

# Selecting a Short Coupled Vertical Turbine Pump

## Step 1 Bowl Selection

From the catalog rating curves select the bowl assembly which will meet the customer's requirements with respect to capacity and total dynamic head. Usually the operating speed (RPM) will be specified. 1800 RPM (nominal) is the most common operating speed, although 3500 RPM is widely used for clean fluid service. In general, lowering the operating speed will lower the noise and vibration level, increase the life expectancy of the pump and increase the initial investment.

## Step 2 Column and Shaft assembly

Select the length of column and shaft to suit the overall length of the pump. Refer to the "Bowl Assemblies" section for dimensional data on bowl assemblies. Due to the relative short lengths of column involved it is common to select column size for higher friction losses than would be desirable for deep well units a friction loss of 7-1 /2' per 100' is generally acceptable.

On units requiring less than 5 feet of column length at speeds up to 1800 RPM, a bearing will not be included in the column. Should, for example, the column requirements work out to be 12'0", two bearings will be installed at 5' intervals above the bowl assembly, with a 2' column pipe below the discharge head. Therefore, the column assembly should be selected as follows:

1800 RPM Maximum*	
up to 5' column length required	1 section
5' to 10' column length required	2-5' sections
10' to 15' column length required	3-5' sections
More than 15'	2-5' sections and additional 10' sections as required.
 Above 1800 RPM	
5' bearing centers required.	

Lineshaft size DOES NOT necessarily have to match the bowl shaft size. For the shaft size and horsepower ratings refer to the "Engineering Section" of the catalog. Minimum recommended line shaft size for short coupled pumps regardless of horsepower is 1".

## Step 3 Discharge Head

Once the column and shaft sizes have been determined, the head selection follows. The discharge size will usually be specified, if not the following can be used as a guideline.

Discharge Size	Maximum Recommended Capacity*
4" .....	475 GPM
6" .....	1050 GPM
8" .....	1900 GPM
10" .....	3000 GPM
12" .....	4700 GPM
14" .....	5700 GPM

\*Based on velocity of 12 F.P.S.

Check the driver mounting flange for compatibility with the discharge head. Remember ----a 10" B.D. drive will mount on a 12" BD discharge head and vice-versa, also a 16 ½" BD driver will mount on a 20" BD discharge head. We must know the driver manufacturer, "CD" dimension, "BD" dimension, clutch size and keyway, and frame number if the customer furnishes his own driver (preferably send certified prints with order).

Remember, the maximum working pressure of the standard cast iron discharge head is 175 PSI for the N-260 model and 275 PSI for the HI-PRO model. Above this, a fabricated discharge head must be used. A hi-pressure packing box will be required if the pressure exceeds 175 PSI (price addition required).

A discharge companion flange will usually not be required, if desired a price addition is required. Applicable discharge head dimensions can be found in the "Discharge Head" section of the catalog.

#### Step 4 Driver

The driver requirements are usually specified. Hollow shaft drivers are more common due to the ease of the shaft adjustment and lower initial cost (up to about 250 HP) of the complete unit. Solid shaft drivers should be considered for the larger units and for certain mechanical seal applications (see mechanical seal pages in "Discharge Head" section for details). Hollow shaft motors are available equipped with a "steady bushing" are recommended when mechanical seals are used in conjunction with hollow shaft motors regardless of speed, and when the shaft span between the packing box and motor clutch on 3600 RPM units exceed the following:

Shaft Diameter	Maximum Span
1" .....	36"
1 3/16" .....	41"
1 ½" .....	47"
1 11/16" .....	50"

Solid shaft drivers provide rigid shaft support near the shaft sealing device and can always be recommended where the cost is not prohibitive. Adjustable couplings must be used with solid shaft drivers. Spacer type adjustable couplings are recommended when mechanical seals are used to allow removal of the mechanical seal without removing the driver. See "Discharge Head" section for details on adjustable couplings.

#### Step 5 Special Requirements

The specifications and/or service requirements should be carefully reviewed for special requirements such as strainers, non-standard materials, mechanical seals, driver protective devices, special painting or coating, tests, etc. See Engineering (Pump Selection) section for further detailed instructions on pump selection.

#### Step 6 Assembly and Shipping

All close coupled vertical turbine pumps as standard will be shipped assembled (bowl, column and discharge head) as long as the total pump length (T.P.L.) as measured from the bottom of the discharge head or base plate, if used, to the bottom of the suction bell, suction case, or strainer, if used, does not exceed 15 ft.

The driver, drive coupling, head shaft and mechanical seal are never shipped assembled to the pump to prevent damage during transit.

When the T.P.L. exceeds 15 ft. the pump will be shipped in separate assemblies (bowl assembly, column assembly, discharged head assembly, drives, mechanical seal and miscellaneous parts).

For pumps requiring assembly that exceed 15 ft. T.P.L. as defined above, contact the factory for special price additions.