Siemens develops SF$_6$-free gas-insulated medium-voltage switchgear

At this year’s Hannover Messe, Siemens will present another medium-voltage switchgear that doesn’t require sulfur hexafluoride (SF$_6$) as the insulating gas: the 8DAB 12. The system uses clean air consisting only of the natural constituents of ambient air as the insulating gas. The switchgear is a new addition to the 8DA and 8DB product family and also works with the proven vacuum switching technology. A vacuum-interrupter unit handles switching and arc extinguishing, while the natural gas insulates the current-carrying conductors inside the housing of the metal-encapsulated gas-insulated switchgear (GIS). This type-tested system is used to switch high currents at the primary distribution level. The single-pole encapsulated 8DAB 12 is a SF$_6$-free medium-voltage switchgear in the Siemens blue GIS portfolio. Switches and switchgear that use SF$_6$ as the insulating, switching, and extinguishing gas remain an important part of the Siemens portfolio.

“With the addition of the 8DAB 12, we’re systematically expanding our portfolio of medium-voltage switchgear,” says Stephan May, CEO of the Siemens Medium Voltage and Systems Business Unit. “We’ll continue to offer our customers proven vacuum switching technology and single-pole switchgear encapsulation. They can now select the characteristics of the insulating gases used, depending on their requirements. The functionality and dimensions remain the same as the switchgear in our 8DA series.” The new blue GIS portfolio is Siemens’ answer to the market requirements of customers who want to use both the proven properties of GIS systems in their power grids as well as a non-chemical insulating medium. The blue GIS portfolio represents Siemens’ work with insulating media that contain no fluorine gases and meet all the strictest safety and environmental standards.
In recent years, the company has intensively researched alternative insulating materials and technologies that approximate the properties of SF₆-based gas mixtures and simultaneously ensure safe and economical switchgear operation. The gas contained in the 8DAB 12 medium-voltage switchgear consists exclusively of natural constituents of the ambient air with no any chemical additives. These constituents are, for example, nitrogen (N₂) and oxygen (O₂). The 8DAB 12 is a gas-insulated medium-voltage switchgear that works with the proven vacuum switching technology, so the operator benefits from all the advantages of this technology: no maintenance, compact design, high operating and personal safety, and high availability. Clean air provides the added benefits of easier handling during installation and recycling. In addition, it’s not necessary to report the quantity of gas used.

Siemens has been using its vacuum interruption technology in its medium-voltage switchgear for more than 40 years. It’s also used in high-voltage systems and recently in switchgear up to 145 kV as well. With vacuum switching technology, when the contacts open the switching arc burns in a metal vapor plasma between the contacts inside the vacuum extinction chamber. The metal vapor condenses back onto the contacts after the arc is extinguished. No decomposition products occur, and the arc doesn’t affect the surrounding insulation. This means that natural gases that aren’t suitable for extinguishing arcs can be used to insulate the current-carrying conductors.

This press release and a press picture is available at www.siemens.com/press/PR2018040245EMEN
For further information on Division Energy Management, please see www.siemens.com/energy-management
For further information on 8DAB 12, please see www.siemens.com/8dab12

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