High Velocity
P/V Valve

Technical Brochure





STABLE BY FLUID DYNAMICS, NOT BY MAGNETS.

Qingdao Exsafe Valve Co., Ltd.

www.exsafevalve.com PV@EXSAFEVALVE.COM

BEYOND SAFETY

Why P/V Valves Matter

Tank venting is a safety-critical system, especially when fleets move toward dual-fuel and alternative fuel applications.

Oscillation

Repeated unstable opening may lead to noise, vibration and accelerated wear.

Hammering

Sudden closing impact can damage the valve seat and surrounding pipe system.

Leakage

Poor sealing increases cargo vapor loss and VOC emission risk.

High Lifecycle Cost

Frequent maintenance, seal replacement and magnet replacement increase total cost.

Exsafe Focus

Solve the root causes of unstable operation through wide-body structure, force balance and fluid-dynamic design rather than relying on magnetic control.

The result is a High Velocity P/V Valve designed for stable opening, tight closing and lower lifecycle cost.

Three Technical Routes

A practical comparison for shipowners, shipyards and fleet technical teams.

Traditional Gravity Type

Simple structure but usually slim and tall, with limited backpressure capability and larger area contraction ratio. More sensitive to pressure fluctuation.

Magnetic Type

Uses magnetic force to assist closing and reduce flutter, but magnets may age, weaken or require periodic replacement and inspection.

Exsafe Fluid-Dynamic Type

Wide-body design with calculated upward air force. When opened, the force difference between airflow, gravity and friction is minimized for stable operation.

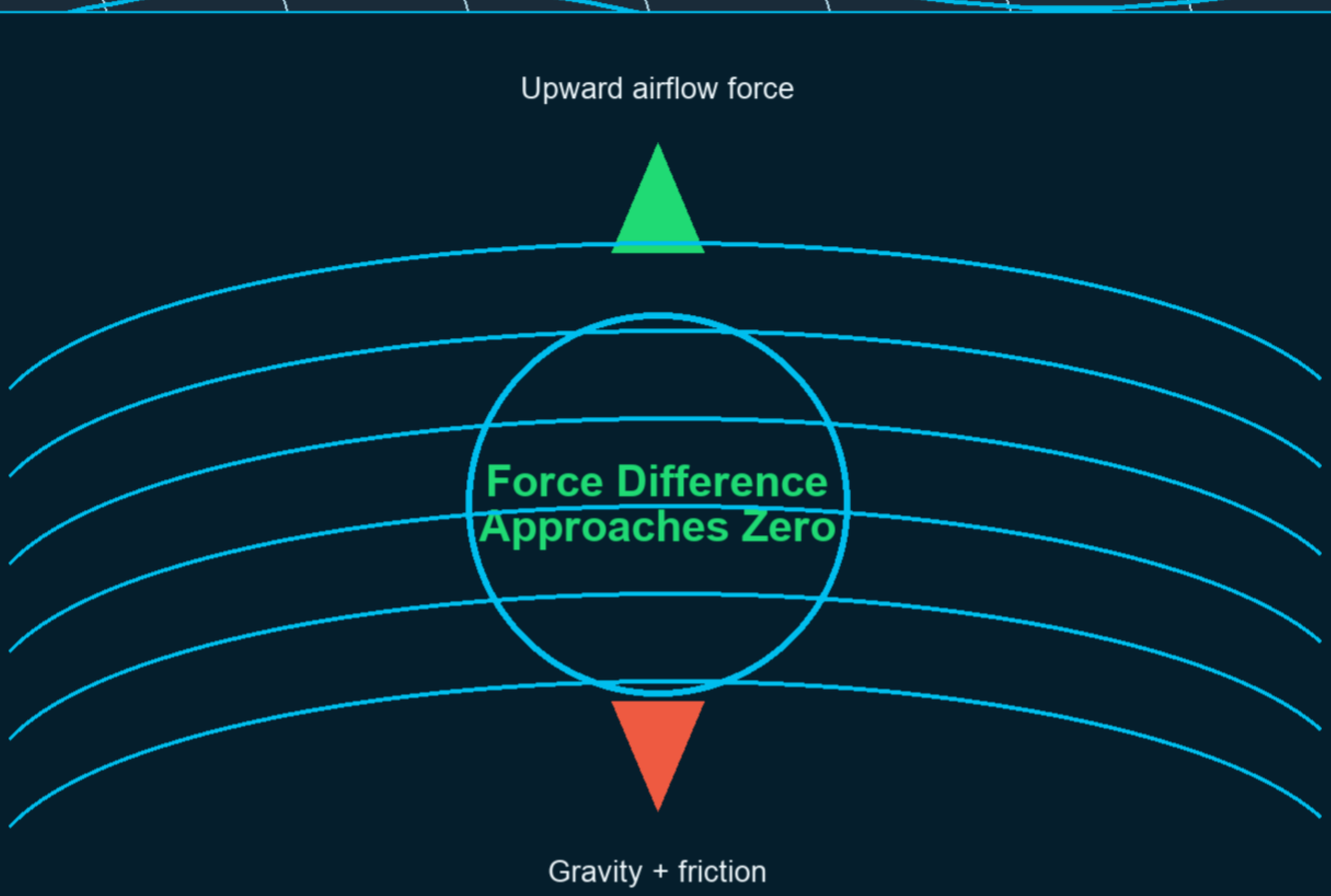
No Magnets Required

Positioning

Exsafe is not a conventional gravity valve. It is a non-magnetic, wide-body P/V valve engineered around force balance and airflow stability.

Stability by Fluid Dynamics

The core is a wide-body structure and calculated force balance.



What It Means

Less sensitivity to pressure fluctuation, smoother opening and closing, and lower risk of oscillation or hammering.

Why It Matters

Stable operation helps protect the valve seat, deck piping and tank venting system during real voyage conditions.

Qingdao Exsafe Valve Co., Ltd.

www.exsafevalve.com PV@EXSAFEVALVE.COM

BEYOND SAFETY

Non-Oscillation and Non-Hammering

Designed to stay stable under pressure fluctuation instead of repeatedly bouncing on the seat.

>=87 %

Opening-closing pressure ratio

0Hz Vs 0.5Hz

Zero contact of valve seat and disc during the test

<=291 m

Maximum vent pipe length for EM-50A to EM-150A



Customer Value

Stable operation reduces noise, impact, maintenance intervention and the risk of repeated seat damage. This is especially valuable for long vent lines or complex deck arrangements.

Metal Hard Sealing and Zero Leakage

Reliable sealing without resilient seals or soft sealing elements.

0 m3/h
Leakage target

5.5 mm
Sealing contact width

30 deg
Tilt test still 0 leakage

50-55
Sealing surface hardness



Technical Notes

Metal-to-metal sealing avoids aging, swelling and detachment risks associated with resilient seals. The conical self-centering design supports repeatable closing and better sealing stability. The sealing surface is designed for marine salt and cargo vapor corrosion environments.

No Magnets, Lower Lifecycle Cost

The valve does not rely on magnetic control to remain stable.

No periodic magnet replacement

Avoid magnetic aging, weakening and inspection uncertainty.

Low maintenance demand

Basic inspection and normal care are usually enough.

Free commissioning and training

Support shipyards and crew during installation and handover.

Warranty and service policy

3-year warranty, lifetime free wearing parts, and preferred factory service terms.

Lifecycle Cost Message

When comparing P/V valves, the purchase price is only one part. Leakage, vibration damage, magnet replacement, crew time, downtime and class/inspection risk can be more important over the vessel lifecycle.

Range and Technical Data

Class certificate attached-sheet data with project customization capability.

Type	EM-50A	EM-65A	EM-80A	EM-100A	EM-125A	EM-150A	EM-200A	EM-250A	EM-300A
Nominal Diameter (mm)	50	65	80	100	125	150	200	250	300
Max. Vent Pipe Length (m)	<=291	<=291	<=291	<=291	<=291	<=291	<=44	<=5	<=5
Max. Ice Thickness (mm)	20	20	20	20	20	20	20	20	20
Pressure Valve Rated Flow (m3/h)	700	800	1250	2400	3750	5000	15600	20710	64200
Vacuum Valve Rated Flow (m3/h)	600	600	800	900	1500	1900	2700	6950	13800
Gas Freeing Cover (m3/h)	850	850	1150	1900	2900	3800	24000	42900	121000

Additional Class Certificate Parameters

Set Opening Pressure	Pressure Valve 13-21 kPa; Vacuum Valve -3.5 to -7 kPa
Rated Working Pressure	Pressure Valve 21 kPa; Vacuum Valve -7 kPa
Outlet Velocity	Pressure Valve >=30 m/s
Body Material	FCD400-15, SC450, SUS304, SUS316L
Seal Material	Graphite Gasket, Viton
Flame Screen	DN50-DN200: 40 mesh; DN250-DN300: 30 mesh; material 316L
MESG / Product Group	MESG >=0.65 mm; applying product group IIA & IIB

Customization

Pressure setting, material, nominal size and project-specific requirements can be customized within approved engineering limits.

Materials and Construction

Multiple material options for marine and cargo vapor environments.

FCD / WCB

Cost-effective body options for conventional marine applications.

FCD

Ductile iron option available for higher elongation requirements.

SUS304

Stainless option for selected corrosion requirements.

SUS316L

Higher corrosion resistance for more demanding environments.

Custom Size and Material Support

Nominal diameter, pressure setting and material configuration can be tailored according to vessel specification, cargo medium and project approval requirements.





Approvals and Standards

Designed and documented for class society and tanker safety requirements.

Type Approvals

CCS, DNV and BV type approval documents are available. ABS / RINA approvals can be supported according to project status and requirement.

Standards

Designed with reference to IMO MSC.1/Circ.677/Rev.1, SOLAS II-2 and ISO 15364:2021 related requirements.

Sealing Test

Leakage test target: 0 m3/h. Inclination test can be performed beyond typical class lab requirements.

Explosion Group

MESG >= 0.65 mm for IIA/IIB applications according to approval conditions.

Document Package for Customers

Technical datasheet, type approval certificates, operation manual, test video, installation/commissioning support and comparison file can be provided for project review.

Recommended Applications

For projects that require higher stability, tight sealing, low maintenance and class acceptance



Oil / Product Tankers

Frequent loading and unloading; high safety requirements.

Chemical Tankers

Medium complexity, material compatibility and sealing reliability matter.

Dual-fuel Vessels

New fuel tanks and venting systems may require reliable P/V protection.

FPSO / FSO / Offshore Tanks

Reliability, low maintenance and class acceptance are critical.

Qingdao Exsafe Valve Co., Ltd.

www.exsafevalve.com PV@EXSAFEVALVE.COM

BEYOND SAFETY

Qingdao Exsafe Valve Co., Ltd.

Beyond Safety

We provide marine High Velocity P/V Valves designed for stable operation, zero leakage performance and lower lifecycle cost.

Contact

Website: www.exsafevalve.com

Email: PV@EXSAFEVALVE.COM

Product: High Velocity Vent Valve / P/V Valve

Stable by Fluid Dynamics, not by Magnets!

No oscillation. No hammering. No magnets. Lower lifecycle cost.