



QUENCH RELIEF VALVE

*Symposium for the inauguration of the LHC Cryogenics
CERN, Geneva, 1st of June 2007*

Speaker: Raphaël COUTURIER (VELAN sas)

- Function and Specification
- Main features and benefits
- Future developments

Valve function

Protect against over-pressure the superfluid helium enclosures of superconducting magnet resulting from resistive transitions (Quench) as well as some of the cryogenic lines (QRL).

CERN specification & Challenges

Superfluid helium service (Temperature: 1.9 K)

Set pressure : 17 bar (full open pressure : 20 bar)

Remote control actuation (on/off function)

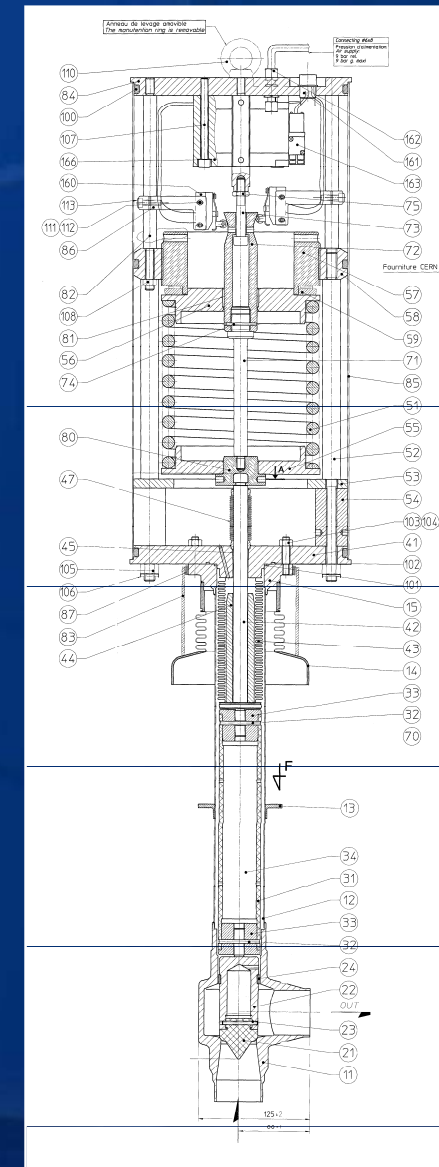
Flow coefficient : Kv 30

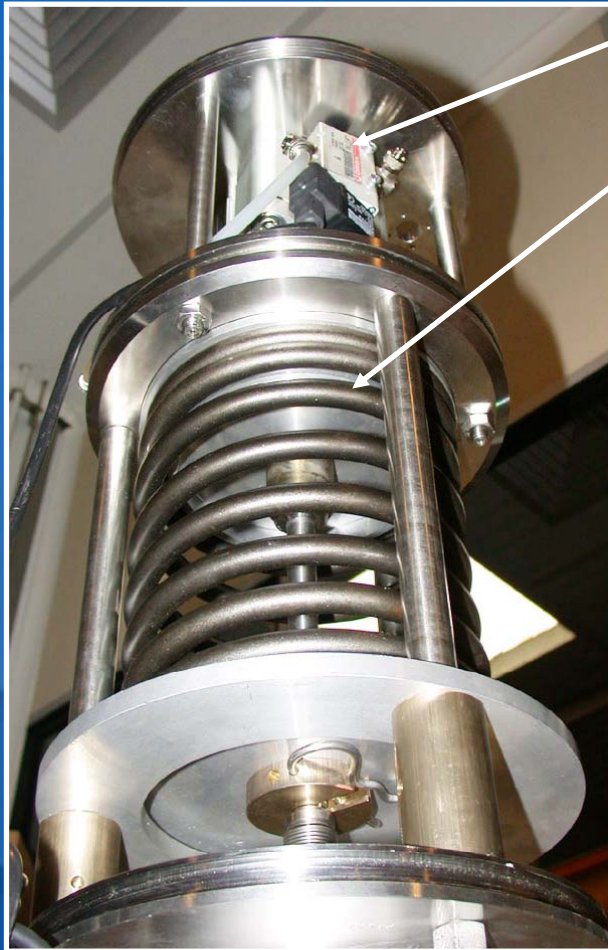
No risk of icing or jamming when operating

Downstream pressure do not affect the set pressure

Very low heat inleak

Resistant to radiations





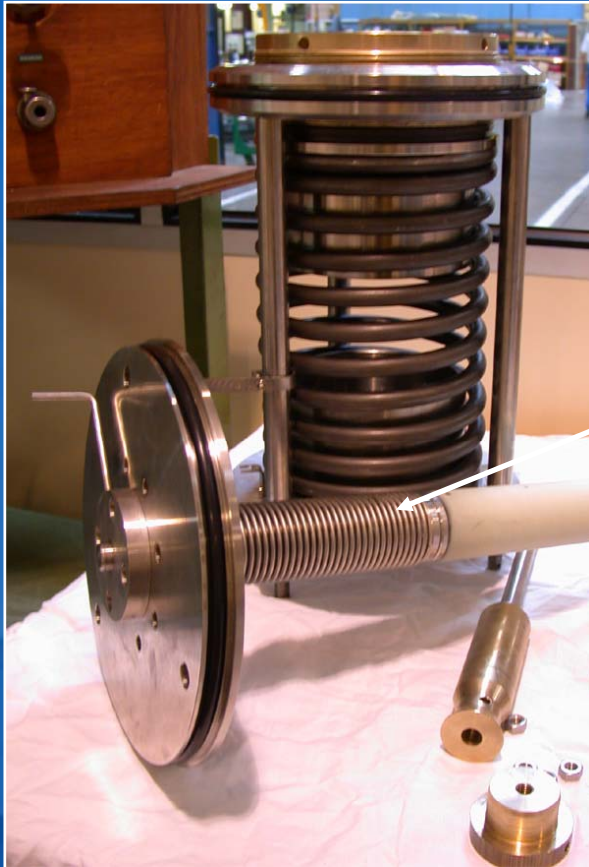
Air piston (on/off function)

Spring loaded type for high reliability

VESPEL plug for radiation resistance

Fiber Glass Stem for low heat inleak

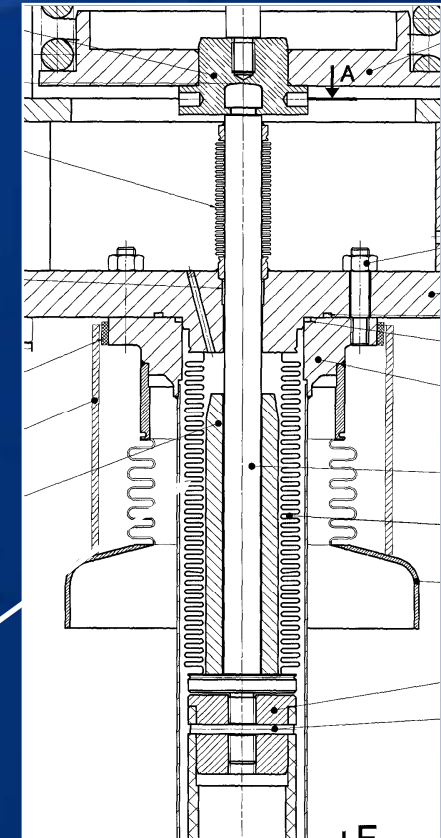




Bellows sealed type for better tightness (double bellows type for QV valves)

- 10000 cycles
- PN25
- 10-8 mbar.l/s

Balanced to downstream pressure (no influence of the downstream pressure on the set pressure)



HEAT IN LEAK

collar @80K
Valves QV

Atm. @300K
Valves SVC/SVE

- Fiber glass stem
- Extension with low thickness
- Thermal collar

0.34 W

0.9 W

Fluid @1.8K



3 types of SRV

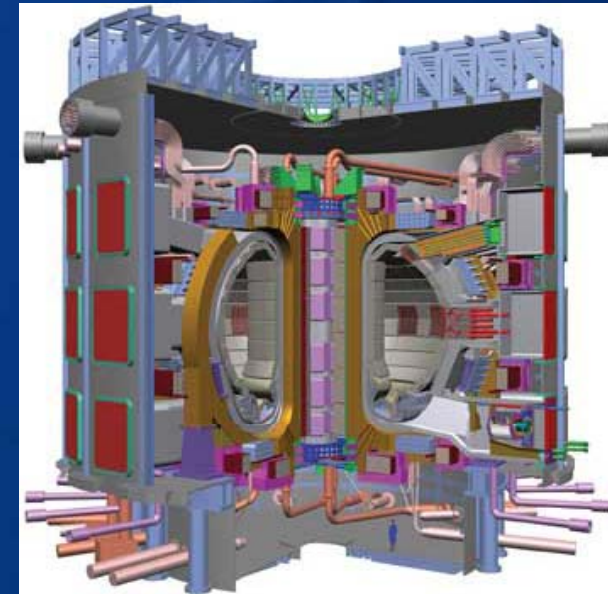
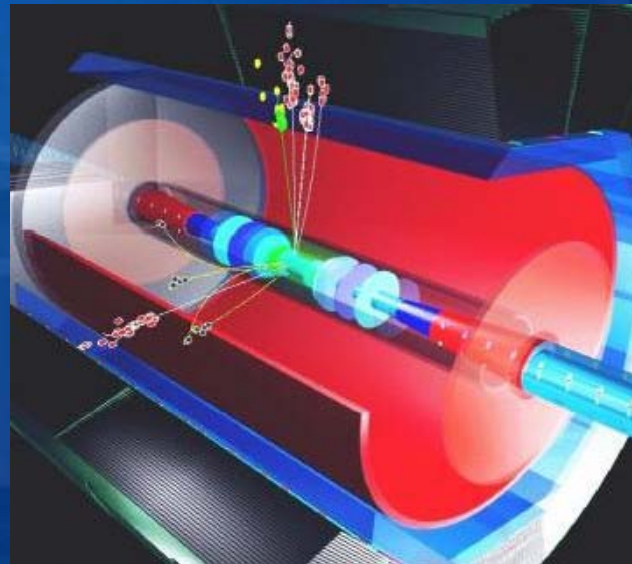


	QV (360 valves supplied)	SVC (9 valves supplied)	SVE (18 valves supplied)
Set Pressure	17-20 bar	20-22 bar	22-24 bar
T service	1.9 K	4 K	50 K
On/off function	Air piston	-	-
Thermal collar 80 K	Yes (0.35W)	No (0.9W)	No (0.9W)
Bellows	Double	single	single
Leakage Rate	< 10 mg/s of SFHe with a DP of 100 mbar	10-4 mbar.l/s	10-4 mbar.l/s

PERSPECTIVES

Technology not limited in terms of flow
and Max/Min Set Pressure

- JT 60 SA
- ITER
- TESLA
- ILC
- K STAR





INFORMATION / INQUIRIES

VELAN sas
90 rue Challemel Lacour,
69367 Lyon,
France

Contact person: Mr Jean-Luc COLIGNON
Tel: +33 4 7861 6783
E-Mail: jlcolignon@velan.fr

VELAN sas (France) : www.velan.fr
VELAN Inc. (Canada) : www.velan.com