

FT Flexitest™ family of test switches

60 years of innovation and excellence



Big innovations come in small packages. The ABB FT Flexitest switch family is a great example. As ABB celebrates the 60th anniversary of this important advancement in electrification, we look back at 60 years of innovation.

Where it all began

The 1960s marked a pivotal time in the evolution of technology. With the rise of personal computing and the adoption of new technologies fueling industrial automation, there was a rapid increase in the demand for electricity. It was an era of transformation and expansion, laying a foundation for the technologically driven world we live in today.

However, increasing digitalization meant utilities were tasked with meeting an ever-growing demand for safe, reliable power. Higher consumption rates necessitated advancements in power generation, transmission, and distribution technologies. Industrial automation further played a critical role in reshaping the landscape. While these advancements introduced dramatic improvements in process efficiency, they required even more power.

A critical component in these early electrical systems, electromechanical protection relays contributed to the stability, reliability, and efficient operation of the evolving electrical systems of the 1960's.

However, the power industry had a significant problem to solve. There was no way to test the functionality of a solid state relay without disrupting the system, creating power reliability challenges for the consumer and safety challenges for the utility. To address those challenges, ABB created the first test switch from the original electromechanical relay FT case design. The FT-1 Flexitest switch was designed to enable safe and straightforward relay testing without the need to disrupt the system's normal operations.

The 1960s were transformative, but in many ways, they can't begin to compare with the speed of change with which today's power utilities must contend and the level of power that will be required by tomorrow's technologies. ABB set an industry standard for test switches in 1960, one which the company has continued to build on for 60 years.

- 01 FT-1X extended-length test switch for faster and easier access to wiring points
- 02 FT switch raised white terminal lettering, for better visibility and identification in low light conditions
- 03 Front view FT-14D
- 04 Rear view FT-14D. Adds electronic module on the back with RJ45 connectors

The evolution of the FT Flexitest™ family of switches

Over the years, the FT Flexitest family of switches grew to include more models, each new market introduction bringing advantages in the quest to meet the expanding need for electrical power faster, easier, and more safely.

- FT-1 streamlined the commissioning, testing, and maintenance processes by introducing new separate source and in-service test plugs, allowing technicians to connect test equipment to the switch’s contacts safely, without exposing themselves to live circuits. This innovation was also added to the FT-14.
- FT-1X offered an extended length that facilitated easier and faster access to wiring points, significantly improving the efficiency of installation, testing, and maintenance processes.
- FT-1F introduced front connections that allow for easier access and manipulation during testing and maintenance, allowing the switch to be mounted virtually anywhere.
- FT-14D was the first digital FT test switch designed for testing protective relays with low energy analog sensor inputs and RJ45 connections.

Industry standards have always been important, but they change as consumer requirements change, technology advances, and societal goals evolve. For example, the oil crisis of the 1970s led to a surge in interest in alternative, domestically sourced forms of energy, including nuclear power. In 1978, ABB added Class 1E switches to the Flexitest family of test switches to meet the nuclear industry’s need for safe, reliable power systems and controls. Today, all Flexitest switches meet or exceed all requirements of ANSI/IEEE Standard C37.90. Furthermore, the Class 1E switches in this family adhere to IEEE standards C37.98, C37.105, 323-1983, and 344-1987.

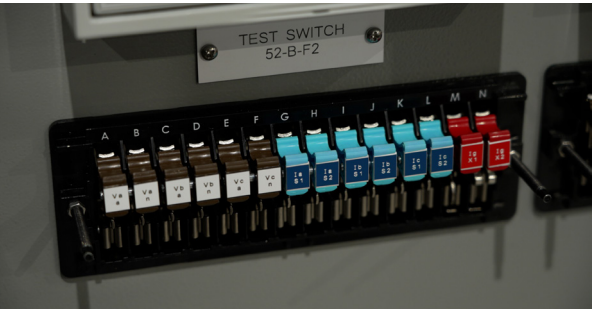


01



02

ABB has continued to implement innovations on its production lines. First introduced in 2004, ABB’s fully automated product line delivers some of the lowest turnaround times in the business. Coupled with the ABB FT switch product configurator, introduced in 2007, ABB customers have the ability to order exactly the configuration they need without sacrificing delivery speed.



03



04

The quest for faster, easier and safer

Then, as now, utilities had to do more with less. ABB innovations over the years have supported this goal with features available across most models of Flexitest™ switches. Many of these innovations arose from suggestions made by technicians and engineers working with relays in the field. On paper, they seem small, but in the real-world they made a huge difference in the ability of the technicians to get the job done faster, easier, and more safely.

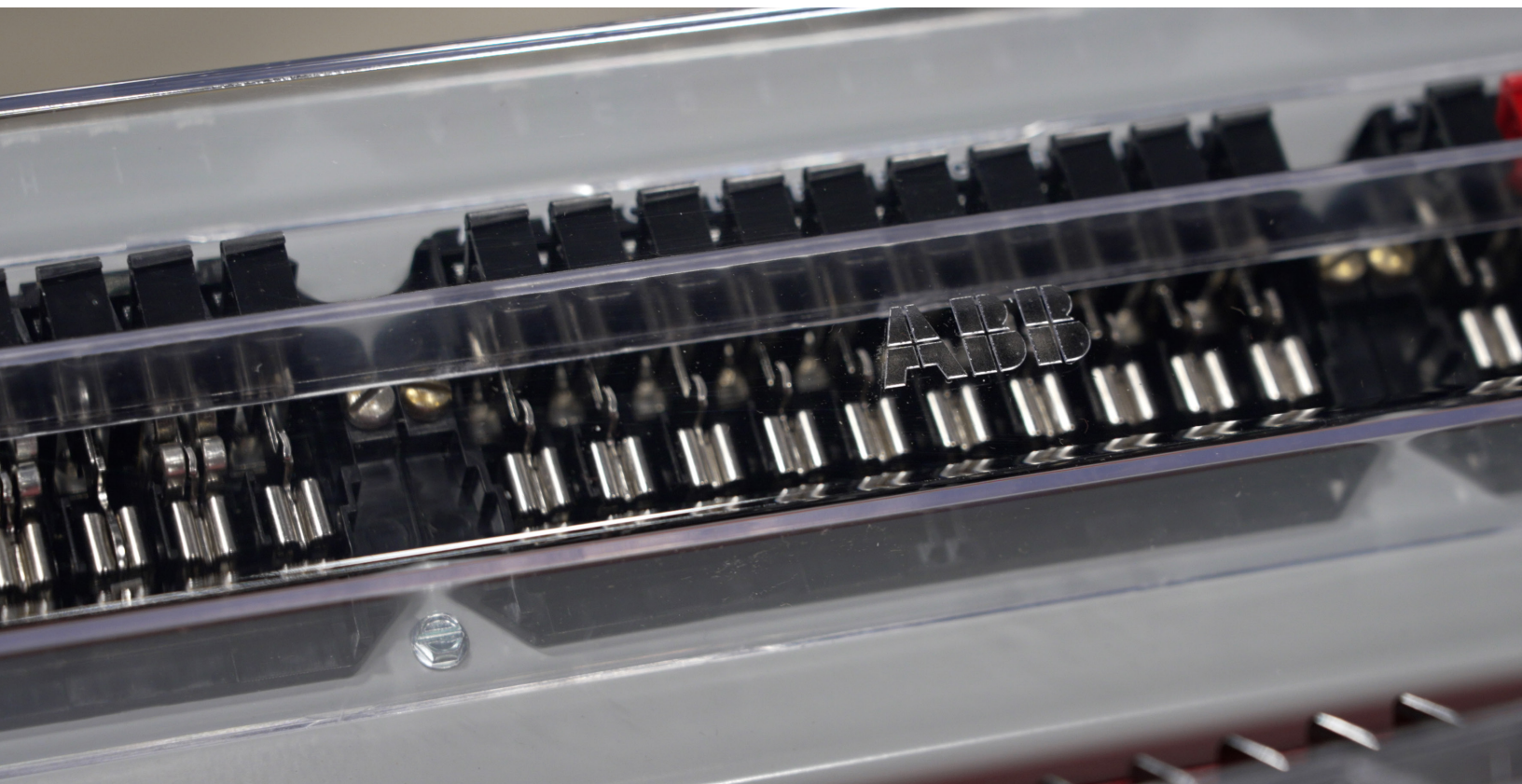
For example, the introduction of color-coded switch handles in 1995 provided an immediate visual cue to quickly identify the type of control or circuit each switch pertains to. Easy visual identification can be crucial in emergencies or during maintenance, where time and accurate recognition are essential for safety and quick response. As power systems advanced, ABB introduced more colors. Today, ABB's configuration system allows customers to order switches with whatever variety of colors they need.

The introduction of deep, clear covers allowed for quick visual inspection of the switch's position and

condition, significantly speeding up troubleshooting and verification processes. Clear, shallow covers helped overcome space constraints in some applications. Cover shields were introduced to protect technicians from hot blades during testing and maintenance. ABB added slotted covers with protective barriers for hanging tags for ease of circuit identification.

Introduced in 2009, the ABB SafePlug™ was the first electronic individual current test plug with a continuous rating of 600 V, 20 A. The SafePlug supports robust testing capabilities with built-in open current transformer (CT) protection. Its ergonomic design also includes LED indicator for open CT protection operation, helping ensure clear visibility and safety during testing procedures.

White lettering in the front and numbering in the rear, introduced in 2016, made it easier to see FT switch markings in low-light conditions. When visibility is even more limited, the raised lettering can help technicians identify the proper circuits without needing a direct line of sight.



A commitment to sustainability

As part of its commitment to material compliance, ABB has compiled a list of prohibited and restricted substances to help its engineers and suppliers comply with regulatory requirements like REACH. This effort demonstrates ABB's dedication to maintaining a high level of protection for human health and the environment, managing risks related to chemicals present in all ABB products, including FT switches.

ABB FT switches are designed to facilitate efficiency and long-term reliability, which promotes responsible resource management and helps customers reduce their overall carbon footprint. Internally, ABB also has goals centered around sustainability and continues to invest in technologies and processes that can reduce the environmental impact of products like FT switches.

Innovators to the core

At ABB, innovation isn't just a concept—it's the heartbeat of the company and the very foundation of its history and growth. The culture of innovation seamlessly intertwines with the enduring commitment to pioneering technologies that energize the transformation of society and industry to achieve a safer, more productive, and more sustainable future.

It's that same pioneering spirit that allows ABB to keep pace with, and even outstrip, the rapid changes and growth across the industries it supports. No doubt, the rapid acceleration of changes in the power industry makes it challenging to predict what the next sixty years will bring. However, through deep investments in research and development and its commitment to customers, ABB will be there with innovations, large and small, to transform the future of energy.