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01 Motor phases and feedback allocation

1 Identify winding pairs and input functions

Capture winding pairs, axis direction, limit-switch states and the selected homing mode. Save acceleration, running and holding currents, microstep setting and stall threshold. Identify whether the four digital inputs are switches or ABR feedback.

2 Separate switch inputs from ABR feedback

Check the saved input assignment before connecting the encoder. Reference switches and ABR signals use the same four configurable inputs; an incorrect assignment can change the meaning of a homing or limit signal.

Record	Complete marking and installed position
Comparison	Field labels agree with application assignments
Motor channels	1 two-phase bipolar stepper motor
Motor supply	24 to 48 VDC ±25%

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02 Motor-supply and bridge limits

1 Size the 24–48 V motor circuit

Check the external 24–48 V DC ±25% motor supply and its maximum 10 A slow-blow fuse. The bridge permits 5 A nominal and 10 A for one second; confirm the supply can support the intended motion without exceeding winding ratings.

2 Distinguish peak current from continuous duty

Compare the programmed running and holding currents with the motor winding rating. The 10 A peak allowance lasts one second and does not permit a 10 A continuous operating setting.

Supply evidence	Measured at the device connection
Work condition	Power isolated while wiring is handled
Nominal motor current	5 A
Peak motor current	10 A for 1 s

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03 Winding polarity and encoder levels

1 Reconnect the two motor phases

Connect the two motor phases to their assigned bridge terminals and retain the original polarity. The input stage expects 24 V sink signals; ABR uses an asymmetrical 24 V interface with a maximum 50 kHz input. Do not connect a 5 V encoder directly.

2 Check the 24 V asymmetrical encoder interface

Trace A, B and reference signals from the encoder to their configured inputs. Confirm the signal level and pulse rate before enabling motion; a 5 V output is not the specified input interface.

Wiring record	Connection-by-connection comparison
Physical inspection	Shield, connector and strain relief checked
Microstep resolution	Up to 256 microsteps per step
Digital inputs	4 sink inputs at 24 VDC

04 Homing and load-dependent settings

1 Restore current stages and microstepping

Restore microstepping and separate current stages. Check reference and limit input polarity before homing. Set any stop-controlled homing delay and establish the stall threshold from the real mechanical load, including acceleration and dwell conditions.

2 Verify the mechanical meaning of each limit

Check each reference and limit input while the axis is stationary. Confirm its indicated state before running the homing sequence, then evaluate the stall threshold with the actual load and acceleration profile.

Configuration	Approved settings restored
Diagnostic condition	Normal recognition before functional testing
Encoder function	1 ABR incremental encoder
Encoder input frequency	50 kHz maximum

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05 Axis-response acceptance

1 Test direction, homing and travel limits

Run short movements in each direction, then test homing and both travel limits. Compare encoder feedback where fitted. Increase duty gradually while observing current and temperature. Prove the configured stall response and communication-loss behavior without exposing the machine to uncontrolled travel.

2 Compare commanded motion with feedback

Record the commanded distance, observed direction and available encoder result for the same movement. Repeat with the intended current stages so a correct unloaded move is not mistaken for acceptance at the operating load.

Technical basis: B&R X20SM1446-1 Data sheet V1.56.

Related product navigation

B&R X20AO2622

B&R X20AI2437

These are related references, not confirmed substitutes or an automatically approved assembly.