■Servo driver VPH Series Model/Driver type description

◎Driver type

VPH - H A
② ③

◎Driver model

NCR - H A 1 201 A - A - 0 0 0 □
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

①		NCR…Servo driver Series
②	Series name	H…VPH Series
③	Machine model type	A…I/O specification
		B…SSCNETⅢ/H specification
		C…CC-Link specification
		D…EtherCAT specification
		E…MECHATROLINK-Ⅲ specification
④	Input power supply specification	1…100 VAC system
		2…200 VAC system
⑤	Output capacity	Example) 201 … 20 1 =20×10^1 =200 W Exponential part of powers of 10 Significant figures
⑥	Hardware specification	A…Standard specification
⑦	Paired motor	A…τDISC
⑧	Analog option *1	0…None
		1…With
⑨	Absolute position compensation data incorporation	0…None
⑩	STO option *2	0…None
		1…With
⑪	Special model symbol	Without…Standard specification
		-S + sequential number…Special model specification

*1 Only the VPH-HA Type(I/O type) is supported.

*2 This option provides a safety function(Safe Torque Off: STO) to shut down the power supply to the τDISC connected to the VPH Series. It is intended for use to prevent an accident from occurring when the motor is powered on unexpectedly. For information about the safety functions and safety performance of this option, refer to "Servo driver VPH Series function specifications" on pp. 50 - 53. For details, refer to the "VPH Series STO Option Manual".

■Common specifications

Ambient condition	Temperature			During operation: 0 to 55℃ During storage: -20 to 65℃
	Humidity			During operation and storage: 90%RH or less; no condensation
	Installation location			Do not install in a harmful atmosphere containing corrosive gas, grinding oil, metal dust, oil, etc. Install in an indoor place not exposed to direct sunlight.
	Height above sea level			1,000 m or less
Vibration resistance				5.9 m/s^2 (10 to 55Hz) No resonance is allowed.
Drive method				3-phase sine wave PWM
Brake method				Regenerative brake: External regenerative resistor *1
Mounting type				Panel mounting
Performance *2	Speed control	Speed control range *3		1:5000 For the analog speed command 1:2000 *4
		Speed variation	Load characteristics	0 to 100% load: ±0.01% or less(at the rated speed)
			Voltage characteristics	Rated voltage ±10%: 0%(at the rated speed)
			Temperature characteristics	0 to 40℃: ±0.1% or less(at the rated speed) For the analog speed command ±0.2% or less *4
	Torque control	Resolution		1:1000(Up to the rated torque)
		Reproducibility		±1%(Up to the rated torque)

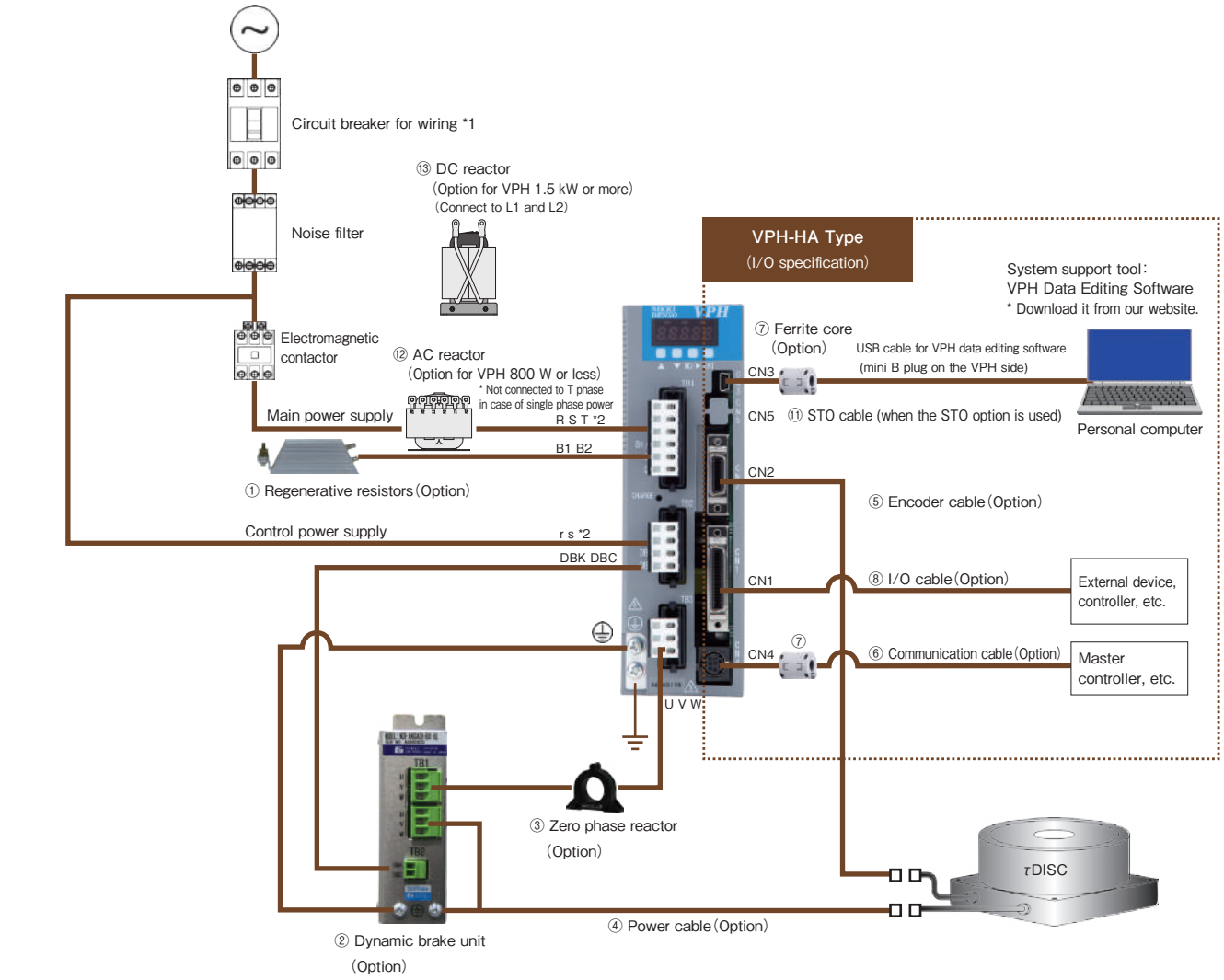
*1 The regenerative resistor is optional.

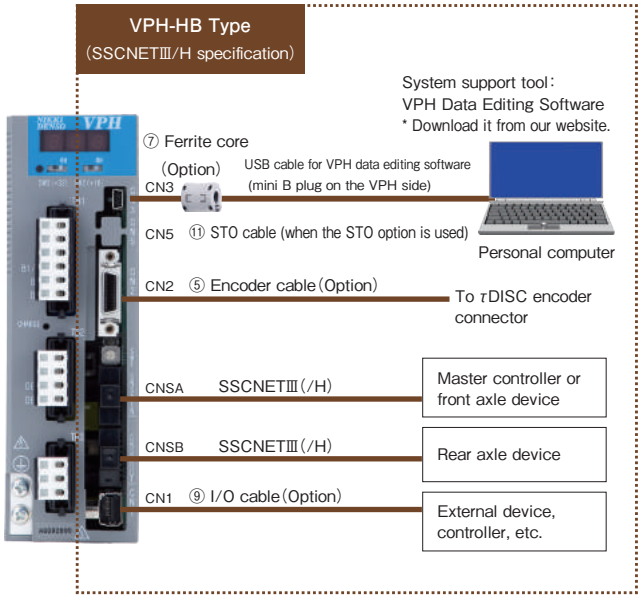
*2 The performance values are those of the servo driver itself. Depending on the combination with a motor, the performance values may not be met.

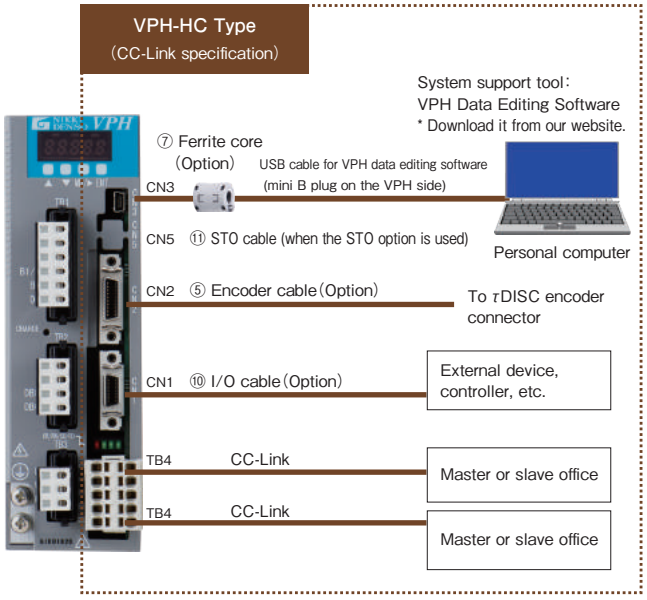
*3 It is assumed that the motor does not stop when the load is 100%.

*4 Applicable only to the VPH-HA Type(I/O specification).

Servo driver VPH Series System configuration



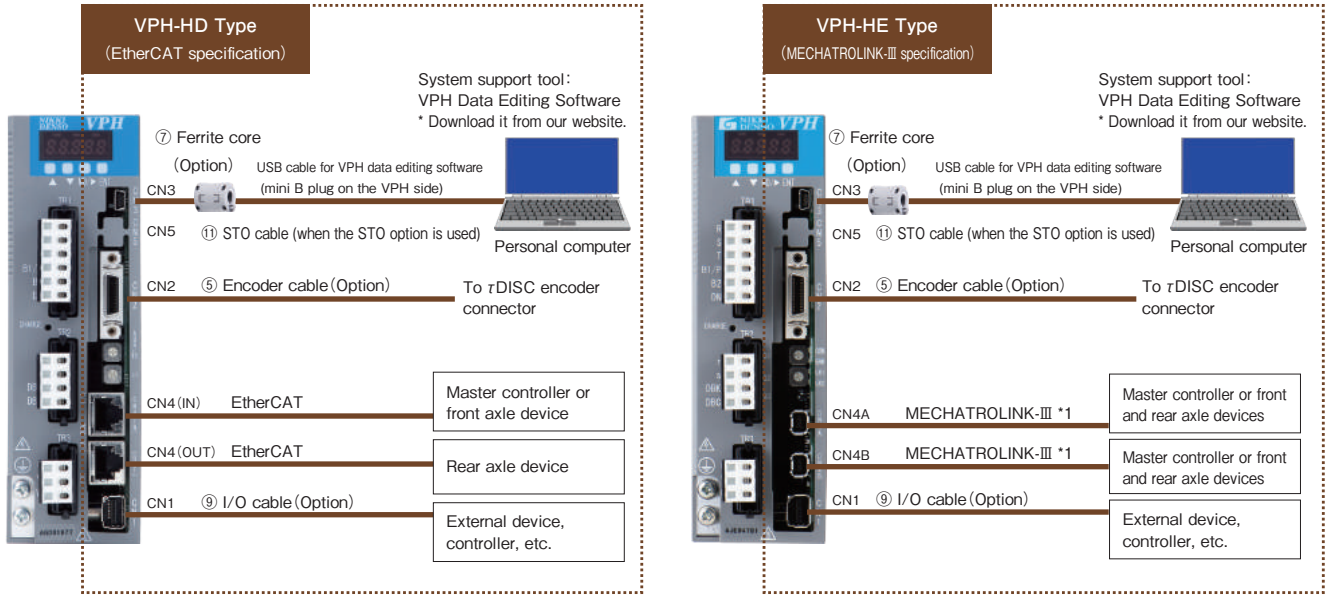




*1 When selecting the circuit breaker for wiring, refer to the values of the rated capacity in "Individual specifications for the VPH Series" on p.49.

*2 For details of the electric wire, refer to the section of the instruction manual of the relevant type of the VPH Series describing the application electric wire.

Servo driver VPH Series System configuration



*1 When connected to the KV-X controller manufactured by KEYENCE Corp., the connector on the KV-X side is an RJ-45 connector.
Use the MECHATROLINK-Ⅲ conversion cable (RJ-45/IMI conversion) SV2-L□A type manufactured by KEYENCE Corp.

◎Optional product description

No.	Product name/specifications	Description	Page
①	Regenerative resistors	Required when the smoothing capacitor of the VPH Series servo driver cannot consume all regenerative power. To determine whether this resistor is required, download the motor selection calculation tool (*1) from our website and make a check.	P.73
②	Dynamic brake unit	An auxiliary brake unit that prevents the connected motor from free-running due to an error in the VPH Series, power failure, etc.	P.72
③	Zero phase reactor	This reactor absorbs the noise generated by the VPH Series servo driver to reduce the effect of noise on the driver main unit and peripheral equipment.	P.69
④	Power cable	This cable is used to connect the motor power connector or terminal of the VPH Series servo driver with the power cable of the motor.	P.61,63-65
⑤	Encoder cable	This cable is used to connect the encoder feedback pulse input connector (CN2) of the VPH Series servo driver with the encoder and magnetic pole sensor.	P.61-62
⑥	Communication cable (For VPH-HA)	This cable is connected with the serial communication connector (CN4) of the VPH-HA Type servo driver to input and output data between the higher-level PLC computer link module or personal computer and the VPH Series.	P.68
⑦	Ferrite core	This option prevents malfunctions due to noise, such as monitor display interruption and the forced shutdown of the editing software.	P.68
⑧	I/O cable (For VPH-HA)	This cable is connected with the control input/output connector (CN1) of the VPH-HA Type servo driver to input and output signals.	P.66
⑨	I/O cable (For VPH-HB/HD/HE)	This cable is connected with the control input/output connector (CN1) of the VPH-HB/HD/HE Type servo driver to input and output signals.	P.67
⑩	I/O cable (For VPH-HC)	This cable is connected with the control input/output connector (CN1) of the VPH-HC Type servo driver to input and output signals.	P.67
⑪	STO cable	This cable is connected with the control input/output connector (CN5) of the VPH Series servo driver to input and output signals when the STO option is selected.	P.67
⑫	AC reactor	This reactor makes the waveform of the input current approximate to that of a sine wave to suppress harmonics. Option for the VPH Series products with an output capacity of 800 W or less.	P.70
⑬	DC reactor	This reactor makes the waveform of the input current approximate to that of a sine wave to suppress harmonics. Option for the VPH Series products with an output capacity of 1.5 kW or more.	P.71

*1 For information about the motor selection calculation tool of the τDISC HD-s Series, contact our sales staff.

■Servo driver VPH Series Individual specifications

Model		NCR-H□	1101A-A-□□□	1201A-A-□□□	2101A-A-□□□	2201A-A-□□□	2401A-A-□□□
Output capacity		W	100	200	100	200	400
Main circuit input power supply	Rated voltage	V	AC100 to 120 1φ		AC200 to 240 1φ or 3φ		
	Frequency	Hz	50/60		50/60		
	Permissible voltage fluctuation	V	AC85 to 132		AC170 to 264		
	Input rated current	Arms	3.0	6.0	1.5(1φ) 0.9(3φ)	3.0(1φ) 1.7(3φ)	5.5(1φ) 3.2(3φ)
	Rated capacity	kVA	0.3	0.6	0.3	0.6	1.1
	Inrush current	A	23【12ms】*1	23【12ms】*1	45【5ms】*2	45【5ms】*2	45【5ms】*2
Control circuit input power supply	Rated voltage	V	AC100 to 120 1φ		AC200 to 240 1φ		
	Frequency	Hz	50/60		50/60		
	Permissible voltage fluctuation	V	AC85 to 132		AC170 to 264		
	Input rated current	Arms	0.24	0.24	0.12	0.12	0.12
	Power consumption	W	15	15	15	15	15
	Inrush current	A	17【5ms】*1	17【5ms】*1	17【3ms】*2	17【3ms】*2	17【3ms】*2
Continuous output current		Arms	2.0	3.5	1.1	2.0	3.5
Instant output current		Arms	6.0	9.9	3.3	6.0	9.9
Structure(IP code)			Natural cooling(IP20)				
Weight		kg	Approx.1.0	Approx.1.0	Approx.1.0	Approx.1.0	Approx.1.0

Model		NCR-H□	2801A-A-□□□	2152A-A-□□□	2222A-A-□□□	2332A-A-□□□
Output capacity		W	800	1.5k	2.2k	3.3k
Main circuit input power supply	Rated voltage	V	AC200 to 240 1φ or 3φ	AC200 to 240 3φ		
	Frequency	Hz	50/60	50/60		
	Permissible voltage fluctuation	V	AC170 to 264			
	Input rated current	Arms	9.0(1φ) 5.2(3φ)	9.6	13.5	17.0
	Rated capacity	kVA	1.8	3.0	4.2	5.9
	Inrush current	A	45【9ms】*2	33【18ms】*2	33【18ms】*2	85【10ms】*2
Control circuit input power supply	Rated voltage	V	AC200 to 240 1φ			
	Frequency	Hz	50/60			
	Permissible voltage fluctuation	V	AC170 to 264			
	Input rated current	Arms	0.12	0.15	0.15	0.18
	Power consumption	W	15	18	18	20
	Inrush current	A	17【3ms】*2	17【3ms】*2	17【3ms】*2	34【2ms】*2
Continuous output current		Arms	6.8	10.0	16.0	24.0(25.0) *3
Instant output current		Arms	17.0	30.0	35.0	63.0
Structure(IP code)			Forced cooling(IP20)			
Weight		kg	Approx.1.5	Approx.2.3	Approx.2.3	Approx.3.7

Model		NCR-H□	2702A-A-□□□	2153A-A-□□□
Output capacity		W	7k	15k
Main circuit input power supply	Rated voltage	V	AC200 to 240 3φ	
	Frequency	Hz	50/60	
	Permissible voltage fluctuation	V	AC170 to 264	
	Input rated current	Arms	44.0	68.0
	Rated capacity	kVA	16.0	23.5
	Inrush current	A	73【30ms】*2	73【38ms】*2
Control circuit input power supply	Rated voltage	V	AC200 to 240 1φ	
	Frequency	Hz	50/60	
	Permissible voltage fluctuation	V	AC170 to 264	
	Input rated current	Arms	0.4	0.4
	Power consumption	W	45	45
	Inrush current	A	26【3ms】*2	26【3ms】*2
Continuous output current		Arms	48.0	62.6
Instant output current		Arms	96.0	125.2
Structure(IP code)			Forced cooling(IP00)	
Weight		kg	Approx.7.5	Approx.9.5

*1 Value applicable when the rated voltage is 120 VAC. The value shown in brackets is the time constant of the inrush current. Roughly three times the value in brackets is equivalent to the time it takes before the inrush current dies down.

*2 Value applicable when the rated voltage is 240 VAC. The value shown in brackets is the time constant of the inrush current. Roughly three times the value in brackets is equivalent to the time it takes before the inrush current dies down.

*3 Shown in parentheses is the value applicable when UL standard compliance is not required.

■Servo driver VPH Series Functional specifications

◎VPH-HA Type(I/O specification)

Item \ Type(Model)		VPH-HA Type(NCR-HA□□□□A-A-□□□)
Operation mode		Speed command operation, torque command operation, and pulse train command operation, and built-in command operation
Speed command	Internal speed command	7 points; Selected by the control signal(setting unit: speed specification)
	Analog command(Option)	1 point; Input voltage range: -12 to +12 V(resolution: 14 bits) Any voltage can be set for the maximum speed.
	Acceleration/deceleration	Values between 0 and 99.999 sec can be set for acceleration and deceleration, respectively.
Torque command	Internal torque command	7 points; Selected by the control signal(setting unit: 0.1%)
	Analog command(Option)	1 point; Input voltage range: -12 to +12 V(resolution: 14 bits) Any voltage can be set for the rated torque.
	Torque increase/decrease time	0 to 9.999 sec
Pulse command	Command style	Line driver method: Up to 6.25 Mpps(1-time multiplication) 90° phase difference pulse(1-, 2-, and 4-time multiplication), directional pulse(1- and 2-time multiplication), or directional signal + feed pulse(1- and 2-time multiplication) can be selected.
	Pulse command compensation	8 points A/B(A, B：1 to 99999999)
	S-curve Acceleration/deceleration	8 points(0 to 1.000 sec)
Built-in command	Setting unit	deg、mm、inch、μm、pulse、kpulse
	Jog	8 speeds
	Command	256 points; 3 types POS(positioning) ：ABS/INC INDX(index positioning) ：Shortcut/unidirectional HOME(zero return) ： STD, LS LESS, OT HOME, CURRENT POSITION, OT HOME LS LESS, SET ABS, OUT POS
	Acceleration/deceleration	8 points(Values between 0 and 99.999 sec can be set for acceleration and deceleration, respectively.)
	S-curve Acceleration/deceleration	8 points(0 to 1.000 sec)
	Coordinate management	Infinite feed Absolute position management -2147483648 to +2147483647 Load axis one rotation position management(e.g., 0 to 359 degrees or -179 to +180 degrees)
Servo adjustment item	Gain change	4 points(changed according to the GSL1 and GSEL2 signals and operation conditions)
	Feed forward	Speed feed forward ratio, speed feed forward shift ratio, inertia torque feed forward ratio, viscous friction torque feed forward ratio
	Filter	Feedback filter, torque command filter, 5 torque command notch filters, speed feed forward filter, torque feed forward filter
	Auto-tuning	Position gain, speed loop gain/integral time constant setting
Control input signal		8 external input signals. The following signals can be assigned to these signals. *1 RST(reset) / ARST(alarm reset) / EMG(emergency stop) SON(servo on) / DR(drive) / CLR(deviation clear) CIH(pulse train command prohibition) / TL(torque limit) / FOT(forward direction over travel) ROT(reverse direction over travel) / MD1 to MD2(mode selection 1 to 2) / GSL1 to GSL2(gain selection 1 to 2) RVS(command direction reversal) / SS1 to SS8(command selection 1 to 8) ZST(positioning start) / ZLS(zero point deceleration) / ZMK(external marker) TRG(external trigger) / CMDZ(command zero) / ZCAN(positioning cancellation) FJOG(forward direction jog) / RJOG(reverse direction jog) / MTOH(motor overheat) The status of the control input signal can be fixed to ON or OFF. When assigned to an external input signal, the signal logic can be changed.
Control output signal		4 external output signals. The following signals can be assigned to these signals. *1 ALM(alarm) / WNG(warning) / RDY(servo ready) SZ(speed zero) / PE1 to PE2(position deviation range 1 to 2) / PN1 to PN2(positioning complete 1 to 2) PZ1 to PZ2(positioning complete response 1 to 2) / ZN(command complete) / ZZ(command complete response) ZRDY(command start ready) / PRF(rough match) / VCP(speed reached) BRK(break release) / LIM(limited) / EMGO(emergency stop in process) HCP(zero return complete) / HLDZ(command zero in process) / OTO(over travel in process) MTON(motor on) / OUT1 to OUT8(common output) SMOD(speed command mode in process) / TMOD(torque command mode in process) / PMOD(Pulse train command mode in process) NMOD(Built-in command mode in process) / OCEM(Marker output in process) When assigned to an external output signal, the signal logic can be changed(except OCEM).
Error detection		Encoder error, over speed error, motor overload error, device overload error, under voltage error, over voltage error, over current error, servo control error, cable disconnection error, magnetic pole error, deviation error, backup data error, CPU error, etc. 5 alarms stored in the history
Holding break(BRK signal)		BRK(break release) signal set to OFF in the motor power off status With control for vertical axis drop prevention(drop prevention control disabled in case of a power error)
Dynamic brake		External dynamic brake unit(option) Activated in the motor power off status
Encoder pulse output		Line driver method: 90° phase difference pulse + marker The marker output signal can also be output as the control output signal. The maximum width that can be set is 2 ms. Dividing frequency output by hardware: Maximum output frequency of 25 Mpps(4-time multiplication) Control output by software: Maximum output frequency of 20.46 Mpps(4-time multiplication) Pulse output division：A/B(A, B：1 to 99999999) Current position data pulse output function(outputs as many pulses as the value of the current position.)
Torque limit command		Set in units of 0.1% by the relevant parameter.
Compensation function		Absolute position compensation(option; refer to p.42), torque compensation
Display function		CHARGE, power LED, front data display 5-digit LED panel
Communication function		USB 2.0(full speed) standard compliance: 1 channel for connection between personal computer(VPH data editing software) and device RS-422：1ch
SEMI F47 compatible function		Torque limit function when the main circuit voltage drops(The control power must be supplied from a UPS.)
Safety function(Option)		STO(IEC/EN61800-5-2)
Safety performance(Option)		EN ISO13849-1 Cat3 PL e EN61508 SIL3

*1 For the initial assignment of the 8 external input signals and 4 external output signals, refer to "Servo driver VPH Series external connection diagram VPH-HA Type" on P.56.

■Servo driver VPH Series Functional specifications

◎VPH-HB Type(SSCNETⅢ/H specification)/◎VPH-HD Type(EtherCAT specification)

Item		Type(Model)	VPH-HB Type(NCR-HB□□□□A-A-□□□)	VPH-HD Type(NCR-HD□□□□A-A-□□□)
Communication mode	Operation mode		Speed command operation, torque command operation, and position control operation	
	Speed command	Command input	Command by SSCNETⅢ(/H)	Issued from the CoE object dictionary (Cyclic synchronous speed mode)
		Acceleration/deceleration	Values between 0 and 99.999 sec can be set for acceleration and deceleration, respectively.	–
	Torque command	Command input	Command by SSCNETⅢ(/H)	Issued from the CoE object dictionary (Cyclic synchronous torque mode)
		Torque increase/decrease time	0 to 9.999 sec	–
	Position control	Command input	Command by SSCNETⅢ(/H)	Issued from the CoE object dictionary (Cyclic synchronous position mode, profile position mode, zero return mode)
		S-curve Acceleration/deceleration	2 points(0 to 1.000 sec)	8 points(0 to 1.000 sec) (changed by the CoE object dictionary)
	Servo adjustment item	Gain change	2 points(changed according to the gain change command from SSCNETⅢ(/H) and operating conditions)	4 points(changed by the CoE object dictionary)
		Feed forward	Speed feed forward ratio, speed feed forward shift ratio, inertia torque feed forward ratio, viscous friction torque feed forward ratio	
		Filter	Feedback filter, torque command filter, 5 torque command notch filters, speed feed forward filter, torque feed forward filter	
Maintenance mode *1	Operation mode		Speed command, torque command, and built-in command operation modes	
	Speed command	Internal speed command	7 points; Selected by the control signal(setting unit: speed specification)	
		Acceleration/deceleration	Values between 0 and 99.999 sec can be set for acceleration and deceleration, respectively.	
	Torque command	Internal torque command	7 points; Selected by the control signal(setting unit: 0.1%)	
		Torque increase/decrease time	0 to 9.999 sec	
	Built-in command	Setting unit	pulse	
		Jog	8 speeds	
		Command	256 points; 3 types POS(positioning) : ABS/INC INDX(index positioning) : Shortcut/unidirectional HOME(zero return) : STD, LS LESS, OT HOME, CURRENT POSITION, OT HOME LS LESS, SET ABS	
		Acceleration/deceleration	8 points(Values between 0 and 99.999 sec can be set for acceleration and deceleration, respectively.)	
		S-curve Acceleration/deceleration	8 points(0 to 1.000 sec)	
		Coordinate management	Infinite feed Absolute position management -2147483648 to +2147483647 Load axis one rotation position management(e.g., 0 to 359 degrees or -179 to +180 degrees)	
	Servo adjustment item	Gain change	4 points(changed according to the GSL1 and GSEL2 signals and operation conditions)	
		Feed forward	Speed feed forward ratio, speed feed forward shift ratio, inertia torque feed forward ratio, viscous friction torque feed forward ratio	
		Filter	Feedback filter, torque command filter, 5 torque command notch filters, speed feed forward filter, torque feed forward filter	
		Auto-tuning	Position gain, speed loop gain/integral time constant setting	
Control input signal			4 external input signals In communication mode, the following signals can be assigned. *2 ARST(alarm reset) EMG(emergency stop) TL(torque limit) FOT(forward direction over travel) ROT(reverse direction over travel) ZLS(zero point deceleration) MTOH(motor overheat)	5 external input signals In communication mode, the following signals can be assigned. *2 EMG(emergency stop) FOT(forward direction over travel) ROT(reverse direction over travel) GSL1 to GSL2(gain selection 1 to 2) ZLS(zero point deceleration) ZMK(external zero point marker) IN1 to IN2(common input 1 to 2) MTOH(motor overheat)
			When assigned to an external input signal, the signal logic can be changed. The status of the control input signal can be fixed to ON or OFF.	
Control output signal			2 external output signals In communication mode, the following signals can be assigned. *2 ALM(alarm) WNG(warning) RDY(servo ready) SZ(speed zero) PE1 to PE2(position deviation range 1 to 2) PN1 to PN2(positioning complete 1 to 2) ZZ(command complete response) ZRDY(command start ready) PRF(rough match) VCP(speed reached) BRK(break release) LIM(limited) EMGO(emergency stop in process) HCP(zero return complete) OTO(over travel in process) MTON(motor on) SMOD(speed command mode in process) TMOD(torque command mode in process) PMOD(position control mode in process) NMOD(Built-in command mode in process) OCEM(marker output)	3 external output signals In communication mode, the following signals can be assigned. *2 ALM(alarm) WNG(warning) RDY(servo ready) SZ(speed zero) PE1 to PE2(position deviation range 1 to 2) PN1 to PN2(positioning complete 1 to 2) ZZ(command complete response) ZRDY(command start ready) PRF(rough match) VCP(speed reached) BRK(break release) LIM(limited) EMGO(emergency stop in process) HCP(zero return complete) OTO(over travel in process) MTON(motor on) SMOD(speed command mode in process) TMOD(torque command mode in process) PMOD(position control mode in process) NMOD(Built-in command mode in process) OCEM(marker output)
			When assigned to an external output signal, the signal logic can be changed(except OCEM).	
Error detection			Encoder error, over speed error, motor overload error, device overload error, under voltage error, over voltage error, over current error, servo control error, phase error, magnetic pole error, deviation error, backup data error, CPU error, etc. 5 alarms stored in the history	
Holding break(BRK signal)			BRK(break release) signal set to OFF in the motor power off status With control for vertical axis drop prevention(drop prevention control disabled in case of a power error)	
Dynamic brake			External dynamic brake unit(option). Activated in the motor power off status	
Torque limit command			Set in units of 0.1% by the relevant parameter.	Issued from the CoE object dictionary(set in units of 0.1%)
Compensation function			Absolute position compensation(option; refer to p.42), torque compensation	
Display function			CHARGE, 3-digit LED data display in the front	CHARGE, power LED, front data display 5-digit LED panel
Communication function			USB 2.0(full speed) standard compliance: 1 channel for connection between personal computer(VPH data editing software) and device	
SEMI F47 compatible function			Torque limit function when the main circuit voltage drops(The control power must be supplied from a UPS.)	
Safety function(Option)			STO(IEC/EN61800-5-2)	
Safety performance(Option)			EN ISO13849-1 Cat3 PL e EN61508 SIL3	

*1 In maintenance mode, the VPH servo driver operates independently.

*2 The signals that can be assigned in maintenance mode are different. For details, refer to the section of the instruction manual of the relevant type of the VPH Series describing the control input and output signals.
For the initial assignment of the external input and output signals, refer to "Servo driver VPH Series external connection diagram VPH-HB Type" on P.57 and "Servo driver VPH Series external connection diagram VPH-HD Type" on P.59.

◎Mitsubishi Electric controllers that can be connected to SSCNETⅢ(/H)

●Motion controller

iQ-R Series	·R32MTCPU、R16MTCPU	Supported OS version: 07 or later
Q Series	·Q173DSCPU、Q172DSCPU、Q170MSCPU(Stand-alone type)	Supported OS: Transport and assembly(SV13) and automatic equipment(SV22) Supported OS version: 00J or later

●Simple motion unit

iQ-R Series	·RD77MS□	Supported serial number: First 2 digits 07 or later
Q Series	·QD77MS□	Supported serial number: First 5 digits 17102 or later
L Series	·LD77MS□	Supported serial number: First 5 digits 17102 or later
iQ-F Series	·FX5-□□SSC-S	Supported version: 1.004 or later

●Position board MR-MC1□□、MR-MC2□□

■Servo driver VPH Series Functional specifications

◎VPH-HC Type(CC-Link specification)

Item \ Type(Model)		VPH-HC Type(NCR-HC□□□□A-A-□□□)
Operation mode		Speed command operation, torque command operation, and pulse train command operation, and built-in command operation
Speed command	Internal speed command	7 points; Selected by the control signal(setting unit: speed specification)
	Acceleration/deceleration	Values between 0 and 99.999 sec can be set for acceleration and deceleration, respectively.
Torque command	Internal torque command	7 points; Selected by the control signal(setting unit: 0.1%)
	Torque increase/decrease time	0 to 9.999 sec
Pulse command	Command style	Line driver method: Up to 6.25 Mpps(1-time multiplication) 90° phase difference pulse(1-, 2-, and 4-time multiplication), directional pulse(1- and 2-time multiplication), or directional signal + feed pulse(1- and 2-time multiplication) can be selected.
	Pulse command compensation	8 points A/B(A, B : 1 to 99999999)
	S-curve Acceleration/deceleration	8 points(0 to 1.000 sec)
Built-in command	Setting unit	deg、mm、inch、μm、pulse、kpulse
	Jog	8 speeds
	Command	256 points; 3 types POS(positioning) : ABS/INC INDEX(index positioning) : Shortcut/unidirectional HOME(zero return) : STD, LS LESS, OT HOME, CURRENT POSITION, OT HOME LS LESS, SET ABS
	Acceleration/deceleration	8 points(Values between 0 and 99.999 sec can be set for acceleration and deceleration, respectively.)
	S-curve Acceleration/deceleration	8 points(0 to 1.000 sec)
	Coordinate management	Infinite feed Absolute position management -2147483648 to +2147483647 Load axis one rotation position management(e.g., 0 to 359 degrees or -179 to +180 degrees)
Servo adjustment item	Gain change	4 points(changed according to the GSL1 and GSEL2 signals and operation conditions)
	Feed forward	Speed feed forward ratio, speed feed forward shift ratio, inertia torque feed forward ratio, viscous friction torque feed forward ratio
	Filter	Feedback filter, torque command filter, 5 torque command notch filters, speed feed forward filter, torque feed forward filter
	Auto-tuning	Position gain, speed loop gain/integral time constant setting
Control input signal		4 external input signals. The following signals can be assigned to these signals. *1 RST(reset) / ARST(alarm reset) / EMG(emergency stop) SON(servo on) / DR(drive) / CLR(deviation clear) CIH(pulse train command prohibition) / TL(torque limit) / FOT(forward direction over travel) ROT(reverse direction over travel) / MD1 to MD2(mode selection 1 to 2) / GSL1 to GSL2(gain selection 1 to 2) RVS(command direction reversal) / SS1 to SS8(command selection 1 to 8) ZST(positioning start) / ZLS(zero point deceleration) / ZMK(external marker) TRG(external trigger) / CMDZ(command zero) / ZCAN(positioning cancellation) FJOG(forward direction jog) / RJOG(reverse direction jog) / MTOH(motor overheat) The status of the control input signal can be fixed to ON or OFF. When assigned to an external input signal, the signal logic can be changed.
Control output signal		2 external output signals. The following signals can be assigned to these signals. *1 ALM(alarm) / WNG(warning) / RDY(servo ready) SZ(speed zero) / PE1 to PE2(position deviation range 1 to 2) / PN1 to PN2(positioning complete 1 to 2) PZ1 to PZ2(positioning complete response 1 to 2) / ZN(command complete) / ZZ(command complete response) ZRDY(command start ready) / PRF(rough match) / VCP(speed reached) BRK(break release) / LIM(limited) / EMGO(emergency stop in process) HCP(zero return complete) / HLDZ(command zero in process) / OTO(over travel in process) MTON(motor on) / OUT1 to OUT8(common output) SMOD(speed command mode in process) / TMOD(torque command mode in process) / PMOD(Pulse train command mode in process) NMOD(Built-in command mode in process) / OCEM(marker output) When assigned to an external output signal, the signal logic can be changed(except OCEM).
Error detection		Encoder error, over speed error, motor overload error, device overload error, under voltage error, over voltage error, over current error, servo control error, cable disconnection error, magnetic pole error, deviation error, backup data error, CPU error, etc. 5 alarms stored in the history
Holding break(BRK signal)		BRK(break release) signal set to OFF in the motor power off status With control for vertical axis drop prevention(drop prevention control disabled in case of a power error)
Dynamic brake		External dynamic brake unit(option) Activated in the motor power off status
Torque limit command		Set in units of 0.1% by the relevant parameter.
Compensation function		Absolute position compensation(option; refer to p.42), torque compensation
Display function		CHARGE, power LED, front data display 5-digit LED panel
Communication function		・USB 2.0(full speed) standard compliance: 1 channel for connection between personal computer(VPH data editing software) and device ・CC-Link(Ver.1.10) : 1ch
SEMI F47 compatible function		Torque limit function when the main circuit voltage drops(The control power must be supplied from a UPS.)
Safety function(Option)		STO(IEC / EN61800-5-2)
Safety performance(Option)		EN ISO13849-1 Cat3 PL e EN61508 SIL3

*1 For the initial assignment of the 8 external input signals and 4 external output signals, refer to "Servo driver VPH Series external connection diagram VPH-HC Type" on P.58.

■Servo driver VPH Series Functional specifications

◎VPH-HE Type(MECHATROLINK-Ⅲ specification)

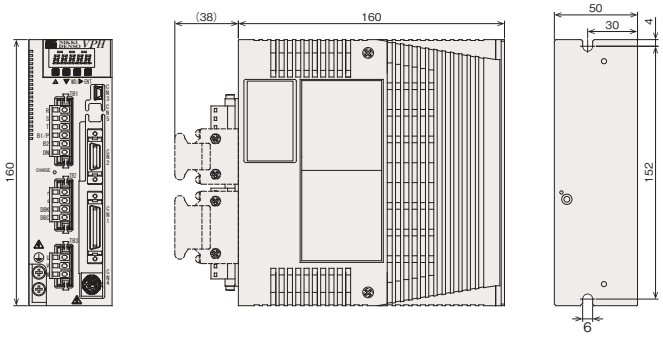
Item \ Type(Model)			VPH-HE Type (NCR-HE□□□□A-A-□□□)
Communication mode	Operation mode		Speed command operation, torque command operation, and position control operation
	Speed command	Command input	Issued from MECHATROLINK-Ⅲ
	Torque command	Command input	Issued from MECHATROLINK-Ⅲ
	Position control	Command input	Issued from MECHATROLINK-Ⅲ
		S-curve Acceleration/deceleration	8 points(0 to 1.000 sec)
	Servo adjustment item	Gain change	4 points(changed to the gain number specified in network selection and changed according to operation conditions)
		Feed forward	Speed feed forward ratio, speed feed forward shift ratio, inertia torque feed forward ratio, viscous friction torque feed forward ratio
		Filter	Feedback filter, torque command filter, 5 torque command notch filters, speed feed forward filter, torque feed forward filter
Maintenance mode *1	Operation mode		Speed command, torque command, and built-in command operation modes
	Speed command	Internal speed command	8 points; Selected by the control signal(setting unit: speed specification)
		Acceleration/deceleration	Values between 0 and 99.999 sec can be set for acceleration and deceleration, respectively.
	Torque command	Internal torque command	8 points; Selected by the control signal(setting unit: 0.1%)
		Torque increase/decrease time	0 to 9.999 sec
	Built-in command	Setting unit	pulse
		Jog	8 speeds
		Command	256 points; 3 types POS(positioning) : ABS/INC INDEX(index positioning) : Shortcut/unidirectional HOME(zero point return) : STD HOME, LS LESS, OT HOME, STOP HOME, OT LSLESS, SET ABS, OUT POS
		Acceleration/deceleration	8 points(Values between 0 and 99.999 sec can be set for acceleration and deceleration, respectively.)
		S-curve Acceleration/deceleration	8 points(0 to 1.000 sec)
		Coordinate management	Infinite feed Absolute position management -2147483648 to +2147483647 Load axis one rotation position management(e.g., 0 to 359 degrees or -179 to +180 degrees)
	Servo adjustment item	Gain change	4 points(changed according to the GSL1 and GSEL2 signals and operation conditions)
		Feed forward	Speed feed forward ratio, speed feed forward shift ratio, inertia torque feed forward ratio, viscous friction torque feed forward ratio
		Filter	Feedback filter, torque command filter, 5 torque command notch filters, speed feed forward filter, torque feed forward filter
		Auto-tuning	Position gain, speed loop gain/integral time constant setting
Control input signal			5 external input signals. In communication mode, the following signals can be assigned. *2 ARST(alarm reset) EMG(emergency stop) TL(torque limit) FOT(forward direction over travel) ROT(reverse direction over travel) GSL1 to GSL2(gain selection 1 to 2) ZLS(zero point deceleration) ZMK(external zero point marker) MTOH(motor overheat) EXT1 to EXT3(1st to 3rd external latch inputs) When assigned to an external input signal, the signal logic can be changed. The status of the control input signal can be fixed to ON or OFF.
Control output signal			3 external output signals. In communication mode, the following signals can be assigned. *2 ALM(alarm) WNG(warning) RDY(servo ready) SZ(speed zero) PE1 to PE2(position deviation range 1 to 2) PN1 to PN2(positioning complete 1 to 2) ZZ(command complete response) ZRDY(command start ready) PRF(rough match) VCP(speed reached) BRK(break release) LIM(limited) EMGO(emergency stop in process) HCP(zero return complete) OTO(over travel in process) MTON(motor on) PMOD(position control mode in process) NMOD(Built-in command mode in process) OCEM(marker output) When assigned to an external output signal, the signal logic can be changed(except OCEM).
Error detection			Encoder error, over speed error, motor overload error, device overload error, under voltage error, over voltage error, over current error, servo control error, phase error, magnetic pole error, deviation error, backup data error, CPU error, etc. 5 alarms stored in the history
Holding break(BRK signal)			BRK(break release) signal set to OFF in the motor power off status With control for vertical axis drop prevention(drop prevention control disabled in case of a power error)
Dynamic brake			External dynamic brake unit(option) Activated in the motor power off status
Torque limit command			Set in units of 0.1% by the relevant parameter.
Compensation function			Absolute position compensation(option; refer to p.42), torque compensation
Display function			CHARGE, power LED, front data display 5-digit LED panel
Communication function			・MECHATROLINK-Ⅲ:2ch ・USB 2.0(full speed) standard compliance: 1 channel for connection between personal computer(VPH data editing software) and device
SEMI F47 compatible function			Torque limit function when the main circuit voltage drops(The control power must be supplied from a UPS.)
Safety function(Option)			STO(IEC/EN61800-5-2)
Safety performance(Option)			EN ISO13849-1 Cat3 PL e EN61508 SIL3

*1 In maintenance mode, the VPH servo driver operates independently.

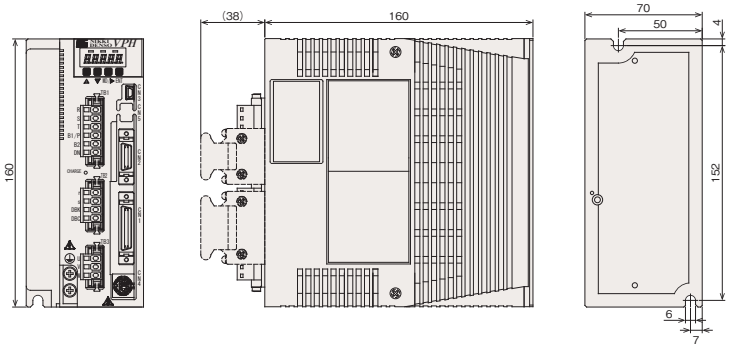
*2 The signals that can be assigned in maintenance mode are different. For details, refer to the section of the instruction manual of the relevant VPH type describing the control input and output signals. For the initial assignment of the external input and output signals, refer to "Servo driver VPH Series external connection diagram VPH-HE Type" on P.60.

Servo driver VPH Series Dimensions

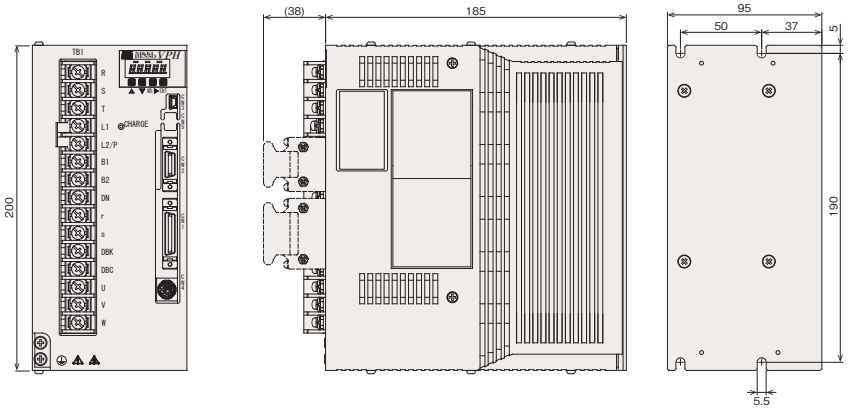
NCR-H□1101A/1201A-A-□□□
NCR-H□2101A/2201A/2401A-A-□□□



NCR-H□2801A-A-□□□



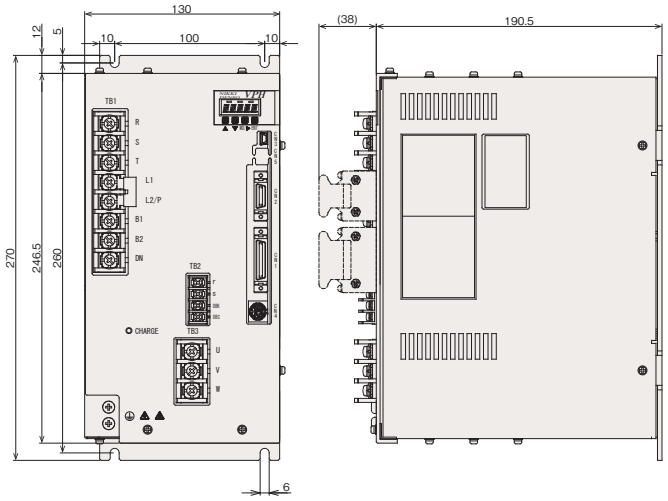
NCR-H□2152A/2222A-A-□□□



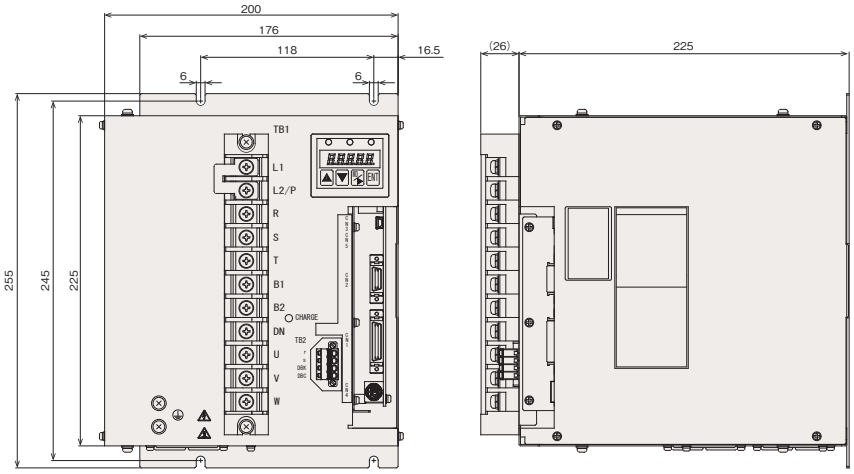
* The above dimensions are those of the VPH-HA Type. The dimensions of the VPH-HB/HC/HD/HE Type are the same.

■Servo driver VPH Series Dimensions

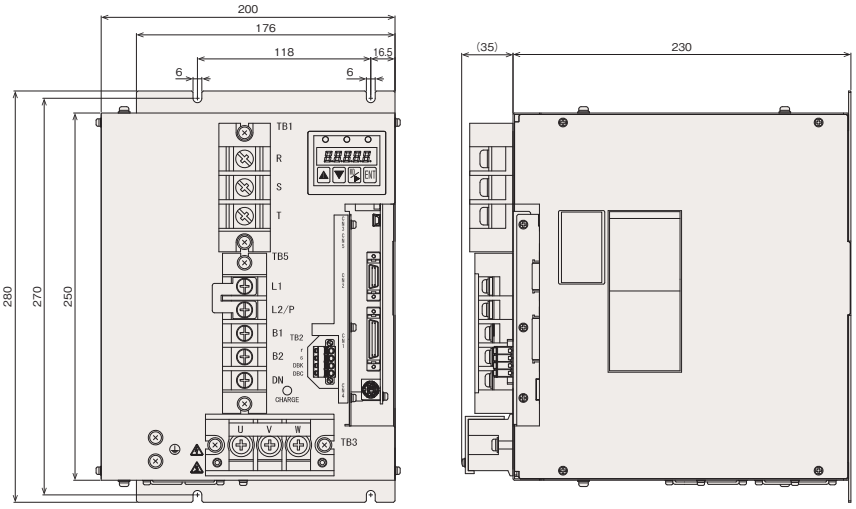
NCR-H□2332A-A-□□□



NCR-H□2702A-A-□□□



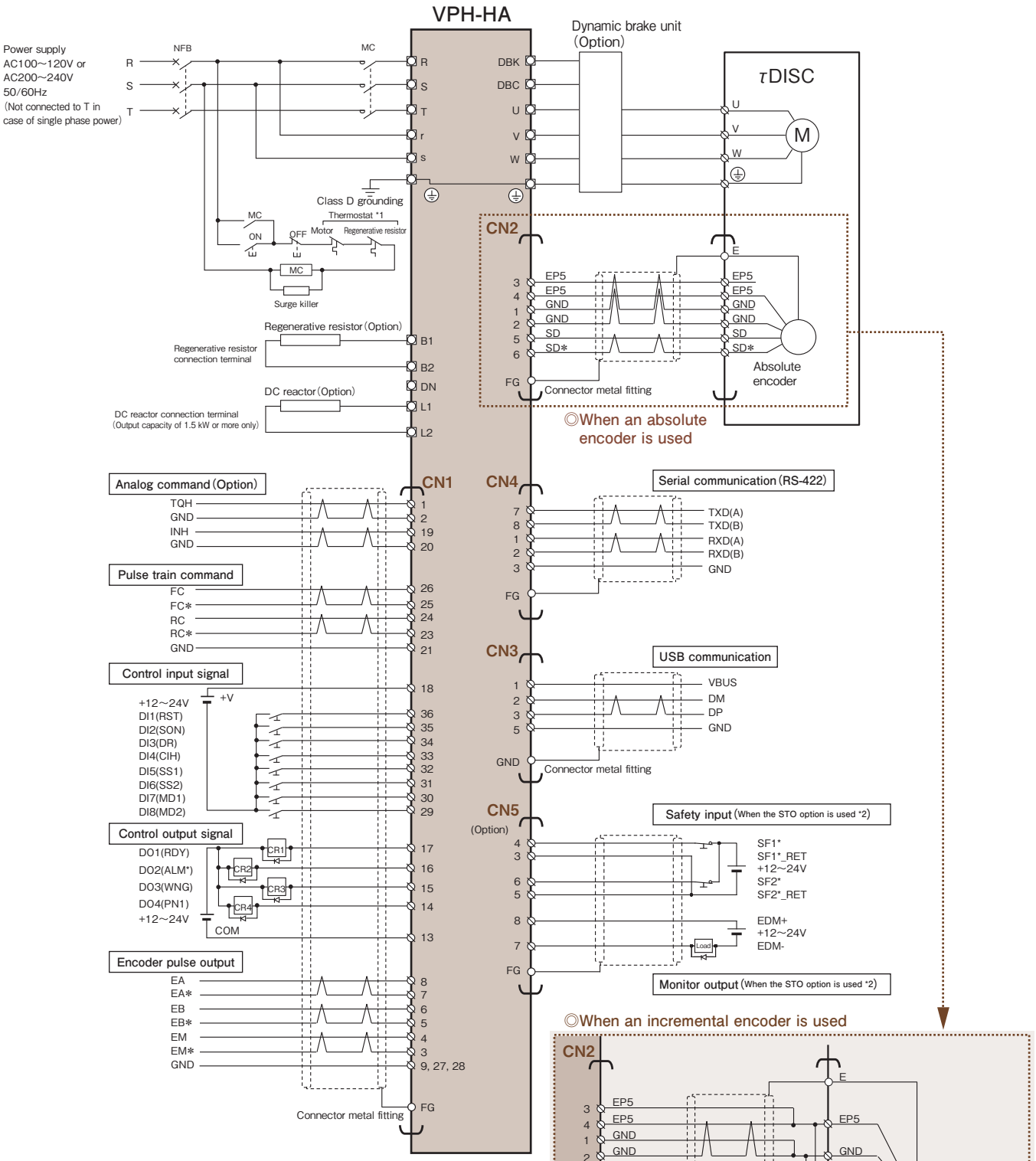
NCR-H□2153A-A-□□□



* The above dimensions are those of the VPH-HA Type. The dimensions of the VPH-HB/HC/HD/HE Type are the same.

■Servo driver VPH Series External wiring diagram

◎VPH-HA Type(I/O specification)



* COM of the CN1 connector is common to the control input and output signals. GND is common to the internal control power supply(+5V) in the servo driver.

* Since COM of CN1 and GND are isolated, do not use common wiring or bundle them together.

* The status of the switch connected to a control input signal indicates the OFF status of the input signal.

* A control input or output signal whose name is shown in parentheses is used as the initial value of the relevant parameter.

* A control input or output signal marked with a * mark uses negative logic as the initial value.

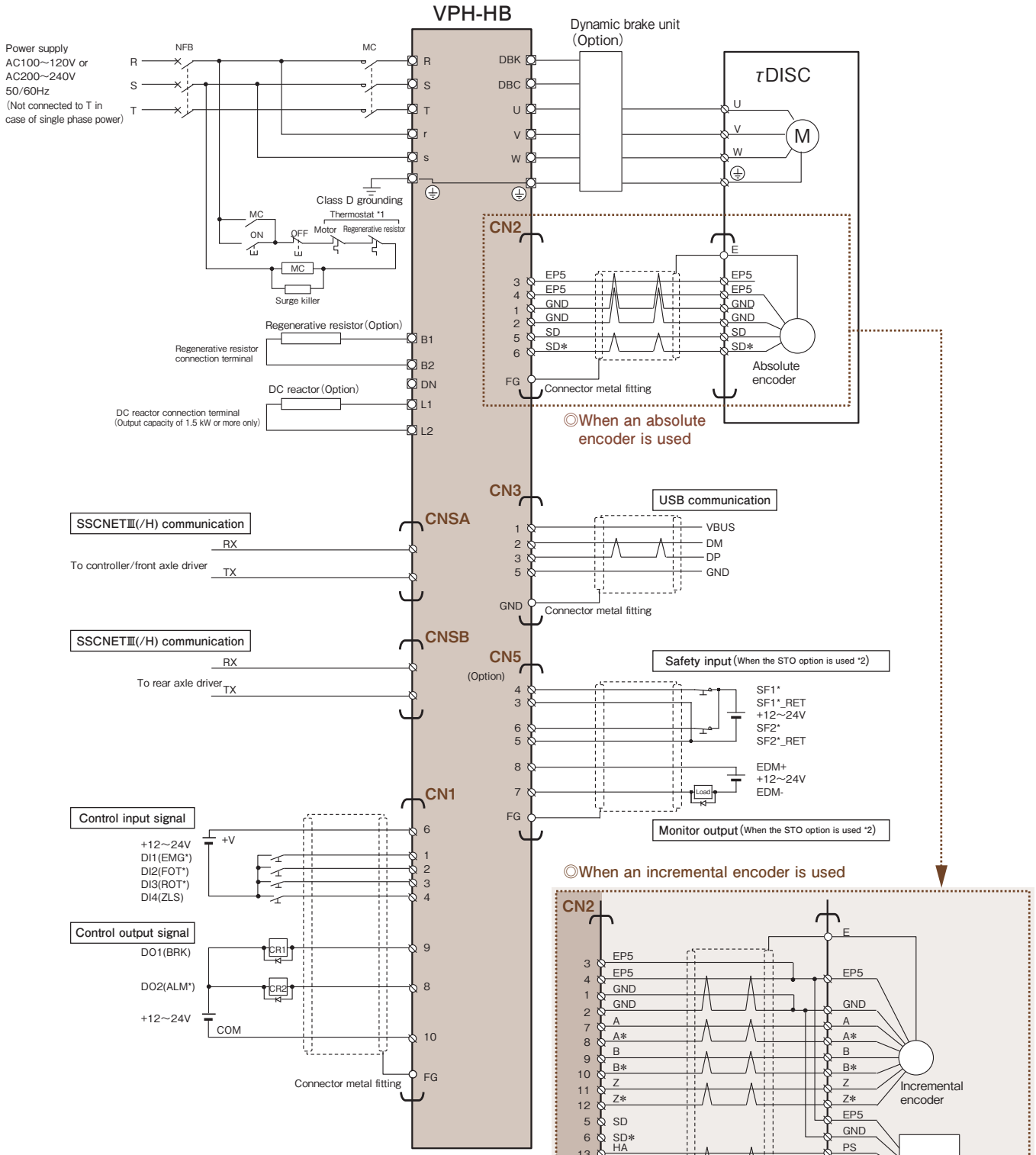
* A control input signal power supply(+12 V, 2.5 mA to +24 V, 5 mA) must be prepared by the user.

*1 The motor is not equipped with a thermostat.

*2 When the STO option is used, the servo driver is shipped with the STO short-circuit plug(for details, refer to P.67) connected to CN5 as an accessory.

■Servo driver VPH Series External wiring diagram

◎VPH-HB Type(SSCNETⅢ/H specification)



* COM of the CN1 connector is common to the control input and output signals. GND is common to the internal control power supply(+5V) in the servo driver.

* Since COM of CN1 and GND are isolated, do not use common wiring or bundle them together.

* The status of the switch connected to a control input signal indicates the OFF status of the input signal.

* A control input or output signal whose name is shown in parentheses is used as the initial value of the relevant parameter.

* A control input or output signal marked with a * mark uses negative logic as the initial value.

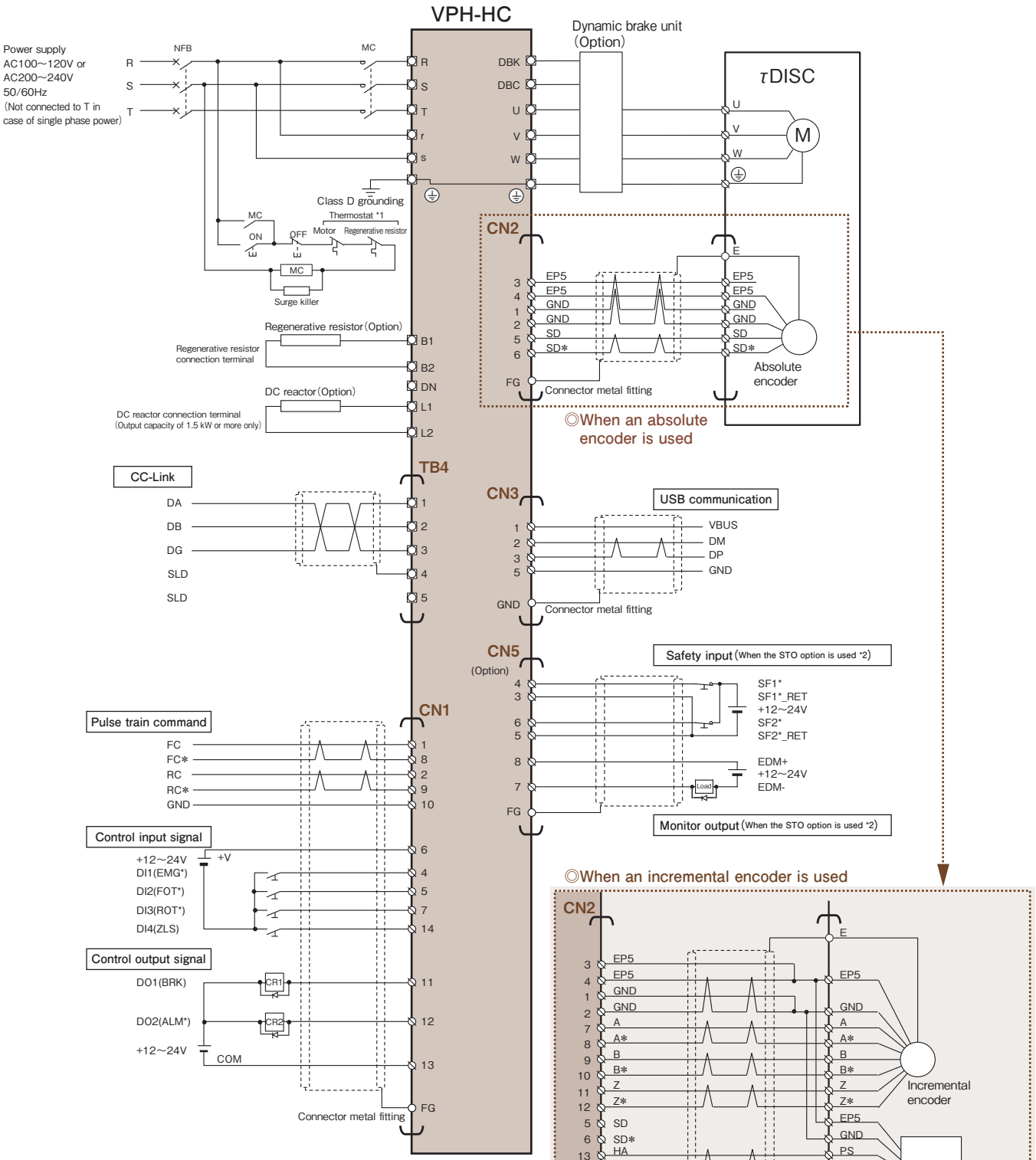
* A control input signal power supply(+12 V, 2.5 mA to +24 V, 5 mA) must be prepared by the user.

*1 The motor is not equipped with a thermostat.

*2 When the STO option is used, the servo driver is shipped with the STO short-circuit plug(for details, refer to P.67) connected to CN5 as an accessory.

■Servo driver VPH Series External wiring diagram

◎VPH-HC Type(CC-Link specification)



* COM of the CN1 connector is common to the control input and output signals. GND is common to the internal control power supply (+5V) in the servo driver.

* Since COM of CN1 and GND are isolated, do not use common wiring or bundle them together.

* The status of the switch connected to a control input signal indicates the OFF status of the input signal.

* A control input or output signal whose name is shown in parentheses is used as the initial value of the relevant parameter.

* A control input or output signal marked with a * mark uses negative logic as the initial value.

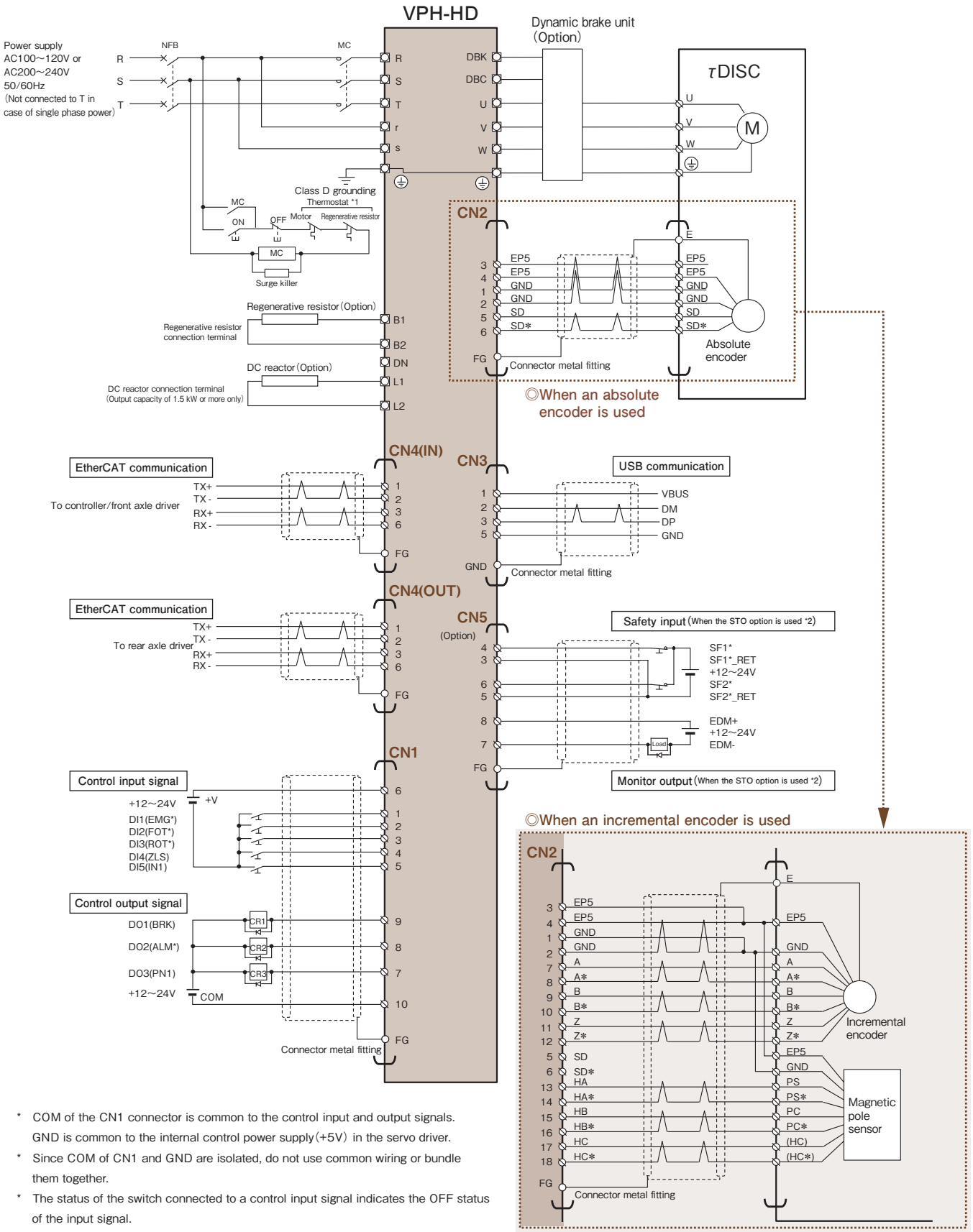
* A control input signal power supply (+12 V, 2.5 mA to +24 V, 5 mA) must be prepared by the user.

*1 The motor is not equipped with a thermostat.

*2 When the STO option is used, the servo driver is shipped with the STO short-circuit plug (for details, refer to P.67) connected to CN5 as an accessory.

■Servo driver VPH Series External wiring diagram

◎VPH-HD Type (EtherCAT specification)



* COM of the CN1 connector is common to the control input and output signals. GND is common to the internal control power supply (+5V) in the servo driver.

* Since COM of CN1 and GND are isolated, do not use common wiring or bundle them together.

* The status of the switch connected to a control input signal indicates the OFF status of the input signal.

* A control input or output signal whose name is shown in parentheses is used as the initial value of the relevant parameter.

* A control input or output signal marked with a * mark uses negative logic as the initial value.

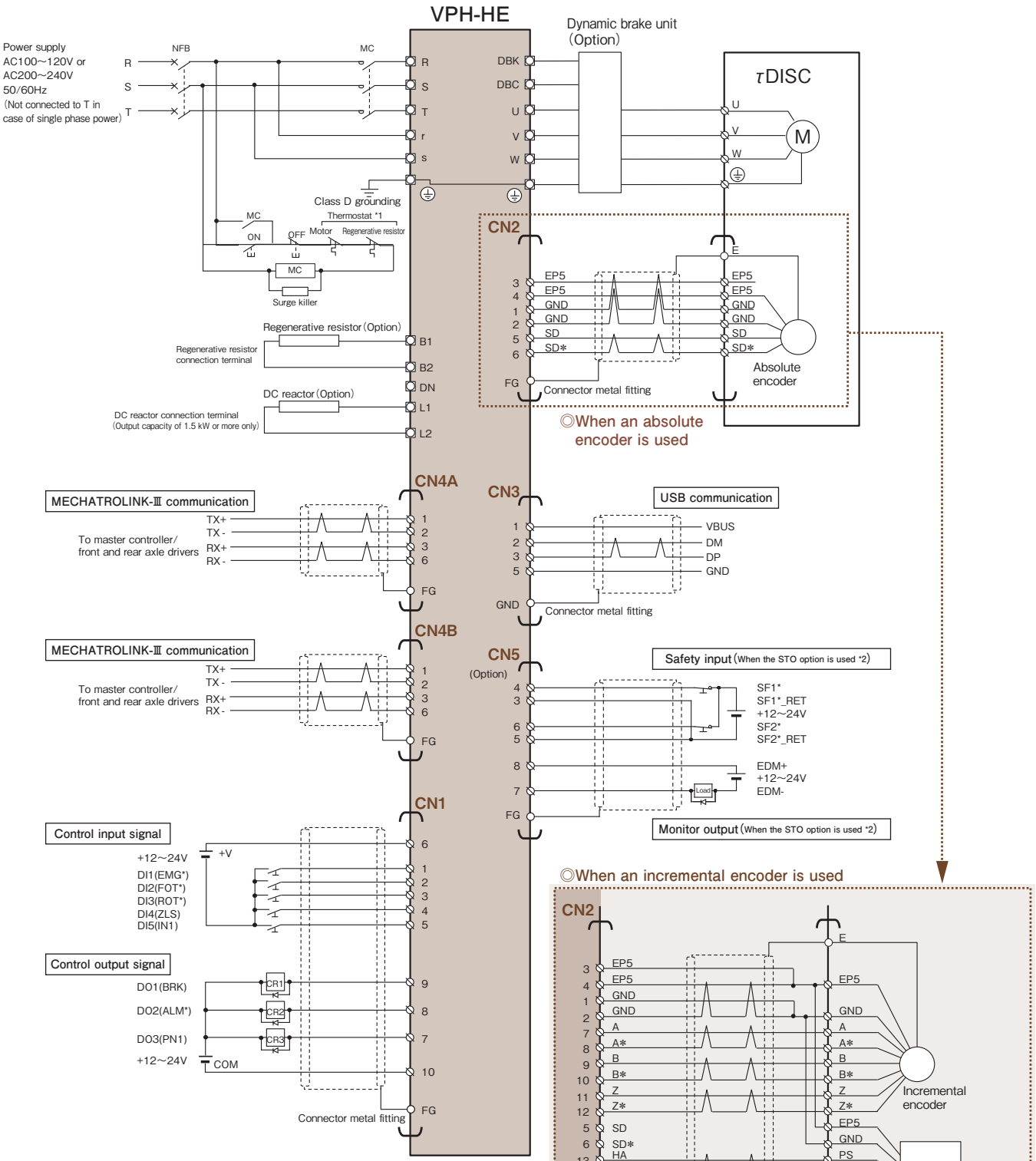
* A control input signal power supply (+12 V, 2.5 mA to +24 V, 5 mA) must be prepared by the user.

*1 The motor is not equipped with a thermostat.

*2 When the STO option is used, the servo driver is shipped with the STO short-circuit plug (for details, refer to P.67) connected to CN5 as an accessory.

■Servo driver VPH Series External wiring diagram

◎VPH-HE Type(MECHATROLINK-Ⅲ specification)



* COM of the CN1 connector is common to the control input and output signals. GND is common to the internal control power supply (+5V) in the servo driver.

* Since COM of CN1 and GND are isolated, do not use common wiring or bundle them together.

* The status of the switch connected to a control input signal indicates the OFF status of the input signal.

* A control input or output signal whose name is shown in parentheses is used as the initial value of the relevant parameter.

* A control input or output signal marked with a * mark uses negative logic as the initial value.

* A control input signal power supply (+12 V, 2.5 mA to +24 V, 5 mA) must be prepared by the user.

*1 The motor is not equipped with a thermostat.

*2 When the STO option is used, the servo driver is shipped with the STO short-circuit plug (for details, refer to P.67) connected to CN5 as an accessory.