TECHNICAL HANDBOOK A7

ASME B73.1 Process Pump

WILFLEY®

Wilfley Sealing Technology

No Flush Water Required

WILFLEY SEALING TECHNOLOGY

Wilfley invented the Dynamic Expeller Seal almost a century ago and has continued to lead advancements in pump sealing technologies ever since.

The combination of the Wilfley Dynamic Expeller Seal (pump running) and the DryLock® 3 Static Seal (pump off) provides **leak free** operation at all times.

The harmony between the dynamic and static seal is what makes Wilfley Sealing Technology excel beyond conventional seals.

AB 1933

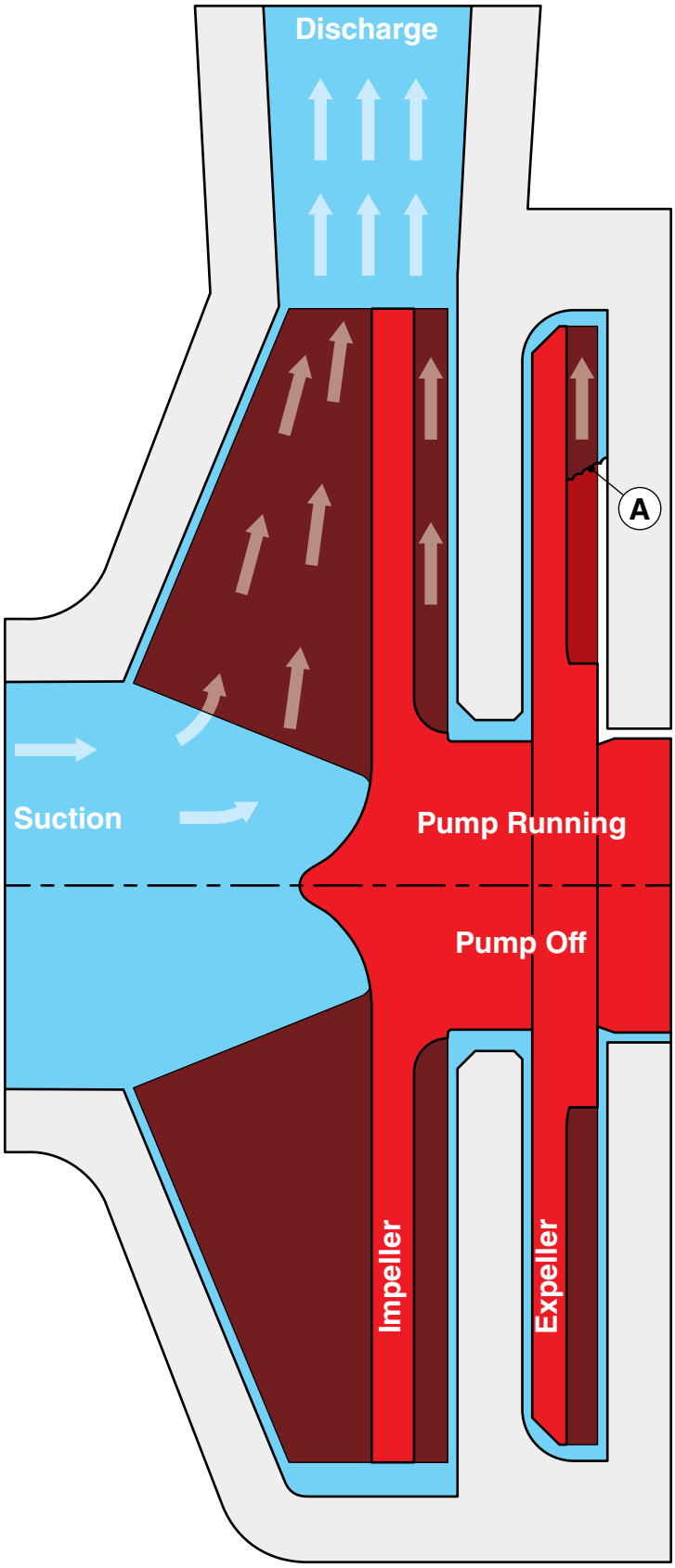
AC 1938

AF 1947

AG 1973

A7 1997

WILFLEY DYNAMIC EXPELLER SEAL



FEATURES & BENEFITS:

- A superior alternative to mechanical seals and associated flush systems
- Inherently safe without gland packing or frictional heat
- Product dilution is eliminated
- Operational abuse tolerant, e.g. cavitation and vibration
- Reduces maintenance costs and maximizes production time through increased mean time between maintenance (MTBM)
- Excellent solids handling capabilities
- Intermittent dry running capability

HOW THE WILFLEY DYNAMIC EXPELLER SEAL WORKS:

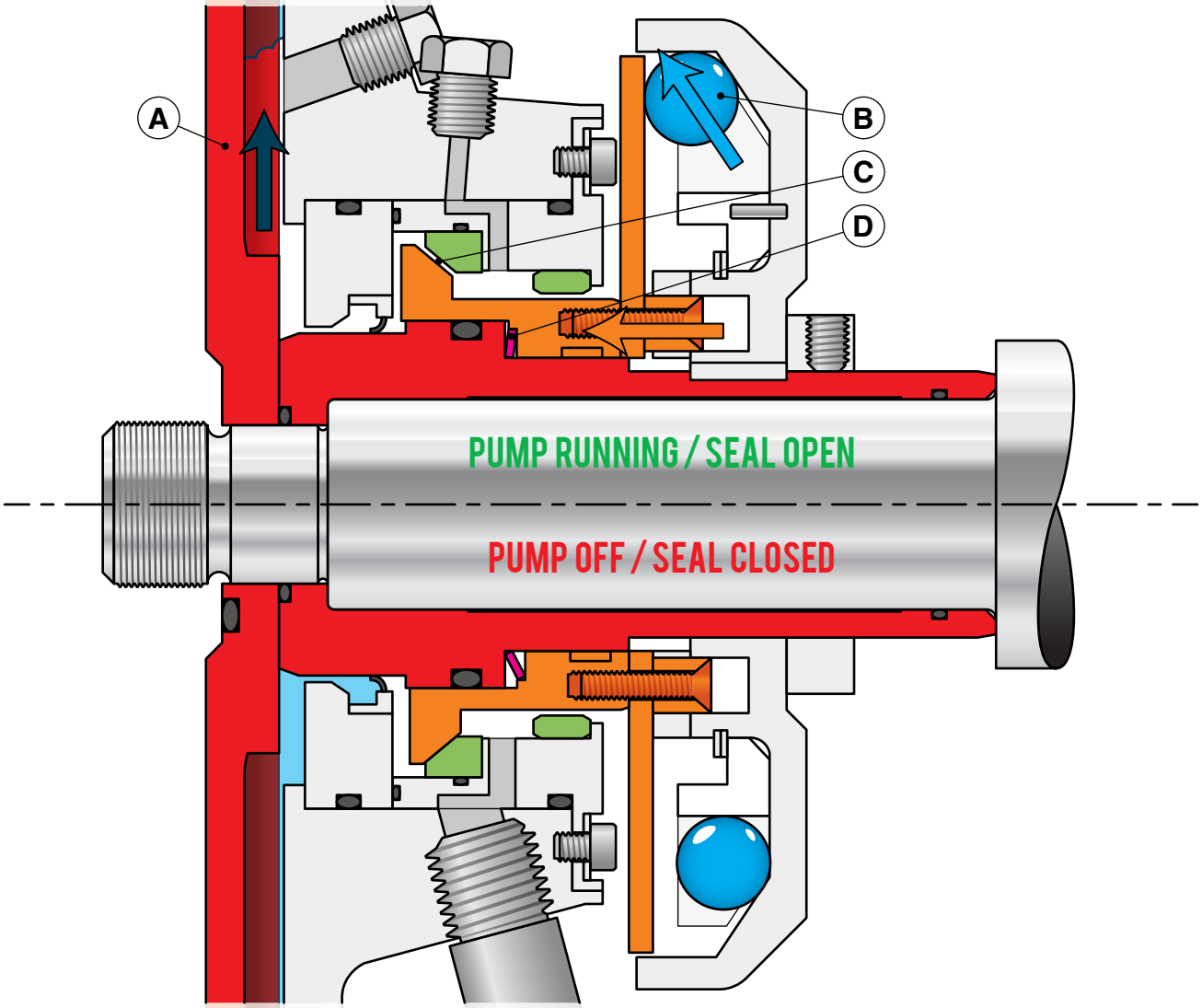
- A liquid interface **(A)** is established during pump operation by centrifugal forces generated by the expeller
- This liquid interface effectively isolates the pumped fluid from the shaft
- The DryLock® 3 static seal prevents any leakage when the pump isn't in operation

WILFLEY DRYLOCK® 3 STATIC SEAL

HOW THE DRYLOCK® 3 SEAL WORKS:

At start up, the expeller **(A)** establishes a liquid interface that pulls the pumped fluid away from the seal faces. As this happens, centrifugal force moves balls **(B)** outwards to open seal faces **(C)** and prevents any rubbing contact.

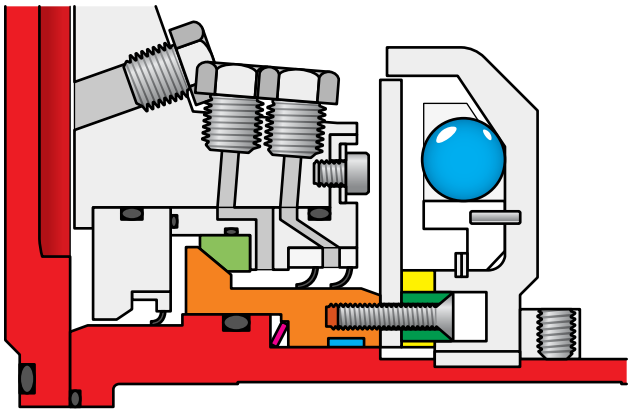
At shut down, the liquid interface collapses and the pumped fluid is pushed towards the seal faces. An isolated wave spring **(D)** forces the seal faces to close before any of the pump fluid can escape.



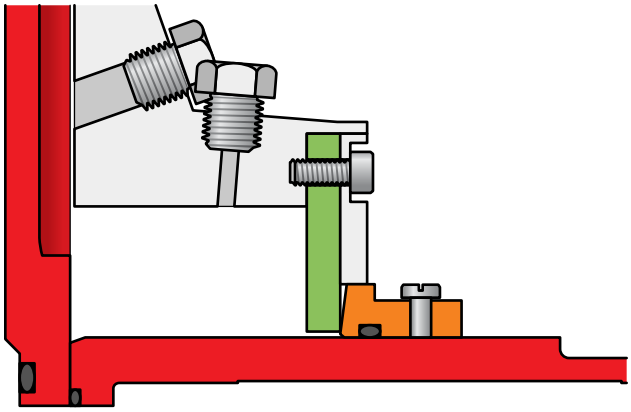
FEATURES & BENEFITS:

- **Leak free operation** - Small precise seal opening allows for rapid seal actuation
- **Reliable and repeatable static seal actuation** - The quantity of balls is specifically set for your application
- **Easy to install / maintain** - Simple and effective design, no special tools needed

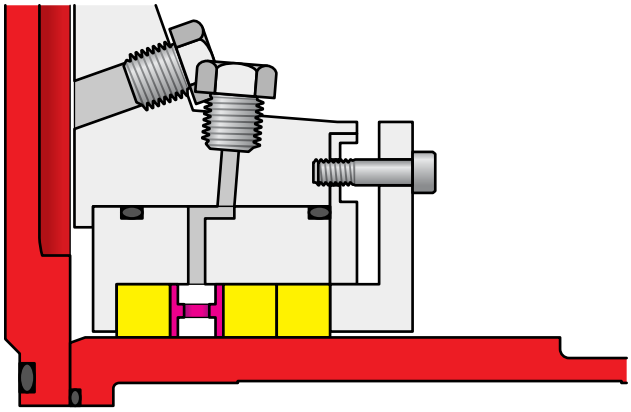
MODEL A7
SEALING OPTIONS



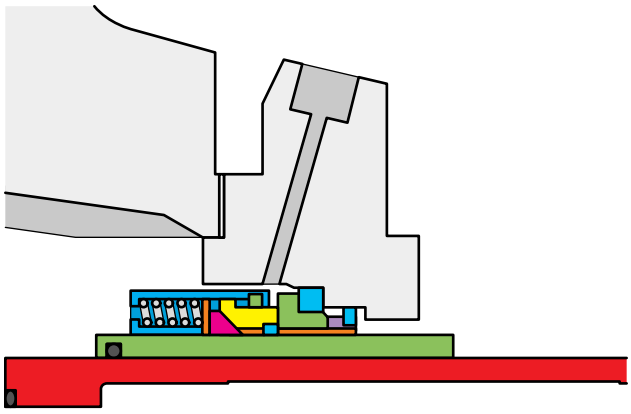
DryLock® 3 with Grease Vapor Barrier



Expeller with Diaphragm

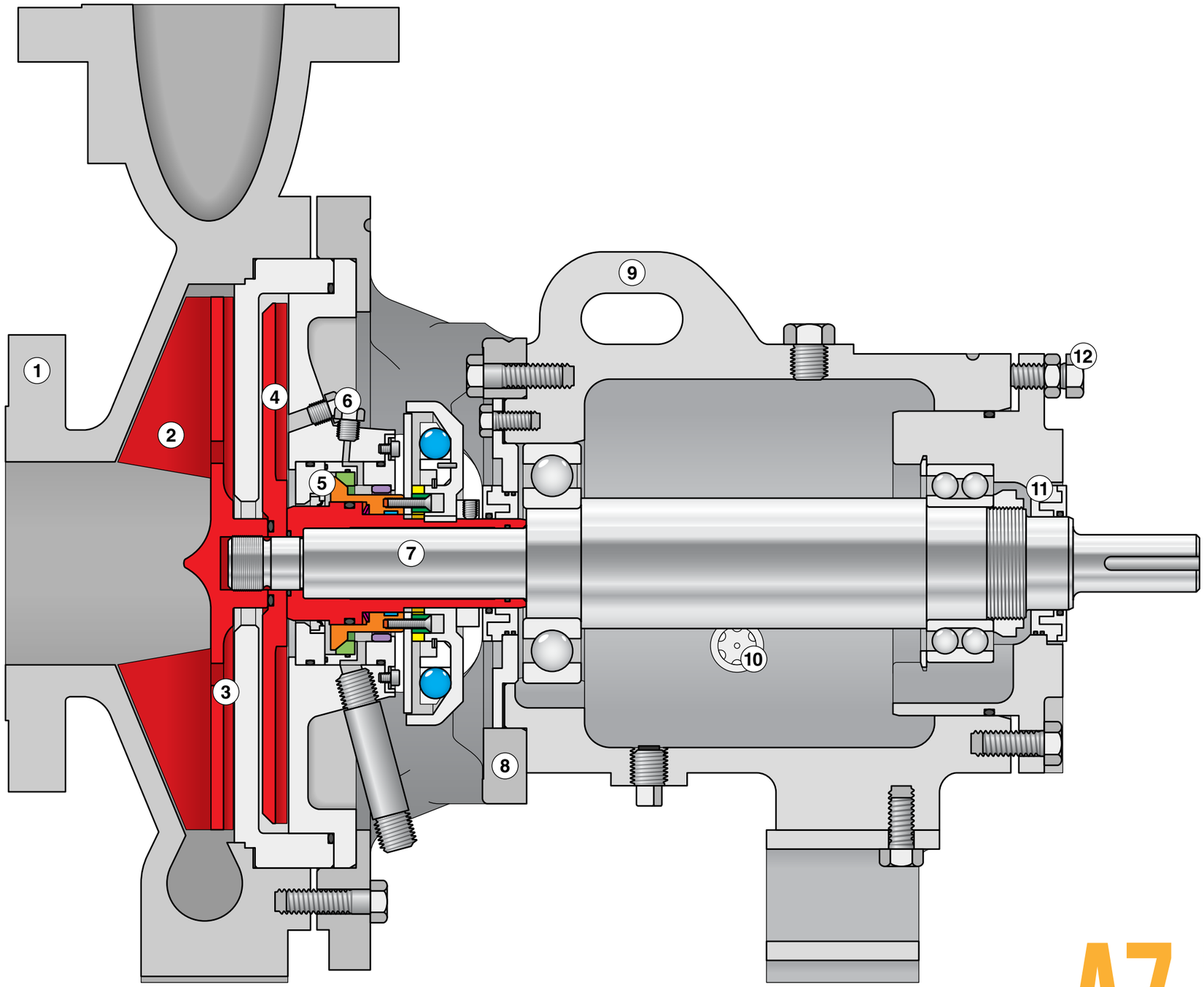


Expeller with Packing



Single / Double Mechanical Seals

The A7 process pump can also be fitted with previous generations of the DryLock® static seal upon request. Contact Wilfley for more information.



MODEL A7 FEATURES & BENEFITS

WET END

1. Heavy duty case design with 150 lb. flanges (300 lb. flanges available)
2. Comprehensive hydraulics available to meet your needs
3. Pressure / temperature balance holes

SEALING

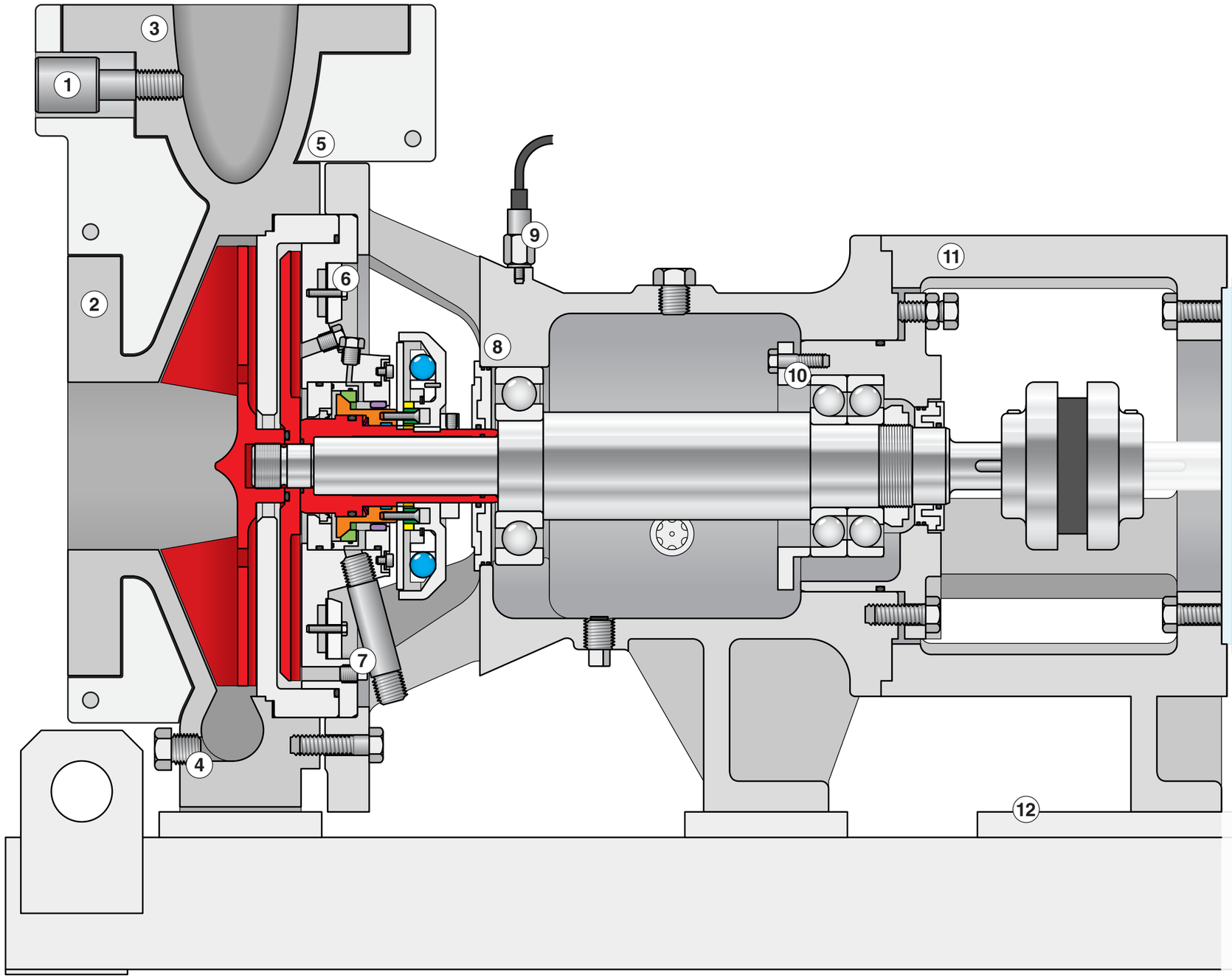
4. Opti-expeller provides superior dynamic sealing with zero operational leakage
5. DryLock® 3 seal engineered for reliable static sealing
6. Expeller / seal wash out capability
7. Robust shaft with **low** L^3/D^4 ratios minimizes deflections and increases seal life and reliability

Other sealing options available including mechanical seals and packing

POWER END

8. Frame bracket designed to protect bearing unit from pumpage (duplex stainless steel optional)
9. Convenient lifting point
10. Large sight glasses on both sides to easily verify oil level
11. 303SS labyrinth seals prevent oil contamination
12. Easy clearance adjustments via external adjustment bolts

A7 HEAVY DUTY ASME B73.1 PROCESS PUMP



MODEL A7 OPTIONS

WET END

1. Dry thermowell at casing discharge
2. 300 lb. flanges
3. Flat face flanges
4. Casing drain
5. Casing steam jacket

Recessed (vortex) impeller (not shown)

DIN flanges (not shown)

Suction / discharge pressure gauge taps (not shown)

SEALING

6. Seal housing steam jacket
7. Expeller cavity drain

Dry thermowell at seal housing (not shown)

Dry thermowell at expeller cavity (not shown)

POWER END

8. One-piece bearing frame
9. Condition monitoring
10. Extreme duty bearings
11. C-face adapter

Dry thermowell at bearing housing (not shown)

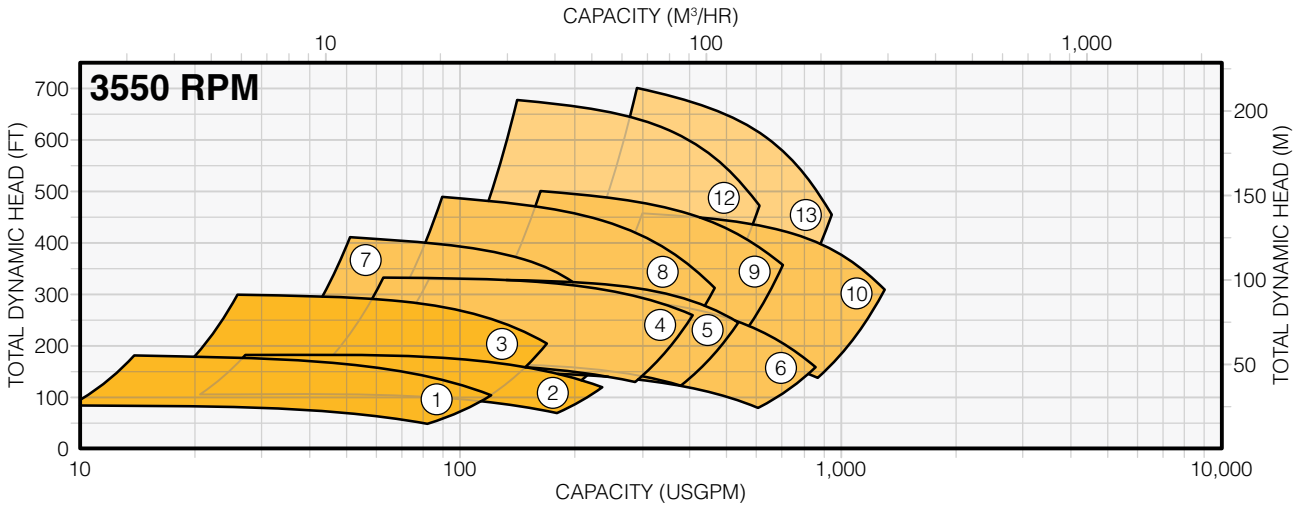
BASE PLATE

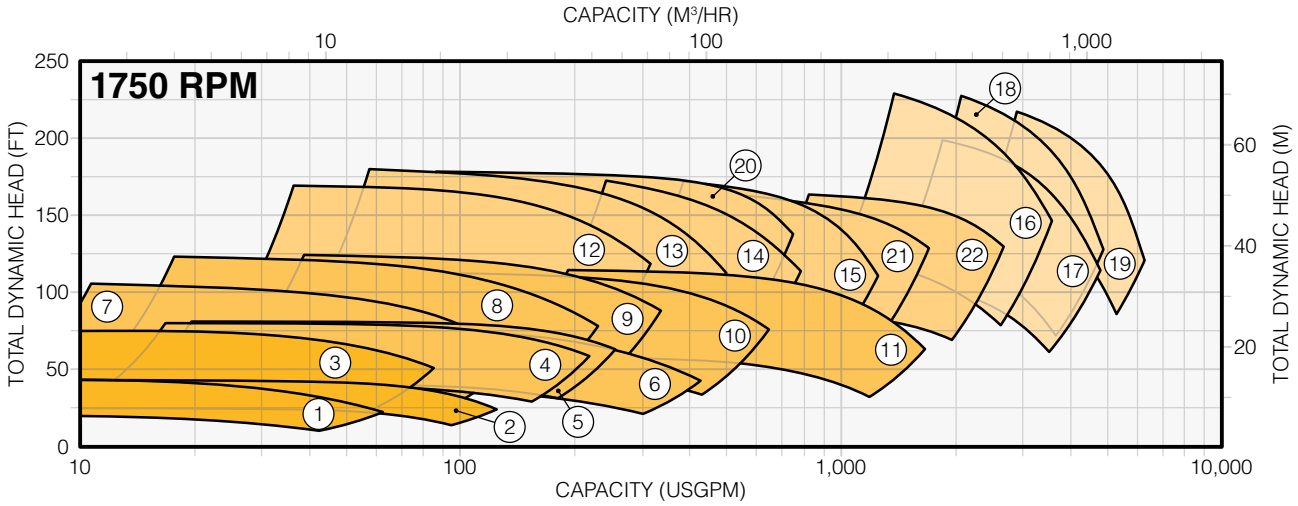
12. Fabricated base plate

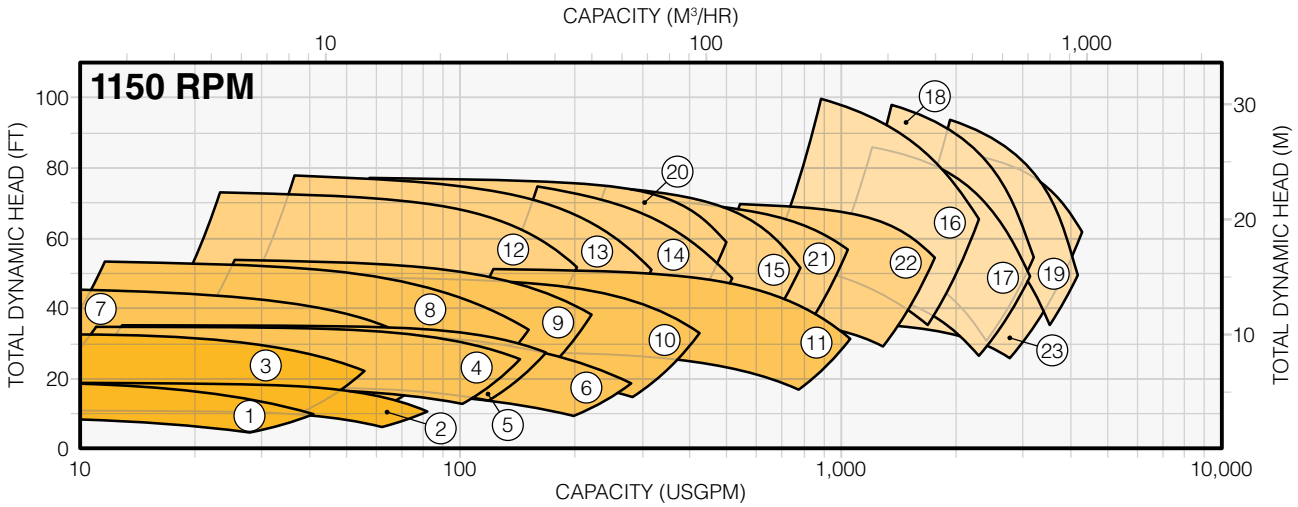
Channel base plate (not shown)

Non-metallic base plate (not shown)

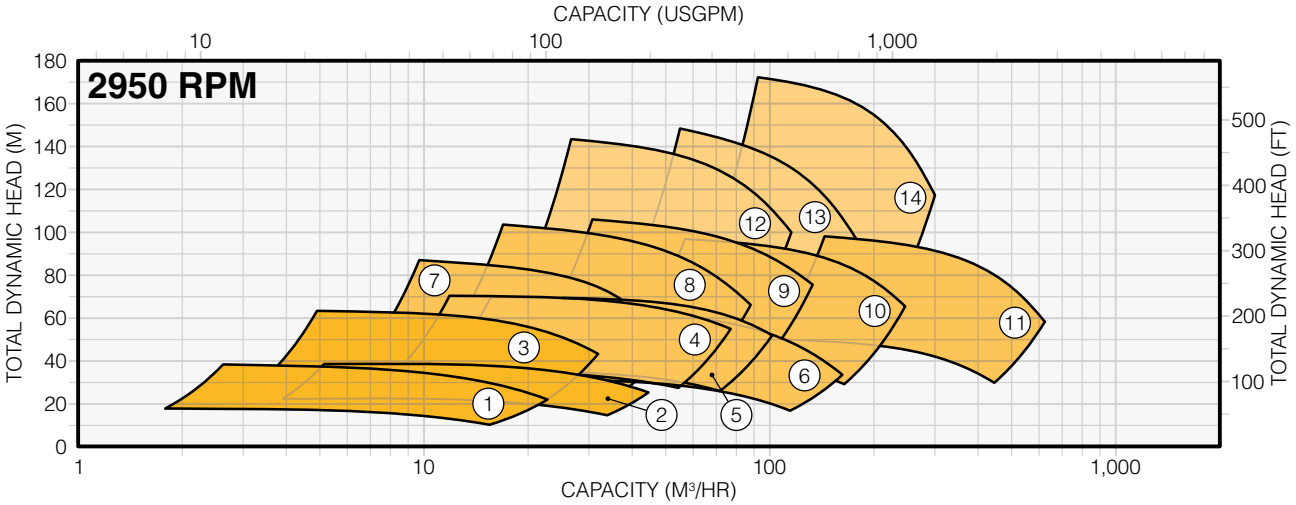
WILFLEY MODEL A7 CAPACITIES

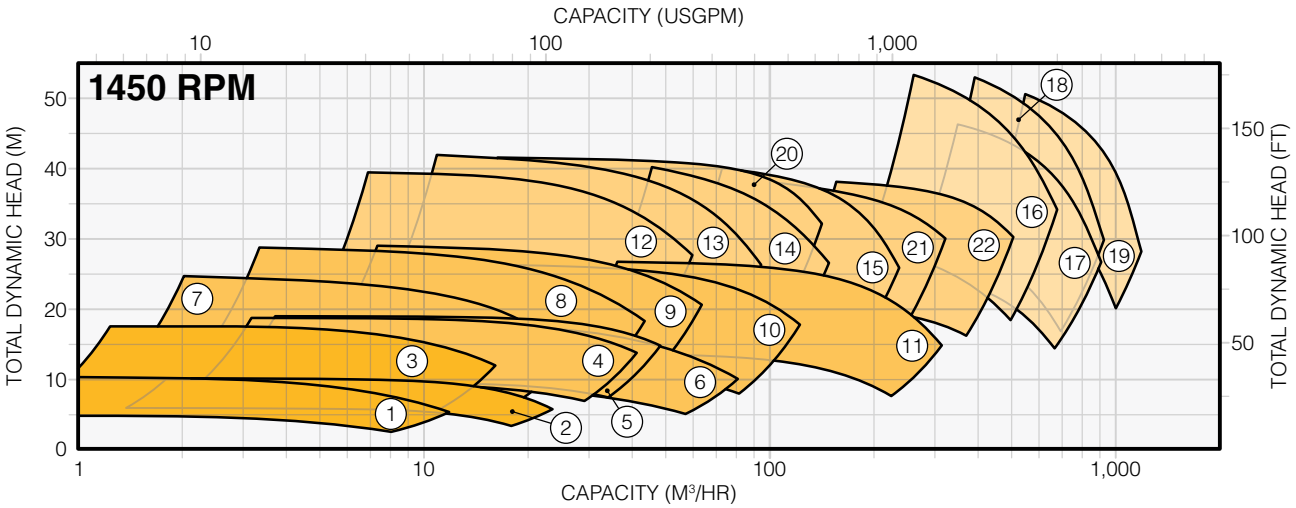


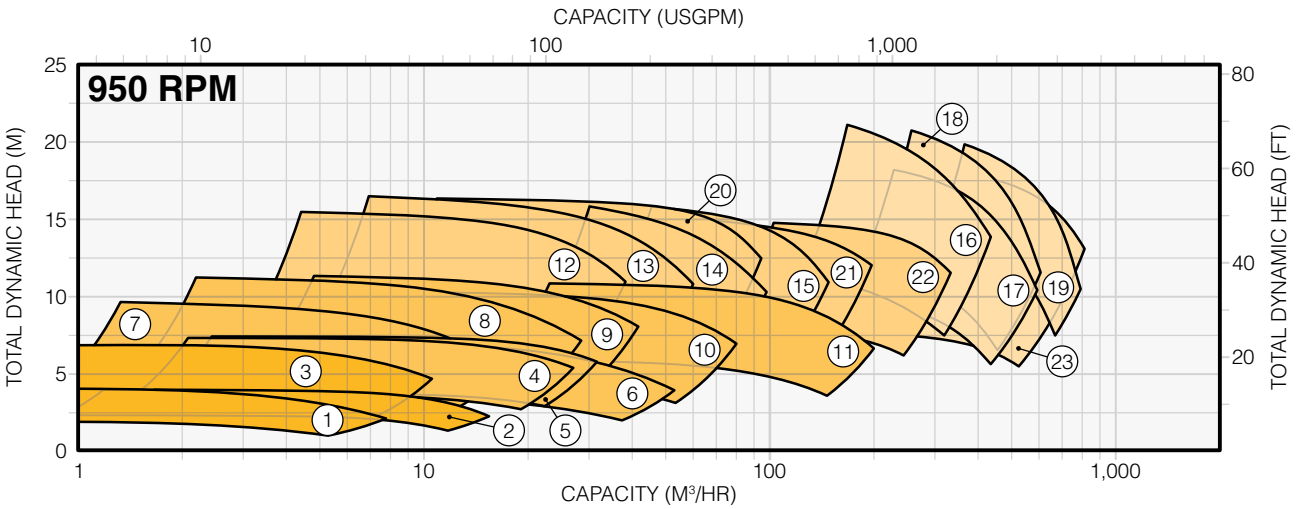




FRAME 1	FRAME 2		FRAME 3	FRAME 4	RECESSED
1. 1.5x1-6	4. 3x1.5-8	8. 3x1.5-10	12. 3x1.5-13	16. 8x6-15	20. 2.5x2-13
2. 3x1.5-6	5. 3x2-8	9. 3x2-10	13. 3x2-13	17. 10x8-15	21. 4x4-13
3. 1.5x1-8	6. 4x3-8	10. 4x3-10	14. 4x3-13	18. 8x6-16S	22. 6x6-13
	7. 2x1-10	11. 6x4-10	15. 6x4-13	19. 10x8-16S	23. 10x10-16







MATERIALS

Wilfley and its wholly owned subsidiary, Western Foundries, provide new metals and proprietary processes for the longest possible pump and parts life and reliability.

WILFLEY KNOWS METALLURGY

Some of Wilfley's most recent innovations include:

MAXALLOY® 5 - a machinable 27% chrome hard iron with an average hardness of 645 HBN

Alloy C Max - better corrosion resistance than CW2M

WCD4™ - better corrosion / erosion resistance than conventional CD4MCuN

Item Name	STANDARD MATERIALS				
	Ductile Iron	316L	CD4MCuN	WCD4™	Alloy 20
WET END					
Cap Screws	18-8				
Case Gasket	Gylon®				
Case Plate	Ductile Iron	316L	CD4MCuN	WCD4™	Alloy 20
Casing	Ductile Iron	316L	CD4MCuN	WCD4™	Alloy 20
Expeller	Ductile Iron	316L	CD4MCuN	WCD4™	Alloy 20
Impeller	Ductile Iron	316L	CD4MCuN	WCD4™	Alloy 20
O-rings	Viton® (Kalrez®, Teflon-Coated Viton®, EPDM Optional)				
SEAL					
DryLock® 3	Ductile Iron	316L	CD4MCuN	WCD4™	Alloy 20
POWER END					
Bearing Frame	Ductile Iron				
Bearing Locknut	Steel				
Frame Bracket	Ductile Iron (CD4MCuN Optional)				
Frame Foot	Ductile Iron				
Inboard Bearing	Single-Row Deep Groove				
Inboard Bearing Cover	316SS				
INPRO® VBXS Oil Seal	303SS				
Oil Sight Glass	Glass/Steel				
O-rings	Viton®				
Outboard Bearing	Double-Row Deep Groove (2x Single-Row Angular Contact Optional)				
Shaft	SAE4340 (316SS, Nitronic 50, Ferralium 255 Optional)				

CONSTRUCTION DETAILS

		FRAME 1			FRAME 2							
		1.5x1-6 AA-6	3x1.5-6 AB-6	1.5x1-8 AA-8	3x1.5-8 A50-8	3x2-8 A60-8	4x3-8 A70-8	2x1-10 A05-10	3x1.5-10 A50-10	3x2-10 A60-10	4x3-10 A70-10	6x4-10 A80-10
GENERAL												
Pump Weight	lbs	145	150	145	305	315	325	290	295	310	335	420
	kg	66	68	66	138	143	147	132	134	141	152	190
Max. Solids Size	in	0.188	0.25	0.313	0.25	0.25	0.375	0.25	0.375	0.375	0.375	0.375
	mm	5	6	8	6	6	10	6	10	10	10	10
SHAFT												
Diameter at Impeller	in	0.75			1							
	mm	19			25							
Diameter at Coupling	in	0.875			1.125							
	mm	22			29							
BEARINGS												
Heavy Duty		Radial - 6308 Thrust - 5208A			Radial - 6311 Thrust - 5211A							
Extreme Duty		Radial - 6308 Thrust - 7308BECB			Radial - 311M Thrust - 7310BECB							

		FRAME 3							FRAME 4				
		3x1.5-13 A20-13	3x2-13 A30-13	4x3-13 A40-13	6x4-13 A80-13	2.5x2-13 -	4x4-13 -	6x6-13 -	8x6-15 A110-15	10x8-15 A120-15	8x6-16S A110-16	10x8-16S A120-16	10x10-16 -
GENERAL													
Pump Weight	lbs	480	490	490	520	680	870	1,025	1,100	1,210	1,110	1,260	2,190
	kg	218	222	222	236	308	395	465	499	549	503	567	993
Max. Solids Size	in	0.25	0.375	0.375	0.375	1	1	1	0.5	0.5	0.5	0.5	1
	mm	6	10	10	10	25	25	25	13	13	13	13	25
SHAFT													
Diameter at Impeller	in	1.125							2.125				
	mm	29							54				
Diameter at Coupling	in	1.125							2.375				
	mm	29							60				
BEARINGS													
Heavy Duty		Radial - 6312 Thrust - 5312							Radial - 6319A Thrust - 7319BECB				
Extreme Duty		Radial - 312M Thrust - 7312BECB							Radial - NU319EC Thrust - 7319BECB				

DIMENSIONS

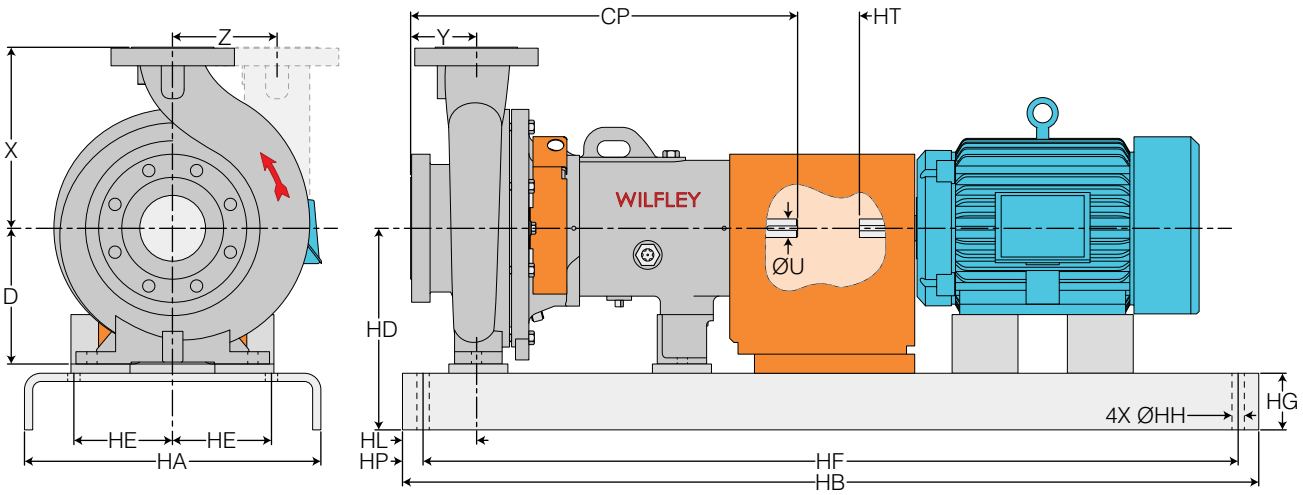
PUMP DIMENSIONS

Dimensions in inches (millimeters)

Pump Size	CP	D	U	X	Y	Z	KEYWAY
FRAME 1							
1.5x1-6 (AA-6)	17.5 (445)	5.25 (133)	0.88 (22)	6.5 (165)	4 (102)	-	0.19 x 0.09 (5 x 2)
3x1.5-6 (AB-6)				6.5 (165)			
1.5x1-8 (AA-8)				6.5 (165)			
FRAME 2							
3x1.5-8 (A50-8)	23.5 (597)	8.25 (210)	1.13 (29)	8.5 (216)	4 (102)	-	0.25 x 0.13 (6 x 3)
3x2-8 (A60-8)				9.5 (242)			
4x3-8 (A70-8)				11 (280)			
2x1-10 (A05-10)				8.5 (216)			
3x1.5-10 (A50-10)				8.5 (216)			
3x2-10 (A60-10)				9.5 (242)			
4x3-10 (A70-10)				11 (280)			
6x4-10 (A80-10)		10 (254)		13.5 (343)			
FRAME 3							
3x1.5-13 (A20-13)	23.5 (597)	10 (254)	1.13 (29)	10.5 (266)	4 (102)	-	0.25 x 0.13 (6 x 3)
3x2-13 (A30-13)				11.5 (292)			
4x3-13 (A40-13)				12.5 (318)			
6x4-13 (A80-13)				13.5 (343)			
2.5x2-13	25.25 (641)			10 (254)	4 (102)	6.75 (171)	
4x4-13	27.5 (699)			12.5 (318)	4.62 (117)	6.13 (156)	
6x6-13	32 (813)			16 (406)	6 (152)	7 (178)	
FRAME 4							
8x6-15 (A110-15)	33.88 (860)	14.5 (368)	2.38 (60)	18 (457)	6 (152)	-	0.63 x 0.31 (16 x 8)
10x8-15 (A120-15)				19 (483)			
8x6-16S (A110-16)				18 (457)			
10x8-16S (A120-16)				19 (483)			
10x10-16	45.52 (1156)			18.75 (476)	9 (229)	8.5 (216)	

These dimensions are not for construction. Certified dimension prints are available for your specific installation

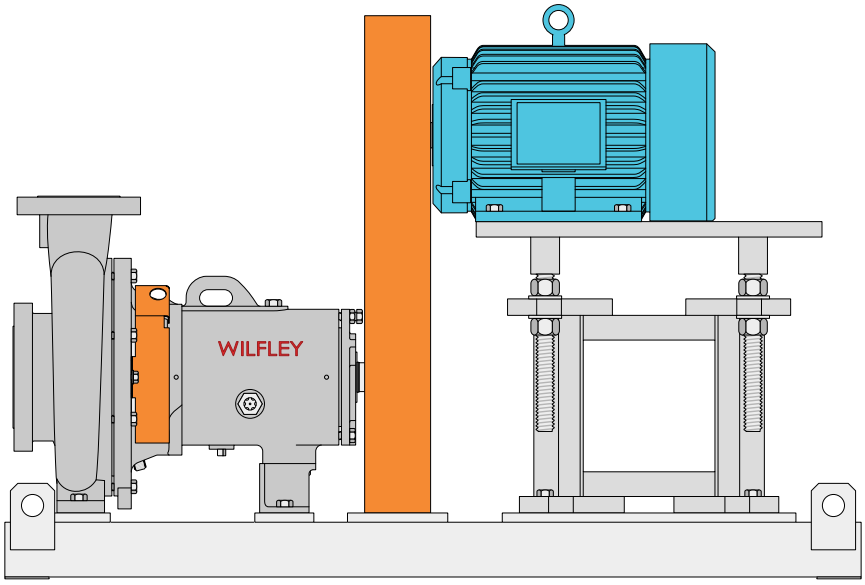
Flanges are drilled to match ASME B16.5 150lbs.



BASE DIMENSIONS

Dimensions in inches (millimeters)

Base	NEMA Motor	IEC Motor	HA	HB	HD (MAX)	HE	HF	HG	HH	HL	HP	HT (MIN)
FRAME 1												
139	143T-184T	80M-90L	15 (381)	39 (991)	9 (229)	4.5 (114)	36.5 (927)	3.63 (92)	0.75 (19)	4.5 (114)	1.25 (32)	3.5 (89)
148	213T-256T	132M-160L	18 (457)	48 (1219)	10.5 (267)	6 (152)	45.5 (1156)	4 (102)				
153	284TS-326TS	180M-180L	21 (533)	53 (1346)	12.88 (327)	7.5 (191)	50.5 (1283)	4 (102)				
FRAME 2 / 3												
245	143T-184T	100L-132M	15 (381)	45 (1143)	13.75 (349)	4.5 (114)	42.5 (1080)	3.63 (92)	0.75 (19)	4.5 (114)	1.25 (32)	3.5 (89)
252	213T-215T	160M-180L	18 (457)	52 (1321)	14.13 (359)	6 (152)	49.5 (1257)	4 (102)				
258	254T-286T	200L	21 (533)	58 (1473)	14.75 (375)	7.5 (191)	55.5 (1410)	4 (102)	1 (25)			
264	324TS-365T	225S-225M	21 (533)	64 (1626)	14.75 (375)	7.5 (191)	61.5 (1562)	4 (102)				
268	404T-405TS	250M	26 (660)	68 (1727)	14.88 (378)	9.5 (241)	65.5 (1664)	4.25 (108)				
280	405T-449TS	280S-280M	26 (660)	80 (2032)	15.88 (403)	9.5 (241)	77.5 (1969)	4.25 (108)				
FRAME 4												
368	284T-286T	180L	26 (660)	68 (1727)	19.25 (489)	9.5 (241)	65.5 (1664)	4.25 (108)	1 (25)	6.5 (165)	1.25 (32)	3.5 (89)
380	324T-405T	200L-250M	26 (660)	80 (2032)	19.25 (489)		77.5 (1969)					
398	444T-449TS	280S-315L	26 (660)	98 (2489)	19.25 (489)		95.5 (2426)					



Overhead belt driven configurations also available

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