

## REFERENCE SPECIFICATIONS

M/S

MODEL AC Servo Motor (□60 DC24 V, DC48 V)  
MSMD0□□L1□ (23 bit absolute encoder)

Issued on Sep. 1.2016  
Changed on Feb.10.2017

Motor Business Unit, Electromechanical Control Business Division,  
Automotive & Industrial Systems Company, Panasonic Corporation

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Checked	Checked	Designed
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## 1. Motor brake specification

Items	Units	Applicable motor		
		MSMD02 MSMD04		
Static friction torque	N·m	1.27 or more		
Rotary part inertia	$10^{-4}$ kg·m <sup>2</sup>	0.018		
Armature pull in time	ms	50 or less		
Armature release time ※1	ms	15 or less		
Release voltage	DC,V	1 or more		
Excitation voltage	DC,V	24±1.2		
Excitation current	DC,A	0.36		
Allowable braking energy ; 1 time each	J	137		
All allowable braking energy	J	$44.1 \times 10^3$		
Allowable angular acceleration	rad/s <sup>2</sup>	30000		

(at 20 °C)

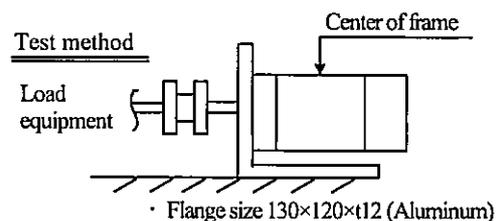
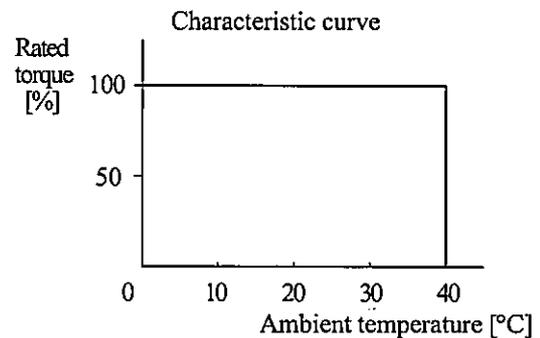
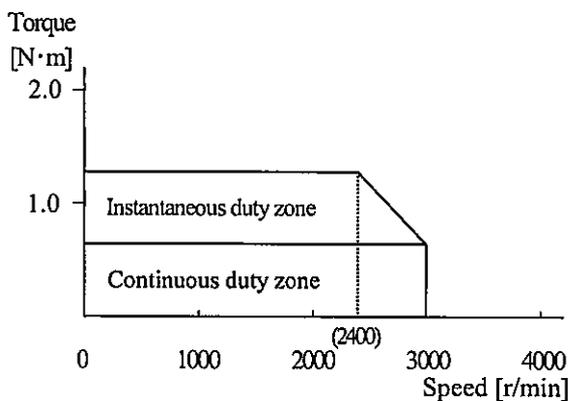
※1 By varistor (TND15G271K made by Nippon Chemi-Con Corporation.)

- (1) Rotary part inertia and Excitation current (at DC24 V) are representative characteristic values.
- (2) When the motor was forwarded, the brake's backlash is  $\pm 1.0^\circ$  or less.
- (3) Power supply for motor brake must be prepared by user side.  
(Either way of connection for polarity would be acceptable)
- (4) The above-mentioned all allowable braking energy shall be braking energy complying with the brake specification (braking energy capable of performing a suction motion in consideration of brake temperature increases).
- (5) The motor life with the repetitions of acceleration and deceleration at the above allowable angular acceleration : 10 million times.  
(The number of acceleration-deceleration cycles until brake's backlash changes rapidly)
- (6) The series connection of the protection parts such as fuses is recommended in the case of the use with varistor.
- (7) Since the brake built in the motor is used for maintenance, do not use it as a stopping device (braking) to ensure the safety of the machine.

## AC Servo Motor Specification

Motor model		MSMD02CL1□ (Without brake)	MSMD02CL1□ (With brake)	
Rated output	W	200	←	
Rating	%	100	←	
Number of poles		8	←	
Rated speed	r/min	3000	←	
Max. speed	r/min	3000	←	
Rated torque	N·m	0.64	←	
Max. torque	N·m	1.27	←	
Rated current	A(rms)	(9.4)	←	
Rotor inertia	$\times 10^{-4}$ kg·m <sup>2</sup>	0.14	0.16	
Electrical time constant	ms	(2.2)	←	
Mechanical time constant	ms	0.83	0.95	
Power rate	kW/s	29.0	25.4	
Momentary max. current	A(o-p)	(26.6)	←	
Demagnetization current	A(o-p)	40.0	←	
Voltage constant per phase	$\times 10^{-3}$ V(rms)/min <sup>-1</sup>	2.5 ±10 %	←	
Excitation voltage constant	$\times 10^{-3}$ V(o-p)/min <sup>-1</sup>	5.3 ±10 %	←	
Torque constant	N·m/A(rms)	0.071 ±10 %	←	
	N·m/A(o-p)	0.050 ±10 %	←	
Phase resistance	Ω	0.10 ±7 %	←	
Phase inductance	mH	(0.22)	←	* Center value
Thermal class		130(B)	←	
Vibration class		V-15	←	
Paint color		Without paint	←	Plastic part : Gray
Mass	kg	0.8	1.3	
Structure		Totally-enclosed self-cooled type	←	Without oil seal
Supply voltage	V <sub>DC</sub>	24	←	

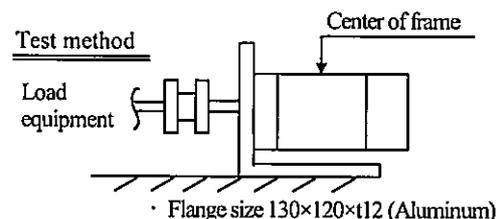
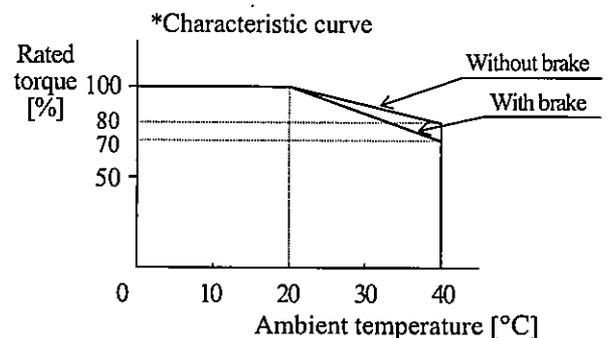
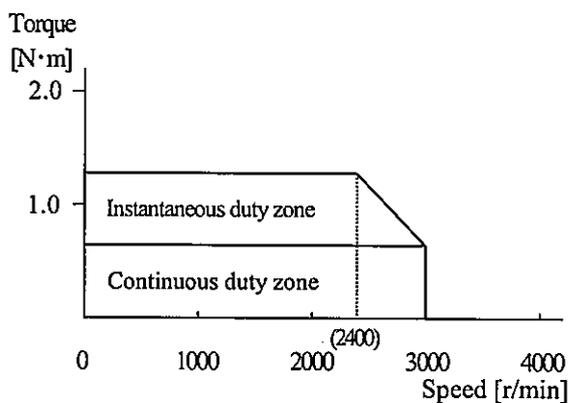
- This specification is guaranteed after combining and adjusting with the amplifier. (Representative value at 20 °C)
- Rated torque is the result that have been considered dispersions of motor specification under our measurement method.
- Set the temperature of center of frame to 70 °C or less. (When ambient temperature is 40 °C)
- Speed - Torque characteristic (Representative value )  
Amplifier power supply voltage : at DC24 V



## AC Servo Motor Specification

Motor model		MSMD02CL1□ (Without brake)	MSMD02CL1□ (With brake)	
Rated output	W	200	←	
Rating	%	(*100)	←	* refer to the
Number of poles		8	←	characteristic
Rated speed	r/min	3000	←	curve below
Max. speed	r/min	3000	←	
Rated torque	N·m	0.64	←	
Max. torque	N·m	1.27	←	
Rated current	A(rms)	(9.4)	←	
Rotor inertia	$\times 10^{-4}$ kg·m <sup>2</sup>	0.14	0.16	
Electrical time constant	ms	(2.2)	←	
Mechanical time constant	ms	0.83	0.95	
Power rate	kW/s	29.0	25.4	
Momentary max. current	A(o-p)	(26.6)	←	
Demagnetization current	A(o-p)	40.0	←	
Voltage constant per phase	$\times 10^{-3}$ V(rms)/min <sup>-1</sup>	2.5 ±10 %	←	
Excitation voltage constant	$\times 10^{-3}$ V(o-p)/min <sup>-1</sup>	5.3 ±10 %	←	
Torque constant	N·m/A(rms)	0.071 ±10 %	←	
	N·m/A(o-p)	0.050 ±10 %	←	
Phase resistance	Ω	0.10 ±7 %	←	
Phase inductance	mH	(0.22)	←	* Center value
Thermal class		130(B)	←	
Vibration class		V-15	←	
Paint color		Without paint	←	Plastic part :Gray
Mass	kg	0.8	1.3	
Structure		Totally-enclosed self-cooled type	←	With oil seal
Supply voltage	V <sub>DC</sub>	24	←	

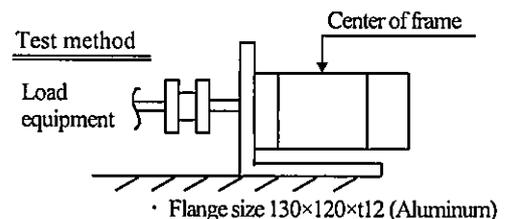
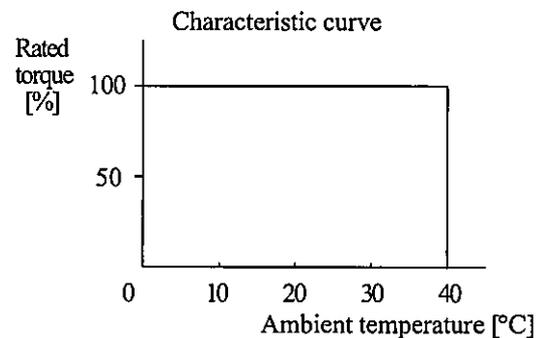
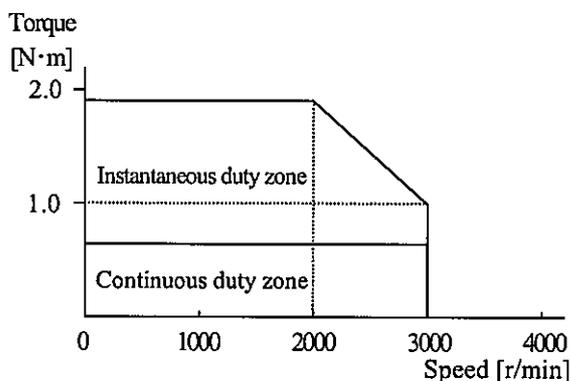
- This specification is guaranteed after combining and adjusting with the amplifier. (Representative value at 20 °C)
- Rated torque is the result that have been considered dispersions of motor specification under our measurement method.
- Set the temperature of center of frame to 70 °C or less. (When ambient temperature is 40 °C)
- Speed - Torque characteristic (Representative value )  
Amplifier power supply voltage : at DC24 V



## AC Servo Motor Specification

Motor model		MSMD02BL1 □ (Without brake)	MSMD02BL1 □ (With brake)	
Rated output	W	200	←	
Rating	%	100	←	
Number of poles		8	←	
Rated speed	r/min	3000	←	
Max. speed	r/min	3000	←	
Rated torque	N·m	0.64	←	
Max. torque	N·m	1.91	←	
Rated current	A(rms)	(5.2)	←	
Rotor inertia	$\times 10^{-4}$ kg·m <sup>2</sup>	0.14	0.16	
Electrical time constant	ms	(2.5)	←	
Mechanical time constant	ms	0.72	0.82	
Power rate	kW/s	29.0	25.4	
Momentary max. current	A(o-p)	(22.5)	←	
Demagnetization current	A(o-p)	30.0	←	
Voltage constant per phase	$\times 10^{-3}$ V(rms)/min <sup>-1</sup>	4.3 ±10 %	←	
Excitation voltage constant	$\times 10^{-3}$ V(o-p)/min <sup>-1</sup>	9.1 ±10 %	←	
Torque constant	N·m/A(rms)	0.122 ±10 %	←	
	N·m/A(o-p)	0.087 ±10 %	←	
Phase resistance	Ω	0.26 ±7 %	←	
Phase inductance	mH	(0.65)	←	* Center value
Thermal class		130(B)	←	
Vibration class		V-15	←	
Paint color		Without paint	←	Plastic part : Gray
Mass	kg	0.8	1.3	
Structure		Totally-enclosed self-cooled type	←	Without oil seal
Supply voltage	V <sub>DC</sub>	48	←	

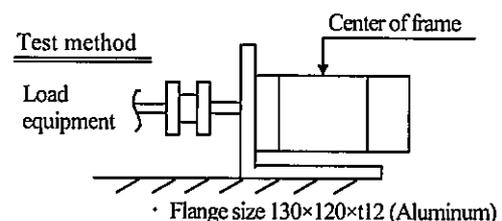
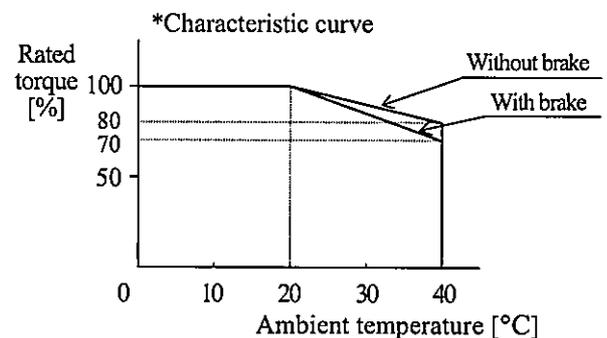
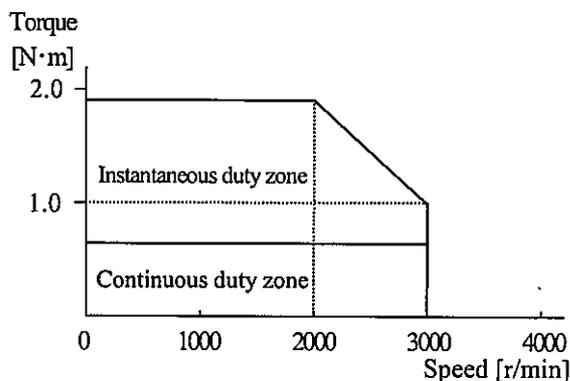
- This specification is guaranteed after combining and adjusting with the amplifier. (Representative value at 20 °C)
- Rated torque is the result that have been considered dispersions of motor specification under our measurement method.
- Set the temperature of center of frame to 70 °C or less. (When ambient temperature is 40 °C)
- Speed - Torque characteristic (Representative value )  
Amplifier power supply voltage : at DC48 V



## AC Servo Motor Specification

Motor model		MSMD02BL1□ (Without brake)	MSMD02BL1□ (With brake)	
Rated output	W	200	←	
Rating	%	(*100)	←	* refer to the
Number of poles		8	←	characteristic
Rated speed	r/min	3000	←	curve below
Max. speed	r/min	3000	←	
Rated torque	N·m	0.64	←	
Max. torque	N·m	1.91	←	
Rated current	A(rms)	(5.2)	←	
Rotor inertia	$\times 10^{-4}$ kg·m <sup>2</sup>	0.14	0.16	
Electrical time constant	ms	(2.5)	←	
Mechanical time constant	ms	0.72	0.82	
Power rate	kW/s	29.0	25.4	
Momentary max. current	A(o-p)	(22.5)	←	
Demagnetization current	A(o-p)	30.0	←	
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Excitation voltage constant	$\times 10^{-3}$ V(o-p)/min <sup>-1</sup>	9.1 ±10 %	←	
Torque constant	N·m/A(rms)	0.122 ±10 %	←	
	N·m/A(o-p)	0.087 ±10 %	←	
Phase resistance	Ω	0.26 ±7 %	←	
Phase inductance	mH	(0.65)	←	* Center value
Thermal class		130(B)	←	
Vibration class		V-15	←	
Paint color		Without paint	←	Plastic part :Gray
Mass	kg	0.8	1.3	
Structure		Totally-enclosed self-cooled type	←	With oil seal
Supply voltage	V <sub>DC</sub>	48	←	

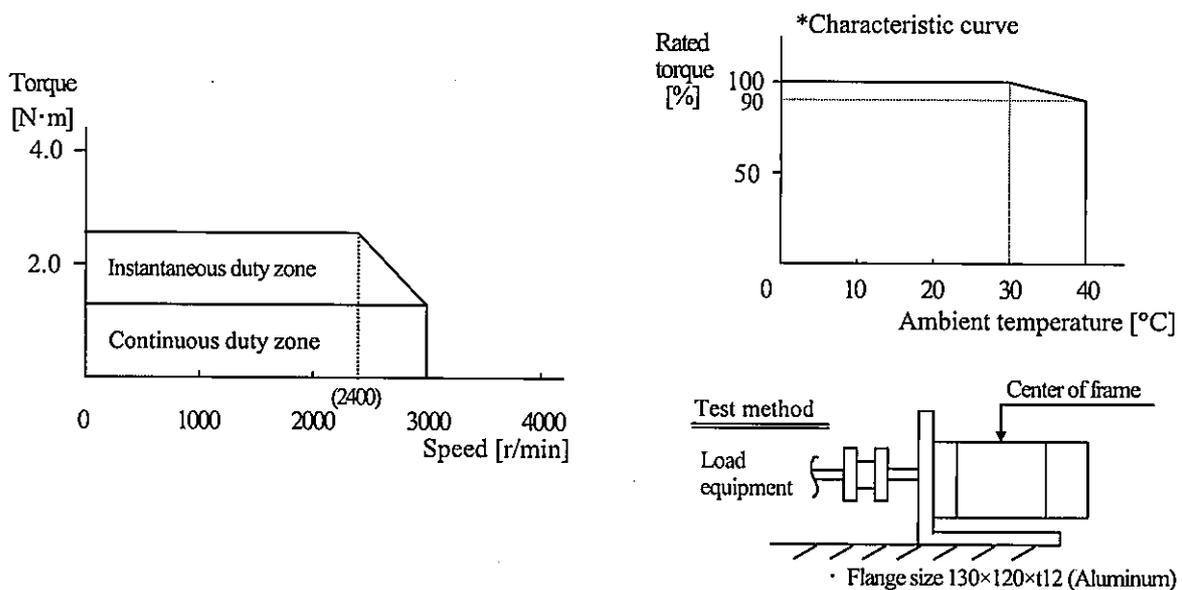
- This specification is guaranteed after combining and adjusting with the amplifier. (Representative value at 20 °C)
- Rated torque is the result that have been considered dispersions of motor specification under our measurement method.
- Set the temperature of center of frame to 70 °C or less. (When ambient temperature is 40 °C)
- Speed - Torque characteristic (Representative value )  
Amplifier power supply voltage : at DC48 V



## AC Servo Motor Specification

Motor model		MSMD04BL1□ (Without brake)	MSMD04BL1□ (With brake)	
Rated output	W	400	←	
Rating	%	100	(*100)	* refer to the
Number of poles		8	←	characteristic
Rated speed	r/min	3000	←	curve below
Max. speed	r/min	3000	←	
Rated torque	N·m	1.27	←	
Max. torque	N·m	2.54	←	
Rated current	A(rms)	(8.6)	←	
Rotor inertia	$\times 10^{-4}$ kg·m <sup>2</sup>	0.26	0.28	
Electrical time constant	ms	(2.8)	←	
Mechanical time constant	ms	0.58	0.63	
Power rate	kW/s	62.4	58.0	
Momentary max. current	A(o-p)	(24.3)	←	
Demagnetization current	A(o-p)	36.5	←	
Voltage constant per phase	$\times 10^{-3}$ V(rms)/min <sup>-1</sup>	5.4 ±10 %	←	
Excitation voltage constant	$\times 10^{-3}$ V(o-p)/min <sup>-1</sup>	11.5 ±10 %	←	
Torque constant	N·m/A(rms)	0.156 ±10 %	←	
	N·m/A(o-p)	0.110 ±10 %	←	
Phase resistance	Ω	0.18 ±7 %	←	
Phase inductance	mH	(0.50)	←	* Center value
Thermal class		130(B)	←	
Vibration class		V-15	←	
Paint color		Without paint	←	Plastic part :Gray
Mass	kg	1.2	1.7	
Structure		Totally-enclosed self-cooled type	←	Without oil seal
Supply voltage	V <sub>DC</sub>	48	←	

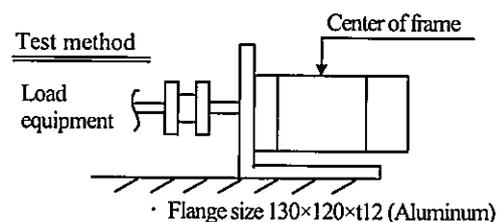
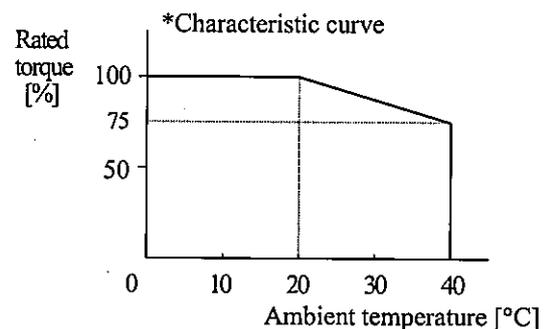
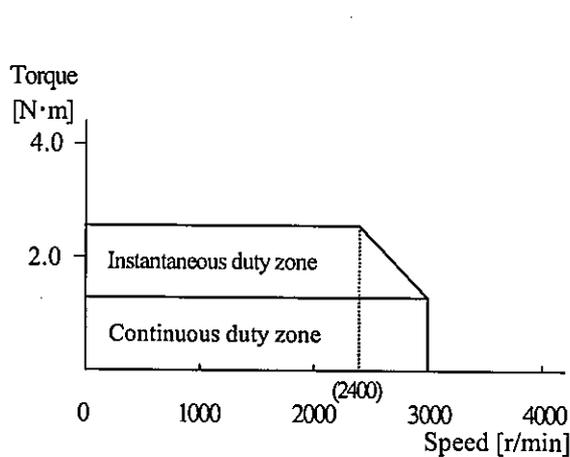
- This specification is guaranteed after combining and adjusting with the amplifier. (Representative value at 20 °C)
- Rated torque is the result that have been considered dispersions of motor specification under our measurement method.
- Set the temperature of center of frame to 85 °C or less. (When ambient temperature is 40 °C)
- Speed - Torque characteristic (Representative value )  
Amplifier power supply voltage : at DC48 V



## AC Servo Motor Specification

Motor model		MSMD04BL1□ (Without brake)	MSMD04BL1□ (With brake)	
Rated output	W	400	←	
Rating	%	(*100)	←	* refer to the
Number of poles		8	←	characteristic
Rated speed	r/min	3000	←	curve below
Max. speed	r/min	3000	←	
Rated torque	N·m	1.27	←	
Max. torque	N·m	2.54	←	
Rated current	A(rms)	(8.6)	←	
Rotor inertia	$\times 10^{-4}$ kg·m <sup>2</sup>	0.26	0.28	
Electrical time constant	ms	(2.8)	←	
Mechanical time constant	ms	0.58	0.63	
Power rate	kW/s	62.4	58.0	
Momentary max. current	A(o-p)	(24.3)	←	
Demagnetization current	A(o-p)	36.5	←	
Voltage constant per phase	$\times 10^{-3}$ V(rms)/min <sup>-1</sup>	5.4 ± 10 %	←	
Excitation voltage constant	$\times 10^{-3}$ V(o-p)/min <sup>-1</sup>	11.5 ± 10 %	←	
Torque constant	N·m/A(rms)	0.156 ± 10 %	←	
	N·m/A(o-p)	0.110 ± 10 %	←	
Phase resistance	Ω	0.18 ± 7 %	←	
Phase inductance	mH	(0.50)	←	* Center value
Thermal class		130(B)	←	
Vibration class		V-15	←	
Paint color		Without paint	←	Plastic part : Gray
Mass	kg	1.2	1.7	
Structure		Totally-enclosed self-cooled type	←	With oil seal
Supply voltage	V <sub>DC</sub>	48	←	

- This specification is guaranteed after combining and adjusting with the amplifier. (Representative value at 20 °C)
- Rated torque is the result that have been considered dispersions of motor specification under our measurement method.
- Set the temperature of center of frame to 85 °C or less. (When ambient temperature is 40 °C)
- Speed - Torque characteristic (Representative value )  
Amplifier power supply voltage : at DC48 V



SX-DSV0316301

Do NOT scale the drawings. Instead rely on the dimensions and their definitions

Opponent connector (No belongings)

Motor connector (JST)  
Housing: F31MSF-04V-KX  
Contact: SF3M-41GF-M2.0N

Detector connector (AMP)  
Cap : 172161-1  
Socket: 170361-1  
or 170365-1

Rotary encoder unit  
(23 bit absolute)

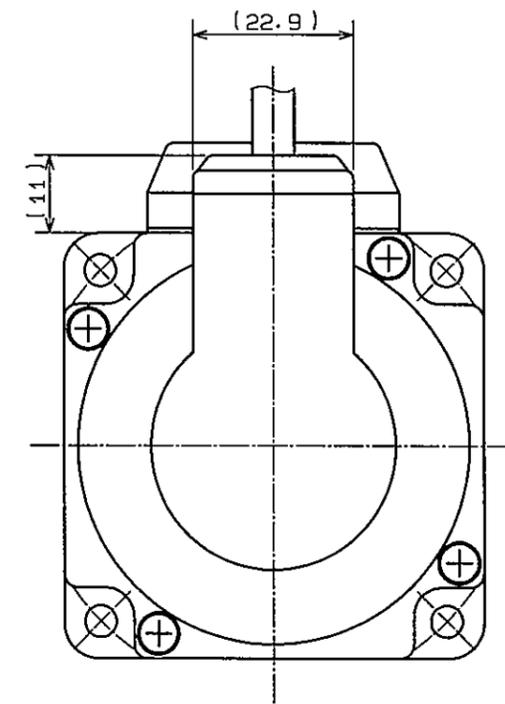
PIN No.	Color	Signal
1	Red	BAT +
2	Pink	BAT -
3	Shield	FG
4	Sky blue	PS (SD)
5	Violet	PS (SD)
6	—	NC
7	White	E5 V
8	Black	E0 V
9	—	NC

Motor unit

Contact No.	Color	Signal
1	Red	U
2	White	V
3	Black or Blue	W
4	Green/Yellow	E

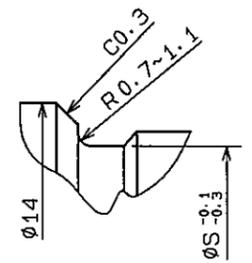
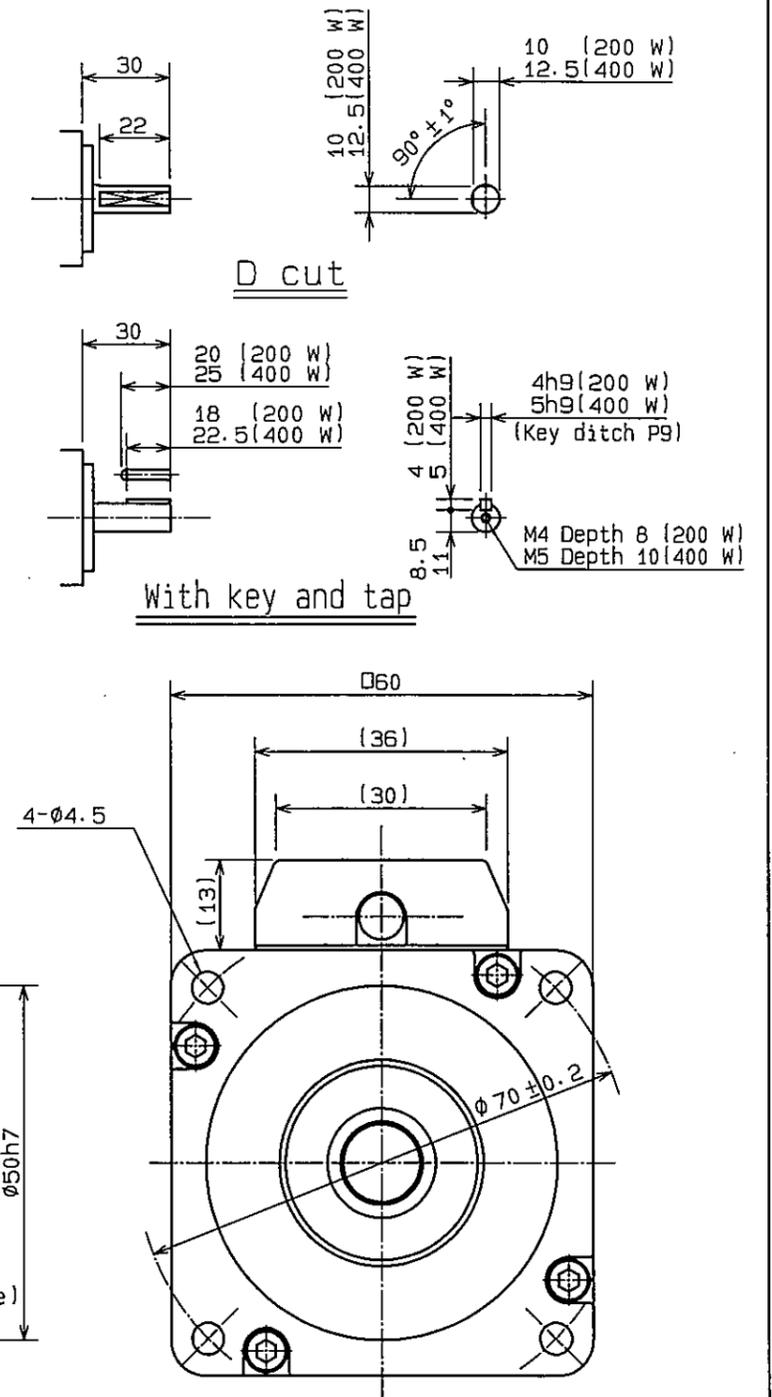
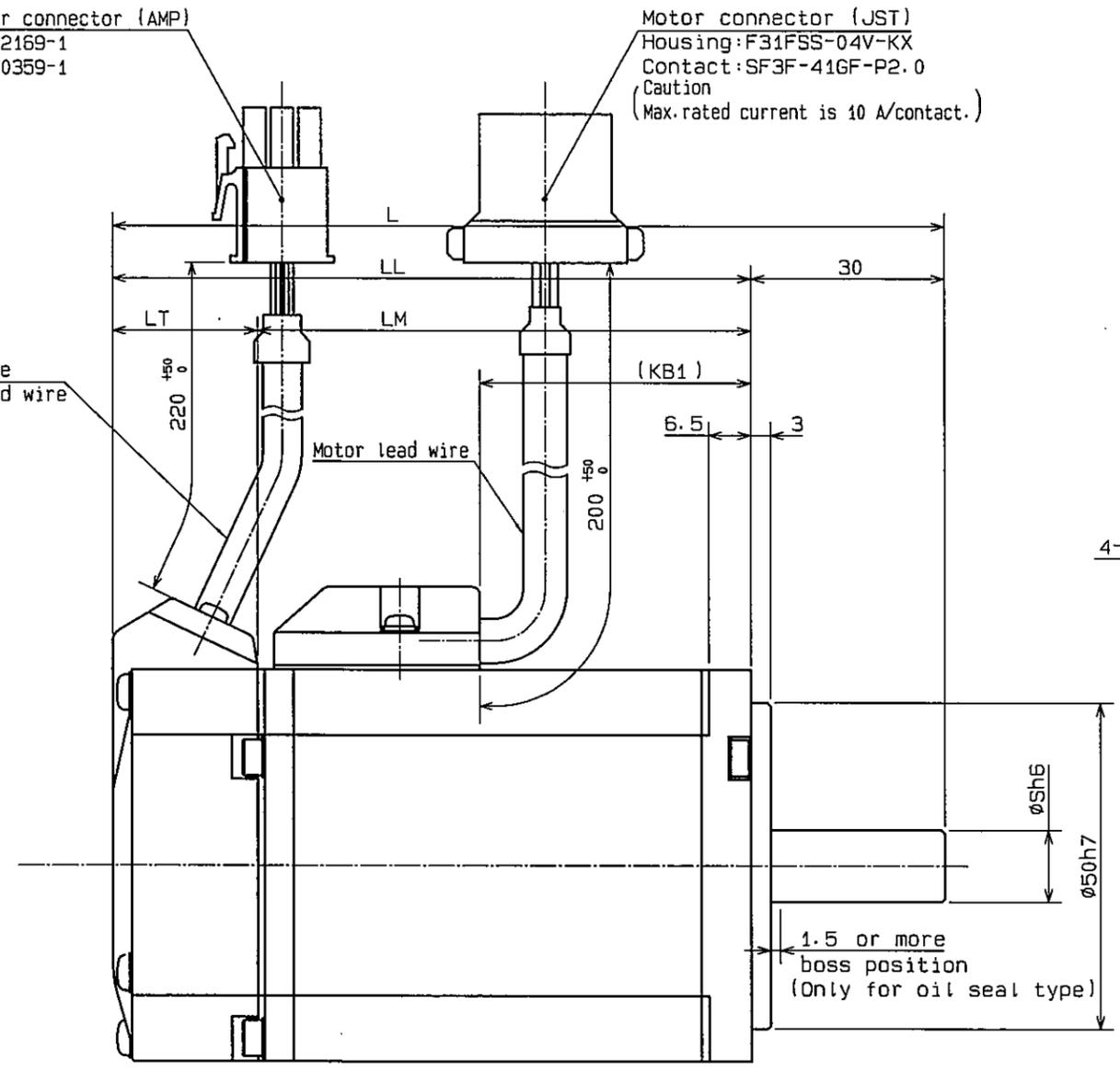
Motor connector (JST)  
Housing: F31FSS-04V-KX  
Contact: SF3F-41GF-P2.0  
Caution  
(Max. rated current is 10 A/contact.)

Detector connector (AMP)  
Plug: 172169-1  
Pin : 170359-1



Detector lead wire  
Multicore shielded wire

Motor lead wire



Detail of shaft step part (S=Free)  
(200 W Only)

NOTE 1. The assembling precision conforms to the Japan Machine Tool Association Standard (MAS402-1981). (TIR value)  
·Shaft end runout: 0.03 (shaft exit middle)  
·Squareness of flange face to shaft: 0.08 (φ70)  
·Eccentricity of flange fitting outside diameter to shaft: 0.06 (middle of spigot)  
2. For flange mounting bolts, use hexagonal socket head bolts.

Model	Voltage (V)	Rated Speed (r/min)	Output (W)	L	LL	LM	S	LT	KB1
MSMD02CL1□	DC24	3000	200	109.5	79.5	57	11	22.5	22.5
MSMD02BL1□	DC48	↑	↑	↑	↑	↑	↑	↑	↑
MSMD04BL1□	↑	↑	400	129	99	76.5	14	↑	42

※ □ shows motor structure

Oil seal	Shaft structure		
	Straight	D cut	With key and tap
Without	A	N	S
With	C	Q	U

Scale	Panasonic Corporation				Agreement	Model
1 : 1	3rd Angle System Unit:mm					MSMD0□□L1□ □60
Designed	Drawn	Checked	Checked	Checked	Name	OUTLINE DRAWING (WITHOUT BRAKE)
MIYAZAKI	MIYAZAKI	Nishio		Kira	No.	SX-DSV0316301
2017/02/10	2017/02/10	2017/12/10		2017/2/10		

TRACE  
MIYAZAKI 2017/02/10  
CLASS E  
SVM

SX-DSV0316302

Do NOT scale the drawings. Instead rely on the dimensions and their definitions

Opponent connector (No belongings)

Motor connector (JST)  
Housing: F31MSF-04V-KX  
Contact: SF3M-41GF-M2.0N

Detector connector (AMP)  
Cap: 172161-1  
Socket: 170361-1  
or 170365-1

Brake connector (AMP)  
Cap: 172157-1  
Socket: 170362-1  
or 170366-1

Rotary encoder unit (23 bit absolute)

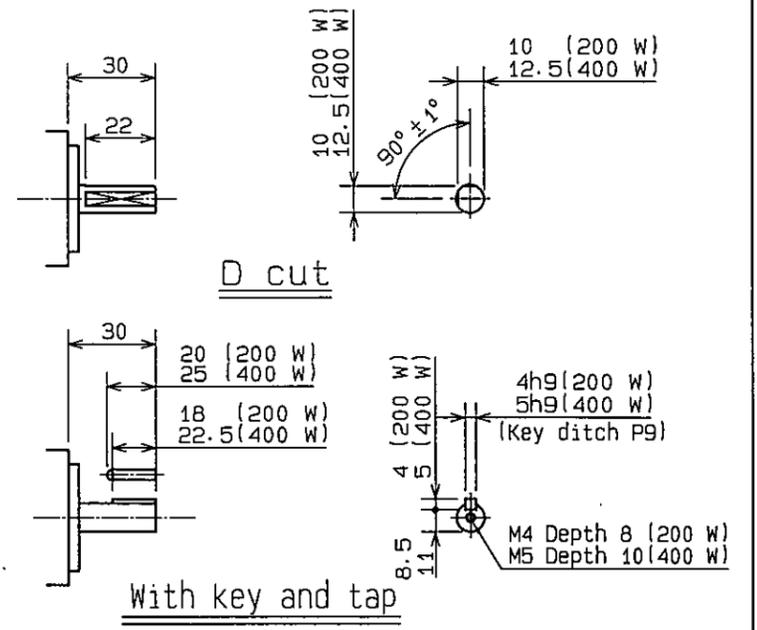
PIN No.	Color	Signal
1	Red	BAT +
2	Pink	BAT -
3	Shield	FG
4	Sky blue	PS (SD)
5	Violet	PS (SD)
6	—	NC
7	White	E5 V
8	Black	E0 V
9	—	NC

Brake unit

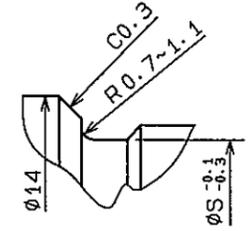
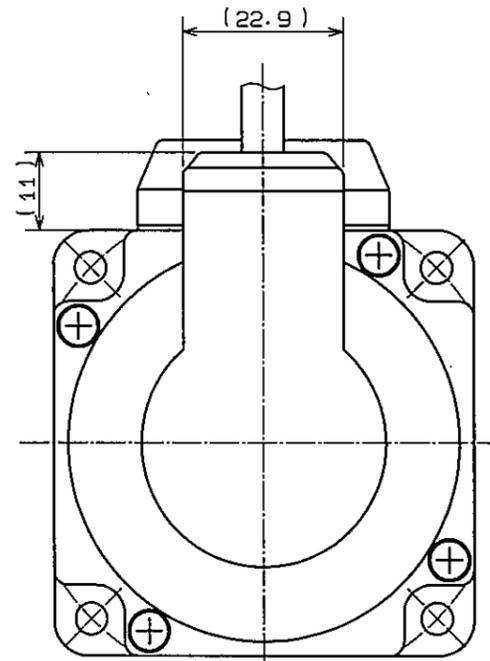
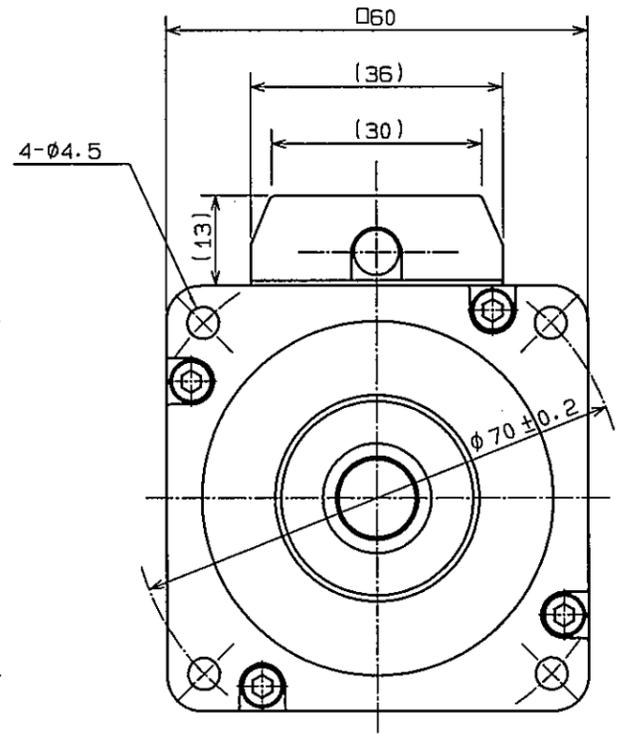
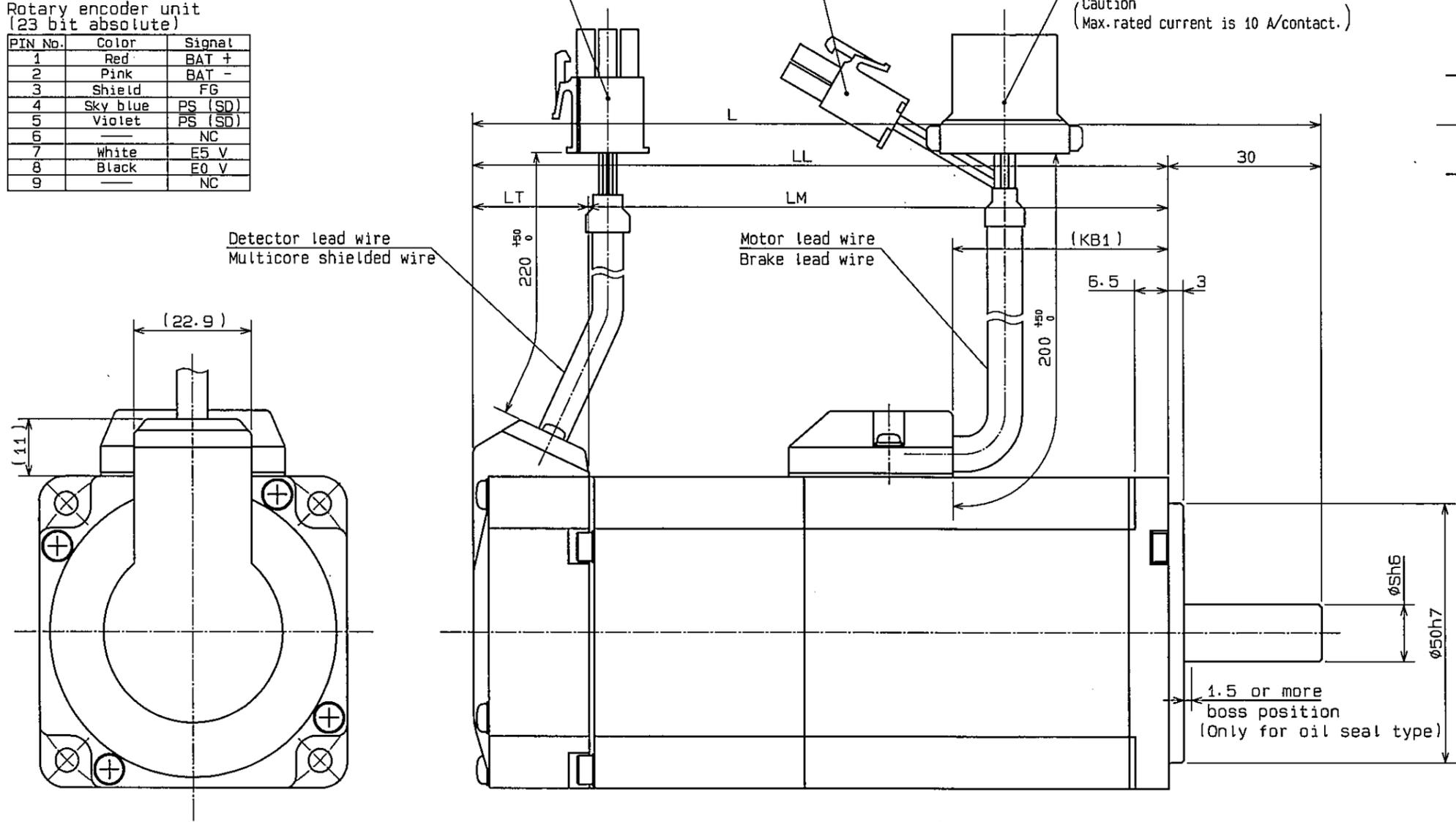
PIN No.	Color	Signal
1	Yellow	Brake
2	Yellow	Brake

Motor unit

Contact No.	Color	Signal
1	Red	U
2	White	V
3	Black or Blue	W
4	Green/Yellow	E



Detector connector (AMP) Plug: 172169-1 Pin: 170359-1  
Brake connector (AMP) Plug: 172165-1 Pin: 170360-1  
Motor connector (JST) Housing: F31FSS-04V-KX Contact: SF3F-41GF-P2.0 (Caution Max. rated current is 10 A/contact.)



Detail of shaft step part (S=Free) (200 W Only)

NOTE 1. The assembling precision conforms to the Japan Machine Tool Association Standard (MAS402-1981). (TIR value)  
·Shaft end runout: 0.03 (shaft exit middle)  
·Squareness of flange face to shaft: 0.08 (Ø70)  
·Eccentricity of flange fitting outside diameter to shaft: 0.06 (middle of spigot)  
2. For flange mounting bolts, use hexagonal socket head bolts.

Model	Voltage (V)	Rated Speed (r/min)	Output (W)	L	LL	LM	S	LT	KB1
MSMD02CL1□	DC24	3000	200	146	116	93.5	11	22.5	22.5
MSMD02BL1□	DC48	1	1	1	1	1	1	1	1
MSMD04BL1□	1	1	400	165.5	135.5	113	14	1	42

\* □ shows motor structure

Oil seal	Shaft structure		
	Straight	D cut	With key and tap
Without	B	P	T
With	D	R	V

Scale	Panasonic Corporation				Agreement	Model
1 : 1	3rd Angle System				Unit: mm	MSMD0□□L1□ □60
Designed	Drawn	Checked	Checked	Checked	Name	OUTLINE DRAWING (WITH BRAKE)
MIYAZAKI	MIYAZAKI	Nishio		Kira	No.	SX-DSV0316302
2017/02/10	2017/02/10	2017/2/10		2017/2/10		

TRACE  
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SVM  
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MIYAZAKI  
2017/02/10