HINDUSTAN SHIPYARD LIMITED
VISAKHAPATNAM – 530005

ENQUIRY TECHNICAL SPECIFICATION FOR ALARM MONITORING SYSTEM FOR 3 Nos. 50T BP TUGS FOR INDIAN NAVY, HSL YARD Nos. – 11162 – 64

1. SCOPE OF SUPPLY AND WORK OF SUPPLIERS:

1.1 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.

1.2 The alarm plant in its entirety shall give complete satisfaction to the shipyard and ship owners 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.

1.3 A Microprocessor based Alarm Monitoring System shall be supplied for monitoring of Alarms as per the enclosed Alarms list at **Annexure – 'A'**. The Main Engine and the Tanks High / Low Level alarms shall be connected by Modbus interface to the Alarm Monitoring System.

1.4 Complete Integrated system to perform monitoring suitable for all functional requirements must be included.

1.5 10% 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.

1.6 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.

1.7 Alarm Panel shall consist of audible and visible signals as per the requirements of IRS Rules.

1.8 The alarm system shall be current or existing model or version of electronic automation as per latest IRS Class Rules and Regulations.

1.9 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.

1.10 Necessary Isolators to be provided to avoid Earth Fault.

1.11 For Tanks, Digital Tank level indication gauges shall be supplied by HSL.

1.12 There should be a remote display of the Alarms in the Engine Room Console (1 No. Main Station and 1 No. Slave station) and Wheel House Console (1 No. Slave station)

1.13 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.

1.14 Alarms associated with machinery, safety and control system fault are to be clearly distinguishable from other alarms.

1.15 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).

1.16 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.

1.17 Failure of the normal power supply of the alarm system is to be indicated by an alarm. Power ON indication on which source is being used on Workstation and there will be an alarm for the same in case of failure of supply and change over to back - up supply.

1.18 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/s Wartsile, France), Voith Schneider Propulsion control system 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.**

1.19 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 No. suitable UPS, 230V AC, 50HZ for 30 minutes backup for the Work station PC.
vi) 1 No. Basic Alarm Panel or Workstation with UPS (230V AC, 50Hz) as standby to meet the class requirement. **Optional price for Basic Alarm Panel or Workstation with UPS shall be indicated in the Price Bid.**

1.20 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.

1.21 Necessary DPUs shall be supplied with IP – 44 degree of Protection or above.

1.22 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 meter distance. Necessary outputs shall be provided in Alarm Monitoring System for giving the Audio- visual Alarms.

1.23 Any other minor modification or 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 (Indian Navy), are to be done without extra cost.

1.24 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.

2. SCOPE OF WORK OF SHIPYARD

2.1 Making suitable seating for the suppliers equipment based on suppliers drawings, but the normal foundations of individual accessories shall be provided by the suppliers.

2.2 Laying up and leading of all cables into suppliers equipments and connecting up under supervision of suppliers engineer.

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

3. GENERAL :-

3.1 DRAWINGS:-

For each equipment or 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 form receipt of HSL Order. The approval drawings shall necessarily include the following.

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

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

3.2 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.

3.3 The tenderer shall have the authorization certificate directly from OEMs for sales and service support in India. Copy of the same shall be enclosed to the Technical offer.

3.4 All COTs equipment (as applicable) shall be provided with AMC for 5 Years. Optional price for the same shall be indicated separately in the Price - Bid.

3.5 **Life time Support:** Supplier shall confirm the provision of life time support by providing for a minimum period of 20 years, except electronics where the minimum period will be 10 years after delivery of the tug. Incase of the equipment is likely to become obsolete, the manufacturer shall be committed to give a clear 3 years notice to the Indian Navy to assess the requirement of "life time buy" of spares.

3.6 **Training:** The Ship's crew and shore maintenance staff are required to be trained on the operation and maintenance of equipment installed onboard.

3.7 **Factory acceptance trials:** The Owner reserves the right to depute representative to witness factory acceptance trials of equipment. The OEM shall intimate the dates of these trials at least six weeks in advance to the Shipyard and Owner. The details like no. of persons, duration of trials, lodging & boarding shall be indicated in the optional Price separately.

3.8 **Labeling and Tally plates:** All tallies plates shall be engraved and made of anodized aluminium alloy.

3.9 **Caution Board:** 230V AC DB and 24V DC DB shall be affixed with Caution Board in a prominent position. The caution board will be red in colour with white letters.

3.10 **Diagram Plates:** All Electrical DB's will be provided with Anodised Aluminum diagram plates, clearly showing connections with terminal marking as on the equipment and they will be secured on the underside of the cover of the DB's

3.11 **Fuses:** Where Fuses are used for circuit over current protection they will conform to international standards and will be approved by Classification Society.

3.12 **Weight :** The weight of Alarm monitoring System including UPS (2 KVA - I/P 415V 3 Ph AC, O/P 24V DC) shall not exceed **750 Kgs.**

4. CLASSIFICATIONS AND RULES:-

The offered equipment shall confirm to the following:

4.1 The vessel is classified with Indian Register of Shipping.

4.1.1 The tug will be built to class rules for operation in harbour and coastal waters and island territories. Required Indian Register of Shipping (IRS) Class Notation is + SUL *TUG* + IY, AGNI 1. The vessel class notation as Fire Fighting Vessel (FFV) should meet AGNI - 1 requirements.

4.1.2 Latest SOLAS rules.

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

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

4.2 The Ambient Temperature is

a) Air Temperature	- upto 45ºC
b) Max. Machinery space Temp.	- upto 55ºC
c) Relative Humidity	- 100% at 35ºC
d) Sea Water Temperature	- upto 35ºC

4.3 Voltage fluctuations of A.C. Source from +6 to -10% of the rated value at rated frequency as per Classification Society

4.4 Frequency fluctuations of ± 5% of the rated value at the rated voltage as per Classification Society.

4.5 When the Vessel is permanently inclined 15º athwart ship, 10º longitudinally and under a roll of 22.5º each side from the vertical.

4.6 Quantity mentioned below is for one vessel. The requirement is for 3 nos. 50 Ton Bollard Pull Tractor Tug for Indian Navy our Yard No.11162 – 64.

4.7 **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.

4.8 All Test Certificates, approvals, Technical manuals, drawings, installation instructions, etc., shall be in English and supplied in 9 (Nine) copies for each vessel. The Technical Manuals shall be essentially include the following

4.8.1 Introduction with Technical Data and General System Description.

4.8.2 Schematic and Wiring Diagram for Alarm Monitoring Plant, UPS, etc.,

4.8.3 Installation and commissioning steps or instruction.

4.8.4 Type of Cards, I/O Modules with circuit diagrams.

4.8.5 Routine maintenance and fault finding instruction.

4.8.6 Detailed list of alarm points indicating the description of the alarm channel, range, set point, etc.,

4.8.7 Operating Instructions.

5. COMMISSIONING AND DEMONSTRATION:-

5.1 Competent Service Engineer shall be deputed for checking the Installation, Termination, Commissioning, present the HATs to class and Owners 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 and electronic test equipments tools, Drawings, Manuals etc., necessary for commissioning of the plant and also any minor electrical and electronic parts that may be needed during commissioning, etc.,

5.4 Supplier's Local Service Engineer shall attend for Joint Inspection at HSL after receipt of the equipment in HSL, inorder to ascertain for any shortages and to supply the same.

6. WIRING AND CABLE ENTRY:-

6.1.1 All the internal wiring shall not be less than 1.5 Sq. mm. LFH cables conforming to marine specification shall be used for internal wiring. 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 **On-Board Spares:** List of Manufacturer Recommended Spares with pattern / part number with individual cost shall be indicated separately in the offer, for two years operation of each vessel. The order for OB spares, tools and test equipment shall be done concurrently while placing the order for main equipment. The spares consumed within the guarantee period to rectify and liquidated known defects shall be replaced free of cost.

7.2 **Base and Depot Spares:** The tenderer shall arrange for quotation from Original equipment suppliers in ILMS format as recommended by them for Base and Depot spares for five years exploitation The quotation shall be for unit price of each item offered. Copy of parts Identification List shall be enclosed to the technical offer. The validity of the offer be for 18 months. The cost of B&D spares will not be considered while evaluating the offer.

7.3 Manufacturer standard spares & Class recommended spares for all the above systems to be provided and properly labeled in English language for identification and to be supplied in well packed rigid boxes.

7.4 The final selection of the equipment shall be at the discretion of ship owners based on the TNC (Technical Negotiation Committee) held among representatives of Owners, HSL and OEM [Original Equipment Manufacturer.]

8. TESTING:-

The vessel is 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 or American Bureau of Shipping (ABS) or DNV or 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 and 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 vessels supplied with similar equipments.

9.3 Un-priced Price – bid with the list of deliverables (Scope of Supply).

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 deviations / alternative systems suggested if any for our consideration.

Manager
(Electrical Designs)

Encl: As above Annexure - A (List of Alarms)

Wärtsilä Italia	External Communication Interface List for W8L26 HSL VC 11162						Generated with: WCT 2.2
Made	Massimo Lazari	Date	Product	WBS Element	Engine number	Class Society	Document	Revision
		05-07-2011	W8L26 - TC FE	SP/00321	PAAE219860-61	IRS	DBAB842633	-
Approved	cfa002							

Modbus/TCP communication info	
Commands in use:	3, 16, 101
Communication mode:	TCP
TCP Port:	502
Error value in case Sensor failure:	-32765
Error value in case not updated:	-32767

Modbus/TCP		Direction: Output									
Address	Bit	Function	Description	ISO code	Range, min	Range, max	Unit	Set Point data	Scale	Bus data	Remark
41001	0	STATUS	Fuel limiter active	IS1001	0	1	-	-	-	0/1	-
41001	4	ALM HIGH	ALM, High FO leakage, clean primary, A-bank	LS103A	0	1	-	= 1	-	0/1	-
41002	0	ALM	ALM, FO filter press diff sw	PDS113	0	1	-	= 1	-	0/1	-
41003	2	STB	SBL, Stop lever in stop position	GS171	0	1	-	= 1	-	0/1	-
41003	3	SHD HIGH	SHD, High Stop lever in stop position	GS171	0	1	-	= 1	-	0/1	-
41004	2	SF	SF, Engine speed, primary	ST196P	0	1	-	-	-	0/1	-
41004	3	SF	SF, Engine speed, secondary	ST196S	0	1	-	-	-	0/1	-
41004	6	EMG HIGH	E-EMG, High Overspeed shutdown 1 status	IS1741	0	1	-	= 1	-	0/1	-
41051		PV	FO press, engine inlet	PT101	0.00	16.00	bar	-	0.01	0 - 1600	-
41052	0	SF	SF, FO press, engine inlet	PT101	0	1	-	-	-	0/1	-
41052	1	ALM LOW	ALM, Low FO press, engine inlet	PT101	0	1	-	< 4.00	-	0/1	-
41054		PV	FO temp, engine inlet	TE101	0.0	160.0	C	-	0.1	0 - 1600	-
41055	0	SF	SF, FO temp, engine inlet	TE101	0	1	-	-	-	0/1	-
41192		PV	Engine load, ppt	GTY1623	0.0	120.0	%	-	0.1	0 - 1200	-
41193	2	ALM HIGH	ALM, High Engine load, ppt	GTY1623	0	1	-	> 102.0	-	0/1	-
41195		PV	Fuel rack position	GT165_2	0	40	mm	-	1	0 - 40	-
41196	0	SF	SF, Fuel rack position	GT165_2	0	1	-	-	-	0/1	-
41219		PV	Engine speed	STY196	0.0	1200.0	rpm	-	0.1	0 - 12000	-
41220	6	EMG	E-EMG, Engine speed	STY196	0	1	-	Mapped	-	0/1	-
41220	8	EMG HIGH	E-EMG, High Engine speed	STY196	0	1	-	> 118.0	-	0/1	-
41228		PV	Torsional vibration level, mean	WY196_1	0	2	deg	-	100	0 - 0.02	-
41229	2	ALM HIGH	ALM, High Torsional vibration level, mean	WY196_1	0	1	-	1)	-	0/1	-
Modbus/TCP		Direction: Output									
Address	Bit	Function	Description	ISO code	Range, min	Range, max	Unit	Set Point data	Scale	Bus data	Remark
42001	1	SHD	SHD, LO press shutdown status	IS2011	0	1	-	Mapped	-	0/1	-
42001	3	ALM	ALM, Low LO low level, wet sump	LS204	0	1	-	-	-	0/1	-
42001	11	ALM	ALM, LO press shutdown status	IS2011	0	1	-	= 1	-	0/1	-
42051		PV	LO press, engine inlet	PT201	0.00	10.00	bar	-	0.01	0 - 1000	-
42052	0	SF	SF, LO press, engine inlet	PT201	0	1	-	-	-	0/1	-
42052	1	ALM LOW	ALM, Low LO press, engine inlet	PT201	0	1	-	< 3.00	-	0/1	-
42053	0	LR LOW	LR, Low LO press, engine inlet	PT201	0	1	-	< 2.50	-	0/1	-
42053	6	STB LOW	STB, Low LO press, engine inlet	PT201	0	1	-	< 0.30	-	0/1	-
42054		PV	LO temp, engine inlet	TE201	0.0	160.0	C	-	0.1	0 - 1600	-
42055	0	SF	SF, LO temp, engine inlet	TE201	0	1	-	-	-	0/1	-
42055	2	ALM HIGH	ALM, High LO temp, engine inlet	TE201	0	1	-	> 75.0	-	0/1	-
42056	1	LR HIGH	LR, High LO temp, engine inlet	TE201	0	1	-	> 80.0	-	0/1	-
42066		PV	LO filter press diff	PDT243	0.00	2.00	bar	-	0.01	0 - 200	-
42067	0	SF	SF, LO filter press diff	PDT243	0	1	-	-	-	0/1	-
42067	2	ALM HIGH	ALM, High LO filter press diff	PDT243	0	1	-	> 1.00	-	0/1	-
42069		PV	LO press, TC A inlet	PT271	0.00	10.00	bar	-	0.01	0 - 1000	-
42070	0	SF	SF, LO press, TC A inlet	PT271	0	1	-	-	-	0/1	-
42070	1	ALM LOW	ALM, Low LO press, TC A inlet	PT271	0	1	-	< 1.30	-	0/1	-
42072		PV	LO temp, TC A outlet	TE272	0.0	160.0	C	-	0.1	0 - 1600	-
42073	2	ALM HIGH	ALM, High LO temp, TC A outlet	TE272	0	1	-	> 120.0	-	0/1	-

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Modbus/TCP		Direction: Output									
Address	Bit	Function	Description	ISO code	Range, min	Range, max	Unit	Set Point data	Scale	Bus data	Remark
43051		PV	Starting air press, engine inlet	PT301	0.00	16.00	bar	-	0.01	0 - 1600	-
43052	0	SF	SF, Starting air press, engine inlet	PT301	0	1	-	-	-	0/1	-
43052	1	ALM LOW	ALM, Low Starting air press, engine inlet	PT301	0	1	-	< 7.00	-	0/1	-
43054		PV	Control air press	PT311	0.00	40.00	bar	-	0.01	0 - 4000	-
43055	0	SF	SF, Control air press	PT311	0	1	-	-	-	0/1	-
43055	1	ALM LOW	ALM, Low Control air press	PT311	0	1	-	< 16.00	-	0/1	-
Modbus/TCP		Direction: Output									
Address	Bit	Function	Description	ISO code	Range, min	Range, max	Unit	Set Point data	Scale	Bus data	Remark
44051		PV	HT water press, jacket inlet	PT401	0.00	6.00	bar	-	0.01	0 - 600	-
44052	0	SF	SF, HT water press, jacket inlet	PT401	0	1	-	-	-	0/1	-
44052	1	ALM LOW	ALM, Low HT water press, jacket inlet	PT401	0	1	-	2)	-	0/1	-
44053	0	LR LOW	LR, Low HT water press, jacket inlet	PT401	0	1	-	3)	-	0/1	-
44054		PV	HT water temp, jacket inlet	TE401	0.0	160.0	C	-	0.1	0 - 1600	-
44055	0	SF	SF, HT water temp, jacket inlet	TE401	0	1	-	-	-	0/1	-
44055	1	ALM LOW	ALM, Low HT water temp, jacket inlet	TE401	0	1	-	< 60.0	-	0/1	-
44057		PV	HT water temp, jacket outlet A-bank	TE402	0.0	160.0	C	-	0.1	0 - 1600	-
44058	0	SF	SF, HT water temp, jacket outlet A-bank	TE402	0	1	-	-	-	0/1	-
44058	2	ALM HIGH	ALM, High HT water temp, jacket outlet A-bank	TE402	0	1	-	> 105.0	-	0/1	-
44059	1	LR HIGH	LR, High HT water temp, jacket outlet A-bank	TE402	0	1	-	> 110.0	-	0/1	-
44059	6	STB LOW	STB, Low HT water temp, jacket outlet A-bank	TE402	0	1	-	< 18.0	-	0/1	-
44072		PV	LT water press, LT CAC inlet	PT471	0.00	6.00	bar	-	0.01	0 - 600	-
44073	0	SF	SF, LT water press, LT CAC inlet	PT471	0	1	-	-	-	0/1	-
44073	1	ALM LOW	ALM, Low LT water press, LT CAC inlet	PT471	0	1	-	2)	-	0/1	-
44078		PV	LT water temp, LT CAC inlet	TE471	0.0	160.0	C	-	0.1	0 - 1600	-
44079	0	SF	SF, LT water temp, LT CAC inlet	TE471	0	1	-	-	-	0/1	-
44079	2	ALM HIGH	ALM, High LT water temp, LT CAC inlet	TE471	0	1	-	> 50.0	-	0/1	-
44081		PV	LT water temp, LT CAC outlet	TE472	0.0	160.0	C	-	0.1	0 - 1600	-
44082	0	SF	SF, LT water temp, LT CAC outlet	TE472	0	1	-	-	-	0/1	-
Modbus/TCP		Direction: Output									
Address	Bit	Function	Description	ISO code	Range, min	Range, max	Unit	Set Point data	Scale	Bus data	Remark
45051		PV	Engine exh gas avg temp	TY500	0.0	750.0	C	-	0.1	0 - 7500	-
45054		PV	Exh gas temp, cyl 01A	TE5011A	0.0	750.0	C	-	0.1	0 - 7500	-
45055	0	SF	SF, Exh gas temp, cyl 01A	TE5011A	0	1	-	-	-	0/1	-
45055	2	ALM HIGH	ALM, High Exh gas temp, cyl 01A	TE5011A	0	1	-	> 500.0	-	0/1	-
45056	1	LR HIGH	LR, High Exh gas temp, cyl 01A	TE5011A	0	1	-	> 540.0	-	0/1	-
45060		PV	Exh gas temp deviation, cyl 01A	TY5017A	-150.0	150.0	C	-	0.1	-1500 - 1500	-
45061	2	ALM HIGH	ALM, High Exh gas temp deviation, cyl 01A	TY5017A	0	1	-	Mapped	-	0/1	-
45062	1	LR HIGH	LR, High Exh gas temp deviation, cyl 01A	TY5017A	0	1	-	Mapped	-	0/1	-
45066		PV	Exh gas temp, cyl 02A	TE5021A	0.0	750.0	C	-	0.1	0 - 7500	-
45067	0	SF	SF, Exh gas temp, cyl 02A	TE5021A	0	1	-	-	-	0/1	-
45067	2	ALM HIGH	ALM, High Exh gas temp, cyl 02A	TE5021A	0	1	-	> 500.0	-	0/1	-
45068	1	LR HIGH	LR, High Exh gas temp, cyl 02A	TE5021A	0	1	-	> 540.0	-	0/1	-
45072		PV	Exh gas temp deviation, cyl 02A	TY5027A	-150.0	150.0	C	-	0.1	-1500 - 1500	-
45073	2	ALM HIGH	ALM, High Exh gas temp deviation, cyl 02A	TY5027A	0	1	-	Mapped	-	0/1	-
45074	1	LR HIGH	LR, High Exh gas temp deviation, cyl 02A	TY5027A	0	1	-	Mapped	-	0/1	-
45078		PV	Exh gas temp, cyl 03A	TE5031A	0.0	750.0	C	-	0.1	0 - 7500	-
45079	0	SF	SF, Exh gas temp, cyl 03A	TE5031A	0	1	-	-	-	0/1	-
45079	2	ALM HIGH	ALM, High Exh gas temp, cyl 03A	TE5031A	0	1	-	> 500.0	-	0/1	-
45080	1	LR HIGH	LR, High Exh gas temp, cyl 03A	TE5031A	0	1	-	> 540.0	-	0/1	-

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45084		PV	Exh gas temp deviation, cyl 03A	TY5C37A	-150.0	150.0	C	-	0.1	-1500 - 1500	-
45085	2	ALM HIGH	ALM, High Exh gas temp deviation, cyl 03A	TY5C37A	0	1	-	Mapped	-	0/1	-
45086	1	LR HIGH	LR, High Exh gas temp deviation, cyl 03A	TY5C37A	0	1	-	Mapped	-	0/1	-
45090		PV	Exh gas temp, cyl 04A	TE5041A	0.0	750.0	C	-	0.1	0 - 7500	-
45091	0	SF	SF, Exh gas temp, cyl 04A	TE5041A	0	1	-	-	-	0/1	-
45091	2	ALM HIGH	ALM, High Exh gas temp, cyl 04A	TE5041A	0	1	-	> 500.0	-	0/1	-
45092	1	LR HIGH	LR, High Exh gas temp, cyl 04A	TE5041A	0	1	-	> 540.0	-	0/1	-
45096		PV	Exh gas temp deviation, cyl 04A	TY5C47A	-150.0	150.0	C	-	0.1	-1500 - 1500	-
45097	2	ALM HIGH	ALM, High Exh gas temp deviation, cyl 04A	TY5C47A	0	1	-	Mapped	-	0/1	-
45098	1	LR HIGH	LR, High Exh gas temp deviation, cyl 04A	TY5C47A	0	1	-	Mapped	-	0/1	-
45102		PV	Exh gas temp, cyl 05A	TE5051A	0.0	750.0	C	-	0.1	0 - 7500	-
45103	0	SF	SF, Exh gas temp, cyl 05A	TE5051A	0	1	-	-	-	0/1	-
45103	2	ALM HIGH	ALM, High Exh gas temp, cyl 05A	TE5051A	0	1	-	> 500.0	-	0/1	-
45104	1	LR HIGH	LR, High Exh gas temp, cyl 05A	TE5051A	0	1	-	> 540.0	-	0/1	-
45108		PV	Exh gas temp deviation, cyl 05A	TY5C57A	-150.0	150.0	C	-	0.1	-1500 - 1500	-
45109	2	ALM HIGH	ALM, High Exh gas temp deviation, cyl 05A	TY5C57A	0	1	-	Mapped	-	0/1	-
45110	1	LR HIGH	LR, High Exh gas temp deviation, cyl 05A	TY5C57A	0	1	-	Mapped	-	0/1	-
45114		PV	Exh gas temp, cyl 06A	TE5061A	0.0	750.0	C	-	0.1	0 - 7500	-
45115	0	SF	SF, Exh gas temp, cyl 06A	TE5061A	0	1	-	-	-	0/1	-
45115	2	ALM HIGH	ALM, High Exh gas temp, cyl 06A	TE5061A	0	1	-	> 500.0	-	0/1	-
45116	1	LR HIGH	LR, High Exh gas temp, cyl 06A	TE5061A	0	1	-	> 540.0	-	0/1	-
45120		PV	Exh gas temp deviation, cyl 06A	TY5C67A	-150.0	150.0	C	-	0.1	-1500 - 1500	-
45121	2	ALM HIGH	ALM, High Exh gas temp deviation, cyl 06A	TY5C67A	0	1	-	Mapped	-	0/1	-
45122	1	LR HIGH	LR, High Exh gas temp deviation, cyl 06A	TY5C67A	0	1	-	Mapped	-	0/1	-
45126		PV	Exh gas temp, cyl 07A	TE5071A	0.0	750.0	C	-	0.1	0 - 7500	-
45127	0	SF	SF, Exh gas temp, cyl 07A	TE5071A	0	1	-	-	-	0/1	-
45127	2	ALM HIGH	ALM, High Exh gas temp, cyl 07A	TE5071A	0	1	-	> 500.0	-	0/1	-
45128	1	LR HIGH	LR, High Exh gas temp, cyl 07A	TE5071A	0	1	-	> 540.0	-	0/1	-
45132		PV	Exh gas temp deviation, cyl 07A	TY5C77A	-150.0	150.0	C	-	0.1	-1500 - 1500	-
45133	2	ALM HIGH	ALM, High Exh gas temp deviation, cyl 07A	TY5C77A	0	1	-	Mapped	-	0/1	-
45134	1	LR HIGH	LR, High Exh gas temp deviation, cyl 07A	TY5C77A	0	1	-	Mapped	-	0/1	-
45138		PV	Exh gas temp, cyl 08A	TE5081A	0.0	750.0	C	-	0.1	0 - 7500	-
45139	0	SF	SF, Exh gas temp, cyl 08A	TE5081A	0	1	-	-	-	0/1	-
45139	2	ALM HIGH	ALM, High Exh gas temp, cyl 08A	TE5081A	0	1	-	> 500.0	-	0/1	-
45140	1	LR HIGH	LR, High Exh gas temp, cyl 08A	TE5081A	0	1	-	> 540.0	-	0/1	-
45144		PV	Exh gas temp deviation, cyl 08A	TY5C87A	-150.0	150.0	C	-	0.1	-1500 - 1500	-
45145	2	ALM HIGH	ALM, High Exh gas temp deviation, cyl 08A	TY5C87A	0	1	-	Mapped	-	0/1	-
45146	1	LR HIGH	LR, High Exh gas temp deviation, cyl 08A	TY5C87A	0	1	-	Mapped	-	0/1	-
45174		PV	Exh gas temp TC A inlet	TE511	0.0	750.0	C	-	0.1	0 - 7500	-
45175	0	SF	SF, Exh gas temp TC A inlet	TE511	0	1	-	-	-	0/1	-
45175	2	ALM HIGH	ALM, High Exh gas temp TC A inlet	TE511	0	1	-	> 590.0	-	0/1	-
45176	1	LR HIGH	LR, High Exh gas temp TC A inlet	TE511	0	1	-	> 640.0	-	0/1	-
45177		PV	Exh gas temp TC A outlet	TE517	0.0	750.0	C	-	0.1	0 - 7500	-
45178	0	SF	SF, Exh gas temp TC A outlet	TE517	0	1	-	-	-	0/1	-
45178	2	ALM HIGH	ALM, High Exh gas temp TC A outlet	TE517	0	1	-	> 450.0	-	0/1	-
45180		PV	TC A speed	SE518	0	75000	rpm	-	10	0 - 7500	-
45181	0	SF	SF, TC A speed	SE518	0	1	-	-	-	0/1	-
45181	2	ALM HIGH	ALM, High TC A speed	SE518	0	1	-	> 35340	-	0/1	-
45182	1	LR HIGH	LR, High TC A speed	SE518	0	1	-	> 35700	-	0/1	-
Modbus/TCP		**Direction: Output**									
Address	**Bit**	**Function**	**Description**	**ISO code**	**Range, min**	**Range, max**	**Unit**	**Set Point data**	**Scale**	**Bus data**	**Remark**
46054		PV	CA press, engine inlet	PT601	0.00	6.00	bar	-	0.01	0 - 600	-

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46055	0	SF	SF, CA press, engine inlet	PT601	0	1	-	-	-	0/1	-
46055	2	ALM HIGH	ALM, High CA press, engine inlet	PT601	0	1	-	> 3.40	-	0/1	-
46056	1	LR HIGH	LR, High CA press, engine inlet	PT601	0	1	-	> 3.70	-	0/1	-
46057		PV	CA temp, engine inlet	TE601	0.0	160.0	C	-	0.1	0 - 1600	-
46058	0	SF	SF, CA temp, engine inlet	TE601	0	1	-	-	-	0/1	-
46058	1	ALM LOW	ALM, Low CA temp, engine inlet	TE601	0	1	-	< 25.0	-	0/1	-
46058	2	ALM HIGH	ALM, High CA temp, engine inlet	TE601	0	1	-	> 70.0	-	0/1	-
46059	1	LR HIGH	LR, High CA temp, engine inlet	TE601	0	1	-	> 75.0	-	0/1	-
46132		PV	Air WG control	CV656	0	1000	-	-	1	0-1000	-
Modbus/TCP		**Direction: Output**									
Address	**Bit**	**Function**	**Description**	**ISO code**	**Range, min**	**Range, max**	**Unit**	**Set Point data**	**Scale**	**Bus data**	**Remark**
47001	1	ALM	ALM, OMD failure	NS700	0	1	-	= 1	-	0/1	-
47001	3	ALM	ALM, OMD alarm	QS700	0	1	-	= 1	-	0/1	-
47001	8	LR	LR, OMD alarm	QS700	0	1	-	= 1	-	0/1	-
47001	13	STATUS	Local control indication	IB724	0	1	-	-	-	0/1	-
47001	15	STATUS	Waiting for reset	IB725	0	1	-	-	-	0/1	-
47002	0	STATUS	Remote control indication	IB726	0	1	-	-	-	0/1	-
47003	4	EMG HIGH	E-EMG, High Emergency Stop status	IS7305	0	1	-	= 1	-	0/1	-
47003	12	SHD	SHD, External shutdown 3 - IPMS	IS7311	0	1	-	= 1	-	0/1	-
47003	13	STB	SBL, Ext Sb1 Clutch engaged	OS7312	0	1	-	= 1	-	0/1	-
47004	0	STATUS	Load reduction request/indication	OS7315	0	1	-	-	-	0/1	-
47005	2	STATUS	Engine blow	OS7343	0	1	-	-	-	0/1	-
47005	3	STATUS	Engine blocked	OS7344	0	1	-	-	-	0/1	-
47005	14	SHD	SHD, Stop / shutdown status 1	IS7602	0	1	-	= 1	-	0/1	-
47006	6	STB HIGH	STB, High Turning gear engaged	GS792	0	1	-	= 1	-	0/1	-
47007	6	ALM HIGH	ALM, High Turning gear engaged	GS792	0	1	-	= 1	-	0/1	-
47007	10	ALM	ALM, PDM system supply earth fault	NS7799_1	0	1	-	= 1	-	0/1	-
47007	12	ALM	ALM, PDM system supply failure	NS7800_1	0	1	-	= 1	-	0/1	-
47007	15	ALM HIGH	ALM, High ESM failure	NS718	0	1	-	= 1	-	0/1	-
47008	0	SHD	SHD, OMD Shutdown status	IS7337	0	1	-	Mapped	-	0/1	-
47008	3	STB	SBL, Engine blocked	OS7344	0	1	-	= 1	-	0/1	-
47008	4	ALM	ALM, System control supply failure	NB7801	0	1	-	Mapped	-	0/1	-
47008	10	ALM	ALM, Stop/shutdown override status	IS7306	0	1	-	= 1	-	0/1	-
47009	10	ALM	ALM, OMD Shutdown status	IS7337	0	1	-	= 1	-	0/1	-
47054		PV	Main bearing 00 temp	TE700	-100.0	756.0	C	-	0.1	-1000 - 7560	-
47055	0	SF	SF, Main bearing 00 temp	TE700	0	1	-	-	-	0/1	-
47055	2	ALM HIGH	ALM, High Main bearing 00 temp	TE700	0	1	-	> 110.0	-	0/1	-
47055	5	SHD HIGH	SHD, High Main bearing 00 temp	TE700	0	1	-	> 120.0	-	0/1	-
47056	1	LR HIGH	LR, High Main bearing 0C temp	TE700	0	1	-	> 115.0	-	0/1	-
47078		PV	Main bearing 01 temp	TE701	-100.0	756.0	C	-	0.1	-1000 - 7560	-
47079	0	SF	SF, Main bearing 01 temp	TE701	0	1	-	-	-	0/1	-
47079	2	ALM HIGH	ALM, High Main bearing 01 temp	TE701	0	1	-	> 110.0	-	0/1	-
47079	5	SHD HIGH	SHD, High Main bearing 01 temp	TE701	0	1	-	> 120.0	-	0/1	-
47080	1	LR HIGH	LR, High Main bearing 01 temp	TE701	0	1	-	> 115.0	-	0/1	-
47099		PV	Main bearing 02 temp	TE702	-100.0	756.0	C	-	0.1	-1000 - 7560	-
47100	0	SF	SF, Main bearing 02 temp	TE702	0	1	-	-	-	0/1	-
47100	2	ALM HIGH	ALM, High Main bearing 02 temp	TE702	0	1	-	> 110.0	-	0/1	-
47100	5	SHD HIGH	SHD, High Main bearing 02 temp	TE702	0	1	-	> 120.0	-	0/1	-
47101	1	LR HIGH	LR, High Main bearing 02 temp	TE702	0	1	-	> 115.0	-	0/1	-

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47120		PV	Main bearing 03 temp	TE703	-100.0	756.0	C	-	0.1	-1000 - 7560	-
47121	0	SF	SF, Main bearing 03 temp	TE703	0	1	-	-	-	0/1	-
47121	2	ALM HIGH	ALM, High Main bearing 03 temp	TE703	0	1	-	> 110.0	-	0/1	-
47121	5	SHD HIGH	SHD, High Main bearing 03 temp	TE703	0	1	-	> 120.0	-	0/1	-
47122	1	LR HIGH	LR, High Main bearing 03 temp	TE703	0	1	-	> 115.0	-	0/1	-
47141		PV	Main bearing 04 temp	TE704	-100.0	756.0	C	-	0.1	-1000 - 7560	-
47142	0	SF	SF, Main bearing 04 temp	TE704	0	1	-	-	-	0/1	-
47142	2	ALM HIGH	ALM, High Main bearing 04 temp	TE704	0	1	-	> 110.0	-	0/1	-
47142	5	SHD HIGH	SHD, High Main bearing 04 temp	TE704	0	1	-	> 120.0	-	0/1	-
47143	1	LR HIGH	LR, High Main bearing 04 temp	TE704	0	1	-	> 115.0	-	0/1	-
47162		PV	Main bearing 05 temp	TE705	-100.0	756.0	C	-	0.1	-1000 - 7560	-
47163	0	SF	SF, Main bearing 05 temp	TE705	0	1	-	-	-	0/1	-
47163	2	ALM HIGH	ALM, High Main bearing 05 temp	TE705	0	1	-	> 110.0	-	0/1	-
47163	5	SHD HIGH	SHD, High Main bearing 05 temp	TE705	0	1	-	> 120.0	-	0/1	-
47164	1	LR HIGH	LR, High Main bearing 05 temp	TE705	0	1	-	> 115.0	-	0/1	-
47183		PV	Main bearing 06 temp	TE706	-100.0	756.0	C	-	0.1	-1000 - 7560	-
47184	0	SF	SF, Main bearing 06 temp	TE706	0	1	-	-	-	0/1	-
47184	2	ALM HIGH	ALM, High Main bearing 06 temp	TE706	0	1	-	> 110.0	-	0/1	-
47184	5	SHD HIGH	SHD, High Main bearing 06 temp	TE706	0	1	-	> 120.0	-	0/1	-
47185	1	LR HIGH	LR, High Main bearing 06 temp	TE706	0	1	-	> 115.0	-	0/1	-
47204		PV	Main bearing 07 temp	TE707	-1000	7560	C	-	1	-1000 - 7560	-
47205	0	SF	SF, Main bearing 07 temp	TE707	0	1	-	-	-	0/1	-
47205	2	ALM HIGH	ALM, High Main bearing 07 temp	TE707	0	1	-	> 1100	-	0/1	-
47205	5	LR HIGH	LR, High Main bearing 07 temp	TE707	0	1	-	> 1150	-	0/1	-
47206	1	LR HIGH	LR, High Main bearing 07 temp	TE707	0	1	-	> 1150	-	0/1	-
47225		PV	Main bearing 08 temp	TE708	-100.0	756.0	C	-	0.1	-1000 - 7560	-
47226	0	SF	SF, Main bearing 08 temp	TE708	0	1	-	-	-	0/1	-
47226	2	ALM HIGH	ALM, High Main bearing 08 temp	TE708	0	1	-	> 110.0	-	0/1	-
47226	5	SHD HIGH	SHD, High Main bearing 08 temp	TE708	0	1	-	> 120.0	-	0/1	-
47227	1	LR HIGH	LR, High Main bearing 08 temp	TE708	0	1	-	> 115.0	-	0/1	-
47246		PV	Main bearing 09 temp	TE709	-100.0	756.0	C	-	0.1	-1000 - 7560	-
47247	0	SF	SF, Main bearing 09 temp	TE709	0	1	-	-	-	0/1	-
47247	2	ALM HIGH	ALM, High Main bearing 09 temp	TE709	0	1	-	> 110.0	-	0/1	-
47247	5	LR HIGH	LR, High Main bearing 09 temp	TE709	0	1	-	> 115.0	-	0/1	-
47248	1	LR HIGH	LR, High Main bearing 09 temp	TE709	0	1	-	> 115.0	-	0/1	-
47402		PV	Max available power	IT797	0	1000	ppt	-	1	0 - 1000	-
Modbus/TCP		**Direction: Output**									
Address	**Bit**	**Function**	**Description**	**ISO code**	**Range, min**	**Range, max**	**Unit**	**Set Point data**	**Scale**	**Bus data**	**Remark**
48001	1	ALM	ALM, CAN failure MCM 1	NS8102_1	0	1	-	≠0	-	0/1	-
48002	15	ALM	ALM, CAN failure IOM A1	NS8104_1	0	1	-	≠0	-	0/1	-
48003	2	ALM	ALM, CAN failure IOM A2	NS8104_2	0	1	-	≠0	-	0/1	-
48003	13	STATUS	Engine status, start mode	IS871	0	1	-	-	-	0/1	-
48003	14	STATUS	Engine ready for start	IS872	0	1	-	-	-	0/1	-
48003	15	STATUS	Start failure indication	IS875	0	1	-	-	-	0/1	-
48004	0	STATUS	Engine status, stop mode	IS878	0	1	-	-	-	0/1	-
48004	1	STATUS	Engine status, shutdown mode	IS879	0	1	-	-	-	0/1	-
48004	5	STATUS	Engine status, run mode	IS883	0	1	-	-	-	0/1	-
48004	11	STATUS	Engine status, emergency stop mode	IS889	0	1	-	-	-	0/1	-
48006	6	ALM	ALM, CAN failure IOM DE	NS8104_9	0	1	-	≠0	-	0/1	-
48006	8	ALM	ALM, CAN failure IOM FE	NS8104_10	0	1	-	≠0	-	0/1	-
48007	2	ALM	ALM, WIP failure	NS869	0	1	-	= 1	-	0/1	-
48105		PV	Modbus counter	KY870	1	1000	-	-	1	0 - 1000	-

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Alarm List for VC - 11162 - 64

Sl. No.	Description	Output	Alarm	Sensor Range	Set Point	Delay	Maxi. Load	Power Supply
Voith - Port								
1	Control Oil Pressure	4 - 20 mA	Low / High	0 - 100 bar	20 / 36 bar	5s	400 Ohm	24v DC
2	Control Oil Pressure	NC - Contact	Low		20 bar	5s	0.4A	24V DC
3	Control Oil Pressure	NC - Contact	High		36 bar	5s	0.4A	24V DC
4	Lub Oil Pressure	4 - 20 mA	Low / High	0 - 16 Bar	0.5 bar	5s	400 Ohm	24V DC
5	Lub Oil Pressure	NC - Contact	Low		0.5 bar	5s	0.4A	24V DC
6	Lub Oil Pressure	NC - Contact	High		5 bar	5s	0.4A	24V DC
7	Rotor Oil Pressure	4 - 20 mA	Low / High	0 - 16 Bar	0.5 bar	5s	400 Ohm	24V DC
8	Rotor Oil	NC - Contact	Low		0.5 bar	5s	0.4A	24V DC
9	Rotor Oil Pressure	NC - Contact	High		5 bar	5s	0.4A	24V DC
10	100% Pollution (Side 1)	NC - Contact			5 bar	30s	0.4A	24V DC
11	100% Pollution (Side 2)	NC - Contact			5 bar	30s	0.4A	24V DC
12	Oil Level in Prop. Housing	NO - / NC - Contact	Low		Low Level	30s	0.4A	
13	Oil Level in elevated Oil Tank	NO - / NC - Contact	Low		Low Level	30s	0.4A	
14	Pressure Alarm Suppression	Switch		0 - 300 Hz	n<40% n_nom		0.4A	
15	Oil Temp.	Pt100	High	0 - 100 °C	75°C		<2 mA (<5 V DC)	
16	Bearing Temp. - 1	Pt100	High	0 - 100 °C	85°C		<2 mA (<5 V DC)	
17	Bearing Temp. - 2	Pt100	High	0 - 100 °C	85°C		<2 mA (<5 V DC)	
18	Bearing Temp. - 3	Pt100	High	0 - 100 °C	85°C		<2 mA (<5 V DC)	

Sl. No.	Description	Output	Alarm	Sensor Range	Set Point	Delay	Maxi. Load	Power Supply
19	Bearing Temp. - 4	Pt100	High	0 - 100 °C	85°C		<2 mA (<5 V DC)	
20	Bearing Temp. - 5	Pt100	High	0 - 100 °C	85°C		<2 mA (<5 V DC)	
21	Zero Position Longitudinal Pitch	NO - / NC - Contact			Zero Position		0.4A	
22	Zero Position Transversal Pitch	NO - / NC - Contact			Zero Position		0.4A	
Voith - STBD								
23	Control Oil Pressure	4 - 20 mA	Low / High	0 - 100 bar	20 / 36 bar	5s	400 Ohm	24v DC
24	Control Oil Pressure	NC - Contact	Low		20 bar	5s	0.4A	24V DC
25	Control Oil Pressure	NC - Contact	High		36 bar	5s	0.4A	24V DC
26	Lub Oil Pressure	4 - 20 mA	Low / High	0 - 16 Bar	0.5 bar	5s	400 Ohm	24V DC
27	Lub Oil Pressure	NC - Contact	Low		0.5 bar	5s	0.4A	24V DC
28	Lub Oil Pressure	NC - Contact	High		5 bar	5s	0.4A	24V DC
29	Rotor Oil Pressure	4 - 20 mA	Low / High	0 - 16 Bar	0.5 bar	5s	400 Ohm	24V DC
30	Rotor Oil	NC - Contact	Low		0.5 bar	5s	0.4A	24V DC
31	Rotor Oil Pressure	NC - Contact	High		5 bar	5s	0.4A	24V DC
32	100% Pollution (Side 1)	NC - Contact			5 bar	30s	0.4A	24V DC
33	100% Pollution (Side 2)	NC - Contact			5 bar	30s	0.4A	24V DC
34	Oil Level in Prop. Housing	NO - / NC - Contact	Low		Low Level	30s	0.4A	
35	Oil Level in elevated Oil Tank	NO - / NC - Contact	Low		Low Level	30s	0.4A	
36	Pressure Alarm Suppression	Switch		0 - 300 Hz	n<40% n_nom		0.4A	

Sl. No.	Description	Output	Alarm	Sensor Range	Set Point	Delay	Maxi. Load	Power Supply
37	Oil Temp.	Pt100	High	0 - 100 °C	75°C		<2 mA (<5 V DC)	
38	Bearing Temp. - 1	Pt100	High	0 - 100 °C	85°C		<2 mA (<5 V DC)	
39	Bearing Temp. - 2	Pt100	High	0 - 100 °C	85°C		<2 mA (<5 V DC)	
40	Bearing Temp. - 3	Pt100	High	0 - 100 °C	85°C		<2 mA (<5 V DC)	
41	Bearing Temp. - 4	Pt100	High	0 - 100 °C	85°C		<2 mA (<5 V DC)	
42	Bearing Temp. - 5	Pt100	High	0 - 100 °C	85°C		<2 mA (<5 V DC)	
43	Zero Position Longitudinal Pitch	NO - / NC - Contact			Zero Position		0.4A	
44	Zero Position Transversal Pitch	NO - / NC - Contact			Zero Position		0.4A	
DG Set - 1								
45	Low Lub oil Pressure	Closed during Normal Condition	Alarm & Shut Down					
46	High F.W. Temp.		Alarm & Shut Down					
47	High Lub Oil Temp.		Alarm					
48	High Alt. Wdg. Temp.		Alarm					
49	Over Speed		Shut Down					
50	High Pressure Pipe		Alarm					
51	Low Battery Charge		Alarm					
DG Set - 2								
52	Low Lub oil Pressure		Alarm & Shut Down					

Sl. No.	Description	Output	Alarm	Sensor Range	Set Point	Delay	Maxi. Load	Power Supply
53	High F.W. Temp.	Closed during Normal Condition	Alarm & Shut Down					
54	High Lub Oil Temp.		Alarm					
55	High Alt. Wdg. Temp.		Alarm					
56	Over Speed		Shut Down					
57	High Pressure Pipe		Alarm					
58	Low Battery Charge		Alarm					
Miscellaneous								
59	STP Abnormal	NC - Contact						
60	Oily Bidge Water Seperator PPM							
61	Air Compressor - 1							
62	Air Compressor - 2							
63	AL UPS1 Battery Charger							
64	AL UPS1 Earth Fault 24V							
65	AL UPS2 Battery Charger							
66	AL UPS2 Earth Fault 24V							
67	F.O DB Tank		High					
68	F.O DB Tank (P)		High					
69	F.O DB Tank (S)		High					
70	F.O DS Tank (P)		High					
71	F.O DS Tank (P)		Low					
72	F.O DS Tank (S)		High					
73	F.O DS Tank (S)		Low					
74	Waste Oil Tank		High					
75	Lub Oil Tank		High					
76	Fresh Water Expansion Tank		Low					