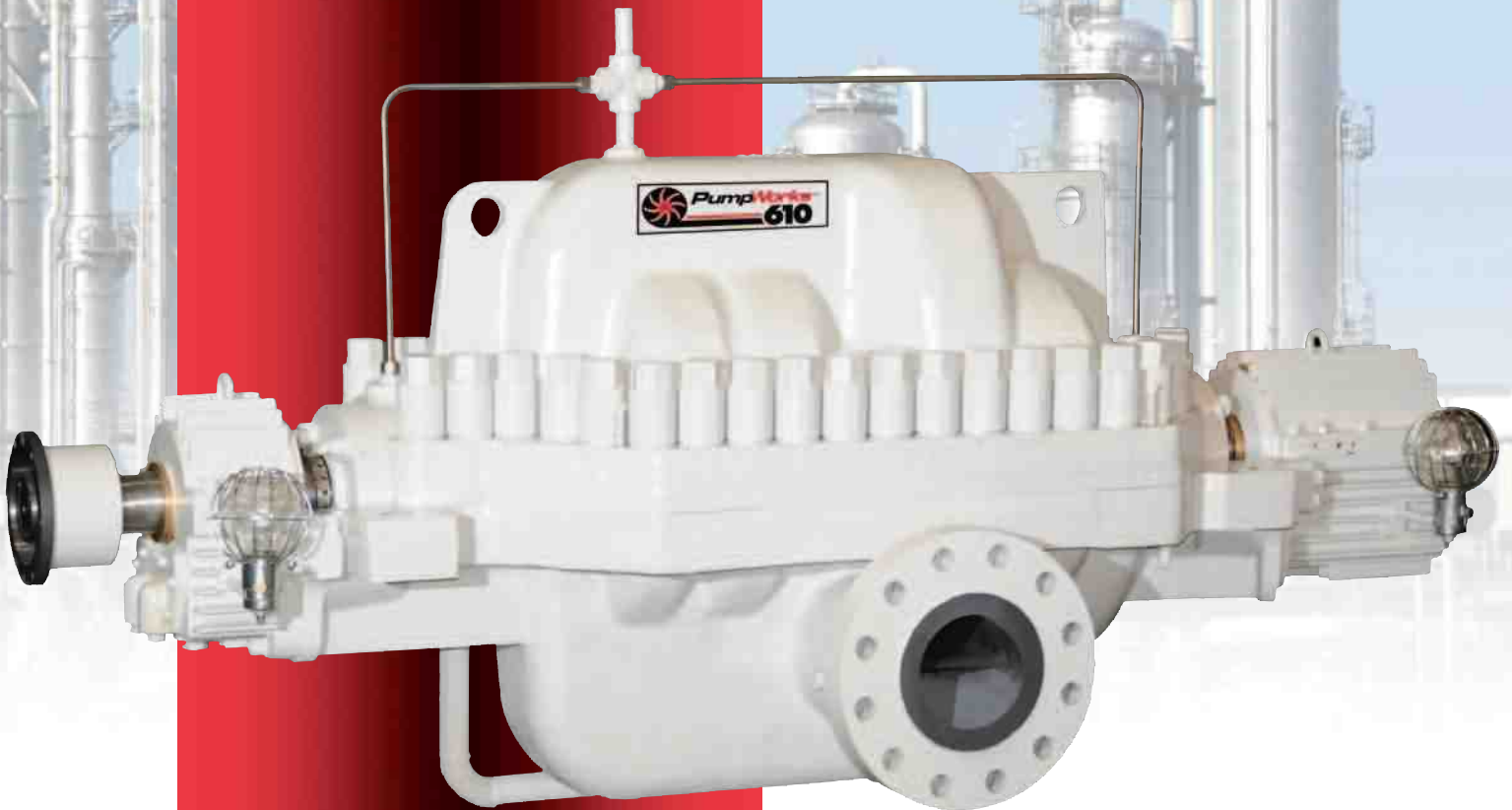




PWM

**API 610 BB3
Multistage Pump**



PWM API 610 BB3 MULTISTAGE PUMP

DESIGN FEATURES AND BENEFITS

Bearing Housing

- Finned design improves heat dissipation for cooler running bearing
- Large bearing housing easily accommodates vibration switches, transmitters and proximity probes
- Optional sleeve bearing designed to handle variety of RTDs

Seal Chamber

- API 610 seal chamber allows user to install any API 682 cartridge seal to meet process requirements
- Renewable throat bushing for controlled seal chamber environment
- Optional water cooled stuffing box for high process temperature application

Double Volute

- Precision cast hydraulic passageways minimizes radial thrust for less shaft deflection and bearing loading

Renewable Wear Rings

- All wear rings are replaceable permitting re-establishing initial running clearances and efficiency

Quality

- Manufactured and tested in the USA

Impeller

- Precision cast for maximum efficiency
- Dynamically balanced to 4W/N before mounting
- Opposing impeller design to limit axial thrust to maximize thrust bearing life
- Individually keyed, shrunk fit and restrained in the direction of thrust by split ring
- Mounted on shaft with vane tips staggered for reduced pressure pulsation
- Optional double suction large eye first stage impeller for lower NPSH performance

Flanges

- ANSI B16.5 Class 900# RF suction & discharge
- Optional 600# RF and 1500# RF

Nozzles

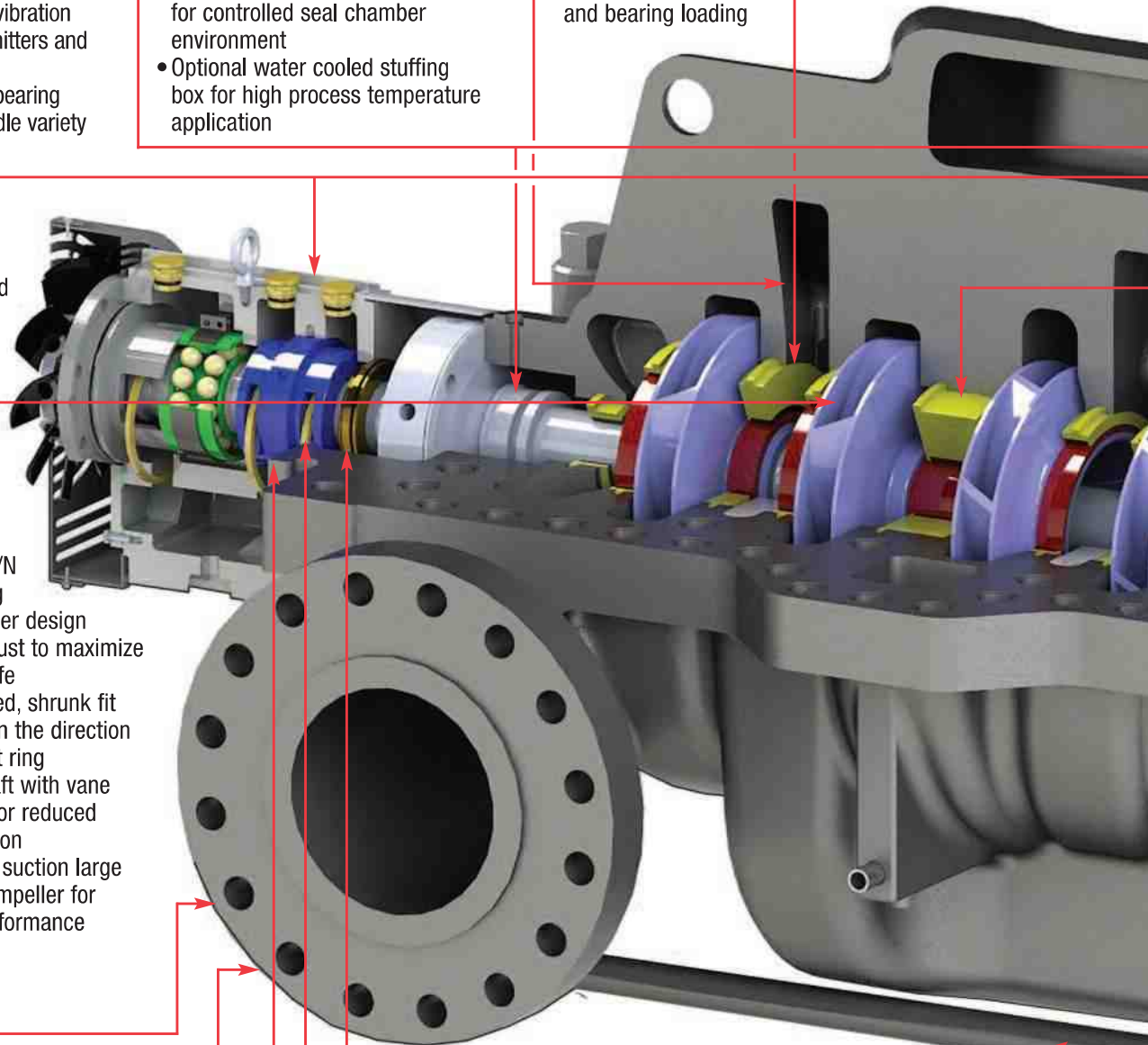
- Cast integrally in the lower half casing, permitting disassembly without disturbing piping connections

Labyrinth Oil Seal

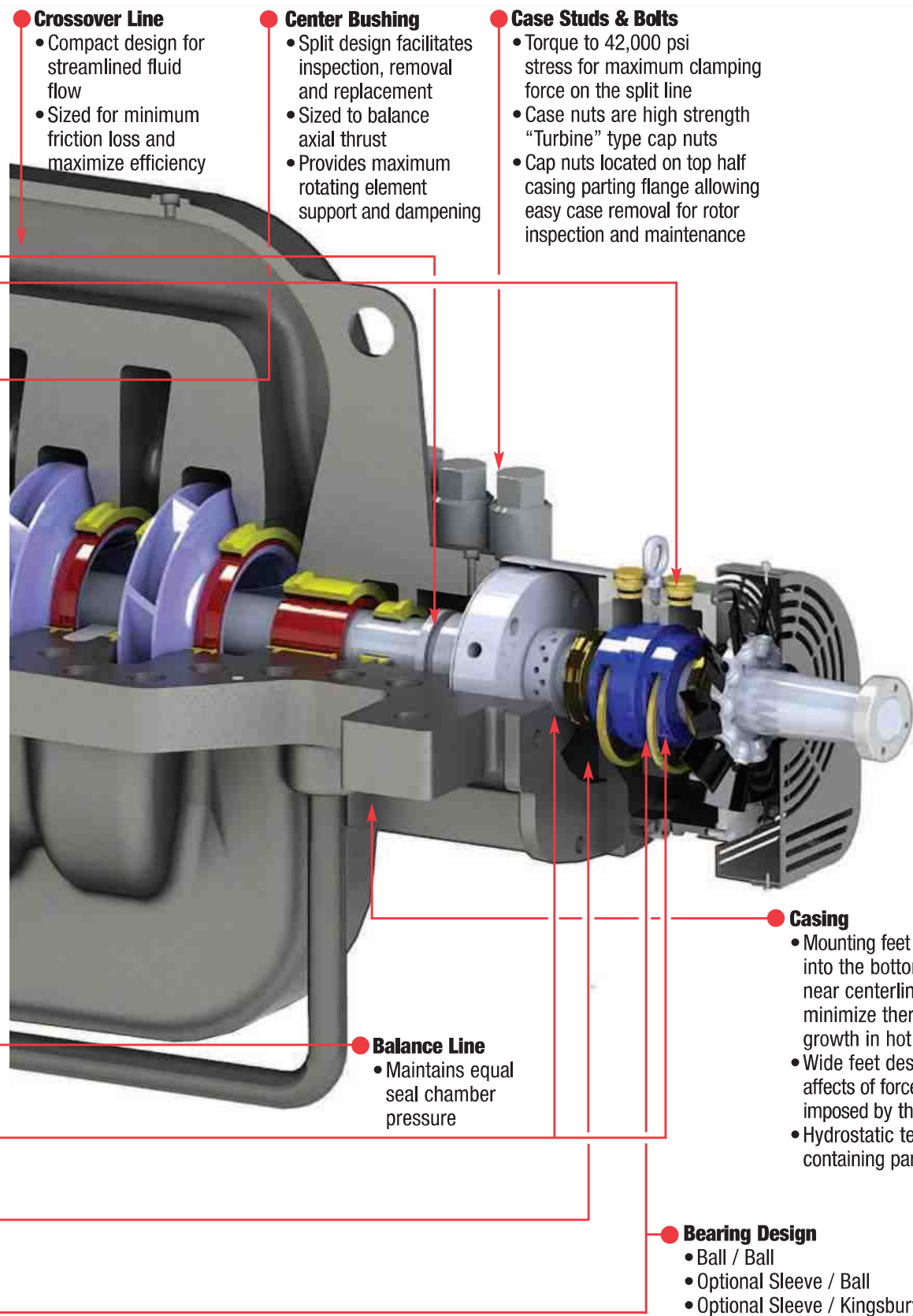
- INPRO™ bearing isolators to provide optimum bearing housing environment

Bearing Lubrication

- Ring oil lubrication to ensure effective lubrication
- Optional pure or purge mist lubrication



PWM API 610 CONSTRUCTION BB3 MULTISTAGE PUMP



- **Crossover Line**
 - Compact design for streamlined fluid flow
 - Sized for minimum friction loss and maximize efficiency

- **Center Bushing**
 - Split design facilitates inspection, removal and replacement
 - Sized to balance axial thrust
 - Provides maximum rotating element support and dampening

- **Case Studs & Bolts**
 - Torque to 42,000 psi stress for maximum clamping force on the split line
 - Case nuts are high strength "Turbine" type cap nuts
 - Cap nuts located on top half casing parting flange allowing easy case removal for rotor inspection and maintenance

- **Balance Line**
 - Maintains equal seal chamber pressure

- **Casing**
 - Mounting feet cast integral into the bottom half providing near centerline mounting to minimize thermal growth in hot service
 - Wide feet design to minimize affects of forces and moments imposed by the system piping
 - Hydrostatic test of pressure containing parts to 1.5 MAWP

- **Bearing Design**
 - Ball / Ball
 - Optional Sleeve / Ball
 - Optional Sleeve / Kingsbury

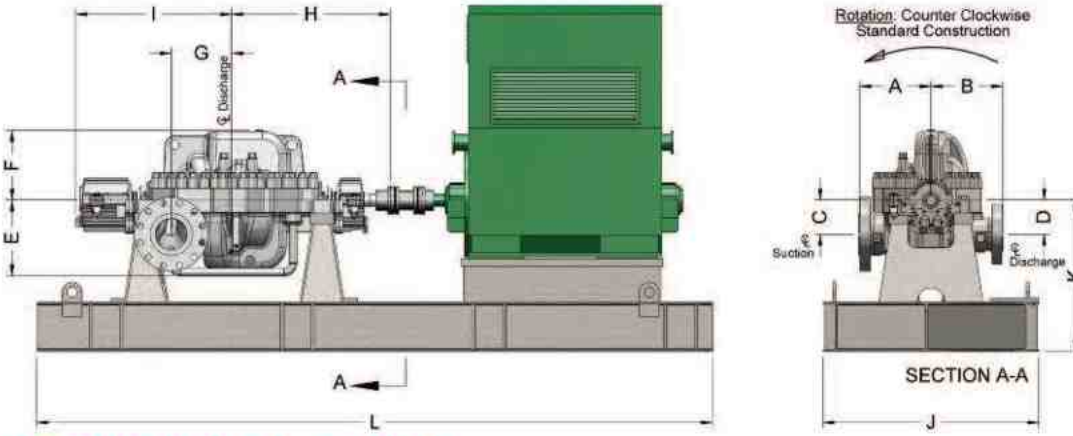
PWM API 610 BB3 MULTISTAGE PUMP

OUTLINE DIMENSIONS

SIZE	INDEPENDENT OF ROTATION							CCW - STD			*CW		BASEPLATE			Weights										
	Stages	A	B	C	D	E	F	*G	H	I	H	I	J	K	L	Pump	**Skid									
3x6x9	3	14.50	14.00	7.50	6.50	13.25	13.25	8.00	34.63	32.63	30.88	36.38	69.5	32.5	165.0	1650	4500									
	4							12.00	34.63	36.63	34.88	36.38			169.0	1925	4550									
	5							12.00	38.63	36.63	34.88	40.38			173.0	2200	4600									
	6							16.00	38.63	40.63	38.88	40.38			177.0	2475	4650									
	7							16.00	42.63	40.63	38.88	44.38			181.0	2750	4700									
	8							20.00	42.63	44.63	42.88	44.38			185.0	3025	4775									
	9							20.00	46.63	44.63	42.88	48.38			189.0	3300	4850									
	10							24.00	46.63	48.63	46.88	48.38			193.0	3575	4900									
	11							24.00	50.63	48.63	46.88	52.38			197.0	3850	4950									
	12							28.00	50.63	52.63	50.88	52.38			201.0	4125	5000									
	13							28.00	54.63	52.63	50.88	56.38			205.0	4400	5075									
	14							32.00	54.63	56.63	54.88	56.38			209.0	4675	5150									
	4x6x10							3	17.00	17.00	8.00	8.00			14.50	14.50	8.00	36.25	34.13	32.50	37.88	69.5	34.0	168.5	2700	4650
								4									12.50	36.25	38.63	37.00	37.88			172.0	2950	4700
5		12.50	40.75	38.63	37.00	42.38	176.5	3200					4750													
6		17.00	40.75	43.13	41.50	42.38	181.0	3450					4825													
7		17.00	45.25	43.13	41.50	46.88	185.5	3700					4900													
8		21.50	45.25	47.63	46.00	46.88	190.0	3950					4950													
9		21.50	49.75	47.63	46.00	51.38	194.5	4200					5050													
10		26.00	49.75	52.13	50.50	51.38	199.0	4450					5100													
11		26.00	54.25	52.13	50.50	55.88	203.5	4700					5150													
12		30.50	54.25	56.63	55.00	55.88	208.0	4950					5225													
13		30.50	58.75	56.63	55.00	60.38	212.5	5200					5300													
14		35.00	58.75	61.13	59.50	60.38	217.0	5450					5350													
4x6x11		3	17.00	17.00	8.00	8.00	16.00	15.00					9.75	37.38			35.00	34.13	38.25	69.5	36.0			169.5	2550	4750
		4											14.50	37.38			39.75	38.88	38.25					174.0	2920	4800
	5	14.50							42.13	39.75	38.88	43.00	179.0	3290	4900											
	6	19.25							42.13	44.50	43.63	43.00	183.5	3660	4950											
	7	19.25							46.88	44.50	43.63	47.75	188.5	4030	5000											
	8	24.00							46.88	49.25	48.38	47.75	193.0	4400	5100											
	9	24.00							51.63	49.25	48.38	52.50	198.0	4770	5200											
	10	28.75							51.63	54.00	53.13	52.50	202.5	5140	5250											
	11	28.75							56.38	54.00	53.13	57.25	207.5	5510	5300											
	12	33.50							56.38	58.75	57.88	57.25	212.0	6320	5375											
	6x8x12	3							18.00	18.00	8.50	8.50	19.00	18.00	9.50	41.50	35.75	34.75	42.50			69.5	36.0	174.0	3500	4800
		4													15.25	41.50	41.50	40.50	42.50					180.0	4000	4900
		5													15.25	47.25	41.50	40.50	48.25					185.5	4500	4975
		6													21.00	47.25	47.25	46.25	48.25					191.5	5000	5075
7		21.00	53.00	47.25	46.25	54.00	197.0	5500							5150											
8		26.75	53.00	53.00	52.00	54.00	203.0	6000							5250											
9		26.75	58.75	53.00	52.00	59.75	208.5	6500							5350											
10		32.50	58.75	58.75	57.75	59.75	214.5	7000							5400											
11		32.50	64.50	58.75	57.75	65.50	220.0	7500							5500											
12		38.25	64.50	64.50	63.50	65.50	226.0	8000							5600											
6x8x12.5		3	20.00	19.00	10.00	10.00	19.00	19.00							9.50	46.38	38.63	39.13	45.88	69.5	36.0			182.0	3125	4925
		4													16.00	46.38	45.13	45.63	45.88					188.5	4050	4950
		5													16.00	52.88	45.13	45.63	52.38					195.0	4975	5125
		6													22.50	52.88	51.63	52.13	52.38					201.5	5900	5250
	7	22.50							59.38	51.63	52.13	58.88	208.0	6825	5350											
	8	29.00							59.38	58.13	58.63	58.88	214.5	7750	5400											
	9	29.00							65.88	58.13	58.63	65.38	221.0	8675	5500											
	10	35.50							65.88	64.63	65.13	65.38	227.5	9600	5600											
	8x10x13	3							22.00	21.00	10.00	10.00	23.00	21.00	9.75	46.25	39.88	38.38	47.75			69.5	42.0	183.0	6,500	5200
		4													17.63	46.25	47.75	46.25	47.75					191.0	7,500	5300
5		17.63	54.13	47.75	46.25	55.63	199.0	8,500							5400											
6		25.50	54.13	55.63	54.13	55.63	207.0	9,500							5500											
7		25.50	62.00	55.63	54.13	63.50	215.0	10,500							5600											
8		33.38	62.00	63.50	62.00	63.50	223.0	11,500							5700											
12x12x16		2	26.38	25.25	12.31	12.31	28.00	26.00							12.13	43.31	43.88	43.06	44.13	69.5	45.0			184.0	7,250	5300
		3													12.13	53.00	43.88	43.06	53.81					194.0	8,600	5450
	4	21.81							53.00	53.56	52.75	53.81	204.0	9,450	5600											
	12x12x17 PWM-D	2							27.00	26.75	14.50	14.50	28.75	28.75	13.75	43.00	50.19	48.38	44.81			69.5	45.5	190.0	13,000	5400
14x16x17 PWM-D	2	28.00	31.00	14.50	14.50	32.13	32.13	16.63	47.50	60.38	51.63	56.25	69.5	50.5	205	13,000	5775									

PWM API 610 BB3 MULTISTAGE PUMP

OUTLINE DIMENSIONS



- NOTES:
1. All dimensions are in inches. Dimensions are not certified for construction.
 2. Standard construction flange rating 900#, except 14x16x17 PWM-D which is 600# standard rating
 3. All dimensions based on sleeve bearing / ball thrust housings with fan cooling, except 14x16x17 PWM-D which is sleeve / KTB
 - *4. For clockwise rotation - suction and discharge are on opposite sides in Section View A-A and side view. Dimension G is toward motor from discharge centerline.
 5. Dimensions "J", "K", & "L" may vary with driver selection
 - **6. Estimated skid weight is based on minimum length and width.

TECHNICAL DATA

PUMP SIZE	Case Min. Thick	Max. Hydro Test	STANDARD SHAFT DIMENSIONS						Ball Bearing Sizes		Sleeve Ball Thrust Brg. Size	Sleeve Pivot Shoe Size	Max. BHP/ 100 RPM	Wear Ring Dia.	Stuffing Box Dim.			Gland BC
			Imp.	Stuff. Box	Slv. Brg.	Ball Thrust Brg.	Radial Ball Brg.	Cplg.	Thrust Brg. Size	Radial Brg. Size					Bore	Face to 1st Obstruction		
																Int.	Ext.	
3x6x9	.63	3350	2.69	2.635	2.625	2.166	2.559	2.44	7311	6213	7310	5 JHJ	42	5.50	5.19	3.38	3.88	6.69
4x6x10	.75	3350	2.75	2.635	2.625	2.166	2.559	2.44	7311	6213	7310	5 JHJ	42	6.00	5.19	3.38	3.88	6.69
4x6x11	.75	3350	3.06	2.885	2.875	2.166	2.559	2.44	7311	6213	7310	5 JHJ	55	6.25	5.50	3.38	3.88	7.13
6x8x12	.63	3350	3.50	3.260	3.250	2.166	2.559	2.44	7311	6213	7310	5 JHJ	80	7.13	6.31	4.50	4.00	8.00
6x8x12.5	.69	3350	3.75	3.510	3.500	2.559	3.150	3.00	7313	6216	7313	6 JHJ	100	7.88	6.31	4.50	4.88	8.00
8x10x13	.69	3350	3.38	3.260	3.250	2.559	3.150	3.00	7313	6216	7313	5 JHJ	80	8.50	6.31	4.50	4.88	8.00
12x12x16	.69	3350	4.19	3.760	3.750	2.559	---	3.75	---	---	---	6 JHJ	123	10.50	6.75	5.50	5.13	8.75
12x12x17 PWM-D	1.25	3350	4.63	4.323	4.313	---	---	4.31	---	---	---	6 JHJ	187	10.75	7.13	5.50	5.25	8.88
14x16x17 PWM-D	1.13	2200	4.75	4.510	4.500	---	---	4.50	---	---	---	7 JHJ	212	12.13	7.50	5.50	5.56	9.25

- NOTES:
1. All dimensions are in inches.
 2. Hydrotest pressures based on standard 900# flange rating, at 1 1/2 maximum working pressure, except 14x16x17 PWM-D which is 600# standard rating.
 3. Max BHP/100 RPM based on 7500# torsional shaft stress

Typical Applications

PWM pump is designed for covering the full range of High Pressure petroleum refinery services, petrochemical plant services, gas processing, oil processing, offshore installations (platforms), hydrocarbon and crude oil pipeline and finished products pipeline services.

- Shorter lead times than the competition – 26 weeks for API 610 material class S-4, S-6, S-8, C-6 and A-8

Typical Services

- Services covered but not limited by the PWM pump include:
- Boiler Feed Water
 - High Pressure Water Services
 - Crude Oil Pipeline
 - Crude Products Pipeline
 - Water Injection
 - High Pressure Condensate
 - Propane Transfer
 - Gasoline Pipeline Service
 - NGL Pipeline
 - Mine Dewatering
 - Water Flood
 - HP Amine Circulation
 - High Pressure Refinery Services

