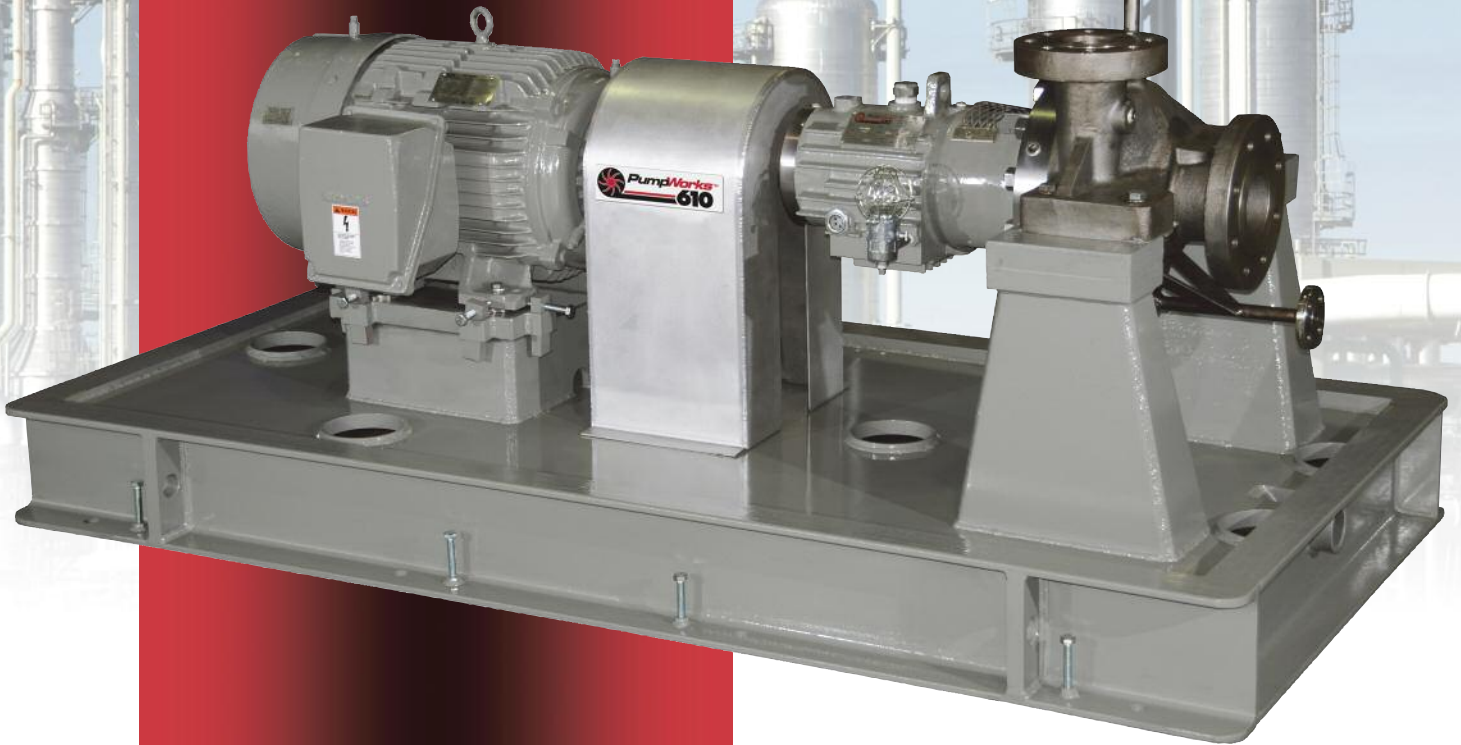




PWH

**API 610
SINGLE STAGE OH2**



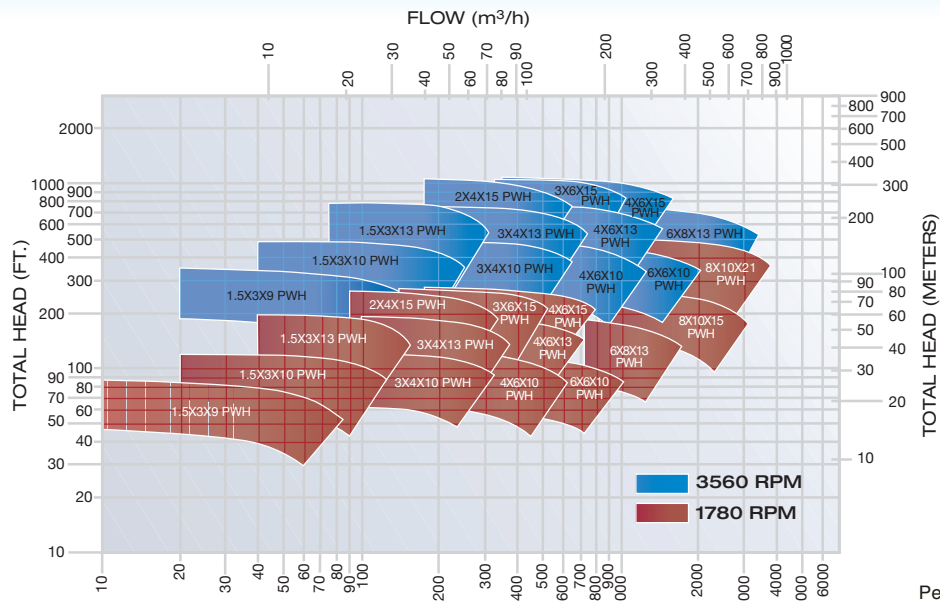
PWH API 610 PROCESS PUMP

HYDRAULIC PERFORMANCE COVERAGE

60 Hz Performance Coverage



Visit our web site at www.pumpworks610.com and specify flow and performance needs and obtain pump selection, performance curve, drawing, and data sheet.

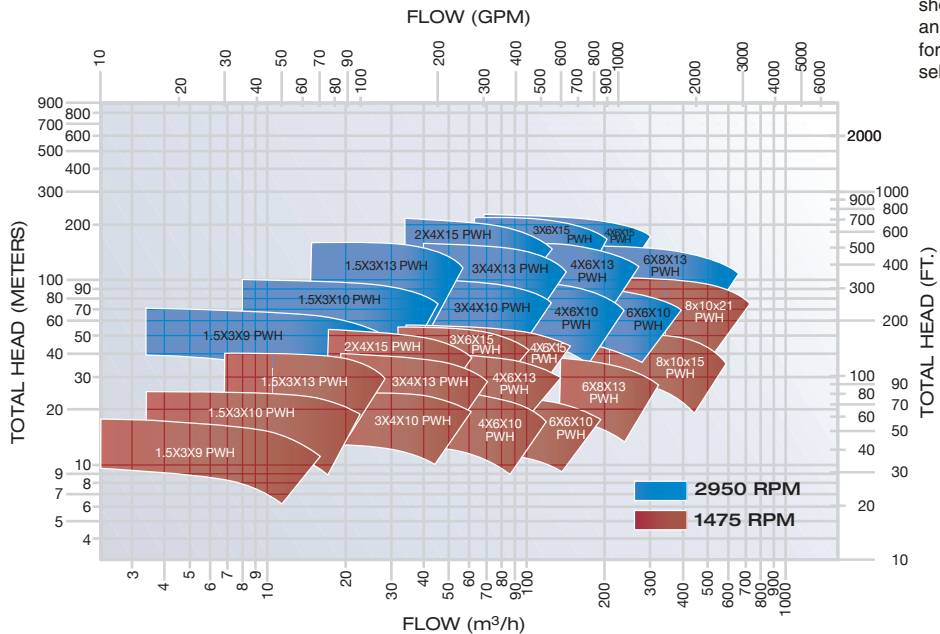


Performances shown are normal and are to be used for preliminary selection only.

50 Hz Performance Coverage



Visit our web site at www.pumpworks610.com and specify flow and performance needs and obtain pump selection, performance curve, drawing, and data sheet.



STANDARD MATERIALS OF CONSTRUCTION

API MATERIAL CLASS	S-6	S-8	C-6	A-8
CASING	A216 GRADE WCB	A216 GRADE WCB	A487 GRADE CA6NM	A351 GRADE CF3M
COVER	A516 GRADE 70	A516 GRADE 70	A479 TYPE 410SS	A479 TYPE 316/316L
IMPELLER	A487 GRADE CA6NM	A351 CF8M 316SS	A487 GRADE CA6NM	A351 CF8M 316SS
SHAFT	A276 TYPE 410SS CONDITION "T"	A479 TYPE 316 / 316L	A276 TYPE 410SS CONDITION "T"	A479 TYPE 316 / 316L
IMPELLER LOCK NUT	A479 TYPE 316L	A479 TYPE 316L	A479 TYPE 316L	A479 TYPE 316L
BEARING HOUSING	A216 GRADE WCB CARBON STEEL	A216 GRADE WCB CARBON STEEL	A216 GRADE WCB CARBON STEEL	A216 GRADE WCB CARBON STEEL
IMPELLER WEAR RINGS	420 SS HT: 400-450 BHN	316 SS HARD FACED	420 SS HT: 400-450 BHN	316 SS HARD FACED
CASING WEAR RINGS	410 SS HT: 262-302 BHN	316 SS HARD FACED	410 SS HT: 262-302 BHN	316 SS HARD FACED
THROAT BUSHING	410 SS HT: 262-302 BHN	316 SS HARD FACED	410 SS HT: 262-302 BHN	316 SS HARD FACED
CASING STUDS	A193 GRADE B-7	A193 GRADE B-7	A193 GRADE B-7	A193 GRADE B-7
CASING NUTS	A194 GRADE 2H	A194 GRADE 2H	A194 GRADE 2H	A194 GRADE 2H

*Other API 610 Material Classes and Combinations are available

PWH API 610 PROCESS PUMP

DESIGN FEATURES AND BENEFITS

Quality

- Manufactured and tested in the USA

Dual Volute Casing

- On larger pump sizes
- Minimizes radial loads and shaft deflection increasing mechanical seal and bearing life

Discharge Nozzle

- Tangential discharge maximizes hydraulic efficiency

Drain & Vent Ports

- Threaded or socket welded
- Socket welded drain port two-plane gusseted and piped to skid edge 3/4" SCH 160 300# RF

Casing Mounting Feet

- Gusseted to meet stringent API nozzle loading criteria

Nozzle Load

- Casing & baseplate design exceeds current edition API 610 nozzle load requirement

Impeller Retention

- Keyed and secured to shaft with exclusive dual set-screw locknut

Pump Casing

- Precision machining and fully confined controlled compression gasket ensures proper sealing and ease to cover alignment

Impeller

- Fully enclosed design provides increased efficiency
- Dynamically balanced to API 610 criteria

Delivery

- 16 weeks for API 610 material class S-6, S-8 and C-6
- Refer to the factory on deliveries for other API material classes and customer specific material combinations

ePOD Pump Selector

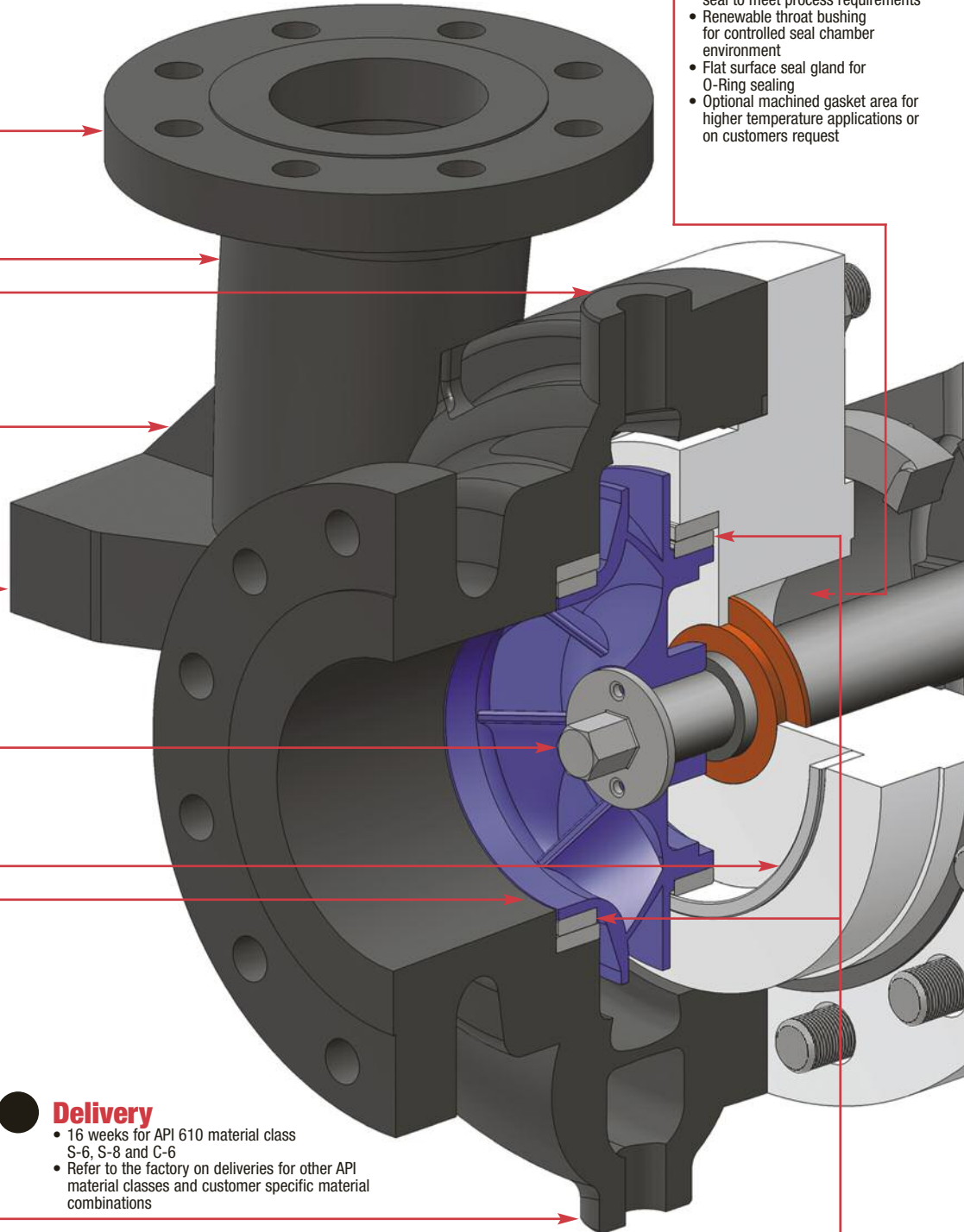
- Access to end users and influencers to select, configure and price your pump application on line at www.pumpworks610.com

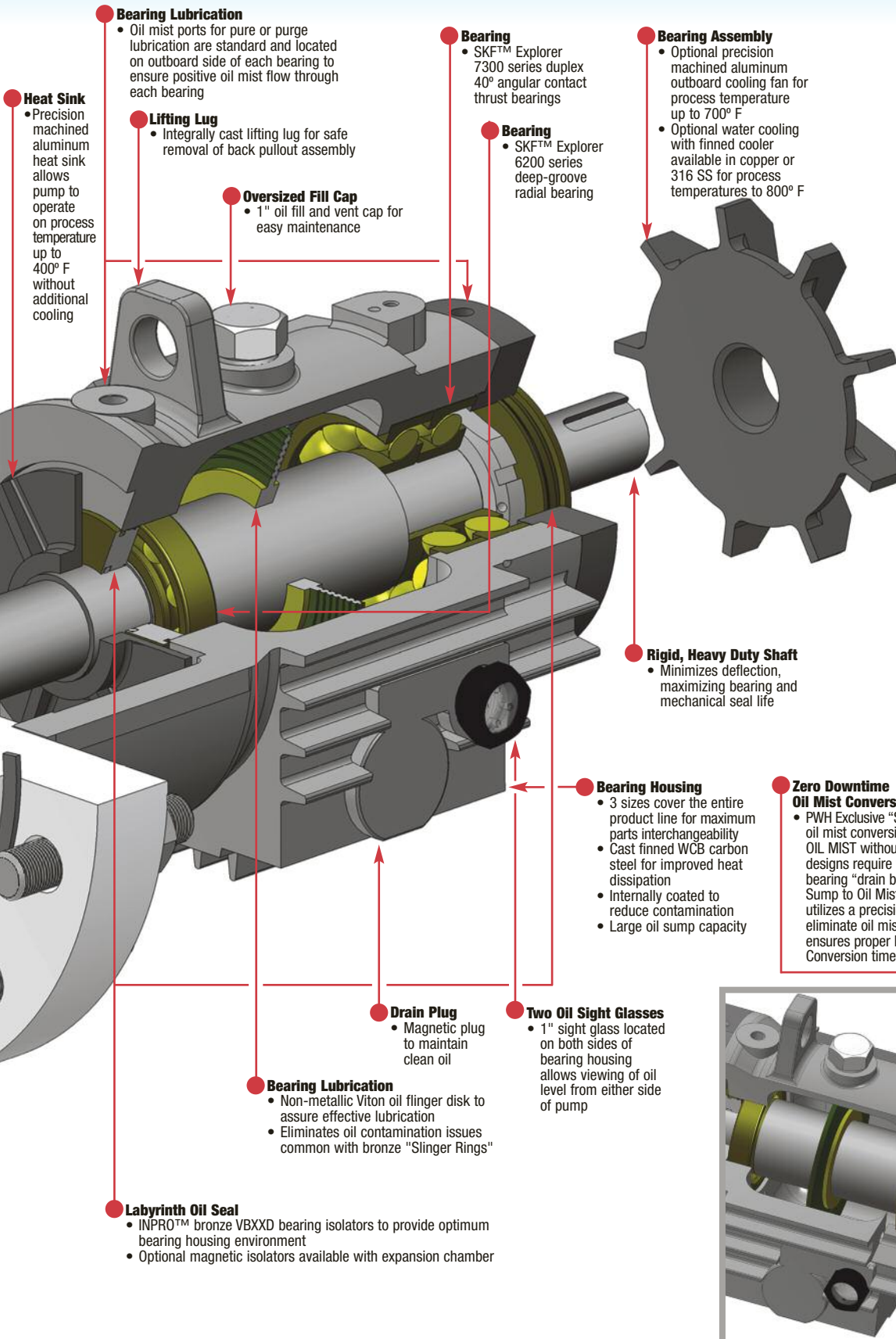
Casing Cover and Seal Chamber

- 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
- Flat surface seal gland for O-Ring sealing
- Optional machined gasket area for higher temperature applications or on customers request

Renewable Casing and Impeller Wear Rings

- Front and back rings control seal chamber pressure and provides impeller stability
- Optional non-metallic rings for improved efficiency and dry running





Heat Sink

- Precision machined aluminum heat sink allows pump to operate on process temperature up to 400° F without additional cooling

Bearing Lubrication

- Oil mist ports for pure or purge lubrication are standard and located on outboard side of each bearing to ensure positive oil mist flow through each bearing

Lifting Lug

- Integrally cast lifting lug for safe removal of back pullout assembly

Oversized Fill Cap

- 1" oil fill and vent cap for easy maintenance

Bearing

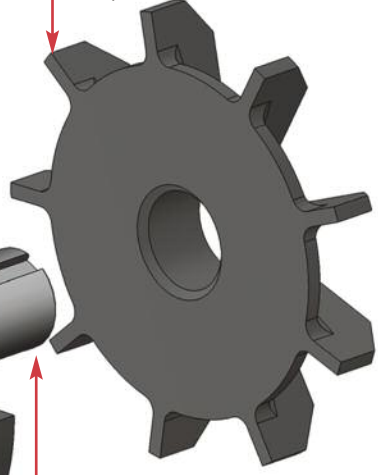
- SKF™ Explorer 7300 series duplex 40° angular contact thrust bearings

Bearing

- SKF™ Explorer 6200 series deep-groove radial bearing

Bearing Assembly

- Optional precision machined aluminum outboard cooling fan for process temperature up to 700° F
- Optional water cooling with finned cooler available in copper or 316 SS for process temperatures to 800° F



Rigid, Heavy Duty Shaft

- Minimizes deflection, maximizing bearing and mechanical seal life

Bearing Housing

- 3 sizes cover the entire product line for maximum parts interchangeability
- Cast finned WCB carbon steel for improved heat dissipation
- Internally coated to reduce contamination
- Large oil sump capacity

Zero Downtime Oil Mist Conversion

- PWH Exclusive "SMART LUBE SYSTEM": The innovative oil mist conversion kit allows user to convert to PURE OIL MIST without removing pump from service! Other designs require you to pull the unit and plug thrust bearing "drain back" ports when converting from Oil Sump to Oil Mist. The PWH "SMART LUBE SYSTEM" utilizes a precision tolerance, elongated port plug to eliminate oil mist "leakage" around bearings. This ensures proper lubrication and limited downtime. Conversion time is less than 5 minutes.

Drain Plug

- Magnetic plug to maintain clean oil

Two Oil Sight Glasses

- 1" sight glass located on both sides of bearing housing allows viewing of oil level from either side of pump

Bearing Lubrication

- Non-metallic Viton oil flinger disk to assure effective lubrication
- Eliminates oil contamination issues common with bronze "Slinger Rings"

Labyrinth Oil Seal

- INPRO™ bronze VBXXD bearing isolators to provide optimum bearing housing environment
- Optional magnetic isolators available with expansion chamber



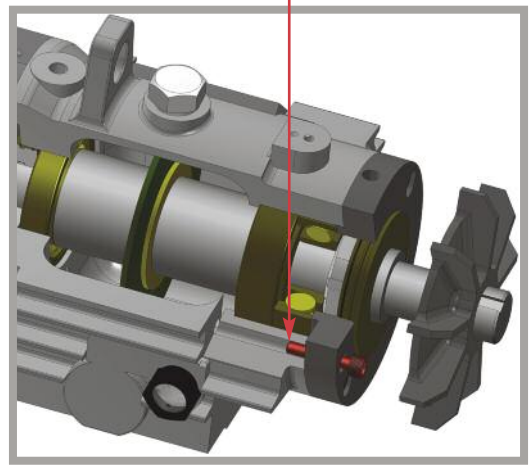
PW-11
API 610 SINGLE STAGE OH2 UPGRADE PROGRAM

PW-11 is the PumpWorks 610 retrofit upgrade kit for any brand of API 610 single stage OH2 process pump. See our PW-11 API 610 Upgrade Program Brochure for more information.



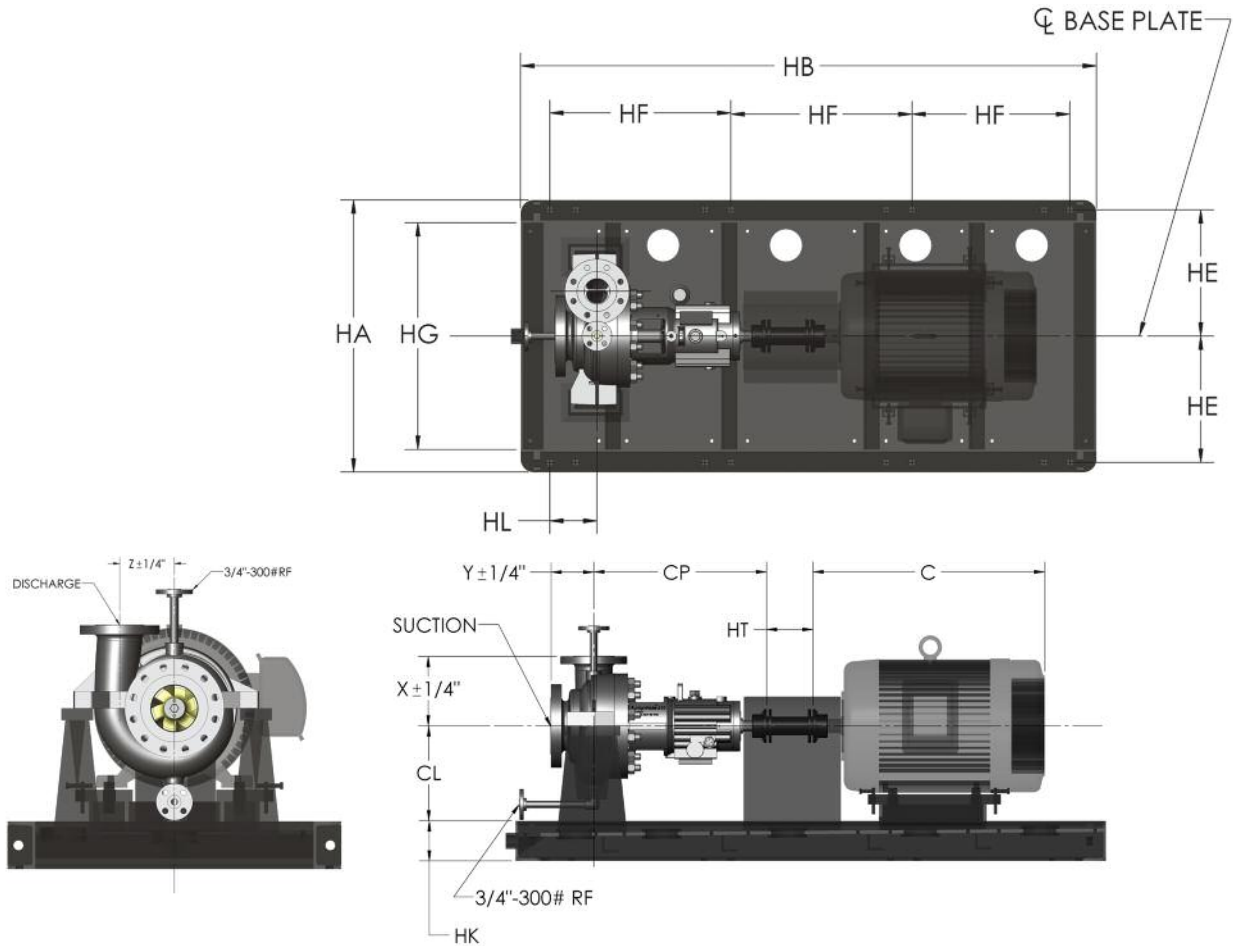
PWV
API 610 Vertical Turbine Pump VS6 (Can Type) VS1 (Sump Type)

PWV is the PumpWorks 610 API 610 current edition VS6 and VS1 vertical turbine pump. See our PWV API 610 Vertical Turbine VS6 (Can Type) and VS1 (Sump Type) Brochure for more information.



PWH API 610 PROCESS PUMP

OUTLINE DIMENSIONS



PUMP AND DRIVER DIMENSIONS

PUMP SIZE	PUMP WEIGHT-LBS	CP	CL	HL	HT	X	Y	Z	SUCTION	DISCHARGE	BASE #
1.5x3x9	550	24.937	12.62	5	5	8.5	6.625	5.125	3	1.5	3
1.5x3x10	600	24.937	14	6	5	10.5	6.9	5.875	3	1.5	3
3x4x10	630	25.64	15.25	6	7	10.06	10.62	6.31	4	3	5
4x6x10	650	25.62	14.5	6	7	10.5	9.29	10.87	6	4	5.5A
6x6x10	650	25.71	14.5	8	7	11	6.87	6	6	6	6
1.5x3x13	630	27.62	11.5	6	5	11.75	7.75	6.87	3	1.5	5
3x4x13	680	27.5	16	6.5	7	13.07	7.5	8.15	4	3	5.5B
4x6x13	700	27.62	18	8.5	7	14	13.43	9.25	6	4	6.5
6x8x13	750	28.438	20	8	8	15.06	8.937	10.5	8	6	7A
2x4x15	700	28.187	12.5	7	7	13	8	7.875	4	2	6
3x6x15	800	28.187	16	7.25	7	12.437	8.15	8.75	6	3	6.5
4x6x15	850	28.437	16	7	7	15.75	7	8.5	6	4	7A
8x10x15	1100	28.562	22	9.5	7	16.062	10.12	12	10	8	6.5
8x10x21	1800	30.38	24	10	7	19	10	15.5	10	8	7A

BASEPLATE DIMENSIONS

BASE #	HA	HB	HK	HE	HF	HG	WEIGHT-LBS.
3	36	72.5	6	16.5	30.25	30	900
5	42	72.5	6	19.5	30.25	36	1000
6	42	96.5	6	19.5	28.16	36	1200
6.5	42	108.5	8	19.5	24.12	36	1400
5.5A	42	84.5	6	19.5	24.16	36	1100
5.5B	42	84.5	8	19.5	24.16	36	1150
7A	61	124	8	29	37.32	55	2077

NOTES

1. DIMENSIONS ARE IN INCHES
2. DIMENSIONS OF PUMP ARE $\pm 0.12"$ UNLESS OTHERWISE NOTED
3. DIMENSIONAL TOLERANCES OF MOTOR ARE IN COMPLIANCE WITH NEMA MG-1
4. PUMP FLANGE RATINGS ARE ANSI B16.5 300# RF
5. CCW ROTATION VIEWED FROM COUPLING END
6. BASEPLATE DIMENSIONS NOT TO BE USED FOR CONSTRUCTION

PWH API 610 PROCESS PUMP

TECHNICAL DATA

PUMP SIZE		1.5x3x9	1.5x3x10	3x4x10	4x6x10	6x6x10	1.5x3x13	3x4x13	4x6x13	6x8x13	2x4x15	3x6x15	4x6x15	8x10x15	8x10x21	
FLANGE	SUCTION - 300# RF [IN]	3	3	4	6	6	3	4	6	8	4	6	6	10	10	
	DISCHARGE - 300# RF [IN]	1.5	1.5	3	4	6	1.5	3	4	6	2	3	4	8	8	
MAWP	S-6 [PSIG 100 DEG F]	740														
	S-8 [PSIG 100 DEG F]															
	C-6 [PSIG 100 DEG F]															
	A-8 [PSIG 100 DEG F]															
Mechanical Group		IA			IB			IIA			IIB			IIIA		
Bearing Frame		I			I			II			II			III		
Volute Type		SINGLE			DOUBLE			SINGLE		DOUBLE		SINGLE		DOUBLE		
AUX PORTS	Discharge (Flush) [IN]	1/2														
	Vent [IN]	1/2														
	Drain [IN]	1/2			3/4			1/2			3/4					
	Suction [IN]	1/2														
SHAFT	Max Impeller [IN]	9.0	10.5	10.5	10.5	10.5	13.3	13.3	13.3	13.3	15.5	15.5	15.5	15.5	21.0	
	Min Impeller [IN]	7.0	8.0	8.0	8.0	8.0	10.0	10.0	10.0	10.0	12.0	12.0	12.0	12.0	15.0	
	Diameter at Coupling [IN]	1.63			1.88			2.38			2.38			2.50		
	Keyway at Coupling [IN]	0.38			0.50			0.50			0.75			0.75		
	Extension at Coupling [IN]	3.50			3.50			4.50			4.50			4.50		
	Diameter at Mechanical Seal [IN]	2.00			2.75			3.37			3.37			3.37		
	Diameter Between Bearings [IN]	3.00			3.50			4.25			4.25			4.25		
	Distance Between Bearings [IN]	7.74			8.81			9.64			9.64			9.64		
	Radial Bearing	6212			6215			6218			6218			6218		
	Thrust Bearing	7312 X 2			7314 X 2			7317 X 2			7317 X 2			7317 X 2		
	Maximum RPM	3600			1780			1780			1780			1780		
	Maximum HP/100 RPM	8.0			12.5			12.5			21.5			21.5		

Typical Applications

PWH pump is designed for covering the full range of petroleum refinery services, petrochemical plants, gas processing, oil processing, offshore installations (platforms), hydrocarbon and crude oil pipeline, and aviation (jet) fueling.

PumpWorks 610 TEST FACILITY

Comprehensive Performance Test
 It is the function of any pump manufacturer to provide performance data for their pumps under the most severe operating conditions. The PumpWorks 610 Test Facility provides a complete test facility for testing pumps under the most severe operating conditions. The facility is equipped with the latest edition of API 610 for horizontal and vertical pumps.

Test Facility Capabilities:

- The flow rate: 750 gpm
- The pressure: 1000 psi
- The temperature: 1000°F
- The viscosity: 1000 cP
- The pump size: 1.5x3x9 through 8x10x21
- The pump type: Horizontal and vertical
- The pump material: Cast iron, stainless steel, titanium
- The pump speed: 1800 RPM
- The pump efficiency: 70%
- The pump NPSHR: 10 ft
- The pump head: 100 ft
- The pump power: 1000 HP
- The pump torque: 1000 ft-lb
- The pump vibration: 0.1 in/sec
- The pump noise: 100 dBA
- The pump life: 10,000 hours
- The pump maintenance: 1000 hours
- The pump cost: \$100,000

See our PumpWorks 610 Test Facility Brochure for more information.

The PumpWorks 610 Pump Test Facility located in Tyler, Texas USA provides performance and NPSHR test in accordance with latest edition of API 610 for horizontal and vertical pumps.

See our PumpWorks 610 Test Facility Brochure for more information.

Typical Services

Services covered but not limited by the PWH pump include:

- Column reflux
- Column bottoms
- Reboiler
- Injection fuel blending
- Heat transfer
- Gas oil
- Heavy gas oil
- Hot oil
- Column charge
- Reactor feed
- Coker unit
- Stabilizer overhead
- Scrubber circulation
- Tower bottoms
- Off-site hydrocarbon
- Stripper overhead
- Gasoline
- Water
- Propanes
- Crude oil
- Vis-breaker
- Naphtha
- Kerosene

