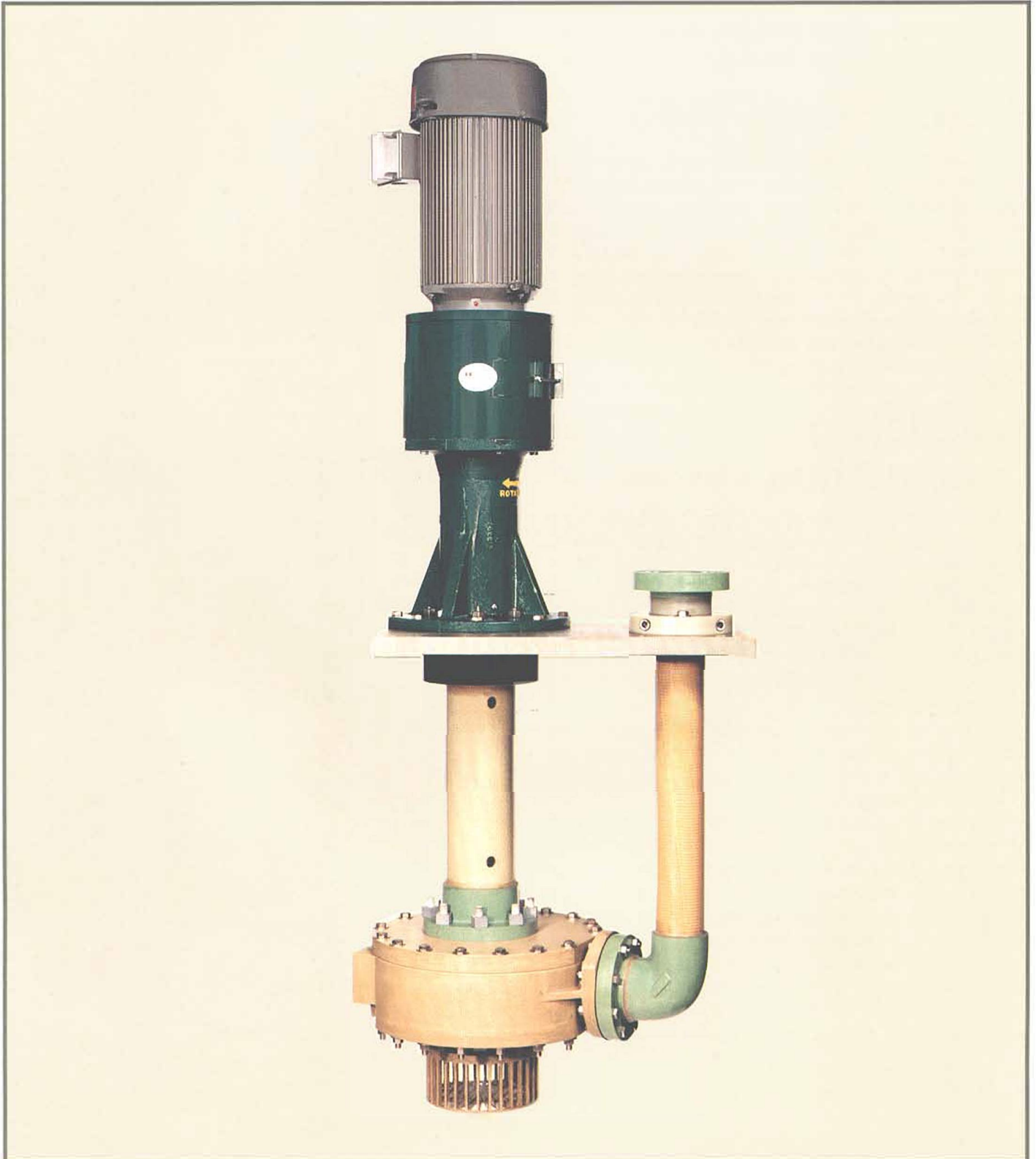


CECO Fybroc

BULLETIN 75B1

SERIES 7500 CANTILEVER PUMPS

FIBERGLASS CONSTRUCTION
FOR CORROSIVE
APPLICATIONS



Fybroc – world leader in corrosion-resistant fiberglass pumps

Fybroc, the world's first manufacturer of fiberglass reinforced centrifugal pumps leads the way with innovative design of the industry's most technically advanced pumps for handling corrosive and other difficult liquids. Each Fybroc product line is the culmination of years of experience in producing the highest quality corrosion resistant pumps available.

Fybroc Series 7500

The Fybroc Series 7500 cantilever pump is designed to handle the most severe sump pump applications where supply of external flush water is either impractical or undesirable. The cantilever design locates both the radial and thrust bearings above the pumpage to provide a very reliable pump for handling corrosive and/or abrasive liquids. The Series 7500 is the ideal choice for pumping tough liquids like chemical and plating wastes, pickling liquors or electrolytes, salt water or brine, and hundreds of other difficult sump services.

Materials of Construction

Fybroc offers a number of specialized materials, each developed to solve specific corrosive and/or abrasive pump problems. Fybroc's standard vinyl ester resin, VR-1, handles the vast majority of corrosive applications and offers broad corrosion resistance to most acids, caustics, bleaches, sea water, brine, and other liquids. For difficult organic applications Fybroc's EY-2 epoxy resin offers outstanding solvent resistance and is available in a wide range of pump sizes.

Fybroc also offers abrasion-resistant materials for handling liquids containing solids. VR-1A, which can handle highly abrasive solids such as fly ash, diatomaceous earth or titanium dioxide.

The pump shaft and exposed bolting are furnished in materials selected for each specific application. Typical materials are 316 stainless steel, alloy-20, titanium, Hastelloy C or B. The 7500 Series can also be furnished with a stainless steel shaft wrapped in fiberglass to provide a lower cost alternative when high alloy shafting is required. Refer to Page 6 for details.

For further information on corrosion resistance to specific chemicals, refer to Bulletin MS-101, Chemical Resistance Guide, or contact your local Fybroc distributor.



Fybroc Series 7500 Cantilever Pump installation



Impellers shown in EY-1, VR-1A, and VR-1 materials

Series 7500 – designed for exceptional strength and rigidity

The design of the shaft, column, support pedestal, and casing are critical to the success of a cantilever pump. The Series 7500 has been designed with an extra emphasis on each of these key areas to ensure extended trouble-free operation.

Large diameter column and shaft

Fybroc utilizes a large diameter fiberglass column, due to its high moment of inertia, to stiffen the entire pump assembly and reduce pump and column deflection. The 7500 Series is also furnished with a large diameter shaft to ensure minimum deflection. This combination of column and shaft design permits the use of reduced clearance at the cover to minimize efficiency-robbing leakage.

Heavy-duty bearing pedestal

The 7500 Series cast iron bearing pedestal supports the shaft and bearing with exceptional rigidity provided by generously-sized gussets. The epoxy-coated pedestal allows for simple external impeller adjustment. Radial and thrust bearings are both furnished with grease fill and vent plugs.

Dual volute casing

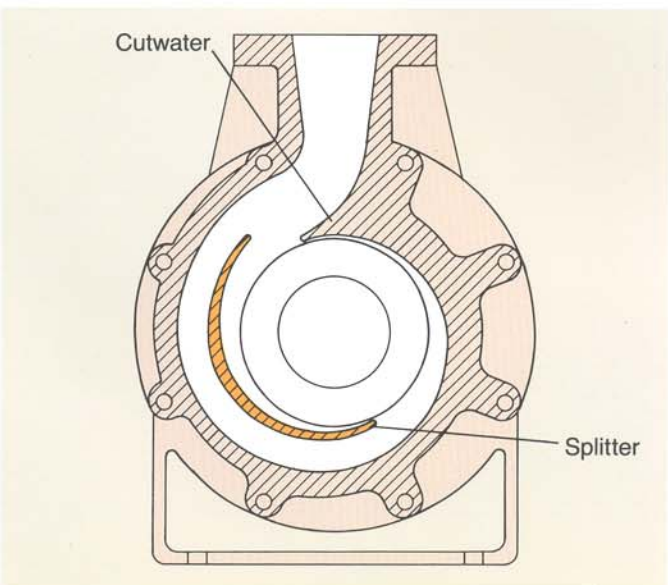
Another key element in the design of Fybroc's superior cantilever pump is the use of dual volute casings to further reduce shaft deflection which results from radial thrust. This important feature is standard design on ten of Fybroc's larger pump sizes and yields significant reductions in radial thrust. Dual volute casings are utilized on all of the following size pumps: 3x4x8, 1½x3x10, 2x3x10, 3x4x10, 4x4x10, 2x3x13, 3x4x13, 4x6x13, 6x8x13, and 8x10x15.



Series 7500 shaft shown with bearing housing, upper and lower bearings, and impeller



External impeller adjustment is accomplished with bearing housing jack screws

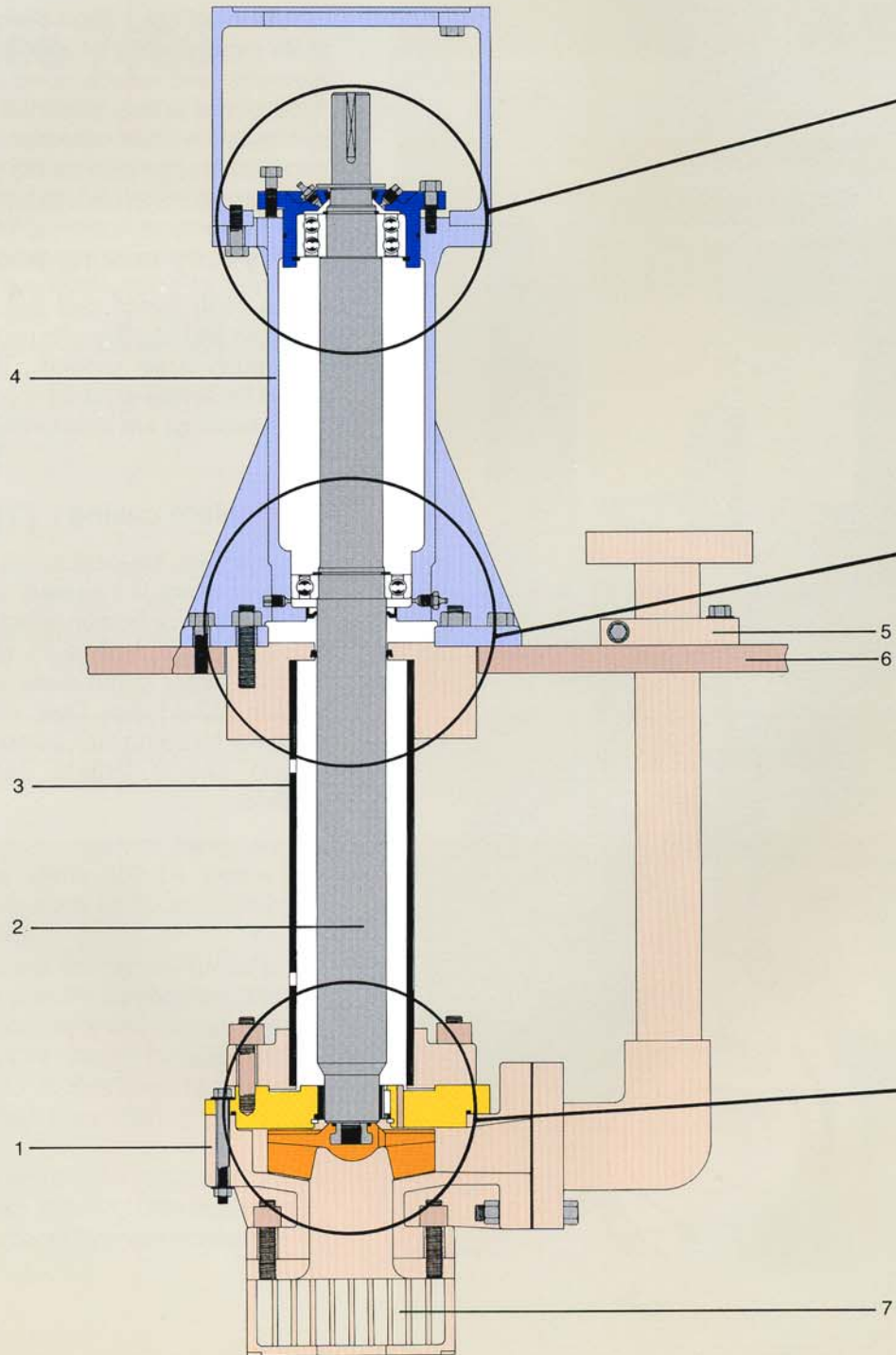


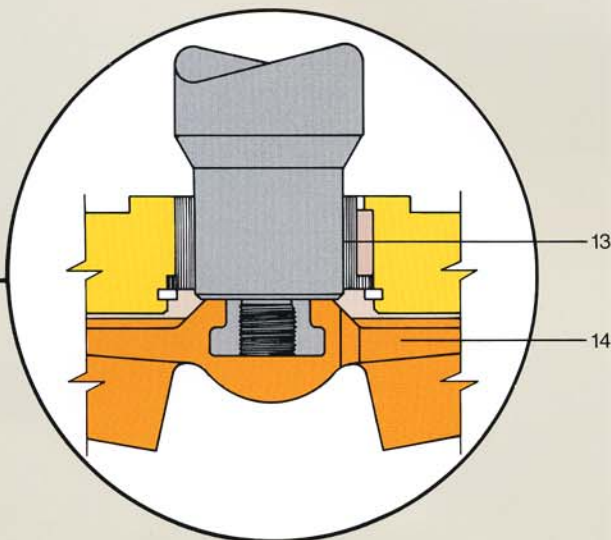
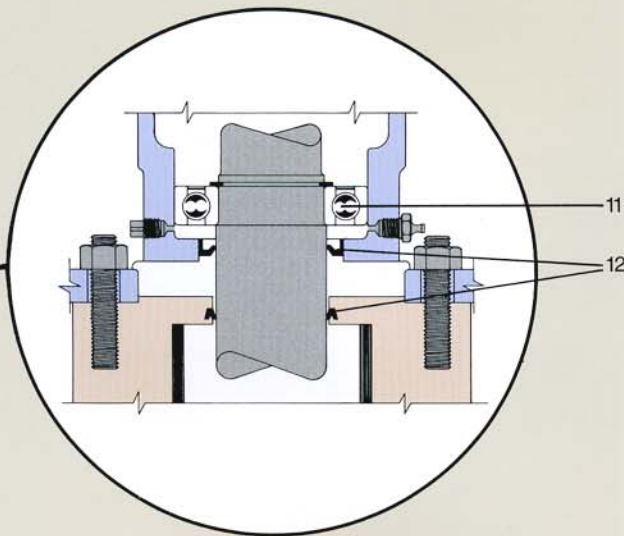
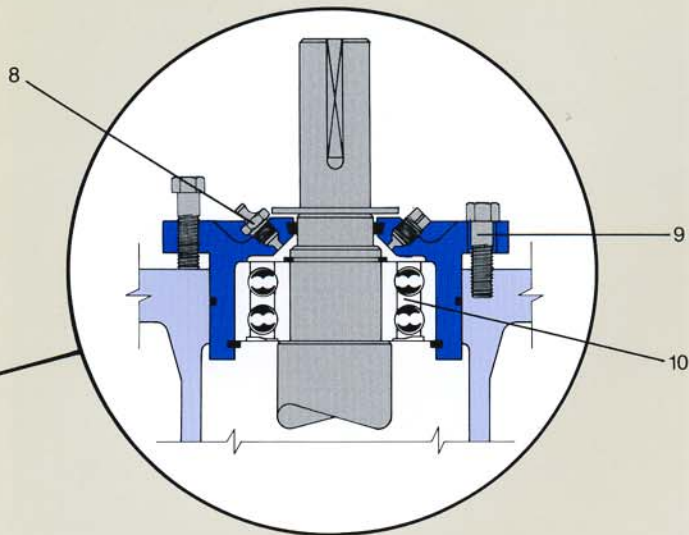
Dual volute casing reduces radial thrust and, therefore, shaft and column deflection

Design features of the Series 7500 cantilever pump

The Fybroc Series 7500 cantilever pump has been designed to yield exceptional structural integrity, excellent corrosion resistance, and dependable service in the most difficult chemical or waste sump environments. The

unique features described on these pages provide for maximum operating life when bearing flush water is not available.





1. FIBERGLASS REINFORCED CONSTRUCTION of all wetted parts, except shaft and pressure bolting, in either vinyl ester or epoxy resin, provides outstanding corrosion resistance for a wide range of difficult liquids.

2. PRECISION-GROUND SHAFT and metal bolting are selected to suit specific applications and are typically 316 stainless steel, alloy 20, titanium or Hastelloy. A fiberglass-wrapped shaft is also available; see Page 6.

3. LARGE DIAMETER COLUMN and shaft design minimize deflection. Column relief holes prevent liquid from reaching the vapor seal.

4. HEAVY-DUTY BEARING PEDESTAL is of cast iron construction to rigidly support the shaft and pump column. The pedestal is epoxy-coated for external corrosion resistance.

5. NON-METALLIC LOCKING COLLAR reduces pump deflection due to piping loads.

6. FIBERGLASS MOUNTING PLATE supports the pump and exhibits the same corrosion-resistance. Mounting plates are available in both standard and custom configurations.

7. FIBERGLASS BASKET STRAINER, attached to the casing by fiberglass studs and nuts, protects the pump casing and impeller against damage from trash or other debris.

8. GREASE FITTINGS with relief plugs provide for re-greasing of upper and lower bearings.

9. EXTERNAL IMPELLER ADJUSTMENT allows field setting of impeller-to-casing operating clearance from above the mounting plate.

10. DOUBLE-ROW THRUST BEARING is oversized to handle both radial and thrust loads.

11. LOWER BEARING carries much of the pump's radial thrust and has a sliding fit in the pedestal to accommodate impeller adjustment.

12. VAPOR SEALS protect lower bearing and pedestal from corrosive sump vapors.

13. RESTRICTION BUSHING minimizes leakage around the shaft. The bushing is pinned against rotation and is easily removable.

14. SEMI-OPEN IMPELLER utilizes rear pump-out vanes and balance holes to reduce axial thrust loads.

Available options with the Series 7500 pump

Many construction options are available with the Series 7500 in addition to the various materials combinations listed on Page 2. The options shown below are those most frequently requested. Please contact your local Fybroc distributor for information on custom configurations.

Fiberglass-wrapped shaft

On highly corrosive services, a fiberglass-wrapped stainless steel shaft provides an alternative to more costly high alloy shafting. The external layer of fiberglass-reinforced vinyl ester or epoxy provides the same corrosion resistance for the shaft as for the other pump components, and each shaft is rigorously tested to ensure there are no leakage paths to the underlying metal. The standard impeller is attached to the shaft utilizing a stud made of an alloy appropriate for the pumped liquid. Positive sealing is accomplished by two O-rings as shown to the right.

Mounting plates

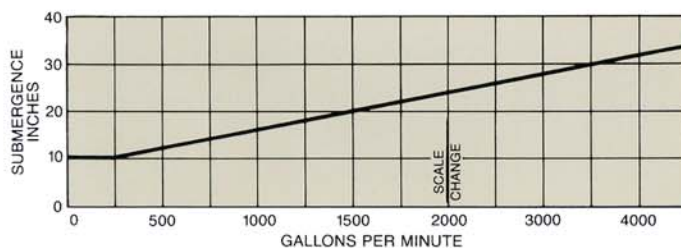
Standard mounting plate dimensions are listed on Page 10. Customized mounting plates can be designed upon request. Fiberglass pit covers, designed to mount one or more pumps plus provision for level controls, are also available.

Special pump lengths

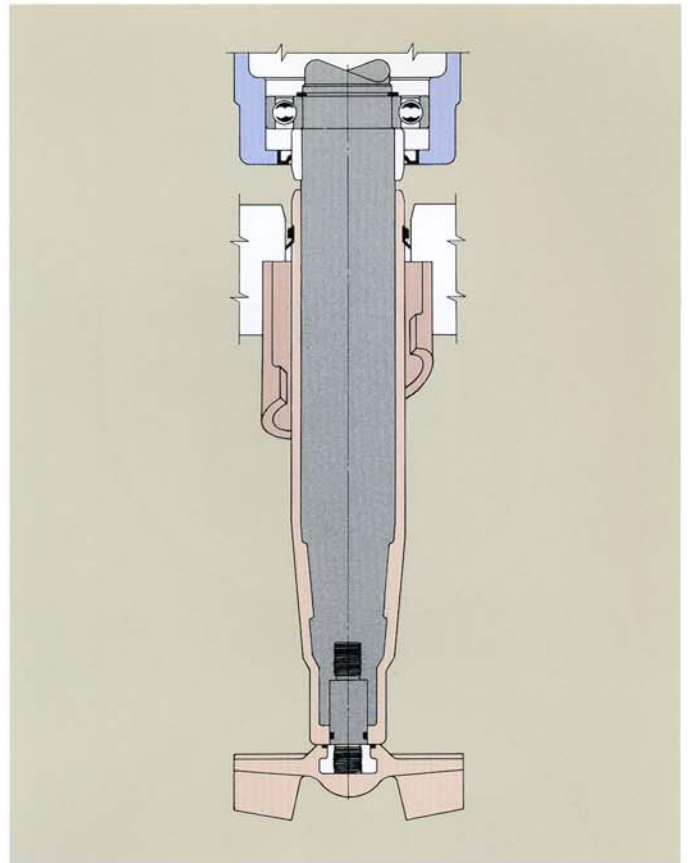
Series 7500 cantilever pumps are available as standard in settings up to 4 feet as shown on Page 10. Where required, longer settings are also available. Larger diameter shafts and columns are normally required.

Tailpipes

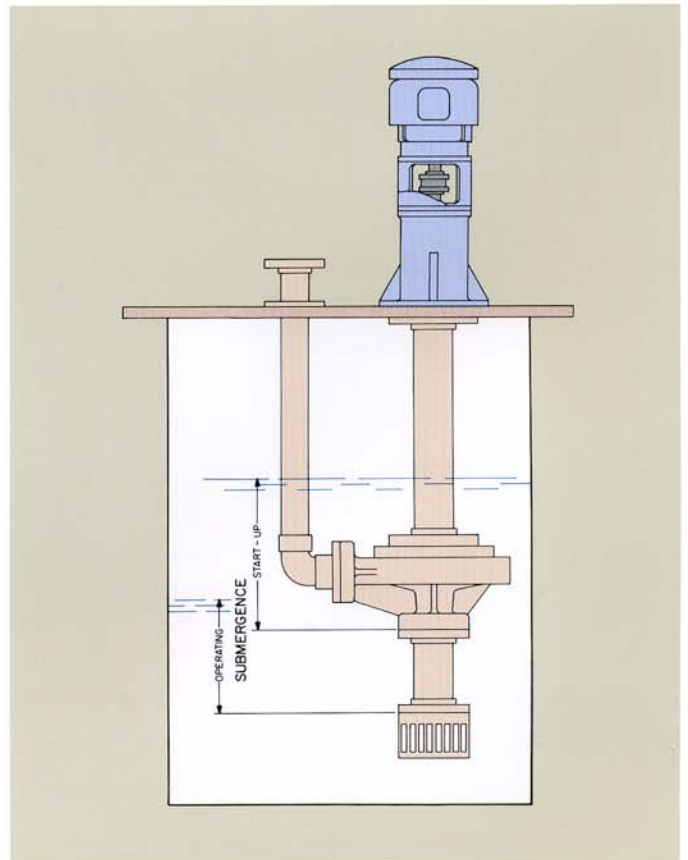
Tailpipes can be utilized to increase the effective setting of a sump pump with a minimum of additional cost. Typically used in a demand-type sump, level controls are arranged to start the pump when the liquid covers the top of the pump casing, then to stop the pump when the liquid nears the bottom of the tailpipe. Minimum submergence requirements are shown at bottom left.



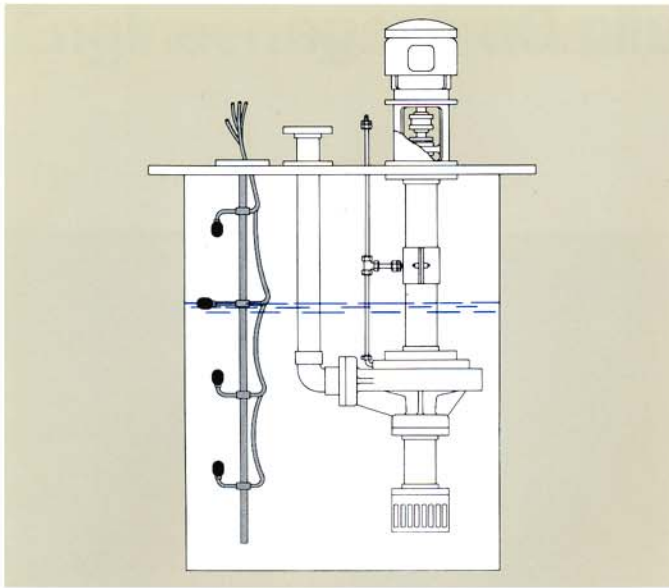
Pump or tailpipe submergence requirements



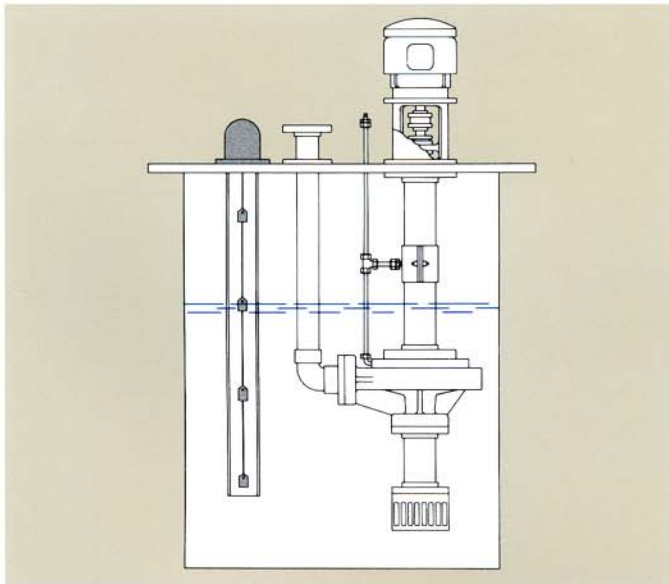
Fiberglass covering, shown in tan, provides excellent shaft corrosion resistance without use of expensive alloys.



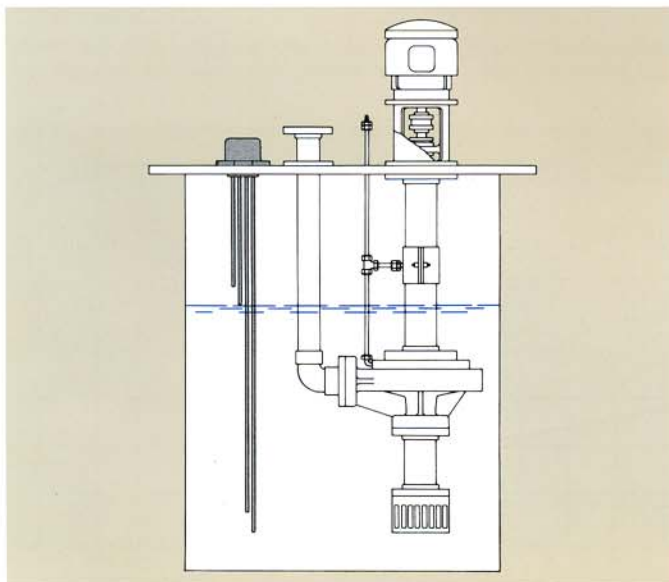
Optional tailpipe is shown along with reference points for submergence requirements.



Float-type level controls



Displacer-type level controls



Probe-type level controls

Level controls

Fybroc can provide a variety of different systems to control pump operations as the liquid level varies. Three typical systems are described below. The number of components required by each is determined by the type of operation and number of pumps being controlled.

Float type

This level control utilizes field-adjustable polypropylene floats which contain mercury switches that actuate when the float becomes horizontal. Each float is secured to a PVC support pipe mounted to either a pit cover or a pump mounting plate, and each is supplied with 20 feet of PVC cable.

Displacer type

This type is furnished with porcelain displacers connected to a flange-mounted switch by alloy wire and cable clamps. The wire and clamps are selected to suit the specific application and are normally 316 stainless, alloy 20, Hastelloy or Monel. To prevent swirling liquids in the sump from improperly activating the switch, the displacers are frequently mounted inside a fiberglass stilling tube.

Probe type

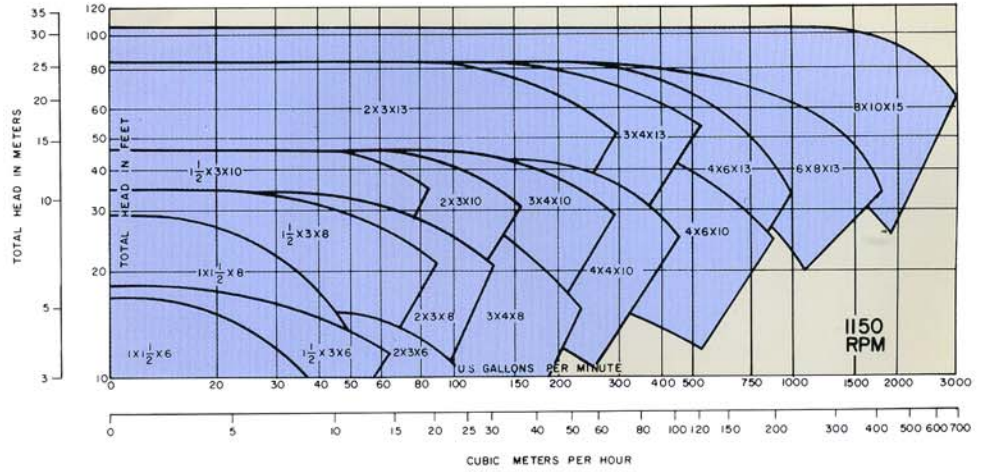
The probe-type level control is either solid rod or adjustable wire suspension electrodes, one for each actuation level. The circuit from an electrode to an external relay is made or broken when the liquid level touches or loses contact with that electrode. Electrodes are attached to a flange-mounted holder which in turn is mounted on either a pit cover or pump mounting plate.

Starters/control panels

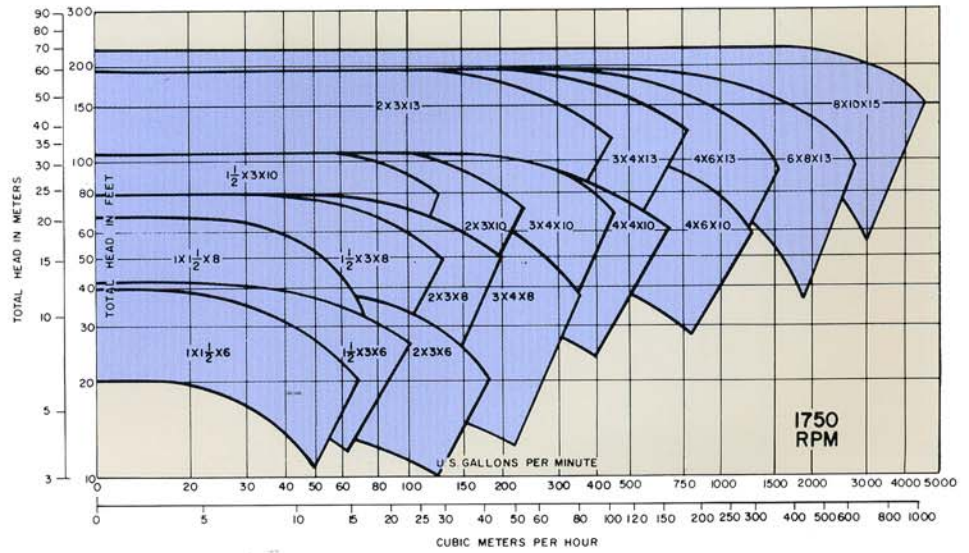
Customized control panels are available in a variety of enclosures. They typically contain starters, alternators, relays, alarms, and other components needed to complete the pump control system. Please contact your Fybroc distributor for additional information.

Fybroc Series 7500 Hydraulic Coverage

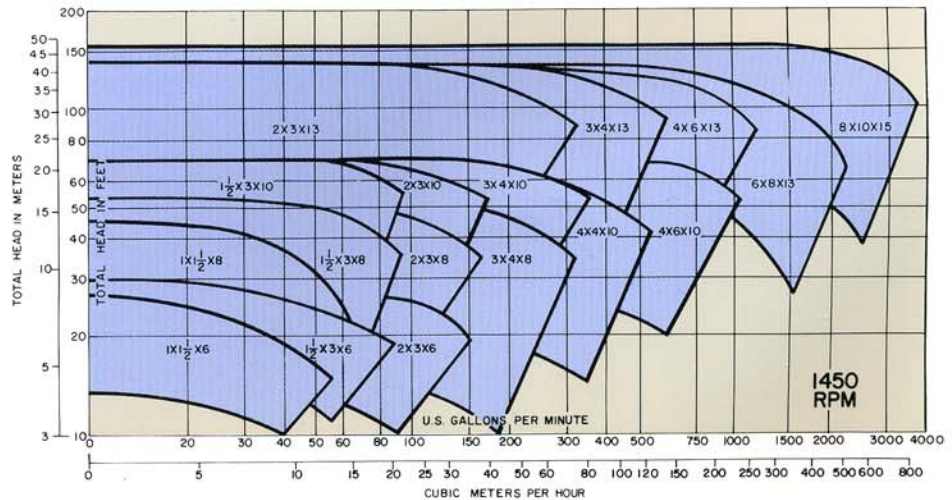
1150 RPM
60 HERTZ



1750 RPM
60 HERTZ



1450 RPM
50 HERTZ



Engineering information – Series 7500

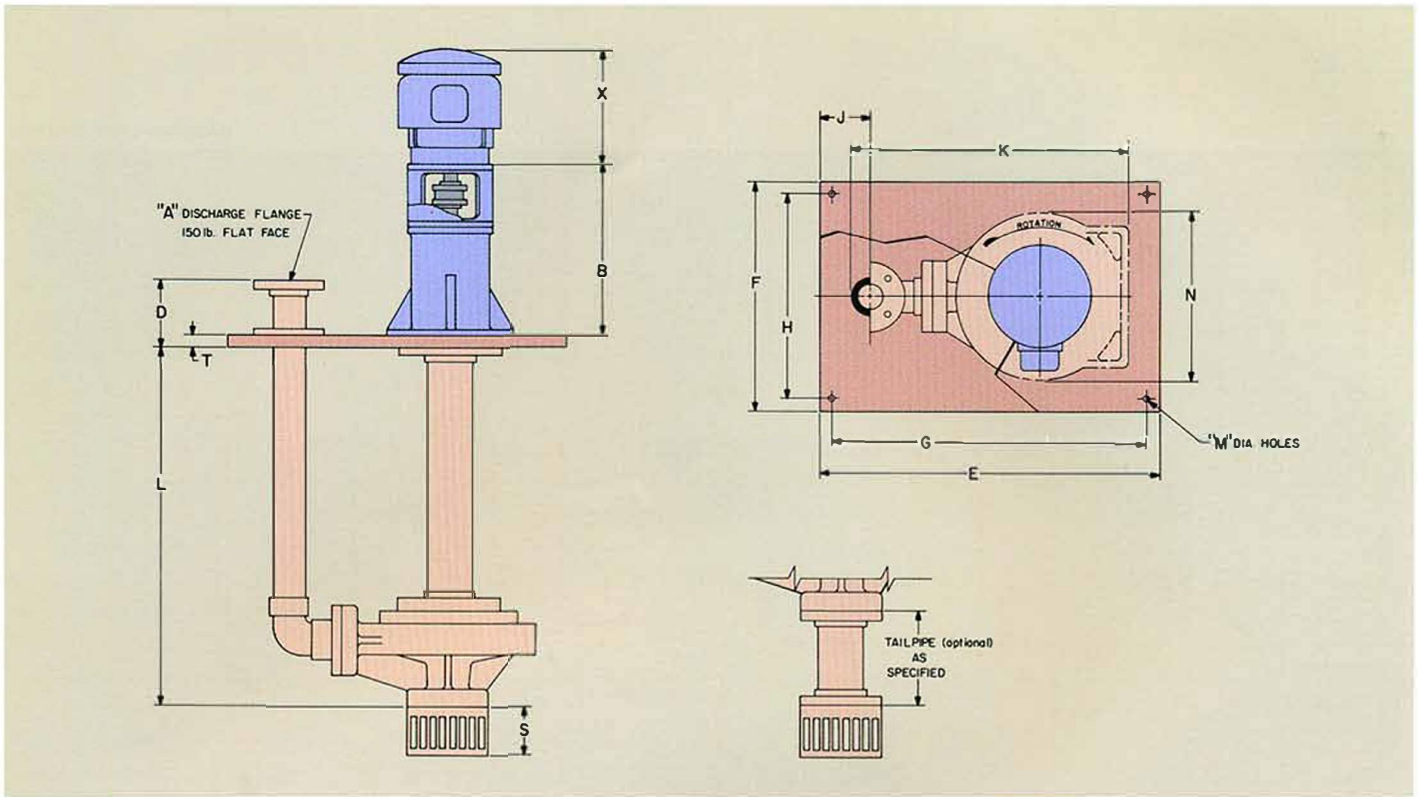
DIMENSIONS ARE IN INCHES

Pump Size		1x1½x6	1½x3x6	2x3x6	1x1½x8	1½x3x8	2x3x8	3x4x8	1½x3x10	2x3x10	3x4x10	4x4x10	4x6x10	2x3x13	3x4x13	4x6x13	6x8x13	8x10x15	
Pump Data	Suction Size	1½	3	1½	3	4	3	4	3	4	6	3	4	6	8	10			
	Discharge Flange	2					3	2	3	4	2	3	4	6	8				
	Max. Impeller Dia.	6¼	6	7½	8¾	8	9¼	10	9½	10¼	13					15			
	Max. Sphere/Imp.	¾	½	⅝	⅝	1	¾	⅝	¾	1	⅝	½	1	1½					
	Max. Sphere/Strnr.	¾	⅞	¾	⅞	½	⅞	½	⅝	⅞	½	⅝	⅞	1					
Casing Data	Impeller Clearance	Front	.015		.020			.025											
		Back	.045		.040			.035											
	Casing Thckns. (Min.)	.50			.75	.62	.75	.62	1.12	.75	1.25	1.37							
Volute	Single					Double					Single	Double							
Shaft and Bearing Data	Dia. at Impeller	.750			1.250										1.500				
	Major Diameter†	2.500			3.000					4.000					Var.*				
	Dia. at Coupling	1.375					1.875					Var.*							
	Radial Brg. No.	2125Z					218MF					Var.*							
	Thrust Brg. No.	5309MZ					5311MZ					Var.*							
Shaft H.P./100 RPM	.9			4					12										

*Varies with pump setting and RPM; contact Fyroc with specific application details.

†Smaller shaft diameters may be possible for certain conditions of service. Consult factory.

Pump dimensions for Series 7500



DIMENSIONS ARE IN INCHES

SIZE	A	B	D	E	F	G	H	J	K	M	N	S	T
1x1½x6	2	25⅞	5⅝	24	15	22	13	4⅞	18⅜	¾	10⅞	3⅞	⅝
1½x3x6	2	25⅞	5⅝	24	15	22	13	4⅞	18⅜	¾	10⅞	4½	⅝
2x3x6	2	25⅞	5⅝	24	15	22	13	4⅞	18⅜	¾	10⅞	4½	⅝
1x1½x8	2	25⅞	5⅝	24	15	22	13	4⅞	18⅜	¾	10⅞	3⅞	⅝
1½x3x8	2	25⅞	6	30	20	28	18	5	23⅜	¾	14¼	4½	1
2x3x8	2	25⅞	6	30	20	28	18	4½	24⅜	¾	14¼	4½	1
3x4x8	3	25⅞	6	34	20	32	18	5½	27	¾	14¼	5	1
1½x3x10	2	25⅞	6	30	20	28	18	5	23⅜	¾	14¼	4½	1
2x3x10	2	25⅞	6	30	24	28	22	4½	24⅜	¾	17¼	4½	1
3x4x10	3	25⅞	6	34	24	32	22	5½	27	¾	17¼	5	1
4x4x10	4	25⅞	6	36	24	34	22	6	30⅞	¾	17¼	6¾	1
4x6x10	4	26⅞	6½	42	32	39	29	7½	33	1	22¼	7	1½
2x3x13	2	26⅞	6½	36	30	33	27	5½	28⅞	1	20½	4½	1½
3x4x13	3	26⅞	6½	40	30	37	27	7	30¼	1	20½	5	1½
4x6x13	4	26⅞	6½	42	32	39	29	7½	33	1	22¼	7	1½
6x8x13	REFER TO FACTORY												
8x10x15													

MOTOR FRAME	X*
143-145TC	10
182-184TC	15
213-215TC	19
254-256TC	24
284-326TC	24½
364-365TC	27½

Standard pump lengths (L) are available in 6 inch increments. Specific pump outline drawings are available from your Fyroc distributor.

The above drawing is not to be used for construction purposes.

*Approximate

CECO Fybroc

700 Emlen Way, Telford, PA 18969
(215) 723-8155 FAX (215) 723-2197
Email: infofhs@onececo.com Web Site: www.cecoenviro.com