P0018 (continued from previous page)

Note that P022 also makes a correction to motor current. The effect of P022 is in addition to the effect of P018. P022 and P018 affect each other.

P018 is used to increase the available motor starting torque in applications requiring very high starting torque. In applications not requiring high slow speed torque; low or negative values of P018 will result in smoother, quieter, cooler, low speed operation. Note: values of P018 that are too, low, or too high may cause "motor pullout" warnings or faults. Read section 5.7 for more information on "pullout".

The 6SE12 Simovert-P makes a transition from "open loop forced current" below 3.00 Hz to "Vector Control" above 3.00 Hz. In some applications, P018 will affect the smoothness of the "transition" at 3 Hz. However, P066 usually has more of an effect on the smoothness of the transition. Read page 5-10 and parameter P066 description for more information on this. Generally, P018 should be set for the proper low speed boost, and not used to smooth the "transition" at 3 Hz.

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0019 CURRENT LIMIT

This parameter sets the inverter current limit.	Depends on model number, see below :	Ready Commission P0004 = 4

Inverter Size (KVA Rating)	Range of adjustment P0019 Current Limit	Factory Setting
P074 = 6 KVA	0 to 12.8 A	8.5 A
P074 = 11 KVA	0 to 21.0 A	14.2 A
P074 = 18 KVA	0 to 34.5 A	23.1 A
P074 = 27 KVA	0 to 51.0 A	34.1 A
P074 = 36 KVA	0 to 67.5 A	44.8 A
P074 = 52 KVA	0 to 97.5 A	64.6 A

Notes :

P019 sets the maximum inverter output current. The value can be set between 0 A and 1.5 times the rated inverter current. As long as the current control loops are stable, the current will not exceed the current limit.

Load inductance too low; short circuits; very unstable speed, frequency, or or voltage loops; or damaged or unstable motors or loads, can cause current to exceed the current limit. This may result in an "overcurrent" fault F012.

P019 Current Limit should be set high enough to permit the motor to develope normally expected overload torque and acceleration torque. Setting P019 too

P019 information continued on next page

P0019 CURRENT LIMIT (continued)

low may result in the motor not being able to handle acceleration or overload torque and also result in nuisance pullout faults (F014). Setting P019 too high will result in less "safety margin" between the controlled current limit and the overcurrent trip level. This will increase the possibility of nuisance overcurrent (F012) or pulse frequency (F018) faults.

In some applications, such as "variable torque applications", it is possible to operate the 6SE12 Simovert-P at up to 110% of it's nameplate rating, continuously; but with no overload capability. When operating in this mode, setting P019 to 110% of the 6SE12 Simovert-P nameplate current rating will prevent inverter overload (F009) faults; however, no overload current (and thus no overload torque) will be available beyond the setting of P019. It is not necessary to set P019 to 110% of the nameplate rating in order to operate above the continuous nameplate rating; however, an inverter overload (F009) fault will occur if current exceeds 110% of the nameplate rating for an extended period of time.

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0020 MOTOR OVERLOAD

This parameter activates the "current times time" i.e., i*t overload protection. The selections represent the amount of current above rated motor current (P008) that is allowed for 1 minute. If this rating is exceded, a Motor Overload (W/F013) fault occurs.	50% x 1 minute 100% x 1 minute 150% x 1 minute 200% x 1 minute 250% x 1 minute 300% x 1 minute Aus/disabled Factory = Aus/disabled	1 2 3 4 5 6 7	Ready Commission P0004 = 4

Notes / examples :

Setting the parameter to 100% x 1 minute means that the motor can operate within a 10 minute period with the following duty cycle (examples):

a) Operate for 1 minute at twice the rated motor current and then no more than the rated motor current for the other 9 minutes.

b) Operate for 4 minutes at 1.25 times the rated motor current, and then no more than the rated motor current for the other 6 minutes.

When the "i*t" (current X time) limit is reached, a warning (W013) is first issued. The inverter will later be turned off, with a "Motor overload" fault (F013) message, if:

a) The motor is overloaded about 8% or more beyond the selected i*t limit (e.g., for a 50% x 1 minute selection, a fault message will appear at 54% x 1 minute).

P020 information continued on next page

P0020 MOTOR OVERLOAD (continued)

b) The warning time set by parameter P0021 has elapsed and the "Motor Overload" condition is still in effect (i.e. the motor is still in the overload range as defined by the selection of P020).

In some circumstances, it may be impossible to turn the unit back on after acknowledging the fault until a suitable cool down period has elapsed (max. 10 minutes, counting from inverter turnoff).

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0021 OVERLOAD TIME

Overload warning time period.	0 to 1000 seconds Factory = 10 seconds	Ready Commission P0004 = 4
This parameter defines the period of time that a warning (W003) is in effect after the i*t conditions defined by P020 are exceeded. Setting 0 seconds as the warning period causes the inverter to shut down immediately on a motor overload fault (F013) as soon as the i*t conditions selected by parameter P020 are exceeded.		

P0022 CORR Iμ / I*R-COMP

If P050 = "V/Hz" mode, P022 is "I*R compensation" . If P050 = "Vector Control" mode, P022 is "magnetizing current correction factor" .	If P050 = "V/Hz" mode, range is 0% to +20% . If P050= "Vector Control" range is -50% to +100%. Factory = 0% (all modes)	Ready On P0004 = 4
When P050 = "V/Hz" mode (see P050 choices 4 & 5), P022 provides a "voltage boost" that is proportional to motor current. This is similar to I*R compensation in DC machine terminology. I*R compensation can be used to provide extra torque capacity (and pullout resistance). Read section 5.7 for a description of "pullout". I*R compensation may also provide better speed regulation; however, this is usually not important in "V/Hz applications". In "V/Hz mode," increasing the value of P022 may improve unstable operation that can occur with some motors. Setting P022 too high may result in loud and/or hot motor operation. P022 information continued on next page		

P0022 CORR Iμ (continued)

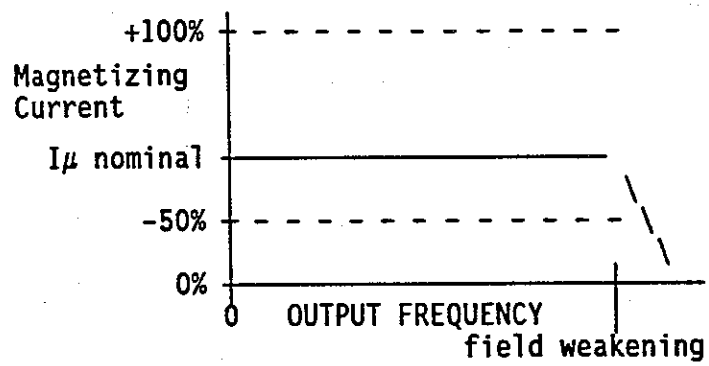
When P050 = "Vector Control" (P050 choices 1,2,3,6), P022 is as follows :

Magnetizing current (Iμ) is the physical quantity that the 6SE12 Simovert-P regulates (keeps constant) when in "Vector Control mode". The nominal Iμ (magnetizing current) is calculated by the 6SE12 Simovert-P during commissioning.

Iμ nominal is affected by P006, P007, P008, P009, P010, and P011 so a change or an error in any of those parameters will affect Iμ nominal. See note below for more details. When P006 thru P011 are entered correctly, the calculated nominal Iμ is usually correct; however, with some motors it will be necessary to adjust Iμ using P022. P022 can provide a -50% to + 100 % correction to Iμ.

The most obvious indications of incorrect magnetizing current are :
Wrong motor voltage for a given frequency.
Unstable "hunting" or oscillation of speed.
Torque "weakness" or inability to withstand a suddenly applied load.
Incorrect magnetizing current can also result in "strange" behavior (pauses or surges, etc.) during acceleration / deceleration, and can exacerbate overvoltage fault problems even if pulsed resistor braking is used.

A graphical representation of P022 is as follows:



When operating at no load and rated speed at rated frequency, the correct Iμ will result in motor voltage being the correct, rated value. (assuming the incoming AC line voltage is high enough)

Note that P018 also makes a correction to motor current at low speed. This is in addition to the effect of P022. P022 and P018 affect each other at low speed. Also note that P067 has a significant effect on motor voltage at higher speeds with load. P067 and P022 affect each other at higher speeds when there is a load present. Also, as stated above, P006 thru P011 have a very significant effect on Iμ and motor voltage.

Note on Iμ nominal :
Iμ nominal is proportional to $\sqrt{(1 - \cos \phi)}$ * Rated Motor Current. It is possible to produce the same effect as changing parameter P022 by changing other parameters. Note that efficiency, not power factor is entered into P009 when P077 = USA. Power factor (and thus Iμ nominal) is calculated by the 6SE12 Simovert-P during commissioning by the following formula:
$\cos \phi$ = motor power / (motor volts * motor amps * $\sqrt{3}$ * efficiency) times appropriate conversion factors. By studying the formula it can be seen that increasing the value of P009 (efficiency) will result in increased Iμ nominal. This alternative method of changing Iμ nominal can be used if the value of P022 is too extreme (i.e. too close to max limits).

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0023 SLIP COMPENSATION

Slip Compensation method	1 automatic 2 manual P24 3 none Factory = none	Ready On Commission P0004 = 4

"Slip Compensation" is an adjustment to inverter output frequency which is intended to maintain constant motor speed, for a given frequency command, when torque load changes. For example : if a 4-pole motor is running unloaded at 30 Hz, its speed will be about 898 RPM. If full load is applied, the speed will drop to about 880 RPM if frequency is held constant at 30 Hz. "Slip Compensation" would sense the increase in load and increase the output frequency to about 30.6 Hz which would maintain motor speed at about 898 RPM even when full load is applied. Note that with "Slip Compensation", the output frequency of the inverter is usually not exactly equal to the command frequency. This is usually desirable, but may be undesirable in some applications. "Good" Slip Compensation can provide almost perfect speed regulation with no tachometer required.

Parameter P023 determines how slip frequency compensation is implemented :

1) Automatically using the internally calculated slip value
2) Manually with the slip frequency value entered via P0024
3) No slip frequency compensation

Below 3 Hz. there is no slip compensation.

Note: If P0050 = speed or torque control, setting 3 is not allowed.

If P0050 = V/HZ sync motor, settings 1 and 2 are not allowed.

Also note: In "high performance" applications (such as winders) where special "tuning" is performed the effects of Slip Compensation may add extra confusion or variables to the "tuning procedure". It may be desirable to "tune" the system optimally with No Slip Compensation, and then turn Slip Compensation on later if Slip Compensation is required.

P0024 SLIP FREQUENCY

Slip Compensation Frequency	0.1 Hz to 10.0 Hz Factory = 0.1 Hz.	Ready On Commission P0004 = 4

This is the manual slip frequency compensation value at rated torque and is active only when P0023 = manual.

Values should typically be in the 1 to 2 Hz range depending on the motor.

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0025 ANALOG SCALING

Software "scaling" parameter for analog input terminal 20.	50% to 120% Factory = 100%	Ready, On Commission P0004 = 4

P025 adjusts the calibration of the analog input at terminal 20. The actual input level which is interpreted as a 100% value may be re-defined as 50% to 120% of the nominal 100% rating of the analog input. See section 4.6.2 for details on hardware scaling (DIP switches) of analog inputs.

For example: if terminal 20 is set-up as a 0 to 10 V input (see section 4.6.2) by hardware, parameter P022 can define 5 V to 12 V as a 100% level.

Example:

P0050 = "Frequency"
P0015 = "Local" (Operator Panel)
P0016 = "analog term. 18/20"

$$\text{Value of P0025} = \frac{\text{Terminal 20 Voltage at Top Speed}}{\text{Terminal 20 Maximum Scaled Voltage}} \times 100\%$$

If the applied reference voltage at terminal 20 is 8 volts at top speed and the terminal scaling switches are set for 10 volts maximum:

$$\text{Value of P0025} = \frac{8}{10} \times 100\% = 80\%$$

If using an analog tachometer for P0050 = Speed or Torque control mode, P025 is used for tachometer scaling.

Note: Analog input terminal 18 is not scalable by any parameter.

P0026 STOP METHOD

Stopping method selection See description of choices below :	1 ramp to stop 2 coast to stop 3 fastest stop Factory = ramp to stop	Ready, On Commission P0004 = 4

P0026 determines inverter operation after a normal "stop" command :

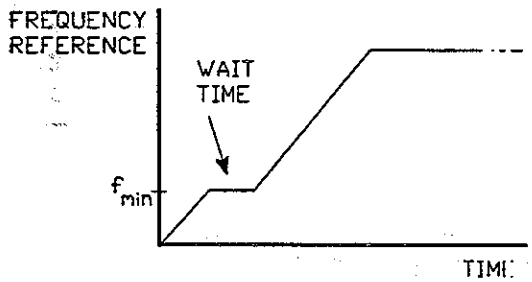
1) Machine brakes to a stop with the selected (by parameter P037) ramp down rate. After f=0 Hz, inverter (transistor) operation is inhibited.
2) Inverter operation is inhibited immediately : motor coasts to a stop.
3) Machine brakes to stop at ramp rate 2 (P032). After f=0, inverter is inhibited. For fastest possible stops, parameter P032 should be set for the fastest "decel time" possible with no overvoltage faults.

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0027 DWELL-ACCEL

Wait time before ramp-up.	0.0 sec to 15.0 sec Factory = 0.0 seconds	Ready Commission P0004 = 4

Once an "On" command has been given (and the setpoint has been released), the inverter frequency is raised from 0 Hz to fmin (P0012), and then held there for the dwell time defined by parameter P027. After this dwell time, the frequency ramps-up to the setpoint frequency.



Dwell time is usually not required, however, in some applications it may improve acceleration and prevent pullout faults. (read section 5.7 for a description of "pullout") Dwell time allows the vector control system to build-up and stabilize motor flux before attempting acceleration.

P0028 ACCEL TIME #1

Ramp-up rate number 1	0 sec to 199.99 sec Factory = 10.0 sec	Ready Commission P0004 = 4

This ramp time is the time it will take to ramp the frequency reference from zero to maximum frequency (P0014).

Note: Ramp-up rate 1 is the factory default acceleration time unless parameter P037 & terminal 9 are used to select ramp-up rate #2.

Also note: The 6SE12 Simovert-P inverter does not start operating until the DC link is finished charging. Depending on system configuration, this may mean that acceleration time does not begin until several seconds after a "start" command is given.

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0029 DECEL TIME #1

Ramp-down rate number 1	0 sec to 199.99 sec Factory = 20.0 sec	Ready Commission P0004 = 4

This ramp time is the time it will take to ramp the frequency reference from maximum frequency (P0014) to zero.

Note: Ramp-down rate 1 is the factory default deceleration time unless parameter P037 & terminal 9 are used to select ramp-down rate #2.

Also note: Excessively short ramp-down times can result in high current or overvoltage faults. If this occurs, set P029 to a longer ramp-down time to maintain the current or DC link voltage within safe limits.

P0030 DWELL-DECEL

Ramp-down wait time	0 sec to 15.0 sec Factory = 0.0 sec	Ready Commission P0004 = 4

Once an "OFF" command has been given, and the frequency has ramped-down to f = 0 Hz, the motor is supplied with 3-phase current at a frequency of 0 Hz for the time set by parameter P030. This is sometimes called "DC injection braking". After the dwell time, inverter (transistor) operation is inhibited. This "dwell-decel" feature is used "lock and hold" the motor shaft after deceleration during a "normal" stop. The DC current supplied during the dwell time is the normal 0 HZ current determined by parameters P008, P018, and P022.

P0031 ACCEL TIME #2

Ramp-up rate number 2	0 sec to 199.99 sec Factory = 20.0 sec	Ready Commission P0004 = 4

This ramp time is the time it will take to ramp the frequency reference from zero to maximum frequency (P0014).

Note: Ramp-up rate 1 is the factory default acceleration time unless parameter P037 & terminal 9 are used to select ramp-up rate #2.

Also note: The 6SE12 Simovert-P inverter does not start operating until the DC link is finished charging. Depending on system configuration, this may mean that acceleration time does not begin until several seconds after a "start" command is given.

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0032 DECEL TIME #2

Ramp-down rate number 2	0 sec to 199.99 sec Factory = 40.0 sec	Ready Commission P0004 = 4

This ramp time is the time it will take to ramp the frequency reference from maximum frequency (P0014) to zero.

Note: Ramp-down rate 1 is the factory default deceleration time unless parameter P037 & terminal 9 are used to select ramp-down rate #2.

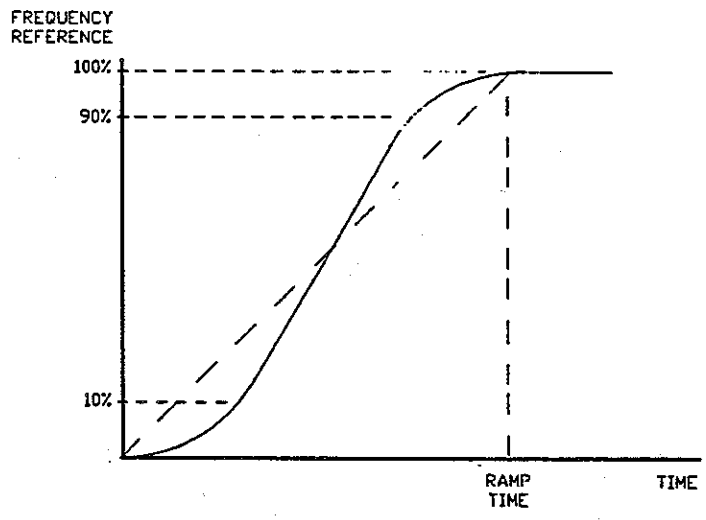
Also note: Excessively short ramp-down times can result in high current or overvoltage faults. If this occurs, set P032 to a longer ramp-down time to maintain the current or DC link voltage within safe limits.

P0033 RAMP ROUNDING

Ramp rounding at the start and end of the ramping process.	0% to 20% Factory = 0.0%	Ready Commission P0004 = 4

P033 determines the characteristics of the "ramp rounding" function. This function is best described by the graphical representation shown below:

If P033 is set to 10%, for example, the ramp output will have rounding for the first 10% of the applied frequency and the last 10% of the applied frequency. In addition the ramp rate will be modified so that the time to complete the ramp plus rounding will still agree with the accel / decel times set in parameters P028, P029, P031, or P032.



PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0034 AUTO RESTART

Determines if inverter will automatically restart after a power interuption / restoration	1 No 2 Yes Factory = No	Commission P0004 = 4

If P034 is set to "Yes", the drive will automatically restart after power is restored after a power interuption. The automatic restart function will only work if parameter P015 is set to "maintained contact", and the "run" command is present when power is restored. If the "run" command is not present when power is restored, a "restart inhibit" condition will exist and a "Reset" or "fault acknowledge" signal will have to occur before the drive will start.

Important:

Because the inverter normally cannot be started into a spinning motor, always use parameter P0035 to make sure that the motor has coasted to a stop before restarting. This precaution does not apply if the "Restart on the Fly" option has been purchased and installed.

Note: When an automatic restart occurs, the phase sequence of the AC line power is not checked. On 36 & 52 KVA model 6SE12 Simovert-P's make sure the phase sequence is not changed during a power outage.

⚠ WARNING

Because the motor will re-start unexpectedly after power is restored, use of the "Automatic Restart" feature is not recommended unless a Safety Engineer or a Responsible Systems Integrator has studied the application and determined that an "Automatic Restart" function is appropriate and safe. Loss of life, severe personal injury, or damage to equipment can result from unexpected re-starting of a motor.

Guard machinery to keep personnel away even when power is off if "Automatic Restart" is used.

P0035 RESTART WAIT

Wait time for Automatic Restart	1 to 300 seconds Factory = 60 sec	Ready Commission P0004

When an Automatic Restart event occurs, as described in P034 above, the 6SE12 Simovert-P will wait for the time set in P035 before re-starting, after power is restored. P035 has no effect if P034 = "no".

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0036 REVERSING

Determines if reverse motor rotation (inverter phase sequence) will be permitted	1 not allowed 2 by rev switch 3 by ref signal Factory = not allowed	Ready On Commission P004 = 4

P036 is evaluated only if P0015 is set to choice 1, 2, or 3 (see parameter P015). If the 6SE12 Simovert-P is controlled by serial communication or an optional Technology Module the command must always have the correct sign.

The choices for P036 are as follows :

1) Only positive reference values are accepted and the inverter will only run in the "forward" direction (forward phase sequence).
2) Only positive reference values are accepted. Reverse commands are made with the Operator Panel ↺ key (if P0015 = "Local") or by terminal 5 (if parameter P015 = "maintained SW or momentary PB".
3) Positive and negative reference values are permitted. Negative values will result in reverse direction of rotation (reverse phase sequence).

P0037 TERM #9 SELECT

Determines the function of the binary input at terminal 9.	1 accel/decel ramps 2 ext fault Factory=accel/decel ramps	Commission P0004 = 4

P037 determines the function of terminal 9 on the Control Module. The choices (for terminal 9) are as follows :

1) When de-energized, ramp-up 1 and ramp-down 1 rates are active (P0028 and P0029). When energized, ramp-up 2 and ramp-down 2 rates are active (P0031 and P0032). Terminal 9 is only active if "local" or "terminal block control" (choice 1, 2, or 3) is selected by parameter P015.

   Note: "fixed setpoints" (P038 & P039) and "fastest stop" (P026) always use "ramp rate #2" regardless of the selection of parameter P037.

2) External fault. If terminal 9 is de-energized inverter operation is inhibited and "External Fault" is displayed on the Operator Panel. Like any fault, the fault condition must be removed, and the fault must be acknowledged (Reset) before the inverter can operate. If P037 = "ext fault", terminal 9 is evaluated for the "fault" condition regardless of the inverter control source (i.e. parameter P015). Terminal 9 must be "logic hi" (+24 VDC) for the "no fault" condition.

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0038 PRESET SPEED #1

This parameter is used to set the value of fixed reference #1 which is also referred to as "preset speed #1".	.1 to 300 Hz Factory = 20 Hz.	Ready On Comm P0004 = 4

Preset Speed #1 is selected as the command reference (setpoint) for the 6SE12 Simovert-P when Control Module terminal 14 is energized (+24 VDC logic hi). Fixed Reference #1 has priority over all other reference sources. When terminal 14 is energized, the inverter will operate at Fixed Reference #1 even when terminal 7 (reference enable) is de-energized (logic low). "Preset Speed" is <u>not</u> the same as a traditional "jog" function; however, operation <u>similar</u> to (<u>not</u> identical to) a traditional "jog" function can be realized as described below:

"Start" the 6SE12 Simovert-P by applying the "start" signals described in section 4.6.1. Do <u>not</u> energize terminal 7 and the "on" LED will be blinking. In this mode, the inverter will respond instantly to a "Preset Speed" command on terminal 14. Then, when the "normal" reference is desired, de-energize terminal 14 and energize terminal 7. The inverter command setpoint will then transfer from "Preset Speed" to "normal setpoint".

"Preset Speeds" use "ramp rate #2" (P031 & P032) reguardless of the status of parameter P037 or terminal 9.

If the inverter is stopped while a "Preset Speed" is active, the ramp-down will occur at ramp rate #2 even if parameter P026 = choice 1. If P026 = "coast to stop" however, the inverter will coast to stop.

If the inverter is operating at a "Preset Speed" (terminal 14 energized), and then terminal 14 is de-energized, the speed will ramp to the "normal" command setpoint using the ramp rate selected by terminal 9.

"Preset Speeds" are not active (do not work) when control of the inverter (see parameter P015) is by serial communications or by a technology module.

P0039 PRESET SPEED #2

This parameter is used to set the value of fixed reference #2 which is also referred to as "Preset Speed #2".	.1 to 300 Hz Factory = 2 Hz.	Ready On Commission P0004 = 4

Preset Speed #2 is identical to Preset Speed #1 described above, except, Preset Speed #2 is activated by terminal 15. Preset Speed #2 has priority over all command references (setpoints) except Preset Speed #1.

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0040 ANALOG OUT T22

This parameter is used to select the function to be output as an analog signal on Control Module terminal 22. (Reference section 4.6.3) These signals are original analog quantities and do not come from a D/A converter.	1 active power 2 reactive power 3 output amps 4 phase u amps 5 phase v amps Factory = active power	Ready On Commission P0004 = 4

Scaling: (The output range is ±10 volts)

1) Output is 6 volts at rated power for the largest motor allowed for the inverter. Positive = motoring, negative = generating.

2) Output is 6 volts at rated power and power factor for the largest motor allowed for the inverter.

3) Rated nameplate output current of the inverter = 5 volts

4) Sinusoidal current with a 5 volt peak at rated nameplate output current.

5) Same as choice 4 above, except inverter phase "v".

P0041 ANALOG OUT T23

This parameter is used to select the function to be output as an analog signal on terminal 23. (see section 4.6.3)	1 output frequency 2 active amps 3 output voltage Factory = output freq	Ready On Commission P0004 = 4

These signals come from a D/A converter and have 8 bit resolution with a 60 ms update time. The output range is 0 to +10 volts.

Scaling:

1. 10 volts = Max frequency (P0014)

2. 6.6 volts = Rated active current of the largest allowed motor

3. 8 volts = 460 volts output

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0042 BINARY OUT T27

This parameter is used to select the function to be output as a binary signal on terminal 27. When the specified condition is met, the open collector output on terminal 27 goes to a low potential to sink current. (see section 4.6.5 for relay connections)	See below for list of selections. Factory: $f = f_{ref}$	Ready On Commission P0004 = 4

SETTING		DESCRIPTION
1	f = fref	Output Frequency = Frequency Reference
2	f ≤ fmin	Output Frequency ≤ Minimum Frequency (P0012)
3	f = 0 Hz	Output Frequency = Zero Hz.
4	f > fmax	Output Frequency > Maximum Frequency (P0014)
5	f ≥ fx	Output Frequency ≥ Frequency Set at P0046 (fx)
6	I > Imax	Output Current > Current Value Set at P0019
7	f > 0 I > 5%	Frequency > 0 Hz. and Output Current > 5% of P0019
8	inverter on	inverter is on
9	no fault	no faults present
10	ref locked	Frequency reference is Inhibited
11	I > Ix	Output Current ≥ Current Value Set at P0047 (Ix)
12	motor thermist	Motor Thermistor Overtemperature
13	heatsink temp	Heatsink Overtemperature (see fault message 6)
14	motor ol	Motor i*t ≥ Limit Value Allowed (see P0020 & F013)
15	pullout prot	Motor Pullout Protection is Active
16	charge finished	DC link is charged
17	line fault	Line Power Fault is Present (see F003)
18	+freq	Negative frequency direction present
19	active I	Active Current = Negative Value (generator mode)

P0043 BINARY OUT T28

This parameter is used to select the function to be output as a binary signal on terminal 28. When the specified condition is met, the open collector output on terminal 28 goes to a low potential to sink current. (see section 4.6.5 for relay connections)	The selections (19 choices) for parameters P0042 thru P0045 are identical. See complete list in parameter P042 description above. Factory: $f \leq f_{min}$	Ready On Comm P0004 = 4

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0044 BINARY OUT T29

This parameter is used to select the function to be output as a binary signal on terminal 29. All other information is the same as in P0042 on previous pg.	The selections for P0042 thru P0045 are identical. See complete list in P0042 description. Factory : f = 0 Hz	Ready On Commission P0004 = 4

P0045 BINARY OUT T30

This parameter is used to select the function to be output as a binary signal on terminal 30. All other information is the same as in P0042 on previous pg.	The selections for P0042 thru P0045 are identical. See complete list in P0042 description. Factory : inverter on	Ready On Commission P0004 = 4

P0046 COMPARE FREQUENCY

Referring to "choice 5" under parameter P0042 description, P0046 is the "fx" comparison frequency. P046 will apply to any or all binary outputs for which "choice 5" was selected.	Range: 0 to 300 Hz. Factory : if P077 = USA : 60 Hz if P077 = Europa : 50 Hz	Ready On Commission P0004 = 4

P0047 COMPARE AMPS

Referring to "choice 11" under parameter P0042 description, P0046 is the "Ix" comparison current. P047 will apply to any or all binary outputs for which "choice 11" was selected.	See below for selection range and factory settings.	Ready On Commission P0004 = 4

Inverter Size (KVA Rating)	Range of adjustment P0047 Compare Amps	If P077 = USA Factory Setting	If P077= Europa Factory Setting
P074 = 6 KVA	2.9 A to 9.4 A	6.7 A	7.0 A
P074 = 11 KVA	4.9 A to 15.4 A	13.0 A	12.0 A
P074 = 18 KVA	8.1 A to 25.5 A	19.0 A	22.8 A
P074 = 27 KVA	11.6 A to 37.4 A	30.6 A	32.7 A
P074 = 36 KVA	15.6 A to 49.5 A	36.5 A	44.1 A
P074 = 52 KVA	22.0 A to 71.5 A	59.1 A	63.8 A

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0048 MOP SPEED

Selects the rate of change of the motor operated potentiometer (MOP) function. See description of choices below	1 slow 2 fast 3 match ramp rate Factory = slow	Ready On Commission P0004 = 4

P0048 defines the rate of change of the reference when it is controlled by the motor operated potentiometer function through terminals 11 & 13.

P0048 is active only if P0015 = choice 2 or 3 and P0016 = choice 1, 4 or 5.

1) Rate of change is approximately 10 Hz per minute.
2) Rate of change is approximately 10 Hz per second.
3) Rate of change is the same as the "ramp rate" selected by parameter P037. However, when inverter is "off", MOP speed is "ramp rate #1" reguardless of the state of terminal 9 or parameter P037.

Note : P0048 applies only to MOP control via terminals 11 & 13. P0048 does not affect MOP speed when using the ↑ ↓ keys on Operator Panel.

P0049 PARAMETER SOURCE

This parameter determines the source from which the inverter parameters can be changed.	1 operator panel 2 internal rs232 3 tech board 4 serial port 1 5 serial port 2 Factory = operator panel	Ready On Commission P0004 = 1 or 4

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0050 TYPE OF CONTROL

This parameter determines the type of control to be used. A description of "Operating Fundamentals" and block diagrams in section 1 provide more information on the choices. Selections described below:	1 frequency 2 speed with tach 3 torque with tach 4 V/Hz ind motor 5 V/Hz sync motor 6 freq with tacho Factory = V/Hz ind motor	Commission P0004 = 4

1) Frequency control with slip compensation.

* 2) Speed control with tachometer

* 3) Torque control with tachometer

4) V/Hz induction motor .. single or multi-motor applications

5) V/Hz synchronous motor .. single or multi-motor applications

* 6) Frequency control with analog tachometer

* NOTE: Selections 2, 3, & 6 require the purchase and installation of an optional PAL chip if an analog tachometer is used. Selections 2, 3, & 6 require the purchase and installation of a technology module if a digital tachometer is used. See section 9 for more information.

Also: The use of an analog tachometer is not recommended – see note 1 on page 1-4 for an explanation.

P0051 SMOOTHING TM20

Adjusts the time constant of a first order smoothing filter. This filter applies to analog input terminal 20 only.	0 to 500 ms Factory = 0	Ready On Commission P0004 = 4

If P0050 = "frequency with analog tacho", the filter is used to smooth the speed error at the input of the slip speed controller, otherwise the filter is used to smooth the analog input from terminal 20.

For applications without an analog tach, it is better to apply the analog reference to terminal 20 rather than terminal 18 because this allows the use of the smoothing filter and scaling of the input with parameter P0025.

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0052 VOLT REG PROPOR

Sets the proportional gain of the "V/Hz" control algorithm when P050 = choice 4 or 5. (No effect if P050 = 1,2,3, or 6)	Range = 0 to 200 Factory = 30 (P050 = 4) Factory = 5 (P050 = 5)	Ready On P0004 = 4

P0053 VOLT REG INTEGRAL

Sets the integral time of the "V/Hz" control algorithm when P050 = choice 4 or 5. Larger values result in shorter "reset" time. (No effect if P050 = 1,2,3, or 6)	Range = 0 to 200 Factory = 75 (P050 = 4) Factory = 10 (P050 = 5)	Ready On P0004 = 4

P0054 MOTOR THERMISTOR

Determines if terminals 24 & 25 will be monitored for a motor overtemperature PTC thermistor or thermostat. Refer to section 4.6.4. for more information,	Choices: 1) No 2) Yes Factory = No	Ready On Commission P0004 = 4

P0055 NOTCH FREQUENCY

Sets the center frequency of a programmable notch filter (band reject filter).	2 to 302 Hz. Factory = 302 Hz	Ready On Commission P0004 = 4

This programmable notch filter is used to avoid operation at the mechanical resonant frequency of the motor/load system. This feature is normally not required; but it is valuable in some applications.

The notch filter causes the inverter output frequency to quickly pass through a band of ± 2 Hz on either side of the value specified with P0055. The inverter will not operate within this ±2 Hz band at steady-state.

The function is disabled if P055 is set 2 Hz higher than the value of P014.

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0056 POWER RIDE THRU

Activates the "kinetic buffering" function if "yes" choice is selected.	Yes No Factory = No	Commission P0004 = 4 must purchase PAL

The kinetic buffering function attempts to maintain inverter operation thru momentary incoming AC line power dips by "regenerating" motor kinetic energy into the DC link. The effectiveness of this technique depends very much on the electrical and mechanical characteristics of the end-use application. A detailed analysis is beyond the scope of this instruction manual. Contact Siemens Energy & Automation Inc. for more information. See section 7.5 for technical assistance and telephone numbers.

Note: on 460/500 V USA model 6SE12 Simovert-P's, the Control Module power supply is not backed-up by the DC link, however, terminals are provided for a small, external power supply capacitor which will permit very long "kinetic buffering" times. With no external capacitor, power supply hold-up times are typically 100 milliseconds (could be longer or shorter depending on line voltage and load conditions).

The use of the kinetic buffering option requires the purchase and installation of an optional PAL chip – see section 9.2 for details.

The "Kinetic Buffering" feature is not available when the Z2006 or PT1 Option Boards are in use.

P0057 MONITOR ACTIVE

This parameter is for factory use only.	No Yes Factory = No	Not Accessible

P0058 BAUD RATE RS232

This parameter sets the baud rate for the serial interface on the Control Module. See section 4.7 for more information	1 300 Baud 2 1200 Baud 3 2400 Baud Factory = 2400 Baud	Commission P0004 = 4

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0059 PULLOUT PROTEC

Activates the "pullout protection" warning and fault (W015 and F014). See description of choices below	1 on 2 off Factory = on	Ready , On Commission P0004 = 4

1) Pullout warning (W015) and pullout fault (F014) are active.
2) Pullout warning (W015) and pullout fault (F014) are not active.

Read section 5.7 for a description of "pullout". The 6SE12 Simovert-P always attempts to recover from a pullout by reducing inverter frequency when a pullout is sensed. If P059 = yes, a failed attempt to recover from a motor pullout will be indicated by a fault (F014). If P059 = no, the inverter control algorithms will still attempt to recover from a pullout; however, a failed attempt to recover will not be indicated by a warning or a fault. In this case, it is possible for the motor to be stopped (in a pullout condition) while the 6SE12 Simovert-P indicates normal operation.

Note: If the inverter size is much larger than the motor size, the pullout detection algorithms may not function properly and it will be necessary to set parameter P059 to "off".

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0060 REF ENABLE TIME

After this waiting period, the controller switches from the "Operate On" mode back to the "Operate Ready" mode.	0 to 1200 sec Factory = 1200 sec. Note: a setting of 1200 s turns this function off !	Ready Commission P0004 = 4

Description:
If the inverter has been given an "ON" command but the reference enable function at terminal 7 is off, the inverter will go into the "Operate On" mode. The dc link is charged and the inverter is ready to operate when the enable is activated. In this mode the "ON" LED will be blinking.

After the waiting period set by this parameter has elapsed and the enable has not been activated, the inverter will switch back to the "Ready" mode.

The function is disabled by setting a value of 1200 seconds.

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0061 DAMPING

This parameter allows the dynamic characteristic of the drive to be optimized, mainly in response to abrupt changes in load. Settings of 100% provides smooth running of the drive while values down to 0% provide excellent responses to load changes.	0 to 100 Factory = 50% (if P050 = 1,4,5,6) 100% (if P050 = 2 or 3)	Ready On P0004 = 4

P0062 PULSE RESISTOR

This parameter activates the pulsed resistor option.	1 No 2 Yes	Initialize only P0004 = 4

P0063 SW#: 6SW 12...

Indicates catalog number of the Control Module base software. The last 4 digits indicate software version – see example:	Example: 00-1xx0x-3AA0 indicates version 3.0 (note: due to a clerical error "3AA1" is really ver 3.2)	Can not be changed

P0064 RESTART ON FLY

Activates the "restart on the fly" option. This option allows the inverter to be started-up into a motor which is already spinning or "coasting". Refer to section 9.2.3 for more detailed information.	On Off Factory = Off Note: This option requires the purchase and installation of a PAL chip. See section 9.2.3 for details.	Commission P0004 = 4

P0065 SEARCH TIME

Search time for "restart on the fly" function described above. Inverter "search" frequency ramps from 0 to max frequency in time set by parameter P0065. P0065 does nothing unless P0064 =	1 to 199 seconds Factory = 5 sec on. See P0064 above	Ready On Commission P0004 = 4

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0066 MOTOR RES CORREC

Correction factor for motor winding resistance used in vector control algorithm. (No effect if P050 = V/Hz)	-100% to +800% Factory = 0%	Ready On Commission P0004 = 4

P0066 has little effect at high speeds. At low speeds, adjustment of P0066 may improve performance. P0066 only has an effect when the vector control algorithms are controlling motor flux (i.e. P050= 1,2,3 or 6 and frequency is greater than 3.01 Hz). The following general principles apply:

With a constant load, motor current should remain constant as speed goes from zero to full speed and back to zero. If the current increases or decreases (from the high speed value) in the 3.01 Hz to 10 Hz range, then an adjustment of P066 should correct the error.

If the transition from "open loop forced current" below 3.00 Hz to "vector control" above 3.00 Hz is not smooth, an adjustment to P066 should correct the problem. Use parameter P018 (and possibly P022) to establish the correct motor current from zero to 2.99 Hz. Then adjust P066 so that the current at 3.01 Hz is the same as at 2.99 Hz.

Correct adjustment of P066 should improve the resistance to pullout at low speeds.

Read section 5.5.3 and section 5.7 for more information.

Note that motor voltage and motor current are easily observed with an appropriate setting of parameter P002.

PARAMETER DESCRIPTION	AVAILABLE SELECTIONS	CHANGE CODE

P0067 MOTOR INDUC CORR

Correction factor for motor winding inductance used in vector control algorithm. (No effect if P050 = V/Hz)	-100% to +800% Factory = 0%	Ready On Commission P0004 = 4

P0067 has little effect at low speeds. At high speeds, adjustment of P0067 may improve performance. P0067 only has an effect when the vector control algorithms are controlling motor flux (i.e. P050= 1,2,3 or 6 and frequency is greater than 3.01 Hz). The following general principles apply:

For applications requiring good dynamic performance (i.e. P005 = constant torque), the motor voltage should be correct at no load at full speed and at full load at full speed. Parameter P022 should be used to obtain the correct motor voltage at no load full speed. P067 should then be used to obtain the correct motor voltage at full load full speed.

Generally, motor voltages "a little on the high side" will result in better "dynamic performance". However if P022 and/or P067 are adjusted too high, "gross overexcitation" will result and this may result in worse dynamic performance.

Correct adjustment of P067 should improve the resistance to pullout at high speeds

Read section 5.5.3 and section 5.7 for more information.

Note: Motor voltage and motor current are easily observed by appropriate settings of parameter P002.

P0068 FREQ / SPEED PROP

Proportional gain of the frequency / speed regulator (No effect if P050 = V/Hz)	Range : 0 to 600 Factory = 50 (P50= 1,6) Factory = 140 (P50= 2,3) don't care if P050 = 4,5.	Ready On P0004 = 4

Higher values of P0068 result in "tighter" speed or frequency control.

If P068 is set too high, unstable operation, "motor growling" and distorted current waveforms will result.

If P068 is set too low, sluggish or sloppy speed or frequency control will result.

In general, "tight" mechanical systems with large motors or high inertia will do better with higher proportional gains. "loose or sloppy" mechanical systems or small motors will be beter off with lower proportional gains.