



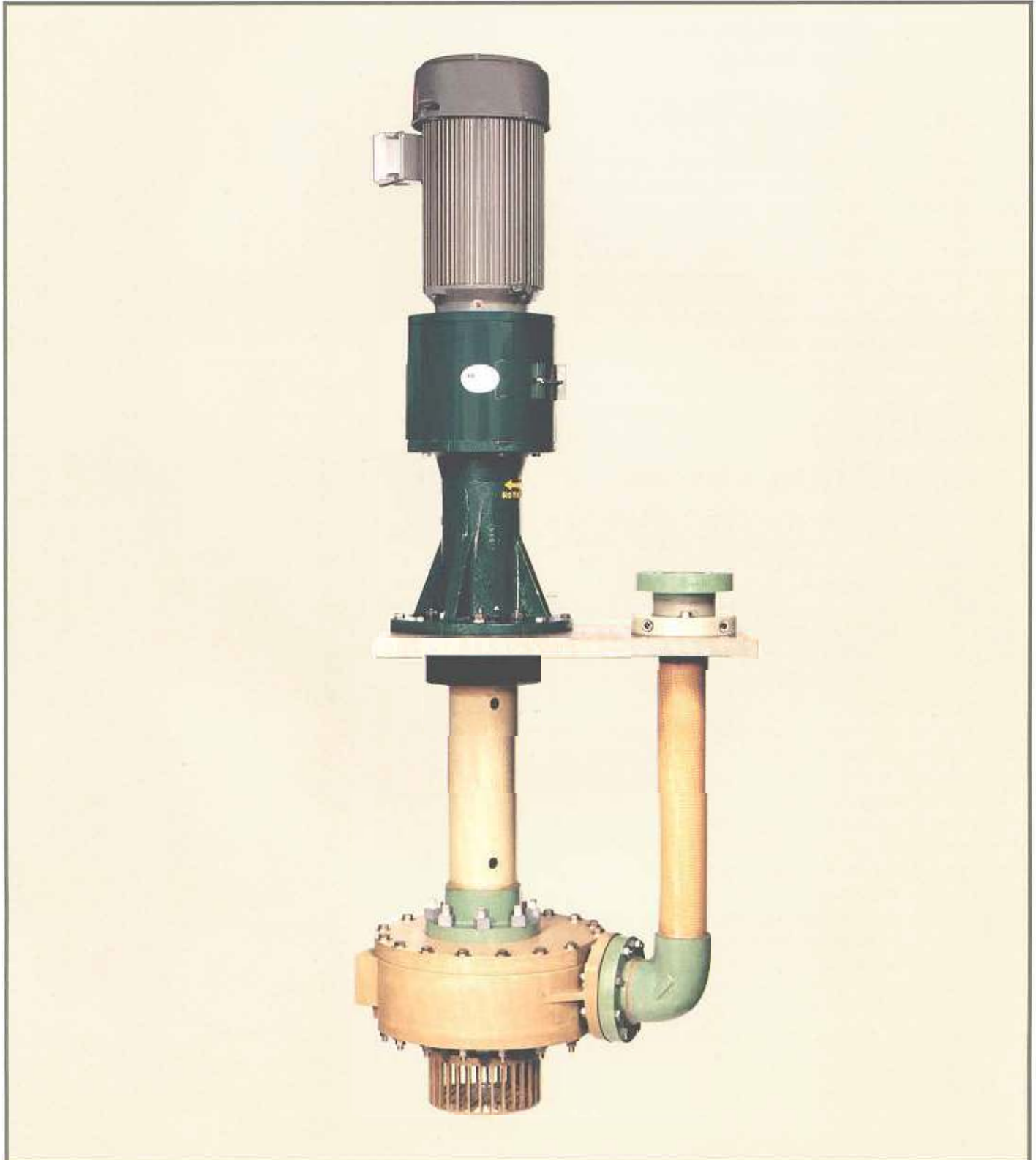
**PUMP SUPPLY**  
INCORPORATED

**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



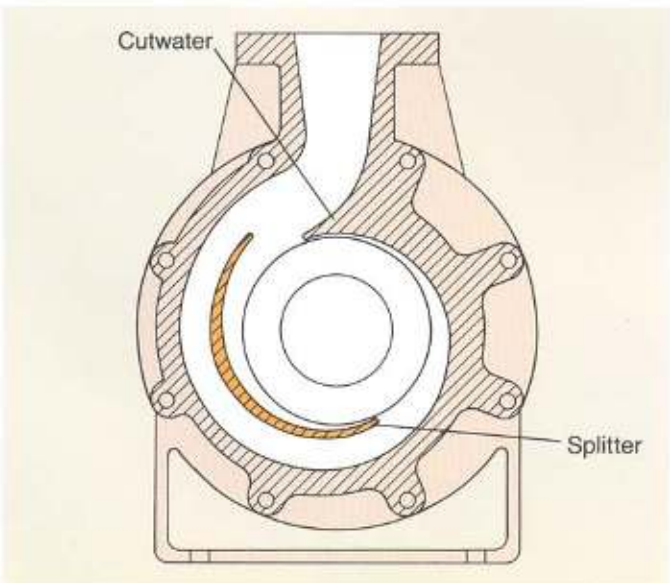
Impellers shown in EY-1, VR-1A, and VR-1 materials



Series 7500 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

## 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.

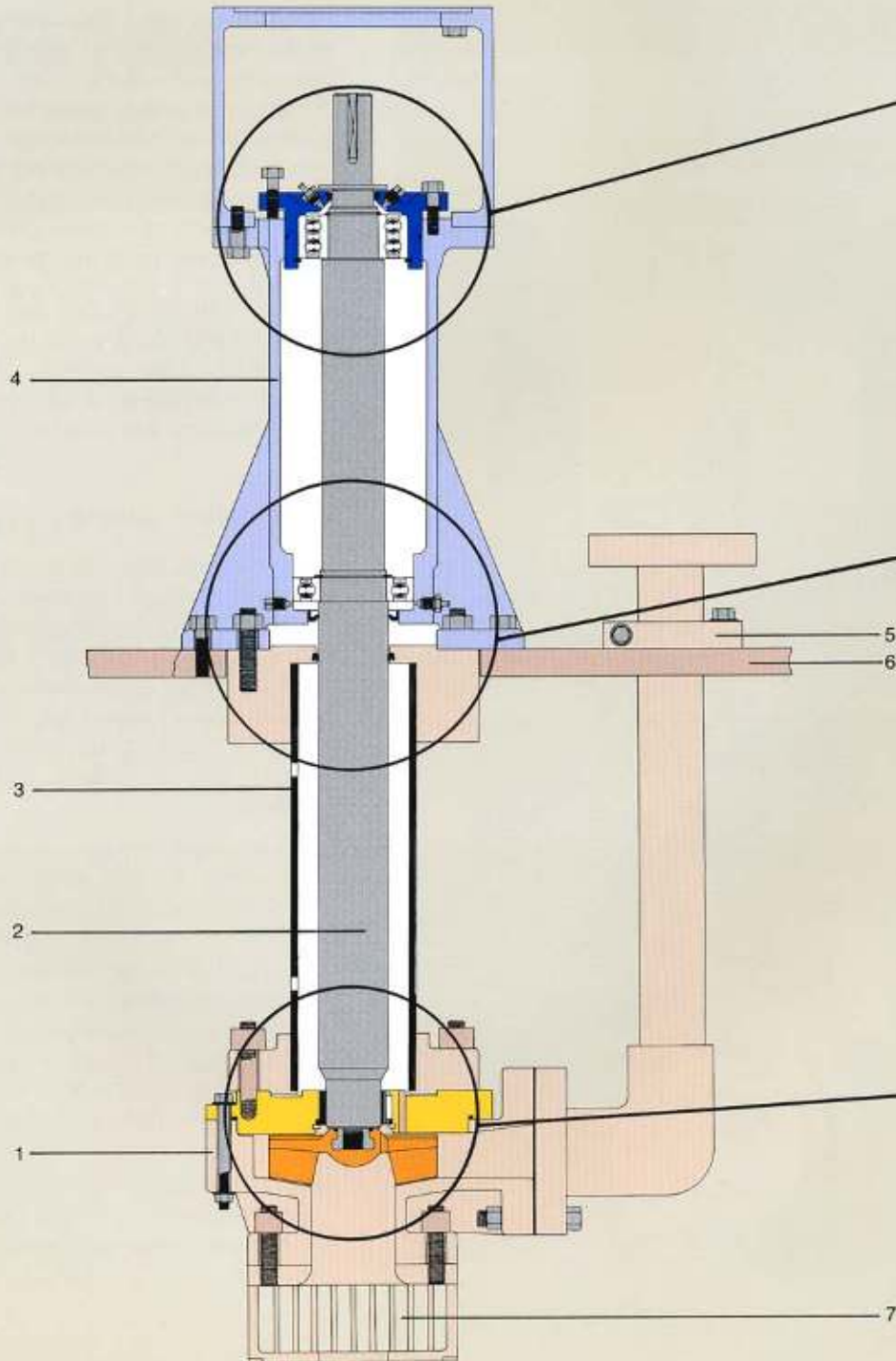
### Dual volute casing

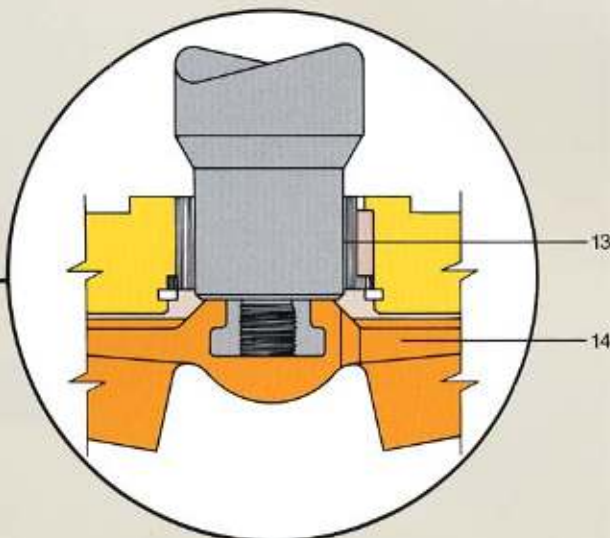
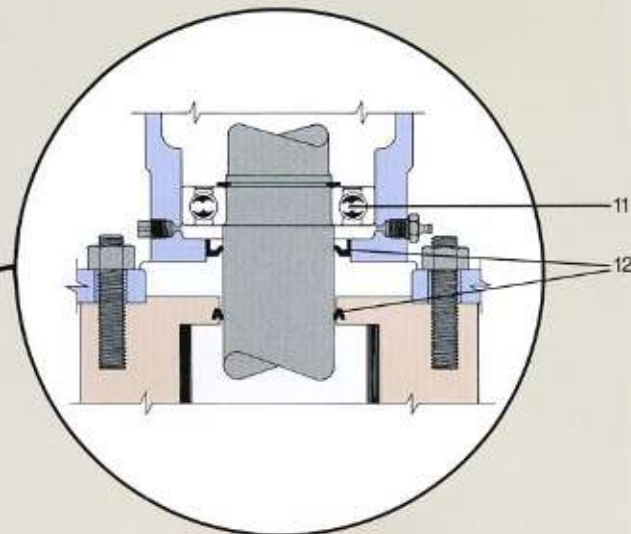
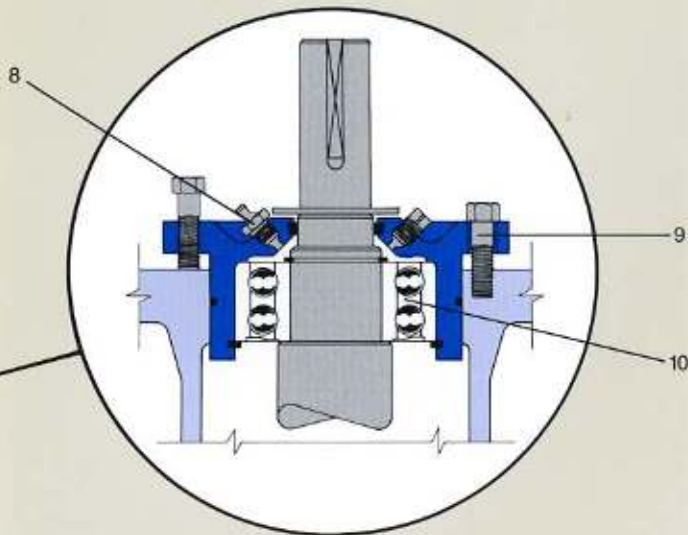
Another key element in the design of Fybroc's superior cantilever pump is the use of dual volute casings to further reduce shaft deflection which results from radial thrust. This important feature is standard design on ten of Fybroc's larger pump sizes and yields significant reductions in radial thrust.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

# 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.

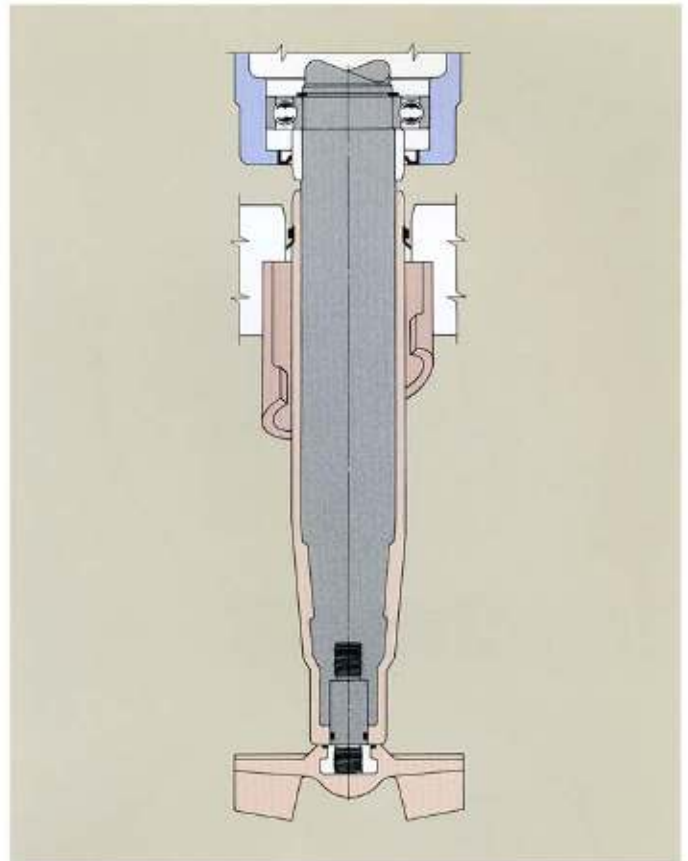
14. SEMI-OPEN IMPELLER utilizes rear pump-out vanes and balance holes to reduce axial thrust loads.

# 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.



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

## Mounting plates

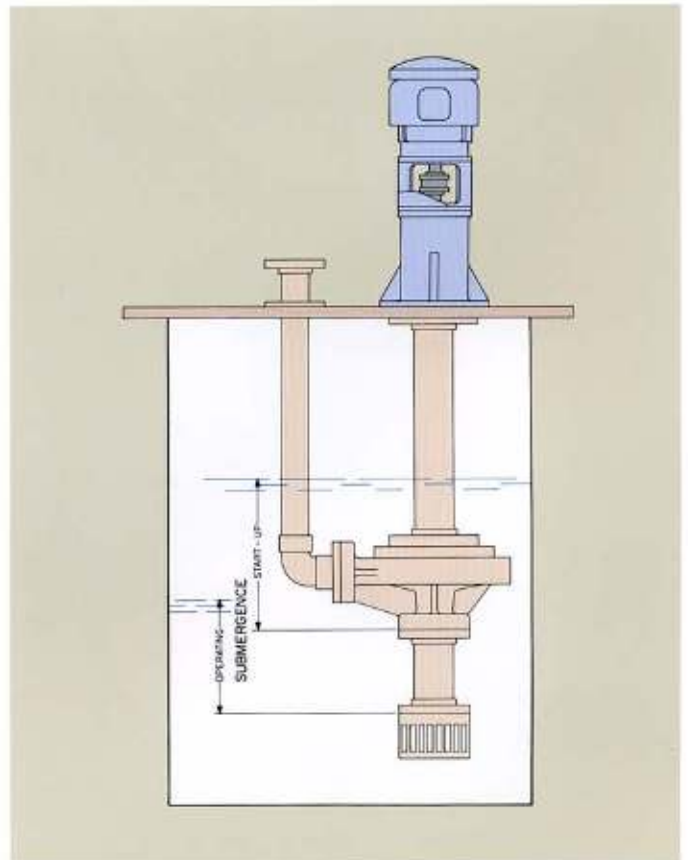
Standard mounting plate dimensions are listed on Page 10. Customized mounting plates can be designed upon request. Fiberglass pit covers, designed to mount one or more pumps plus provision for level controls, are also available.

## Special pump lengths

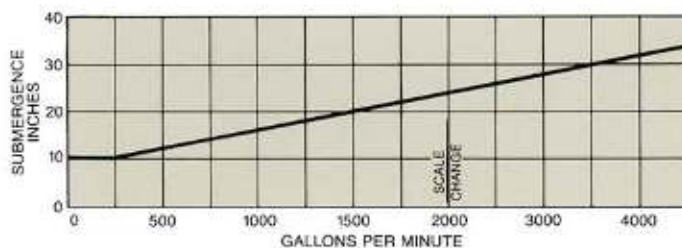
Series 7500 cantilever pumps are available as standard in settings up to 4 feet as shown on Page 10. Where required, longer settings are also available. Larger diameter shafts and columns are normally required.

## 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.



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



Pump or tailpipe submergence requirements

## 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

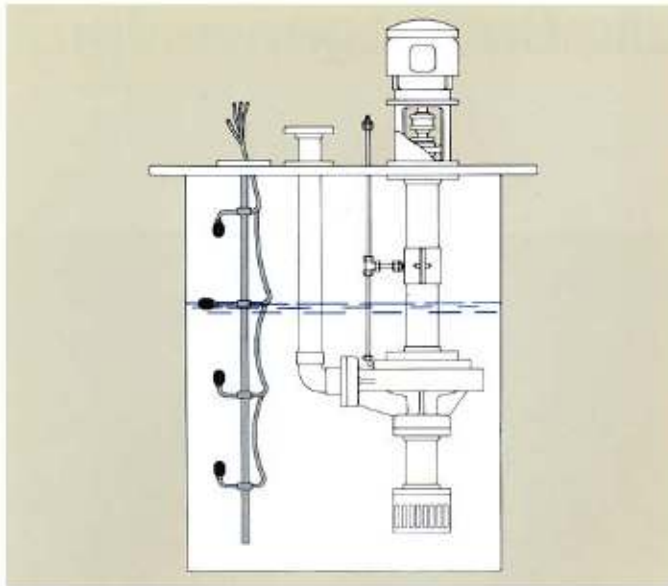
This level control utilizes field-adjustable polypropylene floats which contain mercury switches that actuate when the float becomes horizontal. Each float is secured to a PVC support pipe mounted to either a pit cover or a pump mounting plate, and each is supplied with 20 feet of PVC cable.

### Displacer type

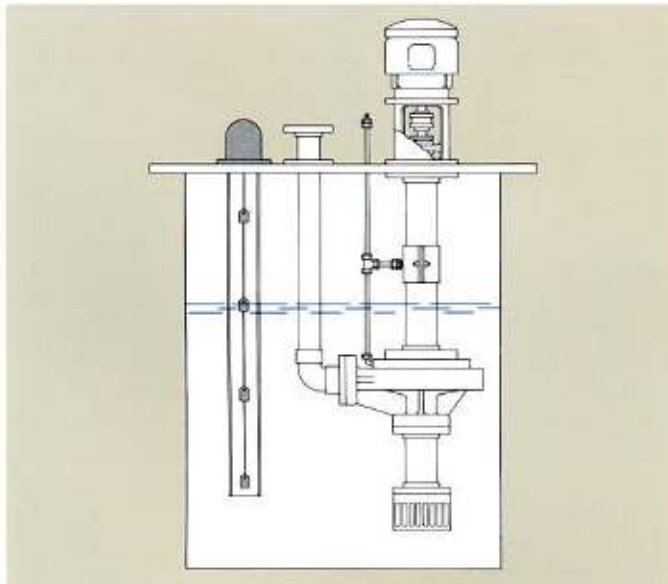
This type is furnished with porcelain displacers connected to a flange-mounted switch by alloy wire and cable clamps. The wire and clamps are selected to suit the specific application and are normally 316 stainless, alloy 20, Hastelloy or Monel. To prevent swirling liquids in the sump from improperly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

### Probe type

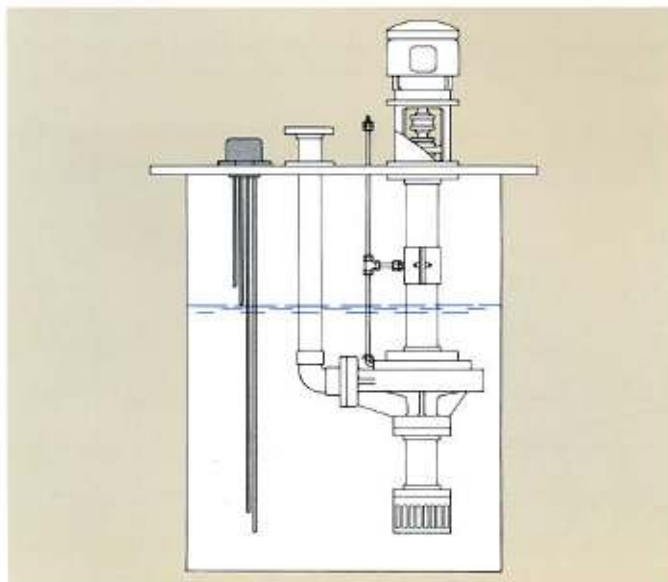
The probe-type level control is either solid rod or adjustable wire suspension electrodes, one for each actuation level. The circuit from an electrode to an external relay is made or broken when the liquid level touches or loses contact with that electrode. Electrodes are attached to a flange-mounted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



Float-type level controls



Displacer-type level controls



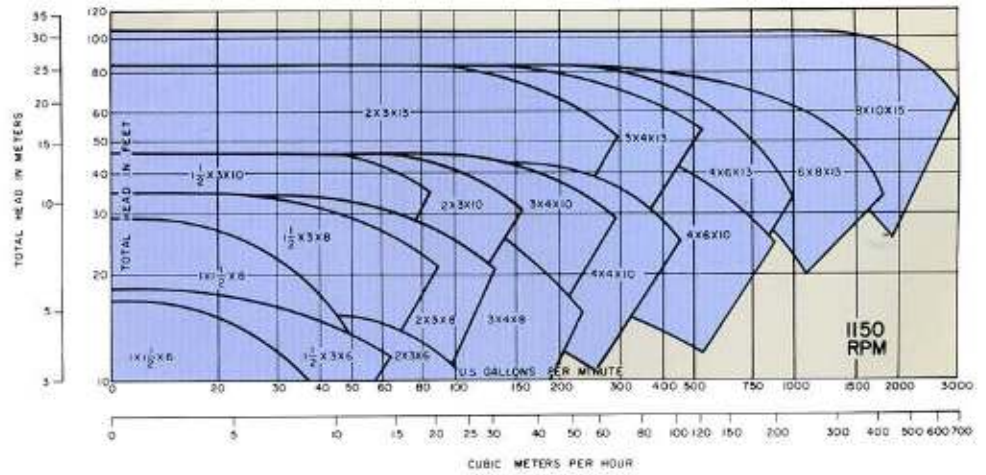
Probe-type level controls

## Starters/control panels

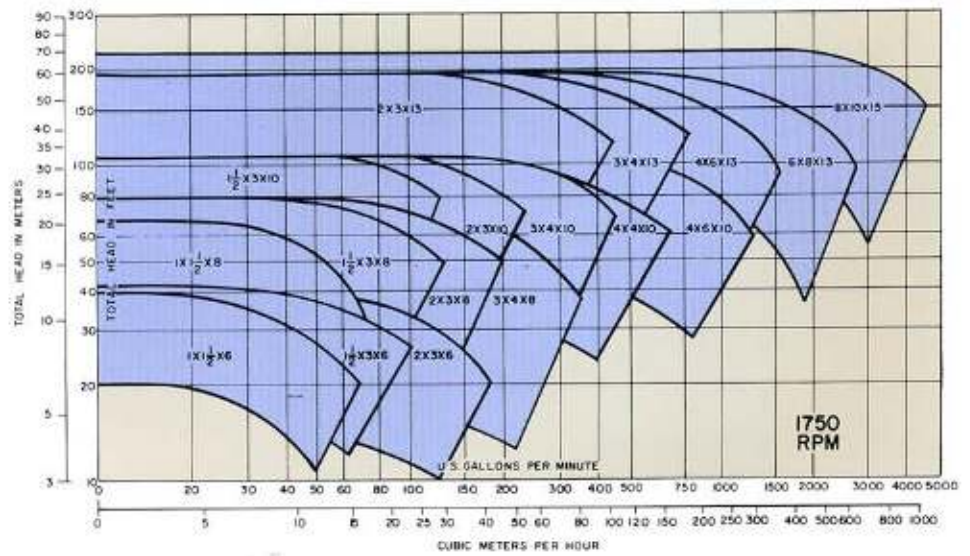
Customized control panels are available in a variety of enclosures. They typically contain starters, alternators, relays, alarms, and other components needed to complete the pump control system. Please contact your Fybroc distributor for additional information.

# Fybroc Series 7500 Hydraulic Coverage

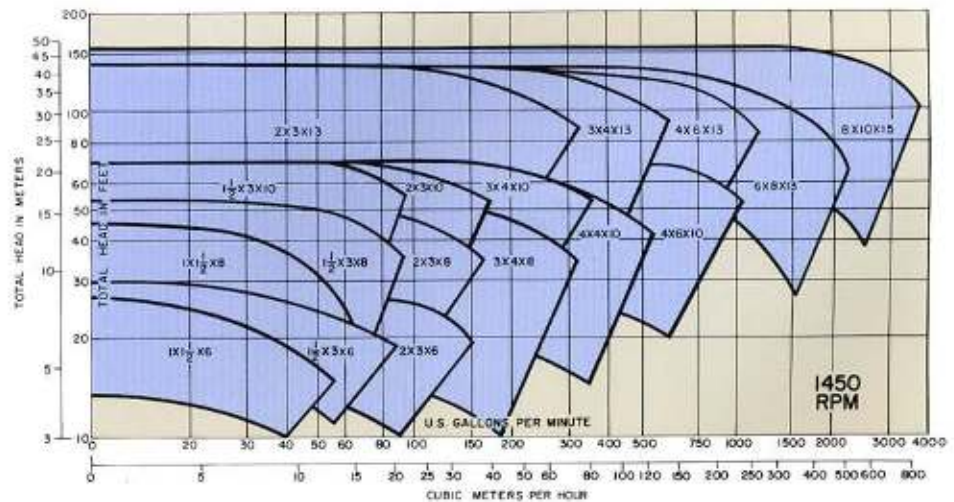
## 1150 RPM 60 HERTZ



## 1750 RPM 60 HERTZ



## 1450 RPM 50 HERTZ





# Engineering information – Series 7500

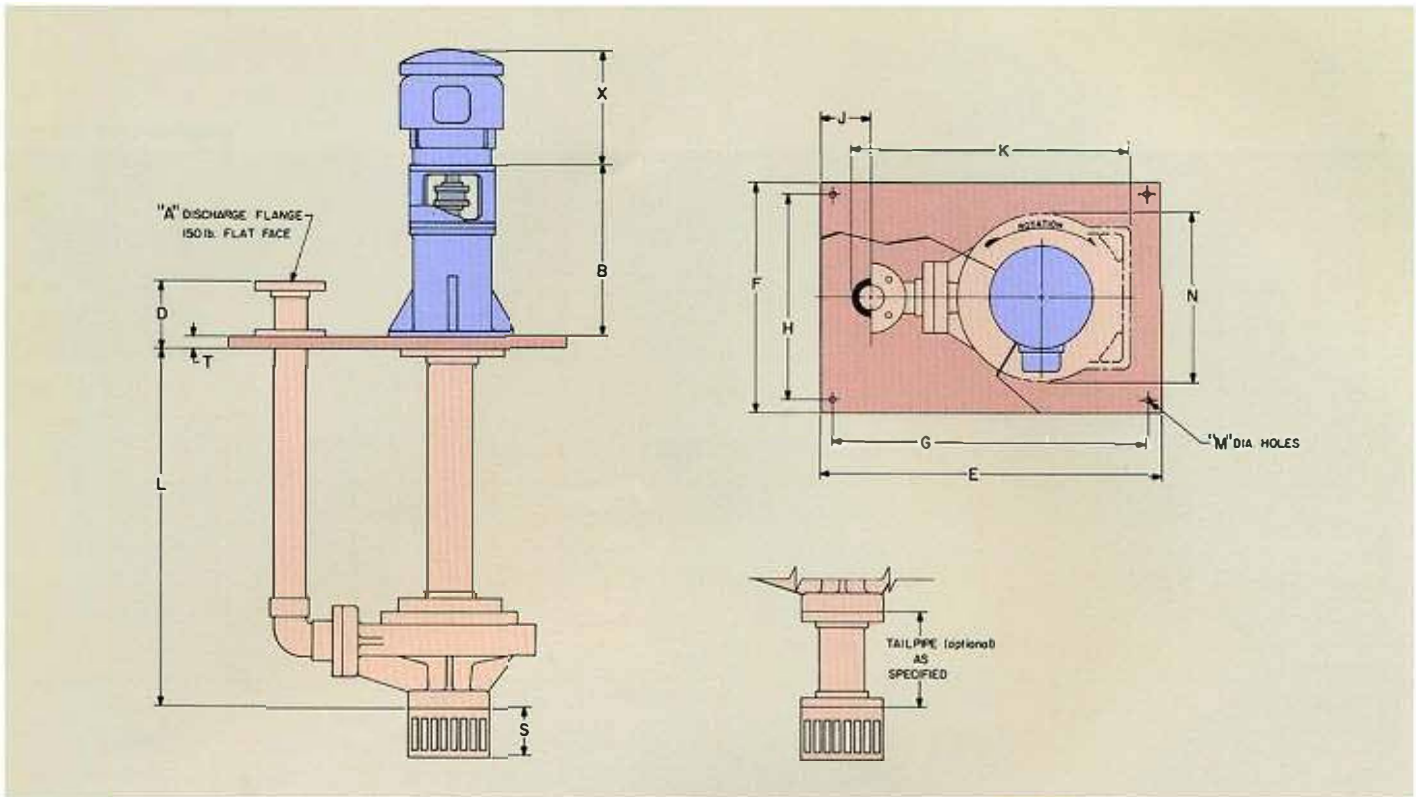
DIMENSIONS ARE IN INCHES

| 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      | 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      | 9¾    | 10     | 9½      | 10¾    | 13     |        |        |        | 15     |        |        |         |  |  |
|                        | Max. Sphere/Imp.      | ¾      | ½      | ¾     | 5/8    | 1      | ¾     | 5/8    | ¾       | 1      | 5/8    | ½      | 1      | 1½     |        |        |        |         |  |  |
|                        | Max. Sphere/Strnr.    | ¾      | 7/16   | ¾     | 7/16   | ½      | 7/16  | ½      | 5/8     | 7/16   | ½      | 5/8    | 7/16   | ½      | ¾      | 1      |        |         |  |  |
| Casing Data            | Impeller Clearance    | Front  | .015   |       |        | .020   |       |        | .025    |        |        |        |        |        |        |        |        |         |  |  |
|                        |                       | Back   | .045   |       |        | .040   |       |        | .035    |        |        |        |        |        |        |        |        |         |  |  |
|                        | Casing Thokns. (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 Fybroc 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



**Illinois Location:**  
(847) 841-7867  
860 Church Rd  
Elgin, IL 60123

**Minnesota Location:**  
(651) 758-7867  
330 Mill Bay South Suite 1511  
Afton, MN 55001  
PumpSupplyInc.com

A map showing the outlines of Illinois and Minnesota. A star is placed in the western part of Illinois, and another star is placed in the western part of Minnesota. Below the map is a smaller version of the Pump Supply Incorporated logo.



|  |  |
|--|--|
| <p><b>Illinois Location:</b><br/>       (847) 841-7867<br/>       860 Church Rd<br/>       Elgin, IL 60123</p>   |  |
| <p><b>Minnesota Location:</b><br/>       (651) 758-7867<br/>       330 Mill Bay South Suite 1511<br/>       Afton, MN 55001<br/>       PumpSupplyInc.com</p> |  |

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