



SIEMENS

HVAC Products



Introducing the SED2 Variable Frequency Drives

SED2
HVAC 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 $\pm$ 10% 380 to 480 VAC $\pm$ 10% 500 to 600 VAC $\pm$ 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	• 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

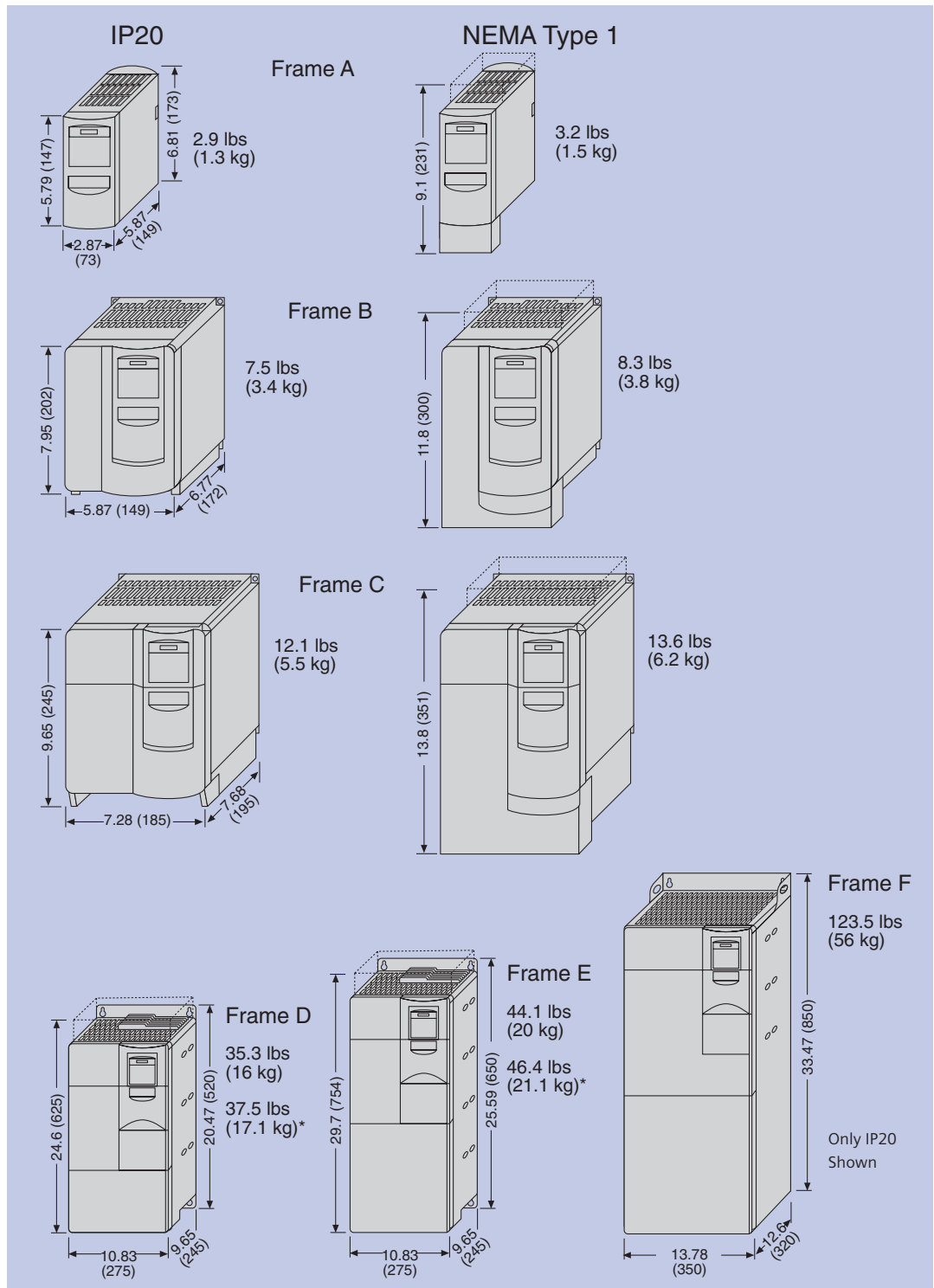
- Modular construction allows maximum configuration flexibility
- Quiet motor operation
- Complete inverter and motor protection
- Main power and motor cable connections are separated for optimum electromagnetic capability
- Detachable operator panels
- Screwless control terminals on detachable I/O board
- 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)

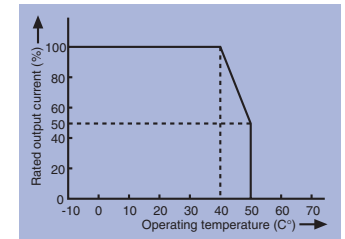
Frame Size	200 to 240 VAC $\pm$ 10%	380 to 480 VAC $\pm$ 10%	500 to 600 VAC $\pm$ 10%
A	1/2 HP - 1 HP	1 HP - 2 HP	
B	1 1/2 HP - 3HP	3 HP - 5 HP	
C	5 HP - 10 HP	7 1/2 HP - 20 HP	1 HP - 20 HP
D	15 HP - 25 HP	25 HP - 40 HP	25 HP - 40 HP
E	30 HP - 40 HP	50 HP - 60 HP	50 HP - 60 HP
F	50 HP - 60 HP	75 HP -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



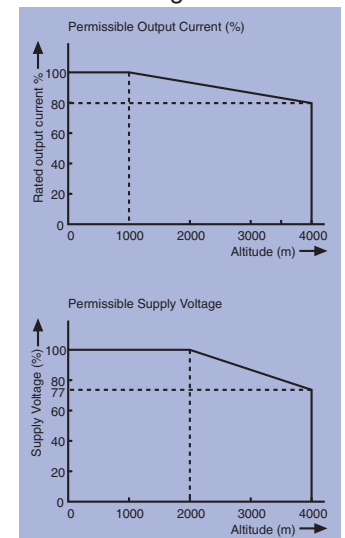
Part Numbers and Ratings Specifications

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



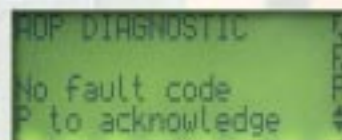
Advanced Operator Panel (AOP)

- 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

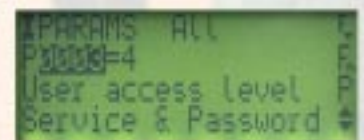
Part Number: SED2-AOP1



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

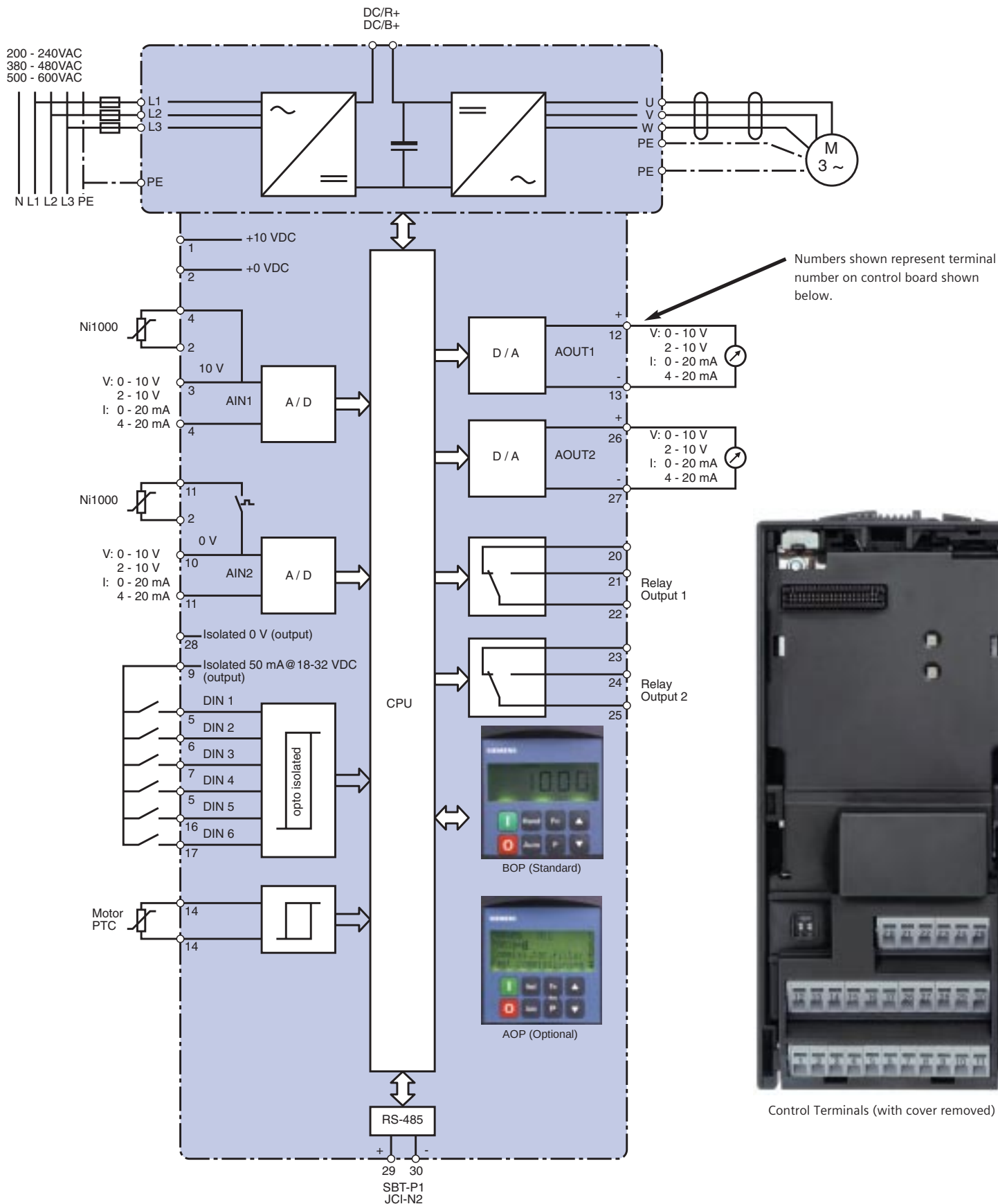


Easy-to-understand diagnostic display for fast troubleshooting.



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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