

- Wiring of main circuit

Circuit Breaker (MCCB)
Protects the power lines. Shuts off the circuit when overcurrent passes.

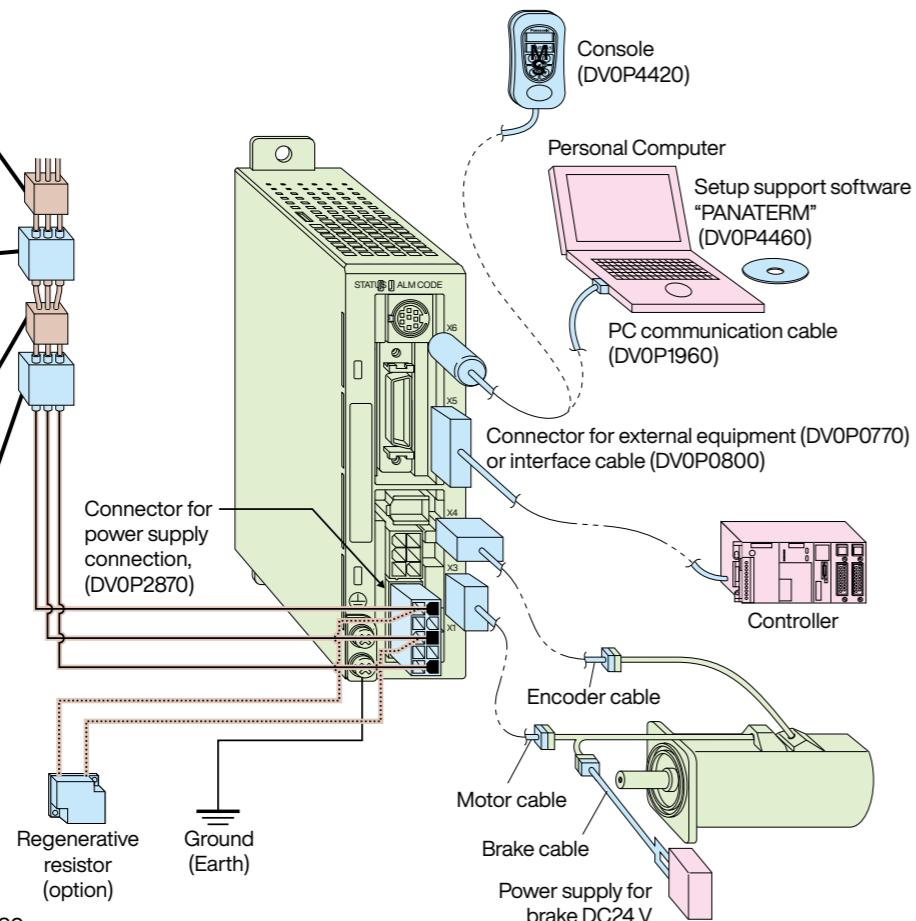
Noise Filter (NF)
Prevents external noise from the power lines. And reduces an effect of the noise generated by the servo driver.

Magnetic Contactor (MC)
Turns on/off the main power of the servo driver. Surge absorber to be used together with this.

Reactor (L)
Reduces harmonic current of the main power.

Pin-5 and Pin-3 of CN POWER

Connect an external regenerative resistor (option) between P(pin-5) and B(pin-3) of connector, CN X1, when regenerative energy is large. (Refer to P.404 for regenerative resistor.)



Motor	to P.389
Driver	to P.385
Option	to P.398
Recommended equipments	
Parts customer to prepare	

List of recommended peripheral devices

Power supply	Motor		Power capacity (at rated output)	Circuit Breaker (Rated current)	Noise Filter	Magnetic Contactor Contact Composition	Wire diameter (L1, L2, L3, U, V and W)
	Series	Output					
Single phase, 100 V	MUMA	50 W	0.3 kVA	5 A	DV0P4160	10 A (3P+1a)	0.75 mm ² to 0.85 mm ² AWG18
		100 W	0.4 kVA	10 A			
		200 W	0.5 kVA	10 A			
Single phase, 200 V	MUMA	50 W	0.3 kVA	5 A	DV0P4160	15 A (3P+1a)	0.75 mm ² to 0.85 mm ² AWG18
		100 W	0.4 kVA	10 A			
		200 W	0.5 kVA	10 A			
3-phase 200 V	MUMA	50 W	0.3 kVA	5 A	DV0P4160	10 A (3P+1a)	0.75 mm ² to 0.85 mm ² AWG18
		100 W	0.4 kVA	10 A			
		200 W	0.5 kVA	10 A			

- * Select the single and 3-phase common specifications corresponding to the power supplies.
- To conform to EU Directives/UK Regulation, install a circuit breaker which conforms to IEC and UL Standards (Listed, Ⓛ marked) between noise filter and power supply.
- For details of the noise filters, refer to 416.

<Remarks>

- Use a copper conductor cables with temperature rating of 60 °C or higher for main power connector and ground terminal wiring. Use a cable for ground with diameter of 2.0 mm² (AWG14) or larger.

Fastening torque list

Ground terminal screw		Connector to host controller[X5]	
Nominal size	Fastening torque (N·m) ^(Note 3)	Nominal size	Fastening torque (N·m) ^(Note 3)
M4	0.7~0.8	M2.6	0.2±0.05

(Note 3) <Caution>

- Applying fastening torque larger than the maximum value may result in damage to the product.

<Remarks>

- To check for looseness, conduct periodic inspection of fastening torque once a year.

Carrying page

Options	Part No.	Carrying page
Console	DV0P4420	403
Setup Support Software, PANATERM	Japanese	398
	English	
RS232 Communication Cable (for Connection with PC)	DV0P1960	403
Interface Cable	DV0P0800	403
Connector Kit for Interface	DV0P0770	402
Connector Kit for Motor and Encoder	DV0P3670	401
Connector Kit for Driver Power Supply	DV0P2870	401
Encoder Cable	MFECA0 * * 0EAM	400
Motor Cable	MFMCA0 * * 0AEB	400
Brake Cable	MFMCB0 * * 0GET	400
Cable Set (3 m) ^(Note 4)	DV0P37300	400
Cable Set (5 m) ^(Note 4)	DV0P39200	400
DIN Rail Mount Unit	DV0P3811	404
External Regenerative Resistor	100 V 50 Ω 10 W	DV0P2890
	200 V 100 Ω 10 W	DV0P2891
Reactor	100 V	DV0P227
	200 V	DV0P228
		DV0P220
Noise Filter	DV0P4160	416
Surge Absorber	Single phase 100 V, 200 V	DV0P4190
	3-phase 200 V	DV0P1450
Ferrite core	DV0P1460	416

(Note 4) Cable set (3 m) contains,

- 1) Interface cable: DV0P0800
- 2) Encoder cable (3 m): MFECA0030EAM
- 3) Motor cable (3 m): MFMCA0030AEB
- 4) Connector kit for driver power supply connection: DV0P2870

Cable set (5 m) contains,

- 1) Interface cable: DV0P0800
- 2) Encoder cable (5 m): MFECA0050EAM
- 3) Motor cable (5 m): MFMCA0050AEB
- 4) Connector kit for driver power supply connection: DV0P2870

Table of Part Numbers and Options

Power supply	Output (W)	2500P/r, Incremental				Option					
		Motor ^(Note 1)	Rating/Spec. (page)	Driver	Dimensions (Frame symbol)	Encoder Cable ^(Note 2)	Motor Cable ^(Note 2)	Brake Cable ^(Note 2)	External Regenerative Resistor	Reactor	Noise Filter
Single phase 100 V	50	MUMA5AZP1 □	389	MKDET1105P	388 (K)	MFECA0 * * 0EAM	MFMCA0 * * 0AEB		DV0P2890	DV0P227	DV0P228
	100	MUMA011P1 □	389	MKDET1110P	388 (K)						
	200	MUMA021P1 □	389	MLDET2110P	388 (L)						
Single phase 200 V	50	MUMA5AZP1 □	391	MKDET1505P	388 (K)						
	100	MUMA012P1 □	391	MKDET1505P	388 (K)						
	200	MUMA022P1 □	391	MLDET2210P	388 (L)						
3-phase 200 V	400	MUMA042P1 □	391	MLDET2510P	388 (L)						
	50	MUMA5AZP1 □	391	MKDET1505P	388 (K)						
	100	MUMA012P1 □	391	MKDET1505P	388 (K)						
	200	MUMA022P1 □	391	MKDET1310P	388 (K)						
	400	MUMA042P1 □	391	MLDET2510P	388 (L)						
				MLDET2310P							

Note) 1 Motor model number suffix: □

S: Key way with center tap, without brake

T: Key way with center tap, with brake

Note) 2 * * represents cable length. For details, refer to P.399.

Compliance to EU/ UK Regulation and EMC Directives

EU Directives/ UK Regulation

The EU Directives/ UK Regulation apply to all such electronic products as those having specific functions and have been exported to EU and directly sold to general consumers. Those products are required to conform to the EU unified standards and to furnish the CE marking on the products. MINAS AC Servos conforms to the EU Directives for EU Low Voltage Directives/ UK Low Voltage Regulation Equipment so that the machine incorporating our servos has an easy access to the conformity to relevant EU Directives for the machine.

EU EMC Directives/UK EMC Regulation

MINAS Servo System conform to relevant standard under EU EMC Directives/UK EMC Regulation setting up certain model (condition) with certain locating distance and wiring of the servo motor and the driver. And actual working condition often differs from this model condition especially in wiring and grounding. Therefore, in order for the machine to conform to the EU EMC Directives/UK EMC Regulation, especially for noise emission and noise terminal voltage, it is necessary to examine the machine incorporating our servos.

Conformed Standards

Subject	Conformed Standard		
Motor	IEC60034-1	IEC60034-5	UL1004 CSA22.2 No.100
Motor and driver	UL61800-5-1		CSA22.2 No.14
	EN55011	Radio Disturbance Characteristics of Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment	
	EN61000-6-2	Immunity for Industrial Environments	
	IEC61000-4-2	Electrostatic Discharge Immunity Test	
	IEC61000-4-3	Radio Frequency Electromagnetic Field Immunity Test	
	IEC61000-4-4	Electric High-Speed Transition Phenomenon/Burst Immunity Test	
	IEC61000-4-5	Lightening Surge Immunity Test	
	IEC61000-4-6	High Frequency Conduction Immunity Test	
IEC61000-4-11	Instantaneous Outage Immunity Test		

IEC : International Electrotechnical Commission
EN : Europäischen Normen
EMC : Electromagnetic Compatibility
UL : Underwriters Laboratories
CSA : Canadian Standards Association

Pursuant to at the directive 2004/108/EC, article 9(2)

Conforms to EU Low Voltage Directives/UK Low Voltage Regulation
Conforms to references by EU EMC Directives/UK EMC Regulation

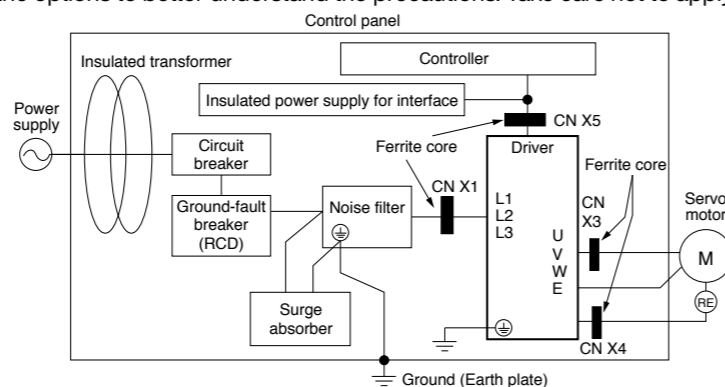
Composition of Peripheral Components

<Precautions in using options>

Use options correctly after reading operation manuals of the options to better understand the precautions. Take care not to apply excessive stress to each optional part.

Installation Environment

Use Minas driver in environment of Pollution Degree 1 or 2 prescribed in IEC-60664-1 (e.g. Install the driver in control panel with IP54 protection structure.)



Power Supply

100 V system	Single phase, 100 V	+10 % -15 %	to	115 V	+10 % -15 %	50 Hz/60 Hz
200 V system	Single phase, 200 V	+10 % -15 %	to	240 V	+10 % -15 %	50 Hz/60 Hz
200 V system	3-phase, 200 V	+10 % -15 %	to	240 V	+10 % -15 %	50 Hz/60 Hz

- Use the power supply under an environment of Overvoltage Category II specified in IEC60664-1.
- For a interface power supply, use the insulated one with 12 VDC to 24 VDC which conforms to CE Marking or EN Standards (EN60950).

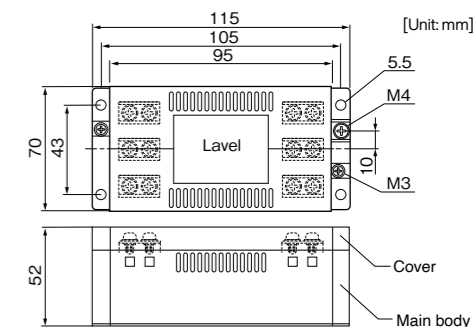
Circuit Breaker

Connect a circuit breaker which conforms to IEC standards and is UL recognized (UL Listed, marked), between the power supply and the noise filter.

Noise Filter

When you install one noise filter in the power supply for multi axis application, consult with the manufacture of the filter.

Option part No.	Part No.	Manufacturer
DV0P4160	3SUP-HU10-ER-6	Okaya Electric Industries Co.

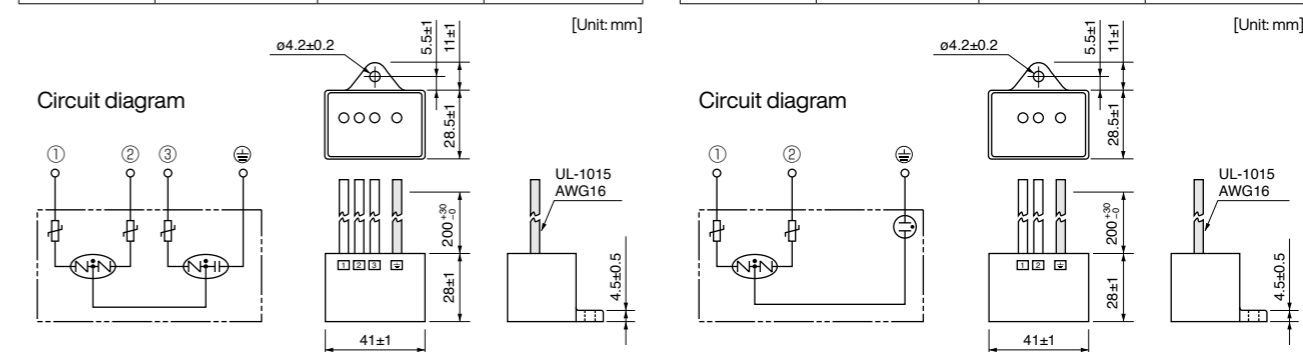


Surge Absorber

Install a surge absorber at primary side of the noise filter.

Option part No.	Driver voltage spec	Part No.	Manufacturer
DV0P1450	3-phase, 200 V	R·A·V-781BXZ-4	Okaya Electric

Option part No.	Driver voltage spec	Part No.	Manufacturer
DV0P4190	Single phase, 100 V, 200 V	R·A·V-781BWZ-4	Okaya Electric



<Remarks>

Remove this surge absorber when you perform dielectric test on the machine, or surge absorber might be damaged.

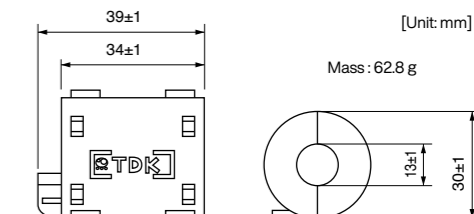
Ferrite core

Install ferrite core to all cables (Power line, motor cable, encoder cable, interface cable)

<Caution>

- Please fix a ferrite core to avoid excessive stress to the cable.
- When using multiple axes, noise generated from each driver might influence driver and peripheral equipment and result to malfunction. Please insert a ferrite core between driver and motor wires (U, V, W but grounding). (Please refer to P.415 "Composition of Peripheral Components".)

Option part No.	Part No.	Qty.	Manufacturer
DV0P1460	ZCAT3035-1330	4	TDK Corp.



Grounding

- Connect the protective earth terminal of the driver () and protective earth terminal of the control panel (PE) without fail to prevent electrical shocks.
- Do not co-clamp to the ground terminals (). Two ground terminals are provided.

Ground-Fault Breaker

Install a ground fault circuit breaker (RCD) to the primary side of the power supply. Please use B-type (DC sensitive) ground fault circuit breakers defined in IEC60947-2, JISC8201-2-2.