



Horizontal Pumping System

Motor-VFD Package Solution

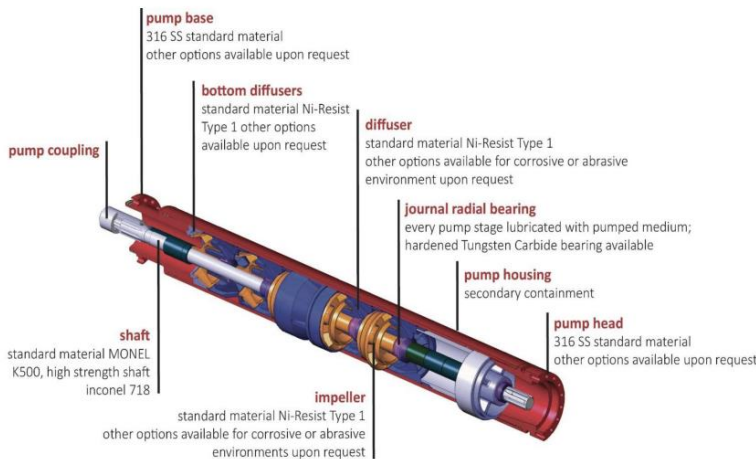
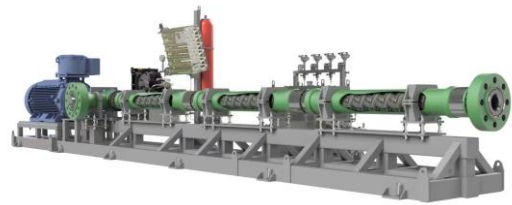
Voltage rating: 690V 50/60Hz

Horizontal Pumping System

Industry Power & Control for Artificial Lift Application



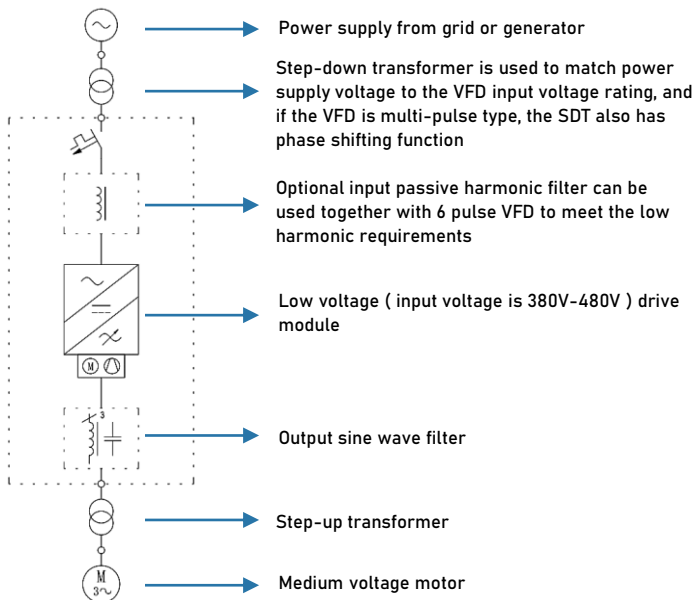
- + Horizontal Pumping System is a horizontally installed Multi-stage Centrifugal Pump widely used in Oil field and Mining industry.
- + Efficient alternatives to positive displacement (Triplex), split-case, and other surface pumping options: short lead time, fast deploy, skid mounted.
- + Delivering high performance with low maintenance.



Applications

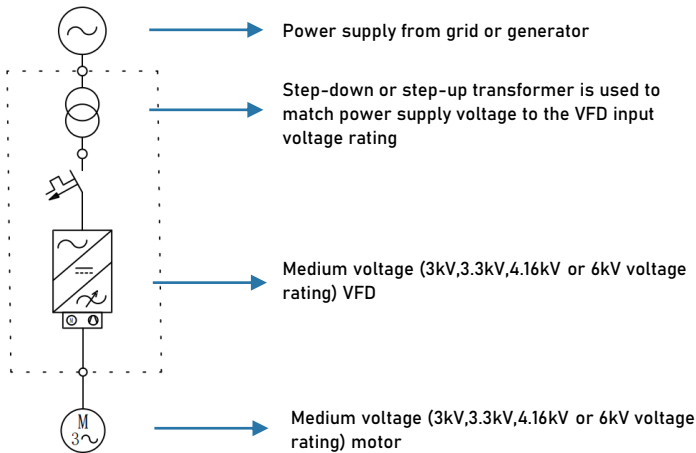
- + Oilfield water disposal and waterflood pressure maintenance
- + Crude oil transfer and pressure boosting
- + Mine dewatering
- + Power fluid pressurization for subsurface jet and piston pumps
- + Liquid propane transfer
- + Dense-phase liquid CO₂ pumping
- + Amine circulation systems

+ Existing power solutions for HPS



- + The same power solution as ESP used, the most popular solution in Artificial Lift.
- + Many options available such as 12 pulse, filtered 6 pulse, AFE, etc. Output sine wave filter is standard.
- + Multiple component suppliers, more footprint.
- + For high horse power requirement solution, the lead time is long and the cost is high.

380V to 480V low voltage VFD & Medium voltage Motor

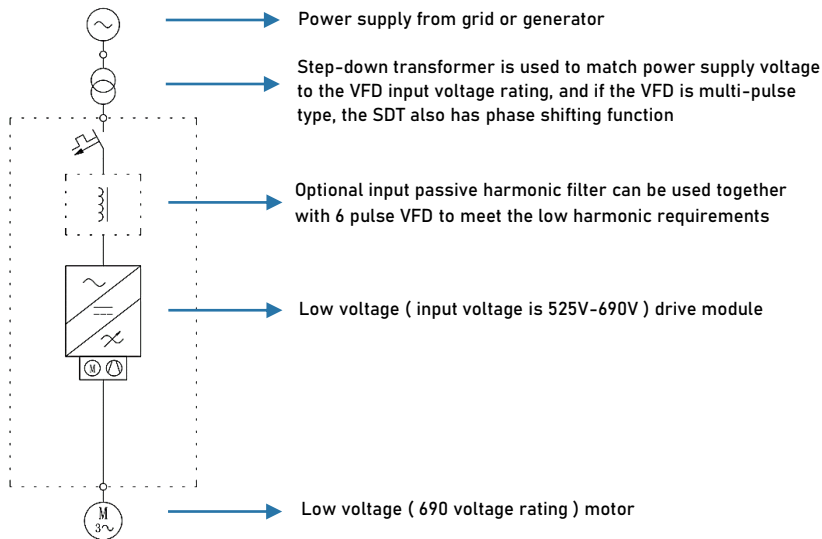


Medium voltage VFD & Medium voltage Motor



- + MV VFD integrated dry type isolating transformer need to be integrated in a skidded power house. More footprint.
- + Multiple vendors supply the devices for the total system. Long lead time and high cost.
- + Professional and certified engineers to operate and maintenance the VFD

ABB 690V Motor-VFD package solution



- + ABB motors can deliver full torque from zero when paired with ABB VFD with Direct Torque Control (DTC) technology.
- + The customers can depend on ABB motors and VFDs to keep their equipment running, day after day
- + Accurate motor and speed control while maintaining superior safety and reliability. No need to further test for certification of motor VFD combination
- + One brand that stands behind their Motor-VFD package.
- + Optimized performance. No need to oversize. Designed to eliminate overheating concerns
- + Short lead time and quick shipment.



ABB ACS880 drive module

Through-wall mounted drive module is designed for outdoor VFD and harsh environment installations

Input voltage is 525V to 690V ±10%, the power rating is up to 1200kW and output current is up to 1320A, 6/12 pulse solution

The most famous brand in the world, high quality, high reliability, global products for worldwide use.



VFD with ABB drive module built-in



ABB motor

- + ABB modular induction motors are built to withstand the most demanding process requirements and the toughest operating environments – hazardous or safe, cold or hot, dusty or humid, onshore or offshore.
- + Each component and each design detail of an ABB modular induction motor are engineered and manufactured to maximize motor performance and provide a uniquely low cost of ownership over a long and productive operating life.
- + Each ABB induction motor passes through a stringent program of tests at each stage of the production process
- + ABB offers a complete portfolio of services to ensure trouble-free operation and prolong the operating life of the motor. The portfolio covers the entire life cycle of the motor, from pre-purchase sales advice to spare parts and preventive maintenance.

Better together



Power matched



Optimized performance



Accurate motor control



One vendor

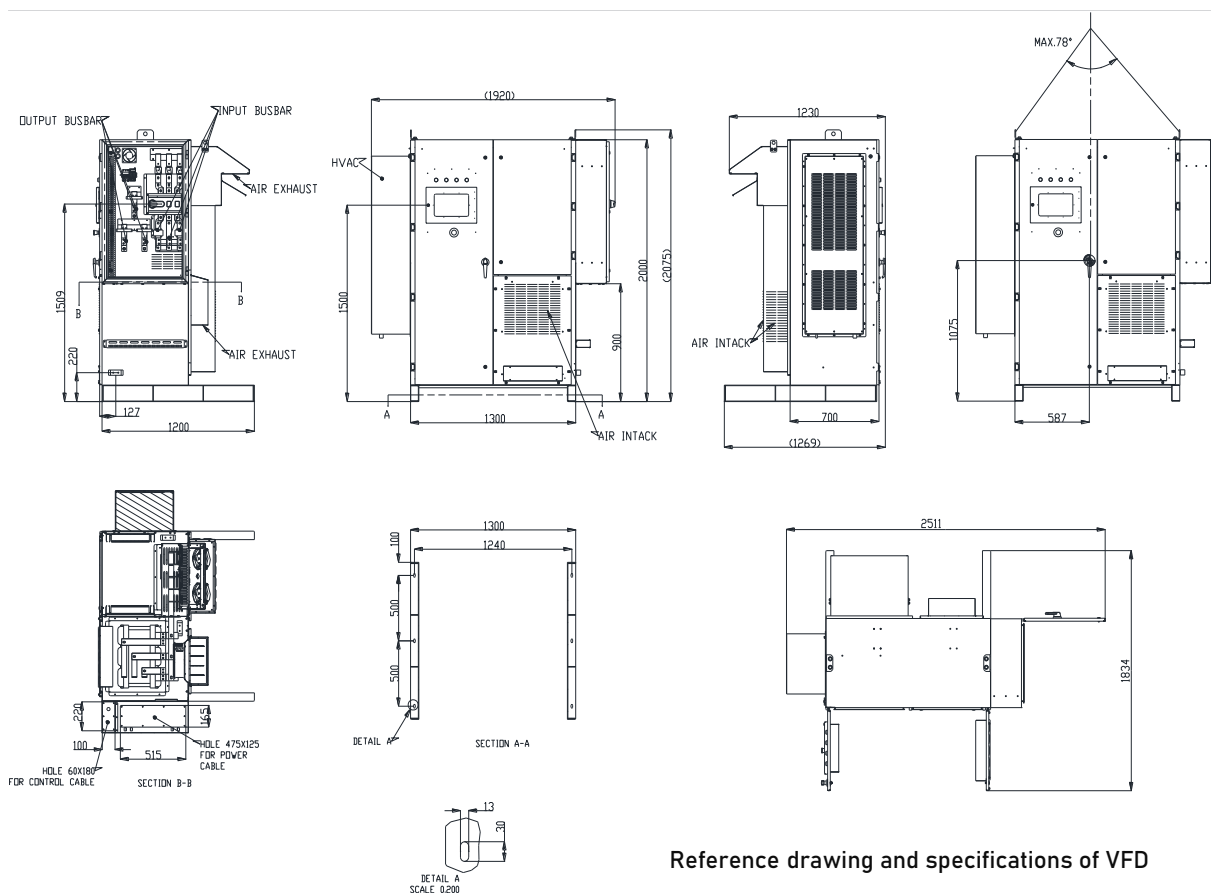


Quick ship motors and VSDs

	380V-480V VFD & Medium voltage motor	Medium voltage VFD & Medium voltage motor	690V Motor-VFD package solution
System power supply	Low voltage (380V to 480V) is from power grid and the voltage is matched with the VFD input rating by step-down transformer, or from generator directly.	Medium voltage is from power grid and the voltage is matched with the VFD input rating by step-down transformer, or from generator through step-up transformer to match the input rating of VFD	Low voltage (690V) is from power grid and the voltage is matched with the VFD input rating by step-down transformer, or from generator directly.
Motor	Customized designed motors	Customized designed motors	< 800HP, standard motors availability 800HP to 1500HP, customized designed
VFD	Outdoor installed or mounted in a mesh skid. NEMA3R/3/4/4X enclosure available. Standard solution in ESP. Sine wave filter and step-up transformer are configured.	Indoor installed in a control room or a container. Bigger size because of the built-in isolation transformer. Big air conditioning units are needed because of the high heat dissipation.	Outdoor installed or mounted in a mesh skid. NEMA3R/3/4/4X enclosure available. No need of sine wave filter and step-up transformer
Components in system	More components	Fewer components	Fewer components
Installation footprint	Outdoor installation ~ 110%	Container installation ~ 200%	Outdoor installation ~ 100%
Installation convenience	Easy to wire and install	Difficult to wire and install because of the armored cables and the system's bigger size	Easy to wire and install
Heat dissipation	~ 110% (higher output current based on the same power rating)	~130% (MV inverter and built-in isolating transformer)	~100% (lower output current based on the same power rating)
Key components vendors	One or two vendors	Multiple component vendors	One vendor
Commissioning and maintenance	A bit complicated, LV electrician serviceable	Complicated, professional and certificated MV engineers are necessary	Simple, LV electrician serviceable
Lead time	Short	Long	Short
Total solution cost	~120%	~140%	~100%
Reliability of solution	Low	High	High

⁽¹⁾ Based on the same power requirement and brand level

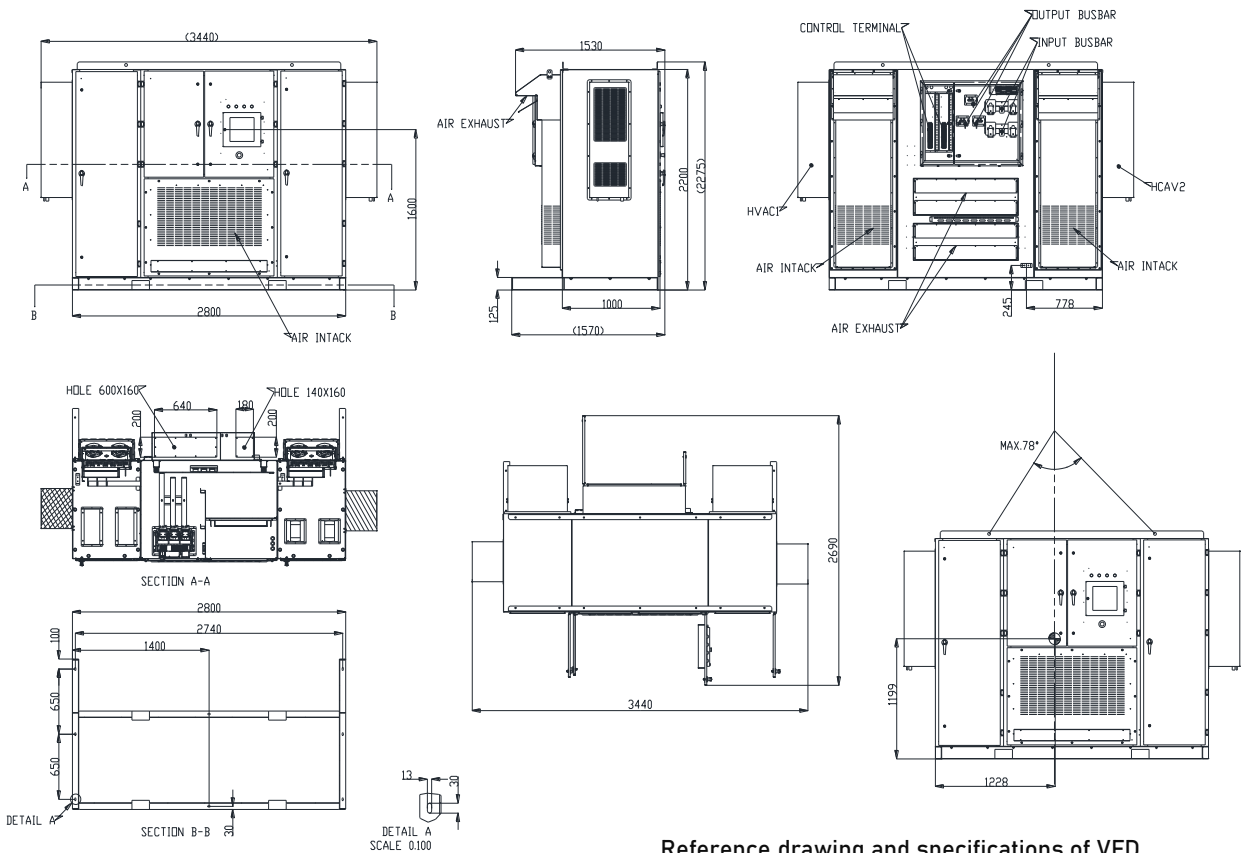




Reference drawing and specifications of VFD

Input voltage	3 phase 525 to 690V ±10%
Built-in drive module	ABB ACS880 drive module
Enclosure rating	IP66 (equivalent to NEMA 4)
Cooling method	Air-conditioning unit and cooling fans
Motor technology	IM or PMM
Motor control	Direct Torque Control (DTC)
Ambient temperature	-30°C to 55°C
Overload capacity	110% 1min/ 5min
Output voltage	The same as power supply
Output power rating	560kW, 630kW
Output current	571A, 630A
Certifications	ISO9001, ISO14001
Efficiency	>97% at full load
Power factor	0.98 across entire speed range
Altitude	0 to 1000m without derating
H ₂ S protection	Conformal-coated PCBs & bus bars
Enclosure material	Carbon steel and thickness is 2.5mm
Control program	Built-in HPS control program
Safety features	Emergency stop
	Electronic interlocks
	Separated power and control room

Specifications for high horsepower requirement 800HP-1500HP



Reference drawing and specifications of VFD

Input voltage	3 phase 525 to 690V $\pm 10\%$
Built-in drive module	ABB ACS880 drive module
Enclosure rating	IP66 (equivalent to NEMA 4)
Cooling method	Air-conditioning unit and cooling fans
Motor technology	IM or PMM
Motor control	Direct Torque Control (DTC)
Ambient temperature	-30°C to 55°C
Overload capacity	110% 1min/ 5min
Output voltage	The same as power supply
Output power rating	900kW, 1000kW, 1200kW
Output current	929A, 1051A, 1297A
Certifications	ISO9001, ISO14001
Efficiency	>97% at full load
Power factor	0.98 across entire speed range
Altitude	0 to 1000m without derating
H ₂ S protection	Conformal-coated PCBs & bus bars
Enclosure material	Carbon steel and thickness is 2.5mm
Control program	Built-in HPS control program
Safety features	Emergency stop
	Electronic interlocks
	Separated power and control room



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