Metronix ARS 2102

01 Servo Positioning Controller

Metronix ARS 2102 coordinates motor current, velocity and position through the configured feedback system. Correct motor identification, feedback selection and braking design are as important as the controller’s nominal output rating.

1 **Command profile** — 2 **Position / speed loops** — 3 **Power stage + motor** — 4 **Resolver / encoder feedback**

Physical and functional arrangement

The controller separates the mains/DC-link power path from its low-voltage control supply. Current for a connected holding brake and I/O must be added to the base control-supply requirement. The PFC stage’s available power falls below nominal mains voltage, so an axis designed at 230 V needs a supply-dependent load review.

Signal path and configuration

Feedback is selected in ServoCommander. Resolver pole pairs must have a valid relationship to motor pole pairs; an encoder interface can provide another supported feedback path for position control. Confirm the actual sensor, supply voltage and signal interface before attempting motor identification.

Application boundary

Regenerative motion can load the braking circuit during deceleration. Evaluate the duty cycle against the internal resistor or an engineered external resistor. Do not transfer safety, power or option claims from the later FS or SE products to an original ARS 2102 merely because the base number looks similar.

Data apply to the original ARS 2102 column of the ARS 2100 manual. ARS 2102 FS, SE and ARS 2105 ratings are not assigned to this product.

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02 Technical data and engineering limits

Mains input	1 × 100–230 V AC ±10%, 50–60 Hz
Alternative DC input	60–380 V DC
Control supply	24 V DC ±20%; 0.55 A plus brake and I/O
Continuous motor current	2.5 A RMS at 230 V AC supply
Peak motor current	5 A RMS for 5 s
Output apparent power	0.5 kVA continuous; 1 kVA for 5 s
Maximum PWM frequency	13 kHz
Internal brake resistor	165 Ω; 10 W continuous
External brake resistance	100 Ω minimum
CAN interface	CANopen DS301 / DS402; up to 1 Mbaud

Additional interface data

External brake continuous power	Up to 250 W; operating voltage ≥460 V
Internal brake pulse power	1.1 kW
RS-232 rate	9600–115200 baud
AIN0	±10 V differential; 16 bit
AIN1 / AIN2	±10 V single-ended; 10 bit
AOUT0 / AOUT1	±10 V; 9 bit

Data apply to the original ARS 2102 column of the ARS 2100 manual. ARS 2102 FS, SE and ARS 2105 ratings are not assigned to this product.

Interpreting the operating envelope

Keep mains, motor-output and control-supply quantities separate in the axis power budget. The short-duration current rating does not establish continuous motor capability, and apparent output power is distinct from brake-resistor energy capacity. Check the actual operating voltage and cabinet temperature, then assess repetitive acceleration and deceleration against the controller, motor and braking circuit together.

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03 Application map and integration boundaries

01 Servo axis positioning

Control a compatible motor using the selected feedback and motion profile.

02 CANopen machine integration

Exchange drive commands and status through the configured DS301/DS402 interface.

03 Analog-reference operation

Use the configured analog input with matched scaling and control authority.

04 Legacy axis maintenance

Restore an original ARS2102 installation without substituting later-variant assumptions.

Feedback consistency

Motor and encoder parameters must describe the actual connected assembly. Preserve direction, pole pairs and offset information during service.

Braking energy

Assess deceleration and repeated-cycle energy against the selected resistor and DC-link design, not just the nominal motor power.

Thermal envelope

Account for temperature and altitude derating. Preserve cabinet ventilation and motor-cable conditions required by the installation design.

Configuration scope: Match original hardware execution, motor data, feedback interface, braking arrangement and application parameters before changing the controller.

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04 Technical questions that affect operation

1 Why can a low mains voltage reduce usable power from ARS 2102?

The PFC stage has a supply-dependent power envelope. Review continuous and acceleration demand at the actual input voltage instead of applying the 230 V rating unchanged.

2 What must be added to the base 24 V demand for ARS 2102?

Include current for the connected holding brake and I/O. A supply sized only for controller electronics can sag when those loads operate.

3 Why can motor identification fail after changing the resolver on ARS 2102?

The resolver type, pole-pair setting or relationship to motor pole pairs may be invalid. Reconcile feedback data before repeating identification.

4 Can an encoder voltage be chosen from connector appearance on ARS 2102?

No. Match the actual encoder and interface specification, including its required supply. Incorrect voltage or signal type can prevent operation or damage equipment.

5 How should repetitive deceleration be assessed for ARS 2102?

Calculate the regenerative duty and compare it with the brake resistor’s pulse and continuous capability. A successful single stop does not prove repetitive thermal capacity.

6 Why should FS safety functions not be assumed for ARS 2102?

The original ARS 2102 and later FS execution are distinct products. Use only functions established for the installed hardware and its assessed machine design.

7 What happens to output capability above 40 °C around ARS 2102?

The original controller requires power derating above 40 °C, at 2.5% per kelvin up to 50 °C. Include cabinet temperature in the load assessment.

8 How can an incorrect encoder direction affect commissioning with ARS 2102?

The control loop can interpret motion with the wrong sign. Verify direction and feedback consistency in a restrained, controlled commissioning test before normal motion.

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05 Selection, service planning and related equipment

Match the installed arrangement

Match the complete Metronix ARS 2102 marking and installed configuration. Compare the original ARS 2102 label, connector arrangement and installed options; do not substitute an FS or SE identity.

Support and migration

The current production and manufacturer-support stage for this exact execution is unconfirmed. Match original hardware execution, motor data, feedback interface, braking arrangement and application parameters before changing the controller.

Equipment boundary

Confirm the controller; motor, feedback cable, brake resistor and optional modules only when itemized. Companion hardware and accessories are included only when itemized; the function of the complete installed arrangement depends on the correct combination.

Engineering review before intervention

Preserve axis configuration	Save controller parameters and identify the motor, feedback sensor, brake and mechanical transmission. Record limits, homing direction and control authority. Secure the axis and its load before isolating power, especially where gravity can cause movement.
Inspect supply and brake circuit	Verify mains/DC and separate control-supply assignments. Follow the discharge and absence-of-voltage procedure before handling the power stage. Compare braking resistance and duty with the design and inspect protective earth and shielding.

Related equipment navigation

Siemens 6ES7953-8LF11-0AA0

Siemens 6ES7322-1BL00-0AA0

Siemens 6ES7331-7KF02-0AB0

Related references support separate application assessment and do not imply replacement compatibility. Technical basis: Metronix ARS 2100 Product Manual, Version 4.0.