

Fuji Spindle Drive System for Machine Tools

FRENIC 5000MS5



Let Fuji give you the best match:
Its spindle drive system and your machine tools.

FRENIC 5000MS5

The FRENIC5000MS5 system consists of several component function blocks and spindle motors. By combining these components, the user can configure a drive system for machine tool spindles including a main shaft and tool shafts. The numerous system functions support advanced and integrated machine tool control.



FEATURES

1. A variety of models for the optimum choice

- The M5 series uses torque vector control. The high-performance V5 series for vector control uses a sensor.
- For each series, two types of braking systems are available: dynamic braking and regenerative braking.

2. Multiple-spindle drive with a single converter

- A converter unit is used to control two or more drive units, enabling construct of a multiple-spindle drive system using only one converter.

3. Conformity to EC Directive

- All system components, including drive units, converter units, spindle motors, and options, conform to the EC Directive. (Under application for the TÜV approval) This ensures compatibility of the system with the international safety standard.
- The drive unit interface for input signals and transistor output is connectable to both sink- and source-type circuits.

4. Improved performance

- The M5 series integrates Fuji's unique digital-AVR (Automatic Voltage Regulator) and torque-vector control techniques to greatly reduce spindle wow as compared with the M3 series, thus reducing machine gear noise levels.
- The constant-output speed ranges of the MVS spindle motors have been extended to shorten acceleration/deceleration time.

5. Reduced function unit size

- The mounting footprint was reduced to 60% of previous models by improvements in the heat-sink structure and other design changes.
- The heights of all function unit models have been standardized. The depths of all function units have also been standardized. These units require only a small space in a control panel when they are mounted side-by-side.

6. Enhanced optional functions

- A rigid-tapping and polygon machining functions have been added to the options to increase the level of machining, thus achieving integrated machine tool control.
- An optional program loading feature for Windows 95-based personal computers is available. This feature enables users to monitor the system operating status or to specify many machining functions at one time from a single personal computer.

Model nomenclature (Example)

Drive unit/Converter unit

FRENIC5000 series

Rated output (kW, at 50% ED)

FRN

7.5

MC5 - 2

For 200V AC

Unit type

- ☐ M5 M5 package type drive unit
- ☐ V5 V5 package type drive unit
- ☐ MC5 M5 drive unit

- ☐ VC5 V5 drive unit
- ☐ PD5 Dynamic braking converter unit
- ☐ PR5 Regenerative braking converter unit

System Components

The FRENIC5000MS5 system consists of two series: The M5 series, which uses torque vector control without sensors, and the high-performance V5 series, which uses vector control with sensors. Each of the series includes spindle motors, drive units, converter units.

(1) Converter unit

- A converter unit supplies the main electric power to the drive units.
- When using a converter unit, select either a dynamic braking converter unit, which consumes braking energy in a resistor, or a regenerative braking converter unit which feeds the braking energy back to the power supply line.
- One converter unit can supply primary power to two or more drive units if the total output of the drive units does not exceed the converter output rating.

(2) Drive unit

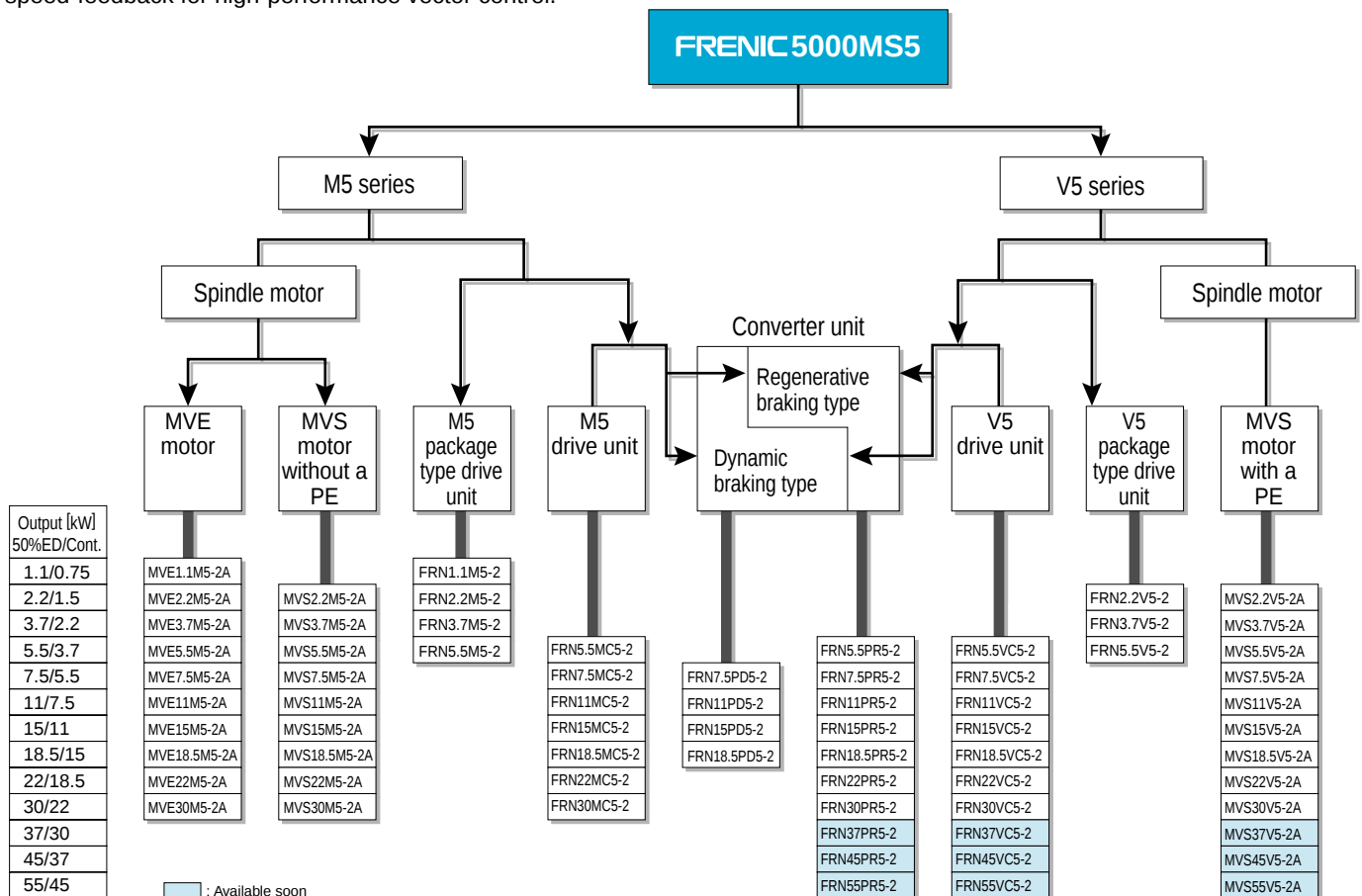
- A drive unit receives the main electric power from a converter unit to drive the spindle motor.
- When using a drive unit, select either an M5 drive unit or a V5 drive unit. The M5 drive unit performs torque-vector control without using speed-feedback, while the V5 drive unit uses a speed-feedback for high-performance vector control.

(3) Package type drive unit

- This type of unit has the functions described in items (1) and (2), above. When using this type, use either an M5 package type drive unit for the torque-vector control without using speed feedback, or a V5 package type drive unit for high-performance vector control using a speed-feedback.

(4) Spindle motor

- Spindle motors are classified into MVS types and MVE types.
- The MVS types with a pulse encoder (PE) are for use in the V5 series system; ones without a PE are for M5 series system.
- The MVE types are for use in M5 series systems.



Spindle motor

Motor type

- MVS** MVS type spindle motor
MVE MVE type spindle motor

MVS 7.5 M5 - 2 A

Rated output
(kW, at 50% ED)

For 200V AC
PE

Mounting type

- A** Foot mounted
G Flange mounted

- M5** Not provided
V5 Provided (for MVS only)

Specifications

◆ Dynamic braking converter unit ◆

Available soon.

Type (FRN...)		7.5PD5-2	11PD5-2	15PD5-2	18.5PD5-2
Output rating	Cont. rating	Output (kW)	5.5	7.5	11
		DC voltage (V)	270 to 330V DC		
	50%ED rating	Output (kW)	7.5	11	15
		DC voltage (V)	270 to 330V DC		
Input power	Phases, voltage, frequency		3-phase 3-wire, 200V/50Hz, 200-230V/60Hz		
	Allowable variation		Voltage : +10 to -15%, Imbalance in power supply voltage (*1) : 3% or less		
	Required power supply capacity (kVA)		17	22	28
Heat loss emanated inside panel (W) (during cont. rated operation) (*2)		80(35)	100(45)	160(60)	230(80)
Braking	Braking method		Dynamic braking		
	Cyclic duration factor (%ED)		10% ED (using optional braking resistor)		
	Braking torque		120% of 50%ED rated torque of applied drive unit for 1 min.		
Mass (Approx. kg)		5	5	6	6

◆ Regenerative braking converter unit ◆

Type (FRN...)		5.5PR5-2	7.5PR5-2	11PR5-2	15PR5-2	18.5PR5-2	22PR5-2	30PR5-2	37PR5-2	45PR5-2	55PR5-2
Output rating	Cont. rating	Output (kW)	3.7	5.5	7.5	11	15	18.5	22	30	37
		DC voltage (V)	270 to 330V DC								
	50%ED rating	Output (kW)	5.5	7.5	11	15	18.5	22	30	37	45
		DC voltage (V)	270 to 330V DC								
Input power	Phases, voltage, frequency		3-phase 3-wire, 200V/50Hz, 200-230V/60Hz								
	Allowable variation		Voltage : +10 to -15%, Imbalance in power supply voltage (*1) : 3% or less								
	Required power supply capacity (kVA)		9	12	17	22	28	34	45	55	67
Heat loss emanated inside panel (W) (during cont. rated operation) (*3)		105(45)	135(60)	180(80)	270(115)	330(140)	400(170)	480(190)	—	—	—
Braking	Braking method		Regenerative braking								
	Cyclic duration factor (%ED)		30%ED								
	Braking torque		120% of 50%ED rated torque of applied drive unit for 1 min.								
Mass (Approx. kg)		6	6	6	8	8	9	9	—	—	—

◆ M5 drive unit ◆

Type (FRN...)			5.5MC5-2	7.5MC5-2	11MC5-2	15MC5-2	18.5MC5-2	22MC5-2	30MC5-2
Output rating	Cont. rating	Output (kW)	3.7	5.5	7.5	11	15	18.5	22
		Current (A)	22	33	45	54	75	88	105
	50% ED raring	Output (kW)	5.5	7.5	11	15	18.5	22	30
		Current (A)	28	41	57	74	88	101	136
	Overload capacity		120% of 50% ED rated output for 1 min.						
Input power	Power supply method		DC input from MS5 series converter unit						
	Input voltage		283 to 325V DC						
	Allowable variation		Voltage : +10 to -15%, Imbalance in power supply voltage (*1) : 3% or less						
	Momentary power dip capability		When the input voltage is 165V or more, the unit can be operated continuously but the output may be reduced. When the input voltage drops below 165V from the rated voltage, the unit can be operated for 15ms.						
Heat loss emanated inside panel (W) (during cont. rated operation) (*2)			175(70)	235(90)	320(125)	400(150)	550(220)	650(260)	720(280)
Speed control	Speed control range (r/min)		30 to 8000 (*4)			30 to 6000 (*4)			
	Base speed (r/min)		1500						
Braking	Braking method		Dynamic braking and regenerative braking by MS5 series converter unit						
	Applied converter unit (*5)	Dynamic braking	—	7.5PD5-2	11PD5-2	15PD5-2	18.5PD5-2	—	—
		Regenerative braking	5.5PR5-2	7.5PR5-2	11PR5-2	15PR5-2	18.5PR5-2	22PR5-2	30PR5-2
Mass (Approx. kg)			6	6	6	8	8	9	9

◆ V5 drive unit ◆

Type (FRN...)			5.5VC5-2	7.5VC5-2	11VC5-2	15VC5-2	18.5VC5-2	22VC5-2	30VC5-2	37VC5-2	45VC5-2	55VC5-2	
Output rating	Cont. rating	Output (kW)	3.7	5.5	7.5	11	15	18.5	22	30	37	45	
		Current (A)	22	33	45	54	75	88	105	137	167	211	
	50% ED rating	Output (kW)	5.5	7.5	11	15	18.5	22	30	37	45	55	
		Current (A)	28	41	57	74	88	101	136	166	195	248	
	Overload capacity		120% of 50% ED rated output for 1 min.										
Input power	Power supply method		DC input from MS5 series converter unit										
	Input voltage		283 to 325V DC										
	Allowable variation		Voltage : +10 to -15%, Imbalance in power supply voltage (*1) : 3% or less										
	Momentary power dip capability		When the input voltage is 165V or more, the unit can be operated continuously but the output may be reduced. When the input voltage drops below 165V from the rated voltage, the unit can be operated for 15ms.										
Heat loss emanated inside panel (W) (during cont. rated operation) (*2)			175(70)	235(90)	320(125)	400(150)	550(220)	650(260)	720(280)	—	—	—	
Speed control	Speed control range (r/min)		30 to 8000				30 to 6000				30 to 4500		30 to 4000
	Base speed (r/min)		1500								1150		1000
Braking	Braking method		Dynamic braking and regenerative braking by MS5 series converter unit										
	Applied converter unit (*5)	Dynamic braking	—	7.5PD5-2	11PD5-2	15PD5-2	18.5PD5-2	—	—	—	—	—	
		Regenerative braking	5.5PR5-2	7.5PR5-2	11PR5-2	15PR5-2	18.5PR5-2	22PR5-2	30PR5-2	37PR5-2	45PR5-2	55PR5-2	
Mass (Approx. kg)			6	6	6	8	8	9	9	—	—	—	

◆ M5 package type drive unit ◆

Type (FRN...)		FRN1.1M5-2	FRN2.2M5-2	FRN3.7M5-2	FRN5.5M5-2
Output rating	Cont. rating	Output (kW)	0.75	1.5	2.2
		Current (A)	5.3	11	17
	50%ED rating	Output (kW)	1.1	2.2	3.7
		Current (A)	7	14	24
	Overload capacity		120% of 50% ED rated torque for 1 min.		
Input power	Phases, voltage, frequency		3-phase 3-wire, 200V/50Hz, 200-230V/60Hz		
	Allowable variation		Voltage: +10 to -15%, Imbalance in power supply voltage (*1): 3% or less		
	Momentary power dip capability		When the input voltage is 165V or more, the unit can be operated continuously but the output may be reduced. When the input voltage drops below 165V from the rated voltage, the unit can be operated for 15ms.		
Heat loss emanated inside panel (W) (during cont. rated operation) (*2)		75(50)	120(70)	165(90)	230(110)
Speed control	Speed control range (r/min) *4)		30 to 6000		
	Base speed (r/min)		1500		
Braking	Braking method		Dynamic braking		
	Breaking torque		120% of 50% ED rated torque for 1 min.		
	Cyclic duration factor		10% ED or 20% ED (using optional braking resistor)		
Mass (Approx. kg)		5.5	5.5	5.5	6.0

◆ V5 package type drive unit ◆

Type (FRN...)		FRN2.2V5-2	FRN3.7V5-2	FRN5.5V5-2
Output rating	Cont. rating	Output (kW)	1.5	2.2
		Current (A)	11	17
	50%ED rating	Output (kW)	2.2	3.7
		Current (A)	14	24
	Overload capacity		120% of 50% ED rated torque for 1 min.	
Input power	Phases, voltage, frequency		3-phase 3-wire, 200V/50Hz, 200-230V/60Hz	
	Allowable variation		Voltage : +10 to -15%, Imbalance in power supply voltage (*1) : 3% or less	
	Momentary power dip capability		When the input voltage is 165V or more, the unit can be operated continuously but the output may be reduced. When the input voltage drops below 165V from the rated voltage, the unit can be operated for 15ms.	
Heat loss emanated inside panel (W) (during cont. rated operation) (*2)		120(70)	165(90)	230(110)
Speed control	Speed control range (r/min)		30 to 8000	
	Base speed (r/min)		1500	
Braking	Braking method		Dynamic braking	
	Breaking torque		120% of 50% ED rated torque for 1 min.	
	Cyclic duration factor		10% ED or 20% ED (using optional braking resistor)	
Mass (Approx. kg)		5.5	5.5	6.0

Notes: (*1) Imbalance rate of power supply voltage (%)= $\frac{(\text{Max. voltage (V)} - \text{Min. voltage (V)})}{3\text{-phase average voltage (V)}} \times 100$

(*2) Value excluding the loss emanated from the heat sink outside. Value in () indicates the heat loss from the heat sink outside.

(*3) Value excluding the loss emanated from the heat sink outside. Value in () indicates the heat loss from the heat sink outside. Other than these losses, the attached "AC reactor for regenerative braking converter unit" also generates heat loss. For this heat loss, please refer to the table on page 11.

(*4) When the MVE spindle motor is driven by the unit, the maximum speed depends on the motor specifications.

(*5) This is a standard combination where one drive unit is combined to one converter unit. In order to combine more than one drive units with one converter unit, select a converter unit having a higher output (cont. rating) than the total output (cont. rating) of the drive units to be used.

Specifications

◆ Unit common specifications ◆

Item			Specifications
Control	Operation	Speed (frequency) setting signal	Analog signal : 0 to +10V DC (+10V at max.speed (frequency), while 0 to $\pm$ 10V DC (+10V at max. speed) for V5 series
		Override signal	$\pm$ 0 to 50% of speed (frequency) setting signal (by 1% step)
		Digital(contact) input	Forward operation command, Reverse operation command, Coast-to-stop command, 2nd setting selection, Torque limiting selection, M gear selection, L gear selection, Simplified orientation start/stop command, External fault, Alarm reset, etc.
	Running status signal	Transistor output	2nd setting selection complete, Under torque limiting, Arbitrary speed(frequency), Level detection, Speed (frequency) arrival, Speed(frequency) zero level detection.
		Analog output	Output for speedometer (frequency meter) (0 to +10V DC), Output for load meter/ammeter (0 to +10V DC).
Acceleration/deceleration			Torque limiting accel/decel, Non-linear accel/decel, etc.
Indication	Running/stopped		Output speed (frequency), Output current, Motor speed, Output torque, DBR %ED, On-off status of input or output signals
	Program mode		Indicates function codes and data in 7 segment LED monitor.
	Tripped		Indicates cause of trip by code in 7 segment LED monitor.
Protection	Overvoltage		Detects DC link circuit overvoltage (400V DC) at braking mode to stop the unit.
	Overcurrent		Detects overcurrent on output side to stop the unit.
	Undervoltage		Detects DC link circuit voltage drop to stop the unit.
	Short-circuit		Detects overcurrent due to short-circuit on output side to protect the unit.
	Unit overload		Protects the unit with electronic thermal overload and by detecting abnormal temperature rise inside.
	Unit overheating		Detects abnormal temperature rise inside to protect the unit.
	Motor overload		Protects motor with NTC thermistors.
	External fault		Inputs external fault signal to stop the unit.
	CPU error		Detects CPU error with WDT (Watch dog timer) to stop the unit.
Incoming surge			4kV (1.2 x 50 μ s)
Cooling method			Natural cooling for up to 2.2/1.5kW, Fan cooling for 5.5/3.7kW or more
Installation method			External cooling
Applied standards			IEC1800-2, IEC1800-3
Environment	Location		Indoor, not more than 1000m above sea level. Do not install in a dusty location or expose to corrosive gases or direct sunlight (Install inside IP54 panel).
	Ambient temperature		-10 to +55 °C (-10 to +40 °C for heat sink)
	Humidity		5 to 85%RH during operating (Non-condensing)
	Vibration		5.9m/s ² or less
	Storage		-25 to +55 °C, 5 to 95%RH (Non-condensing)

◆ Spindle motor standard specifications ◆

<MVE spindle motor>

□ : Available soon.

Type (MVE...)			1.1M5-2□	2.2M5-2□	3.7M5-2□	5.5M5-2□	7.5M5-2□	11M5-2□	15M5-2□	18.5M5-2□	22M5-2□	30M5-2□
Output rating	Cont. rating	Output (kW)	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22
		Torque (N•m)	4.8	7.0	14.0	23.5	35.0	47.7	70.0	95.5	117.7	140.0
	50%ED rating	Output (kW)	1.1	2.2	3.7	5.5	7.5	11	15	18.5	22	30
		Torque (N•m)	9.5	14.0	23.5	35.0	47.7	70.0	95.5	117.7	140.0	190.9
Moment of rotor inertia (kg•m ²)			0.002	0.007	0.0095	0.016	0.027	0.035	0.087	0.12	0.16	0.19
Base speed (r/min)			1500									
Max. speed (r/min)			6000									4500
Output characteristics			Fig. A									Fig. B
Mounting method			Horizontal foot mounted (IMB3, IMV5), Flange mounted (IMB5, IMV1)									
Cooling	Cooling method		Forced fan cooling (A cooling fan blows air over the motor toward the drive-end.)									
	Fan motor input		1ø, 40W, 2P				1ø, 40W, 4P			3ø, 120W, 4P		
Noise level			70dB (A) or less							75dB (A) or less		
Vibration level			V5									
Finishing color			Munsell N5									
Mass (Approx. kg)			Refer to the outline drawings.									

Note : □ in the type section indicates A for foot mounted, or G for flange mounted.

<MVS spindle motor>

Motor type with PE (MVS...V5)			2.2V5-2	3.7V5-2	5.5V5-2	7.5V5-2	11V5-2	15V5-2	18.5V5-2	22V5-2	30V5-2	37V5-2	45V5-2	55V5-2
Motor type without PE (MVS...M5)			2.2M5-2	3.7M5-2	5.5M5-2	7.5M5-2	11M5-2	15M5-2	18.5M5-2	22M5-2	30M5-2	—	—	—
	Cont. rating	Output (kW)	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45
		Torque (N•m)	7.0	14.0	23.5	35.0	47.7	70.0	95.5	117.7	140.0	249.0	307.0	429.5
	50%ED rating	Output (kW)	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55
		Torque (N•m)	14.0	23.5	35.0	47.7	70.0	95.5	117.7	140.0	190.9	307.0	373.5	525.0
Moment of rotor inertia (kg•m²)			0.008	0.008	0.014	0.019	0.026	0.047	0.058	0.083	0.083	0.33	0.42	0.78
Base speed (r/min)			1500									1150		1000
Max. speed (r/min)			8000					6000		4500			4000	
Output characteristics			Fig. C		Fig. D			Fig. E			Fig. F		Fig. G	
Mounting method			Horizontal foot mounted (IMB3, IMV5), Flange mounted (IMB5, IMV1)											
Cooling	Cooling method		Forced fan cooling (A cooling fan blows air over the motor toward the anti-drive-end.)											
	Fan motor input		1ø, 40W, 2P			1ø, 70W, 2P		3ø, 70W, 2P			3ø, 210W, 4P		3ø, 310W, 4P	
Noise level			70dB (A)					75dB (A)			80dB (A)			
Vibration level			V5											
Finishing color			Munsell N1.2, frosted											
Pulse encoder			Magnetic pulse encoder (built in the motor with PE only) •No. of pulses : 256P/R •Output signal A-phase, B-phase (Sine wave) •Power supply : 5V DC											
Mass (Approx. kg)			Refer to the outline drawings.											

Note : □ in the type section indicates A for foot mounted, or G for flange mounted.

◆ Spindle motor common specifications ◆

Insulation class, No. of poles		Class F, 4 poles
Connection to load		Coupling or belted connection
Degree of protection		IP44 (Totally enclosed)
Applied standards		IEC34-1
Environment	Installation location	Indoor, not more than 1000m above sea level.
	Ambient temperature	-10 to + 40 °C
	Humidity	0 to 90%RH

Fig.A

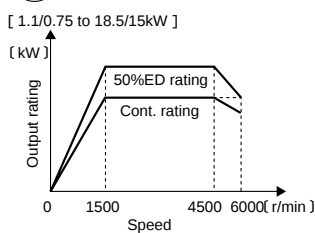


Fig.B

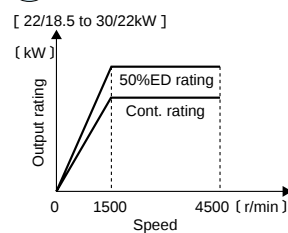


Fig.C

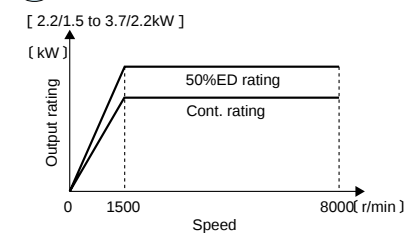


Fig.D

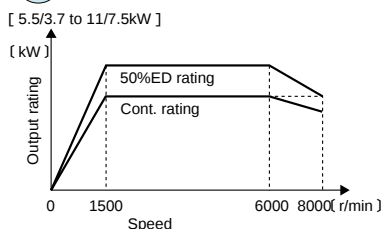


Fig.E

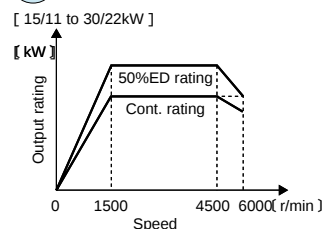


Fig.F

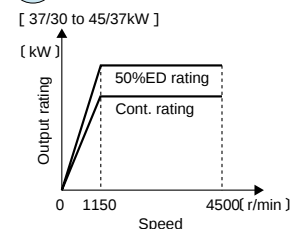
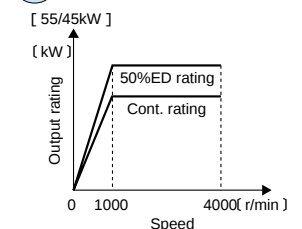


Fig.G



Dimensions

Fig.A

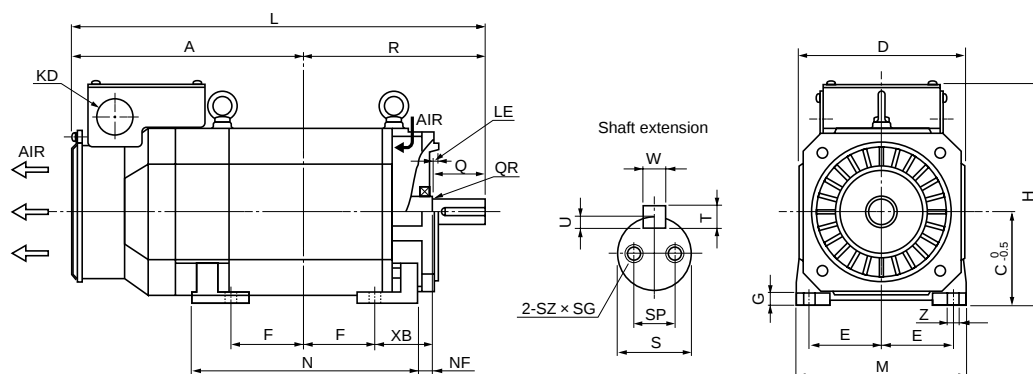
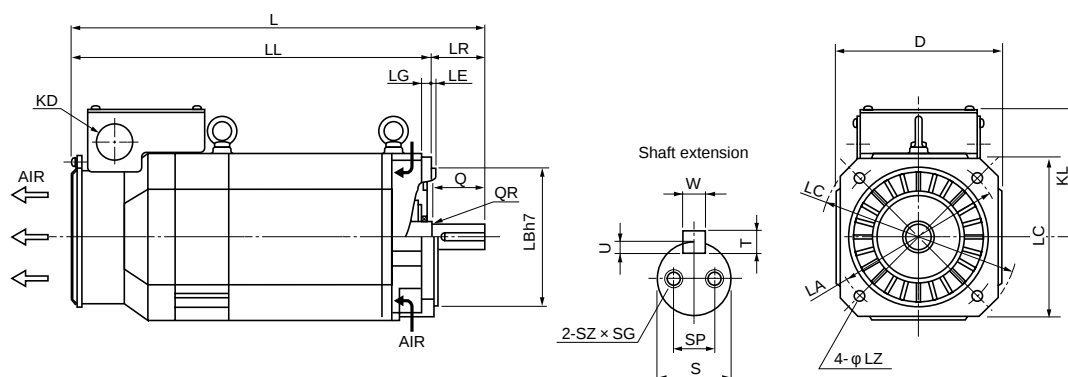


Fig.B



◆ MVS Spindle motor ◆ Foot mounted (□: M = without PE, V = with PE)

Available soon

Output (kW)	Type	Fig.	Dimensions (mm)																	Shaft extension (mm)							Mass	
50%ED/Cont.			A	C	D	E	F	G	H	KD	L	M	N	NF	R	LE	XB	Z	Q	QR	S	T	U	W	SP	SZ	SG	(approx.kg)
2.2/1.5	MVS2.2□5-2A	A	217	100	180	80	50	12	240	34	380	188	215	13	163	6	63	12	50	2	22j6	6	3.5	6	13	M5	10	35
3.7/2.2	MVS3.7□5-2A		217	100	180	80	50	12	240	34	390	188	215	13	173	6	63	12	60	1	28j6	7	4	8	16	M6	12	35
5.5/3.7	MVS5.5□5-2A		267.5	100	180	80	79.5	12	240	34	470	188	274	13	202.5	6	63	12	60	1	28j6	7	4	8	16	M6	12	48
7.5/5.5	MVS7.5□5-2A		295	112	210	95	70	12	267	43	515	218	259	17	220	6	70	12	80	1	32k6	8	5	10	16	M6	12	65
11/7.5	MVS11□5-2A		331	112	210	95	89	12	267	43	600	218	297	17	269	6	70	12	110	—	48k6	9	5.5	14	31.5	M8	16	85
15/11	MVS15□5-2A		277	160	260	127	70	16	345	51	565	287	252	21	288	6	108	14.5	110	1	48k6	9	5.5	14	31.5	M8	16	100
18.5/15	MVS18.5□5-2A		288	160	260	127	89	16	345	51	595	287	290	21	307	6	108	14.5	110	1	48k6	9	5.5	14	31.5	M8	16	110
22/18.5	MVS22□5-2A		358	160	260	127	89	16	345	63	665	287	352	21	307	6	108	14.5	110	1	55m6	10	6	16	31.5	M8	16	150
30/22	MVS30□5-2A		358	160	260	127	89	16	345	63	665	287	352	21	307	6	108	14.5	110	1	55m6	10	6	16	31.5	M8	16	150
37/30	MVS37V5-2A		443.5	200	390	178	133.5	24	475	63	850	420	360	86.5	406.5	6	133	18.5	140	0.5	60m6	11	7	18	40	M10	20	
45/37	MVS45V5-2A		443.5	200	390	178	133.5	24	475	63	850	420	360	86.5	406.5	6	133	18.5	140	0.5	60m6	11	7	18	40	M10	20	
55/45	MVS55V5-2A		530	225	438	178	143	34	521	63	962	436	366	109	432	6	149	18.5	140	1.5	65m6	11	7	18	40	M10	20	

◆ MVS Spindle motor ◆ Flange mounted (□: M = without PE, V = with PE)

Output (kW) 50%ED/Cont.	Type	Fig.	Dimensions (mm)															Shaft extension (mm)							Mass (approx.kg)
			D	L	LL	LR	KD	KL	LA	LB	LC	LC'	LE	LG	LZ	Q	QR	S	T	U	W	SP	SZ	SG	
2.2/1.5	MVS2.2□5-2G	B	180	380	330	50	34	140	185	150	174	220	5	11	11	50	2	22j6	6	3.5	6	13	M5	10	35
3.7/2.2	MVS3.7□5-2G		180	390	330	60	34	140	185	150	174	220	5	11	11	60	1	28j6	7	4	8	16	M6	12	35
5.5/3.7	MVS5.5□5-2G		180	470	410	60	34	140	185	150	174	220	5	11	11	60	1	28j6	7	4	8	16	M6	12	48
7.5/5.5	MVS7.5□5-2G		210	515	435	80	43	155	215	180	204	250	5	15	14.5	80	1	32k6	8	5	10	16	M6	12	65
11/7.5	MVS11□5-2G		210	600	490	110	43	155	215	180	204	250	5	15	14.5	110	—	48k6	9	5.5	14	31.5	M8	16	85
15/11	MVS15□5-2G		260	565	455	110	51	185	265	230	250	300	5	19	14.5	110	1	48k6	9	5.5	14	31.5	M8	16	100
18.5/15	MVS18.5□5-2G		260	595	485	110	51	185	265	230	250	300	5	19	14.5	110	1	48k6	9	5.5	14	31.5	M8	16	110
22/18.5	MVS22□5-2G		260	665	555	110	63	185	265	230	250	300	5	19	14.5	110	1	55m6	10	6	16	31.5	M8	16	150
30/22	MVS30□5-2G		260	665	555	110	63	185	265	230	250	300	5	19	14.5	110	1	55m6	10	6	16	31.5	M8	16	150
37/30	MVS37V5-2G		390	850	710	140	63	275	400	350	370	450	5	23	18.5	140	0.5	60m6	11	7	18	40	M10	20	
45/37	MVS45V5-2G		390	850	710	140	63	275	400	350	370	450	5	23	18.5	140	0.5	60m6	11	7	18	40	M10	20	
55/45	MVS55V5-2G		428	988	848	140	63	296	500	450	480	550	5	25	24	140	1.5	65m6	11	7	18	40	M10	20	

Fig.A

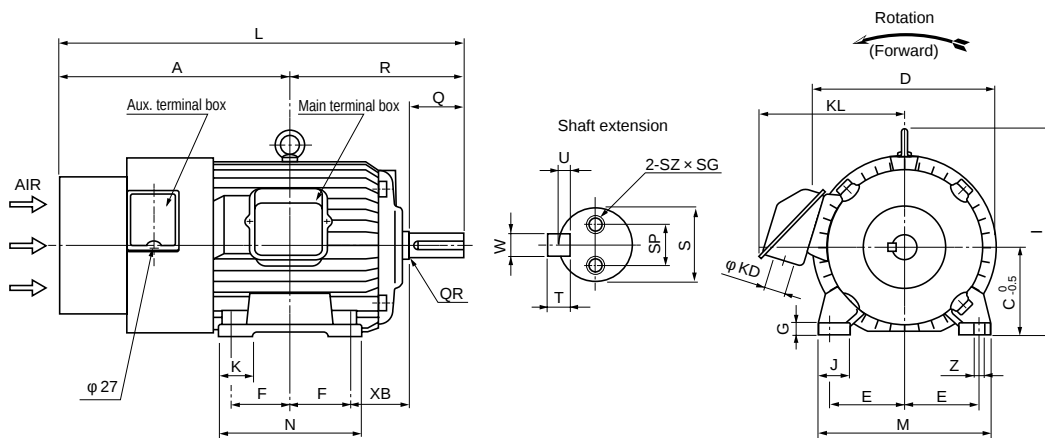
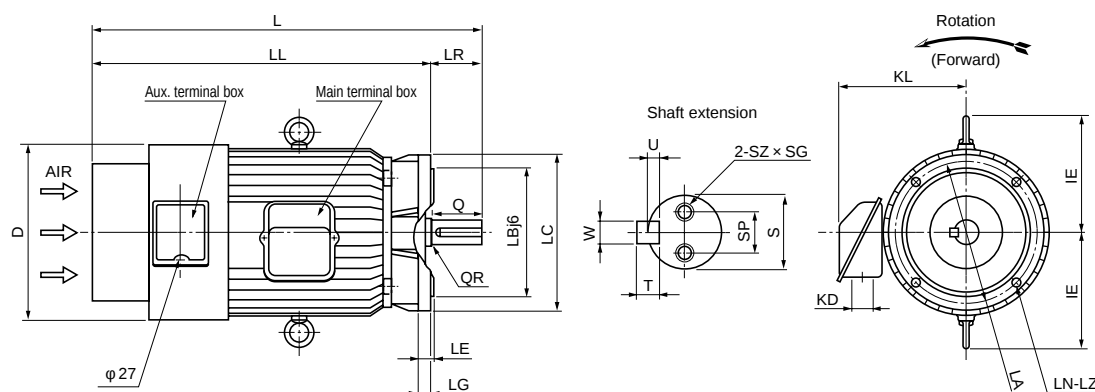


Fig.B



◆ **MVE Spindle motor** ◆ Foot mounted

Output (kW) 50%ED/Cont.	Type	Fig.	Dimensions (mm)																	Shaft extension (mm)										Mass (approx.kg)
			A	C	D	E	F	G	I	J	K	KD	KL	L	M	N	R	XB	Z	Q	QR	S	T	U	W	SP	SZ	SG		
1.1/0.75	MVE1.1M5-2A	A	170	80	174	62.5	50	9	170	35.5	35.5	27	163	310	155	128	140	50	10	40	—	19j6	6	3.5	6	10	M4	8	18	
2.2/1.5	MVE2.2M5-2A		197	90	202	70	62.5	10	195				177	365.5	170	150	168.5	56		50		24j6	7	4	8	16	M5	10	27	
3.7/2.2	MVE3.7M5-2A		212	100		80	70	12.5	238	40	40			405	195	170	193	63	12	60		28j6					M6	12	34	
5.5/3.7	MVE5.5M5-2A		245	112	236	95		14	270		50		197	445	224	175	200	70											47	
7.5/5.5	MVE7.5M5-2A		253	132	273	108		17	311	45		34	212	492	250	180	239	89		80		38k6	8	5	10	25			66	
11/7.5	MVE11M5-2A		272				89							530		212	258												77	
15/11	MVE15M5-2A		342	160	321	127	105	18	376	50	63	48	272	665	300	250	323	108	14.5	110	0.5	42k6		12					131	
18.5/15	MVE18.5M5-2A		364				127							709		300	345												161	
22/18.5	MVE22M5-2A		386	180	376	139.5	120.5	20	428	75	75		305	737.5	350	292	351.5	121		1.5	48k6	9	5.5	14	31.5	M8	16	191		
30/22	MVE30M5-2A		405				139.5					60		775.5		330	370.5					55m6	10	6	16				213	

◆ **MVE Spindle motor** ◆ Flange mounted

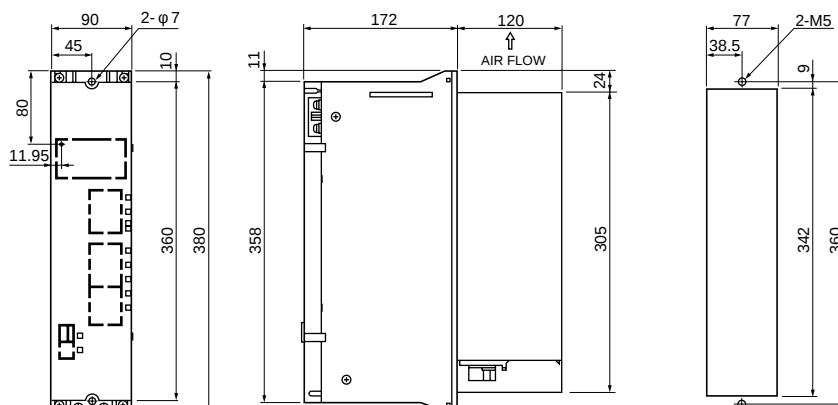
Output (kW) 50%ED/Cont.	Type	Fig.	Dimensions (mm)														Shaft extension (mm)										Mass (approx.kg)
			D	L	LL	LR	KD	KL	LA	LB	IE	LC	LE	LG	LN	LZ	Q	QR	S	T	U	W	SP	SZ	SG		
1.1/0.75	MVE1.1M5-2G	B	174	340	300	40	27	158	165	130	—	200	3.5	12	4	12	40	—	19j6	6	3.5	6	10	M4	8	20	
2.2/1.5	MVE2.2M5-2G		202	390	340	50			172			105							50		24j6	7	4	8	16	M5	10
3.7/2.2	MVE3.7M5-2G			429	369	60						138					60		28j6					M6	12	36	
5.5/3.7	MVE5.5M5-2G		236	465	405				197	215	180	160	250	4	16	14.5	80									52	
7.5/5.5	MVE7.5M5-2G		273	542	462	80	34		208			179			18					38k6	8	5	10	25			74
11/7.5	MVE11M5-2G			580	500																				87		
15/11	MVE15M5-2G		321	703	593	110	48	261	300	250	216	350	5	20	18.5	110	0.5	42k6				12			136		
18.5/15	MVE18.5M5-2G			747	637																						
22/18.5	MVE22M5-2G		376	768	658			296	350	300	248	400						1.5	48k6	9	5.5	14	31.5	M8	16	201	
30/22	MVE30M5-2G			806	696		60												55m6	10	6	16			223		

Dimensions

◆ Converter unit and drive unit ◆

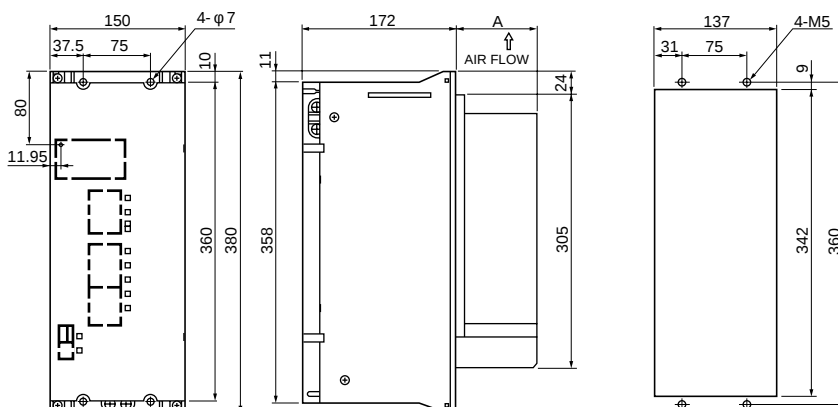
(Unit : mm)

FRN1.1 to 5.5M5-2
FRN2.2 to 5.5V5-2
FRN5.5 to 11MC5-2
FRN5.5 to 11VC5-2
FRN7.5 to 11PD5-2
FRN5.5 to 11PR5-2



FRN15 to 30MC5-2
FRN15 to 30VC5-2
FRN15 to 18.5PD5-2
FRN15 to 30PR5-2

Type	Length A
FRN15 to 18.5MC5-2	92.5
FRN15 to 18.5VC5-2	92.5
FRN15 to 18.5PD5-2	92.5
FRN15 to 18.5PR5-2	92.5
FRN22 to 30MC5-2	142
FRN22 to 30VC5-2	142
FRN22 to 30PR5-2	142



Option

Name	Type	Description
Braking resistor (10% ED)	DB□□□ MS-521	- Used together with the dynamic braking converter unit or package type drive unit to perform dynamic braking.
PE interface card	OPCI-MS5-PE	- Receives signals from the pulse encoder on a machine spindle shaft to make arbitrary positioning of controlled axis. - Receives signals from the pulse encoder on a machine spindle shaft to perform precise speed control. - Switches over the motor windings from Δ to Y
Synchronous operation card	OPCI-MS5-SY	- Optional card having synchronous operation function in addition to the function of PE interface card. - For the synchronous operation, this card is necessary for each drive unit.
Magnet orientation card	OPCI-MS5-MG	- Perform position control of controlled axis together with the use of magnet sensor.
Program loading software connection cable	CB-MS5-PC	- Loader software for personal computer and a dedicated cable for connection a PC and a drive unit.

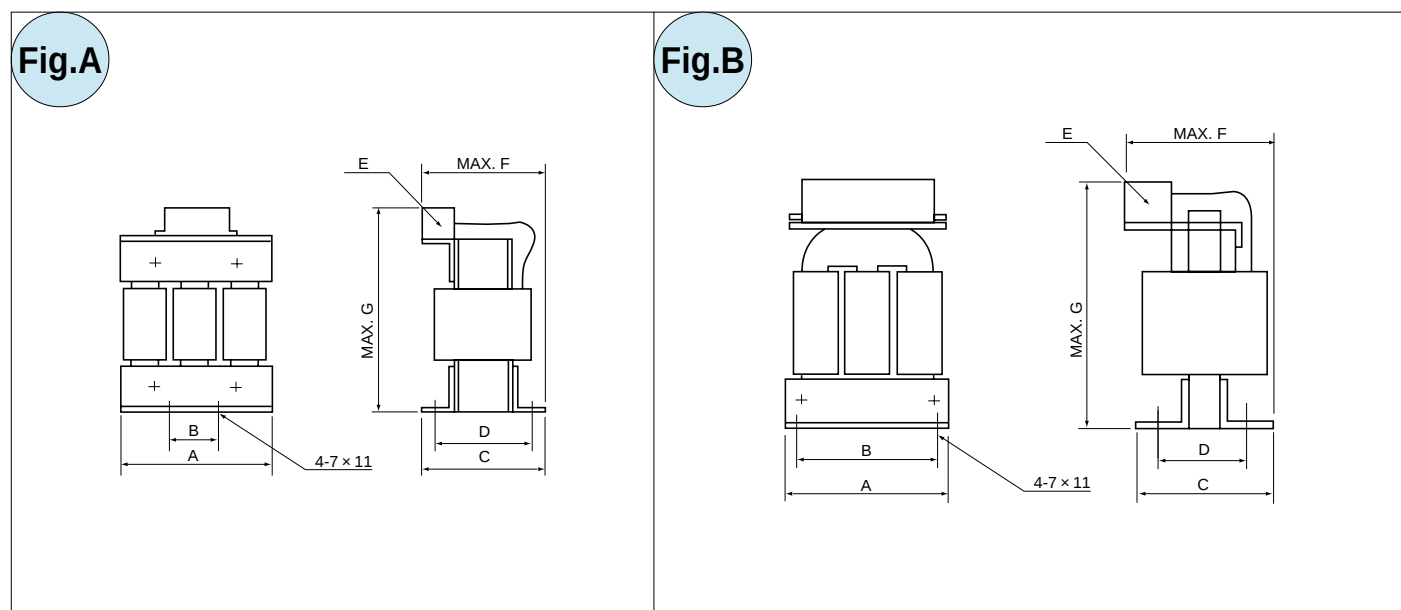
Note: □□□ indicates the output rating (kW).

Accessories and Options

◆ AC reactor for regenerative braking converter unit (Accessory) ◆

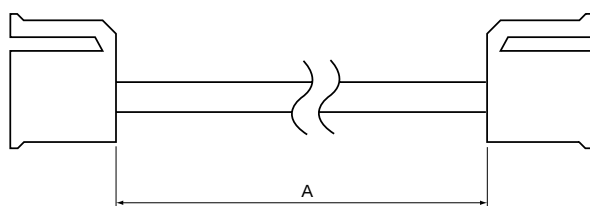
(Unit: mm)

Applied converter unit	AC reactor heat loss (W)	Fig.	A	B	C	D	E	F	G
FRN5.5PR5-2	25	A	130	50	106	86	M4	120	135
FRN7.5PR5-2	30		130	50	116	96	M5	140	135
FRN11PR5-2	35		130	50	121	101	M5	150	135
FRN15PR5-2	45	B	170	150	70	50	M6	105	170
FRN18.5PR5-2	50		190	170	70	50	M6	105	185
FRN22PR5-2	50		190	170	80	60	M6	115	185
FRN30PR5-2	50		190	170	85	65	M8	130	195



◆ Communication cable between units (Option) ◆

CB-MS5-□

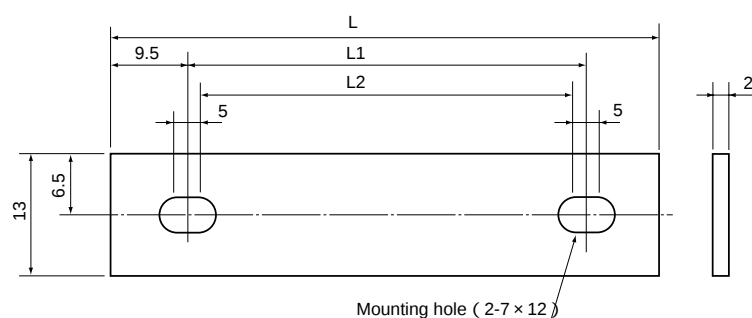


(Unit: mm)

Type	Length A
CB-MS5-1	150
CB-MS5-2	250

◆ DC connecting bar (Option) ◆

CD-MS5-□



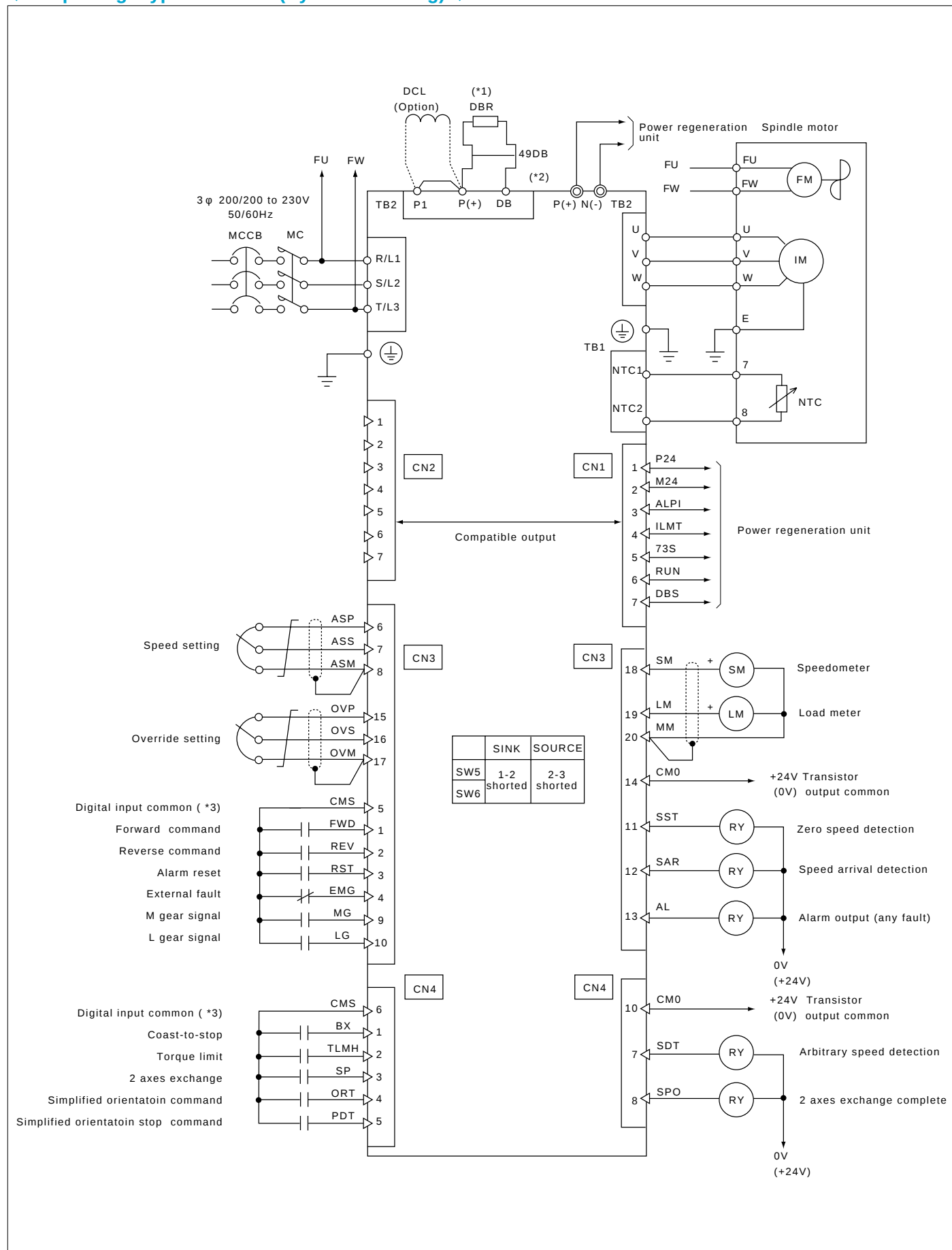
(Unit: mm)

	L	L1	L2
DC-MS5-1	109	90	85
DC-MS5-2	169	150	145
DC-MS5-2R	96	77	72
DC-MS5-2L	182	163	158

Use a DC-MS5-2R where the (converter or drive) unit having 90mm width is mounted on the right hand side. Use a DC-MS5-2L where the (converter or drive) unit having 90mm width is mounted on the left hand side.

Standard Schematic Diagrams (Typical)

◆ M5 package type drive unit (Dynamic braking) ◆



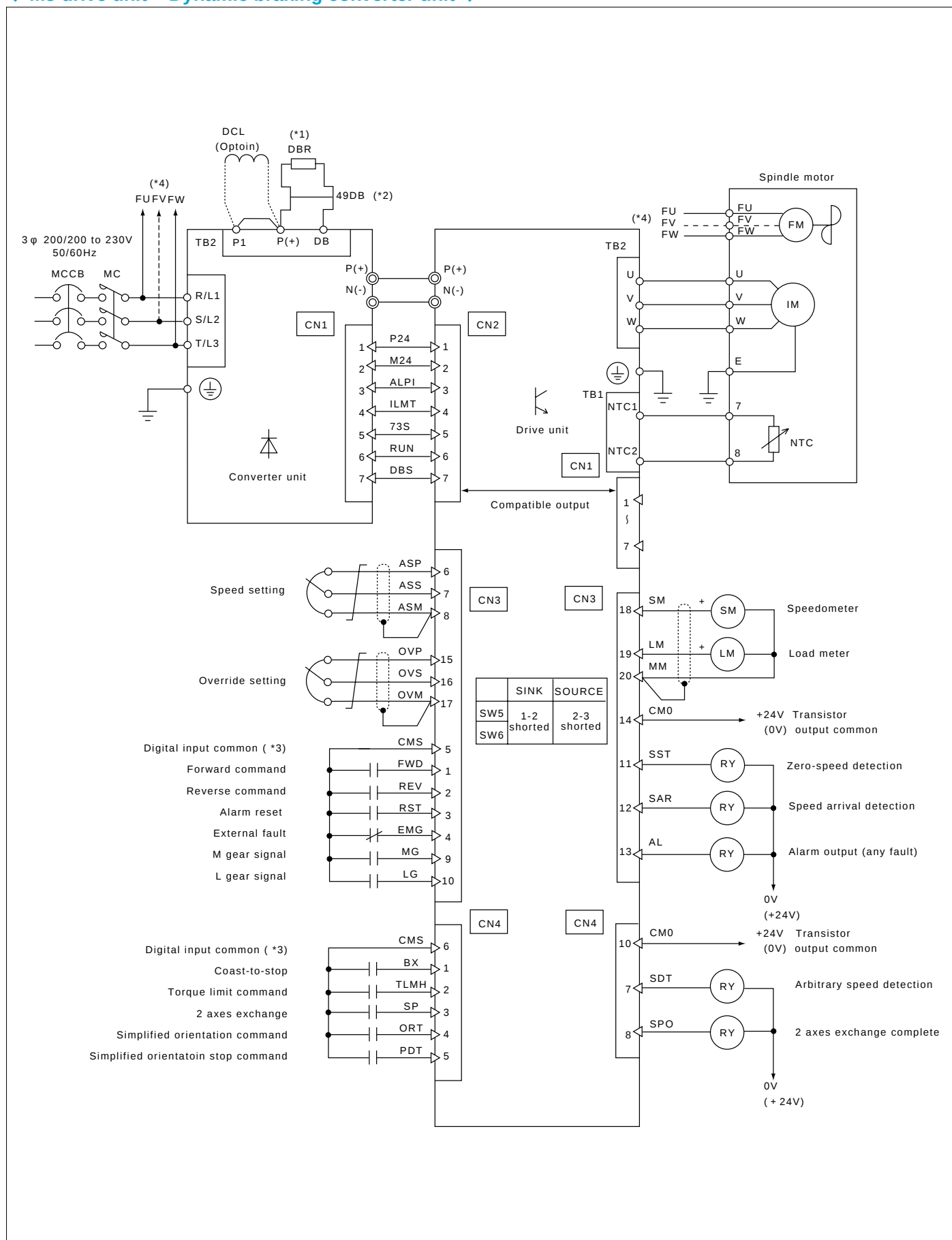
Notes : (*1) When a braking resistor is required, be sure to connect a thermal overload relay to protect the resistor and use a protective cover.

(*2) Connect to the auxiliary contact (manual reset) of the thermal overload relay to trip an MCCB or MC.

(*3) Be careful not to connect the digital input common to a wrong circuit, or else it may damage the unit.

Standard Schematic Diagrams (Typical)

◆ M5 drive unit + Dynamic braking converter unit ◆



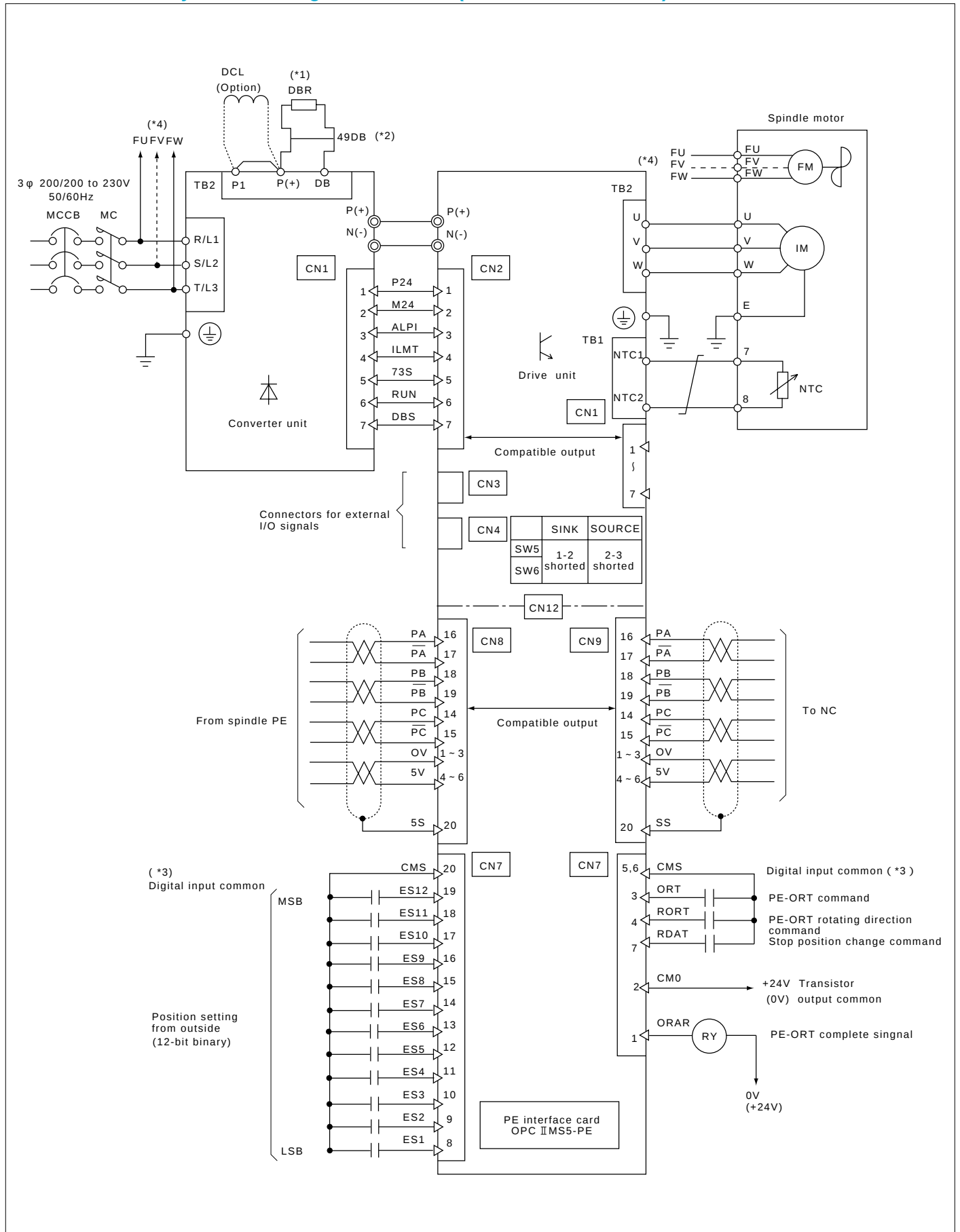
Notes: (*1) When a braking resistor is required, be sure to connect a thermal overload relay to protect the resistor and use a protective cover.

(*2) Connect to the auxiliary contact (manual reset) of the thermal overload relay to trip an MCCB or MC.

(*3) Be careful not to connect the digital input common to a wrong circuit, or else it may damage the unit.

(*4) When the motor model type of MVE15M5-2, MVS15M5-2 or more is used, three-phase power supply is required for operating fan motor.

◆ M5 drive unit + Dynamic braking converter unit (with PE interface card) ◆



Notes: (*1) When a braking resistor is required, be sure to connect a thermal overload relay to protect the resistor and use a protective cover.

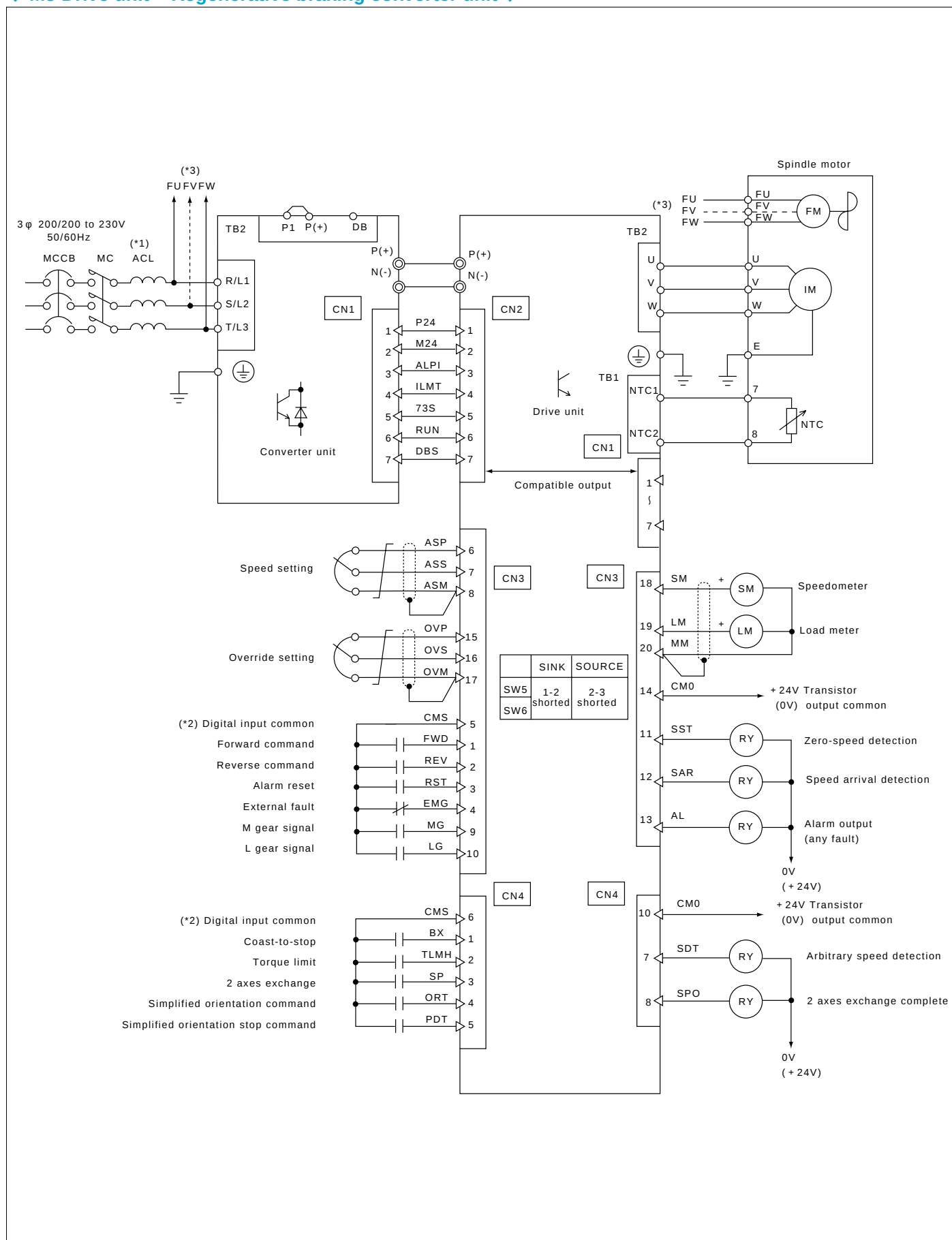
(*2) Connect to the auxiliary contact (manual reset) of the thermal overload relay to trip an MCCB or MC.

(*3) Be careful not to connect the digital input common to a wrong circuit, or else it may damage the unit.

(*4) When the motor model type of MVE15M5-2, MVS15M5-2 or more is used, three-phase power supply is required for operating fan motor.

Standard Schematic Diagram (Typical)

◆ M5 Drive unit + Regenerative braking converter unit ◆



Notes: (*)1 Be sure to connect the attached ACL on AC line side where a regenerative braking converter unit is used.

(*)2 Be careful not to connect the digital input common to a wrong circuit, or else it may damage the unit.

(*)3 When the motor model type of MVE15M5-2, MVS15M5-2 or more is used, three-phase power supply is required for operating fan motor.

[illegible]

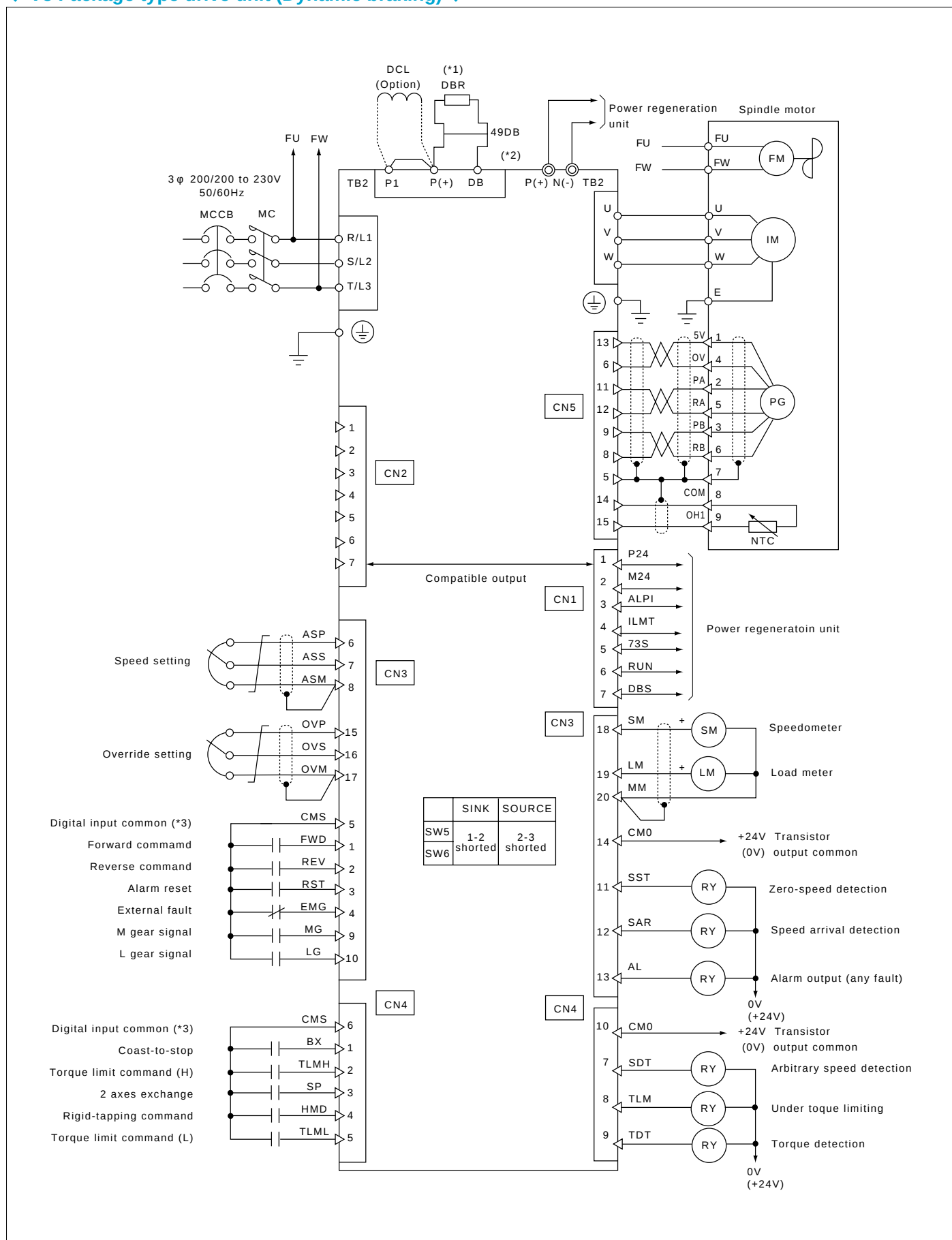
(*2) Be sure to connect the attached ACL on the AC line side to use the regenerative braking converter unit.

(*3) Be careful not to connect the digital input common to a wrong circuit, or else it may damage the unit

(*4) When the motor model type of MVE15M5-2, MVS15M5-2 or more is used, three-phase power supply is required for operating fan motor.

Standard Schematic Diagram (Typical)

◆ V5 Package type drive unit (Dynamic braking) ◆

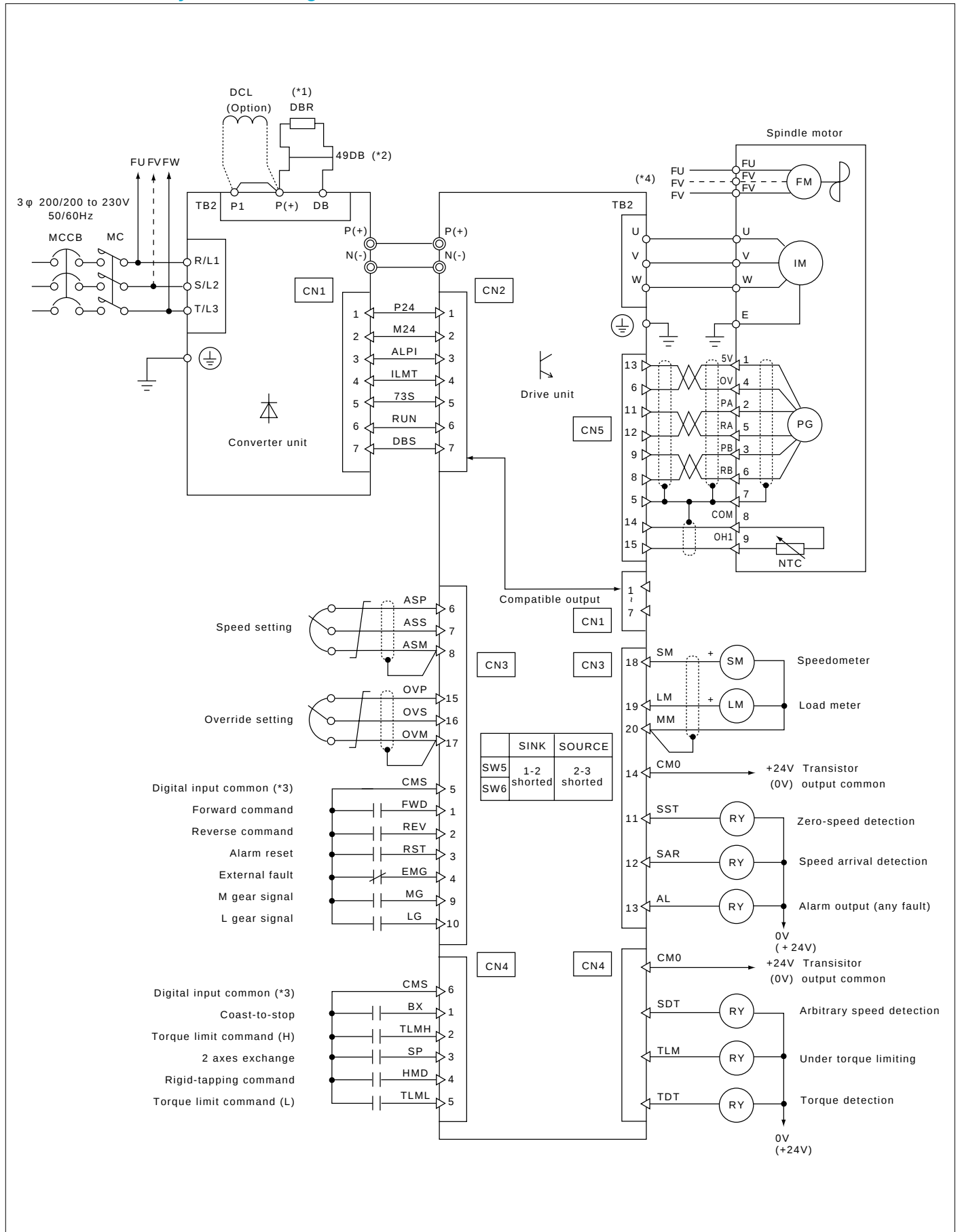


Notes: (*1) When a braking resistor is required, be sure to connect a thermal overload relay to protect the resistor and use a protective cover.

(*2) Connect to the auxiliary contact (manual reset) of the thermal overload relay to trip an MCCB or MC.

(*3) Be careful not to connect the digital input common to a wrong circuit, or else it may damage the unit.

◆ V5 drive unit + Dynamic braking converter unit ◆



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