

HINDUSTAN SHIPYARD LIMITED**VISAKHAPATNAM – 530005****ENQUIRY TECHNICAL SPECIFICATION FOR ALARM MONITORING SYSTEM
FOR 2 Nos. 50T BP TUGS FOR VPT, HSL YARD Nos. – 11160 – 61****1) General :****1.1 DRAWINGS:**

For each equipment / System, complete installation drawings with dimensions, fixing arrangements, internal wiring details, external wiring connections, along with list of alarm points, terminal connections, etc., in English shall be supplied in quadruplicate for Shipyard approval within two weeks from receipt of HSL Order. The approval drawings shall necessarily include the following.

1.1.1 General layout of Alarm monitoring plant along with parts list and I/O panels arrangements, Bill of Material etc.,

1.1.2 Dimensional and erection details drawings and wiring diagram of I/O Cabinets, PC workstations, Basic Alarm Panels, UPS equipment.

1.2 The actual manufacturing shall be commenced only after receipt of HSL approval for the same. Final Drawings in one transparent and four sets of prints and also AUTOCAD 2004 drawing file on a CD, all in English shall be supplied for shipyard's use immediately on receipt of HSL approved drawings.

2. **Classifications and Rules:** The offered equipment shall confirm to the following:

2.1 The vessel is classified with Indian Register of Shipping.

2.2 The vessel shall also comply with latest IMS rules as applicable to this type of vessel (class XII) (IRS) with class notation + SUL TUG + IY of IRS i.e., sea going vessel and machinery built and installed under supervision of IRS Surveyors.

2.3 Latest SOLAS rules.

2.4 IEC Publication 92 / TC (18) – Electrical Installation on ships, with latest amendments.

2.5 The Alarm Monitoring System is intended for installation on board the subject vessel and shall operate satisfactorily in the following conditions:

2.5.1 The Ambient Temperature is
 a) Machinery Spaces - 50°C
 b) Exterior - 40°C

c) Humidity about 60% at 40°C

- 2.5.2 Voltage fluctuations of A.C. Source from +6 to -10% of the rated value at rated frequency as per Classification Society
- 2.5.3 Frequency fluctuations of $\pm 5\%$ of the rated value at the rated voltage as per Classification Society.
- 2.5.4 When the Vessel is permanently inclined 15° athwart ship, 10° longitudinally and under a roll of 22.5° each side from the vertical.
- 2.5.5 Quantity mentioned below is for one vessel. The requirement is for 2 nos. 50 Ton Bollard Pull Tractor Tug for Visakhapatnam Port Trust our Yard No.11160 – 61.
- 2.5.6 **POWER SUPPLIES AVAILABLE ON BOARD:**
- i. 415 V, 3-Phase, 50Hz, 3-wire system(neutral insulated)
 - ii. 230V, 1-Phase, 50Hz.
 - iii. For any other Voltages required for operation of the equipment, suitable converting equipment such as transformers / rectifiers shall be provided.
- 2.5.7 All Test Certificates, approvals, Technical manuals, drawings, installation instructions, etc., shall be in English and supplied in 6 (Six) copies for each vessel. The Technical Manuals shall be essentially include the following
- 2.5.7.1 Introduction with Technical Data and General System Description.
- 2.5.7.2 Schematic and Wiring Diagram for Alarm Monitoring Plant, UPS, etc.,
- 2.5.7.3 Installation and commissioning steps / instruction.
- 2.5.7.4 Type of Cards / IO Modules with circuit diagrams.
- 2.5.7.5 Routine maintenance and fault finding instruction.
- 2.5.7.6 Detailed list of alarm points indicating the description of the alarm channel, range, set point, etc.,
- 2.5.7.7 Operating Instructions.

3 SCOPE OF WORK OF SHIPYARD

- 3.1 Making suitable seating for the suppliers equipment based on suppliers drawings, but the normal foundations of individual accessories shall be provided by the suppliers.
- 3.2 Laying up and leading of all cables into suppliers equipments and connecting up under supervision of suppliers engineer.

3.3 Connecting up the equipment with the rest of the installation.

4. Scope of supply and work of suppliers:

- 4.1 The supply shall include all equipments, special cables, and spares etc., defined in the following paragraph pertaining to each of the individual system. All items normally required for proper functioning of the system specified in this specification shall be supplied and liability for supply of these items & their satisfactory operation rests with the suppliers.
- 4.2 The alarm plant in its entirety shall give complete satisfaction to the shipyard and shipowners and be of the best quality and best marine practice, to ensure reliability, durability and user friendly. Any other parts of the equipment or other requirements that are not specifically mentioned in this specification, but are necessary for the proper and efficient functioning of the equipment as whole shall be included in the scope of supply. The same shall be clearly highlighted in the submitted Technical offer.
- 4.3 A Microprocessor based Alarm Monitoring System shall be supplied for monitoring of Alarms as per the enclosed Alarms list at Annexure – ‘A’.
- 4.4 Complete Integrated system to perform monitoring suitable for all functional requirements must be included.
- 4.5 20% Additional Channels as spare are also to be accommodated for both digital and analog monitoring points. Programming of additional channels as required at the time of system commissioning shall be carried out by service engineer without any extra cost.
- 4.6 An alarm system is to be provided indicating any fault requiring attention and is to as far as is practicable be designed on the fail – to – safe principle.
- 4.7 Alarm Panel shall consist of audible and visible signals as per the requirements of IRS Rules.
- 4.8 The alarm system shall be current / existing model or version of electronic automation.
- 4.9 The Alarm System supplier shall take IRS Class approval for the alarm list provided by HSL. Separate optional cost shall be indicated in the price-bid.
- 4.10 The alarm system shall be designed with self-monitoring properties. Insofar as practical, any fault in the alarm system should cause it to fail to the alarm condition. NC contacts shall be used for Alarm Monitoring and shall have provision for break on Alarm conditions.
- 4.11 The alarm system is to be capable of being tested during normal machinery operation.
- 4.12 The alarm system shall be designed as far as practical to function independently of control and safety systems such that a failure or malfunction in these systems will not prevent the alarm from operating.

- 4.13 Disconnecting or manual override of any part of the alarm system should be clearly indicated as long as the disconnection / manual override is in use.
- 4.14 Necessary Isolators to be provided to avoid Earth Fault.
- 4.15 For Tanks Float switches shall be supplied by HSL.
- 4.16 There should be a remote display of the Alarms in the Engine Room Console (Main Station) and Wheel House Console (Slave station)
- 4.17 An audible and visual alarm on the navigating bridge for any situation which requires action by or attention of officer on watch. Alarms channels should be accepted from the Bridge and alarm listing displays the alarms in a chronological order.
- 4.18 Alarms are displayed and logged in the chronological order of event with the ability to be reset.
- 4.19 The alarm system is to be able to indicate at the same time more than one fault and the acceptance of any alarm is not to inhibit another alarm.
- 4.20 Alarms are to be maintained until they are accepted and the visual indicators of individual alarms are to remain until the fault has been cleared, then the alarm system is to automatically reset to the normal operation condition.
- 4.21 Alarms associated with machinery, safety and control system fault are to be clearly distinguishable from other alarms.
- 4.22 The alarm displayed as group of alarms, provision is to be provided to identify individual alarms at the main control station (MCR or ECR) or alternatively at subsidiary control station (Bridge).
- 4.23 Group alarms are to be arranged in the bridge to indicate machinery faults, but alarm associated with faults required speed or power reduction or the automatic shut down of propulsion machinery are to be separately identified.
- 4.24 Audible and visual indications of machinery space alarms are to be relayed to the navigation bridge control station in such a way that the navigating officer of the watch is made aware when:
- a. one or two or more machinery fault has occurred;
 - b. the machinery fault is being attended to; and
 - c. the machinery fault has been rectified.
- 4.25 The alarm system is to be continuously powered and is to have an automatic change – over to a stand – by power supply in case of loss of normal power supply.
- 4.26 Failure of the normal power supply of the alarm system is to be indicated by an alarm.

- 4.27 2 Nos. suitable Uninterrupted power system of capacity **2KVA**, 3 Ph, 415V AC, 50Hz are to supplied to cater for the loads of Main Engine (Make: M/a ABC), Steerable Rudder Propulsion (SRP) control system (Make: Schottel) and also Alarm Monitoring System to ensure safe power to critical loads in modern control and computer systems. The uninterrupted Power system shall increase the safety both in compensating short mains failure or longer disruption. Suitable MCBs shall be provided for all the outgoing Distribution Feeders. AH Capacity of Batteries required shall be indicated to enable HSL (Shipyard) to provide the same. **Optional price of UPS shall be indicated in the price-bid.**
- 4.28 The following shall be supplied for ECR Console:
- i) 1 No. colour TFT 17" with in-built CPU backside and bracket for mounting the same on the Engine room control console with necessary power supply cables and signal cables to be included.
 - ii) 1 No. Keyboard including Signal Cable.
 - iii) 1 No. Track Ball
 - iv) 1 No. alarm printer with necessary power supply and communication cables.
 - v) 1 Nos. suitable UPS, 230V AC, 50HZ for 1hr. backup for the Work station PC.
- 4.29 1 No. Basic Alarm Panel flush mounted type with 2 mtrs cable terminated in terminal strip for mounting on the Bridge Console shall be supplied.
- 4.30 Necessary DPUs shall be supplied with IP – 44 degree of Protection or above.
- 4.31 The Engine room space shall be provided with a high intensity flashing beacon and high sounding siren with IP 44 Degree of Protection and suitable for BHD Mounting. Suitable fixing arrangements shall be provided to install the same on board the vessel. The audibility of siren shall be 120 dB at one metre distance. Necessary outputs shall be provided in Alarm Monitoring System for giving the Audio- visual Alarms.
- 4.32 Any other minor modification / suggestions like change in Alarm description, software etc., required to be incorporated and not specified in the this specification, either due to the requirement of the class or the owner (VPT), are to be done without extra cost.
- 4.33 Supplier shall ensure full coordination and interaction with other system equipment suppliers wherever they are interconnected with the operation of equipment under their scope of supply.

5. Commissioning and Demonstration:-

- 5.1 Competent Service Engineer shall be deputed for checking the installation, termination, commissioning and testing of equipment supplied and attending seatrials of the Tug for demonstrating the performance of complete equipment under suppliers scope of supply to the satisfaction of surveyors, shipyard and ship owners. Service Engineer shall be deputed to

HSL twice, first for checking the installation, commissioning and testing and presenting surveys to class and owners and second time for attending seatrials to demonstrate satisfactory operation of equipments.

- 5.2 Lumpsum service engineer charges for the above shall be quoted. Also per day charges of Service Engineer shall be quoted.
- 5.3 Supplier shall arrange to send with their Service Engineer with all necessary electrical / electronic test equipments tools, Drawings, Manuals etc., necessary for commissioning of the plant and also any minor electrical / electronic parts that may be needed during commissioning, etc.,

6. Wiring and Cable Entry:-

- 6.1.1 All the internal wiring shall not be less than 1.5 Sq. mm. Only copper conductor cables, having heat resisting insulation and flame retarding construction shall be employed. Extra flexible type shall be used for connection to components fitted on the hinged panels.
- 6.1.2 The following type & sizes of marine electric cables shall be procured by HSL and proposed to use the same for interconnection of various units in the Alarm Monitoring System.
- a) Standard copper conductor, XLPE insulated, PVC inner sheathed Galvanized steel wire braided, Over all PVC sheathed, Flame Retardant Halogen Free Cable of 600 / 1000 V grade approved by classification society for Power – Three Core of different Sizes. For multi – core cables conductor section shall be 1.0 Sq. mm to 2.5 Sq. mm.
 - b) Standard copper conductor, XLPE insulated, PVC inner sheathed Annealed copper wire braided overall Flame Retardant Halogen Free Cable of 150 / 250 V grade paired cables required for communication system having conductor section 0.75 Sq. mm (Viz., 2X2X 0.75, 5X2X 0.75 etc.,)
 - c) Supplier shall confirm suitability of above type of cables for the below equipments on board the vessel. Any cables other than the above, if required shall be considered as special cables and shall be supplied by Alarm monitoring system supplier per meter cost of special cables shall be indicated in the price – bid.
- 6.1.3 All the cables will enter the panels from the bottom only. Necessary suitable Brass cable entry gland shall be provided for both incoming and out going cables. The bottom plate shall be easily removable for arranging cable entries.

All the Electrical Panels shall be painted in conformity with the special requirements for ship board installation where atmosphere is laden with salt, moist air and oil vapour. The painting shall be carried out by seven tank process. The finished coat shall be of light grey shade (RAL 7032). A sample plate of painting shall be supplied with the drawings for HSL approval.

7. Spares:-

- 7.1 Spare for each type of module Analog / Digital to be included in the scope of supply.
- 7.2 Spares shall be supplied based on the Classification society requirements and Makers Recommendations. List of spares offered shall be enclosed to the technical offer, including the part no., item wise price in the price offer.

8. Testing:-

The vessel is under (class XII) (IRS) with class notation + SUL TUG + IY of IRS i.e., sea going vessel and machinery built and installed under supervision of Indian Register of Shipping (IRS) Surveyors. Hence all the equipments shall be IRS approved type as applicable. Supplier shall be responsible for obtaining all approvals by IRS Classification society for the offered Alarm Plant. Complete equipment shall be inspected after completion at the makers works by the IRS and their inspection certificates in Original + 6 (Six) copies shall be supplied to shipyard. Alarm Plant and UPS works Test Certificate shall also be furnished along with the Equipments.

However, in case of other than Indian Manufacturers the Alarm Plant shall be inspected and certified by Lyords Register Shipping / American Bureau of Shipping / DNV / BV on their own behalf and also on behalf of Indian Register of Shipping (IRS).

- 8.1 Alarm monitoring plant offered shall be type approved by concerned National Maritime Authority / Classification Society and copy of certificate shall be submitted along with the Tender. Further, the Test Certificate of Govt. Maritime Authority Surveyor certifying that the complete equipment complied with relevant regulations shall be supplied along with class Test Certificates.
- 9.** The following documents shall be enclosed to the Technical offer failing which the offer is liable for rejection.
- 9.1 All the basic drawings and Technical Literature pertaining to individual items for the offered make and model shall be enclosed to the Technical Offer.
- 9.2 Reference list of similar equipments supplied vessels.
- 9.3 Un-priced Price – bid with the list of deliverables.
- 9.4 Type Approval certificate (copy)
- 9.5 Complete address, Phone No., Fax No., etc., of the Indian Service Agent, as the vessel operates in Indian Water.

- 9.6 Parawise confirmation to enquiry technical Specification with deviation / alternatives systems if any for our consideration.
10. A portable Sensor Testing Kit for testing PT100s, Pressure Sensors, Exhaust Gas Temperature, 4-20ma,4-20 ma meter etc., with ± 0.1 accuracy along with the accessories shall be provided. **Optional price shall be indicated in the Price Bid.**

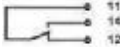
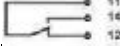
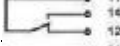
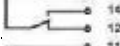

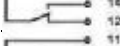
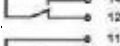
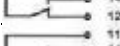
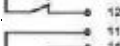

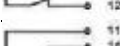







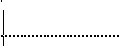
Manager
(Electrical Designs)


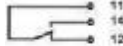
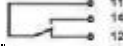
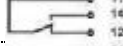
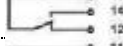
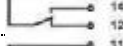

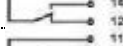
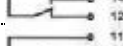
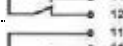
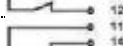

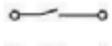
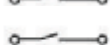



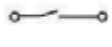
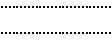
Alarm List for VC - 11160-61

Sl. No.	Tag	Description	set point	Indication	Remarks
I Main Engine 1					
a) Lubricating oil circuit					
1	OLSL.1	Oil level in sump	L<230L	Alarm	
2	OdPSH.1	Differential pressure	dP>0,8bar	Alarm	
3	OTSH.1	Oil temperature	T>80°C	Alarm	
4	OPT.2	Oil pressure sensor	0-10bar / 4-20mA	Indication	
5	OTT.2	Oil temperature sensor	0-100°C / 4-20mA	Indication	
6	OPSL.3	Oil pressure	P<2,6bar	Start standby pump	
7	OPSL.1	Oil pressure	P<2,75bar	Alarm	
8	OPSL.2	Oil pressure	P<1,5bar	Alarm	
9	OPSL.1	Oil pressure	P<2,5bar	Engine stop	
10	OSoV.1	Stop valve			
b) Fuel circuit					
11	FPSL.1	Fuel pressure	P<1,5bar	Alarm	
12	FPSL.2	Fuel pressure	P<1,2bar	Start standby pump	
13	FLSH.1	Leak injection pipe	L>3L	Alarm	
14	FLSH.21	Level daily fuel tank	L>	Alarm	Yard delivery
15	FLSH.22	Level daily fuel tank	L<	Alarm	Yard delivery
c) Starting air circuit					
16	SSaV.1	Start valve			
17	SPT.1	Starting air pressure sensor	0-40Bar/4-20mA	Indication	
18	SPSL.1	Starting air pressure	P<18bar	Alarm	
d) Exhaust circuit					
19	MPT.2	Pick-up turbo speed			
20	ATT.2	Charge air temperature sensor	0-200°C / 4-20mA	Indication	
21	APT.2	Charge air pressure sensor	0-2,5bar / 4-20mA	Indication	
22	ATSH.1	Charge air temperature	T>80°C	Alarm	
23	ATSL.1	Charge air temperature	T<30°C	Alarm	
24	ETT.1	Thermocouple Cyl. 1	0-600°C / 4-20mA	Indication	
25	ETT.2	Thermocouple Cyl. 2	0-600°C / 4-20mA	Indication	
26	ETT.3	Thermocouple Cyl. 3	0-600°C / 4-20mA	Indication	
27	ETT.4	Thermocouple Cyl. 4	0-600°C / 4-20mA	Indication	
28	ETT.5	Thermocouple Cyl. 5	0-600°C / 4-20mA	Indication	
29	ETT.6	Thermocouple Cyl. 6	0-600°C / 4-20mA	Indication	
30	ETT.7	Thermocouple Cyl. 7	0-600°C / 4-20mA	Indication	
31	ETT.8	Thermocouple Cyl. 8	0-600°C / 4-20mA	Indication	
32	ETT.9	Thermocouple for turbo	0-600°C / 4-20mA	Indication	
33	ETT.11	Thermocouple after turbo	0-600°C / 4-20mA	Indication	
e) Cooling water circuit					
34	WPT.1	Water pressure sensor	0-2,5bar / 4-20mA	Indication	
35	WPSL.1	Water pressure	P<0,4bar	Alarm	
36	WPSLL.1	Water pressure	P<0,3bar	Start standby pump	
37	WTSH.2	Water temperature	T> °C	Alarm	
38	WTT.5	Water temperature sensor	0-100°C / 4-20mA	Indication	
39	WTSH.1	Water temperature	T>90°C	Alarm	
40	WTSHH.1	Water temperature	T>95°C	Engine stop	
41	WTT.6	Water temperature sensor	0-100°C / 4-20mA	Indication	
42	WTT.1	Water temperature sensor	0-100°C / 4-20mA	Indication	
43	WTT.2	Water temperature sensor	0-100°C / 4-20mA	Indication	
44	WLSL.1	Water level expansion vessel	L<40L	Alarm	
45	WPSL.3	Sea water pressure	P<0,4bar	Alarm	
46	WPSLL.3	Sea water pressure	P<0,3bar	Start standby pump	
47	WLSH.3	Water in scavenge air receiver		Alarm	
48	ODIW.1	Oil in water detection		Alarm	Yard delivery
f) General					
49	PSL.1	Overload	>102%	Alarm	
50	PTS.1	Turning bar in position		Start condition	
II Main Engine 2					
a) Lubricating oil circuit					
51	OLSL.1	Oil level in sump	L<230L	Alarm	
52	OdPSH.1	Differential pressure	dP>0,8bar	Alarm	
53	OTSH.1	Oil temperature	T>80°C	Alarm	
54	OPT.2	Oil pressure sensor	0-10bar / 4-20mA	Indication	
55	OTT.2	Oil temperature sensor	0-100°C / 4-20mA	Indication	
56	OPSL.3	Oil pressure	P<2,6bar	Start standby pump	
57	OPSL.1	Oil pressure	P<2,75bar	Alarm	
58	OPSL.2	Oil pressure	P<1,5bar	Alarm	
59	OPSL.1	Oil pressure	P<2,5bar	Engine stop	
60	OSoV.1	Stop valve			

Sl. No.	Tag	Description	set point	Indication	Remarks
b) Fuel circuit					
61	FPSL.1	Fuel pressure	P<1,5bar	Alarm	
62	FPSL.2	Fuel pressure	P<1,2bar	Start standby pump	
63	FLSH.1	Leak injection pipe	L>3L	Alarm	
64	FLSH.21	Level daily fuel tank	L>	Alarm	Yard delivery
65	FLSH.22	Level daily fuel tank	L<	Alarm	Yard delivery
c) Starting air circuit					
66	SSaV.1	Start valve			
67	SPT.1	Starting air pressure sensor	0-40Bar/4-20mA	Indication	
68	SPSL.1	Starting air pressure	P<18bar	Alarm	
d) Exhaust circuit					
69	MPT.2	Pick-up turbo speed			
70	ATT.2	Charge air temperature sensor	0-200°C / 4-20mA	Indication	
71	APT.2	Charge air pressure sensor	0-2,5bar / 4-20mA	Indication	
72	ATSH.1	Charge air temperature	T>80°C	Alarm	
73	ATSL.1	Charge air temperature	T<30°C	Alarm	
74	ETT.1	Thermocouple Cyl. 1	0-600°C / 4-20mA	Indication	
75	ETT.2	Thermocouple Cyl. 2	0-600°C / 4-20mA	Indication	
76	ETT.3	Thermocouple Cyl. 3	0-600°C / 4-20mA	Indication	
77	ETT.4	Thermocouple Cyl. 4	0-600°C / 4-20mA	Indication	
78	ETT.5	Thermocouple Cyl. 5	0-600°C / 4-20mA	Indication	
79	ETT.6	Thermocouple Cyl. 6	0-600°C / 4-20mA	Indication	
80	ETT.7	Thermocouple Cyl. 7	0-600°C / 4-20mA	Indication	
81	ETT.8	Thermocouple Cyl. 8	0-600°C / 4-20mA	Indication	
82	ETT.9	Thermocouple for turbo	0-600°C / 4-20mA	Indication	
83	ETT.11	Thermocouple after turbo	0-600°C / 4-20mA	Indication	
e) Cooling water circuit					
84	WPT.1	Water pressure sensor	0-2,5bar / 4-20mA	Indication	
85	WPSL.1	Water pressure	P<0,4bar	Alarm	
86	WPSLL.1	Water pressure	P<0,3bar	Start standby pump	
87	WTSH.2	Water temperature	T> °C	Alarm	
88	WTT.5	Water temperature sensor	0-100°C / 4-20mA	Indication	
89	WTSH.1	Water temperature	T>90°C	Alarm	
90	WTSHH.1	Water temperature	T>95°C	Engine stop	
91	WTT.6	Water temperature sensor	0-100°C / 4-20mA	Indication	
92	WTT.1	Water temperature sensor	0-100°C / 4-20mA	Indication	
93	WTT.2	Water temperature sensor	0-100°C / 4-20mA	Indication	
94	WLSL.1	Water level expansion vessel	L<40L	Alarm	
95	WPSL.3	Sea water pressure	P<0,4bar	Alarm	
96	WPSLL.3	Sea water pressure	P<0,3bar	Start standby pump	
97	WLSH.3	Water in scavenge air receiver		Alarm	
98	ODIW.1	Oil in water detection		Alarm	Yard delivery
f) General					
99	PSL.1	Overload	>102%	Alarm	
100	PTS.1	Turning bar in position		Start condition	
III D.G. Set - 1					
101		Low Lub oil Pressure		Alarm & Shut Down	
102		High F.W. Temp.		Alarm & Shut Down	
103		High Lub Oil Temp.		Alarm	
104		High Alt. Wdg. Temp.		Alarm	
105		Over Speed		Shut Down	
106		High Pressure Pipe		Alarm	
107		Low Battery Charge		Alarm	
IV D.G. Set - 2					
108		Low Lub oil Pressure		Alarm & Shut Down	
109		High F.W. Temp.		Alarm & Shut Down	
110		High Lub Oil Temp.		Alarm	
111		High Alt. Wdg. Temp.		Alarm	
112		Over Speed		Shut Down	
113		High Pressure Pipe		Alarm	
114		Low Battery Charge		Alarm	
V D.G. Set - 2					
115		Low Lub oil Pressure		Alarm & Shut Down	
116		High F.W. Temp.		Alarm & Shut Down	
117		High Lub Oil Temp.		Alarm	
118		High Alt. Wdg. Temp.		Alarm	
119		Over Speed		Shut Down	
120		High Pressure Pipe		Alarm	
121		Low Battery Charge		Alarm	

Open During normal condition

Sl. No.	Tag	Description	set point	Indication	Remarks
VI	SRP (Port)				
a)	AC power supply control system				
122		Earth connection	PE		
b)	AC power supply pump starter				
123		Feed line Control system	Fused		
124					
125		Earth connection	PE		
126		Feed line (e.g. for service plug)	Fuse 16 A		
c)	DC power supply				
127		Feed line Back up power supply	Fuse 16A		
128		Feed line indicators	~ 50W Fuse 2A		
d)	Interface to diesel propulsion motor				
129		Lever in zero	Contact 11/14 closed if lever in zero		
130		Clutch signal, contact is close if clutch is disengaged	Engine can be started if Contact 11/14 is closed		
131		feedline			
132		motor off, Clutch will be disengaged automatically	STOP or emergency stop contact closed if stop is activated		
133		motor on, Suppressing of some alarms	Engine is running contact closed if engine is running		
134		motor at idle speed, Clutch control. Interlock engage clutch	Engine is running at idle speed contact only Closed at idle speed		
135		Actual speed value	Speed value 0-100% max load 500 Ohm		4-20mA(+) 4-20mA(-)
f)	Interface to Ship alarm system				
	Switch box steering control system				
136		indication	Collective alarm of the unit		
137		Failure AC/DC Converter	Contact 11/14 is normal closed Delay time 0s		
138		Failure feed line 24V DC	Contact 11/14 is normal closed Delay time 0s		
139		Failure control system	Contact 11/14 is normal closed Delay time 0s		
140		Failure FFU RPM Control	Contact 11/14 is normal closed Delay time 0s		
141		Failure FFU steering system	Contact 11/14 is normal closed Delay time 0s		
142		Failure NFU steering	Contact 11/14 is normal closed Delay time 0s		
143		FFU steering locked	Contact 11/14 is normal closed Delay time 0s		
144		Failure values external system	Contact 11/14 is normal closed Delay time 0s		
145		Shaft speed less 290rpm	For suppressing lub oil flow alarm if foreseen		
146		Hy oil level min	Contact 11/14 is normal closed Delay time 0s		
147		Standby pressure min steering pump 1	Contact 11/14 is normal closed Delay time 0s		
148		Air pressure Clutch min	Contact 11/14 is normal closed Delay time 0s		
g)	Switch box starter hy pump steering				
149		Overload hy pump steering Contact N.C	Delay time 0s		
150		Phase failure feed line Contact N.C	Delay time 0s		
151		Failure hy pump steering Contact N.C	Delay time 0s		
152		Hy pump steering is switched ON Contact N.C	For suppressing oil pressure min hy pump steering		
h)	Alarm signals hydraulic aggregate				
153		max temperature hydraulic oil Contact N.C.	Delay time 15s		
154		hydraulic oil filter clogged Contact N.C.	Delay time 15s		
155		max hydraulic oil Pressure Contact N.C.	Delay time 3s		
i)	Thruster				
156		Lub oil level min Contact N.C.			
157		Lub oil temperature max Contact N.C.			
158		Lub oil flow min Contact N.C. if shaft speed > 290 rpm	Must be suppressed if shaft speed is < 290rpm		

Sl. No.	Tag	Description	set point	Indication	Remarks
159		Lub oil filter glogged Contact N.C.			
VII	SRP (Stbd)				
a)	AC power supply control system				
160		Earth connection	PE		
b)	AC power supply pump starter				
161		Feed line Control system	Fused		
162					
163		Earth connection	PE		
164		Feed line (e.g. for service plug)	Fuse 16 A		
c)	DC power supply				
165		Feed line Back up power supply	Fuse 16A		
166		Feed line indicators	~ 50W Fuse 2A		
d)	Interface to diesel propulsion motor				
167		Lever in zero	Contact 11/14 closed if lever in zero		
168		Clutch signal, contact is close if clutch is disengaged	Engine can be started if Contact 11/14 is closed		
169		feedline			
170		motor off, Clutch will be disengaged automatically	STOP or emergency stop contact closed if stop is activated		
171		motor on, Suppressing of some alarms	Engine is running contact closed if engine is running		
172		motor at idle speed, Clutch control. Interlock engage clutch	Engine is running at idle speed contact only Closed at idle speed		
173		Actual speed value	Speed value 0-100% max load 500 Ohm		4-20mA(+) 4-20mA(-)
e)	Interface to Ship alarm system				
	Switch box steering control system				
174		indication	Collective alarm of the unit		
175		Failure AC/DC Converter	Contact 11/14 is normal closed Delay time 0s		
176		Failure feed line 24V DC	Contact 11/14 is normal closed Delay time 0s		
177		Failure control system	Contact 11/14 is normal closed Delay time 0s		
178		Failure FFU RPM Control	Contact 11/14 is normal closed Delay time 0s		
179		Failure FFU steering system	Contact 11/14 is normal closed Delay time 0s		
180		Failure NFU steering	Contact 11/14 is normal closed Delay time 0s		
181		FFU steering locked	Contact 11/14 is normal closed Delay time 0s		
182		Failure values external system	Contact 11/14 is normal closed Delay time 0s		
183		Shaft speed less 290rpm	For suppressing lub oil flow alarm if foreseen		
184		Hy oil level min	Contact 11/14 is normal closed Delay time 0s		
185		Standby pressure min steering pump 1	Contact 11/14 is normal closed Delay time 0s		
186		Air pressure Clutch min	Contact 11/14 is normal closed Delay time 0s		
f)	Switch box starter hy pump steering				
187		Overload hy pump steering Contact N.C	Delay time 0s		
188		Phase failure feed line Contact N.C	Delay time 0s		
189		Failure hy pump steering Contact N.C	Delay time 0s		
190		Hy pump steering is switched ON Contact N.C	For suppressing oil pressure min hy pump steering		
g)	Alarm signals hydraulic aggregate				
191		max temperature hydraulic oil Contact N.C.	Delay time 15s		
192		hydraulic oil filter clogged Contact N.C.	Delay time 15s		
193		max hydraulic oil Pressure Contact N.C.	Delay time 3s		
h)	Thruster				
194		Lub oil level min Contact N.C.			
195		Lub oil temperature max Contact N.C.			
196		Lub oil flow min Contact N.C. if shaft speed > 290 rpm	Must be suppressed if shaft speed is < 290rpm		
197		Lub oil filter glogged Contact N.C.			

Sl. No.	Tag	Description	set point	Indication	Remarks
VII	Miscellaneous				
198		Oily Bidge Water Seperator PPM		High	
199		Air Compressor - 1			
200		Air Compressor - 2			
201	General	AL UPS1 Battery Charger			
202		AL UPS1 Earth Fault 24V			
203		AL UPS2 Battery Charger			
204		AL UPS2 Earth Fault 24V			
205		FO Tank - 1		High Low	
206	Tanks	FO Tank - 2		High Low	
207		FO Tank - 3		High Low	
208		Fresh Water Tank		Low	
209		Bilge Tank		High	