

PART-II**QRS/SPECIFICATION FOR CONVERSION OF EXISTING CPCB-II COMPLIANT DG SET INTO DUAL FUEL MODE**

DG sets from 25 KVA to 76 KVA

Need to be converted to DUAL FUEL MODE for existing Gen Sets which are not compatible to CPCB-IV(only 30 KVA comes).

Scope and Supply Details :-

Supply, Installation, Testing & Commissioning of Dual Fuel kit.

Sl.no.	Specifications of the item	Trial Directives
1.	Gas train (filter, ZPR, MVDLE)/ -Sequential gas injection system – Parts supplied in Sequential Gas Retro Kit - Gas Controller (ECM), Injector Rail, Changeover Switch, Wiring Harness , Solenoid valve , Gas Filter , MAP sensor , Exhaust Gas Temperature sensor , Knock Sensor ,Engine Coolant Temp Sensor , Lambda Sensor , Rubber hoses sets as a complete Kit .	Necessary EU standards or equivalent standard certificates to be provided by OEM. To be checked physically by BOO
2.	Filter-50 micron	-do-
3.	150 mbar zero pressure regulator / Sequential gas injection system	-do-
4.	Electrically operated slow opening valve or sequential gas injection system	-do-
5.	Pressure regulator Inlet-2 Bar, Outlet-150m bar or Inlet pressure 500 mbar and Outlet pressure- 150 mbar (As per site requirement)/ Sequential gas injection system	-do-
6.	Pressure gauge 0-500 mbar - or Sequential gas injection system	To be checked by BOO
7.	Air gas mixer with MAS /- Sequential gas injection system	Govt of India approved certificate is required. Warranty of the item for life time.
8.	Manual adjustment Screw/- Sequential gas injection system	To be checked by BOO
9.	Control panel with touch screen-	To be checked by BOO
10.	PLC /ECM	To be checked by BOO
11.	HMI/- In Built sequential gas injection system	To be checked by BOO
12.	MCB/Relay/Contractor etc.	To be checked by BOO
13.	Sensors (Gas leakage sensor)	To be checked by BOO
14.	Pressure sensor	Certificate required from OEM.

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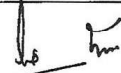
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


	0-1 Bar, 0-4 Bar -	
15.	Vibration sensor 0-2 IPS/Knock sensor-	Certificate required from OEM.
16.	Temperature Sensors	To be checked by BOO
17.	Wire Harness as per Engine	To be checked by BOO
18.	Control	To be checked by BOO
	Dual Fuel system comes with an automatic control panel consisting of PLC (Programmable logic Controller) and HMI (Human Machine Interface) . It controls the complete dual fuel kit with no manual intervention. It is a panel box which is mounted on the DG set itself and requires no extra space. It has proper safeties and all sensors are connected in the panel to ensure smooth transition between diesel and gas fuel.	To be checked by BOO
19.	Power supply	To be checked by BOO
	The system draws its power from the DG set alternator. It does not require any other additional power supply.	To be checked by BOO
20.	Utilities required	To be checked by BOO
	Requires a gas connection outlet at the top of the DG set. PNG connection at 500 MBAR pressure will be provided by the user. A flange outlet of the PNG pipe will be required with the following specifications:- ½ or 1 inches flange outlet.- These outlets will be provided near to the DG set on the TOP of the canopy. In case of canopy DG set and in case of an open DG set , the user will provide at 1- 5 feet height from the ground. Floor preparation for installation & Commissioning Nothing is required except for the PNG pipeline outlet. (As per user requirement)	To be checked by BOO
21.	Installation & Commissioning	To be checked by BOO
	Installation may take a period of 2- 3 days for DG set. Firm will require a downtime of 10-12 hours for 1 DG set during which the DG set won't be allowed to operate. The commissioning would happen after the complete installation. During commissioning firm would run DG set on diesel mode for 1 hour on load. After that firm would optimize the parameters in their software and start the gas for the DG set to run on dual fuel mode. The total commissioning procedure takes 2-3 hours per DG set. Firm requires availability of diesel and load at the time of commissioning.	Necessary certificate of testing will have to be provided by the supplier/seller before installation. To be checked by BOO


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22.	Space requirement for test equipments. No additional space required.	To be checked by BOO
23.	Civil requirement for test equipments	To be checked by BOO
	No civil requirement. Some welding may be required to be done on site for which we would require a welder to be brought from outside for the stand preparation for the gas train incase the DG's do not have the canopy.	To be checked by BOO
24.	Critical spare parts	To be checked by BOO
	Pressure regulating valve, solenoid valve, zero pressure regulator, pressure sensors, PLC and HMI. Sequential gas injection system – Parts supplied in Sequential Gas Retro Kit Gas Controller (ECM), Injector [], Changeover Switch, Wiring Harness , Solenoid valve , Gas Filter , MAP sensor , Exhaust Gas Temperature sensor , Knock Sensor ,Engine Coolant Temp Sensor , Lambda Sensor , Rubber hoses sets as a complete Kit .	Necessary EU standards or equivalent standard certificates to be provided by OEM.
25.	Safety features	To be checked by BOO
	System has inbuilt safeties for engine parameters. It maps the manifold pressure, the gas supply pressure, manifold temperature, exhaust gas temperature , engine vibrations. Incase any parameter goes beyond the specified limits then the system automatically stops the gas flow and the DG set shifts to 100 % diesel and there is no breakdown on the gen set. The panel with IP-56 also has additional safety fuses to ensure that the sensors remain protected.	To be checked by BOO
26.	For retro-fitment emission control device, there is only 1 specification is as under :-	To be checked by BOO
	Further the dual fuel system is mandatory in all areas wherever gas pipeline infrastructure is available. While RECD is to be used only in places where there is no gas pipeline infrastructure or in remote areas. Majority all the metro cities fall under the pipeline infrastructure and hence dual fuel system should be fitted on the same whereas remote area DG sets where there is no pipeline laid by the city gas distribution company and incase they refuse to provide the gas, then only the RECD should be fitted.	To be checked by BOO
27.	After sales/service – After sales service will be provided by the supplier firm for at least 24 months (i.e. warranty period)	To be checked by BOO

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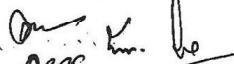
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28.	User manual:- Firm will provide user manual/technical manual with details for proper care of retro fitment/RECD.	To be checked by BOO
29.	AMC Firm has to provide AMC of dual-fuel mode/RECD kit for at least 4000 hrs or 06 years after installation of RECD whichever is earlier.	To be checked by BOO
30.	Testing :- Following testing agencies are currently approved by the Nodal Agency Central Pollution Control Board (CPCB) for purpose of type approval and subsequently conformity of production verification compliance process and may be revised from time to time. a) Automotive Research Association of India (ARAI, Pune) b) International Centre for Automotive Testing (ICAT, Manesar) c) Indian Institute of Petroleum (IIP, Dehradun) d) Vehicle Research Development Establishment (VRDE, Ahmednagar) e) Any testing & certification agency having accreditation from NABL for the parameters referred in "System and procedure for Emission Compliance Testing of Retro-fit emission control devices (RECD) for Diesel Power Generating Set Engines up to Gross Mechanical Power 800 KW" (S & P) and also comply with other requirements of referred S & P. Such testing & certification agencies will provide details of NABL accreditation as well as self-certification of compliance to the requirements of referred S & P to CPCB. The testing & certification agencies shall be mentioned and published by CPCB on its website.	One OEM or importer shall submit application for Type approval to any one of the certification agencies for its families/models out of those approved by Central Pollution Control Board (CPCB)
31.	RECD shall accompanied by the following information : a) Manufacturer's name and /or trademark. b) the make and identifying part number of the RECD as recorded in the information document issued in accordance with the model set out. c) The RECD family as defined in clause 4.1.2.2 including year of manufacture, for which the RECD is approved, including , where applicable, a marking to identify if the RECD is suitable for fitting to an engine & family that is equipped with an on-board diagnostic	To be checked physically by BOO


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	(OBD) system.	
	d) The instruction manual for the retrofit installation.	
	e) The end user service manual including maintenance instructions.	

Note :- Sl.No.26, 30 & 31 point specification is applicable only when Retro Emission Control Device (RECD) is fitted in existing DG set above 30 KVA capacity. Upto 30 KVA capacity RECD is not required as only conversion to Dual Fuel Mode is applicable.

PART-III

Gas agency and distributors work for installation, commissioning and supply of PNG/CNG/LPG gas connection for DG sets.

- 1) Providing connection from nearest distribution point (PNG/CNG)
- 2) Civil work like laying of pipe line.
- 3) Installation of Gas meter
- 4) Security deposit will be made by the buyer/user with gas agency which is refundable.

End of part- III

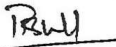

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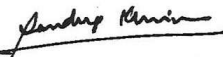

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Director General, BSF