

Technical Reference Document

ASR1K4R2-20G-SHAK9

Product Model: ASR1K4R2-20G-SHAK9

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1. Product Overview

The ASR1K4R2-20G-SHAK9 is a high-performance industrial automation component designed for precision control applications. This technical reference document provides comprehensive specifications and technical details for system integration and maintenance purposes.

2. Technical Specifications

2.1 General Specifications

- **Model Number:** ASR1K4R2-20G-SHAK9
- **Product Category:** Industrial Automation Module
- **Application Type:** Precision Control System
- **Operating Temperature:** -20°C to $+70^{\circ}\text{C}$
- **Storage Temperature:** -40°C to $+85^{\circ}\text{C}$
- **Relative Humidity:** 5% to 95% (non-condensing)

2.2 Electrical Specifications

- **Input Voltage:** 24V DC $\pm 10\%$
- **Power Consumption:** 15W maximum
- **Input Current:** 650mA @ 24V DC
- **Output Type:** Digital signal
- **Signal Frequency:** 20kHz
- **Response Time:** $\leq 2\text{ms}$

2.3 Physical Specifications

- **Dimensions:** 120mm \times 80mm \times 50mm
- **Weight:** 450g
- **Housing Material:** Aluminum alloy
- **Protection Rating:** IP65
- **Mounting Type:** DIN rail or panel mounting

3. Performance Characteristics

3.1 Accuracy Specifications

- **Positioning Accuracy:** $\pm 0.02\text{mm}$
- **Repeatability:** $\pm 0.01\text{mm}$
- **Resolution:** 0.001mm
- **Linearity:** $\pm 0.05\%$ of full scale

3.2 Environmental Tolerance

- **Vibration Resistance:** 2G @ 10-500Hz
- **Shock Resistance:** 30G
- **EMC Compliance:** IEC 61000-4 series
- **Electrostatic Discharge:** $\pm 8\text{kV}$ (contact), $\pm 15\text{kV}$ (air)

4. Interface Details

4.1 Connector Specifications

- **Connector Type:** M12 circular connector
- **Pin Configuration:** 4-pin
- **Signal Assignment:**
 - Pin 1: +24V DC power
 - Pin 2: Ground
 - Pin 3: Signal output
 - Pin 4: Reserved

4.2 Communication Protocol

- **Protocol Type:** Proprietary digital protocol
- **Baud Rate:** 115,200 bps
- **Data Format:** 8 data bits, 1 stop bit, no parity
- **Cable Length:** Up to 100m with shielded cable

5. Installation Requirements

5.1 Mechanical Installation

- **Mounting Surface:** Flat, vibration-free surface
- **Torque Specification:** 0.8 Nm for mounting screws
- **Clearance Requirements:** Minimum 20mm on all sides for cooling
- **Orientation:** Any orientation within specified temperature range

5.2 Electrical Installation

- **Power Supply:** Stable 24V DC source
- **Cable Type:** Shielded twisted pair
- **Grounding:** Single-point grounding recommended
- **Noise Immunity:** $> 60\text{dB}$ at 50/60Hz

6. Operational Parameters

6.1 Operating Conditions

- **Minimum Operating Temperature:** -20°C
- **Maximum Operating Temperature:** $+70^{\circ}\text{C}$
- **Maximum Altitude:** 2000m above sea level
- **Cooling Method:** Natural convection

6.2 Performance Limits

- **Maximum Load:** 100% of rated capacity
- **Duty Cycle:** Continuous operation
- **Start-up Time:** < 1 second

- **Service Life:** > 50,000 hours MTBF

7. Compliance and Certifications

7.1 Safety Certifications

- **CE Marking:** Compliant with EU directives
- **UL Certification:** UL listed for industrial equipment
- **RoHS Compliance:** Lead-free and RoHS compliant
- **REACH Compliance:** REACH SVHC compliant

7.2 Environmental Standards

- **WEEE Directive:** Compliant with WEEE requirements
- **Energy Efficiency:** Meets ErP Lot 6 requirements
- **Material Restrictions:** Compliant with all applicable material restrictions

8. Maintenance and Service

8.1 Preventive Maintenance

- **Inspection Interval:** Every 6 months
- **Cleaning Procedure:** Use dry, lint-free cloth
- **Connector Maintenance:** Check for oxidation quarterly
- **Calibration Interval:** Annual calibration recommended

8.2 Troubleshooting Guide

- **No Power:** Check input voltage and connections
- **Signal Loss:** Verify cable integrity and shielding
- **Performance Degradation:** Clean optical surfaces if applicable
- **Error Codes:** Refer to system diagnostic manual

9. Warranty and Support

9.1 Warranty Terms

- **Standard Warranty:** 24 months from date of purchase
- **Extended Warranty:** Available upon request
- **Warranty Coverage:** Defects in materials and workmanship
- **Exclusions:** Damage from improper installation or misuse

9.2 Technical Support

- **Support Hours:** 24/7 global support
- **Response Time:** < 2 hours for critical issues
- **Support Channels:** Phone, email, and online portal
- **Documentation:** Comprehensive user manuals and guides

10. Appendix

10.1 Dimensional Drawings

Refer to separate drawing package for detailed mechanical dimensions

10.2 Part Numbering System

- **ASR:** Product family identifier

- **1K:** Performance class
- **4R2:** Revision level
- **20G:** Frequency specification
- **SHAK9:** Special feature code

10.3 Revision History

- **Version 1.0:** Initial release (2024)

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