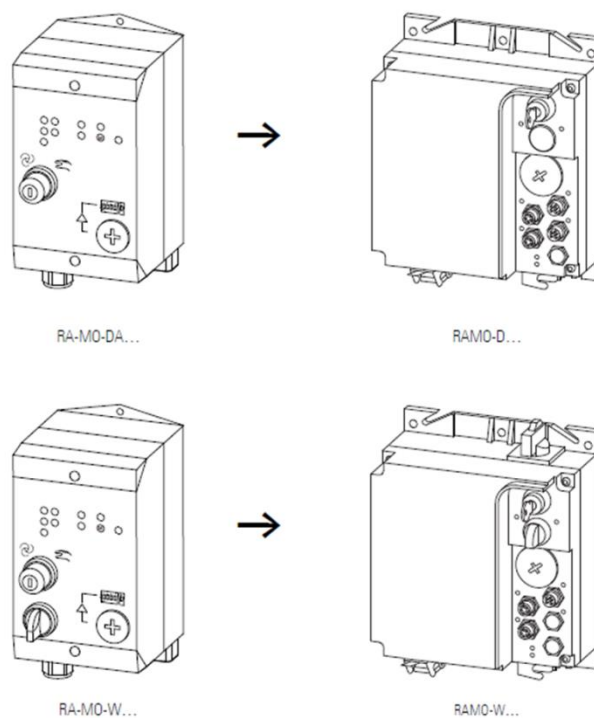


Rapid Link

RAMO

Generation Change RA-MO to RAMO 4.0



<p>Level 3</p>	<p>1 – Fundamental – No previous experience necessary 2 – Basic – Basic knowledge recommended 3 – Advanced – Reasonable knowledge required 4 – Expert – Good experience recommended</p>
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Eaton.com/us/en-us/support.html

Hotline After Sales Service:

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Original Application Note is the English version of this document.

All non-English language versions of this document are translations of the original application note.

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Content

1	General.....	6
2	Dimensions.....	6
3	AS-I Profile	7
4	Replacement Sequence.....	7
5	DIP Switch - Adjust dip switch.....	8
6	RAMO Motor cable.....	9
7	References.....	9

Danger! - Dangerous electrical voltage!

- Disconnect the power supply of the device.
- Ensure that devices cannot be accidentally restarted.
- Verify isolation from the supply.
- Cover or enclose any adjacent live components.
- Follow the engineering instructions (AWA/IL) for the device concerned.
- Only suitably qualified personnel in accordance with EN 50110-1/-2 (VDE 0105 Part 100) may work on this device/system.
- Before installation and before touching the device ensure that you are free of electrostatic charge.
- The functional earth (FE, PES) must be connected to the protective earth (PE) or the potential equalization. The system installer is responsible for implementing this connection.
- Connecting cables and signal lines should be installed so that inductive or capacitive interference does not impair the automatic control functions.
- Suitable safety hardware and software measures should be implemented for the I/O interface so that an open circuit on the signal side does not result in undefined states.
- Deviations of the mains voltage from the rated value must not exceed the tolerance limits given in the specification, otherwise this may cause malfunction and/or dangerous operation.
- Emergency stop devices complying with IEC/EN 60204-1 must be effective in all operating modes. Unlatching of the emergency-stop devices must not cause a restart.
- Devices that are designed for mounting in housings or control cabinets must only be operated and controlled after they have been properly installed and with the housing closed.
- Wherever faults may cause injury or material damage, external measures must be implemented to ensure a safe operating state in the event of a fault or malfunction (e.g. by means of separate limit switches, mechanical interlocks etc.).
- Frequency inverters may have hot surfaces during and immediately after operation.
- Removal of the required covers, improper installation or incorrect operation of motor or frequency inverter may destroy the device and may lead to serious injury or damage.
- The applicable national safety regulations and accident prevention recommendations must be applied to all work carried on live frequency inverters.
- The electrical installation must be carried out in accordance with the relevant electrical regulations (e. g. with regard to cable cross sections, fuses, PE).
- Transport, installation, commissioning and maintenance work must be carried out only by qualified personnel (IEC 60364, HD 384 and national occupational safety regulations).
- Installations containing frequency inverters must be provided with additional monitoring and protective devices in accordance with the applicable safety regulations. Modifications to the frequency inverters using the operating software are permitted.
- All covers and doors must be kept closed during operation.
- To reduce the hazards for people or equipment, the user must include in the machine design measures that restrict the consequences of a malfunction or failure of the frequency inverter (increased motor speed or sudden standstill of motor). These measures include: – Other independent devices for monitoring safety related variables (speed, travel, end positions etc.).
 - Electrical or non-electrical system-wide measures (electrical or mechanical interlocks).
 - Never touch live parts or cable connections of the frequency inverter after it has been disconnected from the power supply. Due to the charge in the capacitors, these parts may still be alive after disconnection. Consider appropriate warning signs.

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Figures Content

Figure 1: Dimensions of RA-MO and RAMO6

Figure 2: DIP switches underneath screw plug8

1 General

The following information indicates the differences that must be taken into account when using RAMO 4.0 to replace RA-MO 3.0 (generation change).

The devices have the following major differences:

- Dimensions
- AS-I profile

The controls handling and functions remain the same. The devices are functionally identical.

2 Dimensions

Comparison of the old and new dimensions:

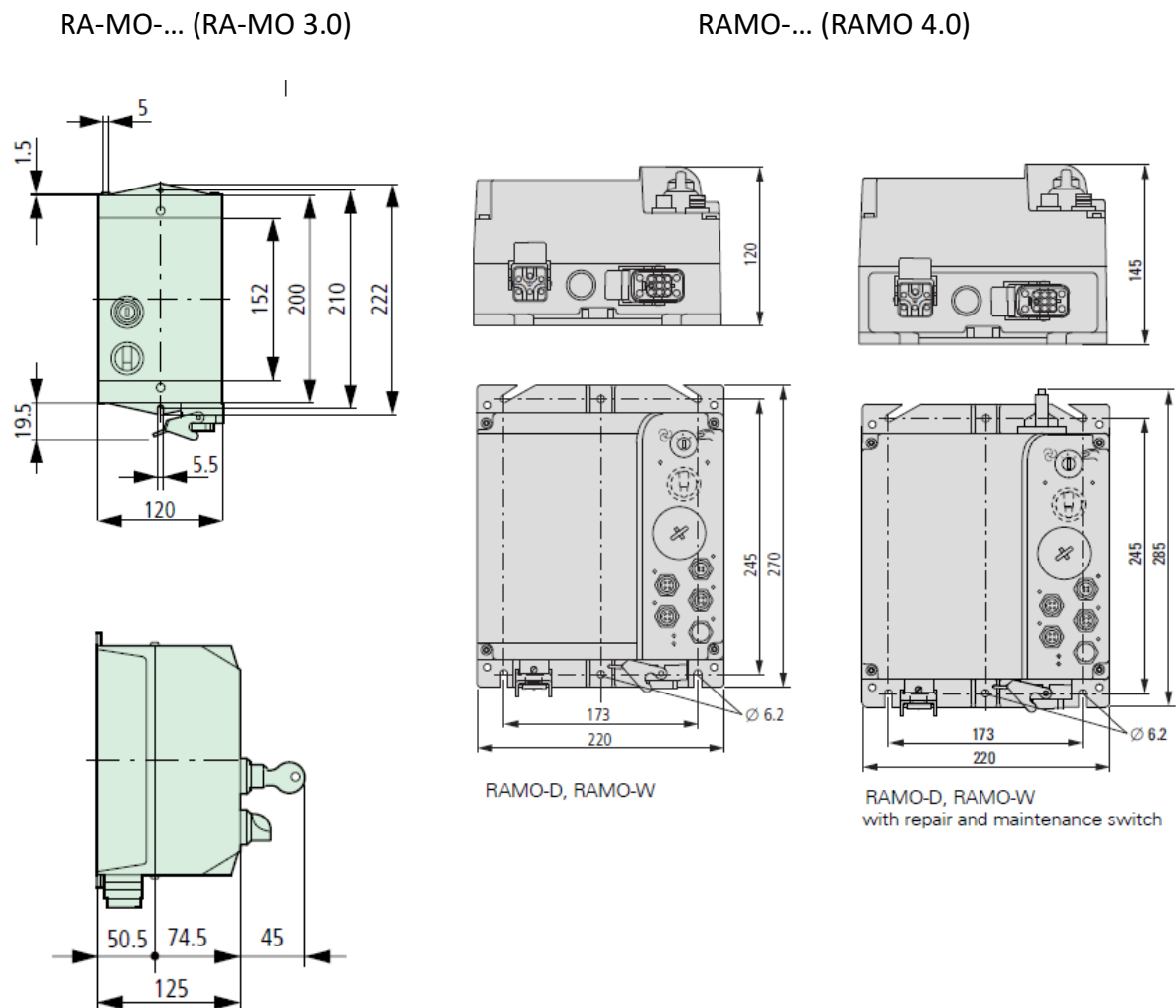


Figure 1: Dimensions of RA-MO and RAMO

3 AS-I Profile

The old generation, RA-MO 3.0, has the AS-I profile S-7.A.D (62 slaves possible). The new generation RAMO 4.0 includes devices with the AS-I profile S-7.4 (31 slaves) and the AS-I profile S-7.A.E with 62 slaves, which should be used for an easy replacement from the old to the new generation.

Due to the different AS-I profiles, the AS-I system needs to be reinitialized, if a new RAMO 4.0 device with AS-I Profile S-7.A.E should replace a RA-MO 3.0 device with AS-I Profile S-7.A.D.

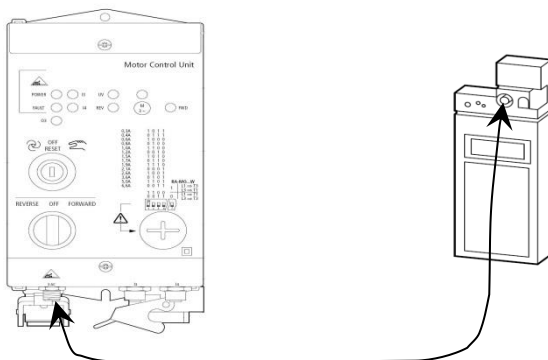
To do this, the AS-I master needs to be switched to configuration mode. In this mode, the AS-I master will recognize the type and profile of the AS-I slaves connected to the AS-I cable. On the AS-I gateways this configuration mode can usually only be activated if there are no ongoing communications with the fieldbus.

The assignment of Rapid Link inputs/outputs and the data bits of the AS-I communication remain the same. The PLC program itself do not have to be modified.

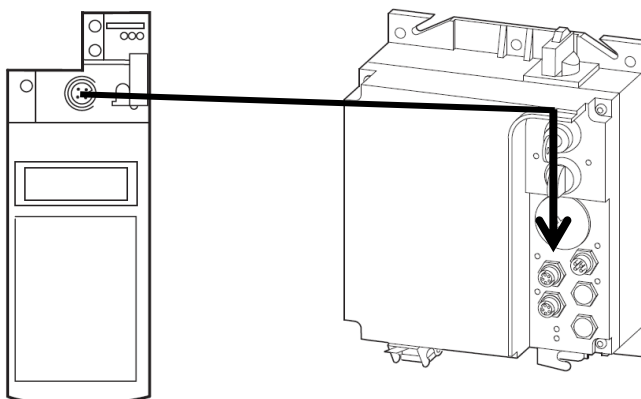
4 Replacement Sequence

Proceed following steps for a proper replacement.

1. Read the Address from RA-MO...



2. Note the DIP-Switches from RA-MO...
3. Remove all connections from RA-MO... (Motor-, Energy-, Asi-, Sensor-, Actor)
4. Set the key switch of RAMO-... to manual mode
5. Give an address to the new device (RAMO-...)



6. Set the DIP Switches on the new device accordingly (RAMO-...)
7. Change the motor-, energy-, AS-I- and sensor cables from the old to the new device (See Chap. 6 Pin Assessment for the motor cable)
8. Switch on the power supply
9. Make a new AS-I configuration via PLC (Refer to MN03406003Z-EN)
10. Ready to start!



Notice!

Before Power On it must be ensured that the motor and the motor cable is properly connected.

5 DIP Switch - Adjust dip switch

Before commissioning the motor control unit (RAMO), the current monitoring function must be set to the rated motor current. This function is disabled by default and would trigger a fault signal as soon as mains power is switched on (Motor LED lights up). To set the DIP switches, open the screw plug (M40 × 1.5).



Notice!

Do not move the DIP and wire jumper switches under the screw plug unless the key switch is in the OFF/RESET position.
Switching during operation may cause an accidental motor start.

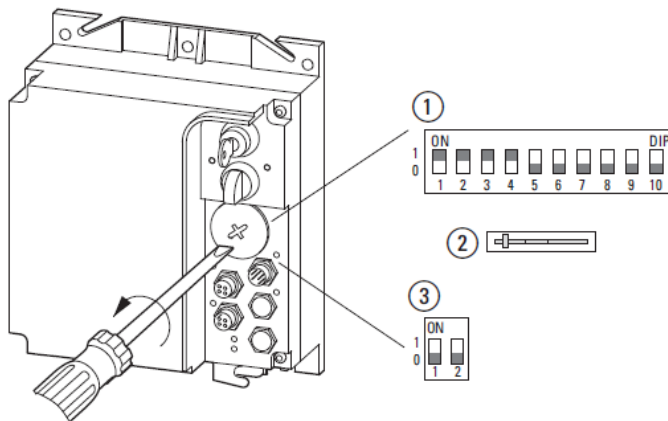


Figure 2: DIP switches underneath screw plug


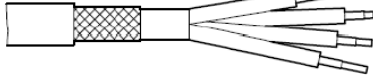
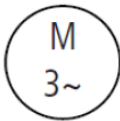
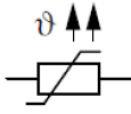
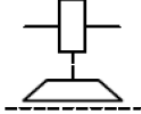
RAMO plug for cable screw gland

- ① Current limit values and functions, dip switches
- ② Thermistor and motor cable monitoring (wire jumper)
- ③ Quick stop (→ Section 5.6.2.7, „Bit DQ3 – Quick stop“, page 107)

When configured with its default settings, the device will have the jumper (DIP switch, ②) open. Closing the jumper will disable the fault signal for thermistor and motor cable monitoring (→Section „Thermistor and motor cable monitoring“, in the manual MN03406003Z-EN).

6 RAMO Motor cable


The motor needs to be connected using an unscreened, DESINA conformant, motor cable RAMO-CM1-.. (8 x 1,5mm²), with the following PIN assignment:

				
1	1	U1		
Coding	-			
3	3	W1		
4	5			B1
5	6		T1	
6	4			B2
7	2	V1		
8	7		T2	
PE	PE*	PE		

*PE = green-yellow

7 References

Documentation	RA-MO-	RAMO 4.0	LINK
Manual	AWB2190-1430	MN03406003Z-EN	DownloadCenter
Instruction Leaflet	AWA2190-1936	IL0306020Z	DownloadCenter

	Notice! Follow the engineering instructions (AWA/AWB or IL/MN) for the device concerned.
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