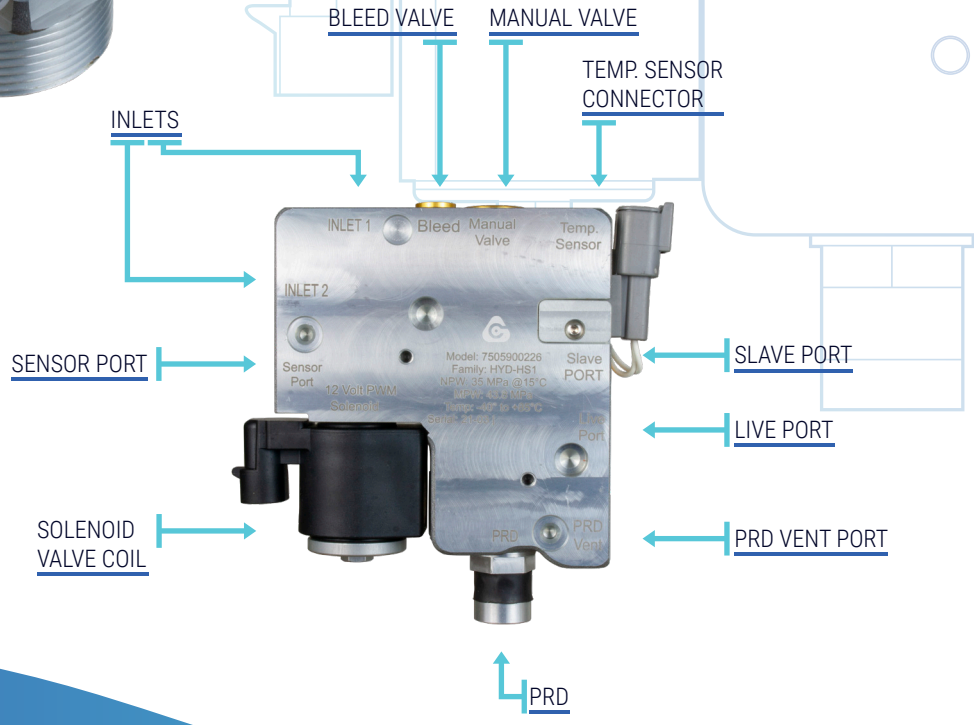
Cavagna Group HS1

Solenoid Hydrogen Valve

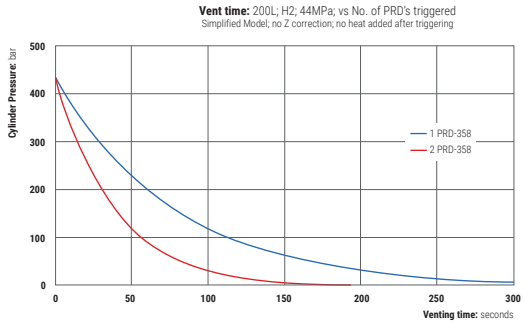
35MPa (350bar)
valve for all transport applications



- **Lightweight aluminum High-flow valve**
  - CV: 0.86
  - Fast-filling: full flow at ultra low tank pressure
  - See graph for flow vs valve dP
- **High-flow excess flow valve**
  - No impact on filling flow
  - Easily calibrated
  - Auto reset
- **High-flow, vented thermobulb PRD**
- **Pressure sensor port option**
  - SAE/ORB
- **Low-torque/high-flow bleed valve**
  - Drive vehicle or drain tank
  - Life > 100 cycles
- **Live port: for remote PRD**
  - For optional remote PRD or sensor
  - IFS format (ø 6 mm or ø 8 mm)
- **Temperature sensor**
- **Total Mass**
  - 1072g
- **EC79 Certification**

PRD vent time model

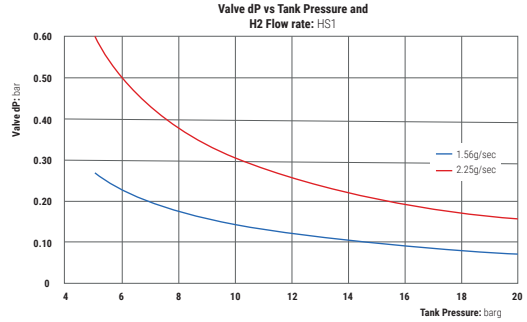
· Vent time directly related to number of PRD's triggered
· PRD meets hypothetical 5 minute goal on 200L tank



Low-pressure valve performance

Valve has capacity for full power performance at ultra-low pressures

· Avoids limp-home modes in low-fuel "emergencies"
· No flow loss at 5 barg (tank pressure)
· Valve has extra capacity in case higher demand fuel cells considered fo future ECEV's



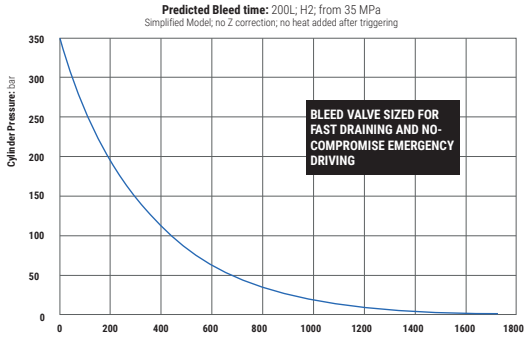
Bleed-valve performance model

Vent mode

· Fastest possible vent time (35 to 0.15 MPa) is 28.8 minutes if valve kept at full flow and outlet is unrestricted

Driving mode

· Solenoid by-passed
· 1.4g/sec available at very low tank pressure (no limp-home mode needed)



Bleed Valve dP at 1.4 g/sec	
Ptank (barg)	**dP** (bar)
5	1.63
10	0.69
15	0.46
20	0.34

cavagna group
Wherever gas is used, we are there

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