



# Custom Compressed Air

**The Efficiency Maine Business Program provides incentives for the purchase and installation of premium efficiency compressed air systems in new construction projects, renovation projects, and for the replacement of functioning, but less efficient, existing equipment.** Custom projects submitted under the Business Program must include a detailed technical analysis showing base electrical energy use and proposed savings. The accompanying worksheets will provide your company's engineering staff or assisting contractor with step-by-step guidelines for analysis beyond what is listed in Table 4 of the Custom Compressed Air Incentive Application.

This instruction guide is intended to present information regarding the operations of the existing and proposed compressed air system components in a consistent manner. Please feel free to present the energy savings analysis in your own format, making sure that the current operations of the compressed air system is correctly represented in the analysis. However, analyses presenting one-line calculations using average loads for the entire year are not recommended, and supplementary information will be requested in order to process the application.

If you require assistance, please contact Efficiency Maine at 866-376-2463, or by email at [efficiencymainec&i@ers-inc.com](mailto:efficiencymainec&i@ers-inc.com). All forms and guidelines are downloadable at [efficiencymaine.com](http://efficiencymaine.com).

## Following you will find:

The first worksheet, on page 2, is for presenting the information regarding the existing compressed air system components and their operational settings. (See example on page 5.)

The second worksheet, on page 3, is for presenting the information regarding the proposed compressed air system components and their intended operational settings. (See example on page 6.)

The third worksheet, on page 4, presents a sample compressed air analysis format. (See example on page 7.)

Please note that, along with the two form documents and the energy savings analysis, we do require the following supporting documents to complete the application package:

Data logging results (CFM or power or both, preferably in graphical plot format) along with the underlying assumptions (such as sampling rates, equipment logged, location etc). We recommend that the data logging be conducted over a minimum period of one regular production week.

Performance curves and product literature for the existing and proposed compressed air system components discussed in the application are also required.

[Please review the attached example analysis for a compressed air system retrofit.](#)

## HOW AND WHERE TO SEND YOUR APPLICATION AND PROOF OF PURCHASE

Please mail or fax all documentation and forms to: Efficiency Maine Business Program | 323 State Street, Suite 2 | Augusta ME 04330

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# Compressed Air System Information Part I Worksheet 1



Leading the Way to a Brighter Future

**EXISTING COMPRESSED AIR EQUIPMENT DESCRIPTION**

**Facility Name:** \_\_\_\_\_

**Environmental conditions (Eg: High Temp., Etc.):** \_\_\_\_\_

**Electric Rate (Example: \$0.15/kWh):** \_\_\_\_\_

**Hours of operation:** \_\_\_\_\_

COMPRESSOR (Add additional sheets if more than 3 compressors)	UNIT 1	UNIT 2	UNIT 3
Location in the facility:			
HP:			
Manufacturer:			
Model Number:			
CFM: Rated Pressure (Eg. 1,000 CFM @ 100 PSIG):			
Age (Years)			
Type (Rotary Screw, Variable Displacement, Modulation, VFD):			
Stages (Single or Double)			
Control Type (Load/Unload, Variable Displacement, Modulation, VFD):			
Operation Sequence (Lead/Lag/Backup):			
Cut-In Pressure (PSIG):			
Cut-Out Pressure (PSIG):			
Full Load kW:			
No Load or Unload kW:			
Air Cooled or Water Cooled?			
Timed Off (Disabled/Enabled)?			
<b>DRYERS (If Applicable)</b>			
Type (Refrigerated-Standard, Cycling, VFD, Desiccant, etc):			
Dew Point Required (38 F or lesser):			
CFM @ PSIG (from nameplate):			
Pressure Drop (PSIG) at Rated Flow:			
HP or kW:			
Air Cooled or Water Cooled?			
<b>RECEIVER/STORAGE TANKS (If Applicable)</b>			
Location in the facility:			
Storage Capacity (Gallons):			
<b>FILTERS (If Applicable)</b>			
Location in the facility:			
Type (Coalescing, Particulate, Absorption, etc):			
Pressure Drop (PSIG) at Rated Flow:			
<b>CONDENSATE TRAPS (If Applicable)</b>			
Location in the facility:			
Type (Timer Drains, Float Drains, etc):			
ON Time (Seconds):			
OFF Time (Seconds):			
Drain Line Size (Inches):			
<b>CENTRALIZED FLOW CONTROLLER (If Applicable)</b>			
Location in the facility:			
Inlet Pressure (PSIG):			
Exit Pressure (PSIG):			

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# Compressed Air System Information Part 2

## Worksheet 2



Leading the Way to a Brighter Future

**PROPOSED COMPRESSED AIR EQUIPMENT DESCRIPTION**

**Facility Name:** \_\_\_\_\_

**Environmental conditions (Eg: High Temp., Etc.):** \_\_\_\_\_

**Electric Rate (Example: \$0.15/kWh):** \_\_\_\_\_

**Hours of operation:** \_\_\_\_\_

COMPRESSOR (Add additional sheets if more than 3 compressors)	UNIT 1	UNIT 2	UNIT 3
Location in the facility:			
HP:			
Manufacturer:			
Model Number:			
CFM: Rated Pressure (Eg. 1,000 CFM @ 100 PSIG):			
Age (Years)			
Type (Rotary Screw, Variable Displacement, Modulation, VFD):			
Stages (Single or Double)			
Control Type (Load/Unload, Variable Displacement, Modulation, VFD):			
Operation Sequence (Lead/Lag/Backup):			
Cut-In Pressure (PSIG):			
Cut-Out Pressure (PSIG):			
Full Load kW:			
No Load or Unload kW:			
Air Cooled or Water Cooled?			
Timed Off (Disabled/Enabled)?			
<b>DRYERS (If Applicable)</b>			
Type (Refrigerated-Standard, Cycling, VFD, Desiccant, etc):			
Dew Point Required (38 F or lesser):			
CFM @ PSIG (from nameplate):			
Pressure Drop (PSIG) at Rated Flow:			
HP or kW:			
Air Cooled or Water Cooled?			
<b>RECEIVER/STORAGE TANKS (If Applicable)</b>			
Location in the facility:			
Storage Capacity (Gallons):			
<b>FILTERS (If Applicable)</b>			
Location in the facility:			
Type (Coalescing, Particulate, Absorption, etc):			
Pressure Drop (PSIG) at Rated Flow:			
<b>CONDENSATE TRAPS (If Applicable)</b>			
Location in the facility:			
Type (Timer Drains, Float Drains, etc):			
ON Time (Seconds):			
OFF Time (Seconds):			
Drain Line Size (Inches):			
<b>CENTRALIZED FLOW CONTROLLER (If Applicable)</b>			
Location in the facility:			
Inlet Pressure (PSIG):			
Exit Pressure (PSIG):			

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# Compressed Air System Sample Analysis Layout Worksheet 3



Leading the Way to a Brighter Future

Date	Day	Hours at Load	Avg. Flow (CFM), or kW, or Amps	Existing Compressor 1			Existing Compressor 2			Existing Total			Proposed Compressor 1			Proposed Compressor 2			Proposed Total			Total Savings		
				CFM	kM	kWh	CFM	kW	kWh	CFM	kW	Total kWh	CFM	kW	kWh	CFM	kW	kWh	CFM	kW	Total kWh	CFM	kW	kWh
7/12/04	Monday	4.00	600	450	81	324	150	49	197	600	130	521	600	114	455				600	114	455	16	66	\$5
		6.00	525	450	81	486	75	40	242	525	121	728	525	99	597				525	99	597	22	131	\$10
		6.00	350	350	76	545	0	0	0	350	76	454	350	66	398				350	66	398	9	237	\$19
		8.00	200	200	68	540	0	0	0	200	68	540	200	38	303				200	38	303	30	237	\$19
7/13/04	Tuesday	4.00	650	450	81	324	200	55	220	650	136	544	650	123	493				650	123	493	13	51	\$4
		8.00	525	450	81	648	75	40	322	525	121	970	525	99	796				525	99	796	22	174	\$14
		6.00	365	365	76	458	0	0	0	365	76	458	365	69	415				365	69	415	7	43	\$3
		6.00	250	250	70	421	0	0	0	250	70	421	250	47	284				250	47	284	23	137	\$11
7/14/04	Wednesday	4.00	625	450	81	324	175	52	208	625	133	532	625	118	474				625	118	474	15	59	\$5
		6.00	525	450	81	435	75	40	242	525	121	728	525	99	597				525	99	597	22	131	\$10
		6.00	350	350	76	454	0	0	0	350	76	454	350	66	398				350	66	398	9	56	\$4
		8.00	200	200	68	540	0	0	0	200	68	540	200	38	303				200	38	303	30	237	\$19
7/15/04	Thursday	4.00	645	450	81	324	195	54	218	645	135	542	645	122	486				645	122	486	13	53	\$4
		8.00	530	450	81	643	80	41	327	530	122	975	530	100	803				530	100	803	21	172	\$14
		6.00	365	365	76	458	0	0	0	365	76	458	365	69	415				365	69	415	7	43	\$3
		6.00	250	250	70	421	0	0	0	250	70	421	250	47	284				250	47	284	23	137	\$11
7/16/04	Friday	4.00	650	450	81	324	200	55	220	650	136	544	650	123	493				650	123	493	13	51	\$4
		6.00	500	450	81	486	50	37	224	500	118	710	500	95	568				500	95	568	24	142	\$11
		6.00	350	350	76	454	0	0	0	350	76	454	350	66	398				350	66	398	9	56	\$4
		8.00	200	200	68	540	0	0	0	200	68	540	200	38	303				200	38	303	30	237	\$19
7/17/04	Saturday	24.00	100	100	62	1490	0	0	0	100	62	1490	100	19	455				100	19	455	43	1036	\$83
7/18/04	Sunday	20.00	90	90	62	1231	0	0	0	90	62	1231	90	17	341				90	17	341	45	890	\$71
		4.00	150	150	65	259	0	0	0	150	65	259	150	28	114				150	28	114	36	146	\$12
<b>Totals:</b>		<b>168.0</b>			<b>81</b>	<b>12,095</b>		<b>55</b>	<b>2,420</b>		<b>136</b>	<b>14,515</b>		<b>123</b>	<b>10,176</b>						<b>30</b>	<b>4,339</b>	<b>\$347</b>	

## Savings Summary

<b>kW Savings:</b>	<b>29.6</b>
<b>kWh Savings:</b>	<b>216,960</b>
<b>Cost Savings:</b>	<b>\$17,357</b>
<b>Implementation Cost:</b>	<b>\$65,000</b>
<b>Simple Payback:</b>	<b>3.7</b>

Note: Please provide compressor performance curves for the existing and proposed compressors along with the data logging results (preferably in charts or plots) as backup.

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# Compressed Air System Information Part I

## Worksheet 1

### EXISTING COMPRESSED AIR EQUIPMENT DESCRIPTION

**Facility Name:** ABC Manufacturing, Portland

**Environmental conditions (Eg: High Temp., Etc.):** Compressor intake air from machine room at approximately 120°F

**Electric Rate (Example: \$0.15/kWh):** \$0.15

**Hours of operation:** 24 x 7 x 52

COMPRESSOR (Add additional sheets if more than 3 compressors)	UNIT 1	UNIT 2	UNIT 3
Location in the facility:	Mechanical Room	Mechanical Room	
HP:	100	75	
Manufacturer:	XYZ	XYZ	
Model Number:	ABC100	BNM75	
CFM: Rated Pressure (Eg. 1,000 CFM @ 100 PSIG):	450 CFM @ 100 PSIG	320 CFM @ 100 PSIG	
Age (Years)	10	15	
Type (Rotary Screw, Variable Displacement, Modulation, VFD):	Rotary Screw	Reciprocating	
Stages (Single or Double)	Single	Single	
Control Type (Load/Unload, Variable Displacement, Modulation, VFD):	Modulation	Load/Unload	
Operation Sequence (Lead/Lag/Backup):	Lead	Lag	
Cut-In Pressure (PSIG):	Set for 105 PSIG	90	
Cut-Out Pressure (PSIG):		100	
Full Load kW:	81.1	62.9	
No Load or Unload kW:	52.7	25.1	
Air Cooled or Water Cooled?	Air-Cooled	Air-Cooled	
Timed Off (Disabled/Enabled)?	N/A	Enabled (Off after 15 minutes)	
<b>DRYERS (If Applicable)</b>			
Type (Refrigerated-Standard, Cycling, VFD, Desiccant, etc):	Refrigerated Standard	Refrigerated Standard	
Dew Point Required (38 F or lesser):	38 F	38 F	
CFM @ PSIG (from nameplate):	500 CFM @ 110 PSIG	400 CFM @ 110 PSIG	
Pressure Drop (PSIG) at Rated Flow:	2.5 PSIG	2.5 PSIG	
HP or kW:	5 HP	3 HP	
Air Cooled or Water Cooled?	Air-Cooled	Air-Cooled	
<b>RECEIVER/STORAGE TANKS (If Applicable)</b>			
Location in the facility:	Before Dryer	After Dryer	
Storage Capacity (Gallons):	250	300	
<b>FILTERS (If Applicable)</b>			
Location in the facility:	Before Dryer	After Dryer	
Type (Coalescing, Particulate, Absorption, etc):	Particulate	Coalescing	
Pressure Drop (PSIG) at Rated Flow:	1 PSIG @ 400 CFM	1 PSIG @ 400 CFM	
<b>CONDENSATE TRAPS (If Applicable)</b>			
Location in the facility:	At Dryer	At Filter 1	At Receiver Tank 1
Type (Timer Drains, Float Drains, etc):	Timer Drain	Timer Drain	Float Drain
ON Time (Seconds):	2	5	N/A
OFF Time (Seconds):	300	100	
Drain Line Size (Inches):	1/8"	1/8"	
<b>CENTRALIZED FLOW CONTROLLER (If Applicable)</b>			
Location in the facility:	N/A		
Inlet Pressure (PSIG):			
Exit Pressure (PSIG):			

# Compressed Air System Information Part 2

## Worksheet 2



Leading the Way to a Brighter Future

**PROPOSED COMPRESSED AIR EQUIPMENT DESCRIPTION**

**Facility Name:** ABC Manufacturing, Portland

**Environmental conditions (Eg: High Temp., Etc.):** Compressor intake air from machine room at approximately 120°F

**Electric Rate (Example: \$0.15/kWh):** \$0.15

**Hours of operation:** 24 x 7 x 52

COMPRESSOR (Add additional sheets if more than 3 compressors)	UNIT 1	UNIT 2	UNIT 3
Location in the facility:	Mechanical Room		
HP:	150		
Manufacturer:	XYZ		
Model Number:	BNM100		
CFM: Rated Pressure (Eg. 1,000 CFM @ 100 PSIG):	675 CFM @ 110 PSIG		
Age (Years)	N/A		
Type (Rotary Screw, Variable Displacement, Modulation, VFD):	Rotary Screw		
Stages (Single or Double)	Single		
Control Type (Load/Unload, Variable Displacement, Modulation, VFD):	VFD		
Operation Sequence (Lead/Ag/Backup):	Lead		
Cut-In Pressure (PSIG):	Set for 105 PSIG		
Cut-Out Pressure (PSIG):			
Full Load kW:	125.4		
No Load or Unload kW:			
Air Cooled or Water Cooled?	Air-Cooled		
Timed Off (Disabled/Enabled)?	Enabled		
<b>DRYERS (If Applicable)</b>			
Type (Refrigerated-Standard, Cycling, VFD, Desiccant, etc):	Refrigerated VFD		
Dew Point Required (38 F or lesser):	38 F		
CFM @ PSIG (from nameplate):	1200 CFM @ 110 PSIG		
Pressure Drop (PSIG) at Rated Flow:	2.5 PSIG		
HP or kW:	10 HP		
Air Cooled or Water Cooled?	Air-Cooled		
<b>RECEIVER/STORAGE TANKS (If Applicable)</b>			
Location in the facility:	Before Dryer	After Dryer	
Storage Capacity (Gallons):	250	3000	
<b>FILTERS (If Applicable)</b>			
Location in the facility:	Before Dryer	After Dryer	
Type (Coalescing, Particulate, Absorption, etc):	Particulate	Coalescing	
Pressure Drop (PSIG) at Rated Flow:	1 PSIG @ 1200 CFM	1 PSIG @ 1200 CFM	
<b>CONDENSATE TRAPS (If Applicable)</b>			
Location in the facility:	At Dryer	At Filter 1	At Receiver Tank 1
Type (Timer Drains, Float Drains, etc):	Float	Float	Float Drain
ON Time (Seconds):	N/A	N/A	N/A
OFF Time (Seconds):			
Drain Line Size (Inches):			
<b>CENTRALIZED FLOW CONTROLLER (If Applicable)</b>			
Location in the facility:	N/A		
Inlet Pressure (PSIG):			
Exit Pressure (PSIG):			

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# Compressed Air System Sample Analysis Layout Worksheet 3



Leading the Way to a Brighter Future

Date	Day	Hours at Load	Avg. Flow (CFM), or kW, or Amps	Existing Compressor 1			Existing Compressor 2			Existing Total			Proposed Compressor 1			Proposed Compressor 2			Proposed Total			Total Savings		
				CFM	kM	kWh	CFM	kW	kWh	CFM	kW	Total kWh	CFM	kW	kWh	CFM	kW	kWh	CFM	kW	Total kWh	CFM	kW	kWh
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		8.00	200	200	68	540	0	0	0	200	68	540	200	38	303				200	38	303	30	237	\$19
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		6.00	365	365	76	458	0	0	0	365	76	458	365	69	415				365	69	415	7	43	\$3
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		6.00	350	350	76	454	0	0	0	350	76	454	350	66	398				350	66	398	9	56	\$4
		8.00	200	200	68	540	0	0	0	200	68	540	200	38	303				200	38	303	30	237	\$19
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7/18/04	Sunday	20.00	90	90	62	1231	0	0	0	90	62	1231	90	17	341				90	17	341	45	890	\$71
		4.00	150	150	65	259	0	0	0	150	65	259	150	28	114				150	28	114	36	146	\$12
<b>Totals:</b>		<b>168.0</b>			<b>81</b>	<b>12,095</b>		<b>55</b>	<b>2,420</b>		<b>136</b>	<b>14,515</b>		<b>123</b>	<b>10,176</b>						<b>30</b>	<b>4,339</b>	<b>\$347</b>	

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