floating pump systems, ETEC, needed a reliable and easy-to-use solution to manage their 60-inch floating pumps, used to circulate water in a large-size aquaculture project.

Aquaculture is the farming of fish, aquatic plants and crustaceans. For a recent project, ETEC had to produce a flow of 152 cubic meters of water per second, distributed over three pump stations. Even a minor stoppage would cause major consequences for the farm.

ABB's softstarters were installed to help reduce the effects of water hammering and high starting currents in the pumps, ensuring a long lifetime of both motor and surrounding equipment. The built-in bypass helps reduce energy consumption during operation.

Besides increased equipment lifetime, ETEC gained access to a wide network of engineering expertise, urgent to respond to their every request. Service and support is now more accessible, saving ETEC approximately 80,000 dollars from reduced service and maintenance.



ETEC, Colombia. ABB's softstarters and expertise helped lower service and maintenance costs by 80,000 dollars.

We owe it to nature to efficiently operate the machines that process the air we need.



Using our only free resource sustainably

Air is free. Our only truly free resource. And it is vital in more senses than sustaining biological life on earth. We need it to generate energy, to fan our combustion processes and to ensure comfort indoor climates in our buildings.

The continuous supply of fresh air is vital to our well-being. Industrial demand for processed air is huge and growing. And the more air we need, the more energy is needed for the process of cleaning and cooling it.

Air must be allowed to flow steadily and uninterruptedly through millions of fans and compressors in numerous industrial processes around the world. Motors are an integral part of these processes. Often running 24/7, the energy use of these motors have a huge impact on the cost efficiency of the entire operation.

To benefit from air as our uniquely free resource, we need to manage our processes sustainably and cost effectively. Our machines that produce air flow need to be run optimally using softstarters. We owe it to nature.

PSTX features that help you control air

Built-in bypass

Conventional softstarters may generate a lot of heat. This is costly in itself, and even more so if you need extra equipment to for cooling in order to avoid problems.

Thanks to built-in bypass, heating from the softstarter is reduced significantly and the energy is saved. The solution is included in the softstarter and no extra time or money is needed to install external equipment.

Graphical user interface

If you have many softstarters and drives in use, it can be difficult for operators to remember how they are set up and controlled. The PSTX comes with a world-class graphical user interface, which is similar to those used on ABB's drives – making the transition for drive users easy.

The user interface is so intuitive it can be operated by anyone with a basic understanding of the product. The PSTX has more than 300 parameters that can be set up easily and rapidly by the user thanks to proper assistance.

Flexible communication

Today, it is highly desirable to be able to receive status information remotely and to control the softstarter from the main control room. This is particularly useful if you have many motors controlled by softstarters.

The PSTX supports all major industrial communication protocols, making the softstarter very easy to adapt to your existing installation. Supporting Anybus module, and with Modbus factory included, the PSTX offers the most flexible communication solution on the market.



Faster motor starting, lower starting current

Rhoss is an Italy-based specialist on air conditioning and air handling systems. In a recent project, where high inrush currents caused problems with the scroll compressors used to compress air, Rhoss contacted ABB for a more sustainable motor starting solution.

Scroll compressors require short starting times. Meanwhile, customers request low starting currents, which proved a challenge for Rhoss. They had also experienced problems with high temperatures and demand for smaller space.

Rhoss implemented ABB's softstarters in their starting equipment and soon became aware of the concept's many benefits. Built-in bypass allowed for a starting solution that took up less space. As a bonus, Rhoss could spend more space controlling the problem of high temperatures.

Most importantly, the softstarter reduced the inrush currents of the scroll compressors by 60 percent, while maintaining the short starting time that this sort of application needs. The lowered starting currents mean less stress on motor and network, reducing the need for maintenance and repairs.



Rhoss, Italy. New motor starting solution from ABB reduced inrush currents of scroll compressors by 60 percent.

Even the smallest softstarter may well be the biggest hero in the eyes of the elements.



ABB's softstarter offering consists of three ranges, covering every need. All products help you secure motor reliability, improve installation efficiency and increase application productivity.

PSTX – The advanced range

The most complete alternative to any motor starting application with motors of medium and large sizes. The PSTX is our latest advancement in motor control and protection and adds new functionality and increased reliability to the ABB softstarter range.

Technical data:

- Rated motor current: 30-1250 A (Inside delta up to 2160 A)
- Rated main voltage: 208-690 V
- Rated control supply voltage: 100-250 V AC

Main features:

- Soft start and stop
- Torque control
- Forward and reverse motor jog
- Motor load irregularities protection
- Network irregularities protection
- Detachable keypad
- Fieldbus communication



PSE – The efficient range

The perfect compromise between functionality and size, specifically designed for pump applications with small and medium sized motors. The PSE includes the most important features for pumps designed to be an efficient solution when it comes to installation and operation.

Technical data:

- Rated motor current: 18–370 A
- Rated main voltage: 208–600 V
- Rated control supply voltage: 100–250 V AC

Main features:

- Soft start and stop
- Torque control
- Electronic overload protection
- Optional fieldbus communication



PSR – The compact range

The basic and compact alternative for smaller sized motors where many starts per hour are required. The PSR comes with basic start and stop features, which makes it suitable for standard for compressor applications. The PSR can also be combined with a manual motor starter for motor protection.

Technical data:

- Rated motor current: 3–105 A
- Rated main voltage: 208–600 V
- Rated control supply voltage: 100–240 V AC or 24 V AC/DC

Main features:

- Soft start and stop
- Optional fieldbus communication

Contact us

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