

▼ Documentation packs		
Documentation pack	Inclusive documents	Standard
<b>Bronze pack</b>	Order acknowledgement (electronic)	●
	Installation, Operating & Maintenance manual	
	Declaration of conformity	
	ATEX Declaration of conformity – only if contracted	
	Hydrostatic test certificate	
	Pump HQ performance test certificate	
	Spare parts list – commissioning	
	Documentation schedule	
	Quality plan	
	Production programme	
<b>Silver Pack (includes bronze pack)</b>	Spare parts list – operating	
	Customer specific pump GA drawing	
	Pump SA & parts list	
	Type 3.1 certificates (* pressure containing + process wetted parts only) – only if contracted	
	Pump HQ performance test curve	
	Certification databook	
	Pump datasheet	
	Motor type test certificate	
	Motor GA drawing	
	Motor datasheet	
<b>Gold pack (includes silver pack)</b>	Motor Declaration of conformity	
	Motor ATEX Declaration of conformity	
	Manufacturing databook	
	Material traceability	
	Progress reports (monthly)	
	Paint certificate	
	Nameplate drawing	
	Spare parts interchangeability report	
	Spare parts list – insurance & commissioning	
	Documentation format	Electronic CD - Adobe (.pdf), ms office (.xls .doc)
	Hard copy	

▼ NDT			
Pump test	Test standard	Acceptance criteria	Standard
Hydrostatic	API 610 / ISO 13709	API 610 / ISO 13709 (1.5 x MAWP)	●
Head & flow	API 610 / ISO 13709	API 610 / ISO 13709	●
Mechanical run - 1 hour at rated duty	API 610 / ISO 13709	API 610 / ISO 13709	
Mechanical run - 4 hours at rated duty	API 610 / ISO 13709	API 610 / ISO 13709	
NPSH - 4 point	API 610 / ISO 13709	API 610 / ISO 13709	
Noise – single point at 1m	API 610 / ISO 13709	Customer datasheet	●
Vibration – FFT spectrum at each test point	API 610 / ISO 13709	API 610 / ISO 13709	●
Bearing bracket resonance	API610 / ISO13709	Mutual Agreement	

▼ NDE		
Visual examination of cast surfaces	ASME V Article 9 / MSS SP55 (pressure containing castings only)	●
Dyepenetrant of machined surfaces	Pressure containing castings only	
Dyepenetrant of cast surfaces	Pressure containing castings only	
Dyepenetrant of welds	Drain & seal pipework (if fitted)	
Positive Material Identification	Excludes minor components (nuts & bolts etc)	
Radiography	Welds (pressure pipework) Castings - shot plan (critical areas)	
Hardness report	NACE (certain materials only – please ask for details)	
Various motor tests		

\* Pressure containing parts include; volute casing, casing cover, & mechanical seal. Process wetted parts include additional shaft, impeller, wear rings, impeller hub cap, lockwasher & nut. A full range of testing and documentation can be tailored to suit your exact requirements. Amaranth reserves the right to alter any information within this document without prior notification. © Copyright 2017. Amaranth Limited. E&OE.

## B Series – OH1 Petrochemical pumps

(API 610 11th: 2010)



▼ General Specification	
<b>General description</b>	A range of OH1 single stage, foot mounted centrifugal end suction pumps with centreline discharge manufactured in a variety of alloys.
<b>Construction</b>	Back pullout design with metal to metal fits
<b>Design methodology</b>	Advanced computer techniques including 3D modelling, FEA & CFD
<b>Design standards</b>	API 610 11th : 2010 / ISO 13709 : 2010 ATEX EC-Directive 94/9/EC
<b>Design pressure rating</b>	20 bar g @ 38°C
<b>Suction pressure rating</b>	16 bar g (standard construction)
<b>Temperature rating</b>	-40°C to 200°C (standard construction) -40°C to 250°C (with cooling)
<b>Performance envelope</b>	
<b>Flowrate</b>	Up to 1500m <sup>3</sup> /h
<b>Differential head</b>	Up to 300m
<b>Speed</b>	Up to 3600 rpm
<b>Configurations</b>	Long coupled pump Bareshaft pump Rotating assembly
<b>Frame sizes</b>	040x025x145 to 300x200x510
<b>Design life</b>	30 years (3 years uninterrupted operation)

▼ Material Options		
Materials	Casing	Impeller
<b>A8 - SS 316 / SS 316</b>	ASTM A351 CF 3M	ASTM A351 CF 3M
<b>I1 - Cast Iron / Cast Iron</b>	ASTM A278 Class30	ASTM A278 Class30
<b>S8 - Carbon Steel / SS 316</b>	ASTM A216 WCB	ASTM A351 CF 3M
<b>S6 - Carbon steel / 12% Cr SS</b>	ASTM A216 WCB	ASTM A217 Gr CA 15
<b>D1 - Duplex SS / Duplex SS</b>	ASTM A890 Gr 4A (UNS J92205)	ASTM A890 Gr 4A (UNS J92205)
<b>D2 - Super Duplex SS / Super Duplex SS</b>	ASTM A890 Gr 6A (UNS J93380)	ASTM A890 Gr 6A (UNS J93380)
<b>Hastelloy B / Hastelloy B</b>	ASTM A494 Gr N 7M	ASTM A494 Gr N 7M
<b>Hastelloy C / Hastelloy C</b>	ASTM A494 Gr CW 12MW	ASTM A494 Gr CW 12MW
<b>Monel / Monel</b>	ASTM A494 Gr M35-1	ASTM A494 Gr M35-1
<b>Titanium / Titanium</b>	ASTM B367 Gr C2	ASTM B367 Gr C2
<b>Customer specified</b>	Other alloys available on request including NACE compliant materials	Other alloys available on request including NACE compliant materials

**B Series – OH1 Petrochemical pumps** (API 610 11th: 2010)

Features	Technical Notes	Benefits	Standard
<b>▼ Casing</b>			
<b>Construction</b>	One piece casting with integral suction cover and 3mm corrosion allowance	Minimal leakage path, prolonged pump life	●
<b>Flange standard</b>	ISO PN20 / ANSI 150 / ANSI 125		●
<b>Nozzle loading</b>	API 610	Rugged construction	●
<b>Fasteners</b>	ASTM 320 Grade B8MX	Strength & corrosion resistance	●
<b>Gasket</b>	Reinforced graphite	Covers most fluids	●
	Expanded PTFE	Covers certain acid duties	
	Customer specified	Matched to site standard	
<b>Wear rings</b>	Suction side (shrouded impeller only)	Prolonged pump life	●
<b>Drain</b>	1/2 / 3/4" butt weld flange		●
	1/2 / 3/4" plugged (I1 material only)		
	No drain	Minimal leakage path	
<b>Jacking screws</b>	SS 316	Ease of maintenance	●
<b>Orifice plate</b>	Loose tang type	Matched to customer requirement	
<b>▼ Impeller</b>			
<b>Construction</b>	One piece casting	Strength & integrity	●
<b>Vanes</b>	Francis type – 4 / 5 off	Low NPSHr & stable H/Q curve	●
<b>Style</b>	Shrouded	Optimum efficiency	●
	Semi open	Handles solids content in fluid	
<b>Fixing</b>	Keyed with retention screw & lock washer	Easy maintenance	●
<b>Wear rings</b>	Suction side (shrouded only)	Prolonged pump life	●
<b>Hydraulic balancing</b>	Backvanes		●
<b>Dynamic balancing</b>	ISO 1940 G 2.5	Prolonged pump life	●
	ISO 1940 G 1.0	Matched to customer requirement	
<b>▼ Seals &amp; seal plans</b>			
<b>Shaft diameters</b>	30mm, 40mm, 50mm, 60mm, 70mm		●
<b>Seal types</b>	API 682 single cartridge	Ease of maintenance	●
	API 682 double cartridge	Environmentally safer	
<b>Seal plans</b>	Plan 11/61	Optimum seal environment	●
	Plans 11/62, 13, 21, 31, 32, 52, 53, 54, 62, 65, 72, 74, 75, 76	Matched to customer requirement	
	Customer specified		
<b>Manufacturers</b>	AES, Burgmann, Jo	Matched to site standard	
	Customer specified		
<b>▼ Bearing bracket</b>			
<b>Style</b>	One piece casting	Better concentricity, less run out	●
<b>Construction</b>	Heavy duty casting with machined abutments	Superior bearing alignment	●
<b>Bearings</b>	Dual angular contact (axial) plus deep groove ball (radial)	Long life	●
<b>Design bearing life</b>	25,000 hours (L10) @ standard duties		●
<b>Bearing seals</b>	Non contacting bearing isolators	Minimal wear, long life, ATEX	●
	Customer specified	Matched to site standard	
<b>Lubrication</b>	Oil (fluid -40°C to 250°C)	Higher operating temperatures	●
	Grease (fluid -20°C to 120°C)	Lowest cost	
<b>Cooling</b>	Cast fins	Dissipates heat	●
	Fan	Extended temperature range	
	Water cooled heat exchanger	Constant cooling	

Features	Technical Notes	Benefits	Standard
<b>Running temperature (oil)</b>	Less than 40°C above ambient	Long life	●
<b>Monitoring</b>	Vibration monitoring points	Assist planned maintenance	●
	Temperature sensor location points		
<b>Bearing bracket materials</b>	Carbon steel		●
	Stainless steel 316	Matched to customer requirement	
<b>Shaft materials</b>	Duplex stainless steel		●
	Customer specified	Material to match casing / fluid	
<b>▼ Coupling &amp; guard</b>			
<b>Coupling style</b>	Spacer type with metal membranes. DBSE 100 / 140 / 180	Easy maintenance	●
<b>Construction</b>	Bored & keywayed		●
	Extraction holes	Easy removal	
	Inconel membranes	Minimal corrosion in saline atmospheres	
<b>Balancing</b>	Inherent by design	Low vibration	●
	Dynamic to ISO 1940 G 2.5	Prolonged pump life	
<b>Manufacturers</b>	John Crane		●
	Customer specified	Matched to site standard	
<b>Standards</b>	ATEX		
<b>Guard</b>	Two piece wrap around in brass	Non sparking/ATEX compliant	●
<b>▼ Baseplate</b>			
<b>Style</b>	Drain pan without grout holes	Lowest cost	●
	Drain pan with grout holes	Matched to customer requirement	
	Drain pan with grout holes, extended	Pump and motor contained	
<b>Construction</b>	Fabricated from rolled steel sections with 4 lifting eye bolts	Rugged construction	●
<b>Standards</b>	ANSI/HI 3-2000, ISO3661		●
<b>Earthing point</b>	2 off M10 studs/nuts/washers		●
	Earth bonding	Matched to customer requirement	
<b>Alignment screws (Up to 132 frame)</b>	Transverse & axial	Easier alignment	
<b>Alignment screws (160 frame and above)</b>	Transverse & axial		●
<b>Material</b>	Carbon steel	Lowest cost	●
	SS 304L	Resistance to low temperature	
<b>▼ Driver</b>			
<b>Motor type</b>	Safe area, Exe, EExN, EExd, EExde,	Matched to area requirements	
<b>Standards</b>	ISO frames	Matched to site standard	●
	NEMA frames		
	ATEX	Hazardous area requirement	
<b>Supply</b>	380 – 440 / 3 / 50, 440 – 460 / 3 / 60	Matched to site standard	
<b>Manufacturers</b>	ABB, Brook Crompton, F&G, Loher, Seimens, WEG, Customer specified	Matched to site standard	
<b>▼ Paint</b>			
<b>Refinery specification</b>	3 coat system (Min DFT 225µm) - off grey		●
<b>Offshore specification</b>	4 coat system (Min DFT 300µm) - off grey		
<b>Customer specification</b>		Matched to site standard	
<b>▼ Packing</b>			
<b>Flange blanking</b>	Metal closures with rubber gaskets		●
<b>Road</b>	Palletised & cling wrap		●
<b>Seafreight</b>	Wooden box paper lined	Long term storage	
	Wooden box with vacuum sealed bag	Moisture free	
<b>Airfreight</b>	Wooden box paper lined	Long term storage	
	Wooden box with vacuum sealed bag	Moisture free	