AZ INSPIRED / SETUP GUIDE

RichAuto A11 + DV203

HQD spindle setup



RichAuto A11 handheld controller

Confirm the model first

Check the A11 handset and DV203 drive labels. The input-assignment section explains why alternate speed gears may fail.

Electrical and motion checks are for qualified technicians.

Verify values against the equipment nameplate and the manufacturer manual for the exact model. Record existing settings before making changes.

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If your equipment differs, contact AZ Inspired with photos of the model labels.

DV203 VFD + RichAuto A11 — HQD Spindle Setup

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⚠️ **SAFETY FIRST — QUALIFIED PERSONS ONLY.** Mains voltage present. Power off the VFD at the isolator and wait at least 5 minutes for the DC bus capacitors to discharge before touching any terminal. AZ Inspired is not liable for injury or damage from incorrect wiring or unqualified work.

1. Overview

Commissions a DV203 VFD driving an HQD spindle through a RichAuto A11 DSP handle in **3-line 8-status** mode — 1 forward line plus 3 binary speed bits = 8 speed steps. DV203 factory defaults on X2/X3/X4 conflict with RichAuto wiring; following this guide avoids the spindle running on alternate gears.

2. Required Hardware

Item	Specification
VFD	DV203 series, sized to spindle (e.g. DV203-2R2G, 2.2 kW)
Controller	RichAuto DSP A11 + interface board + 50-pin cable
Spindle	HQD GDZ, 2-pole, 400 Hz; voltage must match VFD output
Control cable	5-core shielded 0.5–1.0 mm^2
Power cable	4-core shielded (U/V/W + earth) 1.5–2.5 mm^2

3. Wiring — Control (RichAuto J7 → DV203)

Wire (typical colour)	RichAuto	Function	DV203
Red	Y1	Spindle FWD ON/OFF	X1
Green	Y2	Speed bit 0 (LSB)	X2
Black	Y3	Speed bit 1	X3
Yellow	Y4	Speed bit 2 (MSB)	X4
Blue	GND	Common ground	COM

Colours vary by batch — confirm by terminal name. Keep the +24V/OP shorting tab in factory position. Earth shield at VFD end only. Keep control cable ≥200 mm from U/V/W.

Power: Mains R/S/T via breaker+filter → VFD; U/V/W → spindle (phase order = direction); solid earth from spindle, VFD, frame to one point; optional brake resistor across PB/P+.

4. CRITICAL — DV203 Default Parameter Trap

> Factory defaults assign X2/X3/X4 to wrong functions. Left unchanged the spindle runs on alternate gears with NO error code. Fix these first.

Parameter	Default	Wrong function	Required
P4-00 (X1)	1	FWD	1 — keep
P4-01 (X2)	4	FJOG — wrong!	12 — Multi-seg 1
P4-02 (X3)	9	Fault Reset — wrong!	13 — Multi-seg 2
P4-03 (X4)	12	Multi-seg 1 — wrong slot!	14 — Multi-seg 3
P4-04 (X5)	13	Multi-seg 2	0 — disabled

5. DV203 VFD Parameters

F0 Basic: P0-01=2 (V/F) · P0-02=1 (terminal) · P0-03=6 (multi-seg freq) · P0-10=400 (max Hz; 300 if 18,000 RPM) · P0-12=400 · P0-14=0 · P0-17=10 (accel) · P0-18=10 (decel)

F1 Motor (from nameplate — wrong voltage burns the motor): P1-00=0 · P1-01=kW · P1-02=V (220/380) · P1-03=A · P1-04=400 · P1-05=24000 · P1-37=2 then RUN (auto-tune)

F3 V/F: P3-00=0 (linear) · P3-01=0.0–2.0 (boost)

F4 Inputs: P4-00=1 · P4-01=12 · P4-02=13 · P4-03=14 · P4-04=0 · P4-11=0

FC Multi-segment (% of P0-10, match RichAuto):

Gear	Param	%	Hz	RPM
S1	PC-00	0	0	0 (Stop)
S2	PC-01	25	100	6,000
S3	PC-02	37.5	150	9,000
S4	PC-03	50	200	12,000
S5	PC-04	62.5	250	15,000
S6	PC-05	75	300	18,000
S7	PC-06	87.5	350	21,000
S8	PC-07	100	400	24,000

6. Motor Auto-Tuning

Tool out of collet; P1-01…05 entered. Set P1-37=2 (or 1 static), press SET, press **RUN on the VFD keypad**. Spindle ramps and stops (30–60 s). Err19 → check U/V/W wiring & P1-01…05.

7. RichAuto A11 Handle Setup

Menu → Machine Setup → Spindle Setup (password 123 or 459).

- Spindle State: **3-line 8-status**
- Start delay 5000 ms, stop delay 5000 ms
- Gear speeds S1–S8: 0 / 6,000 / 9,000 / 12,000 / 15,000 / 18,000 / 21,000 / 24,000 RPM (match Section 5)

8. Commissioning Sequence

1. Pre-power: wiring per Section 3; pull-test; +24V/OP tab in place; U/V/W + earth tight; no tool; breaker off
2. Power-up: VFD shows 0.00; RichAuto boots
3. Restore (PP-01=1), power-cycle, enter Section 5, power-cycle, verify
4. Auto-tune (collet empty, P1-37=2 then RUN)
5. RichAuto setup (Section 7)
6. Test: ON at S2 → 6,000 RPM; step gears up; OFF ramps ~5 s. Wrong direction → swap two of U/V/W
7. Sign-off: run S8 5 min (body <60 °C), test-cut, log values

9. Troubleshooting

Runs on alternate gears: P4-01 still default 4 (FJOG) → set P4-01=12. **Speeds in pairs (only 4):** a speed bit dead (usually Y2/X2) → watch interface LEDs cycling S1–S8; meter X input 24V→0V. **Wrong RPM:** PC values ≠ handle speeds → re-enter Section 5.

Fault codes: Er02 accel overcurrent (raise P0-17) · Er03 decel overcurrent (raise P0-18 / brake resistor) · Er05/06/07 overvoltage (increase decel) · Er09 undervoltage (mains/stabiliser) · Er10/11 overload (sizing/bearings/P1-03) · Er14 overheat (fan/dust) · Er19 auto-tune fail (U/V/W & P1-01…05) · Er23 output short (megger test).

10. Quick Reference

Wiring: Y1→X1, Y2→X2, Y3→X3, Y4→X4, GND→COM `P0-01=2 · P0-02=1 · P0-03=6 · P0-10=400 · P0-17=10 · P0-18=10` `P1-00=0 · P1-01..05=nameplate · P1-37=2(then RUN) · P3-00=0` `P4-00=1 · P4-01=12 · P4-02=13 · P4-03=14 · P4-04=0 · P4-11=0` `PC-00=0 · PC-01=25 · PC-02=37.5 · PC-03=50 · PC-04=62.5 · PC-05=75 · PC-06=87.5 · PC-07=100`

Top 3 mistakes: (1) skipping P4-01/02/03 reassignment → alternating run/stop; (2) removing +24V/OP tab → dead inputs; (3) skipping auto-tune → weak torque.

Need help? WhatsApp AZ Inspired: +91 98764 32933 · For qualified technicians. Verify all values against your spindle nameplate and VFD manual.