Hall 4A

Chillventa Specialist Forums 2024
Chillventa Fachforen 2024

CONNECTING EXPERTS.

How Advanced Expansion Valve Technology Addresses HVAC Industry Challenges

Magnetic expansion valve MVL702
siemens.com/mvl702

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Industry Challenges

5 – 8%
Increasing demand for comfort cooling and refrigeration CAGR

80%
of heat generation in building sector is based on fossil fuels

55%
reduction of greenhouse emissions by 2030, climate neutrality by 2050

European Green Deal

TCO Total cost of ownership key figure for refrigerant based equipment

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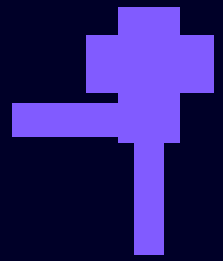
State of the art of electronic expansion valves

Stepper motor valves



Dry stator	Wet motor
Dry motor	
Direct drive	Gearing drive
Pressure balanced	Direct operating
Hard-sealing	Soft-sealing
Spring loaded seal	Static seal

Areas of improvement

Hysteresis
(control performance)

No position feedback
(reliability)

No fail-close function
(reliability)

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Magnetic expansion valve technology

True valve position sensor

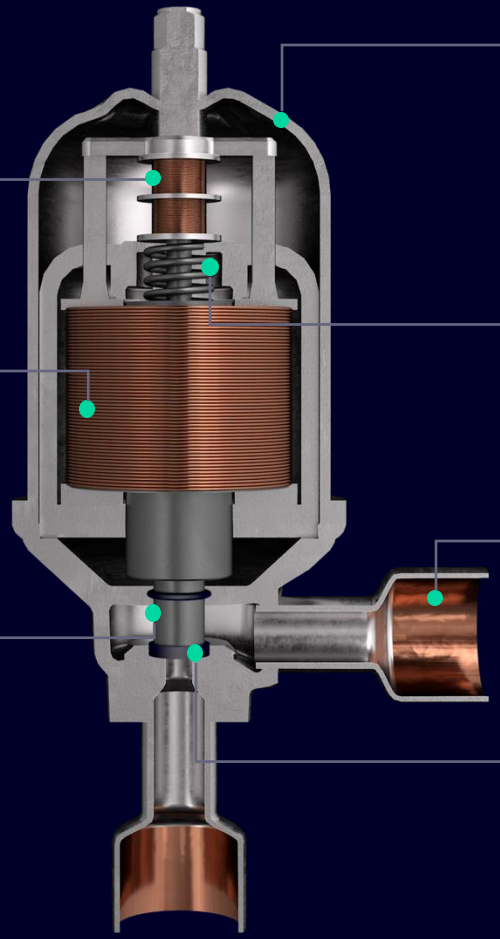
- Position feedback every **50** milliseconds
- No step-losses, no valve synchronization required
- Valve control resolution **1:1000**

Linear actuator

- 1 second positioning speed
- 100% duty cycle for continuous control operation

Pressure balanced design

- Bi-flow capability
- High Maximum Working Pressure Differential (MOPD)



Stainless steel design

- Hermetic, laser welded valve body
- Corrosion resistant
- No risk of external leakage

Normally closed by build-in spring

- No solenoid valve or UPS required
- Robust and reliable NC function

Bi-metal connectors

- No need for silver solder
- Fast installation

Solenoid tight seal

- Spring loaded soft seal
- Avoids liquid migration during standstill

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Product features and control behavior

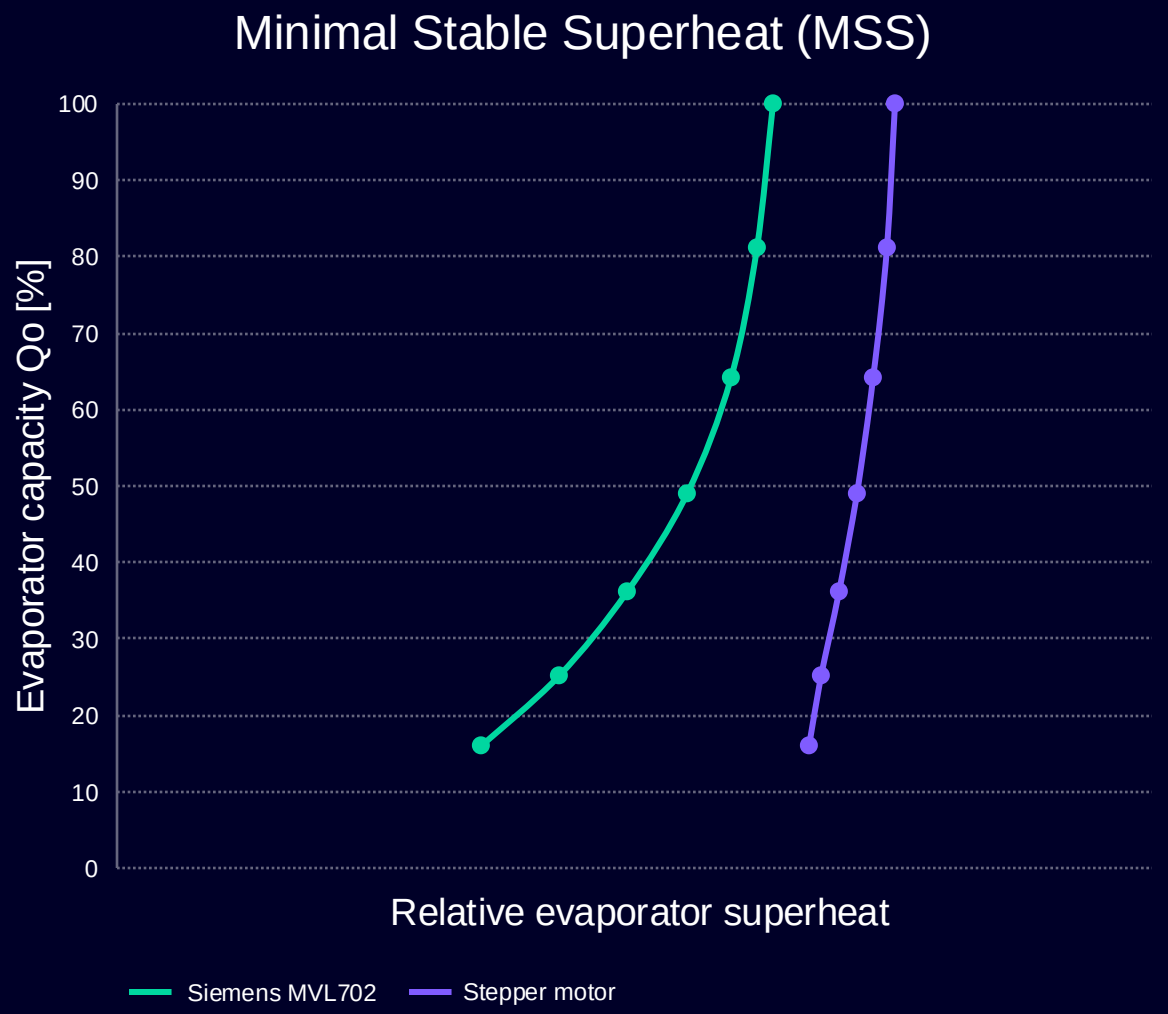
- → Positioning speed 1 second
- → Control resolution 1:1000
- → Duty cycle 100 %

Summary of benchmark tests

- SH-Stability Criteria: +/- 0.3 K
- No PID parameter optimization
  - Full Load (100%) → 15% lower SH
  - Part Load (50%) → 20% lower SH
  - Low Load (25%) → 35 % lower SH

Benefits

- Higher evaporating pressure
- Capacity increase
- Higher COP



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Product features and control behavior

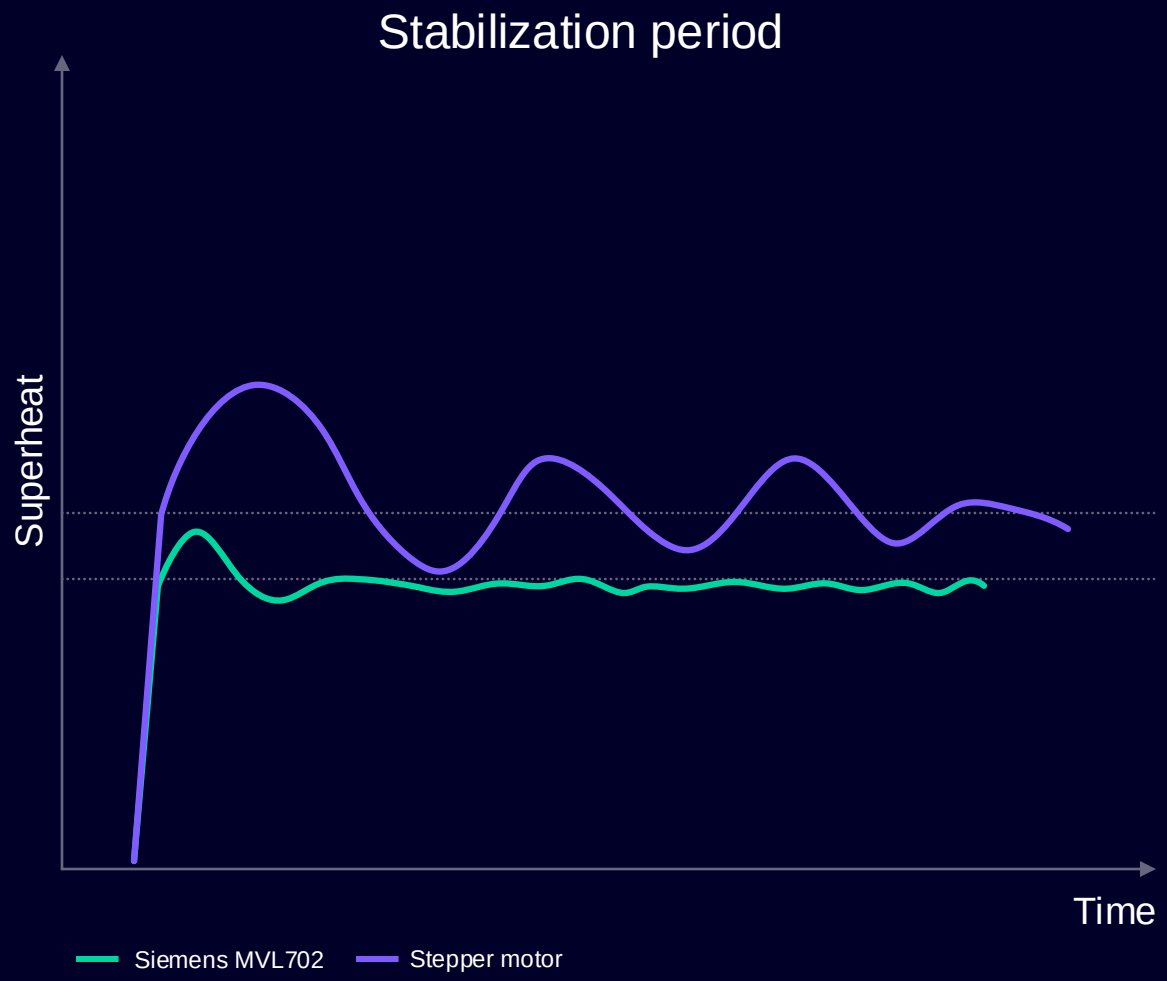
- → Positioning speed 1 second
- → Control resolution 1:1000
- → Duty cycle 100 %

Summary of benchmark tests

- SH-Stability Criteria: +/- 0.3 K
- No PID parameter optimization
  → more than 2 x time shorter stabilization at even lower SH-setpoints

Benefits

- Protects compressor from liquid refrigerant in transient states
- Capacity increase
- Higher COP



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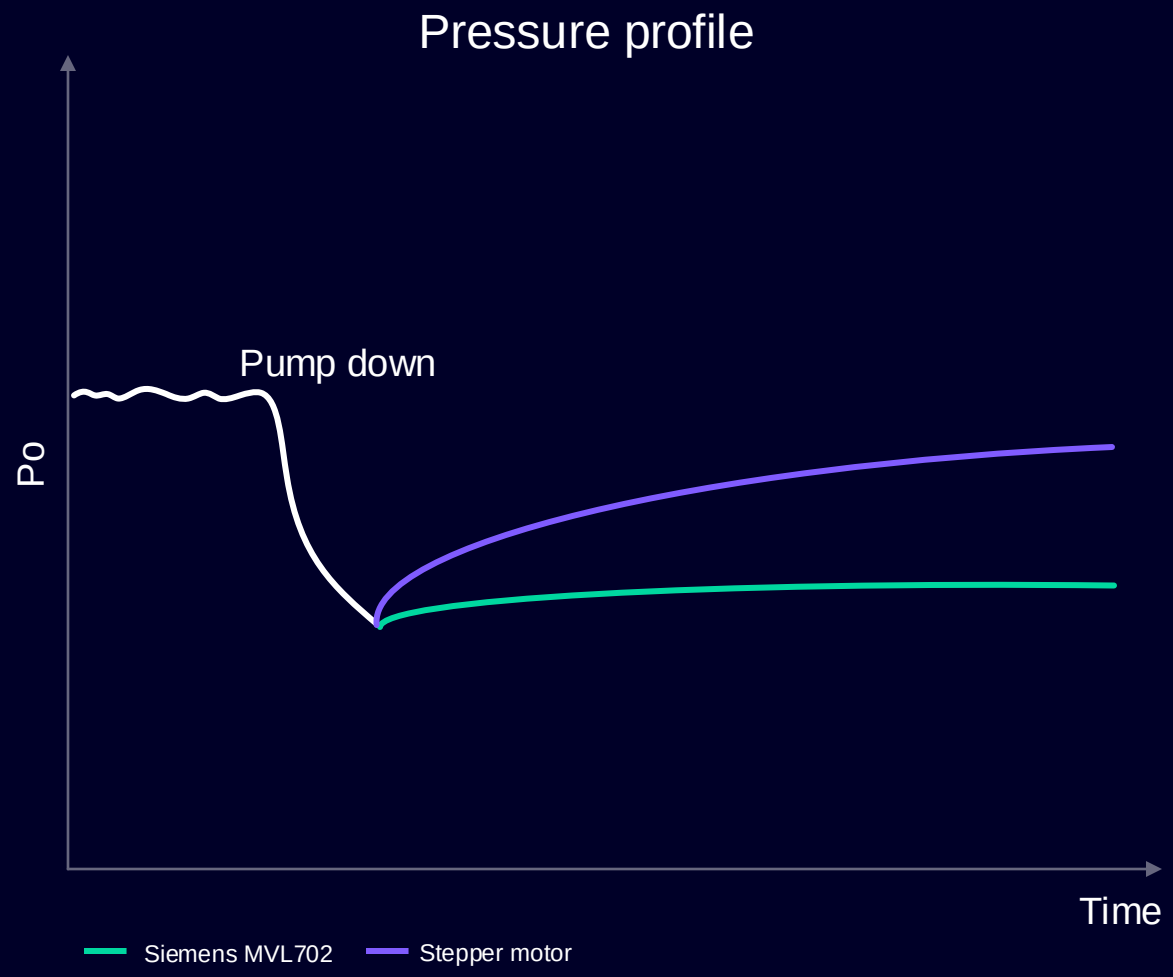
Product features and benefits

- Normally closed by build-in spring
- Compensation of stress relaxation by spring
- Internal leakage 2 – 8 ml/min @ 4 bar

Benefits

- No solenoid valve or back up power module required
- Protection against refrigerant floodback at start-up
- No refrigerant migration during standstill:
  Safe and stable start-up



Questions?

Visit Siemens
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