SMVT

Surface Mount Vertical Turbine from Goulds Pumps

Introduction

ITT Goulds Pumps model SMVT is a surface mounted, multi-stage, vertical turbine pump. While the **small footprint and low profile** of this pump make it ideal for limited space environments and packaging, the SMVT's **high efficiency** performance and **heavy duty** turbine pump design make it a great solution for numerous additional applications. The SMVT has been strategically engineered to leverage Gould's Pumps high-quality stock turbine components and boasts **standard lead times that are unmatched** by competing technologies. Major enhancements to an already technologically industry-leading design reflect ITT Goulds Pumps commitment to driving innovation in the pump industry.

* Pump packaging not available through Texas Turbine Operations.

Commercial Applications:

Booster Units
High Rise Building Water
HVAC

Municipal Applications:

Package Pump Stations
Booster Stations
Water Treatment

Irrigation Applications:

Turf Irrigation
Golf Courses
Stadiums
Greenhouses/ Nurseries
Sprinkler Systems

Engineered for life

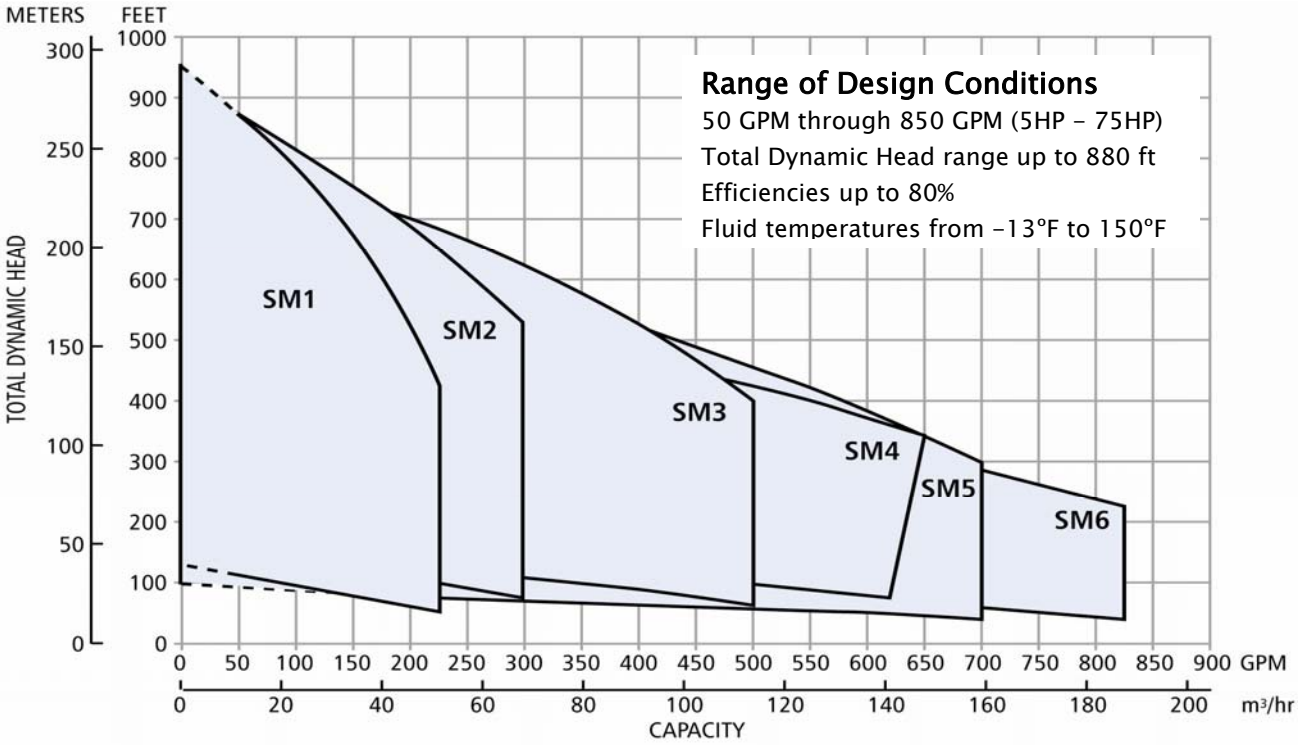
Recent SMVT Enhancements

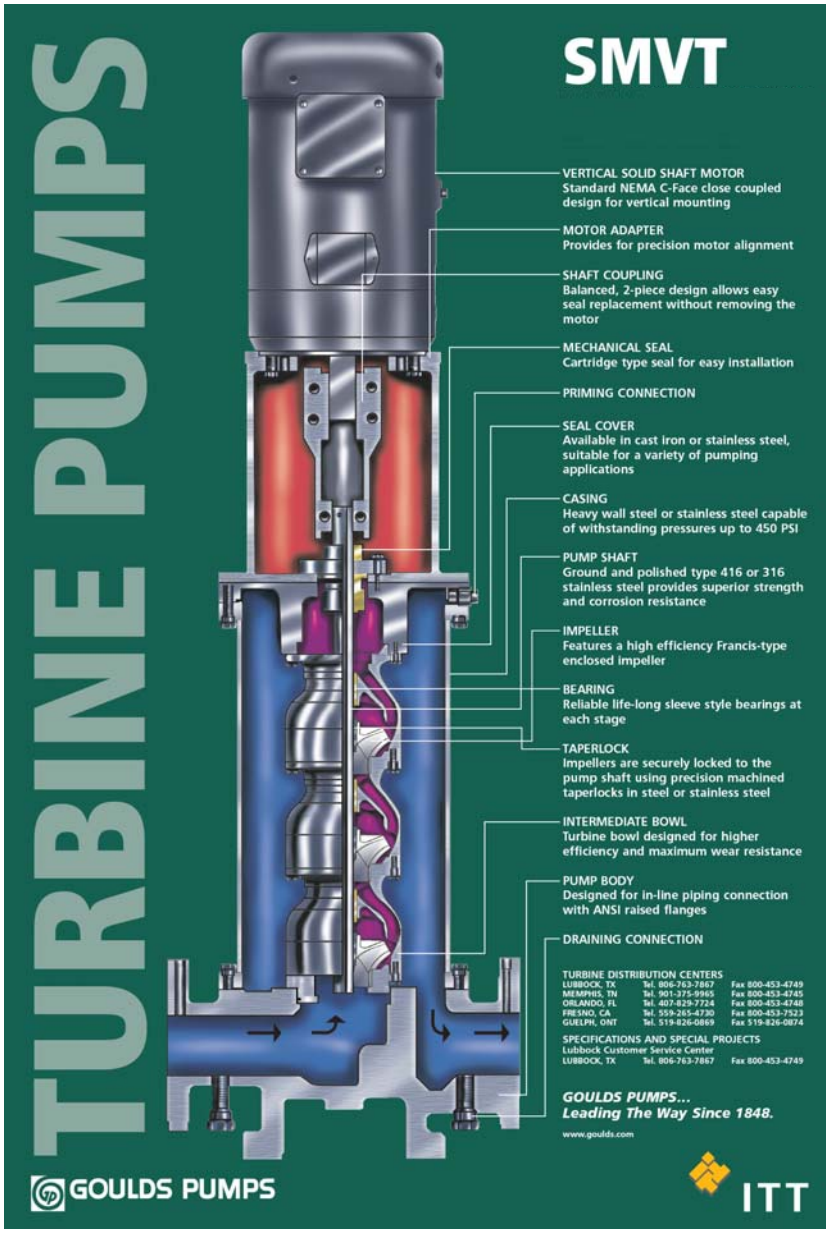
a) **Increased model robustness** through construction design modifications.
   - Heavy duty cast iron, fabricated steel, & stainless steel major components.
   - Slip-fit suction cover minimizes the impact of tensile stress on the bowl units. This feature **maximizes the service life** of the pump, especially those used in **applications with frequent on/off cycles**.

b) Model offered as a pre-engineered product with construction options.
   - Leverages high-quality stock turbine components.
   - New pump **lead times that are unmatched** by competing technologies.
   - Complete replacement bowl assemblies, available at time of purchase, and readily available aftermarket repair parts **minimize user downtime**.

c) Flanged redesign provides improvements to **ease of installation & package-ability**.
   - New flanged design is easier to assemble than previous threaded design. New design allows unit to be **assembled and disassembled using a standard wrench**.
   - New casing is similar to TTO standard flanged column pipe.
   - Bolted-flange assembly allows for **easy alignment of the motor support windows**.

d) Serviceability of design is greatly improved.
   - Top bowl & motor stand fasten independently to the seal flange in order to provide **maintenance and service flexibility**.
   - New flanged casing makes it possible for unit to be serviced in the field **without disturbing system piping arrangement**.
   - New design utilizes standard o-ring grooves & seals instead of compression seals. New static joint **minimizes the risk of seal damage when servicing** and withstands water pressures up to 450 psi.
   - Balanced, 2-piece shaft coupling allows for **replacement of mechanical cartridge-type seal without removing motor**.





Like all ITT Goulds Pumps products, the SMVT is heavy duty for longer service life.

Construction Overview

The redesign of this unit includes enhanced impeller metallurgy as standard, **investment cast stainless steel** suitable for potable water applications, and optional stainless steel casing. Cast iron bowls are glass-lined for **maximum efficiency and wear protection**. The suction and discharge connections are ANSI standard 3 inch 125# or 250# and 4 inch 125# or 250# flange type and are designed for **in-line piping**. Pumps are available with standard ODP or TEFC motors. Shaft coupling is precision balanced for **vibration-free operation**. The SMVT comes equipped with a generously sized thrust bearing to carry the **maximum hydraulic thrust loads** under all operating conditions.

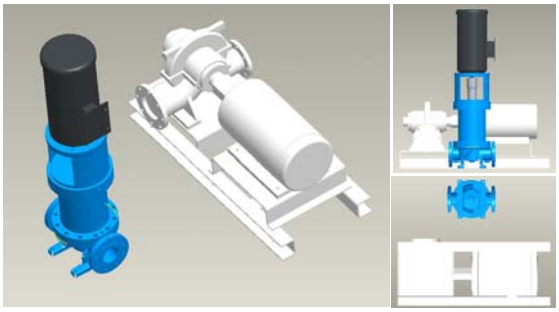
Component Description	Material	ASTM Spec.
Motor Support	Cast Iron	A48 Class 30
Shaft Coupling	Cast Iron	A48 Class 30
Mechanical Seal	Type 316SS, Carbon Silicon Carbide	
Seal Cover	Cast Iron	A48 Class 30
Casing	Steel or Type 316SS	A53 Grade A or A312 S31600
Casing and Suction O-ring	Nitrile	D2000 2BG715B14
Pump Shaft	Type 416SS	A582 S41600
Intermediate Bowl	Cast Iron	A48 Class 30
Bowl Bearing	Bronze	B854 C90300
Impeller	Type 316SS	A744 CF8M
Taperlock	Type 316SS	A276 S31600
Suction Cover	Cast Iron	A48 Class 30
Pump Body	Cast Iron	A48 Class 30
Hex Head Capscrew	Steel	SAE J429 Gr. 8
Socket Head Capscrew	Steel	SAE J429 Gr. 8
Washer	Steel	A108 G10180
Pipe Plug	Malleable Iron	A197

Lifecycle Cost Analysis:

SMVT vs. Horizontal Split Case (HSC).

Design Conditions		
Flow (ft)	**TDH (ft)**	**Specific Gravity –Sp.Gr-**
400	175	1

Assumptions			
Operating Time (hrs/yr)	**Energy Cost ($/kWh)**	**Cost of Commercial Space ($/sqft)**	**Millwright Labor Rate ($/hr)**
2080	$.10	$120	$100



Area of Investment		Formula (if applicable)	Competitor Product HSC	ITT Goulds SMVT	Dollars Saved with SMVT
Purchase Cost			$5,060	$3,560	**$5,060**
Annual Usage Cost	**Pump Efficiency (%)**		58.6%	78.1%	
	Brake Horse Power (BHP)	Flow x TDH x Sp.Gr. / 3960 x Efficiency	30.17	22.63	
	Motor Efficiency (%)		91.7%	91.0%	
	Overall Efficiency (%)	Pump Eff. x Motor Eff.	53.74%	71.07%	
	Electric Power (kW)	Flow x TDH x Sp.Gr. X .746 / 3960 x Efficiency	24.54	18.55	
	Annual Energy Usage Cost ($/year)	kW x hr/year x $/kWh	$5,104.32	$3,859.34	**$1,244.99**
Cost of Space	**Space Required (sqft)**		9.87	1.65	
	Investment Required (hrs)	$/sqft x space required	$1,184.17	$197.71	**$986.46**
Align motor, coupling, and pump shaft.	**Millwright Hours Required (hrs)**		4	0	
	Investment Required (hrs)	$/hr x hours required	$400	$0	**$400**
Total Dollars Saved in Year 1					**$4,131.44**
Dollars Saved Annually – Year 2 and Beyond					**$1,244.99**
Total Dollars Saved After 15 Years					**$21,561.25**

* Actual values may vary depending on location and application.

Benefits not monetized:

New SMVT lead times are significantly better than HSC.

Lifecycle Cost Analysis:

SMVT vs. Vertical In Can Turbine (VIC).

Area of Investment		Formula (if applicable)	Competitor Product VIC	ITT Goulds SMVT	Dollars Saved with SMVT
Purchase Cost			$15,140	$7,215	**$7,925**
Annual Usage Cost	**Pump Efficiency (%)**		78.5%	79.5%	
	Brake Horse Power (BHP)	Flow x TDH x Sp.Gr. / 3960 x Efficiency	69.48	68.61	
	Motor Efficiency (%)		91.0%	93.0%	
	Overall Efficiency (%)	Pump Eff. x Motor Eff.	71.44%	73.94%	
	Electric Power (kW)	Flow x TDH x Sp.Gr. X .746 / 3960 x Efficiency	56.96	55.01	
	Annual Energy Usage Cost ($/year)	kW x hr/year x $/kWh	$11,848.13	$11,447.50	**$400.63**
Investment Required to Bury VIC Casing in the Ground.			$5,000	$0	**$5,000**
Total Dollars Saved in Year 1					**$13,325.63**
Dollars Saved Annually – Year 2 and Beyond					**$400.63**
Total Dollars Saved After 15 Years					**$18,934.40**

* Actual values may vary depending on location and application.

Design Conditions		
Flow (ft)	**TDH (ft)**	**Specific Gravity –Sp.Gr-**
400	540	1

Assumptions	
Operating Time (hrs/yr)	**Energy Cost ($/kWh)**
2080	$.10

Benefits not monetized:

If VIC casing is not buried, unit height is an inconvenience & a safety hazard when servicing or replacing the motor.

ITT

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