

Reasoned Document for Final Draft STR of Air Compressor for Electric locomotives the comments are received from M/s AIMPL, M/s FTRTIL & RLY/LGD.

CL no.	Description in Specification	Comments from Manufacturers & Railways		RDSO Comments
		Firms	Comments	
1.0	General:			
1.1	Indian Railways are procuring Air compressor of different capacity for Electric Locomotives as per RDSO's/CLW's Specifications, called "Specification" hereinafter. The Schedule of Technical Requirements mentioned here under is issued to serve as a guide to the manufacturers (called "the vender" hereinafter), and should be read in conjunction with the above said specification. The vender should satisfy themselves about having complied the requirements of the Specification and the Schedule of Technical Requirements. The Technical Requirements are meant to serve as guideline only and are not exhaustive.	M/s ELGI	"We are not want any deviation in STR"	Language of Para has been simplified.
		M/s KBIL	No comments received	
		M/s FTRTIL	No comments received	
		M/s AIML	Accepted	
		M/s SDC	No comments received	
		RLY/LGD	No comments received	
1.2	The Vendor should have currently valid ISO-9001:2000 certification including the subject item under its range of manufacture.	M/s ELGI	"We are not want any deviation in STR"	Para deleted as not pertaining to any T & P, M&P, testing facility or any other facility.
		M/s KBIL	No comments received	
		M/s FTRTIL	No comments received	
		M/s AIML	ISO 9001:2000 certification is now Upgraded to ISO-9001:2015	
		M/s SDC	No comments received	
		RLY/LGD	No comments received	
1.3	All the machines and measuring instrument/gauges should be properly calibrated when due. Calibration records for verification should be readily available.	M/s ELGI	"We are not want any deviation in STR"	Para deleted as already covered in para 2.3
		M/s KBIL	No comments received	
		M/s FTRTIL	No comments received	
		M/s AIML	Accepted	

		M/s SDC	No comments received	
		RLY/LGD	No comments received	
1.4	Vendor should have technically qualified personnel in the field of design, manufacturing & testing of air compressors.	M/s ELGI	"We are not want any deviation in STR"	Para deleted as not pertaining to any T & P, M&P, testing facility or any other facility.
		M/s KBIL	No comments received	
		M/s FTRTIL	No comments received	
		M/s AIML	Accepted	
		M/s SDC	No comments received	
		RLY/LGD	No comments received	
1.5	The Vendor should have highly skilled qualified / experienced artisan for precision grinding, machining, welding, etc.	M/s ELGI	"We are not want any deviation in STR"	Para deleted as not pertaining to any T & P, M&P, testing facility or any other facility.
		M/s KBIL	No comments received	
		M/s FTRTIL	No comments received	
		M/s AIML	Accepted	
		M/s SDC	No comments received	
		RLY/LGD	No comments received	
1.6	The vendor should preferably have its own Metallurgical & Chemical testing laboratory, otherwise services of a Government approved Test Laboratory can be availed.	M/s ELGI	"We are not want any deviation in STR"	Para deleted as not relevant.
		M/s KBIL	No comments received	
		M/s FTRTIL	No comments received	
		M/s AIML	Accepted	
		M/s SDC	No comments received	
		RLY/LGD	No comments received	
1.7	The Vendor should have their Quality Assurance Plan containing the following as a minimum :- a) Organizational chart clearly bringing out the quality control set up. b) Qualification log sheets of the personnel maintaining the	M/s ELGI	"We are not want any deviation in STR"	Para deleted as this aspect in QAP guidelines.

<p>quality control set up.</p> <p>c) Process flow chart indicating the process of manufacture of compressors.</p> <p>d) Details of sub-vendors :-</p> <ul style="list-style-type: none"> • Name of the item for which sub-vendor is approved. • The name of the approving agency. • Inspection criteria of the sub-vendor. • Whether the sub-vendor has ISO: 9001-2000 Certification. • The primary vendor approves QAP of the sub vendor. • sub-vendor should have submitted the quality manual to the primary vendor. 	M/s KBIL	No comments received	
	M/s FTRTIL	No comments received	
	M/s AIML	Accepted	
	M/s SDC	No comments received	
	RLY/LGD	No comments received	

	<ul style="list-style-type: none"> • Sub-vendor has all the requisite infrastructure of manufacturing and testing facilities, preferably under one roof. • Periodical inspection schedule for sub-vendor is being followed strictly by the primary vendor. <p>e) The vendor should have full-proof system of monitoring the customer complaints including warranty obligations with facility of traceability by the product identification no., locomotive number etc.</p>			
1.8	<p>Quality Assurance System Plan (Inspection & Testing for brought out material)</p> <ul style="list-style-type: none"> • Incoming material • Process control 	M/s ELGI	“We are not want any deviation in STR”	Para deleted as this aspect in QAP guidelines.
M/s KBIL	No comments received	M/s FTRTIL	No comments received	
M/s AIML	Accepted	M/s SDC	No comments received	

	<ul style="list-style-type: none"> • System control • Gauging scheme-in the format of each operation gauges should be maintained.. 	RLY/LGD	No comments received	
2.0	Minimum Facilities :			
2.1	M & P list of M&P required shall be as per Annexure-I. The list does not specify the capacity and quantity of various M&P which may vary according to the manufacturing capacity of the individual vender. -	M/s ELGI	"We are not want any deviation in STR"	No change in Para
		M/s KBIL	No comments received	
		M/s FTRTIL	No comments received	
		M/s AIML	Accepted	
		M/s SDC	No comments received	
		RLY/LGD	No comments	
2.2	Measuring/Checking Instruments/Gauges: List of facilities for measuring equipments and gauges required in vender's premises shall be as per Annexure-II. The accuracy and capacity of the measuring equipment shall be adequate to meet the requirements.	M/s ELGI	"We are not want any deviation in STR"	Heading Deleted
		M/s KBIL	No comments received	
		M/s FTRTIL	No comments received	
		M/s AIML	Accepted	
		M/s SDC	No comments received	
		RLY/LGD	No comments received	
2.3	The measuring equipments/gauges shall be duly calibrated and the validity of calibration should be verified by checking the calibration certificate issued by the	M/s ELGI	"We are not want any deviation in STR"	No change in Para
		M/s KBIL	No comments received	
		M/s FTRTIL	No comments received	
		M/s AIML	Accepted	

	Government Approved Calibration Agency from whom it was calibrated.	M/s SDC	No comments received											
		RLY/LGD	No comments received											
2.4	Testing and other Facilities are mentioned in Annexure-III			New para 2.4 added.										
ANNEXURE-I	Manufacturing Facilities: Following minimum Machinery and Plants are required.	M/s ELGI	“We are not want any deviation in STR”	S.I.no. 3 – Boring Machine in place of Vertical/Horizontal Boring Machine.										
	<table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Details Of Machine</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Lathe Machine</td> </tr> <tr> <td>2.</td> <td>Milling Machine</td> </tr> <tr> <td>3.</td> <td>Vertical/Horizontal Boring Machine</td> </tr> <tr> <td>4.</td> <td>Lapping Machine</td> </tr> </tbody> </table>	Sl. No.	Details Of Machine	1.	Lathe Machine	2.	Milling Machine	3.	Vertical/Horizontal Boring Machine	4.	Lapping Machine			S.no. 4,5,7,10,11,12& 13 has been deleted.
	Sl. No.	Details Of Machine												
	1.	Lathe Machine												
	2.	Milling Machine												
3.	Vertical/Horizontal Boring Machine													
4.	Lapping Machine													
		M/s KBIL	No comments received											
		M/s FTRTIL	No comments received											
		M/s AIML	Accepted	Sl.no. 9 – Grinding Machines in place of										
		M/s SDC	No comments received											

	5.	Horizontal Planer	RLY/LGD	To be modified as in 2.4 : Facility of hot phosphate , zinc plating , anodizing and sand blasting plants to carry out the desired surface treatment process with accuracy should be available with vendor or sub-vendor	Bench grinding machines. <i>The surface treatment facility is already mentioned in other facility.</i> Hence, LGD comments <i>not required</i> to be added in STR All the changes are in Red color.		
	6.	Vertical drilling Machine					
	7.	Pillar drilling machine					
	8.	Tapping tools					
	9.	Bench Grinding Machine					
	10.	Hand Grinder					
	11.	Angle grinder					
	12.	Tool Grinder					
	13.	Power Heck Saw					
	14.	Surface Table					
	15.	Cranes					
	16.	Welding Machine					
	17.	Weighing machine					
	18.	Honing machine					
ANNEXURE – II	A. Measuring Equipment/Gauges		M/s ELGI	“We are not want any deviation in STR”	Corrected some spelling mistakes. LGD comments are not relevant		
	Sl. No.	Details Of Equipments/Gauges.					
	1.	Barometer.					
	2.	Outside Caliper.					
	3.	Inside Caliper.					
	4.	Vernier Caliper.					
	5.	Dial Bore Gauge.					
	6.	Dial Campus.					
	7.	Dial Indicator.				M/s KBIL	No comments received
	8.	Combination Set.				M/s FTRTIL	No comments received
9.	Bevel Protector.	M/s AIML	Accepted				
10.	Spring Tester.						

	11.	Thermometer.	M/s SDC	No comments received	
	12.	Manometer/ Air Flow Meter.	RLY/LGD	To be added	
	13.	Psychrometer.		During individual performance testing of various valves , parameters like “Pressure “ and “Timings of individual valves (D2 Relay Valves , EP Relay Vlave, Distributer Valve etc) Should be given clearly by the OEM in the testing proforma and same may be shared to sheds/RDSO	
	14.	Presser Gauges.			
	15.	Standard Nozzles.			
	16.	Ammeter.			
	17.	Volt Meter.			
	18.	Watt Meter.			
	19.	Frequency Meter.			
	20.	Tongue Tester.			
	21.	Techo Meter.			
	22.	Torque Wrench.			
	23.	Reservoir.			
	24.	Stop Watch.			
	25.	Gauge Block.			
	26.	Hour Meter.			
	27.	Filler Gauges.			
	28.	Radius gauge			
	29.	Depth gauge			
	30.	Ring gauge			
	31.	Groove caliper			
	32.	Slip gauge			
	33.	Hardness tester			

ANNE XURE – III	B. Testing Facilities : 1. Facilities for lifting. 2. Suitable equipments and facilities for welding. 3. Accurate surface table. 4. Facilities for balancing and alignment checking of crank shaft and connecting rod. 5. Facilities for checking the surface and internal defect on piston pins, crank pin pump sheet and pistons etc. such as magnaflux crack detector, ultrasonic testing, die penetration testing etc. 6. Facilities for hydraulic testing of intercoolers, manifolds, cylinders, and cylinder heads etc. 7. Test rigs and fixtures for testing of piston rings for flatness, square ness, tension, light leakage and axial distribution tests. 8. Thermometer, thermocouples and pyrometers for measurement of	M/s ELGI	“We are not want any deviation in STR”	Sl.no. 1,2,3,8,10,11,,12,13, 16,17 & 18 are deleted. S.Ino 11,12,13,16,17 & 18 are shifted in “Other facilities”
		M/s KBIL	No comments received	
		M/s FTRTIL	No comments received	
		M/s AIML	Accepted	
		M/s SDC	No comments received	
		RLY/LGD	To be added During individual performance testing of various valves , parameters like “Pressure “ and “Timings of individual valves (D2 Relay Valves , EP Relay Vlave, Distributer Valve etc) Should be given clearly by the OEM in the testing proforma and same may be shared to sheds/RDSO :Test Benches: To be added The testing Facility shall be able to create various faults which are possible for logging in the brake system (DDS) in addition to the faults which will be logged in the DDS of VCU. This will enable sheds to test the software integrity of the stand alone brake system	

	<p>temperature.</p> <p>9. Pressure gauges and manometers for measurement of pressure/vacuum. and pressure drop.</p> <p>10. Recording type voltmeter, Hour meter, ampere meter & Techno meter/Speedometer, Stopwatch tongue tester, Electro magnetic counter, etc.</p> <p>11. Surface Treatment Facility</p> <p>12. Painting & cleaning facilities.</p> <p>13. Fabrication facilities.</p> <p>14. Environmental Testing Facility.</p> <p>15. Tilted Condition Testing Facility.</p> <p>16. Proper storage Facility for Incoming Material.</p> <p>17. Proper storage facility for finished products.</p> <p>18. Stand By Power Generator Facility.</p>			
3.1	<p>R&D Facilities :</p> <p>The vender should have R&D facilities to investigate into the various types of</p>	M/s ELGI	"We are not want any deviation in STR"	This para has shifted in para 2.5
		M/s KBIL	No comments received	
		M/s FTRTIL	No comments received	

	failures and evolve necessary remedial measures to avoid failures in future. The vender should have the design details for their compressors which will include their own drawings with permissible tolerances, material specifications, treatment details etc. The vender will also have their own drawing for various assemblies and sub-assemblies.	M/s AIML	Accepted	
		M/s SDC	No comments received	
		RLY/LGD	No comments received	