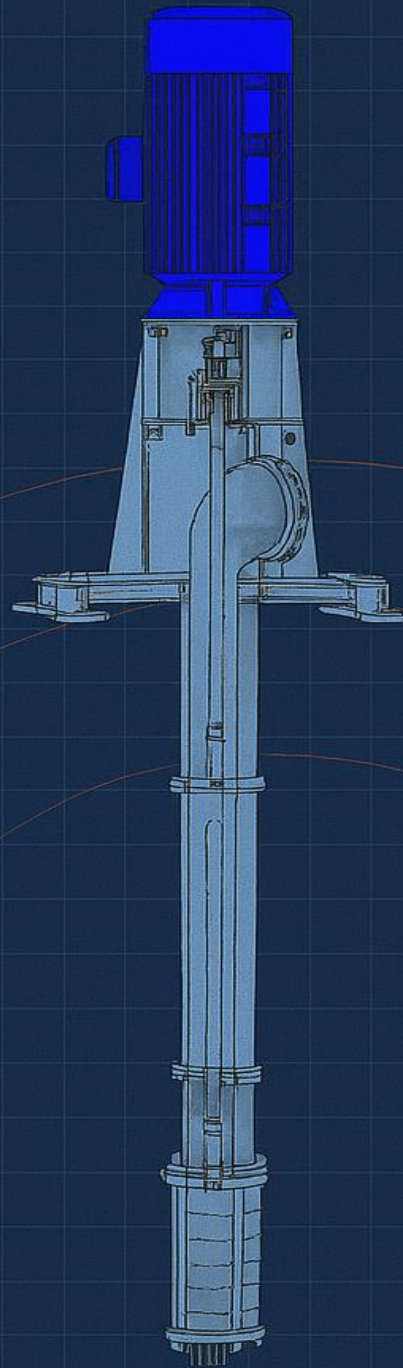




MAKE THE FLUID ENDLESS

API 610 SERIES

VS2



Model: CVM

1. Product Overview

CENTFOS-CVM API 610 VS2 pumps are vertical, barrel-mounted high-performance pumps engineered for continuous operation in demanding refinery, petrochemical, and offshore applications. Designed per API 610 (11th Edition), these pumps offer robust configurations with ATEX, CE, and NACE MR0175/0103 compliance.

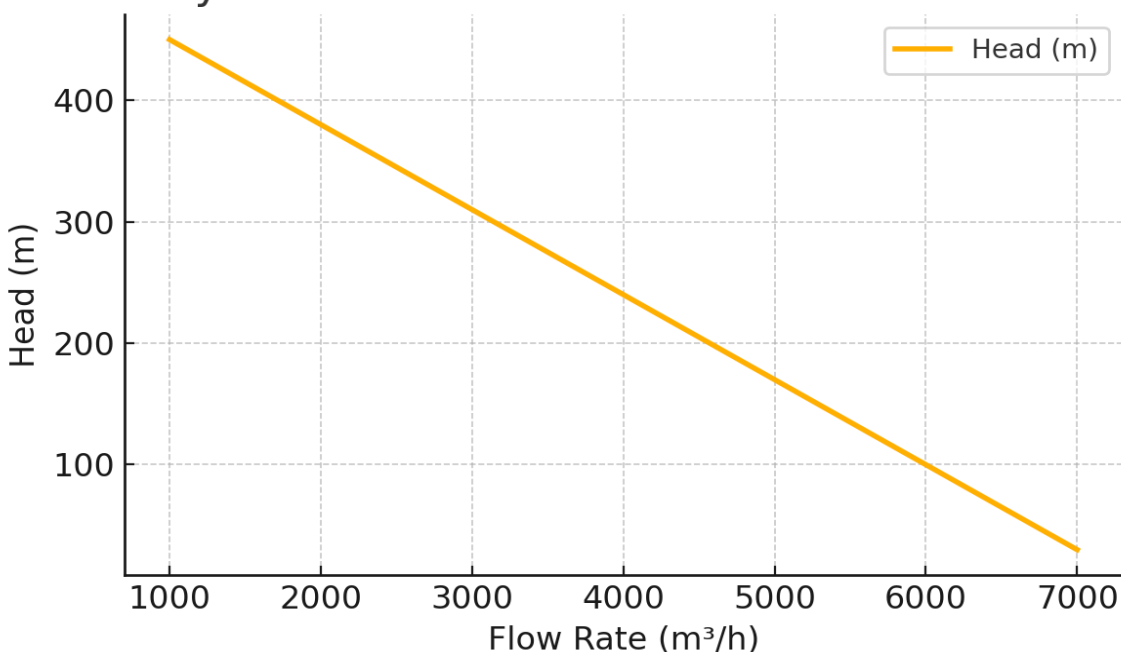
2. Key Advantages

- API 610 (11th Ed.) compliant VS2 barrel configuration.
- Multi-stage vertical suspended design with barrel-mounted suction can.
- High-efficiency hydraulics with enclosed impellers and diffuser bowls.
- Cartridge-type mechanical seals per API 682 (Plan 11, 21, 23, 52, 53A/B/C, 62, 65).
- Low NPSHr design for buried or tank-bottom services.
- Wide range of materials including Super Duplex and Nickel-based alloys.
- Condition monitoring for vibration, temperature, and pressure.
- Structural integrity verified by FEA and optimized by CFD.
- Standard pull-out rotor for ease of maintenance.
- Hydraulic Performance Envelope
- Hydraulic Performance Curve Example (6000 m³/h @ 400 m):

3. Hydraulic Performance Envelope

Parameter	Value
Capacity (Q)	Up to 6,000 m ³ /h
Differential Head (H)	Up to 1,500 m
Discharge Pressure Rating	Up to 100 bar
Speed	1,480 / 2,980 / 3,560 rpm (others on request)
Temperature Range	-50 °C to +220 °C
Number of Stages	1 to n (multi-stage)
NPSHr	Engineered per duty conditions

Hydraulic Performance Curve - CVM Model



4. Construction & Design Details

- Vertical barrel design with pull-out rotor construction.
- Discharge through column pipe to surface-mounted discharge head.
- API 610 compliant bearing spans with product or external lubrication.
- Replaceable wear rings on casing and impeller for performance restoration.
- Suction strainer tailored to process specifications.
- Axial thrust is supported by heavy-duty thrust bearings.
- Spacer-type coupling for maintenance without disturbing driver.
- Top-mounted thrust bearing housing with instrumentation provisions.
- Keyed impellers with dynamic balancing per ISO 21940 (G 2.5 or better).

5. Materials of Construction (Typical)

Component	Material
Barrel / Casing / Discharge Head	ASTM A216 WCB / A352 LCB / A351 CF8M / Duplex / Super Duplex
Bowls	ASTM A352 LCB / A351 CF8M / Duplex / Super Duplex
Impellers	A743 CA6NM / A351 CF8M / Duplex / Super Duplex / Ni alloys
Shaft	AISI 410 / 17-4 PH / Duplex / Super Duplex
Wear Rings / Throat Bush	410SS / 13Cr / 316SS / Alloy 625 / PEEK / Composite
Line Bearings	Carbon, Bronze, Graphite Filled PEEK, VESPEL®
Mechanical Seal	API 682 compliant, materials per service
Fasteners	A193 B7 / B8M, A194 2H / 8M, or project-specific

6. Sealing System (API 682)

- Single, dual (tandem or back-to-back) cartridge seals.
- Flushing plans: Plan 11, 21, 23, 32, 52, 53A/B/C, 62, 65.
- Bearing isolators or labyrinth seals for thrust bearing housing.
- Seal leakage detection and API Plan 75/76 for vapor service.

7. Bearings & Lubrication

- Product or externally flushed line bearings.
- Top thrust bearing: tilting pad or angular contact bearings.
- RTDs and vibration sensors as standard or optional.
- Shaft sleeves at bearing locations to prevent wear.

8. Instrumentation & Monitoring

- Bearing temperature sensors (RTD/PT100).
- Casing/discharge pressure gauges and transmitters.
- Vibration probes per ISO 10816 / API 610.
- Mechanical seal leakage detection with level switches.
- Speed, flow, and temp. transmitters as specified.

9. Testing

- Hydrostatic test per API 610 (1.5 x MAWP).
- Performance test at duty and verification points.
- NPSH and mechanical run test (min. 4 hours).
- Optional string test with full assembly.
- Non-destructive tests: PT/MT/UT/RG as specified.
- Material certificates per EN 10204 3.1 / 3.2.

10. Documentation & QA/QC

- API 610-compliant datasheets and GA drawings.
- Welding procedures (WPS/PQR), QAP, ITP, FAT protocols.
- Bill of Materials with traceability.
- Spare parts list (commissioning + 2 years).
- O&M manual with maintenance guidance.
- Vendor prints and Manufacturing Data Record (MDR).

11. Options & Accessories

- Canned (wet pit) or barrel configurations.
- Fabricated or cast baseplates with grout holes.
- Split lantern for easy maintenance.
- Motor options: TEFC, TEWAC, Ex-d, Ex-e, VFD-ready, API 541/546.
- Coatings: epoxy phenolic, ceramic-filled, glass flake for seawater.
- Cathodic protection systems for marine intakes.

12. Ordering Code / How to Specify

Specification	Details
Model	VS2
Configuration	Stages, shaft length, discharge size
Flow / Head	Rated Q and H
Fluid / SG / Viscosity	Including gas/solid content
Temperature / Pressure	Operating and design conditions
Materials Class	API S-1 to S-6 or project-specific
Seal Type & Plan	API 682 compliant
Instrumentation	Vibration, pressure, temp, leakage
Testing	Performance, NPSH, string, NDT
Compliance	API, ATEX, CE, NACE, ISO

13. Typical Dimensional Data (Indicative)

Dimension	Value
Nozzle Discharge Size	DN 80 to DN 400 (3" to 16")
Column Diameter	As per hydraulic selection
Shaft Diameter	Per power and torque requirement
Setting Length	Up to 30 m (segmented)
Baseplate / Discharge Head	As per API 610 or project specification

14. Allowable Nozzle Loads (per API 610)

Allowable nozzle loads comply with API 610 criteria for vertical pumps. Specific values will be provided on the certified general arrangement drawing following detailed selection.

15. Standards & Compliance

- API 610 (11th Edition) – Centrifugal Pumps for Petroleum, Petrochemical, and Natural Gas Industries.
- API 682 – Shaft Sealing Systems for Centrifugal and Rotary Pumps.
- ISO 13709 / ISO 5199 as applicable.
- NACE MR0175/0103 for sour service.
- ATEX 2014/34/EU compliance for hazardous areas.
- CE Marking (Machinery, PED).
- IEC / NEC standards for electrical classification.

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