Quick Start Guide

Cutler-Hammer SVX9000 Drives from Eaton Corporation

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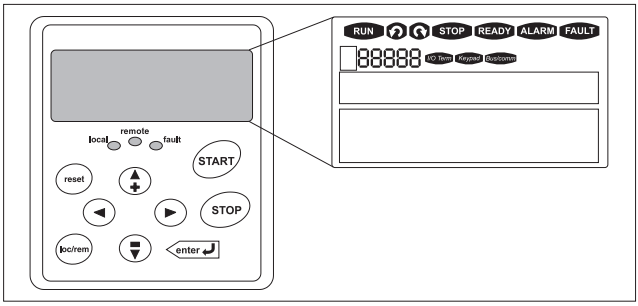
STEP 1

Keypad Operation Overview



Keypad and Display

LCD Status Indicators

Indicator	Description
RUN	**Run** Indicates that the SVX9000 is running and controlling the load. Blinks when a stop command has been given but the SVX9000 is still ramping down.
	Counterclockwise Operation The output phase rotation is BAC, corresponding to counterclockwise rotation of most motors.
	Clockwise Operation The output phase rotation is ABC, corresponding to clockwise rotation of most motors.
STOP	**Stop** Indicates that the SVX9000 is stopped and not controlling the load.
READY	**Ready** Indicates that the SVX9000 is ready to be started.
ALARM	**Alarm** Indicates that there is one or more active drive alarm(s).
FAULT	**Fault** Indicates that there is one or more active drive fault(s).
I/O Term	**I/O Terminal** Indicates that the I/O terminals have been chosen for control.
Keypad	**Keypad** Indicates that the keypad has been chosen for control.
Bus/comm	**Bus/Communications** Indicates that the communications bus control has been chosen for control.

LED Status Indicators

Indicator	Description
local	**Local — Steady Illumination** Indicates that the SVX9000 is ready to be started and operated from the Local mode. **Local — Flashing** Indicates that the SVX9000 is ready for operating command to select Local or Remote operation.
remote	**Remote** Indicates that the SVX9000 is operating and controlling the load remotely. **Remote — Flashing** Indicates that the SVX9000 is ready for operating command to select Local or Remote operation.
fault	**Fault** Indicates that there is one or more active drive fault(s).

STEP 1 (Continued)

Navigation Buttons

Button	Description
START	**Start** This button operates as the START button for normal operation when the "Keypad" is selected as the active control.
enter	**Enter** This button is used in the parameter edit mode to save the parameter setting and move to the next parameter … • to reset the Fault History if pressed while in the "Fault History" menu. • to confirm the acceptance of a change. • to change a virtual button status while in the "Button" menu. • to confirm the start-up list at the end of the Start-Up Wizard. • when the "Operate" menu is active, to exit the "Operate" submenu.
STOP	**Stop** This button has two integrated operations. The button operates as STOP button during normal operation … • motor STOP from the keypad, which is always active unless disabled by the "StopButtonActive" parameter. • used to reset the active faults.
reset	**Reset** Resets the active faults.
loc/rem	**Local / Remote** Switches between LOCAL and REMOTE control for start, speed reference and reverse functions. The control locations corresponding to local and remote can be selected within an application.
◄	**Left Arrow** • navigation button, movement to left. • in parameter edit mode, exits mode, backs up one step. • cancels edited parameter (exit from a parameter edit mode). • When in "Operate" menu will move backward through menu. • At end of "Start-Up Wizard", repeats the "Start-Up Wizard" setup menu.
►	**Right Arrow** • navigation button, movement to right. • enter parameter group mode. • enter parameter mode from group mode. • When in "Operate" menu will move forward through menu.
▲ ▼	**Up and Down Arrows** • move either up or down a menu list to select the desired menu item. • editing a parameter/password, while the active digit/character is scrolled. • increase/decrease the reference value of the selected parameter. • in the "Operate" menu, will cause the display of the active reference source and value and allow its change if the keypad is the active reference source. Used to set the password (if defined) when leaving the "Operate" menu. • scroll through the "Active Faults" menu when the SVX9000 is stopped.

Menu Navigation

Navigation Tips

- To navigate within one level of a menu, use the up and down arrows.
- To move deeper into the menu structure and back out, use the right and left arrows.
- To edit a parameter, navigate to show that parameter's value, and press the right arrow button to enter the edit mode. In edit mode, the parameter value will flash.

STEP 1 (Continued)

- When in edit mode, the parameter value can be changed by pressing the up or down arrow keys.
- When in edit mode, pressing the right arrow a second time will allow you to edit the parameter value digit by digit.
- To confirm the parameter change you must press the ENTER button. *The value will not change unless the ENTER button is pushed.*
- Some parameters can not be changed while the SVX9000 is running. The screen will display LOCKED if you attempt to edit these parameters while the drive is running. Stop the drive to edit these parameters. See the *SVX9000 Application Manual* for identification of these parameters specific to your chosen application.

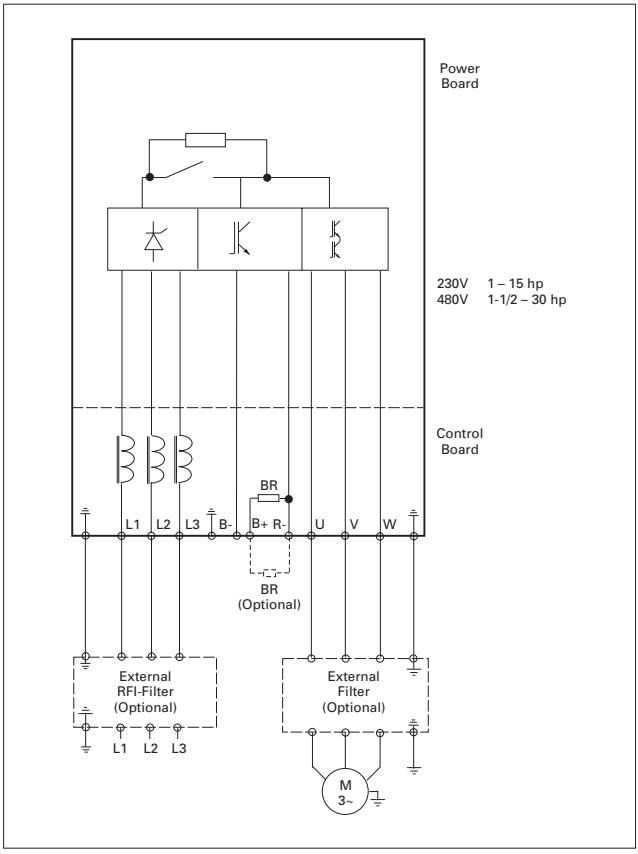
Main Menu

The data on the control keypad are arranged in menus and submenus. The first menu level consists of M1 to M8 and is called the Main Menu. The Main Menu is illustrated on **Page 7**. Some of the submenus will vary for each application choice.

STEP 2

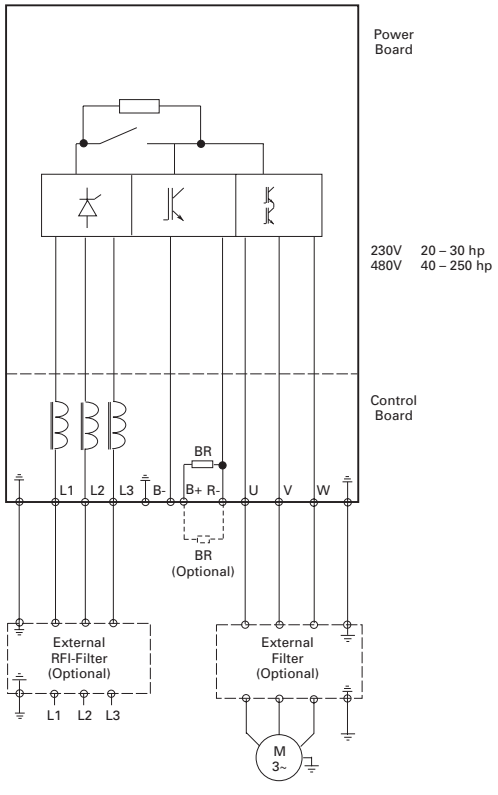
Standard Wiring Diagrams and Terminal Locations

Power and Motor Wiring Terminal Schematic for SVX9000 Drives



SVX9000 Power and Motor Wiring for Low Horsepower Drives (1 – 30 hp)

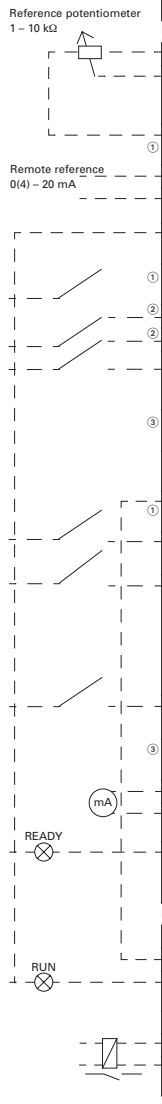
STEP 2 (Continued)



SVX9000 Power and Motor Wiring for Large Horsepower Drives (20 – 250 hp)

STEP 2 (Continued)

Basic Application Default I/O Configuration



Terminal		Signal	Description		
NXOPTA9					
1	+10V$_{ref}$	Reference output	Voltage for potentiometer, etc.		
2	AI1+	Analog input, voltage range 0 – 10V DC	Voltage input frequency reference		
3	AI1-	I/O Ground	Ground for reference and controls		
4	AI2+	Analog input, current range 0 – 20 mA	Current input frequency reference		
5	AI2-				
6	+24V	Control voltage output	Voltage for switches, etc. max 0.1A		
7	GND	I/O ground	Ground for reference and controls		
8	DIN1	Start forward	Contact closed = start forward		
9	DIN2	Start reverse	Contact closed = start reverse		
10	DIN3	External fault input (programmable)	Contact open = no fault Contact closed = fault		
11	CMA	Common for DIN 1 – DIN 3	Connect to GND or +24V		
12	+24V	Control voltage output	Voltage for switches (see terminal 6)		
13	GND	I/O ground	Ground for reference and controls		
14	DIN4	Multi-step speed select 1	**DIN4**	**DIN5**	**Frequency ref.**
15	DIN5	Multi-step speed select 2	Open	Open	Ref.V$_{in}$
			Closed	Open	Multi-step ref.1
			Open	Closed	Multi-step ref.2
			Closed	Closed	Ref$_{Max}$
16	DIN6	Fault reset	Contact open = no action Contact closed = fault reset		
17	CMB	Common for DIN4 – DIN6	Connect to GND or +24V		
18	AO1+	Output frequency	Programmable		
19	AO1-	Analog output	Range 0 – 20 mA, R$_L$ max. 500Ω		
20	DO1	Digital output READY	Programmable Open collector, I ≤ 50 mA, V ≤ 48V DC		
NXOPTA2					
21	RO1	Relay output 1 ④ RUN			
22	RO1				
23	RO1				
24	RO2	Relay output 2 ④ FAULT			
25	RO2				
26	RO2				

① GND terminals 3, 7 and 13 are internally connected.

② For the STANDARD Application, input signals at DIN1 and DIN2 are programmed as a pair using parameter 2.1.

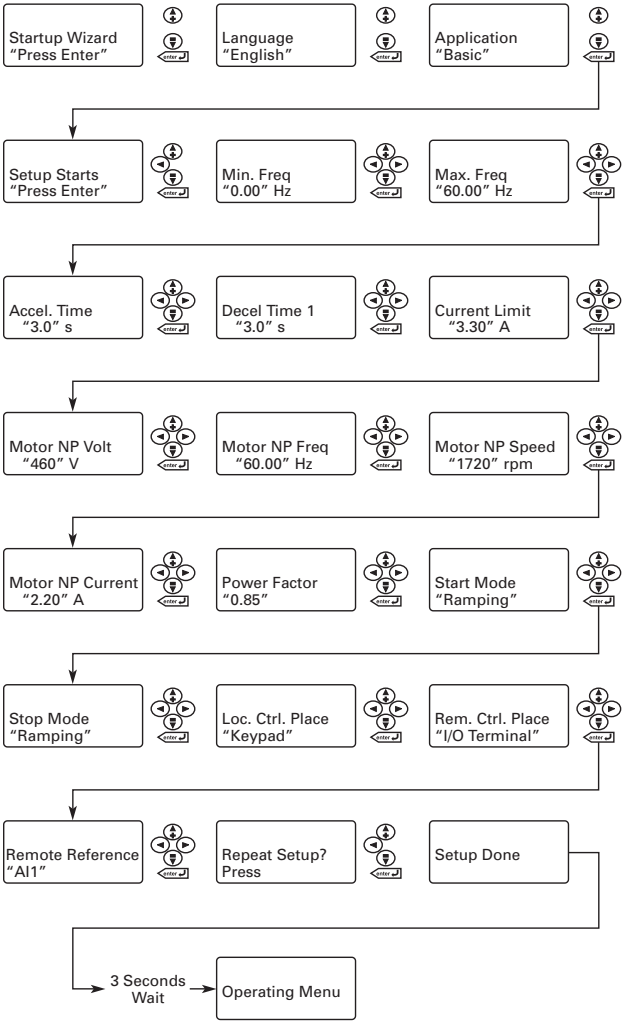
③ Connect CMA/CMB inputs to either logic high or logic low depending upon your application. Refer to the *SVX9000 User Manual* and *SVReady Application Manual* for additional information.

④ Maximum Switching Voltage: 300V DC, 250V AC
Maximum Switching Load: 8A/24V DC; 0.4A/250V DC; 2 kVA/250V AC
Maximum Continuous Load: 2A rms

STEP 3

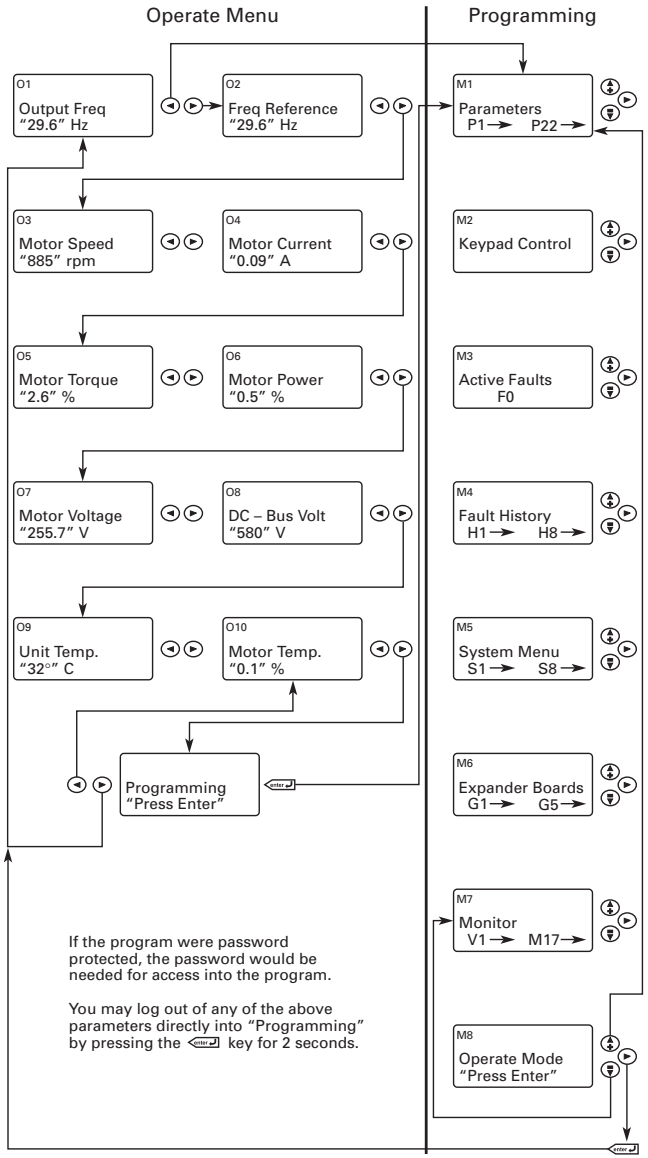
Start-Up Wizard

If the wizard is not enabled at power-up, press the RESET button for 10 secs. to enable it.



STEP 4

Operating & Programming Menu Navigation



STEP 4 (Continued)

Operate Menu — M8

The Operate Menu provides a easy to use method of viewing key numerical Monitoring Menu items. Some applications also support the setting of reference values in this menu. The items displayed vary by application. The table below is an example for the Standard application.

Operate Menu Items — Standard Application Example

Code	Signal Name	Unit	Description
O.1	Output Frequency	Hz	Output frequency
O.2	FreqReference	Hz	Frequency reference
O.3	Motor Speed	rpm	Calculated motor speed
O.4	Motor Current	A	Measured motor current
O.5	Motor Torque	%	Calculated torque based on nominal motor torque
O.6	Motor Power	%	Calculated power based on nominal motor power
O.7	Motor Voltage	V	Calculated motor voltage
O.8	DC-Bus Voltage	V	Measured DC-bus voltage
O.9	Unit Temperature	°C	Heatsink temperature
O.10	MotorTemperature	%	Calculated motor temperature based on the motor nameplate information and the calculated motor load
R1	Keypad Reference	Hz	Keypad frequency reference setting

The menu is navigated by using the left and right arrow buttons. If a reference level is available for setting, the up and down arrow buttons adjust the value. To exit the Operate Menu to access the other menus, depress the ENTER button for 2 seconds. While in the other menus, if there is no keypad activity, the display will return to the Operate Menu after 30 seconds.

STEP 4 (Continued)

Parameters — M1

Basic Parameters — M1

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note
P1.1	Min frequency	0.00	P1.2	Hz	0.00		101	
P1.2	Max frequency	P1.1	320.00	Hz	60.00		102	**NOTE**: If f_{Max} > motor synchronous speed, check suitability for motor and drive system
P1.3	Acceleration time 1	0.1	3000.0	s	3.0		103	
P1.4	Deceleration time 1	0.1	3000.0	s	3.0		104	
P1.5	Current limit	0.4 x I_H	2 x I_H	A	I_L		107	I_H is the nominal current rating of the SVX9000
P1.6 ①	Nominal voltage of the motor	180	690	V	HVX-2: 230V HVX-4: 460V		110	Motor nameplate value
P1.7 ①	Nominal frequency of the motor	30.00	320.00	Hz	60.00		111	Motor nameplate value
P1.8 ①	Nominal speed of the motor	300	20 000	rpm	1775		112	Motor nameplate value — The default applies for a 4-pole motor and a nominal size SVX9000.
P1.9 ①	Nominal current of the motor	0.4 x I_H	2 x I_H	A	I_H		113	Motor nameplate value
P1.10 ①	Power factor	0.30	1.00		0.85		120	Motor nameplate value
P1.11	Start function	0	1		0		505	**0** = Ramp **1** = Flying start
P1.12	Stop function	0	3		1		506	**0** = Coasting **1** = Ramp **2** = Ramp+Run enable coast **3** = Coast+Run enable ramp
P1.13	Local Control Place	1	3		2		171	**1 =** I/O Terminal **2 =** Keypad **3 =** Fieldbus
P1.14	Remote Control Place	1	3		1		172	**1 =** I/O Terminal **2 =** Keypad **3 =** Fieldbus
P1.15	Remote reference	0	3		0		174	**0** = AI1 **1** = AI2 **2** = Keypad **3** = Fieldbus
P1.16 ①	V/Hz optimization	0	1		0		109	**0** = Not used **1** = Automatic torque boost
P1.17	Current reference offset	0	1		1		302	**0** = No offset, 0 – 20 mA **1** = Offset, 4 mA – 20 mA
P1.18	Analog output function	0	8		1		307	**0** = Not used **1** = Output freq. (0 – f_{Max}) **2** = Freq. reference (0 – f_{Max}) **3** = Motor speed (0 – Motor nominal speed) **4** = Output current (0 – I_{nMotor}) **5** = Motor torque (0 – T_{nMotor}) **6** = Motor power (0 – P_{nMotor}) **7** = Motor voltage (0 – U_{nMotor}) **8** = DC-bus volt (0 – 1000V)
P1.19 ①	DIN3 function	0	6		1		301	**0** = Not used **1** = Ext. fault, closing cont. **2** = Ext. fault, opening cont. **3** = Run enable, cc **4** = Run enable, oc **5** = Force cp. to Local **6** = Force cp. to Remote
P1.20	Preset speed 1	0.00	P1.2	Hz	0.00		105	Speeds preset by operator
P1.21	Preset speed 2	0.00	P1.2	Hz	60.00		106	Speeds preset by operator
P1.22	Automatic restart	0	1		0		731	**0** = Disabled **1** = Enabled

① Parameter value can only be changed when the SVX9000 is stopped.

STEP 4 (Continued)

Input Signals — M1 → G1.2

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note		
P1.2.1 ①	Start/Stop logic	0	6		0		300		DIN1	DIN2
								0	Start fwd	Start rev
								1	Start/Stop	Rev/Fwd
								2	Start/Stop	Run enable
								3	Start pulse	Stop pulse
								4	Fwd②	Rev②
								5	Start②/ Stop	Rev②/ Fwd
								6	Start②/ Stop	Run enable②
P1.2.2 ①	DIN3 function	0	7		1		301	**0** = Not used **1** = Ext. fault, closing contact **2** = Ext. fault, opening contact **3** = Run enable **4** = Acc./Dec. time select **5** = Force control pt. to Local **6** = Force control pt. to Remote **7** = Rev (if P1.2.1 = 3)		
P1.2.3	Current reference offset	0	1		1		302	**0** = 0 – 20 mA **1** = 4 – 20 mA		
P1.2.4	Reference scaling minimum value	0.00	P1.2.5	Hz	0.00		303	Selects the frequency that corresponds to the min. reference signal		
P1.2.5	Reference scaling maximum value	0.00	320.00	Hz	0.00		304	Selects the frequency that corresponds to the max. reference signal **0.00** = No scaling		
P1.2.6	Reference inversion	0	1		0		305	**0** = Not inverted **1** = Inverted		
P1.2.7	Reference filter time	0.00	10.00	s	0.10		306	**0.00** = No filtering		
P1.2.8	AI1 signal selection	AnIN: 0.1	AnIN: E.10		AnIN: A.1		377	TTF programming method used.		
P1.2.9	AI2 signal selection	AnIN: 0.1	AnIN: E.10		AnIN: A.2		388	TTF programming method used.		

① Parameter value can only be changed when the SVX9000 is stopped.
② Rising edge pulse required.

Output Signals — M1 → G1.3

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note
P1.3.1	Analog output 1 signal selection	AnOUT: 0.1	AnOUT: E.10		AnOUT: A.1		464	TTF programming method used.
P1.3.2	Analog output function	0	8		1		307	**0** = Not used **1** = Output freq. (0 – f_{Max}) **2** = Freq. reference (0 – f_{Max}) **3** = Motor speed (0 – Motor nominal speed) **4** = Motor current (0 – I_{nMotor}) **5** = Motor torque (0 – T_{nMotor} **6** = Motor power (0 – P_{nMotor}) **7** = Motor voltage (0 – V_{nMotor}) **8** = DC-Bus volt (0 – 1000V)
P1.3.3	Analog output filter time	0.00	10.00	s	1.00		308	**0.00** = No filtering
P1.3.4	Analog output inversion	0	1		0		309	**0** = Not inverted **1** = Inverted
P1.3.5	Analog output minimum	0	1		0		310	**0** = 0 mA **1** = 4 mA
P1.3.6	Analog output scale	10	1000	%	100		311	**100** = No scaling

STEP 4 (Continued)

Output Signals — M1 → G1.3, continued

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note
P1.3.7	Digital output 1 function	0	16		1		312	**0** = Not used **1** = Ready **2** = Run **3** = Fault **4** = Fault inverted **5** = FC overheat warning **6** = Ext. fault or warning **7** = Ref. fault or warning **8** = Warning **9** = Reversed **10** = Preset speed 1 **11** = At speed **12** = Motor. regulator active **13** = Freq. limit 1 supervision **14** = Remote control active **15** = Thermistor fault warning **16** = Fieldbus digital input 1
P1.3.8	Relay output 1 function	0	16		2		313	Same as P1.3.7
P1.3.9	Relay output 2 function	0	16		3		314	Same as P1.3.7
P1.3.10	Output frequency limit 1 supervision	0	2		0		315	**0** = No limit **1** = Low limit supervision **2** = High limit supervision
P1.3.11	Output frequency limit 1; Supervised value	0.00	P1.1.2	Hz	0.00		316	
P1.3.12	Analog output 2 signal selection	AnOUT: 0.1	AnOUT: E.10		AnOUT: 0.1		471	TTF programming method used.
P1.3.13	Analog output 2 function	0	8		4		472	See P1.3.2
P1.3.14	Analog output 2 filter time	0.00	10.00	s	1.00		473	**0.00** = No filtering
P1.3.15	Analog output 2 inversion	0	1		0		474	**0** = Not inverted **1** = Inverted
P1.3.16	Analog output 2 minimum	0	1		0		475	**0** = 0 mA **1** = 4 mA
P1.3.17	Analog output 2 scaling	10	1000	%	100		476	**100** = No scaling

Drive Control Parameters — M1 → G1.4

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note
P1.4.1	Ramp 1 shape	0.0	10.0	s	0.0		500	**0.0** = Linear **>0.0** = S-curve ramp time
P1.4.2	Ramp 2 shape	0.0	10.0	s	0.0		501	**0.0** = Linear **>0.0** = S-curve ramp time
P1.4.3	Acceleration time 2	0.1	3000.0	s	10.0		502	
P1.4.4	Deceleration time 2	0.1	3000.0	s	10.0		503	
P1.4.5 ①	Brake chopper	0	4		0		504	**0** = Disabled **1** = Used when running **2** = External brake chopper **3** = Used when stopped/ running **4** = Used when running (no testing)
P1.4.6	Start function	0	1		0		505	**0** = Ramp **1** = Flying start
P1.4.7	Stop function	0	3		1		506	**0** = Coasting **1** = Ramp **2** = Ramp+Run enable coast **3** = Coast+Run enable ramp
P1.4.8	DC braking current	0.4 x I_H	2.0 x I_H	A	I_H		507	

① Parameter value can only be changed when the SVX9000 is stopped.

STEP 4 (Continued)

Drive Control Parameters — M1 → G1.4, continued

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note
P1.4.9	DC braking time at stop	0.00	600.00	s	0.00		508	**0.00** = DC brake is off at stop
P1.4.10	Frequency to start DC braking during ramp stop	0.10	10.00	Hz	1.50		515	
P1.4.11	DC braking time at start	0.00	600.00	s	0.00		516	**0.00** = DC brake is off at start
P1.4.12	Flux brake	0	1		0		520	**0** = Off **1** = On
P1.4.13	Flux braking current	0.4 x I_H	2.0 x I_H	A	I_H		519	

Prohibit Frequencies — M1 → G1.5

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note
P1.5.1	Prohibit frequency range 1 low limit	0.00	P1.5.2	Hz	0.00		509	
P1.5.2	Prohibit frequency range 1 high limit	P1.5.1	320.00	Hz	0.00		510	
P1.5.3	Prohibit acc./ dec. ramp	0.1	10.0		1.0		518	Multiplier for ramp time in prohibit frequency range, e.g. 0.1 = 10% of normal ramp time

Motor Control Parameters — M1 → G1.6

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note
P1.6.1 ①	Motor control mode	0	1		0		600	**0** = Frequency control **1** = Speed control
P1.6.2 ①	V/Hz optimization	0	1		0		109	**0** = Not used **1** = Automatic torque boost
P1.6.3 ①	V/Hz ratio selection	0	3		0		108	**0** = Linear **1** = Squared **2** = Programmable **3** = Linear with flux optimiz.
P1.6.4 ①	Field weakening point	8.00	320.00	Hz	60.00		602	
P1.6.5 ①	Voltage at field weakening point	10.00	200.00	%	100.00		603	n% x V_{nMotor}
P1.6.6 ①	V/Hz curve midpoint frequency	0.00	P1.6.4	Hz	60.00		604	
P1.6.7 ①	V/Hz curve midpoint voltage	0.00	P1.6.5	%	100.00		605	n% x V_{nMotor}
P1.6.8 ①	Output voltage at zero frequency	0.00	40.00	%	0.00		606	n% x V_{nMotor}
P1.6.9	Switching frequency	1.0	Varies	kHz	Varies		601	See *SVX9000 Application Manual* for exact values
P1.6.10	Overvoltage controller	0	2		1		607	**0** = Not used **1** = Used (no ramping) **2** = Used (ramping)
P1.6.11	Undervoltage controller	0	1		1		608	**0** = Not used **1** = Used
P1.6.12	Load Drooping	0.00	100.00	%	0.01		620	Drooping % of nominal speed at nominal torque
P1.6.13	Identification	0	2		0		631	**0** = Not used **1** = OL V/Hz Ratio **2** = OL V/Hz+Boost

① Parameter value can only be changed when the SVX9000 is stopped.

STEP 4 (Continued)

Protections — M1 → G1.7

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note
P1.7.1	Response to 4 mA reference fault	0	5		0		700	**0** = No response **1** = Warning **2** = Warning+Previous Freq. **3** = Wrng+Preset Freq P1.7.2 **4** = Fault, stop per P1.4.7 **5** = Fault, stop by coasting
P1.7.2	4 mA reference fault frequency	0.00	P1.1.2	Hz	0.00		728	
P1.7.3	Response to external fault	0	3		2		701	**0** = No response **1** = Warning **2** = Fault, stop per P1.4.7 **3** = Fault, stop by coasting
P1.7.4	Input phase supervision	0	3		0		730	See P1.7.3
P1.7.5	Response to undervoltage fault	1	3		2		727	See P1.7.3
P1.7.6	Output phase supervision	0	3		2		702	See P1.7.3
P1.7.7	Earth fault protection	0	3		2		703	See P1.7.3
P1.7.8	Thermal protection of the motor	0	3		2		704	See P1.7.3
P1.7.9	Motor ambient temperature factor	-100.0	100.0	%	0.0		705	
P1.7.10	Motor cooling factor at zero speed	0.0	150.0	%	40.0		706	As a % of I_{nMotor}
P1.7.11	Motor thermal time constant	1	200	min	45		707	
P1.7.12	Motor duty cycle	0	100	%	100		708	
P1.7.13	Stall protection	0	3		0		709	See P1.7.3
P1.7.14	Stall current	0.1	I_{nMotor} x 2	A	I_L		710	
P1.7.15	Stall time limit	1.00	120.00	s	15.00		711	
P1.7.16	Stall frequency limit	1.0	P1.1.2	Hz	25.0		712	
P1.7.17	Underload protection	0	3		0		713	See P1.7.13
P1.7.18	Underload protect. f_{nom} torque	10.0	150.0	%	50.0		714	
P1.7.19	Underload protect. f_0 torque	5.0	150.0	%	10.0		715	
P1.7.20	Underload protect. time limit	2.00	600.00	s	20.00		716	
P1.7.21	Response to thermistor fault	0	3		2		732	See P1.7.3
P1.7.22	Response to fieldbus fault	0	3		2		733	See P1.7.3
P1.7.23	Response to slot fault	0	3		2		734	See P1.7.3

Auto Restart Parameters — M1 → G1.8

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note
P1.8.1	Wait time	0.10	10.00	s	0.50		717	
P1.8.2	Trial time	0.00	60.00	s	30.00		718	
P1.8.3	Start function	0	2		0		719	**0** = Ramp **1** = Flying start per P1.4.6 **2** = System defined
P1.8.4	Number of tries after undervoltage trip	0	10		0		720	
P1.8.5	Number of tries after overvoltage trip	0	10		0		721	
P1.8.6	Number of tries after overcurrent trip	0	3		0		722	
P1.8.7	Number of tries after reference trip	0	10		0		723	
P1.8.8	Number of tries after motor temperature fault trip	0	10		0		726	
P1.8.9	Number of tries after external fault trip	0	10		0		725	
P1.8.10	Number of tries after underload fault trip	0	10		1		738	

STEP 4 (Continued)

Keypad Control — M2

This menu provides the parameters for the setting of the keypad frequency reference, the selection of motor direction when in keypad operation, and when the STOP button is active.

Table 1-1: Keypad Control Parameters — M2

Code	Parameter	Min.	Max.	Unit	Default	Cust	ID	Note
R2.1	Keypad reference	P1.1.1	P1.1.2	Hz				
P2.2	Keypad direction	0	1		0		123	**0** = Forward **1** = Reverse
P2.3	Stop button	0	1		1		114	**0** = Stop enabled only in keypad operation **1** = Stop button always enabled

Other Menus — M3 to M6

Menus M3 to M6 provide information on the Active Faults, Fault History, System Menu settings and the Expander Board setup. These menu items are explained in detail in Chapter 5 of the *SVX9000 User Manual*.

STEP 5

Faults and Fault Codes

Code/Fault Directory

Fault Code	Fault
1	Overcurrent
2	Overvoltage
3	Ground (Earth) Fault
5	Charging Switch
6	Emergency stop
7	Saturation trip
8	System fault
9	Undervoltage
10	Input line supervision
11	Output phase supervision
12	Brake chopper supervision
13	SVX9000 undertemperature
14	SVX9000 overtemperature
15	Motor stalled

Fault Code	Fault
16	Motor overtemperature
17	Motor underload
22	EEPROM checksum fault
24	Counter fault
25	Microprocessor watchdog fault
26	Startup prevented
29	Thermistor fault
31	IGBT temperature (hardware)
32	Fan heat sink
34	CAN bus communication
36	Control unit
37	Device change (same type)
38	Device added (same type)
39	Device removed

Fault Code	Fault
40	Device unknown
41	IGBT temperature
42	Brake resistor overtemperature
43	Encoder fault
44	Device change (different type)
45	Device added (different type)
50	Analog input I_{in} < 4 mA (for the signal range 4 to 20 mA)
51	External fault
52	Keypad communication fault
53	Communication bus fault
54	Slot fault
56	PT100 board temperature fault
—	—
—	—

STEP 6

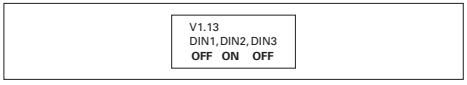
Monitoring Menu — M7

The Monitoring Menu items are meant for viewing parameter values during operation. Monitored values are updated every 0.3 sec. Monitored items are identified by item numbers V7.1 to V1.xx, where "xx" varies by application. The table below provides an example of the monitored values for the **Standard** application.

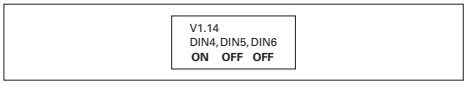
Monitored parameters are not editable from this menu (See Parameter Menu [M1] to change parameter values).

Monitoring Menu Items — Standard Application Example

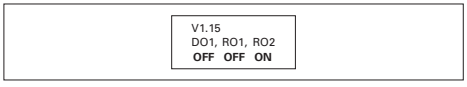
Code	Signal Name	Unit	Description
V7.1	Output Frequency	Hz	Output frequency
V7.2	Frequency reference	Hz	Frequency reference setting
V7.3	Motor speed	rpm	Calculated motor speed
V7.4	Motor current	A	Measured motor current
V7.5	Motor torque	%	Calculated torque based on nominal motor torque
V7.6	Motor power	%	Calculated power based on nominal motor power
V7.7	Motor voltage	V	Calculated motor voltage
V7.8	DC bus voltage	V	Measured DC-bus voltage
V7.9	Unit temperature	°C	Heatsink temperature
V7.10	Calculated motor temperature	°C	Calculated motor temperature based on the motor nameplate information and the calculated motor load
V7.11	Analog Input 1	V	Voltage input at Terminals AI1+ and GND
V7.12	Analog input 2	mA	Current input at Terminals AI2+ and AI2-
V7.13	DIN1, DIN2, DIN3	—	Digital input status (see figure below)
V7.14	DIN4, DIN5,DIN6	—	Digital input status (see figure below)
V7.15	DO1, RO2, RO3	—	Digital and relay output status (see figure below)
V7.16	Analog I_{out}	mA	Current output at Terminals AO1+ and AO1-
V7.17	Multimonitor		(See below)



Digital Inputs — DIN1, DIN2, DIN3 Status



Digital Inputs — DIN4, DIN5, DIN6 Status



Digital and Relay Outputs — DO1, RO1, RO2 Status

Multimonitor (V7.17)

This parameter allows the viewing and selection (if allowed by System menu item, P5.5.4) of three simultaneously monitored items from the Monitored Menu Items shown in the table above. Use the right arrow key to select the item to be modified and then the up or down arrow keys to select the new item. Press the ENTER key to accept the change.

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