

Document No. : SX-DSB00395

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Classification : ☐ New ☒ Change

REFERENCE SPECIFICATIONS

Product Name : Brushless Motor
Product Series Name : MBMS series, KV type
Product Model Number : MBMS041BL□

Motion Control Business Unit, Industrial Device Business Division
Panasonic Industry Co., Ltd.
7-1-1 Morofuku, Daito—City, Osaka 574-0044, Japan

If you have any questions, please contact the seller (Sales office or Distributor) of the product.

Panasonic

1. Scope

The specifications are the brushless motor (MBMU) KV series manufactured and delivered by Motion Control Business Unit, Panasonic Industry Co., Ltd.

This product is for industrial equipment.

Don't use this product at general household.

2. Applicable models, Specification, Outside drawings, Applicable Amplifier

Applicable model	Specification			Outer dimension drawing No.	Applicable Amplifier
MBMS041BL□	SX-DSB00395	1-1	400 W 100 V	SX-DSB0039501	MBEK041BCV

※ □ shows motor structure

		shaft		
		Straight	D cut	With key and screw tap
Oil Seal	None	A	S	E
	Exist	C	U	G

3. Serial numbers (Production numbers)

The serial number of a motor nameplate means as follows:

Ex.: SER No. 13 05 0001
 Christian year Production month Serial number

4. Performance

(1) Heat resistance	Allowable ambient temperature (except for motor temperature rise) Operating 0 °C ~ +40 °C Storing -20 °C ~ +65 °C
(2) Humidity resistance	Allowable ambient humidity 20~85 %RH (not to condense dew)
(3) Insulation resistance	20 MΩ or more when cool by DC500 V megger. (motor unit : between motor frame and motor lead wire)
(4) Dielectric strength	To withstand AC1500 V for 1 minute. (sensed current:10mA) (motor unit : between motor frame and motor lead wire)
(5) Vibration resistance	24.5 m/s ² or less X,Y,Z directions
(6) Impact resistance	98 m/s ² in X,Y,Z directions ; 3 times each
(7) Dust-proof & Drip-proof	Equivalent of IP65* (Except for shaft through sections and connector sections)
(8) Altitude	1000 m or less above sea level

* IP65 is one of the designations that mean classification of degrees of protection defined IEC60529 standard.

It means that the test has been performed to check and the motor passed the test as a result.

It does not guarantee to maintain the IP grade in the actual use.

5. Assembling precision

(1) In accordance with the outside drawings.

- The axial runout is measured in the lateral direction of the shaft.
- The flange surface squareness and spigot eccentricity are measured in the vertical direction of the shaft.

(2) End play (axial play) : 0.3 mm or less.

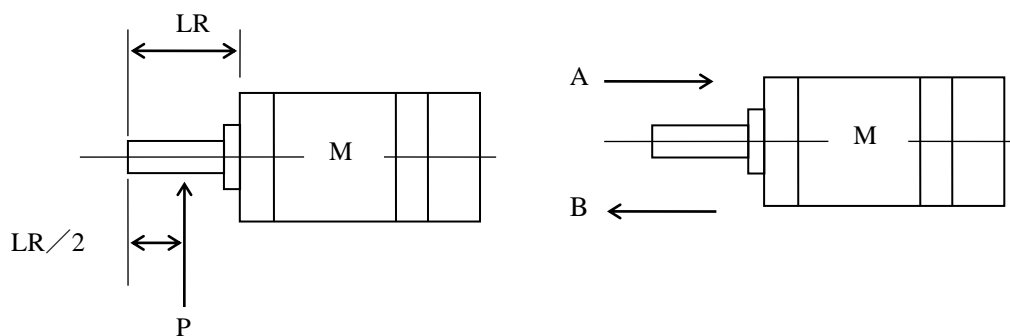
6. Shaft allowable load

Unit : N

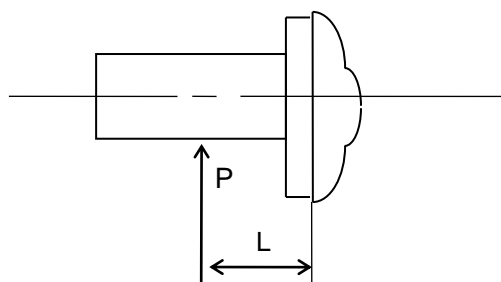
Motor	When assembling			When operating	
	Radial load	Thrust load		Radial load	Thrust load
		Direction A	Direction B		
MBMS041BL*	392	147	196	245	98

Radial load (P) position

Thrust load direction



When a load position is changed, calculate allowable radial load P by the following relational expression, using load position's distance L from the mounting flange surface, and set the load below a value resulting from such calculation.



Applicable models	Relational expression of load and load position
MBMS04	$P = \frac{19723}{L + 65.5}$

Unit : P (N) L (mm)

7. Compliance with safety standards (This standard is asking for the certification.)

- | | |
|---|--|
| <p>(1) Compliance with UL and CSA standards
 Applicable standards UL 1004
 CSA 22.2, No. 100.</p> | <p>(2) Compliance with CE and UKCA
 Applicable standards EN 60034 – 1
 EN 60034 – 5/A1</p> |
| <p>(3) Compliance with CCC
 Applicable standards GB12350</p> | |

8. Standard Life and Standard exchange time

(1) Potential basic rated life of bearings (Calculated values)

90 % reliable fatigue life after dealing with its variation statistically, under the shaft allowable load, is 20,000 hours or more under the continuous application of the rated load.

Be sure that there is no repetitive shaking operation or no oscillation, which may cause fretting phenomena, within 45 degrees of motor shaft rotating angle.

(2) Standard exchange time of oil seal (with oil seal)

5,000 hours under the continuous application of rated load.

(It changes with environment or usage)

9. Regarding the guarantee period

9-1 Guarantee period

The guarantee period shall be 1 year after delivery, or 1.5 years after a production month.

However, the number of acceleration-deceleration cycles of a brake shall not exceed its life.

Even if consumable parts (oil seals) are excluded.

Guarantee period has not been expired yet, the following cases are excluded:

- (1) Defects are caused by misuse, repair or modification by yourselves.
- (2) Defects are caused by dropping after purchase, or damage during transportation.
- (3) Defects are caused by use under the condition exceeding the specification of products.
- (4) Defects are caused by fire, earthquake, lightning stroke, wind and flood damage, salt damage, abnormal voltage, other natural disasters, casualty.
- (5) When a failure is attributable to entry of water / grease / metal strip / other foreign object.

9-2 Coverage of guarantee

As for defects that may occur under our responsibility during the guarantee period, we only undertake to exchange defective sections of the equipment or to repair it. The guarantee covers the delivered unit of a product only. Therefore, we are not in a position to accept any claim of consequential damage resulting from the defects of delivered products.

When you sell this product in China, you need disclosure of " Toxic substance content information on electronic information products.".

・ 電子電気製品の有害物質含有情報

产品中有害物质的名称及含量

构成部位	有害物质					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
框架	×	○	○	○	○	○
定子组装	×	○	○	○	○	○
转子	×	○	○	○	○	○
转子组装	×	○	○	○	○	○
托架	×	○	○	○	○	○
基板完成品	×	○	○	○	○	○
垫圈	○	○	○	○	○	○
螺丝	○	○	○	○	○	○
引线固定器	○	○	○	○	○	○
引线	×	○	○	○	○	○
连接器	×	○	○	○	○	○
油封	○	○	○	○	○	○

本表格依据 SJ/T11364 的规定编制。

○ ：表示该有害物质在该部件所有均质材料中的含量均在 GB/T26572 规定的限量要求以下。

× ：表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T26572 规定的限量要求。

Other information

・ Producer's name

松下机电株式会社
日本大阪府门真市大字门真 1006 番地

・ Country of origin

中国

・ Product Name

无刷电动机

・ Company standard number



无刷电动机 Q/PMRZ 9





Safety precautions

10. Safety Precautions

- The seriousness of injury or damage caused by using the product improperly without observing the indicated description is categorized using the signs below and the meaning is explained.

 Danger	The section with this sign contains items which are “assumed to cause imminently dangerous situation such as death or seriously injury if ignored.”
 Caution	The section with this sign contains items which are “assumed to cause injury or property damage only if ignored.”

- The type of description to be observed is categorized with the signs below and the meaning is explained.

	This sign shows that the item is “prohibited” to perform.
	This sign shows that the item is a “compulsory” to be performed without fail.



Danger



- (1) Be sure not use the product in a place where the product may come in contact with foreign matter such as liquid like grinding oil, oil mist, and file dust, nor in an atmosphere of corrosive gas (such as H₂S, SO₂, NO₂, Cl₂) or flammable gases, nor in a place near inflammable material.
- (2) Do not place inflammable material near a motor, a amplifier, or a regenerative resistance.
- (3) Do not drive the motor with external power.
- (4) Do not damage the cable nor place too much stress or heavy object on the cable. Do not pinch the cable.
- (5) Do not operate the product while the cable is dipped in oil or water.
- (6) Do not install the console near heating element such as a heater or a large-sized wire wound resistor.
- (7) Do not connect the motor to the commercial power source directly.
- (8) Do not use the product in a place where strong vibration or shock may be experienced.
- (9) Be sure not to touch the rotating part of the motor during operation.
- (10) Do not touch the keyway of the output axis of the motor with bare hands.
- (11) Be sure not to insert your hand into the amplifier.
- (12) Do not touch the motor, the heat sink of the amplifier nor the surrounding equipments since they will be hot.
- (13) Do not perform wiring nor operate the product with wet hand.

Safety precautions

Danger



- (14) Be sure that the wiring task is performed by electrical engineer.
- (15) There is no protective device attached to the motor other than the specified ones. Please protect them with an overcurrent protective device, a ground-fault circuit interrupter, an overtemperature preventing device, an emergency stop device, and the like.
- (16) When starting operation of the amplifier after an earthquake, please make sure that there is no abnormality as to the installation condition of the amplifier and the motor and the safety of the machine before starting operation.
- (17) When relocating, wiring, or checking the amplifier, leave it for the period of time indicated on the main body or longer after switching off the power, and confirm that there is no danger of electric shock, and then perform the task.
- (18) To prevent causing fire or accident resulting in injury or death due to improper installation or mounting at the occurrence of earthquake, please install or mount the device securely.
- (19) In order to be able to stop operating the device immediately and to cut off the device from the power source, install an external emergency stop circuit.
- (20) Install the motor, the amplifier, and the surrounding devices on nonflammables such as metal.
- (21) Perform wiring correctly and securely. Insecure and incorrect wiring may be the cause of abnormal motor operation and its damage by fire.
Also, please make sure that no electrical conducting material such as a scrap of electric wire get inside the amplifier at the time of performing installation and wiring task.
- (22) Connect the cables securely, and firmly insulate the current-carrying part with insulating material.
- (23) Be sure to install a no-fuse breaker to the power source.
Also, make sure to connect the ground terminal or the ground lead to the ground.
(In order to prevent electric shock and abnormal operation, the class D grounding
(Grounding resistance: 100 Ω or lower) or higher is recommended.)

Caution



- (24) When transferring the product, do not hold the cable or the axis of the motor.
- (25) Do not adjust or modify the gain of the amplifier extremely, nor let the operation or movement of the machine be unstable.
- (26) After recovering from power failure, do not get close to the machine because there is a possibility that the machine restarts suddenly.
Setting must be made to the machine so that safety for the worker is ensured when the machine restarted suddenly.
- (27) Do not apply strong shock to the axis of the motor.
- (28) Do not apply strong shock to the product.
- (29) Be sure not to start or stop the motor with the electromagnetic contactor installed on the main power source side.
- (30) Do not switch on or off the main power supply of the amplifier frequently.
- (31) 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.
- (32) Be careful not to drop or to topple over the product when transferring or performing installation task.
- (33) Do not climb on the motor or place heavy object on the motor.
- (34) Do not cover the louver on the amplifier nor insert foreign matter.
- (35) Do not use the product in an area exposed to direct sunlight. And when storing the product, avoid direct sunlight and keep the temperature and the humidity within the range specified for when the product is in use.
- (36) Never overhaul or modify the motor.
Overhauling will be performed at our company or at the retailers approved by our company.



Safety precautions



- (37) Use the motor and the driver in the combination specified by our company. Please confirm the performance and the safety at your company when the motor is used in combination with another amplifier.
- (38) Due to the trouble with the motor or the driver combined, the motor may be damaged by fire, or smoking or dusting might occur. Please consider these possibilities when they are to be used in a clean room or the like.
- (39) Perform proper installation which is in proportion to the output and the weight of the main body.
- (40) Keep the ambient temperature and humidity of the installed motor within the range of allowable temperature and humidity.
- (41) Observe the specified installation method and the orientation of the product.
- (42) Keep a space as specified between the driver and the inner surface of the control panel, or between the amplifier and the other devices when installing the product.
- (43) Use the eyebolt attached to motor only for transferring the motor, but not for transferring the equipment.
- (44) Install a relay used to break the circuit at the time of emergency stop in series with the relay used to control the brake.
- (45) Fix the motor at the time of test run, and confirm its movement after isolating it from the mechanical system, and then mount it on the machine.
(The motor should rotate smoothly at 30 r/min or so by the amplifier driving.)
- (46) Confirm that the power source specification is normal.
- (47) When an error has occurred, remove the cause and ensure the safety first, and after releasing the error, restart the machine.
- (48) The brake built in the motor may not be maintained due to its life span, the mechanical structure, and so on. Please install a stopping device to ensure the safety on the machine side.
- (49) Do not place obstacles around the motor, the amplifier, and the surrounding devices in order to keep an adequate amount of ventilation.
- (50) Maintenance should be performed by the specialist.
- (51) If the product is not to be used for a long period of time, be sure to turn off the power.

Please be sure to read the instruction manual (the safety section) before use.

We have been putting maximum effort to ensure the quality of this product. But since the possibility of the occurrence of the product's abnormal behavior not in accordance with the setting still exists due to the unexpectedly strong exogenous noise (including radiation and the like), the application of static electricity, or the rare event such as abnormality in the input power source, the wiring, and the parts, we ask our customers to take measures against the occurrence of unexpected behavior to fully ensure the safety.

11. Other cautions

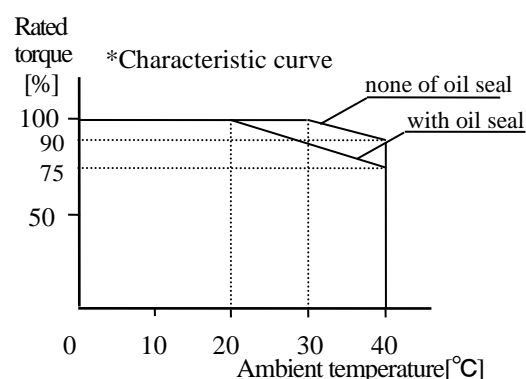
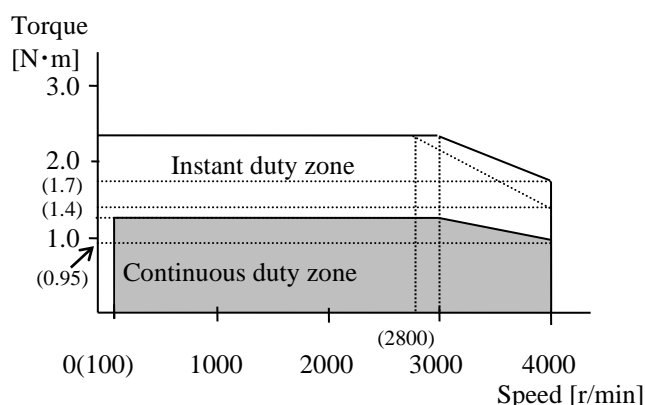
- (1) Do not store the product in a place where the product may be exposed to rainwater or water drop or harmful gas or liquid.
- (2) Store the product in a place where direct sunlight can be avoided and where the temperature and humidity are within the specified range.
If the product has been stored for a long period of time (one and a half years or longer), consult with us.
- (3) Since excessive loading of the product may be the cause of load collapsing, follow the instructions indicated.
- (4) Please make the final decision at your company as to the specification of the completed product, compliance with laws and regulations, and its compatibility with your machine and parts in respects such as the structure, dimensions, service life, and characteristics.
- (5) When the shaft is equipped with a key, please fix the coupling with motor shaft by securing with setscrew or the like, not just by securing the key, and apply fretting prevention grease as well.
- (6) When changing the specification of your machine, pay special attention to matching with our motor.
- (7) When the motor is to be operated without electrically connecting the motor shaft to the ground, depending on the actual equipment and the installing environment, problems such as the ball bearing sound will be louder may occur due to the occurrence of electrical corrosion at the motor ball bearing. So please confirm and verify it by yourself.
- (8) Please confirm the strength of the motor shaft at your company.
(There should be no load heavier than the allowable weight on the motor shaft during operation.)
- (9) Grease (Albania No. 2: produced by Showa Shell Oil) is applied to the shaft end of this motor.
Please consider its influence to materials such as plastic.
- (10) Please meet the need if it is necessary to seal the fitting portion between your machine and our motor.
- (11) When you throw away the battery, isolate the battery with a tape or the like, and abolish it according to the regulations of the local government.
- (12) When you throw away the motor, treat it as industrially disposable things.
- (13) The parts, etc. are subject to change for performance improvement or other purposes provided that the requirements of this specification are satisfied.
- (14) Specification change of the motor is to be made according to our delivery specification or your written document. If it is related to the function and characteristics, samples are to be made and checked before changing the specification.
- (15) In case the specification is changed, it may cause the change of the price.
- (16) If any item which is not described on these specifications has to be agreed upon, please contact us beforehand.
- (17) If any malfunction should be found, the both parties are to discuss with each other based on description on these specifications.
- (18) This product was designed to be used with general industrial products or the like. It is not designed to be used with a machine dealing with human life or as an equipment to be used in unusual circumstances such as nuclear power management, use with aerospace instruments, use in transportation, use with medical equipments, use with various types of safety devices, or use with a equipment for which high level of cleanliness is required.

AC Brushless Motor Specification

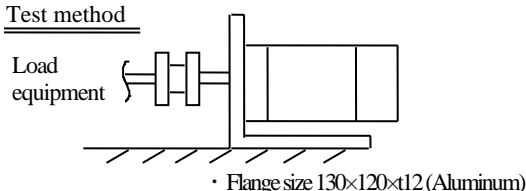
Motor model		MBMS041BL□ (none of oil seal)	MBMS041BL□ (with oil seal)	
Rated output	W	400	←	
Rating	%	(*100)	←	* refer to the
Number of poles		8	←	characteristic
Rated speed	r/min	3000	←	curve below
Max. speed	r/min	4000	←	
Range of speed control	r/min	100～4000	←	
Rated torque	N·m	1.27	←	
Max. torque *1	N·m	2.2	←	
Rated current	A(rms)	4.3	←	
Rotor inertia	$\times 10^{-4}$ kg·m ²	0.26	←	
Momentary max. current	A(o-p)	(12.0)	←	
Phase resistance	Ω	$0.76 \pm 7\%$	←	
Phase inductance	mH	(2.18)	←	* Center Value
Thermal class		130 (B)	←	
Vibration class		V-15	←	
Paint color		None of paint	←	Plastic part :Dark gray
Mass	kg	1.2	←	
Structure		Totally-enclosed self-cooled type	←	
Supply voltage	V AC	100	←	

*1 The Max. forgue is a representative.

- 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 AC 100 V



Test method



Opponent connector (No belongings)

Motor connector (AMP)
Housing :172159-1
Terminal:170362-1 or 170366-1

Detector connector (MOLEX)
Housing :5559-06P-210
Terminal:5558T2L

Connection of the motor

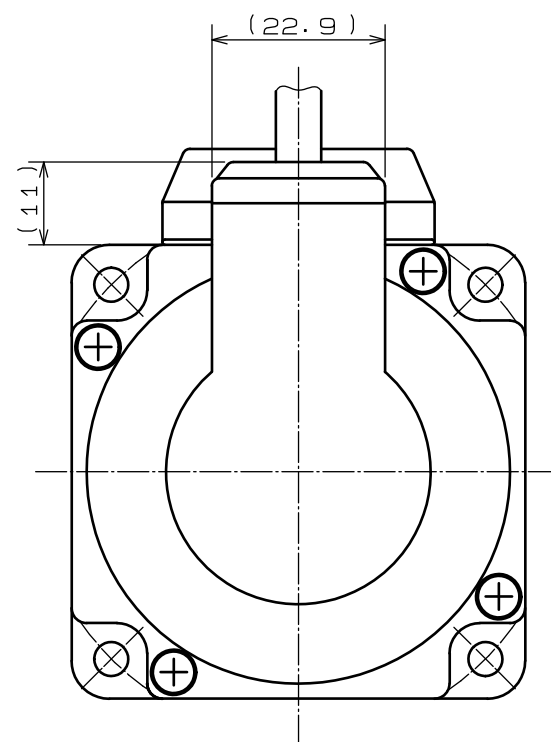
PIN No.	Color	Signal
1	Red	U
2	White	V
3	Black	W
4	Green/Yellow	E

Connection of the detector

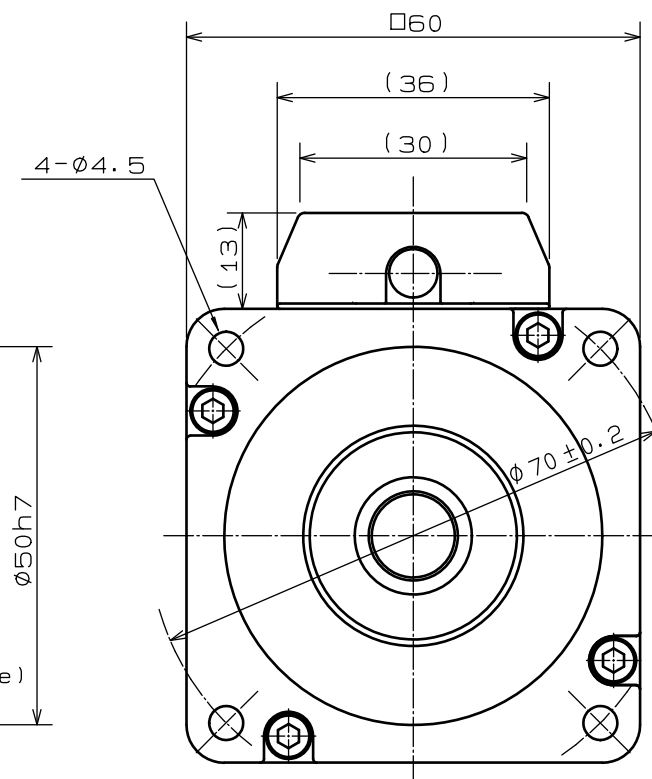
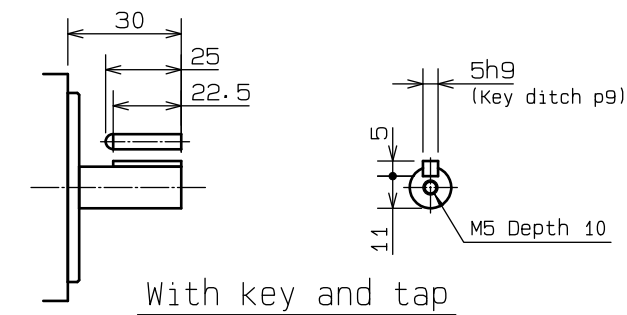
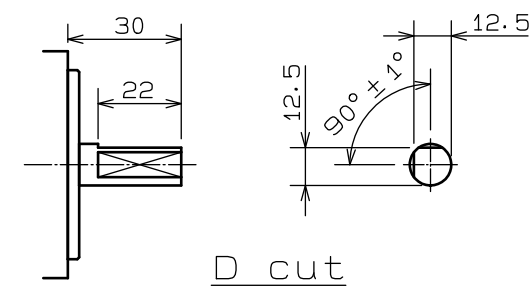
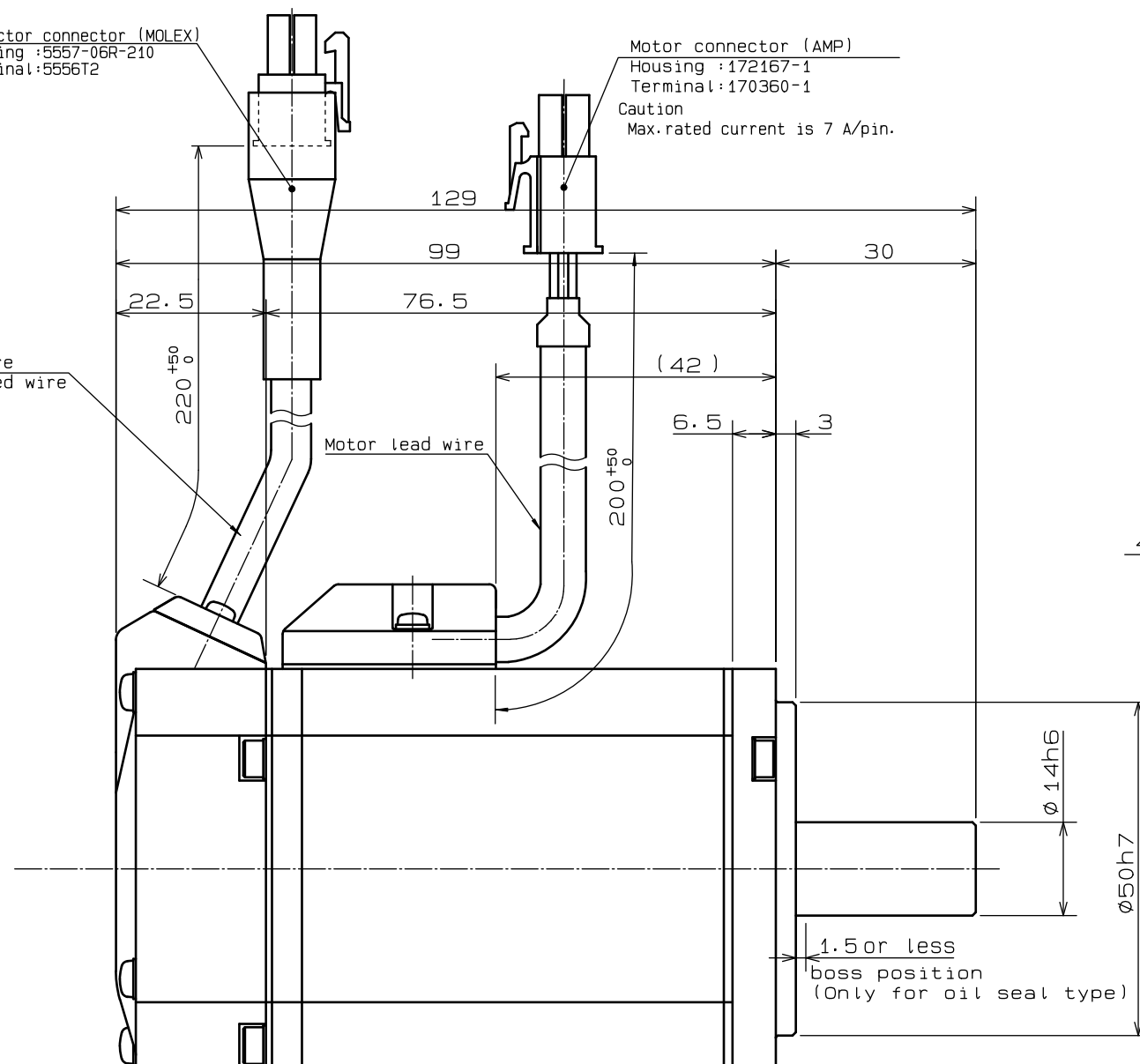
PIN No.	Color	Signal
1	Red	CS1
2	Blue	CS2
3	Yellow	CS3
4	White	VCC
5	Black	OV
6	NC	—

Detector connector (MOLEX)
Housing :5557-06R-210
Terminal:5556T2

Motor connector (AMP)
Housing :172167-1
Terminal:170360-1
Caution
Max. rated current is 7 A/pin.



Detector lead wire
Multicore shielded wire



Model	Voltage (V)	Rated Speed (r/min)	Output (W)
MBMS041BL□	100	3000	400

- NOTE 1. The assembling precision conforms to the Japan Machine Tool Association Standard (MAS402-1981).
 ·Shaft end runout: 0.03(shaft exit middle) (TIR value)
 ·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.