



## PERFORMANCE TEST RESULTS

CLIENT	:	Air Products Manufacturing LLC
PROJECT NAME/NO.	:	WEP Renewables
CLIENT PO NO	:	4505605360
HMD DOCUMENT NO	:	HMD-4505605360-K01-02
CLIENT DOCUMENT NO	:	
HMD PUMP NO	:	839917 A/B
EQUIPMENT TAG NO	:	18-P-252 A/B

0	05/01/2023	ISSUE FOR REVIEW	GC	AFS	AFS
REV	DATE	DESCRIPTION	PREPARED BY	CHECKED BY	APPROVED BY

**NOTE:**

**HMD SEAL/LESS PUMP H/Q/P PERFORMANCE TEST SHEET**

HMD SEAL/LESS PUMPS LTD.  
 HAMPDEN PARK INDUSTRIAL ESTATE  
 EASTBOURNE,  
 EAST SUSSEX  
 BN22 9AN  
 ENGLAND

TELEPHONE : (01323) 452000  
 FAX : (01323) 503369  
 EMAIL : pumps@hmdpumps.com

<b>CLIENT:</b>	Air Products Manufacturing LLC	<b>ORDER N°:</b>	4505605360
<b>HMD JOB N°:</b>	839917A	<b>PUMP SPEED:</b>	3520 RPM
<b>PUMP MODEL:</b>	GSP 1.5x1x8-L DA2 ZL (40 Bar)	<b>IMPELLER DIA:</b>	7.80 Inches
<b>ORIFICE PLATE:</b>	Inches	<b>ITEM NUMBER:</b>	18-P-252A
<b>BALANCE KEYS:</b>		<b>BALANCE HOLES:</b>	5@5 mm
<b>DUTY REQUIREMENTS:-</b>		<b>LIQUID DETAILS:-</b>	
<b>DUTY FLOW:</b>	46.23 (US)GPM	<b>LIQUID PUMPED:</b>	Ammonia Stripper Reflux
<b>DUTY HEAD:</b>	247.05 FT	<b>SG:</b>	0.840
<b>HYD TEST PRESSURE:</b>	870 PSI	<b>TEMPERATURE:</b>	170 ° F
<b>JACKET TEST PRESS:</b>	PSI	<b>VISCOSITY:</b>	0.29 cSt
<b>NPSHA:</b>	16.40 FT		
<b>MOTOR DETAILS:-</b>		<b>SERIAL N°:</b>	Z22053 10287
<b>MANUFACTURER:</b>	Baldor	<b>RATED PWR:</b>	15.00 HP
<b>SUPPLIED BY:</b>	HMD	<b>FRAME SIZE:</b>	256 T
<b>RATED SPEED:</b>	3520 RPM	<b>QUOTED ABS PWR:</b>	9.39 HP
<b>SUPPLY:</b>	460 V / 3~ / 60 Hz		

**PERFORMANCE TESTED TO : API 685**

READING	1	2	3	4	5	6	7	8
FLOW in (GPM)	0.00	10.74	28.49	43.92	46.23	99.95		
DIFFERENTIAL HEAD in FT	268.37	263.38	256.09	245.14	243.64	172.85		
POWER (hp)	6.71	7.24	8.18	8.98	9.12	11.94		
PUMP EFFICIENCY	0.00	9.87	22.52	30.26	31.19	36.55		
Discharge readings M H2O	82.50	80.90	78.00	73.60	72.90	44.25		
Correction gauge FLC	270.67	265.42	255.91	241.47	239.17	145.18		
Suction Head M H2O	1.00	1.00	0.80	0.50	0.40	-1.30		
Correction gauge FLC	3.28	3.28	2.62	1.64	1.31	-4.27		
Wattmetre reading (hp)	6.71	7.24	8.18	8.98	9.12	11.94		
Motor Efficiency (%)	100.0	100.0	100.0	100.0	100.0	100.0		
Motor speed rpm	3520	3520	3520	3520	3520	3520		
Impeller speed rpm	3520	3520	3520	3520	3520	3520		
Slip rpm	0	0	0	0	0	0		
Thrust (lbs)								
Datum correction (FT)	0.98	0.98	0.98	0.98	0.98	0.98		
Suction Bore (INCHES)	1.50	1.50	1.50	1.50	1.50	1.50		
Discharge Bore (INCHES)	0.98	0.98	0.98	0.98	0.98	0.98		
vel suc <sup>2</sup> /2 x g (FLC)	0.000	0.060	0.420	0.998	1.106	5.170		
vel dis <sup>2</sup> /2 x g (FLC)	0.000	0.319	2.242	5.329	5.904	27.596		

TESTED BY : T FEAR

SIGNATURE 

FOR : Air Products Manufacturing LLC

DATE OF TEST : 19-Nov-22

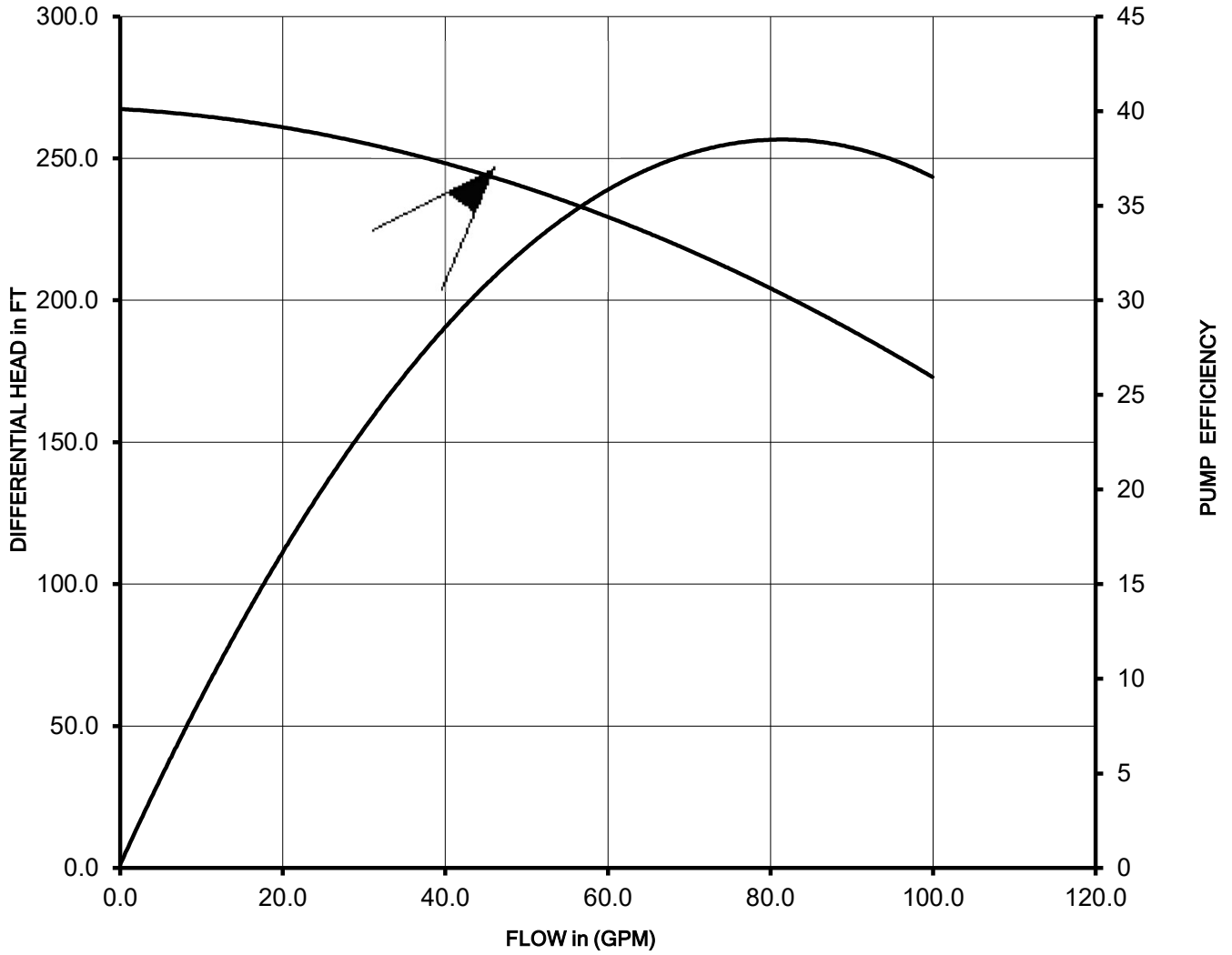
WITNESSED BY :

SIGNATURE .....

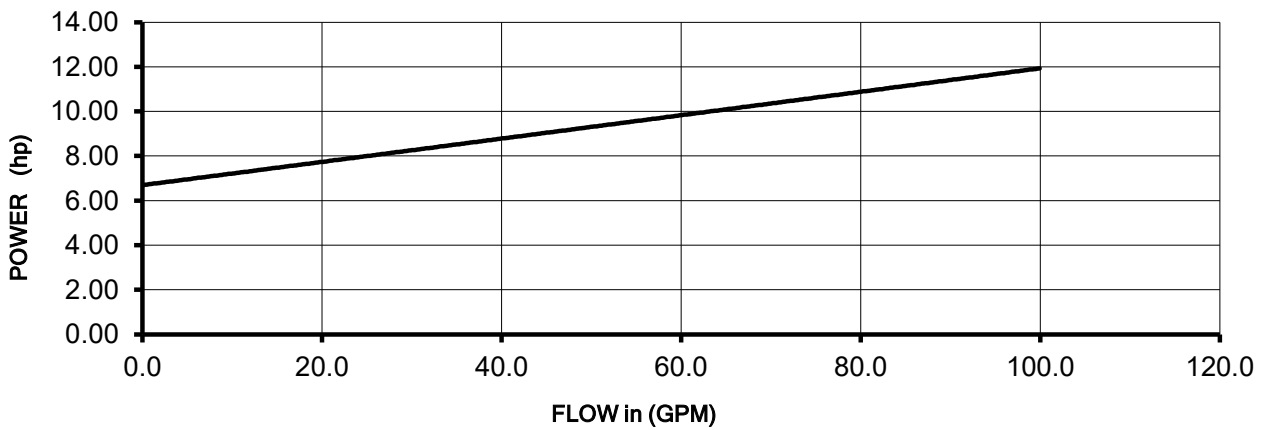
**Pump Model:** GSP 1.5x1x8-L DA2 ZL (40 Bar)  
**Speed:** 3520 **RPM**  
**Impeller Dia:** 7.80 **Inches**  
**Orifice Plate:** **Inches**

**HMD Serial No:** 839917A  
**Item No:** 18-P-252A

**HQ PERFORMANCE CURVE**



**POWER CURVE**



**HMD SEAL/LESS PUMP H/Q/P SG CORR PERFORMANCE TEST SHEET**

HMD SEAL/LESS PUMPS LTD.  
HAMPDEN PARK INDUSTRIAL ESTATE  
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ENGLAND

TELEPHONE : (01323) 452000  
FAX : (01323) 503369  
EMAIL : pumps@hmdpumps.com

<b>CLIENT:</b>	Air Products Manufacturing LLC	<b>ORDER N°:</b>	4505605360
<b>HMD JOB N°:</b>	839917A	<b>PUMP SPEED:</b>	3520 RPM
<b>PUMP MODEL:</b>	GSP 1.5x1x8-L DA2 ZL (40 Bar)	<b>IMPELLER DIA:</b>	7.80 Inches
<b>ORIFICE PLATE:</b>	Inches	<b>ITEM NUMBER:</b>	18-P-252A
<b>BALANCE KEYS:</b>		<b>BALANCE HOLES:</b>	5@5 mm
<b>DUTY REQUIREMENTS:-</b>		<b>LIQUID DETAILS:-</b>	
<b>DUTY FLOW:</b>	46.23 (US)GPM	<b>LIQUID PUMPED:</b>	Ammonia Stripper Reflux
<b>DUTY HEAD:</b>	247.05 FT	<b>SG:</b>	0.840
<b>HYD TEST PRESSURE:</b>	870 PSI	<b>TEMPERATURE:</b>	170 ° F
<b>JACKET TEST PRESS:</b>	PSI	<b>VISCOSITY:</b>	0.29 cSt
<b>NPSHA:</b>	16.40 FT		
<b>MOTOR DETAILS:-</b>		<b>SERIAL N°:</b>	Z22053 10287
<b>MANUFACTURER:</b>	Baldor	<b>RATED PWR:</b>	15.00 HP
<b>SUPPLIED BY:</b>	HMD	<b>FRAME SIZE:</b>	256 T
<b>RATED SPEED:</b>	3520 RPM	<b>QUOTED ABS PWR:</b>	9.39
<b>SUPPLY:</b>	460 V / 3~ / 60 Hz		

**PERFORMANCE TESTED TO : API 685**

READING	PUMP PERFORMANCE ON SITE SG (Ammonia Stripper Reflux) - NOT VISC CORRECTED							
	1	2	3	4	5	6	7	8
FLOW in (GPM)	0.00	10.74	28.49	43.92	46.23	99.95		
DIFFERENTIAL HEAD in FT	268.37	263.38	256.09	245.14	243.64	172.85		
POWER (hp)	5.63	6.08	6.87	7.55	7.66	10.03		
PUMP EFFICIENCY	0.00	9.87	22.52	30.26	31.19	36.55		

READING	PUMP PERFORMANCE ON SITE SG AND VISCOSITY (Ammonia Stripper Reflux)							
	1	2	3	4	5	6	7	8
FLOW in (GPM)	0.00	10.74	28.49	43.92	46.23	99.95		
DIFFERENTIAL HEAD in FT	268.37	263.38	256.09	245.14	243.64	172.85		
POWER (hp)	5.63	6.08	6.87	7.55	7.66	10.03		
PUMP EFFICIENCY	0.00	9.87	22.52	30.26	31.19	36.55		

Note:

All pump efficiency figures stated are OVERALL and include magnetic coupling loss.

Viscosity Correction Factors	
Cq =	1.00
Ch =	1.00
Ce =	1.00

TESTED BY : T FEAR

SIGNATURE 

FOR : Air Products Manufacturing LLC

DATE OF TEST : 19-Nov-22

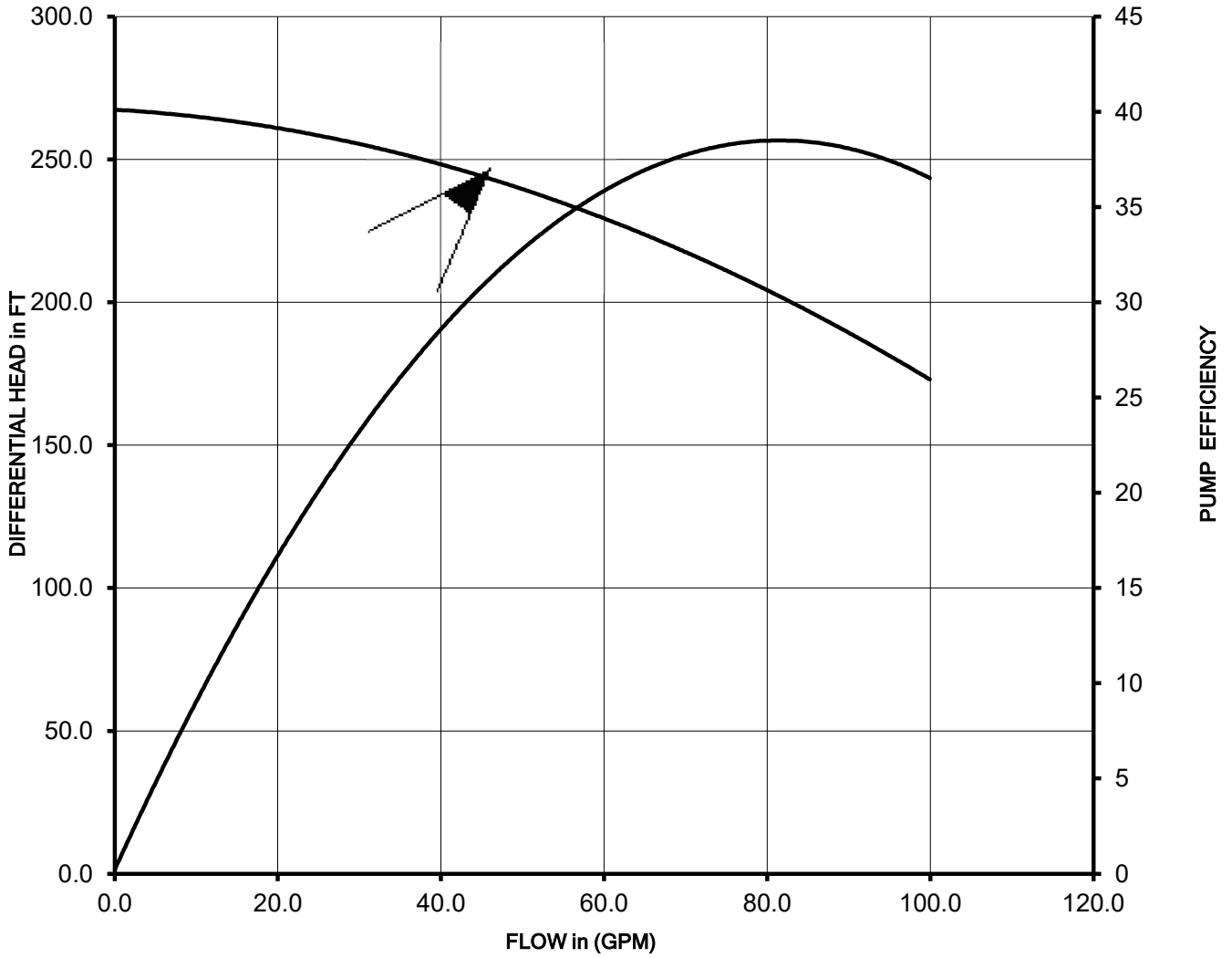
WITNESSED BY : \_\_\_\_\_

SIGNATURE .....

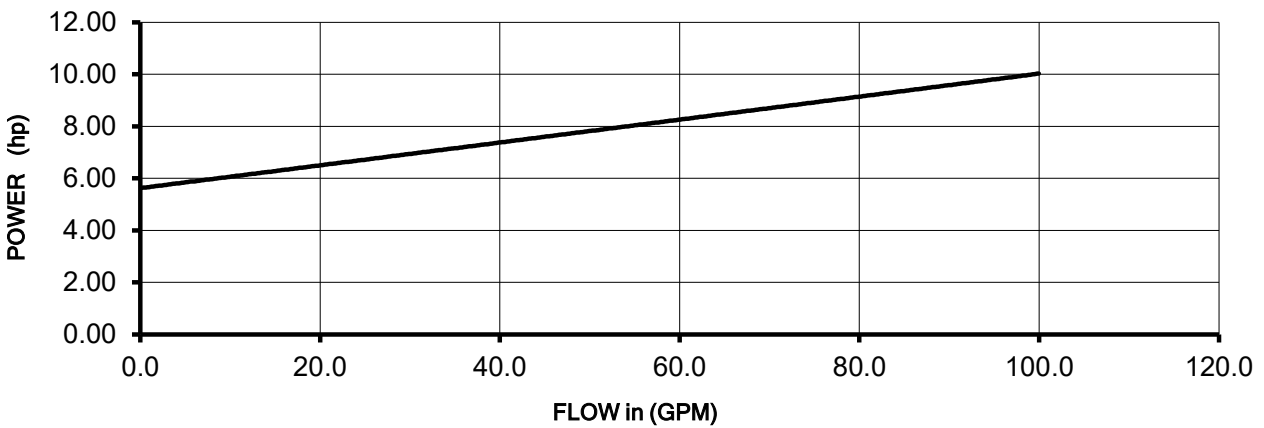
**Pump Model:** GSP 1.5x1x8-L DA2 ZL (40 Bar)  
**Speed:** 3520 **RPM**  
**Impeller Dia:** 7.80 **Inches**  
**Orifice Plate:** **Inches**

**HMD Serial No:** 839917A  
**Item No:** 18-P-252A

**HQ PERFORMANCE CURVE CORRECTED FOR SITE CONDITIONS**



**POWER CURVE CORRECTED FOR SITE CONDITIONS**



## HMD SEAL/LESS PUMP NOISE TEST SHEET

HMD SEAL/LESS PUMPS LTD.  
 HAMPDEN PARK INDUSTRIAL ESTATE  
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 ENGLAND

TELEPHONE : (01323) 452 000  
 FAX : (01323) 503369  
 EMAIL : pumps@hmdpumps.com

<b>CLIENT :</b>	Air Products Manufacturing LLC
<b>CLIENT ORDER N° :</b>	4 505605360
<b>CLIENT ITEM N° :</b>	839917A
<b>HMD JOB N° :</b>	18-P-252A

<b>PUMP UNIT TESTED :-</b>	<b>DESCRIPTION :-</b>	
	<b>PUMP MODEL :</b>	GSP 1.5x1x8-L DA2 ZL (40 Bar)
	<b>DUTY FLOW :</b>	46.23 <b>GPM</b>
	<b>DUTY HEAD :</b>	247.05 <b>FT</b>

<b>MOTOR DETAILS :-</b>	<b>DESCRIPTION :-</b>	
	<b>RATED SPEED :</b>	3520 <b>RPM</b>
	<b>RATED POWER :</b>	15.00 <b>HP</b>
	<b>SUPPLY :</b>	460 V / 3~ / 60 Hz
	<b>SERIAL N° :</b>	222053 10287
	<b>MANUFACTURER :</b>	Baldor

<b>ACOUSTIC CONTROL DEVICES :-</b>	<b>DESCRIPTION :-</b>	

<b>MEASURING EQUIPMENT :-</b>	<b>DESCRIPTION :-</b>	
	<b>SOUND METER :</b>	Bruel&Kjaer
	<b>SERIAL N° :</b>	NV01

**TEST RESULTS :-** (dBA VALUES)  
 (AT DUTY POINT)

MICROPHONE POSITION	OVERALL	62.5	125	250	500	1k	2k	4k	8k
1	78.50	35.00	54.40	63.00	64.70	72.50	73.20	72.80	69.10
2	77.80	37.90	47.90	59.40	64.60	70.10	71.50	73.90	68.30
3	76.60	35.30	49.80	62.90	62.90	69.00	71.00	72.20	66.80
4	76.90	33.80	48.10	57.00	64.30	69.40	70.80	72.70	67.60
5	76.40	37.20	50.30	63.70	63.70	69.40	71.50	70.90	65.10
<b>BACKGROUND NOISE, POST TEST</b>	56.50	30.90	38.30	49.80	49.80	51.00	48.90	43.90	33.90

MEASURED SOUND PRESSURE LEVEL AVERAGED OVER SURFACE MEASURED	77.24
BACKGROUND SOUND PRESSURE LEVEL AVERAGED OVER MEASURED SURFACE	56.50
BACKGROUND NOISE CORRECTION	0.00
TEST ENVIRONMENT NOISE CORRECTION - BASED ON ISO 3744	-6.90
CORRECTION FOR SET-UP (EG. TEST PIPING, VALVES, BASEPLATE ETC)	
<b>CORRECTED SOUND PRESSURE LEVEL AVERAGED OVER MEASURED SURFACE</b>	<b>70.34</b>

**COMMENTS :-**

<b>TESTED BY :</b> M Wheeler	<b>SIGNATURE</b>
<b>FOR :</b> Air Products Manufacturing LLC	<b>DATE OF TEST :</b> 18-Nov-22
<b>WITNESSED BY :</b>	<b>SIGNATURE</b> .....

## HMD SEAL/LESS PUMP VIBRATION TEST SHEET

HMD SEAL/LESS PUMPS LTD.  
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ENGLAND

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FAX : (01323) 503369  
EMAIL : pumps@hmdpumps.com

CLIENT :	Air Products Manufacturing LLC
CLIENT ORDER N° :	4505605360
CLIENT ITEM N° :	839917A
HMD JOB N° :	18-P-252A

<b>PUMP UNIT TESTED :-</b>	<b>DESCRIPTION :-</b>	
	PUMP MODEL :	GSP 1.5x1x8-L DA2 ZL (40 Bar)
	DUTY FLOW :	46.23 GPM
	DUTY HEAD :	247.05 FT

<b>MOTOR DETAILS :-</b>	<b>DESCRIPTION :-</b>	
	RATED SPEED :	3520 RPM
	RATED POWER :	15.00 Hp
	SUPPLY :	460 V / 3~ / 60 Hz
	SERIAL N° :	222053 10287
	MANUFACTURER :	Baldor

<b>ISOLATION DEVICES :-</b>	<b>DESCRIPTION :-</b>	
	MOUNTING TYPE :	
	NUMBER OF MOUNTS :	
	NOISE SHEILDING :	
	CONNECTIONS	

<b>MEASURING EQUIPMENT :-</b>	<b>DESCRIPTION :-</b>	
	ACCELEROMETER :	VIB2
	SERIAL N° :	5146
	FIXING METHOD :	

**TEST RESULTS :-** READINGS TAKEN AS R.M.S

### VIBRATION LEVEL (inches/s)

TEST POINT	1	2	3	4	5	6	7	8
FLOW	10.74	28.49	43.94	46.23	99.95			
VERTICAL- V <sub>1</sub>	0.04	0.05	0.05	0.05	0.05			
TRANSVERSE- H <sub>1</sub>	0.06	0.07	0.06	0.07	0.06			
AXIAL- A	0.02	0.02	0.03	0.02	0.02			
VERTICAL- V <sub>2</sub>	0.04	0.04	0.04	0.04	0.04			
TRANSVERSE- H <sub>2</sub>	0.07	0.07	0.07	0.07	0.07			

**COMMENTS :-**

TESTED BY : M Wheeler

SIGNATURE 

FOR : Air Products Manufacturing LLC

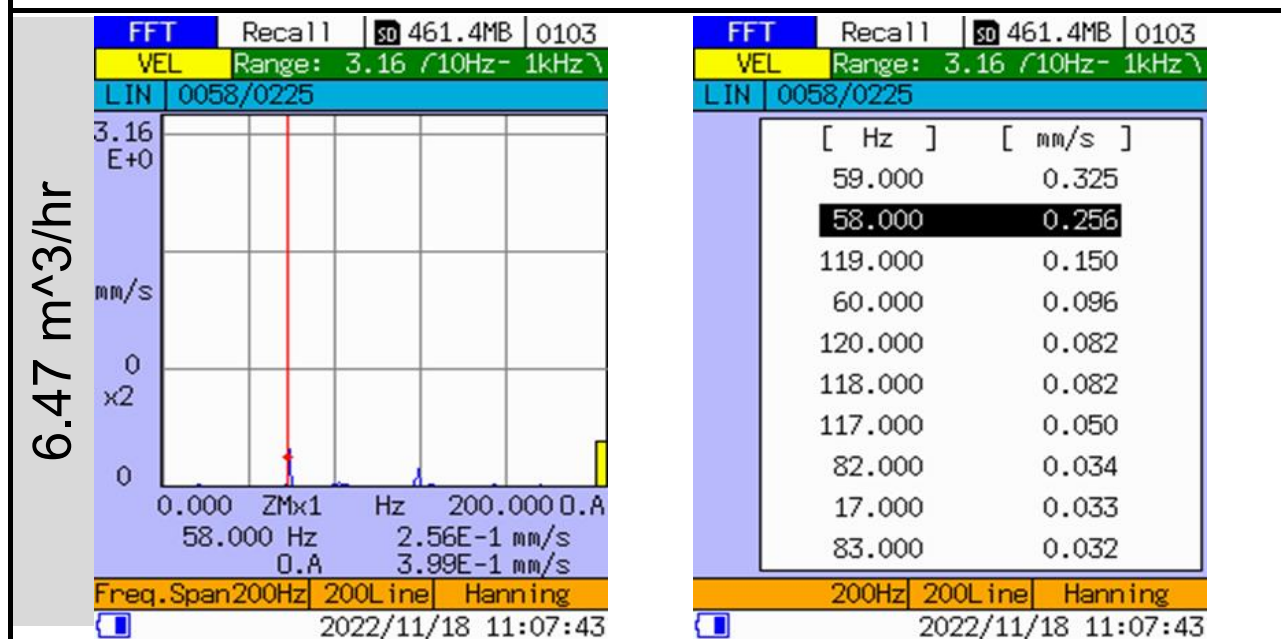
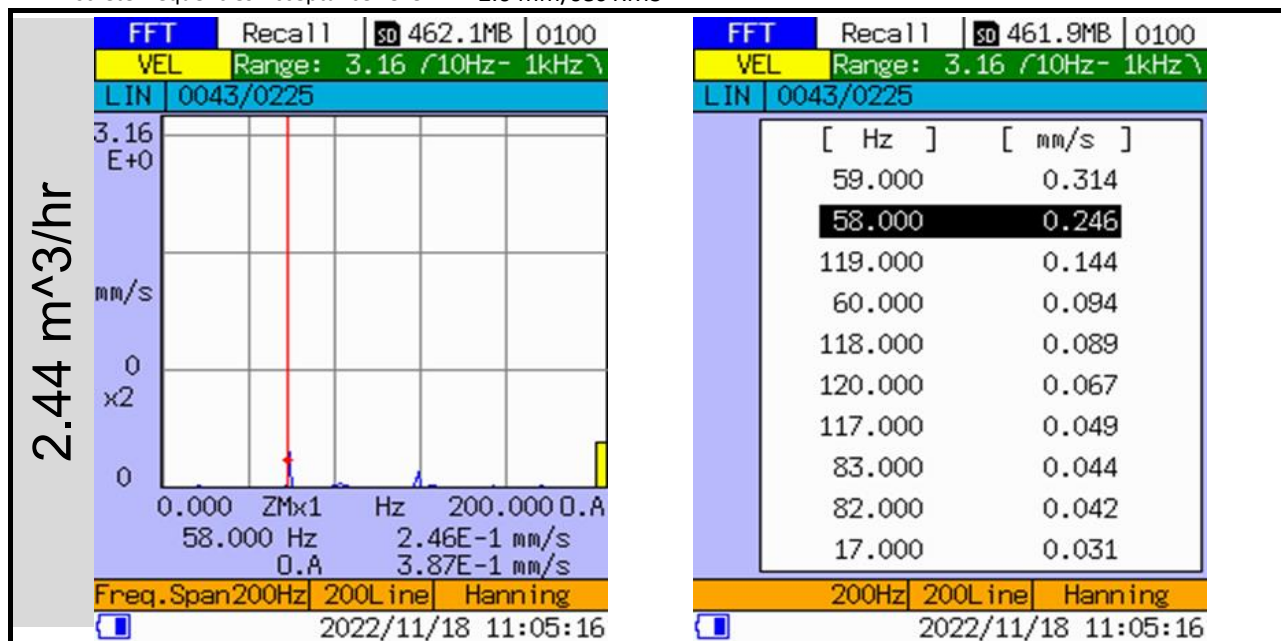
DATE OF TEST : 18-Nov-22



## HMD Kontro

### FFT VIBRATION TEST REPORT ON:

Customer: AIR PRODUCTS MANUFACTURING  
 Pump / Item No: 839917 A  
 Instrument used: Vibration Analyser, model VA-12 serial no.00990032  
 Date: 17 November 2022  
 Sensor location & Position: Bearing housing & Axial  
 Pump rotational speed: 3520 rpm 60Hz  
 API 685 Acceptance levels: <3.0 mm/sec RMS (Overall)  
 Discrete frequencies Acceptance Level: <2.0 mm/sec RMS



Tested by: M Wheeler

Sign:

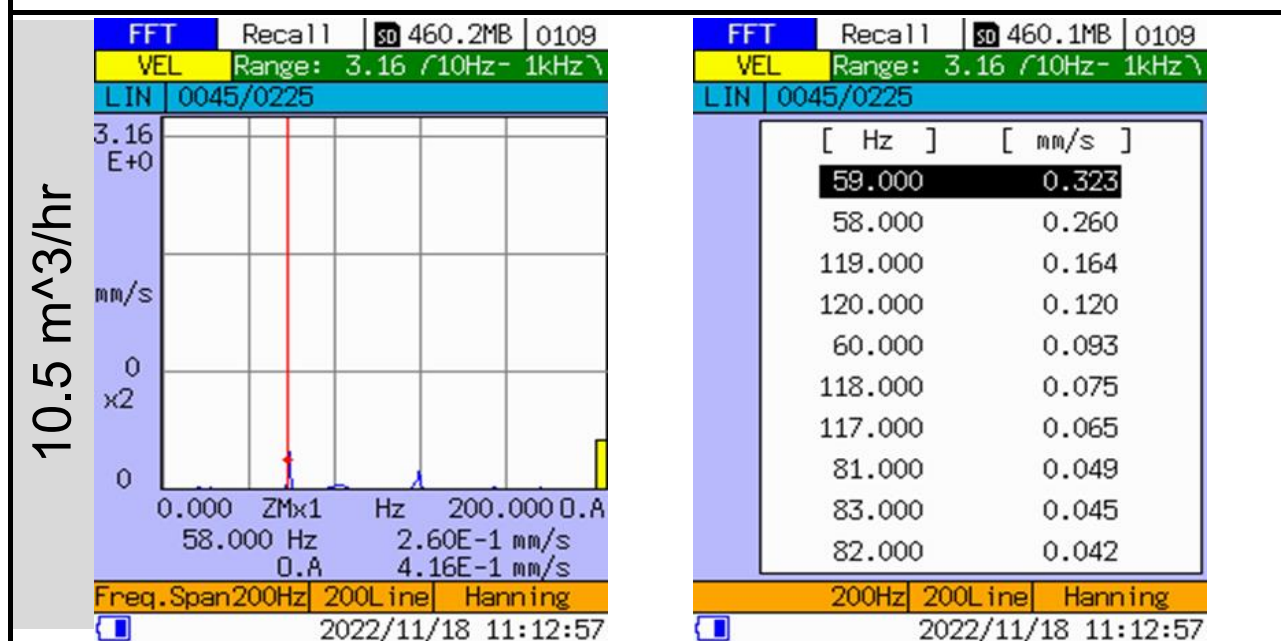
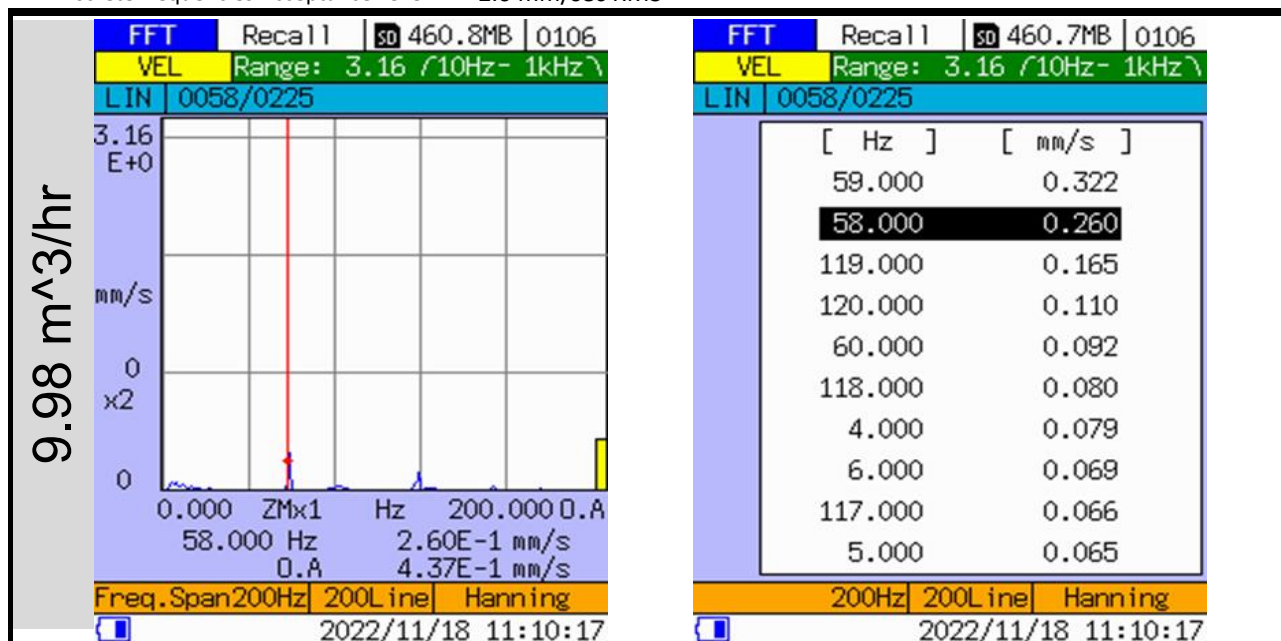




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Tested by: M Wheeler

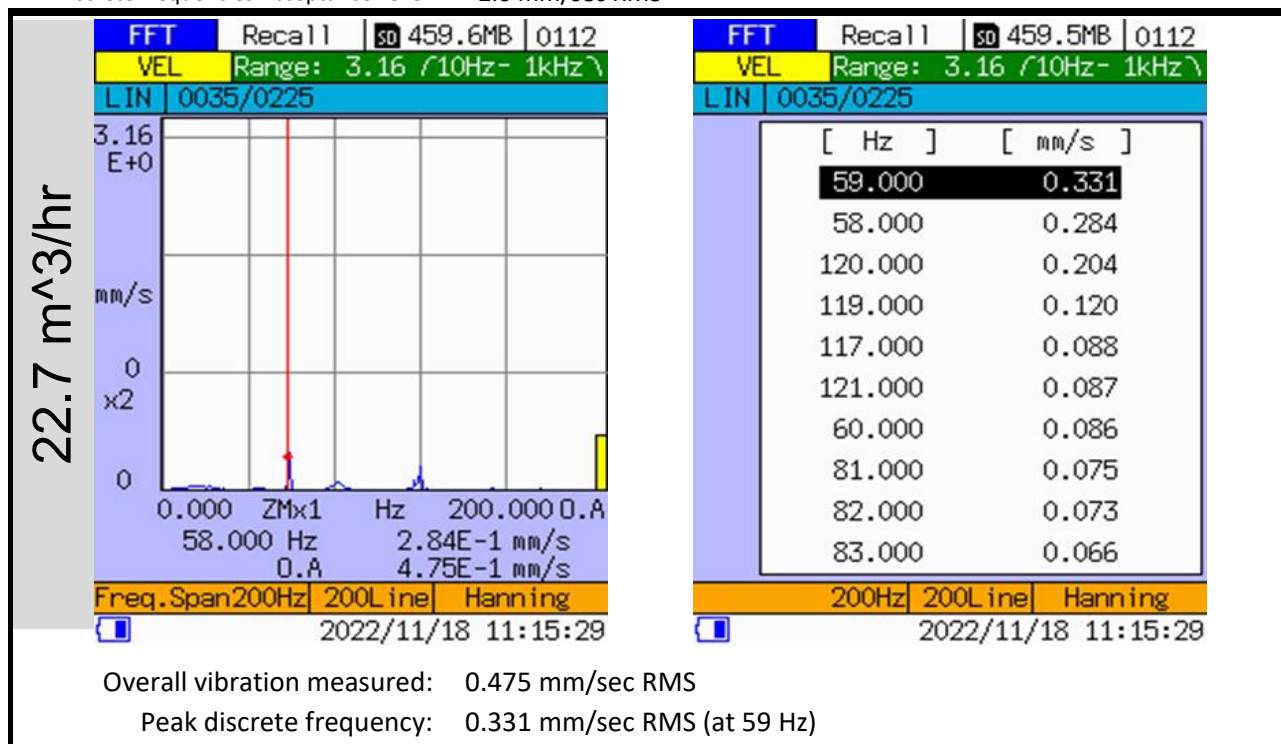
Sign:



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Tested by: M Wheeler

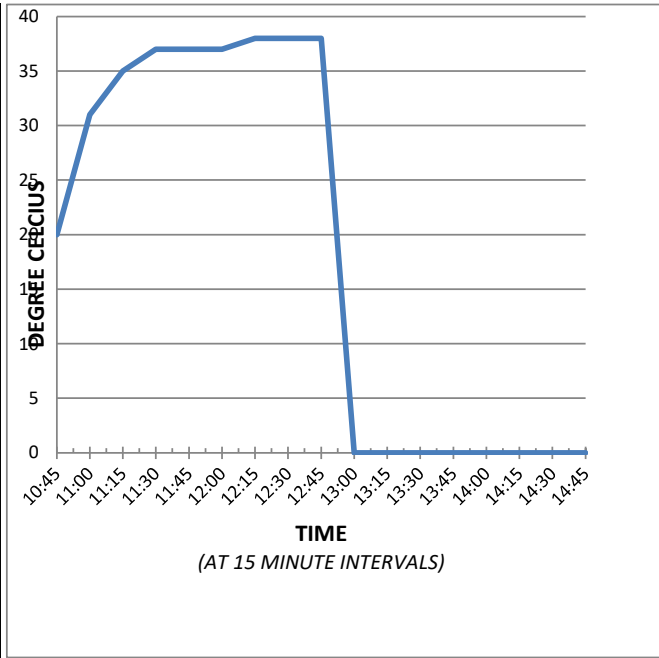
Sign:



**BEARING TEMPERATURE RISE CERTIFICATE**

**Customer:** Air Products Manufacturing LLC  
**Pump / Item No:** 839917A  
**Instrument/Re-Calibration Date:** InfraRed Thermometer: IR01  
**Date:** 18 November 2022  
**Sensor location:** Bearing housing  
**Pump rotational speed:** 3520  
**Pump Test Start Time:** 10:45

TEST TIMES:	TEMPERATURE: S/T
10:45	20
11:00	31
11:15	35
11:30	37
11:45	37
12:00	37
12:15	38
12:30	38
12:45	38
13:00	
13:15	
13:30	
13:45	
14:00	
14:15	
14:30	
14:45	



38

TESTED BY : M Wheeler

SIGNATURE: *M Wheeler*

1498

FOR : Air Products Manufacturing LLC

WITNESSED BY : \_\_\_\_\_

SIGNATURE: .....

**HMD SEAL/LESS PUMP H/Q/P PERFORMANCE TEST SHEET**

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<b>CLIENT:</b>	Air Products Manufacturing LLC	<b>ORDER N°:</b>	4505605360
<b>HMD JOB N°:</b>	839917B	<b>PUMP SPEED:</b>	3520 RPM
<b>PUMP MODEL:</b>	GSP 1.5x1x8-L DA2 ZL (40 Bar)	<b>IMPELLER DIA:</b>	7.80 Inches
<b>ORIFICE PLATE:</b>	Inches	<b>ITEM NUMBER:</b>	18-P-252B
<b>BALANCE KEYS:</b>		<b>BALANCE HOLES:</b>	
<b>DUTY REQUIREMENTS:-</b>		<b>LIQUID DETAILS:-</b>	
<b>DUTY FLOW:</b>	46.23 (US)GPM	<b>LIQUID PUMPED:</b>	Ammonia Stripper Reflux
<b>DUTY HEAD:</b>	247.05 FT	<b>SG:</b>	0.840
<b>HYD TEST PRESSURE:</b>	870 PSI	<b>TEMPERATURE:</b>	170 ° F
<b>JACKET TEST PRESS:</b>	PSI	<b>VISCOSITY:</b>	0.29 cSt
<b>NPSHA:</b>	16.40 FT		
<b>MOTOR DETAILS:-</b>		<b>SERIAL N°:</b>	Z22053 10292
<b>MANUFACTURER:</b>	Baldor	<b>RATED PWR:</b>	15.00 HP
<b>SUPPLIED BY:</b>	HMD	<b>FRAME SIZE:</b>	256 T
<b>RATED SPEED:</b>	3520 RPM	<b>QUOTED ABS PWR:</b>	9.39 HP
<b>SUPPLY:</b>	460 V / 3~ / 60 Hz		

**PERFORMANCE TESTED TO : API 685**

READING	1	2	3	4	5	6	7	8
FLOW in (GPM)	0.00	10.74	28.49	43.92	46.23	99.95		
DIFFERENTIAL HEAD in FT	263.45	258.79	252.48	246.13	243.32	184.17		
POWER (hp)	6.57	7.11	8.05	8.85	9.12	11.80		
PUMP EFFICIENCY	0.00	9.88	22.57	30.84	31.15	39.39		
Discharge readings M H2O	81.00	79.50	77.00	74.00	73.00	48.00		
Correction gauge FLC	265.75	260.83	252.62	242.78	239.50	157.48		
Suction Head M H2O	1.00	1.00	0.90	0.60	0.60	-1.00		
Correction gauge FLC	3.28	3.28	2.95	1.97	1.97	-3.28		
Wattmetre reading (hp)	6.57	7.11	8.05	8.85	9.12	11.80		
Motor Efficiency (%)	100.0	100.0	100.0	100.0	100.0	100.0		
Motor speed rpm	3520	3520	3520	3520	3520	3520		
Impeller speed rpm	3520	3520	3520	3520	3520	3520		
Slip rpm	0	0	0	0	0	0		
Thrust (lbs)								
Datum correction (FT)	0.98	0.98	0.98	0.98	0.98	0.98		
Suction Bore (INCHES)	1.50	1.50	1.50	1.50	1.50	1.50		
Discharge Bore (INCHES)	0.98	0.98	0.98	0.98	0.98	0.98		
vel suc <sup>2</sup> /2 x g (FLC)	0.000	0.060	0.420	0.998	1.106	5.170		
vel dis <sup>2</sup> /2 x g (FLC)	0.000	0.319	2.242	5.329	5.904	27.596		

TESTED BY : T FEAR

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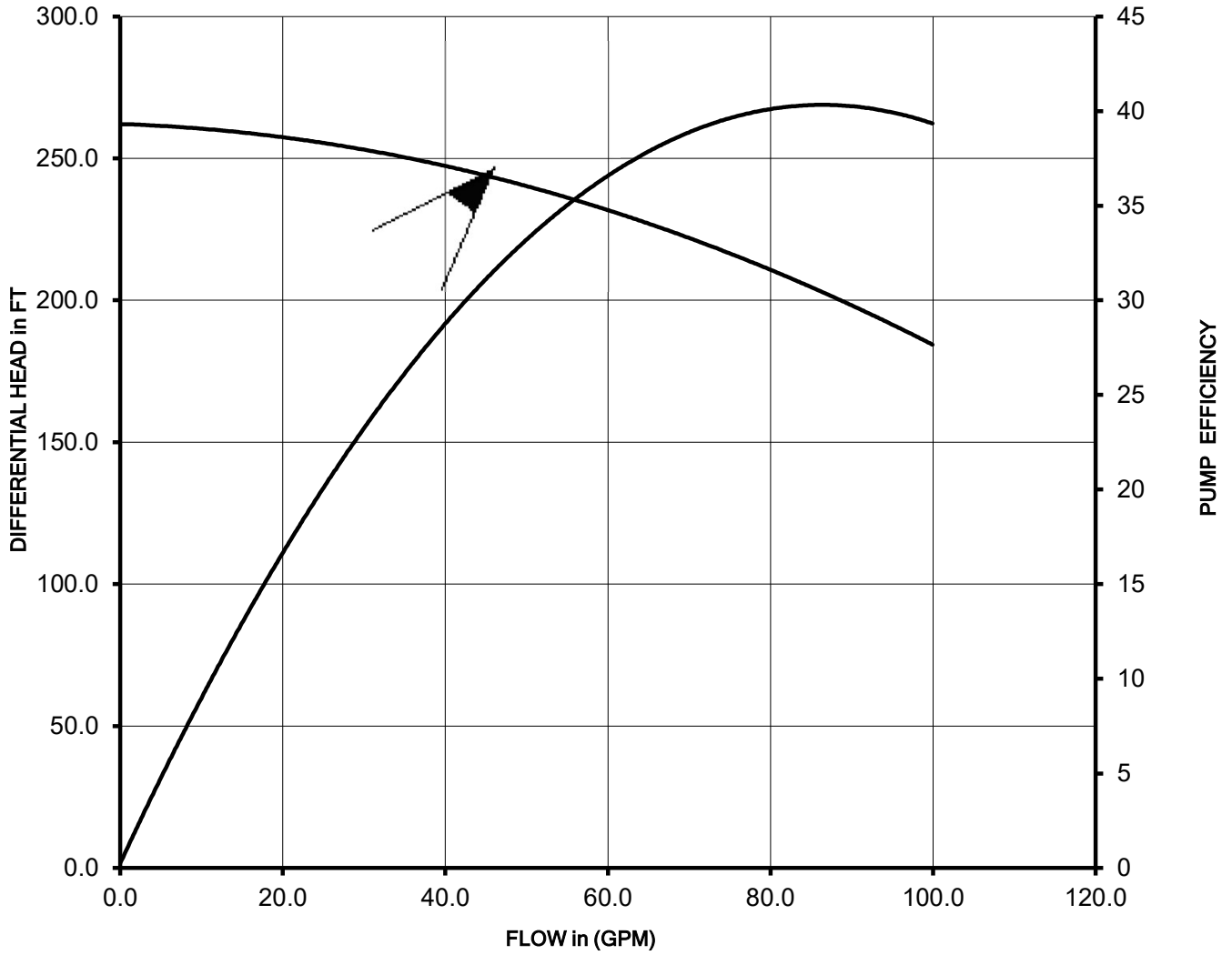
WITNESSED BY :

SIGNATURE .....

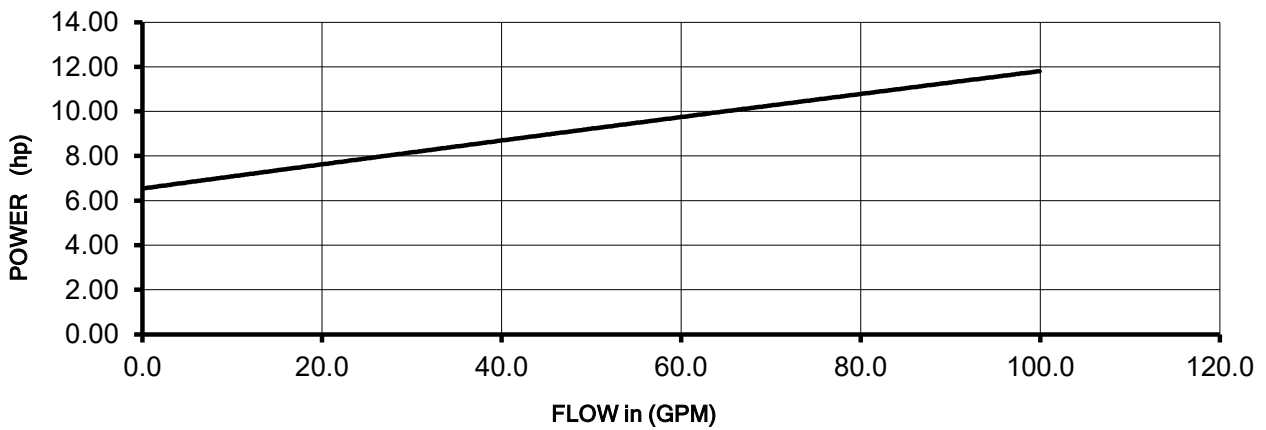
**Pump Model:** GSP 1.5x1x8-L DA2 ZL (40 Bar)  
**Speed:** 3520 **RPM**  
**Impeller Dia:** 7.80 **Inches**  
**Orifice Plate:** **Inches**

**HMD Serial No:** 839917B  
**Item No:** 18-P-252B

**HQ PERFORMANCE CURVE**



**POWER CURVE**



## HMD SEAL/LESS PUMP H/Q/P SG CORR PERFORMANCE TEST SHEET

HMD SEAL/LESS PUMPS LTD.  
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<b>CLIENT:</b>	Air Products Manufacturing LLC	<b>ORDER N°:</b>	4505605360
<b>HMD JOB N°:</b>	839917B	<b>PUMP SPEED:</b>	3520 RPM
<b>PUMP MODEL:</b>	GSP 1.5x1x8-L DA2 ZL (40 Bar)	<b>IMPELLER DIA:</b>	7.80 Inches
<b>ORIFICE PLATE:</b>	Inches	<b>ITEM NUMBER:</b>	18-P-252B
<b>BALANCE KEYS:</b>		<b>BALANCE HOLES:</b>	
<b>DUTY REQUIREMENTS:-</b>		<b>LIQUID DETAILS:-</b>	
<b>DUTY FLOW:</b>	46.23 (US)GPM	<b>LIQUID PUMPED:</b>	Ammonia Stripper Reflux
<b>DUTY HEAD:</b>	247.05 FT	<b>SG:</b>	0.840
<b>HYD TEST PRESSURE:</b>	870 PSI	<b>TEMPERATURE:</b>	170 ° F
<b>JACKET TEST PRESS:</b>	PSI	<b>VISCOSITY:</b>	0.29 cSt
<b>NPSHA:</b>	16.40 FT		
<b>MOTOR DETAILS:-</b>		<b>SERIAL N°:</b>	
<b>MANUFACTURER:</b>	Baldor	<b>RATED PWR:</b>	15.00 HP
<b>SUPPLIED BY:</b>	HMD	<b>FRAME SIZE:</b>	256 T
<b>RATED SPEED:</b>	3520 RPM	<b>QUOTED ABS PWR:</b>	9.39
<b>SUPPLY:</b>	460 V / 3~ / 60 Hz		

**PERFORMANCE TESTED TO : API 685**

READING	PUMP PERFORMANCE ON SITE SG (Ammonia Stripper Reflux) - NOT VISC CORRECTED							
	1	2	3	4	5	6	7	8
<b>FLOW in (GPM)</b>	0.00	10.74	28.49	43.92	46.23	99.95		
<b>DIFFERENTIAL HEAD in FT</b>	263.45	258.79	252.48	246.13	243.32	184.17		
<b>POWER (hp)</b>	5.52	5.97	6.76	7.43	7.66	9.91		
<b>PUMP EFFICIENCY</b>	0.00	9.88	22.57	30.84	31.15	39.39		

READING	PUMP PERFORMANCE ON SITE SG AND VISCOSITY (Ammonia Stripper Reflux)							
	1	2	3	4	5	6	7	8
<b>FLOW in (GPM)</b>	0.00	10.74	28.49	43.92	46.23	99.95		
<b>DIFFERENTIAL HEAD in FT</b>	263.45	258.79	252.48	246.13	243.32	184.17		
<b>POWER (hp)</b>	5.52	5.97	6.76	7.43	7.66	9.91		
<b>PUMP EFFICIENCY</b>	0.00	9.88	22.57	30.84	31.15	39.39		

Note:  
 All pump efficiency figures stated are OVERALL and include magnetic coupling loss.

Viscosity Correction Factors	
Cq =	1.00
Ch =	1.00
Ce =	1.00

**TESTED BY :** T FEAR

**FOR :** Air Products Manufacturing LLC

**WITNESSED BY :** \_\_\_\_\_

**SIGNATURE**

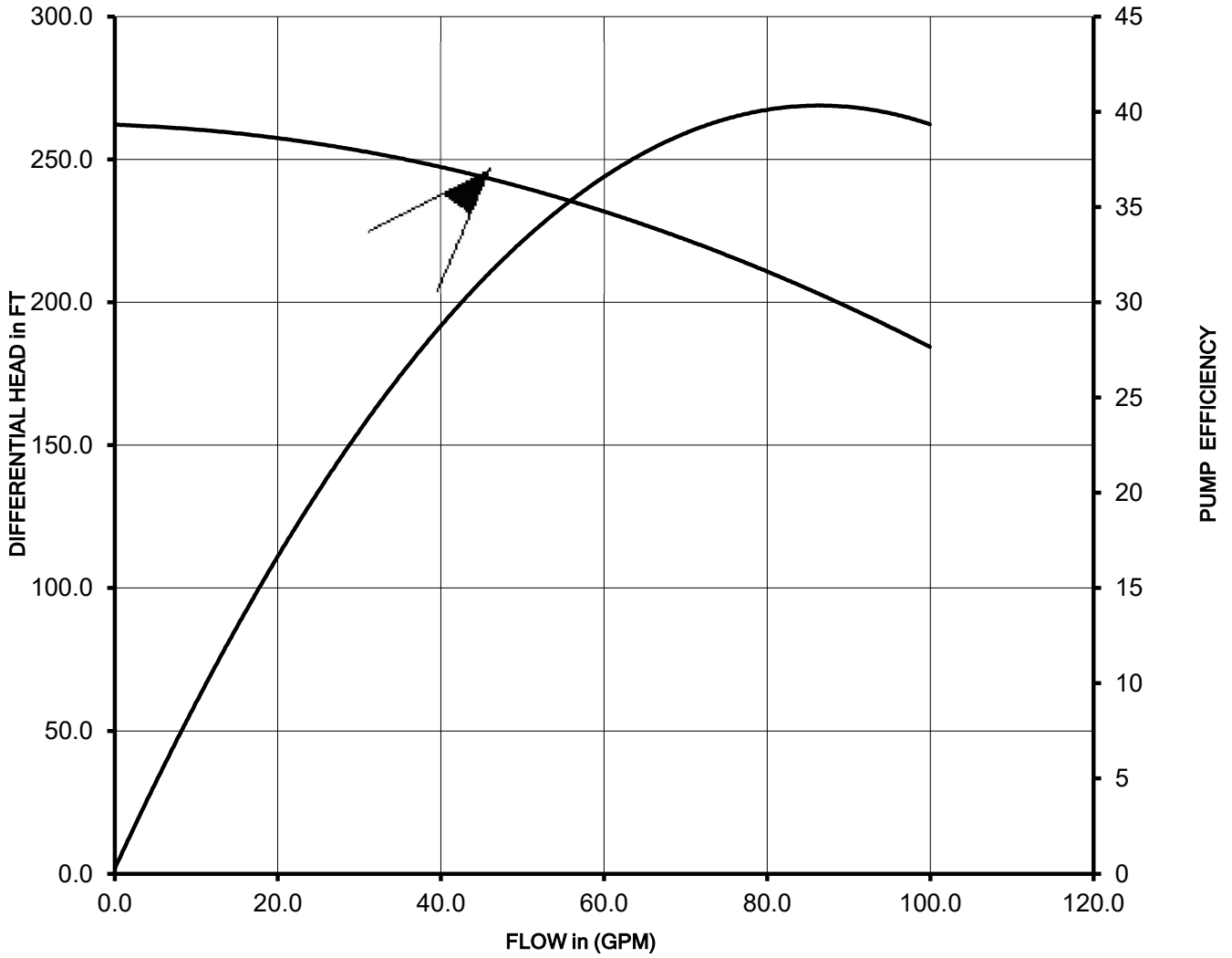
**DATE OF TEST :** 19-Nov-22

**SIGNATURE** .....

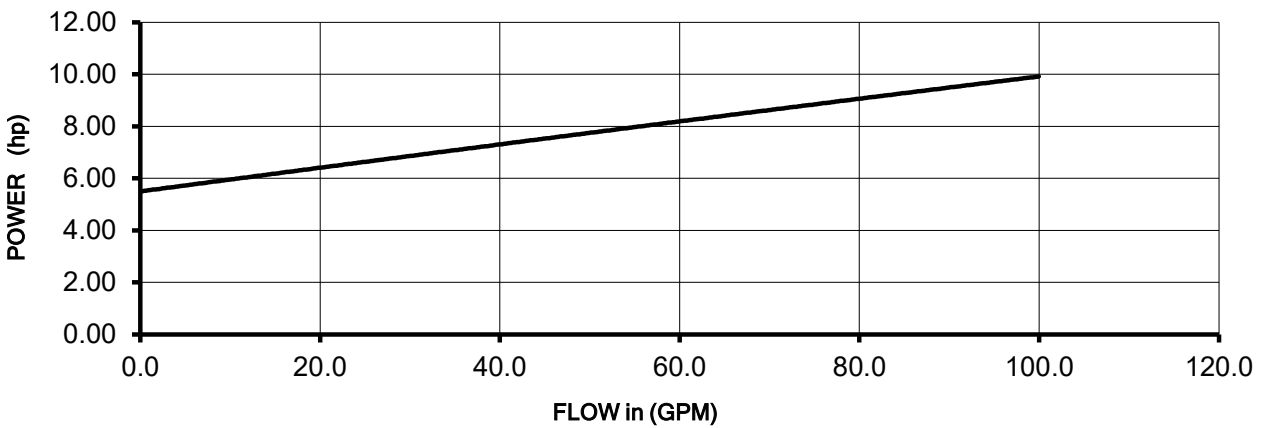
**Pump Model:** GSP 1.5x1x8-L DA2 ZL (40 Bar)  
**Speed:** 3520 **RPM**  
**Impeller Dia:** 7.80 **Inches**  
**Orifice Plate:** **Inches**

**HMD Serial No:** 839917B  
**Item No:** 18-P-252B

**HQ PERFORMANCE CURVE CORRECTED FOR SITE CONDITIONS**



**POWER CURVE CORRECTED FOR SITE CONDITIONS**



## HMD SEAL/LESS PUMP NOISE TEST SHEET

HMD SEAL/LESS PUMPS LTD.  
HAMPDEN PARK INDUSTRIAL ESTATE  
EASTBOURNE,  
EAST SUSSEX  
BN22 9AN  
ENGLAND

TELEPHONE : (01323) 452 000  
FAX : (01323) 503369  
EMAIL : pumps@hmdpumps.com

CLIENT :	Air Products Manufacturing LLC
CLIENT ORDER N° :	4505605360
CLIENT ITEM N° :	839917B
HMD JOB N° :	18-P-252B

<b>PUMP UNIT TESTED :-</b>	<b>DESCRIPTION :-</b>	
	PUMP MODEL :	GSP 1.5x1x8-L DA2 ZL (40 Bar)
	DUTY FLOW :	46.23 GPM
	DUTY HEAD :	247.05 FT

<b>MOTOR DETAILS :-</b>	<b>DESCRIPTION :-</b>	
	RATED SPEED :	3520 RPM
	RATED POWER :	15.00 HP
	SUPPLY :	460 V / 3~ / 60 Hz
	SERIAL N° :	Z22053 10292
	MANUFACTURER :	Baldor

<b>ACOUSTIC CONTROL DEVICES :-</b>	<b>DESCRIPTION :-</b>	

<b>MEASURING EQUIPMENT :-</b>	<b>DESCRIPTION :-</b>	
	SOUND METER :	Bruel & Kjaer
	SERIAL N° :	1824265

**TEST RESULTS :-** (dBA VALUES)

(AT DUTY POINT)

MICROPHONE POSITION	OVERALL	62.5	125	250	500	1k	2k	4k	8k
1	79.00	37.70	49.70	63.10	65.20	72.00	73.00	74.80	70.50
2	77.40	42.90	48.40	58.40	63.50	70.30	71.60	73.40	67.30
3	76.30	37.40	46.00	60.60	63.20	69.20	71.00	71.50	65.70
4	77.20	40.40	46.70	57.00	64.80	70.30	72.00	72.50	66.80
5	75.80	36.10	45.40	60.00	64.30	68.90	71.30	70.20	64.00
<b>BACKGROUND NOISE, POST TEST</b>	55.60	34.00	39.00	52.20	48.90	48.00	44.70	40.60	29.50

MEASURED SOUND PRESSURE LEVEL AVERAGED OVER SURFACE MEASURED  
BACKGROUND SOUND PRESSURE LEVEL AVERAGED OVER MEASURED SURFACE  
BACKGROUND NOISE CORRECTION  
TEST ENVIRONMENT NOISE CORRECTION - BASED ON ISO 3744  
CORRECTION FOR SET-UP (EG. TEST PIPING, VALVES, BASEPLATE ETC)  
CORRECTED SOUND PRESSURE LEVEL AVERAGED OVER MEASURED SURFACE

77.14  
55.60  
0.00  
-6.80  
**70.34**

**COMMENTS :-**

TESTED BY : T FEAR

SIGNATURE 

FOR : Air Products Manufacturing LLC

DATE OF TEST : 19-Nov-22

WITNESSED BY :

SIGNATURE .....



## HMD SEAL/LESS PUMP VIBRATION TEST SHEET

HMD SEAL/LESS PUMPS LTD.  
HAMPDEN PARK INDUSTRIAL ESTATE  
EASTBOURNE,  
EAST SUSSEX  
BN22 9AN  
ENGLAND

TELEPHONE : (01323) 452 000  
FAX : (01323) 503369  
EMAIL : pumps@hmdpumps.com

<b>CLIENT :</b>	Air Products Manufacturing LLC
<b>CLIENT ORDER N° :</b>	4505605360
<b>CLIENT ITEM N° :</b>	839917B
<b>HMD JOB N° :</b>	18-P-252B

<b><u>PUMP UNIT TESTED :-</u></b>	<b><u>DESCRIPTION :-</u></b>	
	<b>PUMP MODEL :</b>	GSP 1.5x1x8-L DA2 ZL (40 Bar)
	<b>DUTY FLOW :</b>	46.23 <b>GPM</b>
	<b>DUTY HEAD :</b>	247.05 <b>FT</b>

<b><u>MOTOR DETAILS :-</u></b>	<b><u>DESCRIPTION :-</u></b>	
	<b>RATED SPEED :</b>	3520 <b>RPM</b>
	<b>RATED POWER :</b>	15.00 <b>Hp</b>
	<b>SUPPLY :</b>	460 V / 3~ / 60 Hz
	<b>SERIAL N° :</b>	Z22053 10292
	<b>MANUFACTURER :</b>	Baldor

<b><u>ISOLATION DEVICES :-</u></b>	<b><u>DESCRIPTION :-</u></b>	
	<b>MOUNTING TYPE :</b>	
	<b>NUMBER OF MOUNTS :</b>	
	<b>NOISE SHEILDING :</b>	
	<b>CONNECTIONS</b>	

<b><u>MEASURING EQUIPMENT :-</u></b>	<b><u>DESCRIPTION :-</u></b>	
	<b>ACCELEROMETER :</b>	Vibrotip
	<b>SERIAL N° :</b>	0 5146
	<b>FIXING METHOD :</b>	

**TEST RESULTS :-** READINGS TAKEN AS R.M.S

**VIBRATION LEVEL (inches/s)**

TEST POINT	1	2	3	4	5	6	7	8
FLOW	10.74	28.49	43.94	46.23	99.95			
VERTICAL- V <sub>1</sub>	0.10	0.10	0.09	0.09	0.09			
TRANSVERSE- H <sub>1</sub>	0.05	0.05	0.05	0.05	0.04			
AXIAL- A	0.04	0.03	0.03	0.03	0.03			
VERTICAL- V <sub>2</sub>	0.07	0.07	0.07	0.07	0.07			
TRANSVERSE- H <sub>2</sub>	0.05	0.05	0.05	0.05	0.06			

**COMMENTS :-**

**TESTED BY :** T FEAR

**SIGNATURE** 

**FOR :** Air Products Manufacturing LLC

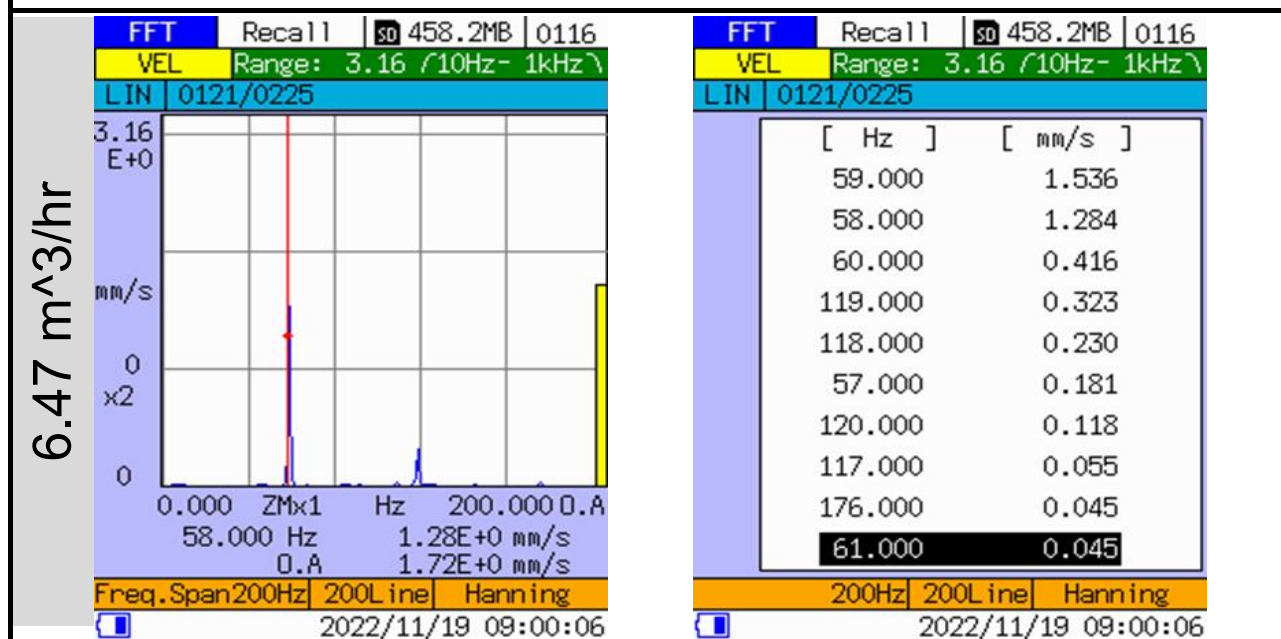
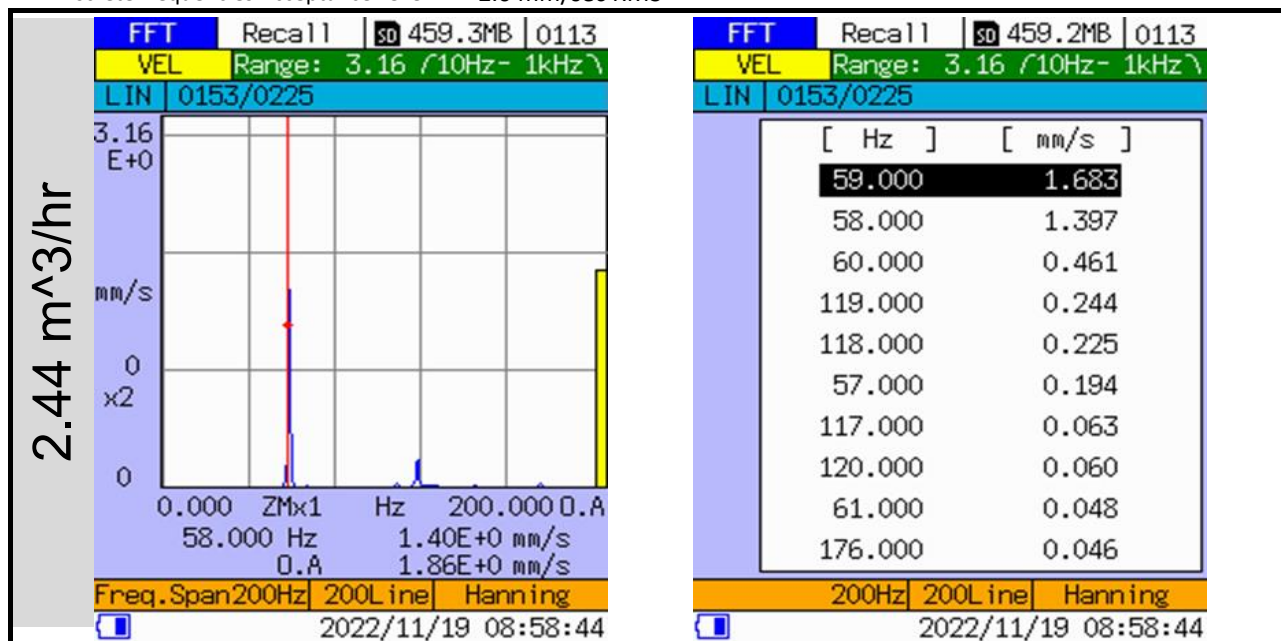
**DATE OF TEST :** 19-Nov-22



## HMD Kontro

### FFT VIBRATION TEST REPORT ON:

Customer: AIR PRODUCTS MANUFACTURING  
 Pump / Item No: 839917 B  
 Instrument used: Vibration Analyser, model VA-12 serial no.00990032  
 Date: 17 November 2022  
 Sensor location & Position: Bearing housing & Radial / Vertical  
 Pump rotational speed: 3520 rpm 60Hz  
 API 685 Acceptance levels: <3.0 mm/sec RMS (Overall)  
 Discrete frequencies Acceptance Level: <2.0 mm/sec RMS



Tested by: M Wheeler

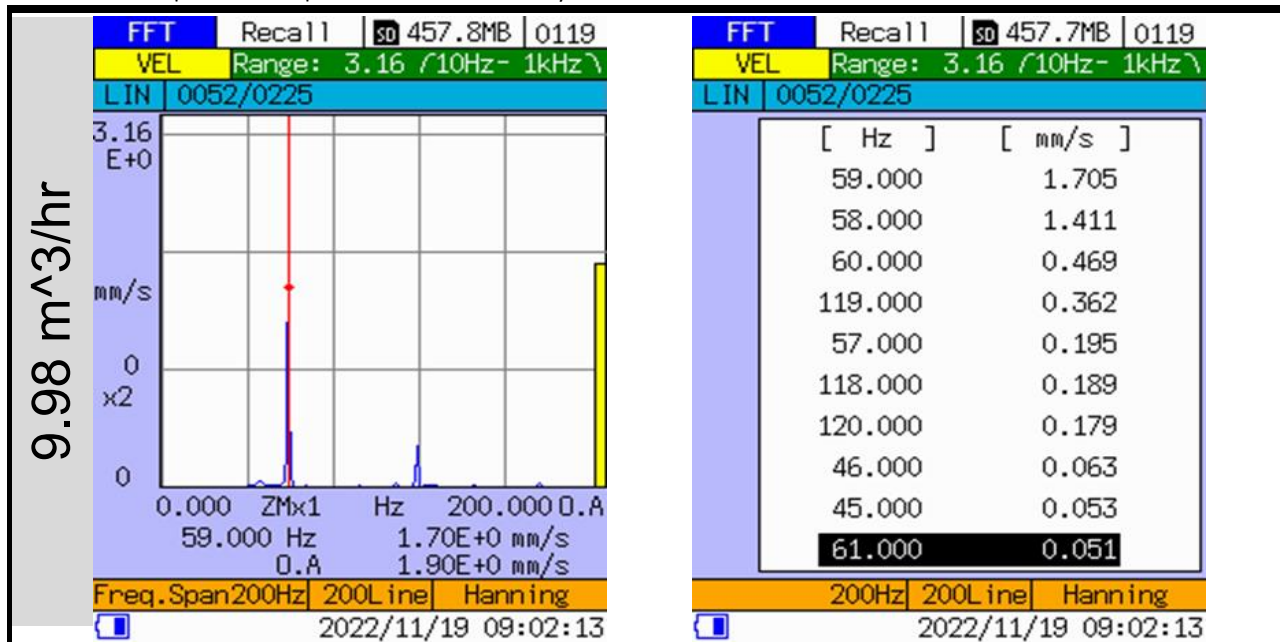
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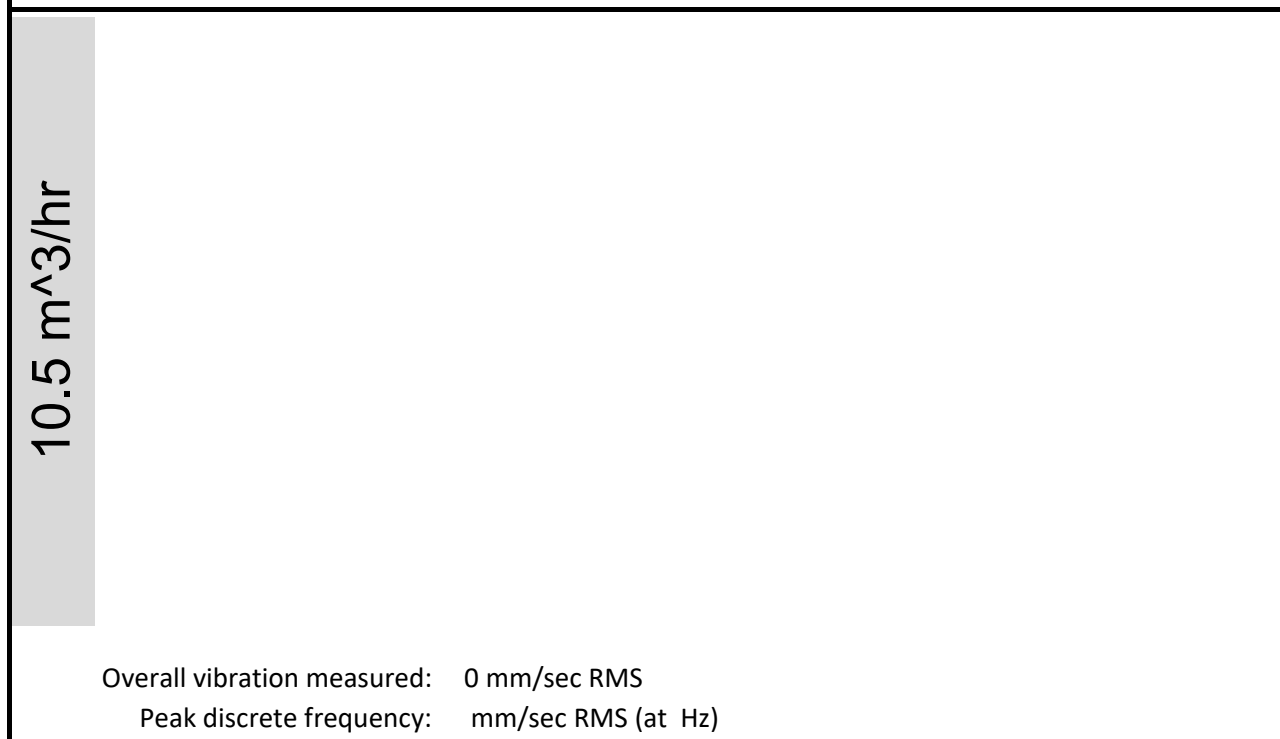
## HMD Kontro

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Customer: AIR PRODUCTS MANUFACTURING  
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 Date: 17 November 2022  
 Sensor location & Position: Bearing housing & Radial / Vertical  
 Pump rotational speed: 3520 rpm 60Hz  
 API 685 Acceptance levels: <3.0 mm/sec RMS (Overall)  
 Discrete frequencies Acceptance Level: <2.0 mm/sec RMS



Overall vibration measured: 1.9 mm/sec RMS  
 Peak discrete frequency: 0.051 mm/sec RMS (at 61 Hz)



Tested by: M Wheeler

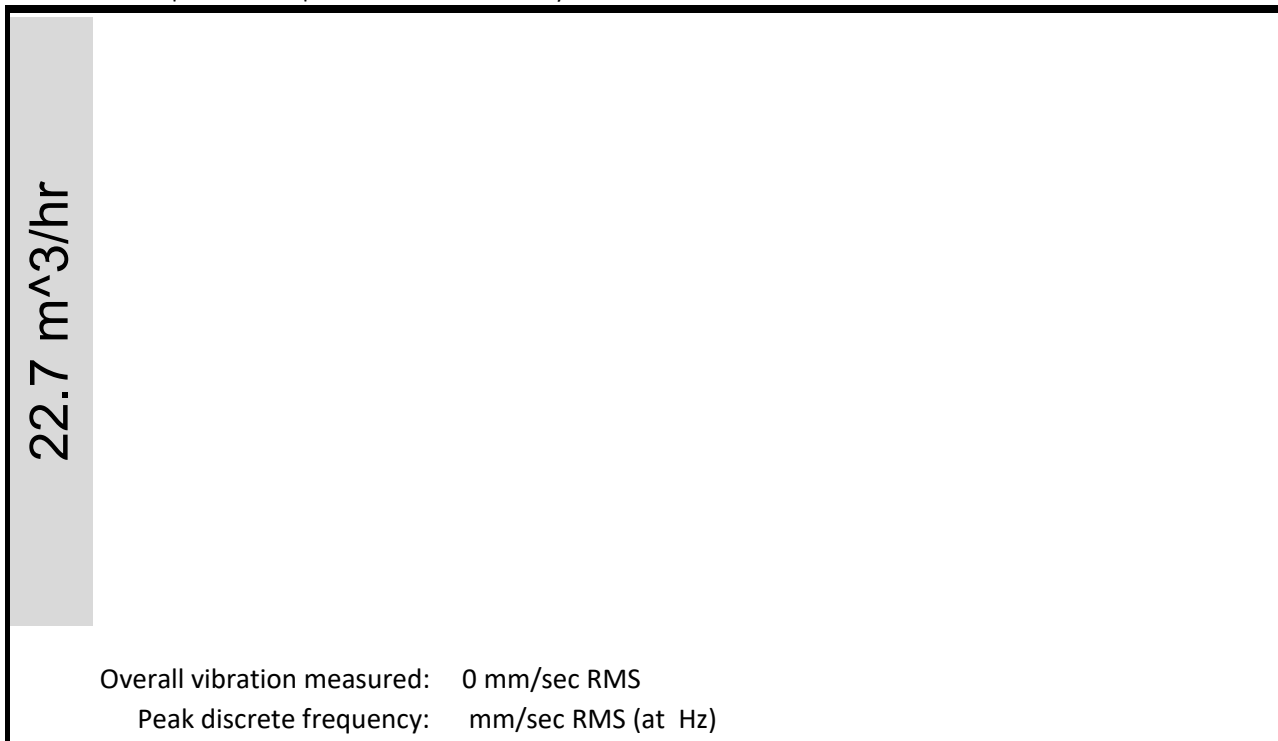
Sign:



## HMD Kontro

### FFT VIBRATION TEST REPORT ON:

Customer: AIR PRODUCTS MANUFACTURING  
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Tested by: M Wheeler

Sign:

