

▼ Documentation packs		
Documentation pack	Inclusive documents	Standard
Bronze pack	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	●
Silver Pack (includes bronze pack)	Documentation schedule Quality plan Production programme 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 Motor Declaration of conformity Motor ATEX Declaration of conformity	
Gold pack (includes silver pack)	Manufacturing databook Material traceability Progress reports (monthly) Paint certificate Nameplate drawing Spare parts interchangeability report Spare parts list – insurance & commissioning	
Documentation format	Hard copy Electronic CD - Adobe (.pdf), ms office (.xls .doc)	●

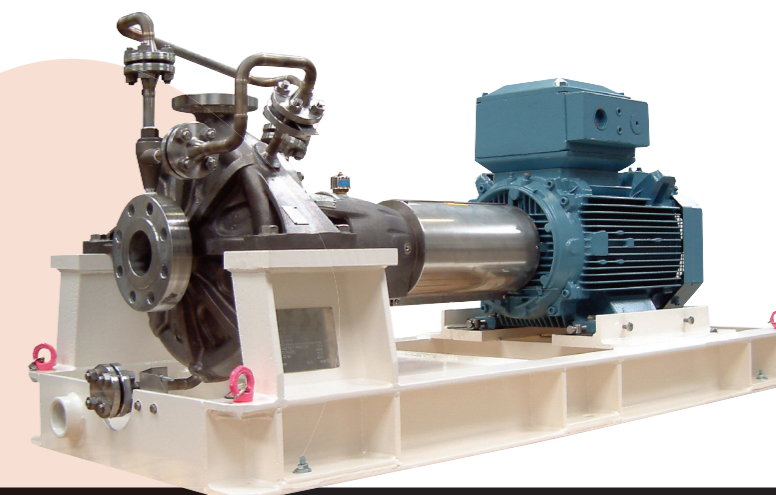
▼ Testing			
Pump test	Test standard	Acceptance criteria	Standard
Hydrostatic	API610 / ISO13709	API610 / ISO13709 (1.5 x MAWP)	●
Head & flow	API610 / ISO13709	ISO9906 Grade 1	●
Mechanical run - 1 hour at rated duty	API610 / ISO13709	API610 / ISO13709	
Mechanical run - 4 hours at rated duty	API610 / ISO13709	API610 / ISO13709	
NPSH at each test point	API610 / ISO13709	API610 / ISO13709	
Noise – single point at 1m	API610 / ISO13709	Customer datasheet	●
Vibration – FFT spectrum at each test point	API610 / ISO13709	API610 / ISO13709	●
Bearing bracket resonance	API610 / ISO13709	Mutual Agreement	
▼ NDT			
Visual examination of cast surfaces	ASME V Article 9 / MSS SP55 (pressure containing castings only)		●
Dyepenetrant of machined surfaces	Pressure containing castings only		
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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 2005. Amaranth Limited. E&OE.

A Series – Petrochemical pumps

(API 610 10th: 2004)

technical specification



▼ General Specification		
General description	A range of OH2 single stage, centreline mounted centrifugal end suction pumps with centreline discharge manufactured in a variety of alloys.	
Construction	Back pullout design with metal to metal fits	
Design methodology	Advanced computer techniques including 3D modelling, FEA & CFD	
Design standards	API 610 10th : 2004 / ISO13709 : 2003 ATEX EC-Directive 94/9/EC	
Design pressure rating	51.8 bar g @ 20°C	
Suction pressure rating	20 bar g (standard construction) 40 bar g (heavy duty construction)	
Temperature rating	-40°C to 200°C (standard construction) -40°C to 370°C (with cooling)	
Performance envelope		
Flowrate	Up to 1100m ³ /h	
Differential head	Up to 225m	
Speed	Up to 3600 rpm	
Configurations	Long coupled pump Bareshaft pump Rotating assembly	
Frame sizes	040x025x145 to 250x200x510	
Design life	20 years (3 years uninterrupted operation)	
▼ Material Options		
Materials	Casing	Impeller
A8 - SS 316 / SS 316	ASTM A744 CF-8M	ASTM A744 CF-8M
I1 - Cast Iron / Cast Iron	ASTM A278 Class30	ASTM A278 Class30
S8 - Carbon Steel / SS 316	ASTM A216 WCB	ASTM A744 CF-8M
S6 - Carbon steel / 12% Cr SS	ASTM A216 WCB	ASTM A217 Gr CA 15
D1 - Duplex SS / Duplex SS	ASTM A890 Gr 1B CD-4MCuN	ASTM A890 Gr 1B CD-4MCuN
D2 - Super Duplex SS / Super Duplex SS	ASTM A890 Gr 5A (UNS J93404)	ASTM A890 Gr 5A (UNS J93404)
Hastelloy B / Hastelloy B	ASTM A949 Gr N-7M	ASTM A949 Gr N-7M
Hastelloy C / Hastelloy C	ASTM A494 GrCW-12MW	ASTM A494 GrCW-12MW
Monel / Monel	ASTM A494 GrM35-1	ASTM A494 GrM35-1
Customer specified	Other alloys available on request including NACE compliant materials	Other alloys available on request including NACE compliant materials



Features	Technical Notes	Benefits	Standard
▼ Casing			
Construction	One piece casting with integral suction cover and 3mm corrosion allowance	Minimal leakage path, prolonged pump life	●
Flange standard	ISO PN50 / ANSI 300 / ANSI 250		●
Fasteners	ASTM 320 Grade B8MX	Strength & corrosion resistance	●
Gasket	Spiral wound with graphite filler	Covers most fluids	●
	Spiral wound with PTFE filler	Covers certain acid duties	
	Customer specified	Matched to site standard	
Wear rings	Suction & drive side (shrouded impeller only)	Prolonged pump life	●
Drain	1/2 / 3/4 " butt weld flange		●
	1/2 / 3/4 " plugged (I1 material only)		
	No drain	Minimal leakage path	
Jacking screws	SS 316	Ease of maintenance	●
Orifice plate	Loose tang type	Matched to customer requirement	
▼ Impeller			
Construction	One piece casting	Strength & integrity	●
Vanes	Francis type – 4 / 5 off	Low NPSHr & stable H/Q curve	●
Style	Shrouded	Optimum efficiency	●
	Semi open	Handles solids content in fluid	
Fixing	Keyed with retention nut & lock washer	Easy maintenance	●
Wear rings	Suction & drive side (shrouded only)	Prolonged pump life	●
Hydraulic balancing	Balance hub / holes (shrouded only)		●
Dynamic balancing	ISO 1940 G 2.5	Prolonged pump life	●
	ISO 1940 G 1.0	Matched to customer requirement	
▼ Seals & seal plans			
Shaft diameters	30mm, 40mm, 50mm, 60mm		●
Seal types	API 682 single cartridge	Ease of maintenance	●
	API 682 double cartridge	Environmentally safer	
Seal plans	Plan 11/61	Optimum seal environment	●
	Plans 11/62, 13, 21, 31, 52, 53, 54	Matched to customer requirement	
	Customer specified		
Manufacturers	AES, Burgmann, John Crane	Matched to site standard	
	or customer specified		
▼ Bearing bracket			
Style	One piece casting	Better concentricity, less run out	●
Construction	Heavy duty casting with machined abutments	Superior bearing alignment	●
Bearings	Dual angular contact (axial) plus deep groove ball (radial)	Long life	●
Design bearing life	25,000 hours (L10) @ standard duties		●
Bearing seals	Non contacting bearing isolators	Minimal wear, long life, ATEX	●
	Bearing protectors (Magtecta)	Hermetically sealed, ATEX	
Lubrication	Oil (fluid -40°C to 370°C)	Higher operating temperatures	●
	Grease (fluid -20°C to 120°C)	Lowest cost	
Cooling	Cast fins	Dissipates heat	●
	Fan	Extended temperature range	
	Water cooled heat exchanger	Constant cooling	
Running temperature	Less than 40°C above ambient	Long life	●

Features	Technical Notes	Benefits	Standard
Monitoring	Vibration monitoring points	Assist planned maintenance	●
	Temperature sensor location points		
Bearing bracket materials	Stainless steel 316		●
	Carbon steel	Matched to customer requirement	
Shaft materials	Duplex stainless steel		●
	Customer specified	Material to match casing / fluid	
▼ Coupling & guard			
Coupling style	Spacer type with metal membranes. DBSE 140 / 180	Easy maintenance	●
Construction	Bored & keywayed		●
	Extraction holes	Easy removal	
	Inconel membranes	Minimal corrosion in saline atmospheres	
Balancing	Inherent by design	Low vibration	●
Dynamic	Hubs up to ISO 1940 G 2.5	Prolonged pump life	
Manufacturers	Autoguard		●
	Customer specified	Matched to site standard	
Standards	ATEX		
Guard	Two piece wrap around in SS 304L	Non sparking/ATEX compliant	●
▼ Baseplate			
Style	Drain pan with grout holes	Full compliance	●
	Drain pan without grout holes	Lower cost, easier installation	
Construction	Fabricated from rolled steel sections with 4 lifting eye bolts	Rugged construction	●
Standards	ANSI/HI 3-2000, API 610, ISO13709:2003		●
Earthing bosses	2 off tapped M10 + screws / washers		●
	Earth bonding	Matched to customer requirement	
Alignment screws (Up to 160 frame)	Transverse only	Easier alignment	
Alignment screws (180 frame and above)	Transverse & axial		●
Material	Carbon steel	Lowest cost	●
	SS 304L	Resistance to low temperature	
▼ Driver			
Motor type	EExN, EExd, EExde, Exe,	Matched to area requirements	
Standards	ISO frames	Matched to site standard	●
	NEMA frames		
	ATEX	Hazardous area requirement	
Supply	380 – 440 / 3 / 50, 440 – 460 / 3 / 60	Matched to site standard	
Manufacturers	ABB, Brook Hansen, F&G, Loher, Seimens, WEG, Customer specified	Matched to site standard	
▼ Paint			
Refinery specification	3 pack epoxy (Min DFT 225µm) - off grey		●
Offshore specification	3 pack epoxy (Min DFT 300µm) - off grey		
Customer specification		Matched to site standard	
▼ Packing			
Flange blanking	Metal closures with rubber gaskets		●
Road	Palletised & cling wrap		●
Seafreight	Wooden box suitable for sea		
	Wooden box with vacuum sealing		
Airfreight	Wooden box suitable for air		