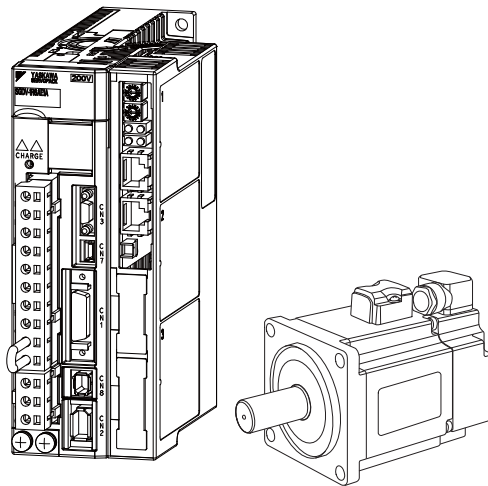


AC Servo Drives  
 **$\Sigma$ -V Series**  
**USER'S MANUAL**  
**Design and Maintenance**  
Rotational Motor  
Command Option Attachable Type

SGDV SERVOPACK  
SGMJV/SGMAV/SGMPS/SGMGV/SGMSV/SGMCS Servomotors



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## About this Manual

This manual describes informations required for designing, and maintaining  $\Sigma$ -V Series SERVOPACKs.

Be sure to refer to this manual and perform design and maintenance to select devices correctly.

Keep this manual in a location where it can be accessed for reference whenever required.

### ■ Description of Technical Terms

The following table shows the meanings of terms used in this manual.

Term	Meaning
Cursor	A mark that indicates the input position of data displayed on the digital operator
Servomotor	$\Sigma$ -V Series SGMJV, SGMVA, SGMPS, SGMGV, SGMV, or SGMCS (Direct Drive) servomotor
SERVOPACK	$\Sigma$ -V Series SGD servo amplifier of command option attachable type
Servo drive	A set including a servomotor and SERVOPACK (i.e., a servo amplifier)
Servo System	A servo control system that includes the combination of a servo drive with a host controller and peripheral devices
Servo ON	When power is being supplied to the servomotor
Servo OFF	When power is not being supplied to the servomotor
Base block	Turning OFF the power by shutting OFF the base current of the IGBT for the current amplifier

### ■ IMPORTANT Explanations

The following icon is displayed for explanations requiring special attention.



IMPORTANT

- Indicates important information that should be memorized, as well as precautions, such as alarm displays, that do not involve potential damage to equipment.

### ■ Notation Used in this Manual

#### • Reverse Symbol Notation

In this manual, the names of reverse signals (ones that are valid when low) are written with a forward slash (/) before the signal name, as shown in the following example:

Example

The notation for  $\overline{\text{BK}}$  is /BK.

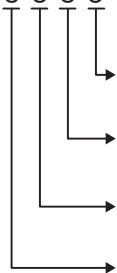
#### • Parameter Notation

The following two types of notations are used for parameter digit places and settings.

Example

Digital Operator Display

Pn000 = n . 0 0 0 0



Notation Example for Pn000

Digit Notation		Set Value Notation	
Notation Method	Meaning	Notation Method	Meaning
Pn000.0	Indicates digit 1 of the parameter (Pn000).	Pn000.0 = x or n.□□□x	Indicates that digit 1 of the parameter (Pn000) is x.
Pn000.1	Indicates digit 2 of the parameter (Pn000).	Pn000.1 = x or n.□□x□	Indicates that digit 2 of the parameter (Pn000) is x.
Pn000.2	Indicates digit 3 of the parameter (Pn000).	Pn000.2 = x or n.□x□□	Indicates that digit 3 of the parameter (Pn000) is x.
Pn000.3	Indicates digit 4 of the parameter (Pn000).	Pn000.3 = x or n.x□□□	Indicates that digit 4 of the parameter (Pn000) is x.

■ **Manuals Related to the  $\Sigma$ -V Series**

Refer to the following manuals as required.

Name	Selecting Models and Peripheral Devices	Ratings and Specifications	Panels and Wiring	Trial Operation	Trial Operation and Servo Adjustment	Maintenance and Inspection
$\Sigma$ -V Series User's Manual Indexer Module (SIEP C720829 02)		✓		✓	✓	✓
$\Sigma$ -V Series User's Manual Safety Module (SIEP C720829 06)		✓		✓	✓	✓
$\Sigma$ -V Series User's Manual Setup Rotational Motor (SIEP S800000 43)			✓	✓		
$\Sigma$ -V Series Product Catalog (KAEP S800000 42)	✓	✓				
$\Sigma$ -V Series User's Manual Operation of Digital Operator (SIEP S800000 55)				✓	✓	✓
$\Sigma$ -V Series AC SERVOPACK SGDV Safety Precautions (TOBP C710800 10)	✓		✓			✓
$\Sigma$ Series Digital Operator Safety Precautions (TOBP C730800 00)						✓
AC SERVOMOTOR Safety Precautions (TOBP C230200 00)			✓			✓

## Outline

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## 1.1 Σ-V Series SERVOPACKs

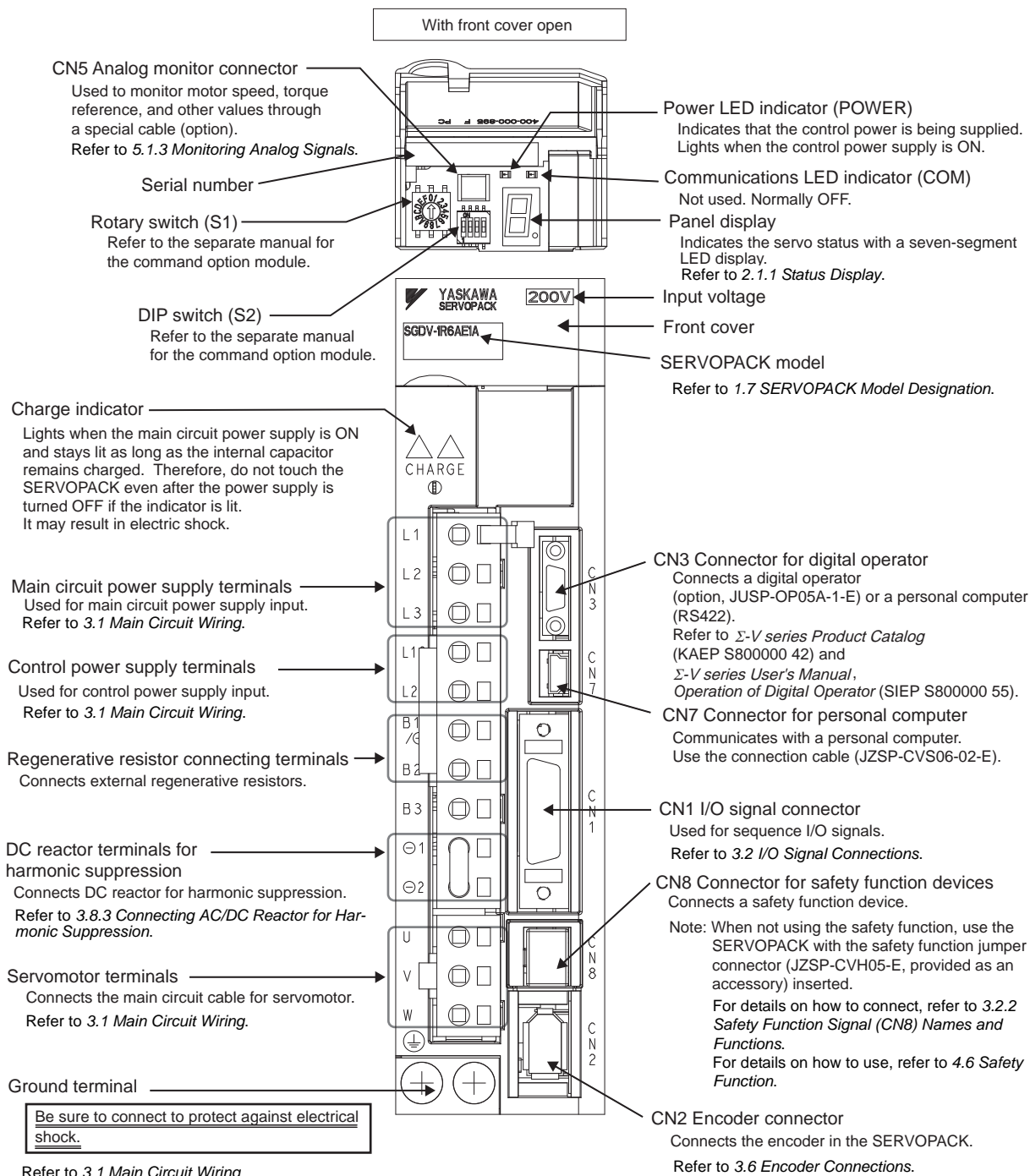
The Σ-V Series SERVOPACKs are designed for applications that require frequent high-speed, high-precision positioning. The SERVOPACK makes the most of machine performance in the shortest time possible, thus contributing to improving productivity.

## 1.2 SERVOPACKs

The command option attachable type SERVOPACK is used with command option modules. For reference methods, I/O signals, and other operations, refer to the manual for the command option module that is connected.

## 1.3 Part Names

This section gives the part names of the SGD-V SERVOPACK (command option attachable type).



## 1.4 SERVOPACK Ratings and Specifications

This section describes the ratings and specifications of SERVOPACKs.

### 1.4.1 Ratings

Ratings of SERVOPACKs are as shown below.

#### (1) SGDV Single-phase 100-V Ratings

SGDV (Single-phase, 100 V)	R70	R90	2R1	2R8
Continuous Output Current [Arms]	0.66	0.91	2.1	2.8
Max. Output Current [Arms]	2.1	2.9	6.5	9.3
Regenerative Resistor	None/External			
Main Circuit Power Supply	Single-phase, 100 to 115 VAC <sup>+10%</sup> / <sub>-15%</sub> , 50/60 Hz			
Control Power	Single-phase, 100 to 115 VAC <sup>+10%</sup> / <sub>-15%</sub> , 50/60 Hz			
Overvoltage Category	III			

#### (2) SGDV Single-phase 200-V Ratings

SGDV (Single-phase, 200 V)	120*
Continuous Output Current [Arms]	11.6
Max. Output Current [Arms]	28
Regenerative Resistor	Built-in/External
Main Circuit Power Supply	Single-phase, 220 to 230 VAC <sup>+10%</sup> / <sub>-15%</sub> , 50/60 Hz
Control Power	Single-phase, 220 to 230 VAC <sup>+10%</sup> / <sub>-15%</sub> , 50/60 Hz
Overvoltage Category	III

\* The official model number is SGDV-120AE1A008000.

#### (3) SGDV Three-phase 200-V Ratings

SGDV (Three-phase, 200 V)	R70	R90	1R6	2R8	3R8	5R5	7R6	120	180	200	330	470	550	590	780
Continuous Output Current [Arms]	0.66	0.91	1.6	2.8	3.8	5.5	7.6	11.6	18.5	19.6	32.9	46.9	54.7	58.6	78.0
Max. Output Current [Arms]	2.1	2.9	5.8	9.3	11.0	16.9	17	28	42	56	84	110	130	140	170
Regenerative Resistor	None/External				Built-in/External						External				
Main Circuit Power Supply	Three-phase, 200 to 230 VAC <sup>+10%</sup> / <sub>-15%</sub> , 50/60 Hz														
Control Power	Single-phase, 200 to 230 VAC <sup>+10%</sup> / <sub>-15%</sub> , 50/60 Hz														
Overvoltage Category	III														

#### (4) SGDV Three-phase 400-V Ratings

SGDV (Three-phase, 400 V)	1R9	3R5	5R4	8R4	120	170	210	260	280	370
Continuous Output Current [Arms]	1.9	3.5	5.4	8.4	11.9	16.5	20.8	25.7	28.1	37.2
Max. Output Current [Arms]	5.5	8.5	14	20	28	42	55	65	70	85
Regenerative Resistor	Built-in/External						External			
Main Circuit Power Supply	Three-phase, 380 to 480 VAC <sup>+10%</sup> / <sub>-15%</sub> , 50/60 Hz									
Control Power	24 VDC ±15%									
Overvoltage Category	III									

## 1.4.2 Basic Specifications

Basic specifications of SERVOPACKs are shown below.

Control Method		IGBT-PWM (sine-wave driven)		
Feedback		Serial encoder: 13-bit (incremental), 17-bit, 20-bit (incremental/absolute)		
Operating Conditions	Surrounding Air/Storage Temperature	0 to +55°C/ -20 to +85°C		
	Ambient/Storage Humidity	90% RH or less (with no condensation)		
	Vibration/Shock Resistance	4.9 m/s <sup>2</sup> / 19.6 m/s <sup>2</sup>		
	Protection Class/ Pollution Degree	Protection class: IP10, Pollution degree: 2 An environment that satisfies the following conditions. <ul style="list-style-type: none"> <li>• Free of corrosive or explosive gases</li> <li>• Free of exposure to water, oil or chemicals</li> <li>• Free of dust, salts or iron dust</li> </ul>		
	Altitude	1000 m or less		
	Others	Free of static electricity, strong electromagnetic fields, magnetic fields or exposure to radioactivity		
Applicable Standards		UL508C EN50178, EN55011 group 1 class A, EN61000-6-2, EN61800-3, EN61800-5-1, EN954-1, IEC61508-1 to 4		
Configuration		Base-mounted <sup>*1</sup>		
Performance	Speed Control Range		1:5000	
	Speed Regulation <sup>*2</sup>	Load Fluctuation	0 to 100% load: ±0.01% max. (at rated speed)	
		Voltage Fluctuation	Rated voltage ±10%: 0% (at rated speed)	
		Temperature Fluctuation	25 ± 25 °C: ±0.1% max. (at rated speed)	
	Torque Control Tolerance (Repeatability)		±1%	
I/O Signals	Encoder Output Pulses		Phase-A, -B, -C: line driver Encoder output pulse: any setting ratio	
	Sequence Input	Input Signals which can be allocated	Number of Channels 7 channels	
		Functions	The signal allocation and positive/negative logic can be modified. Forward run prohibited (P-OT), reverse run prohibited (N-OT), forward external torque limit (/P-CL), reverse external torque limit (/N-CL), general-purpose input signal (/SI0 to /SI6) <sup>*3</sup>	
	Sequence Output	Fixed Output	Servo alarm (ALM)	
		Output Signals which can be allocated	Number of Channels	3 channels
			Functions	The signal allocation and positive/negative logic can be modified. Positioning completion (/COIN), speed coincidence detection (/V-CMP), servomotor rotation detection (/TGON), servo ready (/S-RDY), torque limit detection (/CLT), speed limit detection (/VLT), brake (/BK), warning (/WARN), near (/NEAR)

(cont'd)

Communications Function	RS422A Communications (CN3)	Interface	Digital operator (JUSP-OP05A-1-E), personal computer (can be connected with SigmaWin+), etc.
		1:N Communications	N = Up to 15 stations possible at RS422A
		Axis Address Setting	Set by parameter
	USB Communications (CN7)	Interface	Personal computer (can be connected with SigmaWin+.)
Communications Standard		Complies with standard USB1.1. (12 Mbps)	
LED Display			Panel display (seven-segment, 1 digit), CHARGE and POWER indicators
Analog Monitor (CN5)			Number of points: 2 Output voltage: $\pm 10V$ DC (linearity effective range $\pm 8V$ ) Resolution: 16 bit Accuracy: $\pm 20$ mV (Typ) Max. output current: $\pm 10$ mA Settling time ( $\pm 1\%$ ): 1.2 ms (Typ)
Dynamic Brake (DB)			Activated when a servo alarm, overtravel, or hard wire base block occurs or when the power supply for the main circuit or servomotor is turned OFF.
Regenerative Processing			Built-in or external regenerative resistor (option)
Overtravel Prevention (OT)			Dynamic brake stop at P-OT or N-OT, deceleration to a stop, or free run to a stop
Protection Function			Overcurrent, overvoltage, insufficient voltage, overload, regeneration error, and so on.
Utility Function			Gain adjustment, alarm history, JOG operation, origin search, and so on.
Safety Function	Input	/HWBB1, /HWBB2: Baseblock signal for power module	
	Output	EDM1: Monitoring status of internal safety circuit (fixed output)	
Option Modules			Fully-closed option module and command option module

\*1. Rack mounting and duct-ventilated type available as an option.

\*2. Speed regulation by load fluctuation is defined as follows:

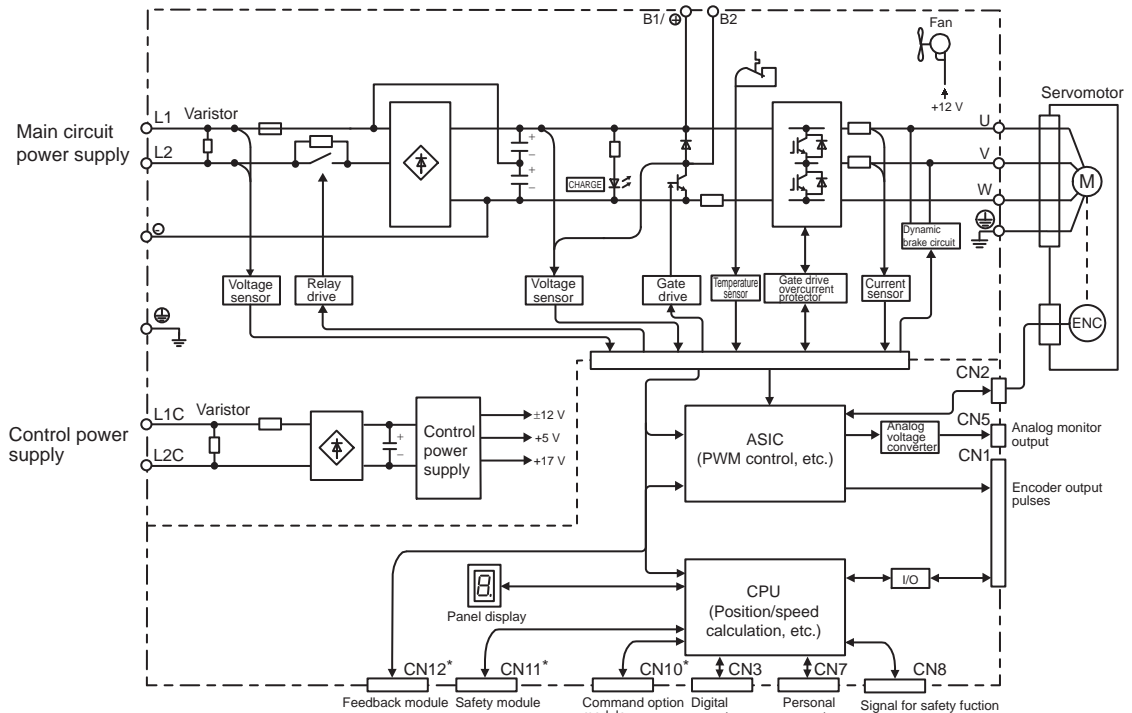
$$\text{Speed regulation} = \frac{\text{No-load motor speed} - \text{Total load motor speed}}{\text{Rated motor speed}} \times 100\%$$

\*3. For information on functions, refer to the manual of the connected command option module.



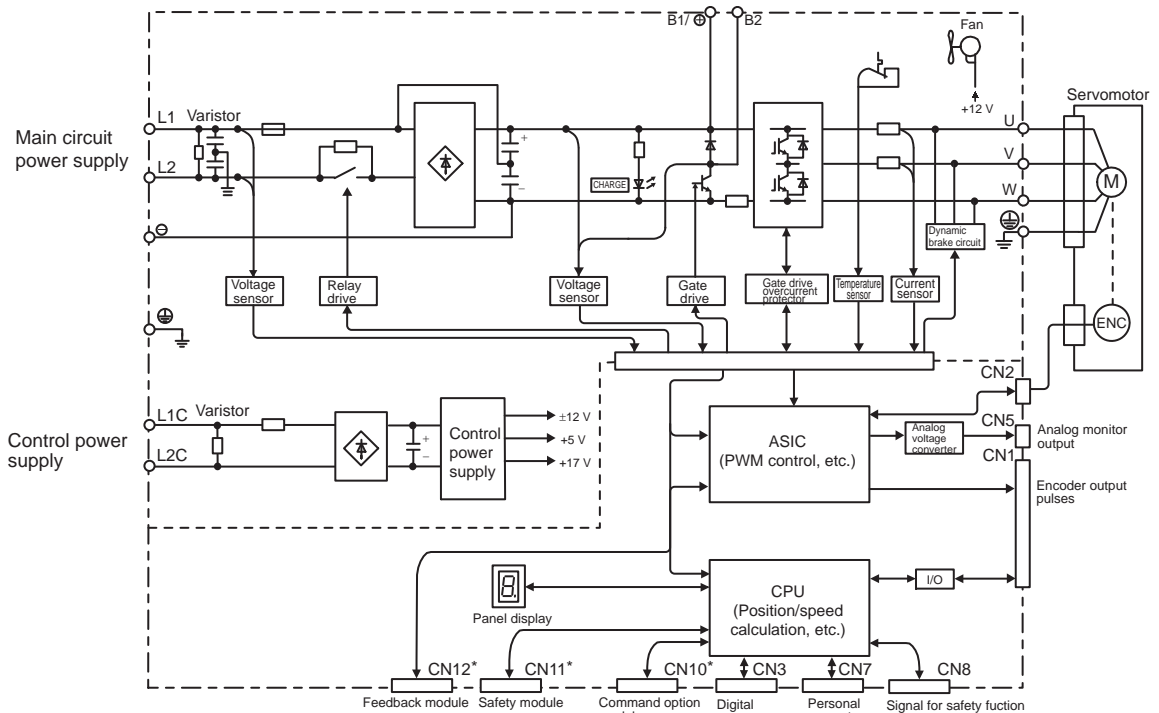
## 1.5 SERVOPACK Internal Block Diagrams

### 1.5.1 Single-phase 100-V, SGDVR70FE1A, -R90FE1A, -2R1FE1A Models



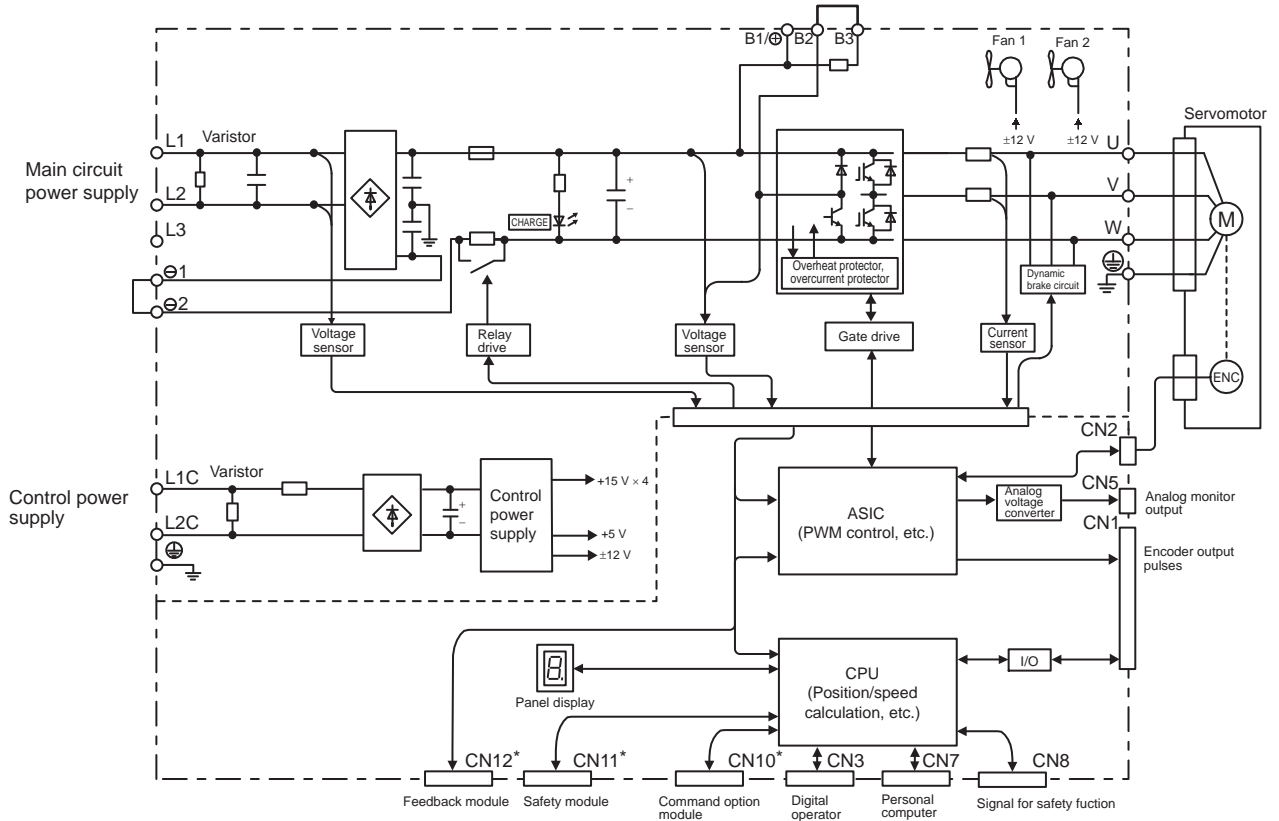
\* This external input signal is used by the option module.  
For details, refer to the manual of the connected option module.

### 1.5.2 Single-phase 100-V, SGDVR2R8FE1A Model



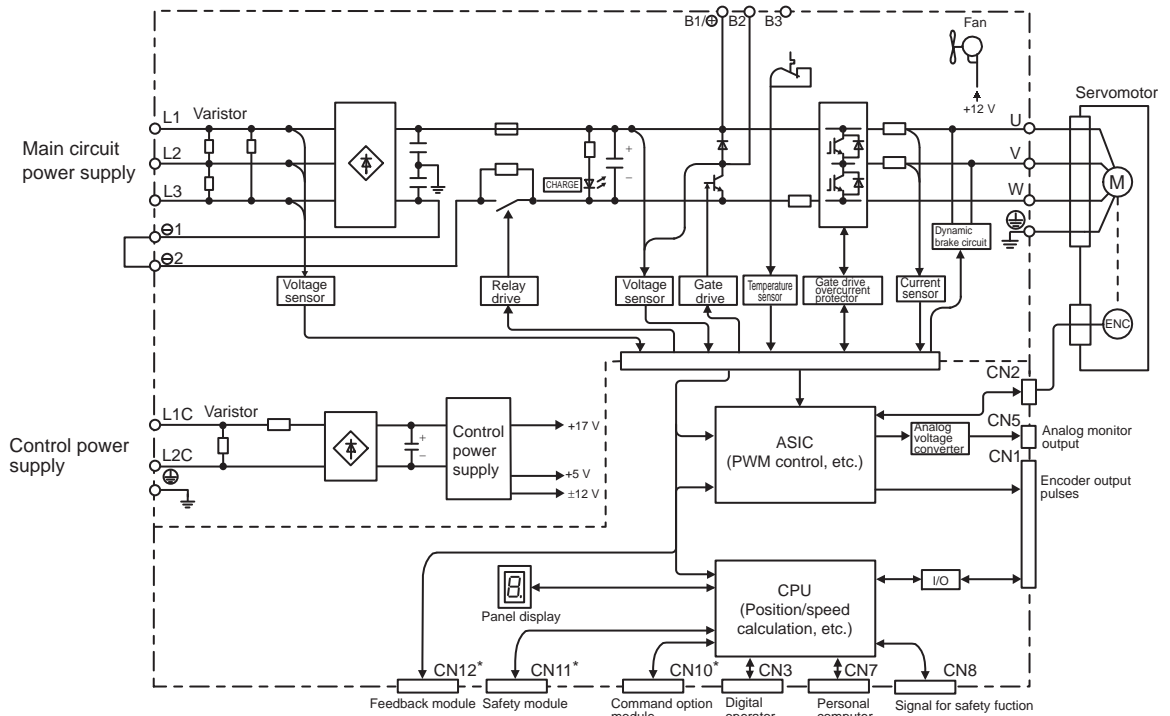
\* This external input signal is used by the option module.  
For details, refer to the manual of the connected option module.

### 1.5.3 Single-phase 200-V, SGDV-120AE1A008000 Model



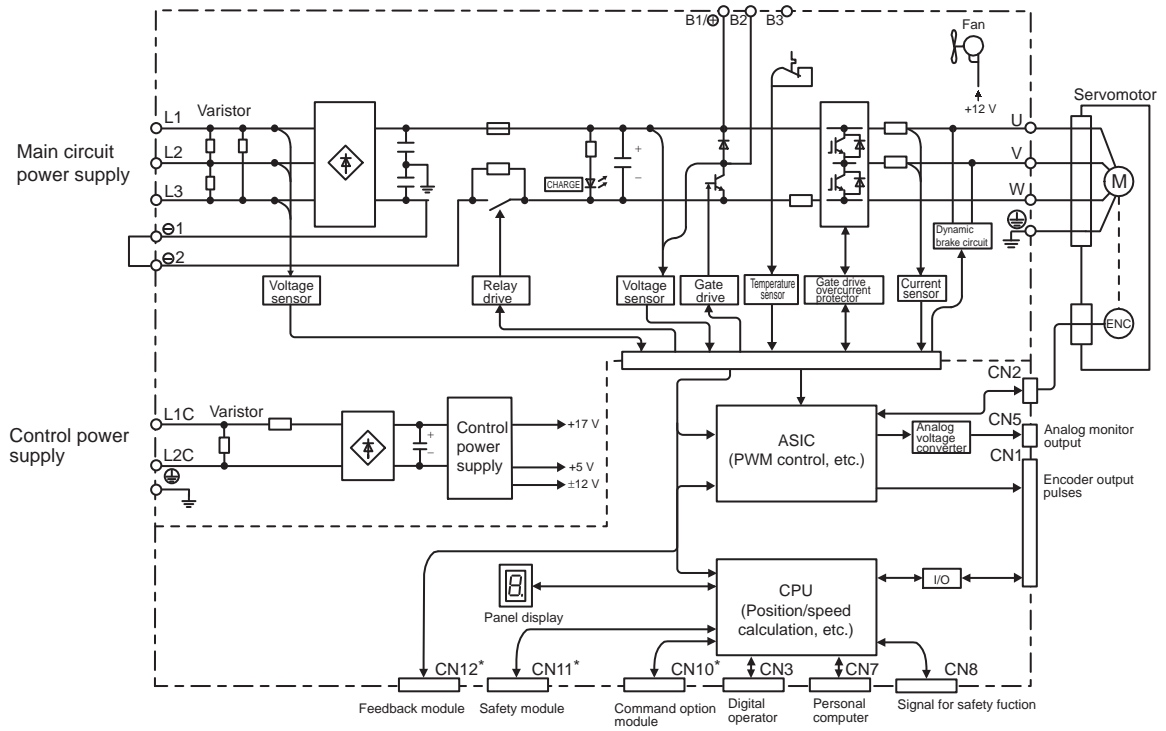
\* This external input signal is used by the option module.  
For details, refer to the manual of the connected option module.

### 1.5.4 Three-phase 200-V, SGDV-R70AE1A, -R90AE1A, -1R6AE1A Models



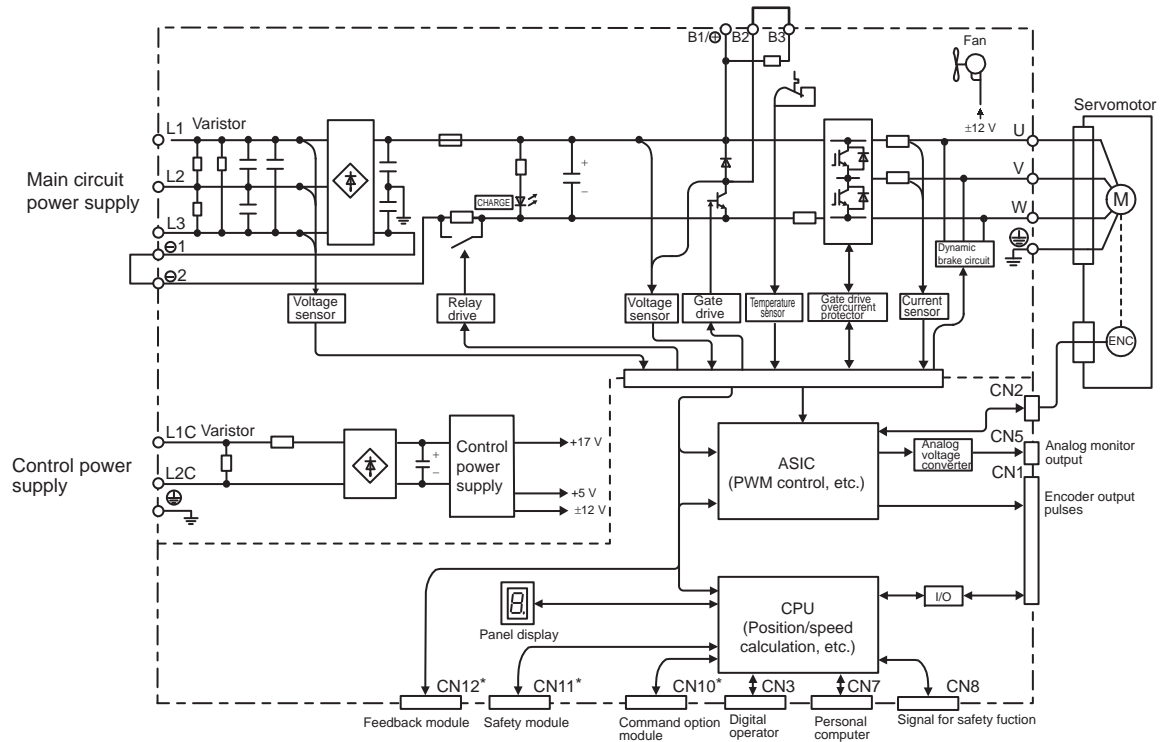
\* This external input signal is used by the option module.  
For details, refer to the manual of the connected option module.

### 1.5.5 Three-phase 200-V, SGDV-2R8AE1A Model



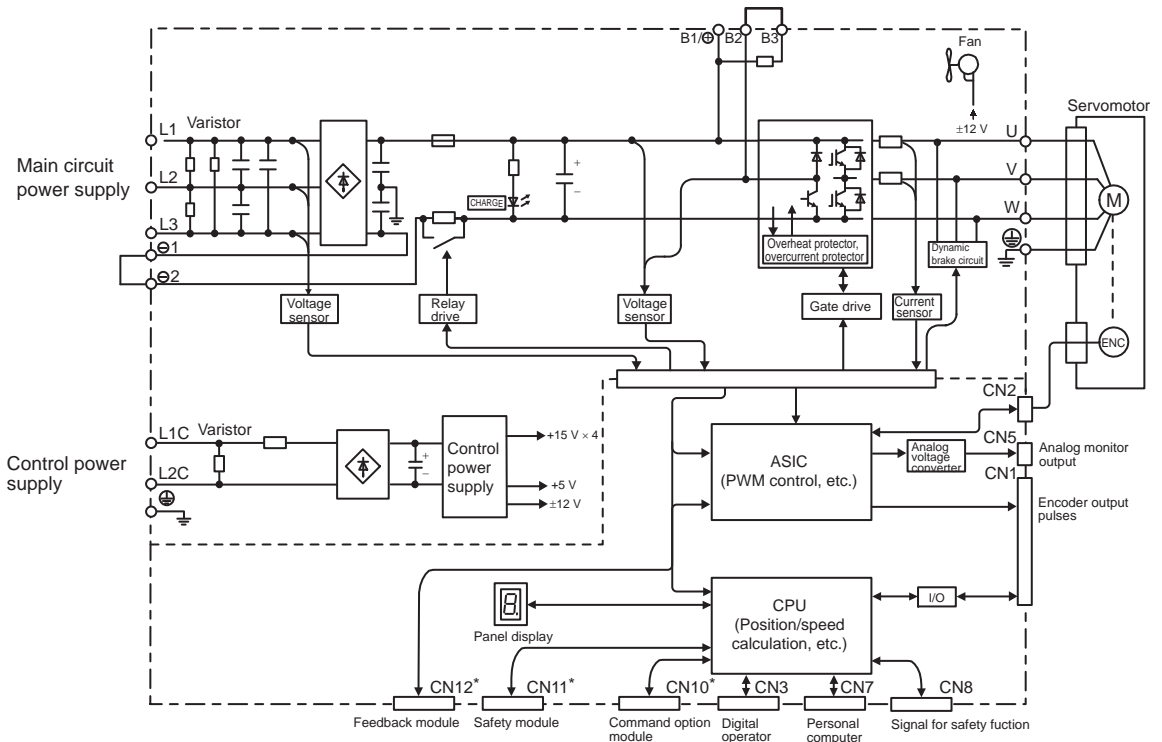
\* This external input signal is used by the option module.  
For details, refer to the manual of the connected option module.

### 1.5.6 Three-phase 200-V, SGDV-3R8AE1A, -5R5AE1A, -7R6AE1A Models



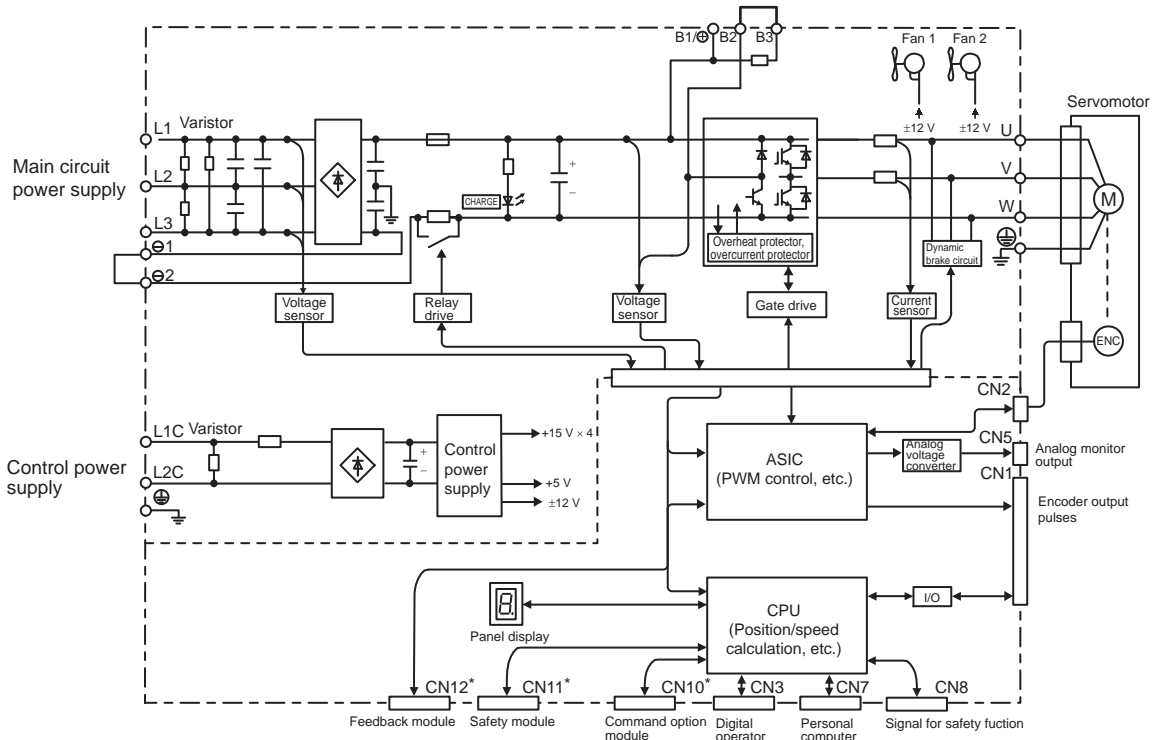
\* This external input signal is used by the option module.  
For details, refer to the manual of the connected option module.

### 1.5.7 Three-phase 200-V, SGDV-120AE1A Model



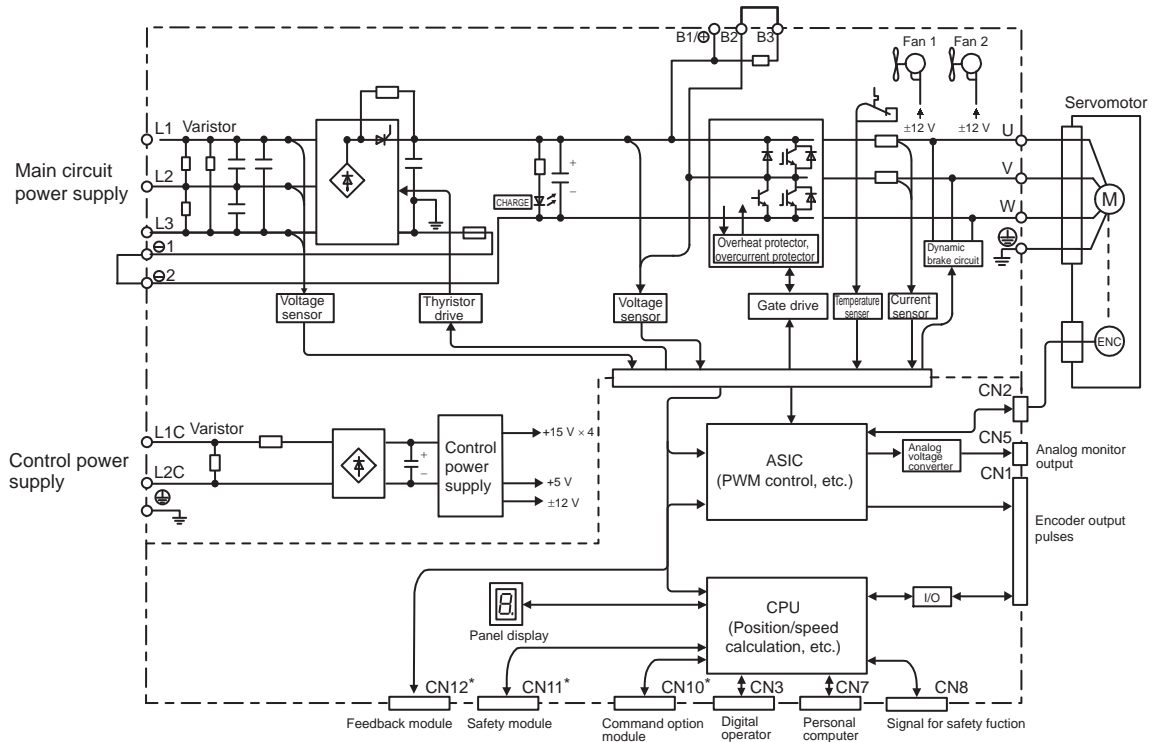
\* This external input signal is used by the option module.  
For details, refer to the manual of the connected option module.

### 1.5.8 Three-phase 200-V, SGDV-180AE1A, -200AE1A Models



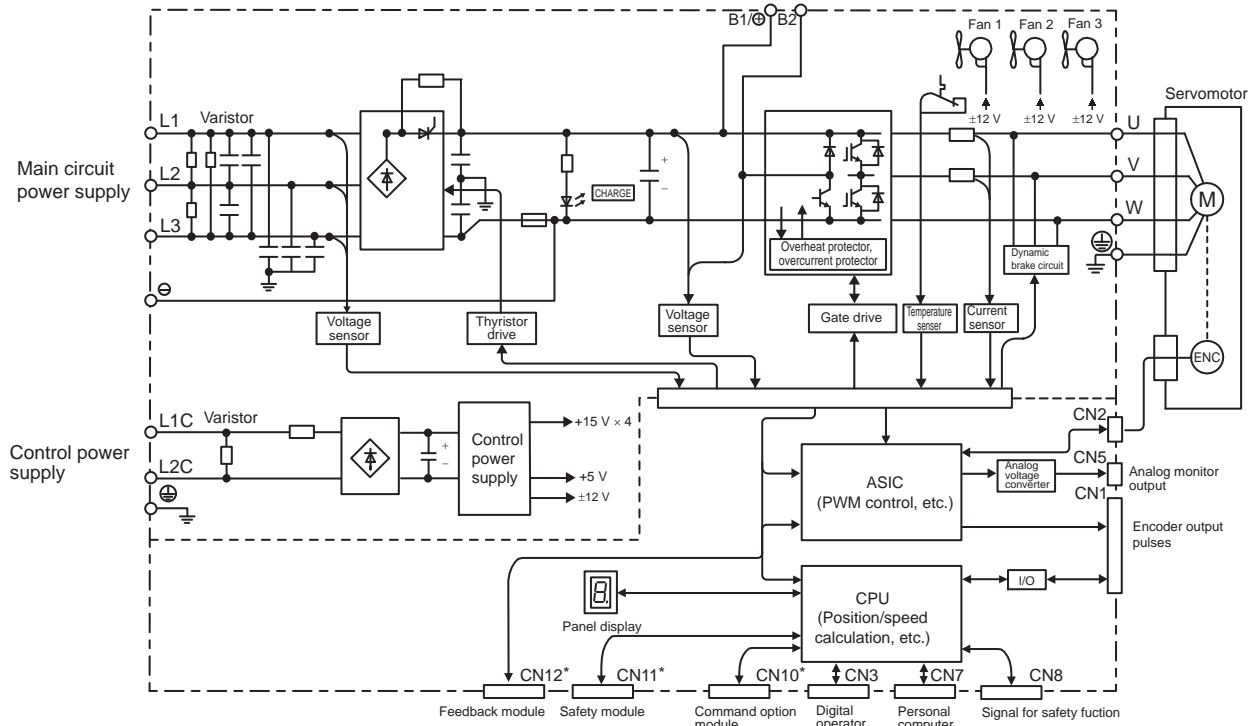
\* This external input signal is used by the option module.  
For details, refer to the manual of the connected option module.

### 1.5.9 Three-phase 200-V, SGDV-330AE1A Model



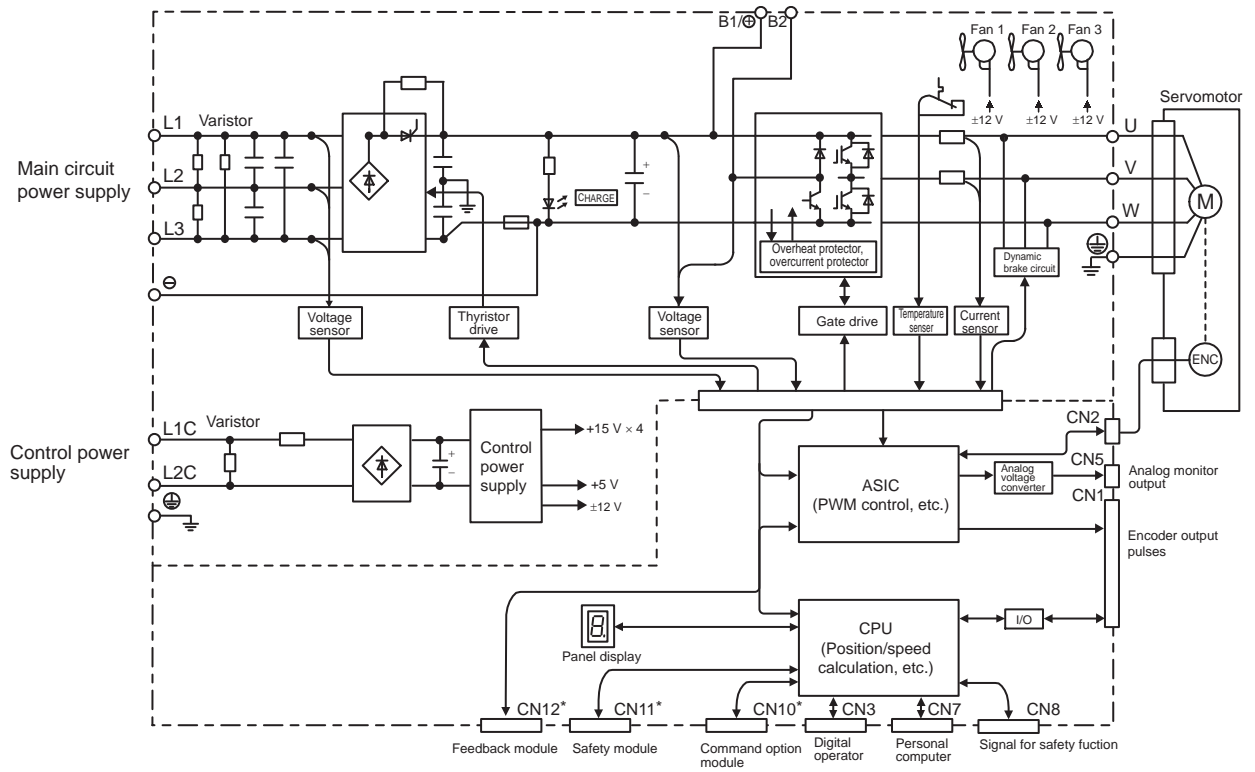
\* This external input signal is used by the option module.  
For details, refer to the manual of the connected option module.

### 1.5.10 Three-phase 200-V, SGDV-470AE1A, -550AE1A Models



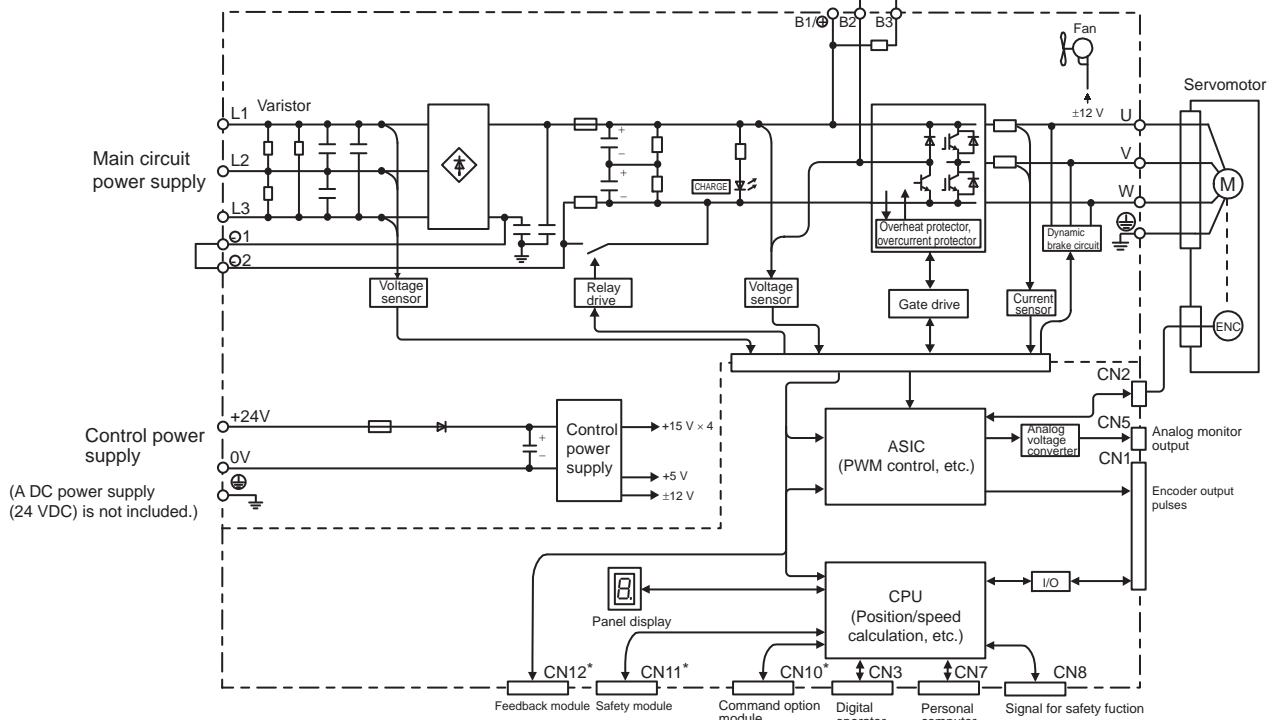
\* This external input signal is used by the option module.  
For details, refer to the manual of the connected option module.

### 1.5.11 Three-phase 200-V, SGDV-590AE1A, -780AE1A Models



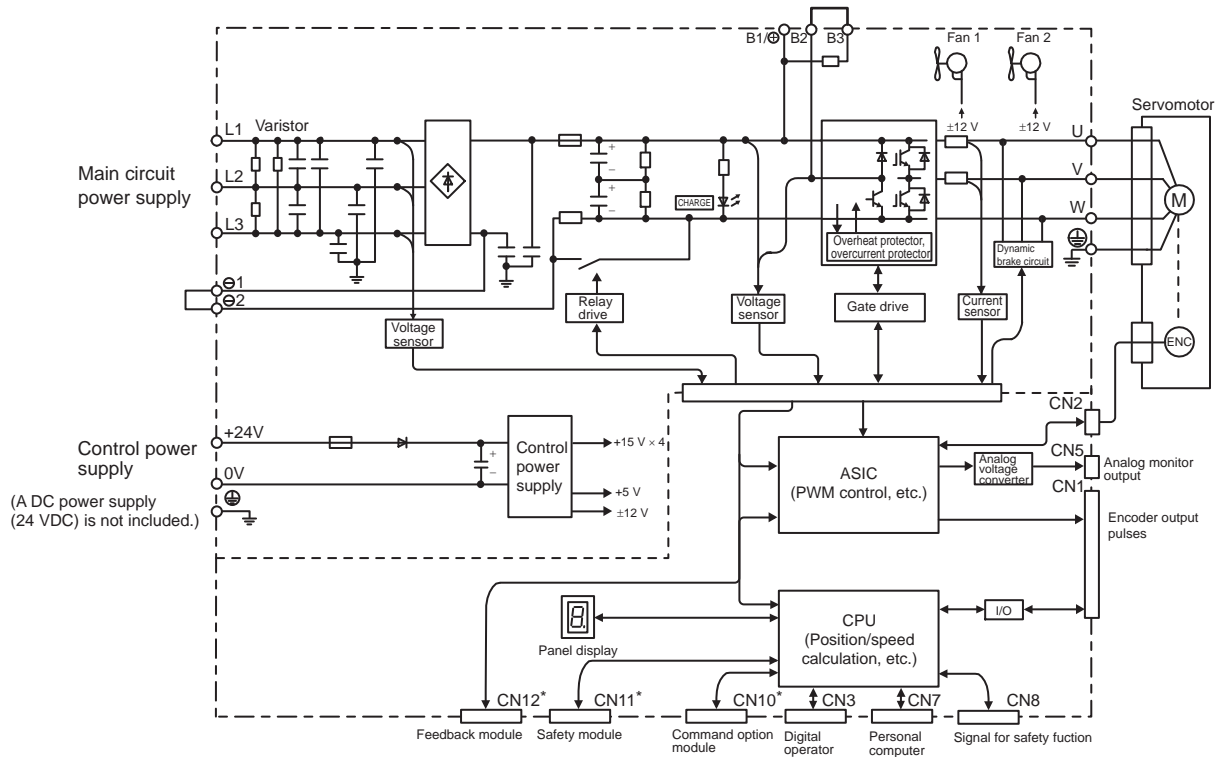
\* This external input signal is used by the option module.  
For details, refer to the manual of the connected option module.

### 1.5.12 Three-phase 400-V, SGDV-1R9DE1A, -3R5DE1A, -5R4DE1A Models



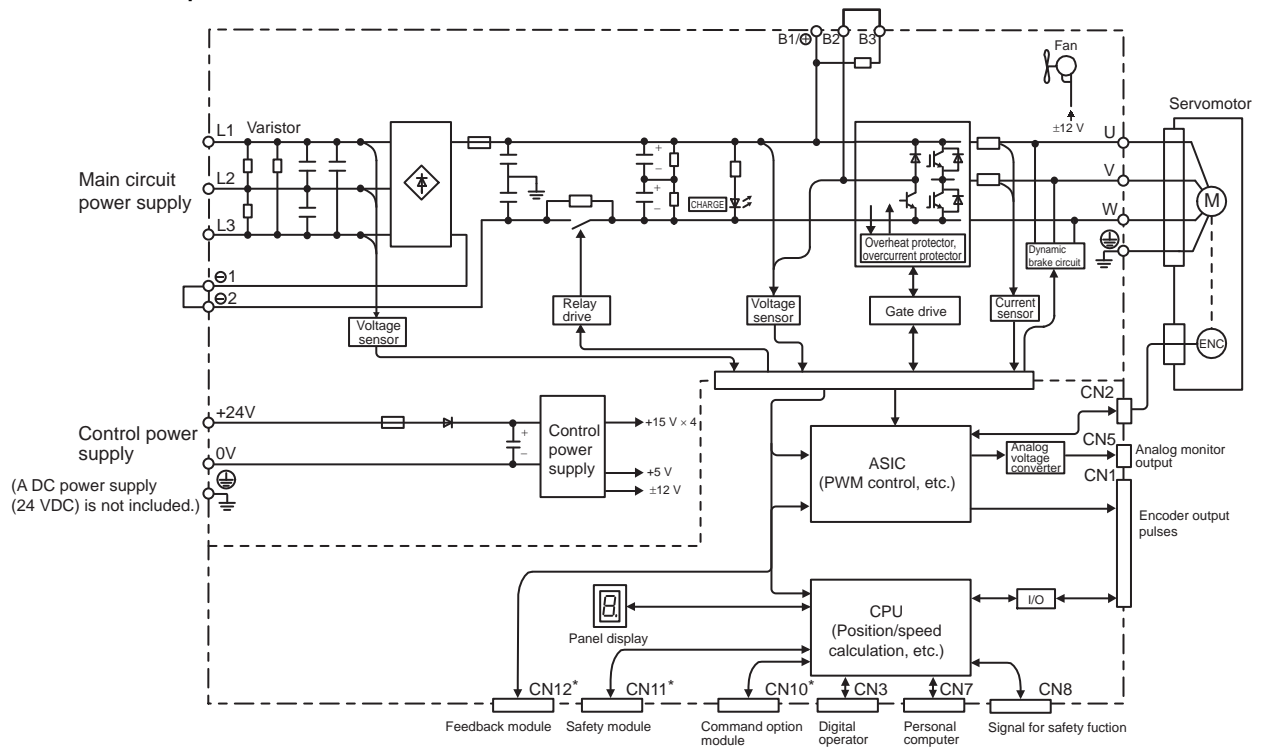
\* This external input signal is used by the option module.  
For details, refer to the manual of the connected option module.

### 1.5.13 Three-phase 400-V, SGDV-8R4DE1A, -120DE1A Models



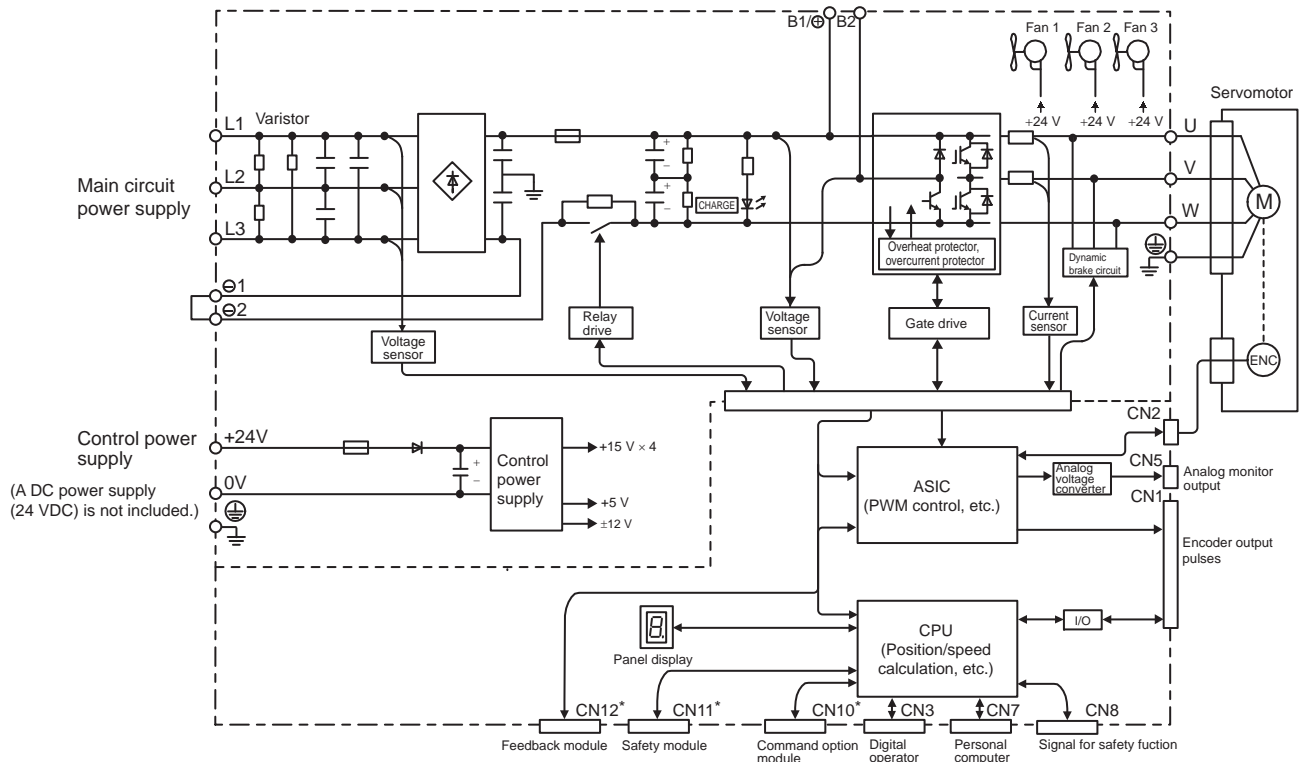
\* This external input signal is used by the option module.  
For details, refer to the manual of the connected option module.

### 1.5.14 Three-phase 400-V, SGDV-170DE1A Model



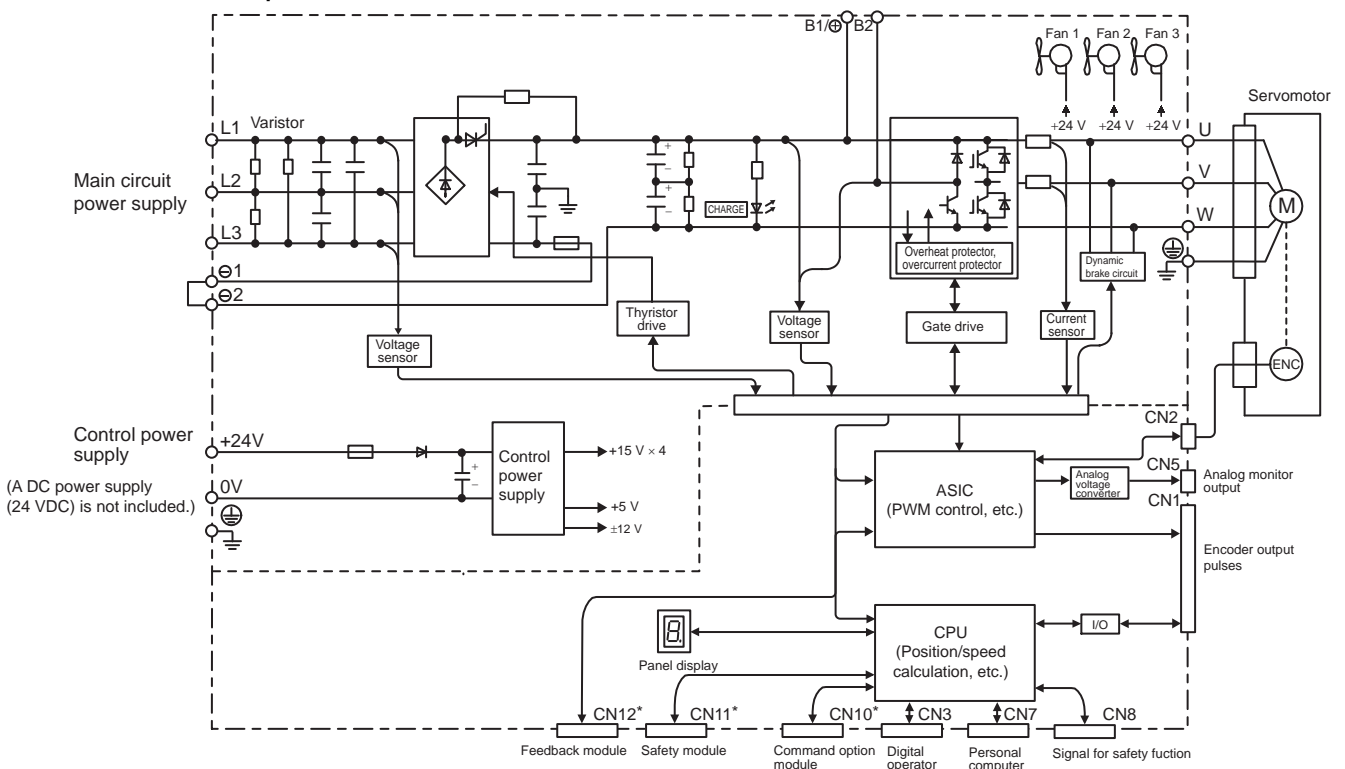
\* This external input signal is used by the option module.  
For details, refer to the manual of the connected option module.

### 1.5.15 Three-phase 400-V, SGDV-210DE1A, -260DE1A Models



\* This external input signal is used by the option module.  
For details, refer to the manual of the connected option module.

### 1.5.16 Three-phase 400-V, SGDV-280DE1A, -370DE1A Models



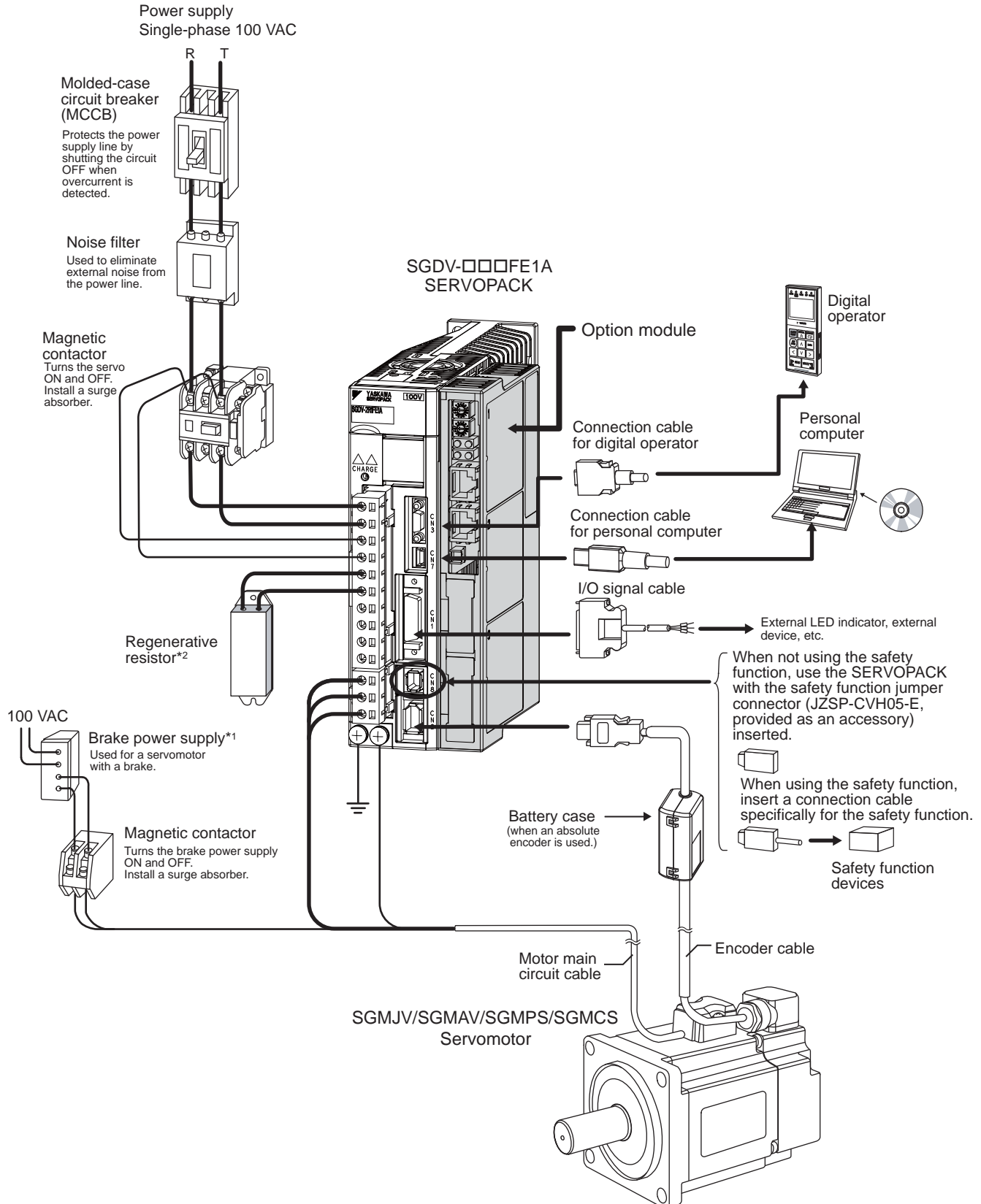
\* This external input signal is used by the option module.  
For details, refer to the manual of the connected option module.



## 1.6 Examples of Servo System Configurations

This section describes examples of basic servo system configuration.

### 1.6.1 Connecting to SGDV-□□□FE1A SERVOPACK

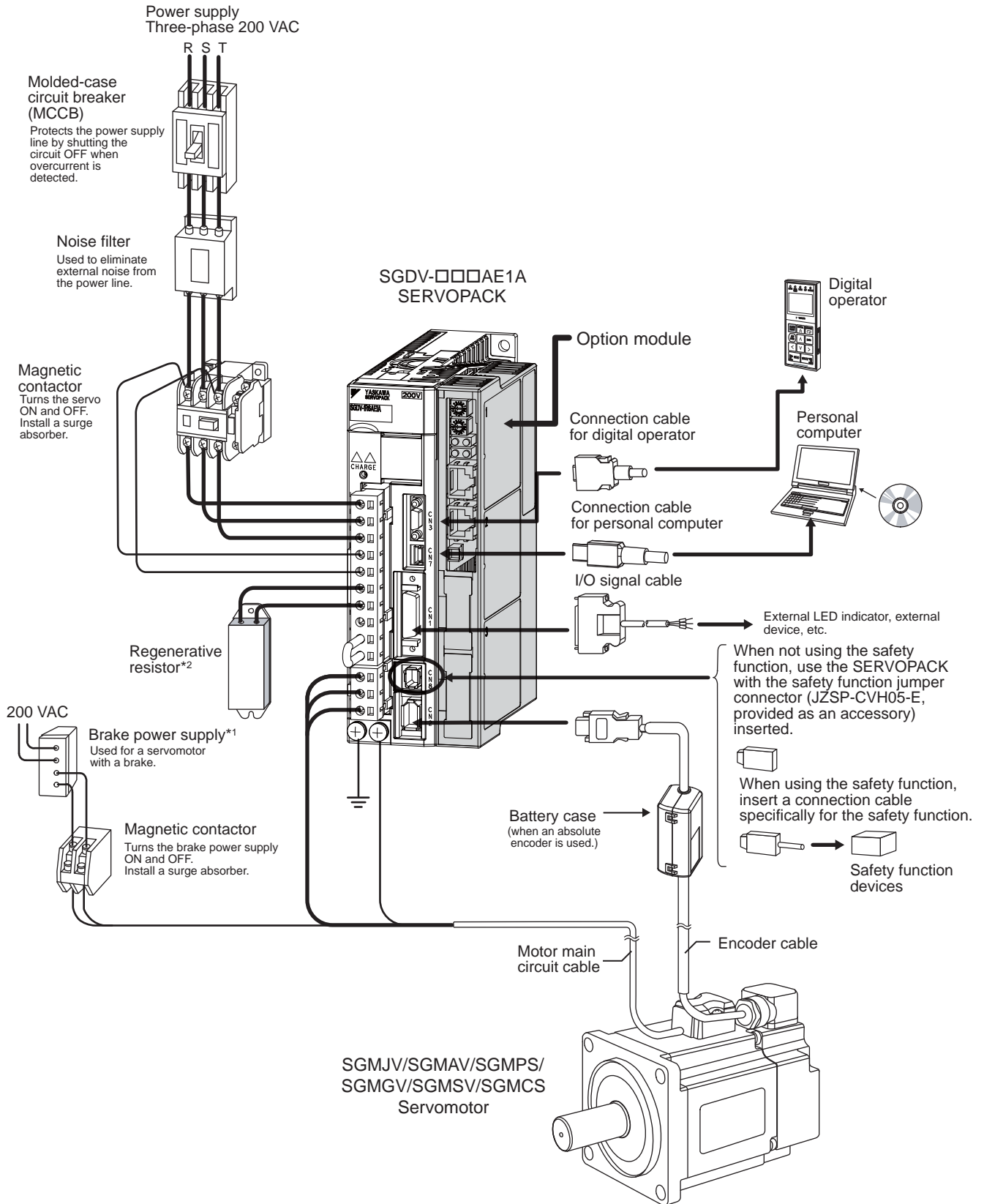


\*1. Use a 24-VDC power supply. (not included.)

\*2. Before connecting an external regenerative resistor to the SERVOPACK, refer to 3.7 *Regenerative Resistors Connections*.

## 1.6.2 Connecting to SGD□□□AE1A SERVOPACK

### (1) Using a Three-phase, 200-V Power Supply



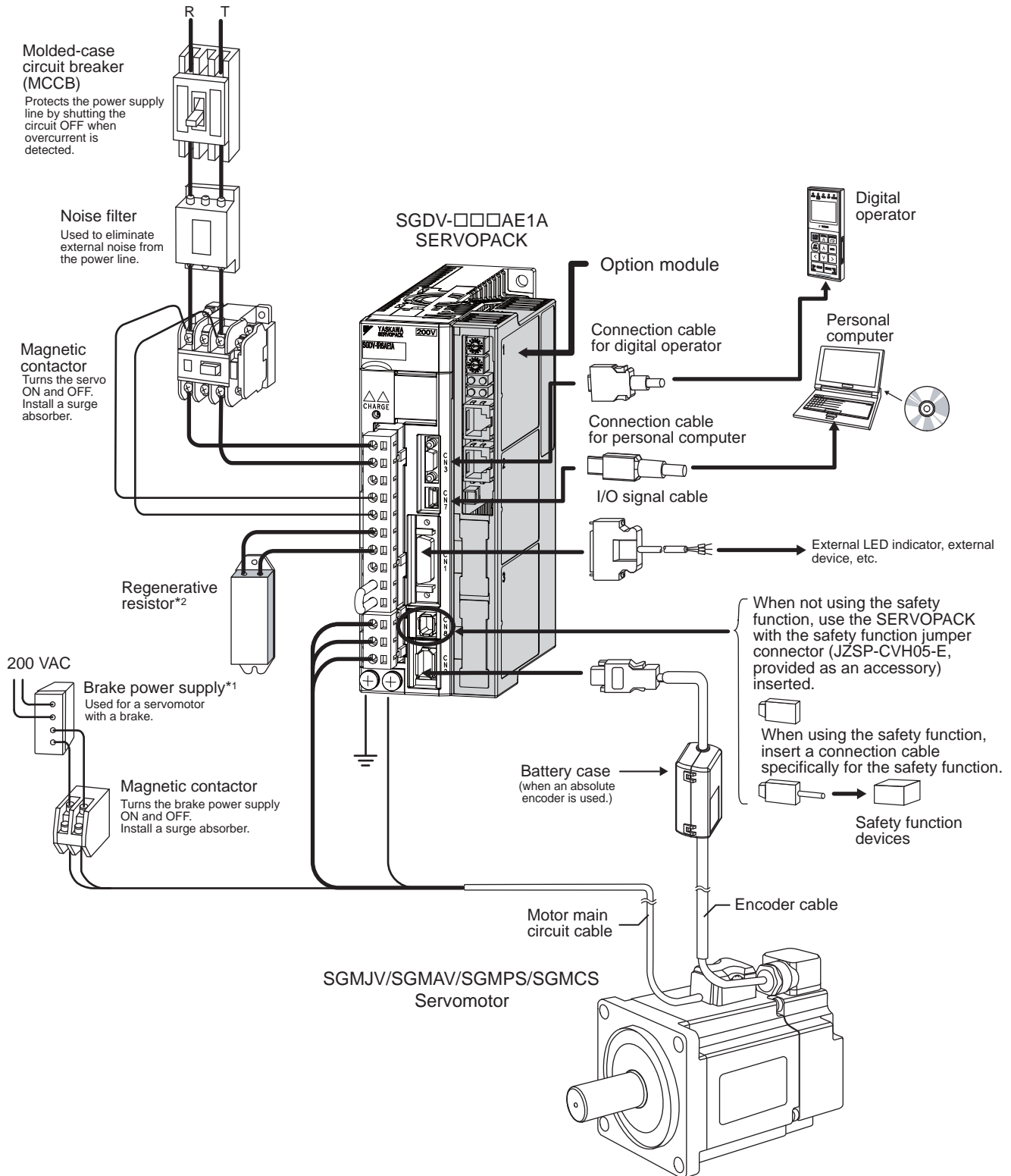
\*1. Use a 24-VDC power supply. (not included.)

\*2. Before connecting an external regenerative resistor to the SERVOPACK, refer to 3.7 *Regenerative Resistors Connections*.

(2) Using a Single-phase, 200-V Power Supply

The  $\Sigma$ -V Series SERVOPACK for a 200-V power supply input has input specifications for a three-phase power supply, but some models can also be used with a single-phase 200-V power supply. For details, refer to 3.1.3 *Using the SERVOPACK with Single-phase, 200-V Power Input*.

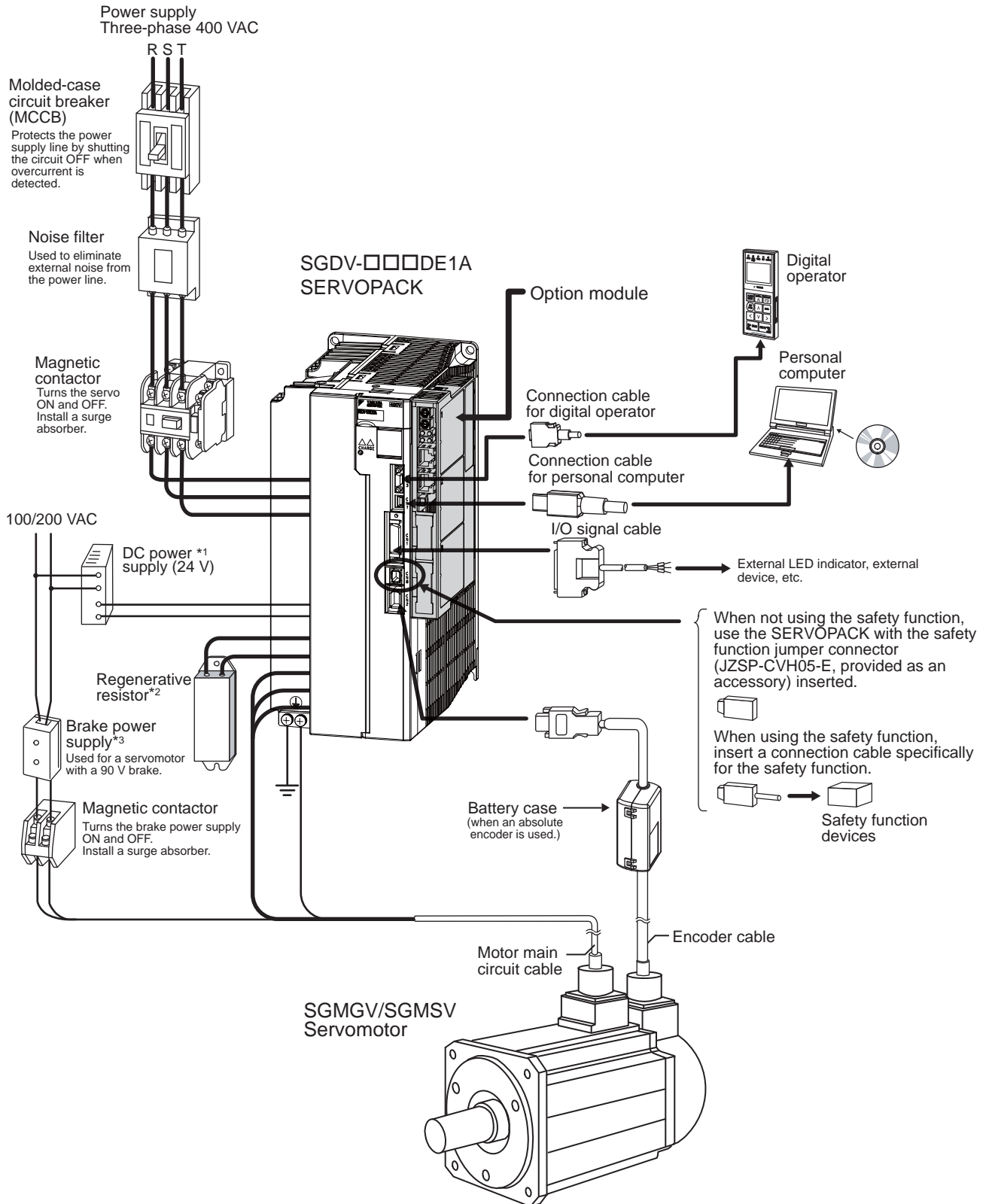
Power supply  
Single-phase 200 VAC



\*1. Use a 24-VDC power supply. (not included.)

\*2. Before connecting an external regenerative resistor to the SERVOPACK, refer to 3.7 *Regenerative Resistors Connections*.

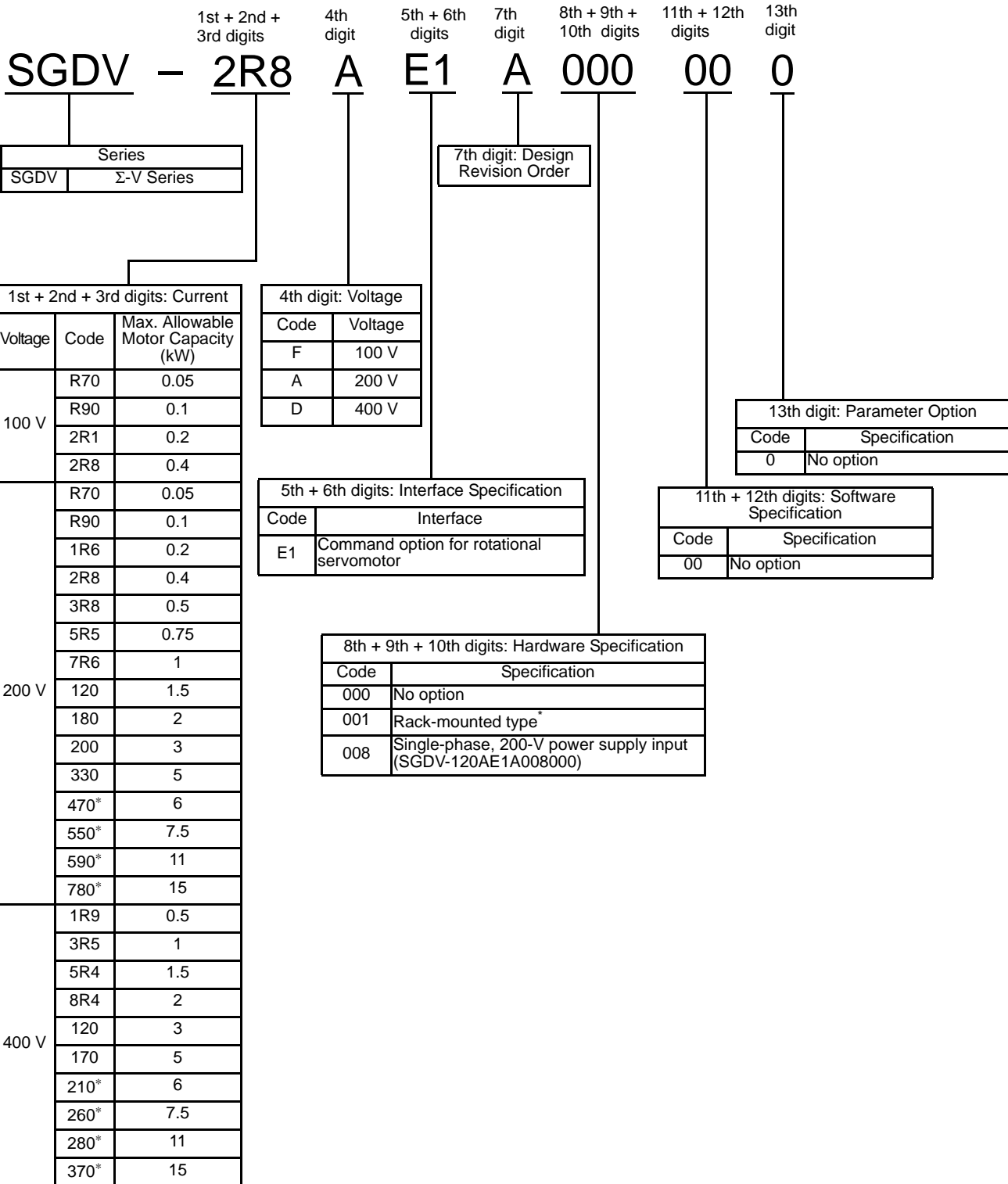
### 1.6.3 Connecting to SGD□□□DE1A SERVOPACK



- \*1. Use a 24-VDC power supply with double insulation or reinforced insulation. (The power supply is not included)
- \*2. Before connecting an external regenerative resistor to the SERVOPACK, refer to 3.7 *Regenerative Resistors Connections*.
- \*3. Use a following power supply for 90-V brake. For details, refer to *Σ-V series Product Catalog* (KAEP S800000 42).
  - For 200-V input voltage: LPSE-2H01-E
  - For 100-V input voltage: LPDE-1H01-E

# 1.7 SERVOPACK Model Designation

Select the SERVOPACK according to the applied servomotor.



\* The SGDV-470A, 550A, 590A, 780A, 210D, 260D, 280D, and 370D have air ducts for ventilation.  
 Note: If the option codes for the 8th to the 13th digits are all zero, the zeroes are omitted.

## 1.8 Inspection and Maintenance

This section describes the inspection and maintenance of SERVOPACK.

### (1) SERVOPACK Inspection


For inspection and maintenance of the SERVOPACK, follow the inspection procedures in the following table at least once every year. Other routine inspections are not required.

Item	Frequency	Procedure	Comments
Exterior	At least once a year	Check for dust, dirt, and oil on the surfaces.	Clean with compressed air.
Loose Screws		Check for loose terminal block and connector screws.	Tighten any loose screws.

### (2) SERVOPACK's Parts Replacement Schedule

The following electric or electronic parts are subject to mechanical wear or deterioration over time. To avoid failure, replace these parts at the frequency indicated.

Refer to the standard replacement period in the following table, contact your Yaskawa representative. After an examination of the part in question, we will determine whether the parts should be replaced or not.

 <b>IMPORTANT</b>	<p>The parameters of any SERVOPACKs overhauled by Yaskawa are reset to the factory settings before shipping. Be sure to confirm that the parameters are properly set before starting operation.</p>
--	---

Part	Standard Replacement Period	Operating Conditions
Cooling Fan	4 to 5 years	<ul style="list-style-type: none"> <li>• Surrounding Air Temperature: Annual average of 30°C</li> <li>• Load Factor: 80% max.</li> <li>• Operation Rate: 20 hours/day max.</li> </ul>
Smoothing Capacitor	7 to 8 years	
Other Aluminum Electrolytic Capacitor	5 years	
Relays	–	
Fuses	10 years	

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## Panel Display and Operation of Digital Operator





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## 2.1 Panel Display

The servo status can be checked on the panel display of the SERVOPACK.  
Also, if an alarm or warning occurs, its alarm or warning number is displayed.

### 2.1.1 Status Display

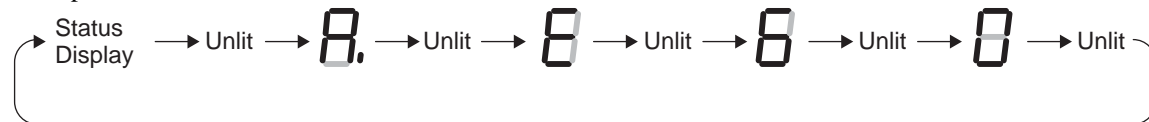
The display shows the following status.

Display	Meaning
	Rotation Detection (/TGON) Lights if motor speed exceeds the value set in Pn502. (Factory setting: 20 min <sup>-1</sup> )
	Base Block Lights for base block.
	Reference Input Lights when a reference is being input.
	Command Option Module Communications Status Display Lights when communications with the command option module are normal.

### 2.1.2 Alarm and Warning Display

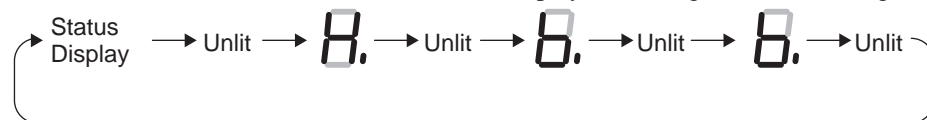
If an alarm or warning occurs, the display will change in the following order.

Example: Alarm A.E60



### 2.1.3 Hard Wire Base Block Display

If a hard wire base block (HWBB) occurs, the display will change in the following order.



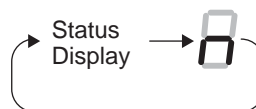
### 2.1.4 Displays during Overtravel

The display will change as shown below during overtravel.

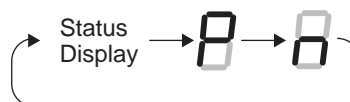
Forward run prohibited (P-OT signal input ON):



Reverse run prohibited (N-OT signal input ON):



Forward/reverse run prohibited (P-OT/N-OT signal input ON):




























## 2.2 Utility Function Mode (Fn□□□)

The setup and adjustment functions of the SERVOPACK are executed in this mode.

The digital operator displays numbers beginning with Fn.

An operation example in Utility Function Mode is shown below for Origin Search (Fn003).

Step	Display after Operation	Keys	Description									
1	<pre> BB      -FUNCTION- Fn002: JOG Fn003: Z-Search Fn004: Program JOG Fn005: Prm Init                     </pre>	  	Open the Utility Function Mode main menu and select Fn003.									
2	<pre> BB      -Z-Search- Un000= 00000 Un002= 00000 Un003= 00774 Un00D= 00000000                     </pre>		Press the  Key. The display changes to the execution display of Fn003. If the display does not change and “NO-OP” is displayed in the status display, change the following settings. <ul style="list-style-type: none"> <li>• If Write Prohibited is set in Fn010: → Change the Write Prohibited setting.</li> <li>• If a servo ON command has been entered: → Send a servo OFF command.</li> </ul>									
3	<pre> RUN      -Z-Search- Un000= 00000 Un002= 00000 Un003= 00774 Un00D= 00000000                     </pre>		Press the  Key. “RUN” is displayed in the status display, and power will be applied to the servomotor. If “NO-OP” is displayed, one of the following statuses will be displayed: <ul style="list-style-type: none"> <li>• Main circuit power supply OFF</li> <li>• Alarm</li> <li>• Hard wire base block</li> </ul>									
4	<pre> RUN      -Complete- Un000= 00000 Un002= 00000 Un003= 00000 Un00D= 00001D58                     </pre>	 	Pressing the  Key will rotate the motor in the forward direction. Pressing the  Key will rotate the motor in the reverse direction. The rotation of the servomotor changes according to the setting of Pn000.0. <table border="1" data-bbox="949 1339 1492 1496"> <thead> <tr> <th>Parameter</th> <th> key (Forward)</th> <th> key (Reverse)</th> </tr> </thead> <tbody> <tr> <td>Pn000</td> <td>n.□□□0</td> <td>CW</td> </tr> <tr> <td></td> <td>n.□□□1</td> <td>CCW</td> </tr> </tbody> </table> Note: Direction when viewed from the load of the servomotor. Press the  or  Key until the motor stops. If the origin search completed normally, “-Complete-” is displayed in the upper right corner.	Parameter	 key (Forward)	 key (Reverse)	Pn000	n.□□□0	CW		n.□□□1	CCW
Parameter	 key (Forward)	 key (Reverse)										
Pn000	n.□□□0	CW										
	n.□□□1	CCW										
5	<pre> BB      -Z-Search- Un000= 00000 Un002= 00000 Un003= 00774 Un00D= 00001D58                     </pre>		When the origin search is completed, press the  Key. “BB” is displayed in the status display, and the servomotor turns OFF. The display “-Complete-” changes to “-Z-Search-” in the upper right corner.									
6	<pre> BB      -FUNCTION- Fn002: JOG Fn003: Z-Search Fn004: Program JOG Fn005: Prm Init                     </pre>		Press the  Key. The display returns to the Utility Function Mode main menu. This completes the operation.									

## 2.3 Parameter (Pn□□□) Operation

This section describes the classifications, notation, and setting methods of parameters given in this manual.

### 2.3.1 Parameter Classifications

The Σ-V-series SERVOPACKs have two types of parameters: setup parameters for the basic settings required for operation and tuning parameters for adjusting servo performance.

Classification	Meaning	Display Method	Setting Method
Setup parameters	Parameters required for setup	Normally displayed. (Pn00B.0 = 0, factory setting)	Set each parameter.
Tuning parameters	Parameters for tuning of control gain and other values	Set Pn00B.0 to 1.	The user is generally not required to set these parameters individually.

Also, there are two notation methods for parameters: “numeric parameters” for which numeric values are set and “selection parameters” for which functions are selected.

The following sections describe each explanation method and setting method.

### 2.3.2 Parameter Notation

#### (1) Notation for Numeric Parameters

Control mode for which the parameter is valid.

Speed : Speed control

Position : Position control

Torque : Torque control

Pn406	Emergency Stop Torque			<input type="checkbox"/> Speed	<input type="checkbox"/> Position	<input type="checkbox"/> Torque
	Setting Range	Setting Unit	Factory Setting	When Enabled	Classification	
	0 to 800%	1%	800%	Immediately	Setup	

The number of the parameter.

Indicates setting range for the parameter.

Indicates minimum setting unit for the parameter.

Indicates parameter value before shipment (factory setting).

Indicates if the power has to be turned OFF and ON again to validate setting changes.

Indicates the parameter classification.

#### (2) Notation for Selection Parameters

Parameter	Meaning	When Enabled	Classification
Pn50A	n.2□□□	After restart	Setup
	n.8□□□		

The number of the parameter.





























n.□□□□ indicates the function selection. The numbers in the boxes indicate the set values for each digit. This example indicates the 4th digit is 8.

This section explains the details of the function selection.

### 2.3.3 Parameter Setting Methods





















#### (1) Setting Method for Numeric Parameters

The following example shows how to change the setting of parameter Pn304 (JOG speed) to 1000 min<sup>-1</sup>.

Step	Display after Operation	Keys	Description
1	<pre> BB          -PRM/MON- Un000= 00000 Un002= 00000 Un008= 00000 Un00D=00000000           </pre>		Press the  Key to select the Parameter/Monitor Mode.
2	<pre> BB          -PRM/MON- Un000= 00000 Un002= 00000 Un008= 00000 Un00D=00000000           </pre>	 	Press the  or  Key to move the cursor to “Un.”
3	<pre> BB          -PRM/MON- Pn000=n.0000 Un002= 00000 Un008= 00000 Un00D=00000000           </pre>	 	Press the  or  Key to change “Un” to “Pn.”
4	<pre> BB          -PRM/MON- Pn000=n.0000 Un002= 00000 Un008= 00000puls e Un00D=00000000           </pre>		Press the  Key to move the cursor to the column on the right of “Pn.”
5	<pre> BB          -PRM/MON- Pn304=00500 Un002= 00000 Un008= 00000 Un00D=00000000           </pre>	   	Press the arrow keys to display “Pn304”. To move the cursor:  ,  Key To change the settings:  ,  Key
6	<pre> BB          -PRM/MON- Pn304=0050<u>0</u> Un002= 00000 Un008= 00000 Un00D=00000000           </pre>		Press the  Key to move the cursor to the one’s place of Pn304.
7	<pre> BB          -PRM/MON- Pn304=00<u>5</u>00 Un002= 00000 Un008= 00000 Un00D=00000000           </pre>		Press the  Key twice to move the cursor to the hundred’s place of Pn304.
8	<pre> BB          -PRM/MON- Pn304=01<u>0</u>00 Un002= 00000 Un008= 00000 Un00D=00000000           </pre>		Press the  Key five times to change the setting to “1000.”
9	<pre> BB          -PRM/MON- Pn304=01000 Un002= 00000 Un008= 00000 Un00D=00000000           </pre>		Press the  Key to write the settings.

## (2) Setting Method for Selection Parameters

The following example shows how to use application function selection switch 1 (Pn001) to change the setting for the stopping method at servo OFF and alarm occurrence from stopping using DB (Pn001 = n.0000) to stopping without DB (Pn001 = n.0002).

Step	Display after Operation	Keys	Description
1	<pre> BB          -PRM/MON- Un00<u>0</u>= 00000 Un002= 00000 Un008= 00000 Un00D=00000000           </pre>		Press the  Key to select the Parameter/Monitor Mode.
2	<pre> BB          -PRM/MON- <u>Un</u>000= 00000 Un002= 00000 Un008= 00000 Un00D=00000000           </pre>	 	Press the  or  Key to move the cursor to "Un."
3	<pre> BB          -PRM/MON- <u>Pn</u>000=n.0000 Un002= 00000 Un008= 00000 Un00D=00000000           </pre>	 	Press the  or  Key to change "Un" to "Pn."
4	<pre> BB          -PRM/MON- Pn00<u>0</u>=n.0000 Un002= 00000 Un008= 00000 Un00D=00000000           </pre>		Press the  Key three times to move the cursor to the left of "n."
5	<pre> BB          -PRM/MON- Pn00<u>1</u>=n.0000 Un002= 00000 Un008= 00000 Un00D=00000000           </pre>		Press the  Key to display "Pn001."
6	<pre> BB          -PRM/MON- Pn001=n.000<u>0</u> Un002= 00000 Un008= 00000 Un00D=00000000           </pre>		Press the  Key to move the cursor to the right edge.
7	<pre> BB          -PRM/MON- Pn001=n.000<u>2</u> Un002= 00000 Un008= 00000 Un00D=00000000           </pre>		Press the  Key twice to change the setting of "n.0000" to "n.0002."
8	<pre> BB          -PRM/MON- Pn001=n.000<u>2</u> Un002= 00000 Un008= 00000 Un00D=00000000           </pre>		Press the  Key to write the settings.

## 2.4 Monitor Mode (Un□□□)

The monitor mode can be used for monitoring the reference values, I/O signal status, and SERVOPACK internal status.

For details, refer to *7.2 Monitor Displays*.

The digital operator display numbers begin with Un.

The following four Un numbers are displayed with the factory settings.

BB		-PRM/MON-
Un000	=	00000
Un002	=	00000
Un008	=	00000
Un00D	=	00000000

← Shows the setting of Un000 (motor speed) as 0 min<sup>-1</sup>.