



SIEMENS

HVAC Products

Introducing the SED2 Variable Frequency Drives



Designed Specifically for HVAC Applications



From a global leader in drives technology and innovation, now comes a drive specifically configured for HVAC applications. The SED2 variable frequency drives from the Siemens HVAC Products Division.

Incorporating the latest advancements in IGBT technology, the SED2 is a PWM drive packed with all the standard features expected in a drive designed for HVAC variable torque applications. Many more unique design features make this variable frequency drive truly advanced.

All the Features You Would Want From an Advanced HVAC Variable Frequency Drive

- Built-in SBT P1 and JCI N2 (Metasys®) building automation system protocols for easy network integration
- Unique low harmonics design minimizing the need for external line reactors
- Built-in PID for fast and accurate pressure control
- Pump controller staging/cascading for constant pressure, constant flow applications
- Multi-level program access
- Belt failure detection with or without an external sensor
- Essential service mode for critical applications requiring continuous, uninterruptible operation
- Accepts a wide variety of digital and analog I/O types, including direct Ni 1000 sensor level inputs
- One common interface throughout all power ranges
- Optional Advanced Operator Panel (AOP) for uploading/downloading of parameters
- Full form C relay contacts for digital outputs



Traditional pump room application for VFDs

General Specifications



| | | |
|--|--|--|
| Input voltage and power ranges (3 phase) | 200 to 240 VAC ± 10% 380 to 480 VAC ± 10% 500 to 600 VAC ± 10% | 1/2 HP - 60 HP 1 HP - 125 HP 1 HP - 125 HP |
| Input frequency | 47 Hz to 63 Hz | |
| Output frequency | 0 Hz to 150 Hz | |
| Power factor | ≥0.9 | |
| VFD efficiency | 96 to 97% | |
| Overload capability | 110% for 60 seconds | |
| Control method | Linear V/f, parabolic V/f (fan curve); flux current control (FCC) low-power mode | |
| PWM frequency | 4kHz to 16kHz (adjustable in 2kHz increments) | |
| Fixed frequencies | 15: programmable | |
| Skip frequency bands | 4: programmable | |
| Setpoint resolution | 0.01 Hz digital 0.01 Hz serial 10 bit analog | |
| Digital inputs (sink/source) | 6: fully programmable and scalable isolated digital inputs, switchable | |
| Analog inputs | 2: 0 to 10VDC, 0/4 to 20 mA, can also be configured as digital inputs or Ni1000 input | |
| Relay outputs | 2: configurable 30VDC / 5A (resistive), 250VAC 2A (inductive) | |
| Analog outputs | 2: programmable (0/4 to 20 mA) | |
| Serial interface | RS-485, SBT-P1; JCI-N2, Siemens USS bus (optional Modbus, LON) | |
| Protection level | IP20 (NEMA Type 1 with protective shield and gland plate installed); IP54 (NEMA Type 12) | |
| Temperature range | -10°C to +40°C (14°F to 104°F) | |
| Storage temperature | -40°C to +70°C (-40°F to 158°F) | |
| Humidity | 95% RH – non-condensing | |
| Operational altitudes | Up to 1000 m above sea level without derating | |
| Protection features | <ul style="list-style-type: none"> • Under-voltage • Over-voltage • Overload • Ground Fault • Short circuit • Stall prevention • Locked motor • Motor overtemperature I^2t, PTC • VFD over-temperature • Parameter PIN protection | |
| Standards | UL, cUL, CE, C-tick | |
| CE marked | Conformity with EC Low Voltage Directive 73/23/EEC and 89/336/EEC | |

Standard Features

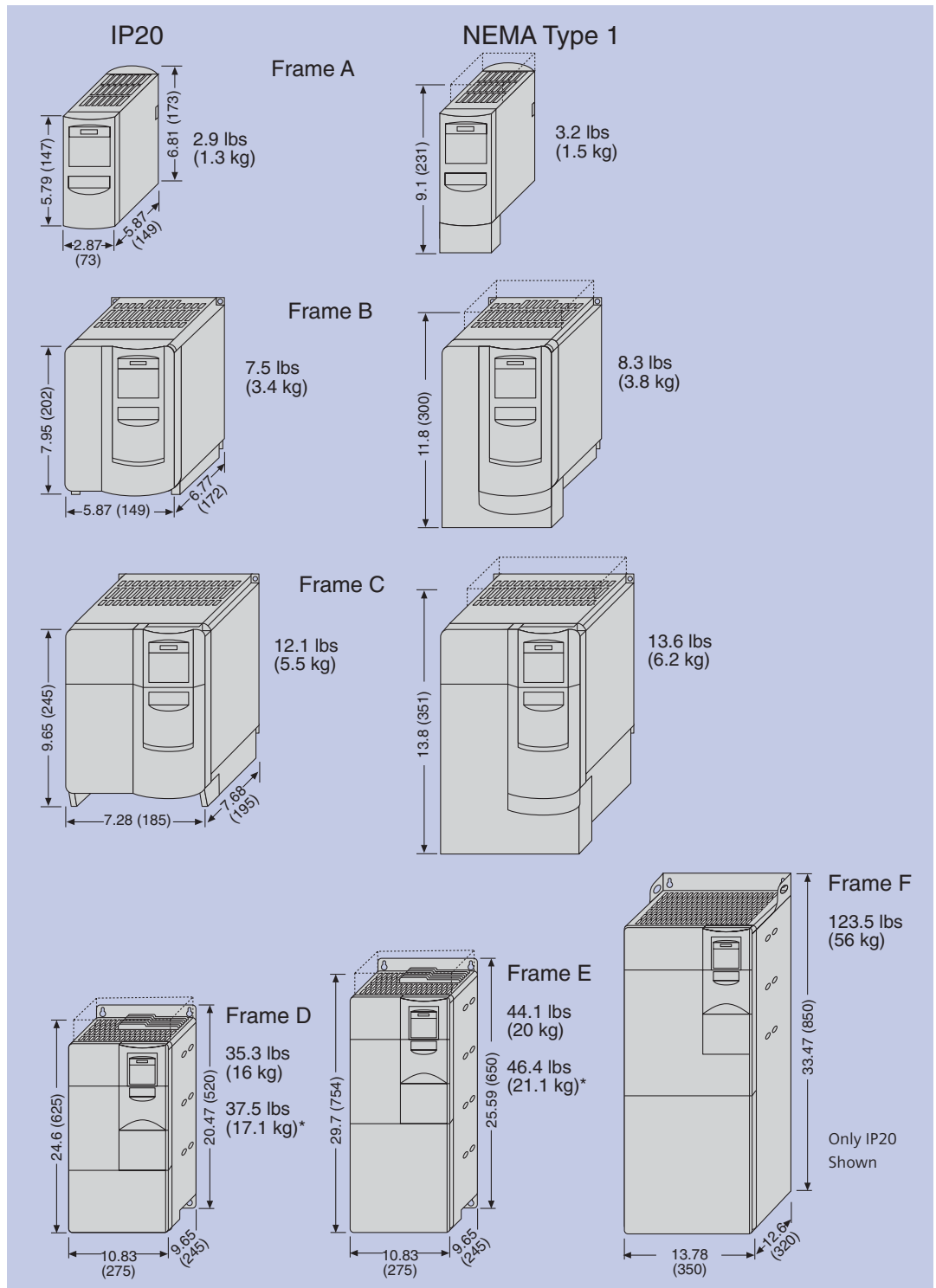
- Modular construction allows maximum configuration flexibility
- Quiet motor operation
- Complete inverter and motor protection
- Main power and motor cable connections are separated for optimum electromagnetic capability
- Detachable operator panels
- Screwless control terminals on detachable I/O board
- Latest IGBT technology
- Digital microprocessor control
- Flying restart
- Slip compensation
- Automatic restart facility following power failure or fault
- Auto-tuning PID controller
- Programmable acceleration/ deceleration, 0 to 650 s
- Ramp smoothing
- Fast current limit (FCL) for trip free operation
- Fast, repeatable digital input response time
- Fine speed adjustment using two high-resolution 10-bit analog inputs



Basic Operator Panel (BOP) included as standard with all units

Frame Sizes Dimensions in inches (mm)

| Frame Size | 200 to 240 VAC ± 10% | 380 to 480 VAC ± 10% | 500 to 600 VAC ± 10% |
|------------|----------------------|----------------------|----------------------|
| A | 1/2 HP - 1 HP | 1 HP - 2 HP | |
| B | 1 1/2 HP - 3HP | 3 HP - 5 HP | |
| C | 5 HP - 10 HP | 7 1/2 HP - 20 HP | 1 HP - 20 HP |
| D | 15 HP - 25 HP | 25 HP - 40 HP | 25 HP - 40 HP |
| E | 30 HP - 40 HP | 50 HP - 60 HP | 50 HP - 60 HP |
| F | 50 HP - 60 HP | 75 HP - 125 HP | 75 HP - 125 HP |



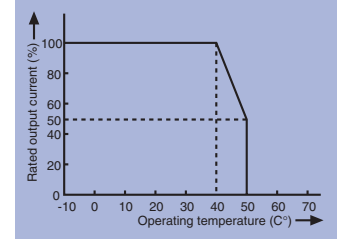
*NEMA Type 1

Part Numbers and Ratings Specifications

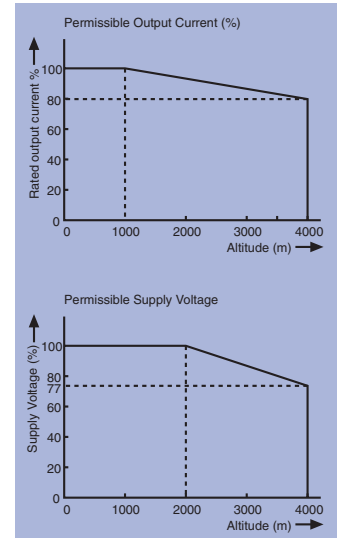


| Voltage (±10%) | Part Number: | | | Output Rating | | Output Current | Frame |
|----------------------|---------------|---------------|---------------|---------------|-------|----------------|-------|
| | IP20 | NEMA Type 1 | NEMA Type 12 | HP | kW | Max.(Amps) | Size |
| 208 - 240V (3-Phase) | SED2-0.37/22X | SED2-0.37/21X | | 0.5 | 0.37 | 2.3 | A |
| | SED2-0.55/22X | SED2-0.55/21X | | 0.75 | 0.55 | 3.0 | A |
| | SED2-0.75/22X | SED2-0.75/21X | | 1.0 | 0.75 | 3.9 | A |
| | SED2-1.1/22X | SED2-1.1/21X | | 1.5 | 1.1 | 5.5 | B |
| | SED2-1.5/22X | SED2-1.5/21X | | 2.0 | 1.5 | 7.4 | B |
| | SED2-2.2/22X | SED2-2.2/21X | | 3.0 | 2.2 | 10.4 | B |
| | SED2-3/22X | SED2-3/21X | | 4.0 | 3.0 | 13.6 | C |
| | SED2-4/22X | SED2-4/21X | | 5.0 | 4.0 | 17.5 | C |
| | SED2-5.5/22X | SED2-5.5/21X | | 7.5 | 5.5 | 22.0 | C |
| | SED2-7.5/22X | SED2-7.5/21X | | 10.0 | 7.5 | 28.0 | C |
| | SED2-11/22X | SED2-11/21X | | 15.0 | 11.0 | 42.0 | D |
| | SED2-15/22X | SED2-15/21X | | 20.0 | 15.0 | 54.0 | D |
| | SED2-18.5/22X | SED2-18.5/21X | | 25.0 | 18.5 | 68.0 | D |
| | SED2-22/22X | SED2-22/21X | | 30.0 | 22.0 | 80.0 | E |
| | SED2-30/22X | SED2-30/21X | | 40.0 | 30.0 | 104.0 | E |
| SED2-37/22X | SED2-37/21X | | 50.0 | 37.0 | 130.0 | F | |
| SED2-45/22X | SED2-45/21X | | 60.0 | 45.0 | 154.0 | F | |
| 380 - 480V (3-Phase) | SED2-0.75/32X | SED2-0.75/31X | | 1.0 | 0.75 | 2.1 | A |
| | SED2-1.1/32X | SED2-1.1/31X | SED2-1.1/35X | 1.5 | 1.1 | 3.0 | A |
| | SED2-1.5/32X | SED2-1.5/31X | SED2-1.5/35X | 2.0 | 1.5 | 4.0 | A |
| | SED2-2.2/32X | SED2-2.2/31X | SED2-2.2/35X | 3.0 | 2.2 | 5.9 | B |
| | SED2-3/32X | SED2-3/31X | SED2-3/35X | 4.0 | 3.0 | 7.7 | B |
| | SED2-4/32X | SED2-4/31X | SED2-4/35X | 5.0 | 4.0 | 10.2 | B |
| | SED2-5.5/32X | SED2-5.5/31X | SED2-5.5/35X | 7.5 | 5.5 | 13.2 | C |
| | SED2-7.5/32X | SED2-7.5/31X | SED2-7.5/35X | 10.0 | 7.5 | 18.4 | C |
| | SED2-11/32X | SED2-11/31X | SED2-11/35X | 15.0 | 11.0 | 26.0 | C |
| | SED2-15/32X | SED2-15/31X | SED2-15/35X | 20.0 | 15.0 | 32.0 | C |
| | SED2-18.5/32X | SED2-18.5/31X | SED2-18.5/35X | 25.0 | 18.5 | 38.0 | D |
| | SED2-22/32X | SED2-22/31X | SED2-22/35X | 30.0 | 22.0 | 45.0 | D |
| | SED2-30/32X | SED2-30/31X | SED2-30/35X | 40.0 | 30.0 | 62.0 | D |
| | 3SED2-7/32X | 3SED2-7/31X | SED2-37/35X | 50.0 | 37.0 | 75.0 | E |
| | SED2-45/32X | SED2-45/31X | SED2-45/35X | 60.0 | 45.0 | 90.0 | E |
| SED2-55/32X | SED2-55/31X | SED2-55/35X | 75.0 | 55.0 | 110.0 | F | |
| SED2-75/32X | SED2-75/31X | SED2-75/35X | 100.0 | 75.0 | 145.0 | F | |
| SED2-90/32X | SED2-90/31X | SED2-90/35X | 125.0 | 90.0 | 178.0 | F | |
| 500 - 600V (3-Phase) | SED2-0.75/42X | SED2-0.75/41X | | 1.0 | 0.75 | 1.4 | C |
| | SED2-1.5/42X | SED2-1.5/41X | SED2-1.5/45X | 2.0 | 1.5 | 2.7 | C |
| | SED2-2.2/42X | SED2-2.2/41X | SED2-2.2/45X | 3.0 | 2.2 | 3.9 | C |
| | SED2-3/42X | SED2-3/41X | SED2-3/45X | 4.0 | 3.0 | 5.4 | C |
| | SED2-4/42X | SED2-4/41X | SED2-4/45X | 5.0 | 4.0 | 6.1 | C |
| | SED2-5.5/42X | SED2-5.5/41X | SED2-5.5/45X | 7.5 | 5.5 | 9.0 | C |
| | SED2-7.5/42X | SED2-7.5/41X | SED2-7.5/45X | 10.0 | 7.5 | 11.0 | C |
| | SED2-11/42X | SED2-11/41X | SED2-11/45X | 15.0 | 11.0 | 17.0 | C |
| | SED2-15/42X | SED2-15/41X | SED2-15/45X | 20.0 | 15.0 | 22.0 | C |
| | SED2-18.5/42X | SED2-18.5/41X | SED2-18.5/45X | 25.0 | 18.5 | 27.0 | D |
| | SED2-22/42X | SED2-22/41X | SED2-22/45X | 30.0 | 22.0 | 32.0 | D |
| | SED2-30/42X | SED2-30/41X | SED2-30/45X | 40.0 | 30.0 | 41.0 | D |
| | SED2-37/42X | SED2-37/41X | SED2-37/45X | 50.0 | 37.0 | 52.0 | E |
| | SED2-45/42X | SED2-45/41X | SED2-45/45X | 60.0 | 45.0 | 62.0 | E |
| | SED2-55/42X | SED2-55/41X | SED2-55/45X | 75.0 | 55.0 | 77.0 | F |
| SED2-75/42X | SED2-75/41X | SED2-75/45X | 100.0 | 75.0 | 99.0 | F | |
| SED2-90/42X | SED2-90/41X | SED2-90/45X | 125.0 | 90.0 | 125.0 | F | |

Operating Temperature



Altitude Rating



VFD control of cooling tower pumps

SED2 Options



Gland Plate

Gland plates

- Attach directly to bottom of Frame sizes A, B and C
- Are integrated into Frame sizes D, E and F (option not required)
- Provides conduit connection for power and control cabling

| Description | Part # |
|-----------------------|-----------|
| Gland Plate - Frame A | SED2-GL-A |
| Gland Plate - Frame B | SED2-GL-B |
| Gland Plate - Frame C | SED2-GL-C |

BOP/AOP Door Mounting Kit

- Remote mounting of operator panels
- IP56 protection
- No special cables needed

| Description | Part # |
|--------------------------------------|----------------|
| BOP/AOP Single VFD Door Mounting Kit | SED2-DOOR-KIT1 |
| AOP Multi VFD Door Mounting Kit | SED2-DOOR-KIT2 |



Door Mounting Kit Assembly

Protective Shield

- Together with Gland Plate provides Nema Type 1 (UL Type 1) rating
- Easily mounts to top of VFD Frame size A, B, C, D and E

| Description | Part # |
|--------------------------------|------------|
| Protective Shield - Frame A | SED2-DC-A |
| Protective Shield - Frame B | SED2-DC-B |
| Protective Shield - Frame C | SED2-DC-C |
| Protective Shield - Frame D, E | SED2-DC-DE |

Modbus Interface Cable

- 3 foot long smart cable
- Converts VFD's USS bus to Modbus RTU

Part Number: SED2-MODBUS1

LON Interface Module (Avail. mid 2002)

- Provides direct connection to LON network and communication with other LONMARK® devices
- Allows read/write access to more than 40 parameters
- Module mounts compactly behind operator panel and provides simple wiring access

Part Number: SED2-LONI/F



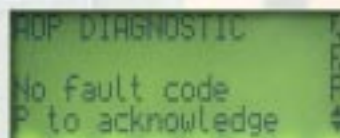
Advanced Operator Panel (AOP)

- Plain text display for reading VFD data
- 4 line x 30 character backlit LCD display
- Supports display in 7 languages
- Allows uploading/downloading of parameters to/from multiple VFDs
- Up to 10 parameter sets can be stored and downloaded into separate VFDs
- Includes an integrated scheduler function

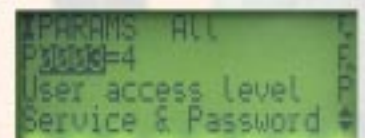
Part Number: SED2-AOP1



Setting initial parameters is extremely simple using the quick commissioning and start-up mode.

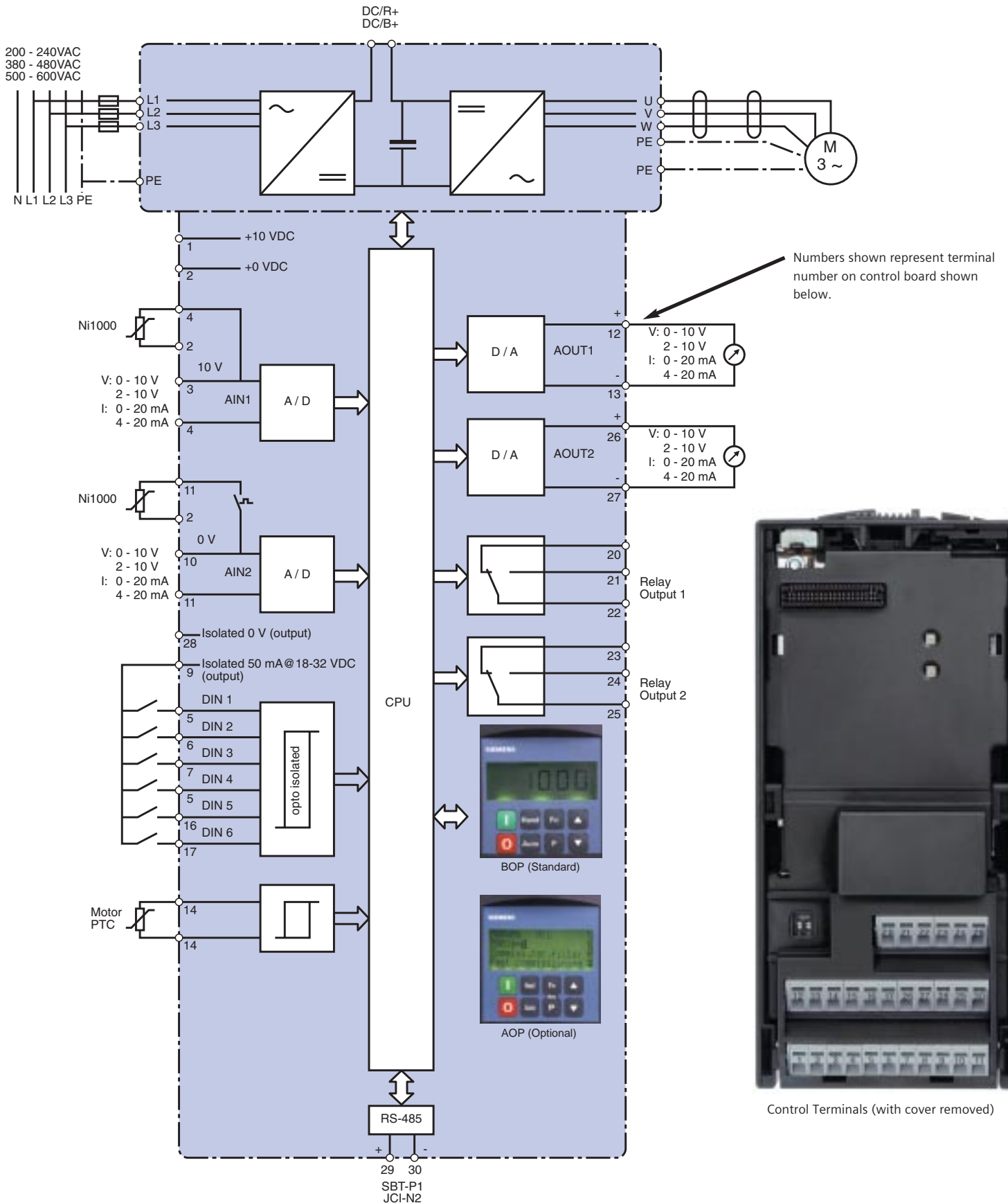


Easy-to-understand diagnostic display for fast troubleshooting.



User access levels and filters provide flexibility and convenience to a specific range of parameters.

Power and Control Interface Connection Diagram



Control Terminals (with cover removed)

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