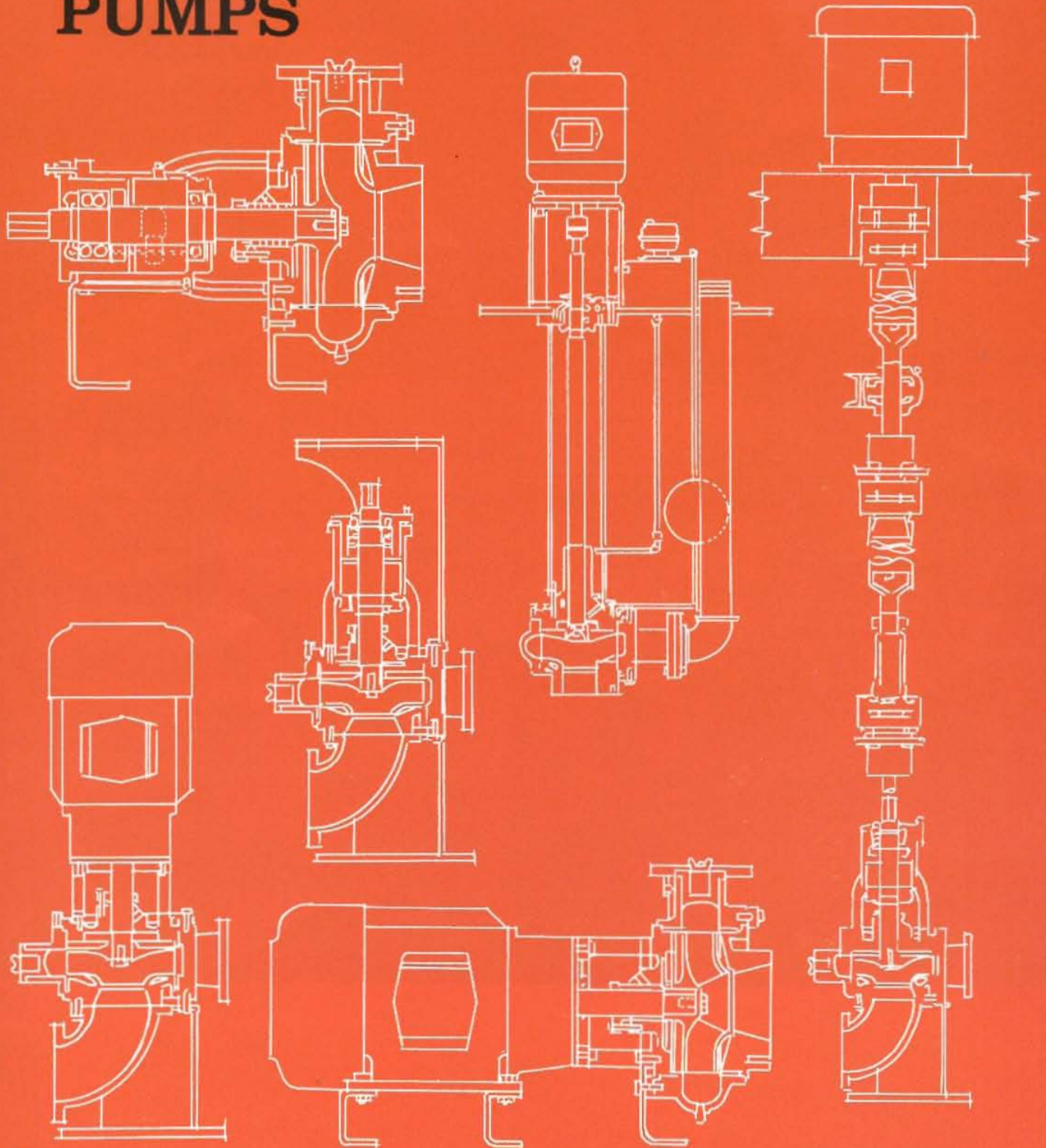


BUFFALO "SH" SOLIDS HANDLING PUMPS



SOLIDS HANDLING PUMPS / "SH"

Background

The solids handling pumps described in this Bulletin are based on Buffalo's over 75 years of experience in designing and manufacturing centrifugal pumps for handling solids in industrial process and waste liquid systems. These latest models incorporate the time proven Buffalo enclosed extra-wide non-clog impeller, and bearing frames from the highly successful Buffalo Four-Way Pump series. The result is a comprehensive line of efficient, easily serviced, long-lived solids handling pumps offering a high degree of parts interchangeability to reduce your parts inventory requirements.

Applications

These solids handling pumps have proven their capability on thousands of applications. They are in use handling raw sewage, paper stock, slurries from paint spray booths, waste from food processing, coal slurries in power plants, bagasse slurries in sugar mills and numerous other applications requiring the handling of solids and slurries.

Overall Specifications

The "SH" Solids Handling Pump is a frame mounted, back pull-out single suction pump featuring an enclosed impeller, oversize bearings, rotatable discharge, and overall rugged construction.

Models Available

HORIZONTAL

VERTICAL NON-SUBMERGED

VERTICAL SUBMERGED

CLOSE COUPLED

CAPACITIES TO: 6000 GPM

WORKING PRESSURE: TO 100 PSI

HEAD: TO 225'

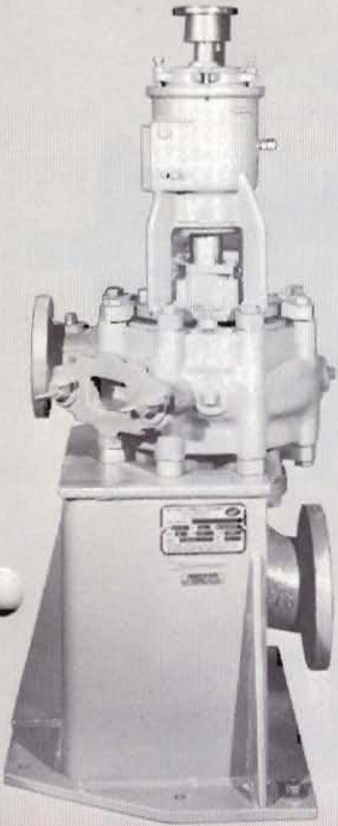
SOLIDS HANDLED: UP TO 4"

EFFICIENCIES: TO 88%

BEARING LIFE: Minimum L (10) exceeds 2 years

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SOLIDS HANDLING PUMPS / "SH"



Buffalo "VNS-SH" Vertical Non-Submerged Pump

This configuration may be shaft driven from the floor above (as model illustrated) or have a motor mounting flange attached to the bearing frame.

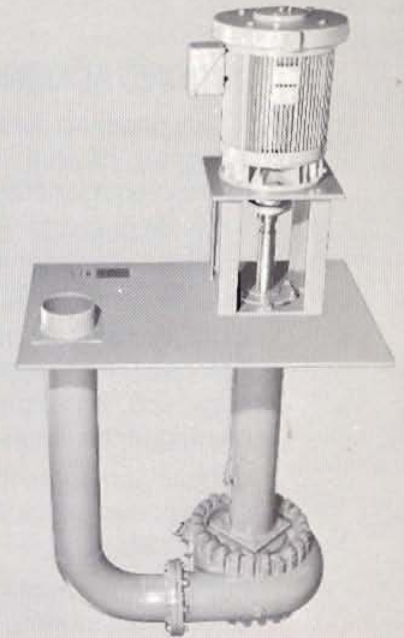
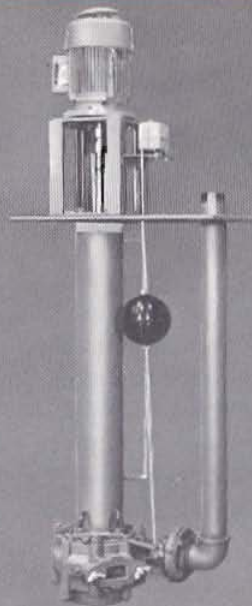
Buffalo "VS-SH" Vertical Submerged Pump

Ready for shipment, this VS pump is equipped with a float and float activated switch.



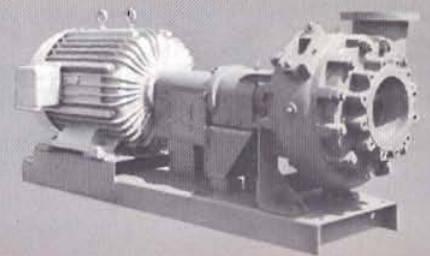
Buffalo "SH" Inlet View

Note the quick release lugs, impeller locking nut and rounded impeller vanes designed to readily accept solids into the impeller.



Buffalo "VS-SH" Vertical Submerged Pump

A large size VS without float and switch. Discharge is not threaded since piping will be welded.



Buffalo "H-SH" Horizontal Pump

Typical horizontal model showing coupling guard, bearing stand, pump and motor base, all mounted on a common steel base. Note "hand hole" in casing for easy inspection.

SOLIDS HANDLING PUMPS / "SH"

"SH" Design/Construction Features

RUGGED BEARING - SHAFT ARRANGEMENT

Solids handling pumps place heavy demands on shafts and bearings. Buffalo design engineers have selected bearing-shaft combinations which are best suited to the three pump configurations in the "SH" line.

Buffalo horizontal "SH" pumps utilize heavy duty ball type thrust bearings, with oil lubrication, mounted in a rugged cast iron bearing frame. Vertical submerged pumps have a Cutless rubber sleeve bearing at the pump end, with a grease lubricated ball type thrust bearing at the upper end of the shaft.

Vertical non-submerged pumps feature a roller bearing at the pump end of the bearing stand and a ball type thrust bearing at the motor end.

Pump shafts are of 4340 steel hardened to 500 Brinell through the stuffing box. When a mechanical seal is specified, the shaft is of 303SS.

In each instance, Buffalo engineers have selected the best combination of design and materials of construction to meet the operating conditions.

QUICK RELEASE LUGS - INSPECTION PORT

The ability to easily gain access to the inside of the pump casing, and to quickly remove the impeller are prime requirements of solids handling pumps. Each Buffalo "SH" Pump has a hand hole port in the casing. Quick release locking lugs of high strength sintered metal allow fast withdrawal of back-removal element from the casing. The piping remains undisturbed. These features make Buffalo "SH" Pumps among the easiest to service.



SOLIDS HANDLING PUMPS / "SH"

"SH" Performance Features

HIGH EFFICIENCY IMPELLERS

Impellers for "SH" Pumps are of an extra wide enclosed non-clog design, having two, three or four vanes, depending on the pump size. They are keyed to the shaft and secured by a cap screw and washer together with either a locking pin or a locking plate. This prevents loosening with reverse rotation. The vanes at suction are rounded from the impeller inlet to offer maximum acceptance of solids. Auxiliary vanes on the external face of the back shrouds assist in clearing the casing area adjacent to the shrouds.



These unique impellers handle solids effectively while maintaining up to 88% mechanical efficiencies.

VERSATILITY OF INSTALLATION

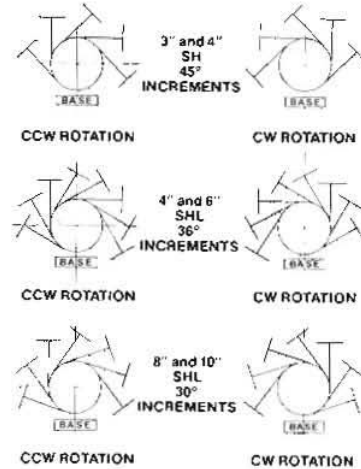
The ability to select a discharge position best suited to your installation requirements adds to the ease of installation. Buffalo "SH" Pumps provide the discharge position shown in the diagrams at the right. Rotation of discharge is easily accomplished due to the quick release casing lugs.

LONG SERVICE LIFE

Correct design, properly sized components, quality construction and ease of service all contribute to an extended service life for Buffalo "SH" Solids Handling Pumps. Add the economy of efficient operation and you realize a very favorable long-term cost of ownership.

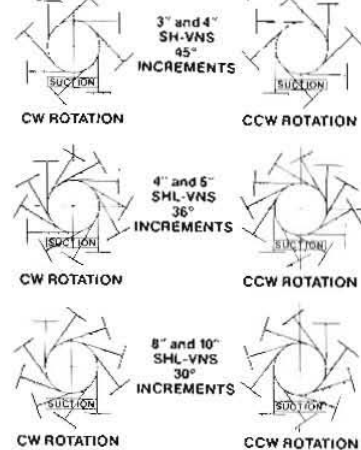
Discharge Positions

HORIZONTAL Viewed from suction end



VERTICAL NON-SUBMERGED

Viewed from top



SOLIDS HANDLING PUMPS / "SH"

Concept

The design criteria for centrifugal pumps to handle solids in suspension differs in several ways compared to pumps for handling clear liquids.

The ability to handle solids must be achieved without a sacrifice in hydraulic efficiency. Pumps handling solids are subjected to operating conditions which place a premium on rugged construction. Ease of disassembly, for inspection and maintenance, is of paramount importance. Several configurations are needed to meet installation requirements frequently

encountered in process systems containing solids.

Parts interchangeability is a very desirable feature too, since more than one model solids handling pump type may be used within a given plant.

Buffalo "SH" Solids Handling Pumps meet all of these criteria, as detailed feature-by-feature in this Bulletin. You may choose your solids handling pumps from the Selection Chart on the facing page with the assurance that it will meet your requirements.

PARTS INTERCHANGEABILITY

Pump Sizes	H-3SH	H-4SHL	H-6SHL	H-8SHL	H-10SHL	VNS-3SH	VNS-4SH	VNS-4SHL	VNS-6SHL	VNS-8SHL	VNS-10SHL	VS-3SH	VS-4SH	VS-4SHL	VS-6SHL	VS-8SHL	VS-10SHL
	H-3SH	H-4SH	H-4SHL	H-8SHL	H-10SHL	VNS-3SH	VNS-4SH	VNS-4SHL	VNS-6SHL	VNS-8SHL	VNS-10SHL	VS-3SH	VS-4SH	VS-4SHL	VS-6SHL	VS-8SHL	VS-10SHL
Bearing Frame or Shaft Group	M3-S	M4-S	M4-S	M3-VNS	M4-VNS	VC-3S	VC-4S	VC-5S									
Pump Component Parts																	
Shaft	M-3	M-4	M-3	M-4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sleeve Bearing	NA	NA	NA	NA	VC-3	VC-4	VC-5										
Gland	M-3	M-4	M-3	M-4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Deflectors	M-3	M-3S	M-3	M-3S	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bearing Frame	M-3	M-4	M-3	M-4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bearing Cover	M-3	M-4	M3-VNS	M4-VNS	VC-3	M3-VNS	M4-VNS										
Guide Bearing	M3-S	M4-S	M3-S	M4-S	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thrust Bearing	M-3	M-4	M-3	M-4	M-2	VC-4	M-4										
Bearing Lock Nut	M-3	M-4	M-4	M-4	NA	NA	M-4										
Bearing Lock Washer	M-3	M-4	M-4	M-4	NA	NA	M-4										
Hand Hole Cover	M-3S	M-4S	M3-S	M-4S	M-3S	M-4S	M-3S	M-4S	M-3S	M-4S	M-3S	M-4S	M-3S	M-4S	M-3S	M-4S	M-3S
Spring Retaining Rings	M-3	M-4	M-3	M-4	M-2	M-3	M-4										

NOTE: Parts listed in vertical columns are interchangeable for pump models listed at the top of the column. Further, parts that have the same designation in more than one column are interchangeable with

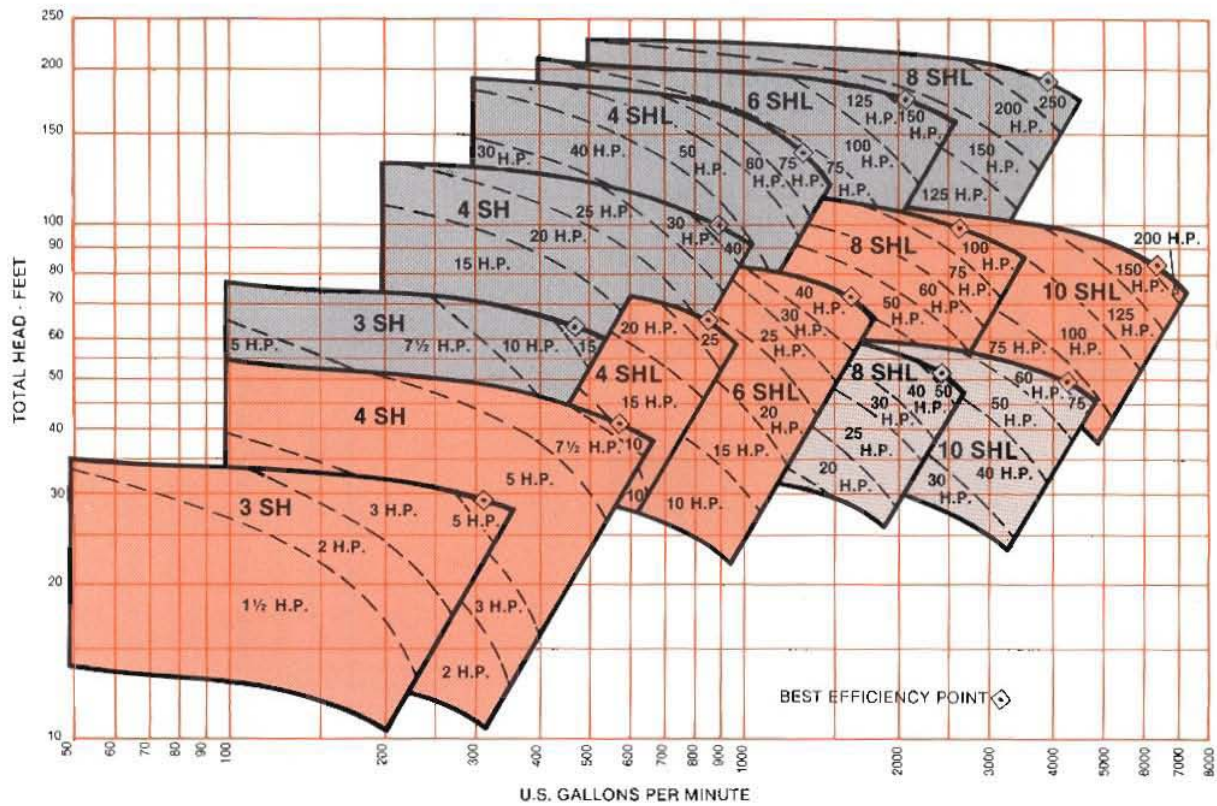
NA. Not applicable. Part not used on this model.

parts on pumps listed in each column where the part designation appears. For example, the same shaft is interchangeable on pump models H-3SH, H-4SH, VNS-3SH and VNS-4SH.

SOLIDS HANDLING PUMPS / "SH"

Selection Chart

PERFORMANCE DATA 1750 RPM 1150 RPM 860 RPM



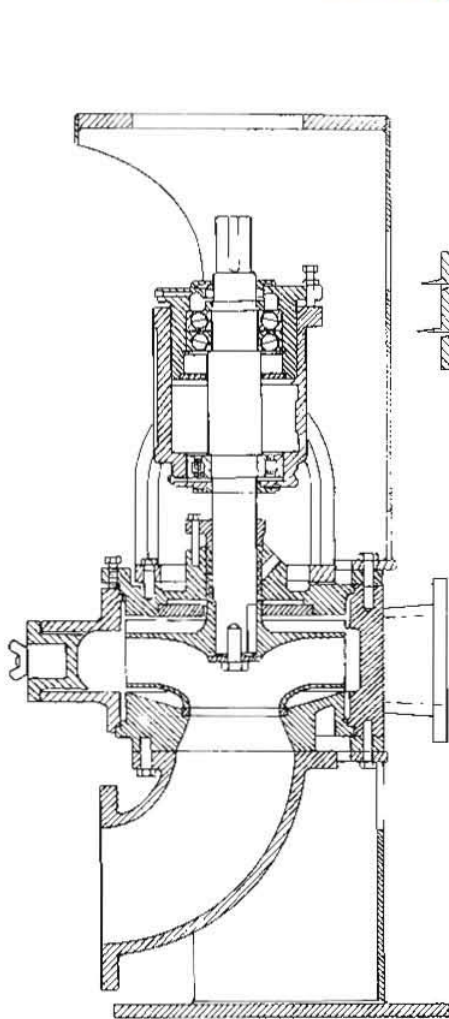
MAXIMUM SIZE OF SOLIDS HANDLED/PUMP SIZE

Horizontal & Vertical Models

	3SH	4SH	4SHL	6SHL	8SHL	10SHL
Shaft Groups	M-3	M-3	M-4	M-4	M-4	M-4
Max. Working Pressure PSIG	65	100	100	100	100	100
Max. Size of Solids	2 3/8"	3"	2 3/4"	3"	4"	4"
No. of Impeller Vanes	2	2	2	2	4	3
Rotation Available	Both	Both	Both	Both	CW	Both

SOLIDS HANDLING PUMPS / "SH"

Design Configurations

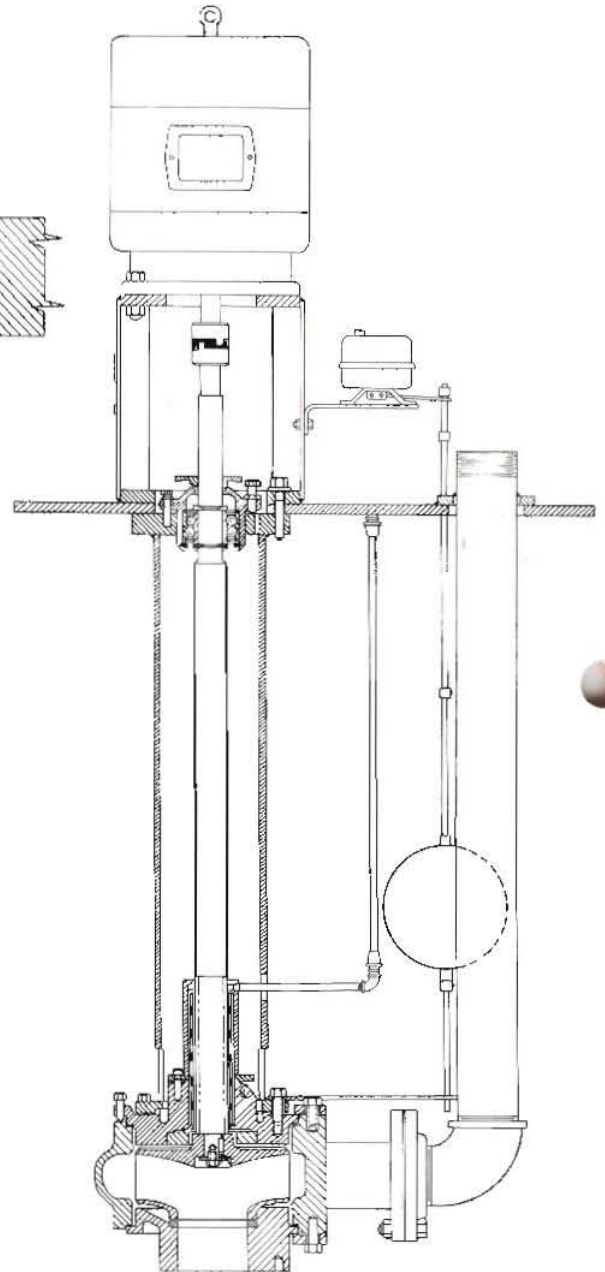
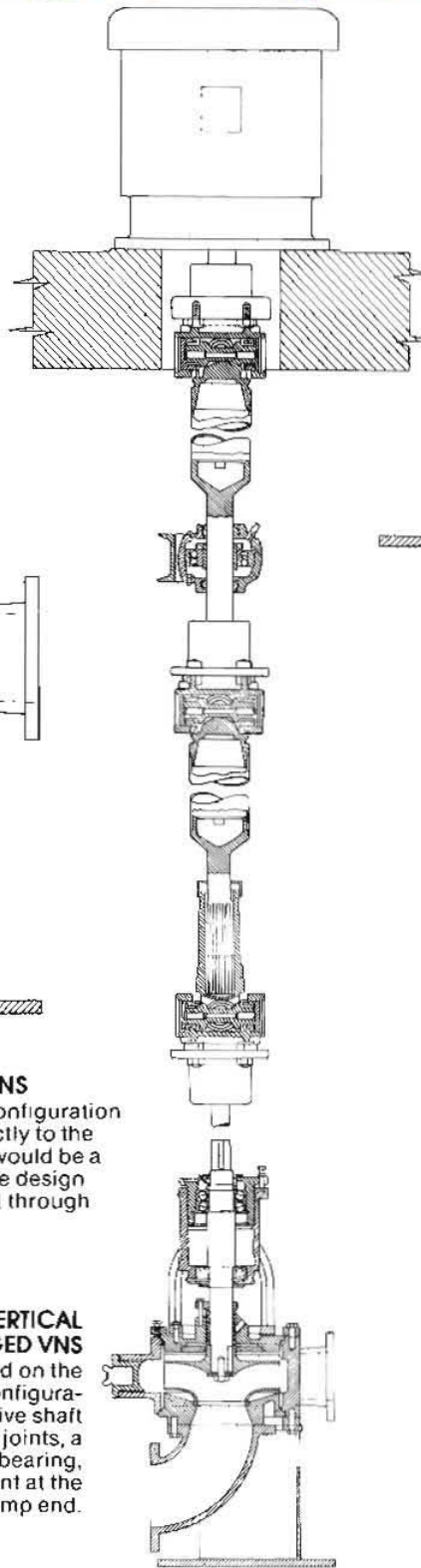


BUFFALO VERTICAL NON-SUBMERGED PUMP VNS

This popular space saving configuration has the motor mounted directly to the top flange. The motor used would be a normal thrust, vertical P-base design connected to the pump shaft through a flexible coupling.

BUFFALO VERTICAL NON-SUBMERGED VNS

When the motor is to be mounted on the floor above the pump floor, this configuration is required. The tubular drive shaft has needle bearing universal joints, a split pillow block intermediate bearing, if required, and a splined slip joint at the pump end.



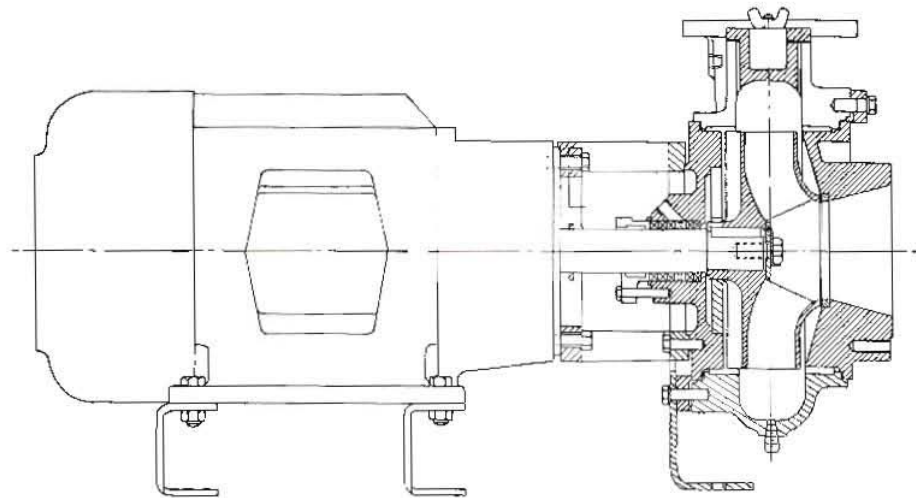
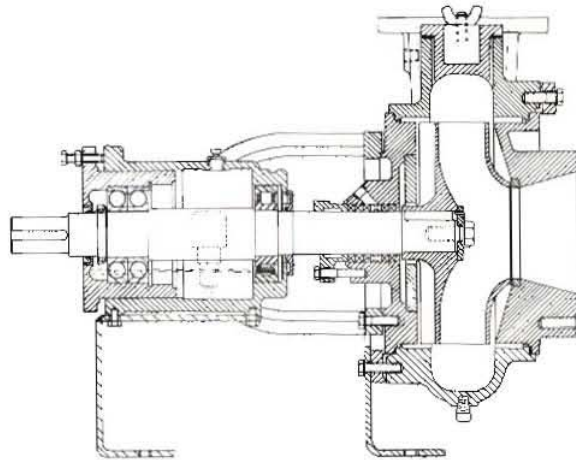
BUFFALO VERTICAL SUBMERGED VS

Designed for wet pit installation, the submerged pump is suspended from the pit cover plate. The motor, motor stand and float controlled motor switch are mounted above the cover plate as shown.

SOLIDS HANDLING PUMPS / "SH"

BUFFALO HORIZONTAL H

A standard horizontal configuration with pump and motor mounted on a common steel base plate.

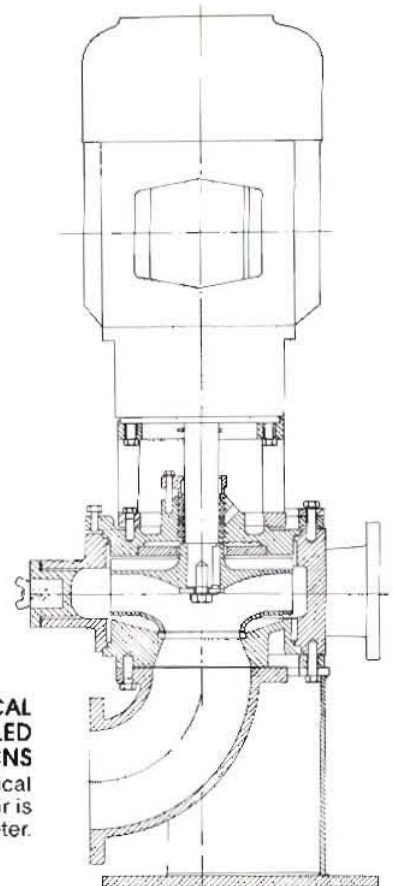


BUFFALO HORIZONTAL CLOSE COUPLED CC

Designed for limited space applications, this configuration has the motor connected directly to the pump by a motor-pump adapter.

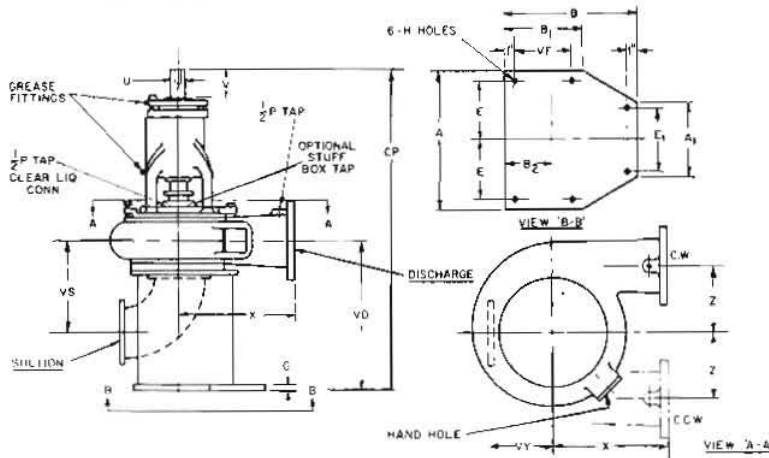
BUFFALO VERTICAL CLOSE COUPLED NON-SUBMERGED VCCNS

For space saving conditions where a vertical non-submerged pump is required. The motor is mounted to the pump by a pump-motor adapter.



SOLIDS HANDLING PUMPS / "SH"

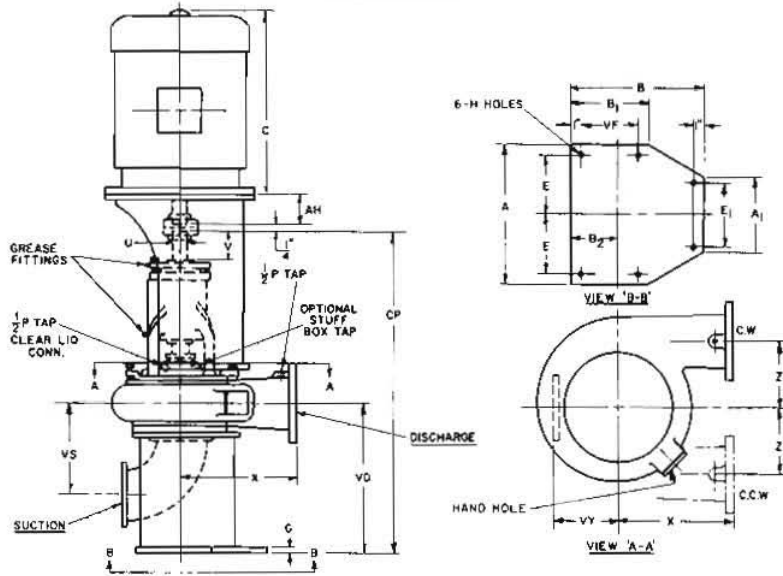
Vertical Non-Submerged Pumps



SUCTION & DISCHARGE FLANGE DIMENSIONS						
Pressure Series	Standard					
Nominal Pipe Size	3	4	6	8	10	12
Outside Diameter	7½	9	11	13½	16	19
Bolt Circle	6	7½	9½	11¾	14¼	17
Bolts (Straddling)	4-5/8	8-5/8	8-3/4	8-3/4	12-7/8	12-7/8
Thickness	1½/16	19/16	1	1½	17/16	1¼

Suction and discharge flange dimensions shown here apply to all "SH" pumps

Size	Suct. x Disch. x Imp. Dia.	A	A ₁	B	B ₁	B ₂	E	E ₁	G	H	U +.0000 - .0005	Keyway	X	Z	CP	VD	VF	VY	VS	V
VNS-3SH	4x3x9	21½	12¾	15¼	7¼	5	9¼	11	½	¾	1¾	3/16 x .176	10	5¼	41	20	5¼	8½	12	3
VNS-4SH	6x4x11	21½	12¾	15¼	7¼	5	9¼	11	½	¾	1¾	3/16 x .176	10	7¼	41	20	5¼	8	13½	3
VNS-4SHL	6x4x14	30	17¾	23	12¼	8	13¼	15	¾	¾	2¾	3/16 x .332	12	7¼	55	25	10¼	8	15½	3¾
VNS-6SHL	8x6x14½	30	17¾	23	12¼	8	13¼	15	¾	¾			12	9¼	55	25	10¼	9	16½	
VNS-8SHL	10x8x16	33½	21¼	25½	15¼	8¾	15¼	18¾	¾				15	11¼	64	33	13¾	11	21	
VNS-10SHL	12x10x17	33½	21¼	25½	15¼	8¾	15¼	18¾	¾				19	12¼	64	33	13¾	12	22	



Motor Frame	C	AH	Motor Frame	C	AH
182 HP	15¼	2¾	324 HP	28¾	4½
184 HP	15¼		326 HP	28¾	
213 HP	18¼		364 HP	30¾	
215 HP	18¼		365 HP	30¾	
254 HP	23		404 HP	34¾	
256 HP	23		405 HP	34¾	
284 HP	26¼		444 HP	39¾	
286 HP	26¼		445 HP	39¾	
			447 HP	43¾	

Size	Suct. x Disch. x Imp. Dia.	A	A ₁	B	B ₁	B ₂	E	E ₁	G	H	U +.0000 - .0005	Keyway	X	Z	CP	VD	VF	VY	VS	V
VNS-3SH	4x3x9	21½	12¾	15¼	7¼	5	9¼	11	½	¾	1¾	3/16 x .176	10	5¼	41	20	5¼	8½	12	3
VNS-4SH	6x4x11	21½	12¾	15¼	7¼	5	9¼	11	½	¾	1¾	3/16 x .176	10	7¼	41	20	5¼	8	13½	3
VNS-4SHL	6x4x14	30	17¾	23	12¼	8	13¼	15	¾	¾	2¾	3/16 x .332	12	7¼	55	25	10¼	8	15½	3¾
VNS-6SHL	8x6x14½	30	17¾	23	12¼	8	13¼	15	¾	¾			12	9¼	55	25	10¼	9	16½	
VNS-8SHL	10x8x16	33½	21¼	25½	15¼	8¾	15¼	18¾	¾				15	11¼	64	33	13¾	11	21	
VNS-10SHL	12x10x17	33½	21¼	25½	15¼	8¾	15¼	18¾	¾				19	12¼	64	33	13¾	12	22	

SALES REPRESENTATIVES

ALBANY, NY
ALBUQUERQUE, NM
ALLENTOWN, PA
ATLANTA, GA
(BALTIMORE)
SEVERNA PARK, MD
BIRMINGHAM, AL
(BOSTON) WAKEFIELD, MA
BUFFALO, NY
CHICAGO, IL
CINCINNATI, OH
CLEVELAND, OH
COLUMBUS, OH
(DALLAS) RICHARDSON, TX
(DENVER) ENGLEWOOD, CO
DES MOINES, IA
(DETROIT)
FARMINGTON HILLS, MI
GREENSBORO, NC
GREENVILLE, SC
HARTFORD, CT
HOUSTON, TX
INDIANAPOLIS, IN
JACKSONVILLE, FL
KANSAS CITY, MO
KNOXVILLE, TN
LOS ANGELES, CA
LOUISVILLE, KY
MEMPHIS, TN
MIAMI, FL
MILWAUKEE, WI
MINNEAPOLIS, MN
NEW ORLEANS, LA
(NEW YORK) DARIEN, CT
(NORTHERN NEW JERSEY)
FLUCKERMIN, NJ
OKLAHOMA CITY, OK
(PHILADELPHIA)
WYNNWOOD, PA
PHOENIX AZ
PITTSBURGH, PA
RICHMOND, VA
(ROCHESTER) WEBSTER, NY
ST. LOUIS, MO
SALT LAKE CITY, UT
SAN ANTONIO, TX
(SAN FRANCISCO)
EMERYVILLE, CA
(SEATTLE) BELLEVUE, WA
SYRACUSE, NY
TAMPA, FL
TOLEDO, OH
TULSA, OK
(WASHINGTON) ROCKVILLE, MD

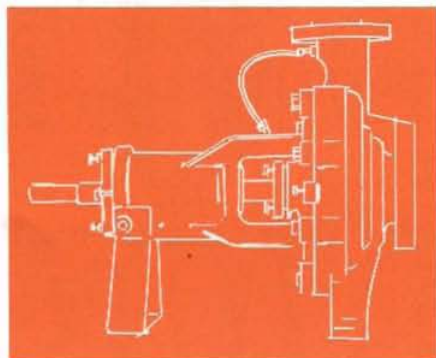
In Canada:

CALGARY, ALTA.
EDMONTON, ALTA.
HAMILTON, ONT.
KITCHENER, ONT.
MONTREAL, QUE.
OTTAWA, ONT.
SAINT JOHN, N.B.
SARNIA, ONT.
SASKATOON, SASK.
TORONTO, ONT.
VANCOUVER 10, B.C.
WINNIPEG, MAN.

In Mexico:

GUADALAJARA, JAL.
MEXICO CITY, D.F.
MONTERREY, N.L.

Other Buffalo Pumps

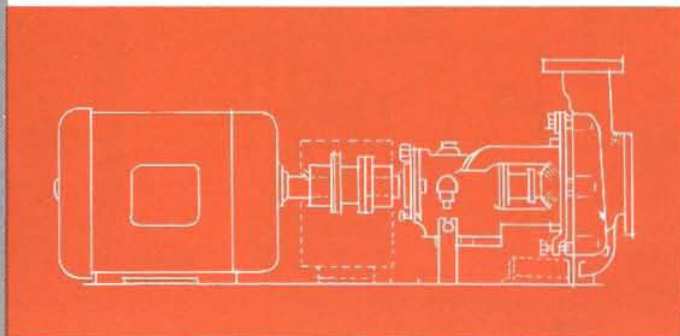
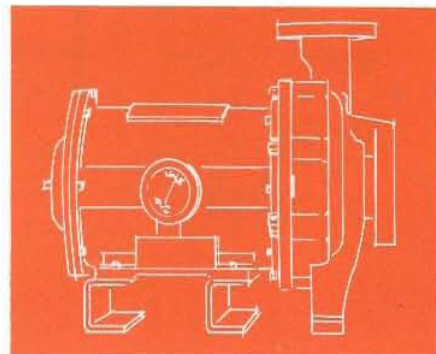


4-Way Frame Mounted Pumps

Buffalo 4-Way pumps are designed to operate with reduced axial and radial loads for long maintenance-free service in the chemical process and allied industries. 21 sizes. Capacities to 5000 gpm. Pressures to 300 psi. Bulletin 903.

Leakproof Can-O-Matic® Pumps

The reliable hermetically sealed pump designed to handle toxic, volatile and corrosive liquids, refrigerants and high temperature water. 17 sizes. Capacities to 1200 gpm. Heads to 480 ft. Temperature from -120° F to +490° F. Pressures to 600 psi. Bulletin 979.



Vortex Pumps

Designed to handle abrasive slurries and solids, this new line of vortex type pumps features an adjustable, replaceable vane

impeller. One impeller hub size and three vane lengths provide impeller diameters from 7" to 13" at 1/2" increments. Adjustability feature provides modification of pump output and compensation for wear. Capacities to 2000 gpm. Heads to 190 ft. Bulletin 902. Patent Pending.

PUMP DIVISION/BUFFALO, NEW YORK 14240

