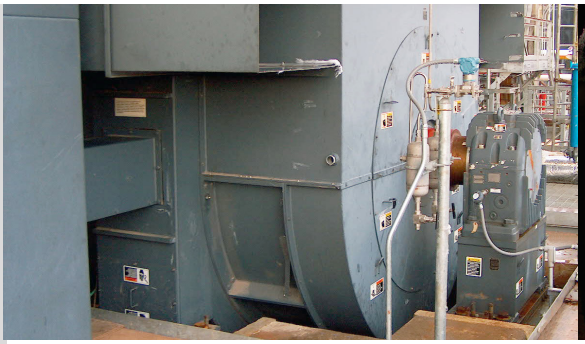
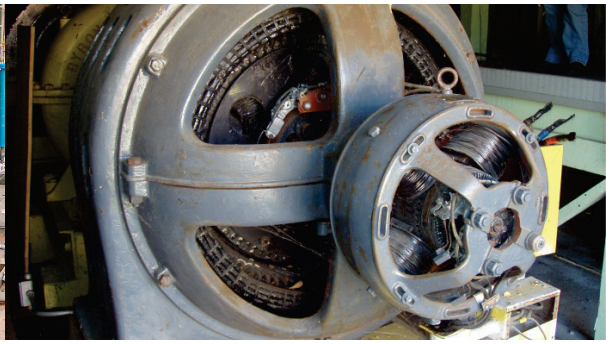
SMC-250 Synchronous Motor Controller





Overview

The SMC-250 Synchronous Motor Controller is a prepackaged control and protection solution for brushless, synchronous motor applications. It features the DECS-250 Digital Excitation Control System and a Basler Electric protection device for motor pullout protection. Both are integrated into a compact package that is preconfigured, prewired, and tested for easy installation in a new or existing enclosure, saving installation and commissioning time.

Features

- 15-ampere, pulse-width-modulated (PWM), insulated-gate bipolar transistor (IGBT) power stage
- Single DECS-250 or dual, redundant DECS-250 option
- Control modes: var/power factor, field current regulation, and field voltage regulation
- Available protection:
  - Power factor/loss of synchronization (55)
  - Over/Under Field Current (40)*
  - Fuse loss detection protects against false trip due to loss of voltage sensing (60FL)*
  - Up to 24 resistive temperature detectors (49RTD) inputs provide thermal protection with an optional remote RTD module*
  - Up to 100 starts per time interval protection (66)*
  - Undervoltage (27)
  - Overvoltage (59)
  - Instantaneous undercurrent (37)*
  - Instantaneous overcurrent (50)*
- Communication provisions:
  - USB
  - Modbus® RS-485 RTU
  - Ethernet 100Base-T (Modbus TCP)
- Monitoring:
  - Real-time monitoring
  - Data logging
  - Sequence of events recorder
- Programmable logic for DECS-250 and BE1-11*m* option

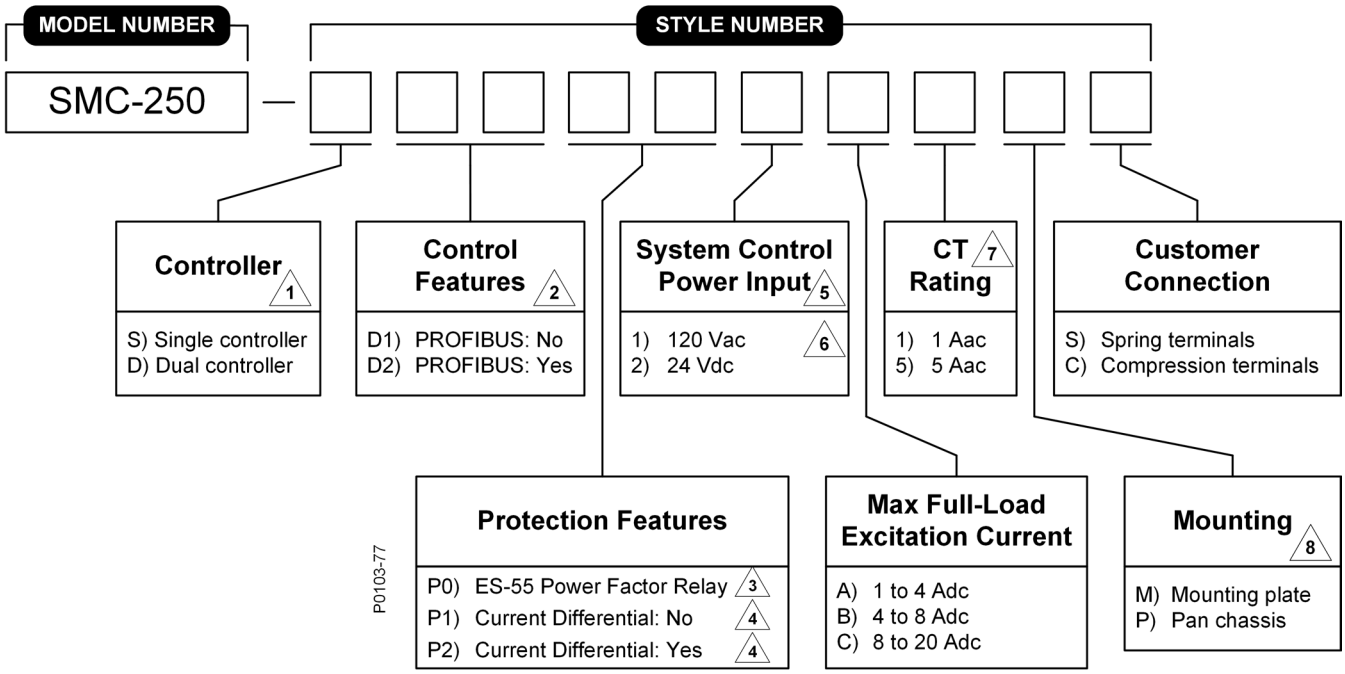
* Available only with BE1-11*m* option.

Benefits

- The DECS-250 and a motor protection device working together results in more efficient control of the machine to help avoid machine downtime
- Maintains constant power factor or vars for varying motor loads
- Improves the plant power factor which could eliminate lower power factor penalties
- Eliminates synchronous motor pullout issues due to insufficient excitation
- Excitation field forcing maintains power factor or var control on the motor during momentary voltage dips of the station power source
- Prevents rotor overheating and motor pullout with field overcurrent and underexcitation limiters
- Improves the life expectancy of brushless exciter diodes by preventing motor pullout
- Brushless exciter diode monitor detects open/shorted diodes that can cause motor vibration
- Real-time monitoring and event recording capture occurrences within the system for live data analysis
- Loss of voltage sensing detection enables a transfer to manual mode to maintain motor operation
- Both the DECS-250 and the BE1-11*m* option are programmed using BESTCOMS*Plus*® software. Utilizing the same program for both devices provides easy logic setup and communication between the DECS-250 and the BE1-11*m*.
- Dual DECS-250 controller option ensures continued operation in the event of a failure
- Prewired for easy installation into new or existing enclosures
- Current transformer (CT) shorting provision for added safety

Style Chart

Please read and utilize all of the notes below the chart to ensure the appropriate control and protection features are specified in the main SMC-250 style chart.



1 When *Controller* option D is selected, *Control Features* option must be D1 and *Protection Features* option must be P0.

2 DECS-250 Control features:

Control Features	Power Supply	PSS	Autotracking	DECS-250 Terminals	Synchronizer	1st Communication Protocol	2nd Communication Protocol
D1	4	Not included	Autotracking is determined by selection of a single DECS-250 or dual DECS-250 controllers.	Spring terminals	None	100Base-T (Modbus® TCP)	None
D2							PROFIBUS

3 ES-55 style number is ES-551AD1NXN0,

4 BE1-11*m* Protection features:

Protection Features	Phase Current	Ground Current	Power Supply	RS-485 Protocol	Ethernet Protocol	Case	Alarm Contact	Option 1	Network Connection	Language	Option 2	Firmware
P1	6	6	4	Modbus®	Modbus® TCP with BESTnet™*Plus*	Vertical case	Normally closed	None	Copper Ethernet	English	None	Latest Release
P2								Current Differential				

5 Power supply for DECS-250 is determined by option chosen in the SMC-250 style number.

6 If *System Control Power Input* is 1, a 24 Vdc power supply is required when adding the CEM-2020, AEM-2020, or IDP-801 accessories.

7 Phase Current and Ground Current values are determined by options chosen in the SMC-250 style number.

8 A mounting plate is a small, bendable, thin sheet of metal designed to hold all components of the controller. Typically, the mounting plate is designed to fit inside a Rittal enclosure. A pan chassis is made with a larger, more rigid metal panel to hold all system components. Typically, the pan chassis is designed to 1 inch (2.5 centimeters) thick with supporting capabilities to help prevent it from bending or flexing.

Specifications

Operating Power (Excitation Power) Input

DECS-250 (Can be either 1-phase or 3-phase)

Full-load continuous field voltage:

32 Vdc:	56 to 70 Vac
63 Vdc:	100 to 139 Vac or 125 Vdc
125 Vdc:	190 to 277 Vac or 250 Vdc
Frequency range:	50 to 420 Hz

Control Power Input

120 Vac nominal input, style XXXXX1XXXX

Voltage:	82 to 132 Vac
Frequency:	50/60 Hz

24 Vdc nominal input, style XXXXX2XXXX

Voltage:	16 to 26 Vdc

Sensing Voltage Input (1-phase or 3-phase)

50 Hz:	100 Vac, 90 to 110 Vac
60 Hz:	120 Vac, 108 to 132 Vac

Sensing Current Input (1-phase or 3-phase)

1 Aac or 5 Aac

Excitation Current for Shunt Selection

Style XXXXXXAXXX:	1 to 4 Adc
Style XXXXXXBXXX:	4 to 8 Adc
Style XXXXXXCXXX:	8 to 20 Adc

Contact Outputs (DECS-250)

Make, break, and carry ratings (resistive load):

24 Vdc:	7.0 Adc
120 Vdc:	7.0 Adc

Temperature Ratings

Operating Temperature:	0°C to 50°C (32°F to 122°F)
Storage Temperature:	–20°C to 60°C (–4°F to 140°F)

Equipment Dimensions

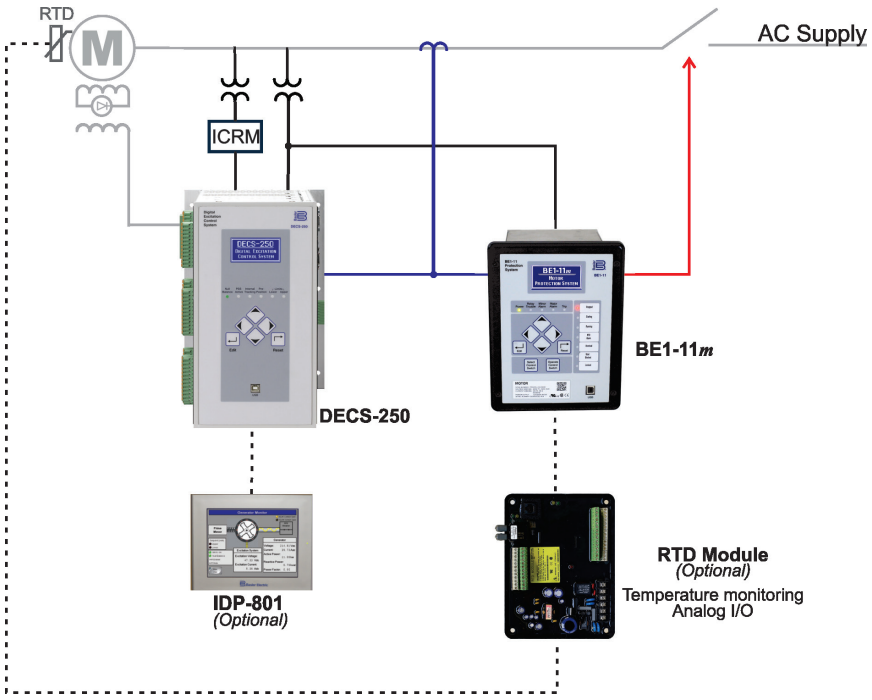
Mounting plate and pan chassis styles have identical dimensions and are expressed here as height by width by depth.

Style SXXXXXXXXX:	28.7 x 27.7 x 10.4 in. 730 x 704 x 264 mm
Style DXXXXXXXXX:	37.4 x 29.5 x 8.9 in. 950 x 750 x 225 mm

Equipment Weights

Style SXXXXXXXMX:	50 lb. (22.7 kg)
Style SXXXXXXXPX:	75 lb. (34.0 kg)
Style DXXXXXXXMX:	95 lb. (43.1 kg)
Style DXXXXXXXPX:	100 lb. (45.4 kg)

For complete specifications, download the instruction manual at www.basler.com.



Typical SMC-250 connection diagram featuring the optional IDP-801 Interactive Display Panel, BE1-11m Motor Protection System, and remote RTD module

Accessories

RTD Module

An RTD module can be paired with a BE1-11*m* to provide 12 remote resistive temperature detector (RTD) inputs, four remote analog inputs, and four remote analog outputs.

CEM-2020 Contact Expansion Module

Each CEM-2020 module adds 16 inputs and up to 24 outputs that are easily programmed through BESTCOMS*Plus*® for easy integration into the system.

AEM-2020 Analog Expansion Module

The AEM-2020 easily increases the functionality by seamlessly adding analog inputs and outputs to their array of configurations.

Interactive Display Panel

An IDP-801 or IDP-1201 display panel can be installed locally or remotely to:

- View analog and digital system parameters,
- Configure motor control, limiter, and protection settings, and
- Download system data recorded by the DECS-250.

The IDP-801is equipped with a 7.5-inch (19-centimeter) display while the IDP-1201 is equipped with a 12.1-inch (21-centimeter) display.

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Visit the Basler website!

Scan the QR code for more information on the SMC-250 Synchronous Motor Controller.