

New Information

AF95 to SV9000



The AF95 and SV9000 are both extremely versatile drives, and few difficulties are expected in an application conversion from the former to the latter. The purpose of this selling aid is to point out the major differences in the two products to assist in the conversion of AF95 customers to the newer SV9000 product. The following product characteristics will be considered:

- Physical size
- Terminal strip functionality
- Keypad functionality
- Control type/methods
- Programming software
- Communications options
- Power/Control options

Physical Size

It should be made clear at the outset that the SV9000 is available in a much wider range of horsepower sizes and voltage ratings than is the AF95. The SV9000 is dual rated for VT and CT applications, while the AF95 has both CT and VT rated models. The following tables show the CT product size comparisons.

hp (kW)	Voltage	Product Catalog Designation				
		AF95 W x H x D in Inches		SV9000 W x H x D in Inches		
		Chassis	Standard NEMA 1	Chassis & Protected Chassis	Compact NEMA 1	Standard NEMA 1 & NEMA 12
15	240	13.7 x 26.9 x 8.1	13.7 x 28.2 x 8.2	8.7 x 20.7 x 11.4	7.3 x 22.8 x 8.5	8.7 x 25.6 x 11.4
20		14.2 x 40.9 x 8.1	14.2 x 44.6 x 8.2	8.7 x 20.7 x 11.4	7.3 x 22.8 x 8.5	8.7 x 25.6 x 11.4
25		14.2 x 40.9 x 8.1	14.2 x 44.6 x 8.2	8.7 x 20.7 x 11.4	N/A	8.7 x 25.6 x 11.4
30		14.2 x 47.4 x 8.1	14.2 x 51.1 x 8.2	8.7 x 20.7 x 11.4	N/A	8.7 x 25.6 x 11.4
40		14.2 x 54.9 x 8.1	14.2 x 60.2 x 8.2	9.8 x 31.5 x 12.4	N/A	14.7 x 39.4 x 13
50		14.2 x 54.9 x 8.1	14.2 x 60.2 x 8.2	9.8 x 31.5 x 12.4	N/A	14.7 x 39.4 x 13
60		N/A	N/A	9.8 x 31.5 x 12.4	N/A	14.7 x 39.4 x 13
75		N/A	N/A	19.5 x 35 x 13.9	N/A	19.5 x 50.8 x 14

Physical Size (Continued)

hp (kW)	Voltage	Product Catalog Designation				
		AF95 W x H x D in Inches		SV9000 W x H x D in Inches		
		Chassis	Standard NEMA 1	Chassis & Protected Chassis	Compact NEMA 1	Standard NEMA 1 & NEMA 12
(11)	380	13.7 x 26.9 x 8.1	13.7 x 28.2 x 8.2	6.2 x 15.9 x 9.4	5.3 x 15.4 x 8.1	6.2 x 20.3 x 9.4
(15)		13.7 x 26.9 x 8.1	13.7 x 28.2 x 8.2	6.2 x 15.9 x 9.4	7.3 x 22.8 x 8.5	6.2 x 20.3 x 9.4
(18.5)		13.7 x 26.9 x 8.1	13.7 x 28.2 x 8.2	8.7 x 20.7 x 11.4	7.3 x 22.8 x 8.5	8.7 x 25.6 x 11.4
(22)		13.7 x 26.9 x 8.1	13.7 x 28.2 x 8.2	8.7 x 20.7 x 11.4	7.3 x 22.8 x 8.5	8.7 x 25.6 x 11.4
(25)		14.2 x 40.9 x 8.1	14.2 x 44.6 x 8.2	N/A	N/A	N/A
(30)		N/A	N/A	8.7 x 20.7 x 11.4	N/A	8.7 x 25.6 x 11.4
(37)		14.2 x 40.9 x 8.1	14.2 x 44.6 x 8.2	8.7 x 20.7 x 11.4	N/A	8.7 x 25.6 x 11.4
(40)		14.2 x 47.4 x 8.1	14.2 x 51.1 x 8.2	N/A	N/A	N/A
(45)		N/A	N/A	8.7 x 20.7 x 11.4	N/A	8.7 x 25.6 x 11.4
(55)		14.2 x 54.9 x 8.1	14.2 x 60.2 x 8.2	9.8 x 31.5 x 12.4	N/A	14.7 x 39.4 x 13
(63)		N/A	N/A	N/A	N/A	N/A
(75)		N/A	N/A	9.8 x 31.5 x 12.4	N/A	14.7 x 39.4 x 13
(90)		N/A	N/A	9.8 x 31.5 x 12.4	N/A	14.7 x 39.4 x 13
(110)		N/A	N/A	19.5 x 35 x 13.9	N/A	19.5 x 47.6 x 13.9
(132)		N/A	N/A	19.5 x 35 x 13.9	N/A	19.5 x 47.6 x 13.9
(160)		N/A	N/A	19.5 x 35 x 13.9	N/A	19.5 x 47.6 x 13.9
(200)		N/A	N/A	27.6 x 39.4 x 15.4	N/A	27.6 x 56.1 x 15.4
(250)		N/A	N/A	27.6 x 39.4 x 15.4	N/A	27.6 x 56.1 x 15.4
(315)		N/A	N/A	38.9 x 39.4 x 15.4	N/A	Refer to Factory
(400)		N/A	N/A	38.9 x 39.4 x 15.4	N/A	Refer to Factory
(500)		N/A	N/A	55.1 x 39.4 x 15.4	N/A	N/A
(630)		N/A	N/A	77.9 x 39.4 x 15.4	N/A	N/A
(710)		N/A	N/A	77.9 x 39.4 x 15.4	N/A	N/A
(800)		N/A	N/A	77.9 x 39.4 x 15.4	N/A	N/A
(900)		N/A	N/A	77.9 x 39.4 x 15.4	N/A	N/A
(1000)		N/A	N/A	77.9 x 39.4 x 15.4	N/A	N/A
15	480	13.7 x 26.9 x 8.1	13.7 x 28.2 x 8.2	6.2 x 15.9 x 9.4	5.3 x 15.4 x 8.1	6.2 x 20.3 x 9.4
20		13.7 x 26.9 x 8.1	13.7 x 28.2 x 8.2	6.2 x 15.9 x 9.4	7.3 x 22.8 x 8.5	6.2 x 20.3 x 9.4
25		13.7 x 26.9 x 8.1	13.7 x 28.2 x 8.2	8.7 x 20.7 x 11.4	7.3 x 22.8 x 8.5	8.7 x 25.6 x 11.4
30		13.7 x 26.9 x 8.1	13.7 x 28.2 x 8.2	8.7 x 20.7 x 11.4	7.3 x 22.8 x 8.5	8.7 x 25.6 x 11.4
40		14.2 x 40.9 x 8.1	14.2 x 44.6 x 8.2	8.7 x 20.7 x 11.4	N/A	8.7 x 25.6 x 11.4
50		14.2 x 40.9 x 8.1	14.2 x 44.6 x 8.2	8.7 x 20.7 x 11.4	N/A	8.7 x 25.6 x 11.4
60		14.2 x 47.4 x 8.1	14.2 x 51.1 x 8.2	8.7 x 20.7 x 11.4	N/A	8.7 x 25.6 x 11.4
75		14.2 x 47.4 x 8.1	14.2 x 51.1 x 8.2	9.8 x 31.5 x 12.4	N/A	14.7 x 39.4 x 13
100		14.2 x 54.9 x 8.1	14.2 x 60.2 x 8.2	9.8 x 31.5 x 12.4	N/A	14.7 x 39.4 x 13
125		24.2 x 53 x 14.5	26.5 x 68.1 x 14.6	9.8 x 31.5 x 12.4	N/A	14.7 x 39.4 x 13
150		24.2 x 53 x 14.5	26.5 x 68.1 x 14.6	19.5 x 35 x 13.9	N/A	19.5 x 47.6 x 13.9
200		27 x 53 x 14.4	40.5 x 90 x 21	19.5 x 35 x 13.9	N/A	19.5 x 47.6 x 13.9
250		N/A	40.5 x 90 x 21	27.6 x 39.4 x 15.4	N/A	27.6 x 56.1 x 15.4
300		N/A	40.5 x 90 x 21	27.6 x 39.4 x 15.4	N/A	27.6 x 56.1 x 15.4
400		N/A	40.5 x 90 x 21	38.9 x 39.4 x 15.4	N/A	Refer to Factory
500		N/A	N/A	38.9 x 39.4 x 15.4	N/A	Refer to Factory
600		N/A	N/A	55.1 x 39.4 x 15.4	N/A	N/A
700		N/A	N/A	77.9 x 39.4 x 15.4	N/A	N/A
800		N/A	N/A	77.9 x 39.4 x 15.4	N/A	N/A
900		N/A	N/A	77.9 x 39.4 x 15.4	N/A	N/A
1000		N/A	N/A	77.9 x 39.4 x 15.4	N/A	N/A
1100		N/A	N/A	77.9 x 39.4 x 15.4	N/A	N/A

Physical Size (Continued)

hp (kW)	Voltage	Product Catalog Designation				
		AF95 W x H x D in Inches		SV9000 W x H x D in Inches		
		Chassis	Standard NEMA 1	Chassis & Protected Chassis	Compact NEMA 1	Standard NEMA 1 & NEMA 12
15	575	13.7 x 26.9 x 8.1	13.7 x 28.2 x 8.2	6.2 x 15.9 x 9.4	N/A	N/A
20		13.7 x 26.9 x 8.1	13.7 x 28.2 x 8.2	6.2 x 15.9 x 9.4	N/A	N/A
25		14.2 x 40.9 x 8.1	14.2 x 44.6 x 8.2	6.2 x 15.9 x 9.4	N/A	N/A
30		14.2 x 40.9 x 8.1	14.2 x 44.6 x 8.2	8.7 x 20.7 x 11.4	N/A	N/A
40		14.2 x 40.9 x 8.1	14.2 x 44.6 x 8.2	8.7 x 20.7 x 11.4	N/A	N/A
50		14.2 x 47.4 x 8.1	14.2 x 51.1 x 8.2	8.7 x 20.7 x 11.4	N/A	N/A
60		N/A	N/A	8.7 x 20.7 x 11.4	N/A	N/A
75		N/A	N/A	8.7 x 20.7 x 11.4	N/A	N/A
100		N/A	N/A	19.5 x 35 x 13.9	N/A	N/A
125		N/A	N/A	19.5 x 35 x 13.9	N/A	N/A
150		N/A	N/A	27.6 x 39.4 x 15.4	N/A	N/A
200		N/A	N/A	27.6 x 39.4 x 15.4	N/A	N/A
250		N/A	N/A	38.9 x 39.4 x 15.4	N/A	N/A
300		N/A	N/A	38.9 x 39.4 x 15.4	N/A	N/A
400		N/A	N/A	55.1 x 39.4 x 15.4	N/A	N/A
500		N/A	N/A	77.9 x 39.4 x 15.4	N/A	N/A
600		N/A	N/A	77.9 x 39.4 x 15.4	N/A	N/A
700		N/A	N/A	77.9 x 39.4 x 15.4	N/A	N/A
800		N/A	N/A	77.9 x 39.4 x 15.4	N/A	N/A

All SV9000 units incorporate a 3% (nominal) line reactor in these sizes as standard. This provides a significant advantage over the AF95, where an

external line reactor or oversized enclosure is required. The SV9000 chassis, protected chassis, standard NEMA 1 and NEMA 12 units include mounting

space for a variety of optional boards. The compact NEMA 1 units do not have any option board space.

Feature Comparison

Primary Design Features	Product Catalog Description			
	AF95	SV9000		
		Compact NEMA 1	Open/Protected Chassis	Standard NEMA 1 or 12

Ratings

hp Range 240 Volts CT (VT)		15 – 20 (20 – 25)	15 – 75 (20 – 100)	15 – 75 (20 – 100)
kW Range 380 Volts CT (VT)		11 – 22 (15 – 30)	11 – 1000 (15 – 900)	11 – 400 (15 – 500)
hp Range 480 Volts CT (VT)		15 – 30 (20 – 50)	15 – 1100 (20 – 1000)	15 – 500 (20 – 600)
hp Range 600 Volts CT (VT) ^①		N/A	2 – 20 (2 – 25)	N/A
1-Phase Input Capability with Derate	N/A	Yes with Field Modification. Refer to Factory.		
50 Hz Ratings	Standard	Standard		
Output: AC Volts Maximum	Input Voltage Base	Input Voltage Base		
Output Frequency Range: Hz	1 – 133	.0 – 500		
Initial Output Current (CT)	180	250% for 2 Seconds		
Overload: 1 Minute (CT/VT)	150%/110%	150%/110%		
Listings	UL, cUL	UL, cUL, CSA (Pending)		
CE Mark (Requires EMC Filter)	N/A	Standard		

① UL Listed to 600 volts. Unit is rated to 690 volts.

Feature Comparison (Continued)

Primary Design Features	Product Catalog Description			
	AF95	SV9000		
		Compact NEMA 1	Open/Protected Chassis	Standard NEMA 1 or 12

Enclosed Control Features

Enclosure Space Heater	N/A	N/A		
Oversize Enclosure	Optional	Optional		
Output Contactor	Optional ①	Optional ①		
Bypass Control	Optional ①	Optional ①		
EMC Filter	Optional ①	Optional		
Dv/dt Filter	Optional	Optional ①		

Protection Features

Incoming Line Fuses	Optional	Optional ①	
AC Input Circuit Disconnect	Optional ①	Optional ①	N/A
Line Reactors	Optional	Standard Internal	
Phase Rotation Insensitive	Standard	Standard	
Input Phase Loss Protection	Standard	Standard	
Input Overvoltage Protection	Standard	Standard	
Line Surge Protection	Standard	Standard	
Output Short Circuit Protection	Standard	Standard	
Output Ground Fault Protection	Standard	Standard	
Output Phase Protection	Standard	Standard	
Overtemperature Protection	Standard	Standard	
DC Overvoltage Protection	Standard	Standard	
Drive Overload Protection	Standard	Standard	
Motor Overload Protection	Standard	Standard	
Fault Alarm Output	Standard	Standard	
Built-In Diagnostics	Standard	Standard	

Input/Output Interface Features

Setup Adjustment Provisions		
Drive Mounted Keypad/Display	Standard	Standard
Remote Keypad/Display	Optional	Optional
Programmer Software	Standard	Standard
Personal Computer	N/A	Standard
Operator Control Provisions		
Drive Mounted Keypad/Display	Standard	Standard
Remote Keypad/Display	Optional	Optional
Conventional Control Elements	Standard	Standard
Keypad Lockout	Standard	Standard
Serial Communications	N/A	Standard
115V AC Control Circuit	Optional	Optional

① Requires optional oversized enclosure.

Feature Comparison (Continued)

Primary Design Features	Product Catalog Description			
	AF95	SV9000		
		Compact NEMA 1	Open/Protected Chassis	Standard NEMA 1 or 12

Input/Output Interface Features (Continued)

Speed Setting Inputs		
Keypad	Standard	Standard
Potentiometers/Voltage Signal	Standard	Standard
4 – 20 mA Isolated	Optional	Optional
4 – 20 mA Differential	Standard	Standard
3 – 15 psig	Optional	Optional
Electronic Potentiometer	Standard	Standard
Preset Speeds	Standard	Standard
Digital Inputs		
Number of Inputs	8 Programmable, Additional Optional	6 Programmable, Additional Optional
Start	Programmable	Programmable
Stop	Programmable	Programmable
Preset Speeds	7 Programmable	7 Programmable
External Fault	Programmable	Programmable
Forward/Reverse	Programmable	Programmable
2nd Acceleration/Deceleration	Programmable	Programmable
Jog	Programmable	Programmable
Fault	Programmable	Programmable
Speed Source Select	Programmable	Programmable
Start Source Select	Programmable	Programmable
Analog Outputs		
Number of Outputs	2	1 Standard, Additional Optional
Speed/Frequency	Standard	Standard
Torque/Load/Current	Programmable	Programmable
Motor Voltage	Programmable	Programmable
Kilowatts	Programmable	Programmable
0 – 10V DC Signals	Standard	Optional
4 – 20 mA DC Signals	Optional	Standard
Isolated Signals	Optional	Optional
Discrete Outputs		
Fault Alarm	Standard	Standard
Drive Running	Programmable	Standard
Drive at Set Speed	Programmable	Programmable
Relay Outputs — Programmable	2	1
Open Collector Outputs	N/A	1
Programming Choices	41	21
Additional Discrete Outputs	Optional	Optional

Feature Comparison (Continued)

Primary Design Features	Product Catalog Description			
	AF95	SV9000		
		Compact NEMA 1	Open/Protected Chassis	Standard NEMA 1 or 12

Input/Output Interface Features (Continued)

Communications			
RS-232	Optional		Standard
RS-422/485	RS-422 Optional RS-485 Standard		Optional
DeviceNet™	N/A		Refer to Factory
Modbus RTU	Optional		Optional
Interbus-S	N/A		Optional
Profibus-DP	N/A		Optional
Lonworks	N/A		Optional
IMPAAAC	N/A		Refer to Factory
Johnson N2	Optional		Refer to Factory
Staefa P1	N/A		Refer to Factory
SDS	N/A		Optional

Performance Features

Sensorless Vector Control	N/A		Standard
Closed Loop Vector Control	N/A		Optional
Volts/Hertz Control	Standard		Standard
IR and Slip Compensation	Standard		Standard
Electronic Reversing	Standard		Standard
Dynamic Braking	Optional		Optional
DC Braking	Standard		Standard
PI Setpoint Controller	N/A		Standard
PID Setpoint Controller	Standard		N/A
Critical Speed Lockout	Standard		Standard
Current (Torque) Limit	Standard		Standard
Adjustable Accel/Decel	Standard		Standard
Linear or S Curve Accel/Decel	Standard		Standard
Jog at Preset Speed	Standard		Standard
Automatic Restart	Programmable		Programmable
Coasting Motor Start	Standard		Standard
Coast or Ramp Stop Selection	Standard		Standard
Elapsed Time Meter	Standard		Standard
Carrier Frequency Adjustment	3 to 12 kHz		1 – 16 kHz

Standard Conditions for Application and Service

Operating Ambient Temperature	0 – 40°C		-10 – 50°C CT, -10 – 40°C VT
Storage Temperature	-20 – 65°C		-40 – 60°C
Humidity (Maximum), Non-condensing	95%		95%
Altitude (Maximum without Derate)	3300 ft. (1000m)		3300 ft. (1000m)
Line Voltage Variation	+10/-10%		+10/-15%
Line Frequency Variation	47 – 63 Hz		45 – 65 Hz
Efficiency	>96%		>96%
Power Factor (Displacement)	.96		.96

I/O Comparison

Terminal Function	AF95 Terminal Number	SV9000 Terminal Number
	As Shipped from Factory	Standard Application

Analog I/O

4 – 20 Input	1 and 2 (Differential Input)	4 and 5 (Differential Input)
0 – 10V DC Input	8 (Wiper), 7 (10V DC)	2 (Wiper), 1 (10V DC)
Input Common	9	3
0 – 10V DC Output #1	4 ①	Available with Option Boards
0 – 10V DC Output #2	5 ①	
4 – 20 mA Output #1	4 ①	18 and 19 (Differential Output) Additional Outputs Available with Option Boards
4 – 20 mA Output #2	5 ①	
Analog Output Common	3	N/A

Digital I/O

Digital Common	10	11 and 17
Stop	11	N/A
Start	12	N/A
PLC Run (Start)	13	8 Fwd/9 Rev
Fwd/Rev	14 ①	8 Fwd/9 Rev
Manual/Auto	14 ① or 16 ①	16 Using Local/Remote Control Application
Smoke Purge	14 ①	8, 9, 10, 14, 15, 16 Programmable
Jog	15 ①	8, 9, 10, 14, 15, 16 Programmable
PM Setback	15 ①	8, 9, 10, 14, 15, 16 Programmable
Preset Speed 1	15 ① or 17 ①	14
Preset Speed 2	16 ①	15
Preset Speed 3	17 ①	8, 9, 10, 14, 15, 16 Programmable
Contact Interlock	17 ①	N/A
External Interlock	17 ①	8, 9, 10, 14, 15, 16 Programmable
External Fault	18	10
Programmable Output #1	19 (NC) and 21 (NO)	21 (NC), 23 (NO)
Programmable Output #2	22 (NC) and 24 (NO)	24 (NC), 26 (NO)
Programmable Output Common	20 (#1) and 23 (#2)	22 and 25

① Denotes parameter is programmable via the keypad to different terminals specified.

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