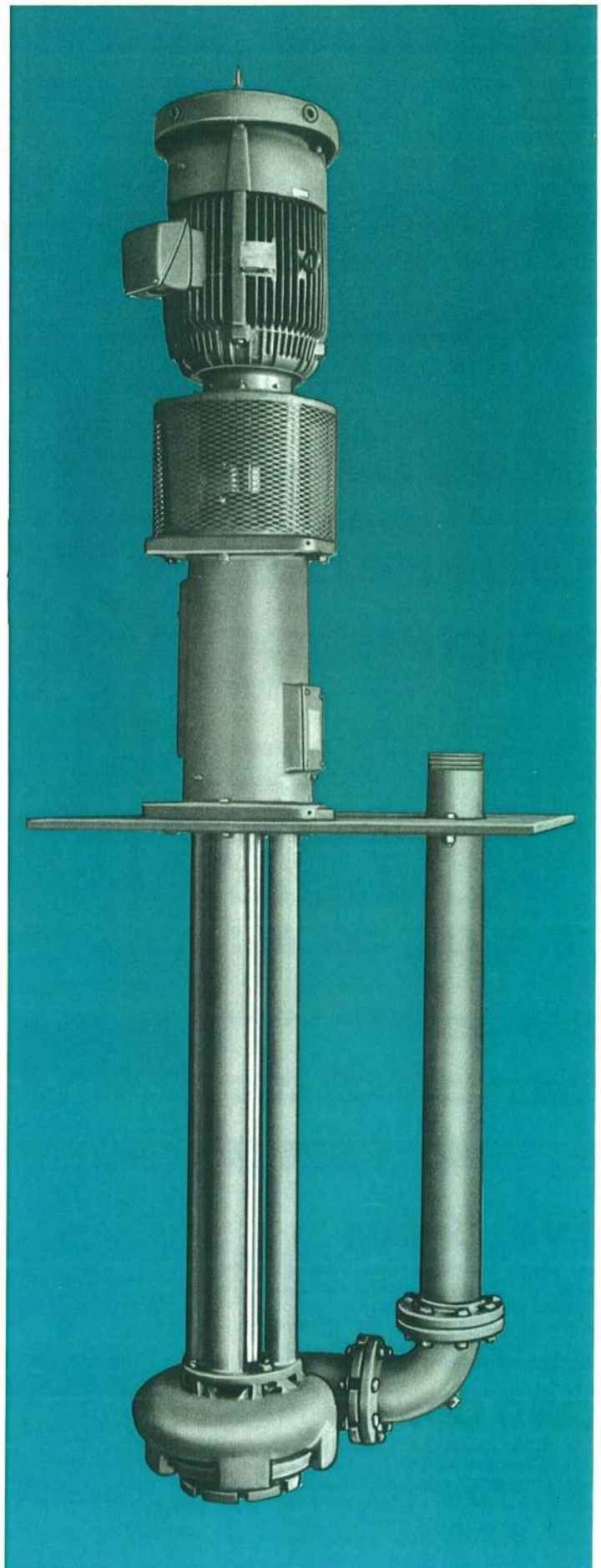
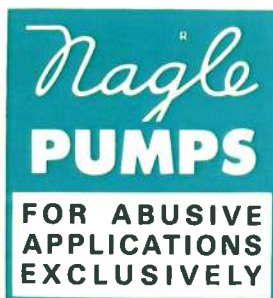


# Nagle CWO & TWO Vertical Cantilever Shaft Wet Pit Pumps



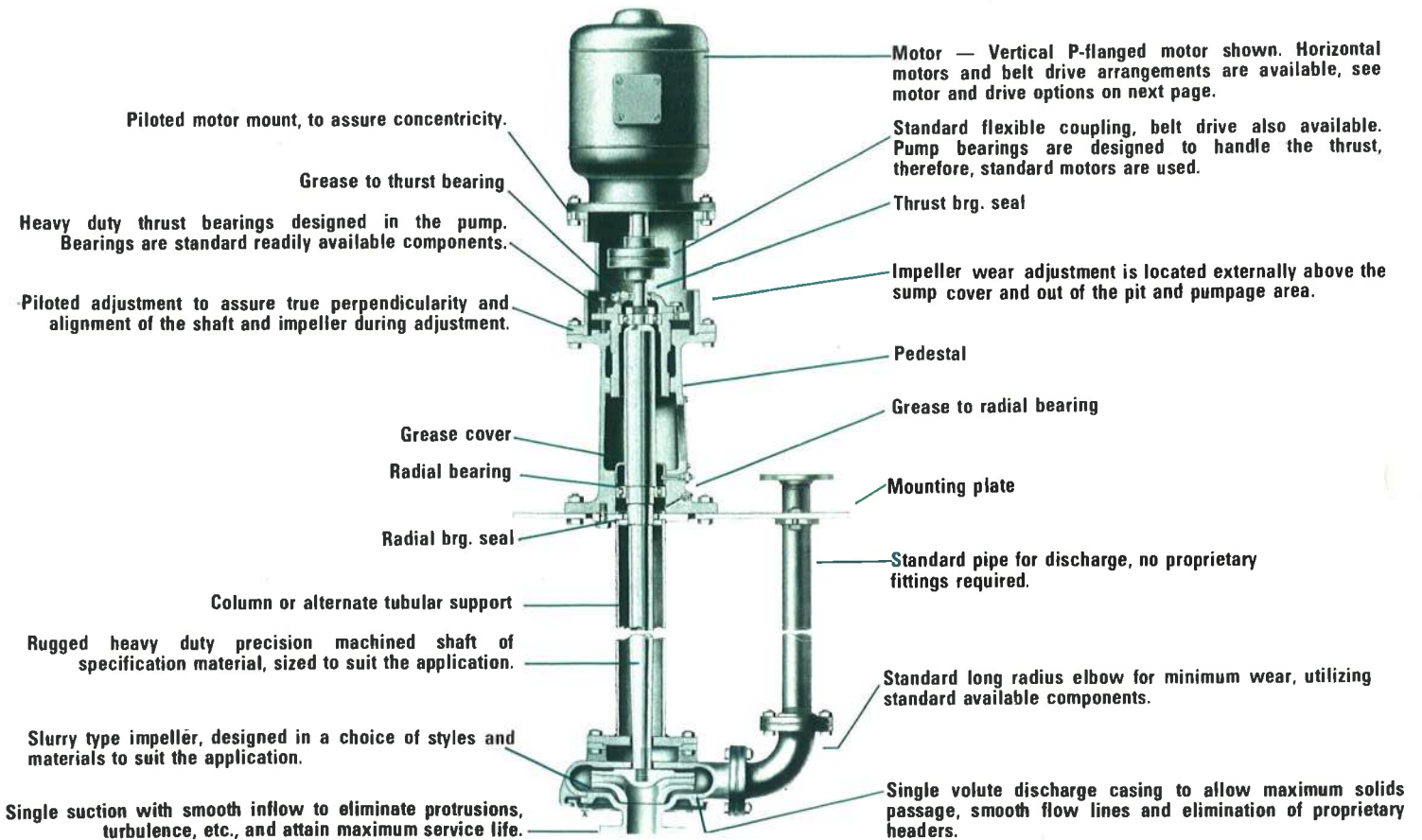
# Nagle CWO & TWO Pumps Offer These Advantages

Nagle CWO and TWO pumps are both single stage centrifugal slurry pumps. The CWO features a single column support of the casing while the TWO features tubular casing supports. In both pumps the impeller is supported solely by the cantilever shaft, and they are identical except for the casing support method. They are designed for wet pit installation with bottom suction or optional top suction. Pumps in these series are available in sizes from 1" to 20" for capacities to 10,000 gpm and pressures to 200 psi. Models are available for handling slurries up to 70% solids and molten salts and metals up to 1500°F.

The pumps incorporate easy maintenance features, especially the absence of any submerged bearings, seals, packing, throttle

bushings, or any rubbing parts in contact with the pumpage. Thus, eliminating the major causes of pump downtime and repair costs.

Through custom selection of impeller, casings and critical components from a wide range of designs. Nagle is able to assure maximum service life and minimum maintenance, even in the most demanding applications. The materials of the wet end components are selected specifically for each application, and can be made from cast iron, ni-hard, HC-250, bronze, stainless steel, monel, Inconel, hastelloy or any other commercially available alloy. Rubber and plastic coatings are also specified when required by the applications.

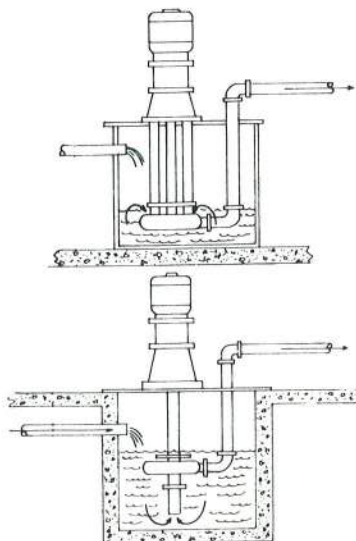


## TWO Design

The TWO Nagle cantilever shaft design which uses four tubular supports for the casing. Size of supports is dependent upon depth of setting and size of pump. Shown at right, the TWO is recommended by Nagle Engineers for heavy slurry applications.

## CWO Design

The CWO Nagle cantilever shaft design uses a single column support for the casing. Column diameter and wall thickness are selected to meet the requirements of the pump size and setting depth. Shown at right, the CWO is the more popular design for light slurry and chemical applications.



## Top Suction

Top suction, self-venting casing design is ideal for handling air entrained or low NPSH fluids. Frequently arranged for continuous running with variable in-flow rate.

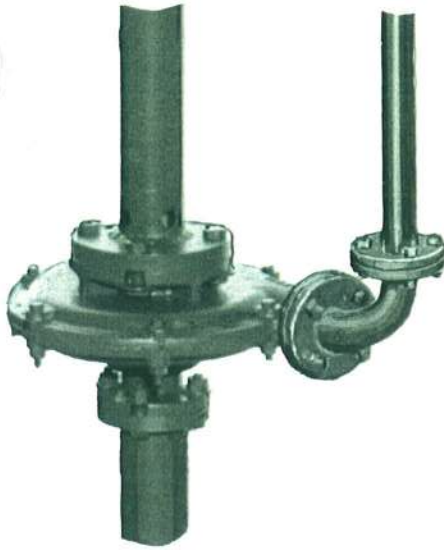
## Bottom Suction

Bottom suction is available with or without tailpipe. In some installations no liquid level control is required. Capable of running dry for indefinite periods.

## Tail Pipe

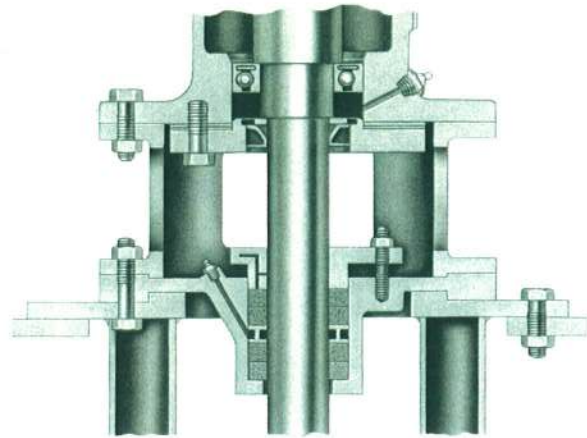
Also shown at left, offers several unique advantages. Shown and described in detail at top of page 3.

## Tail Pipe



The addition of a tail pipe to the bottom suction of a CWO or TWO unit permits the use of a shorter setting pump which not only will reduce the price but also can mean a smaller size unit. The pump will draw down to the bottom of the tail pipe but will not prime again unless the liquid level comes back up to the center of the impeller. This is a perfectly satisfactory arrangement for liquid level control. Where the liquid contains rapidly settling solids, sump agitation or continuous operation with speed regulation, or some other method of flow control is necessary.

## Spacer Pedestal & Stuffing Box

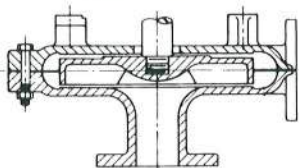


Overflow and fume protection for the radial bearing is provided by the use of a spacer pedestal which is installed between the mounting cover and bearing pedestal. These are optional and can contain a cooling fan and guard arrangement. On occasion these spacer pedestals are necessary if the pump contains a belt drive arrangement with the motor hung on the pedestal itself.

These pedestals are also available with stuffing boxes as shown above. Some applications involve the necessity of an inert gas purge, the maintaining of a pressure in the sump, or the assurance that no foreign substances can enter the pumpage. The type of packing and lubrication is dependent upon the application. Occasionally a mechanical seal arrangement is necessary and can be adapted to our stuffing box.

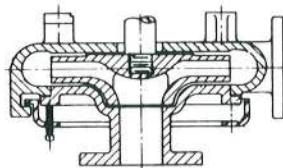
## Casing Options

TYPE CWO-C



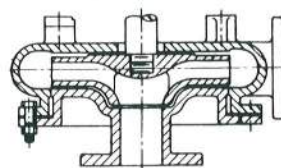
Split casing design, bolted together around periphery, where frequent inspection is not necessary.

TYPE CWO-R



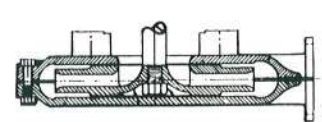
Ring clamp design with suction plate clamped into place by means of ring and set screws to provide easy inspection.

TYPE CWO-F



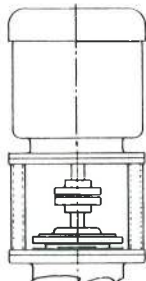
Flanged design, secured to casing by means of flanges and bolts, for high pressure applications.

TYPE CWO-IC



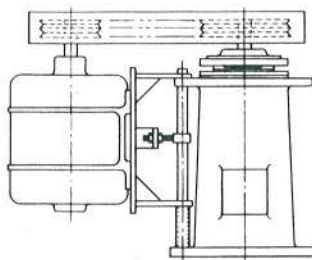
Inverted casing, top suction design, bolted together around periphery.

## Motor and Drive Options



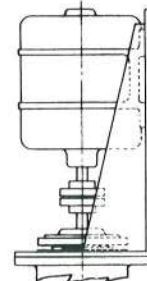
DIRECT MOUNTED

Many installations of vertical pumps utilize vertical motors directly flanged to the top of the pump and connected to the pump by means of a standard flexible coupling.



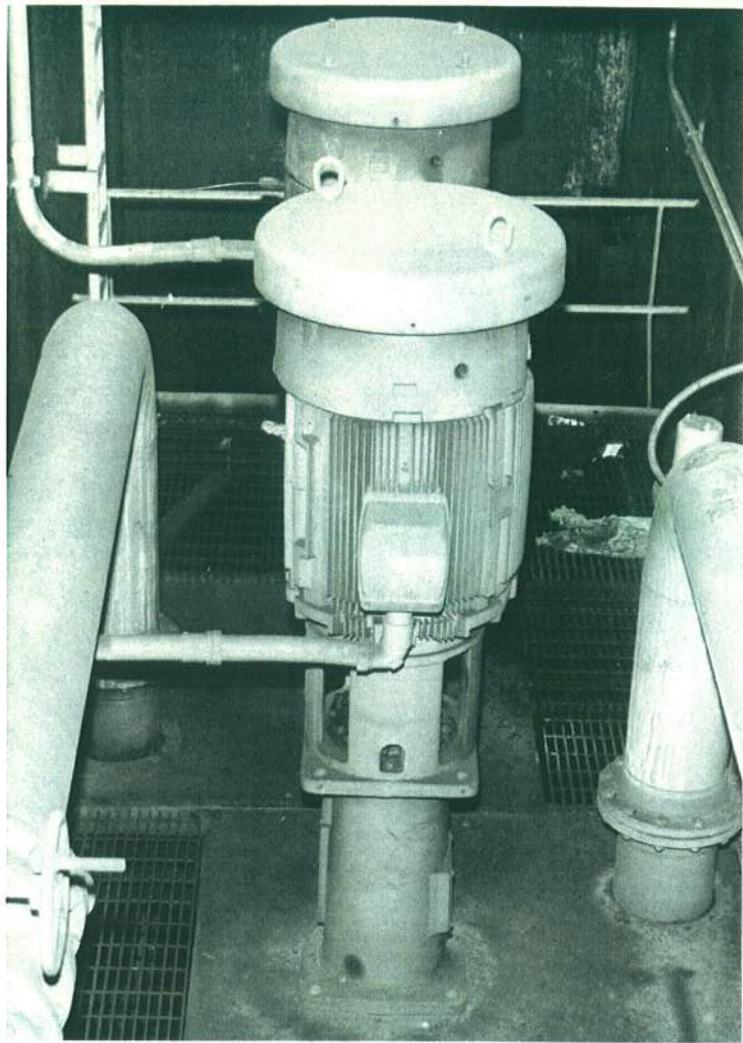
BELT DRIVE

A belt drive reduces the head room requirement and is also very useful where operating conditions are subject to change. It permits a minor change of sheave sizes and belts to accomplish different pump speeds without altering the motor or impeller.

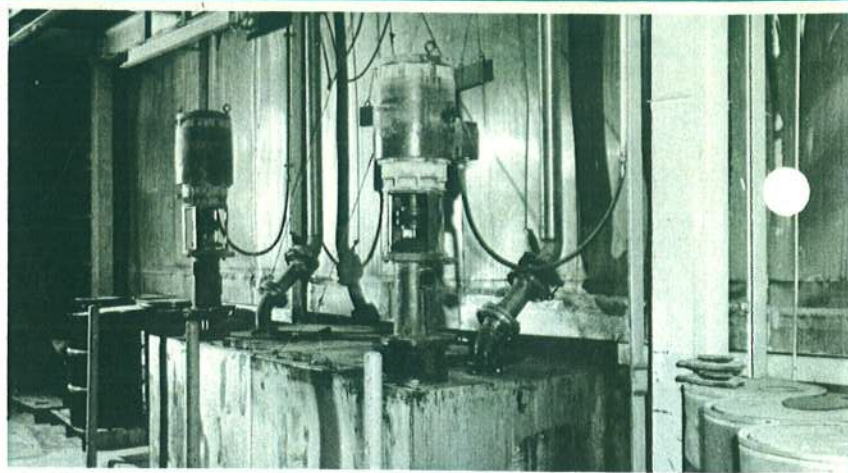


BRACKET MOUNTED

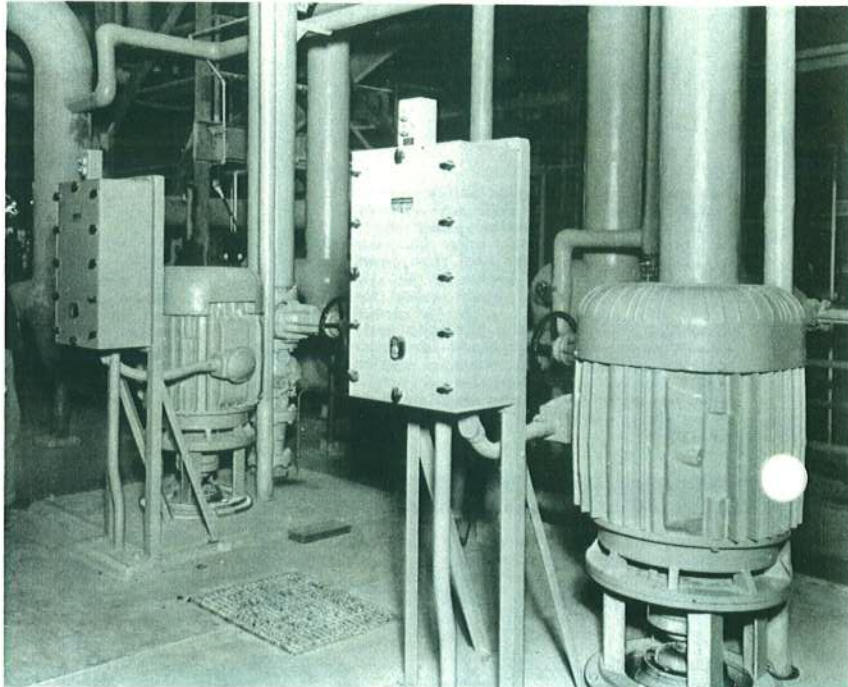
A bracket or chair mounting is available to permit the use of standard horizontal motors for direct connecting by means of a standard flexible coupling.



Above — two Nagle 10" type TWO-R pumps handling abrasive mill scale slurry at Midwestern facility of major steel maker.



Two 4" Nagle type CWO-CS pickling acid pumps installed in metal finishing line at leading manufacturer of home appliance.



Right — two 6" Nagle type CWO-R sump drainage pumps handling water contaminated with ash in boiler house at major Southeastern power producer.

## Typical specifications for Nagle "CWO" & "TWO" Pumps

- Pumps to be cantilever shaft design with no submerged packing, seals, throttle bushings, bearing or any rubbing parts in contact with the pumpage.
- Casing to be of single volute, single discharge and of a slurry design with maximum metal sections.
- Impeller adjustment to be above the mounting plate and of a piloted design to assure concentricity and perpendicularity of the shaft and impeller within the casing.
- Pump to be designed to shut-off condition for maximum protection against deflection.
- Pump bearings designed to withstand maximum possible thrust loads; therefore utilizing standard thrust motors and eliminating outboard bearings.
- Discharge elbow and pipe to be of standard available pipe and fittings eliminating special proprietary items.
- Through bolt construction to be utilized thus eliminating blind tapped holes and stud-type construction.
- All mating proprietary components to be piloted to assure concentricity of assembly.



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