

## C Series – Chemical pumps (long coupled) (ISO 5199 : 2002)

| Documentation packs                   |   |          |
|---------------------------------------|---|----------|
| Documentation pack                    | Inclusive documents   | Standard |
| Bronze pack                           | Order acknowledgement (electronic)<br>Installation, Operating & Maintenance manual<br>Declaration of conformity<br>ATEX Declaration of conformity – only if contracted  | ●        |
| Silver Pack<br>(Includes bronze pack) | Standard pump GA drawing<br>Hydrostatic test certificate<br>Pump HQ performance test certificate<br>Spare parts list – commissioning<br>Type 2.2 certificates (* pressure containing parts only) – only if contracted   |          |
| Gold pack<br>(Includes silver pack)   | Quality plan<br>Progress reports (monthly)<br>Spare parts list – operating<br>Customer specific pump GA drawing<br>Pump SA & parts list<br>Type 3.1 certificates (* pressure containing + process wetted parts only) – only if contracted<br>Pump HQ performance test curve<br>Certification databook<br>Pump datasheet<br>Motor type test certificate<br>Motor GA drawing<br>Motor datasheet<br>Motor Declaration of conformity<br>Motor ATEX Declaration of conformity – only if contracted |          |
| Documentation format                  | Electronic CD – Adobe (.pdf), ms office (.xls .doc)<br>Hard copy  | ●        |

| NDT                                    |                      |                                   |          |
|--|----------------------|-----------------------------------|----------|
| Pump test                              | Test standard        | Acceptance criteria               | Standard |
| Hydrostatic                            | BSEN25199 / ISO 5199 | BSEN25199 / ISO 5199 (1.5 x MAWP) | ●        |
| Head & flow                            | 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                    | BSEN25199 / ISO 5199 | ISO 9906 Grade 2                  |          |
|  | BSEN25199 / ISO 5199 | ISO 9906 Grade 1                  |          |
| NPSH – 4 points                        | BSEN25199 / ISO 5199 | ISO 9906 Grade 2                  |          |
|  | BSEN25199 / ISO 5199 | ISO 9906 Grade 1                  |          |
| Noise – single point at 1m             | BSEN12639 : 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             | Drain & seal pipework (if fitted)                         |
| Positive Material Identification  | Process wetted (excludes minor components e.g. fasteners) |
| Radiography                       | Shot plan – critical areas                                |
| Hardness report                   | NACE (compliant material only) MR0175 / ISO 15156         |
| Various motor tests               |   |

\*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. Amarinth reserves the right to alter any information within this document without prior notification. © Copyright 2005-2017. Amarinth Limited. E&OE.

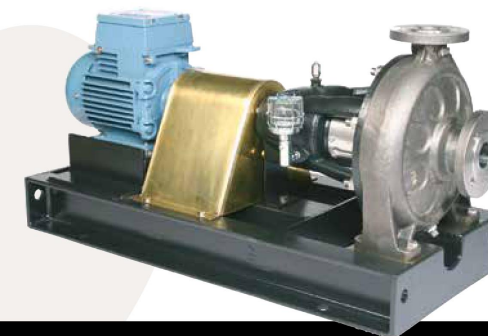


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## C Series – Chemical pumps (long coupled)

(ISO 5199 : 2002)

technical specification



| General Specification   |   |
|-------------------------|---|
| General description     | A range of single stage centrifugal end suction pumps with centreline discharge manufactured in a variety of alloys and interchangeable with Girdlestone 900 series pumps |
| Construction            | Back pullout design with metal to metal fits  |
| Design methodology      | Advanced computer techniques including 3D modelling, FEA & CFD  |
| Design standards        | ISO 5199 : 2002<br>ATEX EC-Directive 94/9/EC  |
| Design pressure rating  | 20 bar g @ 20°C   |
| Suction pressure rating | 16 bar g  |
| Temperature rating      | -40°C to 200°C (standard construction)<br>-40°C to 250°C (with cooling)   |
| Performance envelope    |   |
| Flowrate                | Up to 1100m <sup>3</sup> /h   |
| Differential head       | Up to 225m  |
| Speed                   | Up to 3600 rpm  |
| Configurations          | Long coupled<br>Bareshaft<br>Rotating assembly  |
| Frame sizes             | 040x025x145 to 250x0200x510   |
| 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 4A (UNS J92205)  | ASTM A890 Gr 4A (UNS J92205)  |
| Super Duplex SS / Super Duplex SS | ASTM A890 Gr 6A (UNS J93380)  | ASTM A890 Gr 6A (UNS J93380)  |
| 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<br>including NACE compliant materials | Other alloys available on request<br>including NACE compliant materials |

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MP2510-320 REV E (Nov 17)

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| Features                          | Technical notes  | Benefits  | Standard |
|-----------------------------------|--|---|----------|
| <b>▼ Casing</b>                   |  |   |          |
| Construction                      | One piece casting with integral suction cover and 3mm corrosion allowance      | Minimal leakage path, prolonged pump life   | ●        |
| Flange standard                   | EN1092 PN16<br>ASME class 150 / 125  | Matched to site standard  | ●        |
| Fasteners                         | High tensile SS 316  | Strength & corrosion resistance   | ●        |
| Gasket                            | Reinforced graphite<br>Expanded PTFE<br>Customer specified                     | Confined controlled compression<br>Matched to application<br>Matched to site standard | ●        |
| Wear ring                         | Suction side   | Prolonged pump life   |          |
| Pressure tapping                  | 3/8 " plugged (not 25mm pumps)   | Aids trouble shooting   | ●        |
| Drain                             | 1/2 " plugged  |   | ●        |
|                                   | 1/2 " butt weld flange   | Matched to customer requirement   |          |
| Jacking screws                    | Stainless steel 316  | Ease of maintenance   | ●        |
| <b>▼ Impeller</b>                 |  |   |          |
| Construction                      | One piece casting  | Strength & integrity  | ●        |
| Vanes                             | Francis type   | Low NPSHr & stable H / Q curve  | ●        |
| Style                             | Shrouded<br>Semi open  | Optimum efficiency<br>Handles solids content in fluid                                 | ●        |
| Fixing                            | Keyed with retention nut   | Ease of maintenance   | ●        |
| Wear ring                         | Suction side (shrouded only)   | Prolonged pump life   |          |
| Hydraulic balancing               | Backvanes  | Low NPSHr   | ●        |
| Dynamic balancing                 | Static balance   |   | ●        |
| <b>▼ Seals &amp; seal housing</b> |  |   |          |
|                                   | ISO 1940 G 6.3   | Prolonged pump life   |          |
| Shaft diameters                   | 25mm, 35mm, 45mm, 60mm   |   | ●        |
| Seal types                        | Single component<br>Single cartridge<br>Double cartridge                       | Cost benefit<br>Ease of maintenance<br>Reduced emissions                              | ●        |
| Seal housing                      | Bell type with anti vortex device & metal to metal fits<br>Parallel box type   | Optimum seal environment  | ●        |
| Seal piping arrangements          | Code 01<br>Code 02, 04, 07, 09,10,11<br>Customer specified                     | Optimum seal environment<br>Matched to customers requirement                          | ●        |
| <b>▼ Bearing bracket</b>          |  |   |          |
|                                   | or customer specified  |   |          |
| 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                     | Lip seals<br>Non contacting bearing isolators<br>Bearing protectors (Magtecta) | Cost benefit<br>Minimal wear, long life, ATEX<br>Hermetically sealed, ATEX            | ●        |
| Lubrication                       | Grease (fluid -20°C to 120°C)<br>Oil (fluid -40°C to 250°C)                    | Cost benefit<br>Higher operating temperatures   | ●        |

| Features                      | Technical notes   | Benefits   | Standard |
|-------------------------------|---|--|----------|
| Cooling                       | Stainless steel 304 fan   | Extended temperature range   |          |
| Running temperature           | Less than 40°C above ambient                                      | Long life  | ●        |
| Monitoring                    | Vibration monitoring points<br>Temperature sensor location points | Assist planned maintenance   |          |
| Bearing bracket materials     | SG Iron<br>Stainless steel 316                                    |  | ●        |
| Shaft materials               | Duplex stainless steel<br>Customer specified                      | Material to match application  | ●        |
| <b>▼ Coupling &amp; guard</b> |   |  |          |
| Coupling style                | Spacer wrap round type  | Easy maintenance   | ●        |
| Construction                  | Bored & keywayed  | Easy removal   | ●        |
| Balancing                     | Inherent by design<br>Dynamic to ISO 1940 G 2.5 (hubs only)       | Low vibration<br>Prolonged pump life   | ●        |
| Manufacturers                 | Autoguard, John Crane<br>Customer specified                       | Matched to site standard   | ●        |
| Standards                     | ATEX  |  |          |
| Guard                         | Two piece wrap around in SS 304L                                  | Non sparking / ATEX compliant  | ●        |
| <b>▼ Baseplate</b>            |   |  |          |
| Style                         | Open<br>Drain pan<br>Fully enclosed                               | Cost benefit, ease of grouting<br>Environmentally friendly<br>Pump & motor contained | ●        |
| Construction                  | Fabricated from rolled steel sections with 4 lifting points       | Rugged construction  | ●        |
| Standards                     | ANSI / HI 3-2000, ISO 3661  |  | ●        |
| Earthing connections          | 2 off M10 tapped holes  |  | ●        |
| Motor alignment screws        | Transverse & axial  | Easier alignment   |          |
| Material                      | Carbon steel<br>SS 304L   | Cost benefit<br>Resistance to low temperature  | ●        |
| <b>▼ Drive</b>                |   |  |          |
| Motor type                    | Safe area, Exna, Exe, Exde, Exd                                   | Matched to area requirements   |          |
| Standards                     | ISO frames<br>NEMA frames<br>ATEX                                 | Matched to site standard<br>Hazardous area requirement                               | ●        |
| Supply                        | 380 – 440 / 3 / 50, 440 – 460 / 3 / 60                            | Matched to site standard   |          |
| Manufacturers                 | ABB, Brook Crompton, Loher, Seimens, WEG or Customer specified    | Matched to site standard   |          |
| <b>▼ Paint</b>                |   |  |          |
| Industrial specification      | Air drying alkyd – Green Black 233                                |  | ●        |
| Refinery specification        | 3 coat system (Min DFT 225µm) – RAL 7030 (grey)                   |  |          |
| Offshore specification        | 4 coat system (Min DFT 300µm) – RAL 7030 (grey)                   |  |          |
| Customer specification        |   | Matched to site standard   |          |
| <b>▼ Packing</b>              |   |  |          |
| Road                          | Palletised & cling wrap   |  | ●        |
| Seafreight / airfreight       | Wooden box paper lined<br>Wooden box with vacuum sealed bag       | Long term storage<br>Moisture free   |          |

