

## N Series – API610 OH2 pumps (long coupled) (API610 8th)

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	
<b>Silver Pack (Includes bronze pack)</b>	Standard pump GA drawing	
	Hydrostatic test certificate	
	Pump HQ performance test certificate	
	Spare parts list – commissioning	
	Type 2.2 certificates (* pressure containing parts only) – only if contracted	
<b>Gold pack (Includes silver pack)</b>	Quality plan	
	Progress reports (monthly)	
	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 – only if contracted	
<b>Documentation format</b>	Electronic CD – Adobe (.pdf), ms office (.xls .doc)	●
	Hard copy	

NDT			
Pump test	Test standard	Acceptance criteria	Standard
<b>Hydrostatic</b>	BSEN25199 / ISO 5199	BSEN25199 / ISO 5199 (1.5 x MAWP)	●
<b>Head &amp; flow</b>	BSEN25199 / ISO 5199	ISO 9906 Grade 2	
	BSEN25199 / ISO 5199	ISO 9906 Grade 1	
<b>Mechanical run – 1 hour at rated duty</b>	Amarinth procedure	Amarinth procedure	
<b>Mechanical run – 4 hours at rated duty</b>	Amarinth procedure	Amarinth procedure	
<b>NPSH – single point</b>	BSEN25199 / ISO 5199	ISO 9906 Grade 2	
	BSEN25199 / ISO 5199	ISO 9906 Grade 1	
<b>NPSH – 4 points</b>	BSEN25199 / ISO 5199		
	BSEN25199 / ISO 5199		
<b>Noise – single point at 1m</b>	BSEN12639 : 2000	Mutual agreement	
<b>Vibration – single point</b>	BSEN25199 / ISO 5199	BSEN25199 / ISO 5199	

NDE	
<b>Dyepenetrant of machined surfaces</b>	Pressure containing castings only
<b>Dyepenetrant of cast surfaces</b>	Pressure containing castings only
<b>Dyepenetrant of welds</b>	Drain & seal pipework (if fitted)
<b>Positive Material Identification</b>	Process wetted (excludes minor components e.g. fastners)
<b>Radiography</b>	Shot plan – critical areas
<b>Hardness report</b>	NACE (compliant material only) MR0175 / ISO 15156
<b>Various motor tests</b>	

\*Pressure containing parts include; volute casing, casing cover, & mechanical seal. Process wetted parts include shaft and impeller. A full range of documentation can be tailored to suit your exact requirements. Amarith reserves the right to alter any information within this document without prior notification. © Copyright 2005-2017. Amarith Limited. E&OE.



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## N Series – API610 OH2 pumps (long coupled)

(API610 8th)

technical specification



General Specification	
<b>General description</b>	A range of single stage centrifugal end suction pumps with centreline discharge manufactured in a variety of alloys and interchangeable with Girdlestone 980 series pumps.
<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 8th edition ATEX EC-Directive 94/9/EC
<b>Design pressure rating</b>	25 bar g (standard duty) or 40 bar g (heavy duty) @ 38°C
<b>Suction pressure rating</b>	23 bar g
<b>Temperature rating</b>	-40°C to 200°C (standard oil lubrication) -40°C to 325°C (oil lubrication with cooling)
<b>Performance envelope</b>	
<b>Flowrate</b>	Up to 1100m <sup>3</sup> /h
<b>Differential head</b>	Up to 225m
<b>Speed</b>	Up to 3600 rpm
<b>Configurations</b>	Long coupled Bareshaft Rotating assembly
<b>Frame sizes</b>	040x025x145 to 250x0200x510
<b>Design life</b>	20 years (2 years uninterrupted operation)

Material Options		
Material Options	Casing	Impeller
<b>SS 316L / SS 316L</b>	ASTM A351 CF 3M	ASTM A351 CF 3M
<b>Cast Iron / Cast Iron</b>	ASTM A278 Class 30	ASTM A278 Class 30
<b>Cast Iron / SS 316L</b>	ASTM A278 Class 30	ASTM 351 CF 3M
<b>Carbon Steel / SS 316L</b>	ASTM A216 WCB	ASTM A351 CF 3M
<b>Carbon steel / 12% Cr SS</b>	ASTM A216 WCB	ASTM A217 Gr CA 15
<b>Duplex SS / Duplex SS</b>	ASTM A890 Gr 4A (UNS J92205)	ASTM A890 Gr 4A (UNS J92205)
<b>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>Customer specified</b>	Other alloys available on request including NACE compliant materials	Other alloys available on request including NACE compliant materials

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MP2510-338 REV B (Nov 17)

Features	Technical notes	Benefits	Standard
<b>▼ Casing</b>			
<b>Construction</b>	1 or 2 piece casting (according to size) with 3mm corrosion allowance	Minimal leakage path, prolonged pump life	●
<b>Flange standard</b>	ASME B16 Class 250/300		●
<b>Fasteners</b>	High tensile SS 316	Strength & corrosion resistance	●
<b>Gasket</b>	Kammprofile (metallic core)		●
<b>Wear ring</b>	Suction & drive side (shrouded impeller only)	Matched to customer requirements	
<b>Drain</b>	1/2" / 3/4" plugged (I1 material only)		●
	1/2" / 3/4" flanged (Socket or butt weld)	Matched to customer requirement	●
<b>Jacking screws</b>	Stainless steel 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	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	Ease of maintenance	●
<b>Wear ring</b>	Suction & drive side (shrouded only)	Prolonged pump life	●
<b>Hydraulic balancing</b>	Balance hub / holes (shrouded only)	Low NPSHr	●
<b>Dynamic balancing</b>	ISO 1940 G 2.5	Prolonged pump life	●
<b>▼ Seals &amp; seal housing</b>			
<b>Shaft diameters</b>	25mm, 35mm, 45mm, 60mm		●
<b>Seal types</b>	Single cartridge	Ease of maintenance	●
	Double cartridge	Reduced emissions	
<b>Seal housing</b>	Parallel box type with metal to metal fits		●
<b>Seal piping arrangements</b>	Plan 11/61	Optimum seal environment	●
	Any other API682 plan	Matched to customers requirement	
<b>Manufacturers</b>	AES, Eagle Burgmann, John Crane or customer specified	Matched to site standard	
<b>▼ Bearing bracket</b>			
<b>Style</b>	Two piece casting / fabrication	Maximised modularity & interchangeability	●
<b>Construction</b>	Heavy duty with machined abutments	Long life	●
<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	●
	Bearing protectors (Magtecta)	Hermetically sealed, ATEX	
<b>Lubrication</b>	Grease (fluid -20°C to 120°C)	Cost benefit	●
	Oil (fluid -40°C to 250°C)	Higher operating temperatures	

Features	Technical notes	Benefits	Standard
<b>Cooling</b>	Fan	Extended temperature range	
		Water cooling	
<b>Running temperature</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>	SG Iron		●
	Stainless steel 316	Matched to application	
<b>Shaft materials</b>	Duplex stainless steel		●
	Material to match application		
<b>▼ Coupling &amp; guard</b>			
<b>Coupling style</b>	Spacer type with metal membranes	Ease of maintenance	●
	Customer specified	Matched to site standard	
<b>Construction</b>	Bored & keywayed	Easy removal	●
<b>Balancing</b>	Inherent by design	Low vibration	●
<b>Dynamic</b>	Hubs up to ISO 1940 G 2.5	Prolonged pump life	
<b>Manufacturers</b>	John Crane (Metastream)		●
	Customer specified	Matched to site standard	
<b>Standards</b>	ATEX		
<b>Guard</b>	Two piece wrap around in SS 304L	Non sparking / ATEX compliant	●
<b>▼ Baseplate</b>			
<b>Style</b>	Drain pan		●
	Extended	Pump & motor contained	
<b>Construction</b>	Fabricated from rolled steel sections with 4 lifting points	Rugged construction	●
<b>Earthing points</b>	2 off M10 studs		●
<b>Alignment screws (up to 132 frame)</b>	Transverse & axial	Matched to customer requirements	
<b>Alignment screws (160 frame &amp; above)</b>	Transverse & axial	Ease of alignment	●
<b>Material</b>	Carbon steel	Cost benefit	●
	SS 304L	Resistance to low temperature	
<b>▼ Drive</b>			
<b>Motor type</b>	Safe area, Exna, Exe, Exde, Exd	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, Hansen, Loher, Seimens, TECO, WEG or Customer specified	Matched to site standard	
<b>▼ Paint</b>			
<b>Refinery specification</b>	3 coat system (Min DFT 225µm) – RAL7030 (grey)		
<b>Offshore specification</b>	4 coat system (Min DFT 300µm) – RAL7030 (grey)		
	Customer specification	Matched to site standard	
<b>▼ Packing</b>			
<b>Road</b>	Palletised & cling wrap		●
<b>Seafreight / airfreight</b>	Wooden box paper lined	Long term storage	
	Wooden box with vacuum sealed bag	Moisture free	