



SIEMENS

Building Technologies



Simply Harmonious!
Siemens Easy Drive SED2



Specifically designed for HVAC applications

Siemens Building Technologies – one of the leading and most innovative companies in the fields of HVAC and drive technology – now supplies a variable speed drive designed specifically for HVAC applications – the SED2. This drive offers all the standard features that could be expected from a variable speed drive designed for HVAC applications. What's more, the SED2 incorporates a host of unique features and functions that make this drive a state-of-the-art product.

Low Harmonic Technology (LHT)

Typical applications for the SED2 drive are variable torque fans and pumps. To reduce harmonic currents on the AC line, Siemens has developed a technology for use with the SED2 that does away with extra components such as AC line reactors. The technology is called LHT (Low Harmonic Technology).

Tests reveal that LHT clearly leads to a reduction of low order harmonic currents on the AC line. In contrast to standard variable speed drives, the SED2 delivers good test results without using AC line reactors. Harmonics characteristics of the SED2 are comparable or even better than those of variable speed drives equipped with extra AC line reactors or DC link chokes.

The new technology brings the following benefits:

- Direct cost savings since AC line reactors are not needed
- Lower maintenance costs since the motors produce less heat, leading to longer motor lifecycles
- Added protection for sensitive equipment such as computers and communication modules, etc.

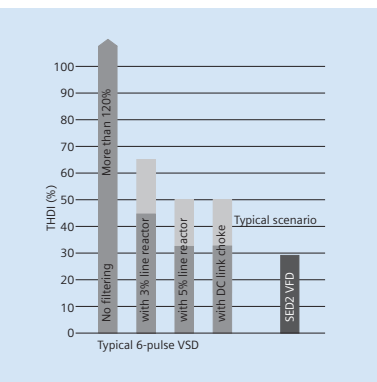
Energy saving variable speed technology

Another benefit offered by the SED in connection with fans and pumps is its considerable energy saving potential, which also brings cost savings. The diagram at the bottom illustrates the typical speed-torque characteristic of a variable torque pump or fan.

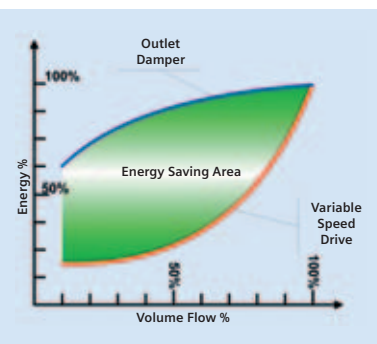
Additional cost saving benefits offered by the SED2

The SED drive provides an array of control functions that optimize energy usage, thereby cutting costs:

- 7-day time program incorporated with the AOP helps save energy and costs
- Integrated HVAC PID controller is easy to use and offers optimum consumption-oriented system control
- Hibernation mode based on the PID controller stops the SED2 whenever demand is low. This also cuts energy usage, thereby lowering costs
- LHT technology reduces the total amount of reactive currents, thus reducing the need for Power Factor Correction (PFC) capacitors
- Reduction of thermal losses thanks to integrated bypass function, which is automatically activated should the SED2 operate under full load conditions for a longer period of time



Comparison of THD (Total Harmonic Current Distortion)



Energy saving potential

SED product overview

And this is how the SED2 drives are delivered:

Standard features

Modular design offers maximum flexibility in terms of configuration

- Very low motor noise level thanks to high pulse frequency
- Complete protection of drive and motor
- Separate mains and motor terminals for optimum electromagnetic compatibility
- Low Harmonic Technology (LHT)
- Special technology for suppressing harmonics
- Plug-in type operator panels
- Control terminal strip without screws, with removable I/O board
- Advanced IGBT technology
- Microprocessor control

- Quadratic U / f characteristic
- Flying restart
- Automatic restart on power failure or operating fault
- Self-regulating PID controller
- Programmable runup / rundown from 0 to 650 seconds
- Fast current limitation (FCL) for trouble-free operation
- Fast, reproducible response of the digital inputs
- Precise setpoint indication owing to high-resolution 10-bit analog input
- 4 skip frequencies
- Onboard kWh meter
- 15 test frequencies



- ① AOP (Advanced Operator Panel)
- Clear text display for reading the parameter values
 - Backlit LCD, 4 lines each with 30 characters
 - Display in 5 languages
 - Up to 10 parameter sets can be stored and downloaded to other drives
 - Integrated time switch function
 - Can also be used as a small network (RS-485) in connection with the door mounting kit

- ② Gland plate, size A-C, IP20
- For direct fitting to variable speed drives of frame sizes A, B and C
 - Integrated in variable speed drives of frame sizes D, E and F
- The gland plate simplifies the shielding connection of motor and data cable, ensuring optimum wiring.
- ③ Door mounting kit
- For fitting BOP / AOP in control panel doors
 - Straightforward detached mounting
 - Degree of protection IP56



IP20 frame size FSA



IP20 frame size FSB/C



IP20 frame size FSB/C with filter



IP20 frame size FSD/E



IP20 frame size FSF



IP54 frame size FSB/F

All the features you could want for HVAC applications

1 Onboard kWh meter

The SED2 drive has incorporated a kWh meter that is displayed via the keypad. The meter can be reset to start metering predefined by the user.

2 Direct connection of an LG-Ni 1000 sensor for temperature control

Direct connection of the LG-Ni 1000 temperature sensor offers a low-cost temperature control loop solution. The built-in PID controller is optimized for HVAC applications.

3 Hibernation mode

Hibernation mode starts and stops the SED2 automatically on demand. This enables greater energy savings and control by stopping the SED2 if it runs at a user-defined minimum speed for a given time. No more idling motors!

4 Belt failure detection with or without sensor

The SED2 ensures reliable V-belt monitoring without the expense of an external sensor. Both speed and torque are compared with a user-defined tolerance band. If the parameters do not match, the SED2 trips in the event of V-belt failure.

5 Staging pumps and fans

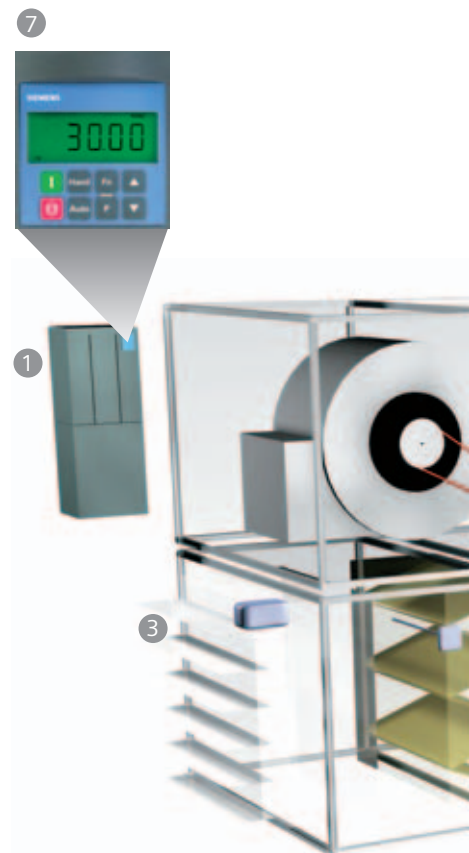
This function allows for the control of up to 2 additional staging pumps or fans. With the 2 relay contacts, the SED2 performs the staging logic without any requirement or expense of additional controllers or I/O cards.

6 Bypass control of the SED2

Bypass control ensures high availability of the application. The SED2 controls an external bypass in the event of failure. This function is activated either automatically or by a digital input. In addition, to save even more energy, the SED2 changes to bypass mode if the motor runs at mains frequency for a preselected period of time.

7 Basic Operator Panel (BOP) as standard

The BOP included as standard is fully removable and interchangeable with all frame sizes. The 5-digit LCD clearly displays if the hand or auto functions have been selected on the keypad. Push button speed control and intuitive 10-step commissioning make the SED2 the easiest drive on the market to program.



⑧ Advanced Operator Panel (AOP) as an option

The AOP offers the following in addition to the functionality of the BOP:

- Unique 10 parameter set storage with full uploading / downloading capability
- Multilingual and multiline clear text display
- Plain language commentary and diagnostics menu
- 7-day timer function with 3 switching operations per day
- Multidrop capability to control 32 SED2 with one AOP
- Real-time clock

⑨ EMC filter of class B

The entire range of SED2 variable speed drives features an EMC class B filter as standard.

By using a filter of the highest class, Siemens has solved all problems associated with present EMC legislation. The SED2 with its excellent EMC characteristics is suited for use in all types of buildings.

⑩ Essential Service Mode (ESM)

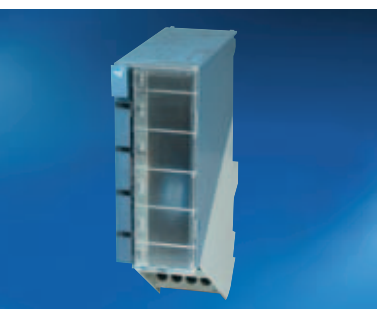
For reliable operation after activation from Fire Control Panel.



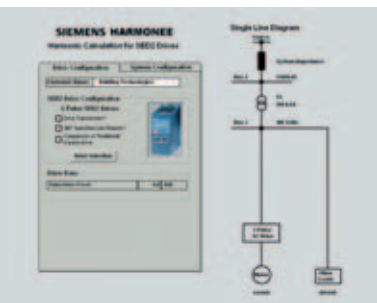
Communication and software



SED2-LONI/F module



PTE-SED2-module for Desigo PX



SED2 Siemens HarmonEE



SED2 EasyComm commissioning software

SED2 system integration

- PTE-SED2-module for integration into Desigo PX
- Implemented P1 protocol for Siemens Apogee
- Third-party systems can easily communicate with the SED2 via USS-Talk or Johnson Metasy N2

LONMARK communication

The SED2 conforms to the LONMARK regulations with regard to Variable Speed Drive Profile Number 6010.

Standard Network Variable Types (SNVTs) are used for communication, enabling the SED2 to be configured, controlled and monitored via the LONTalk® network. 48 SNVTs are pre-configured for control and monitoring, facilitating direct integration into control systems.

The SED2 is of modular design with snap-on facility for straightforward installation and easy integration into a system with existing or newly installed SED2 drives.

SED2-PTE-Module

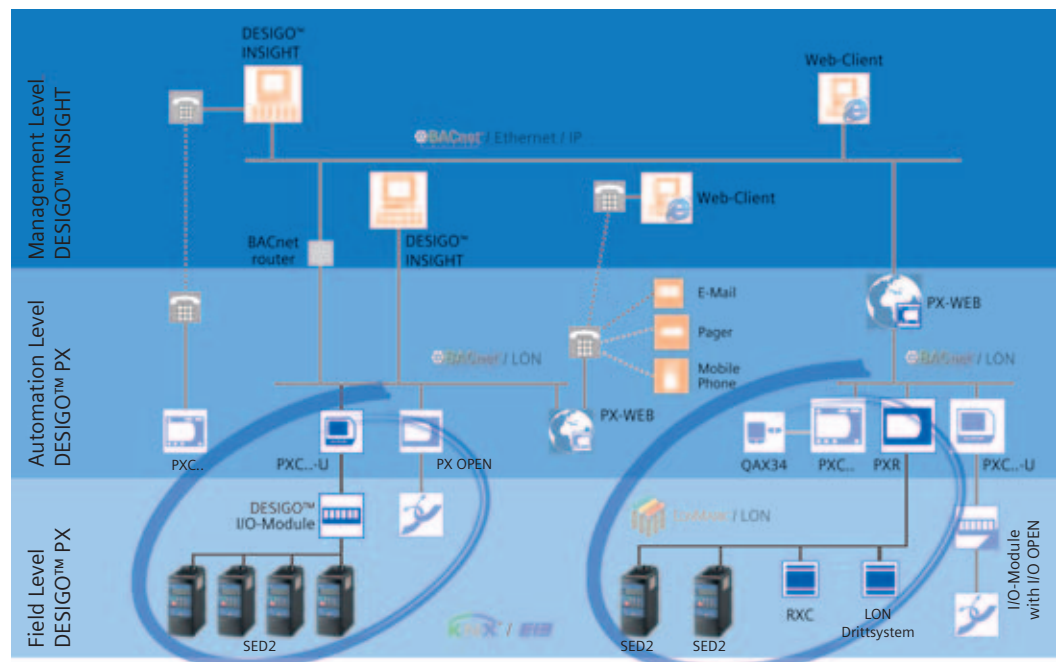
- General control: On/off and preselected set-point (in frequency, % PID or pressure). Both with checkback signal
- SED2 data points: Output frequency (Hz), output current (A), cumulated energy (KWh), and output (KW)
- Errors: Display and acknowledgement (for details, refer to "Operating states")

SED2 Siemens HarmonEE

Calculator software tool for harmonics generated by the variable speed drive.

SED2 EasyComm commissioning and engineering software

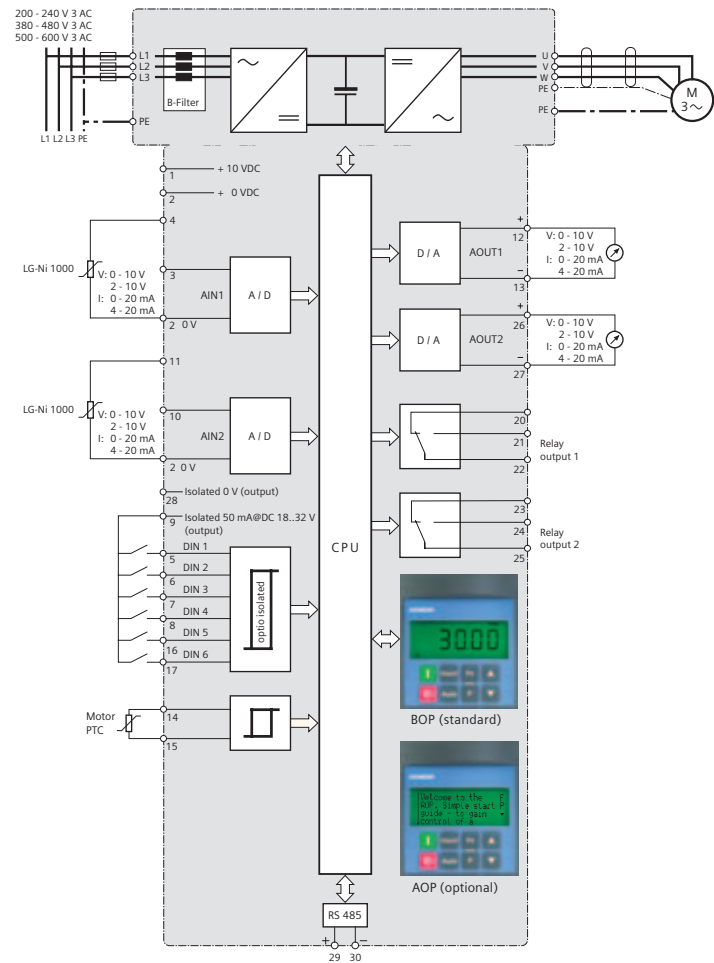
A connection kit facilitates straightforward communication with the SED2. All parameters can be easily shown and changed on the monitor.



Straightforward integration into the Desigo world via the existing I/O-Open module or the LON module for SED2

Technical data

Power and voltage range IP20	0.37 – 45 kW / 3 AC 200 – 240 V + -10% 50/60 Hz 0.37 – 90 kW / 3 AC 380 – 480 V + -10% 50/60 Hz 0.75 – 90 kW / 3 AC 500 – 600 V + -10% 50/60 Hz
Power and voltage range IP54	1.10 – 90 kW / 3 AC 380 – 480 V + -10% 50/60 Hz 1.10 – 90 kW / 3 AC 500 – 600 V + -10% 50/60 Hz
EMC filter	B-class filter (EN 55011-B) built in as standard
Harmonic Current Distortion	LHT (Low Harmonic Technology) special DC link ensuring typically < 30 % THID
Power factor	≥ 0.9
Efficiency	96 – 97 %
Overload capacity	110 % for 60 s
Inputs	analog: 2 digital: 6 LG-Ni 1000
Outputs	analog: 2 digital: 2
Communication and network integration	RS-485 Siemens USS; P1 (SBT); N2 plus: LONMARK
Operating conditions	-10 °C to +40 °C (max. 50 °C with de-rating) 95 % r.h.
Operator panel	standard: BOP (Basic Operator Panel), 5 digits, 7 segments optional: AOP (Advanced Operator Panel), 4 lines
Standards	UL, cUL, CE, C-Tick



Degree of protection of housing and standards

Degree of protection	to EN 50529
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Standards

Product standards	
Adjustable speed electrical power drive system Part 3: EMC requirements and specific test methods	EN 61800-3 (2004)
Product safety	
Safety of Machinery – Electrical Equipment of Machines Semiconductor converters; general requirements and line commutated converters	EN 60204-1 EN 60146-1-1
Electromagnetic compatibility	
EMV emissions	the SED2-***/**B is supplied complete with an EMC filter of class B conforming to EN 55011 for conducted emissions in the first environment
CE conformity	
Electromagnetic compatibility Low-voltage directive	89/336/EEC 73/23/EEC
UL	
	UL- and cUL-listed for 5B33 drives for use in operating environments with degree of contamination 2–3
C-tick Compliance (Australia/New Zealand)	
	C-Tick registered N474

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