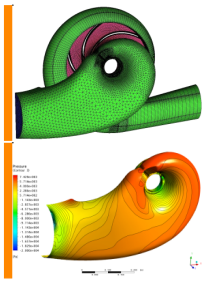
NEW GENERATION
High Efficiency & Energy-saving.



DESIGN TOOLS

State-of-the-art 3D design tools including *Computational Fluid Dynamics* (CFD) and *Finite Element Analysis* (FEA) are used and the results validated through models and prototype testing. This resulted in a new generation of energy-saving pumps with optimum design in improved efficiencies & hydraulic performances.

Reliability of operations of the **Quantum** horizontal split cases are ensured using advanced 3-D range and designing techniques, and its mechanical integrity further optimized with FEA. FEA allows splitting of targeted parts in small portions to be analyzed separately. The minimized bearing span and casing thickness have been optimized to the maximum allowable working pressure ensuring lower weight whilst delivering mechanical reliability and a longer life cycle at minimum cost.

< *Analysis and improvement to the flow passages; and the pressure distribution at the suction chamber.*

PATTERNS & CASTINGS

Small and medium size impellers are precision cast with wax pattern; and the larger scale impellers and casings are resin sand cast with metal (aluminium) or plastic pattern. All other parts of the pump are cast with metal patterns. Castings are assured of uniform wall thickness and smooth surface.

< *Aluminium pattern, ensuring consistencies and uniform wall thickness; and smooth surface.*

< *Close-up on the finishing of an assembled Quantum pump. There are no 'beautifying' treatment to the surface apart from heat treatment, a layer of anti-rust coat and the finishing paintwork.*

NANO PLASTIC STEEL ULTRA-SMOOTH COATING

Environmentally friendly ultra- smooth steel macromolecule coating is standard application to further smoothen surfaces of the internal casings. With the reduction of surface roughness, friction and adhesive force, the overall operating efficiency is vastly improved.

Quantum

Q T

Double Suction
Horizontal Split Case
Centrifugal Pump

General

The **'Quantum'** series features a line of superior performance double suction horizontal split case centrifugal pumps, of robust design to meet today's demands in the industrial, municipal, agriculture and commercial applications. The range is designed with the tightest technical specification in mind, so as to achieve the highest level of efficiency and suction performance for current and future process demands.

Incorporating advances in computer-aided technology, **Quantum** offers high efficiency performance, reliable & long life service resulting in energy-saving, less downtime & low maintenance cost.

^ *Quantum - Vertical mounted version*

Design Features

OPTIMUM DESIGN | With advances in computer software, 3-dimensional design and analytical tools - the *Computational Fluid Dynamics* (CFD) and *Finite Element Analysis* (FEA), **Quantum**'s design is fully optimized, that includes flow passages, velocity and pressure distribution at the suction chamber and impeller vane profile. The results of each design is further validated with modeling and prototype testing.

HIGH EFFICIENCY & ENERGY SAVING | In addition to optimizing the design with advances in software analysis and modeling, the finishing castings of the Quantum range is exceptional. This is apparent in the water passageway of the internal volute of the casings and impellers. Consistencies in achieving smooth finishes with the latest technology in casting and the production of patterns, has ensured high efficiency in pump performances and energy saving operations in the long run.

EASE IN MAINTENANCE & SERVICE | The mechanical design of *Quantum* allows for easy maintenance.

Applications

BUILDING SERVICES | General water transfer; chilled & condenser water circulation in air-conditioning systems and fire protection in office & apartment buildings, malls, hotels, hospitals, schools & institutions and airports.

DISTRICT COOLING | Heat exchanger, chilled & condenser water circulation.

INDUSTRIAL | General water transfer, circulation & dewatering of water in sugar mills, steel mills, paper & pulp manufacture, desalination, chemical & petrolchemical plants, fertiliser plants, mines, power generation plant and in other industrial processes.

UTILITIES | Water intake and municipal waterworks, handling raw, clear, polluted and waste water. Flood control and other auxiliary services.

^ *Performance testing of a Quantum horizontal split case.*

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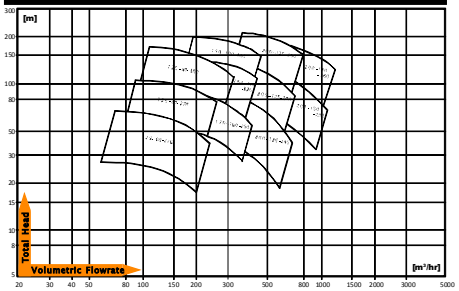
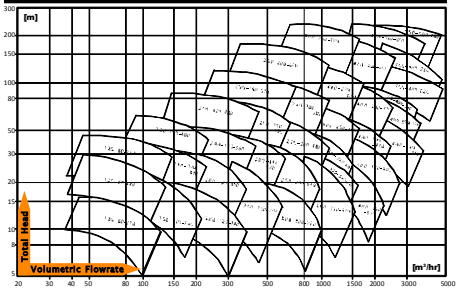
Hydraulic Performance

Performance tested in accordance to **ISO 9906 Class II**

50 Hz | 2-Pole | 2 900 rpm



50 Hz | 4-Pole | 1 450 rpm



General technical data	
Liquid handled	Clear water
Capacity	Maximum flowrates up to **7 000 litres/sec** or **25,000 m³/hr**
Discharge pressures	Maximum pressure head up to **28 bar** or **280 metres**
Working pressure	Working pressure range up to **150 bar**, depending on pump models, material of construction and temperature of fluid handled.
Temperature	Pumped medium up to **200°C**.
Operating speed	Nominal operating speed from **1 500 rpm** to **2 900 rpm** at **50Hz**.
Flange | Drilling standard	DIN 2533-1976; BS 4504-1989; ISO 7005.1-1992; ISO 7005.2-1988

Construction & Description

IMPELLER & ROTOR

The **Quantum** features a 'double-entry' impeller which design is optimised by *Computational Fluid Dynamics* (CFD) and *Finite Element Analysis* (FEA). It resulted in improved vane passage with excellent hydraulic characteristics; and exceptional efficiencies over a wide range of flowrates. The double-suction design minimise the axial thrust, hence prolonging the life of the bearings and the rotor assembly.

The impeller is statically and dynamically balanced in accordance to ISO1940.

SHAFT SLEEVES

Replaceable stainless steel shaft sleeves protect the shaft from wear and corrosion, and they extend through the entire length of the stuffing box.

SHAFT

Heavy-duty shaft to handle maximum loading. Shaft is short and rigid, ensuring minimum deflection and vibration-free operation, hence improve life of bearings and wear rings.

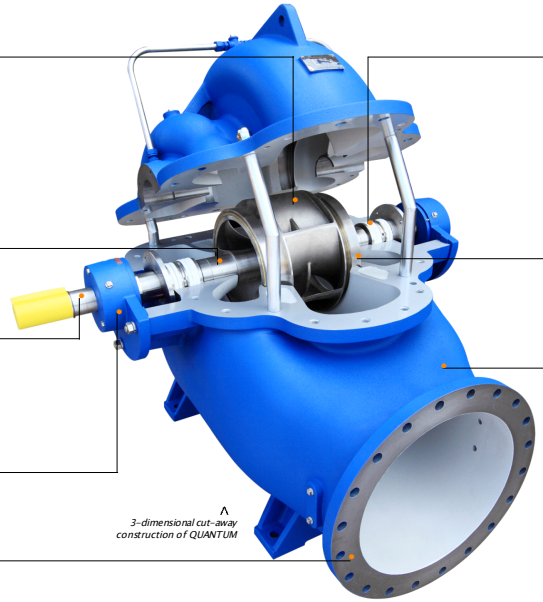
The shaft (and threads) has no contact with the pumped medium, hence ensuring a longer operating life and corrosion-free shaft.

BEARING UNITS

Grease-lubricated, ball radial and duplex thrust bearings are installed as standard. For larger pump models, sleeve bearings with oil lubrication could be adopted.

CONNECTING FLANGES

Flanges can be drilled to ISO, DIN, BS or ANSI standards.



3-dimensional cut-away construction of QUANTUM

SHAFT SEALS

Various configurations of shaft seal are available - mechanical seal types with a variety of material options; or packed gland configuration to specifically meet the application's requirements. 'Unbalanced' mechanical seals in accordance to DIN24960 are installed for pumps operating in <16bars pressure. For >16bars operating pressure condition, 'balanced' seals are installed. Cartridge-type seals are available as option.

The sealing chambers/casing are designed to allow seals or packings to be easily disassembled and assembled from the rotor assembly for repair & servicing without having to remove the upper casing.

WEAR RINGS

Fitted with replaceable wear rings. They protect the pump casing from wear and allow simple maintenance of proper running clearances to reduce maintenance costs and maintain operating efficiency.

UPPER & LOWER CASINGS

The upper casing is axially or horizontally split from the lower casing; and the suction & discharge flanges are in-lined and integrally cast onto the lower half of the casing. This design simplifies disassembly of pump by allowing upper half of casing to be easily removed for inspection, service and maintenance of the complete rotating hydraulic assembly without disturbance to the pipework and driver. The upper & lower casings, which are heavy duty designed for withstanding high working pressure, are self-aligning, hence easing the mounting of the casings together.

The double volute design casing reduces radial forces on the impeller, and consequently the load on the bearings. In addition, the internal of the casings are epoxy-coated as standard to provide a smooth water passage.

Materials of construction

Parts	Material code & specifications			
	Standard	Options		
Casing	Cast Iron GG25 *AS 1830/T260 | BS 1452Gr260*	Ductile cast iron *AS1831/400 | BS2789Gr500/7*	Cast stainless steel *AS2074/H6B | BS1504Gr316*	Duplex stainless steel *1.4460*
Impeller	Cast Iron GG25 *AS 1830/T260 | BS 1452Gr260*	Bronze *AS1565/836 | BS1400LG2*	Cast stainless steel *AS2074/H6B | BS1504Gr316*	Duplex stainless steel *1.4460*
Shaft	Carbon steel	Stainless steel 420 *AS 1444/420 | BS 970Gr.420 S37*	Super duplex stainless steel	-
Wear ring	Cast Iron GG25 *AS 1830/T260 | BS 1452Gr260*	Bronze *AS1565/836 | BS1400LG2*	Stainless steel 420 *AS 1444/420 | BS 970Gr.420 S37*	Hard-faced duplex stainless steel
Shaft sleeve	Stainless steel 420 *AS 1444/420 | BS 970Gr.420 S37*	Carbon steel	5140 alloy steel	Hard-faced duplex stainless steel
Bearing bracket & cap	Cast Iron GG25 *AS 1830/T260 | BS 1452Gr260*	Cast steel		
Seal housing & gland	Cast Iron GG25 *AS 1830/T260 | BS 1452Gr260*			
Shaft seal	Mechanical seals	Packed gland		

Remarks: For more material options, consult our MONOFLO Pumps distributors