

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

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 – only if contracted	
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	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. fastners)
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 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) -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 Bareshaft 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 including NACE compliant materials	Other alloys available on request including NACE compliant materials

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MP2510-320 REV E (Nov 17)

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 ASME class 150 / 125	Matched to site standard	●
Fasteners	High tensile SS 316	Strength & corrosion resistance	●
Gasket	Reinforced graphite Expanded PTFE Customer specified	Confined controlled compression Matched to application 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 Semi open	Optimum efficiency 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 Single cartridge Double cartridge	Cost benefit Ease of maintenance Reduced emissions	●
Seal housing	Bell type with anti vortex device & metal to metal fits Parallel box type	Optimum seal environment	●
Seal piping arrangements	Code 01 Code 02, 04, 07, 09,10,11 Customer specified	Optimum seal environment 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 Non contacting bearing isolators Bearing protectors (Magtecta)	Cost benefit Minimal wear, long life, ATEX Hermetically sealed, ATEX	●
Lubrication	Grease (fluid -20°C to 120°C) Oil (fluid -40°C to 250°C)	Cost benefit 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 Temperature sensor location points	Assist planned maintenance	
Bearing bracket materials	SG Iron Stainless steel 316		●
Shaft materials	Duplex stainless steel 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 Dynamic to ISO 1940 G 2.5 (hubs only)	Low vibration Prolonged pump life	●
Manufacturers	Autoguard, John Crane 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 Drain pan Fully enclosed	Cost benefit, ease of grouting Environmentally friendly 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 SS 304L	Cost benefit Resistance to low temperature	●
<b>▼ Drive</b>			
Motor type	Safe area, Exna, Exe, Exde, Exd	Matched to area requirements	
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, 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 Wooden box with vacuum sealed bag	Long term storage Moisture free	