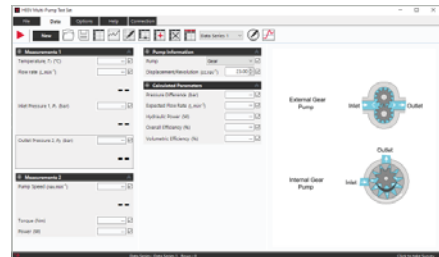


MULTI-PUMP TEST SET

VDAS[®] ONBOARD H85V

A versatile, self-contained mobile unit designed to investigate and demonstrate the performance characteristics of a range of different pump types, including positive displacement gear and piston pumps, rotodynamic centrifugal, axial and channel impeller pumps.



SCREENSHOT OF THE VDAS[®] SOFTWARE

PRESENTATION SUBJECT TO MANUFACTURER MODIFICATION FOR IMPROVED FUNCTIONALITY

KEY FEATURES

- Modular design allows for the quick changeover of pumps
- Includes TecQuipment's Versatile Data Acquisition System (VDAS[®] Onboard) featuring data acquisition
- Wide range of pump types available
- Inverter controlled AC motor
- Torque and speed measurement
- Suction and delivery throttle valves
- Postive displacement and rotodynamic pumps available

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DESCRIPTION

The unit consists of a water tank, pipework, suction and delivery throttle valves, AC dynamometer and quick-release couplings to support a wide range of pump types. VDAS® Onboard provides data acquisition including:

- Suction and delivery pressure
- Flow rate
- Dynamometer torque and speed

Detailed investigation of rotodynamic and positive displacement pumps may be performed with this multi-purpose yet hydraulically self-contained test bench. It requires a single-phase electrical supply and a source of water. The following pumps can be tested on this unit and are available as optional extras:

- Positive displacement gear pump (H85a)
- Positive displacement piston pump (H85b)
- Rotodynamic centrifugal pump (H85c)
- Rotodynamic axial pump (H85d)
- Positive displacement vane pump (H85e)
- Positive displacement lobe pump (H85f)
- Rotodynamic channel impeller (H85g)

The testing of such a wide range of pumps on a single test unit is made possible by the provision of quick-release hose and drive couplings, enabling changeover to be made easily and efficiently.

Torque measurement for the dynamometer is by load cell, whilst speed measurement uses a magnetic-type pick-up. Pump suction and delivery heads are monitored by pressure transducers and the flow rate in the circuit can be determined using the built-in flow meter.

The H85V test set features VDAS® Onboard for data acquisition.

STANDARD FEATURES

- Supplied with comprehensive user guide
- Five-year warranty
- Made in accordance with the latest European Union directives
- ISO9001 certified manufacturer

LEARNING OUTCOMES

- Understanding the performance of the seven different pump types:
 - Positive displacement gear pump
 - Positive displacement piston pump
 - Rotodynamic centrifugal pump
 - Rotodynamic axial pump
 - Positive displacement vane pump
 - Positive displacement lobe pump
 - Rotodynamic channel impeller pump
- Connecting pumps in a hydraulic circuit using quick-release couplings
- Creating characteristic curves for each pump type from experimental data
- Investigating, analysing and comparing the characteristics of the seven pump types

RECOMMENDED ANCILLARIES

- Gear Pump (H85a)
- Piston Pump (H85b)
- Centrifugal pump (H85c)
- Axial Rotodynamic Pump (H85d)
- Vane Pump (H85e)
- Lobe Pump (H85f)
- Channel Impeller (H85g)

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PUMPS

TecEquipment supplies seven optional pumps for use with the multi-pump test set:

Pumps can be simply and quickly changed thanks to the self-sealing, quick-release pipe and dynamometer couplings.

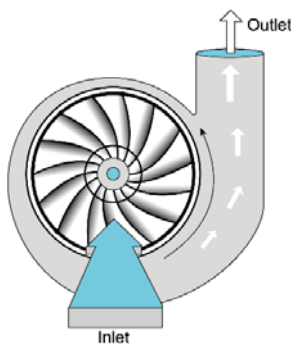
ROTODYNAMIC PUMPS

Three of the pumps are rotodynamic in which the flow through the pump is induced by the centrifugal forces from an impeller or rotor.

CENTRIFUGAL PUMP (H85C)



This is a type of rotodynamic pump in which the flow through the pump is induced by the centrifugal force imparted to the liquid by rotation of the impeller. The pump housing has an expanding volute that collects the discharged water from the impeller and guides it smoothly to the discharge port.

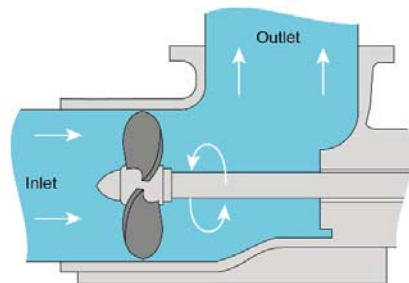


AXIAL ROTODYNAMIC PUMP (H85D)



Axial flow pumps have a motor-driven rotor that directs flow along a path parallel to the axis of the pump. The fluid thus travels in a relatively straight direction, from the inlet pipe, through the pump to the outlet pipe. Axial flow pumps are most often used as compressors in turbo-jet engines. Centrifugal pumps are also used for this purpose, but axial flow pumps are more efficient.

The axial flow pump, or AFP, is a common type of pump that essentially consists of a propeller (an axial impeller) in a pipe. The propeller can be driven directly by a sealed motor in the pipe or by electric motor or petrol/diesel engines mounted to the pipe from the outside, or by a right-angle drive shaft that pierces the pipe.



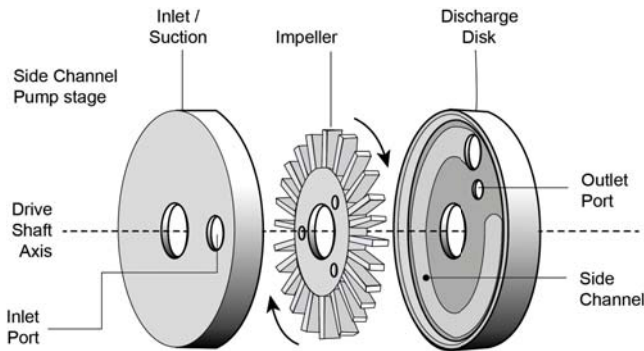
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CHANNEL IMPELLER (H856)



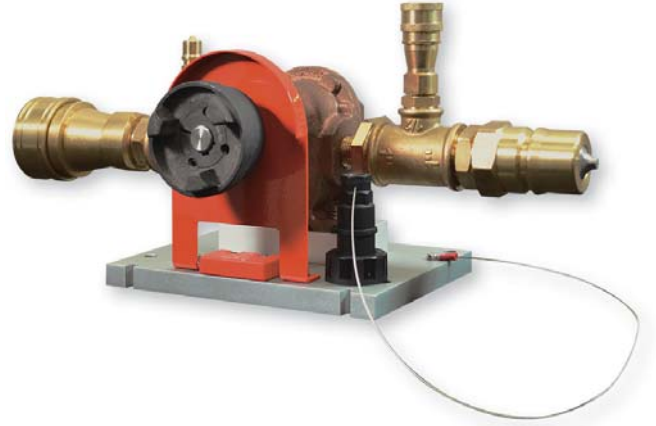
The channel impeller has similarities with the centrifugal pump but, rather than having a volute, there is a channel in the housing for the water to flow around. The inlet is then offset from the centre. This type of pump handles particles in the fluid flow better than some other types and are thus often used for waste water applications.



POSITIVE DISPLACEMENT PUMPS

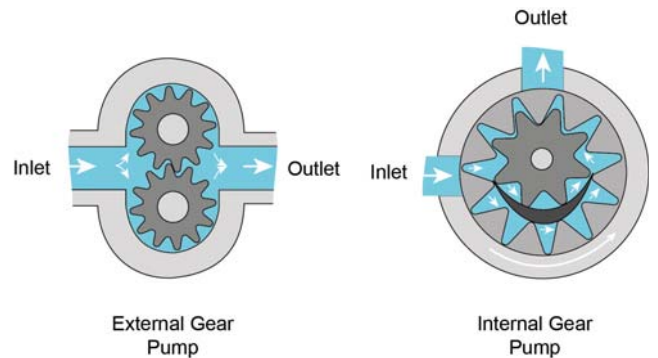
Positive displacement pumps have proportional flow with speed and are often dependent of discharge pressure. Back flow is generally minimised and in some cases eliminated.

GEAR PUMP (H85A)



Two gears are held in a housing, generally with one gear being driven. The fluid is trapped by the gear teeth and the housing and the gears rotate. The fluid is then discharged on the outlet. The engaged teeth of the gears create a seal, preventing leakage back to the inlet. Leakage can occur but this is less with more viscous fluids.

An internal gear pump differs by as much as the gears are of different sizes. The cavity between the gears is filled at the inlet and dispelled by the small gear at the outlet.



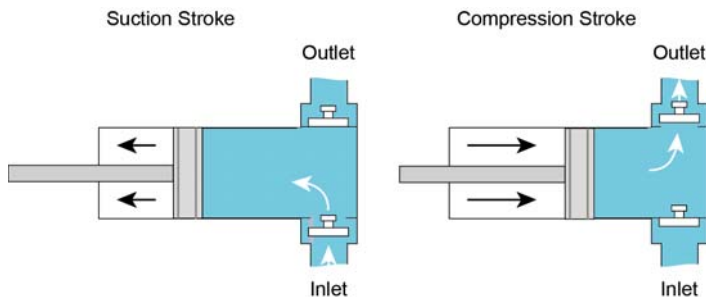
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PISTON PUMP (H85B)

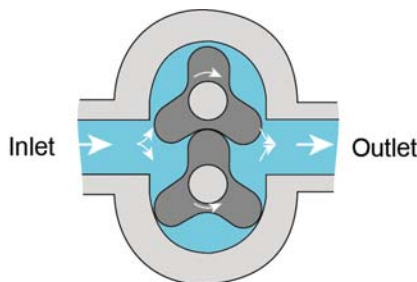


A reciprocating piston inside a cylinder sucks a fluid into the chamber in one stroke and discharges it in the other. Inlet and discharge valves open and close with the varying pressure changes inside the cylinder. As the piston lifts, a negative pressure is created, opening the inlet valve, drawing fluid in and closing the discharge valve. When the piston drops, the discharge valve opens, the inlet valve closes and the fluid is pushed out of the now open discharge valve.



LOBE PUMP (H85F)

The lobe pump is very similar to the gear pump, but lobes are used in place of gears. Each lobe is driven and they do not touch during operation. The wear is much less and as they don't touch, lubrication needs are eliminated. This lends them naturally to food and applications requiring high sanitary levels. They are, however, more expensive than a gear pump.

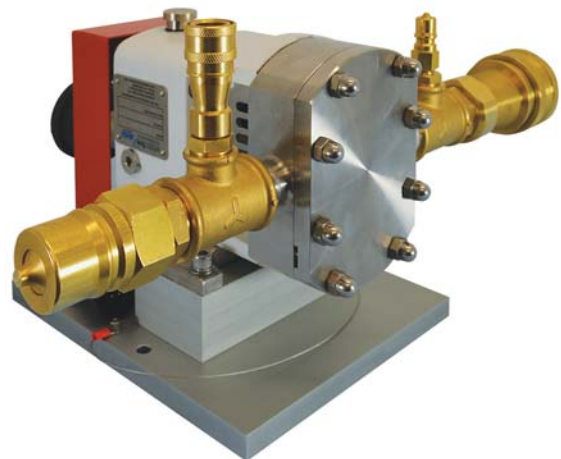
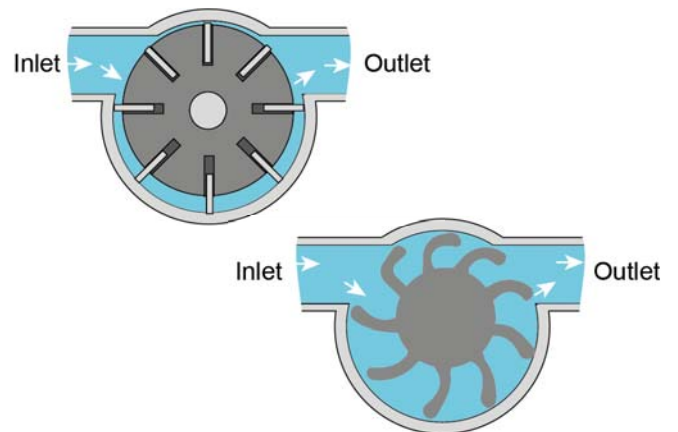


VANE PUMP (H85E)



A series of vanes, flexible by design, rotate on an off-centre rotor. The vanes seal against one side of the housing and leave a void to transfer the fluid. Commonly, the vanes are spring-loaded or utilise a flexible material.

Both types of vane pump are positive displacement pumps, but some flexible types have some performance similarities to rotodynamic pumps.



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ESSENTIAL SERVICES

ELECTRICAL SUPPLY (SPECIFY ON ORDER):

- Single-phase, 220-240 VAC, 50/60 Hz, 20A

OR

- Two-phase, 220-240 VAC, 50/60 Hz, 20A

FLOOR SPACE NEEDED:

- Solid, level floor
- Allow at least 3 m x 2 m for safe and effective use of the equipment

SPECIFICATIONS

TecQuipment is committed to a programme of continuous improvement; hence we reserve the right to alter the design and product specification without prior notice.

NETT DIMENSIONS AND WEIGHT:

1075 mm (width), 1750mm (height), 730mm (depth) and 149 kg (without water in the reservoir)

OPERATING CONDITIONS

OPERATING ENVIRONMENT:

Laboratory

STORAGE TEMPERATURE RANGE:

-25°C to +55°C (when packed for transport)

OPERATING TEMPERATURE RANGE:

+5°C to +40°C

OPERATING RELATIVE HUMIDITY RANGE:

30% to 95% (non-condensing)

PUMP SPECIFICATIONS

PUMP	DIMENSIONS				CC/REV	NOMINAL MAXIMUM RPM	ROTATION DIRECTION	NOMINAL MAXIMUM PRESSURE (BAR)
	LENGTH (MM)	HEIGHT (MM)	WIDTH (MM)	MASS (KG)				
GEAR (H85A)	245	190	450	8	23.0	1725	CW	5
PISTON (H85B)	240	350	460	11	12.90	1040	CW	5
CENTRIFUGAL (H85C)	360	400	200	9	-	3600	CCW	2.1
AXIAL ROTODYNAMIC (H85D)	380	400	200	8	-	9000 (geared 2.5:1)	CW	0.55
VANE (H85E)	200	220	480	7	54.66	1500	CCW	2.6
LOBE (H85F)	320	230	460	18	46	1400	CCW	5
CHANNEL IMPELLER (H85G)	340	340	300	10	-	1400	CW	1.3

