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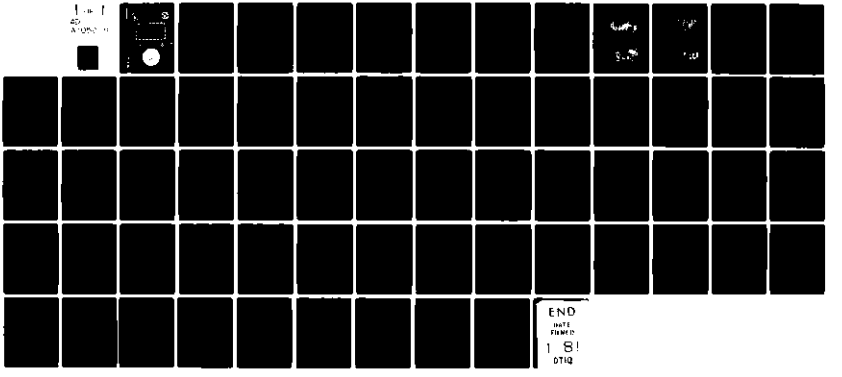

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DEPARTMENT OF THE NAVY
NAVY EXPERIMENTAL DIVING UNIT
Panama City, Florida 32407

(14) NEDU-15-80

NAVY EXPERIMENTAL DIVING UNIT
REPORT NO. 15-80

TEST AND EVALUATION OF BAUER PORTABLE HIGH-PRESSURE BREATHING AIR COMPRESSOR, MODEL VARIUS G-3

(10) R. L. BOWDISH

(11) Nov[redacted]80

(12) 63

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Flow rate
Air Analysis

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

A gasoline engine driven high-pressure breathing air compressor, BAUER Varius G-3, was evaluated by the Navy Experimental Diving Unit to determine its suitability for Navy use. Results of the 50-hour test showed that the portable compressor delivers breathing air at an average charge rate of 2.07 CFM, charging twin 72 cu.ft., twin 50 cu.ft., and single 80 cu.ft. scuba tanks in 71, 44, and 39 minutes respectively. The unit is easily manitained, sturdily constructed, and econmical in gasoline fuel consumption. The BAUER high-pressure breathing air compressor (Varius G-3) is recommended for (CONT)

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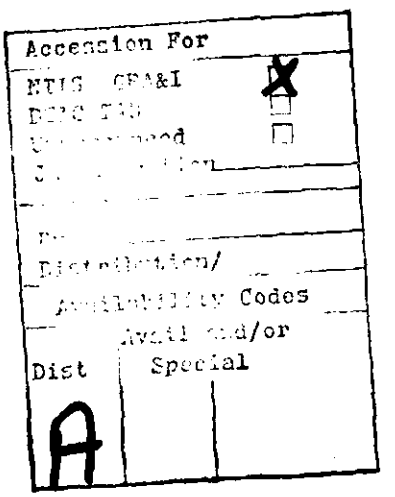
placement on the list of equipment Approved for Navy Use (ANU).



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ABSTRACT

A gasoline engine driven high-pressure breathing air compressor, BAUER Varius G-3, was evaluated by the Navy Experimental Diving Unit to determine its suitability for Navy use. Results of the 50-hour test showed that the portable compressor delivers breathing air at an average charge rate of 2.07 CFM, charging twin 72 cu.ft., twin 50 cu.ft., and single 80 cu.ft. scuba tanks in 71, 44, and 39 minutes respectively. The unit is easily maintained, sturdily constructed, and economical in gasoline fuel consumption. The BAUER high-pressure breathing air compressor (Varius G-3) is recommended for placement on the list of equipment Approved for Navy Use (ANU).

1. INTRODUCTION

1.1 OBJECTIVES

By direction of the Commander, Naval Sea Systems Command (reference 1), the BAUER high-pressure breathing air compressor, model Varius G-3, was tested by the Navy Experimental Diving Unit to determine if the compressor discharges suitable breathing air and has a service life which satisfies the requirements for portable scuba diving compressors throughout the Navy.

1.2 SCOPE

1.2.1 Compressor Operation

Compressor testing simulated the field operation of intermittently filling scuba cylinders to 2250 psig and 3000 psig. A total of 50 hours of compressor operation have been compiled. The testing included subjective operational evaluations but not detailed mechanical considerations of single components of the compressor.

1.2.2 Air Quality Analysis

Testing for analysis of discharged air was conducted as specified in Appendix B.

1.3 BACKGROUND

The Experimental Diving Unit has previously evaluated several portable high-pressure air compressors (references 2 through 5). Mechanical failures in the compressor or prime mover, low capacity, or poor quality of breathing air were cited as reasons for nonacceptance of all but one unit. At the time of this report there are four portable high-pressure air compressors which have been Approved for Navy Use; three are gasoline engine driven and one is diesel driven.

2. DESCRIPTION

2.1 GENERAL DESCRIPTION

The BAUER Varius G-3 high-pressure breathing air compressor (figures 1 and 2) is one of a line of high-pressure air compressors manufactured by BAUER Breathing Air, Incorporated, 1328 Azalea Garden Road, Norfolk, Virginia, 23502.

2.1.1 Air Compressor

The Varius G is a highly portable three stage, three cylinder, high pressure compressor designed to deliver 2.3 actual cubic feet per minute (ACFM) at 3200 psig.

2.1.2 Prime Mover

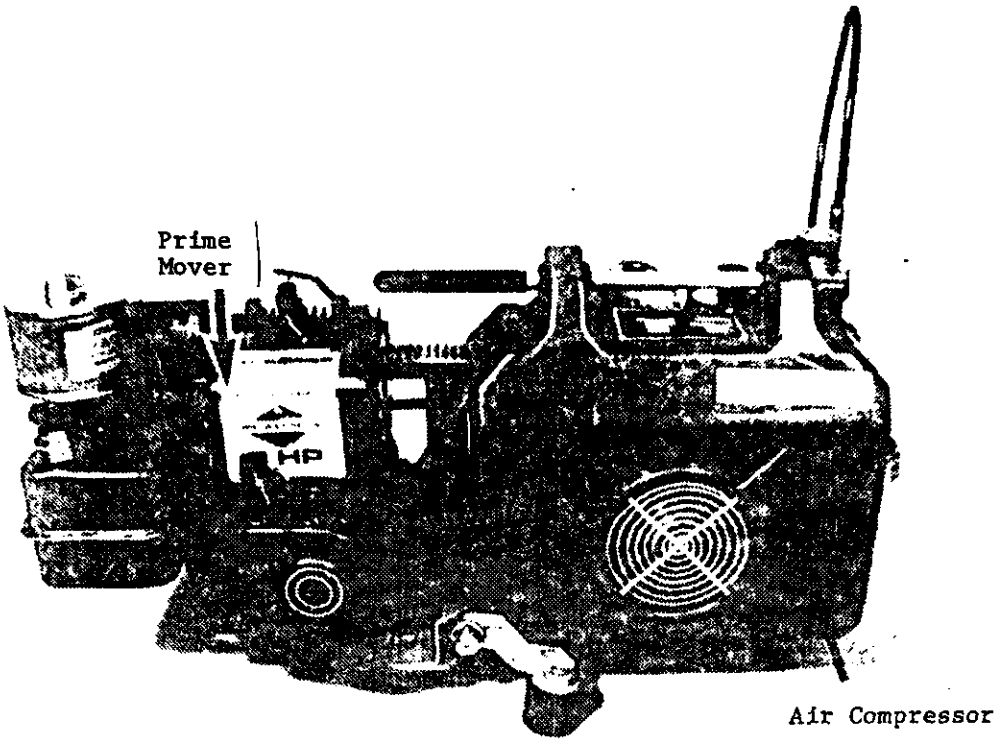
The prime mover for the air compressor tested by NEDU is a four-stroke, single cylinder, L-head, air cooled gasoline engine rated at 3 hp at 3600 rpm. The engine is mounted on the compressor unit with a torsion spring axle, and is coupled to the compressor by a V-belt and detensioning mechanical clutch for ease of engine starting. In addition, an option of three different electric motors (each producing different volume outputs) is available with all prime movers readily interchangeable.

2.1.3 Purification System

The purification block is constructed of machined, anodized aluminum, and consists of three chambers: an oil and water demister; a dehumidifier; and a filter. Replaceable cartridges are used in chambers 2 and 3, with the cartridge service life dependent on ambient temperature and humidity, as indicated in the following table:

COMPRESSOR RUNNING HOURS	OPERATING TEMPERATURE AMBIENT °C	°F	AIR PROCESSED IN C.F.
25	15	60	3500
20	27	80	2750
15	38	100	2100
12	50	120	1700

A back pressure regulator set at 2750 psig is provided to ensure that a constant back pressure is maintained on the final stage of the compressor. The purification block also contains an adjustable relief valve which protects the compressor and the receptacle being filled. It can be set to any pressure from 2800 to 3200 psig.



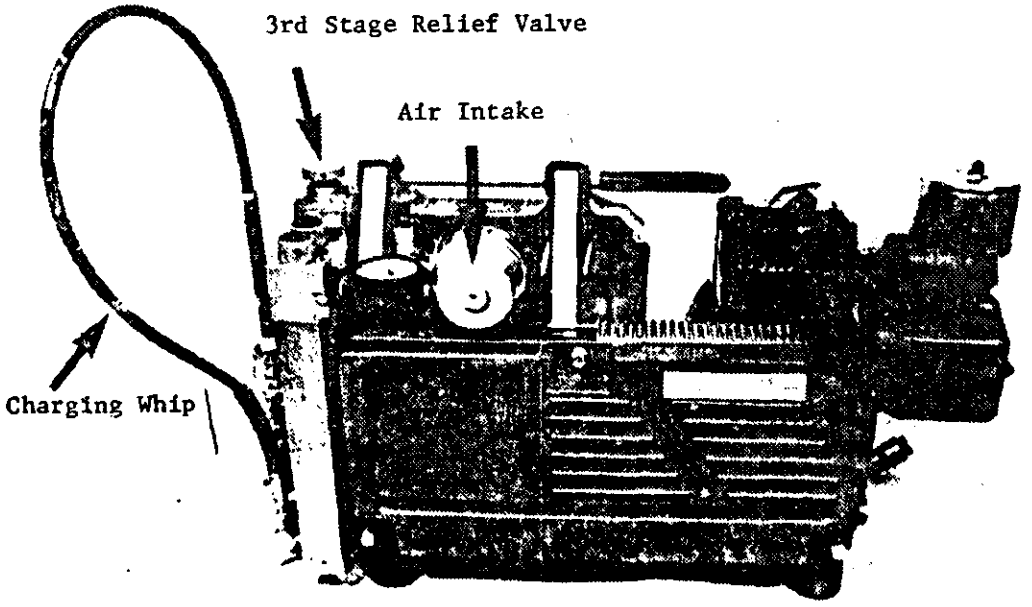
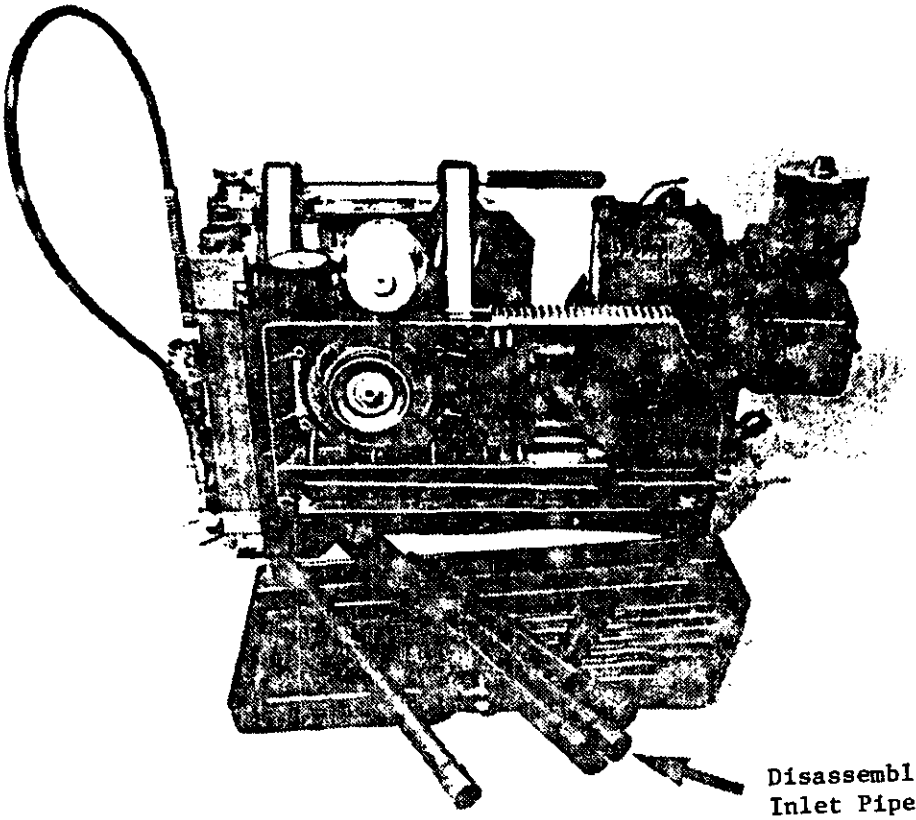
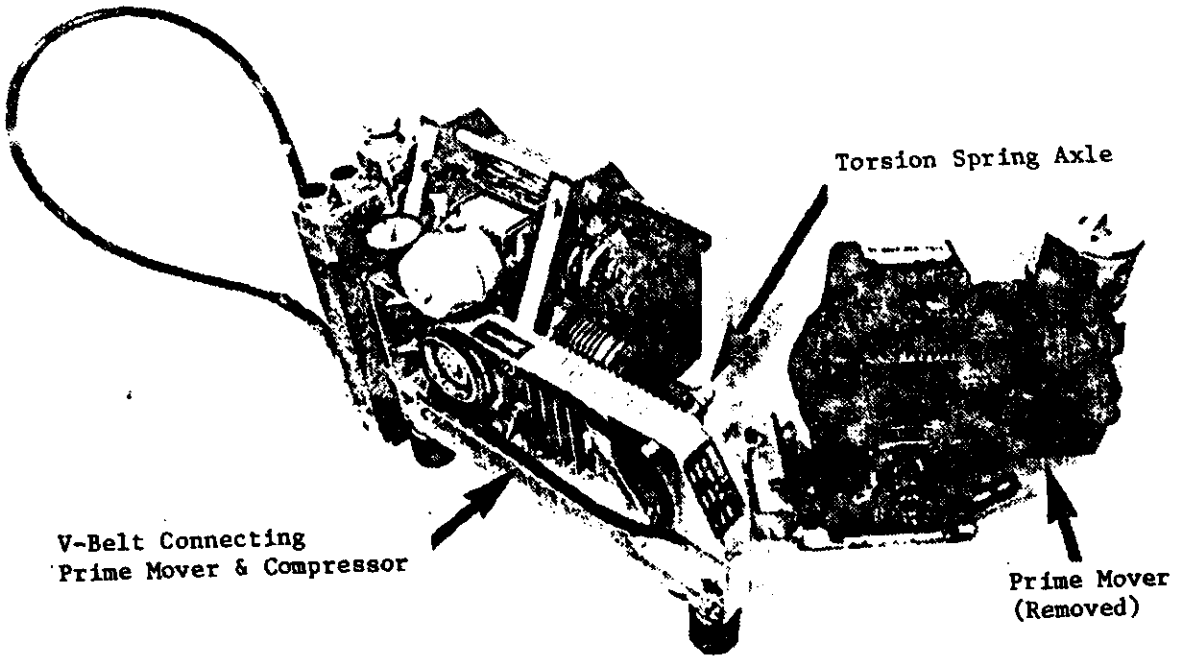


Figure 1. BAUER High-Pressure Breathing Air Compressor, Varius G-3 (modified according to NEDU recommendations)





Varius G with prime mover detached

Figure 2. BAUER Varius G-3

2.2 FUNCTIONAL DESCRIPTION

2.2.1 Compressor Air Flow (Figure 3)

Air is taken into the compressor through the micronic intake filter (2) and is compressed in the first stage cylinder (3) to 80 psig. The air is then cooled in an intermediate cooler (6) and passes into the second stage cylinder (4) for further compression to 800 psig. The air is again cooled in an intermediate cooler (7) and compressed in the third stage cylinder (5) to the charging pressure. In the after cooler (8) the air is cooled to approximately ambient temperature. The stages are protected by safety valves (9) and (10), preset to 116 psig and 1160 psig respectively, and the final safety valve (11) which is adjustable from 2755 psig to 3200 psig. Operating (back) pressure is read from the gauge (12), which is installed in the filter assembly block and indicates the third stage discharge pressure. From the after cooler the compressed air passes through the oil and water separator in the purification assembly (13), and thence through purification cartridges (15). Here vapor and remaining moisture is removed and CO is converted to CO_2. Condensation in the purification assembly is removed by drain valve (14). Downstream of the purification assembly is the back pressure maintaining valve (16) which insures a minimum operating pressure of 2750 psig at both the third stage discharge and purification chambers. The air then flows through the charging hose to the filling valve (18) and the pressure gauge (19), which registers the pressure to the tanks being filled.

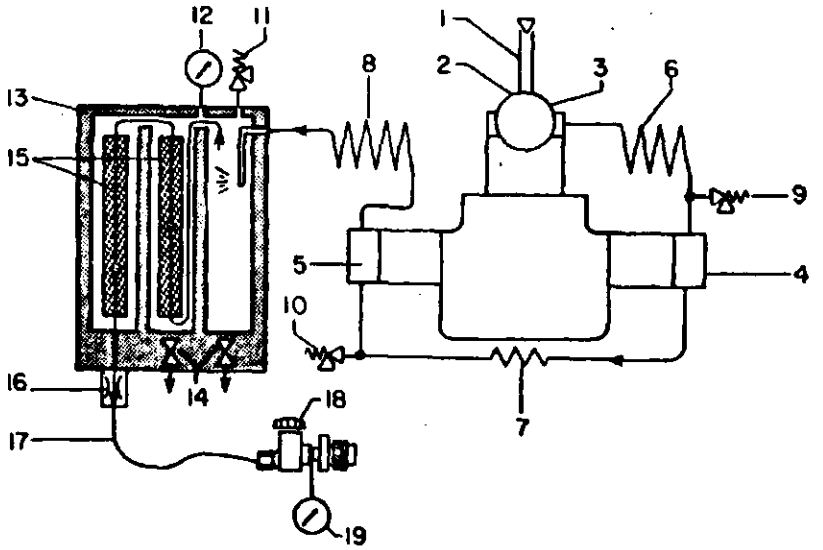
2.2.2 Compressor Lubrication

The second stage cylinder, third stage cylinder, and driving gears are splash lubricated from the crankcase by an oil thrower pin. Due to the direction of crankshaft rotation adequate lubrication of the first stage is not provided by the oil thrower pin. Additional lubrication for the first stage cylinder is provided by venting oil mist from the crankcase into the first stage intake down stream of the micronic filter.

2.3 PHYSICAL DIMENSIONS

Weight	65 lb.
Length	26 in.
Width	12 in.
Height	14 in.

Model	3200 psig/PN 200 bar 5000 psig/PN 300 bar	VG 3 VG 3-H
Number of cylinders		3
Working process		3stage
Cylinder bore	mm	60/28/12
Piston Stroke	mm	15
Compressor speed	rpm	2600
Inter-mediate pressure	3200 psig/PN 200 bar ± 10%	80/800 psi(5.5/55 bar)
	5000 psig/PN 300 bar	94/942 psi(6.5/65 bar)
Adjustment of minimum press. maintaining valve	3200 psig/PN 200 bar	2755 psig (190 bar)
	5000 psig/PN 300 bar	4060 psig (280 bar)
Actual tank filling capacity[1]) cfm(l/min)		2.3 (64)
Standard engine/motor		4-stroke Briggs & Stratton
Nominal power of engine/motor		3 HP (2.2kW)
Oil filling capacity of compressor	(fl. oz) cm^3	14-1/2 (430)
Oil Summer winter		above +50°F (+10°C) = SAE 30 +50°F (+10°C) to +50°F (-15°C) = SAE 20
Approved oil brands		BAUER Compressor Oil — Mobil Delvac 1200 Series BAUER Synthetic Compr. Oil — Tenneco-Anderol 750
[1]) measured bottle filling 0 to 3200 psig ± 5%		



1 Telescopic air intake
2 Intake valve
3 Cylinder 1st stage
4 Cylinder 2nd stage
5 Cylinder 3rd stage
6 Intermediate cooler 1st/2nd stage
7 Intermediate cooler 2nd/3rd stage
8 Aftercooler
9 Safety valve 1st stage
10 Safety valve 2nd stage
11 Final safety valve
12 Gauge
13 Purification assembly
14 Condensate drain valve
15 Filter cartridge
16 Pressure maintaining valve
17 Filling hose
18 Filling valve
19 Bottle pressure gauge (NEDU installed)

Figure 3. Compressor Schematic

3. TEST PROCEDURE

3.1 PRELIMINARY ARRANGEMENTS

A BAUER Varius G-3 air compressor, serial number 80/122/0, was received from the manufacturer and prepared for operation in accordance with instructions in the manufacturer-furnished technical manual.

3.2 TEST PLAN

3.2.1 Test Setup

The compressor was set up as shown in figures 1 and 2, and test equipment was attached. A YSI thermistor was placed in line to check the manufacturer installed thermometer, and an additional 0-3500 psig gauge was added downstream of the shutoff valve at the end of the charging whip. Appendix B describes the actual test plan and test equipment used.

3.2.2 Test Parameters

3.2.2.1 Endurance Test. The compressor was operated daily to charge single 72 cu.ft., single 80 cu.ft., twin 72 cu.ft., and twin 50 cu.ft. scuba tanks until 50 hours of operation were logged. The following measurements were recorded:

(1) Start up time
(2) Filter back pressure
(3) Tank size and pressure
(4) Total hours running time
(5) Ambient air temperature
(6) Delivery air temperature

3.2.2.2 Flow Test. Flow rate was measured approximately every three hours of operation.

3.2.2.3 Air Sample Analysis. The compressor was operated to charge a single 72 cu.ft. tank, which was sampled for air purity analysis. Initial sampling and analysis was conducted under a no-load condition, and then samples were repeated at 12.5, 25, 26, 37.5, and 50 hours of compressor operation.

3.2.2.4 Fuel Consumption. Gasoline fuel consumption of one measured amount of fuel, two quarts, was calculated twice during compressor testing operations.

3.2.2.5 Oil Consumption. Lubrication oil consumption was monitored during operation with oil levels noted in the test logs.

4. RESULTS AND DISCUSSION

4.1 ENDURANCE TEST

4.1.1 Location

The unit was placed in an exterior open work area with the air intake facing the prevailing wind. The test site was not changed, but the air intake was repositioned as dictated by shifts in wind direction.

4.1.2 Initial Operation

Initially the compressor was set up and run to insure proper operation and draw a preliminary air sample.

4.1.3 Charge Cycle

During the 50 hour operating period, the compressor accumulated 63 charging cycles. Due to the nonavailability of twin 90 cubic foot cylinders as called for in the test plan, single 72 and 80 cubic foot and twin 50 and 72 cubic foot cylinders were used during the charging cycles. All data was recorded on log sheets, which are provided as Appendix C. A randomly selected charging cycle is graphically presented as figure 4 to aid in the presentation of the relationship of running time to heat and pressure. It should also be noted that the linear progression of the pressure/time line is due to the back pressure maintaining valve insuring a constant efficiency of the third stage for the entire charging cycle.

4.2 DATA COMPUTATION

4.2.1 Test Data

The test data, Appendix C, for this evaluation provides a complete operational and maintenance log for this test and is the basis for computing and evaluating test results.

4.2.2 Average Charge Rate

Average compressor charge rates for the scuba air cylinders used during the test were:

Cylinder		CFM
Twin 50 cu.ft.	-	2.17
Single 80 cu.ft.	-	2.33
Twin 72 cu.ft.	-	2.02

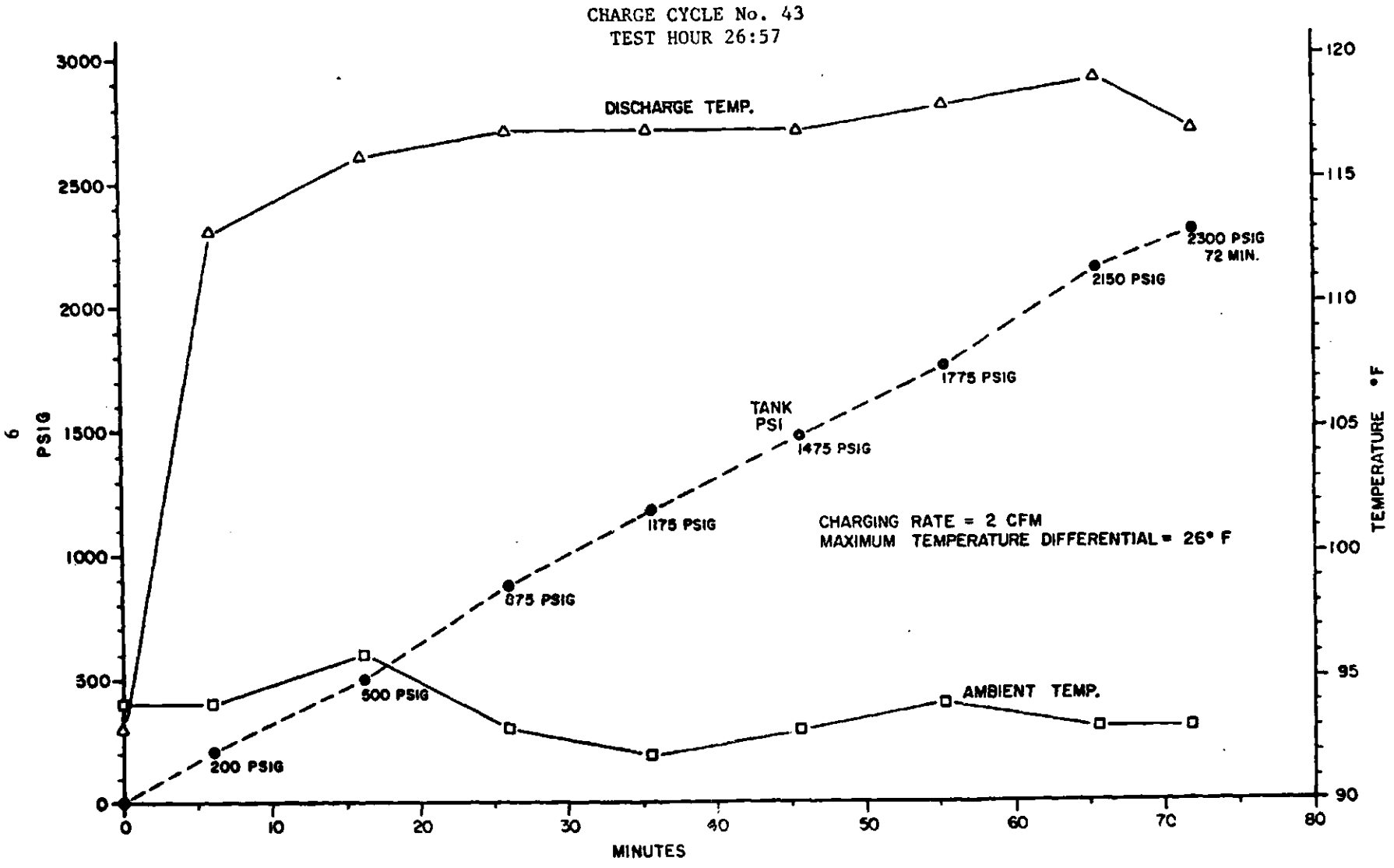


Figure 4. Charge Cycle Graph

4.2.3 Flow Rate

The calculated flow rates at given points throughout the test are presented below. It should be noted that proscribed maintenance was conducted at hour 25. The reduced flow rates starting at hour 30 are felt to be a byproduct of the engine carburetor adjustment, conducted during maintenance.

Hour	Flow Rate (CFM)	Hour	Flow Rate
0	2.0	30	2.0
10	2.2	35	2.0
15	2.3	40	2.0
20	2.3	45	2.0
25	2.4	50	2.2

4.2.4 Filling Time

The average time required to fill standard Navy scuba cylinders is as follows:

Cylinder		Filling Time (mins.)
Twin 50 cu.ft.	-	44
Single 80 cu.ft.	-	39
Twin 72 cu.ft.	-	71

4.2.5 Highest Temperature Differential

The highest ambient and compressor discharge temperature differentials were computed for ambient temperatures of 80, 90, and 100°F. The following data illustrates that the heat of compression retained in the gas after the third stage intercooler is not great enough to become a major factor in the resultant bottle pressure.

Running Time	Ambient Temp.°F	Highest Discharge Temp.°F	Temp. Differential °F
18:28	80	124	44
4:21	90	120	50
11:29	100	139	39

4.2.6 Fuel Consumption

Fuel consumption was calculated twice, at running times of 4 hours 17 minutes and 5 hours 54 minutes. Consumption of two quarts of unleaded gasoline for each test resulted in fuel use of 3 hours and 30 minutes per gallon, and 3 hours and 19 minutes per gallon, respectively.

4.2.7 Air Sampling

Air samples were taken at the start and the end of the test period, every 12.5 hours, and after performance of scheduled maintenance. These samples were analyzed in accordance with Appendix B. The samples indicated no appreciable contamination, and all gas components met the acceptable criteria for U.S. Navy standards for compressed breathing air. Table 4-1 lists the results of the air sample analysis in a form that facilitates ease of comparison for the entire test. Figure 5 is a graphic display of the analysis; the effects of the 25 hour servicing and filter change should be noted.

4.3 MAINTENANCE

4.3.1 General

The BAUER Varius G-3 compressor is easily maintained. Proscribed maintenance as set forth by the manufacturer's recommended procedure is comprehensive, but specific wording of the manual is awkward.

4.3.2 Scheduled Maintenance

Scheduled maintenance was performed in accordance with the manufacturer's instructions and consisted of the following:

Condensate. Condensate was drained on a regular basis, approximately every 10 minutes.

Fuel and Lubrication Oil. Fuel and lubrication oil levels were checked on a regular basis and replenished as required. Use was not considered excessive.

25 Hour Check. After 25 hours of operation, the V-belt was checked for wear, all fittings were checked for tightness, engine and compressor oil was changed, and the oil/water and carbon monoxide filters were replaced.

4.3.3 Corrective Maintenance

Corrective maintenance was limited to adjustment of the back pressure valve and adjustment of the jet screw on the engine carburetor.

Table 4-1. Results of Air Sample Analysis

COMPONENT AND CONTENT MEASUREMENT	STANDARDS FOR BREATHING AIR QUALITY		AIR SAMPLE ANALYSIS					
	US NAVY	ABCA[1]	NO LOAD	12.5 hours	25 hours	26 hours	37.5 hours	50 hours
O_2/%	20 to 22%	21 + 1%	21.0	21.0	21.0	21.0	21.0	21.0
N_2/%		Remainder	78.0	78.0	78.0	78.0	78.0	78.0
Ar/%			0.9	0.9	0.9	0.9	0.9	0.9
CO_2/ppm	1000 ppm	500 ppm	435.0	360.0	350.0	410.0	350.0	300.0
CO/ppm	20 ppm	10 ppm	<0.5	<0.5	8.0	1.0	14.3	2.6
Total halogens/ppm	1.0 ppm[2]		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total hydrocarbons/ppm (methane equivalents)	25 ppm[3]	25 ppm	2.1	3.5	3.0	2.5	6.7	3.2
H_2O/ppm				400.0	450.0	15.0	450.0	
Methane/ppm			1.4	2.3	2.6	2.5	2.7	1.6
Acetylene/ppm			0.65	<0.03	0.1	0.09	0.7	<0.03
Ethane/ppm			<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Acetone/ppm			<0.03	<0.03	0.07	<0.03	<0.03	<0.03
Freon 113/ppm			<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
MEK/ppm			<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Benzene/ppm			<0.04	<0.04	<0.04	<0.04	<0.04	<0.04

1 - American, British, Canadian, and Australian Quadripartite Standard for Compressed Air
2 - Limits depend on OSHA limit for the specific halogen hydrocarbons detected
3 - Generally accepted OSHA limits

Table 4-1. Results of Air Sample Analysis (Cont.)

COMPONENT AND CONTENT MEASUREMENT	STANDARDS FOR BREATHING AIR QUALITY		AIR SAMPLE ANALYSIS					
	US NAVY	ABCA	NO LOAD	12.5 hours	25 hours	26 hours	37.5 hours	50 hours
C_4+/ppm				0.5	0.5	0.1	0.7	0.5
Unknown Hydrocarbon No. 1/ppm				0.3	0.02		0.5	
Unknown Hydrocarbon No. 2/ppm				0.5	0.06			
Unknown Hydrocarbon No. 3/ppm				0.4	0.02			
Unknown Hydrocarbon No. 4/ppm				0.06	0.01			
Unknown Hydrocarbon No. 5/ppm					0.08			
Particulate matter			Passes Test	Passes Test	Passes Test	Passes Test	Passes Test	Passes Test

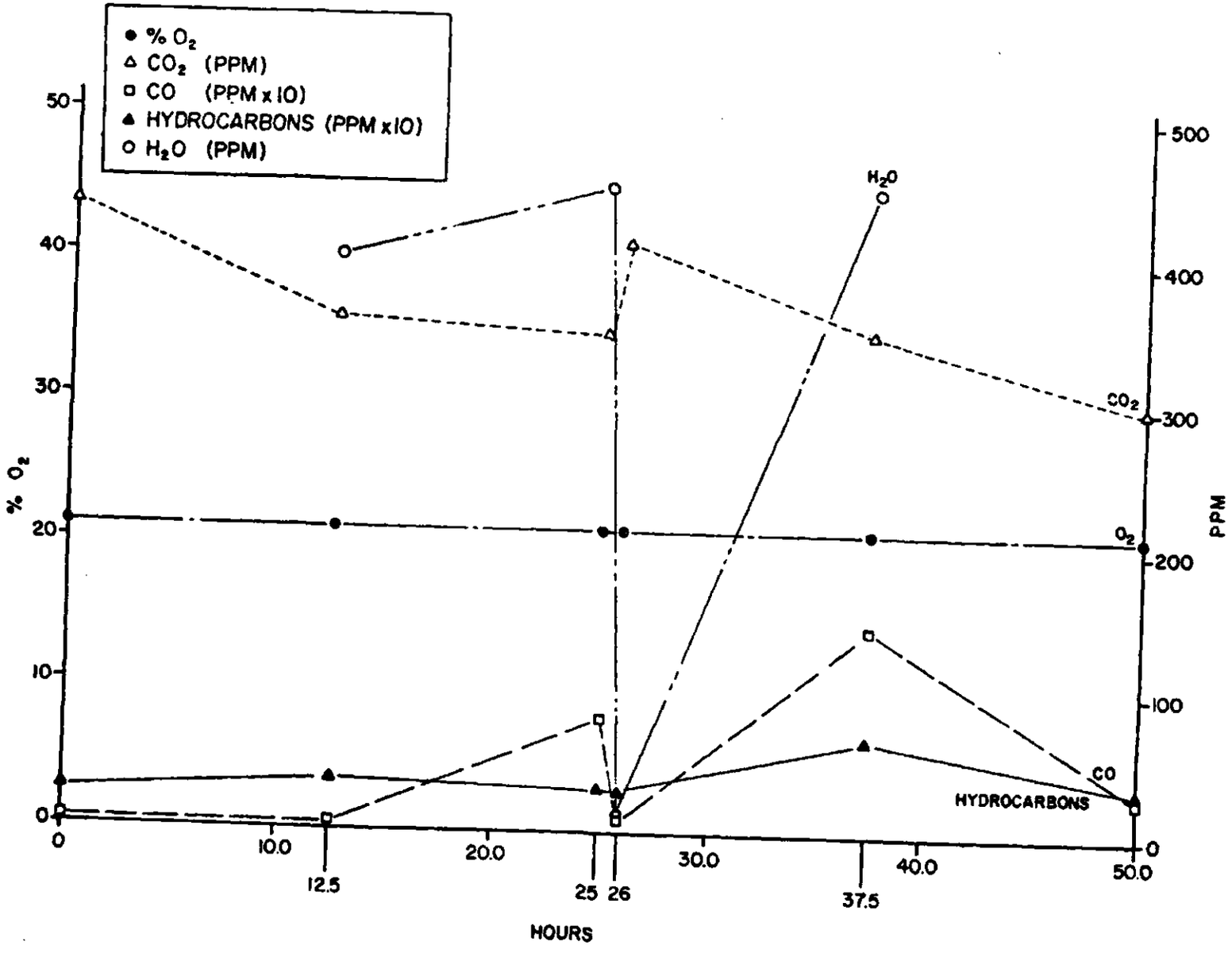


Figure 5. Air Sample Analysis Graph

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

5.1.1 The BAUER Varius G-3 compressor is suitable for use by the Navy.

5.1.2 The BAUER compressor delivers acceptable breathing air at a charge rate and volume, which meets the manufacturer's specifications.

5.1.3 The charging cycle time is considered to be satisfactory.

5.1.4 Fuel consumption of the compressor engine is satisfactory and is very economical.

5.1.5 The unit is sturdy, reliable, readily maintained, and one man portable.

5.2 RECOMMENDATIONS

5.2.1 General

It is recommended that the BAUER Varius G-3 compressor be placed on the list of equipment Approved for Navy Use, enclosure 2 to the NAVSEAINST 9597.1 series.

LIST OF REFERENCES

1. Task No. 80-5 from NAVSEA OOC-3 to Commander, NEDU, Subject: Test and Evaluate BAUER Scuba Jamming Compressor (4700 psig/2.3 CFM/WT 65 lbs), 25 February 1980 (Appendix A).

2. Navy Experimental Diving Unit Report 6-57, Cornelius Company Gasoline-Driven 2-CFM H.P. Air Compressor, by A. C. van Behren, p. 3, 9 February 1956.

3. Navy Experimental Diving Unit Report 5-60, Cornelius Company Scuba Air Compressor Gasoline-Driven, 3.5 CFM, by W. L. Marshall and G. M. Janney, p. 11, 10 September 1959.

4. Navy Experimental Diving Unit Report 4-65, High Pressure Engineering Co., Inc. H. P. Air Compressor 6-CFM Hurricane Model HPE 3000-7-L55, by J. V. Harter, p. 6, 21 July 1965.

5. Navy Experimental Diving Unit Report 21-78, MAKO High-Pressure Breathing Air Compressor KA-51-DF, by D. E. Dodds, p. 17, December 1978.

APPENDIX A

NAVSEA TASK NO. 80-5

INTER-OFFICE M MO

TO CO, NEDU

DATE 2/25/80

FROM NAVSEA 00C-3

SUBJECT TA 80-5

MESSAGE Request you test and evaluate the Bower Scuba Jamming Compressor (4700 psig/ 2.3 CFM/WT 65 lbs). Test will be conducted in accordance with standard compressor test specification developed by NCSC; modification of test specification, where required, is authorized. Bower compressor will be provided by SEPCOV. NAVSEA point of contact is 00C-31, Mr. Harry Rueter. Final report should include recommendation for inclusion in NAVSEA 9597.1 INST if appropriate.

H. K. Byng

REPLY

DATE 15 May 1980

The Bauer Scuba [redacted] Jamming Compressor is under procurement, with receipt anticipated prior to 30 June 1980. A full test plan will be forwarded to NAVSEA, detailing the specific compressor test procedures. NEDU point of contact is MMCS(DV) Dan Dodds.

J. T. HARRISON

APPENDIX B

TEST PLAN AND TEST EQUIPMENT

DEPARTMENT OF THE NAVY
NAVY EXPERIMENTAL DIVING UNIT
PANAMA CITY, FLORIDA 32407

IN REPLY REFER TO

NAVY EXPERIMENTAL DIVING UNIT

TEST PLAN - LONG FORM

Test Title: "Bauer" High Pressure Breathing Air Compressor Model-Varius-G3

Test Plan Number: 80-37

Date: 21 July 1980

Prepared by:

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Approved by:

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Commanding Officer

Appendix B. Test Plan (Continued)

1. Introduction. The Bauer Varius-G High Pressure Breathing Air Compressor is a gasoline-driven 3 stage air compressor with a rated capacity of 2.3 cubic feet per minute (CFM) at a pressure of 3200 pounds per square inch (PSI). The compressor is coupled to the engine by a V-belt and datensioning mechanical clutch for ease of starting the engine. The unit is assembled by Bauer Breathing Air located at 1328 Azalea Garden Road, Norfolk, Virginia.

Reference (a) directed NEDU to conduct test and evaluation of the Varius compressor to determine the suitability of the unit for a recommendation as authorized for Navy use (ANU). Therefore, the testing of this compressor will evaluate whether it produces satisfactory breathing air and maintains adequate service life to meet the requirements of fleet diving activities. In the event the compressor meets the specified requirements, it will be recommended as an addition to enclosure (2) to reference (b), Equipment Authorized for Navy Use (ANU).

2. References.

A. NAVSEA 00C-3 Memo 80-05 dtd 25 Feb 1980, Bauer Scuba Jamming Compressor (3200 PSI/2.3 CFM/wt 65 lbs)

B. NAVSEAINST 9597.1

C. Varius Technical Manual

3. Test Number. 80-37

4. Program. Test and evaluation of the Bauer Varius-G will be conducted as follows:

A. Phase I:

(1) Receive Varius-G at NEDU, Panama City.

(2) Conduct inspection of compressor to ensure all parts and material are received and on hand. Reference C refers.

(3) Using the technical manual for the air compressor and its components, inspect for and determine if the following items exist and/or comply:

a. All instruments and controls are clearly and permanently marked according to their functions.

b. All controls, gauges and indicators necessary for operation of the compressor are visible and convenient to the operator.

c. Safety devices are provided and audible and/or visual warning functions as specified.

d. Liquid level indicators accurately display liquid level.

e. All removable components can be removed and properly re-installed in working condition using the manufacturer's Operating Manual.

f. All drains, traps, and safety valves discharge ports will function without splashing, are conveniently located, and are directed away from operating personnel.

(4) Operate compressor for one (1) hour under a no-load condition.

(5) Take air sample following no-load test run, and have the air analysis conducted by NCSC Gas Analysis Laboratory.

(6) Instrumentation provided by manufacturer shall be compared by NEDU using a King Nutronics Gage Calibrator Model 3194.-F. These instruments shall be compared at 0 psig, 500 psig, 1000 psig, 1500 psig, 2000 psig, 2250 psig, 2500 psig, 3000 psig, and 3200 psig with a data sheet kept as a permanent record.

(7) Conduct testing in accordance with the procedures set forth in section 6. Total compressor running time will be 50 hours.

5. Preliminary Arrangements.

A. Arrange for air analysis to be conducted by NCSC as required, J.O. 5-712-00701.

6. Test Procedure.

The following test procedures will be conducted as specified, and the results entered in the log sheets, (enclosure (1)):

A. Take air samples at hours 1, 25, 50, and anytime air quality is questioned.

B. Log the following measurements on the log sheet (enclosure (1)):

(1) Start up time
(2) Filter back pressure
(3) Flask size and pressure
(4) Total hours running time on compressor. Total testing time will be 50 hours running time.
(5) Ambient air temperature
(6) Delivery air temperature.

C. Compute volume output of the compressor by charging a set of twin aluminum 90 cu. ft. scuba cylinders, timing the charge from 0 to 3000 psig. For a single aluminum 80 cu. ft. charge to 3000 psig. For a set of 71.2 cu. ft. scuba tanks, charge to a pressure of 2250 psig. Log total charging time for each set of tanks in order to calculate charging rate. Calculations to be made and logged at 3 hr intervals in the comments section of the log sheet.

Appendix B. Test Plan (Continued)

D. Measure fuel consumption of one measured gallon of fuel per hours of operation at least twice during the testing. Results will be entered in the log.

E. Oil consumption shall be measured and recorded during testing, with measurements and additions entered in the log.

F. Perform maintenance as required (reference C).

7. Post Test Arrangements. N/A

8. Personnel.

NEDU Test and Evaluation Department personnel (1 ea).

9. Safety Rules and Precautions.

Safety rules and precautions as outlined in Technical Manual for Varius-G Air Compressor, (Reference C).

10. Logistic Support Required.

A. Approximately $2,500.00 for preparation of camera ready copy of report.

B. $56.00 per hour for air analysis by NCSC: 4 hours per sample, 4 samples per test = $896.00 Total.

11. Funding Source.

NAVSEA OOC TASK NO. 80-6
SUPDIVE Support Funds

12. Report Production.

Under supervision of NEDU Test and Evaluation Department, test report and camera ready copy to be written and prepared by local firm and submitted for approval to Commanding Officer, NEDU. Estimated publication date is six weeks following completion of testing. MMCS(DV) D. E. DODDS/BMC(DV) R. BOWDISH are points of contact for NEDU concerning this test.

13. Comments/Additional Information.

The NEDU Test and Evaluation Department is responsible for the following:

A: Control and Safety of Systems. All control systems, safety systems, and valves shall be activated by making the necessary temporary alterations to compressor controls and operations whenever such alterations will not result in a risk of damage to the compressor unit. Where a risk is present, the test may be conducted with control systems completely removed from the compressor unit by subjecting control system sensors to other sources of temperature and pressure; for example, the oil safety switches and sensors, automatic condensate blow down valves, overpressure switches and sensors, high temperature switches and sensors, and any other device designed to operate or protect the system and attending personnel.

B. Integrity of Air System. The air compressor system shall be shut down when the system is at maximum pressure.

(1) Hold pressure.
(2) Allow the system to cool to ambient temperature.
(3) After temperature has stabilized, record the receiver pressure.
(4) After an eight-hour period, record pressure again.
(5) Leak rate shall be zero.

C. The following is Failure Criteria for the suitability of the Bauer Varius-G compressor for ANU:

(1) Failure of any component which cannot be corrected in accordance with the recommended schedule of maintenance.

(2) Failure of the diving air system to operate as specified.

(3) Failure of the valves to operate as specified.

(4) Failure of the pressure relief valves to operate as specified.

(5) A decrease in capacity of the compressor during the performance test.

(6) A discharge air temperature from any cylinder in excess of manufacturer's specifications or recommendations.

(7) Failure of the air samples to pass breathing air specifications.

APPENDIX C

OPERATIONAL TEST LOG

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
July 10		Received and assembled compressor							
July 11	1100	Serviced and lit off compressor Drew sample							
July 14	1055	Commenced testing	1750	72	0	124°F	35°C	90°F	00:20
July 14	1100	Drained condensate	1800		250	124°F	43°C	90°F	00:25
July 14	1110	Drained condensate	1800		1400	131°F	48°C	90°F	00:35
July 14	1120	Secured compressor Checked oil levels	2250		2150	133°F	52°C	96°F	00:45
July 14	1133	Lit-off compressor	1750	80	0	127°F	47°C	96°F	00:45
July 14	1140	Drained condensate	1750		250	138°F	55°C	94°F	00:52
July 14	1150	Drained condensate	1800		1600	140°F	55°C	94°F	1:02
July 14	1200	Drained condensate	2400		2200	142°F	55°C	94°F	1:12
July 14	1210	Secured compressor Drained condensate	3000		2900	140°F	55°C	94°F	1:22
July 14	1225	Adjusted back pressure valve							
July 14	1227	Lit-off compressor	2800	72	0	127°F	45°C	92°F	1:22
July 14	1237	Drained condensate	2500		800	137°F	55°C	93°F	1:32
July 14	1247	Drained condensate	2100		1500	140°F	55°C	92°F	1:42

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
July 14	1256	Secured compressor	2400		2250	141°F	55°C	93°F	1:52
July 14	1300	Lit-off compressor	2600	80	0	135°F	52°C	92°F	1:52
July 14	1310	Drained condensate	2300		500	135°F	53°C	93°F	2:02
July 14	1320	Drained condensate	2050		1400	134°F	52°C	94°F	2:12
July 14	1330	Drained condensate	2400		2250	136°F	53°C	94°F	2:22
July 14	1340	Drained condensate Secured compressor	3050		3000	135°F	52°C	94°F	2:32
July 15	0850	Serviced compressor. Filled fuel tank with 64 oz. for fuel							
		consumption test.							
July 15	0852	Lit-off compressor	0	Twin 50	0	124°F	43°F	84°F	2:32
July 15	0900	Drained condensate	2800		400	126°F	44°C	88°F	2:40
July 15	0910	Drained condensate	2600		1000	131°F	48°C	88°F	2:50
July 15	0920	Drained condensate	2600		1650	132°F	50°C	88°F	3:00
July 15	0930	Drained condensate	2600		2300	134°F	52°C	88°F	3:10
July 15	0940	Drained condensate	2900		2900	140°F	55°C	88°F	3:20
July 15	0942	Secured compressor 100 cu.ft. in 50 min. = 2.0 ACFM	3000		3000	141°F	55°C	88°F	3:22

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
July 15	0946	Lit-off compressor	0		0	140°F	55°C	88°F	3:22
July 15	0948	Engine stalled - restarted							
July 15	0950		2500		100	136°F	53°C	88°F	3:26
July 15	1000	Drained condensate	2500		1000	145°F	55°C	89°F	3:36
July 15	1010	Drained condensate	2400		1800	140°F	55°C	89°F	3:46
July 15	1011	Engine stalled - checked fuel, lubricants and all filters							3:47
July 15	1030	Lit-off compressor	2300		2000	99°F	54°C	90°F	3:47
July 15	1038	Secured compressor to adjust throttle. Drained condensate							3:55
July 15	1040	Lit-off compressor	2800		2600	123°F	55°C	90°F	3:55
July 15	1045	Drained condensate Secured compressor	3000		3000	129°F	55°C	90°F	4:00
July 15	1047	Lit-off compressor	0	Twin 50	0	125°F	55°C	91°F	4:00
July 15	1050		2400		50	129°F	55°C	91°F	4:03
July 15	1100	Drained condensate	2400		800	137°F	55°C	90°F	4:13
July 15	1104	Engine stopped out of fuel computed usage							4:17
		3 hrs 24 min per gallon of fuel							

TABLE C-1
OPERATIONAL TEST LOG

Date -80-	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
July 15	1106	Refueled. Lit-off compressor							4:17
July 15	1110		2300		1350	140°F	55°C	90°F	4:21
July 15	1120	Drained condensate	2400		2050	140°F	55°C	88°F	4:31
July 15	1130	Drained condensate	2800		2700	139°F	55°C	90°F	4:42
July 15	1135	Drained compressor condensate Secured compressor	3000		3000	135°F	55°C	89°F	4:47
July 15	1137	Started compressor		80	0				4:47
July 15	1140		2350		250	137°F	50°C	90°F	4:50
July 15	1150	Drained condensate	2250		1000	138°F	53°C	90°F	5:00
July 15	1200	Drained condensate	2350		1850	142°F	55°C	88°F	5:10
July 15	1210	Drained condensate	2800		2800	134°F	55°C+	92°F	5:20
July 15	1213	Secured compressor	3000		3000	131°F	55°C+	92°F	5:23
July 15	1220	Adjusted back pressure valve Started compressor		Twin 50					5:23
July 15	1230	Drained condensate	2800		700	132°F	53°C	93°F	5:33
July 15	1240	Drained condensate	2800		1200	136°F	55°C	90°F	5:43
July 15	1250	Drained condensate	2700		1950	138°F	55°C	92°F	5:53

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
July 15	1251	Engine died, no fuel							5:54
July 15	1255	Refueled, lit off compressor							5:54
July 15	1300		2800		2500	141°F	55°C+	92°F	6:04
July 15	1309	Secured compressor Drained condensate	3000		3000	139°F	55°C+	92°F	6:13
July 15	1315	Started compressor		80					6:13
July 15	1320		2500		50	135°F	55°C+	94°F	6:18
July 15	1330	Drained condensate	2750		1000	141°F	55°C+	93°F	6:28
July 15	1340	Drained condensate	2750		1600	141°F	55°C+	93°F	6:38
July 15	1350	Drained condensate	2600		2500	142°F	55°C+	93°F	6:48
July 15	1357	Secured compressor for the day			3000				6:55
July 16	0700	Checked compressor and engine oil level. Added 2.5 oz Com-							
		pressor oil. Oil used Mako Super Synthetic.							
July 16	0723	Lit-off compressor	0	Twin 50	0	83°F	30°C	83°F	6:55
July 16	0730	Drained condensate	2800		400	118°F	35°C	84°F	7:02
July 16	0740	Drained condensate	2750		800	124°F	42°C	84°F	7:12

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
July 16	0750	Drained condensate	2600		1400	126°F	46°C	84°F	7:22
July 16	0800	Drained condensate	2500		2200	127°F	45°C	82°F	7:32
July 16	0810	Drained condensate	2800		2800	126°F	47°C	84°F	7:42
July 16	0813	Secured compressor	3000		3000	127°F	47°C	83°F	7:45
July 16	0814	Started compressor		80					7:45
July 16	0820		2800		400	127°F	45°C	84°F	7:51
July 16	0830	Drained condensate	2700		1200	128°F	46°C	84°F	8:01
July 16	0840	Drained condensate	2600		2000	129°F	47°C	85°F	8:11
July 16	0850		3000		2900	131°F	48°C	85°F	8:21
July 16	0851	Secured compressor	3000		3000				8:22
July 16	0852	Started compressor	0	Twin 50	0	127°F	47°C	85°F	8:22
July 16	0900	Drained condensate	2750		400	130°F	47°C	86°F	8:30
July 16	0910	Drained condensate Added fuel to engine tank	2750		1000	130°F	48°C	86°F	8:40
July 16	0920	Drained condensate	2700		1700	130°F	50°C	86°F	8:50
July 16	0930	Drained condensate	2600		2400	131°F	50°C	86°F	9:00

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
July 16	0937	Secured compressor. Computed Charging rate of 2.2 CFM	3000		3000				9:07
July 16	0938	Started compressor	0	80	0				9:07
July 16	0940		2600		100	130°F	49°C	86°F	9:09
July 16	0950	Drained condensate	2600		600	131°F	50°C	87°F	9:19
July 16	1000	Drained condensate	2750		1350	130°F	50°C	87°F	9:29
July 16	1010	Drained condensate	2650		2250	129°F	48°C	87°F	9:39
July 16	1018	Secured compressor, checked oil	3000		3000	130°F	49°C	88°F	9:47
		levels, filled fuel tank							
July 16	1028	Started compressor	0	Twin 50	0				9:47
July 16	1030		2800		50	121°F	47°C	87°F	9:49
July 16	1040	Drained condensate	2700		600	133°F	48°C	88°F	9:59
July 16	1050	Drained condensate	2600		1250	134°F	50°C	88°F	10:09
July 16	1100	Drained condensate	2600		2400	137°F	52°C	89°F	10:19
July 16	1110	Drained condensate	2800		2700	136°F	54°C	90°F	10:29
July 16	1114	Changed Flasks Drained condensate	3100	80	3000				10:33

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
July 16	1120		2750		400	138°F	54°C	90°F	10:39
July 16	1128	Changed ambient thermometer							
July 16	1130	Drained condensate	2600		1200	138°F	54°C	96°F	10:49
July 16	1140	Drained condensate	2600		2100	136°F	54°C	98°F	10:59
July 16	1150	Drained condensate Changed flasks	3000	Twin 50	3000	134°F	55°C	98°F	11:09
July 16	1200	Added fuel Drained condensate	2700		400	135°F	54°C	98°F	11:19
July 16	1210	Drained condensate	2750		1050	139°F	54°C	100°F	11:29
July 16	1220	Drained condensate	2600		1600	140°F	55°C+	101°F	11:39
July 16	1230	Drained condensate	2600		2500	138°F	55°C+	98°F	11:49
July 16	1236	Changed flasks Drained condensate	2750	80	0				
July 16	1240		2750		200	135°F	54°C	97°F	11:59
July 16	1250	Drained condensate	2700		1000	139°F	55°C+	99°F	12:09
July 16	1300	Drained condensate	2600		1750	136°F	55°C+	99°F	12:19
July 16	1315	Drew Air Sample Secured compressor	3000		2950	135°F	55°C+	98°F	12:30

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
July 17	0557	Began set up and servicing compressor. Checked oil levels							
		Filled fuel tank.							
July 17	0613	Started compressor	0	Twin 50	0	93°F	28°C	77°F	12:30
July 17	0623	Drained condensate	2850		600	116°F	34°C	77°F	12:40
July 17	0633	Drained condensate	2800		1250	118°F	37°C	77°F	12:50
July 17	0643	Drained condensate	2750		2000	120°F	37°C	77°F	13:00
July 17	0653		2750		2700	120°F	37°C	78°F	13:10
July 17	0656	Changed flasks. Computed charging rate 2.32 ACFM	3000		3000	120°F	38°C	78°F	13:13
July 17	0703		2900		500	120°F	38°C	78°F	13:20
July 17	0713	Drained condensate	2750		1300	120°F	38°C	78°F	13:30
July 17	0723		2600		2300	121°F	38°C	79°F	13:40
July 17	0730	Drained condensate Changed flasks	3000	Twin 50	3000				13:47
July 17	0733		2750		300	121°F	38°C	79°F	13:50
July 17	0743		2800		800	119°F	38°C	79°F	14:00
July 17	0753	Secured compressor Drained condensate	2750		1450	120°F	38°C	80°F	14:10

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
July 17	0823	Started compressor			1500				14:10
July 17	0833		2750		2300	121°F	40°C	81°F	14:20
July 17	0843	Drained condensate Changed Flask	3050	80	3050	124°F	42°C	82°F	14:30
July 17	0853	Charging rate computed at 2.32 ACFM	2750		900	123°F	43°C	82°F	14:40
July 17	0903	Drained condensate	2700		1700	124°F	43°C	83°F	14:50
July 17	0913		2700		2700	125°F	44°C	84°F	15:00
July 17	0916	Drained condensate Shifted flasks		Twin 50					
July 17	0923		2700		200	124°F	44°C	85°F	15:10
July 17	0933		2700		1000	126°F	45°C	86°F	15:20
July 17	0943		2700		1800	127°F	46°C	86°F	15:30
July 17	0953		2600		2550	128°F	46°C	87°F	15:40
July 17	0958	Drained condensate Secured compressor	3000		3000	129°F	46°C	88°F	15:45
July 17	1004	Checked oil levels, filled fuel tank, started compressor	0	80	0	116°F		89°F	15:45
July 17	1014		2750		700	128°F	47°C	90°F	15:55
July 17	1024	Drained condensate	2650		1600	131°F	48°C	90°F	16:05

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
July 17	1034	Computed charging rate 80 cu.ft. in 34 min. = 2.32 ACFM	2650		2600	133°F	50°C	94°F	16:15
July 17	1038	Drained condensate Shifted flasks	2750	Twin 50	0	133°F	50°C	92°F	16:19
July 17	1044		2750		300	134°F	51°C	94°F	16:25
July 17	1054	Drained condensate	2750		1000	137°F	52°C	93°F	16:35
July 17	1104		2650		1600	135°F	53°C	92°F	16:45
July 17	1114	Drained condensate	2575		2300	134°F	53°C	95°F	16:55
July 17	1121	Drained condensate Shifted bottles	3000	80	3000	128°F	52°C	90°F	17:02
July 17	1129	Drained condensate	2775		500	129°F	52°C	91°F	17:10
July 17	1139		2750		1300	134°F	52°C	95°F	17:20
July 17	1149	Drained condensate	2600		2200	133°F	52°C	94°F	17:30
July 17	1157	Drained condensate Secured compressor	3000		3000	136°F	53°C	95°F	17:38
July 17	1200	Started compressor		Twin 50					17:38
July 17	1210		2750		600	135°F	48°C	93°F	17:48
July 17	1220	Drained condensate	2750		1300	136°F		92°F	17:58
July 17	1230		2600		2000	136°F	52°C	94°F	18:08

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
July 17	1240		2800		2800	136°F	52°C	93°F	18:18
July 17	1242	Drained condensate Secured compressor for the day	3000		3000	136°F	52°C	94°F	18:20
		Checked oil levels Filled fuel tank							
July 18	0612	Started compressor	0	Twin 50	0	80°F	28°C	80°F	18:20
July 18	0620		2800		500	124°F	34°C	80°F	18:28
July 18	0630	Drained condensate	2800		1300	128°F	42°C	81°F	18:38
July 18	0640		2800		2000	129°F	43°C	81°F	18:48
July 18	0650	Drained condensate	2900		2800	130°F	43°C	82°F	18:58
July 18	0653	Drained condensate Changed flask	0	80	0				19:01
July 18	0700		2800		500	128°F	44°C	82°F	19:08
July 18	0710	Drained condensate	2700		1400	130°F	44°C	82°F	19:18
July 18	0720		2600		2400	133°F	46°C	82°F	19:28
July 18	0726	Drained condensate Changed flasks		Twin 50					19:34
July 18	0730		2750		200	129°F	46°C	83°F	19:38
July 18	0740	Drained condensate	2750		700	130°F	45°C	84°F	19:48

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
July 18	0750		2700		1550	131°F	45°C	84°F	19:58
July 18	0800	Drained condensate	2600		2300	131°F	44°C	85°F	20:08
July 18	0808	Drained condensate Changed flasks		80					20:16
July 18	0810		2750		50	130°F	44°C	85°F	20:18
July 18	0820	Drained condensate	2750		850	133°F	44°C	86°F	20:28
July 18	0830		2650		1750	137°F	46°C	87°F	20:38
July 18	0840		2800		2750	137°F	48°C	87°F	20:48
July 18	0842	Drained condensate Shifted flasks		Twin 50					20:50
July 18	0850		2750		450	136°F	48°C	87°F	20:58
July 18	0900	Drained condensate	2700		1100	136°F	48°C	88°F	21:08
July 18	0910		2650		1850	135°F	48°C	89°F	21:18
July 18	0920		2750		2700	135°F	49°C	90°F	21:28
July 18	0924	Secured compressor, checked oil levels, filled fuel tank	3000		3000	136°F	48°C	92°F	21:32
July 18	0927	Started compressor	0	80	0	128°F	46°C	88°F	21:32
July 18	0937		2700		900	129°F	47°C	88°F	21:42

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
July 18	0947	Drained condensate	2600		1800	129°F	47°C	88°F	21:52
July 18	0957		2800		2750	129°F	47°C	89°F	22:02
July 18	0959	Drained condensate Shifted flasks	3000	Twin 50	3000	129°F	47°C	89°F	22:04
July 18	1009		2750		600	129°F	47°C	89°F	22:14
July 18	1019	Drained condensate	2700		1300	130°F	47°C	90°F	22:24
July 18	1030		2750		2300	130°F	47°C	90°F	22:35
July 18	1040	Drained condensate Shifted flasks	3000	80	3000	131°F	47°C	90°F	22:45
July 18	1050		2800		800	130°F	47°C	90°F	22:55
July 18	1100	Drained condensate	2700		1800	130°F	47°C	90°F	23:05
July 18	1110	Computed charging rate, 80 cu.ft. in 34 min. = 2.35 ACFM	2750		2700	131°F	48°C	91°F	23:15
July 18	1114	Drained condensate Changed flasks		Twin 50					23:19
July 18	1120		2750		400	133°F	50°C	93°F	23:25
July 18	1121	Refueled and checked oil level							23:26
July 18	1124	Restarted compressor	2750		500	128°F	50°C	94°F	23:29
July 18	1130		2750		900	132°F	50°C	94°F	23:35

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
July 18	1140	Drained condensate	2600		1600	133°F	50°C	95°F	23:45
July 18	1150		2600		2400	140°F	55°C	97°F	23:55
July 18	1158	Drained condensate Changed flasks		80					24:03
July 18	1200		2800		0	142°F	55°C+	97°F	24:05
July 18	1210	Drained condensate	2750		1000	140°F	54°C	95°F	24:15
July 18	1220	Engine stalled, check oil, fuel	2750		1850	139°F		96°F	24:25
July 18	1224	Restart compressor	2750		1850	128°F	52°C	96°F	24:25
July 18	1230		2500		2450	139°F	55°C	97°F	24:31
July 18	1237	Drained condensate Changed flasks		Twin 50					24:38
July 18	1240		2740		300	141°F	55°C+	95°F	24:41
July 18	1250	Drained condensate	2700		800	143°F	55°C+	93°F	24:51
July 18	1300		2600		1500	144°F	55°C+	94°F	25:01
July 18	1310	Drained condensate	2550		2200	141°F	55°C+	95°F	25:11
July 18	1320	Secured charging-drew air sample							25:21

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
July 18	1322	Secured compressor for P.M.S.							25:33
		1. Check -V- Belt for wear, found minor glazing.							
		2. Checked all fittings for tightness.							
		3. Changed engine oil 4. Changed compressor oil -							
		found heavy sludge and condensation.							
		5. Changed oil/moisture filter and CO filter.							
Aug 4	0900	Started compressor	0	80	0	90.95°F	42°C	91°F	25:23
Aug 4	0910	Drained condensate	3000		600	110°F	43°C	89°F	25:33
Aug 4	0920		2900		1200	112°F	43°C	90°F	25:43
Aug 4	0930	Drained condensate	2875		1800	114°F	43°C	89°F	25:53
Aug 4	0940		2600		2600	115°F	45°C	91°F	26:03
Aug 4	0945		3000		3000	118	47°C	92°F	26:08
Aug 4	0950	Started compressor. Drew air sample. Secured compressor							26:13
Aug 4	1018	Started compressor	0	80	0	108°F	44°C	94°F	26:13
Aug 4	1020		2700		100	113°F	48°C	95°F	26:15

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
Aug 4	1030	Drained condensate	2800		700	120°F	50°C	97°F	26:25
Aug 4	1040		2800		1400	119°F	48°C	95°F	26:35
Aug 4	1050	Drained condensate	2600		2100	123°F	49°C	92°F	26:45
Aug 4	1100		2800		2800	121°F	52°C	100°F	26:55
Aug 4	1102	Drained condensate Secured compressor	3000		3000	123°F	53°C	96°F	26:57
		Check oil levels Filled fuel tank							
Aug 5	0943	Started compressor	0	Twin 72	0	93°F	48°C	94°F	26:57
Aug 5	0950	Drained condensate	2700		200	113°F	45°C	94°F	27:04
Aug 5	1000		2700		500	116°F	45°C	96°F	27:14
Aug 5	1010	Drained condensate	2700		875	117°F	45°C	93°F	27:24
Aug 5	1020		2800		1175	117°F	46°C	92°F	27:34
Aug 5	1030	Drained condensate	2800		1475	117°F	46°C	93°F	27:44
Aug 5	1040		2800		1775	118°F	46°C	94°F	27:54
Aug 5	1050	Drained condensate	2600		2150	119°F	46°C	93°F	28:04
Aug 5	1055	Drained condensate Secured compressor	2600		2300	118°F	47°C	93°F	28:09

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
Aug 5	1100	Checked oil levels, filled fuel tank, started compressor	2700		0	115°F	48°C	94°F	28:09
Aug 5	1110	Drained condensate	2800		250	119°F	47°C	94°F	28:19
Aug 5	1120		2800		475	120°F	47°C	96°F	28:29
Aug 5	1130	Found drain plug on charging hose open. Drained condensate.	2700		600	120°F	48°C.	95°F	28:39
Aug 5	1140		2700		950	122°F	48°C	95°F	28:49
Aug 5	1150	Drained condensate	2600		1250	121°F	48°C	96°F	28:59
Aug 5	1200		2600		1550	122°F	48°C	95°F	29:09
Aug 5	1210	Drained condensate	2700		1900	125°F	50°C	96°F	29:19
Aug 5	1220	Drained condensate Secured compressor	2600		2200	125°F	53°C	98°F	29:29
Aug 5	1227	Check oil levels, added fuel, started compressor	0		0	118°F	52°C	98°F	29:29
Aug 5	1230		2800		50	123°F	55°C+	97°F	29:32
Aug 5	1240	Drained condensate	2800		400	125°F	55°C+	98°F	29:42
Aug 5	1250		2800		700	126°F	55°C+	99°F	29:52
Aug 5	1300	Drained condensate	2800		1000	129°F	55°C+	98°F	29:02
Aug 5	1310		2800		1300	126°F	55°C+	95°F	29:12

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
Aug 5	1320	Drained condensate	2700		1600	125°F	55°C+	97°F	29:22
Aug 5	1330	Secured compressor Drained condensate	2600		1900	125°F	55°C+	98°F	29:32
Aug 6	0910	Check oil levels, filled fuel tank, started compressor.	0	Twin 72	0	93°F	38°C	93°F	30:32
Aug 6	0920		2800		300	115°F	43°C .	91°F	30:42
Aug 6	0930	Drained condensate	2800		600	121°F	46°C	91°F	30:52
Aug 6	0940		2800		950	120°F	46°C	90°F	31:02
Aug 6	0950	Drained condensate	2800		1250	123°F	48°C	90°F	31:12
Aug 6	1000		2700		1600	123°F	48°C	92°F	31:22
Aug 6	1010	Drained condensate	2700		1900	125°F	49°C	93°F	31:32
Aug 6	1020	Drained condensate Secured compressor	2600		2300	123°F	49°C	91°F	31:42
Aug 6	1025	Checked oil, filled fuel tank started compressor	0	Twin 72	0	119°F	49°C	93°F	31:42
Aug 6	1035	Drained condensate	2800		100	119°F	48°C	93°F	31:52
Aug 6	1040	Drained condensate Secured compressor	0		200	115°F	48°C	94°F	31:57
Aug 6	1135	Started compressor	0		200	105°F	47°C	93°F	31:57
Aug 6	1145		2800		600	121°F	47°C	93°F	32:07

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
Aug 6	1155	Drained condensate	2800		900	122°F	48°C	98°F	32:17
Aug 6	1205		2800		1200	124°F	52°C	99°F	32:27
Aug 6	1215	Drained condensate	2700		1600	122°F	52°C	95°F	32:37
Aug 6	1225		2700		1900	124°F	52°C	94°F	32:47
Aug 6	1235	Drained condensate Secured compressor	2600		2250	126°F	52°C	94°F	32:57
Aug 6	1240	Checked oil levels, filled fuel tank, started compressor.	0	Twin 72	0	121°F	51°C	95°F	32:57
Aug 6	1250	Drained condensate	2800		0	127°F	55°C	96°F	33:07
Aug 6	1300		2800		50	128°F	54°C	93°F	33:17
Aug 6	1310	Drained condensate	2800		550	127°F	54°C	96°F	33:27
Aug 6	1320		2800		800	130°F	55°C	96°F	33:37
Aug 6	1330	Drained condensate	2800		1100	129°F	55°C	97°F	33:47
Aug 6	1340		2800		1500	133°F	55°C+	97°F	33:57
Aug 6	1350	Drained condensate	2400		1600	129°F	55°C+	97°F	34:07
Aug 6	1400		2800		1800	129°F	55°C+	98°F	34:17
Aug 6	1410	Drained condensate Secured compressor	2700		2250	130°F	55°C+	97°F	34:27

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
Aug 6	1420	Checked oil level, refilled fuel tank, started compressor	0	Twin 72	0	128°F	55°C+	98°F	34:27
Aug 6	1430		2800		150	127°F	55°C+	98°F	34:37
Aug 6	1440	Drained condensate	2800		600	129°F	55°C+	98°F	34:47
Aug 6	1450		2800		975	133°F	55°C+	99°F	34:57
Aug 6	1500	Drained condensate Secured compressor	2800		1300	130°F	55°C+	98°F	35:07
Aug 7	0800	Checked oil levels, filled fuel tank, started compressor	0	Twin 72	0	85°F	29°C	83°F	35:07
Aug 7	0810		2900		350	112°F	39°C	85°F	35:17
Aug 7	0820	Drained condensate	2800		700	114°F	44°C	87°F	35:27
Aug 7	0830		2900		1000	116°F	44°C	86°F	35:37
Aug 7	0840	Drained condensate	2900		1300	116°F	44°C	87°F	35:47
Aug 7	0850		2900		1600	117°F	44°C	88°F	35:57
Aug 7	0900	Drained condensate	2900		1900	118°F	44°C	87°F	36:07
Aug 7	0910	Secured compressor, checked oil levels, filled fuel tank.	2800		2200	119°F	46°C	89°F	36:17
Aug 7	0915	Started compressor	0	Twin 72	0				36:17
Aug 7	0925		3000		200	118°F	46°C	92°F	36:27

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
Aug 7	0935	Drained condensate	3000		500	120°F	46°C	92°F	36:37
Aug 7	0945		3000		800	121°F	48°C	93°F	36:47
Aug 7	0955	Drained condensate	3000		1200	122°F	48°C	94°F	36:57
Aug 7	1005		2900		1500	123°F	48°C	94°F	37:07
Aug 7	1015	Drained condensate	2900		1800	124°F	50°C	94°F	37:17
Aug 7	1025	Secured compressor, checked oil level	2800		2200	124°F	50°C	95°F	37:27
Aug 7	1040	Took air sample Started compressor	0		0				37:27
Aug 7	1045		0		0				37:32
Aug 7	1055		3000		400	125°F	52°C	96°F	37:42
Aug 7	1105		3000		700	126°F	60°C	95°F	37:52
Aug 7	1115	Drained condensate	3000		1100	126°F	60°C	95°F	38:02
Aug 7	1130	Lost 200 psi flask pressure (open valve)	3000		1400	126°F	60°C	93°F	38:12
Aug 7	1140	Drained condensate	2900		1500	126°F	55°C+	93°F	38:22
Aug 7	1150		2800		1850	126°F	55°C+	96°F	38:32
Aug 7	1200	Drained condensate Secured compressor	2600		2200	125°F	55°C+	95°F	38:42

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
Aug 7	1205	Started compressor	0	Twin 72	0				38:42
Aug 7	1215		3000		300	126°F	53°C	96°F	38:52
Aug 7	1225	Drained condensate	3000		650	125°F	55°C	97°F	39:02
Aug 7	1240	Adjusted back pressure valve	2600		800	118°F		96°F	39:02
Aug 7	1250		2600		1000	121°F	51°C	100°F	39:12
Aug 7	1300	Drained condensate	2600		1400	121°F	51°C	96°F	39:22
Aug 7	1310		2500		1700	120°F	48°C	93°F	39:32
Aug 7	1320	Secured compressor Drained condensate	2600		2200	122°F	51°C	98°F	39:43
Aug 7	1330	Checked oil levels Started compressor	0	Twin 72	0				39:43
Aug 7	1340		2600		200	120°F	46°C	94°F	39:53
Aug 7	1350	Drained condensate	2600		600	121°F	47°C	93°F	40:03
Aug 7	1400		2600		900	122°F	50°C	97°F	40:13
Aug 7	1410	Drained condensate	2600		1300	122°F	50°C	96°F	40:23
Aug 7	1420		2600		1500	122°F	50°C	96°F	40:33
Aug 7	1430	Drained condensate	2600		1900	122°F	50°C	97°F	40:43

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
Aug 7	1450	Started compressor	0		0				40:53
Aug 7	1500		2600		300	122°F	49°C	98°F	41:03
Aug 7	1510	Secured compressor	2600		700	122°F	49°C	99°F	41:13
Aug 8	0800	Checked oil levels, filled fuel tank, started compressor	0	Twin 72	0	91°F	45°C	85°F	41:13
Aug 8	0810		2800		350	110°F	45°C	84°F	41:23
Aug 8	0820	Drained condensate	2600		600	113°F	42°C	86°F	41:33
Aug 8	0830		2200		1000	115°F	45°C	85°F	41:43
Aug 8	0840	Drained condensate	2600		1200	116°F	45°C	86°F	41:53
Aug 8	0850		2600		1500	117°F	45°C	86°F	42:03
Aug 8	0900	Drained condensate	2600		1800	117°F	45°C	87°F	42:13
Aug 8	0910	Secured compressor Drained condensate	2600		2250	116°F	45°C	87°F	42:23
Aug 8	0920	Checked oil levels Started compressor	0		0	107°F	45°C	87°	42:23
Aug 8	0930		2750		400	116°F	45°C	88°F	42:33
Aug 8	0940	Drained condensate	2750	Twin 72	650	117°F	45°C	89°F	42:43
Aug 8	0950		2800		1000	120°F	45°C	90°F	43:53

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
Aug 8	1000	Drained condensate	2800		1250	119°F	48°C	90°F	43:03
Aug 8	1010		2600		1700	120°F	48°C	91°F	43:13
Aug 8	1020	Drained condensate	2600		1800	119°F	48°C	92°F	43:23
Aug 8	1030	Drained condensate Secured compressor	2700		2200	119°F	49°C	91°F	43:33
Aug 8	1045	Refueled, checked oil levels, started compressor	0		0	119°F	49°C	92°F	43:33
Aug 8	1055	Secured for airleak	2600		0				43:43
Aug 8	1110	Started compressor	0		0				
Aug 8	1120		2800		400	120°F	49°C	95°F	43:53
Aug 8	1130	Secured for lunch	2800		700	121°F	49°C	96°F	44:03
Aug 8	1240	Started compressor	0		0				
* Aug 8	1250	Secured compressor Changed filters	2800		300	119°F	50°C	98°F	44:13
Aug 8	1255	Started compressor	0		300				44:13
Aug 8	1305		3200		700	119°F	50°C	97°F	44:23
Aug 8	1310	Secured compressor	3000		750	119°F	50°C	97°F	44:28

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
Aug 11	0810	Check fuel and oil Started compressor	0	Twin 72	0	87°F	35°C	83°F	44:28
Aug 11	0820		3000		100	106°F	35°C	97°F	44:38
Aug 11	0830	Drained condensate	3000		450	110°F	42°C	86°F	44:48
Aug 11	0840		3000		750	110°F	43°C	86°F	44:58
Aug 11	0850	Drained condensate	3000		1100	111°F	44°C	87°C	45:08
Aug 11	0900	Secured compressor Checked fuel and Oil	3000		1350	108°F	45°C	87°F	45:18
Aug 11	0945	Started compressor	1400		1350	99°F	44°C	93°F	45:18
Aug 11	0955	Drained condensate	2900		1500	117°F	45°C	95°F	45:28
Aug 11	1005		2800		1900	117°F	46°C	95°F	45:38
Aug 11	1015	Secured compressor	2800		2250	118°F	47°C	94°F	45:48
Aug 11	1045	Checked fuel and oil Started compressor	0		0	115°F	47°C	93°F	45:48
Aug 11	1055		3000		700	118°F	47°C	88°F	45:58
Aug 11	1105	Drained condensate	2900		1500	119°F	50°C	96°F	46:08
Aug 11	1115	Secured compressor	2900		1700	114°F	49°C	91°F	46:18

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
Aug 12	1250	Checked fuel and oil level Started compressor	0	Twin 72	0	95°F	40°C	93°F	46:18
Aug 12	1300	Drained condensate	3000		150	116°F	45°C	96°F	46:28
Aug 12	1310		3000		500	120°F	50°C	96°F	46:38
Aug 12	1320	Drained condensate	3000		750	121°F	50°C	95°F	46:48
Aug 12	1330		3000		1100	118°F	50°C	96°F	46:58
Aug 12	1340	Drained condensate	3000		1400	122°F	50°C	99°F	47:08
Aug 12	1350		3000		1700	122°F	52°C	99°F	47:18
Aug 12	1400	Drained condensate	2900		2000	121°F	52°C	94°F	47:28
Aug 12	1410	Secured compressor	2800		2250	120°F	54°C	96°F	47:38
Aug 12	1420	Checked fuel and oil Started compressor	0		500	118°F	54°C	96°F	47:38
Aug 12	1430		3000		900	121°F	54°C	95°F	47°48
Aug 12	1440	Drained condensate	2900		1100	122°F	55°C	95°F	47:58
Aug 12	1450		2900		1400	119°F	55°C	92°F	48:08
Aug 12	1500	Secured compressor	2900		1700	118°F	45°C	89°F	48:18

TABLE C-1
OPERATIONAL TEST LOG

Date	Time	Remarks	Filter Back Press.	Tank Used	Tank Press.	Discharge Air Temp.		Ambient Air Temp.	Running Time
						Digitec	Installed		
Aug 13	0820	Started compressor	0	Twin 72	0				48:18
Aug 13	0830		2900		300	111°F	41°C	97°F	48:28
Aug 13	0840	Drained condensate	3000		700	112°F	45°C	94°F	48:38
Aug 13	0850		3000		1100	114°F	45°C	96°F	48:48
Aug 13	0900	Drained condensate	3000		1300	114°	47°C	96°F	48:58
Aug 13	0910		2900		1700	114°F	48°C	96°F	49:08
Aug 13	0920	Drained condensate Secured compressor	2900		1800	114°F	45°C	90°F	49:18
Aug 13	0945	Made checks, started compressor	0	Twin 72	0	99°F	42°C	88°F	49:18
Aug 13	0955		3000		300	115°F	45°C	92°F	49:28
Aug 13	1005	Drained condensate	3000		650	116°F	48°C	99°F	49:38
Aug 13	1015		2900		1000	116°F	45°C	90°F	49:48
Aug 13	1025		2900		1250	114°F	45°C	89°F	49:58
Aug 13	1030		2900		1600	113°F	45°C	91°F	50:08

APPENDIX D

APPLICABLE PORTIONS OF MANUFACTURER'S MANUAL

1. COMPRESSOR function, maintenance

1.1. Operating characteristics

The compressor unit consists of three cylinders and three stages.

Assembly of the unit see Figure 1 and 2.

Piping Scheme

The air flow through the compressor unit is shown on figure 8. Air is drawn in through the telescopic intake – 1 and intake filter – 2, compressed to final pressure in cylinder – 3 – 4 – 5 and recooled by intercoolers – 6 – 7 and aftercooler – 8. The safety valves – 9 – 10 – 11 protect the pressures of the single stages. The operating pressure is readable from gauge – 12. By purification assembly – 13, the compressed air is purified.

The purification assembly – 13, is drained by condensate drain valve – 14. Pressure maintaining valve – 16, keeps the pressure constant within purification assembly – 13. Through filling hose – 17 and filling valve – 18, the compressed and purified air is introduced into the cylinders to be filled.

1.2. Valve heads and valves

The air enters and leaves the cylinder through the valves.

Piston downward = suction stroke = intake valve open, pressure valve closed
Piston upward = compression stroke = intake valve closed, pressure valve open

The valves are subjected to normal wear. Maintenance schedule (item 4) has to be observed. For changing the valves the valve heads have to be disassembled.

First unscrew pressure valve screw from 2 or 3 turns.

Disassembly of intake valve 2nd and 3rd stage with valve tool PN N4555.

Disassembly of pressure valve 2nd and 3rd stage by removing it from the valve head.

Attention: Reassemble pressure valve for 2nd and 3rd stage in the following sequence

- secure valve cover on valve head equally
- tighten torque to approx. 16 ft. lbs (22 Nm) valve screw of pressure valve with 8 mm allen wrench.

1.3. Lubrication

Pistons and driving gear are lubricated by oil thrower pin. Check oil level daily with dipstick.

Oil change should be accomplished while hot through oil drain plug located at the bottom of the compressor.

Replace plug and refill with BAUER Compressor Oil, 14½ fl oz (430 cm^3), PN 059140.

Check oil level with oil dipstick. Oil level has to be at the upper marking. See item 5 for recommended oils.

1.4 Intake filter

The intake filter is a micronic filter. Maintenance includes periodic inspection and blowing out, opposite to the direction of the air intake. Before reassembling, check cover O ring and replace if defective.

1.5. Safety valves

A safety valve is installed in each stage to prevent the stage from over-loading with undue high pressure.

Safety valve 1st stage set to 116 psig (8 bar)
Safety valve 2nd stage set to 1160 psig (80 bar)
Safety valve 3rd stage set to operating pressure required

Should safety valve of 1st or 2nd stage relieve during operation, the respective intermediate pressure is too high. Source of defect is the intake - or pressure valve of the following compression stage.

Disassemble defective valve, clean or exchange, see 1.2

4. Maintenance

4.1. Maintenance schedule	Interval
1 Filter cartridge in filter chambers to be exchanged according to item 3.2 of this manual	H
2 Check oil level	D
3 Oilchange (in compressor)	E, G
4 Telescopic intake correct mounting	C
5 Function of final pressure valve	C
6 Condensate to be drained	A, B, C
7 Condensate drain valve to be checked for air tightness	C
8 Intake filter, O-ringe packing, cap	F
9 Intake filter cartridge	F, G
10 Function and tightness of filling valves	F
11 Check Zero position on final pressure gauge, with depressurized purification assembly	F
12 Check tightness of all tube fittings and fixations	F
13 Check temperature gauge on purification assembly	F
14 Torsion spring axle to be checked for function	F
15 V-belts to be checked for wear and tension	F
16 Valve overhaul	H
17 Maintenance of drive motor/engine according to motor/engine operating manual	-

4.2. Periodicity	Interval
Every 15 minutes during cylinder filling at high humidity	A
Every 30 minutes during cylinder filling	B
Before each cylinder filling	C
Daily	D
After first 25 operating hours	E
Every 25 operating hours to be cleaned and checked	F
Every 125 operating hours to be exchanged	G
Every 500 - 600 operating hours	H

4.3. Trouble shooting

Trouble	Cause	Remede
Motor/engine does not start	*see motor/engine operating manual*	see motor/engine operating manual
Compressor does not reach final pressure	pipes or condensate drain leaking	tighten up, seal
	final pressure safety valve blows off too early	turn out lifting screw cap
	final pressure safety valve defective	exchange valve
Air delivery drops	intake filter soiled	clean filter cartridge or exchange
	pipes leaky	tighten up
	filling valve blows off through ventilation during filling	exchange filling valve
	piston clearance 3rd stage too big	exchange complete piston bushing
Intermediate pressure blows off	intermediate pressure too high, because intake and pressure valve 3rd stage defective	check intake and discharge valve, exchange
	intermediate safety valve leaky	exchange valve
Compressor gets too hot	cooling air supply restrained, ambient temperature too high	check operating site, ambient temperature max 105 F (40 C)
	intake and pressure valve of one stage leaky	check valves, exchange
	sense of rotation incorrect	adjust
Oil taste in the air	filter cartridge used up	exchange cartridge
	unqualified lubricant	change to approved oil
Motor runs non-circular and leaps	V-belts used up	exchange

5. Technical Data

Model	3200 psig/PN 200 bar 5000 psig/PN 300 bar	VG 3 VG 3 H	VE 2 VE 2 H	VE 1 VE 1 H
Number of cylinders		3	3	3
Working process		3stage	3stage	3stage
Cylinder bore mm		60/28/12	60/28/12	60/28/12
Piston stroke mm		15	15	15
Compressor speed rpm		2600	2450	1300
Intermediate pressure	3200 psig/PN 200 bar + 10% 5000 psig/PN 300 bar	80/800 psi (5.5/55 bar)	80/800 psi (5.5/55 bar)	80/800 psi (5.5/55 bar)
		94/942 psi (6.5/65 bar)	94/942 psi (6.5/65 bar)	94/942 psi (6.5/65 bar)
Adjustment of minimum pressure maintaining valve	3200 psig/PN 200 bar + 10% 5000 psig/PN 300 bar	2755 psig (190 bar)	2755 psig (190 bar)	2755 psig (190 bar)
		4060 psig (280 bar)	4060 psig (280 bar)	4060 psig (280 bar)
Actual tank filling capacity[1] cfm (l/min)		2.3 (64)	1.87 (53)	.88 (25)
Standard engine/motor		4-stroke Briggs & Stratton	Three phase 230-460 V 60 Hz	single phase a.c. 115-230 V/60 Hz
Nominal power of engine/motor		3 HP (2.2 kW)	2 HP (1.5 kW)	1 HP (0.75 kW)
Filling capacity of compressor (fl. oz) (cm³)		14 oz (430)	14 oz (430)	14 oz (430)
Oil: summer winter		above +50 F (+10 C) SAE 30 +50 F (+10 C) to +5 F (-15 C) SAE 20		
Approved oil brands		BAUER Compressor Oil BAUER Synthetic Compr. Oil	Mobil Delvac 1200 Series Tenneco-Anderol 750	

[1] measured bottle filling 0 to 3,000 psig + 5%


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