



# AC ADJUSTABLE SPEED DRIVES

## SM PLUS SUB-MICRO INVERTERS

### SM PLUS SUB-MICRO INVERTER DRIVES

**BIG performance from an ultra-compact design. Provides 18 isolated I/O terminals plus RS485 Modbus® serial communication. Other features include:**



SM PLUS

- Removable electronic programming module allows off-line set-up and program replication.
  - Input line voltage calibration—optimizes over and under voltage trip levels
  - Current limit to 180% with frequency foldback
  - Adjustable carrier frequency (4 to 10 kHz)
  - Adjustable V/Hz
  - Output frequency to 240 Hz
  - Seven preset speeds
  - Automatic restart after fault
  - Control via drive face, terminal strip or optional remote keypad
  - Coast or ramp to stop
  - Independent Accel and Decel adjustment
  - Forward only or forward and reverse direction
  - Adjustable DC injection braking
  - Speed reference: Keypad, 0-10 VDC, or 4-20 mA
  - Speed reference calibration
  - Speed and load indicating output signal selection: 0-10 VDC or 4-20mA
  - Output signal calibration
  - IPt motor thermal overload protection; meets UL requirements for motor protection in single motor applications
  - Fixed boost for high starting torque
  - Accel boost for high torque accelerating at any speed
  - Slip compensation
  - Three-digit LED display
  - Password protection
  - Fault history: Stores eight previous trips
  - Terminal status indication
  - Default parameter reset
  - IP20 enclosure with finger safe terminals
  - Dynamic braking and remote keypad kits available on pages 118 and 119
- ✧ User programmable for 50Hz and other voltage inputs



DIMENSIONS ON PAGE 115

PDF file of Manual available at [www.leeson.com](http://www.leeson.com)

### SINGLE PHASE INPUT/THREE PHASE OUTPUT

(Use with three phase 230V motor)

115/230 Volts	HP	Output Amps	Input Voltage ✧	Catalog Number	App. Wgt.(lbs.)	Disc Sym.	Dimension Key
	1	4.2	115/230	174492	4	A	B1
	1 1/2	6.0	115/230	174445	5	A	B1

### SINGLE OR THREE PHASE INPUT/THREE PHASE OUTPUT

(Use with three phase 230V motor)

200-240 Volts	HP	Output Amps	Input Voltage ✧	Catalog Number	App. Wgt.(lbs.)	Disc Sym.	Dimension Key
	1/4	1.4	200-240	174452	2	A	A1
	1/2	2.2	200-240	174453	2	A	A1
	1	4.2	200-240	174454	3	A	A2
	1 1/2	6.0	200-240	174493	4	A	B1
	2	6.8	200-240	174494	5	A	B2
	3	9.6	200-240	174495	5	A	B2
	5	15.2	200-240	174444	8	A	C1

### THREE PHASE INPUT/OUTPUT

200-240 Volts	HP	Output Amps	Input Voltage ✧	Catalog Number	App. Wgt.(lbs.)	Disc Sym.	Dimension Key
	1	4.2	200-240	174455	3	A	A2
	1 1/2	6.0	200-240	174456	3	A	A3
	2	6.8	200-240	174457	4	A	A3
	3	9.6	200-240	174458	4	A	A3
	5	15.2	200-240	174446	4	A	B2
	7 1/2	22.0	200-240	174438	8	A	C1
	10	28.0	200-240	174439	8	A	C1
	15	42.0	200-240	174429	13	A	D1
	20	54.0	200-240	174430	14	A	D1
400-480 Volts							
	1/2	1.1	400-480	174459	2	A	A1
	1	2.1	400-480	174460	3	A	A2
	1 1/2	3.0	400-480	174461	3	A	A3
	2	3.4	400-480	174462	4	A	A3
	3	4.8	400-480	174463	4	A	A3
	5	7.6	400-480	174447	5	A	B2
	7 1/2	11.0	400-480	174440	8	A	C1
	10	14.0	400-480	174441	8	A	C1
	15	21.0	400-480	174431	13	A	D1
	20	27.0	400-480	174432	14	A	D1
	25	34.0	400-480	174433	14	A	D1
	30	40.0	400-480	174500	14	A	D1
480-590 Volts							
	1	1.7	480-590	174464	3	A	A2
	2	3.0	480-590	174491	4	A	A3
	3	4.2	480-590	174497	5	A	B2
	5	6.6	480-590	174448	5	A	B2
	7 1/2	9.9	480-590	174442	8	A	C1
	10	12.2	480-590	174443	8	A	C1
	15	19.0	480-590	174434	8	A	D1
	20	24.0	480-590	174435	14	A	D1
	25	27.0	480-590	174436	14	A	D1

### SPECIFICATIONS:

Storage Temperature	-20° to 70° C
Ambient Operating Temperature	0° to 50° C
Ambient Humidity	<95% (non-condensing)
Maximum Altitude	3300 ft (1000m) above sea level
Input Line Voltages	115/230 VAC, 200-230 VAC, 460-480 VAC, and 550-575 VAC
Input Voltage Tolerance	+10%, -15%
Input Frequency Tolerance	48 to 62 Hz
Output Wave Form	Sine Coded PWM
Output Frequency	0-240 Hz
Carrier Frequency	4 kHz to 10 kHz

Enclosure	IP20
Service Factor	1.0
Efficiency	up to 98%
Power Factor (displacement)	>0.96
Overload Current Capacity	150% for 60 seconds 180% for 20 seconds

Speed Reference Follower	0-10 VDC, 4-20 mA
Control Voltage	15 VDC
Analogue Outputs	0-10 VDC or 2-10 VDC: Proportional to frequency or load

Digital Outputs	Open-collector: 40 mA at 30 VDC
Power Supply for Aux. Relays	40 mA at 12 VDC

# AC ADJUSTABLE SPEED DRIVES

## SM SERIES SUB-MICRO INVERTERS



### SM SERIES SUB-MICRO INVERTER DRIVES

For applications requiring a simpler drive without the advanced features of the SM-Plus drive. Provides 11 isolated I/O terminals with one Form A relay output. Other features include:

- Removable electronic programming module allows off-line set-up and program replication.
- Input line voltage calibration—optimizes over and under voltage trip levels
- Current limit to 180% with frequency foldback
- Adjustable carrier frequency (4 to 10 kHz)
- Adjustable V/Hz
- Output frequency to 240 Hz
- Seven preset speeds
- Automatic restart after fault
- Control via drive face, terminal strip or optional remote keypad
- Coast or ramp to stop
- Independent Accel and Decel adjustment
- Forward only or forward and reverse direction
- Adjustable DC injection braking
- Speed reference: Keypad, 0-10 VDC, or 4-20 mA
- Speed reference calibration
- I<sup>t</sup> motor thermal overload protection; meets UL requirements for motor protection in single motor applications
- Fixed boost for high starting torque
- Accel boost for high torque accelerating at any speed
- Slip compensation
- Three-digit LED display
- Password protection
- Fault history: Stores eight previous trips
- Terminal status indication
- Default parameter reset
- IP20 enclosure with finger safe terminals
- Dynamic braking and remote keypad kits available on pages 118 and 119.

→ User programmable for 50Hz and other voltage inputs



SM SERIES



### SINGLE PHASE INPUT/THREE PHASE OUTPUT (Use with three phase 230V motor)

	HP	Output Amps 230 VAC	Input Voltage	Catalog Number	App. Wgt.(lbs.)	Disc. Sym.	Dimension Key
110-120 Volts	1/3	1.7	110-120	174263	2	A	A5
	1/2	2.4	110-120	174264	2	A	A5
	1	4.2	110-120	174265	3	A	B5
	1 1/2	6.0	110-120	174266	3	A	B5

### SINGLE PHASE INPUT/THREE PHASE OUTPUT (Use with three phase 230V motor)

	HP	Output Amps	Input Voltage	Catalog Number	App. Wgt.(lbs.)	Disc. Sym.	Dimension Key
200-240 Volts	1/3	1.7	200-240	174267	2	A	A5
	1/2	2.4	200-240	174268	2	A	A5
	1	4.2	200-240	174270	3	A	A6
	1 1/2	6.0	200-240	174271	4	A	B5
	2	7.0	200-240	174272	5	A	B5
	3	9.6	200-240	174273	5	A	B6

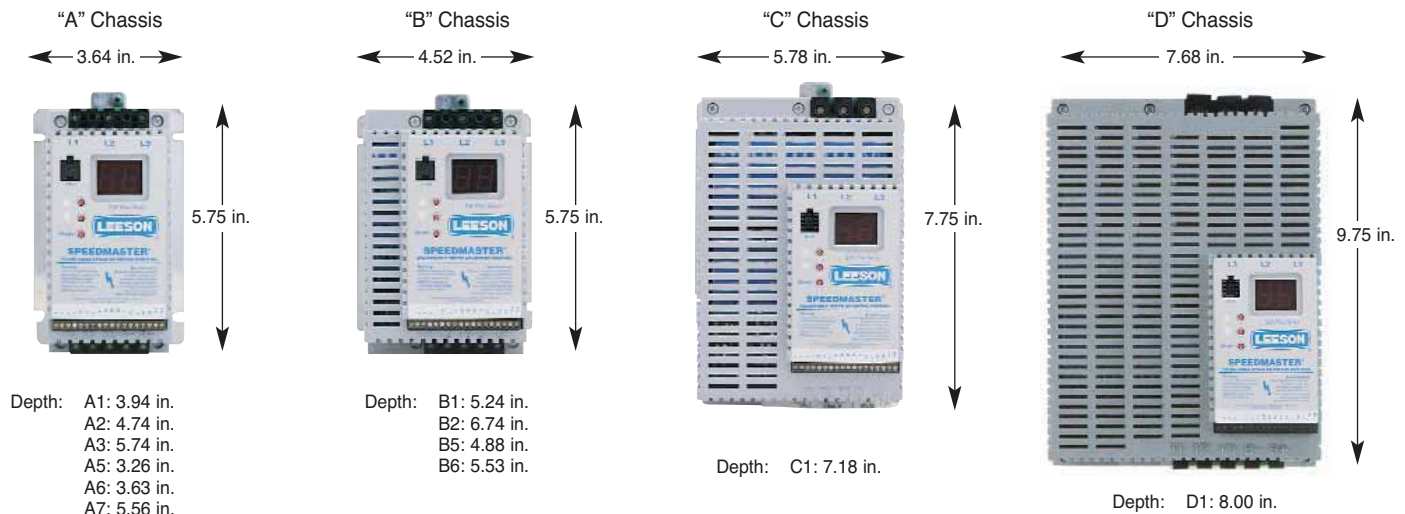
### THREE PHASE INPUT/THREE PHASE OUTPUT

	HP	Output Amps	Input Voltage	Catalog Number	App. Wgt.(lbs.)	Disc. Sym.	Dimension Key
200-240 Volts	1/2	2.4	200-240	174274	2	A	A5
	1	4.2	200-240	174276	2	A	A6
	1 1/2	6.0	200-240	174277	3	A	A7
	2	7.0	200-240	174278	3	A	A7
	3	9.6	200-240	174279	3	A	B6
	5	15.2	200-240	174288	5	A	B2
	7 1/2	22	200-240	174280	8	A	C1
	10	28	200-240	174290	8	A	C1
	15	42	200-240	174292	14	A	D1

### THREE PHASE INPUT/THREE PHASE OUTPUT

	HP	Output Amps	Input Voltage	Catalog Number	App. Wgt.(lbs.)	Disc. Sym.	Dimension Key
400-480 Volts	1/2	1.1	400-480	174281	2	A	A1
	1	2.1	400-480	174282	3	A	A2
	1 1/2	3.0	400-480	174283	3	A	A3
	2	3.4	400-480	174284	4	A	A3
	3	4.8	400-480	174286	4	A	B1
	5	7.8	400-480	174287	5	A	B2
	7 1/2	11	400-480	174285	5	A	B2
	10	14	400-480	174291	8	A	C1
	15	21	400-480	174293	8	A	C1

### DIMENSIONS: SM, SM PLUS AND SM VECTOR INVERTERS



Dimensions shown for reference only. Contact LEESON for detailed drawing.

PDF file of Manual available at [www.leeson.com](http://www.leeson.com)