

خرید پکیج کولرهای هوایی ایستگاه تقویت فشار گاز بینک (قرارداد BK-HD-GCS-CO-0015_02)



شماره پیمان:

.04 - . 14 - 9114

SAT (Performance Test) Procedure								
پروژه	بسته کاری	صادر کننده	تسهيلات	رشته	نوع مدرك	سريال	نسخه	
BK	GCS	AA	120	QC	PR	0007	V00	

شماره صفحه: 1 از 12

طرح نگهداشت و افزایش تولید ۲۷ مخزن

SAT (Performance Test) Procedure

نگهداشت و افزایش تولید میدان نفتی بینک

V00	Nov. 2024	IFA	AAC	M.FAKHARIAN	M.SADEGHIAN	
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Status:

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	SA1 (Performance Test) Procedure								
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SAT (Performance Test) Procedure								
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GCS	AA	120	QC	PR	0007	V00		
	بسته کاری	صادر کننده بسته کاری	تسهیلات صادر کننده بسته کاری	رشته تسهیلات صادر کننده بسته کاری	نوع مدر ک رُشته تسهیلات صادر کننده بسته کاری	سریال نوع مدر ک رشته تسهیلات صادر کننده بسته کاری		

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1. GENERAL

This procedure describes the method for RUN-IN test of air coolers of the 17208 project. The RUN-IN test shall be done at shop as per bellow sequence.

2. STEEL WORK ASSEMBLY

- Columns
- Beams
- Bracings
- Walkway supports
- Plenums and fan rings
- Bundle
- Motor supports

3. MECHANICAL EQUIPMENT ASSEMBLY

- Installation of project fans.
- Installation auxiliary parts (which are supplied by ABAN) for installing motors.
- Installing auxiliary parts for speed reducers.
- Installing of motors.

Make sure that feet of flanges are safely fixed and rest positively on their entire surface.

4. PRE-STAR UP CHECK

- 4.1) PULLY, FAN & motor alignment shaft
- -check the alignment of the motor, pulley & fan shaft in accordance with data sheets.
- -check the reading & compare with data sheet, if adjustment to be made within acceptable tolerances.
- 4.2) Blade Check
- -Turn the rotor by hand
- -check the gap between blade tips & "fan ring", is same at all point.
- -Make sure the clearance between blade tips and ring meet data sheet records.
- 4.3) Motor Check
- -The motor shall be run uncoupled for 5 min.
- -Ensure correct voltage supply for motor to be tested.



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- -Check the starting current and record the reading.
- -Ensure motor rotate in the right direction as indicated on the motor before running.
- -Check RPM & record.
- 4.4) Check Instrumentation
- 4.5) Check lubrication by breaking unions at breaking and filling grease line.
- 4.6) Rotate by hand to check fans and motors are running from any OBSTRUCTION, TOOLS, ASSEMBLYAID and debris are removed from the structure.
- 4.7) Ensure all fan guards are in position & security fixed.
- 4.8) Check the belt tension.

5. EQUIPMENT START UP

Avoid resonance of the base with the turning frequency and double mains frequency .Turn the rotor by hand.

Check the direction of rotation .Use suitable tool to mount or pull off and cove with a protection against accidental contact.

- Start-up of motors before connecting and check the motors.
- Check the belt tensions.
- Start-up of fan with design blade angle. (Refer to fan curves).
- Noise level measuring (Fill the datasheets). run motor uncoupled for 1 hr . check and record Amps ,bearing temp ,rpm , housing temp
- -run motor for 4 hr. check and record above

Attachments:

- 1) Fan specification and curves in design case.
- 2) Noise datasheets.
- 3) Vibration switches datasheets.
- 4) Motor datasheets.
- 5) Run test check list
- -The drive unit with all fans should be running simultaneously and kept continuously running for about 2 hours or more.
- -Ensure all personnel other than group are evacuated to a suitable area outside boundary.



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SAI (Performance Test) Procedure								
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- -Start motor No.1 and run approximately 1 minute, if unit does not exhibit excessive noise or Vibration level (indicating that machinery have problem) then motor No.2 can be also be started.
- -Run for approximately 1 minute and if unit does not exhibit high noise or vibration level, commence test (Min. for 2 hours).
- -During the running test, calibration or setting of the following equipment shall be carried out:
- (1) Record amperage of each motor during running test.
- (2) Vibration check of fan running on individual units as per API 661, record.
- (3) Bearing temperature check & recording.
- (4) RPM of fan record.
- -The maximum permission amplitude of vibration at design fan speed & horse power shall be 0.15 millimetre peak to peak as measured on primary structural members & machinery mounts for either shop or filed test

Fan assemblies shall be balanced by one of the following mean: -

- (1) Static or dynamic balancing as an assembly.
- (2) Static or dynamic balancing of the hub & moment balancing of the blades.
- (3) Hubs & automatically controlled pitch fans shall be dynamically balanced.

6. STRUCTURAL CHECK

After running test was completed, bolting on random joint should be checked to ensure that the bolts are still tight.

7. SHOP ASSEMBLY AND RUN TEST

- 7.1 When a run test is to be made, this test shall be hold by the inspector.
- a) Check operational performance of each component which can be connected.
 Sometimes instrument air is not available to permit complete checking of all components.
- b) Check fan blade pitch. Witness demonstration of changing pitch to the extremes in setting specified in purchase order or data sheets.



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- c) Check direction of fan pitch change and position of louvers with loss of control air Pressure for conformance to specifications.
 - d) Check vibration cut out switch operation.
- e) Check for objectionable vibration of structural components, especially excessive Amplitudes of vibration resulting from resonance.
- f) Hold noise level test, if specifications require a noise level test to be performed in the shop. (Normally hold by Purchaser).

Following steps shall include in run in test:

- a. Check and record the fan tip clearance.
- b. Set the fan pitch for the required operating angle.
- c. Check and record the fan shaft run-out tolerance.
- d. Run the motor and fan at design capacity for at least 5 min, checking and recording the voltage, amperage, and vibration levels.
 - e. Perform air flow test.
 - f. Perform noise test.
- 7.2 Noise control measures applied to equipment (such as acoustic enclosures and acoustic insulation) shall not interfere with the operation and running maintenance of the Equipment. They shall, where appropriate be constructed so that they can be dismantled and re-assembled at site without affecting their acoustic properties. They shall not also interfere with emergency fire fighting in the unit.
- 7.3 The following equipment has been individuated as the critical individual items giving fundamental contribution to the noise level of the plant. The here below specified noise limits for these critical individual items are considered to be satisfactory in respect to the noise limits for the complete plant. The noise limits are shown both in dB (A) (global value) and by equivalent ISO NR (Noise Rating) curves.

The above specified noise limit values are to be considered consistent with the following prescriptions.



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SAT (Performance Test) Procedure										
سریال نوع مدرک رشته تسهیلات صادرکننده بسته کاری پروژه										
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7.4 The above specified noise limits of each critical individual items of equipment will be part of the specification of that equipment and the manufactures will be required to supply satisfactory evidence that this equipment meets the noise limits as required in the specification. For this purpose the equipment manufacturers shall submit filled-in equipment noise data sheets, as per attached sample.

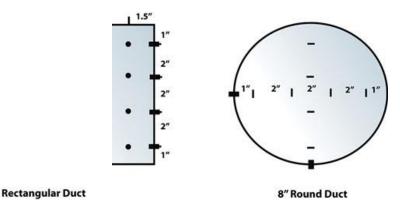
7.5 Fan rotational speed measurement

It can be measured using a tachometer or strobe light. Tachometers can be either mechanical or electronic. With mechanical tachometers, the tachometer shaft is rotated by pressing it against the center of the fan shaft so that both the tachometer shaft and fan shaft have the same speed. Mechanical tachometers should be used carefully so that no personnel or equipment damage occurs if the tachometer shaft slips off the fan shaft. Electronic tachometers (like the one in the figure) send light to a shiny, rotating object, such as a silver sticker attached to a fan blade or shaft, and the reflected light is measured by the tachometer and converted to an rpm measurement.

Tools: tachometer

7.6 air flow measurement

An airflow traverse requires at least 5 lengths of straight exhaust duct. An anemometer, a test instrument that measures air velocity is used to determine the average air speed in the duct. Then the average feet per minute is multiplied by the area of the duct in square feet to determine the airflow moving through the duct.



Example: You have a exhaust fan designed for 200 CFM. The system has an 8-



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بال نوع مدرک رشته تسهیلات صادرکننده بسته کاری پروژه							نسخه		
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in. exhaust duct. The area of an 8-in. duct is .35 sq. ft. You measure the velocity at a point in the duct and find the average velocity in the exhaust duct is 400 FPM. Multiply 400 Feet per Minute times the area of the duct, which is .35 square feet, to find 140 CFM exhaust fan airflow.



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9 .NOISE LEVEL

CLIENT:	
PLANT:	
A	
Description of Auxiliaries Included: Diver Power RW: Driver Speed: Rev/Min:	
Company Comp	
Power Type: Driver Power RW: Driver Speed: Rev/Min:	
B Driver Type:	
Audilaries Included: Yes No No Description of Audilaries: Noise Data Includes Driver: Yes No Noise Data Includes Driver: Yes No Noise Data Data Noise Data Obtained By. Calculation Measurement Workshop Site Noise Data Obtained By. Calculation Measurement Workshop Site Data Data Data Data Data Data Data Da	
10 Description of Auxiliaries: Yes	
11 Noise Data Includes Driver: Yes	
12 Noise Data Obtained By:	
13	
14 Measured in Accordance With: EEMUA 140 Height: Heig	
Typical Sound Level in dB(A) in dB re 20 micro Pascals Equipment Major Dimensions in m. Length: Width: Height OCTAVE BAND ANALYSIS - LINEAR CHARACTERISTIC UNITS LIMITS AND CORRECTIONS SUPPLIERS Sound Pressure Level (SPL) at 1 m	
18 Equipment Major Dimensions in m: Length: Width: Height	
17	
18	
19 Sound Pressure Level (SPL) at 1 m 20 in dB 20 micro Pascals 21 Sound Power Level (PWL) 22 in dB re 1 Pico Watts 23 OCTAVE BAND CENTRE 24 FREQUENCY 25 63 26 125 27 250 28 500 29 1K 30 2K 31 4K 30 2K 31 4K 32 8K 33 A-Weighted 34 Does the equipment emit any audible pure tones? 36 Enclosures may be used to attenuate equipment noise. 37 Ves Model 38 PWL 39 PWL 4 PWL 4 PWL 5 PWL 5 PWL 5 PWL 6 PWL 6 PWL 7 CORRN 7 CORRN 7 CORRN 7 CORRN 8 PWL 7 CORRN 8 PWL 7 CORRN 8 PWL 7 CORRN 8 PWL 8 PWL 9 P	
20 in dB 20 micro Pascals	ATA
Sound Power Level (PWL)	SPL
22 in dB re 1 Pico Watts ACCEPTABLE MPULSIVE TONAL UNSILENCED	
OCTAVE BAND CENTRE	PWL
FREQUENCY	
25	SILENCED
26 125 0 27 250 5 28 500 8 29 1K 11 30 2K 12 31 4K 11 32 8K 8 33 A-Weighted 80 34 Does the equipment emit any audible pure tones? Yes No 35 Is the equipment noise impulsive in character? Yes No 36 Enclosures may be used to attenuate equipment noise. Yes No 37 NOTES: 1. Supplier to provide a dimensional sketch of test arrangement used for base data.	
250	
Solid Soli	
29 1K 11 11 12 130 2K 12 12 12 131 4K 11 1 1 132 8K 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
30 2K 12 12 31 4K 11 11 32 8K 8 8 8 33 A-Weighted 80 8 No Notes 15 Is the equipment emit any audible pure tones? Yes No Sencious may be used to attenuate equipment noise. Yes No No Notes 17 NoTES: 1. Supplier to provide a dimensional sketch of test arrangement used for base data.	
31 4K 11 11 32 8K 8 8 8 33 A-Weighted 80 8 No Notes 1s the equipment emit any audible pure tones? Yes No No Secretary Secretar	
32 8K 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	
33 A-Weighted 80 No Notes 34 Does the equipment emit any audible pure tones? Yes No Notes 35 Is the equipment noise impulsive in character? Yes No No NoTES: 1. Supplier to provide a dimensional sketch of test arrangement used for base data.	
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35 Is the equipment noise impulsive in character? 36 Enclosures may be used to attenuate equipment noise. 37 NOTES: 1. Supplier to provide a dimensional sketch of test arrangement used for base data.	
36 Enclosures may be used to attenuate equipment noise. Yes No 37 NOTES: 1. Supplier to provide a dimensional sketch of test arrangement used for base data.	
NOTES: 1. Supplier to provide a dimensional sketch of test arrangement used for base data.	
29. Correction for pure tones to be added to equipment noise in octave containing pure tone only as EEMUA 140.	
40 3. SPL to apply 1.5m above deck/access platform level and 1m from skid edge	
41 4. Supplier to include missing data.	
42 43	,
44	
45 REMARKS:	\neg



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10 .VIBRATION MEASUREMENT PROCEDURE

Due to minimize the vibration, all structural members such as columns of air .cooler are designed according to UBC-1997

.All consideration are done for minimize the vibration

In Run-in test the vibration measurement shall be done at three points of each columns and machinery mountings such as motor supports.

The maximum amplitude of vibration over the design fan speed range & blade angle shall be 0.15mm from pick to pick. All fans of each type should be checked for balancing/vibration problem during the run in test.

Wind velocity at test conditions shall not exceed 5 m/s.

Structural member shall be designed to minimize vibration. The maximum amplitude of vibration over the design fan-speed range shall be 0.15 mm (0.006 in) from peak to peak, as measured on primary structural members' machinery mountings.

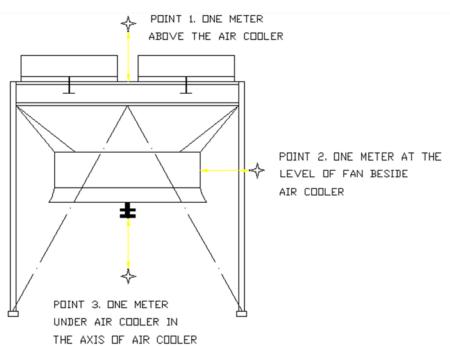


FIGURE 1 : REQUIRED NOISE LEVEL POINTS AROUND AIR COOLERS



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11. RUNNING TEST CHECK LIST

AAC			Qı	uality	Contro	I Syste	em		Code No. : QF-QC-17 Date&Rev.: 0-1386/2/10		
	Running Test REPORT							Report No	D :		
									Date :		
Project No. :											
ABAN AIR COOLER CO.											
ITEM NO. :				Motor:		•					
Procedure No REFRENCE ST		:	Blade):							
				Spee	d (RPM)						
11607	VAL						1				
UNIT		Axial Fan	(RPM)		MOTOR	R(RPM)	Rem	ark			
			,	Vibratio	n Test (m	m)					
UNIT	AVG. VALUE						Rem	ark			
	Noise	Test (Db	A) One l	Vieter Be	side Of A	ir Cooler	•				
UNIT					LUE						
UNIT	POINT1	POINT1 Db POINT2 Db				Db	POINT4	Db			
	North		Under		Left		Right				
				ent (A)			1				
UNIT				LUE			Rem	ark			
			Operation	Current(/	4)						
			Air Flo	w (m / s	s)						
UNIT	AVG. VALUE						Rem	ark			
		Bea	aring Ten	nperetur	e(°C)						
UNIT	VALUE						Rem	ark			
										'	
INSPECTOR		A.A	.C			CLIE	NT			TPI	
SIGNATURE											
DATE			-							_	