



Mold open measurement sensor MEL1002 Instruction Manual

Please read this instruction manual before use.

Keep this manual in a safe place.

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1. Safety Instructions



(Be sure to read these precautions before using our products.)

Thank you very much purchasing "Molded Marshalling System Mold Open Measurement Sensor MEL1002". This manual is an instruction manual for the MEL1002G, and contains "Safety Precautions" for the sensor and transducers to be used in combination with the sensor.

Before using this product, be sure to read this "Safety Precautions" thoroughly to ensure correct use. Familiarize yourself with the machine, safety information, and all precautions before use.


- This instruction manual is to be delivered to the person who actually uses the product.
- Please keep this instruction manual handy so that you can read it whenever necessary.

(1) Types of symbols used in this manual and their meanings



Display	Meaning of Display
	In case of mishandling, a hazardous situation may occur and death or serious injury may result.
	In case of mishandling, a hazardous situation may occur and moderate injury or minor injury may be expected, or property damage may be expected.

In the following explanation, MEL1002 is simply described as "detector" or MPD200F as "transducer".


(2) Application limitation

	<ul style="list-style-type: none">● This product is not designed or manufactured to be used in a life-threatening situation.● Please consult us when considering special applications such as medical equipment, aerospace equipment, nuclear power control systems, and transportation equipment.
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(3) PRECAUTIONS ON USE

	<ul style="list-style-type: none">● Do not disassemble, modify or repair the product by your company. Do not damage the cable, apply excessive stress to it, place heavy objects on it, or allow it to become pinched. Doing so may cause electric shock, fire, malfunction, or malfunction.● Be sure to turn off the power before moving, wiring, or checking the product. Failure to do so may cause an electric shock, fire, failure or malfunction.● Provide an external safety circuit to ensure that the entire system is on the safe side even in the event of a detector or transducer failure.● Be sure to ground the FG terminal of the transducer. Failure to do so may cause electric shock, fire, or malfunction.
	<ul style="list-style-type: none">● The detector is not waterproof, so be careful not to allow water or oil to penetrate.● Never use the transducer where it is exposed to water, in an atmosphere of corrosive or flammable gas, or near combustible materials. Doing so may cause electric shock, fire, malfunction, or malfunction.● Use the detector and transducer in the environment described in the specifications and the instruction manual. Failure to do so may cause an electric shock, fire, failure or malfunction.● The detector, transducer and extension cable must be used in the specified combination.● Failure to do so may cause an electric shock, fire, failure or malfunction.


(4) Storage

	<ul style="list-style-type: none">● Do not store the product where it may be exposed to rain or water drops, or in the presence of harmful gases or liquids.● Store the product in a place that is not exposed to direct sunlight or within the specified temperature and humidity ranges.● If the storage has been extended, please contact our person in charge.
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(5) Transportation

	<ul style="list-style-type: none">● Do not apply excessive stress to the cable outlet of the main unit during transportation. Failure to do so may cause an electric shock, fire, failure or malfunction.
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(6) Disposal

	<ul style="list-style-type: none">● When disposing of the product, treat it as industrial waste.
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(7) Installation

	<ul style="list-style-type: none">● Do not step on the product or place heavy objects on it. Failure to do so may result in an accident.● Do not allow foreign objects to enter. Failure to do so may cause an electric shock, fire, failure or malfunction.● Fix the transducer and detector securely with the mounting holes or attached mounting brackets. Failure to do so may cause accidents, dropping, electric shock, fire, or malfunction.● Keep the specified distance between the transducer and the internal surface of the control panel or other equipment. Failure to do so may cause an electric shock, fire, failure or malfunction.
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(8) Wiring

	<ul style="list-style-type: none">● Securely tighten the terminal block of the transducer. If there is a terminal cover provided with the product, be sure to attach the terminal cover to the product. Failure to do so may cause an electric shock, fire, failure or malfunction.
	<ul style="list-style-type: none">● Keep sensor cables at least 100 mm away from control lines, main circuits, power lines, etc. Failure to do so may cause accidents, electric shock, fire, or malfunction.● Wire correctly and securely. Failure to do so may cause accidents, electric shock, fire, or malfunction.● Securely mount and fix the external I/O connector and the connector for connecting the main unit.● Otherwise, incorrect input, incorrect output, accident, electric shock, fire, failure, or malfunction may result.

(9) Operation and operation

	<ul style="list-style-type: none">● Check that the power specifications are correct. Failure to do so may cause an accident, electric shock, fire, failure or malfunction.● When an error is detected, remove the cause to ensure safety, reset the error, and restart operation. Failure to do so may cause an accident, electric shock, fire, failure or malfunction.
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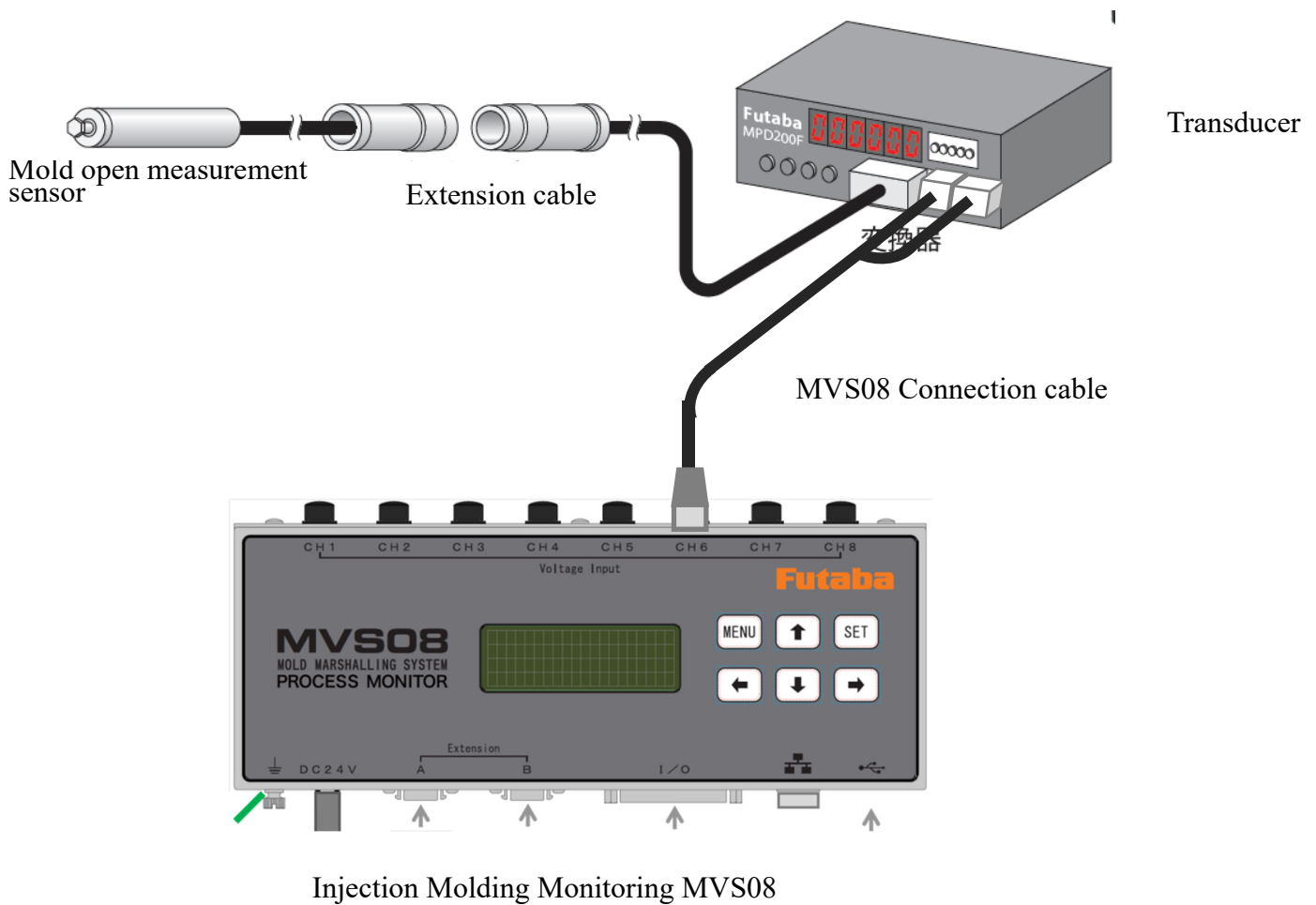
2. Overview

This product is a linear sensor that can be attached to injection molding machines, die-casting machines, high-precision presses, and precision forging machines to accurately determine the amount of mold opening between the core and cavity during processing.

We ask that you please understand the features of this product before using it.

(1) Configuration of Mold Opening Measurement Sensor

MEL1002 consists of an extension cable, a transducer, and an injection molding monitoring system (MVS08).



(2)Main Specifications

□ Mold open measurement sensor

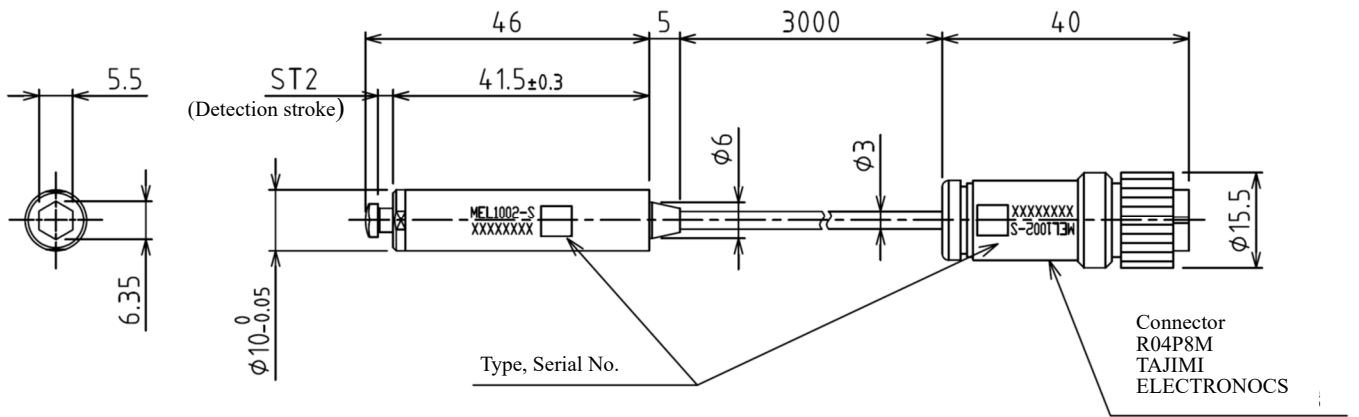
Item		Specifications	Remarks
Model		MEL1002- SF/L	
Principle		Magnetic induction system	
Absolute pitch		8.192mm	Design value
Detection range		2mm	
Precision	Repeatability	±2μm	Measured at 23°C
	Linearity	20μm/F.S.	
Insulation resistance		50 MΩ min. DC250V	
Operating temperature range		0~+150°C	Excluding connectors
Operating humidity range		20~85%	No condensation
Storage temperature range		-20~+80°C	Excluding connectors
Storage humidity range		20~85%	No condensation
Operating temperature range of lead-out cable		0~+150°C	
Vibration resistance		20 to 1 hour in each OOBX,Y,Z direction	
Impact resistance		3 times in each OOBX,Y,Z direction	
Number of sliding durability		3 million times	
Weight		Approx. 20g	Excluding cable section
Cable length		3m	
Connector specifications		R04-P8M (TAJIMI ELECTRONICS)	Waterproof Specifications

□ Extension cable

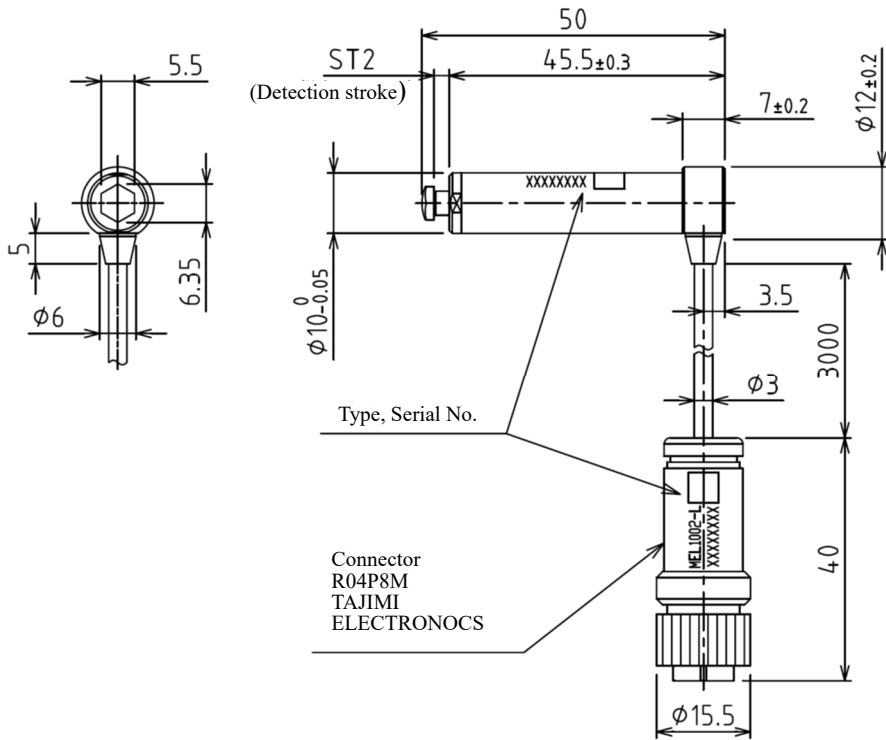
Type	Model	Wire diameter (mm)	Temperature (°C)
General standard	6S05	φ5.5	-15□80

(3) External Dimensions and Part Names (Unit: mm)

MEL1002G-SF



MEL1002G-L

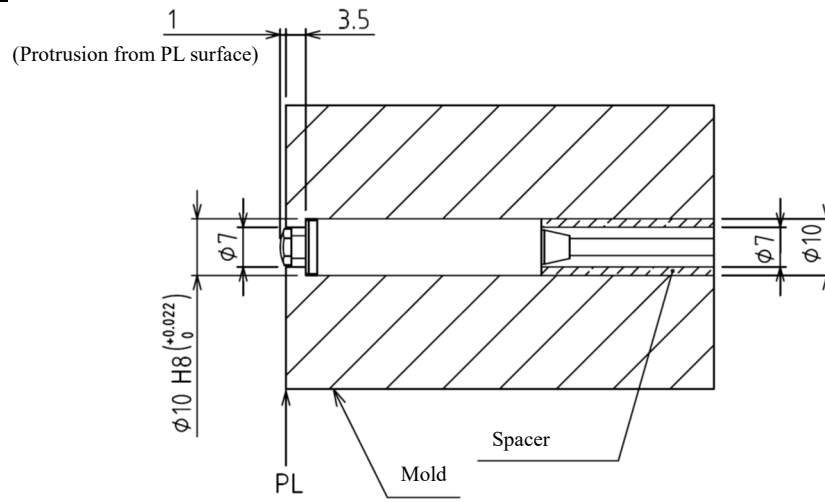


3. Mounting and Precautions (Unit: mm)

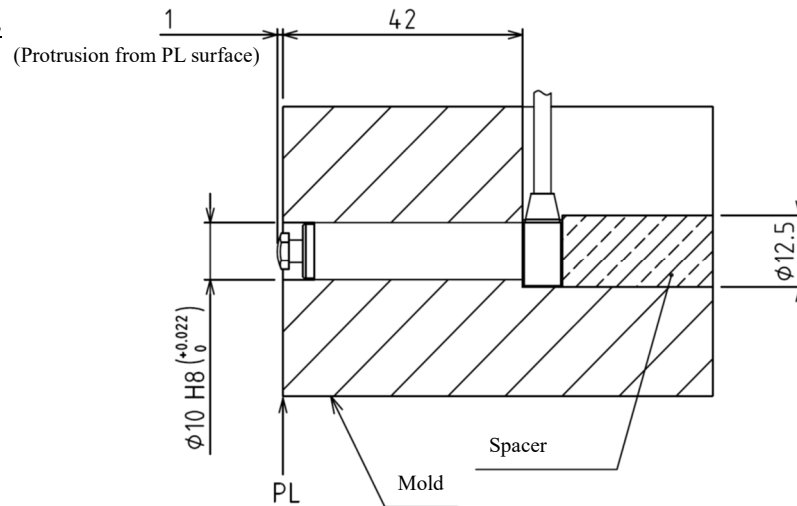
(1) How to install the main unit

- Mounting with Mold Embedded (Example)

MEL1002G-SF

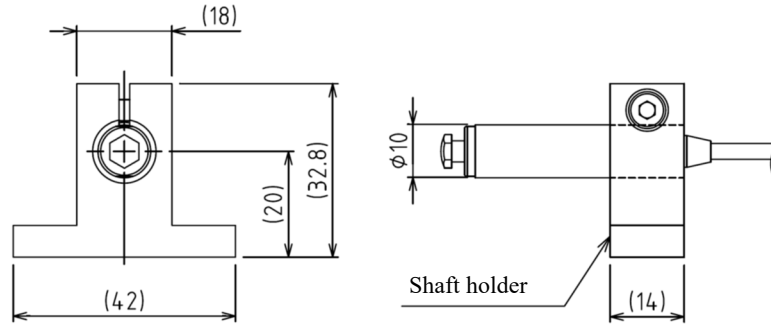


MEL1002G-L

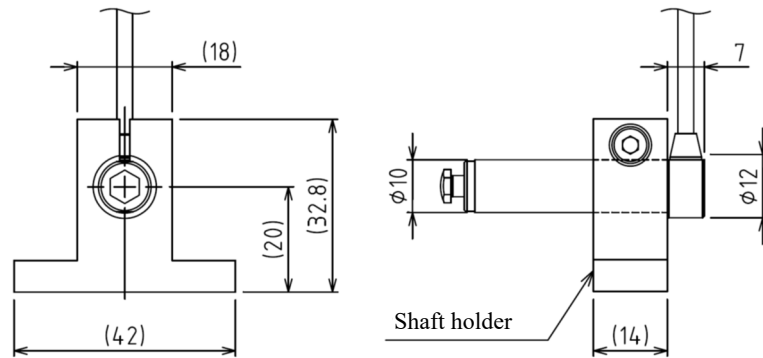


□ Mounting with Shaft holder

MEL1002G-SF



MEL1002G-L

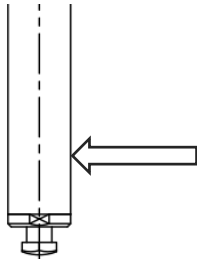


□ MEL1002-SF/L is the position where the shaft holder is aligned with the end face of the sensor,

Shaft holder Reference name: SHAM10 (manufactured by Misumi Corporation) Material: S45C
Tightening torque: Nominal diameter M4 3.6N · m or less (2.4 series)

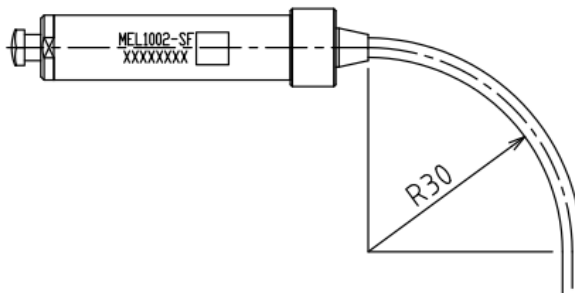
(2)Note

- Mount the unit only with no power applied.
- The stylus is made of a material with a hardness HRC40 of ~45. When the detection surface is made of a soft material such as aluminum, please note that accurate measurements cannot be made due to deformed dents.
- When the contact surface is made of sheet metal, if the sheet thickness is thin, accurate measurements cannot be made due to the deflection of the sheet.
Recommended material: Stainless steel
Thickness 3mm or more
- Do not apply radial force to the contact point or shaft. This may result in damage and reduced service life.



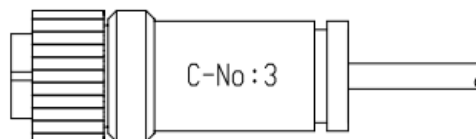
(3)Minimum cable bending radius

- Use the sensor cable with a fixed wiring with a bending radius of 30mm or more.
Wiring with a bending radius of 30 mm or less or with repeated stress may be broken.



(4)High-precision correction less setting (in combination with transmitter MPD200G)

- Check C-No. (Correction number) on the connector part of the detector.



- ⊙ Set the setting Cd2007 of the converter MPD200G to C-No of ⊙.
(Make sure that Cd2000 and Cd2001 are set to "1".)

4. Periodic inspection items

It is recommended that the following items be checked regularly to ensure that the product is used in the best condition at all times.

Inspection items of mold opening measurement sensor

Inspection item	Content of inspection	Judgment criteria	Recommended inspection cycle
DC resistance	Check at connector	Within the standard value (described in Table 1)	Every 6 months
Insulated state	Check at the detector and connector	Within the standard value (described in Table 2)	<input type="checkbox"/>
Mounting condition	Body installation	To be strong	<input type="checkbox"/>
	Wiring	No damage, etc.	<input type="checkbox"/>

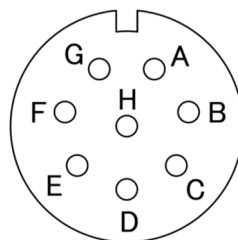
Table 1: Reference values for DC resistance values (measured temperature 23°C)

Model	Resistance value between each pin of the connector		
	Between A and B	Between C and D	Between E and F
MEL1002	104.0~128.0Ω	189.0~231.0Ω	189.0~231.0Ω

Table 2: Insulation status check point Note: Extension cable is not included.

Measurement point		Standard value
Measuring unit	Between A and C	DC250V 50 MΩ or more
	Between A and E	
	Between C and E	
Between detector and shield	Between A and H	
	Between C and H	
	Between E and H	
Between detector and detector housing	Between A and chassis	
	Between C and chassis	
	Between E and chassis	
Between shield and detector housing	H to chassis	

For measurement, use a tester, etc.



Connector pin assignment

5. Inspection Items at the Time of Failure

In the event of a malfunction, perform the following inspections.

- Check the disconnection error indication on the converter.
- Measure the DC resistance of the mold opening measurement sensor at the connector.
(excluding extension cables)
- Check the extension cable for continuity and damage.
- Check the insulation between the sensor body of the mold opening measurement sensor and each pin of the connector.
- Check that the sliding part of the mold opening measurement sensor operates smoothly.

※Refer to Table 1 and Table 2 of 4. Periodic Inspection Items on the previous page for the standard values.

If the condition does not change due to the above operation, contact our person in charge.

6. Warranty

- (1) The warranty period for the Products Delivered shall be one (1) year after delivery to the designated place.
※The warranty herein refers to the warranty of the delivered product alone and does not refer to the operation of your product incorporating the delivered product.
- (2) If a failure occurs due to our responsibility during the above warranty period, we will repair it free of charge. However, the following cases will be excluded from the scope of warranty.
 - ① The fault has been caused by improper condition, environment or use other than those specified in the specifications.
 - ② When an actuator (inverter, servo motor, etc.) is used in an ambient environment and adequate noise suppression measures have not been taken.
 - ③ Failure or damage caused by handling by your company such as dropping or impact during transportation (movement) after delivery.
 - ④ When repaired or modified outside of us.
 - ⑤ The fault or damage is caused by acts of God, natural disasters, etc.

7. Indemnity

We are not responsible for secondary damage caused by defective operation of the delivered product.

FUTABA CORPORATION

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The specifications are subject to change without prior notice for product improvement. MEL1002-1903W-A1J