A cooling command is sent. The valve stays closed.

01 CLIENT BRIEF

“The supply-air temperature does not seem stable and is not tracking the 24°C setpoint well. Please investigate and recommend how to improve it.”

Records gathered during investigation: temperature, setpoint, command, position and P/I trends; DDC settings, actuator specification, manual tests with terminal voltage, and water/air conditions.

02 FINDING AND CORRECTION

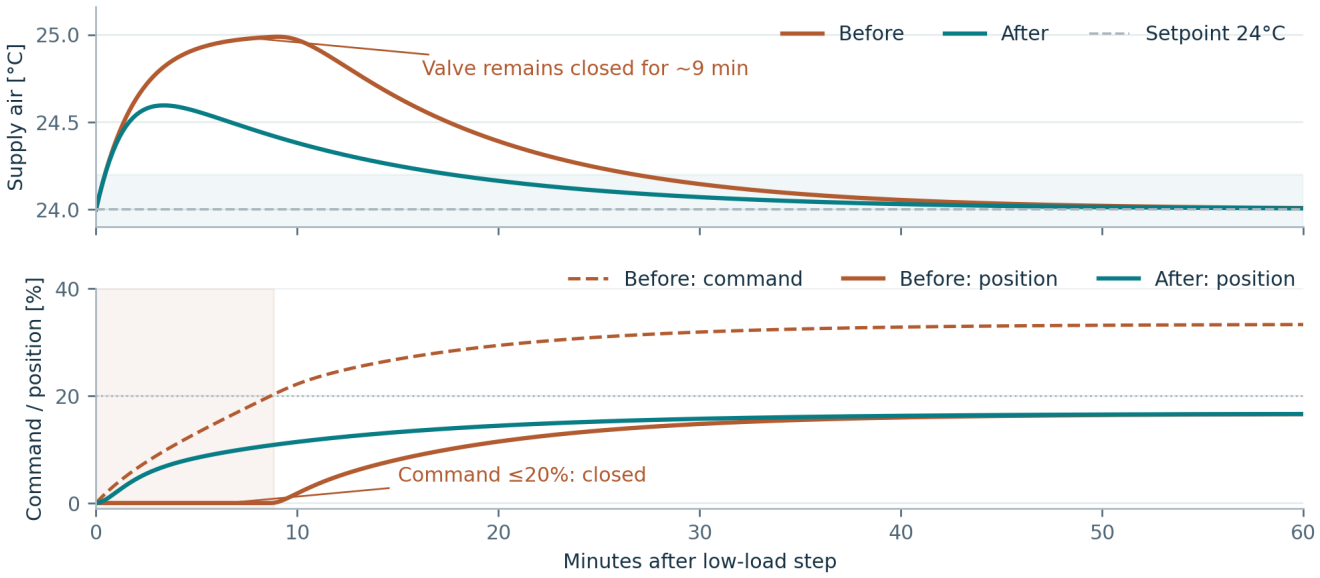
DDC output is 0–10 V; the valve expects 2–10 V.

Commands of 0–20% leave the valve closed. P or accumulated I must push the command above 20%. Correct the mapping to 2–10 V; keep the PI settings unchanged.

Manual 10% command: 1.0 V / 0% position before → 2.8 V / 10% position after.

03 RESULTS

Before / after under identical conditions | synthetic cooling-mode trends



Position at 10% manual command	Time to reach 1% valve position	Recovery to 24°C ±0.2°C
0% → 10%	**9:40 → 0:40**	**26:50 → 17:40**

After correction, all six manual test points (0, 10, 20, 25, 50, 100%) meet the ±5 pp position tolerance.

04 DELIVERY AND ROLES

This report + test and calculation workbook. Client: site measurements, settings change and retest. Reviewer: remote analysis, correction proposal and verification.

Same load, PI and initial temperature/integral state. Two-way coil valve, cooling mode. Times: min:sec; recovery means staying within ±0.2°C through minute 60 (10 s samples). PI eventually compensates; this case demonstrates delayed transient response. Model equations are in the workbook.

Input-range reference: Belimo LR24A-SR (2025-06-02). Simplified model; not a product performance prediction.