

## System 1000 – Seal support systems (ISO arrangement D.10 & D.11)

▼ Documentation packs		
Documentation pack	Inclusive documents	Standard
<b>Bronze pack</b>	ATEX Declaration of conformity ( if contracted)	●
	Declaration of conformity	
	Generic GA drawing, SA & parts list, & P & ID	
	Hydrostatic test certificate (assembly)	
	Installation diagram	
	Installation, Operating & Maintenance manual	
	Instrumentation documentation	
<b>Silver pack (includes Bronze pack)</b>	Order acknowledgement (electronic)	
	Customer specific GA drawing, SA & parts list, & P & ID	
	Generic component utility list	
	Generic instrumentation data sheets	
<b>Gold pack (includes Silver pack)</b>	Type 3.1 certificates ( if contracted)	
	Certification databook	
	Customer specific component utility list	
	Customer specific instrumentation data sheets	
	Documentation schedule	
	Hazardous area equipment list	
	Nameplate drawing	
	NDE reports / certificates (as contracted)	
	Quality plan	
	Vessel design calculations	
<b>Documentation format</b>	Hard copy	●
	Electronic CD – Adobe (.pdf), Microsoft Office (.xls, .doc)	

▼ Non-Destructive Testing (NDT)			
NDT	Test standard	Acceptance criteria	Standard
<b>Hydrostatic (assembly)</b>		1.5x operating pressure (and no less than 15 bar g) for 30 mins	●

▼ Non-Destructive Examination (NDE)			
NDE	Test standard	Acceptance criteria	Standard
<b>Visual inspection</b>	API 682 / BS EN ISO 21049	Visually fault free	●
<b>Dye Penetrant Inspection (100%)</b>	ASME V Articles 6 & 24	ASME VIII Div. 1 App. 8 & 7	●
<b>Radiography – butt welds (10%)</b>	ASME V Articles 2 & 22	ASME VIII Div. 1 UW-52	
<b>Radiography – butt welds (100%)</b>	ASME V Articles 2 & 22	ASME VIII Div. 1 UW-51	
<b>Ultrasonic Inspection</b>	ASME V Articles 5 & 23	ASME VIII Div. 1 App. 12 & 7	
<b>Magnetic Particle Inspection</b>	ASME V Articles 7 & 25	ASME VIII Div. 1 App. 6 & 7	
<b>Positive Material Identification</b>	BS EN 10204 Type 3.1	Material certificates	
<b>Hardness report</b>	NACE MR0175 / ISO 15156	NACE MR0175 / ISO 15156	

A full range of testing and documentation can be tailored to suit your exact requirements. Protect System reserves the right to alter any information within this document without prior notification. © Copyright 2007 Protect System a division of Amarinth Ltd. E&OE.



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## System 1000 – Seal support systems

(ISO arrangement D.10 & D.11)

### technical specification



▼ General specification	
<b>General description</b>	A range of ISO 5199 Arrangement D.10 and Arrangement D.11 Seal Support Systems for use in conjunction with dual mechanical cartridge seals to provide the optimum mechanical seal environment and to contain process fluids.
<b>Construction</b>	Stainless steel 316L pressure vessels with fittings, interconnecting pipework, and instrumentation attached as required to suit system requirements.
<b>Design methodology</b>	Advanced computer techniques, including 3D modelling, FEA & CFD.
<b>Design standards</b>	ISO 5199 ASME VIII Division 1 EC-Directive 94/9/EC ATEX EC-Directive 97/23/EC Pressure Equipment (SEP)
<b>Vessel design pressure / temperature ratings</b>	20 bar g @ -29°C to 38°C (standard construction) Other pressure / temperature ratings available on request
<b>Configurations</b>	ISO Arrangement D.10 (API Plan 52) buffer fluid pressure vessel (unpressurised) ISO Arrangement D.11 (API Plan 53A) barrier fluid pressure vessel (pressurised)
<b>Mechanical seal compatibility</b>	Arrangement 2 contacting wet seals with liquid buffer fluid (ISO Arrangement D.10) Arrangement 3 contacting wet seals with liquid barrier fluid (ISO Arrangement D.11)
<b>Vessel size</b>	2 litres 8.5 litres
<b>Working volume</b>	1 litre 3 litres
<b>Design life</b>	20 years (when recommended maintenance schedule is applied)

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Features	Technical notes	Benefits	Standard
<b>▼ Vessel</b>			
<b>Design standard</b>	ASME VIII Division 1	Internationally recognised standard	●
<b>Construction</b>	ASME B31.3 / ISO 15649 compliant piping components, butt welded to ASME IX / EN 287 & EN 288	Vessel integrity, constructed to internationally recognised standards	●
<b>Material</b>	Stainless steel 316L	Corrosion resistance	●
<b>Connections</b>	ISO 7 Rc1/2	Internationally recognised standard	●
	ISO 7005-01 DN15 PN20 RF	To suit site standard	
	ANSI / ASME B1.20.1 1/2-14NPT-F	To suit site standard	
<b>Cooling</b>	Natural convection cooling	Lowest cost	●
	Internal cooling coil	Improved cooling control	
	External finned tubes	No site services required	
	Circulation pump	Improved thermosyphon	
<b>▼ System filling</b>			
<b>Connection</b>	Valved top connection	Lowest cost	●
	Guyson quick fill connector	No downtime	
	Customer specific	Matched to site standard	
<b>▼ Sight level gauge</b>			
<b>Type</b>	Borosilicate glass with polycarbonate guard tube	Lowest cost	●
	Valve isolated	Ease of maintenance	
<b>Materials</b>	SS 316 / glass / polycarbonate	Lowest cost	●
<b>Manufacturers</b>	Seetru		●
	Customer specific	Matched to site standard	
<b>▼ Level switch (optional)</b>			
<b>Type</b>	Low level	Indication of seal failure or maintenance required	●
	High level	Increased protection	
<b>Materials</b>	SS 316 wetted parts	Lowest cost	●
	All SS 316 parts	Offshore corrosion resistance	
<b>Hazardous Protection Area</b>	Safe Area	Lowest cost	●
	EEx ia (Zones 0, 1 & 2)	To suit site standard	
	EEx d (Zones 1 & 2)	To suit site standard	
<b>Ingress Protection rating</b>	IP65	Suitable for outdoor use	●
	Customer specific	To suit site standard	
<b>Manufacturers</b>	TAV Engineering		●
	Emerson Mobrey, Magnetrol, VEGA or customer specific	To suit site standard	
<b>▼ Level transmitter (optional – replaces level switch)</b>			
<b>Type</b>	Float	Continuous monitoring	●
<b>Materials</b>	SS 316 wetted parts	Lowest cost	●
	All SS 316 parts	Offshore corrosion resistance	
<b>Hazardous Protection Area</b>	Safe Area	Lowest cost	●
	EEx ia (Zones 0, 1 & 2)	To suit site standard	
	EEx d (Zones 1 & 2)	To suit site standard	
<b>Ingress Protection rating</b>	IP65	Suitable for outdoor use	●
	Customer specific	To suit site standard	
<b>Manufacturers</b>	TAV Engineering		●
	Customer specific	To suit site standard	

Features	Technical notes	Benefits	Standard
<b>▼ Pressure gauge (standard on Arrangement D.11 only)</b>			
<b>Type</b>	40mm diameter, back entry	Visual indication	●
<b>Materials</b>	Brass wetted parts	Lowest cost	●
	All SS 316 parts	Offshore corrosion resistance	
<b>Manufacturers</b>	IMI-Norgren		●
	Baumer, Stewart-Buchanan, Wika or customer specific	Matched to site standard	
<b>▼ Pressure regulator (Arrangement D.11 only)</b>			
<b>Type</b>	Relieving, balanced valve design	Simple installation	●
<b>Materials</b>	Aluminium / brass / nitrile	Lowest cost	●
	Customer specific	Matched to site standard	
<b>Manufacturers</b>	IMI-Norgren		●
	Customer specific	Matched to site standard	
<b>▼ Pressure switch (optional)</b>			
<b>Type</b>	High or low pressure alarm	Indication of seal failure	●
<b>Materials</b>	SS 316 wetted parts	Lowest cost	●
	All SS 316 parts	Offshore corrosion resistance	
	Customer specific	To suit site standard	
<b>Hazardous Protection Area</b>	EEx ia (Zones 0, 1 & 2)	Suitable for all zones	●
	EEx d (Zones 1 & 2)	No extra electrical barrier required	
<b>Ingress Protection rating</b>	IP66	Suitable for washdown	●
	Customer specific	To suit site standard	
<b>Manufacturers</b>	Pyropress		●
	Cella or customer specific	To suit site standard	
<b>▼ Pressure transmitter (optional – replaces pressure switch)</b>			
<b>Type</b>	Gauge pressure	Continuous monitoring	●
<b>Materials</b>	SS 316 wetted parts	Lowest cost	●
	All SS 316 parts	Offshore corrosion resistance	
	Customer specific	To suit site standard	
<b>Hazardous Protection Area</b>	EEx ia (Zones 0, 1 & 2)	Suitable for all zones	●
	EEx d (Zones 1 & 2)	No extra electrical barrier required	
	Customer specific	To suit site standard	
<b>Ingress Protection rating</b>	IP66	Suitable for washdown	●
	Customer specific	To suit site standard	
<b>Manufacturers</b>	Wika		●
	ABB, Rosemount, VEGA, or customer specific	To suit site standard	
<b>▼ Isolation valves</b>			
<b>Type</b>	Ball valves	Improved operational visibility	●
<b>Connection</b>	ISO 7 Rc1/2	Internationally recognised standard	●
	Customer specific	To suit site standard	
<b>Material</b>	Stainless steel 316	Corrosion resistance	●
<b>Manufacturers</b>	Lancaster Fittings		●
	Valvestock, Velan or customer specific	Matched to site standard	
<b>▼ Pressure relief valves (optional)</b>			
<b>Type</b>	Direct acting, full lift, unbalanced	Lowest cost	●
	Direct acting, full lift, balanced	Can be used with significant back pressure	
<b>Lifting device</b>	None	Lowest cost	●
	Open lever	Allows manual depressurisation	
	Packed lever	Increased safety	
<b>Material</b>	Stainless steel 316	Corrosion resistance	●
<b>Manufacturers</b>	Broady		●
	Tyco, Leser or customer specific	Matched to site standard	