Wilfley

Technical Handbook

ASME B73.1
Chemical
Processing
Pump

Model A7

Non-metallic

WILFLEY

Wilfley hydraulic seal in actual operation.

ASME B73.1

Wilfley's non-metallic Model A7 pump series offers maximum efficiency coupled with ultimate seal flexibility. It is designed to be sealless, but can also be used with virtually any traditional seal—packing or mechanical.

The non-metallic Model A7 is an end-suction, single-stage centrifugal pump that meets ASME B73.1 requirements. It handles liquids that are highly corrosive. Discharge sizes range from 1" to 4" in diameter. Flow rates range to 800 gallons per minute.

Original Sealless Operation

To prevent leakage while running, Model A7 non-metallic pumps have the original Wilfley expeller. The impeller and expeller rotate together during operation creating a hydraulic seal that keeps liquids away from the shaft while the pump is operating.

Static seal faces prevent leakage when the pump is shut down. The pump remains leak free while running and while shut down.

Wilfley seals can be run dry without damaging internal parts because wetted parts operate freely with no rubbing contact. Constant down time to repair and replace conventional contact seals is eliminated.

Ultimate Flexibility

Wilfley non-metallic Model A7 pumps are designed to handle a wide range of corrosive applications—no matter what the requirements. Wilfley designs and engineers each pump to perform to exact specifications.

A.R. Wilfley & Sons is proud of the individual engineering service traditionally provided to customers. Wilfley engineers have developed new sealing flexibility in answer to customers' needs.

The DryLock® and Lube Seal are now exclusively available through Wilfley for the non-metallic Model A7. The non-metallic Model A7 can also use most other available seals. This flexibility extends to vapor seals. The A7 series frame can use conventional lip seals, labyrinth or magnetic seals.

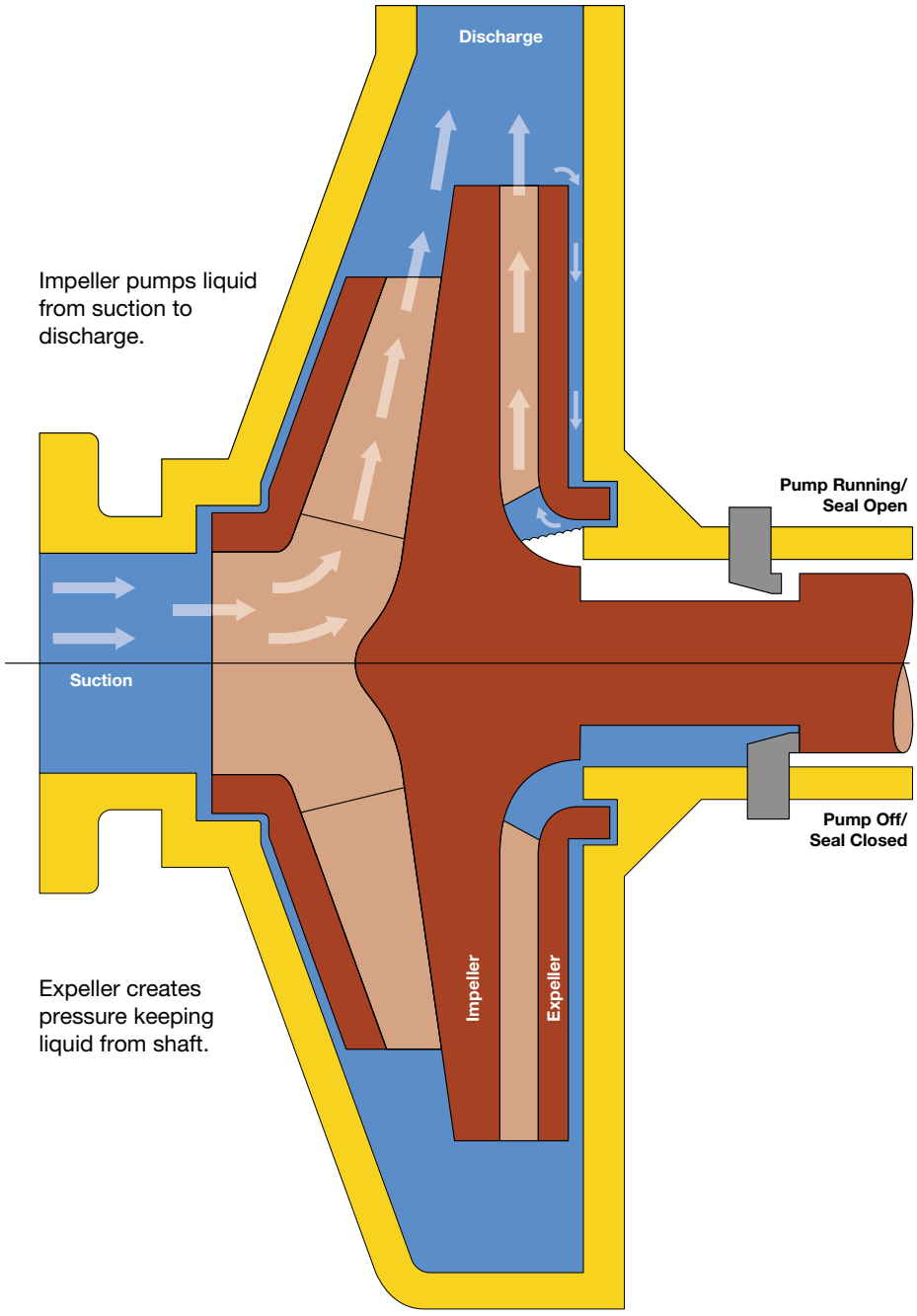
Tradition of Innovation and Quality

Arthur Redman Wilfley was an inventor and entrepreneur. He began working on centrifugal pumps in 1902. Wilfley's first commercially-available pump was sold in 1919 and was built around his unique concept of the expeller for hydraulic sealing. He continued to perfect the expeller design and received a patent in 1920. The expeller is now the hallmark of all Wilfley pumps.

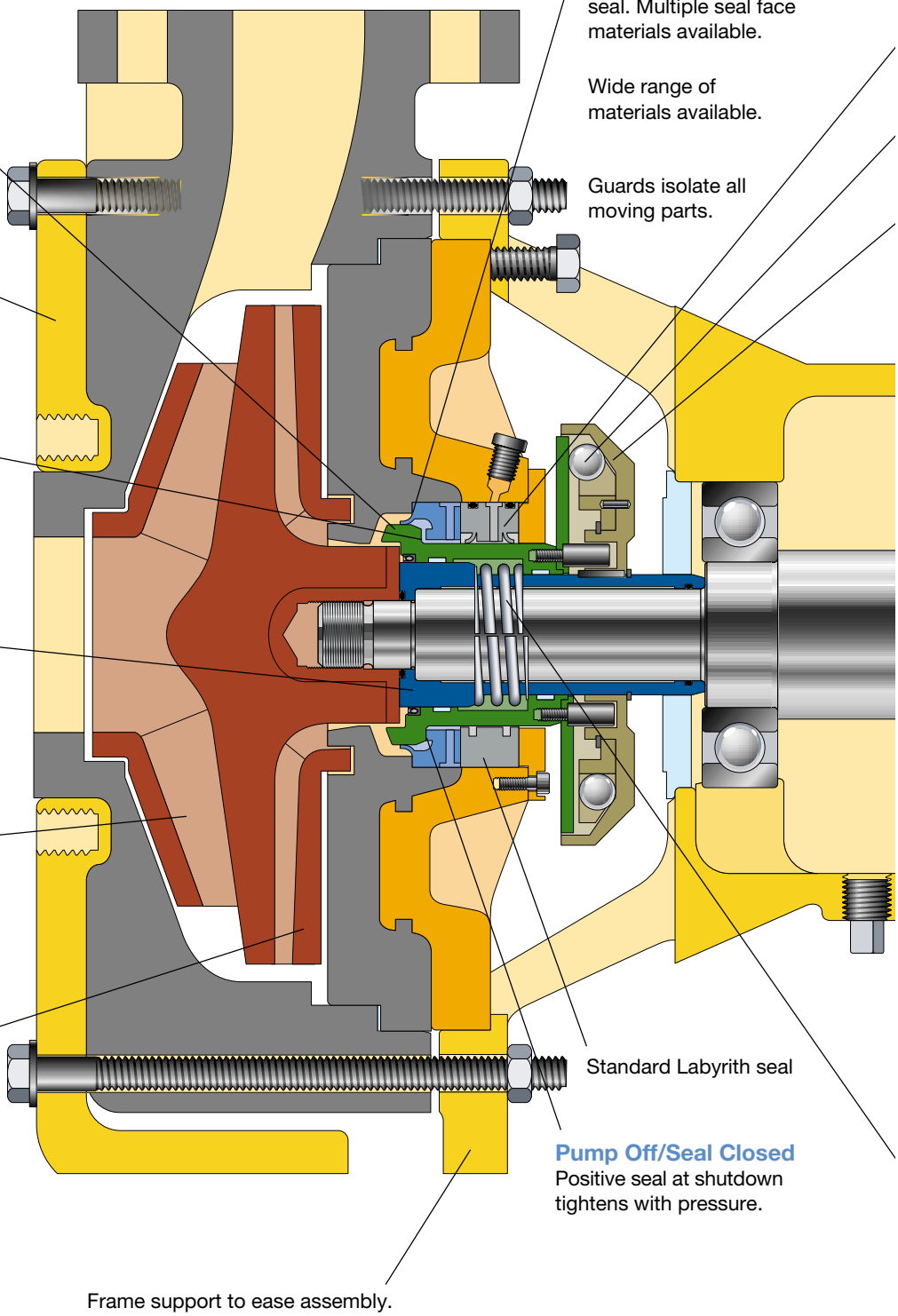
Today, Wilfley's applications and engineering staff continue to provide the most up-to-date information and innovative technology on pumps and pump processes to customers around the world.

Wilfley's pump lines include a wide range of centrifugal pumps that are designed to handle highly-abrasive slurries and corrosive materials.

To locate the Wilfley office or agent nearest you, please contact A.R. Wilfley & Sons, Inc. directly at 1-800-525-9930 or www.wilfley.com.



Wilfley Non-metallic Model A7 Features and Benefits

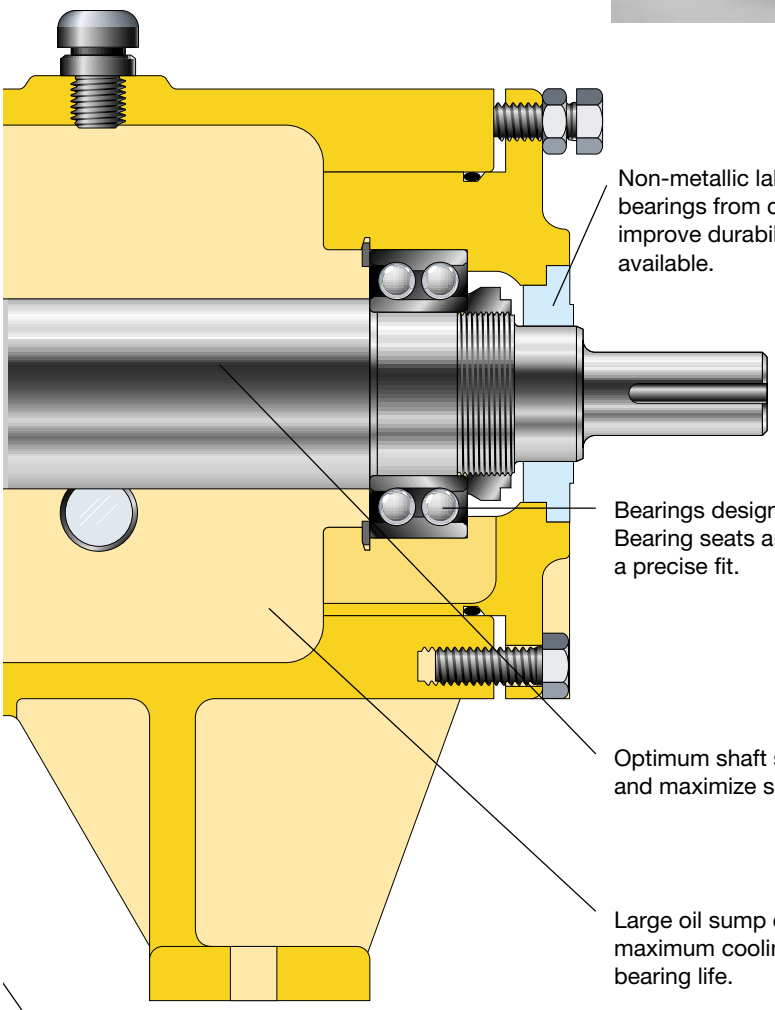


Optional vapor seal meets EPA requirements.

Seal activation can easily be changed to open and close at different speeds simply by adding or subtracting balls

Symmetrical cartridge-type Wilfley hydrodynamic seal to simplify maintenance.

Actuator Assembly



Non-metallic labyrinth seals isolate bearings from contamination to improve durability. Other seals available.

Bearings designed for long life. Bearing seats are ground to provide a precise fit.

Optimum shaft size to transmit loads and maximize sealing flexibility.

Large oil sump capacity to provide maximum cooling and increase bearing life.

Isolated spring for crisp seal action

No rubbing components. Simple replaceable parts.

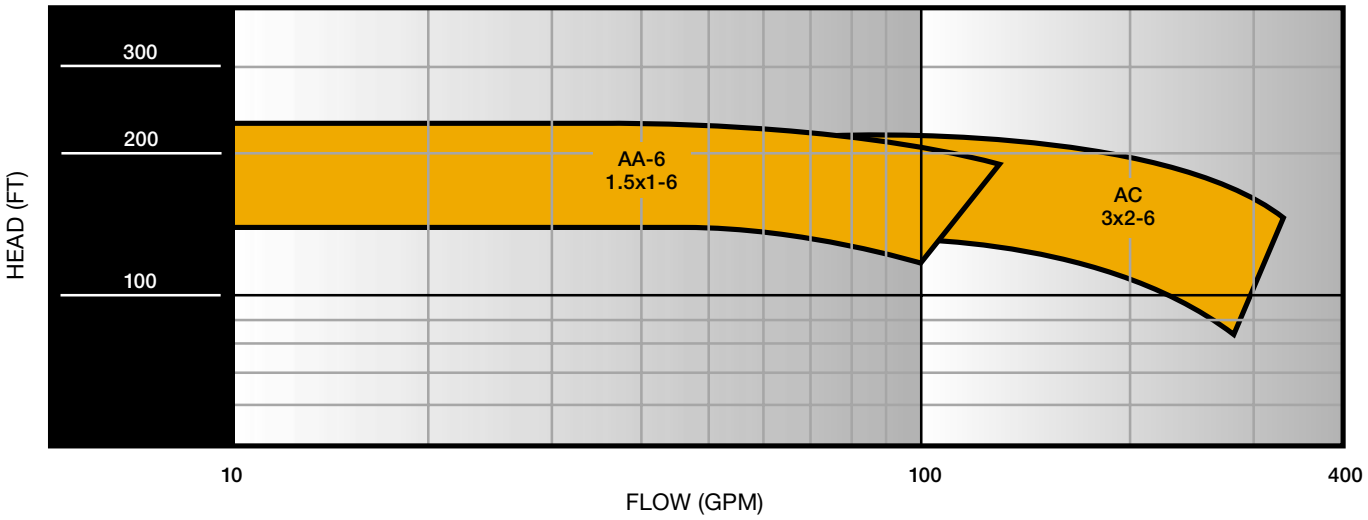
DryLock® Features

The DryLock® uses the action of centrifugal force combined with the smooth actuation of ball bearings to open and close the seal. As the pump starts up, the expeller evacuates the liquid in the seal area. The balls of the DryLock® are forced outward and slide up a ramp created by the ball housing. The ramp forces the balls into the actuator plate and opens the seal faces. Upon shut-down, the balls lose their centrifugal force allowing the spring-loaded actuator plate to move back into its closed position. The seal is then closed.

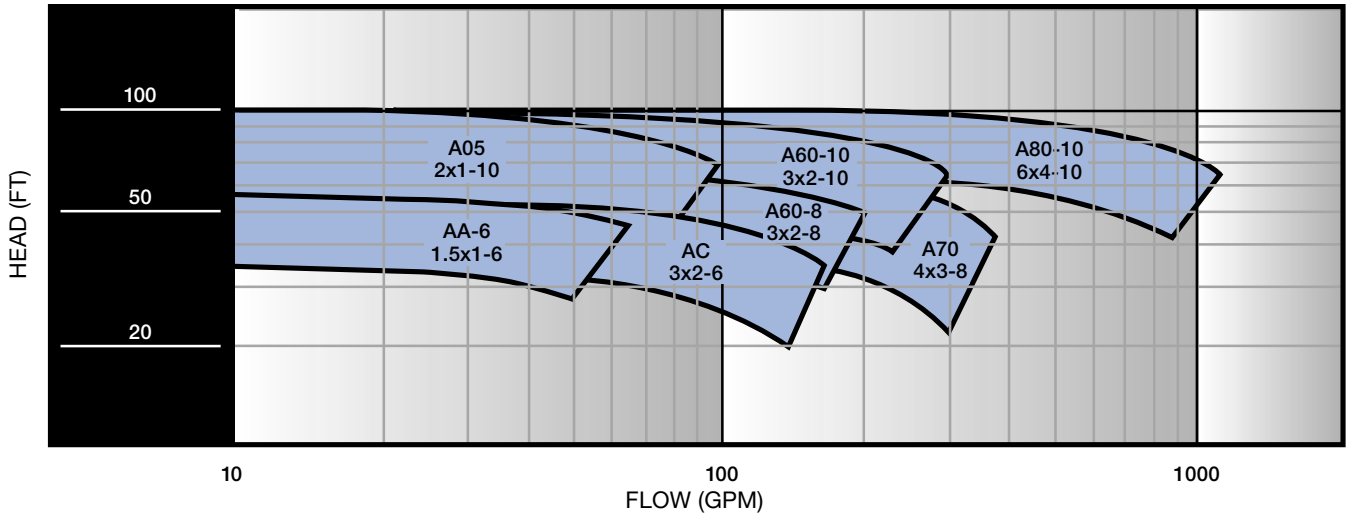
Wilfley Non-metallic Model A7 Pump Capacities

60 cycle performance

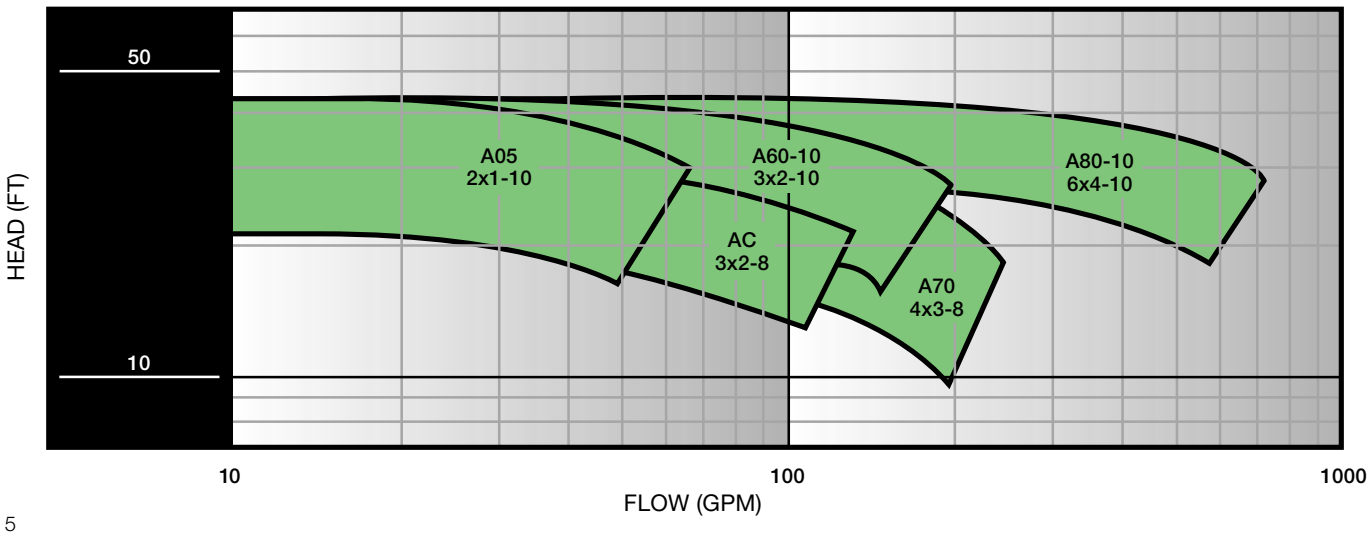
3550 RPM



1750 RPM

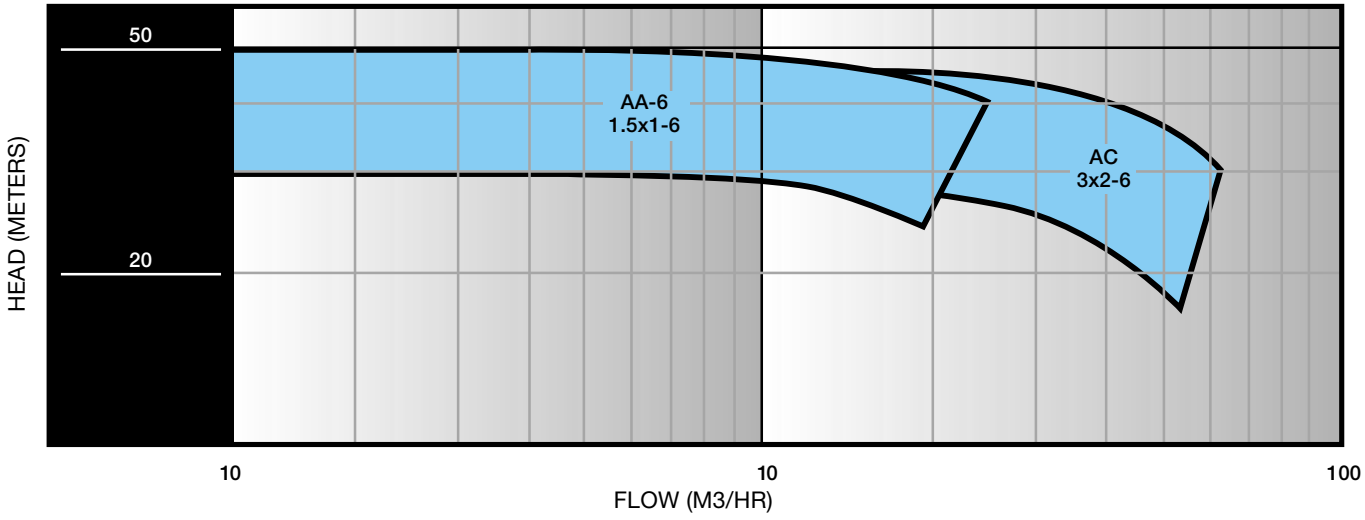


1150 RPM

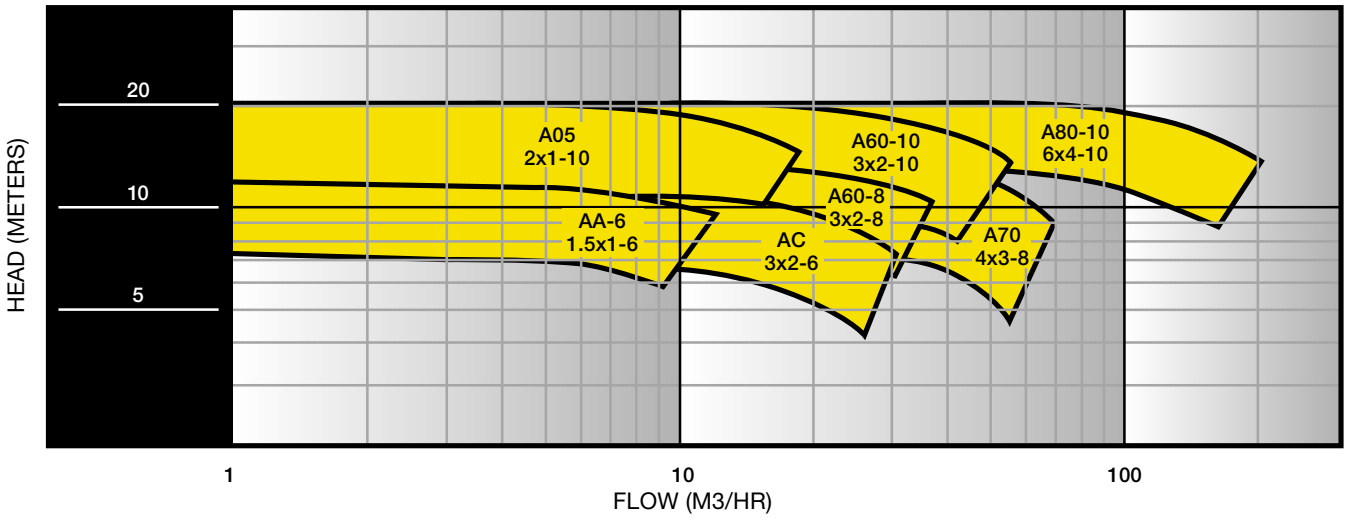


50 cycle performance

2950 RPM



1450 RPM



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Model A7 Non-metallic Options and Engineering Specials

Features	Options
Bearings – single row	Extreme duty bearings Single row deep groove – inboard bearing Duplex angular contact – outboard
Oil lubricated bearings	Grease, oil mist, constant level oiler
Non-metallic labyrinth bearing seal	Magnetic Bearing Seal Oil Filter
Frame and bearing carrier material: Ductile iron	316SS
Frame with large sight glass on the right side when viewed from coupling end.	Sight glass on the opposite side or on both sides Oil cooling provisions
O-Ring material: Viton	Kalrez® Teflon® encapsulated
Wet end material: W35 / Metal	1/2" flat-faced flange connection for case drain
150 lbs. flat faced flanges	
DryLock® seal	
Labyrinth seal	Lube seal

Special Modifications

A.R. Wilfley & Sons is dedicated to manufacturing pumps that maximize their full potential. Wilfley routinely accommodates customer requests for special paint, flush ports, special drain plugs and other modifications required to fit specific needs.

Many applications require special motor and drive configurations, including baseplates and mounting brackets. Non-metallic and fabricated baseplates are available.

Wilfley engineers assist in any special configurations that the liquid and process require. Wilfley's famous high-quality workmanship applies to all special designs to meet customers' needs.

Materials

A.R. Wilfley and Sons produces non-metallic centrifugal pumps from a unique combination of proprietary vinyl esters. The broad chemical resistance of this non-metallic compound boasts an optimum combination of corrosion resistance, strength and toughness.

The superior formulations of these advanced materials include the unmatched toughness of Wilfley's durable alloys, which enable a wide range of applications to be pumped without compromising structural reliability. These proprietary materials are developed to extend the wear life of A7 parts and decrease spare part inventory.

Wilfley's in-house state-of-the-art thermalset molding and metallurgy divisions have developed these enduring materials to survive in the most hostile environments. Wilfley's full time metallurgist and material specialists are constantly testing the effects of corrosion on a wide variety of materials and maintain an extensive library of pump services and corrosion data.

Wilfley's expert engineers are available in providing material selection recommendations.

Construction Details

	Frame 1		Frame 2				
General	AA-6	AA-8	A60-8	A70-8	A05-10	A60-10	A80-10
Pump weight (lbs)	112	123	295	312	314	321	370
Max. working* temperature (°F)	200		200				
Max. working pressure (psi)	100		100				
Max. solids size	3/16	5/16	1/4	3/8	1/4	3/8	3/8
Shaft Diameter at Impeller (in.)	.75		1				
Diameter at Sleeve (in.)	1.375		1.375				
Diameter at Coupling (in.)	.88		1.25				
Diameter between bearings (in.)	1.560		2.5				
Shaft overhang (in.)	6.413		6.85				
Bearing span (in.)	3.175		7.71				
Bearings Standard radial bearing	SKF 6308		SKF 6311				
Standard thrust bearing	5208A		5211A				
Extreme duty radial bearing	6308		311M				
Extreme duty thrust bearing	SKF 7308BECB		SKF 7310BECB				

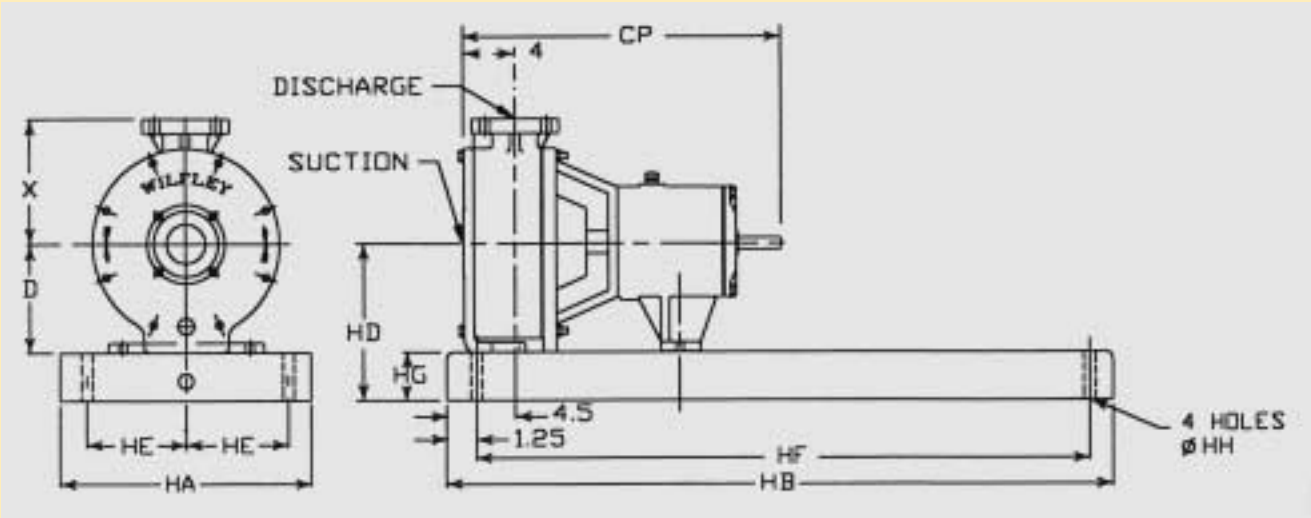
Dimensions

Frame	Baseline Size		Motor Frame Range	HA	HB	HD	HE	HF	HG*	HH	ASME	
	Wilfley	ASME	T									
1	6010-1	IT	143T 182T	10 (254)	35 (889)	8 1/4 (210)	4 (102)	32 1/2 (825)	3 (76)	3/4 (19)	AA-6, AA-8	
	6010-2	2T	184T 215T	12 (305)	39 (990)	8 1/2 (216)	4 1/2 (114)	36 1/2 (927)	3 1/4 (83)			
	6010-3	N.A.	254T 286TS									
2	6010-4	1	143T 215T	12 (305)	45 (1143)	12 (305)	4 1/2 (114)	42 1/2 (1080)	3 3/4 (95)	3/4 (19)	A05-10	
	6010-5	2	254T 286T	15 (381)	52 (1321)	12 3/8 (314)	6 (152)	49 1/2 (1257)	4 1/8 (105)		A60-8, A60-10	
	6010-6		324TS 405T	18 (457)	58 (1473)	13 (330)	7 1/2 (191)	55 1/2 (1410)	4 3/4 (121)	1 (25)	A70-8	
						14 3/4 (375)					A80-10	

* Fabricated baseplate "HG" is 3/8″ when used to establish foundation bolt length except for 6010-3, which is 3/4″.

Dimensions shown are not for construction unless certified.
Dimensions are shown in inches and (approximate equivalent millimeters). Flanges drilled to match ASME B16.5 150lbs.

Field shimming by customer may be required to meet maximum ASME B73.1 HD dimensions. Baseplate dimensions are for cast iron, fabricated or non-metallic designs.



General Installation Recommendations

	SIZE	CP	D	X
	1½ x 1 (40 x 25)	17½ (445)	5¼ (133)	6½ (165)
	3 x 2 (80 x 50)			
	2 x 1 (50 x 25)	23½ (597)	8¼ (210)	8½ (216)
	3 x 2 (80 x 50)			9½ (242)
	4 x 3 (100 x 80)			11 (280)
	6 x 4 (150 x 100)		10 (254)	13½ (343)

Choosing Pump Location

Locate the pump as close to the liquid source as practical so the suction pipe is short and direct with a minimum of elbows, fittings and valves.

Place the pump in a location so the unit is accessible for inspection during operation as well as for maintenance operations involving removal and disassembly.

Foundation

The foundation should be strong enough to absorb any vibration and to form a permanent support for the baseplate. This is important in maintaining the alignment of the direct connected unit. Foundation bolts of the proper size should be embedded in the concrete located by the outline drawing.

Alignment

The pump and motor are aligned at the factory before shipment. However, realignment is necessary after the complete unit has been installed. Guidelines for checking and aligning the pump components may be found in the Hydraulic Institute Standards.

Piping

Both the suction and discharge pipes should be independently supported near the pump so that no stress or strain is transmitted to the casing by piping.

Because this product has non-metallic flanges, care must be taken during the installation procedure. The fasteners used for flanges should be tightened in a manner that provides even loading on both the gaskets and the flanges.

Wifley recommends the use of chemical resistant gaskets that properly compress the pump unit and pipe flanges securely together.

A check valve should be installed in the discharge line to prevent fluid from flowing back through the pump while it is shut down. Gate valves should be installed in both discharge and suction lines to isolate the pump during maintenance.

Care must be taken in sizing and locating suction piping to prevent cavitation.

Ordering Information

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

This list will help establish specific pumping system conditions.

- Liquid
- Temperature
- Static Head
- Discharge Pipe Size
- Length, Discharge Pipe
- Discharge Pipe Fittings
- Equivalent Length Discharge Pipe
- Total Head
- Maximum Suction Pressure
- Minimum Suction Pressure
- Capacity
- Specific Gravity
- % Solids by Weight
- Mesh Analysis
- Viscosity
- NPSH Available

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