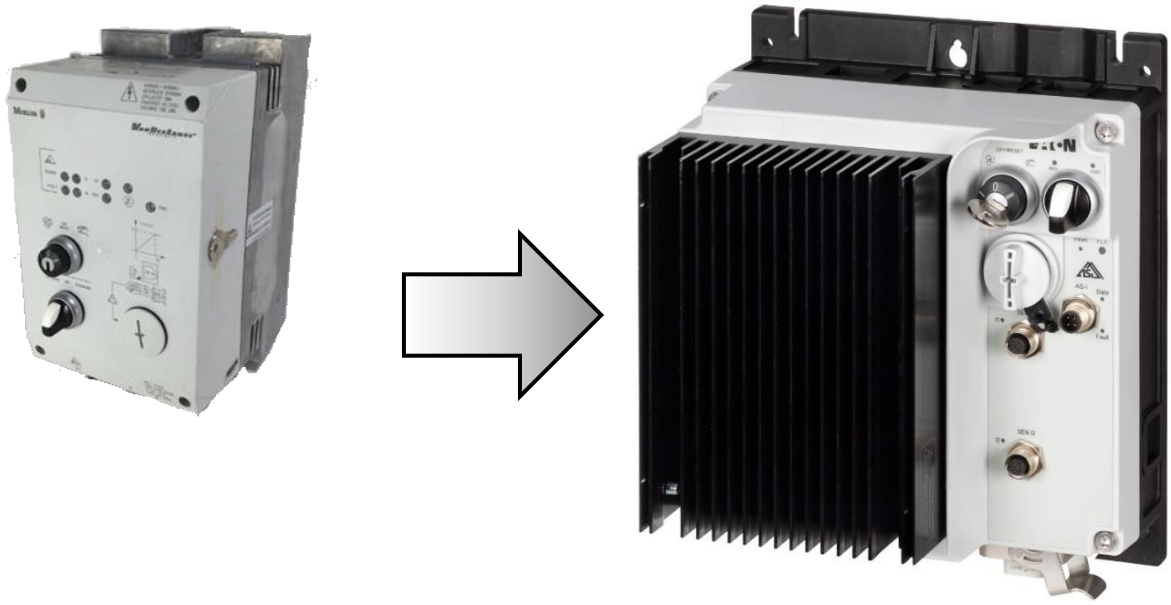
Rapid Link

RASP

Generation Change of Rapid Link RA-SP to RASP5



Level 3	1 – Fundamental – No previous experience necessary 2 – Basic – Basic knowledge recommended 3 – Advanced – Reasonable knowledge required 4 – Expert – Good experience recommended

Powering Business Worldwide

Break-Down Service

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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.

1. Edition 2020, publication date 11/2020

Content

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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1 General

The following information indicates the differences that must be taken into account when expanding systems or creating new projects with RASP5 units, as well as when using them to replace RA-SP2… or RA-SPV… devices.

The devices have the following major differences:

- Dimensions
- Parameter software, parameters, keypad and app functionality
- DIP-Switches to parameter software - sensors and thermistor settings
- No AS-i connection required for RASP5 in manual mode
- AS-Interface profile

The controls' handling and functions remain the same. RASP5 combines the functionality of RA-SP2… and RA-SPV… in a single device. If required, the vector functionality can be activated via the parameters.

2 Dimensions

The dimensions of the RASP5 and RA-SP2… and RA-SPV… are different!

The detailed dimensions are given in the instruction leaflet listed in the reference.

3 AS-I Profile

Changing AS-I devices with different Profiles, requires extended engineering knowledge!
RASP… units have AS-I profile S-7.E.0 (old) and AS-I profile S-7.4 (new). Due to the expanded AS-I profile, the scanner (gateway) needs to carry out a new initialization process if new RASP devices with profile S-7.4 are used as a replacement. To do this, the AS-I scanner needs to be switched to configuration mode. In this mode, the AS-I scanner will recognize the type and profile of the AS-I device connected to the AS-I cable. The profile is hardcoded into the device modules during production and cannot be changed. Refer to AS-I scanner documentation for the detailed information.

The Bit assignment of the AS-I control signals are not changed. However, depending the scanner or gateway which is used it could be that the bit assignment in the PLC can change (PLC tags or Variables)

	Notice! Make sure that the PLC (AS-I scanner) is supporting the new Device Profile S-7.4!

4 Replacement Sequence

Proceed following steps for a proper replacement.

1. Turn key and selector switch (FWD/REV) to '0' position (RA-SP and RASP5).
2. Read the parameter from RA-SP… (DrivesSoft).
3. Read the address from RA-SP… (with addressing device).
4. Note the DIP-positions of the RA-SP.
5. Disconnect motor-, energy-, AS-I -, sensor-, actor connectors from RA-SP…
6. Set parameters of the RASP5 accordingly (with keypad, app or drivesConnect)
7. Settings for the DIP switches must be transferred to RASP5 by parameter settings.
8. Connect all cables, connectors (line 400 V AC, AS-I, motor and sensors).
9. Ready to start.

	Attention! Before power on it must be ensured that the motor and the motor cable is properly connected.

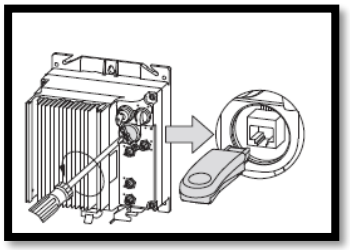
5 Parameterization Software, Keypad and App

The table below shows the comparison of RA-SP… to RASP5 via PC software, PC cable, keypad and smartphone app.

	RA-SP / RA-SPV	**RASP5**
Parameterization PC Software	DrivesSoft 	drivesConnect 
Remote Keypad	DX-KEY-10 	DX-KEY-OLED 
PC - Connection	DEX-CBL-2M0-USB	DX-CBL-PC-3M0 DX-COM-STICK-KIT (Bluetooth Stick)
Parameterization App	Not supported	Bluetooth Stick DX-COM-STICK3-KIT is required 

Connection cable DX-CBL-PC-3M0 and DX-COM-STICK-KIT allows communication and data exchange between RASP5 and a PC.

NOTICE: Connection cable, Keypad or Bluetooth Stick are not supplied with the RASP5.Those are optional articles.



The drivesConnect mobile App helps to connect smartphone to the RASP5. The parametrization and monitor information can be done by using the App (Android or IOS based). For detailed information refer to Appnote: AP040189EN in the Overview Drives Appnotes

Bluetooth connection to RASP5

6 DIP Switch Settings

The functionality of RA-SP… and RASP5 is the same. RA-SP… is generally set via parameters, but some special functions of RA-SP… are set via DIP switches. At RASP5 these settings are also made via parameters.

Functions	RA-SP- DIP Switches				RASP5 – Parameters
Motor cable monitoring	DIP 1 				P2-27
AS-interface diagnostics	DIP 2 				RASP5 includes a ASI bit for Healty signal. This can not be deactivated.
Sensor inputs I3 and I4	DIP 3 				P3-06 to P3-09
Quick stop and interlocked manual:					
	DIP 4	DIP 5	DIP 6		P1-13
	-	-	-		0
	OFF	OFF	OFF	->	1
	OFF	OFF	ON	->	2
	OFF	ON	OFF	->	3
	OFF	ON	ON	->	4
	ON	OFF	OFF	->	5
	ON	OFF	ON	->	6
	ON	ON	OFF	->	7
	ON	ON	ON	->	8
Phase reversal	DIP 7 				P6-08
Stop behavior	DIP 8 				P6-11

7 Power Supply

The previous models (e.g. RA-SP2-…) are supplied with power supply and AS-I connectors (M12 data bus). RASP5 is not supplied with power cable and AS-I data bus cable.

In the system where RA-SP2-… has to be replaced by RASP5, following accessory must be ordered separately:

- RA-C3/C2-1,5HF or RA-C3/C1-1,5HF
- RA-XM12-1M

8 Cross Reference

The RA-SP... cross-reference list to RASP5 can be found at the following table.

Date: 01.04.2020		RASP5																	Accessories						
X[1] = successor, if 230 V brake is necessary X[2] = successor, if 400 V brake is necessary	Type	RASP5-2400A31-5120000S1	RASP5-2402A31-5120000S1	RASP5-2404A31-5120000S1	RASP5-2400A31-5120100S1	RASP5-2402A31-5120100S1	RASP5-2404A31-5120100S1	RASP5-4400A31-5120000S1	RASP5-4402A31-5120000S1	RASP5-4404A31-5120000S1	RASP5-4400A31-5120100S1	RASP5-4402A31-5120100S1	RASP5-4404A31-5120100S1	RASP5-5400A31-5120000S1	RASP5-5402A31-5120000S1	RASP5-5404A31-5120000S1	RASP5-5400A31-5120100S1	RASP5-5402A31-5120100S1	RASP5-5404A31-5120100S1	RA-C3/C1-1,5HF	RA-C3/C2-1,5HF	RA-XM12-1M	DX-KEY-OLED	drivesConnect	DX-CBL-PC-3M0	Please note: The cross-marked accessories are required for the 1:1 exchange! X[3] OLED-Keypad or drivesConnect necessary (no DIP-switch parameterization)
Type	Code	198542	198543	198544	198545	198546	198547	198554	198555	198556	198557	198558	198559	198566	198567	198568	198569	198570	198571	290210	290211	272057	169133	free	744-A3036-00P	Comment
RA-SP2-340-075/C1	254678	X																		X		X				
RA-SP2-340-075/C2	254680	X																			X	X				
RA-SP2-340-1K1/C1	272069							X												X		X				
RA-SP2-340-1K1/C2	272070							X													X	X				
RA-SP2-340-2K2/C1	254679													X						X		X				
RA-SP2-340-2K2/C2	254681													X							X	X				
RA-SP2-341(230)-075/C1	264317		X																	X		X				
RA-SP2-341(230)-075/C1-Q	101450		X																	X		X				
RA-SP2-341(230)-075/C2	264770		X																		X	X				
RA-SP2-341(230)-1K1/C1	268977								X											X		X				
RA-SP2-341(230)-1K1/C2	268978								X												X	X				
RA-SP2-341(230)-2K2/C1	272077													X						X		X				
RA-SP2-341(230)-2K2/C2	272078													X							X	X				
RA-SP2-341-075/C1	254682			X																X		X				
RA-SP2-341-075/C2	254683			X																	X	X				
RA-SP2-341-1K1/C1	267948									X										X		X				
RA-SP2-341-1K1/C2	264653									X											X	X				
RA-SP2-341-2K2/C1	254684															X				X		X				
RA-SP2-341-2K2/C2	254685															X					X	X				
RA-SP2-342-075/C1	272063	X																		X		X				
RA-SP2-342-075/C1-060	289245	X																		X		X				
RA-SP2-342-075/C2	272064	X																			X	X				
RA-SP2-342-075/C2-060	281724	X																			X	X				
RA-SP2-342-075/C3A	290405	X																								
RA-SP2-342-075/C3A-060	116955	X																								
RA-SP2-342-1K1/C1	272071							X												X		X				
RA-SP2-342-1K1/C1-060	289246							X												X		X				

Date: 01.04.2020		RASP5																	Accessories						
X[1] = successor, if 230 V brake is necessary X[2] = successor, if 400 V brake is necessary	Type	RASP5-2400A31-5120000S1	RASP5-2402A31-5120000S1	RASP5-2404A31-5120000S1	RASP5-2400A31-5120100S1	RASP5-2402A31-5120100S1	RASP5-2404A31-5120100S1	RASP5-4400A31-5120000S1	RASP5-4402A31-5120000S1	RASP5-4404A31-5120000S1	RASP5-4400A31-5120100S1	RASP5-4402A31-5120100S1	RASP5-4404A31-5120100S1	RASP5-5400A31-5120000S1	RASP5-5402A31-5120000S1	RASP5-5404A31-5120000S1	RASP5-5400A31-5120100S1	RASP5-5402A31-5120100S1	RASP5-5404A31-5120100S1	RA-C3/C1-1,5HF	RA-C3/C2-1,5HF	RA-XM12-1M	DX-KEY-OLED	drivesConnect	DX-CBL-PC-3M0	Please note: The cross-marked accessories are required for the 1:1 exchange! X[3] OLED-Keypad or drivesConnect necessary (no DIP-switch parameterization)
Type	Code	198542	198543	198544	198545	198546	198547	198554	198555	198556	198557	198558	198559	198566	198567	198568	198569	198570	198571	290210	290211	272057	169133	free	744-A3036-00P	Comment
RA-SP2-342-1K1/C2	272072							X													X	X				
RA-SP2-342-1K1/C2-060	281515							X													X	X				
RA-SP2-342-1K1/C3A	290408							X																		
RA-SP2-342-1K1/C3A-060	116956							X																		
RA-SP2-342-2K2/C1	272079													X						X		X				
RA-SP2-342-2K2/C1-060	289247													X						X		X				
RA-SP2-342-2K2/C2	272080													X							X	X				
RA-SP2-342-2K2/C2-060	281516													X							X	X				
RA-SP2-342-2K2/C3A	290411													X												
RA-SP2-342-2K2/C3A-060	116957													X												
RA-SP2-343(230)-075/C1	272067		X																	X		X				
RA-SP2-343(230)-075/C1-060	283125		X																	X		X				
RA-SP2-343(230)-075/C2	272068		X																		X	X				
RA-SP2-343(230)-075/C2-060	285008		X																		X	X				
RA-SP2-343(230)-075/C3A	290407		X																							
RA-SP2-343(230)-075/C3A-060	116958		X																							
RA-SP2-343(230)-1K1/C1	272075								X											X		X				
RA-SP2-343(230)-1K1/C1-060	283127								X											X		X				
RA-SP2-343(230)-1K1/C2	272076								X												X	X				
RA-SP2-343(230)-1K1/C2-060	281518								X												X	X				
RA-SP2-343(230)-1K1/C3A	290410								X																	
RA-SP2-343(230)-1K1/C3A-060	116959								X																	
RA-SP2-343(230)-2K2/C1	272083														X					X		X				
RA-SP2-343(230)-2K2/C1-060	284383														X					X		X				
RA-SP2-343(230)-2K2/C2	272084														X						X	X				
RA-SP2-343(230)-2K2/C2-060	281517														X						X	X				
RA-SP2-343(230)-2K2/C3A	290413														X											
RA-SP2-343-075/C1	272065			X																X		X				
RA-SP2-343-075/C2	272066			X																	X	X				
RA-SP2-343-075/C3A	290406			X																						
RA-SP2-343-1K1/C1	272073									X										X		X				
RA-SP2-343-1K1/C2	272074									X											X	X				
RA-SP2-343-1K1/C2-060	281519									X											X	X				
RA-SP2-343-1K1/C3A	290409									X																
RA-SP2-343-2K2/C1	272081															X				X		X				
RA-SP2-343-2K2/C2	272082															X					X	X				
RA-SP2-343-2K2/C2-060	281540															X					X	X				
RA-SP2-343-2K2/C3A	290412															X										
RA-SP2-HE-342-075/C3A	290414	X																								
RA-SP2-HE-342-075/C3A-060	289112	X																								
RA-SP2-HE-342-075/C3A-061	113610	X																								
RA-SP2-HE-342-1K1/C2A-060	292315							X													X					

Date: 01.04.2020		RASP5																	Accessories						
X[1] = successor, if 230 V brake is necessary X[2] = successor, if 400 V brake is necessary	Type	RASP5-2400A31-5120000S1	RASP5-2402A31-5120000S1	RASP5-2404A31-5120000S1	RASP5-2400A31-5120100S1	RASP5-2402A31-5120100S1	RASP5-2404A31-5120100S1	RASP5-4400A31-5120000S1	RASP5-4402A31-5120000S1	RASP5-4404A31-5120000S1	RASP5-4400A31-5120100S1	RASP5-4402A31-5120100S1	RASP5-4404A31-5120100S1	RASP5-5400A31-5120000S1	RASP5-5402A31-5120000S1	RASP5-5404A31-5120000S1	RASP5-5400A31-5120100S1	RASP5-5402A31-5120100S1	RASP5-5404A31-5120100S1	RA-C3/C1-1,5HF	RA-C3/C2-1,5HF	RA-XM12-1M	DX-KEY-OLED	drivesConnect	DX-CBL-PC-3M0	Please note: The cross-marked accessories are required for the 1:1 exchange! X[3] OLED-Keypad or drivesConnect necessary (no DIP-switch parameterization)
Type	Code	198542	198543	198544	198545	198546	198547	198554	198555	198556	198557	198558	198559	198566	198567	198568	198569	198570	198571	290210	290211	272057	169133	free	744-A3036-00P	Comment
RA-SP2-HE-342-1K1/C3A	290417							X																		
RA-SP2-HE-342-1K1/C3A-060	289114							X																		
RA-SP2-HE-342-1K1/C3A-061	113612							X																		
RA-SP2-HE-342-2K2/C2A-060	292318													X							X					
RA-SP2-HE-342-2K2/C3A	290420													X												
RA-SP2-HE-342-2K2/C3A-060	289116													X												
RA-SP2-HE-342-2K2/C3A-061	113614													X												
RA-SP2-HE-343(230)-075/C3A	290416		X																							
RA-SP2-HE-343(230)-075/C3A-060	289113		X																							
RA-SP2-HE-343(230)-075/C3A-061	113611		X																							
RA-SP2-HE-343(230)-1K1/C2A-060	290396								X												X					
RA-SP2-HE-343(230)-1K1/C3A	290419								X																	
RA-SP2-HE-343(230)-1K1/C3A-060	289115								X																	
RA-SP2-HE-343(230)-1K1/C3A-061	113613								X																	
RA-SP2-HE-343(230)-2K2/C2A-060	290397														X						X					
RA-SP2-HE-343(230)-2K2/C3A	290343														X											
RA-SP2-HE-343(230)-2K2/C3A-060	289117														X											
RA-SP2-HE-343(230)-2K2/C3A-061	113615														X											
RA-SP2-HE-343-075/C3A	290415			X																						
RA-SP2-HE-343-1K1/C3A	290418									X																
RA-SP2-HE-343-2K2/C3A	290344															X										
RA-SPV-HE-342-1K1/C2A-060	292316										X										X					
RA-SPV-HE-342-1K1/C3A-060	289150										X															
RA-SPV-HE-342-1K1/C3A-061	113616										X															
RA-SPV-HE-342-2K2/C2A-060	292319																X				X					
RA-SPV-HE-342-2K2/C3A-060	289152																X									
RA-SPV-HE-342-2K2/C3A-061	113617																X									
RA-SPV-HE-343(230)-075/C3A	106496					X																				
RA-SPV-HE-343(230)-075/C3A-060	116954					X																				
RA-SPV-HE-343(230)-1K1/C2A-060	292317											X									X					Additional 2 m AS-Interface cable necessary
RA-SPV-HE-343(230)-1K1/C3A	106497											X														
RA-SPV-HE-343(230)-1K1/C3A-060	289151											X														
RA-SPV-HE-343(230)-1K1/C3A-061	113618											X														
RA-SPV-HE-343(230)-2K2/C2A-060	290398																	X			X					Additional 2 m AS-Interface cable necessary
RA-SPV-HE-343(230)-2K2/C3A	290341																	X								
RA-SPV-HE-343(230)-2K2/C3A-060	289153																	X								
RA-SPV-HE-343(230)-2K2/C3A-061	113619																	X								
RA-SPV-HE-343-075/C3A	105014						X																			
RA-SPV-HE-343-1K1/C3A	105015												X													
RA-SPV-HE-343-1K1/C3A	105015												X													
RA-SPV-HE-343-2K2/C3A	290345																		X							
DEX-KEY-10	231421																						X			RAMO5 and RASP5 only
DrivesSoft	free																							X		RAMO5 and RASP5 only
DEX-CBL-2M0-PC	233184																								X	RAMO5 and RASP5 only

9 Parameter Cross Reference

The most important parameters are listed below:

RA-SP			RASP5		
Identifier	Name	Description	ID	Description	Note
A01	SetpointSource	Selection of frequency set point source	P1-13	SEN Config Select	RASP has no potentiometer
A02	Startcommands	Selection of Start signal source	P1-13	SEN Config Select	Operation via keypad not possible
A03	f-Vmax	Base frequency	P1-09	Motor Nom Frequency	
A04	f-max	Maximum frequency (fmax)	P1-01	f-max	
A20	f-refKeypad	Frequency set point, frequency set point of the keypad (PNU A(0)01 must be 02)	P1-12	f-Fix1	
A21	f-Fix 1	Frequency set point, fixed frequency (1)	P2-01	f-Fix2	
A22	f-Fix 2	Frequency set point, fixed frequency (2)	P2-02	f-Fix3	
A23	f-Fix 3	Frequency set point, fixed frequency (3)	P2-03	f-Fix4	
A24	f-Fix 4	Frequency set point, fixed frequency (4)	P2-04	f-Fix5	
A25	f-Fix 5	Frequency set point, fixed frequency (5)	P2-05	f-Fix6	
A26	f-Fix 6	Frequency set point, fixed frequency (6)	P2-06	f-Fix7	
A27	f-Fix 7	Frequency set point, fixed frequency (7)	P2-07	f-Fix8	
A41	BoostMode	Voltage boost characteristics	P7-01	Motor Identification	
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10 References

Documentation			
	RAMO 4.0	RAMO5	LINK
Manual	AWB2190-1430E	MN034004EN	DownloadCenter
Instruction Leaflet	AWB2190-1430E	IL034085ZU	DownloadCenter
Application Note - Parametrisation per Bluetooth	-	AP040189EN	Drives AP Note Overview Document http://www.eaton.com/ap/overview/drives
PowerXL Device Firmware Update	-	AP040214EN	Drives AP Note Overview Document http://www.eaton.com/ap/overview/drives

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

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