Features	Self-priming Diesel Engine Pump		VCBS Electric Motor Series
			
GENERAL DESIGN	Horizontal, priming body, multiple internal moving parts, requires shaft sealing system (mechanical or tow-in)		Vertical cantilever VS5, cantilever shaft, without bushings or mechanical seals.
PRIMING AND STARTING SYSTEM (CRITICAL SAFETY)	Internal self-priming via air-liquid recirculation. High liquid dependency during start-up. Risk of priming failure.		Direct suction of the liquid, no priming or manual assistance required. No initial liquid required.
RISK OF DRY RUNNING (CRITICAL SAFETY)	Stop: severe damage to the mechanical seal and overheating.		Zero: Can operate in the absence of fluid without damaging components.
CRITICAL COMPONENTS AND RISK OF FAILURE (CRITICAL SAFETY)	Vulnerable seals, packings, bushings, and bearings; prone to leaks, wear, and intensive maintenance.		No critical components: cantilevered shaft and simplified design eliminates risk of leaks.
INSTALLATION COMPLEXITY	Requires foot valve or check valve to maintain priming.		Easy installation, no special priming valves required.
ADAPTABILITY AND OPERATING ENVIRONMENTS	Limited: liquids with solids, changes in density or temperature affect performance. Requires relatively stable conditions.		High: designed to operate with solids, aggressive chemicals, thermal variability, and extreme non-metallic mining conditions (salt flats, RILs, etc.).
PROTECTION AGAINST SUDDEN FAILURES (CRITICAL SAFETY)	Low: loss of priming or failures can stop operation and create hazards.		High: robust design, resistant to sudden operational failures.
MAINTENANCE REQUIRED (CRITICAL SAFETY)	Frequent: inspection of seals, valves, cleaning of gaskets, mechanical adjustments.		Low: fewer sensitive parts, less frequent and simpler maintenance.
OPERATOR SAFETY (CRITICAL SAFETY)	High risk of accidents: direct exposure to liquid jets when purging air, risk of burns, chemical injuries, and eye damage.		Maximum safety: no purging required, no dangerous handling, safe automatic operation.
EXPECTED SERVICE LIFE	Subject to proper management of the priming and sealing system.		Extended: robust design geared towards continuous operation in critical environments.
ENVIRONMENTAL AND ENERGY IMPACT	High industrial waste generation, more frequent maintenance, intensive fossil fuel consumption, and polluting emissions (CO_2, NO_x, particulate matter), with risks of leaks and fires.		Low maintenance, reduced waste generation, clean operation with no direct emissions, low noise, and the possibility of connecting to renewable sources, significantly reducing the carbon footprint.

In self-priming pumps, when priming fails, the operator must intervene manually by releasing the trapped air, often in an improvised manner using their hands.

This practice exposes the operator to unexpected jets of pressurized liquid that can cause burns, chemical injuries, or eye damage, especially if the liquid is aggressive or hot.

This risk is inherent in the design of self-priming pumps, which rely on an initial air purge to operate.