

Spec item #:	SPECIFICATION	TCMSB Field #: N/A
Start & Service Air Compressor Supply		

Part 1: SCOPE:

- 1.1** The intent of this specification shall be to supply new air cooled equipment to replace the vessel's existing Start Air and Service Air Compressor systems, to ensure that the systems will meet the Vessel Life Extension Program Goals of the vessel reaching a service life out to the year 2035 (18 years) with a minimum of breakdown maintenance required and guaranteed parts and service availability.
- 1.2** This installation work shall be carried out in conjunction with the following: The vessel's annual refit commencing Apr. 28th through June 6th, 2018. The refit will be at a shipyard to be determined in Eastern Canada. Delivery must be no later than 5 month's from receipt of this supply contract.
- 1.3** Bid price is to include shipping to Canadian Coast Guard, CCGS Henry Larsen, Fleet Technical Stores, 280 Southside Rd. St. John's NL, Canada A1C 5X1.

Part 2: REFERENCES:

2.1 Guidance Drawings/Nameplate Data of Existing Equipment

1. Start Air Compressor (2-Off)

- Make: Hamworthy
- Model: 2TF5
- Capacity: 128 m³/Hr.
- Working Pressure: 3000 kPa
- Stages: Two
- Cooling Medium: Fresh Water
- Serial Number: Aft 41688-07, Fwd 41688-08
- Prime Mover: Etatech Horizontal TEFSC 575V/3/60 26 KW @1750rpm
- Serial Number: Aft NG4567-2, Fwd NG45

2. Service Air Compressor (2-Off)

- Make: Hamworthy
- Type/Model: 2SF42
- Capacity: 50 m³/Hr.
- Working Pressure: 690 kPa.
- Stages: Two.
- Cooling: Fresh Water
- Serial Number: Aft 41688-02, Fwd 41688-04
- Motor: Etatech TEFC 575v/3/60 11 KW @1745rpm
- Serial Number: Aft NG4558-1, Fwd NG4568-2

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2.2 Standards

2.2.1 Supplied Equipment to be manufactured to latest manufacturing standards.

2.2.2 Compressor Motors to be IP55 (TEFC) protection.

2.3 Regulations

2.3.1 Compressors, motors and controls are required to have been designed and manufactured in accordance with rules or codes of an approved Classification society. Pricing for compressor sets are to include copies of approved classification society documentation.

2.3.2 Transport Canada TP127
Lloyds Rules

2.4 Owner Furnished Equipment

2.4.1 The contractor shall supply all materials, equipment, and parts required to meet the specification scope of supply unless otherwise stated.

Part 3: TECHNICAL DESCRIPTION:

3.1 Starting Air General Mandatory Requirement List

3.1.1 The Contractor shall supply quantity two (2) Air Cooled Compressors(s) rated for a continuous duty operation with a capacity of at least 128 m³/Hr with a working pressure of not less than 3000 kpa.

3.1.2 Compressor must operate on 575VAC, 3 phase, 60hz. Compressor to be driven directly from motor and must be mounted on common base with resilient mounts.

3.1.3 Control power shall be 115/230 VAC.

3.1.4 Noise level generated by the operation of this equipment individually is not to exceed 87 dB (A) @ 3 feet.

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- 3.1.5** Control panel/cabinet must be provided with alarm output to a remote operating system. Signal required 4-20 milliamps when any of compressor safety modes are active.
- 3.1.6** Control panel/cabinet shall include the following failure mode protection and system monitoring:
- Low oil level shutdown.
 - High air temperature shutdown.
 - Outlet Pressure of Compressor.
- 3.1.7** The compressors supplied shall fit in the noted footprint. Longitudinal Dimension: 3500mm, Transverse Dimensions: 1280mm. Total height available is 2 meters high. Note: The control panel doesn't have to fit in this footprint and can be supplied loose. However, it shall be capable of being connected to the common compressor base as a complete unit or capable of being bulkhead mounted.
- 3.1.8** The compressors shall be provided with oil/water separators with automatic drainage for each stage of compression.
- 3.1.9** Provision shall be provided to allow for vibration and expansion at high pressure discharge and drainage connections of each compressor.
- 3.1.10** The compressors shall be provided with non-return valve to be mounted on or near compressor high pressure discharge.
- 3.1.11** The compressors shall be provided with pressure relief safeties for each stage of compression.
- 3.1.12** The compressors/control shall be provided with air pressure sensor for automatic start-up and shutdown.
- 3.1.13** The compressors supplied are to have "soft start" capability to prevent high inrush current on start-up and automatic unloading.
- 3.1.14** The compressors supplied shall have provision for automatic demisting and condensate drainage.
- 3.1.15** Assemblies and sub-components-i.e. valves, motors, gauges, hoses etc must be Classification Society approved for marine service.

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3.1.16 Compressor supplier shall be able to provide authorized technical service support within 24 hrs, 7 days a week. Contractor to supply contact information of authorised service support.

3.1.17 One (1) set of manufacturer's special tools must be provided per unit.

3.1.18 One (1) set of manufacturer's minor maintenance spares and major overhaul spares must be provided with each compressor c/w priced itemized list of overhaul spare kit parts list and delivery times.

3.1.19 Mandatory Requirements for Service Air Compressors

3.1.20 The Contractor shall supply quantity two (2) Air Cooled Compressors(s) rated for a continuous duty operation with a capacity of at least 50 m³/Hr with a working pressure of not less than 700 kpa.

3.1.21 Compressor must operate on 575VAC, 3 phase, 60hz. Compressor to be driven directly from motor and must be mounted on common base with resilient mounts.

3.1.22 Control power must be 115/230 VAC.

3.1.23 Noise level generated by the operation of this equipment individually is not to exceed 87 dB (A) @ 3 feet.

3.1.24 Control panel/cabinet must be provided with alarm output to a remote operating system. Signal required 4-20 milliamps when any of compressor safety modes are active.

3.1.25 Control panel/cabinet shall include the following failure mode protection and system monitoring:

- Low oil level shutdown.
- High air temperature shutdown.
- Outlet Pressure of Compressor.

3.1.26 The compressors supplied shall fit in the footprint noted. Longitudinal Dimension: 3470 mm, Transverse Dimensions: 1200mm. Total height available is 2 meters high. Note: The control panel doesn't have to fit in this footprint and can be supplied loose. However, it shall be capable of being connected to the

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- common compressor base as a complete unit or capable of being bulkhead mounted.
- 3.1.27** The compressors shall be provided with oil/water separators with automatic drainage for each stage of compression.
 - 3.1.28** Provision shall be provided to allow for vibration and expansion at high pressure discharge and drainage connections of each compressor.
 - 3.1.29** The compressors shall be provided with non-return valve to be mounted on or near compressor high pressure discharge.
 - 3.1.30** The compressors shall be provided with pressure relief safeties for each stage of compression.
 - 3.1.31** The compressors/control shall be provided with air pressure sensor for automatic start-up and shutdown.
 - 3.1.32** The compressors supplied are to have “soft start” capability to prevent high inrush current on start-up and automatic unloading.
 - 3.1.33** The compressors supplied shall have provision for automatic demisting and condensate drainage.
 - 3.1.34** Assemblies and sub-components-i.e. valves, motors, gauges, hoses etc must be Classification Society approved for marine service.
 - 3.1.35** Compressor supplier shall be able to provide authorized technical service support within 24 hrs, 7 days a week. Contractor to supply contact information of authorised service support.
 - 3.1.36** One (1) set of manufacturer’s special tools must be provided per unit.
 - 3.1.37** One (1) set of manufacturer’s minor maintenance spares and major overhaul spares must be provided with each compressor c/w priced itemized list of overhaul spare kit parts list and delivery times.

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3.2 Location

- 3.2.1. The compressors supplied are to be on compact modular skids that can be disassembled for transit through the vessel to installation location in the Forward Engine Room of the vessel.

3.3 Interferences

- 3.2.1. N/A.

Part 4: PROOF OF PERFORMANCE:

4.1 Inspection

- 4.1.1. Hold Points. N/A

4.2 Testing

- 4.2.1 The Contractor to supply all records of factory testing performed.

4.3 Certification

- 4.3.1 The Contractor shall supply recognized classification society approvals for equipment offered.

Part 5: DELIVERABLES:

5.1 Drawings/Reports

- 5.1.1 Contractor shall supply the following drawings: Dimension drawing, piping diagram, proposed installation drawing c/w detail of connections required and any components valves, flanges etc that will not be part of scope of supply.

5.2 Spares

- 5.2.1 **as noted in Mandatories:** One (1) set of manufacturer's minor maintenance spares and major overhaul spares must be provided with each compressor c/w priced itemized list of overhaul spare kit parts list and delivery times.

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5.2.2 Compressor supplier to have direct access to parts warehouse with the ability to ship spares within 24 hrs.

5.3 Training

5.3.1 N/A at this time. Training will be arranged with successful Contractor in conjunction with installation and commissioning.

5.4 Manuals

5.4.1 Bound Hard Copies of the Operators manual, Maintenance or Shop manual (intended for technicians performing overhaul), and parts manual including original manufacturers part numbers, description, quantities and exploded parts views are to be included.

5.4.2 Three original copies of each manual in English and one copy of each manual in French are to be included if available.

5.4.3 One electronic copy of manual set shall supplied in pdf format.

5.5 Optional Purchases

5.5.1 At this time Canadian Coast Guard has a number of vessels undergoing modernization in order to facilitate equipment commonality and reduce duplication of procurement procedure and effort, CCG would like to include the **optional** purchase of 6 more compressor sets complete with controls as described in this specification to be ordered within the next calendar year from issuance of contract.