

**Wilfley**

**Centrifugal  
Slurry  
Pump**

**Technical  
Handbook**

**Model HD**



**WILFLEY**

## Table of Contents

---

General Description	1
Description of Features and Components	2
Model HD Pump Capabilities	4
General Characteristics	5
Dimension Print Overhead V-Belt Driven	7
Dimension Print Side V-Belt Driven	8
General Installation Recommendations	9
Ordering Information	10

# Wilfley Model HD Pumps

## A Slurry Pump For The Most Abrasive Slurries

- Single stage
- Single suction
- Horizontal
- To 10" discharge

## Seainless Design

- The Wilfley Expeller
- No water gland pump or piping
- No mechanical seals
- No air pressure
- No stuffing box

## A Wilfley Can Run Dry Indefinitely Because There Is No Rubbing Contact While Running

- No dilution
- No contamination
- No leaking while running

Wilfleys are sealed by hydraulic pressure while running. This centrifugal seal is created by the expeller which was developed by Wilfley over 80 years ago. Wear is minimized on the Wilfley expeller because it operates against intake pressure only.

## Leakless At Shutdown

- The Wilfley HD Diaphragm
- Long wear life
- Low cost
- Reliable
- Easily cleaned

When the HD is shut down, the diaphragm seals against the shaft sleeve. The seal becomes stronger as fluid pressure increases.

## Maintenance—Interchangeability

- The Wilfley Design Advantage
- Quick change wear parts
- Side intake
- Nut and bolt assembly

Maintenance is a major consideration in the development of all Wilfley Pumps. All moving parts in the HD can be changed without disturbing the intake or discharge piping. The HD can be ordered or changed to any metric specification because of its nut and bolt assembly. A high degree of interchangeability is available with discharge, runner, case and shaft sizes.

## Wear Life and Efficiency

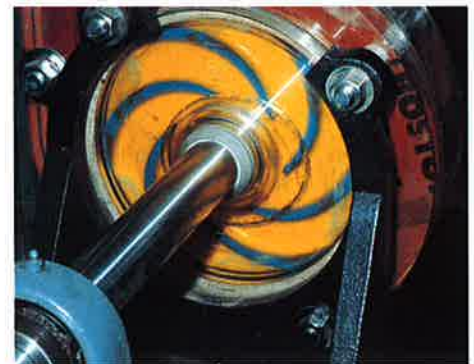
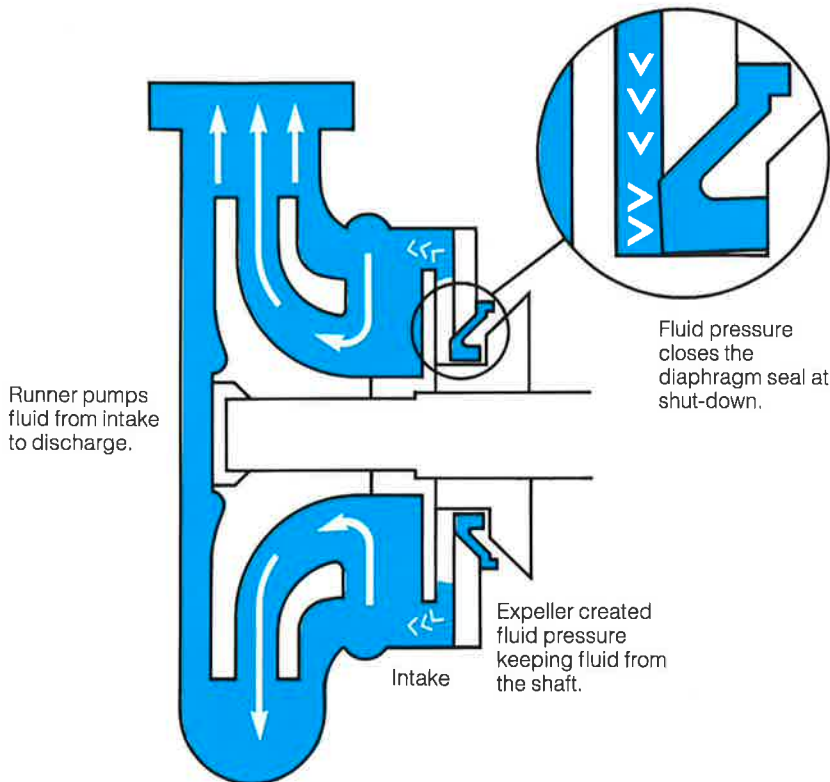
- Modular case construction minimizes waste.
- Wide range of materials

The result is a pump which balances the wear life needed from a heavy duty slurry pump with the high efficiency needed in today's plants.

## Service—Support

- Wilfley Integrity
- Large replacement inventory
- Engineering assistance for the life of the pump
- Quality craftsmanship

A.R. Wilfley & Sons has always produced the finest sealess centrifugal pumps. Wilfley is committed to quality, durability and customer satisfaction. Wilfley still sells parts for and services pumps that have been in continuous service for over 80 years. It is a tradition at Wilfley. The Wilfley HD continues the legacy that is A.R. Wilfley & Sons.



Wilfley hydraulic seal in actual operation.

## Description of Features and Components

The composite case is made up of two major components, the case liner and case shell. The parts are designed to maximize wear and minimize waste. Each part can be replaced independently which promotes efficient use of the entire case.

The case shell acts as a side wearing plate and holds the case assembly on the pump. It receives very little wear and does not need replacement with every new case liner. The case shell can easily be repaired.

The highest case abrasion occurs in the area of the case liner. The case liner is designed to maximize hardness and provide an even long lasting wear life. The open design allows even heat treatment at the foundry which helps eliminate soft spots and maximizes hardness. The case liner has no front plate lugs or feet so the entire part is dedicated to abrasion resistance.

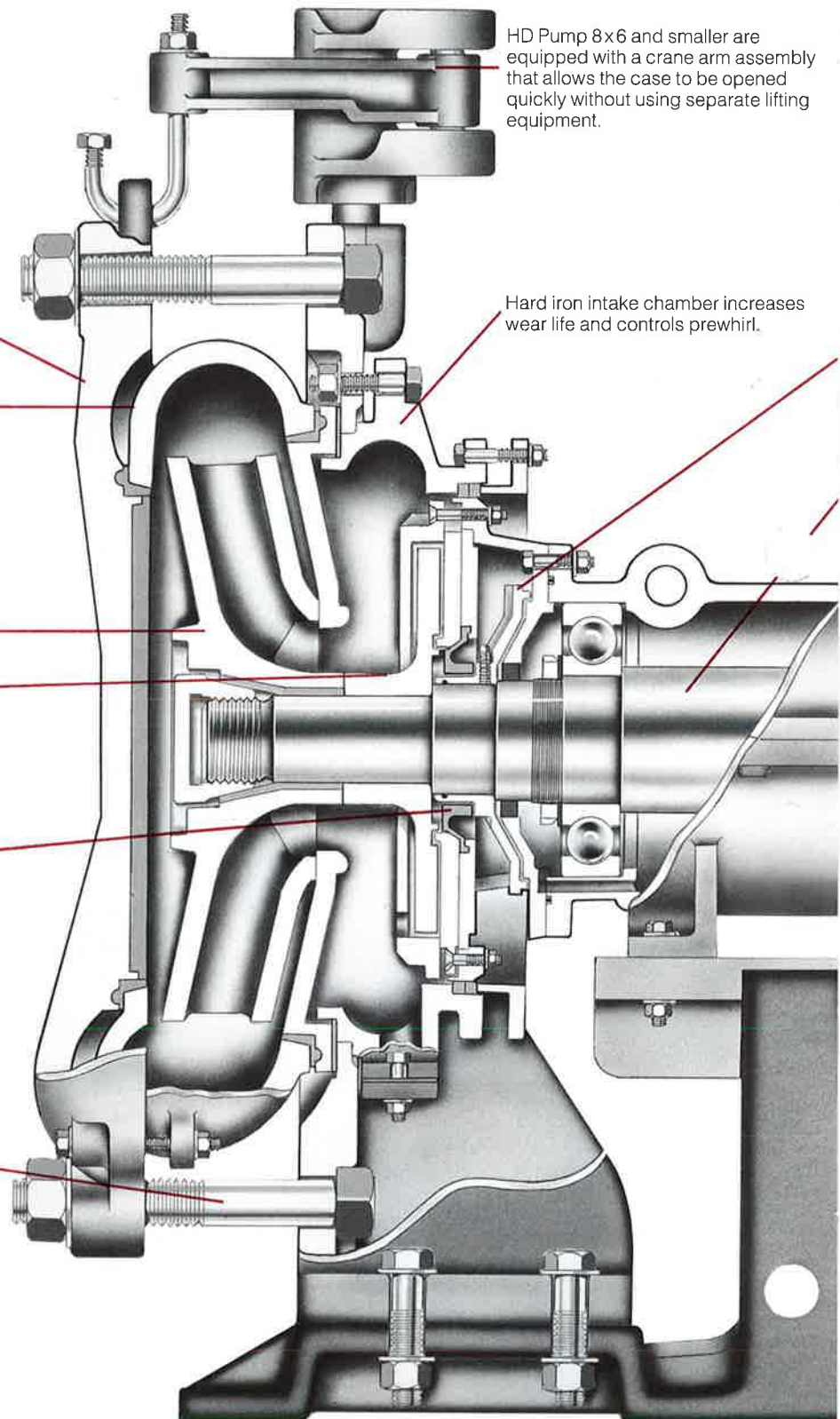
Large diameter runner allows low RPM's which increases wear life.

Expeller design withstands high intake pressures but is not subjected to case pressure.

Diaphragm seal provides positive sealing when pump is shut down. During operation it does not contact the sealing surface and the pump can be run dry with no harmful effects. Diaphragm can be cleaned without disassembling the pump and is inexpensively replaced.

The entire pump is assembled with bolts and nuts, making disassembly and metric adaptation easy.

Rear intake design allows case removal without disturbing the intake piping. It also reduces surging, controls prewhirl and has a drain and vent for special applications.



HD Pump 8x6 and smaller are equipped with a crane arm assembly that allows the case to be opened quickly without using separate lifting equipment.

Hard iron intake chamber increases wear life and controls prewhirl.

The shaft sleeve acts as a slinger to help protect the oil seals and bearings from contamination.

The large diameter shaft is made of high grade steel and has a very short overhang.

The long cylinder has a large oil reservoir for superior bearing lubrication. Bearing bores are machined to precise concentricity for proper bearing alignment.

**Lugs are for the convenience of lifting the long cylinder only. Do not try to lift entire pump with these lugs.**

Heavy duty bearings provide long durable life.

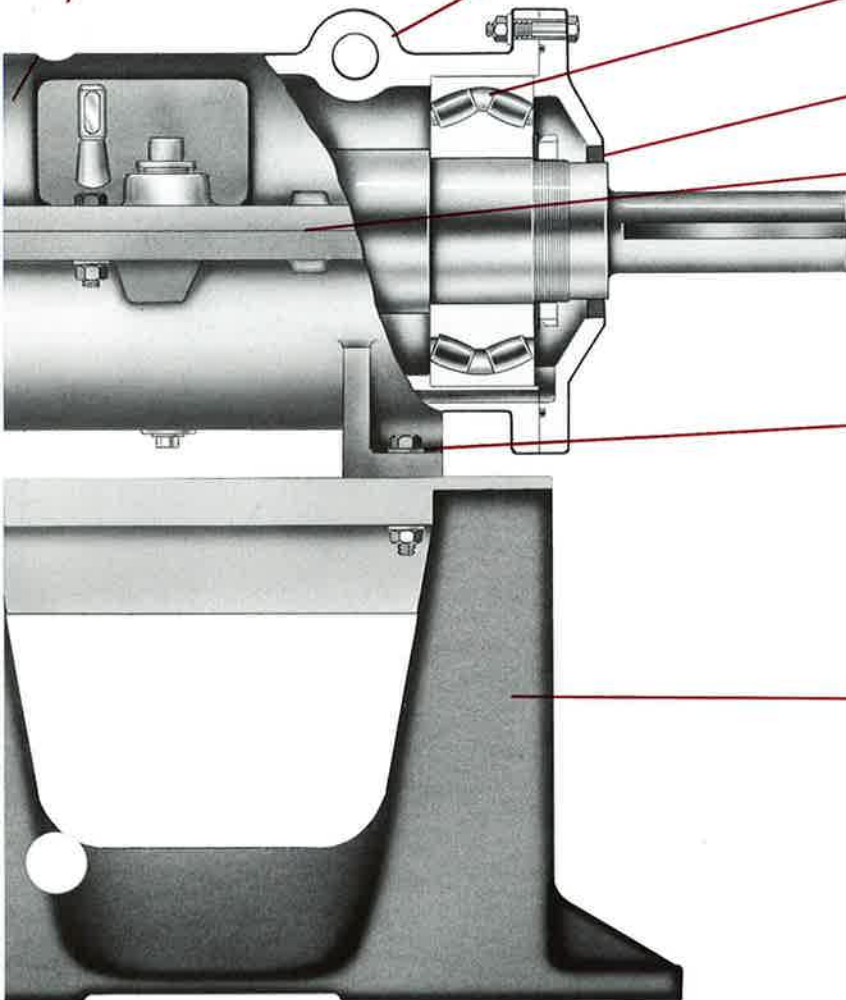
Positive bearing protection is provided by high pressure single lipped bearing oil seals.

Split long cylinder design allows easy replacement of the bearings and shaft.

The long cylinder has feet that makes removal easy and provides a stable base during bench maintenance.

Frame base is made of cast iron with heavy ribbed reinforcement to withstand stresses and dampen vibrations.

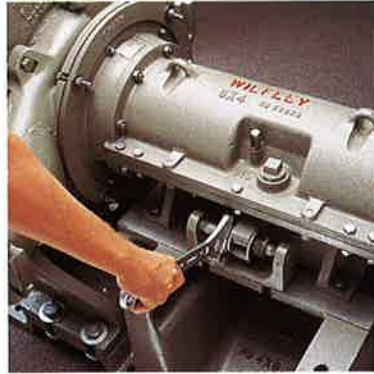
Runner clearance is easily adjusted with the draw bolt bracket.



---

### Runner slippage adjustment

On the Wilfley Model HD Pump a minimum clearance is maintained between the Runner and the Follower Plate by a simple adjustment. This Wilfley feature is appreciated by all operators because it eliminates overspeeding, increases part wear life by eliminating premature replacement, and maintains pump efficiency as normal pump wear occurs.

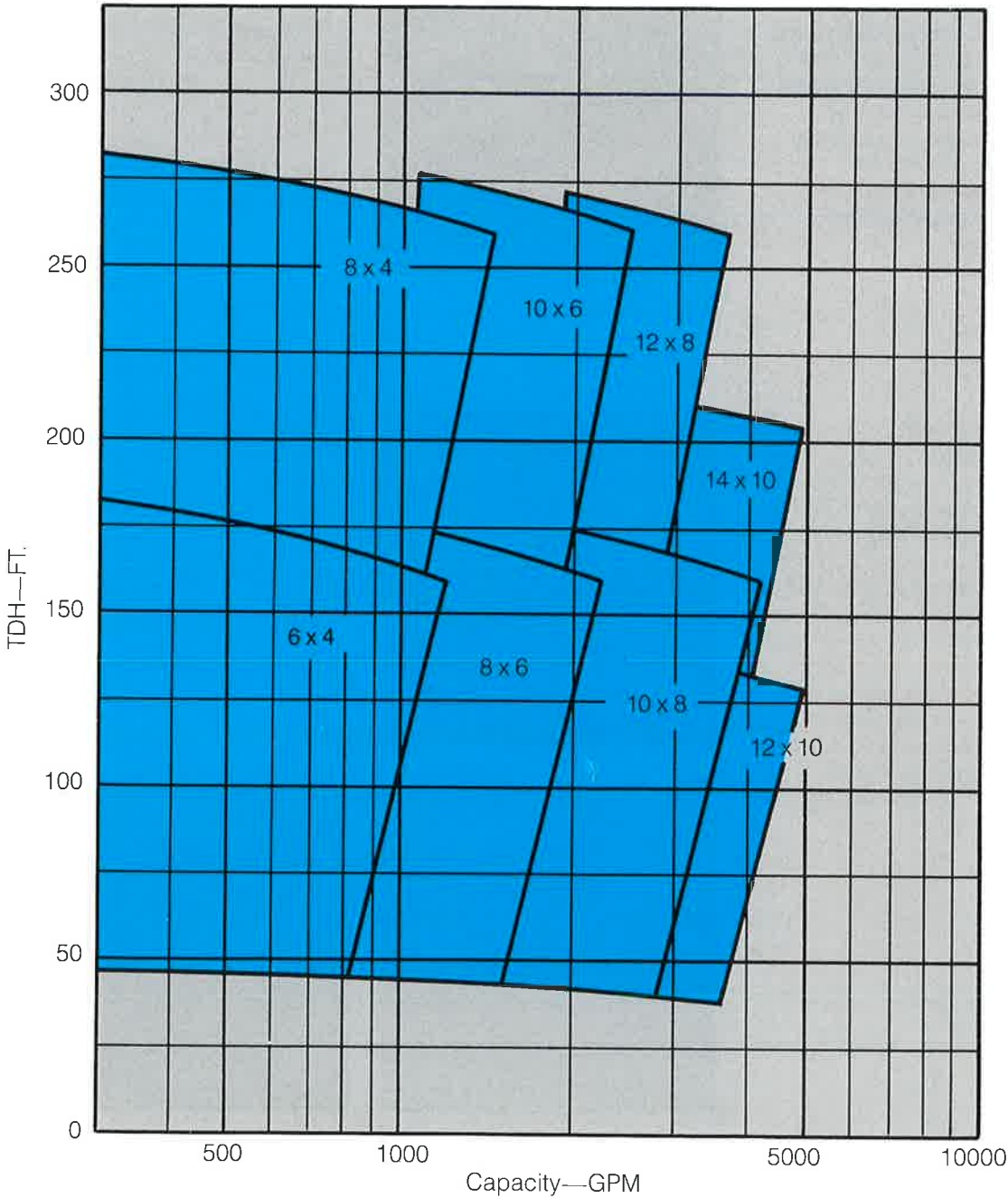


### Quick change features

The seven wear parts—Case Assembly, Runner, Follower Plate, Front Die Ring, Expeller, Rear Die Ring and Check Valve Diaphragm—can be quickly changed without disturbing the intake or discharge piping. This quick change is made possible by a case that is removed with a minimum number of Case Bolts. Pump sizes 8 x 6 and smaller have a Crane Arm assembly that allows the case to swing free which allows easy access to the pump wear parts. This is another exclusive Wilfley feature that saves valuable time.



# Model HD Pump Capabilities



# General Characteristics

Model HD pumps are available in discharge sizes ranging from 4" to 10" in diameter. Special pumping conditions are accommodated with modifications to the basic design.

Two runner sizes are available for each discharge size. The large diameter runner provides high heads and very low speeds to minimize wear in highly abrasive applications. The small diameter runner is less expensive and provides high efficiency in applications where abrasion isn't as critical. Large runners are matched with large shafts and bearings. The chart below shows how runner sizes are matched with discharge sizes and intake frame sizes.

Discharge	Runner Diameter	Intake	Maximum Horsepower
4"	17"	6"	125HP
	22"	8"	250HP
6"	26"	10"	400HP
	30"	12"	600HP
10"	33½"	14"	600HP

Model HD pumps are matched for specific duties. Each discharge size is available in two runner sizes. The size flexibility helps maximize year life and minimize horsepower requirements.

### Special Modifications

Wilfley is equipped to modify pumps for special services; flush ports, special lubrication systems and special drain plugs are common. Wilfley will also engineer modifications required to fit specific installations. You can expect the same high quality Wilfley workmanship with all special modifications.

Wilfley also provides engineering service and in plant modifications for pump related problems such as maintenance and installation. Many applications require specific motor and drive configurations as well as subbases and mounting brackets. Wilfley will design and produce these items to your specifications and satisfaction. Wilfley also has the capability of supplying pumps with a number of exotic corrosion resistant paints.

### Materials of Construction

Wilfley produces pumps from many materials, and can provide special combinations of alloys. Expert advice on the feasibility and durability of many materials has been available at Wilfley for over 80 years.

To assist your selection of materials Wilfley has a full time metallurgist and testing department equipped to accommodate your needs. Wilfley is continually testing the effects that both abrasive and corrosive solutions have on a variety of materials. Wilfley also maintains an extensive library of pump service, corrosion and abrasion data.

The following is a list of materials most commonly used in Wilfley Model HD Pumps. Please note: Many other materials are available for special services.

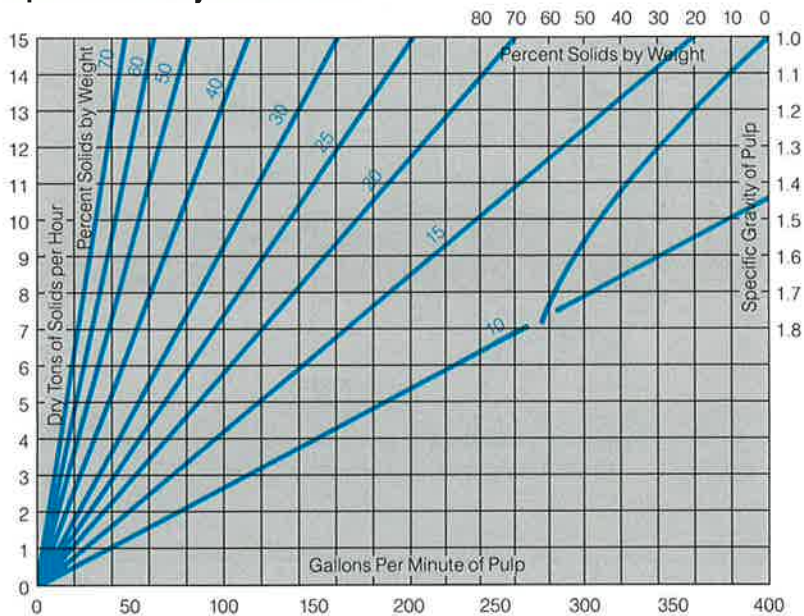
- White Iron
- 27% Chrome
- Ni Hard #1 and #4
- Maxalloy 2

Wilfley manufactures both slurry and acid pumps for a variety of duties. Accompanying the Model HD line are the Wilfley Model AF and Model AG Acid Pumps. For vertical installations, Wilfley offers the Model V Vertical Slurry Pumps. Wilfley Model K Pumps and Model ES Pumps are used for slurry and acid sludge installations. The ES Pump is also used when a negative head is required.

Wilfley will assist you in finding the right pump for your application.



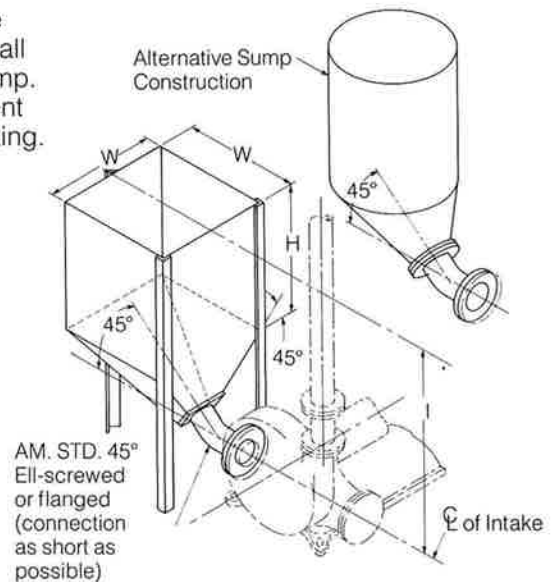
**Pulp Chart**  
**Specific Gravity of Solids 2.7**



**Intake Sump**

It is desirable to feed the Wilfley pump by means of an intake sump or feed box placed as close to the pump as possible. Recommended sump sizes are given below. When the feed to the pump is increased or decreased, the material in the intake sump simply seeks a higher or lower level, respectively. Hopper bottom sumps are much more satisfactory than flat bottom sumps. A sloping pipe from the intake sump into the pump is particularly desirable when handling materials that settle quickly,

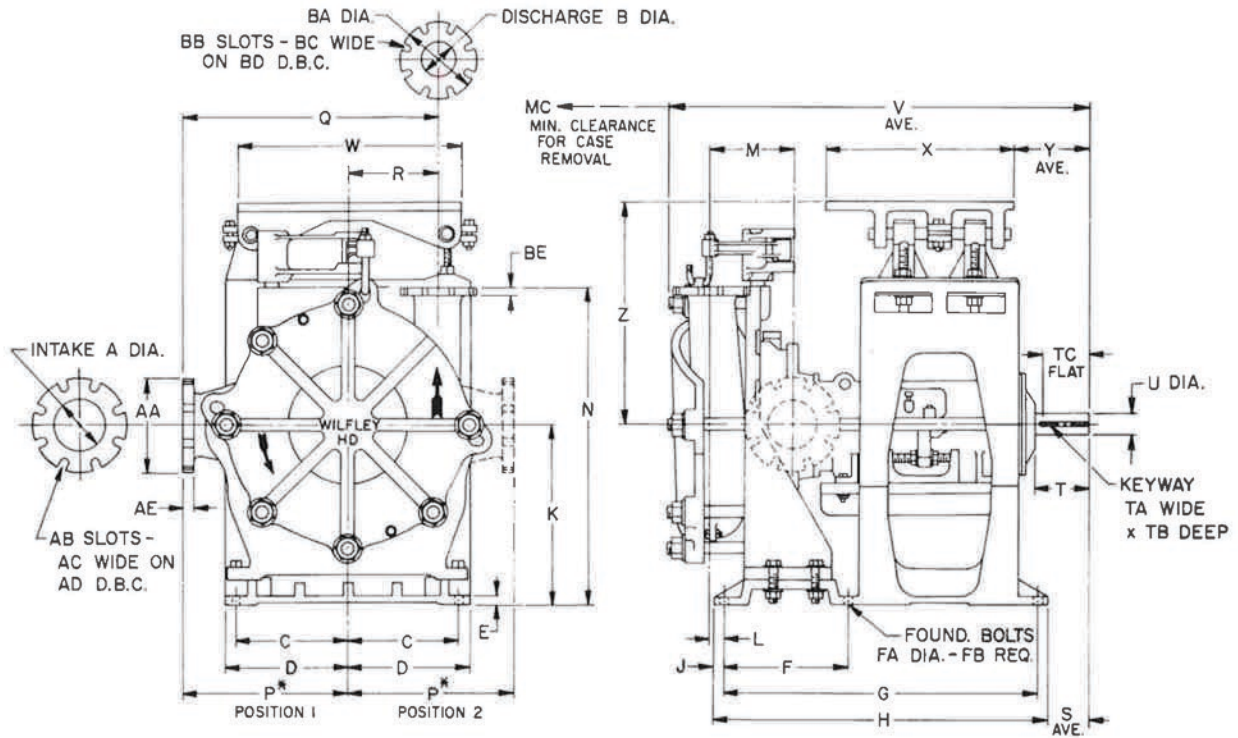
such as concentrates and coarse sands, or when the quantity is small for the size of intake pipe and pump. Long intake pipes require sufficient velocity in the pipe to prevent setting.



**Sump Dimensions**

Discharge Size	4"	6"	8"	10"
W—Inches	66	77	108	120
H—Inches	48	70	76	88
I—Inches	90	132	144	166

# Model HD Slurry Pump Overhead V-Belt Driven



Pump Size A x B	C	CC	D	E	EE	F	FF	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X	Y	Z
4 X 2	NA	13	14 1/4	11/8	NA	NA	14 1/2	36 1/2	39 1/8	1 1/8	21 1/8	13 1/16	7 7/16	37 1/8	19 1/8	27 13/16	8 5/16	4 1/2	6 1/2	2 3/16	47 13/16	26	22	8 3/4	26 1/2
6 x 3	NA	13	14 1/4	11/8	NA	NA	14 1/2	36 1/2	39 1/8	1 1/8	21 1/8	11 1/16	8 13/16	37 1/8	19 1/2	29 5/16	9 13/16	4 1/2	6 1/2	2 3/16	48 11/16	26	22	8 3/4	26 1/2
6 X 4	NA	13	14 1/4	11/8	NA	NA	14 1/2	36 1/2	39 1/8	1 1/8	21 1/8	1 7/16	9 9/16	37 1/8	19 1/2	30	10 1/2	4 1/2	6 1/2	2 3/16	49 1/8	26	22	8 3/4	26 1/2
8 X 4	9	14 1/4	15 1/2	1 1/4	2 3/8	15	25 1/2	45	48	1 1/2	25 5/8	3 1/8	11 7/8	46 5/8	23 1/2	35 3/4	12 1/4	5 7/8	8 7/16	3 3/16	61 1/2	27 1/8	28	6 1/8	31 1/2
8 X 6	9	14 1/2	15 1/2	1 1/4	2 3/8	15	25 1/2	45	48	1 1/2	25 5/8	4 3/16	12 15/16	46 5/8	23 1/2	36 9/16	13 1/16	5 7/8	8 7/16	3 3/16	62 1/2	27 1/8	28	6 1/8	31 1/2
10X6	11 1/2	17	19	1 3/4	3 1/4	18 7/8	31	52	56	2	31 5/8	3 5/8	15 3/8	56 1/8	30 1/2	46 7/16	15 15/16	5 3/4	9 3/8	3 3/4	68 7/8	33 1/8	32	13 3/8	33
10X8	11 1/2	17	19	1 3/4	3 1/4	18 7/8	31	52	56	2	31 5/8	5 1/8	16 7/8	56 1/8	30 1/2	46 1/8	15 5/8	5 3/4	9 3/8	3 3/4	71 5/8	33 1/8	32	13 3/8	33
12X8	14 1/2	20 1/4	22 1/4	2	3 3/4	22 1/4	35 3/4	56 3/4	60 3/4	2	36 1/8	4 7/16	17 9/16	65 5/8	33	50 13/16	17 13/16	6 3/4	10 1/4	3 3/4	77 7/8	33 1/8	32	13 3/8	33
12X10	14 1/2	20 1/4	22 1/4	2	3 3/4	22 1/4	35 3/4	56 3/4	60 3/4	2	36 1/8	6 1/4	19 3/8	65 5/8	33	51 3/8	18 3/8	6 3/4	10 1/4	3 3/4	79 7/8	33 1/8	32	13 3/8	33

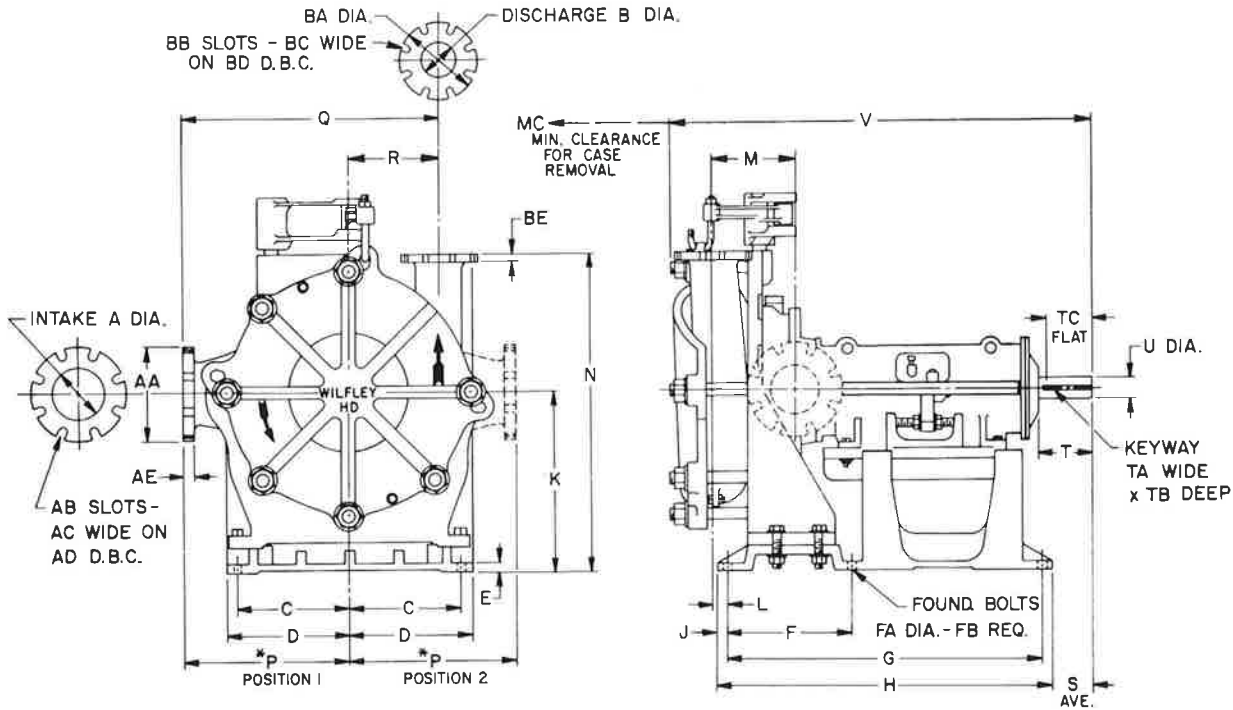
Pump Size A x B	AA	AB	AC	AD	AE	BA	BB	BC	BD	BE	FA	FB	MC	TA	TB	TC
4 X 2	9	8	7/8	7 1/2	11/8	6	4	7/8	4 3/4	13/16	3/4	6	28	1/2	1/4	5 3/8
6 x 3	11	8	1	9 1/2	11/4	7 1/2	4	7/8	6	1	3/4	6	28	1/2	1/4	5 3/8
6 X 4	11	8	1	9 1/2	11/4	9	8	7/8	7 1/2	1 1/8	3/4	6	28	1/2	1/4	5 3/8
8 X 4	13 1/2	8	1	11 3/4	1 3/8	9	8	7/8	7 1/2	1 1/8	3/4	8	30	3/4	7/16	7 1/16
8 X 6	13 1/2	8	1	11 3/4	1 3/8	11	8	1	9 1/2	1 1/4	3/4	8	30	3/4	7/16	7 1/16
10X6	16	12	1 1/8	14 1/4	1/2	11	8	1	9 1/2	1 1/4	1	8	38	7/8	1/2	7 1/2
10X8	16	12	1 1/8	14 1/4	1 1/2	13 1/2	8	1	11 3/4	1 3/8	1	8	38	7/8	1/2	7 1/12
12X8	19	12	1 1/8	7	1 1/2	13 1/2	8	1	11 3/4	1 3/8	1	8	40	7/8	1/2	8 3/8
12X10	19	12	1 1/8	17	1 1/2	16	12	1	14 1/4	1 3/8	1	8	40	7/8	1/2	8 3/8

Dimensions shown are not for construction unless certified.

All dimensions are in inches.

\*Intake may be affected from either side.

# Model HD Slurry Pump Side V-Belt Driven



Pump Size A x C	C	CC	D	E	EE	F	FF	G	H	J	K	L	M	N	P	Q	R	S	T	U	V
4 X 2	NA	13	14 1/4	1 1/8	NA	NA	14 1/2	36 1/2	39 1/8	1 1/8	21 1/8	.13/16	7 7/16	37 1/8	19 1/2	27 13/16	8 5/16	4 1/2	6 1/2	2 3/16	47 13/16
6 x 3	NA	13	14 1/4	1 1/8	NA	NA	14 1/2	36 1/2	39 1/8	1 1/8	21 1/8	.11/16	8 13/16	37 1/8	19 1/2	29 5/16	9 13/16	4 1/2	6 1/2	2 3/16	48 11/16
6 X 4	NA	13	14 1/4	1 1/8	NA	NA	14 1/2	36 1/2	39 1/8	1 1/8	21 1/8	1 7/16	9 9/16	37 1/8	19 1/2	30	10 1/2	4 1/2	6 1/2	2 3/16	49 1/8
8 X 4	9	14 1/4	15 1/2	1 1/4	2 3/8	15	25 1/2	45	48	1 1/2	25 5/8	3 1/8	11 7/8	46 5/8	23 1/2	35 3/4	12 1/4	5 7/8	8 7/16	3 3/16	61 1/2
8 X 6	9	14 1/2	15 1/2	1 1/4	2 3/8	15	25 1/2	45	48	1 1/2	25 5/8	4 3/16	12 15/16	46 5/8	23 1/2	36 9/16	13 1/16	5 7/8	8 7/16	3 3/16	62 1/2
10 X 6	11 1/2	17	19	1 3/4	3 1/4	18 7/8	31	52	56	2	31 5/8	3 5/8	15 3/8	56 1/8	30 1/2	46 7/16	15 15/16	5 3/4	9 3/8	3 3/4	68 7/8
10 X 8	11 1/2	17	19	1 3/4	3 1/4	18 7/8	31	52	56	2	31 5/8	5 1/8	16 7/8	56 1/8	30 1/2	46 1/8	15 5/8	5 3/4	9 3/8	3 3/4	71 5/8
12 X 8	14 1/2	20 1/4	22 1/4	2	3 3/4	22 1/4	35 3/4	56 3/4	60 3/4	2	36 1/8	4 7/16	17 9/16	65 5/8	33	50 13/16	17 13/16	6 3/4	10 1/4	3 3/4	77 7/8
12 X 10	14 1/2	20 1/4	22 1/4	2	3 3/4	22 1/4	35 3/4	56 3/4	60 3/4	2	36 1/8	6 1/4	19 3/8	65 5/8	33	51 3/8	18 3/8	6 3/4	10 1/4	3 3/4	79 7/8

Pump Size A x B	AA	AB	AC	AD	AE	BA	BB	BC	BD	BE	FA	FB	MC	TA	TB	TC
4 X 2	9	8	7/8	7 1/2	1 1/8	6	4	7/8	4 3/4	13/16	3/4	6	28	1/2	1/4	5 3/8
6 x 3	11	8	1	9 1/2	1 1/4	7 1/2	4	7/8	6	1	3/4	6	28	1/2	1/4	5 3/8
6 X 4	11	8	1	9 1/2	1 1/4	9	8	7/8	7 1/2	1 1/8	3/4	6	28	1/2	1/4	5 3/8
8 X 4	13 1/2	8	1	11 3/4	1 3/8	9	8	7/8	7 1/2	1 1/8	3/4	8	30	3/4	7/16	7 1/16
8 X 6	13 1/2	8	1	11 3/4	1 9/16	11	8	1	9 1/2	1 1/4	3/4	8	30	3/4	7/16	7 1/16
10 X 6	16	12	1 1/8	14 1/4	1/2	11	8	1	9 1/2	1 1/4	1	8	38	7/8	1/2	7 1/2
10 X 8	16	12	1 1/8	14 1/4	1 1/2	13 1/2	8	1	11 3/4	1 3/8	1	8	38	7/8	1/2	7 1/12
12 X 8	19	12	1 1/8	7	1 1/2	13 1/2	8	1	11 3/4	1 3/8	1	8	40	7/8	1/2	8 3/8
12 X 10	19	12	1 1/8	17	1 1/2	16	12	1	14 1/4	1 3/8	1	8	40	7/8	1/2	8 3/8

Dimensions shown are not for construction unless certified.  
 All dimensions are in inches.  
 \*Intake may be affected from either side.

## General Installation Recommendations

---

### Inspection upon Arrival

Your pump has been carefully inspected and tested prior to shipment to assure that it meets your requirements. Please inspect the pump upon arrival for any damage which may have occurred during shipment. Report any damage immediately to the carrier. Leave all shipping covers attached to the pump unit until it's ready for installation. If installation is to be delayed more than 15 days, the pump shaft should be rotated by hand once a week to lubricate the bearings and prevent rusting.

### Choosing Pump Location

The following recommendations may be helpful when choosing the best location for your pump.

- a. Locate the pump as close to the liquid source as practical so that the suction pipe is short and direct with a minimum of elbows, fittings and valves. Intake pipe must not slope upward toward the pump.
- b. Place the pump in a location so that the unit is accessible for inspection during operation as well as for maintenance operations involving removal and disassembly.
- c. Intake and discharge can be rotated to accommodate piping from the top or either side of the pump.

### Foundations

The foundations should be sufficiently substantial to absorb any vibration and to form a permanent support for the frame. This is important in maintaining the correct alignment of the direct connected unit. A concrete foundation on a solid base is satisfactory. Foundation bolts of the proper size should be embedded in the concrete located by the outline drawing.

### Alignment

It is necessary to align the pump and motor after the complete unit has been leveled on the foundation and after the foundation bolts have been tightened. Explicit directions for checking and aligning the pump components may be found in the Hydraulic Institute Standard.

### Piping

Both suction and discharge pipes should be supported independently near the pump so that when the flange bolts are tightened no strain will be transmitted to the pipe casing. Expansion joints should be installed where large temperature variations are involved, with a pipe anchor used between pump and the expansion joint. Piping should have the proper valving so that the pump can be removed for maintenance.

## Ordering Information

---

Wilfley Pumps are engineered to operate in compliance with exact specifications. Careful evaluation of pumping conditions is needed to provide accurate pump recommendations and quotations.

**This list will help establish specific pumping conditions.**

- Solution
- Temperature
- Static Head
- Discharge Pipe Size
- Length, Discharge Pipe
- Discharge Pipe Fittings
- Total Head
- Maximum Suction Pressure
- Minimum Suction Pressure
- Capacity—GPM
- Specific Gravity
- % Solids by Weight
- Maximum Size of Solid Particles
- Mesh Analysis
- Electrical Characteristics
- Viscosity