

| 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 | ● |
| Silver Pack (Includes bronze pack) | 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 | |
| Gold pack (Includes silver pack) | 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 | |
| Documentation format | Electronic CD – Adobe (.pdf), ms office (.xls .doc) Hard copy | ● |

| NDT | | | |
|--|----------------------|-----------------------------------|----------|
| Pump test | Test standard | Acceptance criteria | Standard |
| Hydrostatic | BSEN25199 / ISO 5199 | BSEN25199 / ISO 5199 (1.5 x MAWP) | ● |
| Head & flow (reduced length) | BSEN25199 / ISO 5199 | ISO 9906 Grade 2 | |
| | BSEN25199 / ISO 5199 | ISO 9906 Grade 1 | |
| Mechanical run – 1 hour at rated duty | Amarinth procedure | Amarinth procedure | |
| Mechanical run – 4 hours at rated duty | Amarinth procedure | Amarinth procedure | |
| NPSH – single point (close coupled) | BSEN25199 / ISO 5199 | ISO 9906 Grade 2 | |
| | BSEN25199 / ISO 5199 | ISO 9906 Grade 1 | |
| NPSH – 4 points (close coupled) | BSEN25199 / ISO 5199 | ISO 9906 Grade 2 | |
| | BSEN25199 / ISO 5199 | ISO 9906 Grade 1 | |
| Noise – single point at 1m | BSEN12693:2000 | Mutual Agreement | |
| Vibration – single point | BSEN25199 / ISO 5199 | BSEN25199 / ISO 5199 | |

| NDE | |
|-----------------------------------|--|
| Dyepenetrant of machined surfaces | Pressure containing castings only |
| Dyepenetrant of cast surfaces | Pressure containing castings only |
| Dyepenetrant of welds | Delivery pipework |
| Positive Material Identification | Excludes minor components (nuts & bolts etc) |
| Radiography | Shot plan – critical areas |
| Hardness report | NACE (certain materials only – please ask for details) |
| Various motor tests | |

*Pressure containing parts include; volute casing, casing adaptor & delivery pipework. Process wetted parts include additional shaft & impeller columns, impeller hubcap & nut. A full range of testing and documentation can be tailored to suit your exact requirements. Amarinth reserves the right to alter any information within this document without prior notification. © Copyright 2005-2017. Amarinth Limited. E&OE.



T Series – Vertical mounted tank top pumps

(ISO 5199 : 2002)

technical specification



| General Specification | |
|------------------------------|--|
| General description | A range of vertical long shaft single stage centrifugal end suction sump pumps manufactured in a variety of alloys. Designed to suit customer requirements with lengths available up to 6m sump depth as standard, longer length available on request. |
| Construction | Heavy duty modular design maximising flexibility to suit customer's application. |
| Design methodology | Advanced computer techniques including 3D modelling, FEA & CFD |
| Design standards | ISO 5199 : 2002 ATEX EC-Directive 94/9/EC |
| Design pressure rating | 20 bar g at 20°C (pressure containing parts) |
| Operating temperature rating | -40°C to 100°C (standard construction) |
| Design temperature | 150°C |
| Performance envelope | |
| Flowrate | Up to 500m ³ /h |
| Differential head | Up to 225m |
| Speed | Up to 3600 rpm |
| Configurations | ANSI mount flange Rectangular plate |
| Frame sizes | 040x025x145 to 200x150x410 |
| Design life | 20 years (2 years uninterrupted operation) |

| Material Options | Casing | Impeller |
|-----------------------------------|---|---|
| SS 316 / SS 316 | ASTM A744 CF 8M | ASTM A744 CF 8M |
| Cast Iron / Cast Iron | BS EN 1561 Gr EN GJL 250 | BS EN 1561 Gr EN GJL 250 |
| Cast Iron / SS 316 | BS EN 1561 Gr EN GJL 250 | ASTM A744 CF 8M |
| SG Iron / SS 316 | BS EN 1563 Gr EN GJS 400 18 LT | ASTM A744 CF 8M |
| Carbon Steel / SS 316 | ASTM A216 WCB | ASTM A744 CF 8M |
| Carbon steel / 12% Cr SS | ASTM A216 WCB | ASTM A217 Gr CA 15 |
| Duplex SS / Duplex SS | ASTM A890 Gr 1B CD 4MCuN | ASTM A890 Gr 1B CD 4MCuN |
| Super Duplex SS / Super Duplex SS | ASTM A890 Gr 5A (UNS J93404) | ASTM A890 Gr 5A (UNS J93404) |
| Hastelloy B / Hastelloy B | ASTM A494 Gr N 7M | ASTM A494 Gr N 7M |
| Hastelloy C / Hastelloy C | ASTM A494 Gr CW 12MW | ASTM A494 Gr CW 12MW |
| Monel / Monel | ASTM A494 Gr M35 1 | ASTM A494 Gr M35 1 |
| Titanium / Titanium | ASTM B367 Gr C2 | ASTM B367 Gr C2 |
| 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 & delivery pipe | | | |
| Construction | One piece casting with integral suction cover and 3mm corrosion allowance | Minimal leakage path, prolonged pump life | ● |
| Fasteners | High tensile matched to casing Customer specified | Matched to fluid | ● |
| Casing gasket | Reinforced graphite Expanded PTFE Customer specified | Covers most fluids Covers certain acid duties Matched to site standard | ● |
| Wear ring | Suction side | Prolonged pump life | ● |
| Jacking screws | Matched to casing | Ease of maintenance | ● |
| Delivery pipe construction | Schedule 40 seamless pipe with butt welded joints | Strength & corrosion resistance | ● |
| Delivery pipe gasket(s) | CSF | | ● |
| Delivery flange standard | ISO PN20 / ANSI 150 ISO PN16 | Matched to site standard | ● |
| 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 Semi open | Optimum efficiency Handles solids content in fluid | ● |
| Fixing | Keyed with retention nut and lockwasher | Ease of maintenance | ● |
| Wear ring | Suction side | Prolonged pump life | ● |
| Axial adjustment | Shaft lock nuts accessible above mounting plate | Optimised performance | ● |
| Hydraulic balancing | Backvanes | Low NPSHr | ● |
| Dynamic balancing | Static ISO 1940 G 2.5 ISO 1940 G 6.3 | Prolonged pump life | ● |
| ▼ Columns & line bearings | | | |
| Column construction | Fully welded with flanged & spigoted joints | Maximise strength & alignment | ● |
| Column sizes | 4", 6", 8" (dependant on pump size) | Optimised drive shaft stability | ● |
| Column materials | Stainless steel 316L Customer specified | Suits most fluids Material to match casing / fluid | ● |
| Line bearing type | Grooved bush | Clog resistant | ● |
| Line bearing materials | Carbon / PTFE Customer specified | Suits most fluids Matched to site standard | ● |
| Line bearing lubrication | Pumped fluid External flush | Simplified construction Improved pump life when solids present | ● |
| Maximum distance between bearings | As defined in API610 | Minimised vibration | ● |
| ▼ Shaft & shaft sealing | | | |
| Shaft diameters | 30mm, 40mm , 50mm | | ● |
| Line shaft coupling | Screwed sleeve Screwed sleeve (with locking device) Hardened sleeve | Longer life | ● |
| Shaft materials | Duplex stainless steel Customer specified | Material to match casing / fluid | ● |
| Seal types | Twin grease packed lip Single cartridge (dry running) Double cartridge | Cost benefit ATEX compliant Environmentally safer, ATEX | ● |
| Seal piping arrangements | None Plan 52, 53, 54 Customer specified | Simplified construction Match customers requirements | ● |
| Cartridge seal manufacturers | AES, Burgmann, John Crane or customer specified | Matched to site standard | |

| Features | Technical notes | Benefits | Standard |
|--|--|---|----------|
| ▼ Thrust bearing / motor pedestal | | | |
| Thrust bearing type | Self contained bearing unit | | ● |
| Thrust bearing lubrication | Grease | | ● |
| Design bearing life | 25,000 hours (L10) @ standard duties | | ● |
| Running temperature | Less than 40°C above ambient | Long life, ATEX | ● |
| Pedestal construction | Fully welded fabrication | Better alignment | ● |
| Monitoring | Vibration monitoring points Temperature sensor location points | Assist planned maintenance | |
| Motor pedestal materials | Carbon steel Stainless steel 316L Customer specified | | ● |
| ▼ Coupling & guard | | | |
| Coupling style | Non spacer type with metal membranes Spacer type with metal membranes Customer specified | Cost benefit Easy maintenance Matched to site standard | ● |
| Construction | Bored & keywayed | Easy removal | ● |
| Balancing | Inherent by design Dynamic to ISO 1940 G 2.5 (hubs only) | Low vibration Prolonged pump life | ● |
| Manufacturers | John Crane Customer specified | Matched to site standard | ● |
| Standards | ATEX | | |
| Guard | Single piece wrap around in SS 304L | Non sparking/ATEX compliant | ● |
| ▼ Support plate | | | |
| Style | ANSI 150 flange Plate flange Rectangular plate Customer specified | Sealed environment Cost benefit Matched to customer requirement | ● |
| Construction | Blind flange with lifting points Plate with 4 lifting points | Rugged construction | ● |
| Standards | ANSI B16.5, ASME B16.47 | | ● |
| Earthing connections | 2 off M10 tapped holes | | ● |
| Material | Carbon steel Stainless steel 316 Customer specified | Cost benefit Resistance to low temperature | ● |
| ▼ Driver | | | |
| Motor type | Safe area, EExn, EExd, EExde, Exe, | Matched to area requirements | |
| Motor mounting | Flanged for vertical mounting | | ● |
| Standards | ISO frames NEMA frames ATEX | Matched to site standard Hazardous area requirement | ● |
| Supply | 380 – 440 / 3 / 50, 440 – 460 / 3 / 60 | Matched to site standard | |
| Manufacturers | ABB, ATB, Brook Hansen, Loher, Seimens, TECO, WEG, Customer specified | Matched to site standard | |
| ▼ Paint | | | |
| Industrial specification | Air drying alkyd – Bgreen Black 233 | | ● |
| Refinery specification | 3 coat system (Min DFT 225µm) – off grey | | |
| Offshore specification | 4 coat system (Min DFT 300µm) – off grey | | |
| Customer specification | | Matched to site standard | |
| ▼ Packing | | | |
| Road | Palletised & cling wrap | | ● |
| Seafreight | Wooden box paper lined Wooden box with vacuum sealed bag | Long term storage Moisture free | |
| Airfreight | Wooden box paper lined Wooden box with vacuum sealed bag | Long term storage Moisture free | |

